APPENDIX E

DATA QUALITY ASSESSMENT

APPENDIX E – PART 1

DATA QUALITY ASSESSMENT

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DATA QUALITY ASSESSMENT
SOIL AND NAPL RI
DEL AMO SUPERFUND SITE

E.1 INTRODUCTION

This appendix presents the methods and results of data validation procedures completed for data included in the preceding Remedial Investigation Report, Soil and NAPL Operable Unit. Data presented in the RI include soil, soil gas, indoor air and groundwater results for samples collected from 1992 to 2003. The purpose of the data validation was to verify that the data meet analytical data quality objectives (DQOs) and quality assurance criteria, as set forth in the Quality Assurance Project Plan (QAPP; Dames & Moore, 1993a), and QAPP Addendum (URS, 2002).

E.1.1 NON-RI DATA

Soil and soil gas data presented in the RI report were partially derived from investigations conducted outside of the RI process. These data typically originate from investigations conducted on behalf of individual property owners by Dames & Moore (now URS Corporation) and other consulting firms. The data have been independently submitted to the USEPA in some cases. A review of the data was undertaken to determine which of these data could be included in the Soil and NAPL RI database and used in the subsequent risk assessment. The following minimum acceptance criteria were used in the evaluation based on a subset of principles given in the USEPA National Functional Guidelines (USEPA, 1999):

- The data were generated by a certified mobile or fixed analytical laboratory using approved USEPA reference methods;
- Documentation and quality control standards were consistent with those outlined in SW-846 and in the project QAPP;
- Screening data were accepted only if 10% of laboratory analytical records for QC and sample data were available for verification
- The data were analyte specific, and analyte identification and quantification were able to be confirmed following precision, accuracy, representiveness, comparability and completeness standards, as defined in the QAPP;

- The data included documentation of matrix spike/matrix spike duplicates (MS/MSD), laboratory control samples (LCS), method blanks, holding times, internal standards (surrogates) and serial dilutions, as appropriate based on the analytical method, with the following exceptions: (1) Data that were lacking quantitative results for LCS were accepted provided results for other QA samples such as matrix spikes or surrogate recoveries were available and indicated acceptable accuracy with respect to the QAPP standards; and (2) The absence of documentation regarding method blanks, MS/MSD, or serial dilutions did not disqualify the data, provided that only one of these three elements was missing, and all other acceptance criteria were satisfied; and

- Groundwater data for all analytes were excluded, as were soil data for total petroleum hydrocarbons (TPH). Groundwater data for the RI and risk assessment were limited to recent data from a specific RI sampling event, thereby excluding all historical data conducted outside of the RI process. Soil TPH data was excluded because it is non-specific with respect to analyte concentrations and therefore unsuitable for risk assessment.

Table E-1 summarizes the results of the data review following the acceptance criteria above. Approximately 44% of the project site data generated outside of the RI project were accepted for inclusion in the soil and NAPL RI database and use in the risk assessment that is currently in progress. These accepted data are referred to as the "non-RI" data within the preceding Soil and NAPL RI report. The non-RI data are considered to have been validated in a similar fashion as the RI data for the purposes of this data quality assessment, and are therefore included in the various statistics cited below. However, data generated outside of the project RI that did not meet acceptance criteria is not present in any form within the project database. This is distinct from RI data that does not meet validation criteria, which is in the project database, but qualified as 'rejected.' Analytical data and associated qualifiers generated as a result of the data validation process for all RI and non-RI samples are provided in electronic text files on the compact disk provided in Appendix B.

E.2 QUALITY ASSURANCE CRITERIA

Valid conclusions regarding site conditions must be based on definitive data that are analyte specific, confirming both analyte identification and quantification. The data must further be generated using rigorous analytical methods, such as approved EPA or American Society for Testing and Materials (ASTM) reference methods, that have standardized quality control (QC) and documentation requirements.

The soil and NAPL RI data were subjected to data validation to determine usability. Definitive data were not restricted in their use unless quality problems resulted in data qualification flags.

Generally, such flags do not render the data unusable. Data determined to be rejected as a result of data validation were not used to evaluate site conditions during the RI.

RI data were generated and validated according to criteria established in the QAPP and QAPP Addendum. DQOs, including sample collection requirements and quality assurance (QA) goals for the analytical data, are included in these documents. These DQOs are quantitative and qualitative statements that specify the quality of data necessary to support project decisions, and are expressed in terms of precision, accuracy, representativeness, comparability, and completeness (PARCC).

E.2.1 PRECISION

Precision measures the reproducibility of repetitive measurements. It is defined as the degree of mutual agreement among independent measurements resulting from repeated application of the sample analytical process under similar conditions. The two general categories of precision are analytical precision and total precision.

Analytical precision is a measurement of the variability associated with duplicate or replicate analyses of the same sample in the laboratory, and is determined by analysis of laboratory quality control samples, such as duplicate control samples (LCSD or DCS) and matrix spike duplicates (MSD). If the recoveries of analytes in the specified control samples are comparable within established control limits, then precision is within limits.

Total precision is a measurement of the variability associated with the entire sampling and analytical process. It is determined by analysis of duplicate or replicate field samples, and measures variability introduced by both the laboratory and field operations. Field duplicate samples are analyzed to assess field and analytical precision.

Duplicate results are assessed using the relative percent difference (RPD) between duplicate measurements. Precision is expressed as the RPD:

$$RPD = \left(\frac{(X_2 - X_1)}{(X_2 + X_1)} \right) * 200\%$$

where:

X_1 = the measured concentration of the analyte in a sample

X_2 = the measured concentration of the analyte in a duplicate sample.

If the RPD for laboratory quality control samples exceeds the laboratory established control criteria, data are qualified as described in the applicable validation procedure. If the RPD between primary and duplicate field samples exceeds 50% for groundwater, and 100% for soil

and soil gas, then the system is considered to be out of statistical control and further investigation is initiated.

Blind field duplicates were collected for all sampling events with the exception of the 2003 Supplemental Shallow Soil Addendum Investigation (URS, 2002) and the indoor air sampling (URS, 2001c). Forty-four blind duplicate soil samples, seventy-eight duplicate soil gas samples, and twelve blind duplicate groundwater samples were collected and analyzed during the RI.

Sample duplicate and matrix spike duplicate analyses are performed in the laboratory following recommended methodologies to estimate the precision in the analytical process. Both sample and matrix spike duplicates assess matrix effects and analytical variability. Laboratory duplicates were prepared and analyzed for the same parameters as primary samples. The required frequency for laboratory duplicate analyses is outlined in the analytical methods. Laboratory control spike sample (LCS) duplicates are not matrix dependent in determining the precision of the analytical method. If the RPD between duplicate results falls outside the acceptance criteria, then the analytical system is considered to be out of statistical control, and other data quality results are reviewed to establish validity of the data.

E.2.2 ACCURACY

Accuracy is a statistical measure of the correctness of a measurement, and includes components of random error (variability due to imprecision) and systematic error. A measurement is accurate when the value reported does not differ from the true value or known concentration of the spike or standard.

Laboratory accuracy is expressed as the percent recovery (%R). Percent recovery is calculated according to the following formula:

$$\%R = 100 \times \frac{X_s - X}{T}$$

where:

Xs = the measured concentration of the spiked analyte in a spiked sample;
X = the measured concentration of the spiked analyte in an un-spiked sample; and
T = the concentration of the analyte used for spiking.

Analysis of matrix or surrogate spikes and laboratory control spike samples are used to evaluate analytical accuracy. A matrix spike is a solution of method analytes at known concentrations that is added ("spiked") into a field sample before the sample is prepared for analysis. Laboratory control

spike analyses have the same function as matrix spike analyses and differ only in that the spike solution is added to a laboratory blank sample as opposed to a field sample. The results of these spike sample analyses are used to measure the percent recovery of each spiked compound. This percent recovery is a measure of the accuracy of the method. Specific acceptance criteria for each standard method and parameter measured have been established, and periodically updated by the laboratories. All laboratory established acceptance limits are archived by the laboratories and are available to URS upon request.

Surrogate spikes are a group of compounds, other than method analytes, selected for each organic compound analysis. The percent recovery is monitored to ensure adequate performance on a measurement-by-measurement basis. Surrogate spike recoveries are summarized for each sample analysis in the laboratory data packages. These recoveries are compared to specific acceptance criteria, which are outlined in the analytical methods and laboratory SOPs. High surrogate recoveries indicate that reported results are higher than the actual concentrations of analytes in field samples. Low surrogate recoveries may be an indication of false negative data.

The results of the sample matrix and surrogate recoveries and laboratory control spike samples are reviewed as part of the validation process. The results are compared to the acceptable ranges established in the QAPP, and QAPP Addendum, providing an indication of laboratory analytical performance.

E.2.3 REPRESENTATIVENESS

Representativeness is a qualitative parameter that evaluates how accurately the data represent the actual environmental conditions. Representativeness is determined by evaluating the results of trip blanks, field blanks, laboratory method blanks, and blind duplicate samples.

Trip blanks were used to identify volatile organic compounds (VOCs), which may have been introduced during sample transit or during sample storage at the laboratory. The trip blank consisted of a VOC sample vial filled in the laboratory with ASTM Type II reagent grade water. The trip blank traveled to the site with the empty sample bottles and returned from the site with the collected field samples in an effort to simulate sample-handling conditions. One trip blank was included in each shipping container transporting samples for VOCs analysis.

Field blanks, or equipment rinsate blanks, are used to evaluate the effectiveness of decontamination procedures and whether cross contamination has occurred. Field blanks were prepared in the field by pouring de-ionized, distilled water into cleaned, non-dedicated sampling equipment. The water was then collected and submitted to the laboratory as a field sample. Field blanks were given a fictitious sample identification number so that the laboratory could not recognize it as a blank.

Laboratory method blanks are used to demonstrate that all glassware and reagents used in the analytical procedure are free of interferences and compounds of primary interest. Each method blank is subjected to each given laboratory procedure, from sample preparation through quantitation. If an analyte is detected in a method blank, either an interference or contamination in the laboratory process is indicated. The required frequency for analyzing method blanks is specified in the standard operation procedure for each analytical method, and consists of at least one per day for each method/instrument and/or per sample preparation set. Laboratory method blanks are evaluated as part of the validation process. Identification of target compounds at similar concentrations in primary samples results in questionable data because of biases introduced by the analytical process. Blind duplicate samples are collected and analyzed to evaluate the similarity of concentrations with those for the primary samples. Analyses of blind duplicate samples also function to estimate precision in the sampling and analytical process.

E.2.4 COMPARABILITY

Comparability is an expression of the confidence with which one data set can be compared to another. The objective of comparability is to ensure that data developed during the investigation are consistent with site knowledge and adequately address applicable criteria or standards established by the USEPA and California Department of Health Services (CADOHS). The QAPP and the QAPP Addendum address comparability by specifying laboratory methods that are consistent with the current standards of practice as approved by the USEPA and CADOHS. Field methods are discussed in the Work Plan.

Comparability is achieved through the use of standard sampling procedures, analytical methods, and units of measurement. Reported methodologies and quantitation limits are compared to those outlined in the QAPP and the QAPP Addendum. No deviations in the analytical program were noted during the RI.

E.2.5 COMPLETENESS

Completeness is the amount of valid data obtained compared to the amount that was expected under ideal conditions. The number of valid results divided by the number of possible results, expressed as a percentage (%C), determines the completeness of the data set. Completeness is determined after quality control data are calculated and the results are compared to the DQOs. The objective for completeness is to recover at least 90% of the planned data to support field efforts. The formula for calculation of completeness is presented, as follows:

$$\% \ C = \left(\frac{\text{number of valid results}}{\text{number of expected results}} \right) * 100\%$$

Valid data are determined by comparing analytical results to a set of guidelines designed to establish defensibility and reliability of a given data result. Data that fall outside these criteria are labeled, or qualified, as rejected. Data that are determined to have limited usefulness, or that are indicative of bias, are qualified as estimated. Analyte concentrations determined to be the result of contamination introduced by field or laboratory supplies have been qualified as anomalous (not detected). Data that have been qualified as estimated or anomalous are considered valid. Data that are qualified as rejected are excluded as valid data, reducing the percent completeness.

E.3 DATA VALIDATION METHODS

Data validation was accomplished through a review of field QC samples, laboratory QC samples, and analytical method performance to evaluate the degree to which the DQOs for each PARCC parameter were achieved. The field QC samples and analytical data reports were reviewed in accordance with project-specific validation procedures based on the principles discussed in EPA National Functional Guidelines for Laboratory Data Review, Organics and Inorganics (EPA, 1994a, 1999, 2002).

Limited data validation was performed on all laboratory data. Full data validation was performed on more than 20% of the laboratory data. The limited data validation uses the same criteria contained in the USEPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review; however, the reviews do not include checking the raw data, calibrations, and calculations. Instead, limited data validation utilizes the data summary and QA/QC summary provided in the laboratory standard report.

The laboratory data were reviewed for compliance with the applicable method in accordance to laboratory analytical Standard Operating Procedures (SOPs) and the quality of the data reported. The areas of data validation are summarized as follows:

- Data Completeness
- Holding Times
- Blanks
- Calibrations (full validation only)
- Laboratory Control Samples
- Matrix Spike/Matrix Spike Duplicates

- Surrogates
- Internal Standards (full validation only)
- Instrument Tuning Summery (full validation only)
- Field Quality Control Samples
- Compound Identification and Quantification

QC samples included field duplicates, trip blanks, and laboratory method blanks and control spikes. Field duplicate data were evaluated to identify sources of error affecting the quality of the data. The locations of field duplicate samples were randomly selected during the planning stage for the RI activities. Field and trip blanks were used to identify target analytes that may have been introduced during sampling, sample transit (to and from the field) or during laboratory sample storage. In addition, the laboratory analyzed a method blank and at least one blank spike (LCS) for each analytical batch to detect potential reagent contamination and evaluate instrument performance.

The three primary objectives of validation included: (1) a review of sampling, analytical, and data reduction protocols for correctness; (2) a quantitative assessment of the measurement data validity; and (3) an assessment of data completeness. The project data validation procedures were designed to assess laboratory performance, the overall precision, accuracy, representativeness, comparability, and completeness of the data, and to identify biases inherent to the data.

Review of laboratory data packages included an assessment of holding time violations, blank contamination, precision, accuracy, and where checking the raw data, calibrations and calculations. Data qualification was based on guidance presented in the USEPA *Contract Laboratory Program National Functional Guidelines for Organic, and Inorganic Data Review (USEPA, 1994a, 1999, 2002)*. Data validation flags were applied to those sample results that fell outside of specified tolerance limits and, therefore, did not meet the DQOs. An explanation of the data flags is provided in Tables E-2, and E-3.

E.4 DATA VALIDATION RESULTS

The following sections present a summary of data validation results with respect to the PARCC goals. Comprehensive analytical results for the RI, including data qualifier flags, are presented in electronic text files on the compact disk presented in Appendix B.

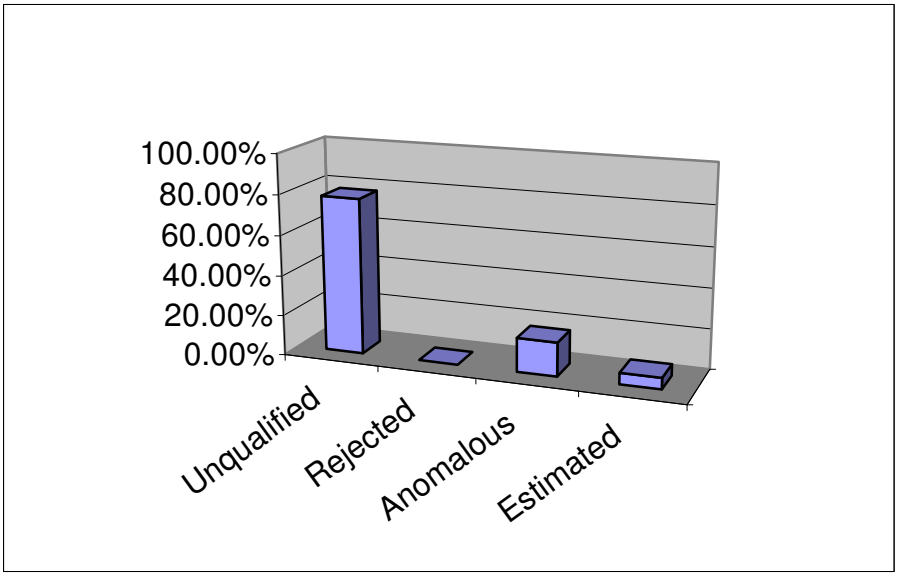
E.4.1 SOIL DATA

Soil sample data in the RI database originate from the following laboratories and analyses:

Data Type	Laboratory	Analyses	Sampling Period
Non-RI data	ATI Laboratories	EPA 8020, 8240, 8270	1990-91
	Centrum Analytical	EPA 8260	1996
	ATL	EPA 8010	1996
	Calscience Environmental Laboratories	EPA 8260, 8080, 8081, 8270 6020	1997-1998
RI data	Brown and Caldwell Analytical Laboratories	EPA 6010B, 7060, 7470, 7740, 8080, 8240, 8260, 8270, 9010	1993-1997
	Severn Trent Laboratories	EPA 8260B, 8270Sim, 6010B, 7471A, 7199, 8081A, 8082	2002-2003

E.4.1.1 Completeness

A total of 786 field soil samples were submitted for laboratory analysis (includes RI and accepted non-RI data). Results were received from the laboratories for all samples scheduled for analyses. More than 99% of the data reported was usable as qualified (valid results include values qualified as estimated). Out of approximately 32682 individual analytical results (both detected and non-detected), 7335 results were qualified. Of those data qualified, only 2 results were qualified as rejected. Based on these findings, the completeness objectives were achieved with respect to the soil samples. The distribution of data with respect to qualification categories is presented in the figure below.



The qualification categories presented above are defined as follows:

Unqualified data include those results for which no QC issues were identified;
Rejected data are those results that are unsuitable for use in characterizing site conditions or risk assessment due to signficant QC issues;
Anomalous data are those results that were originally reported as detectable analyte concentrations by the laboratory, but which were subsequently qualified as undetected during the data validation process due to blank contamination; and
Estimated data are results where the analyte has been positively identified, but the reported concentration could only be estimated due to QC issues.

E.4.1.2 Precision

Forty-four field duplicate soil samples were collected and analyzed for the same analytical parameters as the associated primary samples. The overall precision (sampling and analytical precision) is acceptable, although several results for the field duplicate pairs were qualified as estimated.

The precision of laboratory measurements was additionally evaluated by comparison of spike sample/spike sample duplicate results. All duplicate results satisfied the applicable evaluation criteria. As such, the overall level of analytical precision demonstrated is considered acceptable.

E.4.1.3 Accuracy

Accuracy was measured as the percent recovery (%R) of an analyte in a reference standard or spiked sample.

LCS Summary – Approximately 99% of recoveries for laboratory control samples were within their respective acceptance criteria, indicating that acceptable levels of accuracy were attained on clean sample matrices. Sample results associated with recoveries outside acceptance criteria were qualified as necessary.

Surrogate Summary – Surrogate spikes were performed for samples analyzed for organic analyses in accordance with each method. Less than 5% of the total individual analytical results were qualified as estimated due to surrogate recovery failure in the associated samples.

MS/MSD Summary – Sample matrix spikes were performed using concentrations and conditions specified by the analytical method. The percent recovery of each spiking compound was calculated and compared to the limits outlined in the QAPP and QAPP Addendum. The RPD between recoveries was also calculated. Less than 1% of the total individual analytical results were qualified

based on MS/MSD recovery failure. Based on this finding, the overall level of accuracy demonstrated by the analyses is considered acceptable.

