FINAL REMEDIAL ACTION PLAN

Former Santa Rosa Manufactured Gas Plant

111 Santa Rosa Avenue
Santa Rosa, California

August 19, 2015

prepared for

3401 Crow Canyon Road
San Ramon, California 94583

prepared by

13900 Alton Parkway, Suite 122
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Project No. PGE-1015

TERRA PACIFIC GROUP
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August 19, 2015 Project No. PGE-1015

Ms. Beth Lamb
North Coast Regional Water Quality Control Board
5550 Skylane Boulevard
Santa Rosa, California 94503

RE: Final Remedial Action Plan
Former Santa Rosa Manufactured Gas Plant
111 Santa Rosa Avenue
Santa Rosa, California

Dear Ms. Lamb:

On behalf of Pacific Gas and Electric Company, Terra Pacific Group Incorporated is pleased to submit the above-referenced Final Remedial Action Plan for Pacific Gas and Electric Company's Former Santa Rosa Manufactured Gas Plant. If you have any questions or comments, please do not hesitate to call me at (760) 213-5782.

Respectfully submitted,

Terra Pacific Group Incorporated

Murray Wunderly PG, CHG
Principal

Enclosure: Final Remedial Action Plan (electronic copy)

cc: Chief Tony Gossner, Santa Rosa Fire Dept., Santa Rosa Fire Department, 2373 Circadian Way, Santa Rosa, CA 95407
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The Final Remedial Action Plan presented herein was prepared by Terra Pacific Group Incorporated on behalf of Pacific Gas and Electric Company.

8/19/15

Murray Wunderly, PG, CHG — Date

Principal Hydrogeologist, Project Manager

8/19/15

Max Reyhani, PE, — Date

Principal Engineer

EXECUTIVE SUMMARY

This Final Remedial Action Plan (RAP) addresses soil and groundwater impacts resulting from operation of the former Santa Rosa Manufactured Gas Plant (MGP) in Santa Rosa, California (Figures 1 and 2) from 1877 to1924. The majority of the former Santa Rosa MGP property (the Site) currently consists of a parking lot for the commercial office building located at 111 Santa Rosa Avenue.

Investigation began at the Site in July 1986. To date, samples have been collected at more than 300 locations; many of these locations include samples from multiple depths. Groundwater monitoring was originally conducted sporadically following installation of the first wells in 1988. Since 1997, groundwater has been monitored twice yearly, with the exception of 2006 when only one groundwater monitoring event was conducted.

Early removal of impacted soil took place over several events in late 1987 and mid-1988 prior to Site development. In 2004, PG&E conducted remediation activities in Santa Rosa Creek and the adjacent north bank directly to the south of the Site in association with the development of the Prince Memorial Greenway (PMG) by the City of Santa Rosa Department of Public Works. In 2006, EBA Engineers excavated and removed two underground storage tanks (USTs) from the parking lot area of the Site. A former redwood gas holder at the Site was remediated using electrical resistance heating (ERH) in 2009 and 2010. Due to the large volume of coal tar extracted during ERH operations (approximately 55,000 gallons), geotechnical stabilization of the soils in this area was necessary to prevent further settlement of the ground surface. In situ soil mixing (ISSM) was implemented in the vicinity of the redwood gas holder in 2012 and 2013 using large diameter auger soil mixing and jet grouting. Following ISSM, an engineered cap was installed over the entire treatment area. In October 2011, targeted soil excavation activities were conducted to remove shallow soil with elevated lead concentrations in the area south of the entrance to the underground parking garage. Soil excavation activities were also conducted in 2013 to remove impacted shallow soil in the planter areas in and around the parking areas. Following completion of the remediation activities conducted through 2013, the parking lot at the Site was restored to pre-remediation conditions.

A Screening-Level Human Health Risk Assessment (SLHHRA) was prepared by Iris Environmental to determine whether levels of chemicals remaining in soil at and around the Site could pose a risk to human health based on current and potential future property uses. The results of the SLHHRA were used to identify areas where remedial/mitigation measures and/or risk management may be appropriate, with the overall goal of long-term protection of human health. Three areas were evaluated in the SLHHRA, including the on-site property (111 Santa Rosa Avenue; APNs 010068020 and 010068021), the 438 First Street Property (APN 010068019), and off-site public Right of Way (ROW) areas consisting of all other areas adjacent to the Site (Figure 2). Based on the current and assumed hypothetical future uses for each of these areas, the populations included in the SLHHRA consisted of the following:

- Current commercial worker (also evaluated as protective of infrequent visitors);

- Hypothetical future commercial worker (including short-term construction/intrusive workers); and,
- Hypothetical future resident.

Under current conditions, the potential pathways through which commercial workers could be exposed to compounds of potential concern (COPCs) in soil are considered incomplete or insignificant. Therefore, the current conditions are fully protective of the health of current commercial populations and no further remedial or mitigation measures are warranted. Risk management measures, such as a cap maintenance/soil management plan and deed restrictions, are warranted to ensure that conditions remain protective of human health. Although it is not anticipated that any of the areas evaluated would be used for future residential use, soil impacts within the upper 10 feet were evaluated against residential use criteria and were determined to exceed acceptable levels in at least a portion of each area. Accordingly, risk management measures that restrict future residential use of these areas are also warranted.

Several Feasibility Studies were conducted for soil and groundwater between 2006 and 2015. The overall proposed soil and groundwater remedy selected included the following components:

- Removal of the former USTs in the parking lot west of the building entrance;
- Remediation of the redwood gas holder;
- Removal of the existing on-site UST (on hold pending land use changes);
- Targeted excavations to remove heavily impacted soils in the vicinity of the former and existing USTs (on hold pending land use changes), and shallow soils in the area south of the underground driveway entrance;
- Long-term groundwater monitoring;
- Maintaining current cap; and,
- Deed restrictions.

The majority of these remediation components have been completed. However, removal of the existing steel UST, and targeted soil excavation beneath the existing UST and the two former USTs have been placed on hold pending land use circumstances that will allow for additional significant land use disruption. PG&E will continue to search for a suitable method to remove the existing steel UST that would allow for removal of the UST and its contents without causing a nuisance condition for the building tenants or the community.

An O&M Plan for post-remediation groundwater monitoring and cap inspection and maintenance activities will be prepared and implemented as part of the post-remediation monitoring program. In addition the O&M Plan will also include the details of the five-year reviews that will be conducted.

Groundwater monitoring is proposed at 14 monitoring well locations semiannually. These wells constitute a subset of existing wells and were selected to provide a good spatial distribution of groundwater sample locations including the most downgradient wells. These wells are generally screened within a hydrogeologic unit where migration of contaminants to Santa Rosa Creek, if it were to occur, would most likely be observed.

Five-year reviews will be conducted following the Regional Water Quality Control Board (RWQCB) approval of the proposed O&M Plan. The reviews will include a Site inspection, technical assessments of the ongoing monitoring, presentation of opportunities for optimization of the post-remediation program, any changes to conditions and land use or standards, and any updated risk calculations and assessments, where relevant. The reviews will also include information on any new technologies and/or methods that may be suitable for addressing the existing UST without causing a nuisance condition for the building tenants or the community.

Land Use Covenants (LUCs) will be pursued for the Site and the 438 First Street Property, and an agreement will be pursued with the City of Santa Rosa, to ensure Site occupants (current and future) are aware of areas where chemical residuals remain in soil or groundwater that may have an adverse health impact if disturbed without taking proper precautions. The location of the restricted areas will be surveyed and a legal description prepared for each property. Areas lying outside the restricted areas would not require special precautions unless unknown contamination is encountered.

The RAP will be subject to a 30-day public comment period to solicit community input. The RWQCB may host a public meeting to solicit feedback, as warranted. At the close of the public comment period, the RWQCB will review and respond to all public comments prior to making a decision to approve, modify or deny the RAP.

1.0 INTRODUCTION

This Final Remedial Action Plan (RAP) was prepared by Terra Pacific Group (TPG) for Pacific Gas and Electric (PG&E) to address soil and groundwater impacts at the former Santa Rosa Manufactured Gas Plant (MGP) located at 111 Santa Rosa Avenue, Santa Rosa, California (Figures 1 and 2).

1.1 SITE LOCATION AND DESCRIPTION

The Site is located in the City of Santa Rosa, California located between First Street and Santa Rosa Creek, and B Street and Santa Rosa Avenue (Figures 1 and 2). The Site was formerly the location of an MGP constructed by the Santa Rosa Gas Light Company. The MGP eventually became part of the PG&E system and PG&E sold a portion of the property to the City of Santa Rosa in 1978, and the remaining portion to the 137 Santa Rosa Group Partnership in 1987. A commercial office building overlies a portion of the Site. The two most eastern parcels occupied by the commercial office building were not part of the MGP and were never owned by PG&E.[1]

1.2 HISTORICAL SITE USAGE

In 1876 and 1877, an MGP was constructed at the Site (PG&E, 1986). The MGP was constructed by the Santa Rosa Gas Light Company and originally used coal as a feedstock. The plant was converted to use oil feedstock by about 1904 and was acquired by PG&E in 1908. The manufacturing of gas ceased in 1924 and all above ground gas manufacturing structures and equipment were subsequently removed. Following closure of the MGP, PG&E constructed a new facility for natural gas distribution that was in operation until at least 1969. In 1987, the Site was vacant when the 137 Santa Rosa Group Partnership (137 SR Group) acquired it from PG&E and constructed the existing commercial building at 111 Santa Rosa Avenue. The majority of the MGP operations were conducted in the area presently covered by the parking lot of the commercial building (Figure 2).

1.3 SITE GEOLOGY AND HYDROGEOLOGY

The Site is located in an urban commercial development located in the Santa Rosa Plain, a northwest trending alluvial valley. The Site is directly underlain by artificial fill material that rests on Recent-age alluvial sediments composed of varying amounts of clay, silt, sand, and gravel. The alluvial sediments overlie the Plio-Pleistocene Huichica and Glen Ellen Formations. These formations are composed of poorly consolidated, interbedded silty clay, sand, poorly cemented conglomerate and gravel of fluvial origin. The lower part of the Glen Ellen Formation is tuffaceous (volcanic) in part. The Glen Ellen Formation overlies the Tertiary Sonoma Volcanics. The Sonoma Volcanics consist of lava flows, tuffs, agglomerates and intercalated sediments of volcanic debris (Cardwell, 1958). The Franciscan Complex forms the basement of the region. The Franciscan Complex in this area consists

[1] The Site is identified by assessor parcel numbers (APNs) 010068017 and 010068018. APN 010068018 is the portion of the Site that was sold to the City of Santa Rosa in 1978. The remaining APN, 010068017 was later split into two parcels, 010068021 and 010068022. The commercial office building overlies three separate parcels including APN 010068021, formerly part of the MGP, and APNs 010068010 and 010068020 which were not part of the MGP and were never owned by PG&E.

dominantly of sandstone and shale with minor greenstone, blueschist, limestone, and chert. The Franciscan is pervasively sheared and split from tectonic activity (Cardwell, 1958).

At the Site, the thickness of fill material thins significantly northward from the creek. Coarser grained alluvial material is most prevalent near the creek with finer grained material becoming more prevalent northward from the creek.

The Santa Rosa Plain is an approximately 96 square mile basin drained by Santa Rosa Creek and its tributaries (DWR, 1975). The North Coast Regional Water Quality Control Board has identified the Site as part of the Santa Rosa Creek Hydrologic Subarea of the Russian River Hydrologic Unit. Santa Rosa Creek, the nearest surface water feature, is located on the southern boundary of the Site. Santa Rosa Creek flows in a westerly direction until it reaches the Laguna de Santa Rosa and then to the Russian River.

Cardwell (1958) describes the hydrogeology beneath the Site vicinity as dominated by the alluvium associated with Santa Rosa Creek. Regional groundwater flow is generally to the west-southwest towards the Laguna de Santa Rosa (Cardwell, 1958).

Groundwater at the Site occurs at approximately 20 feet below ground surface (bgs), with a general south to southwesterly gradient towards Santa Rosa Creek. Groundwater levels are generally responsive to seasonal variations in precipitation and may vary as much as a few feet seasonally. As part of the Prince Memorial Greenway (PMG) restoration project, an approximately 350-foot-long section of the creek bed, west of the Santa Rosa Avenue Bridge, was lined with riprap and grout. This low permeability lining in the creek bed limits groundwater discharge to the creek to the south of the Site and causes groundwater beneath the creek to flow west beyond the end of the creek bed lining prior to discharging to the creek. The most recent groundwater elevation contours map is shown in Figure 3 (TPG, 2015b)

1.4 Previous Environmental Investigations

Investigation of the former MGP site began in July 1986 with the collection of sixteen surface soil samples by PG&E (PG&E, 1986). To date samples have been collected from more than 300 locations; many of these locations included samples from multiple depths. Figure 4 shows the location of investigation and confirmation samples used to evaluate Site conditions. Historical samples from locations where remediation has been conducted were excluded from the current dataset because the samples have either been excavated or treated and are no longer representative of current Site conditions.

Following acquisition of the property in 1987, the 137 SR Group conducted a series of soil and groundwater investigations to evaluate the extent of soil and groundwater impacts prior to development of the Site. In 2002, prior to the construction of the PMG, the City of Santa Rosa collected soil and grab groundwater samples from the north bank of the Santa Rosa Creek including six groundwater samples collected from the bottom of the creek, immediately adjacent to 111 Santa Rosa Avenue. In 2003 ENV America conducted a focused investigation of soil and groundwater in the Creek bed (ENV, 2005a). In 2005, additional monitoring wells were installed as part of an

investigation to further delineate groundwater impacts and monitor water levels in areas where groundwater levels have not historically been monitored (ENV 2005b). Groundwater monitoring was originally conducted sporadically following installation of the first wells in 1988. Since 1997, groundwater has been monitored twice yearly, with the exception of 2006 when only one groundwater monitoring event was conducted. The groundwater monitoring data from these events are included in Appendix A.

Various additional field investigations were conducted from July 2006 through April 2007. This work was conducted in accordance with the *Work Plan for Subsurface Investigation of Redwood Tank Area* (TPG, 2006b), the *Work Plan for Additional Subsurface Investigation* (TPG, 2006c), and the *Groundwater Monitoring Plan* (TPG 2007a). In July 2006 drilling was conducted in the vicinity of the former redwood gas holder. In November 2006, drilling was conducted on the neighboring property to the west of the former MGP and three vapor extraction wells were drilled within the footprint of the former redwood gas holder. In December 2006, a pilot scale Soil Vapor Extraction (SVE) test was conducted in the footprint of the former redwood gas holder to evaluate the effectiveness of SVE as a remedial technology for the redwood gas holder area. In February 2007, an investigation was conducted to evaluate previously identified subsurface anomalies, investigate the existing underground storage tank (UST) at the Site, evaluate potential oil feed lines entering the Site from the north, install one additional downgradient monitoring well, and conduct aquifer testing at various locations. In April 2007, an additional geophysical investigation was conducted at the Site. The results from these various investigation activities were summarized in the *Additional Subsurface Investigation Report* (TPG, 2007b).

Field investigations were also conducted from January to March 2008. The work performed was conducted in general accordance with the *2008 Workplan for Additional Subsurface Investigation* (TPG, 2008a), and the *Addendum to the 2008 Workplan for Additional Site Investigation* (TPG 2008b). The primary investigation phases conducted between January and March 2008 included:

- A subsurface investigation along the southern portion of the Site and the PMG;
- A subsurface investigation of soils adjacent to a large diameter storm drain located on the 438 First Street Property to the west of the Former MGP; and,
- A trenching investigation to further evaluate the condition and contents of the 10,817-gallon UST in the southern portion of the Site.

Results from these various investigation activities were summarized in the *2008 Site Assessment Report* (TPG, 2009a).

Field investigations were also conducted from June to August 2009. The work performed was conducted in general accordance with the *Redwood Tank Downgradient Well Installation Workplan* (TPG, 2009b), the *CPT/MIP Drilling Investigation Workplan* (TPG, 2009c), and the *Addendum to Redwood Tank Downgradient Well Installation Workplan* (TPG 2009d). The primary investigation phases conducted between June and August 2009 associated with the groundwater investigation downgradient of the redwood gas holder included:

- Installation of groundwater extraction and monitoring wells downgradient of the redwood gas holder (RW-1 through RW-5), along the PMG further downgradient

from the redwood gas holder (PM-1 through PM-6 and MW-23), and immediately downgradient from monitoring well MW-14 (MW-22);
- Destruction of monitoring well MW-19 and installation of shallow and deep replacement wells;
- Groundwater sampling activities at monitoring wells in the vicinity of, and downgradient of, the redwood gas holder;
- Completion of cone penetration test/membrane interface probe (CPT/MIP) soil borings and hydropunch borings downgradient of the redwood gas holder; and,
- Completion of step drawdown and aquifer testing in selected monitoring wells downgradient of the redwood gas holder.

Results from these various investigation activities were summarized in the *Groundwater Investigation Downgradient of the Redwood Tank Report* (TPG, 2010).

In 2011 and 2012, three phases of soil sampling were conducted in the planter areas on-site, and adjacent to the Site, in accordance with three approved Workplans (TPG, 2011a; 2011b; and 2011c). Soil samples were collected from 34 locations within the planter areas to characterize the shallow soil. Results from the sampling were summarized in the *Planter Area Soil Excavation Workplan* (TPG, 2012b).

1.4.1 Inventory of Groundwater Wells

Monitoring wells were first installed at the Site in 1987. Since then, additional wells have been installed and several wells have been destroyed during various investigations. Existing groundwater monitoring wells include MW-1, MW-2, MW-7 through MW-23, and EBAMW-1 and EBAMW-2. Monitoring well MW-6 was never drilled. Monitoring wells MW-3, MW-4, and MW-5 were destroyed and are no longer available for monitoring. Nine of the existing wells, MW-10 through MW-18, were installed during the Supplemental Groundwater Investigation conducted in March of 2005. These wells were installed to further evaluate potential groundwater impacts and monitor water levels in areas where groundwater levels had not historically been monitored. Monitoring well MW-19 was installed in November 2006 downgradient of the former redwood gas holder area, and was replaced in June 2009 with shallow and deep completion wells MW-19S and MW-19D. MW-20 was installed in the PMG to the southwest of the 111 Santa Rosa Avenue property to monitor groundwater conditions downgradient of the Site. An additional monitoring well, MW-21, was installed in March 2008 to monitor groundwater conditions adjacent to the Santa Rosa Creek immediately south of the Site. EBAMW-1 and EBAMW-2 were installed in November 2008 to assess impacts to groundwater related to two former USTs in the parking area adjacent to the building. Well MW-22 was drilled in June 2009 as a monitoring point downgradient of well MW-14, which has historically had small amounts of light non-aqueous phase liquid (LNAPL) floating on water in the well. Well MW-23 was installed in August 2009 to serve as a monitoring point downgradient of the redwood gas holder between MW-19S/D and MW-20.

In addition to the groundwater monitoring wells described above, a series of wells were installed during remediation at the redwood gas holder (ERH-MW1 through ERH-MW4, and RW-1 through RW-5) to monitor and/or extract groundwater during remediation activities. A series of six additional

potential extraction wells (PM-1 through PM-6) were installed along the Prince Memorial Greenway (TPG, 2010).

As remediation in the vicinity of the redwood gas holder progressed, additional monitoring wells were destroyed. Monitoring well ERH-MW-2 was destroyed in August 2009 because it became plugged with tar. Monitoring wells ERH-MW-1, ERH-MW-3, ERH-MW4, and RW-2 through RW-5 were destroyed between March and April 2012, prior to the final remediation phase at the redwood gas holder, because the wells were located within the area where the in situ soil mixing (ISSM) remedy was planned. Monitoring well MW-18, located in Santa Rosa Avenue, was also destroyed at this time because the well had been damaged by traffic. Two new extraction wells, RW-2R and RW-3R were installed downgradient of the redwood gas holder, outside of the treatment area as replacement wells. In April 2013, well RW-1 was destroyed to accommodate site restoration activities in that area of the Site.

1.5 PREVIOUS REMEDIAL MEASURES COMPLETED

The following sections summarize the various remedial measures that have been completed to date.

1.5.1 Pre-development Excavations

Early removal of impacted soil took place over several events in late 1987 and mid-1988 prior to development of the Site (ATT, 1988). One excavation, located in the northern portion of the Site, where the former redwood gas holder was located, was approximately 20'x20' and 15' deep. A second excavation, located north of the underground high pressure gas line in the central portion of the Site, was approximately 40'x'20' and 15' deep. The intent of this excavation was to remove material identified at the time as coal tar residue and Bunker "C" oil; however, the removal of contamination was ultimately limited by the presence of utilities in the area. The extent of a third excavation is not exactly known but based on drawings of the excavation appears to comprise a circular area approximately 40 feet in diameter where a brick lined vault was uncovered and subsequently removed in the northern portion of the Site near the northwest corner of the building (ATT, 1988). Excavated soil from all of these excavations was profiled and subsequently disposed of off-site. The location of these excavations is shown on Figure 5.

1.5.2 Remediation within Santa Rosa Creek as Part of the PMG Construction

In 2004, remediation activities were conducted in Santa Rosa Creek and the creek's north bank directly to the south of the Site in association with the development of the PMG. The remediation activities were conducted by PG&E and were completed as part of the PMG Project implemented by the City of Santa Rosa Department of Public Works (the City) in 2004. This phase of the PMG Project entailed the restoration of a ½-mile section of Santa Rosa Creek extending eastward from Highway 101 to the Santa Rosa Avenue Bridge. Creek work adjacent to the site was permitted by the California Department of Fish and Game between June 15 and October 15, 2004.

As part of the remediation activities, a total of 160 linear feet of sheet pile shoring was installed to approximately 36 feet deep to the west of the utility bridge along the creek bank immediately south of the concrete double-retaining-wall structure constructed for the PMG.

PG&E excavations in the creek bed extended approximately 100 feet on either side of the utility bridge (to the east and west) at depths ranging from 4 feet to 12 feet deep. The excavations were backfilled with a concrete slurry (Figure 5). Approximately 3,200 tons of impacted soil were excavated and transported for off-site disposal. Additionally, an approximately 350-foot-long section of the creek bed west of the Santa Rosa Avenue Bridge (including the PG&E remedial excavation areas) was subsequently lined with riprap and grout as part of the PMG restoration project.

Excavation and confirmation sampling activities were conducted under the oversight of the RWQCB and the Santa Rosa Fire Department (SRFD). Confirmation soil samples were collected from the bottom and sidewalls of the excavated areas for laboratory analyses prior to backfilling. A post-remediation ecological risk assessment was conducted using the analytical results of the confirmation samples representing soil remaining (ENV, 2005a). The results of this risk assessment indicate that post-remediation Site conditions pose little or no risk to aquatic organisms via a surface water or sediment contact exposure pathway.

The remediation activities effectively reduced the volume of MGP-related wastes beneath the creek bed to the extent practicable and feasible. The sheet pile shoring and grout slurry, in conjunction with the creek bed lining, will control the potential migration of remaining MGP-related wastes from the former MGP site to the creek. The remediation activities were documented in the *Soil Remediation Completion Report* (ENV, 2005a).

Remediation activities at the adjacent Boyett property to the south of the Santa Rosa Creek were also conducted by Granite as part of the 2004 City PMG project, but unrelated to the PG&E remediation activities. The remediation activities at the Boyett property included excavation of soil impacted by refined petroleum products in areas extending from the Boyett property to the south side of the creek centerline. The remedial action for the Boyett property also included the installation of a 400 feet long cut-off wall (sheet pile shoring) along the south side of the creek bed downgradient (north and northwest) of the Boyett property.

1.5.3 Removal of Two Underground Storage Tanks

In 2006, EBA Engineers excavated and removed two USTs from the parking lot area of the Site. The location of the former USTs is shown on Figure 5. The tanks were approximately 7 feet in diameter by 35 feet long with an approximate volume of 10,000 gallons. The USTs were removed from the excavation under the direction of the SRFD. Both tanks were transported under manifest to Ecology Control Industries in Richmond, California, a licensed disposal facility (EBA, 2006).

The final dimensions of the UST excavation were approximately 20 feet wide by 40 feet long by 12 feet deep. Approximately one foot of petroleum hydrocarbon impacted soil was initially removed from the excavation. Confirmation sidewall and bottom samples were collected from the pit center

and bottom at depths of 16 and 20 feet bgs. All of the soil samples were collected directly from the excavator bucket using 2-inch diameter by 6-inch long brass tubes.

Excavated soil was transported for off-site disposal and the excavation pit was lined with plastic sheeting and backfilled to grade with clean import fill material. The backfilled soil was compacted in place and the asphalt surface was paved to match the existing surface. The UST removal activities are documented in the *Report of Investigation UST Removal* (EBA, 2006).

1.5.4 Redwood Gas Holder Remediation – Electrical Resistance Heating

In September 2007, a Feasibility Study (FS) was prepared to evaluate various potential remedial alternatives for mitigation of soil and groundwater impacts in the vicinity of the redwood gas holder at the Site (TPG 2007c). The FS was approved by the RWQCB in a letter dated November 13, 2007 to Mr. Robert Doss of PG&E and Mr. Paul Louie of Upway Properties. Based on the results of the FS, Electrical Resistance Heating (ERH) was selected as the preferred remedial alternative for the redwood gas holder.

An *Engineering Design Report for Redwood Tank Electrical Resistance Heating* (EDR) was subsequently prepared on behalf of PG&E by TPG and TRS Group, Inc. (TRS) (TPG, 2008c). The EDR detailed the ERH system engineering and design, described the various planning and installation activities, outlined key operation and maintenance requirements, and presented the sampling program for monitoring progress. All necessary permits for the ERH system were obtained and the system was constructed at the Site in late 2008 (TPG, 2014b).

The ERH system operated in 2009 and 2010 and extracted volatile vapors and liquids from the redwood gas holder. Over the duration of ERH, approximately 570 pounds of naphthalene and 5,900 pounds of benzene were recovered in the vapor phase. However, the most effective mechanism for mass removal during the ERH project was removal of coal tar from the redwood gas holder as the tar melted. Overall, approximately 557,000 pounds (55,700 gallons) of coal tar were extracted from the subsurface during ERH. The ERH remediation activities are documented in the *Redwood Gas Holder Closure Report* (TPG, 2014b).

1.5.5 Redwood Gas Holder Remediation – In Situ Soil Mixing

Due to the large volume of coal tar extracted during ERH operations, a large amount of consolidation was observed within the redwood gas holder with lesser amounts of settlement observed in the area immediately surrounding the redwood gas holder. During ERH treatment, the surface of the redwood gas holder subsided by as much as five feet. Geotechnical stabilization of the soils in this area was necessary to prevent further settlement of the ground surface prior to restoring the Site to its previous use as a parking lot.

A Workplan was prepared in January 2012 to implement ISSM to treat soil in the vicinity of the redwood gas holder (TPG, 2012a), which was approved by the RWQCB in a letter dated February 28, 2012 to Mr. Darrell Klingman of PG&E and Mr. Paul Louie of Upway Properties. The ISSM treatment was planned to provide geotechnical stability to soil in and around the redwood gas holder,

as well as provide additional containment of any remaining MGP residuals within the redwood gas holder.

ISSM was implemented in 2012 and 2013 using large diameter auger soil mixing and jet grouting. Following ISSM, an engineered cap was installed over the entire treatment area to further minimize the potential for settlement of the ground surface. Within the redwood gas holder, the upper zone to a depth of approximately 8.5 feet bgs was mixed using large diameter augers. Outside of the redwood gas holder, jet grouting was utilized to create a "ring" around the outside of the redwood gas holder from approximately 10 to 50 feet bgs to provide geotechnical support outside of the redwood gas holder and to provide additional containment for the residuals within the redwood gas holder and soils immediately underlying the gas holder. The jet grout columns outside of the redwood gas holder were spaced approximately three feet apart and approximately two feet outside of the redwood gas holder. Where possible, a second, outer ring of jet grout columns was placed outside, and overlapping, the inner ring, from a depth of approximately 15 to 50 feet bgs to provide additional geotechnical support and containment. Jet grouting was also conducted within the redwood gas holder from the base of the auger mixed zone to the base of the gas holder at approximately 22 feet bgs, with a minimum column spacing of 6.5 feet. The purpose of the jet grouting inside the redwood gas holder was to provide geotechnical support for the overlying auger mixed zone. The ISSM remediation activities are documented in the *Redwood Gas Holder Closure Report* (TPG, 2014b).

During remediation activities conducted at the redwood gas holder, a groundwater extraction and treatment (GWET) system was installed and operated to contain groundwater in the immediate vicinity of the redwood gas holder. The groundwater extraction system was turned off on May 27, 2014 in accordance with the RWQCB approved *GWET Shutdown Test Workplan* (TPG, 2014a).

1.5.6 Targeted Soil Excavation

In October 2011, targeted soil excavation and Site restoration activities were conducted to remove shallow soil with elevated lead concentrations in the area south of the entrance to the underground garage. The *Targeted Soil Excavation Workplan* (TPG, 2011d), and the *Addendum to the May 3 Targeted Soil Excavation Workplan* (TPG, 2011e), were approved by the RWQCB in a letter dated July 5, 2011 to Mr. Darrell Klingman of PG&E and Mr. Paul Louie of Upway Properties. The extent of the excavation is shown on Figure 5. The final depth of the excavation ranged from approximately 4.5 to 8 feet excluding the setback for the 12 kilovolt (kV) electric line running through the excavation area. Confirmation soil samples were collected from the bottom and the sidewalls of the excavation prior to backfilling. The excavated soil was transported off-site for disposal and clean, backfill material was imported to replace the contaminated soil. The backfill material was compacted in accordance with the City permit requirements and the surface was restored to pre-existing conditions as asphalt paving. The targeted soil excavation remediation activities are documented in the *Targeted Soil Excavation Completion Report* (TPG, 2012c).

1.5.7 Planter Area Remediation

Soil excavation activities were conducted during May and June, 2013 to remove impacted shallow soil in the planter areas in and around the parking areas at 111 Santa Rosa Avenue. The extent of the planter area excavations are shown on Figure 5. The work was conducted in general accordance with the *Planter Area Soil Excavation Workplan* (TPG, 2012b), which was approved by the RWQCB in a letter dated January 24, 2013 to Mr. Darrell Klingman of PG&E and Mr. Paul Louie of Upway Properties.

Soil within the planter areas was excavated to a depth of two feet unless tree roots or other subsurface obstacles prevented reaching this depth. In several areas, soil was excavated deeper than two feet to remove additional soil where elevated lead concentrations were observed.

Once the final depth was reached in each planter location, confirmation soil samples were collected in accordance with the approved Workplan, the excavation was lined with geotextile fabric, and the excavation was immediately backfilled with clean imported topsoil material. Excavated soil was transported off-site for disposal at an appropriately licensed disposal facility. The planter area remediation activities are documented in the *Planter Area Soil Excavation Completion Report* (TPG, 2013b).

1.5.8 Post-Remediation Site Restoration

Following completion of the remediation activities conducted through 2013, the parking lot at the Site was restored to pre-remediation conditions. This work included relocating the driveway entrance to its original location, relocating and/or removing utilities at the Site, reconstructing sidewalks, curbs, gutters, and parking areas, paving the western half of the parking lot, slurry coating and striping the entire parking lot, and installing new irrigation and landscaping in the planter areas. The restoration activities are documented in the *Redwood Gas Holder Closure Report* (TPG, 2014b).

2.0 NATURE AND EXTENT OF IMPACTS

The chemicals typically associated with former MGP sites include polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, and xylenes (BTEX), and select trace metals. The following discussions regarding the current nature and extent of impacts are based on the historical data collected since 1986. Where remediation activities have removed or treated historical soil sample locations, these samples have not been included in this evaluation because they are no longer representative of current Site conditions.

2.1 SOIL IMPACTS

All published analytical soil data has been summarized in a comprehensive Site database. The soil data used to evaluate the current nature and extent of impacts in the vicinity of the Site are summarized in Tables 1 through 4.

Soil data were divided into three main depth intervals for evaluation purposes:

- Samples collected from depths less than 5 feet bgs;
- Samples collected from depths of 5 feet bgs or greater, but less than 10 feet bgs; and,
- Samples collected from depths of 10 feet bgs or greater.

For cases where multiple samples from a boring were collected, the maximum concentration within each of the soil depth intervals was selected for display in the figures.

2.1.1 PAH Concentrations in Soil

In order to evaluate the extent of impact of PAHs at various depths, PAH concentrations were converted into carcinogenic PAH concentrations expressed in benzo(a)pyrene [B(a)P] equivalent concentrations. The B(a)P equivalent concentrations were calculated and expressed using the potency equivalency factors shown in the table below.

Factors to Calculate Carcinogenic PAH expressed in Benzo(a)Pyrene Equivalent Concentration	
Compound	**Potency Equivalency Factor[(a)]**
Benzo(a)pyrene	1.0
Benzo(a)anthracene	0.1
Benzo(b)fluoranthene	0.1

Factors to Calculate Carcinogenic PAH expressed in Benzo(a)Pyrene Equivalent Concentration	
Benzo(k)fluoranthene	0.1
Chrysene	0.01
Dibenzo(a,h)anthracene	0.34
Indeno(1,2,3-c,d)pyrene	0.1

[a] State of California Environmental Protection Agency (Cal/EPA), 1994 Appendix 1

PAH concentrations in soil at depths less than 5 feet bgs

Figure 6 shows the distribution of B(a)P equivalent concentrations at depths less than 5 feet bgs. The highest concentrations of B(a)P equivalent observed within this depth interval were generally observed scattered across the parking lot area of the on-site property (Figure 6).

PAH concentrations at depths greater than 5 feet bgs, but less than 10 feet bgs

Figure 7 shows the distribution of B(a)P equivalent concentrations at depths 5 feet bgs or greater, but less than 10 feet bgs. The highest concentrations of B(a)P equivalent observed within this depth interval were generally observed on the southern portion of the on-site property with some impacts also occurring the west of the Site along the PMG (Figure 7).

PAH concentrations at depths of 10 feet bgs or greater

Figures 8 shows the distribution of B(a)P equivalent concentrations at depths of 10 feet bgs or greater. The highest concentrations of B(a)P equivalent observed within this depth interval were observed within the footprint of the former redwood gas holder, on the southern portion of the on-site property, and to the west of the Site along the PMG (Figure 8).

2.1.2 Naphthalene Concentrations in Soil

Naphthalene concentrations at depths less than 5 feet bgs

Figure 9 shows the distribution of naphthalene concentrations at depths less than 5 feet bgs. The highest concentrations of naphthalene observed within this depth interval were generally observed scattered across the parking lot area of the on-site property.

Naphthalene concentrations at depths greater than 5 feet bgs, but less than 10 feet bgs

Figure 10 shows the distribution of naphthalene concentrations at depths 5 feet bgs or greater, but less than 10 feet bgs. The highest concentrations of naphthalene observed within this depth interval

were in the on-site parking lot, on the PMG along the southern border of the on-site property, and on the PMG to the west of the property.

Naphthalene concentrations at depths of 10 feet bgs or greater

Figure 11 shows the distribution of naphthalene concentrations at depths of 10 feet bgs or greater. The highest naphthalene concentrations observed within this depth interval were generally observed within the footprint of the former redwood gas holder, along the southern border of the on-site property, and to the west of the Site along the PMG.

2.1.3 TPH and BTEX Concentrations in Soil

Recent and historical TPH data has been compiled and categorized into the three standard TPH carbon ranges, quantified as gasoline (TPHg), diesel (TPHd), and motor oil (TPHmo). While the majority of the historical data for the Site falls into one of these three categories, some of the TPH data historically acquired has been quantified against other miscellaneous standards. In order to present this miscellaneous TPH data, it has been grouped into the standard TPH range which it most closely represents (Table 2).

TPH and BTEX at depths less than 5 feet bgs

Figures 12, 13, and 14 show the distribution of TPHg, TPHd/TPHmo, and BTEX, respectively at depths less than 5 feet bgs. TPHg concentrations in soil are generally low across the investigation area within this depth interval (Figure 12). TPHd/TPHmo impacts in soil within this depth interval are most prevalent on-site with the highest concentrations observed in the northeast and southwest portions of the Site (Figure 13). BTEX compounds were generally not detected within this depth interval with some low concentrations primarily along the south and west boundaries of the Site (Figure 14).

TPH and BTEX at depths 5 feet bgs or greater, but less than 10 feet bgs

Figures 15, 16, and 17 show the distribution of TPHg, TPHd/TPHmo, and BTEX, respectively at depths 5 feet bgs or greater, but less than 10 feet bgs. TPHg concentrations in soil were generally not detected across the investigation area within this depth interval (Figure 15). TPHd/TPHmo impacts in soil within this depth interval are most prevalent on-site with the highest concentrations observed in the southern portions of the Site (Figure 16). BTEX compounds were generally not detected in soil within this depth interval with low concentrations reported in only four on-site samples, primarily along the southern boundary of the Site (Figure 17).

TPH and BTEX at depths of 10 feet bgs or greater

Figures 18, 19, and 20 show the distribution of TPHg, TPHd/TPHmo, and BTEX, respectively at depths of 10 feet bgs or greater. The highest concentrations of TPHg in soil within this depth interval were observed in the former redwood gas holder (Figure 18). The highest concentrations of TPHd/TPHmo within this depth interval were observed in the former redwood gas holder, along the

southern portion of the Site, and extending to the neighboring property to the west of the Site (Figure 19). The highest concentrations of BTEX compounds within this depth interval were observed within the former redwood gas holder (Figure 20).

2.1.4 Lead Concentrations in Soil

Figures 21 through 23 show the concentration of lead in soil for each of the three depth intervals, respectively. Elevated concentrations of lead in soil at depths less than 5 feet bgs are generally scattered across the Site with some elevated detections to the west of the Site on the neighboring property and the PMG (Figure 21). The highest concentrations of lead within the depth interval from 5 feet bgs or greater, but less than 10 feet bgs occur in the southern portion of the Site and along the PMG to the east and west of the Site (Figure 22). In soil greater than 10 feet bgs, the highest concentrations of lead occur along the southern boundary of the Site and along the PMG to the east and west of the Site (Figure 23).

2.1.5 Arsenic Concentrations in Soil

Figures 24 through 26 show the distribution of arsenic in soil for each of the three depth intervals, respectively. Elevated concentrations of arsenic in soil at depths less than 5 feet bgs are scattered across the site with the highest concentrations along the western boundary of the Site within the planter area adjoining the two properties (Figure 24). At depths 5 feet bgs or greater, but less than 10 feet bgs, elevated concentrations of arsenic were observed at one location adjacent to the existing UST at the Site (Figure 25). In soil greater than 10 feet bgs, arsenic concentrations were generally low with the exception of one elevated detection along the PMG to the west of the Site (Figure 26).

2.2 GROUNDWATER IMPACTS

As discussed previously, groundwater monitoring was initially conducted sporadically following installation of the first wells at the Site in 1987. Since 1997, groundwater has been monitored twice yearly, with the exception of 2006 when only one groundwater monitoring event was conducted.

The most recent published semiannual groundwater monitoring results are from September 2014 (TPG, 2015b). Groundwater water elevations from this sampling event are shown in Figure 3. The groundwater analytical results from this sampling event are summarized in Figure 27 (TPG, 2015b). Historical data tables for the previous groundwater monitoring events described above are included in Appendix A and show the historical variations in groundwater concentrations. The results from the September, 2014 sampling event are summarized below.

2.2.1 PAHs

PAHs were only detected in one monitoring well during September 2014 groundwater sampling event. Fluoranthene and pyrene were detected in monitoring well MW-2 at concentrations of 0.16 and 0.19 micrograms per liter (µg/L), respectively. PAHs were not detected in any of the other monitoring wells during this sampling event.

2.2.2 TPH and BTEX

TPHg was not detected in monitoring wells during the September 2014 sampling event.

TPHd was detected in monitoring wells MW-2, MW-9, and MW-21 at concentrations of 53, 57, and 510 µg/L, respectively. TPHmo was detected in monitoring wells MW-2, MW-9, and MW-21 at concentrations of 150, 130, and 670 µg/L, respectively.

BTEX compounds were not detected in monitoring wells during the September 2014 sampling event.

2.2.3 Distribution of NAPL

Petroleum NAPL has been historically observed in several borings. Figure 28 shows boring and/or well locations where NAPL has been observed in soil. NAPL observed in soil generally consists of residual phase NAPL trapped between the grains of soil or within fractures in clay at or near the water table. Although NAPL has been observed in soil at several locations across the Site, it has only been observed floating on the water table in two wells, MW-14 and PM-1.

Groundwater data collected from the Site indicates that current groundwater impacts are limited to areas where residual MGP impacts, such as NAPL, are known to be present and there is no indication that Site contaminants are migrating to the creek. The mobility of NAPL typically decreases over time due to a variety of naturally occurring processes. At this Site, these processes have been occurring for many decades since the NAPL release likely occurred approximately 100 years ago. Observations and data collected from the Site indicate that the NAPL has very limited mobility, consistent with the suspected age of the release. A general discussion of the NAPL mobility is presented in the following sections.

2.2.3.1 Mobility of NAPL

Several factors govern the mobility of NAPL in the subsurface including the properties of the NAPL such as density, viscosity, and interfacial tension, in addition to properties related to subsurface conditions such as hydraulic conductivity, NAPL saturation, and the hydraulic gradient. Data have been collected from the Site to evaluate the potential mobility of the NAPL under existing site conditions.

As a NAPL body migrates through the subsurface, a significant portion of the NAPL is retained in the porous media trailing the NAPL body, thereby depleting and eventually exhausting the mobile NAPL body (Cohen and Mercer, 1993). Below the water table, residual saturation of NAPL is the saturation at which NAPL is immobilized (trapped) by capillary forces as discontinuous ganglia under ambient groundwater flow conditions (Cohen and Mercer, 1993). As a result, a NAPL body that does not have an infinite supply of NAPL can only migrate a limited distance before the saturation of NAPL is reduced to its residual saturation and it is no longer mobile. For reference, published values of residual saturation for crude oil in sandstone, or petroleum reservoirs, ranges from approximately 16 to 50 percent (Cohen and Mercer, 1993).

The mobility of the NAPL in the groundwater zone is largely a function of the saturation of the NAPL in the porous media where the residual saturation of the NAPL defines the point at which the NAPL is no longer able to move under ambient conditions. When more than one fluid exists in a porous medium, the fluids compete for pore space. The result is that the mobility of each of the fluids is reduced (Cohen and Mercer, 1993). If one fluid has a high saturation, then a higher percentage of the pore space is available for that liquid to flow through. Conversely, the lower the saturation of a particular fluid, the less pore space is available for the fluid to flow through. In general, the mobility of NAPL in the groundwater zone decreases exponentially as the saturation of NAPL decreases.

Although the exact source of the NAPL is not known, if the source were related to MGP operations previously conducted at the Site, then the NAPL would be on the order of 100 years old. The fact that the NAPL is still present after decades, demonstrates the limited mobility of the NAPL. Additionally, the NAPL is likely less mobile now than it was when it was released since moving through the subsurface causes a trail of residual NAPL to remain behind the NAPL body, thus reducing the saturation of the NAPL and reducing the NAPL mobility as discussed previously. Over time, the NAPL is also subject to a number of naturally occurring processes which tend to preferentially remove the lighter fractions in the NAPL. As a result, the heavier, less mobile fraction of the NAPL remains in the subsurface and is less mobile than the original source.

Mobility testing conducted on representative cores from NAPL-impacted areas of the Site indicated that the NAPL saturation at these locations was below residual levels indicating that the NAPL is essentially immobile under current Site conditions at these locations. These results are consistent with the observed distribution of NAPL in the subsurface and the suspected age of the NAPL release.

2.2.3.2 Physical Properties Testing Program

To better understand the physical properties that control the mobility and potential recoverability of NAPL, soil and NAPL samples, were collected from within the impacted zone and subjected to various physical tests to evaluate NAPL mobility (ENV, 2005b). Results of the testing are discussed in the following sections.

2.2.3.3 Fluid Properties Testing

During drilling in monitor well MW-16, a sample of the NAPL (MW-16-21.5-23) was collected from the outside surface of the split spoon sampler for fluid properties testing. Only limited volumes of NAPL were available which limited the types of analyses the laboratory could perform on the sample. Analyses that were performed include density and viscosity.

The density of the NAPL was measured at 0.9410 grams per cubic centimeter (g/cc) at 70 degrees Fahrenheit. For comparison, the density of water is 1 g/cc at 39.2 degrees Fahrenheit and therefore the NAPL can be considered a light non-aqueous phase liquid since it is less dense than water. This result is consistent with visual observations in the field. The viscosity of the NAPL was also measured at 70 degrees Fahrenheit and was found to be 561 centipoises. For comparison purposes, the viscosity of water is 0.89 centipoises at 77 degrees Fahrenheit, and the viscosity of maple syrup is approximately 150 centipoises. These data indicate that the NAPL is highly viscous which is consistent with field observations.

An additional test was attempted to measure the interfacial tension of the NAPL. Because only a small volume of NAPL from the site was available, the lab was not able to perform this analysis. However, because one of the mobility tests described in the following subsections required a larger volume of NAPL than was available from the site, the laboratory prepared a blend of site NAPL with a NAPL of similar properties to perform the mobility test. The interfacial tension of this NAPL blend was measured at 72 degrees Fahrenheit and found to be 31 dynes per centimeter for the NAPL air phase pair and 22.3 dynes per centimeter for the NAPL water phase pair (ENV America, 2005b).

2.2.3.4 NAPL Mobility Testing

Intact core samples from three borings drilled during the 2005 groundwater investigation were sent to PTS Laboratories for NAPL mobility testing (ENV, 2005b). The samples were selected from the depth interval in each boring which had the greatest visible amount of NAPL present and therefore likely represent the depth ranges where NAPL is most mobile at each of these boring locations.

The first test was a free product mobility test that was conducted by taking the intact core samples and spinning them in a centrifuge to subject them to a force of 1,000 times that of gravity for one hour. The volume of fluids drained from the core was measured and the water and NAPL fluid saturations in the sample were recorded before and after centrifuging the sample. The testing indicated that NAPL could not be liberated from the soil even when centrifuging the sample under extreme conditions.

The second test performed evaluated the NAPL saturation capacity of the samples. This test involved taking the drained cores from the previous test and resaturating them with NAPL and then subjecting them to the previous test to drain the samples. This test was performed to evaluate the residual saturation by starting with a NAPL saturated sample since the initial NAPL saturations measured in the previous test may be below residual levels. The results indicate the residual saturation of all samples after resaturating and centrifuging was slightly higher in all samples than the NAPL saturation observed in the original samples indicating that the NAPL in the original field samples was below the residual NAPL saturation. Under these conditions, the NAPL would be essentially immobile.

3.0 SCREENING-LEVEL HUMAN HEALTH RISK ASSESSMENT

A *Screening-Level Human Health Risk Assessment* (SLHHRA) was prepared by Iris Environmental for the Site and is presented in Appendix B. The primary purpose of the SLHHRA was to determine whether levels of chemicals present in soil could pose a risk to human health based on current and potential future property uses. The results of the SLHHRA have been used to identify areas of the Site where remedial/mitigation measures and/or risk management may be appropriate, with the overall goal of long-term protection of human health.

Soil data considered relevant for a SLHHRA that includes future land use scenarios typically include all data for soil samples from depths up to and including 10 feet bgs; 10 feet is considered a typical maximum depth for excavation activities associated with subsurface maintenance/ landscaping work or site redevelopment.

For the purposes of supporting risk management decisions, three data subsets were prepared and evaluated in the SLHHRA, including the on-site property (111 Santa Rosa Avenue; APNs 010068020 and 010068021), the 438 First Street Property (APN 010068019), and off-site public Right of Way (ROW) areas consisting of all other areas adjacent to the Site (Figure 2).

3.1 IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN

Chemical compounds included in the SLHHRA are those constituents detected above laboratory reporting limits in at least one soil sample. Although Cal/EPA and USEPA guidance allow for the elimination of inorganic constituents (i.e., metals) from the quantitative risk assessment if they are detected at levels within local background/ambient concentrations, all chemicals detected in on-site and off-site soil samples have been conservatively included in the quantitative SLHHRA. The COPCs detected in on-site and off-site soil that are included in the quantitative SLHHRA include 13 volatile organic compounds (VOCs), TPH, total polychlorinated biphenyls (PCBs), 17 PAHs, and 19 inorganics (Appendix B).

3.2 EXPOSURE ASSESSMENT

To determine whether the chemicals present pose a risk to human populations under current and future anticipated conditions, populations that may potentially be exposed and the pathways through which exposures may occur were identified. The conceptual Site Model (CSM) for the Site is shown in Figure 4 of the SLHHRA (Appendix B) and illustrates the relationship between the chemical sources, exposure pathways and potential receptors. These source-pathway-receptor relationships provide the basis for the quantitative exposure assessment. Only the complete pathways were evaluated in the SLHHRA. Based on the current and assumed hypothetical future uses of the on-site Property, the populations included in the SLHHRA consist of the following:

- Current on-site worker (also evaluated as protective of infrequent visitors);
- Hypothetical future on-site commercial worker (including short-term construction/ intrusive workers); and,

- Hypothetical future on-site resident.

Similar to the on-site Property, the off-site 438 First Street Property and off-site public ROW areas are evaluated under hypothetical future commercial worker and residential scenarios, to provide the basis for any mitigation measures and/or deed restrictions, if warranted, for these areas.

Under current conditions, the potential pathways through which commercial workers could be exposed to COPCs in soil are considered incomplete or insignificant. For the purposes of supporting risk management decisions, this SLHHRA assumes that hypothetical future receptors (on-site commercial workers and residents) could be exposed to COPCs in soil via incidental ingestion, dermal contact, and inhalation of COPCs volatilized or re-suspended as respirable particulates in outdoor air.

3.3 Comparison of Exposure Point Concentrations (EPCs) to Risk-Based and Ambient Based Screening Concentrations

Exposure point concentrations (EPCs) are the representative chemical concentrations that a receptor may contact at an exposure area over the exposure period. The EPC approach is based on the concept that individuals contact the impacted medium on a periodic and random basis. Because of the repeated and random nature of such contact, human exposure does not occur at a fixed point, but rather at a variety of points with equal likelihood that any given point within the exposure area will be the contact location on any given day. Thus, the EPC is based on an average chemical concentration within the exposure area. The calculation of EPCs for each COPC dataset includes an initial evaluation of the distribution of the data as a predecessor step to employing the best statistical methodology for determining a concentration that estimates the mean of the dataset with a prescribed level of confidence.

For the purposes of supporting risk management decisions, potential human health risks for the future hypothetical receptors (on-site commercial and residential populations) are evaluated using risk-based screening concentrations (RBSCs) and ambient based screening concentrations (ABSCs) protective of the exposure pathways identified as potentially complete for these receptors. A detailed discussion of how the RBSCs and ABSCs were developed is included in Appendix B. A comparison of RBSCs and ABSCs to EPCs for COPCs in soil is used to determine whether levels of chemicals detected in soil at the on-site Property, off-site 438 First Street Property, and off-site public ROW could pose a risk to human health above acceptable risk and hazard levels based on potential future property uses. The results of the comparison are used to support the mitigation measures and deed restrictions proposed in this RAP.

The selection of commercial land use RBSCs for the hypothetical future commercial worker, and the residential land use RBSCs selected for the hypothetical future resident for the COPCs in on-site Property soil (0-10 feet bgs), off-site 438 First Street Property soil (0-10 feet bgs), and off-site public ROW soil (0-10 feet bgs), are discussed in detail in the SLHHRA and presented in Tables 2a through 2c, respectively in Appendix B.

Given that risk-based residential cleanup goals for carcinogenic PAHs (CPAHs) and arsenic in soil are below ambient concentrations, the numerical remedial goal for these compounds would not be risk-

based, but rather would be based on the ambient concentrations of these compounds. ABSCs for CPAHs and arsenic in on-site Property soil (0-10 feet bgs), off-site 438 First Street Property soil (0-10 feet bgs), and off-site public ROW soil (0-10 feet bgs) are discussed in detail in the SLHHRA and presented in Tables 2a through 2c, respectively in Appendix B.

A comparison of RBSCs and ABSCs to EPCs for COPCs in soil has been used to determine whether levels of chemicals detected in soil at the on-site Property, off-site 438 First Street Property, and off-site public ROW could pose a risk to human health above acceptable risk and hazard levels based on potential future property uses. The results of the comparison of soil RBSCs and ABSCs to soil EPCs are discussed below.

3.3.1 Current Land Use

Under current Site conditions, the potential pathways through which on-site commercial workers could be exposed to COPCs in soil are considered incomplete or insignificant. Therefore, the current Site conditions are fully protective of the health of current on-site commercial populations and no further remedial or mitigation measures are warranted. Risk management measures, such as a cap maintenance/soil management plan and deed restrictions, are warranted to ensure that the Site continues to remain protective of human health.

3.3.2 Potential Future Land Uses

For the purposes of supporting risk management decisions, a comparison of RBSCs and ABSCs to EPCs for COPCs in soil is used to evaluate potential human health risks under potential future land use scenarios. The following are the conclusions and recommendations for the on-site Property, off-site 438 First Street Property, and off-site public ROW under hypothetical future commercial and residential land use scenarios.

3.3.2.1 On-site Property

The results of the comparison of EPCs for COPCs in on-site Property soil (0-10 feet bgs) to commercial soil RBSCs and ABSCs indicates that levels of arsenic, benzene, CPAHs, naphthalene, TPHd, and lead are above levels suitable for future commercial land use if the Site were to be redeveloped for other commercial uses (e.g., if the existing cover were to be removed, and/or if a building were to be constructed elsewhere on-site). Accordingly, risk management measures, such as a cap maintenance/soil management plan and a deed restriction, are warranted for the protection of future commercial populations (including short-term construction/intrusive workers) at the on-site Property.

The results of the comparison of EPCs for COPCs in on-site Property soil (0-10 feet bgs) to residential soil RBSCs and ABSCs indicates that levels of arsenic, benzene, CPAHs, ethylbenzene, naphthalene, TPHd, total PCBs, and lead are above acceptable levels suitable for future residential land use if the Site were to be redeveloped for residential use. Accordingly, risk management measures that restrict the future residential use of the property are warranted.

3.3.2.2 Off-site 438 First Street Property

The comparison of EPCs for COPCs in off-site 438 First Street Property soil (0-10 feet bgs) to commercial soil RBSCs and ABSCs indicates that levels of arsenic and lead at depths greater than 2 feet bgs in the small landscaped planter areas along the eastern boundaries of the property are above levels suitable for future commercial land use if this property were to be redeveloped for other commercial use. Accordingly, risk management measures such as a cap maintenance/soil management plan for soil below 2 feet bgs in the planter areas are warranted for the protection of future commercial populations at the off-site 438 First Street Property.

The comparison of EPCs for COPCs in off-site 438 First Street Property soil (0- 10 feet bgs) to residential soil RBSCs and ABSCs indicates that levels of arsenic and lead at depths greater than 2 feet bgs in the small landscaped planter areas along the eastern boundaries of the property are above levels suitable for future residential land use if the Site were to be redeveloped for residential use. Accordingly, risk management measures that restrict the future residential use of the property are warranted.

3.3.2.3 Off-site Public ROW

The comparison of EPCs for COPCs in off-site public ROW soil (0-10 feet bgs) to commercial soil RBSCs and ABSCs indicates that levels of CPAHs and naphthalene are above levels suitable for future commercial land use (e.g., if the existing cover in the off-site public ROW, specifically along the PMG, were to be removed). Accordingly, risk management measures are warranted to ensure that impacts that remain in the PMG are properly managed.

The comparison of EPCs for COPCs in off-site public ROW soil (0-10 feet bgs) to residential soil RBSCs and ABSCs indicates that levels of CPAHs, naphthalene, and lead along the PMG are above levels suitable for future residential land use. Accordingly, risk management measures are warranted to ensure that impacts that remain in the PMG are properly managed.

4.0 SUMMARY OF FEASIBILITY STUDIES

In June 2006, a *Corrective Action Plan* (CAP) was prepared for the Site (TPG, 2006a). The CAP included an assessment of on-site and off-site impacts to soil and groundwater. The CAP also contained a Feasibility Study (2006 FS) that evaluated remedial alternatives for impacted soil and groundwater. The groundwater portion of the 2006 FS was preliminary in nature because the scope and scale of the selected groundwater remedial alternative would ultimately be dependent on the nature and extent of residual soil impacts following implementation of the selected soil remedy. The 2006 FS stated that following implementation of the selected soil remedy, groundwater alternatives would be re-evaluated and an appropriate final groundwater remedy selection would be made, consistent with the remedial action goals established for the Site.

Following completion of the CAP, additional investigations were conducted to further evaluate potential sources at the Site. During these investigations, elevated concentrations of benzene and naphthalene were observed within the footprint of the redwood gas holder. Based on the evaluation of investigation results for soils in the redwood gas holder, it was determined that conventional excavation approaches could result in the unacceptable emission of elevated concentrations of volatile compounds into the atmosphere. Accordingly, a Redwood Tank FS was prepared to identify a remediation alternative that could be implemented in a manner protective of human health and the environment (TPG, 2007c). Remedial measures were subsequently implemented as discussed in Section 1.5, and the *Redwood Gas Holder Closure Report* was submitted in April 2014 (TPG, 2014b).

In 2010, the *Draft Supplemental Feasibility Study* was completed for the Site to fulfill the requirements set forth in Cleanup and Abatement Order (CAO) No. R1-2006-0033, revised by the RWQCB on March 27, 2006. This *Supplemental Feasibility Study* (Supplemental FS) was finalized with RWQCB comments in 2012 (TPG, 2012d). The Supplemental FS evaluated soil and groundwater remedial alternatives for the Site based on the remedial measures taken and the additional information collected since the 2006 FS was completed. The remedial alternatives selected in the Supplemental FS for soil and groundwater were determined to be appropriate to achieve the remedial action goals established for the Site. These remedial action goals are: 1) to ensure that concentrations of chemicals remaining in soil and groundwater at the Site are protective of human health and the environment to the extent practicable, and 2) to protect and restore the current and potential beneficial uses of ground and surface water to the extent feasible and practicable.

The Supplemental FS evaluated four soil and four groundwater remediation alternatives (including the No Action alternatives) that were developed by combining compatible and complimentary options into remedial action scenarios that would address the soil and groundwater contamination. The remedial alternatives evaluated for soil were:

- Soil Alternative No. 1: No Action
- Soil Alternative No. 2: Cap and Deed Restriction
- Soil Alternative No. 3: Targeted Soil Excavation (including UST removal)
- Soil Alternative No. 4: Site Wide Soil Excavation (including UST removal)

Ultimately, a combination of Alternative 2, Cap and Deed restriction, and Alternative 3, Targeted Soil Excavation, was selected as the most appropriate soil remedial alternative. Figure 29 shows the targeted soil excavation areas in the selected soil remedial alternative.

Since the Supplemental FS was completed in 2010, many of the elements outlined in the selected remedy for soil have been implemented. Remediation of the shallow impacted soils immediately south of the underground parking entrance was completed in October, 2011 (TPG, 2012c). Remediation of the redwood gas holder, excavation of shallow soil in planter areas, and Site restoration activities were completed in 2013 (TPG 2013b; 2014b). Site restoration activities included re-locating the driveway entrance to its pre-remediation location, reconstructing damaged curbs and sidewalks, repaving and/or slurry coating the parking lot, and replacing the landscaping in the planter areas. Currently the Site is capped and groundwater is not being used as a water supply. Removal of the existing steel UST, as well as targeted soil excavation beneath the existing UST and the two USTs formally located in front of the building entrance (removed in June 2006), have been placed on hold pending land use circumstances that will allow for additional significant disruption. The location of these two areas is shown on Figure 30.

The implemented elements of the soil remedy approved in the Supplemental FS have reduced the potential for future mobilization of Site contaminants. As requested by the RWQCB (letter dated April 25, 2014), and to address these changed conditions, a *Groundwater Feasibility Study* (Groundwater FS) (TPG, 2015), was submitted and subsequently approved on March 13, 2015 by the RWQCB. The Groundwater FS evaluated four alternatives for groundwater that would be implemented in conjunction with the completed and remaining elements of the previously selected soil remedy to provide an overall remedy for the Site. The four groundwater alternatives evaluated were:

- Groundwater Alternative No. 1: No Action
- Groundwater Alternative No. 2: Long-term Groundwater Monitoring
- Groundwater Alternative No. 3: Grout or Slurry Barrier
- Groundwater Alternative No. 4: Funnel and Gate

While the results of the comparison of alternatives indicated that Alternatives 2, 3, and 4 would satisfy the remedial action goals, Alternative 2 (Long-term Groundwater Monitoring) presents significantly less impacts to the creek, the PMG, and the surrounding community. Construction of Alternative 3 would require construction within the creek resulting in significant impacts to the creek, the PMG, and the surrounding community. Alternative 4 would require even more construction in the creek and also require construction activities on the 438 First Street Property. Because Alternative 2 satisfies the remedial action goals and could be implemented with significantly less impact to the creek, the PMG, and the surrounding community, Alternative 2 was selected as the preferred groundwater Alternative.

The overall proposed soil and groundwater remedy selected for the Site includes the following components:

- Removal of the former USTs in the parking lot west of the building entrance (completed in June 2006);

- Remediation of the redwood gas holder (completed in 2013);
- Removal of the existing on-site UST (on hold pending land use changes);
- Targeted excavations to remove heavily impacted soils in the vicinity of the former and existing USTs (on hold pending land use changes), and shallow soils in the area south of the underground driveway entrance (completed in 2011);
- Long-term groundwater monitoring;
- Maintaining current cap; and,
- Deed restrictions.

5.0 OPERATIONS AND MAINTENANCE PLAN

An Operations and Maintenance Plan (O&M Plan) for post-remediation groundwater monitoring and cap inspection and maintenance activities will be prepared for each property and implemented as part of the post-remediation monitoring program. In addition to groundwater monitoring and cap inspection and maintenance activities, the O&M Plan will also include the details of the five-year reviews that will be conducted.

An Operations and Maintenance Agreement for groundwater monitoring will be signed and executed between the RWQCB and PG&E to ensure the implementation of the semiannual monitoring activities described in the O&M Plan. Separate Operations and Maintenance Agreements will be signed and executed between the RWQCB and the current owners of each property to ensure the implementation of the annual cap inspection, access by PG&E for groundwater monitoring activities, and associated reporting activities described in the O&M Plan.

5.1 GROUNDWATER MONITORING PROGRAM

Groundwater monitoring is proposed at 14 monitoring well locations (monitoring wells MW-7, MW-9, MW-10, MW-12 and MW-16, MW-17, MW-19S, MW-19D, MW-20, MW-21, MW-22, MW-23, EBAMW-1, and EBAMW-2) as shown on Figure 31. These wells constitute a subset of existing wells and were selected to provide a good spatial distribution of groundwater sample locations including the most downgradient wells. These wells are generally screened within a hydrogeologic unit where off-site migration of shallow impacted groundwater, or migration of contaminants to Santa Rosa Creek, would most likely occur. The monitoring data will be used to verify that groundwater conditions are stable. If the monitoring results indicate that groundwater conditions are changing and no longer stable, additional monitoring, investigation, or other remedial actions would be implemented as appropriate.

During the first five years, groundwater monitoring events will occur in the spring and fall to coincide with expected high and low groundwater levels. As discussed further in Section 5.3, after the first five years, a comprehensive groundwater evaluation report will be prepared and submitted to the RWQCB.

Groundwater monitoring activities will be conducted in accordance with the procedures developed in a Groundwater Monitoring Workplan, which will be prepared as a separate document. In general, the groundwater monitoring program will include the following:

- Static water level measurements;
- Low-flow purging and sampling;
- Analytical laboratory testing; and
- Reporting.

Groundwater samples from each well, and one duplicate sample, will be analyzed for: TPHd and TPHmo using USEPA Method 8015B with silica gel cleanup; TPHg and benzene using USEPA Method 8260B; and PAHs using USEPA Method 8270 SIM. One trip blank sample will also be analyzed for TPHg and BTEX.

5.1.1 Reporting

Semiannual groundwater monitoring reports will be prepared summarizing the results of each groundwater monitoring event.

5.2 CAP OPERATIONS AND MAINTENANCE

An O&M Plan will be prepared for each property and implemented as part of the post-remediation monitoring plan. Site O&M activities will consist of routine inspections and documentation to show that the capped surfaces in restricted areas remain in good condition, and land uses are compliant with the property usage restrictions.

The O&M Plans will consist of an annual Site inspection which will include:

- Visual inspection of all capped surfaces in restricted areas;
- Notation of significant cracks or degradation in the concrete, AC, or other Site covers in restricted areas;
- Appropriate cap repair and replacement in restricted areas; and,
- Inspection of water drainage patterns and potential erosion issues.

The annual inspection will be documented in a report for each property, which will also include notations of any Site modifications to the cap that were made during the previous year or observed soil erosion issues.

In addition to cap inspections and reporting, the O&M Plans will present the details of post-remediation groundwater monitoring discussed in Section 5.1. An Operation and Maintenance Agreement will also be entered into between RWQCB and each property owner to ensure the implementation of the O&M Plan.

5.3 FIVE-YEAR REVIEW

Reviews will be conducted every five years following the RWQCB approval of the proposed O&M Plan. The review will include a Site inspection, technical assessments of the ongoing monitoring, presentation of opportunities for optimization of the post-remediation program, any changes to conditions and land use or standards, and any updated risk calculations and assessments, where relevant.

In addition, PG&E will also continue to search for a suitable method to remove the existing steel UST and its contents without causing a nuisance condition for the building tenants or the community. Removal of the existing steel UST, as well as targeted soil excavation beneath the existing UST and the two former USTs located in front of the building entrance (removed in June 2006), have been placed on hold pending land use circumstances that will allow for additional significant land use disruption. The five-year review will include information on any new technologies and/or methodologies that may be suitable for effectively completing this work. The results of the five-year

reviews will be presented in written reports together with recommendations and follow-up actions, if any.

6.0 LAND USE COVENANTS

Issuance of a Land Use Covenant (LUC) is an appropriate response action to protect against the future release or threatened release of materials and/or wastes. LUCs will be pursued for the Site, the off-site 438 First Street Property, and off-site ROW, to ensure owners and any party that leases the property(ies) (current and future) are aware of areas where chemical residuals remain in soil or groundwater that may have an adverse health impact if disturbed without taking proper precautions.

Covenants to restrict property use, recorded in the form of LUCs, will disclose information about the properties' residual contamination to the local government and the public and will make current and future property owners responsible for following land use restrictions and protecting capped surfaces. LUCs will remain binding for current and subsequent property owners and in effect until they are terminated or modified by the RWQCB.

LUCs will prohibit future alteration of existing cover features such as concrete foundations, concrete or asphalt paving, and planter soils in areas with residual contamination above concentrations that allow for unrestricted land-use, unless adequately replaced.

The location of the restricted areas will be surveyed and a legal description included in the LUC. Areas lying outside the restricted areas will not require special protections unless unknown contamination is encountered. At a minimum, an LUC will include the following requirements:

- All uses and development of restricted areas will preserve the integrity and physical accessibility of the capped surfaces (including planters overlying impacted soils), and groundwater monitoring wells.
- Activities that will disturb impacted soil below the capped surfaces (including planter areas) will not be permitted without a Soil Management Plan approved by the RWQCB and an associated Health and Safety Plan (HASP).
- Any contaminated soil brought to the surface by grading, excavation, trenching or backfilling will be managed in accordance with applicable provisions of state and federal law and in accordance with the Soil Management Plan.
- Capped surfaces and groundwater monitoring wells will not be altered without RWQCB approval.
- Installation of wells and extraction of groundwater will not be allowed without RWQCB approval.

7.0 SUSTAINABLE PRACTICES

The development of future activities described in this report will be conducted in a sustainable manner. Sustainable practices corresponding to field activities that are least disruptive will be employed where feasible and practicable during the ongoing activities. To help facilitate identification and implementation of sustainable practices during these activities, a simple sustainability framework referred to as the Green Remediation Evaluation Matrix (GREM) was developed. The foundation of this framework is the three triple bottom line elements that are typically associated with sustainability: (1) environmental, (2) economic, and (3) social elements. Within each of the three sustainability elements, stressors which affect specific media are identified, as are the mechanisms for the effect on each medium. Correspondingly, a metric is identified to measure the effect on the stressor. Metrics used for each stressor vary based on the nature of the stressor. These metrics include estimates of the amount of CO_2 equivalents (for greenhouse gas emissions), PM-10 generation measured in milligrams per cubic meters (for airborne particulates), and other calculations and/or ratings that may be appropriate to define the stressor. Following identification of stressors and potential impacts from the proposed work, impact-reduction alternatives are identified (i.e., sustainable best management practices) for implementation during work activities to reduce the impact on the stressor. These impacts will be tracked and measured during the work using the metrics identified.

8.0 PUBLIC PARTICIPATION

The RAP will be subject to a 30-day public comment period to solicit community input on the adequacy of the RAP. The availability of the RAP for public comment will be advertised through a public notice in the Santa Rosa Press Democrat and the distribution of a fact sheet to nearby property owners and the key contact mailing list. At the mid-point of the public comment period, the RWQCB may host a public meeting to explain the RAP and solicit feedback, as warranted. At the close of the public comment period, the RWQCB will review and respond to all public comments prior to making a decision to approve, modify or deny the RAP.

9.0 CONCLUSIONS AND RECOMMENDATIONS

This RAP summarizes the historical investigations, feasibility studies, and remedial actions that have been completed. This RAP also presents the nature and extent of remaining impacts to soil and groundwater, and the results of a SLHHRA that was prepared to determine whether levels of chemicals remaining in soil at the Site and adjoining properties could pose a risk to human health based on current and potential future property uses. The results of the SLHHRA identified areas of the Site and adjoining properties where mitigation measures and/or risk management may be appropriate, with the overall goal of long-term protection of human health.

Under current conditions, the potential pathways through which commercial workers/site visitors could be exposed to COPCs in soil are considered incomplete or insignificant. Therefore, the current conditions are fully protective of the health of current commercial populations and no further remedial or mitigation measures are warranted. Risk management measures, such as a cap maintenance/soil management plan and deed restrictions are warranted to ensure that the Site and off-site areas continue to remain protective of human health.

Overall the soil and groundwater remedy includes the following components:

- Pre-development (1987-1988) soil excavations at three on-site locations (complete);
- Removal of impacted soil from the bed of the Santa Rosa Creek, and lining of the creek bed, conducted in conjunction with the PMG construction in 2004 (complete);
- Removal of the former USTs in the parking lot west of the building entrance (complete);
- Remediation of the redwood gas holder (complete);
- Removal of the existing on-site UST (on hold pending land use change);
- Targeted excavations to remove heavily impacted soils in the vicinity of the former and existing USTs (on hold pending land use change), and shallow soils in the area south of the underground driveway entrance (complete);
- Long-term groundwater monitoring;
- Maintaining cap on restricted areas; and,
- Deed restrictions.

The majority of these remediation components have been completed. However, removal of the existing steel UST, and targeted soil excavation beneath the existing UST and the two former USTs located in front of the building entrance, have been placed on hold pending land use circumstances that will allow for additional significant land use disruption. PG&E will continue to search for a suitable method to remove the existing steel UST and its contents without causing a nuisance condition for the building tenants or the community.

An O&M Plan for post-remediation groundwater monitoring and cap inspection and maintenance activities will be prepared and implemented as part of the post-remediation monitoring program. Groundwater monitoring is proposed at 14 monitoring well locations semiannually. Five-year reviews will be conducted following the RWQCB approval of the proposed O&M Plan. The reviews will

include an inspection of restricted areas, technical assessments of the ongoing monitoring, presentation of opportunities for optimization of the post-remediation program, any changes to conditions and land use or standards, and any updated risk calculations and assessments, where relevant. The reviews will also include information on any new technologies and/or methods that may be suitable for addressing the existing UST without causing a nuisance condition for the building tenants or the community.

LUCs will be pursued with all property owners with impacted soil/groundwater to ensure owners and those leasing the property(ies) (current and future) are aware of the restricted areas where chemical residuals remain in soil or groundwater that may have an adverse health impact if disturbed without taking proper precautions. The location of the restricted areas will be surveyed and a legal description prepared for each LUC. Areas lying outside the restricted areas will not require special procedures unless unknown contamination is encountered.

This RAP will be subject to a 30-day public comment period to solicit community input on the adequacy of the RAP. The RWQCB may host a public meeting to solicit feedback, as warranted. At the close of the public comment period, the RWQCB will review and respond to all public comments prior to making a decision to approve, modify or deny the RAP.

10.0 REFERENCES

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TABLES

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	80E	100E				120E	180E			220E	A2-S	A4-S
Sample ID	14-80E-15'	6-100E-10'	13-100E-15'	20-100E-20'	29-100E-25'	17-120E-15'	32-180E-15'	35-180E-20'	39-180E-25'	40-220E-25'	A2-S-2.5	A4-S-2.5
Sample Depth (feet)	15	10	15	20	25	15	15	20	25	25	2.5	2.5
Date Sampled	7/9/2002	7/9/2002	7/9/2002	7/9/2002	7/24/2002	7/9/2002	7/26/2002	7/29/2002	7/29/2002	7/29/2002	10/22/2011	10/22/2011
Non-Carcinogenic												
Acenaphthene	<33	<33	<66	<33	<16	<66	<16	<3.3	<3.3	<0.33	<0.5	<0.0050
Acenaphthylene	56	<33	<66	<33	<16	<66	<16	<3.3	<3.3	<0.33	6.9	0.0076
Anthracene	<33	<33	<66	<33	<16	<66	<16	<3.3	<3.3	<0.33	4.9	0.0087
Benzo (g,h,i) Perylene	120	82	<66	<33	<16	310	<16	<3.3	<3.3	<0.33	27	0.054
Fluoranthene	230	140	<66	<33	<16	350	<16	<3.3	<3.3	<0.33	56	0.068
Fluorene	<33	<33	<66	<33	<16	<66	<16	<3.3	<3.3	<0.33	1.1	<0.0050
Phenanthrene	240	140	<66	<33	<16	260	<16	<3.3	<3.3	<0.33	20	0.026
Pyrene	300	180	<66	<33	<16	520	<16	<3.3	<3.3	<0.33	56	0.098
Carcinogenic												
Benzo (a) Anthracene	39	<33	<66	<33	<16	88	<16	<3.3	<3.3	<0.33	28	0.043
Benzo (a) Pyrene	88	62	<66	<33	<16	200	<16	<3.3	<3.3	<0.33	36	0.055
Benzo (b) Fluoranthene	57	37	<66	<33	<16	140	<16	<3.3	<3.3	<0.33	41	0.056
Benzo (k) Fluoranthene	43	37	<66	<33	<16	130	<16	<3.3	<3.3	<0.33	12	0.024
Chrysene	57	42	<66	<33	<16	130	<16	<3.3	<3.3	<0.33	26	0.047
Dibenz (a,h) Anthracene	<33	<33	<66	<33	<16	<66	<16	<3.3	<3.3	<0.33	5.1	0.0088
Indeno (1,2,3-c,d) Pyrene	68	48	<66	<33	<16	180	<16	<3.3	<3.3	<0.33	21	0.037
Naphthalene	120	58	<66	<33	<16	67	<16	<3.3	<3.3	<0.33	2.7	<0.0050
Benzo (a) Pyrene (eq)	110	82	58	29	14	270	14	2.9	2.9	0.29	48	0.074

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	A-30		A-31	A-32	A-33		A-34	A-35	B1-S	B2-S	B3-F	B-105	
Sample ID	A-30-1.0	A-30-2.0	A-31-2.0	A-32-2.0	A-33-1.0	A-33-2.0	A-34-2.0	A-35-2.0	B1-S-4.0	B2-S-5.5	B3-F-5.0	B-105-5'	B-105-10'
Sample Depth (feet)	1	2	2	2	1	2	2	2	4	5.5	5	5	10
Date Sampled	3/9/2012	3/9/2012	3/9/2012	3/8/2012	3/8/2012	3/8/2012	3/8/2012	3/7/2012	10/22/2011	10/22/2011	10/22/2011	10/11/2002	10/11/2002
Non-Carcinogenic													
Acenaphthene	0.0022	0.0054	<0.0014	0.0031	0.010	0.010	<0.0070	<0.0070	<0.025	<0.5	<0.0049	0.022	<0.02
Acenaphthylene	0.019	0.052	0.033	0.041	0.13	0.037	0.044	0.036	0.058	4.0	0.011	0.022	<0.02
Anthracene	0.022	0.025	0.031	0.033	0.14	0.054	0.033	0.020	0.051	4.0	0.014	0.22	<0.02
Benzo (g,h,i) Perylene	0.14	0.23	0.12	0.13	0.25	0.082	0.11	0.059	0.99	28	0.073	1.1	0.025
Fluoranthene	0.19	0.27	0.24	0.34	1.1	0.39	0.39	0.23	0.43	39	0.092	2.1	0.049
Fluorene	0.0033	0.011	0.0073	0.0043	0.029	0.015	0.0076	0.0058	<0.025	0.86	<0.0049	0.059	<0.02
Phenanthrene	0.12	0.14	0.18	0.23	0.81	0.29	0.23	0.14	0.15	22	0.059	1.1	0.023
Pyrene	0.18	0.28	0.24	0.29	1.2	0.37	0.40	0.25	0.63	53	0.12	2.5	0.062
Carcinogenic													
Benzo (a) Anthracene	0.056	0.073	0.060	0.16	0.33	0.13	0.11	0.074	0.71	18	0.048	0.99	0.025
Benzo (a) Pyrene	0.10	0.16	0.11	0.22	0.55	0.18	0.20	0.11	1.7	29	0.068	1.3	0.025
Benzo (b) Fluoranthene	0.12	0.16	0.12	0.45	0.69	0.25	0.23	0.14	2.0	31	0.076	1.8	0.032
Benzo (k) Fluoranthene	0.034	0.056	0.032	0.14	0.22	0.080	0.10	0.056	0.7	10	0.024	0.46	<0.02
Chrysene	0.066	0.090	0.073	0.21	0.39	0.15	0.14	0.098	0.78	21	0.054	1.7	0.038
Dibenz (a,h) Anthracene	0.021	0.025	0.015	0.042	0.040	0.015	0.016	0.010	0.31	4.3	0.011	0.17	<0.02
Indeno (1,2,3-c,d) Pyrene	0.10	0.16	0.088	0.14	0.21	0.072	0.092	0.052	0.85	20	0.049	1.1	0.023
Naphthalene	0.015	0.18	0.025	5.1	0.12	0.038	0.03	0.023	<0.025	2.7	0.0071	0.21	<0.02
Benzo (a) Pyrene (eq)	0.14	0.21	0.15	0.33	0.71	0.24	0.26	0.15	2.2	39	0.092	1.8	0.038

Table 1
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Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-106			B-107		B-108	B-109			B-110		
Sample ID	B-106-10'	B-106-15'	B-106-20'	B-107-10'	B-107-20'	B-108-5'	B-109-5'	B-109-10'	B-109-20'	B-110-5'	B-110-10'	B-110-20'
Sample Depth (feet)	10	15	20	10	20	5	5	10	20	5	10	20
Date Sampled	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003
Non-Carcinogenic												
Acenaphthene	<500	<0.02	1000	<500	310	<1	<1	<0.02	<1	<0.02	<0.02	<0.02
Acenaphthylene	<500	0.1	<500	<500	<500	8.3	<1	<0.02	<1	<0.02	<0.02	<0.02
Anthracene	670	0.096	<500	<500	<500	6.7	<1	<0.02	<1	0.035	<0.02	<0.02
Benzo (g,h,i) Perylene	2,600	1.1	<500	2,500	<500	42	6.1	<0.02	<1	0.11	0.024	<0.02
Fluoranthene	4,600	1.3	<500	2,100	<500	67	6	<0.02	<1	0.28	0.038	<0.02
Fluorene	<500	0.02	<500	<500	<500	3.5	<1	<0.02	<1	<0.02	<0.02	<0.02
Phenanthrene	3,500	0.31	<500	800	<500	45	2.9	<0.02	<1	0.17	0.026	<0.02
Pyrene	5,400	1.7	<500	2,900	<500	87	7.8	<0.02	<1	0.25	0.044	<0.02
Carcinogenic												
Benzo (a) Anthracene	1,200	0.76	<500	830	<500	25	3.5	<0.02	<1	0.14	0.03	<0.02
Benzo (a) Pyrene	2,700	1.5	<500	2,300	<500	29	4.9	<0.02	<1	0.16	0.03	<0.02
Benzo (b) Fluoranthene	1,300	1.5	<500	1,000	<500	34	6.6	<0.02	<1	0.24	0.042	<0.02
Benzo (k) Fluoranthene	710	0.39	<500	630	<500	11	1.6	<0.02	<1	0.066	<0.02	<0.02
Chrysene	1,500	1.1	<500	1,100	<500	39	4.6	<0.02	<1	0.2	0.04	<0.02
Dibenz (a,h) Anthracene	<500	0.18	<500	<500	<500	<1	<1	<0.02	<1	0.023	<0.02	<0.02
Indeno (1,2,3-c,d) Pyrene	1,600	1	<500	1,700	<500	33	5.9	<0.02	<1	0.12	0.024	<0.02
Naphthalene	630	<0.02	<500	<500	<500	15	<1	<0.02	<1	<0.02	<0.02	<0.02
Benzo (a) Pyrene (eq)	3,300	1.9	440	2,800	440	40	6.9	0.018	0.88	0.23	0.044	0.018

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-111		B-112		B-113		B-114	B-115		B-116		
Sample ID	B-111-5'	B-111-20'	B-112-20.0'	B-112-25.0'	B-113-5'	B-113-20'	B-114-20'	B-115-7'	B-115-20'	B-116-5'	B-116-10'	B-116-20'
Sample Depth (feet)	5	20	20	25	5	20	20	7	20	5	10	20
Date Sampled	2/3/2003	2/3/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003
Non-Carcinogenic												
Acenaphthene	<0.02	<0.02	<4	<0.02	<1	5.3	<0.02	<1	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	<0.02	<0.02	<4	<0.02	5	<1	<0.02	11	<0.02	0.026	<0.02	<0.02
Anthracene	<0.02	<0.02	<4	<0.02	2.1	<1	<0.02	4.3	<0.02	<0.02	<0.02	<0.02
Benzo (g,h,i) Perylene	0.021	<0.02	<4	<0.02	12	<1	<0.02	13	<0.02	0.088	0.045	<0.02
Fluoranthene	0.028	<0.02	<4	<0.02	22	1.7	<0.02	38	<0.02	0.17	0.097	<0.02
Fluorene	<0.02	<0.02	<4	<0.02	<1	2.2	<0.02	<1	<0.02	<0.02	<0.02	<0.02
Phenanthrene	0.022	<0.02	<4	<0.02	5	<1	<0.02	43	<0.02	0.13	0.044	<0.02
Pyrene	0.034	<0.02	<4	<0.02	33	2.2	<0.02	48	<0.02	0.23	0.1	<0.02
Carcinogenic												
Benzo (a) Anthracene	<0.02	<0.02	<4	<0.02	16	<1	<0.02	7.6	<0.02	0.039	0.056	<0.02
Benzo (a) Pyrene	0.02	<0.02	<4	<0.02	19	<1	<0.02	14	<0.02	0.08	0.064	<0.02
Benzo (b) Fluoranthene	0.025	<0.02	<4	<0.02	19	<1	<0.02	13	<0.02	0.075	0.08	<0.02
Benzo (k) Fluoranthene	<0.02	<0.02	<4	<0.02	7	<1	<0.02	3.3	<0.02	0.025	0.03	<0.02
Chrysene	<0.02	<0.02	<4	<0.02	19	1.3	<0.02	12	<0.02	0.064	0.081	<0.02
Dibenz (a,h) Anthracene	<0.02	<0.02	<4	<0.02	2.2	<1	<0.02	<1	<0.02	<0.02	<0.02	<0.02
Indeno (1,2,3-c,d) Pyrene	<0.02	<0.02	<4	<0.02	12	<1	<0.02	11	<0.02	0.072	0.046	<0.02
Naphthalene	<0.02	<0.02	<4	<0.02	<1	<1	<0.02	14	<0.02	0.028	<0.02	<0.02
Benzo (a) Pyrene (eq)	0.029	0.018	3.5	0.018	25	0.88	0.018	18	0.018	0.11	0.089	0.018

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-117						B-118					
Sample ID	B-117-3'	B-117-5'	B-117-8.5'	B-117-10.5'	B-117-15'	B-117-25'	B-118-5'	B-118-10'	B-118-15'	B-118-20'	B-118-25'	B-118-31'
Sample Depth (feet)	3	5	8.5	10.5	15	25	5	10	15	20	25	31
Date Sampled	7/30/2003	7/30/2003	7/30/2003	7/30/2003	7/30/2003	7/30/2003	7/30/2003	7/30/2003	7/30/2003	7/30/2003	7/30/2003	7/30/2003
Non-Carcinogenic												
Acenaphthene	<0.2	<0.4	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Acenaphthylene	<0.2	0.52	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Anthracene	<0.2	<0.4	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Benzo (g,h,i) Perylene	<0.2	0.95	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Fluoranthene	<0.2	4.4	<1	0.93	0.22	0.21	<0.2	0.41	0.3	<1	<0.2	<0.2
Fluorene	<0.2	<0.4	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Phenanthrene	<0.2	3.8	<1	0.99	0.23	0.24	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Pyrene	<0.2	5.7	<1	1.2	0.28	0.27	<0.2	0.42	0.36	<1	<0.2	<0.2
Carcinogenic												
Benzo (a) Anthracene	<0.2	1	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Benzo (a) Pyrene	<0.2	1.1	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Benzo (b) Fluoranthene	<0.2	1.3	<1	0.41	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Benzo (k) Fluoranthene	<0.2	<0.4	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Chrysene	<0.2	1.3	<1	<0.4	<0.2	<0.2	<0.2	<0.4	0.22	<1	<0.2	<0.2
Dibenz (a,h) Anthracene	<0.2	<0.4	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Indeno (1,2,3-c,d) Pyrene	<0.2	0.66	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Naphthalene	<0.2	1.4	<1	<0.4	<0.2	<0.2	<0.2	<0.4	<0.2	<1	<0.2	<0.2
Benzo (a) Pyrene (eq)	0.18	1.5	0.88	0.37	0.18	0.18	0.18	0.35	0.18	0.88	0.18	0.18

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-119						B-120				
Sample ID	B-119-5'	B-119-10'	B-119-15'	B-119-20'	B-119-25'	B-119-30'	B-120-5'	B-120-10'	B-120-15'	B-120-20'	B-120-25'
Sample Depth (feet)	5	10	15	20	25	30	5	10	15	20	25
Date Sampled	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003
Non-Carcinogenic											
Acenaphthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo (g,h,i) Perylene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Phenanthrene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic											
Benzo (a) Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo (a) Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo (b) Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo (k) Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz (a,h) Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno (1,2,3-c,d) Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo (a) Pyrene (eq)	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-121						B-122					
Sample ID	B-121-5'	B-121-10'	B-121-15'	B-121-20'	B-121-25'	B-121-30'	B-122-2'	B-122-4.5'	B-122-5.5'	B-122-8'	B-122-10'	B-122-15'
Sample Depth (feet)	5	10	15	20	25	30	2	4.5	5.5	8	10	15
Date Sampled	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/1/2003
Non-Carcinogenic												
Acenaphthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	0.84	<0.2
Acenaphthylene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	0.88	<0.2
Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	0.63	<0.2
Benzo (g,h,i) Perylene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	1.3	<0.2
Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	0.22	5.2	0.22
Fluorene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.4	<0.2
Phenanthrene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	0.2	5.3	0.31
Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	0.29	6	0.26
Carcinogenic												
Benzo (a) Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	1.1	<0.2
Benzo (a) Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.4	<0.2
Benzo (b) Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	1.4	<0.2
Benzo (k) Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.4	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	1.7	<0.2
Dibenz (a,h) Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	1.4	<0.2
Indeno (1,2,3-c,d) Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	0.95	<0.2
Naphthalene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	1.5	0.21
Benzo (a) Pyrene (eq)	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.35	0.18	1.1	0.18

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-123						B-124				B-125			
Sample ID	B-123-7.5'	B-123-10.5'	B-123-15.5'	B-123-20'	B-123-25.5'	B-123-31'	B-124-5'	B-124-10'	B-124-15'	B-124-20.5'	B-125-2'	B-125-6'	B-125-10'	B-125-15'
Sample Depth (feet)	7.5	10.5	15.5	20	25.5	31	5	10	15	20.5	2	6	10	15
Date Sampled	8/9/2003	8/9/2003	8/9/2003	8/9/2003	8/9/2003	8/9/2003	8/9/2003	8/9/2003	8/9/2003	8/9/2003	8/11/2003	8/11/2003	8/11/2003	8/11/2003
Non-Carcinogenic														
Acenaphthene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Anthracene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	0.21	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo (g,h,i) Perylene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	1	<0.2	<0.2	<0.2	<0.2	<0.2
Fluoranthene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	1.4	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Phenanthrene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	1.7	<0.2	<0.2	<0.2	<0.2	<0.2
Pyrene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic														
Benzo (a) Anthracene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	0.6	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo (a) Pyrene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	0.88	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo (b) Fluoranthene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	1.1	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo (k) Fluoranthene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	0.61	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz (a,h) Anthracene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno (1,2,3-c,d) Pyrene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	0.61	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.4	<0.2	0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo (a) Pyrene (eq)	0.18	0.18	0.18	0.35	0.18	0.18	0.35	0.18	1.2	0.18	0.18	0.18	0.18	0.18

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-126					B-127						B-128	
Sample ID	B-126-5'	B-126-10'	B-126-15'	B-126-20'	B-126-25'	B-127-3'	B-127-5'	B-127-10'	B-127-15'	B-127-20'	B-127-25'	B-128@26.0'	B-128@30.0'
Sample Depth (feet)	5	10	15	20	25	3	5	10	15	20	25	26	30
Date Sampled	8/11/2003	8/11/2003	8/11/2003	8/11/2003	8/11/2003	8/12/2003	8/12/2003	8/12/2003	8/12/2003	8/12/2003	8/12/2003	2/3/2004	2/3/2004
Non-Carcinogenic													
Acenaphthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<2	<0.2	10	<0.05
Acenaphthylene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<2	<0.2	340	<0.05
Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<2	<0.2	100	0.55
Benzo (g,h,i) Perylene	<0.2	<0.2	<0.2	<0.2	<0.2	0.26	<0.2	<0.2	<1	<2	<0.2	88	1.4
Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	0.33	<0.2	<0.2	<1	<2	<0.2	510	3.4
Fluorene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<2	<0.2	83	0.36
Phenanthrene	<0.2	<0.2	<0.2	<0.2	<0.2	0.21	<0.2	<0.2	<1	<2	<0.2	660	4.3
Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	<0.2	<0.2	<1	<2	<0.2	620	4.1
Carcinogenic													
Benzo (a) Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<2	<0.2	120	0.6
Benzo (a) Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2	0.26	<0.2	<0.2	<1	<2	<0.2	140	1.3
Benzo (b) Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	0.36	<0.2	<0.2	<1	<2	<0.2	100	1
Benzo (k) Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<2	<0.2	36	0.33
Chrysene	<0.2	<0.2	<0.2	<0.2	<0.2	0.24	<0.2	<0.2	<1	<2	<0.2	160	0.87
Dibenz (a,h) Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<2	<0.2	9.9	<0.05
Indeno (1,2,3-c,d) Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<1	<2	<0.2	68	0.64
Naphthalene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<2	<0.2	14000	12
Benzo (a) Pyrene (eq)	0.18	0.18	0.18	0.18	0.18	0.37	0.18	0.18	0.88	1.8	0.18	180	1.6

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-129						B-130					
Sample ID	B-129@5.0'	B-129@11.0'	B-129@16.0'	B-129@21.0'	B-129@26.0'	B-129@30.5'	B-130@5.0'	B-130@10.5'	B-130@15.5'	B-130@20.5'	B-130@25.5'	B-130@31.0'
Sample Depth (feet)	5	11	16	21	26	30.5	5	10.5	15.5	20.5	25.5	31
Date Sampled	2/4/2004	2/4/2004	2/4/2004	2/4/2004	2/4/2004	2/4/2004	2/5/2004	2/5/2004	2/5/2004	2/5/2004	2/5/2004	2/5/2004
Non-Carcinogenic												
Acenaphthene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.2
Acenaphthylene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.2
Anthracene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.2
Benzo (g,h,i) Perylene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.42	<0.1	<0.2	<0.1	<0.1	<0.2
Fluoranthene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.57	<0.1	0.23	<0.1	<0.1	<0.2
Fluorene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.2
Phenanthrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.38	<0.1	0.43	<0.1	<0.1	<0.2
Pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.66	<0.1	0.2	<0.1	<0.1	<0.2
Carcinogenic												
Benzo (a) Anthracene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.33	<0.1	<0.2	<0.1	<0.1	<0.2
Benzo (a) Pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.44	<0.1	<0.2	<0.1	<0.1	<0.2
Benzo (b) Fluoranthene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.2	<0.1	<0.1	<0.2
Benzo (k) Fluoranthene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.22	<0.1	<0.2	<0.1	<0.1	<0.2
Chrysene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.37	<0.1	<0.2	<0.1	<0.1	<0.2
Dibenz (a,h) Anthracene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.2
Indeno (1,2,3-c,d) Pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.29	<0.1	<0.2	<0.1	<0.1	<0.2
Naphthalene	0.18	0.15	0.18	<0.1	<0.1	<0.1	0.14	<0.1	2.3	<0.1	<0.1	0.47
Benzo (a) Pyrene (eq)	0.088	0.088	0.088	0.088	0.088	0.088	0.58	0.088	0.18	0.088	0.088	0.18

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-131					B-132					
Sample ID	B-131@10.0'	B-131@15.5'	B-131@20.5'	B-131@25.5'	B-131@30.5'	B-132@5.0'	B-132@11.0'	B-132@15.5'	B-132@20.5'	B-132@25.5'	B-132@30.5'
Sample Depth (feet)	10	15.5	20.5	25.5	30.5	5	11	15.5	20.5	25.5	30.5
Date Sampled	2/6/2004	2/6/2004	2/6/2004	2/6/2004	2/6/2004	2/9/2004	2/9/2004	2/9/2004	2/9/2004	2/9/2004	2/9/2004
Non-Carcinogenic											
Acenaphthene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo (g,h,i) Perylene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	<0.1	<0.1	<0.2	<0.1	<0.1	0.094	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	<0.1	<0.1	<0.2	<0.1	<0.1	0.11	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	<0.1	<0.1	<0.2	<0.1	<0.1	0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Carcinogenic											
Benzo (a) Anthracene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo (a) Pyrene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo (b) Fluoranthene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo (k) Fluoranthene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz (a,h) Anthracene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno (1,2,3-c,d) Pyrene	<0.1	<0.1	<0.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	<0.1	<0.1	<0.2	<0.1	<0.1	0.19	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo (a) Pyrene (eq)	0.088	0.088	0.18	0.088	0.088	0.044	0.044	0.044	0.044	0.044	0.044

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-133						B-134					
Sample ID	B-133@5'	B-133@10'	B-133@15'	B-133@20'	B-133@25.5'	B-133@30.5'	B-134@5'	B-134@10'	B-134@15'	B-134@20'	B-134@27'	B-134@30.5'
Sample Depth (feet)	5	10	15	20	25.5	30.5	5	10	15	20	27	30.5
Date Sampled	6/22/2004	6/22/2004	6/22/2004	6/22/2004	6/22/2004	6/22/2004	6/22/2004	6/22/2004	6/22/2004	6/22/2004	6/22/2004	6/22/2004
Non-Carcinogenic												
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.98	<0.05	<0.05	<0.05
Acenaphthylene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Benzo (g,h,i) Perylene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Fluorene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Phenanthrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Pyrene	<0.05	<0.05	0.071	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	0.059
Carcinogenic												
Benzo (a) Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Benzo (a) Pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Benzo (b) Fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Benzo (k) Fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Chrysene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Dibenz (a,h) Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Indeno (1,2,3-c,d) Pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Naphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05
Benzo (a) Pyrene (eq)	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.13	0.044	0.044	0.044

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-135						BC-01		BC-02	BC-03	BC-04	BC-05	BC-06
Sample ID	B-135@5'	B-135@10'	B-135@15'	B-135@20'	B-135@25'	B-135@30.5'	BC-01	BC-21	BC-02	BC-03	BC-04	BC-05	BC-06
Sample Depth (feet)	5	10	15	20	25	30.5	0*	0*	0*	0*	0*	0*	0*
Date Sampled	6/22/2004	6/22/2004	6/22/2004	6/22/2004	6/22/2004	6/22/2004	8/6/2004	8/6/2004	8/6/2004	8/6/2004	8/6/2004	8/6/2004	8/7/2004
Non-Carcinogenic													
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.0037	<0.003	<0.003	0.0075	<0.003	<0.003	<0.003
Benzo (g,h,i) Perylene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.021	0.0035	<0.003	0.0062	<0.003	<0.003	<0.003
Fluorene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.0034	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Phenanthrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.021	0.0031	<0.003	0.0044	<0.003	<0.003	<0.003
Pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.031	0.0064	<0.003	0.0083	<0.003	<0.003	<0.003
Carcinogenic													
Benzo (a) Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.0041	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Benzo (a) Pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.012	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Benzo (b) Fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	0.0034	<0.003	0.0057	<0.003	<0.003	<0.003
Benzo (k) Fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.0034	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chrysene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Dibenz (a,h) Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Indeno (1,2,3-c,d) Pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.0085	0.0096	<0.003	<0.003	<0.003	<0.003	<0.003
Naphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.002	<0.002	<0.002	<0.002	<0.002	0.0054	<0.002
Benzo (a) Pyrene (eq)	0.044	0.044	0.044	0.044	0.044	0.044	0.015	0.0036	0.0026	0.0030	0.0026	0.0026	0.0026

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	BC-07	BC-08	BC-09	BC-10	BC-11	BC-12	BC-13	BC-17	BC-18	BC-19	BC-20	BH-1A		
Sample ID	BC07	BC08	BC09	BC10	BC11	BC-12	BC-13	BC-17	BC-18	BC-19	BC-20	Boring 1A - 5'	Boring 1A - 10'	Boring 1A - 15'
Sample Depth (feet)	0	0	0	0	0	1.5*	3*	0*	0*	2*	2*	5	10	15
Date Sampled	8/9/2004	8/9/2004	8/9/2004	8/9/2004	8/9/2004	9/8/2004	9/8/2004	9/14/2004	9/14/2004	9/15/2004	9/15/2004	8/24/1987	8/24/1987	8/24/1987
Non-Carcinogenic														
Acenaphthene	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	120	0.3
Acenaphthylene	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.4	<0.04
Anthracene	<0.003	<0.003	0.1	<0.009	0.033	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.6	72	0.3
Benzo (g,h,i) Perylene	<0.003	<0.003	0.19	<0.009	0.097	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	13	15	0.1
Fluoranthene	<0.003	<0.003	0.58	0.031	0.27	0.0048	<0.003	0.0058	<0.003	<0.003	<0.003	2.1	460	0.6
Fluorene	<0.003	<0.003	0.053	<0.009	0.022	0.0064	<0.003	<0.003	<0.003	<0.003	<0.003	0.2	160	0.4
Phenanthrene	<0.003	<0.003	0.58	0.024	0.32	<0.003	<0.003	0.0045	<0.003	<0.003	<0.003	3.1	160	1.7
Pyrene	<0.003	<0.003	0.82	<0.009	0.33	0.0091	<0.003	0.013	<0.003	<0.003	<0.003	3.9	330	0.7
Carcinogenic														
Benzo (a) Anthracene	<0.003	<0.003	0.12	<0.009	0.049	<0.003	<0.003	0.0032	<0.003	<0.003	<0.003	2.4	94	0.3
Benzo (a) Pyrene	<0.003	<0.003	0.29	<0.009	0.1	0.0043	<0.003	0.0035	<0.003	<0.003	<0.003	7	43	0.2
Benzo (b) Fluoranthene	<0.003	<0.003	0.2	<0.009	0.075	0.0032	<0.003	0.009	<0.003	<0.003	<0.003	7.2	33	0.1
Benzo (k) Fluoranthene	<0.003	<0.003	0.13	<0.009	0.03	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	2.1	18	0.1
Chrysene	<0.003	<0.003	0.2	<0.009	0.071	0.0067	<0.003	0.0083	<0.003	<0.003	<0.003	4.1	110	0.2
Dibenz (a,h) Anthracene	<0.003	<0.003	0.11	<0.009	0.057	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	1	2	0.03
Indeno (1,2,3-c,d) Pyrene	<0.003	<0.003	0.21	0.042	0.069	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	6.1	13	0.1
Naphthalene	0.015	<0.002	0.043	<0.002	0.0072	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	1.9	420	2.9
Benzo (a) Pyrene (eq)	0.0026	0.0026	0.40	0.012	0.14	0.0056	0.0026	0.0056	0.0026	0.0026	0.0026	9.2	61	0.27

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	BH-2			BH-6			BH-7			BH-9		
Sample ID	Boring 2 - 5'	Boring 2 - 10'	Boring 2 - 15'	Boring #6, 5'	Boring #6 - 10'	Boring #6 - 15'	Boring #7 - 5'	Boring #7 - 10'	Boring #7 - 15'	Boring #9 - 5'	Boring #9 - 10'	Boring #9 - 15'
Sample Depth (feet)	5	10	15	5	10	15	5	10	15	5	10	15
Date Sampled	8/24/1987	8/24/1987	8/24/1987	8/26/1987	8/26/1987	8/26/1987	8/26/1987	8/26/1987	8/26/1987	8/26/1987	8/26/1987	8/26/1987
Non-Carcinogenic												
Acenaphthene	0.4	<0.00006	0.006	<0.06	<0.0012	<0.0012	<0.00006	<0.00006	<0.00006	<0.006	<0.03	<0.0006
Acenaphthylene	<0.04	0.003	<0.004	2	0.02	0.007	<0.0004	<0.0004	0.02	0.3	0.6	0.02
Anthracene	0.5	0.0003	0.0003	0.6	0.002	0.002	0.0002	0.0001	0.0002	0.01	0.09	0.07
Benzo (g,h,i) Perylene	0.6	0.0007	0.008	1.9	0.007	0.01	0.001	0.002	0.001	0.2	0.6	0.003
Fluoranthene	2.2	0.002	0.04	3.8	0.001	0.02	0.002	0.002	0.002	0.2	1	0.04
Fluorene	0.3	0.0003	0.005	0.5	0.001	0.03	0.0002	0.0003	0.0003	<0.001	0.05	0.003
Phenanthrene	4.2	0.003	0.06	9.8	0.001	0.03	0.002	0.003	0.003	0.08	2.9	0.04
Pyrene	3.1	0.002	0.06	4.7	0.001	0.03	0.002	0.003	0.003	0.2	3.7	0.04
Carcinogenic												
Benzo (a) Anthracene	0.6	0.0004	0.01	0.8	0.003	0.05	0.0003	0.0004	0.0004	0.05	0.2	0.01
Benzo (a) Pyrene	0.6	0.0006	0.01	1.6	0.005	0.004	0.0007	0.0003	0.0008	0.1	1.2	0.03
Benzo (b) Fluoranthene	0.5	0.0004	0.01	1	0.005	0.005	0.0005	0.0008	0.0007	0.08	0.3	0.02
Benzo (k) Fluoranthene	0.2	0.0002	0.004	0.4	0.002	0.002	0.0002	0.0003	0.0003	0.04	0.1	0.009
Chrysene	0.9	0.0006	0.02	1	0.003	0.006	0.0005	0.0007	0.0007	0.07	0.3	0.01
Dibenz (a,h) Anthracene	<0.004	<0.00004	<0.0004	0.1	0.0004	0.0004	<0.00004	<0.00004	<0.00004	<0.004	0.02	0.003
Indeno (1,2,3-c,d) Pyrene	<0.01	<0.0001	<0.001	1.2	0.006	0.006	0.0006	0.0009	0.0008	0.1	0.3	0.02
Naphthalene	0.7	0.01	0.03	28	0.07	0.05	0.02	0.004	0.01	0.028	0.4	0.05
Benzo (a) Pyrene (eq)	0.74	0.00072	0.013	2.0	0.0068	0.010	0.00087	0.00055	0.0010	0.13	1.3	0.037

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	BH-10			BH-11			C1-F	C3-F	C5-S	CB-1			
Sample ID	Boring #10 - 5'	Boring #10 - 10'	Boring #10 - 15'	Boring #11 - 5'	Boring #11 - 10'	Boring #11 - 15'	C1-F-8.0	C3-F-5.0	C5-S-2.5	CB-1-4.0	CB-1-5.0	CB-1-10.0	CB-1-14.0
Sample Depth (feet)	5	10	15	5	10	15	8	5	2.5	4	5	10	14
Date Sampled	8/26/1987	8/26/1987	8/26/1987	8/26/1987	8/26/1987	8/26/1987	10/22/2011	10/22/2011	10/22/2011	1/31/2008	1/31/2008	1/31/2008	1/31/2008
Non-Carcinogenic													
Acenaphthene	<0.00006	<0.00006	<0.0006	0.0005	<0.00006	<0.00006	0.049	<0.25	<0.25	<0.0050	<0.0050	<1.200	<1.200
Acenaphthylene	<0.0004	0.008	0.01	<0.004	<0.0004	0.01	0.37	1.1	3.2	0.011	<0.0050	7.100	5.200
Anthracene	0.0002	0.002	0.005	0.002	0.0001	0.0002	0.35	0.81	2.7	0.0051	<0.0050	2.500	2.600
Benzo (g,h,i) Perylene	0.001	0.007	0.03	0.04	0.002	0.003	5.0	6.0	13	0.087	0.020	42.000	26.000
Fluoranthene	0.002	0.01	0.02	0.04	0.002	0.003	3.7	7.3	26	0.110	0.014	49.000	22.000
Fluorene	0.0004	0.002	0.003	0.002	0.0001	0.0002	0.066	<0.25	0.78	0.0053	<0.0050	<1.200	<1.200
Phenanthrene	0.01	0.03	0.06	0.03	0.001	0.003	1.8	2.5	19	0.062	0.018	35.000	12.000
Pyrene	0.002	0.01	0.05	0.05	0.002	0.004	4.3	11	27	0.140	0.021	62.000	29.000
Carcinogenic													
Benzo (a) Anthracene	0.0006	0.003	0.008	0.01	0.0005	0.0007	2.1	4.0	9.2	0.028	0.0066	14.000	9.900
Benzo (a) Pyrene	0.0007	0.004	0.01	0.03	0.001	0.0009	4.4	7.1	15	0.053	0.012	31.000	21.000
Benzo (b) Fluoranthene	0.0008	0.005	0.01	0.02	0.0008	0.001	4.6	7.4	16	0.051	0.016	33.000	22.000
Benzo (k) Fluoranthene	0.0003	0.002	0.005	0.01	0.0004	0.0005	1.7	2.5	5.2	0.018	<0.0050	10.000	5.900
Chrysene	0.001	0.006	0.01	0.02	0.0008	0.001	2.3	4.4	11	0.032	0.010	19.000	12.000
Dibenz (a,h) Anthracene	0.0001	0.0004	0.01	0.002	0.0002	0.0001	0.84	1.0	1.9	0.005	<0.0050	3.100	2.400
Indeno (1,2,3-c,d) Pyrene	0.0007	0.004	0.01	0.03	0.001	0.002	3.9	4.6	9.9	0.051	0.012	29.000	18.000
Naphthalene	0.005	0.05	0.06	0.01	0.002	0.003	0.24	0.35	4.0	<0.0050	<0.0050	7.500	3.000
Benzo (a) Pyrene (eq)	0.00098	0.0056	0.017	0.038	0.0013	0.0014	5.9	9.3	20	0.070	0.017	41	28

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CB-1					CB-2					CB-3		
Sample ID	CB-1-20.0	CB-1-24.0	CB-1-30.5	CB-1-35.5	CB-1-39.0	CB-2-4.5	CB-2-11.0	CB-2-15.0	CB-2-23.0	CB-2-27.0	CB-3-4.5	CB-3-9.0	CB-3-11.5
Sample Depth (feet)	20	24	30.5	35.5	39	4.5	11	15	23	27	4.5	9	11.5
Date Sampled	1/31/2008	1/31/2008	1/31/2008	1/31/2008	1/31/2008	1/28/2008	1/28/2008	1/28/2008	1/28/2008	1/28/2008	1/29/2008	1/29/2008	1/29/2008
Non-Carcinogenic													
Acenaphthene	1.300	0.010	0.019	0.046	<0.0050	<0.0050	<0.0049	<0.0050	<0.490	<0.0050	<0.200	<0.500	<0.500
Acenaphthylene	0.480	<0.0099	<0.0050	0.0059	<0.0050	0.033	<0.0049	<0.0050	<0.490	<0.0050	1.400	1.900	0.980
Anthracene	0.340	<0.0099	<0.0050	<0.0050	<0.0050	0.010	<0.0049	<0.0050	0.580	<0.0050	1.100	1.500	0.510
Benzo (g,h,i) Perylene	0.810	<0.0099	0.0054	0.010	<0.0050	0.082	<0.0049	0.0083	1.800	<0.0050	8.400	20.000	10.000
Fluoranthene	1.600	0.011	0.0052	0.021	<0.0050	0.200	<0.0049	0.012	0.740	<0.0050	13.000	23.000	11.000
Fluorene	0.260	<0.0099	<0.0050	<0.0050	<0.0050	0.0054	<0.0049	<0.0050	<0.490	<0.0050	0.280	<0.500	<0.500
Phenanthrene	2.100	<0.0099	0.0061	0.029	<0.0050	0.160	0.005	0.012	<0.490	<0.0050	7.900	12.000	5.600
Pyrene	2.300	0.027	0.0066	0.025	<0.0050	0.220	<0.0049	0.013	2.000	<0.0050	15.000	26.000	13.000
Carcinogenic													
Benzo (a) Anthracene	0.740	<0.0099	<0.0050	0.0066	<0.0050	0.041	<0.0049	<0.0050	<0.490	<0.0050	3.600	6.100	3.100
Benzo (a) Pyrene	0.930	<0.0099	<0.0050	0.0077	<0.0050	0.071	<0.0049	0.0051	<0.490	<0.0050	7.600	14.000	7.500
Benzo (b) Fluoranthene	0.980	<0.0099	<0.0050	0.011	<0.0050	0.077	<0.0049	0.0061	<0.490	<0.0050	7.800	15.000	7.600
Benzo (k) Fluoranthene	0.230	<0.0099	<0.0050	<0.0050	<0.0050	0.024	<0.0049	<0.0050	<0.490	<0.0050	2.300	3.000	2.100
Chrysene	0.710	0.015	<0.0050	0.0057	<0.0050	0.054	<0.0049	<0.0050	1.100	<0.0050	4.800	8.200	4.100
Dibenz (a,h) Anthracene	0.260	<0.0099	<0.0050	<0.0050	<0.0050	0.0081	<0.0049	<0.0050	<0.490	<0.0050	0.980	1.600	0.820
Indeno (1,2,3-c,d) Pyrene	0.600	<0.0099	<0.0050	0.0067	<0.0050	0.060	<0.0049	0.005	<0.490	<0.0050	5.700	13.000	6.700
Naphthalene	0.780	<0.0099	<0.0050	0.0092	<0.0050	0.017	0.005	<0.0050	0.740	<0.0050	1.600	0.740	12.000
Benzo (a) Pyrene (eq)	1.3	0.0088	0.0044	0.011	0.0044	0.094	0.0043	0.0076	0.44	0.0044	9.9	18	9.8

