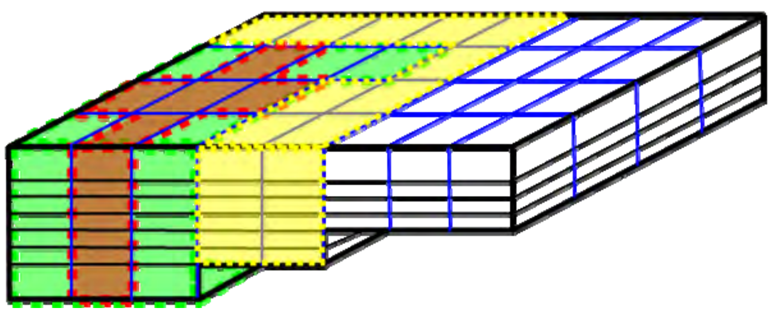
USE OF DECISION UNIT AND MULTI-INCREMENT SOIL SAMPLE INVESTIGATION APPROACHES TO CHARACTERIZE A SUBSURFACE SOLVENT PLUME

SITE CG110

HICKAM AIR FORCE BASE,

HONOLULU, HAWAI‘I



Hawai‘i Department of Health

Hazard Evaluation and Emergency Response Office

Site Discovery, Assessment, and Remediation Section

919 Ala Moana Blvd., #206

Honolulu, HI 96814

March 2011

ACKNOWLEDGEMENTS

This project was funded under a USEPA grant to the Hawai‘i Department of Health (HDOH), Hazard Evaluation and Emergency Response Office (HEER). The USEPA's continued support of HEER office efforts to develop improved guidance for the investigation, evaluation and remediation of contaminated sites is invaluable. The design and implementation of the project represents the collaborative effort of multiple private entities, individuals and government agencies. The individuals involved in early discussions of the project in Hawai'i and on the mainland US are too numerous to fully acknowledge. Their input was critical, however, and they will recognize many of the ideas discussed over phone calls, emails and during environmental conferences in the details of the study.

In particular, the HEER office wishes to acknowledge the following individuals for their input and assistance in the final design, field implementation and interpretation of the final project:

Chuck Ramsey (EnviroStat, Inc.; project co-manager; design, implementation and evaluation),

Alan Hewitt (Army Corps of Engineers; investigation design),

Bill Grannis (Hickam Air Force Base, Honolulu; project point of contact and field documentation),

Pete Lee (Hickam Air Force Base, Honolulu; legal support for Right-of-Entry Agreement),

Fenix Grange (HEER Office SDAR Supervisor, overall project support),

Lynn Bailey (HEER Office; field logistics, design, implementation and evaluation),

Eric Jensen (Tetra Tech, Inc.; project design and contract management),

Marvin Heskett (Test America-Honolulu; sample collection and laboratory analysis),

Kevin Rogers (Geo-Tek Hawai`i, Inc.; borehole installation and sample collection),

Scott Duzan and Rosiland Selbach (Tetra Tech, Inc.; field logistics and implementation),

Tomas Hernandez (Prudent Technologies, Inc.; field assistance).

We would also like to acknowledge the previous investigations conducted at the site by CH2M HILL and other consultants, and discussions with their staff on the design of the study. Roger Brewer and John Peard co-managed the project on behalf of the HEER office. They can be contacted at roger.brewer@doh.hawaii.gov or john.peard@doh.hawaii.gov for additional information on this project.

Executive Summary

Study Overview

A shallow area of trichloroethylene (TCE)-contaminated soil was investigated using Decision Unit (DU) and Multi-Increment Sampling (MIS) techniques. The targeted soil is situated at and below the water table and coincides with a plume of TCE and related contaminants in both groundwater and soil gas. The study was designed to help develop more efficient, accurate and cost-effective approaches for the investigation and ultimately *in situ* remediation of subsurface contamination. Although the study focuses on the investigation of volatile organic compounds (VOCs), the approaches described could be applied to non-VOC contamination as well.

In practice, a DU-MIS subsurface investigation would consist of the following steps:

1. Identify the area of concern (e.g., lateral and vertical estimation of the primary release area);

2. Divide the Decision Unit into appropriately sized, subsurface DU layers (e.g., based on the subsurface geology, suspected contamination distribution and/or optimization of planned, *in situ* remedial actions);

3. Install a large number (ideally 30 or more) of borings spaced in a stratified random manner within the DU area, assuming tabular-shaped DUs that are longer and wider than they are thick;

4. Collect individual, core increments from targeted DU layers in each boring, subsampling each increment at a spacing deemed appropriate for the project (e.g., 5-gram plugs collected every 2 to 12 inches) and preserving the extracted soil in methanol;

5. Combine subsampled core increments into MI samples for individual boreholes and targeted DU layers, either in the field or in the laboratory;

6. Use Specific Ion Monitoring (SIM) to analyze MI samples and reduce the method reporting level for targeted VOCs;

7. Use MIS data for individual boreholes and DU layers to identify the lateral and vertical location of subsurface contamination;

8. Use MIS data to estimate the total contaminant mass for the DU volume of soil within selected subareas of the plume (e.g., 100%, 95% and 80% contaminant mass areas);

9. In cases where individual core increments are preserved in methanol, consider alternative combinations of increment extracts to provide more focused data for key areas of the subsurface plume (e.g., use to further optimize design of *in situ* remedial actions).

As described in this report, determining the mean concentration of targeted contaminants in both boreholes and DU layers allows the lateral and vertical location of the plume core to be quickly identified. Testing of individual core increments collected within each borehole (and by analogy within each DU layer), as might be done in a traditional, discrete sample investigation, is not necessary, since only the *mean* concentration of VOCs within the boreholes and DU layers is needed to determine this information. The resulting MIS data also allow estimation of the mass of VOCs present for the plume as a whole or for smaller, core areas of the plume. This type of information is key to the success of *in situ* remedial actions.

Making both discrete data and MI data available for select sites is very useful for research and training purposes, however. Doing so allows the reader to evaluate the pros and cons of each approach, as well as compare the time and effort required in the field and ultimately the total cost. In the approach described above, each core increment can be thought of as an individual, discrete sample. Although not necessary for the ultimate goal of this project—identifying the location and mass of subsurface contaminants—a decision was made to analyze each core increment separately and generate a comparative set of discrete sample data. The discrete sample data could then be used to both generate “synthetic” MI sample data (i.e., by averaging discrete sample data for individual boreholes and DU layers) and to compare to MI sample data that was actually collected for the site. Actual MI samples were in fact only prepared for select boreholes and DU layers. The resulting data set should in particular help understand the pitfalls of using too few discrete data points to design *in situ* remediation of subsurface contamination.

Decision Unit Designation and Sample Collection

Soil from the top of the water table (approximately 6 feet below ground surface) to the top of an underlying volcanic tuff formation that forms the base of the plume 15 to 25 feet below ground surface was designated as the Decision Unit. DU soils were further subdivided into seven layers. The presence and thickness of lower DU layers varies across the site due to variations in the depth to the top of the tuff formation. The layers represent sub-portions of the DU volume of soil that were to be investigated separately, but combined to make decisions about the DU as a whole.

DU Investigation and MI Sample Preparation

Twenty-nine borings were ultimately installed at the project study site within an area of approximately 100,000 square feet. A planned 30th boring was not completed due to a subsurface obstruction. The section of the core that corresponds to a specific DU layer represents an “increment” (“core increment”) for that layer, in the same manner as an increment collected from a designated DU of surface soil. DU layer increments were too large for individual preservation or combination and had to be subsampled in the field. An increment was subsampled by collecting a series of 5-gram plugs of soil from the core borings at a spacing or “vertical resolution” of 2 inches. Plugs collected from an individual increment were placed in methanol in the field. The core increments for 2-foot-thick DU layers consisted of approximately 12 5-gram plugs of soil collected at a 2-inch spacing, for a total approximate sample mass of 60 grams. Soil plugs were collected at a similar spacing for thicker DU layers, with resulting sample masses up to 120 grams or more.

A total of 164 core increments were subsampled and collected from the targeted DU layers. Replicate sets of increments were collected from three boreholes. This approach allowed for very good, three-dimensional sample coverage of the plume. Use of a small plug spacing and preservation of individual core increments in methanol allowed for the extraction and analysis of very large masses of soil from targeted DU boreholes and DU layers in comparison to traditional, discrete samples. The mass of preserved and extracted soil for individual core increments ranged from 60 to 130 grams. This compares to a standard, 5-gram aliquot mass for a traditional discrete soil sample to be tested for VOCs. The average mass of preserved and extracted soil for boreholes where all seven DU layers were encountered is just over 500 grams. The average mass of preserved and extracted soil for DU layers was approximately 1,000 grams.

MI Sample Preparation, Analysis and Evaluation

In practice, individual core increments would be combined in the field, or extracts of preserved increments would be combined in the laboratory to prepare a single, MI sample for each DU layer and each borehole (total of 7 DU layer samples and 29 borehole samples). The Mi samples would then be analyzed for TCE, *cis* and *trans* dichloroethylene and vinyl chloride. The resulting DU layer and borehole data would then be evaluated to identify the location of the core of the subsurface contamination as well as the concentration, mass and vertical distribution of contaminants within the plume core.

For the purposes of this study, however, each individual core increment was analyzed, and MI sample data were computed by averaging core increment data for targeted boreholes and DU layers. This enables the generation of both “discrete” sample data points and correlative MI sample data for comparison and training purposes. As noted above, the analysis of individual core increments would generally not be necessary, since the objective is to determine the mean concentration of VOCs in the core of each borehole and for the targeted DU layers. This can be most efficiently done by combining individual increments associated with a borehole or DU layer into a single MI sample and then testing the resulting sample.

For this study, borehole and DU layer MI sample data were computed by calculating the arithmetic average of the individual core increment points. The computed borehole and DU layer MI sample data were then used to identify the lateral (borehole data) and vertical (DU layer data) location and mass of the subsurface contamination. Individual borehole MI data were further used to identify portions of the plume that contained 100%, 95% and 80% of the total VOC mass present. In practice, this information could then be passed on to those tasked with *in situ* treatment of the contamination in order to optimize the design of the remediation system (e.g., *in situ* chemical oxidation or thermal treatment).

Related Issues

As discussed in this report, the study included a number of other tasks that were used to evaluate the use of DU and MIS techniques for the investigation of subsurface contamination. These included:

- Preparation of lab-based MI samples for targeted DU layers by combining subsampled methanol extracts of individual core increments, as well as documentation of these laboratory procedures;
- Collection of *field* MI samples (including replicates) for targeted DU layers and DU boreholes for comparison to MI samples computed from individual core increment analyses and to lab-generated MI samples (field MI samples were also used to evaluate optimal vertical resolution of soil plug spacing);
- Collection of replicate core increments to evaluate the precision of methanol extraction for target analytes and evaluate the precision of lab subsampling of methanol extracts;

- Collection of grain-size and total organic carbon data for individual DU layers in order to better understand VOC distribution and partitioning in the subsurface;
- Evaluation of the use of SIM laboratory methods to reduce method reporting limits for samples preserved in methanol;
- Evaluation of laboratory methods for calculation of soil moisture.