E.4.1.4 Representativeness

Representativeness was evaluated through review of results for laboratory preparation blanks and field QC blanks. Field QC blanks included trip blanks and equipment rinsate blanks. Primary sample analyte results were qualified as non-detect ("U") when the analyte was also detected in an associated blank and the concentration in the primary sample was less than five times the blank sample concentration (less than ten times for the common laboratory contaminants of acetone, and methylene chloride). For results qualified as non-detect when the reported value was less than the laboratory reporting limit, the standard reporting limit for that analyte became the effective reporting limit. For results qualified as non-detect at a value above the reporting limit, the reported value became the effective reporting limit.

A total of 79 trip blanks and 102 equipment rinsate blanks were collected and analyzed (includes RI and accepted non-RI data). Laboratory method blanks were analyzed at the required frequency for the various analytical methods. With the exception of the few cases noted below, these QC blanks were found to be free of analyte contamination.

Analytes identified in one or more blank samples included methylene chloride, acetone, beryllium, naphthalene, 2-methylnaphthalene, and benzo(ghi)perylene. These detections appear to have been random, and the analytes were detected at concentrations near their respective analytical reporting limits. The detections could result from a number of factors, including laboratory glassware, sample preparation procedures, cross-contamination occurring during sample storage and shipment, or instrument carry-over during analyses.

E.4.1.5 Comparability

The analyses were conducted in accordance with the procedures outlined in the QAPP and QAPP Addendum, and laboratory reporting limits met the established guidelines. The comparability objective for the soil data was therefore achieved.

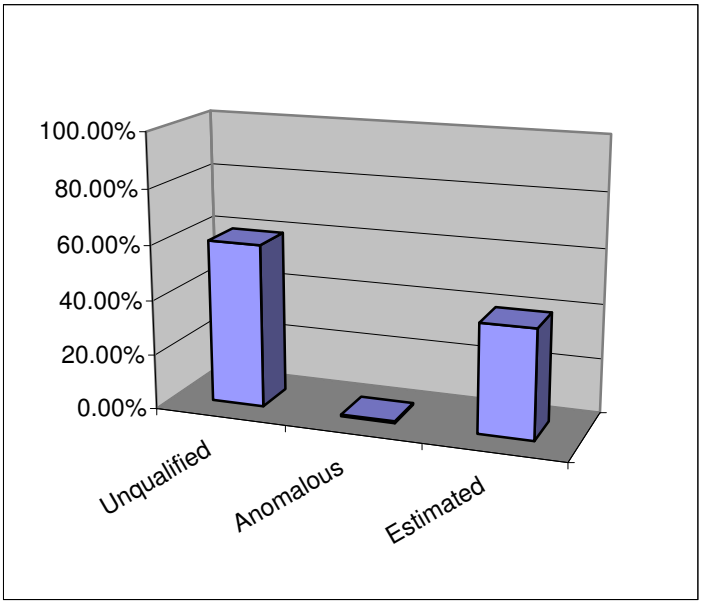
E.4.2 SOIL GAS DATA

Soil gas data were generated from 1992 to 1997 by Optimal Technologies, Enseco Air Toxics Laboratories, and Air Toxics, LTD. Soil gas samples were evaluated for VOCs using methods 8240, 8260B, and TO-14.

E.4.2.1 Completeness

A total of 855 soil gas samples were collected and submitted to the laboratories for analyses. Data were received from the laboratory for all samples scheduled for analyses and 100% of the results reported are valid. Out of approximately 15,222 individual analytical results (both detected and non-detected), 6,147 results were qualified. None of the data were qualified as rejected. Based on these findings, the completeness objectives for the soil gas data were achieved.

The distribution of qualified data is illustrated in the figure below:



E.4.2.2 Precision

Precision was evaluated through review of results for 75 field duplicate soil gas samples. The split samples were analyzed for the same analytical parameters as the associated primary samples. The difference between the results of field duplicate pairs was evaluated during the validation process. The overall precision (sampling and analytical precision) is acceptable, although several results for the field duplicate pairs were qualified as estimated.

Soil gas sample data precision was additionally evaluated by comparison of spike sample/spike sample duplicate results. All duplicate results satisfied the applicable evaluation criteria. As such, the overall level of analytical precision demonstrated is considered acceptable.

Overall, evaluation of the split sample pairs, and spike sample/ spike sample duplicate results indicates acceptable precision, and that field and laboratory techniques employed were appropriate.

E.4.2.3 Accuracy

Accuracy was measured as the percent recovery (%R) of an analyte in a reference standard or spiked sample.

LCS Summary – Approximately 99% of recoveries for soil gas laboratory control samples were within their respective acceptance criteria, indicating that acceptable levels of accuracy were attained on clean sample matrices. Sample results associated with recoveries outside acceptance criteria were appropriately qualified. Overall, the LCS results indicated that acceptable accuracy was obtained by the method on a control sample matrix.

Surrogate Summary – Surrogate spikes were performed for samples analyzed for organic analyses in accordance with each method. Less than 5% of the analytical results were qualified as estimated due to surrogate recovery failure in the associated samples.

MS/MSD Summary – Sample matrix spikes were performed using concentrations and conditions specified by the analytical method. The percent recovery of each spiking compound was calculated and compared to the acceptance limits outlined in the QAPP and QAPP Addendum. The RPD between recoveries for the MS and MSD samples were additionally calculated. Less than 1% of the analytical results were qualified based on MS/MSD recovery failure. In general, the overall level of accuracy demonstrated by the analyses is considered to be acceptable.

E.4.2.4 Representativeness

Representativeness was evaluated by comparing the results obtained for soil gas split sample pars. In general, the results satisfied the soil gas split evaluation criteria, as specified in the QAPP.

Contaminants identified in one or more soil gas laboratory blanks included 1,1,1-trichloroethane, tetrachloroethene, and trichloroethylene. These contaminants were detected at concentrations near the analytical reporting limit, and may originate from laboratory glassware, sample preparation procedures, or instrument carry-over during analyses. Primary sample results associated with these blank contaminants were flagged not detected ("U") when the primary sample concentration was less than five times the concentration detected in the associated QC blank.

Based on the above findings, the soil gas samples are considered to be acceptably representative.

E.4.2.5 Comparability

The soil gas analyses were conducted in accordance with the procedures outlined in the QAPP and laboratory reporting limits met the established guidelines. Based on these findings, the comparability objective for the soil gas data has been achieved.

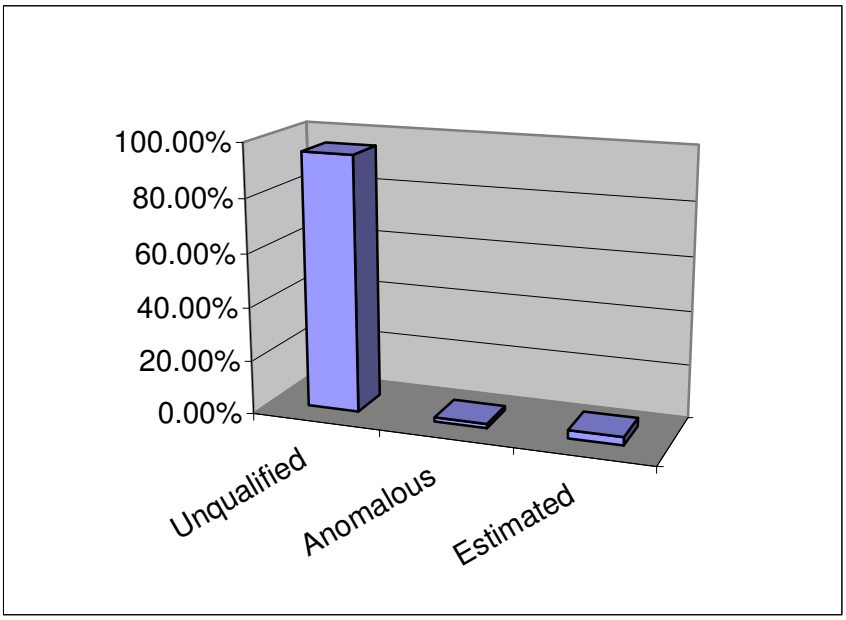
E.4.3 INDOOR AIR DATA

The indoor air analyses were conducted from 1993 to 1995. Indoor air analyses include EPA Methods SM1501 and TO-14. Air sample analyses were completed by Health Science Associates and Air Toxics, LTD.

E.4.3.1 Completeness

A total of 227 indoor air samples were collected and submitted to the laboratories for analyses. Results were received from the laboratory for all samples scheduled for analyses and100% of the results reported are valid. Out of approximately 3,471 analytical results (both detected and non-detected), 163 results were qualified. Of those data qualified, no results were qualified as rejected. The completeness objectives for the indoor air data were therefore achieved.

The distribution of qualified indoor air data is presented in the figure below:



E.4.3.2 Precision

Field indoor air duplicate samples were not required by the QAPP and thus were not collected. Precision of laboratory measurements was evaluated by the comparison of spike sample/spike sample duplicate results. All duplicate results satisfied the applicable evaluation criteria. As such, the level of analytical precision demonstrated is considered acceptable.

E.4.3.3 Accuracy

The accuracy of indoor air results was measured as the percent recovery (%R) of an analyte in a reference standard or spiked sample.

LCS Summary – Approximately 99% of recoveries for laboratory control samples were within their respective acceptance criteria indicating that acceptable levels of accuracy were attained on clean sample matrices. Sample results associated with recoveries outside acceptance criteria were qualified. Overall, the LCS results indicated that acceptable accuracy was obtained by the method on a control sample matrix.

Surrogate Summary – Surrogate spikes were performed in accordance with each method. Less than 5% of the total individual analytical results were qualified as estimated due to surrogate recovery failure in the associated samples.

MS/MSD Summary – Sample matrix spikes were performed using concentrations and conditions specified by the analytical method. The percent recovery of each spiking compound was calculated and compared to the acceptance limits outlined in the QAPP and QAPP Addendum. The RPD between recoveries was additionally calculated. Less than 1% of the analytical results were qualified based on MS/MSD recovery failure.

Based on the above findings, the overall level of accuracy demonstrated by the indoor air analyses is considered to be acceptable.

E.4.3.4 Representativeness

Representativeness of the indoor air data was evaluated through review of results for preparation blanks and field QC blanks. Primary sample results for an analyte were qualified as non-detect ("U") when the analyte was also detected in an associated blank and the concentration in the primary sample was less than five times the blank sample concentration (less than ten times for the common laboratory contaminants of acetone, and methylene chloride). For results qualified as non-detect when the reported value was less than the reporting limit, the standard reporting limit for that analyte became the effective reporting limit.

A total of 21 trip blanks and five equipment blanks were collected and analyzed. Laboratory method blanks were analyzed at the required frequency for the various analytical methods. With the exception of the few cases noted below, the QC blanks were found to be free of analyte contamination.

Contaminants identified in one or more QC blanks included 1,1,1-trichloroethane, benzene, ethyl benzene, methylethylketone, toluene, and xylenes. These compounds were detected at

concentrations near the analytical reporting limit, and may originate laboratory glassware, sample preparation procedures, cross contamination during sample storage or shipment, or carry-over during sampling and analyses. Primary sample results for an analyte were qualified as non-detect ("U") when the analyte was also detected in an associated blank and the concentration in the primary sample was less than five times the blank sample concentration.

E.4.3.5 Comparability

The indoor air analyses were conducted in accordance with the procedures outlined in the QAPP and laboratory reporting limits met the established guidelines. The comparability objective for the indoor air data was therefore achieved.

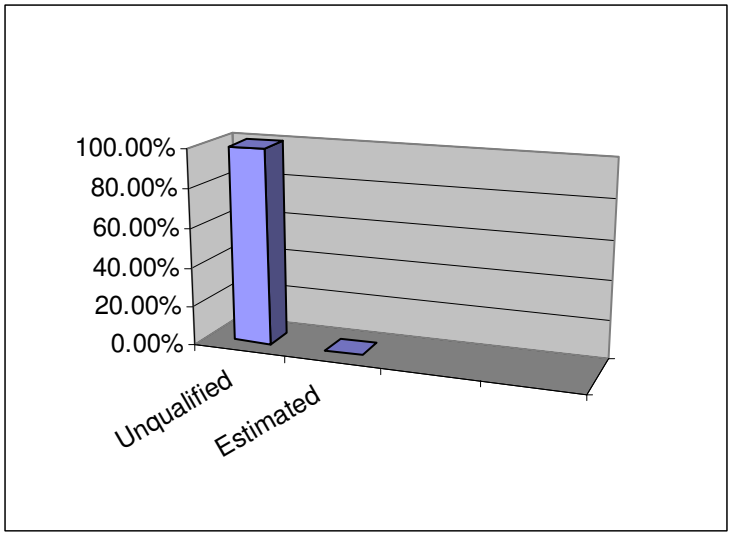
E.4.4 GROUNDWATER DATA

Groundwater data presented in the soil and NAPL RI are limited to VOC data from EPA Method 8260B analyses completed by Severn Trent Laboratories (formerly Quantera). The groundwater analyses were conducted between August and September 2000.

E.4.4.1 Completeness

A total of 91 field groundwater samples were collected and submitted to the laboratory for analyses. Data were received from the laboratory for all samples scheduled for analyses and 100% of the results reported are valid. Out of approximately 5,744 individual analytical results (both detected and non-detected), 5 results were qualified. Of those data qualified, no results were qualified as rejected. Based on these findings, the completeness objectives for the groundwater data were achieved.

The distribution of qualified groundwater data are presented in the figure below:



E.4.4.2 Precision

Blind duplicate groundwater samples were collected from 12 locations. All of the blind duplicates were analyzed for the same analytical parameters as the associated primary samples. Although several results for the field duplicate pairs were qualified as estimated, in general, the overall precision (sampling and analytical precision) is acceptable.

The precision of laboratory groundwater data was further evaluated by comparison of spike sample/spike sample duplicate results. All duplicate results satisfied the applicable evaluation criteria. As such, the level of analytical precision demonstrated is considered acceptable.

Overall, evaluation of the groundwater split sample pairs, and spike sample/spike sample duplicate results indicates acceptable precision, and that field and laboratory techniques employed were appropriate.

E.4.4.3 Accuracy

The accuracy of the groundwater analytical data was measured as the percent recovery (%R) of an analyte in a reference standard or spiked sample.

LCS Summary – Approximately 99% of recoveries for laboratory control samples were within their respective acceptance criteria, indicating that acceptable levels of accuracy were attained on clean sample matrices. Sample results associated with recoveries outside acceptance criteria were qualified as estimated. Overall, the LCS results indicated that acceptable accuracy was obtained by the method on a control sample matrix.

Surrogate Summary – Surrogate spikes were performed for samples in accordance with the analytical method. Less than 1% of the total individual analytical results were qualified as estimated due to surrogate recovery failure in the associated samples.

MS/MSD Summary – Sample matrix spikes were performed using concentrations and conditions specified by the analytical method. The percent recovery of each spiking compound was calculated and compared to the acceptance limits outlined in the QAPP and QAPP Addendum. The RPD between recoveries was additionally calculated. The vast majority of matrix spike and matrix spike duplicate recoveries for both site-specific samples and non-site samples were within the criterion. Less than 1% of the total individual analytical results were qualified based on MS/MSD recovery failure.

Based on the above findings, the groundwater data demonstrate an acceptable level of accuracy.

E.4.4.4 Representativeness

A total of 23 trip blanks and two field equipment blanks were collected and analyzed during the 2000 groundwater analyses. These QC blanks were typically found to be free of detectable contaminants.

E.4.4.5 Comparability

The groundwater analyses were conducted in accordance with the procedures outlined in the QAPP and laboratory reporting limits met the established guidelines. Based on these findings, the comparability objective for the groundwater data was achieved.

E.5 SUMMARY

The data validation process consisted of reviewing the RI and non-RI data to evaluate whether samples were collected and analyzed according to quality control sample collection requirements and specific DQOs established in the QAPP and QAPP Addendum.

Validation discrepancies identified during data validation included equipment calibration failure, surrogate recovery problems, matrix biases, blank contamination and holding time violations. The majority of the data associated with these anomalies have been flagged as estimated or not detected. These qualifiers do not render the data unusable for their intended purpose. Results for samples analyzed outside of the required holding times were found to be consistent with historical data.

There were few qualifications identified in the quality control data. More than 99% of the data were valid and met the project DQOs. Rejected data were not used for RI evaluation of site conditions. Overall, the soil, soil gas, indoor air and groundwater analytical data quality objectives were achieved. Data validation indicates that more than 99% of the data generated are accurate and representative, are able to withstand scientific and legal scrutiny, and are useful for evaluating site conditions and remedial alternatives.

E.6 REFERENCES

USEPA, 1994a. EPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review. Office of Emergency and Remedial Response. Washington, D.C.

USEPA, 1994b. Test methods for the Evaluation of Solid Waste, Physical/Chemical Methods, Third Edition (including updates I and II), SW-846. Washington, D.C.

USEPA, 1999. Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA540/R-99/008. Office of Emergency and Remedial Response. Washington, D.C.

USEPA, 2002. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. EPA540/R-01/008. Office of Emergency and Remedial Response. Washington, D.C.