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CB-3			CB-4						CB-5			
Sample ID	CB-3-15.0	CB-3-23.5	CB-3-28.0	CB-4-4.5	CB-4-5.5	CB-4-12.75	CB-4-15.0	CB-4-22.0	CB-4-29.5	CB-5-5.0	CB-5-8.5	CB-5-13.5	CB-5-17.5
Sample Depth (feet)	15	23.5	28	4.5	5.5	12.75	15	22	29.5	5	8.5	13.5	17.5
Date Sampled	1/29/2008	1/29/2008	1/29/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008
Non-Carcinogenic													
Acenaphthene	<0.0050	<0.050	<0.0050	<0.0050	<0.050	<0.500	<0.0050	0.580	<0.0049	<0.0050	<0.500	2.700	<0.0050
Acenaphthylene	<0.0050	<0.050	<0.0050	<0.0050	<0.050	1.800	<0.0050	0.180	<0.0049	<0.0050	2.600	29.000	0.013
Anthracene	<0.0050	<0.050	<0.0050	<0.0050	0.140	1.300	<0.0050	0.450	<0.0049	<0.0050	3.700	33.000	0.013
Benzo (g,h,i) Perylene	0.028	<0.050	<0.0050	<0.0050	0.910	5.700	0.015	<0.100	<0.0049	0.0072	22.000	33.000	0.059
Fluoranthene	0.028	0.140	<0.0050	<0.0050	1.500	13.000	0.022	0.540	<0.0049	0.010	29.000	130.000	0.089
Fluorene	<0.0050	<0.050	<0.0050	<0.0050	<0.050	<0.500	<0.0050	0.140	<0.0049	<0.0050	1.500	16.000	0.0059
Phenanthrene	0.017	<0.050	<0.0050	0.011	0.900	5.100	0.016	<0.100	<0.0049	0.020	26.000	150.000	0.076
Pyrene	0.036	0.340	<0.0050	0.008	1.700	17.000	0.028	0.960	<0.0049	0.014	36.000	160.000	0.110
Carcinogenic													
Benzo (a) Anthracene	0.0099	0.096	<0.0050	<0.0050	0.390	6.800	0.0096	0.530	<0.0049	<0.0050	8.300	70.000	0.036
Benzo (a) Pyrene	0.020	0.063	<0.0050	<0.0050	0.770	7.500	0.014	0.390	<0.0049	0.0056	20.000	66.000	0.056
Benzo (b) Fluoranthene	0.025	0.120	<0.0050	0.0066	0.780	9.000	0.016	<0.100	<0.0049	0.012	19.000	70.000	0.060
Benzo (k) Fluoranthene	0.0069	<0.050	<0.0050	<0.0050	0.190	2.300	0.0058	<0.100	<0.0049	<0.0050	5.000	25.000	0.020
Chrysene	0.012	0.180	<0.0050	<0.0050	0.510	6.900	0.013	0.590	<0.0049	0.007	11.000	76.000	0.043
Dibenz (a,h) Anthracene	<0.0050	<0.050	<0.0050	<0.0050	0.052	0.900	<0.0050	<0.100	<0.0049	<0.0050	1.600	10.000	0.0056
Indeno (1,2,3-c,d) Pyrene	0.018	<0.050	<0.0050	<0.0050	0.620	4.500	0.009	0.280	<0.0049	<0.0050	15.000	31.000	0.043
Naphthalene	0.0068	0.140	0.0053	<0.0050	0.072	2.300	<0.0050	1.300	<0.0049	0.012	15.000	2.800	0.036
Benzo (a) Pyrene (eq)	0.027	0.10	0.0044	0.0048	0.99	10	0.019	0.50	0.0043	0.0085	25	90	0.074

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CB-5			CB-6								CB-7	
Sample ID	CB-5-25.0	CB-5-29.0	CB-5-38.5	CB-6-5.5	CB-6-10.5	CB-6-13.5	CB-6-21.5	CB-6-27.0	CB-6-30.5	CB-6-38.5	CB-6-40.5	CB-7-5.5	CB-7-10.5
Sample Depth (feet)	25	29	38.5	5.5	10.5	13.5	21.5	27	30.5	38.5	40.5	5.5	10.5
Date Sampled	1/30/2008	1/30/2008	1/30/2008	1/29/2008	1/29/2008	1/29/2008	1/29/2008	1/29/2008	1/29/2008	1/29/2008	1/29/2008	1/31/2008	1/31/2008
Non-Carcinogenic													
Acenaphthene	<0.050	0.120	<0.0050	<0.0050	<0.250	<25.000	<0.250	0.310	<0.025	0.014	<0.0049	0.006	<20
Acenaphthylene	0.300	1.100	<0.0050	<0.0050	3.100	320.000	3.500	0.055	<0.025	0.067	<0.0049	<0.0050	0.260
Anthracene	0.400	1.300	<0.0050	<0.0050	1	74.000	0.500	0.120	<0.025	0.020	<0.0049	<0.0050	0.081
Benzo (g,h,i) Perylene	0.340	0.920	<0.0050	0.012	6.200	490.000	2.800	0.200	<0.025	0.120	<0.0049	0.015	0.710
Fluoranthene	1.500	5.100	0.0087	0.022	14.000	1100.000	8.300	0.260	0.029	0.210	<0.0049	0.013	1.200
Fluorene	0.190	1	<0.0050	<0.0050	0.670	65.000	0.660	0.120	<0.025	0.013	<0.0049	0.016	0.057
Phenanthrene	2.000	7.800	0.0086	0.021	12.000	1200.000	10.000	0.120	<0.025	0.180	<0.0049	0.039	1.100
Pyrene	1.800	6.600	0.011	0.025	16.000	1300.000	9.200	0.410	0.094	0.260	<0.0049	0.029	1.600
Carcinogenic													
Benzo (a) Anthracene	0.840	2.700	<0.0050	0.011	3.300	180.000	1.200	0.170	0.050	0.047	<0.0049	0.0061	0.280
Benzo (a) Pyrene	0.680	2.000	<0.0050	0.010	5.900	400.000	2.700	0.130	0.025	0.095	<0.0049	0.0072	0.610
Benzo (b) Fluoranthene	0.830	2.300	0.0098	0.014	6.000	400.000	2.300	0.200	0.056	0.095	<0.0049	0.017	0.610
Benzo (k) Fluoranthene	0.250	0.950	<0.0050	<0.0050	1.700	110.000	0.750	<0.050	<0.025	0.022	<0.0049	<0.0050	0.160
Chrysene	0.840	2.700	<0.0050	0.013	4.000	250.000	1.400	0.130	0.053	0.055	<0.0049	0.017	0.370
Dibenz (a,h) Anthracene	0.130	0.300	<0.0050	<0.0050	0.440	27.000	<0.250	0.150	<0.025	0.0076	<0.0049	<0.0050	0.050
Indeno (1,2,3-c,d) Pyrene	0.380	0.930	<0.0050	0.0088	4.300	330.000	1.900	0.070	<0.025	0.077	<0.0049	0.0063	0.490
Naphthalene	<0.050	1.900	<0.0050	0.014	4.900	850.000	13.000	0.110	<0.025	0.190	<0.0049	0.010	0.460
Benzo (a) Pyrene (eq)	0.96	2.8	0.0051	0.015	7.6	510	3.4	0.23	0.043	0.12	0.0043	0.011	0.78

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CB-7							CB-8					
Sample ID	CB-7-15.5	CB-7-21.5	CB-7-24.0	CB-7-26.5	CB-7-30.5	CB-7-35.0	CB-7-39.0	CB-8-2.5	CB-8-5.5	CB-8-12.5	CB-8-17.5	CB-8-21.5	CB-8-26.0
Sample Depth (feet)	15.5	21.5	24	26.5	30.5	35	39	2.5	5.5	12.5	17.5	21.5	26
Date Sampled	1/31/2008	1/31/2008	1/31/2008	1/31/2008	1/31/2008	1/31/2008	1/31/2008	2/1/2008	2/1/2008	2/1/2008	2/1/2008	2/1/2008	2/1/2008
Non-Carcinogenic													
Acenaphthene	<0.490	<0.0050	<0.0099	<0.0049	<0.0049	<0.0050	<0.0050	<5.000	<0.025	0.950	2.300	0.059	<0.0050
Acenaphthylene	3.100	0.033	0.083	<0.0049	<0.0049	0.010	<0.0050	6.100	<0.025	<0.250	0.130	<0.0049	<0.0050
Anthracene	0.880	0.019	0.057	<0.0049	<0.0049	0.0085	<0.0050	<5.000	<0.025	0.690	0.630	<0.0049	<0.0050
Benzo (g,h,i) Perylene	8.400	0.081	0.240	0.0074	<0.0049	0.023	<0.0050	190.000	0.031	6.200	0.360	<0.0049	<0.0050
Fluoranthene	16.000	0.260	0.620	0.025	0.013	0.076	0.011	140.000	<0.025	3.500	3.400	0.0051	<0.0050
Fluorene	0.680	0.0057	0.020	<0.0049	<0.0049	<0.0050	<0.0050	<5.000	<0.025	<0.250	1.100	<0.0049	<0.0050
Phenanthrene	14.000	0.058	0.220	0.0089	0.0051	0.031	<0.0050	18.000	<0.025	0.540	1.500	<0.0049	<0.0050
Pyrene	19.000	0.260	0.750	0.039	0.012	0.073	0.011	200.000	<0.025	4.100	2.000	0.0063	<0.0050
Carcinogenic													
Benzo (a) Anthracene	2.900	0.110	0.270	0.011	0.0057	0.034	<0.0050	36.000	<0.025	2.700	0.970	<0.0049	<0.0050
Benzo (a) Pyrene	7.300	0.140	0.320	0.010	<0.0049	0.032	<0.0050	130.000	<0.025	5.600	0.660	<0.0049	<0.0050
Benzo (b) Fluoranthene	6.800	0.160	0.360	0.013	0.0067	0.042	0.006	130.000	<0.025	5.500	0.790	<0.0049	<0.0050
Benzo (k) Fluoranthene	2.200	0.051	0.087	<0.0049	<0.0049	0.016	<0.0050	31.000	<0.025	1.400	0.210	<0.0049	<0.0050
Chrysene	4.200	0.110	0.270	0.010	0.0053	0.032	<0.0050	54.000	<0.025	2.300	0.790	<0.0049	<0.0050
Dibenz (a,h) Anthracene	0.970	0.017	0.039	<0.0049	<0.0049	<0.0050	<0.0050	11.000	<0.025	0.830	0.073	<0.0049	<0.0050
Indeno (1,2,3-c,d) Pyrene	5.800	0.075	0.200	0.0069	<0.0049	0.020	<0.0050	120.000	<0.025	5.900	0.350	<0.0049	<0.0050
Naphthalene	6.500	0.014	0.033	0.0057	0.0078	<0.0050	<0.0050	<5.000	<0.025	<0.250	1.300	<0.0049	<0.0050
Benzo (a) Pyrene (eq)	9.4	0.19	0.43	0.014	0.0051	0.044	0.0047	170	0.022	7.5	0.92	0.0043	0.0044

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CB-8				CB-9					CB-10			
Sample ID	CB-8-30.5	CB-8-36.0	CB-8-45.0	CB-8-47.5	CB-9-3.0	CB-9-10.0	CB-9-15.0	CB-9-17.5	CB-9-25.5	CB-10-11.0	CB-10-14.5	CB-10-20.0	CB-10-24.0
Sample Depth (feet)	30.5	36	45	47.5	3	10	15	17.5	25.5	11	14.5	20	24
Date Sampled	2/1/2008	2/1/2008	2/1/2008	2/1/2008	1/28/2008	1/28/2008	1/28/2008	1/28/2008	1/28/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008
Non-Carcinogenic													
Acenaphthene	0.032	<0.0049	<0.0050	<0.0050	<0.250	0.140	80.000	56.000	0.037	0.160	<0.0049	<0.0099	0.860
Acenaphthylene	<0.0049	<0.0049	<0.0050	<0.0050	1.800	0.230	150.000	3.200	0.033	<0.099	<0.0049	<0.0099	<0.050
Anthracene	<0.0049	<0.0049	<0.0050	<0.0050	1.200	0.076	230.000	4.400	0.043	0.240	<0.0049	<0.0099	0.150
Benzo (g,h,i) Perylene	<0.0049	<0.0049	<0.0050	<0.0050	7.700	0.560	35.000	1.200	0.052	5.000	<0.0049	<0.0099	<0.050
Fluoranthene	0.0065	<0.0049	<0.0050	<0.0050	13.000	0.940	330.000	7.600	0.170	1.900	<0.0049	0.011	0.200
Fluorene	<0.0049	<0.0049	<0.0050	<0.0050	0.620	0.048	350.000	7.900	0.043	<0.099	<0.0049	<0.0099	<0.050
Phenanthrene	0.0069	<0.0049	<0.0050	<0.0050	11.000	0.650	610.000	2.500	0.160	0.630	<0.0049	<0.0099	0.054
Pyrene	0.0071	<0.0049	<0.0050	<0.0050	16.000	1.200	290.000	8.300	0.180	1.800	<0.0049	0.020	0.240
Carcinogenic													
Benzo (a) Anthracene	<0.0049	<0.0049	<0.0050	<0.0050	3.000	0.250	160.000	3.800	0.064	2.200	<0.0049	0.013	0.120
Benzo (a) Pyrene	<0.0049	<0.0049	<0.0050	<0.0050	5.900	0.460	100.000	2.800	0.064	6.200	<0.0049	<0.0099	<0.050
Benzo (b) Fluoranthene	<0.0049	<0.0049	<0.0050	<0.0050	6.300	0.470	110.000	3.200	0.075	6.100	<0.0049	<0.0099	<0.050
Benzo (k) Fluoranthene	<0.0049	<0.0049	<0.0050	<0.0050	1.800	0.140	35.000	0.830	0.019	1.600	<0.0049	<0.0099	<0.050
Chrysene	<0.0049	<0.0049	<0.0050	<0.0050	3.900	0.240	130.000	3.300	0.048	2.000	<0.0049	<0.0099	0.140
Dibenz (a,h) Anthracene	<0.0049	<0.0049	<0.0050	<0.0050	0.530	0.041	<25.000	1.100	0.0062	1	<0.0049	<0.0099	<0.050
Indeno (1,2,3-c,d) Pyrene	<0.0049	<0.0049	<0.0050	<0.0050	5.500	0.380	36.000	1.600	0.038	5.100	<0.0049	0.013	<0.050
Naphthalene	<0.0049	<0.0049	<0.0050	<0.0050	3.400	0.980	1100.000	10.000	0.170	0.110	0.015	<0.0099	0.055
Benzo (a) Pyrene (eq)	0.0043	0.0043	0.0044	0.0044	7.8	0.60	140	4.2	0.086	8.1	0.0043	0.010	0.054

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CB-10				CB-11					CB-12				
Sample ID	CB-10-29.0	CB-10-35.0	CB-10-37.5	CB-10-39	CB-11-4.5	CB-11-10.0	CB-11-15.0	CB-11-22.0	CB-11-25.0	CB-12-17.5	CB-12-30.0	CB-12-35.0	CB-12-40.0	CB-12-48.0
Sample Depth (feet)	29	35	37.5	39	4.5	10	15	22	25	17.5	30	35	40	48
Date Sampled	1/30/2008	1/30/2008	1/30/2008	1/30/2008	1/28/2008	1/28/2008	1/28/2008	1/28/2008	1/28/2008	3/1/2008	3/1/2008	3/1/2008	3/1/2008	3/1/2008
Non-Carcinogenic														
Acenaphthene	0.130	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	2.600	0.0084	49.000	0.095	<0.0050	<0.0050	0.011
Acenaphthylene	<0.025	<0.0049	<0.0049	<0.0050	0.110	<0.0050	<0.0050	0.280	<0.0050	4.500	0.022	<0.0050	<0.0050	<0.0050
Anthracene	0.040	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	0.730	<0.0050	17.000	0.074	<0.0050	<0.0050	<0.0050
Benzo (g,h,i) Perylene	<0.025	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	0.700	<0.0050	3.000	0.021	0.012	<0.0050	<0.0050
Fluoranthene	0.053	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	0.990	0.0051	24.000	0.130	0.020	<0.0050	<0.0050
Fluorene	<0.025	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	1	<0.0050	20.000	0.073	<0.0050	<0.0050	<0.0050
Phenanthrene	<0.025	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	<0.250	<0.0050	32.000	0.160	0.011	<0.0050	<0.0050
Pyrene	0.077	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	1.400	0.0076	25.000	0.120	0.024	<0.0050	<0.0050
Carcinogenic														
Benzo (a) Anthracene	0.026	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	0.640	<0.0050	13.000	0.058	0.007	<0.0050	<0.0050
Benzo (a) Pyrene	<0.025	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	0.600	<0.0050	8.100	0.040	0.0093	<0.0050	<0.0050
Benzo (b) Fluoranthene	<0.025	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	<0.250	<0.0050	9.400	0.045	0.015	<0.0050	<0.0050
Benzo (k) Fluoranthene	<0.025	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	<0.250	<0.0050	2.800	0.020	<0.0050	<0.0050	<0.0050
Chrysene	0.031	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	0.920	<0.0050	9.800	0.047	0.0069	<0.0050	<0.0050
Dibenz (a,h) Anthracene	<0.025	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	<0.250	<0.0050	1.600	<0.0050	<0.0050	<0.0050	<0.0050
Indeno (1,2,3-c,d) Pyrene	<0.025	<0.0049	<0.0049	<0.0050	<0.100	<0.0050	<0.0050	0.270	<0.0050	2.300	0.019	0.0076	<0.0050	<0.0050
Naphthalene	<0.025	<0.0049	<0.0049	<0.0050	7.800	<0.0050	<0.0050	<0.250	<0.0050	44.000	0.110	0.0052	<0.0050	0.045
Benzo (a) Pyrene (eq)	0.023	0.0043	0.0043	0.0044	0.088	0.0044	0.0044	0.77	0.0044	11	0.056	0.013	0.0044	0.0044

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CS-1								CS-3					
Sample ID	CS-1-4.0	CS-1-8.0	CS-1-12.0	CS-1-16.0	CS-1-20.0	CS-1-24.0	CS-1-28.0	CS-1-31.5	CS-3-4.0	CS-3-8.0	CS-3-12.0	CS-3-16.0	CS-3-20.0	CS-3-21.75
Sample Depth (feet)	4	8	12	16	20	24	28	31.5	4	8	12	16	20	21.75
Date Sampled	8/18/2008	8/18/2008	8/18/2008	8/18/2008	8/18/2008	8/18/2008	8/18/2008	8/18/2008	8/18/2008	8/18/2008	8/18/2008	8/18/2008	8/18/2008	8/18/2008
Non-Carcinogenic														
Acenaphthene	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	0.015	<0.05	<0.005	<0.05	0.053	0.026	0.04	0.16
Acenaphthylene	0.012	0.26	<0.005	<0.005	<0.005	<0.005	0.02	0.078	0.031	0.053	0.042	0.16	0.094	0.078
Anthracene	0.011	0.13	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	0.01	<0.05	0.019	0.06	0.039	0.056
Benzo (g,h,i) Perylene	0.11	0.64	0.022	0.016	0.0066	<0.005	<0.01	<0.05	0.06	<0.05	0.076	0.25	0.19	0.13
Fluoranthene	0.11	1.7	0.032	0.033	0.0093	0.006	<0.01	<0.05	0.078	<0.05	0.14	0.53	0.32	0.27
Fluorene	<0.005	0.06	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	0.0067	<0.05	0.036	0.045	0.041	0.061
Phenanthrene	0.024	2	0.025	0.031	<0.005	<0.005	0.014	<0.05	0.076	<0.05	0.14	0.54	0.32	0.37
Pyrene	0.12	2.1	0.039	0.035	0.011	0.007	<0.01	<0.05	0.1	<0.05	0.17	0.66	0.39	0.32
Carcinogenic														
Benzo (a) Anthracene	0.12	0.35	0.016	0.01	0.009	0.0065	<0.01	<0.05	0.02	<0.05	0.042	0.12	0.08	0.067
Benzo (a) Pyrene	0.16	0.5	0.021	0.014	0.0092	0.0067	<0.01	<0.05	0.042	<0.05	0.073	0.25	0.16	0.11
Benzo (b) Fluoranthene	0.2	0.56	0.025	0.018	0.011	0.0072	<0.01	<0.05	0.041	<0.05	0.067	0.22	0.14	0.094
Benzo (k) Fluoranthene	0.055	0.15	0.0071	0.0065	<0.005	<0.005	<0.01	<0.05	0.0099	<0.05	0.015	0.057	0.037	0.035
Chrysene	0.11	0.43	0.016	0.013	0.007	<0.005	<0.01	<0.05	0.025	<0.05	0.045	0.14	0.092	0.072
Dibenz (a,h) Anthracene	0.029	0.05	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	<0.05	0.0073	0.022	<0.025	<0.025
Indeno (1,2,3-c,d) Pyrene	0.1	0.44	0.016	0.012	0.0056	<0.005	<0.01	<0.05	0.038	<0.05	0.05	0.17	0.12	0.086
Naphthalene	0.025	0.6	0.012	0.012	0.034	0.026	0.68	3.6	0.39	2.6	0.33	0.65	1	0.86
Benzo (a) Pyrene (eq)	0.22	0.67	0.028	0.020	0.013	0.0094	0.0088	0.044	0.054	0.044	0.093	0.32	0.20	0.14

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CSA-1	CSA-2	CSB-1	CSB-2	CSC-1	CSC-3	CSC-4	CSC-5	CSC-6	CSD-1	CSD-2	CSD-4
Sample ID	CSA-1-2.0	CSA-2-2.0	CSB-1-2.0	CSB-2-0.5	CSC-1-2.0	CSC-3-2.0	CSC-4-1.0	CSC-5-2.0	CSC-6-1.5	CSD-1-2.0	CSD-2-2.0	CSD-4-2.0
Sample Depth (feet)	2	2	2	0.5	2	2	1	2	1.5	2	2	2
Date Sampled	6/11/2013	6/11/2013	6/13/2013	6/14/2013	6/3/2013	6/4/2013	6/5/2013	6/5/2013	6/12/2013	5/23/2013	5/24/2013	5/30/2013
Non-Carcinogenic												
Acenaphthene	<2.5	3.3	<0.025	<0.49	0.017	<0.0049	<0.0050	<0.0049	0.016	<0.50	<0.10	<0.049
Acenaphthylene	38	3.6	0.33	1.4	0.081	0.016	0.020	0.042	0.043	2.9	1.3	0.13
Anthracene	21	3.1	0.29	1.8	0.083	0.018	0.019	0.059	0.048	3.3	1.1	0.17
Benzo (g,h,i) Perylene	77	18	0.96	10	0.36	0.066	0.071	0.10	0.25	13	4.3	1.1
Fluoranthene	210	38	2.0	12	0.88	0.15	0.15	0.35	0.35	29	10	1.6
Fluorene	9.7	1.1	0.12	<0.49	0.025	0.0059	<0.0050	0.017	0.011	<0.50	0.24	<0.049
Phenanthrene	180	29	1.5	6.8	0.48	0.072	0.091	0.25	0.19	15	6.4	0.69
Pyrene	250	47	2.5	15	0.99	0.14	0.16	0.29	0.44	38	13	1.9
Carcinogenic												
Benzo (a) Anthracene	68	10	0.96	5.0	0.27	0.056	0.067	0.12	0.14	11	2.4	0.49
Benzo (a) Pyrene	120	21	1.3	8.7	0.52	0.093	0.10	0.16	0.25	18	4.9	0.97
Benzo (b) Fluoranthene	130	23	1.3	6.6	0.44	0.081	0.084	0.14	0.26	20	5.0	0.64
Benzo (k) Fluoranthene	39	7.1	0.55	4.7	0.31	0.062	0.078	0.13	0.10	5.5	1.4	0.63
Chrysene	90	13	1.1	5.2	0.39	0.065	0.078	0.13	0.18	12	2.8	0.58
Dibenz (a,h) Anthracene	11	1.9	0.17	1.3	0.053	0.010	0.013	0.019	0.033	2.0	0.46	0.13
Indeno (1,2,3-c,d) Pyrene	64	13	0.75	6.7	0.26	0.051	0.056	0.083	0.17	9.7	3.0	0.71
Naphthalene	44	6.0	0.17	1.2	0.065	0.010	0.010	0.028	0.023	2.3	0.53	0.10
Benzo (a) Pyrene (eq)	150	27	1.7	11	0.67	0.12	0.13	0.22	0.33	23	6.3	1.3

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CSE-1	CSE-2	CSE-3	CSE-4	CSE-5	CSE-6	CSF-1	CSF-2	CSF-3	CSF-4	CSF-5	CSF-6
Sample ID	CSE-1-2.0	CSE-2-2.0	CSE-3-1.0	CSE-4-2.0	CSE-5-1.0	CSE-6-2.0	CSF-1-2.0	CSF-2-2.0	CSF-3-2.0	CSF-4-1.0	CSF-5-2.0	CSF-6-0.5
Sample Depth (feet)	2	2	1	2	1	2	2	2	2	1	2	0.5
Date Sampled	5/29/2013	5/30/2013	6/3/2013	6/5/2013	6/6/2013	6/10/2013	6/6/2013	6/6/2013	6/7/2013	6/7/2013	6/7/2013	6/7/2013
Non-Carcinogenic												
Acenaphthene	<0.049	<0.010	<0.050	<0.050	<0.0050	0.18	0.0079	0.0065	<0.50	<0.025	<0.0049	0.090
Acenaphthylene	0.28	0.019	0.33	<0.050	<0.0050	2.9	0.023	0.023	3.8	0.089	0.0056	0.74
Anthracene	0.21	0.017	0.31	<0.050	<0.0050	1.8	0.035	0.039	3.1	0.043	<0.0049	0.35
Benzo (g,h,i) Perylene	1.2	0.053	1.1	0.094	<0.0050	6.0	0.25	0.087	25	0.19	0.017	2.4
Fluoranthene	2.1	0.088	2.2	0.20	0.0059	19	0.23	0.26	40	0.51	0.032	4.6
Fluorene	0.054	<0.010	0.079	<0.050	<0.0050	1.2	0.0051	0.010	1.1	<0.025	<0.0049	0.18
Phenanthrene	1.2	0.083	1.6	0.13	<0.0050	19	0.088	0.20	28	0.37	0.035	3.3
Pyrene	2.5	0.16	2.4	0.22	0.0071	22	0.23	0.27	49	0.69	0.042	5.6
Carcinogenic												
Benzo (a) Anthracene	0.59	0.050	0.64	0.071	<0.0050	5.4	0.19	0.090	12	0.14	0.012	1.4
Benzo (a) Pyrene	1.1	0.074	1.3	0.11	<0.0050	8.9	0.33	0.12	23	0.27	0.022	3.0
Benzo (b) Fluoranthene	1.1	0.072	1.0	0.084	<0.0050	9.5	0.35	0.13	24	0.31	0.031	3.1
Benzo (k) Fluoranthene	0.61	0.050	0.82	0.080	<0.0050	3.3	0.25	0.068	8.1	0.11	0.0080	0.99
Chrysene	0.75	0.062	0.84	0.084	<0.0050	7.0	0.20	0.10	16	0.19	0.018	2.0
Dibenz (a,h) Anthracene	0.14	0.011	0.13	<0.050	<0.0050	0.69	0.086	0.015	2.7	<0.025	<0.0049	0.25
Indeno (1,2,3-c,d) Pyrene	0.81	0.041	0.78	0.066	<0.0050	4.8	0.25	0.068	17	0.15	0.013	1.9
Naphthalene	0.24	0.021	0.63	<0.050	<0.0050	1.7	0.50	0.019	5.3	0.051	0.0097	0.38
Benzo (a) Pyrene (eq)	1.5	0.10	1.7	0.15	0.0044	12	0.47	0.16	30	0.35	0.029	3.8

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CSF-7	CSF-8	CSF-9	CSF-10	CSG-1	CSG-2	CSG-5	D1-S	D4-S	EBAMW-1			
Sample ID	CSF-7-2.0	CSF-8-2.0	CSF-9-2.0	CSF-10-2.0	CSG-1-2.0	CSG-2-2.0	CSG-5-1.0	D1-S-2.5	D4-S-2.5	EBAMW-1@1.5-2.0	EBAMW-1@13.0-13.5	EBAMW-1@16.5-17.0	EBAMW-1@25.5-26.0
Sample Depth (feet)	2	2	2	2	2	2	1	2.5	2.5	1.5	13	16.5	25.5
Date Sampled	6/10/2013	6/14/2013	6/25/2013	6/25/2013	5/15/2013	5/21/2013	5/22/2013	10/22/2011	10/22/2011	11/17/2008	11/17/2008	11/17/2008	11/17/2008
Non-Carcinogenic													
Acenaphthene	0.045	0.090	<0.10	0.087	0.58	0.0057	<0.50	<0.99	<0.5	<1	<0.005	<0.005	<0.005
Acenaphthylene	0.97	0.24	0.23	1.6	0.80	0.014	3.2	4.7	3.9	2.5	0.0096	0.0057	<0.005
Anthracene	0.55	0.21	0.24	0.82	0.86	0.019	3.8	8.6	3.9	1.2	<0.005	<0.005	<0.005
Benzo (g,h,i) Perylene	4.6	1.2	1.2	3.8	7.1	0.12	19	13	18	15	<0.005	<0.005	<0.005
Fluoranthene	7.9	1.8	1.8	8.5	11	0.16	32	71	30	25	<0.005	<0.005	<0.005
Fluorene	0.20	0.11	<0.10	0.43	0.24	<0.0050	0.59	1.2	0.83	<1	<0.005	<0.005	<0.005
Phenanthrene	5.2	1.5	1.1	6.5	7.4	0.080	15	41	22	16	0.0097	<0.005	<0.005
Pyrene	9.9	2.2	2.2	9.9	13	0.20	35	66	40	27	<0.005	0.046	0.0055
Carcinogenic													
Benzo (a) Anthracene	2.2	0.45	0.58	2.7	2.4	0.065	12	29	12	5.9	<0.005	<0.005	<0.005
Benzo (a) Pyrene	5.3	0.99	0.95	5.5	5.2	0.095	21	28	19	4.6	<0.005	<0.005	<0.005
Benzo (b) Fluoranthene	5.6	0.97	0.78	4.4	4.3	0.13	25	35	19	11	<0.005	<0.005	<0.005
Benzo (k) Fluoranthene	1.6	0.26	0.59	2.1	2.6	0.036	7.4	13	6.7	3.4	<0.005	<0.005	<0.005
Chrysene	3.0	0.66	0.73	3.1	3.4	0.075	14	31	13	7.3	<0.005	<0.005	<0.005
Dibenz (a,h) Anthracene	0.47	0.095	0.14	0.37	0.66	0.017	2.9	3.8	2.2	1.9	<0.005	<0.005	<0.005
Indeno (1,2,3-c,d) Pyrene	2.8	0.77	0.80	2.7	4.8	0.077	14	13	12	9.5	<0.005	<0.005	<0.005
Naphthalene	0.79	0.75	0.19	0.94	1.4	0.034	5.3	1.4	4.9	1.1	0.11	0.017	0.024
Benzo (a) Pyrene (eq)	6.7	1.3	1.3	6.8	6.9	0.13	28	39	25	8.3	0.0044	0.0044	0.0044

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	EBAMW-2				EBASB-1			EBASB-2				
Sample ID	EBAMW-2@12.0-12.5	EBAMW-2@17.0-17.5	EBAMW-2@22.5-23.0	EBAMW-2@26.5-27.0	EBASB-1@2.5-3.0	EBASB-1@18.0-18.5	EBASB-1@28.5-29.0	EBASB-2@1.5-2.0	EBASB-2@13.0-13.5	EBASB-2@17.0-17.5	EBASB-2@26.0-26.5	EBASB-2@33.0-33.5
Sample Depth (feet)	12	17	22.5	26.5	2.5	18	28.5	1.5	13	17	26	33
Date Sampled	11/18/2008	11/18/2008	11/18/2008	11/18/2008	11/18/2008	11/18/2008	11/18/2008	11/19/2008	11/19/2008	11/19/2008	11/19/2008	11/19/2008
Non-Carcinogenic												
Acenaphthene	0.0093	2.1	3.6	<0.005	0.39	<0.025	<0.005	<0.15	<0.05	<0.005	<0.005	<0.005
Acenaphthylene	0.05	1.8	3	0.0093	1.2	<0.025	<0.005	0.72	<0.05	<0.005	<0.005	<0.005
Anthracene	0.051	9.4	20	<0.005	2.7	<0.025	<0.005	0.76	<0.05	<0.005	<0.005	<0.005
Benzo (g,h,i) Perylene	0.17	1.4	2.8	<0.005	12	0.027	<0.005	7.5	0.077	<0.005	<0.005	<0.005
Fluoranthene	0.31	12	25	<0.005	14	<0.025	<0.005	4.7	<0.05	<0.005	<0.005	<0.005
Fluorene	0.033	8.2	21	<0.005	1.3	<0.025	<0.005	0.22	<0.05	<0.005	<0.005	<0.005
Phenanthrene	0.31	4.1	43	0.012	12	<0.025	<0.005	3.3	<0.05	<0.005	<0.005	<0.005
Pyrene	0.36	11	21	<0.005	16	0.085	<0.005	6.1	<0.05	<0.005	<0.005	<0.005
Carcinogenic												
Benzo (a) Anthracene	0.12	6.1	12	<0.005	13	<0.025	<0.005	2.3	<0.05	<0.005	<0.005	<0.005
Benzo (a) Pyrene	0.16	4.2	8.7	<0.005	22	<0.025	<0.005	4.2	<0.05	<0.005	<0.005	<0.005
Benzo (b) Fluoranthene	0.16	4.6	9.4	<0.005	18	<0.025	<0.005	5	<0.05	<0.005	<0.005	<0.005
Benzo (k) Fluoranthene	0.037	1.6	3.3	<0.005	5.5	<0.025	<0.005	1.2	<0.05	<0.005	<0.005	<0.005
Chrysene	0.12	4.2	8.9	<0.005	12	0.028	<0.005	2.9	<0.05	<0.005	<0.005	<0.005
Dibenz (a,h) Anthracene	0.026	0.76	1.6	<0.005	4	<0.025	<0.005	0.93	<0.05	<0.005	<0.005	<0.005
Indeno (1,2,3-c,d) Pyrene	0.12	1.6	3.3	<0.005	11	<0.025	<0.005	4.9	<0.05	<0.005	<0.005	<0.005
Naphthalene	0.22	0.36	57	0.095	1.3	<0.025	<0.005	0.61	<0.05	<0.005	<0.005	<0.005
Benzo (a) Pyrene (eq)	0.21	5.9	12	0.0044	28	0.022	0.0044	5.9	0.044	0.0044	0.0044	0.0044

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	EBASB-3		EBASB-4			EBASB-5		EBASB-6			EBASB-7		
Sample ID	EBASB-3@1.5-2.0	EBASB-3@19.5-20.0	EBASB-4@8.5-9.0	EBASB-4@18.5-19.0	EBASB-4@34.5-35.0	EBASB-5@11.5-12.0	EBASB-5@29.0-29.5	EBASB-6@8.0-8.5	EBASB-6@11.5-12.0	EBASB-6@29.5-30.0	EBASB-7@18.5-19.0	EBASB-7@24.0-24.5	EBASB-7@29.0-29.5
Sample Depth (feet)	1.5	19.5	8.5	18.5	34.5	11.5	29	8	11.5	29.5	18.5	24	29
Date Sampled	11/20/2008	11/20/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	11/18/2008	11/19/2008	11/19/2008
Non-Carcinogenic													
Acenaphthene	2.7	<0.005	<0.25	9.6	0.015	<0.12	0.022	0.83	21	0.015	<0.025	<0.005	<0.005
Acenaphthylene	37	<0.005	<0.25	<0.50	<0.0050	<0.12	<0.0050	3.1	1.2	0.018	<0.025	<0.005	<0.005
Anthracene	15	<0.005	<0.25	0.93	<0.0050	<0.12	<0.0050	0.7	2.8	0.01	<0.025	<0.005	<0.005
Benzo (g,h,i) Perylene	110	<0.005	<0.25	0.82	<0.0050	0.21	<0.0050	11	2.1	0.048	<0.025	<0.005	<0.005
Fluoranthene	200	<0.005	<0.25	2	0.0074	<0.12	0.0099	3	7.9	0.1	<0.025	<0.005	<0.005
Fluorene	17	<0.005	<0.25	0.53	<0.0050	<0.12	<0.0050	<0.49	4.5	0.013	<0.025	<0.005	<0.005
Phenanthrene	200	<0.005	<0.25	<0.50	<0.0050	<0.12	0.0064	3.1	2.6	0.12	<0.025	<0.005	<0.005
Pyrene	240	<0.005	<0.25	2.7	0.012	<0.12	0.019	3.4	9.7	0.12	0.06	0.026	<0.005
Carcinogenic													
Benzo (a) Anthracene	41	<0.005	<0.25	0.54	<0.0050	<0.12	<0.0050	1.8	1.5	0.023	<0.025	0.0092	<0.005
Benzo (a) Pyrene	87	<0.005	<0.25	0.71	<0.0050	<0.12	0.005	5.2	2.5	0.043	<0.025	<0.005	<0.005
Benzo (b) Fluoranthene	88	<0.005	<0.25	0.95	<0.0050	<0.12	0.0052	5.1	2.6	0.04	<0.025	<0.005	<0.005
Benzo (k) Fluoranthene	22	<0.005	<0.25	<0.50	<0.0050	<0.12	<0.0050	1.6	0.78	0.011	<0.025	<0.005	<0.005
Chrysene	51	<0.005	<0.25	0.85	<0.0050	<0.12	0.0055	1.7	2.5	0.028	0.047	0.021	<0.005
Dibenz (a,h) Anthracene	11	<0.005	<0.25	<0.50	<0.0050	<0.12	<0.0050	1.2	<0.49	0.0065	<0.025	<0.005	<0.005
Indeno (1,2,3-c,d) Pyrene	81	<0.005	<0.25	<0.50	0.0057	<0.12	<0.0050	6.6	1.7	0.029	<0.025	<0.005	<0.005
Naphthalene	91	<0.005	<0.25	<0.50	<0.0050	0.2	0.017	8.9	5.9	0.057	<0.025	0.012	<0.005
Benzo (a) Pyrene (eq)	110	0.0044	0.22	1.0	0.0047	0.11	0.0072	7.1	3.3	0.056	0.022	0.0052	0.0044

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	ET-EAST-1	ET-EAST-2	FC-1				FC-2				FC-3			
Sample ID	ET-EAST-1-10.0	ET-EAST-2-10.0	FC-1-12.5	FC-1-15.5	FC-1-19.0	FC-1-21.5	FC-2-11.0	FC-2-15.5	FC-2-17.5	FC-2-21.0	FC-3-12.0	FC-3-13.75	FC-3-18.0	FC-3-21.5
Sample Depth (feet)	10	10	12.5	15.5	19	21.5	11	15.5	17.5	21	12	13.75	18	21.5
Date Sampled	5/31/2013	5/31/2013	4/5/2011	4/5/2011	4/5/2011	4/5/2011	4/6/2011	4/6/2011	4/6/2011	4/6/2011	4/6/2011	4/6/2011	4/6/2011	4/6/2011
Non-Carcinogenic														
Acenaphthene	0.26	35	<29	<29	<29	<30	<60	<60	<59	<59	<59	79	<58	<59
Acenaphthylene	0.32	13	230	210	260	340	860	750	740	350	170	120	200	200
Anthracene	0.018	8.4	200	200	240	270	380	340	320	230	140	190	220	250
Benzo (g,h,i) Perylene	0.032	17	400	420	490	580	780	660	650	350	270	540	560	710
Fluoranthene	0.042	57	940	950	1,100	1,400	1,800	1,600	1,600	870	610	1,200	1,300	1,700
Fluorene	0.016	4.1	90	98	110	140	190	250	210	140	88	170	170	220
Phenanthrene	0.22	49	1,300	1,300	1,600	2,000	2,500	2,300	2,300	1,300	900	1,700	1,900	2,300
Pyrene	0.039	66	1,200	1,300	1,500	1,900	2,400	2,100	2,100	1,200	850	1,700	1,800	2,200
Carcinogenic														
Benzo (a) Anthracene	0.024	21	190	190	210	280	340	290	330	160	130	240	260	320
Benzo (a) Pyrene	0.056	33	370	340	440	550	700	610	620	320	230	480	500	640
Benzo (b) Fluoranthene	0.090	33	270	290	350	450	560	470	460	220	180	380	360	480
Benzo (k) Fluoranthene	0.034	12	140	140	140	180	250	230	230	140	91	170	200	260
Chrysene	0.034	19	190	200	230	300	400	350	320	200	140	260	280	340
Dibenz (a,h) Anthracene	0.012	3.9	<29	<29	<29	<30	<60	<60	<59	<59	<59	<60	<58	<59
Indeno (1,2,3-c,d) Pyrene	0.030	14	240	250	300	350	470	400	400	210	160	320	320	430
Naphthalene	0.81	38	15,000	13,000	16,000	19,000	18,000	18,000	22,000	9,100	7,800	13,000	18,000	19,000
Benzo (a) Pyrene (eq)	0.078	43	460	430	550	680	880	760	780	410	300	600	630	800

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	FC-4				FC-5				FC-6			
Sample ID	FC-4-11.5	FC-4-13.5	FC-4-18.0	FC-4-20.0	FC-5-10.0	FC-5-14.5	FC-5-18.0	FC-5-19-5	FC-6-14.5	FC-6-16.0	FC-6-18.0	FC-6-21.0
Sample Depth (feet)	11.5	13.5	18	20	10	14.5	18	19.5	14.5	16	18	21
Date Sampled	4/7/2011	4/7/2011	4/7/2011	4/7/2011	4/7/2011	4/7/2011	4/7/2011	4/7/2011	4/7/2011	4/7/2011	4/7/2011	4/7/2011
Non-Carcinogenic												
Acenaphthene	<60	<59	61	58	<59	<60	<59	<60	39	<29	<28	29
Acenaphthylene	1,300	420	81	100	400	140	<59	<60	460	120	90	56
Anthracene	570	260	170	490	280	120	<59	<60	250	130	130	<28
Benzo (g,h,i) Perylene	1,000	440	350	810	560	430	220	310	500	240	270	550
Fluoranthene	2,400	1,000	830	1,800	1,300	1,000	540	730	1,200	590	710	1,500
Fluorene	320	160	120	220	170	150	81	97	120	79	96	190
Phenanthrene	3,500	1,500	1,200	2,400	1,900	1,500	940	1,200	1,700	850	1,100	2,400
Pyrene	3,300	1,500	1,200	2,400	1,900	1,500	750	1,000	1,700	840	1,100	2,200
Carcinogenic												
Benzo (a) Anthracene	480	210	170	380	270	210	110	140	230	110	130	270
Benzo (a) Pyrene	940	400	310	730	500	390	190	260	440	190	270	590
Benzo (b) Fluoranthene	740	340	220	580	370	290	140	200	340	170	210	440
Benzo (k) Fluoranthene	330	120	130	260	210	160	91	120	200	98	110	250
Chrysene	470	260	180	410	330	230	130	160	220	160	170	290
Dibenz (a,h) Anthracene	66	<59	<59	<58	<59	<60	<59	<60	<29	<29	<28	31
Indeno (1,2,3-c,d) Pyrene	620	260	200	490	330	260	130	180	290	140	160	330
Naphthalene	27,000	14,000	11,000	16,000	15,000	16,000	5,500	12,000	5,700	11,000	13,000	24,000
Benzo (a) Pyrene (eq)	1,200	510	390	910	630	490	250	340	550	250	340	730

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	MW-1			MW-2			MW-3		MW-5			
Sample ID	MW#1 5 ft.	MW#1 10 ft.	MW#1 15 ft.	MW#2 5 ft.	MW#2 10 ft.	MW#2 15 ft.	MW3-10'	MW3-15'	MW-5@5'	MW-5@10'	MW-5@15'	MW-5-20
Sample Depth (feet)	5	10	15	5	10	15	10	15	5	10	15	20
Date Sampled	11/25/1987	11/25/1987	11/25/1987	11/25/1987	11/25/1987	11/25/1987	12/1/1987	12/1/1987	4/27/1988	4/27/1988	4/27/1988	4/27/1988
Non-Carcinogenic												
Acenaphthene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	<0.044	<0.44	<0.044	<0.044	<0.044
Acenaphthylene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	0.2206	1.4	0.067	<0.044	<0.044
Anthracene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	0.2189	1.76	0.047	<0.044	<0.044
Benzo (g,h,i) Perylene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	1.051	14.1	1.69	<0.044	<0.044
Fluoranthene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	1.9822	13.7	1.27	<0.044	<0.044
Fluorene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	0.1115	<0.44	<0.044	<0.044	<0.044
Phenanthrene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	1.8735	5.17	0.499	<0.044	<0.044
Pyrene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	5.9272	8.44	0.673	<0.044	<0.044
Carcinogenic												
Benzo (a) Anthracene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	1.0241	7.69	0.546	<0.044	<0.044
Benzo (a) Pyrene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	1.5119	11.9	0.406	<0.044	<0.044
Benzo (b) Fluoranthene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	2.249	22	0.544	<0.044	<0.044
Benzo (k) Fluoranthene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	<0.044	<0.44	0.544	<0.044	<0.044
Chrysene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	1.2193	7.68	0.627	<0.044	<0.044
Dibenz (a,h) Anthracene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	<0.044	0.745	0.093	<0.044	<0.044
Indeno (1,2,3-c,d) Pyrene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	<0.044	15.3	1.32	<0.044	<0.044
Naphthalene	<0.65	<0.657	<0.657	<0.657	<0.644	<0.667	<0.044	0.0653	0.497	0.063	<0.044	<0.044
Benzo (a) Pyrene (eq)	0.57	0.57	0.57	0.57	0.56	0.58	0.039	1.9	17	0.74	0.039	0.039

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	MW-7		MW-10			MW-11			MW-12			
Sample ID	MW-7 5 ft.	MW-7 10 ft.	MW-10-8	MW-10-11	MW-10-18.5	MW-11-10.5	MW-11-15.5	MW-11-24	MW-12-15.5	MW-12-20	MW-12-24	DUPLICATE A
Sample Depth (feet)	5	10	8	11	18.5	10.5	15.5	24	15.5	20	24	24.5
Date Sampled	4/19/1988	4/19/1988	3/3/2005	3/3/2005	3/3/2005	3/3/2005	3/3/2005	3/3/2005	3/3/2005	3/3/2005	3/3/2005	3/3/2005
Non-Carcinogenic												
Acenaphthene	<0.044	<0.044	<0.005	<0.2	<0.005	<0.005	<2	0.35	<0.005	6.3	0.015	<0.005
Acenaphthylene	<0.044	<0.044	0.013	0.7	0.005	<0.005	3.1	0.029	<0.005	0.7	<0.005	0.01
Anthracene	<0.044	<0.044	0.008	0.5	<0.005	0.009	<2	0.062	<0.005	1	0.016	0.017
Benzo (g,h,i) Perylene	<0.044	<0.044	0.023	1.3	0.019	0.057	37	0.013	<0.005	0.4	<0.005	0.023
Fluoranthene	<0.044	<0.044	0.053	3.8	0.032	0.06	24	0.011	<0.005	2.1	0.024	0.041
Fluorene	<0.044	<0.044	<0.005	0.4	<0.005	<0.005	<2	0.012	<0.005	1.8	<0.005	<0.005
Phenanthrene	<0.044	<0.044	0.052	4.6	0.029	0.033	14	0.026	<0.005	<0.1	<0.005	0.01
Pyrene	<0.044	<0.044	0.065	4.6	0.039	0.062	33	0.12	<0.005	2.5	0.04	0.16
Carcinogenic												
Benzo (a) Anthracene	<0.044	<0.044	0.011	0.7	0.011	0.064	8.2	0.041	<0.005	1	0.014	0.074
Benzo (a) Pyrene	<0.044	<0.044	0.028	1.4	0.017	0.092	19	0.03	<0.005	0.8	0.01	0.051
Benzo (b) Fluoranthene	<0.044	<0.044	0.023	0.8	0.012	0.059	12	0.034	<0.005	0.8	0.011	0.05
Benzo (k) Fluoranthene	<0.044	<0.044	0.007	0.7	0.01	0.063	7.9	0.018	<0.005	0.3	<0.005	0.007
Chrysene	<0.044	<0.044	0.012	0.9	0.013	0.054	12	0.087	<0.005	1.4	0.027	0.14
Dibenz (a,h) Anthracene	<0.044	<0.044	<0.005	<0.2	<0.005	0.015	<2	<0.005	<0.005	<0.1	<0.005	<0.005
Indeno (1,2,3-c,d) Pyrene	<0.044	<0.044	0.016	0.8	0.013	0.051	22	0.009	<0.005	0.2	<0.005	0.012
Naphthalene	<0.044	<0.044	0.008	1	0.011	0.01	5.2	0.014	<0.005	<0.1	<0.005	<0.005
Benzo (a) Pyrene (eq)	0.039	0.039	0.035	1.7	0.023	0.12	24	0.042	0.0044	1.1	0.014	0.068

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	MW-13		MW-14				MW-15			MW-16		
Sample ID	MW-13-15.5	MW-13-20	MW-14-4	MW-14-9.5	DUP-B	MW-14-20.5	MW-15-11.5	MW-15-17.5	MW-15-22.5	MW-16-8	MW-16-14.5	MW-16-23.5
Sample Depth (feet)	15.5	20	4	9.5	20	20.5	11.5	17.5	22.5	8	14.5	23.5
Date Sampled	3/2/2005	3/2/2005	3/3/2005	3/4/2005	3/4/2005	3/4/2005	3/2/2005	3/2/2005	3/2/2005	3/1/2005	3/1/2005	3/1/2005
Non-Carcinogenic												
Acenaphthene	<0.005	<0.005	<2	<0.02	<0.005	1.1	<0.005	<0.005	<0.1	<0.005	<0.005	0.04
Acenaphthylene	<0.005	<0.005	8.3	0.02	0.016	0.3	<0.005	<0.005	0.1	<0.005	<0.005	0.06
Anthracene	<0.005	<0.005	2.8	<0.02	<0.005	0.3	<0.005	<0.005	<0.1	<0.005	<0.005	0.08
Benzo (g,h,i) Perylene	<0.005	<0.005	41	0.17	0.075	0.8	<0.005	<0.005	0.2	<0.005	<0.005	0.06
Fluoranthene	<0.005	<0.005	64	0.26	0.008	1.2	<0.005	<0.005	0.3	<0.005	<0.005	0.2
Fluorene	<0.005	<0.005	<2	<0.02	<0.005	0.6	<0.005	<0.005	<0.1	<0.005	<0.005	<0.02
Phenanthrene	<0.005	<0.005	36	0.2	<0.005	<0.1	<0.005	<0.005	<0.1	<0.005	<0.005	<0.02
Pyrene	<0.005	<0.005	76	0.31	0.008	1.8	<0.005	<0.005	0.8	<0.005	<0.005	0.37
Carcinogenic												
Benzo (a) Anthracene	<0.005	<0.005	25	0.1	<0.005	0.6	<0.005	<0.005	0.1	<0.005	<0.005	0.12
Benzo (a) Pyrene	<0.005	<0.005	34	0.15	0.032	0.8	<0.005	<0.005	0.3	<0.005	<0.005	0.11
Benzo (b) Fluoranthene	<0.005	<0.005	24	0.1	0.018	0.7	<0.005	<0.005	0.2	<0.005	<0.005	0.11
Benzo (k) Fluoranthene	<0.005	<0.005	25	0.1	0.013	0.4	<0.005	<0.005	<0.1	<0.005	<0.005	0.04
Chrysene	<0.005	<0.005	33	0.13	<0.005	1	<0.005	<0.005	0.4	<0.005	<0.005	0.19
Dibenz (a,h) Anthracene	<0.005	<0.005	6.7	0.02	<0.005	0.1	<0.005	<0.005	<0.1	<0.005	<0.005	0.02
Indeno (1,2,3-c,d) Pyrene	<0.005	<0.005	33	0.12	0.035	0.5	<0.005	<0.005	0.1	<0.005	<0.005	0.04
Naphthalene	<0.005	<0.005	<2	0.09	<0.005	<0.1	<0.005	<0.005	<0.1	<0.005	<0.005	<0.02
Benzo (a) Pyrene (eq)	0.0044	0.0044	47	0.20	0.040	1.1	0.0044	0.0044	0.37	0.0044	0.0044	0.15

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	MW-17			MW-18			MW-19					
Sample ID	MW-17-9	MW-17-13.5	MW-17-16	MW-18-10	MW-18-15.5	MW-18-18	MW-19-5	MW-19-11	MW-19-15	DUP-111406	MW-19-19.5	MW-19-26
Sample Depth (feet)	9	13.5	16	10	15.5	18	5	11	15	19.5	19.5	26
Date Sampled	3/2/2005	3/2/2005	3/2/2005	3/4/2005	3/4/2005	3/4/2005	11/14/2006	11/14/2006	11/14/2006	11/14/2006	11/14/2006	11/14/2006
Non-Carcinogenic												
Acenaphthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.130	0.250	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.470	0.250	<0.050	0.057	<0.050	0.240
Anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.080	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo (g,h,i) Perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.200	0.210	<0.050	<0.050	<0.050	0.130
Fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.360	0.300	<0.050	<0.050	<0.050	0.170
Fluorene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.110	0.079	<0.050	<0.050	<0.050	<0.050
Phenanthrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.780	0.590	<0.050	<0.050	<0.050	0.380
Pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.570	0.510	<0.050	<0.050	<0.050	0.290
Carcinogenic												
Benzo (a) Anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.110	0.089	<0.050	<0.050	<0.050	0.052
Benzo (a) Pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.290	<0.050	<0.050	<0.050	<0.050	0.130
Benzo (b) Fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.160	0.140	<0.050	<0.050	<0.050	0.078
Benzo (k) Fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.061	0.051	<0.050	<0.050	<0.050	<0.050
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.140	0.110	<0.050	<0.050	<0.050	0.066
Dibenz (a,h) Anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Indeno (1,2,3-c,d) Pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.220	0.200	<0.050	<0.050	<0.050	0.110
Naphthalene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	3.400	1.500	0.180	0.840	0.670	3.300
Benzo (a) Pyrene (eq)	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.36	0.083	0.044	0.044	0.044	0.17

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	MW-19D			MW-20				MW-21			MW-22	PA-1
Sample ID	MW-19D-16	MW-19D-23.5	MW-19D-27.5	MW-20-6	MW-20-10.5	MW-20-15.5	MW-20-20.5	MW-21-32.5	MW-21-35.5	MW-21-37.5	MW-22-21.5	PA-1-2.0
Sample Depth (feet)	16	23.5	27.5	6	10.5	15.5	20.5	32.5	35.5	37.5	21.5	2
Date Sampled	6/13/2009	6/13/2009	6/13/2009	2/23/2007	2/23/2007	2/23/2007	2/23/2007	3/3/2008	3/3/2008	3/3/2008	6/11/2009	4/11/2011
Non-Carcinogenic												
Acenaphthene	<0.005	0.200	0.0061	<0.050	0.200	0.310	1.400	<0.0049	<0.0049	<0.0049	0.350	<1.4
Acenaphthylene	<0.005	0.026	<0.005	<0.050	0.120	<0.050	<0.050	<0.0049	0.005	<0.0049	<0.25	8.5
Anthracene	<0.005	0.0092	<0.005	<0.050	0.073	<0.050	<0.050	<0.0049	<0.0049	<0.0049	<0.25	4.7
Benzo (g,h,i) Perylene	<0.005	<0.005	<0.005	0.095	0.350	<0.050	<0.050	<0.0049	0.022	<0.0049	<0.25	110
Fluoranthene	<0.005	0.011	<0.005	<0.050	0.520	<0.050	<0.050	<0.0049	0.026	<0.0049	0.350	120
Fluorene	<0.005	0.050	<0.005	<0.050	0.076	<0.050	<0.050	<0.0049	<0.0049	<0.0049	0.260	1.3
Phenanthrene	<0.005	0.140	<0.005	<0.050	0.880	<0.050	<0.050	<0.0049	0.027	0.0083	<0.25	41
Pyrene	<0.005	0.013	<0.005	<0.050	0.790	<0.050	<0.050	<0.0049	0.032	0.0058	0.670	170
Carcinogenic												
Benzo (a) Anthracene	<0.005	<0.005	<0.005	<0.050	0.130	<0.050	<0.050	<0.0049	0.0097	<0.0049	<0.25	34
Benzo (a) Pyrene	<0.005	<0.005	<0.005	0.130	0.410	<0.050	<0.050	<0.0049	0.016	<0.0049	<0.25	85
Benzo (b) Fluoranthene	<0.005	<0.005	<0.005	<0.050	0.200	<0.050	<0.050	<0.0049	0.020	<0.0049	<0.25	61
Benzo (k) Fluoranthene	<0.005	<0.005	<0.005	0.370	0.100	<0.050	<0.050	<0.0049	<0.0049	<0.0049	<0.25	43
Chrysene	<0.005	0.011	<0.005	<0.050	0.180	<0.050	<0.050	<0.0049	0.0097	<0.0049	0.320	51
Dibenz (a,h) Anthracene	<0.005	<0.005	<0.005	0.067	<0.050	<0.050	<0.050	<0.0049	<0.0049	<0.0049	<0.25	9.9
Indeno (1,2,3-c,d) Pyrene	<0.005	<0.005	<0.005	<0.050	0.320	<0.050	<0.050	<0.0049	0.011	<0.0049	<0.25	74
Naphthalene	0.220	2.700	0.011	0.054	1.600	<0.050	<0.050	<0.0049	0.0063	<0.0049	<0.25	7
Benzo (a) Pyrene (eq)	0.0044	0.0045	0.0044	0.20	0.50	0.044	0.044	0.0043	0.021	0.0043	0.22	110

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	PA-2	PA-3	PA-4	PA-5	PA-6	PA-8	PA-9	PA-10	PA-11	PA-12	PA-13	PA-14
Sample ID	PA-2-2.0	PA-3-1.25	PA-4-2.0	PA-5-2.0	PA-6-2.0	PA-8-2.0	PA-9-2.0	PA-10	PA-11	PA-12	PA-13	PA-14
Sample Depth (feet)	2	1.25	2	2	2	2	2	2	2	2	2	2
Date Sampled	4/11/2011	4/11/2011	4/12/2011	4/12/2011	4/12/2011	4/12/2011	4/12/2011	4/13/2011	4/13/2011	4/13/2011	4/14/2011	4/13/2011
Non-Carcinogenic												
Acenaphthene	<0.28	<1.4	0.0041	0.03	<0.14	0.0023	0.026	0.0032	0.097	0.003	0.018	0.22
Acenaphthylene	0.41	15	0.14	1.1	1.7	0.056	0.72	0.049	0.19	0.023	0.13	1.8
Anthracene	0.26	14	0.059	0.39	1.3	0.024	0.58	0.032	0.11	0.015	0.054	0.87
Benzo (g,h,i) Perylene	2.8	81	0.88	3.4	13	0.19	3.5	0.32	0.8	0.12	0.34	14
Fluoranthene	3.9	180	1.2	5.2	18	0.37	6.5	0.43	1.2	0.15	0.64	16
Fluorene	<0.21	4.7	0.022	0.2	0.31	0.01	0.16	0.011	0.052	0.0039	0.033	0.35
Phenanthrene	2.6	120	0.59	4.3	7.4	0.35	2.8	0.21	0.83	0.087	0.52	9.5
Pyrene	4.8	200	1.4	6.8	23	0.42	7.9	0.55	1.7	0.2	0.76	21
Carcinogenic												
Benzo (a) Anthracene	1.1	65	0.31	1.2	8	0.11	3	0.17	0.37	0.079	0.16	4.6
Benzo (a) Pyrene	2.1	92	0.68	2.8	13	0.18	4.4	0.29	0.6	0.13	0.31	10
Benzo (b) Fluoranthene	1.6	69	0.46	1.9	9.2	0.14	2.9	0.19	0.51	0.094	0.19	7.5
Benzo (k) Fluoranthene	1.3	67	0.37	1.4	9.2	0.11	3.1	0.17	0.4	0.096	0.17	5.4
Chrysene	1.5	74	0.43	1.7	10	0.14	3.3	0.21	0.49	0.1	0.19	6.4
Dibenz (a,h) Anthracene	<0.35	12	0.076	0.3	1.8	0.023	0.59	0.04	0.086	0.024	0.03	1.1
Indeno (1,2,3-c,d) Pyrene	1.7	60	0.57	2.2	9.3	0.13	2.6	0.22	0.57	0.088	0.23	9.3
Naphthalene	0.41	8.6	0.077	1.2	1	0.12	0.28	0.037	0.15	0.043	0.076	2.2
Benzo (a) Pyrene (eq)	2.7	120	0.88	3.6	17	0.24	5.8	0.38	0.82	0.17	0.40	13

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	PA-15	PA-16	PA-17	PA-18		PA-20	PA-21	PA-22	PA-23		PA-24	
Sample ID	PA-15-2	PA-16-2	PA-17-2	PA-18-1	PA-18-2	PA-20-2	PA-21-2	PA-22-2	PA-23-1	PA-23-2	PA-24-1	PA-24-2
Sample Depth (feet)	2	2	2	1	2	2	2	2	1	2	1	2
Date Sampled	7/13/2011	7/13/2011	7/13/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011
Non-Carcinogenic												
Acenaphthene	0.16	<0.24	<0.86	<0.5	<0.24	<0.48	0.0024	<0.0023	<0.085	<0.023	<0.0092	0.00071
Acenaphthylene	1.7	1.4	9.5	2.4	0.96	1.8	<0.0016	0.0079	0.55	0.18	0.053	0.0080
Anthracene	0.74	0.71	6	1.3	1	1.4	0.0022	0.0030	0.72	0.09	0.044	0.0071
Benzo (g,h,i) Perylene	8.3	13	63	13	4.9	19	0.018	0.037	2.4	0.54	0.18	0.053
Fluoranthene	13	18	90	24	9.2	31	0.024	0.06	7.4	1.1	0.46	0.092
Fluorene	0.38	0.34	2.5	0.72	0.68	<0.5	0.022	<0.0024	0.25	0.073	0.034	0.0040
Phenanthrene	8.8	10	75	19	7.6	15	0.07	0.046	6.1	1.1	0.46	0.065
Pyrene	15	21	110	28	9.8	39	0.045	0.07	8.8	1.5	0.54	0.11
Carcinogenic												
Benzo (a) Anthracene	3	5	20	5.9	3.1	6.7	0.0075	0.016	2.1	0.39	0.17	0.043
Benzo (a) Pyrene	6.7	10	44	9.9	4.2	15	0.01	0.028	2.8	0.5	0.2	0.057
Benzo (b) Fluoranthene	4.5	7.8	34	9	3.3	12	0.022	0.024	2	0.4	0.16	0.033
Benzo (k) Fluoranthene	3.8	6.8	21	6.6	3.4	7.8	<0.0038	0.023	2.2	0.4	0.17	0.036
Chrysene	3.9	7.2	28	8.3	3.8	9.9	0.032	0.023	2.7	0.49	0.23	0.053
Dibenz (a,h) Anthracene	0.45	0.93	3.7	<1.3	<0.61	<1.2	<0.0060	<0.0059	0.31	<0.06	0.027	0.0087
Indeno (1,2,3-c,d) Pyrene	6.6	10	48	15	5.7	18	0.0088	0.047	2.8	0.61	0.22	0.048
Naphthalene	0.55	1.9	12	3.4	1.4	0.36	0.0080	0.015	0.23	0.067	0.029	0.006
Benzo (a) Pyrene (eq)	8.7	13	58	14	5.9	20	0.015	0.040	3.8	0.70	0.28	0.076

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	PA-25		PA-27	PA-28	PH03	PH-10	PH-11	PIT CENTER			PM-1
Sample ID	PA-25-1	PA-25-2	PA-27-2	PA-28-2	ENV-PH03-2	PH-10	PH-11	Pit Center@12'	Pit Center@16'	Pit Center@20'	PM-1-19
Sample Depth (feet)	1	2	2	2	2	2.5*	2.5*	12	16	20	19
Date Sampled	7/13/2011	7/13/2011	7/13/2011	7/13/2011	6/18/2004	9/29/2004	9/29/2004	6/3/2006	6/3/2006	6/3/2006	6/15/2009
Non-Carcinogenic											
Acenaphthene	0.11	<0.093	0.00058	<0.1	0.13	<0.1	<0.1	0.0903	0.714	1.650	<0.025
Acenaphthylene	0.67	0.32	0.0030	2.2	0.13	<0.1	<0.1	<0.050	0.0619	<0.050	0.037
Anthracene	0.43	1.7	0.0030	0.92	0.087	<0.003	0.059	<0.050	0.108	<0.050	<0.025
Benzo (g,h,i) Perylene	3.2	1.6	0.033	5.5	0.16	0.015	0.24	<0.050	<0.0500	<0.050	0.120
Fluoranthene	6.6	5.3	0.055	15	0.43	0.011	0.73	0.0595	0.220	<0.050	0.160
Fluorene	0.16	0.42	0.0015	0.52	0.06	<0.003	0.018	<0.050	<0.0500	<0.050	<0.025
Phenanthrene	4.5	4.2	0.03	14	0.4	0.0059	0.3	<0.050	<0.0500	<0.050	0.061
Pyrene	7.4	4.8	0.063	18	0.5	0.026	0.68	0.236	0.869	1.010	0.260
Carcinogenic											
Benzo (a) Anthracene	1.9	1.8	0.024	2.5	0.073	0.0043	0.12	0.292	<0.0500	<0.050	0.100
Benzo (a) Pyrene	3.1	2	0.033	4.8	0.18	0.0096	0.26	<0.050	<0.0500	<0.050	0.150
Benzo (b) Fluoranthene	2.4	1.7	0.036	3.8	0.12	0.0074	0.2	<0.050	<0.0500	<0.050	0.110
Benzo (k) Fluoranthene	2.1	1.6	0.024	2.8	0.055	<0.003	0.085	<0.050	<0.0500	<0.050	0.030
Chrysene	2.2	1.8	0.03	3.6	0.11	0.006	0.15	<0.050	0.711	1.320	0.110
Dibenz (a,h) Anthracene	0.25	<0.24	0.0044	0.3	<0.05	0.011	0.039	<0.050	<0.0500	<0.050	<0.025
Indeno (1,2,3-c,d) Pyrene	2.7	1.5	0.029	4.5	0.15	0.0085	0.27	<0.050	<0.0500	<0.050	0.092
Naphthalene	0.72	0.22	0.0048	6.2	0.4	<0.002	<0.002	<0.050	0.165	<0.050	0.026
Benzo (a) Pyrene (eq)	4.1	2.7	0.046	6.3	0.23	0.016	0.34	0.070	0.051	0.057	0.19

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	RT-1				RT-2	RT-3		RT-4		RT-5	RW-1	
Sample ID	RT-1-10	RT-1-20	RT-1-25	RT-1-37	RT-2-30	RT-3-10	RT-3-20	RT-4-10	RT-4-20	RT-5-30	RW1-25	RW1-30
Sample Depth (feet)	10	20	25	37	30	10	20	10	20	30	25	30
Date Sampled	7/19/2006	7/19/2006	7/19/2006	7/19/2006	7/19/2006	7/20/2006	7/20/2006	7/20/2006	7/20/2006	7/20/2006	6/12/2009	6/12/2009
Non-Carcinogenic												
Acenaphthene	<0.050	<0.050	<0.050	<0.050	<0.500	<0.050	<0.050	<0.050	<0.050	<0.050	0.410	<0.005
Acenaphthylene	<0.050	<0.050	<0.050	<0.050	24.000	<0.050	0.160	<0.050	<0.050	0.370	0.031	<0.005
Anthracene	<0.050	<0.050	<0.050	<0.050	3.400	<0.050	<0.050	<0.050	<0.050	0.180	0.022	<0.005
Benzo (g,h,i) Perylene	<0.050	<0.050	<0.050	<0.050	8.200	<0.050	0.064	<0.050	<0.050	0.430	<0.0049	<0.005
Fluoranthene	<0.050	0.180	<0.050	<0.050	24.000	0.058	0.087	<0.050	<0.050	0.990	0.018	<0.005
Fluorene	<0.050	<0.050	<0.050	<0.050	4.600	<0.050	<0.050	<0.050	<0.050	0.190	0.084	<0.005
Phenanthrene	<0.050	0.070	0.130	<0.050	28.000	<0.050	<0.050	<0.050	<0.050	1.500	0.260	<0.005
Pyrene	<0.050	0.110	<0.050	<0.050	25.000	<0.050	0.053	<0.050	<0.050	1.400	0.024	<0.005
Carcinogenic												
Benzo (a) Anthracene	<0.050	<0.050	<0.050	<0.050	3.500	<0.050	<0.050	<0.050	<0.050	0.210	0.0078	<0.005
Benzo (a) Pyrene	<0.050	0.070	<0.050	<0.050	8.500	<0.050	0.051	<0.050	<0.050	0.530	<0.0049	<0.005
Benzo (b) Fluoranthene	<0.050	<0.050	<0.050	<0.050	5.700	<0.050	<0.050	<0.050	<0.050	0.320	<0.0049	<0.005
Benzo (k) Fluoranthene	<0.050	<0.050	<0.050	<0.050	2.200	<0.050	<0.050	<0.050	<0.050	0.120	<0.0049	<0.005
Chrysene	<0.050	0.069	<0.050	<0.050	4.800	<0.050	<0.050	<0.050	<0.050	0.280	0.016	<0.005
Dibenz (a,h) Anthracene	<0.050	<0.050	<0.050	<0.050	<0.500	<0.050	<0.050	<0.050	<0.050	<0.050	<0.0049	<0.005
Indeno (1,2,3-c,d) Pyrene	<0.050	<0.050	<0.050	<0.050	6.900	<0.050	<0.050	<0.050	<0.050	0.420	<0.0049	<0.005
Naphthalene	0.150	1.900	1.300	0.340	200.000	0.096	0.190	<0.050	<0.050	7.500	3.800	0.0084
Benzo (a) Pyrene (eq)	0.044	0.089	0.044	0.044	10	0.044	0.070	0.044	0.044	0.65	0.0050	0.0044

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	RW-5		RW-104-6-1	RW-104-6-2	RW-104-6-4	RW-104-6-5	RW-104-6-6	RW-104-6-9	RW-104-6-10	RW-104-6-12	RW-104-6-14	RW-104-6-15
Sample ID	RW-5-23.5	RW-5-28.0	RW-104-6-1	RW-104-6-2	RW-104-6-4	RW-104-6-5	RW-104-6-6	RW-104-6-9	RW-104-6-10	RW-104-6-12	RW-104-6-14	RW-104-6-15
Sample Depth (feet)	23.5	28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Date Sampled	6/11/2009	6/11/2009	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986
Non-Carcinogenic												
Acenaphthene	<0.005	<0.005	0.17	0.08	0.07	0.06	0.007	0.005	0.04	0.02	0.005	0.01
Acenaphthylene	<0.005	<0.005	0.2	1.6	4.2	5.2	---	0.007	---	0.15	0.01	---
Anthracene	<0.005	<0.005	0.18	2.5	2.5	3.2	0.01	0.01	0.05	0.15	0.01	0.02
Benzo (g,h,i) Perylene	0.008	<0.005	1.8	15	16	13	0.15	0.29	0.64	1.1	0.14	0.04
Fluoranthene	0.013	<0.005	3.8	0.74	2.1	43	0.23	0.38	0.03	0.1	0.005	0.16
Fluorene	<0.005	<0.005	0.11	38	42	1.7	0.03	0.008	1.4	2.1	0.19	0.01
Phenanthrene	0.014	<0.005	3.8	39	51	67	0.25	0.29	1	4	0.14	0.19
Pyrene	0.016	<0.005	5	55	61	64	0.33	0.48	1.8	2.3	0.26	0.21
Carcinogenic												
Benzo (a) Anthracene	<0.005	<0.005	0.97	13	9.4	10	0.08	0.09	0.23	0.4	0.06	0.04
Benzo (a) Pyrene	0.0079	<0.005	2.6	22	20	19	0.15	0.2	0.26	0.89	0.13	0.08
Benzo (b) Fluoranthene	0.0069	<0.005	1.3	12	11	10	0.13	0.13	1	0.5	0.09	0.11
Benzo (k) Fluoranthene	<0.005	<0.005	0.6	5.8	5.1	4.7	0.06	0.06	0.27	0.23	0.04	0.05
Chrysene	<0.005	<0.005	1.8	16	13	15	0.14	0.12	0.43	0.49	0.09	0.08
Dibenz (a,h) Anthracene	<0.005	<0.005	0.13	0.85	0.73	0.74	0.01	0.01	0.06	0.08	0.117	NA**
Indeno (1,2,3-c,d) Pyrene	0.0056	<0.005	1.4	8.7	8.9	8.9	0.1	0.18	0.68	0.74	0.12	0.05
Naphthalene	0.048	0.025	1	6.7	13	4.8	0.08	0.04	0.25	0.28	0.03	0.05
Benzo (a) Pyrene (eq)	0.011	0.0044	3.1	26	24	23	0.19	0.25	0.50	1.1	0.20	0.11

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	RW-104-6-16	SD-1	SD-2										SD-6
Sample ID	RW-104-6-16	SD-1-15.0	SD-2-5.0	SD-2-10.0	SD-2-14.5	SD-2-20.0	SD-2-25.0	SD-2-27.5	SD-2-35.0	SD-2-40.0	SD-2-45.0	SD-2-52.0	SD-6-18.5
Sample Depth (feet)	0.25	15	5	10	14.5	20	25	27.5	35	40	45	52	18.5
Date Sampled	7/11/1986	1/29/2008	2/4/2008	2/4/2008	2/4/2008	2/4/2008	2/4/2008	2/4/2008	2/4/2008	2/4/2008	2/4/2008	2/4/2008	2/6/2008
Non-Carcinogenic													
Acenaphthene	0.009	<0.050	<0.025	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Acenaphthylene	0.13	0.050	0.036	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Anthracene	0.01	<0.050	0.026	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Benzo (g,h,i) Perylene	0.05	0.250	0.360	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Fluoranthene	0.16	0.690	0.420	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Fluorene	0.01	<0.050	<0.025	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Phenanthrene	0.15	0.320	0.200	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Pyrene	0.2	0.650	0.480	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Carcinogenic													
Benzo (a) Anthracene	NA**	0.270	0.190	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Benzo (a) Pyrene	0.06	0.310	0.300	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Benzo (b) Fluoranthene	0.05	0.370	0.340	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Benzo (k) Fluoranthene	0.03	0.110	0.100	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Chrysene	0.09	0.230	0.170	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Dibenz (a,h) Anthracene	0.004	0.053	0.038	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Indeno (1,2,3-c,d) Pyrene	0.06	0.220	0.260	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Naphthalene	0.08	<0.050	<0.025	<0.0050	<0.0050	<0.0049	<0.0050	<0.0050	<0.0050	<0.0050	<0.0049	<0.0049	<0.0050
Benzo (a) Pyrene (eq)	0.076	0.43	0.40	0.0044	0.0044	0.0043	0.0044	0.0044	0.0044	0.0044	0.0043	0.0043	0.0044

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	SD-8		SD-12	SIDEWALL-E	SIDEWALL-N	SIDEWALL-S	SIDEWALL-W	SR-1			SR-2	SR-4	
Sample ID	SD-8-18.5	SD-8-26.0	SD-12-15.0	Sidewall-E@5'	Sidewall-N@6'	Sidewall-S@5'	Sidewall-W@7'	SR-1-6.5	SR-1-20	SR-1-25	SR-2-22	SR-4-5.5	SR-4-20.5
Sample Depth (feet)	18.5	26	15	5	6	5	7	6.5	20	25	22	5.5	20.5
Date Sampled	2/7/2008	2/7/2008	3/2/2008	6/3/2006	6/3/2006	6/3/2006	6/3/2006	11/15/2006	11/15/2006	11/15/2006	11/15/2006	11/16/2006	11/16/2006
Non-Carcinogenic													
Acenaphthene	0.410	<0.0050	<0.0050	<0.0500	0.149	<0.050	<0.0500	0.690	<0.050	<0.050	0.880	<0.050	<0.050
Acenaphthylene	<0.120	<0.0050	<0.0050	<0.0500	0.783	0.505	<0.0500	0.072	<0.050	<0.050	1.500	<0.050	0.095
Anthracene	<0.120	<0.0050	<0.0050	<0.0500	0.773	0.636	<0.0500	<0.050	<0.050	<0.050	<0.050	<0.050	0.160
Benzo (g,h,i) Perylene	<0.120	<0.0050	<0.0050	0.101	5.990	12.200	<0.0500	<0.050	<0.050	<0.050	0.380	0.140	<0.050
Fluoranthene	0.140	<0.0050	<0.0050	<0.0500	5.490	5.240	0.0687	<0.050	<0.050	<0.050	1.200	<0.050	0.160
Fluorene	<0.120	<0.0050	<0.0050	<0.0500	0.368	0.141	<0.0500	<0.050	<0.050	<0.050	0.300	<0.050	0.130
Phenanthrene	<0.120	<0.0050	<0.0050	<0.0500	4.070	2.730	<0.0500	<0.050	<0.050	<0.050	2.100	<0.050	0.210
Pyrene	0.330	<0.0050	<0.0050	0.121	14.200	13.300	0.140	<0.050	<0.050	<0.050	2.200	<0.050	0.680
Carcinogenic													
Benzo (a) Anthracene	<0.120	<0.0050	<0.0050	<0.0500	3.930	3.600	0.0549	<0.050	<0.050	<0.050	0.320	<0.050	0.300
Benzo (a) Pyrene	<0.120	<0.0050	<0.0050	<0.0500	4.830	6.490	<0.0500	<0.050	<0.050	<0.050	0.670	<0.050	0.210
Benzo (b) Fluoranthene	<0.120	<0.0050	<0.0050	0.0567	2.300	4.200	<0.0500	<0.050	<0.050	<0.050	0.610	0.072	0.750
Benzo (k) Fluoranthene	<0.120	<0.0050	<0.0050	0.0599	3.390	4.430	<0.0500	<0.050	<0.050	<0.050	0.230	<0.050	<0.050
Chrysene	<0.120	<0.0050	<0.0050	<0.0500	5.320	5.330	0.0632	<0.050	<0.050	<0.050	0.890	<0.050	<0.050
Dibenz (a,h) Anthracene	<0.120	<0.0050	<0.0050	<0.0500	1.020	1.430	<0.0500	<0.050	<0.050	<0.050	0.070	<0.050	<0.050
Indeno (1,2,3-c,d) Pyrene	<0.120	<0.0050	<0.0050	<0.0500	4.900	8.390	<0.0500	<0.050	<0.050	<0.050	0.510	0.120	<0.050
Naphthalene	<0.120	<0.0050	0.0096	<0.0500	1.740	0.612	0.367	<0.050	0.140	<0.050	18.000	0.063	0.240
Benzo (a) Pyrene (eq)	0.11	0.0044	0.0044	0.050	6.7	9.1	0.047	0.044	0.044	0.044	0.87	0.058	0.33

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	SRC-01			SRC-02		SRC-03			SRC-04				
Sample ID	SRC-01-2.5	SRC-01-5.5	SRC-01-7.0	SRC-02-4.0	SRC-02-7.0	SRC-03-4.0	SRC-03-5.5	SRC-03-7.0	SRC-04-2.5	SRC-04-3.5	SRC-04-4.0	SRC-04-5.5	SRC-04-7.0
Sample Depth (feet)	2.5	5.5	7	4	7	4	5.5	7	2.5	3.5	4	5.5	7
Date Sampled	7/11/2003	7/11/2003	7/11/2003	7/11/2003	7/11/2003	7/12/2003	7/12/2003	7/12/2003	7/14/2003	7/14/2003	7/14/2003	7/14/2003	7/14/2003
Non-Carcinogenic													
Acenaphthene	0.11	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	0.45	<0.05	<0.05	<0.05
Acenaphthylene	0.1	<0.05	<0.05	<0.05	<0.05	0.054	<0.05	<0.05	0.023	0.68	0.026	<0.05	<0.05
Anthracene	0.08	<0.05	<0.05	0.0021	<0.05	0.025	<0.05	<0.05	0.0073	0.27	0.0073	0.0047	0.0021
Benzo (g,h,i) Perylene	0.27	<0.05	<0.05	<0.05	0.01	0.1	<0.05	<0.05	0.048	0.85	0.024	<0.05	<0.05
Fluoranthene	0.71	<0.05	<0.05	<0.05	<0.05	0.25	<0.05	<0.05	0.077	2.7	0.064	0.026	0.0075
Fluorene	0.053	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.038	0.2	<0.05	<0.05	<0.05
Phenanthrene	0.5	<0.05	<0.05	0.0095	<0.05	0.17	<0.05	<0.05	0.039	2.4	0.051	0.033	0.0082
Pyrene	0.59	<0.05	<0.05	<0.05	<0.05	0.2	0.0071	<0.05	0.075	2.1	0.057	0.03	0.0081
Carcinogenic													
Benzo (a) Anthracene	0.12	<0.05	<0.05	<0.05	<0.05	0.036	<0.05	<0.05	0.011	0.28	0.0058	<0.05	<0.05
Benzo (a) Pyrene	0.26	<0.05	<0.05	0.015	0.012	0.085	0.0047	<0.05	0.031	0.77	0.017	0.0075	<0.05
Benzo (b) Fluoranthene	0.16	<0.05	<0.05	0.028	<0.05	0.073	<0.05	<0.05	0.03	0.61	0.014	0.0087	<0.05
Benzo (k) Fluoranthene	0.084	<0.05	<0.05	0.0079	<0.05	0.023	<0.05	<0.05	0.0085	0.16	0.0041	<0.05	<0.05
Chrysene	0.14	<0.05	<0.05	<0.05	<0.05	0.045	0.0032	<0.05	0.022	0.35	0.0098	0.0047	<0.05
Dibenz (a,h) Anthracene	0.028	0.0079	<0.05	<0.05	0.022	0.052	<0.05	<0.05	0.021	0.53	0.0098	<0.05	<0.05
Indeno (1,2,3-c,d) Pyrene	0.19	<0.05	<0.05	0.0059	0.0041	0.077	0.0043	<0.05	0.031	0.7	0.016	0.0028	<0.05
Naphthalene	0.23	<0.05	<0.05	0.31	<0.05	0.093	<0.05	<0.05	0.083	3.6	0.076	0.056	<0.05
Benzo (a) Pyrene (eq)	0.33	0.038	0.044	0.030	0.028	0.12	0.021	0.044	0.046	1.1	0.024	0.022	0.044

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	SRC-05			SRC-06			SRC-08			SRC-B4	SRC-B8	SRC-D2	SRC-D3
Sample ID	SRC-05-2.5	SRC-05-5.5	SRC-05-7.0	SRC-06-2.5	SRC-06-4.0	SRC-06-7.0	SRC-08-3.5	SRC-08-5.0	SRC-08-8.0	95071803	95071807	SRC-D2	SRC-D3
Sample Depth (feet)	2.5	5.5	7	2.5	4	7	3.5	5	8	4	2	-	-
Date Sampled	7/12/2003	7/12/2003	7/12/2003	7/15/2003	7/15/2003	7/15/2003	7/17/2003	7/17/2003	7/17/2003	7/18/1995	7/18/1995	7/18/2003	7/18/2003
Non-Carcinogenic													
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.33	<0.7	---	---
Acenaphthylene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.3	1.9	---	---
Anthracene	0.0026	<0.05	<0.05	0.002	<0.05	<0.05	0.0081	0.011	<0.05	0.17	1.3	---	---
Benzo (g,h,i) Perylene	<0.05	<0.05	<0.05	0.0084	<0.05	<0.05	0.025	0.11	<0.05	0.27	15	---	---
Fluoranthene	0.02	<0.05	<0.05	0.011	<0.05	<0.05	0.051	0.09	<0.05	1.1	18	---	---
Fluorene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.33	0.4	---	---
Phenanthrene	0.02	<0.05	<0.05	0.013	<0.05	<0.05	0.054	0.069	<0.05	1.3	10	---	---
Pyrene	0.019	0.0058	<0.05	0.011	<0.05	<0.05	0.047	0.096	<0.05	1.2	23	---	---
Carcinogenic													
Benzo (a) Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.0078	0.023	<0.05	0.24	5.1	---	---
Benzo (a) Pyrene	0.0069	<0.05	<0.05	0.0046	<0.05	<0.05	0.018	0.089	<0.05	0.39	14	---	---
Benzo (b) Fluoranthene	0.0057	<0.05	<0.05	<0.05	<0.05	<0.05	0.014	0.068	<0.05	0.26	10	---	---
Benzo (k) Fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.0054	0.022	<0.05	0.31	9.7	---	---
Chrysene	0.0042	<0.05	<0.05	0.0038	<0.05	<0.05	0.01	0.039	<0.05	0.37	10	---	---
Dibenz (a,h) Anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.013	0.069	<0.05	<0.33	<0.7	---	---
Indeno (1,2,3-c,d) Pyrene	0.006	<0.05	<0.05	0.0027	<0.05	<0.05	0.016	0.087	<0.05	0.23	12	---	---
Naphthalene	<0.05	<0.05	<0.05	<50	<0.05	<0.05	0.046	0.083	<0.05	0.31	1.3	0.13	2.4
Benzo (a) Pyrene (eq)	0.022	0.044	0.044	0.021	0.044	0.044	0.027	0.13	0.044	0.55	18		

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	SRC-D4	SRG-1-1	SRG-1-2	SRG-1-3	SW-01	SW-03	SW-04	SW-05	SW-06	SW-07		SW-10	SW-14
Sample ID	SRC-D4	SRG-1-1-0.5'	SRG-1-2-0.5'	SRG-1-3-0.7'	SW-01	SW-03	SW-04	SW05	SW06	SW07	SW27	SW-10	SW-14
Sample Depth (feet)	-	0.5	0.5	0.7	2*	1*	2*	2*	2*	2*	2*	2*	5*
Date Sampled	7/18/2003	11/1/1986	11/1/1986	11/1/1986	8/6/2004	8/6/2004	8/6/2004	8/9/2004	8/9/2004	8/9/2004	8/9/2004	8/12/2004	9/8/2004
Non-Carcinogenic													
Acenaphthene	---	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	---	8.2	<1	3.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	---	<1	<1	<1	0.041	0.033	0.014	<0.003	0.024	<0.003	0.0037	<0.003	<0.003
Benzo (g,h,i) Perylene	---	---	---	---	0.14	0.06	0.05	<0.003	0.076	<0.003	0.0093	<0.003	<0.003
Fluoranthene	---	---	---	---	0.36	0.22	0.14	<0.003	0.21	<0.003	0.017	<0.003	0.018
Fluorene	---	---	---	---	0.013	0.021	0.0077	<0.003	0.011	<0.003	<0.003	<0.003	0.019
Phenanthrene	---	48	<1	2	0.27	0.24	0.09	<0.003	0.14	<0.003	0.018	<0.003	<0.003
Pyrene	---	---	---	---	0.59	0.28	0.21	<0.003	0.28	<0.003	0.022	<0.003	<0.003
Carcinogenic													
Benzo (a) Anthracene	---	---	---	---	0.071	0.035	0.042	<0.003	<0.003	<0.003	0.0031	<0.003	<0.003
Benzo (a) Pyrene	---	---	---	---	0.19	0.096	0.12	<0.003	0.1	<0.003	0.0059	0.013	<0.003
Benzo (b) Fluoranthene	---	---	---	---	0.15	0.051	0.055	<0.003	0.062	<0.003	0.0043	<0.003	0.21
Benzo (k) Fluoranthene	---	---	---	---	0.066	0.026	0.038	<0.003	0.027	<0.003	<0.003	<0.003	<0.003
Chrysene	---	---	---	---	0.13	0.058	0.069	<0.003	0.053	<0.003	0.0047	<0.003	0.3
Dibenz (a,h) Anthracene	---	---	---	---	0.036	0.03	0.047	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Indeno (1,2,3-c,d) Pyrene	---	---	---	---	0.17	0.057	0.069	<0.003	0.1	<0.003	0.0042	0.0045	<0.003
Naphthalene	<0.05	<1	<1	<1	<0.002	<0.002	<0.002	<0.002	<0.002	0.0047	0.0078	<0.002	<0.002
Benzo (a) Pyrene (eq)					0.25	0.12	0.16	0.0026	0.12	0.0026	0.0078	0.014	0.026

Table 1
Summary of Current Soil Conditions – Concentrations of PAHs
Santa Rosa Site
Santa Rosa, California
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Station ID	SW-15	T-6-PIPE	T-8-SW-2.5-NE	T-8-SW-4.5-C	T-8-B-5.0-NE	T-8-B-5.0-SW	T-8-B-6.0-C	UST-EAST-N	UST-EAST-S	UST-WEST-N	UST-WEST-S
Sample ID	SW-15	T-6-PIPE	T-8-SW-2.5-NE	T-8-SW-4.5-C	T-8-B-5.0-NE	T-8-B-5.0-SW	T-8-B-6.0-C	UST-East-N@11'	UST-EAST-S@11'	UST-WEST-N@11'	UST-WEST-S@11'
Sample Depth (feet)	6*	2.5	2.5	4.5	5	5	6	11	11	11	11
Date Sampled	9/8/2004	2/24/2007	2/25/2007	2/25/2007	2/25/2007	2/25/2007	2/25/2007	6/3/2006	6/3/2006	6/3/2006	6/3/2006
Non-Carcinogenic											
Acenaphthene	<0.1	<0.500	<2.500	<12.000	<0.500	<0.050	<1.200	0.339	<0.050	0.385	<0.050
Acenaphthylene	<0.1	3.600	7.600	32.000	1.800	0.380	3.300	<0.0500	<0.050	<0.050	<0.050
Anthracene	<0.003	0.820	6.800	<12.000	<0.500	<0.050	2.500	0.218	<0.050	<0.050	<0.050
Benzo (g,h,i) Perylene	<0.003	6.900	14.000	<12.000	2.600	0.170	5.700	0.155	0.284	<0.050	<0.050
Fluoranthene	0.003	11.000	43.000	140.000	3.400	0.380	17.000	0.729	0.236	0.143	<0.050
Fluorene	<0.003	0.520	2.800	<12.000	<0.500	<0.050	<1.200	0.323	<0.050	0.350	<0.050
Phenanthrene	0.0053	6.300	24.000	<12.000	1.500	0.140	8.400	0.058	0.057	<0.050	<0.050
Pyrene	0.0067	7.600	21.000	60.000	2.000	0.150	8.400	1.530	0.707	0.404	0.204
Carcinogenic											
Benzo (a) Anthracene	<0.003	3.700	16.000	45.000	1.300	0.093	5.900	0.244	0.204	0.142	<0.050
Benzo (a) Pyrene	<0.003	7.900	21.000	55.000	2.600	0.170	7.800	0.109	0.171	<0.050	<0.050
Benzo (b) Fluoranthene	<0.003	4.900	14.000	33.000	1.600	0.090	5.200	<0.0500	0.112	<0.050	<0.050
Benzo (k) Fluoranthene	<0.003	2.900	10.000	28.000	1.000	0.059	3.700	<0.0500	0.138	<0.050	<0.050
Chrysene	<0.003	4.400	16.000	47.000	1.500	0.150	6.100	0.420	0.226	0.194	<0.050
Dibenz (a,h) Anthracene	<0.003	<0.500	<2.500	<12.000	<0.500	<0.050	<1.200	<0.0500	<0.050	<0.050	<0.050
Indeno (1,2,3-c,d) Pyrene	<0.003	6.000	11.000	19.000	1.500	0.069	4.100	<0.0500	0.192	<0.050	<0.050
Naphthalene	<0.002	6.200	8.800	<12.000	2.100	0.120	4.400	0.0556	<0.050	<0.050	0.0543
Benzo (a) Pyrene (eq)	0.0026	9.8	27	70	3.2	0.21	10	0.15	0.25	0.057	0.044

Notes:

* Sample depth is estimated
** Detection limit is unknown and assumed 0 for Benzo (a) Pyrene equivalent calculations
<# = not detected at or above value indicated
--- = not analyzed
Bold font indicates detections above the laboratory reporting limit
Benzo (a) Pyrene (eq) represent the sum of the concentration of each carcinogenic PAH multiplied by its toxicity equivalence factor (except for naphthalene)
PAH = polycyclic aromatic hydrocarbons

Table 2
Summary of Current Soil Conditions – Concentrations of TPH
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	TPH as Gasoline	TPH as Diesel	TPH as Motor Oil
0E	27-0E-15'	15	7/9/2002	---	18	99
	26-0E-20'	20	7/9/2002	---	620	1,200
20E	10-20E-5'	5	7/9/2002	---	2.7	14
	11-20E-10'	10	7/9/2002	---	4.2	9.2
	24-20E-15'	15	7/9/2002	---	58	120
	25-20E-20'	20	7/9/2002	---	150	210
40E	1-40E-5'	5	7/8/2002	---	180	200
	9-40E-10'	10	7/9/2002	---	15	18
	16-40E-15'	15	7/9/2002	---	1.5	4.5
	23-40E-20'	20	7/9/2002	---	280	310
60E	2-60E-5'	5	7/8/2002	---	230	240
	8-60E-10'	10	7/9/2002	---	4.8	14
	15-60E-15'	15	7/9/2002	---	130	210
	22-60E-20'	20	7/9/2002	---	1,000	580
80E	3-80E-5'	5	7/8/2002	---	29	62
	7-80E-10'	10	7/9/2002	---	78	45
	14-80E-15'	15	7/9/2002	---	2,100	3,100
	21-80E-20'	20	7/9/2002	---	69	80
	28-80E-25'	25	7/24/2002	---	58	74
100E	4-100E-5'	5	7/8/2002	---	4,100	6,000
	6-100E-10'	10	7/9/2002	---	280	270
	13-100E-15'	15	7/9/2002	---	290	1,500
	20-100E-20'	20	7/9/2002	---	140	510
	29-100E-25'	25	7/24/2002	---	120	280
120E	5-120E-5'	5	7/9/2002	---	83	120
	12-120E-10'	10	7/9/2002	---	5,800	9,100
	17-120E-15'	15	7/9/2002	---	2,500	8,000
	18-120E-20'	20	7/9/2002	---	89	310
	19-120E-25'	25	7/9/2002	---	29	94
140E	37-140E-10'	10	7/29/2002	---	1,000	1,300
	30-140E-15'	15	7/26/2002	---	170	320
160E	41-160E-10'	10	7/29/2002	---	110	64
	31-160E-15'	15	7/26/2002	---	59	160
	36-160E-20'	20	7/29/2002	---	8.7	42
180E	42-180E-10'	10	7/29/2002	---	120	250
	32-180E-15'	15	7/26/2002	---	150	300
	35-180E-20'	20	7/29/2002	---	5.6	12
	39-180E-25'	25	7/29/2002	---	940	1,100
200E	43-200E-10'	10	7/29/2002	---	180	1,000
	33-200E-15'	15	7/29/2002	---	180	450
	34-200E-20'	20	7/29/2002	---	<1.0	<2.0
	38-200E-25'	25	7/29/2002	---	<1.0	<2.0
220E	40-220E-25'	25	7/29/2002	---	2.1	8.1
A-30	A-30-1.0	1	3/9/2012	<0.26 (2)	2.6 (4)	<50 (8)
	A-30-2.0	2	3/9/2012	<0.25 (2)	7.0 (4)	<49 (8)
A-31	A-31-2.0	2	3/9/2012	<0.21 (2)	7.8 (4)	<50 (8)
A-32	A-32-2.0	2	3/8/2012	<0.18 (2)	10 (4)	<50 (8)
A-33	A-33-1.0	1	3/8/2012	<0.20 (2)	18 (4)	87 (8)
	A-33-2.0	2	3/8/2012	<0.28 (2)	31 (4)	210 (8)
A-34	A-34-2.0	2	3/8/2012	<0.16 (2)	14 (4)	97 (8)
A-35	A-35-2.0	2	3/7/2012	<0.19 (2)	55 (4)	200 (8)
B-101	B-101-5	5	4/19/1997	---	3,000	5,700
	B-101-10	10	4/19/1997	---	4,400	18,000
	B-101-15	15	4/19/1997	---	4,200	4,400
B-102	B-102-5	5	4/19/1997	---	1,800	1,300
	B-102-10	10	4/19/1997	---	2,600	1,500
	B-102-15	15	4/19/1997	---	1,600	1,900

Table 2
Summary of Current Soil Conditions – Concentrations of TPH
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	TPH as Gasoline	TPH as Diesel	TPH as Motor Oil
B-103	B-103-5	5	4/19/1997	---	2,300	7,600
	B-103-10	10	4/19/1997	---	360	1,500
	B-103-15	15	4/19/1997	---	9,100	10,000
B-104	B-104-5	5	4/19/1997	---	780	760
	B-104-10	10	4/19/1997	---	620	860
	B-104-15	15	4/19/1997	---	3,800	1,000
B-105	B-105-5'	5	10/11/2002	---	26	73
	B-105-10'	10	10/11/2002	---	<1.0	<2.0
	B-105-15'	15	10/11/2002	---	5.5	12
	B-105-20'	20	10/11/2002	---	29	33
	B-105-25'	25	10/11/2002	---	<1.0	<2.0
	B-105-30'	30	10/11/2002	---	2.4	3.2
B-106	B-106-5'	5	10/11/2002	---	10	67
	B-106-10'	10	10/11/2002	---	330	400
	B-106-15'	15	10/11/2002	---	21	64
	B-106-20'	20	10/11/2002	---	790	740
	B-106-25'	25	10/11/2002	---	1.6	2.9
	B-106-30'	30	10/11/2002	---	2.3	3.3
B-107	B-107-5'	5	10/11/2002	---	3.4	28
	B-107-10'	10	10/11/2002	---	550	1,600
	B-107-15'	15	10/11/2002	---	6.0	16
	B-107-20'	20	10/11/2002	---	1,900	1,700
	B-107-25'	25	10/11/2002	---	<1.0	<2.0
	B-107-30'	30	10/11/2002	---	2.2	2.8
B-108	B-108-5'	5	10/11/2002	---	30	130
	B-108-10'	10	10/11/2002	---	13	28
	B-108-15'	15	10/11/2002	---	<1.0	<2.0
	B-108-20'	20	10/11/2002	---	<1.0	<2.0
	B-108-25'	25	10/11/2002	---	<1.0	<2.0
	B-108-30'	30	10/11/2002	---	<1.0	<2.0
B-109	B-109-5'	5	2/3/2003	---	930 (6)	<1,000
	B-109-10'	10	2/3/2003	---	<5.0 (6)	<100
	B-109-15'	15	2/3/2003	---	<5.0 (6)	<100
	B-109-20'	20	2/3/2003	---	46 (6)	<100
	B-109-25'	25	2/3/2003	---	<5.0 (6)	<100
	B-109-30'	30	2/3/2003	---	300 (6)	<100
B-110	B-110-5'	5	2/3/2003	---	55 (6)	<100
	B-110-10'	10	2/3/2003	---	<5.0 (6)	<100
	B-110-15'	15	2/3/2003	---	<5.0 (6)	<100
	B-110-20'	20	2/3/2003	---	<5.0 (6)	<100
	B-110-25'	25	2/3/2003	---	<5.0 (6)	<100
	B-110-30'	30	2/3/2003	---	<5.0 (6)	<100
B-111	B-111-5'	5	2/3/2003	---	<5.0 (6)	<100
	B-111-10'	10	2/3/2003	---	<5.0 (6)	<100
	B-111-15'	15	2/3/2003	---	<5.0 (6)	<100
	B-111-20'	20	2/3/2003	---	<5.0 (6)	<100
	B-111-25'	25	2/3/2003	---	990 (6)	<100
	B-111-30'	30	2/3/2003	---	<5.0 (6)	<100
B-112	B-112-10.0'	10	2/4/2003	---	<5.0 (6)	<100
	B-112-15.0'	15	2/4/2003	---	<5.0 (6)	<100
	B-112-20.0'	20	2/4/2003	---	7,100 (6)	<5,000
	B-112-25.0'	25	2/4/2003	---	<5.0 (6)	<100
	B-112-30.0'	30	2/4/2003	---	<5.0 (6)	<100
B-113	B-113-5'	5	2/4/2003	---	360 (6)	<1,000
	B-113-10'	10	2/4/2003	---	<5.0 (6)	<100
	B-113-15'	15	2/4/2003	---	<5.0 (6)	<100
	B-113-20'	20	2/4/2003	---	10,000 (6)	<5,000
	B-113-25'	25	2/4/2003	---	91 (6)	<100
	B-113-30'	30	2/4/2003	---	65 (6)	<100

Table 2
Summary of Current Soil Conditions – Concentrations of TPH
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	TPH as Gasoline	TPH as Diesel	TPH as Motor Oil
B-114	B-114-5'	5	2/4/2003	---	<5.0 (6)	<100
	B-114-10'	10	2/4/2003	---	<5.0 (6)	<100
	B-114-15'	15	2/4/2003	---	<5.0 (6)	<100
	B-114-20'	20	2/4/2003	---	<5.0 (6)	<100
	B-114-25'	25	2/4/2003	---	<5.0 (6)	<100
	B-114-30'	30	2/4/2003	---	<5.0 (6)	<100
B-115	B-115-2'	2	2/4/2003	---	<5.0 (6)	<100
	B-115-7'	7	2/4/2003	---	550 (6)	<100
	B-115-12'	12	2/4/2003	---	<5.0 (6)	<100
	B-115-15'	15	2/4/2003	---	<5.0 (6)	<100
	B-115-20'	20	2/4/2003	---	<5.0 (6)	<100
	B-115-25'	25	2/4/2003	---	<5.0 (6)	<100
B-116	B-116-5'	5	2/4/2003	---	<5.0 (6)	<100
	B-116-10'	10	2/4/2003	---	<5.0 (6)	<100
	B-116-15'	15	2/4/2003	---	<5.0 (6)	<100
	B-116-20'	20	2/4/2003	---	<5.0 (6)	<100
	B-116-25'	25	2/4/2003	---	<5.0 (6)	<100
	B-116-30'	30	2/4/2003	---	<5.0 (6)	<100
B-117	B-117-3'	3	7/30/2003	---	<5.0 (6)	<100
	B-117-5'	5	7/30/2003	---	11 (6)	<100
	B-117-8.5'	8.5	7/30/2003	---	<5.0 (6)	<100
	B-117-10.5'	10.5	7/30/2003	---	27 (6)	<100
	B-117-15'	15	7/30/2003	---	<5.0 (6)	<100
	B-117-25'	25	7/30/2003	---	<5.0 (6)	<100
B-118	B-118-5'	5	7/30/2003	---	<5.0 (6)	<100
	B-118-10'	10	7/30/2003	---	<5.0 (6)	<100
	B-118-15'	15	7/30/2003	---	<5.0 (6)	<100
	B-118-20'	20	7/30/2003	---	2,000 (6)	<250
	B-118-25'	25	7/30/2003	---	<5.0 (6)	<100
	B-118-31'	31	7/30/2003	---	<5.0 (6)	<100
B-119	B-119-5'	5	7/31/2003	---	<5.0 (6)	<100
	B-119-10'	10	7/31/2003	---	<5.0 (6)	<100
	B-119-15'	15	7/31/2003	---	<5.0 (6)	<100
	B-119-20'	20	7/31/2003	---	<5.0 (6)	<100
	B-119-25'	25	7/31/2003	---	<5.0 (6)	<100
	B-119-30'	30	7/31/2003	---	<5.0 (6)	<100
B-120	B-120-5'	5	7/31/2003	---	<5.0 (6)	<100
	B-120-10'	10	7/31/2003	---	<5.0 (6)	<100
	B-120-15'	15	7/31/2003	---	<5.0 (6)	<100
	B-120-20'	20	7/31/2003	---	<5.0 (6)	<100
	B-120-25'	25	7/31/2003	---	1,100 (6)	<100
B-121	B-121-5'	5	8/1/2003	---	<5.0 (6)	<100
	B-121-10'	10	8/1/2003	---	<5.0 (6)	<100
	B-121-15'	15	8/1/2003	---	<5.0 (6)	<100
	B-121-20'	20	8/1/2003	---	<5.0 (6)	<100
	B-121-25'	25	8/1/2003	---	<5.0 (6)	<100
	B-121-30'	30	8/1/2003	---	<5.0 (6)	<100
B-122	B-122-2'	2	8/1/2003	---	<5.0 (6)	<100
	B-122-4.5'	4.5	8/1/2003	---	<5.0 (6)	<100
	B-122-5.5'	5.5	8/1/2003	---	<5.0 (6)	<100
	B-122-8'	8	8/1/2003	---	<5.0 (6)	<100
	B-122-10'	10	8/1/2003	---	310 (6)	<100
	B-122-15'	15	8/1/2003	---	<5.0 (6)	<100
B-123	B-123-7.5'	7.5	8/9/2003	---	<5.0 (6)	<100
	B-123-10.5'	10.5	8/9/2003	---	<5.0 (6)	<100
	B-123-15.5'	15.5	8/9/2003	---	<5.0 (6)	<100
	B-123-20'	20	8/9/2003	---	<5.0 (6)	<100
	B-123-25.5'	25.5	8/9/2003	---	<5.0 (6)	<100
	B-123-31'	31	8/9/2003	---	<5.0 (6)	<100

Table 2
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Station ID	Sample ID	Sample Depth (feet)	Date Sampled	TPH as Gasoline	TPH as Diesel	TPH as Motor Oil
B-124	B-124-5'	5	8/9/2003	---	<5.0 (6)	<100
	B-124-10'	10	8/9/2003	---	<5.0 (6)	<100
	B-124-15'	15	8/9/2003	---	31 (6)	<100
	B-124-20.5'	20.5	8/9/2003	---	<5.0 (6)	<100
B-125	B-125-2'	2	8/11/2003	---	<5.0 (6)	<100
	B-125-6'	6	8/11/2003	---	<5.0 (6)	<100
	B-125-10'	10	8/11/2003	---	<5.0 (6)	<100
	B-125-15'	15	8/11/2003	---	<5.0 (6)	<100
B-126	B-126-5'	5	8/11/2003	---	<5.0 (6)	<100
	B-126-10'	10	8/11/2003	---	<5.0 (6)	<100
	B-126-15'	15	8/11/2003	---	<5.0 (6)	<100
	B-126-20'	20	8/11/2003	---	<5.0 (6)	<100
	B-126-25'	25	8/11/2003	---	49 (6)	<100
B-127	B-127-3'	3	8/12/2003	---	<5.0 (6)	<100
	B-127-5'	5	8/12/2003	---	<5.0 (6)	<100
	B-127-10'	10	8/12/2003	---	<5.0 (6)	<100
	B-127-15'	15	8/12/2003	---	<5.0 (6)	<100
	B-127-20'	20	8/12/2003	---	1,500 (6)	<200
	B-127-25'	25	8/12/2003	---	<5.0 (6)	<100
B-128	B-128@26.0'	26	2/3/2004	---	9,700 (6)	<1,000
	B-128@30.0'	30	2/3/2004	---	82 (6)	<50
B-129	B-129@5.0'	5	2/4/2004	---	<5.0 (6)	<50
	B-129@11.0'	11	2/4/2004	---	<5.0 (6)	<50
	B-129@16.0'	16	2/4/2004	---	<5.0 (6)	<50
	B-129@21.0'	21	2/4/2004	---	<5.0 (6)	<50
	B-129@26.0'	26	2/4/2004	---	<5.0 (6)	<50
	B-129@30.5'	30.5	2/4/2004	---	<5.0 (6)	<50
B-130	B-130@5.0'	5	2/5/2004	---	<5.0 (6)	<50
	B-130@10.5'	10.5	2/5/2004	---	<5.0 (6)	<50
	B-130@15.5'	15.5	2/5/2004	---	520 (6)	<50
	B-130@20.5'	20.5	2/5/2004	---	<5.0 (6)	<50
	B-130@25.5'	25.5	2/5/2004	---	24 (6)	<50
	B-130@31.0'	31	2/5/2004	---	120 (6)	<50
B-131	B-131@10.0'	10	2/6/2004	---	<5.0 (6)	<50
	B-131@15.5'	15.5	2/6/2004	---	<5.0 (6)	<50
	B-131@20.5'	20.5	2/6/2004	---	210 (6)	<50
	B-131@25.5'	25.5	2/6/2004	---	20 (6)	<50
	B-131@30.5'	30.5	2/6/2004	---	110 (6)	<50
B-132	B-132@5.0'	5	2/9/2004	---	<5.0 (6)	<50
	B-132@11.0'	11	2/9/2004	---	<5.0 (6)	<50
	B-132@15.5'	15.5	2/9/2004	---	<5.0 (6)	<50
	B-132@20.5'	20.5	2/9/2004	---	<5.0 (6)	<50
	B-132@25.5'	25.5	2/9/2004	---	<5.0 (6)	<50
	B-132@30.5'	30.5	2/9/2004	---	<5.0 (6)	<50
B-133	B-133@5'	5	6/22/2004	---	<5.0 (6)	<50
	B-133@10'	10	6/22/2004	---	<5.0 (6)	<50
	B-133@15'	15	6/22/2004	---	240 (6)	69
	B-133@20'	20	6/22/2004	---	<5.0 (6)	<50
	B-133@25.5'	25.5	6/22/2004	---	<5.0 (6)	<50
	B-133@30.5'	30.5	6/22/2004	---	<5.0 (6)	<50
B-134	B-134@5'	5	6/22/2004	---	<5.0 (6)	<50
	B-134@10'	10	6/22/2004	---	<5.0 (6)	<50
	B-134@15'	15	6/22/2004	---	610 (6)	9,200
	B-134@20'	20	6/22/2004	---	160 (6)	<50
	B-134@27'	27	6/22/2004	---	<5.0 (6)	<50
	B-134@30.5'	30.5	6/22/2004	---	<5.0 (6)	<50