Investigation Results

The borehole MIS data were used to define the aerial portions of the plume that contain 100%, 95% and 80% of the total VOC mass. The DU layer MIS data indicate a progressive increase of VOCs mass downward, with the majority of the mass distributed in the more silty and clayey deeper units of the DU. The total mass of VOCs present within the plume area is estimated to be between 10 and 15 kilograms.

The DU and MIS investigation approaches employed were able to identify the location, vertical distribution, representative concentration and core mass of VOCs associated with the TCE plume in a single investigation. This is a substantial improvement over traditional, discrete sample investigations, which typically require multiple mobilizations over an extended period of time and even then tend to significantly underestimate the mass of contaminant present. The use of well-thought-out DUs and provision of a high-quality, three-dimensional network of MIS data allow for a cost-effective and significantly more accurate characterization of subsurface soil contamination. Use of these approaches is anticipated to significantly improve the efficiency and cost effectiveness of subsurface characterizations and remedial actions ultimately conducted at a site.

Table of Contents

Tables

Figures

Appendices

1.0 INTRODUCTION

An accurate estimation of the location, concentration, mass and partitioning of subsurface contamination can be very time consuming and expensive to achieve, yet this type of information is critical for environmental hazard evaluations (aka “risk assessment”) and proper design of *in situ* cleanup actions. An inadequate understanding of these factors can lead to failed remediation and additional time and expense needed to fully treat a contaminated site.

This study looks at the use of “Decision Unit (DU)” and “Multi-Increment Sample” (“MI Sample” or “MIS,” also referred to as “Incremental Sampling”) investigation approaches to expedite and improve the characterization of subsurface contamination. *Multi Increment®* is a registered trademark of EnviroStat, Inc. Although the study focuses on the investigation of volatile organic contaminants (VOCs), the approaches discussed could be applied to nonvolatile and inorganic contaminants as well. Similar but less intensive studies have been conducted in the recent past (e.g., Hewitt et al 2008). The *Sampling and Analysis Plan* prepared for the study provides a detailed overview of the study design and implementation (HDOH 2010).

As discussed below, a relatively small and isolated plume of VOC-contaminated soil located below the shallow groundwater level at Hickam Air Force Base in Honolulu, Hawai‘i was selected for the study. No remedial actions are planned for the site in the near future. The study was designed to address a hypothetical scenario where *in situ* remediation of the core area of the plume was to be conducted. Consequently, the key objectives of the study included: 1) Identify the core area of the plume (i.e., the area that contains 95% of the contaminant mass), 2) Estimate the mean concentration and mass of contaminants present within this area and 3) Evaluate the partitioning of contaminants between dissolved and sorbed phases within the plume. This information would then in theory be used to help design and optimize *in situ* remediation of the plume in the most cost-effective and efficient manner possible.

2.0 STUDY SITE

A shallow, approximately 2-acre plume of solvent-contaminated soil and groundwater at Hickam Air Force Base in Honolulu was selected as the study site (Figure 1). The site is referred to as “CG110” in the Air Force database. The CG110 site was used in the past for aircraft refueling, carburetor cleaning, and other routine aircraft maintenance and is currently used for maintenance and storage purposes.

The water table is situated approximately 6 feet below ground surface (bgs). Groundwater is not considered to be a current or potential source of drinking water. The subsurface is characterized by recent (Holocene) marine sediments (referred to in subsequent sections as “soil” for the purposes of this report), and volcanic units (refer to boring logs in Appendix 1). The upper vadose zone appears to be composed primarily of coralline, dredged fill material. This overlies a coarsening upwards sequence of unconsolidated, fine-grained silts and muds and coralline sands and gravels. The sediment ranges from 10 to 20+ feet in thickness, with a shallow, northeast-southwest trough passing through one area of the site. These units overlie a dense, lithified volcanic tuff. The top of the tuff unit is marked in most areas by a medium-grained, tuffaceous sand layer.

A summary of previous investigations at the CG110 site is provided in the Air Force document *Remedial Investigation Report for Site CG 110* (USAF 2007). Trichloroethylene (TCE) contamination was identified in shallow soil and groundwater. Reported concentrations of TCE and related chemicals in soil, groundwater and soil gas are not indicative of Dense, Non-

Aqueous-Phase Liquid (DNAPL) or “free product” in the immediate vicinity of the site. The release appears instead to be related to past discharges of TCE-contaminated wastewater from cleaning operations into the subsurface (e.g., via breaks in sewer lines or disposal of wastewater on the ground surface).

The primary contaminants of concern are as follows:

- Trichloroethylene (TCE),
- 1,2 *cis* dichloroethylene (DCE), and
- Vinyl chloride.

The breakdown chemical 1,2 trans DCE has only been reported in a small number of samples across the site and is not considered to be a primary contaminant.

Summaries of previous investigation data for groundwater, soil gas and soil are provided in Figures 2, 3 and 4 (after USAF 2007). Figure 5 depicts the primary area of contamination based on the previous data. TCE has been reported in groundwater at concentrations up to 1.9 mg/L (Tier 1 Environmental Action Level [EAL] 360 ug/L), in soil up to 3.9 mg/kg (Tier 1 EAL 0.21 mg/kg) and in soil gas up to 31,000 micrograms per square meter (ug/m^3) (Tier 1 EAL 1,300 ug/m^3). [Tier 1 EALs noted are for unrestricted land use and groundwater that is not a source of drinking water]. Figure 5 depicts the approximate core area of contamination based on previous data. Previous data suggest that the main mass of solvent contamination is situated in the lower half of the sediment and immediately above the tuff unit (see cross sections in Figure 4). Slightly higher levels of VOCs were reported in deeper samples from one boring. The area of deeper contamination is at this point believed to be limited, however.

The reported concentrations of TCE in groundwater and soil gas exceed HDOH EALs for potential vapor intrusion hazards. TCE in the groundwater also exceeds action levels intended to be protective of groundwater discharges to aquatic habitats (e.g., via natural springs or during construction-related dewatering operations). The building most likely to be impacted by vapor emissions from the subsurface is a large, open-ended hangar, however, and actual vapor intrusion hazards under current site conditions are considered to be minimal (refer to USAF 2007). Contaminants in groundwater likewise do not appear to be migrating away from the site at concentrations above levels of concern for potential impacts to aquatic habitats. No further actions are currently recommended for the site, although institutional controls imposed on the site require proper management of soil and groundwater if encountered during future, subsurface construction or utility work. A more detailed vapor intrusion study is also required prior to the construction of new buildings in the plume area.

Estimation of total contaminant mass at the site based on existing subsurface data has been problematic due to limited subsurface soil data and an overreliance on groundwater data. The DU and MIS investigation methods described in this study are intended to explore approaches that can be used to help address these types of problems.

3.0 INVESTIGATION OBJECTIVES

The purpose of the study is to evaluate the use of DU and MIS approaches to investigate and characterize subsurface soils contaminated with VOCs. The primary objectives of the study include: 1) Evaluate use of DU boring MIS data and DU layer MIS data to identify the primary area(s) of concentrated contamination and total contaminant mass present (aka “row and column” approach); 2) Evaluate field subsampling of core increments by collection of regularly spaced plugs from cores; 3) Evaluate advantages and disadvantages of field versus laboratory preparation of methanol-preserved, MI samples; 4) Evaluate use of methanol to preserve relatively large field samples and prepare MI samples for targeted DU layers and DU boreholes; 5) Evaluate the use of specific ion monitoring (SIM) laboratory methods to reduce method reporting limits for samples preserved in methanol; 6) Generate a three-dimensional set of corresponding MI sample data and discrete sample (core increment) data for future training and demonstration purposes; and 7) Use grain-size and total organic carbon data from DU layers to help evaluate the partitioning of contaminants between dissolved and sorbed phases within the plume.

As described below, soil from the water table (approximately 6 feet bgs) to the top of an underlying, volcanic tuff formation was designated as the vertical dimension of the DU. The DU soil was further subdivided into seven layers. The DU layers represent portions of DUs that are investigated separately but combined to make decisions about DU soil as a whole. Twenty-nine borings, located across the site in a stratified random manner, were installed through the DU layers. Soil increments were collected across each targeted DU layer in each boring.

There are three ways to estimate the mean contaminant concentration and ultimately the contaminant mass within a targeted DU layer of soil. These include: 1) Collection of approximately 30 or more increments of soil from the targeted DU layer and combination of the increments in methanol in the field to prepare a MIS for analysis, 2) Collection and preservation of approximately 30 or more individual core increments of soil from the targeted DU layer, followed by combination of subsamples of methanol extracts from individual core increment sample containers at the laboratory to prepare a MIS for analysis, and 3) Collection and preservation of approximately 30 or more individual increments of soil from the targeted DU layer, followed by the analysis of each individual increment at the laboratory and use of statistical methods to estimate a representative mean.

From an investigation standpoint, the latter approach is not cost effective nor recommended, since the stated objective of the study is to estimate a mean contaminant concentration for targeted DU layers and DU boreholes. By definition, the concentration of a contaminant at any given, individual point within a DU does not need to be determined, nor does the variability of concentrations between individual points (refer to Section 3 of the HEER office TGM; HDOH 2009). As described in this study, properly designed DUs and the field- or lab-based preparation of MI samples, will most cost-effectively meet the stated investigation objectives. An evaluation of the advantages and disadvantages of the field versus laboratory preparation of MI samples was therefore one of the primary objectives of this study.

The use of MIS versus discrete sample approaches to investigate subsurface contamination is a newly evolving field, however, and the project team anticipated the need for comparison of MI and discrete data for future discussion and training purposes. Due to the desire to provide a comparable set of “discrete” sample data, each individual core increment collected during the study *was* in fact tested (Appendix 1). This negated the need to prepare MI samples for every DU layer and borehole, since MI samples could be generated by computing the arithmetic average of corresponding, individual increments. Field and lab-based MI samples were prepared for selected DU layers, however, in order to gain experience and obtain data regarding their anticipated use for future investigations. This assumes that the laboratory evaluation of multiple, discrete samples (i.e., core increments) will be comparable to a single sample prepared by combining the same increments. As discussed in this report, data for Field MI samples, laboratory-prepared MI samples and MI data calculated as the averaged individual core increment samples for the same, target DU layer were in good agreement.

The results of the project will be used to update and expand HDOH guidance for the investigation of subsurface contamination. In particular, it is anticipated that the use of DU and MI sampling approaches will help increase the quality and reduce the cost of subsurface investigations, improve the accuracy of site-specific environmental hazard evaluations, and help optimize the design of remedial options.

