

# Appendix E

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## Soil and Soil Vapor Sampling Summary Memo

## MEMORANDUM

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**To:** Mr. Kevin Little  
**From:** Nicole Peacock, Dudek  
**Subject:** Soil and Soil Vapor Sampling Summary  
APN 117-040-055  
**Date:** June 15, 2021  
**Attachment(s):** Table 1: Soil Sampling Results; Table 2: Soil Vapor Sampling Results; Figure 1: Project Location; Figure 2: Soil and Soil Vapor Sample Locations; Attachment A: Analytical Laboratory Reports

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The Cloverdale Unified School District plans to develop portions of the property located on APN 117-040-055 with athletic fields, a restroom building, and a concessions stand. Development of the project will include grading, trenching for utilities, construction, paving, and landscaping. The development would be split into two phases: initial rough grading and then trenching, construction, paving, and landscaping at a later date.

The project site is a 29.48 acre plot of undeveloped land, located between the two Kelly Roads and west of South Cloverdale Boulevard in Cloverdale, Sonoma County, California (Figure 1). Currently, a commercial park that includes a gas station, lawn mower retailer, and various other commercial buildings is located to the north of the project site, across the northern Kelly Road.

Prior environmental investigations of the project and adjacent sites were reviewed, and soil and soil vapor sampling were conducted to assess the current environmental condition of the project site.

## 1 Prior Investigations

Dudek reviewed a 2018 Phase I Environmental Site Assessment (ESA) for the project site and a 2017 Phase II Subsurface Assessment for the northern-adjacent site.

### 1.1 Site Documents

In May 2018, Terraphase Engineering Inc. prepared a Draft Phase I ESA for the project site.<sup>1</sup> The Draft Phase I ESA stated that the project site has never been developed and was used for livestock grazing since at least the 1950s. The project site is located adjacent to a light industrial area where historical uses included a wood waste landfill and a sawmill that used a teepee burner. The Draft Phase I ESA identified the following recognized environmental conditions:

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<sup>1</sup> Terraphase Engineering Inc., 2018. Phase I Environmental Site Assessment, Highway 101 Parcel, Cloverdale, Sonoma County, CA

- A former, unlined, wood waste landfill was located approximately 950 feet southwest of the project site. Wood wastes from the former Louisiana Pacific Sawmill and the former Masonite wood preserve facility were reportedly disposed of in the landfill. Impacts to groundwater and the deposition of contaminants by surface drainage may have occurred on the project site.
- A teepee burner was formerly located on an adjacent parcel. The teepee burner was used to burn wood waste by the former Louisiana Pacific Sawmill. The past operation of the teepee burner may have aerielly deposited contaminants on the project site.

Additionally, while not a recognized environmental condition, the Draft Phase I ESA recommended evaluation of potential naturally occurring asbestos at the site.

## 1.2 Adjacent Site Documents

Soil, soil vapor, and groundwater sampling were conducted on the northern-adjacent property in 2017 during a Phase II Limited Subsurface Assessment for 28195 Highway 101.<sup>2</sup> The sampling indicated the following:

- Volatile organic compounds (VOCs) tetrachloroethylene (PCE) and trichloroethylene (TCE) were detected in the soil vapor on the western portion of the northern-adjacent site. The VOCs benzene and chloroform were detected in soil vapor along Kelly Rd, just northeast of the project site.
  - The noted VOCs were detected at concentrations exceeding the Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs) for the residential scenario, while the maximum benzene and chloroform concentrations also exceeded the ESLs for the commercial scenario. However, the VOC concentrations were all less than the Department of Toxic Substances Control (DTSC) and Environmental Protection Agency (EPA) screening levels for the residential and commercial scenarios, using a DTSC attenuation factor for soil vapor to ambient air of 0.001.<sup>3</sup> An attenuation factor of 0.03 was proposed by the EPA and is also used by the RWQCB in the ESLs.<sup>4</sup> This more conservative attenuation factor was proposed in a draft guidance document presented by the RWQCB and DTSC in 2020.<sup>5</sup> However, the USEPA attenuation factor of 0.03 is based on several building and climate factors that generally do not apply to California buildings. The DTSC is in the process of finalizing a study on attenuation factors based on buildings in California and also revising the draft 2020 guidance. The initial findings of the DTSC attenuation factor study were presented at the California Land Recycling Conference in September 2020. The initial findings were that the attenuation factors calculated by comparing measured indoor air concentrations to measured soil vapor concentrations were similar to the 2011 DTSC attenuation factor of 0.001. Therefore, an attenuation factor of 0.001 is more appropriate for this site than the attenuation factor of 0.03.

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<sup>2</sup> Krazan & Associates, 2017. Phase II Limited Subsurface Assessment, 28195 Highway 101, Cloverdale, CA

<sup>3</sup> DTSC, 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). October.

<sup>4</sup> USEPA, 2015. Technical Guide For Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. June.

<sup>5</sup> DTSC and SWRCB, 2020. Draft Supplemental Guidance: Screening and Evaluating Vapor Intrusion. February.

- Lead was detected in groundwater at concentrations up to 700 micrograms per liter (ug/L), which is above the drinking water maximum contaminant level of 15 ug/L. No VOCs were detected in the groundwater samples.
- Arsenic was detected in soil samples at concentrations that were mostly below background (one sample out of 7 was slightly above background).
- No organochlorine pesticides or chlorinated herbicides were detected in shallow soil samples.
- Groundwater was encountered at 18 to 20 feet below ground surface (bgs).
- Serpentine rock was identified in borings along Kelly Road, just northeast of the project site, at 2.5 to 23 feet bgs in one boring and at 10 to 20 feet bgs in the other. The weathered serpentine was not sampled for asbestos.

## 2 Recent Soil and Soil Vapor Sampling

The subsurface investigation at the site consisted of soil and soil vapor sampling and was conducted in December 2020 and February 2021. Detected concentrations of analytes were compared to following human health thresholds of pertinent regulatory agencies: the RWQCB ESLs, the EPA Regional Screening Levels (EPA RSLs), and the DTSC Human and Ecological Risk Office's Screening Levels (DTSC HERO SL). The results of the laboratory analysis are discussed below and summarized alongside the previously mentioned regulatory thresholds in Tables 1 and 2.

### 2.1 Soil Sampling

On December 10, 2020, Geocon Consultants Inc. advanced a hand auger 1-foot bgs in five different locations across the project site in order to collect soil samples (E1 through E5; Figure 2). Soil samples from each boring were individually labeled and transported under chain-of-custody protocol to McCampbell Analytical Inc., an analytical laboratory in Pittsburg, California, for analysis. The soil samples were analyzed for metals and dioxins/furans using EPA Methods 6020 and 8290.

The dioxin OCDD was the only individual dioxin or furan detected above laboratory reporting limits. The laboratory also reported total concentrations for certain categories of dioxins and furans, as well as the toxic equivalency (TEQ). The TEQ for the five soil samples ranged from 0.0 to 0.00459 picograms per gram. The TEQs were all below the soil screening levels; therefore, dioxins and furans do not appear to be a concern at the project site.

Arsenic was detected above its RWQCB ESL, EPA RSL, and DTSC HERO SL (0.067 milligrams per kilogram [mg/kg], 0.68 mg/kg, and 0.11 mg/kg, respectively) in all five analyzed samples. The arsenic concentrations in four of the five samples were within the range of typical background concentrations for California (up to 12 mg/kg).<sup>6</sup> Only sample E1-0.5-1 had an arsenic concentration higher than the typical background concentration. The arsenic

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<sup>6</sup> Department of Toxic Substances Control, 2008. Determination of a Southern California Regional Background Arsenic Concentration in Soil.



concentration detected in sample E1-0.5-1 was 18 mg/kg, while the other exceedances were similar to the background concentration of 12 mg/kg (8.7 to 12 mg/kg).

Cobalt was detected above the residential soil screening level of 23 mg/kg (RWQCB ESL and EPA RSL), but below the commercial use soil screening level in all five soil samples: E1-0.5-1 (46 mg/kg), E2-0.5-1 (52 mg/kg), E3-0.5-1 (48 mg/kg), E4-0.5-1 (56 mg/kg), and E5-0.5-1 (42 mg/kg). Three out of five of the cobalt concentrations also exceed the maximum background concentration for California soils of 46.9 mg/kg.<sup>7</sup> All of the cobalt concentrations were less than the commercial screening levels. The screening evaluation proposed by DTSC for use at potential school sites is health-conservative and assumes that the site will be used for residential purposes.<sup>8</sup> Therefore, three of the cobalt concentrations (samples from E2, E3, and E4) exceeded the soil screening level for schools and background.

Chromium and nickel were detected in the soils at concentrations that would indicate potential hazardous waste concentrations; however, further evaluation following soluble threshold limit concentration (STLC) or toxicity characteristic leaching procedures (TCLP) extraction indicated that the metals concentrations are not at hazardous waste levels.

Several other borings were also advanced to 5.75 feet bgs in order to collect soil samples to be analyzed for asbestos. Five soil samples (B1-5.5-5.75, B2-5.5-5.75, B3-5.5-5.75, B4-5.5-5.75, and B5-5.5-5.75) were transported under chain-of-custody protocol to ESML Analytical Inc., an analytical laboratory in San Leandro, California, to be analyzed for asbestos using EPA Method 600/R-93/116. Asbestos was not detected in any of the five samples. Boring logs were not provided by Geocon for these borings; however, based on personal communication with Shane Rodacker of Geocon, no formational materials (such as serpentine rock) were observed in the borings; the soils observed were alluvium and terrace deposits.<sup>9</sup>

The presence of elevated concentrations of cobalt throughout the site can potentially be explained by the presence of serpentine soils and rock in the site vicinity. Studies show that serpentine soils and rock have elevated concentrations of heavy metals, specifically chromium, cobalt and nickel (chromium and nickel concentrations were elevated, but are not hazardous or above human health screening levels).<sup>10</sup> However, as serpentine rock was not identified in the borings at the site, it cannot be assumed that the elevated cobalt concentrations are naturally occurring based on the data collected to date.

The results of the soil sampling are summarized in Table 1: Soil Sampling Results. The laboratory reports are included in Attachment A.

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<sup>7</sup> Kearney Foundation of Soil Science, 1996. Background Concentrations of Trace and Major Elements in California Soils. March.

<sup>8</sup> DTSC, 2015. Preliminary Endangerment Assessment Guidance Manual. October.

<sup>9</sup> Shane Rodacker, pers. com., 2021. Email sent March 24.

<sup>10</sup> Saglam, 2017. Heavy Metal Concentrations in Serpentine Soils and Plants from Kizildag National Park (ISPARTA) in Turkey. June.

Tashakor, et. al., 2011. Speciation and Availability of Cr, Ni and Co in Serpentine Soils of Ranau, Sabah.

## 2.2 Soil Vapor Sampling

On February 9, 2021, Geocon Consultants Inc. collected soil vapor samples from six temporary soil vapor probes. The probe depths were approximately 5 feet bgs. Geocon Consultants Inc. prepared a report discussing the sampling activities and presenting the results (Attachment A). Samples were collected using 6-liter Summa canisters and were delivered under chain-of-custody protocol to Eurofins Air Toxins in Folsom, California for analysis. Eurofins Air Toxins analyzed samples for volatile organic compounds using a modified version of EPA Method TO-15.

The VOCs 1,2-dichloroethane, benzene, and chloroform were detected at concentrations above their respective RWQCB ESL (3.6 micrograms per cubic meter [ $\mu\text{g}/\text{m}^3$ ],  $3.2 \mu\text{g}/\text{m}^3$ , and  $4.1 \mu\text{g}/\text{m}^3$ , respectively) in three soil vapor samples (SV-2, SV-4, and SV-5). 1,2-dichloroethane was detected above its commercial and residential RWQCB ESLs in sample SV-2 ( $19 \mu\text{g}/\text{m}^3$ ). Benzene and chloroform were detected above their residential RWQCB ESLs in samples SV-2 ( $6.4 \mu\text{g}/\text{m}^3$  and  $5.6 \mu\text{g}/\text{m}^3$ , respectively), SV-4 ( $5.6 \mu\text{g}/\text{m}^3$  and  $4.5 \mu\text{g}/\text{m}^3$ , respectively), and SV-5 ( $6.8 \mu\text{g}/\text{m}^3$  and  $11 \mu\text{g}/\text{m}^3$ , respectively). The benzene and chloroform concentrations were below the commercial RWQCB ESLs.

As noted in Section 1.2, the RWQCB ESLs use a soil vapor to indoor air attenuation factor of 0.03, which is overly conservative for building and weather conditions in California. Also as noted in Section 1.2, the DTSC has recently calculated a preliminary empirically derived attenuation factor for California non-residential buildings that is similar to the 2011 DTSC vapor intrusion guidance attenuation factor of 0.001. None of the site soil vapor sample concentrations exceeded the screening levels (DTSC or EPA) using the more appropriate attenuation factor of 0.001. Therefore, while VOCs are present in the subsurface, it is unlikely that they are a concern for grading or site development. Additionally, no buildings are planned for consistent occupation at the site. The project includes a restroom, which will not have long-term occupation, and a concessions stand, which will likely not be fully enclosed when occupied.

The results of the soil vapor analyses are summarized in Table 2: Soil Vapor Sampling Results.

## 3 Conclusions

Soil and soil vapor sampling were conducted on December 10, 2020 and February 9, 2021 at the property located on APN 117-040-055 to assess the current environmental conditions and address environmental concerns raised by previous environmental investigations.

Cobalt concentrations in three soil sample locations (E2, E3, and E4, from 0.5 to 1 feet bgs) exceeded residential soil screening levels and background levels ( $46.9 \text{ mg}/\text{kg}$ ).<sup>11</sup> While the cobalt concentrations were all less than the commercial use soil screening levels, the screening evaluation proposed by DTSC for use at potential school sites is health-conservative and assumes that the site will be used for residential purposes.<sup>12</sup> Dudek recommends a

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<sup>11</sup> Kearney Foundation of Soil Science, 1996. Background Concentrations of Trace and Major Elements in California Soils. March.

<sup>12</sup> DTSC, 2015. Preliminary Endangerment Assessment Guidance Manual. October.

targeted removal of soil at the sample locations E2, E3, and E4 and confirmation soil sampling to confirm removal of the elevated cobalt (>46.9 mg/kg) prior to rough grading. If serpentine rock is discovered during targeted removal or further sampling and the elevated cobalt is determined to be due to the presence of serpentine rock, then alternative mitigation can occur following rough grading if targeted removal is determined to not be practical. The alternative mitigation would include the following remedies noted by DTSC for sites with naturally occurring asbestos (NOA) where removal is not practical.<sup>13</sup>

- Cover the site areas with elevated cobalt with imported clean fill materials or cover/cap specified areas with buildings, hardscape, sod, or landscaping sufficient to create a barrier and prevent future exposure pathways;
- Develop an Operations and Maintenance Plan to ensure that the remedy remains protective in perpetuity; and
- Record a land use covenant and/or school board resolution to restrict future activities that would create exposure to impacted soils.

During grading, soils should be wetted as needed to keep dust to a minimum, in accordance with the Northern Sonoma County Air Pollution Control District Rule 430.

Arsenic was detected at a concentration above the typical background concentration of 12 mg/kg in one sample location (E1 at 0.5 to 1 feet bgs). Dudek recommends a targeted removal of soil at the sample location E1 and confirmation soil sampling to confirm removal of the elevated arsenic prior to rough grading.

Asbestos was not detected in any of the five soil samples (B1-5.5-5.75, B2-5.5-5.75, B3-5.5-5.75, B4-5.5-5.75, and B5-5.5-5.75). Additionally, no formational materials (such as serpentine rock) were observed in the site borings, which were advanced up to 5.75 feet). While asbestos was not detected in the soil samples and serpentine rock was not observed in the site borings, if grading activities uncover potential naturally-occurring asbestos (e.g. serpentine rock), the grading and excavation work shall comply with State and local regulations for asbestos, including the California Air Resources Board Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations. The Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations requires notification of the Northern Sonoma Air Pollution Control District within the next business day of the identification of NOA, serpentine, or ultramafic rock within the area to be graded. Additionally, for areas to be disturbed that are greater than 1 acre, the owner/operator must submit and implement an asbestos dust mitigation plan within 14 days of the discovery of NOA, serpentine, or ultramafic rock. Lastly, site mitigation should be implemented to prevent future exposure to NOA, if identified. The mitigation would include the following remedies where removal is not practical.<sup>14</sup>

- Cover the site areas with NOA with imported clean fill materials or cover/cap specified areas with buildings, hardscape, sod, or landscaping sufficient to create a barrier and prevent future exposure pathways;
- Develop an Operations and Maintenance Plan to ensure that the remedy remains protective in perpetuity; and

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<sup>13</sup> DTSC, 2004. Interim Guidance Naturally Occurring Asbestos at School Sites. September.

<sup>14</sup> DTSC, 2004. Interim Guidance Naturally Occurring Asbestos at School Sites. September.

- Record a land use covenant and/or school board resolution to restrict future activities that would create exposure to impacted soils.

The VOC 1,2-dichloroethane was detected above the residential and commercial RWQCB ESLs in one soil vapor sample (SV-2) and the VOCs benzene and chloroform were detected above the residential RWQCB ESLs in three soil vapor samples (SV-2, SV-4, and SV-5). As discussed in Section 2.2, the RWQCB ESLs use a soil vapor to indoor air attenuation factor of 0.03, which is overly conservative for building and weather conditions in California. None of the soil vapor samples contained concentrations of VOCs that exceeded screening levels using a more appropriate attenuation factor of 0.001. Therefore, while VOCs are present in the subsurface, it is unlikely that they are a concern for development of the proposed project, which does not include enclosed buildings that will have long-term occupation. If buildings other than a restroom and concessions stand are included in future potential projects at the site, vapor intrusion should be reevaluated for that specific project.

Lastly, groundwater is expected to be encountered around 18 to 20 feet bgs. If groundwater is encountered during grading and dewatering is conducted (this is not anticipated), the dewatered groundwater will need to be properly managed in accordance with a National Pollutant Discharge Elimination System (NPDES) permit. Based on the groundwater data collected from the northern-adjacent site, elevated concentrations of lead may be present in the dewatered groundwater such that groundwater treatment may be required prior to discharge in accordance with a NPDES permit.



Table 2  
Soil Vapor Sample Results  
Cloverdale South Fields

Analyte	Comparison Criteria			Sample ID					
Modified EPA Method TO-15 GC/MS Full Scan	RWQCB ESLs (residential / industrial) (µg/m³)	RSL (residential, HQ=1 / industrial, HQ=1) (µg/m³)*	DTSC HHRA Note 3 (residential / industrial) (µg/m³)*	Concentration (µg/m³)					
				SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
1,2-Dichloroethane	3.6 / 16	110 / 470	N/A	<0.98	<b>19</b>	<0.94	<0.96	<0.98	<1.0
1,2,4-Trimethylbenzene	N/A	63,000 / 260,000	N/A	<1.2	3.8	<1.1	<1.2	3.0	<1.2
1,3 Butadiene	N/A	94 / 410	17 / 72	<0.54	0.61	0.95	0.94	1.6	1.3
1,3,5-Trimethylbenzene	N/A	63,000 / 260,000	N/A	<1.2	1.5	<1.1	<1.2	1.3	<1.2
2-Butanone (Methyl Ethyl Ketone)	170,000 / 730,000	5,200,000 / 22,000,000	N/A	4.1	5.3	6.4	<3.5	6.6	<3.7
2-Propanol	N/A	N/A	N/A	3.1	5.4	4.7	3.4	5.4	5.0
4-Ethyltoluene	N/A	N/A	N/A	1.2	4.9	<1.1	<1.2	4.0	<1.2
4-Methyl-2-pentanone	N/A	3,100,000 / 13,000,000	N/A	<0.99	1.2	<0.95	<0.97	1.6	<1.0
Acetone	1,100,000 / 4,500,000	32,000,000 / 140,000,000	N/A	19	27	29	14	35	16
Benzene	3.2 / 14	360 / 1,600	97 / 420	1.5	<b>6.4</b>	1.2	<b>5.6</b>	<b>6.8</b>	1.7
Bromodichloromethane	2.5 / 11	76 / 330	76 / 330	<1.6	1.8	<1.6	<1.6	<1.6	<1.7
Carbon Disulfide	N/A	730,000 / 3,100,000	N/A	<3.8	<4	5.2	<3.7	4.5	<3.9
Chloroform	4.1 / 18	120 / 530	N/A	<1.2	<b>5.6</b>	<1.1	<b>4.5</b>	<b>11</b>	<1.2
Cyclohexane	N/A	6,300,000 / 26,000,000	N/A	<4.2	<4.4	<4.0	6.6	<4.2	<4.3
Ethanol	N/A	N/A	N/A	2.5	2.6	3.2	2.6	4.3	3.3
Ethylbenzene	37 / 160	1,100 / 4,900	N/A	1.5	5.7	<1.0	<1.0	3.8	<1.1
Freon 11	N/A	N/A	N/A	<1.4	<1.4	<1.3	1.4	<1.4	<1.4
Hexane	N/A	14,000 / 61,000	N/A	<4.3	<4.5	<4.1	4.2	<4.3	<4.4
Styrene	31,000 / 130,000	1,000,000 / 4,400,000	N/A	<1.0	1.3	<0.99	<1.0	1.1	<1.1
Toluene	10,000 / 44,000	5,200,000 / 22,000,000	N/A	5.1	31	2.2	4.6	21	1.9
m,p-Xylene	3,500 / 15,000	100,000 / 44,000,000	N/A	4.5	23	1.1	1.5	17	<1.1
o-Xylene	3,500 / 15,000	100,000 / 44,000,000	N/A	1.6	7.1	<1.0	<1.0	5.6	<1.1

**Notes:**

All samples collected on February 9, 2021

DTSC HHRA = Department of Toxic Substances Control Human and Ecological Risk Office, Human Health Risk Assessment June 2020

\*Attenuation factor (AF) of 0.001 applied to ambient air screening levels to obtain soil vapor screening levels; soil vapor screening levels are listed in the table. 0.001 AF (DTSC, 2011) is similar to a preliminary empirically-derived AF for non-residential buildings (95th percentile) from a draft DTSC study presented at a 2020 conference (study is under review and not final)

µg/m³ = micrograms per cubic meter

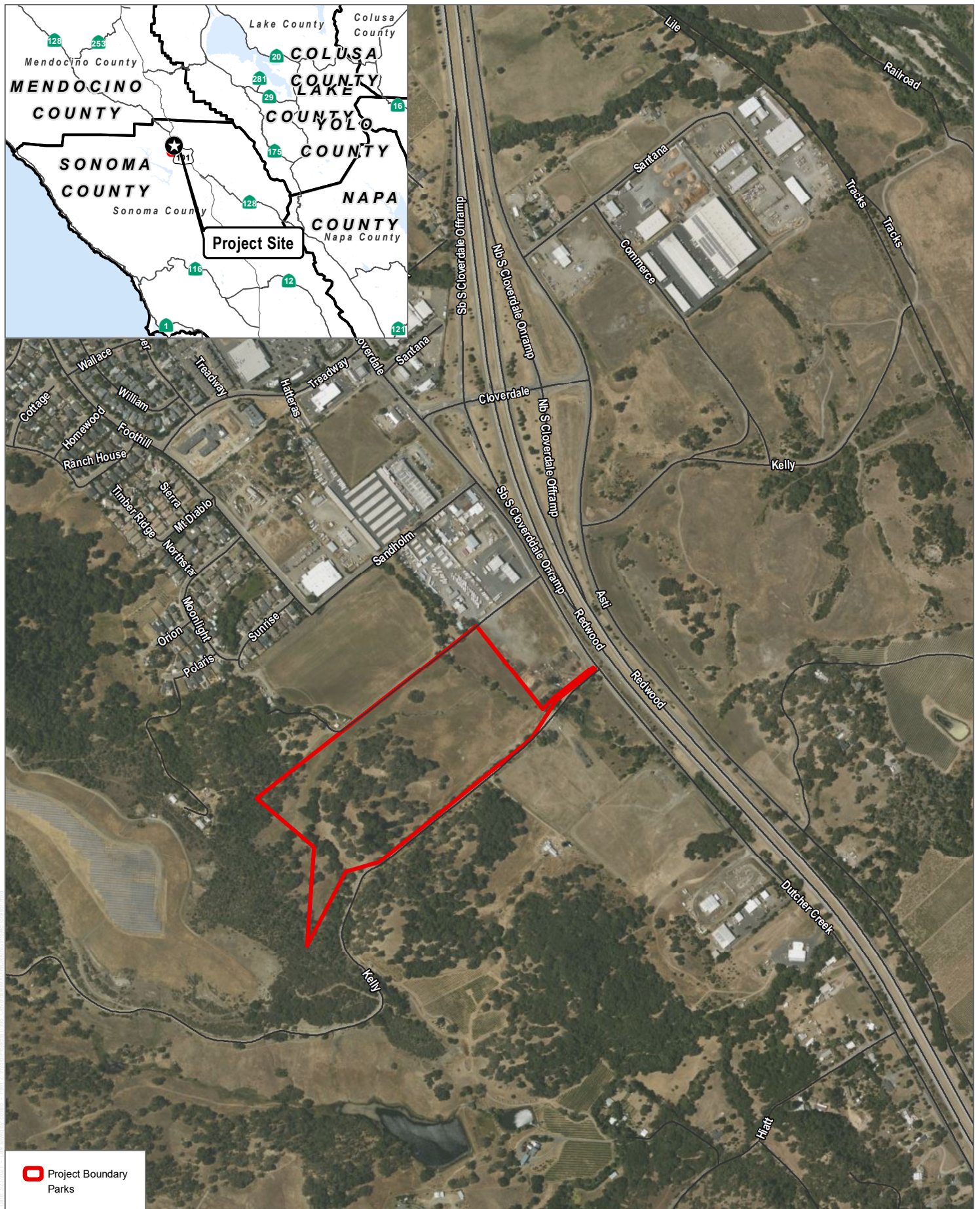
N/A = Not applicable

RSL = EPA Regional Screening Level, November 2020 (HQ=hazard quotient)

RWQCB ESL = Regional Water Quality Control Board Environmental Screening Level for Subslab/Soil Gas Vapor Intrusion: Human Health Risk Levels (San Francisco Region) - uses 0.03 AF

Bold value exceeds ESLs (0.03 AF)





SOURCE: ERSI

**FIGURE 1**

**Project Location**

11995 Cloverdale Highschool South Fields





SOURCE: ERSI, Geocon, Kelder Engineering

Figure 2 - Soil and Soil Vapor Sample Locations

11995 Cloverdale Highschool South Fields



# APPENDIX A

## *Analytical Laboratory Reports*



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 2012571

**Report Created for:** GEOCON Env. Consultants

6671 Brisa St  
Livermore, CA 94550

**Project Contact:** Shane Rodacker

**Project P.O.:**

**Project:** E8695-04-19; Cloverdale South Campus

**Project Received:** 12/10/2020

Analytical Report reviewed & approved for release on 12/28/2020 by:

Jennifer Lagerbom  
Project Manager

*The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in a case narrative.*





## Glossary of Terms & Qualifier Definitions

**Client:** GEOCON Env. Consultants  
**Project:** E8695-04-19; Cloverdale South Campus  
**WorkOrder:** 2012571

### Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
CPT	Consumer Product Testing not NELAP Accredited
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
LQL	Lowest Quantitation Level
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDS D	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
TZA	TimeZone Net Adjustment for sample collected outside of MAI's UTC.
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)



## **Glossary of Terms & Qualifier Definitions**

**Client:** GEOCON Env. Consultants  
**Project:** E8695-04-19; Cloverdale South Campus  
**WorkOrder:** 2012571

### **Analytical Qualifiers**

B	Analyte detected in the associated Method Blank and in the sample
J	Result is less than the RL/ML but greater than the MDL. The reported concentration is an estimated value.
R	RPD outside accepted recovery limits
S	Surrogate recovery outside accepted recovery limits.