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B-135	B-135@5'	5	6/22/2004	---	<5.0 (6)	<50
	B-135@10'	10	6/22/2004	---	<5.0 (6)	<50
	B-135@15'	15	6/22/2004	---	<5.0 (6)	<50
	B-135@20'	20	6/22/2004	---	<5.0 (6)	<50
	B-135@25'	25	6/22/2004	---	<5.0 (6)	<50
	B-135@30.5'	30.5	6/22/2004	---	<5.0 (6)	<50
BC-01	BC-01	0*	8/6/2004	<5.0 (1)	<1.0 (5)	<50
	BC-21	0*	8/6/2004	<5.0 (1)	<1.0 (5)	<50
BC-02	BC-02	0*	8/6/2004	<5.0 (1)	<1.0 (5)	<50
BC-03	BC-03	0*	8/6/2004	<5.0 (1)	<1.0 (5)	<50
BC-04	BC-04	0*	8/6/2004	<5.0 (1)	<1.0 (5)	<50
BC-05	BC-05	0*	8/6/2004	<5.0 (1)	<1.0 (5)	<50
BC-06	BC-06	0*	8/7/2004	<5.0 (1)	<1.0 (5)	<50
BC-07	BC07	0	8/9/2004	<1.0	<5.0	<50
BC-08	BC08	0	8/9/2004	<1.0	<5.0	<50
BC-09	BC09	0	8/9/2004	1.1	<5.0	<50
BC-10	BC10	0	8/9/2004	3.7	58	<50
BC-11	BC11	0	8/9/2004	<1.0	<5.0	<50
BC-12	BC-12	1.5*	9/8/2004	<5.0 (1)	1.2 (5)	<50
BC-13	BC-13	3*	9/8/2004	<5.0 (1)	<1.0 (5)	<50
BC-17	BC-17	0*	9/14/2004	5.3 (1)	1.1 (5)	<50
BC-18	BC-18	0*	9/14/2004	<5.0 (1)	<1.0 (5)	<50
BC-19	BC-19	2*	9/15/2004	<1.0	<5.0	<50
BC-20	BC-20	2*	9/15/2004	<1.0	<5.0	<50
BH-13	BH-13@5 ft.	5	5/18/1988	---	---	712 (9)
	BH-13@10 ft.	10	5/18/1988	---	---	18.7 (9)
	BH-13@15 ft.	15	5/18/1988	---	---	25 (9)
BH-15	BH-15@5 ft.	5	5/18/1988	---	---	2,875 (9)
	BH-15@10 ft.	10	5/18/1988	---	---	2,222 (9)
	BH-15@15 ft.	15	5/18/1988	---	---	7,500 (9)
BH-16	BH-16@5 ft.	5	5/18/1988	---	---	625 (9)
	BH-16@10 ft.	10	5/18/1988	---	---	3,890 (9)
	BH-16@15 ft.	15	5/18/1988	---	---	50 (9)
CB-1	CB-1-4.0	4	1/31/2008	---	7.5 (4)	<49 (8)
	CB-1-5.0	5	1/31/2008	---	8.0 (4)	<50 (8)
	CB-1-10.0	10	1/31/2008	---	2,600 (4)	5,100 (8)
	CB-1-14.0	14	1/31/2008	---	1,000 (4)	3,400 (8)
	CB-1-20.0	20	1/31/2008	---	1,200 (4)	1,700 (8)
	CB-1-24.0	24	1/31/2008	---	200 (4)	220 (8)
	CB-1-30.5	30.5	1/31/2008	0.38 (2)	66 (4)	87 (8)
	CB-1-35.5	35.5	1/31/2008	---	15 (4)	<50 (8)
	CB-1-39.0	39	1/31/2008	---	<0.99 (4)	<49 (8)
CB-2	CB-2-4.5	4.5	1/28/2008	---	2.4 (4)	<50 (8)
	CB-2-11.0	11	1/28/2008	---	<0.99 (4)	<49 (8)
	CB-2-15.0	15	1/28/2008	---	<1.0 (4)	<50 (8)
	CB-2-23.0	23	1/28/2008	97 (2)	12,000 (4)	19,000 (8)
	CB-2-27.0	27	1/28/2008	<0.19 (2)	4.2 (4)	<50 (8)
CB-3	CB-3-4.5	4.5	1/29/2008	<0.23 (2)	---	---
	CB-3-9.0	9	1/29/2008	<0.33 (2)	160 (4)	660 (8)
	CB-3-11.5	11.5	1/29/2008	---	140 (4)	570 (8)
	CB-3-15.0	15	1/29/2008	---	1.3 (4)	<50 (8)
	CB-3-23.5	23.5	1/29/2008	17 (2)	1,500 (4)	2100 (8)
	CB-3-28.0	28	1/29/2008	---	2.3 (4)	<49 (8)
CB-4	CB-4-4.5	4.5	1/30/2008	---	3.9 (4)	<50 (8)
	CB-4-5.5	5.5	1/30/2008	---	12 (4)	<50 (8)
	CB-4-12.75	12.75	1/30/2008	<0.25 (2)	260 (4)	610 (8)
	CB-4-15.0	15	1/30/2008	---	1.4 (4)	<49 (8)
	CB-4-22.0	22	1/30/2008	210 (2)	4,400 (4)	5,200 (8)
	CB-4-29.5	29.5	1/30/2008	---	4.7 (4)	<49 (8)

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CB-5	CB-5-5.0	5	1/30/2008	---	2.1 (4)	<50 (8)
	CB-5-8.5	8.5	1/30/2008	<0.24 (2)	410 (4)	1,400 (8)
	CB-5-13.5	13.5	1/30/2008	---	1,100 (4)	2,200 (8)
	CB-5-17.5	17.5	1/30/2008	---	3.1 (4)	<50 (8)
	CB-5-25.0	25	1/30/2008	<0.23 (2)	130 (4)	170 (8)
	CB-5-29.0	29	1/30/2008	---	6.2 (4)	<50 (8)
	CB-5-38.5	38.5	1/30/2008	---	<0.99 (4)	<50 (8)
CB-6	CB-6-5.5	5.5	1/29/2008	---	13 (4)	<50 (8)
	CB-6-10.5	10.5	1/29/2008	---	76 (4)	160 (8)
	CB-6-13.5	13.5	1/29/2008	0.8 (2)	5,500 (4)	7,200 (8)
	CB-6-21.5	21.5	1/29/2008	---	92 (4)	190 (8)
	CB-6-27.0	27	1/29/2008	0.5 (2)	950 (4)	1,300 (8)
	CB-6-30.5	30.5	1/29/2008	2.1 (2)	740 (4)	930 (8)
	CB-6-38.5	38.5	1/29/2008	0.69 (2)	80 (4)	110 (8)
	CB-6-40.5	40.5	1/29/2008	<0.19 (2)	2.4 (4)	<49 (8)
CB-7	CB-7-5.5	5.5	1/31/2008	---	5.5 (4)	<50 (8)
	CB-7-10.5	10.5	1/31/2008	---	21 (4)	110 (8)
	CB-7-15.5	15.5	1/31/2008	---	470 (4)	3,500 (8)
	CB-7-21.5	21.5	1/31/2008	<0.19 (2)	2.7 (4)	<50 (8)
	CB-7-24.0	24	1/31/2008	---	11 (4)	<49 (8)
	CB-7-26.5	26.5	1/31/2008	---	<1.0 (4)	<50 (8)
	CB-7-30.5	30.5	1/31/2008	---	<0.99 (4)	<49 (8)
	CB-7-35.0	35	1/31/2008	---	<1.0 (4)	<50 (8)
	CB-7-39.0	39	1/31/2008	---	<0.99 (4)	<50 (8)
CB-8	CB-8-2.5	2.5	2/1/2008	---	1,100 (4)	4,200 (8)
	CB-8-5.5	5.5	2/1/2008	---	44 (4)	210 (8)
	CB-8-12.5	12.5	2/1/2008	---	1,900 (4)	2,600 (8)
	CB-8-17.5	17.5	2/1/2008	140 (2)	650 (4)	770 (8)
	CB-8-21.5	21.5	2/1/2008	---	21 (4)	<49 (8)
	CB-8-26.0	26	2/1/2008	---	<0.99 (4)	<50 (8)
	CB-8-30.5	30.5	2/1/2008	---	4.1 (4)	<50 (8)
	CB-8-36.0	36	2/1/2008	---	1.5 (4)	<50 (8)
	CB-8-45.0	45	2/1/2008	---	<0.99 (4)	<50 (8)
	CB-8-47.5	47.5	2/1/2008	---	2.9 (4)	<49 (8)
CB-9	CB-9-3.0	3	1/28/2008	---	190 (4)	390 (8)
	CB-9-10.0	10	1/28/2008	<0.18 (2)	16 (4)	<50 (8)
	CB-9-15.0	15	1/28/2008	---	15,000 (4)	11,000 (8)
	CB-9-17.5	17.5	1/28/2008	390 (2)	2,500 (4)	2,800 (8)
	CB-9-25.5	25.5	1/28/2008	---	3.7 (4)	<49 (8)
CB-10	CB-10-11.0	11	1/30/2008	---	74 (4)	460 (8)
	CB-10-14.5	14.5	1/30/2008	---	1.8 (4)	<50 (8)
	CB-10-20.0	20	1/30/2008	<35 (2)	260 (4)	320 (8)
	CB-10-24.0	24	1/30/2008	6.3 (2)	1,400 (4)	1,500 (8)
	CB-10-29.0	29	1/30/2008	---	390 (4)	460 (8)
	CB-10-35.0	35	1/30/2008	---	10 (4)	<50 (8)
	CB-10-37.5	37.5	1/30/2008	---	3.4 (4)	<50 (8)
	CB-10-39	39	1/30/2008	---	<0.99 (4)	<50 (8)
CB-11	CB-11-4.5	4.5	1/28/2008	---	1.6 (4)	<49 (8)
	CB-11-10.0	10	1/28/2008	---	<0.99 (4)	<50 (8)
	CB-11-15.0	15	1/28/2008	---	6.0 (4)	<50 (8)
	CB-11-22.0	22	1/28/2008	240 (2)	7,800 (4)	9,000 (8)
	CB-11-25.0	25	1/28/2008	---	26 (4)	<50 (8)
CB-12	CB-12-17.5	17.5	3/1/2008	170 (2)	4,700 (4)	4,900 (8)
	CB-12-30.0	30	3/1/2008	---	19 (4)	<49 (8)
	CB-12-35.0	35	3/1/2008	---	<1.0 (4)	<50 (8)
	CB-12-40.0	40	3/1/2008	---	<0.99 (4)	<50 (8)
	CB-12-48.0	48	3/1/2008	---	<1.0 (4)	<50 (8)

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CS-1	CS-1-4.0	4	8/18/2008	<0.19 (2)	8.3 (4)	<50 (8)
	CS-1-8.0	8	8/18/2008	<0.18 (2)	4.7 (4)	<50 (8)
	CS-1-12.0	12	8/18/2008	<0.18 (2)	6.4 (4)	<50 (8)
	CS-1-16.0	16	8/18/2008	<0.18 (2)	1.2 (4)	<50 (8)
	CS-1-20.0	20	8/18/2008	<0.18 (2)	1.5 (4)	<50 (8)
	CS-1-24.0	24	8/18/2008	<0.19 (2)	<1.0 (4)	<50 (8)
	CS-1-28.0	28	8/18/2008	<0.21 (2)	<1.0 (4)	<50 (8)
	CS-1-31.5	31.5	8/18/2008	<0.18 (2)	<1.0 (4)	<50 (8)
CS-3	CS-3-4.0	4	8/18/2008	<0.24 (2)	3.1 (4)	<50 (8)
	CS-3-8.0	8	8/18/2008	<0.19 (2)	<1.0 (4)	<50 (8)
	CS-3-12.0	12	8/18/2008	0.69 (2)	1.8 (4)	<50 (8)
	CS-3-16.0	16	8/18/2008	0.97 (2)	9.9 (4)	<50 (8)
	CS-3-20.0	20	8/18/2008	0.6 (2)	6.3 (4)	<50 (8)
	CS-3-21.75	21.75	8/18/2008	<0.24 (2)	22 (4)	<50 (8)
CSA-1	CSA-1-2.0	2	6/11/2013	<0.24 (2)	2,000 (4)	2,400 (8)
CSA-2	CSA-2-2.0	2	6/11/2013	<0.28 (2)	320 (4)	500 (8)
CSB-1	CSB-1-2.0	2	6/13/2013	<0.24 (2)	45 (4)	79 (8)
CSB-2	CSB-2-0.5	0.5	6/14/2013	<0.22 (2)	170 (4)	380 (8)
CSC-1	CSC-1-2.0	2	6/3/2013	<0.23 (2)	18 (4)	68 (8)
CSC-3	CSC-3-2.0	2	6/4/2013	<0.21 (2)	13 (4)	77 (8)
CSC-4	CSC-4-1.0	1	6/5/2013	<0.26 (2)	9.1 (4)	<49 (8)
CSC-5	CSC-5-2.0	2	6/5/2013	<0.20 (2)	14 (4)	<50 (8)
CSC-6	CSC-6-1.5	1.5	6/12/2013	<0.24 (2)	77 (4)	72 (8)
CSD-1	CSD-1-2.0	2	5/23/2013	39 (2)	270 (4)	530 (8)
CSD-2	CSD-2-2.0	2	5/24/2013	<0.19 (2)	58 (4)	100 (8)
CSD-4	CSD-4-2.0	2	5/30/2013	<0.19 (2)	140 (4)	140 (8)
CSE-1	CSE-1-2.0	2	5/29/2013	<0.21 (2)	57 (4)	130 (8)
CSE-2	CSE-2-2.0	2	5/30/2013	<0.21 (2)	25 (4)	140 (8)
CSE-3	CSE-3-1.0	1	6/3/2013	<0.19 (2)	69 (4)	360 (8)
CSE-4	CSE-4-2.0	2	6/5/2013	<0.22 (2)	38 (4)	170 (8)
CSE-5	CSE-5-1.0	1	6/6/2013	<0.22 (2)	3.8 (4)	<50 (8)
CSE-6	CSE-6-2.0	2	6/10/2013	<0.21 (2)	94 (4)	130 (8)
CSF-1	CSF-1-2.0	2	6/6/2013	<0.22 (2)	25 (4)	110 (8)
CSF-2	CSF-2-2.0	2	6/6/2013	<0.23 (2)	38 (4)	150 (8)
CSF-3	CSF-3-2.0	2	6/7/2013	<0.23 (2)	730 (4)	1,300 (8)
CSF-4	CSF-4-1.0	1	6/7/2013	<0.23 (2)	15 (4)	87 (8)
CSF-5	CSF-5-2.0	2	6/7/2013	<0.23 (2)	1.3 (4)	<49 (8)
CSF-6	CSF-6-0.5	0.5	6/7/2013	<0.27 (2)	62 (4)	110 (8)
CSF-7	CSF-7-2.0	2	6/10/2013	<0.20 (2)	150 (4)	270 (8)
CSF-8	CSF-8-2.0	2	6/14/2013	<0.21 (2)	73 (4)	140 (8)
CSF-9	CSF-9-2.0	2	6/25/2013	<0.22 (2)	120 (4)	420 (8)
CSF-10	CSF-10-2.0	2	6/25/2013	<0.20 (2)	140 (4)	170 (8)
CSG-1	CSG-1-2.0	2	5/15/2013	<0.23 (2)	160 (4)	270 (8)
CSG-2	CSG-2-2.0	2	5/21/2013	<0.23 (2)	4.1 (4)	<50 (8)
CSG-5	CSG-5-1.0	1	5/22/2013	<0.20 (2)	770 (4)	1,200 (8)
EBAMW-1	EBAMW-1@13.5	13.5	11/17/2008	---	<10	<10
	EBAMW-1@18.5	18.5	11/17/2008	---	908	544
	EBAMW-1@23	23	11/17/2008	---	<10	<10
	EBAMW-1@26	26	11/17/2008	---	<10	<10
EBAMW-2	EBAMW-2@9.5	9.5	11/18/2008	---	<10	<10
	EBAMW-2@18.5	18.5	11/18/2008	---	<10	<10
	EBAMW-2@23.5	23.5	11/18/2008	---	387	152
	EBAMW-2@29	29	11/18/2008	---	<10	<10
EBASB-1	EBASB-1@9.5	9.5	11/18/2008	---	<10	<10
	EBASB-1@18.5	18.5	11/18/2008	---	118	97.3
	EBASB-1@24.5	24.5	11/18/2008	---	<10	<10
	EBASB-1@26	26	11/18/2008	---	2,330	1,270
	EBASB-1@29	29	11/18/2008	---	<10	<10

Table 2
Summary of Current Soil Conditions – Concentrations of TPH
Santa Rosa Site
Santa Rosa, California
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Station ID	Sample ID	Sample Depth (feet)	Date Sampled	TPH as Gasoline	TPH as Diesel	TPH as Motor Oil
EBASB-2	EBASB-2@9.5	9.5	11/19/2008	---	143	278
	EBASB-2@19	19	11/19/2008	---	484	371
	EBASB-2@24	24	11/19/2008	---	204	157
	EBASB-2@26.0-26.5	26	11/19/2008	---	64	81
	EBASB-2@33.0-33.5	33	11/19/2008	---	<1.0	<50
	EBASB-2@38.5-39.0	38.5	11/19/2008	---	<1.0	<50
EBASB-3	EBASB-3@9.5	9.5	11/20/2008	---	---	<10
	EBASB-3@18.5	18.5	11/20/2008	---	<10	<10
	EBASB-3@24.5	24.5	11/20/2008	---	<10	<10
	EBASB-3@29	29	11/20/2008	---	<10	<10
EBASB-4	EBASB-4@8	8	12/1/2008	---	11.7	64.8
	EBASB-4@20	20	12/1/2008	---	7,970	4,110
	EBASB-4@23	23	12/1/2008	---	<10	<10
	EBASB-4@27.5	27.5	12/1/2008	---	4,390	2,470
	EBASB-4@34.5-35.0	34.5	12/1/2008	---	1.5	<50
EBASB-5	EBASB-5@10	10	12/1/2008	---	4,280	4,330
	EBASB-5@19	19	12/2/2008	---	2,940	5,270
	EBASB-5@25	25	12/2/2008	---	92.9	69.6
	EBASB-5@34.0-34.5	34	12/2/2008	---	<0.99	<49
	EBASB-5@40.5-41.0	40.5	12/2/2008	---	<1.0	<50
	EBASB-5@41.5	41.5	12/2/2008	---	<10	<10
EBASB-6	EBASB-6@8.5	8.5	12/2/2008	---	7,960	2,900
	EBASB-6@11.5-12.0	11.5	12/2/2008	---	7,900	8,000
	EBASB-6@14.5	14.5	12/2/2008	---	3,370	2,500
	EBASB-6@29.5	29.5	12/2/2008	---	<10	<10
	EBASB-6@50.5	50.5	12/2/2008	---	<10	<10
EBASB-7	EBASB-7@9.5	9.5	11/18/2008	---	<10	<10
	EBASB-7@18.5	18.5	11/18/2008	---	555	403
	EBASB-7@26	26	11/18/2008	---	72.4	69.2
	EBASB-7@29	29	11/19/2008	---	463	344
ET-EAST-1	ET-EAST-1-10.0	10	5/31/2013	<0.25 (2)	18 (4)	<49 (8)
ET-EAST-2	ET-EAST-2-10.0	10	5/31/2013	<0.23 (2)	1,200 (4)	2,700 (8)
ET-WEST-1	ET-WEST-1-9.0	9	6/1/2013	<0.20 (2)	98 (4)	240 (8)
FC-1	FC-1-12.5	12.5	4/5/2011	<2,100 (2)	27,000 (4)	<15,000 (8)
	FC-1-15.5	15.5	4/5/2011	3,000 (2)	27,000 (4)	<15,000 (8)
	FC-1-19.0	19	4/5/2011	2,500 (2)	29,000 (4)	<14,000 (8)
	FC-1-21.5	21.5	4/5/2011	5,000 (2)	40,000 (4)	<30,000 (8)
FC-2	FC-2-11.0	11	4/6/2011	4,200 (2)	21,000 (4)	7,000 (8)
	FC-2-15.5	15.5	4/6/2011	2,400 (2)	30,000 (4)	<14,000 (8)
	FC-2-17.5	17.5	4/6/2011	2,800 (2)	29,000 (4)	<14,000 (8)
	FC-2-21.0	21	4/6/2011	3,700 (2)	14,000 (4)	<14,000 (8)
FC-3	FC-3-12.0	12	4/6/2011	<370 (2)	8,700 (4)	<14,000 (8)
	FC-3-13.75	13.75	4/6/2011	940 (2)	28,000 (4)	<15,000 (8)
	FC-3-18.0	18	4/6/2011	2,100 (2)	28,000 (4)	<15,000 (8)
	FC-3-21.5	21.5	4/6/2011	<4,100 (2)	37,000 (4)	<15,000 (8)
FC-4	FC-4-11.5	11.5	4/7/2011	4,400 (2)	36,000 (4)	<14,000 (8)
	FC-4-13.5	13.5	4/7/2011	3,300 (2)	28,000 (4)	<15,000 (8)
	FC-4-18.0	18	4/7/2011	1,300 (2)	29,000 (4)	<15,000 (8)
	FC-4-20.0	20	4/7/2011	2,800 (2)	29,000 (4)	<15,000 (8)
FC-5	FC-5-10.0	10	4/7/2011	1,800 (2)	18,000 (4)	<14,000 (8)
	FC-5-14.5	14.5	4/7/2011	2,200 (2)	32,000 (4)	<14,000 (8)
	FC-5-18.0	18	4/7/2011	750 (2)	22,000 (4)	<15,000 (8)
	FC-5-19-5	19.5	4/7/2011	640 (2)	42,000 (4)	<15,000 (8)
FC-6	FC-6-14.5	14.5	4/7/2011	490 (2)	18,000 (4)	8,400 (8)
	FC-6-16.0	16	4/7/2011	1,800 (2)	20,000 (4)	<6,000 (8)
	FC-6-18.0	18	4/7/2011	3,000 (2)	36,000 (4)	<15,000 (8)
	FC-6-21.0	21	4/7/2011	2,200 (2)	69,000 (4)	<30,000 (8)

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Station ID	Sample ID	Sample Depth (feet)	Date Sampled	TPH as Gasoline	TPH as Diesel	TPH as Motor Oil
MW-3	MW3-10'	10	12/1/1987	---	---	105
	MW3-15'	15	12/1/1987	---	---	23
MW-5	MW-5@5'	5	4/27/1988	---	---	<10
	MW-5@10'	10	4/27/1988	---	---	138
	MW-5@15'	15	4/27/1988	---	---	<10
	MW-5@20'	20	4/27/1988	---	---	<10
MW-7	MW-7 5 ft.	5	4/19/1988	---	---	<10
	MW-7 10 ft.	10	4/19/1988	---	---	<10
MW-8	MW-8-5	5	1/23/1999	---	4.9	53
	MW-8-9.5	9.5	1/23/1999	---	110	380
	MW-8-14.5	14.5	1/23/1999	---	3.3	<2.0
MW-9	MW-9-5.5	5.5	1/23/1999	---	2.4	6.7
	MW-9-9.5	9.5	1/23/1999	---	2,400	5,300
	MW-9-14.5	14.5	1/23/1999	---	1,600	1,400
MW-10	MW-10-8	8	3/3/2005	<0.5	<10	<10
	MW-10-11	11	3/3/2005	<0.5	51	91
MW-11	MW-11-10.5	10.5	3/3/2005	<0.5	<10	<10
	MW-11-24	24	3/3/2005	1.6	500	210
MW-12	MW-12-15.5	15.5	3/3/2005	<0.5	<10	<10
	MW-12-24	24	3/3/2005	0.9	230	97
	DUPLICATE A	24.5	3/3/2005	0.9	1,000	690
MW-13	MW-13-15.5	15.5	3/2/2005	<0.5	<10	<10
	MW-13-20	20	3/2/2005	<0.5	<10	<10
MW-14	MW-14-9.5	9.5	3/4/2005	<0.5	<10	<10
	MW-14-20.5	20.5	3/4/2005	0.9	6,100	2,400
MW-15	MW-15-11.5	11.5	3/2/2005	<0.5	<10	<10
	MW-15-17.5	17.5	3/2/2005	<0.5	<10	<10
	MW-15-22.5	22.5	3/2/2005	<0.5	2,800	3,000
MW-16	MW-16-8	8	3/1/2005	<0.5	<10	<10
	MW-16-23.5	23.5	3/1/2005	4.4	1,400	800
MW-17	MW-17-9	9	3/2/2005	<0.5	<10	<10
	MW-17-16	16	3/2/2005	<0.5	<10	<10
MW-18	MW-18-10	10	3/4/2005	<0.5	<10	<10
	MW-18-15.5	15.5	3/4/2005	<0.5	<10	<10
MW-19	MW-19-5	5	11/14/2006	<0.21	17	<25
	MW-19-11	11	11/14/2006	<0.22	5.3	<25
	MW-19-15	15	11/14/2006	<0.22	<5.0	<25
	DUP-111406	19.5	11/14/2006	0.78	<5.0	<25
	MW-19-19.5	19.5	11/14/2006	0.66	<5.0	<25
	MW-19-26	26	11/14/2006	1.5	8.8	<25
MW-19D	MW-19D-16	16	6/13/2009	0.93 (2)	21 (4)	<49 (8)
	MW-19D-23.5	23.5	6/13/2009	44 (2)	150 (4)	160 (8)
	MW-19D-27.5	27.5	6/13/2009	1.8 (2)	4.2 (4)	<50 (8)
MW-20	MW-20-6	6	2/23/2007	<0.21	20	67
	MW-20-10.5	10.5	2/23/2007	0.21	75	120
	MW-20-15.5	15.5	2/23/2007	<0.50	<5.0	<25
	MW-20-20.5	20.5	2/23/2007	<0.50	<5.0	<25
MW-21	MW-21-32.5	32.5	3/3/2008	---	2.3 (4)	<50 (8)
	MW-21-35.5	35.5	3/3/2008	---	1.3 (4)	<50 (8)
	MW-21-37.5	37.5	3/3/2008	---	<0.99 (4)	<49 (8)
MW-22	MW-22-21.5	21.5	6/11/2009	140 (2)	5,400 (4)	8,800 (8)
PA-1	PA-1-2.0	2	4/11/2011	<0.09 (2)	400 (4)	1,100 (8)
PA-2	PA-2-2.0	2	4/11/2011	<0.085 (2)	110 (4)	600 (8)
PA-3	PA-3-1.25	1.25	4/11/2011	0.17 (2)	3,000 (4)	5,600 (8)
PA-4	PA-4-2.0	2	4/12/2011	<0.15 (2)	16 (4)	35 (8)
PA-5	PA-5-2.0	2	4/12/2011	<0.12 (2)	87 (4)	160 (8)
PA-6	PA-6-2.0	2	4/12/2011	<0.098 (2)	140 (4)	300 (8)
PA-8	PA-8-2.0	2	4/12/2011	<0.084 (2)	11 (4)	26 (8)

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PA-9	PA-9-2.0	2	4/12/2011	<0.11 (2)	66 (4)	140 (8)
PA-10	PA-10	2	4/13/2011	<0.088 (2)	7.3 (4)	<1.7 (8)
PA-11	PA-11	2	4/13/2011	0.21 (2)	17 (4)	<1.7 (8)
PA-12	PA-12	2	4/13/2011	<0.097 (2)	22 (4)	<1.7 (8)
PA-13	PA-13	2	4/14/2011	<0.085 (2)	14 (4)	<1.7 (8)
PA-14	PA-14	2	4/13/2011	<0.061 (2)	220 (4)	360 (8)
PA-15	PA-15-2	2	7/13/2011	<0.14 (2)	65 (3)	140 (7)
PA-16	PA-16-2	2	7/13/2011	<0.1 (2)	280 (3)	700 (7)
PA-17	PA-17-2	2	7/13/2011	<0.1 (2)	450 (3)	760 (7)
PA-18	PA-18-1	1	7/14/2011	<0.087 (2)	53 (3)	110 (7)
	PA-18-2	2	7/14/2011	<0.084 (2)	24 (3)	54 (7)
PA-20	PA-20-2	2	7/14/2011	<0.086 (2)	18 (3)	53 (7)
PA-21	PA-21-2	2	7/14/2011	<0.086 (2)	8.3 (3)	29 (7)
PA-22	PA-22-2	2	7/14/2011	<0.093 (2)	1.3 (3)	8.2 (7)
PA-23	PA-23-1	1	7/14/2011	<0.089 (2)	7.5 (3)	50 (7)
	PA-23-2	2	7/14/2011	<0.081 (2)	9.3 (3)	42 (7)
PA-24	PA-24-1	1	7/14/2011	<0.092 (2)	6.5 (3)	25 (7)
	PA-24-2	2	7/14/2011	<0.094 (2)	3.4 (3)	23 (7)
PA-25	PA-25-1	1	7/13/2011	<0.11 (2)	76 (3)	160 (7)
	PA-25-2	2	7/13/2011	<0.14 (2)	6.3 (3)	21 (7)
PA-27	PA-27-2	2	7/13/2011	<0.087 (2)	2.4 (3)	19 (7)
PA-28	PA-28-2	2	7/13/2011	<0.087 (2)	20 (3)	81 (7)
PH03	ENV-PH03-2	2	6/18/2004	<0.5	13	39
PH-10	PH-10	2.5*	9/29/2004	<1.0	<5.0	<50
PH-11	PH-11	2.5*	9/29/2004	<1.0	<5.0	<50
PIT CENTER	Pit Center@12'	12	6/3/2006	---	1,600	878
	Pit Center@16'	16	6/3/2006	---	5,280	2,680
	Pit Center@20'	20	6/3/2006	---	4,050	1,960
PM-1	PM-1-19	19	6/15/2009	2.5 (2)	370 (4)	620 (8)
RT-1	RT-1-10	10	7/19/2006	<0.50	<5.0	<25
	RT-1-15	15	7/19/2006	<0.23	<5.0	<25
	RT-1-20	20	7/19/2006	2.7	<5.0	<25
	RT-1-25	25	7/19/2006	2.5	<5.0	<25
	RT-1-37	37	7/19/2006	24	11	<25
RT-2	RT-2-30	30	7/19/2006	6,500	400	47
	RT-2-35	35	7/19/2006	7.5	21	<25
	RT-2-41.5	41.5	7/19/2006	8.8	18	<25
RT-3	RT-3-10	10	7/20/2006	<0.50	<5.0	<25
	RT-3-20	20	7/20/2006	<0.50	<5.0	<25
	RT-3-25	25	7/20/2006	27	<5.0	<25
RT-4	RT-4-10	10	7/20/2006	<0.50	<5.0	<25
	RT-4-20	20	7/20/2006	<0.50	<5.0	<25
	RT-4-25	25	7/20/2006	<0.50	<5.0	<25
RT-5	RT-5-30	30	7/20/2006	100	7.2	<25
RW-1	RW1-25	25	6/12/2009	<41 (2)	92 (4)	120 (8)
	RW1-30	30	6/12/2009	<45 (2)	<1.0 (4)	<50 (8)
RW-5	RW-5-23.5	23.5	6/11/2009	<0.19 (2)	8.2 (4)	<50 (8)
	RW-5-28.0	28	6/11/2009	<46 (2)	<1.0 (4)	<50 (8)
SD-1	SD-1-15.0	15	1/29/2008	---	210 (4)	780 (8)
SD-2	SD-2-5.0	5	2/4/2008	---	15 (4)	59 (8)
	SD-2-10.0	10	2/4/2008	---	<1.0 (4)	<50 (8)
	SD-2-14.5	14.5	2/4/2008	---	<0.99 (4)	<49 (8)
	SD-2-20.0	20	2/4/2008	---	<0.99 (4)	<49 (8)
	SD-2-25.0	25	2/4/2008	---	<0.99 (4)	<50 (8)
	SD-2-27.5	27.5	2/4/2008	<0.20 (2)	<0.99 (4)	<49 (8)
	SD-2-35.0	35	2/4/2008	---	1.4 (4)	<50 (8)
	SD-2-40.0	40	2/4/2008	---	<0.99 (4)	<49 (8)
	SD-2-45.0	45	2/4/2008	---	<0.99 (4)	<50 (8)
	SD-2-52.0	52	2/4/2008	---	<0.99 (4)	<50 (8)

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SD-3	SD-3-4.5	4.5	2/5/2008	---	<1.0 (4)	<50 (8)
	SD-3-9.5	9.5	2/5/2008	---	<0.99 (4)	<50 (8)
	SD-3-17.0	17	2/5/2008	<0.20 (2)	<0.99 (4)	<49 (8)
	SD-3-23.0	23	2/5/2008	---	<0.99 (4)	<50 (8)
SD-4	SD-4-5.5	5.5	2/5/2008	---	<0.99 (4)	<50 (8)
	SD-4-9.5	9.5	2/5/2008	---	<1.0 (4)	<50 (8)
	SD-4-17.5	17.5	2/5/2008	<0.19 (2)	<0.99 (4)	<50 (8)
	SD-4-22.0	22	2/5/2008	---	<0.99 (4)	<49 (8)
	SD-4-27.0	27	2/5/2008	---	<1.0 (4)	<50 (8)
SD-5	SD-5-3.5	3.5	2/6/2008	---	<0.99 (4)	<50 (8)
	SD-5-11.0	11	2/6/2008	---	<1.0 (4)	<50 (8)
	SD-5-15.5	15.5	2/6/2008	<0.18 (2)	<0.99 (4)	<49 (8)
	SD-5-20.0	20	2/6/2008	---	<0.99 (4)	<50 (8)
	SD-5-24.0	24	2/6/2008	---	<0.99 (4)	<50 (8)
SD-6	SD-6-4.5	4.5	2/6/2008	---	14 (4)	64 (8)
	SD-6-7.5	7.5	2/6/2008	---	18 (4)	69 (8)
	SD-6-12.0	12	2/6/2008	---	1.0 (4)	<50 (8)
	SD-6-15.0	15	2/6/2008	---	3.7 (4)	<50 (8)
	SD-6-16.5	16.5	2/6/2008	<0.22 (2)	3.2 (4)	<50 (8)
	SD-6-18.5	18.5	2/6/2008	<0.21 (2)	1.1 (4)	<49 (8)
SD-7	SD-7-5.0	5	2/6/2008	---	<0.99 (4)	<50 (8)
	SD-7-10.0	10	2/6/2008	---	<0.99 (4)	<49 (8)
	SD-7-15.0	15	2/6/2008	---	<1.0 (4)	<50 (8)
	SD-7-20.0	20	2/6/2008	---	<0.98 (4)	<49 (8)
	SD-7-24.0	24	2/6/2008	<0.19 (2)	<1.0 (4)	<50 (8)
SD-8	SD-8-6.5	6.5	2/7/2008	---	1.6 (4)	<49 (8)
	SD-8-18.5	18.5	2/7/2008	45 (2)	1,600 (4)	2,200 (8)
	SD-8-26.0	26	2/7/2008	---	1.5 (4)	<49 (8)
	SD-8-39.0	39	2/7/2008	---	<0.99 (4)	<50 (8)
	SD-8-49.0	49	2/7/2008	<0.35 (2)	2.0 (4)	<50 (8)
SD-9	SD-9-12.0	12	2/8/2008	<0.23 (2)	24 (4)	59 (8)
	SD-9-19.5	19.5	2/8/2008	2.9 (2)	750 (4)	930 (8)
SD-11	SD-11-15.0	15	2/8/2008	<0.21 (2)	<1.0 (4)	<50 (8)
SD-12	SD-12-15.0	15	3/2/2008	---	<0.99 (4)	<50 (8)
SIDEWALL-E	Sidewall-E@5'	5	6/3/2006	---	ND	ND
SIDEWALL-N	Sidewall-N@6'	6	6/3/2006	---	411	342
SIDEWALL-S	Sidewall-S@5'	5	6/3/2006	---	567	949
SIDEWALL-W	Sidewall-W@7'	7	6/3/2006	---	ND	ND
SR-1	SR-1-6.5	6.5	11/15/2006	<0.21	<5.0	<25
	SR-1-9.5	9.5	11/15/2006	<0.21	<5.0	<25
	SR-1-15	15	11/15/2006	<0.22	<5.0	<25
	SR-1-20	20	11/15/2006	<0.21	<5.0	<25
	SR-1-25	25	11/15/2006	<0.19	<5.0	<25
SR-2	SR-2-15.5	15.5	11/15/2006	<0.21	5.8	<25
	SR-2-22	22	11/15/2006	0.31	410	560
	SR-2-26.5	26.5	11/15/2006	<0.22	<5.0	<25
SR-4	SR-4-5.5	5.5	11/16/2006	<0.50	<5.0	<25
	SR-4-10.5	10.5	11/16/2006	<0.50	<5.0	<25
	SR-4-15	15	11/16/2006	<0.50	280	980
	SR-4-20.5	20.5	11/16/2006	110	3,700	5,400
SRC-01	SRC-01-2.5	2.5	7/11/2003	<0.28	<5.0	<25
	SRC-01-5.5	5.5	7/11/2003	<0.5	<5.0	<25
	SRC-01-7.0	7	7/11/2003	<0.5	<5.0	<25
SRC-02	SRC-02-4.0	4	7/11/2003	0.92	<5.0	<25
	SRC-02-7.0	7	7/11/2003	<0.57	<5.0	<25
SRC-03	SRC-03-4.0	4	7/12/2003	<0.5	<5.0	<25
	SRC-03-5.5	5.5	7/12/2003	<0.5	<5.0	<25
	SRC-03-7.0	7	7/15/2003	<0.5	<5.0	<25

Table 2
Summary of Current Soil Conditions – Concentrations of TPH
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	TPH as Gasoline	TPH as Diesel	TPH as Motor Oil
SRC-04	SRC-04-2.5	2.5	7/14/2003	<0.5	<5.0	<25
	SRC-04-3.5	3.5	7/14/2003	0.56	8.8	110
	SRC-04-3.5 ENCORE	3.5	7/14/2003	1.4	---	---
	SRC-04-4.0	4	7/14/2003	<0.5	<5.0	<25
	SRC-04-4.0 ENCORE	4	7/14/2003	<0.97	---	---
	SRC-04-5.5	5.5	7/14/2003	<0.5	<5.0	<25
	SRC-04-7.0	7	7/14/2003	<0.5	<5.0	<25
SRC-05	SRC-05-2.5	2.5	7/12/2003	<0.5	<5.0	<25
	SRC-05-5.5	5.5	7/12/2003	<0.5	<5.0	<25
	SRC-05-7.0	7	7/15/2003	<0.5	<5.0	<25
SRC-06	SRC-06-2.5	2.5	7/15/2003	<0.5	<5.0	<25
	SRC-06-4.0	4	7/15/2003	<0.4	<5.0	<25
	SRC-06-7.0	7	7/15/2003	<0.5	<5.0	<25
SRC-08	SRC-08-3.5	3.5	7/17/2003	<0.5	<5.0	<25
	SRC-08-5.0	5	7/17/2003	<0.5	<5.0	<25
	SRC-08-5.0 ENCORE	5	7/17/2003	<0.32	---	---
	SRC-08-8.0	8	7/17/2003	<0.5	<5.0	<25
SRC-B4	95071803	4	7/18/1995	<1.0	230	<200
SRC-B8	95071807	2	7/18/1995	<1.0	1,200	2,300
SW-01	SW-01	2*	8/6/2004	<5.0 (1)	<1.0 (5)	<50
SW-03	SW-03	1*	8/6/2004	<5.0 (1)	<1.0 (5)	<50
SW-04	SW-04	2*	8/6/2004	<5.0 (1)	<1.0 (5)	<50
SW-05	SW05	2*	8/9/2004	<1.0	<5.0	<50
SW-06	SW06	2*	8/9/2004	<1.0	<5.0	<50
SW-07	SW07	2*	8/9/2004	<1.0	<5.0	<50
	SW27	2*	8/9/2004	<1.0	<5.0	<50
SW-10	SW-10	2*	8/12/2004	<5.0 (1)	<1.0 (5)	<50
SW-14	SW-14	5*	9/8/2004	410 (1)	17 (5)	<50
SW-15	SW-15	6*	9/8/2004	<5.0 (1)	<1.0 (5)	<50
T-6-PIPE	T-6-PIPE	2.5	2/24/2007	0.42	120	250
T-8-SW-2.5-NE	T-8-SW-2.5-NE	2.5	2/25/2007	<0.50	1,500	2,800
T-8-SW-4.5-C	T-8-SW-4.5-C	4.5	2/25/2007	<0.50	5,600	8,900
T-8-B-5.0-NE	T-8-B-5.0-NE	5	2/25/2007	<0.50	32	60
T-8-B-5.0-SW	T-8-B-5.0-SW	5	2/25/2007	<0.50	<5.0	<25
T-8-B-6.0-C	T-8-B-6.0-C	6	2/25/2007	<0.50	11	<25
UST-EAST-N	UST-East-N@11'	11	6/3/2006	---	553	330
UST-EAST-S	UST-East-S@11'	11	6/3/2006	---	26.5	33.2
UST-WEST-N	UST-West-N@11'	11	6/3/2006	---	1,050	550
UST-WEST-S	UST-West-S@11'	11	6/3/2006	---	361	347

Notes:

(1) Lab analyses was for TPH carbon chain C4-C12
(2) Lab analyses was for TPH carbon chain C5-C12
(3) Lab analyses was for TPH carbon chain C10-C24
(4) Lab analyses was for TPH carbon chain C10-C28
(5) Lab analyses was for TPH-extractable
(6) Lab analyses was for Total Recoverable Petroleum Hydrocarbons (TRPH)
(7) Lab analyses was for TPH carbon chain C19-C36
(8) Lab analyses was for TPH carbon chain C24-C36
(9) Lab analyses was for TPH-Heavy
* Sample depth is estimated
<# = not detected at or above value indicated
--- = not analyzed
Bold font indicates detections above the laboratory reporting limit
TPH = Total Petroleum Hydrocarbons
ND = not detected

Table 3
Summary of Current Soil Conditions – Concentrations of BTEX
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Xylenes, total
A-30	A-30-1.0	1	3/9/2012	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.010
	A-30-2.0	2	3/9/2012	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098
A-31	A-31-2.0	2	3/9/2012	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0082
A-32	A-32-2.0	2	3/8/2012	<0.0037	<0.0037	<0.0037	---	---	<0.0074
A-33	A-33-1.0	1	3/8/2012	<0.0039	<0.0039	<0.0039	---	---	<0.0079
	A-33-2.0	2	3/8/2012	<0.0056	<0.0056	<0.0056	---	---	<0.011
A-34	A-34-2.0	2	3/8/2012	<0.0032	<0.0032	<0.0032	---	---	<0.0063
A-35	A-35-2.0	2	3/7/2012	<0.0038	<0.0038	<0.0038	---	---	<0.0077
BC-01	BC-01	0*	8/6/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	BC-21	0*	8/6/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-02	BC-02	0*	8/6/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-03	BC-03	0*	8/6/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-04	BC-04	0*	8/6/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-05	BC-05	0*	8/6/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-06	BC-06	0*	8/7/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-07	BC07	0	8/9/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-08	BC08	0	8/9/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-09	BC09	0	8/9/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-10	BC10	0	8/9/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-11	BC11	0	8/9/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-12	BC-12	1.5*	9/8/2004	<0.005	<0.005	<0.005	<0.002	<0.002	<0.015
BC-13	BC-13	3*	9/8/2004	<0.005	<0.005	<0.005	<0.002	<0.002	<0.015
BC-17	BC-17	0*	9/14/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-18	BC-18	0*	9/14/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-19	BC-19	2*	9/15/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
BC-20	BC-20	2*	9/15/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
CB-1	CB-1-30.5	30.5	1/31/2008	<0.0041	<0.0041	<0.0041	---	---	<0.0081
CB-2	CB-2-23.0	23	1/28/2008	<0.75	<0.75	<0.75	---	---	<1.5
	CB-2-27.0	27	1/28/2008	<0.0038	<0.0038	<0.0038	---	---	<0.0076
CB-3	CB-3-4.5	4.5	1/29/2008	0.013	0.0048	<0.0045	---	---	<0.0091
	CB-3-9.0	9	1/29/2008	0.24	0.0093	<0.0067	---	---	<0.013
	CB-3-23.5	23.5	1/29/2008	<0.0041	<0.0041	<0.0041	---	---	<0.0083
CB-4	CB-4-12.75	12.75	1/30/2008	<0.0049	<0.0049	<0.0049	---	---	<0.0099
	CB-4-22.0	22	1/30/2008	<1.2	<1.2	<1.2	---	---	<2.3
CB-5	CB-5-8.5	8.5	1/30/2008	0.019	<0.0048	<0.0048	---	---	<0.0096
	CB-5-25.0	25	1/30/2008	<0.0047	<0.0047	<0.0047	---	---	<0.0094

Table 3
Summary of Current Soil Conditions – Concentrations of BTEX
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Xylenes, total
CB-6	CB-6-13.5	13.5	1/29/2008	0.39	0.039	<0.0047	---	---	0.019
	CB-6-27.0	27	1/29/2008	<0.0036	<0.0036	<0.0036	---	---	<0.0072
	CB-6-30.5	30.5	1/29/2008	<0.0040	<0.0040	<0.0040	---	---	<0.0079
	CB-6-38.5	38.5	1/29/2008	<0.0037	<0.0037	<0.0037	---	---	<0.0074
	CB-6-40.5	40.5	1/29/2008	<0.0039	<0.0039	<0.0039	---	---	<0.0078
CB-7	CB-7-21.5	21.5	1/31/2008	<0.0037	<0.0037	<0.0037	---	---	<0.0075
CB-8	CB-8-17.5	17.5	2/1/2008	<0.93	<0.93	<0.93	---	---	<1.9
CB-9	CB-9-10.0	10	1/28/2008	0.02	<0.0035	<0.0035	---	---	<0.0070
	CB-9-17.5	17.5	1/28/2008	<0.77	<0.77	<0.77	---	---	<1.5
CB-10	CB-10-20.0	20	1/30/2008	<0.70	<0.70	<0.70	---	---	<1.4
	CB-10-24.0	24	1/30/2008	<0.0038	<0.0038	<0.0038	---	---	<0.0076
CB-11	CB-11-22.0	22	1/28/2008	<0.83	<0.83	<0.83	---	---	<1.7
CB-12	CB-12-17.5	17.5	3/1/2008	<0.77	<0.77	<0.77	---	---	<1.5
CS-1	CS-1-4.0	4	8/18/2008	<0.0039	<0.0039	<0.0039	---	---	<0.0077
	CS-1-8.0	8	8/18/2008	0.0049	<0.0036	<0.0036	---	---	<0.0072
	CS-1-12.0	12	8/18/2008	0.006	<0.0037	<0.0037	---	---	<0.0073
	CS-1-16.0	16	8/18/2008	<0.0037	<0.0037	<0.0037	---	---	<0.0074
	CS-1-20.0	20	8/18/2008	0.0073	<0.0037	<0.0037	---	---	<0.0074
	CS-1-24.0	24	8/18/2008	0.006	<0.0038	<0.0038	---	---	<0.0076
	CS-1-28.0	28	8/18/2008	0.0077	<0.0041	<0.0041	---	---	<0.0082
	CS-1-31.5	31.5	8/18/2008	0.0056	<0.0037	<0.0037	---	---	<0.0074
CS-3	CS-3-4.0	4	8/18/2008	0.0058	<0.0049	<0.0049	---	---	<0.0098
	CS-3-8.0	8	8/18/2008	<0.0039	<0.0039	<0.0039	---	---	<0.0078
	CS-3-12.0	12	8/18/2008	0.21	<0.0042	0.0082	---	---	<0.0083
	CS-3-16.0	16	8/18/2008	0.21	0.018	0.038	---	---	0.021
	CS-3-20.0	20	8/18/2008	0.17	0.012	0.015	---	---	0.01
	CS-3-21.75	21.75	8/18/2008	0.032	<0.0048	<0.0048	---	---	<0.0096
CSA-1	CSA-1-2.0	2	6/11/2013	0.027	0.0071	<0.0049	---	---	<0.0098
CSA-2	CSA-2-2.0	2	6/11/2013	<0.0056	<0.0056	<0.0056	---	---	<0.011
CSB-1	CSB-1-2.0	2	6/13/2013	<0.0049	<0.0049	<0.0049	---	---	<0.0098
CSB-2	CSB-2-0.5	0.5	6/14/2013	<0.0044	<0.0044	<0.0044	---	---	<0.0089
CSC-1	CSC-1-2.0	2	6/3/2013	<0.0047	<0.0047	<0.0047	---	---	<0.0093
CSC-3	CSC-3-2.0	2	6/4/2013	<0.0042	<0.0042	<0.0042	---	---	<0.0084
CSC-4	CSC-4-1.0	1	6/5/2013	<0.0053	<0.0053	<0.0053	---	---	<0.011
CSC-5	CSC-5-2.0	2	6/5/2013	<0.0040	<0.0040	<0.0040	---	---	<0.0079
CSC-6	CSC-6-1.5	1.5	6/12/2013	<0.0048	<0.0048	<0.0048	---	---	<0.0097

Table 3
Summary of Current Soil Conditions – Concentrations of BTEX
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Xylenes, total
CSD-1	CSD-1-2.0	2	5/23/2013	<0.43	<0.43	0.71	---	---	5.2
CSD-2	CSD-2-2.0	2	5/24/2013	<0.0039	<0.0039	<0.0039	---	---	<0.0083
CSD-4	CSD-4-2.0	2	5/30/2013	<0.0039	<0.0039	<0.0039	---	---	<0.0078
CSE-1	CSE-1-2.0	2	5/29/2013	<0.0043	<0.0043	<0.0043	---	---	<0.0085
CSE-2	CSE-2-2.0	2	5/30/2013	<0.0042	<0.0042	<0.0042	---	---	<0.0084
CSE-3	CSE-3-1.0	1	6/3/2013	<0.0039	<0.0039	<0.0039	---	---	<0.0078
CSE-4	CSE-4-2.0	2	6/5/2013	<0.0044	<0.0044	<0.0044	---	---	<0.0088
CSE-5	CSE-5-1.0	1	6/6/2013	<0.0045	<0.0045	<0.0045	---	---	<0.0089
CSE-6	CSE-6-2.0	2	6/10/2013	<0.0041	<0.0041	<0.0041	---	---	<0.0082
CSF-1	CSF-1-2.0	2	6/6/2013	<0.0044	<0.0044	<0.0044	---	---	<0.0088
CSF-2	CSF-2-2.0	2	6/6/2013	<0.0045	<0.0045	<0.0045	---	---	<0.0091
CSF-3	CSF-3-2.0	2	6/7/2013	0.090	0.010	<0.0046	---	---	<0.0092
CSF-4	CSF-4-1.0	1	6/7/2013	<0.0047	<0.0047	<0.0047	---	---	<0.0093
CSF-5	CSF-5-2.0	2	6/7/2013	<0.0045	<0.0045	<0.0045	---	---	<0.0091
CSF-6	CSF-6-0.5	0.5	6/7/2013	0.0085	<0.0053	<0.0053	---	---	<0.011
CSF-7	CSF-7-2.0	2	6/10/2013	<0.0040	<0.0040	<0.0040	---	---	<0.0079
CSF-8	CSF-8-2.0	2	6/14/2013	<0.0042	<0.0042	<0.0042	---	---	<0.0084
CSF-9	CSF-9-2.0	2	6/25/2013	<0.0044	<0.0044	<0.0044	---	---	<0.0088
CSF-10	CSF-10-2.0	2	6/25/2013	<0.0040	<0.0040	<0.0040	---	---	<0.0080
CSG-1	CSG-1-2.0	2	5/15/2013	0.027	<0.0045	<0.0045	---	---	<0.0090
CSG-2	CSG-2-2.0	2	5/21/2013	<0.0046	<0.0046	<0.0046	---	---	<0.0092
CSG-5	CSG-5-1.0	1	5/22/2013	<0.0041	<0.0041	<0.0041	---	---	<0.0081
EBAMW-1	EBAMW-1@13.5	13.5	11/17/2008	<0.00118	<0.00118	<0.00118	<0.00118	<0.00118	<0.00118
	EBAMW-1@18.5	18.5	11/17/2008	<0.00119	<0.00119	<0.00119	<0.00119	<0.00119	<0.00119
	EBAMW-1@23	23	11/17/2008	<0.00131	<0.00131	<0.00131	<0.00131	<0.00131	<0.00131
EBAMW-2	EBAMW-2@9.5	9.5	11/18/2008	<0.00127	<0.00127	<0.00127	<0.00127	<0.00127	<0.00127
	EBAMW-2@18.5	18.5	11/18/2008	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	EBAMW-2@23.5	23.5	11/18/2008	<0.2	<0.2	0.209	<0.2	<0.2	<0.2
EBASB-1	EBASB-1@9.5	9.5	11/18/2008	<0.00139	<0.00139	<0.00139	<0.00139	<0.00139	<0.00139
	EBASB-1@18.5	18.5	11/18/2008	<0.00131	<0.00131	<0.00131	<0.00131	<0.00131	<0.00131
	EBASB-1@26	26	11/18/2008	<0.00132	<0.00132	<0.00132	<0.00132	<0.00132	<0.00132
EBASB-2	EBASB-2@9.5	9.5	11/19/2008	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133
	EBASB-2@19	19	11/19/2008	<0.00136	<0.00136	<0.00136	<0.00136	<0.00136	<0.00136
	EBASB-2@24	24	11/19/2008	<0.00126	<0.00126	<0.00126	<0.00126	<0.00126	<0.00126
EBASB-3	EBASB-3@9.5	9.5	11/20/2008	<0.00157	<0.00157	<0.00157	<0.00157	<0.00157	<0.00157
	EBASB-3@18.5	18.5	11/20/2008	<0.00127	<0.00127	<0.00127	<0.00127	<0.00127	<0.00127
	EBASB-3@24.5	24.5	11/20/2008	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013

Table 3
Summary of Current Soil Conditions – Concentrations of BTEX
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Xylenes, total
EBASB-4	EBASB-4@8	8	12/1/2008	<0.00149	<0.00149	<0.00149	<0.00149	<0.00149	<0.00149
	EBASB-4@20	20	12/1/2008	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	EBASB-4@23	23	12/1/2008	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	EBASB-4@27.5	27.5	12/1/2008	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EBASB-5	EBASB-5@10	10	12/1/2008	1.8	0.283	0.234	<0.2	<0.2	<0.2
	EBASB-5@19	19	12/2/2008	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	EBASB-5@25	25	12/2/2008	<0.00127	<0.00127	<0.00127	<0.00127	<0.00127	<0.00127
EBASB-6	EBASB-6@8.5	8.5	12/2/2008	0.179	0.0197	0.0259	0.0117	0.0177	0.0294
	EBASB-6@14.5	14.5	12/2/2008	1.32	<0.2	<0.2	<0.2	<0.2	<0.2
	EBASB-6@29.5	29.5	12/2/2008	<0.00123	<0.00123	<0.00123	<0.00123	<0.00123	<0.00123
EBASB-7	EBASB-7@9.5	9.5	11/18/2008	<0.00141	<0.00141	<0.00141	<0.00141	<0.00141	<0.00141
	EBASB-7@18.5	18.5	11/18/2008	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	EBASB-7@29	29	11/19/2008	<0.00125	<0.00125	<0.00125	<0.00125	<0.00125	<0.00125
ET-EAST-1	ET-EAST-1-10.0	10	5/31/2013	<0.0050	<0.0050	<0.0050	---	---	<0.010
ET-EAST-2	ET-EAST-2-10.0	10	5/31/2013	0.016	<0.0047	<0.0047	---	---	<0.0094
ET-WEST-1	ET-WEST-1-9.0	9	6/1/2013	<0.0041	<0.0041	<0.0041	---	---	<0.0082
FC-1	FC-1-12.5	12.5	4/5/2011	900	240	66	---	---	81
	FC-1-15.5	15.5	4/5/2011	1,400	260	79	---	---	84
	FC-1-19.0	19	4/5/2011	1,100	210	65	---	---	68
	FC-1-21.5	21.5	4/5/2011	1,800	240	82	---	---	81
FC-2	FC-2-11.0	11	4/6/2011	1,700	310	98	---	---	100
	FC-2-15.5	15.5	4/6/2011	940	180	76	---	---	55
	FC-2-17.5	17.5	4/6/2011	1,000	240	100	---	---	75
	FC-2-21.0	21	4/6/2011	1,500	270	130	---	---	85
FC-3	FC-3-12.0	12	4/6/2011	53	19	13	---	---	<15
	FC-3-13.75	13.75	4/6/2011	370	86	50	---	---	32
	FC-3-18.0	18	4/6/2011	940	200	67	---	---	66
	FC-3-21.5	21.5	4/6/2011	920	190	120	---	---	64
FC-4	FC-4-11.5	11.5	4/7/2011	1,800	340	100	---	---	100
	FC-4-13.5	13.5	4/7/2011	1,300	230	61	---	---	68
	FC-4-18.0	18	4/7/2011	340	130	74	---	---	66
	FC-4-20.0	20	4/7/2011	1,300	240	26	---	---	81
FC-5	FC-5-10.0	10	4/7/2011	490	180	80	---	---	73
	FC-5-14.5	14.5	4/7/2011	860	170	54	---	---	53
	FC-5-18.0	18	4/7/2011	290	99	50	---	---	44
	FC-5-19-5	19.5	4/7/2011	200	58	40	---	---	31

Table 3
Summary of Current Soil Conditions – Concentrations of BTEX
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Xylenes, total
FC-6	FC-6-14.5	14.5	4/7/2011	48	19	31	---	---	18
	FC-6-16.0	16	4/7/2011	510	160	56	---	---	65
	FC-6-18.0	18	4/7/2011	1,200	210	68	---	---	76
	FC-6-21.0	21	4/7/2011	1,000	220	77	---	---	83
MW-10	MW-10-8	8	3/3/2005	<0.005	<0.005	<0.005	---	---	<0.005
	MW-10-11	11	3/3/2005	<0.005	<0.005	<0.005	---	---	<0.005
MW-11	MW-11-10.5	10.5	3/3/2005	<0.005	<0.005	<0.005	---	---	<0.005
	MW-11-24	24	3/3/2005	<0.005	<0.005	<0.005	---	---	<0.005
MW-12	MW-12-15.5	15.5	3/3/2005	<0.005	<0.005	<0.005	---	---	<0.005
	MW-12-24	24	3/3/2005	<0.005	<0.005	<0.005	---	---	<0.005
	DUPLICATE A	24.5	3/3/2005	<0.005	<0.005	<0.005	---	---	<0.005
MW-13	MW-13-15.5	15.5	3/2/2005	<0.005	<0.005	<0.005	---	---	<0.005
	MW-13-20	20	3/2/2005	<0.005	<0.005	<0.005	---	---	<0.005
MW-14	MW-14-9.5	9.5	3/4/2005	<0.005	<0.005	<0.005	---	---	<0.005
	MW-14-20.5	20.5	3/4/2005	<0.005	<0.005	<0.005	---	---	<0.005
MW-15	MW-15-11.5	11.5	3/2/2005	<0.005	<0.005	<0.005	---	---	<0.005
	MW-15-17.5	17.5	3/2/2005	<0.005	<0.005	<0.005	---	---	<0.005
	MW-15-22.5	22.5	3/2/2005	<0.005	<0.005	<0.005	---	---	<0.005
MW-16	MW-16-8	8	3/1/2005	<0.005	<0.005	<0.005	---	---	<0.005
	MW-16-23.5	23.5	3/1/2005	<0.005	<0.005	<0.005	---	---	<0.005
MW-17	MW-17-9	9	3/2/2005	<0.005	<0.005	<0.005	---	---	<0.005
	MW-17-16	16	3/2/2005	<0.005	<0.005	<0.005	---	---	<0.005
MW-18	MW-18-10	10	3/4/2005	<0.005	<0.005	<0.005	---	---	<0.005
	MW-18-15.5	15.5	3/4/2005	<0.005	<0.005	<0.005	---	---	<0.005
MW-19	DUP-111406	19.5	11/14/2006	<0.00087	<0.00087	<0.00087	<0.00087	<0.0017	<0.0017
	MW-19-19.5	19.5	11/14/2006	0.0011	<0.00087	<0.00087	<0.00087	<0.0017	<0.0017
	MW-19-26	26	11/14/2006	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005
MW-19D	MW-19D-16	16	6/13/2009	0.023	<0.0043	<0.0043	---	---	<0.0086
	MW-19D-23.5	23.5	6/13/2009	0.85	<0.82	2	---	---	<1.6
	MW-19D-27.5	27.5	6/13/2009	0.021	<0.0042	0.026	---	---	<0.0085
MW-20	MW-20-10.5	10.5	2/23/2007	<0.00079	<0.00079	<0.00079	<0.00079	<0.0016	<0.0016
MW-22	MW-22-21.5	21.5	6/11/2009	<0.9	<0.9	<0.9	---	---	<1.8
PA-1	PA-1-2.0	2	4/11/2011	0.00044	<0.00018	<0.00032	---	---	<0.00047
PA-2	PA-2-2.0	2	4/11/2011	0.00067	<0.00017	<0.00031	---	---	<0.00044
PA-3	PA-3-1.25	1.25	4/11/2011	0.11	0.0077	0.00039	---	---	0.001
PA-4	PA-4-2.0	2	4/12/2011	<0.00045	<0.0003	<0.00054	---	---	<0.00078

Table 3
Summary of Current Soil Conditions – Concentrations of BTEX
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Xylenes, total
PA-5	PA-5-2.0	2	4/12/2011	<0.00036	<0.00024	<0.00043	---	---	<0.00062
PA-6	PA-6-2.0	2	4/12/2011	0.00036	<0.0002	<0.00035	---	---	<0.00051
PA-8	PA-8-2.0	2	4/12/2011	<0.00025	<0.00017	<0.0003	---	---	<0.00044
PA-9	PA-9-2.0	2	4/12/2011	<0.00034	<0.00022	<0.0004	---	---	<0.00058
PA-10	PA-10	2	4/13/2011	<0.00027	<0.00018	<0.00032	---	---	<0.00046
PA-11	PA-11	2	4/13/2011	<0.00026	<0.00017	<0.00031	---	---	<0.00044
PA-12	PA-12	2	4/13/2011	<0.00029	<0.00019	<0.00035	---	---	<0.0005
PA-13	PA-13	2	4/14/2011	<0.00026	<0.00017	<0.00031	---	---	<0.00044
PA-14	PA-14	2	4/13/2011	<0.00018	<0.00012	<0.00022	---	---	<0.00031
PA-15	PA-15-2	2	7/13/2011	<0.00049	<0.00075	<0.00052	---	---	<0.00075
PA-16	PA-16-2	2	7/13/2011	<0.00034	<0.00052	<0.00036	---	---	<0.00052
PA-17	PA-17-2	2	7/13/2011	0.00062	<0.00053	<0.00037	---	---	<0.00053
PA-18	PA-18-1	1	7/14/2011	<0.00029	<0.00045	<0.00031	---	---	0.0021
	PA-18-2	2	7/14/2011	0.0014	<0.00044	<0.00030	---	---	<0.00044
PA-20	PA-20-2	2	7/14/2011	<0.00029	<0.00045	<0.00031	---	---	<0.00045
PA-21	PA-21-2	2	7/14/2011	<0.00029	<0.00045	<0.00031	---	---	<0.00045
PA-22	PA-22-2	2	7/14/2011	<0.00032	<0.00048	<0.00034	---	---	<0.00048
PA-23	PA-23-1	1	7/14/2011	<0.00030	<0.00046	<0.00032	---	---	<0.00046
	PA-23-2	2	7/14/2011	<0.00028	<0.00042	<0.00029	---	---	<0.00042
PA-24	PA-24-1	1	7/14/2011	<0.00031	<0.00048	<0.00033	---	---	<0.00048
	PA-24-2	2	7/14/2011	<0.00032	<0.00049	<0.00034	---	---	<0.00049
PA-25	PA-25-1	1	7/13/2011	<0.00036	<0.00056	<0.00039	---	---	<0.00056
	PA-25-2	2	7/13/2011	<0.00048	<0.00073	<0.00051	---	---	<0.00073
PA-27	PA-27-2	2	7/13/2011	<0.00030	<0.00045	<0.00031	---	---	<0.00045
PA-28	PA-28-2	2	7/13/2011	<0.00030	<0.00045	<0.00031	---	---	<0.00045
PH03	ENV-PH03-2	2	6/18/2004	<0.005	<0.005	<0.005	---	---	<0.005
PH-10	PH-10	2.5*	9/29/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
PH-11	PH-11	2.5*	9/29/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
PIT CENTER	Pit Center@12'	12	6/3/2006	ND	ND	ND	ND	ND	ND
	Pit Center@16'	16	6/3/2006	<0.300	<0.300	<0.300	<0.300	<0.300	<0.3
	Pit Center@20'	20	6/3/2006	ND	ND	ND	ND	ND	ND
PM-1	PM-1-19	19	6/15/2009	<0.0048	<0.0048	<0.0048	---	---	<0.0095
RT-1	RT-1-15	15	7/19/2006	0.0015	<0.00086	<0.00086	<0.00086	<0.0017	<0.0017
	RT-1-25	25	7/19/2006	1.400	<0.00082	0.085	0.0054	0.0038	0.0092
RW-1	RW1-25	25	6/12/2009	<0.83	<0.83	<0.83	---	---	<1.7
	RW1-30	30	6/12/2009	<0.89	<0.89	<0.89	---	---	<1.8

Table 3
Summary of Current Soil Conditions – Concentrations of BTEX
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Xylenes, total
RW-5	RW-5-23.5	23.5	6/11/2009	0.0042	<0.0039	<0.0039	---	---	<0.0078
	RW-5-28.0	28	6/11/2009	1.5	<0.91	<0.91	---	---	<1.8
SD-2	SD-2-27.5	27.5	2/4/2008	<0.0039	<0.0039	<0.0039	---	---	<0.0078
SD-3	SD-3-17.0	17	2/5/2008	<0.0040	<0.0040	<0.0040	---	---	<0.0080
SD-4	SD-4-17.5	17.5	2/5/2008	<0.0039	<0.0039	<0.0039	---	---	<0.0078
SD-5	SD-5-15.5	15.5	2/6/2008	<0.0036	<0.0036	<0.0036	---	---	<0.0073
SD-6	SD-6-16.5	16.5	2/6/2008	0.0072	<0.0044	<0.0044	---	---	<0.0088
	SD-6-18.5	18.5	2/6/2008	<0.0042	<0.0042	<0.0042	---	---	<0.0084
SD-7	SD-7-24.0	24	2/6/2008	<0.0037	<0.0037	<0.0037	---	---	<0.0074
SD-8	SD-8-18.5	18.5	2/7/2008	<0.70	<0.70	<0.70	---	---	<1.4
	SD-8-49.0	49	2/7/2008	<0.0069	<0.0069	<0.0069	---	---	<0.014
SD-9	SD-9-12.0	12	2/8/2008	<0.0045	<0.0045	<0.0045	---	---	<0.0090
	SD-9-19.5	19.5	2/8/2008	<0.0042	<0.0042	<0.0042	---	---	<0.0085
SD-11	SD-11-15.0	15	2/8/2008	<0.0042	<0.0042	<0.0042	---	---	<0.0083
SIDEWALL-E	Sidewall-E@5'	5	6/3/2006	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
SIDEWALL-N	Sidewall-N@6'	6	6/3/2006	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
SIDEWALL-S	Sidewall-S@5'	5	6/3/2006	ND	ND	ND	ND	ND	ND
SIDEWALL-W	Sidewall-W@7'	7	6/3/2006	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
SR-1	SR-1-20	20	11/15/2006	<0.00083	<0.00083	<0.00083	<0.00083	<0.0017	<0.0017
SR-2	SR-2-22	22	11/15/2006	0.0011	<0.00080	<0.00080	<0.00080	<0.0016	<0.0016
SR-4	SR-4-10.5	10.5	11/16/2006	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005
	SR-4-20.5	20.5	11/16/2006	<0.120	<0.120	<0.120	<0.120	<0.120	<0.12
SRC-01	SRC-01-2.5	2.5	7/11/2003	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002
SRC-02	SRC-02-7.0	7	7/11/2003	0.027	<0.0012	<0.0012	<0.0012	<0.0025	<0.0025
SRC-03	SRC-03-4.0	4	7/12/2003	<0.005	<0.005	<0.005	---	---	<0.005
	SRC-03-5.5	5.5	7/12/2003	<0.005	<0.005	<0.005	---	---	<0.005
SRC-04	SRC-04-3.5 ENCORE	3.5	7/14/2003	<0.0028	0.015	<0.0028	---	---	0.0061
SRC-05	SRC-05-2.5	2.5	7/12/2003	<0.005	<0.005	<0.005	---	---	<0.005
	SRC-05-5.5	5.5	7/12/2003	<0.005	<0.005	<0.005	---	---	<0.005
SRC-06	SRC-06-2.5	2.5	7/15/2003	<0.005	<0.005	<0.005	---	---	<0.005
	SRC-06-4.0	4	7/15/2003	<0.0032	0.012	<0.0032	---	---	<0.0032
SRC-08	SRC-08-5.0 ENCORE	5	7/17/2003	<0.0025	<0.0025	<0.0025	---	---	<0.0025
SRC-B4	95071803	4	7/18/1995	<0.005	<0.005	<0.005	---	---	<0.005
SRC-B8	95071807	2	7/18/1995	<0.005	<0.005	<0.005	---	---	<0.005
SRC-D2	SRC-D2	-	7/18/2003	<0.005	<0.005	0.0066	0.028	0.034	0.062
SRC-D3	SRC-D3	-	7/18/2003	0.031	<0.02	<0.02	<0.02	<0.02	<0.02

Table 3
Summary of Current Soil Conditions – Concentrations of BTEX
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	Sample ID	Sample Depth (feet)	Date Sampled	Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Xylenes, total
SRC-D4	SRC-D4	-	7/18/2003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SW-01	SW-01	2*	8/6/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
SW-03	SW-03	1*	8/6/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
SW-04	SW-04	2*	8/6/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
SW-05	SW05	2*	8/9/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
SW-06	SW06	2*	8/9/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
SW-07	SW07	2*	8/9/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	SW27	2*	8/9/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
SW-10	SW-10	2*	8/12/2004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
SW-14	SW-14	5*	9/8/2004	<0.005	<0.005	<0.005	<0.002	<0.002	<0.015
SW-15	SW-15	6*	9/8/2004	<0.005	<0.005	<0.005	<0.002	<0.002	<0.015
T-6-PIPE	T-6-PIPE	2.5	2/24/2007	0.160	0.0030	<0.001	<0.001	<0.002	<0.002
UST-EAST-N	UST-EAST-N@11'	11	6/3/2006	<0.300	<0.300	<0.300	<0.300	<0.300	<0.3
UST-EAST-S	UST-East-S@11'	11	6/3/2006	ND	ND	ND	ND	ND	ND
UST-WEST-N	UST-West-N@11'	11	6/3/2006	ND	ND	ND	ND	ND	ND
UST-WEST-S	UST-West-S@11'	11	6/3/2006	ND	ND	ND	ND	ND	ND

Notes:

* Sample depth is estimated
<# = not detected at or above value indicated
--- = not analyzed
Bold font indicates detections above the laboratory reporting limit
BTEX = Benzene, Toluene, Ethylbenzene, Total Xylenes
ND = not detected

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	0E		100E					120E					140E	
Sample ID	27-0E-15'	26-0E-20'	4-100E-5'	6-100E-10'	13-100E-15'	20-100E-20'	29-100E-25'	5-120E-5'	12-120E-10'	17-120E-15'	18-120E-20'	19-120E-25B	37-140E-10'	30-140E-15'
Sample Depth (feet)	15	20	5	10	15	20	25	5	10	15	20	25	10	15
Date Sampled	7/9/2002	7/9/2002	7/8/2002	7/9/2002	7/9/2002	7/9/2002	7/24/2002	7/9/2002	7/9/2002	7/9/2002	7/9/2002	7/9/2002	7/29/2002	7/26/2002
Antimony	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lead	43	1,100	420	210	2,000	130	6.4	67	220	360	19	6.9	300	210
Mercury	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	160E			180E				200E				20E			
Sample ID	41-160E-10'	31-160E-15'	36-160E-20'	42-180E-10'	32-180E-15'	35-180E-20'	39-180E-25'	43-200E-10'	33-200E-15'	34-200E-20'	38-200E-25'	10-20E-5'	11-20E-10'	24-20E-15'	25-20E-20'
Sample Depth (feet)	10	15	20	10	15	20	25	10	15	20	25	5	10	15	20
Date Sampled	7/29/2002	7/26/2002	7/29/2002	7/29/2002	7/26/2002	7/29/2002	7/29/2002	7/29/2002	7/29/2002	7/29/2002	7/29/2002	7/9/2002	7/9/2002	7/9/2002	7/9/2002
Antimony	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lead	59	51	17	830	37	28	6.3	2,100	570	11	6.2	14	56	1,700	500
Mercury	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	220E	40E				60E				80E				
Sample ID	40-220E-25'	1-40E-5'	9-40E-10'	16-40E-15'	23-40E-20'	2-60E-5'	8-60E-10'	15-60E-15'	22-60E-20'	3-80E-5'	7-80E-10'	14-80E-15'	21-80E-20'	28-80E-25'
Sample Depth (feet)	25	5	10	15	20	5	10	15	20	5	10	15	20	25
Date Sampled	7/29/2002	7/8/2002	7/9/2002	7/9/2002	7/9/2002	7/8/2002	7/9/2002	7/9/2002	7/9/2002	7/8/2002	7/9/2002	7/9/2002	7/9/2002	7/24/2002
Antimony	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lead	53	260	76	16	830	230	31	470	270	100	200	960	94	8.3
Mercury	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	A2-S	A4-S	A-30		A-31	A-32	A-33		A-34	A-35	B1-S	B2-S
Sample ID	A2-S-2.5	A4-S-2.5	A-30-1.0	A-30-2.0	A-31-2.0	A-32-2.0	A-33-1.0	A-33-2.0	A-34-2.0	A-35-2.0	B1-S-4.0	B2-S-5.5
Sample Depth (feet)	2.5	2.5	1	2	2	2	1	2	2	2	4	5.5
Date Sampled	10/22/2011	10/22/2011	3/9/2012	3/9/2012	3/9/2012	3/8/2012	3/8/2012	3/8/2012	3/8/2012	3/7/2012	10/22/2011	10/22/2011
Antimony	---	---	<1.9	<1.9	<2.0	<1.9	<1.9	<1.9	<1.9	7.3	---	---
Arsenic	---	---	5.8	6.2	6.0	4.2	4.0	4.2	5.3	12	---	---
Barium	---	---	170	160	180	150	130	160	160	120	---	---
Beryllium	---	---	<0.37	<0.39	<0.40	<0.37	<0.37	<0.39	<0.38	<0.38	---	---
Cadmium	---	---	<0.47	<0.49	<0.50	<0.47	<0.46	<0.49	<0.48	<0.48	---	---
Chromium	---	---	90	94	86	64	69	52	70	46	---	---
Cobalt	---	---	20	19	19	10	13	16	14	15	---	---
Copper	---	---	29	28	31	30	25	25	35	56	---	---
Lead	550	20	28	24	15	100	46	71	71	990	170	490
Mercury	---	---	0.49	0.16	0.087	0.39	0.27	0.19	0.49	0.20	---	---
Molybdenum	---	---	<1.9	<1.9	<2.0	<1.9	<1.9	<1.9	<1.9	<1.9	---	---
Nickel	---	---	150	150	140	71	86	75	88	69	---	---
Selenium	---	---	<3.7	<3.9	<4.0	<3.7	<3.7	<3.9	<3.8	<3.8	---	---
Silver	---	---	<0.93	<0.97	<0.99	<0.93	<0.93	<0.97	<0.96	<0.96	---	---
Thallium	---	---	<1.9	<1.9	<2.0	<1.9	<1.9	<1.9	<1.9	<1.9	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	50	51	51	40	38	38	46	38	---	---
Zinc	---	---	70	82	70	100	94	90	100	93	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B3-F	B-105						B-106					
Sample ID	B3-F-5.0	B-105-5'	B-105-10'	B-105-15'	B-105-20'	B-105-25'	B-105-30'	B-106-5'	B-106-10'	B-106-15'	B-106-20'	B-106-25'	B-106-30'
Sample Depth (feet)	5	5	10	15	20	25	30	5	10	15	20	25	30
Date Sampled	10/22/2011	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002
Antimony	---	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---	---
Lead	7.0	48	9.1	13	7.4	<5	5.1	47	99	20	5.8	5.2	5
Mercury	---	---	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-107						B-108					
Sample ID	B-107-5'	B-107-10'	B-107-15'	B-107-20'	B-107-25'	B-107-30'	B-108-5'	B-108-10'	B-108-15'	B-108-20'	B-108-25'	B-108-30'
Sample Depth (feet)	5	10	15	20	25	30	5	10	15	20	25	30
Date Sampled	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002	10/11/2002
Antimony	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---
Lead	16	63	9.9	6.1	5.2	<5	99	400	8.1	14	<5	<5
Mercury	---	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-109						B-110					
Sample ID	B-109-5'	B-109-10'	B-109-15'	B-109-20'	B-109-25'	B-109-30'	B-110-5'	B-110-10'	B-110-15'	B-110-20'	B-110-25'	B-110-30'
Sample Depth (feet)	5	10	15	20	25	30	5	10	15	20	25	30
Date Sampled	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003
Antimony	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---
Lead	790	4.4	3.5	5.3	4.3	2.6	270	550	4.9	<3	4.2	<3
Mercury	---	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-111						B-112				
Sample ID	B-111-5'	B-111-10'	B-111-15'	B-111-20'	B-111-25'	B-111-30'	B-112-10.0'	B-112-15.0'	B-112-20.0'	B-112-25.0'	B-112-30.0'
Sample Depth (feet)	5	10	15	20	25	30	10	15	20	25	30
Date Sampled	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/3/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003
Antimony	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---
Lead	150	31	<3	3.3	4.1	<3	5.8	4.7	<3	5.8	<3
Mercury	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-113						B-114					
Sample ID	B-113-5'	B-113-10'	B-113-15'	B-113-20'	B-113-25'	B-113-30'	B-114-5'	B-114-10'	B-114-15'	B-114-20'	B-114-25'	B-114-30'
Sample Depth (feet)	5	10	15	20	25	30	5	10	15	20	25	30
Date Sampled	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003
Antimony	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---
Lead	150	64	<3	<3	3.9	<3	4.7	4.6	4.5	5.2	3.6	3.4
Mercury	---	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-115						B-116					
Sample ID	B-115-2'	B-115-7'	B-115-12'	B-115-15'	B-115-20'	B-115-25'	B-116-5'	B-116-10'	B-116-15'	B-116-20'	B-116-25'	B-116-30'
Sample Depth (feet)	2	7	12	15	20	25	5	10	15	20	25	30
Date Sampled	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003	2/4/2003
Antimony	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---
Lead	6.8	670	26	4.1	<3	6.1	12	57	6.3	4.2	3.1	<3
Mercury	---	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-119						B-120				
Sample ID	B-119-5'	B-119-10'	B-119-15'	B-119-20'	B-119-25'	B-119-30'	B-120-5'	B-120-10'	B-120-15'	B-120-20'	B-120-25'
Sample Depth (feet)	5	10	15	20	25	30	5	10	15	20	25
Date Sampled	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003	7/31/2003
Antimony	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---
Lead	4	<3	3.8	5.3	4.3	<3	99	8.8	4.9	3.5	3.3
Mercury	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
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All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-121						B-123					
Sample ID	B-121-5'	B-121-10'	B-121-15'	B-121-20'	B-121-25'	B-121-30'	B-123-7.5'	B-123-10.5'	B-123-15.5'	B-123-20'	B-123-25.5'	B-123-31'
Sample Depth (feet)	5	10	15	20	25	30	7.5	10.5	15.5	20	25.5	31
Date Sampled	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/1/2003	8/9/2003	8/9/2003	8/9/2003	8/9/2003	8/9/2003	8/9/2003
Antimony	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---
Lead	34	5.7	4.7	5.3	4.7	<3	13	9.6	12	7.8	<3	<3
Mercury	---	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
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All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	B-124				B-132						BC-01		BC-02
Sample ID	B-124-5'	B-124-10'	B-124-15'	B-124-20.5'	B-132@5.0'	B-132@11.0'	B-132@15.5'	B-132@20.5'	B-132@25.5'	B-132@30.5'	BC-01	BC-21	BC-02
Sample Depth (feet)	5	10	15	20.5	5	11	15.5	20.5	25.5	30.5	0*	0*	0*
Date Sampled	8/9/2003	8/9/2003	8/9/2003	8/9/2003	2/9/2004	2/9/2004	2/9/2004	2/9/2004	2/9/2004	2/9/2004	8/6/2004	8/6/2004	8/6/2004
Antimony	---	---	---	---	---	---	---	---	---	---	<7	<7	<7
Arsenic	---	---	---	---	---	---	---	---	---	---	<5	<5	<5
Barium	---	---	---	---	---	---	---	---	---	---	100	89	100
Beryllium	---	---	---	---	---	---	---	---	---	---	<0.5	<0.5	<0.5
Cadmium	---	---	---	---	---	---	---	---	---	---	<0.5	<0.5	<0.5
Chromium	---	---	---	---	---	---	---	---	---	---	30	35	36
Cobalt	---	---	---	---	---	---	---	---	---	---	12	12	8.5
Copper	---	---	---	---	---	---	---	---	---	---	13	12	15
Lead	43	15	44000	25	5.3	6.8	5.2	7	4.4	<3	4.5	4.6	<3
Mercury	---	---	---	---	---	---	---	---	---	---	<0.1	<0.1	<0.1
Molybdenum	---	---	---	---	---	---	---	---	---	---	<1	<1	<1
Nickel	---	---	---	---	---	---	---	---	---	---	56	51	53
Selenium	---	---	---	---	---	---	---	---	---	---	<5	<5	<5
Silver	---	---	---	---	---	---	---	---	---	---	<1	<1	<1
Thallium	---	---	---	---	---	---	---	---	---	---	<10	<10	<10
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	26	32	27
Zinc	---	---	---	---	---	---	---	---	---	---	34	32	33

Table 4
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Station ID	BC-03	BC-04	BC-05	BC-06	BC-07	BC-08	BC-09	BC-10	BC-11	BC-12	BC-13	BC-17	BC-18
Sample ID	BC-03	BC-04	BC-05	BC-06	BC07	BC08	BC09	BC10	BC11	BC-12	BC-13	BC-17	BC-18
Sample Depth (feet)	0*	0*	0*	0*	0	0	0	0	0	1.5*	3*	0*	0*
Date Sampled	8/6/2004	8/6/2004	8/6/2004	8/7/2004	8/9/2004	8/9/2004	8/9/2004	8/9/2004	8/9/2004	9/8/2004	9/8/2004	9/14/2004	9/14/2004
Antimony	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
Arsenic	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Barium	78	94	120	95	84	120	130	120	150	140	100	130	120
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<0.5
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	21	19	24	47	37	39	29	48	18	29	23	26	30
Cobalt	5.6	8.3	7.6	8	6.7	7.3	7.4	7.8	6	9.7	6.7	6.8	6.7
Copper	10	21	14	8	13	17	21	16	14	13	13	12	15
Lead	<3	<3	<3	<3	<3	3	15	5.4	<3	4.1	<3	<3	3.3
Mercury	<0.1	<0.1	<0.1	0.19	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	36	42	40	67	39	54	51	49	33	45	44	37	48
Selenium	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Silver	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Thallium	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	18	32	32	25	24	26	25	23	44	23	24	23	24
Zinc	23	31	29	32	26	32	45	34	21	27	31	26	27

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
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Station ID	BC-19	BC-20	C1-F	C3-F	C5-S	CB-1				CB-2		
Sample ID	BC-19	BC-20	C1-F-8.0	C3-F-5.0	C5-S-2.5	CB-1-5.0	CB-1-10.0	CB-1-30.5	CB-1-35.5	CB-2-4.5	CB-2-23.0	CB-2-27.0
Sample Depth (feet)	2*	2*	8	5	2.5	5	10	30.5	35.5	4.5	23	27
Date Sampled	9/15/2004	9/15/2004	10/22/2011	10/22/2011	10/22/2011	1/31/2008	1/31/2008	1/31/2008	1/31/2008	1/28/2008	1/28/2008	1/28/2008
Antimony	<7	<7	---	---	---	<2.0	<2.0	<2.0	<2.0	<1.9	<2.0	<2.0
Arsenic	<5	<5	---	---	---	---	---	---	---	---	---	---
Barium	83	92	---	---	---	---	---	---	---	---	---	---
Beryllium	<0.5	<0.5	---	---	---	---	---	---	---	---	---	---
Cadmium	<0.5	<0.5	---	---	---	---	---	---	---	---	---	---
Chromium	37	46	---	---	---	---	---	---	---	---	---	---
Cobalt	7.4	8.6	---	---	---	---	---	---	---	---	---	---
Copper	14	15	---	---	---	---	---	---	---	---	---	---
Lead	<3	<3	33	130	850	6.3	1,200	2.9	3.2	50	1.7	3.7
Mercury	<0.1	<0.1	---	---	---	---	---	---	---	---	---	---
Molybdenum	<1	<1	---	---	---	---	---	---	---	---	---	---
Nickel	47	53	---	---	---	---	---	---	---	---	---	---
Selenium	<5	<5	---	---	---	---	---	---	---	---	---	---
Silver	<1	<1	---	---	---	---	---	---	---	---	---	---
Thallium	<10	<10	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	31	33	---	---	---	---	---	---	---	---	---	---
Zinc	30	33	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
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Station ID	CB-3				CB-4				CB-5		CB-6		
Sample ID	CB-3-4.5	CB-3-11.5	CB-3-23.5	CB-3-28.0	CB-4-5.5	CB-4-15.0	CB-4-22.0	CB-4-29.5	CB-5-5.0	CB-5-8.5	CB-6-5.5	CB-6-10.5	CB-6-27.0
Sample Depth (feet)	4.5	11.5	23.5	28	5.5	15	22	29.5	5	8.5	5.5	10.5	27
Date Sampled	1/29/2008	1/29/2008	1/29/2008	1/29/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008	1/29/2008	1/29/2008	1/29/2008
Antimony	22	19	<2.0	<2.0	<1.9	<1.9	<2.0	<1.9	<2.0	<2.0	<2.0	4.0	<1.9
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---	---
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---	---
Lead	6,700	4,900	3.2	4.1	810	4.9	2.0	2.2	4.9	370	5.8	300	3.1
Mercury	---	---	---	---	---	---	---	---	---	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	---	---	---	---
Selenium	---	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
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Station ID	CB-7			CB-8		CSA-1	CSA-2	CSB-1	CSB-2	CSC-1	CSC-2	CSC-3	CSC-4
Sample ID	CB-7-5.5	CB-7-10.5	CB-7-21.5	CB-8-2.5	CB-8-12.5	CSA-1-2.0	CSA-2-2.0	CSB-1-2.0	CSB-2-0.5	CSC-1-2.0	CSC-2-4.0	CSC-3-2.0	CSC-4-1.0
Sample Depth (feet)	5.5	10.5	21.5	2.5	12.5	2	2	2	0.5	2	4	2	1
Date Sampled	1/31/2008	1/31/2008	1/31/2008	2/1/2008	2/1/2008	6/11/2013	6/11/2013	6/13/2013	6/14/2013	6/3/2013	6/18/2013	6/4/2013	6/5/2013
Antimony	<1.9	<2.0	<1.9	270	<1.9	9.5	43	2.2	<1.9	<1.9	---	<1.9	2.2
Arsenic	---	---	---	---	---	19	16	9.1	5.0	5.0	---	4.8	4.7
Barium	---	---	---	---	---	170	220	300	120	140	---	170	180
Beryllium	---	---	---	---	---	<0.38	<0.40	0.46	<0.37	<0.37	---	0.39	0.39
Cadmium	---	---	---	---	---	1.1	<0.50	<0.47	<0.46	<0.47	---	<0.46	<0.47
Chromium	---	---	---	---	---	58	63	140	57	55	---	100	110
Cobalt	---	---	---	---	---	17	15	23	17	14	---	15	17
Copper	---	---	---	---	---	100	34	150	64	30	---	42	54
Lead	6.5	49	4.5	2,300	14	410	450	470	90	83	620	74	120
Mercury	---	---	---	---	---	1.1	0.42	0.73	0.21	0.65	---	0.17	0.28
Molybdenum	---	---	---	---	---	<1.9	<2.0	<1.9	<1.9	<1.9	---	<1.9	<1.9
Nickel	---	---	---	---	---	140	87	190	87	61	---	110	120
Selenium	---	---	---	---	---	<3.8	<4.0	<3.8	<3.7	<3.7	---	<3.7	<3.8
Silver	---	---	---	---	---	<0.95	<1.0	<0.94	<0.93	<0.93	---	<0.93	<0.94
Thallium	---	---	---	---	---	<1.9	<2.0	<1.9	<1.9	<1.9	---	<1.9	<1.9
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	89	57	91	53	45	---	57	55
Zinc	---	---	---	---	---	380	190	250	110	99	---	94	120

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
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Station ID	CSC-5	CSC-6	CSD-1	CSD-2	CSD-3	CSD-4	CSE-1	CSE-2	CSE-3	CSE-4	CSE-5	CSE-6	CSF-1
Sample ID	CSC-5-2.0	CSC-6-1.5	CSD-1-2.0	CSD-2-2.0	CSD-3-2.5	CSD-4-2.0	CSE-1-2.0	CSE-2-2.0	CSE-3-1.0	CSE-4-2.0	CSE-5-1.0	CSE-6-2.0	CSF-1-2.0
Sample Depth (feet)	2	1.5	2	2	2.5	2	2	2	1	2	1	2	2
Date Sampled	6/5/2013	6/12/2013	5/23/2013	5/24/2013	6/18/2013	5/30/2013	5/29/2013	5/30/2013	6/3/2013	6/5/2013	6/6/2013	6/10/2013	6/6/2013
Antimony	3.4	<1.9	<2.0	<1.9	---	<1.9	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	2.2
Arsenic	4.5	6.0	4.1	5.7	---	4.6	5.6	4.6	4.8	5.0	<3.7	17	5.1
Barium	220	210	180	210	---	210	130	160	130	180	16	180	280
Beryllium	0.48	<0.38	<0.40	<0.38	---	0.58	<0.36	<0.36	<0.37	<0.36	<0.37	<0.36	<0.38
Cadmium	<0.48	<0.48	<0.50	<0.47	---	<0.47	<0.45	<0.45	<0.46	<0.45	<0.47	<0.45	<0.48
Chromium	94	100	63	81	---	84	59	61	84	66	9.6	61	97
Cobalt	17	20	14	18	---	19	14	15	14	14	8.8	15	12
Copper	59	72	65	44	---	35	40	32	27	33	18	40	37
Lead	160	170	140	69	53	23	61	90	28	73	2.3	74	55
Mercury	0.27	0.50	0.35	0.25	---	0.28	0.32	0.24	0.20	0.29	0.028	0.29	0.38
Molybdenum	<1.9	<1.9	<2.0	<1.9	---	<1.9	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.9
Nickel	130	140	120	110	---	120	75	78	97	80	7.9	85	84
Selenium	<3.8	<3.8	<4.0	<3.8	---	<3.8	<3.6	<3.6	<3.7	<3.6	<3.7	<3.6	<3.8
Silver	<0.95	<0.96	<0.99	<0.94	---	<0.94	<0.91	<0.91	<0.92	<0.91	<0.93	<0.91	<0.96
Thallium	<1.9	<1.9	<2.0	<1.9	---	<1.9	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.9
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	50	70	66	62	---	54	44	48	48	47	62	58	72
Zinc	140	130	170	90	---	61	110	130	60	130	39	130	97

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
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Santa Rosa, California
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Station ID	CSF-2	CSF-3	CSF-4	CSF-5	CSF-6	CSF-7	CSF-8	CSF-9	CSF-10	CSG-1	CSG-2	CSG-3	CSG-4
Sample ID	CSF-2-2.0	CSF-3-2.0	CSF-4-1.0	CSF-5-2.0	CSF-6-0.5	CSF-7-2.0	CSF-8-2.0	CSF-9-2.0	CSF-10-2.0	CSG-1-2.0	CSG-2-2.0	CSG-3-2.5	CSG-4-2.0
Sample Depth (feet)	2	2	1	2	0.5	2	2	2	2	2	2	2.5	2
Date Sampled	6/6/2013	6/7/2013	6/7/2013	6/7/2013	6/7/2013	6/10/2013	6/14/2013	6/25/2013	6/25/2013	5/15/2013	5/21/2013	6/18/2013	6/12/2013
Antimony	<1.9	<1.9	<1.9	<1.9	<1.9	2.9	<1.9	<1.9	2.0	3.6	<1.9	---	---
Arsenic	6.6	150	5.5	6.4	6.6	110	5.8	9.2	9.5	11	5.5	---	---
Barium	200	240	170	230	210	180	110	180	180	180	210	---	---
Beryllium	<0.37	<0.38	<0.38	<0.38	<0.38	<0.40	<0.39	<0.37	<0.36	0.39	<0.39	---	---
Cadmium	<0.46	<0.48	0.78	<0.48	0.72	0.75	<0.49	<0.46	<0.45	1.0	<0.49	---	---
Chromium	110	83	73	110	89	110	60	76	66	70	84	---	---
Cobalt	20	19	17	24	20	22	15	16	13	20	20	---	---
Copper	47	88	48	36	58	45	21	34	30	150	44	---	---
Lead	84	350	73	16	180	100	12	59	160	190	53	920	230
Mercury	0.26	4.0	0.30	0.19	0.88	0.45	0.08	0.25	0.13	0.41	0.62	---	---
Molybdenum	<1.9	<1.9	<1.9	<1.9	<1.9	<2.0	<1.9	<1.9	<1.8	<1.9	<1.9	---	---
Nickel	150	150	96	170	110	160	76	110	99	130	120	---	---
Selenium	<3.7	<3.8	<3.8	<3.8	<3.8	<4.0	<3.9	<3.7	<3.6	<3.8	<3.9	---	---
Silver	<0.93	<0.96	<0.95	<0.96	<0.96	<1.0	<0.97	<0.93	<0.91	<0.95	<0.97	---	---
Thallium	<1.9	<1.9	<1.9	<1.9	<1.9	<2.0	<1.9	<1.9	<1.8	<1.9	<1.9	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	65	70	54	66	69	66	55	53	45	56	55	---	---
Zinc	140	330	270	72	220	290	70	110	150	520	100	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	CSG-5	D1-S	D4-S	EBAMW-1				EBAMW-2				EBASB-1		
Sample ID	CSG-5-1.0	D1-S-2.5	D4-S-2.5	EBAMW-1@1.5-2.0	EBAMW-1@13.0-13.5	EBAMW-1@16.5-17.0	EBAMW-1@25.5-26.0	EBAMW-2@12.0-12.5	EBAMW-2@17.0-17.5	EBAMW-2@22.5-23.0	EBAMW-2@26.5-27.0	EBASB-1@2.5-3.0	EBASB-1@18.0-18.5	EBASB-1@28.5-29.0
Sample Depth (feet)	1	2.5	2.5	1.5	13	16.5	25.5	12	17	22.5	26.5	2.5	18	28.5
Date Sampled	5/22/2013	10/22/2011	10/22/2011	11/17/2008	11/17/2008	11/17/2008	11/17/2008	11/18/2008	11/18/2008	11/18/2008	11/18/2008	11/18/2008	11/18/2008	11/18/2008
Antimony	<1.9	---	---	21	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0	<1.9	<2.0	<1.9	<1.9
Arsenic	6.3	---	---	9.7	3.0	2.5	2.6	4.2	4.1	2.5	2.9	3.2	5.1	2
Barium	260	---	---	150	180	140	97	150	160	130	69	130	140	64
Beryllium	<0.38	---	---	<0.52	<0.53	<0.50	<0.51	0.77	0.73	0.66	<0.49	0.53	0.76	0.5
Cadmium	<0.48	---	---	<0.52	<0.53	<0.50	<0.51	<0.51	<0.52	<0.51	<0.49	<0.51	<0.48	<0.48
Chromium	85	---	---	86	98	84	40	87	69	55	40	82	75	39
Cobalt	14	---	---	14	23	15	8.8	17	19	9.6	8.2	13	22	9.5
Copper	400	---	---	25	28	19	14	28	27	15	11	20	25	13
Lead	550	200	380	2,500	5.8	4	4.7	26	5.1	5.4	4	47	5.7	4
Mercury	3.4	---	---	0.28	0.11	0.087	0.094	0.14	0.14	0.088	0.066	0.19	0.095	0.068
Molybdenum	<1.9	---	---	<1.0	<1.1	<0.99	<1.0	<1.0	<1.0	<1.0	<0.97	<1.0	<0.96	<0.96
Nickel	110	---	---	88	130	110	49	140	120	67	55	140	130	58
Selenium	<3.8	---	---	<2.1	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0	<1.9	<2.0	<1.9	<1.9
Silver	<0.95	---	---	<1.0	<1.1	<0.99	<1.0	<1.0	<1.0	<1.0	<0.97	<1.0	<0.96	<0.96
Thallium	<1.9	---	---	<1.0	<1.1	<0.99	<1.0	<1.0	<1.0	<1.0	<0.97	<1.0	<0.96	<0.96
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	59	---	---	44	50	49	35	46	43	34	24	33	42	24
Zinc	170	---	---	130	49	39	27	51	40	29	23	55	43	26

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	EBASB-2					EBASB-3		EBASB-4			EBASB-5	
Sample ID	EBASB-2@1.5-2.0	EBASB-2@13.0-13.5	EBASB-2@17.0-17.5	EBASB-2@26.0-26.5	EBASB-2@33.0-33.5	EBASB-3@1.5-2.0	EBASB-3@19.5-20.0	EBASB-4@8.5-9.0	EBASB-4@18.5-19.0	EBASB-4@34.5-35.0	EBASB-5@11.5-12.0	EBASB-5@29.0-29.5
Sample Depth (feet)	1.5	13	17	26	33	1.5	19.5	8.5	18.5	34.5	11.5	29
Date Sampled	11/19/2008	11/19/2008	11/19/2008	11/19/2008	11/19/2008	11/20/2008	11/20/2008	12/1/2008	12/1/2008	12/1/2008	12/1/2008	12/2/2008
Antimony	<2.0	<2.1	<2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	6.2	5.7	3	3.1	4.4	3.9	2.8	3.3	2.8	4.1	3.2	2.4
Barium	290	140	110	73	88	140	140	180	87	84	54	68
Beryllium	0.55	0.62	0.8	0.51	0.51	<0.51	0.61	0.78	0.53	0.5	<0.49	<0.51
Cadmium	1.9	<0.52	<0.52	<0.50	<0.49	<0.51	<0.50	<0.50	<0.50	<0.49	0.67	<0.51
Chromium	46	61	54	59	32	57	64	81	100	52	27	52
Cobalt	13	11	9.2	12	8.4	14	11	20	14	11	6.7	8.9
Copper	83	19	21	14	15	43	23	30	31	24	64	18
Lead	530	4.5	5.6	3	2.4	290	6	6.2	3	3	68	2.8
Mercury	0.7	0.09	0.078	0.08	<0.050	0.96	0.13	0.089	0.067	0.052	0.075	0.086
Molybdenum	<0.99	<1.0	<1.0	<1.0	<0.98	<1.0	<0.99	<0.99	<0.99	<0.98	<0.98	<1.0
Nickel	94	77	78	98	41	99	69	120	110	66	76	71
Selenium	<2.0	<2.1	<2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Silver	<0.99	<1.0	<1.0	<1.0	<0.98	<1.0	<0.99	<0.99	<0.99	<0.98	<0.98	<1.0
Thallium	<0.99	<1.0	<1.0	<1.0	<0.98	<1.0	<0.99	<0.99	<0.99	<0.98	<0.98	<1.0
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	48	43	27	34	40	48	39	47	58	44	46	43
Zinc	360	36	37	33	33	150	41	45	34	36	220	33

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	EBASB-6			EBASB-7			ET-EAST-1	ET-EAST-2	ET-WEST-1	FC-1	MW-10	MW-11
Sample ID	EBASB-6@8.0-8.5	EBASB-6@11.5-12.0	EBASB-6@29.5-30.0	EBASB-7@18.5-19.0	EBASB-7@24.0-24.5	EBASB-7@29.0-29.5	ET-EAST-1-10.0	ET-EAST-2-10.0	ET-WEST-1-9.0	FC-1-17.0	MW-10-11	MW-11-24
Sample Depth (feet)	8	11.5	29.5	18.5	24	29	10	10	9	17	11	24
Date Sampled	12/2/2008	12/2/2008	12/2/2008	11/18/2008	11/19/2008	11/19/2008	5/31/2013	5/31/2013	6/1/2013	4/5/2011	3/3/2005	3/3/2005
Antimony	<1.9	<1.9	<1.9	<2.0	<2.0	<2.0	<1.9	<1.8	<1.9	<1.8	<5	<5
Arsenic	1.7	2.7	2.7	4.5	4.3	2.5	11	4.9	71	<3.6	4.1	1.2
Barium	98	120	54	120	99	63	270	210	110	97	220	130
Beryllium	0.53	0.52	<0.48	0.72	0.54	<0.51	<0.38	<0.37	<0.38	<0.36	<0.5	0.6
Cadmium	<0.49	<0.48	<0.48	<0.51	<0.50	<0.51	1.2	<0.46	<0.48	<0.45	1.1	<1
Chromium	62	78	100	69	44	87	100	84	94	77	74	48
Cobalt	11	12	7.5	14	11	12	16	14	19	11	14	9.8
Copper	14	15	13	25	16	11	570	37	26	19	170	14
Lead	6.3	5.1	1.5	5.2	4.2	3.1	320	62	71	15	480	4.8
Mercury	0.078	0.13	<0.051	0.11	<0.048	0.084	3.8	0.18	0.38	0.072	0.6	<0.1
Molybdenum	<0.97	<0.96	<0.95	<1.0	<1.0	<1.0	<1.9	<1.8	<1.9	<1.8	<1	<1
Nickel	82	82	57	110	71	64	110	100	100	85	88	67
Selenium	<1.9	<1.9	<1.9	<2.0	<2.0	<2.0	<3.8	<3.7	<3.8	<3.6	<5	<5
Silver	<0.97	<0.96	<0.95	<1.0	<1.0	<1.0	1.2	<0.92	<0.95	<0.89	<1	<1
Thallium	<0.97	<0.96	<0.95	<1.0	<1.0	<1.0	<1.9	<1.8	<1.9	<1.8	<5	<5
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	41	48	30	43	30	34	80	68	70	37	40	21
Zinc	37	33	21	42	28	26	810	130	130	42	480	30

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	MW-12			MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19		MW-20	
Sample ID	MW-12-20	MW-12-24	DUPLICATE A	MW-13-15.5	MW-14-4	MW-15-11.5	MW-16-23.5	MW-17-13.5	MW-18-10	DUP-111406	MW-19-19.5	MW-20-10.5	MW-20-20.5
Sample Depth (feet)	20	24	24.5	15.5	4	11.5	23.5	13.5	10	19.5	19.5	10.5	20.5
Date Sampled	3/3/2005	3/3/2005	3/3/2005	3/2/2005	3/3/2005	3/2/2005	3/1/2005	3/2/2005	3/4/2005	11/14/2006	11/14/2006	2/23/2007	2/23/2007
Antimony	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.750	<0.750	2400	3.34
Arsenic	2.9	1.6	1.7	8.3	1.8	2	2.2	3.1	2.6	4.00	1.98	79.5	5.12
Barium	76	120	91	140	18	100	89	170	130	190	128	104	142
Beryllium	0.6	<0.5	<0.5	0.6	<0.5	0.8	<0.5	0.7	<0.5	0.778	0.713	<0.250	<0.250
Cadmium	<1	<1	<1	<1	1.8	<1	<1	<1	<1	<0.500	<0.500	0.878	0.869
Chromium	56	38	43	71	7.2	71	36	79	80	61.4	48.0	36.8	46.3
Cobalt	15	9.6	10	15	2.6	14	13	12	16	23.0	13.8	11.9	15.1
Copper	19	12	15	17	140	20	18	22	19	26.7	21.0	36.9	22.1
Lead	3.5	5.6	3.4	3.9	120	4	2.6	5.3	4.5	6.95	6.65	44,100	11.7
Mercury	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	0.101	<0.0835	0.121	<0.0835
Molybdenum	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.250	<0.250	<0.250	<0.250
Nickel	110	62	78	100	78	90	93	120	130	99.5	69.7	58.6	64.5
Selenium	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.750	<0.750	<0.750	<0.750
Silver	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.873	0.739	3.98	<0.250
Thallium	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.750	<0.750	2.21	0.898
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	50	24	28	53	110	42	41	40	39	49.1	37.1	33.7	43.0
Zinc	44	29	35	36	180	37	45	44	41	48.2	40.9	93.1	38.8

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	PA-1	PA-2	PA-3	PA-4	PA-5	PA-6	PA-8	PA-9	PA-10	PA-11	PA-12	PA-13	PA-14
Sample ID	PA-1-2.0	PA-2-2.0	PA-3-1.25	PA-4-2.0	PA-5-2.0	PA-6-2.0	PA-8-2.0	PA-9-2.0	PA-10	PA-11	PA-12	PA-13	PA-14
Sample Depth (feet)	2	2	1.25	2	2	2	2	2	2	2	2	2	2
Date Sampled	4/11/2011	4/11/2011	4/11/2011	4/12/2011	4/12/2011	4/12/2011	4/12/2011	4/12/2011	4/13/2011	4/13/2011	4/13/2011	4/14/2011	4/13/2011
Antimony	4.6	2.4	1.6	0.84	2.1	1.6	4.9	3.6	<0.3	<0.32	11	<0.29	2.2
Arsenic	14	75	14	2.5	6.1	5.6	5.2	6.9	5.0	4.7	9.9	3.5	4.7
Barium	140	130	140	140	160	200	170	200	160	150	180	84	130
Beryllium	0.15	0.15	0.23	0.17	0.21	0.26	0.31	<0.13	<0.12	<0.12	<0.12	<0.11	<0.12
Cadmium	0.72	0.25	0.27	<0.043	0.44	0.43	0.16	0.74	<0.045	<0.047	<0.048	<0.044	<0.046
Chromium	54	64	50	55	66	53	66	78	76	77	85	49	72
Cobalt	13	15	16	6.4	15	13	17	17	18	17	19	12	15
Copper	91	37	110	35	46	51	61	110	42	34	30	17	29
Lead	120	120	180	24	140	150	180	490	100	52	39	8.3	110
Mercury	0.16	0.16	0.28	0.11	0.45	0.27	0.18	0.49	0.14	0.16	0.11	0.062	0.19
Molybdenum	0.22	0.24	0.33	<0.22	<0.22	<0.23	<0.22	<0.25	<0.23	<0.24	<0.25	<0.22	<0.24
Nickel	84	96	99	65	93	110	100	120	120	110	140	70	98
Selenium	<0.52	0.75	<0.53	<0.52	<0.51	<0.54	<0.53	<0.58	<0.55	<0.57	<0.58	<0.53	<0.56
Silver	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	<0.18	<0.19	<0.18	<0.19	<0.19	<0.18	<0.19
Thallium	<0.5	0.56	<0.51	<0.5	<0.49	0.56	<0.51	0.67	<0.53	<0.55	<0.56	<0.51	<0.54
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	39	48	46	25	48	44	47	51	48	47	53	44	52
Zinc	230	120	110	88	170	180	100	290	120	83	86	38	100

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	PA-15	PA-16	PA-17	PA-18		PA-20	PA-21	PA-22	PA-23		PA-24	
Sample ID	PA-15-2	PA-16-2	PA-17-2	PA-18-1	PA-18-2	PA-20-2	PA-21-2	PA-22-2	PA-23-1	PA-23-2	PA-24-1	PA-24-2
Sample Depth (feet)	2	2	2	1	2	2	2	2	1	2	1	2
Date Sampled	7/13/2011	7/13/2011	7/13/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011	7/14/2011
Antimony	3.4	2.9	0.89	1.3	36	0.52	0.49	0.51	0.59	1.8	<0.29	<0.29
Arsenic	8.7	9.9	130	7.5	7.0	5.1	5.7	4.1	5.1	5.1	4.8	3.9
Barium	130	200	190	140	270	200	170	140	160	190	160	130
Beryllium	0.15	<0.12	0.39	0.35	0.43	0.47	0.4	0.39	0.45	0.47	0.34	0.3
Cadmium	0.29	0.33	0.38	0.48	0.23	0.082	<0.048	0.11	0.17	0.53	0.13	0.059
Chromium	81	81	55	43	44	79	25	57	74	78	89	86
Cobalt	15	13	16	13	11	17	16	14	17	18	17	15
Copper	48	38	34	110	280	36	27	31	42	97	45	45
Lead	65	220	560	120	910	67	9.8	41	120	210	91	70
Mercury	0.16	1.1	0.15	0.17	0.075	0.12	0.073	0.11	0.15	0.18	0.20	0.17
Molybdenum	<0.23	<0.23	0.65	0.46	0.29	<0.22	<0.25	<0.22	<0.23	<0.26	0.34	0.23
Nickel	110	94	200	68	75	140	52	82	120	130	130	120
Selenium	<0.54	<0.54	<0.59	<0.59	<0.59	<0.50	<0.58	<0.52	<0.54	<0.60	<0.53	<0.53
Silver	<0.18	<0.18	<0.20	<0.20	<0.20	<0.17	<0.19	<0.17	<0.18	<0.20	<0.18	<0.18
Thallium	<0.52	<0.52	0.6	<0.57	<0.57	<0.49	<0.56	<0.5	<0.52	<0.58	<0.51	<0.51
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	47	54	90	41	44	48	37	43	46	45	49	44
Zinc	97	130	460	260	240	81	57	86	130	120	100	75