4.0 DECISION UNIT AND DU LAYER DESIGNATION

The study area DU encompasses the primary extent of TCE contamination previously identified at the CG110 site (Figure 2; approximately 100,000-square-foot area). Soil from the top of the groundwater (approximately 6 feet bgs) to the top of an underlying, volcanic tuff formation is designated as the vertical dimension of the DU. Contamination in the vadose zone that could be associated with primary release areas was not identified in previous investigations. Soil samples were only collected in the vadose zone as part of a soil moisture evaluation in the study. Based on cross sections provided in previous reports, the total volume of soil included in the DU is estimated to be 70,000 cubic yards (see Table 1).

The DU soil was subdivided into seven DU layers that range in thickness from 2 to 4+ feet (refer to cross sections in Figure 4):

- Layer A (DUL-A): 6 to 10 feet bgs;
- Layer B (DUL-B): 10 to 12 feet bgs;
- Layer C (DUL-C): 12 to 14 feet bgs;
- Layer D (DUL-D): 14 to 16 feet bgs;
- Layer E (DUL-E): 16 to 18 feet bgs;
- Layer F (DUL-F): 18 to 20 feet bgs;
- Layer G (DUL-G): 20+ feet bgs to top of volcanic tuff unit (anticipated maximum depth 25 feet bgs).

As discussed in the next section, investigation of the DU layers was conducted by the installation of direct-push borings.

5.0 BORING INSTALLATION AND SAMPLE COLLECTION

5.1 BORING LOCATION AND SPACING

The target media is subsurface soil. From a three-dimensional perspective, the DU layers are very thin tablets, up to 400 feet long and 200 feet wide but only 2 to 4 feet thick. The investigation of tablet-shaped DUs requires good lateral coverage of sampling points in order to adequately capture the distribution of contaminants within the targeted soil. From an MIS perspective, this would ideally be accomplished through the collection of individual soil increments from 30 to 50+ sampling locations laterally dispersed across each DU layer in the decision unit (HDOH 2009).

For the purposes of this study, the investigation of DU layers and the DU as a whole was conducted through the installation of 29 borings distributed across the site in a systematic, random fashion (Figure 6; GPS locations of borings provided in Appendix 2). A 30th boring was abandoned due to refusal. Separate core increments were collected from each DU layer within each boring (total four to seven core increments per boring)**.** The type and location of field samples collected from each borehole is summarized in Table 2.

Field activities were conducted from June 14 through June 17, 2010. Twenty-nine borings were successfully installed into the DU layers using a Geoprobe push rig. A planned 30th boring encountered refusal at 2 feet and was abandoned. The depth of each boring, DU layers intercepted, and volume of soil represented by each boring (and DU layer) is summarized in Table 2. A refined cross section that more accurately depicts the top of the tuff unit is provided in Figure 7. The borings confirmed that the top of the tuff unit slopes downward from a shallow platform in the northwest to a localized, 3- to 4-foot-deep depression (possibly representing a small paleo-channel) in the vicinity of Borings 2, 3, 5, 6 and 7. The full set of seven DU layers was only encountered in the northwest portion of the site, within the area of the depression. DU Layers A through D were encountered in all borings (depth to volcanic tuff unit $\geq$16 feet bgs across entire study area). DU Layer E was encountered in Borings 1-20, in the northwest half of the site (depth to tuff >16 feet bgs). Decision Unit layer F was encountered in Borings 1-16, in the northwest half of the site (depth to tuff >18 feet bgs). DU layer G was encountered only in Borings 1-12, in the area of the localized depression (depth to tuff >20 feet bgs).

The upper 6 feet of soil from each boring was described and then discarded, unless used for the soil moisture study. Continuous cores were then collected from a depth of 6 feet to the top of the underlying tuff unit in 4-foot lengths, using a push-drive drill rig and core barrels with acetate liners.

5.2 SAMPLE COLLECTION

The following types of samples were collected from one or more of the boreholes (Table 2):

- DU layer core increment samples (primary);
- DU layer core increment samples (replicate);
- DU layer soil moisture samples;
- Borehole field MI samples;
- DU layer field MI samples; and
- Total organic carbon (TOC) and grain size field MI samples.

The collection of these samples is discussed below.

5.2.1 DU Layer Core Increment Samples

From an MIS perspective, the core retrieved from a targeted, DU layer in a single boring represents the "increment" for the DU layer, similar to increments collected from a surface soil decision unit (Figure 8). Note that increments do not necessarily need to be collected from the same depth *within* a designated DU layer or across the full thickness of the DU layer. Use of a direct-push rig allowed collection of continuous cores and collection of the full interval of targeted DU layers. Ideally, the entire core section of the DU layer would be preserved for preparation of a layer-wide (or borehole) MI sample. As discussed below, this was not practical in this study due to soil volume constraints and the need to preserve the sample in methanol. Core increments were instead subsampled in the field through the collection of regularly spaced, five-gram plugs of soil from the targeted DU layer interval exposed in the core ("core increment (CI) sample"). Soil plugs for individual core increments were combined in methanol in the field (Figure 9).

For the primary CI samples, 5-gram plugs of soil were collected at an interval of one plug per every 2 inches (e.g., total 24 plugs for Layer A for a CI sample mass of ~120 grams; 12 plugs for Layers B through F for a core increment mass of ~60 grams; and 24 plugs for Layer G for a core increment mass of ~120 grams). The plugs of soil were extracted from an exposed core with a modified Terra Core sampling tube by cutting the forward end of the tube at an angle (see Figure 9). Modification of the Terra Core sampling tube was necessary due to the presence of large fragments of coral in the cores, especially in the shallower DUs. Soil plugs for each individual core increment were placed in a jar with an approximately equal mass of methanol. A scale was used in the field to ensure that an adequate mass of soil had been placed in each sample jar.

Field logs for each boring are provided in Appendix 1. A total of 164 core increment samples were collected from the 29 borings, plus replicates. Samples were stored on ice and submitted to the laboratory for preparation and analysis at the end of each day, with the exception of field MI samples that were held on ice until increments from the final boring were collected and added on the fourth and final day of the project. An open-sided tent was set up to provide shade and minimize heating of samples during collection.

5.2.2 Field Preservation of CI Samples

Each separate CI sample from a borehole was field-preserved in methanol in a separate bottle. A premeasured volume/mass of methanol was placed in each bottle by the laboratory, based on the anticipated mass of soil to be collected from each targeted DU layer interval. For example, sample jars for CI samples to be collected from DU Layers B through F contained 60 grams of methanol. Sample jars for CI samples to be collected from DU Layers A and G contained 120 grams of methanol.

As part of this study, each individual CI sample was analyzed for targeted contaminants of concern. This allows for comparison of MIS data versus "discrete" data (i.e., data for single core increments) for future training and research purposes.

5.2.3 Collection of CI Samples from Bottom-Most Layer

The thickness of the lowermost DU layer is noted in the boring logs in Appendix 1 and can be inferred from Table 1. The thickness of the bottom-most layer varied with respect to the depth to the top of the volcanic tuff unit at each individual boring. A targeted layer was considered "present" and sampled only if a minimum of 1 foot of soil was present. A consistent mass of soil was collected from the bottom-most layer, regardless of its actual thickness. This simplified subsampling of the core increments in the field and avoided the need for different sample bottle setups in the field. While this potentially over-weighted the influence of VOC concentrations in core increments from thinner areas of the layers, the resulting bias is not considered to be significant.

5.2.4 Core Increment Replicates

Triplicate core increments were collected from borings 5, 7 and 8 (see Table 1). The second and third replicate samples were collected in the same manner as discussed above for the primary core increment used to compute MI sample concentrations (i.e., 5-gram plugs collected at a 2-inch spacing, with individual samples preserved in methanol; refer to Table 3).

5.2.5 Field DU Layer and Borehole MI Samples

Multi-increment samples were prepared *in the field* for Layers E, F and G, which were anticipated to be the most contaminated layers in the decision unit. MI samples were prepared for DU Layers E and F using cores from Borings 1 through 16. The MI sample prepared for DU Layer G used increments collected from Borings 1-12 (DU Layer G was not encountered in Borings 13-16). Field MI samples were also prepared for the entire core length of Borings 5, 7 and 8 (i.e., combined DU Layers A-G).

Two sets of field MIS samples were collected for these targeted DU layers (E, F and G) and borings (5, 7 and 8). Borehole increments were subsampled in a similar fashion as described above, although alternative plug spacings were used. A plug spacing of 6 inches was used to collect the first set of MI samples. A spacing of 1 foot was used to collect the second set of samples. The 6- and 12-inch spacing for core increment samples were also collected for all borehole sections making up DU Layers E, F and G. Soil plugs collected from corresponding DU layers across boreholes or from targeted boreholes were combined in a single jar containing methanol. This was done to help evaluate the density (i.e., spacing) of soil plugs needed to adequately capture the vertical heterogeneity of contaminant distribution within the targeted DU layers and boreholes, and estimate mean contaminant concentrations and total mass. An increasingly closer spacing of soil plugs should provide an increasingly more representative subsample of a core increment with vertical contaminant heterogeneity. At some point, however, added time and effort (and cost) required to collect additional increments from a core increment will no longer provide significant added value to the resulting data quality. Based on professional judgment for the type of soil (i.e., layered sediment deposited in an aquatic environment), the ideal plug spacing was estimated to be between 2 inches and 1 foot.

The field MI samples were preserved in amber glass, narrow-mouthed sample jars containing a premeasured volume and mass of methanol approximately equal to the anticipated sample mass. This resulted in an average sample mass of 467 grams for each 6-inch-spaced MI sample from DU Layers E, F and G (see Table 3a). The average MI sample mass of the second set of DU layer MI samples, collected at a plug spacing of 12 inches, was 252 grams. The average mass of the individual MI samples collected in Boreholes 5, 7 and 8 was approximately 224 grams for samples collected at a plug spacing of 6 inches and 110 grams for samples collected at a spacing of 12 inches.

5.2.6 Field MI Samples for TOC and Grain-size analysis

An additional set of MI samples was collected for each targeted DU layer and analyzed for TOC (total seven samples). A grain-size analysis was also conducted on each sample. The resulting data were used to help determine how VOCs are partitioned in the soil (e.g., dissolved in groundwater versus sorbed to organic carbon or clay particles). This type of information is especially useful for *in situ* remediation of VOC-contaminated soil and groundwater but is not traditionally collected as a part of site investigations.

5.2.7 Field MI Samples for Soil Moisture analysis

Five MIS samples were collected in the vadose zone (just above the saturated zone) to evaluate laboratory subsampling procedures for soil moisture (see Table 2). The total mass of soil samples collected was between 50 and 100 grams (12 plugs of approximately 5 to 10 grams). The soil plugs were taken from 2-foot lengths of core collected at the vadose zone.