TABLE E-1
NON-RI DATA REVIEW

Sample Matrix	Sample ID	Sample Depth (ft)	Analysis	Useable?	Notes
S	MW3-25-A	25	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	MW3-25-A	25	8020	No	Data Not Provided
S	MW3-25-A	25	8240	No	Data Not Provided
S	MW3-30-A	30	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	MW3-30-A	30	8020	No	Data Not Provided
S	MW3-30-A	30	8240	No	Data Not Provided
S	MW3-30-B	30	8020	Yes	
S	MW3-40-A	40	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	MW3-40-A	40	8020	No	Data Not Provided
S	MW3-40-A	40	8240	Yes	No LCS (Non-project MS/MSD)
S	MW2-30-A	30	8020	Yes	
S	MW2-40-A	40	8020	Yes	
S	MW2-45-A	45	8020	Yes	
S	MW1-15-A	15	8015	No	No LCS; No Method Blank; No Surrogate; TPH data
S	MW1-15-A	15	8020	No	Data Not Provided
S	MW1-30-A	30	8015	No	Data Not Provided; TPH data
S	MW1-30-A	30	8020	Yes	No LCS (Project MS/MSD)
S	MW1-40-A	40	8015	No	Data Not Provided; TPH data
S	MW1-40-A	40	8020	Yes	No LCS (Project MS/MSD)
S	MW1-45-A	45	8015	No	Data Not Provided; TPH data
S	MW1-45-A	45	8020	Yes	No LCS (Project MS/MSD)
S	DW2-45A	45	8015	No	No LCS (Project MS/MSD); No Surrogate; No COC; TPH data
S	DW2-45A	45	8020	Yes	No LCS (Non-project MS/MSD); No Chain-of-Custody
S	DWP1-40	40	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	DWP1-40	40	8020	Yes	No LCS (Non-project MS/MSD); No Chain-of-Custody
S	DWP3-40A	40	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	DWP3-40A	40	8020	Yes	
S	DWP6-35A	35	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	DWP6-35A	35	8020	Yes	
S	DWP8-45A	45	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	DWP8-45A	45	8020	Yes	
S	DWP9-30A	30	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	DWP9-30A	30	8020	Yes	
S	DWP9-40A	40	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	DWP9-40A	40	8020	Yes	
W	DWP3-W-A	0	8240	Yes	No LCS (Non-project MS/MSD); groundwater data
W	DWP3-W-B	0	8240	Yes	No LCS (Non-project MS/MSD); groundwater data
W	DWP5-W-A	0	8240	Yes	No LCS (Non-project MS/MSD); groundwater data
W	DWP5-W-B	0	8240	Yes	No LCS (Non-project MS/MSD); groundwater data
S	DWP10-30A	30	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	DWP10-30A	30	8020	Yes	
S	DWP7-45A	45	8015	No	No LCS (Project MS/MSD); No Surrogate; TPH data
S	DWP7-45A	45	8020	Yes	
S	DWP4-40A	40	8015	No	No LCS (Non-project MS/MSD); No Surrogate; TPH data
S	DWP4-40A	40	8020	Yes	No LCS (Non-project MS/MSD)
S	DWP3-40B	40.1	8015	No	No LCS (Non-project MS/MSD); No Surrogate; TPH data
S	DWP3-40B	40.1	8020	Yes	No LCS (Project MS/MSD)
W	MW-1	0	8240	Yes	No LCS (Project MS/MSD); groundwater data
W	MW-2	0	8240	Yes	No LCS (Project MS/MSD); groundwater data
W	MW-3	0	8240	Yes	No LCS (Project MS/MSD); groundwater data
W	MW-4	0	8240	Yes	No LCS (Project MS/MSD); groundwater data
S	DWP5-45A	45	8015	No	No LCS (Project MS/MSD); No Surrogate; Holding Time exceeded; TPH data
S	DWP11-50A	50	8015	No	No Surrogate; TPH data
S	DWP11-50A	50	8020	Yes	No LCS (Project MS/MSD)
W	DWP11-W-A	0	8240	Yes	No LCS (Project MS/MSD); groundwater data
S	DWP12-50A	50	8015	No	No Surrogate; TPH data
S	DWP12-50A	50	8020	Yes	No LCS (Project MS/MSD)
W	DWP12-W-A	0	8240	Yes	No LCS (Project MS/MSD); groundwater data
W	DWP13-W-A	0	8240	Yes	No LCS (Non-project MS/MSD); groundwater data
S	DWP14-40A	40	8015	No	No LCS; No Surrogate; TPH data
S	DWP14-40A	40	8020	Yes	No LCS (Project MS/MSD)

TABLE E-1
NON-RI DATA REVIEW

Sample Matrix	Sample ID	Sample Depth (ft)	Analysis	Useable?	Notes
W	DWP14-W-A	0	8240	Yes	No LCS (Non-project MS/MSD); groundwater data
S	DWP-15-30A	30	8015	No	No Surrogate; TPH data
S	DWP-15-30A	30	8020	Yes	No LCS (Project MS/MSD)
S	DWP16-25A	25	8015	No	No Surrogate; TPH data
S	DWP16-25A	25	8020	Yes	No LCS (Project MS/MSD)
S	HAB1-5A	5	8020	Yes	No LCS (Non-project MS/MSD)
S	HAB1-5A	5	8240	Yes	No LCS (Non-project MS/MSD)
S	HAB1-5A	5	8270	Yes	No MS/MSD
S	GP1@15.5	15.5	8015	No	No Surrogate; No COC; TPH data
S	GP1@15.5	15.5	8020	Yes	No Chain-of-Custody
S	GP12@16.5	16.5	8015	No	No Surrogate; No COC
S	GP12@16.5	16.5	8015	No	No Surrogate; No COC
S	GP12@16.5	16.5	8020	Yes	No Chain-of-Custody
S	GP12@6	6	8015	No	No Surrogate; No COC
S	GP12@6	6	8020	No	Data Not Provided
S	GP13@6	6	8015	No	No Surrogate; No COC
S	GP13@6	6	8020	No	Data Not Provided
S	GP14@10.5	10.5	8015	No	No Surrogate; No COC
S	GP14@10.5	10.5	8015	No	No Surrogate; No COC
S	GP14@10.5	10.5	8020	Yes	No Chain-of-Custody
S	GP15@6	6	8015	No	No Surrogate; No COC
S	GP15@6	6	8015	No	No Surrogate; No COC
S	GP15@6	6	8020	Yes	No Chain-of-Custody
S	GP16@15.5	15.5	8015	No	No Surrogate; No COC
S	GP16@15.5	15.5	8015	No	No Surrogate; No COC
S	GP16@15.5	15.5	8020	Yes	No Chain-of-Custody
S	GP2@10.5	10.5	8015	No	No Surrogate; No COC
S	GP2@10.5	10.5	8020	Yes	No Chain-of-Custody
S	GP3@15.5	15.5	8015	No	No Surrogate; No COC
S	GP3@15.5	15.5	8020	Yes	No Chain-of-Custody
S	GP5@15.5	15.5	8015	No	No Surrogate; No COC
S	GP5@15.5	15.5	8020	Yes	No Chain-of-Custody
S	GP11@5.5	5.5	8015	No	No Surrogate; TPH data
S	GP11@5.5	5.5	8020	Yes	
S	GP11@15.5	15.5	8260	Yes	
S	GP23@10.5	10.5	8015	No	No Surrogate; TPH data
S	GP24@5.5	5.5	8015	No	no surrogate; TPH data
S	GP24@5.5	5.5	8020	Yes	
S	GP25@10.5	10.5	8260	Yes	
S	GP25@15.5	15.5	8015	No	no surrogate; TPH data
S	GP25@15.5	15.5	8020	Yes	
S	GP4@10.5	10.5	8015	No	no surrogate; TPH data
S	GP4@10.5	10.5	8020	Yes	
S	GP6@15.5	15.5	8015	No	no surrogate; TPH data
S	GP6@15.5	15.5	8020	Yes	
S	GP6@20.5	20.5	8015	No	no surrogate; TPH data
S	GP6@20.5	20.5	8020	Yes	
S	GP6@5.5	5.5	8015	No	no surrogate; TPH data
S	GP6@5.5	5.5	8020	Yes	
S	GP7@15.5	15.5	8015	No	no surrogate; TPH data
S	GP7@15.5	15.5	8020	Yes	
S	GP8@10.5	10.5	8015	No	no surrogate; TPH data
S	GP8@10.5	10.5	8020	Yes	
S	GP8@15.5	15.5	8015	No	no surrogate; TPH data
S	GP8@15.5	15.5	8020	Yes	
S	GP8@20.5	20.5	8260	Yes	
S	GP9@15.5	15.5	8015	No	no surrogate; TPH data
S	GP9@15.5	15.5	8020	Yes	
S	GP9@5.5	5.5	8015	No	no surrogate; TPH data
S	GP9@5.5	5.5	8020	Yes	
S	GP10@10.5	10.5	8260	Yes	
S	GP10@15.5	15.5	8015	No	no surrogate; TPH data

TABLE E-1
NON-RI DATA REVIEW

Sample Matrix	Sample ID	Sample Depth (ft)	Analysis	Useable?	Notes
S	GP10@15.5	15.5	8020	Yes	
S	GP10@5.5	5.5	8015	No	no surrogate; TPH data
S	GP10@5.5	5.5	8020	Yes	
S	GP18@10.5	10.5	8015	No	no surrogate; TPH data
S	GP18@10.5	10.5	8015	No	no surrogate; TPH data
S	GP18@10.5	10.5	8020	Yes	
S	GP19@15.5	15.5	8015	No	no surrogate; TPH data
S	GP19@15.5	15.5	8015	No	no surrogate; TPH data
S	GP19@15.5	15.5	8020	Yes	
S	GP20@15.5	15.5	8015	No	no surrogate; TPH data
S	GP20@15.5	15.5	8015	No	no surrogate; TPH data
S	GP20@15.5	15.5	8020	Yes	
S	GP22@15.5	15.5	8015	No	no surrogate; TPH data
S	GP22@15.5	15.5	8015	No	no surrogate; TPH data
S	GP22@15.5	15.5	8020	Yes	
S	GP30@15.5	15.5	8015	No	no surrogate; TPH data
S	GP30@15.5	15.5	8015	No	no surrogate; TPH data
S	GP30@15.5	15.5	8020	Yes	
S	GP32@15.5	15.5	8015	No	no surrogate; TPH data
S	GP32@15.5	15.5	8015	No	no surrogate; TPH data
S	GP32@15.5	15.5	8020	Yes	
S	GP33@15.5	15.5	8015	No	no surrogate; TPH data
S	GP33@15.5	15.5	8015	No	no surrogate; TPH data
S	GP33@15.5	15.5	8020	Yes	
S	GP34@10.5	10.5	8015	No	no surrogate; TPH data
S	GP34@10.5	10.5	8015	No	no surrogate; TPH data
S	GP34@10.5	10.5	8020	Yes	
S	GP35@15.5	15.5	8015	No	no surrogate; TPH data
S	GP35@15.5	15.5	8015	No	no surrogate; TPH data
S	GP35@15.5	15.5	8020	Yes	
S	GP17@15.5	15.5	8015	No	no surrogate; TPH data
S	GP17@15.5	15.5	8015	No	no surrogate; TPH data
S	GP17@15.5	15.5	8020	Yes	
S	GP21@15.5	15.5	8015	No	no surrogate; TPH data
S	GP21@15.5	15.5	8015	No	no surrogate; TPH data
S	GP21@15.5	15.5	8020	Yes	
S	GP21@5.5	5.5	8015	No	no surrogate; TPH data
S	GP21@5.5	5.5	8020	Yes	
S	GP26@15.5	15.5	8015	No	no surrogate; TPH data
S	GP26@15.5	15.5	8015	No	no surrogate; TPH data
S	GP26@15.5	15.5	8020	Yes	
S	GP27@15.5	15.5	8015	No	no surrogate; TPH data
S	GP27@15.5	15.5	8015	No	no surrogate; TPH data
S	GP27@15.5	15.5	8020	Yes	
S	GP28@15.5	15.5	8015	No	no surrogate; TPH data
S	GP28@15.5	15.5	8015	No	no surrogate; TPH data
S	GP28@15.5	15.5	8020	Yes	
S	GP29@15.5	15.5	8015	No	no surrogate; TPH data
S	GP29@15.5	15.5	8015	No	no surrogate; TPH data
S	GP29@15.5	15.5	8020	Yes	
S	GP31@15.5	15.5	8015	No	no surrogate; TPH data
S	GP31@15.5	15.5	8015	No	no surrogate; TPH data
S	GP31@15.5	15.5	8020	Yes	
S	GP36@15.5	15.5	8015	No	no surrogate; TPH data
S	GP36@15.5	15.5	8020	Yes	
S	HB1@5	5	418.1	Yes	
S	HB1@5	5	8015	No	no surrogate; TPH data
S	HB1@5	5	8015	No	no surrogate; TPH data
S	HB1@5	5	8020	Yes	
S	IMMW4-5	5	8015	No	no surrogate; TPH data
S	IMMW4-5	5	8240	Yes	
S	MMW4-10	10	8015	No	no surrogate; TPH data

TABLE E-1
NON-RI DATA REVIEW

Sample Matrix	Sample ID	Sample Depth (ft)	Analysis	Useable?	Notes
S	MMW4-10	10	8240	Yes	
S	MMW4-15	15	8015	No	no surrogate; TPH data
S	MMW4-15	15	8240	Yes	
S	MMW4-35	35	8015	No	no surrogate; TPH data
S	MMW4-35	35	8240	Yes	
S	MMW4-40	40	8015	No	no surrogate; TPH data
S	MMW4-40	40	8240	Yes	
S	MMW4-5	5	8015	No	no surrogate; TPH data
S	MMW4-5	5	8240	Yes	
S	SB1-10A/10B	10	8015	No	no surrogate; TPH data
S	SB1-10A/10B	10	8240	Yes	
S	SB1-15A/15B	15	8015	No	no surrogate; TPH data
S	SB1-15A/15B	15	8240	Yes	
S	SB1-40A/40B	40	8015	No	no surrogate; TPH data
S	SB1-40A/40B	40	8240	Yes	
S	SB1-5A	5	8015	No	no surrogate; TPH data
S	SB1-5A	5	8240	Yes	
S	MMW1	35	8015	No	no surrogate; TPH data
S	MMW1	35	8240	Yes	
S	MMW2	35	8015	No	no surrogate; TPH data
S	MMW2	35	8240	Yes	
S	MMW3	35	8015	No	no surrogate; TPH data
S	MMW3	35	8240	Yes	
S	MMW4	35	8015	No	no surrogate; TPH data
S	MMW4	35	8240	Yes	
S	MMW1	35	8015	No	No MS/MSD; no surrogate; TPH data
S	MMW1	35	8240	Yes	No LCS
S	MMW2	35	8015	No	No MS/MSD; no surrogate; TPH data
S	MMW2	35	8240	Yes	No LCS
S	MMW3	35	8015	No	No MS/MSD; no surrogate; TPH data
S	MMW3	35	8240	Yes	No LCS
S	MMW4	35	8015	No	No MS/MSD; no surrogate; TPH data
S	MMW4	35	8240	Yes	No LCS
A	SG-01-13	13	TO-14	Yes	
A	SG-01-5	5	TO-14	Yes	
A	SG-02-13	13	TO-14	Yes	
A	SG-03-5	5	TO-14	Yes	
A	SG-04-13	13	TO-14	Yes	
A	SG-04-5	5	TO-14	Yes	
A	SG-05-13	13	TO-14	Yes	
A	SG-05-5	5	TO-14	Yes	
A	SG-06-13	13	TO-14	Yes	
A	SG-06-5	5	TO-14	Yes	
A	SG-07-5	5	TO-14	Yes	
A	SG-08-13	13	TO-14	Yes	
A	SG-08-5	5	TO-14	Yes	
A	SG-09-5	5	TO-14	Yes	
A	SG-10-5	5	TO-14	Yes	
A	SG-11-5	5	TO-14	Yes	
A	SG-12-5	5	TO-14	Yes	
A	SG-13-5	5	TO-14	Yes	
A	SG-14-5	5	TO-14	Yes	
A	SG-15-5	5	TO-14	Yes	
A	SG-16-5	5	TO-14	Yes	
A	SG-17-5	5	TO-14	Yes	
A	SG-18-13	13	TO-14	Yes	
A	SG-18-5	5	TO-14	Yes	
A	SG-19-5	5	TO-14	Yes	
A	SG-20-5	5	TO-14	Yes	
A	SG-22-13	13	TO-14	Yes	
A	SG-22-5	5	TO-14	Yes	
A	SG-23-13	13	TO-14	Yes	
A	SG-23-5	5	TO-14	Yes	

TABLE E-1
NON-RI DATA REVIEW

Sample Matrix	Sample ID	Sample Depth (ft)	Analysis	Useable?	Notes
A	SG-24-5	5	TO-14	Yes	
A	SG-25-5	5	TO-14	Yes	
A	SG-27-5	5	TO-14	Yes	
A	SG-28-5	5	TO-14	Yes	
A	SG-1-B	0	8240	No	No LCS, No MS/MSD, No Method Blank
A	SG-1-B	0	Gases	No	No Chain-of-Custody, No Method Reference
A	SG-22-B	0	8240	No	No LCS, No MS/MSD, No Method Blank
A	SG-22-B	0	Gases	No	No COC, No Method Reference
S	GPS00001	4.5	8260	Yes	
S	GPS00002	4.8	8260	Yes	
S	GPS00003	1.5	8260	Yes	
S	GPS00004	2.2	8260	Yes	
S	GPS00005	3.8	8260	Yes	
S	GPS00006	4.3	8260	Yes	
S	GPS00007	2.3	8260	Yes	
S	GPS00008	2.2	8260	Yes	
S	GPS00009	2.2	8260	Yes	
S	GPS00010	4.7	8260	Yes	
S	GPS00011	1.3	8260	Yes	
S	GPS00012	2	8260	Yes	
S	GPS00013	3	8260	Yes	
S	GPS00014	2.3	8260	Yes	
S	GPS00015	3.8	8260	Yes	
S	GPS00016	4.8	8260	Yes	
S	GPS00017	3.8	8260	Yes	
S	GPS00018	2.8	8260	Yes	
S	GPS00019	3.5	8260	Yes	
S	GPS00020	1.5	8260	Yes	
S	GPS00021	4.8	8260	Yes	
S	GPS00022	4.8	8260	Yes	
S	GPS00023	4.7	8260	Yes	
S	GPS00024	3.3	8260	Yes	
S	GPS00025	3.8	8260	Yes	
S	GPS00026	4.8	8260	Yes	
S	GPS00027	3.8	8260	Yes	
S	GPS00028	2.5	8260	Yes	
S	GPS00029	2.5	8260	Yes	
S	GPS00030	3.7	8260	Yes	
S	GPS00031	3.7	8260	Yes	
S	GPS00032	0.5	8260	Yes	

TABLE E-2

DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY (1994-1999 data)

The following data qualifiers are based on definitions presented in EPA National Functional Guidelines (EPA, 1994a).

DATA QUALIFER DEFINITIONS

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

DATA QUALIFIER DEFINITIONS — REASON CODE DEFINITIONS

The following reason code definitions were developed by URS to provide an explanation of data qualification.

b Associated blank contamination
c Calibration failure; poor or unstable response.
d Laboratory/field duplicate imprecision.
f No confirmation column present (GC Organics only).
h Holding time violation.
i Internal standard failure.
k Matrix spike/matrix spike duplicate recovery failure.
l Laboratory control sample recovery failure.
m Poor chromatography.
n Gross compound breakdown (4,4'DDT/Endrin).
o Analytical sequence deficiency or omission.
q Quantitation cannot be verified.
s Surrogate spike recovery failure.

INTERPRETATION KEY

The following example shows how an analytical result which includes qualifiers assigned by the URS data review team is displayed in the data tables:

<5.20 Ub

The qualifier assigned by the data review team follows the analytical result. In this example, the result is qualified as a non-detection due to the bias introduced by contamination of the associated method blank. The qualifier assigned by the URS data review team (Ub) indicates that the analyte concentration is considered to be below the adjusted detection limit (quantitation limit) based on the level of contamination in the method blank.

TABLE E-3

DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY

(1999-present data)

The following data qualifiers are based on definitions presented in EPA National Functional Guidelines (EPA, 1999).

DATA QUALIFIER DEFINITIONS FOR ORGANIC ANALYES

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

DATA QUALIFIER DEFINITIONS FOR INORGANIC ANALYSES

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

UJ The analyte was analyzed for, but was not detected. The reported sample quantitation limit is approximate and may be inaccurate or imprecise.

R The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control (QC) criteria. The analyte may or may not be present in the sample.

URS DATA QUALIFIER DEFINITIONS — REASON CODE DEFINITIONS

a Analytical sequence deficiency or omission.

b Gross compound breakdown (4,4'-DDT/Endrin).

c Calibration failure; poor or unstable response.

d Laboratory duplicate imprecision.

e Laboratory duplicate control sample imprecision.

f Field duplicate imprecision.

g Poor chromatography.

h Holding time violation.

i Internal standard failure.

j Poor mass spectrographic performance.

k Serial dilution imprecision.

l Laboratory control sample recovery failure.

m Matrix spike/matrix spike duplicate recovery failure.

n Interference check sample recovery failure.

INTERPRETATION KEY

The following example shows how an analytical result which includes qualifiers assigned by both the URS data review team and the analytical laboratory could be displayed in the data tables:

<5.20 Uz | JB

The qualifier assigned by the URS data review team precedes the "|"; the qualifier assigned by the laboratory follows it. In this example, the result is qualified as a non-detection data to the bias introduced by contamination of the associated method blank. Presence of the analyte in the method blank is indicated by the laboratory qualifier (B). The qualifier assigned by the URS data review team (Uz) indicates that the analyte concentration is considered to be below the adjusted detection limit (quantitation limit) based on the level of contamination in the method blank.

o Calibration blank contamination (metals/inorganics only).
p Preparation blank contamination (metals/inorganics only).
q Quantitation outside linear range.
r Linearity failure in initial calibration.
s Surrogate spike recovery failure
t Instrument tuning failure.
u No valid confirmation column (GC Organics only).
v Value is estimated below the MDA (Rads only).
w Retention time (RT) outside of RT window.
x Field blank contamination.
y Trip blank contamination.
z Method blank contamination.
a1 Poor agreement between columns (GC Organics only).