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	PA-25		PA-27	PA-28	PH03	PH-10	PH-11	PIT CENTER			RW-104-6-1	RW-104-6-2	RW-104-6-4
Sample ID	PA-25-1	PA-25-2	PA-27-2	PA-28-2	ENV-PH03-2	PH-10	PH-11	Pit Center@12'	Pit Center@16'	Pit Center@20'	RW-104-6-1	RW-104-6-2	RW-104-6-4
Sample Depth (feet)	1	2	2	2	2	2.5*	2.5*	12	16	20	0.25	0.25	0.25
Date Sampled	7/13/2011	7/13/2011	7/13/2011	7/13/2011	6/18/2004	9/29/2004	9/29/2004	6/3/2006	6/3/2006	6/3/2006	7/11/1986	7/11/1986	7/11/1986
Antimony	0.65	0.71	1.9	0.82	<0.75	<7	<7	---	---	---	---	---	---
Arsenic	4.4	5.8	4.8	120	3.77	<5	<5	---	---	---	20	15	17
Barium	100	160	150	170	85	86	150	---	---	---	---	---	---
Beryllium	0.24	0.41	0.37	0.51	0.281	<0.5	<0.5	---	---	---	---	---	---
Cadmium	0.095	0.27	0.26	0.075	<0.5	<0.5	<0.5	ND	<2.50	ND	---	---	---
Chromium	57	81	70	81	40.5	27	34	103	29.1	100	---	---	---
Cobalt	12	15	16	16	13.8	6.2	8.9	---	---	---	---	---	---
Copper	25	120	52	33	18.6	9.5	21	---	---	---	---	---	---
Lead	46	100	480	30	20.6	<3	49	6.37	3.96	5.17	280	190	54
Mercury	0.11	0.16	0.25	0.10	<0.835	<0.1	<0.1	---	---	---	0.28	0.25	0.17
Molybdenum	<0.23	<0.25	<0.23	<0.22	<0.25	<1	<1	---	---	---	---	---	---
Nickel	90	120	110	120	59.9	41	53	145	42.9	141	---	---	---
Selenium	<0.55	0.71	<0.55	<0.51	<0.75	<5	<5	---	---	---	---	---	---
Silver	<0.19	<0.19	<0.18	<0.17	<0.25	<1	<1	---	---	---	---	---	---
Thallium	<0.53	0.56	<0.53	<0.49	<0.75	<10	<10	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	41	51	45	50	30.1	18	23	---	---	---	---	---	---
Zinc	61	140	110	85	53.9	26	49	55.1	28.7	51.8	---	---	---

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	RW-104-6-5	RW-104-6-6	RW-104-6-9	RW-104-6-10	RW-104-6-12	RW-104-6-14	RW-104-6-15		RW-104-6-16	SIDEWALL-E	SIDEWALL-N	SIDEWALL-S	SIDEWALL-W
Sample ID	RW-104-6-5	RW-104-6-6	RW-104-6-9	RW-104-6-10	RW-104-6-12	RW-104-6-14	RW-104-6-15	RW-104-6-15D	RW-104-6-16	Sidewall-E@5'	Sidewall-N@6'	Sidewall-S@5'	Sidewall-W@7'
Sample Depth (feet)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	5	6	5	7
Date Sampled	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986	7/11/1986	6/3/2006	6/3/2006	6/3/2006	6/3/2006
Antimony	---	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	25	21	16	59	15	11	12	---	13	---	---	---	---
Barium	---	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium	---	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium	---	---	---	---	---	---	---	---	---	<2.50	<2.50	ND	<2.50
Chromium	---	---	---	---	---	---	---	---	---	90.4	115	67.4	144
Cobalt	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---	---
Lead	170	200	26	420	5.8	26	16	16	130	13.80	41.6	91.8	<2.50
Mercury	0.48	0.48	0.4	0.28	0.3	0.12	0.28	---	0.12	---	---	---	---
Molybdenum	---	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	---	---	---	---	---	---	---	---	---	421	183	135	140
Selenium	---	---	---	---	---	---	---	---	---	---	---	---	---
Silver	---	---	---	---	---	---	---	---	---	---	---	---	---
Thallium	---	---	---	---	---	---	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	77.7	81.5	154	83.2

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	SR-1	SR-2	SR-4	SRC-04	SRC-05	SRC-08	SRC-B4	SRC-B8	SRC-D2	SRC-D4	SRG-1-1		
Sample ID	SR-1-20	SR-2-22	SR-4-20.5	SRC-04-3.5	SRC-05-2.5	SRC-08-5.0	95071803	95071807	SRC-D2	SRC-D4	SRG-1-1-0'	SRG-1-1-1.5'	SRG-1-1-2.5'
Sample Depth (feet)	20	22	20.5	3.5	2.5	5	4	2	-	-	0	1.5	2.5
Date Sampled	11/15/2006	11/15/2006	11/16/2006	7/14/2003	7/12/2003	7/17/2003	7/18/1995	7/18/1995	7/18/2003	7/18/2003	11/1/1986	11/1/1986	11/1/1986
Antimony	<0.750	<0.750	<0.750	<0.75	<0.75	<0.75	---	---	---	---	---	---	---
Arsenic	3.05	3.52	2.70	3	2.98	<0.75	---	4	---	---	---	---	---
Barium	137	87.2	127	92.5	79.7	123	---	---	---	---	---	---	---
Beryllium	0.534	0.438	0.435	0.317	0.309	0.573	---	---	---	---	---	---	---
Cadmium	<0.500	<0.500	<0.500	2.25	<0.5	<0.5	<2	---	---	---	3	3	0.5
Chromium	50.5	61.0	49.8	33.8	44.7	37.8	52	---	---	---	46	23	12
Cobalt	15.8	14.0	18.1	15.7	11.6	10.1	---	---	---	---	---	---	---
Copper	17.9	17.4	17.2	30.4	13.7	46.7	---	---	---	---	45	80	25
Lead	4.88	3.03	3.18	19.5	2.38	99.1	20	---	0.174	0.281	530	470	65
Mercury	<0.0835	<0.0835	<0.0835	<0.0835	<0.0835	<0.0835	---	---	---	---	---	---	---
Molybdenum	<0.250	<0.250	<0.250	<0.25	<0.25	<0.25	---	---	---	---	---	---	---
Nickel	76.2	71.1	79.8	55.8	70.8	45.1	---	---	---	---	100	732	35
Selenium	<0.750	<0.750	<0.750	<0.75	<0.75	<0.75	---	---	---	---	---	---	---
Silver	<0.250	0.736	<0.250	<0.25	<0.25	<0.25	---	---	---	---	0.5	1.5	0.25
Thallium	<0.750	<0.750	<0.750	<0.75	<0.75	<0.75	---	---	---	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	4	39	3
Vanadium	32.6	38.4	40.0	37.6	33.2	26.9	---	---	---	---	---	---	---
Zinc	37.6	33.2	37.5	249	33.5	53.3	50	---	---	---	1400	350	65

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	SRG-1-2		SRG-1-3		SRG-1-4	SW-01	SW-03	SW-04	SW-05	SW-06	SW-07		SW-10
Sample ID	SRG-1-2-0'	SRG-1-2-2'	SRG-1-3-0.5'	SRG-1-3-2.5'	SRG-1-4-2'	SW-01	SW-03	SW-04	SW05	SW06	SW07	SW27	SW-10
Sample Depth (feet)	0	2	0.5	2.5	2	2*	1*	2*	2*	2*	2*	2*	2*
Date Sampled	11/1/1986	11/1/1986	11/1/1986	11/1/1986	11/1/1986	8/6/2004	8/6/2004	8/6/2004	8/9/2004	8/9/2004	8/9/2004	8/9/2004	8/12/2004
Antimony	---	---	---	---	---	<7	<7	<7	<7	<7	<7	<7	<7
Arsenic	---	---	---	---	---	<5	<5	<5	<5	<5	<5	<5	<5
Barium	---	---	---	---	---	120	140	90	130	110	140	91	420
Beryllium	---	---	---	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	2	3	1	1	0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	62	51	85	67	72	29	54	44	41	31	30	35	25
Cobalt	---	---	---	---	---	9.7	19	10	8.2	8.4	7.5	7	5.8
Copper	80	120	55	40	40	19	15	30	17	19	14	14	13
Lead	250	820	200	225	85	46	13	21	3.9	5.5	<3	<3	30
Mercury	---	---	---	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	---	---	---	---	---	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	114	118	150	275	160	48	94	77	66	52	48	60	37
Selenium	---	---	---	---	---	<5	<5	<5	<5	<5	<5	<5	<5
Silver	0.8	0.7	0.75	0.6	0.7	<1	<1	<1	<1	<1	<1	<1	<1
Thallium	---	---	---	---	---	<10	<10	<10	<10	<10	<10	<10	<10
Titanium	5	5	6	6	5	---	---	---	---	---	---	---	---
Vanadium	---	---	---	---	---	24	38	30	25	33	25	23	17
Zinc	512	995	170	120	148	49	42	62	36	37	31	29	120

Table 4
Summary of Current Soil Conditions – Concentrations of Metals
Santa Rosa Site
Santa Rosa, California
All concentrations reported in milligrams per kilogram (mg/kg)

Station ID	SW-14	SW-15	T-6-PIPE	T-8-SW-2.5-NE	T-8-SW-4.5-C	T-8-B-5.0-NE	T-8-B-5.0-SW	T-8-B-6.0-C	UST-EAST-N	UST-EAST-S	UST-WEST-N	UST-WEST-S
Sample ID	SW-14	SW-15	T-6-PIPE	T-8-SW-2.5-NE	T-8-SW-4.5-C	T-8-B-5.0-NE	T-8-B-5.0-SW	T-8-B-6.0-C	UST-EAST-N@11'	UST-East-S@11'	UST-West-N@11'	UST-West-S@11'
Sample Depth (feet)	5*	6*	2.5	2.5	4.5	5	5	6	11	11	11	11
Date Sampled	9/8/2004	9/8/2004	2/24/2007	2/25/2007	2/25/2007	2/25/2007	2/25/2007	2/25/2007	6/3/2006	6/3/2006	6/3/2006	6/3/2006
Antimony	<7	<7	<0.750	<0.750	<0.750	<0.750	<0.750	<0.750	---	---	---	---
Arsenic	<5	<5	9.41	6.18	7.68	8.11	6.19	3.60	---	---	---	---
Barium	150	210	275	186	139	139	197	160	---	---	---	---
Beryllium	<0.5	<0.5	<0.250	<0.250	<0.250	<0.250	<0.250	0.394	---	---	---	---
Cadmium	<0.5	<0.5	1.29	1.19	1.13	1.31	1.19	0.643	<2.50	ND	ND	ND
Chromium	38	52	59.3	63.2	66.6	73.1	75.3	51.1	99.1	95.8	92.6	107
Cobalt	6.6	12	13.2	17.1	13.9	17.6	21.6	12.3	---	---	---	---
Copper	13	22	52.4	39.1	22.9	25.7	24.8	18.2	---	---	---	---
Lead	<3	6.2	442	200	7.02	42.3	6.64	12.9	5.96	14.5	8.05	6.19
Mercury	<0.1	<0.1	1.57	0.359	<0.0835	0.0910	<0.0835	<0.0835	---	---	---	---
Molybdenum	<1	<1	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250	---	---	---	---
Nickel	46	82	84.5	83.3	91.0	116	118	56.2	150	156	144	166
Selenium	<5	<5	<0.750	<0.750	<0.750	<0.750	<0.750	<0.750	---	---	---	---
Silver	<1	<1	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250	---	---	---	---
Thallium	<10	<10	0.790	<0.750	<0.750	<0.750	<0.750	<0.750	---	---	---	---
Titanium	---	---	---	---	---	---	---	---	---	---	---	---
Vanadium	26	34	39.1	45.4	43.9	45.1	50.5	35.3	---	---	---	---
Zinc	33	47	322	212	47.4	70.4	48.0	45.3	66.3	61.4	56.9	56.3

Notes:

* Sample depth is estimated
<# = not detected at or above value indicated
--- = not analyzed
Bold font indicates detections above the laboratory reporting limit
ND = not detected

FIGURES

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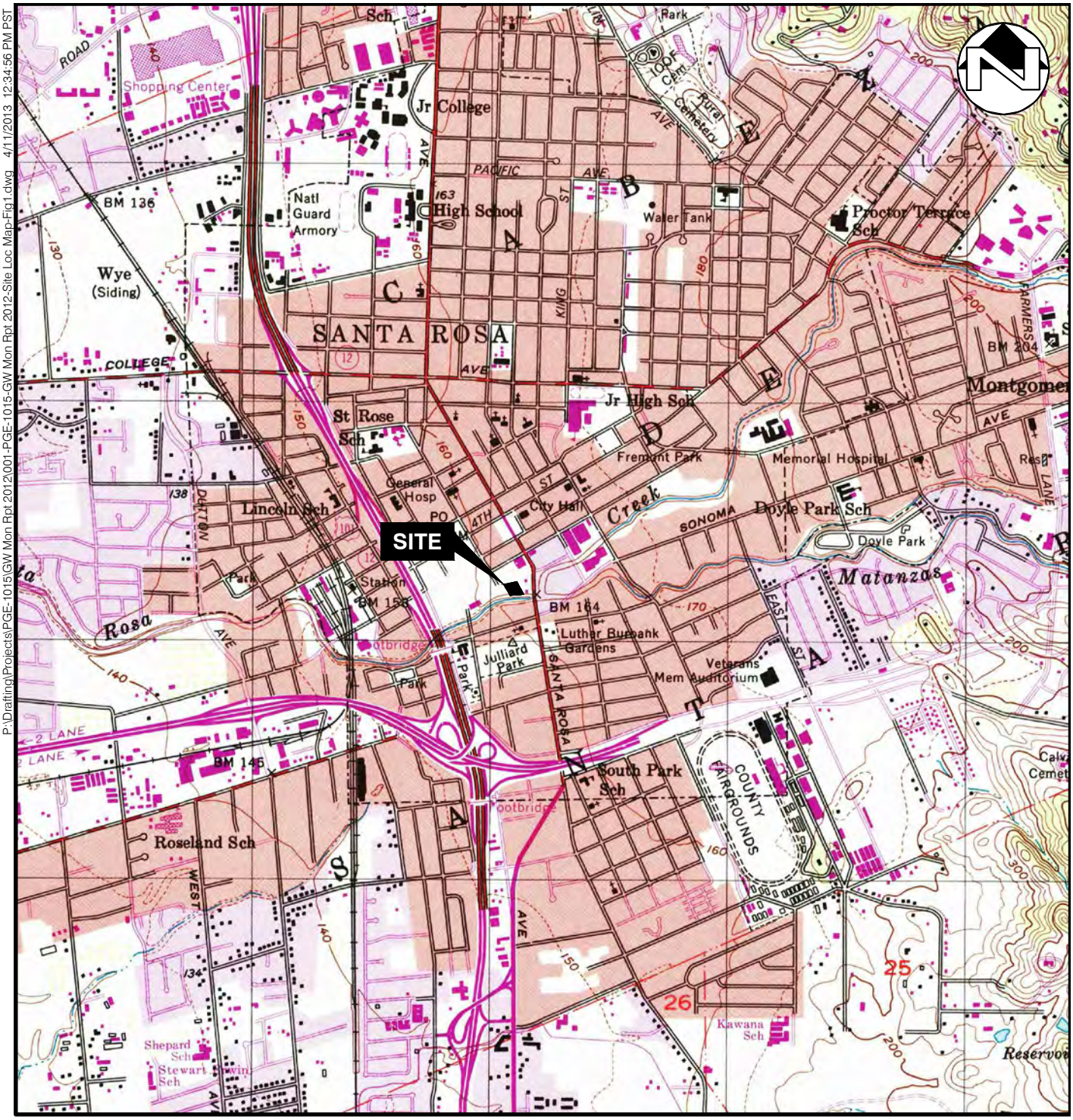

0 2,000 4,000 FEET

APPROXIMATE SCALE

FIGURE 1

SITE LOCATION MAP

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

REFERENCE:
7.5 MINUTE U.S.G.S. TOPOGRAPHIC MAP OF
SANTA ROSA, CALIFORNIA
DATED: 1994

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- PROPERTY LINE
- PARCEL LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 2

SITE PLAN

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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B STREET

FIRST STREET

SIDEWALK

PLANTER

SIDEWALK

SANTA ROSA AVENUE

BUILDING
111 SANTA ROSA AVENUE

BUILDING
438 FIRST STREET

MW-1
143.48

MW-2
141.31

MW-7
141.41

MW-8
141.19

MW-9
141.03

MW-10
138.76

MW-11
141.19

MW-12
141.31

MW-13
141.55

MW-14

MW-15
142.72

MW-16
143.03

MW-17
144.99

MW-19S
DRY

MW-19D
140.87

MW-20
135.99

MW-21
141.31

MW-22
142.64

MW-23
140.37

EBAMW-1
145.30

EBAMW-2
141.43

10,817 GAL. UST

SHEET PILING

Santa Rosa Creek

SANTA ROSA AVENUE BRIDGE

144 143 142 141 140 139 138 137 136

EXPLANATION

- EXISTING GROUNDWATER MONITORING WELL
- 135.99 — GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 10,817 gal EXISTING UST
- 136 — GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL, DASHED WHERE UNCERTAIN
- GROUNDWATER FLOW DIRECTION
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD GAS HOLDER)

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

0 30 60 FEET
APPROXIMATE SCALE

FIGURE 3

GROUNDWATER ELEVATION CONTOUR MAP SEPTEMBER 2014

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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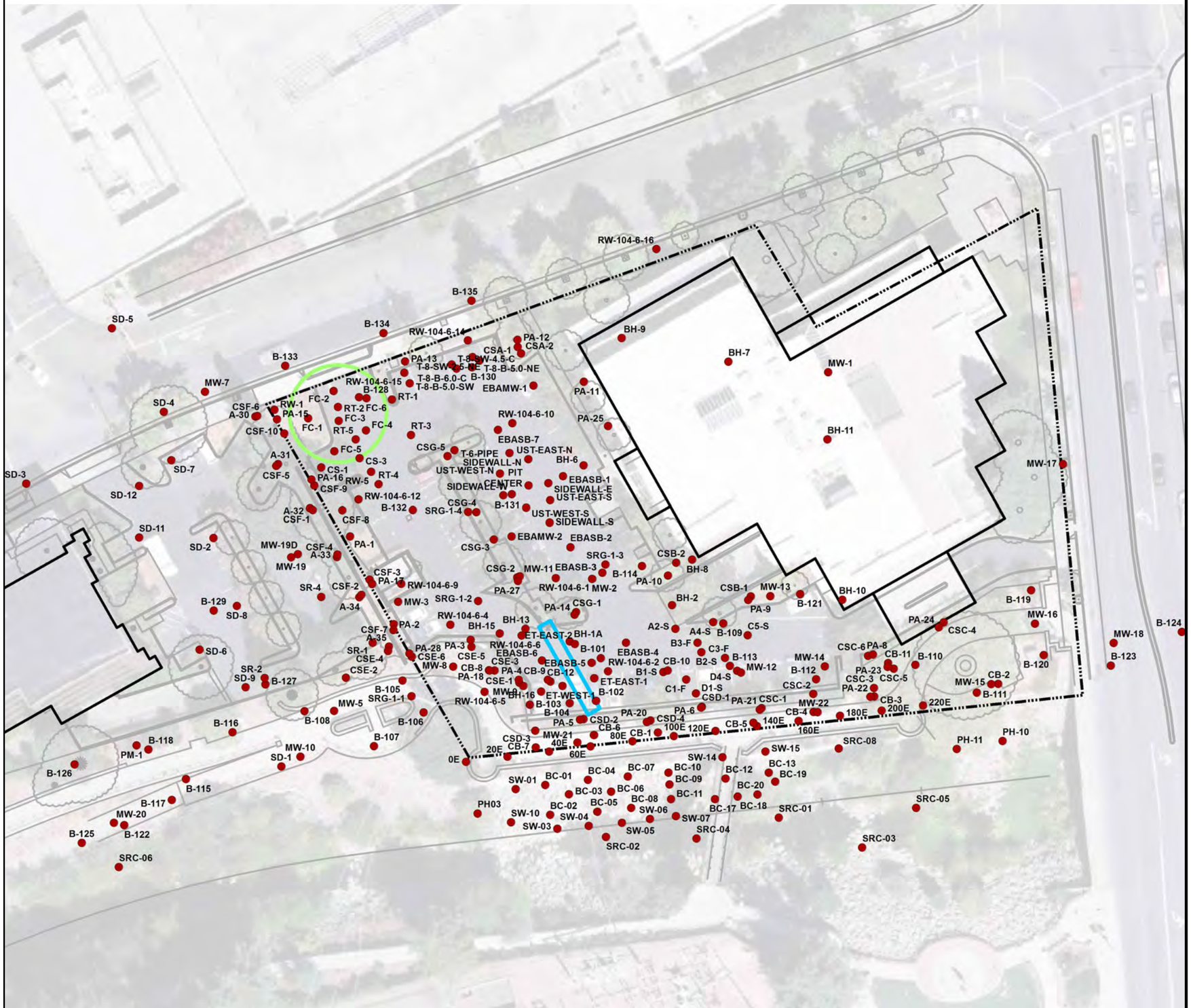

0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- SOIL SAMPLE
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 4

SITE PLAN WITH SAMPLE LOCATIONS

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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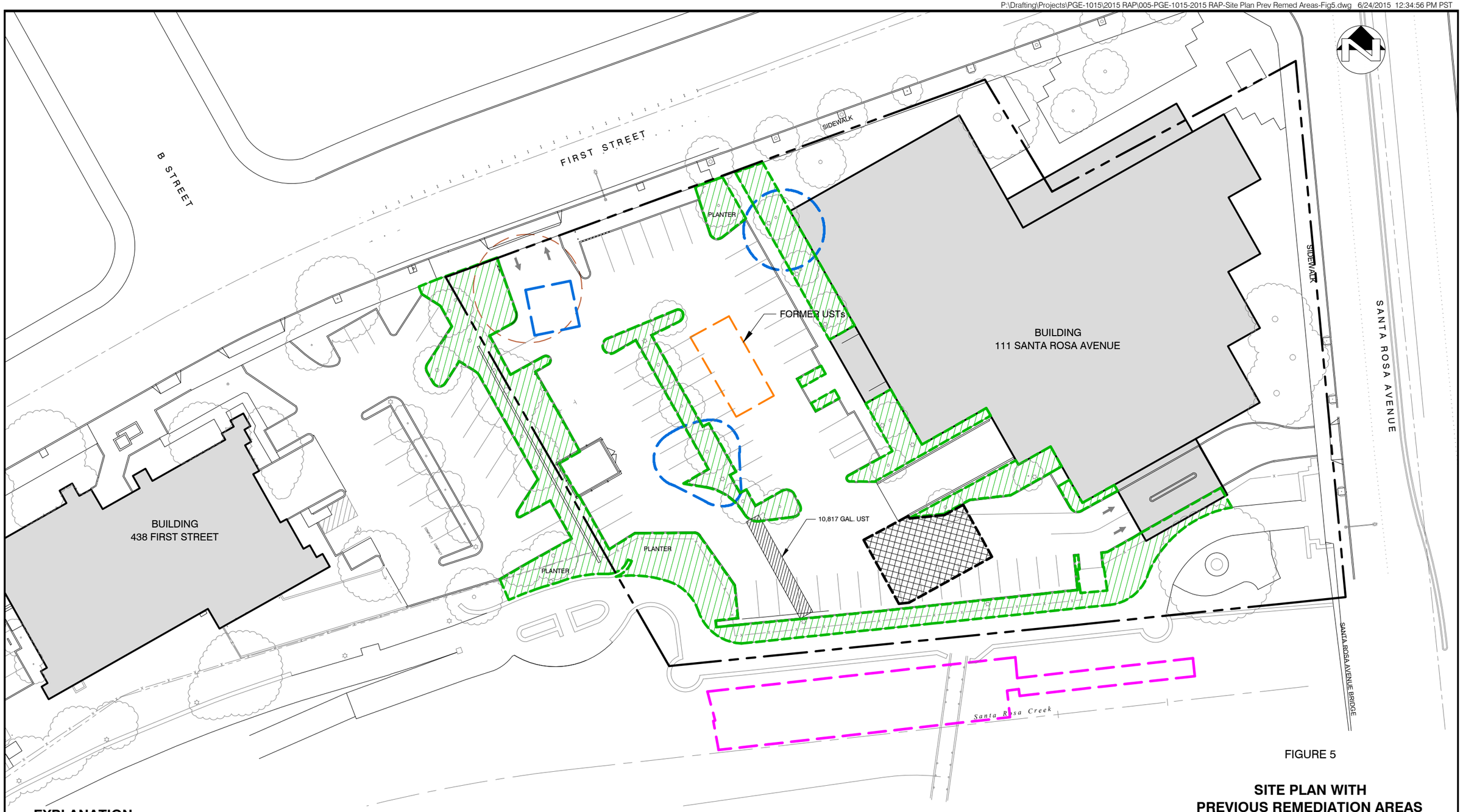


FIGURE 5

SITE PLAN WITH PREVIOUS REMEDIATION AREAS

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

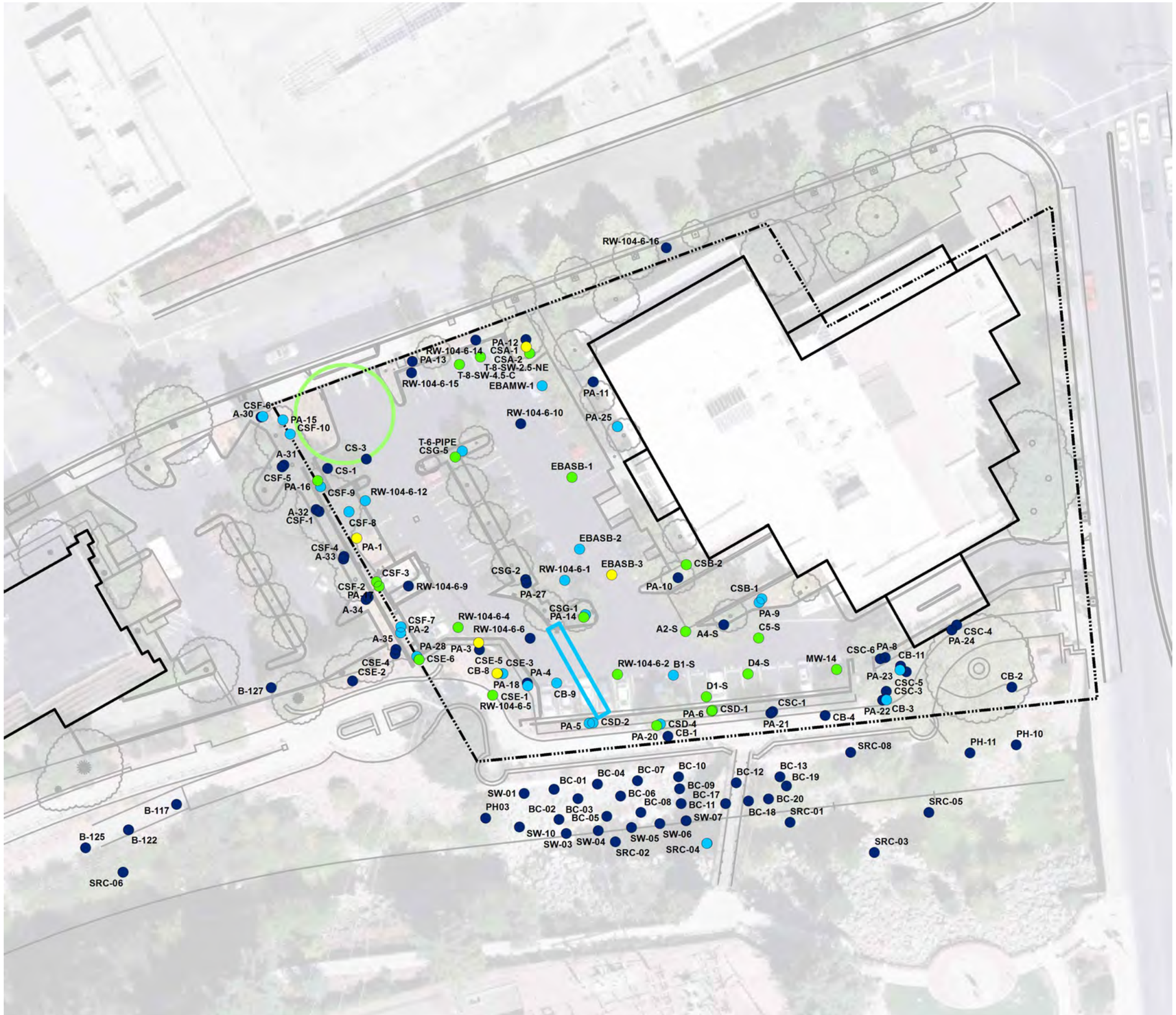
EXPLANATION

- FORMER UST EXCAVATION
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY
- PREDEVELOPMENT EXCAVATION
- EXCAVATION IN CREEK AS PART OF PMG CONSTRUCTION
- 10,817 gal EXISTING UST
- BUILDING FOOTPRINT
- PLANTER AREA EXCAVATION
- TARGETED SOIL EXCAVATION

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

0 40 80 FEET
APPROXIMATE SCALE

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction



0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 6

B(a)P EQUIVALENT CONCENTRATIONS IN SOIL AT DEPTHS LESS THAN 5 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 7

B(a)P EQUIVALENT CONCENTRATIONS IN SOIL AT DEPTHS FROM 5 TO LESS THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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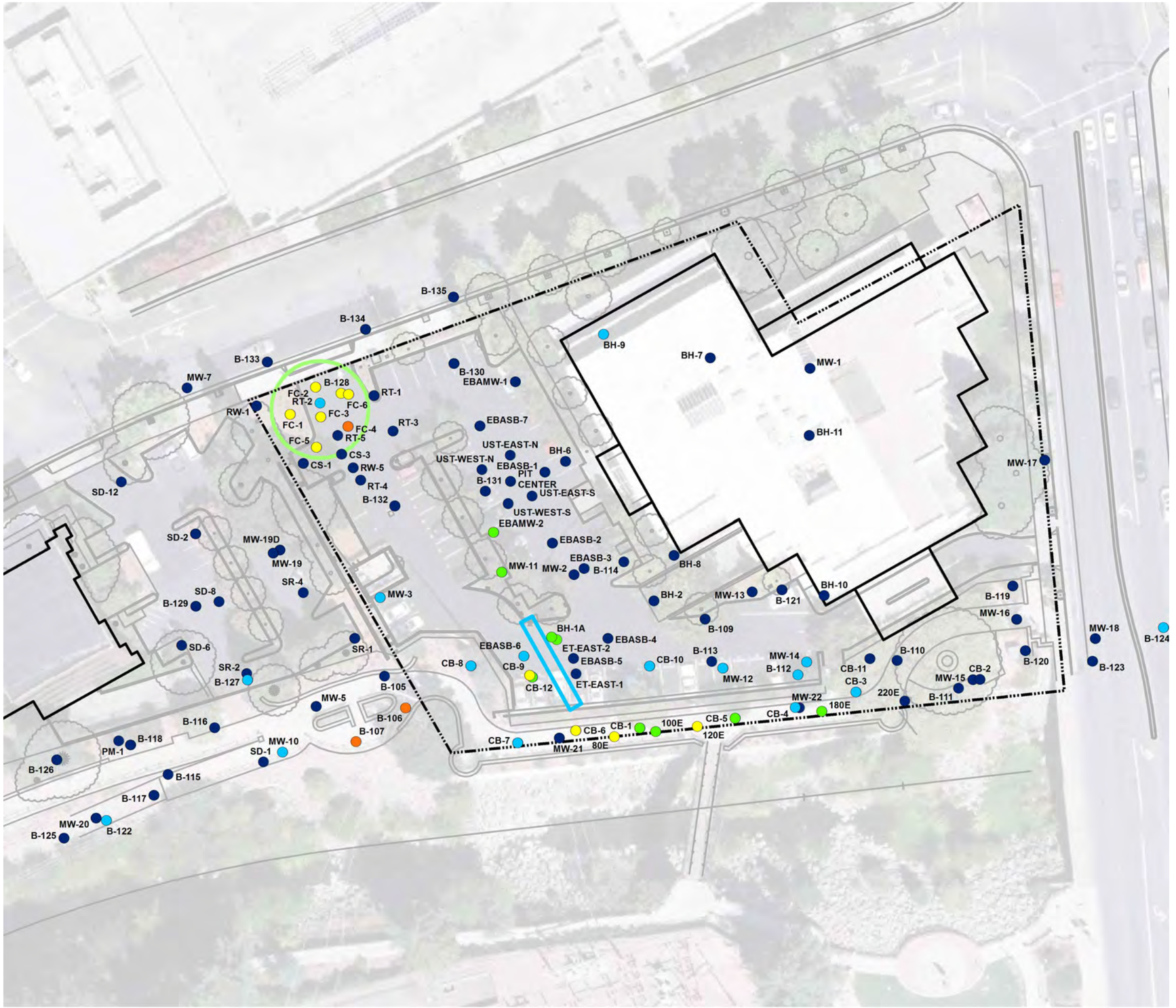


0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

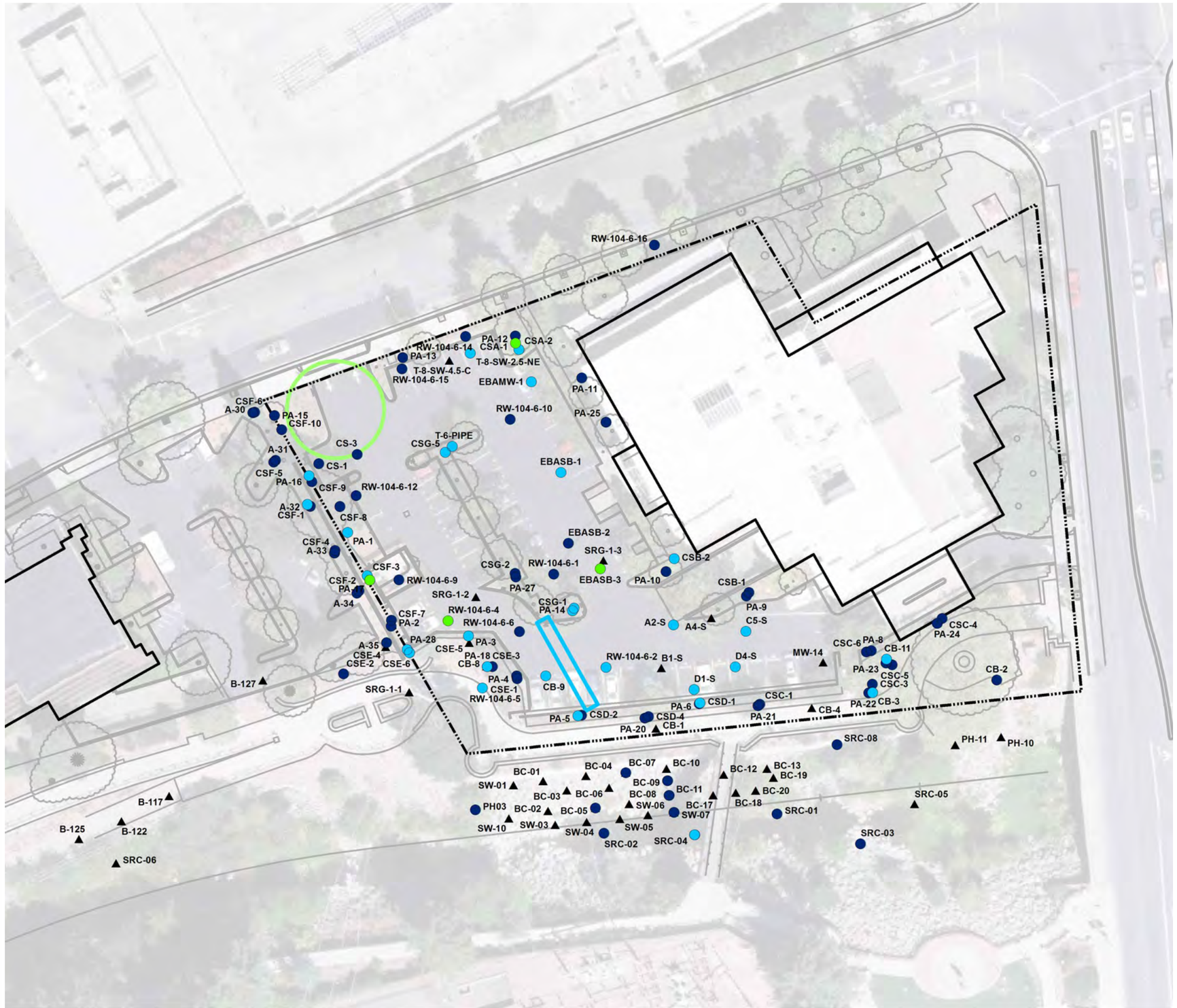
NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 8

B(a)P EQUIVALENT CONCENTRATIONS IN SOIL AT DEPTHS GREATER THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction



0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 9

NAPHTHALENE CONCENTRATIONS IN SOIL AT DEPTHS LESS THAN 5 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 10

NAPHTHALENE CONCENTRATIONS IN SOIL AT DEPTHS FROM 5 TO LESS THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 11

NAPHTHALENE CONCENTRATIONS IN SOIL AT DEPTHS GREATER THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

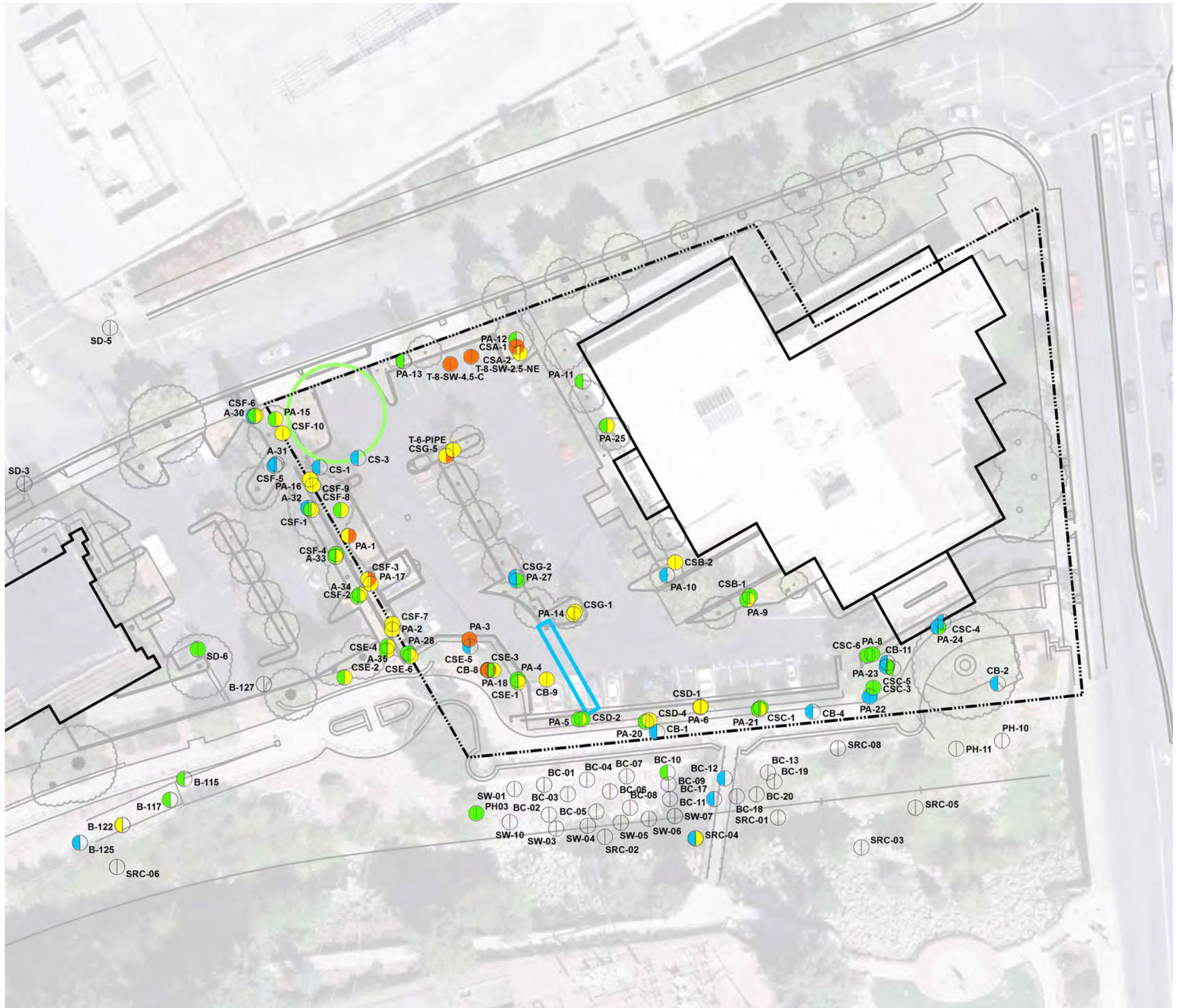
NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 12

TPHg CONCENTRATIONS IN SOIL AT DEPTHS LESS THAN 5 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction



0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- TPHmo
- TPHd
- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

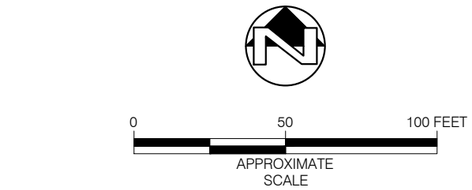
NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 13

TPHd AND TPHmo CONCENTRATIONS IN SOIL AT DEPTHS LESS THAN 5 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction



EXPLANATION

- BENZENE
- TOLUENE
- TOTAL XYLENES
- ETHYLBENZENE
- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 14

BTEX CONCENTRATIONS IN SOIL AT DEPTHS LESS THAN 5 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 15

TPHg CONCENTRATIONS IN SOIL AT DEPTHS FROM 5 TO LESS THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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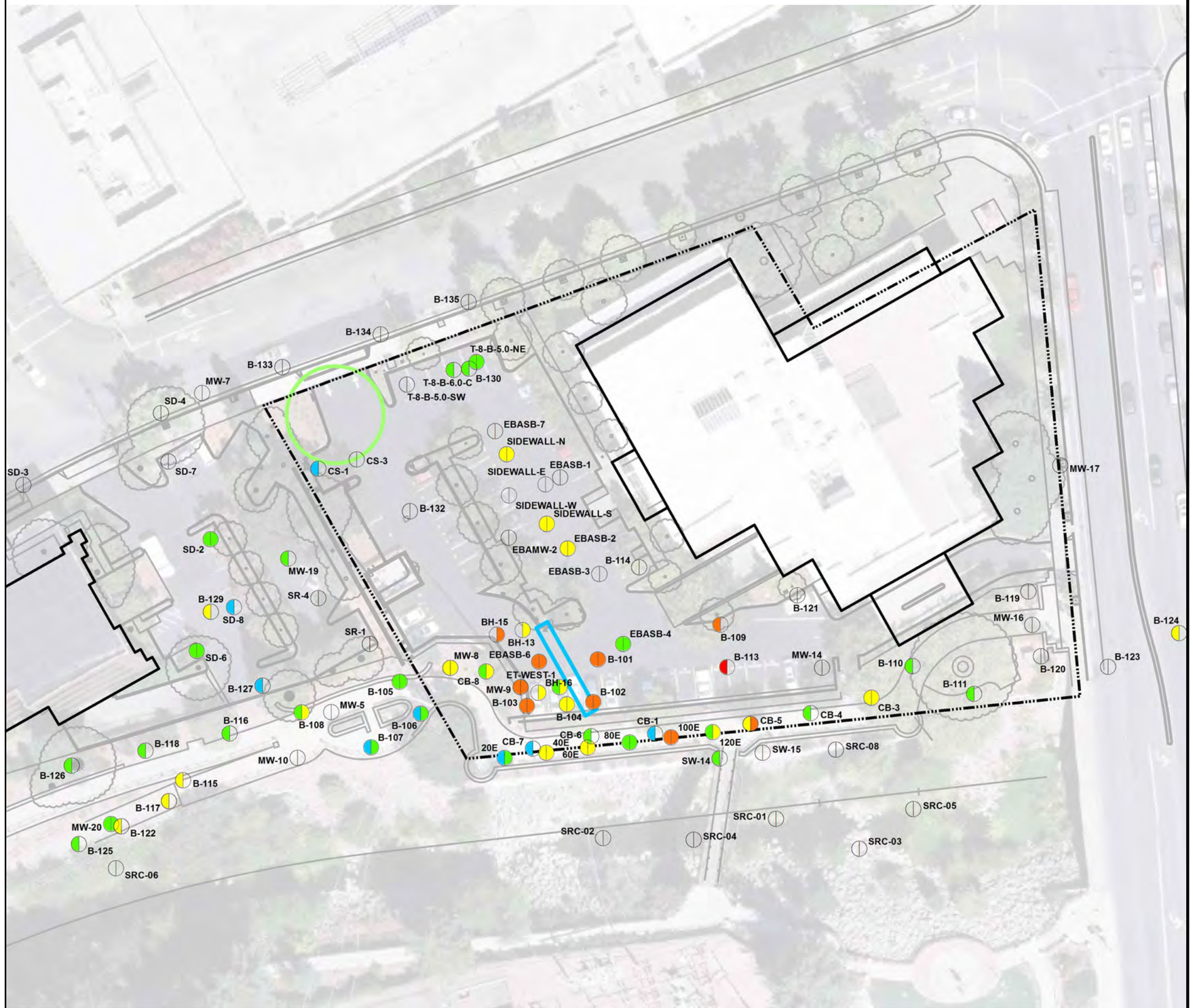


0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- TPHmo
- TPHd
- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 16

TPHd and TPHmo CONCENTRATIONS IN SOIL AT DEPTHS FROM 5 TO LESS THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- BENZENE
- TOLUENE
- TOTAL XYLENES
- ETHYLBENZENE
- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 17

BTEX CONCENTRATIONS IN SOIL AT DEPTHS FROM 5 TO LESS THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

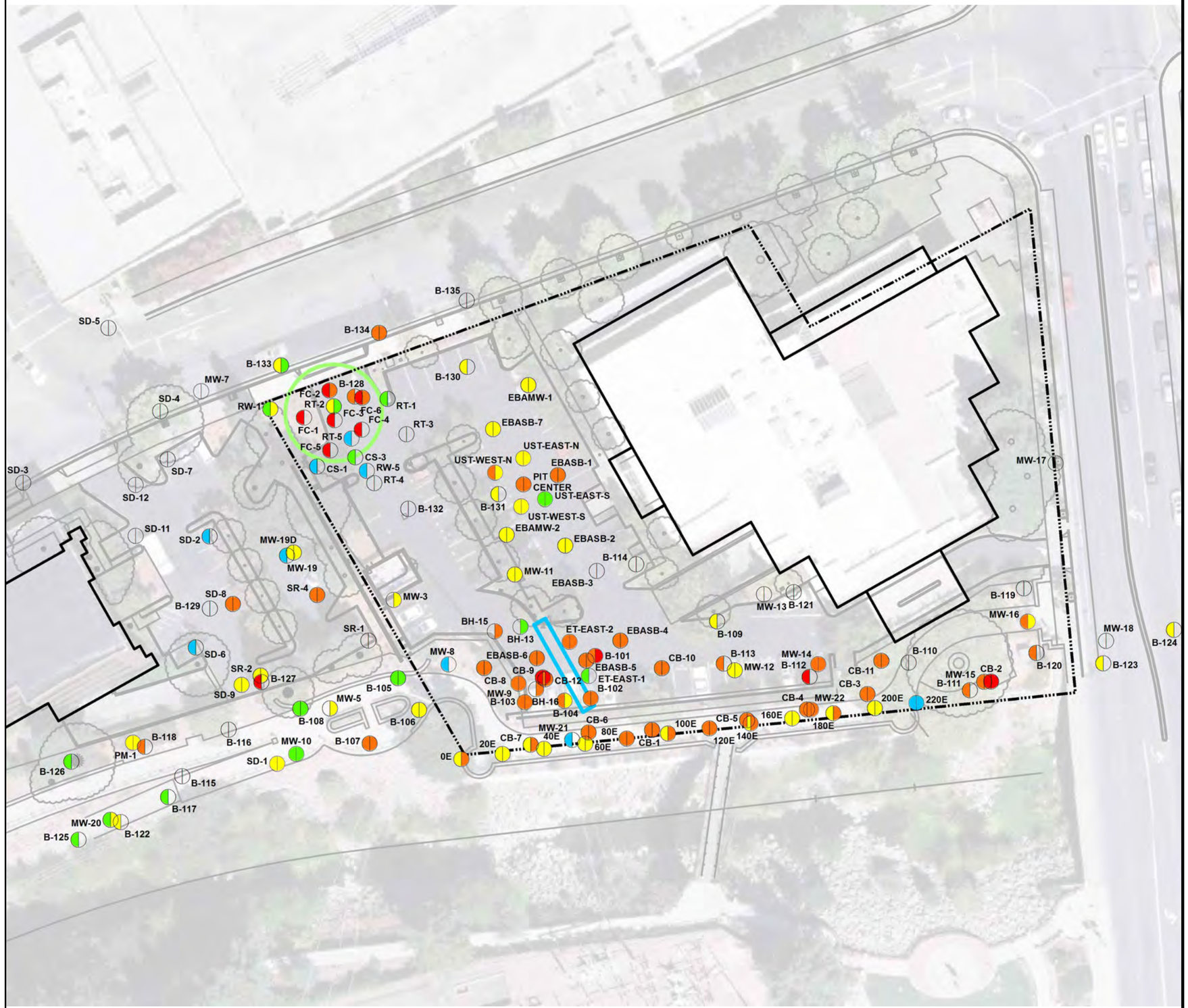
NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 18

TPHg CONCENTRATIONS IN SOIL AT DEPTHS GREATER THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction



0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- TPHmo
- TPHd
- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 19

TPHd and TPHmo CONCENTRATIONS IN SOIL AT DEPTHS GREATER THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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EXPLANATION

- BENZENE
- TOLUENE
- TOTAL XYLENES
- ETHYLBENZENE
- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 20

BTEX CONCENTRATIONS IN SOIL AT DEPTHS GREATER THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 21

LEAD CONCENTRATIONS IN SOIL AT DEPTHS LESS THAN 5 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 22

LEAD CONCENTRATIONS IN SOIL AT DEPTHS FROM 5 TO LESS THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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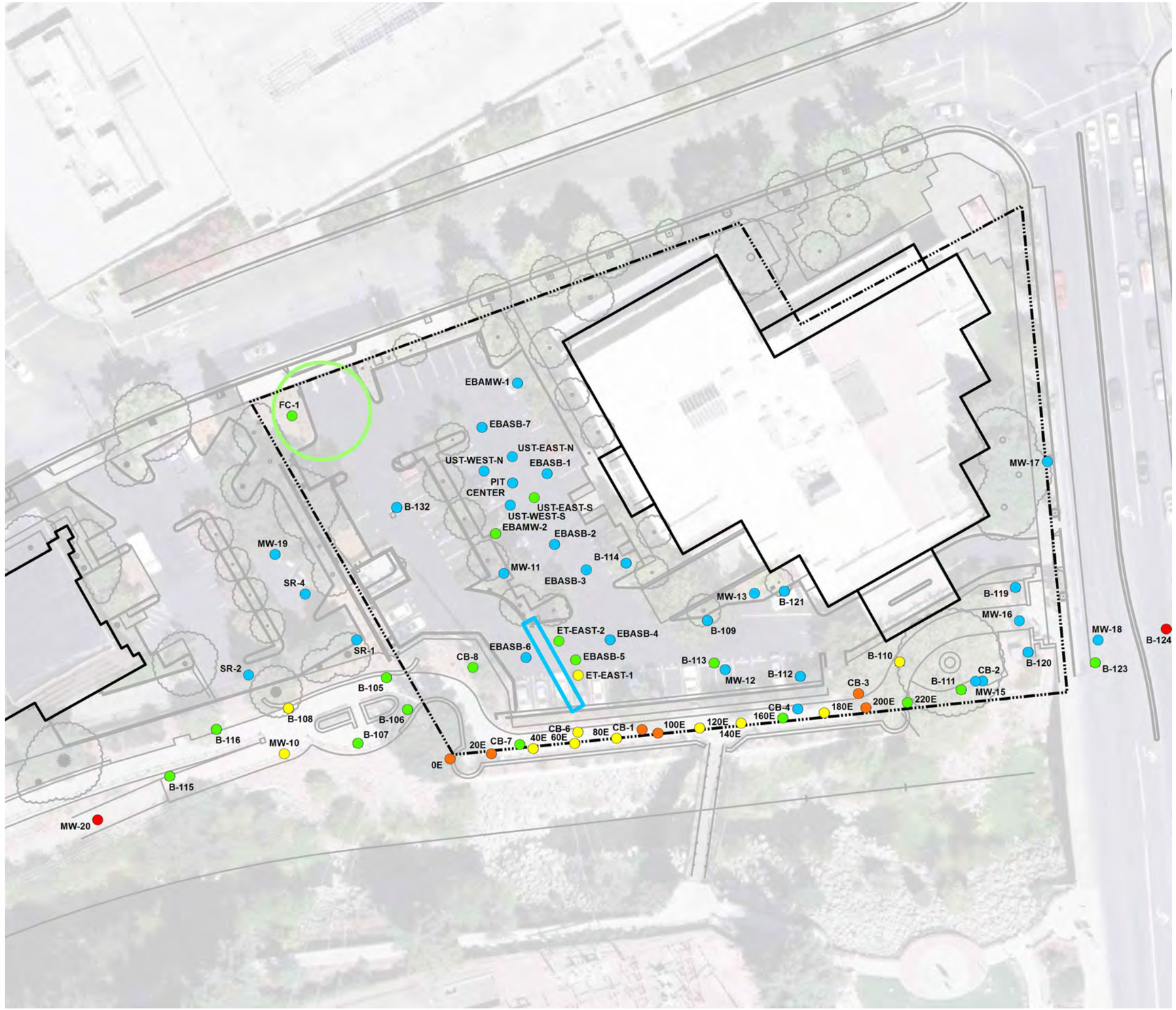


0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 23

LEAD CONCENTRATIONS IN SOIL AT DEPTHS GREATER THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

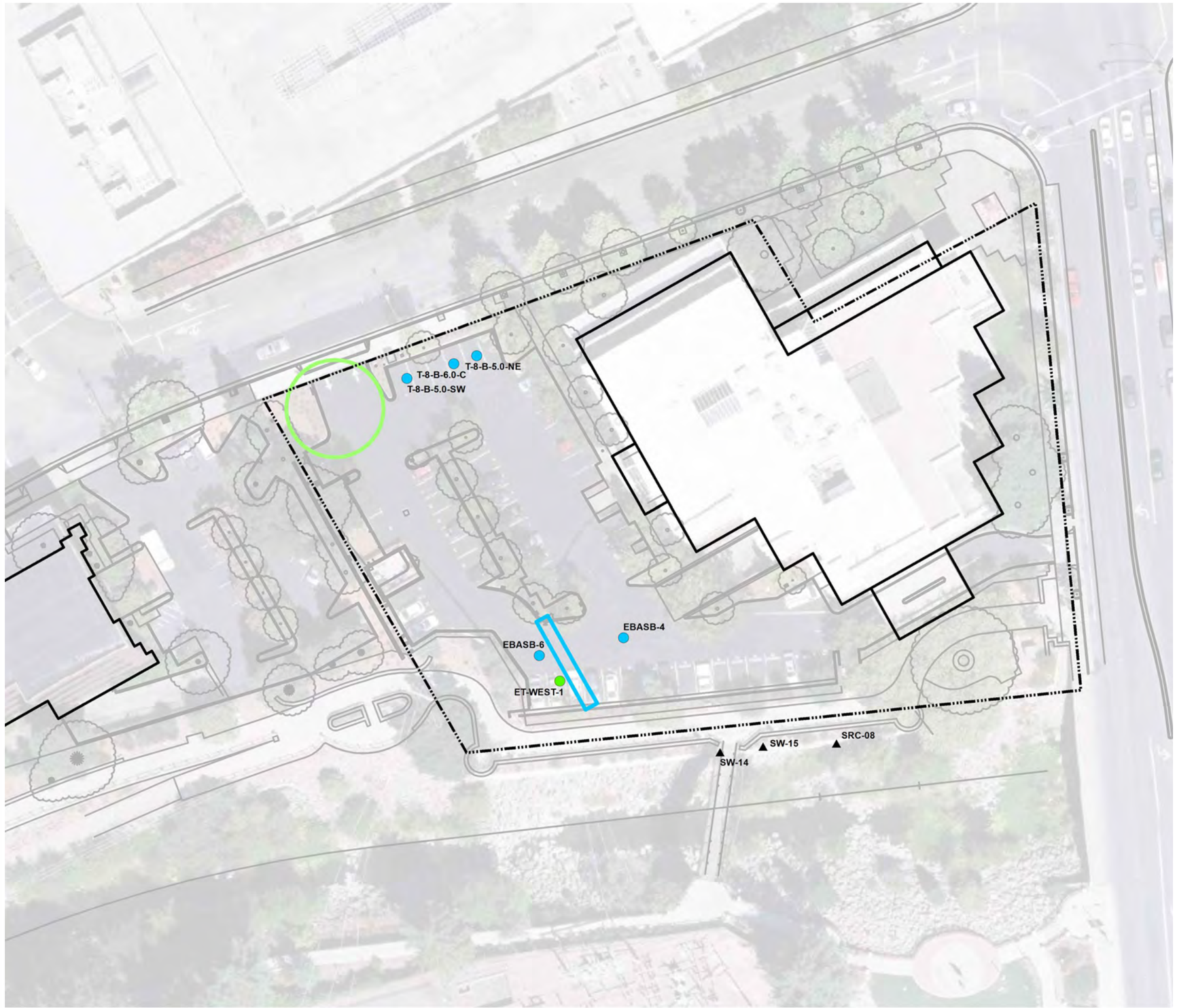
NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 24

ARSENIC CONCENTRATIONS IN SOIL AT DEPTHS LESS THAN 5 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction



0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 25

ARSENIC CONCENTRATIONS IN SOIL AT DEPTHS FROM 5 TO LESS THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

0 50 100 FEET

APPROXIMATE SCALE

EXPLANATION

- NON-DETECT
- 0-1 mg/kg
- 1-10 mg/kg
- 10-100 mg/kg
- 100-1,000 mg/kg
- 1,000-10,000 mg/kg
- GREATER THAN 10,000 mg/kg
- PROPERTY LINE
- REDWOOD GAS HOLDER
- UNDERGROUND STORAGE TANK
- OTHER SITE FEATURE

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

FIGURE 26

ARSENIC CONCENTRATIONS IN SOIL AT DEPTHS GREATER THAN 10 FEET

FORMER SANTA ROSA MGP
111 SANTA ROSA AVENUE
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

MW-19S	
TPHd	NA
TPHmo	NA
FLUORANTHENE	NA
PYRENE	NA

MW-7	
TPHd	<52
TPHmo	<100
FLUORANTHENE	<0.11
PYRENE	<0.11

EBAMW-2	
TPHd	<54
TPHmo	<110
FLUORANTHENE	<0.11
PYRENE	<0.11

EBAMW-1	
TPHd	<73
TPHmo	<150
FLUORANTHENE	<0.15
PYRENE	<0.15

MW-2	
TPHd	53
TPHmo	150
FLUORANTHENE	0.16
PYRENE	0.19

MW-1	
TPHd	<50
TPHmo	<100
FLUORANTHENE	<0.10
PYRENE	<0.10

MW-17	
TPHd	<65
TPHmo	<130
FLUORANTHENE	<0.14
PYRENE	<0.14

MW-22	
TPHd	<51
TPHmo	<100
FLUORANTHENE	<0.10
PYRENE	<0.10

MW-19D	
TPHd	<51
TPHmo	<100
FLUORANTHENE	<0.10
PYRENE	<0.10

MW-23	
TPHd	<51
TPHmo	<100
FLUORANTHENE	<0.10
PYRENE	<0.10

MW-20	
TPHd	<50
TPHmo	<100
FLUORANTHENE	<0.11
PYRENE	<0.11

MW-10	
TPHd	<49
TPHmo	<99
FLUORANTHENE	<0.11
PYRENE	<0.11

MW-9	
TPHd	57
TPHmo	130
FLUORANTHENE	<0.11
PYRENE	<0.11

MW-21	
TPHd	510
TPHmo	670
FLUORANTHENE	<0.11
PYRENE	<0.11

MW-12	
TPHd	<53
TPHmo	<110
FLUORANTHENE	<0.11
PYRENE	<0.11

MW-16	
TPHd	<52
TPHmo	<100
FLUORANTHENE	<0.11
PYRENE	<0.11

B STREET
FIRST STREET
SANTA ROSA AVENUE
SANTA ROSA AVENUE BRIDGE
PLANTER
BUILDING
438 FIRST STREET
BUILDING
111 SANTA ROSA AVENUE
10,817 GAL. UST
MW-7
MW-19S
MW-19D
MW-23
MW-20
MW-10
MW-8
MW-9
EBAMW-1
EBAMW-2
MW-11
MW-2
MW-1
MW-13
MW-21
MW-12
MW-14
MW-22
MW-15
MW-16
MW-17

EXPLANATION

- EXISTING GROUNDWATER MONITORING WELL
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD GAS HOLDER)
- 10,817 gal EXISTING UST
- BUILDING FOOTPRINT

WELL NAME — TOTAL PETROLEUM HYDROCARBON (TPH) DIESEL — TPH-MOTOR OIL

MW-10	
TPHd	<49
TPHmo	<99
FLUORANTHENE	<0.11
PYRENE	<0.11

NOTES:
1. NA INDICATES NOT ANALYZED.
2. < INDICATES NOT DETECTED AT OR ABOVE LABORATORY DETECTION LIMIT SHOWN.
3. ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)
4. PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

0 40 80 FEET
APPROXIMATE SCALE

FIGURE 27

SUMMARY OF DETECTED GROUNDWATER SAMPLING RESULTS SEPTEMBER 2014

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

P:\Drafting\Projects\PGE-1015\2015 RAP\028-PGE-1015-2015 RAP-NAPL Observed-Fig28.dwg 5/26/2015 12:34:56 PM PST

B STREET

FIRST STREET

SIDEWALK

PLANTER

(E) DI

(E) SDMH

FORMER USTs

BUILDING
111 SANTA ROSA AVENUE

BUILDING
438 FIRST STREET

10,817 GAL. UST

(E) CB

SANTA ROSA AVENUE

SANTA ROSA AVENUE BRIDGE

Santa Rosa Creek

EXPLANATION

- OBSERVED NON-AQUEOUS PHASE LIQUID (NAPL)
- FORMER USTs
- GAS HOLDER, PRESENT 1893;
- 35,000 cu ft CAPACITY (REDWOOD GAS HOLDER)
- 10,817 gal EXISTING UST

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

0 40 80 FEET
APPROXIMATE SCALE

FIGURE 28

OBSERVED NAPL LOCATIONS

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

P:\Drafting\Projects\PGE-1015\2015 RAP\029-PGE-1015-2015 RAP-Soil Remedy-Fig29.dwg 5/26/2015 12:34:56 PM PST

B STREET

FIRST STREET

SIDEWALK

PLANTER

(E) DI

(E) SDMH

FORMER USTs

BUILDING
111 SANTA ROSA AVENUE

SIDEWALK

SANTA ROSA AVENUE

(E) CB

BUILDING
438 FIRST STREET

10,817 GAL. UST

PLANTER

PLANTER

SANTA ROSA AVENUE BRIDGE

Santa Rosa Creek

EXPLANATION

- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD GAS HOLDER)
- EXCAVATION AREAS (APPROXIMATE)
- 10,817 gal EXISTING UST

0 40 80 FEET
APPROXIMATE SCALE

FIGURE 29

OVERVIEW OF SELECTED SOIL REMEDY

PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

P:\Drafting\Projects\PGE-1015\2015 RAP\030-PGE-1015-2015 RAP-Remaining Soil and UST Remedy-Fig30.dwg 6/24/2015 12:34:56 PM PST

B STREET

FIRST STREET

SIDEWALK

PLANTER

(E) DI

(E) SDMH

FORMER USTs

BUILDING
111 SANTA ROSA AVENUE

SIDEWALK

SANTA ROSA AVENUE

(E) CB

BUILDING
438 FIRST STREET

10,817 GAL. UST

PLANTER

PLANTER

(E) CB

SANTA ROSA AVENUE BRIDGE

Santa Rosa Creek

EXPLANATION

- FORMER USTs
- EXCAVATION AREAS (APPROXIMATE)
- 10,817 gal EXISTING UST

0 40 80 FEET
APPROXIMATE SCALE

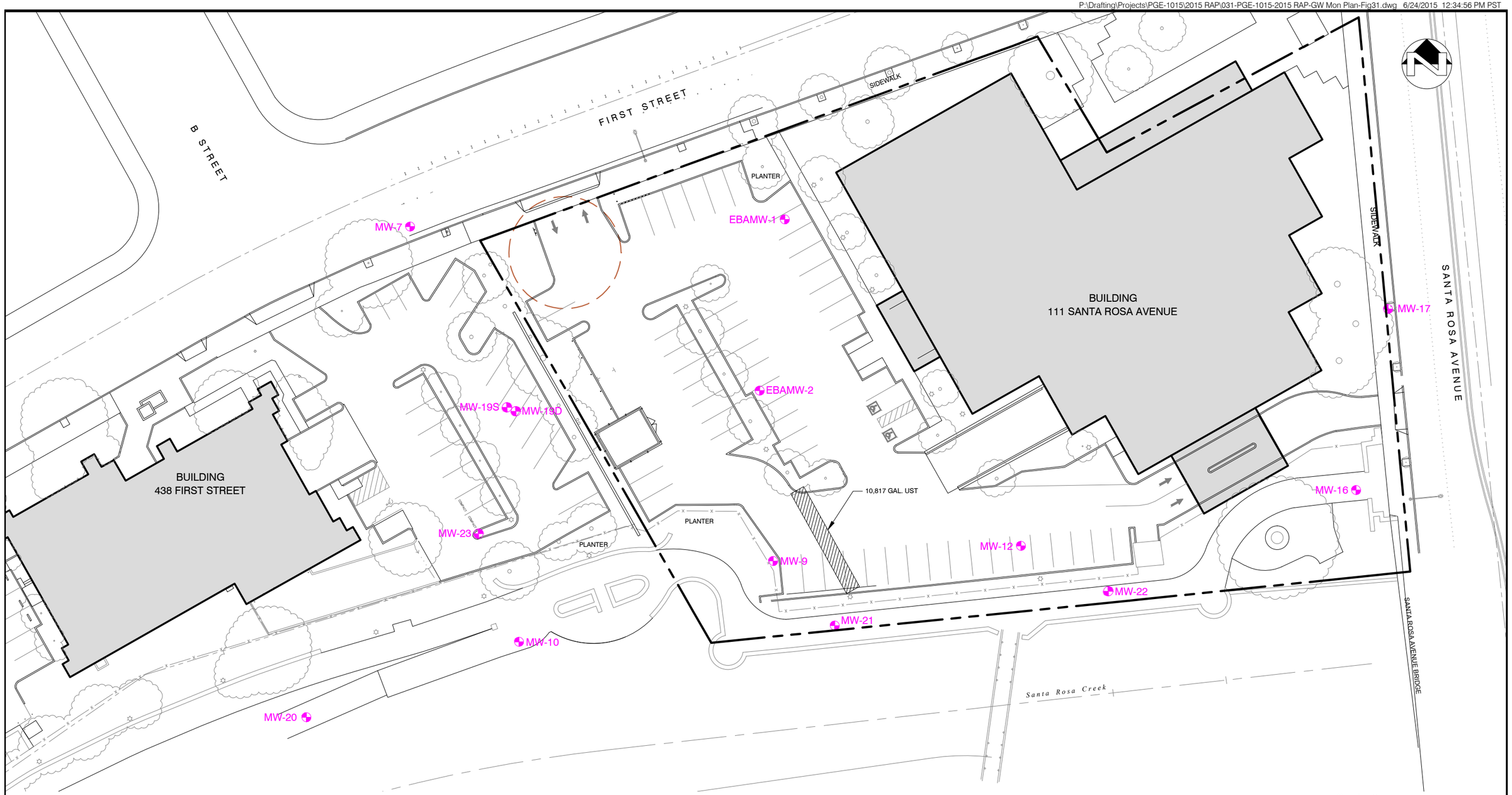
FIGURE 30

REMAINING SOIL AND UST REMEDY

PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

P:\Drafting\Projects\PGE-1015\2015 RAP\031-PGE-1015-2015 RAP-GW Mon Plan-Fig31.dwg 6/24/2015 12:34:56 PM PST



EXPLANATION

- GROUNDWATER MONITORING WELL
- GAS HOLDER, PRESENT 1893;
- 35,000 cu ft CAPACITY (REDWOOD GAS HOLDER)
- 10,817 gal EXISTING UST
- BUILDING FOOTPRINT

NOTE:
PROPERTY LINES OBTAINED FROM CITY OF SANTA ROSA GIS WEBSITE

0 40 80 FEET
APPROXIMATE SCALE

FIGURE 31

GROUNDWATER MONITORING PLAN

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

APPENDIX A

Historical Groundwater Monitoring Data

Appendix C from Groundwater Monitoring Report, September 2014 (TPG, 2015b)

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-1	1/8/1988	3510/8015	---	---	<1000	---	---	---	---
	11/8/1988	8015(Modified)/3510	---	<50	---	<50	---	<50	---
	11/10/1988	8015	---	<50	---	<50	---	<50	---
	3/27/1989	3510/8015	---	<1000	---	---	---	---	---
	1/12/1996	8015	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	5/16/1996	8015 Modified	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	8/26/1996	8015M	---	<50	<50	---	---	<50	---
		8020/8015M	<50	---	---	---	---	---	---
	12/3/1996	8015/MOD	---	<50.0	<100	---	---	<50	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/5/1997	8015/MOD	---	<50	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	<50	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	4/18/2007	8015B (M)	<50	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	<50	<250	---	---	---	---
	11/29/2007	8260B	<50	---	---	---	---	---	---
	11/29/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	**61**	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	<50	<300	---	---	---	---
	12/2/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2009(2)	8015B	---	<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/11/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2011 (2)	8015B	---	<52	<100	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011 (2)	8015B	---	<50	<99	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<50	<100	---	---	---	---
	3/18/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/18/2013 (2)	8015B	---	<50	<99	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-1	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<53	<110	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	<50	<100	---	---	---	---
	9/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/11/2014(2)	8015B	---	<50	<100	---	---	---	---
MW-2	12/10/1987	3510/8015	---	**13,000**	---	---	---	---	---
	1/8/1988	3510/8015	---	---	**6,000**	---	---	---	---
	3/4/1988	3510/8015	---	---	**2.2**	---	---	---	---
	11/8/1988	8015(Modified)/3510	---	<50	---	<50	---	<50	---
	11/10/1988	8015	---	<50	---	<50	---	<50	---
	3/9/1989	3510/8015	---	<1000	---	---	---	---	---
	1/12/1996	8015	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	5/16/1996	8015 Modified	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	8/26/1996	8015M	---	<50	<50	---	---	<50	---
		8020/8015M	<50	---	---	---	---	---	---
	12/3/1996	8015/MOD	---	**68**	**160**	---	---	<50	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/5/1997	8015/MOD	---	**77**	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	6/19/1997	8015	---	<50	<50	---	---	---	---
		8020/8015	<50	---	---	---	---	---	---
	2/19/1999	8015/MOD	---	<50	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	6/15/1999	8015M	---	<50	<100	---	---	---	---
		GCFID-5030A	<50	---	---	---	---	---	---
	8/11/1999	8015M	---	**61**	**120**	---	---	---	---
		GCFID-5030A	<50	---	---	---	---	---	---
	11/11/1999	8015M	---	**67**	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	2/15/2000	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	5/15/2000	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	8/15/2000	8015M	---	**140**	**580**	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	11/17/2000	8015M	---	**79**	**130**	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	2/14/2001	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	5/10/2001	8015DRO	---	**100**	**210**	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
	8/7/2001	8015DRO	---	**56**	<110	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
	11/5/2001	8015DRO	---	**61**	**140**	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-2	2/15/2002	8015DRO	---	**61**	**160**	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
	11/11/2002	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8020	<50	---	---	---	---	---	---
	2/10/2003	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8020	<50	---	---	---	---	---	---
	1/30/2004	3510/8015M	---	<50	<200	---	---	---	---
	12/21/2004	3510/8015	---	<50	<200	---	---	---	---
	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	4/18/2007	8015B (M)	<50	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	**220**	<250	---	---	---	---
	11/29/2007	8260B	<50	---	---	---	---	---	---
	11/29/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	**88**	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	<50	<300	---	---	---	---
	12/2/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2009(2)	8015B		**65**	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	**60**	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	**67**	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	**---**	---	---	---	---	---
	3/4/2011 (2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	**---**	---	---	---	---	---
	9/13/2011 (2)	8015B	---	<50	<99	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	<50	<100	---	---	---	---
	9/5/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/5/2012 (2)	8015B	---	**62**	**280**	---	---	---	---
	3/20/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/20/2013(2)	8015B	---	**290**	**750**	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<50	**110**	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	**110**	<99	---	---	---	---
	9/8/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/8/2014(2)	8015B	---	**53**	**150**	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-3	12/1/1987	3510/8015M	---	**185,000**	---	---	---	---	---
				168,000					
	12/10/1987	3510/8015	---	**25,000**	---	---	---	---	---
	1/8/1988	3510/8015	---	---	**43,000**	---	---	---	---
	3/4/1988	3510/8015	---	---	<1.0	---	---	---	---
	11/8/1988	8015(Modified)/3510	---	<50	---	<50		<50	
	11/10/1988	8015	---	<50	---	<50		<50	
	3/9/1989	3510/8015	---	<1000	---	---	---	---	---
	12/3/1996	8015/MOD	---	**960**	**1,400**	---	**4,300**	<50	
	3/5/1997	8015/MOD	---	**730**	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	6/19/1997	8015	---	<50	<50	---	---	---	---
		8020/8015	<50	---	---	---	---	---	---
MW-4	5/20/1988	unknown	---	<50	<50	---	---	---	---
	3/9/1989	3510/8015	---	<1000	---	---	---	---	---
MW-5	5/20/1988	unknown	---	<50	<50	---	---	---	---
	11/8/1988	8015(Modified)/3510	---	<50	---	<50	---	<50	---
	11/10/1988	8015	---	<50	---	<50	---	<50	---
	3/9/1989	3510/8015	---	<1000	---	---	---	---	---
	1/12/1996	8015	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	5/16/1996	8015 Modified	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	8/26/1996	8015M	---	<50	<50	---	---	<50	---
		8020/8015M	<50	---	---	---	---	---	---
	12/3/1996	8015/MOD	---	<50.0	<100	---	---	<50	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/5/1997	8015/MOD	---	<50	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	6/19/1997	8015	---	<50	<50	---	---	---	---
		8020/8015	<50	---	---	---	---	---	---
	3/2/1999	8015/MOD	---	<50	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	6/15/1999	8015M	---	<50	<100	---	---	---	---
		GCFID-5030A	<50	---	---	---	---	---	---
	8/11/1999	GCFID-5030A	<50	---	---	---	---	---	---
	11/11/1999	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	2/15/2000	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	5/15/2000	8015M	---	**54**	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	8/15/2000	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	11/17/2000	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	2/14/2001	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	5/10/2001	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-5	8/7/2001	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
	11/5/2001	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
	2/15/2002	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
MW-7	5/20/1988	unknown	---	<50	<50	---	---	---	---
				<50	<50				
	11/8/1988	8015(Modified)/3510	---	<50	---	<50	---	<50	---
	11/10/1988	8015	---	<50	---	<50	---	<50	---
	3/27/1989	3510/8015	---	<1000	---	---	---	---	---
	1/12/1996	8015	---	<50	<50	---	---	<50	---
		8020/8015	69	---	---	---	---	---	---
	5/16/1996	8015 Modified	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	8/26/1996	8015M	---	<50	<50	---	---	<50	---
		8020/8015M	<50	---	---	---	---	---	---
	12/3/1996	8015/MOD	---	<50.0	<100	---	---	<50	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/5/1997	8015/MOD	---	<50	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	**100**	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	4/19/2007	8015B (M)	<50	---	---	---	---	---	---
	4/19/2007(2)	8015B (M)	---	**80**	<250	---	---	---	---
	11/28/2007	8260B	<50	---	---	---	---	---	---
	11/28/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	**59**	<500	---	---	---	---
	12/1/2008	8260B	<50	---	---	---	---	---	---
	12/1/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	<50	<300	---	---	---	---
	12/1/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/1/2009(2)	8015B		<50	<300	---	---	---	---
	4/2/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/2/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011 (2)	8015B	---	**85**	**240**	---	---	---	---

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Historical Summary of TPH in Groundwater
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-7	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011	8015B	---	<50	<100	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/5/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/5/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<52	**160**	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	**79**	**230**	---	---	---	---
	9/9/2014	8260B/CA_LUFTMS	<50			---	---	---	---
	9/9/2014(2)	8015B	---	<52	<100	---	---	---	---
MW-8	2/19/1999	8015/MOD	---	**18,000**	**20,000**	---	---	---	---
	6/15/1999	8015M	---	**4,800**	**5,800**	---	---	---	---
	11/11/1999	8015M	---	**4,900**	**4,500**	---	---	---	---
	2/15/2000	8015	---	---	**1,900**	---	---	---	---
		8015M	---	**1,700**	---	---	---	---	---
	5/15/2000	8015M	---	**260**	**180**	---	---	---	---
	8/15/2000	8015M	---	**2,900**	**4,000**	---	---	---	---
	11/17/2000	8015M	---	**330**	**300**	---	---	---	---
	2/14/2001	8015M	---	**280**	**250**	---	---	---	---
	5/10/2001	8015DRO	---	**740**	**860**	---	---	---	---
	8/7/2001	8015DRO	---	**350**	**360**	---	---	---	---
	11/5/2001	8015DRO	---	**500**	**550**	---	---	---	---
	2/15/2002	8015DRO	---	**290**	**280**	---	---	---	---
	11/11/2002	8015DRO	---	**1,100**	**1,300**	---	---	---	---
	2/10/2003	8015DRO	---	**150**	**200**	---	---	---	---
	1/30/2004	3510/8015M	---	**94**	<200	---	---	---	---
		418.1m	---	---	---	---	---	---	<1000
	12/21/2004	3510/8015	---	**2,700**	<200	---	---	---	---
	3/10/2005	GC/MS COMB	<50	**230**	<100	---	---	---	---
	3/10/2005(2)	3630	---	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	**110**	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	**220**	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	**200**	<250	---	---	---	---
	11/30/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	11/30/2009(2)	8015B		<50	<300	---	---	---	---
	4/2/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/2/2010(2)	8015B		**53**	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-9	2/19/1999	8015/MOD	---	**1,600**	**1,200**	---	---	---	---
	6/15/1999	8015M	---	**350**	**290**	---	---	---	---
	11/11/1999	8015M	---	**550**	**340**	---	---	---	---
	2/15/2000	8015M	---	**270**	**290**	---	---	---	---
	5/15/2000	8015M	---	**1,100**	**1,200**	---	---	---	---
	8/15/2000	8015M	---	**290**	**380**	---	---	---	---
	11/17/2000	8015M	---	**110**	<100	---	---	---	---
	2/14/2001	8015M	---	**170**	**140**	---	---	---	---
	5/10/2001	8015DRO	---	**200**	**260**	---	---	---	---
	8/7/2001	8015DRO	---	**410**	**280**	---	---	---	---
	11/5/2001	8015DRO	---	**480**	**550**	---	---	---	---
	2/15/2002	8015DRO	---	**210**	**290**	---	---	---	---
	11/11/2002	8015DRO	---	**180**	**170**	---	---	---	---
	2/10/2003	8015DRO	---	**100**	<100	---	---	---	---
	1/30/2004	3510/8015M	---	<50	<200	---	---	---	---
		418.1m	---	---	---	---	---	---	<1000
	12/21/2004	3510/8015	---	<200	---	---	---	---	---
			---	**330**	---	---	---	---	---
	3/10/2005	GC/MS COMB	<50	**110**	<100	---	---	---	---
	3/10/2005(2)	3630	---	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	<50	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	**180**	<250	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	**150**	<250	---	---	---	---
	4/18/2007	8015B (M)	<50	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	**230**	350	---	---	---	---
	11/28/2007	8260B	<50	---	---	---	---	---	---
	11/28/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	**140**	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	**73**	<300	---	---	---	---
	12/1/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/1/2009(2)	8015B		<50	<300	---	---	---	---
	4/2/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/2/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	**77**	<300	---	---	---	---
	3/2/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/2/2011(2)	8015B	---	<49	<98	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-9	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<50	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/18/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/18/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<51	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014 (2)	8015B	---	<50	<100	---	---	---	---
	9/8/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/8/2014 (2)	8015B	---	**57**	**130**	---	---	---	---
MW-10	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
			<50	<100	<100				
	6/28/2005	8015M/8020	<50	---	---	---	---	-----	-----
			<50						
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
				<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	4/18/2007	8015B (M)	**52**	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	<50	<250	---	---	---	---
	11/28/2007	8260B	<50	---	---	---	---	---	---
	11/28/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
			<50						
	12/2/2008(2)	8015B	---	**55**	<500	---	---	---	---
				<50	<500				
	3/9/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/9/2009(2)	8015B	---	<50	<300	---	---	---	---
	11/30/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	11/30/2009(2)	8015B		<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	----	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---

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Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-10	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	<50	<99	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/10/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2014 (2)	8015B	---	<50	<100	---	---	---	---
	9/9/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2014 (2)	8015B	---	<49	<99	---	---	---	---
MW-11	3/10/2005	GC/MS COMB	<50	**190**	<100	---	---	---	---
	3/10/2005(2)	3630	---	**100**	<100	---	---	---	---
	6/28/2005	8015M/8020	**99**	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	<50	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	**240**	<250	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	**370**	<250	---	---	---	---
MW-12	3/10/2005	GC/MS COMB	<50	**2,500**	**1,700**	---	---	---	---
	3/10/2005(2)	3630	---	**2,200**	**1,300**	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	<50	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	**51**	<250	---	---	---	---
	4/18/2007	8015B (M)	<50	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	<50	<250	---	---	---	---
	11/29/2007	8260B	<50	---	---	---	---	---	---
	11/29/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	<50	<300	---	---	---	---
	12/2/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2009(2)	8015B		<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	**350**	**540**	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-12	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	<50	<100	---	---	---	---
	9/5/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/5/2012 (2)	8015B	---	<50	<100	---	---	---	---
	3/20/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/20/2013(2)	8015B	---	**140**	**210**	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<50	<99	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014 (2)	8015B	---	<50	<100	---	---	---	---
	9/8/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/8/2014(2)	8015B	---	<53	<110	---	---	---	---
MW-13	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	<50	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
MW-14	3/10/2005	GC/MS COMB	**57**	**3,300**	**2,000**	---	---	---	---
	3/10/2005(2)	3630	---	**2,800**	**1,700**	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	**77** **56**	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	**400** **430**	**340** **320**	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	**430** **460**	**280** **330**	---	---	---	---
MW-15	3/10/2005	GC/MS COMB	<50	**1,600**	**920**	---	---	---	---
	3/10/2005(2)	3630	---	**790**	**500**	---	---	---	---
	6/28/2005	8015M/8020	**100**	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	**460**	**400**	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	**1,100**	<250	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-16	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	**120**	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	**220**	<250	---	---	---	---
	4/18/2007	8015B (M)	<50	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	**260**	**400**	---	---	---	---
	11/28/2007	8260B	<50	---	---	---	---	---	---
	11/28/2007(2)	8015B (M)	---	**59 UN**	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	**120**	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/9/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/9/2009(2)	8015B	---	<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	**2,100**	**2,700**	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	**200**	**300**	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	**100**	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	**68**	**100**	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014 (2)	8015B	---	<50	<100	---	---	---	---
	9/9/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2014 (2)	8015B	---	<52	<100	---	---	---	---

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Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-17	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<97	<190	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<51	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014 (2)	8015B	---	<50	<100	---	---	---	---
	9/9/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2014 (2)	8015B	---	<65	<130	---	---	---	---
MW-18	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	4/19/2007	8015B (M)	<50	---	---	---	---	---	---
	4/19/2007(2)	8015B (M)	---	<50	<250	---	---	---	---
	11/28/2007	8260B/8015B (M)	---	---	---	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
	12/1/2008	8260B	<50	---	---	---	---	---	---
	12/1/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	<50	<300	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-18	12/1/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/1/2009(2)	8015B	---	<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
MW-19	4/18/2007	8015B (M)	**100**	---	---	---	---	---	---
			180						
	4/18/2007(2)	8015B (M)	---	**290**	<250	---	---	---	---
				250	**270**				
	11/28/2007	8260B	**30 J**	---	---	---	---	---	---
	11/28/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/23/2008	8260B	<50	---	---	---	---	---	---
			<50						
	5/23/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
				53	<500				
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B	**590**	---	---	---	---	---	---
			620	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	**72**	<300	---	---	---	---
			---	**94**	<300	---	---	---	---
MW-19S	3/3/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/3/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/18/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
MW-19D	11/30/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	11/30/2009(2)	8015B	---	<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/3/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/3/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<100	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<50	<100	---	---	---	---
			---	<51	<100	---	---	---	---
	9/5/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	9/5/2012 (2)	8015B	---	<51	<100	---	---	---	---
			---	<50	<100	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-19D	3/18/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	3/18/2013(2)	8015B	---	<50	<99	---	---	---	---
			---	<50	<99	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
			---	<51	<100	---	---	---	---
	3/10/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	3/10/2014 (2)	8015B	---	<50	<100	---	---	---	---
			---	<50	<100	---	---	---	---
	9/8/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	9/8/2014 (2)	8015B	---	<51	<100	---	---	---	---
			---	<51	<100	---	---	---	---
MW-20	4/19/2007	8015B (M)	<50	---	---	---	---	---	---
	4/19/2007(2)	8015B (M)	---	<50	<250	---	---	---	---
	11/28/2007	8015B (M)	<50	---	---	---	---	---	---
			<50						
	11/28/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
				<50	**97 J**				
	5/22/2008	8015B (M)	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/9/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/9/2009(2)	8015B	---	<50	<300	---	---	---	---
	11/30/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	11/30/2009(2)	8015B	---	<51	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<100	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<50	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<50	<99	---	---	---	---

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Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-20	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/10/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2014 (2)	8015B	---	<50	<100	---	---	---	---
	9/9/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2014 (2)	8015B	---	<50	<100	---	---	---	---
MW-21	5/30/2008	8015B (M)	<50	---	---	---	---	---	---
	5/30/2008(2)	8015B (M)	---	**70**	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/9/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/9/2009(2)	8015B	---	<50	<300	---	---	---	---
	12/2/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2009(2)	8015B	---	<51	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	**330**	**610**	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<51	<100	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	<50	<99	---	---	---	---
	9/9/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2014(2)	8015B	---	**510**	**670**	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-22	12/2/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2009(2)	8015B	---	**120**	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	**210**	<300	---	---	---	---
	3/11/2011	8260B/CA_LUFTMS	<50	**---**	---	---	---	---	---
	3/11/2011(2)	8015B	---	**220**	**250**	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	**---**	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	**100**	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	**100**	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	**140**	**110**	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	**100**	<99	---	---	---	---
	9/9/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2014(2)	8015B	---	<51	<100	---	---	---	---
MW-23	11/30/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	11/30/2009(2)	8015B	---	<51	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/3/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/3/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<51	<100	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<50	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/18/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/18/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/10/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2014 (2)	8015B	---	<50	<99	---	---	---	---
	9/8/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/8/2014 (2)	8015B	---	<51	<100	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
EBAMW-1	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	**120**	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<51	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	**950**	**1,300**	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	**---**	**---**	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	**---**	**---**	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	**160**	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<50	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	**72 HB**	**160 HB**	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	<50	<100	---	---	---	---
	9/8/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/8/2014(2)	8015B	---	<73	<150	---	---	---	---
EBAMW-2	12/2/2008	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	**52**	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	**280**	<300	---	---	---	---
	12/1/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/1/2009(2)	8015B	---	**65**	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	<50	<300	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
EBAMW-2	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<51	<100	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	**100**	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/20/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/20/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<51	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	<50	<100	---	---	---	---
	9/9/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2014(2)	8015B	---	<54	<110	---	---	---	---

Notes:
(1) sample was filtered by the laboratory prior to analysis using 0.7 micron glass fiber filter
(2) sample extract was subjected to silica gel treatment prior to analysis
TPH = total petroleum hydrocarbons
TRPH = total recoverable petroleum hydrocarbons
ug/L = micrograms per liter
"<" = not detected at or above laboratory reporting limit
--- = not analyzed
B = compound was found in the blank and sample.
H = sample was prepped or analyzed beyond the specified holding time.
UN = compound was found in the blank and sample and result should be viewed as tentative non detection (i.e. suspect)
J = Result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL) and the concentration is an approximate value

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-1	11/8/1988	602	<1	<1	<1	---	---	<1
	11/10/1988	602	<1	<1	<1	---	---	<1
	3/27/1989	8020	<0.5	<0.5	<0.5	---	---	<0.5
	1/12/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	5/16/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	8/26/1996	8020/8015M	<0.3	<0.3	<0.3	---	---	<0.3
	12/3/1996	602	<.300	<.300	<.500	---	---	<.500
	3/5/1997	602	<.300	<.300	<.500	---	---	<.500
	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/29/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/18/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-2	11/8/1988	602	<1	<1	<1	---	---	<1
	11/10/1988	602	<1	<1	<1	---	---	<1
	3/9/1989	8020	<0.2	<0.2	<0.2	---	---	<0.2
	1/12/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	5/16/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	8/26/1996	8020/8015M	<0.3	<0.3	<0.3	---	---	<0.3
	12/3/1996	602	<.300	<.300	<.500	---	---	<.500
	3/5/1997	602	<.300	<.300	<.500	---	---	<.500
	6/19/1997	8020/8015	<0.50	<0.50	<0.50	---	---	<0.50
	2/19/1999	602	**3.6**	**1.2**	**1.3**	---	---	**4**
	6/15/1999	8020	<0.30	<0.30	<0.50	---	---	<.50
	8/11/1999	8020	**1.8**	**0.52**	**0.61**	---	---	**1.8**
	11/11/1999	8020	<0.30	<0.30	<0.50	---	---	<0.50
	2/15/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	5/15/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	8/15/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	11/17/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	2/14/2001	8020	<0.30	<0.30	<0.50	---	---	<.50
	5/10/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	8/7/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	11/5/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	2/15/2002	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	11/11/2002	8015GRO/8020	**0.42**	<0.30	<0.50	---	---	<0.50
	2/10/2003	8015GRO/8020	<0.30	<0.30	<0.50	---	---	<0.50
	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/29/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-2	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/20/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/8/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-3	11/8/1988	602	<1	<1	<1	---	---	<1
	11/10/1988	602	<1	<1	<1	---	---	<1
	3/9/1989	8020	<0.2	<0.2	<0.2	---	---	<0.2
	3/5/1997	602	<.300	<.300	<.500	---	---	<.500
	6/19/1997	8020/8015	<0.50	<0.50	<0.50	---	---	<0.50
MW-4	3/9/1989	8020	<0.2	<0.2	<0.2	---	---	<0.2
MW-5	11/8/1988	602	<1	<1	<1	---	---	<1
	11/10/1988	602	<1	<1	<1	---	---	<1
	3/9/1989	8020	<0.2	<0.2	<0.2	---	---	<0.2
	1/12/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	5/16/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	8/26/1996	8020/8015M	<0.3	<0.3	<0.3	---	---	<0.3
	12/3/1996	602	<.300	<.300	<.500	---	---	<.500
	3/5/1997	602	<.300	<.300	<.500	---	---	<.500
	6/19/1997	8020/8015	<0.50	<0.50	<0.50	---	---	<0.50
	3/2/1999	602	<0.300	<0.300	<0.500	---	---	**0.69**
	6/15/1999	8020	<0.30	<0.30	<0.50	---	---	**0.58**
	8/11/1999	8020	<0.30	<0.30	<0.50	---	---	<0.50
	11/11/1999	8020	<0.30	<0.30	<0.50	---	---	<0.50
	2/15/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	5/15/2000	8020	<0.30	<0.30	<0.50	---	---	**0.6**
	8/15/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	11/17/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	2/14/2001	8020	<0.30	<0.30	<0.50	---	---	<.50
	5/10/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	8/7/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	11/5/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	2/15/2002	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	**1.3**
MW-7	11/8/1988	602	<1	<1	<1	---	---	<1
	11/10/1988	602	<1	<1	<1	---	---	<1
	3/27/1989	8020	<0.5	<0.5	<0.5	---	---	<0.5
	1/12/1996	8020/8015	<0.3	<0.3	<0.3	---	---	**2.1**
	5/16/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	8/26/1996	8020/8015M	<0.3	<0.3	<0.3	---	---	<0.3
	12/3/1996	602	<.300	<.300	<.500	---	---	<.500
	3/5/1997	602	<.300	<.300	<.500	---	---	<.500
	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/19/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/28/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/1/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	**8.3**	<0.50	<0.50	---	---	<1.0
	12/1/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-7	4/2/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-8	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	11/30/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/2/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-9	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/28/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/1/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/2/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/2/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/18/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/8/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-10	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
			<0.5	<0.5	<0.5			<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
			<0.5	<0.5	<0.5			<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/28/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50			<1.0
	3/9/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	11/30/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-11	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
MW-12	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/29/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/20/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/8/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-13	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
MW-14	3/10/2005	8260	<0.5	**2.3**	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
			<0.50	<1.0	<1.0			<1.0
MW-15	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
MW-16	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/28/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/9/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-17	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-18	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/19/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/1/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/1/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/2/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-19	4/18/2007	8260B	**34**	<1.0	<1.0	<1.0	<1.0	---
			39	<1.0	<1.0	<1.0	<1.0	
	11/28/2007	8260B	**1.2**	<0.50	<0.50	---	---	<1.0
	5/23/2008	8260B	**0.79**	<0.50	<0.50	---	---	<1.0
			0.72	<0.50	<0.50			<1.0
	12/2/2008	8260B	**1.5**	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	**460**	<5.0	<5.0	---	---	<10
			440	<5.0	<5.0			<10
MW-19S	3/3/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/18/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-19D	11/30/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/3/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
	3/18/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
	9/8/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
MW-20	4/19/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/28/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50			<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/9/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	11/30/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-21	5/30/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/9/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2112	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-22	12/2/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-23	11/30/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/3/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/18/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/8/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
EBAMW-1	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1
	4/1/2010	8260B/CA_LUFTMS	**20**	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/8/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
EBAMW-2	12/2/2008	8260B	**4.1**	<0.5	**1.6**	---	---	<1
	3/10/2009	8260B/CA_LUFTMS	**9.3**	**0.6**	**3.7**	---	---	**2.2**
	12/1/2009	8260B/CA_LUFTMS	**5.7**	<0.5	**1.7**	---	---	<1
	4/1/2010	8260B/CA_LUFTMS	**3.9**	<0.50	**1.5**	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	**1.1**	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/20/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					

Notes:
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
ug/L = micrograms per liter
"<" = not detected at or above laboratory reporting limit
--- = not analyzed

Table C-3
Historical Summary of Metals in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Inorganic Compounds																		
			Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
			Results (mg/L)																			
MW-1	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	61	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	<0.1	---	---	<0.01	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.33	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.03
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.6	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.18
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.123	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	0.00542	<0.0100
	7/5/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.117	<0.00100	<0.00500	0.00513	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00539	<0.0150	<0.00500	<0.0150	<0.00500	<0.0100
MW-2	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	64	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	<0.1	---	---	1.4	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.16	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	0.02	<0.05	<0.01	<0.05	<0.01	0.01
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.48	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.15
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.119	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.0125	<0.0150	<0.00500	<0.0150	0.0076	0.0302
	7/6/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.109	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.0132	<0.0150	<0.00500	<0.0150	<0.00500	<0.0100
MW-7	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	59	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	1.8	---	---	4.3	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.18	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.02
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.54	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.11
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.137	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	<0.0100
	7/6/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.134	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	<0.0100
MW-8	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	64	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	1.7	---	---	3.1	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.28	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.03
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.42	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.14
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.134	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.01
	7/6/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.118	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.022
MW-9	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	33	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	0.1	---	---	0.87	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.26	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.03
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.51	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.15
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.196	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.0172	<0.0150	<0.00500	<0.0150	<0.00500	0.0252
	7/5/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.189	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.0161	<0.0150	<0.00500	<0.0150	<0.00500	0.055
MW-10	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	97	---	---	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---	---	---	110		---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	<0.1	---	---	1.9	---	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---	<0.1		---	1.9	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.17	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.01
			<0.05	<0.05	0.17	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.44	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	<0.05
			<0.15	<0.20	0.36	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.091
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.172	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0309
	7/6/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.173	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0316
MW-11	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	150	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	3.6	---	---	5.3	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.32	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.03
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.63	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.14
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.324	<0.00100	<0.00500	0.0321	0.011	0.00958	---	<0.0100	---	---	<0.000500	<0.00500	0.0394	<0.0150	<0.00500	<0.0150	0.0214	0.0511
	7/5/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.171	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0317

Table C-3
Historical Summary of Metals in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Inorganic Compounds																			
			Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
			Results (mg/L)																			
MW-12	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	230	----	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	2.2		---	1.9	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.42	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	0.01	<0.05	<0.01	<0.05	<0.01	0.06
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.7	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.2
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.146	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00829	<0.0150	<0.00500	<0.0150	0.00561	0.0407
	7/5/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.141	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00805	<0.0150	<0.00500	<0.0150	0.0086	0.0537
MW-13	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	83	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	0.3		---	0.37	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.25	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.05
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.29	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.091
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.0492	<0.00100	<0.00500	0.00768	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00721	<0.0150	<0.00500	<0.0150	0.00751	0.0134
	7/5/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.0382	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0124
MW-14	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	190	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	0.8	---	---	0.78	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.46	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.09
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.6	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.18
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.14	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0743
			<0.0150	<0.0100	0.143	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0439
	7/5/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.121	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0631
			<0.0150	<0.0100	0.117	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0207
MW-15	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	400	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	0.1		---	4.1	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.52	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	0.02	<0.05	<0.01	<0.05	<0.01	0.06
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.82	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.2
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.223	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.022
	7/6/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.218	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00613	<0.0150	<0.00500	<0.0150	<0.00500	0.0261
MW-16	6/28/2005(1)	3010/6010	<0.15	<0.20	0.7	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.2
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.154	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00578	<0.0150	<0.00500	<0.0150	<0.00500	0.0114
	7/6/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.146	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0629
MW-17	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	45	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	<0.1		---	0.06	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.04	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.47	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	<0.05
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.127	<0.00100	<0.00500	0.0146	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.0166	<0.0150	<0.00500	<0.0150	0.0105	0.018
	7/6/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.0957	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0296
MW-18	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	220	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	0.8		---	0.77	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.76	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	0.02	0.02	<0.05	<0.01	<0.05	0.01	0.16
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.79	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.16
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.159	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00965	<0.0150	<0.00500	<0.0150	0.0101	0.0177
	7/6/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.153	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00653	<0.0150	<0.00500	<0.0150	0.00856	<0.0100

Notes:
(1) sample was filtered in the field using 0.45 micron filter
mg/L = milligrams per liter
"<" = not detected at or above laboratory reporting limit
--- = not analyzed

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-1	12/10/1987	610	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1/8/1988	610	<2	<4	<2	<4	<2	<2	<2	<6	<2	<8	<3	<5	<3	<3	<3	<4
	11/8/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	11/10/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	3/27/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	1/12/1996	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/29/2007	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.027 J**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2011	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/18/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-2	12/10/1987	610	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1/8/1988	610	<2	<4	<2	<4	<2	<2	<2	<6	<2	<8	<3	<5	<3	<3	<3	<4
	11/8/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	11/10/1988	610	<5	<5	<5	<25	<5	<5	---	<5	<5	<5	<5	<5	<5	<5	<25	<25
	3/9/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	1/12/1996	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	11/10/1998	610	----	----	----	----	----	----	<5	----	----	----	----	----	----	----	----	----
	2/15/2000	8310	<0.20	<0.20	<0.20	**0.33**	**0.26**	<0.20	<0.20	<0.20	**0.37**	<0.20	**0.34**	<0.20	<0.20	<0.20	<0.20	**0.24**
	5/17/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/15/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	11/17/2000	8310	**0.23**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/14/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.29**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	5/10/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/7/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	11/5/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2002	8310	<0.5	**0.41**	<2.0	<0.1	<0.05	<0.1	<0.2	<0.05	<0.05	<0.1	<0.1	<10	<2	<5.0	<0.1	<0.05
	11/11/2002	SW8310	<1	<0.4	<4.0	<0.2	<0.1	<0.2	<0.4	<0.1	<0.1	<2.0	<0.2	<20	<4.0	<10	<0.2	<0.1
	2/10/2003	SW8310	<0.5	<0.2	<2.0	<0.1	<0.05	<0.1	<0.2	<0.05	**0.2**	<1.0	<0.1	<10	<2.0	<5.0	<0.1	<0.05
	1/30/2004	8270	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	12/21/2004	8270	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	**1.2**	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/29/2007	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.029 J**	<0.11	<0.11	<0.11	**0.047 J**	<0.11	<0.11	<0.11	<0.11	<0.11
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.14**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/20/2013	8270C SIM	<0.10	<0.10	<0.10	**0.24**	**0.41**	<0.10	<0.10	**0.13**	**0.56**	**0.21**	**0.27**	**0.31**	**0.12**	**0.21**	<0.10	**0.17**
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/8/2014	8270C SIM	<0.11	<0.11	<0.11	<0.11	**0.16**	<0.11	<0.11	<0.11	**0.19**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-3	12/1/1987		**117.4**	**23.7**	**24.8**	**25.4**	**36.8**	**67.2**	**21.2**	**41.2**	**182.4**	**17.2**	**22.5**	**12.8**	<3	**26.3**	<3	<4
		610	**138**	**16**	**16.6**	**14.2**	**34**	**76.2**	**15.6**	**28.6**	**90.8**	**26.7**	**17.7**	**24.3**	<3	**33.8**	<3	<4
	12/10/1987	610	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1/8/1988	610	**17.2**	**4.3**	**2.2**	<4	**10.3**	**8.5**	<2	<6	**9.3**	<8	**3.1**	<5	<3	**4.6**	<3	<4
	3/4/1988	610	**11.5**	<1	<1	<1	**2.5**	**4.1**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	11/8/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	11/10/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	3/9/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	3/5/1997	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	6/19/1997	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<3	<10	<10	<10	<4.5	<10
MW-4	5/20/1988	unknown	**3.5**	<1	<1	<1	<1	**1.2**	**1**	<1	<1	<1	<1	<1	<1	<1	<1	<1
	3/9/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	4/19/1997	8310	**33**	<2	**1.2**	<0.4	**1.5**	**9.5**	**1.8**	<0.1	**2.5**	<0.2	<2	<0.2	<0.2	<0.3	<0.6	<0.2
	6/19/1997	8270	**33**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<3	<10	<10	<10	<4.5	<10
MW-5	5/20/1988	unknown	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	11/8/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	11/10/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	3/9/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	1/12/1996	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	2/15/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	5/17/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/15/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	11/17/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/14/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	5/10/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/7/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	11/5/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2002	8310	<0.5	**0.23**	<2.0	<0.1	<0.05	<0.1	<0.2	<0.05	<0.05	<0.1	<0.1	<10	<2	<5.0	<0.1	<0.05

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-7	5/20/1988		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
		unknown	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	11/8/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	11/10/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	3/27/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	1/12/1996	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.3**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/19/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	5/22/2008	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	12/1/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	**0.12**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/1/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/2/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	0.13	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2014	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
MW-8	6/15/1999	8310/3510	**95**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	8/11/1999	8310/3510	**190**	<2.0	<2.0	<2.0	**15**	<2.0	**40**	**4.5**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	11/11/1999	8310/3520	**62**	<0.20	<0.20	<0.20	<0.20	<0.20	**5.9**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2000	8310	**53**	<0.20	**5.4**	<0.20	**0.94**	<0.20	**44**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	5/17/2000	8310	**57**	<2.0	**6.8**	<2.0	**6.8**	<2.0	**7.7**	<2.0	**43**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	8/15/2000	8310	**47**	<0.20	**7**	**2**	**3.4**	<0.20	<0.20	<0.20	**13**	**2.4**	**0.79**	<0.20	**1.3**	**3.4**	<0.20	<0.20
	11/17/2000	8310	**47**	<0.20	**3.6**	**0.43**	<0.20	<0.20	**4.3**	<0.20	**4.7**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/14/2001	8310	**44**	<0.20	<0.20	**0.26**	<0.20	<0.20	<0.20	<0.20	**13**	<0.20	**0.22**	<0.20	<0.20	<0.20	<0.20	<0.20
	5/10/2001	8310	**25**	<0.20	<0.20	<0.20	<0.20	<0.20	**2.9**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/7/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	11/5/2001	8310	**13**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2002	8310	**14**	**1.3**	<2.0	<0.5	**0.53**	<0.5	**1.3**	<0.5	<0.5	<0.5	<0.5	**0.98**	<2	<5.0	<0.5	<0.5
	11/11/2002	SW8310	**7.3**	<1	<10	<0.5	<0.2	<0.5	<1	<0.2	<0.2	<5.0	<0.5	<50	<10	<25	<0.5	<0.2
	2/10/2003	SW8310	**2.1**	<1.0	<10	<0.5	**0.6**	<0.5	<1.0	<0.2	**0.64**	<5.0	<0.5	<50	<10	<25	<0.5	<0.2
	1/30/2004	8270	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	12/21/2004	8270	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
	3/10/2005[2]	8270 (SIM)	**1.3**	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	**2**	<1.0	<0.10	<0.10	**0.11**	<0.10	<2.0	<0.10	**0.1**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/30/2009	8270C (SIM)	**0.14**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-9	6/15/1999	3510	----	----	----	----	----	----	----	----	**1.4**	----	----	----	----	----	----	----
		8310/3510	<0.20	<0.20	**6.5**	<0.20	**0.83**	<0.20	<0.20	**3.5**	----	<0.20	**1.1**	<0.20	<0.20	**0.31**	<0.20	<0.20
	8/11/1999	8310/3510	**66**	<2.0	**24**	**6**	**21**	<2.0	**23**	**3.1**	**39**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	**6.8**
	11/11/1999	8310/3520	**44**	<0.20	**5.2**	<0.20	**3.6**	<0.20	**4.9**	<0.20	**4**	<0.20	**1.2**	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2000	8310	**33**	<0.20	**4.6**	**0.29**	**0.77**	<0.20	**11**	**0.82**	**1.3**	**0.34**	**0.26**	<0.20	<0.20	**0.22**	<0.20	<0.20
	5/17/2000	8310	**30**	<0.20	**2.3**	**0.83**	**1.3**	<0.20	**3.8**	<0.20	**1.5**	**0.94**	**1**	**0.77**	**0.32**	**0.7**	<0.20	**0.76**
	8/15/2000	8310	**36**	<0.20	**7.6**	**0.35**	**1.4**	<0.20	**2.2**	<0.20	**1.5**	**0.41**	**1.3**	<0.20	<0.20	**0.41**	<0.20	**0.25**
	11/17/2000	8310	**42**	<0.20	**9.1**	<0.20	<0.20	<0.20	**2.2**	<0.20	**0.22**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/14/2001	8310	**26**	<0.20	**4.1**	<0.20	**0.63**	**9**	**2**	<0.20	**1**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	5/10/2001	8310	**25**	<0.20	<0.20	<0.20	<0.20	<0.20	**1.6**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/7/2001	8310	**11**	<0.20	<0.20	<0.20	<0.20	<0.20	**0.73**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.29**	<0.20	<0.20
	11/5/2001	8310	**29**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2002	8310	**11**	**1.7**	<2.0	<0.5	**0.49**	<0.5	**0.73**	<0.5	<0.5	<0.5	<0.5	**0.98**	<2	<5.0	<0.5	<0.5
	11/11/2002	SW8310	**8.2**	<1.0	<10	<0.5	<0.2	<0.5	<1	<0.2	<0.2	<5.0	<0.5	<50	<10	<25	<0.5	<0.2
	2/10/2003	SW8310	**4.4**	<1.0	<10	<0.5	<0.2	<0.5	<1.0	<0.2	**0.29**	<5.0	<0.5	<50	<10	<25	<0.5	<0.2
	1/30/2004	8270	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	12/21/2004	8270	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/10/2005[2]	8270 (SIM)	**0.6**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	**0.012 J**	**0.033 J**	<0.11	<0.11	**0.023 J**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/1/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/2/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.1**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/2/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**<0.10**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**<0.10**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/18/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/8/2014	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-10	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.023 J**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.13**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
			<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/9/2009	8270C (SIM)	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
	11/30/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/10/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2014	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
MW-11	3/10/2005[2]	8270 (SIM)	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	**1.3**	<1.0	**0.21**	<0.10	<0.10	**0.52**	<2.0	**0.12**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-12	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/29/2007	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/20/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/8/2014	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
MW-13	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-14	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	**2**	<1.0	**0.16**	<0.10	<0.10	**0.72**	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	**4.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
			4.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006[1]	8270C	**3.5**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
			3.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-15	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-16	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	**3.4**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	**<0.10**	<0.10	<0.10	**0.13**	**0.043 J**	**0.026 J**	**0.029 J**	<0.10	**0.26**	<0.10	<0.10	<0.10	<0.10	**0.097 J**	<0.10	<0.10
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/9/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.19**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2014	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
MW-17	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	**0.15**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2014	8270C SIM	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
MW-18	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/19/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/1/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/1/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/2/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-19	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	**0.081 J**	<0.10	<0.10	<0.10	**0.031 J**	**0.019 J**	**0.042 J**	**0.011 J**	**0.038 J**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
			<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.13**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	**0.27**	<0.11	<0.11	<0.11	<0.11	<0.11	**9.2**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
			0.25	<0.11	<0.11	<0.11	<0.11	<0.11	**7.9**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
MW-19S	3/3/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-19D	11/30/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/3/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.12**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/18/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/10/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/8/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-20	4/19/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.020 J**	**0.016 J**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
			<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	**0.022 J**	**0.013 J**	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.12**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/9/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	11/30/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.10**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/10/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2014	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-21	5/30/2008	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/9/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.11**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2014	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
MW-22	12/2/2009	8270C (SIM)	**0.17**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	**0.82**	**0.12**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	**0.12**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2011	8270C SIM	**0.31**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	**0.37**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	**0.39**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.11**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	**0.32**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-23	11/30/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.28**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.12**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/3/2011	8270C SIM	<0.10	**0.17**	**0.23**	<0.10	**0.29**	**0.21**	**0.83**	**0.46**	**0.3**	**0.14**	<0.10	**0.11**	<0.10	**0.13**	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/18/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/10/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/8/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
EBAMW-1	3/10/2009	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	4/1/2010	8270C (SIM)	**0.66**	**1.0**	<0.10	<0.10	<0.10	**0.16**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/8/2014	8270C SIM	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
EBAMW-2	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	**0.51**	**18**	**0.23**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	**1.2**	<0.56	**0.79**	<0.56	<0.56	<0.56	**2.2**	**38**	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
	12/1/2009	8270C (SIM)	**1.2**	**0.55**	**0.72**	<0.1	**0.33**	**2.1**	**0.16**	**1.1**	**0.22**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	**0.58**	**0.32**	**0.35**	<0.10	**0.13**	**1.3**	**0.13**	<0.10	**0.13**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	**0.61**	**0.35**	**0.43**	<0.10	**0.18**	**2.3**	**0.11**	<0.10	**0.14**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	**1.0**	**0.45**	**0.57**	<0.10	**0.21**	**2.8**	**0.17**	<0.10	**0.15**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	**0.7**	**0.3**	**0.34**	<0.10	**0.15**	**1.9**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	**0.72**	**0.33**	**0.31**	<0.10	**0.14**	**1.1**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	**0.29**	**0.21**	**0.26**	<0.10	**0.18**	**0.30**	<0.10	<0.10	**0.11**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/20/2013	8270C SIM	<0.10	<0.10	**0.13**	<0.10	<0.10	**0.11**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	**0.17**	**0.10**	**0.15**	<0.10	<0.10	**0.23**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	**0.11**	<0.10	<0.10	<0.10	<0.10	**0.17**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2014	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11

Notes:
(1) sample was filtered by the laboratory prior to analysis using 0.7 micron glass fiber filter
(2) sample was filtered in the field using 0.45 micron filter
PAH = polycyclic aromatic hydrocarbon
ug/L = micrograms per liter
"<" = not detected at or above laboratory reporting limit
--- = not analyzed
J = Result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL) and the concentration is an approximate value

APPENDIX B

Screening Level Human Health Risk Assessment

DRAFT
SCREENING-LEVEL
HUMAN HEALTH RISK ASSESSMENT

Former Santa Rosa Manufactured Gas Plant
Santa Rosa, California

July 2015

Prepared for:

Pacific Gas and Electric Company
San Francisco, California

Prepared by:

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1438 Webster Street, Suite 302
Oakland, California 94612

Project No. 12-877D

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1.0 INTRODUCTION

This Appendix to the Remedial Action Plan (RAP) describes the screening-level human health risk assessment (SLHHRA) conducted to support the proposed remedial/mitigation measures and risk management decisions as outlined in the RAP for the former Santa Rosa Manufactured Gas Plant (MGP) site ("the Site"), located at 111 Santa Rosa Avenue in Santa Rosa, California. The Site location is shown in Figure 1. The primary purpose of the SLHHRA is to determine whether levels of chemicals detected in soil at the Site could pose a risk to human health based on current and potential future property uses. The results of the SLHHRA may then be used to identify areas of the Site where remedial/mitigation measures and/or risk management may be appropriate, with the overall goal of long-term protection of human health.