Fourteen samples were also collected to determine moisture content of soils in the saturated zone (see Table 2). Two samples were collected, similar to core increments for VOCs, for each of the seven DU layers. Samples consisted of approximately 5- to 10-gram plugs at 2-inch intervals over the 2-foot length of the selected core increments, for a total mass of approximately 65 to 130 grams.

5.2.8 Laboratory MI Samples

MI samples were prepared in the laboratory for the DU Layers E, F and G and Borings 5, 7 and 8 by combining methanol extracts from individual, CI samples that corresponded to the targeted layers and boreholes. Approximately 20-ml aliquots of methanol were collected and combined from each CI sample associated with the targeted DU Layer A and then analyzed as a single MI sample. As discussed above, the CI-based extracts reflect a vertical plug density/resolution of 2 inches. This resulted in an equivalent aliquot mass of approximately 60 grams per CI sample for DU Layers E and F and 120 grams per CI sample for DU G, a significant improvement over the default mass of 5 grams used for traditional, discrete samples (see Table 3b). The combined aliquots for lab-generated DU Layer E (Boreholes 1-20), F (Boreholes 1-16) and G (Boreholes 1-12) represent an MI sample mass of 1,236 grams, 997 grams and 1,101 grams, respectively (see Table 3a).

The lab-prepared DU layer MI samples were tested for TCE, *cis* DCE, *trans* DCE and vinyl chloride. Observations on the advantages and disadvantages of methods used by the lab to prepare these MI samples will be documented and incorporated into future updates of the HDOH Hazard Evaluation and Emergency Response (HEER) Office *Technical Guidance Manual* (TGM).

Triplicate MI samples were prepared in the lab as described above for the three targeted DU layers (i.e., two additional separate sets of 20-ml methanol aliquots collected and combined from respective CI samples for the selected DU layers). The resulting data was used to evaluate the precision of combining extracts from individual CI sample jars in the laboratory to prepare DU layer MI samples.

6.0 SAMPLE ANALYSIS

Samples tested for VOCs were analyzed for the following target chemicals:

- Trichloroethylene;
- *Cis* and *trans* DCE; and
- Vinyl chloride.

Samples were tested using Method 8260 and SIM. The SIM method requires that a very small number of chemicals be targeted for quantification. This allows an order-of-magnitude reduction in reporting limits in comparison to standard Method 8260 analysis (e.g., 50 ug/kg to 5 ug/kg). Data are reported in wet weight and were not adjusted with respect to the soil moisture analysis results of the project.

Soil moisture analyses were conducted in accordance with Appendix 1 of the *Sampling and Analysis Plan*. Three separate 5-gram subsamples were collected from each of five samples collected for soil moisture and analyzed for soil moisture content using Method SM 2540G. The lab then analyzed all the remaining soil (total remaining mass of each sample, approximately 55 to 80 grams) from each of the five samples as a single sample for comparison.

7.0 DATA RESULTS

7.1 FIELD CORE INCREMENT SAMPLE DATA

A summary of data for individual, field CI samples is presented in Table 4. Laboratory reports are provided in Appendix 3. Data are presented in wet weight. As discussed in the introduction, individual CI samples would not be recommended for analysis as part of a normal subsurface MIS investigation. Individual samples were tested in this study primarily for research and training purposes. Under a typical subsurface MIS investigation, CI samples would be combined in the field and/or in the laboratory to prepare MI samples for targeted DU layers and boreholes. The MI sample data would then be used for decision making purposes. This might include locating the main mass of subsurface contamination for removal or remediation or using alternative combinations of field-preserved CI samples at the lab for better resolution of areas targeted for remediation or further investigation.

A total of 164 primary CI samples were collected and analyzed (see Table 4; replicate CI data presented in the following section). One or more target VOCs was identified in 15 of the 29 borings. Data for 1,2 *trans* DCE are not included in the tables, since this chemical was only identified in a single sample and only marginally above the method reporting limit (MRL) (refer to laboratory reports in Appendix 3). Reported concentrations of total VOCs ranged from less than the reporting limit of 5 to 25 ug/kg (the higher MRL reflects vinyl chloride) to a maximum of 2,750 ug/kg (Sample B5 Layer E). Total VOC concentrations noted in Table 4 were calculated using one-half the MRL for borings where individual VOCs were not detected.

Total VOC concentrations were not calculated for borings where no VOCs were identified above the method reporting limit, since the total would simply represent the sum of one-half of the MRLs and would suggest contamination where no contamination had been definitively identified. Total VOCs were not calculated for Borings 8 and 16, which had detections of only a single VOC marginally above the MRL. The calculated total VOC concentrations for Borings 14, 17 and 20 reflect MRL contributions of 18%, 40% and 22%, respectively (i.e., the estimated total concentrations would be 18%, 40% and 22% lower if non-detects were not considered). The use of one-half the MRL does not significantly affect estimated total VOC concentrations for the remainder of the borings.

7.2 DU LAYER MI DATA (FIELD, LABORATORY AND COMPUTED FROM CORE INCREMENTS)

A summary of VOC data for field- and laboratory-prepared MI samples is presented in Table 5. Field MI samples were collected for DU Layers E, F and G using subsampled core increments from Borings B1-20, B1-16 and B1-12, respectively. Two sets of soil samples were collected for each DU layer, the first utilizing a 6-inch plug spacing and the second utilizing a 12-inch plug spacing.

For comparison, laboratory MI samples were prepared for the same three DU layers by combining and analyzing 20-milliliters aliquots from all individual, methanol-preserved, CI samples. Triplicate MI samples were prepared and tested for each DU layer.

Computed MIS data were calculated for all seven DU layers as the arithmetic average of CI sample data associated with each layer (refer to Table 4). In theory, combination and analysis of aliquots from the same CI increments would have yielded the same data. As discussed earlier, individual CI samples were analyzed primarily for research and training purposes. Averages for DU Layers E through G were calculated using CI sample data for the same borings that the field- and laboratory-based MI samples were collected or prepared from. In general, reported concentrations of VOCs were higher in the laboratory-based and computed MI samples than the field-based MI samples. As discussed later in this report, this may reflect the closer (2-inch) plug spacing used for the CI samples in the lab and computed MI samples, and a resulting better ability to capture contaminant heterogeneity within the cores.

7.3 BOREHOLE MI DATA (FIELD AND COMPUTED FROM CORE INCREMENTS)

A summary of field-based MI sample data for borings B5, B7 and B8 and computed MI sample data for all borings is presented in Table 6. Laboratory-based MI samples were not prepared for boreholes, based on anticipated use of CI sample data to generate computed MI data. Two sets of field samples were collected, the first utilizing a 6-inch plug spacing and the second utilizing a 12-inch plug spacing. The computed MIS data reflect the arithmetic average of individual CI sample data associated with each boring, reflecting a 2-inch plug spacing for subsampling of individual core increments (refer to Table 4). As discussed in the following section, the cause of the variance between VOCs reported in field-based MI samples (6-inch and 12-inch plug spacing) and CI-based samples (2-inch plug spacing) for Borings 5, 7 and 8 is uncertain.

7.4 TOC AND GRAIN-SIZE DATA

Table 7a summarizes grain-size and TOC data for MI subsamples submitted to the TestAmerica Burlington lab for analysis. Table 7b presents the actual mass of particle-size groups (dry weight) for each DU layer with fine-grained sand-, silt- and clay-size particles lumped under a single category for “fines.” The concentration of TOC is also recalculated in terms of the fines fraction of the soil only (used in revised data discussed below). Table 7c shows the relative proportions of “gravel” vs “sand” vs “fines.” Table 7d summarizes the relative proportions of fine sand vs silt vs clays fines with respect to the total fraction of fines in the Burlington lab DU layer data.

A discrepancy between the grain-size distribution reported in the TestAmerica Burlington lab data and observations made in the field was immediately obvious. In the field, the DU layers exhibited a distinct and relatively sharp although transitional increase in fines from the shallow to deeper layers in all borings, with DU Layers A and B dominated by gravels and sand and DU Layers E, F and G containing a significant component of fines. The DU Layers C and D reflected the transition between the upper and lower portions of the sequence. The Burlington lab data, in contrast, suggests a relatively consistent proportion of coarse versus fine material throughout the vertical extent of the DU layers. The data also suggest a much higher proportion of fines in the upper layers than observed in the field.

Based on these observations, HDOH requested that the TestAmerica Honolulu lab conduct a second grain-size distribution sieve analysis on the original MI samples. The results of these analyses are presented in Tables 8a and 8b.

The gain-size distribution masses for the original MI samples were then calculated by adding the DU layer data reported by the Burlington and Honolulu labs (Table 9a). The revised, relative proportion of grain-size distributions is presented in Table 9b. The revised data more accurately reflect boring observations made in the field and are considered to be representative of the overall decision unit. The estimated breakdown of “fines” included in the table is based on the relative proportions of fine sand, silt and clay reported by the Burlington lab (see Table 9b). A revised concentration of TOC in each DU layer was calculated as the concentration of TOC in fines fraction noted in Table 8b times the corrected percentage of fines in each sample (see Table 9b).

As discussed in the next section, the revised grain-size distribution and TOC data are used to help evaluate the partitioning of VOCs between the groundwater, organic carbon and clays within the solvent plume. This type of information can be used to better understand the fate and transport of VOCs in the subsurface as well as optimize *in situ* remedial options. An improved and more accurate laboratory approach for grain-size distribution analysis is also discussed.

7.5 SOIL MOISTURE DATA

A summary of soil moisture data for field MI samples is presented in Table 10. Nineteen large samples (75 to 100 grams) were collected for percent moisture analysis: 14 of these were from subsurface core increments, and 5 were from a vadose zone core increment (4 to 6 feet bgs) just above the water table. For each of the five samples collected in the vadose zone, three 5-gram subsamples were collected for percent moisture analysis. The remaining material for each of these five samples (55 to 80 grams) was analyzed in its entirety to determine the “true” percent moisture determination. The purpose of analyzing three 5-gram subsamples was to measure the precision of percent moisture based on 5-gram subsamples. The purpose of analyzing the remaining material from the five samples was to measure any bias from collecting 5-gram subsamples, when compared to sampling a significantly larger mass.

The precision of the 5-gram subsamples was quite good, with the largest precision error being 11.4% and the average precision error being 9.0%. The bias was also quite good, with the largest individual bias being 18% and the average bias being -0.05%. The bias was not consistent in direction or magnitude (see Table 10).

The results are better than what would be predicted with sampling theory. The predicted relative standard deviation (RSD) for a particle size of 2 millimeters (mm) would be about 17%. It is difficult to make definite conclusions from five samples, and repeating this experiment at another location would be recommended for additional evaluation of the sample mass needed for accurate soil moisture analyses.

