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Innovative Strategies for Environmental Liability Management

December 29, 2015

Mr. Tom Fitzsimons
Marinwood Plaza, LLC C/O
Wells Fargo Wealth Management
333 Market Street, 29th Floor
San Francisco, CA 94105

REMEDIAL ACTION PLAN
FORMER PROSPERITY CLEANERS
MARINWOOD PLAZA SHOPPING CENTER
187 MARINWOOD AVENUE
CASE #21S0053
SAN RAFAEL, CA 94903

Dear Mr. Fitzsimons:

GEOLOGICA, Inc. (GEOLOGICA) is pleased to present this Remedial Action Plan (RAP) describing our approach and schedule for remediation of the above-referenced property. This report was prepared to complete the requirements of Task 6 of Regional Board Order # R2-2014-0007 ("the Order") specifying site cleanup requirements.

We have enjoyed working with you on this project and appreciate the opportunity to be of service. Should you have any questions, please do not hesitate to contact us at (415) 597-7888.

Very truly yours,

GEOLOGICA, Inc.

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Remedial Action Plan

Former Prosperity Cleaners
Marinwood Plaza Shopping Center
187 Marinwood Avenue
Case #21S0053
San Rafael, CA 94903

Submitted to:

Marinwood Plaza, LLC

December 29, 2015

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187 MARINWOOD AVENUE
CASE #21S0053
SAN RAFAEL, CA 94903

1 INTRODUCTION

On behalf of Marinwood Plaza, LLC (Marinwood Plaza), GEOLOGICA is pleased to present this Remedial Action Plan (RAP) for the former Prosperity Cleaners located at 187 Marinwood Avenue in San Rafael, California ("the Site or Subject Property"). **Figure 1** illustrates the Site location and vicinity. The Site is an active Spills, Leaks, Investigation and Cleanup (SLIC) site, Case #21S0053, administered by the California Regional Water Quality Control Board, San Francisco Bay Region ("the Regional Board").

In 2007, an apparent release of tetrachloroethylene (PCE) to soil and groundwater at the Site was identified during environmental due diligence Phase II investigation activities. Since then, multiple investigations and interim remedial actions (IRAs) have been performed to address residual PCE in soil, soil vapor, and groundwater at the Site under the oversight of the Regional Board. The purpose of this document is to develop and present a proposed final remedial action to address residual PCE and its breakdown products in an effort meet the Regional Board's low risk closure requirements and receive a no further action letter from the Regional Board.

1.1 SITE BACKGROUND

The Prosperity Cleaners dry cleaning business was formerly located at 187 Marinwood Avenue in the Marinwood Plaza Shopping Center. Marinwood Plaza occupies a commercially-zoned property north of the City of San Rafael at the southeast corner of the intersection of Marinwood Avenue and Miller Creek Road and between Marinwood Avenue on the west and Highway 101 on the east (**Figure 1**). The property is comprised of four parcels (164-47-64, 164-47-65, 164-47-69, and 164-47-70) totaling approximately five acres. The areas to the north and west of the Site are single-family residential housing, and another commercial parcel borders the Site to the south. The Miller Creek Road onramp to southbound Highway 101 bounds the property on the east. A dairy farm owned by the Silveira family is located across Highway 101 to the east and southeast of the Site.

The shopping center was developed in 1962 and is configured as a linear strip mall. There are currently two occupied tenant spaces in Marinwood Plaza Shopping Center: Savemor Liquors at 197 Marinwood Avenue and the Marinwood Market grocery store at 155 Marinwood

Avenue. Marinwood Market is located in a separate building north of the line of buildings that includes the dry cleaner. The rear storage room of Savemor Liquors shares a wall with the former Prosperity Cleaners tenant space. A former Unocal gasoline station previously occupied the vacant lot at the northern end of the property.

According to the Phase I prepared by Environ International Corporation (Environ) in May 2004, the first listing for a dry cleaner at the Site references an EPA generator number for Marinwood Cleaners in November 1989. An EPA generator number for Prosperity Cleaners at the same address (187 Marinwood Avenue) appears in January 2002 under different ownership. Prosperity Cleaners reportedly discontinued dry cleaning on the property in 2005. Consequently, it appears that a dry cleaner used PCE in its daily operations and conducted dry cleaning at the Site for approximately 15 years, from 1990 to 2005. The dry cleaning machine was still present on site in 2007/2008 when initial subsurface investigation work began. In December 2009, the dry cleaner vacated the property. The dry cleaning machine was subsequently removed from the building in April 2010.

1.2 Current Land Use and Potential Redevelopment

The subject property is currently zoned for commercial use only. Future use of the property is anticipated to include a mixture of commercial and residential use. It is expected that the southern building on the property will be demolished during redevelopment activities.

1.3 Regulatory Oversight

As discussed in **Section 3** below, initial investigations of soil and groundwater quality at the Site were conducted as part of routine environmental due diligence investigations by a prospective buyer in August and September 2007. In December 2007, GEOLOGICA installed and sampled groundwater monitoring wells at the Site and confirmed the presence of volatile organic compounds (VOCs) including PCE and related compounds in Site groundwater. In January 2008, Marinwood Plaza voluntarily requested oversight with the Regional Board. A series of remedial investigations and several Interim Remedial Actions (IRAs) were voluntarily conducted under Regional Board oversight until February 2014 when the Regional Board issued Cleanup Order No. R2-2014-0007 (RWQCB, 2014a), which established cleanup requirements and a schedule for conducting remedial investigations. Task 6 of the February 2014 Cleanup Order requires submittal of this RAP. Section B of the February 2014 Cleanup Order established preliminary cleanup levels for the Site. The Regional Board amended the February 2014 Order in September 2014 (RWQCB, 2014b) to modify the compliance date for submittal of an Offsite Remedial Investigation Report and decoupled potential onsite and offsite IRAs.

1.4 ORGANIZATION OF THIS REPORT

The remainder of this document is organized in general accordance with the requirements of Task 6 of the February 2014 Cleanup Order as follows:

- Section 2 presents a summary of Surface and Subsurface Conditions at the Site;
- Section 3 presents a Summary of Remedial Investigations completed on and off the subject property;
- Section 4 summarizes and presents an Evaluation of Interim Remedial Actions Implemented at the Site;
- Section 5 describes the Source and Distribution of VOCs at the Site derived from existing information and data, including the nature and extent of contamination in soil, groundwater, soil vapor and indoor air; and provides a Risk Evaluation for Onsite and Offsite Receptors;
- Section 6 presents the Remedial Action Feasibility Study including proposed Remedial Action Objectives (RAOs), proposed Final Cleanup Goals for the Site, presents and evaluates available and appropriate potential Remedial Actions for Soil, Groundwater, and Soil Vapor;
- Section 7 presents our Recommended Final Remedial Actions;
- Section 8 describes Remedial Action Implementation Tasks and Proposed Schedule for implementation;
- Section 9 summarizes the Proposed Risk Management Plan for the Site; and,
- Section 10 provides citations for all referenced documents.

2 SURFACE AND SUBSURFACE CONDITIONS

Sections below describe topography and surface water near the Site, soil lithology, groundwater occurrence, and flow conditions.

2.1 TOPOGRAPHY AND SURFACE WATER

The subject property is located in the Gallinas Valley at an elevation of approximately 40 feet above Mean Sea Level (MSL). Surface topography slopes gently to the east. The Site is located approximately 500 feet north of Miller Creek, which flows in a generally easterly direction towards San Francisco Bay. San Francisco Bay is located approximately 2 miles east of the Site.

2.2 SOIL LITHOLOGY

The site and vicinity are underlain by Quaternary Alluvium consisting of unconsolidated deposits of silt, clay, sand and gravel. Franciscan bedrock comprised of sandstone and shale reportedly outcrops in highland areas north, west, and south of the site. Borings have been advanced to maximum depths of 52 feet (ft) below ground surface (bgs) on the property and 78 feet bgs on the Silveira Ranch property to the east across Highway 101. The Site and vicinity are underlain by up to 50 to 60 feet of silt, sand, and gravel deposited by a meandering ancestral Miller Creek over fractured bedrock of the Franciscan Complex. Borings advanced at and near the Site indicate that these stream deposits are variable in texture both laterally and vertically and generally become coarser with depth. Key lithologic boring locations are shown on **Figure 2**. Schematic subsurface cross sections are presented on **Figures 3**, **4**, and **5**.

Soils encountered at the Site generally consist of a surficial sandy clay horizon overlying as many as three horizons of clayey sand separated by grading to clayey medium sand as depicted on Cross Section A-A' (**Figure 3A**). The upper silt and clay horizon was encountered to depths of approximately 15 to 25 feet bgs. Varying thicknesses of more permeable sand horizons and less permeable silt and clay horizons were encountered below that depth. However, many of the permeable sand layers may have limited lateral continuity.

2.3 GROUNDWATER OCCURRENCE AND FLOW

Groundwater is encountered under semi-confined to unconfined conditions in the uppermost permeable soil horizon beneath the Site; groundwater present in deeper permeable strata appears to be semi-confined or confined by overlying finer-grained strata. As evidence of these conditions, groundwater is typically first encountered at depths of 16 to 20 feet bgs during drilling, and rises following boring completion. Groundwater levels in monitoring wells completed at the Site fluctuate seasonally, ranging from 6 to 12 feet bgs in late winter and several feet lower in late fall (see **Figure 6**). Generally easterly to southeasterly horizontal groundwater gradients have been identified at the property and off-site on the Silveira Ranch to

the east. **Figure 7** presents a groundwater elevation contour map for the most recent quarterly monitoring event, which was conducted in November 2015.

Based on off-site investigations, groundwater north and east of Miller Creek was encountered below the upper silt and clay horizon under partially confined conditions. South of Miller Creek on the Silveira property, groundwater was encountered in a shallow sand horizon overlying the upper silt and clay horizon as well as in deeper confined units underlying the upper silt and clay horizon (See Schematic Cross Sections B-B' and C-C', **Figures 4** and **5**). Offsite investigation completed in August/September 2015 estimated groundwater elevation ranging between approximately 18 and 31 feet MSL, which is consistently above the water level in Miller Creek, indicating that the creek gains water from the underlying groundwater-bearing zone as it crosses the Silveira Ranch property.

3 SUMMARY OF REMEDIAL INVESTIGATIONS

A number of remedial investigations have been conducted on- and off the property in association with the dry cleaning solvent release at the former Prosperity Cleaners.

3.1 ONSITE REMEDIAL INVESTIGATIONS

Onsite remedial investigations completed at the Site include:

- Preliminary environmental due diligence investigations conducted in August and September 2007 to assess whether a dry cleaning solvent release had occurred at the Site;
- Groundwater monitoring well installation and sampling in December 2007 to confirm initial "grab" groundwater sampling results;
- A site-wide remedial investigation was conducted between October and December 2008 to evaluate the extent of impacts to soil, soil vapor, and groundwater at the Site;
- Focused soil sampling conducted in two areas of the Site in June 2010 to further evaluate the extent of VOC-impacted soil on the property;
- Ongoing quarterly soil vapor, groundwater, and indoor air quality monitoring conducted from September 2011 to present to evaluate changes in VOC concentrations with time.

3.1.1 PRELIMINARY ENVIRONMENTAL DUE DILIGENCE INVESTIGATIONS (AUGUST/SEPTEMBER 2007)

Edd Clark & Associates (EC&A) conducted a limited Phase II investigation in August 2007 to assess subsurface conditions at the subject property (EC&A, 2007a). Four soil borings were advanced at selected locations in front of the dry cleaner (B-1), on the south end of the strip of buildings (B-2), inside the building in front of the dry cleaning machine (B-3), and immediately inside the doorway in the back of the dry cleaner (B-4). The borings were advanced to groundwater and "grab" groundwater samples were collected from each location for analysis for Volatile Organic Compounds (VOCs). Soil samples were collected from three of the borings (B-1, B-2, and B-3) for VOC analysis. Approximate boring locations are shown on **Figure 8**.

EC&A (2007b) conducted a follow up subsurface investigation at the property in September 2007. Six direct push borings (B-5, B-6, B-6b, B-7, B-8, and B-9) and four cone penetrometer test (CPT) borings (CPT-1 through CPT-4) were advanced during the September 2007 field program. Soil samples were collected for VOC analysis from borings B-1 through B-3, and, B-5 through B-9. Groundwater "grab" samples were collected for analytical testing from borings B-5 through B-9, CPT-3, and CPT-4. Approximate boring locations are shown on **Figure 8**.

The initial subsurface investigation results revealed the presence of VOC impacts to soil beneath the dry cleaner. Analysis of "grab" groundwater samples found evidence of VOC impacts to groundwater beneath and behind (east of) the dry cleaner as well as around the southern and western edges of the building the dry cleaner is located in. Concentrations of PCE and cis-1,2-dichloroethene (cis-DCE) in soil were found to exceed the Regional Board's commercial/industrial Environmental Screening Levels (ESLs). Concentrations of PCE, trichloroethene (TCE), cis-DCE, and vinyl chloride (VC) in groundwater beneath and east of the dry cleaner were found to exceed the Regional Board's ESLs for potable drinking water.

3.1.2 GROUNDWATER MONITORING WELL INSTALLATION (NOVEMBER 2007)

GEOLOGICA (2007) installed five groundwater monitoring wells (MW-1 through MW-5) at the Site including one well on the west side of the property and four wells east and southeast of the dry cleaner in November 2007 **(**see **Figure 8**). The wells were screened between depths of 20 and 30 feet below ground surface (bgs). After developing the wells, the newly installed wells were purged and sampled on November 6, 2007. The five groundwater samples and a quality control trip blank were analyzed for VOCs; groundwater samples from well MW-1 and MW-5 were additionally tested for nitrate, sulfate, dissolved iron, and manganese to evaluate geochemical conditions that affect microbial transformation of VOCs.

The November 2007 groundwater monitoring well sampling results confirmed the presence of VOCs including PCE, TCE, cis-DCE, and VC in groundwater beneath, east, and southeast of the dry cleaner at concentrations greater than their respective ESLs for potable drinking water. Groundwater elevations measured in November 2007 indicated easterly to southeasterly groundwater flow at the Site.

3.1.3 SITE-WIDE REMEDIAL INVESTIGATION (OCTOBER – DECEMBER 2008)

GEOLOGICA (2009a) conducted extensive supplementary soil, soil vapor, and groundwater quality investigations between October and December 2008. The work completed included collecting shallow soil gas samples at depths of 5 ft bgs at a total of 23 locations across the Marinwood Plaza property; conducting an Membrane Interface Probe (MIP) survey to depths of 25 to 50 ft bgs at 8 locations behind and south of the dry cleaner; advancing direct push explorations to depths of up to 30 ft bgs at nine locations across the property to collect soil and "grab" groundwater samples to confirm the MIP screening level evaluation of VOC distribution in soil and groundwater; and, advancing direct push explorations to depths of 25 ft bgs at three locations off the property on the northern shoulder of south bound on-ramp to Highway 101 to collect "grab" groundwater samples downgradient of the former dry cleaners. Approximate exploration locations are shown on **Figure 8**.

Results of the site-wide remedial investigation identified two locations on Site with elevated VOC concentrations in soil including the soil beneath and near the dry cleaning machine inside the dry cleaner, and soil near the eastern property line of the Site approximately

60 feet east of the dry cleaner. The area east of the dry cleaner with elevated VOC concentrations in soil came to be known as the "Eastern Hot Spot". VOC impacts to groundwater were identified beneath, east, and southeast of the dry cleaner. VOCs including PCE, TCE, and cis-DCE were also found in "grab" groundwater samples collected in two of three soil borings advanced on the east shoulder of the southbound onramp to Highway 101 approximately 150 feet east of the dry cleaner.

3.1.4 INDOOR AND AMBIENT AIR SAMPLING (2009, 2010, AND 2011)

GEOLOGICA collected indoor and ambient air samples in March and July 2009 to evaluate air quality in several vacant tenant spaces (185, 193, and 195 Marinwood Avenue) and in the Savemor Liquor Store at 197 Marinwood Avenue (GEOLOGICA, 2009b). Additional indoor air sampling was conducted in the liquor store in April 2010 and May 2011. Also, GEOLOGICA collected an indoor air sample inside the then vacant tenant space at 155 Marinwood Avenue before the unit was remodeled to become the Marinwood Market in May 2011. Approximate sampling locations are shown on **Figure 9**. The air samples were analyzed for VOCs using EPA Method TO-15 sims.

Testing results indicated low, but detectable, PCE concentrations in outdoor ambient air, slightly elevated PCE concentrations in the vacant tenant spaces, and elevated PCE concentrations in the liquor store (GEOLOGICA, 2009b). No VOCs were detected in the Marinwood Market building. After reviewing the 2009 testing results, the Regional Board issued a Directive Letter on October 23, 2009 requiring preparation of an Interim Mitigation Work Plan to mitigate VOC concentrations inside the liquor store. **Section 4.2** discusses the measures implemented to address VOC intrusion into the liquor store.

3.1.5 QUARTERLY SOIL VAPOR, INDOOR AIR, AND GROUNDWATER MONITORING (2011 – PRESENT)

Beginning in September 2011, GEOLOGICA has conducted quarterly monitoring of soil vapor, indoor air, and groundwater quality at the Site. Soil vapor samples are collected for VOC analysis from five soil vapor monitoring probes (SVM-1 through SVM-5) completed at locations around and inside the dry cleaner. Indoor air samples are collected at two locations in the Savemor Liquor store for analysis for VOCs. Groundwater samples are collected from five Site monitoring wells (MW-1 through MW-5) for analysis for VOCs as well as field parameters including depth to groundwater, pH, temperature, electrical conductivity, and oxidation-reduction potential. Approximate monitoring locations are shown on **Figure 10**. The most recent (November 2015) quarterly monitoring results are presented in **Appendix A**.

The quarterly monitoring program has indicated generally stable, elevated concentrations of VOCs in soil vapor and groundwater beneath and near the dry cleaner. In contrast, initially elevated VOC concentrations in soil vapor and groundwater beneath and near the Eastern Hot Spot have decreased substantially since quarterly monitoring began. The decreasing VOC concentrations in and near the Eastern Hot Spot are attributed to in-situ treatment IRA conducted

in that area in 2010, which is discussed in more detail in **Section 4.3**. Initially elevated VOC concentrations observed in indoor air in the liquor store decreased following sealing of the floor of the rear storeroom and installation of ventilation fans in two locations inside the building.

3.2 OFFSITE REMEDIAL INVESTIGATIONS

Offsite remedial investigations have been conducted to evaluate the extent of VOC migration in the subsurface off the property including:

- Four rounds of groundwater quality investigation east and southeast of the Site were completed in October 2013, December 2014, May and August/September 2015; and,
- Three rounds of soil vapor quality investigation on and west of the Site were completed in May, September, and December 2015.

3.2.1 OFFSITE GROUNDWATER INVESTIGATIONS (OCTOBER 2013 – SEPTEMBER 2015)

As discussed in **Section 2.3**, generally easterly to southeasterly groundwater flow has been identified at the Site. Offsite groundwater sampling completed in December 2008 revealed the presence of PCE and related compounds at concentrations above the Regional Board's drinking water ESLs, but below ESLs established for protection of non-potable groundwater in groundwater "grab" samples collected on the west side of Highway 101. At that time, the notable decrease in VOC concentrations between onsite sampling locations and the offsite sampling location on the west side of Highway 101 suggested minimal potential for offsite migration of VOCs. However, a well survey conducted in March 2013 identified a water supply well potentially used for drinking water purposes on the Silveira Ranch property approximately 1,000 feet southeast of the Site. Consequently, Tasks 2 and 3 of the February 2014 Cleanup Order required Marinwood Plaza to submit a work plan and remedial investigation report, respectively, to assess the offsite extent of VOC impacts to groundwater east and southeast of the Site. GEOLOGICA (2013a) submitted a Work Plan for supplemental offsite groundwater sampling in April 2013, which was subsequently amended in May 2013 (GEOLOGICA, 2013b), to assess subsurface lithology and the extent of offsite VOC impacts in groundwater. Four rounds of offsite groundwater quality investigation have been completed to date. The offsite groundwater investigation program has involved advancing CPT borings at selected locations to log soil lithology and identify more permeable soil horizons followed by completion of a cluster of individual soil borings around each lithologic boring location to collect depth-discrete groundwater "grab" samples. Offsite groundwater exploration locations are shown on **Figure 11**.

The initial round of sampling conducted in October 2013 included advancing one boring cluster (C-1) within the Eastern Hot Spot area between previous borings GP-2 and MW-5 to allow correlation between on-site and off-site soil lithology. Boring cluster C-2 was advanced on the east shoulder of the on-ramp to highway 101, east of onsite well MW-5 to evaluate the distribution of VOCs with depth near the 2008 offsite location (OS-2) that previously had the

highest detection of PCE in off-site groundwater. Boring cluster locations C-3 through C-9 were advanced on roughly 50 ft centers along the east shoulder of the northbound lanes of highway 101 to evaluate the distribution of VOCs in groundwater with depth east (downgradient) of the Marinwood Plaza property. Groundwater "grab" samples were collected at up to five depth intervals at each boring cluster location. Results of the October 2013 offsite groundwater quality investigation (GEOLOGICA, 2013c) indicated the presence of PCE at concentrations slightly greater than the PCE drinking water ESL of 5 micrograms per liter (ug/L) in two boring clusters (C-3 and C-4) completed on the east shoulder of the north bound Highway 101 offramp. Based on these results, GEOLOGICA recommended additional offsite groundwater quality investigation north and east of this location.

Following the October 2013 field program, three additional rounds of offsite groundwater investigation have been conducted. CPT boring clusters C-10 to C-18, C-19 to C-26, and C-27 to C-40 were advanced on the east side of Highway 101 on the Silveira Ranch Property in December 2014, May, and August/September, 2015, respectively. CPT boring depths varied between 46 and 78 ft bgs, depending on the depth of bedrock refusal. Analytical results for the offsite groundwater samples indicated that low concentrations of VOCs including PCE at up to 39 ug/L were present in groundwater up to 1,400 feet east of Highway 101 on the Silveira ranch property (GEOLOGICA, 2015d). Low concentrations of PCE, below 1 ug/L, have also been found in groundwater samples collected on the south side of Miller Creek on the Silveira Ranch property. The apparent extent of VOC detections in groundwater is shown on **Figure 12**. Offsite investigation work completed to date appears to have identified the southern extent of VOC impacts to groundwater, but not the northern or eastern extent. Additional investigation will be completed to fully delineate the northern and eastern extent of VOC impacts to groundwater.

Due to the potential presence of VOCs in groundwater south of Miller Creek, the Regional Board issued a Directive Letter dated June 2, 2015 requiring submittal of a Work Plan and implementation schedule for treating produced well water or replacing the water supply well located on the south side of Miller Creek on the Silveira Ranch property. GEOLOGICA (2015e) submitted a Work Plan evaluating treatment or replacement options for the well on July 9, 2015. GEOLOGICA (2015f) oversaw the installation of a well head treatment system for the well on September 23, 2015, which is described in more detail in **Section 4**.

3.2.2 OFFSITE SOIL VAPOR INVESTIGATIONS (MAY, SEPTEMBER, AND DECEMBER 2015)

A soil vapor quality investigation conducted in October 2008 during the Sitewide Remedial Investigation program identified elevated VOC concentrations in soil vapor near the dry cleaner. No VOCs were found in three soil vapor samples (SV-14, SV-15, and SV-16) collected on the parcel at the north end of the Marinwood Plaza property formerly occupied by a Unocal gasoline service station (see **Figure 13**). However, PCE was reported at a concentration of 370 micrograms per cubic meter (ug/m^3) in a soil vapor sample (SV-12) collected on the west side of the property adjacent to the location where the sanitary sewer line exits the property.

This concentration was below the Residential and Commercial/Industrial ESLs for PCE of 410 and 1,400 ug/m^3, respectively, in effect at that time. In December 2013, the Regional Board promulgated revised ESLs that reduced the Residential ESL for PCE in soil vapor to 210 ug/m^3. Additionally, quarterly monitoring of soil vapor probe SVM-1, which is located approximately 50 feet west of the former dry cleaner, has consistently found PCE in soil vapor samples at concentrations exceeding the December 2013 Residential ESL. Because a residential neighborhood is located immediately west of the Site on the west side of Marinwood Avenue, in March 2015, the Regional Board issued a Directive Letter requiring Marinwood Plaza to submit a Work Plan and a remedial investigation report, respectively, to assess the western extent of VOC impacts to soil vapor. GEOLOGICA (2015g) submitted a Work Plan for supplemental soil vapor sampling in April 2015.

To determine the western extent of soil vapor migration, three subsurface soil vapor investigations were performed in 2015. Approximate sampling locations are shown on **Figure 13**. In May 2015, six soil vapor boings (SV-24 to SV-29) were advanced at the western edge of the property along Marinwood Avenue (GEOLOGICA, 2015g). PCE was reported in four of the six sampling locations at concentrations ranging from 24 to 580 ug/m^3. Because the PCE concentration (580 ug/m^3) in the SV-26 sample location collected on the west side of the Marinwood Plaza Shopping Center property (opposite the dry cleaner) exceeded the December 2013 Residential ESL, the Regional Board requested additional soil vapor investigation west of the property. Subsequently, in September 2015, six more soil vapor borings (SV-30 to SV-35) were advanced in the sidewalk along the west side of Marinwood Avenue. PCE was reported in five of the six samples at concentrations ranging from 130 to 2,300 ug/m^3; PCE concentrations in four of the six soil vapor samples was greater than the current residential ESL. Consequently, the Regional Board issued a Directive Letter dated November 6, 2015 requiring additional soil vapor investigation in the residential neighborhood west of the Site to evaluate the western extent of VOC concentrations greater than the Residential ESLs.

In December 2015 GEOLOGICA conducted an extensive soil vapor investigation in the Casa Marinwood residential area located west of Marinwood Avenue. This investigation was conducted to identify the western extent of impacted soil vapor, and also to determine if the VOC-impacted soil vapor is migrating from the dry cleaner along the backfill of underground utility trenches. The work completed including collecting ten soil vapor samples (SV-36 to SV-45) onsite on the west side of the strip mall buildings along and between underground utility alignments and collecting 21 soil vapor samples (SV-46 to SV-66) offsite in the Casa Marinwood neighborhood (GEOLOGICA, 2015h). Approximate sampling locations are shown on **Figure 13**.

3.2.2.1 On-Site Soil Vapor Testing Results

The only analyte detected in the December 2015 soil vapor investigation was PCE, which was reported in four of the sampling locations on the Marinwood Plaza property (SV-36, SV-37, SV-38, and SV-45) at concentrations ranging from 170 to 740 ug/m^3 (see **Figure 13**). During the December 2015 investigation on the Marinwood Plaza property, PCE was only detected in

samples collected near a sanitary sewer line serving the grocery store and the natural gas pipeline and storm sewer serving the buildings on the southern part of the shopping mall. PCE was previously detected in the SV-12 and SV-28 sampling locations completed near the point where the sanitary sewer line exits the west side of the property. VOCs were not detected in samples collected in between the utility alignments or along the fire suppression water line or domestic supply water line serving the shopping mall. PCE was not detected in previous boring SV-27, which was completed near the location where the fire suppression line enters the property. PCE was previously detected in samples SV-31 et al, collected near the natural gas pipeline alignment on the west side of Marinwood Avenue. These findings suggest that preferential flow of VOCs along the backfill of the sanitary sewer, natural gas pipe line, and storm sewer onsite maybe a significant factor in the migration of VOCs away from the property.

3.2.2.2 Offsite Soil Vapor Testing Results

No VOCs were reported in the 21 soil vapor samples collected in the Casa Marinwood neighborhood (see **Figure 13**). Based on these results, it does not appear that migration of VOCs into soil beneath homes in the Casa Marinwood neighborhood has occurred. The southwestern extent of elevated VOC concentrations in soil vapor appears to be limited to the west side of Marinwood Avenue. Based on the results of several rounds of soil vapor investigation, there is no evidence of significant northerly or southerly migration of VOCs in south vapor.

3.2.3 SURFACE WATER QUALITY SAMPLING (2010, 2011, 2015)

GEOLOGICA sampled Miller Creek at two locations on the Silveira property in October 2010 and April 2011 and at a single location in April 2015. Approximate surface water sampling locations are shown on **Figure 12**. No VOCs were detected in any of the surface water samples.

4 EVALUATION OF INTERIM REMEDIAL ACTIONS (IRAS) IMPLEMENTED

Several Interim Remedial Actions (IRAs) have been implemented at the Site. These include:

- Remedial Excavation and offsite disposal of soil impacted with petroleum hydrocarbons and acetone on the former Unocal parcel in 2008;
- Installation of ventilation fans and treatment of the exposed concrete floor in the liquor store to mitigate elevated concentrations of VOCs in indoor air in 2010;
- In-situ treatment of VOC-impacted soil in the Eastern Hot Spot area in 2010;
- In-situ treatment of VOC-impacted soil inside the former dry cleaner in 2010; and,
- Installation of a well head treatment system in September 2015 to remove VOCs in water produced from a water supply well on the Silveira Ranch property southeast of the Site.

Sections below describe the basis for these IRAs and evaluate their effectiveness relative to preliminary RAOs for the Site.

4.1 FORMER UNOCAL PARCEL – REMEDIAL SOIL EXCAVATION

The remedial investigation completed in 2008 included the advancement of one boring (GP-8) in the northern part of the property to sample soil and groundwater at a location where the closure documentation for the former Unocal service station indicated visibly petroleum-impacted soil may have been left in-place. A groundwater "grab" sample and a soil sample collected at a depth of 4 ft bgs were analyzed for TPH-gasoline and VOCs, TPH-diesel and TPH-motor oil. TPH-gasoline, diesel, and motor oil were detected in the soil sample at concentrations ranging from 16 to 110 milligrams per kilogram (mg/kg), below Regional Board Residential and Commercial/industrial ESLs. Toluene, ethylbenzene, xylenes and other gasoline components, but not benzene, were detected in the soil sample at concentrations ranging from 37 to 19,000 micrograms per kilogram (ug/kg) and acetone at a concentration of 139,960 ug/kg. The detected concentrations of acetone exceeded the RWQCB residential and commercial/industrial land use ESL of 500 ug/kg; the xylenes concentration in the sample exceeded the residential land use ESL of 2,300 ug/kg. In March 2010, a remedial excavation was advanced to remove potentially impacted soil from a limited area surrounding soil boring GP-8. Approximately 60 tons of impacted soil was excavated and disposed of off-site. The approximate location of the remedial excavation is shown on **Figure 8**.

Four sidewall and one bottom soil sample collected from the remedial excavation were submitted for analysis for VOCs and TPH-gasoline. No VOCs or TPH-gasoline were detected in the excavation confirmation samples.

Confirmation samples from the excavation pit indicated that all of the impacted soil was removed (GEOLOGICA, 2010a) indicating that the soil IRA effectively addressed soil quality concerns at this location.

4.2 SAVEMOR LIQUOR STORE – VAPOR INTRUSION MITIGATION IRA

In July 2009 GEOLOGICA collected indoor air samples at two locations inside the (active) liquor store located at 197 Marinwood Avenue (GEOLOGICA, 2009b). The chlorinated hydrocarbons PCE, TCE, cis-DCE, and trans-1,2- dichloroethene (trans-DCE) were detected in one or both of the samples. PCE was detected at concentrations of 17 ug/m^3 near the cash register in the front of the store and at a concentration of 85 ug/m^3 in a small alcove in the northeast corner of the store room in the back of the store. Both PCE detections in the liquor store exceeded the Regional Board indoor air ESL for commercial / industrial land use of 0.69 ug/m^3 in force at that time. In October 2009, the Regional Board issued a Directive Letter requiring submittal of a Interim Mitigation Work Plan to mitigate elevated VOC concentrations reported in indoor air in the liquor store. GEOLOGICA (2009c) prepared a Work Plan for Indoor Air Mitigation and Monitoring dated November 23, 2009 that described measures for mitigating VOC intrusion into indoor air. The proposed mitigation measures included installing ventilation fans at two locations in the liquor store to increase air flow into the building and sealing the exposed concrete floor of the storeroom in the back of the liquor store with a chemical resistant coating applied for that purpose.

In March 2010, GEOLOGICA arranged for the installation of two through-the-wall ventilation fans, one in the back of the liquor store and one in front to increase fresh air circulation into the tenant space (see **Figure 9**). Both fans are configured to continuously force outside air into the building. In addition, GEOLOGICA engaged a general contractor to apply a polycarbonate floor sealing compound (ProSeal DP-36) to the exposed concrete floor in accessible portions of the store room in the back of the liquor store.

In April 2010, GEOLOGICA collected indoor air samples at two locations inside the liquor store. The two samples were submitted to a California-certified analytical laboratory for analysis for VOCs by EPA Method TO-15, with selective ion monitoring (SIMs) for low level detection. PCE was reported in both samples at concentrations of 0.42 and 1.7 ug/m^3, a greater than 90% reduction from levels observed in July 2009. Based on these results, and subsequent quarterly indoor air monitoring events, the Vapor Intrusion Mitigation IRA appears to have successfully reduced VOC concentrations in indoor air to levels generally close to or below applicable Indoor Air ESLs.

4.3 ONSITE SOIL – IN-SITU TREATMENT IRA

Soil sampling conducted in 2007 revealed the presence of PCE and other VOCs at concentrations of up to 1.7 mg/kg in soil beneath the dry cleaner while soil sampling completed in 2008 revealed the presence of PCE and other VOCs at concentrations of up to 16.095 mg/kg

in soil in the Eastern Hot Spot area (GEOLOGICA, 2009a). In December 2009, GEOLOGICA submitted a Work Plan to the Regional Board to conduct an in-situ soil treatment IRA (Geologica, 2009d). The work proposed included conducting a pilot treatment product injection test, conducting additional soil sampling inside the dry cleaner and in the Eastern Hot Spot area to further evaluate the lateral and vertical extent of VOC-impacts to soil, installation of soil vapor monitoring probes at the Site to facilitate monitoring of soil vapor quality, and injection of a chemical oxidation treatment product at two locations to treat VOCs in soil in-situ.

Initial work for the in-situ soil IRA was conducted in June 2010. A pilot liquid treatment product injection test was conducted in June 2010 that demonstrated the general feasibility of injecting liquid treatment products in near surface soil at the Site. Also in June 2010, soil borings were advanced inside the dry cleaners and in the Eastern Hot Spot area to further assess the horizontal and vertical extent VOC-impacted soil in the area with the highest apparent VOC concentrations. Five soil borings (S-1 through S-4, and S-13) were advanced inside the dry cleaner; a sixth soil boring, S-5, was advanced in the alcove located on the north side of rear store room of the adjacent liquor store. Seven soil borings were advanced in and around the Eastern Hot Spot area. Approximate exploration locations and sampling results inside the dry cleaner are shown on **Figure 14**. The June 2010 soil sampling results indicated the presence of elevated concentrations of VOCs in soil beneath the dry cleaner that extended several feet beneath the storeroom of the adjacent liquor store. VOCs were found in soil samples collected within 1 ft of ground surface and extending to depths of up to 15 ft bgs in both the dry cleaner and Eastern Hot Spot areas. Concentrations of PCE, cis-DCE, and in some cases, VC, in soil samples exceeded respective Regional Board ESLs for Residential and/or Commercial/ Industrial land use. The in-situ treatment IRA injection program is discussed below.

4.3.1 FORMER DRY CLEANER – IN-SITU TREATMENT

In accordance with the December 2009 IRA Work Plan, two liquid oxidizer injection product borings were completed inside the dry cleaner in September 2010. Two borings were advanced to depths of 17 feet bgs. Oxidizer injection was conducted in 2 ft intervals from the bottom up. Injection was stopped in the first boring as a result of fluid surfacing when the perforated injection rod was raised to within 3 feet of ground surface. A second boring (R1-2) was attempted approximately 5 ft north of the southern wall of the dry cleaner and discontinued at a depth of approximately 7 ft bgs as a result of treatment fluid surfacing. Both borings were abandoned by backfilling with bentonite-cement grout.

In 2011, a second attempt was made to inject the liquid oxidizer injection product into vadose zone soil beneath the dry cleaner. In February 2011, a portion of the concrete floor slab near the former location of the dry cleaning machine was removed. Between April 18 and 26, 2011, GEOLOGICA supervised the advancement of 14 injection borings inside the dry cleaner. Borings were advanced to depths of 17 ft bgs; Regenox in-situ oxidizer product was injected in the borings from the bottom up between 17 ft bgs and approximately 3 ft bgs. Apparently due to the presence of low permeability clay soil, a significant amount of treatment product surfaced

inside the dry cleaner and adjacent tenant spaces during the injection program; as a result, no additional treatment product injection was conducted after the April field program. After completing the injection program, the concrete floor was patched with ready mix concrete. Due to treatment product surfacing during the injection program and the limited number of borings completed, the oxidizer injection program inside the dry cleaner was judged to be less effective than the program conducted in the Eastern Hot Spot area. No confirmation soil samples were collected to evaluate VOC concentrations after treatment.

4.3.2 EASTERN HOT SPOT AREA – IN-SITU TREATMENT

Following the Injection Pilot Test in June 2010, three rounds of liquid oxidizer injection were conducted in unsaturated soil in the Eastern Hot Spot area. Between September and November 2010, three rounds of injections, consisting of 14 or 15 injection borings each, were advanced to 17 ft bgs. Injection borings were advanced on approximate 5 foot centers, with succeeding rounds of borings offsite by 2.5 feet to saturate vadose soil in the area targeted for treatment. The in-situ chemical oxidation product, Regenox obtained from Regensis of San Clemente, CA, was injected from the bottom up at two foot intervals from between 17 ft bgs and approximately 3 ft bgs.

In December 2010, six soil borings were advanced to depths of 16 ft bgs in and near the Eastern Hot Spot area. Soil samples were collected at approximate depths of 1, 5, 10, and 15 ft bgs from each boring for analysis for VOCs. The confirmation sampling results indicated an approximate 60% reduction in VOC mass in unsaturated soil with maximum VOC concentrations reduced from just over 16 mg/kg to 2 mg/kg (GEOLOGICA, 2011).

Although VOC concentrations were demonstrably reduced following completion of the in-situ oxidizer injection program, concentrations of PCE et al in a number of soil samples collected in the Eastern Hot Spot area still exceeded respective Commercial / Industrial ESLs. To address this issue, in August 2011 GEOLOGICA oversaw an injection program that included advancement of 33 injection borings in the Eastern Hot Spot area. Borings were advanced to depths of 17 ft bgs; biotreatment product injection was conducted in 2 ft intervals from the bottom up between 17 ft bgs and approximately 3 ft bgs. Injection at depths of less than approximately 3 ft bgs was infeasible due to treatment product surfacing. The biotreatment treatment product was mixed in accordance with the manufacturer's directions and consisted of 20 pounds (lbs) of water from a hydrant on-site, 3 lbs of the Regenesis 3-D Microemulsion (3DME) biological treatment product, and 3 lbs of Regenesis HRC-Primer to inject approximately 4 gallons of the mixture per foot of boring exposed. This combination of treatment products was intended to enhance the bioremediation of VOCs in the Eastern Hot Spot area. Variable treatment product surfacing occurred during the injection process. The product that surfaced was contained within the treatment area and allowed to reinfiltrate into the ground between boring locations.

4.3.3 ASSESSMENT OF IN-SITU SOIL TREATMENT IRA EFFECTIVENESS

The effectiveness of the in-situ soil treatment IRA has been assessed by evaluating trends in soil vapor and groundwater quality monitoring results for the Site and by collection of discrete soil and "grab" groundwater samples in the Eastern Hot Spot treatment area.

4.3.3.1 Soil Vapor and Groundwater Quality Monitoring

Following completion of the in-situ treatment program, six permanent soil vapor monitoring probes (SVM-1 through SVM-6) were installed at the Site in September 2011 (see **Figure 10** for locations) and have been sampled quarterly since that time. The probes were completed in accordance with DTSC guidance with sample intervals set at approximately 5 ft bgs. Vapor probe SVM-2 was completed within the in-situ treatment area inside the dry cleaner; vapor probe SVM-5 was completed within the Eastern Spot in-situ treatment area. VOC concentrations in soil vapor beneath the dry cleaner measured in monitoring well SVM-2 have not changed significantly since in-situ treatment was attempted in this area in 2011 (see **Appendix A**, **Figure A-17**). In contrast, total VOC concentrations in soil vapor beneath the Eastern Hot Spot have decreased from an initial level of approximately 2.4 million ug/m^3 to just over 10,000 ug/m^3 in the 2015 quarterly sampling events (**Appendix A**, **Figure A-17**).

Quarterly monitoring of the five Site groundwater monitoring wells (MW-1 through MW-5) also began in September 2011. Monitoring results for well MW-5, which is completed near the southern edge of the Eastern Hot Spot area, show a consistent decrease in total VOC concentrations from values of nearly 800 ug/L in 2008 to less than 50 ug/L in the July and November 2015 quarterly sampling events (see **Appendix A**, **Figure A-9**). The monitoring results for well MW-3, which was completed near the southeast corner of the building where the dry cleaner is located, show a general decreasing trend. Monitoring results for well MW-4 were generally stable but below 5 ug/L in all sampling events.

Quarterly soil vapor and groundwater monitoring results for the Site show a significant decrease in VOC concentrations in soil vapor and groundwater near the Eastern Hot Spot, but little to no change in concentrations beneath and near the dry cleaner.

4.3.3.2 Eastern Hot Spot Confirmation Soil and Groundwater Sampling

In January 2014, approximately 2-½ years after the oxidizer and enhanced bioremediation product injections, additional soil and groundwater samples were collected to evaluate the in-situ treatment (GEOLOGICA, 2014). Eight direct push geoprobe soil borings (GP-10 to GP-17) were advanced in the Eastern Hot Spot area to depths of up to 25 ft bgs. Soil samples were collected and analyzed at approximately 5 ft depth intervals in each boring. Groundwater "grab" samples were collected from three of the geoprobe borings (GP-11, GP-15, and GP-17), selected to span the width of the Eastern Hot Spot area.

Soil – The VOCs PCE, TCE, cis-DCE, and VC were detected in one or more of the soil samples collected in January 2014. No other VOCs were detected in the samples. The maximum

detected concentrations of PCE, TCE, cis-DCE, and VC were 420 ug/kg, 83 ug/kg, 160 ug/kg, and 38 ug/kg, respectively (see **Figure 15**). None of the detected VOC concentrations exceed the preliminary Cleanup Levels established in the February 2014 Cleanup Order for the Site. Based on these results, the combination of in-situ oxidizer injection and in-situ biodegradation product injection was judged to be highly effective in reducing VOC concentrations in soil.

Groundwater – The VOCs PCE, TCE, cis-DCE, trans-DCE and VC were detected in one or more of the groundwater samples collected in the Eastern Hot Spot area in January 2014. No other VOCs were detected in the samples. The maximum detected concentrations of PCE, TCE, cis-DCE, trans-DCE, and VC were 16 ug/L, 7.6 ug/L, 39 ug/L, 0.74 ug/L, and 15 ug/L, respectively. Although the PCE, TCE, cis-DCE, and VC concentrations in the sample from boring GP-11, and cis-DCE and VC concentrations in samples from borings GP-15 and GP-17 exceeded respective Groundwater Cleanup Levels established in the February 2014 Cleanup Order, they are substantially lower than concentrations initially observed at the Site in 2007/2008.

4.4 WELL HEAD TREATMENT SYSTEM INSTALLATION – SILVEIRA RANCH WATER SUPPLY WELL

Due to the presence of VOCs in groundwater south of Miller Creek that appear to be present as a result of southeasterly migration of a groundwater VOC plume originating on the Marinwood Plaza Site, the Regional Board issued a Directive Letter dated June 2, 2015 requiring submittal of a Work Plan and implementation schedule for treating produced water or replacing the water supply well located on the south side of Miller Creek on the Silveira Ranch property. GEOLOGICA (2015x) submitted a Work Plan evaluating treatment or replacement options for the well on July 9, 2015 that recommended installation of a well head treatment system to remove VOCs from produced water. On September 23, 2015, GEOLOGICA oversaw the installation of a groundwater treatment system for the water supply well. The treatment system installed at the well head on September 23, 2015 comprised three main components connected in series including: 1) a 20 micron sediment filter to remove suspended sediment; 2) two sets of three 4.5 cubic foot activated carbon filters to remove dissolved VOCs from groundwater at a flow rate of up to 15 gpm; and, 3) an ultraviolet lamp (UV lamp) bacterial treatment unit. The activated carbon canisters were installed in two banks of three canisters. Each bank of three canisters is connected in parallel and equipped with three 5 gpm Dole rate limiting valves to allow a maximum total flow rate of 15 gpm.

To assess the effectiveness of the well head treatment system, GEOLOGICA collected samples of influent to the treatment system and effluent from the treatment system on October 23, 2015. A trace concentration of PCE at 0.6 ug/L was reported in the influent to the treatment system. No VOCs were detected in the effluent sample from the treatment system, indicating that the treatment system effectively removes VOCs from influent groundwater.

5 SOURCE AND DISTRIBUTION OF VOCS

This section presents a discussion of the source and distribution of VOCs identified in subsurface investigation work completed at the Site as it relates to potential site redevelopment plans and remedial alternative evaluation. Figures incorporating the data collected in recent field investigations (as described in **Sections 3** and **4**) illustrating the distribution of VOCs are presented as follows:

- **Figure 12** – for On- and Off-Site Groundwater Sampling Results;
- **Figure 13** – for On- and Off-Site Soil Vapor Sampling Results; and,
- **Figures 14** and **15** – for Dry Cleaner area and Eastern Hot Spot area Soil Sampling Results

Figure 16 schematically illustrates areas with VOC concentrations greater than Cleanup Goals.

5.1 CHEMICALS RELEASED & BREAKDOWN PRODUCTS

The principal VOC contaminants of concern in groundwater and soil vapor at the Site include:

Primary Chemicals	Daughter Products
• PCE	• TCE • cis-DCE, trans-DCE • VC

Based on review of the sampling data for the Site and the distribution of chemicals in the subsurface, PCE appears to have been the primary chemical originally released at the Site. Two apparent release areas were identified: 1) beneath the dry cleaner; and, 2) in the area referred to as the Eastern Hot Spot, approximately 50 feet east of the dry cleaner.

5.2 DISTRIBUTION OF VOCS IN THE SUBSURFACE

Impacted media at the Site include soil, soil vapor, indoor air, and groundwater. No VOC detections have been reported in surface water samples collected in the Site vicinity. Available information regarding impacts to each of these media is summarized below.

5.2.1 VOCS IN SOIL

Soil quality investigations conducted in 2007 and 2008 identified VOC impacts to soil near the former location of the dry cleaning machine inside the dry cleaner, in an area behind the dry cleaner referred to as the Eastern Hot Spot, and in a small area around the GP-8 boring in the northern part of the Site formerly occupied by a Unocal gasoline service station. As discussed in **Section 4.3**, confirmation sampling conducted in January 2014 indicated that in-situ soil treatment has successfully reduced VOC concentrations in soil in the Eastern Hot Spot area to below the soil Cleanup Levels identified in the February 2014 Cleanup Order. **Table 1A**

summarizes final soil sampling results for the Eastern Hot Spot area. Confirmation sampling conducted following excavation of impacted soil at the GP-8 boring location in the northern part of the Site in March 2010 indicated that soil impacted with VOCs and hydrocarbons had successfully been removed.

The only remaining area of soil with VOC concentrations potentially greater than the Soil Cleanup Levels identified in the February 2014 Site Cleanup Order is located beneath and adjacent to the former location of the dry cleaning machine in the former Prosperity Cleaners tenant space. As discussed in **Section 3**, two rounds of in-situ treatment using a chemical oxidation treatment product were attempted inside the dry cleaner. Due to treatment product surfacing in adjacent occupied tenant spaces, the in-situ treatment in this area is believed to have been only partially successful in reducing VOC concentrations in soil. However, VOC concentrations in soil beneath the dry cleaner have not been evaluated since treatment was attempted in April 2011. Results of analyses of soil samples collected before treatment in 2007 and 2010 are depicted on **Figure 14.** Soil sampling results are summarized in **Table 1B.** Because in-situ treatment inside the dry cleaner likely partially reduced VOC concentrations in soil, the VOC concentrations identified on **Figure 14** are likely higher than are currently present in that area. In any case, available data indicate that PCE, cis-DCE, and VC may be present in soil to depths of 15 ft bgs at concentrations greater than current Residential and/or Commercial ESLs. The volume of VOC-impacted soil in this area is estimated to be approximately 425 cubic yards (cy), based on sampling data from 2007 and 2010.

5.2.2 Distribution and Source of VOCs in Groundwater

Groundwater sampling and analysis has revealed the presence of VOCs in groundwater on and off the Marinwood Plaza property. The highest concentrations of VOCs in groundwater have consistently been observed in the two areas at the Site where the highest concentrations of VOCs were observed in soil indicating that VOC-impacted soil is the primary source of VOCs observed in groundwater. The distribution of VOCs in groundwater is discussed below.

5.2.2.1 Onsite Groundwater Quality

VOC impacts to groundwater have been identified beneath the southern half of the line of strip mall buildings on the property as shown on **Figure 12**. Onsite groundwater monitoring well sampling results are summarized in **Table 2**. The approximate area where VOC concentrations in groundwater likely exceed the Cleanup Levels listed in the February 2014 Site Cleanup Order is shown on **Figure 16.** Based on the detection of PCE and/or its breakdown products, the sand horizon encountered between depths of approximately 15 and 25 ft bgs on the property appears to be the principal groundwater-bearing unit impacted with VOCs. The onsite CPT cluster boring, C-1, encountered only trace VOC concentrations in the deepest sand horizon immediately overlying Franciscan bedrock.

Initial sampling in 2007/2008 indicated PCE concentrations in groundwater "grab" samples of up to 5,900 ug/L, TCE at up to 460 ug/L, cis-DCE at up to 770 ug/L, and VC at up to

27 ug/L. However, lower VOC concentrations have been observed in recent groundwater monitoring events including monitoring well sampling results (see **Appendix A**) and groundwater "grab" samples collected in the Eastern Hot Spot area in January 2014. The maximum VOC concentrations reported in the November 2015 monitoring event included PCE at up 25 ug/L, TCE at up to 7.7 ug/L, cis-DCE at up to 8.6 ug/L, and VC at up to 0.71 ug/L (**Table 2**).

5.2.2.2 Offsite Groundwater Quality

As discussed in **Section 3.2.1**, four rounds of offsite groundwater investigation have been completed to assess VOC impacts to groundwater east and southeast of the Site in October 2013, December 2014, and May and August/September 2015. The main portion of the offsite groundwater VOC plume appears to lie on the north side of the Silveira Ranch property. **Figure 12** depicts the groundwater plume with the most current groundwater data. Offsite groundwater sampling results are summarized in **Tables 3A** through **3D**. The downgradient (eastern) and northern edge of the VOC plume were not identified in the most recent (August/ September 2015) investigation. Low but detectable concentrations of PCE were found in two out of the five borings completed on the south side of Miller Creek. However, VOCs were not detected in the other boring cluster locations south of Miller Creek indicating that the groundwater VOC plume has not migrated extensively on the south side of the creek. Offsite investigation work to date appears to have identified the southern extent of VOC impacts to groundwater, but not the northern or eastern extent.

On and near the site, the highest VOC concentrations were found in sand horizons encountered between depths of approximately 15 and 25 ft bgs corresponding to elevations of approximately +10 to +20 ft MSL. Offsite, VOCs were found in sand horizons encountered between depths of approximately 12 and 45 feet bgs. The sand horizons sampled during the offsite groundwater investigations were generally overlain and underlain by varying thicknesses of silt and clay. The presence of similar VOCs in groundwater "grab" samples collected at several depth intervals that are each separated by varying thicknesses of silt and clay suggests some form of hydraulic connection between the sand horizons observed at different depths. Consistent with previous offsite investigation phases, low to not-detected VOC concentrations were found in groundwater grab samples collected below depths of 40 to 45 feet bgs. Based on investigation results to date, the depth of VOC impacts to groundwater appears to be limited to approximately 40 feet bgs.

It is difficult to evaluate possible changes in VOC concentrations in offsite groundwater because the offsite groundwater sampling events have been conducted at different locations and different times as knowledge of the groundwater VOC plume has evolved. The highest VOC concentration found in groundwater on the east side of Highway 101 was PCE at 39 ug/L in the north central part of the northwest pasture on the Silveira Ranch property (**Figure 12**). Lower VOC concentrations were found in groundwater grab samples collected south and east of that location.

5.2.3 DISTRIBUTION AND SOURCE OF VOCS IN SOIL VAPOR

Soil vapor sampling and analysis has revealed the presence of VOCs in soil vapor on and, to a limited extent off, the Marinwood Plaza property. The highest concentrations of VOCs in soil vapor have consistently been observed in the areas at the Site where the highest concentrations of VOCs were observed in soil indicating that VOC-impacted soil is the primary source of VOCs observed in soil vapor. The distribution of VOCs in soil vapor is discussed below.

5.2.3.1 Onsite Soil Vapor Quality

VOC impacts to soil vapor have been identified beneath the dry cleaner and adjacent tenant spaces in the southern part of the building as well as areas east, south, and west of the dry cleaner. The most recent data collected onsite includes results of sampling the soil vapor monitoring probes in November 2015 and collection of "grab" soil vapor samples in the parking area on the west side of the Site in December 2015. Recent sampling results are summarized on **Figure 13.** Onsite soil vapor sampling results are summarized in **Tables 4** and **5.** Historically, the highest concentrations of PCE were observed beneath the former dry cleaner in probe SVM-2, near the southeast corner of the building in probe SVM-3 and in the Eastern Hot Spot in probe SVM-5. As discussed in **Section 3.2.2**, GEOLOGICA collected six soil vapor samples along the west side of the Marinwood Shopping Center in May 2015. PCE was reported in four of the six May 2015 sampling locations at concentrations ranging from 24 to 580 ug/m^3. The highest detected concentration of PCE from the May 2015 investigation, 580 ug/m^3 from soil vapor boring SV-26, exceeded the Residential soil vapor Cleanup Level, but was below the Commercial/Industrial soil vapor Cleanup Level. The SV-26 sample was collected in a landscaped area on the west edge of the shopping center parking area approximately 100 ft southwest of the former dry cleaner.

The results from the additional soil vapor sampling in December 2015 show that four samples contained concentration of PCE which exceed the Residential Cleanup Level, but are below the Commercial/Industrial Cleanup Level. The locations of these soil vapor samples, SV-36, SV-37, SV-38, and SV-45 are adjacent to the sanitary sewer, storm drain, and natural gas lines (see **Figure 13**). Utility trenches may provide a conduit for the migration of impacted soil vapor since utility trenches are typically backfilled with more permeable material than the silt and clay soil generally encountered at the Site.

5.2.3.2 Offsite Soil Vapor Quality

VOC impacts to offsite soil vapor have been identified on the west side of the shopping mall property in an area west of the dry cleaner and along the sanitary sewer that exits the northwest side of the property (see **Figure 13**). Offsite soil vapor sampling results are summarized in **Tables 6A** through **6C**. PCE was the only constituent detected in offsite soil vapor samples. The lateral extent of PCE migration in soil vapor along the sanitary sewer near the north end of the property is believed to be confined to the eastern side of Marinwood Avenue. Based on sampling conducted in September and December 2015, PCE appears to have

migrated in soil vapor to the west side of Marinwood Avenue opposite the dry cleaner, but not significantly beyond the west side of the street, because no VOCs were detected in soil vapor samples collected on adjacent residential properties to the west. Reported PCE concentrations in four soil vapor samples (SV-31, SV-32, SV-34, and SV-35) exceed the residential soil vapor Cleanup Levels set by the February 2014 Cleanup Order and exceed the Commercial/Industrial soil vapor Cleanup Level in one sample, SV-31.

The December 2015 soil vapor investigation, performed both on and offsite, did not detect PCE or related compounds in any of the 21 soil vapor samples (SV-46 to SV-66) collected in the Casa Marinwood residential neighborhood.

5.2.4 VOC IMPACTS IN INDOOR AIR

VOC impacts to indoor air have been identified in several of the vacant tenant spaces adjacent to the former dry cleaner and in the tenant space at 197 Marinwood Avenue occupied by the Savemor Liquor store. No evidence of VOC impacts to indoor air in the Marinwood Market have been identified. VOCs including PCE, TCE, and cis-DCE have been detected in indoor air in the liquor store. **Table 7** provides a summary of indoor air sampling results. PCE was detected at concentrations of 4.9 and 5.3 ug/m^3, above the Indoor Air Cleanup Level established for the Site of 2.1 ug/m^3 in the two indoor air samples collected in the most recent sampling event in November 2015 (see **Appendix A**).

5.3 SOURCE OF VOCS IN GROUNDWATER, SOIL VAPOR, AND INDOOR AIR

As noted above, based on the magnitude and distribution of primary and daughter product VOCs in soil, groundwater and soil vapor, the principal VOC release appears to have mainly involved PCE and originated near the former location of the dry cleaning machine inside the dry cleaner and within the Eastern Hot Spot. Both releases appear to have originated close to ground surface as the highest PCE concentration in soil beneath the dry cleaner (12,000 ug/kg) was found in a sample collected at depth of 1 ft bgs and the highest PCE concentration in soil in the Eastern Hot Spot area (16,095 ug/kg) was found in a soil sample collected at a depth of 2 ft bgs. No evidence of elevated VOC concentrations in soil below the groundwater table or a dense non-aqueous phase liquid (DNAPL) has been identified at the Site. Consequently, VOCs identified in soil above the water table in these two areas appear to be the primary source of VOCs to soil vapor and groundwater.

As discussed in **Section 4**, an IRA was implemented in 2011 to treat VOCs in soil in the Eastern Hot Spot area. Confirmation sampling conducted in January 2014 indicated that VOC concentrations in soil in the Eastern Hot Spot area had decreased to below the Soil Cleanup Levels established in the February 2014 Cleanup Order. Moreover, quarterly monitoring results for both soil vapor and groundwater have documented steady decreases in VOC concentrations in both media near the Eastern Hot Spot. Consequently, treatment or removal of VOCs in soil has the added benefit of reducing VOC concentrations in soil vapor and groundwater.

5.4 RISK EVALUATION FOR ONSITE AND OFFSITE RECEPTORS

This section describes a conceptual risk evaluation for onsite and offsite receptors.

5.4.1 POTENTIAL HUMAN RECEPTORS AND EXPOSURE PATHWAYS

5.4.1.1 Current Land Use Conditions

Potential sensitive receptors on and near the Site include on-site workers, nearby residents, and residents/workers on the Silveira Ranch that get their drinking water from a water supply well on that property. Potential exposure pathways include direct contact/ingestion of soil (onsite workers only), leaching to groundwater, intrusion into indoor air (onsite workers only), discharge to surface water and sediment, and migration to/in groundwater used for drinking water supply. Potable water on the Marinwood Plaza property is obtained from the Marin Municipal Water District (MMWD). There is no current use of Site groundwater for any purpose.

There is minimal current potential for direct contact or ingestion of VOC impacted soil at the Site because VOC impacted soil is overlain by the building or pavement. Leaching of VOCs from soil into underlying groundwater may be occurring underneath the dry cleaner. Based on soil sampling conducted in January 2014 following in-situ oxidation and biological treatment, soil in the Eastern Hot Spot area is unlikely to be a significant source of VOCs to underlying groundwater. VOC volatilization from soil and/or groundwater into soil vapor is likely occurring at the Site. VOC intrusion into indoor air in the Savemore liquor store has been documented.

Trace concentrations of PCE have been found in water produced from the water supply well on the south side of Miller Creek on the Silveira Ranch property. A well head treatment system was installed on the well in September 2015. By installation of engineering controls (a well head treatment system), potential exposure to residents/workers and livestock on the Silveira Ranch has been mitigated. Due to the prevailing easterly groundwater VOC plume migration, VOCs are unlikely to migrate in groundwater towards a second well in the southern part of the Silveira Ranch property. No occupied structures are located over the groundwater VOC plume; therefore, there is minimal potential for VOC offgassing from groundwater to soil vapor and vapor intrusion into structures. Based on the results of a well survey conducted in 2013, no other water supply wells have been identified downgradient (east) of the subject property.

5.4.1.2 Potential Future Land Use Conditions

It is anticipated that the Marinwood Plaza Shopping Center property will be redeveloped for residential uses or a mix of residential and commercial uses. Redevelopment would involve demolishing the southernmost building on the property and erecting new structures in the northern part of the property and south of Marinwood Market. Construction would probably involve digging and trenching to construct/replace utilities servicing the property. Construction workers and future onsite residents/workers could be exposed to VOC impacted soil and soil

vapor. Potable water on the Marinwood Plaza property will likely continue to be obtained from the MMWD. Future use of Site groundwater for any purpose is unlikely.

VOC concentrations in groundwater on the Silveira Ranch currently exceed applicable drinking water standards, but are below Regional Board Table E ESLs for offgassing of VOCs to soil vapor. Potable water for new development on the property would most likely be provided by the MMWD. As no VOC impacted soil has been identified offsite, there is minimal potential for ingestion/dermal contact with VOC impacted soil on the Silveira Ranch property. Due to low VOC concentrations in groundwater and minimal potential for eastern migration of VOCs in soil vapor, vapor intrusion is unlikely to pose significant risk to current or future residents/workers on the property.

5.4.2 POTENTIAL ECOLOGICAL RECEPTORS

The primary ecological receptors downgradient (southeast and east) of the Marinwood Plaza property include surface water in Miller Creek and surface water of San Francisco Bay (approximately two miles east of the Site). GEOLOGICA sampled Miller Creek at two locations on the Silveira property in October 2010, April 2011, and April 2015. Surface water sample locations are shown on **Figure 12**. No VOCs were detected in any of the surface water samples. The Regional Board has requested sampling of Miller Creek east of the current maximum extent of the groundwater VOC plume on the Silveira Ranch property. This sampling will be conducted after winter rains restore flow in the creek, which has been dry for much of 2015.

6 REMEDIAL ACTION FEASIBILITY STUDY

This section develops preliminary remedial objectives for the site, presents a focused evaluation of potential remedial alternatives, and identifies a preferred alternative.

6.1 PROPOSED REMEDIAL ACTION OBJECTIVES

Proposed Remedial Action Objectives (RAOs) were developed based on current and anticipated future land use for the Site and downgradient area to the east and southeast.

- **Soil** – Prevent contact with VOC-affected residual soils that may pose hazardous or nuisance conditions. Inhibit VOCs in soil from leaching and dissolving in groundwater at concentrations that may pose hazardous or nuisance conditions, or that may affect groundwater quality, and inhibit direct contact to human receptors with soil above cleanup goals.

- **Soil Vapor** – Inhibit migration of VOCs in soil gas to indoor air above cleanup goals under the residential and/or commercial use pathways.

- **Groundwater** – Reduce or eliminate hazardous or nuisance conditions caused by VOCs in groundwater, and inhibit the downgradient migration of VOCs in groundwater at concentrations greater than those protective of downgradient ecological receptors and/or concentrations greater than those protective of the vapor intrusion pathway.

- **Indoor Air** – Inhibit migration of VOCs in soil gas to indoor air above residential and/or commercial worker protection levels.

6.2 PROPOSED FINAL CLEANUP GOALS FOR THE SITE

Proposed Cleanup Goals for the Site based on the Cleanup Levels established in the February 2014 Site Cleanup Order (or relevant December 2013 ESLs for constituents or exposure pathways identified in **Section 6.1** that are not addressed in the Site Cleanup Order) are summarized in **Table 8**. Soil Cleanup Goals are based on protection of soil to groundwater leaching or residential direct exposure, whichever is lower. Areas with VOCs in soil, groundwater, and soil vapor, respectively, at concentrations greater than the proposed Final Cleanup Goals for the Site are identified on **Figure 16**.

6.3 GENERAL REMEDIAL ACTION STRATEGY

As discussed in **Section 5**, impacted media at the Site include soil, groundwater, soil vapor, and indoor air. However, the source of VOCs in groundwater, soil vapor, and indoor air appears to be VOC-impacted soil beneath the former dry cleaner. As demonstrated by the results of treating VOC-impacted soil in the Eastern Hot Spot area, treating or removing VOCs in soil will be the key to reducing VOC concentrations in other impacted media. Accordingly, **Section**

6.4 discusses potential alternatives for reducing or eliminating VOC concentrations in Site soil. Treatment or removal of VOC-impacted soil at the Site is expected to result in a decrease in associated VOC concentrations in groundwater, soil vapor, and indoor air. The duration of the period over which VOC concentrations in groundwater and soil vapor will decline to below Cleanup Goals is unknown. Consequently, monitoring of groundwater and soil vapor quality is discussed in **Sections 6.5** and **6.6**, respectively, to document remediation effectiveness. The "No Action" alternative was also evaluated to provide a base for comparison of alternatives.

Investigations completed to date indicate that offsite groundwater quality has been impacted by the VOC release at the Site. Concentrations of PCE and cis-DCE in offsite groundwater samples exceed Site Cleanup Goals. Concomitant with the reduction in VOC concentrations in onsite groundwater following treatment or removal of VOC-impacted soil, VOC concentrations in offsite groundwater are also expected to gradually decrease. Currently, potential exposure to VOC-impacted groundwater has been addressed by implementation of engineering controls, i.e., installation of a well head treatment system for the water supply well on the Silveira Ranch property. Monitoring is proposed in **Section 6.5** to verify the effectiveness of the well head treatment system and document that VOC concentrations in offsite groundwater decrease with time.

Because the period over which VOC concentrations in soil vapor will decline following treatment or removal of VOC-impacted soil in the dry cleaner area is unknown, several strategies to minimize potential offsite VOC migration in soil vapor are discussed in **Section 6.6**. Because the redevelopment schedule for the Site is uncertain, new structures may be proposed before VOC concentrations in soil vapor decrease to be Site Cleanup Goals. **Section 6.6** discusses alternatives evaluated to mitigate potential VOC intrusion into future occupied structures on the property.

6.4 Potential Remedial Actions for Soils

This section describes technologies that are potentially applicable to address residual VOC impacts in Site soil in the dry cleaner area.

- **In-Situ Treatment beneath Dry Cleaner Area** – IRAs conducted previously at the Site included injection of a liquid oxidizer treatment compound into vadose zone soil beneath the Eastern Hot Spot area and former dry cleaner, followed by the injection of a biological reducing agent in the Eastern Hot Spot area. The combination of in-situ treatments in the Eastern Hot Spot area was effective at reducing VOC concentrations in soil to below soil Cleanup Levels established in the Cleanup Order. As a final remedial action, additional in-situ treatment using a biological reducing agent could be conducted in vadose zone soil beneath the former dry cleaner. The remedial performance evaluation for the in-situ IRA conducted at the Eastern Hot Spot area indicated that in-situ biological treatment required approximately 2-1/2 years to reduce VOC concentrations in soil to below soil Cleanup Levels. The required duration of treatment in the dry cleaner area is difficult to predict, but

would be expected to require a comparable period of time. Due to treatment product surfacing concerns, the need for closely spaced injection borings to uniformly distribute treatment product, and the presence of load-bearing walls in areas requiring treatment, this alternative would best be conducted after building demolition. Biological treatment would slowly reduce VOC concentrations in soil and soil vapor, generate degradation byproducts including VC that can be more toxic than the parent compound PCE, but would eventually also break down to non-toxic materials, and could generate methane, a combustible gas, potentially creating a hazardous condition. By reducing the maximum concentration and residual mass of VOCs in soil, in-situ treatment would also decrease VOC concentrations in soil vapor and reduce VOC leaching to groundwater. If the development schedule allows, in-situ biological treatment could be implemented at the Site with the provision that an alternate remedial approach such as excavation and off-site disposal be implemented if the treatment schedule was not being met or if the development schedule changed.

- **Excavation and Off-Site Disposal** – Excavation could be conducted to remove Site soils with VOC concentrations greater than the respective soil Cleanup Goals listed in **Table 8**. By reducing the maximum concentration and residual mass of VOCs in soil, excavation would also decrease VOC concentrations in soil vapor and reduce VOC leaching to groundwater. Excavation would be conducted to depths of up to 15 feet bgs, and the excavation area would therefore likely require appropriate sloping or shoring. Due to the presence of load-bearing walls in the area requiring soil removal, this alternative would best be conducted after building demolition. Excavated soils would be stockpiled on plastic sheeting, sampled for disposal characterization, and then transported off-site to a landfill. Excavated soil would likely classify as F-001-listed, RCRA Hazardous Waste, requiring disposal at a Class I landfill, based upon the known source of dry cleaning operations. Excavation has already been performed successfully at the Site on the former Unocal parcel to address residual VOCs and petroleum hydrocarbons. Excavation would likely require several weeks to complete, depending on the need for iterative additional excavation to meet soil Cleanup Goals. By rapidly (within a few weeks) reducing the maximum concentration and residual mass of VOCs in soil, in-situ treatment would also rapidly decrease VOC concentrations in soil vapor and reduce VOC leaching to groundwater.

- **Excavation and On-Site Treatment** – This option would involve excavating VOC-impacted soil, stockpiling it onto a plastic-lined treatment pad, applying liquid oxidizer treatment product, tilling the soil to thoroughly mix in the oxidizer treatment product, and periodically collecting confirmation samples until the soil meets soil Cleanup Goals. Depending on the amount of natural or anthropogenic chemical oxygen demand associated with the soil, additional rounds of oxidizer treatment and tilling might be needed to reach Site Cleanup Goals. With Regional Board approval, after meeting soil Cleanup Goals, the treated soil could be used to backfill the excavated areas. This option could be faster than in-situ biological treatment, but not as rapid as excavation and offsite disposal. The open excavation would need to be secured with fencing and possibly supported with shoring to maintain the integrity of the excavation.

This alternative may be more cost-effective than off-Site disposal at a Class I landfill if it can be successfully implemented. Implementation challenges include safely keeping remedial excavations open during the period of soil treatment, preventing runoff, monitoring air quality during excavation and tilling activities, and maintaining ambient VOC concentrations below acceptable levels, and effectively treating soil to meet remedial action goals. Based on the presence of clayey soil at the Site, extensive and vigorous tilling may be needed to ensure uniform contact between the oxidizer treatment product and VOCs in soil.

- **Capping/Institutional Controls** – Capping would involve removing surficial concrete and conducting grading in accordance with Site redevelopment plans, then placing an extensive asphalt or concrete pavement section over the VOC-impacted soil in the former dry cleaner area. Institutional controls including periodic inspection and prohibitions against disturbing the Cap would be implemented to maintain cap integrity. Capping and institutional controls could be easily implemented and would prevent exposure to VOC impacted soil. Capping itself would not reduce residual VOC mass or concentrations in soil and so would have little to any effectiveness reducing VOC concentrations in soil vapor. Because it would prevent rainfall infiltration into VOC-impacted soil, capping might reduce VOC leaching from soil to underlying groundwater. Because it would not reduce contaminant mass or toxicity, this alternative is unlikely to be acceptable to the Regional Board or members of the community.

- **Soil Vapor Extraction (SVE)** – SVE is the process of extracting VOC-impacted soil vapor from the subsurface using a vacuum pump to apply vacuum to one or more SVE wells. VOC concentrations in soil vapors will eventually decrease after SVE operation and additional VOCs would desorb from soils to soil vapor. In this way, VOC concentrations in soil are also gradually reduced by SVE. Collected VOC-impacted soil vapor would be treated using either vapor phase granular activated carbon (GAC) or catalytic oxidation prior to discharge to the atmosphere. Operation of an SVE system at the Site would require annual permitting and periodic monitoring with oversight by the Bay Area Air Quality Management District (BAAQMD). Due to the low permeability, high moisture content, and relatively high VOC concentrations in the dry cleaner area, SVE would take a prohibitively long time to reduce VOC levels in soil. Therefore, SVE is unlikely to be cost-effective or viable over the short-term and is not an appropriate technology to enable timely site redevelopment.

6.5 REMEDIAL ACTIONS FOR GROUNDWATER

This section describes actions applicable to address residual VOC impacts in Site groundwater.

- **Monitored Natural Attenuation (MNA)** – Groundwater monitoring will be conducted to demonstrate that natural attenuation is occurring over time (primarily via source elimination, offgassing, and/or dilution and ongoing reductive dechlorination). Periodic monitoring data will be evaluated to document that VOC concentrations in groundwater are decreasing.

Following the implementation of remedial actions for soils, MNA is expected to be effective in reducing PCE and daughter products to concentrations below Site Cleanup Goals.

- **Engineering Controls** – The existing engineering control implemented for the water supply well on the Silveira Ranch, i.e., well head treatment using GAC to remove VOCs in groundwater produced from the well, will be maintained.

6.6 REMEDIAL ACTIONS FOR SOIL VAPOR/INDOOR AIR

This section describes actions that are applicable to residual VOC impacts in soil vapor. Remedial technologies effective at removing VOCs from soil will also be effective over time at reducing VOC concentrations in soil vapor because VOCs in soil vapor primarily originate from VOC-impacted soil. Consequently, VOC concentrations in soil vapor are expected to decrease subsequent to soil remedial action. The timeframe over which VOC concentrations in soil vapor will decrease is difficult to predict. Depending on the schedule selected for implementation of the RAP, potential VOC migration in soil vapor toward the western property boundary may continue to be a concern. Also, depending on development timeframes, there may be a transient period when residential or commercial structures may be proposed in portions of the Site with soil vapor VOC concentrations greater than respective residential or commercial soil vapor cleanup goals. Remedial strategies to address these concerns are discussed below.

- **Monitored Natural Attenuation (MNA)** – Soil vapor monitoring will be conducted to demonstrate that natural attenuation is occurring over time (primarily via offgassing to ambient air and source reduction resulting from removing VOCs in soil). Periodic monitoring data will be evaluated to document that VOC concentrations in soil vapor are decreasing. Following the implementation of remedial actions for soils, MNA is expected to be effective in reducing concentrations of PCE and daughter products in soil vapor to concentrations below Site Cleanup Goals.

- **Utility Corridor Barriers** – Results of the December 2015 soil vapor investigation discussed in Section 2 indicated that VOC migration in soil vapor along underground utility backfill alignments on the subject property appeared to be a significant factor in the westward migration of VOCs in soil vapor. To address this issue, cut-off trenches could be excavated at one or more locations perpendicular to the utility alignments to expose the utility backfill at that location. Then the sand/gravel backfill surrounding the utility pipe within the cutoff trench could be replaced with a cutoff wall of low permeability clay or Portland cement containing less than 3% bentonite clay. This measure would be relatively straight forward to implement and could significantly reduce the potential for VOC migration along preferential pathways created by existing permeable utility trench backfill.

- **Subslab Vapor Barriers** – In the event that new residential or commercial buildings will be constructed over the area where VOC concentrations in soil vapor exceed respective soil vapor Cleanup Goals, subslab vapor mitigation systems comprising an impermeable,

chemical resistant membrane system coupled with a passive vapor collection and venting system could be installed to prevent VOC intrusion into future occupied structures. The vapor barrier system would be constructed to comply with current DTSC guidance for mitigation of vapor intrusion. The vapor collection system would be constructed with a passive (wind-powered) venting design with an option for future conversion to active venting. In the event that active venting is considered necessary, permitting and monitoring of the discharge with the Bay Area Air Quality Management District (BAAQMD) may be required. The vapor barrier systems would be installed during building construction, prior to pouring the concrete floor slab.

6.7 COMPARATIVE EVALUATION OF REMEDIAL ALTERNATIVES

In accordance with CERCLA guidance, the No Action alternative was retained for comparison of potential remedial alternatives. Each of the remedial alternatives described in Section 4.5 was evaluated relative to the nine criteria identified in CERCLA guidance, namely:

- Overall protection of human health and the environment;
- Compliance with ARARs (applicable or relevant and appropriate standards);
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility or volume;
- Short-term effectiveness;
- Implementability;
- Cost;
- State acceptance; and,
- Community acceptance.

The results of comparative evaluation of remedial alternatives for soil, groundwater, and soil vapor/indoor air are discussed below.

6.7.1 EVALUATION OF REMEDIAL ALTERNATIVES FOR SOIL

A comparison of remedial alternatives for soil is presented in **Table 9**. The No Action alternative is unlikely to be effective for reducing direct contact, leaching to groundwater or preventing VOC offgassing to soil vapor. Five remedial alternatives in addition to the No Action alternative were evaluated. Capping & institutional controls could prevent dermal contact and ingestion of VOC-impacted soil, but would not be effective at reducing offgassing to soil vapor. Capping would also require periodic inspection & maintenance, would not reduce contaminant

toxicity or volume, and is unlikely to be well received by the State or local community. SVE could be effective at reducing VOC concentrations in soil vapor, but could require a long time to reduce VOC concentrations in soil. Due to the high moisture content and low permeability of clayey soils encountered in the vadose zone at the Site, SVE could be difficult if not impractical to implement. Excavation and onsite treatment of VOC-impacted soil could be more cost-effective than offsite disposal, however, ensuring uniform contact between an oxidizing treatment product and clayey Site soil could require extensive tilling efforts and/or multiple treatment episodes to achieve Site Cleanup Goals. Excavation and offsite disposal would likely be the most rapid alternative for reducing VOC concentrations in soil, but also more expensive. While excavation is readily implemented, care will need to be taken to prevent excessive offgassing of VOCs to ambient air during excavation activities. If the redevelopment schedule allows it, additional in-situ treatment could be quite effective to reduce VOC concentrations in soil. This alternative could take several years to achieve Site Cleanup Goals and may be subject to a longer lag period than excavation before treatment actively reduces VOC concentrations.

6.7.2 Evaluation of Remedial Strategy for Groundwater

A comparison of the remedial strategies for groundwater is presented in **Table 10**. The No Action alternative is unlikely to be effective for reducing potential exposure to VOCs in groundwater or preventing VOC offgassing to soil vapor. Two remedial strategies in addition to the No Action alternative were evaluated. Engineering controls have been implemented to reduce exposure to VOCs in groundwater from the water supply well on the Silveira property. Provided they are properly maintained, engineering controls will be highly effective at preventing exposure to VOCs in groundwater. MNA will be very effective at reducing VOC concentrations in groundwater when coupled with appropriate soil VOC source elimination/control methods. MNA will have low short term effectiveness, but does permanently reduce VOC concentrations with time.

6.7.3 Evaluation of Remedial Strategy for Soil Vapor/Indoor Air

A comparison of remedial strategies for soil vapor and indoor air is presented in **Table 11**. Three remedial strategies in addition to the No Action alternative were evaluated. The No Action alternative is unlikely to be effective for reducing exposure to VOCs in soil vapor or preventing VOC intrusion into indoor air. MNA will be very effective at reducing VOC concentrations in soil vapor when coupled with appropriate soil VOC source elimination/control methods. MNA will have low short term effectiveness but does permanently reduce VOC concentrations over time.