The methodology used in this SLHHRA is consistent with risk assessment guidelines provided by the U.S. Environmental Protection Agency's (USEPA) *"Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), Interim Final"* (USEPA, 1989a), and the California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control's (DTSC) *"Preliminary Endangerment Assessment Guidance Manual"* (Cal/EPA, 2013). The approach used in this SLHHRA, in general, follows the traditional steps in the risk assessment process, employing the use of risk-based screening concentrations (RBSCs) and ambient-based screening concentrations (ABSCs) to evaluate potential human health risks.

The remaining sections of this report are as follows:

- Section 2.0 – Data Evaluation and Selection of Chemicals of Potential Concern. Presents an evaluation of the data used in the SLHHRA and identifies the chemicals of potential concern (COPCs).
- Section 3.0 – Exposure Assessment. Presents an analysis of the mechanisms by which human receptors may be exposed to COPCs and discusses the representative exposure point concentrations (EPCs) used in this SLHHRA to evaluate potential health risks.
- Section 4.0 – Selection of Risk-Based Screening Concentrations. Presents the quantitative RBSCs developed by USEPA and Cal/EPA considered protective of the potentially complete exposure pathways and receptors identified in Section 3.0. For select COPCs such as CPAHs and arsenic, where RBSCs are lower than ambient levels, ABSCs are presented.
- Section 5.0 – Comparison of Soil RBSCs and ABSCs to Soil EPCs. Presents a comparison of EPCs for COPCs in soil to RBSCs and ABSCs to evaluate the potential for cancer or other adverse health effects as a result of potential exposures.
- Section 6.0 – Conclusions and Recommendations. Summarizes the results of the HHRA and provides context for risk management and consideration of potential mitigation options.
- Section 7.0 – References. Presents the sources of information cited in the text.

There is one attachment that accompanies the SLHHRA; Attachment A presents output from USEPA's ProUCL 5.0.00 (USEPA, 2013a), used to determine upper confidence limit (UCL) concentrations from the on-Site and off-Site soil data.

2.0 DATA EVALUATION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Data evaluation is the process of analyzing site characteristics and analytical data to identify constituents that are potentially related to the Site and for which there are data of sufficient quality to be used in a quantitative risk assessment. This section summarizes: (1) the chemical characterization of soil (i.e., the relevant environmental medium for this SLHHRA); and (2) the COPCs identified for inclusion in the SLHHRA.

2.1 Development of SLHHRA Datasets

Site investigations began in July 1986 and remedial actions were initiated at the Site as early as 1987. Investigation and remedial actions have been conducted at the Site through June 2013. A detailed summary of previous investigations and remedial measures conducted at the Site is provided in Sections 1.4 and 1.5, respectively, of the RAP. As described in Section 1.1 of the RAP, the Site currently consists of the parking lot, a commercial office building located at 111 Santa Rosa Avenue, and a portion of the Prince Memorial Greenway (PMG) (Figures 2 and 3). Previous Site investigations and/or remedial actions have been conducted beyond the property boundaries of the Site in the adjacent commercial property to the west of the Site and in the adjacent public rights-of-way (ROW) to the north, east, and south. Analytical data included in the SLHHRA consist of representative soil data (i.e., from samples from locations and/or depths that have not been remediated) collected during previous Site investigations and/or remedial actions conducted at the Site and off-Site areas. The locations of the in-place soil samples representative of current on-Site and off-Site conditions are presented on Figure 3. Analytical results for volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), total polychlorinated biphenyls (PCBs), metals, cyanide, and semi-volatile (SVOCs) including polycyclic aromatic hydrocarbons (PAHs), representative of in-place soil, are presented in Tables 1 through 4 of the RAP.

Soil data considered relevant for a SLHHRA that includes future land use scenarios typically include all available data for soil samples from depths up to and including 10 feet below ground surface (bgs) or first encountered groundwater, whichever is shallower, because: (1) 10 feet is considered a typical maximum depth for excavation activities associated with subsurface maintenance/landscaping work or site redevelopment, and (2) the models and assumptions used to evaluate potential exposures are not directly applicable for saturated soils. Groundwater at the Site has been reported to occur at approximately 20 feet bgs, and groundwater levels are generally responsive to seasonal variations in precipitation and vary as much as a few feet seasonally (TPG, 2013). Given the depth of groundwater, the analytical results for all constituents detected in soil samples from the soil surface (0 feet bgs) to 10 feet bgs are considered relevant for the SLHHRA.[1]

[1] Site soil analytical data were provided to Iris Environmental in a database format by Terra Pacific Group. Soil samples where the location coordinates were unknown are excluded from the dataset used in the SLHHRA (i.e., 450 out of 10,704 data records [or 4.2 percent] for in-place soil from 0-10 feet bgs). Also,

For the purposes of supporting risk management decisions, separate data subsets were prepared and evaluated in the SLHHRA for: 1) the on-Site Property (i.e., the 111 Santa Rosa Avenue Property); 2) the off-Site 438 First Street Property; and 3) the off-Site public ROW (inclusive of the PMG).

2.2 Selection of Chemicals of Potential Concern

COPCs included in the SLHHRA are those constituents detected above laboratory reporting limits in at least one soil sample. Although Cal/EPA and USEPA guidance allow for the elimination of inorganic constituents (i.e., metals) from the quantitative risk assessment if they are detected at levels within local background/ambient concentrations (Cal/EPA, 1997; USEPA, 2002a), all chemicals detected in on-Site and off-Site soil samples have been conservatively included in the quantitative SLHHRA to streamline the evaluation. The COPCs detected in on-Site and off-Site soil that are included in the quantitative SLHHRA include 13 VOCs, 6 TPH, total PCBs, 17 PAHs, and 19 inorganics. The specific COPCs detected in soil are as follows:

- **VOCs**: 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 2-butanone (MEK), 4-isopropyltoluene, acetone, benzene, butylbenzene, ethylbenzene, methyl-t-butyl ether (MTBE), naphthalene, propylbenzene, toluene and xylenes;
- **TPH**: oil and grease, TPH as extractable (TPH-extractable), total recoverable petroleum hydrocarbons, TPH as gasoline (TPH-gasoline) TPH as diesel (TPH-diesel), and TPH-motor oil;
- **PCBs**: total PCBs;
- **PAHs**: 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene [B(a)P], benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, and pyrene; and
- **Inorganics**: ammonia, antimony, arsenic, barium, beryllium, cadmium, chromium, copper, cyanide, lead, mercury, molybdenum, nickel, selenium, silver, vanadium, thallium, titanium, and zinc.

Data summaries for the COPCs in on-Site Property soil (0-10 feet bgs), off-Site 438 First Street Property soil (0-10 feet bgs), and off-Site public ROW soil (0-10 feet bgs) are presented in Tables 1a through 1c, respectively.

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soil analytical data reported as non-detect (ND) without a laboratory reporting limit in previous investigation reports are excluded from the dataset used in the SLHHRA (i.e., 14 out of 10,704 data records [or 0.13 percent] for in-place soil from 0-10 feet bgs).

3.0 EXPOSURE ASSESSMENT

Exposure assessment is the process of describing, measuring, or estimating the intensity, frequency, and duration of potential human exposure to COPCs in environmental media. This section discusses the mechanisms by which people (receptors) might come in contact with the COPCs present in soil at the Site. It includes the characterization of the exposure setting (physical environment and potential receptors), identification of exposure pathways (potential sources, points of release, and exposure routes), and quantification of representative EPCs based on current and potential future land uses.

An exposure assessment is best conducted within the context of a risk-based conceptual site model (CSM) (Figure 4). The CSM is used to show the relationships between a chemical source, exposure pathway, and the potential receptor. The CSM identifies chemical sources, potentially impacted media, migration pathways, exposure routes, and possible exposure scenarios (USEPA, 1989a). These source-pathway-receptor relationships provide the basis for the quantitative exposure assessment. Only complete source-pathway-receptor relationships are included in the SLHHRA.

3.1 Characterization of Exposure Setting

Potential exposure to COPCs at a site depends on a number of factors related to the physical characteristics of a site and its surroundings. These factors include location, surrounding land use, surface topography, hydrogeology, meteorology, and vegetation. They also include factors related to the current and possible future uses of a site, which determine the types of activities that might occur at a site, the degree to which a site is accessible to the general public, and the mechanisms that might result in migration of COPCs to on- and off-Site populations.

3.1.1 Physical Setting

As summarized in Section 1.1 of the RAP, the Site occupies approximately 1.5 acres and is located in Santa Rosa, California, between First Street and Santa Rosa Creek, and B Street and Santa Rosa Avenue (Figure 2). The Site currently consists of a parking lot, a commercial office building located at 111 Santa Rosa Avenue, and a portion of the PMG (Figure 3). Commercial office buildings are present to the east, west, and north (across 1st Street) of the Site. The PMG is to the south of the Site. The Site surface is covered with asphalt pavement in the parking lot, small landscaped planters, a portion of the commercial office building, and the concrete walkway of the PMG. The off-Site 438 First Street Property surface is covered with asphalt pavement in the parking lot with small landscaped planters and a commercial building. The off-Site public ROW surface is covered with concrete sidewalks, asphalt pavement in the streets, and concrete walkway and adjacent planters of the PMG. The small on-Site landscaped planters and the shared landscaped planters on the western and southern boundaries of the Site that extend onto the off-Site 438 First Street Property and the PMG were remediated in May and June 2013, down to approximately 2 feet bgs and a geotextile marker was placed at

the bottom of the excavation to prevent direct exposure to subsurface impacted soil. The commercial office building located on a portion of the Site has an underground parking garage with an automated rollup door entry; exhaust fumes are ventilated with fans inside the garage.

3.1.2 Potential Receptors

Populations identified in this SLHHRA include those who could potentially receive the most exposure to Site-related chemicals under current or foreseeable future land use scenarios (USEPA, 1989a). Under current Site use, potentially exposed receptors include on-Site commercial workers and infrequent visitors. However, given that the overall exposure that an infrequent visitor could potentially have to COPCs in soil at the Site would be considerably less than that for a commercial worker who completes standard 8-hour day shifts 5 days per week, potential human health risks to infrequent visitors are not separately evaluated. The current on-Site commercial worker is evaluated as protective of both receptors.

Although the on-Site Property will likely remain in its current commercial configuration in the future, this SLHHRA also assumes that the Site could alternatively be redeveloped for other commercial uses. Potentially exposed receptors identified for the SLHHRA, therefore, include hypothetical future on-Site commercial workers [2]. The future on-Site commercial worker is evaluated to provide support for the remedial/mitigation measures described in the RAP. In addition, while future residential land use of the Site is not anticipated given the current and surrounding commercial property uses, hypothetical future on-Site residents are also evaluated, primarily for informational purposes and to provide the basis for a deed restriction on the Site, if warranted.

In sum, based on the current and assumed hypothetical future uses of the on-Site Property, the populations included in the SLHHRA consist of the following:

- Current on-Site worker (also evaluated as protective of infrequent visitors);
- Hypothetical future on-Site commercial worker; and
- Hypothetical future on-Site resident.

Similar to the on-Site Property, the off-Site 438 First Street Property and off-Site public ROW areas are evaluated under hypothetical future commercial worker and residential scenarios, to provide the basis for any remedial/mitigation measures and/or deed restrictions, if warranted, for these areas.

[2] The future on-Site commercial scenario evaluated in the SLHHRA is protective of a construction/intrusive worker scenario. Given that the overall exposure that a short-term construction/intrusive worker could potentially have to COPCs in soil at the Site would be less than that for a commercial worker who completes standard 8 hour day shifts 5 days per week for 25 years, potential human health risks to a construction/intrusive worker are not separately evaluated. The future on-Site commercial worker is evaluated as protective of both receptors.

3.2 Identification of Exposure Pathways

This section describes the potential pathways by which the receptors described above could be exposed to the COPCs in soil at the Site. An exposure pathway is a description of the mechanism by which an individual may come into contact with a COPC in the environment. An exposure pathway is defined by the following four elements (USEPA, 1989a):

1. Source and mechanism of COPC release to the environment;
2. Environmental receiving or transport medium (e.g., soil) for the released COPC;
3. Point of potential contact with the medium of concern; and
4. Potential exposure route (e.g., ingestion) at the contact point.

An exposure pathway is considered "complete" if all of the foregoing elements are present.

The characterization of the potential exposure pathways based on existing information is presented in the CSM (Figure 4). Further discussion of potential exposure pathways is presented in the following subsections.

3.2.1 Chemical Sources and Potential Transport Mechanisms

For the purposes of this SLHHRA, former MGP facility operations were considered the primary source of COPCs in soil. Chemicals released into the surface and subsurface soils have the potential to migrate to other areas or to other media by potential secondary release mechanisms based on their inherent physical nature, including volatilization into air, wind erosion and atmospheric dispersion of nonvolatile, particulate-bound constituents, and subsurface migration of constituents into groundwater.

3.2.2 Complete Exposure Pathways

Complete exposure pathways for the identified receptors require an exposure point for contact with the COPCs and human exposure routes. As mentioned previously in Section 3.1.1, the majority of the Site surface is currently covered with asphalt pavement in the parking lot, a portion of the commercial office building with an underground parking garage, and the concrete walkway of the PMG; all of these physical features prevent direct exposure to subsurface impacted soil. Furthermore, the small landscaped planters in the on-Site and off-Site 438 First Street Property parking lots were remediated down to 2 feet bgs and a geotextile marker was placed at the bottom of the excavation to prevent direct exposure to subsurface impacted soil. Under current Site conditions, on-Site commercial workers could potentially be exposed via inhalation to volatile constituents that have migrated through the soil column into the outdoor air. Although this is theoretically a complete exposure pathway for current on-Site commercial workers, this pathway is considered an insignificant exposure pathway, as discussed in the section below.

For the purposes of supporting risk management decisions, this SLHHRA assumes that hypothetical future receptors (on-Site commercial workers and residents) could be exposed to COPCs in soil via incidental ingestion, dermal contact, and inhalation of COPCs volatilized or re-suspended as respirable particulates in outdoor air.

3.2.3 Insignificant/Incomplete Exposure Pathways

Exposure pathways considered insignificant or incomplete for current on-Site populations were not included in the risk evaluation and are discussed below:

- Exposures related to direct contact with subsurface impacted soil: As discussed above, the current Site current cover prevents direct exposure to subsurface impacted soil. Therefore, exposure to COPCs in soil via the ingestion and dermal contact pathways as well as inhalation of particulates in outdoor air pathway are considered incomplete for the current on-Site commercial worker and not included in this SLHHRA.
- Exposures related to volatilization and migration to indoor air (vapor intrusion): Vapor intrusion, the process whereby volatile compounds in subsurface media volatilize and migrate up through the soil column into the indoor air space of an overlying building, is considered an insignificant transport/exposure pathway under current land use conditions at the Site. As shown on Figure 2, less than one tenth of the commercial building is within the footprint of the former MGP, and there are no other structures on-Site. As mentioned previously, the commercial building has a single story underground parking. Thus, soil impacts within the footprint of the commercial building, if they existed, would have been excavated and removed when the underground parking garage was constructed. The underground parking garage has an automated rollup door entry and exhaust fumes are ventilated with fans inside the garage. The underground garage is a physical feature that would minimize the potential for vapor intrusion, even in the unlikely event that there were a source of VOCs that remained beneath the underground garage. Based on the extremely limited potential for there to be any Site-related source of VOCs beneath the building, combined with the presence of the subsurface garage, the vapor intrusion pathway is considered insignificant for the commercial occupants of the current building and not included in this SLHHRA.
- Exposures related to volatilization and migration of volatiles to outdoor air: Volatile compounds in subsurface media could volatilize and migrate up through the soil column into the outdoor ambient air, and then current on-Site commercial workers (and visitors) could be exposed via the inhalation pathway. Perimeter air monitoring for volatile compounds has been conducted throughout the period of Site remediation in the area of the former redwood gas holder where elevated VOCs were detected in soil. The monitoring data, collected daily over a 2-year period, support that even during this remediation phase, the levels of volatile compounds in ambient air were below levels of concern with respect to the health of on-Site and nearby off-site populations (TPG, 2014). The air monitoring data support that the levels of volatile compounds in ambient air are fully protective of

the health of off-Site as well as on-Site populations. Therefore, the inhalation of vapors in outdoor air pathway is considered insignificant for the current on-Site commercial workers (and visitors) and not included in this SLHHRA.

- Exposures related to groundwater: Groundwater is approximately 20 feet bgs, and currently not used as a drinking water source on-Site. As noted in the Groundwater Feasibility Study (TPG 2015), the remedy for the Site includes long-term groundwater monitoring and deed restrictions that will prevent the use of groundwater in the future. Accordingly, direct contact exposure pathways related to Site groundwater are considered incomplete and not included in this SLHHRA.
- Exposures related to migration of groundwater to the surface water in Santa Rosa Creek: As discussed in the Groundwater Feasibility Study for the Site (TPG, 2015), during the removal activities of impacted soil in the bank and bed of Santa Rosa Creek in 2004, sheet pile and slurry curtains were installed at various locations along the bank of the creek. These barriers, in conjunction with the creek bed lining, restrict groundwater flow within the shallow soil adjacent to the creek, reducing the potential for residual contaminants present at the Site to migrate towards the creek. Further, historic and recent groundwater data collected from the Site indicate that current groundwater impacts are limited to areas where residual MGP impacts are known to be present and there is no indication that Site contaminants are migrating to the creek. The North Coast Regional Water Quality Control Board (NCRWQCB, 2015) has concurred that remaining contamination near the creek does not present a significant threat to the creek and the selected groundwater remedy of long-term groundwater monitoring is an appropriate technology that will achieve the project's remedial action goals. Therefore, potential exposures associated with migration of groundwater to the surface water in the adjacent Santa Rosa Creek are considered incomplete and not included in this SLHHRA.

3.3 Estimation of Representative Exposure Point Concentrations

The USEPA defines EPCs as the representative chemical concentrations that a receptor may contact at an exposure area over the exposure period (USEPA, 1989a). The EPC approach is based on the concept that individuals contact the impacted medium on a periodic and random basis. Because of the repeated and random nature of such contact, human exposure does not occur at a fixed point, but rather at a variety of points with equal likelihood that any given point within the exposure area will be the contact location on any given day. Thus, the EPC is based on an average chemical concentration within the exposure area. To account for the uncertainty in estimating the average concentration, USEPA recommends that a UCL be used to represent the EPCs (USEPA, 2002b).

The calculation of EPCs for each COPC dataset includes an initial evaluation of the distribution of the data as a predecessor step to employing the best statistical methodology for determining a concentration that estimates the mean of the dataset with a prescribed level of confidence. This means that the average has been bounded by a

statistically determined concentration to afford a percent level of confidence in the "true" mean of the dataset. USEPA's ProUCL 5.0.00 (USEPA, 2013a) is used to determine UCL concentrations of the COPCs in soil (0-10 feet bgs). The 95% UCL of the mean, for example, is considered a reasonable maximum exposure level (USEPA, 1989a) so that there is confidence that the mean concentration of each COPC has been bounded at least 95 percent of the time. In accordance with USEPA guidance (USEPA, 2013b), UCLs are not calculated for datasets with less than four detections. Although USEPA guidance (USEPA, 2013b) recommends the use of the mean or median when there are insufficient detections in the dataset, the maximum detected concentration is conservatively used as the representative EPC in these cases in this SLHHRA.

Data summaries for the COPCs in on-Site Property soil (0-10 feet bgs), off-Site 438 First Street Property soil (0-10 feet bgs), and off-Site public ROW soil (0-10 feet bgs) are presented in Tables 1a through 1c, respectively, with the ProUCL output files presented in Attachment A.

4.0 SELECTION OF RISK-BASED AND AMBIENT-BASED SCREENING CONCENTRATIONS

4.1 Risk-Based Screening Concentrations

As discussed previously in Section 3.2.3, the potential pathways through which current on-Site commercial workers could be exposed to COPCs at the Site are considered either incomplete or insignificant. Therefore, the current Site conditions are fully protective of the current on-Site commercial populations.

For the purposes of supporting risk management decisions, hypothetical future receptors (on-Site commercial workers and residents) are assumed to be exposed to COPCs in soil via incidental ingestion, dermal contact, and via inhalation of COPCs volatilized or re-suspended as respirable particulates in outdoor air. Potential human health risks for the future hypothetical receptors identified above are evaluated using RBSCs protective of the exposure pathways identified as potentially complete for these receptors. Specifically, Regional Screening Levels (RSLs) developed by the USEPA (2014) for industrial soil are considered to be applicable cancer-based and noncancer-based criteria for hypothetical future commercial workers, and RSLs for residential soil are considered applicable cancer-based and noncancer-based criteria for hypothetical future residents. These screening benchmarks are based on reasonable maximum exposure assumptions for industrial or residential land use – specifically, exposure to COPCs in soil via incidental soil ingestion, dermal contact with soil, and inhalation of volatiles or particulates in outdoor air, for 250 days per year for 25 years for industrial workers, or 350 days per year for 26 years for residents – corresponding to a target incremental lifetime excess cancer risk (ILECR) of one in one million (1×10^{-6}) (i.e., Cal/EPA's point of departure for ILECR for all receptor groups)[3] or a target noncancer hazard quotient (HQ) of 1.[4] Cal/EPA's HHRA Note Number 3 (Cal/EPA, 2014) was also consulted for recommended alternatives to RSLs to ensure the SLHHRA conforms to Cal/EPA risk assessment guidance (Cal/EPA, 2013). The RSLs and Cal/EPA's HHRA Note Number 3 alternative screening values are by design protective of potential on-Site industrial or residential soil exposure via incidental ingestion, dermal contact, and outdoor air inhalation. RSLs and Cal/EPA's HHRA Note Number 3 alternative screening values were selected for use in the SLHHRA over California Regional Water Quality Control Board, San Francisco Bay Region (SFRWQCB) Environmental Screening Levels (ESLs) for direct contact exposure pathways for industrial and residential populations because

[3] The National Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] 300) indicates that ILECRs posed by a site should not exceed a range of 1×10^{-6} to one hundred in a million (1×10^{-4}). While Cal/EPA's point of departure for ILECR for all receptor groups (*i.e.*, commercial/industrial worker and residential populations) is 1×10^{-6}, risk management decisions may raise this criterion depending on site-specific conditions. For instance, the "target" cancer risk typically used by Cal/EPA and USEPA in determining the need for mitigation is 1×10^{-5} for worker populations on commercial/industrial sites.

[4] Chemical exposures that yield hazard indices (HIs) of less than 1 are not expected to result in adverse noncancer health effects (USEPA, 1989a).

the current RSLs incorporate the latest USEPA exposure assumption recommendations, whereas the ESLs do not.

In the absence of RSLs for TPH mixtures, direct exposure ESLs developed by the SFRWQCB for TPH as gasoline, diesel and motor oil (SFRWQCB, 2013) were selected to evaluate potential exposures to these mixtures in soil.

Note that the Cal/EPA-recommended screening levels for lead are unique from the cancer-based and noncancer-based RBSCs selected for the other COPCs and are based on blood lead concentrations rather than external dose (Cal/EPA, 2014).

The commercial land use RBSCs selected for the hypothetical future commercial worker, and the residential land use RBSCs selected for the hypothetical future resident for the COPCs in on-Site Property soil (0-10 feet bgs), off-Site 438 First Street Property soil (0-10 feet bgs), and off-Site public ROW soil (0-10 feet bgs), using the hierarchy presented above, are presented in Tables 2a through 2c, respectively.

4.2 Ambient-Based Screening Concentrations

Given that risk-based residential cleanup goals for carcinogenic PAHs (CPAHs [5]) and arsenic in soil are below ambient concentrations, the numerical remedial goal for these compounds would not be risk-based, but rather would be based on the ambient concentrations of CPAHs and arsenic.

In order to facilitate the development of an ambient background data set for CPAHs in northern California, a dataset was compiled from previous site investigations in northern California conducted under the oversight of DTSC by PG&E and the United States Navy. The dataset was developed in cooperation and collaboration with a task group of representatives from the HERD and Site Mitigation branches of DTSC, Cal/EPA. The team of consulting firms involved in the development of the database were ENVIRON, Entrix, Iris Environmental, and ENV America. The final dataset consists of eighty-six data points from twenty-one different sites. The details of this study are presented in a report that was submitted to HERD June 7, 2002 (ENVIRON et al., 2002). Multiple analyses conducted in the study demonstrate that the final dataset is consistent with a lognormal distribution and support the hypothesis that the final dataset represents a single background population. The arithmetic mean and the 95% UCL of the mean of the background CPAH dataset, in B(a)P equivalents, are 0.21 mg/kg and 0.40 mg/kg, respectively.

DTSC has issued an Advisory (Cal/EPA, 2009) that supports the use of the PAH background dataset as a tool for assessing PAH impacts and making remediation

[5] Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene are collectively referred to as CPAHs. The concentrations of these CPAHs were converted into B(a)P equivalent concentrations for purposes of assessing potential health risks associated with CPAHs in soils. Although naphthalene is also carcinogenic, it is a volatile PAH and thus, is evaluated separately in this SLHHRA.

decisions for PAHs at sites. Consistent with the approaches used at other sites, and with the approach often used for determining ambient-based remediation targets for inorganics, an upper tolerance limit (UTL) of the ambient distribution is often proposed as the initial remediation target for the Site. The USEPA has described the calculation of the UTL, and has suggested its use for groundwater monitoring activities (USEPA, 1989b), although it is applicable to performing background comparisons for soil samples as well. The approach used in calculating the UTL is consistent with the approach recommended by the USEPA (1989b).

The 95% UTL (95% coverage and 95% confidence) of the 86 background sample dataset is 1.5 mg/kg (in B(a)P equivalents). Because the coverage of the UTL is set at 95%, approximately 5% of samples that are actually representative of ambient concentrations will be greater than the UTL of 1.5 mg/kg.

Another parameter that is commonly used in establishing ambient-based remediation targets is the 95th percentile of the distribution. Measured concentrations that are below the 95th percentile are considered to be ambient. The DTSC has recommended the use of the 95th percentile for determining ambient levels of metals at former military bases. The 95th percentile of the northern California background dataset is 0.92 mg/kg (in B(a)P equivalents). Because the 95th percentile is lower than the UTL of the data, we propose to use 0.92 mg/kg as the initial ABSC B(a)P equivalents to identify areas of the Site for either remediation or other forms of risk management. Concentrations below the initial background-based screening concentration ABSC of 0.9 mg/kg will be considered representative of ambient concentrations, and will not initially be targeted for remediation or other forms of risk management.

An evaluation of Site arsenic data and a determination of an ambient arsenic level were previously conducted for the planter area remediation, per Cal/EPA guidance (2009b). The evaluation is presented in Appendix B of the Planter Area Soil Excavation Workplan for the Site (TPG, 2012). The ABSC for arsenic at the Site was determined to be 14 mg/kg.

ABSCs for CPAHs and arsenic in on-Site Property soil (0-10 feet bgs), off-Site 438 First Street Property soil (0-10 feet bgs), and off-Site public ROW soil (0-10 feet bgs) are presented in Tables 2a through 2c, respectively.

5.0 COMPARISON OF SOIL RBSCS AND ABSCS TO SOIL EPCS

As previously mentioned, the Site conditions are fully protective of the health of current on-Site populations. For the purposes of supporting risk management decisions, potential human health risks for the future hypothetical receptors (on-Site commercial and residential populations) have been evaluated using RBSCs and ABSCs protective of the exposure pathways identified as potentially complete for these receptors. A comparison of RBSCs and ABSCs to EPCs for COPCs in soil has been used to determine whether levels of chemicals detected in soil at the on-Site Property, off-Site 438 First Street Property, and off-Site public ROW could pose a risk to human health above acceptable risk and hazard levels based on potential future property uses. The results of the comparison may be used to support the remedial/mitigation measures and deed restrictions proposed in the RAP. The results of the comparison of soil RBSCs and ABSCs to soil EPCs are discussed below.

5.1 On-Site Property

As indicated on Table 2a, the EPCs for benzene, naphthalene, TPH-diesel, and lead in on-Site Property soil (0-10 feet bgs) exceed the lower of either the cancer or noncancer commercial soil RBSCs by a factor ranging from 1.5 (TPH-diesel; noncancer RBSC) up to 41 (naphthalene, cancer RBSC). Individual detections of COPCs that exceed commercial soil RBSCs, as summarized in Table 3a, are scattered across the parking lot area of the on-Site Property.

The EPCs for benzene, ethylbenzene, naphthalene, TPH-diesel, total PCBs and lead in on-Site Property soil (0-10 feet bgs) exceed the lower of either the cancer or noncancer residential soil RBSCs by a factor ranging from 2.2 (ethylbenzene; cancer RBSC) up to 183 (naphthalene; cancer RBSC). Individual detections of COPCs that exceed residential soil RBSCs, as summarized in Table 3a, are scattered across the parking lot area of the on-Site Property.

The EPCs for CPAHs (expressed as B(a)P equivalents) and arsenic in on-Site Property soil (0-10 feet bgs) exceed their respective ABSCs by a factor of 39 and 1.5, respectively. Individual detections of COPCs that exceed ABSCs, as summarized in Table 3a, are scattered across the parking lot area of the on-Site Property.

5.2 Off-Site 438 First Street Property

As indicated on Table 2b, the EPC for lead in off-Site 438 First Street Property soil (0-10 feet bgs) exceeds its noncancer commercial soil RBSC by a factor of 1.5. As summarized in Table 3b, there is only one detection of lead in the shared planter area on the eastern boundary of the off-Site 438 First Street Property that exceeds its commercial soil RBSC. The sample is at depth (2 feet bgs), below the geotextile barrier put in place following the remediation of the planter areas.

The EPC for lead in off-Site 438 First Street Property soil (0-10 feet bgs) exceeds its noncancer residential soil RBSC by a factor of 6.0. As summarized in Table 3b, there are four detections of lead in the shared planter area, on the eastern boundary of the off-Site 438 First Street Property, that exceed the residential soil RBSC. The samples are at depth (all at 2 feet bgs), below the geotextile barrier put in place following the remediation of the planter areas.

The EPC for arsenic in off-Site 438 First Street Property soil (0-10 feet bgs) exceeds its ABSC by a factor of 2.6. As summarized in Table 3b, there is only one detection of arsenic in the shared planter area on the eastern boundary of the off-Site 438 First Street Property that exceeds its ABSC. The sample is at depth (2 feet bgs), below the geotextile barrier put in place following the remediation of all planters.

5.3 Off-Site Public ROW

As indicated on Table 2c, the EPC for naphthalene in off-Site public ROW soil (0-10 feet bgs) exceeds the lower of either its cancer or noncancer commercial soil RBSCs by a factor of 2.8. Individual detections of naphthalene that exceed its commercial soil RBSC, as summarized in Table 3c, are along the PMG. There are no exceedances in the sidewalks or streets to the north or east of the Site.

The EPCs for naphthalene and lead in off-Site public ROW soil (0-10 feet bgs) exceed the lower of either the cancer or noncancer residential soil RBSCs by a factor of 12 and 1.7, respectively. Individual detections of naphthalene and lead that exceed residential soil RBSCs, as summarized in Table 3c, are along the PMG. There are no exceedances in the sidewalks or streets to the north or east of the Site.

The EPC for CPAHs (expressed as B(a)P equivalents) in off-Site public ROW soil (0-10 feet bgs) exceeds its ABSC by a factor of 283. Individual detections of CPAHs exceed its ABSC, as summarized in Table 3c, are along the PMG. There are no exceedances in the sidewalks or streets to the north or east of the Site.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The primary purpose of the SLHHRA is to determine whether levels of chemicals detected in soil at the Site could pose a risk to human health based on current and potential future property uses. The results of the SLHHRA may then be used to identify areas of the Site where remedial/mitigation measures and/or risk management may be appropriate, with the overall goal of long-term protection of human health. The conclusions and recommendations of the SLHHRA, based on the current and potential future property uses, are summarized below.

6.1 Current Land Use

Under current Site conditions, the potential pathways through which on-Site commercial workers could be exposed to COPCs in soil are considered incomplete or insignificant. Therefore, the current Site conditions are fully protective of the health of current on-Site commercial populations and no further remedial or mitigation measures are warranted. Risk management measures, such as a cap maintenance/soil management plan and deed restrictions, are warranted to ensure that the Site continues to remain protective of human health.

6.2 Potential Future Land Uses

For the purposes of supporting risk management decisions, a comparison of RBSCs and ABSCs to EPCs for COPCs in soil was used to evaluate potential human health risks under potential future land use scenarios. The following are the conclusions and recommendations for the on-Site Property, off-Site 438 First Street Property, and off-Site public ROW under hypothetical future commercial and residential land use scenarios.

6.2.1 On-Site Property

The results of the comparison of EPCs for COPCs in on-Site Property soil (0-10 feet bgs) to commercial soil RBSCs and ABSCs indicate that levels of arsenic, benzene, CPAHs, naphthalene, TPH-diesel, and lead are above levels suitable for future commercial land use if the Site were to be redeveloped for other commercial uses (e.g., if the existing cover were to be removed, and/or if a building were to be constructed elsewhere on-Site). Accordingly, risk management measures, such as a cap maintenance/soil management plan and a deed restriction, are warranted for the protection of future commercial populations at the on-Site Property.

The results of the comparison of EPCs for COPCs in on-Site Property soil (0-10 feet bgs) to residential soil RBSCs and ABSCs indicate that levels of arsenic, benzene, CPAHs, ethylbenzene, naphthalene, TPH-diesel, total PCBs, and lead are above acceptable levels suitable for future residential land use if the Site were to be redeveloped for residential use. Accordingly, risk management measures that restrict the future residential use of the property are warranted for the on-Site Property.

6.2.2 Off-Site 438 First Street Property

The results of the comparison of EPCs for COPCs in off-Site 438 First Street Property soil (0-10 feet bgs) to commercial soil RBSCs and ABSCs indicate that levels of arsenic and lead at depths greater than 2 feet bgs in the small landscaped planter areas along the eastern boundaries of the property are above levels suitable for future commercial land use if this property were to be redeveloped for other commercial use. Accordingly, risk management measures such as a cap maintenance/soil management plan for soil below 2 feet bgs in the planter areas are warranted for the protection of future commercial populations at the off-Site 438 First Street Property.

The results of the comparison of EPCs for COPCs in off-Site 438 First Street Property soil (0-10 feet bgs) to residential soil RBSCs and ABSCs indicate that levels of arsenic and lead at depths greater than 2 feet bgs in the small landscaped planter areas along the eastern boundaries of the property are above levels suitable for future residential land use if the Site were to be redeveloped for residential use. Accordingly, risk management measures that restrict the future residential use of the property are warranted for the off-Site 438 First Street Property.

6.2.2 Off-Site Public ROW

The results of the comparison of EPCs for COPCs in off-Site public ROW soil (0-10 feet bgs) to commercial soil RBSCs and ABSCs indicate that levels of CPAHs and naphthalene are above levels suitable for future commercial land use (e.g., if the existing cover in the off-Site public ROW, specifically along the PMG, were to be removed). Accordingly, risk management measures are warranted to ensure that impacts that remain in the PMG are properly managed.

The results of the comparison of EPCs for COPCs in off-Site public ROW soil (0-10 feet bgs) to residential soil RBSCs and ABSCs indicate that levels of CPAHs, naphthalene, and lead along the PMG are above levels suitable for future residential land use. Accordingly, risk management measures are warranted to ensure that impacts that remain in the PMG are properly managed.

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TABLES

TABLE 1a
Statistical Summary of Chemicals Detected in On-Site Property Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Chemical	Detection Frequency (Detections/ Samples Analyzed)	Range of Detected Concentrations (mg/kg)	Arithmetic Mean of Detected Concentrations (mg/kg)	Upper Confidence Limit (UCL) on the Arithmetic Mean[a] (mg/kg)	Representative Exposure Point Concentration (EPC)[b] (mg/kg)
Volatile Organic Compounds					
Benzene	19 / 78	0.00036 - 490	6.3	46	46
Ethylbenzene	5 / 78	0.00039 - 80	1.0	13	13
Methyl tert-butyl ether (MTBE)	0 / 4	ND	NC	NC	ND
Naphthalene_voc	7 / 11	0.37 - 91	9.7	93	91
Toluene	9 / 78	0.0030 - 180	2.3	18	18
Xylenes	16 / 78	0.0010 - 73	1.0	7.0	7.0
Total Petroleum Hydrocarbons					
Oil & Grease	34 / 40	32 - 45,000	3,083	NC	45,000
Total Recoverable Petroleum Hydrocarbons	6 / 20	18 - 21,000	1,146	NC	21,000
TPH-Diesel	111 / 139	1.3 - 18,000	624	1,647	1,647
TPH-Gasoline	5 / 75	0.17 - 1,800	25	309	309
TPH-Motor Oil	91 / 147	6.7 - 18,000	924	2,009	2,009
Semi-Volatile Organic Compounds					
1,2,4-Trichlorobenzene	0 / 1	ND	NC	NC	ND
1,2-Dichlorobenzene	0 / 1	ND	NC	NC	ND
1,2-Diphenylhydrazine	0 / 1	ND	NC	NC	ND
1,3-Dichlorobenzene	0 / 1	ND	NC	NC	ND
1,4-Dichlorobenzene	0 / 1	ND	NC	NC	ND
2,4,5-Trichlorophenol	0 / 1	ND	NC	NC	ND
2,4,6-Trichlorophenol	0 / 1	ND	NC	NC	ND
2,4-Dichlorophenol	0 / 1	ND	NC	NC	ND
2,4-Dimethylphenol	0 / 1	ND	NC	NC	ND
2,4-Dinitrophenol	0 / 1	ND	NC	NC	ND
2,4-Dinitrotoluene	0 / 1	ND	NC	NC	ND
2,6-Dinitrotoluene	0 / 1	ND	NC	NC	ND
2-Chloronaphthalene	0 / 1	ND	NC	NC	ND
2-Chlorophenol	0 / 1	ND	NC	NC	ND
2-Methyl-4,6-dinitrophenol	0 / 1	ND	NC	NC	ND
2-Methylphenol	0 / 1	ND	NC	NC	ND
2-Nitroaniline	0 / 1	ND	NC	NC	ND
2-Nitrophenol	0 / 1	ND	NC	NC	ND
3 & 4 Methylphenol	0 / 1	ND	NC	NC	ND
3,3-Dichlorobenzidine	0 / 1	ND	NC	NC	ND
3-Nitroaniline	0 / 1	ND	NC	NC	ND
4-Bromophenyl-phenyl Ether	0 / 1	ND	NC	NC	ND
4-Chloro-3-methylphenol	0 / 1	ND	NC	NC	ND
4-Chloroaniline	0 / 1	ND	NC	NC	ND
4-Chlorophenyl-phenyl Ether	0 / 1	ND	NC	NC	ND
4-Nitroaniline	0 / 1	ND	NC	NC	ND
4-Nitrophenol	0 / 1	ND	NC	NC	ND
Benzidine	0 / 1	ND	NC	NC	ND
Benzoic acid	0 / 1	ND	NC	NC	ND
Benzyl alcohol	0 / 1	ND	NC	NC	ND
Bis(2-Chloroethoxy)methane	0 / 1	ND	NC	NC	ND
Bis(2-Chloroethyl)ether	0 / 1	ND	NC	NC	ND
Bis(2-chloroisopropyl)ether	0 / 1	ND	NC	NC	ND
Bis(2-ethylhexyl)phthalate	0 / 1	ND	NC	NC	ND
Butyl benzyl phthalate	0 / 1	ND	NC	NC	ND

TABLE 1a
Statistical Summary of Chemicals Detected in On-Site Property Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Chemical	Detection Frequency (Detections/ Samples Analyzed)	Range of Detected Concentrations (mg/kg)	Arithmetic Mean of Detected Concentrations (mg/kg)	Upper Confidence Limit (UCL) on the Arithmetic Mean[a] (mg/kg)	Representative Exposure Point Concentration (EPC)[b] (mg/kg)
Dibenzofuran	0 / 1	ND	NC	NC	ND
Dibutyl phthalate	0 / 1	ND	NC	NC	ND
Diethyl phthalate	0 / 1	ND	NC	NC	ND
Dimethylphthalate	0 / 1	ND	NC	NC	ND
Di-n-octylphthalate	0 / 1	ND	NC	NC	ND
Diphenylnitrosoamine	0 / 1	ND	NC	NC	ND
Hexachlorobenzene	0 / 1	ND	NC	NC	ND
Hexachlorobutadiene	0 / 1	ND	NC	NC	ND
Hexachlorocyclopentadiene	0 / 1	ND	NC	NC	ND
Hexachloroethane	0 / 1	ND	NC	NC	ND
Isophorone	0 / 1	ND	NC	NC	ND
Nitrobenzene	0 / 1	ND	NC	NC	ND
N-Nitroso-di-n-propylamine	0 / 1	ND	NC	NC	ND
Pentachlorophenol	0 / 1	ND	NC	NC	ND
Phenol	0 / 1	ND	NC	NC	ND
Polychlorinated Biphenyls					
Polychlorinated Biphenyls (PCBs)	1 / 2	0.70	0.48	NC	**0.70**
Polycyclic Aromatic Hydrocarbons					
2-Methylnaphthalene	0 / 7	ND	NC	NC	ND
Acenaphthene	46 / 158	0.00050 - 120	1.5	6.0	6.0
Acenaphthylene	109 / 155	0.0030 - 400	4.6	21	21
Anthracene	115 / 158	0.00010 - 280	3.5	15	15
Benzo(a)anthracene	127 / 156	0.00030 - 270	7.1	19	19
Benzo(a)pyrene	129 / 156	0.00030 - 500	12	28	28
Benzo(b)fluoranthene	131 / 156	0.00040 - 370	10	28	28
Benzo(g,h,i)perylene	130 / 156	0.00070 - 560	13	38	38
Benzo(k)fluoranthene	123 / 156	0.00020 - 210	5.1	12	12
Chrysene	129 / 156	0.00050 - 330	8.9	24	24
Dibenz(a,h)anthracene	99 / 155	0.000080 - 12	1.3	1.3	1.3
Fluoranthene	133 / 156	0.0010 - 1,300	26	83	83
Fluorene	93 / 156	0.00010 - 170	3.3	13	13
Indeno(1,2,3-c,d)pyrene	125 / 156	0.00060 - 330	8.7	24	24
Naphthalene	123 / 158	0.0020 - 15,000	101	694	694
Phenanthrene	131 / 158	0.0010 - 1,900	23	100	100
Pyrene	134 / 156	0.0010 - 1,900	32	112	112
Carcinogenic Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene Equivalent	133 / 156	0.00055 - 630	16	35	35
Inorganics					
Antimony	34 / 78	0.49 - 270	6.4	15	15
Arsenic	77 / 78	1.7 - 150	15	21	21
Barium	68 / 68	16 - 300	170	180	180
Beryllium	32 / 68	0.15 - 0.78	0.27	0.31	0.31
Cadmium	38 / 76	0.050 - 3.0	0.51	0.58	0.58
Chromium	77 / 77	7.2 - 144	72	76	76
Cobalt	68 / 68	2.6 - 23	15	16	16
Copper	73 / 73	14 - 570	67	110	110
Cyanide	1 / 10	2.4	0.69	NC	**2.4**
Lead	138 / 140	2.3 - 6,700	280	633	633
Mercury	75 / 78	0.028 - 4.0	0.43	0.58	0.58

TABLE 1a
Statistical Summary of Chemicals Detected in On-Site Property Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Chemical	Detection Frequency (Detections/ Samples Analyzed)	Range of Detected Concentrations (mg/kg)	Arithmetic Mean of Detected Concentrations (mg/kg)	Upper Confidence Limit (UCL) on the Arithmetic Mean[a] (mg/kg)	Representative Exposure Point Concentration (EPC)[b] (mg/kg)
Molybdenum	7 / 68	0.22 - 0.65	0.51	0.28	0.28
Nickel	77 / 77	7.9 - 421	115	125	125
Selenium	1 / 68	0.71	1.0	NC	**0.71**
Silver	6 / 73	0.60 - 1.2	0.33	0.31	0.31
Thallium	5 / 68	0.56 - 0.79	0.62	0.54	0.54
Titanium	5 / 5	5.0 - 6.0	5.4	NC	**6.0**
Vanadium	68 / 68	25 - 110	53	56	56
Zinc	77 / 77	37 - 995	167	247	247

Notes:

a = Upper confidence limits (UCLs) on the arithmetic mean derived using ProUCL 5.0 (U.S. Environmental Protection Agency [USEPA], 2013a); ProUCL output is presented in Attachment A.

b = Where calculated, estimated UCLs on the arithmetic mean were selected as representative exposure point concentrations (EPCs) for the human health risk assessment (HHRA), consistent with USEPA guidance (2002). Maximum detected concentrations (**BOLDED**) are alternatively conservatively used as representative EPCs.

mg/kg = milligrams per kilogram

NC = Not calculated. In order for ProUCL 5.0 to reliably evaluate a specific data population (e.g., dataset of concentrations of a particular chemical measured at the site), the population must include at least ten results including at least four detections (USEPA, 2013b).

ND = Not detected.

References:

U.S. Environmental Protection Agency (USEPA). 2002. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. Office of Emergency and Remedial Response. Washington, D.C. OSWER 9285.6-10. December.

USEPA. 2013a. ProUCL Version 5.0.00. Downloaded from: http://www.epa.gov/esd/tsc/software.htm

USEPA. 2013b. ProUCL Version 5.0.00 Technical Guide. September.

TABLE 1b
Statistical Summary of Chemicals Detected in Off-Site West Property Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Chemical	Detection Frequency (Detections/ Samples Analyzed)	Range of Detected Concentrations (mg/kg)	Arithmetic Mean of Detected Concentrations (mg/kg)	Upper Confidence Limit (UCL) on the Arithmetic Mean[a] (mg/kg)	Representative Exposure Point Concentration (EPC)[b] (mg/kg)
Volatile Organic Compounds					
Benzene	1 / 12	0.00067	0.0020	NC	**0.00067**
Ethylbenzene	0 / 12	ND	NC	NC	ND
Toluene	0 / 12	ND	NC	NC	ND
Xylenes	0 / 12	ND	NC	NC	ND
Total Petroleum Hydrocarbons					
Total Recoverable Petroleum Hydrocarbons	2 / 4	10 - 350	93	NC	**350**
TPH-Diesel	17 / 27	1.3 - 110	17	36	36
TPH-Gasoline	0 / 16	ND	NC	NC	ND
TPH-Motor Oil	12 / 27	59 - 600	85	198	198
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	7 / 21	0.0031 - 0.69	0.068	0.26	0.26
Acenaphthylene	14 / 21	0.0056 - 0.47	0.088	0.25	0.25
Anthracene	12 / 21	0.020 - 0.26	0.058	0.072	0.072
Benzo(a)anthracene	14 / 21	0.012 - 1.1	0.15	0.25	0.25
Benzo(a)pyrene	15 / 21	0.022 - 2.1	0.26	0.45	0.45
Benzo(b)fluoranthene	16 / 21	0.031 - 1.6	0.27	0.47	0.47
Benzo(g,h,i)perylene	16 / 21	0.017 - 2.8	0.26	1.1	1.1
Benzo(k)fluoranthene	14 / 21	0.0080 - 1.3	0.14	0.52	0.52
Chrysene	15 / 21	0.018 - 1.5	0.19	0.32	0.32
Dibenz(a,h)anthracene	9 / 21	0.010 - 0.086	0.044	0.034	0.034
Fluoranthene	15 / 21	0.032 - 3.9	0.44	0.82	0.82
Fluorene	9 / 21	0.0043 - 0.11	0.036	0.032	0.032
Indeno(1,2,3-c,d)pyrene	16 / 21	0.013 - 1.7	0.19	0.68	0.68
Naphthalene	14 / 21	0.0097 - 5.1	0.49	3.3	3.3
Phenanthrene	15 / 21	0.035 - 2.6	0.32	1.1	1.1
Pyrene	15 / 21	0.042 - 4.8	0.51	1.9	1.9
Carcinogenic Polycyclic Aromatic Hydrocarbons					
Phenanthrene	15 / 21	0.035 - 2.6	0.32	1.1	1.1
Inorganics					
Antimony	3 / 12	2.2 - 7.3	1.7	NC	**7.3**
Arsenic	12 / 12	4.0 - 75	12	37	37
Barium	12 / 12	120 - 280	174	198	198
Beryllium	1 / 12	0.15	0.19	NC	**0.15**
Cadmium	2 / 12	0.25 - 0.78	0.28	NC	**0.78**
Chromium	12 / 12	46 - 110	76	86	86
Cobalt	12 / 12	10 - 24	16	18	18
Copper	12 / 12	25 - 56	37	42	42
Lead	12 / 12	15 - 990	143	481	481
Mercury	12 / 12	0.087 - 0.49	0.27	0.33	0.33
Molybdenum	1 / 12	0.24	0.89	NC	**0.24**
Nickel	12 / 12	69 - 170	100	120	120
Selenium	1 / 12	0.75	1.8	NC	**0.75**
Silver	0 / 12	ND	NC	NC	ND
Thallium	1 / 12	0.56	0.92	NC	**0.56**
Vanadium	12 / 12	38 - 72	50	56	56
Zinc	12 / 12	70 - 270	115	144	144
Benzo(a)pyrene Equivalent	16 / 21	0.029 - 2.7	0.34	0.58	0.58

TABLE 1b
Statistical Summary of Chemicals Detected in Off-Site West Property Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Chemical	Detection Frequency (Detections/ Samples Analyzed)	Range of Detected Concentrations (mg/kg)	Arithmetic Mean of Detected Concentrations (mg/kg)	Upper Confidence Limit (UCL) on the Arithmetic Mean[a] (mg/kg)	Representative Exposure Point Concentration (EPC)[b] (mg/kg)

Notes:

a = Upper confidence limits (UCLs) on the arithmetic mean derived using ProUCL 5.0 (U.S. Environmental Protection Agency [USEPA], 2013a); ProUCL output is presented in Attachment A.

b = Where calculated, estimated UCLs on the arithmetic mean were selected as representative exposure point concentrations (EPCs) for the human health risk assessment (HHRA), consistent with USEPA guidance (2002). Maximum detected concentrations (**BOLDED**) are alternatively conservatively used as representative EPCs.

mg/kg = milligrams per kilogram

NC = Not calculated. In order for ProUCL 5.0 to reliably evaluate a specific data population (e.g., dataset of concentrations of a particular chemical measured at the site), the population must include at least ten results including at least four detections (USEPA, 2013b).

ND = Not detected.

References:

U.S. Environmental Protection Agency (USEPA). 2002. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. Office of Emergency and Remedial Response. Washington, D.C. OSWER 9285.6-10. December.

USEPA. 2013a. ProUCL Version 5.0.00. Downloaded from: http://www.epa.gov/esd/tsc/software.htm

USEPA. 2013b. ProUCL Version 5.0.00 Technical Guide. September.

TABLE 1c
Statistical Summary of Chemicals Detected in Off-Site Public ROW Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Chemical	Detection Frequency (Detections/ Samples Analyzed)	Range of Detected Concentrations (mg/kg)	Arithmetic Mean of Detected Concentrations (mg/kg)	Upper Confidence Limit (UCL) on the Arithmetic Mean[a] (mg/kg)	Representative Exposure Point Concentration (EPC)[b] (mg/kg)
Volatile Organic Compounds					
1,1,1,2-Tetrachloroethane	0 / 30	ND	NC	NC	ND
1,1,1-Trichloroethane	0 / 30	ND	NC	NC	ND
1,1,2,2-Tetrachloroethane	0 / 30	ND	NC	NC	ND
1,1,2-Trichloroethane	0 / 30	ND	NC	NC	ND
1,1-Dichloroethane	0 / 30	ND	NC	NC	ND
1,1-Dichloroethene	0 / 30	ND	NC	NC	ND
1,1-Dichloropropene	0 / 30	ND	NC	NC	ND
1,2,3-Trichlorobenzene	0 / 30	ND	NC	NC	ND
1,2,3-Trichloropropane	0 / 30	ND	NC	NC	ND
1,2,4-Trichlorobenzene	0 / 30	ND	NC	NC	ND
1,2,4-Trimethylbenzene	0 / 30	ND	NC	NC	ND
1,2-Dibromoethane (EDB)	0 / 30	ND	NC	NC	ND
1,2-Dichlorobenzene	0 / 30	ND	NC	NC	ND
1,2-Dichloroethane	0 / 30	ND	NC	NC	ND
1,2-Dichloropropene	0 / 30	ND	NC	NC	ND
1,3,5-Trimethylbenzene	0 / 30	ND	NC	NC	ND
1,3-Dichlorobenzene	0 / 30	ND	NC	NC	ND
1,3-Dichloropropane	0 / 30	ND	NC	NC	ND
1,4-Dichlorobenzene	0 / 30	ND	NC	NC	ND
2,2-Dichloropropane	0 / 30	ND	NC	NC	ND
2-Chlorotoluene	0 / 30	ND	NC	NC	ND
4-Chlorotoluene	0 / 30	ND	NC	NC	ND
4-Isopropyltoluene	0 / 30	ND	NC	NC	ND
Benzene	2 / 48	0.0085 - 0.027	0.0021	NC	**0.027**
Bromobenzene	0 / 30	ND	NC	NC	ND
Bromodichloromethane	0 / 30	ND	NC	NC	ND
Bromoform	0 / 30	ND	NC	NC	ND
Bromomethane	0 / 30	ND	NC	NC	ND
Butylbenzene	0 / 30	ND	NC	NC	ND
Carbon Tetrachloride	0 / 30	ND	NC	NC	ND
Chlorobenzene	0 / 30	ND	NC	NC	ND
Chlorobromomethane	0 / 30	ND	NC	NC	ND
Chloroethane	0 / 30	ND	NC	NC	ND
Chloroform	0 / 30	ND	NC	NC	ND
Chloromethane	0 / 30	ND	NC	NC	ND
cis-1,2-Dichloroethene	0 / 30	ND	NC	NC	ND
cis-1,3-Dichloropropene	0 / 30	ND	NC	NC	ND
Dibromochloromethane	0 / 30	ND	NC	NC	ND
Dibromomethane	0 / 30	ND	NC	NC	ND
Dichlorodifluoromethane (Freon 12)	0 / 30	ND	NC	NC	ND
Ethanol	0 / 2	ND	NC	NC	ND
Ethyl tert-Butyl Ether (ETBE)	0 / 32	ND	NC	NC	ND
Ethylbenzene	0 / 48	ND	NC	NC	ND
Hexachlorobutadiene	0 / 30	ND	NC	NC	ND

TABLE 1c
Statistical Summary of Chemicals Detected in Off-Site Public ROW Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Chemical	Detection Frequency (Detections/ Samples Analyzed)	Range of Detected Concentrations (mg/kg)	Arithmetic Mean of Detected Concentrations (mg/kg)	Upper Confidence Limit (UCL) on the Arithmetic Mean[a] (mg/kg)	Representative Exposure Point Concentration (EPC)[b] (mg/kg)
Isopropyl ether	0 / 32	ND	NC	NC	ND
Isopropylbenzene (Cumene)	0 / 30	ND	NC	NC	ND
Methyl tert-butyl ether (MTBE)	1 / 40	0.011	0.0028	NC	**0.011**
Methylene Chloride	0 / 30	ND	NC	NC	ND
Naphthalene_voc	6 / 31	0.0047 - 0.043	0.020	0.0070	0.0070
Propylbenzene	0 / 30	ND	NC	NC	ND
sec-Butylbenzene	0 / 30	ND	NC	NC	ND
Styrene	0 / 30	ND	NC	NC	ND
Tert-Amyl Methyl Ether (TAME)	0 / 32	ND	NC	NC	ND
tert-Butyl Alcohol (TBA)	0 / 32	ND	NC	NC	ND
tert-Butylbenzene	0 / 30	ND	NC	NC	ND
Tetrachloroethene	0 / 30	ND	NC	NC	ND
Toluene	2 / 48	0.012 - 0.015	0.0019	NC	**0.015**
trans-1,2-Dichloroethene	0 / 30	ND	NC	NC	ND
Trichloroethene	0 / 30	ND	NC	NC	ND
Trichlorofluoromethane (Freon 11)	0 / 30	ND	NC	NC	ND
Vinyl Chloride	0 / 30	ND	NC	NC	ND
Xylenes	29 / 48	0.0030 - 0.0061	0.0040	NC	0.0061
Total Petroleum Hydrocarbons					
Oil & Grease	18 / 22	20 - 4,320	418	NC	4,320
Total Petroleum Hydrocarbons-Extractable	3 / 17	1.1 - 17	1.5	NC	**17**
Total Recoverable Petroleum Hydrocarbons	18 / 28	10 - 320	58	NC	320
TPH-Diesel	24 / 91	2.6 - 550	27	71	71
TPH-Gasoline	7 / 64	0.56 - 410	7.4	50	50
TPH-Motor Oil	19 / 112	9.2 - 1,600	51	70	70
Polychlorinated Biphenyls					
Polychlorinated Biphenyls (PCBs)	0 / 1	ND	NC	NC	ND
Polycyclic Aromatic Hydrocarbons					
1-Methylnaphthalene	0 / 2	ND	NC	NC	ND
2-Methylnaphthalene	2 / 8	0.025 - 1.8	63	NC	**1.8**
Acenaphthene	10 / 99	0.0022 - 0.84	5.1	0.056	0.056
Acenaphthylene	21 / 99	0.013 - 11	5.4	1.4	1.4
Anthracene	36 / 99	0.0020 - 670	9.5	50	50
Benzo(a)anthracene	35 / 97	0.0031 - 1,200	21	116	116
Benzo(a)pyrene	45 / 98	0.0035 - 2,700	52	278	278
Benzo(b)fluoranthene	44 / 98	0.0032 - 1,300	24	129	129
Benzo(g,h,i)perylene	38 / 98	0.0084 - 2,600	53	283	283
Benzo(k)fluoranthene	32 / 98	0.0034 - 710	14	75	75
Chrysene	43 / 98	0.0032 - 1,500	27	146	146
Dibenz(a,h)anthracene	26 / 98	0.0040 - 1.4	5.2	0.083	0.083
Fluoranthene	49 / 98	0.0030 - 4,600	70	392	392
Fluorene	20 / 98	0.0033 - 3.5	5.2	0.21	0.21
Indeno(1,2,3-c,d)pyrene	45 / 98	0.0027 - 1,700	34	183	183
Naphthalene	28 / 99	0.0080 - 630	9.6	47	47
Phenanthrene	48 / 99	0.0031 - 3,500	45	272	272

TABLE 1c
Statistical Summary of Chemicals Detected in Off-Site Public ROW Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Chemical	Detection Frequency (Detections/ Samples Analyzed)	Range of Detected Concentrations (mg/kg)	Arithmetic Mean of Detected Concentrations (mg/kg)	Upper Confidence Limit (UCL) on the Arithmetic Mean[a] (mg/kg)	Representative Exposure Point Concentration (EPC)[b] (mg/kg)
Pyrene	49 / 98	0.0058 - 5,400	86	477	477
Carcinogenic Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene Equivalent	51 / 98	0.0030 - 3,300	63	255	255
Inorganics					
Antimony	0 / 39	ND	NC	NC	ND
Arsenic	9 / 40	2.6 - 13	3.1	4.4	4.4
Barium	39 / 39	78 - 420	128	142	142
Beryllium	4 / 39	0.28 - 0.57	0.51	0.33	0.33
Cadmium	5 / 42	0.50 - 3.0	0.45	0.80	0.80
Chromium	42 / 42	12 - 94	40	45	45
Cobalt	39 / 39	5.6 - 20	10	11	11
Copper	42 / 42	8.0 - 80	21	25	25
Cyanide	0 / 1	ND	NC	NC	ND
Lead	49 / 64	2.4 - 670	66	137	137
Mercury	6 / 40	0.12 - 0.88	0.10	0.17	0.17
Molybdenum	0 / 39	ND	NC	NC	ND
Nickel	42 / 42	33 - 732	78	150	150
Selenium	0 / 39	ND	NC	NC	ND
Silver	3 / 42	0.25 - 1.5	0.48	NC	**1.5**
Thallium	0 / 39	ND	NC	NC	ND
Titanium	3 / 3	3.0 - 39	15	NC	**39**
Vanadium	39 / 39	17 - 69	31	33	33
Zinc	42 / 42	21 - 1,400	92	238	238

Notes:

a = Upper confidence limits (UCLs) on the arithmetic mean derived using ProUCL 5.0 (U.S. Environmental Protection Agency [USEPA], 2013a); ProUCL output is presented in Attachment A.

b = Where calculated, estimated UCLs on the arithmetic mean were selected as representative exposure point concentrations (EPCs) for the human health risk assessment (HHRA), consistent with USEPA guidance (2002). Maximum detected concentrations (**BOLDED**) are alternatively conservatively used as representative EPCs.

mg/kg = milligrams per kilogram

NC = Not calculated. In order for ProUCL 5.0 to reliably evaluate a specific data population (e.g., dataset of concentrations of a particular chemical measured at the site), the population must include at least ten results including at least four detections (USEPA, 2013b).

ND = Not detected.

References:

U.S. Environmental Protection Agency (USEPA). 2002. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. Office of Emergency and Remedial Response. Washington, D.C. OSWER 9285.6-10. December.

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USEPA. 2013b. ProUCL Version 5.0.00 Technical Guide. September.

TABLE 2a
Comparison of Exposure Point Concentration to Risk-Based Screening Concentrations for Chemicals of Potential Concern in On-Site Property Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

		Industrial Land Use RBSCs						Residential Land Use RBSCs					
Chemical	**Exposure Point Concentration (mg/kg)**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Industrial RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Residential RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**
Volatile Organic Compounds													
Benzene	46	5.1	USEPA, 2015	420	USEPA, 2015	5.1	**9.0E+00**	1.2	USEPA, 2015	82	USEPA, 2015	1.2	**3.8E+01**
Ethylbenzene	13	25	USEPA, 2015	20,000	USEPA, 2015	25	5.2E-01	5.8	USEPA, 2015	3,400	USEPA, 2015	5.8	**2.2E+00**
Naphthalene	91	17	USEPA, 2015	590	USEPA, 2015	17	**5.4E+00**	3.8	USEPA, 2015	130	USEPA, 2015	3.8	**2.4E+01**
Toluene	18	--	USEPA, 2015	47,000	USEPA, 2015	47,000	3.8E-04	--	USEPA, 2015	4,900	USEPA, 2015	4,900	3.7E-03
Xylenes	7.0	--	USEPA, 2015	2,500	USEPA, 2015	2,500	2.8E-03	--	USEPA, 2015	580	USEPA, 2015	580	1.2E-02
Total Petroleum Hydrocarbons													
Oil & Grease	45,000	--	--	--	--	--	--	--	--	--	--	--	--
Total Recoverable Petroleum Hydrocarbons	21,000	--	--	--	--	--	--	--	--	--	--	--	--
TPH-Diesel	1,647	--	--	1,128	SFRWQCB, 2013	1,128	**1.5E+00**	--	--	238	SFRWQCB, 2013	238	**6.9E+00**
TPH-Gasoline	309	--	--	3,962	SFRWQCB, 2013	3,962	7.8E-02	--	--	766	SFRWQCB, 2013	766	4.0E-01
TPH-Motor Oil	2,009	--	--	104,663	SFRWQCB, 2013	104,663	1.9E-02	--	--	10,388	SFRWQCB, 2013	10,388	1.9E-01
Polychlorinated Biphenyls													
Total Polychlorinated Biphenyls (PCBs)	0.70	1.0	USEPA, 2015	--	USEPA, 2015	1.0	7.0E-01	0.24	USEPA, 2015	--	USEPA, 2015	0.24	**2.9E+00**
Polycyclic Aromatic Hydrocarbons													
Acenaphthene	6.0	--	USEPA, 2015	45,000	USEPA, 2015	45,000	1.3E-04	--	USEPA, 2015	3,500	USEPA, 2015	3,500	1.7E-03
Acenaphthylene [a]	21	--	USEPA, 2015	45,000	USEPA, 2015	45,000	4.7E-04	--	USEPA, 2015	3,500	USEPA, 2015	3,500	6.0E-03
Anthracene	15	--	USEPA, 2015	230,000	USEPA, 2015	230,000	6.5E-05	--	USEPA, 2015	17,000	USEPA, 2015	17,000	8.8E-04
Benzo(a)anthracene	19	na	na	na	na	na	--	na	na	na	na	na	--
Benzo(a)pyrene	28	na	na	na	na	na	--	na	na	na	na	na	--
Benzo(b)fluoranthene	28	na	na	na	na	na	--	na	na	na	na	na	--
Benzo(g,h,i)perylene [b]	38	--	USEPA, 2015	23,000	USEPA, 2015	23,000	1.7E-03	--	USEPA, 2015	1,700	USEPA, 2015	1,700	2.2E-02
Benzo(k)fluoranthene	12	na	na	na	na	na	--	na	na	na	na	na	--
Chrysene	24	na	na	na	na	na	--	na	na	na	na	na	--
Dibenz(a,h)anthracene	1.3	na	na	na	na	na	--	na	na	na	na	na	--
Fluoranthene	83	--	USEPA, 2015	30,000	USEPA, 2015	30,000	2.8E-03	--	USEPA, 2015	2,300	USEPA, 2015	2,300	3.6E-02
Fluorene	13	--	USEPA, 2015	30,000	USEPA, 2015	30,000	4.3E-04	--	USEPA, 2015	2,300	USEPA, 2015	2,300	5.7E-03
Indeno(1,2,3-c,d)pyrene	24	na	na	na	na	na	--	na	na	na	na	na	--
Naphthalene	694	17	USEPA, 2015	590	USEPA, 2015	17	**4.1E+01**	3.8	USEPA, 2015	130	USEPA, 2015	3.8	**1.8E+02**
Phenanthrene [c]	100	--	USEPA, 2015	230,000	USEPA, 2015	230,000	4.3E-04	--	USEPA, 2015	17,000	USEPA, 2015	17,000	5.9E-03
Pyrene	112	--	USEPA, 2015	23,000	USEPA, 2015	23,000	4.9E-03	--	USEPA, 2015	1,700	USEPA, 2015	1,700	6.6E-02
Carcinogenic Polycyclic Aromatic Hydrocarbons													
Benzo(a)pyrene Equivalent	35	0.9 (ABSC)	ENVIRON, 2002	--	--	0.90	**3.9E+01**	0.9 (ABSC)	ENVIRON, 2002	--	--	0.90	**3.9E+01**
Inorganics													
Antimony	15	--	USEPA, 2015	470	USEPA, 2015	470	3.2E-02	--	USEPA, 2015	31	USEPA, 2015	31	4.8E-01
Arsenic	21	14 (ABSC)	TPG, 2012	--	--	14	**1.5E+00**	14 (ABSC)	TPG, 2012	--	--	14	**1.5E+00**
Barium	180	--	USEPA, 2015	220,000	USEPA, 2015	220,000	8.2E-04	--	USEPA, 2015	15,000	USEPA, 2015	15,000	1.2E-02
Beryllium	0.31	6,950	Cal/EPA, 2014	183	Cal/EPA, 2014	183	1.7E-03	1,380	Cal/EPA, 2014	15	Cal/EPA, 2014	15	2.0E-02
Cadmium	0.58	3,970	Cal/EPA, 2014	6.4	Cal/EPA, 2014	6.4	9.1E-02	788	Cal/EPA, 2014	4.6	Cal/EPA, 2014	4.6	1.3E-01
Chromium	76	--	USEPA, 2014	1,800,000	USEPA, 2014	1,800,000	4.2E-05	--	USEPA, 2014	120,000	USEPA, 2014	120,000	6.3E-04
Cobalt	16	1,900	USEPA, 2015	350	USEPA, 2015	350	4.6E-02	420	USEPA, 2015	23	USEPA, 2015	23	7.0E-01
Copper	110	--	USEPA, 2015	47,000	USEPA, 2015	47,000	2.3E-03	--	USEPA, 2015	3,100	USEPA, 2015	3,100	3.5E-02
Cyanide	2.4	--	USEPA, 2015	130	USEPA, 2015	130	1.8E-02	--	USEPA, 2015	21	USEPA, 2015	21	1.1E-01

TABLE 2a
Comparison of Exposure Point Concentration to Risk-Based Screening Concentrations for Chemicals of Potential Concern in On-Site Property Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

		Industrial Land Use RBSCs						Residential Land Use RBSCs					
Chemical	**Exposure Point Concentration (mg/kg)**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Industrial RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Residential RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**
Lead	633	--	Cal/EPA, 2014	320	Cal/EPA, 2014	320	**2.0E+00**	--	Cal/EPA, 2014	80	Cal/EPA, 2014	80	**7.9E+00**
Mercury	0.58	--	USEPA, 2015	40	USEPA, 2015	40	1.5E-02	--	USEPA, 2015	9.4	USEPA, 2015	9.4	6.2E-02
Molybdenum	0.28	--	USEPA, 2015	5,800	USEPA, 2015	5,800	4.8E-05	--	USEPA, 2015	390	USEPA, 2015	390	7.2E-04
Nickel	125	64,000	USEPA, 2015	22,000	USEPA, 2015	22,000	5.7E-03	15,000	USEPA, 2015	1,500	USEPA, 2015	1,500	8.3E-02
Selenium	0.71	--	USEPA, 2015	5,800	USEPA, 2015	5,800	1.2E-04	--	USEPA, 2015	390	USEPA, 2015	390	1.8E-03
Silver	0.31	--	USEPA, 2015	5,800	USEPA, 2015	5,800	5.3E-05	--	USEPA, 2015	390	USEPA, 2015	390	7.9E-04
Thallium	0.54	--	USEPA, 2015	12	USEPA, 2015	12	4.5E-02	--	USEPA, 2015	0.78	USEPA, 2015	0.78	6.9E-01
Titanium	6.0	--	Cal/EPA, 2014	3,800,000	Cal/EPA, 2014	3,800,000	1.6E-06	--	Cal/EPA, 2014	310,000	Cal/EPA, 2014	310,000	1.9E-05
Vanadium	56	--	USEPA, 2015	5,800	USEPA, 2015	5,800	9.7E-03	--	USEPA, 2015	390	USEPA, 2015	390	1.4E-01
Zinc	247	--	USEPA, 2015	350,000	USEPA, 2015	350,000	7.1E-04	--	USEPA, 2015	23,000	USEPA, 2015	23,000	1.1E-02

Notes:
ABSC = Ambient-Based Screening Concentration.
RBSC = Risk-Based Screening Concentration.
na = Carcinogenic PAHs (CPAHs) evalauted using benzo(a)pyrene equivalency method.
-- = Not applicable.
a = Surrogate value - assumes RBSC for acenaphthene.
b = Surrogate value - assumes RBSC for pyrene.
c = Surrogate value - assumes RBSC for anthracene.
d = Ratio of exposure point concentration (EPC) Over RBSC or ABSC is **BOLDED**.

References:

California Environmental Protection Agency (Cal/EPA). 2014. DTSC/HERO Human Health Risk Assessment (HHRA) Note Number 3, DTSC Recommended Methodology for Use of U.S. EPA Regional Screening Levels (RSLs) in the Human Health Risk Assessment Process at Hazardous Waste Sites and Permitted Facilities. Department of Toxic Substances Control (DTSC) /Office of Human and Ecological Risk (HERO). July 14.

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TABLE 2b
Comparison of Exposure Point Concentration to Risk-Based Screening Concentrations for Chemicals of Potential Concern in Off-Site 438 First Street Property Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

		Industrial Land Use RBSC						Residential Land Use RBSC					
Chemical	**Exposure Point Concentration (mg/kg)**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Industrial RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Residential RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**
Volatile Organic Compounds													
Benzene	0.00067	5.1	USEPA, 2015	420	USEPA, 2015	5.1	1.3E-04	1.2	USEPA, 2015	82	USEPA, 2015	1.2	5.6E-04
Total Petroleum Hydrocarbons													
Total Recoverable Petroleum Hydrocarbons	350	--	--	--	--	--		--	--	--	--	--	--
TPH-Diesel	36	--	--	1,128	SFRWQCB, 2013	1,128	3.2E-02	--	--	238	SFRWQCB, 2013	238	1.5E-01
TPH-Motor Oil	198	--	--	104,663	SFRWQCB, 2013	104,663	1.9E-03	--	--	10,388	SFRWQCB, 2013	10,388	1.9E-02
Polycyclic Aromatic Hydrocarbons													
Acenaphthene	0.26	--	USEPA, 2015	45,000	USEPA, 2015	45,000	5.8E-06	--	USEPA, 2015	3,500	USEPA, 2015	3,500	7.4E-05
Acenaphthylene [a]	0.25	--	USEPA, 2015	45,000	USEPA, 2015	45,000	5.6E-06	--	USEPA, 2015	3,500	USEPA, 2015	3,500	7.1E-05
Anthracene	0.072	--	USEPA, 2015	230,000	USEPA, 2015	230,000	3.1E-07	--	USEPA, 2015	17,000	USEPA, 2015	17,000	4.2E-06
Benzo(a)anthracene	0.25	na	na	na	na	na	--	na	na	na	na	na	--
Benzo(a)pyrene	0.45	na	na	na	na	na	--	na	na	na	na	na	--
Benzo(b)fluoranthene	0.47	na	na	na	na	na	--	na	na	na	na	na	--
Benzo(g,h,i)perylene [b]	1.1	--	USEPA, 2015	23,000	USEPA, 2015	23,000	4.8E-05	--	USEPA, 2015	1,700	USEPA, 2015	1,700	6.5E-04
Benzo(k)fluoranthene	0.52	na	na	na	na	na	--	na	na	na	na	na	--
Chrysene	0.32	na	na	na	na	na	--	na	na	na	na	na	--
Dibenz(a,h)anthracene	0.034	na	na	na	na	na	--	na	na	na	na	na	--
Fluoranthene	0.82	--	USEPA, 2015	30,000	USEPA, 2015	30,000	2.7E-05	--	USEPA, 2015	2,300	USEPA, 2015	2,300	3.6E-04
Fluorene	0.032	--	USEPA, 2015	30,000	USEPA, 2015	30,000	1.1E-06	--	USEPA, 2015	2,300	USEPA, 2015	2,300	1.4E-05
Indeno(1,2,3-c,d)pyrene	0.68	na	na	na	na	na	--	na	na	na	na	na	--
Naphthalene	3.3	17	USEPA, 2015	590	USEPA, 2015	17	1.9E-01	3.8	USEPA, 2015	130	USEPA, 2015	3.8	8.7E-01
Phenanthrene [c]	1.1	--	USEPA, 2015	230,000	USEPA, 2015	230,000	4.8E-06	--	USEPA, 2015	17,000	USEPA, 2015	17,000	6.5E-05
Pyrene	1.9	--	USEPA, 2015	23,000	USEPA, 2015	23,000	8.3E-05	--	USEPA, 2015	1,700	USEPA, 2015	1,700	1.1E-03
Carcinogenic Polycyclic Aromatic Hydrocarbons													
Benzo(a)pyrene Equivalent	0.58	0.9 (ABSC)	ENVIRON, 2002	--	--	0.90	6.4E-01	0.9 (ABSC)	ENVIRON, 2002	--	--	0.90	6.4E-01
Inorganics													
Antimony	7.3	--	USEPA, 2015	470	USEPA, 2015	470	1.6E-02	--	USEPA, 2015	31	USEPA, 2015	31	2.4E-01
Arsenic	37	14 (ABSC)	TPG, 2012	--	--	14	**2.6E+00**	14 (ABSC)	TPG, 2012	--	--	14	**2.6E+00**
Barium	198	--	USEPA, 2015	220,000	USEPA, 2015	220,000	9.0E-04	--	USEPA, 2015	15,000	USEPA, 2015	15,000	1.3E-02
Beryllium	0.15	6,950	Cal/EPA, 2014	183	Cal/EPA, 2014	183	8.2E-04	1,380	Cal/EPA, 2014	15	Cal/EPA, 2014	15	9.9E-03
Cadmium	0.78	3,970	Cal/EPA, 2014	6.4	Cal/EPA, 2014	6.4	1.2E-01	788	Cal/EPA, 2014	4.6	Cal/EPA, 2014	4.6	1.7E-01
Chromium	86	--	USEPA, 2014	1,800,000	USEPA, 2014	1,800,000	4.8E-05	--	USEPA, 2014	120,000	USEPA, 2014	120,000	7.2E-04
Cobalt	18	1,900	USEPA, 2015	350	USEPA, 2015	350	5.1E-02	420	USEPA, 2015	23	USEPA, 2015	23	7.8E-01
Copper	42	--	USEPA, 2015	47,000	USEPA, 2015	47,000	8.9E-04	--	USEPA, 2015	3,100	USEPA, 2015	3,100	1.4E-02
Lead	481	--	Cal/EPA, 2014	320	Cal/EPA, 2014	320	**1.5E+00**	--	Cal/EPA, 2014	80	Cal/EPA, 2014	80	**6.0E+00**
Mercury	0.33	--	USEPA, 2015	40	USEPA, 2015	40	8.3E-03	--	USEPA, 2015	9.4	USEPA, 2015	9.4	3.5E-02
Molybdenum	0.24	--	USEPA, 2015	5,800	USEPA, 2015	5,800	4.1E-05	--	USEPA, 2015	390	USEPA, 2015	390	6.2E-04
Nickel	120	64,000	USEPA, 2015	22,000	USEPA, 2015	22,000	5.5E-03	15,000	USEPA, 2015	1,500	USEPA, 2015	1,500	8.0E-02
Selenium	0.75	--	USEPA, 2015	5,800	USEPA, 2015	5,800	1.3E-04	--	USEPA, 2015	390	USEPA, 2015	390	1.9E-03
Thallium	0.56	--	USEPA, 2015	12	USEPA, 2015	12	4.7E-02	--	USEPA, 2015	0.78	USEPA, 2015	0.78	7.2E-01

TABLE 2b
Comparison of Exposure Point Concentration to Risk-Based Screening Concentrations for Chemicals of Potential Concern in Off-Site 438 First Street Property Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

		Industrial Land Use RBSC						Residential Land Use RBSC					
Chemical	**Exposure Point Concentration (mg/kg)**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Industrial RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Residential RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**
Vanadium	56	--	USEPA, 2015	5,800	USEPA, 2015	5,800	9.7E-03	--	USEPA, 2015	390	USEPA, 2015	390	1.4E-01
Zinc	144	--	USEPA, 2015	350,000	USEPA, 2015	350,000	4.1E-04	--	USEPA, 2015	23,000	USEPA, 2015	23,000	6.3E-03

Notes:
ABSC = Ambient-Based Screening Concentration.
RBSC = Risk-Based Screening Concentration.
na = Carcinogenic PAHs (CPAHs) evalauted using benzo(a)pyrene equivalency method.
-- = Not applicable.
a = Surrogate value - assumes RBSC for acenaphthene.
b = Surrogate value - assumes RBSC for pyrene.
c = Surrogate value - assumes RBSC for anthracene.
d = Ratio of exposure point concentration (EPC) Over RBSC or ABSC is **BOLDED**.

References:

California Environmental Protection Agency (Cal/EPA). 2014. DTSC/HERO Human Health Risk Assessment (HHRA) Note Number 3, DTSC Recommended Methodology for Use of U.S. EPA Regional Screening Levels (RSLs) in the Human Health Risk Assessment Process at Hazardous Waste Sites and Permitted Facilities. Department of Toxic Substances Control (DTSC) /Office of Human and Ecological Risk (HERO). July 14.

ENVIRON Corporation, ENTRIX, IRIS Environmental, and ENV America (ENVIRON Corporation). 2002. Background Levels of Polycyclic Aromatic Hydrocarbons in Northern California Surface Soil. June 7.

San Francisco Bay Region Water Quality Control Board (SFRWQC). 2013. Enivornmental Screening Levels. Maintained online at http://www.swrcb.ca.gov/rwqcb2/water_issues/programs/esl.shtml.

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U.S. Environmental Protection Agency (USEPA). 2015. Regional Screening Levels, Screening Levels for Chemical Contaminants, November 2015. Available at http://www.epa.gov/region9/superfund/prg/.

TABLE 2c
Comparison of Exposure Point Concentration to Risk-Based Screening Concentrations for Chemicals of Potential Concern in Off-Site Public ROW Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

		Industrial Land Use RBSCs						Residential Land Use RBSCs					
Chemical	**Exposure Point Concentration (mg/kg)**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Industrial RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Residential RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**
Volatile Organic Compounds													
Benzene	0.027	5.1	USEPA, 2015	420	USEPA, 2015	5.1	5.3E-03	1.2	USEPA, 2015	82	USEPA, 2015	1.2	2.3E-02
Methyl tert-butyl ether (MTBE)	0.011	210	USEPA, 2015	64,000	USEPA, 2015	210	5.2E-05	47	USEPA, 2015	15,000	USEPA, 2015	47	2.3E-04
Naphthalene	0.0070	17	USEPA, 2015	590	USEPA, 2015	17	4.1E-04	3.8	USEPA, 2015	130	USEPA, 2015	3.8	1.8E-03
Toluene	0.015	--	USEPA, 2015	47,000	USEPA, 2015	47,000	3.2E-07	--	USEPA, 2015	4,900	USEPA, 2015	4,900	3.1E-06
Xylenes	0.0061	--	USEPA, 2015	2,500	USEPA, 2015	2,500	2.4E-06	--	USEPA, 2015	580	USEPA, 2015	580	1.1E-05
Total Petroleum Hydrocarbons													
Oil & Grease	4,320	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons-Extractable	17	--	--	--	--	--	--	--	--	--	--	--	--
Total Recoverable Petroleum Hydrocarbons	320	--	--	--	--	--	--	--	--	--	--	--	--
TPH-Diesel	71	--	--	1,128	SFRWQCB, 2013	1,128	6.3E-02	--	--	238	SFRWQCB, 2013	238	3.0E-01
TPH-Gasoline	50	--	--	3,962	SFRWQCB, 2013	3,962	1.3E-02	--	--	766	SFRWQCB, 2013	766	6.5E-02
TPH-Motor Oil	70	--	--	104,663	SFRWQCB, 2013	104,663	6.7E-04	--	--	10,388	SFRWQCB, 2013	10,388	6.7E-03
Polycyclic Aromatic Hydrocarbons													
2-Methylnaphthalene	1.8	--	USEPA, 2015	3,000	USEPA, 2015	3,000	6.0E-04	--	USEPA, 2015	230	USEPA, 2015	230	7.8E-03
Acenaphthene	0.056	--	USEPA, 2015	45,000	USEPA, 2015	45,000	1.2E-06	--	USEPA, 2015	3,500	USEPA, 2015	3,500	1.6E-05
Acenaphthylene [a]	1.4	--	USEPA, 2015	45,000	USEPA, 2015	45,000	3.1E-05	--	USEPA, 2015	3,500	USEPA, 2015	3,500	4.0E-04
Anthracene	50	--	USEPA, 2015	230,000	USEPA, 2015	230,000	2.2E-04	--	USEPA, 2015	17,000	USEPA, 2015	17,000	2.9E-03
Benzo(a)anthracene	116	na	na	na	na	na	--	na	na	na	na	na	--
Benzo(a)pyrene	278	na	na	na	na	na	--	na	na	na	na	na	--
Benzo(b)fluoranthene	129	na	na	na	na	na	--	na	na	na	na	na	--
Benzo(g,h,i)perylene [b]	283	--	USEPA, 2015	23,000	USEPA, 2015	23,000	1.2E-02	--	USEPA, 2015	1,700	USEPA, 2015	1,700	1.7E-01
Benzo(k)fluoranthene	75	na	na	na	na	na	--	na	na	na	na	na	--
Chrysene	146	na	na	na	na	na	--	na	na	na	na	na	--
Dibenz(a,h)anthracene	0.083	na	na	na	na	na	--	na	na	na	na	na	--
Fluoranthene	392	--	USEPA, 2015	30,000	USEPA, 2015	30,000	1.3E-02	--	USEPA, 2015	2,300	USEPA, 2015	2,300	1.7E-01
Fluorene	0.21	--	USEPA, 2015	30,000	USEPA, 2015	30,000	7.0E-06	--	USEPA, 2015	2,300	USEPA, 2015	2,300	9.1E-05
Indeno(1,2,3-c,d)pyrene	183	na	na	na	na	na	--	na	na	na	na	na	--
Naphthalene	47	17	USEPA, 2015	590	USEPA, 2015	17	**2.8E+00**	3.8	USEPA, 2015	130	USEPA, 2015	3.8	**1.2E+01**
Phenanthrene [c]	272	--	USEPA, 2015	230,000	USEPA, 2015	230,000	1.2E-03	--	USEPA, 2015	17,000	USEPA, 2015	17,000	1.6E-02
Pyrene	477	--	USEPA, 2015	23,000	USEPA, 2015	23,000	2.1E-02	--	USEPA, 2015	1,700	USEPA, 2015	1,700	2.8E-01
Polycyclic Aromatic Hydrocarbons	0.00	--	USEPA, 2015	--	USEPA, 2015	--	--	--	USEPA, 2015	--	USEPA, 2015	--	--
Carcinogenic Polycyclic Aromatic Hydrocarbons													
Benzo(a)pyrene Equivalent	255	0.9 (ABSC)	ENVIRON, 2002	--	--	0.90	**2.8E+02**	0.9 (ABSC)	ENVIRON, 2002	--	--	0.90	**2.8E+02**
Inorganics													
Arsenic	4.4	14 (ABSC)	TPG, 2012	--	--	14	3.1E-01	14 (ABSC)	TPG, 2012	--	--	14	3.1E-01
Barium	142	--	USEPA, 2015	220,000	USEPA, 2015	220,000	6.5E-04	--	USEPA, 2015	15,000	USEPA, 2015	15,000	9.5E-03
Beryllium	0.33	6,950	Cal/EPA, 2014	183	Cal/EPA, 2014	183	1.8E-03	1,380	Cal/EPA, 2014	15	Cal/EPA, 2014	15	2.2E-02
Cadmium	0.80	3,970	Cal/EPA, 2014	6.4	Cal/EPA, 2014	6.4	1.3E-01	788	Cal/EPA, 2014	4.6	Cal/EPA, 2014	4.6	1.7E-01
Chromium	45	--	USEPA, 2014	1,800,000	USEPA, 2014	1,800,000	2.5E-05	--	USEPA, 2014	120,000	USEPA, 2014	120,000	3.8E-04
Cobalt	11	1,900	USEPA, 2015	350	USEPA, 2015	350	3.1E-02	420	USEPA, 2015	23	USEPA, 2015	23	4.8E-01
Copper	25	--	USEPA, 2015	47,000	USEPA, 2015	47,000	5.3E-04	--	USEPA, 2015	3,100	USEPA, 2015	3,100	8.1E-03

TABLE 2c
Comparison of Exposure Point Concentration to Risk-Based Screening Concentrations for Chemicals of Potential Concern in Off-Site Public ROW Soil (0-10 feet bgs)
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

		Industrial Land Use RBSCs						Residential Land Use RBSCs					
Chemical	**Exposure Point Concentration (mg/kg)**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Industrial RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**	**Cancer RBSC (mg/kg)**	**Source**	**Noncancer RBSC (mg/kg)**	**Source**	**Minimum Residential RBSC or ABSC (mg/kg)**	**Ratio of EPC Over RBSC/ABSC [d]**
Lead	137	--	Cal/EPA, 2014	320	Cal/EPA, 2014	320	4.3E-01	--	Cal/EPA, 2014	80	Cal/EPA, 2014	80	**1.7E+00**
Mercury	0.17	--	USEPA, 2015	40	USEPA, 2015	40	4.3E-03	--	USEPA, 2015	9.4	USEPA, 2015	9.4	1.8E-02
Nickel	150	64,000	USEPA, 2015	22,000	USEPA, 2015	22,000	6.8E-03	15,000	USEPA, 2015	1,500	USEPA, 2015	1,500	1.0E-01
Silver	1.5	--	USEPA, 2015	5,800	USEPA, 2015	5,800	2.6E-04	--	USEPA, 2015	390	USEPA, 2015	390	3.8E-03
Titanium	39	--	Cal/EPA, 2014	3,800,000	Cal/EPA, 2014	3,800,000	1.0E-05	--	Cal/EPA, 2014	310,000	Cal/EPA, 2014	310,000	1.3E-04
Vanadium	33	--	USEPA, 2015	5,800	USEPA, 2015	5,800	5.7E-03	--	USEPA, 2015	390	USEPA, 2015	390	8.5E-02
Zinc	238	--	USEPA, 2015	350,000	USEPA, 2015	350,000	6.8E-04	--	USEPA, 2015	23,000	USEPA, 2015	23,000	1.0E-02

Notes:
ABSC = Ambient-Based Screening Concentration.
RBSC = Risk-Based Screening Concentration.
na = Carcinogenic PAHs (CPAHs) evalauted using benzo(a)pyrene equivalency method.
-- = Not applicable.
a = Surrogate value - assumes RBSC for acenaphthene.
b = Surrogate value - assumes RBSC for pyrene.
c = Surrogate value - assumes RBSC for anthracene.
d = Ratio of exposure point concentration (EPC) Over RBSC or ABSC is **BOLDED**.

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TABLE 3a
Detections of Chemicals of Potential Concern in On-Site Property Soil (0-10 feet bgs) Above Risk-Based Screening Concentrations
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Sample Location ID	Sample Depth (feet bgs)	Sample ID	Chemical	Concentration (mg/kg)	Minimum Industrial RBSC or ABSC (mg/kg)	Above Industrial RBSC or ABSC?	Minimum Residential RBSC or ABSC (mg/kg)	Above Residential RBSC or ABSC?
100E	5	4-100E-5'	Lead	420	320	**Yes**	80	**Yes**
100E	5	4-100E-5'	TPH-Diesel	4,100	1,128	**Yes**	238	**Yes**
100E	10	6-100E-10'	Benzo(a)pyrene Equivalent	82	0.9	**Yes**	0.9	**Yes**
100E	10	6-100E-10'	Lead	210	320	No	80	**Yes**
100E	10	6-100E-10'	Naphthalene	58	17	**Yes**	3.8	**Yes**
100E	10	6-100E-10'	TPH-Diesel	280	1,128	No	238	**Yes**
120E	10	12-120E-10'	Lead	220	320	No	80	**Yes**
120E	10	12-120E-10'	TPH-Diesel	5,800	1,128	**Yes**	238	**Yes**
140E	10	37-140E-10'	Lead	300	320	No	80	**Yes**
140E	10	37-140E-10'	TPH-Diesel	1,000	1,128	No	238	**Yes**
180E	10	42-180E-10'	Lead	830	320	**Yes**	80	**Yes**
200E	10	43-200E-10'	Lead	2,100	320	**Yes**	80	**Yes**
60E	5	2-60E-5'	Lead	230	320	No	80	**Yes**
A2-S-2.5	2.5	A2-S-2.5	Benzo(a)pyrene Equivalent	48	0.9	**Yes**	0.9	**Yes**
A2-S-2.5	2.5	A2-S-2.5	Lead	550	320	**Yes**	80	**Yes**
B-101	5	B-101-5	TPH-Diesel	3,000	1,128	**Yes**	238	**Yes**
B-101	10	B-101-10	TPH-Diesel	4,400	1,128	**Yes**	238	**Yes**
B-102	5	B-102-5	TPH-Diesel	1,800	1,128	**Yes**	238	**Yes**
B-102	10	B-102-10	TPH-Diesel	2,600	1,128	**Yes**	238	**Yes**
B-103	5	B-103-5	TPH-Diesel	2,300	1,128	**Yes**	238	**Yes**
B-103	10	B-103-10	TPH-Diesel	360	1,128	No	238	**Yes**
B-104	5	B-104-5	TPH-Diesel	780	1,128	No	238	**Yes**
B-104	10	B-104-10	TPH-Diesel	620	1,128	No	238	**Yes**
B-109	5	B-109-5'	Benzo(a)pyrene Equivalent	6.9	0.9	**Yes**	0.9	**Yes**
B-109	5	B-109-5'	Lead	790	320	**Yes**	80	**Yes**
B-109	5	B-109-5'	TPH-Diesel	930	1,128	No	238	**Yes**
B-110	5	B-110-5'	Lead	270	320	No	80	**Yes**
B-110	10	B-110-10'	Lead	550	320	**Yes**	80	**Yes**
B-111	5	B-111-5'	Lead	150	320	No	80	**Yes**
B-113	5	B-113-5'	Benzo(a)pyrene Equivalent	25	0.9	**Yes**	0.9	**Yes**
B-113	5	B-113-5'	Lead	150	320	No	80	**Yes**
B-113	5	B-113-5'	TPH-Diesel	360	1,128	No	238	**Yes**
B-120	5	B-120-5'	Lead	99	320	No	80	**Yes**

TABLE 3a
Detections of Chemicals of Potential Concern in On-Site Property Soil (0-10 feet bgs) Above Risk-Based Screening Concentrations
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Sample Location ID	Sample Depth (feet bgs)	Sample ID	Chemical	Concentration (mg/kg)	Minimum Industrial RBSC or ABSC (mg/kg)	Above Industrial RBSC or ABSC?	Minimum Residential RBSC or ABSC (mg/kg)	Above Residential RBSC or ABSC?
B1-S-4.0	4	B1-S-4.0	Benzo(a)pyrene Equivalent	2.2	0.9	**Yes**	0.9	**Yes**
B1-S-4.0	4	B1-S-4.0	Lead	170	320	No	80	**Yes**
B2-S-5.5	5.5	B2-S-5.5	Benzo(a)pyrene Equivalent	39	0.9	**Yes**	0.9	**Yes**
B2-S-5.5	5.5	B2-S-5.5	Lead	490	320	**Yes**	80	**Yes**
BH-1A	5	Boring 1A - 5'	Benzo(a)pyrene Equivalent	9.2	0.9	**Yes**	0.9	**Yes**
BH-1A	10	Boring 1A - 10'	Benzo(a)pyrene Equivalent	61	0.9	**Yes**	0.9	**Yes**
BH-1A	10	Boring 1A - 10'	Naphthalene	420	17	**Yes**	3.8	**Yes**
BH-6	5	Boring #6, 5'	Benzo(a)pyrene Equivalent	2.0	0.9	**Yes**	0.9	**Yes**
BH-6	5	Boring #6, 5'	Naphthalene	28	17	**Yes**	3.8	**Yes**
BH-9	10	Boring #9 - 10'	Benzo(a)pyrene Equivalent	1.3	0.9	**Yes**	0.9	**Yes**
C1-F-8.0	8	C1-F-8.0	Benzo(a)pyrene Equivalent	5.9	0.9	**Yes**	0.9	**Yes**
C3-F-5.0	5	C3-F-5.0	Benzo(a)pyrene Equivalent	9.3	0.9	**Yes**	0.9	**Yes**
C3-F-5.0	5	C3-F-5.0	Lead	130	320	No	80	**Yes**
C5-S-2.5	2.5	C5-S-2.5	Benzo(a)pyrene Equivalent	20	0.9	**Yes**	0.9	**Yes**
C5-S-2.5	2.5	C5-S-2.5	Lead	850	320	**Yes**	80	**Yes**
C5-S-2.5	2.5	C5-S-2.5	Naphthalene	4.0	17	No	3.8	**Yes**
CB-1	10	CB-1-10.0	Benzo(a)pyrene Equivalent	41	0.9	**Yes**	0.9	**Yes**
CB-1	10	CB-1-10.0	Lead	1,200	320	**Yes**	80	**Yes**
CB-1	10	CB-1-10.0	Naphthalene	7.5	17	No	3.8	**Yes**
CB-1	10	CB-1-10.0	TPH-Diesel	2,600	1,128	**Yes**	238	**Yes**
CB-3	4.5	CB-3-4.5	Benzo(a)pyrene Equivalent	9.9	0.9	**Yes**	0.9	**Yes**
CB-3	4.5	CB-3-4.5	Lead	6,700	320	**Yes**	80	**Yes**
CB-3	9	CB-3-9.0	Benzo(a)pyrene Equivalent	18	0.9	**Yes**	0.9	**Yes**
CB-4	5.5	CB-4-5.5	Benzo(a)pyrene Equivalent	1.0	0.9	**Yes**	0.9	**Yes**
CB-4	5.5	CB-4-5.5	Lead	810	320	**Yes**	80	**Yes**
CB-5	8.5	CB-5-8.5	Benzo(a)pyrene Equivalent	25	0.9	**Yes**	0.9	**Yes**
CB-5	8.5	CB-5-8.5	Lead	370	320	**Yes**	80	**Yes**
CB-5	8.5	CB-5-8.5	Naphthalene	15	17	No	3.8	**Yes**
CB-5	8.5	CB-5-8.5	TPH-Diesel	410	1,128	No	238	**Yes**
CB-8	2.5	CB-8-2.5	Benzo(a)pyrene Equivalent	170	0.9	**Yes**	0.9	**Yes**
CB-8	2.5	CB-8-2.5	Lead	2,300	320	**Yes**	80	**Yes**
CB-8	2.5	CB-8-2.5	TPH-Diesel	1,100	1,128	No	238	**Yes**
CB-9	3	CB-9-3.0	Benzo(a)pyrene Equivalent	7.8	0.9	**Yes**	0.9	**Yes**

TABLE 3a
Detections of Chemicals of Potential Concern in On-Site Property Soil (0-10 feet bgs) Above Risk-Based Screening Concentrations
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Sample Location ID	Sample Depth (feet bgs)	Sample ID	Chemical	Concentration (mg/kg)	Minimum Industrial RBSC or ABSC (mg/kg)	Above Industrial RBSC or ABSC?	Minimum Residential RBSC or ABSC (mg/kg)	Above Residential RBSC or ABSC?
CB-11	4.5	CB-11-4.5	Naphthalene	7.8	17	No	3.8	**Yes**
CSA-1	2	CSA-1-2.0	Benzo(a)pyrene Equivalent	150	0.9	**Yes**	0.9	**Yes**
CSA-1	2	CSA-1-2.0	Arsenic	19	14	**Yes**	14	**Yes**
CSA-1	2	CSA-1-2.0	Lead	410	320	**Yes**	80	**Yes**
CSA-1	2	CSA-1-2.0	Naphthalene	44	17	**Yes**	3.8	**Yes**
CSA-1	2	CSA-1-2.0	TPH-Diesel	2,000	1,128	**Yes**	238	**Yes**
CSA-2	2	CSA-2-2.0	Benzo(a)pyrene Equivalent	27	0.9	**Yes**	0.9	**Yes**
CSA-2	2	CSA-2-2.0	Arsenic	16	14	**Yes**	14	**Yes**
CSA-2	2	CSA-2-2.0	Lead	450	320	**Yes**	80	**Yes**
CSA-2	2	CSA-2-2.0	Naphthalene	6.0	17	No	3.8	**Yes**
CSA-2	2	CSA-2-2.0	TPH-Diesel	320	1,128	No	238	**Yes**
CSB-1	2	CSB-1-2.0	Benzo(a)pyrene Equivalent	1.7	0.9	**Yes**	0.9	**Yes**
CSB-1	2	CSB-1-2.0	Lead	470	320	**Yes**	80	**Yes**
CSB-2	0.5	CSB-2-0.5	Benzo(a)pyrene Equivalent	11	0.9	**Yes**	0.9	**Yes**
CSB-2	0.5	CSB-2-0.5	Lead	90	320	No	80	**Yes**
CSC-1	2	CSC-1-2.0	Lead	83	320	No	80	**Yes**
CSC-2	4	CSC-2-4.0	Lead	620	320	**Yes**	80	**Yes**
CSC-4	1	CSC-4-1.0	Lead	120	320	No	80	**Yes**
CSC-5	2	CSC-5-2.0	Lead	160	320	No	80	**Yes**
CSC-6	1.5	CSC-6-1.5	Lead	170	320	No	80	**Yes**
CSD-1	2	CSD-1-2.0	Benzo(a)pyrene Equivalent	23	0.9	**Yes**	0.9	**Yes**
CSD-1	2	CSD-1-2.0	Lead	140	320	No	80	**Yes**
CSD-1	2	CSD-1-2.0	TPH-Diesel	270	1,128	No	238	**Yes**
CSD-2	2	CSD-2-2.0	Benzo(a)pyrene Equivalent	6.3	0.9	**Yes**	0.9	**Yes**
CSD-4	2	CSD-4-2.0	Benzo(a)pyrene Equivalent	1.3	0.9	**Yes**	0.9	**Yes**
CSE-1	2	CSE-1-2.0	Benzo(a)pyrene Equivalent	1.5	0.9	**Yes**	0.9	**Yes**
CSE-3	1	CSE-3-1.0	Benzo(a)pyrene Equivalent	1.7	0.9	**Yes**	0.9	**Yes**
CSE-6	2	CSE-6-2.0	Benzo(a)pyrene Equivalent	12	0.9	**Yes**	0.9	**Yes**
CSE-6	2	CSE-6-2.0	Arsenic	17	14	**Yes**	14	**Yes**
CSF-3	2	CSF-3-2.0	Benzo(a)pyrene Equivalent	30	0.9	**Yes**	0.9	**Yes**
CSF-3	2	CSF-3-2.0	Arsenic	150	14	**Yes**	14	**Yes**
CSF-3	2	CSF-3-2.0	Lead	350	320	**Yes**	80	**Yes**
CSF-3	2	CSF-3-2.0	Naphthalene	5.3	17	No	3.8	**Yes**

TABLE 3a
Detections of Chemicals of Potential Concern in On-Site Property Soil (0-10 feet bgs) Above Risk-Based Screening Concentrations
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Sample Location ID	Sample Depth (feet bgs)	Sample ID	Chemical	Concentration (mg/kg)	Minimum Industrial RBSC or ABSC (mg/kg)	Above Industrial RBSC or ABSC?	Minimum Residential RBSC or ABSC (mg/kg)	Above Residential RBSC or ABSC?
CSF-3	2	CSF-3-2.0	TPH-Diesel	730	1,128	No	238	**Yes**
CSF-7	2	CSF-7-2.0	Benzo(a)pyrene Equivalent	6.7	0.9	**Yes**	0.9	**Yes**
CSF-7	2	CSF-7-2.0	Arsenic	110	14	**Yes**	14	**Yes**
CSF-7	2	CSF-7-2.0	Lead	100	320	No	80	**Yes**
CSF-8	2	CSF-8-2.0	Benzo(a)pyrene Equivalent	1.3	0.9	**Yes**	0.9	**Yes**
CSF-9	2	CSF-9-2.0	Benzo(a)pyrene Equivalent	1.3	0.9	**Yes**	0.9	**Yes**
CSF-10	2	CSF-10-2.0	Benzo(a)pyrene Equivalent	6.8	0.9	**Yes**	0.9	**Yes**
CSF-10	2	CSF-10-2.0	Lead	160	320	No	80	**Yes**
CSG-1	2	CSG-1-2.0	Benzo(a)pyrene Equivalent	6.9	0.9	**Yes**	0.9	**Yes**
CSG-1	2	CSG-1-2.0	Lead	190	320	No	80	**Yes**
CSG-3	2.5	CSG-3-2.5	Lead	920	320	**Yes**	80	**Yes**
CSG-4	2	CSG-4-2.0	Lead	230	320	No	80	**Yes**
CSG-5	1	CSG-5-1.0	Benzo(a)pyrene Equivalent	28	0.9	**Yes**	0.9	**Yes**
CSG-5	1	CSG-5-1.0	Lead	550	320	**Yes**	80	**Yes**
CSG-5	1	CSG-5-1.0	Naphthalene	5.3	17	No	3.8	**Yes**
CSG-5	1	CSG-5-1.0	TPH-Diesel	770	1,128	No	238	**Yes**
D1-S-2.5	2.5	D1-S-2.5	Benzo(a)pyrene Equivalent	39	0.9	**Yes**	0.9	**Yes**
D1-S-2.5	2.5	D1-S-2.5	Lead	200	320	No	80	**Yes**
D4-S-2.5	2.5	D4-S-2.5	Benzo(a)pyrene Equivalent	25	0.9	**Yes**	0.9	**Yes**
D4-S-2.5	2.5	D4-S-2.5	Lead	380	320	**Yes**	80	**Yes**
D4-S-2.5	2.5	D4-S-2.5	Naphthalene	4.9	17	No	3.8	**Yes**
EBAMW-1	1.5	EBAMW-1@1.5-2.0	Benzo(a)pyrene Equivalent	8.3	0.9	**Yes**	0.9	**Yes**
EBAMW-1	1.5	EBAMW-1@1.5-2.0	Lead	2,500	320	**Yes**	80	**Yes**
EBASB-1	2.5	EBASB-1@2.5-3.0	Benzo(a)pyrene Equivalent	28	0.9	**Yes**	0.9	**Yes**
EBASB-2	1.5	EBASB-2@1.5-2.0	Benzo(a)pyrene Equivalent	5.9	0.9	**Yes**	0.9	**Yes**
EBASB-2	1.5	EBASB-2@1.5-2.0	Lead	530	320	**Yes**	80	**Yes**
EBASB-3	1.5	EBASB-3@1.5-2.0	Benzo(a)pyrene Equivalent	110	0.9	**Yes**	0.9	**Yes**
EBASB-3	1.5	EBASB-3@1.5-2.0	Lead	290	320	No	80	**Yes**
EBASB-3	1.5	EBASB-3@1.5-2.0	Naphthalene	91	17	**Yes**	3.8	**Yes**
EBASB-3	1.5	EBASB-3@1.5-2.0	Naphthalene	91	17	**Yes**	3.8	**Yes**
EBASB-5	10	EBASB-5@10	TPH-Diesel	4,280	1,128	**Yes**	238	**Yes**
EBASB-5	10	EBASB-5@10	Benzene	1.8	5.1	No	1.2	**Yes**
EBASB-6	8	EBASB-6@8.0-8.5	Benzo(a)pyrene Equivalent	7.1	0.9	**Yes**	0.9	**Yes**

TABLE 3a
Detections of Chemicals of Potential Concern in On-Site Property Soil (0-10 feet bgs) Above Risk-Based Screening Concentrations
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Sample Location ID	Sample Depth (feet bgs)	Sample ID	Chemical	Concentration (mg/kg)	Minimum Industrial RBSC or ABSC (mg/kg)	Above Industrial RBSC or ABSC?	Minimum Residential RBSC or ABSC (mg/kg)	Above Residential RBSC or ABSC?
EBASB-6	8	EBASB-6@8.0-8.5	Naphthalene	8.9	17	No	3.8	**Yes**
EBASB-6	8	EBASB-6@8.0-8.5	Naphthalene	8.9	17	No	3.8	**Yes**
EBASB-6	8.5	EBASB-6@8.5	TPH-Diesel	7,960	1,128	**Yes**	238	**Yes**
ET-EAST-1	10	ET-EAST-1-10.0	Lead	320	320	No	80	**Yes**
ET-EAST-2	10	ET-EAST-2-10.0	Benzo(a)pyrene Equivalent	43	0.9	**Yes**	0.9	**Yes**
ET-EAST-2	10	ET-EAST-2-10.0	Naphthalene	38	17	**Yes**	3.8	**Yes**
ET-EAST-2	10	ET-EAST-2-10.0	TPH-Diesel	1,200	1,128	**Yes**	238	**Yes**
ET-WEST-1	9	ET-WEST-1-9.0	Arsenic	71	14	**Yes**	14	**Yes**
FC-5	10	FC-5-10.0	Benzo(a)pyrene Equivalent	630	0.9	**Yes**	0.9	**Yes**
FC-5	10	FC-5-10.0	Naphthalene	15,000	17	**Yes**	3.8	**Yes**
FC-5	10	FC-5-10.0	TPH-Diesel	18,000	1,128	**Yes**	238	**Yes**
FC-5	10	FC-5-10.0	Benzene	490	5.1	**Yes**	1.2	**Yes**
FC-5	10	FC-5-10.0	Ethylbenzene	80	25	**Yes**	5.8	**Yes**
MW-14	4	MW-14-4	Benzo(a)pyrene Equivalent	47	0.9	**Yes**	0.9	**Yes**
MW-14	4	MW-14-4	Lead	120	320	No	80	**Yes**
MW-9	9.5	MW-9-9.5	TPH-Diesel	2,400	1,128	**Yes**	238	**Yes**
PA-1	2	PA-1-2.0	Benzo(a)pyrene Equivalent	110	0.9	**Yes**	0.9	**Yes**
PA-1	2	PA-1-2.0	Lead	120	320	No	80	**Yes**
PA-1	2	PA-1-2.0	Naphthalene	7.0	17	No	3.8	**Yes**
PA-1	2	PA-1-2.0	TPH-Diesel	400	1,128	No	238	**Yes**
PA-3	1.25	PA-3-1.25	Benzo(a)pyrene Equivalent	120	0.9	**Yes**	0.9	**Yes**
PA-3	1.25	PA-3-1.25	Lead	180	320	No	80	**Yes**
PA-3	1.25	PA-3-1.25	Naphthalene	8.6	17	No	3.8	**Yes**
PA-3	1.25	PA-3-1.25	TPH-Diesel	3,000	1,128	**Yes**	238	**Yes**
PA-5	2	PA-5-2.0	Benzo(a)pyrene Equivalent	3.6	0.9	**Yes**	0.9	**Yes**
PA-5	2	PA-5-2.0	Lead	140	320	No	80	**Yes**
PA-6	2	PA-6-2.0	Benzo(a)pyrene Equivalent	17	0.9	**Yes**	0.9	**Yes**
PA-6	2	PA-6-2.0	Lead	150	320	No	80	**Yes**
PA-8	2	PA-8-2.0	Lead	180	320	No	80	**Yes**
PA-9	2	PA-9-2.0	Benzo(a)pyrene Equivalent	5.8	0.9	**Yes**	0.9	**Yes**
PA-9	2	PA-9-2.0	Lead	490	320	**Yes**	80	**Yes**
PA-10	2	PA-10	Lead	100	320	No	80	**Yes**
PA-14	2	PA-14	Benzo(a)pyrene Equivalent	13	0.9	**Yes**	0.9	**Yes**

TABLE 3a
Detections of Chemicals of Potential Concern in On-Site Property Soil (0-10 feet bgs) Above Risk-Based Screening Concentrations
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Sample Location ID	Sample Depth (feet bgs)	Sample ID	Chemical	Concentration (mg/kg)	Minimum Industrial RBSC or ABSC (mg/kg)	Above Industrial RBSC or ABSC?	Minimum Residential RBSC or ABSC (mg/kg)	Above Residential RBSC or ABSC?
PA-14	2	PA-14	Lead	110	320	No	80	**Yes**
PA-15	2	PA-15-2	Benzo(a)pyrene Equivalent	8.7	0.9	**Yes**	0.9	**Yes**
PA-16	2	PA-16-2	Benzo(a)pyrene Equivalent	13	0.9	**Yes**	0.9	**Yes**
PA-16	2	PA-16-2	Lead	220	320	No	80	**Yes**
PA-16	2	PA-16-2	TPH-Diesel	280	1,128	No	238	**Yes**
PA-17	2	PA-17-2	Benzo(a)pyrene Equivalent	58	0.9	**Yes**	0.9	**Yes**
PA-17	2	PA-17-2	Arsenic	130	14	**Yes**	14	**Yes**
PA-17	2	PA-17-2	Lead	560	320	**Yes**	80	**Yes**
PA-17	2	PA-17-2	Naphthalene	12	17	No	3.8	**Yes**
PA-17	2	PA-17-2	TPH-Diesel	450	1,128	No	238	**Yes**
PA-18	1	PA-18-1	Benzo(a)pyrene Equivalent	14	0.9	**Yes**	0.9	**Yes**
PA-18	1	PA-18-1	Lead	120	320	No	80	**Yes**
PA-18	2	PA-18-2	Benzo(a)pyrene Equivalent	5.9	0.9	**Yes**	0.9	**Yes**
PA-18	2	PA-18-2	Lead	910	320	**Yes**	80	**Yes**
PA-20	2	PA-20-2	Benzo(a)pyrene Equivalent	20	0.9	**Yes**	0.9	**Yes**
PA-23	1	PA-23-1	Benzo(a)pyrene Equivalent	3.8	0.9	**Yes**	0.9	**Yes**
PA-23	1	PA-23-1	Lead	120	320	No	80	**Yes**
PA-23	2	PA-23-2	Lead	210	320	No	80	**Yes**
PA-24	1	PA-24-1	Lead	91	320	No	80	**Yes**
PA-25	1	PA-25-1	Benzo(a)pyrene Equivalent	4.1	0.9	**Yes**	0.9	**Yes**
PA-25	2	PA-25-2	Benzo(a)pyrene Equivalent	2.7	0.9	**Yes**	0.9	**Yes**
PA-25	2	PA-25-2	Lead	100	320	No	80	**Yes**
PA-27	2	PA-27-2	Lead	480	320	**Yes**	80	**Yes**
PA-28	2	PA-28-2	Benzo(a)pyrene Equivalent	6.3	0.9	**Yes**	0.9	**Yes**
PA-28	2	PA-28-2	Arsenic	120	14	**Yes**	14	**Yes**
PA-28	2	PA-28-2	Naphthalene	6.2	17	No	3.8	**Yes**
RW-104-6-1	0.25	RW-104-6-1	Benzo(a)pyrene Equivalent	3.1	0.9	**Yes**	0.9	**Yes**
RW-104-6-1	0.25	RW-104-6-1	Arsenic	20	14	**Yes**	14	**Yes**
RW-104-6-1	0.25	RW-104-6-1	Lead	280	320	No	80	**Yes**
RW-104-6-10	0.25	RW-104-6-10	Arsenic	59	14	**Yes**	14	**Yes**
RW-104-6-10	0.25	RW-104-6-10	Lead	420	320	**Yes**	80	**Yes**
RW-104-6-12	0.25	RW-104-6-12	Benzo(a)pyrene Equivalent	1.1	0.9	**Yes**	0.9	**Yes**
RW-104-6-12	0.25	RW-104-6-12	Arsenic	15	14	**Yes**	14	**Yes**

TABLE 3a
Detections of Chemicals of Potential Concern in On-Site Property Soil (0-10 feet bgs) Above Risk-Based Screening Concentrations
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Sample Location ID	Sample Depth (feet bgs)	Sample ID	Chemical	Concentration (mg/kg)	Minimum Industrial RBSC or ABSC (mg/kg)	Above Industrial RBSC or ABSC?	Minimum Residential RBSC or ABSC (mg/kg)	Above Residential RBSC or ABSC?
RW-104-6-2	0.25	RW-104-6-2	Benzo(a)pyrene Equivalent	26	0.9	**Yes**	0.9	**Yes**
RW-104-6-2	0.25	RW-104-6-2	Arsenic	15	14	**Yes**	14	**Yes**
RW-104-6-2	0.25	RW-104-6-2	Lead	190	320	No	80	**Yes**
RW-104-6-2	0.25	RW-104-6-2	Naphthalene	6.7	17	No	3.8	**Yes**
RW-104-6-4	0.25	RW-104-6-4	Benzo(a)pyrene Equivalent	24	0.9	**Yes**	0.9	**Yes**
RW-104-6-4	0.25	RW-104-6-4	Arsenic	17	14	**Yes**	14	**Yes**
RW-104-6-4	0.25	RW-104-6-4	Naphthalene	13	17	No	3.8	**Yes**
RW-104-6-5	0.25	RW-104-6-5	Benzo(a)pyrene Equivalent	23	0.9	**Yes**	0.9	**Yes**
RW-104-6-5	0.25	RW-104-6-5	Arsenic	25	14	**Yes**	14	**Yes**
RW-104-6-5	0.25	RW-104-6-5	Lead	170	320	No	80	**Yes**
RW-104-6-5	0.25	RW-104-6-5	Naphthalene	5	17	No	3.8	**Yes**
RW-104-6-6	0.25	RW-104-6-6	Arsenic	21	14	**Yes**	14	**Yes**
RW-104-6-6	0.25	RW-104-6-6	Lead	200	320	No	80	**Yes**
RW-104-6-9	0.25	RW-104-6-9	Arsenic	16	14	**Yes**	14	**Yes**
Sidewall-N@6'	6	Sidewall-N@6'	Benzo(a)pyrene Equivalent	6.7	0.9	**Yes**	0.9	**Yes**
Sidewall-N@6'	6	Sidewall-N@6'	TPH-Diesel	411	1,128	No	238	**Yes**
Sidewall-S@5'	5	Sidewall-S@5'	Benzo(a)pyrene Equivalent	9.1	0.9	**Yes**	0.9	**Yes**
Sidewall-S@5'	5	Sidewall-S@5'	Lead	92	320	No	80	**Yes**
Sidewall-S@5'	5	Sidewall-S@5'	TPH-Diesel	567	1,128	No	238	**Yes**
SRG-1-2	0	SRG-1-2-0'	Lead	250	320	No	80	**Yes**
SRG-1-2	0.5	SRG-1-2-0.5'	Polychlorinated Biphenyls (PCBs)	0.7			0.24	**Yes**
SRG-1-2	2	SRG-1-2-2'	Lead	820	320	**Yes**	80	**Yes**
SRG-1-3	0.5	SRG-1-3-0.5'	Lead	200	320	No	80	**Yes**
SRG-1-3	2.5	SRG-1-3-2.5'	Lead	225	320	No	80	**Yes**
SRG-1-4	2	SRG-1-4-2'	Lead	85	320	No	80	**Yes**
T-6-PIPE	2.5	T-6-PIPE	Benzo(a)pyrene Equivalent	10	0.9	**Yes**	0.9	**Yes**
T-6-PIPE	2.5	T-6-PIPE	Lead	442	320	**Yes**	80	**Yes**
T-6-PIPE	2.5	T-6-PIPE	Naphthalene	6.2	17	No	3.8	**Yes**
T-8-B-5.0-NE	5	T-8-B-5.0-NE	Benzo(a)pyrene Equivalent	3.2	0.9	**Yes**	0.9	**Yes**
T-8-B-6.0-C	6	T-8-B-6.0-C	Benzo(a)pyrene Equivalent	10	0.9	**Yes**	0.9	**Yes**
T-8-B-6.0-C	6	T-8-B-6.0-C	Naphthalene	4.4	17	No	3.8	**Yes**
T-8-SW-2.5-NE	2.5	T-8-SW-2.5-NE	Benzo(a)pyrene Equivalent	27	0.9	**Yes**	0.9	**Yes**
T-8-SW-2.5-NE	2.5	T-8-SW-2.5-NE	Lead	200	320	No	80	**Yes**

TABLE 3a
Detections of Chemicals of Potential Concern in On-Site Property Soil (0-10 feet bgs) Above Risk-Based Screening Concentrations
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Sample Location ID	Sample Depth (feet bgs)	Sample ID	Chemical	Concentration (mg/kg)	Minimum Industrial RBSC or ABSC (mg/kg)	Above Industrial RBSC or ABSC?	Minimum Residential RBSC or ABSC (mg/kg)	Above Residential RBSC or ABSC?
T-8-SW-2.5-NE	2.5	T-8-SW-2.5-NE	Naphthalene	8.8	17	No	3.8	**Yes**
T-8-SW-2.5-NE	2.5	T-8-SW-2.5-NE	TPH-Diesel	1,500	1,128	**Yes**	238	**Yes**
T-8-SW-4.5-C	4.5	T-8-SW-4.5-C	Benzo(a)pyrene Equivalent	70	0.9	**Yes**	0.9	**Yes**
T-8-SW-4.5-C	4.5	T-8-SW-4.5-C	TPH-Diesel	5,600	1,128	**Yes**	238	**Yes**

Notes:
ABSC = Ambient-Based Screening Concentration.
bgs = below ground surface
mg/kg = milligrams per kilogram
RBSC = Risk-Based Screening Concentration.