APPENDIX E – PART 2

1003 TECHNICAL MEMORANDUM
DEL AMO SOIL GAS DATA CONFIRMATION EVAULATION

TECHNICAL MEMORANDUM
DEL AMO SOIL GAS DATA CONFIRMATION EVALUATION

1.0 INTRODUCTION

A comparative evaluation of the paired "primary" (Level II) and "confirmatory" (Level IV) soil gas results associated with the existing Del Amo soil gas data has been performed as part of the standard quality assurance/quality control (QA/QC) review procedures. The evaluation was conducted on data available (407 primary samples and 31 confirmatory samples) as of October 1, 1993. The results and conclusions associated with this evaluation are presented below. Based on the results of this evaluation, an additional QA/QC audit was performed to investigate an apparent bias in the soil gas sampling techniques used.

2.0 PURPOSE

The purpose of the comparative study was to evaluate the usability of soil gas data by assessing whether analytical data sets for primary (field analysis) and confirmatory (fixed laboratory analysis) samples meet confirmation criteria.

3.0 DESCRIPTION OF DATA CONFIRMATION EVALUATION

The Del Amo soil gas data will be used for risk assessment (RA) purposes, as well as site characterization, and therefore must meet the data quality objectives (DQOs) outlined in the original Draft Technical Memorandum entitled *Data Quality Objectives For Baseline Risk Assessment, Del Amo Superfund Site, Los Angeles, California, May 1992* (prepared by Bechtel Environmental, Inc., and presented by EPA). Section 2.3.5 of this document states that "In general only Level IV data is used in quantitative RA. However, Level III and Level II data may be used if at least 10% of the data are confirmed by CLP Level IV analyses." A confirmatory soil gas sampling program was established during the Phase I RI to satisfy this requirement, and is described below.

Soil gas samples were collected for analysis by the field laboratory using either active stream or static stream syringe techniques. The samples were analyzed for aromatic and halogenated volatile organic compounds (VOCs) using a GC equipped with a photoionization detector (PID) and an electron capture detector (ECD), respectively, and reported in a Level II data package. These samples are designated as "primary" soil gas samples. "Confirmatory" samples were collected using a Summa canister, transported to an offsite (fixed) laboratory, analyzed via EPA Testing Method TO14 (GC/MS) (EPA 600/4-89/018, June 1988), and presented in a Level IV (CLP-equivalent) data package. The corresponding primary and confirmatory sample results were compiled and evaluated.

Three components of confirmation were evaluated for the Del Amo study area soil gas data. They are summarized as follows:

- Positive identification by the fixed laboratory of the analytes detected by the field laboratory.

- A comparison of field laboratory and fixed laboratory analytical results to the corresponding analyte-specific threshold concentrations as defined in the Addendum RI Work Plan dated March 22, 1993. This comparison would identify sampling locations in which additional investigation may be required if decisions based on primary data would have differed from decisions based on confirmatory data.

- A quantitative comparison between concentrations of analytes detected in primary (field laboratory) and confirmatory (fixed laboratory) data.

A detailed explanation of these components is provided below.

3.1 DATA CONFIRMATION VIA POSITIVE IDENTIFICATION

3.1.1 Methodology

Soil gas data confirmation via positive identification was achieved if any of the following criteria were met:

- Both the field laboratory and the fixed laboratory reported the analyte as Not Detected (ND);

- Both the field laboratory and the fixed laboratory reported detectable concentrations of the analyte; or

- One laboratory reported a concentration of an analyte which fell below the reported detection limit (RDL) of the other laboratory (i.e. reported as "ND").

The responses "YES" and "NO" were used in the "CONFIRMATION VIA POSITIVE IDENTIFICATION" column of Table A to represent the confirmation status of the corresponding sample pairs.

3.1.2 Results

A total of 283 primary/confirmatory analytical data pairs of the 302 existing pairs were confirmed via positive identification criteria. These results are represented as "YES" in the "CONFIRMATION VIA POSITIVE IDENTIFICATION" column of Table A. Nineteen pairs were "Not Confirmed" via the positive identification criteria and were designated as "NO" in the "CONFIRMATION VIA POSITIVE IDENTIFICATION" column of Table A. For the reader's convenience, these nineteen "Not Confirmed" data pairs have been presented separately in Table B. In 17 of the 19 analytical pairs which did not meet the confirmation criteria, the field laboratory reported analyte concentrations as "ND" with RDLs ranging from 0.005 ppm(v/v) to 0.06 ppm(v/v) while the fixed laboratory reported analyte concentrations greater than these RDLs and less than 1 ppm(v/v). For one pair, the field laboratory reported an ethylene dibromide concentration of 2.9 ppm(v/v), while the fixed lab reported the analyte as "ND" at an RDL of 0.2 ppm(v/v). All 19 concentrations reported by the fixed and field laboratories fell well below their respective analyte-specific threshold concentrations.

One analytical data pair had substantially different results and, therefore, was investigated further. At site location (SITE ID) SGL0005, a concentration of "ND" at an RDL of 0.03 ppm(v/v) was reported for the primary sample (VSS00021), while a concentration of 37 ppm(v/v) which was flagged (qualified) "J" (estimated) was reported for the confirmatory sample (VSS00022). The "J" qualifier was investigated to evaluate possible reasons for the variance in the reported concentrations. The quantitative report for the confirmatory sample [provided in Enseco-Air Toxics sample delivery group (SDG) number A92-23-305] was reviewed. The report indicated that due to an elevated ethylbenzene concentration [reported as 18,000 ppm(v/v) in confirmatory sample VSS00022], the sample had been diluted by a factor of 48,810 prior to GC/MS analysis. As a result of the dilution (which allowed accurate quantitation of the relatively high concentration of ethylbenzene), 1,4-dichlorobenzene was detected below its corresponding RDL of 0.004 ppm(v/v) at an estimated concentration of 0.00075 ppm(v/v). This extremely low estimated concentration of 1,4-dichlorobenzene was then multiplied by the dilution factor (0.00075J x 48,810) and reported as 37 ppm(v/v)J, compounding the analytical error in quantitation at levels below the RDL for that analyte.

The higher (more conservative) of the two reported (primary/confirmatory) concentrations in each data set is always chosen to represent the actual concentration of the analyte in the corresponding soil gas sample for decision making purposes. Thus, the higher of the two concentrations presented for the 19 analytical data pairs, identified in Table B, were used for decisions regarding the need for further investigation and should, therefore, also be used for any other data purposes.

3.2 DATA CONFIRMATION VIA POTENTIAL FIELD DECISIONS

3.2.1 Methodology

An evaluation of soil gas data confirmation data has been performed with respect to impacts on potential field decisions. A change in field decision may have occurred if the field data fell below the analyte threshold concentration when the fixed laboratory data exceeded the analyte threshold concentration, or vice-versa.

A response of "YES" in the "CONFIRMATION VIA POTENTIAL DECISION CHANGE" column of Table A indicates that the fixed laboratory result would have yielded the same field decision as did the field laboratory result. A response of "NO" in the "CONFIRMATION VIA POTENTIAL DECISION CHANGE" column of Table A indicates that the decision would be different if made based on results from the confirmatory sample rather than the result from the primary sample.

3.2.2 Results

The results of the evaluation in terms of potential field decision changes are presented in Table A. The entries in the "CONFIRMATION VIA POTENTIAL DECISION CHANGE" column of Table A indicate that all but one out of the 302 field decisions made would have been the same using the confirmatory data as those made in the field based solely on the primary data. The outlying analytical data pair corresponds to the styrene result for site location (SITE ID) SGL0005. The primary sample (VSS00021) result reported a styrene concentration of 1,040

ppm(v/v) whereas the corresponding confirmatory sample (VSS00022) result reported the styrene concentration to be 1,900 ppm(v/v). Since the associated analyte-specific threshold concentration for styrene was 1,500 ppm (v/v), the confirmatory sample result indicated that additional investigation (i.e. sampling) would be required.

As stated in Section 3.1.2, the higher (more conservative) of the two reported (primary/confirmatory) concentrations was chosen (i.e. 1,900 ppm(v/v) styrene) to represent the actual concentration of the analyte in the corresponding soil gas sample for data evaluation purposes. It should be noted, however, that both of these samples (VSS00021 and VSS00022) yielded reported benzene and ethylbenzene concentrations that exceeded their respective analyte-specific threshold concentrations. Consequently, the field data set for these samples indicated that further investigative action was required, hence, additional sampling was conducted in this area.

3.3 RELATIVE COMPARISON BETWEEN PRIMARY AND CONFIRMATORY QUANTITATIVE RESULTS

3.3.1 Methodology

The relative comparability between primary and corresponding confirmatory sample results was evaluated using a calculated comparability factor generated for 22 of the 23 primary/confirmatory sample pairs in which the field laboratory and the fixed laboratory reported detectable concentrations of the associated analyte. The comparability factor was calculated by dividing the primary sample result by the confirmatory sample result. Graphical representations of the relative comparability obtained were also prepared.

3.3.2 Results

The results of the confirmation evaluation based on the relative comparison of quantitative data is presented in Tables C and D, and illustrated ONigures 1 and 2. Table C presents comparability of field data collected via the static stream syringe technique and the corresponding confirmatory data, while Table D presents the comparability of field data collected using the active stream technique and the corresponding confirmatory data. Based on the manner in which the relative comparability factors were calculated (field laboratory result ÷ fixed laboratory result), a value of 1.0 represents the best possible comparability factor that can be achieved between the two results. This comparability factor would fall directly on the line $Y = X$, as illustrated ONigures 1 and 2, and would represent the case in which the field laboratory result (X coordinate) was equal to the fixed laboratory result (Y coordinate).

Table C contains comparability factors for 17 of the 18 primary/confirmatory sample pairs. A comparability factor was not calculated for one of the primary/confirmatory sample pairs due to the fact that the field laboratory ethylbenzene result for sample VSS00021 was reported as greater than 3,018 ppm(v/v). Table D contains 5 primary/confirmatory sample pairs all of which provided the analytical data necessary to produce 5 comparability factors. The 17 comparability factors in Table C ranged from 0.2 to 2.9. The 5 comparability factors in Table D ranged from 0.76 to 5.79. The averages of these calculated comparability factors were 0.8

with a standard deviation of 0.7 and 2.3 with a standard deviation of 2.0, respectively (Tables C and D).

Calculated relative comparability factors indicated that 11 of the 17 factors presented in Table C (primary/static stream syringe vs. confirmatory/Summa canister sampling techniques) were less than 1.0 (i.e. the static stream syringe/field laboratory result was less than the corresponding Summa canister/fixed laboratory result). These data pairs appear in Figure 1 as the 9 data points which lie above the line Y = X. Only 1 of the 5 factors presented in Table D (primary/active stream syringe vs. confirmatory/Summa canister sampling techniques) was less than 1.0 (i.e., the active stream syringe/field laboratory result was less than the corresponding Summa canister/fixed laboratory result), indicating that the majority of the active stream syringe results were higher than the confirmatory Summa canister results. A potential trend emerged which indicated that the active stream syringe sampling technique yields higher results than the corresponding Summa canister sampling technique, which in turn yields higher results than the corresponding static stream syringe sample technique. To evaluate whether a bias is introduced due to sampling protocol, a sampling QA/QC audit was conducted and is discussed below.

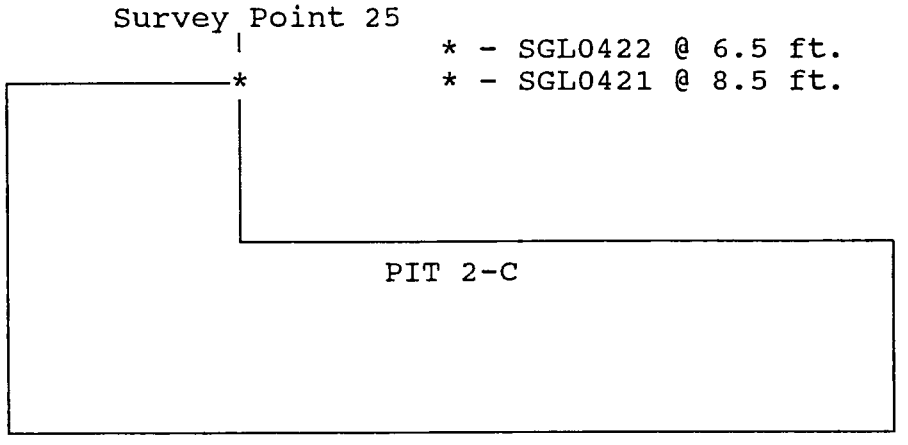
4.0 EVALUATION OF SAMPLING METHODOLOGY

A QA/QC audit of sampling methodology was performed on July 1, 1993 to evaluate the three soil gas sample collection techniques: (1) active stream syringe (analyzed by field laboratory GC/PID/ECD); (2) static stream syringe (analyzed by field laboratory GC/PID/ECD); and, (3) Summa canister (analyzed by fixed laboratory GC/MS). The active stream syringe soil gas sampling technique consists of the collection of soil gas samples via syringe from tubing in which the soil gas is flowing toward an operating vacuum pump. This sample collection technique was used in most cases at the Del Amo study area for locations in which no confirmatory sample was to be collected. The static stream syringe soil gas sampling technique consists of the collection of soil gas samples via syringe from tubing in which the flow of soil gas to the Summa canister has been discontinued. This sample collection technique was used in most cases at the Del Amo study area for locations in which a confirmatory sample was to be collected. The Summa canister technique consists of the collection of soil gas using a Summa canister evacuated to 50 mtorr after purging the soil gas probe system (probe and tubing) with a vacuum pump. An illustration of the three soil gas sample collection techniques are presented in Figure 3.

Each of the three sample collection techniques discussed above were used to obtain two sets of soil gas samples as part of a standard analytical laboratory and field procedure QA/QC audit. The data obtained from this audit was used to establish and evaluate the variance (bias) produced in analytical results from the three techniques mentioned above. Two locations were selected for sample collection, one with high levels of volatile organic compounds (VOCs) and one with moderate levels of VOCs, to ensure that the QA/QC audit was not biased by the concentration range.

The first set of soil gas samples (SITE ID = SGL0421) was collected from an area north of Pit 2-C approximately 17 feet due east of Survey Point 25 at a depth of approximately 8½ feet below ground surface (bgs). This location was selected because analytical screening techniques indicated the presence of high levels of aromatic VOCs in the soil gas.

The second set of soil gas samples (SITE ID = SGL0422) was collected approximately 1 foot due north of location SGL0421 at a depth of approximately 6½ feet bgs. This location was selected because analytical screening techniques indicated the presence of moderate levels of aromatic VOCs in the soil gas.



NOT TO SCALE

At each location, three active stream syringe samples, three Summa canister samples, and three static stream syringe samples were collected. The sampling was performed according to the following steps.

- The field laboratory (Optimal Technologies, Inc.) advanced a soil gas probe at SGL0421 and set up the sampling apparatus as depicted on Figure 3.
- A vacuum pump was used to purge the system for approximately 45 seconds following standard protocol outlined in the Del Amo RI/FS Work Plan.
- An active stream syringe sample was collected and analyzed in the field (see syringe sample A on Figure 3). The T-valve was switched immediately to collect a sample in the Summa canister. The T-valve was then closed and a static syringe sample was collected from the tubing directly upstream of the filled Summa canister and analyzed in the field (see syringe sample B on Figure 3).
- Following the collection and analysis of the first set of samples from SGL0421, the sampling syringes were decontaminated and the second and third sets of samples were collected at this location using the protocol described above.

- Three sets of samples from SGL0422 were collected using the above-described sampling protocol.

- The six Summa canister samples were sent to the fixed laboratory (Enseco-Air Toxics) for immediate analysis by Method TO14 according to the existing fixed laboratory protocol.

Analytical data for the soil gas samples collected during the QA/QC audit at locations SGL0421 and SGL0422, are presented in Tables E and F, respectively. Graphical representations of the comparability between the various sampling techniques are presented on Figures 4 and 5. Each graph contains a line described by the equation Y = X. Under ideal conditions, all (X,Y) data points would fall directly on this line (i.e., analytical results obtained using different sampling techniques would represent the true concentration of that analyte in the sample, and, therefore, should be equivalent). (X,Y) data points depicted below this line indicate that the X value (active stream syringe/field laboratory sample) was greater than the corresponding Y value (static stream syringe/field laboratory sample or Summa canister/fixed laboratory sample), whereas any (X,Y) data points above the line indicate that the X value (active stream syringe/field laboratory sample) was less than the corresponding Y value (static stream syringe/field laboratory sample or Summa canister/fixed laboratory sample). In addition, Tables E and F demonstrate that the Summa canister/fixed laboratory sample results were generally higher than the corresponding static stream syringe/field laboratory sample results.

The data obtained from this QA/QC audit indicate that the active stream syringe/field laboratory sample results were generally higher than the corresponding Summa canister/fixed laboratory sample results, which were higher than the corresponding static stream syringe/field laboratory sample results.

5.0 STATIC STREAM SYRINGE SAMPLE DATA INVESTIGATION

Based on the results of the QA/QC audit and the data confirmation evaluation, it appears that the bias observed in analytical results is dependent upon the sampling technique. The active stream syringe sampling technique yielded the highest or most conservative concentrations of analytes in soil gas at the site. Consequently, data collected using this technique were used in the decision-making process (i.e. evaluating whether or not further investigation/sampling was necessary). The majority of the primary soil gas samples were collected using the active stream syringe sampling technique. A subset of samples collected using the static stream syringe method have corresponding Summa canister/fixed laboratory confirmatory data. In these cases, the higher concentration for each data set was used in the decision-making process. However, some samples were collected using the static stream syringe technique which do not have corresponding confirmatory samples. Thus, an investigation was conducted to identify and evaluate field decisions which were based on the primary static stream syringe/field laboratory sample results that did not have corresponding confirmatory Summa canister/fixed laboratory results.

5.1 METHODOLOGY

Because Summa canister samples were not collected at all static stream syringe sampling locations, a conservative "correction factor" was developed using the relative comparability factors calculated for primary static stream syringe and corresponding confirmatory Summa canister samples (Table C). The average factor obtained from this comparative analysis was 0.9 with actual factors ranging from 0.2 to 2.9. The most conservative comparability factor was 0.2 which represents the greatest potential underestimation observed for the Del Amo study area primary static stream syringe/confirmatory Summa canister sample result pairs. This "correction factor" was used to conservatively elevate ("adjust") the reported results for the static stream syringe sample (i.e., Reported Concentration ÷ 0.2). The reported concentrations and corresponding "adjusted" concentrations (Table G) were then compared to the associated analyte-specific threshold concentration.

5.2 RESULTS AND DISCUSSION

A total of 3 samples were identified in which the "adjusted" (conservatively elevated) concentrations for a single analyte exceeded their corresponding analyte-specific threshold concentration (Table G). These results represent 3 site locations in which a field decision for no further investigative action may have been made where further investigation was required. Of these 3 locations, 2 (SGL0294 and SGL0327) are adjacent to buildings (Tri-Lite and Schaffer, respectively) that are proposed for selection for indoor workplace monitoring, because portions of the former facility lie well within the perimeter of these buildings and, therefore, were not accessible to soil gas sampling.

The remaining site location (SGL0350) is adjacent to one of two buildings (Takechi; second building being Hamilton-Dutch) selected for indoor air monitoring due to the proximity of the two buildings to a known source of contamination and the existence of elevated levels of VOCs detected by previous investigators beneath a parking lot between the two buildings.

6.0 SUMMARY AND CONCLUSIONS

Confirmation of field soil gas data collected at the Del Amo study area was evaluated in the following manner:

- Positive identification by the fixed laboratory of the analytes detected by the the field laboratory.
- A comparison of field laboratory and fixed laboratory analytical results to the corresponding analyte-specific threshold concentrations which would identify sampling locations in which additional investigation may be required if decisions based on primary data would have differed given the confirmatory data.
- A comparison between primary (field laboratory) and confirmatory (fixed laboratory) quantitative data.