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/16/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW8290  
**Analytical Method:** SW8290  
**Unit:** pg/g-dry

### Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E1-0.5-1	2012571-001A	Soil	12/10/2020 12:25	GC36	211916

Analytes	TEF WHO '05	Result	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
2,3,7,8-TCDD		ND	0.500	1				12/24/2020 22:42
1,2,3,7,8-PeCDD		ND	2.50	1				12/24/2020 22:42
1,2,3,4,7,8-HxCDD		ND	2.50	1				12/24/2020 22:42
1,2,3,6,7,8-HxCDD		ND	2.50	1				12/24/2020 22:42
1,2,3,7,8,9-HxCDD		ND	2.50	1				12/24/2020 22:42
1,2,3,4,6,7,8-HpCDD		ND	2.50	1				12/24/2020 22:42
OCDD		ND	5.00	1				12/24/2020 22:42
2,3,7,8-TCDF		ND	0.500	1				12/24/2020 22:42
1,2,3,7,8-PeCDF		ND	2.50	1				12/24/2020 22:42
2,3,4,7,8-PeCDF		ND	2.50	1				12/24/2020 22:42
1,2,3,4,7,8-HxCDF		ND	2.50	1				12/24/2020 22:42
1,2,3,6,7,8-HxCDF		ND	2.50	1				12/24/2020 22:42
2,3,4,6,7,8-HxCDF		ND	2.50	1				12/24/2020 22:42
1,2,3,7,8,9-HxCDF		ND	2.50	1				12/24/2020 22:42
1,2,3,4,6,7,8-HpCDF		ND	2.50	1				12/24/2020 22:42
1,2,3,4,7,8,9-HpCDF		ND	2.50	1				12/24/2020 22:42
OCDF		ND	5.00	1				12/24/2020 22:42
Total-Tetradoxins		ND	0.500	1				12/24/2020 22:42
Total-Pentadoxins		ND	2.50	1				12/24/2020 22:42
Total-Hexadoxins		ND	2.50	1				12/24/2020 22:42
Total-Heptadoxins		ND	2.50	1				12/24/2020 22:42
Total-Tetrafurans		4.02	0.500	1				12/24/2020 22:42
Total-Pentafurans		ND	2.50	1				12/24/2020 22:42
Total-Hexafurans		ND	2.50	1				12/24/2020 22:42
Total-Heptafurans		ND	2.50	1				12/24/2020 22:42

**Total Toxicity Equivalence (TEQ):**

**0**

Cleanup Standard	REC (%)	Limits	
37Cl-2,3,7,8-TCDD	88	40-130	12/24/2020 22:42
Labeled Compound Recovery	REC (%)	Limits	
13C-2,3,7,8-TCDD	80	40-130	12/24/2020 22:42
13C-1,2,3,7,8-PeCDD	81	40-130	12/24/2020 22:42
13C-1,2,3,6,7,8-HxCDD	89	40-130	12/24/2020 22:42
13C-1,2,3,4,6,7,8-HpCDD	81	25-130	12/24/2020 22:42
13C-OCDD	72	25-130	12/24/2020 22:42
13C-2,3,7,8-TCDF	82	40-130	12/24/2020 22:42

(Cont.)



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/16/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW8290  
**Analytical Method:** SW8290  
**Unit:** pg/g-dry

### Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E1-0.5-1	2012571-001A	Soil	12/10/2020 12:25	GC36	211916

Analytes	TEF WHO '05	Result	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
Labeled Compound Recovery	REC (%)	Limits						
13C-1,2,3,7,8-PeCDF	80	40-130			12/24/2020 22:42			
13C-1,2,3,4,7,8-HxCDF	86	40-130			12/24/2020 22:42			
13C-1,2,3,4,6,7,8-HpCDF	86	25-130			12/24/2020 22:42			

**Analyst(s):** KBO



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/16/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW8290  
**Analytical Method:** SW8290  
**Unit:** pg/g-dry

### Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E2-0.5-1	2012571-002A	Soil	12/10/2020 12:35	GC36	211916

Analytes	TEF WHO '05	Result	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
2,3,7,8-TCDD		ND	0.500	1				12/24/2020 18:37
1,2,3,7,8-PeCDD		ND	2.50	1				12/24/2020 18:37
1,2,3,4,7,8-HxCDD		ND	2.50	1				12/24/2020 18:37
1,2,3,6,7,8-HxCDD		ND	2.50	1				12/24/2020 18:37
1,2,3,7,8,9-HxCDD		ND	2.50	1				12/24/2020 18:37
1,2,3,4,6,7,8-HpCDD		ND	2.50	1				12/24/2020 18:37
OCDD		ND	5.00	1				12/24/2020 18:37
2,3,7,8-TCDF		ND	0.500	1				12/24/2020 18:37
1,2,3,7,8-PeCDF		ND	2.50	1				12/24/2020 18:37
2,3,4,7,8-PeCDF		ND	2.50	1				12/24/2020 18:37
1,2,3,4,7,8-HxCDF		ND	2.50	1				12/24/2020 18:37
1,2,3,6,7,8-HxCDF		ND	2.50	1				12/24/2020 18:37
2,3,4,6,7,8-HxCDF		ND	2.50	1				12/24/2020 18:37
1,2,3,7,8,9-HxCDF		ND	2.50	1				12/24/2020 18:37
1,2,3,4,6,7,8-HpCDF		ND	2.50	1				12/24/2020 18:37
1,2,3,4,7,8,9-HpCDF		ND	2.50	1				12/24/2020 18:37
OCDF		ND	5.00	1				12/24/2020 18:37
Total-Tetradoxins		ND	0.500	1				12/24/2020 18:37
Total-Pentadoxins		ND	2.50	1				12/24/2020 18:37
Total-Hexadoxins		ND	2.50	1				12/24/2020 18:37
Total-Heptadoxins		ND	2.50	1				12/24/2020 18:37
Total-Tetrafurans		1.00	0.500	1				12/24/2020 18:37
Total-Pentafurans		ND	2.50	1				12/24/2020 18:37
Total-Hexafurans		ND	2.50	1				12/24/2020 18:37
Total-Heptafurans		ND	2.50	1				12/24/2020 18:37

**Total Toxicity Equivalence (TEQ):**

**0**

Cleanup Standard	REC (%)	Limits	
37Cl-2,3,7,8-TCDD	78	40-130	12/24/2020 18:37
Labeled Compound Recovery	REC (%)	Limits	
13C-2,3,7,8-TCDD	80	40-130	12/24/2020 18:37
13C-1,2,3,7,8-PeCDD	84	40-130	12/24/2020 18:37
13C-1,2,3,6,7,8-HxCDD	87	40-130	12/24/2020 18:37
13C-1,2,3,4,6,7,8-HpCDD	85	25-130	12/24/2020 18:37
13C-OCDD	76	25-130	12/24/2020 18:37
13C-2,3,7,8-TCDF	81	40-130	12/24/2020 18:37

(Cont.)



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/16/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW8290  
**Analytical Method:** SW8290  
**Unit:** pg/g-dry

### Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E2-0.5-1	2012571-002A	Soil	12/10/2020 12:35	GC36	211916

Analytes	TEF WHO '05	Result	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
Labeled Compound Recovery	REC (%)	Limits						
13C-1,2,3,7,8-PeCDF	83	40-130			12/24/2020 18:37			
13C-1,2,3,4,7,8-HxCDF	86	40-130			12/24/2020 18:37			
13C-1,2,3,4,6,7,8-HpCDF	91	25-130			12/24/2020 18:37			

**Analyst(s):** KBO





## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/16/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW8290  
**Analytical Method:** SW8290  
**Unit:** pg/g-dry

### Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E3-0.5-1	2012571-003A	Soil	12/10/2020 12:45	GC36	211916

Analytes	TEF WHO '05	Result	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
2,3,7,8-TCDD		ND	0.500	1				12/24/2020 19:44
1,2,3,7,8-PeCDD		ND	2.50	1				12/24/2020 19:44
1,2,3,4,7,8-HxCDD		ND	2.50	1				12/24/2020 19:44
1,2,3,6,7,8-HxCDD		ND	2.50	1				12/24/2020 19:44
1,2,3,7,8,9-HxCDD		ND	2.50	1				12/24/2020 19:44
1,2,3,4,6,7,8-HpCDD		ND	2.50	1				12/24/2020 19:44
OCDD	0.0003	<b>5.64</b>	5.00	1	0.958	1	0.001692	12/24/2020 19:44
2,3,7,8-TCDF		ND	0.500	1				12/24/2020 19:44
1,2,3,7,8-PeCDF		ND	2.50	1				12/24/2020 19:44
2,3,4,7,8-PeCDF		ND	2.50	1				12/24/2020 19:44
1,2,3,4,7,8-HxCDF		ND	2.50	1				12/24/2020 19:44
1,2,3,6,7,8-HxCDF		ND	2.50	1				12/24/2020 19:44
2,3,4,6,7,8-HxCDF		ND	2.50	1				12/24/2020 19:44
1,2,3,7,8,9-HxCDF		ND	2.50	1				12/24/2020 19:44
1,2,3,4,6,7,8-HpCDF		ND	2.50	1				12/24/2020 19:44
1,2,3,4,7,8,9-HpCDF		ND	2.50	1				12/24/2020 19:44
OCDF		ND	5.00	1				12/24/2020 19:44
Total-Tetradoxins		ND	0.500	1				12/24/2020 19:44
Total-Pentadoxins		ND	2.50	1				12/24/2020 19:44
Total-Hexadoxins		ND	2.50	1				12/24/2020 19:44
Total-Heptadoxins		ND	2.50	1				12/24/2020 19:44
Total-Tetrafurans		ND	0.500	1				12/24/2020 19:44
Total-Pentafurans		ND	2.50	1				12/24/2020 19:44
Total-Hexafurans		ND	2.50	1				12/24/2020 19:44
Total-Heptafurans		ND	2.50	1				12/24/2020 19:44

**Total Toxicity Equivalence (TEQ):**

**0.00169**

Cleanup Standard	REC (%)	Limits	
37Cl-2,3,7,8-TCDD	82	40-130	12/24/2020 19:44
Labeled Compound Recovery	REC (%)	Limits	
13C-2,3,7,8-TCDD	83	40-130	12/24/2020 19:44
13C-1,2,3,7,8-PeCDD	91	40-130	12/24/2020 19:44
13C-1,2,3,6,7,8-HxCDD	95	40-130	12/24/2020 19:44
13C-1,2,3,4,6,7,8-HpCDD	89	25-130	12/24/2020 19:44
13C-OCDD	82	25-130	12/24/2020 19:44
13C-2,3,7,8-TCDF	86	40-130	12/24/2020 19:44

(Cont.)



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/16/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW8290  
**Analytical Method:** SW8290  
**Unit:** pg/g-dry

### Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E3-0.5-1	2012571-003A	Soil	12/10/2020 12:45	GC36	211916

Analytes	TEF WHO '05	Result	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
Labeled Compound Recovery	REC (%)	Limits						
13C-1,2,3,7,8-PeCDF	87	40-130			12/24/2020 19:44			
13C-1,2,3,4,7,8-HxCDF	93	40-130			12/24/2020 19:44			
13C-1,2,3,4,6,7,8-HpCDF	96	25-130			12/24/2020 19:44			

**Analyst(s):** KBO



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/16/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW8290  
**Analytical Method:** SW8290  
**Unit:** pg/g-dry

### Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E4-0.5-1	2012571-004A	Soil	12/10/2020 12:55	GC36	211916

Analytes	TEF WHO '05	Result	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
2,3,7,8-TCDD		ND	0.500	1				12/24/2020 20:40
1,2,3,7,8-PeCDD		ND	2.50	1				12/24/2020 20:40
1,2,3,4,7,8-HxCDD		ND	2.50	1				12/24/2020 20:40
1,2,3,6,7,8-HxCDD		ND	2.50	1				12/24/2020 20:40
1,2,3,7,8,9-HxCDD		ND	2.50	1				12/24/2020 20:40
1,2,3,4,6,7,8-HpCDD		ND	2.50	1				12/24/2020 20:40
OCDD	0.0003	15.3	5.00	1	0.873	1	0.00459	12/24/2020 20:40
2,3,7,8-TCDF		ND	0.500	1				12/24/2020 20:40
1,2,3,7,8-PeCDF		ND	2.50	1				12/24/2020 20:40
2,3,4,7,8-PeCDF		ND	2.50	1				12/24/2020 20:40
1,2,3,4,7,8-HxCDF		ND	2.50	1				12/24/2020 20:40
1,2,3,6,7,8-HxCDF		ND	2.50	1				12/24/2020 20:40
2,3,4,6,7,8-HxCDF		ND	2.50	1				12/24/2020 20:40
1,2,3,7,8,9-HxCDF		ND	2.50	1				12/24/2020 20:40
1,2,3,4,6,7,8-HpCDF		ND	2.50	1				12/24/2020 20:40
1,2,3,4,7,8,9-HpCDF		ND	2.50	1				12/24/2020 20:40
OCDF		ND	5.00	1				12/24/2020 20:40
Total-Tetradoxins		ND	0.500	1				12/24/2020 20:40
Total-Pentadoxins		ND	2.50	1				12/24/2020 20:40
Total-Hexadoxins		ND	2.50	1				12/24/2020 20:40
Total-Heptadoxins		3.64	2.50	1				12/24/2020 20:40
Total-Tetrafurans		0.520	0.500	1				12/24/2020 20:40
Total-Pentafurans		ND	2.50	1				12/24/2020 20:40
Total-Hexafurans		ND	2.50	1				12/24/2020 20:40
Total-Heptafurans		ND	2.50	1				12/24/2020 20:40

**Total Toxicity Equivalence (TEQ):**

**0.00459**

Cleanup Standard	REC (%)	Limits	
37Cl-2,3,7,8-TCDD	79	40-130	12/24/2020 20:40
Labeled Compound Recovery	REC (%)	Limits	
13C-2,3,7,8-TCDD	80	40-130	12/24/2020 20:40
13C-1,2,3,7,8-PeCDD	87	40-130	12/24/2020 20:40
13C-1,2,3,6,7,8-HxCDD	89	40-130	12/24/2020 20:40
13C-1,2,3,4,6,7,8-HpCDD	82	25-130	12/24/2020 20:40
13C-OCDD	73	25-130	12/24/2020 20:40
13C-2,3,7,8-TCDF	80	40-130	12/24/2020 20:40

(Cont.)



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/16/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW8290  
**Analytical Method:** SW8290  
**Unit:** pg/g-dry

### Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E4-0.5-1	2012571-004A	Soil	12/10/2020 12:55	GC36	211916

<u>Analytes</u>	<u>TEF</u> <u>WHO '05</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Ion</u> <u>Ratio</u>	<u>RRT</u>	<u>TEQ</u>	<u>Date Analyzed</u>
<u>Labeled Compound Recovery</u>		<u>REC (%)</u>	<u>Limits</u>					
13C-1,2,3,7,8-PeCDF		85	40-130					12/24/2020 20:40
13C-1,2,3,4,7,8-HxCDF		87	40-130					12/24/2020 20:40
13C-1,2,3,4,6,7,8-HpCDF		88	25-130					12/24/2020 20:40
<u>Analyst(s):</u> KBO								



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/16/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW8290  
**Analytical Method:** SW8290  
**Unit:** pg/g-dry

### Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E5-0.5-1	2012571-005A	Soil	12/10/2020 13:05	GC36	211916

Analytes	TEF WHO '05	Result	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
2,3,7,8-TCDD		ND	0.500	1				12/24/2020 21:46
1,2,3,7,8-PeCDD		ND	2.50	1				12/24/2020 21:46
1,2,3,4,7,8-HxCDD		ND	2.50	1				12/24/2020 21:46
1,2,3,6,7,8-HxCDD		ND	2.50	1				12/24/2020 21:46
1,2,3,7,8,9-HxCDD		ND	2.50	1				12/24/2020 21:46
1,2,3,4,6,7,8-HpCDD		ND	2.50	1				12/24/2020 21:46
OCDD	0.0003	9.46	5.00	1	0.856	1	0.002838	12/24/2020 21:46
2,3,7,8-TCDF		ND	0.500	1				12/24/2020 21:46
1,2,3,7,8-PeCDF		ND	2.50	1				12/24/2020 21:46
2,3,4,7,8-PeCDF		ND	2.50	1				12/24/2020 21:46
1,2,3,4,7,8-HxCDF		ND	2.50	1				12/24/2020 21:46
1,2,3,6,7,8-HxCDF		ND	2.50	1				12/24/2020 21:46
2,3,4,6,7,8-HxCDF		ND	2.50	1				12/24/2020 21:46
1,2,3,7,8,9-HxCDF		ND	2.50	1				12/24/2020 21:46
1,2,3,4,6,7,8-HpCDF		ND	2.50	1				12/24/2020 21:46
1,2,3,4,7,8,9-HpCDF		ND	2.50	1				12/24/2020 21:46
OCDF		ND	5.00	1				12/24/2020 21:46
Total-Tetradoxins		ND	0.500	1				12/24/2020 21:46
Total-Pentadoxins		ND	2.50	1				12/24/2020 21:46
Total-Hexadoxins		ND	2.50	1				12/24/2020 21:46
Total-Heptadoxins		ND	2.50	1				12/24/2020 21:46
Total-Tetrafurans		ND	0.500	1				12/24/2020 21:46
Total-Pentafurans		ND	2.50	1				12/24/2020 21:46
Total-Hexafurans		ND	2.50	1				12/24/2020 21:46
Total-Heptafurans		ND	2.50	1				12/24/2020 21:46

**Total Toxicity Equivalence (TEQ):**

**0.00284**

Cleanup Standard	REC (%)	Limits	
37Cl-2,3,7,8-TCDD	82	40-130	12/24/2020 21:46
Labeled Compound Recovery	REC (%)	Limits	
13C-2,3,7,8-TCDD	81	40-130	12/24/2020 21:46
13C-1,2,3,7,8-PeCDD	85	40-130	12/24/2020 21:46
13C-1,2,3,6,7,8-HxCDD	93	40-130	12/24/2020 21:46
13C-1,2,3,4,6,7,8-HpCDD	82	25-130	12/24/2020 21:46
13C-OCDD	74	25-130	12/24/2020 21:46
13C-2,3,7,8-TCDF	83	40-130	12/24/2020 21:46

(Cont.)



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/16/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW8290  
**Analytical Method:** SW8290  
**Unit:** pg/g-dry

### Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E5-0.5-1	2012571-005A	Soil	12/10/2020 13:05	GC36	211916

Analytes	TEF WHO '05	Result	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
Labeled Compound Recovery	REC (%)	Limits						
13C-1,2,3,7,8-PeCDF	84		40-130					12/24/2020 21:46
13C-1,2,3,4,7,8-HxCDF	87		40-130					12/24/2020 21:46
13C-1,2,3,4,6,7,8-HpCDF	87		25-130					12/24/2020 21:46
Analyst(s): KBO								



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/11/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E1-0.5-1	2012571-001A	Soil	12/10/2020 12:25	ICP-MS2 090SMPL.D	211119

Analytes	Result	Qualifiers	RL	DF	Date Analyzed
Antimony	1.2		0.50	1	12/14/2020 16:59
Arsenic	18		0.50	1	12/14/2020 16:59
Barium	230		5.0	1	12/14/2020 16:59
Beryllium	0.82		0.50	1	12/14/2020 16:59
Cadmium	ND		0.50	1	12/14/2020 16:59
Chromium	150		0.50	1	12/14/2020 16:59
Cobalt	46		0.50	1	12/14/2020 16:59
Copper	35		0.50	1	12/14/2020 16:59
Lead	22		0.50	1	12/14/2020 16:59
Mercury	ND		0.050	1	12/14/2020 16:59
Molybdenum	1.0		0.50	1	12/14/2020 16:59
Nickel	320		0.50	1	12/14/2020 16:59
Selenium	0.72		0.50	1	12/14/2020 16:59
Silver	ND		0.50	1	12/14/2020 16:59
Thallium	ND		0.50	1	12/14/2020 16:59
Vanadium	74		0.50	1	12/14/2020 16:59
Zinc	69	B	5.0	1	12/14/2020 16:59

Surrogates	REC (%)	Limits	
Terbium	102	70-130	12/14/2020 16:59

Analyst(s): DB

(Cont.)



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/11/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E2-0.5-1	2012571-002A	Soil	12/10/2020 12:35	ICP-MS2 091SMPL.D	211119

Analytes	Result	Qualifiers	RL	DF	Date Analyzed
Antimony	ND		0.50	1	12/14/2020 17:05
Arsenic	11		0.50	1	12/14/2020 17:05
Barium	240		5.0	1	12/14/2020 17:05
Beryllium	0.65		0.50	1	12/14/2020 17:05
Cadmium	ND		0.50	1	12/14/2020 17:05
Chromium	150		0.50	1	12/14/2020 17:05
Cobalt	52		0.50	1	12/14/2020 17:05
Copper	38		0.50	1	12/14/2020 17:05
Lead	11		0.50	1	12/14/2020 17:05
Mercury	0.066		0.050	1	12/14/2020 17:05
Molybdenum	ND		0.50	1	12/14/2020 17:05
Nickel	500		5.0	10	12/15/2020 16:18
Selenium	ND		0.50	1	12/14/2020 17:05
Silver	ND		0.50	1	12/14/2020 17:05
Thallium	ND		0.50	1	12/14/2020 17:05
Vanadium	68		0.50	1	12/14/2020 17:05
Zinc	61	B	5.0	1	12/14/2020 17:05

Surrogates	REC (%)	Limits	
Terbium	103	70-130	12/14/2020 17:05

**Analyst(s):** DB, MIG





## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/11/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected		Instrument	Batch ID
E3-0.5-1	2012571-003A	Soil	12/10/2020 12:45		ICP-MS2 092SMPL.D	211119
<u>Analytes</u>	<u>Result</u>	<u>Qualifiers</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>	
Antimony	ND		0.50	1	12/14/2020 17:10	
Arsenic	8.7		0.50	1	12/14/2020 17:10	
Barium	270		5.0	1	12/14/2020 17:10	
Beryllium	0.64		0.50	1	12/14/2020 17:10	
Cadmium	ND		0.50	1	12/14/2020 17:10	
Chromium	130		0.50	1	12/14/2020 17:10	
Cobalt	48		0.50	1	12/14/2020 17:10	
Copper	38		0.50	1	12/14/2020 17:10	
Lead	10		0.50	1	12/14/2020 17:10	
Mercury	ND		0.050	1	12/14/2020 17:10	
Molybdenum	ND		0.50	1	12/14/2020 17:10	
Nickel	410		0.50	1	12/14/2020 17:10	
Selenium	ND		0.50	1	12/14/2020 17:10	
Silver	ND		0.50	1	12/14/2020 17:10	
Thallium	ND		0.50	1	12/14/2020 17:10	
Vanadium	70		0.50	1	12/14/2020 17:10	
Zinc	64	B	5.0	1	12/14/2020 17:10	

<u>Surrogates</u>	<u>REC (%)</u>	<u>Limits</u>	
Terbium	104	70-130	12/14/2020 17:10

Analyst(s): DB



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/11/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected		Instrument	Batch ID
E4-0.5-1	2012571-004A	Soil	12/10/2020 12:55		ICP-MS2 093SMPL.D	211119
<u>Analytes</u>	<u>Result</u>	<u>Qualifiers</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>	
Antimony	ND		0.50	1	12/14/2020 17:16	
Arsenic	12		0.50	1	12/14/2020 17:16	
Barium	180		5.0	1	12/14/2020 17:16	
Beryllium	0.63		0.50	1	12/14/2020 17:16	
Cadmium	ND		0.50	1	12/14/2020 17:16	
Chromium	130		0.50	1	12/14/2020 17:16	
Cobalt	56		0.50	1	12/14/2020 17:16	
Copper	40		0.50	1	12/14/2020 17:16	
Lead	12		0.50	1	12/14/2020 17:16	
Mercury	ND		0.050	1	12/14/2020 17:16	
Molybdenum	ND		0.50	1	12/14/2020 17:16	
Nickel	410		0.50	1	12/14/2020 17:16	
Selenium	ND		0.50	1	12/14/2020 17:16	
Silver	ND		0.50	1	12/14/2020 17:16	
Thallium	ND		0.50	1	12/14/2020 17:16	
Vanadium	77		0.50	1	12/14/2020 17:16	
Zinc	69	B	5.0	1	12/14/2020 17:16	
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>			
Terbium	104		70-130		12/14/2020 17:16	
Analyst(s): DB						

(Cont.)

CA ELAP 1644 • NELAP 4033ORELAP



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 12/11/2020  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW3050B  
**Analytical Method:** SW6020  
**Unit:** mg/Kg

### CAM / CCR 17 Metals

Client ID	Lab ID	Matrix	Date Collected		Instrument	Batch ID
E5-0.5-1	2012571-005A	Soil	12/10/2020 13:05		ICP-MS2 094SMPL.D	211119
<u>Analytes</u>	<u>Result</u>	<u>Qualifiers</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>	
Antimony	ND		0.50	1	12/14/2020 17:21	
Arsenic	11		0.50	1	12/14/2020 17:21	
Barium	280		5.0	1	12/14/2020 17:21	
Beryllium	0.68		0.50	1	12/14/2020 17:21	
Cadmium	ND		0.50	1	12/14/2020 17:21	
Chromium	120		0.50	1	12/14/2020 17:21	
Cobalt	42		0.50	1	12/14/2020 17:21	
Copper	37		0.50	1	12/14/2020 17:21	
Lead	11		0.50	1	12/14/2020 17:21	
Mercury	ND		0.050	1	12/14/2020 17:21	
Molybdenum	0.58		0.50	1	12/14/2020 17:21	
Nickel	300		0.50	1	12/14/2020 17:21	
Selenium	ND		0.50	1	12/14/2020 17:21	
Silver	ND		0.50	1	12/14/2020 17:21	
Thallium	ND		0.50	1	12/14/2020 17:21	
Vanadium	74		0.50	1	12/14/2020 17:21	
Zinc	59	B	5.0	1	12/14/2020 17:21	
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>			
Terbium	106		70-130		12/14/2020 17:21	
<u>Analyst(s):</u> DB						

CLIENT: GEOCON Env. Consultants

## ANALYTICAL QC SUMMARY REPORT

Work Order: 2012571

Project: E8695-04-19; Cloverdale South Campus

BatchID:

211916

SampleID: MB-211916		TestCode: 8290_FULL_S			Units: pg/g-dry			Prep Date: 12/16/2020			
Batch ID: 211916		TestNo: SW8290			Run ID: GC36_201227A			Analysis Date: 12/24/2020			
Analyte	Result	MDL	PQL	SPKValue	SPKRefVal	%REC	Limits	RPDRefVal	%RPD	RPDLimit	Qual
2,3,7,8-TCDD	ND	0.240	0.500				-				
1,2,3,7,8-PeCDD	ND	0.660	2.50				-				
1,2,3,4,7,8-HxCDD	ND	0.620	2.50				-				
1,2,3,6,7,8-HxCDD	ND	0.620	2.50				-				
1,2,3,7,8,9-HxCDD	ND	0.940	2.50				-				
1,2,3,4,6,7,8-HpCDD	ND	0.690	2.50				-				
OCDD	ND	3.20	5.00				-				
2,3,7,8-TCDF	ND	0.380	0.500				-				
1,2,3,7,8-PeCDF	ND	0.480	2.50				-				
2,3,4,7,8-PeCDF	ND	0.290	2.50				-				
1,2,3,4,7,8-HxCDF	ND	0.740	2.50				-				
1,2,3,6,7,8-HxCDF	ND	0.670	2.50				-				
2,3,4,6,7,8-HxCDF	ND	0.740	2.50				-				
1,2,3,7,8,9-HxCDF	ND	0.820	2.50				-				
1,2,3,4,6,7,8-HpCDF	ND	0.760	2.50				-				
1,2,3,4,7,8,9-HpCDF	ND	1.40	2.50				-				
OCDF	ND	1.80	5.00				-				
Total-Tetradoxins	ND	0.240	0.500				-				
Total-Pentadoxins	ND	0.660	2.50				-				
Total-Hexadoxins	ND	0.940	2.50				-				
Total-Heptadoxins	ND	0.690	2.50				-				
Total-Tetrafurans	ND	0.380	0.500				-				
Total-Pentafurans	ND	0.480	2.50				-				
Total-Hexafurans	ND	0.820	2.50				-				
Total-Heptafurans	ND	1.40	2.50				-				

**Cleanup Standard**

37Cl-2,3,7,8-TCDD	8.54	10	85	58 - 126
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**Labeled Compound Recovery**

13C-2,3,7,8-TCDD	78.2	100	78	41 - 120
13C-1,2,3,7,8-PeCDD	90.4	100	90	51 - 124
13C-1,2,3,6,7,8-HxCDD	87.2	100	87	49 - 104
13C-1,2,3,4,6,7,8-HpCDD	80.7	100	81	38 - 129
13C-OCDD	153	200	77	10 - 160
13C-2,3,7,8-TCDF	80.8	100	81	49 - 108
13C-1,2,3,7,8-PeCDF	83.4	100	83	47 - 120
13C-1,2,3,4,7,8-HxCDF	79.2	100	79	51 - 106
13C-1,2,3,4,6,7,8-HpCDF	86.3	100	86	44 - 125

CLIENT: GEOCON Env. Consultants

## ANALYTICAL QC SUMMARY REPORT

Work Order: 2012571

Project: E8695-04-19; Cloverdale South Campus

BatchID:

211916

SampleID: <b>LCS-211916</b>	TestCode: <b>8290_FULL_S</b>	Units: <b>pg/g-dry</b>	Prep Date: <b>12/16/2020</b>							
Batch ID: <b>211916</b>	TestNo: <b>SW8290</b>	Run ID: <b>GC36_201227C</b>	Analysis Date: <b>12/24/2020</b>							
Analyte	Result	PQL	SPKValue	SPKRefVal	%REC	Limits	RPDRefVal	%RPD	RPDLimit	Qual
2,3,7,8-TCDD	9.00	0.500	10	0	90	72 - 120				
1,2,3,7,8-PeCDD	44.5	2.50	50	0	89	75 - 124				
1,2,3,4,7,8-HxCDD	40.7	2.50	50	0	81	63 - 128				
1,2,3,6,7,8-HxCDD	44.6	2.50	50	0	89	70 - 130				
1,2,3,7,8,9-HxCDD	40.2	2.50	50	0	80	69 - 138				
1,2,3,4,6,7,8-HpCDD	45.2	2.50	50	0	90	69 - 126				
OCDD	93.6	5.00	100	0	94	77 - 114				
2,3,7,8-TCDF	8.70	0.500	10	0	87	69 - 134				
1,2,3,7,8-PeCDF	46.0	2.50	50	0	92	75 - 125				
2,3,4,7,8-PeCDF	48.6	2.50	50	0	97	68 - 144				
1,2,3,4,7,8-HxCDF	45.7	2.50	50	0	91	77 - 128				
1,2,3,6,7,8-HxCDF	50.4	2.50	50	0	101	68 - 141				
2,3,4,6,7,8-HxCDF	49.1	2.50	50	0	98	73 - 140				
1,2,3,7,8,9-HxCDF	46.7	2.50	50	0	93	79 - 130				
1,2,3,4,6,7,8-HpCDF	45.8	2.50	50	0	92	68 - 136				
1,2,3,4,7,8,9-HpCDF	44.4	2.50	50	0	89	65 - 143				
OCDF	90.4	5.00	100	0	90	75 - 134				

**Cleanup Standard**

37Cl-2,3,7,8-TCDD	8.96		10		90	58 - 126
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**Labeled Compound Recovery**

13C-2,3,7,8-TCDD	86.1		100		86	41 - 120
13C-1,2,3,7,8-PeCDD	90.0		100		90	51 - 124
13C-1,2,3,6,7,8-HxCDD	94.8		100		95	49 - 104
13C-1,2,3,4,6,7,8-HpCDD	81.7		100		82	38 - 129
13C-OCDD	154		200		77	10 - 160
13C-2,3,7,8-TCDF	86.7		100		87	49 - 108
13C-1,2,3,7,8-PeCDF	88.9		100		89	47 - 120
13C-1,2,3,4,7,8-HxCDF	84.8		100		85	51 - 106
13C-1,2,3,4,6,7,8-HpCDF	86.2		100		86	44 - 125

CLIENT: GEOCON Env. Consultants

## ANALYTICAL QC SUMMARY REPORT

Work Order: 2012571

Project: E8695-04-19; Cloverdale South Campus

BatchID:

211916

SampleID: <b>LCSD-211916</b>	TestCode: <b>8290_FULL_S</b>	Units: <b>pg/g-dry</b>					Prep Date: <b>12/16/2020</b>			
Batch ID: <b>211916</b>	TestNo: <b>SW8290</b>	Run ID: <b>GC36_201227C</b>					Analysis Date: <b>12/24/2020</b>			
Analyte	Result	PQL	SPKValue	SPKRefVal	%REC	Limits	RPDRefVal	%RPD	RPDLimit	Qual
2,3,7,8-TCDD	9.54	0.500	10	0	95	72 - 120	9	5.83	20	
1,2,3,7,8-PeCDD	46.3	2.50	50	0	93	75 - 124	44.5	3.96	20	
1,2,3,4,7,8-HxCDD	43.8	2.50	50	0	88	63 - 128	40.7	7.43	20	
1,2,3,6,7,8-HxCDD	47.6	2.50	50	0	95	70 - 130	44.64	6.42	20	
1,2,3,7,8,9-HxCDD	44.3	2.50	50	0	89	69 - 138	40.24	9.69	20	
1,2,3,4,6,7,8-HpCDD	45.2	2.50	50	0	90	69 - 126	45.22	0.0885	20	
OCDD	92.7	5.00	100	0	93	77 - 114	93.6	0.988	20	
2,3,7,8-TCDF	9.54	0.500	10	0	95	69 - 134	8.7	9.21	20	
1,2,3,7,8-PeCDF	48.4	2.50	50	0	97	75 - 125	46	5.04	20	
2,3,4,7,8-PeCDF	50.9	2.50	50	0	102	68 - 144	48.58	4.59	20	
1,2,3,4,7,8-HxCDF	47.0	2.50	50	0	94	77 - 128	45.7	2.85	20	
1,2,3,6,7,8-HxCDF	49.5	2.50	50	0	99	68 - 141	50.44	1.84	20	
2,3,4,6,7,8-HxCDF	49.6	2.50	50	0	99	73 - 140	49.14	0.972	20	
1,2,3,7,8,9-HxCDF	48.3	2.50	50	0	97	79 - 130	46.7	3.45	20	
1,2,3,4,6,7,8-HpCDF	47.9	2.50	50	0	96	68 - 136	45.8	4.40	20	
1,2,3,4,7,8,9-HpCDF	44.8	2.50	50	0	90	65 - 143	44.44	0.807	20	
OCDF	94.1	5.00	100	0	94	75 - 134	90.44	3.92	20	

**Cleanup Standard**

37Cl-2,3,7,8-TCDD	8.80	10	88	58 - 126
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**Labeled Compound Recovery**

13C-2,3,7,8-TCDD	84.7	100	85	41 - 120
13C-1,2,3,7,8-PeCDD	89.2	100	89	51 - 124
13C-1,2,3,6,7,8-HxCDD	93.2	100	93	49 - 104
13C-1,2,3,4,6,7,8-HpCDD	82.8	100	83	38 - 129
13C-OCDD	152	200	76	10 - 160
13C-2,3,7,8-TCDF	85.6	100	86	49 - 108
13C-1,2,3,7,8-PeCDF	87.6	100	88	47 - 120
13C-1,2,3,4,7,8-HxCDF	86.3	100	86	51 - 106
13C-1,2,3,4,6,7,8-HpCDF	88.3	100	88	44 - 125

CLIENT: GEOCON Env. Consultants

## ANALYTICAL QC SUMMARY REPORT

Work Order: 2012571

Project: E8695-04-19; Cloverdale South Campus

BatchID:

211916

SampleID: 2012571-001AMS		TestCode: 8290_FULL_S		Units: pg/g-dry			Prep Date: 12/16/2020			
Batch ID: 211916		TestNo: SW8290		Run ID: GC36_201227B			Analysis Date: 12/25/2020			
Analyte	Result	PQL	SPKValue	SPKRefVal	%REC	Limits	RPDRefVal	%RPD	RPDLimit	Qual
2,3,7,8-TCDD	9.42	0.500	10	0	94	67 - 158				
1,2,3,7,8-PeCDD	45.6	2.50	50	0	91	70 - 142				
1,2,3,4,7,8-HxCDD	42.9	2.50	50	0	86	70 - 164				
1,2,3,6,7,8-HxCDD	45.8	2.50	50	0	92	70 - 164				
1,2,3,7,8,9-HxCDD	48.9	2.50	50	0	98	64 - 162				
1,2,3,4,6,7,8-HpCDD	46.1	2.50	50	0	92	70 - 140				
OCDD	96.8	5.00	100	0	97	78 - 144				
2,3,7,8-TCDF	9.12	0.500	10	0	91	75 - 158				
1,2,3,7,8-PeCDF	48.8	2.50	50	0	98	80 - 134				
2,3,4,7,8-PeCDF	91.9	2.50	50	0	184	68 - 160				S
1,2,3,4,7,8-HxCDF	48.5	2.50	50	0	97	72 - 134				
1,2,3,6,7,8-HxCDF	56.9	2.50	50	0	114	84 - 134				
2,3,4,6,7,8-HxCDF	148	2.50	50	0	295	70 - 156				S
1,2,3,7,8,9-HxCDF	132	2.50	50	0	264	78 - 130				S
1,2,3,4,6,7,8-HpCDF	49.5	2.50	50	0	99	82 - 122				
1,2,3,4,7,8,9-HpCDF	69.0	2.50	50	0	138	78 - 138				
OCDF	82.0	5.00	100	0	82	63 - 170				

**Cleanup Standard**

37Cl-2,3,7,8-TCDD	9.16		10		92	31 - 191				
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**Labeled Compound Recovery**

13C-2,3,7,8-TCDD	89.2		100		89	20 - 175				
13C-1,2,3,7,8-PeCDD	86.7		100		87	21 - 227				
13C-1,2,3,6,7,8-HxCDD	87.0		100		87	25 - 163				
13C-1,2,3,4,6,7,8-HpCDD	85.6		100		86	26 - 166				
13C-OCDD	154		200		77	13 - 199				
13C-2,3,7,8-TCDF	104		100		104	22 - 152				
13C-1,2,3,7,8-PeCDF	56.4		100		56	21 - 192				
13C-1,2,3,4,7,8-HxCDF	31.5		100		31	19 - 202				
13C-1,2,3,4,6,7,8-HpCDF	50.3		100		50	21 - 158				

CLIENT: GEOCON Env. Consultants

## ANALYTICAL QC SUMMARY REPORT

Work Order: 2012571

Project: E8695-04-19; Cloverdale South Campus

BatchID:

211916

SampleID: 2012571-001AMSD	TestCode: 8290_FULL_S	Units: pg/g-dry					Prep Date: 12/16/2020			
Batch ID: 211916	TestNo: SW8290	Run ID: GC36_201227B					Analysis Date: 12/25/2020			
Analyte	Result	PQL	SPKValue	SPKRefVal	%REC	Limits	RPDRefVal	%RPD	RPDLimit	Qual
2,3,7,8-TCDD	9.38	0.500	10	0	94	67 - 158	9.42	0.426	30	
1,2,3,7,8-PeCDD	47.2	2.50	50	0	94	70 - 142	45.56	3.58	30	
1,2,3,4,7,8-HxCDD	43.0	2.50	50	0	86	70 - 164	42.92	0.140	30	
1,2,3,6,7,8-HxCDD	47.4	2.50	50	0	95	70 - 164	45.78	3.39	30	
1,2,3,7,8,9-HxCDD	42.3	2.50	50	0	85	64 - 162	48.92	14.5	30	
1,2,3,4,6,7,8-HpCDD	45.6	2.50	50	0	91	70 - 140	46.12	1.09	30	
OCDD	105	5.00	100	0	105	78 - 144	96.82	7.97	30	
2,3,7,8-TCDF	9.32	0.500	10	0	93	75 - 158	9.12	2.17	30	
1,2,3,7,8-PeCDF	49.6	2.50	50	0	99	80 - 134	48.78	1.59	30	
2,3,4,7,8-PeCDF	52.8	2.50	50	0	106	68 - 160	91.86	53.9	30	R
1,2,3,4,7,8-HxCDF	49.4	2.50	50	0	99	72 - 134	48.54	1.68	30	
1,2,3,6,7,8-HxCDF	54.0	2.50	50	0	108	84 - 134	56.88	5.23	30	
2,3,4,6,7,8-HxCDF	52.2	2.50	50	0	104	70 - 156	147.64	95.5	30	R
1,2,3,7,8,9-HxCDF	48.6	2.50	50	0	97	78 - 130	132.16	92.4	30	R
1,2,3,4,6,7,8-HpCDF	50.4	2.50	50	0	101	82 - 122	49.48	1.88	30	
1,2,3,4,7,8,9-HpCDF	45.6	2.50	50	0	91	78 - 138	68.98	40.8	30	R
OCDF	99.1	5.00	100	0	99	63 - 170	82	18.9	30	

**Cleanup Standard**

37Cl-2,3,7,8-TCDD	10.7	10	107	31 - 191
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**Labeled Compound Recovery**

13C-2,3,7,8-TCDD	102	100	102	20 - 175	
13C-1,2,3,7,8-PeCDD	105	100	105	21 - 227	
13C-1,2,3,6,7,8-HxCDD	112	100	112	25 - 163	
13C-1,2,3,4,6,7,8-HpCDD	102	100	102	26 - 166	
13C-OCDD	172	200	86	13 - 199	
13C-2,3,7,8-TCDF	104	100	104	22 - 152	
13C-1,2,3,7,8-PeCDF	104	100	104	21 - 192	R
13C-1,2,3,4,7,8-HxCDF	103	100	103	19 - 202	R
13C-1,2,3,4,6,7,8-HpCDF	106	100	106	21 - 158	R





## Quality Control Report

**Client:** GEOCON Env. Consultants

**Date Prepared:** 12/11/2020

**Date Analyzed:** 12/11/2020 - 12/14/2020

**Instrument:** ICP-MS4

**Matrix:** Soil

**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571

**BatchID:** 211119

**Extraction Method:** SW3050B

**Analytical Method:** SW6020

**Unit:** mg/kg

**Sample ID:** MB/LCS/LCSD-211119

### QC Summary Report for Metals

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Antimony	ND	0.160	0.500	-	-	-
Arsenic	ND	0.150	0.500	-	-	-
Barium	ND	0.570	5.00	-	-	-
Beryllium	ND	0.0730	0.500	-	-	-
Cadmium	ND	0.0610	0.500	-	-	-
Chromium	ND	0.130	0.500	-	-	-
Cobalt	ND	0.0520	0.500	-	-	-
Copper	ND	0.180	0.500	-	-	-
Lead	ND	0.140	0.500	-	-	-
Mercury	ND	0.0320	0.0500	-	-	-
Molybdenum	ND	0.160	0.500	-	-	-
Nickel	ND	0.170	0.500	-	-	-
Selenium	ND	0.150	0.500	-	-	-
Silver	ND	0.120	0.500	-	-	-
Thallium	ND	0.0670	0.500	-	-	-
Vanadium	ND	0.130	0.500	-	-	-
Zinc	4.13,J	3.00	5.00	-	-	-
<b>Surrogate Recovery</b>						
Terbium	506			500	101	70-130



## Quality Control Report

**Client:** GEOCON Env. Consultants

**Date Prepared:** 12/11/2020

**Date Analyzed:** 12/11/2020 - 12/14/2020

**Instrument:** ICP-MS4

**Matrix:** Soil

**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571

**BatchID:** 211119

**Extraction Method:** SW3050B

**Analytical Method:** SW6020

**Unit:** mg/kg

**Sample ID:** MB/LCS/LCSD-211119

### QC Summary Report for Metals

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Antimony	47.0	47.2	50	94	94	75-125	0.357	20
Arsenic	49.0	49.1	50	98	98	75-125	0.298	20
Barium	473	480	500	95	96	75-125	1.59	20
Beryllium	46.4	46.7	50	93	93	75-125	0.589	20
Cadmium	48.6	48.2	50	97	96	75-125	0.729	20
Chromium	48.5	48.2	50	97	96	75-125	0.767	20
Cobalt	48.1	48.2	50	96	96	75-125	0.0935	20
Copper	49.1	49.8	50	98	100	75-125	1.50	20
Lead	47.8	48.3	50	96	97	75-125	1.02	20
Mercury	1.21	1.23	1.25	97	98	75-125	1.39	20
Molybdenum	48.3	48.7	50	97	97	75-125	0.808	20
Nickel	49.0	49.7	50	98	99	75-125	1.31	20
Selenium	47.8	48.4	50	96	97	75-125	1.31	20
Silver	46.4	46.9	50	93	94	75-125	1.02	20
Thallium	47.0	47.4	50	94	95	75-125	0.853	20
Vanadium	48.9	48.6	50	98	97	75-125	0.773	20
Zinc	482	491	500	96	98	75-125	1.76	20
<b>Surrogate Recovery</b>								
Terbium	496	504	500	99	101	70-130	1.45	20



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(925) 252-9262

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 2012571

ClientCode: GECL

☐ WaterTrax☐ WriteOn☐ EDF☐ EQUIS☐ Dry-Weight☒ Email☐ HardCopy☐ ThirdParty☐ J-flag☐ Detection Summary☐ Excel**Report to:**

Shane Rodacker  
GEOCON Env. Consultants  
6671 Brisa St  
Livermore, CA 94550  
(925) 961-1270 FAX: 925-371-5915

Email: rodacker@geoconinc.com

cc/3rd Party:

PO:

Project: E8695-04-19; Cloverdale South Campus

**Bill to:**

Accounts Payable  
GEOCON Env. Consultants  
6671 Brisa St  
Livermore, CA 94550  
DONTSEND!!!! elisa@mcccampbell.com;

**Requested TATs: 15 days;  
5 days;**

**Date Received: 12/10/2020****Date Logged: 12/11/2020**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
2012571-001	E1-0.5-1	Soil	12/10/2020 12:25	<input type="checkbox"/>	A	A	A									
2012571-002	E2-0.5-1	Soil	12/10/2020 12:35	<input type="checkbox"/>	A	A	A									
2012571-003	E3-0.5-1	Soil	12/10/2020 12:45	<input type="checkbox"/>	A	A	A									
2012571-004	E4-0.5-1	Soil	12/10/2020 12:55	<input type="checkbox"/>	A	A	A									
2012571-005	E5-0.5-1	Soil	12/10/2020 13:05	<input type="checkbox"/>	A	A	A									

**Test Legend:**

1	8290_FULL_S
5	
9	

2	CAM17MS_TTLC_S
6	
10	

3	PRDisposal Fee
7	
11	

4	
8	
12	

**Project Manager: Angela Rydelius****Prepared by: Maria Venegas****Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
Hazardous samples will be returned to client or disposed of at client expense.



McC Campbell Analytical, Inc.

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701  
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269  
http://www.mccampbell.com / E-mail: main@mccampbell.com

## WORK ORDER SUMMARY

**Client Name:** GEOCON ENV. CONSULTANTS

**Client Contact:** Shane Rodacker

**Contact's Email:** rodacker@geoconinc.com

**Project:** E8695-04-19; Cloverdale South Campus

**Comments:**

**Work Order:** 2012571

**QC Level:** LEVEL 2

**Date Logged:** 12/11/2020

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☒ EQUIS ☒ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	DryWeight	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
2012571-001A	E1-0.5-1	Soil	SW6020 (CAM 17)	1	Stainless Steel tube 2.5"x6"	<input type="checkbox"/>	12/10/2020 12:25	5 days		<input type="checkbox"/>	
			SW8290 (PCDDs & PCDFs)			<input type="checkbox"/>		15 days		<input type="checkbox"/>	
2012571-002A	E2-0.5-1	Soil	SW6020 (CAM 17)	1	Stainless Steel tube 2.5"x6"	<input type="checkbox"/>	12/10/2020 12:35	5 days		<input type="checkbox"/>	
			SW8290 (PCDDs & PCDFs)			<input type="checkbox"/>		15 days		<input type="checkbox"/>	
2012571-003A	E3-0.5-1	Soil	SW6020 (CAM 17)	1	Stainless Steel tube 2.5"x6"	<input type="checkbox"/>	12/10/2020 12:45	5 days		<input type="checkbox"/>	
			SW8290 (PCDDs & PCDFs)			<input type="checkbox"/>		15 days		<input type="checkbox"/>	
2012571-004A	E4-0.5-1	Soil	SW6020 (CAM 17)	1	Stainless Steel tube 2.5"x6"	<input type="checkbox"/>	12/10/2020 12:55	5 days		<input type="checkbox"/>	
			SW8290 (PCDDs & PCDFs)			<input type="checkbox"/>		15 days		<input type="checkbox"/>	
2012571-005A	E5-0.5-1	Soil	SW6020 (CAM 17)	1	Stainless Steel tube 2.5"x6"	<input type="checkbox"/>	12/10/2020 13:05	5 days		<input type="checkbox"/>	
			SW8290 (PCDDs & PCDFs)			<input type="checkbox"/>		15 days		<input type="checkbox"/>	

**NOTES:** - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

Temp 3.8 °C Initials JP



## Sample Receipt Checklist

Client Name: **GEOCON Env. Consultants**  
Project: **E8695-04-19; Cloverdale South Campus**  
WorkOrder No: **2012571** Matrix: Soil  
Carrier: Client Drop-In

Date and Time Received: **12/10/2020 15:15**  
Date Logged: **12/11/2020**  
Received by: Tina Perez  
Logged by: Maria Venegas

### Chain of Custody (COC) Information

Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample IDs noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Date and Time of collection noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sampler's name noted on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
COC agrees with Quote?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

### Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper containers/bottles?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

### Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Samples Received on Ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

(Ice Type: WET ICE )

Sample/Temp Blank temperature	Temp: 3.8°C	NA <input type="checkbox"/>
Water - VOA vials have zero headspace / no bubbles?	Yes <input type="checkbox"/> No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Sample labels checked for correct preservation?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
pH acceptable upon receipt (Metal: <2; Nitrate 353.2/4500NO <sub>3</sub> : <2; 522: <4; 218.7: >8)?	Yes <input type="checkbox"/> No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

### UCMR Samples:

pH tested and acceptable upon receipt (200.8: ≤2; 525.3: ≤4; 530: ≤7; 541: <3; 544: <6.5 & 7.5)?	Yes <input type="checkbox"/> No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Free Chlorine tested and acceptable upon receipt (<0.1mg/L)?	Yes <input type="checkbox"/> No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Comments:



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 2012571 A

**Report Created for:** GEOCON Env. Consultants

6671 Brisa St  
Livermore, CA 94550

**Project Contact:** Shane Rodacker

**Project P.O.:**

**Project:** E8695-04-19; Cloverdale South Campus

**Project Received:** 12/10/2020

Analytical Report reviewed & approved for release on 01/29/2021 by:

Christine Askari  
Project Manager

*The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in a case narrative.*







## Glossary of Terms & Qualifier Definitions

**Client:** GEOCON Env. Consultants  
**Project:** E8695-04-19; Cloverdale South Campus  
**WorkOrder:** 2012571 A

### Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
CPT	Consumer Product Testing not NELAP Accredited
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
LQL	Lowest Quantitation Level
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDS D	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
TZA	TimeZone Net Adjustment for sample collected outside of MAI's UTC.
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)





## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 01/26/2021  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW1311/SW3010  
**Analytical Method:** SW6020  
**Unit:** mg/L

### Metals (TCLP)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E1-0.5-1	2012571-001A	Soil	12/10/2020 12:25	ICP-MS5 137SMPL.d	213917

Analytes	Result	RL	DF	Date Analyzed
Chromium	ND	0.10	1	01/28/2021 11:00

Analyst(s): WV

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E2-0.5-1	2012571-002A	Soil	12/10/2020 12:35	ICP-MS5 187SMPL.d	213917

Analytes	Result	RL	DF	Date Analyzed
Chromium	ND	0.10	1	01/28/2021 13:46

Analyst(s): JAG

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E3-0.5-1	2012571-003A	Soil	12/10/2020 12:45	ICP-MS5 188SMPL.d	213917

Analytes	Result	RL	DF	Date Analyzed
Chromium	ND	0.10	1	01/28/2021 13:49

Analyst(s): JAG

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E4-0.5-1	2012571-004A	Soil	12/10/2020 12:55	ICP-MS5 189SMPL.d	213917

Analytes	Result	RL	DF	Date Analyzed
Chromium	ND	0.10	1	01/28/2021 13:52

Analyst(s): JAG

(Cont.)



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 01/26/2021  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** SW1311/SW3010  
**Analytical Method:** SW6020  
**Unit:** mg/L

### Metals (TCLP)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E5-0.5-1	2012571-005A	Soil	12/10/2020 13:05	ICP-MS5 190SMPL.d	213917

Analytes	Result	RL	DF	Date Analyzed
Chromium	ND	0.10	1	01/28/2021 13:56

Analyst(s): JAG



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 01/26/2021  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** CA Title 22  
**Analytical Method:** SW6020  
**Unit:** mg/L

### Metals (STLC)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E1-0.5-1	2012571-001A	Soil	12/10/2020 12:25	ICP-MS5 290SMPL.d	213916

Analytes	Result	RL	DF	Date Analyzed
Chromium	0.41	0.10	1	01/28/2021 20:36
Nickel	3.8	0.10	1	01/28/2021 20:36

Analyst(s): DB

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E2-0.5-1	2012571-002A	Soil	12/10/2020 12:35	ICP-MS5 323SMPL.d	213916

Analytes	Result	RL	DF	Date Analyzed
Chromium	0.32	0.10	1	01/28/2021 22:25
Nickel	7.1	0.10	1	01/28/2021 22:25

Analyst(s): DB

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E3-0.5-1	2012571-003A	Soil	12/10/2020 12:45	ICP-MS5 324SMPL.d	213916

Analytes	Result	RL	DF	Date Analyzed
Chromium	0.26	0.10	1	01/28/2021 22:28
Nickel	6.1	0.10	1	01/28/2021 22:28

Analyst(s): DB

(Cont.)



## Analytical Report

**Client:** GEOCON Env. Consultants  
**Date Received:** 12/10/2020 15:15  
**Date Prepared:** 01/26/2021  
**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571  
**Extraction Method:** CA Title 22  
**Analytical Method:** SW6020  
**Unit:** mg/L

### Metals (STLC)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E4-0.5-1	2012571-004A	Soil	12/10/2020 12:55	ICP-MS5 325SMPL.d	213916

Analytes	Result	RL	DF	Date Analyzed
Chromium	0.22	0.10	1	01/28/2021 22:32
Nickel	2.5	0.10	1	01/28/2021 22:32

Analyst(s): DB

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
E5-0.5-1	2012571-005A	Soil	12/10/2020 13:05	ICP-MS5 326SMPL.d	213916

Analytes	Result	RL	DF	Date Analyzed
Chromium	0.14	0.10	1	01/28/2021 22:35
Nickel	1.5	0.10	1	01/28/2021 22:35

Analyst(s): DB



## Quality Control Report

<b>Client:</b>	GEOCON Env. Consultants	<b>WorkOrder:</b>	2012571
<b>Date Prepared:</b>	01/26/2021	<b>BatchID:</b>	213917
<b>Date Analyzed:</b>	01/28/2021	<b>Extraction Method:</b>	SW1311/SW3010
<b>Instrument:</b>	ICP-MS5	<b>Analytical Method:</b>	SW6020
<b>Matrix:</b>	Soil	<b>Unit:</b>	mg/L
<b>Project:</b>	E8695-04-19; Cloverdale South Campus	<b>Sample ID:</b>	MB/LCS/LCSD-213917 2012571-001AMS/MSD

### QC Summary Report for Metals (TCLP)

Analyte	MB Result	MDL	RL			
Chromium	ND	0.100	0.100	-	-	-

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Chromium	9.74	9.66	10	97	97	75-125	0.809	20

Analyte	MS DF	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Chromium	1	9.71	9.81	10	ND	97	98	75-125	1.04	20

Analyte	DLT Result	DLTRef Val	%D	%D Limit
Chromium	ND<0.500	ND	-	-

%D Control Limit applied to analytes with concentrations greater than 25 times the reporting limits.



## Quality Control Report

**Client:** GEOCON Env. Consultants

**Date Prepared:** 01/26/2021

**Date Analyzed:** 01/28/2021

**Instrument:** ICP-MS5

**Matrix:** Soil

**Project:** E8695-04-19; Cloverdale South Campus

**WorkOrder:** 2012571

**BatchID:** 213916

**Extraction Method:** CA Title 22

**Analytical Method:** SW6020

**Unit:** mg/L

**Sample ID:** MB/LCS/LCSD-213916  
2012571-001AMS/MSD

### QC Summary Report for Metals (STLC)

Analyte	MB Result	MDL	RL			
Chromium	ND	0.100	0.100	-	-	-
Nickel	ND	0.100	0.100	-	-	-

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Chromium	10.4	9.94	10	104	99	75-125	4.59	20
Nickel	10.4	9.92	10	104	99	75-125	4.81	20

Analyte	MS DF	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Chromium	1	10.1	10.0	10	0.4112	97	96	75-125	0.834	20
Nickel	1	13.8	13.6	10	3.837	100	98	75-125	1.54	20



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# CHAIN-OF-CUSTODY RECORD

Page 1 of 1

WorkOrder: 2012571 A

ClientCode: GECL

☐ WaterTrax☐ WriteOn☐ EDF☐ EQUIS☐ Dry-Weight☒ Email☐ HardCopy☐ ThirdParty☐ J-flag☐ Detection Summary☐ Excel

## Report to:

Shane Rodacker  
GEOCON Env. Consultants  
6671 Brisa St  
Livermore, CA 94550  
(925) 961-1270 FAX: 925-371-5915

Email: rodacker@geoconinc.com

cc/3rd Party:

PO:

Project: E8695-04-19; Cloverdale South Campus

## Bill to:

Accounts Payable  
GEOCON Env. Consultants  
6671 Brisa St  
Livermore, CA 94550  
DONTSEND!!!! elisa@mccampbell.com;

Requested TAT: 5 days;

Date Received: 12/10/2020

Date Logged: 12/11/2020

Date Add-On: 01/22/2021

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
2012571-001	E1-0.5-1	Soil	12/10/2020 12:25	<input type="checkbox"/>	A	A										
2012571-002	E2-0.5-1	Soil	12/10/2020 12:35	<input type="checkbox"/>	A	A										
2012571-003	E3-0.5-1	Soil	12/10/2020 12:45	<input type="checkbox"/>	A	A										
2012571-004	E4-0.5-1	Soil	12/10/2020 12:55	<input type="checkbox"/>	A	A										
2012571-005	E5-0.5-1	Soil	12/10/2020 13:05	<input type="checkbox"/>	A	A										

## Test Legend:

1	CRMS_TCLP_S
5	
9	

2	METALSMS_STLC_S
6	
10	

3	
7	
11	

4	
8	
12	

Project Manager: Angela Rydelius

Prepared by: Maria Venegas

Add-On Prepared By: Maria Venegas

Comments: STLC &amp; TCLP added 1/22/21 STAT.