TABLE 3b

Detections of Chemicals of Potential Concern in Off-Site 438 First Street Property Soil (0-10 feet bgs) Above Risk-Based Screening Concentrations

Former Santa Rosa Manufactured Gas Plant Site

Santa Rosa, California

Sample Location ID	Sample Depth (feet bgs)	Sample ID	Chemical	Concentration (mg/kg)	Minimum Industrial RBSC or ABSC (mg/kg)	Above Industrial RBSC or ABSC?	Minimum Residential RBSC or ABSC (mg/kg)	Above Residential RBSC or ABSC?
A-32	2	A-32-2.0	Lead	100	320	No	80	**Yes**
A-32	2	A-35-2.0	Lead	990	320	**Yes**	80	**Yes**
CSF-2	2	CSF-2-2.0	Lead	84	320	No	80	**Yes**
PA-2	2	PA-2-2.0	Arsenic	75	14	**Yes**	14	**Yes**
PA-2	2	PA-2-2.0	Lead	120	320	No	80	**Yes**

Notes:

ABSC = Ambient-Based Screening Concentration.

bgs = below ground surface

mg/kg = milligrams per kilogram

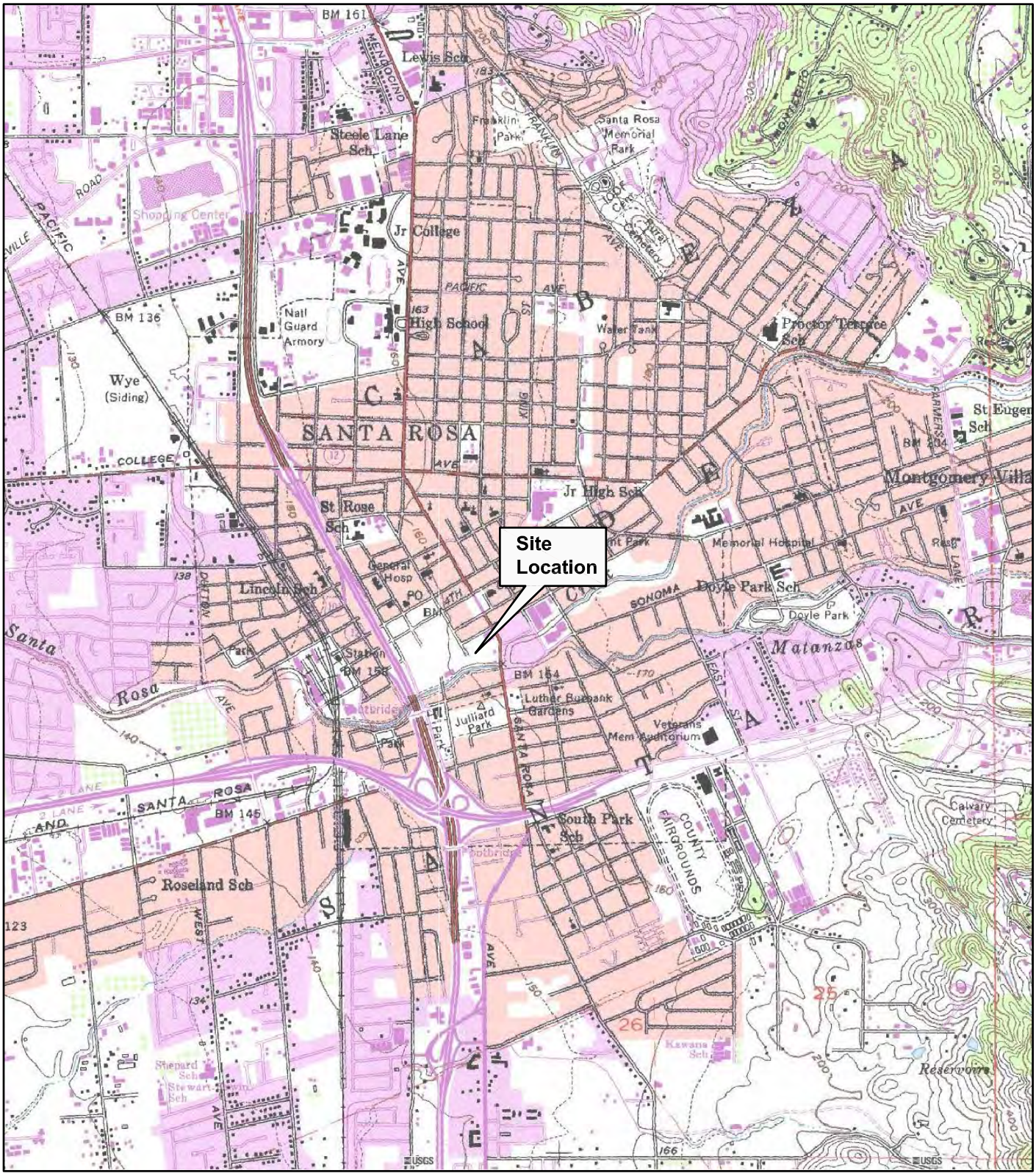
RBSC = Risk-Based Screening Concentration.

TABLE 3c
Detections of Chemicals of Potential Concern in Off-Site Public ROW Soil (0-10 feet bgs) Above Risk-Based Screening Concentrations
Former Santa Rosa Manufactured Gas Plant Site
Santa Rosa, California

Sample Location ID	Sample Depth (feet bgs)	Sample ID	Chemical	Concentration (mg/kg)	Minimum Industrial RBSC or ABSC (mg/kg)	Above Industrial RBSC or ABSC?	Minimum Residential RBSC or ABSC (mg/kg)	Above Residential RBSC or ABSC?
40E	5	1-40E-5'	Lead	260	320	No	80	**Yes**
80E	5	3-80E-5'	Lead	100	320	No	80	**Yes**
80E	10	7-80E-10'	Lead	200	320	No	80	**Yes**
B-105	5	B-105-5'	Benzo(a)pyrene Equivalent	1.8	0.9	**Yes**	0.9	**Yes**
B-106	10	B-106-10'	Benzo(a)pyrene Equivalent	3,300	0.9	**Yes**	0.9	**Yes**
B-106	10	B-106-10'	Lead	99	320	No	80	**Yes**
B-106	10	B-106-10'	Naphthalene	630	17	**Yes**	3.8	**Yes**
B-107	10	B-107-10'	Benzo(a)pyrene Equivalent	2,800	0.9	**Yes**	0.9	**Yes**
B-108	5	B-108-5'	Benzo(a)pyrene Equivalent	40	0.9	**Yes**	0.9	**Yes**
B-108	5	B-108-5'	Lead	99	320	No	80	**Yes**
B-108	5	B-108-5'	Naphthalene	15	17	No	3.8	**Yes**
B-108	10	B-108-10'	Lead	400	320	**Yes**	80	**Yes**
B-115	7	B-115-7'	Benzo(a)pyrene Equivalent	18	0.9	**Yes**	0.9	**Yes**
B-115	7	B-115-7'	Lead	670	320	**Yes**	80	**Yes**
B-115	7	B-115-7'	Naphthalene	14	17	No	3.8	**Yes**
B-117	5	B-117-5'	Benzo(a)pyrene Equivalent	1.5	0.9	**Yes**	0.9	**Yes**
B-122	10	B-122-10'	Benzo(a)pyrene Equivalent	1.1	0.9	**Yes**	0.9	**Yes**
CSE-2	2	CSE-2-2.0	Lead	90	320	No	80	**Yes**
CSF-6	0.5	CSF-6-0.5	Benzo(a)pyrene Equivalent	3.8	0.9	**Yes**	0.9	**Yes**
CSF-6	0.5	CSF-6-0.5	Lead	180	320	No	80	**Yes**
MW-5	5	MW-5@5'	Benzo(a)pyrene Equivalent	17	0.9	**Yes**	0.9	**Yes**
RW-104-6-16	0.25	RW-104-6-16	Lead	130	320	No	80	**Yes**
SRC-04	3.5	SRC-04-3.5	Benzo(a)pyrene Equivalent	1.1	0.9	**Yes**	0.9	**Yes**
SRC-08	5	SRC-08-5.0	Lead	99	320	No	80	**Yes**
SRG-1-1	0	SRG-1-1-0'	Lead	530	320	**Yes**	80	**Yes**
SRG-1-1	1.5	SRG-1-1-1.5'	Lead	470	320	**Yes**	80	**Yes**

Notes:
ABSC = Ambient-Based Screening Concentration.
bgs = below ground surface
mg/kg = milligrams per kilogram
RBSC = Risk-Based Screening Concentration.

FIGURES



Source: Microsoft Research Maps, USGS 7.5' Quadrangle, Santa Rosa, California, 1981

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SCALE IN FEET

IRIS ENVIRONMENTAL
1438 Webster Street, Suite 302
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Site Location
Former Santa Rosa MGP Site
111 Santa Rosa Avenue, Santa Rosa, California

Figure
1

Drafter: EC | Date: 04/25/13 | Contract Number: 12-877A

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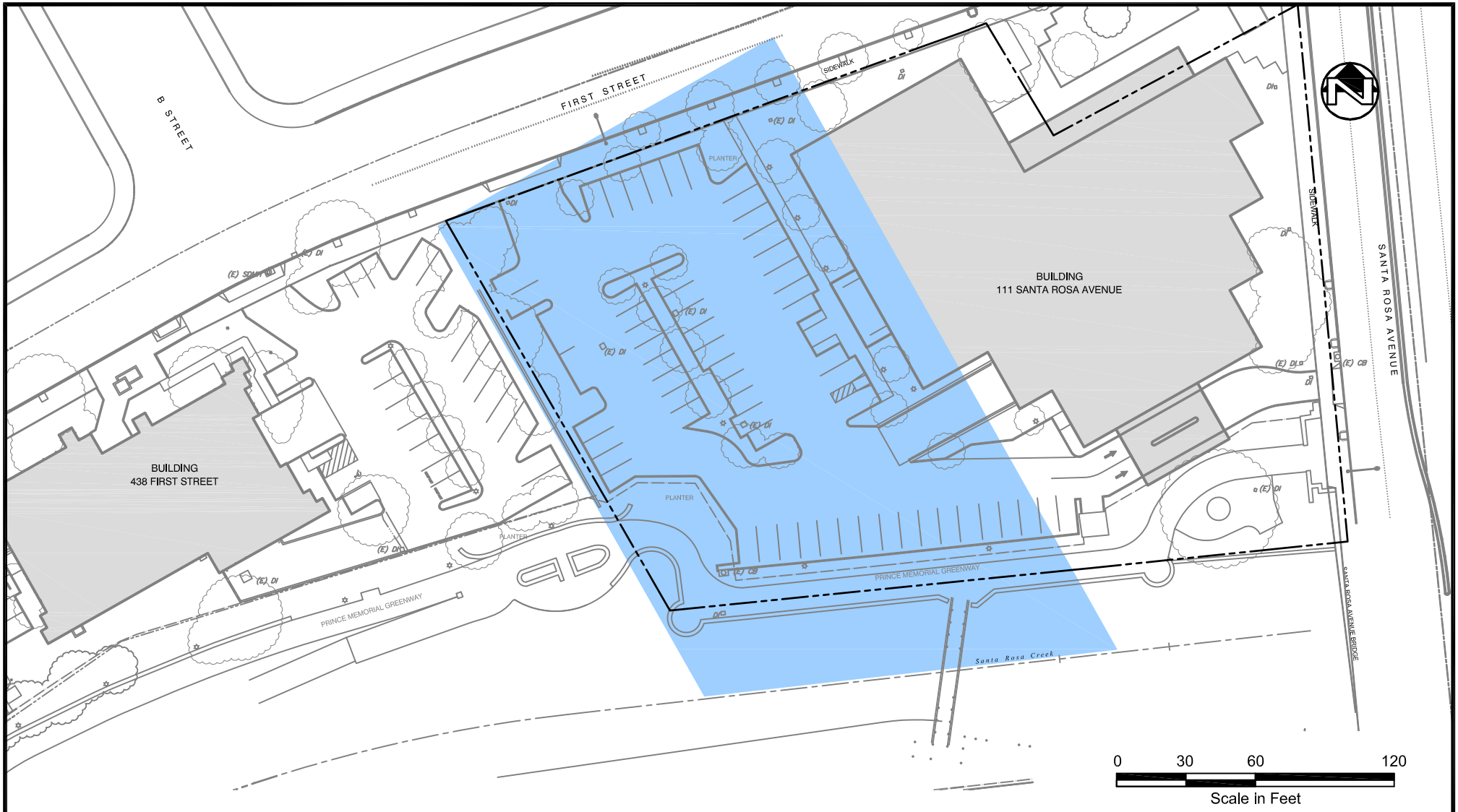

EXPLANATION

FOOTPRINT OF FORMER MGP OPERATIONS

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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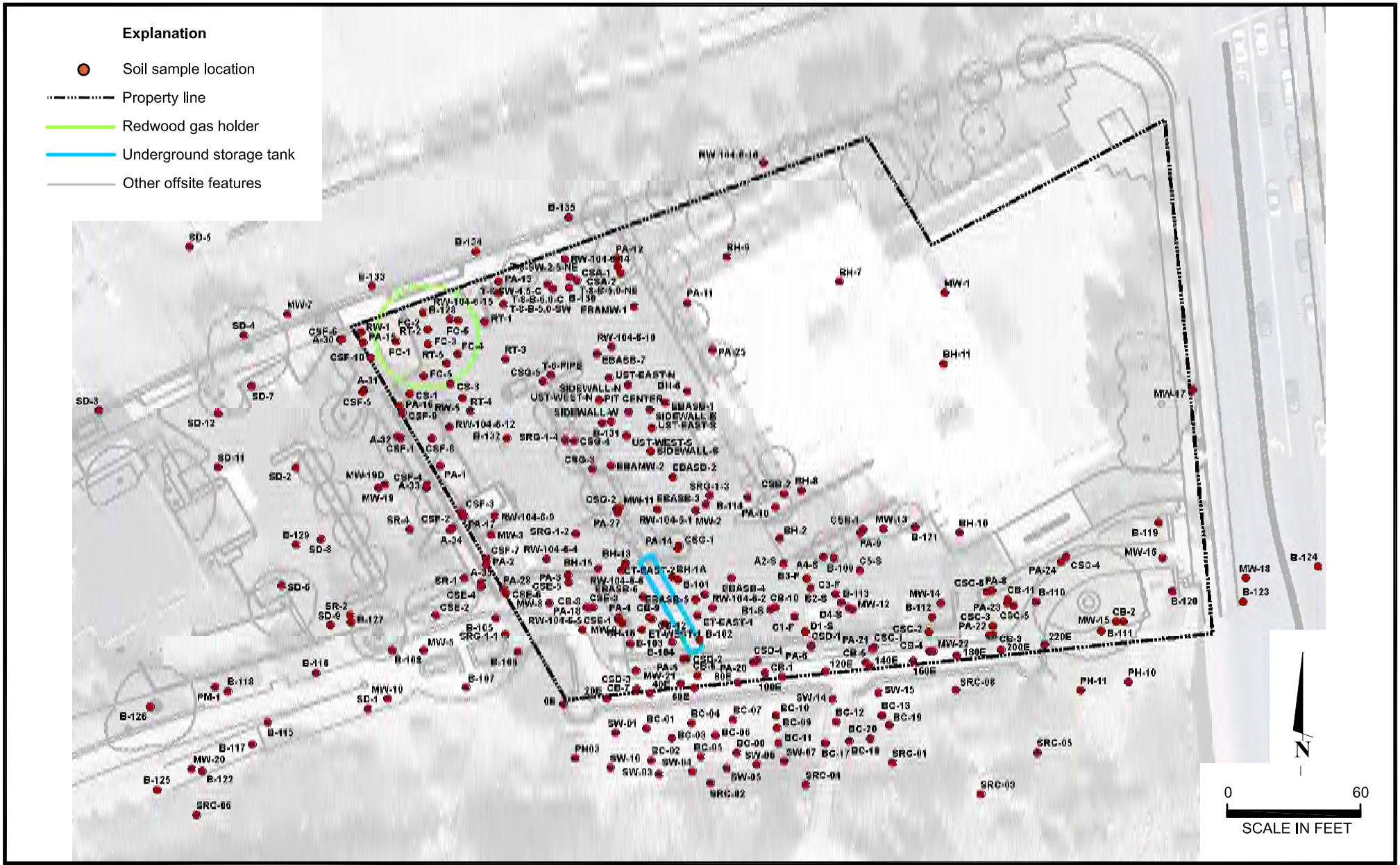
Site Plan Showing Former MGP Footprint
Former Santa Rosa MGP Site
111 Santa Rosa Avenue
Santa Rosa, California

Figure
2

Drafter: EC | Date: 06/16/15 | Contract Number: 13-877D

I:\CAD\13\13-877-D\FormerMGPfootprint.dwg



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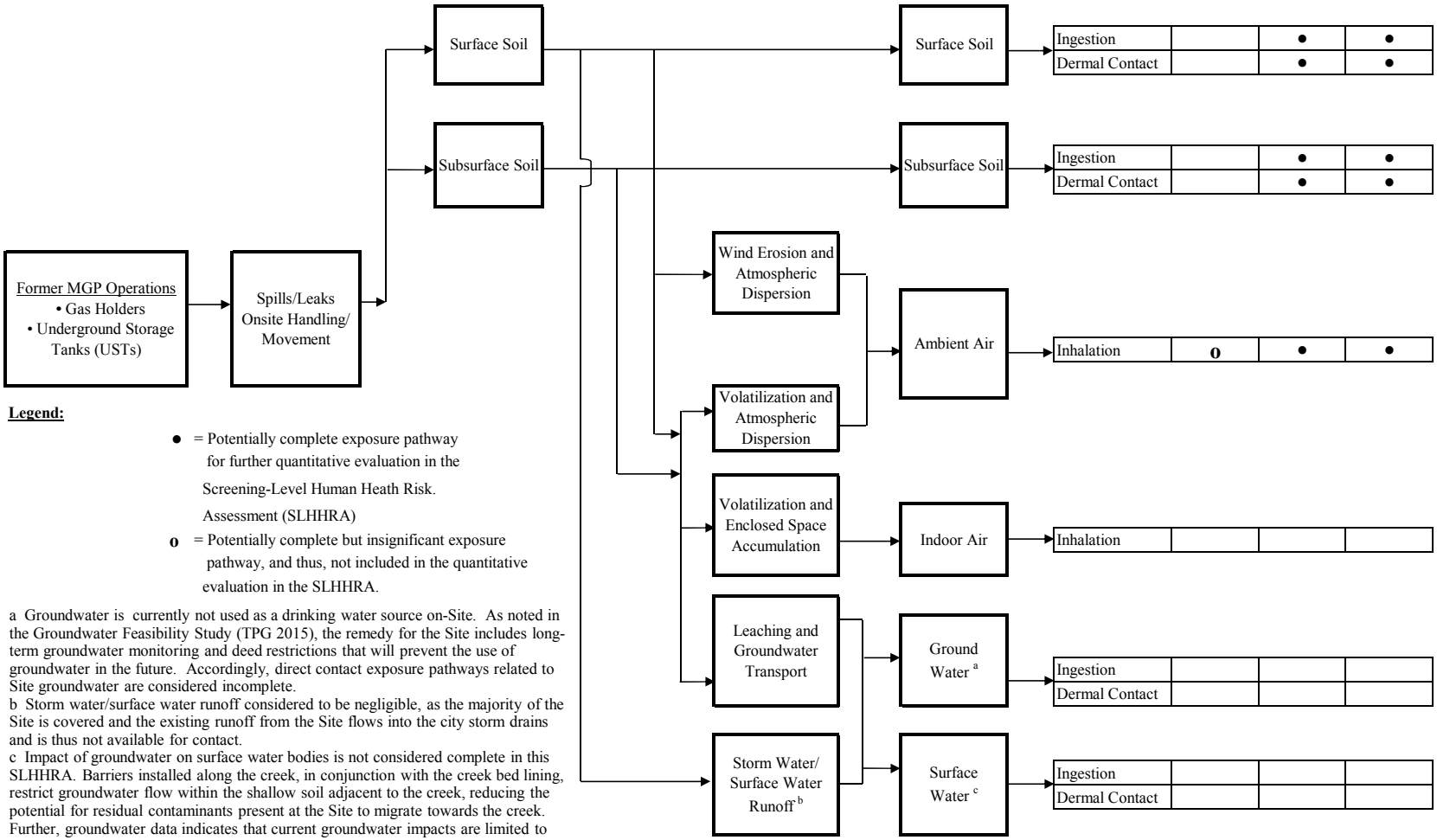
Sampling Locations
Former Santa Rosa MGP Site
111 Santa Rosa Avenue
Santa Rosa, California

Figure
3

Drafter: EC | Date: 06/23/15 | Contract Number: 13-877D

I:\CAD\13\13-877-D\FormerMGPfootprint.dwg



Legend:

● = Potentially complete exposure pathway for further quantitative evaluation in the Screening-Level Human Heath Risk. Assessment (SLHHRA)

o = Potentially complete but insignificant exposure pathway, and thus, not included in the quantitative evaluation in the SLHHRA.

a Groundwater is currently not used as a drinking water source on-Site. As noted in the Groundwater Feasibility Study (TPG 2015), the remedy for the Site includes long-term groundwater monitoring and deed restrictions that will prevent the use of groundwater in the future. Accordingly, direct contact exposure pathways related to Site groundwater are considered incomplete.

b Storm water/surface water runoff considered to be negligible, as the majority of the Site is covered and the existing runoff from the Site flows into the city storm drains and is thus not available for contact.

c Impact of groundwater on surface water bodies is not considered complete in this SLHHRA. Barriers installed along the creek, in conjunction with the creek bed lining, restrict groundwater flow within the shallow soil adjacent to the creek, reducing the potential for residual contaminants present at the Site to migrate towards the creek. Further, groundwater data indicates that current groundwater impacts are limited to areas where residual MGP impacts are known to be present and there is no indication that Site contaminants are migrating to the creek.

File Name: I:\PG&E\Santa Rosa\HHRA\Figures\Figure 4_CSM.xlsx

IRIS ENVIRONMENTAL
1438 Webster St., Suite 302, Oakland, California 94612

Conceptual Site Model
Former Santa Rosa MGP Site
111 Santa Rosa Avenue, Santa Rosa, California

Figure 4

Drafter: SS | Date: 5/14/15 | Contract Number: 13-877D

Attachment A

ProUCL Output

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	5/7/2015 5:55:10 PM
From File	Santa_Rosa_Soil_input_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chemical (acenaphthene)

General Statistics

Total Number of Observations	158	Number of Distinct Observations	76
Number of Detects	46	Number of Non-Detects	112
Number of Distinct Detects	45	Number of Distinct Non-Detects	40
Minimum Detect	5.0000E-4	Minimum Non-Detect	6.0000E-5
Maximum Detect	120	Maximum Non-Detect	59
Variance Detects	334.4	Percent Non-Detects	70.89%
Mean Detects	3.6	SD Detects	18.29
Median Detects	0.0545	CV Detects	5.08
Skewness Detects	6.102	Kurtosis Detects	38.69
Mean of Logged Detects	-2.992	SD of Logged Detects	2.608

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.216	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.473	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.131	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	1.062	Standard Error of Mean	0.796
SD	9.897	95% KM (BCA) UCL	2.551
95% KM (t) UCL	2.38	95% KM (Percentile Bootstrap) UCL	2.563
95% KM (z) UCL	2.372	95% KM Bootstrap t UCL	32.42
90% KM Chebyshev UCL	3.451	95% KM Chebyshev UCL	4.533
97.5% KM Chebyshev UCL	6.035	99% KM Chebyshev UCL	8.985

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	6.826	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.935	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.33	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.146	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.176	k star (bias corrected MLE)	0.179
Theta hat (MLE)	20.49	Theta star (bias corrected MLE)	20.14
nu hat (MLE)	16.16	nu star (bias corrected)	16.44
MLE Mean (bias corrected)	3.6	MLE Sd (bias corrected)	8.515

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0115	nu hat (KM)	3.639
Approximate Chi Square Value (3.64, α)	0.585	Adjusted Chi Square Value (3.64, β)	0.574
95% Gamma Approximate KM-UCL (use when n>=50)	6.611	95% Gamma Adjusted KM-UCL (use when n<50)	6.73

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	5.0000E-4	Mean	1.075
Maximum	120	Median	0.01
SD	9.927	CV	9.235
k hat (MLE)	0.179	k star (bias corrected MLE)	0.18
Theta hat (MLE)	5.992	Theta star (bias corrected MLE)	5.965
nu hat (MLE)	56.69	nu star (bias corrected)	56.95
MLE Mean (bias corrected)	1.075	MLE Sd (bias corrected)	2.532
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (56.95, α)	40.6	Adjusted Chi Square Value (56.95, β)	40.47
95% Gamma Approximate UCL (use when n>=50)	1.508	95% Gamma Adjusted UCL (use when n<50)	1.512

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.945	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0901	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.131	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.052	Mean in Log Scale	-5.928
SD in Original Scale	9.927	SD in Log Scale	2.921
95% t UCL (assumes normality of ROS data)	2.358	95% Percentile Bootstrap UCL	2.553
95% BCA Bootstrap UCL	3.544	95% Bootstrap t UCL	31.43
95% H-UCL (Log ROS)	0.54		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-5.92	95% H-UCL (KM -Log)	1.588
KM SD (logged)	3.206	95% Critical H Value (KM-Log)	4.859
KM Standard Error of Mean (logged)	0.383		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.498	Mean in Log Scale	-3.318
SD in Original Scale	10.25	SD in Log Scale	2.779
95% t UCL (Assumes normality)	2.847	95% H-Stat UCL	4.463

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	6.035

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (acenaphthylene)

General Statistics

Total Number of Observations	155	Number of Distinct Observations	101
Number of Detects	109	Number of Non-Detects	46
Number of Distinct Detects	86	Number of Distinct Non-Detects	18

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Minimum Detect	0.003	Minimum Non-Detect	4.0000E-4
Maximum Detect	400	Maximum Non-Detect	33
Variance Detects	1486	Percent Non-Detects	29.68%
Mean Detects	6.405	SD Detects	38.55
Median Detects	0.72	CV Detects	6.019
Skewness Detects	10.05	Kurtosis Detects	103.3
Mean of Logged Detects	-0.77	SD of Logged Detects	2.447

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.162	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.434	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0849	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	4.52	Standard Error of Mean	2.607
SD	32.31	95% KM (BCA) UCL	10.1
95% KM (t) UCL	8.835	95% KM (Percentile Bootstrap) UCL	9.348
95% KM (z) UCL	8.809	95% KM Bootstrap t UCL	30.69
90% KM Chebyshev UCL	12.34	95% KM Chebyshev UCL	15.89
97.5% KM Chebyshev UCL	20.8	99% KM Chebyshev UCL	30.46

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	5.545	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.884	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.182	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.0953	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.267	k star (bias corrected MLE)	0.266
Theta hat (MLE)	23.95	Theta star (bias corrected MLE)	24.06
nu hat (MLE)	58.3	nu star (bias corrected)	58.03
MLE Mean (bias corrected)	6.405	MLE Sd (bias corrected)	12.41

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0196	nu hat (KM)	6.068
Approximate Chi Square Value (6.07, α)	1.675	Adjusted Chi Square Value (6.07, β)	1.653
95% Gamma Approximate KM-UCL (use when n>=50)	16.38	95% Gamma Adjusted KM-UCL (use when n<50)	16.59

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.003	Mean	4.507
Maximum	400	Median	0.13
SD	32.42	CV	7.192
k hat (MLE)	0.213	k star (bias corrected MLE)	0.214
Theta hat (MLE)	21.12	Theta star (bias corrected MLE)	21.1
nu hat (MLE)	66.15	nu star (bias corrected)	66.2
MLE Mean (bias corrected)	4.507	MLE Sd (bias corrected)	9.753
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (66.20, α)	48.48	Adjusted Chi Square Value (66.20, β)	48.34
95% Gamma Approximate UCL (use when n>=50)	6.155	95% Gamma Adjusted UCL (use when n<50)	6.173

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.0969	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0849	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	4.509	Mean in Log Scale	-2.036
SD in Original Scale	32.41	SD in Log Scale	2.953
95% t UCL (assumes normality of ROS data)	8.817	95% Percentile Bootstrap UCL	9.633
95% BCA Bootstrap UCL	14.95	95% Bootstrap t UCL	30.7
95% H-UCL (Log ROS)	29.96		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	4.634	Mean in Log Scale	-1.717
SD in Original Scale	32.42	SD in Log Scale	2.833
95% t UCL (Assumes normality)	8.944	95% H-Stat UCL	26.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	20.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (anthracene)

General Statistics

Total Number of Observations	158	Number of Distinct Observations	99
Number of Detects	115	Number of Non-Detects	43
Number of Distinct Detects	88	Number of Distinct Non-Detects	16
Minimum Detect	1.0000E-4	Minimum Non-Detect	0.005
Maximum Detect	280	Maximum Non-Detect	33
Variance Detects	723.9	Percent Non-Detects	27.22%
Mean Detects	4.552	SD Detects	26.9
Median Detects	0.43	CV Detects	5.91
Skewness Detects	9.72	Kurtosis Detects	98.86
Mean of Logged Detects	-1.65	SD of Logged Detects	3.009

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.172	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.433	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0826	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	3.338	Standard Error of Mean	1.833
SD	22.94	95% KM (BCA) UCL	6.672
95% KM (t) UCL	6.371	95% KM (Percentile Bootstrap) UCL	6.868
95% KM (z) UCL	6.353	95% KM Bootstrap t UCL	24.9
90% KM Chebyshev UCL	8.837	95% KM Chebyshev UCL	11.33
97.5% KM Chebyshev UCL	14.79	99% KM Chebyshev UCL	21.58

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	5.024	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.904	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.17	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.0944	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.228	k star (bias corrected MLE)	0.228
Theta hat (MLE)	19.99	Theta star (bias corrected MLE)	20
nu hat (MLE)	52.38	nu star (bias corrected)	52.35
MLE Mean (bias corrected)	4.552	MLE Sd (bias corrected)	9.542

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0212	nu hat (KM)	6.688
Approximate Chi Square Value (6.69, α)	2.001	Adjusted Chi Square Value (6.69, β)	1.978
95% Gamma Approximate KM-UCL (use when n>=50)	11.16	95% Gamma Adjusted KM-UCL (use when n<50)	11.29

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	1.0000E-4	Mean	3.316
Maximum	280	Median	0.0505
SD	23.02	CV	6.941
k hat (MLE)	0.201	k star (bias corrected MLE)	0.202
Theta hat (MLE)	16.48	Theta star (bias corrected MLE)	16.44
nu hat (MLE)	63.59	nu star (bias corrected)	63.72
MLE Mean (bias corrected)	3.316	MLE Sd (bias corrected)	7.385
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (63.72, α)	46.36	Adjusted Chi Square Value (63.72, β)	46.22
95% Gamma Approximate UCL (use when n>=50)	4.558	95% Gamma Adjusted UCL (use when n<50)	4.572

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.124	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0826	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.318	Mean in Log Scale	-2.575
SD in Original Scale	23.02	SD in Log Scale	3.095
95% t UCL (assumes normality of ROS data)	6.348	95% Percentile Bootstrap UCL	6.779
95% BCA Bootstrap UCL	9.666	95% Bootstrap t UCL	25.26
95% H-UCL (Log ROS)	29.35		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.498	Mean in Log Scale	-2.033
SD in Original Scale	23.03	SD in Log Scale	2.867
95% t UCL (Assumes normality)	6.53	95% H-Stat UCL	21.87

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 14.79

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (antimony)

General Statistics

Total Number of Observations	78	Number of Distinct Observations	33
Number of Detects	34	Number of Non-Detects	44
Number of Distinct Detects	28	Number of Distinct Non-Detects	8
Minimum Detect	0.49	Minimum Non-Detect	0.29
Maximum Detect	270	Maximum Non-Detect	5
Variance Detects	2149	Percent Non-Detects	56.41%
Mean Detects	13.73	SD Detects	46.36
Median Detects	2.2	CV Detects	3.377
Skewness Detects	5.436	Kurtosis Detects	30.66
Mean of Logged Detects	1.07	SD of Logged Detects	1.442

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.297	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.933	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.388	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.152	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	6.331	Standard Error of Mean	3.546
SD	30.85	95% KM (BCA) UCL	14.52
95% KM (t) UCL	12.23	95% KM (Percentile Bootstrap) UCL	12.92
95% KM (z) UCL	12.16	95% KM Bootstrap t UCL	34.57
90% KM Chebyshev UCL	16.97	95% KM Chebyshev UCL	21.79
97.5% KM Chebyshev UCL	28.48	99% KM Chebyshev UCL	41.61

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.906	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.829	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.308	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.161	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.421	k star (bias corrected MLE)	0.404
Theta hat (MLE)	32.59	Theta star (bias corrected MLE)	34.01
nu hat (MLE)	28.64	nu star (bias corrected)	27.45
MLE Mean (bias corrected)	13.73	MLE Sd (bias corrected)	21.61

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0421	nu hat (KM)	6.57
Approximate Chi Square Value (6.57, α)	1.938	Adjusted Chi Square Value (6.57, β)	1.891
95% Gamma Approximate KM-UCL (use when n>=50)	21.47	95% Gamma Adjusted KM-UCL (use when n<50)	22

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.989
Maximum	270	Median	0.01
SD	31.11	CV	5.195
k hat (MLE)	0.189	k star (bias corrected MLE)	0.191
Theta hat (MLE)	31.64	Theta star (bias corrected MLE)	31.43
nu hat (MLE)	29.53	nu star (bias corrected)	29.73
MLE Mean (bias corrected)	5.989	MLE Sd (bias corrected)	13.72
		Adjusted Level of Significance (β)	0.0469
Approximate Chi Square Value (29.73, α)	18.28	Adjusted Chi Square Value (29.73, β)	18.11
95% Gamma Approximate UCL (use when n>=50)	9.741	95% Gamma Adjusted UCL (use when n<50)	9.832

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.899	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.933	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.152	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	6.231	Mean in Log Scale	-0.32
SD in Original Scale	31.07	SD in Log Scale	1.774
95% t UCL (assumes normality of ROS data)	12.09	95% Percentile Bootstrap UCL	12.7
95% BCA Bootstrap UCL	18.52	95% Bootstrap t UCL	34.51
95% H-UCL (Log ROS)	6.619		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	6.448	Mean in Log Scale	0.263
SD in Original Scale	31.03	SD in Log Scale	1.284
95% t UCL (Assumes normality)	12.3	95% H-Stat UCL	4.32

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL 14.52

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (arsenic)

General Statistics

Total Number of Observations	78	Number of Distinct Observations	57
Number of Detects	77	Number of Non-Detects	1
Number of Distinct Detects	56	Number of Distinct Non-Detects	1
Minimum Detect	1.7	Minimum Non-Detect	3.7
Maximum Detect	150	Maximum Non-Detect	3.7
Variance Detects	813	Percent Non-Detects	1.282%
Mean Detects	15.66	SD Detects	28.51
Median Detects	6.18	CV Detects	1.82
Skewness Detects	3.546	Kurtosis Detects	12.13

Mean of Logged Detects	2.122	SD of Logged Detects	0.917

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.446	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.351	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.101	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	15.5	Standard Error of Mean	3.212
SD	28.18	95% KM (BCA) UCL	20.55
95% KM (t) UCL	20.85	95% KM (Percentile Bootstrap) UCL	20.97
95% KM (z) UCL	20.78	95% KM Bootstrap t UCL	23.19
90% KM Chebyshev UCL	25.13	95% KM Chebyshev UCL	29.5
97.5% KM Chebyshev UCL	35.56	99% KM Chebyshev UCL	47.46

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.476	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.785	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.238	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.105	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.925	k star (bias corrected MLE)	0.898
Theta hat (MLE)	16.93	Theta star (bias corrected MLE)	17.44
nu hat (MLE)	142.5	nu star (bias corrected)	138.3
MLE Mean (bias corrected)	15.66	MLE Sd (bias corrected)	16.53

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.302	nu hat (KM)	47.18
Approximate Chi Square Value (47.18, α)	32.42	Adjusted Chi Square Value (47.18, β)	32.19
95% Gamma Approximate KM-UCL (use when n>=50)	22.56	95% Gamma Adjusted KM-UCL (use when n<50)	22.72

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	15.46
Maximum	150	Median	6.14
SD	28.38	CV	1.836
k hat (MLE)	0.839	k star (bias corrected MLE)	0.815
Theta hat (MLE)	18.43	Theta star (bias corrected MLE)	18.97
nu hat (MLE)	130.9	nu star (bias corrected)	127.2
MLE Mean (bias corrected)	15.46	MLE Sd (bias corrected)	17.12
		Adjusted Level of Significance (β)	0.0469
Approximate Chi Square Value (127.18, α)	102.1	Adjusted Chi Square Value (127.18, β)	101.7
95% Gamma Approximate UCL (use when n>=50)	19.25	95% Gamma Adjusted UCL (use when n<50)	19.33

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.166	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.101	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	15.49	Mean in Log Scale	2.103

SD in Original Scale	28.37	SD in Log Scale	0.926
95% t UCL (assumes normality of ROS data)	20.84	95% Percentile Bootstrap UCL	21.25
95% BCA Bootstrap UCL	22.64	95% Bootstrap t UCL	22.92
95% H-UCL (Log ROS)	15.85		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	15.49	Mean in Log Scale	2.102
SD in Original Scale	28.37	SD in Log Scale	0.927
95% t UCL (Assumes normality)	20.83	95% H-Stat UCL	15.86

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL 20.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (barium)

General Statistics

Total Number of Observations	68	Number of Distinct Observations	26
		Number of Missing Observations	0
Minimum	16	Mean	169.6
Maximum	300	Median	170
SD	53	Std. Error of Mean	6.427
Coefficient of Variation	0.313	Skewness	-0.0642

Normal GOF Test

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0.0564	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.11	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.107	Data Not Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	180.3	95% Adjusted-CLT UCL (Chen-1995)	180.1
		95% Modified-t UCL (Johnson-1978)	180.3

Gamma GOF Test

A-D Test Statistic	2.426	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.753	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.178	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.108	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.848	k star (bias corrected MLE)	6.556
Theta hat (MLE)	24.76	Theta star (bias corrected MLE)	25.87
nu hat (MLE)	931.4	nu star (bias corrected)	891.6
MLE Mean (bias corrected)	169.6	MLE Sd (bias corrected)	66.23

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

		Approximate Chi Square Value (0.05)	823.3
Adjusted Level of Significance	0.0465	Adjusted Chi Square Value	821.9

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	183.7	95% Adjusted Gamma UCL (use when n<50)	184

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.71	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.224	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.107	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.773	Mean of logged Data	5.059
Maximum of Logged Data	5.704	SD of logged Data	0.469

Assuming Lognormal Distribution

95% H-UCL	195.3	90% Chebyshev (MVUE) UCL	206.7
95% Chebyshev (MVUE) UCL	220.9	97.5% Chebyshev (MVUE) UCL	240.7
99% Chebyshev (MVUE) UCL	279.4		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	180.2	95% Jackknife UCL	180.3
95% Standard Bootstrap UCL	180.4	95% Bootstrap-t UCL	180.1
95% Hall's Bootstrap UCL	180.2	95% Percentile Bootstrap UCL	180
95% BCA Bootstrap UCL	179.7		
90% Chebyshev(Mean, Sd) UCL	188.9	95% Chebyshev(Mean, Sd) UCL	197.6
97.5% Chebyshev(Mean, Sd) UCL	209.7	99% Chebyshev(Mean, Sd) UCL	233.5

Suggested UCL to Use

95% Student's-t UCL 180.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Chemical (benzene)

General Statistics

Total Number of Observations	78	Number of Distinct Observations	52
Number of Detects	19	Number of Non-Detects	59
Number of Distinct Detects	18	Number of Distinct Non-Detects	36
Minimum Detect	3.6000E-4	Minimum Non-Detect	1.8000E-4
Maximum Detect	490	Maximum Non-Detect	0.43
Variance Detects	12629	Percent Non-Detects	75.64%
Mean Detects	25.93	SD Detects	112.4
Median Detects	0.02	CV Detects	4.334
Skewness Detects	4.359	Kurtosis Detects	19
Mean of Logged Detects	-3.499	SD of Logged Detects	3.278

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.246	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.532	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.203	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	6.317	Standard Error of Mean	6.412
SD	55.12	95% KM (BCA) UCL	18.88
95% KM (t) UCL	16.99	95% KM (Percentile Bootstrap) UCL	18.88
95% KM (z) UCL	16.86	95% KM Bootstrap t UCL	9325
90% KM Chebyshev UCL	25.55	95% KM Chebyshev UCL	34.27
97.5% KM Chebyshev UCL	46.36	99% KM Chebyshev UCL	70.12

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.903	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.967	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.42	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.226	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.118	k star (bias corrected MLE)	0.134
Theta hat (MLE)	220.3	Theta star (bias corrected MLE)	193.2
nu hat (MLE)	4.473	nu star (bias corrected)	5.1
MLE Mean (bias corrected)	25.93	MLE Sd (bias corrected)	70.78

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0131	nu hat (KM)	2.049
Approximate Chi Square Value (2.05, α)	0.157	Adjusted Chi Square Value (2.05, β)	0.152
95% Gamma Approximate KM-UCL (use when n>=50)	82.23	95% Gamma Adjusted KM-UCL (use when n<50)	85.03

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	3.6000E-4	Mean	6.324
Maximum	490	Median	0.01
SD	55.48	CV	8.772
k hat (MLE)	0.127	k star (bias corrected MLE)	0.131
Theta hat (MLE)	49.68	Theta star (bias corrected MLE)	48.3
nu hat (MLE)	19.86	nu star (bias corrected)	20.43
MLE Mean (bias corrected)	6.324	MLE Sd (bias corrected)	17.48
		Adjusted Level of Significance (β)	0.0469
Approximate Chi Square Value (20.43, α)	11.17	Adjusted Chi Square Value (20.43, β)	11.04
95% Gamma Approximate UCL (use when n>=50)	11.57	95% Gamma Adjusted UCL (use when n<50)	11.7

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.897	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.158	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.203	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	6.317	Mean in Log Scale	-11.11
SD in Original Scale	55.48	SD in Log Scale	5.011
95% t UCL (assumes normality of ROS data)	16.78	95% Percentile Bootstrap UCL	18.88
95% BCA Bootstrap UCL	31.43	95% Bootstrap t UCL	9956
95% H-UCL (Log ROS)	341.3		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-7.276	95% H-UCL (KM -Log)	0.099
KM SD (logged)	2.693	95% Critical H Value (KM-Log)	4.361
KM Standard Error of Mean (logged)	0.319		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	6.32	Mean in Log Scale	-6.333
SD in Original Scale	55.48	SD in Log Scale	2.587
95% t UCL (Assumes normality)	16.78	95% H-Stat UCL	0.175

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	46.36

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(a)anthracene)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	111
Number of Detects	127	Number of Non-Detects	29
Number of Distinct Detects	104	Number of Distinct Non-Detects	12
Minimum Detect	3.0000E-4	Minimum Non-Detect	0.005
Maximum Detect	270	Maximum Non-Detect	33
Variance Detects	740.5	Percent Non-Detects	18.59%
Mean Detects	8.618	SD Detects	27.21
Median Detects	0.96	CV Detects	3.157
Skewness Detects	7.59	Kurtosis Detects	69
Mean of Logged Detects	-0.495	SD of Logged Detects	3.029

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.346	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.376	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0786	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	7.041	Standard Error of Mean	1.984
SD	24.68	95% KM (BCA) UCL	11.06
95% KM (t) UCL	10.33	95% KM (Percentile Bootstrap) UCL	10.56
95% KM (z) UCL	10.31	95% KM Bootstrap t UCL	13.92
90% KM Chebyshev UCL	12.99	95% KM Chebyshev UCL	15.69
97.5% KM Chebyshev UCL	19.43	99% KM Chebyshev UCL	26.79

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.825	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.885	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0916	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.0903	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.266	k star (bias corrected MLE)	0.264
Theta hat (MLE)	32.46	Theta star (bias corrected MLE)	32.59
nu hat (MLE)	67.44	nu star (bias corrected)	67.18
MLE Mean (bias corrected)	8.618	MLE Sd (bias corrected)	16.76

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0814	nu hat (KM)	25.39
Approximate Chi Square Value (25.39, α)	14.91	Adjusted Chi Square Value (25.39, β)	14.84
95% Gamma Approximate KM-UCL (use when n>=50)	11.99	95% Gamma Adjusted KM-UCL (use when n<50)	12.05

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	3.0000E-4	Mean	7.018
Maximum	270	Median	0.32
SD	24.76	CV	3.529
k hat (MLE)	0.225	k star (bias corrected MLE)	0.225
Theta hat (MLE)	31.17	Theta star (bias corrected MLE)	31.18
nu hat (MLE)	70.25	nu star (bias corrected)	70.23
MLE Mean (bias corrected)	7.018	MLE Sd (bias corrected)	14.79
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (70.23, α)	51.94	Adjusted Chi Square Value (70.23, β)	51.79
95% Gamma Approximate UCL (use when n>=50)	9.49	95% Gamma Adjusted UCL (use when n<50)	9.517

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.112	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0786	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	7.022	Mean in Log Scale	-1.249
SD in Original Scale	24.76	SD in Log Scale	3.222
95% t UCL (assumes normality of ROS data)	10.3	95% Percentile Bootstrap UCL	10.53
95% BCA Bootstrap UCL	12.58	95% Bootstrap t UCL	13.93
95% H-UCL (Log ROS)	182.1		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	7.137	Mean in Log Scale	-1
SD in Original Scale	24.77	SD in Log Scale	3.043
95% t UCL (Assumes normality)	10.42	95% H-Stat UCL	117.1

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

97.5% KM (Chebyshev) UCL 19.43

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(a)pyrene)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	108
Number of Detects	129	Number of Non-Detects	27
Number of Distinct Detects	102	Number of Distinct Non-Detects	11
Minimum Detect	3.0000E-4	Minimum Non-Detect	0.005
Maximum Detect	500	Maximum Non-Detect	0.657
Variance Detects	2344	Percent Non-Detects	17.31%
Mean Detects	14.84	SD Detects	48.41
Median Detects	1.7	CV Detects	3.262
Skewness Detects	8.259	Kurtosis Detects	80.1
Mean of Logged Detects	0.0131	SD of Logged Detects	3.118

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.326	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.38	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.078	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	12.28	Standard Error of Mean	3.553
SD	44.21	95% KM (BCA) UCL	19.21
95% KM (t) UCL	18.16	95% KM (Percentile Bootstrap) UCL	18.87
95% KM (z) UCL	18.12	95% KM Bootstrap t UCL	25.14
90% KM Chebyshev UCL	22.94	95% KM Chebyshev UCL	27.77
97.5% KM Chebyshev UCL	34.47	99% KM Chebyshev UCL	47.63

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.542	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.887	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0794	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.0898	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.263	k star (bias corrected MLE)	0.262
Theta hat (MLE)	56.53	Theta star (bias corrected MLE)	56.73
nu hat (MLE)	67.73	nu star (bias corrected)	67.49
MLE Mean (bias corrected)	14.84	MLE Sd (bias corrected)	29.01

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0771	nu hat (KM)	24.06
Approximate Chi Square Value (24.06, α)	13.9	Adjusted Chi Square Value (24.06, β)	13.82
95% Gamma Approximate KM-UCL (use when n>=50)	21.26	95% Gamma Adjusted KM-UCL (use when n<50)	21.37

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	3.0000E-4	Mean	12.27
Maximum	500	Median	0.56
SD	44.35	CV	3.614
k hat (MLE)	0.22	k star (bias corrected MLE)	0.22
Theta hat (MLE)	55.76	Theta star (bias corrected MLE)	55.75
nu hat (MLE)	68.67	nu star (bias corrected)	68.68
MLE Mean (bias corrected)	12.27	MLE Sd (bias corrected)	26.16
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (68.68, α)	50.61	Adjusted Chi Square Value (68.68, β)	50.46
95% Gamma Approximate UCL (use when n>=50)	16.66	95% Gamma Adjusted UCL (use when n<50)	16.7

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.125	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.078	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	12.28	Mean in Log Scale	-0.761
SD in Original Scale	44.35	SD in Log Scale	3.355
95% t UCL (assumes normality of ROS data)	18.15	95% Percentile Bootstrap UCL	19.02
95% BCA Bootstrap UCL	22.08	95% Bootstrap t UCL	25.24
95% H-UCL (Log ROS)	507		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	12.29	Mean in Log Scale	-0.559
SD in Original Scale	44.35	SD in Log Scale	3.161
95% t UCL (Assumes normality)	18.16	95% H-Stat UCL	285.3

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	27.77	95% GROS Approximate Gamma UCL	16.66
95% Approximate Gamma KM-UCL	21.26		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(a)pyrene equivalent)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	116
		Number of Missing Observations	0
Minimum	5.5000E-4	Mean	15.89
Maximum	630	Median	0.72
SD	56.17	Std. Error of Mean	4.497
Coefficient of Variation	3.535	Skewness	8.883

Normal GOF Test

Shapiro Wilk Test Statistic	0.308	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	

Lilliefors Test Statistic	0.389	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0709	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	23.33	95% Adjusted-CLT UCL (Chen-1995)	26.7
		95% Modified-t UCL (Johnson-1978)	23.86

Gamma GOF Test

A-D Test Statistic	3.895	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.899	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.132	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.0826	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.24	k star (bias corrected MLE)	0.239
Theta hat (MLE)	66.32	Theta star (bias corrected MLE)	66.42
nu hat (MLE)	74.74	nu star (bias corrected)	74.64
MLE Mean (bias corrected)	15.89	MLE Sd (bias corrected)	32.48
		Approximate Chi Square Value (0.05)	55.74
Adjusted Level of Significance	0.0485	Adjusted Chi Square Value	55.59

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	21.27	95% Adjusted Gamma UCL (use when n<50)	21.33

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.00118	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.11	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0709	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-7.506	Mean of logged Data	-0.22
Maximum of Logged Data	6.446	SD of logged Data	3.097

Assuming Lognormal Distribution

95% H-UCL	313.6	90% Chebyshev (MVUE) UCL	206.3
95% Chebyshev (MVUE) UCL	262.5	97.5% Chebyshev (MVUE) UCL	340.4
99% Chebyshev (MVUE) UCL	493.5		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	23.28	95% Jackknife UCL	23.33
95% Standard Bootstrap UCL	23.25	95% Bootstrap-t UCL	31.32
95% Hall's Bootstrap UCL	51.91	95% Percentile Bootstrap UCL	24.38
95% BCA Bootstrap UCL	29.03		
90% Chebyshev(Mean, Sd) UCL	29.38	95% Chebyshev(Mean, Sd) UCL	35.49
97.5% Chebyshev(Mean, Sd) UCL	43.97	99% Chebyshev(Mean, Sd) UCL	60.63

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	35.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. For additional insight the user may want to consult a statistician.

Chemical (benzo(b)fluoranthene)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	109
Number of Detects	131	Number of Non-Detects	25
Number of Distinct Detects	103	Number of Distinct Non-Detects	11
Minimum Detect	4.0000E-4	Minimum Non-Detect	0.005
Maximum Detect	370	Maximum Non-Detect	0.657
Variance Detects	1414	Percent Non-Detects	16.03%
Mean Detects	12.44	SD Detects	37.6
Median Detects	1.3	CV Detects	3.023
Skewness Detects	7.296	Kurtosis Detects	64.53
Mean of Logged Detects	-0.14	SD of Logged Detects	3.047

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.361	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.37	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0774	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	10.45	Standard Error of Mean	2.783
SD	34.63	95% KM (BCA) UCL	15.82
95% KM (t) UCL	15.06	95% KM (Percentile Bootstrap) UCL	15.63
95% KM (z) UCL	15.03	95% KM Bootstrap t UCL	19.89
90% KM Chebyshev UCL	18.8	95% KM Chebyshev UCL	22.58
97.5% KM Chebyshev UCL	27.83	99% KM Chebyshev UCL	38.14

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.852	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.886	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0938	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.0891	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.265	k star (bias corrected MLE)	0.264
Theta hat (MLE)	47.02	Theta star (bias corrected MLE)	47.19
nu hat (MLE)	69.31	nu star (bias corrected)	69.05
MLE Mean (bias corrected)	12.44	MLE Sd (bias corrected)	24.23

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0911	nu hat (KM)	28.42
Approximate Chi Square Value (28.42, α)	17.26	Adjusted Chi Square Value (28.42, β)	17.17
95% Gamma Approximate KM-UCL (use when n>=50)	17.21	95% Gamma Adjusted KM-UCL (use when n<50)	17.29

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	4.0000E-4	Mean	10.45

Maximum	370	Median	0.485
SD	34.74	CV	3.326
k hat (MLE)	0.226	k star (bias corrected MLE)	0.225
Theta hat (MLE)	46.32	Theta star (bias corrected MLE)	46.33
nu hat (MLE)	70.37	nu star (bias corrected)	70.35
MLE Mean (bias corrected)	10.45	MLE Sd (bias corrected)	22
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (70.35, α)	52.04	Adjusted Chi Square Value (70.35, β)	51.89
95% Gamma Approximate UCL (use when n>=50)	14.12	95% Gamma Adjusted UCL (use when n<50)	14.16

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.11	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0774	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	10.45	Mean in Log Scale	-0.806
SD in Original Scale	34.74	SD in Log Scale	3.232
95% t UCL (assumes normality of ROS data)	15.05	95% Percentile Bootstrap UCL	15.75
95% BCA Bootstrap UCL	17	95% Bootstrap t UCL	19.92
95% H-UCL (Log ROS)	295		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	10.46	Mean in Log Scale	-0.626
SD in Original Scale	34.74	SD in Log Scale	3.061
95% t UCL (Assumes normality)	15.06	95% H-Stat UCL	181.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 27.83

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(g,h,i)perylene)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	107
Number of Detects	130	Number of Non-Detects	26
Number of Distinct Detects	101	Number of Distinct Non-Detects	11
Minimum Detect	7.0000E-4	Minimum Non-Detect	0.005
Maximum Detect	560	Maximum Non-Detect	12
Variance Detects	2943	Percent Non-Detects	16.67%
Mean Detects	15.1	SD Detects	54.25
Median Detects	1.2	CV Detects	3.592
Skewness Detects	8.363	Kurtosis Detects	80.68
Mean of Logged Detects	0.0114	SD of Logged Detects	2.982

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.296	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.39	**Lilliefors GOF Test**

5% Lilliefors Critical Value	0.0777	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	12.6	Standard Error of Mean	3.99
SD	49.65	95% KM (BCA) UCL	21.22
95% KM (t) UCL	19.2	95% KM (Percentile Bootstrap) UCL	19.91
95% KM (z) UCL	19.16	95% KM Bootstrap t UCL	28.77
90% KM Chebyshev UCL	24.57	95% KM Chebyshev UCL	29.99
97.5% KM Chebyshev UCL	37.52	99% KM Chebyshev UCL	52.3

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.542	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.888	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.109	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.0895	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.261	k star (bias corrected MLE)	0.26
Theta hat (MLE)	57.87	Theta star (bias corrected MLE)	58.07
nu hat (MLE)	67.84	nu star (bias corrected)	67.61
MLE Mean (bias corrected)	15.1	MLE Sd (bias corrected)	29.61

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0644	nu hat (KM)	20.09
Approximate Chi Square Value (20.09, α)	10.92	Adjusted Chi Square Value (20.09, β)	10.86
95% Gamma Approximate KM-UCL (use when n>=50)	23.18	95% Gamma Adjusted KM-UCL (use when n<50)	23.32

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	7.0000E-4	Mean	12.59
Maximum	560	Median	0.6
SD	49.81	CV	3.958
k hat (MLE)	0.22	k star (bias corrected MLE)	0.22
Theta hat (MLE)	57.14	Theta star (bias corrected MLE)	57.13
nu hat (MLE)	68.72	nu star (bias corrected)	68.74
MLE Mean (bias corrected)	12.59	MLE Sd (bias corrected)	26.81
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (68.74, α)	50.65	Adjusted Chi Square Value (68.74, β)	50.51
95% Gamma Approximate UCL (use when n>=50)	17.08	95% Gamma Adjusted UCL (use when n<50)	17.13

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.11	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0777	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	12.59	Mean in Log Scale	-0.67
SD in Original Scale	49.81	SD in Log Scale	3.177
95% t UCL (assumes normality of ROS data)	19.19	95% Percentile Bootstrap UCL	19.39
95% BCA Bootstrap UCL	23.54	95% Bootstrap t UCL	28.87
95% H-UCL (Log ROS)	271.8		

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	12.64	Mean in Log Scale	-0.498
SD in Original Scale	49.8	SD in Log Scale	3.04
95% t UCL (Assumes normality)	19.24	95% H-Stat UCL	191.2

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	37.52

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(k)fluoranthene)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	105
Number of Detects	123	Number of Non-Detects	33
Number of Distinct Detects	96	Number of Distinct Non-Detects	12
Minimum Detect	2.0000E-4	Minimum Non-Detect	0.0038
Maximum Detect	210	Maximum Non-Detect	0.657
Variance Detects	438	Percent Non-Detects	21.15%
Mean Detects	6.502	SD Detects	20.93
Median Detects	1.2	CV Detects	3.219
Skewness Detects	7.982	Kurtosis Detects	74.69
Mean of Logged Detects	-0.585	SD of Logged Detects	2.961

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.329	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.378	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0799	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	5.132	Standard Error of Mean	1.503
SD	18.7	95% KM (BCA) UCL	7.901
95% KM (t) UCL	7.619	95% KM (Percentile Bootstrap) UCL	7.802
95% KM (z) UCL	7.604	95% KM Bootstrap t UCL	10.69
90% KM Chebyshev UCL	9.641	95% KM Chebyshev UCL	11.68
97.5% KM Chebyshev UCL	14.52	99% KM Chebyshev UCL	20.09

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.585	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.876	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0851	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.091	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.283	k star (bias corrected MLE)	0.282
Theta hat (MLE)	22.95	Theta star (bias corrected MLE)	23.07
nu hat (MLE)	69.7	nu star (bias corrected)	69.33

MLE Mean (bias corrected)	6.502	MLE Sd (bias corrected)	12.25

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0753	nu hat (KM)	23.5
Approximate Chi Square Value (23.50, α)	13.47	Adjusted Chi Square Value (23.50, β)	13.4
95% Gamma Approximate KM-UCL (use when n>=50)	8.953	95% Gamma Adjusted KM-UCL (use when n<50)	9

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	2.0000E-4	Mean	5.128
Maximum	210	Median	0.225
SD	18.76	CV	3.658
k hat (MLE)	0.234	k star (bias corrected MLE)	0.234
Theta hat (MLE)	21.93	Theta star (bias corrected MLE)	21.95
nu hat (MLE)	72.97	nu star (bias corrected)	72.9
MLE Mean (bias corrected)	5.128	MLE Sd (bias corrected)	10.61
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (72.90, α)	54.24	Adjusted Chi Square Value (72.90, β)	54.09
95% Gamma Approximate UCL (use when n>=50)	6.893	95% Gamma Adjusted UCL (use when n<50)	6.912

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.119	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0799	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	5.13	Mean in Log Scale	-1.517
SD in Original Scale	18.76	SD in Log Scale	3.255
95% t UCL (assumes normality of ROS data)	7.615	95% Percentile Bootstrap UCL	7.726
95% BCA Bootstrap UCL	9.296	95% Bootstrap t UCL	10.62
95% H-UCL (Log ROS)	158.7		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	5.141	Mean in Log Scale	-1.26
SD in Original Scale	18.75	SD in Log Scale	3.036
95% t UCL (Assumes normality)	7.626	95% H-Stat UCL	87.92

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	11.68	95% GROS Approximate Gamma UCL	6.893
95% Approximate Gamma KM-UCL	8.953		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (beryllium)

General Statistics

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Total Number of Observations	68	Number of Distinct Observations	33
Number of Detects	32	Number of Non-Detects	36
Number of Distinct Detects	25	Number of Distinct Non-Detects	12
Minimum Detect	0.15	Minimum Non-Detect	0.11
Maximum Detect	0.78	Maximum Non-Detect	0.52
Variance Detects	0.0187	Percent Non-Detects	52.94%
Mean Detects	0.39	SD Detects	0.137
Median Detects	0.39	CV Detects	0.351
Skewness Detects	0.337	Kurtosis Detects	0.937
Mean of Logged Detects	-1.01	SD of Logged Detects	0.392

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.962	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.93	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.126	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.157	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.275	Standard Error of Mean	0.0215
SD	0.156	95% KM (BCA) UCL	0.311
95% KM (t) UCL	0.311	95% KM (Percentile Bootstrap) UCL	0.312
95% KM (z) UCL	0.311	95% KM Bootstrap t UCL	0.309
90% KM Chebyshev UCL	0.34	95% KM Chebyshev UCL	0.369
97.5% KM Chebyshev UCL	0.41	99% KM Chebyshev UCL	0.489

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.678	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.174	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.156	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	7.548	k star (bias corrected MLE)	6.862
Theta hat (MLE)	0.0516	Theta star (bias corrected MLE)	0.0568
nu hat (MLE)	483.1	nu star (bias corrected)	439.1
MLE Mean (bias corrected)	0.39	MLE Sd (bias corrected)	0.149

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	3.13	nu hat (KM)	425.6
Approximate Chi Square Value (425.62, α)	378.8	Adjusted Chi Square Value (425.62, β)	377.8
95% Gamma Approximate KM-UCL (use when n>=50)	0.309	95% Gamma Adjusted KM-UCL (use when n<50)	0.31

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0454	Mean	0.277
Maximum	0.78	Median	0.241
SD	0.15	CV	0.543
k hat (MLE)	3.36	k star (bias corrected MLE)	3.222
Theta hat (MLE)	0.0825	Theta star (bias corrected MLE)	0.086
nu hat (MLE)	457	nu star (bias corrected)	438.1
MLE Mean (bias corrected)	0.277	MLE Sd (bias corrected)	0.154
		Adjusted Level of Significance (β)	0.0465
Approximate Chi Square Value (438.14, α)	390.6	Adjusted Chi Square Value (438.14, β)	389.6

95% Gamma Approximate UCL (use when n>=50)	0.311	95% Gamma Adjusted UCL (use when n<50)	0.312

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.194	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.157	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.284	Mean in Log Scale	-1.376
SD in Original Scale	0.142	SD in Log Scale	0.482
95% t UCL (assumes normality of ROS data)	0.312	95% Percentile Bootstrap UCL	0.311
95% BCA Bootstrap UCL	0.314	95% Bootstrap t UCL	0.316
95% H-UCL (Log ROS)	0.316		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.268	Mean in Log Scale	-1.493
SD in Original Scale	0.154	SD in Log Scale	0.634
95% t UCL (Assumes normality)	0.3	95% H-Stat UCL	0.32

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.311	95% KM (Percentile Bootstrap) UCL	0.312

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (cadmium)

General Statistics

Total Number of Observations	76	Number of Distinct Observations	48
Number of Detects	38	Number of Non-Detects	38
Number of Distinct Detects	34	Number of Distinct Non-Detects	15
Minimum Detect	0.05	Minimum Non-Detect	0.043
Maximum Detect	3	Maximum Non-Detect	2.5
Variance Detects	0.44	Percent Non-Detects	50%
Mean Detects	0.732	SD Detects	0.664
Median Detects	0.505	CV Detects	0.907
Skewness Detects	1.406	Kurtosis Detects	2.376
Mean of Logged Detects	-0.789	SD of Logged Detects	1.09

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.863	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.938	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.152	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.144	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.448	Standard Error of Mean	0.0676
SD	0.561	95% KM (BCA) UCL	0.576

95% KM (t) UCL	0.56	95% KM (Percentile Bootstrap) UCL	0.559
95% KM (z) UCL	0.559	95% KM Bootstrap t UCL	0.587
90% KM Chebyshev UCL	0.651	95% KM Chebyshev UCL	0.743
97.5% KM Chebyshev UCL	0.87	99% KM Chebyshev UCL	1.121

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.372	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.773	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.114	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.147	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.189	k star (bias corrected MLE)	1.112
Theta hat (MLE)	0.616	Theta star (bias corrected MLE)	0.658
nu hat (MLE)	90.34	nu star (bias corrected)	84.54
MLE Mean (bias corrected)	0.732	MLE Sd (bias corrected)	0.694

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.638	nu hat (KM)	97.01
Approximate Chi Square Value (97.01, α)	75.29	Adjusted Chi Square Value (97.01, β)	74.92
95% Gamma Approximate KM-UCL (use when n>=50)	0.577	95% Gamma Adjusted KM-UCL (use when n<50)	0.58

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.426
Maximum	3	Median	0.22
SD	0.569	CV	1.337
k hat (MLE)	0.56	k star (bias corrected MLE)	0.546
Theta hat (MLE)	0.761	Theta star (bias corrected MLE)	0.779
nu hat (MLE)	85.05	nu star (bias corrected)	83.02
MLE Mean (bias corrected)	0.426	MLE Sd (bias corrected)	0.576
		Adjusted Level of Significance (β)	0.0468
Approximate Chi Square Value (83.02, α)	63.02	Adjusted Chi Square Value (83.02, β)	62.69
95% Gamma Approximate UCL (use when n>=50)	0.561	95% Gamma Adjusted UCL (use when n<50)	0.564

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.95	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.938	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.134	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.144	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.433	Mean in Log Scale	-1.541
SD in Original Scale	0.559	SD in Log Scale	1.208
95% t UCL (assumes normality of ROS data)	0.54	95% Percentile Bootstrap UCL	0.539
95% BCA Bootstrap UCL	0.555	95% Bootstrap t UCL	0.569
95% H-UCL (Log ROS)	0.628		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-1.532	95% H-UCL (KM -Log)	0.676
KM SD (logged)	1.247	95% Critical H Value (KM-Log)	2.516
KM Standard Error of Mean (logged)	0.174		

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.505	Mean in Log Scale	-1.261
SD in Original Scale	0.56	SD in Log Scale	1.179
95% t UCL (Assumes normality)	0.612	95% H-Stat UCL	0.792

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.56	95% GROS Approximate Gamma UCL	0.561
95% Approximate Gamma KM-UCL	0.577		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (chromium)

General Statistics

Total Number of Observations	77	Number of Distinct Observations	49
		Number of Missing Observations	0
Minimum	7.2	Mean	72.16
Maximum	144	Median	72
SD	22.72	Std. Error of Mean	2.589
Coefficient of Variation	0.315	Skewness	0.234

Normal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0.0317	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.115	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.101	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	76.47	95% Adjusted-CLT UCL (Chen-1995)	76.49
		95% Modified-t UCL (Johnson-1978)	76.48

Gamma GOF Test

A-D Test Statistic	2.398	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.753	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.126	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.102	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.339	k star (bias corrected MLE)	7.062
Theta hat (MLE)	9.832	Theta star (bias corrected MLE)	10.22
nu hat (MLE)	1130	nu star (bias corrected)	1088
MLE Mean (bias corrected)	72.16	MLE Sd (bias corrected)	27.15
		Approximate Chi Square Value (0.05)	1012
Adjusted Level of Significance	0.0469	Adjusted Chi Square Value	1011

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	77.55	95% Adjusted Gamma UCL (use when n<50)	77.65

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.755	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.168	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.101	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.974	Mean of logged Data	4.209
Maximum of Logged Data	4.97	SD of logged Data	0.441

Assuming Lognormal Distribution

95% H-UCL	81.31	90% Chebyshev (MVUE) UCL	85.68
95% Chebyshev (MVUE) UCL	90.95	97.5% Chebyshev (MVUE) UCL	98.26
99% Chebyshev (MVUE) UCL	112.6		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	76.42	95% Jackknife UCL	76.47
95% Standard Bootstrap UCL	76.34	95% Bootstrap-t UCL	76.48
95% Hall's Bootstrap UCL	76.8	95% Percentile Bootstrap UCL	76.61
95% BCA Bootstrap UCL	76.84		
90% Chebyshev(Mean, Sd) UCL	79.93	95% Chebyshev(Mean, Sd) UCL	83.44
97.5% Chebyshev(Mean, Sd) UCL	88.33	99% Chebyshev(Mean, Sd) UCL	97.92

Suggested UCL to Use

95% Student's-t UCL	76.47	or 95% Modified-t UCL	76.48

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (chrysene)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	114
Number of Detects	129	Number of Non-Detects	27
Number of Distinct Detects	107	Number of Distinct Non-Detects	11
Minimum Detect	5.0000E-4	Minimum Non-Detect	0.005
Maximum Detect	330	Maximum Non-Detect	0.657
Variance Detects	1094	Percent Non-Detects	17.31%
Mean Detects	10.7	SD Detects	33.08
Median Detects	1.1	CV Detects	3.092
Skewness Detects	7.568	Kurtosis Detects	69.13
Mean of Logged Detects	-0.231	SD of Logged Detects	2.976

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.353	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.373	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.078	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	8.851	Standard Error of Mean	2.43
SD	30.24	95% KM (BCA) UCL	13.29
95% KM (t) UCL	12.87	95% KM (Percentile Bootstrap) UCL	13.51
95% KM (z) UCL	12.85	95% KM Bootstrap t UCL	17.17
90% KM Chebyshev UCL	16.14	95% KM Chebyshev UCL	19.44
97.5% KM Chebyshev UCL	24.03	99% KM Chebyshev UCL	33.03

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.874	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.883	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0927	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.0896	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.27	k star (bias corrected MLE)	0.269
Theta hat (MLE)	39.65	Theta star (bias corrected MLE)	39.82
nu hat (MLE)	69.6	nu star (bias corrected)	69.31
MLE Mean (bias corrected)	10.7	MLE Sd (bias corrected)	20.64

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0857	nu hat (KM)	26.74
Approximate Chi Square Value (26.74, α)	15.95	Adjusted Chi Square Value (26.74, β)	15.87
95% Gamma Approximate KM-UCL (use when n>=50)	14.84	95% Gamma Adjusted KM-UCL (use when n<50)	14.91

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	5.0000E-4	Mean	8.847
Maximum	330	Median	0.43
SD	30.33	CV	3.429
k hat (MLE)	0.228	k star (bias corrected MLE)	0.227
Theta hat (MLE)	38.87	Theta star (bias corrected MLE)	38.89
nu hat (MLE)	71.01	nu star (bias corrected)	70.98
MLE Mean (bias corrected)	8.847	MLE Sd (bias corrected)	18.55
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (70.98, α)	52.58	Adjusted Chi Square Value (70.98, β)	52.44
95% Gamma Approximate UCL (use when n>=50)	11.94	95% Gamma Adjusted UCL (use when n<50)	11.98

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.101	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.078	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	8.85	Mean in Log Scale	-0.962
SD in Original Scale	30.33	SD in Log Scale	3.195
95% t UCL (assumes normality of ROS data)	12.87	95% Percentile Bootstrap UCL	13.35
95% BCA Bootstrap UCL	15.55	95% Bootstrap t UCL	17.06
95% H-UCL (Log ROS)	218.2		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	8.861	Mean in Log Scale	-0.767

SD in Original Scale	30.33	SD in Log Scale	3.015
95% t UCL (Assumes normality)	12.88	95% H-Stat UCL	133.4

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 24.03

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (cobalt)

General Statistics

Total Number of Observations	68	Number of Distinct Observations	21
		Number of Missing Observations	0
Minimum	2.6	Mean	15.42
Maximum	23	Median	15
SD	3.365	Std. Error of Mean	0.408
Coefficient of Variation	0.218	Skewness	-0.775

Normal GOF Test

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0.0252	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.118	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.107	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	16.1	95% Adjusted-CLT UCL (Chen-1995)	16.05
		95% Modified-t UCL (Johnson-1978)	16.09

Gamma GOF Test

A-D Test Statistic	2.26	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.75	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.172	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.108	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	15.01	k star (bias corrected MLE)	14.36
Theta hat (MLE)	1.027	Theta star (bias corrected MLE)	1.074
nu hat (MLE)	2041	nu star (bias corrected)	1952
MLE Mean (bias corrected)	15.42	MLE Sd (bias corrected)	4.07
		Approximate Chi Square Value (0.05)	1851
Adjusted Level of Significance	0.0465	Adjusted Chi Square Value	1849

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	16.27	95% Adjusted Gamma UCL (use when n<50)	16.28

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.745	**Shapiro Wilk Lognormal GOF Test**	

5% Shapiro Wilk P Value	6.661E-16	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.205	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.107	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.956	Mean of logged Data	2.702
Maximum of Logged Data	3.135	SD of logged Data	0.298

Assuming Lognormal Distribution

95% H-UCL	16.62	90% Chebyshev (MVUE) UCL	17.3
95% Chebyshev (MVUE) UCL	18.08	97.5% Chebyshev (MVUE) UCL	19.16
99% Chebyshev (MVUE) UCL	21.29		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	16.09	95% Jackknife UCL	16.1
95% Standard Bootstrap UCL	16.09	95% Bootstrap-t UCL	16.07
95% Hall's Bootstrap UCL	16.1	95% Percentile Bootstrap UCL	16.06
95% BCA Bootstrap UCL	16.02		
90% Chebyshev(Mean, Sd) UCL	16.64	95% Chebyshev(Mean, Sd) UCL	17.2
97.5% Chebyshev(Mean, Sd) UCL	17.97	99% Chebyshev(Mean, Sd) UCL	19.48

Suggested UCL to Use

95% Student's-t UCL	16.1	or 95% Modified-t UCL	16.09

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Chemical (copper)

General Statistics

Total Number of Observations	73	Number of Distinct Observations	52
		Number of Missing Observations	0
Minimum	14	Mean	67.28
Maximum	570	Median	42
SD	83.36	Std. Error of Mean	9.756
Coefficient of Variation	1.239	Skewness	4.276

Normal GOF Test

Shapiro Wilk Test Statistic	0.53	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.264	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.104	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	83.53	95% Adjusted-CLT UCL (Chen-1995)	88.54
		95% Modified-t UCL (Johnson-1978)	84.35

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Gamma GOF Test

A-D Test Statistic	3.986	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.767	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.194	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.106	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.68	k star (bias corrected MLE)	1.62
Theta hat (MLE)	40.04	Theta star (bias corrected MLE)	41.52
nu hat (MLE)	245.3	nu star (bias corrected)	236.6
MLE Mean (bias corrected)	67.28	MLE Sd (bias corrected)	52.85
		Approximate Chi Square Value (0.05)	202
Adjusted Level of Significance	0.0467	Adjusted Chi Square Value	201.3

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	78.8	95% Adjusted Gamma UCL (use when n<50)	79.05

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	1.4687E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.147	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.104	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.639	Mean of logged Data	3.883
Maximum of Logged Data	6.346	SD of logged Data	0.706

Assuming Lognormal Distribution

95% H-UCL	73.53	90% Chebyshev (MVUE) UCL	78.99
95% Chebyshev (MVUE) UCL	86.67	97.5% Chebyshev (MVUE) UCL	97.33
99% Chebyshev (MVUE) UCL	118.3		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	83.32	95% Jackknife UCL	83.53
95% Standard Bootstrap UCL	83.53	95% Bootstrap-t UCL	98.89
95% Hall's Bootstrap UCL	149.9	95% Percentile Bootstrap UCL	84.98
95% BCA Bootstrap UCL	91.9		
90% Chebyshev(Mean, Sd) UCL	96.54	95% Chebyshev(Mean, Sd) UCL	109.8
97.5% Chebyshev(Mean, Sd) UCL	128.2	99% Chebyshev(Mean, Sd) UCL	164.4

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	109.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (dibenz(a,h)anthracene)

General Statistics

Total Number of Observations	155	Number of Distinct Observations	95

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Number of Detects	99	Number of Non-Detects	56
Number of Distinct Detects	79	Number of Distinct Non-Detects	26
Minimum Detect	8.0000E-5	Minimum Non-Detect	4.0000E-5
Maximum Detect	12	Maximum Non-Detect	59
Variance Detects	6.599	Percent Non-Detects	36.13%
Mean Detects	1.374	SD Detects	2.569
Median Detects	0.3	CV Detects	1.87
Skewness Detects	2.872	Kurtosis Detects	8.167
Mean of Logged Detects	-1.766	SD of Logged Detects	2.768

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.572	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.296	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.089	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.906	Standard Error of Mean	0.176
SD	2.159	95% KM (BCA) UCL	1.201
95% KM (t) UCL	1.197	95% KM (Percentile Bootstrap) UCL	1.21
95% KM (z) UCL	1.195	95% KM Bootstrap t UCL	1.284
90% KM Chebyshev UCL	1.434	95% KM Chebyshev UCL	1.673
97.5% KM Chebyshev UCL	2.005	99% KM Chebyshev UCL	2.658

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.855	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.861	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0993	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.0973	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.326	k star (bias corrected MLE)	0.323
Theta hat (MLE)	4.208	Theta star (bias corrected MLE)	4.249
nu hat (MLE)	64.64	nu star (bias corrected)	64.01
MLE Mean (bias corrected)	1.374	MLE Sd (bias corrected)	2.416

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.176	nu hat (KM)	54.56
Approximate Chi Square Value (54.56, α)	38.59	Adjusted Chi Square Value (54.56, β)	38.46
95% Gamma Approximate KM-UCL (use when n>=50)	1.281	95% Gamma Adjusted KM-UCL (use when n<50)	1.285

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	8.0000E-5	Mean	0.881
Maximum	12	Median	0.02
SD	2.152	CV	2.443
k hat (MLE)	0.264	k star (bias corrected MLE)	0.263
Theta hat (MLE)	3.335	Theta star (bias corrected MLE)	3.345
nu hat (MLE)	81.89	nu star (bias corrected)	81.64
MLE Mean (bias corrected)	0.881	MLE Sd (bias corrected)	1.717
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (81.64, α)	61.82	Adjusted Chi Square Value (81.64, β)	61.66
95% Gamma Approximate UCL (use when n>=50)	1.164	95% Gamma Adjusted UCL (use when n<50)	1.167

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.101	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.089	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.881	Mean in Log Scale	-3.167
SD in Original Scale	2.152	SD in Log Scale	3.089
95% t UCL (assumes normality of ROS data)	1.167	95% Percentile Bootstrap UCL	1.153
95% BCA Bootstrap UCL	1.205	95% Bootstrap t UCL	1.247
95% H-UCL (Log ROS)	15.98		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.258	Mean in Log Scale	-2.385
SD in Original Scale	3.39	SD in Log Scale	2.924
95% t UCL (Assumes normality)	1.709	95% H-Stat UCL	19.03

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL	1.201	95% GROS Approximate Gamma UCL	1.164
95% Approximate Gamma KM-UCL	1.281		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (ethylbenzene)

General Statistics

Total Number of Observations	78	Number of Distinct Observations	45
Number of Detects	5	Number of Non-Detects	73
Number of Distinct Detects	5	Number of Distinct Non-Detects	41
Minimum Detect	3.9000E-4	Minimum Non-Detect	2.2000E-4
Maximum Detect	80	Maximum Non-Detect	0.0067
Variance Detects	1272	Percent Non-Detects	93.59%
Mean Detects	16.19	SD Detects	35.67
Median Detects	0.234	CV Detects	2.203
Skewness Detects	2.236	Kurtosis Detects	4.999
Mean of Logged Detects	-1.783	SD of Logged Detects	4.486

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.559	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.468	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.396	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	1.038	Standard Error of Mean	1.139
SD	8.999	95% KM (BCA) UCL	3.096
95% KM (t) UCL	2.935	95% KM (Percentile Bootstrap) UCL	3.092
95% KM (z) UCL	2.912	95% KM Bootstrap t UCL	244

90% KM Chebyshev UCL	4.456	95% KM Chebyshev UCL	6.004
97.5% KM Chebyshev UCL	8.153	99% KM Chebyshev UCL	12.37

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.425	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.807	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.324	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.394	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.166	k star (bias corrected MLE)	0.2
Theta hat (MLE)	97.67	Theta star (bias corrected MLE)	81.11
nu hat (MLE)	1.658	nu star (bias corrected)	1.997
MLE Mean (bias corrected)	16.19	MLE Sd (bias corrected)	36.24

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0133	nu hat (KM)	2.077
Approximate Chi Square Value (2.08, α)	0.161	Adjusted Chi Square Value (2.08, β)	0.156
95% Gamma Approximate KM-UCL (use when n>=50)	13.36	95% Gamma Adjusted KM-UCL (use when n<50)	13.82

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	3.9000E-4	Mean	1.047
Maximum	80	Median	0.01
SD	9.056	CV	8.646
k hat (MLE)	0.169	k star (bias corrected MLE)	0.171
Theta hat (MLE)	6.201	Theta star (bias corrected MLE)	6.126
nu hat (MLE)	26.35	nu star (bias corrected)	26.67
MLE Mean (bias corrected)	1.047	MLE Sd (bias corrected)	2.533
		Adjusted Level of Significance (β)	0.0469
Approximate Chi Square Value (26.67, α)	15.9	Adjusted Chi Square Value (26.67, β)	15.74
95% Gamma Approximate UCL (use when n>=50)	1.757	95% Gamma Adjusted UCL (use when n<50)	1.775

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.99	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.396	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.038	Mean in Log Scale	-27.45
SD in Original Scale	9.057	SD in Log Scale	8.936
95% t UCL (assumes normality of ROS data)	2.745	95% Percentile Bootstrap UCL	3.09
95% BCA Bootstrap UCL	4.133	95% Bootstrap t UCL	354.9
95% H-UCL (Log ROS)	2.153E+11		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-7.98	95% H-UCL (KM -Log)	0.00443
KM SD (logged)	1.916	95% Critical H Value (KM-Log)	3.325
KM Standard Error of Mean (logged)	0.244		

DL/2 Statistics

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.039	Mean in Log Scale	-6.867
SD in Original Scale	9.057	SD in Log Scale	2.043
95% t UCL (Assumes normality)	2.747	95% H-Stat UCL	0.0189

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	2.935	95% GROS Approximate Gamma UCL	1.757
95% Approximate Gamma KM-UCL	13.36		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (fluoranthene)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	112
Number of Detects	133	Number of Non-Detects	23
Number of Distinct Detects	104	Number of Distinct Non-Detects	11
Minimum Detect	0.001	Minimum Non-Detect	0.005
Maximum Detect	1300	Maximum Non-Detect	0.657
Variance Detects	15234	Percent Non-Detects	14.74%
Mean Detects	30.75	SD Detects	123.4
Median Detects	2.1	CV Detects	4.014
Skewness Detects	8.755	Kurtosis Detects	86.85
Mean of Logged Detects	0.319	SD of Logged Detects	3.17

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.27	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.402	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0768	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	26.22	Standard Error of Mean	9.166
SD	114.1	95% KM (BCA) UCL	42.54
95% KM (t) UCL	41.39	95% KM (Percentile Bootstrap) UCL	43.09
95% KM (z) UCL	41.3	95% KM Bootstrap t UCL	65.18
90% KM Chebyshev UCL	53.72	95% KM Chebyshev UCL	66.18
97.5% KM Chebyshev UCL	83.47	99% KM Chebyshev UCL	117.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.175	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.903	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.11	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.0893	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.231	k star (bias corrected MLE)	0.231
Theta hat (MLE)	132.9	Theta star (bias corrected MLE)	133
nu hat (MLE)	61.57	nu star (bias corrected)	61.51

MLE Mean (bias corrected)	30.75	MLE Sd (bias corrected)	63.94

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0529	nu hat (KM)	16.49
Approximate Chi Square Value (16.49, α)	8.31	Adjusted Chi Square Value (16.49, β)	8.255
95% Gamma Approximate KM-UCL (use when n>=50)	52.04	95% Gamma Adjusted KM-UCL (use when n<50)	52.38

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.001	Mean	26.22
Maximum	1300	Median	0.91
SD	114.4	CV	4.364
k hat (MLE)	0.2	k star (bias corrected MLE)	0.201
Theta hat (MLE)	130.9	Theta star (bias corrected MLE)	130.6
nu hat (MLE)	62.49	nu star (bias corrected)	62.62
MLE Mean (bias corrected)	26.22	MLE Sd (bias corrected)	58.52
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (62.62, α)	45.42	Adjusted Chi Square Value (62.62, β)	45.28
95% Gamma Approximate UCL (use when n>=50)	36.15	95% Gamma Adjusted UCL (use when n<50)	36.26

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.0836	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0768	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	26.22	Mean in Log Scale	-0.338
SD in Original Scale	114.4	SD in Log Scale	3.369
95% t UCL (assumes normality of ROS data)	41.38	95% Percentile Bootstrap UCL	42.96
95% BCA Bootstrap UCL	52.73	95% Bootstrap t UCL	67.73
95% H-UCL (Log ROS)	820		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	26.23	Mean in Log Scale	-0.189
SD in Original Scale	114.4	SD in Log Scale	3.224
95% t UCL (Assumes normality)	41.39	95% H-Stat UCL	528.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	83.47

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (fluorene)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	92

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Number of Detects	93	Number of Non-Detects	63
Number of Distinct Detects	76	Number of Distinct Non-Detects	23
Minimum Detect	1.0000E-4	Minimum Non-Detect	0.001
Maximum Detect	170	Maximum Non-Detect	33
Variance Detects	605.5	Percent Non-Detects	40.38%
Mean Detects	5.15	SD Detects	24.61
Median Detects	0.2	CV Detects	4.778
Skewness Detects	6.166	Kurtosis Detects	38.56
Mean of Logged Detects	-2.176	SD of Logged Detects	3.004

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.225	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.452	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0919	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	3.09	Standard Error of Mean	1.535
SD	19.06	95% KM (BCA) UCL	5.672
95% KM (t) UCL	5.629	95% KM (Percentile Bootstrap) UCL	5.83
95% KM (z) UCL	5.614	95% KM Bootstrap t UCL	12.42
90% KM Chebyshev UCL	7.693	95% KM Chebyshev UCL	9.779
97.5% KM Chebyshev UCL	12.67	99% KM Chebyshev UCL	18.36

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	7.869	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.922	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.254	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.103	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.194	k star (bias corrected MLE)	0.195
Theta hat (MLE)	26.57	Theta star (bias corrected MLE)	26.44
nu hat (MLE)	36.05	nu star (bias corrected)	36.22
MLE Mean (bias corrected)	5.15	MLE Sd (bias corrected)	11.67

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0263	nu hat (KM)	8.196
Approximate Chi Square Value (8.20, α)	2.849	Adjusted Chi Square Value (8.20, β)	2.82
95% Gamma Approximate KM-UCL (use when n>=50)	8.888	95% Gamma Adjusted KM-UCL (use when n<50)	8.98

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	1.0000E-4	Mean	3.074
Maximum	170	Median	0.01
SD	19.13	CV	6.222
k hat (MLE)	0.175	k star (bias corrected MLE)	0.176
Theta hat (MLE)	17.52	Theta star (bias corrected MLE)	17.43
nu hat (MLE)	54.74	nu star (bias corrected)	55.02
MLE Mean (bias corrected)	3.074	MLE Sd (bias corrected)	7.321
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (55.02, α)	38.97	Adjusted Chi Square Value (55.02, β)	38.85

95% Gamma Approximate UCL (use when n>=50)	4.34	95% Gamma Adjusted UCL (use when n<50)	4.354

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.0843	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0919	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.075	Mean in Log Scale	-3.57
SD in Original Scale	19.13	SD in Log Scale	3.075
95% t UCL (assumes normality of ROS data)	5.609	95% Percentile Bootstrap UCL	5.891
95% BCA Bootstrap UCL	7.256	95% Bootstrap t UCL	13.93
95% H-UCL (Log ROS)	10.11		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-3.671	95% H-UCL (KM -Log)	21.06
KM SD (logged)	3.288	95% Critical H Value (KM-Log)	4.964
KM Standard Error of Mean (logged)	0.301		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.281	Mean in Log Scale	-2.574
SD in Original Scale	19.14	SD in Log Scale	2.751
95% t UCL (Assumes normality)	5.817	95% H-Stat UCL	8.589

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	12.67

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (indeno(1,2,3-c,d)pyrene)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	109
Number of Detects	125	Number of Non-Detects	31
Number of Distinct Detects	98	Number of Distinct Non-Detects	13
Minimum Detect	6.0000E-4	Minimum Non-Detect	1.0000E-4
Maximum Detect	330	Maximum Non-Detect	0.657
Variance Detects	1130	Percent Non-Detects	19.87%
Mean Detects	10.88	SD Detects	33.61
Median Detects	1.5	CV Detects	3.089
Skewness Detects	7.491	Kurtosis Detects	67.06
Mean of Logged Detects	-0.105	SD of Logged Detects	2.936

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.346	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.373	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0792	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	8.723	Standard Error of Mean	2.434
SD	30.28	95% KM (BCA) UCL	13.81
95% KM (t) UCL	12.75	95% KM (Percentile Bootstrap) UCL	13.18
95% KM (z) UCL	12.73	95% KM Bootstrap t UCL	17.38
90% KM Chebyshev UCL	16.02	95% KM Chebyshev UCL	19.33
97.5% KM Chebyshev UCL	23.92	99% KM Chebyshev UCL	32.94

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.81	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.878	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.101	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.0905	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.28	k star (bias corrected MLE)	0.279
Theta hat (MLE)	38.87	Theta star (bias corrected MLE)	39.06
nu hat (MLE)	69.98	nu star (bias corrected)	69.63
MLE Mean (bias corrected)	10.88	MLE Sd (bias corrected)	20.62

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.083	nu hat (KM)	25.9
Approximate Chi Square Value (25.90, α)	15.3	Adjusted Chi Square Value (25.90, β)	15.23
95% Gamma Approximate KM-UCL (use when n>=50)	14.76	95% Gamma Adjusted KM-UCL (use when n<50)	14.84

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	6.0000E-4	Mean	8.72
Maximum	330	Median	0.505
SD	30.37	CV	3.483
k hat (MLE)	0.228	k star (bias corrected MLE)	0.228
Theta hat (MLE)	38.28	Theta star (bias corrected MLE)	38.29
nu hat (MLE)	71.08	nu star (bias corrected)	71.05
MLE Mean (bias corrected)	8.72	MLE Sd (bias corrected)	18.27
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (71.05, α)	52.64	Adjusted Chi Square Value (71.05, β)	52.49
95% Gamma Approximate UCL (use when n>=50)	11.77	95% Gamma Adjusted UCL (use when n<50)	11.8

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.124	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0792	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	8.722	Mean in Log Scale	-1.026
SD in Original Scale	30.37	SD in Log Scale	3.29
95% t UCL (assumes normality of ROS data)	12.75	95% Percentile Bootstrap UCL	13.23
95% BCA Bootstrap UCL	14.79	95% Bootstrap t UCL	17.34
95% H-UCL (Log ROS)	298.3		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	8.733	Mean in Log Scale	-0.82

SD in Original Scale	30.37	SD in Log Scale	3.112
95% t UCL (Assumes normality)	12.76	95% H-Stat UCL	182.3

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 23.92

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (lead)

General Statistics

Total Number of Observations	140	Number of Distinct Observations	106
Number of Detects	138	Number of Non-Detects	2
Number of Distinct Detects	104	Number of Distinct Non-Detects	2
Minimum Detect	2.3	Minimum Non-Detect	2
Maximum Detect	6700	Maximum Non-Detect	3
Variance Detects	452414	Percent Non-Detects	1.429%
Mean Detects	283.9	SD Detects	672.6
Median Detects	100	CV Detects	2.369
Skewness Detects	7.065	Kurtosis Detects	62.06
Mean of Logged Detects	4.484	SD of Logged Detects	1.628

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.408	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.338	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0754	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	279.9	Standard Error of Mean	56.51
SD	666.2	95% KM (BCA) UCL	380.9
95% KM (t) UCL	373.5	95% KM (Percentile Bootstrap) UCL	375.6
95% KM (z) UCL	372.8	95% KM Bootstrap t UCL	448.7
90% KM Chebyshev UCL	449.4	95% KM Chebyshev UCL	526.2
97.5% KM Chebyshev UCL	632.8	99% KM Chebyshev UCL	842.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.325	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.816	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.116	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.084	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.539	k star (bias corrected MLE)	0.532
Theta hat (MLE)	526.7	Theta star (bias corrected MLE)	533.6
nu hat (MLE)	148.8	nu star (bias corrected)	146.9
MLE Mean (bias corrected)	283.9	MLE Sd (bias corrected)	389.2

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.177	nu hat (KM)	49.42
Approximate Chi Square Value (49.42, α)	34.28	Adjusted Chi Square Value (49.42, β)	34.15
95% Gamma Approximate KM-UCL (use when n>=50)	403.5	95% Gamma Adjusted KM-UCL (use when n<50)	405

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	279.9
Maximum	6700	Median	100
SD	668.6	CV	2.389
k hat (MLE)	0.497	k star (bias corrected MLE)	0.491
Theta hat (MLE)	563.5	Theta star (bias corrected MLE)	570.3
nu hat (MLE)	139.1	nu star (bias corrected)	137.4
MLE Mean (bias corrected)	279.9	MLE Sd (bias corrected)	399.5
		Adjusted Level of Significance (β)	0.0483
Approximate Chi Square Value (137.41, α)	111.3	Adjusted Chi Square Value (137.41, β)	111.1
95% Gamma Approximate UCL (use when n>=50)	345.4	95% Gamma Adjusted UCL (use when n<50)	346.2

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.0708	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0754	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	279.9	Mean in Log Scale	4.424
SD in Original Scale	668.6	SD in Log Scale	1.692
95% t UCL (assumes normality of ROS data)	373.5	95% Percentile Bootstrap UCL	382.8
95% BCA Bootstrap UCL	435.9	95% Bootstrap t UCL	463.7
95% H-UCL (Log ROS)	530.5		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	4.43	95% H-UCL (KM -Log)	510.5
KM SD (logged)	1.671	95% Critical H Value (KM-Log)	2.892
KM Standard Error of Mean (logged)	0.142		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	279.9	Mean in Log Scale	4.423
SD in Original Scale	668.6	SD in Log Scale	1.695
95% t UCL (Assumes normality)	373.4	95% H-Stat UCL	532.7

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	632.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (mercury)

General Statistics

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Total Number of Observations	78	Number of Distinct Observations	47
Number of Detects	75	Number of Non-Detects	3
Number of Distinct Detects	46	Number of Distinct Non-Detects	1
Minimum Detect	0.028	Minimum Non-Detect	0.0835
Maximum Detect	4	Maximum Non-Detect	0.0835
Variance Detects	0.529	Percent Non-Detects	3.846%
Mean Detects	0.444	SD Detects	0.727
Median Detects	0.25	CV Detects	1.639
Skewness Detects	3.954	Kurtosis Detects	16.01
Mean of Logged Detects	-1.352	SD of Logged Detects	0.912

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.472	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.323	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.102	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.429	Standard Error of Mean	0.0812
SD	0.712	95% KM (BCA) UCL	0.577
95% KM (t) UCL	0.564	95% KM (Percentile Bootstrap) UCL	0.57
95% KM (z) UCL	0.563	95% KM Bootstrap t UCL	0.656
90% KM Chebyshev UCL	0.673	95% KM Chebyshev UCL	0.783
97.5% KM Chebyshev UCL	0.936	99% KM Chebyshev UCL	1.237

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.456	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.78	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.197	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.106	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.063	k star (bias corrected MLE)	1.029
Theta hat (MLE)	0.418	Theta star (bias corrected MLE)	0.431
nu hat (MLE)	159.4	nu star (bias corrected)	154.4
MLE Mean (bias corrected)	0.444	MLE Sd (bias corrected)	0.437

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.363	nu hat (KM)	56.67
Approximate Chi Square Value (56.67, α)	40.36	Adjusted Chi Square Value (56.67, β)	40.11
95% Gamma Approximate KM-UCL (use when n>=50)	0.603	95% Gamma Adjusted KM-UCL (use when n<50)	0.607

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.427
Maximum	4	Median	0.25
SD	0.718	CV	1.681
k hat (MLE)	0.93	k star (bias corrected MLE)	0.903
Theta hat (MLE)	0.459	Theta star (bias corrected MLE)	0.473
nu hat (MLE)	145.1	nu star (bias corrected)	140.8
MLE Mean (bias corrected)	0.427	MLE Sd (bias corrected)	0.45
		Adjusted Level of Significance (β)	0.0469
Approximate Chi Square Value (140.83, α)	114.4	Adjusted Chi Square Value (140.83, β)	114

95% Gamma Approximate UCL (use when n>=50)	0.526	95% Gamma Adjusted UCL (use when n<50)	0.528

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.116	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.102	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.429	Mean in Log Scale	-1.414
SD in Original Scale	0.717	SD in Log Scale	0.948
95% t UCL (assumes normality of ROS data)	0.564	95% Percentile Bootstrap UCL	0.578
95% BCA Bootstrap UCL	0.615	95% Bootstrap t UCL	0.655
95% H-UCL (Log ROS)	0.484		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.428	Mean in Log Scale	-1.422
SD in Original Scale	0.717	SD in Log Scale	0.961
95% t UCL (Assumes normality)	0.564	95% H-Stat UCL	0.489

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL	0.577

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (molybdenum)

General Statistics

Total Number of Observations	68	Number of Distinct Observations	16
Number of Detects	7	Number of Non-Detects	61
Number of Distinct Detects	7	Number of Distinct Non-Detects	11
Minimum Detect	0.22	Minimum Non-Detect	0.22
Maximum Detect	0.65	Maximum Non-Detect	2
Variance Detects	0.0228	Percent Non-Detects	89.71%
Mean Detects	0.36	SD Detects	0.151
Median Detects	0.33	CV Detects	0.419
Skewness Detects	1.36	Kurtosis Detects	1.663
Mean of Logged Detects	-1.088	SD of Logged Detects	0.383

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.869	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.267	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.335	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.249	Standard Error of Mean	0.0157
SD	0.085	95% KM (BCA) UCL	0.278
95% KM (t) UCL	0.275	95% KM (Percentile Bootstrap) UCL	0.275
95% KM (z) UCL	0.275	95% KM Bootstrap t UCL	0.299

90% KM Chebyshev UCL	0.296	95% KM Chebyshev UCL	0.318
97.5% KM Chebyshev UCL	0.347	99% KM Chebyshev UCL	0.406

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.329	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.709	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.229	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.312	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	7.691	k star (bias corrected MLE)	4.49
Theta hat (MLE)	0.0468	Theta star (bias corrected MLE)	0.0802
nu hat (MLE)	107.7	nu star (bias corrected)	62.86
MLE Mean (bias corrected)	0.36	MLE Sd (bias corrected)	0.17

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	8.596	nu hat (KM)	1169
Approximate Chi Square Value (N/A, α)	1091	Adjusted Chi Square Value (N/A, β)	1089
95% Gamma Approximate KM-UCL (use when n>=50)	0.267	95% Gamma Adjusted KM-UCL (use when n<50)	0.267

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.089
Maximum	0.65	Median	0.01
SD	0.136	CV	1.523
k hat (MLE)	0.579	k star (bias corrected MLE)	0.563
Theta hat (MLE)	0.154	Theta star (bias corrected MLE)	0.158
nu hat (MLE)	78.78	nu star (bias corrected)	76.63
MLE Mean (bias corrected)	0.089	MLE Sd (bias corrected)	0.119
		Adjusted Level of Significance (β)	0.0465
Approximate Chi Square Value (76.63, α)	57.47	Adjusted Chi Square Value (76.63, β)	57.11
95% Gamma Approximate UCL (use when n>=50)	0.119	95% Gamma Adjusted UCL (use when n<50)	0.119

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.205	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.335	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.142	Mean in Log Scale	-2.198
SD in Original Scale	0.114	SD in Log Scale	0.697
95% t UCL (assumes normality of ROS data)	0.165	95% Percentile Bootstrap UCL	0.166
95% BCA Bootstrap UCL	0.169	95% Bootstrap t UCL	0.17
95% H-UCL (Log ROS)	0.168		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-1.425	95% H-UCL (KM -Log)	0.26
KM SD (logged)	0.235	95% Critical H Value (KM-Log)	1.728
KM Standard Error of Mean (logged)	0.0436		

DL/2 Statistics

DL/2 Normal **DL/2 Log-Transformed**

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Mean in Original Scale	0.511	Mean in Log Scale	-1.054
SD in Original Scale	0.378	SD in Log Scale	0.949
95% t UCL (Assumes normality)	0.587	95% H-Stat UCL	0.708

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.275	95% KM (Percentile Bootstrap) UCL	0.275

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (naphthalene)

General Statistics

Total Number of Observations	158	Number of Distinct Observations	108
Number of Detects	123	Number of Non-Detects	35
Number of Distinct Detects	101	Number of Distinct Non-Detects	15
Minimum Detect	0.002	Minimum Non-Detect	0.005
Maximum Detect	15000	Maximum Non-Detect	12
Variance Detects	1829046	Percent Non-Detects	22.15%
Mean Detects	129.1	SD Detects	1352
Median Detects	0.53	CV Detects	10.48
Skewness Detects	11.08	Kurtosis Detects	122.8
Mean of Logged Detects	-0.891	SD of Logged Detects	2.726

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.0965	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.497	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0799	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	100.5	Standard Error of Mean	95.03
SD	1190	95% KM (BCA) UCL	290.7
95% KM (t) UCL	257.8	95% KM (Percentile Bootstrap) UCL	290
95% KM (z) UCL	256.8	95% KM Bootstrap t UCL	12791
90% KM Chebyshev UCL	385.6	95% KM Chebyshev UCL	514.7
97.5% KM Chebyshev UCL	694	99% KM Chebyshev UCL	1046

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	22.37	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.981	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.354	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.0948	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.136	k star (bias corrected MLE)	0.138
Theta hat (MLE)	952.1	Theta star (bias corrected MLE)	937.5
nu hat (MLE)	33.35	nu star (bias corrected)	33.87
MLE Mean (bias corrected)	129.1	MLE Sd (bias corrected)	347.9

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.00714	nu hat (KM)	2.256
Approximate Chi Square Value (2.26, α)	0.191	Adjusted Chi Square Value (2.26, β)	0.188
95% Gamma Approximate KM-UCL (use when n>=50)	1186	95% Gamma Adjusted KM-UCL (use when n<50)	1209

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.002	Mean	100.5
Maximum	15000	Median	0.145
SD	1193	CV	11.87
k hat (MLE)	0.125	k star (bias corrected MLE)	0.127
Theta hat (MLE)	805.6	Theta star (bias corrected MLE)	793.9
nu hat (MLE)	39.42	nu star (bias corrected)	40
MLE Mean (bias corrected)	100.5	MLE Sd (bias corrected)	282.5
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (40.00, α)	26.51	Adjusted Chi Square Value (40.00, β)	26.41
95% Gamma Approximate UCL (use when n>=50)	151.6	95% Gamma Adjusted UCL (use when n<50)	152.2

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.0482	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0799	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	100.5	Mean in Log Scale	-1.673
SD in Original Scale	1193	SD in Log Scale	2.928
95% t UCL (assumes normality of ROS data)	257.6	95% Percentile Bootstrap UCL	289.8
95% BCA Bootstrap UCL	389.3	95% Bootstrap t UCL	13308
95% H-UCL (Log ROS)	38.95		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-1.649	95% H-UCL (KM -Log)	36.12
KM SD (logged)	2.9	95% Critical H Value (KM-Log)	4.454
KM Standard Error of Mean (logged)	0.239		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	100.6	Mean in Log Scale	-1.35
SD in Original Scale	1193	SD in Log Scale	2.751
95% t UCL (Assumes normality)	257.7	95% H-Stat UCL	29.09

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 694

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (naphthalene_voc)

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Number of Detects	7	Number of Non-Detects	4
Number of Distinct Detects	7	Number of Distinct Non-Detects	3
Minimum Detect	0.367	Minimum Non-Detect	0.05
Maximum Detect	91	Maximum Non-Detect	1
Variance Detects	1132	Percent Non-Detects	36.36%
Mean Detects	15	SD Detects	33.64
Median Detects	1.3	CV Detects	2.243
Skewness Detects	2.604	Kurtosis Detects	6.822
Mean of Logged Detects	0.873	SD of Logged Detects	1.89

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.514	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.429	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.335	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	9.605	Standard Error of Mean	8.42
SD	25.85	95% KM (BCA) UCL	26.02
95% KM (t) UCL	24.87	95% KM (Percentile Bootstrap) UCL	25.56
95% KM (z) UCL	23.45	95% KM Bootstrap t UCL	418
90% KM Chebyshev UCL	34.86	95% KM Chebyshev UCL	46.31
97.5% KM Chebyshev UCL	62.19	99% KM Chebyshev UCL	93.38

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.962	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.774	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.363	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.333	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.364	k star (bias corrected MLE)	0.303
Theta hat (MLE)	41.21	Theta star (bias corrected MLE)	49.47
nu hat (MLE)	5.097	nu star (bias corrected)	4.246
MLE Mean (bias corrected)	15	MLE Sd (bias corrected)	27.24

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.138	nu hat (KM)	3.037
Approximate Chi Square Value (3.04, α)	0.383	Adjusted Chi Square Value (3.04, β)	0.269
95% Gamma Approximate KM-UCL (use when n>=50)	76.08	95% Gamma Adjusted KM-UCL (use when n<50)	108.3

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	9.551
Maximum	91	Median	0.61
SD	27.14	CV	2.841
k hat (MLE)	0.215	k star (bias corrected MLE)	0.217
Theta hat (MLE)	44.32	Theta star (bias corrected MLE)	43.95
nu hat (MLE)	4.74	nu star (bias corrected)	4.781
MLE Mean (bias corrected)	9.551	MLE Sd (bias corrected)	20.49

		Adjusted Level of Significance (β)	0.0278
Approximate Chi Square Value (4.78, α)	1.052	Adjusted Chi Square Value (4.78, β)	0.8
95% Gamma Approximate UCL (use when n>=50)	43.39	95% Gamma Adjusted UCL (use when n<50)	57.11

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.868	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.281	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.335	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	9.575	Mean in Log Scale	-0.527
SD in Original Scale	27.13	SD in Log Scale	2.492
95% t UCL (assumes normality of ROS data)	24.4	95% Percentile Bootstrap UCL	25.52
95% BCA Bootstrap UCL	34.28	95% Bootstrap t UCL	420
95% H-UCL (Log ROS)	1881		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-0.329	95% H-UCL (KM -Log)	396
KM SD (logged)	2.197	95% Critical H Value (KM-Log)	5.607
KM Standard Error of Mean (logged)	0.741		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	9.652	Mean in Log Scale	-0.0948
SD in Original Scale	27.1	SD in Log Scale	2.134
95% t UCL (Assumes normality)	24.46	95% H-Stat UCL	354.1

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

99% KM (Chebyshev) UCL 93.38

Warning: Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (nickel)

General Statistics

Total Number of Observations	77	Number of Distinct Observations	40
		Number of Missing Observations	0
Minimum	7.9	Mean	115.1
Maximum	421	Median	110
SD	50.82	Std. Error of Mean	5.792
Coefficient of Variation	0.442	Skewness	3.262

Normal GOF Test

Shapiro Wilk Test Statistic	0.759	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.202	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.101	Data Not Normal at 5% Significance Level	

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	124.7	95% Adjusted-CLT UCL (Chen-1995)	126.9
		95% Modified-t UCL (Johnson-1978)	125.1

Gamma GOF Test

A-D Test Statistic	2.4	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.753	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.146	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.102	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.241	k star (bias corrected MLE)	6.006
Theta hat (MLE)	18.44	Theta star (bias corrected MLE)	19.16
nu hat (MLE)	961	nu star (bias corrected)	924.9
MLE Mean (bias corrected)	115.1	MLE Sd (bias corrected)	46.96
		Approximate Chi Square Value (0.05)	855.3
Adjusted Level of Significance	0.0469	Adjusted Chi Square Value	854.1

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	124.4	95% Adjusted Gamma UCL (use when n<50)	124.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.822	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	6.968E-13	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.148	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.101	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.067	Mean of logged Data	4.663
Maximum of Logged Data	6.043	SD of logged Data	0.443

Assuming Lognormal Distribution

95% H-UCL	128.3	90% Chebyshev (MVUE) UCL	135.2
95% Chebyshev (MVUE) UCL	143.6	97.5% Chebyshev (MVUE) UCL	155.2
99% Chebyshev (MVUE) UCL	178		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	124.6	95% Jackknife UCL	124.7
95% Standard Bootstrap UCL	124.5	95% Bootstrap-t UCL	128.3
95% Hall's Bootstrap UCL	138.9	95% Percentile Bootstrap UCL	124.9
95% BCA Bootstrap UCL	127.3		
90% Chebyshev(Mean, Sd) UCL	132.5	95% Chebyshev(Mean, Sd) UCL	140.3
97.5% Chebyshev(Mean, Sd) UCL	151.2	99% Chebyshev(Mean, Sd) UCL	172.7

Suggested UCL to Use

95% Student's-t UCL	124.7	or 95% Modified-t UCL	125.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

For additional insight the user may want to consult a statistician.