A total of 283 of the 302 primary/confirmatory analyte pairs were confirmed via positive identification. In 17 of the 19 remaining analyte pairs, the field laboratory reported analyte concentrations as "ND" with RDLs ranging from 0.005 ppm(v/v) to 0.06 ppm(v/v) while the

fixed laboratory reported analyte concentrations greater than these RDLs and less than 1 ppm(v/v). In one case, the field laboratory sample (VSS00353) the field reported an ethylene dibromide concentration of 2.9 ppm(v/v) and the fixed laboratory sample (VSS00357) reported the analyte as "ND" at an RDL of 0.2 ppm(v/v). The remaining pair (VSS00021 and VSS00022) had reported a field laboratory 1,4-dichlorobenzene concentration of "ND" at an RDL of 0.03 ppm(v/v) and a fixed laboratory 1,4-dichlorobenzene concentration of 37 ppm(v/v), respectively. Further investigation into this data pair provided potential reasons for the observed variance in the reported concentrations. The fixed laboratory concentration was found to have a great deal of potential analytical error associated with it due to an original concentration detected below the RDL and an extremely high dilution factor (48,810) associated with the GC/MS analysis. In all 19 cases, concentrations of the analytes reported by the fixed and field laboratories were well below the corresponding analyte-specific threshold values.

The comparison of field laboratory and fixed laboratory results to their respective analyte-specific threshold concentrations demonstrated that 301 out of the 302 primary/confirmatory analyte pairs produced the same field decision. The outlying analyte pair corresponds to the styrene results for samples VSS00021 and VSS00022 collected from site location SGL0005. Note that this is one of the same primary/confirmatory analyte pairs that was not confirmed in terms of positive identification. The samples from this location yielded reported benzene and ethylbenzene concentrations that exceeded their respective analyte-specific threshold concentrations. Therefore, additional sampling was conducted in this area (see Section 3.2.2).

During concurrent evaluation of the sampling techniques, a potential bias associated with the techniques used to collect the soil gas samples was identified . The evaluation indicated that the active stream syringe sampling technique yields higher results relative to the Summa canister collection technique, which in turn yields higher results relative to the static stream syringe technique. Based on the results of this evaluation, remaining primary field laboratory syringe samples will be collected using the active stream syringe technique to yield the more conservative (higher) results upon which to base field decisions.

Based on the data evaluations conducted and the QA/QC audit, 3 cases were identified in which analyte-specific data would potentially affect decisions made in the field for a particular sample location (see Table G). The results from this investigation have been used in combination with other site data and historical information to select buildings in which to perform workplace air monitoring. The buildings identified, herein, for monitoring were; Donnelley, Tri-Lite, Schaffer, Takechi, and Hamilton-Dutch.

This "Del Amo Soil Gas Data Confirmation Evaluation" was performed to establish whether or not the soil gas data generated by the field laboratory met the applicable DQOs outlined in the original Draft Technical Memorandum entitled *Data Quality Objectives For Baseline Risk Assessment, Del Amo Superfund Site, Los Angeles, California, May 1992.* The field laboratory soil gas data were confirmed by the fixed laboratory data, based on the criteria outlined and discussed in this memorandum, and are, therefore, acceptable as qualified for their intended use (risk assessment and site characterization).

TABLE A – DEL AMO SOIL GAS DATA[1]

SITE ID	ANALYTE	FIELD LAB				FIXED LAB				THRESHOLD CONC[3]	CONFIRMATION VIA POSITIVE IDENTIFICATION	CONFIRMATION VIA POTENTIAL DECISION CHANGE
		SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	ppm(v/v)		
SGL0002	1,1,1–TRICHLOROETHANE	VSS00002	ND	U	0.005	VSS00003	0.0023		0.002	10500	YES	YES
SGL0002	1,1,2–TRICHLOROETHANE	VSS00002	ND	U	0.010	VSS00003	ND	U	0.003	NA	YES	YES
SGL0002	1,1–DICHLOROETHYLENE	VSS00002	ND	U	0.010	VSS00003	ND	U	0.002	30	YES	YES
SGL0002	1,2–DICHLOROETHANE	VSS00002	ND	U	0.010	VSS00003	ND	U	0.002	30	YES	YES
SGL0002	1,4–DICHLOROBENZENE	VSS00002	ND	U	0.030	VSS00003	ND	U	0.004	NA	YES	YES
SGL0002	BENZENE	VSS00002	ND	U	0.030	VSS00003	0.031		0.003	30	NO	YES
SGL0002	CHLOROFORM	VSS00002	ND	U	0.005	VSS00003	ND	U	0.002	60	YES	YES
SGL0002	CIS–1,2–DICHLOROETHYLENE	VSS00002	ND	U	0.010	VSS00003	ND	U	0.002	NA	YES	YES
SGL0002	ETHYLBENZENE	VSS00002	ND	U	0.030	VSS00003	0.040		0.0025	3000	NO	YES
SGL0002	METHYLENE CHLORIDE	VSS00002	ND	U	0.010	VSS00003	ND	U	0.004	1500	YES	YES
SGL0002	STYRENE	VSS00002	ND	U	0.030	VSS00003	0.0031	J	0.007	1500	YES	YES
SGL0002	TETRACHLOROETHYLENE	VSS00002	ND	U	0.006	VSS00003	0.0014	J	0.003	3000	YES	YES
SGL0002	TOLUENE	VSS00002	ND	U	0.030	VSS00003	0.049		0.003	3000	NO	YES
SGL0002	TRICHLOROETHYLENE	VSS00002	ND	U	0.006	VSS00003	ND	U	0.0025	3000	YES	YES
SGL0004	1,1,1–TRICHLOROETHANE	VSS00005	0.0067	F	0.005	VSS00006	0.0088		0.002	10500	YES	YES
SGL0004	1,1,2–TRICHLOROETHANE	VSS00005	ND	U F	0.010	VSS00006	ND	U	0.003	NA	YES	YES
SGL0004	1,1–DICHLOROETHYLENE	VSS00005	ND	U F	0.010	VSS00006	ND	U	0.002	30	YES	YES
SGL0004	1,2–DICHLOROETHANE	VSS00005	ND	U F	0.010	VSS00006	ND	U	0.002	30	YES	YES
SGL0004	1,4–DICHLOROBENZENE	VSS00005	ND	U F	0.030	VSS00006	0.0013	J	0.004	NA	YES	YES
SGL0004	BENZENE	VSS00005	ND	U F	0.030	VSS00006	0.055		0.003	30	NO	YES
SGL0004	CHLOROFORM	VSS00005	ND	U F	0.005	VSS00006	ND	U	0.002	60	YES	YES
SGL0004	CIS–1,2–DICHLOROETHYLENE	VSS00005	ND	U F	0.010	VSS00006	ND	U	0.002	NA	YES	YES
SGL0004	ETHYLBENZENE	VSS00005	ND	U F	0.030	VSS00006	0.021		0.0025	3000	YES	YES
SGL0004	METHYLENE CHLORIDE	VSS00005	ND	U F	0.010	VSS00006	ND	U	0.004	1500	YES	YES
SGL0004	STYRENE	VSS00005	ND	U F	0.030	VSS00006	ND	U	0.007	1500	YES	YES
SGL0004	TETRACHLOROETHYLENE	VSS00005	0.0081	F	0.006	VSS00006	0.0014	J	0.003	3000	YES	YES
SGL0004	TOLUENE	VSS00005	ND	UJ F	0.030	VSS00006	0.140		0.003	3000	NO	YES
SGL0004	TRICHLOROETHYLENE	VSS00005	ND	U F	0.006	VSS00006	ND	U	0.0025	3000	YES	YES
SGL0005	1,1–DICHLOROETHYLENE	VSS00019	ND	U F	0.010	VSS00020	ND	U	0.004	30	YES	YES
SGL0005	1,1,1–TRICHLOROETHANE	VSS00019	ND	UJ F	0.005	VSS00020	0.011		0.004	10500	NO	YES
SGL0005	1,1,2–TRICHLOROETHANE	VSS00019	ND	U F	0.010	VSS00020	ND	U	0.003	NA	YES	YES
SGL0005	1,2–DICHLOROETHANE	VSS00019	ND	U F	0.010	VSS00020	ND	U	0.004	30	YES	YES
SGL0005	1,4–DICHLOROBENZENE	VSS00019	ND	U F	0.030	VSS00020	ND	U	0.004	NA	YES	YES
SGL0005	BENZENE	VSS00019	ND	U F	0.030	VSS00020	0.032		0.006	30	NO	YES
SGL0005	CHLOROFORM	VSS00019	ND	U F	0.005	VSS00020	ND	U	0.004	60	YES	YES
SGL0005	CIS–1,2–DICHLOROETHYLENE	VSS00019	ND	U F	0.010	VSS00020	ND	U	0.004	NA	YES	YES
SGL0005	ETHYLBENZENE	VSS00019	0.245	F	0.030	VSS00020	0.740		0.0025	3000	YES	YES
SGL0005	METHYLENE CHLORIDE	VSS00019	ND	U F	0.010	VSS00020	ND	U	0.008	1500	YES	YES
SGL0005	STYRENE	VSS00019	ND	U F	0.030	VSS00020	0.100		0.007	1500	NO	YES
SGL0005	TETRACHLOROETHYLENE	VSS00019	ND	U F	0.006	VSS00020	0.0018	J	0.003	3000	YES	YES
SGL0005	TOLUENE	VSS00019	ND	U F	0.030	VSS00020	0.140		0.003	3000	NO	YES
SGL0005	TRICHLOROETHYLENE	VSS00019	ND	U F	0.006	VSS00020	ND	U	0.005	3000	YES	YES
SGL0005	1,1–DICHLOROETHYLENE	VSS00021	ND	U	0.010	VSS00022	ND	U	40.000	30	YES	YES
SGL0005	1,1,1–TRICHLOROETHANE	VSS00021	ND	UJ	0.005	VSS00022	ND	U	40.000	10500	YES	YES
SGL0005	1,1,2–TRICHLOROETHANE	VSS00021	ND	U	0.010	VSS00022	ND	U	60.000	NA	YES	YES
SGL0005	1,2–DICHLOROETHANE	VSS00021	ND	U	0.010	VSS00022	ND	U	40.000	30	YES	YES
SGL0005	1,4–DICHLOROBENZENE	VSS00021	ND	U	0.030	VSS00022	37.000	J	80.000	NA	NO	YES

TABLE A – DEL AMO SOIL GAS DATA[1]

SITE ID	ANALYTE	FIELD LAB				FIXED LAB				THRESHOLD CONC[3] ppm(v/v)	CONFIRMATION VIA POSITIVE IDENTIFICATION	CONFIRMATION VIA POTENTIAL DECISION CHANGE
		SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)			
SGL0005	BENZENE	VSS00021	128.000		0.030	VSS00022	120.000		30.000	30	YES	YES
SGL0005	CHLOROFORM	VSS00021	ND	U	0.005	VSS00022	ND	U	40.000	60	YES	YES
SGL0005	CIS–1,2–DICHLOROETHYLENE	VSS00021	ND	U	0.010	VSS00022	ND	U	40.000	NA	YES	YES
SGL0005	ETHYLBENZENE	VSS00021	3018.000+	J	0.030	VSS00022	18000.000		50.000	3000	YES	YES
SGL0005	METHYLENE CHLORIDE	VSS00021	ND	U	0.010	VSS00022	ND	U	80.000	1500	YES	YES
SGL0005	STYRENE	VSS00021	1040.000		0.030	VSS00022	1900.000		70.000	1500	YES	NO
SGL0005	TETRACHLOROETHYLENE	VSS00021	ND	U	0.006	VSS00022	ND	U	60.000	3000	YES	YES
SGL0005	TOLUENE	VSS00021	358.000		0.030	VSS00022	320.000		30.000	3000	YES	YES
SGL0005	TRICHLOROETHYLENE	VSS00021	0.017		0.006	VSS00022	ND	U	50.000	3000	YES	YES
SGL0007	1,1,1–TRICHLOROETHANE	VSS00009	0.012		0.005	VSS00010	ND	U	4.000	10500	YES	YES
SGL0007	1,1,2–TRICHLOROETHANE	VSS00009	ND	U	0.010	VSS00010	ND	U	6.000	NA	YES	YES
SGL0007	1,1–DICHLOROETHYLENE	VSS00009	ND	U	0.010	VSS00010	ND	U	4.000	30	YES	YES
SGL0007	1,2–DICHLOROETHANE	VSS00009	ND	U	0.010	VSS00010	ND	U	4.000	30	YES	YES
SGL0007	1,4–DICHLOROBENZENE	VSS00009	ND	U	0.030	VSS00010	ND	U	8.000	NA	YES	YES
SGL0007	BENZENE	VSS00009	ND	U	0.030	VSS00010	ND	U	6.000	30	YES	YES
SGL0007	CHLOROFORM	VSS00009	ND	U	0.005	VSS00010	ND	U	4.000	60	YES	YES
SGL0007	CIS–1,2–DICHLOROETHYLENE	VSS00009	ND	U	0.010	VSS00010	ND	U	4.000	NA	YES	YES
SGL0007	ETHYLBENZENE	VSS00009	510.000		0.030	VSS00010	230.000		5.000	3000	YES	YES
SGL0007	METHYLENE CHLORIDE	VSS00009	ND	U	0.010	VSS00010	ND	U	8.000	1500	YES	YES
SGL0007	STYRENE	VSS00009	ND	U	0.030	VSS00010	ND	U	14.000	1500	YES	YES
SGL0007	TETRACHLOROETHYLENE	VSS00009	0.028		0.006	VSS00010	ND	U	6.000	3000	YES	YES
SGL0007	TOLUENE	VSS00009	ND	UJ	0.030	VSS00010	ND	U	6.000	3000	YES	YES
SGL0007	TRICHLOROETHYLENE	VSS00009	ND	U	0.006	VSS00010	ND	U	5.000	3000	YES	YES
SGL0011	1,1,1–TRICHLOROETHANE	VSS00015	ND	UJ	0.005	VSS00016	0.0019	J	0.004	10500	YES	YES
SGL0011	1,1,2–TRICHLOROETHANE	VSS00015	ND	U	0.010	VSS00016	ND	U	0.006	NA	YES	YES
SGL0011	1,1–DICHLOROETHYLENE	VSS00015	ND	U	0.010	VSS00016	ND	U	0.004	30	YES	YES
SGL0011	1,2–DICHLOROETHANE	VSS00015	ND	U	0.010	VSS00016	ND	U	0.004	30	YES	YES
SGL0011	1,2–DICHLOROETHANE	VSS00015	ND	U	0.010	VSS00016	ND	U	0.005	30	YES	YES
SGL0011	1,4–DICHLOROBENZENE	VSS00015	ND	U	0.030	VSS00016	ND	U	0.008	NA	YES	YES
SGL0011	BENZENE	VSS00015	ND	U	0.030	VSS00016	0.018		0.006	30	YES	YES
SGL0011	CHLOROFORM	VSS00015	ND	U	0.005	VSS00016	ND	U	0.004	60	YES	YES
SGL0011	CIS–1,2–DICHLOROETHYLENE	VSS00015	ND	U	0.010	VSS00016	ND	U	0.004	NA	YES	YES
SGL0011	ETHYLBENZENE	VSS00015	ND	U	0.030	VSS00016	0.072		0.005	3000	NO	YES
SGL0011	METHYLENE CHLORIDE	VSS00015	ND	U	0.010	VSS00016	ND	U	0.008	1500	YES	YES
SGL0011	STYRENE	VSS00015	ND	U	0.030	VSS00016	ND	U	0.014	1500	YES	YES
SGL0011	TETRACHLOROETHYLENE	VSS00015	ND	U	0.006	VSS00016	ND	U	0.006	3000	YES	YES
SGL0011	TOLUENE	VSS00015	ND	U	0.030	VSS00016	0.022		0.006	3000	YES	YES
SGL0011	TRICHLOROETHYLENE	VSS00015	ND	U	0.006	VSS00016	ND	U	0.005	3000	YES	YES
SGL0013	1,1,1–TRICHLOROETHANE	VSS00024	ND	UJ F	0.005	VSS00025	0.014		0.004	10500	NO	YES
SGL0013	1,1,2–TRICHLOROETHANE	VSS00024	ND	U F	0.010	VSS00025	ND	U	0.006	NA	YES	YES
SGL0013	1,1–DICHLOROETHYLENE	VSS00024	ND	U F	0.010	VSS00025	ND	U	0.004	30	YES	YES
SGL0013	1,2–DICHLOROETHANE	VSS00024	ND	U F	0.010	VSS00025	ND	U	0.004	30	YES	YES
SGL0013	1,4–DICHLOROBENZENE	VSS00024	ND	U F	0.030	VSS00025	ND	U	0.008	NA	YES	YES
SGL0013	BENZENE	VSS00024	ND	U F	0.030	VSS00025	0.037		0.006	30	NO	YES
SGL0013	CHLOROFORM	VSS00024	0.013	F	0.005	VSS00025	0.0094		0.004	60	YES	YES
SGL0013	CIS–1,2–DICHLOROETHYLENE	VSS00024	ND	U F	0.010	VSS00025	ND	U	0.004	NA	YES	YES
SGL0013	ETHYLBENZENE	VSS00024	ND	UJ F	0.030	VSS00025	0.850		0.005	3000	NO	YES