8.0 EVALUATION OF REPLICATE DATA

Four types of replicate samples were prepared and evaluated as part of the project (see Table 2):

- DU borehole core increment sample replicates;
- Laboratory DU layer MI sample replicates;
- DU borehole field MI sample replicates;
- DU layer field MI sample replicates.

The DU borehole CI samples and laboratory DU layer MI samples were true replicates, with each replicate sample collected in the same manner as the others. The field MI replicate samples were collected at different increment plug spacings in order to evaluate the effects and added benefit of using a smaller plug spacing. The resulting data are compared to MI sample concentrations computed from the average of individual CI samples collected from the same boreholes and DU layers.

Triplicate CI samples were collected from Boreholes 5, 7 and 8 and individually preserved. All samples were prepared by extracting 5-gram plugs from exposed cores across targeted DU layers at a 2-inch spacing. Replicate CI samples were collected from different areas of the exposed core using the same 2-inch plug spacing as the primary CI sample. A summary of the resulting data is provided in Table 11. The replicate samples displayed very good precision, with the RSD ranging between 2% and 20% in the most heavily contaminated portions of the plume (Table 11b).

Multi-increment samples were prepared in the laboratory for DU Layers E, F and G by combining extracts of methanol from preserved CI samples for corresponding DU layers. To determine the precision of creating the MI samples in the laboratory, the process of combining extracts from individual CI samples was repeated three times for each layer. For data analysis, the sum of all the individual analytes was used. The data for the laboratory-prepared MI samples are presented in Table 12. The replicate samples displayed a very good precision error, with a maximum RSD that ranged from 1.3% to 3.3%.

A comparison of field MI sample data, laboratory MI sample data and computed MI sample data for targeted DU layers and boreholes is provided in Table 13. Replicate field MI samples were collected from DU Layers E, F and G across multiple boreholes. This included Boreholes 1-20 for Layer E, Boreholes 1-6 for Layer F and Boreholes 1-12 for Layer G. An initial MI sample was prepared combining increment plugs from the targeted DU layer across the noted borings at a 2-inch spacing. Two additional MI samples were collected from each layer, one with a subsample plug spacing of 6 inches and one with a plug spacing of 12 inches. Replicate field MI samples were collected from Boreholes 5, 6 and 8. An initial MI sample was prepared combining increment plugs across all DU layers encountered in the borings at a 2-inch spacing (Layers A-G). Two samples were again collected from each borehole, one with a plug spacing of 6 inches and one with plug spacing of 12 inches.

A comparison of data for 6-inch plug spacing field MI samples, 12-inch plug spacing field MI samples, laboratory-prepared MI samples and computed MI samples (representing a 2-inch plug spacing) is presented in Table 13. Laboratory-based MI samples were not prepared for the boreholes. The RSD is used to measure the precision error across all the estimates (except for Borehole 8, due to the low analyte levels). Most of the RSDs are in the 10% range except for Layer E, which is 22.4%. For Layer E, the two samples with greater increment spacing have lower values. This may indicate that for Layer E the greater spacing was not able to capture the distributional heterogeneity and therefore underestimated the true mean concentration. From a risk and even a remediation standpoint, however, the data are considered to be very comparable.

The RSD relative standard difference between the laboratory-prepared MI samples and the computed MI samples for DU Layers E, F, and G is 7.1%, 8.9%, 8.5% respectively. The precision error for laboratory-prepared MI samples, which includes the analytical error, is very good. The computed MI data reflect the combined analytical error for up to 29 analyses and therefore reflect a higher degree of uncertainty than data for the laboratory-based MI samples, which were prepared by combining aliquots from the same sets of CIs. Higher concentrations of TCE (15% to 20%) were reported for lab-prepared MI samples for DU Layers E and F in comparison to computed averages for the same DU layers. In contrast, vinyl chloride was not detected in the lab-based MI samples, while the average concentration reported for the individual CIs was well above reporting limits. The CI-based averages for DU Layer G were very similar to lab-based MI samples, but again vinyl chloride was much lower in the latter. It is feasible that vinyl chloride was lost during the preparation of the lab-based MI samples, but the reason for an apparent increase in TCE is less clear, beyond a combined lab error from the individual CI samples (i.e., TCE consistently under-reported in discrete CI samples).

The close similarity of the field versus laboratory replicate data suggest that preparation of MI samples in the field versus the laboratory will be largely a site-by-site basis, depending on the nature and needs of the subject investigation. The added time and cost of collecting and managing individual CI samples may be desirable if the need for additional combination of samples is anticipated (e.g., to optimize remedial design) or if management of large field MI samples preserved in methanol will be unwieldy. If a recombination of CI samples is not anticipated and field MI samples can be reasonably managed, then the time and effort saved by preparing MI samples in the field will be advantageous. The acceptable range of plug spacing to subsample CIs will also be a site-specific decision, based on the stratigraphy of the targeted subsurface soil and the anticipated distribution of contaminants. If the soil does not contain significant gravel then a thin wedge could also be cut from the entire length of the wedge for 100% vertical coverage of the increment. This approach was not feasible at the subject site due the prevalence of gravel throughout the sediment.

9.0 CHARACTERIZATION OF SUBSURFACE PLUME

9.1 PROJECT DESIGN REVIEW

The objective of this investigation was to estimate the mean concentration and mass of TCE, DCE and vinyl chloride for the targeted DU volume of soil and to evaluate the vertical distribution of VOCs within the DU. This was accomplished by vertically subdividing the DU into seven layers and installing 29 continuous core borings into the soil. *Core increment* (CI) samples were collected from each DU layer encountered in each boring.

Multi-increment sample data was prepared by combining CI samples for individual DU layers across boreholes. This was accomplished by combining subsampled core increments in methanol the field, by combing extracts of methanol of individually preserved CI samples for specific DU layers in the laboratory, or by computing equivalent MI sample concentrations as the average of individually preserved and tested CI samples. In practice, preparation of DU layer MI samples would be directly conducted in the field or the laboratory and subsequently analyzed. Individual CI samples were tested as part of this study purely for research purposes and to generate a three-dimensional set of both MI and discrete sample data for comparison.

Total VOCs rather than individual compounds were selected for evaluation due to previous, *in situ* treatment of some areas of the plume that converted some of the TCE to DCE and vinyl chloride. Computed Core Increment MIS data for DU layers are referred to, although in practice data for actual MI samples prepared for each DU Layer either in the field or in the laboratory would be used (see discussions in *Investigation Objectives* [Section 3.0] and *DU Layer MI Data* [Section 7.2]).

9.2 TOTAL DU VOC MASS AND VERTICAL DISTRIBUTION

Table 14a summarizes the estimated mean concentration and mass of total VOCs in each DU layer volume of soil. Total VOC mass is calculated as the estimated mass of the DU layer (in kilograms) multiplied by the estimated mean concentration of total VOCs for that layer (in mg/kg with total mass converted to kilograms; see footnotes at bottom of Table 14). The mean concentration of total VOCs in the DU soil is 153 ug/kg. The total mass of VOCs present is estimated to be 13 kilograms.

As depicted in Figure 10a, total VOC concentrations increase downwards, with the highest mean concentration reported for DU Layer G (476 ug/kg), in the low point of the central trough area and immediately above the underlying tuff unit. Total VOC *mass* is likewise concentrated in DU Layers E through G, corresponding to the more clay-rich sequence of the DU sediments. As noted in Table 14a, 63% of the total VOC mass is present within these DU layers even though they comprise only 26% of the total DU volume. (Note that this estimate of total VOC mass may not fully account for the dissolved-phase mass in DU layers, due to partial drainage of groundwater from cores during sample collection; see the following section.)

Based on this initial DU-MIS evaluation, treatment of DU Layers E through G within the DU area would address the majority of the contaminant mass present. This would restrict the area of treatment to Boreholes 1-20, since these deeper DU layers were not encountered outside of this area. The overlying DU layers within this narrower area of borings most likely contain a significant proportion of the remaining VOC mass, but this cannot be discerned by the MIS data for DU layers alone. As discussed below, a closer look at the borehole MIS data helps to further characterize and isolate the main mass of contamination within the DU area.

9.3 DISTRIBUTION OF VOCS IN 100% VOC MASS AREA

The aerial distribution of contaminants in the subsurface soil can be further refined by reviewing the borehole MIS data for total VOCs. Table 15 summarizes borehole MIS data, sorted with respect to total estimated VOC mass (computed from individually tested CI samples). Again, in practice the MI samples would have been prepared and directly analyzed in the field or in the laboratory, rather than testing of individual increments.

As summarized in Figure 11, 100% of the total VOC mass in soil is captured within an area represented by Boreholes 1-20. This includes the upper four DU layers as suspected, suggesting (based purely on the results of this study) that releases of VOCs to the subsurface were restricted to this area. Based on MI data computed from CI sample for DU layers in these boreholes, the vertical distribution of VOCs within this area is identical to the distribution indicated in Figure 10a with VOC mass again concentrated in the lower, clay-rich sediment. In practice, preserved CI samples could be combined in the laboratory to prepare additional MI sample data for a project. Treatment of DU Layers A through G within this area would address 100% of soil-related VOCs.

Note that that the presence or absence of VOCs in borehole MI samples becomes more sporadic along the perimeter of the 100% plume area (see Figure 11), with isolated, borehole-size “hot spots” adjacent to boreholes with minimal contamination. This reflects the heterogeneity of contaminant distribution within the plume area and especially along the perimeter. Individual, core-size samples from this area may or may not identify contaminants above laboratory detection levels. The same observation is typical of surface soil samples.

Twenty borings were installed within the area of soil that contains 100% of the total VOC mass. Each boring represents a single “increment” collected from either an individual DU layer *or* the full area and volume of DU layers (see Figure 8). Twenty increments of soil, representing the twenty boreholes, were therefore extracted from each DU layer. *A total of 20 increments of soil were likewise collected from the full volume of soil represented by the combined DU layers* *across Boreholes 1-20*. This might seem confusing at first, since a total of 128 CI samples were collected from the individual DU layers within these boreholes (12 to 20 CI samples per DU layer; see Table 2). Individual CI samples cannot be added across DU layers to generate a sum of increments for the total volume of DU soil, however; since one of the requirements of MIS investigations is that *multiple increments cannot be collected from the same point within the targeted soil.* Each boring represents a single increment within the individual DU layers *or* within the combined volume of DU layer soil. Collecting multiple increments at depth from a targeted volume of soil within a single borehole is no more valid than collecting multiple increments from a single location within a surface soil decision unit.

This study used fewer than the 30+ borings recommended in HEER office guidance for MIS investigations (HDOH 2009). The recommendation for 30+ increments per DU (or DU layer) is based primarily on experience with contaminant distribution heterogeneity in surface soils, with a focus on particulate contaminants (e.g., explosives). A smaller number of increments could be adequate for subsurface soil investigations associated with dissolved-phase dispersal of contaminants via groundwater, as is the suspected case for this study. This hypothesis has not been evaluated in detail, however.