Chemical (phenanthrene)

General Statistics

Total Number of Observations	158	Number of Distinct Observations	114
Number of Detects	131	Number of Non-Detects	27
Number of Distinct Detects	107	Number of Distinct Non-Detects	13
Minimum Detect	0.001	Minimum Non-Detect	0.005
Maximum Detect	1900	Maximum Non-Detect	12
Variance Detects	28223	Percent Non-Detects	17.09%
Mean Detects	28.15	SD Detects	168
Median Detects	2	CV Detects	5.968
Skewness Detects	10.82	Kurtosis Detects	121.1
Mean of Logged Detects	0.198	SD of Logged Detects	2.96

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.167	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.433	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0774	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	23.36	Standard Error of Mean	12.2
SD	152.8	95% KM (BCA) UCL	49.58
95% KM (t) UCL	43.54	95% KM (Percentile Bootstrap) UCL	46.54
95% KM (z) UCL	43.42	95% KM Bootstrap t UCL	119.2
90% KM Chebyshev UCL	59.95	95% KM Chebyshev UCL	76.53
97.5% KM Chebyshev UCL	99.54	99% KM Chebyshev UCL	144.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	5.02	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.904	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.138	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.0899	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.229	k star (bias corrected MLE)	0.229
Theta hat (MLE)	122.7	Theta star (bias corrected MLE)	122.8
nu hat (MLE)	60.09	nu star (bias corrected)	60.05
MLE Mean (bias corrected)	28.15	MLE Sd (bias corrected)	58.8

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0234	nu hat (KM)	7.387
Approximate Chi Square Value (7.39, α)	2.386	Adjusted Chi Square Value (7.39, β)	2.36
95% Gamma Approximate KM-UCL (use when n>=50)	72.32	95% Gamma Adjusted KM-UCL (use when n<50)	73.12

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.001	Mean	23.34
Maximum	1900	Median	0.67
SD	153.2	CV	6.566

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

k hat (MLE)	0.196	k star (bias corrected MLE)	0.196
Theta hat (MLE)	119.3	Theta star (bias corrected MLE)	119
nu hat (MLE)	61.84	nu star (bias corrected)	62
MLE Mean (bias corrected)	23.34	MLE Sd (bias corrected)	52.69
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (62.00, α)	44.89	Adjusted Chi Square Value (62.00, β)	44.75
95% Gamma Approximate UCL (use when n>=50)	32.24	95% Gamma Adjusted UCL (use when n<50)	32.33

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.096	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0774	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	23.35	Mean in Log Scale	-0.505
SD in Original Scale	153.2	SD in Log Scale	3.164
95% t UCL (assumes normality of ROS data)	43.52	95% Percentile Bootstrap UCL	46.75
95% BCA Bootstrap UCL	63.81	95% Bootstrap t UCL	118.4
95% H-UCL (Log ROS)	302.6		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	23.39	Mean in Log Scale	-0.331
SD in Original Scale	153.2	SD in Log Scale	3.022
95% t UCL (Assumes normality)	43.56	95% H-Stat UCL	210.3

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	99.54

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (polycyclic aromatic hydrocarbons)

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	1.1	Mean	82.36
Maximum	270	Median	11.05
SD	120.7	Std. Error of Mean	38.18
Coefficient of Variation	1.466	Skewness	1.035

Normal GOF Test

Shapiro Wilk Test Statistic	0.657	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.383	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.28	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL	**95% UCLs (Adjusted for Skewness)**

95% Student's-t UCL	152.3	95% Adjusted-CLT UCL (Chen-1995)	158.5
		95% Modified-t UCL (Johnson-1978)	154.4

Gamma GOF Test

A-D Test Statistic	0.862	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.8	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.217	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.285	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.375	k star (bias corrected MLE)	0.329
Theta hat (MLE)	219.7	Theta star (bias corrected MLE)	250.3
nu hat (MLE)	7.496	nu star (bias corrected)	6.58
MLE Mean (bias corrected)	82.36	MLE Sd (bias corrected)	143.6
		Approximate Chi Square Value (0.05)	1.943
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	1.537

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	278.9	95% Adjusted Gamma UCL (use when n<50)	352.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.86	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.197	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.0953	Mean of logged Data	2.637
Maximum of Logged Data	5.598	SD of logged Data	2.251

Assuming Lognormal Distribution

95% H-UCL	15933	90% Chebyshev (MVUE) UCL	307.8
95% Chebyshev (MVUE) UCL	402.8	97.5% Chebyshev (MVUE) UCL	534.6
99% Chebyshev (MVUE) UCL	793.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	145.2	95% Jackknife UCL	152.3
95% Standard Bootstrap UCL	142	95% Bootstrap-t UCL	164.9
95% Hall's Bootstrap UCL	120.3	95% Percentile Bootstrap UCL	136.3
95% BCA Bootstrap UCL	156.3		
90% Chebyshev(Mean, Sd) UCL	196.9	95% Chebyshev(Mean, Sd) UCL	248.8
97.5% Chebyshev(Mean, Sd) UCL	320.8	99% Chebyshev(Mean, Sd) UCL	462.2

Suggested UCL to Use

95% Adjusted Gamma UCL	352.5

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Chemical (pyrene)

General Statistics

Total Number of Observations	156	Number of Distinct Observations	117
Number of Detects	134	Number of Non-Detects	22
Number of Distinct Detects	112	Number of Distinct Non-Detects	11
Minimum Detect	0.001	Minimum Non-Detect	0.005
Maximum Detect	1900	Maximum Non-Detect	0.657
Variance Detects	29036	Percent Non-Detects	14.1%
Mean Detects	37.72	SD Detects	170.4
Median Detects	2.5	CV Detects	4.518
Skewness Detects	10.04	Kurtosis Detects	109.3
Mean of Logged Detects	0.592	SD of Logged Detects	3.144

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.227	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.412	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0765	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	32.4	Standard Error of Mean	12.69
SD	157.9	95% KM (BCA) UCL	58.48
95% KM (t) UCL	53.4	95% KM (Percentile Bootstrap) UCL	55.34
95% KM (z) UCL	53.27	95% KM Bootstrap t UCL	95.95
90% KM Chebyshev UCL	70.47	95% KM Chebyshev UCL	87.71
97.5% KM Chebyshev UCL	111.6	99% KM Chebyshev UCL	158.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.03	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.9	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0969	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.0889	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.236	k star (bias corrected MLE)	0.236
Theta hat (MLE)	159.8	Theta star (bias corrected MLE)	160.1
nu hat (MLE)	63.24	nu star (bias corrected)	63.15
MLE Mean (bias corrected)	37.72	MLE Sd (bias corrected)	77.7

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0421	nu hat (KM)	13.14
Approximate Chi Square Value (13.14, α)	5.989	Adjusted Chi Square Value (13.14, β)	5.944
95% Gamma Approximate KM-UCL (use when n>=50)	71.11	95% Gamma Adjusted KM-UCL (use when n<50)	71.65

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.001	Mean	32.4
Maximum	1900	Median	1.6
SD	158.4	CV	4.889
k hat (MLE)	0.203	k star (bias corrected MLE)	0.203
Theta hat (MLE)	159.7	Theta star (bias corrected MLE)	159.4

nu hat (MLE)	63.3	nu star (bias corrected)	63.42
MLE Mean (bias corrected)	32.4	MLE Sd (bias corrected)	71.87
		Adjusted Level of Significance (β)	0.0485
Approximate Chi Square Value (63.42, α)	46.1	Adjusted Chi Square Value (63.42, β)	45.96
95% Gamma Approximate UCL (use when n>=50)	44.57	95% Gamma Adjusted UCL (use when n<50)	44.71

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.091	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0765	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	32.4	Mean in Log Scale	-0.0426
SD in Original Scale	158.4	SD in Log Scale	3.343
95% t UCL (assumes normality of ROS data)	53.39	95% Percentile Bootstrap UCL	55.51
95% BCA Bootstrap UCL	70.22	95% Bootstrap t UCL	96.72
95% H-UCL (Log ROS)	992		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	32.41	Mean in Log Scale	0.0858
SD in Original Scale	158.4	SD in Log Scale	3.214
95% t UCL (Assumes normality)	53.4	95% H-Stat UCL	669.2

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	111.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (silver)

General Statistics

Total Number of Observations	73	Number of Distinct Observations	19
Number of Detects	6	Number of Non-Detects	67
Number of Distinct Detects	5	Number of Distinct Non-Detects	14
Minimum Detect	0.6	Minimum Non-Detect	0.17
Maximum Detect	1.2	Maximum Non-Detect	1
Variance Detects	0.0444	Percent Non-Detects	91.78%
Mean Detects	0.792	SD Detects	0.211
Median Detects	0.725	CV Detects	0.266
Skewness Detects	1.905	Kurtosis Detects	4.144
Mean of Logged Detects	-0.259	SD of Logged Detects	0.236

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.788	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.318	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.362	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.252	Standard Error of Mean	0.0346
SD	0.213	95% KM (BCA) UCL	0.31
95% KM (t) UCL	0.31	95% KM (Percentile Bootstrap) UCL	0.305
95% KM (z) UCL	0.309	95% KM Bootstrap t UCL	0.288
90% KM Chebyshev UCL	0.356	95% KM Chebyshev UCL	0.403
97.5% KM Chebyshev UCL	0.468	99% KM Chebyshev UCL	0.597

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.587	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.697	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.285	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.332	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	20.03	k star (bias corrected MLE)	10.13
Theta hat (MLE)	0.0395	Theta star (bias corrected MLE)	0.0782
nu hat (MLE)	240.4	nu star (bias corrected)	121.5
MLE Mean (bias corrected)	0.792	MLE Sd (bias corrected)	0.249

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	1.41	nu hat (KM)	205.9
Approximate Chi Square Value (205.88, α)	173.7	Adjusted Chi Square Value (205.88, β)	173.1
95% Gamma Approximate KM-UCL (use when n>=50)	0.299	95% Gamma Adjusted KM-UCL (use when n<50)	0.3

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.218
Maximum	1.2	Median	0.153
SD	0.239	CV	1.096
k hat (MLE)	0.648	k star (bias corrected MLE)	0.631
Theta hat (MLE)	0.336	Theta star (bias corrected MLE)	0.345
nu hat (MLE)	94.66	nu star (bias corrected)	92.1
MLE Mean (bias corrected)	0.218	MLE Sd (bias corrected)	0.274
		Adjusted Level of Significance (β)	0.0467
Approximate Chi Square Value (92.10, α)	70.97	Adjusted Chi Square Value (92.10, β)	70.6
95% Gamma Approximate UCL (use when n>=50)	0.283	95% Gamma Adjusted UCL (use when n<50)	0.284

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.857	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.273	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.362	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.376	Mean in Log Scale	-1.057
SD in Original Scale	0.169	SD in Log Scale	0.388
95% t UCL (assumes normality of ROS data)	0.409	95% Percentile Bootstrap UCL	0.409
95% BCA Bootstrap UCL	0.417	95% Bootstrap t UCL	0.416
95% H-UCL (Log ROS)	0.407		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-1.565	95% H-UCL (KM -Log)	0.268
KM SD (logged)	0.517	95% Critical H Value (KM-Log)	1.863

KM Standard Error of Mean (logged)	0.0867

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.327	Mean in Log Scale	-1.443
SD in Original Scale	0.238	SD in Log Scale	0.855
95% t UCL (Assumes normality)	0.373	95% H-Stat UCL	0.422

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.31	95% KM (Percentile Bootstrap) UCL	0.305

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (thallium)

General Statistics

Total Number of Observations	68	Number of Distinct Observations	21
Number of Detects	5	Number of Non-Detects	63
Number of Distinct Detects	4	Number of Distinct Non-Detects	18
Minimum Detect	0.56	Minimum Non-Detect	0.49
Maximum Detect	0.79	Maximum Non-Detect	5
Variance Detects	0.00943	Percent Non-Detects	92.65%
Mean Detects	0.636	SD Detects	0.0971
Median Detects	0.6	CV Detects	0.153
Skewness Detects	1.259	Kurtosis Detects	0.887
Mean of Logged Detects	-0.461	SD of Logged Detects	0.146

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.853	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.245	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.396	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.514	Standard Error of Mean	0.0126
SD	0.0631	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.535	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.535	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.552	95% KM Chebyshev UCL	0.569
97.5% KM Chebyshev UCL	0.593	99% KM Chebyshev UCL	0.64

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.43	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.678	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.252	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	57.14	k star (bias corrected MLE)	22.99

Theta hat (MLE)	0.0111	Theta star (bias corrected MLE)	0.0277
nu hat (MLE)	571.4	nu star (bias corrected)	229.9
MLE Mean (bias corrected)	0.636	MLE Sd (bias corrected)	0.133

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	66.47	nu hat (KM)	9040
Approximate Chi Square Value (N/A, α)	8820	Adjusted Chi Square Value (N/A, β)	8816
95% Gamma Approximate KM-UCL (use when n>=50)	0.527	95% Gamma Adjusted KM-UCL (use when n<50)	0.527

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0601	Mean	0.351
Maximum	0.79	Median	0.342
SD	0.143	CV	0.406
k hat (MLE)	5.815	k star (bias corrected MLE)	5.568
Theta hat (MLE)	0.0604	Theta star (bias corrected MLE)	0.0631
nu hat (MLE)	790.8	nu star (bias corrected)	757.3
MLE Mean (bias corrected)	0.351	MLE Sd (bias corrected)	0.149
		Adjusted Level of Significance (β)	0.0465
Approximate Chi Square Value (757.26, α)	694.4	Adjusted Chi Square Value (757.26, β)	693.1
95% Gamma Approximate UCL (use when n>=50)	0.383	95% Gamma Adjusted UCL (use when n<50)	0.384

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.869	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.233	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.396	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.408	Mean in Log Scale	-0.926
SD in Original Scale	0.105	SD in Log Scale	0.241
95% t UCL (assumes normality of ROS data)	0.429	95% Percentile Bootstrap UCL	0.429
95% BCA Bootstrap UCL	0.432	95% Bootstrap t UCL	0.431
95% H-UCL (Log ROS)	0.429		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-0.671	95% H-UCL (KM -Log)	0.525
KM SD (logged)	0.105	95% Critical H Value (KM-Log)	1.683
KM Standard Error of Mean (logged)	0.0213		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.623	Mean in Log Scale	-0.649
SD in Original Scale	0.385	SD in Log Scale	0.602
95% t UCL (Assumes normality)	0.701	95% H-Stat UCL	0.722

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.535	95% KM (Percentile Bootstrap) UCL	N/A

Warning: One or more Recommended UCL(s) not available!

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (toluene)

General Statistics

Total Number of Observations	78	Number of Distinct Observations	51
Number of Detects	9	Number of Non-Detects	69
Number of Distinct Detects	9	Number of Distinct Non-Detects	43
Minimum Detect	0.003	Minimum Non-Detect	1.2000E-4
Maximum Detect	180	Maximum Non-Detect	0.43
Variance Detects	3598	Percent Non-Detects	88.46%
Mean Detects	20.04	SD Detects	59.99
Median Detects	0.0093	CV Detects	2.994
Skewness Detects	3	Kurtosis Detects	9
Mean of Logged Detects	-3.36	SD of Logged Detects	3.462

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.391	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.518	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.295	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	2.312	Standard Error of Mean	2.432
SD	20.25	95% KM (BCA) UCL	6.931
95% KM (t) UCL	6.361	95% KM (Percentile Bootstrap) UCL	6.927
95% KM (z) UCL	6.312	95% KM Bootstrap t UCL	16051
90% KM Chebyshev UCL	9.608	95% KM Chebyshev UCL	12.91
97.5% KM Chebyshev UCL	17.5	99% KM Chebyshev UCL	26.51

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.17	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.915	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.431	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.315	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.124	k star (bias corrected MLE)	0.157
Theta hat (MLE)	161.4	Theta star (bias corrected MLE)	127.8
nu hat (MLE)	2.235	nu star (bias corrected)	2.823
MLE Mean (bias corrected)	20.04	MLE Sd (bias corrected)	50.6

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.013	nu hat (KM)	2.034
Approximate Chi Square Value (2.03, α)	0.155	Adjusted Chi Square Value (2.03, β)	0.15
95% Gamma Approximate KM-UCL (use when n>=50)	30.28	95% Gamma Adjusted KM-UCL (use when n<50)	31.3

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Minimum	0.003	Mean	2.321
Maximum	180	Median	0.01
SD	20.38	CV	8.781
k hat (MLE)	0.146	k star (bias corrected MLE)	0.149
Theta hat (MLE)	15.95	Theta star (bias corrected MLE)	15.63
nu hat (MLE)	22.71	nu star (bias corrected)	23.17
MLE Mean (bias corrected)	2.321	MLE Sd (bias corrected)	6.023
		Adjusted Level of Significance (β)	0.0469
Approximate Chi Square Value (23.17, α)	13.22	Adjusted Chi Square Value (23.17, β)	13.07
95% Gamma Approximate UCL (use when n>=50)	4.068	95% Gamma Adjusted UCL (use when n<50)	4.112

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.672	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.343	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.295	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.312	Mean in Log Scale	-16.37
SD in Original Scale	20.38	SD in Log Scale	5.626
95% t UCL (assumes normality of ROS data)	6.154	95% Percentile Bootstrap UCL	6.927
95% BCA Bootstrap UCL	9.25	95% Bootstrap t UCL	19304
95% H-UCL (Log ROS)	141.4		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.316	Mean in Log Scale	-6.764
SD in Original Scale	20.38	SD in Log Scale	2.132
95% t UCL (Assumes normality)	6.158	95% H-Stat UCL	0.0269

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 17.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (tph-diesel)

General Statistics

Total Number of Observations	139	Number of Distinct Observations	95
Number of Detects	111	Number of Non-Detects	28
Number of Distinct Detects	91	Number of Distinct Non-Detects	4
Minimum Detect	1.3	Minimum Non-Detect	0.99
Maximum Detect	18000	Maximum Non-Detect	10
Variance Detects	4544556	Percent Non-Detects	20.14%
Mean Detects	781.3	SD Detects	2132
Median Detects	83	CV Detects	2.728
Skewness Detects	5.594	Kurtosis Detects	39.81
Mean of Logged Detects	4.421	SD of Logged Detects	2.29

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.422	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.357	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0841	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	624.5	Standard Error of Mean	163.8
SD	1922	95% KM (BCA) UCL	935.8
95% KM (t) UCL	895.7	95% KM (Percentile Bootstrap) UCL	911.6
95% KM (z) UCL	893.9	95% KM Bootstrap t UCL	1056
90% KM Chebyshev UCL	1116	95% KM Chebyshev UCL	1338
97.5% KM Chebyshev UCL	1647	99% KM Chebyshev UCL	2254

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	5.019	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.866	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.172	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.0939	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.307	k star (bias corrected MLE)	0.304
Theta hat (MLE)	2548	Theta star (bias corrected MLE)	2567
nu hat (MLE)	68.08	nu star (bias corrected)	67.58
MLE Mean (bias corrected)	781.3	MLE Sd (bias corrected)	1416

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.106	nu hat (KM)	29.35
Approximate Chi Square Value (29.35, α)	17.99	Adjusted Chi Square Value (29.35, β)	17.89
95% Gamma Approximate KM-UCL (use when n>=50)	1019	95% Gamma Adjusted KM-UCL (use when n<50)	1025

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	623.9
Maximum	18000	Median	24
SD	1929	CV	3.092
k hat (MLE)	0.193	k star (bias corrected MLE)	0.194
Theta hat (MLE)	3232	Theta star (bias corrected MLE)	3222
nu hat (MLE)	53.66	nu star (bias corrected)	53.84
MLE Mean (bias corrected)	623.9	MLE Sd (bias corrected)	1418
		Adjusted Level of Significance (β)	0.0483
Approximate Chi Square Value (53.84, α)	37.98	Adjusted Chi Square Value (53.84, β)	37.84
95% Gamma Approximate UCL (use when n>=50)	884.4	95% Gamma Adjusted UCL (use when n<50)	887.7

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.0903	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0841	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	624.5	Mean in Log Scale	3.597
SD in Original Scale	1929	SD in Log Scale	2.695
95% t UCL (assumes normality of ROS data)	895.4	95% Percentile Bootstrap UCL	907.2
95% BCA Bootstrap UCL	1045	95% Bootstrap t UCL	1072

95% H-UCL (Log ROS) 3564

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	624.5	Mean in Log Scale	3.716
SD in Original Scale	1929	SD in Log Scale	2.493
95% t UCL (Assumes normality)	895.4	95% H-Stat UCL	2099

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 1647

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (tph-gasoline)

General Statistics

Total Number of Observations	75	Number of Distinct Observations	35
Number of Detects	5	Number of Non-Detects	70
Number of Distinct Detects	5	Number of Distinct Non-Detects	31
Minimum Detect	0.17	Minimum Non-Detect	0.061
Maximum Detect	1800	Maximum Non-Detect	0.5
Variance Detects	641137	Percent Non-Detects	93.33%
Mean Detects	368	SD Detects	800.7
Median Detects	0.42	CV Detects	2.176
Skewness Detects	2.234	Kurtosis Detects	4.991
Mean of Logged Detects	1.392	SD of Logged Detects	4.07

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.567	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.459	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.396	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	24.59	Standard Error of Mean	26.65
SD	206.4	95% KM (BCA) UCL	73.11
95% KM (t) UCL	68.98	95% KM (Percentile Bootstrap) UCL	72.6
95% KM (z) UCL	68.43	95% KM Bootstrap t UCL	63223
90% KM Chebyshev UCL	104.5	95% KM Chebyshev UCL	140.8
97.5% KM Chebyshev UCL	191	99% KM Chebyshev UCL	289.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.653	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.805	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.343	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.394	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.167	k star (bias corrected MLE)	0.2

Theta hat (MLE)	2198	Theta star (bias corrected MLE)	1837
nu hat (MLE)	1.674	nu star (bias corrected)	2.003
MLE Mean (bias corrected)	368	MLE Sd (bias corrected)	822.1

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0142	nu hat (KM)	2.129
Approximate Chi Square Value (2.13, α)	0.169	Adjusted Chi Square Value (2.13, β)	0.163
95% Gamma Approximate KM-UCL (use when n>=50)	309.1	95% Gamma Adjusted KM-UCL (use when n<50)	320.8

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	24.54
Maximum	1800	Median	0.01
SD	207.8	CV	8.469
k hat (MLE)	0.109	k star (bias corrected MLE)	0.113
Theta hat (MLE)	226.1	Theta star (bias corrected MLE)	217
nu hat (MLE)	16.28	nu star (bias corrected)	16.96
MLE Mean (bias corrected)	24.54	MLE Sd (bias corrected)	72.98
		Adjusted Level of Significance (β)	0.0468
Approximate Chi Square Value (16.96, α)	8.644	Adjusted Chi Square Value (16.96, β)	8.527
95% Gamma Approximate UCL (use when n>=50)	48.15	95% Gamma Adjusted UCL (use when n<50)	48.81

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.831	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.311	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.396	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	24.53	Mean in Log Scale	-16.83
SD in Original Scale	207.8	SD in Log Scale	7.119
95% t UCL (assumes normality of ROS data)	64.51	95% Percentile Bootstrap UCL	72.03
95% BCA Bootstrap UCL	120	95% Bootstrap t UCL	105147
95% H-UCL (Log ROS)	34177251		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.481	95% H-UCL (KM -Log)	0.354
KM SD (logged)	1.413	95% Critical H Value (KM-Log)	2.699
KM Standard Error of Mean (logged)	0.186		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	24.63	Mean in Log Scale	-2.148
SD in Original Scale	207.8	SD in Log Scale	1.456
95% t UCL (Assumes normality)	64.6	95% H-Stat UCL	0.537

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	68.98	95% GROS Approximate Gamma UCL	48.15
95% Approximate Gamma KM-UCL	309.1		

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (tph-motor oil)

General Statistics

Total Number of Observations	147	Number of Distinct Observations	79
Number of Detects	91	Number of Non-Detects	56
Number of Distinct Detects	74	Number of Distinct Non-Detects	8
Minimum Detect	6.7	Minimum Non-Detect	1.7
Maximum Detect	18000	Maximum Non-Detect	14000
Variance Detects	7095695	Percent Non-Detects	38.1%
Mean Detects	1389	SD Detects	2664
Median Detects	278	CV Detects	1.918
Skewness Detects	3.629	Kurtosis Detects	17.24
Mean of Logged Detects	5.821	SD of Logged Detects	1.804

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.57	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.302	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.0929	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	871.1	Standard Error of Mean	182.1
SD	2192	95% KM (BCA) UCL	1201
95% KM (t) UCL	1173	95% KM (Percentile Bootstrap) UCL	1194
95% KM (z) UCL	1171	95% KM Bootstrap t UCL	1264
90% KM Chebyshev UCL	1418	95% KM Chebyshev UCL	1665
97.5% KM Chebyshev UCL	2009	99% KM Chebyshev UCL	2683

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.79	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.829	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.157	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.0997	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.455	k star (bias corrected MLE)	0.448
Theta hat (MLE)	3049	Theta star (bias corrected MLE)	3101
nu hat (MLE)	82.9	nu star (bias corrected)	81.5
MLE Mean (bias corrected)	1389	MLE Sd (bias corrected)	2075

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.158	nu hat (KM)	46.45
Approximate Chi Square Value (46.45, α)	31.81	Adjusted Chi Square Value (46.45, β)	31.69
95% Gamma Approximate KM-UCL (use when n>=50)	1272	95% Gamma Adjusted KM-UCL (use when n<50)	1277

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	859.6
Maximum	18000	Median	64.8
SD	2198	CV	2.557
k hat (MLE)	0.156	k star (bias corrected MLE)	0.157
Theta hat (MLE)	5519	Theta star (bias corrected MLE)	5471
nu hat (MLE)	45.79	nu star (bias corrected)	46.19
MLE Mean (bias corrected)	859.6	MLE Sd (bias corrected)	2169
		Adjusted Level of Significance (β)	0.0484
Approximate Chi Square Value (46.19, α)	31.6	Adjusted Chi Square Value (46.19, β)	31.48
95% Gamma Approximate UCL (use when n>=50)	1257	95% Gamma Adjusted UCL (use when n<50)	1261

Lognormal GOF Test on Detected Observations Only

Lilliefors Test Statistic	0.0606	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.0929	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	866.3	Mean in Log Scale	4.423
SD in Original Scale	2196	SD in Log Scale	2.421
95% t UCL (assumes normality of ROS data)	1166	95% Percentile Bootstrap UCL	1197
95% BCA Bootstrap UCL	1253	95% Bootstrap t UCL	1302
95% H-UCL (Log ROS)	3348		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	4.32	95% H-UCL (KM -Log)	4225
KM SD (logged)	2.53	95% Critical H Value (KM-Log)	3.951
KM Standard Error of Mean (logged)	0.236		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	923.6	Mean in Log Scale	4.798
SD in Original Scale	2249	SD in Log Scale	2.131
95% t UCL (Assumes normality)	1231	95% H-Stat UCL	2159

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 2009

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (vanadium)

General Statistics

Total Number of Observations	68	Number of Distinct Observations	37
		Number of Missing Observations	0
Minimum	25	Mean	52.75
Maximum	110	Median	48
SD	14.38	Std. Error of Mean	1.744
Coefficient of Variation	0.273	Skewness	1.707

Normal GOF Test

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Shapiro Wilk Test Statistic	0.857	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	9.7252E-9	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.173	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.107	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	55.66	95% Adjusted-CLT UCL (Chen-1995)	56.01
		95% Modified-t UCL (Johnson-1978)	55.72

Gamma GOF Test

A-D Test Statistic	2.106	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.75	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.136	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.108	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	16.16	k star (bias corrected MLE)	15.46
Theta hat (MLE)	3.265	Theta star (bias corrected MLE)	3.413
nu hat (MLE)	2198	nu star (bias corrected)	2102
MLE Mean (bias corrected)	52.75	MLE Sd (bias corrected)	13.42
		Approximate Chi Square Value (0.05)	1997
Adjusted Level of Significance	0.0465	Adjusted Chi Square Value	1994

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	55.54	95% Adjusted Gamma UCL (use when n<50)	55.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.946	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.0105	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.12	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.107	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.219	Mean of logged Data	3.934
Maximum of Logged Data	4.7	SD of logged Data	0.245

Assuming Lognormal Distribution

95% H-UCL	55.49	90% Chebyshev (MVUE) UCL	57.42
95% Chebyshev (MVUE) UCL	59.57	97.5% Chebyshev (MVUE) UCL	62.56
99% Chebyshev (MVUE) UCL	68.44		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	55.62	95% Jackknife UCL	55.66
95% Standard Bootstrap UCL	55.62	95% Bootstrap-t UCL	56.25
95% Hall's Bootstrap UCL	56.29	95% Percentile Bootstrap UCL	55.53
95% BCA Bootstrap UCL	55.95		
90% Chebyshev(Mean, Sd) UCL	57.99	95% Chebyshev(Mean, Sd) UCL	60.35
97.5% Chebyshev(Mean, Sd) UCL	63.64	99% Chebyshev(Mean, Sd) UCL	70.1

Suggested UCL to Use

95% Student's-t UCL	55.66	or 95% Modified-t UCL	55.72

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (xylenes)

General Statistics

Total Number of Observations	78	Number of Distinct Observations	56
Number of Detects	16	Number of Non-Detects	62
Number of Distinct Detects	13	Number of Distinct Non-Detects	43
Minimum Detect	0.001	Minimum Non-Detect	3.1000E-4
Maximum Detect	73	Maximum Non-Detect	0.013
Variance Detects	331.3	Percent Non-Detects	79.49%
Mean Detects	4.916	SD Detects	18.2
Median Detects	0.003	CV Detects	3.702
Skewness Detects	3.967	Kurtosis Detects	15.8
Mean of Logged Detects	-4.378	SD of Logged Detects	3.219

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.302	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.473	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.222	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	1.009	Standard Error of Mean	0.962
SD	8.225	95% KM (BCA) UCL	2.885
95% KM (t) UCL	2.61	95% KM (Percentile Bootstrap) UCL	2.881
95% KM (z) UCL	2.591	95% KM Bootstrap t UCL	1478
90% KM Chebyshev UCL	3.895	95% KM Chebyshev UCL	5.202
97.5% KM Chebyshev UCL	7.016	99% KM Chebyshev UCL	10.58

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.756	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.948	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.439	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.244	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.131	k star (bias corrected MLE)	0.148
Theta hat (MLE)	37.47	Theta star (bias corrected MLE)	33.16
nu hat (MLE)	4.198	nu star (bias corrected)	4.744
MLE Mean (bias corrected)	4.916	MLE Sd (bias corrected)	12.77

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0151	nu hat (KM)	2.348
Approximate Chi Square Value (2.35, α)	0.209	Adjusted Chi Square Value (2.35, β)	0.201
95% Gamma Approximate KM-UCL (use when n>=50)	11.35	95% Gamma Adjusted KM-UCL (use when n<50)	11.81

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.001	Mean	1.016
Maximum	73	Median	0.01
SD	8.277	CV	8.144
k hat (MLE)	0.166	k star (bias corrected MLE)	0.168
Theta hat (MLE)	6.139	Theta star (bias corrected MLE)	6.059
nu hat (MLE)	25.83	nu star (bias corrected)	26.17
MLE Mean (bias corrected)	1.016	MLE Sd (bias corrected)	2.482
		Adjusted Level of Significance (β)	0.0469
Approximate Chi Square Value (26.17, α)	15.51	Adjusted Chi Square Value (26.17, β)	15.35
95% Gamma Approximate UCL (use when n>=50)	1.715	95% Gamma Adjusted UCL (use when n<50)	1.732

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.643	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.417	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.222	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.009	Mean in Log Scale	-9.743
SD in Original Scale	8.278	SD in Log Scale	3.476
95% t UCL (assumes normality of ROS data)	2.569	95% Percentile Bootstrap UCL	2.875
95% BCA Bootstrap UCL	4.691	95% Bootstrap t UCL	1468
95% H-UCL (Log ROS)	0.214		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.011	Mean in Log Scale	-6.181
SD in Original Scale	8.278	SD in Log Scale	2.117
95% t UCL (Assumes normality)	2.571	95% H-Stat UCL	0.0461

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 7.016

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (zinc)

General Statistics

Total Number of Observations	77	Number of Distinct Observations	52
		Number of Missing Observations	0
Minimum	37	Mean	166.9
Maximum	995	Median	120
SD	160.3	Std. Error of Mean	18.27
Coefficient of Variation	0.96	Skewness	3.093

Normal GOF Test

Shapiro Wilk Test Statistic	0.669	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	

Lilliefors Test Statistic	0.247	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.101	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	197.3	95% Adjusted-CLT UCL (Chen-1995)	203.9
		95% Modified-t UCL (Johnson-1978)	198.4

Gamma GOF Test

A-D Test Statistic	2.388	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.763	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.161	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.103	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.984	k star (bias corrected MLE)	1.916
Theta hat (MLE)	84.12	Theta star (bias corrected MLE)	87.14
nu hat (MLE)	305.6	nu star (bias corrected)	295
MLE Mean (bias corrected)	166.9	MLE Sd (bias corrected)	120.6
		Approximate Chi Square Value (0.05)	256.2
Adjusted Level of Significance	0.0469	Adjusted Chi Square Value	255.6

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	192.2	95% Adjusted Gamma UCL (use when n<50)	192.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.0389	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.11	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.101	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.611	Mean of logged Data	4.845
Maximum of Logged Data	6.903	SD of logged Data	0.691

Assuming Lognormal Distribution

95% H-UCL	188.7	90% Chebyshev (MVUE) UCL	202.4
95% Chebyshev (MVUE) UCL	221.3	97.5% Chebyshev (MVUE) UCL	247.5
99% Chebyshev (MVUE) UCL	299		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	197	95% Jackknife UCL	197.3
95% Standard Bootstrap UCL	195.8	95% Bootstrap-t UCL	208.7
95% Hall's Bootstrap UCL	209.7	95% Percentile Bootstrap UCL	196.6
95% BCA Bootstrap UCL	203.6		
90% Chebyshev(Mean, Sd) UCL	221.7	95% Chebyshev(Mean, Sd) UCL	246.5
97.5% Chebyshev(Mean, Sd) UCL	281	99% Chebyshev(Mean, Sd) UCL	348.7

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	246.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN ON-SITE PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. For additional insight the user may want to consult a statistician.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	5/7/2015 5:37:47 PM
From File	Santa_Rosa_Soil_input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chemical (acenaphthene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	15
Number of Detects	7	Number of Non-Detects	14
Number of Distinct Detects	6	Number of Distinct Non-Detects	9
Minimum Detect	0.0031	Minimum Non-Detect	0.0014
Maximum Detect	0.69	Maximum Non-Detect	0.28
Variance Detects	0.0647	Percent Non-Detects	66.67%
Mean Detects	0.123	SD Detects	0.254
Median Detects	0.01	CV Detects	2.077
Skewness Detects	2.483	Kurtosis Detects	6.256
Mean of Logged Detects	-3.896	SD of Logged Detects	1.941

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.559	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.385	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.335	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.045	Standard Error of Mean	0.0349
SD	0.147	95% KM (BCA) UCL	0.112
95% KM (t) UCL	0.105	95% KM (Percentile Bootstrap) UCL	0.105
95% KM (z) UCL	0.102	95% KM Bootstrap t UCL	1.395
90% KM Chebyshev UCL	0.15	95% KM Chebyshev UCL	0.197
97.5% KM Chebyshev UCL	0.263	99% KM Chebyshev UCL	0.392

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.993	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.773	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.409	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.332	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.371	k star (bias corrected MLE)	0.307
Theta hat (MLE)	0.33	Theta star (bias corrected MLE)	0.399
nu hat (MLE)	5.191	nu star (bias corrected)	4.299
MLE Mean (bias corrected)	0.123	MLE Sd (bias corrected)	0.221

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0935	nu hat (KM)	3.927
Approximate Chi Square Value (3.93, α)	0.693	Adjusted Chi Square Value (3.93, β)	0.6
95% Gamma Approximate KM-UCL (use when n>=50)	0.255	95% Gamma Adjusted KM-UCL (use when n<50)	0.295

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0031	Mean	0.0476
Maximum	0.69	Median	0.01
SD	0.15	CV	3.143
k hat (MLE)	0.485	k star (bias corrected MLE)	0.447
Theta hat (MLE)	0.0981	Theta star (bias corrected MLE)	0.106
nu hat (MLE)	20.36	nu star (bias corrected)	18.78
MLE Mean (bias corrected)	0.0476	MLE Sd (bias corrected)	0.0711
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (18.78, α)	9.96	Adjusted Chi Square Value (18.78, β)	9.468
95% Gamma Approximate UCL (use when n>=50)	0.0897	95% Gamma Adjusted UCL (use when n<50)	0.0944

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.822	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.357	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.335	Detected Data Not Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0427	Mean in Log Scale	-5.615
SD in Original Scale	0.151	SD in Log Scale	1.877
95% t UCL (assumes normality of ROS data)	0.0995	95% Percentile Bootstrap UCL	0.107
95% BCA Bootstrap UCL	0.141	95% Bootstrap t UCL	1.709
95% H-UCL (Log ROS)	0.111		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-5.11	95% H-UCL (KM -Log)	0.0607
KM SD (logged)	1.526	95% Critical H Value (KM-Log)	3.352
KM Standard Error of Mean (logged)	0.429		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0683	Mean in Log Scale	-4.089
SD in Original Scale	0.15	SD in Log Scale	1.745
95% t UCL (Assumes normality)	0.125	95% H-Stat UCL	0.327

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	0.263

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (acenaphthylene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	16
Number of Detects	14	Number of Non-Detects	7
Number of Distinct Detects	12	Number of Distinct Non-Detects	4
Minimum Detect	0.0056	Minimum Non-Detect	0.005
Maximum Detect	0.47	Maximum Non-Detect	0.2
Variance Detects	0.0214	Percent Non-Detects	33.33%
Mean Detects	0.104	SD Detects	0.146

Median Detects	0.039	CV Detects	1.414
Skewness Detects	2.124	Kurtosis Detects	3.389
Mean of Logged Detects	-2.939	SD of Logged Detects	1.154

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.615	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.325	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.237	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0796	Standard Error of Mean	0.0276
SD	0.121	95% KM (BCA) UCL	0.13
95% KM (t) UCL	0.127	95% KM (Percentile Bootstrap) UCL	0.127
95% KM (z) UCL	0.125	95% KM Bootstrap t UCL	0.233
90% KM Chebyshev UCL	0.162	95% KM Chebyshev UCL	0.2
97.5% KM Chebyshev UCL	0.252	99% KM Chebyshev UCL	0.354

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.13	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.765	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.27	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.236	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.875	k star (bias corrected MLE)	0.735
Theta hat (MLE)	0.118	Theta star (bias corrected MLE)	0.141
nu hat (MLE)	24.49	nu star (bias corrected)	20.57
MLE Mean (bias corrected)	0.104	MLE Sd (bias corrected)	0.121

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.433	nu hat (KM)	18.19
Approximate Chi Square Value (18.19, α)	9.526	Adjusted Chi Square Value (18.19, β)	9.045
95% Gamma Approximate KM-UCL (use when n>=50)	0.152	95% Gamma Adjusted KM-UCL (use when n<50)	0.16

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0056	Mean	0.0788
Maximum	0.47	Median	0.036
SD	0.125	CV	1.58
k hat (MLE)	0.831	k star (bias corrected MLE)	0.744
Theta hat (MLE)	0.0948	Theta star (bias corrected MLE)	0.106
nu hat (MLE)	34.9	nu star (bias corrected)	31.25
MLE Mean (bias corrected)	0.0788	MLE Sd (bias corrected)	0.0914
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (31.25, α)	19.48	Adjusted Chi Square Value (31.25, β)	18.76
95% Gamma Approximate UCL (use when n>=50)	0.126	95% Gamma Adjusted UCL (use when n<50)	0.131

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.237	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0788	Mean in Log Scale	-3.229
SD in Original Scale	0.124	SD in Log Scale	1.134
95% t UCL (assumes normality of ROS data)	0.125	95% Percentile Bootstrap UCL	0.125
95% BCA Bootstrap UCL	0.145	95% Bootstrap t UCL	0.271
95% H-UCL (Log ROS)	0.151		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-3.241	95% H-UCL (KM -Log)	0.156
KM SD (logged)	1.153	95% Critical H Value (KM-Log)	2.779
KM Standard Error of Mean (logged)	0.288		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0882	Mean in Log Scale	-3.067
SD in Original Scale	0.122	SD in Log Scale	1.196
95% t UCL (Assumes normality)	0.134	95% H-Stat UCL	0.204

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	0.252

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (anthracene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	16
Number of Detects	12	Number of Non-Detects	9
Number of Distinct Detects	11	Number of Distinct Non-Detects	5
Minimum Detect	0.02	Minimum Non-Detect	0.0049
Maximum Detect	0.26	Maximum Non-Detect	0.2
Variance Detects	0.0048	Percent Non-Detects	42.86%
Mean Detects	0.0662	SD Detects	0.0693
Median Detects	0.037	CV Detects	1.047
Skewness Detects	2.41	Kurtosis Detects	5.917
Mean of Logged Detects	-3.03	SD of Logged Detects	0.741

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.65	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.32	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0492	Standard Error of Mean	0.0132
SD	0.0561	95% KM (BCA) UCL	0.0728
95% KM (t) UCL	0.072	95% KM (Percentile Bootstrap) UCL	0.0717
95% KM (z) UCL	0.071	95% KM Bootstrap t UCL	0.1
90% KM Chebyshev UCL	0.0889	95% KM Chebyshev UCL	0.107
97.5% KM Chebyshev UCL	0.132	99% KM Chebyshev UCL	0.181

Gamma GOF Tests on Detected Observations Only

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

A-D Test Statistic	1.093	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.744	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.272	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.249	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.739	k star (bias corrected MLE)	1.36
Theta hat (MLE)	0.0381	Theta star (bias corrected MLE)	0.0487
nu hat (MLE)	41.73	nu star (bias corrected)	32.63
MLE Mean (bias corrected)	0.0662	MLE Sd (bias corrected)	0.0567

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.77	nu hat (KM)	32.34
Approximate Chi Square Value (32.34, α)	20.34	Adjusted Chi Square Value (32.34, β)	19.61
95% Gamma Approximate KM-UCL (use when n>=50)	0.0782	95% Gamma Adjusted KM-UCL (use when n<50)	0.0811

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0483
Maximum	0.26	Median	0.033
SD	0.057	CV	1.179
k hat (MLE)	1.398	k star (bias corrected MLE)	1.23
Theta hat (MLE)	0.0345	Theta star (bias corrected MLE)	0.0393
nu hat (MLE)	58.73	nu star (bias corrected)	51.67
MLE Mean (bias corrected)	0.0483	MLE Sd (bias corrected)	0.0435
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (51.67, α)	36.16	Adjusted Chi Square Value (51.67, β)	35.16
95% Gamma Approximate UCL (use when n>=50)	0.069	95% Gamma Adjusted UCL (use when n<50)	0.071

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.869	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.229	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0495	Mean in Log Scale	-3.34
SD in Original Scale	0.0559	SD in Log Scale	0.761
95% t UCL (assumes normality of ROS data)	0.0705	95% Percentile Bootstrap UCL	0.0725
95% BCA Bootstrap UCL	0.0819	95% Bootstrap t UCL	0.11
95% H-UCL (Log ROS)	0.0695		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-3.47	95% H-UCL (KM -Log)	0.0889
KM SD (logged)	0.987	95% Critical H Value (KM-Log)	2.547
KM Standard Error of Mean (logged)	0.263		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0583	Mean in Log Scale	-3.302
SD in Original Scale	0.0585	SD in Log Scale	1.119
95% t UCL (Assumes normality)	0.0803	95% H-Stat UCL	0.136

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.072	95% KM (% Bootstrap) UCL	0.0717

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (arsenic)

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	4	Mean	11.61
Maximum	75	Median	5.4
SD	20.08	Std. Error of Mean	5.795
Coefficient of Variation	1.729	Skewness	3.398

Normal GOF Test

Shapiro Wilk Test Statistic	0.404	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.432	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	22.02	95% Adjusted-CLT UCL (Chen-1995)	27.21
		95% Modified-t UCL (Johnson-1978)	22.96

Gamma GOF Test

A-D Test Statistic	2.514	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.416	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.252	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.102	k star (bias corrected MLE)	0.882
Theta hat (MLE)	10.53	Theta star (bias corrected MLE)	13.16
nu hat (MLE)	26.45	nu star (bias corrected)	21.17
MLE Mean (bias corrected)	11.61	MLE Sd (bias corrected)	12.36
		Approximate Chi Square Value (0.05)	11.72
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	10.66

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	20.97	95% Adjusted Gamma UCL (use when n<50)	23.06

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.627	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.356	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.386	Mean of logged Data	1.934

Maximum of Logged Data	4.317	SD of logged Data	0.805

Assuming Lognormal Distribution

95% H-UCL	17.89	90% Chebyshev (MVUE) UCL	16.03
95% Chebyshev (MVUE) UCL	19.11	97.5% Chebyshev (MVUE) UCL	23.37
99% Chebyshev (MVUE) UCL	31.75		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	21.14	95% Jackknife UCL	22.02
95% Standard Bootstrap UCL	20.8	95% Bootstrap-t UCL	165.1
95% Hall's Bootstrap UCL	80.46	95% Percentile Bootstrap UCL	22.73
95% BCA Bootstrap UCL	28.98		
90% Chebyshev(Mean, Sd) UCL	28.99	95% Chebyshev(Mean, Sd) UCL	36.87
97.5% Chebyshev(Mean, Sd) UCL	47.8	99% Chebyshev(Mean, Sd) UCL	69.27

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 36.87

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (barium)

General Statistics

Total Number of Observations	12	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	120	Mean	174.2
Maximum	280	Median	165
SD	45.62	Std. Error of Mean	13.17
Coefficient of Variation	0.262	Skewness	1.179

Normal GOF Test

Shapiro Wilk Test Statistic	0.908	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.199	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	197.8	95% Adjusted-CLT UCL (Chen-1995)	200.6
		95% Modified-t UCL (Johnson-1978)	198.6

Gamma GOF Test

A-D Test Statistic	0.291	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.164	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	17.62	k star (bias corrected MLE)	13.27
Theta hat (MLE)	9.884	Theta star (bias corrected MLE)	13.12
nu hat (MLE)	422.9	nu star (bias corrected)	318.5

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

MLE Mean (bias corrected)	174.2	MLE Sd (bias corrected)	47.81
		Approximate Chi Square Value (0.05)	278.2
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	272.4

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	199.4	95% Adjusted Gamma UCL (use when n<50)	203.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.151	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.787	Mean of logged Data	5.131
Maximum of Logged Data	5.635	SD of logged Data	0.245

Assuming Lognormal Distribution

95% H-UCL	200.4	90% Chebyshev (MVUE) UCL	211.1
95% Chebyshev (MVUE) UCL	228	97.5% Chebyshev (MVUE) UCL	251.3
99% Chebyshev (MVUE) UCL	297.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	195.8	95% Jackknife UCL	197.8
95% Standard Bootstrap UCL	195	95% Bootstrap-t UCL	207.7
95% Hall's Bootstrap UCL	222.7	95% Percentile Bootstrap UCL	195.8
95% BCA Bootstrap UCL	200.8		
90% Chebyshev(Mean, Sd) UCL	213.7	95% Chebyshev(Mean, Sd) UCL	231.6
97.5% Chebyshev(Mean, Sd) UCL	256.4	99% Chebyshev(Mean, Sd) UCL	305.2

Suggested UCL to Use

95% Student's-t UCL	197.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (benzo(a)anthracene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	16
Number of Detects	14	Number of Non-Detects	7
Number of Distinct Detects	12	Number of Distinct Non-Detects	4
Minimum Detect	0.012	Minimum Non-Detect	0.005
Maximum Detect	1.1	Maximum Non-Detect	0.2
Variance Detects	0.0733	Percent Non-Detects	33.33%
Mean Detects	0.198	SD Detects	0.271
Median Detects	0.12	CV Detects	1.37
Skewness Detects	3.261	Kurtosis Detects	11.32
Mean of Logged Detects	-2.106	SD of Logged Detects	0.994

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.548	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.368	**Lilliefors GOF Test**

5% Lilliefors Critical Value	0.237	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.147	Standard Error of Mean	0.0518
SD	0.227	95% KM (BCA) UCL	0.248
95% KM (t) UCL	0.237	95% KM (Percentile Bootstrap) UCL	0.243
95% KM (z) UCL	0.232	95% KM Bootstrap t UCL	0.377
90% KM Chebyshev UCL	0.303	95% KM Chebyshev UCL	0.373
97.5% KM Chebyshev UCL	0.471	99% KM Chebyshev UCL	0.662

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.871	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.757	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.251	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.234	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.171	k star (bias corrected MLE)	0.967
Theta hat (MLE)	0.169	Theta star (bias corrected MLE)	0.204
nu hat (MLE)	32.77	nu star (bias corrected)	27.08
MLE Mean (bias corrected)	0.198	MLE Sd (bias corrected)	0.201

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.421	nu hat (KM)	17.68
Approximate Chi Square Value (17.68, α)	9.162	Adjusted Chi Square Value (17.68, β)	8.692
95% Gamma Approximate KM-UCL (use when n>=50)	0.284	95% Gamma Adjusted KM-UCL (use when n<50)	0.3

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.144
Maximum	1.1	Median	0.09
SD	0.234	CV	1.619
k hat (MLE)	0.749	k star (bias corrected MLE)	0.674
Theta hat (MLE)	0.193	Theta star (bias corrected MLE)	0.215
nu hat (MLE)	31.45	nu star (bias corrected)	28.29
MLE Mean (bias corrected)	0.144	MLE Sd (bias corrected)	0.176
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (28.29, α)	17.15	Adjusted Chi Square Value (28.29, β)	16.49
95% Gamma Approximate UCL (use when n>=50)	0.238	95% Gamma Adjusted UCL (use when n<50)	0.248

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.184	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.237	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.147	Mean in Log Scale	-2.535
SD in Original Scale	0.231	SD in Log Scale	1.112
95% t UCL (assumes normality of ROS data)	0.234	95% Percentile Bootstrap UCL	0.243
95% BCA Bootstrap UCL	0.302	95% Bootstrap t UCL	0.405
95% H-UCL (Log ROS)	0.289		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.719	95% H-UCL (KM -Log)	0.482
KM SD (logged)	1.408	95% Critical H Value (KM-Log)	3.165
KM Standard Error of Mean (logged)	0.352		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.151	Mean in Log Scale	-2.512
SD in Original Scale	0.23	SD in Log Scale	1.233
95% t UCL (Assumes normality)	0.237	95% H-Stat UCL	0.386

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL 0.248

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(a)pyrene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	16
Number of Detects	15	Number of Non-Detects	6
Number of Distinct Detects	13	Number of Distinct Non-Detects	4
Minimum Detect	0.022	Minimum Non-Detect	0.005
Maximum Detect	2.1	Maximum Non-Detect	0.2
Variance Detects	0.252	Percent Non-Detects	28.57%
Mean Detects	0.345	SD Detects	0.502
Median Detects	0.22	CV Detects	1.455
Skewness Detects	3.472	Kurtosis Detects	12.73
Mean of Logged Detects	-1.564	SD of Logged Detects	0.98

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.509	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.378	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.229	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.255	Standard Error of Mean	0.0982
SD	0.434	95% KM (BCA) UCL	0.448
95% KM (t) UCL	0.424	95% KM (Percentile Bootstrap) UCL	0.43
95% KM (z) UCL	0.417	95% KM Bootstrap t UCL	0.74
90% KM Chebyshev UCL	0.55	95% KM Chebyshev UCL	0.683
97.5% KM Chebyshev UCL	0.868	99% KM Chebyshev UCL	1.232

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.03	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.76	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.26	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.227	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.139	k star (bias corrected MLE)	0.956

Theta hat (MLE)	0.303	Theta star (bias corrected MLE)	0.361
nu hat (MLE)	34.18	nu star (bias corrected)	28.68
MLE Mean (bias corrected)	0.345	MLE Sd (bias corrected)	0.353

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.345	nu hat (KM)	14.5
Approximate Chi Square Value (14.50, α)	6.913	Adjusted Chi Square Value (14.50, β)	6.513
95% Gamma Approximate KM-UCL (use when n>=50)	0.535	95% Gamma Adjusted KM-UCL (use when n<50)	0.568

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.249
Maximum	2.1	Median	0.12
SD	0.447	CV	1.796
k hat (MLE)	0.593	k star (bias corrected MLE)	0.54
Theta hat (MLE)	0.42	Theta star (bias corrected MLE)	0.461
nu hat (MLE)	24.92	nu star (bias corrected)	22.69
MLE Mean (bias corrected)	0.249	MLE Sd (bias corrected)	0.339
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (22.69, α)	12.86	Adjusted Chi Square Value (22.69, β)	12.29
95% Gamma Approximate UCL (use when n>=50)	0.44	95% Gamma Adjusted UCL (use when n<50)	0.46

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.189	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.229	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.257	Mean in Log Scale	-2.078
SD in Original Scale	0.443	SD in Log Scale	1.198
95% t UCL (assumes normality of ROS data)	0.424	95% Percentile Bootstrap UCL	0.435
95% BCA Bootstrap UCL	0.524	95% Bootstrap t UCL	0.779
95% H-UCL (Log ROS)	0.55		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.337	95% H-UCL (KM -Log)	1.174
KM SD (logged)	1.592	95% Critical H Value (KM-Log)	3.458
KM Standard Error of Mean (logged)	0.393		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.261	Mean in Log Scale	-2.116
SD in Original Scale	0.442	SD in Log Scale	1.394
95% t UCL (Assumes normality)	0.427	95% H-Stat UCL	0.847

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL	0.448

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(a)pyrene equivalent)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	18
		Number of Missing Observations	0
Minimum	0.0044	Mean	0.352
Maximum	2.7	Median	0.18
SD	0.565	Std. Error of Mean	0.123
Coefficient of Variation	1.606	Skewness	3.934

Normal GOF Test

Shapiro Wilk Test Statistic	0.493	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.908	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.323	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.193	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.564	95% Adjusted-CLT UCL (Chen-1995)	0.667
		95% Modified-t UCL (Johnson-1978)	0.582

Gamma GOF Test

A-D Test Statistic	0.714	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.777	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.172	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.196	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.861	k star (bias corrected MLE)	0.77
Theta hat (MLE)	0.408	Theta star (bias corrected MLE)	0.457
nu hat (MLE)	36.16	nu star (bias corrected)	32.33
MLE Mean (bias corrected)	0.352	MLE Sd (bias corrected)	0.401
		Approximate Chi Square Value (0.05)	20.33
Adjusted Level of Significance	0.0383	Adjusted Chi Square Value	19.6

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	0.559	95% Adjusted Gamma UCL (use when n<50)	0.58

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.921	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.908	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.21	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.193	Data Not Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-5.426	Mean of logged Data	-1.728
Maximum of Logged Data	0.993	SD of logged Data	1.3

Assuming Lognormal Distribution

95% H-UCL	0.988	90% Chebyshev (MVUE) UCL	0.773
95% Chebyshev (MVUE) UCL	0.948	97.5% Chebyshev (MVUE) UCL	1.191
99% Chebyshev (MVUE) UCL	1.669		

Nonparametric Distribution Free UCL Statistics

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.554	95% Jackknife UCL	0.564
95% Standard Bootstrap UCL	0.55	95% Bootstrap-t UCL	1.006
95% Hall's Bootstrap UCL	1.402	95% Percentile Bootstrap UCL	0.565
95% BCA Bootstrap UCL	0.702		
90% Chebyshev(Mean, Sd) UCL	0.721	95% Chebyshev(Mean, Sd) UCL	0.889
97.5% Chebyshev(Mean, Sd) UCL	1.121	99% Chebyshev(Mean, Sd) UCL	1.577

Suggested UCL to Use

95% Adjusted Gamma UCL 0.58

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (benzo(b)fluoranthene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	20
Number of Detects	16	Number of Non-Detects	5
Number of Distinct Detects	16	Number of Distinct Non-Detects	4
Minimum Detect	0.031	Minimum Non-Detect	0.005
Maximum Detect	1.6	Maximum Non-Detect	0.2
Variance Detects	0.143	Percent Non-Detects	23.81%
Mean Detects	0.332	SD Detects	0.378
Median Detects	0.24	CV Detects	1.137
Skewness Detects	2.816	Kurtosis Detects	9.118
Mean of Logged Detects	-1.526	SD of Logged Detects	0.949

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.669	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.283	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.222	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.264	Standard Error of Mean	0.0774
SD	0.343	95% KM (BCA) UCL	0.423
95% KM (t) UCL	0.397	95% KM (Percentile Bootstrap) UCL	0.404
95% KM (z) UCL	0.391	95% KM Bootstrap t UCL	0.52
90% KM Chebyshev UCL	0.496	95% KM Chebyshev UCL	0.601
97.5% KM Chebyshev UCL	0.747	99% KM Chebyshev UCL	1.034

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.388	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.758	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.163	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.22	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.32	k star (bias corrected MLE)	1.114
Theta hat (MLE)	0.252	Theta star (bias corrected MLE)	0.298
nu hat (MLE)	42.23	nu star (bias corrected)	35.65
MLE Mean (bias corrected)	0.332	MLE Sd (bias corrected)	0.315

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.593	nu hat (KM)	24.91
Approximate Chi Square Value (24.91, α)	14.54	Adjusted Chi Square Value (24.91, β)	13.93
95% Gamma Approximate KM-UCL (use when n>=50)	0.452	95% Gamma Adjusted KM-UCL (use when n<50)	0.472

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.258
Maximum	1.6	Median	0.14
SD	0.355	CV	1.377
k hat (MLE)	0.729	k star (bias corrected MLE)	0.657
Theta hat (MLE)	0.353	Theta star (bias corrected MLE)	0.392
nu hat (MLE)	30.64	nu star (bias corrected)	27.59
MLE Mean (bias corrected)	0.258	MLE Sd (bias corrected)	0.318
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (27.59, α)	16.61	Adjusted Chi Square Value (27.59, β)	15.96
95% Gamma Approximate UCL (use when n>=50)	0.428	95% Gamma Adjusted UCL (use when n<50)	0.445

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.985	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.11	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.222	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.265	Mean in Log Scale	-1.912
SD in Original Scale	0.35	SD in Log Scale	1.117
95% t UCL (assumes normality of ROS data)	0.397	95% Percentile Bootstrap UCL	0.407
95% BCA Bootstrap UCL	0.458	95% Bootstrap t UCL	0.553
95% H-UCL (Log ROS)	0.545		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.082	95% H-UCL (KM -Log)	0.977
KM SD (logged)	1.435	95% Critical H Value (KM-Log)	3.208
KM Standard Error of Mean (logged)	0.353		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.266	Mean in Log Scale	-1.986
SD in Original Scale	0.349	SD in Log Scale	1.361
95% t UCL (Assumes normality)	0.398	95% H-Stat UCL	0.888

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL	0.423	95% GROS Adjusted Gamma UCL	0.445
95% Adjusted Gamma KM-UCL	0.472		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(g,h,i)perylene)

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

General Statistics

Total Number of Observations	21	Number of Distinct Observations	18
Number of Detects	16	Number of Non-Detects	5
Number of Distinct Detects	15	Number of Distinct Non-Detects	4
Minimum Detect	0.017	Minimum Non-Detect	0.005
Maximum Detect	2.8	Maximum Non-Detect	0.2
Variance Detects	0.445	Percent Non-Detects	23.81%
Mean Detects	0.322	SD Detects	0.667
Median Detects	0.135	CV Detects	2.072
Skewness Detects	3.879	Kurtosis Detects	15.3
Mean of Logged Detects	-1.87	SD of Logged Detects	1.063

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.393	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.415	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.222	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.256	Standard Error of Mean	0.13
SD	0.576	95% KM (BCA) UCL	0.515
95% KM (t) UCL	0.481	95% KM (Percentile Bootstrap) UCL	0.503
95% KM (z) UCL	0.47	95% KM Bootstrap t UCL	1.308
90% KM Chebyshev UCL	0.646	95% KM Chebyshev UCL	0.823
97.5% KM Chebyshev UCL	1.068	99% KM Chebyshev UCL	1.549

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.693	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.772	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.297	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.223	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.805	k star (bias corrected MLE)	0.696
Theta hat (MLE)	0.4	Theta star (bias corrected MLE)	0.463
nu hat (MLE)	25.76	nu star (bias corrected)	22.26
MLE Mean (bias corrected)	0.322	MLE Sd (bias corrected)	0.386

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.198	nu hat (KM)	8.317
Approximate Chi Square Value (8.32, α)	2.92	Adjusted Chi Square Value (8.32, β)	2.679
95% Gamma Approximate KM-UCL (use when n>=50)	0.73	95% Gamma Adjusted KM-UCL (use when n<50)	0.796

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.248
Maximum	2.8	Median	0.11
SD	0.593	CV	2.387
k hat (MLE)	0.576	k star (bias corrected MLE)	0.525
Theta hat (MLE)	0.432	Theta star (bias corrected MLE)	0.473
nu hat (MLE)	24.18	nu star (bias corrected)	22.06
MLE Mean (bias corrected)	0.248	MLE Sd (bias corrected)	0.343
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (22.06, α)	12.38	Adjusted Chi Square Value (22.06, β)	11.83

95% Gamma Approximate UCL (use when n>=50)	0.443	95% Gamma Adjusted UCL (use when n<50)	0.463

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.898	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.186	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.222	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.256	Mean in Log Scale	-2.22
SD in Original Scale	0.59	SD in Log Scale	1.171
95% t UCL (assumes normality of ROS data)	0.478	95% Percentile Bootstrap UCL	0.509
95% BCA Bootstrap UCL	0.648	95% Bootstrap t UCL	1.398
95% H-UCL (Log ROS)	0.449		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.341	95% H-UCL (KM -Log)	0.681
KM SD (logged)	1.396	95% Critical H Value (KM-Log)	3.146
KM Standard Error of Mean (logged)	0.337		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.258	Mean in Log Scale	-2.248
SD in Original Scale	0.589	SD in Log Scale	1.339
95% t UCL (Assumes normality)	0.48	95% H-Stat UCL	0.647

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	1.068

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(k)fluoranthene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	15
Number of Detects	14	Number of Non-Detects	7
Number of Distinct Detects	12	Number of Distinct Non-Detects	4
Minimum Detect	0.008	Minimum Non-Detect	0.005
Maximum Detect	1.3	Maximum Non-Detect	0.2
Variance Detects	0.107	Percent Non-Detects	33.33%
Mean Detects	0.186	SD Detects	0.327
Median Detects	0.09	CV Detects	1.759
Skewness Detects	3.487	Kurtosis Detects	12.59
Mean of Logged Detects	-2.365	SD of Logged Detects	1.131

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.474	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.351	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.237	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.136	Standard Error of Mean	0.0608
SD	0.268	95% KM (BCA) UCL	0.264
95% KM (t) UCL	0.241	95% KM (Percentile Bootstrap) UCL	0.245
95% KM (z) UCL	0.236	95% KM Bootstrap t UCL	0.495
90% KM Chebyshev UCL	0.319	95% KM Chebyshev UCL	0.402
97.5% KM Chebyshev UCL	0.516	99% KM Chebyshev UCL	0.742

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.115	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.766	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.243	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.237	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.861	k star (bias corrected MLE)	0.724
Theta hat (MLE)	0.216	Theta star (bias corrected MLE)	0.257
nu hat (MLE)	24.1	nu star (bias corrected)	20.27
MLE Mean (bias corrected)	0.186	MLE Sd (bias corrected)	0.219

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.259	nu hat (KM)	10.89
Approximate Chi Square Value (10.89, α)	4.506	Adjusted Chi Square Value (10.89, β)	4.194
95% Gamma Approximate KM-UCL (use when n>=50)	0.33	95% Gamma Adjusted KM-UCL (use when n<50)	0.354

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.008	Mean	0.133
Maximum	1.3	Median	0.068
SD	0.276	CV	2.079
k hat (MLE)	0.631	k star (bias corrected MLE)	0.572
Theta hat (MLE)	0.211	Theta star (bias corrected MLE)	0.232
nu hat (MLE)	26.48	nu star (bias corrected)	24.03
MLE Mean (bias corrected)	0.133	MLE Sd (bias corrected)	0.175
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (24.03, α)	13.87	Adjusted Chi Square Value (24.03, β)	13.28
95% Gamma Approximate UCL (use when n>=50)	0.23	95% Gamma Adjusted UCL (use when n<50)	0.24

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.237	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.135	Mean in Log Scale	-2.823
SD in Original Scale	0.275	SD in Log Scale	1.224
95% t UCL (assumes normality of ROS data)	0.238	95% Percentile Bootstrap UCL	0.254
95% BCA Bootstrap UCL	0.327	95% Bootstrap t UCL	0.577
95% H-UCL (Log ROS)	0.277		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.892	95% H-UCL (KM -Log)	0.354
KM SD (logged)	1.356	95% Critical H Value (KM-Log)	3.084
KM Standard Error of Mean (logged)	0.344		

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.143	Mean in Log Scale	-2.685
SD in Original Scale	0.272	SD in Log Scale	1.256
95% t UCL (Assumes normality)	0.246	95% H-Stat UCL	0.342

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	0.516

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (chromium)

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	46	Mean	75.58
Maximum	110	Median	69.5
SD	20.91	Std. Error of Mean	6.036
Coefficient of Variation	0.277	Skewness	0.585

Normal GOF Test

Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.216	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	86.42	95% Adjusted-CLT UCL (Chen-1995)	86.6
		95% Modified-t UCL (Johnson-1978)	86.59

Gamma GOF Test

A-D Test Statistic	0.392	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.185	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	14.71	k star (bias corrected MLE)	11.09
Theta hat (MLE)	5.137	Theta star (bias corrected MLE)	6.816
nu hat (MLE)	353.1	nu star (bias corrected)	266.2
MLE Mean (bias corrected)	75.58	MLE Sd (bias corrected)	22.7
		Approximate Chi Square Value (0.05)	229.4
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	224.2

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	87.7	95% Adjusted Gamma UCL (use when n<50)	89.74

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.167	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.829	Mean of logged Data	4.291
Maximum of Logged Data	4.7	SD of logged Data	0.273

Assuming Lognormal Distribution

95% H-UCL	88.68	90% Chebyshev (MVUE) UCL	93.59
95% Chebyshev (MVUE) UCL	101.8	97.5% Chebyshev (MVUE) UCL	113.1
99% Chebyshev (MVUE) UCL	135.4		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	85.51	95% Jackknife UCL	86.42
95% Standard Bootstrap UCL	85.12	95% Bootstrap-t UCL	88.57
95% Hall's Bootstrap UCL	87.33	95% Percentile Bootstrap UCL	85.42
95% BCA Bootstrap UCL	86.08		
90% Chebyshev(Mean, Sd) UCL	93.69	95% Chebyshev(Mean, Sd) UCL	101.9
97.5% Chebyshev(Mean, Sd) UCL	113.3	99% Chebyshev(Mean, Sd) UCL	135.6

Suggested UCL to Use

95% Student's-t UCL 86.42

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (chrysene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	16
Number of Detects	15	Number of Non-Detects	6
Number of Distinct Detects	14	Number of Distinct Non-Detects	4
Minimum Detect	0.018	Minimum Non-Detect	0.005
Maximum Detect	1.5	Maximum Non-Detect	0.2
Variance Detects	0.128	Percent Non-Detects	28.57%
Mean Detects	0.247	SD Detects	0.357
Median Detects	0.15	CV Detects	1.448
Skewness Detects	3.499	Kurtosis Detects	12.87
Mean of Logged Detects	-1.875	SD of Logged Detects	0.941

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.502	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.374	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.229	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.188	Standard Error of Mean	0.0697
SD	0.308	95% KM (BCA) UCL	0.315
95% KM (t) UCL	0.308	95% KM (Percentile Bootstrap) UCL	0.318

95% KM (z) UCL	0.303	95% KM Bootstrap t UCL	0.541
90% KM Chebyshev UCL	0.397	95% KM Chebyshev UCL	0.492
97.5% KM Chebyshev UCL	0.623	99% KM Chebyshev UCL	0.881

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.113	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.76	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.257	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.227	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.188	k star (bias corrected MLE)	0.995
Theta hat (MLE)	0.208	Theta star (bias corrected MLE)	0.248
nu hat (MLE)	35.64	nu star (bias corrected)	29.85
MLE Mean (bias corrected)	0.247	MLE Sd (bias corrected)	0.247

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.374	nu hat (KM)	15.71
Approximate Chi Square Value (15.71, α)	7.758	Adjusted Chi Square Value (15.71, β)	7.331
95% Gamma Approximate KM-UCL (use when n>=50)	0.381	95% Gamma Adjusted KM-UCL (use when n<50)	0.403

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.183
Maximum	1.5	Median	0.1
SD	0.317	CV	1.735
k hat (MLE)	0.707	k star (bias corrected MLE)	0.637
Theta hat (MLE)	0.259	Theta star (bias corrected MLE)	0.287
nu hat (MLE)	29.67	nu star (bias corrected)	26.77
MLE Mean (bias corrected)	0.183	MLE Sd (bias corrected)	0.229
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (26.77, α)	15.97	Adjusted Chi Square Value (26.77, β)	15.33
95% Gamma Approximate UCL (use when n>=50)	0.306	95% Gamma Adjusted UCL (use when n<50)	0.319

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.914	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.184	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.229	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.189	Mean in Log Scale	-2.287
SD in Original Scale	0.314	SD in Log Scale	1.08
95% t UCL (assumes normality of ROS data)	0.307	95% Percentile Bootstrap UCL	0.314
95% BCA Bootstrap UCL	0.392	95% Bootstrap t UCL	0.564
95% H-UCL (Log ROS)	0.347		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.494	95% H-UCL (KM -Log)	0.633
KM SD (logged)	1.427	95% Critical H Value (KM-Log)	3.194
KM Standard Error of Mean (logged)	0.353		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.191	Mean in Log Scale	-2.338

SD in Original Scale	0.313	SD in Log Scale	1.285
95% t UCL (Assumes normality)	0.309	95% H-Stat UCL	0.519

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL 0.315

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (cobalt)

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	10	Mean	15.75
Maximum	24	Median	15
SD	3.817	Std. Error of Mean	1.102
Coefficient of Variation	0.242	Skewness	0.784

Normal GOF Test

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.161	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	17.73	95% Adjusted-CLT UCL (Chen-1995)	17.83
		95% Modified-t UCL (Johnson-1978)	17.77

Gamma GOF Test

A-D Test Statistic	0.181	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.732	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.138	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	19.43	k star (bias corrected MLE)	14.63
Theta hat (MLE)	0.81	Theta star (bias corrected MLE)	1.077
nu hat (MLE)	466.4	nu star (bias corrected)	351.1
MLE Mean (bias corrected)	15.75	MLE Sd (bias corrected)	4.118
		Approximate Chi Square Value (0.05)	308.7
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	302.6

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	17.91	95% Adjusted Gamma UCL (use when n<50)	18.27

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.989	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.122	**Lilliefors Lognormal GOF Test**	

5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.303	Mean of logged Data	2.731
Maximum of Logged Data	3.178	SD of logged Data	0.237

Assuming Lognormal Distribution

95% H-UCL	18.04	90% Chebyshev (MVUE) UCL	18.99
95% Chebyshev (MVUE) UCL	20.47	97.5% Chebyshev (MVUE) UCL	22.51
99% Chebyshev (MVUE) UCL	26.52		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	17.56	95% Jackknife UCL	17.73
95% Standard Bootstrap UCL	17.51	95% Bootstrap-t UCL	18
95% Hall's Bootstrap UCL	18.34	95% Percentile Bootstrap UCL	17.58
95% BCA Bootstrap UCL	17.58		
90% Chebyshev(Mean, Sd) UCL	19.06	95% Chebyshev(Mean, Sd) UCL	20.55
97.5% Chebyshev(Mean, Sd) UCL	22.63	99% Chebyshev(Mean, Sd) UCL	26.71

Suggested UCL to Use

95% Student's-t UCL	17.73

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (copper)

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	25	Mean	36.67
Maximum	56	Median	35.5
SD	9.413	Std. Error of Mean	2.717
Coefficient of Variation	0.257	Skewness	0.795

Normal GOF Test

Shapiro Wilk Test Statistic	0.921	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.236	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	41.55	95% Adjusted-CLT UCL (Chen-1995)	41.8
		95% Modified-t UCL (Johnson-1978)	41.65

Gamma GOF Test

A-D Test Statistic	0.336	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.203	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Gamma Statistics

k hat (MLE)	17.53	k star (bias corrected MLE)	13.2
Theta hat (MLE)	2.092	Theta star (bias corrected MLE)	2.778
nu hat (MLE)	420.7	nu star (bias corrected)	316.8
MLE Mean (bias corrected)	36.67	MLE Sd (bias corrected)	10.09
		Approximate Chi Square Value (0.05)	276.6
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	270.9

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	42	95% Adjusted Gamma UCL (use when n<50)	42.89

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.95	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.189	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.219	Mean of logged Data	3.573
Maximum of Logged Data	4.025	SD of logged Data	0.248

Assuming Lognormal Distribution

95% H-UCL	42.31	90% Chebyshev (MVUE) UCL	44.58
95% Chebyshev (MVUE) UCL	48.18	97.5% Chebyshev (MVUE) UCL	53.17
99% Chebyshev (MVUE) UCL	62.97		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	41.14	95% Jackknife UCL	41.55
95% Standard Bootstrap UCL	40.97	95% Bootstrap-t UCL	43.16
95% Hall's Bootstrap UCL	42.56	95% Percentile Bootstrap UCL	41.08
95% BCA Bootstrap UCL	41.25		
90% Chebyshev(Mean, Sd) UCL	44.82	95% Chebyshev(Mean, Sd) UCL	48.51
97.5% Chebyshev(Mean, Sd) UCL	53.64	99% Chebyshev(Mean, Sd) UCL	63.7

Suggested UCL to Use

95% Student's-t UCL 41.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (dibenz(a,h)anthracene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	14
Number of Detects	9	Number of Non-Detects	12
Number of Distinct Detects	7	Number of Distinct Non-Detects	7
Minimum Detect	0.01	Minimum Non-Detect	0.0049
Maximum Detect	0.086	Maximum Non-Detect	0.35
Variance Detects	5.8869E-4	Percent Non-Detects	57.14%
Mean Detects	0.0308	SD Detects	0.0243
Median Detects	0.016	CV Detects	0.788
Skewness Detects	1.654	Kurtosis Detects	2.961
Mean of Logged Detects	-3.717	SD of Logged Detects	0.708

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.78	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.284	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.295	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0235	Standard Error of Mean	0.00586
SD	0.0206	95% KM (BCA) UCL	0.033
95% KM (t) UCL	0.0336	95% KM (Percentile Bootstrap) UCL	0.033
95% KM (z) UCL	0.0331	95% KM Bootstrap t UCL	0.0382
90% KM Chebyshev UCL	0.0411	95% KM Chebyshev UCL	0.049
97.5% KM Chebyshev UCL	0.0601	99% KM Chebyshev UCL	0.0818

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.682	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.3	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.282	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.272	k star (bias corrected MLE)	1.589
Theta hat (MLE)	0.0135	Theta star (bias corrected MLE)	0.0194
nu hat (MLE)	40.9	nu star (bias corrected)	28.6
MLE Mean (bias corrected)	0.0308	MLE Sd (bias corrected)	0.0244

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	1.293	nu hat (KM)	54.3
Approximate Chi Square Value (54.30, α)	38.37	Adjusted Chi Square Value (54.30, β)	37.34
95% Gamma Approximate KM-UCL (use when n>=50)	0.0332	95% Gamma Adjusted KM-UCL (use when n<50)	0.0341

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0229
Maximum	0.086	Median	0.016
SD	0.0182	CV	0.797
k hat (MLE)	2.52	k star (bias corrected MLE)	2.192
Theta hat (MLE)	0.00908	Theta star (bias corrected MLE)	0.0104
nu hat (MLE)	105.8	nu star (bias corrected)	92.05
MLE Mean (bias corrected)	0.0229	MLE Sd (bias corrected)	0.0154
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (92.05, α)	70.92	Adjusted Chi Square Value (92.05, β)	69.5
95% Gamma Approximate UCL (use when n>=50)	0.0297	95% Gamma Adjusted UCL (use when n<50)	0.0303

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.885	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.278	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.295	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.022	Mean in Log Scale	-4.063
SD in Original Scale	0.0183	SD in Log Scale	0.691

95% t UCL (assumes normality of ROS data)	0.0289	95% Percentile Bootstrap UCL	0.0291
95% BCA Bootstrap UCL	0.0313	95% Bootstrap t UCL	0.0337
95% H-UCL (Log ROS)	0.0306		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-4.091	95% H-UCL (KM -Log)	0.0363
KM SD (logged)	0.828	95% Critical H Value (KM-Log)	2.341
KM Standard Error of Mean (logged)	0.252		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0438	Mean in Log Scale	-3.63
SD in Original Scale	0.044	SD in Log Scale	1.121
95% t UCL (Assumes normality)	0.0604	95% H-Stat UCL	0.0986

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.0336	95% KM (Percentile Bootstrap) UCL	0.033

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (fluoranthene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	16
Number of Detects	15	Number of Non-Detects	6
Number of Distinct Detects	13	Number of Distinct Non-Detects	4
Minimum Detect	0.032	Minimum Non-Detect	0.005
Maximum Detect	3.9	Maximum Non-Detect	0.2
Variance Detects	0.891	Percent Non-Detects	28.57%
Mean Detects	0.595	SD Detects	0.944
Median Detects	0.34	CV Detects	1.585
Skewness Detects	3.503	Kurtosis Detects	12.79
Mean of Logged Detects	-1.063	SD of Logged Detects	0.998

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.473	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.403	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.229	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.43	Standard Error of Mean	0.184
SD	0.814	95% KM (BCA) UCL	0.823
95% KM (t) UCL	0.747	95% KM (Percentile Bootstrap) UCL	0.75
95% KM (z) UCL	0.732	95% KM Bootstrap t UCL	1.576
90% KM Chebyshev UCL	0.981	95% KM Chebyshev UCL	1.231
97.5% KM Chebyshev UCL	1.578	99% KM Chebyshev UCL	2.259

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.587	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.762	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.301	**Kolmogrov-Smirnoff GOF**	

5% K-S Critical Value	0.228	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.054	k star (bias corrected MLE)	0.888
Theta hat (MLE)	0.565	Theta star (bias corrected MLE)	0.671
nu hat (MLE)	31.62	nu star (bias corrected)	26.63
MLE Mean (bias corrected)	0.595	MLE Sd (bias corrected)	0.632

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.279	nu hat (KM)	11.73
Approximate Chi Square Value (11.73, α)	5.047	Adjusted Chi Square Value (11.73, β)	4.713
95% Gamma Approximate KM-UCL (use when n>=50)	0.999	95% Gamma Adjusted KM-UCL (use when n<50)	1.07

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.428
Maximum	3.9	Median	0.24
SD	0.835	CV	1.95
k hat (MLE)	0.515	k star (bias corrected MLE)	0.473
Theta hat (MLE)	0.831	Theta star (bias corrected MLE)	0.904
nu hat (MLE)	21.65	nu star (bias corrected)	19.89
MLE Mean (bias corrected)	0.428	MLE Sd (bias corrected)	0.622
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (19.89, α)	10.77	Adjusted Chi Square Value (19.89, β)	10.25
95% Gamma Approximate UCL (use when n>=50)	0.791	95% Gamma Adjusted UCL (use when n<50)	0.83

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.225	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.229	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.439	Mean in Log Scale	-1.648
SD in Original Scale	0.829	SD in Log Scale	1.276
95% t UCL (assumes normality of ROS data)	0.751	95% Percentile Bootstrap UCL	0.765
95% BCA Bootstrap UCL	0.995	95% Bootstrap t UCL	1.655
95% H-UCL (Log ROS)	1.012		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.052	95% H-UCL (KM -Log)	3.318
KM SD (logged)	1.83	95% Critical H Value (KM-Log)	3.853
KM Standard Error of Mean (logged)	0.456		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.44	Mean in Log Scale	-1.758
SD in Original Scale	0.829	SD in Log Scale	1.56
95% t UCL (Assumes normality)	0.752	95% H-Stat UCL	1.913

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL 0.823

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (fluorene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	16
Number of Detects	9	Number of Non-Detects	12
Number of Distinct Detects	9	Number of Distinct Non-Detects	7
Minimum Detect	0.0043	Minimum Non-Detect	0.0049
Maximum Detect	0.11	Maximum Non-Detect	0.21
Variance Detects	0.00116	Percent Non-Detects	57.14%
Mean Detects	0.0216	SD Detects	0.034
Median Detects	0.0076	CV Detects	1.578
Skewness Detects	2.734	Kurtosis Detects	7.697
Mean of Logged Detects	-4.47	SD of Logged Detects	1.032

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.56	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.354	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.295	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0149	Standard Error of Mean	0.00644
SD	0.0247	95% KM (BCA) UCL	0.0243
95% KM (t) UCL	0.026	95% KM (Percentile Bootstrap) UCL	0.0254
95% KM (z) UCL	0.0255	95% KM Bootstrap t UCL	0.0674
90% KM Chebyshev UCL	0.0342	95% KM Chebyshev UCL	0.0429
97.5% KM Chebyshev UCL	0.0551	99% KM Chebyshev UCL	0.079

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.023	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.746	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.28	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.288	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.92	k star (bias corrected MLE)	0.688
Theta hat (MLE)	0.0234	Theta star (bias corrected MLE)	0.0314
nu hat (MLE)	16.57	nu star (bias corrected)	12.38
MLE Mean (bias corrected)	0.0216	MLE Sd (bias corrected)	0.026

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.362	nu hat (KM)	15.19
Approximate Chi Square Value (15.19, α)	7.391	Adjusted Chi Square Value (15.19, β)	6.976
95% Gamma Approximate KM-UCL (use when n>=50)	0.0305	95% Gamma Adjusted KM-UCL (use when n<50)	0.0323

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0043	Mean	0.0161

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Maximum	0.11	Median	0.01
SD	0.0224	CV	1.388
k hat (MLE)	1.601	k star (bias corrected MLE)	1.404
Theta hat (MLE)	0.0101	Theta star (bias corrected MLE)	0.0115
nu hat (MLE)	67.23	nu star (bias corrected)	58.96
MLE Mean (bias corrected)	0.0161	MLE Sd (bias corrected)	0.0136
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (58.96, α)	42.3	Adjusted Chi Square Value (58.96, β)	41.22
95% Gamma Approximate UCL (use when n>=50)	0.0224	95% Gamma Adjusted UCL (use when n<50)	0.023

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.849	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.219	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.295	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0133	Mean in Log Scale	-4.852
SD in Original Scale	0.023	SD in Log Scale	0.874
95% t UCL (assumes normality of ROS data)	0.0219	95% Percentile Bootstrap UCL	0.0224
95% BCA Bootstrap UCL	0.0293	95% Bootstrap t UCL	0.0503
95% H-UCL (Log ROS)	0.0183		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-4.758	95% H-UCL (KM -Log)	0.0192
KM SD (logged)	0.844	95% Critical H Value (KM-Log)	2.361
KM Standard Error of Mean (logged)	0.238		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0359	Mean in Log Scale	-4.011
SD in Original Scale	0.0401	SD in Log Scale	1.261
95% t UCL (Assumes normality)	0.051	95% H-Stat UCL	0.0919

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.026	95% GROS Adjusted Gamma UCL	0.023
95% Adjusted Gamma KM-UCL	0.0323		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (indeno(1,2,3-c,d)pyrene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	19
Number of Detects	16	Number of Non-Detects	5
Number of Distinct Detects	16	Number of Distinct Non-Detects	4
Minimum Detect	0.013	Minimum Non-Detect	0.005
Maximum Detect	1.7	Maximum Non-Detect	0.2
Variance Detects	0.159	Percent Non-Detects	23.81%
Mean Detects	0.231	SD Detects	0.399
Median Detects	0.13	CV Detects	1.724
Skewness Detects	3.759	Kurtosis Detects	14.63

Mean of Logged Detects	-2.064	SD of Logged Detects	1.029

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.447	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.409	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.222	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.186	Standard Error of Mean	0.0784
SD	0.347	95% KM (BCA) UCL	0.352
95% KM (t) UCL	0.321	95% KM (Percentile Bootstrap) UCL	0.335
95% KM (z) UCL	0.315	95% KM Bootstrap t UCL	0.63
90% KM Chebyshev UCL	0.421	95% KM Chebyshev UCL	0.528
97.5% KM Chebyshev UCL	0.676	99% KM Chebyshev UCL	0.966

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.19	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.765	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.261	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.221	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.966	k star (bias corrected MLE)	0.827
Theta hat (MLE)	0.239	Theta star (bias corrected MLE)	0.28
nu hat (MLE)	30.91	nu star (bias corrected)	26.45
MLE Mean (bias corrected)	0.231	MLE Sd (bias corrected)	0.254

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.287	nu hat (KM)	12.07
Approximate Chi Square Value (12.07, α)	5.271	Adjusted Chi Square Value (12.07, β)	4.929
95% Gamma Approximate KM-UCL (use when n>=50)	0.426	95% Gamma Adjusted KM-UCL (use when n<50)	0.456

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.181
Maximum	1.7	Median	0.088
SD	0.358	CV	1.979
k hat (MLE)	0.69	k star (bias corrected MLE)	0.624
Theta hat (MLE)	0.262	Theta star (bias corrected MLE)	0.29
nu hat (MLE)	29	nu star (bias corrected)	26.19
MLE Mean (bias corrected)	0.181	MLE Sd (bias corrected)	0.229
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (26.19, α)	15.52	Adjusted Chi Square Value (26.19, β)	14.89
95% Gamma Approximate UCL (use when n>=50)	0.305	95% Gamma Adjusted UCL (use when n<50)	0.318

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.18	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.222	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.186	Mean in Log Scale	-2.394

SD in Original Scale	0.356	SD in Log Scale	1.129
95% t UCL (assumes normality of ROS data)	0.319	95% Percentile Bootstrap UCL	0.332
95% BCA Bootstrap UCL	0.426	95% Bootstrap t UCL	0.664
95% H-UCL (Log ROS)	0.345		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.505	95% H-UCL (KM -Log)	0.493
KM SD (logged)	1.333	95% Critical H Value (KM-Log)	3.049
KM Standard Error of Mean (logged)	0.32		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.189	Mean in Log Scale	-2.395
SD in Original Scale	0.354	SD in Log Scale	1.277
95% t UCL (Assumes normality)	0.323	95% H-Stat UCL	0.48

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	0.676

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (lead)

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	15	Mean	142.8
Maximum	990	Median	72
SD	268.5	Std. Error of Mean	77.51
Coefficient of Variation	1.88	Skewness	3.384

Normal GOF Test

Shapiro Wilk Test Statistic	0.433	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.451	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	282	95% Adjusted-CLT UCL (Chen-1995)	351.2
		95% Modified-t UCL (Johnson-1978)	294.7

Gamma GOF Test

A-D Test Statistic	1.562	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.762	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.331	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.254	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.843	k star (bias corrected MLE)	0.687

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Theta hat (MLE)	169.5	Theta star (bias corrected MLE)	207.8
nu hat (MLE)	20.22	nu star (bias corrected)	16.5
MLE Mean (bias corrected)	142.8	MLE Sd (bias corrected)	172.3
		Approximate Chi Square Value (0.05)	8.315
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	7.445

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	283.4	95% Adjusted Gamma UCL (use when n<50)	316.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.844	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.226	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.708	Mean of logged Data	4.262
Maximum of Logged Data	6.898	SD of logged Data	1.056

Assuming Lognormal Distribution

95% H-UCL	323.5	90% Chebyshev (MVUE) UCL	230
95% Chebyshev (MVUE) UCL	281.6	97.5% Chebyshev (MVUE) UCL	353.3
99% Chebyshev (MVUE) UCL	494		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	270.3	95% Jackknife UCL	282
95% Standard Bootstrap UCL	264.5	95% Bootstrap-t UCL	1051
95% Hall's Bootstrap UCL	1016	95% Percentile Bootstrap UCL	296.5
95% BCA Bootstrap UCL	375.4		
90% Chebyshev(Mean, Sd) UCL	375.4	95% Chebyshev(Mean, Sd) UCL	480.7
97.5% Chebyshev(Mean, Sd) UCL	626.9	99% Chebyshev(Mean, Sd) UCL	914.1

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	480.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (mercury)

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	0.087	Mean	0.267
Maximum	0.49	Median	0.265
SD	0.113	Std. Error of Mean	0.0325
Coefficient of Variation	0.421	Skewness	0.463

Normal GOF Test

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.141	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Data appear Normal at 5% Significance Level	

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.326	95% Adjusted-CLT UCL (Chen-1995)	0.325
		95% Modified-t UCL (Johnson-1978)	0.326

Gamma GOF Test

A-D Test Statistic	0.202	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.732	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.114	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.246	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.66	k star (bias corrected MLE)	4.3
Theta hat (MLE)	0.0472	Theta star (bias corrected MLE)	0.0621
nu hat (MLE)	135.8	nu star (bias corrected)	103.2
MLE Mean (bias corrected)	0.267	MLE Sd (bias corrected)	0.129
		Approximate Chi Square Value (0.05)	80.76
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	77.74

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.342	95% Adjusted Gamma UCL (use when n<50)	0.355

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.137	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.442	Mean of logged Data	-1.411
Maximum of Logged Data	-0.713	SD of logged Data	0.467

Assuming Lognormal Distribution

95% H-UCL	0.366	90% Chebyshev (MVUE) UCL	0.381
95% Chebyshev (MVUE) UCL	0.431	97.5% Chebyshev (MVUE) UCL	0.501
99% Chebyshev (MVUE) UCL	0.638		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.321	95% Jackknife UCL	0.326
95% Standard Bootstrap UCL	0.318	95% Bootstrap-t UCL	0.331
95% Hall's Bootstrap UCL	0.336	95% Percentile Bootstrap UCL	0.319
95% BCA Bootstrap UCL	0.321		
90% Chebyshev(Mean, Sd) UCL	0.365	95% Chebyshev(Mean, Sd) UCL	0.409
97.5% Chebyshev(Mean, Sd) UCL	0.47	99% Chebyshev(Mean, Sd) UCL	0.591

Suggested UCL to Use

95% Student's-t UCL	0.326

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Chemical (naphthalene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	17
Number of Detects	14	Number of Non-Detects	7
Number of Distinct Detects	14	Number of Distinct Non-Detects	4
Minimum Detect	0.0097	Minimum Non-Detect	0.005
Maximum Detect	5.1	Maximum Non-Detect	0.2
Variance Detects	2.381	Percent Non-Detects	33.33%
Mean Detects	0.712	SD Detects	1.543
Median Detects	0.057	CV Detects	2.167
Skewness Detects	2.468	Kurtosis Detects	5.334
Mean of Logged Detects	-2.225	SD of Logged Detects	1.924

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.519	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.412	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.237	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.484	Standard Error of Mean	0.285
SD	1.256	95% KM (BCA) UCL	1.045
95% KM (t) UCL	0.975	95% KM (Percentile Bootstrap) UCL	0.974
95% KM (z) UCL	0.952	95% KM Bootstrap t UCL	4.719
90% KM Chebyshev UCL	1.337	95% KM Chebyshev UCL	1.724
97.5% KM Chebyshev UCL	2.261	99% KM Chebyshev UCL	3.315

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.42	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.821	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.249	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.246	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.356	k star (bias corrected MLE)	0.327
Theta hat (MLE)	2.001	Theta star (bias corrected MLE)	2.176
nu hat (MLE)	9.962	nu star (bias corrected)	9.161
MLE Mean (bias corrected)	0.712	MLE Sd (bias corrected)	1.245

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.148	nu hat (KM)	6.231
Approximate Chi Square Value (6.23, α)	1.759	Adjusted Chi Square Value (6.23, β)	1.583
95% Gamma Approximate KM-UCL (use when n>=50)	1.714	95% Gamma Adjusted KM-UCL (use when n<50)	1.904

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0097	Mean	0.481
Maximum	5.1	Median	0.03
SD	1.288	CV	2.679
k hat (MLE)	0.312	k star (bias corrected MLE)	0.3
Theta hat (MLE)	1.54	Theta star (bias corrected MLE)	1.606
nu hat (MLE)	13.12	nu star (bias corrected)	12.58
MLE Mean (bias corrected)	0.481	MLE Sd (bias corrected)	0.879
		Adjusted Level of Significance (β)	0.0383

Approximate Chi Square Value (12.58, α)	5.611	Adjusted Chi Square Value (12.58, β)	5.256
95% Gamma Approximate UCL (use when n>=50)	1.078	95% Gamma Adjusted UCL (use when n<50)	1.151

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.182	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.237	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.483	Mean in Log Scale	-2.964
SD in Original Scale	1.288	SD in Log Scale	2.033
95% t UCL (assumes normality of ROS data)	0.967	95% Percentile Bootstrap UCL	0.947
95% BCA Bootstrap UCL	1.179	95% Bootstrap t UCL	4.841
95% H-UCL (Log ROS)	2.749		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.846	95% H-UCL (KM -Log)	1.528
KM SD (logged)	1.836	95% Critical H Value (KM-Log)	3.862
KM Standard Error of Mean (logged)	0.433		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.492	Mean in Log Scale	-2.657
SD in Original Scale	1.284	SD in Log Scale	1.835
95% t UCL (Assumes normality)	0.975	95% H-Stat UCL	1.84

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

99% KM (Chebyshev) UCL	3.315

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (nickel)

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	69	Mean	100.4
Maximum	170	Median	87
SD	33.65	Std. Error of Mean	9.713
Coefficient of Variation	0.335	Skewness	1.231

Normal GOF Test

Shapiro Wilk Test Statistic	0.811	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.302	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL	**95% UCLs (Adjusted for Skewness)**

95% Student's-t UCL	117.9	95% Adjusted-CLT UCL (Chen-1995)	120.1
		95% Modified-t UCL (Johnson-1978)	118.4

Gamma GOF Test

A-D Test Statistic	0.856	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.731	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.27	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.245	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	11.35	k star (bias corrected MLE)	8.568
Theta hat (MLE)	8.847	Theta star (bias corrected MLE)	11.72
nu hat (MLE)	272.4	nu star (bias corrected)	205.6
MLE Mean (bias corrected)	100.4	MLE Sd (bias corrected)	34.3
		Approximate Chi Square Value (0.05)	173.5
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	169

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	119	95% Adjusted Gamma UCL (use when n<50)	122.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.867	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.25	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.234	Mean of logged Data	4.565
Maximum of Logged Data	5.136	SD of logged Data	0.301

Assuming Lognormal Distribution

95% H-UCL	119.7	90% Chebyshev (MVUE) UCL	126.5
95% Chebyshev (MVUE) UCL	138.4	97.5% Chebyshev (MVUE) UCL	155
99% Chebyshev (MVUE) UCL	187.6		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	116.4	95% Jackknife UCL	117.9
95% Standard Bootstrap UCL	115.8	95% Bootstrap-t UCL	125
95% Hall's Bootstrap UCL	116	95% Percentile Bootstrap UCL	115.9
95% BCA Bootstrap UCL	119.3		
90% Chebyshev(Mean, Sd) UCL	129.6	95% Chebyshev(Mean, Sd) UCL	142.8
97.5% Chebyshev(Mean, Sd) UCL	161.1	99% Chebyshev(Mean, Sd) UCL	197.1

Suggested UCL to Use

95% Student's-t UCL	117.9	or 95% Modified-t UCL	118.4
or 95% H-UCL	119.7		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Chemical (phenanthrene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	16
Number of Detects	15	Number of Non-Detects	6
Number of Distinct Detects	13	Number of Distinct Non-Detects	4
Minimum Detect	0.035	Minimum Non-Detect	0.005
Maximum Detect	2.6	Maximum Non-Detect	0.2
Variance Detects	0.41	Percent Non-Detects	28.57%
Mean Detects	0.433	SD Detects	0.64
Median Detects	0.21	CV Detects	1.48
Skewness Detects	3.151	Kurtosis Detects	10.71
Mean of Logged Detects	-1.397	SD of Logged Detects	1.011

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.554	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.339	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.229	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.32	Standard Error of Mean	0.125
SD	0.553	95% KM (BCA) UCL	0.58
95% KM (t) UCL	0.536	95% KM (Percentile Bootstrap) UCL	0.549
95% KM (z) UCL	0.526	95% KM Bootstrap t UCL	0.847
90% KM Chebyshev UCL	0.695	95% KM Chebyshev UCL	0.865
97.5% KM Chebyshev UCL	1.101	99% KM Chebyshev UCL	1.564

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.079	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.763	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.259	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.228	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.028	k star (bias corrected MLE)	0.867
Theta hat (MLE)	0.421	Theta star (bias corrected MLE)	0.5
nu hat (MLE)	30.83	nu star (bias corrected)	26
MLE Mean (bias corrected)	0.433	MLE Sd (bias corrected)	0.465

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.334	nu hat (KM)	14.04
Approximate Chi Square Value (14.04, α)	6.598	Adjusted Chi Square Value (14.04, β)	6.208
95% Gamma Approximate KM-UCL (use when n>=50)	0.681	95% Gamma Adjusted KM-UCL (use when n<50)	0.723

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.312
Maximum	2.6	Median	0.18
SD	0.57	CV	1.828
k hat (MLE)	0.545	k star (bias corrected MLE)	0.499
Theta hat (MLE)	0.572	Theta star (bias corrected MLE)	0.625
nu hat (MLE)	22.91	nu star (bias corrected)	20.97

MLE Mean (bias corrected)	0.312	MLE Sd (bias corrected)	0.442
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (20.97, α)	11.57	Adjusted Chi Square Value (20.97, β)	11.03
95% Gamma Approximate UCL (use when n>=50)	0.566	95% Gamma Adjusted UCL (use when n<50)	0.593

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.939	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.195	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.229	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.321	Mean in Log Scale	-1.947
SD in Original Scale	0.566	SD in Log Scale	1.256
95% t UCL (assumes normality of ROS data)	0.534	95% Percentile Bootstrap UCL	0.547
95% BCA Bootstrap UCL	0.675	95% Bootstrap t UCL	0.884
95% H-UCL (Log ROS)	0.715		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.161	95% H-UCL (KM -Log)	1.499
KM SD (logged)	1.615	95% Critical H Value (KM-Log)	3.496
KM Standard Error of Mean (logged)	0.412		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.324	Mean in Log Scale	-1.997
SD in Original Scale	0.565	SD in Log Scale	1.459
95% t UCL (Assumes normality)	0.536	95% H-Stat UCL	1.134

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	1.101

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (pyrene)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	18
Number of Detects	15	Number of Non-Detects	6
Number of Distinct Detects	14	Number of Distinct Non-Detects	4
Minimum Detect	0.042	Minimum Non-Detect	0.005
Maximum Detect	4.8	Maximum Non-Detect	0.2
Variance Detects	1.362	Percent Non-Detects	28.57%
Mean Detects	0.697	SD Detects	1.167
Median Detects	0.37	CV Detects	1.675
Skewness Detects	3.542	Kurtosis Detects	13.06
Mean of Logged Detects	-0.951	SD of Logged Detects	1.011

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.472	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.369	**Lilliefors GOF Test**	

5% Lilliefors Critical Value	0.229	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.504	Standard Error of Mean	0.226
SD	1.001	95% KM (BCA) UCL	0.915
95% KM (t) UCL	0.893	95% KM (Percentile Bootstrap) UCL	0.921
95% KM (z) UCL	0.875	95% KM Bootstrap t UCL	1.902
90% KM Chebyshev UCL	1.182	95% KM Chebyshev UCL	1.489
97.5% KM Chebyshev UCL	1.915	99% KM Chebyshev UCL	2.753

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.403	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.764	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.239	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.228	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.982	k star (bias corrected MLE)	0.83
Theta hat (MLE)	0.71	Theta star (bias corrected MLE)	0.84
nu hat (MLE)	29.45	nu star (bias corrected)	24.89
MLE Mean (bias corrected)	0.697	MLE Sd (bias corrected)	0.765