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SITE ID	ANALYTE	FIELD LAB				FIXED LAB				THRESHOLD CONC[3]	CONFIRMATION VIA POSITIVE IDENTIFICATION	CONFIRMATION VIA POTENTIAL DECISION CHANGE
		SAMP. ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	SAMP. ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	ppm(v/v)		
SGL0013	METHYLENE CHLORIDE	VSS00024	ND	U F	0.010	VSS00025	ND	U	0.008	1500	YES	YES
SGL0013	STYRENE	VSS00024	ND	UJ F	0.030	VSS00025	0.095		0.014	1500	NO	YES
SGL0013	TETRACHLOROETHYLENE	VSS00024	0.015	F	0.006	VSS00025	0.012		0.006	3000	YES	YES
SGL0013	TOLUENE	VSS00024	ND	U F	0.030	VSS00025	0.055		0.006	3000	NO	YES
SGL0013	TRICHLOROETHYLENE	VSS00024	ND	U F	0.006	VSS00025	ND	U	0.005	3000	YES	YES
SGL0014	1,1,1–TRICHLOROETHANE	VSS00034	ND	U F	0.010	VSS00035	0.0036		0.002	10500	YES	YES
SGL0014	1,1,2–TRICHLOROETHANE	VSS00034	ND	U F	0.020	VSS00035	ND	U	0.003	NA	YES	YES
SGL0014	1,1–DICHLOROETHYLENE	VSS00034	ND	U F	0.020	VSS00035	ND	U	0.002	30	YES	YES
SGL0014	1,2–DICHLOROETHANE	VSS00034	ND	U F	0.020	VSS00035	ND	U	0.002	30	YES	YES
SGL0014	1,4–DICHLOROBENZENE	VSS00034	ND	U F	0.060	VSS00035	ND	U	0.004	NA	YES	YES
SGL0014	BENZENE	VSS00034	ND	U F	0.060	VSS00035	0.019		0.003	30	YES	YES
SGL0014	CHLOROFORM	VSS00034	ND	U F	0.010	VSS00035	ND	U	0.002	60	YES	YES
SGL0014	CIS–1,2–DICHLOROETHYLENE	VSS00034	ND	U F	0.020	VSS00035	ND	U	0.002	NA	YES	YES
SGL0014	ETHYLBENZENE	VSS00034	ND	U F	0.060	VSS00035	0.240		0.0025	3000	NO	YES
SGL0014	METHYLENE CHLORIDE	VSS00034	ND	U F	0.020	VSS00035	ND	U	0.004	1500	YES	YES
SGL0014	STYRENE	VSS00034	ND	U F	0.060	VSS00035	0.022		0.007	1500	YES	YES
SGL0014	TETRACHLOROETHYLENE	VSS00034	ND	U F	0.012	VSS00035	ND	U	0.003	3000	YES	YES
SGL0014	TOLUENE	VSS00034	ND	U F	0.060	VSS00035	0.023		0.003	3000	YES	YES
SGL0014	TRICHLOROETHYLENE	VSS00034	ND	U F	0.012	VSS00035	ND	U	0.0025	3000	YES	YES
SGL0016	1,1,1–TRICHLOROETHANE	VSS00028	ND	UJ F	0.010	VSS00029	0.0024	J	0.004	10500	YES	YES
SGL0016	1,1,2–TRICHLOROETHANE	VSS00028	ND	U F	0.020	VSS00029	ND	U	0.006	NA	YES	YES
SGL0016	1,1–DICHLOROETHYLENE	VSS00028	ND	U F	0.020	VSS00029	ND	U	0.004	30	YES	YES
SGL0016	1,2–DICHLOROETHANE	VSS00028	ND	U F	0.020	VSS00029	ND	U	0.004	30	YES	YES
SGL0016	1,4–DICHLOROBENZENE	VSS00028	ND	U F	0.060	VSS00029	ND	U	0.008	NA	YES	YES
SGL0016	BENZENE	VSS00028	ND	U F	0.060	VSS00029	0.0069		0.006	30	YES	YES
SGL0016	CHLOROFORM	VSS00028	ND	U F	0.010	VSS00029	ND	U	0.004	60	YES	YES
SGL0016	CIS–1,2–DICHLOROETHYLENE	VSS00028	ND	U F	0.020	VSS00029	ND	U	0.004	NA	YES	YES
SGL0016	ETHYLBENZENE	VSS00028	ND	U F	0.060	VSS00029	0.360		0.005	3000	NO	YES
SGL0016	METHYLENE CHLORIDE	VSS00028	ND	U F	0.020	VSS00029	ND	U	0.008	1500	YES	YES
SGL0016	STYRENE	VSS00028	ND	U F	0.060	VSS00029	0.029		0.014	1500	YES	YES
SGL0016	TETRACHLOROETHYLENE	VSS00028	ND	U F	0.012	VSS00029	ND	U	0.006	3000	YES	YES
SGL0016	TOLUENE	VSS00028	ND	U F	0.060	VSS00029	0.011		0.006	3000	YES	YES
SGL0016	TRICHLOROETHYLENE	VSS00028	ND	U F	0.012	VSS00029	ND	U	0.005	3000	YES	YES
SGL0096	1,1,1–TRICHLOROETHANE	VSS00153	0.108		0.050	VSS00154	0.089		0.006	10500	YES	YES
SGL0096	1,1–DICHLOROETHYLENE	VSS00153	0.780		0.020	VSS00154	0.610		0.006	30	YES	YES
SGL0096	BENZENE	VSS00153	ND	U	0.030	VSS00154	0.025		0.009	30	YES	YES
SGL0096	ETHYLBENZENE	VSS00153	ND	U	0.030	VSS00154	0.018		0.0075	3000	YES	YES
SGL0096	STYRENE	VSS00153	ND	U	0.030	VSS00154	ND	U	0.021	1500	YES	YES
SGL0096	TETRACHLOROETHYLENE	VSS00153	0.022	J	0.060	VSS00154	0.041		0.012	3000	YES	YES
SGL0096	TOLUENE	VSS00153	ND	U	0.030	VSS00154	0.019		0.012	3000	YES	YES
SGL0096	TRICHLOROETHYLENE	VSS00153	0.038	J	0.060	VSS00154	0.027		0.0075	3000	YES	YES
SGL0102	1,1,1–TRICHLOROETHANE	VSS00160	0.018		0.010	VSS00162	ND	U	16.000	10500	YES	YES
SGL0102	1,1–DICHLOROETHYLENE	VSS00160	ND	U	0.020	VSS00162	ND	U	16.000	30	YES	YES
SGL0102	BENZENE	VSS00160	5.130		0.150	VSS00162	ND	U	24.000	30	YES	YES
SGL0102	ETHYLBENZENE	VSS00160	1427.000		0.150	VSS00162	2200.000		20.000	3000	YES	YES
SGL0102	STYRENE	VSS00160	47.200		0.150	VSS00162	99.000		56.000	1500	YES	YES

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SITE ID	ANALYTE	FIELD LAB				FIXED LAB				THRESHOLD CONC[3]	CONFIRMATION VIA POSITIVE IDENTIFICATION	CONFIRMATION VIA POTENTIAL DECISION CHANGE
		SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	ppm(v/v)		
SGL0102	TETRACHLOROETHYLENE	VSS00160	0.009	J	0.012	VSS00162	ND	U	24.000	3000	YES	YES
SGL0102	TOLUENE	VSS00160	5.700		0.150	VSS00162	ND	U	24.000	3000	YES	YES
SGL0102	TRICHLOROETHYLENE	VSS00160	0.017		0.012	VSS00162	ND	U	20.000	3000	YES	YES
SGL0109	ACETONITRILE	VSS00283	ND	U	1.00	VSS00298	ND	U	0.100	1200	YES	YES
SGL0109	BENZENE	VSS00283	ND	U	0.1	VSS00298	ND	U	0.003	30	YES	YES
SGL0109	CHLOROETHANE	VSS00283	ND	U	2.0	VSS00298	ND	U	0.005	NA	YES	YES
SGL0109	ETHYLENE DIBROMIDE	VSS00283	ND	U	2.0	VSS00298	ND	U	0.002	NA	YES	YES
SGL0109	ETHYLBENZENE	VSS00283	ND	U	0.1	VSS00298	ND	U	0.0025	3000	YES	YES
SGL0109	STYRENE	VSS00283	ND	U	0.1	VSS00298	ND	U	0.007	1500	YES	YES
SGL0109	TOLUENE	VSS00283	ND	U	0.1	VSS00298	0.0015	J	0.003	3000	YES	YES
SGL0109	XYLENES	VSS00283	ND	U	0.10	VSS00298	0.0032	J	0.005	3000	YES	YES
SGL0133	1,1,1–TRICHLOROETHANE	VSS00199	ND	U	0.010	VSS00200	ND	U	0.008	10500	YES	YES
SGL0133	1,1–DICHLOROETHYLENE	VSS00199	ND	U	0.020	VSS00200	ND	U	0.008	30	YES	YES
SGL0133	BENZENE	VSS00199	ND	U	0.030	VSS00200	ND	U	0.012	30	YES	YES
SGL0133	ETHYLBENZENE	VSS00199	ND	U	0.030	VSS00200	0.015		0.010	3000	YES	YES
SGL0133	STYRENE	VSS00199	ND	U	0.030	VSS00200	ND	U	0.028	1500	YES	YES
SGL0133	TETRACHLOROETHYLENE	VSS00199	0.155		0.012	VSS00200	0.250		0.012	3000	YES	YES
SGL0133	TOLUENE	VSS00199	ND	U	0.030	VSS00200	ND	U	0.012	3000	YES	YES
SGL0133	TRICHLOROETHYLENE	VSS00199	ND	U	0.012	VSS00200	ND	U	0.010	3000	YES	YES
SGL0139	1,1,1–TRICHLOROETHANE	VSS00208	ND	U	0.010	VSS00209	ND	U	0.016	10500	YES	YES
SGL0139	1,1–DICHLOROETHYLENE	VSS00208	ND	U	0.020	VSS00209	ND	U	0.016	30	YES	YES
SGL0139	BENZENE	VSS00208	ND	U	0.030	VSS00209	ND	U	0.024	30	YES	YES
SGL0139	ETHYLBENZENE	VSS00208	ND	U	0.030	VSS00209	ND	U	0.020	3000	YES	YES
SGL0139	STYRENE	VSS00208	ND	U	0.030	VSS00209	ND	U	0.056	1500	YES	YES
SGL0139	TETRACHLOROETHYLENE	VSS00208	0.009	J	0.012	VSS00209	ND	U	0.024	3000	YES	YES
SGL0139	TOLUENE	VSS00208	ND	U	0.030	VSS00209	ND	U	0.024	3000	YES	YES
SGL0141	1,1,1–TRICHLOROETHANE	VSS00212	ND	U	0.010	VSS00213	ND	U	0.002	10500	YES	YES
SGL0141	1,1–DICHLOROETHYLENE	VSS00212	ND	U	0.020	VSS00213	ND	U	0.002	30	YES	YES
SGL0141	BENZENE	VSS00212	ND	U	0.030	VSS00213	0.0010	J	0.003	30	YES	YES
SGL0141	ETHYLBENZENE	VSS00212	ND	U	0.030	VSS00213	0.0074		0.0025	3000	YES	YES
SGL0141	STYRENE	VSS00212	ND	U	0.030	VSS00213	ND	U	0.007	1500	YES	YES
SGL0141	TETRACHLOROETHYLENE	VSS00212	ND	U	0.012	VSS00213	ND	U	0.003	3000	YES	YES
SGL0141	TOLUENE	VSS00212	ND	U	0.030	VSS00213	0.029		0.003	3000	YES	YES
SGL0141	TRICHLOROETHYLENE	VSS00212	ND	U	0.012	VSS00213	ND	U	0.0025	3000	YES	YES
SGL0143	ACETONITRILE	VSS00280	ND	U F	1.00	VSS00303	ND	U	0.200	1200	YES	YES
SGL0143	BENZENE	VSS00280	ND	U F	0.1	VSS00303	0.032		0.006	30	YES	YES
SGL0143	CHLOROETHANE	VSS00280	ND	U F	2.0	VSS00303	ND	U	0.010	NA	YES	YES
SGL0143	ETHYLENE DIBROMIDE	VSS00280	ND	U F	2.0	VSS00303	ND	U	0.004	NA	YES	YES
SGL0143	ETHYLBENZENE	VSS00280	0.12	F	0.1	VSS00303	0.360		0.005	3000	YES	YES
SGL0143	STYRENE	VSS00280	ND	U F	0.1	VSS00303	ND	U	0.014	1500	YES	YES
SGL0143	TOLUENE	VSS00280	ND	U F	0.1	VSS00303	0.013		0.006	3000	YES	YES
SGL0143	XYLENES	VSS00280	ND	U F	0.10	VSS00303	0.029		0.010	3000	YES	YES
SGL0152	ACETONITRILE	VSS00365	ND	U	1.00	VSS00358	ND	U	0.200	1200	YES	YES
SGL0152	BENZENE	VSS00365	ND	U	0.1	VSS00358	ND	U	0.006	30	YES	YES

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SITE ID	ANALYTE	FIELD LAB				FIXED LAB				THRESHOLD CONC[3]	CONFIRMATION VIA POSITIVE IDENTIFICATION	CONFIRMATION VIA POTENTIAL DECISION CHANGE
		SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	ppm(v/v)		
SGL0152	CHLOROETHANE	VSS00365	ND	U	2.0	VSS00358	ND	U	0.010	NA	YES	YES
SGL0152	ETHYLENE DIBROMIDE	VSS00365	ND	U	2.0	VSS00358	ND	U	0.004	NA	YES	YES
SGL0152	ETHYLBENZENE	VSS00365	ND	U	0.1	VSS00358	ND	U	0.005	3000	YES	YES
SGL0152	STYRENE	VSS00365	ND	U	0.1	VSS00358	ND	U	0.014	1500	YES	YES
SGL0152	TOLUENE	VSS00365	ND	U	0.1	VSS00358	ND	U	0.006	3000	YES	YES
SGL0152	XYLENES	VSS00365	ND	U	0.10	VSS00358	0.0023	J	0.010	3000	YES	YES
SGL0172	ACETONITRILE	VSS00256	ND	U	1.00	VSS00296	0.031	J	0.100	1200	YES	YES
SGL0172	BENZENE	VSS00256	ND	U	0.1	VSS00296	0.0043		0.003	30	YES	YES
SGL0172	CHLOROETHANE	VSS00256	ND	U	2.0	VSS00296	ND	U	0.005	NA	YES	YES
SGL0172	ETHYLENE DIBROMIDE	VSS00256	ND	U	2.0	VSS00296	ND	U	0.002	NA	YES	YES
SGL0172	ETHYLBENZENE	VSS00256	ND	U	0.1	VSS00296	0.0025		0.0025	3000	YES	YES
SGL0172	STYRENE	VSS00256	ND	U	0.1	VSS00296	0.0014	J	0.007	1500	YES	YES
SGL0172	TOLUENE	VSS00256	ND	U	0.1	VSS00296	0.0050		0.003	3000	YES	YES
SGL0172	XYLENES	VSS00256	ND	U	0.10	VSS00296	0.0081		0.005	3000	YES	YES
SGL0183	ACETONITRILE	VSS00413	ND	U F	1.00	VSS00433	0.011	J	0.100	1200	YES	YES
SGL0183	BENZENE	VSS00413	ND	U F	0.1	VSS00433	0.034		0.003	30	YES	YES
SGL0183	CHLOROETHANE	VSS00413	ND	U F	2.0	VSS00433	ND	U	0.005	NA	YES	YES
SGL0183	ETHYLENE DIBROMIDE	VSS00413	ND	U F	2.0	VSS00433	ND	U	0.002	NA	YES	YES
SGL0183	ETHYLBENZENE	VSS00413	ND	U F	0.1	VSS00433	0.019		0.0025	3000	YES	YES
SGL0183	STYRENE	VSS00413	ND	U F	0.1	VSS00433	0.0028	J	0.007	1500	YES	YES
SGL0183	TOLUENE	VSS00413	ND	U F	0.1	VSS00433	0.047		0.003	3000	YES	YES
SGL0183	XYLENES	VSS00413	ND	U F	0.10	VSS00433	0.053		0.005	3000	YES	YES
SGL0188	ACETONITRILE	VSS00383	ND	U	1.00	VSS00360	ND	U	0.100	1200	YES	YES
SGL0188	BENZENE	VSS00383	ND	U	0.1	VSS00360	ND	U	0.003	30	YES	YES
SGL0188	CHLOROETHANE	VSS00383	ND	U	2.0	VSS00360	ND	U	0.005	NA	YES	YES
SGL0188	ETHYLENE DIBROMIDE	VSS00383	ND	U	2.0	VSS00360	ND	U	0.002	NA	YES	YES
SGL0188	ETHYLBENZENE	VSS00383	ND	U	0.1	VSS00360	ND	U	0.0025	3000	YES	YES
SGL0188	STYRENE	VSS00383	ND	U	0.1	VSS00360	ND	U	0.007	1500	YES	YES
SGL0188	TOLUENE	VSS00383	ND	U	0.1	VSS00360	0.0016	J	0.003	3000	YES	YES
SGL0188	XYLENES	VSS00383	ND	U	0.10	VSS00360	0.0021	J	0.005	3000	YES	YES
SGL0194	ACETONITRILE	VSS00313	ND	U	1.00	VSS00299	0.015	J	0.100	1200	YES	YES
SGL0194	BENZENE	VSS00313	ND	U	0.1	VSS00299	0.0096		0.003	30	YES	YES
SGL0194	CHLOROETHANE	VSS00313	ND	U	2.0	VSS00299	ND	U	0.005	NA	YES	YES
SGL0194	ETHYLENE DIBROMIDE	VSS00313	ND	U	2.0	VSS00299	ND	U	0.002	NA	YES	YES
SGL0194	ETHYLBENZENE	VSS00313	ND	U	0.1	VSS00299	0.0053		0.0025	3000	YES	YES
SGL0194	STYRENE	VSS00313	ND	U	0.1	VSS00299	0.0024	J	0.007	1500	YES	YES
SGL0194	TOLUENE	VSS00313	ND	U	0.1	VSS00299	0.0073		0.003	3000	YES	YES
SGL0194	XYLENES	VSS00313	ND	U	0.10	VSS00299	0.0068		0.005	3000	YES	YES
SGL0236	ACETONITRILE	VSS00336	ND	U F	1.00	VSS00307	ND	R	R	1200	YES	YES
SGL0236	BENZENE	VSS00336	ND	U F	0.1	VSS00307	0.015		0.006	30	YES	YES
SGL0236	CHLOROETHANE	VSS00336	ND	U F	2.0	VSS00307	ND	U	0.010	NA	YES	YES
SGL0236	ETHYLENE DIBROMIDE	VSS00336	ND	U F	2.0	VSS00307	ND	U	0.004	NA	YES	YES
SGL0236	ETHYLBENZENE	VSS00336	ND	U F	0.1	VSS00307	0.017		0.005	3000	YES	YES
SGL0236	STYRENE	VSS00336	ND	U F	0.1	VSS00307	ND	U	0.014	1500	YES	YES
SGL0236	TOLUENE	VSS00336	ND	U F	0.1	VSS00307	0.019		0.006	3000	YES	YES

TABLE A – DEL AMO SOIL GAS DATA[1]