One remedial strategy for reducing or preventing offsite migration of VOCs, construction of utility corridor cutoff barriers, was evaluated relative to the nine CERCLA criteria. This strategy was found to have a high likelihood of preventing further VOC migration along utility corridors on the Marinwood Plaza property, would meet applicable and relevant standards, would have high long term effectiveness, would reduce the mobility of VOCs in soil vapor,

although not toxicity or volume, would be effective rapidly, would be relatively inexpensive, and would likely be readily accepted by both regulators and the community.

One remedial strategy for reducing or preventing VOC intrusion in occupied structures, construction of subslab vapor barrier systems during building construction, was evaluated relative to the nine CERCLA criteria. This alternative was found to have a high likelihood of preventing VOC into new structures built over the VOC plume in soil vapor on the Marinwood Plaza property, would meet applicable and relevant standards, would have high long term effectiveness, but would require occasional maintenance, would reduce the mobility of VOCs in soil vapor, although not toxicity or volume, would be effective immediately after construction, would be relatively inexpensive, and would likely be readily accepted by both regulators and the community.

7 RECOMMENDED FINAL REMEDIAL ACTIONS

Based on a critical evaluation of the remedial alternatives described in **Section 6**, several remedial actions are recommended for implementation for soil, groundwater, and soil vapor/indoor air, respectively.

7.1 RECOMMENDED FINAL SOIL REMEDIAL ACTIONS

To prevent direct contact with VOCs in soil, reduce VOC offgassing to soil vapor, and reduce VOC leaching to groundwater, we recommend implementing a remedial excavation program in the former dry cleaning area to remove soil containing VOCs at concentrations greater than the Site Cleanup Goals with offsite disposal of excavated soil. In the event that the anticipated redevelopment schedule allows sufficient time for effective remediation using in-situ soil treatment methods, we recommend optionally treating soil in-situ in advance of excavation to reduce the amount of soil transported to a Class I landfill.

7.2 RECOMMENDED FINAL GROUNDWATER REMEDIAL ACTIONS

In conjunction with soil VOC source reduction measures, we recommend implementing a MNA program for onsite and offsite groundwater. Onsite monitoring should be conducted on a periodic basis at the five existing groundwater monitoring wells, plus a new well to be constructed at the approximate former location of the dry cleaning area excavation. Offsite, additional groundwater quality investigation is required to delineate the northern and eastern extent of VOC impacts to groundwater. This work will be completed during implementation of this RAP. After completing the delineation of the offsite groundwater VOC plume, we recommend installing offsite groundwater monitoring well cluster installations at up to three locations along the apparent centerline of the groundwater VOC plume.

Monitoring should be conducted until, with concurrence from the Regional Board, a definitive downward trend in VOC concentrations is observed in all monitoring wells. Operation & maintenance of the well head treatment system installed on the water supply well on the Silveira Ranch property should be conducted until, with concurrence from the Regional Board, VOC concentrations in the water supply well and applicable monitoring wells have decreased to below Site Cleanup Goals.

7.3 RECOMMENDED FINAL SOIL VAPOR/INDOOR AIR REMEDIAL ACTIONS

In conjunction with soil VOC source reduction measures, we recommend implementing a MNA program for soil vapor. Onsite monitoring should be conducted on a periodic basis at the six existing soil vapor monitoring wells, plus a new well to be constructed at the western edge of the property opposite the former location of the dry cleaner. The soil vapor well inside the dry cleaner should be replaced after building demolition and remedial excavation activities are completed. Monitoring should be conducted until, with concurrence from the Regional Board, a definitive downward trend in VOC concentrations is observed in the soil vapor monitoring wells.

To prevent/reduce further offsite migration of VOCs in soil vapor along utility corridors on the Marinwood Plaza property, we recommend constructing utility corridor cutoff barriers as described in **Section 6.6**. Constructing cutoff barriers to soil vapor migration across key utility corridors including the sanitary sewer line exiting the northwestern part of the Site opposite Marinwood Market, the natural gas line, and storm sewer crossing the southern part of the Site will reduce potential VOC migration towards residential property to the west of the Site. This alternative could be implemented rapidly and relatively inexpensively.

To prevent future VOC intrusion into new structures on the property, we recommend installing subslab vapor mitigation systems during building construction. This requirement will be waived if periodic monitoring of the existing soil vapor monitoring probes demonstrates that VOC concentrations onsite have decreased to below applicable soil vapor Cleanup Goals as a result of the proposed soil remedial action prior to building construction. As discussed in **Section 6.6**, the vapor mitigation systems should be constructed in accordance with DTSC guidance. The systems should be built with passive VOC collection and venting systems to convey accumulated VOCs to the roofline with an option for conversion to active systems. If vapor mitigation systems will not be constructed under new structures on the property, then additional soil vapor testing at the time of construction may be needed to determine which parts of the Site still exceed applicable residential or commercial/industrial soil vapor Cleanup Goals. In addition, provision will need to be made in the deed/title to the structures to ensure system maintenance and to prevent damage to the vapor mitigation system by future building modifications and/or penetrations of the floor slab.

8 REMEDIAL ACTION IMPLEMENTATION TASKS AND PROPOSED SCHEDULE

This section describes the procedures and schedule for implementing the recommended Final Remedial Actions for the Site.

8.1 REMEDIAL ACTION IMPLEMENTATION TASKS

Procedures for implemented the recommended final remedial action tasks for soil, groundwater, and soil vapor/indoor air are described below.

8.1.1 SOIL REMEDIAL ACTIONS

Procedures for implemented the recommended final soil remedial action task, which consists of executing a remedial excavation program to remove soil containing VOCs at concentrations greater than the Site Cleanup Goals in the former dry cleaning area with offsite disposal of excavated soil, are described below.

8.1.1.1 Preliminary Activities

Preliminary activities to be completed before starting excavation include preparing health & safety and soil management plans, surveying the proposed excavation area, demolishing the building, staking the proposed excavation area and clearing underground utilities. The project environmental consultant will coordinate work with the Regional Board, engage a licensed surveyor, private utility locating contractor, the remediation contractor, and an accredited laboratory; and schedule field activities. All work associated with obtaining demolition permits and demolishing the building will be managed by the general contractor for the Site. Given the age of the building, asbestos and lead abatement may also be needed before demolition, which will be addressed by the general contractor. To reduce the potential for incidental disturbance of VOC-impacted soil during demolition activities, the concrete floor slab will be left in place following building demolition.

Prior to beginning field work, a qualified industrial health professional will be engaged to prepare a site specific health & safety plan (HSP) appropriate to the planned remedial activities. The HSP will describe general health & safety measures, personnel protective equipment, and ambient air monitoring procedures. In addition, the project environmental consultant will prepare a soil management plan (SMP) to describe general grading procedures, excavated soil and produced water management procedures, measures to minimize generation of fugitive dust, and documentation procedures.

The project environmental consultant will coordinate with appropriate site personnel to arrange site access and mark the proposed excavation location, review available as-built blueprints and contact Underground Services Alert (USA) to help establish the approximate location of subsurface utilities within the proposed excavation area. The project environmental consultant will also engage a private utility locator to locate existing underground utilities in the

proposed excavation area and work with the respective utilities and the general contractor to safely deactivate each utility.

8.1.1.2 Soil Disposal Profiling

Prior to transport to an approved offsite disposal facility, the excavated soil will need to be profiled, which will involve testing the soil to determine its waste characteristics. As an optional measure to reduce potential VOC offgassing from excavated soil, in-situ profiling may be conducted to determine the waste disposal classification of the soil prior to excavation. This will involve advancing up to four soil borings within the foot print of the proposed excavation to collect soil samples for analytical testing. Alternatively, soil profiling samples can be collected from the excavated soil stockpile. Soil profiling samples will be submitted to a California-certified analytical laboratory for analysis. At a minimum, the samples will be analyzed for VOCs by EPA Method 8260. Depending on receiving facility requirements, analyses for petroleum hydrocarbons, metals, and/or pesticides may also be required. Based on the dry cleaning site history and presence of PCE, the soil will most likely classify as F-listed RCRA waste and require disposal at a licensed Class I landfill.

8.1.1.3 Soil Excavation Procedures

The project environmental consultant will oversee a remediation contractor hired by the property owner to remove VOC-impacted soil beneath the former dry cleaner. The approximate proposed excavation area is shown on **Figure 17**. The initial excavation is anticipated to encompass an approximately 25 ft by 30 ft area to a depth of approximately 15 ft bgs.

Excavation to comply with the soil Cleanup Goals will involve breaking up the concrete floor slab**.** After removing the concrete floor slab, the remediation contractor will mobilize an excavator and properly trained and certified laborers to the site to excavate the VOC-impacted soil.

During excavation, the excavation sidewalls will be sloped as needed for stability of the excavation. In the event that pre-construction soil profiling is completed before excavation begins and soil from the remedial excavation has been pre-approved for disposal, excavated soil will be loaded directly into trucks for disposal as described below (see Direct Haul procedures). In the event that excavated soil will be stockpiled on site pending collection and analysis of soil profiling sample, soil removed from the excavation will be stockpiled on plastic in a stockpile area constructed for that purpose in on adjacent vacant land south of the dry cleaner pending approval for disposal at an appropriate facility. The soil stockpile will be covered with plastic sheeting secured with sand bags at the end of each work day.

During excavation work, the remediation contractor will implement standard best management practices to minimize generation of fugitive dust including wetting exposed soil to reduce dust generation in accordance with the approved SMP. The project environmental consultant will conduct ambient air monitoring as required by the HSP.

8.1.1.4 Excavation Confirmation Sampling

During the excavation activities, confirmation soil samples will be collected for analysis for VOCs to assess the progress of the excavation. Based on the analytical results for the soil samples, the extent of the excavation area may be adjusted. After completing the initial planned excavation, the project environmental consultant will collect confirmation soil samples along the base and perimeter of the completed excavation to document the quality of the soils that will be left in place. Confirmation samples will be collected from the bottom of the excavation at a minimum of one soil sample for each 100 square feet of excavation bottom area. Along the boundary of the excavation, one soil sample will be collected per 20 linear feet. Sidewall samples will be collected at an approximate depth of 5 feet bgs and 10 – 12 feet bgs. At least one discrete bottom sample and four discrete (east, west, north, and south) sidewall samples will be collected from the excavation to confirm that cleanup goals have been met. Confirmation samples will be submitted to a California-certified laboratory under EPA Chain of Custody procedures for analysis for VOCs by EPA Method 8260 on a dry weight basis.

In the event that VOCs are found in a sidewall confirmation sample at concentrations greater than the approved Site Cleanup Goals, the excavation will be extended in the direction of the elevated detection and additional confirmation samples will be collected to assess compliance with Cleanup Goals. Depending on the rate at which groundwater enters the excavation, deepening the excavation in the event that bottom confirmation samples are found to have elevated concentrations of VOCs may not be practical. Given that the majority of the VOC will be removed by the planned excavation, this is unlikely to be a significant issue.

8.1.1.5 Transport and Disposal

After receiving and reviewing all confirmation sampling results and determining that the Site Cleanup Goals have been met to the extent practical, excavated soil will be loaded and transported offsite for disposal at an appropriate licensed waste disposal facility. In the event excavation and immediate truck loading (direct haul) is planned for the remedial excavation work, appropriately licensed and bonded trucks qualified to transport hazardous waste will be brought to the Site and loaded as the excavation progresses. In the event that excavated soil is first placed in a designated stockpile area, a loader will be brought to the Site to load appropriately licensed and bonded trucks qualified to transport hazardous waste to the disposal facility. During loading operations, the remediation contractor will implement standard best management practices to minimize generation of fugitive dust including wetting exposed soil to reduce dust generation. A representative of the project environmental consultant will be onsite during loading activities to oversee implementation of the requirements of the SMP and HSP and document field activities.

8.1.1.6 Backfilling

After receiving approval to close the excavations, the project environmental consultant will oversee excavation backfilling by the remediation contractor. The excavation will be backfilled to the base of the existing concrete slab inside the building or ground surface outside the building. Depending on the time of year the work is completed and the rate at which

groundwater enters the excavation, groundwater may enter the remedial excavation. Consequently, backfilling may be conducted in the wet. If more than 1 foot of groundwater is present in the excavation, the excavation will be backfilled with cohesionless soil (drain rock or 6" minus gravel) up to the water table. The remainder of the excavation will be backfilled with clean soil. All material placed in the excavation will either be virgin material from an approved source (e.g., gravel from Dutra Quarry) or clean soil tested and confirmed to meet the Site Cleanup Goals and/or December 2013 Residential ESLs for constituents for which Site Cleanup Goals have not been identified. During backfilling operations, the remediation contractor will implement standard best management practices to minimize generation of fugitive dust including wetting exposed soil to reduce dust generation. A representative of the project environmental consultant will be onsite during loading activities to oversee implementation of the requirements of the SMP and HSP and document field activities.

8.1.1.7 Documentation

After completing and backfilling the remedial excavation and receiving all lab reports and waste disposal documentation, .i.e. weight tickets and manifests, the project environmental consultant will prepare a brief report documenting remedial excavation activities. The report will describe remedial excavation work completed, confirmation sampling results, and document waste disposal activities.

8.1.2 GROUNDWATER REMEDIAL ACTIONS

Procedures for implemented the recommended final groundwater remedial action task, which consists of executing a MNA program for groundwater are described below.

8.1.2.1 Preliminary Activities

Preliminary activities to be completed before starting the MNA program include reviewing the health & safety and soil management plans and updating them as needed to accommodate planned activities, staking the proposed monitoring well, clearing underground utilities, and obtaining a drilling permit. The project environmental consultant will coordinate work with the Regional Board, engage a licensed surveyor if needed, private utility locating contractor, licensed drilling contractor, and an accredited laboratory; and schedule field activities. This work will be completed after building demolition and completion of the remedial excavation task.

8.1.2.2 Monitoring Well Closure

Onsite monitoring well MW-4, which is located behind the dry cleaner, will be closed prior to building demolition. VOCs have never been detected in Well MW-4 at concentrations greater than the Site Cleanup Goals. A California-licensed driller will be engaged to drill the well out and properly close the well.

8.1.2.3 New Groundwater Monitoring Well Installations

Onsite, one new groundwater monitoring well will be installed within the former dry cleaner area to facilitate monitoring of groundwater recovery after removal of VOC-impacted soil. The schedule for monitoring well installation will be coordinated with the general contractor for the Site as needed to arrange site access. The new well will be installed using hollow stem auger drilling techniques. The well will be completed with 10 feet of 2"-dia. slotted PVC screen installed between depths of 20 and 30 ft bgs. The well will be completed with a flush monument. The approximate proposed well location is shown on **Figure 17**.

Offsite, three new groundwater monitoring well clusters will be installed at locations along the centerline of the groundwater VOC plume. Approximate proposed offsite groundwater monitoring well cluster locations are shown on **Figure 18**. One well cluster will be installed on the side of the access road near the western edge of the Silveira Ranch property; one well cluster will be completed near the approximate mid-point of the plume or near the C-29 CPT boring cluster, and one well cluster will be completed near the eastern edge of the groundwater VOC plume at a location to be determined based on the results of the planned additional offsite groundwater investigation. Monitoring well clusters will be completed with up to three individual monitoring well screens installed to span the groundwater-bearing zones observed to have elevated VOC concentrations during the offsite groundwater investigation program. Screen intervals will be determined based on lithologic logging results.

8.1.2.4 Periodic Groundwater Quality Monitoring

The newly installed onsite monitoring well, four existing onsite monitoring wells, and offsite monitoring wells will be purged and sampled on a quarterly basis for at least four consecutive quarters following redevelopment activities to document that the proposed remedial activities have reduced or eliminated VOC leaching to groundwater and that VOC concentrations in onsite groundwater continue to decline. These monitoring data will be used to assess groundwater concentrations relative to Cleanup Goals.

8.1.2.5 Reporting

Quarterly groundwater monitoring activities and results will be documented in a series of quarterly monitoring reports to be submitted to the Regional Board. The quarterly reports will describe monitoring activities completed, monitoring results, and document progress towards achieving RAOs for groundwater.

8.1.3 Soil Vapor/Indoor Air Remedial Actions

Procedures for implemented the recommended final soil vapor/indoor air remedial action tasks, which consists of installing utility corridor barriers to and constructing vapor barriers beneath new buildings constructed on the property are described below.

8.1.3.1 Preliminary Activities

Preliminary activities to be completed before starting the soil vapor MNA program include reviewing the health & safety and soil management plans and updating them as needed to accommodate planned activities, staking the proposed monitoring well locations, and clearing underground utilities. The project environmental consultant will coordinate work with the Regional Board, engage a licensed surveyor if needed, private utility locating contractor, licensed drilling contractor, and an accredited laboratory; and schedule field activities. This work will be completed after building demolition and completion of the remedial excavation task.

8.1.3.2 New Soil Vapor Probe Installations

One new soil vapor monitoring probe will be installed within the former dry cleaner area to facilitate monitoring of soil vapor recovery after removal of VOC-impacted soil. A second new soil vapor monitoring probe will be installed at the western edge of the subject property, west of the dry cleaner. The schedule for soil vapor probe installation will be coordinated with the general contractor for the Site as needed to arrange site access. The new soil vapor probes will be completed in accordance with DTSC guidance with a sample interval set 5 ft bgs. The new vapor probes will be completed with a flush monument. The approximate proposed vapor probe location is shown on **Figure 17.**

8.1.3.3 Periodic Soil Vapor Quality Monitoring

The newly installed onsite vapor probes, and five existing onsite monitoring probes will be purged and sampled on a quarterly basis for at least four consecutive quarters following redevelopment activities to document that the proposed remedial activities have reduced or eliminated VOC offgassing to soil vapor and that VOC concentrations in soil vapor continue to decline. These monitoring data will be used to compare soil vapor concentrations over time to the Cleanup Goals.

8.1.3.4 Utility Corridor Cutoff Barriers

Results of the December 2015 soil vapor investigation discussed in Section 2 indicated that VOC migration in soil vapor along underground utility backfill alignments on the subject property appeared to be a significant factor in the westward migration of VOCs in soil vapor. In the long term, planned soil remedial activities are expected to reduce VOC concentrations to de minimis levels and eliminate potential offsite migration. However, in the short term, to address this issue, shallow trenches will be carefully excavated at three locations perpendicular to the sanitary sewer, storm sewer, and natural gas pipeline alignments onsite to expose the full depth of the utility backfill (see **Figure 17**). Then the sand/gravel backfill surrounding the utility pipe will be replaced with low permeability bentonite clay. The remainder of the excavation at each barrier location will be backfilled to within 6-inches of ground surface with compacted native soil. Then the remainder of the excavations will be filled with virgin gravel or concrete to surrounding grade.

8.1.3.5 Vapor Barrier and Venting Systems

In the short term, the vapor intrusion pathway into onsite structures will be mitigated through engineering controls, i.e., an appropriately-designed vapor mitigation system to address chlorinated VOCs will be included in each of the Site building designs (in the long term, planned soil remedial activities are expected to reduce VOC concentrations to de minimis levels). The vapor mitigation systems should be constructed in accordance with DTSC guidance. The vapor mitigation systems will include an impermeable barrier layer placed below the buildings that will be designed to be chemically compatible and effective on chlorinated VOCs. A passive venting system with the capability to be converted to active venting will be incorporated into the designs to convey accumulated VOCs to the roof top for dispersal. In the event that active venting becomes necessary, permitting and monitoring of the discharge with the Bay Area Air Quality Management District (BAAQMD) may be required.

If vapor barrier systems will not be constructed under all new structures on the property, then additional soil vapor testing at the time of construction may be needed to determine which parts of the Site still exceed applicable residential or commercial/industrial soil vapor Cleanup Goals. This requirement will be waived if periodic monitoring of the existing soil vapor monitoring probes demonstrates that VOC concentrations onsite have decreased to below applicable soil vapor Cleanup Goals as a result of the proposed soil remedial action. If VOC concentrations onsite still exceed applicable soil vapor Cleanup Goals, at least one soil vapor sample will be collected beneath the footprint of each planned structure to assess the need for vapor barrier systems. The soil vapor samples will be collected in accordance with DTSC guidance at depth of approximately 5 ft bgs with analysis for VOCs using EPA Method TO-15 or equivalent.

If vapor mitigation systems are constructed at the Site, provision will be made in the deed/title to the structures to avoid damaging the vapor barrier system and maintain venting systems as needed. Procedures for inspecting and maintaining the venting systems and requirements for avoiding damage to the subslab vapor barrier will be detailed in a Vapor Mitigation Plan (VMP). The VMP will describe monitoring, engineering and institutional controls to be implemented to control vapor intrusion into new structures on the property.

8.1.3.6 Reporting

Sampling procedures and soil vapor monitoring results will be presented in the planned quarterly remediation monitoring reports.

8.2 CLOSURE ACTIVITIES

After completing the planned Remedial Actions and with the concurrence of the Regional Board, a Request for Site Closure will be prepared. The Site Closure request will summarize remedial actions completed, and describe the technical basis for requesting closure for the Site. It is anticipated that the Site Closure will generally comply with the Recommended Closure

Criteria for Low-Threat Chlorinated Solvent Sites detailed in the Regional Board's Assessment Tool for Closure of Low-Threat Chlorinated Solvent Sites (RWQCB, 2009).

8.3 Proposed Remedial Action Implementation Schedule

The proposed remedial action implementation schedule is shown on **Figure 19**. As discussed in **Section 8.1**, the schedule for the proposed while remedial actions is partially dependent on the Site redevelopment schedule, which has not been determined. Groundwater and soil vapor monitoring as well as operation & maintenance of the Silveira well treatment system will continue on a quarterly basis on the current schedule. The proposed utility corridor cutoff barrier task will be implemented as soon as the RAP is approved by the Regional Board. Additional offsite groundwater investigation will be conducted as soon as the Regional Board approves an investigation plan for the work. Implementation of the remedial soil excavation and monitoring well installation and replacement in the dry cleaner area will begin after the building is demolished. It is anticipated that it may take up to 6 months to obtain permits and approvals to demolish the building, conduct asbestos & lead abatement activities, and demolish the building.

9 PROPOSED RISK MANAGEMENT PLAN

VOC-impacted soil, soil vapor, and groundwater have previously been found on the property, which is an active SLIC site. This RAP describes remedial measures to be implemented by an approved and appropriately trained and experienced hazardous waste remediation contractor. However, redevelopment of the Site may occur in concert with remedial activities or the complete removal or abatement of all hazardous materials may not be complete before redevelopment begins. Consequently, a site specific Soil Management Plan (SMP) should be developed prior to construction to guide earthwork and soil management procedures to be used during site clearing and preparation activities to be performed during initial construction activities. The SMP should describe specific measures for managing potentially contaminated soil and groundwater that could be encountered during underground utility construction. Depending on the timing of redevelopment relative to proposed Site remediation activities and results of final confirmation sampling for all media, all soil and groundwater encountered at the site will be presumed to be contaminated. The SMP should be developed by a qualified environmental professional with knowledge of the Site. The SMP should include a site specific health & safety plan to describe appropriate personal protective equipment, monitoring, and general safety procedures appropriate to the proposed development plan.

10 REFERENCES AND RELEVANT DOCUMENTS

- Edd Clark and Associates, Inc., August 30, 2007a. Soil and Groundwater Investigation, Prosperity Cleaners, 187 Marinwood Avenue, San Rafael, California.

- Edd Clark and Associates, Inc., October 12, 2007b. Report of Additional Soil and Groundwater Investigation, Prosperity Cleaners, 187 Marinwood Avenue, San Rafael, California.

- Environ, 2004, Phase I Environmental Site Assessment, 155, 175, 185, 187, 195,and 197 Marinwood Avenue, San Rafael, California, Environ International Corporation, May 6, 2004.

- GEOLOGICA, December 7, 2007. Report, Groundwater Monitoring Well Installation and Initial Sampling, Prosperity Cleaners, 187 Marinwood Avenue, San Rafael, California.

- GEOLOGICA, February 2009a. Report Limited Subsurface Investigation, Marinwood Mall Property, RWQCB Case No. 21S0053, Marinwood Avenue, San Rafael, California.

- GEOLOGICA, August 5, 2009b. Report, Indoor Air Testing Results, Marinwood Plaza Property, San Rafael, California.

- GEOLOGICA, November 23, 2009c. Work Plan, Indoor Air Mitigation and Monitoring, Marinwood Plaza Dry Cleaner, Case No. 21S0053, 187 Marinwood Avenue, San Rafael, California.

- GEOLOGICA, December 1, 2009d. Final Work Plan, Soil Interim Remedial Measures (Soil IRM), Marinwood Plaza Dry Cleaner, 187 Marinwood Avenue, San Rafael, California.

- GEOLOGICA, July 20, 2010a. Memorandum, Soil Excavation and Disposal, Supplemental Soil Sampling, and Pilot Injection Test Results, Marinwood Plaza/Prosperity Cleaners, Case #21S0053, San Rafael, California.

- GEOLOGICA, January 26, 2011. Soil IRM Implementation Status Report, Marinwood Plaza/Prosperity Cleaners, Case #21S0053, San Rafael, California.

- GEOLOGICA, April 22, 2013a. Work Plan, Supplemental Off-Site Groundwater Sampling, Marinwood Plaza Shopping Center Case, 187 Marinwood Avenue, San Rafael, CA 94903.

- GEOLOGICA, May 29, 2013b. Work Plan Addendum No. 1, Supplemental Off-Site Groundwater Sampling, Marinwood Plaza Shopping Center, 187 Marinwood Avenue, San Rafael, CA 94903.

- GEOLOGICA, December 12, 2013c. Report, October 2013 Off-Site Groundwater Sampling, Marinwood Plaza Shopping Center, 187 Marinwood Avenue, San Rafael, CA 94903.

- GEOLOGICA, March 31, 2014. Eastern Hot Spot Area Supplemental Soil and Groundwater Quality Results, Marinwood Plaza / Former Prosperity Cleaners, Case #21S0053, San Rafael, CA.

- GEOLOGICA, September 24, 2015d. Interim Report, Offsite Remedial Investigation Status – September 2015, Marinwood Plaza Shopping Center, 187 Marinwood Avenue, Case #21S0053, San Rafael, CA 94903.

- GEOLOGICA, July 9, 2015e, Work Plan, Offsite Interim Remedial Action Plan (IRAP), Silveira Ranch Water Supply Well, Marinwood Plaza Shopping Center, Case #21S0053, San Rafael, CA 94903.

- GEOLOGICA, December 15, 2015f, Report Of Offsite Interim Remedial Action Implementation, Silveira Ranch Water Supply Well, Marinwood Plaza Shopping Center, Case #21S0053, San Rafael, CA 94903.

- GEOLOGICA, April 20, 2015g. Work Plan, Supplemental Soil Vapor Sampling, Former Prosperity Cleaners / Marinwood Plaza Shopping Center, Case #21S0053, 187 Marinwood Avenue, San Rafael, CA 94903.

- GEOLOGICA, December 15, 2015h. Report, Offsite Soil Vapor Investigation, Former Prosperity Cleaners/Marinwood Plaza Shopping Center, Case #21S0053, 187 Marinwood Avenue, San Rafael, CA 94903.

- RWQCB, 2009, Assessment Tool for Closure of Low-Threat Chlorinated Solvent Sites, Prepared by: Groundwater Committee, a staff committee of the California Regional Water Quality Control Board, San Francisco Bay Region, Draft Final – July 31, 2009.

- RWQCB, 2014a, Order No. R2-2014-0007, Site Cleanup Requirements For: Marinwood Plaza, LLC for the property located at: 187 MARINWOOD AVENUE, MARINWOOD, MARIN COUNTY, February 14, 2014.

- RWQCB, 2014b, Order No. R2-2014-0036, Amendment Of Site Cleanup Requirements (Order No. R2-2014-0007) for: Marinwood Plaza, LLC for the property located at: 187 Marinwood Avenue, Marinwood, Marin County, September, 2014.

TABLES

Table 1A
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Summary of January 2014 Eastern Hot Spot Area Confirmation Soil Testing Results

Concentration in micrograms per kilogram (ug/kg)

Analyte	Sample ID	Sample Depth, ft	Date Sampled	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-dichloroethene (cis-DCE)	Vinyl Chloride (VC)
Sample Reporting Limit				4.9-6.0	4.9-6.0	4.9-6.0	4.9-6.0
GP-10	GP-10-1'	1'	1/23/14	**7.4**	ND	ND	ND
	GP-10-5'	5'	1/23/14	ND	ND	ND	ND
	GP-10-10'	10'	1/23/14	ND	ND	ND	ND
	GP-10-15'	15'	1/23/14	ND	ND	ND	ND
	GP-10-20'	20'	1/23/14	ND	ND	ND	ND
GP-11	GP-11-1'	1'	1/23/14	**7.2**	ND	**19**	ND
	GP-11-5'	5'	1/23/14	ND	ND	ND	ND
	GP-11-10'	10'	1/23/14	ND	ND	ND	ND
	GP-11-15'	15'	1/23/14	ND	ND	**8.4**	**30**
	GP-11-20'	20'	1/23/14	ND	ND	ND	ND
GP-12	GP-12-1'	1'	1/23/14	**7.0**	ND	ND	ND
	GP-12-5'	5'	1/23/14	ND	ND	**9.3**	ND
	GP-12-10'	10'	1/23/14	ND	ND	ND	ND
	GP-12-15'	15'	1/23/14	**5.6**	ND	**22**	**9.2**
	GP-12-20'	20'	1/23/14	**46**	**11**	**14**	ND
GP-13	GP-13-1'	1'	1/23/14	**130**	**36**	**7.9**	ND
	GP-13-5'	5'	1/23/14	**56**	**14**	ND	ND
	GP-13-10'	10'	1/23/14	ND	ND	**33**	**12**
	GP-13-15'	15'	1/23/14	**280**	**53**	**52**	**32**
	GP-13-20'	20'	1/23/14	**23**	ND	ND	ND
GP-14	GP-14-1'	1'	1/23/14	**18**	**6.4**	**12**	ND
	GP-14-5'	5'	1/23/14	**140**	**49**	**130**	**6.8**
	GP-14-10'	10'	1/23/14	**67**	**54**	**36**	**11**
	GP-14-15'	15'	1/23/14	**420**	**83**	**100**	**17**
	GP-14-20'	20'	1/23/14	ND	ND	ND	ND
GP-15	GP-15-1'	1'	1/23/14	ND	ND	ND	ND
	GP-15-5'	5'	1/23/14	ND	ND	ND	ND
	GP-15-10'	10'	1/23/14	ND	ND	ND	ND
	GP-15-15'	15'	1/23/14	**25**	**29**	**160**	**38**
	GP-15-20'	20'	1/23/14	**6.5**	ND	ND	ND
GP-16	GP-16-1'	1'	1/23/14	**5.9**	ND	ND	ND
	GP-16-5'	5'	1/23/14	ND	ND	ND	ND
	GP-16-10'	10'	1/23/14	ND	ND	ND	ND
	GP-16-15'	15'	1/23/14	**7.5**	**5.7**	**86**	**28**
	GP-16-20'	20'	1/23/14	ND	ND	ND	ND
GP-17	GP-17-1'	1'	1/23/14	**35**	**7.5**	ND	ND
	GP-17-5'	5'	1/23/14	**32**	**11**	ND	ND
	GP-17-10'	10'	1/23/14	ND	ND	ND	ND
	GP-17-15'	15'	1/23/14	**29**	**8.0**	**41**	ND
	GP-17-20'	20'	1/23/14	ND	ND	ND	ND
Site Cleanup Goal				**550**	**460**	**190**	**32**

Notes:
1) See Table 8 for proposed Site Cleanup Goals.
2) ND = Not detected above method reporting limit.

Table 1B
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Summary of Dry Cleaner Area Soil Testing Results

Concentration in micrograms per kilogram (ug/kg)

Boring	Sample Depth, ft bgs	Date Collected	Analyte	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Trans-1,2, Dichloroethene (trans-DCE)	cis-1,2 Dichloroethene (cis-DCE)	Vinyl chloride (VC)
			Method Reporting Limit	4.8 - 25	4.8 - 25	4.8 - 25	4.8 - 25	4.8 - 25
B-1	5.5	8/10/2007	B-1d5.5	**21**	ND	ND	ND	ND
	11.0	8/10/2007	B-1d11.0	**5.1**	ND	ND	ND	ND
B-2	10.5	8/10/2007	B-2d10.5	**6.4**	ND	ND	ND	ND
	15	8/10/2007	B-2d15.0	**21**	ND	ND	ND	ND
B-3	5.5	8/10/2007	B-3d5.5	**1,700**	ND	ND	**610**	ND
	11	8/10/2007	B-3d11.0	**580**	ND	ND	**1,000**	ND
	15.5	8/10/2007	B-3d15.5	**110**	ND	ND	**240**	ND
B-5	4.5	9/14/2007	B-5d4.5	ND	ND	ND	**8**	ND
	9.5	9/14/2007	B-5d9.5	ND	ND	ND	**15**	ND
	19.5	9/14/2007	B-5d19.5	ND	ND	ND	ND	ND
S-1	1	6/9/2010	S-1-1	**200**	**8.3**	ND	**150**	ND
	5	6/9/2010	S-1-5	**330**	**15**	ND	**250**	ND
	10	6/9/2010	S-1-10	**370**	**17**	ND	**340**	ND
	15	6/9/2010	S-1-15	**130**	**9**	ND	**350**	ND
S-2	1	6/9/2010	S-2-1	**770**	ND	ND	**560**	ND
	5	6/9/2010	S-2-5	**300**	ND	ND	**510**	ND
	10	6/9/2010	S-2-10	**110**	**8.6**	ND	**1,000**	ND
	15	6/9/2010	S-2-15	**60**	**6.4**	ND	**360**	ND
S-3	2	6/9/2010	S-3-2	**7,600**	ND	ND	**1,100**	ND
	5	6/9/2010	S-3-5	ND	ND	ND	**3,900**	ND
	10	6/9/2010	S-3-10	**240**	**32**	ND	**350**	ND
	15	6/9/2010	S-3-15	**95**	**11**	ND	**350**	ND
S-4	1	6/9/2010	S-4-1	**370**	ND	ND	**29**	ND
	5	6/9/2010	S-4-5	**320**	ND	ND	**150**	ND
	10	6/9/2010	S-4-10	**230**	**14**	ND	**72**	ND
	15	6/9/2010	S-4-15	**140**	**8.5**	ND	**34**	ND
S-5	1.5	6/9/2010	S-5-1.5	**310**	ND	ND	ND	ND
	5	6/9/2010	S-5-5	**450**	ND	ND	ND	ND
	10	6/9/2010	S-5-10	**210**	ND	ND	**16**	ND
	15	6/9/2010	S-5-15	**170**	**9.6**	ND	**57**	ND
S-13	1	6/9/2010	S-13-1	**12,000**	ND	ND	ND	ND
	5	6/9/2010	S-13-5	**480**	**45**	ND	**330**	ND
	10	6/9/2010	S-13-10	**3,300**	ND	ND	ND	ND
	15	6/9/2010	S-13-15	**5,200**	ND	ND	ND	ND
Site Cleanup Goal				**550**	**460**	670	**190**	32

Notes:
1) See Table 8 for proposed Site Cleanup Goals.
2) ND = Not detected above method reporting limit.
3) **400** Sample result exceeding Site Cleanup Goal.

Table 2
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Onsite Groundwater Monitoring Well Sample Chemical Testing Summary

Concentrations in micrograms per liter (ug/L)

Date	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-dichloroethene (cis-DCE)	trans-1,2-dichloroethene (trans-DCE)	Vinyl Chloride (VC)	Chloro ethane	MTBE	1,1-Dichloroethene
Well MW-1								
Nov-2007	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sep-2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dec-2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Mar-2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Jun-2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Discontinued sampling July 2012-May 2015								
May-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
Jul-2015	-	-	-	-	-	-	-	-
Nov-2015	-	-	-	-	-	-	-	-
Well MW-2								
Nov-2007	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sep-2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dec-2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Mar-2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.83**	<0.5
Jun-2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.76**	<0.5
Discontinued sampling from July 2012 to Feb 2014								
Feb-2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
May-2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.54**	<0.5
Aug-2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nov-2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Feb-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
May-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
Jul-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
Nov-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
Well MW-3								
Nov-2007	**3.7**	**0.59**	**13**	**0.66**	<0.5	<0.5	<0.5	<0.5
Sep-2011	**2.8**	**0.69**	**34**	**1.3**	<0.5	<0.5	<0.5	<0.5
Dec-2011	**2.8**	**0.66**	**33**	**1.4**	**1.3**	<0.5	<0.5	<0.5
Mar-2012	**2.9**	**0.95**	**89**	**3**	**4.5**	<0.5	<0.5	<0.5
Jun-2012	**2.6**	**0.78**	**44**	**1.6**	**0.85**	<0.5	<0.5	<0.5
Oct-2012	**2.1**	<0.5	**20**	**0.81**	<0.5	<0.5	<0.5	<0.5
Well MW-3 continued								
Jan-2013	**2.7**	**0.97**	**85**	**2.8**	**4.8**	<0.5	**0.52**	<0.5
Apr-2013	**2.2**	**0.67**	**47**	**1.9**	**0.75**	<0.5	**0.54**	<0.5
Aug-2013	**2.5**	**0.61**	**19**	**0.77**	<0.5	<0.5	<0.5	<0.5
Nov-2013	**2.4**	**0.56**	**12**	<0.5	<0.5	<0.5	<0.5	<0.5
Feb-2014	<0.5	<0.5	**3.1**	<0.5	<0.5	<0.5	<0.5	<0.5
May-2014	**2.9**	**0.78**	**69**	**2.4**	**5.4**	<0.5	<0.5	<0.5
Aug-2014	**0.83**	<0.5	**27**	<0.5	<0.5	<0.5	<0.5	<0.5
Nov-2014	**0.57**	<0.5	**14**	**0.52**	<0.5	<0.5	<0.5	<0.5
Feb-2015	**0.74**	<0.5	**16**	**0.56**	**1.3**	<1.0	<0.5	<0.5
May-2015	**1.4**	<0.5	**9.3**	<0.5	<0.5	<1.0	<0.5	<0.5
Jul-2015	**1.5**	<0.5	**7.9**	<0.5	<0.5	<1.0	<0.5	<0.5
Nov-2015	**1.3**	<0.5	**6.3**	<0.5	<0.5	<1.0	<0.5	<0.5

Table 2 (continued)
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Onsite Groundwater Monitoring Well Sample Chemical Testing Summary

Concentrations in micrograms per liter (ug/L)

Date	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-dichloroethene (cis-DCE)	trans-1,2-dichloroethene (trans-DCE)	Vinyl Chloride (VC)	Chloro ethane	MTBE	1,1-Dichloroethene
Well MW-4								
Nov-2007	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sep-2011	<0.5	<0.5	**0.54**	<0.5	<0.5	<0.5	<0.5	<0.5
Dec-2011	<0.5	<0.5	**0.68**	<0.5	<0.5	<0.5	<0.5	<0.5
Mar-2012	<0.5	<0.5	**3**	<0.5	<0.5	<0.5	<0.5	<0.5
Jun-2012	<0.5	<0.5	**0.81**	<0.5	<0.5	<0.5	<0.5	<0.5
Oct-2012	**0.54**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Jan-2013	<0.5	<0.5	**2.8**	<0.5	<0.5	<0.5	<0.5	<0.5
Apr-2013	<0.5	<0.5	**0.79**	<0.5	<0.5	<0.5	<0.5	<0.5
Aug-2013	**1.4**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nov-2013	**0.86**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Feb-2014	<0.5	<0.5	**1.4**	<0.5	<0.5	<0.5	<0.5	<0.5
May-2014	<0.5	<0.5	**1.5**	<0.5	<0.5	<0.5	<0.5	<0.5
Aug-2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nov-2014	**0.53**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Feb-2015	**1.3**	<0.5	**0.53**	<0.5	<0.5	<1.0	<0.5	<0.5
May-2015	<0.5	<0.5	**0.88**	<0.5	<0.5	<1.0	<0.5	<0.5
Jul-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
Nov-2015	**0.6**	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5
Well MW-5								
Nov-2007	**680**	**45**	**37**	<5	<5	<0.5	<0.5	<0.5
Sep-2011	**120**	**480**	**140**	**3**	**3**	<0.5	<0.5	<0.5
Dec-2011	**130**	**79**	**310**	**3.2**	**1.3**	<0.5	<0.5	<0.5
Mar-2012	**130**	**43**	**78**	<0.5	<0.5	<0.5	<0.5	<0.5
Jun-2012	**200**	**75**	**100**	<0.5	**13**	<0.5	<0.5	<0.5
Oct-2012	**99**	**31**	**42**	**0.94**	**3.7**	<0.5	<0.5	<0.5
Jan-2013	**200**	**73**	**110**	**2.2**	**53**	**2.8**	**0.54**	<0.5
Apr-2013	**84**	**40**	**64**	**1.6**	**33**	**2.1**	<0.5	<0.5
Aug-2013	**47**	**15**	**21**	<0.5	**6.7**	**1.5**	<0.5	<0.5
Nov-2013	**12**	**4.4**	**99**	<0.5	**2**	<0.5	<0.5	<0.5
Feb-2014	**120**	**69**	**100**	**2.4**	**58**	<0.5	<0.5	**0.51**
May-2014	**130**	**68**	**110**	**2.1**	**54**	<0.5	<0.5	<0.5
Aug-2014	**52**	**16**	**19**	**0.64**	**2.2**	<0.5	<0.5	<0.5
Nov-2014	**47**	**14**	**13**	<0.5	<0.5	<1.0	<0.5	<0.5
Feb-2015	**72**	**37**	**51**	**1.1**	**24**	<1.0	<0.5	<0.5
May-2015	**31**	**13**	**18**	<0.5	**3.5**	<1.0	<0.5	<0.5
Jul-2015	**28**	**8.8**	**9.0**	<0.5	**0.63**	<1.0	<0.5	<0.5
Nov-2015	**25**	**7.7**	**8.6**	<0.5	**0.71**	<1.0	<0.5	<0.5
Site Cleanup Levels(2)	**5**	**5**	**6**	**10**	**0.5**	**16(3)**	**5(3)**	**6(3)**

Notes:
1) Analysis by EPA Method 8260B.
2) See Table 8 for proposed Site Cleanup Goals.
3) Cleanup Level not Established in February 2014 Order; Level based on ESLs for Groundwater; Table A: Groundwater Screening Levels for Groundwater that is a Potable Water Supply; SF RWQCB, Interim Final (Revised December 2013).
4) <0.5 = Not detected at the laboratory reporting limit cited.
5) - = Not analyzed for or not established.
6) **5** Sample result exceeding Site Cleanup Level.

Table 3A
Offsite Groundwater Quality Investigation
Marinwood Plaza/Former Prosperity Cleaners
San Rafael, CA

Summary of October 2013 "Grab" Groundwater Sampling Data

Concentrations in micrograms per liter (ug/L)

Cluster Boring ID	Sample ID	Groundwater Sample Intervals	Date Sampled	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2 Dichloroethene (cis-DCE)	Trans-1,2, dichloroethene (trans-DCE)	Vinyl Chloride (VC)	Chloroethane
C-1	C-1-A-24'-28'	24'-28'	10/21/2013	**25**	**4.9**	**7.8**	<1	**3.7**	<2
	C-1-B-36'-39'	36'-39'	10/21/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-1-C-49'-52'	49'-52'	10/21/2013	**0.58**	**0.51**	<0.5	<0.5	**0.62**	<1
C-2	C-2-A-21'-24'	21'-24'	10/22/2013	**83**	**16**	**43**	**0.7**	**4.8**	<1
	C-2-D-36'-39'	36'-39'	10/22/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-2-B-47'-50'	47'-50'	10/22/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-2-C-65'-68'	65'-68'	10/22/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
C-3	C-3-B-27'-30'	27'-30'	10/23/2013	**9.4**	<0.5	**2.3**	<0.5	<0.5	<1
	C-3-C-37'-40'	37'-40'	10/23/2013	<10	<10	<10	<10	<10	<20
	C-3-A-47'-50'	47'-50'	10/23/2013	<10	<10	<10	<10	<10	<20
	C-3-D-69'-72'	69'-72'	10/23/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
C-4	C-4-A-13'-16'	13'-16'	10/23/2013	**3.7**	<0.5	<0.5	<0.5	<0.5	<1
	C-4-B-33'-36'	33'-36'	10/23/2013	**8.0**	<0.5	**1.9**	<0.5	<0.5	<1
	C-4-C-46'-51'	46'-51'	10/23/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-4-D-70'-73'	70'-73'	10/24/2013	<2	<2	<2	<2	<2	<4
C-5	C-5-A-37'-40'	37'-40'	10/24/2013	<1	<1	<1	<1	<1	<2
	C-5-B-51'-54'	51'-54'	10/24/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-5-C-72'-75'	72'-75'	10/24/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
C-6	C-6-A-37'-40'	37'-40'	10/25/2013	<1	<1	<1	<1	<1	<2
	C-6-B-47.5'-50.5	47.5'-50.5'	10/25/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-6-C-55'-58'	55'-58'	10/25/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-6-D-71'-74'	71'-74'	10/25/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
C-7	C-7-A-36'-39	36'-39	10/25/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-7-B-51'-54'	51'-54'	10/28/2013	<5	<5	<5	<5	<5	<10
C-8	C-8-A-16'-20'	16'-20'	10/28/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-8-B-39'-42'	39'-42'	10/28/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-8-C-51'-54'	51'-54'	10/28/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
C-9	C-9-A-29'-32'	29'-32'	10/29/2013	<1	<1	<1	<1	<1	<2
	C-9-B-37.5'-40.5	37.5'-40.5'	10/29/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-9-C-45'-48'	45'-48'	10/29/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	C-9-D-52'-55'	52'-55'	10/29/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	TRIPBLANKS		10/23/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	TRIPBLANKS		10/25/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
	IDW-WATER		10/29/2013	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Site Cleanup Levels(2)				**5**	**5**	**6**	**10**	0.5	**16**

Notes:

1) Analysis by EPA Method 8260B, results for analytes detected in at least one sample listed.
2) See Table 8 for proposed Site Cleanup Goals.
3) - = Not analyzed or not established.
4) <0.5 = Not detected above sample reporting limit.
5) 400 Sample result exceeding Site Cleanup Level.

Table 3B
Offsite Groundwater Quality Investigation
Marinwood Plaza/Former Prosperity Cleaners, San Rafael, CA

Summary of December 2014 "Grab" Groundwater Sampling Data

				Concentrations in micrograms per liter (ug/L)					
C-10	C-10-13'16'	13'16'	12/17/2014	**0.51**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-10-29'-34'	29'-34'	12/17/2014	<5	<5	<5	<5	<5	<5
	C-10-38'-42'	38'-42'	12/17/2014	<5	<5	<5	<5	<5	<5
	C-10-70'-75'	70'-75'	12/17/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-11	C-11-13'-18'	13'-18'	12/17/2014	**3.8**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-11-35'-40	35'-40	12/17/2014	**7.5**	<0.5	**2.2**	<0.5	<0.5	**0.62**
	C-11-46'-50	46'-50	12/17/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-11-69'-74'	69'-74'	12/17/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-12	C-12-15'-20'	15'-20'	12/18/2014	**1.5**	<0.5	<0.5	<0.5	<0.5	<0.5
	C12-32'-36'	32'-36'	12/18/2014	**7.6**	<0.5	**2.2**	<0.5	<0.5	<0.5
	C12-50'-55'	50'-55'	12/18/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C12-69'-73'	69'-73'	12/18/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-13	C-13-30'-35'	30'-35'	12/16/2014	<50	<50	<50	<50	<50	<50
	C-13-47'-52'	47'-52'	12/16/2014	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
C-14	C-14-19'-22'	19'-22'	12/23/2014	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
	C-14-33'-36'	33'-36'	12/23/2014	**7**	<0.5	**2**	<0.5	<0.5	**0.51**
	C-14-48'-51'	48'-51'	12/23/2014	<5	<5	<5	<5	<5	<5
	C-14-71'-75'	71'-75'	12/23/2014	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
C-15	C-15-12'-14'	12'-14'	12/19/2014	**2.9**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-15-17'-22	17'-22	12/19/2014	**3.5**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-15-31'-36'	31'-36'	12/19/2014	**11**	<10	<10	<10	<10	<10
	C-15-45'-50'	45'-50'	12/19/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-15-70'-75'	70'-75'	12/19/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-16	C-16-6'-9'	6'-9'	12/19/2014	**0.97**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-16-32'-34'	32'-34'	12/19/2014	**6.3**	<0.5	**1.6**	<0.5	<0.5	<0.5
	C-16-46'-51'	46'-51'	12/19/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-16-60'-65'	60'-65'	12/19/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-17	C-17-5'-9'	5'-9'	12/22/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-17-14'-17'	14'-17'	12/22/2014	**0.79**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-17-30'-35'	30'-35'	12/22/2014	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
	C-17-44'-48'	44'-48'	12/22/2014	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
	C-17-52'-57'	52'-57'	12/22/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-18	C-18-6'-9'	6'-9'	12/22/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-18-16'-19'	16'-19'	12/22/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-18-33'-36'	33'-36'	12/23/2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-18-43'-47'	43'-47'	12/23/2014	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Site Cleanup Levels(2)				**5**	**5**	**6**	**10**	0.5	-

Notes:

1) Analysis by EPA Method 8260B, results for analytes detected in at least one sample listed.
2) See Table 8 for proposed Site Cleanup Goals.
3) - = Not analyzed or not established.
4) <0.5 = Not detected above sample reporting limit.
5) **400** Sample result exceeding Site Cleanup Level.

Table 3C
Offsite Groundwater Quality Investigation
Marinwood Plaza/Former Prosperity Cleaners, San Rafael, CA

Summary of May 2015 "Grab" Groundwater Sampling Data

				Concentrations in micrograms per liter (ug/L)					
Cluster Boring ID	*Sample ID*	*Groundwater Sample Interval*	*Date Sampled*	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2 Dichloroethene (cis-DCE)	Trans-1,2, dichloroethene (trans-DCE)	Vinyl Chloride (VC)	Dichloro difluoro methane
C-19	C-19-13'-16'	13'-16'	5/4/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-19-20'-22'	20'-22'	5/4/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-19-30'-34'	30'-34'	5/5/2015	**35**	**1.7**	**9.6**	<0.5	<0.5	**0.53**
	C-19-37'-40'	37'-40'	5/5/2015	**7.6**	<0.5	**2.2**	<0.5	<0.5	<0.5
C-20	C-20-20'-22'	20'-22'	5/4/2015	<0.5	<0.5	<0.5	<0.5	<0.5	**0.71**
	C-20-30'-34'	30'-34'	5/4/2015	**2.6**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-20-36'-38'	36'-38'	5/4/2015	**2.0**	<0.5	<0.5	<0.5	<0.5	<0.5
C-21	C-21-18'-20'	18'-20'	5/5/2015	**4.2**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-21-31'-33'	31'-33'	5/5/2015	**0.63**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-21-35'-39'	35'-39'	5/5/2015	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
C-22	C-22-36'-38'	36'-38'	5/6/2015	**10**	<1.0	**2.6**	<1.0	<1.0	**1.3**
	C-22-39'-41'	39'-41'	5/6/2015	**6.5**	<1.0	**1.7**	<1.0	<1.0	**1.6**
C-23	C-23-16'-18'	16'-18'	5/6/2015	**30**	**1.3**	**3.8**	<0.5	<0.5	<0.5
	C-23-30'-34'	30'-34'	5/7/2015	**12**	**0.55**	**2.8**	<0.5	<0.5	<0.5
	C-23-35'-37'	35'-37'	5/7/2015	**14**	**0.71**	**3.5**	<0.5	<0.5	<0.5
C-24	C-24-14'-16'	14'-16'	5/7/2015	**32**	**1.7**	**8.0**	<0.5	<0.5	<0.5
	C-24-31'-34'	31'-34'	5/7/2015	**2.8**	<1.0	<1.0	<1.0	<1.0	<1.0
	C-24-36'-39'	36'-39'	5/7/2015	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
C-25	C-25-31'-36'	31'-36'	5/8/2015	**30**	<2.5	**6.4**	<2.5	<2.5	<2.5
C-26	C-26-33'-37'	33'-37'	5/8/2015	**0.82**	<0.5	<0.5	<0.5	<0.5	<0.5
C-27	C-27-30'-33'	30'-33'	5/8/2015	**14**	**0.74**	**3.6**	<0.5	<0.5	**0.76**
	C-27-34'-39'	34'-39'	5/8/2015	**8.4**	<1.0	**1.9**	<1.0	<1.0	<1.0
Site Cleanup Levels(2)				**5**	**5**	**6**	**10**	0.5	-

Notes:

1) Analysis by EPA Method 8260B, results for analytes detected in at least one sample listed.
2) See Table 8 for proposed Site Cleanup Goals.
3) - = Not analyzed or not established.
4) <0.5 = Not detected above sample reporting limit.
5) **400** Sample result exceeding Site Cleanup Level.

Table 3D
Offsite Groundwater Quality Investigation
Marinwood Plaza/Former Prosperity Cleaners, San Rafael, CA

Summary of August/September 2015 "Grab" Groundwater Sampling Data

				Concentrations in micrograms per liter (ug/L)					
Cluster Boring ID	*Sample ID*	*Groundwater Sample Interval*	*Date Sampled*	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2 Dichloroethene (cis-DCE)	Trans-1,2, dichloroethene (trans-DCE)	Vinyl Chloride (VC)	Dichloro difluoro methane (Freon 12)
C-28	C-28-30'-35'	30'-35'	8/24/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-28-40'-50'	40'-50'	8/24/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-29	C-29-12'-14'	12'-14'	8/24/2015	**2.4**	<0.5	**1.1**	<0.5	<0.5	<0.5
	C-29-16'-18'	16'-18'	8/24/2015	<0.5	<0.5	<0.5	<0.5	<0.5	**1.3**
	C-29-23'-25'	23'-25'	8/24/2015	**35**	**1.7**	**5.5**	<1.0	<1.0	<1.0
	C-29-36'-40'	36'-40'	8/24/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-30	C-30-10'-20'	10'-20'	8/28/2015	**1.5**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-30-32'-42'	32'-42'	8/28/2015	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	C-30-48'-53'	48'-53'	8/28/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-31	C-31-30'-32'	30'-32'	8/25/2015	**26**	**1.6**	**9.4**	<0.5	<0.5	<0.5
	C-31-35'-39'	35'-39'	8/25/2015	**12**	**0.66**	**3.7**	<0.5	<0.5	**1.4**
C-32	C-32-20'-25'	20'-25'	8/26/2015	**3.5**	<0.5	**1.9**	<0.5	<0.5	<0.5
	C-32-35'-39'	35'-39'	8/26/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-32-42'-50'	42'-50'	8/26/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-33	C-33-12'-22'	12'-22'	9/1/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-33-31'-41'	31'-41'	9/1/2015	**0.53**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-33-45'-50'	45'-50'	9/1/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-34	C-34-29'-32'	29'-32'	8/27/2015	**11**	<1.0	**3.3**	<1.0	<1.0	**1.6**
	C-34-37'-42'	37'-42'	8/27/2015	<0.5	<0.5	<0.5	<0.5	<0.5	**1.3**
	C-34-44'-48'	44'-48'	8/27/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-35	C-35-8'-18'	8'-18'	8/31/2015	**0.97**	<0.5	<0.5	<0.5	<0.5	<0.5
	C-35-35'-40'	35'-40'	8/31/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-35-47'-50'	47'-50'	8/31/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-36	C-36-16'-19'	16'-19'	8/27/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-36-35'-45'	35'-45'	8/27/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-37	C-37-19'-21'	19'-21'	8/26/2015	**27**	**1.9**	**7.4**	<0.5	<0.5	**1.4**
	C-37-28'-31'	28'-31'	8/26/2015	**39**	**2.9**	**11**	<0.5	<0.5	**1.5**
	C-37-43'-49'	43'-49'	8/26/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-38	C-38-32'-38'	32'-38'	8/26/2015	**25**	**1.5**	**7.6**	<0.5	<0.5	**1.1**
	C-38-41'-43'	41'-43'	8/26/2015	**33**	**1.4**	**6.2**	<0.5	<0.5	**2.7**
	C-38-46'-49'	46'-49'	8/26/2015	<0.5	<0.5	<0.5	<0.5	<0.5	**4.8**
	C-38-52'-60'	52'-60'	8/26/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-39	C-39-12'-16'	12'-16'	8/25/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-39-30'-34'	30'-34'	8/25/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-39-38'-48'	38'-48'	8/25/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C-40	C-40-10'-15'	10'-15'	8/28/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-40-24'-29'	24'-29'	8/28/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-40-32'-37'	32'-37'	8/28/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	C-40-42'-47'	42'-47'	8/28/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Site Cleanup Levels(2)				**5**	**5**	**6**	**10**	0.5	-

Notes:

1) Analysis by EPA Method 8260B, results for analytes detected in at least one sample listed.
2) See Table 8 for proposed Site Cleanup Goals.
3) - = Not analyzed or not established.
4) <0.5 = Not detected above sample reporting limit.
5) **400** Sample result exceeding Site Cleanup Level.

Table 4
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Summary of October 2008 Soil Vapor Survey Sampling Results

			Concentration in micrograms per cubic meter (ug/m^3)												
Boring ID	*Sample Depth (ft)*	*Date Sampled*	**Dichlorodifluoromethane (Freon-12)**	**Vinyl Chloride (VC)**	**1,1-Dichloroethene**	**trans-1,2-Dichloroethene**	**cis-1,2-Dichloroethene (cis-DCE)**	**Benzene**	**Trichloroethene (TCE)**	**Toluene**	**Tetrachloroethene (PCE)**	**o-Xylene**	**1,2,4-Trimethyl benzene**	**TPH (gasoline range)**	Methane
Method Reporting Limit			100	100	100	100	100	100	100	200	100	100	100	10,000	500
SV-1	4.5	10/10/2008	ND	ND	ND	ND	**560**	ND	**110**	ND	**3,800**	ND	ND	ND	-
SV-1 dup	4.5	10/10/2008	ND	ND	ND	ND	**580**	ND	**110**	ND	**3,200**	ND	ND	ND	-
SV-2	5	10/10/2008	ND	**240**	**430**	**3,200**	**98,000**	**160**	**1,800**	**470**	**130**	**100**	**140**	**29,000**	-
SV-3	5	10/10/2008	ND	ND	ND	ND	ND	ND	**320**	ND	**110,000**	ND	ND	ND	-
SV-4	5	10/10/2008	ND	**4,100**	ND	**930**	**6,800**	**100**	**440**	ND	ND	ND	ND	ND	-
SV-5	5	10/10/2008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
SV-6	5	10/10/2008	ND	ND	ND	ND	ND	ND	ND	ND	**2,100**	ND	ND	ND	-
SV-7	5	10/10/2008	ND	ND	ND	ND	ND	ND	ND	ND	**19,000**	ND	ND	ND	-
SV-8	5	10/10/2008	ND	ND	ND	ND	ND	ND	ND	ND	**2,600**	ND	ND	ND	-
SV-9	5	10/9/2008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
SV-10	5	10/9/2008	ND	ND	ND	ND	ND	ND	ND	ND	**1,800**	ND	ND	ND	-
SV-11	5	10/9/2008	**200**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
SV-12	5	10/9/008	ND	ND	ND	ND	ND	ND	ND	ND	**370**	ND	ND	ND	-
SV-13	5	10/9/2008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SV-14	5	10/9/2008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SV-15	5	10/9/2008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SV-16	6	10/9/2008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SV-17	5	10/10/2008	ND	ND	ND	ND	ND	ND	ND	ND	**130,000**	ND	ND	ND	-
SV-18	5	10/10/2008	**320**	ND	ND	**850**	**1,200**	**110**	**150**	ND	ND	ND	ND	ND	-
SV-19	5	10/10/2008	ND	ND	ND	ND	ND	ND	**170**	ND	**13,000**	ND	ND	ND	-
SV-20	5	10/10/2008	ND	**1,700**	**590**	**4,100**	**150,000**	**130**	**380,000**	ND	**5,200,000**	ND	ND	ND	-
SV-21	5	10/10/2008	ND	**3,200,000**	**14,000**	**290,000**	**5,100,000**	**480**	**790**	**440**	**2,900**	ND	ND	ND	-
SV-22	5	10/10/2008	ND	ND	ND	ND	**310**	ND	ND	ND	**110**	ND	ND	ND	-
SV-23	4	10/10/2008	ND	ND	ND	ND	**160**	ND	ND	ND	**220**	ND	ND	ND	-
Residential Site Cleanup Levels(2)			-	16	100,000(3)	3,100	3,700(3)	42(3)	300	160,000(3)	210	52,000(3)	-	300,000(3)	-
Commercial / Industrial Site Cleanup Levels(2)			-	160	880,000(3)	26,000	31,000(3)	420(3)	3,000	1,300,000(3)	2,100	440,000(3)	-	2,500,000(3)	-

Notes:

1) VOC Analysis by EPA Method 8260B; methane analysis by EPA Method 805M.
2) See Table 8 for proposed Site Cleanup Goals.
3) Cleanup Level not Established in February 2014 Order; Level based on ESLs for Groundwater; Table E: Screening Levels for Indoor Air and Soil Gas (Vapor Intrusion Concerns); SF RWQCB, Interim Final (Revised December 2013).
4) ND = Not detected at the laboratory reporting limit cited.
5) - = Not analyzed for or not established.
6) **31** Concentration above Cleanup Level for Residential Use.
7) **100** Concentration above Cleanup Level for Commercial / Industrial and Residential Use.

Table 5
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Soil Vapor Monitoring Well Sample Chemical Testing Summary

	Concentrations in micrograms per cubic meter (ug/m^3)									
Date	**Tetrachloroethene (PCE)**	**Trichloroethene (TCE)**	**cis-1,2-dichloroethene (cis-DCE)**	**trans-1,2-dichloroethene (trans-DCE)**	**Vinyl Chloride (VC)**	**1,1-dichloroethene (1,1-DCE)**	Carbon Tetrachloride	Isopropyl Alcohol (11)	**Toluene**	**Benzene**
	Well SVM-1									
Sep-2011	**840**	<22	<16	<16	<10	<16	<63	-	<15	<13
Dec-2011	**610**	<27	<20	<20	<13	<20	<19	-	<19	<16
Apr-2012	**640**	<13	**140**	<9.9	<6.4	<9.9	<9.4	<61	<33	<28
Jun-2012	**1,000**	<47	<35	<35	<22	<35	<33	<210	<9.4	<8
Sep-2012	**210**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Jan-2013	**410**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Apr-2013	**750**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Aug-2013	**2,500**	<160	<120	<120	<76	<120	<110	<730	<110	<96
Feb-2014	**300***	<13	<9.9	<9.9	<6.4	<9.9	<9.4	**4,800**	<9.4	<8
May-2014	**350**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Aug-2014	**670**	<79	<58	<58	<38	<58	<55	<90	<55	<47
Nov-2014	**920**	<94	<69	<69	<44	<69	<66	<430	<66	<56
Nov-2014 (DU	**820**	<72	<53	<53	<34	<53	<51	<330	<50	<43
Feb-2015	**600**	<54	<40	<40	<26	<40	<38	<250	<38	<32
May-2015	**570**	<27	<20	<20	<13	<20	<19	<120	<19	<16
Jul-2015	**710**	<27	<20	<20	<13	<20	<19	<120	<19	<16
Nov-2015[(11)]	**410**	<4.7	<3.5	<3.5	<2.2	<3.5	<5.5	<8.6	<3.3	**5.6**
	Well SVM-2									
Sep-2011	**490,000**	**34,000**	**430,000**	**10,000**	<670	<670	<4,100	-	<990	<840
Dec-2011	**1,200,000**	<89,000	**490,000**	<65,000	<42,000	<42,000	<62,000	-	<62,000	<53,000
Apr-2012	**450,000**	**33,000**	**300,000**	**15,000**	<350	<350	<510	<3,300	<510	<430
Jun-2012	**620,000**	**22,000**	**320,000**	<14000	<9,100	<9,100	<13,000	<88,000	<13,000	<11,000
Sep-2012	**300,000**	**13,000**	**170,000**	**4,500**	<1,900	<1,900	<2,800	<18,000	<2,800	<2,400
Jan-2013	**680,000**	**21,000**	**260,000**	<12,000	<7,900	<7900	<12,000	<76,000	<12,000	<9,900
Apr-2013	**590,000**	<27,000	**240,000**	<20,000	<13,000	<20,000	<19,000	<120,000	<19,000	<16,000
	Well SVM-2 (continued)									
Aug-2013	**1,800,000**	**58,000**	**600,000**	<28,000	<18,000	<28,000	<27,000	<180,000	<27,000	<23,000
Feb-2014	**450,000**	**16,000**	**150,000**	<7,400	<4,800	<7,400	<7,000	<46,000	<7,000	<5,900
May-2014	**400,000**	<23000	**150,000**	<7,400	<11,000	<17,000	<16,000	<110,000	<16,000	<14,000
Aug-2014	**92,000***	<4,100*	**29,000***	<3,100*	<2,000*	<3,100*	<2,900*	**130,000**	<2,900*	<2,500*
Nov-2014	**550,000**	<36,000	**130,000**	<27,000	<17,000	<27,000	<25,000	<160,000	<25,000	<21,000
Feb-2015	**680,000**	**21,000**	**160,000**	<7,100	<4,600	<7,100	<6,700	<44,000	<6,700	<5,700
May-2015	**250,000**	<19,000	**73,000**	<14,000	<9,100	<14,000	<13,000	<88,000	<13,000	<11,000
Jul-2015	**450,000**	<21,000	**110,000**	<15,000	<9,800	<15,000	<15,000	<95,000	<15,000	<12,000
Nov-2015	**780,000**	**31,000**	**200,000**	**8,400**	<2,900	<4,500	<7,100	<18,000	<4,300	<3,600
	Well SVM-3									
Sep-2011	**15,000**	<360	<260	<260	<170	<260	<1,000	-	<250	<210
Dec-2011	**10,000**	<270	<200	<200	<130	<200	<190	-	<190	<160
Apr-2012	NS	NS	NS	NS	NS	NS	NS	NS	-	-
Jun-2012	**17,000**	<1000	<760	<760	<490	<760	<730	<4700	<730	<610
Sep-2012	**10,000**	<900	<660	<660	<430	<660	<630	<4,100	<630	<530
Jan-2013	**6,300**	<170	<120	<120	<79	<120	<120	<760	<120	<99
Apr-2013	**11,000**	<310	<230	<230	<150	<230	<220	<1,400	<220	<180
Aug-2013	**65,000**	<1,600	<1,200	<1,200	<780	<1,200	<1,200	<7,500	<1,200	<980
Feb-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Aug-2014	**11,000**	<540	<400	<400	<260	<400	<380	<2,500	<380	<320
Nov-2014	**11,000**	<770	<570	<570	<370	<570	<540	<3,500	<540	<460
Feb-2015	**7,200**	<410	<310	<310	<200	<310	<290	<1,900	<290	<250
May-2015	**10,000**	<450	<330	<330	<210	<330	<320	<2,100	<310	<270
Aug-2015	**10,000**	<520	<380	<380	<250	<380	<360	<2,400	<360	<310
Nov-2015	**9,400**	<58	<43	<43	<28	<43	<68	<180	<41	<35
	Well SVM-4									
Sep-2011	**69**	<22	<16	<16	<10	<16	<63	-	<15	**20**
Dec-2011	**42**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	-	<9.4	<8
Apr-2012	NS	NS	NS	NS	NS	NS	NS	NS	-	-
Jun-2012	**170**	**33**	**47**	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Sep-2012	**42**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Jan-2013	**18**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Apr-2013	**55**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Aug-2013	**200**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Feb-2014	**24***	<13	<9.9	<9.9	<6.4	<9.9	<9.4	**240**	<9.4	<8
May-2014	**23**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8

Table 5 (continued)
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Soil Vapor Monitoring Well Sample Chemical Testing Summary

	Concentrations in micrograms per cubic meter (ug/m^3)									
Date	**Tetrachloroethene (PCE)**	**Trichloroethene (TCE)**	**cis-1,2-dichloroethene (cis-DCE)**	**trans-1,2-dichloroethene (trans-DCE)**	**Vinyl Chloride (VC)**	**1,1-dichloroethene (1,1-DCE)**	Carbon Tetrachloride	Isopropyl Alcohol (11)	**Toluene**	**Benzene**
	Well SVM-4 (continued)									
Aug-2014	**54**	<19	<14	<14	<9.1	<14	<13	<88	<13	<11
Nov-2014	**50**	<18	<13	<13	<8.6	<13	<13	<82	<13	<11
Feb-2015	**32**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
May-2015	**30**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Jul-2015	**63**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Nov-2015	**34**	<4.8	<3.5	<3.5	<2.3	<3.5	<5.6	<8.8	<3.4	<2.9
	Well SVM-5									
Sep-2011	**1,400,000**	**360,000**	**580,000**	**18,000**	**41,000**	<16,000	<62,000	-	<15,000	<12,000
Dec-2011	**840,000**	**280,000**	**200,000**	<44,000	**94,000**	<44,000	<41,000	-	**140,000**	<35,000
Apr-2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Jun-2012	**940,000**	**370,000**	**420,000**	<31,000	**280,000**	<31,000	<25,000	<190,000	<29,000	<25000
Sep-2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Jan-2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Aug-2013	**240,000**	**110,000**	**150,000**	<14,000	<9,300	<14,000	<14,000	<89,000	<14,000	<12,000
Feb-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Aug-2014	**37,000**	**11,000**	**6,700**	<1,500	<940	<1,500	<1,400	<9,000	<1,400	<1,200
Nov-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Feb-2015	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-2015	**8,300**	**2,800**	**1,500**	<320	<200	<320	<300	<2,000	<300	<260
Aug-2015	**10,000**	**3,400**	**1,000**	<380	<250	<380	<360	<2,400	<360	<310
Nov-2015	**8,600**	**3,100**	**570**	<82	<53	<82	<130	<200	<78	<66
	Well SVM-6									
Sep-2011	**900**	**1,000**	**980**	**81**	**40**	<25	<98	-	<23	**55**
Dec-2011	**490**	**530**	**500**	**49**	**27**	<40	<38	-	<38	<32
Apr-2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Jun-2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sep-2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Jan-2013	**370**	**450**	**330**	**26**	**14**	<9.9	<9.4	<61	<9.4	<8
Apr-2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Aug-2013	**1,900**	**2,200**	**1,400**	**160**	**39**	**27**	<9.4	<61	<9.4	<8
Feb-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Aug-2014	**710**	**440**	**280**	<61	<39	<61	<58	<95	<58	<49
Nov-2014	**940**	**530**	**260**	<59	<38	<59	<56	<360	<56	<47
Feb-2015	**510**	**240**	**130**	<40	<26	<40	<38	<250	<38	<32
May-2015	**550**	**330**	**220**	**22**	<13	<20	<19	<120	<19	<16
Aug-2015	**1,200**	**600**	**270**	<40	<26	<40	<38	**470***	<38	<32
Nov-2015	**390**	**170**	**59**	<3.9	<2.5	<3.9	<6.2	<9.7	<3.7	<3.1
Residential Site Cleanup Levels(2)	210	300	3,700(3)	3,100	16	100,000(3)	29(3)	-	160,000(3)	42(3)
Commercial / Industrial Site Cleanup Levels(2)	2,100	3,000	31,000(3)	26,000	160	880,000(3)	290(3)	-	1,300,000(3)	420(3)

Notes:
1) Analysis by EPA Method TO-15.
2) See Table 8 for proposed Site Cleanup Goals.
3) Cleanup Level not Established in February 2014 Order; Level based on ESLs for Groundwater; Table E: Screening Levels for Indoor Air and Soil Gas (Vapor Intrusion Concerns); SF RWQCB, Interim Final (Revised December 2013).
4) <24 = Not detected above sample reporting limit.
5) - = Not analyzed or not established.
6) NS = Sample not collected due to presence of soil moisture in well.
7) **40** = Analyte detected above sample reporting limit.
8) **31** Concentration above Cleanup Level for Residential Use.
9) **100** Concentration above Cleanup Level for Commercial / Industrial and Residential Use.
10) **92,000*** = Leak check compound (isopropyl alcohol) detected in sample; sample result biased low.
11) n-Hexane, n-Heptane, and Chloroform were also reported for soil vapor sample SVM-1 in Nov 2015; reported at 130, 85, and 17 ug/m3, respectively.

Table 6A
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

May 2015 Temporary Soil Vapor Probe Sample Chemical Testing Summary

Concentrations in micrograms per cubic meter (ug/m^3)

Sample Location	**Tetrachloroethene (PCE)**	**Benzene**	**m,p-Xylene**	**Toluene**
SV-24	<17	<8	<11	**22**
SV-25	**65**	**14**	**13**	**19**
SV-26	**580**	<32	<43	<38
SV-27	<17	<8	**25**	**39**
SV-28	**24**	<8	**21**	**16**
SV-29	**180**	<8	**18**	**21**

Residential Site Cleanup Levels[2]	**210**	**42[3]**	**52,000[3,4]**	**160,000[3]**
Commercial / Industrial Site Cleanup Levels[2]	**2,100**	**420[3]**	**440,000[3,4]**	**1,300,000[3]**

Notes:
1) Analysis by EPA Method 8260.
2) See Table 8 for proposed Site Cleanup Goals.
Indoor Air and Soil Gas (Vapor Intrusion Concerns); SF RWQCB, Interim Final (Revised December 2013).
4) <16 = Not detected above sample reporting limit.
5) **260** = Analyte detected above sample reporting limit.
6) **710** Concentration above Cleanup Level for Residential Use.
7) 710/740 = primary and laboratory duplicate result.

Table 6B
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

September 2015 Temporary Soil Vapor Probe Sample Chemical Testing Summary

Concentrations in micrograms per cubic meter (ug/m^3)

Sample Location	**Tetrachloroethene (PCE)**	**Benzene**	**m,p-Xylene**	**Toluene**
SV-30	<17	<8	<11	<9.4
SV-31	**2,300**	<8	<11	**9.9**
SV-32	**540**	<16	<22	<19
SV-33	**130**	**8.9**	**22**	**28**
SV-34	**310**	**14**	**24**	**38**
SV-35	**870**	<8	<11	<9.4

Residential Site Cleanup Levels[2]	**210**	**42[3]**	**52,000[3,4]**	**160,000[3]**
Commercial / Industrial Site Cleanup Levels[2]	**2,100**	**420[3]**	**440,000[3,4]**	**1,300,000[3]**

Notes:
1) Analysis by EPA Method 8260.
2) See Table 8 for proposed Site Cleanup Goals.
3) Cleanup Level not Established in February 2014 Order; Level based on Table E: Screening Levels for Indoor Air and Soil Gas (Vapor Intrusion Concerns); SF RWQCB, Interim Final (Revised December 2013).
4) <16 = Not detected above sample reporting limit.
5) **260** = Analyte detected above sample reporting limit.
6) **710** Concentration above Cleanup Level for Residential Use.
7) 710/740 = primary and laboratory duplicate result.

Table 6C
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

December 2015 Temporary Soil Vapor Probe Sample Chemical Testing Summary

Concentrations in micrograms per cubic meter (ug/m^3)

Sample Location	Date Sampled	Time Sampled	**Tetrachloroethene (PCE)**	**Trichloroethylene (TCE)**	**cis-1,2-dichloroethene (cis-DCE)**	**Vinyl Chloride**
SV-36	12/7/2015	12:22 PM	**710/740**	<100	<100	<16
SV-37	12/8/2015	11:01 AM	**220/170**	<100	<100	<16
SV-38	12/8/2015	10:39 AM	**570**	<100	<100	<16
SV-39	12/7/2015	11:56 AM	<100	<100	<100	<16
SV-40	12/8/2015	11:59 AM	<100	<100	<100	<16
SV-41	12/7/2015	2:49 PM	<100	<100	<100	<16
SV-41	12/9/2015	1:01 PM	<100	<100	<100	<16
SV-42	12/7/2015	11:33 AM	<100	<100	<100	<16
SV-43	12/7/2015	11:16 AM	<100	<100	<100	<16
SV-44	12/7/2015	10:50 AM	<100	<100	<100	<16
SV-45	12/7/2015	2:02 PM	**260**	<100	<100	<16
SV-45	12/9/2015	12:30 PM	**410**	<100	<100	<16
SV-46	12/9/2015	4:01 PM	<100	<100	<100	<16
SV-47	12/8/2015	1:07 PM	<100	<100	<100	<16
SV-48	12/8/2015	1:54 PM	<100	<100	<100	<16
SV-49	12/8/2015	2:55 PM	<100	<100	<100	<16
SV-50	12/9/2015	4:22 PM	<100	<100	<100	<16
SV-51	12/8/2015	1:34 PM	<100	<100	<100	<16
SV-52	12/8/2015	4:07 PM	<100	<100	<100	<16
SV-53	12/9/2015	9:09 AM	<100	<100	<100	<16
SV-54	12/9/2015	9:32 AM	<100/<100	<100/<100	<100/<100	<16/<16
SV-55	12/9/2015	11:12 AM	<100	<100	<100	<16
SV-56	12/9/2015	11:41 AM	<100	<100	<100	<16
SV-57	12/9/2015	10:47 AM	<100	<100	<100	<16
SV-58	12/8/2015	4:36 PM	<100	<100	<100	<16
SV-59	12/8/2015	4:54 PM	<100	<100	<100	<16
SV-60	12/8/2015	5:12 PM	<100	<100	<100	<16
SV-61	12/9/2015	4:39 PM	<100	<100	<100	<16
SV-62	12/9/2015	12:02 PM	<100	<100	<100	<16
SV-63	12/9/2015	3:24 PM	<100	<100	<100	<16
SV-64	12/9/2015	3:41 PM	<100	<100	<100	<16
SV-65	12/8/2015	3:49 PM	<100	<100	<100	<16
SV-66	12/8/2015	3:39 PM	<100	<100	<100	<16

Residential Site Cleanup Levels[2]	**210**	**300**	**3,700[3]**	**16**
Commercial / Industrial Site Cleanup Levels[2]	**2,100**	**3,000**	**31,000[3]**	**160**

Notes:
1) Analysis by EPA Method 8260.
2) See Table 8 for proposed Site Cleanup Goals.
3) <16 = Not detected above sample reporting limit.
4) **260** = Analyte detected above sample reporting limit.
5) **710** Concentration above Cleanup Level for Residential Use.
6) 710/740 = primary and laboratory duplicate result.