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
Hazardous samples will be returned to client or disposed of at client expense.



## WORK ORDER SUMMARY

**Client Name:** GEOCON ENV. CONSULTANTS

**Client Contact:** Shane Rodacker

**Contact's Email** rodacker@geoconinc.com

**Project:** E8695-04-19; Cloverdale South Campus

**Comments:** STLC & TCLP added 1/22/21 STAT.

**Work Order:** 2012571

**QC Level:** LEVEL 2

**Date Logged:** 12/11/2020

**Date Add-On:** 1/22/2021

LabID	ClientSampID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	Head Space	Dry-Weight	Collection Date & Time	TAT	Test Due Date	Sediment Content	Hold	SubOut
001A	E1-0.5-1	Soil	SW6020 (Metals) (STLC) <Chromium, Nickel> SW6020 (Chromium) (TCLP)	1	Stainless Steel tube 2.5"x6"	<input type="checkbox"/>	<input type="checkbox"/>	12/10/2020 12:25	5 days*	2/3/2021		<input type="checkbox"/>	
						<input type="checkbox"/>	<input type="checkbox"/>		5 days*	2/3/2021		<input type="checkbox"/>	
002A	E2-0.5-1	Soil	SW6020 (Metals) (STLC) <Chromium, Nickel> SW6020 (Chromium) (TCLP)	1	Stainless Steel tube 2.5"x6"	<input type="checkbox"/>	<input type="checkbox"/>	12/10/2020 12:35	5 days*	2/3/2021		<input type="checkbox"/>	
						<input type="checkbox"/>	<input type="checkbox"/>		5 days*	2/3/2021		<input type="checkbox"/>	
003A	E3-0.5-1	Soil	SW6020 (Metals) (STLC) <Chromium, Nickel> SW6020 (Chromium) (TCLP)	1	Stainless Steel tube 2.5"x6"	<input type="checkbox"/>	<input type="checkbox"/>	12/10/2020 12:45	5 days*	2/3/2021		<input type="checkbox"/>	
						<input type="checkbox"/>	<input type="checkbox"/>		5 days*	2/3/2021		<input type="checkbox"/>	
004A	E4-0.5-1	Soil	SW6020 (Metals) (STLC) <Chromium, Nickel> SW6020 (Chromium) (TCLP)	1	Stainless Steel tube 2.5"x6"	<input type="checkbox"/>	<input type="checkbox"/>	12/10/2020 12:55	5 days*	2/3/2021		<input type="checkbox"/>	
						<input type="checkbox"/>	<input type="checkbox"/>		5 days*	2/3/2021		<input type="checkbox"/>	
005A	E5-0.5-1	Soil	SW6020 (Metals) (STLC) <Chromium, Nickel> SW6020 (Chromium) (TCLP)	1	Stainless Steel tube 2.5"x6"	<input type="checkbox"/>	<input type="checkbox"/>	12/10/2020 13:05	5 days*	2/3/2021		<input type="checkbox"/>	
						<input type="checkbox"/>	<input type="checkbox"/>		5 days*	2/3/2021		<input type="checkbox"/>	

**NOTES:** \* STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.







# EMSL Analytical, Inc.

464 McCormick Street San Leandro, CA 94577

Phone/Fax: (510) 895-3675 / (510) 895-3680

<http://www.EMSL.com> / [sanleandrolab@emsl.com](mailto:sanleandrolab@emsl.com)

EMSL Order: 092021554

Customer ID: GECN21

Customer PO: E8695-04-19

Project ID:

**Attention:** Shane Rodacker  
Geocon Consultants, Inc.  
6671 Brisa Street  
Livermore, CA 94550

**Phone:** (925) 371-5900  
**Fax:** (925) 371-5915  
**Received:** 12/11/2020 2:30 PM  
**Analysis Date:** 12/17/2020  
**Collected:** 12/10/2020

**Project:** E8695-04-19

## Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
B1-5.5-5.75 092021554-0001	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
B3-5.5-5.75 092021554-0002	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
B7-5.5-5.75 092021554-0003	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
B8-5.5-5.75 092021554-0004	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
B14-5.5-5.75 092021554-0005	SOIL	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Van (Rebecca) Huynh (5)

Cecilia Yu, Laboratory Manager  
or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. EMSL suggests that samples reported as <0.25% or none detected undergo additional analysis via TEM.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA

Initial report from: 12/17/2020 12:15:49



Project No. E8695-04-21  
March 1, 2021

Cloverdale Unified School District  
97 School Street  
Cloverdale, California 95425

Attention: Mr. Kevin Little

Subject: SOIL VAPOR SAMPLING AND ANALYSIS  
CLOVERDALE UNIFIED SCHOOL DISTRICT - VACANT LOT  
SONOMA COUNTY ASSESSOR'S PARCEL NUMBER 117-040-055  
KELLY ROAD  
CLOVERDALE, CALIFORNIA

Dear Mr. Little:

Geocon Consultants, Inc. (Geocon) performed soil vapor sampling and analysis for the Cloverdale Unified School District (CUSD) as presented in our proposal number E8695-04-19 dated December 10, 2020 and authorized on December 15, 2020. The soil vapor sampling and analysis was conducted at the request of Dudek whom identified six general areas for soil vapor assessment on the CUSD-owned vacant lot, located approximately 450 feet southwest of South Cloverdale Boulevard, on the northwestern side of Kelly Road (the Site), in Cloverdale, California (Figure 1). The Site is identified by Sonoma County assessor's parcel number 117-040-055. The Site is being assessed for future use as sports fields and CUSD facilities.

We prepared a workplan and site-specific Health and Safety Plan (Appendix A) for the County of Sonoma Department of Health Services, Environmental Health and Safety (EHS) as part of our boring permit application. EHS issued permit number SR0017715 (Appendix B) on January 26, 2021 to construct six temporary soil vapor wells at the Site. As required, we contacted EHS on February 4, 2021 to notify them of our field activities on February 9, 2021.

On February 3, 2021 we marked the boring locations at the Site with stakes and white paint then contacted Underground Service Alert (USA) so that USA could notify subscribing local utility companies to locate underground utilities in the vicinity of the onsite investigation areas (USA Ticket Number X103403438).

On February 9, 2021, Penecore Drilling (Penecore, C57-license #906899) used direct-push equipment to advance six borings to a depth of 5.5 feet for soil vapor well installation. Penecore advanced borings and installed six soil vapor wells as described in our workplan. As described in our workplan, each boring was tested for permeability prior to installing the soil vapor well. A vacuum was encountered, indicating low permeability conditions and no vapor flow, at the initial location for SV5; therefore, we moved the location approximately 20 feet to the southwest. This location had greater permeability than the original SV5 and a temporary well was constructed. Geocon collected soil vapor samples from each of the temporary soil vapor wells SV1 through SV6 (Figure 2), as described in our workplan. Readings collected during the sampling are provided in the soil vapor sampling field sheets (Appendix C). After sampling was completed, Penecore abandoned the temporary soil vapor wells by removing the tubing, filling the hole with neat cement, and patching the surface to match the surrounding area.

Geocon delivered the soil vapor samples under chain-of-custody protocol to Eurofins Air Toxics (Air Toxics) in Folsom, California. Air Toxics analyzed soil vapor samples for volatile organic compounds by United States

Environmental Protection Agency Method TO-15 and for oxygen and helium by ASTM Standard 1946. The laboratory analytical reports are in Appendix D.

This letter has been prepared exclusively for the Cloverdale Unified School District. The information contained herein is only valid as of the date of the report. This is not a comprehensive site characterization and should not be construed as such. The data as presented in this letter are predicated on the results of the limited sampling and laboratory testing performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein. Therefore, this letter should be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this letter or any subsequent reports, correspondence or consultation. Geocon strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

If you have any questions regarding the content of this correspondence, please contact the undersigned at your convenience.

Sincerely,  
**GEOCON CONSULTANTS, INC.**



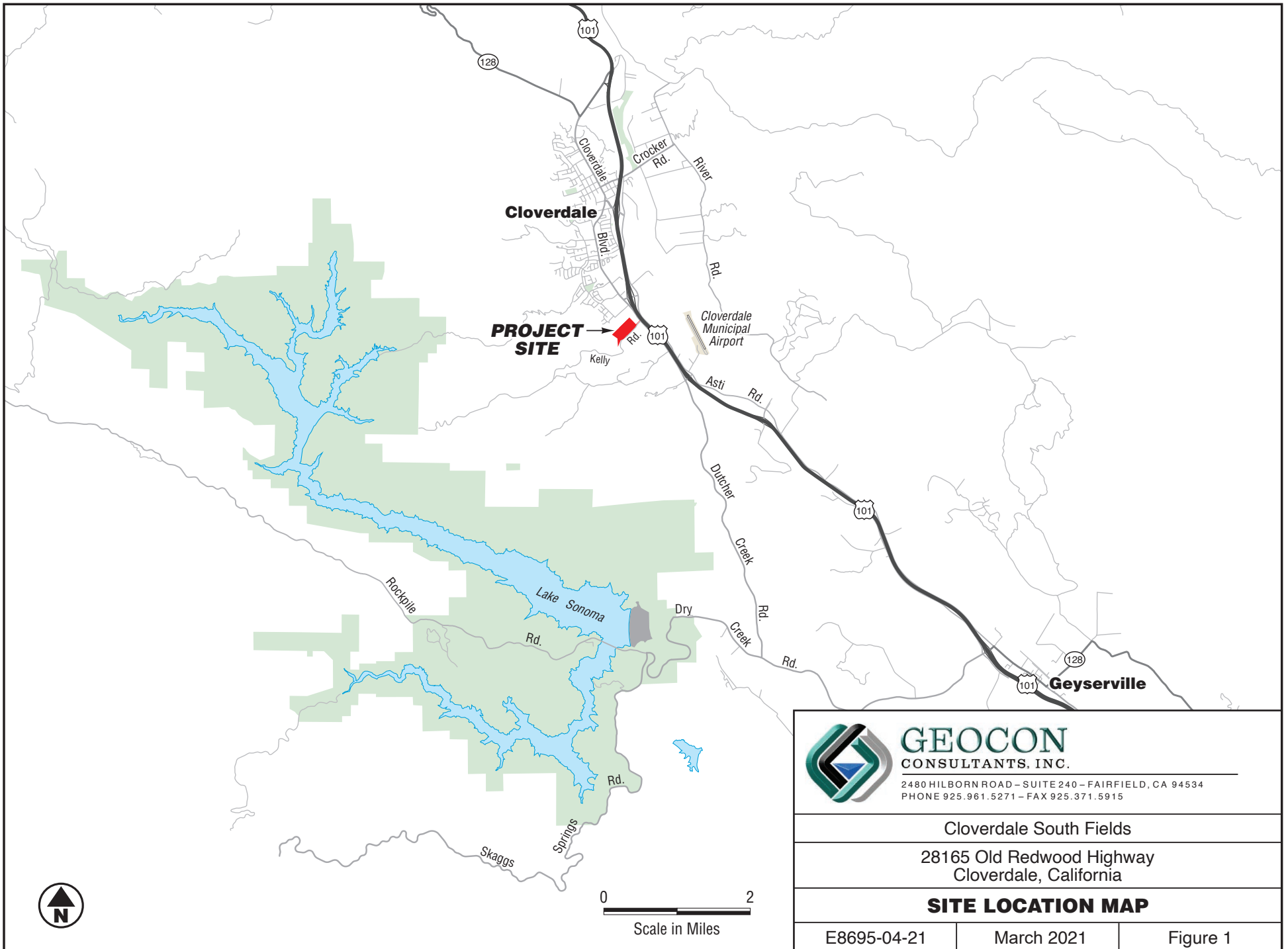
Suzanne Nase  
Project Geologist



Shane Rodacker, GE  
Vice President

Figures:        Figure 1, Site Location Map  
                    Figure 2, Sample Location Map

Attachments: Appendix A, Approved Workplan  
                    Appendix B, Soil Boring Permit  
                    Appendix C, Soil Vapor Sampling Field Sheets  
                    Appendix D, Analytical Laboratory Reports




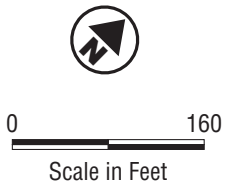




LEGEND:

— Approximate Site Boundary

SV1  Approximate Soil Vapor Sample Location



 <b>GEOCON</b> CONSULTANTS, INC. 2480 HILBORN ROAD – SUITE 240 – FAIRFIELD, CA 94534 PHONE 925.961.5271 – FAX 925.371.5915		
Cloverdale South Fields		
28165 Old Redwood Highway Cloverdale, California		
<b>SITE PLAN</b>		
E8695-04-21	March 2021	Figure 2



# APPENDIX

A



Project No. E8695-04-21  
January 19, 2021

VIA ELECTRONIC MAIL

County of Sonoma Department of Health Services  
Environmental Health and Safety  
625 5<sup>th</sup> Street  
Santa Rosa, California 95404

Subject: SOIL VAPOR ASSESSMENT WORKPLAN  
CLOVERDALE UNIFIED SCHOOL DISTRICT - VACANT LOT  
SONOMA COUNTY ASSESSOR'S PARCEL NUMBER 117-040-055  
28165 OLD REDWOOD HIGHWAY  
CLOVERDALE, CALIFORNIA

To whom this may concern:

Geocon Consultants, Inc. is submitting this workplan to the County of Sonoma Department of Health Services, Environmental Health and Safety (EHS) for advancement of soil borings for a soil vapor assessment on a vacant lot (the Site) at 28165 Old Redwood Highway in Cloverdale, California (Figure 1). The Site is identified by Sonoma County assessor's parcel number 117-040-055. This Cloverdale Unified School District (CUSD)-owned property is being assessed for future use for sports fields and CUSD facility services.

The soil vapor assessment will consist of the advancement of six borings for the installation of six temporary soil vapor wells, collection of soil vapor samples, and analysis of the soil vapor samples for volatile organic compounds (VOCs).

## **SOIL VAPOR ASSESSMENT**

We will implement the following tasks for our soil vapor assessment:

- Task 1 – Pre-field activities: health and safety planning, permitting, and utility clearance;
- Task 2 – Field activities: boring advancement, temporary soil vapor well installation, soil vapor sample collection, and well removal;
- Task 3 – Laboratory analysis of soil vapor samples; and
- Task 4 – Report preparation.

Following are descriptions of each of these tasks.

### **Task 1 – Pre-field Activities**

#### **Health and Safety Planning**

We will prepare a site-specific Health and Safety Plan (HSP) describing the physical and chemical hazards at the Site and providing health and safety guidelines protective of Geocon and subcontractor field personnel (a copy of the HSP is attached).



## **Permitting**

We will submit this workplan to, obtain a boring permit from, and provide advanced notification of field activities to EHS for advancement of borings for soil vapor sampling.

## **Utility Clearance**

We will mark boring locations at the Site with white paint then contact Underground Service Alert (USA) a minimum of 72 hours prior to the start of field activities so that subscribing public utilities can mark their subsurface utilities and conduits on and in proximity to the Site.

## **Subcontractor Procurement**

We will retain Penecore Drilling (Penecore), a C57-licensed drilling contractor, to advance borings, install, and abandon six temporary soil vapor wells. We will also retain Eurofins Air Toxics (Air Toxics) of Folsom, California to provide soil vapor sampling equipment for and chemical analysis of soil vapor samples.

## **Task 2 – Boring Advancement, Temporary Soil Vapor Well Installation, Soil Vapor Sample Collection, and Well Removal**

### **Boring Advancement and Temporary Soil Vapor Well Installation**

Penecore will use direct-push equipment to advance six 1.5-inch-diameter borings using post-run-tubing (PRT) rods fitted with a stainless steel drop-tip to a depth of 5.5 feet for soil vapor well installation and sample collection.

Each boring will be tested for permeability prior to installing a soil vapor well. Soil permeability is tested by running tubing through the PRT rods and exerting pressure with a syringe for tightness. If the connection is tight (no air is able to be pulled into the syringe), then the rods are lifted approximately 6 inches, releasing the drop tip and exposing the formation. If we are able to pull approximately 500 milliliters of soil vapor through a syringe, then we assume the permeability of the boring to be acceptable and we install the temporary soil vapor well. If vacuum pressure is encountered (no or little soil vapor flow), then Penecore will raise the rods another 6-inches, but no more than 4.0 feet and conducted the permeability test processes again. If vacuum pressure is still encountered at a depth less than 4.0 feet, then we will direct Penecore to move at least 5 feet or more to advance a new boring, and conduct the permeability test process again. Borings in which wells are not constructed will be backfilled with cement grout.

To install each soil vapor well, we will:

- Construct a well using 0.125-inch-diameter Nylaflow® tubing fitted with a 1.75-inch-long, stainless steel vapor probe tip with a 0.0057-inch, wire-wrapped screen and extend the Nylaflow® tubing approximately 2 feet above the ground surface for connection to soil vapor sampling equipment;
- Place the vapor probe tip at a depth of approximately 5 feet, and a filter pack consisting of #30 silica sand around it and the tubing from the bottom of the boring to a depth of approximately 4.5 feet;
- Place dry granular bentonite clay above the filter pack from approximately 4 to 4.5 feet;

- Place hydrated granular bentonite clay from above the dry granular bentonite clay at 4 feet to the ground surface (to create a seal to separate the soil vapor probe from atmospheric air); and
- Cap the Nylaflow® tubing with a polypropylene ball valve in the closed position.

### **Soil Vapor Sampling**

We will wait a minimum of 2 hours following installation of the soil vapor wells to allow subsurface conditions to equilibrate prior to sampling. We will collect soil vapor samples following guidelines in *Advisory-Active Soil Gas Investigation* (California Environmental Protection Agency, et al., 2015) and as outlined below:

- Assemble and attach the soil vapor manifold to the Nylaflow tubing using a Swagelok fitting with the well valve in the closed position.
- Encompass the manifold and the 1 liter Summa canister used for sampling with a plastic shroud.
- Conduct a shut-in test by exerting a vacuum inside the manifold using the 6-liter Summa canister with the polypropylene ball valve in the closed position to the soil vapor well. If the vacuum is not maintained for a duration of 5 minutes, we will adjust the fittings and repeat the vacuum application on the assembly until a successful shut-in test is achieved.
- Place a helium detector inside the shroud to monitor helium concentrations. Seal the shroud and fill with helium and maintain a minimum helium concentration of 20% throughout purging and sampling.
- Open the polypropylene ball valve to the soil vapor well and purge three soil vapor well volumes using the 6-liter Summa canister.
- Once the appropriate volume of soil vapor has been purged, we will close the purge valve and manifold valve, leaving the “sample train” open to the soil vapor well. Then we will open the sample valve to draw soil vapor into the 1-liter Summa canister at a flow rate of 167 ml/min and at a vacuum of less than 7 in-Hg. Once the 1-liter Summa canister has approximately 5 in-Hg of vacuum remaining, we will stop sampling by closing the sample and soil vapor well valves.
- Disconnect the manifolds from the soil vapor well and label the 1-liter Summa canister in preparation for submittal of the sample to Air Toxics under standard chain-of-custody protocol.

### **Temporary Soil Vapor Well Removal**

We will abandon the temporary soil vapor wells after sampling is complete by removing the tubing, filling the hole with neat cement, and patching the surface to match the surrounding area.

### **Task 3 – Laboratory Analysis**

Air Toxics will analyze the soil vapor samples for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method TO-15 and for oxygen and helium by ASTM 1946. The laboratory will use TO-15 low-level reporting to achieve reporting limits less than the screening levels for benzene, chloroform, naphthalene, and 1,2,4-trichlorobenzene. The laboratory is aware we will be requesting low-level reporting on soil vapor samples. Additionally, because of this request, Summa canisters and manifolds provided by the laboratory will be individually certified as clean.

#### **Task 4 – Report Preparation**

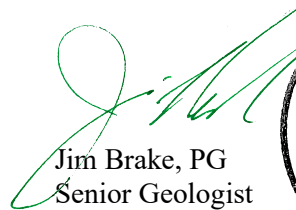
We will prepare and transmit a formal correspondence with soil vapor sampling locations and laboratory analysis results to the Client. We trust this workplan adequately describes the planned soil vapor assessment. Please contact us if you have any questions concerning this workplan.

Sincerely,

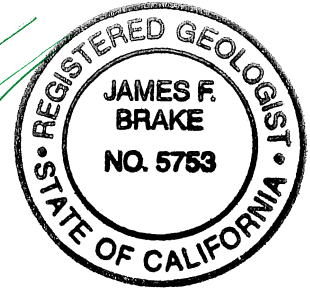
**GEOCON CONSULTANTS, INC.**



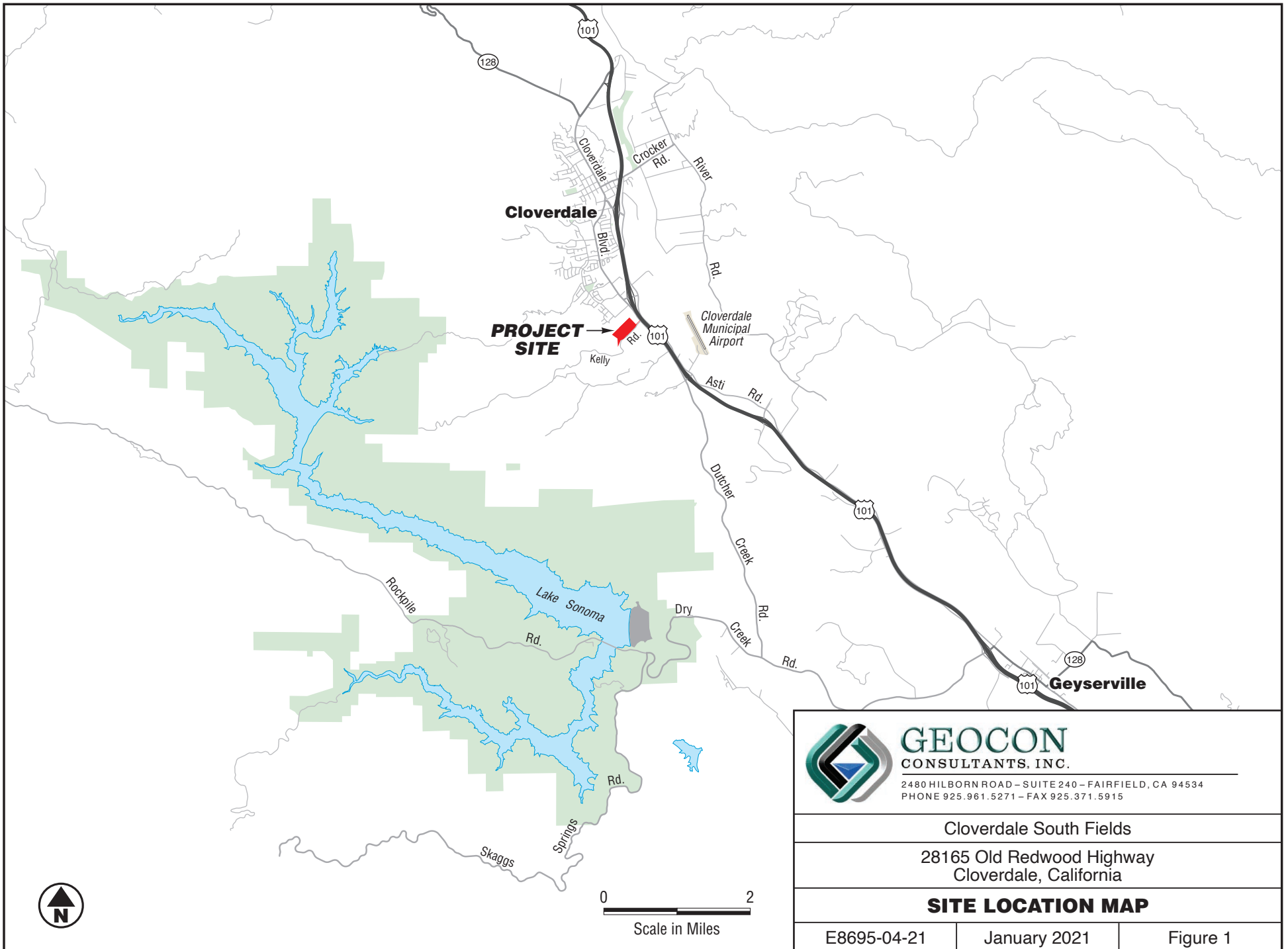
Nicole Hastings-Bethel  
Project Environmental Scientist



Jim Brake, PG  
Senior Geologist



Attachments: Figure 1, Site Location Map  
Figure 2, Sample Location Map  
Health and Safety Plan

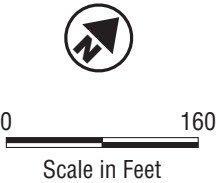






LEGEND:

- Approximate Site Boundary
- SV1  Approximate Soil Vapor Sample Location



 <b>GEOCON</b> CONSULTANTS, INC. <small>2480 HILBORN ROAD – SUITE 240 – FAIRFIELD, CA 94534 PHONE 925.961.5271 – FAX 925.371.5915</small>		
Cloverdale South Fields		
28165 Old Redwood Highway Cloverdale, California		
<b>SITE PLAN</b>		
E8695-04-21	January 2021	Figure 2



# HEALTH AND SAFETY PLAN

---

## SOIL VAPOR ASSESSMENT

CLOVERDALE UNIFIED SCHOOL DISTRICT  
– VACANT LOT  
28165 OLD REDWOOD HIGHWAY  
CLOVERDALE, SONOMA COUNTY,  
CALIFORNIA



**GEOCON**  
CONSULTANTS, INC.

GEOTECHNICAL  
ENVIRONMENTAL  
MATERIALS

PREPARED BY

GEOCON CONSULTANTS, INC.  
2480 HILBORN ROAD, SUITE 240  
FAIRFIELD, CALIFORNIA 94534

PROJECT NO. E8695-04-21

JANUARY 2021

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Attachment A: Volatile Organic Compounds (VOCs) – Brief Summary	
Figure 1 – Site Location Map	



## HEALTH AND SAFETY PLAN SUMMARY

**Site Name:** Cloverdale Unified School District – Vacant Lot

**Site Location:** 28165 Old Redwood Highway in Cloverdale, Sonoma County, California

### Project Representatives:

- |                           |                               |                                |
|---------------------------|-------------------------------|--------------------------------|
| • Project Manager:        | <b>Shane Rodacker</b>         | <b>925-337-9533</b> - Cell No. |
| • Project Safety Officer: | <b>Nicole Hastings-Bethel</b> | <b>805-801-4998</b> - Cell No. |
|                           | <b>Geocon Office No.:</b>     | <b>916-852-9118</b>            |
| • Project CIH:            | <b>Pamela Murcell</b>         | <b>916-712-4547</b> - Cell No. |
|                           | <b>Geocon Office No.:</b>     | <b>530-622-7196</b>            |

### Scope:

- General survey/non-intrusive activities
- Soil vapor sampling - Geoprobe direct-push

### Hazard Summary:

- Mechanical - material handling, slip/trip, struck-by injuries, steep slopes
- Underground Utilities
- Noise – road traffic, drill rig
- Biological - bites or stings
- Chemical – Volatile organic compounds (VOCs)

### Control Summary:

- PPE: Safety vests, hard hats, safety glasses, steel-toed boots
- Site Control - utility location/identification
- Hearing protection – ear plugs or muffs
- Site inspection & awareness; repellent;
- Engineering Controls/Isolation/PPE - safe (wet) sampling methods & work practices; protective gloves; sanitation.

**Hospital Reference:** Healdsburg District Hospital                      **707-431-6300**  
1375 University Ave.  
Healdsburg, California 95448

**Directions:**                      **From the Site:** Head southeast on S. Cloverdale Boulevard/Dutcher Creek Road for 1.5 mile. Turn left to merge onto US-101 South and continue for 12.5 miles. Take exit 505 and turn left onto Dry Creek Road (which turns into March Avenue) for 0.9 miles. Turn left onto University Avenue and hospital will be on the left (see Vicinity Map, Figure 1). Travel time is approximately 20 minutes in normal traffic conditions.