SITE ID	ANALYTE	FIELD LAB				FIXED LAB				THRESHOLD CONC[3] ppm(v/v)	CONFIRMATION VIA POSITIVE IDENTIFICATION	CONFIRMATION VIA POTENTIAL DECISION CHANGE
		SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)			
SGL0236	XYLENES	VSS00336	ND	U F	0.10	VSS00307	0.027		0.010	3000	YES	YES
SGL0242	ACETONITRILE	VSS00353	ND	U	1.00	VSS00357	ND	U	10.000	1200	YES	YES
SGL0242	BENZENE	VSS00353	1.63		0.1	VSS00357	2.300		0.300	30	YES	YES
SGL0242	CHLOROETHANE	VSS00353	ND	U	2.0	VSS00357	ND	U	0.500	NA	YES	YES
SGL0242	ETHYLENE DIBROMIDE	VSS00353	2.90		2.0	VSS00357	ND	U	0.200	NA	NO	YES
SGL0242	ETHYLBENZENE	VSS00353	16.2		0.1	VSS00357	33.000		0.250	3000	YES	YES
SGL0242	STYRENE	VSS00353	ND	U	0.1	VSS00357	ND	U	0.700	1500	YES	YES
SGL0242	TOLUENE	VSS00353	ND	U	0.1	VSS00357	ND	U	0.300	3000	YES	YES
SGL0242	XYLENES	VSS00353	ND	U	0.10	VSS00357	ND	U	0.500	3000	YES	YES
SGL0246	ACETONITRILE	VSS00269	ND	U F	1.00	VSS00301	ND	U	1.000	1200	YES	YES
SGL0246	BENZENE	VSS00269	ND	U F	0.1	VSS00301	0.016	J	0.030	30	YES	YES
SGL0246	CHLOROETHANE	VSS00269	ND	U F	2.0	VSS00301	ND	U	0.050	NA	YES	YES
SGL0246	ETHYLENE DIBROMIDE	VSS00269	ND	U F	2.0	VSS00301	ND	U	0.020	NA	YES	YES
SGL0246	ETHYLBENZENE	VSS00269	0.06	J F	0.1	VSS00301	0.021	J	0.025	3000	YES	YES
SGL0246	STYRENE	VSS00269	ND	U F	0.1	VSS00301	ND	U	0.070	1500	YES	YES
SGL0246	TOLUENE	VSS00269	ND	U F	0.1	VSS00301	0.024	J	0.030	3000	YES	YES
SGL0246	XYLENES	VSS00269	ND	U F	0.10	VSS00301	0.038	J	0.050	3000	YES	YES
SGL0249	ACETONITRILE	VSS00272	ND	U	1.00	VSS00302	ND	U	30.000	1200	YES	YES
SGL0249	BENZENE	VSS00272	1.68		0.1	VSS00302	4.900		0.900	30	YES	YES
SGL0249	CHLOROETHANE	VSS00272	ND	U	2.0	VSS00302	ND	U	1.500	NA	YES	YES
SGL0249	ETHYLENE DIBROMIDE	VSS00272	ND	U	2.0	VSS00302	ND	U	0.600	NA	YES	YES
SGL0249	ETHYLBENZENE	VSS00272	13.3		0.1	VSS00302	64.000		0.750	3000	YES	YES
SGL0249	STYRENE	VSS00272	ND	U	0.1	VSS00302	ND	U	2.100	1500	YES	YES
SGL0249	TOLUENE	VSS00272	ND	U	0.1	VSS00302	ND	U	0.900	3000	YES	YES
SGL0249	XYLENES	VSS00272	ND	U	0.10	VSS00302	ND	U	1.500	3000	YES	YES
SGL0256	ACETONITRILE	VSS00222	ND	U F	1.00	VSS00304	0.058	J	0.100	1200	YES	YES
SGL0256	BENZENE	VSS00222	ND	U F	0.1	VSS00304	0.020		0.003	30	YES	YES
SGL0256	CHLOROETHANE	VSS00222	ND	U F	2.0	VSS00304	0.0031	J	0.005	NA	YES	YES
SGL0256	ETHYLENE DIBROMIDE	VSS00222	ND	U F	2.0	VSS00304	ND	U	0.002	NA	YES	YES
SGL0256	ETHYLBENZENE	VSS00222	ND	U F	0.1	VSS00304	0.0078		0.0025	3000	YES	YES
SGL0256	STYRENE	VSS00222	ND	U F	0.1	VSS00304	0.0018	J	0.007	1500	YES	YES
SGL0256	TOLUENE	VSS00222	ND	U F	0.1	VSS00304	0.028		0.003	3000	YES	YES
SGL0256	XYLENES	VSS00222	ND	U F	0.10	VSS00304	0.035		0.005	3000	YES	YES
SGL0265	ACETONITRILE	VSS00232	ND	U F	1.00	VSS00305	0.110		0.100	1200	YES	YES
SGL0265	BENZENE	VSS00232	ND	U F	0.1	VSS00305	0.045		0.003	30	YES	YES
SGL0265	CHLOROETHANE	VSS00232	ND	U F	2.0	VSS00305	ND	U	0.005	NA	YES	YES
SGL0265	ETHYLENE DIBROMIDE	VSS00232	ND	U F	2.0	VSS00305	ND	U	0.002	NA	YES	YES
SGL0265	ETHYLBENZENE	VSS00232	ND	U F	0.1	VSS00305	0.073		0.0025	3000	YES	YES
SGL0265	STYRENE	VSS00232	ND	U F	0.1	VSS00305	0.0049	J	0.007	1500	YES	YES
SGL0265	TOLUENE	VSS00232	ND	U F	0.1	VSS00305	0.018		0.003	3000	YES	YES
SGL0265	XYLENES	VSS00232	ND	U F	0.10	VSS00305	0.034		0.005	3000	YES	YES
SGL0271	ACETONITRILE	VSS00261	ND	U F	1.00	VSS00297	0.026	J	0.100	1200	YES	YES
SGL0271	BENZENE	VSS00261	ND	U F	0.1	VSS00297	0.011		0.003	30	YES	YES
SGL0271	CHLOROETHANE	VSS00261	ND	U F	2.0	VSS00297	ND	U	0.005	NA	YES	YES

TABLE A – DEL AMO SOIL GAS DATA[1]

SITE ID	ANALYTE	FIELD LAB				FIXED LAB				THRESHOLD CONC[3] ppm(v/v)	CONFIRMATION VIA POSITIVE IDENTIFICATION	CONFIRMATION VIA POTENTIAL DECISION CHANGE
		SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)			
SGL0271	ETHYLENE DIBROMIDE	VSS00261	ND	U F	2.0	VSS00297	ND	U	0.002	NA	YES	YES
SGL0271	ETHYLBENZENE	VSS00261	ND	U F	0.1	VSS00297	0.0092		0.0025	3000	YES	YES
SGL0271	STYRENE	VSS00261	ND	U F	0.1	VSS00297	ND	U	0.007	1500	YES	YES
SGL0271	TOLUENE	VSS00261	ND	U F	0.1	VSS00297	0.015		0.003	3000	YES	YES
SGL0271	XYLENES	VSS00261	ND	U F	0.10	VSS00297	0.023		0.005	3000	YES	YES
SGL0279	ACETONITRILE	VSS00316	ND	U	1.00	VSS00300	ND	U	0.100	1200	YES	YES
SGL0279	BENZENE	VSS00316	ND	U	0.1	VSS00300	ND	U	0.003	30	YES	YES
SGL0279	CHLOROETHANE	VSS00316	ND	U	2.0	VSS00300	ND	U	0.005	NA	YES	YES
SGL0279	ETHYLENE DIBROMIDE	VSS00316	ND	U	2.0	VSS00300	ND	U	0.002	NA	YES	YES
SGL0279	ETHYLBENZENE	VSS00316	ND	U	0.1	VSS00300	ND	U	0.0025	3000	YES	YES
SGL0279	STYRENE	VSS00316	ND	U	0.1	VSS00300	ND	U	0.007	1500	YES	YES
SGL0279	TOLUENE	VSS00316	ND	U	0.1	VSS00300	ND	U	0.003	3000	YES	YES
SGL0279	XYLENES	VSS00316	ND	U	0.10	VSS00300	0.0015	J	0.005	3000	YES	YES
SGL0317	ACETONITRILE	VSS00398	ND	U	1.00	VSS00431	ND	U	0.100	1200	YES	YES
SGL0317	BENZENE	VSS00398	ND	U	0.1	VSS00431	0.011		0.003	30	YES	YES
SGL0317	CHLOROETHANE	VSS00398	ND	U	2.0	VSS00431	ND	U	0.005	NA	YES	YES
SGL0317	ETHYLENE DIBROMIDE	VSS00398	ND	U	2.0	VSS00431	ND	U	0.002	NA	YES	YES
SGL0317	ETHYLBENZENE	VSS00398	ND	U	0.1	VSS00431	0.0061		0.0025	3000	YES	YES
SGL0317	STYRENE	VSS00398	ND	U	0.1	VSS00431	ND	U	0.007	1500	YES	YES
SGL0317	TOLUENE	VSS00398	ND	U	0.1	VSS00431	0.0073		0.003	3000	YES	YES
SGL0317	XYLENES	VSS00398	ND	U	0.10	VSS00431	0.021		0.005	3000	YES	YES
SGL0342	ACETONITRILE	VSS00436	ND	U	1.00	VSS00434	0.036	J	0.100	1200	YES	YES
SGL0342	BENZENE	VSS00436	ND	U	0.1	VSS00434	0.019		0.003	30	YES	YES
SGL0342	CHLOROETHANE	VSS00436	ND	U	2.0	VSS00434	ND	U	0.005	NA	YES	YES
SGL0342	ETHYLENE DIBROMIDE	VSS00436	ND	U	2.0	VSS00434	ND	U	0.002	NA	YES	YES
SGL0342	ETHYLBENZENE	VSS00436	ND	U	0.1	VSS00434	0.0088		0.0025	3000	YES	YES
SGL0342	STYRENE	VSS00436	ND	U	0.1	VSS00434	0.0099		0.007	1500	YES	YES
SGL0342	TOLUENE	VSS00436	ND	U	0.1	VSS00434	0.023		0.003	3000	YES	YES
SGL0342	XYLENES	VSS00436	ND	U	0.10	VSS00434	0.025		0.005	3000	YES	YES

[1] Subset of entire sample population; Table includes only those soil gas samples which reported both primary (field lab) static stream syringe and confirmatory (fixed lab) Summa canister results.

[2] DV FLAG = Data Validation Qualifier

- "F" indicates that the reported concentration is estimated due to exceedingly low air permeability in soil.
- "J" indicates that the reported concentration is an estimated quantity.
- "U" indicates that the analyte was not detected above the reported detection limit (RDL).
- "UJ" indicates that the analyte was not detected above the reported detection limit (RDL), and the RDL is an estimate which may be inaccurate or imprecise.
- "R" indicates that the data are not usable (note: the analyte may or may not be present).

[3] Threshold concentrations were obtained and derived from the *Addendum Remedial Investigation/Feasibility Study Workplan, Del Amo Site, March 22, 1993.*

CONC = Concentration

NA = Not Applicable; no threshold concentration was calculated for the corresponding analyte.

ND = Not Detected at or above the corresponding reported detection limit (RDL).

RDL = Reported Detection Limit [Method Detection Limit (MDL) adjusted for sample specific analytical parameters].

+ = Due to lab error, accurate concentration information was not obtainable, however, the lab was able to confidently estimate that the actual concentration exceeded the value listed.

TABLE B – DEL AMO SOIL GAS DATA – SUMMARY[1]

SITE ID	ANALYTE	FIELD LAB				FIXED LAB				THRESHOLD CONC[3] ppm(v/v)	CONFIRMATION VIA POSITIVE IDENTIFICATION	CONFIRMATION VIA POTENTIAL DECISION CHANGE
		SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)			
SGL0002	BENZENE	VSS00002	ND	U	0.030	VSS00003	0.031		0.003	30	NO	YES
SGL0002	ETHYLBENZENE	VSS00002	ND	U	0.030	VSS00003	0.040		0.0025	3000	NO	YES
SGL0002	TOLUENE	VSS00002	ND	U	0.030	VSS00003	0.049		0.003	3000	NO	YES
SGL0004	BENZENE	VSS00005	ND	U F	0.030	VSS00006	0.055		0.003	30	NO	YES
SGL0004	TOLUENE	VSS00005	ND	UJ F	0.030	VSS00006	0.140		0.003	3000	NO	YES
SGL0005	1,1,1-TRICHLOROETHANE	VSS00019	ND	UJ F	0.005	VSS00020	0.011		0.004	10500	NO	YES
SGL0005	1,4-DICHLOROBENZENE	VSS00021	ND	U	0.030	VSS00022	37.000	J	80.000	NA	NO	YES
SGL0005	BENZENE	VSS00019	ND	U F	0.030	VSS00020	0.032		0.006	30	NO	YES
SGL0005	STYRENE	VSS00019	ND	U F	0.030	VSS00020	0.100		0.007	1500	NO	YES
SGL0005	TOLUENE	VSS00019	ND	U F	0.030	VSS00020	0.140		0.003	3000	NO	YES
SGL0011	ETHYLBENZENE	VSS00015	ND	U	0.030	VSS00016	0.072		0.005	3000	NO	YES
SGL0013	1,1,1-TRICHLOROETHANE	VSS00024	ND	UJ F	0.005	VSS00025	0.014		0.004	10500	NO	YES
SGL0013	BENZENE	VSS00024	ND	U F	0.030	VSS00025	0.037		0.006	30	NO	YES
SGL0013	ETHYLBENZENE	VSS00024	ND	UJ F	0.030	VSS00025	0.850		0.005	3000	NO	YES
SGL0013	STYRENE	VSS00024	ND	UJ F	0.030	VSS00025	0.095		0.014	1500	NO	YES
SGL0013	TOLUENE	VSS00024	ND	U F	0.030	VSS00025	0.055		0.006	3000	NO	YES
SGL0014	ETHYLBENZENE	VSS00034	ND	U F	0.060	VSS00035	0.240		0.0025	3000	NO	YES
SGL0016	ETHYLBENZENE	VSS00028	ND	U F	0.060	VSS00029	0.360		0.005	3000	NO	YES
SGL0242	ETHYLENE DIBROMIDE	VSS00353	2.90		2.0	VSS00357	ND	U	0.200	NA	NO	YES

[1] Subset of Table A; Table B includes only those primary/confirmatory soil gas sample pairs which were "Not Confirmed" via positive identification.

[2] DV FLAG = Data Validation Qualifier

- "F" indicates that the reported concentration is estimated due to exceedingly low air permeability in soil.
- "J" indicates that the reported concentration is an estimated quantity.
- "U" indicates that the analyte was not detected above the reported detection limit (RDL).
- "UJ" indicates that the analyte was not detected above the reported detection limit (RDL), and the RDL is an estimate which may be inaccurate or imprecise.

[3] Threshold concentrations were obtained and derived from the *Addendum Remedial Investigation/Feasibility Study Workplan, Del Amo Site, March 22, 1993.*

CONC = Concentration
NA = Not Applicable; no threshold concentration was calculated for the corresponding analyte.
ND = Not Detected at or above the corresponding reported detection limit (RDL).
RDL = Reported Detection Limit [Method Detection Limit (MDL) adjusted for sample specific analytical parameters].

TABLE C – DEL AMO SOIL GAS DATA COMPARABILITY[1]

SITE_ID	ANALYTE	FIELD LAB				FIXED LAB				FACTOR[3]
		SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	
SGL0005	BENZENE	VSS00021	128		0.030	VSS00022	120		30.000	1.1
SGL0005	ETHYLBENZENE	VSS00019	0.245	F	0.030	VSS00020	0.74		0.0025	0.3
SGL0005	ETHYLBENZENE	VSS00021	3018.000+	J	0.030	VSS00022	18000		50.000	NC
SGL0005	STYRENE	VSS00021	1040		0.030	VSS00022	1900		70.000	0.5
SGL0005	TOLUENE	VSS00021	358		0.030	VSS00022	320		30.000	1.1
SGL0096	1,1,1-TRICHLOROETHANE	VSS00153	0.108		0.050	VSS00154	0.089		0.006	1.2
SGL0096	1,1-DICHLOROETHYLENE	VSS00153	0.78		0.020	VSS00154	0.61		0.006	1.3
SGL0096	TETRACHLOROETHYLENE	VSS00153	0.022	J	0.060	VSS00154	0.041		0.012	0.5
SGL0096	TRICHLOROETHYLENE	VSS00153	0.038	J	0.060	VSS00154	0.027		0.0075	1.4
SGL0102	ETHYLBENZENE	VSS00160	1427		0.150	VSS00162	2200		20.000	0.6
SGL0102	STYRENE	VSS00160	47.2		0.150	VSS00162	99		56.000	0.5
SGL0133	TETRACHLOROETHYLENE	VSS00199	0.155		0.012	VSS00200	0.25		0.012	0.6
SGL0143	ETHYLBENZENE	VSS00280	0.12	F	0.1	VSS00303	0.36		0.005	0.3
SGL0242	BENZENE	VSS00353	1.63		0.1	VSS00357	2.3		0.300	0.7
SGL0242	ETHYLBENZENE	VSS00353	16.2		0.1	VSS00357	33		0.250	0.5
SGL0246	ETHYLBENZENE	VSS00269	0.06	J F	0.1	VSS00301	0.021	J	0.025	2.9
SGL0249	BENZENE	VSS00272	1.68		0.1	VSS00302	4.9		0.900	0.3
SGL0249	ETHYLBENZENE	VSS00272	13.3		0.1	VSS00302	64		0.750	0.2
AVERAGE										0.8

[1] Subset of entire sample population; Table includes only those samples in which both the field lab and the fixed lab reported detectable concentrations of the associated analyte using static stream syringe and Summa canister sampling techniques, respectively.

[2] DV FLAG = Data Validation Qualifier
- "F" indicates that the reported concentration is estimated due to the exceedingly low air permeability in soil.
- "J" indicates that the reported concentration is an estimated quantity.

[3] Factors calculated by: Field Lab Concentration/Fixed Lab Concentration. Therefore, factors > 1 designate Field Lab Concentration > Fixed Lab Concentration and factors < 1 designate Field Lab Concentration < Fixed Lab Concentration.

CONC = Concentration
NC = Not Calculable due to qualitative ethylbenzene result for sample VSS00021.
RDL = Reported Detection Limit [Method Detection Limit (MDL) adjusted for sample specific analytical parameters].
+ = Due to lab error, accurate concentration information was not obtainable, however, the lab was able to confidently estimate that the actual concentration exceeded the value listed.

TABLE D – DEL AMO SOIL GAS DATA COMPARABILITY[1]

		FIELD LAB				FIXED LAB				
SITE ID	ANALYTE	SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	SAMP ID	CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	FACTOR[3]
SGL0004	1,1,1-TRICHLOROETHANE	VSS00005	0.0067	F	0.005	VSS00006	0.0088		0.002	0.76
SGL0004	TETRACHLOROETHYLENE	VSS00005	0.0081	F	0.006	VSS00006	0.0014	J	0.003	5.79
SGL0007	ETHYLBENZENE	VSS00009	510		0.030	VSS00010	230		5.000	2.22
SGL0013	CHLOROFORM	VSS00024	0.013	F	0.005	VSS00025	0.0094		0.004	1.38
SGL0013	TETRACHLOROETHYLENE	VSS00024	0.015	F	0.006	VSS00025	0.012		0.006	1.25
AVERAGE										2.28

[1] Subset of entire sample population; Table includes only those samples in which both the field lab and the fixed lab reported detectable concentrations of the associated analyte using active stream syringe and Summa canister sampling techniques, respectively.

[2] DV FLAG = Data Validation Qualifier
- "F" indicates that the reported concentration is estimated due to exceedingly low air permeabilbity in soil.
- "J" indicates that the reported concentration is an estimated quantity.

[3] Factors calculated by: Field Lab Concentration/Fixed Lab Concentration. Therefore, factors > 1 designate Field Lab Concentration > Fixed Lab Concentration and factors < 1 designate Field Lab Concentration < Fixed Lab Concentration.

CONC = Concentration
RDL = Reported Detection Limit [Method Detection Limit (MDL) adjusted for sample specific analytical parameters].

TABLE E – SAMPLE LOCATION SGL0421

		FIELD LAB ANALYSES – GC/PID				FIXED LAB ANALYSES – GC/MS	
SITE ID	ANALYTE	ACTIVE STREAM SYRINGE SAMPLE ID	CONC[1] ppm(v/v)	STATIC STREAM SYRINGE SAMPLE ID	CONC[1] ppm(v/v)	SUMMA CANISTER SAMPLE ID	CONC[1] ppm(v/v)
SGL0421	BENZENE	VSS00526	252.00	VSS00528	124.00	VSS00527	240.00
SGL0421	TOLUENE	VSS00526	2.71	VSS00528	2.71	VSS00527	ND
SGL0421	ETHYLBENZENE	VSS00526	184.00	VSS00528	55.80	VSS00527	250.00
SGL0421	STYRENE	VSS00526	<2.50	VSS00528	<2.50	VSS00527	ND
SGL0421	BUTYLBENZENE	VSS00526	19.90	VSS00528	5.93	VSS00527	NA
SGL0421	BENZENE	VSS00533	281.00	VSS00535	138.00	VSS00534	250.00
SGL0421	TOLUENE	VSS00533	ND	VSS00535	ND	VSS00534	ND
SGL0421	ETHYLBENZENE	VSS00533	202.00	VSS00535	56.90	VSS00534	220.00
SGL0421	STYRENE	VSS00533	ND	VSS00535	ND	VSS00534	ND
SGL0421	BUTYLBENZENE	VSS00533	20.80	VSS00535	<5.00	VSS00534	NA
SGL0421	BENZENE	VSS00536	401.00	VSS00538	164.00	VSS00537	170.00
SGL0421	TOLUENE	VSS00536	ND	VSS00538	ND	VSS00537	ND
SGL0421	ETHYLBENZENE	VSS00536	331.00	VSS00538	109.00	VSS00537	190.00
SGL0421	STYRENE	VSS00536	ND	VSS00538	ND	VSS00537	ND
SGL0421	BUTYLBENZENE	VSS00536	13.90	VSS00538	5.40	VSS00537	NA

[1] Shaded concentrations represent the highest analyte concentration detected using the three associated sample collection and analysis techniques.

CONC = Concentration.
NA = Laboratory did Not Analyze the sample for this compound.
ND = Compound was Not Detected in the sample.