Table 7
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Liquor Store Indoor Air Sampling Results Summary

	Concentration in micrograms per cubic meter (ug/m^3)					
Analyte	Vinyl Chloride	1,1-Dichloroethene	trans-1,2-Dichloroethene	cis-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene
Back of Liquor Store (near Wall closest to Dry Cleaner)						
Jul-2009	<0.04	<0.04	**0.064**	**3.2**	**0.76**	**85**
Apr-2010	<0.046	<0.046	<0.046	<0.046	<0.046	**1.7**
May-2011	<0.03	<4	<4	<4	<1.1	**3.8**
Sep-2011	<0.013	<0.04	<0.055	**0.83**	**0.18**	**14**
Dec-2011	<0.03	<4	<4	<4	<1.1	**5.1**
Feb-2012	<0.03	<4	<4	<4	<1.1	**2.6**
Apr-2012	<0.03	<4	<4	<4	<1.1	**1.1**
Oct-2012	<0.03	<4	<4	<4	<1.1	**2.4**
Apr-2013	<0.03	<4	<4	<4	<1.1	**3.6**
Oct-2013	<0.03	<4	<4	<4	<1.1	**3.3**
Mar-2014	<0.03	<4	<4	<4	<1.1	**2.5**
May-2014	<0.03	<4	<4	<4	<1.1	**1.5**
Aug-2014	<0.03	<4	<4	<4	<1.1	**6.9**
Nov-2014	<0.03	<4	<4	<4	<1.1	**5.1**
Feb-2015	<0.03	<4	<4	<4	<1.1	**2.9**
May-2015	<0.03	<4	<4	<4	<1.1	**2.1**
Jul-2015	<0.03	<4	<4	<4	<1.1	**5.0**
Nov-2015	<0.036	<0.036	<0.036	**0.19**	**0.092**	**4.9**
Front of Liquor Store (near Cash Register)						
Jul-2009	<0.034	<0.034	<0.034	**0.42**	**0.12**	**17**
Apr-2010	<0.037	<0.037	<0.037	<0.037	**0.24**	**0.42**
May-2011	<0.03	<4	<4	<4	<1.1	**0.81**
Sep-2011	<0.013	<0.04	<0.055	**0.28**	**0.057**	**5.3**
Dec-2011	<0.03	<4	<4	<4	<1.1	**1.6**
Feb-2012	<0.03	<4	<4	<4	<1.1	**2.7**
Apr-2012	<0.03	<4	<4	<4	<1.1	**0.49**
Oct-2012	<0.03	<4	<4	<4	<1.1	**0.92**
Apr-2013	<0.03	<4	<4	<4	<1.1	**0.49**
Oct-2013	<0.03	<4	<4	<4	<1.1	**0.9**
Mar-2014	<0.03	<4	<4	<4	<1.1	**2.1**
May-2014	<0.03	<4	<4	<4	<1.1	<0.41
Aug-2014	<0.03	<4	<4	<4	<1.1	**2.5**
Nov-2014	<0.03	<4	<4	<4	<1.1	**5.1**
Feb-2015	<0.03	<4	<4	<4	<1.1	**2.4**
May-2015	<0.03	<4	<4	<4	<1.1	**0.92**
Jul-2015	<0.03	<4	<4	<4	<1.1	**1.5**
Nov-2015	<0.065	<0.065	<0.065	**0.13**	**0.075**	**5.3**
Site Cleanup Levels(2)	0.16	880(3)	**260**	**31(3)**	**3**	**2.1**

Notes:
1) Analysis by EPA Method TO-15 sims, results for analytes detected in at least one sample listed.
2) See Table 8 for proposed Site Cleanup Goals.
3) <0.013 = Analyte not detected above reporting limit.
4) Bold-faced type = Analyte detected.
5) - = Screening level not established.
6) **3** Shaded value = concentration reported exceeds regulatory screening level.

Table 8
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Summary of Proposed Final Cleanup Goals

Constituent	Soil	Groundwater	Soil Vapor		Indoor Air	
			Residential	Commercial or Industrial	Residential	Commercial or Industrial
Basis for Cleanup Goal	Leaching to Groundwater	Drinking Water MCL	Vapor Intrusion	Vapor Intrusion	Inhalation	Inhalation
Units	ug/kg	ug/L	ug/m^3	ug/m^3	ug/m^3	ug/m^3
Tetrachloroethene (PCE)	550[2]	5	210	2,100	0.41	2.1
Trichloroethene (TCE)	460	5	300	3,000	0.59	3
cis-1,2-dichloroethene (cis-DCE)	190	6	3,700[3]	31,000[3]	7.3[3]	31[3]
trans-1,2-dichloroethene (trans-DCE)	670	10	3,100	26,000	63	260
Vinyl Chloride (VC)	32[2]	0.5	16	160	0.031	0.16

Notes:

1) Proposed Cleanup Goals for the Site are based on the Cleanup Levels established in the February 2014 Site Cleanup Order or relevant December 2013 ESLs for constituents or exposure pathways not addressed in the Site Cleanup Order
2) Cleanup goal based on December 2013 Table K-1 Direct Exposure Soil Screening Levels, Residential Exposure Scenario.
3) Cleanup goal based on December 2013 Table E ESL for Indoor Air and Soil Gas (Vapor Intrusion Concerns).

Table 9
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Comparative Evaluation Of Soil Remedial Alternatives

	Criteria	No Action	Additional In-Situ Treatment	Excavation and Off-Site Disposal	Excavation and On-Site Treatment	Capping/ Institutional Controls	Soil Vapor Extraction (SVE)
	Summary	No Action	Inject bio-treatment product in 25' x 30' by 15' deep volume; monitor 2-3 years	Excavate & offsite disposal of ~625 tons VOC impacted soil	Excavate & treat ~625 tons VOC impacted soil onsite; reuse onsite	Cap approximately 50' x 50' area; Restrict future use	Operate SVE in 50' x 50' area w/carbon treatment for up to 10 years
	Threshold Criteria						
1)	Overall protection of human health and the environment	Not Protective	Reduces exposure to VOCs via direct contact/ingestion, reduces offgassing to soil vapor, reduces VOC leaching to groundwater	Reduces exposure to VOCs via direct contact/ingestion, reduces offgassing to soil vapor, reduces VOC leaching to groundwater	Protective if VOC offgassing is properly managed	Protective of direct contact only	Reduces exposure to VOCs via direct contact/ingestion, reduces offgassing to soil vapor, reduces VOC leaching to groundwater
2)	Compliance with ARARs (applicable or relevant and appropriate standards)	Not compliant	Compliant	Compliant	Compliant; may require monitoring and permitting by BAAQMD	Poor, does not prevent VOC offgassing to soil vapor	Compliant; will require monitoring and permitting by BAAQMD
	Primary Balancing Criteria						
3)	Long-term effectiveness and permanence	Poor	High	High	High if implemented successfully	Only effective with periodic inspection & maintanence	High
4)	Reduction of toxicity, mobility or volume	Poor	High	High	High if implemented successfully	Poor	High if implemented successfully
5)	Short-term effectiveness	Avoids some excavation or treatment byproducts, poor otherwise	May be lag period before treatment actively reduces VOC concentrations; cannot be implemented until building is demolished	High	High if implemented successfully	High	High
6)	Implementability	Readily implemented	Must be implemented with care	Readily implemented	Difficult to implement with clayey soil	Readily implemented	Difficult to implement in moist, clayey soil
7)	Cost	None	$200k	$500k	$350k-$650k	$100k	$350k-$750k
	Modifying Criteria						
8)	State acceptance	Poor	Poor	High	Moderate	Poor	High
9)	Community acceptance	Poor	Poor	High	Moderate	Poor	Moderate

Table 10
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Comparative Evaluation Of Groundwater Remedial Actions

	Criteria	No Action	Engineering Controls	Monitored Natural Attenuation (MNA)
	Summary	No Action	Monitoring & Maintenance of Well Head Treatment System on Silveira Water Supply Well	Install 1 onsite well & up to 9 offsite wells; monitor 15 wells quarterly for 1-2 years
	Threshold Criteria			
1)	Overall protection of human health and the environment	Not Protective	Effective at preventing exposure to VOCs	Reduces parent VOC concentrations; transient concentrations of VC and cis-DCE may be concern
2)	Compliance with ARARs (applicable or relevant and appropriate standards)	Not compliant	Compliant	Compliant
	Primary Balancing Criteria			
3)	Long-term effectiveness and permanence	Poor	High	High
4)	Reduction of toxicity, mobility or volume	Poor	Poor	High
5)	Short-term effectiveness	Poor	High	Low
6)	Implementability	Readily implemented	Readily implemented	Readily implemented but must be coupled with soil source control measures
7)	Cost	None	$25k	$300k
	Modifying Criteria			
8)	State acceptance	Poor	High	High
9)	Community acceptance	Poor	High	High

Table 11
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Comparative Evaluation Of Soil Vapor/Indoor Air Remedial Actions

Criteria	No Action	Monitored Natural Attenuation (MNA)	Utility Corridor Barriers	Subslab Vapor Barriers
Summary	No Action	Replace dry cleaner well; install 1 onsite well near west edge of property, monitor 7 wells quarterly for 1-2 years	Excavate across sanitary sewer, natural gas, and storm sewer backfill, seal with bentonite clay at 3 locations each	Construct chemical resistant membrane and vapor collection system below new building floor slab
Threshold Criteria				
1) Overall protection of human health and the environment	Not Protective	Reduces VOC concentrations;	Prevents VOC migration off the property	Prevents VOC migration into occupied structures
2) Compliance with ARARs (applicable or relevant and appropriate standards)	Not compliant	Compliant	Compliant	Compliant
Primary Balancing Criteria				
3) Long-term effectiveness and permanence	Poor	High	High	High, but requires maintenance
4) Reduction of toxicity, mobility or volume	Poor	High	Reduces contaminant mobility but not toxicity or volume	Reduces contaminant mobility but not toxicity or volume
5) Short-term effectiveness	Poor	Low	Rapidly effective	Immediately effective
6) Implementability	Readily implemented	Readily implemented but must be coupled with soil source control measures	Readily implemented	Readily implemented during building construction
7) Cost	None	$100k	$10k - $15k	$4-$7/sf
Modifying Criteria				
8) State acceptance	Poor	High	High	High
9) Community acceptance	Poor	High	High	High

FIGURES

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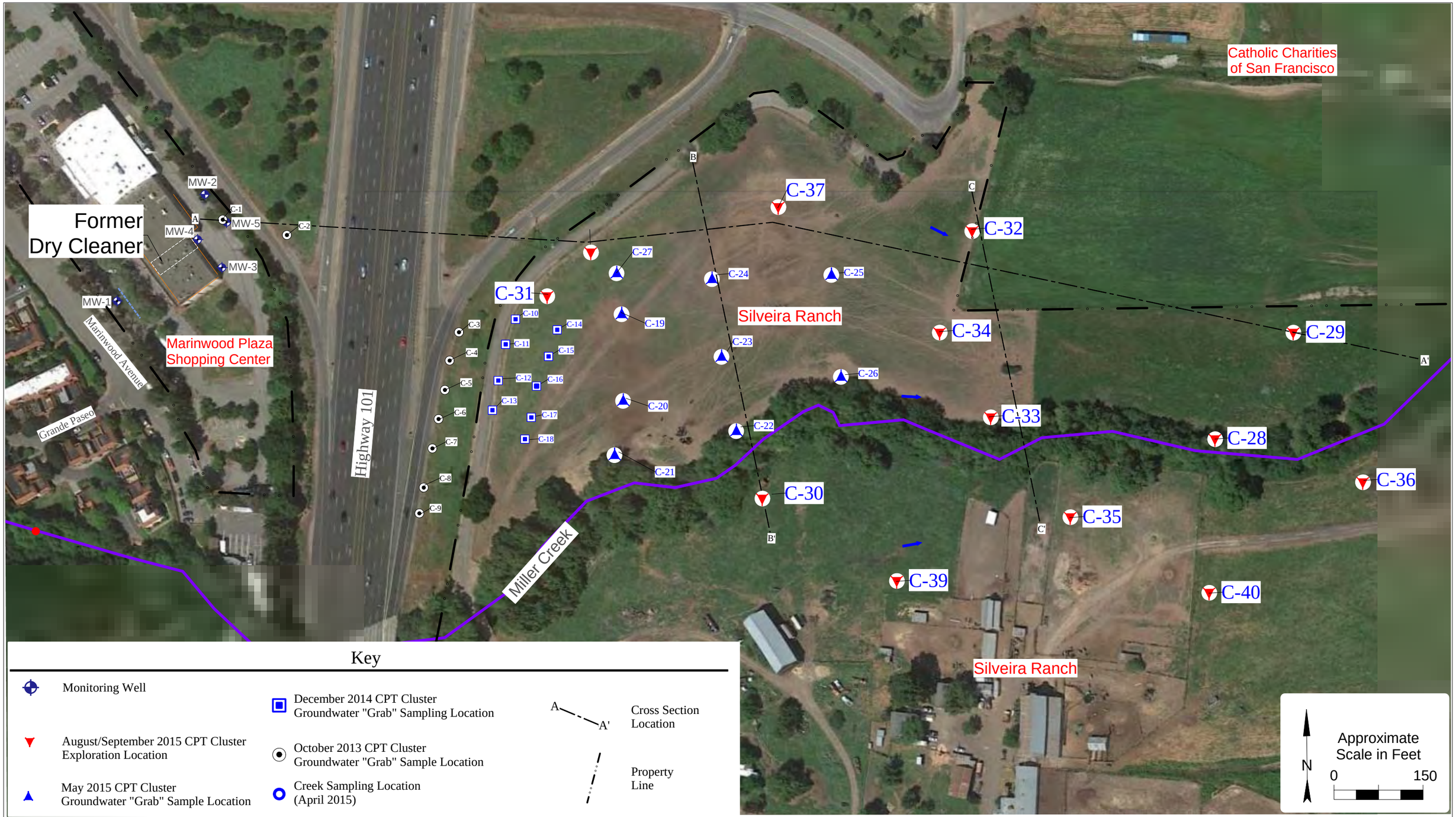
Marinwood Plaza/
Former Prosperity Cleaners
187 Marinwood Avenue
San Rafael, California

Figure 1

Site Location and Vicinity Map



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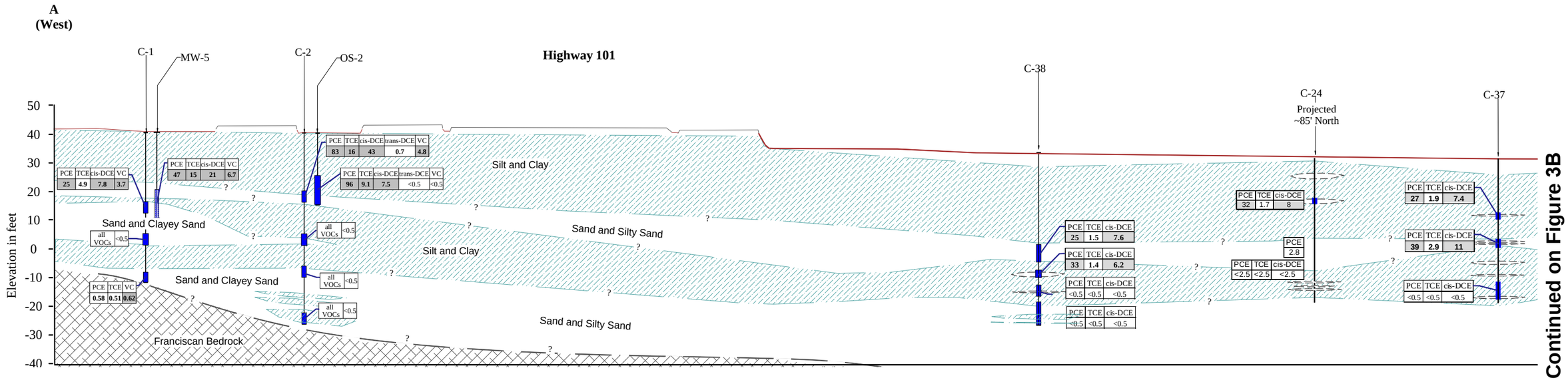
Marinwood Plaza/ Former Prosperity Cleaners

187 Marinwood Avenue
San Rafael, California

Figure 2

Offsite Exploration and Cross Section Location Map



(Temporary) Grab Groundwater Sample Interval (boring abandoned after sampling)

(Existing) Permanent Well Screen Interval

Chemical Constituent

PCE	cis-DCE
9.4	2.3

Constituent Concentration, ug/L

<0.5 Not detected

9.4 Detection exceeding ESL

Horizontal Scale in feet
0 70
0 35
Vertical Scale in feet

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Marinwood Plaza/ Former Prosperity Cleaners

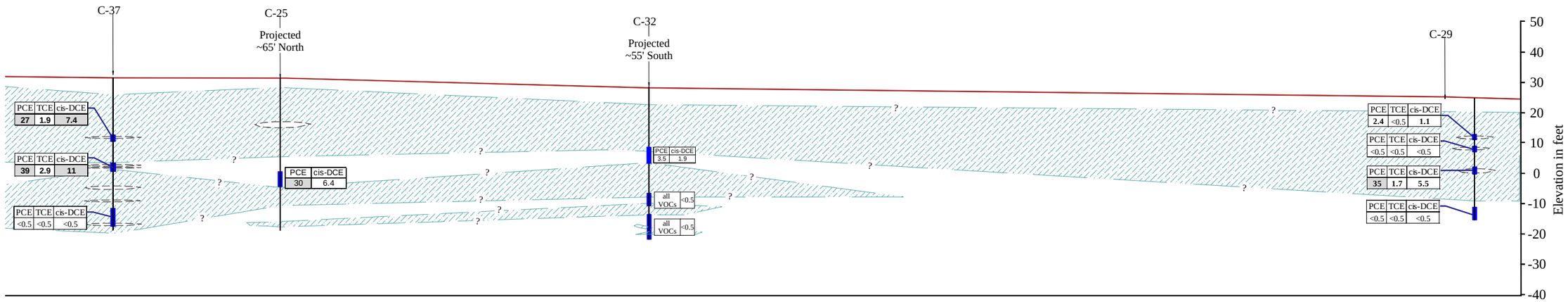
187 Marinwood Avenue
San Rafael, California

Figure 3A

Schematic Subsurface Cross Section A-A'

Continued on Figure 3A

A'
(East)



(Temporary) Grab Groundwater Sample Interval (boring abandoned after sampling)

(Existing) Permanent Well Screen Interval

Chemical Constituent

PCE	cis-DCE
9.4	**2.3**

Constituent Concentration, ug/L

<0.5 Not detected

9.4 Detection exceeding ESL

Horizontal Scale in feet
0 70
0 35
Vertical Scale in feet

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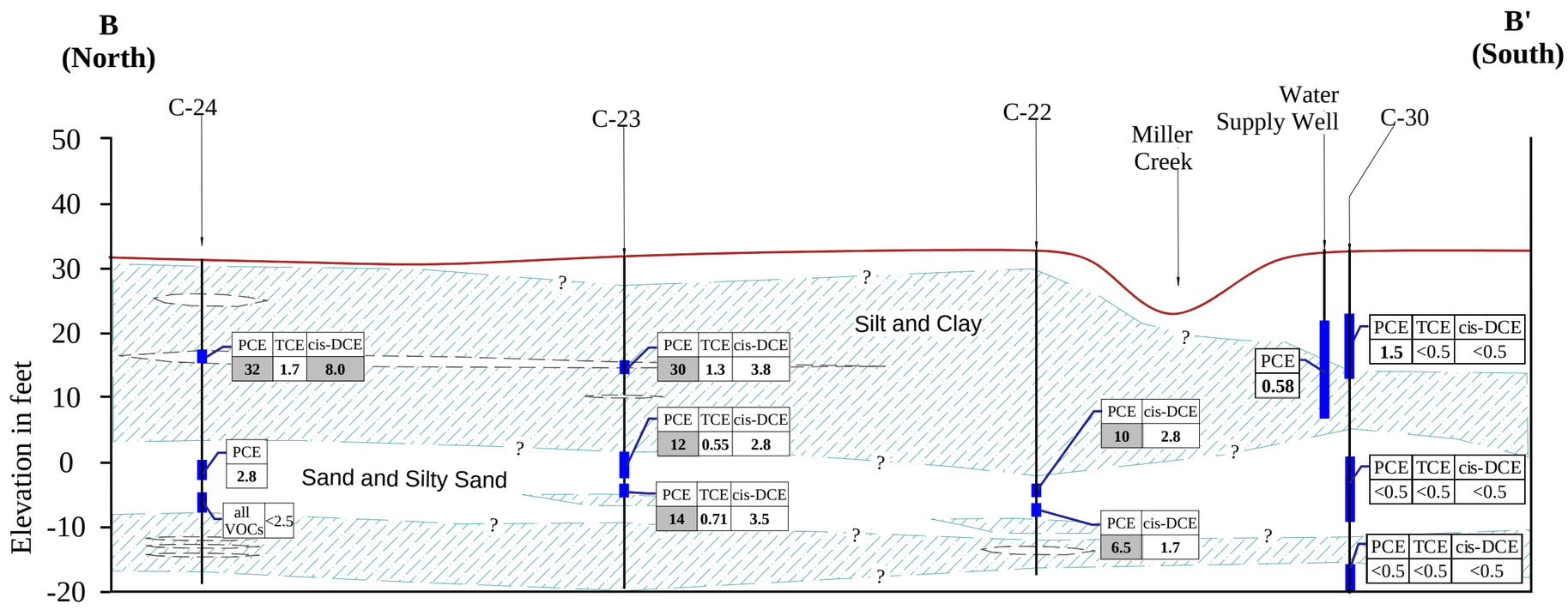
Marinwood Plaza/ Former Prosperity Cleaners

187 Marinwood Avenue
San Rafael, California

Figure 3B

Schematic Subsurface Cross Section A-A'



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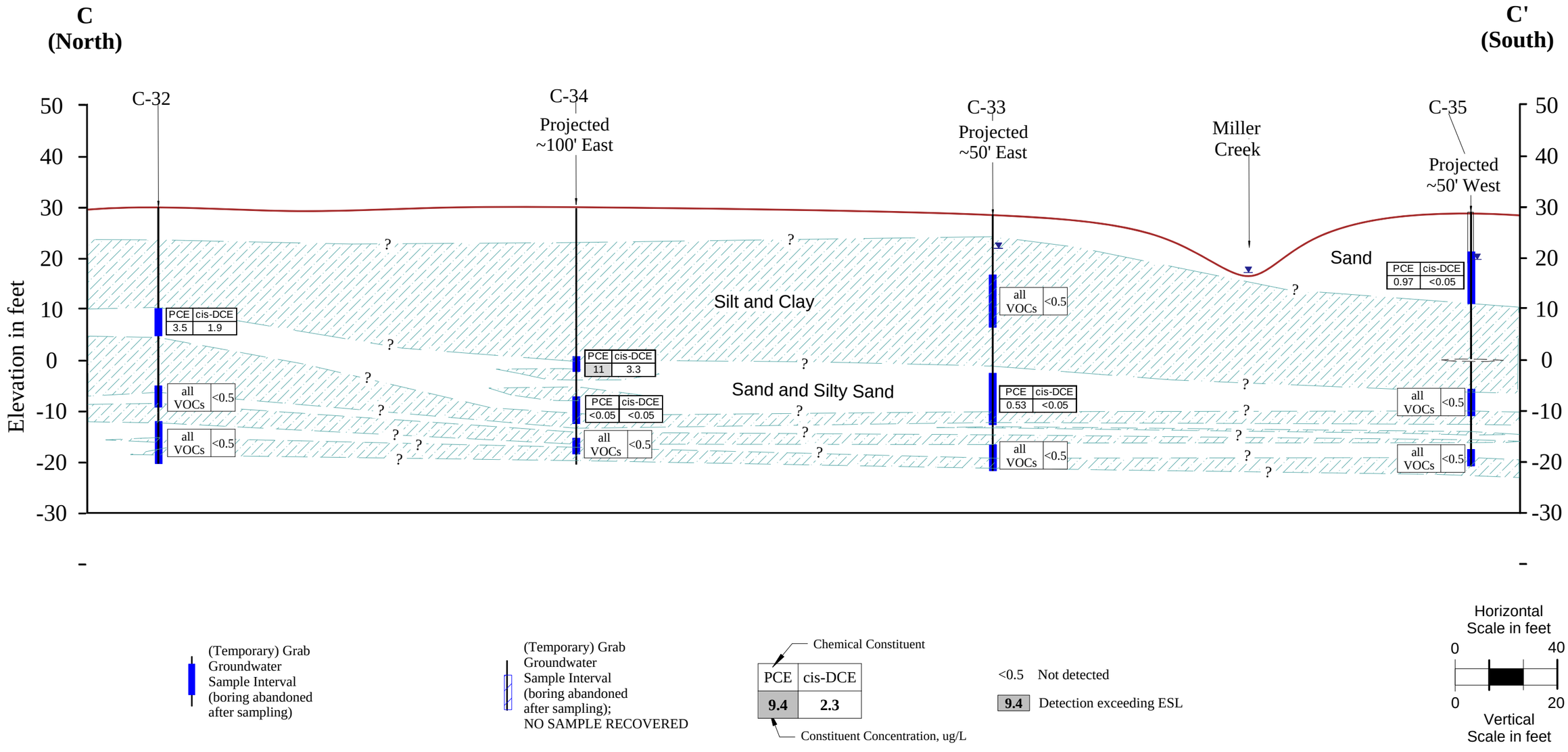
Marinwood Plaza/ Former Prosperity Cleaners

187 Marinwood Avenue
San Rafael, California

Figure 4

Schematic Subsurface Cross Section B-B'



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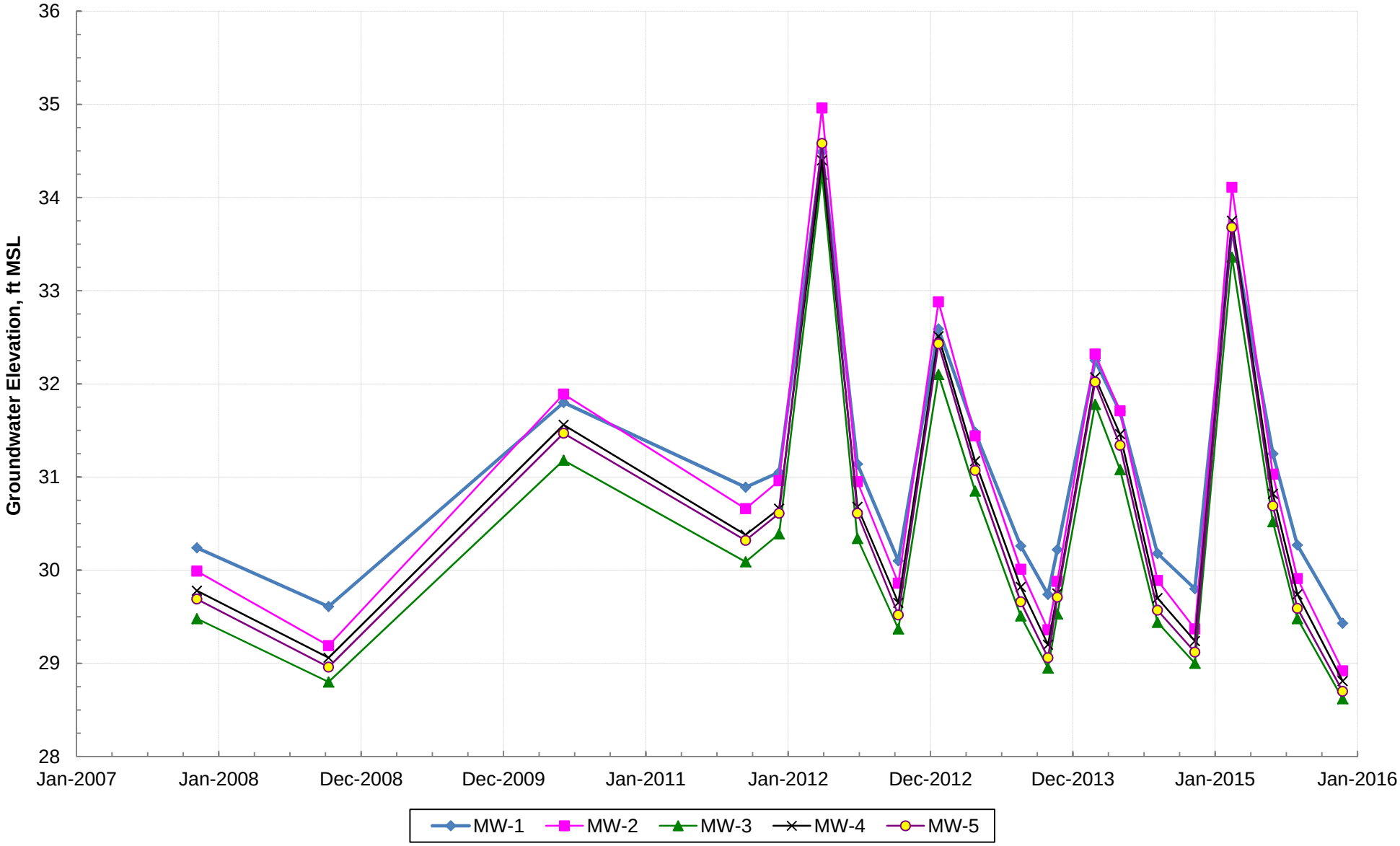
Marinwood Plaza/ Former Prosperity Cleaners

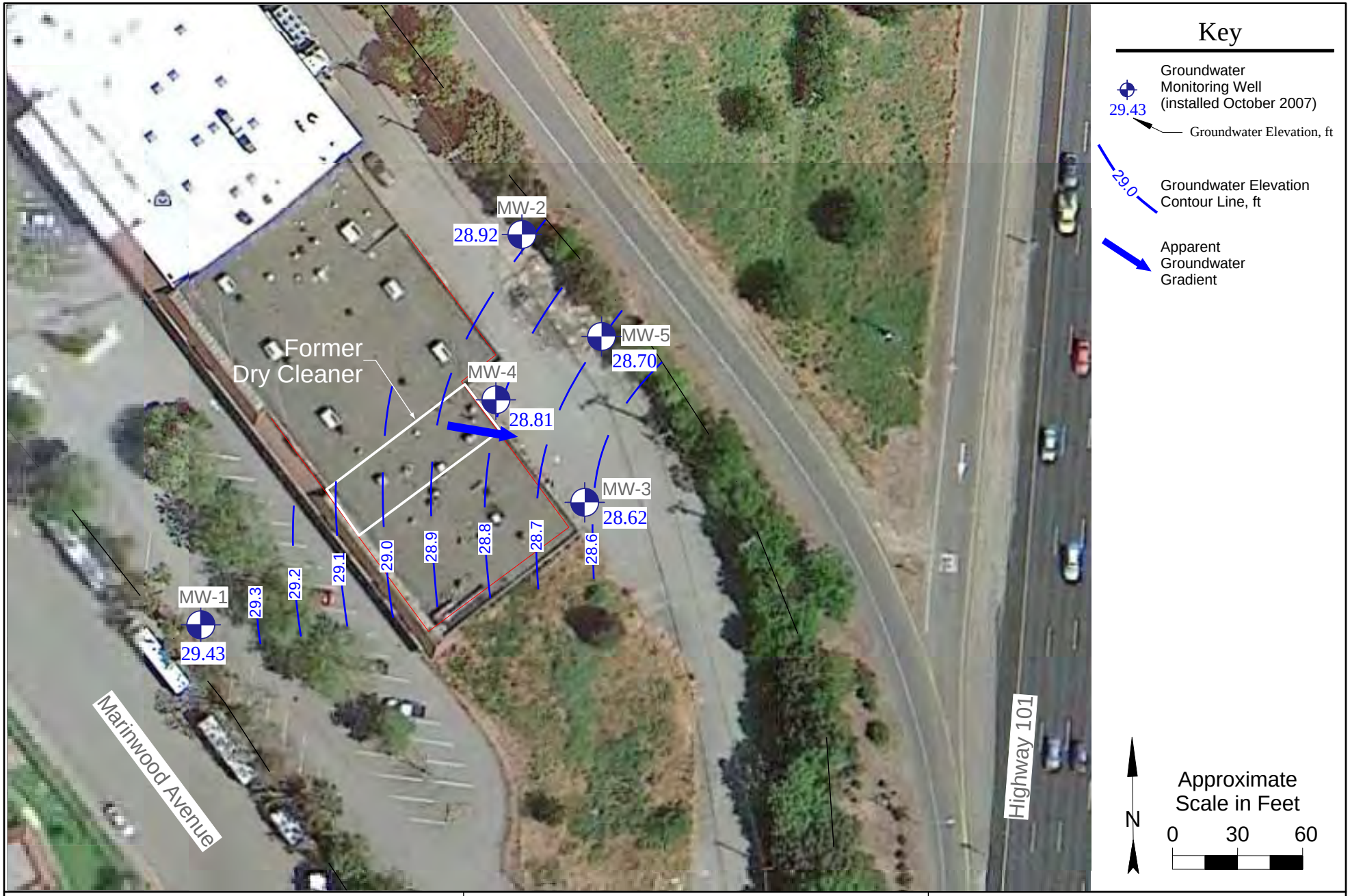
187 Marinwood Avenue
San Rafael, California

Figure 5

Schematic Subsurface Cross Section C-C'

Figure 6: Groundwater Monitoring Wells Hydrographs





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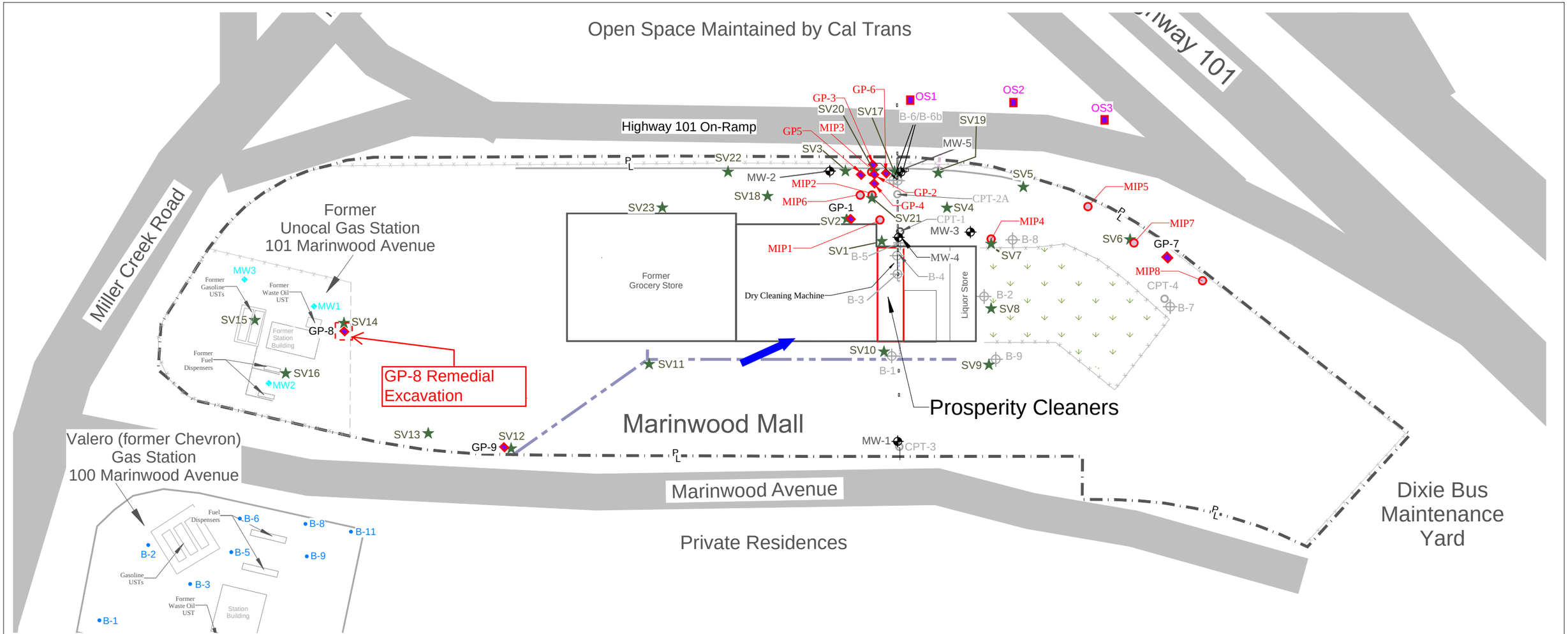
Marinwood Plaza/
Former Prosperity Cleaners
187 Marinwood Avenue
San Rafael, California

Figure 7

Groundwater Elevation Contour Map
November 2015



Key

- Groundwater Flow Direction
- Property Line
- Sanitary Sewer
- Groundwater Monitoring Well (November 2007)
- CPT Exploration (August, 2007)
- Geoprobe Exploration (September, 2007)
- October 2008 Soil Gas Sample Location
- MIP Boring (October, 2008)
- On-Site Soil and Grab Groundwater Sample Location (November 2008)

N

Approximate Scale in Feet

0 40 80

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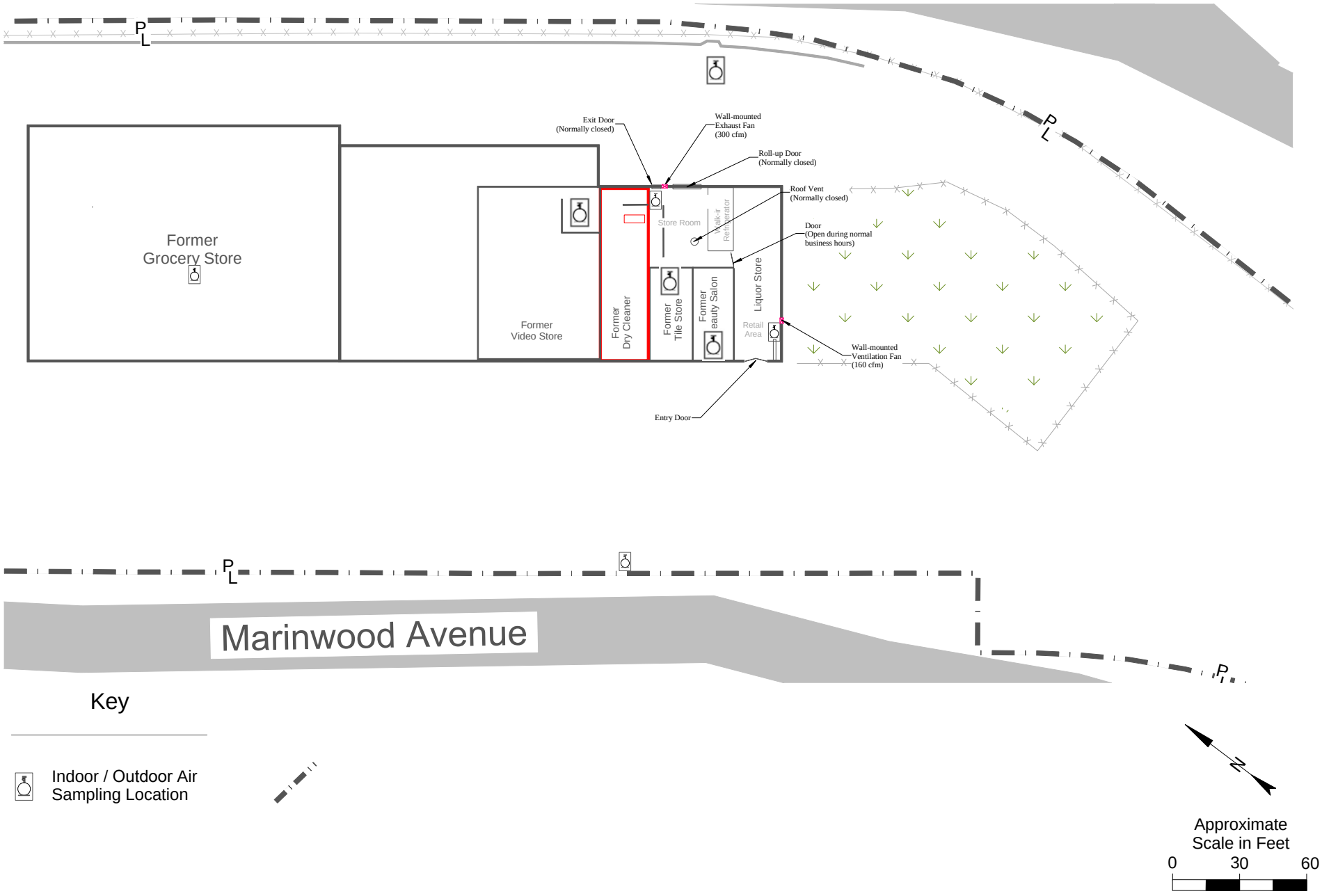
Marinwood Mall/ Prosperity Cleaners

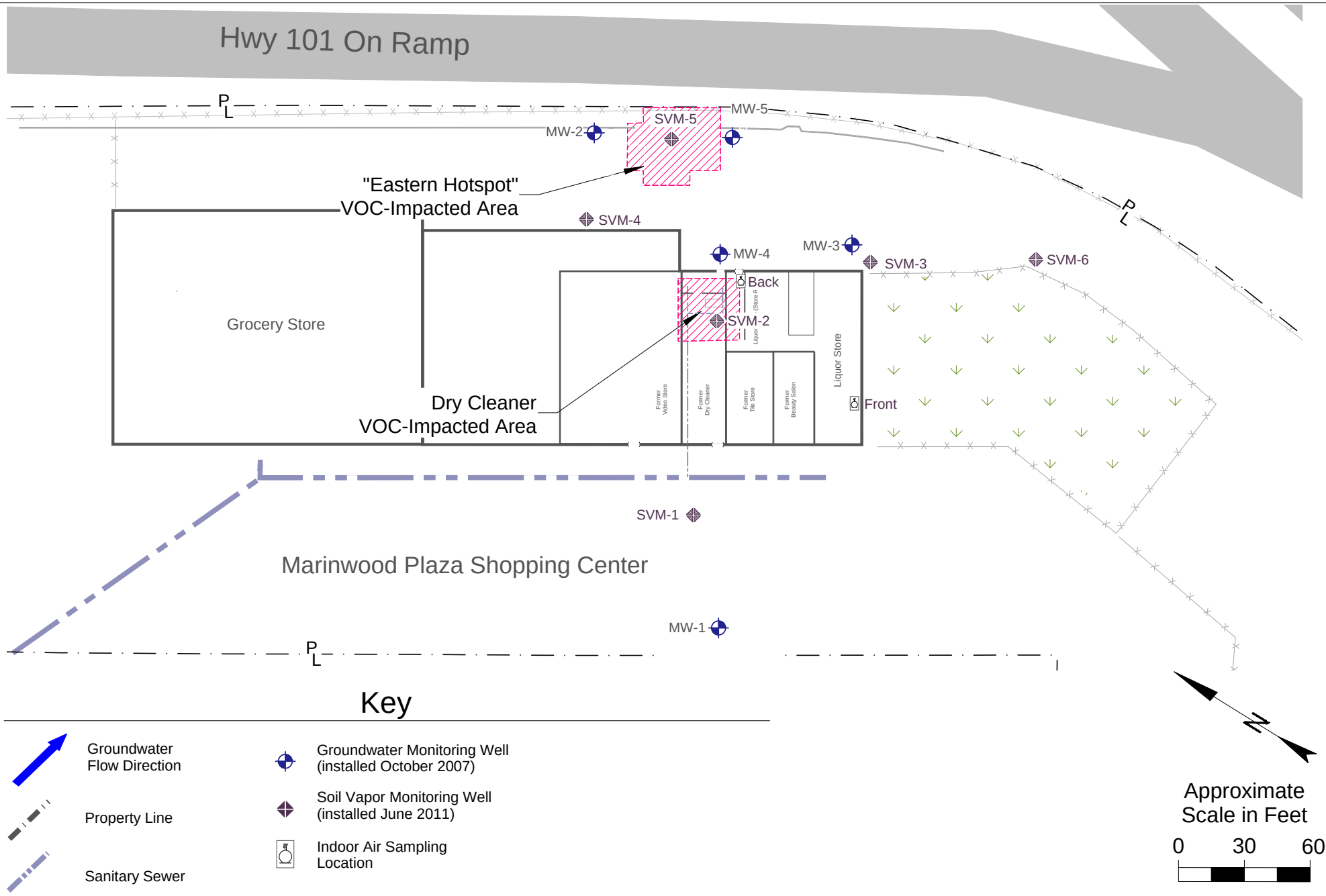
187 Marinwood Avenue
San Rafael, California

Figure 8

2007 - 2008
Exploration Locations



geologica San Francisco, California	**Marinwood Plaza Dry Cleaner** **187 Marinwood Avenue** **San Rafael, California**	**Figure 9** **Air Sampling Locations**



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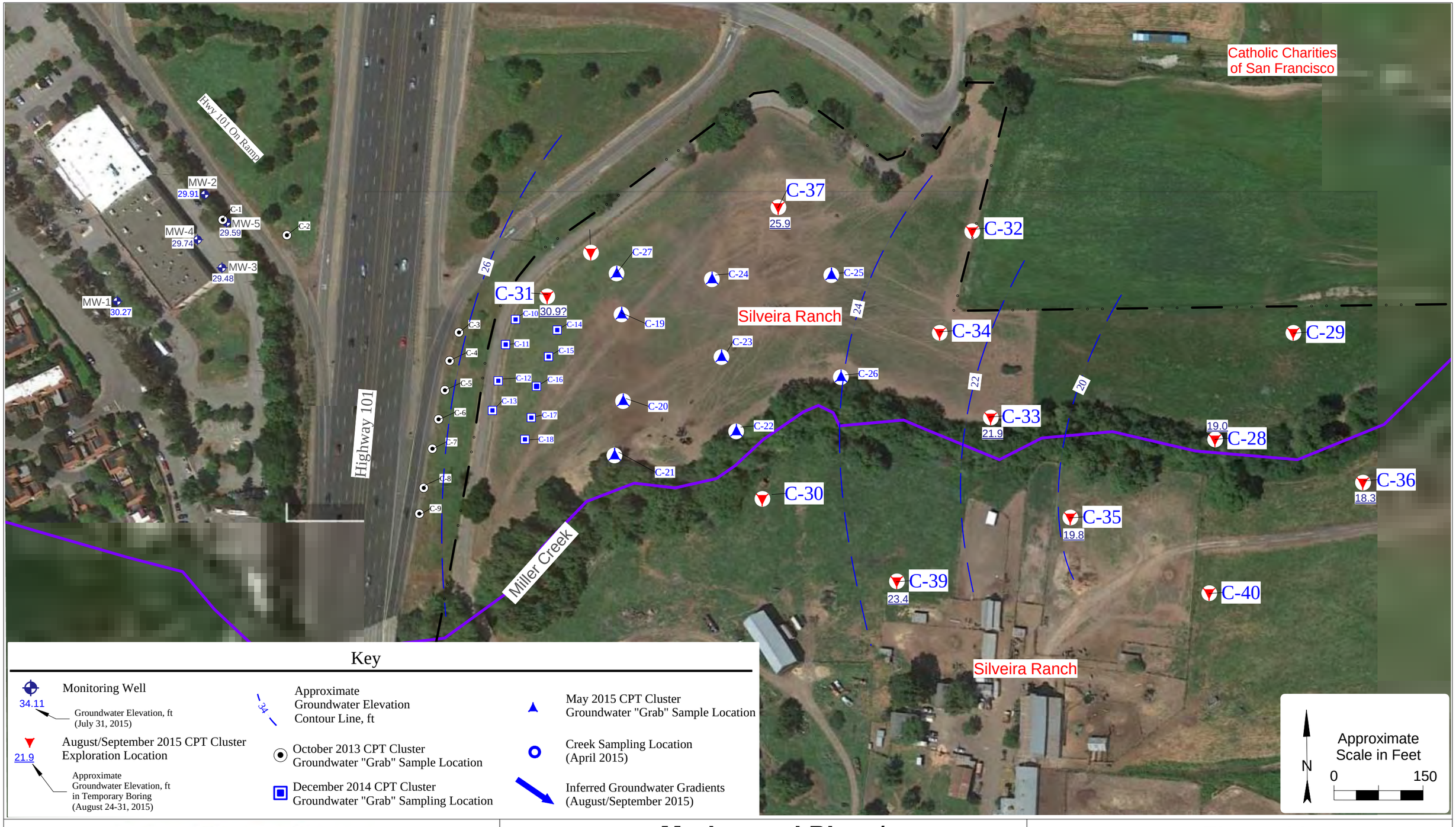
Marinwood Plaza
Dry Cleaner Soil IRM
187 Marinwood Avenue
San Rafael, California

Figure 10

Environmental Monitoring Locations



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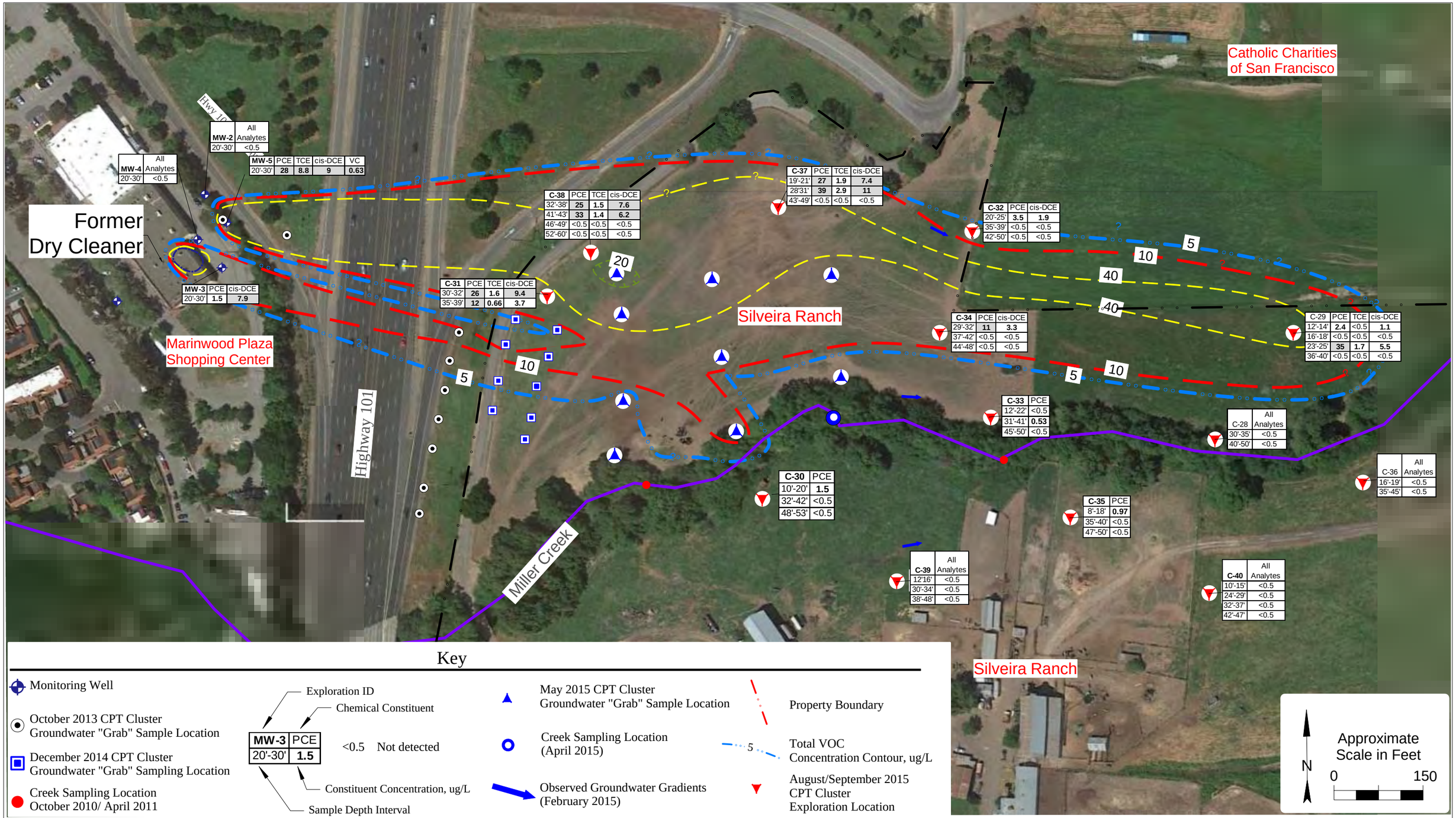
187 Marinwood Avenue
San Rafael, California

Figure 11

Offsite Groundwater Exploration Locations



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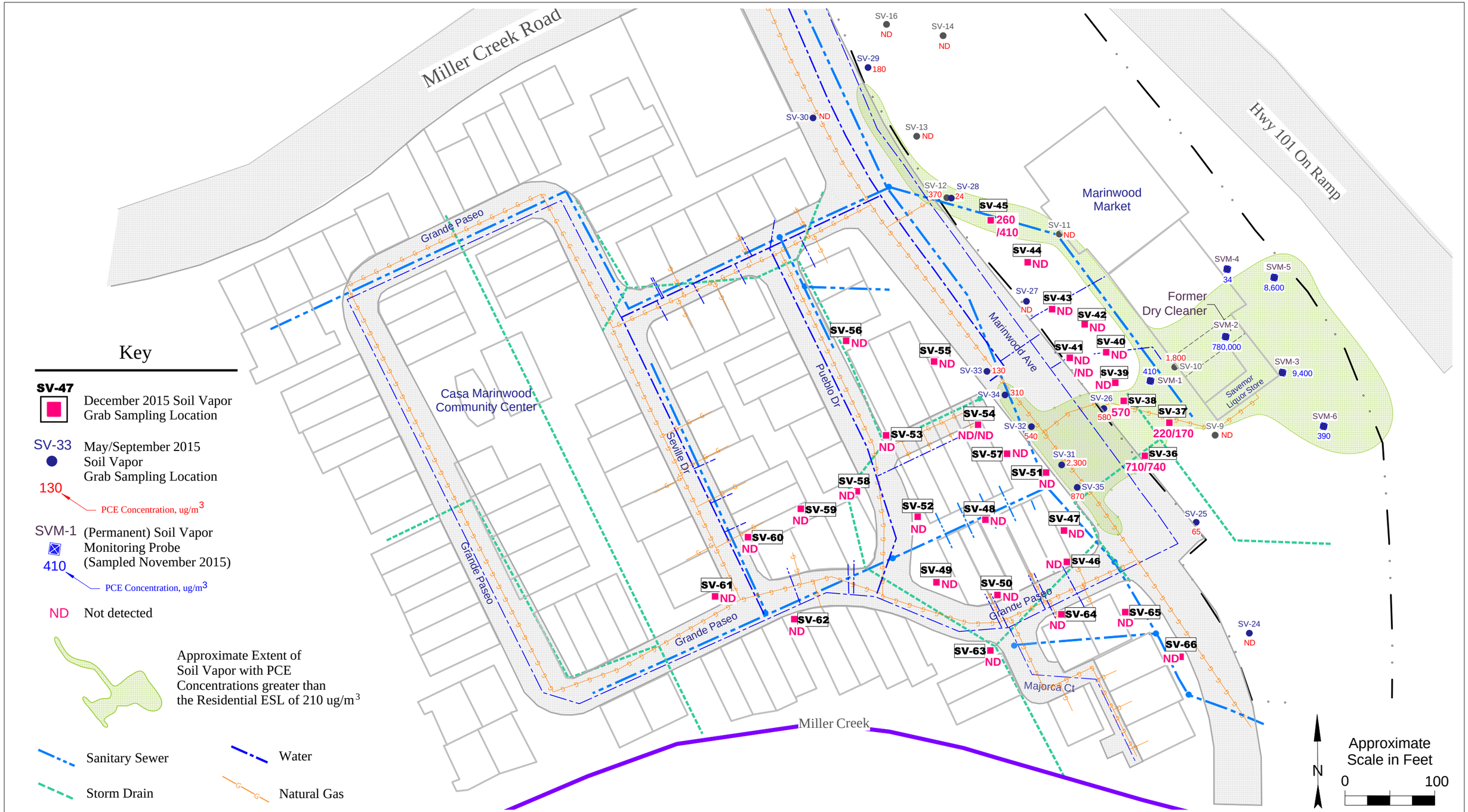
Marinwood Plaza/ Former Prosperity Cleaners

187 Marinwood Avenue
San Rafael, California

Figure 12

Summary Map of
Off-Site Groundwater Sampling Results



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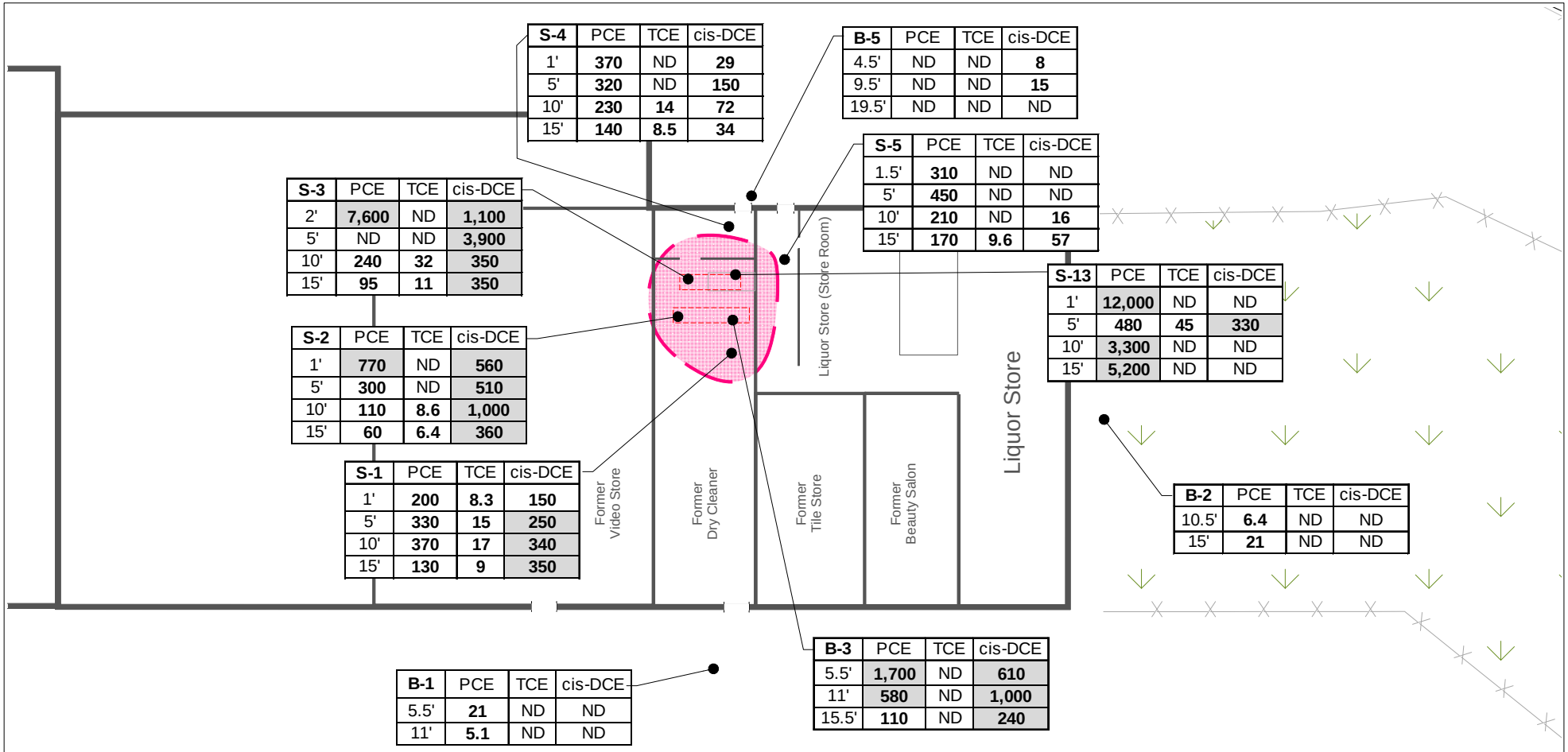
Marinwood Plaza/ Former Prosperity Cleaners

187 Marinwood Avenue
San Rafael, California

Figure 13

Summary of 2015 Soil Vapor Sampling Results



Key

- Geoprobe Exploration
- 45 — Detected Concentration, ug/kg
- ND — Not Detected
- 12,000 — Sample result exceeding Site Groundwater Cleanup Level

Boring ID

Constituent Detected in one or more Samples

S-13	PCE	TCE	cis-DCE
1'	12,000	ND	ND
5'	480	45	330
10'	3,300	ND	ND
15'	5,200	ND	ND

Sample Depth

Approximate Extent of Soil with VOC Concentrations greater than the Soil Cleanup Goals

*See Table 8 for Site Cleanup Goals

N

Approximate Scale in Feet

0 15 30

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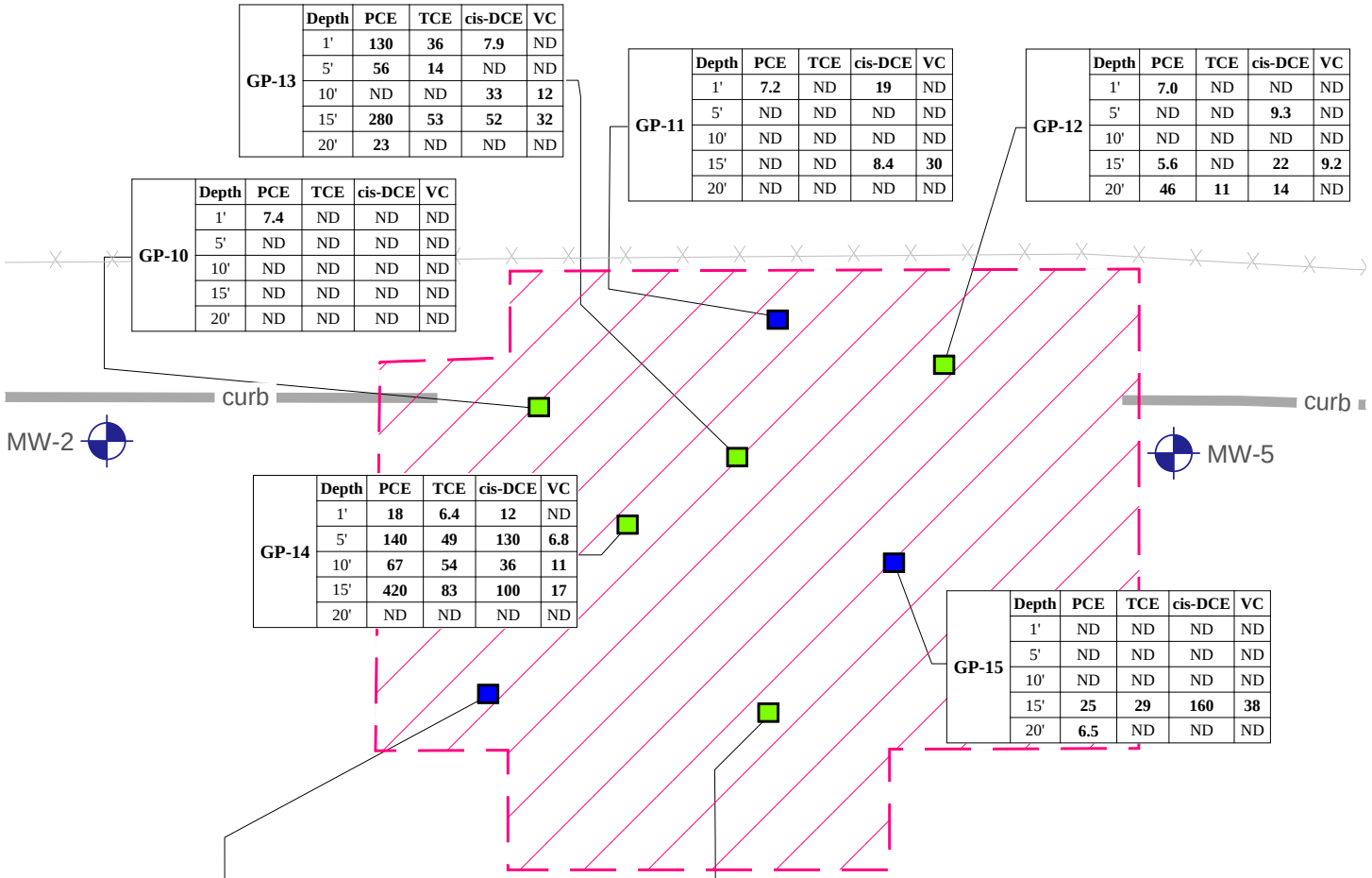
San Francisco, California

Marinwood Plaza / Former Prosperity Cleaners

187 Marinwood Avenue
San Rafael, California

Figure 14

Dry Cleaner Soil Sampling Results



GP-13	Depth	PCE	TCE	cis-DCE	VC
	1'	**130**	**36**	**7.9**	ND
	5'	**56**	**14**	ND	ND
	10'	ND	ND	**33**	**12**
	15'	**280**	**53**	**52**	**32**
	20'	**23**	ND	ND	ND

GP-10	Depth	PCE	TCE	cis-DCE	VC
	1'	**7.4**	ND	ND	ND
	5'	ND	ND	ND	ND
	10'	ND	ND	ND	ND
	15'	ND	ND	ND	ND
	20'	ND	ND	ND	ND

GP-11	Depth	PCE	TCE	cis-DCE	VC
	1'	**7.2**	ND	**19**	ND
	5'	ND	ND	ND	ND
	10'	ND	ND	ND	ND
	15'	ND	ND	**8.4**	**30**
	20'	ND	ND	ND	ND

GP-12	Depth	PCE	TCE	cis-DCE	VC
	1'	**7.0**	ND	ND	ND
	5'	ND	ND	**9.3**	ND
	10'	ND	ND	ND	ND
	15'	**5.6**	ND	**22**	**9.2**
	20'	**46**	**11**	**14**	ND

GP-14	Depth	PCE	TCE	cis-DCE	VC
	1'	**18**	**6.4**	**12**	ND
	5'	**140**	**49**	**130**	**6.8**
	10'	**67**	**54**	**36**	**11**
	15'	**420**	**83**	**100**	**17**
	20'	ND	ND	ND	ND

GP-15	Depth	PCE	TCE	cis-DCE	VC
	1'	ND	ND	ND	ND
	5'	ND	ND	ND	ND
	10'	ND	ND	ND	ND
	15'	**25**	**29**	**160**	**38**
	20'	**6.5**	ND	ND	ND

GP-17	Depth	PCE	TCE	cis-DCE	VC
	1'	**35**	**7.5**	ND	ND
	5'	**32**	**11**	ND	ND
	10'	ND	ND	ND	ND
	15'	**29**	**8.0**	**41**	ND
	20'	ND	ND	ND	ND

GP-16	Depth	PCE	TCE	cis-DCE	VC
	1'	**5.9**	ND	ND	ND
	5'	ND	ND	ND	ND
	10'	ND	ND	ND	ND
	15'	**7.5**	**5.7**	**86**	**28**
	20'	ND	ND	ND	ND

Key

- Groundwater Monitoring Well (October 2007)
- GP-12 — Soil Sampling Boring (January 2014)
- GP-17 — Soil and Groundwater "Grab" Sample Boring (January 2014)
- Approximate Location of Eastern Hot Spot Area

Constituent Detected in one or more Samples

GP-15	Depth	PCE	TCE	cis-DCE	VC
	1'	ND	ND	ND	ND
	5'	ND	ND	ND	ND
	10'	ND	ND	ND	ND
	15'	**25**	**29**	**160**	**38**
	20'	**6.5**	ND	ND	ND

Boring ID

25 Detected Concentration, ug/kg

ND Not Detected

Approximate Scale in Feet

0 5 10

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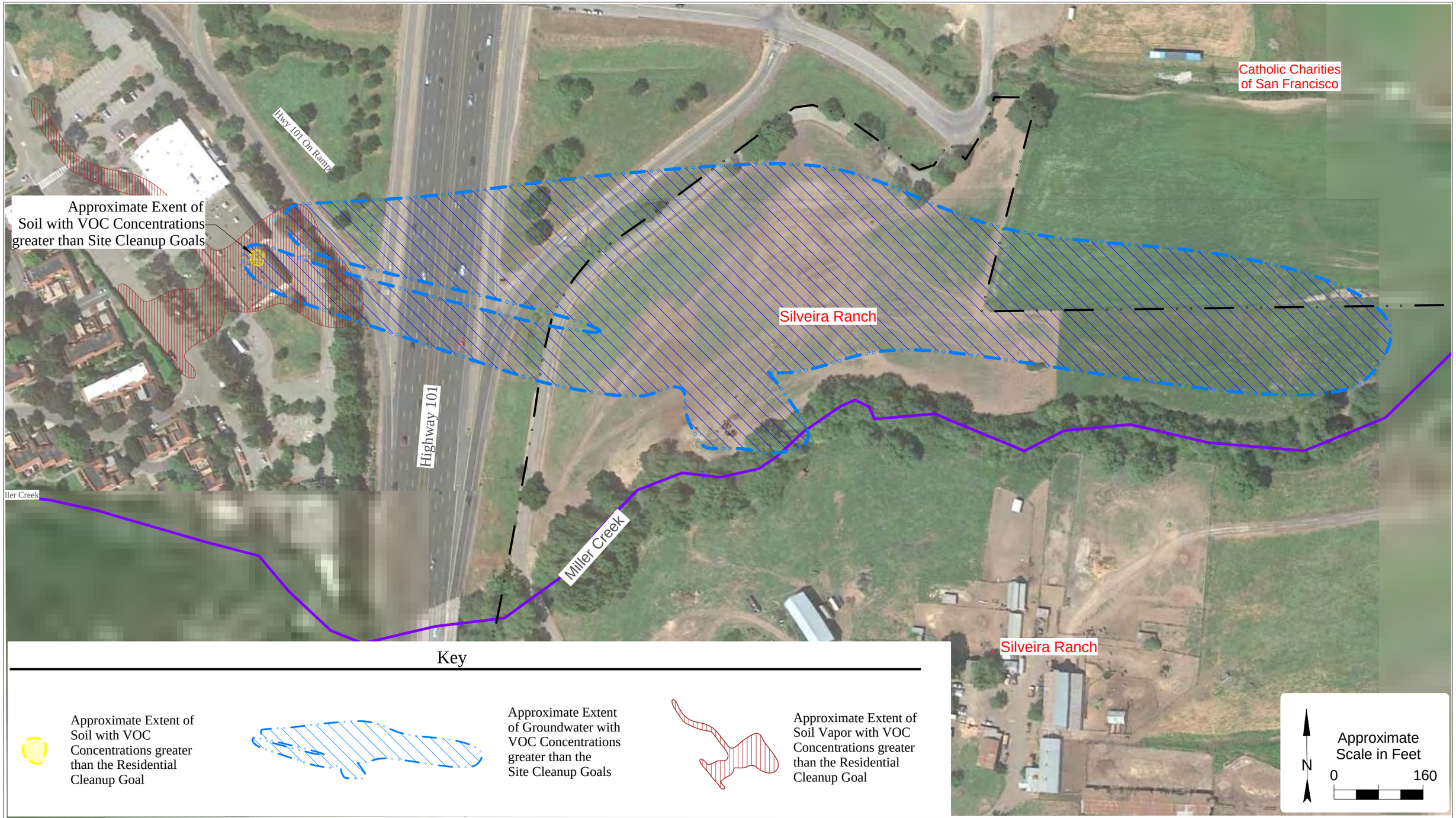
Marinwood Plaza
Dry Cleaner Soil IRM
187 Marinwood Avenue
San Rafael, California

Figure 15

January 2014
Soil Confirmation Sampling Results
Eastern Hot Spot Area



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San Rafael, California

Figure 16

Map Showing Areas with VOC Concentrations greater than Cleanup Goals

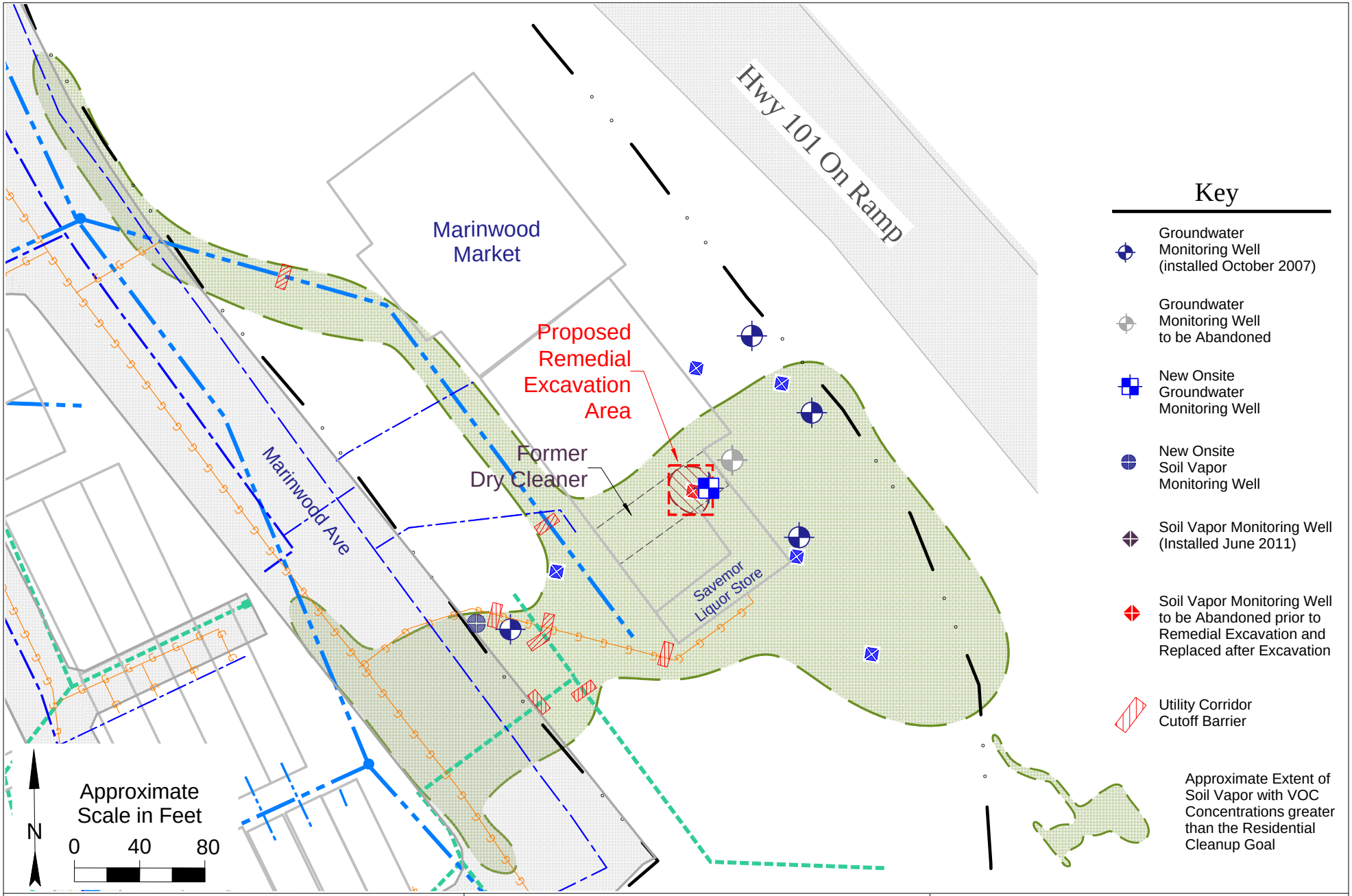

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Figure 17

Map Showing Soil and Soil Vapor Remedial Action Areas

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Figure 18

Map Showing Proposed Groundwater Monitoring Well Locations

Figure 19 - Proposed Remedial Action Implementation Schedule

Activity / Month*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Soil Remedial Actions																					
Preliminary Activities (including building demolition by others)	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX															
(Optional) Pre-excavation Disposal Profiling						XXXX															
Soil Excavation (following building demolition)							XXXX	XXXX													
Confirmation Sampling & Analysis							XXXX	XXXX													
Iterative Excavation/Confirmation Sampling								XXXX													
Transport & Disposal							XXXX	XXXX													
Backfilling								X													
Reporting									XXXX												
Groundwater Remedial Actions																					
Preliminary Activities								XXXX													
New On-Site Groundwater Monitoring Well Installation (following building demo)									XXXX												
Additional Offsite Groundwater Investigation to Delineate Plume Extent	XXXX	XXXX	XXXX	XXXX																	
New Off-Site Groundwater Monitoring Well Installations					XXXX																
Silveira Well Treatment System O&M	X			X			X			X			X			X			X		
Groundwater Quality Monitoring	X			X			X			X			X			X			X		
Laboratory Testing	XX			XX			XX			XX			XX			XX			XX		
Reporting		XXXX			XXXX			XXXX			XXXX			XXXX			XXXX			XXXX	
Soil Vapor / Indoor Remedial Actions																					
Preliminary Activities								XXXX													
New On-Site Soil Vapor Monitoring Well Installation (after building demolition)									XXXX												
Soil Vapor Quality Monitoring	X			X			X			X			X			X			X		
Laboratory Testing	XX			XX			XX			XX			XX			XX			XX		
Reporting		XXXX			XXXX			XXXX			XXXX			XXXX			XXXX			XXXX	
Utility Corridor Cutoff Barriers	XXXX																				
Vapor Barrier and Venting Systems	To be determined																				
Request for Closure																				XXXX	XXXX

* Schedule starts on Regional Board approval of the RAP.

APPENDIX A

Fourth Quarter 2015
Remediation Monitoring Report

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Innovative Strategies for Environmental and
Natural Resource Management

Memorandum

To: Ralph Lambert, Regional Water Quality Control Board
cc: Tom Fitzsimons, Wells Fargo Wealth Management

From: Dan Matthews, Brian Aubry

Date: December 17, 2015

Re: 4th Quarter 2015 Remediation Monitoring Report
Marinwood Plaza / Former Prosperity Cleaners, Case #21S0053
San Rafael, CA

1 INTRODUCTION

This memorandum summarizes activities conducted in the fourth quarter 2015 for the Soil Interim Remedial Measure (IRM) at the Marinwood Plaza property in San Rafael, CA. The Site location is shown on **Figure A-1**. The work completed included conducting routine monitoring of subsurface soil vapor, indoor air, and groundwater quality as described in the Soil IRM Work Plan (GEOLOGICA, 2009).

2 BACKGROUND

GEOLOGICA began quarterly monitoring of soil vapor and groundwater in September 2011. The five Site groundwater monitoring wells (MW-1 through MW-5) were initially sampled on a quarterly basis. Quarterly sampling was conducted from September 2011 through June 2012. In July 2012, with Regional Water Quality Control Board (Regional Board) concurrence, GEOLOGICA discontinued quarterly sampling of wells MW-1 and MW-2 due to the absence of VOC detections in those wells. In February 2014, the Regional Water Quality Control Board (Regional Board) established Site cleanup requirements for the Site in Cleanup Order No. R2-2014-0007 that mandated quarterly sampling of groundwater wells MW-2 through MW-5. Consequently, GEOLOGICA resumed quarterly sampling of well MW-2 in February 2014.