### Emergency Assistance:

Fire/Police/Medical Assistance:	<b>911</b>
Cloverdale Police Department:	<b>707-894-2150</b> – Non-Emergency
Poison Control:	<b>800-222-1222</b>

## **1.0 INTRODUCTION**

This Health and Safety Plan (HSP) is a compilation of health and safety guidelines, policies and/or performance protocols that, when exercised, are intended to reduce or eliminate the potential for injury and exposure during the performance of the activities at the site described below. Conformance with its contents does not warrant that injuries or exposures will not occur.

This HSP is not a training tool and does not contain the degree of detail necessary to train an employee on the appropriate performance, approach and/or equipment-use protocols referenced, herein. Persons working on this project and referring to this HSP shall meet the minimum training requirements described in Section 2.2.

This HSP has been prepared to specifically support the field activities described herein. The provisions described herein apply to employees of Geocon Consultants, Inc. and its subcontractors, only. Representatives of the Client, Client-retained subcontractors, and representatives of state or local government agencies are expected to observe the safety rules and requirements established by their respective organizations, provided they do not conflict with this HSP. However, Geocon will not be responsible for enforcing the conditions of this HSP on these representatives.

The contents of this HSP are based on factors and conditions understood prior to the start of the field activities. If those factors and conditions change during the performance of the activities, including the service scope, or if conditions exist that were not considered in the preparation of this HSP, then such shall be brought to the immediate attention of the person approving this HSP, and the HSP shall be modified, accordingly. The date indicated in Section 8.0 of this document indicates the latest version of this HSP.

All project personnel will review, and become familiar with the elements of the Plan prior to site work. A copy of the Plan will be provided to all subcontractors or designee involved with project activities.

A pre-job conference will be held to delineate roles and responsibilities, discuss key elements of the Plan, and coordinate activities. This Plan is a "working document" to be used by affected personnel. The Plan may be modified at any time in accordance with Section 1.4 to adequately address changing conditions or previously unrecognized exposure hazards which may be encountered during the project. An updated, current copy of the Plan will be maintained at the project site and be available to all affected personnel.

### **1.1 Project Location**

Site Location: 28165 Old Redwood Highway in Cloverdale, Sonoma County, California.

### **1.2 Background**

The Site is being assessed for potential sports fields development. The client has requested a soil vapor survey to assess the Site for contaminant impacts related to offsite commercial/industrial uses that might necessitate mitigation prior to redevelopment of the Site for public use.

### **1.3 Project Purpose and Objectives**

The purpose of the soil vapor assessment will be to assess the potential presence of COCs in soil vapor beneath the Site, and, if present, to determine if COCs pose a threat to human health or the environment. The objective will be to collect a sufficient number of representative soil vapor samples for chemical analysis to meet the purpose of the Soil Vapor Assessment.

### **1.4 Planned Scope of Services**

- Soil vapor sampling – Geoprobe direct-push drill rig

### **1.5 Schedule**

Anticipated Period of Performance: February/March 2021

Anticipated Weather/Temperature: Cool to mild daytime temperatures.

## **2.0 ADMINISTRATIVE REQUIREMENTS/CONTROLS**

### **2.1 Personnel**

Personnel responsible for project safety include the Project Manager (PM), the Project Safety Officer (PSO), the CIH, and participating project personnel.

#### **2.1.1 Project Manager (PM)**

The Project Manager has ultimate authority and responsibility for project Health and Safety. Accordingly she has the responsibility to: develop and approve the HSP (or assign its development); audit compliance with the provisions of this HSP; suspend project activities or modify service practices for health and safety reasons; and, to dismiss from a project site individuals whose onsite conduct either endangers the health and/or safety of others or is judged not to comply with the provisions of the HSP.

The PM is also responsible for sharing/distributing the HSP to participating field personnel and to an authorized representative of each project subcontractor. The PM is responsible for implementing all provisions of the HSP and any applicable addenda. Implementation includes:

- Reviewing and approving the HSP requirements (if prepared by another project member);
- Presenting an overview of the provisions of the HSP with project participants;
- Providing the safety equipment specified herein;
- Collecting and submitting the requisite health and safety documentation (training rosters/certificates, air monitoring records (exposure assessments); site personnel logs, medical approvals), and copying them to the PSO, if appropriate;

**Note:** Monitoring and exposure assessment records will be maintained in accordance with the provisions of T8 CCR §§1532 – Cadmium, 1532.1 – Lead, and 1532.2 – Chromium VI, which is representative of T22 metals, and 3204 – Access to Employee Exposure and Medical Records.

- Designating/identifying a qualified project member as the PSO; and
- Reporting all Plan amendments to the CIH.

### **2.1.2 Project Safety Officer (PSO)**

The designated PSO is responsible for onsite implementation of the HSP. The PSO's responsibilities include:

- Maintaining project safety equipment supplies;
- Directing decontamination procedures, as appropriate;
- Enforcing the provisions of this HSP;
- Directing emergency response operations until public emergency personnel arrive;
- Setting up Site Controls, if needed and as specified herein; and
- Reporting all incidents and infractions to the PM.

The PSO has the authority to suspend project activities any time he/she determines that the provisions of the HSP are inadequate to provide a service/project environment conducive to employee safety. Further, the PSO is to inform the PM of any individuals whose onsite actions jeopardize either their health and safety or the health and safety of others.

### **2.1.3 Certified Industrial Hygienist (CIH)**

The CIH provides industrial hygiene and safety technical support to the PM and PSO. In this capacity they:

- Provides training, as requested;
- Approves or recommends airborne sampling strategies and monitoring equipment;
- Provides technical support for the selection and use of Personal Protective Equipment (PPE); and,
- Provides arbitration on project health and safety issues.

### **2.1.4 Project Field Staff**

All project personnel are responsible for:

- Complying with the provisions of this HSP;
- Performing services in a manner that is consistent with good health and safety practice; and
- Reading and being knowledgeable of the contents of this HSP.

## **2.2 Personnel Training**

### **2.2.1 General Site Employees**

Site employees will attend a project orientation prior to starting the project. The orientation will review all elements of the HSP, including: 1) the location of potential health and safety hazards on the site and 2) requirements of the HSP. The training will also address other Cal/OSHA requirements such as the Geocon Hazard Communication Program (T8 CCR §5194), including the potential hazards of exposure to T22 metals (T8 CCR §§1532 Cadmium, 1532.1 Lead, 1532.2 Chromium VI), and the Injury and Illness Prevention Program (T8 CCR §§3203 and 1509).

### **2.2.2 Tailgate Meetings**

During the active field components of the project PSO will conduct regular (i.e., weekly or daily, as appropriate) “tailgate” safety meetings. These meetings will include information on the following subjects, as applicable:

- Changes to project scope;
- Recognized changes to site conditions;
- Review of safe work practices;
- On or off the project safety practices;
- Feedback from employees on hazards, safety suggestions, or concerns; and
- Recognition for compliance, good safety performance or attitude.

Attendance at the tailgate meetings is considered a part of each employee’s job responsibilities.

## **2.3 Medical Surveillance**

Negative Exposure Assessments for representative sampling tasks, including operation of direct-push drill rig, for heavy metals characterization activities using similar sampling practices and controls, have documented exposures consistently below the 30 µg/m<sup>3</sup> Action Level for inorganic lead (ref. T8 CCR §1532.1). Therefore, additional exposure assessments will not be performed and medical surveillance as specified under T8 CCR §1532.1 is not required or justified for personnel assigned for this project.

Geocon and subcontractor employees, if required to wear respiratory protection shall have a current medical evaluation and approval by a physician or other licensed health care professional (PLHCP). Medical evaluations for Geocon staff will be provided in accordance with the Geocon Respiratory Protective Equipment Program (ref. T8 CCR §5144(e) “Medical Evaluation”).

Project personnel are to arrive at the jobsite well rested and physically prepared to perform assigned tasks.

### 3.0 HAZARD AND CONTROL ANALYSIS

The following hazards were assessed to either exist, or have the potential to develop, during the performance of the project activities:

TASKS	HAZARDS							
	MECHANICAL	UNDERGROUND UTILITIES	NOISE	BIOLOGICAL	RADIOLOGICAL	THERMAL	CHEMICAL	OTHER
Driving	X							
Non-intrusive GPS Survey	X		X	X			X	
Soil boring advancement – direct-push	X	X	X	X			X	
Soil vapor sampling	X			X			X	

#### 3.1 Safe Driving

Hundreds of workers are injured or die in job-related motor vehicle accidents annually. Motor vehicle accidents are one of the number-one causes of employee injuries and deaths. Most accidents can be avoided by practicing defensive driving. Geocon policies mandate that employees:

- Prepare themselves and their vehicle for the road before travel;
- Drive according to posted speed limits unless adverse conditions necessitate slower speeds;
- Never tailgate, employ the three (3) second rule in following vehicles;
- Fully comply with California Vehicle Code and other local laws and regulations regarding the use of cellular phones for communication while driving – talking on a cell phone and/or texting while driving is not only a significant hazard to yourself and others, but also violates Geocon H&S policy; and,
- Use practical driving procedures in cities, on the freeway, and in rural areas.

#### 3.2 Mechanical Hazards

Type(s)/Source:

- Material Handling/Back Injury
- Striking (slips, trips); and
- Struck-by injuries.

Qualified Exposure Risk: Moderate

Hazard Control(s):

- Safe Lifting

- Isolation - shoulder closure traffic control/work methods/no work during inclement weather or darkness.
- PPE – safety shoes/boots, ANSI approved Class III safety vests, hardhats, safety glasses.

### **3.2.1 Material Handling/Back Injury**

Hazard: It is expected that field personnel will be required to lift heavy equipment and supplies and/or perform arduous tasks during this project. Accordingly, back injuries or physical strain may be caused by: routine lifting or one-time-only lifting; the weight of a lifted object; the frequency of lifting; bending, twisting, or rotating during lifting; prolonged sitting; exposure to vibrations; poor arch support in shoes; and, not stretching prior to physical activity. If the following “control” mechanisms are not exercised, debilitating back injury may occur.

Control(s): Before attempting to lift and carry an object, always test its weight first. If it is too heavy, get help. If possible, use mechanical lifting aids. If manageable, the proper method for lifting is:

- Get a good footing;
- Place feet about shoulder width apart;
- Bend knees to pick up load. Never bend from the waist;
- Keep back straight;
- Get a firm hold. Grasp opposite corners of the load, if possible;
- Keep the back as upright as possible;
- Lift gradually by straightening the legs - don't jerk the load;
- Keep the weight as close to the body as possible; and
- When changing directions, turn the entire body, including the feet. Don't twist the body.

If devices are used for handling materials manually (e.g., two-handed lifters, barrel ring clamps, hand trucks, wheelbarrows, etc.), wear protective equipment like gloves and safety shoes to minimize the potential of appendages becoming pinched or smashed between the load and stationary features. Also, avoid overloading the device.

### **3.2.2 "Striking" Injuries**

Hazard: Injuries can, and often, result when a person (a kinetic mass) unexpectedly instigates contact with another kinetic mass. These occurrences typically result from inadvertent slips, trips and falls.

Control(s): To minimize risks of “slip/trip” hazards, personnel shall maintain a constant program of good housekeeping, keeping areas clear of trip hazards and wet and slippery surfaces. All hand tools shall be regularly secured and care shall be taken when entering areas where work is being performed above eye level.

### 3.3 Underground Utilities

Type(s)/Source: Electrical, water, sewer, etc.

Qualified Exposure Risk: Moderate to high – Geoprobe direct-push soil sampling

Hazard Control: Isolation - contact USA

Hazard: Contact with electrical current can cause shock, electrical burns, and/or be instantly fatal. If direct-push drill probe makes contact with electrical wires, it may or may not be insulated from the ground by the tires of the carrier. Under either circumstance, the human body, if it simultaneously comes in contact with the drill rig and the ground, will provide a conductor of the electricity to the ground.

Control(s): Demarcate all drilling/digging locations, first. Contact Underground Service Alert (USA) (1-800-227-2600 or 811) and review as-built plans before performing any excavation/drilling/coring activity. It is advised that a private utility locator be contacted to supplement USA's demarcations, especially when the project is on private property. Soil intrusive work shall not proceed until all locating activities have been completed and fully documented in the site records. The initial site safety orientation meeting for all personnel onsite shall include a review of the underground utility locations and the location of the site map, showing the position of any underground utility lines. The site safety orientation shall include a site walkover of each marked utility or line.

Should a sub-surface condition be encountered that creates suspicion that there may be an unidentified underground line or utility, immediately cease work and secure the equipment. Work will not proceed until the potential risk or condition is resolved.

### 3.4 Noise Hazards

Geoprobe direct-push drill equipment operated at sampling sites may present a noise hazard to employees. In all cases where the sound pressure levels may exceed a time-weighted average noise dose of 85 decibels (the Action Level), the PSO will evaluate exposures according to the Geocon Hearing Conservation Program (ref. T8 CCR §§5095-5100). Selection of hearing protection will be made in accordance with the Geocon Safety Equipment Guide. Only hearing protectors (ear plugs or muffs) with a Noise Reduction Rating of 20 dB, or higher, will be used. When worn, earmuffs will be donned in the "over the head" position with the hair pulled back from the sealing surface.

**Note:** In general, noise levels in excess of 85 dBA interfere with communication between two individuals speaking in a normal tone of voice at a distance of 3 feet from one another.

### 3.5 Biological Hazards

Type(s)/Source: Biting insects (mosquitoes, wasps, bees & ticks) and animals;

Qualified Exposure Risk: Low – moderate; soil boring advancement at project sites.



Primary Control(s):

- Site inspection & isolation/avoidance;
- PPE (Gloves/boots/long-sleeve shirts);
- Insect repellent, barrier crèmes, wasp spray;

Hazard: Contact with insects and animals likely to be present at the site should be avoided. Stinging and biting insects, including bees, spiders, and ticks, can cause extreme discomfort and/or serious allergic responses. Insect bites are generally not dangerous, unless they are from a poisonous insect or mosquitoes potentially carrying West Nile and/or Zika virus.

The primary concern with animal bites and scratches is the potential for infection and/or rabies. Snake or scorpion bites can also be dangerous, but more from infection or trauma than the toxins injected by the snake or scorpion.

Control(s) – Biting Insects: Before beginning fieldwork each day, inspect the work area for the presence of standing water and inhabitant reptiles and take measures necessary to minimize the potential for contact. Specially prepared topical barriers and insect repellent containing approximately 50% DEET, or picaridin, IR3535, oil of lemon eucalyptus, or para-menthane-diol for long lasting protection can be useful for protecting exposed skin from biting insects. These products are commercially available and may minimize the potential for development of skin rashes and/or irritations due to such exposures; apply insect repellent sparingly to exposed skin.

**Note:** Avoid contacting plastic zippers or other plastic closure mechanisms on clothing, equipment bags, etc., with DEET containing crème which will cause these materials to degrade.

If you are allergic to bee or wasp stings, be sure to have the appropriate first aid available (e.g., an epi-pen) on the project. If you are stung, administer first aid and seek immediate medical attention.

Be sure a reptile or animal bite victim obtains medical attention quickly if a bite or scratch occurs, especially if there is a potential that it was poisonous. In the meantime, administer First Aid by scrubbing the wound with soap and water, and rinsing thoroughly under running water. Dry off and place a clean bandage on the wound. Victims of these bites should lie down and remain calm and motionless; cold packs should be applied and medical attention sought immediately.

### **3.6 Chemical Hazard – Volatile Organic Compounds**

The risk of significant exposure to volatile organic compounds due to soil vapor and/or soil contaminants is considered to be minimal during this project due to the sampling methods and work practices to be employed, due to the previous remediation activities conducted at the site, and due to the time that has passed since this was an active plating operation.

Type(s)/Source: Former metal plating activities

Exposure Route: Inhalation, skin absorption; ref Attachment D – Volatile Organic Compounds

Target Organs: central nervous system; liver

Qualified Exposure Risk: Low

Primary Controls:

- Isolation – site control;
- Engineering Controls – Water mist to allay potential airborne dust;
- Follow safe work practices and sampling procedures;
- PPE – eye (safety glasses or goggles) and hand protection (leather and/or chemical-resistant gloves)
- Sanitation – good personal hygiene; see Section 4.2

## **4.0 GENERAL HEALTH AND SAFETY REQUIREMENTS**

### **4.1 Air Monitoring**

The necessity for evaluating potential airborne concentrations of vapors from volatile organic compounds will be determined during the project by the PSO. Based on preliminary information from previous sampling and characterization activities conducted at this site, the potential for significant exposure to these contaminants is low.

If necessary, based on observations, odors, or other information which becomes available during sampling activities, potential exposure to volatile organic compounds will be evaluated using a direct-reading photoionization detector (PID) equipped with a 10.2 electron volt probe; measurements will be made at the sampling locations and in the operator's breathing zone.

All measurements shall be recorded in the field logbook. The frequency or need for continued sampling will be based on results from initial measurements. Justification for discontinuing measurements shall also be recorded in the field logbook.

The PSO shall be responsible for interpreting monitoring data and upgrading or downgrading the level of protection during field activities according to the following guide:

**Response Criteria For Airborne Vapor Concentrations**  
(measured at breathing zone level)

READING	LEVEL OF PROTECTION
0 ppm or Background (as measured up-wind of sampling location)	Level D
Background - 5 ppm above background	
> 5 ppm up to 10 ppm above background	Level D w/ continuous monitoring
>10 up to 300 ppm above background	Level C
>300 ppm above background	Stop Operations Move Up-Wind

**Note:** Readings exceeding 500 ppm at the sampling point – suspend sampling activities until conditions can be further assessed. If corrective action cannot be taken, site personnel must remain up-wind or move to a predetermined safe area and contact the Project CIH.

The PID shall be calibrated both before and after field operations, or more frequently as deemed necessary by the PSO. The instrument will be calibrated and maintained in accordance with the manufacturer's instructions. The calibration gas and the calibration readings (in ppm equivalent) shall be recorded in the field log book.

It should be noted that high humidity environments can cause a PID instrument to indicate lower organic vapor concentrations than actually exist.

## 4.2 Personal Hygiene

The PSO will establish on-site sanitation procedures which may, depending on site tasks and conditions involve: hand-wash facilities including clean water and hand soap; waterless hand cleaner; sanitary wipes and clean towels at the project site.

All Geocon personnel, subcontractor employees, and Clients and their designees leaving the project site (work zones) will clean potential impacted soils from their footwear and follow personal hygiene procedures prior to leaving the project site. In addition, the following procedures will be followed to ensure worker protection against potential exposure through ingestion:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-in-mouth transfer and ingestion of material is prohibited in any area designated as being potentially impacted.
- Hands and face must be thoroughly washed upon leaving the work area, and before eating, drinking, or other non-project activities.
- Avoid unnecessary kneeling, sitting, leaning, or general contact with potentially impacted surfaces or with surfaces suspected of being potentially impacted by hazardous materials (i.e., puddles, mud, leachate, etc.).

### **4.3 Buddy System**

Project personnel are to work with another person when performing sampling tasks; the client or a subcontractor's representative can serve as the second person while the work is being conducted in the field. Under no circumstances, other than completion of paper work at the end of the day, are field personnel to work alone at the site.

### **4.4 Work Zone Controls**

Although formal work zones will not be required for this project, work areas will be designated using traffic cones.

### **4.5 Code of Safe Practices**

General safe work practices to be utilized by all project personnel are summarized below:

- All nonessential personnel will be kept clear of work areas.
- The use of entertainment and personal communication devices in the work zone shall not be allowed.
- Adequate signs and safety devices will be installed on equipment.
- All site employees will wear assigned personal protective equipment and level of protection as designated by the PSO.
- Eating, drinking, smoking, chewing gum or tobacco, or application of cosmetics is allowed in designated areas only.
- At a minimum, all personnel will wash with soap and water before lunch, using the restroom, and at the end of work. The face and hands shall be washed before eating, drinking, smoking, chewing gum, applying cosmetics, etc.
- Over-the-counter drugs and prescription medications must be reported to the PSO for clearance before an employee is allowed to work near drill rig or other heavy equipment.
- When portable electric tools and equipment are used, three-wire extension cords are required.
- Employees will advise their supervisors of any malfunctioning equipment immediately.
- An ongoing safety maintenance program for tools and equipment will be instituted. Inspections will occur on a regular basis to ensure parts are secure and intact. Defective equipment will be repaired or replaced.
- Appropriate engineering controls and equipment guards will be installed on tools and equipment. This includes seat belts & backup warning lights and signals.
- A list of names of personnel who are trained in CPR and first aid shall be available.
- Labels shall be placed on containers of hazardous materials.
- No one will work alone; the "buddy system" shall be implemented for all field work.
- Employees shall be trained to identify effects and symptoms of toxic exposure and report them immediately.
- Under no circumstances are Geocon personnel authorized to enter a Permit-Required Confined Space or an excavation or trench greater than 4 feet in depth.

## 5.0 PERSONAL PROTECTIVE EQUIPMENT

The employment of the aforementioned engineering controls is the preferred method of providing personal protection from hazards identified at this and any site. PPE provides acceptable secondary recourse, but only when engineering controls fail or cannot adequately eliminate exposure to the hazard. The use of PPE is intended to provide protection for onsite personnel from operational hazards that cannot be controlled through other safety procedures or work practices. PPE required to be onsite for each worker during this project will include:

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Hard Hat (without face Shield)       | <input checked="" type="checkbox"/> Safety Glasses                                |
| <input checked="" type="checkbox"/> Synthetic/Leather Safety Boots/Shoes | <input checked="" type="checkbox"/> Disposable inner gloves (for sample handling) |
| <input type="checkbox"/> Chem. Resistant Boots                           | <input type="checkbox"/> Chem. Resistant gloves                                   |
| <input checked="" type="checkbox"/> Synthetic/Leather Gloves             | <input type="checkbox"/> Air-Purifying Respirator                                 |
| <input checked="" type="checkbox"/> Hearing Protection - Ear Plugs/Muffs | <input type="checkbox"/> APR Cartridges   |
| <input checked="" type="checkbox"/> ANSI Class II/III Safety Vest        | <input type="checkbox"/> Tyvek coveralls  |
| <input type="checkbox"/> Other: _____                                    |   |

Only ANSI approved PPE and NIOSH approved respirators will be assigned for use. The use applications for this equipment are summarized in the following matrix. Specific procedures are further described below.

TASKS	PPE										
	Hard Hat	Safety Glasses	Synthetic/Leather Boots	Chemical Resistant Boots	Disposable Inner Gloves	Chemical Resistant Gloves	Synthetic/Leather Gloves	Hearing Protection Plugs/Muffs	Air-Purifying Respirator (Half-/Full Face)	APR Cartridges	ANSI Class II/III Vest
Non-intrusive general survey:	X	X	X					X			X
Soil boring advancement – Geoprobe direct-push drilling	X	X	X		X		X	X			X
Soil vapor sampling	X	X	X		X						X

### 5.1 Respiratory Protection

Respiratory protection will not be required during sampling activities. The PSO, in consultation with the PM, will determine the need for upgrading the level of protection from “D” to “C”. If it is determined that respiratory protection is required, personnel shall don a full facepiece or half-mask dual cartridge air-purifying respirator fitted with combination organic vapor cartridges and HEPA (P100, Magenta) filters.

## **5.2 PPE – Level D Protection**

The protective equipment to be donned by personnel working in the sampling areas (Exclusion Zones) includes:

- **Body Protection:** Body protection shall include the use of "work clothing," including long pants and long- or short-sleeved shirts, and Class II/III ANSI-approved safety vest.
- **Head Protection:** Non-metallic hard hats shall be worn by all personnel; ref. T8 CCR §§1514 & 3381 Head Protection.
- **Hearing Protection:** Hearing protection shall include the use of foam ear inserts or muffs; ref. T8 CCR §5098.
- **Face & Eye Protection:** Protective eye wear (i.e., safety glasses) shall be worn by personnel working in direct proximity to operating heavy equipment and highway traffic; ref. T8 CCR §§1514 & 3382 Eye Protection.
- **Hand Protection:** Appropriate hand protection shall be required for employees whose work involves unusual and excessive exposure of hands to cuts capable of causing injury or impairments; ref. T8 CCR §§1514 & 3384 Hand Protection.
- **Foot Protection:** Foot protection, such as steel toed shoes or boots shall be required for employees who are exposed to foot injuries from electrical hazards, falling objects, or crushing or penetrating actions; ref. T8 CCR §§1514 & 3385 Foot Protection.

## **5.3 PPE – Level “C” Protection**

Level D protection may be up-graded to Level C protection by site personnel with prior notification to the PSO. Level C protection shall only be downgraded in consultation with the Project CIH.

## **5.4 Miscellaneous Safety Equipment**

Additional protective equipment to be available to personnel working at the project site(s) includes cell phones or portable radios if cellular phone service is not available.

## **6.0 DECONTAMINATION**

The PSO will establish a work zone around each sampling location. The zone will be established to minimize access by the public and the potential spread of contaminated soils.

The following decontamination (cleansing/disposal) procedures for equipment and PPE have been developed with the intent of reducing the potential for the transfer of hazardous soil from the site(s). Decontamination should be performed in direct proximity to each work area. The primary principle in consideration of decontamination procedure is: Avoid unnecessary contamination of PPE and Sampling Equipment.

### **6.1 Equipment Decontamination**

Decontamination of soil sampling equipment shall include washing with a solution of TSP, Alconox<sup>®</sup>, or Liquinox<sup>®</sup> and water followed by a tap water rinse and a third rinse of purified water between samples and before vacating the work area.

### **6.2 PPE Decontamination**

The PSO will determine the necessity for and arrangement of decontamination appropriate to this project. Consumable PPE may be discarded as general refuse. Knock loose dust and soil from shoes before entering vehicles.

Post-project respirator decontamination, if required, shall include a wash with soap and water followed by a clean water rinse, air drying and proper storage prior to future use.

## **7.0 EMERGENCY RESPONSE PROCEDURES**

### **7.1 Physical Injury**

In the event of an accident resulting in physical injury, call emergency service personnel immediately and perform first aid commensurate with training and seriousness of the injury. Severely injured personnel are to be transported only by emergency service personnel and/or by ambulance personnel, unless a life-threatening condition is judged to exist that must be addressed immediately.

The PM is to be notified by the PSO, as soon after the injury as practical, regarding the nature of the accident. The PM or designee will prepare a written report within 24 hours of the accident.

### **7.2 Catastrophic Event**

In the event of a catastrophic event (e.g., severe personal injury, fire, explosion, and/or property damage), notify the fire/safety and rescue department immediately by dialing 911.

Any accident involving serious injury will require suspension of site activities until the PM (or designee) has completed a review of the events and site conditions and authorized work to resume.

The PM (or designee) will notify the nearest Cal/OSHA District Office immediately (within 8 hours) by phone or fax upon learning of a death or serious injury:

**American Canyon District Office**  
**3419 Broadway Street, Suite H8**  
**American Canyon, CA 94503**  
**Tel: 707-649-3700**  
**Fax: 707-649-3712**  
**email: DIRDOSHAmericanCanyon@dir.ca.gov**

### **7.3 Emergency Telephone Numbers**

Fire/Police/Medical Assistance: **911**  
Cloverdale Police Department: **707-894-2150** – Non-Emergency  
Poison Control: **800-222-1222**

Other phone numbers may be available or required for emergency response at specific sites. Check with onsite representatives before mobilizing to the job site.

### **7.4 Project Site Address**

Site Locations: 28165 Old Redwood Highway in Cloverdale, Sonoma County, California



## 7.5 Hospital Address and Route

Healdsburg District Hospital

**707-431-6300**

1375 University Ave.  
Healdsburg, California 95448

**Directions:**

**From the Site:** Head southeast on S. Cloverdale Boulevard/Dutcher Creek Road for 1.5 mile. Turn left to merge onto US-101 South and continue for 12.5 miles. Take exit 505 and turn left onto Dry Creek Road (which turns into March Avenue) for 0.9 miles. Turn left onto University Avenue and hospital will be on the left (see Vicinity Map, Figure 1). Travel time is approximately 20 minutes in normal traffic conditions.

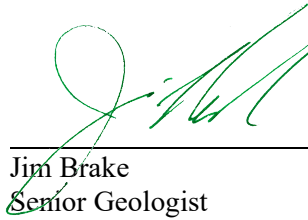
## 8.0 PLAN APPROVAL

The undersigned has reviewed and approved this Health and Safety Plan prepared for the vacant lot at 28165 Old Redwood Highway in Cloverdale, Sonoma County, California, as described herein.