9.4 DISTRIBUTION OF VOCS IN 95% AND 80% VOC MASS AREAS

The use of a smaller number of boreholes (and consequently, increments) to characterize subsurface soil impacted by dissolved-phase dispersal of contaminants has not been studied in detail at this time. At least for a screening-level evaluation, however, the borehole and DU layer MI data from this study are useful to further focus in on the core area of contamination.

As noted in Table 15 and Figure 11, 95% of the total VOC mass is captured by 16 borings and includes just half the volume of soil required to capture 100% of the contamination. 80% of the total VOC mass is captured in just five borings and just 30% of the total volume of impacted soil.

In practice, the vertical distribution of VOCs within the 95% and 80% VOC mass areas could be more closely evaluated by asking the laboratory to prepare additional DU layer MI samples from individually preserved CI samples collected from corresponding boreholes (i.e., by combining aliquots from associated CI samples). All of the CI samples were analyzed as part of this study. MIS data for DU layers within subsets of boreholes associated with the 95% and 80% VOC mass areas were therefore computed as the average of corresponding CI samples. The data for DU layers that varied in thickness between boreholes are weighted with respect to the representative DU layer volume and mass (i.e., CI samples from thicker areas of Layer G are weighted more heavily than CI samples from thinner areas). This did not make a significant difference in the resulting data (refer to table footnotes and discussion under *Lessons Learned* [Section 10.0]).

Table 16 and Figures 10a,b and c summarize the variance in DU layer VOC concentrations with respect to the full investigation area and progressively smaller plume areas (i.e., 100%, 95% and 80% contaminant mass areas; see Figure 11). Contaminants are again concentrated within the lower three DU layers, as was the case for the DU soil as a whole. Contaminants appear to be somewhat more concentrated in DU Layer G within the 80% VOC mass area, although the difference is not significant.

Contaminant distribution becomes significantly heterogeneous at the scale of individual CI samples, similar to what is typically observed in discrete samples of surface soil. Figure 10d depicts the vertical distribution of total VOCs between adjacent boreholes in the core area of contamination (Borings 2, 6 and 10). As expected, individual increments from single borings are poor indicators of contaminant distribution for the targeted volume of soil as a whole. A very limited number of borings, and consequently of increments of soil collected from individual DU layers within these areas, can lead to a false interpretation of contaminant distribution. As is the case for MI samples in general, a minimum of 30 increments is desirable to adequately capture contaminant heterogeneity and mean concentration within a targeted DU volume of soil.

As expected, total VOC concentrations in the targeted DU layers increase within the core of the plume (compare the estimates for 100% contaminant mass area to 80% contaminant mass area in Table 16). This is especially apparent by comparing representative VOC concentrations for the combined DU Layers A through G across the study area as a whole versus the core plume area that contains 80% of the total contaminant mass.

9.5 ADDITIONAL INVESTIGATION AND REMEDIAL ACTIONS

The type of DU-MIS investigation described in this study might prove to be a very useful step for initial identification of a subsurface "spill area," as defined in the HEER office *Technical Guidance Manual* (HDOH 2009). Once the spill area or some targeted portion of the spill area has been defined, a second DU-MIS investigation within that area might be needed to optimize the design of the remedial action. The need to remediate the full volume of contaminated soil identified at a site versus some subset of the soil will be based on a number of factors, including the type of environmental hazards posed by the contamination (e.g., impacted drinking water aquifer versus more localized, vapor intrusion hazards), the urgency of the treatment (currently used versus potential future use), and the alternative use of engineered or institutional controls, as well as cost.

The resolution of the data collected within the area targeted for treatment—i.e., the number and spacing of increments collected—should be matched to the requirements of the proposed remedial action. For example, *in situ* oxidation or injection of hydrogen-releasing compounds may require a tighter spacing of borings and associated borehole MI samples than thermal treatment, where a single treatment point can affect a very large area. While the *relative* mass distribution of total VOCs across the study site as described above is likely to be accurate, the small number of increments collected within the 80%, 95% and even 100% VOC mass areas risks underestimating the *actual* mass of VOCs present. In addition, and unlike surface soil DUs designated for evaluation of direct-exposure concerns, the actual distribution of contaminants *within* a DU (i.e., heterogeneity) that is designated for *in situ* remediation might be very important.

Once the subsurface area of contamination has been initially delineated, preparation of a comparison table of the estimated, lateral and vertical distribution of VOCs in terms of percent total mass (e.g., 80%, 95% and 100%), with the volumes of soil represented by DU layers, provides a very useful tool for determining (or negotiating) the scope of removal or *in situ* treatment options (Table 17). For example, increasing the targeted treatment area to incorporate 95% versus 80% of the contaminant mass increases the volume of soil to be treated by approximately 70%. This would presumably be accompanied by a similarly significant increase in treatment cost. Further expanding the treatment area to address 100% of the contamination identified increases the volume of soil by another 56% and more than doubles the volume of soil associated with 80% of the contaminant mass. With respect to the vertical distribution of contaminants, focusing on only the most heavily contaminated DU layers (Layers D, E, F and G) would address 77% of the VOC mass within any of the targeted core areas, while reducing the volume of soil that requires treatment by almost 50% in comparison to full treatment of DU Layers A though G.

9.6 PARTITIONING OF CONTAMINANTS BETWEEN SORBED AND DISSOLVED PHASES

Contaminants are assumed to be partitioned within the soil in three states: 1) Sorbed to organic carbon, 2) Sorbed or otherwise bound to clay particles and 3) Dissolved into pore waters (i.e., groundwater). Total organic carbon data as well as data on the clay fraction of the targeted DU layers was collected as part of this study in order to further evaluate this issue (see Tables 9a and 9b). Vapor-phase contaminants are assumed to be not present, since the study DU layers are all below the water table. Reported concentrations of VOCs in soil samples as well as groundwater samples are not indicative of free product or DNAPL at the site (e.g., reported concentrations in groundwater are well below 10% of solubility).

A simple set of partitioning equations can then be used to estimate the sorbed-phase concentration and mass of the contaminant in comparison to the dissolved-phase concentration and mass (e.g., refer to USEPA 2002):

Conc.total (mg/kg) = Conc.dissolved(mg/kg) + Conc.sorbed(mg/kg) + Conc.vapor(mg/kg)

Conc.dissolved (mg/kg) = [Conc.dissolved(mg/L)/soil bulk density(kg/L)] x water-filled porosity

Conc.sorbed (mg/kg) = Conc.dissolved(mg/L)/soil bulk density(kg/L)] x koc x foc

Percent Dissolved = Conc.dissolved/Conc.total

Percent Sorbed = Conc.sorbed/Conc.total

Table 18 summarizes the theoretical partitioning of VOCs in the study site DU layers based on the reported fraction of organic carbon (foc) in the soil (see Table 9b), and the published sorption coefficient (koc) for the target chemical (see Table 18 footnotes) and assuming that vapor-phase VOCs are not present, since the DUs are below the water table. As noted in the table, the majority of the VOC mass is predicted to be present as dissolved-phase contaminants in the groundwater. The proportion of dissolved-phase VOC mass in the groundwater increases as the TOC decreases, especially for more volatile and less sorptive chemicals such as vinyl chloride.

The partitioning of contaminant mass within the soil plays an important role in the selection and design of remedial options. If the majority of the contaminant mass is present in the groundwater, for example, extracting the contaminated groundwater for treatment at the surface might be the most time- and cost-effective action. Experience with pump-and-treat systems has shown, however, that the simplistic partitioning equations used in fate-and-transport models significantly underpredict the proportion of sorbed-phase contaminant mass. This is a root cause of many failed *in situ* remedial actions. A key factor is the hidden sorption of contaminants in aged plumes to clay particles in soil.

This issue would ideally be evaluated through the use of a Synthetic Precipitation Leaching Procedure (SPLP) test to estimate the true sorption of the targeted chemical in the soil, including sorption to both organic carbon and clay particles (HDOH 2007). Unfortunately, SPLP tests were not included as part of this study. An alternative is to use the reported VOC data for soil to predict concentrations of VOCs in groundwater (see the following section), using a similar equilibrium partitioning equation as noted above. A model prediction of significantly higher concentrations of VOCs in groundwater than actually observed at the site would indicate the potential sorption and storage of VOC mass in clays.

9.7 PREDICTED DISSOLVED-PHASE CONTAMINANTS WITHIN PRIMARY PLUME AREA

The following equilibrium partition equation was used to predict concentrations of VOCs in groundwater based on the reported concentrations of VOCs in DU layers and boreholes:

Conc. groundwater = Conc.soil x {soil density/[total porosity + (koc x (TOC x (1kg/1,000,000ug)) x soil density)]},

Where “koc” is the published sorption coefficient for the targeted VOC (see Table 18 footnotes) and TOC is the study-generated TOC for the targeted DU layer, or the average organic carbon within the screened interval of a hypothetical monitoring well. The soil density is assumed to be 1.5, and the total porosity of the soil is assumed to be 0.43 (HDOH 2009, defaults in USEPA screening level models, USEPA 2009).

The predicted concentrations of VOCs in the groundwater in specific DU layers or groups of layers across the study site as a whole are presented in Table 19. This includes data from the southern portion of the study area where VOCs were not detected in soil samples (Borings 21-30). The predicted concentrations of VOCs in groundwater for the full extent of DU layers as well as combined shallow and deep DU layers within the 100%, 95% and 80% contaminant mass areas are also presented.

Concentrations of VOCs in groundwater were also predicted for hypothetical monitoring wells installed at individual boreholes within the primary plume area, based on the average, measured concentration of VOCs in soil for all DU layers encountered in a boring (Table 20; see Computed MI sample data in Table 6, weighted to relative thickness of individual DU layer). This allowed a synthetic groundwater VOC map to be generated (Figure 13).

In general, the predicted concentrations of VOCs in groundwater based on the MI soil data agreed reasonably well with nearby groundwater data actually collected at the site (see Figure 14), with maximum total VOC approaching 4.0 mg/L. A closer comparison is provided in Table 21. Data for six monitoring wells are compared to the estimated concentrations of VOCs in groundwater for those well locations based on nearby, hypothetical monitoring wells.

Although the difference is not large, the estimated concentration of VOCs in groundwater based on soil boring data is, however, consistently higher than that identified in the monitoring wells in five out of six cases. This suggests that VOCs could be binding to clays in the soils rather than partitioning into groundwater in accordance with the standard equilibrium-partitioning equation noted above. The difference could also be due in part to a patchy and heterogeneous distribution of contaminants in the subsurface. This is observed in the discrepancy between heavy contamination identified at Monitoring Well BH-22 from the US Air Force study and the relatively light contamination identified in nearby Borehole 1 from this study. The fact that VOC concentrations in groundwater are lower than predicted in five out of the six monitoring wells seems to support some role for binding of contamination to clays, however. This would need to be confirmed with SPLP tests on soil samples collected from the most contaminated areas of the site.