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GEOLOGICA has conducted indoor air sampling in the Savemor Liquor Store at the south end of the strip mall on a bi-annual basis since 2009. The February 2014 Cleanup Order for the Site mandated quarterly sampling of Indoor air in the liquor store tenant space. Consequently, GEOLOGICA began quarterly sampling of indoor air in February 2014.

Soil vapor monitoring wells (SVM-1 through SVM-6) have been sampled on a quarterly basis since September 2011 as weather conditions permitted.

2.1 Monitoring Procedures

Groundwater, soil vapor, and indoor air sampling procedures employed in the 4th quarter of 2015 are described below.

2.2 Groundwater Monitoring Procedures

Prior to groundwater sampling, groundwater measurements and well purging was performed. Depth to groundwater was measured in each well after the well was opened and allowed a minimum of 15 minutes to equilibrate under atmospheric conditions. Prior to sampling, each well sampled was purged using a peristaltic pump equipped with dedicated, disposable tubing. Each well was purged by removing approximately three well casing volumes of water from the well. During purging, each well was monitored for temperature, conductivity, pH, oxidation-reduction potential (redox potential), and dissolved oxygen concentrations. Field parameters were measured using a flow through cell and a YSI 556 multi-parameter field meter. Purging was considered complete when these parameters stabilized or at least three casing volumes of water had been removed.

Following purging, each well was sampled using a dedicated bailer. Samples were sealed in appropriate pre-cleaned, preserved, containers provided by the analytical laboratory, labeled, and immediately stored on ice in an ice chest. The samples were shipped to a California EPA certified analytical laboratory within 24-hours of collection. The collected groundwater samples were analyzed for VOCs using EPA Method 8260 according to EPA certified protocols under the laboratory's Quality Assurance Plan. Standard EPA chain-of-custody protocol and documentation were followed.

Depth to groundwater and final, stable pH, temperature, oxidation/reduction potential, dissolved oxygen concentration, and specific conductance values are listed in **Table A-1**. The groundwater samples were submitted to Test America's Pleasanton, CA analytical laboratory. Groundwater sampling results are summarized in **Table A-2**; copies of the groundwater analytical testing reports and field sampling forms are provided in **Attachment A.** Well locations are shown on **Figure A-2**.

2.3 Soil Vapor Sampling Procedures

Soil vapor monitoring wells were purged and sampled in general accordance with the DTSC 2015 Guidance Advisory – Active Soil Gas Investigations. Prior to sampling, a well flow test was conducted at each soil vapor monitoring well by attaching a clean 60-milliliter (ml) syringe and vacuum gauge to the well head and slowly extracting approximately 50 ml of soil vapor. Wells were considered ready for sampling if 50-ml of soil vapor could be removed in 30 seconds under a vacuum of less than 20 inches of water (in-Wtr). During the November 2015 sampling event, all soil vapor monitoring wells (SVM-1 through SVM-6) were found to be ready for sampling.

After conducting a well flow test at each well and verifying that the summa canisters provided by the laboratory were properly evacuated, a vacuum test was conducted to confirm that the sample tubing setup was assembled without leaks. The vacuum test consisted of applying a applying a vacuum to the system with the flow valve to the well closed to assess the sampling setup for leaks; all fittings were retightened or replaced and the vacuum test repeated until the sample setup at each well retained a vacuum for a 60 second check period.

After completing the tubing leak checks, each soil vapor monitoring well was purged of approximately 3 casing volumes of soil vapor (the casing volume for ¼-in tubing is approximately 10 ml per ft or ~50 ml for a 5 ft length of tubing). The wells were manually purged using a 60-ml syringe at a rate of no more than 100 ml per minute.

After purging each well, soil vapor samples were collected into pre-cleaned, evacuated 1,400 ml stainless steel summa canisters provided by the analytical laboratory. An in-line flow restrictor was installed between the well head and the summa canister to limit the purge rate to 150 ml per minute (ml/min) in accordance with DTSC guidance. The well head and sample canister valves were opened to allow canister filling which took approximately 10 minutes per well. During sampling, a plastic box was set over the well head to form a leak check shroud. Then a piece of paper towel moistened with a leak check compound (isopropyl alcohol) was placed under the shroud to check for direct leakage into the well head tubing assembly or leakage around the surface well seal during sampling.

After completion of sampling, the soil vapor monitoring well samples were shipped to Curtis and Tompkins Laboratory in Berkeley, CA, a California EPA certified analytical laboratory, within 24-hours of collection. In accordance with DTSC and EPA guidance, the soil vapor samples were <u>not</u> refrigerated during shipping. The collected soil vapor samples were analyzed for VOCs (including the leak check compound) using EPA Method TO-15 according to EPA certified protocols under the laboratory's quality assurance plan. Standard EPA chain-of-custody protocol and

documentation was followed. Copies of the soil vapor analytical testing reports are provided in **Attachment A.** Well locations are shown on **Figure A-2**.

2.4 Indoor Air Sampling Procedures

Indoor air samples were collected for VOC analysis using 6-liter (6-L) stainless steel individually certified-clean summa canisters and individually certified-clean 8-hour flow controllers provided by the analytical laboratory. The summa canisters were placed at designated sample locations by a GEOLOGICA field representative on the morning of the day of sampling and retrieved no less than 8 hours later. The samples were shipped by overnight courier under chain-of-custody protocol to a State of California certified laboratory. The samples were analyzed for VOCs using EPA Method TO-15, with selective ion monitoring (SIMs) for low level detection. Sample locations are shown on **Figure A-2**.

3 Fourth Quarter 2015 Monitoring Results

Results of the fourth quarter 2015 groundwater, soil vapor, and indoor air sampling events are described below.

3.1 Fourth Quarter Groundwater Quality Monitoring Results

GEOLOGICA conducted a routine quarterly groundwater monitoring event at the site in November 2015. On November 24, 2015, GEOLOGICA measured depth to groundwater in all five groundwater monitoring wells (MW-1 through MW-5), then purged and sampled wells MW-2 through MW-5.

3.1.1 Groundwater Occurrence and Flow in November 2015

Measured depths to groundwater in the site groundwater monitoring wells were used to calculate groundwater elevation. Calculated groundwater elevation values in November 2015 are tabulated in **Table A-1**. The groundwater elevation values were used to create a groundwater elevation contour map for November 2015 which is depicted on **Figure A-3**. As shown on **Figure A-3**, an easterly to southeasterly groundwater gradient was observed at the site in November 2015. Variations in groundwater elevation with time in the five site groundwater monitoring wells are depicted on **Figure A-4**. As illustrated on **Figure A-4**, groundwater level measurements over the last five years generally indicate lower groundwater elevations in the summer and fall and higher elevations in the winter and spring, consistent with variations in precipitation in the area. Groundwater elevations decreased by an average of 0.9 feet between July and November 2015, most likely in response to decreased precipitation in the summer months.

3.1.2 Groundwater Redox Conditions in November 2015

Dissolved oxygen concentrations and oxidation/reduction (Redox) potential measured during monitoring well purging to assess groundwater Redox conditions are tabulated in **Table A-1**. Measured dissolved oxygen concentrations ranged from 0.31 to 1.80 milligrams per liter (mg/L). Measured redox potential values ranged from -35.8 to 7.1 millivolts (mV). Dissolved oxygen concentrations less than 2 mg/L and redox potential values less than 200 mV are generally considered to indicate reducing conditions.

3.1.3 Groundwater Chemical Testing Results in November 2015

Groundwater chemical testing results are summarized in **Table A-2**. The constituents detected and pattern of VOC detections in the groundwater monitoring well samples in November 2015 were generally consistent with previous sampling results. The VOCs PCE, TCE, cis-DCE, trans-DCE, and VC were detected above sample reporting limits in one or more of the groundwater samples collected from the site monitoring wells in November 2015.

The VOC data were compared to the Site Cleanup Levels set by the RWQCB in the February 2014 Order (No. R2-2014-0007) for the Site or Environmental Screening Levels (ESLs) developed by the SFB RWQCB for Groundwater that IS a Current of Potential Source of Drinking Water (Table A ESLs) for constituents not listed in the Order (see **Table A-2**). Monitoring well locations and VOC testing results for groundwater are illustrated on **Figure A-5** for November 2015.

- VOCs were detected in wells MW-3, MW-4, and MW-5, though primarily the highest detections were in well MW-5, which is generally downgradient of the former dry cleaner.

- The concentration of cis-DCE (6.3 ug/L) in well MW-3 exceeded its respective Site Cleanup Level of 6 ug/L (see **Table A-2** for listing). No other VOC detection in this well exceeded its Site Cleanup Level or Table A ESL.

- Concentrations of PCE (25 ug/L), TCE (7.7 ug/L), cis-DCE (8.6 ug/L), and vinyl chloride (0.71 ug/L) in well MW-5 exceeded their respective Site Cleanup Levels of 5, 5, 6, and 0.5 ug/L (see **Table A-2** for listing). No other VOC detection in this well exceeded its Site Cleanup Level or Table A ESL.

- Low concentrations of PCE were also detected in well MW-3 (1.3 ug/L) and well MW-4 (0.6 ug/L). This result is consistent with VOC concentrations detected in this well in previous sampling events.

Time-series plots of detections of PCE, TCE, cis-DCE, trans-DCE, and vinyl chloride in wells MW-3, MW-4, and MW-5 are presented on **Figures A-6**, **A-7**, and **A-8**, respectively. **Figure A-9** presents time-series plots of the total concentration of VOCs (sum of PCE, TCE, cis-DCE, trans-DCE, and vinyl chloride) for wells MW-3, MW-4, and MW-5. These VOCs have not been detected in wells MW-1 or MW-2 and consequently were not plotted. Note, the notation "ND" on **Figures A-6** through **A-9** means not detected above the sample reporting limit.

3.2 Soil Vapor Quality Monitoring Results in November 2015

GEOLOGICA conducted a soil vapor monitoring event at the site in November 2015. Soil vapor monitoring wells SVM-1 to SVM-6 were purged and sampled on November 20, 2015.

The VOCs PCE, TCE, cis-DCE, and trans-DCE were detected above sample reporting limits in one or more of the soil vapor samples collected from the site monitoring wells in November 2015. The constituents detected and pattern of VOC detections in soil vapor in the fourth quarter of 2015 were generally consistent with previous sampling results. The leak check compound (isopropyl alcohol) was not reported for any soil vapor sample. The VOC concentration results were compared to the Site Cleanup Levels set by the RWQCB in the February 2014 Order (No. R2-2014-0007) for the Site or the ESLs developed by the SFB RWQCB for Vapor Intrusion Concerns (Table E ESLs) for constituents not listed in the Order for residential and commercial / industrial land use (see **Table A-3**).

- Detected VOC concentrations ranged from 34 micrograms per cubic meter (ug/m^3) (PCE in well SVM-4) to 780,000 ug/m^3 (PCE in well SVM-2).

- As schematically illustrated on **Figure A-10**, concentrations of PCE in wells SVM-1, SVM-2, SVM-3, SVM-5, and SVM-6, exceeded the Residential Site Cleanup Level of 210 ug/m^3 in November 2015. PCE concentrations in wells SVM-2, SVM-3, and SVM-5 also exceeded the Site Cleanup Level for commercial / industrial land use of 2,100 ug/m^3.

- Concentrations of trans-DCE in well SVM-2 exceeded the residential Site Cleanup Level, whereas concentrations of TCE and cis-DCE in well SVM-2 exceeded the respective residential and commercial / industrial Site Cleanup Levels.

- Concentrations of TCE in well SVM-5 also exceeded the residential and commercial / industrial Site Cleanup Level.

Time-series plots of detections of PCE, TCE, cis-DCE, trans-DCE, and vinyl chloride in wells SVM-1, SVM-2, SVM-3, SVM-4, SVM-5, and SVM-6 are presented on **Figures A-11** through **A-16**, respectively. Note, the notation "ND" on **Figures A-11** through **A-16** means not detected

above the sample reporting limit. **Figure A-17** presents time-series plots of the total concentration of VOCs (sum of PCE, TCE, cis-DCE, trans-DCE, and vinyl chloride) for wells SVM-1 through SVM-6.

3.3 Indoor Air Testing Results in November 2015

GEOLOGICA collected indoor air samples at two locations near the front and back of the liquor store on November 20, 2015. The VOCs PCE, TCE, cis-DCE were reported for both indoor air samples labeled "Front" and "Back". The reported concentrations of TCE and cis-DCE are below their Site Cleanup Level. PCE concentrations were reported for the indoor air sample "Front" and "Back" at 5.3 and 4.9 ug/m^3, respectively, which exceed the Site Cleanup Level for commercial / industrial land use of 2.1 ug/m^3. No other VOCs were detected in the samples. **Table A-4** provides a summary of indoor air testing results and a comparison to the Site Cleanup Levels. Sample locations are shown on **Figure A-2**.

4 DISCUSSION AND RECOMMENDATIONS

The results of the environmental monitoring conducted at the Site indicate that substantial progress has been made in reducing the mass of VOCs present in soil in the Eastern Hot Spot area. The results of soil sampling in the Eastern Hot Spot completed in January 2014 indicated that VOC concentrations in soil in this area have decreased to below Site Cleanup Levels. VOC concentrations in groundwater monitoring well MW-5, which is the well closest to the Eastern Hot Spot, show a declining concentration trend. VOC concentrations detected in soil vapor from the Eastern Hot Spot area monitoring well, SVM-5, were one of lowest recorded in November 2015.

VOC concentrations in soil vapor samples collected beneath and adjacent to the former dry cleaner in wells SVM-1, SVM-2, SVM-3, SVM-4, and SVM-6 show seasonal variability but are generally comparable to results observed in initial sampling in 2011. Similarly, VOC concentrations in the two groundwater monitoring wells closest to the dry cleaner, MW-3 and MW-4, also show seasonal variability but are generally comparable to results observed in initial sampling in 2007. PCE concentrations in indoor air in the liquor store still occasionally exceed the commercial / industrial Site Cleanup Levels, particularly at the sample location in the back of the store.

5 PLANNED UPCOMING ACTIVITIES

5.1 Remediation Monitoring

The next quarterly groundwater and soil vapor sampling event is scheduled to be conducted in February 2016.

5.2 Indoor Air Mitigation and Monitoring

The next indoor air sampling event will be conducted in the liquor store in February 2016.

Attachments:

Table A-1 – Summary of Groundwater Sampling Field Parameter Measurements
Table A-2 – Groundwater Monitoring Well Sample Chemical Testing Summary
Table A-3 – Soil Vapor Monitoring Well Sample Chemical Testing Summary
Table A-4 – Liquor Store Indoor Air Sampling Results Summary

Figure A-1 – Site Location Map
Figure A-2 – Environmental Monitoring Locations
Figure A-3 – Groundwater Elevation Contour Map – November 2015
Figure A-4 – Groundwater Monitoring Well Hydrographs
Figure A-5 – Distribution of VOC Detections in Groundwater Monitoring Wells in November 2015
Figure A-6 – Time-Series Plot of VOC Detections in Groundwater Monitoring Well MW-3
Figure A-7 – Time-Series Plot of VOC Detections in Groundwater Monitoring Well MW-4
Figure A-8 – Time-Series Plot of VOC Detections in Groundwater Monitoring Well MW-5
Figure A-9 – Total VOC Detections in Groundwater Monitoring Wells MW-3 through MW-5
Figure A-10 – Distribution of VOC Detections in Soil Vapor Monitoring Wells – November 2015
Figure A-11 – Time-Series Plot of VOC Detections in Soil Vapor Monitoring Well SVM-1
Figure A-12 – Time-Series Plot of VOC Detections in Soil Vapor Monitoring Well SVM-2
Figure A-13 – Time-Series Plot of VOC Detections in Soil Vapor Monitoring Well SVM-3
Figure A-14 – Time-Series Plot of VOC Detections in Soil Vapor Monitoring Well SVM-4
Figure A-15 – Time-Series Plot of VOC Detections in Soil Vapor Monitoring Well SVM-5
Figure A-16 – Time-Series Plot of VOC Detections in Soil Vapor Monitoring Well SVM-6
Figure A-17 – Total VOC Detections in Soil Vapor Monitoring Wells SVM-1 through SVM-6
Figure A-18 – Time-Series Plots of PCE Concentrations in Indoor Air

Attachment A – Laboratory Analytical Testing Reports

TABLES

Table A-1
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Summary of Groundwater Sampling Field Parameter Measurements

Date Measured	Casing Elevation (1)	Depth to Groundwater(2)	Calculated Groundwater Elevation(3)	pH	Temperature	Oxidation/ Reduction Potential	Dissolved Oxygen Concentration	Specific Conductance
	ft MSL	ft	ft MSL	-	°C	millivolts	mg/L	mmhos/cm
Well MW-1								
Nov-2007	40.00	9.76	30.24	6.52	17.5	219	-	609.8
Oct-2008	40.00	10.39	29.61	-	-	-	-	-
Jun-2010	40.00	8.20	31.8	-	-	-	-	-
Sep-2011	40.00	9.11	30.89	6.01	18.68	-	7.84	553
Dec-2011	40.00	8.95	31.05	5.94	19.17	211	4.29	624
Mar-2012	40.00	5.51	34.49	7.06	16.24	190	7.05	584
Jun-2012	40.00	8.86	31.14	5.79	20.14	241	4.59	639
Oct-2012	40.00	9.90	30.1	-	-	-	-	-
Jan-2013	40.00	7.41	32.59	-	-	-	-	-
Apr-2013	40.00	8.52	31.48	-	-	-	-	-
Aug-2013	40.00	9.74	30.26	-	-	-	-	-
Oct-2013	40.00	10.26	29.74	-	-	-	-	-
Nov-2013	40.00	9.78	30.22	-	-	-	-	-
Feb-2014	40.00	7.75	32.25	-	-	-	-	-
May-2014	40.00	8.30	31.7	-	-	-	-	-
Aug-2014	40.00	9.82	30.18	-	-	-	-	-
Nov-2014	40.00	10.20	29.8	-	-	-	-	-
Feb-2015	40.00	6.33	33.67	-	-	-	-	-
May-2015	40.00	8.75	31.25	5.72	18.51	98.1	1.93	536
Jul-2015	40.00	9.73	30.27	-	-	-	-	-
Nov-2015	40.00	10.57	29.43	-	-	-	-	-
Well MW-2								
Nov-2007	40.76	10.77	29.99	6.47	19.1	212	-	782.8
Oct-2008	40.76	11.57	29.19	-	-	-	-	-
Jun-2010	40.76	8.87	31.89	-	-	-	-	-
Sep-2011	40.76	10.10	30.66	5.88	19.07	72.7	3.01	785
Dec-2011	40.76	9.80	30.96	6	18.94	215	5.92	813
Mar-2012	40.76	5.80	34.96	7.58	14.16	158	3.52	830
Jun-2012	40.76	9.81	30.95	6.7	19.02	6.5	4.47	852
Oct-2012	40.76	10.90	29.86	-	-	-	-	-
Jan-2013	40.76	7.88	32.88	-	-	-	-	-
Apr-2013	40.76	9.32	31.44	-	-	-	-	-
Aug-2013	40.76	10.75	30.01	-	-	-	-	-
Oct-2013	40.76	11.40	29.36	-	-	-	-	-
Nov-2013	40.76	10.88	29.88	-	-	-	-	-
Feb-2014	40.76	8.44	32.32	6.12	17.86	-25.9	0.12	644
May-2014	40.76	9.05	31.71	6.68	17.75	-454	0.13	690
Aug-2014	40.76	10.87	29.89	6.2	18.46	39.5	0.18	629
Nov-2014	40.76	11.39	29.37	6.15	19.37	26.1	0.12	784
Feb-2015	40.76	6.65	34.11	5.96	19.34	140.2	0.20	724
May-2015	40.76	9.73	31.03	5.92	17.59	45.4	0.56	746
Jul-2015	40.76	10.85	29.91	6.14	18.38	282.9	0.54	716
Nov-2015	40.76	11.84	28.92	6.01	19.21	-31.7	0.32	639

Table A-1 (continued)
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Summary of Groundwater Sampling Field Parameter Measurements

Date Measured	Casing Elevation (1)	Depth to Groundwater(2)	Calculated Groundwater Elevation(3)	pH	Temperature	Oxidation/ Reduction Potential	Dissolved Oxygen Concentration	Specific Conductance
	ft MSL	ft	ft MSL	-	°C	millivolts	mg/L	mmhos/cm
Well MW-3								
Nov-2007	41.78	12.30	29.48	6.28	19.2	228	-	693.1
Oct-2008	41.78	12.98	28.8	-	-	-	-	-
Jun-2010	41.78	10.60	31.18	-	-	-	-	-
Sep-2011	41.78	11.69	30.09	6.59	17.04	53.4	4.32	756
Dec-2011	41.78	11.39	30.39	5.88	19.06	223	4.58	855
Mar-2012	41.78	7.53	34.25	7.43	14.53	187	5.69	781
Jun-2012	41.78	11.44	30.34	6.41	19.19	271	4.23	828
Oct-2012	41.78	12.41	29.37	6.01	18.5	70.9	0.56	624
Jan-2013	41.78	9.68	32.1	5.44	18.3	129.8	0.35	816
Apr-2013	41.78	10.93	30.85	6.13	17.66	-94.1	1.78	671
Aug-2013	41.78	12.27	29.51	5.82	19.06	108.9	0.41	603
Oct-2013	41.78	12.83	28.95	-	-	-	-	-
Nov-2013	41.78	12.25	29.53	6.14	18.01	148.7	0.36	613
Feb-2014	41.78	10.00	31.78	6.14	18.19	22.9	0.38	587
May-2014	41.78	10.70	31.08	6.55	17.81	-423	0.33	647
Aug-2014	41.78	12.34	29.44	6.12	18.77	33.2	0.48	562
Nov-2014	41.78	12.78	29.00	6.08	19.62	40.3	0.73	672
Feb-2015	41.78	8.42	33.36	5.90	19.22	152	0.34	700
May-2015	41.78	11.26	30.52	5.77	17.56	77.3	1.32	699
Jul-2015	41.78	12.30	29.48	5.95	18.48	342.2	1.51	663
Nov-2015	41.78	13.16	28.62	5.95	19.60	-8.2	0.98	610
Well MW-4								
Nov-2007	41.95	12.17	29.78	6.36	18.4	233	-	672.2
Oct-2008	41.95	12.89	29.06	-	-	-	-	-
Jun-2010	41.95	10.39	31.56	-	-	-	-	-
Sep-2011	41.95	11.57	30.38	5.68	18.31	58.5	5.15	722
Dec-2011	41.95	11.29	30.66	5.84	18.15	226	5.03	836
Mar-2012	41.95	7.55	34.4	7.45	14.11	186	4.5	774
Jun-2012	41.95	11.27	30.68	6.4	19.05	283	4.55	803
Oct-2012	41.95	12.30	29.65	5.96	17.94	74.1	0.67	600
Jan-2013	41.95	9.44	32.51	5.44	17.9	133.8	0.42	781
Apr-2013	41.95	10.78	31.17	6.11	17.4	-117	1.91	655
Aug-2013	41.95	12.13	29.82	5.79	18.2	129.8	0.76	582
Oct-2013	41.95	12.75	29.2	-	-	-	-	-
Nov-2013	41.95	12.20	29.75	6.14	18.01	148.7	0.36	613
Feb-2014	41.95	9.88	32.07	6.01	17.84	16.4	0.21	588
May-2014	41.95	10.49	31.46	6.55	17.81	-420	0.41	622
Aug-2014	41.95	12.25	29.7	6.08	18.59	52.3	0.79	546
Nov-2014	41.95	12.71	29.24	6.04	18.70	69.0	2.58	658
Feb-2015	41.95	8.20	33.75	5.90	18.91	216.8	0.23	678
May-2015	41.95	11.13	30.82	5.75	17.53	68.8	1.42	685
Jul-2015	41.95	12.21	29.74	5.97	18.40	330.8	2.89	651
Nov-2015	41.95	13.14	28.81	5.82	18.76	7.1	1.80	532

Table A-1 (continued)
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Summary of Groundwater Sampling Field Parameter Measurements

Date Measured	Casing Elevation (1)	Depth to Groundwater(2)	Calculated Groundwater Elevation(3)	pH	Temperature	Oxidation/ Reduction Potential	Dissolved Oxygen Concentration	Specific Conductance
	ft MSL	ft	ft MSL	-	°C	millivolts	mg/L	mmhos/cm
Well MW-5								
Nov-2007	39.72	10.03	29.69	6.34	19.4	253	-	741.6
Oct-2008	39.72	10.76	28.96	-	-	-	-	-
Jun-2010	39.72	8.25	31.47	-	-	-	-	-
Sep-2011	39.72	9.40	30.32	5.8	18.19	92	3.31	794
Dec-2011	39.72	9.11	30.61	6.14	18.24	218	5.2	916
Mar-2012	39.72	5.14	34.58	7.88	14.32	75	4.86	1070
Jun-2012	39.72	9.11	30.61	6.71	19.09	7.13	5.12	855
Oct-2012	39.72	10.20	29.52	6.02	17.94	70.8	0.3	713
Jan-2013	39.72	7.29	32.43	5.35	18.4	137.5	0.33	907
Apr-2013	39.72	8.65	31.07	6.31	19.3	-108.2	1.06	750
Aug-2013	39.72	10.06	29.66	5.89	18.8	76.7	0.19	687
Oct-2013	39.72	10.66	29.06	-	-	-	-	-
Nov-2013	39.72	10.01	29.71	6.14	18.17	46.3	0.14	758
Feb-2014	39.72	7.70	32.02	6.11	18.46	-42.3	0.13	724
May-2014	39.72	8.38	31.34	6.57	18.14	-499	0.11	762
Aug-2014	39.72	10.15	29.57	6.15	18.89	-3.2	0.1	672
Nov-2014	39.72	10.60	29.12	6.12	19.75	22.4	0.15	820
Feb-2015	39.72	6.04	33.68	5.94	19.06	176.9	0.33	812
May-2015	39.72	9.03	30.69	5.84	17.70	53.0	0.39	798
Jul-2015	39.72	10.13	29.59	6.11	18.72	201.9	0.46	744
Nov-2015	39.72	11.02	28.70	5.94	19.52	-35.8	0.31	677

Notes:

1) Top of PVC well casing, NGVD 1983.

2) Measured from top of PVC casing.

3) NGVD 1983

4) Survey by Virgil Chavez Land Surveying.

5) Wells purged using peristaltic pump and flow through cell beginning in October 2012; previously measurements collected using a dedicated disposable bailer to purge well.

Table A-2
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Groundwater Monitoring Well Sample Chemical Testing Summary

Concentrations in micrograms per liter (ug/L)

Date	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-dichloroethene (cis-DCE)	trans-1,2-dichloroethene (trans-DCE)	Vinyl Chloride (VC)	Chloro ethane	MTBE	1,1-Dichloro ethene	Nitrate as N	Sulfate	Manganese
Well MW-1											
Nov-2007	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Sep-2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Dec-2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Mar-2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Jun-2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Discontinued sampling July 2012-May 2015											
May-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	-	-	-
Jul-2015	-	-	-	-	-	-	-	-	-	-	-
Nov-2015	-	-	-	-	-	-	-	-	-	-	-
Well MW-2											
Nov-2007	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Sep-2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Dec-2011	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Mar-2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.83**	<0.5	-	-	-
Jun-2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.76**	<0.5	-	-	-
Discontinued sampling from July 2012 to Feb 2014											
Feb-2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
May-2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.54**	<0.5	-	-	-
Aug-2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Nov-2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Feb-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	-	-	-
May-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	-	-	-
Jul-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	-	-	-
Nov-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	-	-	-
Well MW-3											
Nov-2007	**3.7**	**0.59**	**13**	**0.66**	<0.5	<0.5	<0.5	<0.5	-	-	-
Sep-2011	**2.8**	**0.69**	**34**	**1.3**	<0.5	<0.5	<0.5	<0.5	-	-	-
Dec-2011	**2.8**	**0.66**	**33**	**1.4**	**1.3**	<0.5	<0.5	<0.5	-	-	-
Mar-2012	**2.9**	**0.95**	**89**	**3**	**4.5**	<0.5	<0.5	<0.5	-	-	-
Jun-2012	**2.6**	**0.78**	**44**	**1.6**	**0.85**	<0.5	<0.5	<0.5	-	-	-
Oct-2012	**2.1**	<0.5	**20**	**0.81**	<0.5	<0.5	<0.5	<0.5	-	-	-

Table A-2 (continued)
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Groundwater Monitoring Well Sample Chemical Testing Summary

Concentrations in micrograms per liter (ug/L)

Date	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-dichloroethene (cis-DCE)	trans-1,2-dichloroethene (trans-DCE)	Vinyl Chloride (VC)	Chloro ethane	MTBE	1,1-Dichloro ethene	Nitrate as N	Sulfate	Manganese
Well MW-3 continued											
Jan-2013	**2.7**	**0.97**	**85**	**2.8**	**4.8**	<0.5	**0.52**	<0.5	-	-	-
Apr-2013	**2.2**	**0.67**	**47**	**1.9**	**0.75**	<0.5	**0.54**	<0.5	-	-	-
Aug-2013	**2.5**	**0.61**	**19**	**0.77**	<0.5	<0.5	<0.5	<0.5	-	-	-
Nov-2013	**2.4**	**0.56**	**12**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Feb-2014	<0.5	<0.5	**3.1**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
May-2014	**2.9**	**0.78**	**69**	**2.4**	**5.4**	<0.5	<0.5	<0.5	-	-	-
Aug-2014	**0.83**	<0.5	**27**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Nov-2014	**0.57**	<0.5	**14**	**0.52**	<0.5	<0.5	<0.5	<0.5	-	-	-
Feb-2015	**0.74**	<0.5	**16**	**0.56**	**1.3**	<1.0	<0.5	<0.5	-	-	-
May-2015	**1.4**	<0.5	**9.3**	<0.5	<0.5	<1.0	<0.5	<0.5	**5.5**	**11**	**0.045**
Jul-2015	**1.5**	<0.5	**7.9**	<0.5	<0.5	<1.0	<0.5	<0.5	**-**	**-**	**-**
Nov-2015	**1.3**	<0.5	**6.3**	<0.5	<0.5	<1.0	<0.5	<0.5	**-**	**-**	**-**
Well MW-4											
Nov-2007	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Sep-2011	<0.5	<0.5	**0.54**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Dec-2011	<0.5	<0.5	**0.68**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Mar-2012	<0.5	<0.5	**3**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Jun-2012	<0.5	<0.5	**0.81**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Oct-2012	**0.54**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Jan-2013	<0.5	<0.5	**2.8**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Apr-2013	<0.5	<0.5	**0.79**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Aug-2013	**1.4**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Nov-2013	**0.86**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Feb-2014	<0.5	<0.5	**1.4**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
May-2014	<0.5	<0.5	**1.5**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Aug-2014	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Nov-2014	**0.53**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Feb-2015	**1.3**	<0.5	**0.53**	<0.5	<0.5	<1.0	<0.5	<0.5	-	-	-
May-2015	<0.5	<0.5	**0.88**	<0.5	<0.5	<1.0	<0.5	<0.5	-	-	-
Jul-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	-	-	-
Nov-2015	**0.6**	<0.5	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	-	-	-

Table A-2 (continued)
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Groundwater Monitoring Well Sample Chemical Testing Summary

Concentrations in micrograms per liter (ug/L)

Date	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-dichloroethene (cis-DCE)	trans-1,2-dichloroethene (trans-DCE)	Vinyl Chloride (VC)	Chloro ethane	MTBE	1,1-Dichloro ethene	Nitrate as N	Sulfate	Manganese
Well MW-5											
Nov-2007	**680**	**45**	**37**	<5	<5	<0.5	<0.5	<0.5	-	-	-
Sep-2011	**120**	**480**	**140**	**3**	**3**	<0.5	<0.5	<0.5	-	-	-
Dec-2011	**130**	**79**	**310**	**3.2**	**1.3**	<0.5	<0.5	<0.5	-	-	-
Mar-2012	**130**	**43**	**78**	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Jun-2012	**200**	**75**	**100**	<0.5	**13**	<0.5	<0.5	<0.5	-	-	-
Oct-2012	**99**	**31**	**42**	**0.94**	**3.7**	<0.5	<0.5	<0.5	-	-	-
Jan-2013	**200**	**73**	**110**	**2.2**	**53**	**2.8**	**0.54**	<0.5	-	-	-
Apr-2013	**84**	**40**	**64**	**1.6**	**33**	**2.1**	<0.5	<0.5	-	-	-
Aug-2013	**47**	**15**	**21**	<0.5	**6.7**	**1.5**	<0.5	<0.5	-	-	-
Nov-2013	**12**	**4.4**	**99**	<0.5	**2**	<0.5	<0.5	<0.5	-	-	-
Feb-2014	**120**	**69**	**100**	**2.4**	**58**	<0.5	<0.5	**0.51**	-	-	-
May-2014	**130**	**68**	**110**	**2.1**	**54**	<0.5	<0.5	<0.5	-	-	-
Aug-2014	**52**	**16**	**19**	**0.64**	**2.2**	<0.5	<0.5	<0.5	-	-	-
Nov-2014	**47**	**14**	**13**	<0.5	<0.5	<1.0	<0.5	<0.5	-	-	-
Feb-2015	**72**	**37**	**51**	**1.1**	**24**	<1.0	<0.5	<0.5	-	-	-
May-2015	**31**	**13**	**18**	<0.5	**3.5**	<1.0	<0.5	<0.5	**2.2**	**49**	**0.18**
Jul-2015	**28**	**8.8**	**9.0**	<0.5	**0.63**	<1.0	<0.5	<0.5	**-**	**-**	**-**
Nov-2015	**25**	**7.7**	**8.6**	<0.5	**0.71**	<1.0	<0.5	<0.5	**-**	**-**	**-**
Site Cleanup Levels(2)	**5**	**5**	**6**	**10**	**0.5**	**16(3)**	**5(3)**	**6(3)**	-	-	-

Notes:

1) Analysis by EPA Method 8260B, results for analytes detected in at least one sample listed, see laboratory testing report in Attachment A for complete listing.

2) California Regional Water Quality Control Board San Francisco Bay Region, Order No. R2-2014-0007, Site Cleanup Requirements For Marinwood Plaza, LLC; Section B: Groundwater Cleanup Levels. February 18, 2014.

3) Cleanup Level not Established in February 2014 Order; Level based on ESLs for Groundwater; Table A: Groundwater Screening Levels for Groundwater that is a Potable Water Supply; SF RWQCB, Interim Final (Revised December 2013).

4) <0.5 = Not detected at the laboratory reporting limit cited.

5) - = Not analyzed for or not established.

6) **5** Sample result exceeding Site Cleanup Level.

Table A-3

Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Soil Vapor Monitoring Well Sample Chemical Testing Summary

	Concentrations in micrograms per cubic meter (ug/m^3)									
Date	**Tetrachloroethene (PCE)**	**Trichloroethene (TCE)**	**cis-1,2-dichloroethene (cis-DCE)**	**trans-1,2-dichloroethene (trans-DCE)**	**Vinyl Chloride (VC)**	**1,1-dichloroethene (1,1-DCE)**	Carbon Tetrachloride	Isopropyl Alcohol (11)	**Toluene**	**Benzene**
	Well SVM-1									
Sep-2011	**840**	<22	<16	<16	<10	<16	<63	-	<15	<13
Dec-2011	**610**	<27	<20	<20	<13	<20	<19	-	<19	<16
Apr-2012	**640**	<13	**140**	<9.9	<6.4	<9.9	<9.4	<61	<33	<28
Jun-2012	**1,000**	<47	<35	<35	<22	<35	<33	<210	<9.4	<8
Sep-2012	**210**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Jan-2013	**410**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Apr-2013	**750**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Aug-2013	**2,500**	<160	<120	<120	<76	<120	<110	<730	<110	<96
Feb-2014	**300***	<13	<9.9	<9.9	<6.4	<9.9	<9.4	**4,800**	<9.4	<8
May-2014	**350**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Aug-2014	**670**	<79	<58	<58	<38	<58	<55	<90	<55	<47
Nov-2014	**920**	<94	<69	<69	<44	<69	<66	<430	<66	<56
Nov-2014 (DUP)	**820**	<72	<53	<53	<34	<53	<51	<330	<50	<43
Feb-2015	**600**	<54	<40	<40	<26	<40	<38	<250	<38	<32
May-2015	**570**	<27	<20	<20	<13	<20	<19	<120	<19	<16
Jul-2015	**710**	<27	<20	<20	<13	<20	<19	<120	<19	<16
Nov-2015[(11)]	**410**	<4.7	<3.5	<3.5	<2.2	<3.5	<5.5	<8.6	<3.3	**5.6**
	Well SVM-2									
Sep-2011	**490,000**	**34,000**	**430,000**	**10,000**	<670	<670	<4,100	-	<990	<840
Dec-2011	**1,200,000**	<89,000	**490,000**	<65,000	<42,000	<42,000	<62,000	-	<62,000	<53,000
Apr-2012	**450,000**	**33,000**	**300,000**	**15,000**	<350	<350	<510	<3,300	<510	<430
Jun-2012	**620,000**	**22,000**	**320,000**	<14000	<9,100	<9,100	<13,000	<88,000	<13,000	<11,000
Sep-2012	**300,000**	**13,000**	**170,000**	**4,500**	<1,900	<1,900	<2,800	<18,000	<2,800	<2,400
Jan-2013	**680,000**	**21,000**	**260,000**	<12,000	<7,900	<7900	<12,000	<76,000	<12,000	<9,900
Apr-2013	**590,000**	<27,000	**240,000**	<20,000	<13,000	<20,000	<19,000	<120,000	<19,000	<16,000
Aug-2013	**1,800,000**	**58,000**	**600,000**	<28,000	<18,000	<28,000	<27,000	<180,000	<27,000	<23,000
Feb-2014	**450,000**	**16,000**	**150,000**	<7,400	<4,800	<7,400	<7,000	<46,000	<7,000	<5,900
May-2014	**400,000**	<23000	**150,000**	<7,400	<11,000	<17,000	<16,000	<110,000	<16,000	<14,000
Aug-2014	**92,000***	<4,100*	**29,000***	<3,100*	<2,000*	<3,100*	<2,900*	**130,000**	<2,900*	<2,500*
Nov-2014	**550,000**	<36,000	**130,000**	<27,000	<17,000	<27,000	<25,000	<160,000	<25,000	<21,000
Feb-2015	**680,000**	**21,000**	**160,000**	<7,100	<4,600	<7,100	<6,700	<44,000	<6,700	<5,700
May-2015	**250,000**	<19,000	**73,000**	<14,000	<9,100	<14,000	<13,000	<88,000	<13,000	<11,000
Jul-2015	**450,000**	<21,000	**110,000**	<15,000	<9,800	<15,000	<15,000	<95,000	<15,000	<12,000
Nov-2015	**780,000**	**31,000**	**200,000**	**8,400**	<2,900	<4,500	<7,100	<18,000	<4,300	<3,600

Table A-3 (continued)
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Soil Vapor Monitoring Well Sample Chemical Testing Summary

	Concentrations in micrograms per cubic meter (ug/m^3)									
Date	**Tetrachloroethene (PCE)**	**Trichloroethene (TCE)**	**cis-1,2-dichloroethene (cis-DCE)**	**trans-1,2-dichloroethene (trans-DCE)**	**Vinyl Chloride (VC)**	**1,1-dichloroethene (1,1-DCE)**	Carbon Tetrachloride	Isopropyl Alcohol (11)	**Toluene**	**Benzene**
	Well SVM-3									
Sep-2011	**15,000**	<360	<260	<260	<170	<260	<1,000	-	<250	<210
Dec-2011	**10,000**	<270	<200	<200	<130	<200	<190	-	<190	<160
Apr-2012	NS	NS	NS	NS	NS	NS	NS	NS	-	-
Jun-2012	**17,000**	<1000	<760	<760	<490	<760	<730	<4700	<730	<610
Sep-2012	**10,000**	<900	<660	<660	<430	<660	<630	<4,100	<630	<530
Jan-2013	**6,300**	<170	<120	<120	<79	<120	<120	<760	<120	<99
Apr-2013	**11,000**	<310	<230	<230	<150	<230	<220	<1,400	<220	<180
Aug-2013	**65,000**	<1,600	<1,200	<1,200	<780	<1,200	<1,200	<7,500	<1,200	<980
Feb-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Aug-2014	**11,000**	<540	<400	<400	<260	<400	<380	<2,500	<380	<320
Nov-2014	**11,000**	<770	<570	<570	<370	<570	<540	<3,500	<540	<460
Feb-2015	**7,200**	<410	<310	<310	<200	<310	<290	<1,900	<290	<250
May-2015	**10,000**	<450	<330	<330	<210	<330	<320	<2,100	<310	<270
Aug-2015	**10,000**	<520	<380	<380	<250	<380	<360	<2,400	<360	<310
Nov-2015	**9,400**	<58	<43	<43	<28	<43	<68	<180	<41	<35
	Well SVM-4									
Sep-2011	**69**	<22	<16	<16	<10	<16	<63	-	<15	**20**
Dec-2011	**42**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	-	<9.4	<8
Apr-2012	NS	NS	NS	NS	NS	NS	NS	NS	-	-
Jun-2012	**170**	**33**	**47**	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Sep-2012	**42**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Jan-2013	**18**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Apr-2013	**55**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Aug-2013	**200**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Feb-2014	**24***	<13	<9.9	<9.9	<6.4	<9.9	<9.4	**240**	<9.4	<8
May-2014	**23**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Aug-2014	**54**	<19	<14	<14	<9.1	<14	<13	<88	<13	<11
Nov-2014	**50**	<18	<13	<13	<8.6	<13	<13	<82	<13	<11
Feb-2015	**32**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
May-2015	**30**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Jul-2015	**63**	<13	<9.9	<9.9	<6.4	<9.9	<9.4	<61	<9.4	<8
Nov-2015	**34**	<4.8	<3.5	<3.5	<2.3	<3.5	<5.6	<8.8	<3.4	<2.9

Table A-3 (continued)
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Soil Vapor Monitoring Well Sample Chemical Testing Summary

	Concentrations in micrograms per cubic meter (ug/m^3)									
Date	**Tetrachloroethene (PCE)**	**Trichloroethene (TCE)**	**cis-1,2-dichloroethene (cis-DCE)**	**trans-1,2-dichloroethene (trans-DCE)**	**Vinyl Chloride (VC)**	**1,1-dichloroethene (1,1-DCE)**	Carbon Tetrachloride	Isopropyl Alcohol (11)	**Toluene**	**Benzene**
	Well SVM-5									
Sep-2011	**1,400,000**	**360,000**	**580,000**	**18,000**	**41,000**	<16,000	<62,000	-	<15,000	<12,000
Dec-2011	**840,000**	**280,000**	**200,000**	<44,000	**94,000**	<44,000	<41,000	-	**140,000**	<35,000
Apr-2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Jun-2012	**940,000**	**370,000**	**420,000**	<31,000	**280,000**	<31,000	<25,000	<190,000	<29,000	<25000
Sep-2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Jan-2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Aug-2013	**240,000**	**110,000**	**150,000**	<14,000	<9,300	<14,000	<14,000	<89,000	<14,000	<12,000
Feb-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Aug-2014	**37,000**	**11,000**	**6,700**	<1,500	<940	<1,500	<1,400	<9,000	<1,400	<1,200
Nov-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Feb-2015	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-2015	**8,300**	**2,800**	**1,500**	<320	<200	<320	<300	<2,000	<300	<260
Aug-2015	**10,000**	**3,400**	**1,000**	<380	<250	<380	<360	<2,400	<360	<310
Nov-2015	**8,600**	**3,100**	**570**	<82	<53	<82	<130	<200	<78	<66
	Well SVM-6									
Sep-2011	**900**	**1,000**	**980**	**81**	**40**	<25	<98	-	<23	**55**
Dec-2011	**490**	**530**	**500**	**49**	**27**	<40	<38	-	<38	<32
Apr-2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Jun-2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sep-2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Jan-2013	**370**	**450**	**330**	**26**	**14**	<9.9	<9.4	<61	<9.4	<8
Apr-2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Aug-2013	**1,900**	**2,200**	**1,400**	**160**	**39**	**27**	<9.4	<61	<9.4	<8
Feb-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Aug-2014	**710**	**440**	**280**	<61	<39	<61	<58	<95	<58	<49
Nov-2014	**940**	**530**	**260**	<59	<38	<59	<56	<360	<56	<47

Table A-3 (continued)
Former Prosperity Cleaners / Marinwood Plaza
187 Marinwood Avenue, San Rafael, California

Soil Vapor Monitoring Well Sample Chemical Testing Summary

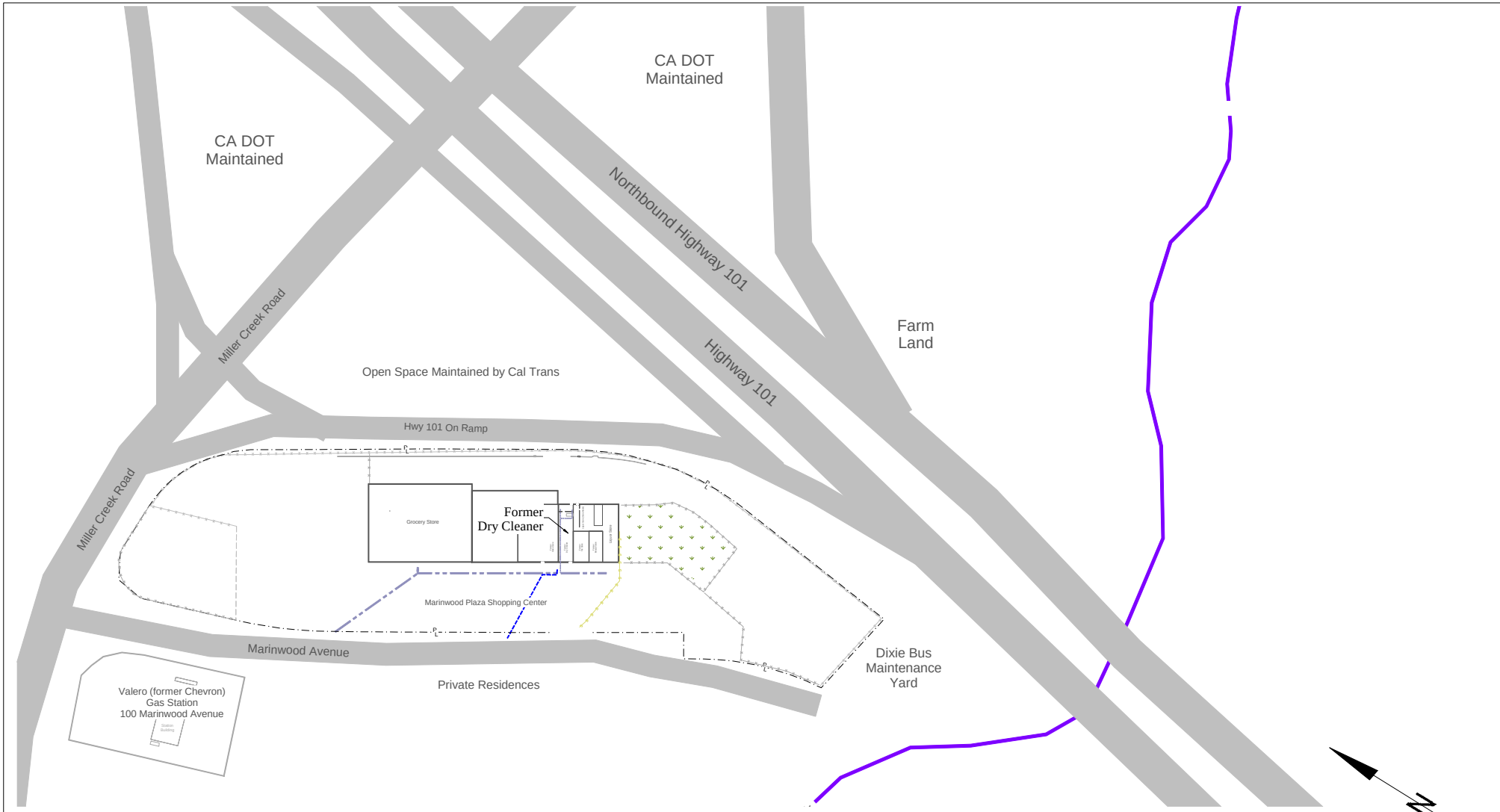
	Concentrations in micrograms per cubic meter (ug/m^3)									
Date	**Tetrachloroethene (PCE)**	**Trichloroethene (TCE)**	**cis-1,2-dichloroethene (cis-DCE)**	**trans-1,2-dichloroethene (trans-DCE)**	**Vinyl Chloride (VC)**	**1,1-dichloroethene (1,1-DCE)**	Carbon Tetrachloride	Isopropyl Alcohol (11)	**Toluene**	**Benzene**
	Well SVM-6 continued									
Feb-2015	**510**	**240**	**130**	<40	<26	<40	<38	<250	<38	<32
May-2015	**550**	**330**		**22**	<13	<20	<19	<120	<19	<16
Aug-2015	**1,200**	**600**	**270**	<40	<26	<40	<38	**470***	<38	<32
Nov-2015	**390**	**170**	**59**	<3.9	<2.5	<3.9	<6.2	<9.7	<3.7	<3.1
Residential Site Cleanup Levels(2)	210	300	3,700(3)	3,100	16	100,000(3)	29(3)	-	160,000(3)	42(3)
Commercial / Industrial Site Cleanup Levels(2)	2,100	3,000	31,000(3)	26,000	160	880,000(3)	290(3)	-	1,300,000(3)	420(3)

Notes:
1) Analysis by EPA Method TO-15, results for analytes detected in at least one sample listed, see laboratory testing report in Attachment A for complete listing.

2) California Regional Water Quality Control Board San Francisco Bay Region, Order No. R2-2014-0007, Site Cleanup Requirements For Marinwood Plaza, LLC; Section B: Soil Vapor Cleanup Levels. February 18, 2014.

3) Cleanup Level not Established in February 2014 Order; Level based on ESLs for Groundwater; Table E: Screening Levels for Indoor Air and Soil Gas (Vapor Intrusion Concerns); SF RWQCB, Interim Final (Revised December 2013).
4) <24 = Not detected above sample reporting limit.
5) - = Not analyzed or not established.
6) NS = Sample not collected due to presence of soil moisture in well.
7) **40** = Analyte detected above sample reporting limit.
8) **31** Concentration above Cleanup Level for Residential Use.
9) **100** Concentration above Cleanup Level for Commercial / Industrial and Residential Use.
10) **92,000*** = Leak check compound (isopropyl alcohol) detected in sample; sample result biased low.
11) n-Hexane, n-Heptane, and Chloroform were also reported for soil vapor sample SVM-1 in Nov 2015; reported at 130, 85, and 17 ug/m3, respectively.

FIGURES



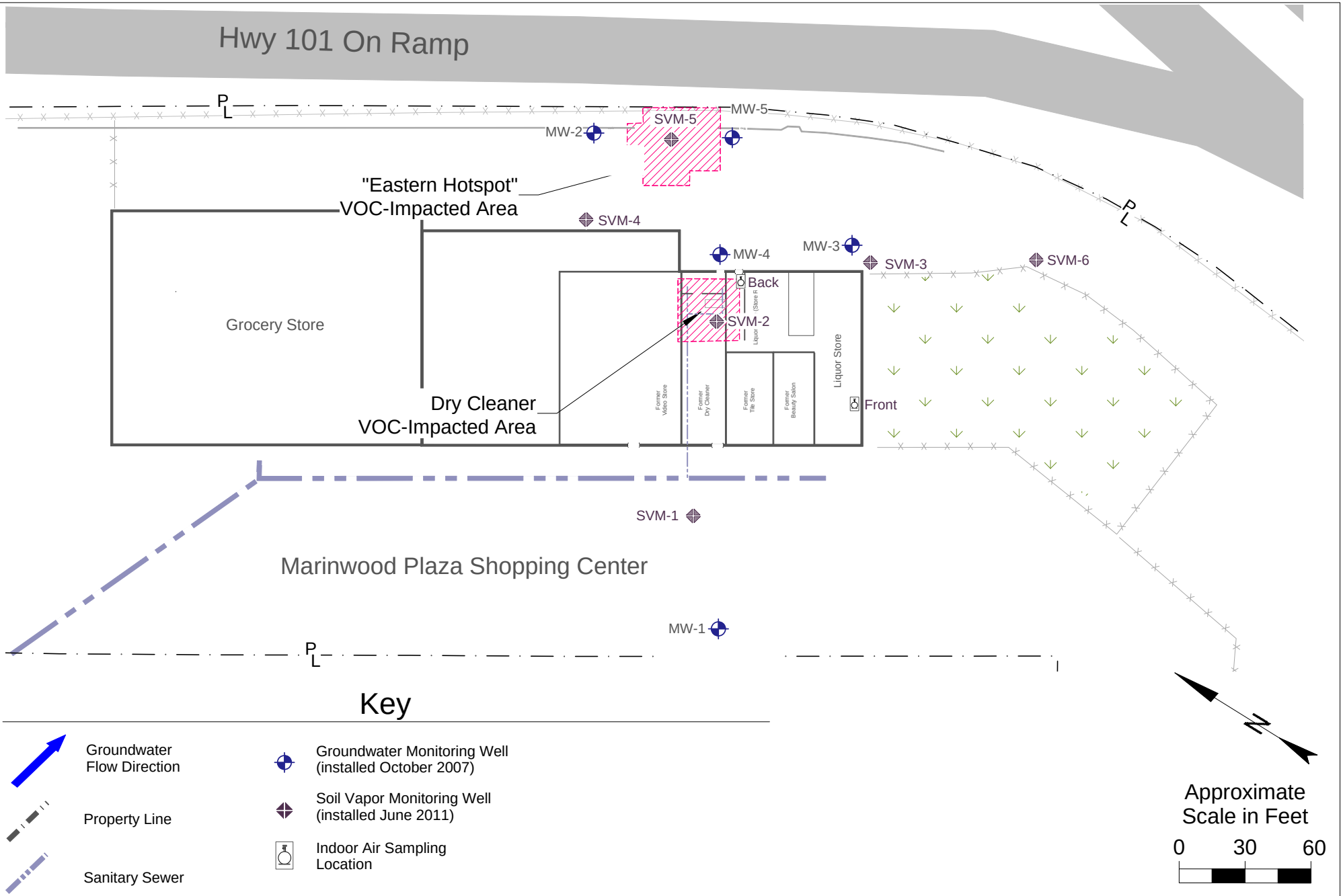
geologica

San Francisco, California

Marinwood Plaza
Dry Cleaner Soil IRM
187 Marinwood Avenue
San Rafael, California

Figure A-1

Site Location



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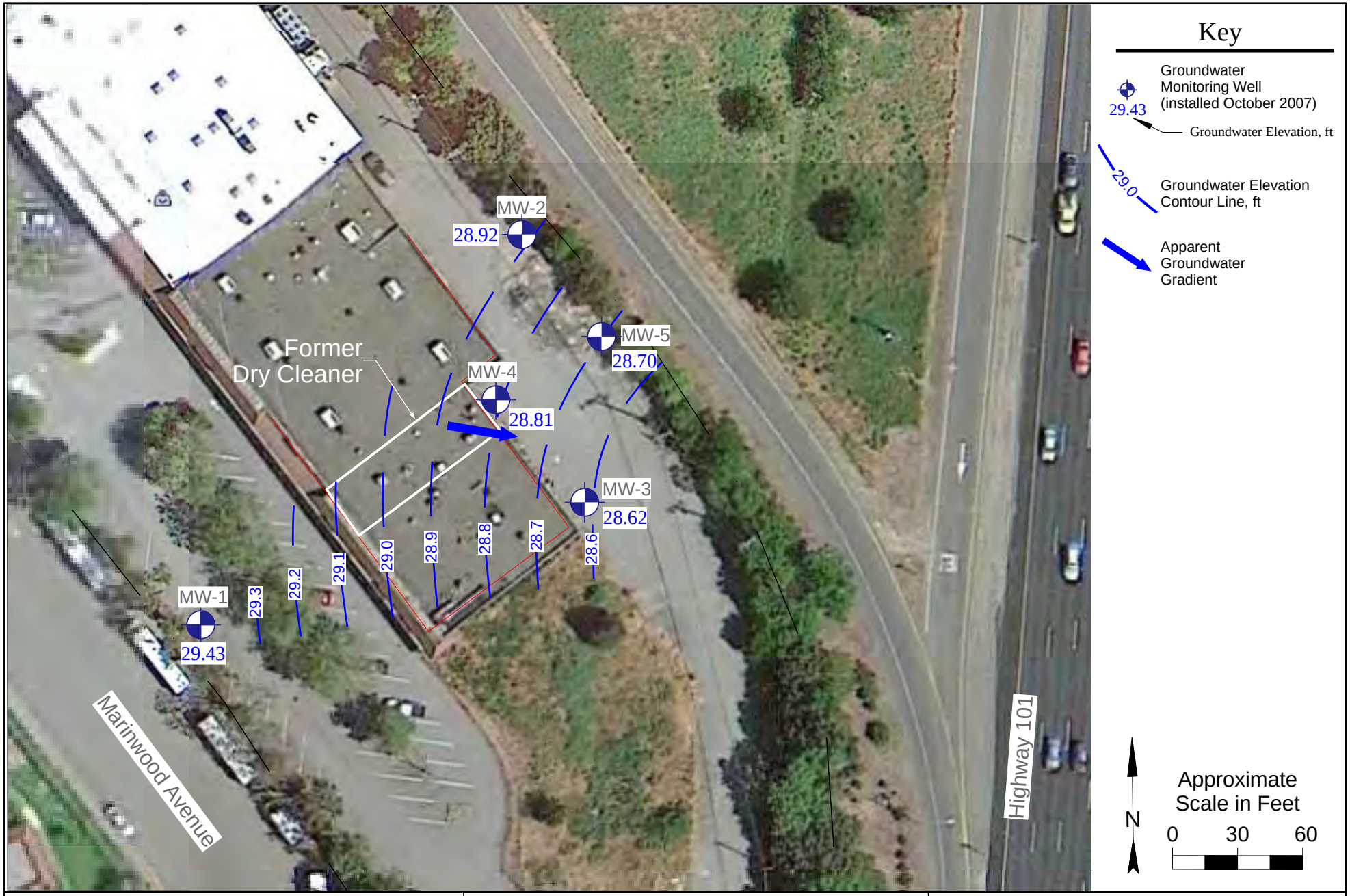
San Francisco, California

Marinwood Plaza
Dry Cleaner Soil IRM
187 Marinwood Avenue
San Rafael, California

Figure A-2

Environmental Monitoring Locations



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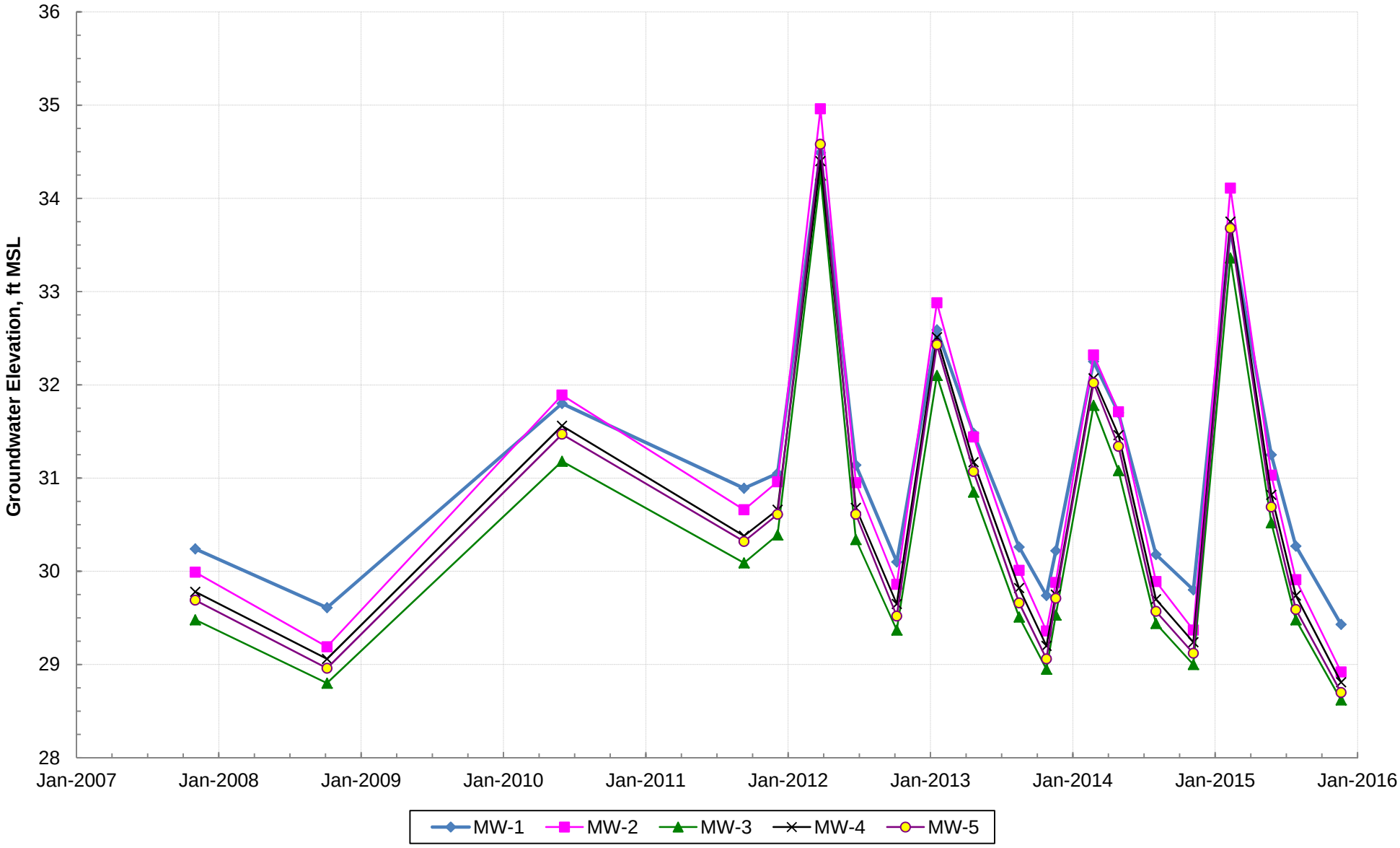
Oakland, California

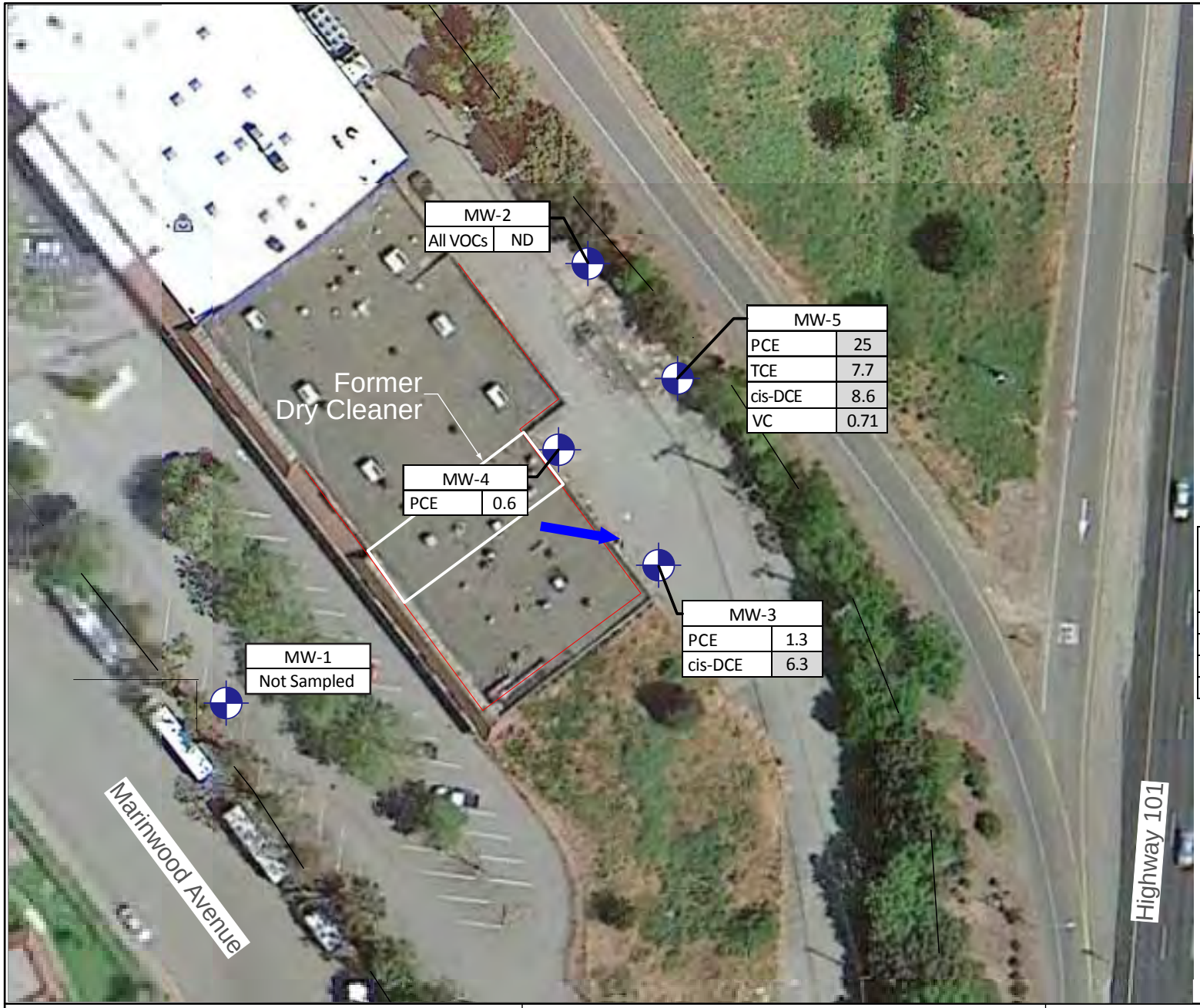
Marinwood Plaza/
Former Prosperity Cleaners
187 Marinwood Avenue
San Rafael, California

Figure A-3

Groundwater Elevation Contour Map
November 2015

Figure A-4: Groundwater Monitoring Wells Hydrographs





Key

Groundwater Monitoring Well (installed October 2007)

Apparent Groundwater Gradient

1.3 Analyte concentration in groundwater micrograms per liter (ug/L)

6.3 Analyte concentration greater than Site Cleanup Level

Only analytes detected in one or more groundwater samples posted

ND Not detected

Constituent	Site Cleanup Levels
Tetracloroethene (PCE)	5
Trichloroethene (TCE)	5
cis-1,2-dichloroethene (cis-DCE)	6
trans-1,2-dichloroethene (trans-DCE)	10
Vinyl Chloride (VC)	0.5

N

Approximate Scale in Feet

0 30 60

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Oakland, California

Marinwood Plaza/ Former Prosperity Cleaners

187 Marinwood Avenue
San Rafael, California

Figure A-5

Distribution of VOC Detections in Groundwater Monitoring Wells
November 2015

Figure A-6: VOC Detections in Groundwater Monitoring Well MW-3

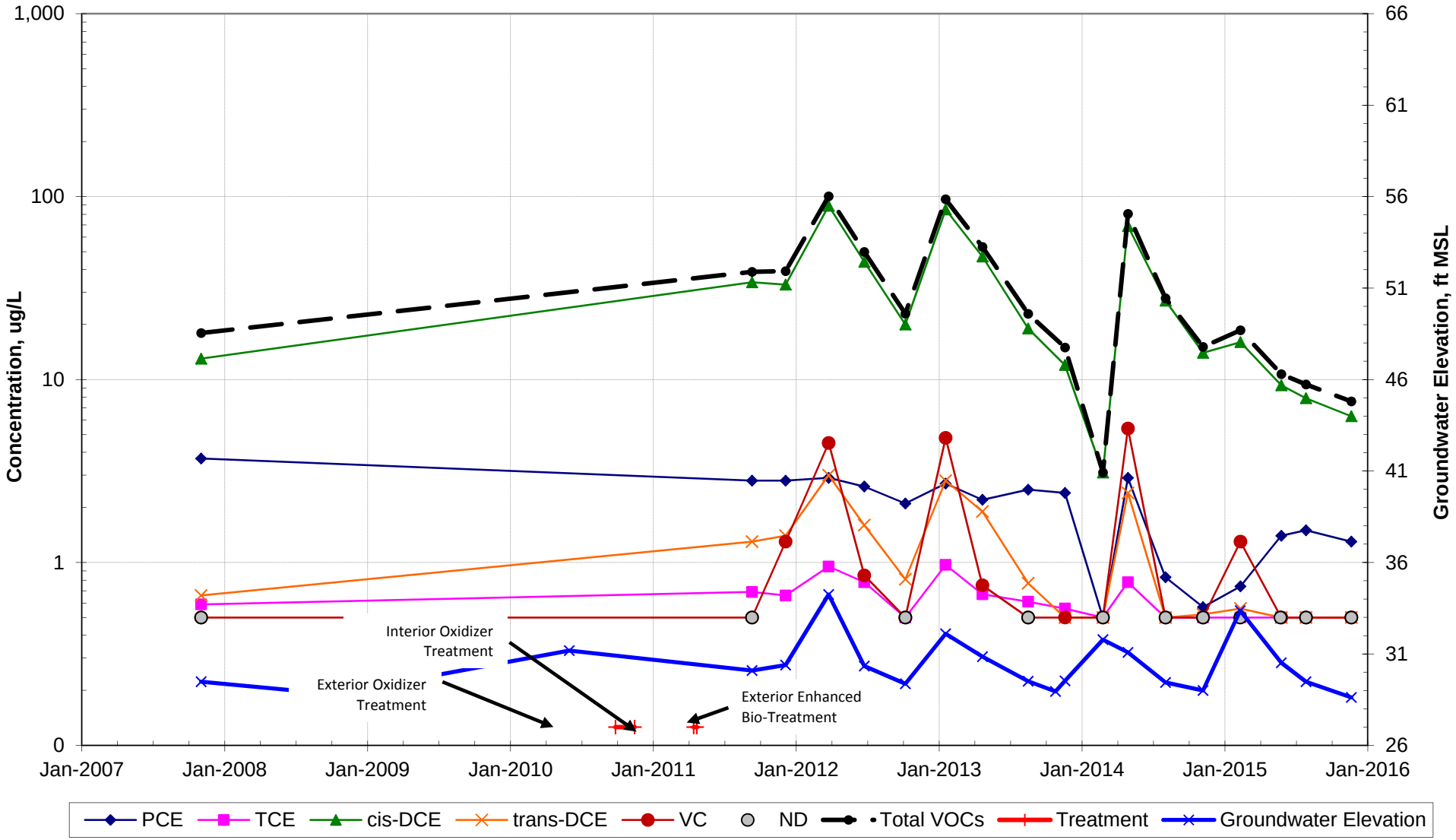


Figure A-7: VOC Detections in Groundwater Monitoring Well MW-4

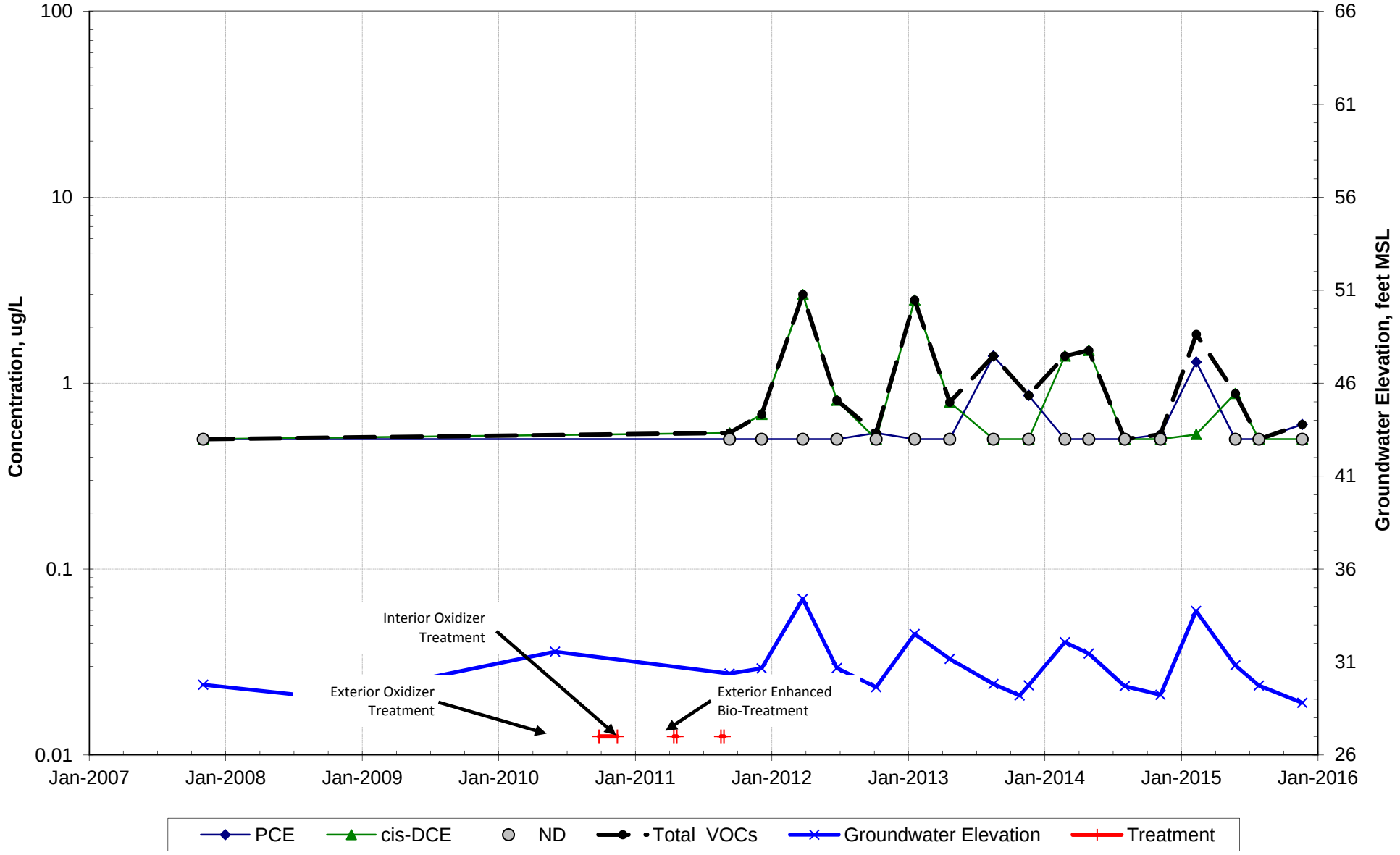


Figure A-8: VOC Detections in Groundwater Monitoring Well MW-5

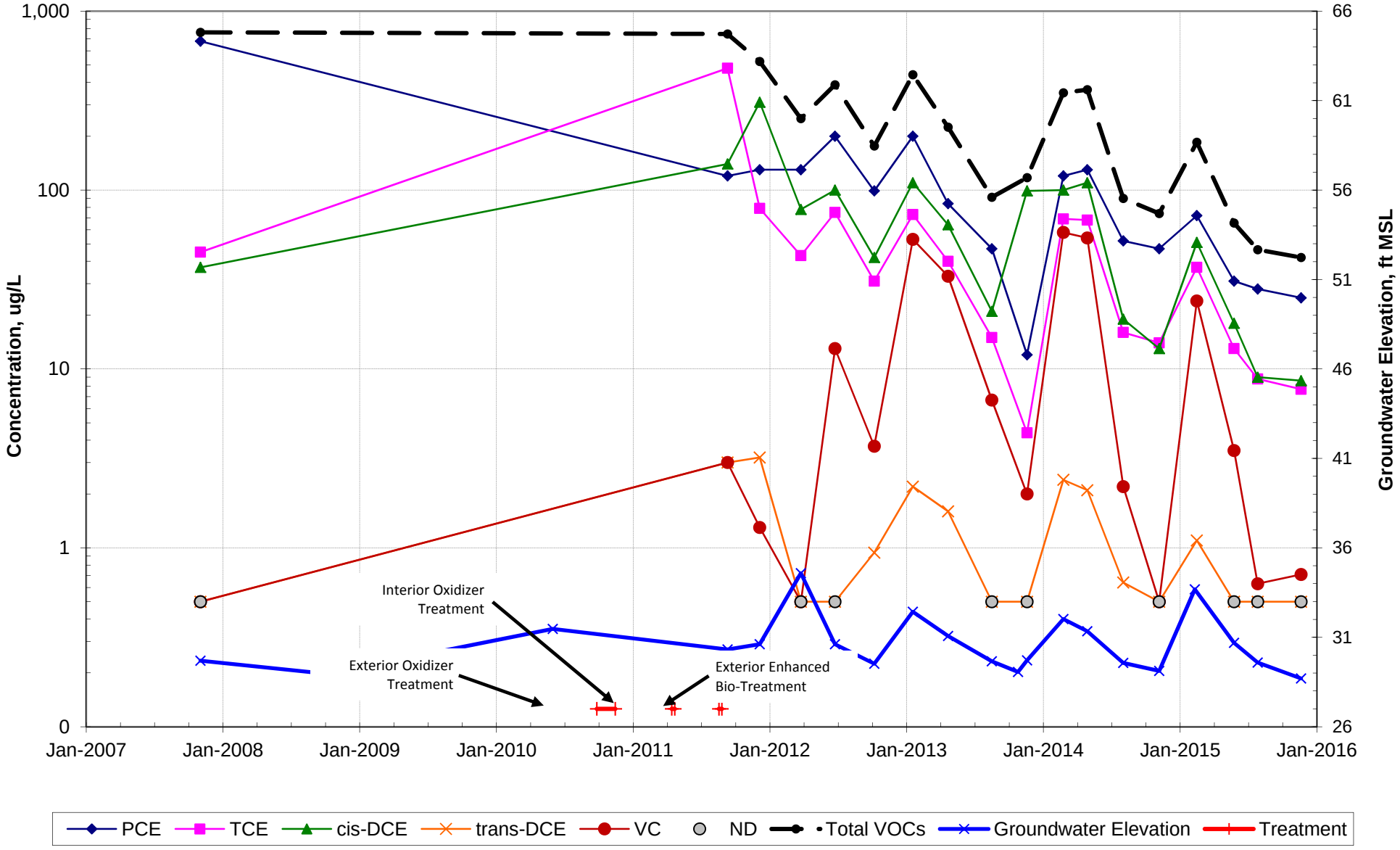
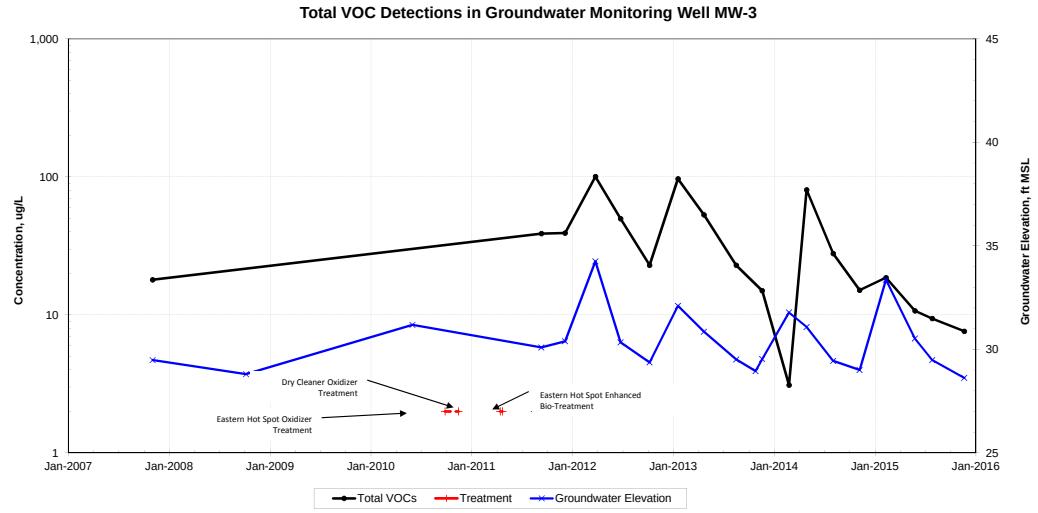
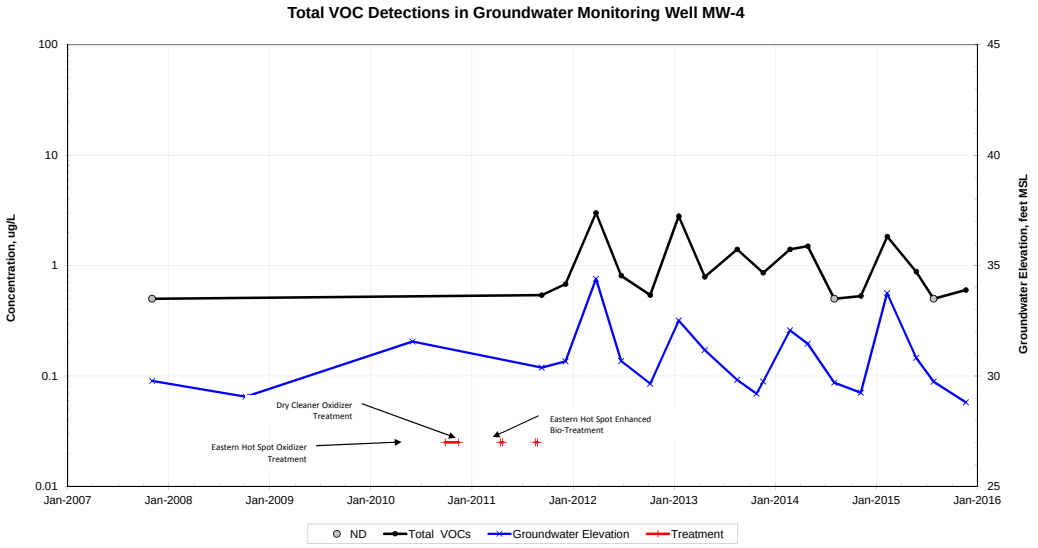
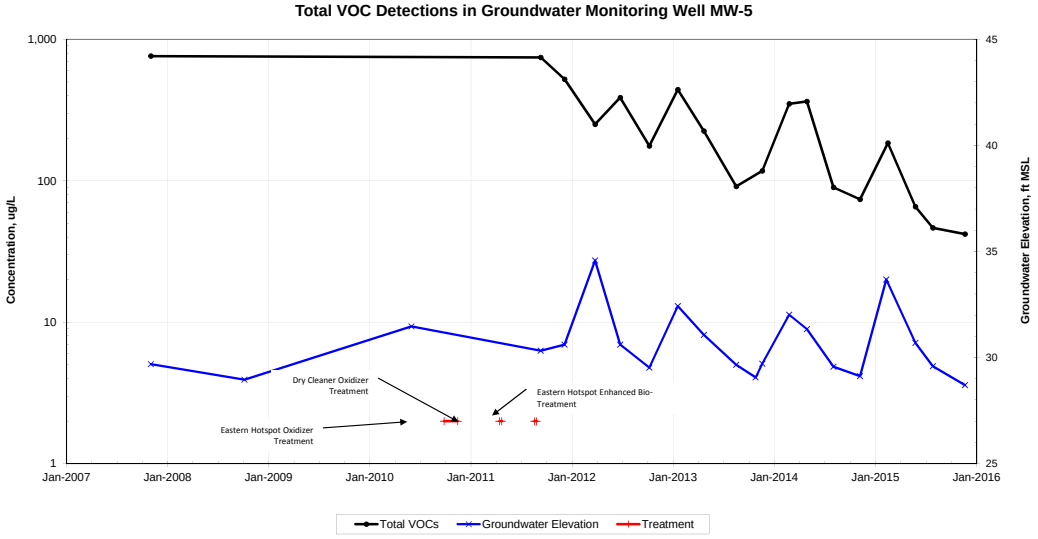