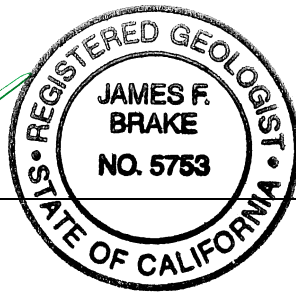


Nicole Hastings-Bethel  
Project Environmental Scientist

January 19, 2021  
Date



Jim Brake  
Senior Geologist



January 19, 2021  
Date

The following personnel, including subcontractors involved with the project activities, have reviewed or received a copy of this Plan and Attachment A and agree to follow the health and safety procedures described herein.

Print Name	Title	Signature	Date

ATTACHMENT

A

VOLATILE ORGANIC COMPOUNDS (VOCs)<sup>1</sup>

VOCs are a class of chemicals that are volatile (evaporate easily) and are organic compounds (contain carbon atoms). Some common VOCs include acetone and automotive gasoline.

## SUBSTANCES LISTING

1,1,1-Trichloroethane	Chloroform
1,1,2,2-Tetrachloroethane	Chloromethane
1,1,2-Trichloroethane	Dichlorobenzenes
1,1-Dichloroethane	Dichloropropenes
1,1-Dichloroethene	Ethylbenzene
1,2,3 Trichloropropane	Ethylene Dibromide
1,2-Dibromo-3-Chloropropane	Formaldehyde
1,2-Dibromoethane	Gasoline, Automotive
1,2-Dichloroethene	Hexachlorobutadiene
1,2-Dichloropropane	Hexachloroethane
1,3-Butadiene	Hydrazines
2-Butanone	Methyl Mercaptan
2-Hexanone	n-Hexane
Acetone	Nitrobenzene
Acrolein	Stoddard Solvent
Benzene	Styrene
Bromodichloromethane	Tetrachloroethylene (PERC)
Bromomethane	Toluene
Carbon Disulfide	Trichloroethylene (TCE)
Carbon Tetrachloride	Vinyl Chloride
Chlorobenzene	Xylenes
Chloroethane	

1 Source for definition and list: Agency for Toxic Substance and Disease Registry, August 14, 2008

The substances on this list have varying effects based on the type of exposure, including frequency, duration and airborne concentration. Many of these substances have the potential to cause central nervous system effects such as headaches and nausea due to acute, high concentration exposure. These effects are not anticipated based on the anticipated site conditions and project scope of work. Benzene is an example of a substance that has potential chronic effects due to low concentration, long term exposure. These effects are not anticipated based on the anticipated site conditions and project scope of work.



APPENDIX

B

Permit # SR 0017

Address: 28, 165 Old Redwood Hwy ( ) Check/CC#

~~( ) Parcel Map~~ ~~( ) BWQCB Concurrence~~ From

~~( ) Access Agreement~~ ~~( ) Encroachment Permit~~ ~~( ) Attachment 3~~ ( ) Invoice#

~~( ) Work Plan~~ ~~( ) Boring / Well Construction~~ ~~( ) Diagrams~~ ( ) Enter in Log ( ) Enter EC Approval Date

~~( ) Site Map~~ ~~( ) Boring / Well Locations~~ ~~( ) Waste Disposal~~ ( ) E/mailed Date

~~( ) Health & Safety~~ ( ) Approved & emailed on 1/26/2 ( ) 1<sup>st</sup> Verification ( ) 2<sup>nd</sup> Verification ( ) Completed

~~( ) ECR~~ ~~( ) OnBase~~ ~~( ) E~~ ~~( ) Emailed JC~~

( ) Construction completed ( ) Final Report

Notes:

COUNTY OF SONOMA — DEPARTMENT OF HEALTH SERVICES  
 ENVIRONMENTAL HEALTH & SAFETY  
 825 5th Street, Santa Rosa, CA 95404  
 Phone (707) 565-6585 Fax (707) 565-6525 www.sonoma-county.org

DEPT. OF HEALTH SERVICES

JAN 26 2021

APPLICATION FOR DRILLING PERMIT

for Regional Board Lead/Environmental Assessment/LOP Lead

ENVIRONMENTAL  
 HEALTH AND SAFETY

For Office Use Only

Amount Paid \$868.-  
 Receipt Number crcl 06261C PE 1406  
 Payment Date 1/25/21 Rev. Code \_\_\_\_\_  
 Site ID# FA0021077  
 Permit # SR0017715 ENTERED JC

Permit Type:

☐ Monitoring Well ☐ Borings ☐ Destruct ☒ Environmental Assessment

Well Type: ☐ Remediation Well ☐ Extraction Well ☒ Soil Vapor  
☐ Other \_\_\_\_\_

# On-Site Well 0 ID # \_\_\_\_\_ # Off-Site Well 0 ID # \_\_\_\_\_

# On-Site Boring 6 ID # SV1 - SV6 # Off-Site Boring 0 ID # \_\_\_\_\_

Submit legal right-of-entry/off-site well address/encroachment permit

Site Address 28165 Old Redwood HWY APE 117-040-055

Facility Name Vacant Land

Site Owner Cloverdale Unified School District Phone \_\_\_\_\_

Street 97 School Street City Cloverdale State CA Zip 95425

Responsible Party Not Applicable Phone \_\_\_\_\_

Street \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Consultant Gecocon Consultants License #/Type \_\_\_\_\_ Phone 916-852-9118 x 518

Street 3160 Gold Valley Dr #800 City Rancho Cordova State CA Zip 95742

License #/Type \_\_\_\_\_ Email hastings@geoconinc.com

Drilling Contractor PeneCore Drilling Phone 530-661-3600

Street 220 N. East Street City Woodland State CA Zip 95776

C-57 License 906899

Disposal method for soil cuttings soil cuttings not anticipated

Disposal method for development water not applicable

Drilling method direct push

Method of drill equipment rinses containment and disposal sanitary sewer

If destroying a well, abandonment method \_\_\_\_\_

Submit plot plan of wells in relation to all sewer or septic lines.

Is well to be constructed within: 100 feet of a septic tank or leach field? ☐ Yes ☒ No

50 feet of any sanitary sewer line? ☐ Yes ☒ No

25 feet of any private sanitary sewer line? ☐ Yes ☒ No

In addition, all monitoring wells must include an identification system affixed to the interior surface

1) Well identification 2) Well type 3) Well depth 4) Well casing diameter 5) Perforated intervals

Well identification number and well type shall be affixed to the exterior surface security structure.



TM

For Office Use Only	
Address	<u>28165 Old Redwood Hwy</u>
	<u>Cloverdale CA 95425</u>
Site ID#	<u>FA0021077</u>
Permit #	<u>SR0017715</u>

I hereby agree to comply with all laws and regulations of the County of Sonoma and State of California pertaining to water well construction. I will telephone (707) 565-6565, 48 hours in advance, to notify the Environmental Health Specialist when completing or destroying a well. I will furnish the Director of Environmental Health and the owner a legible copy of the State Water Well Driller's Report within 15 days; and a copy of the Summary Report, including sample results, should be received by the Department of Health Services, Environmental Health and Safety Section within 90 days in order to obtain final approval on this well permit. I acknowledge that the application will become a permit only after site approval and payment of fee. I understand that this permit is not transferable and expires one year from date of issuance.

[Signature] Date 1-19-21  
 Signature of Well Driller—no proxies (Wet Signature Required)  
 Insurance Carrier SCIF Expiration Date 8-1-21

Once all wells/borings are installed, submit a Well Driller's Log and/or Summary Report to complete permit process.

Indicate on attached plot plan the exact location of well(s) with respect to the following items: property lines, water bodies or water courses drainage pattern, roads, existing wells, sewer main and laterals and private sewage disposal systems or other sources of contamination or pollution. INCLUDE DIMENSIONS. The validity of this permit depends upon the accuracy of the information provided by the applicant.

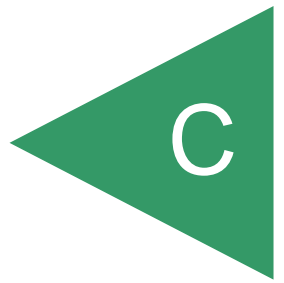
Conditions of permit:

- \* Provide 48 hrs notice before drilling.
- \* Soil Vapor Wells shall be constructed in accordance w/ DTSC's Advisory - Active Soil Gas Investigations (2015).
- \* Provide Final Report w/in 90 days of Work Completion.

FOR OFFICE USE ONLY - ENVIRONMENTAL HEALTH & SAFETY

Permit approved by [Signature] Date 1/26/21  
 Constr. approved by \_\_\_\_\_ Observed? ☐ Yes ☐ No Well # \_\_\_\_\_ Date \_\_\_\_\_  
 RWQCB/LOP approval \_\_\_\_\_ Date \_\_\_\_\_

APPENDIX





Project Name: ClaverdaleGeocon Project Number: E8695-04-21Date: 2-9-21Well ID: SV1Sampled by: NH

Vapor Well Construction Details	Was Vapor Recovery Confirmed during installation using PRT? Y / N		At what depth?	
	Length of Tubing <u>7'</u>			
	Diameter of Tubing <u>0.25"</u>			
	Tubing Material <u>teflon</u>			
	Borehole Diameter <u>1.5"</u>			
	Length of Sand Filter Pack <u>1.0'</u>			
	Length of Dry Bentonite <u>0.5'</u>			
	Volume of Tubing <sup>1</sup> <u>31.2</u>			
	Volume of Sand Filter Pack <sup>2</sup> <u>138.9</u>			
	Volume of Dry Bentonite <sup>3</sup> <u>86.9</u>			
	Total Volume (1 well volume) <u>257</u>		(3 well volumes) = <u>771</u>	
	Calculated Purge Time <u>4</u> Min		<u>36</u> Sec	
Shut-In Test	Shipped with pressure in sample train? Y / <u>N</u>			
	Start Pressure on purge canister <u>25.5/25</u>		Start Time <u>1155</u>	
	End Pressure on purge canister <u>25.5/25</u>		End Time <u>1217</u>	
Purging the well	Purged with <u>canister</u> or syringe?			
	Purge Canister ID <u>2419</u>			
	Volume Purged <u>3</u>		# of Well Volumes	
	Start Time <u>1219</u>			
	Start Canister Vacuum <u>24.5</u>		Start Well Vacuum <u>3</u>	
	Helium in Shroud at Start <u>23</u>			
	Helium in Purge Train <u>—</u>			
	# of 50 ml syringe pulls <u>—</u>			
	Syringe back pressure: none/low/moderate/high <u>—</u> starting at <u>—</u> ml			
	End Time <u>1224</u>			
	End Canister Vacuum <u>20.5</u>		End Well Vacuum <u>1.5</u>	
	Helium in Shroud at End <u>23</u>		Lowest Helium level during purge <u>23</u>	
Sampling the well	Sampling with <u>summas</u> or sorbants with tedlars?			
	Sample Canister/Sorbant Tube ID <u>40870</u>		Manifold ID <u>25381</u>	
	Start Time <u>1225</u>			
	Start Canister Vacuum <u>29</u>		Start Well Vacuum <u>1.5</u>	
	Helium in Shroud at Start <u>22</u>			
	# of 50 ml syringe pulls <u>—</u>			
	Syringe back pressure: none/low/moderate/high <u>—</u> starting at <u>—</u> ml			
	End Time <u>1231</u>			
	End Canister Vacuum <u>4.5</u>		End Well Vacuum <u>1.0</u>	
	Helium in Shroud at End <u>25</u>		Lowest Helium level during Sampling <u>20</u>	

Flow restrictors are calibrated to 167 ml/min or 0.167 L/min

1 in-Hg = 13.6 in-H<sub>2</sub>OKeep the vacuum on the well below 10-inches of H<sub>2</sub>O to avoid stripping vapor from soil.10 in-H<sub>2</sub>O = 0.73 in-Hg

Inner Diameter of 2 inch PVC pipe is 2.067 in

1 Liter = 61.024 in<sup>3</sup>

Inner Diameter of 0.25 inch tubing is 0.17 in

 $\pi = 3.145927$ Porosity of a sand pack  $\approx$  0.40, porosity of dry bentonite  $\approx$  0.50

Volume of a cylinder

 $V = \pi r^2 h$ 

1 = If tubing diameter is 0.25 in, then linear volume of tubing is 4.45 ml/ft

2 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of sand filter pack is 312.7 ml/ft. If it's 1.5 in (PRT hole), then linear volume is 138.9 ml/ft

3 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of dry bentonite is 390.9 ml/ft. If it's 1.5 in (PRT hole), then linear volume is 173.7 ml/ft

Project Name: CloverdaleGeocon Project Number: E8695-04-21Date: 2/9/21Well ID: SV2Sampled by: S. Nase

Vapor Well Construction Details	Was Vapor Recovery Confirmed during installation using PRT? Y/(N)		At what depth?
	Length of Tubing <u>7 ft</u>		
	Diameter of Tubing <u>0.25</u>		
	Tubing Material <u>teflon</u>		
	Borehole Diameter <u>1.5 in</u>		
	Length of Sand Filter Pack <u>12 in</u>		
	Length of Dry Bentonite <u>6 in</u>		
	Volume of Tubing <sup>1</sup> <u>31.15 mL</u>		
	Volume of Sand Filter Pack <sup>2</sup> <u>138.9 mL</u>		
	Volume of Dry Bentonite <sup>3</sup> <u>86.9 mL</u>		
Total Volume (1 well volume) <u>257 mL</u>		(3 well volumes) = <u>771</u>	
Shut-In Test	Shipped with pressure in sample train? Y/(N)		
	Start Pressure on purge canister <u>29.27</u>	Start Time <u>1212</u>	
	End Pressure on purge canister <u>29.27</u>	End Time <u>1217</u>	
Purging the well	Purged with canister or syringe? <u>canister</u>		
	Purge Canister ID <u>5411</u>		
	Volume Purged <u>771 mL</u>	# of Well Volumes <u>3</u>	
	Start Time <u>1223</u>		
	Start Canister Vacuum <u>27</u>	Start Well Vacuum <u>0</u>	
	Helium in Shroud at Start <u>20.1</u>		
	Helium in Purge Train <u>NA</u>		
	# of 50 ml syringe pulls <u>NA</u>		
	Syringe back pressure: none/low/moderate/high <u>NA</u> starting at <u>ml</u>		
	End Time <u>1228</u>		
	End Canister Vacuum <u>23</u>	End Well Vacuum <u>0</u>	
Helium in Shroud at End <u>21.3</u>		Lowest Helium level during purge <u>20.1</u>	
Sampling the well	Sampling with summas or sorbants with tedlars? <u>Summa</u>		
	Sample Canister/Sorbant Tube ID <u>1L2485</u> manifold: <u>24575</u>		
	Start Time <u>1229</u>		
	Start Canister Vacuum <u>28.5</u>	Start Well Vacuum <u>0</u>	
	Helium in Shroud at Start <u>19.5</u>		
	# of 50 ml syringe pulls <u>NA</u>		
	Syringe back pressure: none/low/moderate/high <u>NA</u> starting at <u>ml</u>		
	End Time <u>1234</u>		
	End Canister Vacuum <u>5</u>	End Well Vacuum <u>0</u>	
Helium in Shroud at End <u>20.8</u>		Lowest Helium level during Sampling <u>19.5</u>	

Flow restrictors are calibrated to 167 ml/min or 0.167 L/min

1 in-Hg = 13.6 in-H<sub>2</sub>OKeep the vacuum on the well below 10-inches of H<sub>2</sub>O to avoid stripping vapor from soil.10 in-H<sub>2</sub>O = 0.73 in-Hg

Inner Diameter of 2 inch PVC pipe is 2.067 in

1 Liter = 61.024 in<sup>3</sup>

Inner Diameter of 0.25 inch tubing is 0.17 in

 $\pi = 3.145927$ Porosity of a sand pack  $\approx 0.40$ , porosity of dry bentonite  $\approx 0.50$ 

Volume of a cylinder

 $V = \pi r^2 h$ 

1 = If tubing diameter is 0.25 in, then linear volume of tubing is 4.45 ml/ft

2 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of sand filter pack is 312.7 ml/ft. If it's 1.75 in (hydropunch), then linear volume is 189.2 ml/ft

3 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of dry bentonite is 390.9 ml/ft. If it's 1.75 in (hydropunch), then linear volume is 236.5 ml/ft



Project Name: USD Cloverdale Kelly RdGeocon Project Number: E8695-04-21Date: 2.9.21Well ID: 5V3Sampled by: NH

Vapor Well Construction Details	Was Vapor Recovery Confirmed during installation using PRT? Y/(N) At what depth?	
	Length of Tubing <u>7'</u>	
	Diameter of Tubing <u>0.25"</u>	
	Tubing Material <u>teflon</u>	
	Borehole Diameter <u>1.5"</u>	
	Length of Sand Filter Pack <u>1.0'</u>	
	Length of Dry Bentonite <u>0.5'</u>	
	Volume of Tubing <sup>1</sup> <u>31.2</u>	
	Volume of Sand Filter Pack <sup>2</sup> <u>138.9</u>	
	Volume of Dry Bentonite <sup>3</sup> <u>86.9</u>	
	Total Volume (1 well volume) <u>250 257</u> (3 well volumes) = <u>771</u>	
Calculated Purge Time <u>~ 4</u> Min <u>36</u> Sec		
Shut-In Test	Shipped with pressure in sample train? Y/(N)	
	Start Pressure on purge canister <u>29/28.5</u>	Start Time <u>1058</u>
	End Pressure on purge canister <u>29/28.5</u>	End Time <u>1104</u>
Purging the well	Purged with <u>canister</u> or syringe?	
	Purge Canister ID <u>2</u>	
	Volume Purged	# of Well Volumes
	Start Time <u>1105</u>	
	Start Canister Vacuum <u>28</u>	Start Well Vacuum <u>2</u>
	Helium in Shroud at Start <u>21</u>	
	Helium in Purge Train <u>—</u>	
	# of 50 ml syringe pulls <u>—</u>	
	Syringe back pressure: none/low/moderate/high <u>—</u> starting at <u>—</u> ml	
	End Time <u>1112</u>	
	End Canister Vacuum <u>25</u>	End Well Vacuum <u>4</u>
Helium in Shroud at End <u>23</u>	Lowest Helium level during purge <u>21</u>	
Sampling the well	Sampling with summas or sorbants with tedlars?	
	Sample Canister/Sorbant Tube ID <u>1L2084</u>	Manifold ID <u>22527</u>
	Start Time <u>1114</u>	
	Start Canister Vacuum <u>29</u>	Start Well Vacuum <u>2</u>
	Helium in Shroud at Start <u>28</u>	
	# of 50 ml syringe pulls <u>—</u>	
	Syringe back pressure: none/low/moderate/high <u>—</u> starting at <u>—</u> ml	
	End Time <u>1120</u>	
	End Canister Vacuum <u>4</u>	End Well Vacuum <u>2.5</u>
Helium in Shroud at End <u>22</u>	Lowest Helium level during Sampling <u>22</u>	

Flow restrictors are calibrated to 167 ml/min or 0.167 L/min

1 in-Hg = 13.6 in-H<sub>2</sub>OKeep the vacuum on the well below 10-inches of H<sub>2</sub>O to avoid stripping vapor from soil.10 in-H<sub>2</sub>O = 0.73 in-Hg

Inner Diameter of 2 inch PVC pipe is 2.067 in

1 Liter = 61.024 in<sup>3</sup>

Inner Diameter of 0.25 inch tubing is 0.17 in

 $\pi = 3.145927$ Porosity of a sand pack  $\approx 0.40$ , porosity of dry bentonite  $\approx 0.50$ 

Volume of a cylinder

 $V = \pi r^2 h$ 

1 = If tubing diameter is 0.25 in, then linear volume of tubing is 4.45 ml/ft

2 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of sand filter pack is 312.7 ml/ft. If it's 1.5 in (PRT hole), then linear volume is 138.9 ml/ft

3 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of dry bentonite is 390.9 ml/ft. If it's 1.5 in (PRT hole), then linear volume is 173.7 ml/ft

Project Name: Cloverdale Geocon Project Number: E 8695-04-21  
 Date: 2/9/  
 Well ID: SV4 Sampled by: S.N./NHB

Vapor Well Construction Details	Was Vapor Recovery Confirmed during installation using PRT? Y/(N)		At what depth?
	Length of Tubing <u>7 ft</u>		
	Diameter of Tubing <u>0.25</u>		
	Tubing Material <u>teflon</u>		
	Borehole Diameter <u>1.5 in</u>		
	Length of Sand Filter Pack <u>12 in</u>		
	Length of Dry Bentonite <u>6 in</u>		
	Volume of Tubing <sup>1</sup> <u>31.15 mL</u>		
	Volume of Sand Filter Pack <sup>2</sup> <u>138.9 mL</u>		
	Volume of Dry Bentonite <sup>3</sup> <u>86.9 mL</u>		
	Total Volume (1 well volume) <u>257 mL</u>		(3 well volumes) = <u>771</u>
Shut-In Test	Shipped with pressure in sample train? Y/(N)		
	Start Pressure on purge canister <u>18.5</u>	Start Time <u>1445</u>	
	End Pressure on purge canister <u>18.5</u>	End Time <u>1450</u>	
Purging the well	Purged with canister or syringe? <u>canister</u>		
	Purge Canister ID <u>5411</u>		
	Volume Purged <u>771</u>	# of Well Volumes <u>3</u>	
	Start Time <u>1451</u>		
	Start Canister Vacuum <u>19.5</u>	Start Well Vacuum <u>1.5</u>	
	Helium in Shroud at Start <u>24.0</u>		
	Helium in Purge Train <u>NA</u>		
	# of 50 ml syringe pulls <u>NA</u>		
	Syringe back pressure: none/low/moderate/high <u>NA</u> starting at <u>ml</u>		
	End Time <u>1456</u>		
	End Canister Vacuum <u>15.5</u>	End Well Vacuum <u>1.5</u>	
Helium in Shroud at End <u>24.4</u>		Lowest Helium level during purge <u>24.0</u>	
Sampling the well	Sampling with summas or sorbants with tedlars? <u>summa</u>		
	Sample Canister/Sorbant Tube ID <u>1L2583</u> manifold: <u>24595</u>		
	Start Time <u>1456</u>		
	Start Canister Vacuum <u>29</u>	Start Well Vacuum <u>0.5</u>	
	Helium in Shroud at Start <u>22</u>		
	# of 50 ml syringe pulls <u>NA</u>		
	Syringe back pressure: none/low/moderate/high <u>NA</u> starting at <u>ml</u>		
	End Time <u>1502</u>		
End Canister Vacuum <u>4.5</u>	End Well Vacuum <u>0</u>		
Helium in Shroud at End <u>20</u>		Lowest Helium level during Sampling <u>20</u>	

Flow restrictors are calibrated to 167 ml/min or 0.167 L/min

Keep the vacuum on the well below 10-inches of H<sub>2</sub>O to avoid stripping vapor from soil.

Inner Diameter of 2 inch PVC pipe is 2.067 in

Inner Diameter of 0.25 inch tubing is 0.17 in

Porosity of a sand pack ≈ 0.40, porosity of dry bentonite ≈ 0.50

1 = If tubing diameter is 0.25 in, then linear volume of tubing is 4.45 ml/ft

2 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of sand filter pack is 312.7 ml/ft. If it's 1.75 in (hydropunch), then linear volume is 189.2 ml/ft

3 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of dry bentonite is 390.9 ml/ft. If it's 1.75 in (hydropunch), then linear volume is 236.5 ml/ft

1 in-Hg = 13.6 in-H<sub>2</sub>O

10 in-H<sub>2</sub>O = 0.73 in-Hg

1 Liter = 61.024 in<sup>3</sup>

$\pi = 3.145927$

Volume of a cylinder

$V = \pi r^2 h$



Project Name: CiarenateGeocon Project Number: E 8695-04-21Date: 2-9-21Well ID: SV5Sampled by: NH

Vapor Well Construction Details	Was Vapor Recovery Confirmed during installation using PRT? Y <input checked="" type="checkbox"/> N <input type="checkbox"/> At what depth?	
	Length of Tubing	<u>7'</u>
	Diameter of Tubing	<u>0.25"</u>
	Tubing Material	<u>teflon</u>
	Borehole Diameter	<u>1.5"</u>
	Length of Sand Filter Pack	<u>1'</u>
	Length of Dry Bentonite	<u>0.5'</u>
	Volume of Tubing <sup>1</sup>	<u>31.2</u>
	Volume of Sand Filter Pack <sup>2</sup>	<u>138.9</u>
	Volume of Dry Bentonite <sup>3</sup>	<u>86.9</u>
	Total Volume (1 well volume)	<u>257</u> (3 well volumes) = <u>771</u>
	Calculated Purge Time	<u>4</u> Min <u>36</u> Sec
Shut-In Test	Shipped with pressure in sample train? Y / N	
	Start Pressure on purge canister	<u>20</u> Start Time <u>1328</u>
	End Pressure on purge canister	<u>20</u> End Time <u>1334</u>
Purging the well	Purged with <u>canister</u> or syringe?	
	Purge Canister ID	<u>2419</u>
	Volume Purged	<u>3</u> # of Well Volumes
	Start Time	<u>1335</u>
	Start Canister Vacuum	<u>20</u> Start Well Vacuum <u>1.5</u>
	Helium in Shroud at Start	<u>25</u>
	Helium in Purge Train	<u>—</u>
	# of 50 ml syringe pulls	<u>—</u>
	Syringe back pressure: none/low/moderate/high	<u>—</u> starting at <u>—</u> ml
	End Time	<u>1355</u> *
	End Canister Vacuum	<u>16.5</u> End Well Vacuum <u>5.0</u>
	Helium in Shroud at End	<u>21</u> Lowest Helium level during purge <u>20</u>
Sampling the well	Sampling with <u>summas</u> or sorbants with tedlars?	
	Sample Canister/Sorbant Tube ID	<u>141819</u> Manifold ID <u>22581</u>
	Start Time	<u>1357</u>
	Start Canister Vacuum	<u>29</u> Start Well Vacuum <u>2</u>
	Helium in Shroud at Start	<u>23</u>
	# of 50 ml syringe pulls	<u>—</u>
	Syringe back pressure: none/low/moderate/high	<u>—</u> starting at <u>—</u> ml
	End Time	<u>1422</u> *
	End Canister Vacuum	<u>5.0</u> End Well Vacuum <u>4.5</u>
Helium in Shroud at End	<u>21</u> Lowest Helium level during Sampling <u>20</u>	

Flow restrictors are calibrated to 167 ml/min or 0.167 L/min

1 in-Hg = 13.6 in-H<sub>2</sub>OKeep the vacuum on the well below 10-inches of H<sub>2</sub>O to avoid stripping vapor from soil.10 in-H<sub>2</sub>O = 0.73 in-Hg

Inner Diameter of 2 inch PVC pipe is 2.067 in

1 Liter = 61.024 in<sup>3</sup>

Inner Diameter of 0.25 inch tubing is 0.17 in

 $\pi = 3.145927$ Porosity of a sand pack  $\approx$  0.40, porosity of dry bentonite  $\approx$  0.50

Volume of a cylinder

 $V = \pi r^2 h$ 

1 = If tubing diameter is 0.25 in, then linear volume of tubing is 4.45 ml/ft

2 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of sand filter pack is 312.7 ml/ft. If it's 1.5 in (PRT hole), then linear volume is 138.9 ml/ft

3 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of dry bentonite is 390.9 ml/ft. If it's 1.5 in (PRT hole), then linear volume is 173.7 ml/ft

\* Tight conditions Purge 30-60 sec, back pressure 7, stop purge 1 min to let disaspate + purge again, same procedure w/ sampling



Project Name: CloverdaleGeocon Project Number: E8695-04-21Date: 2/9/21Well ID: SV6Sampled by: SN

Vapor Well Construction Details	Was Vapor Recovery Confirmed during installation using PRT? <u>Y</u> / <u>N</u>		At what depth? <u>5 ft</u>
	Length of Tubing <u>7 ft</u>		
	Diameter of Tubing <u>0.25</u>		
	Tubing Material <u>teflon</u>		
	Borehole Diameter <u>1.5 in</u>		
	Length of Sand Filter Pack <u>12 in</u>		
	Length of Dry Bentonite <u>6 in</u>		
	Volume of Tubing <sup>1</sup> <u>31.15 mL</u>		
	Volume of Sand Filter Pack <sup>2</sup> <u>138.9 mL</u>		
	Volume of Dry Bentonite <sup>3</sup> <u>86.9 mL</u>		
Total Volume (1 well volume) <u>257 mL</u>			(3 well volumes) = <u>771 mL</u>
Shut-In Test	Shipped with pressure in sample train? <u>Y</u> / <u>N</u>		
	Start Pressure on purge canister <u>23</u>	Start Time <u>1330</u>	
	End Pressure on purge canister <u>23</u>	End Time <u>1335</u>	
Purging the well	Purged with canister or syringe? <u>canister</u>		
	Purge Canister ID <u>5411</u>		
	Volume Purged <u>771 mL</u>	# of Well Volumes <u>3</u>	
	Start Time <u>1337</u>		
	Start Canister Vacuum <u>23</u>	Start Well Vacuum <u>0</u>	
	Helium in Shroud at Start <u>20.1</u>		
	Helium in Purge Train <u>NA</u>		
	# of 50 ml syringe pulls <u>NA</u>		
	Syringe back pressure: none/low/moderate/high <u>NA</u> starting at <u>ml</u>		
	End Time <u>1342</u>		
	End Canister Vacuum <u>20.4</u> 18	End Well Vacuum <u>0</u>	
	Helium in Shroud at End <u>20.4</u>	Lowest Helium level during purge <u>20.1</u>	
Sampling the well	Sampling with summas or sorbants with tedlars? <u>Summa</u>		
	Sample Canister/Sorbant Tube ID <u>141873</u> <u>Manifold: 24580</u>		
	Start Time <u>1343</u>		
	Start Canister Vacuum <u>28</u>	Start Well Vacuum <u>0</u>	
	Helium in Shroud at Start <u>20.2</u>		
	# of 50 ml syringe pulls <u>NA</u>		
	Syringe back pressure: none/low/moderate/high <u>NA</u> starting at <u>ml</u>		
	End Time <u>13.48</u>		
	End Canister Vacuum <u>4 mL</u>	End Well Vacuum <u>0</u>	
	Helium in Shroud at End <u>21.4</u>	Lowest Helium level during Sampling <u>20.2</u>	