9.8 PREDICTED VAPOR-PHASE CONTAMINANTS WITHIN PRIMARY PLUME AREA

As discussed in the *Remedial Investigation* (RI) report (USAF 2007), the primary, potential environmental hazard posed by the study area solvent plume is vapor intrusion to existing or future buildings. Soil gas sampling and a risk assessment included in the RI report indicate that vapor intrusion is not a concern under current site conditions. Predicted concentrations of VOCs in groundwater can be used to predict concentrations of VOCs in shallow soil gas across the site. This can be compared to actual site data to help evaluate the accuracy of the groundwater vapor intrusion model used in the risk assessment.

The concentration of VOCs in soil gas immediately above the water table can be determined by multiplying the concentration in groundwater by the Henry's Law constant of the target chemical:

Conc.soil gas = Conc.groundwater x H'.

Vapor emissions are controlled by the uppermost layer of groundwater, in this case DU Layer A (see Figure 7). The predicted concentrations of VOCs in groundwater associated with DU Layer A at the study borehole locations are summarized in Table 22. Note that the concentrations are significantly lower than predicted for the boreholes based on the combined DU layers (Table 19). This is because most of the contamination in the soil is at depth, with only a few exceptions (e.g., Boreholes 1, 3 and 20).

Predicted concentrations of VOCs in soil gas are summarized in Table 23 and compared to actual soil gas data presented in the Air Force's RI report (USAF 2007, 2008). The groundwater vapor intrusion model used by USEPA assumes very limited upward attenuation of VOCs in vadose-zone soil gas. In-house use of the model on the study area site suggested an attenuation of only 1.3 from the top of the water table to the ground surface. As indicated in Table 24, an attenuation of at least one order-of-magnitude is suggested by the actual site data. (Note that the predicted increase in DCE and vinyl chloride in groundwater and soil gas in comparison to the 2007 RI report most likely reflects the result of the *in situ*, reductive dechlorination pilot test conducted at the site in 2008 to 2009 [USAF 2010].)

An over-prediction of vapor-phase VOCs could be due to a flaw in the model, for example a failure to adequately take into account an immediate reduction in VOC concentrations away from the water table due to an increase in effective diffusivity and upward dispersion of VOCs in the vadose zone, in comparison to the much slower rate of diffusion and migration through groundwater (increase estimated to be approximately 50-fold for the study area). Like cars speeding up and spreading out after passing through a toll booth, the concentration of VOCs would be expected to rapidly drop immediately above the top of the water table as they speed upward toward the ground surface. Other potential causes include capillary-zone effects on vapor emission and biodegradation. The observation of lower-than-predicted concentrations of VOCs in vadose-zone soil gas is persistent across sites in the experience of the authors of this study, however. This reinforces the TGM recommendation to collect soil gas data at sites where potential vapor intrusion hazards exist.

10.0 LESSONS LEARNED

10.1 USE OF DU-MIS FOR CHARACTERIZATION OF SUBSURFACE CONTAMINATION

The use of DU and MIS investigation approaches proved to be highly effective for characterization of subsurface contamination at the site. The study focused on VOCs in soil (and groundwater) below the water table. Similar approaches could, however, be used for vadose-zone contamination as well as for semivolatile or nonvolatile contaminants.

As discussed below, DU-MIS data can provide a significant improvement on data quality and added cost-benefit over traditional, discrete sample approaches for characterization of subsurface contamination, especially at sites where *in situ* remediation is planned. The study highlights the need to install a large number (e.g., 30+) of borings within a targeted area in order to gain an accurate understanding of the extent and magnitude of contamination present.

Although data from a smaller number of borings is perhaps useful for delineating subsurface contamination that is easily recognizable in the field, reliance on a small number of borings to estimate representative contaminant concentrations and contaminant mass results in very low confidence of actual site conditions due to the heterogeneous distribution of contaminants in soil and the risk of false negatives. The use of individual borings to define the boundaries of subsurface contamination requires that those boundaries be sharp and easily recognizable, which may or may not be the case depending on contaminant distribution. As was the case for this study, initial screening-level soil data are very useful for designing a full-scale MIS investigation. This issue is discussed in more detail in a HEER office technical memorandum that presents updates and comments on the 2009 *Technical Guidance Manual* (HDOH 2011).

10.2 Cost-Benefit Analysis of DU-MIS Investigations

Subsurface DU-MIS investigations similar to the one described in this study could prove very cost effective at sites where extensive *in situ* remedial actions are planned. The total field and laboratory cost of the investigation was approximately $70,000, including the assistance of three consultants to assist in the project design and field implementation. At medium-size and larger sites, this might represent only a fraction of *in situ* remedial costs, which can easily run several hundred thousand dollars or higher. A thorough DU-MIS investigation should significantly increase the likelihood of a successful remediation.

The field cost includes upfront expenses for utility clearance, permits, field equipment and supplies and other incidentals, drilling, two field contractors and sample preparation and analysis. It does not include the cost for report preparation (prepared in-house by the HEER office). This study benefited from previous investigations that identified the approximate extent of subsurface contamination, which significantly assisted in the final design of the DU-MIS investigation. In practice, at sites that had not been previously investigated, a DU-MIS study would likely be preceded by smaller-scale, exploratory investigations.

The combined use of direct-push drilling methods and field-preserved multi-increment samples resulted in high-quality data at a reasonable cost. Twenty-nine borings were installed to a depth of 15 to 25 feet bgs over a period of three-and-a-half days. Subsurface soils were characterized by unconsolidated, marine clays and gravels with blocks of coral. This allowed for relatively easy drilling (average of 1 hour start-to-finish per boring). Note that drilling costs vary significantly depending on site conditions.

A total of 192 core increment samples were collected from cores and preserved in the field. A minimum of two field staff were required to keep up with the drillers, one to collect the samples and a second to prepare, log and store the containers. Three field staff would be ideal, in order to ensure that sample collection and handling did not impede the speed of drilling. (A second team of samplers was on hand for this study to collect additional sets of MI samples as part of the research aspect of the project.)

In practice, these increments would have been combined in the field and/or laboratory to produce one MI sample per DU layer (7 total) and one MI sample per borehole (29 total), plus replicates (approximately 4), for a total of 40 samples to be initially analyzed by the laboratory for VOCs using SIM methods. Following a review of the initial MIS data to locate the core of the contamination, the laboratory would have been asked to prepare a minimum of one to two additional MI samples from the preserved core increments (e.g., combined DU Layers A, B, C and D and DU Layers E, F and G within the 95% contaminant mass area). The total number of samples to be tested by the laboratory in practice would therefore have been no greater than 50. Individual testing of the entire set of 192 core increment samples in order to generate a comparative set of discrete data at the same field coverage and quality increased the project laboratory cost from approximately $4,000 to $14,000. As is the case for MIS investigations of surface soil, the savings in laboratory costs by moving from discrete samples to MIS samples is significant. Just as important, the use of MI samples in combination with methanol preservation allows a 10- to 100-fold or more increase in the mass of soil extracted for analysis, greatly improving data quality.

In situ treatment of a subsurface VOC plume similar to the one investigated is likely to cost several hundreds of thousands of dollars. The ability to use high-quality MIS data to optimize *in situ* remediation is expected to make investigations similar to the one described in this report very cost effective.

10.3 CHARACTERIZATION OF TARGETED DEPTHS VERSUS TARGETED LAYERS

Traditional, discrete sample investigations typically target specific sample point depths for characterization of subsurface contamination (e.g., every 5 feet). This approach is only valid if the distribution of contaminants at the targeted depth is relatively homogenous at the scale of the discrete sample aliquot (e.g., 5 grams for VOCs). In other words, if the drill were moved over a few feet then the difference in contaminant concentrations collected from another sample would be minimal. The use depth-specific, discrete sample data in this manner also presumes that the sample point is representative of above or below that point. Contaminant concentrations at this scale could easily vary by one to two or more orders of magnitude at this scale for both VOCs and non-VOCs (e.g., Schumacher 2000, Feenstra 2003). The same is true laterally as well.

Significant variations in contaminant levels may not matter in the core of a plume, where contaminant concentrations are significantly above target action levels anyway (Figure 15a, assuming a lognormal distribution of contaminant concentrations at the scale of a discrete sample aliquot). If this is the case then any given sample point will *exceed* the action level and even a small number of discrete samples will identify contamination, although they are likely to underestimate the mean.

If the variance of concentrations at the scale of an individual sample point (or more specifically aliquot mass) straddles the target action level, however, then the chance of a false negative at any given sample point could be very high (see Figure 15b). This leads to a false negative hazard for discrete samples, since a significant proportion of individual sample points are *below* the action level even though the targeted volume of soil as a whole (the mean) exceeds the action level. This helps explain why discrete samples often fail to accurately delineate the boundaries of contaminated soil prior to excavation, resulting in the need for repeated over-excavations based on additional, and often more numerous confirmation samples. This is likely to be the case at moderately contaminated sites or in moderately contaminated soil around the perimeter of a core of heavy contamination, where the mean concentration of contaminants within the targeted volume of soil exceeds action levels but a large percentage of individual points within the volume of soil may be below action levels.

At the other end of the spectrum, the presence of isolated, sample-size “hot spots” outside of the primary area of contamination could lead to the false impression that soil in this area on the whole is contaminated above action levels when in fact the mean concentration of a contaminant in the soil is well below action levels (see Figure 15c). This leads to a false positive hazard for discrete samples, since a significant proportion of individual sample points could fall *above* the action level even though the targeted soil as a whole (mean level) is less than the action level. The potential presence of sample-size, outlier “hot spot” sample points can cause unnecessary confusion over the risk posed by contaminants in the soil, however. This sometimes leads to a misguided attempt to excavate and remove individual sample points.

The above issues highlight the need to base subsurface investigations on targeted DU layers and volumes of soil using MI samples rather than targeted depths using discrete samples. (Note that the same pitfalls of discrete soil samples also apply to surface soil investigations.) With respect to Figure 15, the sample collected from the DU should be representative of the mean of all potential sample points under the distribution curve. A vertical “resolution” of 2 to 4 feet for designation of subsurface DU layers worked well. Designation of DU layers is a very site-specific process, however, and will generally require one or more initial, exploratory investigations to gain a basic understanding of subsurface conditions before a full DU-MIS investigation can be conducted.