Figure A-9: Total VOC Detections in Groundwater Monitoring Wells MW-3 through MW-5







***Total VOCs = Sum of detected concentrations of tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride**

Key

- Groundwater Monitoring Well (installed October 2007)
- Soil Vapor Monitoring Well (Installed June 2011)
- 34 — Analyte concentration in soil vapor micrograms per cubic meter (ug/m3)
- 410 — Analyte concentration greater than Site Cleanup Level

Only analytes detected in one or more or more soil vapor samples posted

Constituent	Residential Site Cleanup Levels
Tetracloroethene (PCE)	210
Trichloroethene (TCE)	300
cis-1,2-dichloroethene (cis-DCE)	3,700

N

Approximate Scale in Feet

0 30 60

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Oakland, California

Marinwood Plaza/ Former Prosperity Cleaners

187 Marinwood Avenue
San Rafael, California

Figure A-10

VOC Detections in Soil Vapor Monitoring Wells
November 2015

Figure A-11: VOC Detections in Soil Vapor Monitoring Well SVM-1

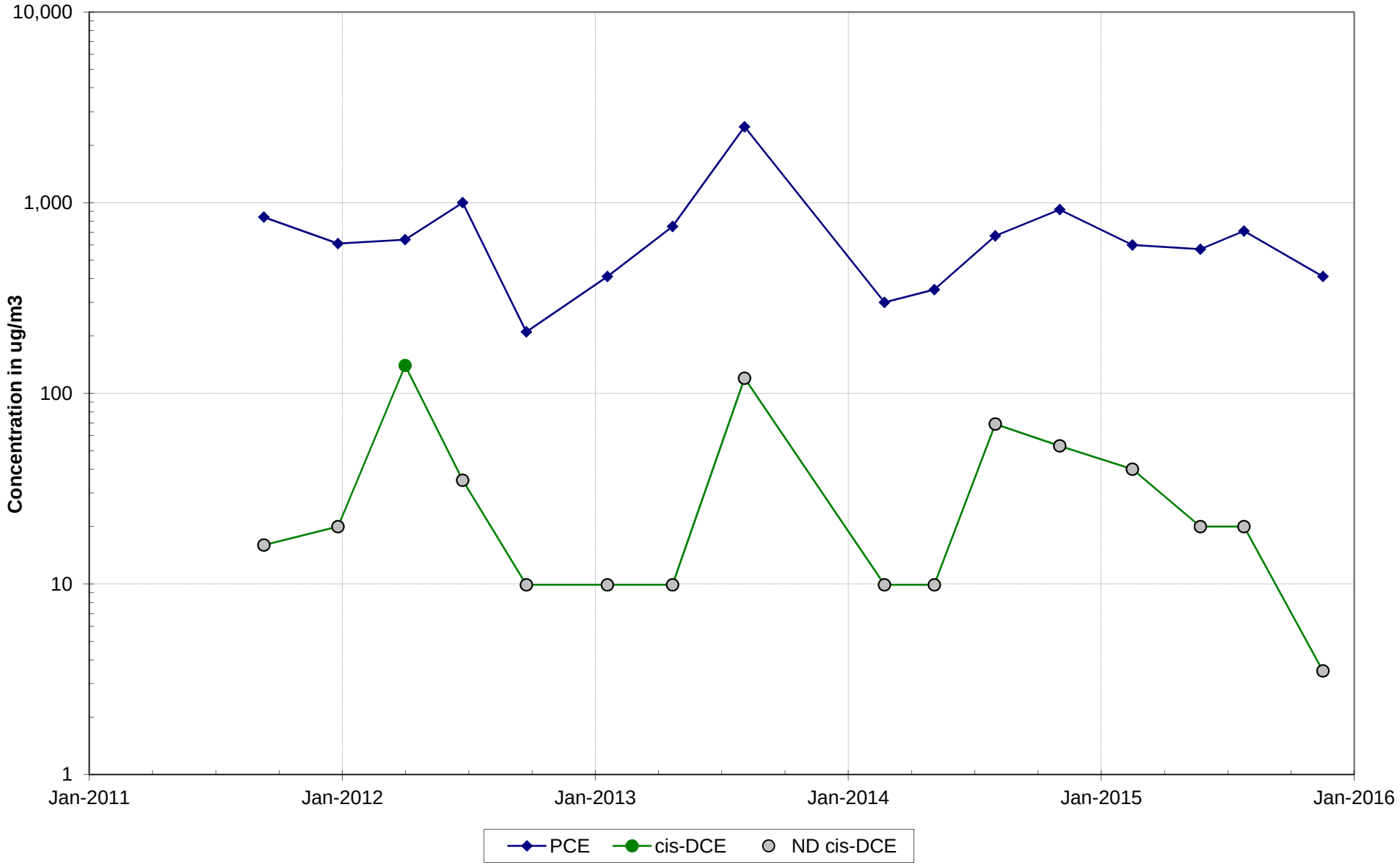


Figure A-12: VOC Detections in Soil Vapor Monitoring Well SVM-2

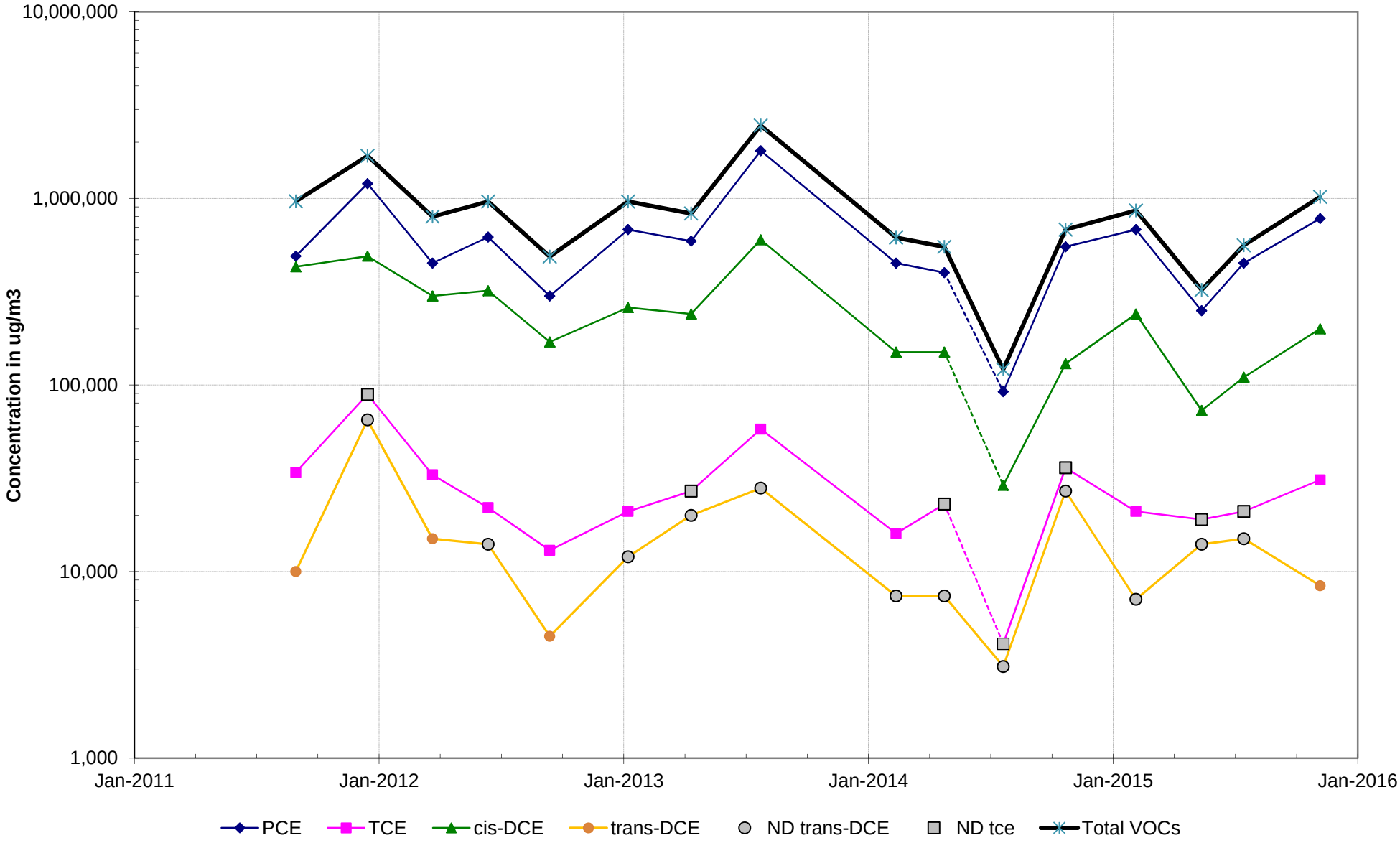


Figure A-13: VOC Detections in Soil Vapor Monitoring Well Well SVM-3

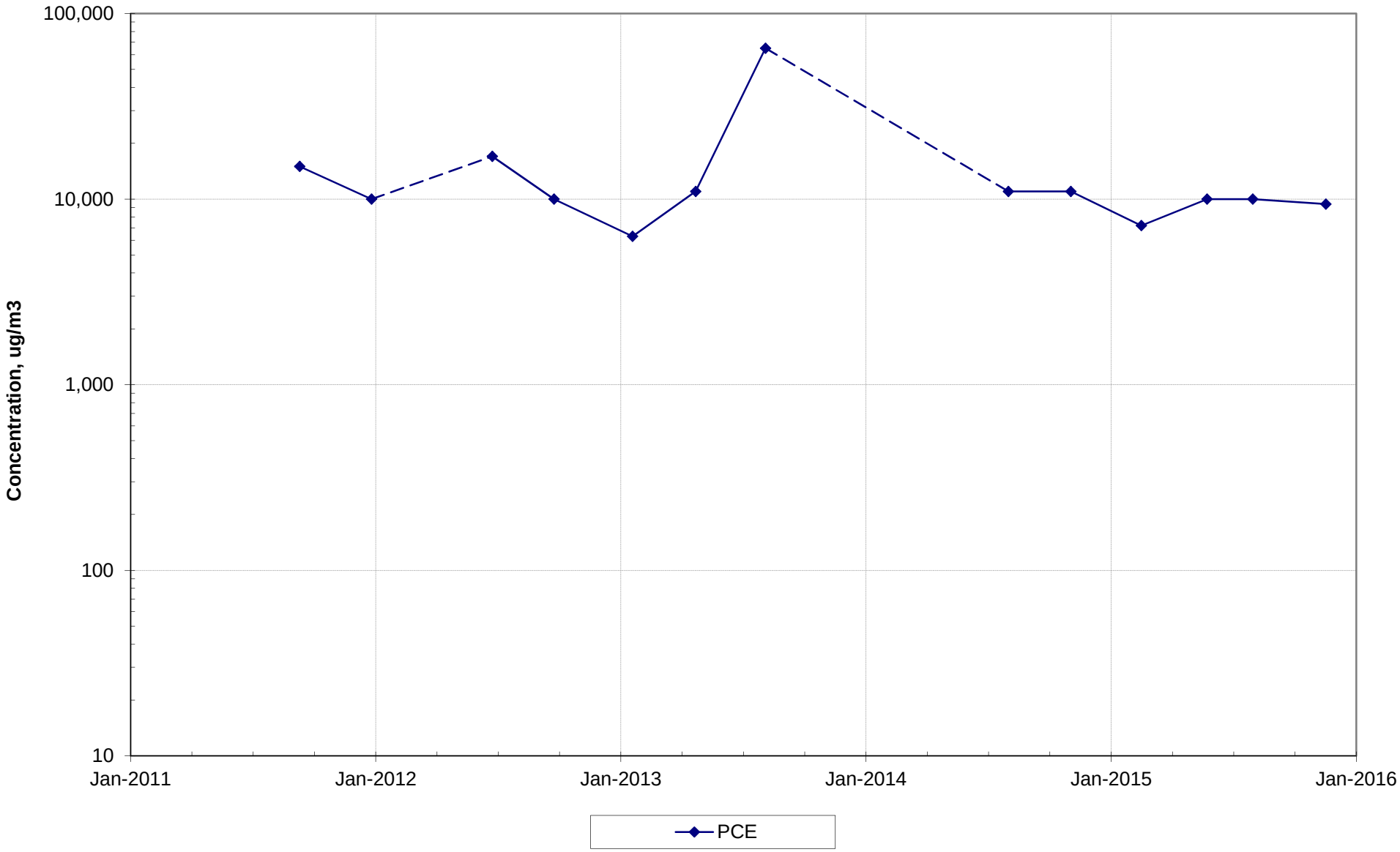


Figure A-14: VOC Detections in Soil Vapor Monitoring Well SVM-4

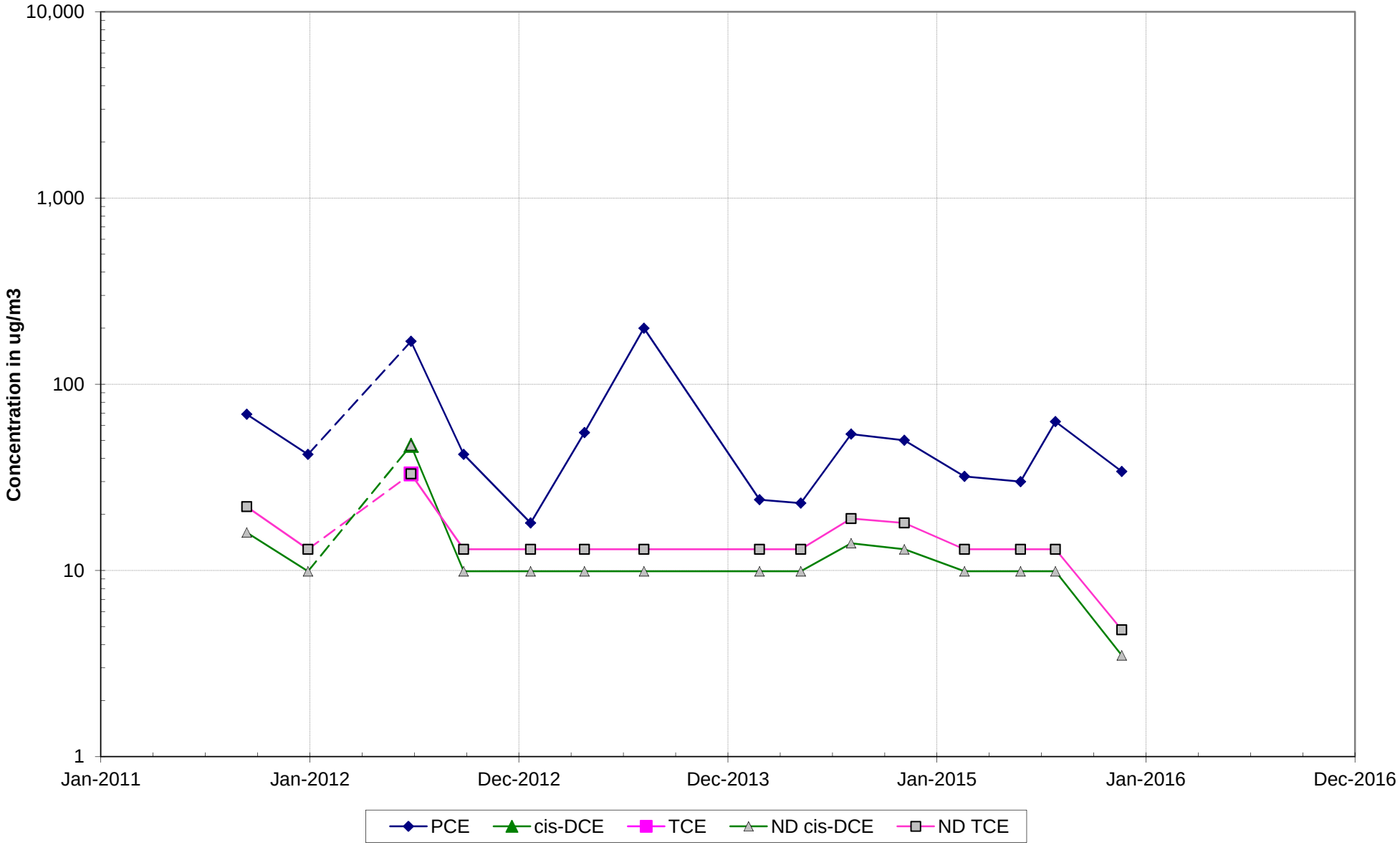


Figure A-15: VOC Detections in Soil Vapor Monitoring Well SVM-5

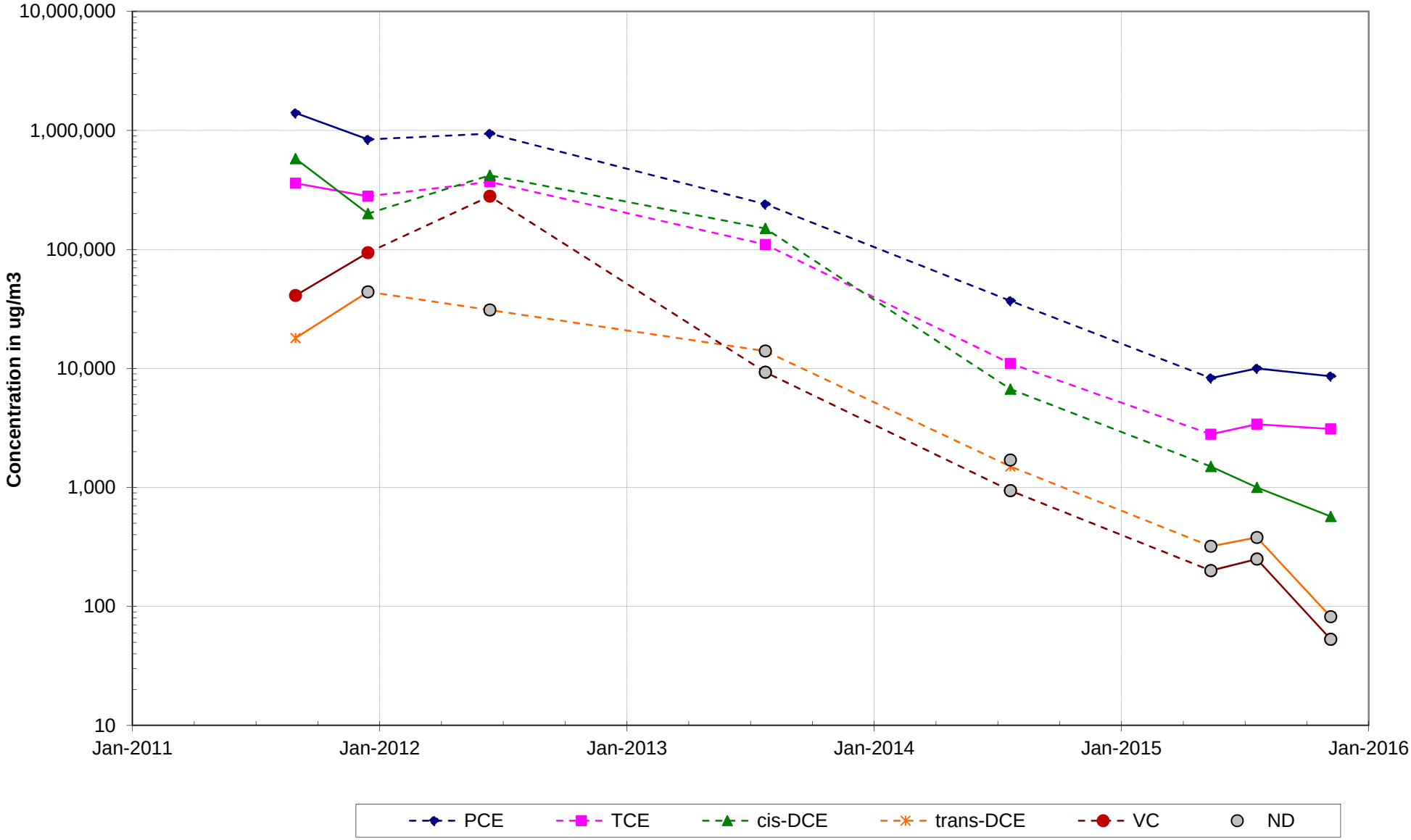


Figure A-16: VOC Detections in Soil Vapor Monitoring Well SVM-6

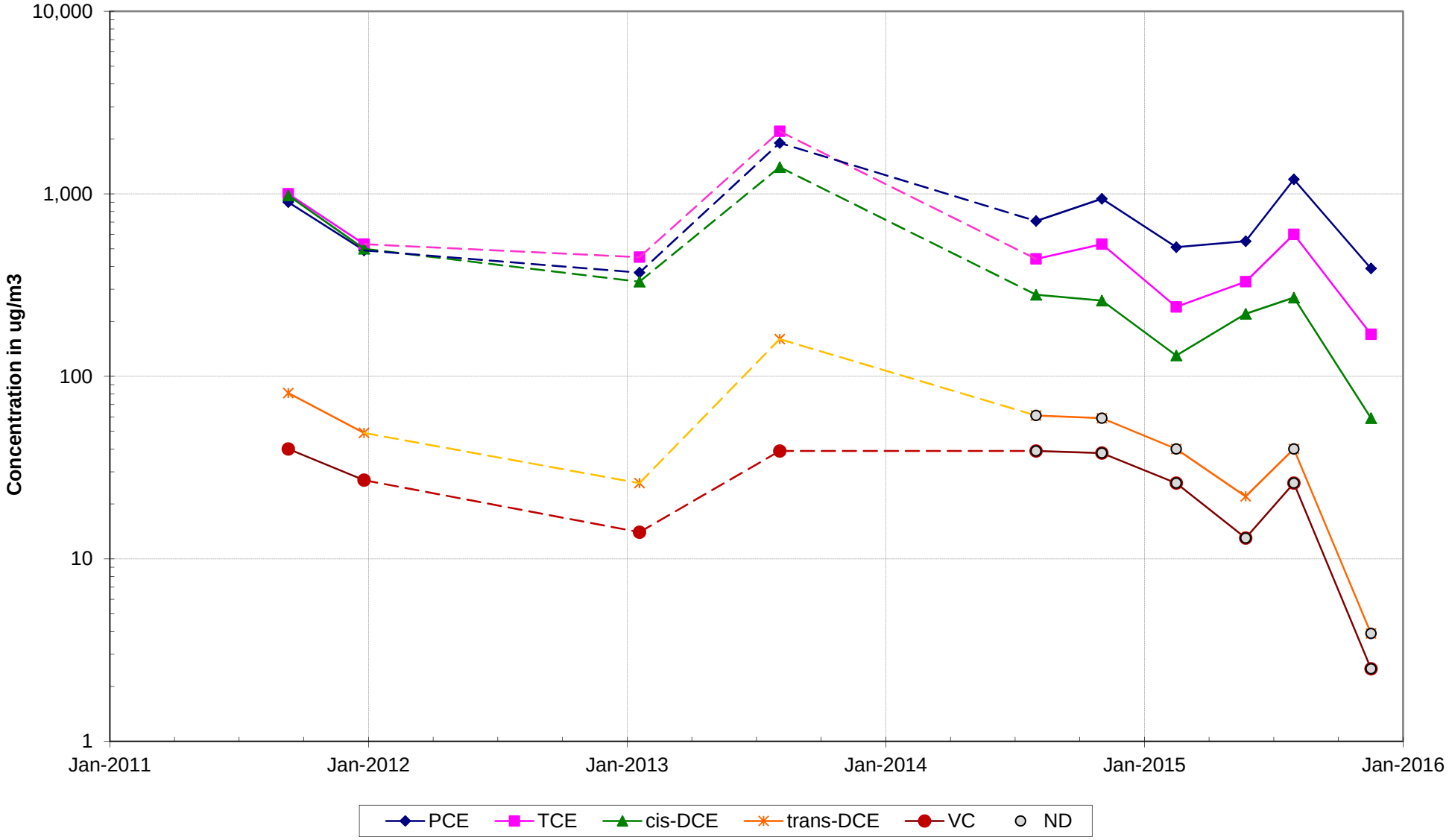
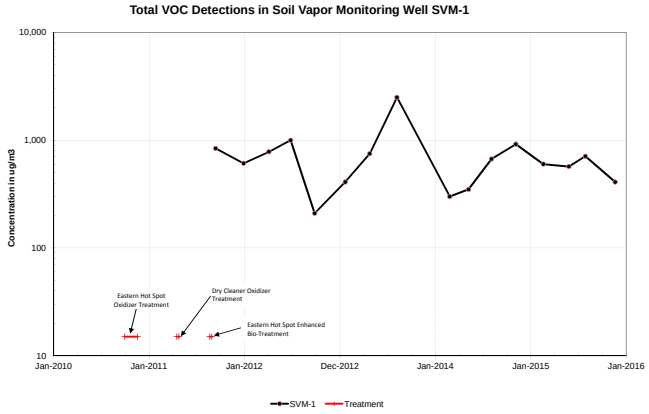
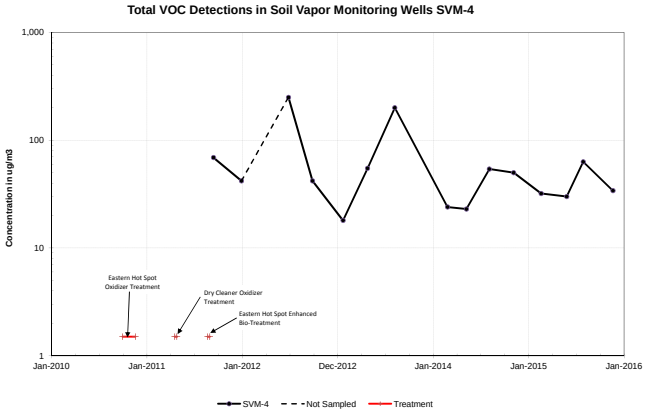
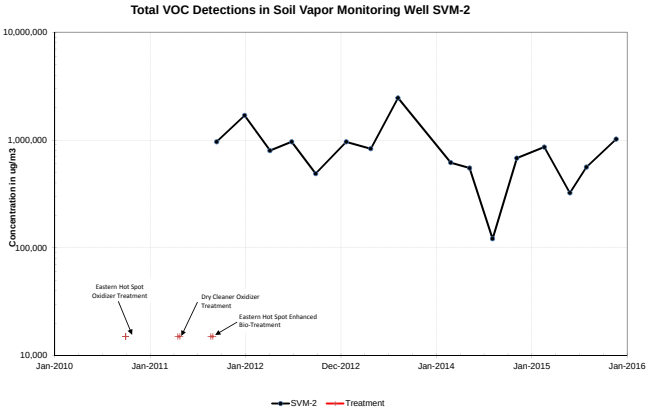
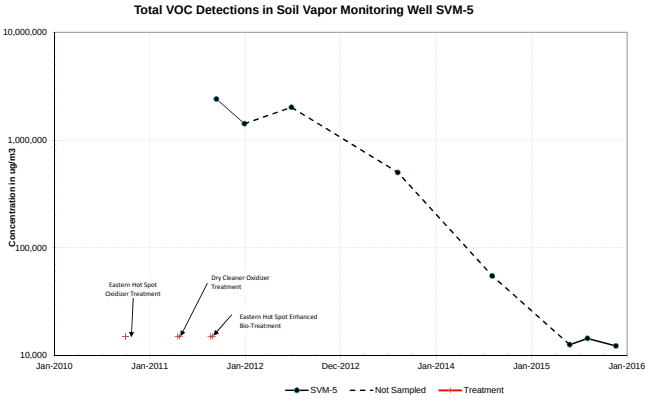


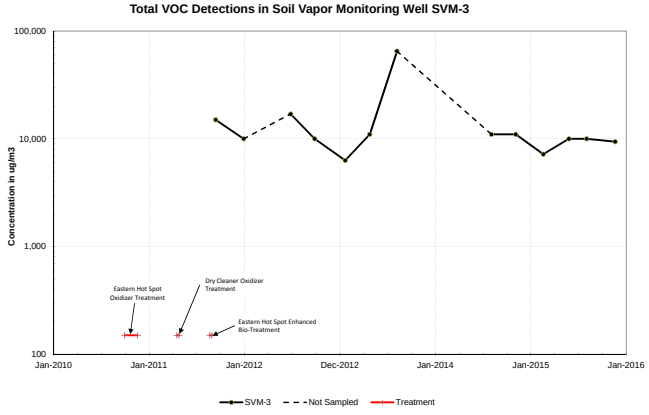
Figure A-17: Total VOC Dectections in Soil Vapor Monitoring Wells SVM-1 through SVM-6

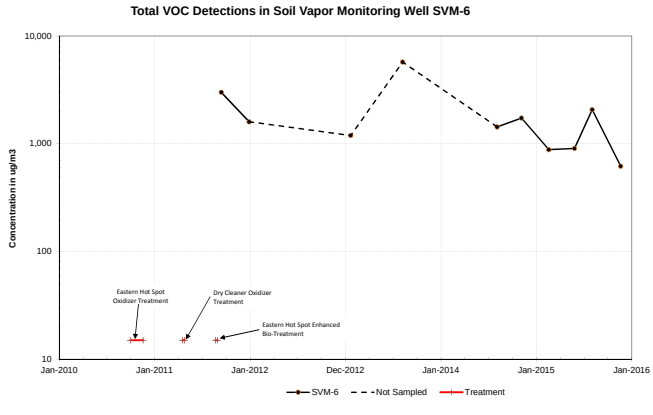






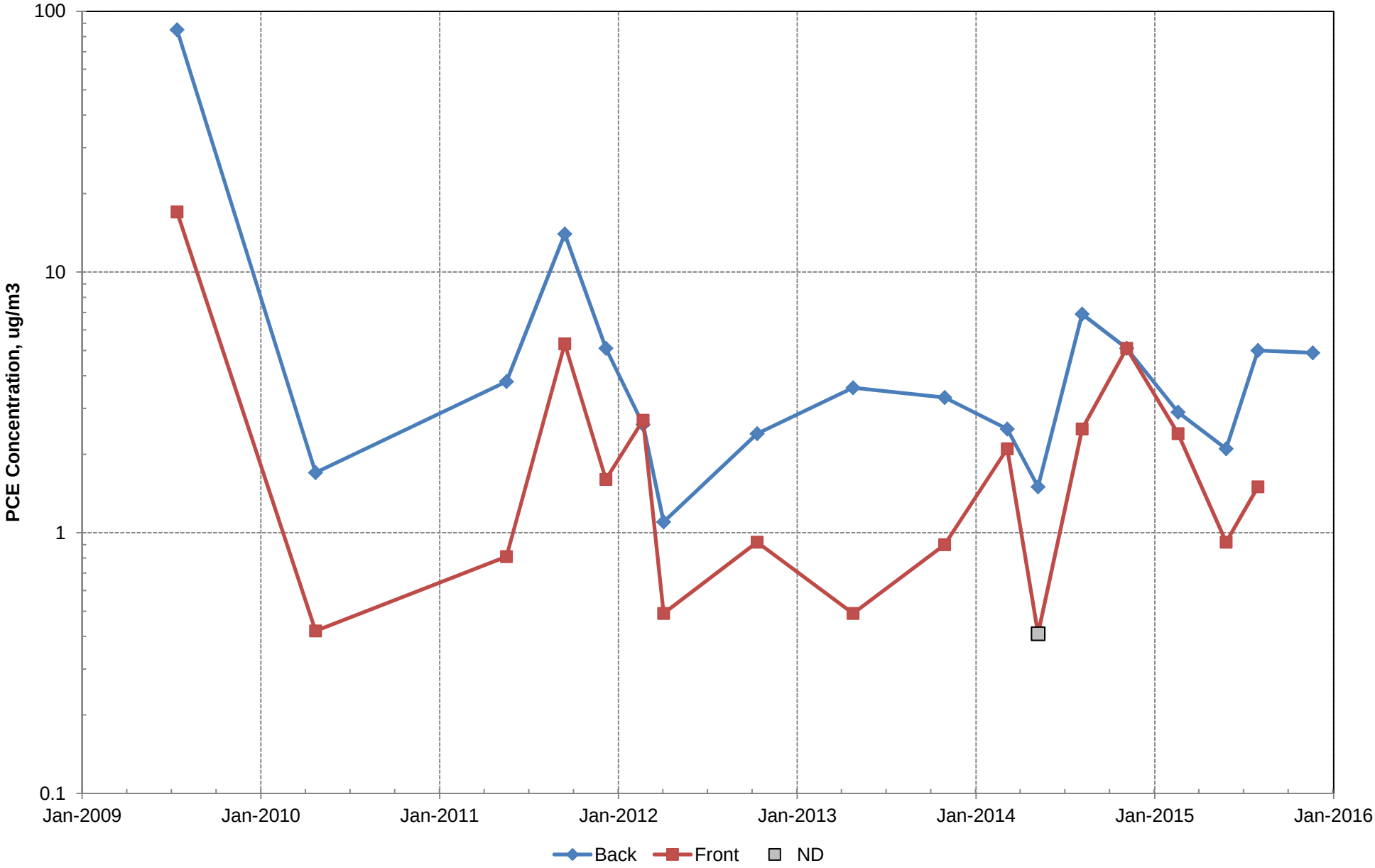






*Total VOCs = Sum of detected concentrations of tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride

Figure A-18: PCE Detections in Indoor Air Samples



ATTACHMENT A

Laboratory Analytical Testing Reports


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 271871
ANALYTICAL REPORT

Geologica	Project : MARINWOOD CLEANERS
594 Howard Street	Location : Marinwood Cleaners
San Francisco, CA 94105	Level : III

Sample ID	Lab ID
SVM-1	271871-001
SVM-2	271871-002
SVM-3	271871-003
SVM-4	271871-004
SVM-5	271871-005
SVM-6	271871-006
FRONT	271871-007
BACK	271871-008

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 12/17/2015

Mike Dahlquist
Project Manager
mike.dahlquist@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**271871**
Client:	**Geologica**
Project:	**MARINWOOD CLEANERS**
Location:	**Marinwood Cleaners**
Request Date:	**11/23/15**
Samples Received:	**11/23/15**

This data package contains sample and QC results for eight air samples, requested for the above referenced project on 11/23/15. See attached cooler receipt form for any sample receipt problems or discrepancies.

Volatile Organics in Air by MS (EPA TO-15):

High responses were observed for hexachlorobutadiene, naphthalene, and 1,2,4-trichlorobenzene in the CCV analyzed 12/01/15 11:28; these analytes were not detected at or above the RL in the associated samples, and affected data was qualified with "b".

Low response was observed for isopropanol in the CCV analyzed 11/30/15 10:29; affected data was qualified with "b". High responses were observed for hexachlorobutadiene, naphthalene, and 1,2,4-trichlorobenzene; these analytes were not detected at or above the RL in the associated samples, and affected data was qualified with "b".

High responses were observed for hexachlorobutadiene, naphthalene, and 1,2,4-trichlorobenzene in the CCV analyzed 12/02/15 10:37; these analytes were not detected at or above the RL in the associated samples, and affected data was qualified with "b".

Low recoveries were observed for isopropanol in the BS/BSD for batch 229891; the associated RPD was within limits, and these low recoveries were not associated with any reported results. High recoveries were observed for hexachlorobutadiene, naphthalene, and 1,2,4-trichlorobenzene; the associated RPDs were within limits, and these analytes were not detected at or above the RL in the associated samples.

High recoveries were observed for hexachlorobutadiene, naphthalene, and 1,2,4-trichlorobenzene in the BS/BSD for batch 229948; the associated RPDs were within limits, and these analytes were not detected at or above the RL in the associated samples.

High recoveries were observed for hexachlorobutadiene, naphthalene, and 1,2,4-trichlorobenzene in the BS/BSD for batch 229988; the associated RPDs were within limits, and these analytes were not detected at or above the RL in the associated sample.

No other analytical problems were encountered.

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**271871**
Client:	**Geologica**
Project:	**MARINWOOD CLEANERS**
Location:	**Marinwood Cleaners**
Request Date:	**11/23/15**
Samples Received:	**11/23/15**

Volatile Organics in Air (EPA TO-15 SIM):

ALS (formerly Columbia) in Simi Valley, CA performed the analysis (NELAP certified). Please see the ALS (formerly Columbia) case narrative.

Chain of Custody

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street

Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

AIR TESTING CHAIN OF CUSTODY
& PURCHASE ORDER

Page 1 of 1
Chain of Custody # : 1

C&T LOGIN # 27187

Project No: MARINWOOD CLEANERS 001 Sampler: E Mule
Project Name: MARINWOOD CLEANERS Report To: DAN MATTHEWS
EDD Format: _____ Rpt Level: II III IV Company: GEOLOGICA
Turnaround Time: ☐ RUSH _____ ☒ Standard Telephone: 415-597-7888
Email: dmatthews@geologicagroup.com

Lab No.	Sample ID.	Sampling Information: Date Collected	Time Collected	Canister ID (Bar Code #)	Flow Controller ID	Sample Volume (Gauge Reading)	TESTING REQUESTED: TO-15	TO-15 SIMS ~~TO-3M: C6-C12 GRO~~ REPORT PCE, TCE, 1,1-DCE cis-DCE, TRANS-DCE, VC ONLY	TO-3M: C1-C6 Hydrocarbons	D1946: (Please Circle Targets) H_2 He N_2 O_2 CO CO_2 CH_4	
1	SVM-1	11-20-15	1000	79	~~#~~ 222	4	X				ISOPROPYL ALCOHOL LEAK CHECK
2	SVM-2	↓	1345	380	187	5	↓				
3	SVM-3		1052	386	229	4.5					
4	SVM-4		1303	397	186	4					
5	SVM-5		1224	253	183	5					
6	SVM-6	↓	1137	150	212	4.5	↓				
				EM 11/20							
7	FRONT	11-20-15	1747	~~#~~ 038	044	2		X			
8	BACK	↓	1745	429	109	4.5		X			

Notes:

RELINQUISHED BY: E Mule 11-23-15 905 DATE/TIME
DATE/TIME
DATE/TIME

RECEIVED BY: 11/23/15 0905 DATE/TIME
DATE/TIME
DATE/TIME

COOLER RECEIPT CHECKLIST Curtis & Tompkins, Ltd.

Login # 27187 Date Received 11/23/15 Number of coolers 0
Client Geologica Project Marinwood Cleaners

Date Opened 11/23/15 By (print) AAI (sign)
Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
   Shipping info
2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☑ NO
   How many Name Date
2B. Were custody seals intact upon arrival? YES NO (N/A)
3. Were custody papers dry and intact when received? (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) (YES) NO
6. Indicate the packing in cooler: (if other, describe)

   ☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☐ None
   ☐ Cloth material ☑ Cardboard ☐ Styrofoam ☐ Paper towels
7. Temperature documentation: * Notify PM if temperature exceeds 6°C

   Type of ice used: ☐ Wet ☐ Blue/Gel ☑ None Temp(°C)

   ☐ Samples Received on ice & cold without a temperature blank

   ☐ Samples received on ice directly from the field. Cooling process had begun
8. Were Method 5035 sampling containers present? YES (NO)
   If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? (YES) NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? (YES) NO
12. Are sample labels present, in good condition and complete? (YES) NO
13. Do the sample labels agree with custody papers? (YES) NO
14. Was sufficient amount of sample sent for tests requested? (YES) NO
15. Are the samples appropriately preserved? YES NO (N/A)
16. Did you check preservatives for all bottles for each sample? YES NO (N/A)
17. Did you document your preservative check? YES NO (N/A)
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? YES NO (N/A)
21. Was the client contacted concerning this sample delivery? YES (NO)
   If YES, Who was called? By Date:

COMMENTS

Rev 9, 10/11

Curtis & Tompkins, Ltd.

Detections Summary for 271871

Results for any subcontracted analyses are not included in this summary.

Client : Geologica
Project : MARINWOOD CLEANERS
Location : Marinwood Cleaners

Client Sample ID : SVM-1 Laboratory Sample ID : 271871-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
n-Hexane	36		0.88	ppbv	As Recd	1.750	EPA TO-15	METHOD
Chloroform	3.5		0.88	ppbv	As Recd	1.750	EPA TO-15	METHOD
Benzene	1.8		0.88	ppbv	As Recd	1.750	EPA TO-15	METHOD
n-Heptane	21		0.88	ppbv	As Recd	1.750	EPA TO-15	METHOD
Tetrachloroethene	60		0.88	ppbv	As Recd	1.750	EPA TO-15	METHOD

Client Sample ID : SVM-2 Laboratory Sample ID : 271871-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
trans-1,2-Dichloroethene	2,100		1,100	ppbv	As Recd	2256	EPA TO-15	METHOD
cis-1,2-Dichloroethene	50,000		1,100	ppbv	As Recd	2256	EPA TO-15	METHOD
Trichloroethene	5,800		1,100	ppbv	As Recd	2256	EPA TO-15	METHOD
Tetrachloroethene	110,000		1,100	ppbv	As Recd	2256	EPA TO-15	METHOD

Client Sample ID : SVM-3 Laboratory Sample ID : 271871-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Tetrachloroethene	1,400		11	ppbv	As Recd	21.72	EPA TO-15	METHOD

Client Sample ID : SVM-4 Laboratory Sample ID : 271871-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Tetrachloroethene	5.0		0.90	ppbv	As Recd	1.790	EPA TO-15	METHOD

Client Sample ID : SVM-5 Laboratory Sample ID : 271871-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
cis-1,2-Dichloroethene	140		21	ppbv	As Recd	41.60	EPA TO-15	METHOD
Trichloroethene	580		21	ppbv	As Recd	41.60	EPA TO-15	METHOD
Tetrachloroethene	1,300		21	ppbv	As Recd	41.60	EPA TO-15	METHOD

Client Sample ID : SVM-6 Laboratory Sample ID : 271871-006

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
cis-1,2-Dichloroethene	15		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
Trichloroethene	32		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
Tetrachloroethene	57		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD

Client Sample ID : FRONT Laboratory Sample ID : 271871-007

No Detections

Client Sample ID : BACK Laboratory Sample ID : 271871-008

No Detections

Laboratory Job Number 271871

ANALYTICAL REPORT

Volatile Organics in Air by MS

Matrix: Air

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-1	Diln Fac:	1.750
Lab ID:	271871-001	Batch#:	229948
Matrix:	Air	Sampled:	11/20/15
Units (V):	ppbv	Received:	11/23/15
Units (M):	ug/m3	Analyzed:	12/01/15

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.88	ND	4.3
Freon 114	ND	0.88	ND	6.1
Chloromethane	ND	0.88	ND	1.8
Vinyl Chloride	ND	0.88	ND	2.2
1,3-Butadiene	ND	0.88	ND	1.9
Bromomethane	ND	0.88	ND	3.4
Chloroethane	ND	0.88	ND	2.3
Trichlorofluoromethane	ND	0.88	ND	4.9
Acrolein	ND	3.5	ND	8.0
1,1-Dichloroethene	ND	0.88	ND	3.5
Freon 113	ND	0.88	ND	6.7
Acetone	ND	3.5	ND	8.3
Carbon Disulfide	ND	0.88	ND	2.7
Isopropanol	ND	3.5	ND	8.6
Methylene Chloride	ND	0.88	ND	3.0
trans-1,2-Dichloroethene	ND	0.88	ND	3.5
MTBE	ND	0.88	ND	3.2
n-Hexane	36	0.88	130	3.1
1,1-Dichloroethane	ND	0.88	ND	3.5
Vinyl Acetate	ND	0.88	ND	3.1
cis-1,2-Dichloroethene	ND	0.88	ND	3.5
2-Butanone	ND	0.88	ND	2.6
Ethyl Acetate	ND	0.88	ND	3.2
Tetrahydrofuran	ND	0.88	ND	2.6
Chloroform	3.5	0.88	17	4.3
1,1,1-Trichloroethane	ND	0.88	ND	4.8
Cyclohexane	ND	0.88	ND	3.0
Carbon Tetrachloride	ND	0.88	ND	5.5
Benzene	1.8	0.88	5.6	2.8
1,2-Dichloroethane	ND	0.88	ND	3.5
n-Heptane	21	0.88	85	3.6
Trichloroethene	ND	0.88	ND	4.7
1,2-Dichloropropane	ND	0.88	ND	4.0
Bromodichloromethane	ND	0.88	ND	5.9
cis-1,3-Dichloropropene	ND	0.88	ND	4.0

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-1	Diln Fac:	1.750
Lab ID:	271871-001	Batch#:	229948
Matrix:	Air	Sampled:	11/20/15
Units (V):	ppbv	Received:	11/23/15
Units (M):	ug/m3	Analyzed:	12/01/15

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.88	ND	3.6
Toluene	ND	0.88	ND	3.3
trans-1,3-Dichloropropene	ND	0.88	ND	4.0
1,1,2-Trichloroethane	ND	0.88	ND	4.8
Tetrachloroethene	60	0.88	410	5.9
2-Hexanone	ND	0.88	ND	3.6
Dibromochloromethane	ND	0.88	ND	7.5
1,2-Dibromoethane	ND	0.88	ND	6.7
Chlorobenzene	ND	0.88	ND	4.0
Ethylbenzene	ND	0.88	ND	3.8
m,p-Xylenes	ND	0.88	ND	3.8
o-Xylene	ND	0.88	ND	3.8
Styrene	ND	0.88	ND	3.7
Bromoform	ND	0.88	ND	9.0
1,1,2,2-Tetrachloroethane	ND	0.88	ND	6.0
4-Ethyltoluene	ND	0.88	ND	4.3
1,3,5-Trimethylbenzene	ND	0.88	ND	4.3
1,2,4-Trimethylbenzene	ND	0.88	ND	4.3
1,3-Dichlorobenzene	ND	0.88	ND	5.3
1,4-Dichlorobenzene	ND	0.88	ND	5.3
Benzyl chloride	ND	0.88	ND	4.5
1,2-Dichlorobenzene	ND	0.88	ND	5.3
1,2,4-Trichlorobenzene	ND	0.88	ND	6.5
Hexachlorobutadiene	ND	0.88	ND	9.3
Naphthalene	ND	3.5	ND	18

Surrogate	%REC	Limits
Bromofluorobenzene	108	80-121

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-2	Units (M):	ug/m3
Lab ID:	271871-002	Sampled:	11/20/15
Matrix:	Air	Received:	11/23/15
Units (V):	ppbv		

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#	Analyzed
Freon 12	ND	1,100	ND	5,600	2,256	229891	12/01/15
Freon 114	ND	1,100	ND	7,900	2,256	229891	12/01/15
Chloromethane	ND	1,100	ND	2,300	2,256	229891	12/01/15
Vinyl Chloride	ND	1,100	ND	2,900	2,256	229891	12/01/15
1,3-Butadiene	ND	1,100	ND	2,500	2,256	229891	12/01/15
Bromomethane	ND	1,100	ND	4,400	2,256	229891	12/01/15
Chloroethane	ND	1,100	ND	3,000	2,256	229891	12/01/15
Trichlorofluoromethane	ND	1,100	ND	6,300	2,256	229891	12/01/15
Acrolein	ND	4,500	ND	10,000	2,256	229891	12/01/15
1,1-Dichloroethene	ND	1,100	ND	4,500	2,256	229891	12/01/15
Freon 113	ND	1,100	ND	8,600	2,256	229891	12/01/15
Acetone	ND	4,500	ND	11,000	2,256	229891	12/01/15
Carbon Disulfide	ND	1,100	ND	3,500	2,256	229891	12/01/15
Isopropanol	ND	7,500	ND	18,000	3,760	229988	12/02/15
Methylene Chloride	ND	1,100	ND	3,900	2,256	229891	12/01/15
trans-1,2-Dichloroethene	2,100	1,100	8,400	4,500	2,256	229891	12/01/15
MTBE	ND	1,100	ND	4,100	2,256	229891	12/01/15
n-Hexane	ND	1,100	ND	4,000	2,256	229891	12/01/15
1,1-Dichloroethane	ND	1,100	ND	4,600	2,256	229891	12/01/15
Vinyl Acetate	ND	1,100	ND	4,000	2,256	229891	12/01/15
cis-1,2-Dichloroethene	50,000	1,100	200,000	4,500	2,256	229891	12/01/15
2-Butanone	ND	1,100	ND	3,300	2,256	229891	12/01/15
Ethyl Acetate	ND	1,100	ND	4,100	2,256	229891	12/01/15
Tetrahydrofuran	ND	1,100	ND	3,300	2,256	229891	12/01/15
Chloroform	ND	1,100	ND	5,500	2,256	229891	12/01/15
1,1,1-Trichloroethane	ND	1,100	ND	6,200	2,256	229891	12/01/15
Cyclohexane	ND	1,100	ND	3,900	2,256	229891	12/01/15
Carbon Tetrachloride	ND	1,100	ND	7,100	2,256	229891	12/01/15
Benzene	ND	1,100	ND	3,600	2,256	229891	12/01/15
1,2-Dichloroethane	ND	1,100	ND	4,600	2,256	229891	12/01/15
n-Heptane	ND	1,100	ND	4,600	2,256	229891	12/01/15
Trichloroethene	5,800	1,100	31,000	6,100	2,256	229891	12/01/15
1,2-Dichloropropane	ND	1,100	ND	5,200	2,256	229891	12/01/15
Bromodichloromethane	ND	1,100	ND	7,600	2,256	229891	12/01/15
cis-1,3-Dichloropropene	ND	1,100	ND	5,100	2,256	229891	12/01/15
4-Methyl-2-Pentanone	ND	1,100	ND	4,600	2,256	229891	12/01/15

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-2	Units (M):	ug/m3
Lab ID:	271871-002	Sampled:	11/20/15
Matrix:	Air	Received:	11/23/15
Units (V):	ppbv		

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#	Analyzed
Toluene	ND	1,100	ND	4,300	2,256	229891	12/01/15
trans-1,3-Dichloropropene	ND	1,100	ND	5,100	2,256	229891	12/01/15
1,1,2-Trichloroethane	ND	1,100	ND	6,200	2,256	229891	12/01/15
Tetrachloroethene	110,000	1,100	780,000	7,700	2,256	229891	12/01/15
2-Hexanone	ND	1,100	ND	4,600	2,256	229891	12/01/15
Dibromochloromethane	ND	1,100	ND	9,600	2,256	229891	12/01/15
1,2-Dibromoethane	ND	1,100	ND	8,700	2,256	229891	12/01/15
Chlorobenzene	ND	1,100	ND	5,200	2,256	229891	12/01/15
Ethylbenzene	ND	1,100	ND	4,900	2,256	229891	12/01/15
m,p-Xylenes	ND	1,100	ND	4,900	2,256	229891	12/01/15
o-Xylene	ND	1,100	ND	4,900	2,256	229891	12/01/15
Styrene	ND	1,100	ND	4,800	2,256	229891	12/01/15
Bromoform	ND	1,100	ND	12,000	2,256	229891	12/01/15
1,1,2,2-Tetrachloroethane	ND	1,100	ND	7,700	2,256	229891	12/01/15
4-Ethyltoluene	ND	1,100	ND	5,500	2,256	229891	12/01/15
1,3,5-Trimethylbenzene	ND	1,100	ND	5,500	2,256	229891	12/01/15
1,2,4-Trimethylbenzene	ND	1,100	ND	5,500	2,256	229891	12/01/15
1,3-Dichlorobenzene	ND	1,100	ND	6,800	2,256	229891	12/01/15
1,4-Dichlorobenzene	ND	1,100	ND	6,800	2,256	229891	12/01/15
Benzyl chloride	ND	1,100	ND	5,800	2,256	229891	12/01/15
1,2-Dichlorobenzene	ND	1,100	ND	6,800	2,256	229891	12/01/15
1,2,4-Trichlorobenzene	ND	1,100	ND	8,400	2,256	229891	12/01/15
Hexachlorobutadiene	ND	1,100	ND	12,000	2,256	229891	12/01/15
Naphthalene	ND	4,500	ND	24,000	2,256	229891	12/01/15

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed
Bromofluorobenzene	100	80-121	2,256	229891	12/01/15

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-3	Units (M):	ug/m3
Lab ID:	271871-003	Sampled:	11/20/15
Matrix:	Air	Received:	11/23/15
Units (V):	ppbv		

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#	Analyzed
Freon 12	ND	11	ND	54	21.72	229891	12/01/15
Freon 114	ND	11	ND	76	21.72	229891	12/01/15
Chloromethane	ND	11	ND	22	21.72	229891	12/01/15
Vinyl Chloride	ND	11	ND	28	21.72	229891	12/01/15
1,3-Butadiene	ND	11	ND	24	21.72	229891	12/01/15
Bromomethane	ND	11	ND	42	21.72	229891	12/01/15
Chloroethane	ND	11	ND	29	21.72	229891	12/01/15
Trichlorofluoromethane	ND	11	ND	61	21.72	229891	12/01/15
Acrolein	ND	43	ND	100	21.72	229891	12/01/15
1,1-Dichloroethene	ND	11	ND	43	21.72	229891	12/01/15
Freon 113	ND	11	ND	83	21.72	229891	12/01/15
Acetone	ND	43	ND	100	21.72	229891	12/01/15
Carbon Disulfide	ND	11	ND	34	21.72	229891	12/01/15
Isopropanol	ND	72	ND	180	36.20	229988	12/02/15
Methylene Chloride	ND	11	ND	38	21.72	229891	12/01/15
trans-1,2-Dichloroethene	ND	11	ND	43	21.72	229891	12/01/15
MTBE	ND	11	ND	39	21.72	229891	12/01/15
n-Hexane	ND	11	ND	38	21.72	229891	12/01/15
1,1-Dichloroethane	ND	11	ND	44	21.72	229891	12/01/15
Vinyl Acetate	ND	11	ND	38	21.72	229891	12/01/15
cis-1,2-Dichloroethene	ND	11	ND	43	21.72	229891	12/01/15
2-Butanone	ND	11	ND	32	21.72	229891	12/01/15
Ethyl Acetate	ND	11	ND	39	21.72	229891	12/01/15
Tetrahydrofuran	ND	11	ND	32	21.72	229891	12/01/15
Chloroform	ND	11	ND	53	21.72	229891	12/01/15
1,1,1-Trichloroethane	ND	11	ND	59	21.72	229891	12/01/15
Cyclohexane	ND	11	ND	37	21.72	229891	12/01/15
Carbon Tetrachloride	ND	11	ND	68	21.72	229891	12/01/15
Benzene	ND	11	ND	35	21.72	229891	12/01/15
1,2-Dichloroethane	ND	11	ND	44	21.72	229891	12/01/15
n-Heptane	ND	11	ND	45	21.72	229891	12/01/15
Trichloroethene	ND	11	ND	58	21.72	229891	12/01/15
1,2-Dichloropropane	ND	11	ND	50	21.72	229891	12/01/15
Bromodichloromethane	ND	11	ND	73	21.72	229891	12/01/15
cis-1,3-Dichloropropene	ND	11	ND	49	21.72	229891	12/01/15
4-Methyl-2-Pentanone	ND	11	ND	44	21.72	229891	12/01/15

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-3	Units (M):	ug/m3
Lab ID:	271871-003	Sampled:	11/20/15
Matrix:	Air	Received:	11/23/15
Units (V):	ppbv		

Analyte	Result (V)	RL	Result (M)	RL	Diln Fac	Batch#	Analyzed
Toluene	ND	11	ND	41	21.72	229891	12/01/15
trans-1,3-Dichloropropene	ND	11	ND	49	21.72	229891	12/01/15
1,1,2-Trichloroethane	ND	11	ND	59	21.72	229891	12/01/15
Tetrachloroethene	1,400	11	9,400	74	21.72	229891	12/01/15
2-Hexanone	ND	11	ND	44	21.72	229891	12/01/15
Dibromochloromethane	ND	11	ND	93	21.72	229891	12/01/15
1,2-Dibromoethane	ND	11	ND	83	21.72	229891	12/01/15
Chlorobenzene	ND	11	ND	50	21.72	229891	12/01/15
Ethylbenzene	ND	11	ND	47	21.72	229891	12/01/15
m,p-Xylenes	ND	11	ND	47	21.72	229891	12/01/15
o-Xylene	ND	11	ND	47	21.72	229891	12/01/15
Styrene	ND	11	ND	46	21.72	229891	12/01/15
Bromoform	ND	11	ND	110	21.72	229891	12/01/15
1,1,2,2-Tetrachloroethane	ND	11	ND	75	21.72	229891	12/01/15
4-Ethyltoluene	ND	11	ND	53	21.72	229891	12/01/15
1,3,5-Trimethylbenzene	ND	11	ND	53	21.72	229891	12/01/15
1,2,4-Trimethylbenzene	ND	11	ND	53	21.72	229891	12/01/15
1,3-Dichlorobenzene	ND	11	ND	65	21.72	229891	12/01/15
1,4-Dichlorobenzene	ND	11	ND	65	21.72	229891	12/01/15
Benzyl chloride	ND	11	ND	56	21.72	229891	12/01/15
1,2-Dichlorobenzene	ND	11	ND	65	21.72	229891	12/01/15
1,2,4-Trichlorobenzene	ND	11	ND	81	21.72	229891	12/01/15
Hexachlorobutadiene	ND	11	ND	120	21.72	229891	12/01/15
Naphthalene	ND	43	ND	230	21.72	229891	12/01/15

Surrogate	%REC	Limits	Diln Fac	Batch#	Analyzed
Bromofluorobenzene	102	80-121	21.72	229891	12/01/15

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-4	Diln Fac:	1.790
Lab ID:	271871-004	Batch#:	229948
Matrix:	Air	Sampled:	11/20/15
Units (V):	ppbv	Received:	11/23/15
Units (M):	ug/m3	Analyzed:	12/01/15

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.90	ND	4.4
Freon 114	ND	0.90	ND	6.3
Chloromethane	ND	0.90	ND	1.8
Vinyl Chloride	ND	0.90	ND	2.3
1,3-Butadiene	ND	0.90	ND	2.0
Bromomethane	ND	0.90	ND	3.5
Chloroethane	ND	0.90	ND	2.4
Trichlorofluoromethane	ND	0.90	ND	5.0
Acrolein	ND	3.6	ND	8.2
1,1-Dichloroethene	ND	0.90	ND	3.5
Freon 113	ND	0.90	ND	6.9
Acetone	ND	3.6	ND	8.5
Carbon Disulfide	ND	0.90	ND	2.8
Isopropanol	ND	3.6	ND	8.8
Methylene Chloride	ND	0.90	ND	3.1
trans-1,2-Dichloroethene	ND	0.90	ND	3.5
MTBE	ND	0.90	ND	3.2
n-Hexane	ND	0.90	ND	3.2
1,1-Dichloroethane	ND	0.90	ND	3.6
Vinyl Acetate	ND	0.90	ND	3.2
cis-1,2-Dichloroethene	ND	0.90	ND	3.5
2-Butanone	ND	0.90	ND	2.6
Ethyl Acetate	ND	0.90	ND	3.2
Tetrahydrofuran	ND	0.90	ND	2.6
Chloroform	ND	0.90	ND	4.4
1,1,1-Trichloroethane	ND	0.90	ND	4.9
Cyclohexane	ND	0.90	ND	3.1
Carbon Tetrachloride	ND	0.90	ND	5.6
Benzene	ND	0.90	ND	2.9
1,2-Dichloroethane	ND	0.90	ND	3.6
n-Heptane	ND	0.90	ND	3.7
Trichloroethene	ND	0.90	ND	4.8
1,2-Dichloropropane	ND	0.90	ND	4.1
Bromodichloromethane	ND	0.90	ND	6.0
cis-1,3-Dichloropropene	ND	0.90	ND	4.1

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-4	Diln Fac:	1.790
Lab ID:	271871-004	Batch#:	229948
Matrix:	Air	Sampled:	11/20/15
Units (V):	ppbv	Received:	11/23/15
Units (M):	ug/m3	Analyzed:	12/01/15

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.90	ND	3.7
Toluene	ND	0.90	ND	3.4
trans-1,3-Dichloropropene	ND	0.90	ND	4.1
1,1,2-Trichloroethane	ND	0.90	ND	4.9
Tetrachloroethene	5.0	0.90	34	6.1
2-Hexanone	ND	0.90	ND	3.7
Dibromochloromethane	ND	0.90	ND	7.6
1,2-Dibromoethane	ND	0.90	ND	6.9
Chlorobenzene	ND	0.90	ND	4.1
Ethylbenzene	ND	0.90	ND	3.9
m,p-Xylenes	ND	0.90	ND	3.9
o-Xylene	ND	0.90	ND	3.9
Styrene	ND	0.90	ND	3.8
Bromoform	ND	0.90	ND	9.3
1,1,2,2-Tetrachloroethane	ND	0.90	ND	6.1
4-Ethyltoluene	ND	0.90	ND	4.4
1,3,5-Trimethylbenzene	ND	0.90	ND	4.4
1,2,4-Trimethylbenzene	ND	0.90	ND	4.4
1,3-Dichlorobenzene	ND	0.90	ND	5.4
1,4-Dichlorobenzene	ND	0.90	ND	5.4
Benzyl chloride	ND	0.90	ND	4.6
1,2-Dichlorobenzene	ND	0.90	ND	5.4
1,2,4-Trichlorobenzene	ND	0.90	ND	6.6
Hexachlorobutadiene	ND	0.90	ND	9.5
Naphthalene	ND	3.6	ND	19

Surrogate	%REC	Limits
Bromofluorobenzene	90	80-121

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-5	Diln Fac:	41.60
Lab ID:	271871-005	Batch#:	229988
Matrix:	Air	Sampled:	11/20/15
Units (V):	ppbv	Received:	11/23/15
Units (M):	ug/m3	Analyzed:	12/02/15

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	21	ND	100
Freon 114	ND	21	ND	150
Chloromethane	ND	21	ND	43
Vinyl Chloride	ND	21	ND	53
1,3-Butadiene	ND	21	ND	46
Bromomethane	ND	21	ND	81
Chloroethane	ND	21	ND	55
Trichlorofluoromethane	ND	21	ND	120
Acrolein	ND	83	ND	190
1,1-Dichloroethene	ND	21	ND	82
Freon 113	ND	21	ND	160
Acetone	ND	83	ND	200
Carbon Disulfide	ND	21	ND	65
Isopropanol	ND	83	ND	200
Methylene Chloride	ND	21	ND	72
trans-1,2-Dichloroethene	ND	21	ND	82
MTBE	ND	21	ND	75
n-Hexane	ND	21	ND	73
1,1-Dichloroethane	ND	21	ND	84
Vinyl Acetate	ND	21	ND	73
cis-1,2-Dichloroethene	140	21	570	82
2-Butanone	ND	21	ND	61
Ethyl Acetate	ND	21	ND	75
Tetrahydrofuran	ND	21	ND	61
Chloroform	ND	21	ND	100
1,1,1-Trichloroethane	ND	21	ND	110
Cyclohexane	ND	21	ND	72
Carbon Tetrachloride	ND	21	ND	130
Benzene	ND	21	ND	66
1,2-Dichloroethane	ND	21	ND	84
n-Heptane	ND	21	ND	85
Trichloroethene	580	21	3,100	110
1,2-Dichloropropane	ND	21	ND	96
Bromodichloromethane	ND	21	ND	140
cis-1,3-Dichloropropene	ND	21	ND	94

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-5	Diln Fac:	41.60
Lab ID:	271871-005	Batch#:	229988
Matrix:	Air	Sampled:	11/20/15
Units (V):	ppbv	Received:	11/23/15
Units (M):	ug/m3	Analyzed:	12/02/15

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	21	ND	85
Toluene	ND	21	ND	78
trans-1,3-Dichloropropene	ND	21	ND	94
1,1,2-Trichloroethane	ND	21	ND	110
Tetrachloroethene	1,300	21	8,600	140
2-Hexanone	ND	21	ND	85
Dibromochloromethane	ND	21	ND	180
1,2-Dibromoethane	ND	21	ND	160
Chlorobenzene	ND	21	ND	96
Ethylbenzene	ND	21	ND	90
m,p-Xylenes	ND	21	ND	90
o-Xylene	ND	21	ND	90
Styrene	ND	21	ND	89
Bromoform	ND	21	ND	220
1,1,2,2-Tetrachloroethane	ND	21	ND	140
4-Ethyltoluene	ND	21	ND	100
1,3,5-Trimethylbenzene	ND	21	ND	100
1,2,4-Trimethylbenzene	ND	21	ND	100
1,3-Dichlorobenzene	ND	21	ND	130
1,4-Dichlorobenzene	ND	21	ND	130
Benzyl chloride	ND	21	ND	110
1,2-Dichlorobenzene	ND	21	ND	130
1,2,4-Trichlorobenzene	ND	21	ND	150
Hexachlorobutadiene	ND	21	ND	220
Naphthalene	ND	83	ND	440

Surrogate	%REC	Limits
Bromofluorobenzene	89	80-121

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-6	Diln Fac:	1.970
Lab ID:	271871-006	Batch#:	229948
Matrix:	Air	Sampled:	11/20/15
Units (V):	ppbv	Received:	11/23/15
Units (M):	ug/m3	Analyzed:	12/01/15

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.99	ND	4.9
Freon 114	ND	0.99	ND	6.9
Chloromethane	ND	0.99	ND	2.0
Vinyl Chloride	ND	0.99	ND	2.5
1,3-Butadiene	ND	0.99	ND	2.2
Bromomethane	ND	0.99	ND	3.8
Chloroethane	ND	0.99	ND	2.6
Trichlorofluoromethane	ND	0.99	ND	5.5
Acrolein	ND	3.9	ND	9.0
1,1-Dichloroethene	ND	0.99	ND	3.9
Freon 113	ND	0.99	ND	7.5
Acetone	ND	3.9	ND	9.4
Carbon Disulfide	ND	0.99	ND	3.1
Isopropanol	ND	3.9	ND	9.7
Methylene Chloride	ND	0.99	ND	3.4
trans-1,2-Dichloroethene	ND	0.99	ND	3.9
MTBE	ND	0.99	ND	3.6
n-Hexane	ND	0.99	ND	3.5
1,1-Dichloroethane	ND	0.99	ND	4.0
Vinyl Acetate	ND	0.99	ND	3.5
cis-1,2-Dichloroethene	15	0.99	59	3.9
2-Butanone	ND	0.99	ND	2.9
Ethyl Acetate	ND	0.99	ND	3.5
Tetrahydrofuran	ND	0.99	ND	2.9
Chloroform	ND	0.99	ND	4.8
1,1,1-Trichloroethane	ND	0.99	ND	5.4
Cyclohexane	ND	0.99	ND	3.4
Carbon Tetrachloride	ND	0.99	ND	6.2
Benzene	ND	0.99	ND	3.1
1,2-Dichloroethane	ND	0.99	ND	4.0
n-Heptane	ND	0.99	ND	4.0
Trichloroethene	32	0.99	170	5.3
1,2-Dichloropropane	ND	0.99	ND	4.6
Bromodichloromethane	ND	0.99	ND	6.6
cis-1,3-Dichloropropene	ND	0.99	ND	4.5

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Field ID:	SVM-6	Diln Fac:	1.970
Lab ID:	271871-006	Batch#:	229948
Matrix:	Air	Sampled:	11/20/15
Units (V):	ppbv	Received:	11/23/15
Units (M):	ug/m3	Analyzed:	12/01/15

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.99	ND	4.0
Toluene	ND	0.99	ND	3.7
trans-1,3-Dichloropropene	ND	0.99	ND	4.5
1,1,2-Trichloroethane	ND	0.99	ND	5.4
Tetrachloroethene	57	0.99	390	6.7
2-Hexanone	ND	0.99	ND	4.0
Dibromochloromethane	ND	0.99	ND	8.4
1,2-Dibromoethane	ND	0.99	ND	7.6
Chlorobenzene	ND	0.99	ND	4.5
Ethylbenzene	ND	0.99	ND	4.3
m,p-Xylenes	ND	0.99	ND	4.3
o-Xylene	ND	0.99	ND	4.3
Styrene	ND	0.99	ND	4.2
Bromoform	ND	0.99	ND	10
1,1,2,2-Tetrachloroethane	ND	0.99	ND	6.8
4-Ethyltoluene	ND	0.99	ND	4.8
1,3,5-Trimethylbenzene	ND	0.99	ND	4.8
1,2,4-Trimethylbenzene	ND	0.99	ND	4.8
1,3-Dichlorobenzene	ND	0.99	ND	5.9
1,4-Dichlorobenzene	ND	0.99	ND	5.9
Benzyl chloride	ND	0.99	ND	5.1
1,2-Dichlorobenzene	ND	0.99	ND	5.9
1,2,4-Trichlorobenzene	ND	0.99	ND	7.3
Hexachlorobutadiene	ND	0.99	ND	11
Naphthalene	ND	3.9	ND	21

Surrogate	%REC	Limits
Bromofluorobenzene	88	80-121

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229891
Units (V):	ppbv	Analyzed:	11/30/15
Diln Fac:	1.000		

Type: BS Lab ID: QC814669

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	9.675	97	70-130
Freon 114	10.00	9.269	93	70-130
Chloromethane	10.00	8.990	90	70-130
Vinyl Chloride	10.00	8.100	81	70-130
1,3-Butadiene	10.00	9.327	93	70-130
Bromomethane	10.00	9.406	94	70-130
Chloroethane	10.00	7.524	75	70-130
Trichlorofluoromethane	10.00	9.276	93	70-130
Acrolein	10.00	8.110	81	70-130
1,1-Dichloroethene	10.00	8.472	85	70-130
Freon 113	10.00	9.430	94	70-130
Acetone	10.00	8.003	80	70-130
Carbon Disulfide	10.00	8.856	89	70-130
Isopropanol	10.00	6.579 b	66 *	70-130
Methylene Chloride	10.00	8.440	84	70-130
trans-1,2-Dichloroethene	10.00	10.00	100	70-130
MTBE	10.00	8.734	87	70-130
n-Hexane	10.00	8.559	86	70-130
1,1-Dichloroethane	10.00	8.573	86	70-130
Vinyl Acetate	10.00	9.229	92	70-130
cis-1,2-Dichloroethene	10.00	8.817	88	70-130
2-Butanone	10.00	10.04	100	70-130
Ethyl Acetate	10.00	10.04	100	70-130
Tetrahydrofuran	10.00	9.817	98	70-130
Chloroform	10.00	9.135	91	70-130
1,1,1-Trichloroethane	10.00	9.276	93	70-130
Cyclohexane	10.00	8.708	87	70-130
Carbon Tetrachloride	10.00	9.054	91	70-130
Benzene	10.00	8.432	84	70-130
1,2-Dichloroethane	10.00	8.077	81	70-130
n-Heptane	10.00	9.296	93	70-130
Trichloroethene	10.00	9.486	95	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229891
Units (V):	ppbv	Analyzed:	11/30/15
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
1,2-Dichloropropane	10.00	8.523	85	70-130
Bromodichloromethane	10.00	9.097	91	70-130
cis-1,3-Dichloropropene	10.00	8.898	89	70-130
4-Methyl-2-Pentanone	10.00	10.58	106	70-130
Toluene	10.00	8.252	83	70-130
trans-1,3-Dichloropropene	10.00	9.374	94	70-130
1,1,2-Trichloroethane	10.00	9.528	95	70-130
Tetrachloroethene	10.00	9.431	94	70-130
2-Hexanone	10.00	9.391	94	70-130
Dibromochloromethane	10.00	9.243	92	70-130
1,2-Dibromoethane	10.00	8.927	89	70-130
Chlorobenzene	10.00	8.936	89	70-130
Ethylbenzene	10.00	8.262	83	70-130
m,p-Xylenes	20.00	16.28	81	70-130
o-Xylene	10.00	8.575	86	70-130
Styrene	10.00	10.06	101	70-130
Bromoform	10.00	9.407	94	70-130
1,1,2,2-Tetrachloroethane	10.00	8.380	84	70-130
4-Ethyltoluene	10.00	9.775	98	70-130
1,3,5-Trimethylbenzene	10.00	9.228	92	70-130
1,2,4-Trimethylbenzene	10.00	9.597	96	70-130
1,3-Dichlorobenzene	10.00	10.45	104	70-130
1,4-Dichlorobenzene	10.00	10.26	103	70-130
Benzyl chloride	10.00	10.40	104	70-130
1,2-Dichlorobenzene	10.00	10.32	103	70-130
1,2,4-Trichlorobenzene	10.00	14.35 b	144 *	70-130
Hexachlorobutadiene	10.00	13.83 b	138 *	70-130
Naphthalene	10.00	14.78 b	148 *	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	97	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229891
Units (V):	ppbv	Analyzed:	11/30/15
Diln Fac:	1.000		