Flow restrictors are calibrated to 167 ml/min or 0.167 L/min

1 in-Hg = 13.6 in-H<sub>2</sub>OKeep the vacuum on the well below 10-inches of H<sub>2</sub>O to avoid stripping vapor from soil.10 in-H<sub>2</sub>O = 0.73 in-Hg

Inner Diameter of 2 inch PVC pipe is 2.067 in

1 Liter = 61.024 in<sup>3</sup>

Inner Diameter of 0.25 inch tubing is 0.17 in

 $\pi = 3.145927$ Porosity of a sand pack  $\approx$  0.40, porosity of dry bentonite  $\approx$  0.50

Volume of a cylinder

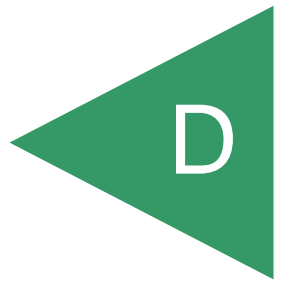
 $V = \pi r^2 h$ 

1 = If tubing diameter is 0.25 in, then linear volume of tubing is 4.45 ml/ft

2 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of sand filter pack is 312.7 ml/ft. If it's 1.75 in (hydropunch), then linear volume is 189.2 ml/ft

3 = If borehole diameter is 2.25 in (macrocore hole), then linear volume of dry bentonite is 390.9 ml/ft. If it's 1.75 in (hydropunch), then linear volume is 236.5 ml/ft

APPENDIX



2/22/2021

Ms. Nicole Hastings-Bethel  
Geocon Consultants, Inc.  
3160 Gold Valley Drive  
Suite 800  
Rancho Cordova CA 95742-7207

Project Name: Cloverdale  
Project #: E8695-04-21  
Workorder #: 2102278A

Dear Ms. Nicole Hastings-Bethel

The following report includes the data for the above referenced project for sample(s) received on 2/10/2021 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Alexandra Winslow  
Project Manager

**WORK ORDER #: 2102278A**

Work Order Summary

<b>CLIENT:</b>	Ms. Nicole Hastings-Bethel Geocon Consultants, Inc. 3160 Gold Valley Drive Suite 800 Rancho Cordova, CA 95742-7207	<b>BILL TO:</b>	Ms. Nicole Hastings-Bethel Geocon Consultants, Inc. 3160 Gold Valley Drive Suite 800 Rancho Cordova, CA 95742-7207
<b>PHONE:</b>	916-852-9118	<b>P.O. #</b>	
<b>FAX:</b>	916-852-9132	<b>PROJECT #</b>	E8695-04-21 Cloverdale
<b>DATE RECEIVED:</b>	02/10/2021	<b>CONTACT:</b>	Alexandra Winslow
<b>DATE COMPLETED:</b>	02/22/2021		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	SV1	Modified TO-15	5.0 "Hg	15 psi
02A	SV2	Modified TO-15	6.5 "Hg	15 psi
03A	SV3	Modified TO-15	4.0 "Hg	15 psi
04A	SV5	Modified TO-15	5.0 "Hg	15 psi
05A	SV6	Modified TO-15	6.0 "Hg	15 psi
06A	SV4	Modified TO-15	4.5 "Hg	15 psi
07A	Lab Blank	Modified TO-15	NA	NA
08A	CCV	Modified TO-15	NA	NA
09A	LCS	Modified TO-15	NA	NA
09AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY:



Technical Director

DATE: 02/22/21

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935

Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)

Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.

Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

*This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.*

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

**LABORATORY NARRATIVE**  
**Modified TO-15**  
**Geocon Consultants, Inc.**  
**Workorder# 2102278A**

Six 1 Liter Summa Canister (100% Certified) samples were received on February 10, 2021. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the EATL modifications.

<i>Requirement</i>	<i>TO-15</i>	<i>ATL Modifications</i>
Initial Calibration	$\leq 30\%$ RSD with 2 compounds allowed out to $< 40\%$ RSD	$\leq 30\%$ RSD with 4 compounds allowed out to $< 40\%$ RSD
Blank and standards	Zero Air	UHP Nitrogen provides a higher purity gas matrix than zero air

### **Receiving Notes**

There were no receiving discrepancies.

### **Analytical Notes**

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

The reported result for 4-Ethyltoluene in samples SV1, SV2 and SV5 may be biased high due to co-elution with a non target compound with similar characteristic ions. Both the primary and secondary ion for 4-Ethyltoluene exhibited potential interference.

### **Definition of Data Qualifying Flags**

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

## Summary of Detected Compounds

### MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

**Client Sample ID: SV1**

**Lab ID#: 2102278A-01A**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	1.2	1.4	2.3	2.5
Acetone	2.4	7.9	5.7	19
2-Propanol	1.2	1.3 J0	3.0	3.1 J0
2-Butanone (Methyl Ethyl Ketone)	1.2	1.4	3.6	4.1
Benzene	0.24	0.48	0.77	1.5
Toluene	0.24	1.4	0.91	5.1
Ethyl Benzene	0.24	0.35	1.0	1.5
m,p-Xylene	0.24	1.0	1.0	4.5
o-Xylene	0.24	0.36	1.0	1.6
4-Ethyltoluene	0.24	0.25	1.2	1.2

**Client Sample ID: SV2**

**Lab ID#: 2102278A-02A**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	0.26	0.28 J0	0.57	0.61 J0
Ethanol	1.3	1.4	2.4	2.6
Acetone	2.6	11	6.1	27
2-Propanol	1.3	2.2 J0	3.2	5.4 J0
2-Butanone (Methyl Ethyl Ketone)	1.3	1.8	3.8	5.3
Chloroform	0.26	1.2	1.2	5.6
Benzene	0.26	2.0	0.82	6.4
1,2-Dichloroethane	0.26	4.7	1.0	19
Bromodichloromethane	0.26	0.26	1.7	1.8
4-Methyl-2-pentanone	0.26	0.30	1.0	1.2
Toluene	0.26	8.2	0.97	31
Ethyl Benzene	0.26	1.3	1.1	5.7
m,p-Xylene	0.26	5.2	1.1	23
o-Xylene	0.26	1.6	1.1	7.1
Styrene	0.26	0.30	1.1	1.3
4-Ethyltoluene	0.26	0.99	1.3	4.9
1,3,5-Trimethylbenzene	0.26	0.31	1.3	1.5
1,2,4-Trimethylbenzene	0.26	0.76	1.3	3.8



## Summary of Detected Compounds

### MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

**Client Sample ID: SV3**

**Lab ID#: 2102278A-03A**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	0.23	0.43 J0	0.52	0.95 J0
Ethanol	1.2	1.7	2.2	3.2
Acetone	2.3	12	5.5	29
2-Propanol	1.2	1.9 J0	2.9	4.7 J0
Carbon Disulfide	1.2	1.7	3.6	5.2
2-Butanone (Methyl Ethyl Ketone)	1.2	2.2	3.4	6.4
Benzene	0.23	0.36	0.74	1.2
Toluene	0.23	0.60	0.88	2.2
m,p-Xylene	0.23	0.25	1.0	1.1

**Client Sample ID: SV5**

**Lab ID#: 2102278A-04A**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	0.24	0.72 J0	0.54	1.6 J0
Ethanol	1.2	2.3	2.3	4.3
Acetone	2.4	15	5.7	35
2-Propanol	1.2	2.2 J0	3.0	5.4 J0
Carbon Disulfide	1.2	1.4	3.8	4.5
2-Butanone (Methyl Ethyl Ketone)	1.2	2.2	3.6	6.6
Chloroform	0.24	2.2	1.2	11
Benzene	0.24	2.1	0.77	6.8
4-Methyl-2-pentanone	0.24	0.40	0.99	1.6
Toluene	0.24	5.5	0.91	21
Ethyl Benzene	0.24	0.89	1.0	3.8
m,p-Xylene	0.24	4.0	1.0	17
o-Xylene	0.24	1.3	1.0	5.6
Styrene	0.24	0.26	1.0	1.1
4-Ethyltoluene	0.24	0.82	1.2	4.0
1,3,5-Trimethylbenzene	0.24	0.27	1.2	1.3
1,2,4-Trimethylbenzene	0.24	0.61	1.2	3.0

## Summary of Detected Compounds

### MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

**Client Sample ID: SV6**

**Lab ID#: 2102278A-05A**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	0.25	0.58 J0	0.56	1.3 J0
Ethanol	1.3	1.8	2.4	3.3
Acetone	2.5	6.5	6.0	16
2-Propanol	1.3	2.0 J0	3.1	5.0 J0
Benzene	0.25	0.52	0.80	1.7
Toluene	0.25	0.50	0.95	1.9

**Client Sample ID: SV4**

**Lab ID#: 2102278A-06A**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	0.24	0.42 J0	0.53	0.94 J0
Freon 11	0.24	0.24	1.3	1.4
Ethanol	1.2	1.4	2.2	2.6
Acetone	2.4	5.9	5.6	14
2-Propanol	1.2	1.4 J0	2.9	3.4 J0
Hexane	1.2	1.2	4.2	4.2
Chloroform	0.24	0.93	1.2	4.5
Cyclohexane	1.2	1.9	4.1	6.6
Benzene	0.24	1.7	0.76	5.6
Toluene	0.24	1.2	0.90	4.6
m,p-Xylene	0.24	0.34	1.0	1.5

Client Sample ID: SV1

Lab ID#: 2102278A-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021612	Date of Collection:	2/9/21 12:31:00 PM
Dil. Factor:	2.42	Date of Analysis:	2/16/21 03:59 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.0	Not Detected
Freon 114	0.24	Not Detected	1.7	Not Detected
Chloromethane	1.2	Not Detected	2.5	Not Detected
Vinyl Chloride	0.24	Not Detected	0.62	Not Detected
1,3-Butadiene	0.24	Not Detected UJ	0.54	Not Detected UJ
Bromomethane	1.2	Not Detected	4.7	Not Detected
Chloroethane	1.2	Not Detected	3.2	Not Detected
Freon 11	0.24	Not Detected	1.4	Not Detected
Ethanol	1.2	1.4	2.3	2.5
Freon 113	0.24	Not Detected	1.8	Not Detected
1,1-Dichloroethene	0.24	Not Detected	0.96	Not Detected
Acetone	2.4	7.9	5.7	19
2-Propanol	1.2	1.3 J0	3.0	3.1 J0
Carbon Disulfide	1.2	Not Detected	3.8	Not Detected
3-Chloropropene	1.2	Not Detected	3.8	Not Detected
Methylene Chloride	0.48	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.24	Not Detected	0.87	Not Detected
trans-1,2-Dichloroethene	0.24	Not Detected	0.96	Not Detected
Hexane	1.2	Not Detected	4.3	Not Detected
1,1-Dichloroethane	0.24	Not Detected	0.98	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.2	1.4	3.6	4.1
cis-1,2-Dichloroethene	0.24	Not Detected	0.96	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.6	Not Detected
Chloroform	0.24	Not Detected	1.2	Not Detected
1,1,1-Trichloroethane	0.24	Not Detected	1.3	Not Detected
Cyclohexane	1.2	Not Detected	4.2	Not Detected
Carbon Tetrachloride	0.24	Not Detected	1.5	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.6	Not Detected
Benzene	0.24	0.48	0.77	1.5
1,2-Dichloroethane	0.24	Not Detected	0.98	Not Detected
Heptane	1.2	Not Detected	5.0	Not Detected
Trichloroethene	0.24	Not Detected	1.3	Not Detected
1,2-Dichloropropane	0.24	Not Detected	1.1	Not Detected
1,4-Dioxane	0.24	Not Detected	0.87	Not Detected
Bromodichloromethane	0.24	Not Detected	1.6	Not Detected
cis-1,3-Dichloropropene	0.24	Not Detected	1.1	Not Detected
4-Methyl-2-pentanone	0.24	Not Detected	0.99	Not Detected
Toluene	0.24	1.4	0.91	5.1
trans-1,3-Dichloropropene	0.24	Not Detected	1.1	Not Detected
1,1,2-Trichloroethane	0.24	Not Detected	1.3	Not Detected
Tetrachloroethene	0.24	Not Detected	1.6	Not Detected
2-Hexanone	1.2	Not Detected	5.0	Not Detected

Client Sample ID: SV1

Lab ID#: 2102278A-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021612	Date of Collection:	2/9/21 12:31:00 PM
Dil. Factor:	2.42	Date of Analysis:	2/16/21 03:59 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.24	Not Detected	2.1	Not Detected
1,2-Dibromoethane (EDB)	0.24	Not Detected	1.8	Not Detected
Chlorobenzene	0.24	Not Detected	1.1	Not Detected
Ethyl Benzene	0.24	0.35	1.0	1.5
m,p-Xylene	0.24	1.0	1.0	4.5
o-Xylene	0.24	0.36	1.0	1.6
Styrene	0.24	Not Detected	1.0	Not Detected
Bromoform	0.24	Not Detected	2.5	Not Detected
Cumene	0.24	Not Detected	1.2	Not Detected
1,1,2,2-Tetrachloroethane	0.24	Not Detected	1.7	Not Detected
Propylbenzene	0.24	Not Detected	1.2	Not Detected
4-Ethyltoluene	0.24	0.25	1.2	1.2
1,3,5-Trimethylbenzene	0.24	Not Detected	1.2	Not Detected
1,2,4-Trimethylbenzene	0.24	Not Detected	1.2	Not Detected
1,3-Dichlorobenzene	0.24	Not Detected	1.4	Not Detected
1,4-Dichlorobenzene	0.24	Not Detected	1.4	Not Detected
alpha-Chlorotoluene	0.24	Not Detected	1.2	Not Detected
1,2-Dichlorobenzene	0.24	Not Detected	1.4	Not Detected
1,2,4-Trichlorobenzene	1.2	Not Detected	9.0	Not Detected
Hexachlorobutadiene	1.2	Not Detected	13	Not Detected

UJ = Analyte associated with low bias in the CCV.

J0 = Estimated value due to bias in the CCV.

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	89	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	101	70-130

Client Sample ID: SV2

Lab ID#: 2102278A-02A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021613	Date of Collection:	2/9/21 12:34:00 PM
Dil. Factor:	2.58	Date of Analysis:	2/16/21 04:39 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	Not Detected	6.4	Not Detected
Freon 114	0.26	Not Detected	1.8	Not Detected
Chloromethane	1.3	Not Detected	2.7	Not Detected
Vinyl Chloride	0.26	Not Detected	0.66	Not Detected
1,3-Butadiene	0.26	0.28 J0	0.57	0.61 J0
Bromomethane	1.3	Not Detected	5.0	Not Detected
Chloroethane	1.3	Not Detected	3.4	Not Detected
Freon 11	0.26	Not Detected	1.4	Not Detected
Ethanol	1.3	1.4	2.4	2.6
Freon 113	0.26	Not Detected	2.0	Not Detected
1,1-Dichloroethene	0.26	Not Detected	1.0	Not Detected
Acetone	2.6	11	6.1	27
2-Propanol	1.3	2.2 J0	3.2	5.4 J0
Carbon Disulfide	1.3	Not Detected	4.0	Not Detected
3-Chloropropene	1.3	Not Detected	4.0	Not Detected
Methylene Chloride	0.52	Not Detected	1.8	Not Detected
Methyl tert-butyl ether	0.26	Not Detected	0.93	Not Detected
trans-1,2-Dichloroethene	0.26	Not Detected	1.0	Not Detected
Hexane	1.3	Not Detected	4.5	Not Detected
1,1-Dichloroethane	0.26	Not Detected	1.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	1.8	3.8	5.3
cis-1,2-Dichloroethene	0.26	Not Detected	1.0	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.8	Not Detected
Chloroform	0.26	1.2	1.2	5.6
1,1,1-Trichloroethane	0.26	Not Detected	1.4	Not Detected
Cyclohexane	1.3	Not Detected	4.4	Not Detected
Carbon Tetrachloride	0.26	Not Detected	1.6	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.0	Not Detected
Benzene	0.26	2.0	0.82	6.4
1,2-Dichloroethane	0.26	4.7	1.0	19
Heptane	1.3	Not Detected	5.3	Not Detected
Trichloroethene	0.26	Not Detected	1.4	Not Detected
1,2-Dichloropropane	0.26	Not Detected	1.2	Not Detected
1,4-Dioxane	0.26	Not Detected	0.93	Not Detected
Bromodichloromethane	0.26	0.26	1.7	1.8
cis-1,3-Dichloropropene	0.26	Not Detected	1.2	Not Detected
4-Methyl-2-pentanone	0.26	0.30	1.0	1.2
Toluene	0.26	8.2	0.97	31
trans-1,3-Dichloropropene	0.26	Not Detected	1.2	Not Detected
1,1,2-Trichloroethane	0.26	Not Detected	1.4	Not Detected
Tetrachloroethene	0.26	Not Detected	1.8	Not Detected
2-Hexanone	1.3	Not Detected	5.3	Not Detected

Client Sample ID: SV2

Lab ID#: 2102278A-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021613	Date of Collection:	2/9/21 12:34:00 PM
Dil. Factor:	2.58	Date of Analysis:	2/16/21 04:39 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.26	Not Detected	2.2	Not Detected
1,2-Dibromoethane (EDB)	0.26	Not Detected	2.0	Not Detected
Chlorobenzene	0.26	Not Detected	1.2	Not Detected
Ethyl Benzene	0.26	1.3	1.1	5.7
m,p-Xylene	0.26	5.2	1.1	23
o-Xylene	0.26	1.6	1.1	7.1
Styrene	0.26	0.30	1.1	1.3
Bromoform	0.26	Not Detected	2.7	Not Detected
Cumene	0.26	Not Detected	1.3	Not Detected
1,1,2,2-Tetrachloroethane	0.26	Not Detected	1.8	Not Detected
Propylbenzene	0.26	Not Detected	1.3	Not Detected
4-Ethyltoluene	0.26	0.99	1.3	4.9
1,3,5-Trimethylbenzene	0.26	0.31	1.3	1.5
1,2,4-Trimethylbenzene	0.26	0.76	1.3	3.8
1,3-Dichlorobenzene	0.26	Not Detected	1.6	Not Detected
1,4-Dichlorobenzene	0.26	Not Detected	1.6	Not Detected
alpha-Chlorotoluene	0.26	Not Detected	1.3	Not Detected
1,2-Dichlorobenzene	0.26	Not Detected	1.6	Not Detected
1,2,4-Trichlorobenzene	1.3	Not Detected	9.6	Not Detected
Hexachlorobutadiene	1.3	Not Detected	14	Not Detected

J0 = Estimated value due to bias in the CCV.

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	91	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	98	70-130



Client Sample ID: SV3

Lab ID#: 2102278A-03A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021614	Date of Collection:	2/9/21 11:20:00 AM
Dil. Factor:	2.33	Date of Analysis:	2/16/21 05:19 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	5.8	Not Detected
Freon 114	0.23	Not Detected	1.6	Not Detected
Chloromethane	1.2	Not Detected	2.4	Not Detected
Vinyl Chloride	0.23	Not Detected	0.60	Not Detected
1,3-Butadiene	0.23	0.43 J0	0.52	0.95 J0
Bromomethane	1.2	Not Detected	4.5	Not Detected
Chloroethane	1.2	Not Detected	3.1	Not Detected
Freon 11	0.23	Not Detected	1.3	Not Detected
Ethanol	1.2	1.7	2.2	3.2
Freon 113	0.23	Not Detected	1.8	Not Detected
1,1-Dichloroethene	0.23	Not Detected	0.92	Not Detected
Acetone	2.3	12	5.5	29
2-Propanol	1.2	1.9 J0	2.9	4.7 J0
Carbon Disulfide	1.2	1.7	3.6	5.2
3-Chloropropene	1.2	Not Detected	3.6	Not Detected
Methylene Chloride	0.47	Not Detected	1.6	Not Detected
Methyl tert-butyl ether	0.23	Not Detected	0.84	Not Detected
trans-1,2-Dichloroethene	0.23	Not Detected	0.92	Not Detected
Hexane	1.2	Not Detected	4.1	Not Detected
1,1-Dichloroethane	0.23	Not Detected	0.94	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.2	2.2	3.4	6.4
cis-1,2-Dichloroethene	0.23	Not Detected	0.92	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.4	Not Detected
Chloroform	0.23	Not Detected	1.1	Not Detected
1,1,1-Trichloroethane	0.23	Not Detected	1.3	Not Detected
Cyclohexane	1.2	Not Detected	4.0	Not Detected
Carbon Tetrachloride	0.23	Not Detected	1.5	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.4	Not Detected
Benzene	0.23	0.36	0.74	1.2
1,2-Dichloroethane	0.23	Not Detected	0.94	Not Detected
Heptane	1.2	Not Detected	4.8	Not Detected
Trichloroethene	0.23	Not Detected	1.2	Not Detected
1,2-Dichloropropane	0.23	Not Detected	1.1	Not Detected
1,4-Dioxane	0.23	Not Detected	0.84	Not Detected
Bromodichloromethane	0.23	Not Detected	1.6	Not Detected
cis-1,3-Dichloropropene	0.23	Not Detected	1.0	Not Detected
4-Methyl-2-pentanone	0.23	Not Detected	0.95	Not Detected
Toluene	0.23	0.60	0.88	2.2
trans-1,3-Dichloropropene	0.23	Not Detected	1.0	Not Detected
1,1,2-Trichloroethane	0.23	Not Detected	1.3	Not Detected
Tetrachloroethene	0.23	Not Detected	1.6	Not Detected
2-Hexanone	1.2	Not Detected	4.8	Not Detected

Client Sample ID: SV3

Lab ID#: 2102278A-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021614	Date of Collection:	2/9/21 11:20:00 AM
Dil. Factor:	2.33	Date of Analysis:	2/16/21 05:19 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.23	Not Detected	2.0	Not Detected
1,2-Dibromoethane (EDB)	0.23	Not Detected	1.8	Not Detected
Chlorobenzene	0.23	Not Detected	1.1	Not Detected
Ethyl Benzene	0.23	Not Detected	1.0	Not Detected
m,p-Xylene	0.23	0.25	1.0	1.1
o-Xylene	0.23	Not Detected	1.0	Not Detected
Styrene	0.23	Not Detected	0.99	Not Detected
Bromoform	0.23	Not Detected	2.4	Not Detected
Cumene	0.23	Not Detected	1.1	Not Detected
1,1,2,2-Tetrachloroethane	0.23	Not Detected	1.6	Not Detected
Propylbenzene	0.23	Not Detected	1.1	Not Detected
4-Ethyltoluene	0.23	Not Detected	1.1	Not Detected
1,3,5-Trimethylbenzene	0.23	Not Detected	1.1	Not Detected
1,2,4-Trimethylbenzene	0.23	Not Detected	1.1	Not Detected
1,3-Dichlorobenzene	0.23	Not Detected	1.4	Not Detected
1,4-Dichlorobenzene	0.23	Not Detected	1.4	Not Detected
alpha-Chlorotoluene	0.23	Not Detected	1.2	Not Detected
1,2-Dichlorobenzene	0.23	Not Detected	1.4	Not Detected
1,2,4-Trichlorobenzene	1.2	Not Detected	8.6	Not Detected
Hexachlorobutadiene	1.2	Not Detected	12	Not Detected

J0 = Estimated value due to bias in the CCV.

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	99	70-130

Client Sample ID: SV5

Lab ID#: 2102278A-04A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021615	Date of Collection:	2/9/21 2:22:00 PM
Dil. Factor:	2.42	Date of Analysis:	2/16/21 05:59 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	6.0	Not Detected
Freon 114	0.24	Not Detected	1.7	Not Detected
Chloromethane	1.2	Not Detected	2.5	Not Detected
Vinyl Chloride	0.24	Not Detected	0.62	Not Detected
1,3-Butadiene	0.24	0.72 J0	0.54	1.6 J0
Bromomethane	1.2	Not Detected	4.7	Not Detected
Chloroethane	1.2	Not Detected	3.2	Not Detected
Freon 11	0.24	Not Detected	1.4	Not Detected
Ethanol	1.2	2.3	2.3	4.3
Freon 113	0.24	Not Detected	1.8	Not Detected
1,1-Dichloroethene	0.24	Not Detected	0.96	Not Detected
Acetone	2.4	15	5.7	35
2-Propanol	1.2	2.2 J0	3.0	5.4 J0
Carbon Disulfide	1.2	1.4	3.8	4.5
3-Chloropropene	1.2	Not Detected	3.8	Not Detected
Methylene Chloride	0.48	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.24	Not Detected	0.87	Not Detected
trans-1,2-Dichloroethene	0.24	Not Detected	0.96	Not Detected
Hexane	1.2	Not Detected	4.3	Not Detected
1,1-Dichloroethane	0.24	Not Detected	0.98	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.2	2.2	3.6	6.6
cis-1,2-Dichloroethene	0.24	Not Detected	0.96	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.6	Not Detected
Chloroform	0.24	2.2	1.2	11
1,1,1-Trichloroethane	0.24	Not Detected	1.3	Not Detected
Cyclohexane	1.2	Not Detected	4.2	Not Detected
Carbon Tetrachloride	0.24	Not Detected	1.5	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.6	Not Detected
Benzene	0.24	2.1	0.77	6.8
1,2-Dichloroethane	0.24	Not Detected	0.98	Not Detected
Heptane	1.2	Not Detected	5.0	Not Detected
Trichloroethene	0.24	Not Detected	1.3	Not Detected
1,2-Dichloropropane	0.24	Not Detected	1.1	Not Detected
1,4-Dioxane	0.24	Not Detected	0.87	Not Detected
Bromodichloromethane	0.24	Not Detected	1.6	Not Detected
cis-1,3-Dichloropropene	0.24	Not Detected	1.1	Not Detected
4-Methyl-2-pentanone	0.24	0.40	0.99	1.6
Toluene	0.24	5.5	0.91	21
trans-1,3-Dichloropropene	0.24	Not Detected	1.1	Not Detected
1,1,2-Trichloroethane	0.24	Not Detected	1.3	Not Detected
Tetrachloroethene	0.24	Not Detected	1.6	Not Detected
2-Hexanone	1.2	Not Detected	5.0	Not Detected

Client Sample ID: SV5

Lab ID#: 2102278A-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021615	Date of Collection:	2/9/21 2:22:00 PM
Dil. Factor:	2.42	Date of Analysis:	2/16/21 05:59 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.24	Not Detected	2.1	Not Detected
1,2-Dibromoethane (EDB)	0.24	Not Detected	1.8	Not Detected
Chlorobenzene	0.24	Not Detected	1.1	Not Detected
Ethyl Benzene	0.24	0.89	1.0	3.8
m,p-Xylene	0.24	4.0	1.0	17
o-Xylene	0.24	1.3	1.0	5.6
Styrene	0.24	0.26	1.0	1.1
Bromoform	0.24	Not Detected	2.5	Not Detected
Cumene	0.24	Not Detected	1.2	Not Detected
1,1,2,2-Tetrachloroethane	0.24	Not Detected	1.7	Not Detected
Propylbenzene	0.24	Not Detected	1.2	Not Detected
4-Ethyltoluene	0.24	0.82	1.2	4.0
1,3,5-Trimethylbenzene	0.24	0.27	1.2	1.3
1,2,4-Trimethylbenzene	0.24	0.61	1.2	3.0
1,3-Dichlorobenzene	0.24	Not Detected	1.4	Not Detected
1,4-Dichlorobenzene	0.24	Not Detected	1.4	Not Detected
alpha-Chlorotoluene	0.24	Not Detected	1.2	Not Detected
1,2-Dichlorobenzene	0.24	Not Detected	1.4	Not Detected
1,2,4-Trichlorobenzene	1.2	Not Detected	9.0	Not Detected
Hexachlorobutadiene	1.2	Not Detected	13	Not Detected

J0 = Estimated value due to bias in the CCV.