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.253	nu hat (KM)	10.64
Approximate Chi Square Value (10.64, α)	4.343	Adjusted Chi Square Value (10.64, β)	4.037
95% Gamma Approximate KM-UCL (use when n>=50)	1.233	95% Gamma Adjusted KM-UCL (use when n<50)	1.326

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.501
Maximum	4.8	Median	0.25
SD	1.027	CV	2.051
k hat (MLE)	0.489	k star (bias corrected MLE)	0.451
Theta hat (MLE)	1.023	Theta star (bias corrected MLE)	1.11
nu hat (MLE)	20.55	nu star (bias corrected)	18.95
MLE Mean (bias corrected)	0.501	MLE Sd (bias corrected)	0.745
		Adjusted Level of Significance (β)	0.0383
Approximate Chi Square Value (18.95, α)	10.08	Adjusted Chi Square Value (18.95, β)	9.582
95% Gamma Approximate UCL (use when n>=50)	0.941	95% Gamma Adjusted UCL (use when n<50)	0.99

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.893	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.222	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.229	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.511	Mean in Log Scale	-1.562
SD in Original Scale	1.022	SD in Log Scale	1.317
95% t UCL (assumes normality of ROS data)	0.896	95% Percentile Bootstrap UCL	0.931
95% BCA Bootstrap UCL	1.174	95% Bootstrap t UCL	2.017
95% H-UCL (Log ROS)	1.215		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-1.939	95% H-UCL (KM -Log)	4.04
KM SD (logged)	1.855	95% Critical H Value (KM-Log)	3.894
KM Standard Error of Mean (logged)	0.473		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.512	Mean in Log Scale	-1.678
SD in Original Scale	1.021	SD in Log Scale	1.604
95% t UCL (Assumes normality)	0.897	95% H-Stat UCL	2.355

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 1.915

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (tph-diesel)

General Statistics

Total Number of Observations	27	Number of Distinct Observations	16
Number of Detects	17	Number of Non-Detects	10
Number of Distinct Detects	13	Number of Distinct Non-Detects	3
Minimum Detect	1.3	Minimum Non-Detect	0.99
Maximum Detect	110	Maximum Non-Detect	5
Variance Detects	670.8	Percent Non-Detects	37.04%
Mean Detects	25.22	SD Detects	25.9
Median Detects	17	CV Detects	1.027
Skewness Detects	2.439	Kurtosis Detects	7.143
Mean of Logged Detects	2.767	SD of Logged Detects	1.112

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.736	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.892	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.257	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.215	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	16.29	Standard Error of Mean	4.58
SD	23.09	95% KM (BCA) UCL	23.34
95% KM (t) UCL	24.1	95% KM (Percentile Bootstrap) UCL	24.49
95% KM (z) UCL	23.83	95% KM Bootstrap t UCL	29.86
90% KM Chebyshev UCL	30.03	95% KM Chebyshev UCL	36.25
97.5% KM Chebyshev UCL	44.89	99% KM Chebyshev UCL	61.86

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.46	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.761	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.164	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.214	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.225	k star (bias corrected MLE)	1.048

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Theta hat (MLE)	20.59	Theta star (bias corrected MLE)	24.07
nu hat (MLE)	41.64	nu star (bias corrected)	35.62
MLE Mean (bias corrected)	25.22	MLE Sd (bias corrected)	24.64

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.498	nu hat (KM)	26.9
Approximate Chi Square Value (26.90, α)	16.07	Adjusted Chi Square Value (26.90, β)	15.54
95% Gamma Approximate KM-UCL (use when n>=50)	27.27	95% Gamma Adjusted KM-UCL (use when n<50)	28.21

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	15.88
Maximum	110	Median	10
SD	23.8	CV	1.499
k hat (MLE)	0.259	k star (bias corrected MLE)	0.255
Theta hat (MLE)	61.36	Theta star (bias corrected MLE)	62.34
nu hat (MLE)	13.98	nu star (bias corrected)	13.76
MLE Mean (bias corrected)	15.88	MLE Sd (bias corrected)	31.46
		Adjusted Level of Significance (β)	0.0401
Approximate Chi Square Value (13.76, α)	6.406	Adjusted Chi Square Value (13.76, β)	6.086
95% Gamma Approximate UCL (use when n>=50)	34.11	95% Gamma Adjusted UCL (use when n<50)	35.9

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.906	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.892	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.219	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.215	Detected Data Not Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	16.5	Mean in Log Scale	1.86
SD in Original Scale	23.39	SD in Log Scale	1.541
95% t UCL (assumes normality of ROS data)	24.18	95% Percentile Bootstrap UCL	24.59
95% BCA Bootstrap UCL	26.43	95% Bootstrap t UCL	29.22
95% H-UCL (Log ROS)	57.14		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	1.777	95% H-UCL (KM -Log)	54.15
KM SD (logged)	1.552	95% Critical H Value (KM-Log)	3.319
KM Standard Error of Mean (logged)	0.309		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	16.58	Mean in Log Scale	1.902
SD in Original Scale	23.34	SD in Log Scale	1.514
95% t UCL (Assumes normality)	24.24	95% H-Stat UCL	55.49

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Percentile Bootstrap) UCL	24.49	95% GROS Adjusted Gamma UCL	35.9
95% Adjusted Gamma KM-UCL	28.21		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (tph-motor oil)

General Statistics

Total Number of Observations	27	Number of Distinct Observations	15
Number of Detects	12	Number of Non-Detects	15
Number of Distinct Detects	11	Number of Distinct Non-Detects	4
Minimum Detect	59	Minimum Non-Detect	25
Maximum Detect	600	Maximum Non-Detect	100
Variance Detects	22064	Percent Non-Detects	55.56%
Mean Detects	158.6	SD Detects	148.5
Median Detects	103.5	CV Detects	0.937
Skewness Detects	2.749	Kurtosis Detects	8.361
Mean of Logged Detects	4.822	SD of Logged Detects	0.66

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.642	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.281	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.256	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	86.3	Standard Error of Mean	23.23
SD	115.2	95% KM (BCA) UCL	128.3
95% KM (t) UCL	125.9	95% KM (Percentile Bootstrap) UCL	127.6
95% KM (z) UCL	124.5	95% KM Bootstrap t UCL	161.5
90% KM Chebyshev UCL	156	95% KM Chebyshev UCL	187.6
97.5% KM Chebyshev UCL	231.4	99% KM Chebyshev UCL	317.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.736	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.193	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.248	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.201	k star (bias corrected MLE)	1.706
Theta hat (MLE)	72.06	Theta star (bias corrected MLE)	92.95
nu hat (MLE)	52.82	nu star (bias corrected)	40.95
MLE Mean (bias corrected)	158.6	MLE Sd (bias corrected)	121.4

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.561	nu hat (KM)	30.31
Approximate Chi Square Value (30.31, α)	18.74	Adjusted Chi Square Value (30.31, β)	18.15
95% Gamma Approximate KM-UCL (use when n>=50)	139.6	95% Gamma Adjusted KM-UCL (use when n<50)	144.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	71.31
Maximum	600	Median	0.01
SD	125.2	CV	1.756
k hat (MLE)	0.171	k star (bias corrected MLE)	0.177
Theta hat (MLE)	416.1	Theta star (bias corrected MLE)	402.8

nu hat (MLE)	9.255	nu star (bias corrected)	9.56
MLE Mean (bias corrected)	71.31	MLE Sd (bias corrected)	169.5
		Adjusted Level of Significance (β)	0.0401
Approximate Chi Square Value (9.56, α)	3.669	Adjusted Chi Square Value (9.56, β)	3.438
95% Gamma Approximate UCL (use when n>=50)	185.8	95% Gamma Adjusted UCL (use when n<50)	198.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.157	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	84.61	Mean in Log Scale	3.871
SD in Original Scale	118.2	SD in Log Scale	1.041
95% t UCL (assumes normality of ROS data)	123.4	95% Percentile Bootstrap UCL	125.3
95% BCA Bootstrap UCL	152.4	95% Bootstrap t UCL	160.6
95% H-UCL (Log ROS)	139.5		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	3.973	95% H-UCL (KM -Log)	120.3
KM SD (logged)	0.894	95% Critical H Value (KM-Log)	2.386
KM Standard Error of Mean (logged)	0.184		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	85.24	Mean in Log Scale	3.904
SD in Original Scale	117.9	SD in Log Scale	1.007
95% t UCL (Assumes normality)	123.9	95% H-Stat UCL	135.6

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	125.9	95% GROS Adjusted Gamma UCL	198.3
95% Adjusted Gamma KM-UCL	144.1		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (vanadium)

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	38	Mean	50.25
Maximum	72	Median	47.5
SD	11.84	Std. Error of Mean	3.418
Coefficient of Variation	0.236	Skewness	0.706

Normal GOF Test

Shapiro Wilk Test Statistic	0.886	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.159	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.256	Data appear Normal at 5% Significance Level	

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	56.39	95% Adjusted-CLT UCL (Chen-1995)	56.62
		95% Modified-t UCL (Johnson-1978)	56.5

Gamma GOF Test

A-D Test Statistic	0.489	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.732	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.156	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	20.79	k star (bias corrected MLE)	15.64
Theta hat (MLE)	2.418	Theta star (bias corrected MLE)	3.212
nu hat (MLE)	498.8	nu star (bias corrected)	375.5
MLE Mean (bias corrected)	50.25	MLE Sd (bias corrected)	12.7
		Approximate Chi Square Value (0.05)	331.6
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	325.3

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	56.9	95% Adjusted Gamma UCL (use when n<50)	58.01

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.148	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.638	Mean of logged Data	3.893
Maximum of Logged Data	4.277	SD of logged Data	0.227

Assuming Lognormal Distribution

95% H-UCL	57.2	90% Chebyshev (MVUE) UCL	60.16
95% Chebyshev (MVUE) UCL	64.67	97.5% Chebyshev (MVUE) UCL	70.92
99% Chebyshev (MVUE) UCL	83.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	55.87	95% Jackknife UCL	56.39
95% Standard Bootstrap UCL	55.68	95% Bootstrap-t UCL	57.15
95% Hall's Bootstrap UCL	56.04	95% Percentile Bootstrap UCL	55.75
95% BCA Bootstrap UCL	56.42		
90% Chebyshev(Mean, Sd) UCL	60.5	95% Chebyshev(Mean, Sd) UCL	65.15
97.5% Chebyshev(Mean, Sd) UCL	71.6	99% Chebyshev(Mean, Sd) UCL	84.26

Suggested UCL to Use

95% Student's-t UCL	56.39

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Chemical (zinc)

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	70	Mean	114.7
Maximum	270	Median	98.5
SD	53.17	Std. Error of Mean	15.35
Coefficient of Variation	0.464	Skewness	2.58

Normal GOF Test

Shapiro Wilk Test Statistic	0.689	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.275	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	142.2	95% Adjusted-CLT UCL (Chen-1995)	152.1
		95% Modified-t UCL (Johnson-1978)	144.1

Gamma GOF Test

A-D Test Statistic	0.897	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.731	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.262	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.246	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.45	k star (bias corrected MLE)	5.643
Theta hat (MLE)	15.39	Theta star (bias corrected MLE)	20.32
nu hat (MLE)	178.8	nu star (bias corrected)	135.4
MLE Mean (bias corrected)	114.7	MLE Sd (bias corrected)	48.27
		Approximate Chi Square Value (0.05)	109.5
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	106

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	141.8	95% Adjusted Gamma UCL (use when n<50)	146.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.853	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.242	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.248	Mean of logged Data	4.673
Maximum of Logged Data	5.598	SD of logged Data	0.357

Assuming Lognormal Distribution

95% H-UCL	141.2	90% Chebyshev (MVUE) UCL	149
95% Chebyshev (MVUE) UCL	165.1	97.5% Chebyshev (MVUE) UCL	187.4
99% Chebyshev (MVUE) UCL	231.3		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE 438 FIRST STREET PROPERTY SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Nonparametric Distribution Free UCLs

95% CLT UCL	139.9	95% Jackknife UCL	142.2
95% Standard Bootstrap UCL	138.7	95% Bootstrap-t UCL	174.2
95% Hall's Bootstrap UCL	243.8	95% Percentile Bootstrap UCL	142.2
95% BCA Bootstrap UCL	154.2		
90% Chebyshev(Mean, Sd) UCL	160.7	95% Chebyshev(Mean, Sd) UCL	181.6
97.5% Chebyshev(Mean, Sd) UCL	210.5	99% Chebyshev(Mean, Sd) UCL	267.4

Suggested UCL to Use

95% Student's-t UCL	142.2	or 95% Modified-t UCL	144.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	5/7/2015 5:59:36 PM
From File	Santa_Rosa_Soil_input_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chemical (acenaphthene)

General Statistics

Total Number of Observations	99	Number of Distinct Observations	21
Number of Detects	10	Number of Non-Detects	89
Number of Distinct Detects	10	Number of Distinct Non-Detects	12
Minimum Detect	0.0022	Minimum Non-Detect	0.005
Maximum Detect	0.84	Maximum Non-Detect	500
Variance Detects	0.0729	Percent Non-Detects	89.9%
Mean Detects	0.171	SD Detects	0.27
Median Detects	0.07	CV Detects	1.581
Skewness Detects	2.129	Kurtosis Detects	4.26
Mean of Logged Detects	-3.049	SD of Logged Detects	1.914

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.675	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.36	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.28	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0253	Standard Error of Mean	0.0111
SD	0.0991	95% KM (BCA) UCL	0.0485
95% KM (t) UCL	0.0437	95% KM (Percentile Bootstrap) UCL	0.0444
95% KM (z) UCL	0.0435	95% KM Bootstrap t UCL	0.069
90% KM Chebyshev UCL	0.0586	95% KM Chebyshev UCL	0.0737
97.5% KM Chebyshev UCL	0.0947	99% KM Chebyshev UCL	0.136

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.293	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.778	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.182	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.281	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.496	k star (bias corrected MLE)	0.414
Theta hat (MLE)	0.344	Theta star (bias corrected MLE)	0.413
nu hat (MLE)	9.919	nu star (bias corrected)	8.277
MLE Mean (bias corrected)	0.171	MLE Sd (bias corrected)	0.266

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.065	nu hat (KM)	12.87
Approximate Chi Square Value (12.87, α)	5.808	Adjusted Chi Square Value (12.87, β)	5.737
95% Gamma Approximate KM-UCL (use when n>=50)	0.056	95% Gamma Adjusted KM-UCL (use when n<50)	0.0567

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0022	Mean	0.0311
Maximum	0.84	Median	0.01
SD	0.0966	CV	3.102
k hat (MLE)	0.72	k star (bias corrected MLE)	0.705
Theta hat (MLE)	0.0432	Theta star (bias corrected MLE)	0.0442
nu hat (MLE)	142.5	nu star (bias corrected)	139.5
MLE Mean (bias corrected)	0.0311	MLE Sd (bias corrected)	0.0371
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (139.52, α)	113.2	Adjusted Chi Square Value (139.52, β)	112.9
95% Gamma Approximate UCL (use when n>=50)	0.0384	95% Gamma Adjusted UCL (use when n<50)	0.0385

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.972	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.131	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.28	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.024	Mean in Log Scale	-5.584
SD in Original Scale	0.0962	SD in Log Scale	1.767
95% t UCL (assumes normality of ROS data)	0.04	95% Percentile Bootstrap UCL	0.0411
95% BCA Bootstrap UCL	0.0523	95% Bootstrap t UCL	0.084
95% H-UCL (Log ROS)	0.0313		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-5.23	95% H-UCL (KM -Log)	0.0173
KM SD (logged)	1.294	95% Critical H Value (KM-Log)	2.564
KM Standard Error of Mean (logged)	0.29		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	5.134	Mean in Log Scale	-2.94
SD in Original Scale	35.34	SD in Log Scale	1.661
95% t UCL (Assumes normality)	11.03	95% H-Stat UCL	0.347

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.0437	95% GROS Approximate Gamma UCL	0.0384
95% Approximate Gamma KM-UCL	0.056		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (acenaphthylene)

General Statistics

Total Number of Observations	99	Number of Distinct Observations	27
Number of Detects	21	Number of Non-Detects	78

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Number of Distinct Detects	18	Number of Distinct Non-Detects	10
Minimum Detect	0.013	Minimum Non-Detect	0.005
Maximum Detect	11	Maximum Non-Detect	500
Variance Detects	10.56	Percent Non-Detects	78.79%
Mean Detects	1.543	SD Detects	3.25
Median Detects	0.1	CV Detects	2.106
Skewness Detects	2.26	Kurtosis Detects	3.828
Mean of Logged Detects	-1.744	SD of Logged Detects	2.185

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.522	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.908	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.39	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.193	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.349	Standard Error of Mean	0.167
SD	1.604	95% KM (BCA) UCL	0.66
95% KM (t) UCL	0.626	95% KM (Percentile Bootstrap) UCL	0.635
95% KM (z) UCL	0.624	95% KM Bootstrap t UCL	1.548
90% KM Chebyshev UCL	0.85	95% KM Chebyshev UCL	1.077
97.5% KM Chebyshev UCL	1.391	99% KM Chebyshev UCL	2.01

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.824	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.843	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.265	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.205	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.314	k star (bias corrected MLE)	0.301
Theta hat (MLE)	4.91	Theta star (bias corrected MLE)	5.125
nu hat (MLE)	13.2	nu star (bias corrected)	12.64
MLE Mean (bias corrected)	1.543	MLE Sd (bias corrected)	2.812

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0474	nu hat (KM)	9.389
Approximate Chi Square Value (9.39, α)	3.563	Adjusted Chi Square Value (9.39, β)	3.51
95% Gamma Approximate KM-UCL (use when n>=50)	0.92	95% Gamma Adjusted KM-UCL (use when n<50)	0.934

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.348
Maximum	11	Median	0.01
SD	1.597	CV	4.584
k hat (MLE)	0.251	k star (bias corrected MLE)	0.25
Theta hat (MLE)	1.389	Theta star (bias corrected MLE)	1.394
nu hat (MLE)	49.64	nu star (bias corrected)	49.47
MLE Mean (bias corrected)	0.348	MLE Sd (bias corrected)	0.697
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (49.47, α)	34.32	Adjusted Chi Square Value (49.47, β)	34.14
95% Gamma Approximate UCL (use when n>=50)	0.502	95% Gamma Adjusted UCL (use when n<50)	0.505

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.89	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.908	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.173	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.193	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.345	Mean in Log Scale	-4.263
SD in Original Scale	1.596	SD in Log Scale	2.256
95% t UCL (assumes normality of ROS data)	0.612	95% Percentile Bootstrap UCL	0.607
95% BCA Bootstrap UCL	0.782	95% Bootstrap t UCL	1.978
95% H-UCL (Log ROS)	0.421		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-3.68	95% H-UCL (KM -Log)	0.135
KM SD (logged)	1.563	95% Critical H Value (KM-Log)	2.872
KM Standard Error of Mean (logged)	0.237		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	5.424	Mean in Log Scale	-2.676
SD in Original Scale	35.33	SD in Log Scale	1.799
95% t UCL (Assumes normality)	11.32	95% H-Stat UCL	0.618

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	1.391

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (anthracene)

General Statistics

Total Number of Observations	99	Number of Distinct Observations	41
Number of Detects	36	Number of Non-Detects	63
Number of Distinct Detects	31	Number of Distinct Non-Detects	10
Minimum Detect	0.002	Minimum Non-Detect	0.003
Maximum Detect	670	Maximum Non-Detect	500
Variance Detects	12455	Percent Non-Detects	63.64%
Mean Detects	19.03	SD Detects	111.6
Median Detects	0.0245	CV Detects	5.866
Skewness Detects	5.999	Kurtosis Detects	35.99
Mean of Logged Detects	-3.191	SD of Logged Detects	2.662

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.175	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.935	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.516	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.148	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	6.925	Standard Error of Mean	6.828
SD	66.99	95% KM (BCA) UCL	20.44
95% KM (t) UCL	18.26	95% KM (Percentile Bootstrap) UCL	20.44
95% KM (z) UCL	18.16	95% KM Bootstrap t UCL	1061
90% KM Chebyshev UCL	27.41	95% KM Chebyshev UCL	36.69
97.5% KM Chebyshev UCL	49.56	99% KM Chebyshev UCL	74.86

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.101	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.975	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.371	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.167	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.128	k star (bias corrected MLE)	0.136
Theta hat (MLE)	148.6	Theta star (bias corrected MLE)	140
nu hat (MLE)	9.221	nu star (bias corrected)	9.786
MLE Mean (bias corrected)	19.03	MLE Sd (bias corrected)	51.61

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0107	nu hat (KM)	2.116
Approximate Chi Square Value (2.12, α)	0.167	Adjusted Chi Square Value (2.12, β)	0.163
95% Gamma Approximate KM-UCL (use when n>=50)	87.54	95% Gamma Adjusted KM-UCL (use when n<50)	90.01

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.002	Mean	6.951
Maximum	670	Median	0.01
SD	67.32	CV	9.686
k hat (MLE)	0.131	k star (bias corrected MLE)	0.134
Theta hat (MLE)	53	Theta star (bias corrected MLE)	51.91
nu hat (MLE)	25.97	nu star (bias corrected)	26.51
MLE Mean (bias corrected)	6.951	MLE Sd (bias corrected)	18.99
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (26.51, α)	15.77	Adjusted Chi Square Value (26.51, β)	15.65
95% Gamma Approximate UCL (use when n>=50)	11.68	95% Gamma Adjusted UCL (use when n<50)	11.77

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.86	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.935	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.147	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.148	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	6.923	Mean in Log Scale	-5.291
SD in Original Scale	67.33	SD in Log Scale	2.743
95% t UCL (assumes normality of ROS data)	18.16	95% Percentile Bootstrap UCL	20.43
95% BCA Bootstrap UCL	34.03	95% Bootstrap t UCL	1060
95% H-UCL (Log ROS)	0.736		

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-4.705	95% H-UCL (KM -Log)	0.18
KM SD (logged)	2.111	95% Critical H Value (KM-Log)	3.56
KM Standard Error of Mean (logged)	0.236		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	9.479	Mean in Log Scale	-3.737
SD in Original Scale	71.61	SD in Log Scale	2.404
95% t UCL (Assumes normality)	21.43	95% H-Stat UCL	1.118

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	49.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (arsenic)

General Statistics

Total Number of Observations	40	Number of Distinct Observations	11
Number of Detects	9	Number of Non-Detects	31
Number of Distinct Detects	9	Number of Distinct Non-Detects	2
Minimum Detect	2.6	Minimum Non-Detect	0.75
Maximum Detect	13	Maximum Non-Detect	5
Variance Detects	10.34	Percent Non-Detects	77.5%
Mean Detects	5.394	SD Detects	3.216
Median Detects	4.6	CV Detects	0.596
Skewness Detects	1.874	Kurtosis Detects	4.149
Mean of Logged Detects	1.559	SD of Logged Detects	0.51

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.797	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.243	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.295	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	3.445	Standard Error of Mean	0.546
SD	2.082	95% KM (BCA) UCL	4.293
95% KM (t) UCL	4.365	95% KM (Percentile Bootstrap) UCL	4.344
95% KM (z) UCL	4.343	95% KM Bootstrap t UCL	4.419
90% KM Chebyshev UCL	5.083	95% KM Chebyshev UCL	5.826
97.5% KM Chebyshev UCL	6.856	99% KM Chebyshev UCL	8.879

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.406	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.168	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.28	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Gamma Statistics on Detected Data Only

k hat (MLE)	4.125	k star (bias corrected MLE)	2.824
Theta hat (MLE)	1.308	Theta star (bias corrected MLE)	1.91
nu hat (MLE)	74.25	nu star (bias corrected)	50.83
MLE Mean (bias corrected)	5.394	MLE Sd (bias corrected)	3.21

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	2.738	nu hat (KM)	219.1
Approximate Chi Square Value (219.05, α)	185.8	Adjusted Chi Square Value (219.05, β)	184.7
95% Gamma Approximate KM-UCL (use when n>=50)	4.062	95% Gamma Adjusted KM-UCL (use when n<50)	4.087

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.323
Maximum	13	Median	2.99
SD	2.375	CV	0.715
k hat (MLE)	1.477	k star (bias corrected MLE)	1.383
Theta hat (MLE)	2.249	Theta star (bias corrected MLE)	2.402
nu hat (MLE)	118.2	nu star (bias corrected)	110.7
MLE Mean (bias corrected)	3.323	MLE Sd (bias corrected)	2.825
		Adjusted Level of Significance (β)	0.044
Approximate Chi Square Value (110.66, α)	87.38	Adjusted Chi Square Value (110.66, β)	86.61
95% Gamma Approximate UCL (use when n>=50)	4.208	95% Gamma Adjusted UCL (use when n<50)	4.246

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.929	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.15	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.295	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.596	Mean in Log Scale	1.16
SD in Original Scale	2.051	SD in Log Scale	0.481
95% t UCL (assumes normality of ROS data)	4.143	95% Percentile Bootstrap UCL	4.153
95% BCA Bootstrap UCL	4.315	95% Bootstrap t UCL	4.355
95% H-UCL (Log ROS)	4.149		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	1.058	95% H-UCL (KM -Log)	4.385
KM SD (logged)	0.647	95% Critical H Value (KM-Log)	2.042
KM Standard Error of Mean (logged)	0.234		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	3.098	Mean in Log Scale	1.014
SD in Original Scale	1.95	SD in Log Scale	0.481
95% t UCL (Assumes normality)	3.618	95% H-Stat UCL	3.582

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	4.365	95% KM (Percentile Bootstrap) UCL	4.344

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (barium)

General Statistics

Total Number of Observations	39	Number of Distinct Observations	24
		Number of Missing Observations	0
Minimum	78	Mean	128
Maximum	420	Median	120
SD	58.26	Std. Error of Mean	9.329
Coefficient of Variation	0.455	Skewness	3.535

Normal GOF Test

Shapiro Wilk Test Statistic	0.667	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.939	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.199	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.142	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	143.7	95% Adjusted-CLT UCL (Chen-1995)	149
		95% Modified-t UCL (Johnson-1978)	144.6

Gamma GOF Test

A-D Test Statistic	1.363	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.128	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.141	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.993	k star (bias corrected MLE)	7.395
Theta hat (MLE)	16.01	Theta star (bias corrected MLE)	17.31
nu hat (MLE)	623.5	nu star (bias corrected)	576.8
MLE Mean (bias corrected)	128	MLE Sd (bias corrected)	47.07
		Approximate Chi Square Value (0.05)	522.1
Adjusted Level of Significance	0.0437	Adjusted Chi Square Value	520.1

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	141.4	95% Adjusted Gamma UCL (use when n<50)	142

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.939	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.12	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.142	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.357	Mean of logged Data	4.788
Maximum of Logged Data	6.04	SD of logged Data	0.332

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Assuming Lognormal Distribution

95% H-UCL	139.8	90% Chebyshev (MVUE) UCL	147.3
95% Chebyshev (MVUE) UCL	156.7	97.5% Chebyshev (MVUE) UCL	169.6
99% Chebyshev (MVUE) UCL	195.1		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	143.4	95% Jackknife UCL	143.7
95% Standard Bootstrap UCL	143.5	95% Bootstrap-t UCL	155.2
95% Hall's Bootstrap UCL	214.8	95% Percentile Bootstrap UCL	143.8
95% BCA Bootstrap UCL	150.6		
90% Chebyshev(Mean, Sd) UCL	156	95% Chebyshev(Mean, Sd) UCL	168.7
97.5% Chebyshev(Mean, Sd) UCL	186.3	99% Chebyshev(Mean, Sd) UCL	220.8

Suggested UCL to Use

95% Adjusted Gamma UCL 142

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (benzo(a)anthracene)

General Statistics

Total Number of Observations	97	Number of Distinct Observations	36
Number of Detects	35	Number of Non-Detects	62
Number of Distinct Detects	30	Number of Distinct Non-Detects	8
Minimum Detect	0.0031	Minimum Non-Detect	0.003
Maximum Detect	1200	Maximum Non-Detect	1
Variance Detects	59013	Percent Non-Detects	63.92%
Mean Detects	59.33	SD Detects	242.9
Median Detects	0.056	CV Detects	4.094
Skewness Detects	4.211	Kurtosis Detects	17.33
Mean of Logged Detects	-1.955	SD of Logged Detects	3.158

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.27	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.934	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.499	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.15	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	21.42	Standard Error of Mean	15.1
SD	146.6	95% KM (BCA) UCL	46.42
95% KM (t) UCL	46.5	95% KM (Percentile Bootstrap) UCL	46.34
95% KM (z) UCL	46.26	95% KM Bootstrap t UCL	1832
90% KM Chebyshev UCL	66.73	95% KM Chebyshev UCL	87.25
97.5% KM Chebyshev UCL	115.7	99% KM Chebyshev UCL	171.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	6.525	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.973	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.356	**Kolmogrov-Smirnoff GOF**	

5% K-S Critical Value	0.169	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.13	k star (bias corrected MLE)	0.138
Theta hat (MLE)	456.7	Theta star (bias corrected MLE)	430.5
nu hat (MLE)	9.094	nu star (bias corrected)	9.648
MLE Mean (bias corrected)	59.33	MLE Sd (bias corrected)	159.8

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0213	nu hat (KM)	4.139
Approximate Chi Square Value (4.14, α)	0.777	Adjusted Chi Square Value (4.14, β)	0.757
95% Gamma Approximate KM-UCL (use when n>=50)	114	95% Gamma Adjusted KM-UCL (use when n<50)	117.1

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0031	Mean	21.42
Maximum	1200	Median	0.01
SD	147.4	CV	6.882
k hat (MLE)	0.118	k star (bias corrected MLE)	0.122
Theta hat (MLE)	180.9	Theta star (bias corrected MLE)	176.2
nu hat (MLE)	22.96	nu star (bias corrected)	23.58
MLE Mean (bias corrected)	21.42	MLE Sd (bias corrected)	61.42
		Adjusted Level of Significance (β)	0.0475
Approximate Chi Square Value (23.58, α)	13.53	Adjusted Chi Square Value (23.58, β)	13.42
95% Gamma Approximate UCL (use when n>=50)	37.32	95% Gamma Adjusted UCL (use when n<50)	37.64

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.87	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.934	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.15	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	21.41	Mean in Log Scale	-6.079
SD in Original Scale	147.4	SD in Log Scale	4.383
95% t UCL (assumes normality of ROS data)	46.27	95% Percentile Bootstrap UCL	49.77
95% BCA Bootstrap UCL	59.65	95% Bootstrap t UCL	1246
95% H-UCL (Log ROS)	683.2		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	21.44	Mean in Log Scale	-3.415
SD in Original Scale	147.4	SD in Log Scale	2.594
95% t UCL (Assumes normality)	46.29	95% H-Stat UCL	2.887

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	115.7

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(a)pyrene)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	49
Number of Detects	45	Number of Non-Detects	53
Number of Distinct Detects	41	Number of Distinct Non-Detects	8
Minimum Detect	0.0035	Minimum Non-Detect	0.003
Maximum Detect	2700	Maximum Non-Detect	1
Variance Detects	272984	Percent Non-Detects	54.08%
Mean Detects	112.5	SD Detects	522.5
Median Detects	0.089	CV Detects	4.643
Skewness Detects	4.624	Kurtosis Detects	20.46
Mean of Logged Detects	-2.032	SD of Logged Detects	3.056

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.23	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.519	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.132	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	51.68	Standard Error of Mean	36.22
SD	354.6	95% KM (BCA) UCL	106.9
95% KM (t) UCL	111.8	95% KM (Percentile Bootstrap) UCL	110.7
95% KM (z) UCL	111.3	95% KM Bootstrap t UCL	5668
90% KM Chebyshev UCL	160.3	95% KM Chebyshev UCL	209.6
97.5% KM Chebyshev UCL	277.9	99% KM Chebyshev UCL	412.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	9.81	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.99	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.38	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.151	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.118	k star (bias corrected MLE)	0.125
Theta hat (MLE)	956.1	Theta star (bias corrected MLE)	902.6
nu hat (MLE)	10.59	nu star (bias corrected)	11.22
MLE Mean (bias corrected)	112.5	MLE Sd (bias corrected)	318.7

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0212	nu hat (KM)	4.165
Approximate Chi Square Value (4.16, α)	0.788	Adjusted Chi Square Value (4.16, β)	0.767
95% Gamma Approximate KM-UCL (use when n>=50)	273.2	95% Gamma Adjusted KM-UCL (use when n<50)	280.6

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Minimum	0.0035	Mean	51.68
Maximum	2700	Median	0.01
SD	356.4	CV	6.896
k hat (MLE)	0.109	k star (bias corrected MLE)	0.112
Theta hat (MLE)	474.1	Theta star (bias corrected MLE)	459.5
nu hat (MLE)	21.36	nu star (bias corrected)	22.04
MLE Mean (bias corrected)	51.68	MLE Sd (bias corrected)	154.1
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (22.04, α)	12.37	Adjusted Chi Square Value (22.04, β)	12.26
95% Gamma Approximate UCL (use when n>=50)	92.09	95% Gamma Adjusted UCL (use when n<50)	92.9

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.845	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.175	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.132	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	51.68	Mean in Log Scale	-4.982
SD in Original Scale	356.4	SD in Log Scale	3.956
95% t UCL (assumes normality of ROS data)	111.5	95% Percentile Bootstrap UCL	126.2
95% BCA Bootstrap UCL	164.4	95% Bootstrap t UCL	5843
95% H-UCL (Log ROS)	198.7		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	51.7	Mean in Log Scale	-3.169
SD in Original Scale	356.4	SD in Log Scale	2.682
95% t UCL (Assumes normality)	111.5	95% H-Stat UCL	4.966

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 277.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(a)pyrene equivalent)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	50
		Number of Missing Observations	0
Minimum	0.0026	Mean	63.2
Maximum	3300	Median	0.044
SD	434.8	Std. Error of Mean	43.92
Coefficient of Variation	6.88	Skewness	6.962

Normal GOF Test

Shapiro Wilk Test Statistic	0.148	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.511	**Lilliefors GOF Test**	

5% Lilliefors Critical Value	0.0895	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	136.1	95% Adjusted-CLT UCL (Chen-1995)	168.5
		95% Modified-t UCL (Johnson-1978)	141.3

Gamma GOF Test

A-D Test Statistic	24.23	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.998	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.423	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.103	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.117	k star (bias corrected MLE)	0.121
Theta hat (MLE)	538.3	Theta star (bias corrected MLE)	524
nu hat (MLE)	23.01	nu star (bias corrected)	23.64
MLE Mean (bias corrected)	63.2	MLE Sd (bias corrected)	182
		Approximate Chi Square Value (0.05)	13.58
Adjusted Level of Significance	0.0476	Adjusted Chi Square Value	13.46

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	110.1	95% Adjusted Gamma UCL (use when n<50)	111

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.864	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	6.555E-13	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.138	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.0895	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-5.952	Mean of logged Data	-2.628
Maximum of Logged Data	8.102	SD of logged Data	2.58

Assuming Lognormal Distribution

95% H-UCL	6.015	90% Chebyshev (MVUE) UCL	4.172
95% Chebyshev (MVUE) UCL	5.265	97.5% Chebyshev (MVUE) UCL	6.783
99% Chebyshev (MVUE) UCL	9.764		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	135.4	95% Jackknife UCL	136.1
95% Standard Bootstrap UCL	136.7	95% Bootstrap-t UCL	6738
95% Hall's Bootstrap UCL	6888	95% Percentile Bootstrap UCL	149.5
95% BCA Bootstrap UCL	169.1		
90% Chebyshev(Mean, Sd) UCL	195	95% Chebyshev(Mean, Sd) UCL	254.7
97.5% Chebyshev(Mean, Sd) UCL	337.5	99% Chebyshev(Mean, Sd) UCL	500.2

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	254.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.

For additional insight the user may want to consult a statistician.

Chemical (benzo(b)fluoranthene)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	43
Number of Detects	44	Number of Non-Detects	54
Number of Distinct Detects	38	Number of Distinct Non-Detects	8
Minimum Detect	0.0032	Minimum Non-Detect	0.003
Maximum Detect	1300	Maximum Non-Detect	1
Variance Detects	59607	Percent Non-Detects	55.1%
Mean Detects	54.09	SD Detects	244.1
Median Detects	0.074	CV Detects	4.514
Skewness Detects	4.644	Kurtosis Detects	20.94
Mean of Logged Detects	-1.964	SD of Logged Detects	3.004

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.241	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.944	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.487	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.134	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	24.29	Standard Error of Mean	16.75
SD	163.9	95% KM (BCA) UCL	59.13
95% KM (t) UCL	52.11	95% KM (Percentile Bootstrap) UCL	54.61
95% KM (z) UCL	51.85	95% KM Bootstrap t UCL	1090
90% KM Chebyshev UCL	74.55	95% KM Chebyshev UCL	97.31
97.5% KM Chebyshev UCL	128.9	99% KM Chebyshev UCL	191

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.504	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.976	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.357	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.152	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.132	k star (bias corrected MLE)	0.138
Theta hat (MLE)	411.3	Theta star (bias corrected MLE)	392.8
nu hat (MLE)	11.57	nu star (bias corrected)	12.12
MLE Mean (bias corrected)	54.09	MLE Sd (bias corrected)	145.8

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.022	nu hat (KM)	4.303
Approximate Chi Square Value (4.30, α)	0.845	Adjusted Chi Square Value (4.30, β)	0.823
95% Gamma Approximate KM-UCL (use when n>=50)	123.7	95% Gamma Adjusted KM-UCL (use when n<50)	127

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0032	Mean	24.29
Maximum	1300	Median	0.01

SD	164.8	CV	6.784
k hat (MLE)	0.12	k star (bias corrected MLE)	0.123
Theta hat (MLE)	202.4	Theta star (bias corrected MLE)	197.3
nu hat (MLE)	23.52	nu star (bias corrected)	24.13
MLE Mean (bias corrected)	24.29	MLE Sd (bias corrected)	69.23
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (24.13, α)	13.95	Adjusted Chi Square Value (24.13, β)	13.83
95% Gamma Approximate UCL (use when n>=50)	42.02	95% Gamma Adjusted UCL (use when n<50)	42.38

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.871	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.944	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.197	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.134	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	24.29	Mean in Log Scale	-5.031
SD in Original Scale	164.8	SD in Log Scale	3.959
95% t UCL (assumes normality of ROS data)	51.93	95% Percentile Bootstrap UCL	55.31
95% BCA Bootstrap UCL	70.67	95% Bootstrap t UCL	1093
95% H-UCL (Log ROS)	192.5		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	24.31	Mean in Log Scale	-3.119
SD in Original Scale	164.8	SD in Log Scale	2.602
95% t UCL (Assumes normality)	51.96	95% H-Stat UCL	3.965

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 128.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(g,h,i)perylene)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	42
Number of Detects	38	Number of Non-Detects	60
Number of Distinct Detects	35	Number of Distinct Non-Detects	8
Minimum Detect	0.0084	Minimum Non-Detect	0.003
Maximum Detect	2600	Maximum Non-Detect	1
Variance Detects	332597	Percent Non-Detects	61.22%
Mean Detects	136.3	SD Detects	576.7
Median Detects	0.105	CV Detects	4.231
Skewness Detects	4.175	Kurtosis Detects	16.3
Mean of Logged Detects	-1.334	SD of Logged Detects	2.986

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.25	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.938	Detected Data Not Normal at 5% Significance Level

Lilliefors Test Statistic	0.512	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.144	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	52.86	Standard Error of Mean	36.91
SD	360.5	95% KM (BCA) UCL	129.8
95% KM (t) UCL	114.2	95% KM (Percentile Bootstrap) UCL	128.9
95% KM (z) UCL	113.6	95% KM Bootstrap t UCL	4324
90% KM Chebyshev UCL	163.6	95% KM Chebyshev UCL	213.7
97.5% KM Chebyshev UCL	283.4	99% KM Chebyshev UCL	420.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.133	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.979	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.377	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.163	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.126	k star (bias corrected MLE)	0.134
Theta hat (MLE)	1081	Theta star (bias corrected MLE)	1020
nu hat (MLE)	9.581	nu star (bias corrected)	10.16
MLE Mean (bias corrected)	136.3	MLE Sd (bias corrected)	372.9

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0215	nu hat (KM)	4.214
Approximate Chi Square Value (4.21, α)	0.808	Adjusted Chi Square Value (4.21, β)	0.787
95% Gamma Approximate KM-UCL (use when n>=50)	275.7	95% Gamma Adjusted KM-UCL (use when n<50)	283.1

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0084	Mean	52.86
Maximum	2600	Median	0.01
SD	362.4	CV	6.855
k hat (MLE)	0.11	k star (bias corrected MLE)	0.113
Theta hat (MLE)	481.2	Theta star (bias corrected MLE)	466.6
nu hat (MLE)	21.53	nu star (bias corrected)	22.21
MLE Mean (bias corrected)	52.86	MLE Sd (bias corrected)	157
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (22.21, α)	12.49	Adjusted Chi Square Value (22.21, β)	12.38
95% Gamma Approximate UCL (use when n>=50)	93.96	95% Gamma Adjusted UCL (use when n<50)	94.79

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.826	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.938	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.144	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	52.86	Mean in Log Scale	-5.416
SD in Original Scale	362.4	SD in Log Scale	4.359
95% t UCL (assumes normality of ROS data)	113.7	95% Percentile Bootstrap UCL	107.2

95% BCA Bootstrap UCL	156.7	95% Bootstrap t UCL	6207
95% H-UCL (Log ROS)	1143		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	52.88	Mean in Log Scale	-3.153
SD in Original Scale	362.4	SD in Log Scale	2.742
95% t UCL (Assumes normality)	113.7	95% H-Stat UCL	6.25

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	283.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (benzo(k)fluoranthene)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	39
Number of Detects	32	Number of Non-Detects	66
Number of Distinct Detects	30	Number of Distinct Non-Detects	10
Minimum Detect	0.0034	Minimum Non-Detect	0.003
Maximum Detect	710	Maximum Non-Detect	1
Variance Detects	27211	Percent Non-Detects	67.35%
Mean Detects	42.43	SD Detects	165
Median Detects	0.044	CV Detects	3.888
Skewness Detects	3.819	Kurtosis Detects	13.5
Mean of Logged Detects	-2.274	SD of Logged Detects	2.948

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.277	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.513	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.157	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	13.86	Standard Error of Mean	9.738
SD	94.88	95% KM (BCA) UCL	33.88
95% KM (t) UCL	30.03	95% KM (Percentile Bootstrap) UCL	33.18
95% KM (z) UCL	29.88	95% KM Bootstrap t UCL	1190
90% KM Chebyshev UCL	43.08	95% KM Chebyshev UCL	56.31
97.5% KM Chebyshev UCL	74.68	99% KM Chebyshev UCL	110.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	6.969	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.972	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.381	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.176	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.13	k star (bias corrected MLE)	0.139
Theta hat (MLE)	325.8	Theta star (bias corrected MLE)	305.6
nu hat (MLE)	8.334	nu star (bias corrected)	8.886
MLE Mean (bias corrected)	42.43	MLE Sd (bias corrected)	113.9

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0213	nu hat (KM)	4.183
Approximate Chi Square Value (4.18, α)	0.795	Adjusted Chi Square Value (4.18, β)	0.774
95% Gamma Approximate KM-UCL (use when n>=50)	72.91	95% Gamma Adjusted KM-UCL (use when n<50)	74.87

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0034	Mean	13.93
Maximum	710	Median	0.01
SD	95.37	CV	6.847
k hat (MLE)	0.123	k star (bias corrected MLE)	0.126
Theta hat (MLE)	113	Theta star (bias corrected MLE)	110.3
nu hat (MLE)	24.15	nu star (bias corrected)	24.75
MLE Mean (bias corrected)	13.93	MLE Sd (bias corrected)	39.2
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (24.75, α)	14.42	Adjusted Chi Square Value (24.75, β)	14.3
95% Gamma Approximate UCL (use when n>=50)	23.91	95% Gamma Adjusted UCL (use when n<50)	24.1

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.807	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.213	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.157	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	13.86	Mean in Log Scale	-6.166
SD in Original Scale	95.37	SD in Log Scale	3.945
95% t UCL (assumes normality of ROS data)	29.86	95% Percentile Bootstrap UCL	33.03
95% BCA Bootstrap UCL	40.32	95% Bootstrap t UCL	2259
95% H-UCL (Log ROS)	57.61		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	13.89	Mean in Log Scale	-3.578
SD in Original Scale	95.37	SD in Log Scale	2.427
95% t UCL (Assumes normality)	29.89	95% H-Stat UCL	1.414

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	74.68

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Chemical (beryllium)

General Statistics

Total Number of Observations	39	Number of Distinct Observations	10
Number of Detects	4	Number of Non-Detects	35
Number of Distinct Detects	4	Number of Distinct Non-Detects	6
Minimum Detect	0.281	Minimum Non-Detect	0.36
Maximum Detect	0.573	Maximum Non-Detect	20
Variance Detects	0.0186	Percent Non-Detects	89.74%
Mean Detects	0.37	SD Detects	0.136
Median Detects	0.313	CV Detects	0.368
Skewness Detects	1.922	Kurtosis Detects	3.762
Mean of Logged Detects	-1.037	SD of Logged Detects	0.325

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.733	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.401	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.443	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.309	Standard Error of Mean	0.0129
SD	0.0459	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.331	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.331	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.348	95% KM Chebyshev UCL	0.366
97.5% KM Chebyshev UCL	0.39	99% KM Chebyshev UCL	0.438

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.674	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.657	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.412	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.395	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	11.76	k star (bias corrected MLE)	3.106
Theta hat (MLE)	0.0315	Theta star (bias corrected MLE)	0.119
nu hat (MLE)	94.05	nu star (bias corrected)	24.85
MLE Mean (bias corrected)	0.37	MLE Sd (bias corrected)	0.21

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	45.4	nu hat (KM)	3542
Approximate Chi Square Value (N/A, α)	3404	Adjusted Chi Square Value (N/A, β)	3399
95% Gamma Approximate KM-UCL (use when n>=50)	0.322	95% Gamma Adjusted KM-UCL (use when n<50)	0.322

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.172	Mean	0.317
Maximum	0.573	Median	0.307
SD	0.0797	CV	0.251
k hat (MLE)	17.08	k star (bias corrected MLE)	15.79
Theta hat (MLE)	0.0185	Theta star (bias corrected MLE)	0.0201

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

nu hat (MLE)	1333	nu star (bias corrected)	1231
MLE Mean (bias corrected)	0.317	MLE Sd (bias corrected)	0.0797
		Adjusted Level of Significance (β)	0.0437
Approximate Chi Square Value (N/A, α)	1151	Adjusted Chi Square Value (N/A, β)	1148
95% Gamma Approximate UCL (use when n>=50)	0.339	95% Gamma Adjusted UCL (use when n<50)	N/A

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.772	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.384	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.443	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.319	Mean in Log Scale	-1.166
SD in Original Scale	0.0724	SD in Log Scale	0.215
95% t UCL (assumes normality of ROS data)	0.339	95% Percentile Bootstrap UCL	0.338
95% BCA Bootstrap UCL	0.341	95% Bootstrap t UCL	0.342
95% H-UCL (Log ROS)	0.339		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-1.181	95% H-UCL (KM -Log)	0.319
KM SD (logged)	0.115	95% Critical H Value (KM-Log)	1.703
KM Standard Error of Mean (logged)	0.0388		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.506	Mean in Log Scale	-1.285
SD in Original Scale	1.561	SD in Log Scale	0.615
95% t UCL (Assumes normality)	0.927	95% H-Stat UCL	0.408

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.331	95% KM (Percentile Bootstrap) UCL	N/A

Warning: One or more Recommended UCL(s) not available!

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (cadmium)

General Statistics

Total Number of Observations	42	Number of Distinct Observations	8
Number of Detects	5	Number of Non-Detects	37
Number of Distinct Detects	4	Number of Distinct Non-Detects	5
Minimum Detect	0.5	Minimum Non-Detect	0.45
Maximum Detect	3	Maximum Non-Detect	1
Variance Detects	1.474	Percent Non-Detects	88.1%
Mean Detects	1.894	SD Detects	1.214
Median Detects	2.25	CV Detects	0.641
Skewness Detects	-0.367	Kurtosis Detects	-3.001
Mean of Logged Detects	0.397	SD of Logged Detects	0.847

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.83	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.233	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.396	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.622	Standard Error of Mean	0.103
SD	0.599	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.796	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.792	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.932	95% KM Chebyshev UCL	1.073
97.5% KM Chebyshev UCL	1.268	99% KM Chebyshev UCL	1.651

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.554	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.684	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.287	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.224	k star (bias corrected MLE)	1.023
Theta hat (MLE)	0.852	Theta star (bias corrected MLE)	1.852
nu hat (MLE)	22.24	nu star (bias corrected)	10.23
MLE Mean (bias corrected)	1.894	MLE Sd (bias corrected)	1.873

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	1.078	nu hat (KM)	90.55
Approximate Chi Square Value (90.55, α)	69.61	Adjusted Chi Square Value (90.55, β)	68.96
95% Gamma Approximate KM-UCL (use when n>=50)	0.809	95% Gamma Adjusted KM-UCL (use when n<50)	0.817

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.238
Maximum	3	Median	0.01
SD	0.724	CV	3.042
k hat (MLE)	0.278	k star (bias corrected MLE)	0.274
Theta hat (MLE)	0.855	Theta star (bias corrected MLE)	0.867
nu hat (MLE)	23.38	nu star (bias corrected)	23.05
MLE Mean (bias corrected)	0.238	MLE Sd (bias corrected)	0.454
		Adjusted Level of Significance (β)	0.0443
Approximate Chi Square Value (23.05, α)	13.13	Adjusted Chi Square Value (23.05, β)	12.86
95% Gamma Approximate UCL (use when n>=50)	0.418	95% Gamma Adjusted UCL (use when n<50)	0.426

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.821	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.287	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.396	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.284	Mean in Log Scale	-3.237

SD in Original Scale	0.714	SD in Log Scale	2.071
95% t UCL (assumes normality of ROS data)	0.47	95% Percentile Bootstrap UCL	0.476
95% BCA Bootstrap UCL	0.537	95% Bootstrap t UCL	0.593
95% H-UCL (Log ROS)	1.13		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-0.656	95% H-UCL (KM -Log)	0.664
KM SD (logged)	0.467	95% Critical H Value (KM-Log)	1.876
KM Standard Error of Mean (logged)	0.0806		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.451	Mean in Log Scale	-1.162
SD in Original Scale	0.659	SD in Log Scale	0.647
95% t UCL (Assumes normality)	0.622	95% H-Stat UCL	0.473

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.796	95% KM (Percentile Bootstrap) UCL	N/A

Warning: One or more Recommended UCL(s) not available!

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (chromium)

General Statistics

Total Number of Observations	42	Number of Distinct Observations	34
		Number of Missing Observations	0
Minimum	12	Mean	39.66
Maximum	94	Median	35.5
SD	19.01	Std. Error of Mean	2.934
Coefficient of Variation	0.479	Skewness	1.545

Normal GOF Test

Shapiro Wilk Test Statistic	0.816	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.942	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.164	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.137	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	44.6	95% Adjusted-CLT UCL (Chen-1995)	45.24
		95% Modified-t UCL (Johnson-1978)	44.72

Gamma GOF Test

A-D Test Statistic	0.792	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.752	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.108	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.137	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Gamma Statistics

k hat (MLE)	5.395	k star (bias corrected MLE)	5.026
Theta hat (MLE)	7.351	Theta star (bias corrected MLE)	7.891
nu hat (MLE)	453.2	nu star (bias corrected)	422.2
MLE Mean (bias corrected)	39.66	MLE Sd (bias corrected)	17.69
		Approximate Chi Square Value (0.05)	375.5
Adjusted Level of Significance	0.0443	Adjusted Chi Square Value	374

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	44.59	95% Adjusted Gamma UCL (use when n<50)	44.77

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.942	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0884	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.137	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.485	Mean of logged Data	3.585
Maximum of Logged Data	4.543	SD of logged Data	0.435

Assuming Lognormal Distribution

95% H-UCL	44.93	90% Chebyshev (MVUE) UCL	47.77
95% Chebyshev (MVUE) UCL	51.51	97.5% Chebyshev (MVUE) UCL	56.69
99% Chebyshev (MVUE) UCL	66.87		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	44.49	95% Jackknife UCL	44.6
95% Standard Bootstrap UCL	44.47	95% Bootstrap-t UCL	45.59
95% Hall's Bootstrap UCL	45.53	95% Percentile Bootstrap UCL	44.64
95% BCA Bootstrap UCL	44.86		
90% Chebyshev(Mean, Sd) UCL	48.46	95% Chebyshev(Mean, Sd) UCL	52.45
97.5% Chebyshev(Mean, Sd) UCL	57.98	99% Chebyshev(Mean, Sd) UCL	68.86

Suggested UCL to Use

95% Adjusted Gamma UCL	44.77

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (chrysene)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	46
Number of Detects	43	Number of Non-Detects	55
Number of Distinct Detects	40	Number of Distinct Non-Detects	8
Minimum Detect	0.0032	Minimum Non-Detect	0.003
Maximum Detect	1500	Maximum Non-Detect	1
Variance Detects	78480	Percent Non-Detects	56.12%
Mean Detects	62.05	SD Detects	280.1
Median Detects	0.069	CV Detects	4.515

Skewness Detects	4.636	Kurtosis Detects	21.02
Mean of Logged Detects	-2.079	SD of Logged Detects	3.071

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.242	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.943	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.501	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.135	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	27.23	Standard Error of Mean	19.01
SD	186	95% KM (BCA) UCL	64.39
95% KM (t) UCL	58.8	95% KM (Percentile Bootstrap) UCL	60.28
95% KM (z) UCL	58.5	95% KM Bootstrap t UCL	2278
90% KM Chebyshev UCL	84.26	95% KM Chebyshev UCL	110.1
97.5% KM Chebyshev UCL	145.9	99% KM Chebyshev UCL	216.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.433	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.98	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.355	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.153	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.127	k star (bias corrected MLE)	0.133
Theta hat (MLE)	489.4	Theta star (bias corrected MLE)	465
nu hat (MLE)	10.9	nu star (bias corrected)	11.48
MLE Mean (bias corrected)	62.05	MLE Sd (bias corrected)	169.9

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0214	nu hat (KM)	4.204
Approximate Chi Square Value (4.20, α)	0.804	Adjusted Chi Square Value (4.20, β)	0.783
95% Gamma Approximate KM-UCL (use when n>=50)	142.4	95% Gamma Adjusted KM-UCL (use when n<50)	146.2

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0032	Mean	27.23
Maximum	1500	Median	0.01
SD	186.9	CV	6.864
k hat (MLE)	0.117	k star (bias corrected MLE)	0.12
Theta hat (MLE)	232.8	Theta star (bias corrected MLE)	226.5
nu hat (MLE)	22.93	nu star (bias corrected)	23.56
MLE Mean (bias corrected)	27.23	MLE Sd (bias corrected)	78.54
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (23.56, α)	13.52	Adjusted Chi Square Value (23.56, β)	13.4
95% Gamma Approximate UCL (use when n>=50)	47.47	95% Gamma Adjusted UCL (use when n<50)	47.88

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.868	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.943	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.135	Detected Data Not Lognormal at 5% Significance Level	

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	27.23	Mean in Log Scale	-5.307
SD in Original Scale	186.9	SD in Log Scale	4.077
95% t UCL (assumes normality of ROS data)	58.59	95% Percentile Bootstrap UCL	60.76
95% BCA Bootstrap UCL	83.88	95% Bootstrap t UCL	1268
95% H-UCL (Log ROS)	271.6		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	27.26	Mean in Log Scale	-3.245
SD in Original Scale	186.9	SD in Log Scale	2.635
95% t UCL (Assumes normality)	58.61	95% H-Stat UCL	3.915

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 145.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (cobalt)

General Statistics

Total Number of Observations	39	Number of Distinct Observations	31
		Number of Missing Observations	0
Minimum	5.6	Mean	10.09
Maximum	20	Median	8.4
SD	4.202	Std. Error of Mean	0.673
Coefficient of Variation	0.416	Skewness	1.223

Normal GOF Test

Shapiro Wilk Test Statistic	0.825	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.939	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.203	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.142	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	11.23	95% Adjusted-CLT UCL (Chen-1995)	11.34
		95% Modified-t UCL (Johnson-1978)	11.25

Gamma GOF Test

A-D Test Statistic	1.569	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.75	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.178	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.142	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.108	k star (bias corrected MLE)	6.578
Theta hat (MLE)	1.42	Theta star (bias corrected MLE)	1.534
nu hat (MLE)	554.4	nu star (bias corrected)	513.1
MLE Mean (bias corrected)	10.09	MLE Sd (bias corrected)	3.935
		Approximate Chi Square Value (0.05)	461.6
Adjusted Level of Significance	0.0437	Adjusted Chi Square Value	459.6

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	11.22	95% Adjusted Gamma UCL (use when n<50)	11.27

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.939	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.158	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.142	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.723	Mean of logged Data	2.24
Maximum of Logged Data	2.996	SD of logged Data	0.371

Assuming Lognormal Distribution

95% H-UCL	11.23	90% Chebyshev (MVUE) UCL	11.87
95% Chebyshev (MVUE) UCL	12.71	97.5% Chebyshev (MVUE) UCL	13.86
99% Chebyshev (MVUE) UCL	16.13		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	11.2	95% Jackknife UCL	11.23
95% Standard Bootstrap UCL	11.2	95% Bootstrap-t UCL	11.48
95% Hall's Bootstrap UCL	11.31	95% Percentile Bootstrap UCL	11.24
95% BCA Bootstrap UCL	11.33		
90% Chebyshev(Mean, Sd) UCL	12.11	95% Chebyshev(Mean, Sd) UCL	13.03
97.5% Chebyshev(Mean, Sd) UCL	14.29	99% Chebyshev(Mean, Sd) UCL	16.79

Suggested UCL to Use

95% Student's-t UCL	11.23	or 95% Modified-t UCL	11.25

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (copper)

General Statistics

Total Number of Observations	42	Number of Distinct Observations	24
		Number of Missing Observations	0
Minimum	8	Mean	21.14
Maximum	80	Median	15.5
SD	13.96	Std. Error of Mean	2.154
Coefficient of Variation	0.66	Skewness	2.583

Normal GOF Test

Shapiro Wilk Test Statistic	0.687	**Shapiro Wilk GOF Test**	

5% Shapiro Wilk Critical Value	0.942	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.242	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.137	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	24.77	95% Adjusted-CLT UCL (Chen-1995)	25.6
		95% Modified-t UCL (Johnson-1978)	24.91

Gamma GOF Test

A-D Test Statistic	2.205	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.753	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.179	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.137	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.78	k star (bias corrected MLE)	3.525
Theta hat (MLE)	5.593	Theta star (bias corrected MLE)	5.996
nu hat (MLE)	317.5	nu star (bias corrected)	296.1
MLE Mean (bias corrected)	21.14	MLE Sd (bias corrected)	11.26
		Approximate Chi Square Value (0.05)	257.3
Adjusted Level of Significance	0.0443	Adjusted Chi Square Value	256

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	24.33	95% Adjusted Gamma UCL (use when n<50)	24.46

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.873	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.942	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.163	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.137	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.079	Mean of logged Data	2.913
Maximum of Logged Data	4.382	SD of logged Data	0.488

Assuming Lognormal Distribution

95% H-UCL	23.95	90% Chebyshev (MVUE) UCL	25.56
95% Chebyshev (MVUE) UCL	27.77	97.5% Chebyshev (MVUE) UCL	30.85
99% Chebyshev (MVUE) UCL	36.88		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	24.68	95% Jackknife UCL	24.77
95% Standard Bootstrap UCL	24.61	95% Bootstrap-t UCL	26.26
95% Hall's Bootstrap UCL	27.16	95% Percentile Bootstrap UCL	24.74
95% BCA Bootstrap UCL	25.53		
90% Chebyshev(Mean, Sd) UCL	27.6	95% Chebyshev(Mean, Sd) UCL	30.53
97.5% Chebyshev(Mean, Sd) UCL	34.59	99% Chebyshev(Mean, Sd) UCL	42.57

Suggested UCL to Use

95% Student's-t UCL	24.77	or 95% Modified-t UCL	24.91

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Chemical (dibenz(a,h)anthracene)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	34
Number of Detects	26	Number of Non-Detects	72
Number of Distinct Detects	24	Number of Distinct Non-Detects	10
Minimum Detect	0.004	Minimum Non-Detect	0.003
Maximum Detect	1.4	Maximum Non-Detect	500
Variance Detects	0.0943	Percent Non-Detects	73.47%
Mean Detects	0.149	SD Detects	0.307
Median Detects	0.0375	CV Detects	2.064
Skewness Detects	3.282	Kurtosis Detects	11.5
Mean of Logged Detects	-3.07	SD of Logged Detects	1.434

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.504	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.358	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.174	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0474	Standard Error of Mean	0.0179
SD	0.17	95% KM (BCA) UCL	0.0826
95% KM (t) UCL	0.0771	95% KM (Percentile Bootstrap) UCL	0.0811
95% KM (z) UCL	0.0768	95% KM Bootstrap t UCL	0.119
90% KM Chebyshev UCL	0.101	95% KM Chebyshev UCL	0.125
97.5% KM Chebyshev UCL	0.159	99% KM Chebyshev UCL	0.225

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.865	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.805	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.241	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.181	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.539	k star (bias corrected MLE)	0.502
Theta hat (MLE)	0.276	Theta star (bias corrected MLE)	0.296
nu hat (MLE)	28.03	nu star (bias corrected)	26.13
MLE Mean (bias corrected)	0.149	MLE Sd (bias corrected)	0.21

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0776	nu hat (KM)	15.22
Approximate Chi Square Value (15.22, α)	7.413	Adjusted Chi Square Value (15.22, β)	7.331
95% Gamma Approximate KM-UCL (use when n>=50)	0.0972	95% Gamma Adjusted KM-UCL (use when n<50)	0.0983

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Minimum	0.004	Mean	0.0493
Maximum	1.4	Median	0.01
SD	0.168	CV	3.402
k hat (MLE)	0.557	k star (bias corrected MLE)	0.547
Theta hat (MLE)	0.0886	Theta star (bias corrected MLE)	0.0903
nu hat (MLE)	109.2	nu star (bias corrected)	107.1
MLE Mean (bias corrected)	0.0493	MLE Sd (bias corrected)	0.0667
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (107.15, α)	84.26	Adjusted Chi Square Value (107.15, β)	83.96
95% Gamma Approximate UCL (use when n>=50)	0.0627	95% Gamma Adjusted UCL (use when n<50)	0.063

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.955	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.92	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.122	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.174	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0439	Mean in Log Scale	-5.364
SD in Original Scale	0.169	SD in Log Scale	2.05
95% t UCL (assumes normality of ROS data)	0.0721	95% Percentile Bootstrap UCL	0.075
95% BCA Bootstrap UCL	0.0918	95% Bootstrap t UCL	0.112
95% H-UCL (Log ROS)	0.0789		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-4.738	95% H-UCL (KM -Log)	0.0394
KM SD (logged)	1.476	95% Critical H Value (KM-Log)	2.768
KM Standard Error of Mean (logged)	0.182		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	5.184	Mean in Log Scale	-3.741
SD in Original Scale	35.52	SD in Log Scale	2.256
95% t UCL (Assumes normality)	11.14	95% H-Stat UCL	0.713

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL 0.0826

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (fluoranthene)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	52
Number of Detects	49	Number of Non-Detects	49
Number of Distinct Detects	46	Number of Distinct Non-Detects	7
Minimum Detect	0.003	Minimum Non-Detect	0.003
Maximum Detect	4600	Maximum Non-Detect	1
Variance Detects	512916	Percent Non-Detects	50%
Mean Detects	139.7	SD Detects	716.2

Median Detects	0.17	CV Detects	5.127
Skewness Detects	5.685	Kurtosis Detects	33.65
Mean of Logged Detects	-1.469	SD of Logged Detects	3.084

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.216	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.5	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.127	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	69.85	Standard Error of Mean	51.65
SD	506.1	95% KM (BCA) UCL	162.5
95% KM (t) UCL	155.6	95% KM (Percentile Bootstrap) UCL	163.2
95% KM (z) UCL	154.8	95% KM Bootstrap t UCL	5239
90% KM Chebyshev UCL	224.8	95% KM Chebyshev UCL	295
97.5% KM Chebyshev UCL	392.4	99% KM Chebyshev UCL	583.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	9.542	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.985	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.352	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.144	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.123	k star (bias corrected MLE)	0.129
Theta hat (MLE)	1133	Theta star (bias corrected MLE)	1080
nu hat (MLE)	12.08	nu star (bias corrected)	12.68
MLE Mean (bias corrected)	139.7	MLE Sd (bias corrected)	388.4

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0191	nu hat (KM)	3.734
Approximate Chi Square Value (3.73, α)	0.62	Adjusted Chi Square Value (3.73, β)	0.602
95% Gamma Approximate KM-UCL (use when n>=50)	421	95% Gamma Adjusted KM-UCL (use when n<50)	433.1

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.003	Mean	69.85
Maximum	4600	Median	0.01
SD	508.7	CV	7.282
k hat (MLE)	0.11	k star (bias corrected MLE)	0.114
Theta hat (MLE)	634.3	Theta star (bias corrected MLE)	615.1
nu hat (MLE)	21.59	nu star (bias corrected)	22.26
MLE Mean (bias corrected)	69.85	MLE Sd (bias corrected)	207.3
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (22.26, α)	12.53	Adjusted Chi Square Value (22.26, β)	12.42
95% Gamma Approximate UCL (use when n>=50)	124.1	95% Gamma Adjusted UCL (use when n<50)	125.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.905	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.134	**Lilliefors GOF Test**

5% Lilliefors Critical Value	0.127	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	69.85	Mean in Log Scale	-4.411
SD in Original Scale	508.7	SD in Log Scale	4.105
95% t UCL (assumes normality of ROS data)	155.2	95% Percentile Bootstrap UCL	164.7
95% BCA Bootstrap UCL	231.1	95% Bootstrap t UCL	5233
95% H-UCL (Log ROS)	768.3		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	69.87	Mean in Log Scale	-2.773
SD in Original Scale	508.7	SD in Log Scale	2.814
95% t UCL (Assumes normality)	155.2	95% H-Stat UCL	11.85

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	392.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (fluorene)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	28
Number of Detects	20	Number of Non-Detects	78
Number of Distinct Detects	18	Number of Distinct Non-Detects	12
Minimum Detect	0.0033	Minimum Non-Detect	0.003
Maximum Detect	3.5	Maximum Non-Detect	500
Variance Detects	0.601	Percent Non-Detects	79.59%
Mean Detects	0.214	SD Detects	0.775
Median Detects	0.02	CV Detects	3.615
Skewness Detects	4.436	Kurtosis Detects	19.77
Mean of Logged Detects	-3.59	SD of Logged Detects	1.613

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.282	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.457	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.198	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.0503	Standard Error of Mean	0.0372
SD	0.355	95% KM (BCA) UCL	0.127
95% KM (t) UCL	0.112	95% KM (Percentile Bootstrap) UCL	0.123
95% KM (z) UCL	0.112	95% KM Bootstrap t UCL	0.658
90% KM Chebyshev UCL	0.162	95% KM Chebyshev UCL	0.213
97.5% KM Chebyshev UCL	0.283	99% KM Chebyshev UCL	0.421

Gamma GOF Tests on Detected Observations Only

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

A-D Test Statistic	2.998	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.838	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.352	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.209	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.331	k star (bias corrected MLE)	0.315
Theta hat (MLE)	0.648	Theta star (bias corrected MLE)	0.682
nu hat (MLE)	13.24	nu star (bias corrected)	12.59
MLE Mean (bias corrected)	0.214	MLE Sd (bias corrected)	0.382

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.02	nu hat (KM)	3.927
Approximate Chi Square Value (3.93, α)	0.693	Adjusted Chi Square Value (3.93, β)	0.674
95% Gamma Approximate KM-UCL (use when n>=50)	0.285	95% Gamma Adjusted KM-UCL (use when n<50)	0.293

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0033	Mean	0.0556
Maximum	3.5	Median	0.01
SD	0.354	CV	6.363
k hat (MLE)	0.449	k star (bias corrected MLE)	0.442
Theta hat (MLE)	0.124	Theta star (bias corrected MLE)	0.126
nu hat (MLE)	88.03	nu star (bias corrected)	86.67
MLE Mean (bias corrected)	0.0556	MLE Sd (bias corrected)	0.0835
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (86.67, α)	66.21	Adjusted Chi Square Value (86.67, β)	65.95
95% Gamma Approximate UCL (use when n>=50)	0.0727	95% Gamma Adjusted UCL (use when n<50)	0.073

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.893	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.165	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.198	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0467	Mean in Log Scale	-6.244
SD in Original Scale	0.354	SD in Log Scale	2.165
95% t UCL (assumes normality of ROS data)	0.106	95% Percentile Bootstrap UCL	0.118
95% BCA Bootstrap UCL	0.156	95% Bootstrap t UCL	0.712
95% H-UCL (Log ROS)	0.0449		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-5.058	95% H-UCL (KM -Log)	0.0187
KM SD (logged)	1.238	95% Critical H Value (KM-Log)	2.5
KM Standard Error of Mean (logged)	0.16		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	5.189	Mean in Log Scale	-3.803
SD in Original Scale	35.52	SD in Log Scale	2.177
95% t UCL (Assumes normality)	11.15	95% H-Stat UCL	0.533

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL 0.213

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (indeno(1,2,3-c,d)pyrene)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	47
Number of Detects	45	Number of Non-Detects	53
Number of Distinct Detects	40	Number of Distinct Non-Detects	7
Minimum Detect	0.0027	Minimum Non-Detect	0.003
Maximum Detect	1700	Maximum Non-Detect	1
Variance Detects	118167	Percent Non-Detects	54.08%
Mean Detects	74.85	SD Detects	343.8
Median Detects	0.069	CV Detects	4.593
Skewness Detects	4.58	Kurtosis Detects	19.89
Mean of Logged Detects	-2.151	SD of Logged Detects	3.092

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.23	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.504	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.132	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	34.38	Standard Error of Mean	23.84
SD	233.3	95% KM (BCA) UCL	69.94
95% KM (t) UCL	73.96	95% KM (Percentile Bootstrap) UCL	70.4
95% KM (z) UCL	73.58	95% KM Bootstrap t UCL	2413
90% KM Chebyshev UCL	105.9	95% KM Chebyshev UCL	138.3
97.5% KM Chebyshev UCL	183.2	99% KM Chebyshev UCL	271.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	9.103	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.985	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.366	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.15	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.122	k star (bias corrected MLE)	0.129
Theta hat (MLE)	611.9	Theta star (bias corrected MLE)	580.3
nu hat (MLE)	11.01	nu star (bias corrected)	11.61
MLE Mean (bias corrected)	74.85	MLE Sd (bias corrected)	208.4

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0217	nu hat (KM)	4.254
Approximate Chi Square Value (4.25, α)	0.824	Adjusted Chi Square Value (4.25, β)	0.803

95% Gamma Approximate KM-UCL (use when n>=50)	177.4	95% Gamma Adjusted KM-UCL (use when n<50)	182.1

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0027	Mean	34.37
Maximum	1700	Median	0.01
SD	234.5	CV	6.823
k hat (MLE)	0.114	k star (bias corrected MLE)	0.117
Theta hat (MLE)	302	Theta star (bias corrected MLE)	293.4
nu hat (MLE)	22.31	nu star (bias corrected)	22.96
MLE Mean (bias corrected)	34.37	MLE Sd (bias corrected)	100.4
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (22.96, α)	13.06	Adjusted Chi Square Value (22.96, β)	12.95
95% Gamma Approximate UCL (use when n>=50)	60.43	95% Gamma Adjusted UCL (use when n<50)	60.95

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.868	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.158	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.132	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	34.37	Mean in Log Scale	-4.785
SD in Original Scale	234.5	SD in Log Scale	3.695
95% t UCL (assumes normality of ROS data)	73.72	95% Percentile Bootstrap UCL	83.38
95% BCA Bootstrap UCL	101.3	95% Bootstrap t UCL	3024
95% H-UCL (Log ROS)	66.14		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	34.4	Mean in Log Scale	-3.257
SD in Original Scale	234.5	SD in Log Scale	2.684
95% t UCL (Assumes normality)	73.74	95% H-Stat UCL	4.593

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 183.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (lead)

General Statistics

Total Number of Observations	64	Number of Distinct Observations	45
Number of Detects	49	Number of Non-Detects	15
Number of Distinct Detects	45	Number of Distinct Non-Detects	1
Minimum Detect	2.38	Minimum Non-Detect	3

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Maximum Detect	670	Maximum Non-Detect	3
Variance Detects	20724	Percent Non-Detects	23.44%
Mean Detects	85.34	SD Detects	144
Median Detects	28	CV Detects	1.687
Skewness Detects	2.712	Kurtosis Detects	7.228
Mean of Logged Detects	3.385	SD of Logged Detects	1.504

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.6	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.296	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.127	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	65.89	Standard Error of Mean	16.36
SD	129.5	95% KM (BCA) UCL	94.04
95% KM (t) UCL	93.2	95% KM (Percentile Bootstrap) UCL	94.59
95% KM (z) UCL	92.8	95% KM Bootstrap t UCL	103.7
90% KM Chebyshev UCL	115	95% KM Chebyshev UCL	137.2
97.5% KM Chebyshev UCL	168.1	99% KM Chebyshev UCL	228.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.516	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.807	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.127	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.133	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.584	k star (bias corrected MLE)	0.562
Theta hat (MLE)	146.1	Theta star (bias corrected MLE)	151.8
nu hat (MLE)	57.25	nu star (bias corrected)	55.08
MLE Mean (bias corrected)	85.34	MLE Sd (bias corrected)	113.8

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.259	nu hat (KM)	33.12
Approximate Chi Square Value (33.12, α)	20.97	Adjusted Chi Square Value (33.12, β)	20.74
95% Gamma Approximate KM-UCL (use when n>=50)	104.1	95% Gamma Adjusted KM-UCL (use when n<50)	105.2

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	65.34
Maximum	670	Median	14.5
SD	130.8	CV	2.002
k hat (MLE)	0.264	k star (bias corrected MLE)	0.262
Theta hat (MLE)	247.5	Theta star (bias corrected MLE)	249.4
nu hat (MLE)	33.79	nu star (bias corrected)	33.54
MLE Mean (bias corrected)	65.34	MLE Sd (bias corrected)	127.6
		Adjusted Level of Significance (β)	0.0463
Approximate Chi Square Value (33.54, α)	21.29	Adjusted Chi Square Value (33.54, β)	21.07
95% Gamma Approximate UCL (use when n>=50)	102.9	95% Gamma Adjusted UCL (use when n<50)	104

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk GOF Test**	

5% Shapiro Wilk Critical Value	0.947	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0804	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.127	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	65.66	Mean in Log Scale	2.604
SD in Original Scale	130.7	SD in Log Scale	1.978
95% t UCL (assumes normality of ROS data)	92.93	95% Percentile Bootstrap UCL	92.27
95% BCA Bootstrap UCL	104.4	95% Bootstrap t UCL	103.6
95% H-UCL (Log ROS)	203.3		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	2.795	95% H-UCL (KM -Log)	118.9
KM SD (logged)	1.683	95% Critical H Value (KM-Log)	2.67
KM Standard Error of Mean (logged)	0.213		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	65.69	Mean in Log Scale	2.687
SD in Original Scale	130.7	SD in Log Scale	1.828
95% t UCL (Assumes normality)	92.95	95% H-Stat UCL	150.2

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	137.2	95% GROS Approximate Gamma UCL	102.9
95% Approximate Gamma KM-UCL	104.1		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (mercury)

General Statistics

Total Number of Observations	40	Number of Distinct Observations	9
Number of Detects	6	Number of Non-Detects	34
Number of Distinct Detects	6	Number of Distinct Non-Detects	3
Minimum Detect	0.12	Minimum Non-Detect	0.0835
Maximum Detect	0.88	Maximum Non-Detect	0.835
Variance Detects	0.0854	Percent Non-Detects	85%
Mean Detects	0.347	SD Detects	0.292
Median Detects	0.215	CV Detects	0.843
Skewness Detects	1.579	Kurtosis Detects	1.991
Mean of Logged Detects	-1.314	SD of Logged Detects	0.751

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.803	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.309	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.362	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Mean	0.123	Standard Error of Mean	0.0243
SD	0.14	95% KM (BCA) UCL	0.167
95% KM (t) UCL	0.164	95% KM (Percentile Bootstrap) UCL	0.166
95% KM (z) UCL	0.164	95% KM Bootstrap t UCL	0.225
90% KM Chebyshev UCL	0.196	95% KM Chebyshev UCL	0.23
97.5% KM Chebyshev UCL	0.275	99% KM Chebyshev UCL	0.366

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.423	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.704	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.272	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.336	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.118	k star (bias corrected MLE)	1.17
Theta hat (MLE)	0.164	Theta star (bias corrected MLE)	0.296
nu hat (MLE)	25.42	nu star (bias corrected)	14.04
MLE Mean (bias corrected)	0.347	MLE Sd (bias corrected)	0.32

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.778	nu hat (KM)	62.23
Approximate Chi Square Value (62.23, α)	45.08	Adjusted Chi Square Value (62.23, β)	44.54
95% Gamma Approximate KM-UCL (use when n>=50)	0.17	95% Gamma Adjusted KM-UCL (use when n<50)	0.173

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0605
Maximum	0.88	Median	0.01
SD	0.161	CV	2.654
k hat (MLE)	0.488	k star (bias corrected MLE)	0.468
Theta hat (MLE)	0.124	Theta star (bias corrected MLE)	0.129
nu hat (MLE)	39.05	nu star (bias corrected)	37.45
MLE Mean (bias corrected)	0.0605	MLE Sd (bias corrected)	0.0884
		Adjusted Level of Significance (β)	0.044
Approximate Chi Square Value (37.45, α)	24.44	Adjusted Chi Square Value (37.45, β)	24.04
95% Gamma Approximate UCL (use when n>=50)	0.0927	95% Gamma Adjusted UCL (use when n<50)	0.0942

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.227	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.362	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0699	Mean in Log Scale	-4.028
SD in Original Scale	0.159	SD in Log Scale	1.678
95% t UCL (assumes normality of ROS data)	0.112	95% Percentile Bootstrap UCL	0.116
95% BCA Bootstrap UCL	0.139	95% Bootstrap t UCL	0.183
95% H-UCL (Log ROS)	0.177		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-2.304	95% H-UCL (KM -Log)	0.132
KM SD (logged)	0.497	95% Critical H Value (KM-Log)	1.919

KM Standard Error of Mean (logged) 0.0867

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.103	Mean in Log Scale	-2.704
SD in Original Scale	0.158	SD in Log Scale	0.734
95% t UCL (Assumes normality)	0.145	95% H-Stat UCL	0.112

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.164	95% KM (Percentile Bootstrap) UCL	0.166

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (naphthalene)

General Statistics

Total Number of Observations	99	Number of Distinct Observations	37
Number of Detects	28	Number of Non-Detects	71
Number of Distinct Detects	27	Number of Distinct Non-Detects	11
Minimum Detect	0.008	Minimum Non-Detect	0.005
Maximum Detect	630	Maximum Non-Detect	500
Variance Detects	14125	Percent Non-Detects	71.72%
Mean Detects	23.89	SD Detects	118.8
Median Detects	0.145	CV Detects	4.975
Skewness Detects	5.283	Kurtosis Detects	27.94
Mean of Logged Detects	-1.378	SD of Logged Detects	2.4

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.209	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.924	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.494	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.167	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	6.782	Standard Error of Mean	6.447
SD	62.99	95% KM (BCA) UCL	19.39
95% KM (t) UCL	17.49	95% KM (Percentile Bootstrap) UCL	19.41
95% KM (z) UCL	17.39	95% KM Bootstrap t UCL	664.8
90% KM Chebyshev UCL	26.12	95% KM Chebyshev UCL	34.88
97.5% KM Chebyshev UCL	47.04	99% KM Chebyshev UCL	70.93

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	5.504	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.935	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.366	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.186	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.166	k star (bias corrected MLE)	0.172

Theta hat (MLE)	143.6	Theta star (bias corrected MLE)	138.6
nu hat (MLE)	9.313	nu star (bias corrected)	9.648
MLE Mean (bias corrected)	23.89	MLE Sd (bias corrected)	57.55

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0116	nu hat (KM)	2.295
Approximate Chi Square Value (2.30, α)	0.199	Adjusted Chi Square Value (2.30, β)	0.193
95% Gamma Approximate KM-UCL (use when n>=50)	78.43	95% Gamma Adjusted KM-UCL (use when n<50)	80.86

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.008	Mean	6.763
Maximum	630	Median	0.01
SD	63.31	CV	9.361
k hat (MLE)	0.139	k star (bias corrected MLE)	0.141
Theta hat (MLE)	48.76	Theta star (bias corrected MLE)	47.89
nu hat (MLE)	27.46	nu star (bias corrected)	27.96
MLE Mean (bias corrected)	6.763	MLE Sd (bias corrected)	18
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (27.96, α)	16.9	Adjusted Chi Square Value (27.96, β)	16.77
95% Gamma Approximate UCL (use when n>=50)	11.19	95% Gamma Adjusted UCL (use when n<50)	11.28

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.882	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.924	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.167	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	6.769	Mean in Log Scale	-4.378
SD in Original Scale	63.31	SD in Log Scale	2.862
95% t UCL (assumes normality of ROS data)	17.34	95% Percentile Bootstrap UCL	19.4
95% BCA Bootstrap UCL	32.18	95% Bootstrap t UCL	297.8
95% H-UCL (Log ROS)	2.829		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	9.582	Mean in Log Scale	-2.442
SD in Original Scale	67.87	SD in Log Scale	1.933
95% t UCL (Assumes normality)	20.91	95% H-Stat UCL	1.079

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	47.04

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Chemical (naphthalene_voc)

General Statistics

Total Number of Observations	31	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	25
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.0047	Minimum Non-Detect	0.002
Maximum Detect	0.043	Maximum Non-Detect	1
Variance Detects	2.1740E-4	Percent Non-Detects	80.65%
Mean Detects	0.0139	SD Detects	0.0147
Median Detects	0.0075	CV Detects	1.065
Skewness Detects	2.142	Kurtosis Detects	4.672
Mean of Logged Detects	-4.619	SD of Logged Detects	0.826

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.69	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.326	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.362	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.00437	Standard Error of Mean	0.00153
SD	0.00766	95% KM (BCA) UCL	0.00732
95% KM (t) UCL	0.00697	95% KM (Percentile Bootstrap) UCL	0.00693
95% KM (z) UCL	0.00689	95% KM Bootstrap t UCL	0.0114
90% KM Chebyshev UCL	0.00897	95% KM Chebyshev UCL	0.011
97.5% KM Chebyshev UCL	0.0139	99% KM Chebyshev UCL	0.0196

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.633	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.707	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.319	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.618	k star (bias corrected MLE)	0.92
Theta hat (MLE)	0.00856	Theta star (bias corrected MLE)	0.015
nu hat (MLE)	19.42	nu star (bias corrected)	11.04
MLE Mean (bias corrected)	0.0139	MLE Sd (bias corrected)	0.0144

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.325	nu hat (KM)	20.17
Approximate Chi Square Value (20.17, α)	10.98	Adjusted Chi Square Value (20.17, β)	10.6
95% Gamma Approximate KM-UCL (use when n>=50)	0.00803	95% Gamma Adjusted KM-UCL (use when n<50)	0.00832

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0047	Mean	0.0107
Maximum	0.043	Median	0.01
SD	0.00621	CV	0.578
k hat (MLE)	6.866	k star (bias corrected MLE)	6.223
Theta hat (MLE)	0.00156	Theta star (bias corrected MLE)	0.00173
nu hat (MLE)	425.7	nu star (bias corrected)	385.8

MLE Mean (bias corrected)	0.0107	MLE Sd (bias corrected)	0.00431
		Adjusted Level of Significance (β)	0.0413
Approximate Chi Square Value (385.85, α)	341.3	Adjusted Chi Square Value (385.85, β)	339
95% Gamma Approximate UCL (use when n>=50)	0.0121	95% Gamma Adjusted UCL (use when n<50)	0.0122

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.865	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.278	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.362	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00311	Mean in Log Scale	-7.683
SD in Original Scale	0.00807	SD in Log Scale	2.11
95% t UCL (assumes normality of ROS data)	0.00557	95% Percentile Bootstrap UCL	0.00572
95% BCA Bootstrap UCL	0.00729	95% Bootstrap t UCL	0.0107
95% H-UCL (Log ROS)	0.0198		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-5.896	95% H-UCL (KM -Log)	0.00472
KM SD (logged)	0.722	95% Critical H Value (KM-Log)	2.123
KM Standard Error of Mean (logged)	0.144		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0196	Mean in Log Scale	-6.264
SD in Original Scale	0.0895	SD in Log Scale	1.422
95% t UCL (Assumes normality)	0.0469	95% H-Stat UCL	0.0113

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.00697	95% KM (Percentile Bootstrap) UCL	0.00693

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (nickel)

General Statistics

Total Number of Observations	42	Number of Distinct Observations	35
		Number of Missing Observations	0
Minimum	33	Mean	77.75
Maximum	732	Median	52.5
SD	107.4	Std. Error of Mean	16.57
Coefficient of Variation	1.381	Skewness	5.794

Normal GOF Test

Shapiro Wilk Test Statistic	0.345	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.942	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.338	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.137	Data Not Normal at 5% Significance Level	

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	105.6	95% Adjusted-CLT UCL (Chen-1995)	120.8
		95% Modified-t UCL (Johnson-1978)	108.1

Gamma GOF Test

A-D Test Statistic	4.514	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.759	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.242	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.138	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.14	k star (bias corrected MLE)	2.003
Theta hat (MLE)	36.32	Theta star (bias corrected MLE)	38.81
nu hat (MLE)	179.8	nu star (bias corrected)	168.3
MLE Mean (bias corrected)	77.75	MLE Sd (bias corrected)	54.93
		Approximate Chi Square Value (0.05)	139.3
Adjusted Level of Significance	0.0443	Adjusted Chi Square Value	138.4

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	93.94	95% Adjusted Gamma UCL (use when n<50)	94.58

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.753	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.942	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.198	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.137	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.497	Mean of logged Data	4.102
Maximum of Logged Data	6.596	SD of logged Data	0.549

Assuming Lognormal Distribution

95% H-UCL	82.99	90% Chebyshev (MVUE) UCL	88.84
95% Chebyshev (MVUE) UCL	97.37	97.5% Chebyshev (MVUE) UCL	109.2
99% Chebyshev (MVUE) UCL	132.5		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	105	95% Jackknife UCL	105.6
95% Standard Bootstrap UCL	104	95% Bootstrap-t UCL	171.8
95% Hall's Bootstrap UCL	199.8	95% Percentile Bootstrap UCL	108.5
95% BCA Bootstrap UCL	135.9		
90% Chebyshev(Mean, Sd) UCL	127.5	95% Chebyshev(Mean, Sd) UCL	150
97.5% Chebyshev(Mean, Sd) UCL	181.2	99% Chebyshev(Mean, Sd) UCL	242.6

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL 150

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

For additional insight the user may want to consult a statistician.

Chemical (phenanthrene)

General Statistics

Total Number of Observations	99	Number of Distinct Observations	51
Number of Detects	48	Number of Non-Detects	51
Number of Distinct Detects	47	Number of Distinct Non-Detects	7
Minimum Detect	0.0031	Minimum Non-Detect	0.003
Maximum Detect	3500	Maximum Non-Detect	1
Variance Detects	265564	Percent Non-Detects	51.52%
Mean Detects	92.96	SD Detects	515.3
Median Detects	0.135	CV Detects	5.544
Skewness Detects	6.468	Kurtosis Detects	43.07
Mean of Logged Detects	-1.552	SD of Logged Detects	3.074

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.196	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.493	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.128	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	45.08	Standard Error of Mean	36.37
SD	358.1	95% KM (BCA) UCL	116.4
95% KM (t) UCL	105.5	95% KM (Percentile Bootstrap) UCL	114.4
95% KM (z) UCL	104.9	95% KM Bootstrap t UCL	2418
90% KM Chebyshev UCL	154.2	95% KM Chebyshev UCL	203.6
97.5% KM Chebyshev UCL	272.2	99% KM Chebyshev UCL	407

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.753	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.98	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.347	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.145	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.129	k star (bias corrected MLE)	0.135
Theta hat (MLE)	720.3	Theta star (bias corrected MLE)	689.2
nu hat (MLE)	12.39	nu star (bias corrected)	12.95
MLE Mean (bias corrected)	92.96	MLE Sd (bias corrected)	253.1

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0158	nu hat (KM)	3.137
Approximate Chi Square Value (3.14, α)	0.414	Adjusted Chi Square Value (3.14, β)	0.402
95% Gamma Approximate KM-UCL (use when n>=50)	341.4	95% Gamma Adjusted KM-UCL (use when n<50)	352.1

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0031	Mean	45.07
Maximum	3500	Median	0.01
SD	359.9	CV	7.985

k hat (MLE)	0.115	k star (bias corrected MLE)	0.118
Theta hat (MLE)	391.8	Theta star (bias corrected MLE)	381.1
nu hat (MLE)	22.78	nu star (bias corrected)	23.42
MLE Mean (bias corrected)	45.07	MLE Sd (bias corrected)	131.1
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (23.42, α)	13.41	Adjusted Chi Square Value (23.42, β)	13.3
95% Gamma Approximate UCL (use when n>=50)	78.73	95% Gamma Adjusted UCL (use when n<50)	79.39

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.142	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.128	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	45.07	Mean in Log Scale	-4.577
SD in Original Scale	359.9	SD in Log Scale	4.114
95% t UCL (assumes normality of ROS data)	105.1	95% Percentile Bootstrap UCL	115.5
95% BCA Bootstrap UCL	177.5	95% Bootstrap t UCL	2120
95% H-UCL (Log ROS)	677.4		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	45.1	Mean in Log Scale	-2.881
SD in Original Scale	359.9	SD in Log Scale	2.805
95% t UCL (Assumes normality)	105.2	95% H-Stat UCL	10.25

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 272.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (pyrene)

General Statistics

Total Number of Observations	98	Number of Distinct Observations	52
Number of Detects	49	Number of Non-Detects	49
Number of Distinct Detects	45	Number of Distinct Non-Detects	8
Minimum Detect	0.0058	Minimum Non-Detect	0.003
Maximum Detect	5400	Maximum Non-Detect	1
Variance Detects	752394	Percent Non-Detects	50%
Mean Detects	172.9	SD Detects	867.4
Median Detects	0.2	CV Detects	5.016
Skewness Detects	5.42	Kurtosis Detects	30.24
Mean of Logged Detects	-1.347	SD of Logged Detects	3.067

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.22	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.499	**Lilliefors GOF Test**

5% Lilliefors Critical Value	0.127	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	86.47	Standard Error of Mean	62.58
SD	613.2	95% KM (BCA) UCL	199.3
95% KM (t) UCL	190.4	95% KM (Percentile Bootstrap) UCL	201.2
95% KM (z) UCL	189.4	95% KM Bootstrap t UCL	6068
90% KM Chebyshev UCL	274.2	95% KM Chebyshev UCL	359.3
97.5% KM Chebyshev UCL	477.3	99% KM Chebyshev UCL	709.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	9.862	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.987	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.368	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.144	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.122	k star (bias corrected MLE)	0.128
Theta hat (MLE)	1420	Theta star (bias corrected MLE)	1352
nu hat (MLE)	11.93	nu star (bias corrected)	12.54
MLE Mean (bias corrected)	172.9	MLE Sd (bias corrected)	483.5

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0199	nu hat (KM)	3.897
Approximate Chi Square Value (3.90, α)	0.682	Adjusted Chi Square Value (3.90, β)	0.663
95% Gamma Approximate KM-UCL (use when n>=50)	494.4	95% Gamma Adjusted KM-UCL (use when n<50)	508.3

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0058	Mean	86.46
Maximum	5400	Median	0.01
SD	616.3	CV	7.128
k hat (MLE)	0.108	k star (bias corrected MLE)	0.112
Theta hat (MLE)	799.6	Theta star (bias corrected MLE)	774.6
nu hat (MLE)	21.19	nu star (bias corrected)	21.88
MLE Mean (bias corrected)	86.46	MLE Sd (bias corrected)	258.8
		Adjusted Level of Significance (β)	0.0476
Approximate Chi Square Value (21.88, α)	12.25	Adjusted Chi Square Value (21.88, β)	12.14
95% Gamma Approximate UCL (use when n>=50)	154.5	95% Gamma Adjusted UCL (use when n<50)	155.8

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.152	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.127	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	86.46	Mean in Log Scale	-4.374
SD in Original Scale	616.3	SD in Log Scale	4.141
95% t UCL (assumes normality of ROS data)	189.9	95% Percentile Bootstrap UCL	199.3
95% BCA Bootstrap UCL	259.2	95% Bootstrap t UCL	6010

95% H-UCL (Log ROS) 966.8

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	86.48	Mean in Log Scale	-2.758
SD in Original Scale	616.3	SD in Log Scale	2.869
95% t UCL (Assumes normality)	189.9	95% H-Stat UCL	14.76

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 477.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (tph-diesel)

General Statistics

Total Number of Observations	91	Number of Distinct Observations	25
Number of Detects	24	Number of Non-Detects	67
Number of Distinct Detects	22	Number of Distinct Non-Detects	4
Minimum Detect	2.6	Minimum Non-Detect	0.99
Maximum Detect	550	Maximum Non-Detect	10
Variance Detects	27487	Percent Non-Detects	73.63%
Mean Detects	97.45	SD Detects	165.8
Median Detects	22.5	CV Detects	1.701
Skewness Detects	2.064	Kurtosis Detects	3.272
Mean of Logged Detects	3.308	SD of Logged Detects	1.633

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.608	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.916	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.338	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.181	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	27.03	Standard Error of Mean	10.01
SD	93.4	95% KM (BCA) UCL	44.83
95% KM (t) UCL	43.66	95% KM (Percentile Bootstrap) UCL	44.31
95% KM (z) UCL	43.49	95% KM Bootstrap t UCL	55.04
90% KM Chebyshev UCL	57.05	95% KM Chebyshev UCL	70.65
97.5% KM Chebyshev UCL	89.52	99% KM Chebyshev UCL	126.6

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.461	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.806	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.246	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.188	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.5	k star (bias corrected MLE)	0.465

Theta hat (MLE)	195	Theta star (bias corrected MLE)	209.5
nu hat (MLE)	23.99	nu star (bias corrected)	22.33
MLE Mean (bias corrected)	97.45	MLE Sd (bias corrected)	142.9

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0838	nu hat (KM)	15.25
Approximate Chi Square Value (15.25, α)	7.433	Adjusted Chi Square Value (15.25, β)	7.345
95% Gamma Approximate KM-UCL (use when n>=50)	55.45	95% Gamma Adjusted KM-UCL (use when n<50)	56.11

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	25.71
Maximum	550	Median	0.01
SD	94.28	CV	3.667
k hat (MLE)	0.135	k star (bias corrected MLE)	0.138
Theta hat (MLE)	190	Theta star (bias corrected MLE)	186.1
nu hat (MLE)	24.63	nu star (bias corrected)	25.15
MLE Mean (bias corrected)	25.71	MLE Sd (bias corrected)	69.16
		Adjusted Level of Significance (β)	0.0474
Approximate Chi Square Value (25.15, α)	14.72	Adjusted Chi Square Value (25.15, β)	14.6
95% Gamma Approximate UCL (use when n>=50)	43.91	95% Gamma Adjusted UCL (use when n<50)	44.29

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.916	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.144	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.181	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	26.56	Mean in Log Scale	-0.0353
SD in Original Scale	94.06	SD in Log Scale	2.779
95% t UCL (assumes normality of ROS data)	42.95	95% Percentile Bootstrap UCL	43
95% BCA Bootstrap UCL	50.59	95% Bootstrap t UCL	53.99
95% H-UCL (Log ROS)	167.3		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	1.178	95% H-UCL (KM -Log)	18.82
KM SD (logged)	1.594	95% Critical H Value (KM-Log)	2.891
KM Standard Error of Mean (logged)	0.218		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	27.49	Mean in Log Scale	1.464
SD in Original Scale	93.79	SD in Log Scale	1.447
95% t UCL (Assumes normality)	43.83	95% H-Stat UCL	18.64

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	70.65

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (tph-gasoline)

General Statistics

Total Number of Observations	64	Number of Distinct Observations	19
Number of Detects	7	Number of Non-Detects	57
Number of Distinct Detects	7	Number of Distinct Non-Detects	12
Minimum Detect	0.56	Minimum Non-Detect	0.21
Maximum Detect	410	Maximum Non-Detect	5
Variance Detects	23765	Percent Non-Detects	89.06%
Mean Detects	60.43	SD Detects	154.2
Median Detects	1.4	CV Detects	2.551
Skewness Detects	2.645	Kurtosis Detects	6.997
Mean of Logged Detects	1.252	SD of Logged Detects	2.243

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.463	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.497	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.335	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	6.838	Standard Error of Mean	6.859
SD	50.8	95% KM (BCA) UCL	19.66
95% KM (t) UCL	18.29	95% KM (Percentile Bootstrap) UCL	19.61
95% KM (z) UCL	18.12	95% KM Bootstrap t UCL	507.4
90% KM Chebyshev UCL	27.41	95% KM Chebyshev UCL	36.74
97.5% KM Chebyshev UCL	49.67	99% KM Chebyshev UCL	75.08

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.382	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.804	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.434	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.339	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.249	k star (bias corrected MLE)	0.238
Theta hat (MLE)	242.3	Theta star (bias corrected MLE)	254.2
nu hat (MLE)	3.491	nu star (bias corrected)	3.328
MLE Mean (bias corrected)	60.43	MLE Sd (bias corrected)	123.9

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0181	nu hat (KM)	2.319
Approximate Chi Square Value (2.32, α)	0.203	Adjusted Chi Square Value (2.32, β)	0.194
95% Gamma Approximate KM-UCL (use when n>=50)	78.1	95% Gamma Adjusted KM-UCL (use when n<50)	81.94

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

Minimum	0.01	Mean	6.618
Maximum	410	Median	0.01
SD	51.23	CV	7.741
k hat (MLE)	0.133	k star (bias corrected MLE)	0.138
Theta hat (MLE)	49.58	Theta star (bias corrected MLE)	48.08
nu hat (MLE)	17.09	nu star (bias corrected)	17.62
MLE Mean (bias corrected)	6.618	MLE Sd (bias corrected)	17.84
		Adjusted Level of Significance (β)	0.0463
Approximate Chi Square Value (17.62, α)	9.116	Adjusted Chi Square Value (17.62, β)	8.975
95% Gamma Approximate UCL (use when n>=50)	12.79	95% Gamma Adjusted UCL (use when n<50)	12.99

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.767	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.284	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.335	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	6.636	Mean in Log Scale	-6.214
SD in Original Scale	51.23	SD in Log Scale	4.081
95% t UCL (assumes normality of ROS data)	17.33	95% Percentile Bootstrap UCL	19.43
95% BCA Bootstrap UCL	26.02	95% Bootstrap t UCL	683.5
95% H-UCL (Log ROS)	138		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	-1.189	95% H-UCL (KM -Log)	0.814
KM SD (logged)	1.145	95% Critical H Value (KM-Log)	2.263
KM Standard Error of Mean (logged)	0.164		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	7.392	Mean in Log Scale	-0.504
SD in Original Scale	51.14	SD in Log Scale	1.367
95% t UCL (Assumes normality)	18.06	95% H-Stat UCL	2.28

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL 49.67

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (tph-motor oil)

General Statistics

Total Number of Observations	112	Number of Distinct Observations	22
Number of Detects	19	Number of Non-Detects	93
Number of Distinct Detects	16	Number of Distinct Non-Detects	6
Minimum Detect	9.2	Minimum Non-Detect	2
Maximum Detect	1600	Maximum Non-Detect	100
Variance Detects	127667	Percent Non-Detects	83.04%
Mean Detects	172.5	SD Detects	357.3

Median Detects	67	CV Detects	2.071
Skewness Detects	3.937	Kurtosis Detects	16.23
Mean of Logged Detects	4.29	SD of Logged Detects	1.212

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.433	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.378	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.203	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	37.84	Standard Error of Mean	15.31
SD	156	95% KM (BCA) UCL	70.35
95% KM (t) UCL	63.24	95% KM (Percentile Bootstrap) UCL	66.12
95% KM (z) UCL	63.03	95% KM Bootstrap t UCL	117
90% KM Chebyshev UCL	83.78	95% KM Chebyshev UCL	104.6
97.5% KM Chebyshev UCL	133.5	99% KM Chebyshev UCL	190.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.198	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.783	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.248	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.207	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.702	k star (bias corrected MLE)	0.626
Theta hat (MLE)	245.7	Theta star (bias corrected MLE)	275.5
nu hat (MLE)	26.68	nu star (bias corrected)	23.8
MLE Mean (bias corrected)	172.5	MLE Sd (bias corrected)	218

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0589	nu hat (KM)	13.18
Approximate Chi Square Value (13.18, α)	6.016	Adjusted Chi Square Value (13.18, β)	5.953
95% Gamma Approximate KM-UCL (use when n>=50)	82.91	95% Gamma Adjusted KM-UCL (use when n<50)	83.79

Gamma (KM) may not be used when k hat (KM) is < 0.1

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detected data is small such as < 0.1
For such situations, GROS method tends to yield inflated values of UCLs and BTVs
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	30.72
Maximum	1600	Median	0.01
SD	157.9	CV	5.141
k hat (MLE)	0.126	k star (bias corrected MLE)	0.129
Theta hat (MLE)	243.2	Theta star (bias corrected MLE)	238.4
nu hat (MLE)	28.29	nu star (bias corrected)	28.86
MLE Mean (bias corrected)	30.72	MLE Sd (bias corrected)	85.58
		Adjusted Level of Significance (β)	0.0479
Approximate Chi Square Value (28.86, α)	17.6	Adjusted Chi Square Value (28.86, β)	17.49
95% Gamma Approximate UCL (use when n>=50)	50.37	95% Gamma Adjusted UCL (use when n<50)	50.7

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.901	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.138	**Lilliefors GOF Test**

5% Lilliefors Critical Value	0.203	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	36.26	Mean in Log Scale	1.793
SD in Original Scale	157	SD in Log Scale	1.795
95% t UCL (assumes normality of ROS data)	60.86	95% Percentile Bootstrap UCL	63.87
95% BCA Bootstrap UCL	86.55	95% Bootstrap t UCL	131.2
95% H-UCL (Log ROS)	50.75		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed

KM Mean (logged)	2.273	95% H-UCL (KM -Log)	34.96
KM SD (logged)	1.373	95% Critical H Value (KM-Log)	2.591
KM Standard Error of Mean (logged)	0.395		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	51.31	Mean in Log Scale	3.292
SD in Original Scale	154.6	SD in Log Scale	0.921
95% t UCL (Assumes normality)	75.54	95% H-Stat UCL	49.58

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL	70.35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (vanadium)

General Statistics

Total Number of Observations	39	Number of Distinct Observations	23
		Number of Missing Observations	0
Minimum	17	Mean	30.58
Maximum	69	Median	26.9
SD	10.44	Std. Error of Mean	1.672
Coefficient of Variation	0.341	Skewness	1.725

Normal GOF Test

Shapiro Wilk Test Statistic	0.848	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.939	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.173	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.142	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	33.4	95% Adjusted-CLT UCL (Chen-1995)	33.83
		95% Modified-t UCL (Johnson-1978)	33.48

Gamma GOF Test

A-D Test Statistic	1.115	**Anderson-Darling Gamma GOF Test**

5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.156	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.141	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	10.78	k star (bias corrected MLE)	9.964
Theta hat (MLE)	2.838	Theta star (bias corrected MLE)	3.07
nu hat (MLE)	840.5	nu star (bias corrected)	777.2
MLE Mean (bias corrected)	30.58	MLE Sd (bias corrected)	9.689
		Approximate Chi Square Value (0.05)	713.5
Adjusted Level of Significance	0.0437	Adjusted Chi Square Value	711.1

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	33.31	95% Adjusted Gamma UCL (use when n<50)	33.43

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.939	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.14	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.142	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.833	Mean of logged Data	3.373
Maximum of Logged Data	4.234	SD of logged Data	0.3

Assuming Lognormal Distribution

95% H-UCL	33.3	90% Chebyshev (MVUE) UCL	34.96
95% Chebyshev (MVUE) UCL	36.98	97.5% Chebyshev (MVUE) UCL	39.79
99% Chebyshev (MVUE) UCL	45.31		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	33.33	95% Jackknife UCL	33.4
95% Standard Bootstrap UCL	33.36	95% Bootstrap-t UCL	34.1
95% Hall's Bootstrap UCL	34.59	95% Percentile Bootstrap UCL	33.56
95% BCA Bootstrap UCL	33.67		
90% Chebyshev(Mean, Sd) UCL	35.6	95% Chebyshev(Mean, Sd) UCL	37.87
97.5% Chebyshev(Mean, Sd) UCL	41.02	99% Chebyshev(Mean, Sd) UCL	47.22

Suggested UCL to Use

95% Student's-t UCL	33.4	or 95% Modified-t UCL	33.48
or 95% H-UCL	33.3		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Chemical (xylenes)

ATTACHMENT A
ESTIMATION OF REPRESENTATIVE EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN IN OFF-SITE PUBLIC ROW SOIL (0-10 FEET BGS) - PROUCL OUTPUT
Former Santa Rosa MGP Site
Santa Rosa, California

General Statistics

Total Number of Observations	48	Number of Distinct Observations	12
Number of Detects	29	Number of Non-Detects	19
Number of Distinct Detects	4	Number of Distinct Non-Detects	8
Minimum Detect	0.003	Minimum Non-Detect	0.0025
Maximum Detect	0.0061	Maximum Non-Detect	0.015
Variance Detects	1.9564E-7	Percent Non-Detects	39.58%
Mean Detects	0.00403	SD Detects	4.4231E-4
Median Detects	0.004	CV Detects	0.11
Skewness Detects	3.449	Kurtosis Detects	19.28
Mean of Logged Detects	-5.52	SD of Logged Detects	0.0976

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.368	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.926	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.49	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.165	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.00392	Standard Error of Mean	8.9937E-5
SD	5.1512E-4	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.00407	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.00407	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.00419	95% KM Chebyshev UCL	0.00431
97.5% KM Chebyshev UCL	0.00448	99% KM Chebyshev UCL	0.00482

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.373	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.742	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.48	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.162	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	101.6	k star (bias corrected MLE)	91.1
Theta hat (MLE)	3.9645E-5	Theta star (bias corrected MLE)	4.4208E-5
nu hat (MLE)	5892	nu star (bias corrected)	5284
MLE Mean (bias corrected)	0.00403	MLE Sd (bias corrected)	4.2196E-4

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	57.94	nu hat (KM)	5562
Approximate Chi Square Value (N/A, α)	5389	Adjusted Chi Square Value (N/A, β)	5384
95% Gamma Approximate KM-UCL (use when n>=50)	0.00405	95% Gamma Adjusted KM-UCL (use when n<50)	0.00405

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.003	Mean	0.00639
Maximum	0.01	Median	0.004
SD	0.00297	CV	0.465
k hat (MLE)	4.93	k star (bias corrected MLE)	4.636
Theta hat (MLE)	0.0013	Theta star (bias corrected MLE)	0.00138
nu hat (MLE)	473.3	nu star (bias corrected)	445.1
MLE Mean (bias corrected)	0.00639	MLE Sd (bias corrected)	0.00297

		Adjusted Level of Significance (β)	0.045
Approximate Chi Square Value (445.06, α)	397.1	Adjusted Chi Square Value (445.06, β)	395.8
95% Gamma Approximate UCL (use when n>=50)	0.00716	95% Gamma Adjusted UCL (use when n<50)	0.00719

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.402	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.926	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.473	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.165	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00398	Mean in Log Scale	-5.529
SD in Original Scale	3.7100E-4	SD in Log Scale	0.0839
95% t UCL (assumes normality of ROS data)	0.00407	95% Percentile Bootstrap UCL	0.00408
95% BCA Bootstrap UCL	0.00411	95% Bootstrap t UCL	0.00411
95% H-UCL (Log ROS)	N/A		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.00399	Mean in Log Scale	-5.583
SD in Original Scale	0.0014	SD in Log Scale	0.359
95% t UCL (Assumes normality)	0.00433	95% H-Stat UCL	0.00441

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL N/A

Warning: One or more Recommended UCL(s) not available!

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Chemical (zinc)

General Statistics

Total Number of Observations	42	Number of Distinct Observations	30
		Number of Missing Observations	0
Minimum	21	Mean	91.78
Maximum	1400	Median	34
SD	217	Std. Error of Mean	33.48
Coefficient of Variation	2.364	Skewness	5.653

Normal GOF Test

Shapiro Wilk Test Statistic	0.32	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.942	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.375	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.137	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	148.1	95% Adjusted-CLT UCL (Chen-1995)	178.1

95% Modified-t UCL (Johnson-1978)	153

Gamma GOF Test

A-D Test Statistic	6.339	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.782	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.304	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.141	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.917	k star (bias corrected MLE)	0.868
Theta hat (MLE)	100.1	Theta star (bias corrected MLE)	105.8
nu hat (MLE)	77.05	nu star (bias corrected)	72.88
MLE Mean (bias corrected)	91.78	MLE Sd (bias corrected)	98.53
		Approximate Chi Square Value (0.05)	54.22
Adjusted Level of Significance	0.0443	Adjusted Chi Square Value	53.65

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	123.4	95% Adjusted Gamma UCL (use when n<50)	124.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.726	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.942	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.213	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.137	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.045	Mean of logged Data	3.884
Maximum of Logged Data	7.244	SD of logged Data	0.835

Assuming Lognormal Distribution

95% H-UCL	91.55	90% Chebyshev (MVUE) UCL	97.71
95% Chebyshev (MVUE) UCL	111.1	97.5% Chebyshev (MVUE) UCL	129.7
99% Chebyshev (MVUE) UCL	166.3		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	146.9	95% Jackknife UCL	148.1
95% Standard Bootstrap UCL	146.6	95% Bootstrap-t UCL	305.4
95% Hall's Bootstrap UCL	322.1	95% Percentile Bootstrap UCL	152.1
95% BCA Bootstrap UCL	191		
90% Chebyshev(Mean, Sd) UCL	192.2	95% Chebyshev(Mean, Sd) UCL	237.7
97.5% Chebyshev(Mean, Sd) UCL	300.9	99% Chebyshev(Mean, Sd) UCL	424.9

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	237.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.