Type: BSD Lab ID: QC814670

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	9.174	92	70-130	5	25
Freon 114	10.00	8.862	89	70-130	4	25
Chloromethane	10.00	8.590	86	70-130	5	25
Vinyl Chloride	10.00	8.033	80	70-130	1	25
1,3-Butadiene	10.00	10.16	102	70-130	9	25
Bromomethane	10.00	8.982	90	70-130	5	25
Chloroethane	10.00	7.456	75	70-130	1	25
Trichlorofluoromethane	10.00	9.002	90	70-130	3	25
Acrolein	10.00	8.652	87	70-130	6	25
1,1-Dichloroethene	10.00	8.810	88	70-130	4	25
Freon 113	10.00	9.733	97	70-130	3	25
Acetone	10.00	8.363	84	70-130	4	25
Carbon Disulfide	10.00	9.216	92	70-130	4	25
Isopropanol	10.00	6.795 b	68 *	70-130	3	25
Methylene Chloride	10.00	8.590	86	70-130	2	25
trans-1,2-Dichloroethene	10.00	10.55	106	70-130	5	25
MTBE	10.00	8.838	88	70-130	1	25
n-Hexane	10.00	9.522	95	70-130	11	25
1,1-Dichloroethane	10.00	8.800	88	70-130	3	25
Vinyl Acetate	10.00	10.14	101	70-130	9	25
cis-1,2-Dichloroethene	10.00	9.161	92	70-130	4	25
2-Butanone	10.00	10.72	107	70-130	7	25
Ethyl Acetate	10.00	10.93	109	70-130	9	25
Tetrahydrofuran	10.00	9.520	95	70-130	3	25
Chloroform	10.00	9.450	95	70-130	3	25
1,1,1-Trichloroethane	10.00	9.121	91	70-130	2	25
Cyclohexane	10.00	8.807	88	70-130	1	25
Carbon Tetrachloride	10.00	9.094	91	70-130	0	25
Benzene	10.00	8.566	86	70-130	2	25
1,2-Dichloroethane	10.00	8.116	81	70-130	0	25
n-Heptane	10.00	9.467	95	70-130	2	25
Trichloroethene	10.00	9.662	97	70-130	2	25

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229891
Units (V):	ppbv	Analyzed:	11/30/15
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
1,2-Dichloropropane	10.00	8.546	85	70-130	0	25
Bromodichloromethane	10.00	8.891	89	70-130	2	25
cis-1,3-Dichloropropene	10.00	9.402	94	70-130	6	25
4-Methyl-2-Pentanone	10.00	10.80	108	70-130	2	25
Toluene	10.00	9.290	93	70-130	12	25
trans-1,3-Dichloropropene	10.00	9.583	96	70-130	2	25
1,1,2-Trichloroethane	10.00	10.59	106	70-130	11	25
Tetrachloroethene	10.00	10.98	110	70-130	15	25
2-Hexanone	10.00	10.50	105	70-130	11	25
Dibromochloromethane	10.00	10.45	104	70-130	12	25
1,2-Dibromoethane	10.00	10.07	101	70-130	12	25
Chlorobenzene	10.00	9.653	97	70-130	8	25
Ethylbenzene	10.00	8.453	85	70-130	2	25
m,p-Xylenes	20.00	16.56	83	70-130	2	25
o-Xylene	10.00	8.226	82	70-130	4	25
Styrene	10.00	9.717	97	70-130	3	25
Bromoform	10.00	10.38	104	70-130	10	25
1,1,2,2-Tetrachloroethane	10.00	8.995	90	70-130	7	25
4-Ethyltoluene	10.00	9.940	99	70-130	2	25
1,3,5-Trimethylbenzene	10.00	9.128	91	70-130	1	25
1,2,4-Trimethylbenzene	10.00	9.621	96	70-130	0	25
1,3-Dichlorobenzene	10.00	10.29	103	70-130	2	25
1,4-Dichlorobenzene	10.00	9.907	99	70-130	4	25
Benzyl chloride	10.00	9.682	97	70-130	7	25
1,2-Dichlorobenzene	10.00	10.16	102	70-130	2	25
1,2,4-Trichlorobenzene	10.00	14.85 b	149 *	70-130	3	25
Hexachlorobutadiene	10.00	13.99 b	140 *	70-130	1	25
Naphthalene	10.00	15.70 b	157 *	70-130	6	25

Surrogate	%REC	Limits
Bromofluorobenzene	90	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC814671	Diln Fac:	1.000
Matrix:	Air	Batch#:	229891
Units (V):	ppbv	Analyzed:	11/30/15

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC814671	Diln Fac:	1.000
Matrix:	Air	Batch#:	229891
Units (V):	ppbv	Analyzed:	11/30/15

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	88	70-130

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229948
Units (V):	ppbv	Analyzed:	12/01/15
Diln Fac:	1.000		

Type: BS Lab ID: QC814894

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	9.701	97	70-130
Freon 114	10.00	9.593	96	70-130
Chloromethane	10.00	9.127	91	70-130
Vinyl Chloride	10.00	8.268	83	70-130
1,3-Butadiene	10.00	9.733	97	70-130
Bromomethane	10.00	9.360	94	70-130
Chloroethane	10.00	7.421	74	70-130
Trichlorofluoromethane	10.00	9.783	98	70-130
Acrolein	10.00	8.095	81	70-130
1,1-Dichloroethene	10.00	8.465	85	70-130
Freon 113	10.00	9.872	99	70-130
Acetone	10.00	8.267	83	70-130
Carbon Disulfide	10.00	8.761	88	70-130
Isopropanol	10.00	7.099	71	70-130
Methylene Chloride	10.00	8.785	88	70-130
trans-1,2-Dichloroethene	10.00	9.627	96	70-130
MTBE	10.00	8.958	90	70-130
n-Hexane	10.00	9.141	91	70-130
1,1-Dichloroethane	10.00	8.941	89	70-130
Vinyl Acetate	10.00	9.471	95	70-130
cis-1,2-Dichloroethene	10.00	8.846	88	70-130
2-Butanone	10.00	10.31	103	70-130
Ethyl Acetate	10.00	10.78	108	70-130
Tetrahydrofuran	10.00	9.762	98	70-130
Chloroform	10.00	9.356	94	70-130
1,1,1-Trichloroethane	10.00	9.178	92	70-130
Cyclohexane	10.00	8.864	89	70-130
Carbon Tetrachloride	10.00	9.415	94	70-130
Benzene	10.00	8.278	83	70-130
1,2-Dichloroethane	10.00	8.094	81	70-130
n-Heptane	10.00	8.665	87	70-130
Trichloroethene	10.00	9.746	97	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229948
Units (V):	ppbv	Analyzed:	12/01/15
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
1,2-Dichloropropane	10.00	8.583	86	70-130
Bromodichloromethane	10.00	9.082	91	70-130
cis-1,3-Dichloropropene	10.00	9.040	90	70-130
4-Methyl-2-Pentanone	10.00	10.59	106	70-130
Toluene	10.00	8.448	84	70-130
trans-1,3-Dichloropropene	10.00	9.039	90	70-130
1,1,2-Trichloroethane	10.00	10.07	101	70-130
Tetrachloroethene	10.00	10.11	101	70-130
2-Hexanone	10.00	9.607	96	70-130
Dibromochloromethane	10.00	9.945	99	70-130
1,2-Dibromoethane	10.00	9.729	97	70-130
Chlorobenzene	10.00	8.880	89	70-130
Ethylbenzene	10.00	8.003	80	70-130
m,p-Xylenes	20.00	16.95	85	70-130
o-Xylene	10.00	8.706	87	70-130
Styrene	10.00	10.31	103	70-130
Bromoform	10.00	9.971	100	70-130
1,1,2,2-Tetrachloroethane	10.00	8.703	87	70-130
4-Ethyltoluene	10.00	10.49	105	70-130
1,3,5-Trimethylbenzene	10.00	9.670	97	70-130
1,2,4-Trimethylbenzene	10.00	10.50	105	70-130
1,3-Dichlorobenzene	10.00	10.52	105	70-130
1,4-Dichlorobenzene	10.00	10.23	102	70-130
Benzyl chloride	10.00	9.605	96	70-130
1,2-Dichlorobenzene	10.00	10.64	106	70-130
1,2,4-Trichlorobenzene	10.00	15.41 b	154 *	70-130
Hexachlorobutadiene	10.00	15.32 b	153 *	70-130
Naphthalene	10.00	16.36 b	164 *	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	96	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229948
Units (V):	ppbv	Analyzed:	12/01/15
Diln Fac:	1.000		

Type: BSD Lab ID: QC814895

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	10.12	101	70-130	4	25
Freon 114	10.00	9.889	99	70-130	3	25
Chloromethane	10.00	9.221	92	70-130	1	25
Vinyl Chloride	10.00	8.583	86	70-130	4	25
1,3-Butadiene	10.00	9.602	96	70-130	1	25
Bromomethane	10.00	9.771	98	70-130	4	25
Chloroethane	10.00	7.512	75	70-130	1	25
Trichlorofluoromethane	10.00	9.952	100	70-130	2	25
Acrolein	10.00	7.575	76	70-130	7	25
1,1-Dichloroethene	10.00	8.535	85	70-130	1	25
Freon 113	10.00	10.02	100	70-130	1	25
Acetone	10.00	8.157	82	70-130	1	25
Carbon Disulfide	10.00	8.780	88	70-130	0	25
Isopropanol	10.00	7.331	73	70-130	3	25
Methylene Chloride	10.00	8.795	88	70-130	0	25
trans-1,2-Dichloroethene	10.00	9.782	98	70-130	2	25
MTBE	10.00	9.092	91	70-130	1	25
n-Hexane	10.00	8.706	87	70-130	5	25
1,1-Dichloroethane	10.00	9.012	90	70-130	1	25
Vinyl Acetate	10.00	9.159	92	70-130	3	25
cis-1,2-Dichloroethene	10.00	8.789	88	70-130	1	25
2-Butanone	10.00	10.06	101	70-130	2	25
Ethyl Acetate	10.00	10.71	107	70-130	1	25
Tetrahydrofuran	10.00	10.36	104	70-130	6	25
Chloroform	10.00	9.271	93	70-130	1	25
1,1,1-Trichloroethane	10.00	9.573	96	70-130	4	25
Cyclohexane	10.00	9.150	92	70-130	3	25
Carbon Tetrachloride	10.00	9.717	97	70-130	3	25
Benzene	10.00	8.250	83	70-130	0	25
1,2-Dichloroethane	10.00	8.392	84	70-130	4	25
n-Heptane	10.00	9.015	90	70-130	4	25
Trichloroethene	10.00	9.773	98	70-130	0	25

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229948
Units (V):	ppbv	Analyzed:	12/01/15
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
1,2-Dichloropropane	10.00	8.827	88	70-130	3	25
Bromodichloromethane	10.00	9.302	93	70-130	2	25
cis-1,3-Dichloropropene	10.00	8.895	89	70-130	2	25
4-Methyl-2-Pentanone	10.00	10.70	107	70-130	1	25
Toluene	10.00	8.009	80	70-130	5	25
trans-1,3-Dichloropropene	10.00	8.910	89	70-130	1	25
1,1,2-Trichloroethane	10.00	9.867	99	70-130	2	25
Tetrachloroethene	10.00	9.678	97	70-130	4	25
2-Hexanone	10.00	9.166	92	70-130	5	25
Dibromochloromethane	10.00	9.785	98	70-130	2	25
1,2-Dibromoethane	10.00	9.280	93	70-130	5	25
Chlorobenzene	10.00	8.835	88	70-130	1	25
Ethylbenzene	10.00	8.208	82	70-130	3	25
m,p-Xylenes	20.00	17.50	87	70-130	3	25
o-Xylene	10.00	8.776	88	70-130	1	25
Styrene	10.00	10.68	107	70-130	3	25
Bromoform	10.00	9.568	96	70-130	4	25
1,1,2,2-Tetrachloroethane	10.00	8.594	86	70-130	1	25
4-Ethyltoluene	10.00	10.45	105	70-130	0	25
1,3,5-Trimethylbenzene	10.00	9.937	99	70-130	3	25
1,2,4-Trimethylbenzene	10.00	10.45	105	70-130	0	25
1,3-Dichlorobenzene	10.00	10.68	107	70-130	2	25
1,4-Dichlorobenzene	10.00	10.63	106	70-130	4	25
Benzyl chloride	10.00	9.789	98	70-130	2	25
1,2-Dichlorobenzene	10.00	10.86	109	70-130	2	25
1,2,4-Trichlorobenzene	10.00	15.88 b	159 *	70-130	3	25
Hexachlorobutadiene	10.00	15.15 b	152 *	70-130	1	25
Naphthalene	10.00	15.82 b	158 *	70-130	3	25

Surrogate	%REC	Limits
Bromofluorobenzene	96	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC814896	Diln Fac:	1.000
Matrix:	Air	Batch#:	229948
Units (V):	ppbv	Analyzed:	12/01/15

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC814896	Diln Fac:	1.000
Matrix:	Air	Batch#:	229948
Units (V):	ppbv	Analyzed:	12/01/15

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	86	70-130

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229988
Units (V):	ppbv	Analyzed:	12/02/15
Diln Fac:	1.000		

Type: BS Lab ID: QC815053

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	9.688	97	70-130
Freon 114	10.00	9.569	96	70-130
Chloromethane	10.00	8.870	89	70-130
Vinyl Chloride	10.00	8.287	83	70-130
1,3-Butadiene	10.00	9.707	97	70-130
Bromomethane	10.00	9.312	93	70-130
Chloroethane	10.00	7.042	70	70-130
Trichlorofluoromethane	10.00	9.870	99	70-130
Acrolein	10.00	8.131	81	70-130
1,1-Dichloroethene	10.00	8.636	86	70-130
Freon 113	10.00	9.869	99	70-130
Acetone	10.00	8.339	83	70-130
Carbon Disulfide	10.00	8.623	86	70-130
Isopropanol	10.00	7.024	70	70-130
Methylene Chloride	10.00	8.803	88	70-130
trans-1,2-Dichloroethene	10.00	9.445	94	70-130
MTBE	10.00	8.873	89	70-130
n-Hexane	10.00	8.504	85	70-130
1,1-Dichloroethane	10.00	8.853	89	70-130
Vinyl Acetate	10.00	9.131	91	70-130
cis-1,2-Dichloroethene	10.00	8.772	88	70-130
2-Butanone	10.00	10.28	103	70-130
Ethyl Acetate	10.00	10.35	103	70-130
Tetrahydrofuran	10.00	10.25	102	70-130
Chloroform	10.00	9.228	92	70-130
1,1,1-Trichloroethane	10.00	9.433	94	70-130
Cyclohexane	10.00	8.903	89	70-130
Carbon Tetrachloride	10.00	9.618	96	70-130
Benzene	10.00	8.082	81	70-130
1,2-Dichloroethane	10.00	8.209	82	70-130
n-Heptane	10.00	8.657	87	70-130
Trichloroethene	10.00	9.548	95	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229988
Units (V):	ppbv	Analyzed:	12/02/15
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
1,2-Dichloropropane	10.00	8.409	84	70-130
Bromodichloromethane	10.00	9.160	92	70-130
cis-1,3-Dichloropropene	10.00	8.616	86	70-130
4-Methyl-2-Pentanone	10.00	10.41	104	70-130
Toluene	10.00	7.865	79	70-130
trans-1,3-Dichloropropene	10.00	8.943	89	70-130
1,1,2-Trichloroethane	10.00	9.839	98	70-130
Tetrachloroethene	10.00	9.730	97	70-130
2-Hexanone	10.00	9.068	91	70-130
Dibromochloromethane	10.00	9.405	94	70-130
1,2-Dibromoethane	10.00	9.186	92	70-130
Chlorobenzene	10.00	8.712	87	70-130
Ethylbenzene	10.00	8.241	82	70-130
m,p-Xylenes	20.00	17.34	87	70-130
o-Xylene	10.00	8.525	85	70-130
Styrene	10.00	10.31	103	70-130
Bromoform	10.00	9.550	96	70-130
1,1,2,2-Tetrachloroethane	10.00	8.386	84	70-130
4-Ethyltoluene	10.00	10.36	104	70-130
1,3,5-Trimethylbenzene	10.00	9.743	97	70-130
1,2,4-Trimethylbenzene	10.00	10.21	102	70-130
1,3-Dichlorobenzene	10.00	10.49	105	70-130
1,4-Dichlorobenzene	10.00	10.49	105	70-130
Benzyl chloride	10.00	10.31	103	70-130
1,2-Dichlorobenzene	10.00	10.63	106	70-130
1,2,4-Trichlorobenzene	10.00	15.49 b	155 *	70-130
Hexachlorobutadiene	10.00	15.13 b	151 *	70-130
Naphthalene	10.00	15.21 b	152 *	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	96	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229988
Units (V):	ppbv	Analyzed:	12/02/15
Diln Fac:	1.000		

Type: BSD Lab ID: QC815054

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	10.15	101	70-130	5	25
Freon 114	10.00	10.02	100	70-130	5	25
Chloromethane	10.00	9.277	93	70-130	4	25
Vinyl Chloride	10.00	8.721	87	70-130	5	25
1,3-Butadiene	10.00	10.12	101	70-130	4	25
Bromomethane	10.00	9.689	97	70-130	4	25
Chloroethane	10.00	7.424	74	70-130	5	25
Trichlorofluoromethane	10.00	10.03	100	70-130	2	25
Acrolein	10.00	8.393	84	70-130	3	25
1,1-Dichloroethene	10.00	8.802	88	70-130	2	25
Freon 113	10.00	10.18	102	70-130	3	25
Acetone	10.00	8.542	85	70-130	2	25
Carbon Disulfide	10.00	9.063	91	70-130	5	25
Isopropanol	10.00	7.464	75	70-130	6	25
Methylene Chloride	10.00	9.050	91	70-130	3	25
trans-1,2-Dichloroethene	10.00	9.941	99	70-130	5	25
MTBE	10.00	9.223	92	70-130	4	25
n-Hexane	10.00	8.969	90	70-130	5	25
1,1-Dichloroethane	10.00	9.212	92	70-130	4	25
Vinyl Acetate	10.00	9.557	96	70-130	5	25
cis-1,2-Dichloroethene	10.00	9.090	91	70-130	4	25
2-Butanone	10.00	10.37	104	70-130	1	25
Ethyl Acetate	10.00	10.88	109	70-130	5	25
Tetrahydrofuran	10.00	10.09	101	70-130	2	25
Chloroform	10.00	9.712	97	70-130	5	25
1,1,1-Trichloroethane	10.00	9.406	94	70-130	0	25
Cyclohexane	10.00	8.876	89	70-130	0	25
Carbon Tetrachloride	10.00	9.660	97	70-130	0	25
Benzene	10.00	8.305	83	70-130	3	25
1,2-Dichloroethane	10.00	8.187	82	70-130	0	25
n-Heptane	10.00	8.793	88	70-130	2	25
Trichloroethene	10.00	9.780	98	70-130	2	25

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	229988
Units (V):	ppbv	Analyzed:	12/02/15
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
1,2-Dichloropropane	10.00	8.429	84	70-130	0	25
Bromodichloromethane	10.00	9.275	93	70-130	1	25
cis-1,3-Dichloropropene	10.00	8.790	88	70-130	2	25
4-Methyl-2-Pentanone	10.00	10.59	106	70-130	2	25
Toluene	10.00	8.324	83	70-130	6	25
trans-1,3-Dichloropropene	10.00	8.848	88	70-130	1	25
1,1,2-Trichloroethane	10.00	10.18	102	70-130	3	25
Tetrachloroethene	10.00	10.10	101	70-130	4	25
2-Hexanone	10.00	9.375	94	70-130	3	25
Dibromochloromethane	10.00	10.17	102	70-130	8	25
1,2-Dibromoethane	10.00	9.642	96	70-130	5	25
Chlorobenzene	10.00	8.863	89	70-130	2	25
Ethylbenzene	10.00	8.091	81	70-130	2	25
m,p-Xylenes	20.00	17.31	87	70-130	0	25
o-Xylene	10.00	8.761	88	70-130	3	25
Styrene	10.00	10.14	101	70-130	2	25
Bromoform	10.00	10.06	101	70-130	5	25
1,1,2,2-Tetrachloroethane	10.00	8.840	88	70-130	5	25
4-Ethyltoluene	10.00	10.61	106	70-130	2	25
1,3,5-Trimethylbenzene	10.00	10.32	103	70-130	6	25
1,2,4-Trimethylbenzene	10.00	10.71	107	70-130	5	25
1,3-Dichlorobenzene	10.00	10.62	106	70-130	1	25
1,4-Dichlorobenzene	10.00	10.61	106	70-130	1	25
Benzyl chloride	10.00	9.470	95	70-130	9	25
1,2-Dichlorobenzene	10.00	10.95	109	70-130	3	25
1,2,4-Trichlorobenzene	10.00	15.74 b	157 *	70-130	2	25
Hexachlorobutadiene	10.00	15.99 b	160 *	70-130	6	25
Naphthalene	10.00	16.17 b	162 *	70-130	6	25

Surrogate	%REC	Limits
Bromofluorobenzene	94	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC815055	Diln Fac:	1.000
Matrix:	Air	Batch#:	229988
Units (V):	ppbv	Analyzed:	12/02/15

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	271871	Location:	Marinwood Cleaners
Client:	Geologica	Prep:	METHOD
Project#:	MARINWOOD CLEANERS	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC815055	Diln Fac:	1.000
Matrix:	Air	Batch#:	229988
Units (V):	ppbv	Analyzed:	12/02/15

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	88	70-130

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Initial & Continuing Calibration Data

CURTIS & TOMPKINS BFB TUNE FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : BFB IDF : 1.0
Seqnum : 1205403859005 File : 280_005 Time : 07-OCT-2015 16:31

Standards: S26124 (150X)

Mass	Ion Abundance Criteria	Abundance	% Relative Abundance	Q
50	8% - 40% of mass 95	87772	15.99	
75	30% - 66% of mass 95	302630	55.14	
95		548815	100.00	
96	5% - 9% of mass 95	35940	6.55	
173	< 2% of mass 174	1556	0.34	
174	50% - 120% of mass 95	460744	83.95	
175	4% - 9% of mass 174	32126	6.97	
176	93% - 101% of mass 174	433742	94.14	
177	5% - 9% of mass 176	29547	6.81	

Analyst: TEW Date: 10/07/15 Reviewer: LW Date: 10/12/15

CURTIS & TOMPKINS BFB TUNE FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : BFB IDF : 1.0
Seqnum : 1205406576001 File : 282_001 Time : 09-OCT-2015 08:16

Standards: S26124 (150X)

Mass	Ion Abundance Criteria	Abundance	% Relative Abundance	Q
50	8% - 40% of mass 95	85203	16.69	
75	30% - 66% of mass 95	303637	59.46	
95		510619	100.00	
96	5% - 9% of mass 95	30338	5.94	
173	< 2% of mass 174	1233	0.28	
174	50% - 120% of mass 95	434536	85.10	
175	4% - 9% of mass 174	29207	6.72	
176	93% - 101% of mass 174	423194	97.39	
177	5% - 9% of mass 176	27011	6.38	

Analyst: TEW Date: 10/09/15 Reviewer: LW Date: 10/12/15

CURTIS & TOMPKINS BFB TUNE FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : BFB IDF : 1.0
Seqnum : 1205481527002 File : 334_002 Time : 30-NOV-2015 09:27

Standards: S28218 (150X)

Mass	Ion Abundance Criteria	Abundance	% Relative Abundance	Q
50	8% - 40% of mass 95	64016	15.09	
75	30% - 66% of mass 95	225275	53.11	
95		424155	100.00	
96	5% - 9% of mass 95	33023	7.79	
173	< 2% of mass 174	1129	0.30	
174	50% - 120% of mass 95	375405	88.51	
175	4% - 9% of mass 174	23572	6.28	
176	93% - 101% of mass 174	370724	98.75	
177	5% - 9% of mass 176	26088	7.04	

Analyst: TKC Date: 11/30/15 Reviewer: LW Date: 12/01/15

CURTIS & TOMPKINS BFB TUNE FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : BFB IDF : 1.0
Seqnum : 1205482965002 File : 335_002 Time : 01-DEC-2015 09:25

Standards: S28218 (150X)

Mass	Ion Abundance Criteria	Abundance	% Relative Abundance	Q
50	8% - 40% of mass 95	64166	15.61	
75	30% - 66% of mass 95	216858	52.77	
95		410939	100.00	
96	5% - 9% of mass 95	27733	6.75	
173	< 2% of mass 174	876	0.25	
174	50% - 120% of mass 95	357231	86.93	
175	4% - 9% of mass 174	21725	6.08	
176	93% - 101% of mass 174	352303	98.62	
177	5% - 9% of mass 176	20913	5.94	

Analyst: TEW Date: 12/02/15 Reviewer: LW Date: 12/02/15

CURTIS & TOMPKINS BFB TUNE FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : BFB IDF : 1.0
Seqnum : 1205484408001 File : 336_001 Time : 02-DEC-2015 09:28

Standards: S28218 (150X)

Mass	Ion Abundance Criteria	Abundance	% Relative Abundance	Q
50	8% - 40% of mass 95	52415	14.37	
75	30% - 66% of mass 95	196008	53.74	
95		364758	100.00	
96	5% - 9% of mass 95	23944	6.56	
173	< 2% of mass 174	1178	0.38	
174	50% - 120% of mass 95	313608	85.98	
175	4% - 9% of mass 174	19510	6.22	
176	93% - 101% of mass 174	299265	95.43	
177	5% - 9% of mass 176	18025	6.02	

Analyst: TEW Date: 12/03/15 Reviewer: LW Date: 12/03/15

CURTIS & TOMPKINS INITIAL CALIBRATION FOR 271871 MSAIR Air: EPA TO-15

Inst : MSAIR01
Calnum : 1205403859001
Units : nL/L

Name : to15
Date : 07-OCT-2015 19:37
X Axis : R

Level	File	Seqnum	Sample ID	Analyzed	Stds
L1	280_008	1205403859008	0.05PPB	07-OCT-2015 19:37	S28258 (2X), S26124 (150X)
L2	280_009	1205403859009	0.1PPB	07-OCT-2015 20:38	S28258, S26124 (150X)
L3	280_010	1205403859010	0.167PPB	07-OCT-2015 21:41	S28257 (6X), S26124 (150X)
L4	280_011	1205403859011	0.5PPB	07-OCT-2015 22:43	S28257 (2X), S26124 (150X)
L5	280_012	1205403859012	1.67PPB	07-OCT-2015 23:45	S28256 (6X), S26124 (150X)
L6	280_013	1205403859013	5PPB	08-OCT-2015 00:47	S28256 (2X), S26124 (150X)
L7	280_014	1205403859014	16.67PPB	08-OCT-2015 01:49	S28255 (6X), S26124 (150X)
L8	280_015	1205403859015	33PPB	08-OCT-2015 02:51	S28255 (3X), S26124 (150X)
L9	280_016	1205403859016	50PPB	08-OCT-2015 03:53	S28255 (2X), S26124 (150X)
L10	280_017	1205403859017	100PPB	08-OCT-2015 04:55	S28255, S26124 (150X)

Analyte	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	Type	a0	a1	a2	Avg	r^2 %RSD	MnR^2	MxRSD	Flg
Freon 12	2.8763	2.9412	3.0746	3.0280	3.1566	3.2677	3.5798	3.7958	4.1286		AVRG		0.30152		3.3165	13	0.99	30	
Freon 114	2.8345	2.9027	3.0871	3.0877	3.2107	3.2575	3.4364	3.6465	3.9008	4.6605	AVRG		0.29391		3.4024	16	0.99	30	
Chloromethane	0.2369	0.1752	0.1917	0.1912	0.2014	0.2064	0.2432	0.2684	0.2967		AVRG		4.47500		0.2235	18	0.99	30	
Vinyl Chloride	0.9334	0.8965	0.9512	0.9472	0.9976	0.9997	1.1209	1.2176	1.3107		AVRG		0.96002		1.0416	14	0.99	30	
1,3-Butadiene		0.4633	0.5101	0.4871	0.5228	0.5117	0.5914	0.6272	0.6543		AVRG		1.83162		0.5460	13	0.99	30	
Bromomethane	0.5626	0.5085	0.5328	0.5340	0.6015	0.6161	0.6959	0.7412	0.8105		AVRG		1.60623		0.6226	17	0.99	30	
Chloroethane	0.1278	0.1075m	0.0942	0.1135	0.1018	0.1090	0.1136	0.1183	0.1252	0.1375	AVRG		8.70840		0.1148	11	0.99	30	
Trichlorofluoromethane	3.3335	3.3575	3.6769	3.5708	3.8049	3.7984	4.1179	4.3811	4.6928		AVRG		0.25911		3.8593	12	0.99	30	
Acrolein		0.1308m	0.1354	0.1454	0.1508	0.1505	0.1769	0.1918	0.2008		AVRG		6.23871		0.1603	16	0.99	30	
1,1-Dichloroethene	1.6547	1.6537	1.8588	1.8259	1.9539	1.9060	2.1485	2.3050	2.3497	2.8468	AVRG		0.48773		2.0503	18	0.99	30	
Freon 113	2.3218	2.3195	2.5941	2.4827	2.6174	2.5639	2.7901	2.9181	2.9471	3.5212	AVRG		0.36933		2.7076	13	0.99	30	
Acetone				1.9008	1.4332	1.3697	1.5550	1.6688	1.7293	2.1620	AVRG		0.59228		1.6884	16	0.99	30	
Carbon Disulfide	1.3017	1.1688	1.2479	1.1757	1.2434m	1.1844	1.3742	1.4708	1.5105m	1.8846	AVRG		0.73736		1.3562	16	0.99	30	
Isopropanol				0.8471	0.7582	0.7047	0.7444	0.7926	0.8271	0.9182	AVRG		1.25171		0.7989	9	0.99	30	
Methylene Chloride	1.7016	1.4958	1.5433	1.5209	1.6109	1.5737	1.7929	1.9057	2.0187		AVRG		0.59353		1.6848	11	0.99	30	
trans-1,2-Dichloroethene	1.1592	1.1102	1.2515m	1.2135	1.3294	1.2356	1.2910	1.1973	1.1109	1.0057	AVRG		0.84001		1.1905	8	0.99	30	
MTBE	1.2993	1.2924	1.3892	1.3891	1.4557m	1.4265m	1.5241	1.5613	1.5745	1.9569	AVRG		0.67254		1.4869	13	0.99	30	
n-Hexane	0.5566	0.5262m	0.5130m	0.5013m	0.5186	0.4659	0.5115	0.5158	0.5421	0.6638	AVRG		1.88159		0.5315	10	0.99	30	
1,1-Dichloroethane	2.0573	2.1017	2.2375	2.2366	2.3848	2.2858	2.5490	2.8383	2.9604		AVRG		0.41568		2.4057	13	0.99	30	
Vinyl Acetate	1.0646	1.1975	1.2675	1.3363	1.4769	1.3567	1.5971	1.7050	1.7032	1.9893	AVRG		0.68054		1.4694	19	0.99	30	
cis-1,2-Dichloroethene	1.3191	1.1905	1.3688	1.3763	1.4703	1.3716	1.5300	1.5458	1.5191	1.7576	AVRG		0.69208		1.4449	11	0.99	30	
2-Butanone	1.5727	1.3997	1.0986	1.1840	1.2370	1.2660	1.4468	1.4726	1.4585	1.6145	AVRG		0.72725		1.3750	12	0.99	30	
Ethyl Acetate	1.4598	1.5602	1.7066	1.5746	1.6578	1.5418	1.5881	1.5091	1.4543	1.5805	AVRG		0.63969		1.5633	5	0.99	30	

Analyte	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	Type	a0	a1	a2	Avg	r^2 %RSD	MnR^2	MxRSD	Flg
Tetrahydrofuran	0.5045	0.4995	0.4370	0.5053	0.5352	0.5219	0.5263	0.4573	0.4022		AVRG		2.05047		0.4877	9	0.99	30	
Chloroform	1.8364	1.7366	1.9355	1.8995	2.0029	1.8772	2.0296	2.2192	2.2413		AVRG		0.50624		1.9754	9	0.99	30	
1,1,1-Trichloroethane	1.2862	1.2214	1.3891	1.2868	1.3798	1.3846	1.4991	1.4729	1.3800	1.3585	AVRG		0.73214		1.3658	6	0.99	30	
Cyclohexane	0.7194	0.7175	0.7600	0.7001	0.7520	0.7571	0.8375	0.8407	0.7795	0.7456	AVRG		1.31413		0.7610	6	0.99	30	
Carbon Tetrachloride	1.5195	1.5039	1.7167	1.5823	1.6860	1.6851	1.8641	1.8643	1.7470	1.7522	AVRG		0.59098		1.6921	7	0.99	30	
Benzene	0.7801	0.7421	0.7113	0.6523	0.6726	0.6530	0.7032	0.6559	0.6173	0.5757	AVRG		1.47853		0.6763	9	0.99	30	
1,2-Dichloroethane	0.9002	0.8491	0.9887	0.9139m	1.0016	0.9588	1.0936	1.0640	1.0014	0.9534	AVRG		1.02833		0.9725	8	0.99	30	
n-Heptane	0.7512	0.6382	0.6216	0.5986	0.6694	0.5818	0.6079	0.5224	0.4893	0.4291	AVRG		1.69219		0.5909	16	0.99	30	
Trichloroethene	0.5450	0.5182	0.5655	0.5182	0.5470	0.5226	0.5548	0.5355	0.5006	0.4564	AVRG		1.89977		0.5264	6	0.99	30	
1,2-Dichloropropane	0.4390	0.3950	0.4442	0.4187	0.4513	0.4325	0.4717	0.4289	0.3936	0.3418	AVRG		2.37153		0.4217	9	0.99	30	
Bromodichloromethane	0.8975	0.8726	1.0342	0.9656	1.0435	1.0239	1.1140	1.1127	1.0587	1.0501	AVRG		0.98302		1.0173	8	0.99	30	
cis-1,3-Dichloropropene	0.3253	0.2940	0.3557	0.3358	0.3724	0.3587	0.4040	0.3794	0.3590	0.3266	AVRG		2.84812		0.3511	9	0.99	30	
4-Methyl-2-Pentanone	0.5709	0.7135	0.8335	0.8793	1.0402	0.9390	0.9840	0.8691	0.7923	0.6621	AVRG		1.20715		0.8284	18	0.99	30	
Toluene	1.5240	1.3592	1.2833	1.1127	1.2674	1.1105	1.2549	1.1974	1.2003	1.1454	AVRG		0.80288		1.2455	10	0.99	30	
trans-1,3-Dichloropropene	0.2435	0.2307	0.2737	0.2907	0.3166	0.3045	0.3603	0.3298	0.3096	0.2845	AVRG		3.39697		0.2944	13	0.99	30	
1,1,2-Trichloroethane	0.2991	0.3011	0.3678	0.3947	0.4192	0.4012	0.4563	0.4401	0.4328	0.4039	AVRG		2.55351		0.3916	14	0.99	30	
Tetrachloroethene	0.7970	0.6938	0.7899	0.7082	0.7892	0.7166	0.8690	0.8689	0.8892	0.8690	AVRG		1.25142		0.7991	9	0.99	30	
2-Hexanone			0.6663m	0.6552	1.0583	0.8832	0.9847	0.8444	0.7526		AVRG		1.19766		0.8350	18	0.99	30	
Dibromochloromethane	1.1122	1.0697	1.2409	1.1630	1.3193	1.2667	1.5381	1.5423	1.5943	1.5428	AVRG		0.74687		1.3389	15	0.99	30	
1,2-Dibromoethane	0.7241	0.6254	0.7255	0.7040	0.7663	0.7191	0.8653	0.8221	0.8780	0.8315	AVRG		1.30525		0.7661	11	0.99	30	
Chlorobenzene	1.1407	0.8865	1.0982	0.9258	1.0568	0.8634	0.9817	0.9052	0.8240	0.7314	AVRG		1.06226		0.9414	14	0.99	30	
Ethylbenzene	2.4607m	1.9261	2.4722	2.0546m	2.3791	1.9833	2.3172	1.8794	1.7078		AVRG		0.46923		2.1312	13	0.99	30	
m,p-Xylenes	3.2072	2.5883	3.0271	2.6368	2.9031	2.6494	2.7780	2.3465	2.0956		AVRG		0.37141		2.6924	13	0.99	30	
o-Xylene	3.2238m	2.7065m	3.0663	2.7265	2.9515	2.7389	2.9698	2.4738m	2.2622m		AVRG		0.35829		2.7910	11	0.99	30	
Styrene	1.4999	1.3155	1.5147	1.4999	1.7888	1.7833	2.3373	2.2152	2.2076	1.6674	AVRG		0.56087		1.7830	20	0.99	30	
Bromoform			0.9989	0.9852	1.1029	1.0771	1.3948	1.5110	1.6173	1.5335	AVRG		0.78273		1.2776	21	0.99	30	
1,1,2,2-Tetrachloroethane	1.1027	0.9722	1.2118	1.0282	1.1020	0.9369	1.0481	0.9354	0.9330	0.8308	AVRG		0.98999		1.0101	11	0.99	30	
4-Ethyltoluene	4.0988	3.7881	4.0164	3.8847	4.0946	4.0489	4.3769	3.7591	3.4557	2.8545	AVRG		0.26057		3.8378	11	0.99	30	
1,3,5-Trimethylbenzene	5.7644	5.2069	5.1462	4.6924	4.6621	4.5344	4.6119	4.0237	3.7502	3.1994	AVRG		0.21934		4.5592	16	0.99	30	
1,2,4-Trimethylbenzene	4.7712	4.5364	4.1035	4.3005	4.2899	4.3111	4.1604	3.5064	3.2259	2.7285	AVRG		0.25041		3.9934	16	0.99	30	
1,3-Dichlorobenzene	2.7230	2.3006	2.3539	2.3070	2.4117	2.2944	2.5433	2.2646	2.1142	1.7127	AVRG		0.43430		2.3025	12	0.99	30	
1,4-Dichlorobenzene	3.1438	2.7849	2.4725	2.4371	2.4447	2.4200	2.5903	2.3850	2.1803	1.8236	AVRG		0.40515		2.4682	14	0.99	30	
Benzyl chloride	2.1129	1.9223m	2.2549	2.2578m	2.4676	2.3878	2.7190	2.3949	2.1875	1.6458	AVRG		0.44742		2.2350	13	0.99	30	
1,2-Dichlorobenzene	2.7788	2.6980	2.4556	2.3638	2.3976	2.2611m	2.4664	2.1856	2.1501	1.7480	AVRG		0.42544		2.3505	12	0.99	30	
1,2,4-Trichlorobenzene			2.2350	2.1290	1.9353m	2.0589	2.2082	2.1007	2.1530	1.7998	AVRG		0.48135		2.0775	7	0.99	30	
Hexachlorobutadiene			2.3727	2.1906	1.9815	1.8078	1.7369	1.5554	1.4521		AVRG		0.53447		1.8710	18	0.99	30	
Naphthalene			4.4063	4.8129	3.8261	4.3733	4.6903	4.7581	4.8791	4.1036	AVRG		0.22315		4.4812	8	0.99	30	
Bromofluorobenzene	1.2417	1.2285	1.2452	1.2230	1.2601	1.3483	1.4049	1.4255	1.4683	1.4309	AVRG		0.75322		1.3276	7	0.99	30	

Spiked Amounts / Drifts	L1	%D	L2	%D	L3	%D	L4	%D	L5	%D	L6	%D	L7	%D	L8	%D	L9	%D	L10	%D
Freon 12	0.0500	-13	0.1000	-11	0.1667	-7	0.5000	-9	1.6667	-5	5.0000	-1	16.667	8	33.333	14	50.000	**24**		
Freon 114	0.0500	-17	0.1000	-15	0.1667	-9	0.5000	-9	1.6667	-6	5.0000	-4	16.667	1	33.333	7	50.000	15	100.00	**37**
Chloromethane	0.0500	6	0.1000	**-22**	0.1667	-14	0.5000	-14	1.6667	-10	5.0000	-8	16.667	9	33.333	20	50.000	**33**		
Vinyl Chloride	0.0500	-10	0.1000	-14	0.1667	-9	0.5000	-9	1.6667	-4	5.0000	-4	16.667	8	33.333	17	50.000	**26**		
1,3-Butadiene			0.1000	-15	0.1667	-7	0.5000	-11	1.6667	-4	5.0000	-6	16.667	8	33.333	15	50.000	20		
Bromomethane	0.0500	-10	0.1000	-18	0.1667	-14	0.5000	-14	1.6667	-3	5.0000	-1	16.667	12	33.333	19	50.000	**30**		
Chloroethane	0.0500	11	0.1000	-6	0.1667	-18	0.5000	-1	1.6667	-11	5.0000	-5	16.667	-1	33.333	3	50.000	9	100.00	20
Trichlorofluoromethane	0.0500	-14	0.1000	-13	0.1667	-5	0.5000	-7	1.6667	-1	5.0000	-2	16.667	7	33.333	14	50.000	**22**		
Acrolein			0.1000	-18	0.1667	-16	0.5000	-9	1.6667	-6	5.0000	-6	16.667	10	33.333	20	50.000	**25**		
1,1-Dichloroethene	0.0500	-19	0.1000	-19	0.1667	-9	0.5000	-11	1.6667	-5	5.0000	-7	16.667	5	33.333	12	50.000	15	100.00	**39**
Freon 113	0.0500	-14	0.1000	-14	0.1667	-4	0.5000	-8	1.6667	-3	5.0000	-5	16.667	3	33.333	8	50.000	9	100.00	**30**
Acetone							0.5000	13	1.6667	-15	5.0000	-19	16.667	-8	33.333	-1	50.000	2	100.00	**28**
Carbon Disulfide	0.0500	-4	0.1000	-14	0.1667	-8	0.5000	-13	1.6667	-8	5.0000	-13	16.667	1	33.333	8	50.000	11	100.00	**39**
Isopropanol							0.5000	6	1.6667	-5	5.0000	-12	16.667	-7	33.333	-1	50.000	4	100.00	15
Methylene Chloride	0.0500	1	0.1000	-11	0.1667	-8	0.5000	-10	1.6667	-4	5.0000	-7	16.667	6	33.333	13	50.000	20		
trans-1,2-Dichloroethene	0.0500	-3	0.1000	-7	0.1667	5	0.5000	2	1.6667	12	5.0000	4	16.667	8	33.333	1	50.000	-7	100.00	-16
MTBE	0.0500	-13	0.1000	-13	0.1667	-7	0.5000	-7	1.6667	-2	5.0000	-4	16.667	3	33.333	5	50.000	6	100.00	**32**
n-Hexane	0.0500	5	0.1000	-1	0.1667	-3	0.5000	-6	1.6667	-2	5.0000	-12	16.667	-4	33.333	-3	50.000	2	100.00	**25**
1,1-Dichloroethane	0.0500	-14	0.1000	-13	0.1667	-7	0.5000	-7	1.6667	-1	5.0000	-5	16.667	6	33.333	18	50.000	**23**		
Vinyl Acetate	0.0500	**-28**	0.1000	-19	0.1667	-14	0.5000	-9	1.6667	1	5.0000	-8	16.667	9	33.333	16	50.000	16	100.00	**35**
cis-1,2-Dichloroethene	0.0500	-9	0.1000	-18	0.1667	-5	0.5000	-5	1.6667	2	5.0000	-5	16.667	6	33.333	7	50.000	5	100.00	**22**
2-Butanone	0.0500	14	0.1000	2	0.1667	-20	0.5000	-14	1.6667	-10	5.0000	-8	16.667	5	33.333	7	50.000	6	100.00	17
Ethyl Acetate	0.0500	-7	0.1000	0	0.1667	9	0.5000	1	1.6667	6	5.0000	-1	16.667	2	33.333	-3	50.000	-7	100.00	1
Tetrahydrofuran	0.0500	3	0.1000	2	0.1667	-10	0.5000	4	1.6667	10	5.0000	7	16.667	8	33.333	-6	50.000	-18		
Chloroform	0.0500	-7	0.1000	-12	0.1667	-2	0.5000	-4	1.6667	1	5.0000	-5	16.667	3	33.333	12	50.000	13		
1,1,1-Trichloroethane	0.0500	-6	0.1000	-11	0.1667	2	0.5000	-6	1.6667	1	5.0000	1	16.667	10	33.333	8	50.000	1	100.00	-1
Cyclohexane	0.0500	-5	0.1000	-6	0.1667	0	0.5000	-8	1.6667	-1	5.0000	-1	16.667	10	33.333	10	50.000	2	100.00	-2
Carbon Tetrachloride	0.0500	-10	0.1000	-11	0.1667	1	0.5000	-6	1.6667	0	5.0000	0	16.667	10	33.333	10	50.000	3	100.00	4
Benzene	0.0500	15	0.1000	10	0.1667	5	0.5000	-4	1.6667	-1	5.0000	-3	16.667	4	33.333	-3	50.000	-9	100.00	-15
1,2-Dichloroethane	0.0500	-7	0.1000	-13	0.1667	2	0.5000	-6	1.6667	3	5.0000	-1	16.667	12	33.333	9	50.000	3	100.00	-2
n-Heptane	0.0500	**27**	0.1000	8	0.1667	5	0.5000	1	1.6667	13	5.0000	-2	16.667	3	33.333	-12	50.000	-17	100.00	**-27**
Trichloroethene	0.0500	4	0.1000	-2	0.1667	7	0.5000	-2	1.6667	4	5.0000	-1	16.667	5	33.333	2	50.000	-5	100.00	-13
1,2-Dichloropropane	0.0500	4	0.1000	-6	0.1667	5	0.5000	-1	1.6667	7	5.0000	3	16.667	12	33.333	2	50.000	-7	100.00	-19
Bromodichloromethane	0.0500	-12	0.1000	-14	0.1667	2	0.5000	-5	1.6667	3	5.0000	1	16.667	10	33.333	9	50.000	4	100.00	3
cis-1,3-Dichloropropene	0.0500	-7	0.1000	-16	0.1667	1	0.5000	-4	1.6667	6	5.0000	2	16.667	15	33.333	8	50.000	2	100.00	-7
4-Methyl-2-Pentanone	0.0500	**-31**	0.1000	-14	0.1667	1	0.5000	6	1.6667	**26**	5.0000	13	16.667	19	33.333	5	50.000	-4	100.00	-20
Toluene	0.0500	**22**	0.1000	9	0.1667	3	0.5000	-11	1.6667	2	5.0000	-11	16.667	1	33.333	-4	50.000	-4	100.00	-8
trans-1,3-Dichloropropene	0.0500	-17	0.1000	**-22**	0.1667	-7	0.5000	-1	1.6667	8	5.0000	3	16.667	**22**	33.333	12	50.000	5	100.00	-3
1,1,2-Trichloroethane	0.0500	**-24**	0.1000	**-23**	0.1667	-6	0.5000	1	1.6667	7	5.0000	2	16.667	17	33.333	12	50.000	11	100.00	3
Tetrachloroethene	0.0500	0	0.1000	-13	0.1667	-1	0.5000	-11	1.6667	-1	5.0000	-10	16.667	9	33.333	9	50.000	11	100.00	9
2-Hexanone					0.1667	-20	0.5000	**-22**	1.6667	**27**	5.0000	6	16.667	18	33.333	1	50.000	-10		
Dibromochloromethane	0.0500	-17	0.1000	-20	0.1667	-7	0.5000	-13	1.6667	-1	5.0000	-5	16.667	15	33.333	15	50.000	19	100.00	15

Spiked Amounts / Drifts	L1	%D	L2	%D	L3	%D	L4	%D	L5	%D	L6	%D	L7	%D	L8	%D	L9	%D	L10	%D
1,2-Dibromoethane	0.0500	-5	0.1000	-18	0.1667	-5	0.5000	-8	1.6667	0	5.0000	-6	16.667	13	33.333	7	50.000	15	100.00	9
Chlorobenzene	0.0500	**21**	0.1000	-6	0.1667	17	0.5000	-2	1.6667	12	5.0000	-8	16.667	4	33.333	-4	50.000	-12	100.00	**-22**
Ethylbenzene	0.0500	15	0.1000	-10	0.1667	16	0.5000	-4	1.6667	12	5.0000	-7	16.667	9	33.333	-12	50.000	-20		
m,p-Xylenes	0.1000	19	0.2000	-4	0.3333	12	1.0000	-2	3.3333	8	10.000	-2	33.333	3	66.667	-13	100.00	**-22**		
o-Xylene	0.0500	16	0.1000	-3	0.1667	10	0.5000	-2	1.6667	6	5.0000	-2	16.667	6	33.333	-11	50.000	-19		
Styrene	0.0500	-16	0.1000	**-26**	0.1667	-15	0.5000	-16	1.6667	0	5.0000	0	16.667	**31**	33.333	**24**	50.000	**24**	100.00	-6
Bromoform					0.1667	**-22**	0.5000	**-23**	1.6667	-14	5.0000	-16	16.667	9	33.333	18	50.000	**27**	100.00	20
1,1,2,2-Tetrachloroethane	0.0500	9	0.1000	-4	0.1667	20	0.5000	2	1.6667	9	5.0000	-7	16.667	4	33.333	-7	50.000	-8	100.00	-18
4-Ethyltoluene	0.0500	7	0.1000	-1	0.1667	5	0.5000	1	1.6667	7	5.0000	6	16.667	14	33.333	-2	50.000	-10	100.00	**-26**
1,3,5-Trimethylbenzene	0.0500	**26**	0.1000	14	0.1667	13	0.5000	3	1.6667	2	5.0000	-1	16.667	1	33.333	-12	50.000	-18	100.00	**-30**
1,2,4-Trimethylbenzene	0.0500	19	0.1000	14	0.1667	3	0.5000	8	1.6667	7	5.0000	8	16.667	4	33.333	-12	50.000	-19	100.00	**-32**
1,3-Dichlorobenzene	0.0500	18	0.1000	0	0.1667	2	0.5000	0	1.6667	5	5.0000	0	16.667	10	33.333	-2	50.000	-8	100.00	**-26**
1,4-Dichlorobenzene	0.0500	**27**	0.1000	13	0.1667	0	0.5000	-1	1.6667	-1	5.0000	-2	16.667	5	33.333	-3	50.000	-12	100.00	**-26**
Benzyl chloride	0.0500	-5	0.1000	-14	0.1667	1	0.5000	1	1.6667	10	5.0000	7	16.667	**22**	33.333	7	50.000	-2	100.00	**-26**
1,2-Dichlorobenzene	0.0500	18	0.1000	15	0.1667	4	0.5000	1	1.6667	2	5.0000	-4	16.667	5	33.333	-7	50.000	-9	100.00	**-26**
1,2,4-Trichlorobenzene					0.1667	8	0.5000	2	1.6667	-7	5.0000	-1	16.667	6	33.333	1	50.000	4	100.00	-13
Hexachlorobutadiene					0.1667	**27**	0.5000	17	1.6667	6	5.0000	-3	16.667	-7	33.333	-17	50.000	**-22**		
Naphthalene					0.1667	-2	0.5000	7	1.6667	-15	5.0000	-2	16.667	5	33.333	6	50.000	9	100.00	-8
Bromofluorobenzene	6.6667	-6	6.6667	-7	6.6667	-6	6.6667	-8	6.6667	-5	6.6667	2	6.6667	6	6.6667	7	6.6667	11	6.6667	8

TEW 10/09/15 [1,3-Butadiene]: Corrected automatically drawn baseline in 0.05PPB (280_008).

TEW 10/09/15 [2-Hexanone]: Corrected automatically drawn baseline in multiple levels.

TEW 10/09/15 [Ethylbenzene]: Corrected automatically drawn baseline in multiple levels.

TEW 10/09/15 [Methyl methacrylate]: Corrected automatically drawn baseline in 0.05PPB (280_008).

TEW 10/09/15 [o-Xylene]: Corrected automatically drawn baseline in multiple levels.

TEW 10/09/15 [Acrolein]: Corrected automatically drawn baseline in 0.1PPB (280_009).

TEW 10/09/15 [Benzyl chloride]: Corrected automatically drawn baseline in multiple levels.

TEW 10/09/15 [Chloroethane]: Corrected automatically drawn baseline in 0.1PPB (280_009).

TEW 10/09/15 [n-Hexane]: Corrected automatically drawn baseline in multiple levels.

TEW 10/09/15 [trans-1,2-Dichloroethene]: Corrected automatically drawn baseline in 0.167PPB (280_010).

TEW 10/09/15 [1,2-Dichloroethane]: Corrected automatically drawn baseline in 0.5PPB (280_011).

TEW 10/09/15 [1,2,4-Trichlorobenzene]: Corrected automatically drawn baseline in 1.67PPB (280_012).

TEW 10/09/15 [Carbon Disulfide]: Corrected automatically drawn baseline in multiple levels.

TEW 10/09/15 [MTBE]: Corrected automatically drawn baseline in multiple levels.

TEW 10/09/15 [1,2-Dichlorobenzene]: Corrected automatically drawn baseline in 5PPB (280_013).

Analyst: TEW Date: 10/12/15 Reviewer: LW Date: 10/12/15

m=manual integration

Instrument amount = a0 + response * a1 + response^2 * a2; AVRG=Average response factor

1205403859001

CURTIS & TOMPKINS 2ND SOURCE CALIBRATION SUMMARY FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Name : to15
Calnum : 1205403859001 Cal Date : 07-OCT-2015

ICV 1205406576004 (282_004 09-OCT-2015) stds: S28215, S26124 (150X)

Analyte	Spiked	Quant	Units	%D	Max	Flags
Freon 12	10.00	10.38	nL/L	4	30	
Freon 114	10.00	9.985	nL/L	0	30	
Chloromethane	10.00	9.977	nL/L	0	30	
Vinyl Chloride	10.00	10.10	nL/L	1	30	
1,3-Butadiene	10.00	9.726	nL/L	-3	30	
Bromomethane	10.00	10.49	nL/L	5	30	
Chloroethane	10.00	9.118	nL/L	-9	30	
Trichlorofluoromethane	10.00	10.07	nL/L	1	30	
Acrolein	10.00	9.963	nL/L	0	30	
1,1-Dichloroethene	10.00	10.05	nL/L	0	30	
Freon 113	10.00	9.798	nL/L	-2	30	
Acetone	10.00	8.729	nL/L	-13	30	
Carbon Disulfide	10.00	9.686	nL/L	-3	30	
Isopropanol	10.00	9.071	nL/L	-9	30	
Methylene Chloride	10.00	9.674	nL/L	-3	30	
trans-1,2-Dichloroethene	10.00	10.73	nL/L	7	30	
MTBE	10.00	10.31	nL/L	3	30	
n-Hexane	10.00	9.370	nL/L	-6	30	
1,1-Dichloroethane	10.00	10.28	nL/L	3	30	
Vinyl Acetate	10.00	9.327	nL/L	-7	30	
cis-1,2-Dichloroethene	10.00	10.07	nL/L	1	30	
2-Butanone	10.00	9.791	nL/L	-2	30	
Ethyl Acetate	10.00	9.971	nL/L	0	30	
Tetrahydrofuran	10.00	10.14	nL/L	1	30	
Chloroform	10.00	10.25	nL/L	3	30	
1,1,1-Trichloroethane	10.00	10.26	nL/L	3	30	
Cyclohexane	10.00	9.735	nL/L	-3	30	
Carbon Tetrachloride	10.00	9.755	nL/L	-2	30	
Benzene	10.00	9.592	nL/L	-4	30	
1,2-Dichloroethane	10.00	9.878	nL/L	-1	30	
n-Heptane	10.00	8.816	nL/L	-12	30	
Trichloroethene	10.00	9.625	nL/L	-4	30	
1,2-Dichloropropane	10.00	10.35	nL/L	4	30	
Bromodichloromethane	10.00	10.22	nL/L	2	30	
cis-1,3-Dichloropropene	10.00	10.02	nL/L	0	30	
4-Methyl-2-Pentanone	10.00	10.89	nL/L	9	30	
Toluene	10.00	8.995	nL/L	-10	30	
trans-1,3-Dichloropropene	10.00	10.42	nL/L	4	30	
1,1,2-Trichloroethane	10.00	10.86	nL/L	9	30	
Tetrachloroethene	10.00	9.861	nL/L	-1	30	
2-Hexanone	10.00	9.682	nL/L	-3	30	
Dibromochloromethane	10.00	10.37	nL/L	4	30	
1,2-Dibromoethane	10.00	10.04	nL/L	0	30	
Chlorobenzene	10.00	8.752	nL/L	-12	30	
Ethylbenzene	10.00	8.386	nL/L	-16	30	
m,p-Xylenes	20.00	18.02	nL/L	-10	30	
o-Xylene	10.00	9.149	nL/L	-9	30	
Styrene	10.00	9.687	nL/L	-3	30	
Bromoform	10.00	9.045	nL/L	-10	30	

Analyte	Spiked	Quant	Units	%D	Max	Flags
1,1,2,2-Tetrachloroethane	10.00	8.977	nL/L	-10	30	
4-Ethyltoluene	10.00	10.08	nL/L	1	30	
1,3,5-Trimethylbenzene	10.00	9.355	nL/L	-6	30	
1,2,4-Trimethylbenzene	10.00	9.868	nL/L	-1	30	
1,3-Dichlorobenzene	10.00	9.470	nL/L	-5	30	
1,4-Dichlorobenzene	10.00	9.286	nL/L	-7	30	
Benzyl chloride	10.00	9.073	nL/L	-9	30	
1,2-Dichlorobenzene	10.00	9.124	nL/L	-9	30	
1,2,4-Trichlorobenzene	10.00	9.925	nL/L	-1	30	
Hexachlorobutadiene	10.00	9.155	nL/L	-8	30	
Naphthalene	10.00	9.617	nL/L	-4	30	

Analyst: TEW Date: 10/12/15 Reviewer: LW Date: 10/12/15

CURTIS & TOMPKINS SPIKE USER REPORT FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : QC814669 IDF : 1.0
Seqnum : 1205481527003.3 File : 334_003 Time : 30-NOV-2015 10:29
Cal : 1205403859001 Caldate : 07-OCT-2015
Standards: S28600, S28218 (150X)

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Freon 12	3.3165	3.2086	10.00	9.675	nL/L	-3	30	u
Freon 114	3.4024	3.1532	10.00	9.269	nL/L	-7	30	u
Chloromethane	0.2235	0.2008	10.00	8.990	nL/L	-10	30	u
Vinyl Chloride	1.0416	0.8435	10.00	8.100	nL/L	-19	30	u
1,3-Butadiene	0.5460	0.5091	10.00	9.327	nL/L	-7	30	u
Bromomethane	0.6226	0.5855	10.00	9.406	nL/L	-6	30	u
Chloroethane	0.1148	0.0864	10.00	7.524	nL/L	-25	30	u
Trichlorofluoromethane	3.8593	3.5795	10.00	9.276	nL/L	-7	30	u
Acrolein	0.1603	0.1300	10.00	8.110	nL/L	-19	30	u
1,1-Dichloroethene	2.0503	1.7360	10.00	8.472	nL/L	-15	30	u
Freon 113	2.7076	2.5531	10.00	9.430	nL/L	-6	30	u
Acetone	1.6884	1.3519	10.00	8.003	nL/L	-20	30	u
Carbon Disulfide	1.3562	1.2013	10.00	8.856	nL/L	-11	30	u
Isopropanol	0.7989	0.5256	10.00	6.579	nL/L	**-34**	30	c- u ***
Methylene Chloride	1.6848	1.4216	10.00	8.440	nL/L	-16	30	u
trans-1,2-Dichloroethene	1.1905	1.1902	10.00	10.00	nL/L	0	30	u
MTBE	1.4869	1.2987	10.00	8.734	nL/L	-13	30	u
n-Hexane	0.5315	0.4548	10.00	8.559	nL/L	-14	30	u
1,1-Dichloroethane	2.4057	2.0615	10.00	8.573	nL/L	-14	30	u
Vinyl Acetate	1.4694	1.3563	10.00	9.229	nL/L	-8	30	u
cis-1,2-Dichloroethene	1.4449	1.2732	10.00	8.817	nL/L	-12	30	u
2-Butanone	1.3750	1.3806	10.00	10.04	nL/L	0	30	u
Ethyl Acetate	1.5633	1.5689	10.00	10.04	nL/L	0	30	u
Tetrahydrofuran	0.4877	0.4789	10.00	9.817	nL/L	-2	30	u
Chloroform	1.9754	1.8036	10.00	9.135	nL/L	-9	30	u
1,1,1-Trichloroethane	1.3658	1.2674	10.00	9.276	nL/L	-7	30	u
Cyclohexane	0.7610	0.6626	10.00	8.708	nL/L	-13	30	u
Carbon Tetrachloride	1.6921	1.5322	10.00	9.054	nL/L	-9	30	u
Benzene	0.6763	0.5704	10.00	8.432	nL/L	-16	30	u
1,2-Dichloroethane	0.9725	0.7857	10.00	8.077	nL/L	-19	30	u
n-Heptane	0.5909	0.5494	10.00	9.296	nL/L	-7	30	u
Trichloroethene	0.5264	0.4994	10.00	9.486	nL/L	-5	30	u
1,2-Dichloropropane	0.4217	0.3594	10.00	8.523	nL/L	-15	30	u
Bromodichloromethane	1.0173	0.9256	10.00	9.097	nL/L	-9	30	u
cis-1,3-Dichloropropene	0.3511	0.3125	10.00	8.898	nL/L	-11	30	u
4-Methyl-2-Pentanone	0.8284	0.8766	10.00	10.58	nL/L	6	30	u
Toluene	1.2455	1.0278	10.00	8.252	nL/L	-17	30	u
trans-1,3-Dichloropropene	0.2944	0.2760	10.00	9.374	nL/L	-6	30	u
1,1,2-Trichloroethane	0.3916	0.3731	10.00	9.528	nL/L	-5	30	u
Tetrachloroethene	0.7991	0.7534	10.00	9.431	nL/L	-6	30	u
2-Hexanone	0.8350	0.7838	10.00	9.391	nL/L	-6	30	u
Dibromochloromethane	1.3389	1.2375	10.00	9.243	nL/L	-8	30	u
1,2-Dibromoethane	0.7661	0.6835	10.00	8.927	nL/L	-11	30	u
Chlorobenzene	0.9414	0.8408	10.00	8.936	nL/L	-11	30	u
Ethylbenzene	2.1312	1.7605	10.00	8.262	nL/L	-17	30	u
m,p-Xylenes	2.6924	2.1926	20.00	16.28	nL/L	-19	30	u
o-Xylene	2.7910	2.3929	10.00	8.575	nL/L	-14	30	u
Styrene	1.7830	1.7929	10.00	10.06	nL/L	1	30	u

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Bromoform	1.2776	1.2013	10.00	9.407	nL/L	-6	30	u
1,1,2,2-Tetrachloroethane	1.0101	0.8466	10.00	8.380	nL/L	-16	30	u
4-Ethyltoluene	3.8378	3.7502	10.00	9.775	nL/L	-2	30	u
1,3,5-Trimethylbenzene	4.5592	4.2065	10.00	9.228	nL/L	-8	30	u
1,2,4-Trimethylbenzene	3.9934	3.8317	10.00	9.597	nL/L	-4	30	u
1,3-Dichlorobenzene	2.3025	2.4058	10.00	10.45	nL/L	4	30	u
1,4-Dichlorobenzene	2.4682	2.5327	10.00	10.26	nL/L	3	30	u
Benzyl chloride	2.2350	2.3236	10.00	10.40	nL/L	4	30	u
1,2-Dichlorobenzene	2.3505	2.4259	10.00	10.32	nL/L	3	30	u
1,2,4-Trichlorobenzene	2.0775	2.9806	10.00	14.35	nL/L	**44**	30	c+ u ***
Hexachlorobutadiene	1.8710	2.5858	10.00	13.83	nL/L	**38**	30	c+ u ***
Naphthalene	4.4812	6.6214	10.00	14.78	nL/L	**48**	30	c+ u ***
Bromofluorobenzene	1.3276	1.2932	6.667	6.492	nL/L	-3	30	u

ISTD (ICAL 280_013)	ICAL Area	Area	%Drift	ICAL RT	RT	Drift
Bromochloromethane	786291	602137	-23.42	34.66	34.62	-0.04
1,4-Difluorobenzene	1353000	1143000	-15.52	38.71	38.67	-0.04
Chlorobenzene-d5	1200000	1030000	-14.17	48.30	48.28	-0.02

5% spike rule

Analyst: TEW Date: 12/03/15 Reviewer: LW Date: 12/04/15

+=high bias -=low bias c=CCV u=use

CURTIS & TOMPKINS SPIKE USER REPORT FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : QC814894 IDF : 1.0
Seqnum : 1205482965004.1 File : 335_004 Time : 01-DEC-2015 11:28
Cal : 1205403859001 Caldate : 07-OCT-2015
Standards: S28600, S28218 (150X)

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Freon 12	3.3165	3.2174	10.00	9.701	nL/L	-3	30	u
Freon 114	3.4024	3.2628	10.00	9.593	nL/L	-4	30	u
Chloromethane	0.2235	0.2039	10.00	9.127	nL/L	-9	30	u
Vinyl Chloride	1.0416	0.8610	10.00	8.268	nL/L	-17	30	u
1,3-Butadiene	0.5460	0.5312	10.00	9.733	nL/L	-3	30	u
Bromomethane	0.6226	0.5827	10.00	9.360	nL/L	-6	30	u
Chloroethane	0.1148	0.0852	10.00	7.421	nL/L	-26	30	u
Trichlorofluoromethane	3.8593	3.7746	10.00	9.783	nL/L	-2	30	u
Acrolein	0.1603	0.1297	10.00	8.095	nL/L	-19	30	u
1,1-Dichloroethene	2.0503	1.7348	10.00	8.465	nL/L	-15	30	u
Freon 113	2.7076	2.6722	10.00	9.872	nL/L	-1	30	u
Acetone	1.6884	1.3965	10.00	8.267	nL/L	-17	30	u
Carbon Disulfide	1.3562	1.1879	10.00	8.761	nL/L	-12	30	u
Isopropanol	0.7989	0.5671	10.00	7.099	nL/L	-29	30	u
Methylene Chloride	1.6848	1.4802	10.00	8.785	nL/L	-12	30	u
trans-1,2-Dichloroethene	1.1905	1.1457	10.00	9.627	nL/L	-4	30	u
MTBE	1.4869	1.3319	10.00	8.958	nL/L	-10	30	u
n-Hexane	0.5315	0.4857	10.00	9.141	nL/L	-9	30	u
1,1-Dichloroethane	2.4057	2.1509	10.00	8.941	nL/L	-11	30	u
Vinyl Acetate	1.4694	1.3917	10.00	9.471	nL/L	-5	30	u
cis-1,2-Dichloroethene	1.4449	1.2781	10.00	8.846	nL/L	-12	30	u
2-Butanone	1.3750	1.4180	10.00	10.31	nL/L	3	30	u
Ethyl Acetate	1.5633	1.6846	10.00	10.78	nL/L	8	30	u
Tetrahydrofuran	0.4877	0.4760	10.00	9.762	nL/L	-2	30	u
Chloroform	1.9754	1.8472	10.00	9.356	nL/L	-6	30	u
1,1,1-Trichloroethane	1.3658	1.2532	10.00	9.178	nL/L	-8	30	u
Cyclohexane	0.7610	0.6741	10.00	8.864	nL/L	-11	30	u
Carbon Tetrachloride	1.6921	1.5927	10.00	9.415	nL/L	-6	30	u
Benzene	0.6763	0.5597	10.00	8.278	nL/L	-17	30	u
1,2-Dichloroethane	0.9725	0.7868	10.00	8.094	nL/L	-19	30	u
n-Heptane	0.5909	0.5119	10.00	8.665	nL/L	-13	30	u
Trichloroethene	0.5264	0.5129	10.00	9.746	nL/L	-3	30	u
1,2-Dichloropropane	0.4217	0.3618	10.00	8.583	nL/L	-14	30	u
Bromodichloromethane	1.0173	0.9236	10.00	9.082	nL/L	-9	30	u
cis-1,3-Dichloropropene	0.3511	0.3173	10.00	9.040	nL/L	-10	30	u
4-Methyl-2-Pentanone	0.8284	0.8768	10.00	10.59	nL/L	6	30	u
Toluene	1.2455	1.0519	10.00	8.448	nL/L	-16	30	u
trans-1,3-Dichloropropene	0.2944	0.2660	10.00	9.039	nL/L	-10	30	u
1,1,2-Trichloroethane	0.3916	0.3943	10.00	10.07	nL/L	1	30	u
Tetrachloroethene	0.7991	0.8084	10.00	10.11	nL/L	1	30	u
2-Hexanone	0.8350	0.8018	10.00	9.607	nL/L	-4	30	u
Dibromochloromethane	1.3389	1.3315	10.00	9.945	nL/L	-1	30	u
1,2-Dibromoethane	0.7661	0.7452	10.00	9.729	nL/L	-3	30	u
Chlorobenzene	0.9414	0.8357	10.00	8.880	nL/L	-11	30	u
Ethylbenzene	2.1312	1.7051	10.00	8.003	nL/L	-20	30	u
m,p-Xylenes	2.6924	2.2819	20.00	16.95	nL/L	-15	30	u
o-Xylene	2.7910	2.4297	10.00	8.706	nL/L	-13	30	u
Styrene	1.7830	1.8390	10.00	10.31	nL/L	3	30	u

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Bromoform	1.2776	1.2733	10.00	9.971	nL/L	0	30	u
1,1,2,2-Tetrachloroethane	1.0101	0.8791	10.00	8.703	nL/L	-13	30	u
4-Ethyltoluene	3.8378	4.0253	10.00	10.49	nL/L	5	30	u
1,3,5-Trimethylbenzene	4.5592	4.4078	10.00	9.670	nL/L	-3	30	u
1,2,4-Trimethylbenzene	3.9934	4.1922	10.00	10.50	nL/L	5	30	u
1,3-Dichlorobenzene	2.3025	2.4216	10.00	10.52	nL/L	5	30	u
1,4-Dichlorobenzene	2.4682	2.5239	10.00	10.23	nL/L	2	30	u
Benzyl chloride	2.2350	2.1465	10.00	9.605	nL/L	-4	30	u
1,2-Dichlorobenzene	2.3505	2.4996	10.00	10.64	nL/L	6	30	u
1,2,4-Trichlorobenzene	2.0775	3.2006	10.00	15.41	nL/L	**54**	30	c+ u ***
Hexachlorobutadiene	1.8710	2.8652	10.00	15.32	nL/L	**53**	30	c+ u ***
Naphthalene	4.4812	7.3281	10.00	16.36	nL/L	**64**	30	c+ u ***
Bromofluorobenzene	1.3276	1.2755	6.667	6.403	nL/L	-4	30	u

ISTD (ICAL 280_013)	ICAL Area	Area	%Drift	ICAL RT	RT	Drift
Bromochloromethane	786291	557593	-29.09	34.66	34.62	-0.04
1,4-Difluorobenzene	1353000	1082000	-20.03	38.71	38.68	-0.03
Chlorobenzene-d5	1200000	906277	-24.48	48.30	48.29	-0.01

TEW 12/01/15 : Corrected standard ID in LIMS. [general version]

Analyst: TEW Date: 12/03/15 Reviewer: LW Date: 12/04/15

+=high bias c=CCV u=use

CURTIS & TOMPKINS SPIKE USER REPORT FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : QC815053 IDF : 1.0
Seqnum : 1205484408002.1 File : 336_002 Time : 02-DEC-2015 10:37
Cal : 1205403859001 Caldate : 07-OCT-2015
Standards: S28600, S28218 (150X)

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Freon 12	3.3165	3.2119	10.00	9.688	nL/L	-3	30	u
Freon 114	3.4024	3.2554	10.00	9.569	nL/L	-4	30	u
Chloromethane	0.2235	0.1982	10.00	8.870	nL/L	-11	30	u
Vinyl Chloride	1.0416	0.8630	10.00	8.287	nL/L	-17	30	u
1,3-Butadiene	0.5460	0.5298	10.00	9.707	nL/L	-3	30	u
Bromomethane	0.6226	0.5796	10.00	9.312	nL/L	-7	30	u
Chloroethane	0.1148	0.0808	10.00	7.042	nL/L	-30	30	u
Trichlorofluoromethane	3.8593	3.8090	10.00	9.870	nL/L	-1	30	u
Acrolein	0.1603	0.1303	10.00	8.131	nL/L	-19	30	u
1,1-Dichloroethene	2.0503	1.7701	10.00	8.636	nL/L	-14	30	u
Freon 113	2.7076	2.6716	10.00	9.869	nL/L	-1	30	u
Acetone	1.6884	1.4076	10.00	8.339	nL/L	-17	30	u
Carbon Disulfide	1.3562	1.1692	10.00	8.623	nL/L	-14	30	u
Isopropanol	0.7989	0.5611	10.00	7.024	nL/L	-30	30	u
Methylene Chloride	1.6848	1.4827	10.00	8.803	nL/L	-12	30	u
trans-1,2-Dichloroethene	1.1905	1.1242	10.00	9.445	nL/L	-6	30	u
MTBE	1.4869	1.3193	10.00	8.873	nL/L	-11	30	u
n-Hexane	0.5315	0.4519	10.00	8.504	nL/L	-15	30	u
1,1-Dichloroethane	2.4057	2.1299	10.00	8.853	nL/L	-11	30	u
Vinyl Acetate	1.4694	1.3417	10.00	9.131	nL/L	-9	30	u
cis-1,2-Dichloroethene	1.4449	1.2671	10.00	8.772	nL/L	-12	30	u
2-Butanone	1.3750	1.4129	10.00	10.28	nL/L	3	30	u
Ethyl Acetate	1.5633	1.6172	10.00	10.35	nL/L	3	30	u
Tetrahydrofuran	0.4877	0.4997	10.00	10.25	nL/L	2	30	u
Chloroform	1.9754	1.8228	10.00	9.228	nL/L	-8	30	u
1,1,1-Trichloroethane	1.3658	1.2881	10.00	9.433	nL/L	-6	30	u
Cyclohexane	0.7610	0.6773	10.00	8.903	nL/L	-11	30	u
Carbon Tetrachloride	1.6921	1.6269	10.00	9.618	nL/L	-4	30	u
Benzene	0.6763	0.5465	10.00	8.082	nL/L	-19	30	u
1,2-Dichloroethane	0.9725	0.7982	10.00	8.209	nL/L	-18	30	u
n-Heptane	0.5909	0.5115	10.00	8.657	nL/L	-13	30	u
Trichloroethene	0.5264	0.5025	10.00	9.548	nL/L	-5	30	u
1,2-Dichloropropane	0.4217	0.3545	10.00	8.409	nL/L	-16	30	u
Bromodichloromethane	1.0173	0.9319	10.00	9.160	nL/L	-8	30	u
cis-1,3-Dichloropropene	0.3511	0.3025	10.00	8.616	nL/L	-14	30	u
4-Methyl-2-Pentanone	0.8284	0.8626	10.00	10.41	nL/L	4	30	u
Toluene	1.2455	0.9791	10.00	7.865	nL/L	-21	30	u
trans-1,3-Dichloropropene	0.2944	0.2632	10.00	8.943	nL/L	-11	30	u
1,1,2-Trichloroethane	0.3916	0.3853	10.00	9.839	nL/L	-2	30	u
Tetrachloroethene	0.7991	0.7773	10.00	9.730	nL/L	-3	30	u
2-Hexanone	0.8350	0.7570	10.00	9.068	nL/L	-9	30	u
Dibromochloromethane	1.3389	1.2595	10.00	9.405	nL/L	-6	30	u
1,2-Dibromoethane	0.7661	0.7036	10.00	9.186	nL/L	-8	30	u
Chlorobenzene	0.9414	0.8200	10.00	8.712	nL/L	-13	30	u
Ethylbenzene	2.1312	1.7557	10.00	8.241	nL/L	-18	30	u
m,p-Xylenes	2.6924	2.3354	20.00	17.34	nL/L	-13	30	u
o-Xylene	2.7910	2.3787	10.00	8.525	nL/L	-15	30	u
Styrene	1.7830	1.8376	10.00	10.31	nL/L	3	30	u

Analyte	Avg RF/CF	RF/CF	Spiked	Quant	Units	%D	Max %D	Flags
Bromoform	1.2776	1.2201	10.00	9.550	nL/L	-4	30	u
1,1,2,2-Tetrachloroethane	1.0101	0.8467	10.00	8.386	nL/L	-16	30	u
4-Ethyltoluene	3.8378	3.9761	10.00	10.36	nL/L	4	30	u
1,3,5-Trimethylbenzene	4.5592	4.4409	10.00	9.743	nL/L	-3	30	u
1,2,4-Trimethylbenzene	3.9934	4.0770	10.00	10.21	nL/L	2	30	u
1,3-Dichlorobenzene	2.3025	2.4150	10.00	10.49	nL/L	5	30	u
1,4-Dichlorobenzene	2.4682	2.5883	10.00	10.49	nL/L	5	30	u
Benzyl chloride	2.2350	2.3047	10.00	10.31	nL/L	3	30	u
1,2-Dichlorobenzene	2.3505	2.4969	10.00	10.63	nL/L	6	30	u
1,2,4-Trichlorobenzene	2.0775	3.2160	10.00	15.49	nL/L	**55**	30	c+ u ***
Hexachlorobutadiene	1.8710	2.8301	10.00	15.13	nL/L	**51**	30	c+ u ***
Naphthalene	4.4812	6.8141	10.00	15.21	nL/L	**52**	30	c+ u ***
Bromofluorobenzene	1.3276	1.2796	6.667	6.426	nL/L	-4	30	u

ISTD (ICAL 280_013)	ICAL Area	Area	%Drift	ICAL RT	RT	Drift
Bromochloromethane	786291	505821	-35.67	34.66	34.62	-0.04
1,4-Difluorobenzene	1353000	962155	-28.89	38.71	38.67	-0.04
Chlorobenzene-d5	1200000	846383	-29.47	48.30	48.28	-0.02

Analyst: TEW Date: 12/03/15 Reviewer: LW Date: 12/04/15

+=high bias c=CCV u=use

CURTIS & TOMPKINS Canister Check FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : C00110 IDF : 1.0
Seqnum : 1205462738007 File : 321_007 Time : 17-NOV-2015 15:04
Cal : 1205403859001 Caldate : 07-OCT-2015