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	91	70-130
4-Bromofluorobenzene	97	70-130

Client Sample ID: SV6

Lab ID#: 2102278A-05A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021616	Date of Collection:	2/9/21 1:48:00 PM
Dil. Factor:	2.52	Date of Analysis:	2/16/21 06:39 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	Not Detected	6.2	Not Detected
Freon 114	0.25	Not Detected	1.8	Not Detected
Chloromethane	1.3	Not Detected	2.6	Not Detected
Vinyl Chloride	0.25	Not Detected	0.64	Not Detected
1,3-Butadiene	0.25	0.58 J0	0.56	1.3 J0
Bromomethane	1.3	Not Detected	4.9	Not Detected
Chloroethane	1.3	Not Detected	3.3	Not Detected
Freon 11	0.25	Not Detected	1.4	Not Detected
Ethanol	1.3	1.8	2.4	3.3
Freon 113	0.25	Not Detected	1.9	Not Detected
1,1-Dichloroethene	0.25	Not Detected	1.0	Not Detected
Acetone	2.5	6.5	6.0	16
2-Propanol	1.3	2.0 J0	3.1	5.0 J0
Carbon Disulfide	1.3	Not Detected	3.9	Not Detected
3-Chloropropene	1.3	Not Detected	3.9	Not Detected
Methylene Chloride	0.50	Not Detected	1.8	Not Detected
Methyl tert-butyl ether	0.25	Not Detected	0.91	Not Detected
trans-1,2-Dichloroethene	0.25	Not Detected	1.0	Not Detected
Hexane	1.3	Not Detected	4.4	Not Detected
1,1-Dichloroethane	0.25	Not Detected	1.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	Not Detected	3.7	Not Detected
cis-1,2-Dichloroethene	0.25	Not Detected	1.0	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.7	Not Detected
Chloroform	0.25	Not Detected	1.2	Not Detected
1,1,1-Trichloroethane	0.25	Not Detected	1.4	Not Detected
Cyclohexane	1.3	Not Detected	4.3	Not Detected
Carbon Tetrachloride	0.25	Not Detected	1.6	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	5.9	Not Detected
Benzene	0.25	0.52	0.80	1.7
1,2-Dichloroethane	0.25	Not Detected	1.0	Not Detected
Heptane	1.3	Not Detected	5.2	Not Detected
Trichloroethene	0.25	Not Detected	1.4	Not Detected
1,2-Dichloropropane	0.25	Not Detected	1.2	Not Detected
1,4-Dioxane	0.25	Not Detected	0.91	Not Detected
Bromodichloromethane	0.25	Not Detected	1.7	Not Detected
cis-1,3-Dichloropropene	0.25	Not Detected	1.1	Not Detected
4-Methyl-2-pentanone	0.25	Not Detected	1.0	Not Detected
Toluene	0.25	0.50	0.95	1.9
trans-1,3-Dichloropropene	0.25	Not Detected	1.1	Not Detected
1,1,2-Trichloroethane	0.25	Not Detected	1.4	Not Detected
Tetrachloroethene	0.25	Not Detected	1.7	Not Detected
2-Hexanone	1.3	Not Detected	5.2	Not Detected

Client Sample ID: SV6

Lab ID#: 2102278A-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021616	Date of Collection:	2/9/21 1:48:00 PM
Dil. Factor:	2.52	Date of Analysis:	2/16/21 06:39 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.25	Not Detected	2.1	Not Detected
1,2-Dibromoethane (EDB)	0.25	Not Detected	1.9	Not Detected
Chlorobenzene	0.25	Not Detected	1.2	Not Detected
Ethyl Benzene	0.25	Not Detected	1.1	Not Detected
m,p-Xylene	0.25	Not Detected	1.1	Not Detected
o-Xylene	0.25	Not Detected	1.1	Not Detected
Styrene	0.25	Not Detected	1.1	Not Detected
Bromoform	0.25	Not Detected	2.6	Not Detected
Cumene	0.25	Not Detected	1.2	Not Detected
1,1,2,2-Tetrachloroethane	0.25	Not Detected	1.7	Not Detected
Propylbenzene	0.25	Not Detected	1.2	Not Detected
4-Ethyltoluene	0.25	Not Detected	1.2	Not Detected
1,3,5-Trimethylbenzene	0.25	Not Detected	1.2	Not Detected
1,2,4-Trimethylbenzene	0.25	Not Detected	1.2	Not Detected
1,3-Dichlorobenzene	0.25	Not Detected	1.5	Not Detected
1,4-Dichlorobenzene	0.25	Not Detected	1.5	Not Detected
alpha-Chlorotoluene	0.25	Not Detected	1.3	Not Detected
1,2-Dichlorobenzene	0.25	Not Detected	1.5	Not Detected
1,2,4-Trichlorobenzene	1.3	Not Detected	9.4	Not Detected
Hexachlorobutadiene	1.3	Not Detected	13	Not Detected

J0 = Estimated value due to bias in the CCV.

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	105	70-130



Client Sample ID: SV4

Lab ID#: 2102278A-06A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021617	Date of Collection:	2/9/21 3:02:00 PM
Dil. Factor:	2.38	Date of Analysis:	2/16/21 07:19 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	5.9	Not Detected
Freon 114	0.24	Not Detected	1.7	Not Detected
Chloromethane	1.2	Not Detected	2.4	Not Detected
Vinyl Chloride	0.24	Not Detected	0.61	Not Detected
1,3-Butadiene	0.24	0.42 J0	0.53	0.94 J0
Bromomethane	1.2	Not Detected	4.6	Not Detected
Chloroethane	1.2	Not Detected	3.1	Not Detected
Freon 11	0.24	0.24	1.3	1.4
Ethanol	1.2	1.4	2.2	2.6
Freon 113	0.24	Not Detected	1.8	Not Detected
1,1-Dichloroethene	0.24	Not Detected	0.94	Not Detected
Acetone	2.4	5.9	5.6	14
2-Propanol	1.2	1.4 J0	2.9	3.4 J0
Carbon Disulfide	1.2	Not Detected	3.7	Not Detected
3-Chloropropene	1.2	Not Detected	3.7	Not Detected
Methylene Chloride	0.48	Not Detected	1.6	Not Detected
Methyl tert-butyl ether	0.24	Not Detected	0.86	Not Detected
trans-1,2-Dichloroethene	0.24	Not Detected	0.94	Not Detected
Hexane	1.2	1.2	4.2	4.2
1,1-Dichloroethane	0.24	Not Detected	0.96	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.2	Not Detected	3.5	Not Detected
cis-1,2-Dichloroethene	0.24	Not Detected	0.94	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.5	Not Detected
Chloroform	0.24	0.93	1.2	4.5
1,1,1-Trichloroethane	0.24	Not Detected	1.3	Not Detected
Cyclohexane	1.2	1.9	4.1	6.6
Carbon Tetrachloride	0.24	Not Detected	1.5	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.6	Not Detected
Benzene	0.24	1.7	0.76	5.6
1,2-Dichloroethane	0.24	Not Detected	0.96	Not Detected
Heptane	1.2	Not Detected	4.9	Not Detected
Trichloroethene	0.24	Not Detected	1.3	Not Detected
1,2-Dichloropropane	0.24	Not Detected	1.1	Not Detected
1,4-Dioxane	0.24	Not Detected	0.86	Not Detected
Bromodichloromethane	0.24	Not Detected	1.6	Not Detected
cis-1,3-Dichloropropene	0.24	Not Detected	1.1	Not Detected
4-Methyl-2-pentanone	0.24	Not Detected	0.97	Not Detected
Toluene	0.24	1.2	0.90	4.6
trans-1,3-Dichloropropene	0.24	Not Detected	1.1	Not Detected
1,1,2-Trichloroethane	0.24	Not Detected	1.3	Not Detected
Tetrachloroethene	0.24	Not Detected	1.6	Not Detected
2-Hexanone	1.2	Not Detected	4.9	Not Detected

Client Sample ID: SV4

Lab ID#: 2102278A-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021617	Date of Collection: 2/9/21 3:02:00 PM
Dil. Factor:	2.38	Date of Analysis: 2/16/21 07:19 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.24	Not Detected	2.0	Not Detected
1,2-Dibromoethane (EDB)	0.24	Not Detected	1.8	Not Detected
Chlorobenzene	0.24	Not Detected	1.1	Not Detected
Ethyl Benzene	0.24	Not Detected	1.0	Not Detected
m,p-Xylene	0.24	0.34	1.0	1.5
o-Xylene	0.24	Not Detected	1.0	Not Detected
Styrene	0.24	Not Detected	1.0	Not Detected
Bromoform	0.24	Not Detected	2.5	Not Detected
Cumene	0.24	Not Detected	1.2	Not Detected
1,1,2,2-Tetrachloroethane	0.24	Not Detected	1.6	Not Detected
Propylbenzene	0.24	Not Detected	1.2	Not Detected
4-Ethyltoluene	0.24	Not Detected	1.2	Not Detected
1,3,5-Trimethylbenzene	0.24	Not Detected	1.2	Not Detected
1,2,4-Trimethylbenzene	0.24	Not Detected	1.2	Not Detected
1,3-Dichlorobenzene	0.24	Not Detected	1.4	Not Detected
1,4-Dichlorobenzene	0.24	Not Detected	1.4	Not Detected
alpha-Chlorotoluene	0.24	Not Detected	1.2	Not Detected
1,2-Dichlorobenzene	0.24	Not Detected	1.4	Not Detected
1,2,4-Trichlorobenzene	1.2	Not Detected	8.8	Not Detected
Hexachlorobutadiene	1.2	Not Detected	13	Not Detected

J0 = Estimated value due to bias in the CCV.

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	94	70-130
4-Bromofluorobenzene	92	70-130

Client Sample ID: Lab Blank

Lab ID#: 2102278A-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021606	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/16/21 09:43 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.10	Not Detected	0.70	Not Detected
Chloromethane	0.50	Not Detected	1.0	Not Detected
Vinyl Chloride	0.10	Not Detected	0.26	Not Detected
1,3-Butadiene	0.10	Not Detected UJ	0.22	Not Detected UJ
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	0.50	Not Detected	1.3	Not Detected
Freon 11	0.10	Not Detected	0.56	Not Detected
Ethanol	0.50	Not Detected	0.94	Not Detected
Freon 113	0.10	Not Detected	0.77	Not Detected
1,1-Dichloroethene	0.10	Not Detected	0.40	Not Detected
Acetone	1.0	Not Detected	2.4	Not Detected
2-Propanol	0.50	Not Detected UJ	1.2	Not Detected UJ
Carbon Disulfide	0.50	Not Detected	1.6	Not Detected
3-Chloropropene	0.50	Not Detected	1.6	Not Detected
Methylene Chloride	0.20	Not Detected	0.69	Not Detected
Methyl tert-butyl ether	0.10	Not Detected	0.36	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.10	Not Detected	0.40	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.50	Not Detected	1.5	Not Detected
cis-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.10	Not Detected	0.49	Not Detected
1,1,1-Trichloroethane	0.10	Not Detected	0.54	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.10	Not Detected	0.63	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.10	Not Detected	0.32	Not Detected
1,2-Dichloroethane	0.10	Not Detected	0.40	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.10	Not Detected	0.54	Not Detected
1,2-Dichloropropane	0.10	Not Detected	0.46	Not Detected
1,4-Dioxane	0.10	Not Detected	0.36	Not Detected
Bromodichloromethane	0.10	Not Detected	0.67	Not Detected
cis-1,3-Dichloropropene	0.10	Not Detected	0.45	Not Detected
4-Methyl-2-pentanone	0.10	Not Detected	0.41	Not Detected
Toluene	0.10	Not Detected	0.38	Not Detected
trans-1,3-Dichloropropene	0.10	Not Detected	0.45	Not Detected
1,1,2-Trichloroethane	0.10	Not Detected	0.54	Not Detected
Tetrachloroethene	0.10	Not Detected	0.68	Not Detected
2-Hexanone	0.50	Not Detected	2.0	Not Detected

Client Sample ID: Lab Blank

Lab ID#: 2102278A-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021606	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/16/21 09:43 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.10	Not Detected	0.85	Not Detected
1,2-Dibromoethane (EDB)	0.10	Not Detected	0.77	Not Detected
Chlorobenzene	0.10	Not Detected	0.46	Not Detected
Ethyl Benzene	0.10	Not Detected	0.43	Not Detected
m,p-Xylene	0.10	Not Detected	0.43	Not Detected
o-Xylene	0.10	Not Detected	0.43	Not Detected
Styrene	0.10	Not Detected	0.42	Not Detected
Bromoform	0.10	Not Detected	1.0	Not Detected
Cumene	0.10	Not Detected	0.49	Not Detected
1,1,2,2-Tetrachloroethane	0.10	Not Detected	0.69	Not Detected
Propylbenzene	0.10	Not Detected	0.49	Not Detected
4-Ethyltoluene	0.10	Not Detected	0.49	Not Detected
1,3,5-Trimethylbenzene	0.10	Not Detected	0.49	Not Detected
1,2,4-Trimethylbenzene	0.10	Not Detected	0.49	Not Detected
1,3-Dichlorobenzene	0.10	Not Detected	0.60	Not Detected
1,4-Dichlorobenzene	0.10	Not Detected	0.60	Not Detected
alpha-Chlorotoluene	0.10	Not Detected	0.52	Not Detected
1,2-Dichlorobenzene	0.10	Not Detected	0.60	Not Detected
1,2,4-Trichlorobenzene	0.50	Not Detected	3.7	Not Detected
Hexachlorobutadiene	0.50	Not Detected	5.3	Not Detected

UJ = Analyte associated with low bias in the CCV.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	92	70-130
4-Bromofluorobenzene	103	70-130

Client Sample ID: CCV

Lab ID#: 2102278A-08A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021602	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/16/21 06:57 AM

Compound	%Recovery
Freon 12	84
Freon 114	89
Chloromethane	74
Vinyl Chloride	80
1,3-Butadiene	69 Q
Bromomethane	94
Chloroethane	75
Freon 11	97
Ethanol	71
Freon 113	91
1,1-Dichloroethene	84
Acetone	70
2-Propanol	65 Q
Carbon Disulfide	83
3-Chloropropene	83
Methylene Chloride	77
Methyl tert-butyl ether	76
trans-1,2-Dichloroethene	83
Hexane	71
1,1-Dichloroethane	79
2-Butanone (Methyl Ethyl Ketone)	74
cis-1,2-Dichloroethene	83
Tetrahydrofuran	76
Chloroform	82
1,1,1-Trichloroethane	84
Cyclohexane	79
Carbon Tetrachloride	87
2,2,4-Trimethylpentane	72
Benzene	87
1,2-Dichloroethane	92
Heptane	77
Trichloroethene	105
1,2-Dichloropropane	85
1,4-Dioxane	91
Bromodichloromethane	90
cis-1,3-Dichloropropene	85
4-Methyl-2-pentanone	85
Toluene	90
trans-1,3-Dichloropropene	87
1,1,2-Trichloroethane	95
Tetrachloroethene	101
2-Hexanone	83

Client Sample ID: CCV

Lab ID#: 2102278A-08A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021602	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/16/21 06:57 AM

Compound	%Recovery
Dibromochloromethane	105
1,2-Dibromoethane (EDB)	101
Chlorobenzene	97
Ethyl Benzene	92
m,p-Xylene	85
o-Xylene	85
Styrene	87
Bromoform	102
Cumene	84
1,1,2,2-Tetrachloroethane	86
Propylbenzene	91
4-Ethyltoluene	88
1,3,5-Trimethylbenzene	92
1,2,4-Trimethylbenzene	91
1,3-Dichlorobenzene	98
1,4-Dichlorobenzene	96
alpha-Chlorotoluene	80
1,2-Dichlorobenzene	102
1,2,4-Trichlorobenzene	97
Hexachlorobutadiene	91

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	81	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	95	70-130



Client Sample ID: LCS

Lab ID#: 2102278A-09A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021603	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/16/21 07:42 AM

Compound	%Recovery	Method Limits
Freon 12	90	70-130
Freon 114	97	70-130
Chloromethane	79	70-130
Vinyl Chloride	86	70-130
1,3-Butadiene	75	70-130
Bromomethane	98	70-130
Chloroethane	83	70-130
Freon 11	103	70-130
Ethanol	67 Q	70-130
Freon 113	100	70-130
1,1-Dichloroethene	91	70-130
Acetone	77	70-130
2-Propanol	68 Q	70-130
Carbon Disulfide	86	70-130
3-Chloropropene	85	70-130
Methylene Chloride	80	70-130
Methyl tert-butyl ether	80	70-130
trans-1,2-Dichloroethene	91	70-130
Hexane	77	70-130
1,1-Dichloroethane	84	70-130
2-Butanone (Methyl Ethyl Ketone)	79	70-130
cis-1,2-Dichloroethene	89	70-130
Tetrahydrofuran	78	70-130
Chloroform	88	70-130
1,1,1-Trichloroethane	91	70-130
Cyclohexane	85	70-130
Carbon Tetrachloride	93	70-130
2,2,4-Trimethylpentane	75	70-130
Benzene	89	70-130
1,2-Dichloroethane	92	70-130
Heptane	78	70-130
Trichloroethene	109	70-130
1,2-Dichloropropane	88	70-130
1,4-Dioxane	96	70-130
Bromodichloromethane	91	70-130
cis-1,3-Dichloropropene	86	70-130
4-Methyl-2-pentanone	88	70-130
Toluene	90	70-130
trans-1,3-Dichloropropene	89	70-130
1,1,2-Trichloroethane	95	70-130
Tetrachloroethene	104	70-130
2-Hexanone	82	70-130

Client Sample ID: LCS

Lab ID#: 2102278A-09A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>v021603</b>	<b>Date of Collection:</b> NA
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b> 2/16/21 07:42 AM

Compound	%Recovery	Method Limits
Dibromochloromethane	106	70-130
1,2-Dibromoethane (EDB)	102	70-130
Chlorobenzene	99	70-130
Ethyl Benzene	91	70-130
m,p-Xylene	87	70-130
o-Xylene	86	70-130
Styrene	86	70-130
Bromoform	107	70-130
Cumene	82	70-130
1,1,2,2-Tetrachloroethane	84	70-130
Propylbenzene	92	70-130
4-Ethyltoluene	89	70-130
1,3,5-Trimethylbenzene	95	70-130
1,2,4-Trimethylbenzene	94	70-130
1,3-Dichlorobenzene	101	70-130
1,4-Dichlorobenzene	100	70-130
alpha-Chlorotoluene	81	70-130
1,2-Dichlorobenzene	102	70-130
1,2,4-Trichlorobenzene	115	70-130
Hexachlorobutadiene	115	70-130

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	84	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	94	70-130

Client Sample ID: LCSD

Lab ID#: 2102278A-09AA

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021604	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/16/21 08:22 AM

Compound	%Recovery	Method Limits
Freon 12	89	70-130
Freon 114	97	70-130
Chloromethane	80	70-130
Vinyl Chloride	86	70-130
1,3-Butadiene	75	70-130
Bromomethane	91	70-130
Chloroethane	79	70-130
Freon 11	100	70-130
Ethanol	66 Q	70-130
Freon 113	98	70-130
1,1-Dichloroethene	89	70-130
Acetone	74	70-130
2-Propanol	67 Q	70-130
Carbon Disulfide	85	70-130
3-Chloropropene	84	70-130
Methylene Chloride	80	70-130
Methyl tert-butyl ether	80	70-130
trans-1,2-Dichloroethene	87	70-130
Hexane	73	70-130
1,1-Dichloroethane	81	70-130
2-Butanone (Methyl Ethyl Ketone)	78	70-130
cis-1,2-Dichloroethene	88	70-130
Tetrahydrofuran	76	70-130
Chloroform	85	70-130
1,1,1-Trichloroethane	90	70-130
Cyclohexane	83	70-130
Carbon Tetrachloride	90	70-130
2,2,4-Trimethylpentane	73	70-130
Benzene	90	70-130
1,2-Dichloroethane	93	70-130
Heptane	78	70-130
Trichloroethene	110	70-130
1,2-Dichloropropane	88	70-130
1,4-Dioxane	93	70-130
Bromodichloromethane	93	70-130
cis-1,3-Dichloropropene	87	70-130
4-Methyl-2-pentanone	87	70-130
Toluene	91	70-130
trans-1,3-Dichloropropene	90	70-130
1,1,2-Trichloroethane	97	70-130
Tetrachloroethene	108	70-130
2-Hexanone	83	70-130

Client Sample ID: LCSD

Lab ID#: 2102278A-09AA

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	v021604	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/16/21 08:22 AM

Compound	%Recovery	Method Limits
Dibromochloromethane	109	70-130
1,2-Dibromoethane (EDB)	105	70-130
Chlorobenzene	100	70-130
Ethyl Benzene	90	70-130
m,p-Xylene	83	70-130
o-Xylene	82	70-130
Styrene	83	70-130
Bromoform	110	70-130
Cumene	81	70-130
1,1,2,2-Tetrachloroethane	88	70-130
Propylbenzene	86	70-130
4-Ethyltoluene	84	70-130
1,3,5-Trimethylbenzene	92	70-130
1,2,4-Trimethylbenzene	95	70-130
1,3-Dichlorobenzene	96	70-130
1,4-Dichlorobenzene	93	70-130
alpha-Chlorotoluene	80	70-130
1,2-Dichlorobenzene	96	70-130
1,2,4-Trichlorobenzene	113	70-130
Hexachlorobutadiene	114	70-130

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	83	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	93	70-130

2/23/2021

Ms. Nicole Hastings-Bethel  
Geocon Consultants, Inc.  
3160 Gold Valley Drive  
Suite 800  
Rancho Cordova CA 95742-7207

Project Name: Cloverdale  
Project #: E8695-04-21  
Workorder #: 2102278B

Dear Ms. Nicole Hastings-Bethel

The following report includes the data for the above referenced project for sample(s) received on 2/10/2021 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by Modified ASTM D-1946 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Alexandra Winslow  
Project Manager

**WORK ORDER #: 2102278B**

Work Order Summary

<b>CLIENT:</b>	Ms. Nicole Hastings-Bethel Geocon Consultants, Inc. 3160 Gold Valley Drive Suite 800 Rancho Cordova, CA 95742-7207	<b>BILL TO:</b>	Ms. Nicole Hastings-Bethel Geocon Consultants, Inc. 3160 Gold Valley Drive Suite 800 Rancho Cordova, CA 95742-7207
<b>PHONE:</b>	916-852-9118	<b>P.O. #</b>	
<b>FAX:</b>	916-852-9132	<b>PROJECT #</b>	E8695-04-21 Cloverdale
<b>DATE RECEIVED:</b>	02/10/2021	<b>CONTACT:</b>	Alexandra Winslow
<b>DATE COMPLETED:</b>	02/23/2021		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	SV1	Modified ASTM D-1946	5.0 "Hg	15 psi
02A	SV2	Modified ASTM D-1946	6.5 "Hg	15 psi
03A	SV3	Modified ASTM D-1946	4.0 "Hg	15 psi
04A	SV5	Modified ASTM D-1946	5.0 "Hg	15 psi
05A	SV6	Modified ASTM D-1946	6.0 "Hg	15 psi
06A	SV4	Modified ASTM D-1946	4.5 "Hg	15 psi
07A	Lab Blank	Modified ASTM D-1946	NA	NA
07B	Lab Blank	Modified ASTM D-1946	NA	NA
08A	LCS	Modified ASTM D-1946	NA	NA
08AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY:



Technical Director

DATE: 02/23/21

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935

Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)

Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.

Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

*This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.*

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279



**LABORATORY NARRATIVE**  
**Modified ASTM D-1946**  
**Geocon Consultants, Inc.**  
**Workorder# 2102278B**

Six 1 Liter Summa Canister (100% Certified) samples were received on February 10, 2021. The laboratory performed analysis via Modified ASTM Method D-1946 for fixed gases in air using GC/TCD. The method involves direct injection of 1.0 mL of sample.

On the analytical column employed for this analysis, Oxygen coelutes with Argon. The corresponding peak is quantitated as Oxygen.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the EATL modifications.

<i>Requirement</i>	<i>ASTM D-1946</i>	<i>ATL Modifications</i>
Calibration	A single point calibration is performed using a reference standard closely matching the composition of the unknown.	A minimum of 5-point calibration curve is performed. Quantitation is based on average Response Factor.
Reference Standard	The composition of any reference standard must be known to within 0.01 mol % for any component.	The standards used by ATL are blended to a $\geq 95\%$ accuracy.
Sample Injection Volume	Components whose concentrations are in excess of 5 % should not be analyzed by using sample volumes greater than 0.5 mL.	The sample container is connected directly to a fixed volume sample loop of 1.0 mL on the GC. Linear range is defined by the calibration curve. Bags are loaded by vacuum.
Normalization	Normalize the mole percent values by multiplying each value by 100 and dividing by the sum of the original values. The sum of the original values should not differ from 100% by more than 1.0%.	Results are not normalized. The sum of the reported values can differ from 100% by as much as 15%, either due to analytical variability or an unusual sample matrix.
Precision	Precision requirements established at each concentration level.	Duplicates should agree within 25% RPD for detections > 5 X's the RL.

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

There were no analytical discrepancies.

**Definition of Data Qualifying Flags**

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:

B - Compound present in laboratory blank greater than reporting limit.

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the detection limit.

M - Reported value may be biased due to apparent matrix interferences.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

## Summary of Detected Compounds

### NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

**Client Sample ID: SV1**

**Lab ID#: 2102278B-01A**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	17

**Client Sample ID: SV2**

**Lab ID#: 2102278B-02A**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	20

**Client Sample ID: SV3**

**Lab ID#: 2102278B-03A**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.23	20

**Client Sample ID: SV5**

**Lab ID#: 2102278B-04A**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	19

**Client Sample ID: SV6**

**Lab ID#: 2102278B-05A**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	20

**Client Sample ID: SV4**

**Lab ID#: 2102278B-06A**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	3.5



Air Toxics

Client Sample ID: SV1

Lab ID#: 2102278B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10021816b	Date of Collection:	2/9/21 12:31:00 PM
Dil. Factor:	2.42	Date of Analysis:	2/18/21 05:22 PM

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	17
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)



Air Toxics

Client Sample ID: SV2

Lab ID#: 2102278B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10021817b	Date of Collection: 2/9/21 12:34:00 PM
Dil. Factor:	2.58	Date of Analysis: 2/18/21 05:45 PM

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	20
Helium	0.13	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)



Air Toxics

Client Sample ID: SV3

Lab ID#: 2102278B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10021818b	Date of Collection: 2/9/21 11:20:00 AM
Dil. Factor:	2.33	Date of Analysis: 2/18/21 06:08 PM

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.23	20
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)





Air Toxics

Client Sample ID: SV5

Lab ID#: 2102278B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10021819b	Date of Collection: 2/9/21 2:22:00 PM
Dil. Factor:	2.42	Date of Analysis: 2/18/21 06:31 PM

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	19
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)



Air Toxics

Client Sample ID: SV6

Lab ID#: 2102278B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10021820b	Date of Collection: 2/9/21 1:48:00 PM
Dil. Factor:	2.52	Date of Analysis: 2/18/21 06:54 PM

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	20
Helium	0.13	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)



Air Toxics

Client Sample ID: SV4

Lab ID#: 2102278B-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	10021821b	Date of Collection: 2/9/21 3:02:00 PM
Dil. Factor:	2.38	Date of Analysis: 2/18/21 07:16 PM

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	3.5
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister (100% Certified)



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2102278B-07A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946 GC/TC

File Name: 10021803b  
Dil. Factor: 1.00

Date of Collection: NA  
Date of Analysis: 2/18/21 12:04 PM

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	Not Detected

Container Type: NA - Not Applicable



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2102278B-07B

**NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946**

File Name: 10021804c  
Dil. Factor: 1.00

Date of Collection: NA  
Date of Analysis: 2/18/21 12:48 PM

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.050	Not Detected

Container Type: NA - Not Applicable



Air Toxics

Client Sample ID: LCS

Lab ID#: 2102278B-08A

**NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946**

File Name:	10021802b	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/18/21 11:40 AM

Compound	%Recovery	Method Limits
Oxygen	100	85-115
Helium	101	85-115

Container Type: NA - Not Applicable





Air Toxics

Client Sample ID: LCSD

Lab ID#: 2102278B-08AA

**NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946**

<b>File Name:</b>	<b>10021825b</b>	<b>Date of Collection:</b> NA
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis:</b> 2/18/21 08:56 PM

<b>Compound</b>	<b>%Recovery</b>	<b>Method Limits</b>
Oxygen	100	85-115
Helium	100	85-115

Container Type: NA - Not Applicable