TABLE F – SAMPLE LOCATION SGL0422

SITE ID	ANALYTE	FIELD LAB ANALYSES – GC/PID				FIXED LAB ANALYSES – GC/MS	
		ACTIVE STREAM SYRINGE SAMPLE ID	CONC[1] ppm(v/v)	STATIC STREAM SYRINGE SAMPLE ID	CONC[1] ppm(v/v)	SUMMA CANISTER SAMPLE ID	CONC[1] ppm(v/v)
SGL0422	BENZENE	VSS00541	32.10	VSS00543	15.00	VSS00542	14.00
SGL0422	TOLUENE	VSS00541	1.20	VSS00543	<1.00	VSS00542	ND
SGL0422	ETHYLBENZENE	VSS00541	14.60	VSS00543	4.95	VSS00542	9.80
SGL0422	STYRENE	VSS00541	ND	VSS00543	<1.00	VSS00542	ND
SGL0422	BUTYLBENZENE	VSS00541	ND	VSS00543	ND	VSS00542	NA
SGL0422	BENZENE	VSS00546	21.30	VSS00548	5.20	VSS00547	12.00
SGL0422	TOLUENE	VSS00546	ND	VSS00548	<0.50	VSS00547	ND
SGL0422	ETHYLBENZENE	VSS00546	12.30	VSS00548	1.63	VSS00547	6.40
SGL0422	STYRENE	VSS00546	ND	VSS00548	<0.50	VSS00547	ND
SGL0422	BUTYLBENZENE	VSS00546	ND	VSS00548	ND	VSS00547	NA
SGL0422	BENZENE	VSS00551	16.60	VSS00553	7.49	VSS00552	10.00
SGL0422	TOLUENE	VSS00551	ND	VSS00553	ND	VSS00552	ND
SGL0422	ETHYLBENZENE	VSS00551	6.46	VSS00553	3.19	VSS00552	5.40
SGL0422	STYRENE	VSS00551	<0.50	VSS00553	ND	VSS00552	ND
SGL0422	BUTYLBENZENE	VSS00551	ND	VSS00553	ND	VSS00552	NA

[1] Shaded results represent the highest analyte concentration detected using the three associated sample collection and analysis techniques.

CONC = Concentration.
NA = Laboratory did Not Analyze the sample for this compound.
ND = Compound was Not Detected in the sample.

TABLE G – SUMMARY OF POTENTIAL FIELD DECISION CHANGES[1]

SITE ID	ANALYTE	SAMP ID	DATE SAMPLED	SAMPLING TECHNIQUE	REPORTED CONC ppm(v/v)	DV FLAG[2]	RDL ppm(v/v)	CORRECTION FACTOR	ADJUSTED CONC ppm(v/v)	THRESHOLD CONC ppm(v/v)	POTENTIAL DECISION CHANGE
SGL0294	Benzene	VSS00354	22–Apr–93	STATIC	15.8		0.1	0.2	79.00	30	YES
SGL0327	Benzene	VSS00407	05–May–93	STATIC	7.20	F	0.1	0.2	36.00	30	YES
SGL0350	Benzene	VSS00458	22–May–93	STATIC	17.9	F	0.1	0.2	89.50	30	YES

[1] Subset of entire sample population; Table includes only those static stream syringe sample results which meet all of the following criteria: 1) REPORTED CONC < THRESHOLD CONC; 2) ADJUSTED CONC > THRESHOLD CONC; and, 3) no corresponding Summa canister sample was taken.

[2] DV FLAG = Data Validation Qualifer

- "F" indicates that the reported concentration is estimated due to exceedingly low air permeability in soil.

CONC = Concentration

RDL = Reported Detection Limit [Method Detection Limit (MDL) adjusted for sample specific analytical parameters].

STATIC = Static Stream Syringe/Field Lab sampling technique.

FIGURE 1 – DEL AMO SOIL GAS DATA COMPARABILITY

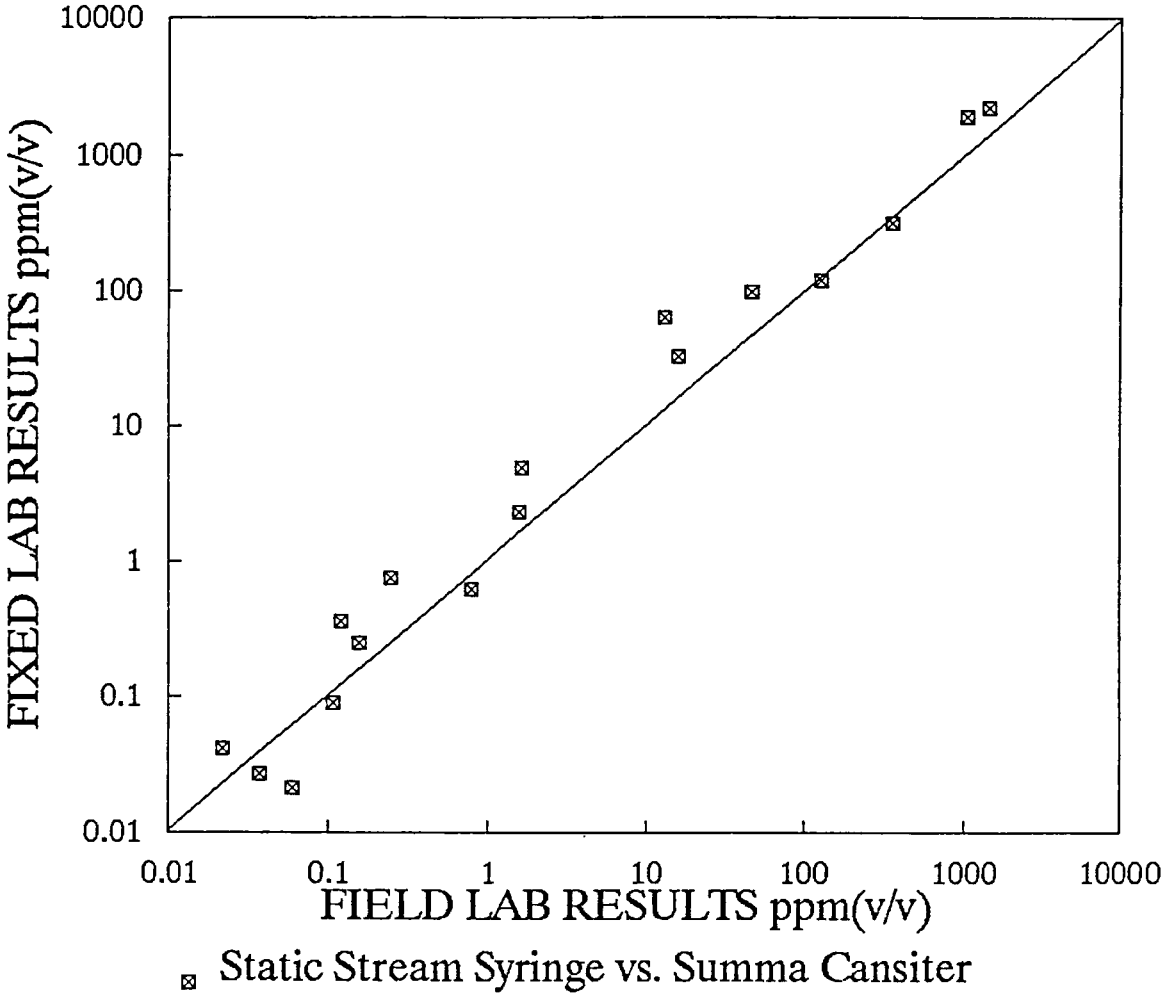
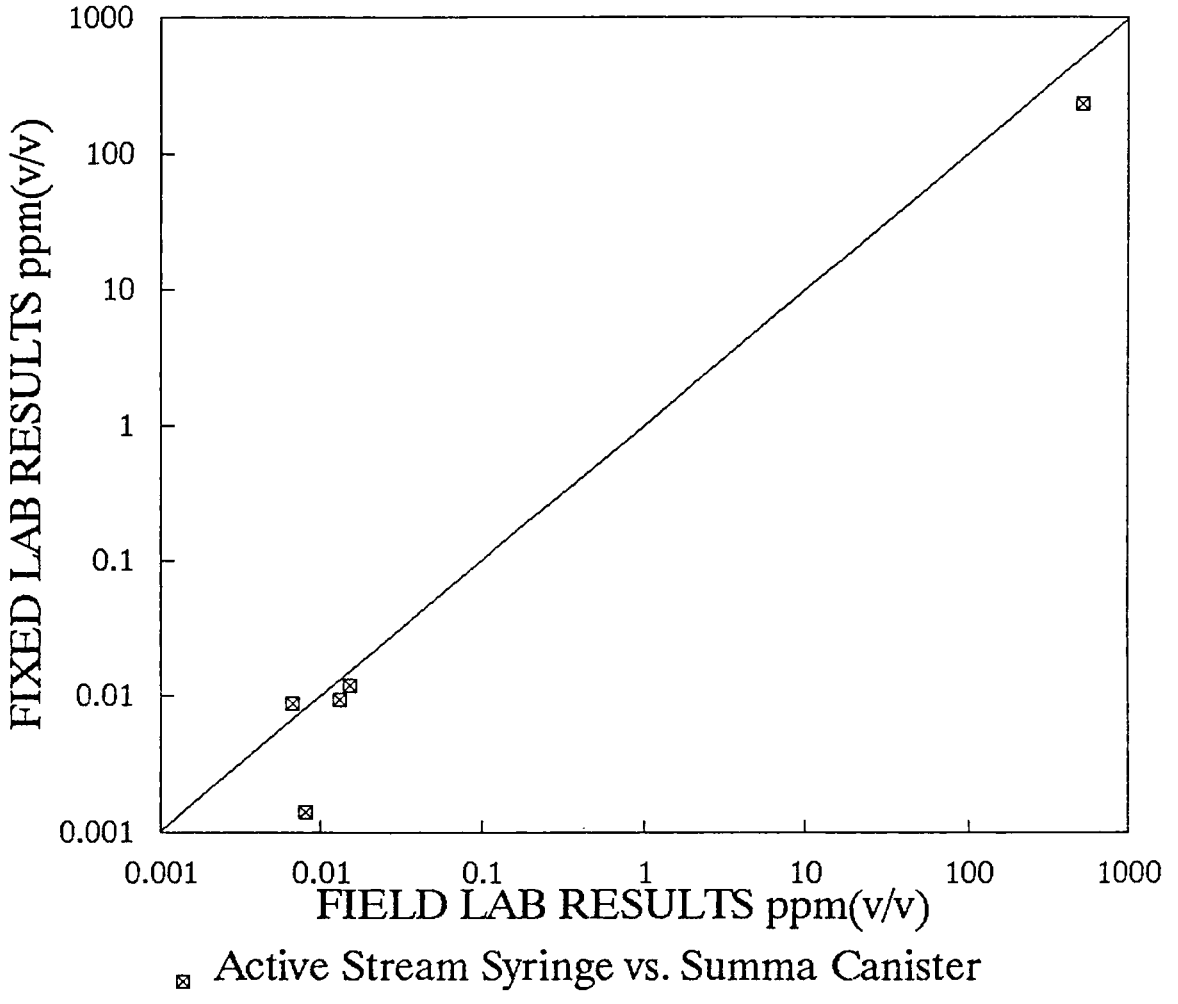
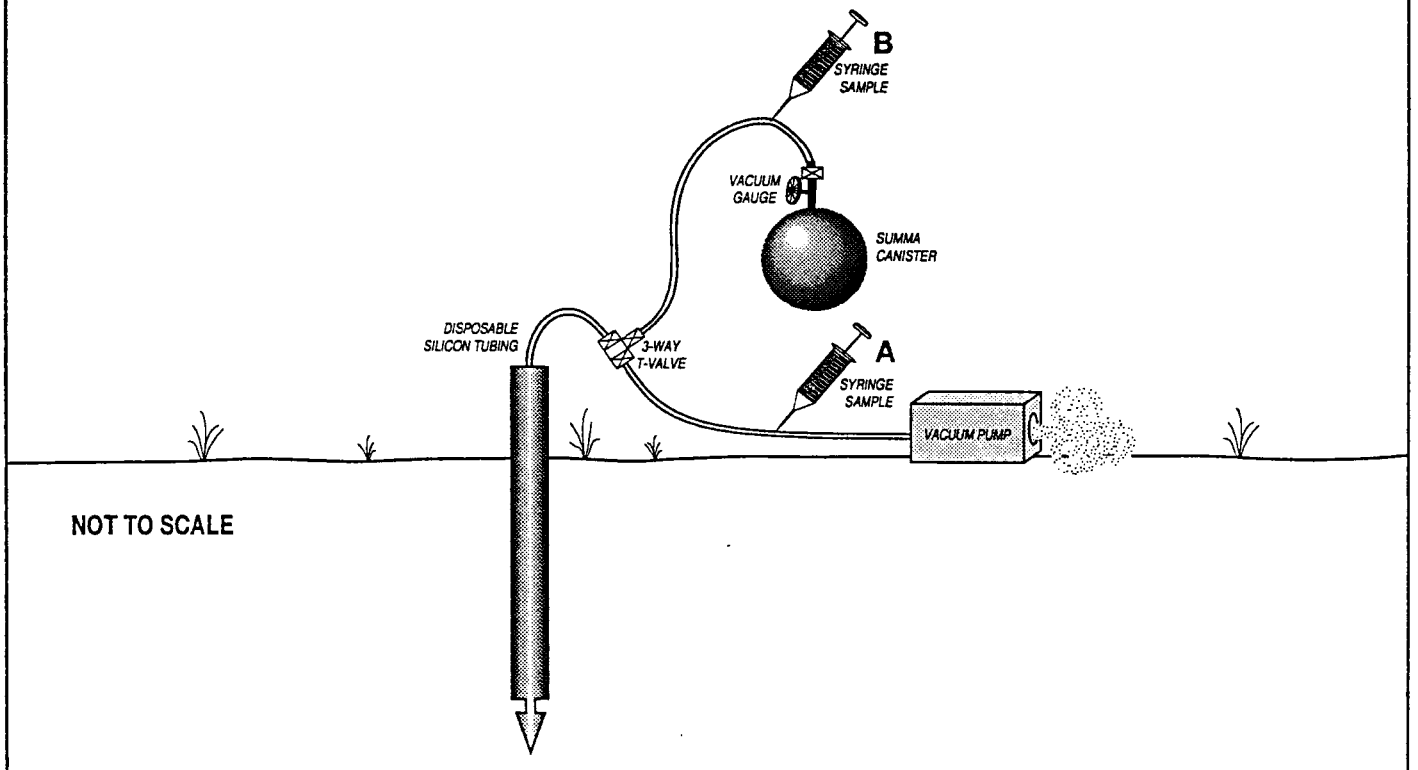


FIGURE 2 – DEL AMO SOIL GAS DATA COMPARABILITY





NOT TO SCALE

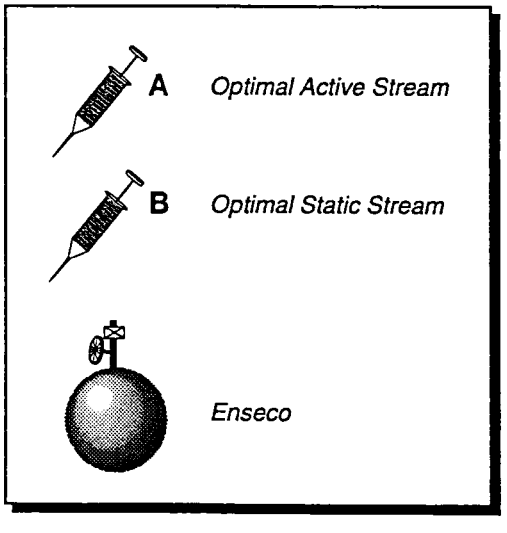


FIGURE 3

COMPARISON OF SUMMA CANISTER, ACTIVE STREAM SYRINGE, AND STATIC STREAM SYRINGE SAMPLING TECHNIQUES

DAMES & MOORE

FIGURE 4 – SAMPLE LOCATION SGL0421

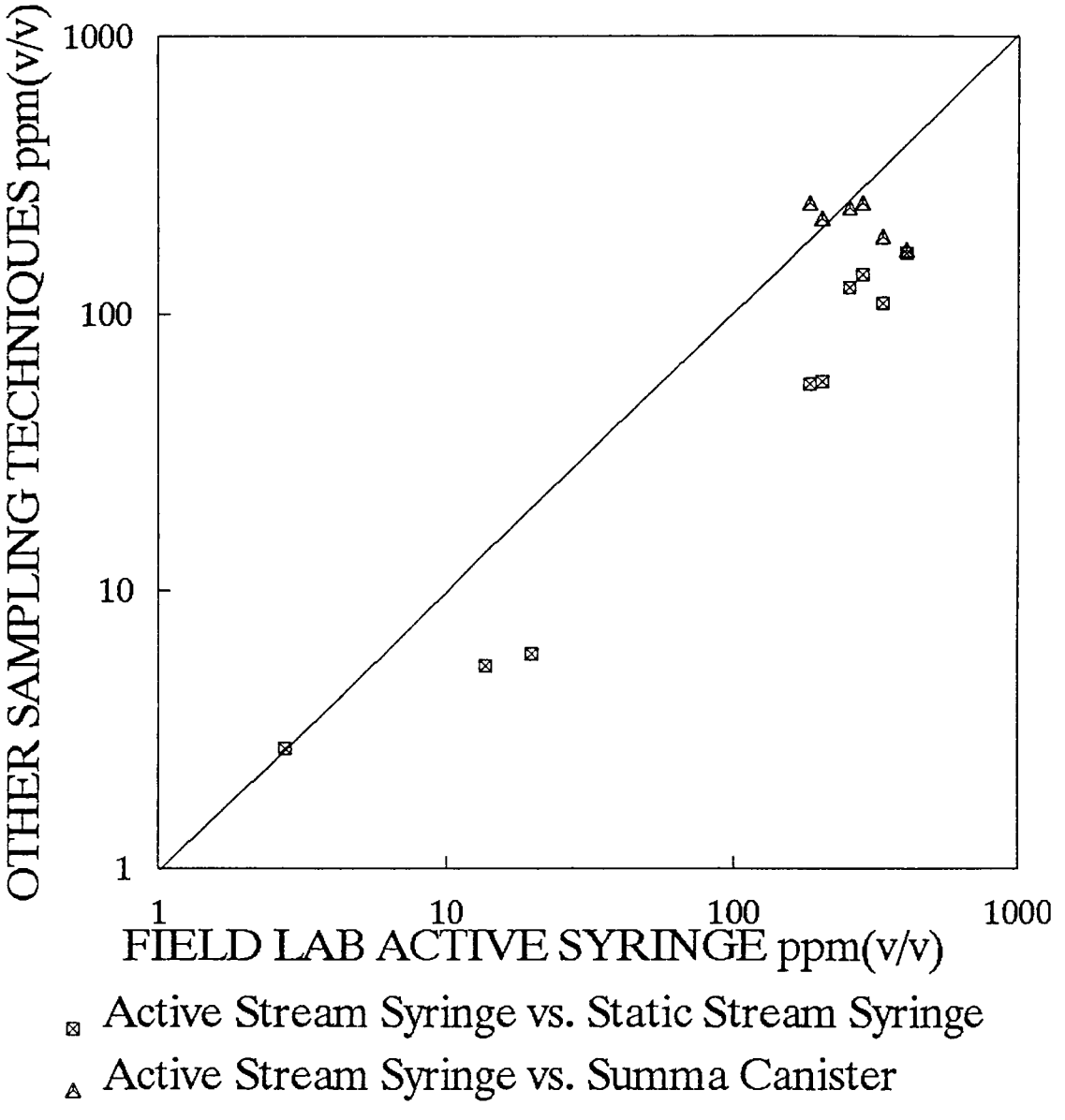


FIGURE 5 – SAMPLE LOCATION SGL0422