Analyte	Quant	RL	Units	Flags
Freon 12	ND	0.2000	nL/L	
Freon 114	ND	0.2000	nL/L	
Chloromethane	ND	0.2000	nL/L	
Vinyl Chloride	ND	0.2000	nL/L	
1,3-Butadiene	ND	0.2000	nL/L	
Bromomethane	ND	0.2000	nL/L	
Chloroethane	ND	0.2000	nL/L	
Trichlorofluoromethane	ND	0.2000	nL/L	
Acrolein	ND	2.000	nL/L	
1,1-Dichloroethene	ND	0.2000	nL/L	
Freon 113	ND	0.2000	nL/L	
Acetone	ND	0.8000	nL/L	
Carbon Disulfide	ND	0.2000	nL/L	
Isopropanol	ND	2.000	nL/L	
Methylene Chloride	ND	0.2000	nL/L	
trans-1,2-Dichloroethene	ND	0.2000	nL/L	
MTBE	ND	0.2000	nL/L	
n-Hexane	ND	0.2000	nL/L	
1,1-Dichloroethane	ND	0.2000	nL/L	
Vinyl Acetate	ND	0.2000	nL/L	
cis-1,2-Dichloroethene	ND	0.2000	nL/L	
2-Butanone	ND	0.2000	nL/L	
Ethyl Acetate	ND	0.2000	nL/L	
Tetrahydrofuran	ND	0.2000	nL/L	
Chloroform	ND	0.2000	nL/L	
1,1,1-Trichloroethane	ND	0.2000	nL/L	
Cyclohexane	ND	0.2000	nL/L	
Carbon Tetrachloride	ND	0.2000	nL/L	
Benzene	ND	0.2000	nL/L	
1,2-Dichloroethane	ND	0.2000	nL/L	
n-Heptane	ND	0.2000	nL/L	
Trichloroethene	ND	0.2000	nL/L	
1,2-Dichloropropane	ND	0.2000	nL/L	
Bromodichloromethane	ND	0.2000	nL/L	
cis-1,3-Dichloropropene	ND	0.2000	nL/L	
4-Methyl-2-Pentanone	ND	0.2000	nL/L	
Toluene	ND	0.2000	nL/L	
trans-1,3-Dichloropropene	ND	0.2000	nL/L	
1,1,2-Trichloroethane	ND	0.2000	nL/L	
Tetrachloroethene	ND	0.2000	nL/L	
2-Hexanone	ND	0.2000	nL/L	
Dibromochloromethane	ND	0.2000	nL/L	
1,2-Dibromoethane	ND	0.2000	nL/L	
Chlorobenzene	ND	0.2000	nL/L	
Ethylbenzene	ND	0.2000	nL/L	
m,p-Xylenes	ND	0.2000	nL/L	
o-Xylene	ND	0.2000	nL/L	
Styrene	ND	0.2000	nL/L	
Bromoform	ND	0.2000	nL/L	
1,1,2,2-Tetrachloroethane	ND	0.2000	nL/L	

Analyte	Quant	RL	Units	Flags
4-Ethyltoluene	ND	0.2000	nL/L	
1,3,5-Trimethylbenzene	ND	0.2000	nL/L	
1,2,4-Trimethylbenzene	ND	0.2000	nL/L	
1,3-Dichlorobenzene	ND	0.2000	nL/L	
1,4-Dichlorobenzene	ND	0.2000	nL/L	
Benzyl chloride	ND	0.2000	nL/L	
1,2-Dichlorobenzene	ND	0.2000	nL/L	
1,2,4-Trichlorobenzene	ND	0.2000	nL/L	
Hexachlorobutadiene	ND	0.2000	nL/L	
Naphthalene	ND	0.8000	nL/L	

ISTD (ICAL 280_013)	ICAL Area	Area	%Drift	ICAL RT	RT	Drift
Bromochloromethane	786291	524769	-33.26	34.66	34.62	-0.04
1,4-Difluorobenzene	1353000	1006000	-25.65	38.71	38.67	-0.04
Chlorobenzene-d5	1200000	906327	-24.47	48.30	48.29	-0.01

TO15 Certified (Batch 974)

Analyst: TEW Date: 11/18/15 Reviewer: LW Date: 11/18/15

CURTIS & TOMPKINS Canister Check FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : C00281 IDF : 1.0
Seqnum : 1205462738008 File : 321_008 Time : 17-NOV-2015 16:06
Cal : 1205403859001 Caldate : 07-OCT-2015

Analyte	Quant	RL	Units	Flags
Freon 12	ND	0.2000	nL/L	
Freon 114	ND	0.2000	nL/L	
Chloromethane	ND	0.2000	nL/L	
Vinyl Chloride	ND	0.2000	nL/L	
1,3-Butadiene	ND	0.2000	nL/L	
Bromomethane	ND	0.2000	nL/L	
Chloroethane	ND	0.2000	nL/L	
Trichlorofluoromethane	ND	0.2000	nL/L	
Acrolein	ND	2.000	nL/L	
1,1-Dichloroethene	ND	0.2000	nL/L	
Freon 113	ND	0.2000	nL/L	
Acetone	ND	0.8000	nL/L	
Carbon Disulfide	ND	0.2000	nL/L	
Isopropanol	ND	2.000	nL/L	
Methylene Chloride	ND	0.2000	nL/L	
trans-1,2-Dichloroethene	ND	0.2000	nL/L	
MTBE	ND	0.2000	nL/L	
n-Hexane	ND	0.2000	nL/L	
1,1-Dichloroethane	ND	0.2000	nL/L	
Vinyl Acetate	ND	0.2000	nL/L	
cis-1,2-Dichloroethene	ND	0.2000	nL/L	
2-Butanone	ND	0.2000	nL/L	
Ethyl Acetate	ND	0.2000	nL/L	
Tetrahydrofuran	ND	0.2000	nL/L	
Chloroform	ND	0.2000	nL/L	
1,1,1-Trichloroethane	ND	0.2000	nL/L	
Cyclohexane	ND	0.2000	nL/L	
Carbon Tetrachloride	ND	0.2000	nL/L	
Benzene	ND	0.2000	nL/L	
1,2-Dichloroethane	ND	0.2000	nL/L	
n-Heptane	ND	0.2000	nL/L	
Trichloroethene	ND	0.2000	nL/L	
1,2-Dichloropropane	ND	0.2000	nL/L	
Bromodichloromethane	ND	0.2000	nL/L	
cis-1,3-Dichloropropene	ND	0.2000	nL/L	
4-Methyl-2-Pentanone	ND	0.2000	nL/L	
Toluene	ND	0.2000	nL/L	
trans-1,3-Dichloropropene	ND	0.2000	nL/L	
1,1,2-Trichloroethane	ND	0.2000	nL/L	
Tetrachloroethene	ND	0.2000	nL/L	
2-Hexanone	ND	0.2000	nL/L	
Dibromochloromethane	ND	0.2000	nL/L	
1,2-Dibromoethane	ND	0.2000	nL/L	
Chlorobenzene	ND	0.2000	nL/L	
Ethylbenzene	ND	0.2000	nL/L	
m,p-Xylenes	ND	0.2000	nL/L	
o-Xylene	ND	0.2000	nL/L	
Styrene	ND	0.2000	nL/L	
Bromoform	ND	0.2000	nL/L	
1,1,2,2-Tetrachloroethane	ND	0.2000	nL/L	

Analyte	Quant	RL	Units	Flags
4-Ethyltoluene	ND	0.2000	nL/L	
1,3,5-Trimethylbenzene	ND	0.2000	nL/L	
1,2,4-Trimethylbenzene	ND	0.2000	nL/L	
1,3-Dichlorobenzene	ND	0.2000	nL/L	
1,4-Dichlorobenzene	ND	0.2000	nL/L	
Benzyl chloride	ND	0.2000	nL/L	
1,2-Dichlorobenzene	ND	0.2000	nL/L	
1,2,4-Trichlorobenzene	ND	0.2000	nL/L	
Hexachlorobutadiene	ND	0.2000	nL/L	
Naphthalene	ND	0.8000	nL/L	

ISTD (ICAL 280_013)	ICAL Area	Area	%Drift	ICAL RT	RT	Drift
Bromochloromethane	786291	525505	-33.17	34.66	34.62	-0.04
1,4-Difluorobenzene	1353000	1018000	-24.76	38.71	38.67	-0.04
Chlorobenzene-d5	1200000	915441	-23.71	48.30	48.29	-0.01

TO15 Certified (Batch 974)

Analyst: TEW Date: 11/18/15 Reviewer: LW Date: 11/18/15

CURTIS & TOMPKINS Canister Check FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : C00323 IDF : 1.0
Seqnum : 1205464202013 File : 322_013 Time : 18-NOV-2015 21:29
Cal : 1205403859001 Caldate : 07-OCT-2015

Analyte	Quant	RL	Units	Flags
Freon 12	ND	0.2000	nL/L	
Freon 114	ND	0.2000	nL/L	
Chloromethane	ND	0.2000	nL/L	
Vinyl Chloride	ND	0.2000	nL/L	
1,3-Butadiene	ND	0.2000	nL/L	
Bromomethane	ND	0.2000	nL/L	
Chloroethane	ND	0.2000	nL/L	
Trichlorofluoromethane	ND	0.2000	nL/L	
Acrolein	ND	2.000	nL/L	
1,1-Dichloroethene	ND	0.2000	nL/L	
Freon 113	ND	0.2000	nL/L	
Acetone	ND	0.8000	nL/L	
Carbon Disulfide	ND	0.2000	nL/L	
Isopropanol	ND	2.000	nL/L	
Methylene Chloride	ND	0.2000	nL/L	
trans-1,2-Dichloroethene	ND	0.2000	nL/L	
MTBE	ND	0.2000	nL/L	
n-Hexane	ND	0.2000	nL/L	
1,1-Dichloroethane	ND	0.2000	nL/L	
Vinyl Acetate	ND	0.2000	nL/L	
cis-1,2-Dichloroethene	ND	0.2000	nL/L	
2-Butanone	ND	0.2000	nL/L	
Ethyl Acetate	ND	0.2000	nL/L	
Tetrahydrofuran	ND	0.2000	nL/L	
Chloroform	ND	0.2000	nL/L	
1,1,1-Trichloroethane	ND	0.2000	nL/L	
Cyclohexane	ND	0.2000	nL/L	
Carbon Tetrachloride	ND	0.2000	nL/L	
Benzene	ND	0.2000	nL/L	
1,2-Dichloroethane	ND	0.2000	nL/L	
n-Heptane	ND	0.2000	nL/L	
Trichloroethene	ND	0.2000	nL/L	
1,2-Dichloropropane	ND	0.2000	nL/L	
Bromodichloromethane	ND	0.2000	nL/L	
cis-1,3-Dichloropropene	ND	0.2000	nL/L	
4-Methyl-2-Pentanone	ND	0.2000	nL/L	
Toluene	ND	0.2000	nL/L	
trans-1,3-Dichloropropene	ND	0.2000	nL/L	
1,1,2-Trichloroethane	ND	0.2000	nL/L	
Tetrachloroethene	ND	0.2000	nL/L	
2-Hexanone	ND	0.2000	nL/L	
Dibromochloromethane	ND	0.2000	nL/L	
1,2-Dibromoethane	ND	0.2000	nL/L	
Chlorobenzene	ND	0.2000	nL/L	
Ethylbenzene	ND	0.2000	nL/L	
m,p-Xylenes	ND	0.2000	nL/L	
o-Xylene	ND	0.2000	nL/L	
Styrene	ND	0.2000	nL/L	
Bromoform	ND	0.2000	nL/L	
1,1,2,2-Tetrachloroethane	ND	0.2000	nL/L	

Analyte	Quant	RL	Units	Flags
4-Ethyltoluene	ND	0.2000	nL/L	
1,3,5-Trimethylbenzene	ND	0.2000	nL/L	
1,2,4-Trimethylbenzene	ND	0.2000	nL/L	
1,3-Dichlorobenzene	ND	0.2000	nL/L	
1,4-Dichlorobenzene	ND	0.2000	nL/L	
Benzyl chloride	ND	0.2000	nL/L	
1,2-Dichlorobenzene	ND	0.2000	nL/L	
1,2,4-Trichlorobenzene	ND	0.2000	nL/L	
Hexachlorobutadiene	ND	0.2000	nL/L	
Naphthalene	ND	0.8000	nL/L	

ISTD (ICAL 280_013)	ICAL Area	Area	%Drift	ICAL RT	RT	Drift
Bromochloromethane	786291	598240	-23.92	34.66	34.63	-0.03
1,4-Difluorobenzene	1353000	1248000	-7.76	38.71	38.68	-0.03
Chlorobenzene-d5	1200000	1101000	-8.25	48.30	48.29	-0.01

TO15 Certified (Batch 975)

Analyst: TEW Date: 11/19/15 Reviewer: LW Date: 11/19/15

CURTIS & TOMPKINS Canister Check FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : C00385 IDF : 1.0
Seqnum : 1205464202024 File : 322_024 Time : 19-NOV-2015 08:54
Cal : 1205403859001 Caldate : 07-OCT-2015

Analyte	Quant	RL	Units	Flags
Freon 12	ND	0.2000	nL/L	
Freon 114	ND	0.2000	nL/L	
Chloromethane	ND	0.2000	nL/L	
Vinyl Chloride	ND	0.2000	nL/L	
1,3-Butadiene	ND	0.2000	nL/L	
Bromomethane	ND	0.2000	nL/L	
Chloroethane	ND	0.2000	nL/L	
Trichlorofluoromethane	ND	0.2000	nL/L	
Acrolein	ND	2.000	nL/L	
1,1-Dichloroethene	ND	0.2000	nL/L	
Freon 113	ND	0.2000	nL/L	
Acetone	ND	0.8000	nL/L	
Carbon Disulfide	ND	0.2000	nL/L	
Isopropanol	ND	2.000	nL/L	
Methylene Chloride	ND	0.2000	nL/L	
trans-1,2-Dichloroethene	ND	0.2000	nL/L	
MTBE	ND	0.2000	nL/L	
n-Hexane	ND	0.2000	nL/L	
1,1-Dichloroethane	ND	0.2000	nL/L	
Vinyl Acetate	ND	0.2000	nL/L	
cis-1,2-Dichloroethene	ND	0.2000	nL/L	
2-Butanone	ND	0.2000	nL/L	
Ethyl Acetate	ND	0.2000	nL/L	
Tetrahydrofuran	ND	0.2000	nL/L	
Chloroform	ND	0.2000	nL/L	
1,1,1-Trichloroethane	ND	0.2000	nL/L	
Cyclohexane	ND	0.2000	nL/L	
Carbon Tetrachloride	ND	0.2000	nL/L	
Benzene	ND	0.2000	nL/L	
1,2-Dichloroethane	ND	0.2000	nL/L	
n-Heptane	ND	0.2000	nL/L	
Trichloroethene	ND	0.2000	nL/L	
1,2-Dichloropropane	ND	0.2000	nL/L	
Bromodichloromethane	ND	0.2000	nL/L	
cis-1,3-Dichloropropene	ND	0.2000	nL/L	
4-Methyl-2-Pentanone	ND	0.2000	nL/L	
Toluene	ND	0.2000	nL/L	
trans-1,3-Dichloropropene	ND	0.2000	nL/L	
1,1,2-Trichloroethane	ND	0.2000	nL/L	
Tetrachloroethene	ND	0.2000	nL/L	
2-Hexanone	ND	0.2000	nL/L	
Dibromochloromethane	ND	0.2000	nL/L	
1,2-Dibromoethane	ND	0.2000	nL/L	
Chlorobenzene	ND	0.2000	nL/L	
Ethylbenzene	ND	0.2000	nL/L	
m,p-Xylenes	ND	0.2000	nL/L	
o-Xylene	ND	0.2000	nL/L	
Styrene	ND	0.2000	nL/L	
Bromoform	ND	0.2000	nL/L	
1,1,2,2-Tetrachloroethane	ND	0.2000	nL/L	

Analyte	Quant	RL	Units	Flags
4-Ethyltoluene	ND	0.2000	nL/L	
1,3,5-Trimethylbenzene	ND	0.2000	nL/L	
1,2,4-Trimethylbenzene	ND	0.2000	nL/L	
1,3-Dichlorobenzene	ND	0.2000	nL/L	
1,4-Dichlorobenzene	ND	0.2000	nL/L	
Benzyl chloride	ND	0.2000	nL/L	
1,2-Dichlorobenzene	ND	0.2000	nL/L	
1,2,4-Trichlorobenzene	ND	0.2000	nL/L	
Hexachlorobutadiene	ND	0.2000	nL/L	
Naphthalene	ND	0.8000	nL/L	

ISTD (ICAL 280_013)	ICAL Area	Area	%Drift	ICAL RT	RT	Drift
Bromochloromethane	786291	587001	-25.35	34.66	34.63	-0.03
1,4-Difluorobenzene	1353000	1206000	-10.86	38.71	38.68	-0.03
Chlorobenzene-d5	1200000	1070000	-10.83	48.30	48.29	-0.01

TO15 Certified (Batch 975)

Analyst: TEW Date: 11/19/15 Reviewer: LW Date: 11/19/15

CURTIS & TOMPKINS Canister Check FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : C00353 IDF : 1.0
Seqnum : 1205470891014 File : 327_014 Time : 24-NOV-2015 00:55
Cal : 1205403859001 Caldate : 07-OCT-2015

Analyte	Quant	RL	Units	Flags
Freon 12	ND	0.2000	nL/L	
Freon 114	ND	0.2000	nL/L	
Chloromethane	ND	0.2000	nL/L	
Vinyl Chloride	ND	0.2000	nL/L	
1,3-Butadiene	ND	0.2000	nL/L	
Bromomethane	ND	0.2000	nL/L	
Chloroethane	ND	0.2000	nL/L	
Trichlorofluoromethane	ND	0.2000	nL/L	
Acrolein	ND	2.000	nL/L	
1,1-Dichloroethene	ND	0.2000	nL/L	
Freon 113	ND	0.2000	nL/L	
Acetone	ND	0.8000	nL/L	
Carbon Disulfide	ND	0.2000	nL/L	
Isopropanol	ND	2.000	nL/L	
Methylene Chloride	ND	0.2000	nL/L	
trans-1,2-Dichloroethene	ND	0.2000	nL/L	
MTBE	ND	0.2000	nL/L	
n-Hexane	ND	0.2000	nL/L	
1,1-Dichloroethane	ND	0.2000	nL/L	
Vinyl Acetate	ND	0.2000	nL/L	
cis-1,2-Dichloroethene	ND	0.2000	nL/L	
2-Butanone	ND	0.2000	nL/L	
Ethyl Acetate	ND	0.2000	nL/L	
Tetrahydrofuran	ND	0.2000	nL/L	
Chloroform	ND	0.2000	nL/L	
1,1,1-Trichloroethane	ND	0.2000	nL/L	
Cyclohexane	ND	0.2000	nL/L	
Carbon Tetrachloride	ND	0.2000	nL/L	
Benzene	ND	0.2000	nL/L	
1,2-Dichloroethane	ND	0.2000	nL/L	
n-Heptane	ND	0.2000	nL/L	
Trichloroethene	ND	0.2000	nL/L	
1,2-Dichloropropane	ND	0.2000	nL/L	
Bromodichloromethane	ND	0.2000	nL/L	
cis-1,3-Dichloropropene	ND	0.2000	nL/L	
4-Methyl-2-Pentanone	ND	0.2000	nL/L	
Toluene	ND	0.2000	nL/L	
trans-1,3-Dichloropropene	ND	0.2000	nL/L	
1,1,2-Trichloroethane	ND	0.2000	nL/L	
Tetrachloroethene	ND	0.2000	nL/L	
2-Hexanone	ND	0.2000	nL/L	
Dibromochloromethane	ND	0.2000	nL/L	
1,2-Dibromoethane	ND	0.2000	nL/L	
Chlorobenzene	ND	0.2000	nL/L	
Ethylbenzene	ND	0.2000	nL/L	
m,p-Xylenes	ND	0.2000	nL/L	
o-Xylene	ND	0.2000	nL/L	
Styrene	ND	0.2000	nL/L	
Bromoform	ND	0.2000	nL/L	
1,1,2,2-Tetrachloroethane	ND	0.2000	nL/L	

Analyte	Quant	RL	Units	Flags
4-Ethyltoluene	ND	0.2000	nL/L	
1,3,5-Trimethylbenzene	ND	0.2000	nL/L	
1,2,4-Trimethylbenzene	ND	0.2000	nL/L	
1,3-Dichlorobenzene	ND	0.2000	nL/L	
1,4-Dichlorobenzene	ND	0.2000	nL/L	
Benzyl chloride	ND	0.2000	nL/L	
1,2-Dichlorobenzene	ND	0.2000	nL/L	
1,2,4-Trichlorobenzene	ND	0.2000	nL/L	
Hexachlorobutadiene	ND	0.2000	nL/L	
Naphthalene	ND	0.8000	nL/L	

ISTD (ICAL 280_013)	ICAL Area	Area	%Drift	ICAL RT	RT	Drift
Bromochloromethane	786291	665477	-15.37	34.66	34.67	0.01
1,4-Difluorobenzene	1353000	1347000	-0.44	38.71	38.72	0.01
Chlorobenzene-d5	1200000	1205000	0.42	48.30	48.31	0.01

TO15 Certified (Batch 977)

Analyst: TEW Date: 11/24/15 Reviewer: LW Date: 11/24/15

CURTIS & TOMPKINS Canister Check FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : C00299 IDF : 1.0
Seqnum : 1205474272014 File : 329_014 Time : 25-NOV-2015 22:37
Cal : 1205403859001 Caldate : 07-OCT-2015

Analyte	Quant	RL	Units	Flags
Freon 12	ND	0.2000	nL/L	
Freon 114	ND	0.2000	nL/L	
Chloromethane	ND	0.2000	nL/L	
Vinyl Chloride	ND	0.2000	nL/L	
1,3-Butadiene	ND	0.2000	nL/L	
Bromomethane	ND	0.2000	nL/L	
Chloroethane	ND	0.2000	nL/L	
Trichlorofluoromethane	ND	0.2000	nL/L	
Acrolein	ND	2.000	nL/L	
1,1-Dichloroethene	ND	0.2000	nL/L	
Freon 113	ND	0.2000	nL/L	
Acetone	ND	0.8000	nL/L	
Carbon Disulfide	ND	0.2000	nL/L	
Isopropanol	ND	2.000	nL/L	
Methylene Chloride	ND	0.2000	nL/L	
trans-1,2-Dichloroethene	ND	0.2000	nL/L	
MTBE	ND	0.2000	nL/L	
n-Hexane	ND	0.2000	nL/L	
1,1-Dichloroethane	ND	0.2000	nL/L	
Vinyl Acetate	ND	0.2000	nL/L	
cis-1,2-Dichloroethene	ND	0.2000	nL/L	
2-Butanone	ND	0.2000	nL/L	
Ethyl Acetate	ND	0.2000	nL/L	
Tetrahydrofuran	ND	0.2000	nL/L	
Chloroform	ND	0.2000	nL/L	
1,1,1-Trichloroethane	ND	0.2000	nL/L	
Cyclohexane	ND	0.2000	nL/L	
Carbon Tetrachloride	ND	0.2000	nL/L	
Benzene	ND	0.2000	nL/L	
1,2-Dichloroethane	ND	0.2000	nL/L	
n-Heptane	ND	0.2000	nL/L	
Trichloroethene	ND	0.2000	nL/L	
1,2-Dichloropropane	ND	0.2000	nL/L	
Bromodichloromethane	ND	0.2000	nL/L	
cis-1,3-Dichloropropene	ND	0.2000	nL/L	
4-Methyl-2-Pentanone	ND	0.2000	nL/L	
Toluene	ND	0.2000	nL/L	
trans-1,3-Dichloropropene	ND	0.2000	nL/L	
1,1,2-Trichloroethane	ND	0.2000	nL/L	
Tetrachloroethene	ND	0.2000	nL/L	
2-Hexanone	ND	0.2000	nL/L	
Dibromochloromethane	ND	0.2000	nL/L	
1,2-Dibromoethane	ND	0.2000	nL/L	
Chlorobenzene	ND	0.2000	nL/L	
Ethylbenzene	ND	0.2000	nL/L	
m,p-Xylenes	ND	0.2000	nL/L	
o-Xylene	ND	0.2000	nL/L	
Styrene	ND	0.2000	nL/L	
Bromoform	ND	0.2000	nL/L	
1,1,2,2-Tetrachloroethane	ND	0.2000	nL/L	

Analyte	Quant	RL	Units	Flags
4-Ethyltoluene	ND	0.2000	nL/L	
1,3,5-Trimethylbenzene	ND	0.2000	nL/L	
1,2,4-Trimethylbenzene	ND	0.2000	nL/L	
1,3-Dichlorobenzene	ND	0.2000	nL/L	
1,4-Dichlorobenzene	ND	0.2000	nL/L	
Benzyl chloride	ND	0.2000	nL/L	
1,2-Dichlorobenzene	ND	0.2000	nL/L	
1,2,4-Trichlorobenzene	ND	0.2000	nL/L	
Hexachlorobutadiene	ND	0.2000	nL/L	
Naphthalene	ND	0.8000	nL/L	

ISTD (ICAL 280_013)	ICAL Area	Area	%Drift	ICAL RT	RT	Drift
Bromochloromethane	786291	645050	-17.96	34.66	34.66	0.00
1,4-Difluorobenzene	1353000	1359000	0.44	38.71	38.70	-0.01
Chlorobenzene-d5	1200000	1208000	0.67	48.30	48.30	0.00

TO15 Certified (Batch 979)

Analyst: TEW Date: 11/30/15 Reviewer: LW Date: 11/30/15

CURTIS & TOMPKINS Canister Check FOR 271871 MSAIR Air
EPA TO-15

Inst : MSAIR01 Run Name : C00259 IDF : 1.0
Seqnum : 1205482965022 File : 335_022 Time : 02-DEC-2015 07:23
Cal : 1205403859001 Caldate : 07-OCT-2015

Analyte	Quant	RL	Units	Flags
Freon 12	ND	0.2000	nL/L	
Freon 114	ND	0.2000	nL/L	
Chloromethane	ND	0.2000	nL/L	
Vinyl Chloride	ND	0.2000	nL/L	
1,3-Butadiene	ND	0.2000	nL/L	
Bromomethane	ND	0.2000	nL/L	
Chloroethane	ND	0.2000	nL/L	
Trichlorofluoromethane	ND	0.2000	nL/L	
Acrolein	ND	2.000	nL/L	
1,1-Dichloroethene	ND	0.2000	nL/L	
Freon 113	ND	0.2000	nL/L	
Acetone	ND	0.8000	nL/L	
Carbon Disulfide	ND	0.2000	nL/L	
Isopropanol	ND	2.000	nL/L	
Methylene Chloride	ND	0.2000	nL/L	
trans-1,2-Dichloroethene	ND	0.2000	nL/L	
MTBE	ND	0.2000	nL/L	
n-Hexane	ND	0.2000	nL/L	
1,1-Dichloroethane	ND	0.2000	nL/L	
Vinyl Acetate	ND	0.2000	nL/L	
cis-1,2-Dichloroethene	ND	0.2000	nL/L	
2-Butanone	ND	0.2000	nL/L	
Ethyl Acetate	ND	0.2000	nL/L	
Tetrahydrofuran	ND	0.2000	nL/L	
Chloroform	ND	0.2000	nL/L	
1,1,1-Trichloroethane	ND	0.2000	nL/L	
Cyclohexane	ND	0.2000	nL/L	
Carbon Tetrachloride	ND	0.2000	nL/L	
Benzene	ND	0.2000	nL/L	
1,2-Dichloroethane	ND	0.2000	nL/L	
n-Heptane	ND	0.2000	nL/L	
Trichloroethene	ND	0.2000	nL/L	
1,2-Dichloropropane	ND	0.2000	nL/L	
Bromodichloromethane	ND	0.2000	nL/L	
cis-1,3-Dichloropropene	ND	0.2000	nL/L	
4-Methyl-2-Pentanone	ND	0.2000	nL/L	
Toluene	ND	0.2000	nL/L	
trans-1,3-Dichloropropene	ND	0.2000	nL/L	
1,1,2-Trichloroethane	ND	0.2000	nL/L	
Tetrachloroethene	ND	0.2000	nL/L	
2-Hexanone	ND	0.2000	nL/L	
Dibromochloromethane	ND	0.2000	nL/L	
1,2-Dibromoethane	ND	0.2000	nL/L	
Chlorobenzene	ND	0.2000	nL/L	
Ethylbenzene	ND	0.2000	nL/L	
m,p-Xylenes	ND	0.2000	nL/L	
o-Xylene	ND	0.2000	nL/L	
Styrene	ND	0.2000	nL/L	
Bromoform	ND	0.2000	nL/L	
1,1,2,2-Tetrachloroethane	ND	0.2000	nL/L	

Analyte	Quant	RL	Units	Flags
4-Ethyltoluene	ND	0.2000	nL/L	
1,3,5-Trimethylbenzene	ND	0.2000	nL/L	
1,2,4-Trimethylbenzene	ND	0.2000	nL/L	
1,3-Dichlorobenzene	ND	0.2000	nL/L	
1,4-Dichlorobenzene	ND	0.2000	nL/L	
Benzyl chloride	ND	0.2000	nL/L	
1,2-Dichlorobenzene	ND	0.2000	nL/L	
1,2,4-Trichlorobenzene	ND	0.2000	nL/L	
Hexachlorobutadiene	ND	0.2000	nL/L	
Naphthalene	ND	0.8000	nL/L	

ISTD (ICAL 280_013)	ICAL Area	Area	%Drift	ICAL RT	RT	Drift
Bromochloromethane	786291	528271	-32.81	34.66	34.62	-0.04
1,4-Difluorobenzene	1353000	1089000	-19.51	38.71	38.67	-0.04
Chlorobenzene-d5	1200000	998961	-16.75	48.30	48.28	-0.02

TO15 Certified (Batch 979)

Analyst: TEW Date: 12/02/15 Reviewer: LW Date: 12/02/15

Logbooks & Sequences

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 1205462738

Date : 11/17/15 Reference : 280_013
Sequence : MSAIR01 321 Analyzed : 10/08/15 00:47

#	Type	Sample ID	BRCLME	RT	14DFB	RT	CLBZD5	RT
		ICAL STD	786291	34.66	1353000	38.71	1200000	48.30
		LOWER LIMIT	471775	34.33	811800	38.38	720000	47.97
		UPPER LIMIT	1100807	34.99	1894200	39.04	1680000	48.63
003	CCV/BS	QC813139	492920	34.60	923637	38.65	810407	48.27
004	BSD	QC813140	497152	34.61	932341	38.66	793951	48.27
005	CANCHECK		525920	34.61	1057000	38.67	944491	48.28
006	BLANK	QC813141	519572	34.62	1019000	38.67	907208	48.28
007	CANCHECK		524769	34.62	1006000	38.67	906327	48.29
008	CANCHECK		525505	34.62	1018000	38.67	915441	48.29
009	SAMPLE	271518-006	521422	34.62	1033000	38.67	949595	48.28
010	IB	NONE	512247	34.62	1000000	38.67	906144	48.28
011	CANCHECK		518792	34.61	1026000	38.66	908129	48.28
012	CANCHECK		524032	34.61	999979	38.66	910972	48.28
013	CANCHECK		506461	34.62	989255	38.67	898920	48.28
014	CANCHECK		507853	34.62	1010000	38.67	907399	48.28
015	CANCHECK		500247	34.62	1004000	38.67	880283	48.28
016	CANCHECK		506418	34.62	1028000	38.67	967192	48.28
017	CANCHECK		503233	34.62	1042000	38.67	932475	48.29
018	CANCHECK		495769	34.62	990368	38.67	880074	48.29

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 1205464202

Date : 11/18/15 Reference : 280_013
Sequence : MSAIR01 322 Analyzed : 10/08/15 00:47

#	Type	Sample ID	BRCLME		RT	14DFB	RT	CLBZD5	RT
		ICAL STD	786291		34.66	1353000	38.71	1200000	48.30
		LOWER LIMIT	471775		34.33	811800	38.38	720000	47.97
		UPPER LIMIT	1100807		34.99	1894200	39.04	1680000	48.63
003	CCV	NONE	468252	*	34.62	903692	38.67	788452	48.28
004	CCV	NONE	479212		34.63	907906	38.68	775003	48.29
005	CCV	NONE	459985	*	34.63	898072	38.69	798100	48.29
006	CCV	NONE	460627	*	34.64	889944	38.69	758748	48.29
010	IB	NONE	623433		34.64	1254000	38.69	1136000	48.29
011	CCV/BS	QC813369	569417		34.64	1112000	38.69	945439	48.29
012	BSD	QC813370	583198		34.63	1106000	38.68	927251	48.28
013	CANCHECK		598240		34.63	1248000	38.68	1101000	48.29
014	BLANK	QC813371	614253		34.63	1271000	38.68	1109000	48.29
015	SAMPLE	271693-002	581278		34.63	1204000	38.68	1076000	48.29
016	SAMPLE	271728-001	590329		34.63	1165000	38.68	1044000	48.29
017	SAMPLE	271693-001	475128		34.63	939507	38.68	847748	48.29
018	SAMPLE	271693-003	474387		34.63	958156	38.68	908219	48.29
019	SAMPLE	271728-002	483485		34.64	941275	38.69	910554	48.30
020	SAMPLE	271693-004	600837		34.64	1217000	38.69	1115000	48.29
021	SAMPLE	271728-003	587549		34.63	1163000	38.68	1147000	48.29
022	SAMPLE	271687-001	484929		34.63	919943	38.68	830660	48.29
023	IB	NONE	596321		34.63	1236000	38.68	1176000	48.29
024	CANCHECK		587001		34.63	1206000	38.68	1070000	48.29

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 1205470891

Date : 11/23/15 Reference : 280_013
Sequence : MSAIR01 327 Analyzed : 10/08/15 00:47

#	Type	Sample ID	BRCLME		RT	14DFB	RT	CLBZD5	RT
		ICAL STD	786291		34.66	1353000	38.71	1200000	48.30
		LOWER LIMIT	471775		34.33	811800	38.38	720000	47.97
		UPPER LIMIT	1100807		34.99	1894200	39.04	1680000	48.63
001	CCV	NONE	441045	*	34.67	824080	38.72	755167	48.31
002	CCV	NONE	497948		34.66	937869	38.71	857843	48.31
004	CCV/BS	QC814111	556197		34.67	1058000	38.71	901572	48.31
005	BSD	QC814112	578604		34.67	1097000	38.72	959733	48.31
006	IB	NONE	603960		34.66	1252000	38.72	1124000	48.31
007	BLANK	QC814113	630196		34.67	1296000	38.72	1166000	48.31
008	SAMPLE	271767-001	515807		34.66	996518	38.72	818432	48.31
009	SAMPLE	271757-002	636723		34.67	1256000	38.72	1155000	48.31
010	SAMPLE	271775-001	646277		34.67	1272000	38.72	1136000	48.31
011	SAMPLE	271775-002	638170		34.67	1252000	38.71	1153000	48.31
012	SAMPLE	271843-001	655537		34.66	1298000	38.71	1148000	48.31
013	SAMPLE	271843-004	659820		34.67	1330000	38.72	1173000	48.31
014	CANCHECK		665477		34.67	1347000	38.72	1205000	48.31
015	CANCHECK		662973		34.66	1369000	38.71	1212000	48.31

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 1205474272

Date : 11/25/15 Reference : 280_013
Sequence : MSAIR01 329 Analyzed : 10/08/15 00:47

#	Type	Sample ID	BRCLME	RT	14DFB	RT	CLBZD5	RT
		ICAL STD	786291	34.66	1353000	38.71	1200000	48.30
		LOWER LIMIT	471775	34.33	811800	38.38	720000	47.97
		UPPER LIMIT	1100807	34.99	1894200	39.04	1680000	48.63
002	CCV/BS	QC814472	618773	34.66	1150000	38.71	940649	48.31
003	BSD	QC814473	623747	34.66	1176000	38.71	991614	48.31
005	IB	NONE	635657	34.67	1343000	38.72	1231000	48.31
006	BLANK	QC814474	620342	34.67	1265000	38.72	1096000	48.31
007	SAMPLE	271857-001	607586	34.66	1156000	38.71	974809	48.31
008	SAMPLE	271857-004	613629	34.66	1218000	38.71	1024000	48.31
009	SAMPLE	271884-001	628253	34.66	1201000	38.71	1123000	48.31
010	SAMPLE	271884-004	623865	34.66	1194000	38.71	1115000	48.31
011	SAMPLE	271843-003	502054	34.65	957687	38.71	846812	48.31
012	IB	NONE	643149	34.65	1292000	38.70	1183000	48.30
013	CANCHECK		641059	34.65	1307000	38.70	1166000	48.30
014	CANCHECK		645050	34.66	1359000	38.70	1208000	48.30

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 1205481527

Date : 11/30/15 Reference : 280_013
Sequence : MSAIR01 334 Analyzed : 10/08/15 00:47

#	Type	Sample ID	BRCLME	RT	14DFB	RT	CLBZD5	RT
		ICAL STD	786291	34.66	1353000	38.71	1200000	48.30
		LOWER LIMIT	471775	34.33	811800	38.38	720000	47.97
		UPPER LIMIT	1100807	34.99	1894200	39.04	1680000	48.63
001	IB	NONE	641488	34.62	1361000	38.67	1227000	48.28
003	CCV/BS	QC814669	602137	34.62	1143000	38.67	1030000	48.28
004	BSD	QC814670	648857	34.62	1290000	38.67	1041000	48.28
005	IB	NONE	613936	34.63	1279000	38.68	1108000	48.29
006	BLANK	QC814671	615305	34.63	1220000	38.68	1109000	48.29
009	SAMPLE	271954-001	617235	34.63	1221000	38.68	1144000	48.29
010	SAMPLE	271884-001	617921	34.63	1175000	38.68	1149000	48.29
011	SAMPLE	271884-004	604625	34.63	1142000	38.68	1076000	48.29
012	SAMPLE	271857-001	615681	34.63	1194000	38.68	1014000	48.29
013	SAMPLE	271857-004	605603	34.63	1172000	38.68	1004000	48.29
014	SAMPLE	271857-002	490235	34.63	909506	38.68	786043	48.29
015	SAMPLE	271954-001	592600	34.62	1123000	38.67	1070000	48.28
016	SAMPLE	271954-002	596572	34.62	1098000	38.67	988792	48.28
017	SAMPLE	271954-003	589940	34.62	1079000	38.67	872382	48.28
018	SAMPLE	271954-004	592697	34.62	1119000	38.67	1019000	48.29
019	CANCHECK		597986	34.62	1141000	38.67	1044000	48.29
020	SAMPLE	271871-001	586632	34.62	1115000	38.67	977221	48.28
021	SAMPLE	271871-002	473736	34.62	885155	38.67	928320	48.29
022	SAMPLE	271871-003	481676	34.62	882781	38.67	894019	48.29
023	SAMPLE	271871-004	583976	34.62	1182000	38.67	1142000	48.28
024	IB	NONE	586353	34.62	1215000	38.67	1161000	48.28

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 1205482965

Date : 12/01/15 Reference : 280_013
Sequence : MSAIR01 335 Analyzed : 10/08/15 00:47

#	Type	Sample ID	BRCLME		RT	14DFB		RT	CLBZD5	RT
		ICAL STD	786291		34.66	1353000		38.71	1200000	48.30
		LOWER LIMIT	471775		34.33	811800		38.38	720000	47.97
		UPPER LIMIT	1100807		34.99	1894200		39.04	1680000	48.63
001	IB	NONE	585693		34.62	1179000		38.67	1075000	48.28
004	CCV/BS	QC814894	557593		34.62	1082000		38.68	906277	48.29
005	BSD	QC814895	537697		34.63	1016000		38.68	893184	48.28
006	IB	NONE	545773		34.63	1181000		38.68	1062000	48.29
007	BLANK	QC814896	564942		34.63	1191000		38.68	1044000	48.29
008	SAMPLE	272026-001	549311		34.63	1133000		38.68	938468	48.29
009	SAMPLE	272026-002	544076		34.63	1068000		38.68	923785	48.29
010	SAMPLE	271871-001	541574		34.63	1028000		38.68	844699	48.29
011	SAMPLE	271871-002	438332	*	34.62	830961		38.67	819996	48.29
012	SAMPLE	271871-003	439738	*	34.63	811653	*	38.68	806320	48.29
013	SAMPLE	271871-004	563218		34.62	1120000		38.67	1056000	48.28
014	SAMPLE	271871-006	558038		34.62	1099000		38.67	1055000	48.28
015	SAMPLE	271871-005	436630	*	34.63	797389	*	38.68	801191	48.29
016	SAMPLE	271958-001	543558		34.62	1108000		38.67	1026000	48.28
017	SAMPLE	271958-002	529714		34.62	1075000		38.67	1021000	48.28
018	SAMPLE	271958-003	546444		34.62	1033000		38.67	1023000	48.28
019	SAMPLE	271958-004	525467		34.62	1008000		38.67	981049	48.29
020	IB	NONE	539160		34.62	1113000		38.68	1017000	48.29
022	CANCHECK		528271		34.62	1089000		38.67	998961	48.28

CURTIS & TOMPKINS INTERNAL STANDARD SUMMARY FOR SEQUENCE 1205484408

Date : 12/02/15 Reference : 280_013
Sequence : MSAIR01 336 Analyzed : 10/08/15 00:47

#	Type	Sample ID	BRCLME		RT	14DFB	RT	CLBZD5	RT
		ICAL STD	786291		34.66	1353000	38.71	1200000	48.30
		LOWER LIMIT	471775		34.33	811800	38.38	720000	47.97
		UPPER LIMIT	1100807		34.99	1894200	39.04	1680000	48.63
002	CCV/BS	QC815053	505821		34.62	962155	38.67	846383	48.28
003	BSD	QC815054	487678		34.63	955062	38.68	803666	48.29
005	CANCHECK		504402		34.64	1041000	38.69	943997	48.30
006	BLANK	QC815055	500047		34.64	1035000	38.69	909020	48.29
007	CANCHECK		500905		34.64	1030000	38.69	922327	48.30
008	SAMPLE	272029-001	325565	*	34.65	1006000	38.69	925712	48.30
009	SAMPLE	272029-002	503070		34.65	973403	38.70	818449	48.30
010	SAMPLE	271958-004	476901		34.65	938354	38.70	908907	48.30
011	SAMPLE	271871-002	489479		34.65	970315	38.70	938795	48.30
012	SAMPLE	271871-003	495801		34.65	958768	38.70	916387	48.30
013	SAMPLE	271871-005	488538		34.65	938753	38.70	912487	48.30
014	SAMPLE	271995-002	492110		34.65	909008	38.70	932972	48.30
015	SAMPLE	271995-003	496815		34.65	936331	38.70	935914	48.30
016	SAMPLE	271995-001	478273		34.65	901710	38.71	911466	48.31
017	IB	NONE	492519		34.66	968973	38.71	950155	48.31
018	CANCHECK		485507		34.65	956758	38.71	943841	48.30
019	CANCHECK		472888		34.66	952437	38.71	875234	48.30
020	CANCHECK		485886		34.66	973889	38.71	914889	48.31
021	CANCHECK		477388		34.66	959524	38.71	920485	48.31
022	CANCHECK		471139	*	34.66	943682	38.71	911483	48.31

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1205403859

Instrument : MSAIR01 Begun : 10/07/15 10:59
Method : EPA TO-15 SOP Version : msair_rv5

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	280_001	X	IB			10/07/15 10:59	1.0	1	
002	280_002	CCV	NONE			10/07/15 12:01	1.0	2 1	?t
003	280_003	TUN	BFB			10/07/15 14:11	1.0	1	t
004	280_004	TUN	BFB			10/07/15 15:25	1.0	1	t
005	280_005	TUN	BFB			10/07/15 16:31	1.0	1	
006	280_006	IB	NONE			10/07/15 17:33	1.0	1	
007	280_007	IB	CALIB			10/07/15 18:35	1.0	1	
008	280_008	ICAL	0.05PPB			10/07/15 19:37	1.0	3 1	
009	280_009	ICAL	0.1PPB			10/07/15 20:38	1.0	3 1	
010	280_010	ICAL	0.167PPB			10/07/15 21:41	1.0	4 1	
011	280_011	ICAL	0.5PPB			10/07/15 22:43	1.0	4 1	
012	280_012	ICAL	1.67PPB			10/07/15 23:45	1.0	5 1	
013	280_013	ICAL	5PPB			10/08/15 00:47	1.0	5 1	
014	280_014	ICAL	16.67PPB			10/08/15 01:49	1.0	6 1	
015	280_015	ICAL	33PPB			10/08/15 02:51	1.0	6 1	
016	280_016	ICAL	50PPB			10/08/15 03:53	1.0	6 1	
017	280_017	ICAL	100PPB			10/08/15 04:55	1.0	6 1	
018	280_018	IB	NONE			10/08/15 05:57	1.0	1	
019	280_019	ICV	NONE			10/08/15 06:59	1.0	2 1	
020	280_020	CCV	NONE			10/08/15 08:00	1.0	2 1	

TEW 10/07/15 : Adjusted ion time prior to file 280_005.

TEW 10/09/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 20.

Analyst: TEW Date: 10/09/15 Reviewer: LW Date: 10/12/15

Standards used: 1=S26124 2=S28192 3=S28258 4=S28257 5=S28256 6=S28255

Flags used: ?t=missing tune t=tune failure

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CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1205406576

Instrument : MSAIR01 Begun : 10/09/15 08:16
Method : EPA TO-15 SOP Version : msair_rv5

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	282_001	TUN	BFB			10/09/15 08:16	1.0	1	
002	282_002	X	NONE			10/09/15 12:07	1.0	2 1	
003	282_003	X	NONE			10/09/15 13:08	1.0	2 1	
004	282_004	ICV	NONE			10/09/15 14:10	1.0	3 1	
005	282_005	CCV/BS	QC807447	Air	228115	10/09/15 15:16	1.0	3 1	
006	282_006	BSD	QC807448	Air	228115	10/09/15 16:18	1.0	3 1	
007	282_007	IB				10/09/15 17:20	1.0	1	
008	282_008	BLANK	QC807449	Air	228115	10/09/15 18:23	1.0	1	

TEW 10/09/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 4.

TEW 10/12/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 5 through 8.

Analyst: TEW Date: 10/12/15 Reviewer: LW Date: 10/12/15

Standards used: 1=S26124 2=S28192 3=S28215

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1205462738

Instrument : MSAIR01 Begun : 11/17/15 08:18
Method : EPA TO-15 SOP Version : msair_rv5

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	321_001	TUN	BFB			11/17/15 08:18	1.0	1	t
002	321_002	TUN	BFB			11/17/15 09:20	1.0	1	
003	321_003	CCV/BS	QC813139	Air	229528	11/17/15 10:23	1.0	2 1	
004	321_004	BSD	QC813140	Air	229528	11/17/15 11:24	1.0	2 1	
005	321_005	CANCHECK				11/17/15 12:59	1.0	1	Certifies
006	321_006	BLANK	QC813141	Air	229528	11/17/15 14:02	1.0	1	
007	321_007	CANCHECK				11/17/15 15:04	1.0	1	Certifies
008	321_008	CANCHECK				11/17/15 16:06	1.0	1	Certifies
009	321_009	SAMPLE	271518-006	Air	229528	11/17/15 17:09	1512	1	TO15 Certified , high NT
010	321_010	IB	NONE			11/17/15 18:11	1.0	1	
011	321_011	CANCHECK				11/17/15 19:13	1.0	1	Certifies
012	321_012	CANCHECK				11/17/15 20:16	1.0	1	Certifies
013	321_013	CANCHECK				11/17/15 21:18	1.0	1	CertFail
014	321_014	CANCHECK				11/17/15 22:20	1.0	1	Certifies
015	321_015	CANCHECK				11/17/15 23:23	1.0	1	Certifies
016	321_016	CANCHECK				11/18/15 00:25	1.0	1	Certifies
017	321_017	CANCHECK				11/18/15 01:27	1.0	1	Certifies
018	321_018	CANCHECK				11/18/15 02:29	1.0	1	Certifies

TEW 11/18/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 18.

Analyst: TEW Date: 11/18/15 Reviewer: LW Date: 11/18/15

Standards used: 1=S28218 2=S28434

Flags used: CertFail=TO15 certification problem Certifies=TO15 Certified (Batch 973) TO15 Certified=C00133 Batch Certified (Batch 969) t=tune failure

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CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1205464202

Instrument : MSAIR01 Begun : 11/18/15 08:42
Method : EPA TO-15 SOP Version : msair_rv5

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	322_001	TUN	BFB			11/18/15 08:42	1.0	1	t
002	322_002	TUN	BFB			11/18/15 09:44	1.0	1	
003	322_003	CCV	NONE			11/18/15 10:46	1.0	2 1	
004	322_004	CCV	NONE			11/18/15 11:48	1.0	2 1	
005	322_005	CCV	NONE			11/18/15 13:05	1.0	2 1	
006	322_006	CCV	NONE			11/18/15 14:09	1.0	2 1	
007	322_007	TUN	BFB			11/18/15 15:16	1.0	1	t
008	322_008	TUN	BFB			11/18/15 16:18	1.0	1	t
009	322_009	TUN	BFB			11/18/15 17:20	1.0	1	
010	322_010	IB	NONE			11/18/15 18:22	1.0	1	
011	322_011	CCV/BS	QC813369	Air	229582	11/18/15 19:24	1.0	2 1	
012	322_012	BSD	QC813370	Air	229582	11/18/15 20:26	1.0	2 1	
013	322_013	CANCHECK				11/18/15 21:29	1.0	1	Certifies
014	322_014	BLANK	QC813371	Air	229582	11/18/15 22:31	1.0	1	
015	322_015	SAMPLE	271693-002	Air	229582	11/18/15 23:33	2.94	1	TO15 Certified
016	322_016	SAMPLE	271728-001	Air	229582	11/19/15 00:36	1.86	1	TO15 Certified
017	322_017	SAMPLE	271693-001	Air	229582	11/19/15 01:38	23.40	1	TO15 Certified , 2:DCE12C=120
018	322_018	SAMPLE	271693-003	Air	229582	11/19/15 02:41	29.52	1	TO15 Certified
019	322_019	SAMPLE	271728-002	Air	229582	11/19/15 03:43	23.16	1	TO15 Certified
020	322_020	SAMPLE	271693-004	Air	229582	11/19/15 04:45	40.80	1	TO15 Certified
021	322_021	SAMPLE	271728-003	Air	229582	11/19/15 05:47	205.0	1	TO15 Certified
022	322_022	SAMPLE	271687-001	Air	229582	11/19/15 06:50	43200	1	TO15 Certified
023	322_023	IB	NONE			11/19/15 07:52	1.0	1	
024	322_024	CANCHECK				11/19/15 08:54	1.0	1	Certifies

TEW 11/18/15 : TKC adjusted EM setting prior to File 322_007.

TEW 11/18/15 : Adjusted Ion Time prior to File 322_009.

TEW 11/19/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 24.

Analyst: TEW Date: 11/19/15 Reviewer: LW Date: 11/19/15

Standards used: 1=S28218 2=S28434

Flags used: Certifies=TO15 Certified (Batch 975) TO15 Certified=C00033 100% Certified (Batch 951) t=tune failure

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1205470891

Instrument : MSAIR01
Method : EPA TO-15
Begun : 11/23/15 00:11
SOP Version : msair_rv5

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	327_001	CCV	NONE			11/23/15 00:11	1.0	1 2	?t
002	327_002	CCV	NONE			11/23/15 12:19	1.0	1 2	?t
003	327_003	TUN	BFB			11/23/15 13:25	1.0	2	
004	327_004	CCV/BS	QC814111	Air	229751	11/23/15 14:27	1.0	1 2	
005	327_005	BSD	QC814112	Air	229751	11/23/15 15:29	1.0	1 2	
006	327_006	IB	NONE			11/23/15 16:36	1.0	2	
007	327_007	BLANK	QC814113	Air	229751	11/23/15 17:38	1.0	2	
008	327_008	SAMPLE	271767-001	Air	229751	11/23/15 18:40	412.8	2	TO15 Certified
009	327_009	SAMPLE	271757-002	Air	229751	11/23/15 19:43	676.0	2	TO15 Certified , high NT
010	327_010	SAMPLE	271775-001	Air	229751	11/23/15 20:45	1.91	2	TO15 Certified
011	327_011	SAMPLE	271775-002	Air	229751	11/23/15 21:47	2.47	2	TO15 Certified
012	327_012	SAMPLE	271843-001	Air	229751	11/23/15 22:50	2.41	2	TO15 Certified
013	327_013	SAMPLE	271843-004	Air	229751	11/23/15 23:52	2.06	2	TO15 Certified
014	327_014	CANCHECK				11/24/15 00:55	1.0	2	Certifies
015	327_015	CANCHECK				11/24/15 01:57	1.0	2	Certifies

TEW 11/24/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 15.

Analyst: TEW Date: 11/24/15 Reviewer: LW Date: 11/24/15

Standards used: 1=S28434 2=S28218

Flags used: ?t=missing tune Certifies=TO15 Certified (Batch 978) TO15 Certified=C00144 100% Certified (Batch 956)

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CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1205474272

Instrument : MSAIR01 Begun : 11/25/15 08:32
Method : EPA TO-15 SOP Version : msair_rv5

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	329_001	TUN	BFB			11/25/15 08:32	1.0	1	
002	329_002	CCV/BS	QC814472	Air	229840	11/25/15 09:34	1.0	2 1	
003	329_003	BSD	QC814473	Air	229840	11/25/15 10:36	1.0	2 1	
004	329_004	CHECK	NONE			11/25/15 11:39	1.0	3 1	
005	329_005	IB	NONE			11/25/15 13:17	1.0	1	
006	329_006	BLANK	QC814474	Air	229840	11/25/15 14:19	1.0	1	
007	329_007	SAMPLE	271857-001	Air	229840	11/25/15 15:21	179.0	1	TO15 Certified , high NT
008	329_008	SAMPLE	271857-004	Air	229840	11/25/15 16:23	178.0	1	TO15 Certified , high NT
009	329_009	SAMPLE	271884-001	Air	229840	11/25/15 17:25	67.20	1	TO15 Certified
010	329_010	SAMPLE	271884-004	Air	229840	11/25/15 18:28	66.0	1	TO15 Certified
011	329_011	SAMPLE	271843-003	Air	229840	11/25/15 19:30	21.48	1	spk TO15 Certified , high NT
012	329_012	IB	NONE			11/25/15 20:32	1.0	1	
013	329_013	CANCHECK				11/25/15 21:35	1.0	1	CertFail
014	329_014	CANCHECK				11/25/15 22:37	1.0	1	Certifies

TKC 11/30/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 14.

Analyst: TKC Date: 11/30/15 Reviewer: LW Date: 11/30/15

Standards used: 1=S28218 2=S28434 3=S28544

Flags used: CertFail=TO15 certification problem Certifies=TO15 Certified (Batch 979) TO15 Certified=C00246 100% Certified (Batch 968) spk=5% spike rule

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1205481527

Instrument : MSAIR01 Begun : 11/30/15 08:25
Method : EPA TO-15 SOP Version : msair_rv5

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	334_001	IB	NONE			11/30/15 08:25	1.0	1	?t
002	334_002	TUN	BFB			11/30/15 09:27	1.0	1	
003	334_003	CCV/BS	QC814669	Air	229891	11/30/15 10:29	1.0	2 1	spk
004	334_004	BSD	QC814670	Air	229891	11/30/15 11:30	1.0	2 1	spk
005	334_005	IB	NONE			11/30/15 12:41	1.0	1	
006	334_006	BLANK	QC814671	Air	229891	11/30/15 13:43	1.0	1	
009	334_009	SAMPLE	271954-001	Air	229891	11/30/15 15:10	11.34	1	spk TO15 Certified
010	334_010	SAMPLE	271884-001	Air	229891	11/30/15 16:12	67.20	1	spk TO15 Certified
011	334_011	SAMPLE	271884-004	Air	229891	11/30/15 17:14	66.0	1	spk TO15 Certified
012	334_012	SAMPLE	271857-001	Air	229891	11/30/15 18:16	179.0	1	spk TO15 Certified , high NT
013	334_013	SAMPLE	271857-004	Air	229891	11/30/15 19:19	178.0	1	spk TO15 Certified , high NT
014	334_014	SAMPLE	271857-002	Air	229891	11/30/15 20:21	2088	1	spk TO15 Certified , high NT
015	334_015	SAMPLE	271954-001	Air	229891	11/30/15 21:23	1.89	1	spk TO15 Certified
016	334_016	SAMPLE	271954-002	Air	229891	11/30/15 22:26	1.93	1	spk TO15 Certified , 1:PROPENE=210
017	334_017	SAMPLE	271954-003	Air	229891	11/30/15 23:28	10.02	1	spk TO15 Certified , high HC
018	334_018	SAMPLE	271954-004	Air	229891	12/01/15 00:30	1.88	1	spk TO15 Certified , 1:PROPENE=240
019	334_019	CANCHECK				12/01/15 01:32	1.0	1	CertFail
020	334_020	SAMPLE	271871-001	Air	229891	12/01/15 02:35	1.75	1	spk TO15 Certified
021	334_021	SAMPLE	271871-002	Air	229891	12/01/15 03:37	2256	1	spk TO15 Certified
022	334_022	SAMPLE	271871-003	Air	229891	12/01/15 04:39	21.72	1	spk TO15 Certified
023	334_023	SAMPLE	271871-004	Air	229891	12/01/15 05:41	1.79	1	spk TO15 Certified
024	334_024	IB	NONE			12/01/15 06:44	1.0	1	

TKC 11/30/15 : runs 007 and 008 were cleanline runs

TEW 12/01/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 24.

Analyst: TEW Date: 12/01/15 Reviewer: LW Date: 12/01/15

Standards used: 1=S28218 2=S28600

Flags used: ?t=missing tune CertFail=TO15 certification problem TO15 Certified=C00397 Batch Certified (Batch 975) spk=5% spike rule

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1205482965

Instrument : MSAIR01 Begun : 12/01/15 08:23
Method : EPA TO-15 SOP Version : msair_rv5

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	335_001	IB	NONE			12/01/15 08:23	1.0	1	?t
002	335_002	TUN	BFB			12/01/15 09:25	1.0	1	
003	335_003	X	NONE			12/01/15 10:27	1.0	2 1	
004	335_004	CCV/BS	QC814894	Air	229948	12/01/15 11:28	1.0	2 1	
005	335_005	BSD	QC814895	Air	229948	12/01/15 12:41	1.0	2 1	
006	335_006	IB	NONE			12/01/15 14:48	1.0	1	
007	335_007	BLANK	QC814896	Air	229948	12/01/15 15:50	1.0	1	
008	335_008	SAMPLE	272026-001	Air	229948	12/01/15 16:52	1.78	1	TO15 Certified
009	335_009	SAMPLE	272026-002	Air	229948	12/01/15 17:54	1.78	1	TO15 Certified
010	335_010	SAMPLE	271871-001	Air	229948	12/01/15 18:56	1.75	1	TO15 Certified
011	335_011	SAMPLE	271871-002	Air	229948	12/01/15 19:59	2256	1	TO15 Certified
012	335_012	SAMPLE	271871-003	Air	229948	12/01/15 21:01	21.72	1	TO15 Certified
013	335_013	SAMPLE	271871-004	Air	229948	12/01/15 22:03	1.79	1	TO15 Certified
014	335_014	SAMPLE	271871-006	Air	229948	12/01/15 23:05	1.97	1	TO15 Certified
015	335_015	SAMPLE	271871-005	Air	229948	12/02/15 00:08	24.96	1	TO15 Certified
016	335_016	SAMPLE	271958-001	Air	229948	12/02/15 01:10	1.82	1	TO15 Certified
017	335_017	SAMPLE	271958-002	Air	229948	12/02/15 02:12	1.84	1	TO15 Certified
018	335_018	SAMPLE	271958-003	Air	229948	12/02/15 03:14	3.92	1	TO15 Certified
019	335_019	SAMPLE	271958-004	Air	229948	12/02/15 04:17	2.0	1	TO15 Certified , 1:PCE=110
020	335_020	IB	NONE			12/02/15 05:19	1.0	1	
021	335_021	X				12/02/15 06:21	1.0	1	CertFail
022	335_022	CANCHECK				12/02/15 07:23	1.0	1	Certifies
023	335_023	CHECK				12/02/15 08:25	1.0	3 1	

TEW 12/02/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 23.

Analyst: TEW Date: 12/02/15 Reviewer: LW Date: 12/02/15

Standards used: 1=S28218 2=S28600 3=S28627

Flags used: ?t=missing tune CertFail=TO15 certification problem Certifies=TO15 Certified (Batch 979) TO15 Certified=C00290 Batch Certified (Batch 974)

CURTIS & TOMPKINS SEQUENCE SUMMARY FOR 1205484408

Instrument : MSAIR01 Begun : 12/02/15 09:28
Method : EPA TO-15 SOP Version : msair_rv5

#	File	Type	Sample ID	Matrix	Batch	Analyzed	IDF	Stds Used	
001	336_001	TUN	BFB			12/02/15 09:28	1.0	1	
002	336_002	CCV/BS	QC815053	Air	229988	12/02/15 10:37	1.0	2 1	
003	336_003	BSD	QC815054	Air	229988	12/02/15 11:39	1.0	2 1	
004	336_004	CHECK				12/02/15 12:41	1.0	3 1	
005	336_005	CANCHECK				12/02/15 15:06	1.0	1	CertFail
006	336_006	BLANK	QC815055	Air	229988	12/02/15 16:09	1.0	1	
007	336_007	CANCHECK				12/02/15 17:11	1.0	1	Certifies
008	336_008	SAMPLE	272029-001	Air	229988	12/02/15 18:13	1.0	1	spk
009	336_009	SAMPLE	272029-002	Air	229988	12/02/15 19:15	400.0	1	spk TO15 Certified
010	336_010	SAMPLE	271958-004	Air	229988	12/02/15 20:18	4.0	1	TO15 Certified
011	336_011	SAMPLE	271871-002	Air	229988	12/02/15 21:20	3760	1	TO15 Certified
012	336_012	SAMPLE	271871-003	Air	229988	12/02/15 22:22	36.20	1	TO15 Certified
013	336_013	SAMPLE	271871-005	Air	229988	12/02/15 23:25	41.60	1	TO15 Certified
014	336_014	SAMPLE	271995-002	Air	229988	12/03/15 00:27	76.0	1	TO15 Certified
015	336_015	SAMPLE	271995-003	Air	229988	12/03/15 01:29	108.0	1	TO15 Certified
016	336_016	SAMPLE	271995-001	Air	229988	12/03/15 02:32	11.28	1	TO15 Certified
017	336_017	IB	NONE			12/03/15 03:34	1.0	1	
018	336_018	CANCHECK				12/03/15 04:36	1.0	1	Certifies
019	336_019	CANCHECK				12/03/15 05:38	1.0	1	CertFail
020	336_020	CANCHECK				12/03/15 06:41	1.0	1	Certifies
021	336_021	CANCHECK				12/03/15 07:43	1.0	1	Certifies
022	336_022	CANCHECK				12/03/15 08:45	1.0	1	Certifies

TEW 12/03/15 : I verified that the vials loaded on the instrument matched the sequence data entry, for runs 1 through 22.

Analyst: TEW Date: 12/03/15 Reviewer: LW Date: 12/03/15

Standards used: 1=S28218 2=S28600 3=S28601

Flags used: CertFail=TO15 certification problem Certifies=TO15 Certified (Batch 981) TO15 Certified=C00267 Batch Certified (Batch 975) spk=5% spike rule

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PROJECT Air Sample Prep Log

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Prep by / Date	Sample ID	Can ID	Initial Pressure (PSI)	Final Pressure (PSI)	Dilution Factor	Comments
TEH 11-19-15	271757-004	C00313	15.50	25.72	1.66x	
	271767-001	C00080	14.85	25.50	1.72x	
	-002	C00336	14.54	25.35	1.74x	
	-003	C00401	14.28	25.25	1.77x	
	-004	C00108	14.52	25.32	1.74x	
	271775-001	C00087	13.33	25.45	1.91x	
	-002	C00122	10.26	25.32	2.47x	
	271780-001	C00273	13.83	25.45	1.84x	
	-002	C00098	14.60	25.65	1.76x	
	-003	C00178	30.61	30.61	1x	Trip Blank
	271757-001	C00283	1.5 added	30.0 total	33.4x	20x of 1.67x can C00403
	271767-001	C00096			34.4x	20x of 1.72x can C00080
	271643-001	C00107			39x	20x of 1.95x can C00111
	271757-002	C00090			33.8x	20x of 1.69x can C00088
	-002	C00093			676x	20x of 33.8x can C00090
	271780-001	C00400			36.8x	20x of 1.84x can C00273
	-002	C00280			35.2x	20x of 1.76x can C00098
AH 11/23/15	Blank	C00355	—	—	1x	
	271843-001	C00420	10.63	25.67	2.41x	
	-2	C00331	14.10	27.14	1.92x	
	-3	C00246	14.22	25.49	1.79x	
	-4	C00144	12.78	26.35	2.06x	
	-5	C00394	0.70	25.35	36.2x	
	271857-001	C00257	14.21	25.37	1.79x	
	-2	C00425	14.59	25.43	1.74x	
	-4	C00106	14.28	25.40	1.78x	
	271871-001	C00079	14.45	25.28	1.75x	
	-2	C00380	13.49	25.33	1.88x	
	-3	C00386	14.12	25.59	1.81x	
	-4	C00397	14.68	26.30	1.79x	
	-5	C00253	12.17	25.32	2.08x	
	-6	C00180	12.99	25.54	1.97x	
	271885-001	C00172	12.19	25.41	~~25.25~~ AH 11/24/15 2.08x	
	-2	C00068	12.70	25.25	1.99x	

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Prep by/Date	Sample ID	Can ID	Initial Pressure (PSI)	Final Pressure (PSI)	Dilution Factor	Comments
AH 11/23/15	271884-001	C00281	15.23	25.53	1.68x	
	-2	C00071	13.20	25.28	1.92x	
	-3	C00051	14.04	25.37	1.81x	
	-4	C00123	15.31	25.31	1.65x	
TEH 11-24-15	BLANK	C00003	—	—	1x	
	271843-002	C00211	0.3 added	30.0 total	192x	100x of 1.92x can C00331
	-002	C00261	1.5 added		3840x	20x of 192x can C00211
	-003	C00214	0.3 added		179x	100x of 1.79x can C00246
	271884-001	C00269	1.5 added		33.6x	20x of 1.68x can C00281
	-004	C00102			33x	20x of 1.65x can C00123
	271857-001	C00367	0.3 added		179x	100x of 1.79x can C00257
	-002	C00219			174x	100x of 1.74x can C00425
	-004	C00215			178x	100x of 1.78x can C00106
TEH 11-25-15	BLANK	C00015	—	—	1x	
	271900-001	C00167	5.29	25.47	4.81x	
	-002	C00337	3.28	25.46	7.76x	
	-003	C00383	4.34	25.50	5.88x	
	-004	C00092	3.56	25.57	7.18x	
	271954-001	C00345	13.54	25.56	1.89x	
	-002	C00317	13.42	25.96	1.93x	
	-003	C00243	15.30	25.57	1.67x	
	-004	C00346	13.60	25.50	1.88x	
	271958-001	C00328	13.96	25.46	1.82x	
	-002	C00255	13.82	25.47	1.84x	
	-003	C00409	13.16	25.78	1.96x	
	-004	C00290	12.75	25.52	2.00x	
11/30/15	Blank	C00222	—	—	1x	
	271994-001	C00103	13.81	25.24	1.83x	
	-2	C00263	12.63	25.49	2.02x	
	-3	C00109	13.34	25.34	1.90x	
	-4	C00168	12.98	25.30	1.95x	
	-5	C00418	13.46	25.86	1.92x	
	271995-001	C00267	13.41	25.24	1.88x	
	-2	C00393	13.62	25.84	1.90x	
	-3	C00126	14.20	25.57	1.80x	

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Prep by / Date	Sample ID	Can ID	Initial Pressure (PSI)	Final Pressure (PSI)	Dilution Factor	Comments
TRC 11/30/15	271871-002	C00208	0.3added	30.0 total	188x	100x of 1.88x can C00380
AH 11/30/15	272026-001	C00066	14.22	25.27	1.78x	
↓	↓ -2	C00376	14.16	25.24	1.78x	

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Prep by / Date	Sample ID	Can ID	Initial Pressure (PSI)	Final Pressure (PSI)	Dilution Factor	Comments
TEH 11-19-15	271757-004	C00313	15.50	25.72	1.66x	
	271767-001	C00080	14.85	25.50	1.72x	
	-002	C00336	14.54	25.35	1.74x	
	-003	C00401	14.28	25.25	1.77x	
	-004	C00108	14.52	25.32	1.74x	
	271775-001	C00087	13.33	25.45	1.91x	
	-002	C00122	10.26	25.32	2.47x	
	271780-001	C00273	13.83	25.45	1.84x	
	-002	C00098	14.60	25.65	1.76x	
	-003	C00178	30.61	30.61	1x	Trip Blank
	271757-001	C00283	1.5 added	30.0 total	33.4x	20x of 1.67x can C00403
	271767-001	C00096			34.4x	20x of 1.72x can C00080
	271643-001	C00107			39x	20x of 1.95x can C00111
	271757-002	C00090			33.8x	20x of 1.69x can C00088
	-002	C00093			676x	20x of 33.8x can C00090
	271780-001	C00400			36.8x	20x of 1.84x can C00273
	-002	C00280			35.2x	20x of 1.76x can C00098
AH 11/23/15	Blank	C00355	—	—	1x	
	271843-001	C00420	10.63	25.67	2.41x	
	-2	C00331	14.10	27.14	1.92x	
	-3	C00246	14.22	25.49	1.79x	
	-4	C00144	12.78	26.35	2.06x	
	-5	C00394	0.70	25.35	36.2x	
	271857-001	C00257	14.21	25.37	1.79x	
	-2	C00425	14.59	25.43	1.74x	
	-4	C00106	14.28	25.40	1.78x	
	271871-001	C00079	14.45	25.28	1.75x	
	-2	C00380	13.49	25.33	1.88x	
	-3	C00386	14.12	25.59	1.81x	
	-4	C00397	14.68	26.30	1.79x	
	-5	C00253	12.17	25.32	2.08x	
	-6	C00180	12.99	25.54	1.97x	
	271885-001	C00172	12.19	25.41	~~25.25~~ AH 11/24/15 2.08x	
	-2	C00068	12.70	25.25	1.99x	

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Prep by/Date	Sample ID	Can ID	Initial Pressure (PSI)	Final Pressure (PSI)	Dilution Factor	Comments
AH 11/23/15	271884-001	C00281	15.23	25.53	1.68x	
	-2	C00071	13.20	25.28	1.92x	
	-3	C00051	14.04	25.37	1.81x	
	-4	C00123	15.31	25.31	1.65x	
TEH 11-24-15	BLANK	C00003	—	—	1x	
	271843-002	C00211	0.3 added	30.0 +/- 1	192x	100x of 1.92x can C00331
	-002	C00261	1.5 added		3840x	20x of 192x can C00211
	-003	C00214	0.3 added		179x	100x of 1.79x can C00246
	271884-001	C00269	1.5 added		33.6x	20x of 1.68x can C00281
	-004	C00102			33x	20x of 1.65x can C00123
	271857-001	C00367	0.3 added		179x	100x of 1.79x can C00257
	-002	C00219			174x	100x of 1.74x can C00425
	-004	C00215			178x	100x of 1.78x can C00106
TEH 11-25-15	BLANK	C00015	—	—	1x	
	271900-001	C00167	5.29	25.47	4.81x	
	-002	C00337	3.28	25.46	7.76x	
	-003	C00383	4.34	25.50	5.88x	
	-004	C00092	3.56	25.57	7.18x	
	271954-001	C00345	13.54	25.56	1.89x	
	-002	C00317	13.42	25.96	1.93x	
	-003	C00243	15.30	25.57	1.67x	
	-004	C00346	13.60	25.50	1.88x	
	271938-001	C00328	13.96	25.46	1.82x	
	-002	C00255	13.82	25.47	1.84x	
	-003	C00409	13.16	25.78	1.96x	
	-004	C00290	12.75	25.52	2.00x	
11/30/15	Blank	C00222	—	—	1x	
	271994-001	C00103	13.81	25.24	1.83x	
	-2	C00263	12.63	25.49	2.02x	
	-3	C00109	13.34	25.34	1.90x	
	-4	C00168	12.98	25.30	1.95x	
	-5	C00418	13.46	25.86	1.92x	
	271995-001	C00267	13.41	25.24	1.88x	
	-2	C00393	13.62	25.84	1.90x	
	-3	C00126	14.20	25.57	1.80x	

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Prep by / Date	Sample ID	Can ID	Initial Pressure (PSI)	Final Pressure (PSI)	Dilution Factor	Comments
TBC 11/30/15	271871-002	C00208	0.3added	30.0 total	188x	100x of 1.88x can C00380
AM 11/30/15	272026-001	C00066	14.22	25.27	1.78x	
↓	↓ -2	C00376	14.16	25.24	1.78x	
AM 12/1/15	Blank	C00359	—	—	1x	
	272027-001	C00189	15.15	25.13	1.66x	
	-2	C00171	13.24	25.05	1.89x	
	-3	C00143	14.90	25.26	1.70x	
	-4	C00285	14.76	25.10	1.70x	
↓	↓ -5	C00315	14.28	26.45	1.85x	

Continued on Page

Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

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PROJECT Air Sample Prep Log

Notebook No. BK3714

Continued from Page _____

Prep by / Date	Sample ID	Can ID	Initial Pressure (PSI)	Final Pressure (PSI)	Dilution Factor	Comments
TEW 11-19-15	271757-004	C00313	15.50	25.72	1.66x	
	271767-001	C00080	14.85	25.50	1.72x	
	-002	C00336	14.54	25.35	1.74x	
	-003	C00401	14.28	25.25	1.77x	
	-004	C00108	14.52	25.32	1.74x	
	271775-001	C00087	13.33	25.45	1.91x	
	-002	C00122	10.26	25.32	2.47x	
	271780-001	C00273	13.83	25.45	1.84x	
	-002	C00098	14.60	25.65	1.76x	
	-003	C00178	30.61	30.61	1x	Trip Blank
	271757-001	C00283	1.5 added	30.0 total	33.4x	20x of 1.67x can C00403
	271767-001	C00096			34.4x	20x of 1.72x can C00080
	271643-001	C00107			39x	20x of 1.95x can C00111
	271757-002	C00090			33.8x	20x of 1.69x can C00088
	-002	C00093			676x	20x of 33.8x can C00090
	271780-001	C00400			36.8x	20x of 1.84x can C00273
	-002	C00280			35.2x	20x of 1.76x can C00098
AH 11/23/15	FBlank	C00355	—	—	1x	
	271843-001	C00420	10.63	25.67	2.41x	
	-2	C00331	14.10	27.14	1.92x	
	-3	C00246	14.22	25.49	1.79x	
	-4	C00144	12.78	26.35	2.06x	
	-5	C00394	0.70	25.35	36.2x	
	271857-001	C00257	14.21	25.37	1.79x	
	-2	C00425	14.59	25.43	1.74x	
	-4	C00106	14.28	25.40	1.78x	
	271871-001	C00079	14.45	25.28	1.75x	
	-2	C00380	13.49	25.33	1.88x	
	-3	C00386	14.12	25.59	1.81x	
	-4	C00397	14.68	26.30	1.79x	
	-5	C00253	12.17	25.32	2.08x	
	-6	C00180	12.99	25.54	1.97x	
	271885-001	C00172	12.19	25.41	~~25.25~~ AH 11/24/15 2.08x	
	-2	C00068	12.70	25.25	1.99x	

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Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

PROJECT Air Sample Prep Log

Notebook No. BK3714 11

Continued from Page _____

Prep by / Date	Sample ID	Can ID	Initial Pressure (PSI)	Final Pressure (PSI)	Dilution Factor	Comments
AH 11/23/15	271884-001	C00281	15.23	25.53	1.68x	
	-2	C00071	13.20	25.28	1.92x	
	-3	C00051	14.04	25.37	1.81x	
	-4	C00123	15.31	25.31	1.65x	
TEW 11-24-15	BLANK	C00003	—	—	1x	
	271843-002	C00211	0.3 added	30.0 total	192x	100x of 1.92x can C00331
	-002	C00261	1.5 added		3840x	20x of 192x can C00211
	-003	C00214	0.3 added		179x	100x of 1.79x can C00246
	271884-001	C00269	1.5 added		33.6x	20x of 1.68x can C00281
	-004	C00102			33x	20x of 1.65x can C00123
	271857-001	C00367	0.3 added		179x	100x of 1.79x can C00257
	-002	C00219			174x	100x of 1.74x can C00425
	-004	C00215			178x	100x of 1.78x can C00106
TEW 11-25-15	BLANK	C00015	—	—	1x	
	271900-001	C00167	5.29	25.47	4.81x	
	-002	C00337	3.28	25.46	7.76x	
	-003	C00383	4.34	25.50	5.88x	
	-004	C00092	3.56	25.57	7.18x	
	271954-001	C00345	13.54	25.56	1.89x	
	-002	C00317	13.42	25.96	1.93x	
	-003	C00243	15.30	25.57	1.67x	
	-004	C00346	13.60	25.50	1.88x	
	271958-001	C00328	13.96	25.46	1.82x	
	-002	C00255	13.82	25.47	1.84x	
	-003	C00409	13.16	25.78	1.96x	
	-004	C00290	12.75	25.52	2.00x	
11/30/15	Blank	C00222	—	—	1x	
	271994-001	C00103	13.81	25.24	1.83x	
	-2	C00263	12.63	25.49	2.02x	
	-3	C00109	13.34	25.34	1.90x	
	-4	C00168	12.98	25.30	1.95x	
	-5	C00418	13.46	25.86	1.92x	
	271995-001	C00267	13.41	25.24	1.88x	
	-2	C00393	13.62	25.84	1.90x	
	-3	C00126	14.20	25.57	1.80x	

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PROJECT Air Sample Prep Log

Notebook No. BK3714

Continued from Page _____

Prep by / Date	Sample ID	Can ID	Initial Pressure (PSI)	Final Pressure (PSI)	Dilution Factor	Comments
TEH 11/30/15	271871-002	C00208	0.3 added	30.0 total	188x	100x of 1.88x can C00380
AA 11/30/15	272026-001	C00066	14.22	25.27	1.78x	
↓	↓ -2	C00376	14.16	25.24	1.78x	
AA 12/1/15	Blank	C00359	—	—	1x	
	272027-001	C00189	15.15	25.13	1.66x	
	-2	C00171	13.24	25.05	1.89x	
	-3	C00143	14.90	25.26	1.70x	
	-4	C00285	14.76	25.10	1.70x	
	-5	C00315	14.28	26.45	1.85x	
AA 12/2/15	272029-002	C00117	1.5 added	30.0 total	20x	20x of tedlar bag
TEH 12-2-15	271871-002	C00389			3760x	20x of 188x can C00208
	-003	C00100			36.2x	20x of 1.81x can C00386
	-005	C00249			41.6x	20x of 2.08x can C00253
	~~271~~ 272029-002 2nd run 12-2-15	C00392			4100x	20x of 20x can C00117
	271995-002	C00161			38x	20x of 1.90x can C00393
	↓ -003	C00128			36x	20x of 1.80x can C00126

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Signed _____ Date _____ Signed _____ Date _____

Laboratory Job Number 271871

ANALYTICAL REPORT

Subcontracted Products

Laboratory Job Number 271871

Subcontracted Products

ALS (formerly Columbia)

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

December 17, 2015

Mike Dahlquist
Curtis & Tompkins, Ltd.
2323 5th Street
Berkeley, CA 94710

RE: Marinwood Cleaners / 271871

Dear Mike:

Enclosed are the results of the samples submitted to our laboratory on December 3, 2015. For your reference, these analyses have been assigned our service request number P1505239.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Kate Aguilera at 9:55 am, Dec 17, 2015

Kate Aguilera
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: Curtis & Tompkins, Ltd. Service Request No: P1505239
Project: Marinwood Cleaners / 271871

CASE NARRATIVE

The samples were received intact under chain of custody on December 3, 2015 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Volatile Organic Compound Analysis

The samples were analyzed in SIM mode for selected volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation, however it is not part of the AIHA-LAP accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The canisters were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L14-2-R1
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	977273
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-001
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-15-6
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA016272015-5
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Curtis & Tompkins, Ltd. Service Request: P1505239

Project ID: Marinwood Cleaners / 271871

Date Received: 12/3/2015

Time Received: 13:45

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Pi1 (psig)	Pf1 (psig)	TO-15 - VOC SIM
FRONT	P1505239-001	Air	11/20/2015	17:47	-0.18	4.07	X
BACK	P1505239-002	Air	11/20/2015	17:45	-1.83	3.70	X

Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900
(510) 486-0532

Project Number: 271871
Site: Marinwood Cleaners

Subcontract Laboratory:
ALS (formerly Columbia)
2655 Park Center Drive
Suite A
Simi Valley, CA 93065
(805) 526-7161
ATTN: Kate Aguilera

P15B5239

Results due: Report Level: III

Please send report to: Mike Dahlquist (mike.dahlquist@ctberk.com)
*** Please report using Sample ID rather than C&T Lab #.

Sample ID	Sampled	Matrix	Analysis	C&T Lab #	Comments
FRONT	11/20 17:47	Air	TO-15 SIM	271871-007	PCE,TCE, 1,1-DCE, CIS-DCE, TRANS-DCE, & VC
BACK	11/20 17:45	Air	TO-15 SIM	271871-008	PCE,TCE, 1,1-DCE, CIS-DCE, TRANS-DCE, & VC

Notes:	Relinquished By:	Received By:
	Date/Time: 12/01/15 1315	Date/Time: 12/3/15 1345
	Date/Time:	Date/Time:

Signature on this form constitutes a firm Purchase Order for the services requested above.

ALS Environmental
Sample Acceptance Check Form

Client: Curtis & Tompkins, Ltd. Work order: P1505239

Project: Marinwood Cleaners / 271871

Sample(s) received on: 12/3/15 Date opened: 12/3/15 by: KKELPE

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1505239-001.01	Canister					
P1505239-002.01	Canister					

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Curtis & Tompkins, Ltd.**
Client Sample ID: **FRONT** ALS Project ID: P1505239
Client Project ID: **Marinwood Cleaners / 271871** ALS Sample ID: P1505239-001

Test Code: EPA TO-15 SIM Date Collected: 11/20/15
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19 Date Received: 12/3/15
Analyst: Wida Ang Date Analyzed: 12/9/15
Sample Type: Canister Volume(s) Analyzed: 0.50 Liter(s)
Test Notes:

Initial Pressure (psig): -0.18 Final Pressure (psig): 4.07

Canister Dilution Factor: 1.29

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.065	ND	0.025	
75-35-4	1,1-Dichloroethene	ND	0.065	ND	0.016	
156-60-5	trans-1,2-Dichloroethene	ND	0.065	ND	0.016	
156-59-2	cis-1,2-Dichloroethene	**0.13**	0.065	**0.032**	0.016	
79-01-6	Trichloroethene	**0.075**	0.065	**0.014**	0.012	
127-18-4	Tetrachloroethene	**5.3**	0.065	**0.78**	0.0095	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Curtis & Tompkins, Ltd.**
Client Sample ID: **BACK** ALS Project ID: P1505239
Client Project ID: **Marinwood Cleaners / 271871** ALS Sample ID: P1505239-002

Test Code: EPA TO-15 SIM Date Collected: 11/20/15
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19 Date Received: 12/3/15
Analyst: Wida Ang Date Analyzed: 12/9/15
Sample Type: Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Initial Pressure (psig): -1.83 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.43

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.036	ND	0.014	
75-35-4	1,1-Dichloroethene	ND	0.036	ND	0.0090	
156-60-5	trans-1,2-Dichloroethene	ND	0.036	ND	0.0090	
156-59-2	cis-1,2-Dichloroethene	**0.19**	0.036	**0.048**	0.0090	
79-01-6	Trichloroethene	**0.092**	0.036	**0.017**	0.0067	
127-18-4	Tetrachloroethene	**4.9**	0.036	**0.72**	0.0053	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Curtis & Tompkins, Ltd.**
Client Sample ID: **Method Blank** ALS Project ID: P1505239
Client Project ID: **Marinwood Cleaners / 271871** ALS Sample ID: P151208-MB

Test Code: EPA TO-15 SIM Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19 Date Received: NA
Analyst: Wida Ang Date Analyzed: 12/8/15
Sample Type: Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.025	ND	0.0098	
75-35-4	1,1-Dichloroethene	ND	0.025	ND	0.0063	
156-60-5	trans-1,2-Dichloroethene	ND	0.025	ND	0.0063	
156-59-2	cis-1,2-Dichloroethene	ND	0.025	ND	0.0063	
79-01-6	Trichloroethene	ND	0.025	ND	0.0047	
127-18-4	Tetrachloroethene	ND	0.025	ND	0.0037	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Curtis & Tompkins, Ltd.**
Client Sample ID: **Method Blank** ALS Project ID: P1505239
Client Project ID: **Marinwood Cleaners / 271871** ALS Sample ID: P151209-MB

Test Code: EPA TO-15 SIM Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19 Date Received: NA
Analyst: Wida Ang Date Analyzed: 12/9/15
Sample Type: Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-01-4	Vinyl Chloride	ND	0.025	ND	0.0098	
75-35-4	1,1-Dichloroethene	ND	0.025	ND	0.0063	
156-60-5	trans-1,2-Dichloroethene	ND	0.025	ND	0.0063	
156-59-2	cis-1,2-Dichloroethene	ND	0.025	ND	0.0063	
79-01-6	Trichloroethene	ND	0.025	ND	0.0047	
127-18-4	Tetrachloroethene	ND	0.025	ND	0.0037	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Client: **Curtis & Tompkins, Ltd.**
Client Project ID: **Marinwood Cleaners / 271871** ALS Project ID: P1505239

Test Code: EPA TO-15 SIM
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19 Date(s) Collected: 11/20/15
Analyst: Wida Ang Date(s) Received: 12/3/15
Sample Type: Canister(s) Date(s) Analyzed: 12/8 - 12/9/15
Test Notes:

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4 % Recovered	Toluene-d8 % Recovered	Bromofluorobenzene % Recovered	Acceptance Limits	Data Qualifier
Method Blank	P151208-MB	**102**	**112**	**99**	70-130	
Method Blank	P151209-MB	**102**	**114**	**93**	70-130	
Lab Control Sample	P151208-LCS	**101**	**100**	**101**	70-130	
Lab Control Sample	P151209-LCS	**100**	**96**	**100**	70-130	
FRONT	P1505239-001	**102**	**109**	**96**	70-130	
BACK	P1505239-002	**98**	**104**	**108**	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Curtis & Tompkins, Ltd.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1505239
Client Project ID: **Marinwood Cleaners / 271871** ALS Sample ID: P151208-LCS

Test Code: EPA TO-15 SIM Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19 Date Received: NA
Analyst: Wida Ang Date Analyzed: 12/8/15
Sample Type: Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
75-01-4	Vinyl Chloride	4.00	**3.64**	**91**	64-118	
75-35-4	1,1-Dichloroethene	4.32	**4.58**	**106**	72-113	
156-60-5	trans-1,2-Dichloroethene	4.20	**4.48**	**107**	70-115	
156-59-2	cis-1,2-Dichloroethene	4.36	**4.89**	**112**	72-115	
79-01-6	Trichloroethene	4.32	**3.69**	**85**	70-112	
127-18-4	Tetrachloroethene	4.04	**3.56**	**88**	67-114	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Curtis & Tompkins, Ltd.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1505239
Client Project ID: **Marinwood Cleaners / 271871** ALS Sample ID: P151209-LCS

Test Code: EPA TO-15 SIM Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19 Date Received: NA
Analyst: Wida Ang Date Analyzed: 12/9/15
Sample Type: Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
75-01-4	Vinyl Chloride	4.00	**3.52**	**88**	64-118	
75-35-4	1,1-Dichloroethene	4.32	**4.41**	**102**	72-113	
156-60-5	trans-1,2-Dichloroethene	4.20	**4.39**	**105**	70-115	
156-59-2	cis-1,2-Dichloroethene	4.36	**4.64**	**106**	72-115	
79-01-6	Trichloroethene	4.32	**3.73**	**86**	70-112	
127-18-4	Tetrachloroethene	4.04	**3.56**	**88**	67-114	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

Response Factor Report MS19

Method Path : I:\MS19\METHODS\
Method File : S19101915.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Tue Oct 20 08:48:23 2015
Response Via : Initial Calibration

Calibration Files
10 =10191508.D 20 =10191522.D 50 =10191510.D 100 =10191511.D 500 =10191512.D 1000=10191513.D 2000=10191514.D
5000=10191515.D 10K =10191516.D

		Compound	10	20	50	100	500	1000	2000	5000	10K	Avg	%RSD
1)	I	Bromochloromethane...	----------ISTD----------										
2)	T	Dichlorodifluo...	3.379	2.768	3.824	4.028	2.900	2.868	2.747	2.633	2.594	3.082	17.25
3)	T	Chloromethane	0.795	0.832	1.061	1.126	0.777	0.724	0.621	0.628	0.561	0.792	24.44
4)	T	1,2-Dichloro,1...	3.447	2.834	3.609	3.730	2.697	2.651	2.556	2.472	2.459	2.939	17.35
5)	T	Vinyl Chloride	3.007	2.488	3.213	3.446	2.466	2.446	2.359	2.308	2.292	2.669	16.25
6)	T	1,3-Butadiene	2.120	1.646	2.070	2.305	1.587	1.575	1.501	1.585	1.578	1.774	17.01
7)	T	Bromomethane	1.451	1.314	1.425	1.476	1.270	1.272	1.213	1.196	1.191	1.312	8.53
8)	T	Chloroethane	0.904	0.786	1.077	1.157	0.852	0.859	0.983	0.792	0.778	0.910	14.88
9)	T	Acrolein			0.823	0.713	0.505	0.565	0.549	0.526	0.519	0.600	20.11
10)	T	Acetone				1.156	0.784	0.770	0.742	0.752	0.744	0.825	19.78
11)	T	Trichlorofluor...	2.616	2.153	2.805	2.950	2.145	2.104	2.020	1.943	1.922	2.295	16.94
12)	T	1,1-Dichloroet...	1.080	0.989	1.162	1.238	0.972	0.997	1.000	1.020	1.040	1.055	8.52
13)	T	Methylene Chlo...			1.816	1.762	1.228	1.193	1.147	1.100	1.090	1.334	23.64
14)	T	Trichlorotrifl...	1.328	1.104	1.467	1.564	1.133	1.105	1.066	1.038	1.043	1.205	16.37
15)	T	trans-1,2-Dich...	1.097	1.003	1.238	1.367	1.049	1.070	1.076	1.108	1.139	1.128	9.83
16)	T	1,1-Dichloroet...	2.332	1.947	2.679	2.850	2.127	2.110	2.056	2.005	1.994	2.233	14.49
17)	T	Methyl tert-Bu...	2.060	1.960	2.336	2.579	2.183	2.447	2.717	2.948	3.106	2.482	15.82
18)	T	cis-1,2-Dichlo...	1.044	0.959	1.217	1.359	1.092	1.116	1.123	1.159	1.183	1.139	9.86
19)	T	Chloroform			3.556	3.338	2.243	2.160	2.065	1.989	1.962	2.473	27.29
20)	S	1,2-Dichloroet...	1.882	1.832	1.894	1.902	1.866	1.866	1.854	1.831	1.809	1.859	1.67
21)	T	1,2-Dichloroet...	1.834	1.470	1.988	2.209	1.685	1.661	1.608	1.571	1.552	1.731	13.74
22)	T	1,1,1-Trichlor...	2.260	1.777	2.447	2.618	1.927	1.904	1.851	1.821	1.827	2.048	15.22
23)	T	Benzene		6.859	6.135	6.249	4.576	4.472	4.335	4.264	4.236	5.141	21.01
24)	T	Carbon Tetrach...	1.893	1.656	2.093	2.231	1.664	1.641	1.599	1.566	1.577	1.769	13.87
25)	I	1,4-Difluorobenzen...	----------ISTD----------										
26)	T	1,2-Dichloropr...		0.234	0.348	0.340	0.225	0.218	0.212	0.210	0.209	0.249	23.59
27)	T	Bromodichlorom...		0.336	0.512	0.512	0.332	0.320	0.310	0.307	0.307	0.367	24.62
28)	T	Trichloroethene	0.342	0.271	0.353	0.367	0.255	0.252	0.248	0.247	0.247	0.287	17.93
29)	T	1,4-Dioxane		0.148	0.182	0.186	0.137	0.148	0.158	0.172	0.176	0.163	11.04
30)	T	cis-1,3-Dichlo...	0.335	0.266	0.355	0.384	0.280	0.288	0.301	0.328	0.343	0.320	12.11
31)	T	trans-1,3-Dich...	0.313	0.234	0.297	0.329	0.246	0.255	0.268	0.299	0.315	0.284	12.02
32)	T	1,1,2-Trichlor...	0.260	0.199	0.297	0.295	0.194	0.188	0.182	0.180	0.179	0.219	22.88
33)	S	Toluene-d8 (SS2)	0.967	0.958	0.935	0.882	0.822	0.829	0.848	0.880	0.895	0.891	5.97
34)	T	Toluene	1.333	0.997	1.213	1.200	0.836	0.840	0.853	0.883	0.896	1.006	19.08
35)	T	Dibromochlorom...	0.318	0.251	0.368	0.383	0.248	0.244	0.237	0.239	0.241	0.281	21.05
36)	T	1,2-Dibromoethane	0.305	0.237	0.328	0.342	0.232	0.229	0.227	0.234	0.236	0.263	17.95
37)	T	Tetrachloroethene	0.358	0.287	0.392	0.396	0.274	0.265	0.259	0.261	0.263	0.306	19.13
38)	I	Chlorobenzene-d5 (...	----------ISTD----------										
39)	T	Chlorobenzene	4.041	3.450	4.672	4.979	3.805	3.780	3.706	3.711	3.627	3.975	12.91
40)	T	Ethylbenzene	4.597	4.112	5.246	5.695	4.900	5.473	5.966	6.430	6.455	5.431	14.78
41)	T	m,p-Xylene	3.157	2.870	3.650	4.128	4.204	4.913	5.182	5.307	5.363	4.308	21.88

KDA 10/22/15

Method Path : I:\MS19\METHODS\
Method File : S19101915.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

42)	T	Styrene	3.010	2.164	2.529	3.005	2.912	3.354	3.640	3.928	4.013	3.173	19.57
43)	T	o-Xylene	1.668	1.520	1.911	2.231	2.305	2.561	2.646	2.680	2.686	2.245	20.03
44)	T	1,1,2,2-Tetrac...	2.792	2.159	3.535	3.828	2.910	2.885	2.758	2.670	2.658	2.910	16.99
45)	S	Bromofluoroben...	1.876	2.169	1.916	2.008	2.233	2.283	2.315	2.324	2.306	2.159	8.29
46)	T	1,3,5-Trimethy...			3.504	4.498	5.115	5.587	5.726	5.922	6.070	5.203	17.68
47)	T	1,2,4-Trimethy...			3.295	4.220	4.848	5.502	5.753	6.141	6.467	5.175	21.74
48)	T	1,3-Dichlorobe...	2.604	2.351	3.459	4.135	3.543	3.569	3.462	3.501	3.539	3.351	16.13
49)	T	1,4-Dichlorobe...	2.342	2.235	3.159	3.819	3.407	3.463	3.428	3.532	3.558	3.216	17.21
50)	T	1,2-Dichlorobe...	2.365	2.194	3.292	3.897	3.341	3.392	3.339	3.430	3.465	3.191	17.18
51)	T	1,2-Dibromo-3-...	0.735	0.636	1.068	1.250	1.075	1.115	1.120	1.191	1.188	1.042	20.33
52)	T	1,2,4-Trichlor...			1.442	1.768	1.539	1.670	1.780	2.139	2.190	1.790	15.81
53)	T	Naphthalene			3.232	4.619	5.676	6.815	7.245			5.517	29.68
54)	T	Hexachlorobuta...	1.248	1.059	1.513	1.758	1.345	1.347	1.329	1.361	1.356	1.368	13.80

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : I:\MS19\DATA\2015 12\08\12081503.D Vial: 16
Acq On : 8 Dec 2015 10:40 Operator: WA/CL
Sample : CCV S19120815 500pg Inst : MS19
Misc : S2912081501/S29-11111510 (12/10)

Quant Time: Dec 08 11:04:53 2015
Quant Method : I:\MS19\METHODS\S19101915.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Oct 20 08:48:23 2015 CL 12/8/15
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

WA 12/11/15

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Bromochloromethane (IS1)	1.000	1.000	0.0	91	0.00
2	T	Dichlorodifluoromethane (CF	3.082	2.832	8.1	89	0.00
3	T	Chloromethane	0.792	0.752	5.1	88	0.00
4	T	1,2-Dichloro,1,1,2,2-tetrac	2.939	2.530	13.9	85	0.00
5	T	Vinyl Chloride	2.669	2.352	11.9	87	0.00
6	T	1,3-Butadiene	1.774	1.523	14.1	87	0.00
7	T	Bromomethane	1.312	1.078	17.8	77	0.00
8	T	Chloroethane	0.910	0.849	6.7	91	0.00
9	T	Acrolein	0.600	0.580	3.3	105	-0.02
10	T	Acetone	0.825	0.933	-13.1	108	-0.02
11	T	Trichlorofluoromethane	2.295	2.078	9.5	88	0.00
12	T	1,1-Dichloroethene	1.055	1.091	-3.4	102	0.00
13	T	Methylene Chloride	1.334	1.248	6.4	92	0.00
14	T	Trichlorotrifluoroethane	1.205	1.117	7.3	90	0.00
15	T	trans-1,2-Dichloroethene	1.128	1.188	-5.3	103	0.00
16	T	1,1-Dichloroethane	2.233	2.235	-0.1	96	0.00
17	T	Methyl tert-Butyl Ether	2.482	3.082	-24.2	128	-0.02
18	T	cis-1,2-Dichloroethene	1.139	1.246	-9.4	104	0.00
19	T	Chloroform	2.473	2.267	8.3	92	0.00
20	S	1,2-Dichloroethane-d4 (SS1)	1.859	1.858	0.1	91	0.00
21	T	1,2-Dichloroethane	1.731	1.686	2.6	91	0.00
22	T	1,1,1-Trichloroethane	2.048	1.962	4.2	93	0.00
23	T	Benzene	5.141	4.714	8.3	94	0.00
24	T	Carbon Tetrachloride	1.769	1.628	8.0	89	0.00
25	I	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	99	0.00
26	T	1,2-Dichloropropane	0.249	0.226	9.2	99	0.00
27	T	Bromodichloromethane	0.367	0.308	16.1	91	0.00
28	T	Trichloroethene	0.287	0.247	13.9	96	0.00
29	T	1,4-Dioxane	0.163	0.164	-0.6	118	-0.02
30	T	cis-1,3-Dichloropropene	0.320	0.312	2.5	110	0.00
31	T	trans-1,3-Dichloropropene	0.284	0.274	3.5	110	0.00
32	T	1,1,2-Trichloroethane	0.219	0.187	14.6	95	0.00
33	S	Toluene-d8 (SS2)	0.891	0.890	0.1	107	0.00
34	T	Toluene	1.006	0.887	11.8	105	0.00
35	T	Dibromochloromethane	0.281	0.227	19.2	90	0.00
36	T	1,2-Dibromoethane	0.263	0.230	12.5	98	0.00
37	T	Tetrachloroethene	0.306	0.265	13.4	95	0.00
38	I	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	102	0.00
39	T	Chlorobenzene	3.975	3.840	3.4	103	0.00
40	T	Ethylbenzene	5.431	5.722	-5.4	119	0.00
41	T	m,p-Xylene	4.308	4.706	-9.2	114	0.00
42	T	Styrene	3.173	3.097	2.4	108	0.00
43	T	o-Xylene	2.245	2.486	-10.7	110	0.00
44	T	1,1,2,2-Tetrachloroethane	2.910	2.659	8.6	93	0.00
45	S	Bromofluorobenzene (SS3)	2.159	2.240	-3.8	102	0.00
46	T	1,3,5-Trimethylbenzene	5.203	5.243	-0.8	104	0.00
47	T	1,2,4-Trimethylbenzene	5.175	5.143	0.6	108	0.00
48	T	1,3-Dichlorobenzene	3.351	3.226	3.7	93	0.00
49	T	1,4-Dichlorobenzene	3.216	3.202	0.4	96	0.00
50	T	1,2-Dichlorobenzene	3.191	3.088	3.2	94	0.00
51	T	1,2-Dibromo-3-chloropropane	1.042	1.005	3.6	95	0.00
52	T	1,2,4-Trichlorobenzene	1.790	1.821	-1.7	120	0.00
53	T	Naphthalene	5.517	6.306	-14.3	113	0.00
54	T	Hexachlorobutadiene	1.368	1.327	3.0	100	0.00

Evaluate Continuing Calibration Report

Data File : I:\MS19\DATA\2015 12\08\12081503.D Vial: 16
Acq On : 8 Dec 2015 10:40 Operator: WA/CL
Sample : CCV S19120815 500pg Inst : MS19
Misc : S2912081501/S29-11111510 (12/10)

Quant Time: Dec 08 11:04:53 2015
Quant Method : I:\MS19\METHODS\S19101915.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Oct 20 08:48:23 2015
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Data File : I:\MS19\DATA\2015 12\09\12091502.D Vial: 16
Acq On : 9 Dec 2015 8:00 Operator: WA/CL
Sample : CCV S19120915 500pg Inst : MS19
Misc : S2912081501/S29-11111510 (12/10)

Quant Time: Dec 09 09:19:42 2015
Quant Method : I:\MS19\METHODS\S19101915.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Oct 20 08:48:23 2015
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

CL 12/9/15

WA 12/11/15

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Bromochloromethane (IS1)	1.000	1.000	0.0	94	0.00
2	T	Dichlorodifluoromethane (CF	3.082	2.681	13.0	87	-0.01
3	T	Chloromethane	0.792	0.719	9.2	87	-0.02
4	T	1,2-Dichloro,1,1,2,2-tetrac	2.939	2.365	19.5	83	-0.01
5	T	Vinyl Chloride	2.669	2.182	18.2	83	-0.02
6	T	1,3-Butadiene	1.774	1.518	14.4	90	-0.02
7	T	Bromomethane	1.312	1.015	22.6	75	-0.02
8	T	Chloroethane	0.910	0.804	11.6	89	-0.02
9	T	Acrolein	0.600	0.581	3.2	108	-0.03
10	T	Acetone	0.825	0.885	-7.3	106	-0.03
11	T	Trichlorofluoromethane	2.295	1.968	14.2	86	-0.01
12	T	1,1-Dichloroethene	1.055	0.981	7.0	95	-0.02
13	T	Methylene Chloride	1.334	1.184	11.2	91	-0.01
14	T	Trichlorotrifluoroethane	1.205	1.062	11.9	88	-0.01
15	T	trans-1,2-Dichloroethene	1.128	1.068	5.3	96	-0.02
16	T	1,1-Dichloroethane	2.233	2.074	7.1	92	-0.01
17	T	Methyl tert-Butyl Ether	2.482	2.558	-3.1	110	-0.02
18	T	cis-1,2-Dichloroethene	1.139	1.109	2.6	96	-0.01
19	T	Chloroform	2.473	2.108	14.8	89	0.00
20	S	1,2-Dichloroethane-d4 (SS1)	1.859	1.853	0.3	94	0.00
21	T	1,2-Dichloroethane	1.731	1.577	8.9	88	-0.01
22	T	1,1,1-Trichloroethane	2.048	1.814	11.4	89	0.00
23	T	Benzene	5.141	4.457	13.3	92	-0.01
24	T	Carbon Tetrachloride	1.769	1.518	14.2	86	-0.01
25	I	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	100	0.00
26	T	1,2-Dichloropropane	0.249	0.213	14.5	95	0.00
27	T	Bromodichloromethane	0.367	0.296	19.3	89	0.00
28	T	Trichloroethene	0.287	0.236	17.8	92	0.00
29	T	1,4-Dioxane	0.163	0.142	12.9	103	-0.02
30	T	cis-1,3-Dichloropropene	0.320	0.274	14.4	98	0.00
31	T	trans-1,3-Dichloropropene	0.284	0.238	16.2	97	0.00
32	T	1,1,2-Trichloroethane	0.219	0.179	18.3	92	0.00
33	S	Toluene-d8 (SS2)	0.891	0.860	3.5	104	0.00
34	T	Toluene	1.006	0.816	18.9	97	0.00
35	T	Dibromochloromethane	0.281	0.221	21.4	89	0.00
36	T	1,2-Dibromoethane	0.263	0.217	17.5	94	0.00
37	T	Tetrachloroethene	0.306	0.253	17.3	92	0.00
38	I	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	102	0.00
39	T	Chlorobenzene	3.975	3.618	9.0	97	0.00
40	T	Ethylbenzene	5.431	4.852	10.7	101	0.00
41	T	m,p-Xylene	4.308	4.147	3.7	100	0.00
42	T	Styrene	3.173	2.786	12.2	97	0.00
43	T	o-Xylene	2.245	2.246	-0.0	99	0.00
44	T	1,1,2,2-Tetrachloroethane	2.910	2.597	10.8	91	0.00
45	S	Bromofluorobenzene (SS3)	2.159	2.198	-1.8	100	0.00
46	T	1,3,5-Trimethylbenzene	5.203	4.799	7.8	95	0.00
47	T	1,2,4-Trimethylbenzene	5.175	4.630	10.5	97	0.00
48	T	1,3-Dichlorobenzene	3.351	3.122	6.8	90	0.00
49	T	1,4-Dichlorobenzene	3.216	3.034	5.7	90	0.00
50	T	1,2-Dichlorobenzene	3.191	2.957	7.3	90	0.00
51	T	1,2-Dibromo-3-chloropropane	1.042	0.959	8.0	91	0.00
52	T	1,2,4-Trichlorobenzene	1.790	1.586	11.4	105	0.00
53	T	Naphthalene	5.517	5.513	0.1	99	0.00
54	T	Hexachlorobutadiene	1.368	1.271	7.1	96	0.00

Evaluate Continuing Calibration Report

Data File : I:\MS19\DATA\2015 12\09\12091502.D Vial: 16
Acq On : 9 Dec 2015 8:00 Operator: WA/CL
Sample : CCV S19120915 500pg Inst : MS19
Misc : S2912081501/S29-11111510 (12/10)

Quant Time: Dec 09 09:19:42 2015
Quant Method : I:\MS19\METHODS\S19101915.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Oct 20 08:48:23 2015
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)

(#) = Out of Range SPCC's out = 0 CCC's out = 0

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-68832-1
Client Project/Site: Marinwood 001

For:
Geologica Inc
220 4th Street, suite 201
Oakland, California 94607

Attn: Mr. Dan Matthews

Authorized for release by:
11/30/2015 2:56:58 PM
Laura Turpen, Project Manager I
(916)374-4414
laura.turpen@testamericainc.com

Designee for

Micah Smith, Project Manager II
(925)484-1919
micah.smith@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-68832-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-68832-1

Comments
No additional comments.

Receipt
The samples were received on 11/24/2015 5:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.5º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Client Sample ID: MW-2 — Lab Sample ID: 720-68832-1

No Detections.

Client Sample ID: MW-3 — Lab Sample ID: 720-68832-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	6.3		0.50		ug/L	1		8260B	Total/NA
Tetrachloroethene	1.3		0.50		ug/L	1		8260B	Total/NA

Client Sample ID: MW-4 — Lab Sample ID: 720-68832-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Tetrachloroethene	0.60		0.50		ug/L	1		8260B	Total/NA

Client Sample ID: MW-5 — Lab Sample ID: 720-68832-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	8.6		0.50		ug/L	1		8260B	Total/NA
Tetrachloroethene	25		0.50		ug/L	1		8260B	Total/NA
Trichloroethene	7.7		0.50		ug/L	1		8260B	Total/NA
Vinyl chloride	0.71		0.50		ug/L	1		8260B	Total/NA

Client Sample ID: TB-112415 — Lab Sample ID: 720-68832-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-2
Date Collected: 11/24/15 12:30
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		0.50		ug/L			11/27/15 16:12	1
Acetone	ND		50		ug/L			11/27/15 16:12	1
Benzene	ND		0.50		ug/L			11/27/15 16:12	1
Dichlorobromomethane	ND		0.50		ug/L			11/27/15 16:12	1
Bromobenzene	ND		1.0		ug/L			11/27/15 16:12	1
Chlorobromomethane	ND		1.0		ug/L			11/27/15 16:12	1
Bromoform	ND		1.0		ug/L			11/27/15 16:12	1
Bromomethane	ND		1.0		ug/L			11/27/15 16:12	1
2-Butanone (MEK)	ND		50		ug/L			11/27/15 16:12	1
n-Butylbenzene	ND		1.0		ug/L			11/27/15 16:12	1
sec-Butylbenzene	ND		1.0		ug/L			11/27/15 16:12	1
tert-Butylbenzene	ND		1.0		ug/L			11/27/15 16:12	1
Carbon disulfide	ND		5.0		ug/L			11/27/15 16:12	1
Carbon tetrachloride	ND		0.50		ug/L			11/27/15 16:12	1
Chlorobenzene	ND		0.50		ug/L			11/27/15 16:12	1
Chloroethane	ND		1.0		ug/L			11/27/15 16:12	1
Chloroform	ND		1.0		ug/L			11/27/15 16:12	1
Chloromethane	ND		1.0		ug/L			11/27/15 16:12	1
2-Chlorotoluene	ND		0.50		ug/L			11/27/15 16:12	1
4-Chlorotoluene	ND		0.50		ug/L			11/27/15 16:12	1
Chlorodibromomethane	ND		0.50		ug/L			11/27/15 16:12	1
1,2-Dichlorobenzene	ND		0.50		ug/L			11/27/15 16:12	1
1,3-Dichlorobenzene	ND		0.50		ug/L			11/27/15 16:12	1
1,4-Dichlorobenzene	ND		0.50		ug/L			11/27/15 16:12	1
1,3-Dichloropropane	ND		1.0		ug/L			11/27/15 16:12	1
1,1-Dichloropropene	ND		0.50		ug/L			11/27/15 16:12	1
1,2-Dibromo-3-Chloropropane	ND		1.0		ug/L			11/27/15 16:12	1
Ethylene Dibromide	ND		0.50		ug/L			11/27/15 16:12	1
Dibromomethane	ND		0.50		ug/L			11/27/15 16:12	1
Dichlorodifluoromethane	ND		0.50		ug/L			11/27/15 16:12	1
1,1-Dichloroethane	ND		0.50		ug/L			11/27/15 16:12	1
1,2-Dichloroethane	ND		0.50		ug/L			11/27/15 16:12	1
1,1-Dichloroethene	ND		0.50		ug/L			11/27/15 16:12	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			11/27/15 16:12	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			11/27/15 16:12	1
1,2-Dichloropropane	ND		0.50		ug/L			11/27/15 16:12	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 16:12	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 16:12	1
Ethylbenzene	ND		0.50		ug/L			11/27/15 16:12	1
Hexachlorobutadiene	ND		1.0		ug/L			11/27/15 16:12	1
2-Hexanone	ND		50		ug/L			11/27/15 16:12	1
Isopropylbenzene	ND		0.50		ug/L			11/27/15 16:12	1
4-Isopropyltoluene	ND		1.0		ug/L			11/27/15 16:12	1
Methylene Chloride	ND		5.0		ug/L			11/27/15 16:12	1
4-Methyl-2-pentanone (MIBK)	ND		50		ug/L			11/27/15 16:12	1
Naphthalene	ND		1.0		ug/L			11/27/15 16:12	1
N-Propylbenzene	ND		1.0		ug/L			11/27/15 16:12	1
Styrene	ND		0.50		ug/L			11/27/15 16:12	1
1,1,1,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 16:12	1

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Client Sample ID: MW-2
Date Collected: 11/24/15 12:30
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 16:12	1
Tetrachloroethene	ND		0.50		ug/L			11/27/15 16:12	1
Toluene	ND		0.50		ug/L			11/27/15 16:12	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			11/27/15 16:12	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			11/27/15 16:12	1
1,1,1-Trichloroethane	ND		0.50		ug/L			11/27/15 16:12	1
1,1,2-Trichloroethane	ND		0.50		ug/L			11/27/15 16:12	1
Trichloroethene	ND		0.50		ug/L			11/27/15 16:12	1
Trichlorofluoromethane	ND		1.0		ug/L			11/27/15 16:12	1
1,2,3-Trichloropropane	ND		0.50		ug/L			11/27/15 16:12	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			11/27/15 16:12	1
1,2,4-Trimethylbenzene	ND		0.50		ug/L			11/27/15 16:12	1
1,3,5-Trimethylbenzene	ND		0.50		ug/L			11/27/15 16:12	1
Vinyl acetate	ND		10		ug/L			11/27/15 16:12	1
Vinyl chloride	ND		0.50		ug/L			11/27/15 16:12	1
Xylenes, Total	ND		1.0		ug/L			11/27/15 16:12	1
2,2-Dichloropropane	ND		0.50		ug/L			11/27/15 16:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*84*		*67 - 130*		*11/27/15 16:12*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*72 - 130*		*11/27/15 16:12*	*1*
Toluene-d8 (Surr)	*81*		*70 - 130*		*11/27/15 16:12*	*1*

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Client Sample ID: MW-3
Date Collected: 11/24/15 12:30
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		0.50		ug/L			11/27/15 16:40	1
Acetone	ND		50		ug/L			11/27/15 16:40	1
Benzene	ND		0.50		ug/L			11/27/15 16:40	1
Dichlorobromomethane	ND		0.50		ug/L			11/27/15 16:40	1
Bromobenzene	ND		1.0		ug/L			11/27/15 16:40	1
Chlorobromomethane	ND		1.0		ug/L			11/27/15 16:40	1
Bromoform	ND		1.0		ug/L			11/27/15 16:40	1
Bromomethane	ND		1.0		ug/L			11/27/15 16:40	1
2-Butanone (MEK)	ND		50		ug/L			11/27/15 16:40	1
n-Butylbenzene	ND		1.0		ug/L			11/27/15 16:40	1
sec-Butylbenzene	ND		1.0		ug/L			11/27/15 16:40	1
tert-Butylbenzene	ND		1.0		ug/L			11/27/15 16:40	1
Carbon disulfide	ND		5.0		ug/L			11/27/15 16:40	1
Carbon tetrachloride	ND		0.50		ug/L			11/27/15 16:40	1
Chlorobenzene	ND		0.50		ug/L			11/27/15 16:40	1
Chloroethane	ND		1.0		ug/L			11/27/15 16:40	1
Chloroform	ND		1.0		ug/L			11/27/15 16:40	1
Chloromethane	ND		1.0		ug/L			11/27/15 16:40	1
2-Chlorotoluene	ND		0.50		ug/L			11/27/15 16:40	1
4-Chlorotoluene	ND		0.50		ug/L			11/27/15 16:40	1
Chlorodibromomethane	ND		0.50		ug/L			11/27/15 16:40	1
1,2-Dichlorobenzene	ND		0.50		ug/L			11/27/15 16:40	1
1,3-Dichlorobenzene	ND		0.50		ug/L			11/27/15 16:40	1
1,4-Dichlorobenzene	ND		0.50		ug/L			11/27/15 16:40	1
1,3-Dichloropropane	ND		1.0		ug/L			11/27/15 16:40	1
1,1-Dichloropropene	ND		0.50		ug/L			11/27/15 16:40	1
1,2-Dibromo-3-Chloropropane	ND		1.0		ug/L			11/27/15 16:40	1
Ethylene Dibromide	ND		0.50		ug/L			11/27/15 16:40	1
Dibromomethane	ND		0.50		ug/L			11/27/15 16:40	1
Dichlorodifluoromethane	ND		0.50		ug/L			11/27/15 16:40	1
1,1-Dichloroethane	ND		0.50		ug/L			11/27/15 16:40	1
1,2-Dichloroethane	ND		0.50		ug/L			11/27/15 16:40	1
1,1-Dichloroethene	ND		0.50		ug/L			11/27/15 16:40	1
cis-1,2-Dichloroethene	**6.3**		0.50		ug/L			11/27/15 16:40	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			11/27/15 16:40	1
1,2-Dichloropropane	ND		0.50		ug/L			11/27/15 16:40	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 16:40	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 16:40	1
Ethylbenzene	ND		0.50		ug/L			11/27/15 16:40	1
Hexachlorobutadiene	ND		1.0		ug/L			11/27/15 16:40	1
2-Hexanone	ND		50		ug/L			11/27/15 16:40	1
Isopropylbenzene	ND		0.50		ug/L			11/27/15 16:40	1
4-Isopropyltoluene	ND		1.0		ug/L			11/27/15 16:40	1
Methylene Chloride	ND		5.0		ug/L			11/27/15 16:40	1
4-Methyl-2-pentanone (MIBK)	ND		50		ug/L			11/27/15 16:40	1
Naphthalene	ND		1.0		ug/L			11/27/15 16:40	1
N-Propylbenzene	ND		1.0		ug/L			11/27/15 16:40	1
Styrene	ND		0.50		ug/L			11/27/15 16:40	1
1,1,1,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 16:40	1

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Client Sample ID: MW-3
Date Collected: 11/24/15 12:30
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 16:40	1
Tetrachloroethene	**1.3**		0.50		ug/L			11/27/15 16:40	1
Toluene	ND		0.50		ug/L			11/27/15 16:40	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			11/27/15 16:40	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			11/27/15 16:40	1
1,1,1-Trichloroethane	ND		0.50		ug/L			11/27/15 16:40	1
1,1,2-Trichloroethane	ND		0.50		ug/L			11/27/15 16:40	1
Trichloroethene	ND		0.50		ug/L			11/27/15 16:40	1
Trichlorofluoromethane	ND		1.0		ug/L			11/27/15 16:40	1
1,2,3-Trichloropropane	ND		0.50		ug/L			11/27/15 16:40	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			11/27/15 16:40	1
1,2,4-Trimethylbenzene	ND		0.50		ug/L			11/27/15 16:40	1
1,3,5-Trimethylbenzene	ND		0.50		ug/L			11/27/15 16:40	1
Vinyl acetate	ND		10		ug/L			11/27/15 16:40	1
Vinyl chloride	ND		0.50		ug/L			11/27/15 16:40	1
Xylenes, Total	ND		1.0		ug/L			11/27/15 16:40	1
2,2-Dichloropropane	ND		0.50		ug/L			11/27/15 16:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*83*		*67 - 130*		*11/27/15 16:40*	*1*
1,2-Dichloroethane-d4 (Surr)	*89*		*72 - 130*		*11/27/15 16:40*	*1*
Toluene-d8 (Surr)	*81*		*70 - 130*		*11/27/15 16:40*	*1*

Client Sample ID: MW-4
Date Collected: 11/24/15 13:05
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		0.50		ug/L			11/27/15 17:07	1
Acetone	ND		50		ug/L			11/27/15 17:07	1
Benzene	ND		0.50		ug/L			11/27/15 17:07	1
Dichlorobromomethane	ND		0.50		ug/L			11/27/15 17:07	1
Bromobenzene	ND		1.0		ug/L			11/27/15 17:07	1
Chlorobromomethane	ND		1.0		ug/L			11/27/15 17:07	1
Bromoform	ND		1.0		ug/L			11/27/15 17:07	1
Bromomethane	ND		1.0		ug/L			11/27/15 17:07	1
2-Butanone (MEK)	ND		50		ug/L			11/27/15 17:07	1
n-Butylbenzene	ND		1.0		ug/L			11/27/15 17:07	1
sec-Butylbenzene	ND		1.0		ug/L			11/27/15 17:07	1
tert-Butylbenzene	ND		1.0		ug/L			11/27/15 17:07	1
Carbon disulfide	ND		5.0		ug/L			11/27/15 17:07	1
Carbon tetrachloride	ND		0.50		ug/L			11/27/15 17:07	1
Chlorobenzene	ND		0.50		ug/L			11/27/15 17:07	1
Chloroethane	ND		1.0		ug/L			11/27/15 17:07	1
Chloroform	ND		1.0		ug/L			11/27/15 17:07	1
Chloromethane	ND		1.0		ug/L			11/27/15 17:07	1
2-Chlorotoluene	ND		0.50		ug/L			11/27/15 17:07	1
4-Chlorotoluene	ND		0.50		ug/L			11/27/15 17:07	1
Chlorodibromomethane	ND		0.50		ug/L			11/27/15 17:07	1
1,2-Dichlorobenzene	ND		0.50		ug/L			11/27/15 17:07	1
1,3-Dichlorobenzene	ND		0.50		ug/L			11/27/15 17:07	1
1,4-Dichlorobenzene	ND		0.50		ug/L			11/27/15 17:07	1
1,3-Dichloropropane	ND		1.0		ug/L			11/27/15 17:07	1
1,1-Dichloropropene	ND		0.50		ug/L			11/27/15 17:07	1
1,2-Dibromo-3-Chloropropane	ND		1.0		ug/L			11/27/15 17:07	1
Ethylene Dibromide	ND		0.50		ug/L			11/27/15 17:07	1
Dibromomethane	ND		0.50		ug/L			11/27/15 17:07	1
Dichlorodifluoromethane	ND		0.50		ug/L			11/27/15 17:07	1
1,1-Dichloroethane	ND		0.50		ug/L			11/27/15 17:07	1
1,2-Dichloroethane	ND		0.50		ug/L			11/27/15 17:07	1
1,1-Dichloroethene	ND		0.50		ug/L			11/27/15 17:07	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			11/27/15 17:07	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			11/27/15 17:07	1
1,2-Dichloropropane	ND		0.50		ug/L			11/27/15 17:07	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 17:07	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 17:07	1
Ethylbenzene	ND		0.50		ug/L			11/27/15 17:07	1
Hexachlorobutadiene	ND		1.0		ug/L			11/27/15 17:07	1
2-Hexanone	ND		50		ug/L			11/27/15 17:07	1
Isopropylbenzene	ND		0.50		ug/L			11/27/15 17:07	1
4-Isopropyltoluene	ND		1.0		ug/L			11/27/15 17:07	1
Methylene Chloride	ND		5.0		ug/L			11/27/15 17:07	1
4-Methyl-2-pentanone (MIBK)	ND		50		ug/L			11/27/15 17:07	1
Naphthalene	ND		1.0		ug/L			11/27/15 17:07	1
N-Propylbenzene	ND		1.0		ug/L			11/27/15 17:07	1
Styrene	ND		0.50		ug/L			11/27/15 17:07	1
1,1,1,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 17:07	1

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Client Sample ID: MW-4
Date Collected: 11/24/15 13:05
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 17:07	1
Tetrachloroethene	**0.60**		0.50		ug/L			11/27/15 17:07	1
Toluene	ND		0.50		ug/L			11/27/15 17:07	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			11/27/15 17:07	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			11/27/15 17:07	1
1,1,1-Trichloroethane	ND		0.50		ug/L			11/27/15 17:07	1
1,1,2-Trichloroethane	ND		0.50		ug/L			11/27/15 17:07	1
Trichloroethene	ND		0.50		ug/L			11/27/15 17:07	1
Trichlorofluoromethane	ND		1.0		ug/L			11/27/15 17:07	1
1,2,3-Trichloropropane	ND		0.50		ug/L			11/27/15 17:07	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			11/27/15 17:07	1
1,2,4-Trimethylbenzene	ND		0.50		ug/L			11/27/15 17:07	1
1,3,5-Trimethylbenzene	ND		0.50		ug/L			11/27/15 17:07	1
Vinyl acetate	ND		10		ug/L			11/27/15 17:07	1
Vinyl chloride	ND		0.50		ug/L			11/27/15 17:07	1
Xylenes, Total	ND		1.0		ug/L			11/27/15 17:07	1
2,2-Dichloropropane	ND		0.50		ug/L			11/27/15 17:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*83*		*67 - 130*		*11/27/15 17:07*	*1*
1,2-Dichloroethane-d4 (Surr)	*86*		*72 - 130*		*11/27/15 17:07*	*1*
Toluene-d8 (Surr)	*82*		*70 - 130*		*11/27/15 17:07*	*1*

Client Sample ID: MW-5
Date Collected: 11/24/15 14:40
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		0.50		ug/L			11/27/15 17:35	1
Acetone	ND		50		ug/L			11/27/15 17:35	1
Benzene	ND		0.50		ug/L			11/27/15 17:35	1
Dichlorobromomethane	ND		0.50		ug/L			11/27/15 17:35	1
Bromobenzene	ND		1.0		ug/L			11/27/15 17:35	1
Chlorobromomethane	ND		1.0		ug/L			11/27/15 17:35	1
Bromoform	ND		1.0		ug/L			11/27/15 17:35	1
Bromomethane	ND		1.0		ug/L			11/27/15 17:35	1
2-Butanone (MEK)	ND		50		ug/L			11/27/15 17:35	1
n-Butylbenzene	ND		1.0		ug/L			11/27/15 17:35	1
sec-Butylbenzene	ND		1.0		ug/L			11/27/15 17:35	1
tert-Butylbenzene	ND		1.0		ug/L			11/27/15 17:35	1
Carbon disulfide	ND		5.0		ug/L			11/27/15 17:35	1
Carbon tetrachloride	ND		0.50		ug/L			11/27/15 17:35	1
Chlorobenzene	ND		0.50		ug/L			11/27/15 17:35	1
Chloroethane	ND		1.0		ug/L			11/27/15 17:35	1
Chloroform	ND		1.0		ug/L			11/27/15 17:35	1
Chloromethane	ND		1.0		ug/L			11/27/15 17:35	1
2-Chlorotoluene	ND		0.50		ug/L			11/27/15 17:35	1
4-Chlorotoluene	ND		0.50		ug/L			11/27/15 17:35	1
Chlorodibromomethane	ND		0.50		ug/L			11/27/15 17:35	1
1,2-Dichlorobenzene	ND		0.50		ug/L			11/27/15 17:35	1
1,3-Dichlorobenzene	ND		0.50		ug/L			11/27/15 17:35	1
1,4-Dichlorobenzene	ND		0.50		ug/L			11/27/15 17:35	1
1,3-Dichloropropane	ND		1.0		ug/L			11/27/15 17:35	1
1,1-Dichloropropene	ND		0.50		ug/L			11/27/15 17:35	1
1,2-Dibromo-3-Chloropropane	ND		1.0		ug/L			11/27/15 17:35	1
Ethylene Dibromide	ND		0.50		ug/L			11/27/15 17:35	1
Dibromomethane	ND		0.50		ug/L			11/27/15 17:35	1
Dichlorodifluoromethane	ND		0.50		ug/L			11/27/15 17:35	1
1,1-Dichloroethane	ND		0.50		ug/L			11/27/15 17:35	1
1,2-Dichloroethane	ND		0.50		ug/L			11/27/15 17:35	1
1,1-Dichloroethene	ND		0.50		ug/L			11/27/15 17:35	1
cis-1,2-Dichloroethene	**8.6**		0.50		ug/L			11/27/15 17:35	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			11/27/15 17:35	1
1,2-Dichloropropane	ND		0.50		ug/L			11/27/15 17:35	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 17:35	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 17:35	1
Ethylbenzene	ND		0.50		ug/L			11/27/15 17:35	1
Hexachlorobutadiene	ND		1.0		ug/L			11/27/15 17:35	1
2-Hexanone	ND		50		ug/L			11/27/15 17:35	1
Isopropylbenzene	ND		0.50		ug/L			11/27/15 17:35	1
4-Isopropyltoluene	ND		1.0		ug/L			11/27/15 17:35	1
Methylene Chloride	ND		5.0		ug/L			11/27/15 17:35	1
4-Methyl-2-pentanone (MIBK)	ND		50		ug/L			11/27/15 17:35	1
Naphthalene	ND		1.0		ug/L			11/27/15 17:35	1
N-Propylbenzene	ND		1.0		ug/L			11/27/15 17:35	1
Styrene	ND		0.50		ug/L			11/27/15 17:35	1
1,1,1,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 17:35	1

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Client Sample ID: MW-5
Date Collected: 11/24/15 14:40
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 17:35	1
Tetrachloroethene	**25**		0.50		ug/L			11/27/15 17:35	1
Toluene	ND		0.50		ug/L			11/27/15 17:35	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			11/27/15 17:35	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			11/27/15 17:35	1
1,1,1-Trichloroethane	ND		0.50		ug/L			11/27/15 17:35	1
1,1,2-Trichloroethane	ND		0.50		ug/L			11/27/15 17:35	1
Trichloroethene	**7.7**		0.50		ug/L			11/27/15 17:35	1
Trichlorofluoromethane	ND		1.0		ug/L			11/27/15 17:35	1
1,2,3-Trichloropropane	ND		0.50		ug/L			11/27/15 17:35	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			11/27/15 17:35	1
1,2,4-Trimethylbenzene	ND		0.50		ug/L			11/27/15 17:35	1
1,3,5-Trimethylbenzene	ND		0.50		ug/L			11/27/15 17:35	1
Vinyl acetate	ND		10		ug/L			11/27/15 17:35	1
Vinyl chloride	**0.71**		0.50		ug/L			11/27/15 17:35	1
Xylenes, Total	ND		1.0		ug/L			11/27/15 17:35	1
2,2-Dichloropropane	ND		0.50		ug/L			11/27/15 17:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*83*		*67 - 130*		*11/27/15 17:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*72 - 130*		*11/27/15 17:35*	*1*
Toluene-d8 (Surr)	*83*		*70 - 130*		*11/27/15 17:35*	*1*

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Client Sample ID: TB-112415
Date Collected: 11/24/15 12:00
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		0.50		ug/L			11/27/15 15:16	1
Acetone	ND		50		ug/L			11/27/15 15:16	1
Benzene	ND		0.50		ug/L			11/27/15 15:16	1
Dichlorobromomethane	ND		0.50		ug/L			11/27/15 15:16	1
Bromobenzene	ND		1.0		ug/L			11/27/15 15:16	1
Chlorobromomethane	ND		1.0		ug/L			11/27/15 15:16	1
Bromoform	ND		1.0		ug/L			11/27/15 15:16	1
Bromomethane	ND		1.0		ug/L			11/27/15 15:16	1
2-Butanone (MEK)	ND		50		ug/L			11/27/15 15:16	1
n-Butylbenzene	ND		1.0		ug/L			11/27/15 15:16	1
sec-Butylbenzene	ND		1.0		ug/L			11/27/15 15:16	1
tert-Butylbenzene	ND		1.0		ug/L			11/27/15 15:16	1
Carbon disulfide	ND		5.0		ug/L			11/27/15 15:16	1
Carbon tetrachloride	ND		0.50		ug/L			11/27/15 15:16	1
Chlorobenzene	ND		0.50		ug/L			11/27/15 15:16	1
Chloroethane	ND		1.0		ug/L			11/27/15 15:16	1
Chloroform	ND		1.0		ug/L			11/27/15 15:16	1
Chloromethane	ND		1.0		ug/L			11/27/15 15:16	1
2-Chlorotoluene	ND		0.50		ug/L			11/27/15 15:16	1
4-Chlorotoluene	ND		0.50		ug/L			11/27/15 15:16	1
Chlorodibromomethane	ND		0.50		ug/L			11/27/15 15:16	1
1,2-Dichlorobenzene	ND		0.50		ug/L			11/27/15 15:16	1
1,3-Dichlorobenzene	ND		0.50		ug/L			11/27/15 15:16	1
1,4-Dichlorobenzene	ND		0.50		ug/L			11/27/15 15:16	1
1,3-Dichloropropane	ND		1.0		ug/L			11/27/15 15:16	1
1,1-Dichloropropene	ND		0.50		ug/L			11/27/15 15:16	1
1,2-Dibromo-3-Chloropropane	ND		1.0		ug/L			11/27/15 15:16	1
Ethylene Dibromide	ND		0.50		ug/L			11/27/15 15:16	1
Dibromomethane	ND		0.50		ug/L			11/27/15 15:16	1
Dichlorodifluoromethane	ND		0.50		ug/L			11/27/15 15:16	1
1,1-Dichloroethane	ND		0.50		ug/L			11/27/15 15:16	1
1,2-Dichloroethane	ND		0.50		ug/L			11/27/15 15:16	1
1,1-Dichloroethene	ND		0.50		ug/L			11/27/15 15:16	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			11/27/15 15:16	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			11/27/15 15:16	1
1,2-Dichloropropane	ND		0.50		ug/L			11/27/15 15:16	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 15:16	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 15:16	1
Ethylbenzene	ND		0.50		ug/L			11/27/15 15:16	1
Hexachlorobutadiene	ND		1.0		ug/L			11/27/15 15:16	1
2-Hexanone	ND		50		ug/L			11/27/15 15:16	1
Isopropylbenzene	ND		0.50		ug/L			11/27/15 15:16	1
4-Isopropyltoluene	ND		1.0		ug/L			11/27/15 15:16	1
Methylene Chloride	ND		5.0		ug/L			11/27/15 15:16	1
4-Methyl-2-pentanone (MIBK)	ND		50		ug/L			11/27/15 15:16	1
Naphthalene	ND		1.0		ug/L			11/27/15 15:16	1
N-Propylbenzene	ND		1.0		ug/L			11/27/15 15:16	1
Styrene	ND		0.50		ug/L			11/27/15 15:16	1
1,1,1,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 15:16	1

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Client Sample ID: TB-112415
Date Collected: 11/24/15 12:00
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 15:16	1
Tetrachloroethene	ND		0.50		ug/L			11/27/15 15:16	1
Toluene	ND		0.50		ug/L			11/27/15 15:16	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			11/27/15 15:16	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			11/27/15 15:16	1
1,1,1-Trichloroethane	ND		0.50		ug/L			11/27/15 15:16	1
1,1,2-Trichloroethane	ND		0.50		ug/L			11/27/15 15:16	1
Trichloroethene	ND		0.50		ug/L			11/27/15 15:16	1
Trichlorofluoromethane	ND		1.0		ug/L			11/27/15 15:16	1
1,2,3-Trichloropropane	ND		0.50		ug/L			11/27/15 15:16	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			11/27/15 15:16	1
1,2,4-Trimethylbenzene	ND		0.50		ug/L			11/27/15 15:16	1
1,3,5-Trimethylbenzene	ND		0.50		ug/L			11/27/15 15:16	1
Vinyl acetate	ND		10		ug/L			11/27/15 15:16	1
Vinyl chloride	ND		0.50		ug/L			11/27/15 15:16	1
Xylenes, Total	ND		1.0		ug/L			11/27/15 15:16	1
2,2-Dichloropropane	ND		0.50		ug/L			11/27/15 15:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*85*		*67 - 130*		*11/27/15 15:16*	*1*
1,2-Dichloroethane-d4 (Surr)	*83*		*72 - 130*		*11/27/15 15:16*	*1*
Toluene-d8 (Surr)	*80*		*70 - 130*		*11/27/15 15:16*	*1*

Surrogate Summary

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	12DCE	TOL
Lab Sample ID	Client Sample ID	(67-130)	(72-130)	(70-130)
720-68832-1	MW-2	84	84	81
720-68832-2	MW-3	83	89	81
720-68832-3	MW-4	83	86	82
720-68832-4	MW-5	83	87	83
720-68832-5	TB-112415	85	83	80
LCS 720-193269/5	Lab Control Sample	95	78	85
LCSD 720-193269/6	Lab Control Sample Dup	96	74	86
MB 720-193269/4	Method Blank	86	84	83

Surrogate Legend

BFB = 4-Bromofluorobenzene
12DCE = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 720-193269/4
Matrix: Water
Analysis Batch: 193269

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		0.50		ug/L			11/27/15 12:15	1
Acetone	ND		50		ug/L			11/27/15 12:15	1
Benzene	ND		0.50		ug/L			11/27/15 12:15	1
Dichlorobromomethane	ND		0.50		ug/L			11/27/15 12:15	1
Bromobenzene	ND		1.0		ug/L			11/27/15 12:15	1
Chlorobromomethane	ND		1.0		ug/L			11/27/15 12:15	1
Bromoform	ND		1.0		ug/L			11/27/15 12:15	1
Bromomethane	ND		1.0		ug/L			11/27/15 12:15	1
2-Butanone (MEK)	ND		50		ug/L			11/27/15 12:15	1
n-Butylbenzene	ND		1.0		ug/L			11/27/15 12:15	1
sec-Butylbenzene	ND		1.0		ug/L			11/27/15 12:15	1
tert-Butylbenzene	ND		1.0		ug/L			11/27/15 12:15	1
Carbon disulfide	ND		5.0		ug/L			11/27/15 12:15	1
Carbon tetrachloride	ND		0.50		ug/L			11/27/15 12:15	1
Chlorobenzene	ND		0.50		ug/L			11/27/15 12:15	1
Chloroethane	ND		1.0		ug/L			11/27/15 12:15	1
Chloroform	ND		1.0		ug/L			11/27/15 12:15	1
Chloromethane	ND		1.0		ug/L			11/27/15 12:15	1
2-Chlorotoluene	ND		0.50		ug/L			11/27/15 12:15	1
4-Chlorotoluene	ND		0.50		ug/L			11/27/15 12:15	1
Chlorodibromomethane	ND		0.50		ug/L			11/27/15 12:15	1
1,2-Dichlorobenzene	ND		0.50		ug/L			11/27/15 12:15	1
1,3-Dichlorobenzene	ND		0.50		ug/L			11/27/15 12:15	1
1,4-Dichlorobenzene	ND		0.50		ug/L			11/27/15 12:15	1
1,3-Dichloropropane	ND		1.0		ug/L			11/27/15 12:15	1
1,1-Dichloropropene	ND		0.50		ug/L			11/27/15 12:15	1
1,2-Dibromo-3-Chloropropane	ND		1.0		ug/L			11/27/15 12:15	1
Ethylene Dibromide	ND		0.50		ug/L			11/27/15 12:15	1
Dibromomethane	ND		0.50		ug/L			11/27/15 12:15	1
Dichlorodifluoromethane	ND		0.50		ug/L			11/27/15 12:15	1
1,1-Dichloroethane	ND		0.50		ug/L			11/27/15 12:15	1
1,2-Dichloroethane	ND		0.50		ug/L			11/27/15 12:15	1
1,1-Dichloroethene	ND		0.50		ug/L			11/27/15 12:15	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			11/27/15 12:15	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			11/27/15 12:15	1
1,2-Dichloropropane	ND		0.50		ug/L			11/27/15 12:15	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 12:15	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			11/27/15 12:15	1
Ethylbenzene	ND		0.50		ug/L			11/27/15 12:15	1
Hexachlorobutadiene	ND		1.0		ug/L			11/27/15 12:15	1
2-Hexanone	ND		50		ug/L			11/27/15 12:15	1
Isopropylbenzene	ND		0.50		ug/L			11/27/15 12:15	1
4-Isopropyltoluene	ND		1.0		ug/L			11/27/15 12:15	1
Methylene Chloride	ND		5.0		ug/L			11/27/15 12:15	1
4-Methyl-2-pentanone (MIBK)	ND		50		ug/L			11/27/15 12:15	1
Naphthalene	ND		1.0		ug/L			11/27/15 12:15	1
N-Propylbenzene	ND		1.0		ug/L			11/27/15 12:15	1
Styrene	ND		0.50		ug/L			11/27/15 12:15	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 720-193269/4
Matrix: Water
Analysis Batch: 193269

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 12:15	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			11/27/15 12:15	1
Tetrachloroethene	ND		0.50		ug/L			11/27/15 12:15	1
Toluene	ND		0.50		ug/L			11/27/15 12:15	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			11/27/15 12:15	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			11/27/15 12:15	1
1,1,1-Trichloroethane	ND		0.50		ug/L			11/27/15 12:15	1
1,1,2-Trichloroethane	ND		0.50		ug/L			11/27/15 12:15	1
Trichloroethene	ND		0.50		ug/L			11/27/15 12:15	1
Trichlorofluoromethane	ND		1.0		ug/L			11/27/15 12:15	1
1,2,3-Trichloropropane	ND		0.50		ug/L			11/27/15 12:15	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			11/27/15 12:15	1
1,2,4-Trimethylbenzene	ND		0.50		ug/L			11/27/15 12:15	1
1,3,5-Trimethylbenzene	ND		0.50		ug/L			11/27/15 12:15	1
Vinyl acetate	ND		10		ug/L			11/27/15 12:15	1
Vinyl chloride	ND		0.50		ug/L			11/27/15 12:15	1
Xylenes, Total	ND		1.0		ug/L			11/27/15 12:15	1
2,2-Dichloropropane	ND		0.50		ug/L			11/27/15 12:15	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*86*		*67 - 130*		*11/27/15 12:15*	*1*
1,2-Dichloroethane-d4 (Surr)	*84*		*72 - 130*		*11/27/15 12:15*	*1*
Toluene-d8 (Surr)	*83*		*70 - 130*		*11/27/15 12:15*	*1*

Lab Sample ID: LCS 720-193269/5
Matrix: Water
Analysis Batch: 193269

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl tert-butyl ether	25.0	23.0		ug/L		92	62 - 130
Acetone	125	128		ug/L		102	26 - 180
Benzene	25.0	24.1		ug/L		96	79 - 130
Dichlorobromomethane	25.0	23.0		ug/L		92	70 - 130
Bromobenzene	25.0	24.0		ug/L		96	70 - 130
Chlorobromomethane	25.0	22.3		ug/L		89	70 - 130
Bromoform	25.0	22.1		ug/L		88	68 - 136
Bromomethane	25.0	22.1		ug/L		88	43 - 151
2-Butanone (MEK)	125	147		ug/L		118	54 - 130
n-Butylbenzene	25.0	26.0		ug/L		104	70 - 142
sec-Butylbenzene	25.0	24.8		ug/L		99	70 - 134
tert-Butylbenzene	25.0	23.5		ug/L		94	70 - 135
Carbon disulfide	25.0	25.3		ug/L		101	58 - 130
Carbon tetrachloride	25.0	20.2		ug/L		81	70 - 146
Chlorobenzene	25.0	23.6		ug/L		94	70 - 130
Chloroethane	25.0	22.6		ug/L		90	62 - 138
Chloroform	25.0	23.1		ug/L		92	70 - 130
Chloromethane	25.0	21.6		ug/L		86	52 - 175
2-Chlorotoluene	25.0	24.6		ug/L		99	70 - 130

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-193269/5
Matrix: Water
Analysis Batch: 193269

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorotoluene	25.0	25.0		ug/L		100	70 - 130
Chlorodibromomethane	25.0	22.0		ug/L		88	70 - 145
1,2-Dichlorobenzene	25.0	23.2		ug/L		93	70 - 130
1,3-Dichlorobenzene	25.0	22.6		ug/L		91	70 - 130
1,4-Dichlorobenzene	25.0	23.2		ug/L		93	70 - 130
1,3-Dichloropropane	25.0	23.3		ug/L		93	70 - 130
1,1-Dichloropropene	25.0	23.5		ug/L		94	70 - 130
1,2-Dibromo-3-Chloropropane	25.0	21.8		ug/L		87	70 - 136
Ethylene Dibromide	25.0	21.7		ug/L		87	70 - 130
Dibromomethane	25.0	23.4		ug/L		94	70 - 130
Dichlorodifluoromethane	25.0	27.4		ug/L		110	34 - 132
1,1-Dichloroethane	25.0	24.4		ug/L		98	70 - 130
1,2-Dichloroethane	25.0	24.2		ug/L		97	61 - 132
1,1-Dichloroethene	25.0	23.8		ug/L		95	64 - 128
cis-1,2-Dichloroethene	25.0	24.5		ug/L		98	70 - 130
trans-1,2-Dichloroethene	25.0	24.3		ug/L		97	68 - 130
1,2-Dichloropropane	25.0	25.1		ug/L		100	70 - 130
cis-1,3-Dichloropropene	25.0	24.8		ug/L		99	70 - 130
trans-1,3-Dichloropropene	25.0	21.1		ug/L		84	70 - 140
Ethylbenzene	25.0	24.3		ug/L		97	80 - 120
Hexachlorobutadiene	25.0	23.0		ug/L		92	70 - 130
2-Hexanone	125	132		ug/L		106	60 - 164
Isopropylbenzene	25.0	23.7		ug/L		95	70 - 130
4-Isopropyltoluene	25.0	24.6		ug/L		99	70 - 130
Methylene Chloride	25.0	23.8		ug/L		95	70 - 147
4-Methyl-2-pentanone (MIBK)	125	134		ug/L		107	58 - 130
Naphthalene	25.0	25.6		ug/L		103	70 - 130
N-Propylbenzene	25.0	25.4		ug/L		102	70 - 130
Styrene	25.0	24.1		ug/L		96	70 - 130
1,1,1,2-Tetrachloroethane	25.0	22.3		ug/L		89	70 - 130
1,1,2,2-Tetrachloroethane	25.0	28.3		ug/L		113	70 - 130
Tetrachloroethene	25.0	21.5		ug/L		86	70 - 130
Toluene	25.0	23.3		ug/L		93	78 - 120
1,2,3-Trichlorobenzene	25.0	23.9		ug/L		96	70 - 130
1,2,4-Trichlorobenzene	25.0	23.4		ug/L		94	70 - 130
1,1,1-Trichloroethane	25.0	21.3		ug/L		85	70 - 130
1,1,2-Trichloroethane	25.0	22.7		ug/L		91	70 - 130
Trichloroethene	25.0	22.7		ug/L		91	70 - 130
Trichlorofluoromethane	25.0	22.0		ug/L		88	66 - 132
1,2,3-Trichloropropane	25.0	24.1		ug/L		96	70 - 130
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	22.4		ug/L		89	42 - 162
1,2,4-Trimethylbenzene	25.0	24.7		ug/L		99	70 - 132
1,3,5-Trimethylbenzene	25.0	24.3		ug/L		97	70 - 130
Vinyl acetate	25.0	30.9		ug/L		124	43 - 163
Vinyl chloride	25.0	22.6		ug/L		90	54 - 135
m-Xylene & p-Xylene	25.0	23.1		ug/L		93	70 - 142
o-Xylene	25.0	24.1		ug/L		96	70 - 130

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-193269/5
Matrix: Water
Analysis Batch: 193269

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
2,2-Dichloropropane			25.0	22.3		ug/L		89	70 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*95*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*78*		*72 - 130*
Toluene-d8 (Surr)	*85*		*70 - 130*

Lab Sample ID: LCSD 720-193269/6
Matrix: Water
Analysis Batch: 193269

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methyl tert-butyl ether			25.0	23.7		ug/L		95	62 - 130	3	20
Acetone			125	133		ug/L		107	26 - 180	4	30
Benzene			25.0	24.8		ug/L		99	79 - 130	3	20
Dichlorobromomethane			25.0	23.4		ug/L		94	70 - 130	2	20
Bromobenzene			25.0	23.9		ug/L		96	70 - 130	0	20
Chlorobromomethane			25.0	22.8		ug/L		91	70 - 130	2	20
Bromoform			25.0	22.6		ug/L		90	68 - 136	2	20
Bromomethane			25.0	22.7		ug/L		91	43 - 151	3	20
2-Butanone (MEK)			125	149		ug/L		119	54 - 130	1	20
n-Butylbenzene			25.0	26.6		ug/L		106	70 - 142	2	20
sec-Butylbenzene			25.0	25.0		ug/L		100	70 - 134	1	20
tert-Butylbenzene			25.0	23.8		ug/L		95	70 - 135	1	20
Carbon disulfide			25.0	26.0		ug/L		104	58 - 130	3	20
Carbon tetrachloride			25.0	20.8		ug/L		83	70 - 146	3	20
Chlorobenzene			25.0	23.8		ug/L		95	70 - 130	1	20
Chloroethane			25.0	22.8		ug/L		91	62 - 138	1	20
Chloroform			25.0	23.7		ug/L		95	70 - 130	2	20
Chloromethane			25.0	22.0		ug/L		88	52 - 175	2	20
2-Chlorotoluene			25.0	24.7		ug/L		99	70 - 130	0	20
4-Chlorotoluene			25.0	25.1		ug/L		100	70 - 130	0	20
Chlorodibromomethane			25.0	22.2		ug/L		89	70 - 145	1	20
1,2-Dichlorobenzene			25.0	23.9		ug/L		96	70 - 130	3	20
1,3-Dichlorobenzene			25.0	23.1		ug/L		92	70 - 130	2	20
1,4-Dichlorobenzene			25.0	23.5		ug/L		94	70 - 130	1	20
1,3-Dichloropropane			25.0	24.5		ug/L		98	70 - 130	5	20
1,1-Dichloropropene			25.0	24.2		ug/L		97	70 - 130	3	20
1,2-Dibromo-3-Chloropropane			25.0	22.3		ug/L		89	70 - 136	2	20
Ethylene Dibromide			25.0	21.9		ug/L		87	70 - 130	1	20
Dibromomethane			25.0	23.6		ug/L		94	70 - 130	1	20
Dichlorodifluoromethane			25.0	27.7		ug/L		111	34 - 132	1	20
1,1-Dichloroethane			25.0	24.8		ug/L		99	70 - 130	2	20
1,2-Dichloroethane			25.0	24.8		ug/L		99	61 - 132	3	20
1,1-Dichloroethene			25.0	24.3		ug/L		97	64 - 128	2	20
cis-1,2-Dichloroethene			25.0	24.7		ug/L		99	70 - 130	1	20
trans-1,2-Dichloroethene			25.0	25.3		ug/L		101	68 - 130	4	20
1,2-Dichloropropane			25.0	26.0		ug/L		104	70 - 130	3	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 720-193269/6
Matrix: Water
Analysis Batch: 193269

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,3-Dichloropropene			25.0	25.4		ug/L		102	70 - 130	2	20
trans-1,3-Dichloropropene			25.0	21.5		ug/L		86	70 - 140	2	20
Ethylbenzene			25.0	24.8		ug/L		99	80 - 120	2	20
Hexachlorobutadiene			25.0	23.3		ug/L		93	70 - 130	1	20
2-Hexanone			125	138		ug/L		110	60 - 164	4	20
Isopropylbenzene			25.0	24.0		ug/L		96	70 - 130	1	20
4-Isopropyltoluene			25.0	24.9		ug/L		100	70 - 130	1	20
Methylene Chloride			25.0	24.4		ug/L		98	70 - 147	2	20
4-Methyl-2-pentanone (MIBK)			125	138		ug/L		111	58 - 130	3	20
Naphthalene			25.0	25.9		ug/L		103	70 - 130	1	20
N-Propylbenzene			25.0	25.7		ug/L		103	70 - 130	1	20
Styrene			25.0	24.4		ug/L		98	70 - 130	1	20
1,1,1,2-Tetrachloroethane			25.0	22.8		ug/L		91	70 - 130	2	20
1,1,2,2-Tetrachloroethane			25.0	28.3		ug/L		113	70 - 130	0	20
Tetrachloroethene			25.0	21.9		ug/L		88	70 - 130	2	20
Toluene			25.0	23.8		ug/L		95	78 - 120	2	20
1,2,3-Trichlorobenzene			25.0	23.6		ug/L		94	70 - 130	1	20
1,2,4-Trichlorobenzene			25.0	23.5		ug/L		94	70 - 130	0	20
1,1,1-Trichloroethane			25.0	22.1		ug/L		88	70 - 130	4	20
1,1,2-Trichloroethane			25.0	22.9		ug/L		92	70 - 130	1	20
Trichloroethene			25.0	23.7		ug/L		95	70 - 130	4	20
Trichlorofluoromethane			25.0	22.5		ug/L		90	66 - 132	2	20
1,2,3-Trichloropropane			25.0	24.9		ug/L		99	70 - 130	3	20
1,1,2-Trichloro-1,2,2-trifluoroethane			25.0	23.2		ug/L		93	42 - 162	4	20
1,2,4-Trimethylbenzene			25.0	24.8		ug/L		99	70 - 132	0	20
1,3,5-Trimethylbenzene			25.0	24.8		ug/L		99	70 - 130	2	20
Vinyl acetate			25.0	32.0		ug/L		128	43 - 163	3	20
Vinyl chloride			25.0	23.7		ug/L		95	54 - 135	5	20
m-Xylene & p-Xylene			25.0	24.0		ug/L		96	70 - 142	4	20
o-Xylene			25.0	24.6		ug/L		98	70 - 130	2	20
2,2-Dichloropropane			25.0	22.8		ug/L		91	70 - 140	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*96*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*74*		*72 - 130*
Toluene-d8 (Surr)	*86*		*70 - 130*

QC Association Summary

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

GC/MS VOA

Analysis Batch: 193269

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-68832-1	MW-2	Total/NA	Water	8260B	
720-68832-2	MW-3	Total/NA	Water	8260B	
720-68832-3	MW-4	Total/NA	Water	8260B	
720-68832-4	MW-5	Total/NA	Water	8260B	
720-68832-5	TB-112415	Total/NA	Water	8260B	
LCS 720-193269/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-193269/6	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 720-193269/4	Method Blank	Total/NA	Water	8260B	

Lab Chronicle

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Client Sample ID: MW-2
Date Collected: 11/24/15 12:30
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	193269	11/27/15 16:12	YB1	TAL PLS

Client Sample ID: MW-3
Date Collected: 11/24/15 12:30
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	193269	11/27/15 16:40	YB1	TAL PLS

Client Sample ID: MW-4
Date Collected: 11/24/15 13:05
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	193269	11/27/15 17:07	YB1	TAL PLS

Client Sample ID: MW-5
Date Collected: 11/24/15 14:40
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	193269	11/27/15 17:35	YB1	TAL PLS

Client Sample ID: TB-112415
Date Collected: 11/24/15 12:00
Date Received: 11/24/15 17:15

Lab Sample ID: 720-68832-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	193269	11/27/15 15:16	YB1	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Laboratory: TestAmerica Pleasanton

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-16

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Geologica Inc
Project/Site: Marinwood 001

TestAmerica Job ID: 720-68832-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-68832-1	MW-2	Water	11/24/15 12:30	11/24/15 17:15
720-68832-2	MW-3	Water	11/24/15 12:30	11/24/15 17:15
720-68832-3	MW-4	Water	11/24/15 13:05	11/24/15 17:15
720-68832-4	MW-5	Water	11/24/15 14:40	11/24/15 17:15
720-68832-5	TB-112415	Water	11/24/15 12:00	11/24/15 17:15

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

720-68832

TESTAMERICA Pleasanton Chain of Custody

1220 Quarry Lane • Pleasanton CA 94566-4756

Phone: (925) 484-1919 • Fax: (925) 600-3002

Reference #: 165235

Date 11-24-15 Page 1 of 1

11/30/2015

Report To

Attn: DAN MATTHEWS

Company: GEOLOGICA

Address: 220 4th St, ste 201 OAKLAND

Email: dmatthews@geologicagroup.com

Bill To: ABOVE

Sampled By: E. Mule

Attn:

Phone: 415-597-7588

Analysis Request

Sample ID	Date	Time	Mat rix	Preserv	Volatile Organics GCMS (VOCs) ☐ EPA 8260B	HVOCs by ☐ EPA 8260B	EPA 8260B: ☐ Gas ☐ BTEX ☐ 5 Oxygenates ☐ DCA, EDB ☐ Ethanol	TEPH EPA 8015B ☐ Silica Gel ☐ Diesel ☐ Motor Oil ☐ Other	SemiVolatile Organics GCMS ☐ EPA 8270C	PNA/PAH's by ☐ 8270C ☐ 8270C SIM	Oil and Grease (EPA 1664/9071) ☐ Petroleum ☐ Total	Pesticides PCBs ☐ EPA 8081 ☐ EPA 8082	CAM17 Metals (EPA 6010/7470/7471)	Metals: ☐ 6010B ☐ 200.7 ☐ Lead ☐ LUFT ☐ RCRA ☐ Other:	Metals: ☐ 6020 ☐ 200.8 (ICP-MS):	☐ W.E.T (STLC) ☐ TCLP ☐ W.E.T (DI)	Hex Chrom by ☐ EPA 7196 ☐ or EPA 7199	pH ☐ 9040 ☐ SM4500	☐ Spec Cond. ☐ Alkalinity ☐ TSS ☐ SS ☐ TDS	Anions: ☐ Cl ☐ SO_4 ☐ NO_3 ☐ F ☐ Br ☐ NO_2 ☐ PO_4	☐ Perchlorate by EPA 314.0	COD ☐ EPA 410.4 ☐ SM5220D ☐ Turbidity			Number of Containers
MW-2	11-24-15	1355	WATER	HCl	X																				3
MW-3	EM 11/24	1230																							
MW-4		1305																							
MW-5		1440																							
~~TB-0~~ TB-112415		1200	↓	↓	↓																				2
EM 11/24																									

Project Info.

Project Name/ #: MARINWOOD-001

PO#:

Sample Receipt

of Containers:

Head Space:

Temp: 4.5°C

Credit Card Y/N: If yes, please call with payment information ASAP

TAT: 10 Day | 5 Day | 4 Day | 3 Day | 2 Day | 1 Day | Other:

Report: ☐ Routine ☐ Level 3 ☐ Level 4 ☐ EDD ☐ EDF

Special Instructions / Comments: ☐ Global ID

See Terms and Conditions on reverse

1) Relinquished by:	2) Relinquished by:	3) Relinquished by:
Signature: E. Mule — Time: 1500	Signature: — Time: 1715	Signature: — Time:
Printed Name: ERIN MULE — Date: 11-24-15	Printed Name: Ed Martinez — Date: 11-24-15	Printed Name: — Date:
Company: GEOLOGICA	Company: TA	Company:

1) Received by:	2) Received by:	3) Received by:
Signature: — Time: 1500	Signature: — Time: 1715	Signature: — Time:
Printed Name: Ed Martinez — Date: 11-24-15	Printed Name: E. Mule — Date: 11/24/15	Printed Name: — Date:
Company: TA	Company:	Company:

720-68832 Chain of Custody

Rev.10/20

Login Sample Receipt Checklist

Client: Geologica Inc

Job Number: 720-68832-1

Login Number: 68832
List Number: 1
Creator: Arauz, Dennis

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

geologica

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