10.4 Designation of Subsurface DU Layers

Information from previous investigations was critical for the designation of subsurface DU layers. The earlier studies suggested that contamination was heaviest in the lower half of the sediments and immediately above the underlying tuff unit. There was no indication of contamination in the vadose zone. Subdividing the sediment into seven layers allowed good vertical resolution of contaminant distribution within the main area of contamination. This also allowed a large number of increments to be collected from the core of the plume (95% contaminant mass area, total nine borings and nine core increments per layer). Preparation of a (computed) MI sample from these core increments allowed for a more precise estimate of contaminant mass within the main part of the plume. The number of increments per layer was adequate to refine the vertical distribution of contaminants at the scale of several combined layers (e.g., Layers A through D and E through G; 36 and 27 increments, respectively). This is still sufficient to help optimize remedial options at these types of sites.

10.5 DU Layer Increment Subsample Spacing

The spacing of plugs extracted during subsampling of a core increment could have a significant effect on reported concentration of target contaminants (see also *Comparison of Targeted Depths versus Targeted Layers* [Section 10.3] above). Increasing the density of the increment plug spacing reduces the grouping and segregation error. For this study, there was little difference in data based on 2-inch, 6-inch and 12-inch spacing. This was most likely due to dispersion of TCE in the subsurface as a dissolved-phase contaminant in wastewater released at the site.

As is the case for surface DU-MIS investigations, subsampling of core increments (versus surface soil DUs) is a function of the site investigation objectives and associated data quality objectives (refer to Section 3 of the HEER office TGM). Designation of DU layers for characterization within a core with associated *decision statements* for the anticipated data is an important first step. Core increments extracted from borings should be subsampled in a manner that captures the contaminant heterogeneity within the targeted interval of the core. For example, if the objective of the investigation is to estimate representative contaminant concentration and mass in a targeted DU volume of soil, as was the case for this study, then increment plugs should be evenly spaced within a core and not be biased to areas suspected to be more heavily contaminated (e.g., layers with increased organic carbon and clay content). Doing so would incorrectly bias the resulting data upwards. If the objective of the investigation is to characterize thin zones of suspected heavy contamination (e.g., suspected subsurface layers of ash, tar or other waste), then these specific zones should be designated as DU layers (individual or combined) and cores intentionally subsampled with a bias toward these layers. An understanding of the site history, geology, contaminant fate and transport and other site-related issues is especially necessary to design sampling plans for decision units where access is limited, as in the case of subsurface investigations.

10.6 Preservation of Field Samples or Increments in Methanol

Preservation of MI core increments in methanol is a significant improvement over traditional discrete soil sampling methods for VOCs. Traditional methods ultimately rely on analysis of a very small, 5-gram mass of soil (enough to fill a soda bottle cap) collected from a single point within a borehole to draw conclusions about contaminant concentrations in a length of core up to 5 feet long. This provides very poor coverage and representation of the targeted interval of soil. Preservation of MI samples for core increments in methanol allowed for the extraction of sample masses exceeding 500 grams and up to several kilograms. This significantly improved the quality and representativeness of the data and overall characterization of subsurface contamination.

10.7 Use of Specific Ion Monitoring (SIM)

A drawback of the preservation of soil samples (or core increments) in methanol is the accompanying increase in laboratory detection limits and MRLs. For example, a typical MRL for VOCs using Method 8260 for soil is 5 ug/kg. Dilution of a sample with an equal mass of methanol will raise the MRL by a factor of ten under normal analysis procedures. Using the GC/MS in specific ion monitoring mode allows the equipment to focus on a very narrow range of chemicals, however, resulting in a reduction of detection and reporting limits of a similar magnitude. In this study, the laboratory was generally able to achieve a detection level of VOCs in soil between 5 and 10 ug/kg and a reporting limit between 10 and 20 ug/kg, well within the desirable range for detailed characterization of the subsurface contamination.

10.8 Field- Versus Laboratory-Prepared MI Samples

During preparation of the investigation there was significant discussion in regard to whether MI samples (for an entire DU borehole or DU layer) should be prepared in the field or in the laboratory. If analysis of alternative combinations of increments collected in the field is not anticipated, then preparation of MI samples in the field is clearly more efficient. If analysis of alternative combinations of increments may be desired at some point to improve the resolution of the investigation to areas of heaviest contamination, then preservation of individual core increments in the field (e.g., using methanol for VOCs) followed by combination of increments and preparation of MI samples at the laboratory is required. Additional potential advantages of preparation of MIS in the laboratory include:

- Permits the inclusion of a large mass of soil into the final MIS sample extract without requiring very large sample containers in the field;
- Reduces the chance that spillage, breakage or accidental mixing of a single sample container in the field or laboratory will significantly impact the overall investigation (e.g., breakage of the single MI sample container for a targeted DU layer);
- Allows for a more controlled preparation of MI samples in the laboratory.

Potential disadvantages of preparing MI samples in the lab include added laboratory cost (e.g., typically $75-100 for preparation of an MI sample, in addition to analysis fees), as well as an increased field cost due to the number of samples to store, label, track, ship, etc. Preparation of MI samples from individual core increments must also be weighted with respect to relative thickness and mass of increments if this varies between or within boreholes (i.e., larger extract volume taken from increments that represent longer intervals of strata). Standard methods for preparation of MI samples from methanol-preserved core increments have not been developed. A summary of the approach used for this study will be included in future updates of the HEER Office TGM.

10.9 USE OF BOREHOLE AND DU LAYER MI DATA TO LOCATE AND CHARACTERIZE PLUME CORE

Comparing borehole and DU layer MI samples provides a very powerful and relatively inexpensive method to identify the core area of subsurface contamination. Simply put, the volume of soil encompassed by relatively higher levels of target contaminants in borehole MI samples and DU layer MI samples represents the core of the plume. The borehole data identify the aerial location of the core, while the DU layer data identify the vertical location. The MI data can be further used to define core areas of contamination in terms of the percent of total contaminant mass.

Such an approach should prove especially useful for *in situ* remedial actions. A more refined evaluation of the distribution of contaminants within the core area of the plume might also be possible by the preparation of additional MI samples from preserved core increments at the laboratory.

10.10 COLLECTION OF SOIL SAMPLES BELOW GROUNDWATER

Groundwater fate and transport models and remedial actions for *in situ* treatment of contaminated groundwater rely on an accurate estimate of the total mass of contaminant present. Standard approaches to estimate total mass based on groundwater data and assumed or measured soil TOC data, in conjunction with standard equilibrium partitioning models, can significantly underestimate the total mass of contaminant present. This is seen in the field by constant rebound of contaminants in groundwater following the cessation of pump-and-treat or *in situ* remedial actions. A likely explanation for this problem is the sorption of a significant proportion of the contaminant mass to clay particles in the unit containing the groundwater.

This problem can be overcome by the collection and analysis of MI soil samples directly within a plume of contaminated groundwater. The bulk soil samples, with consideration of groundwater data, will provide a much more accurate estimate of the total contaminant mass present as well as provide information on the partitioning of contaminants between sorbed and dissolved phases. This information can then be used to design and optimize potential remedial actions. For example, if the bulk of the contaminants is in the dissolved phase (i.e., in the groundwater), then pump-and-treat may be the most cost-effective manner to treat the soil. If the bulk of the contaminants are sorbed to soil particles, then *in situ* treatment is likely to be more effective (e.g., injection of oxygen- or hydrogen-releasing compounds). Obtaining grain-size and TOC data is an important part of this process.

10.11 USE OF GRAIN-SIZE AND TOTAL ORGANIC CARBON DATA

Grain-size and TOC data can be very useful for evaluating the distribution of chemicals within a plume of contaminated groundwater (keeping in mind that >65% of a groundwater plume is actually soil). TOC data can be used to initially estimate the proportion of sorbed-phase vs. dissolved-phase contaminant mass in the soil. As described in this report, TOC data can be used in conjunction with soil data to turn soil borings into hypothetical monitoring wells.

Comparison of this data to actual groundwater data, if available, may shed some light on the mass of contaminants that are bound up in clay particles. If the estimated concentration of contaminants in groundwater is significantly less than that measured, then a comparable portion of the contaminants is likely to be bound up in clays. This can be an important factor in the selection and design of remedial actions. Note that standard laboratory methods can also be ineffective for extraction of chemicals that are tightly bound to clay particles, resulting in an underestimation of total contaminant concentrations in soil.

10.12 LABORATORY PROCEDURES FOR GRAIN-SIZE ANALYSIS

The primary laboratory subsampled bulk MI samples for each DU layer in order to prepare aliquots for grain-size analysis. The results proved to be significantly biased toward the finer-grained fraction of the bulk sample. This was due in part to submittal of an inadequately small subsample mass (<100 grams) to the subcontracted lab for analysis. The method used, ASTM D422, calls for a minimum of 500 to 5,000 grams of soil for a sieve analysis, depending on the maximum size of particles (ASTM 1998). A minimum aliquot mass of 65 grams is required for separation of fines into fine-grained sand, silt and clays.

A better approach would be to dry and sieve the *entire* bulk sample into separate gravel (>2 mm), sand (<2 mm to >250 micrometers [um]) and fines (<250 um) fractions at the primary lab. The separated, fines fraction of the sample should then be submitted for further separation into fine sand, silt and clays. If initial sieving yields a fines mass greater than 65 grams, then the fines should be subsampled using MI techniques to prepare a 65-gram aliquot for analysis. This approach will avoid potential error associated with subsampling of the bulk MI sample.

10.13 LAB SUBSAMPLING PROCEDURE FOR SOIL MOISTURE

The results of the limited testing regarding the soil sample mass required for a precise measure of soil moisture revealed that the result of three 5-gram subsamples from each of five vadose zone soil samples agreed quite well with results for a much larger soil mass of the same sample (54 to 88 grams). The RSD of the 5-gram subsamples had an average precision error of 9%. This is a better than expected result based on sampling theory predictions. Repeating this testing on a larger number of samples at other sites is recommended to gain additional data.

10.14 ADDITIONAL OBSERVATIONS

Monitoring Wells and Soil Gas Samples
Monitoring wells should generally not be used for the collection of soil gas samples if the data are to be used to evaluate potential vapor intrusion hazards. Soil gas samples for this purpose

should reflect vapors emitted from VOCs in groundwater at the water table. As demonstrated in this study, VOC concentrations in both soil and groundwater can vary significantly with depth. Mixing of groundwater within a monitoring well will result in a concentration of VOCs that reflects all of the groundwater zones crossed by the well screen (e.g., Britt 2005, Britt et. al 2010). The resulting concentration of VOCs within the well water is unlikely to not be representative of the concentration of VOCs at the top of the water table in general.

For example, if the well screen crosses deeper zones of heavier contamination, then the concentration of VOCs in the water at the top surface could be significantly elevated in comparison to the surrounding water table, with a correlative increase in VOC concentrations in the soil gas within the well casing. If this is the case, then the soil gas within the well casing will not be representative of the vapors being emitted from groundwater across the site as a whole and will overestimate potential vapor intrusion hazards.

11.0 REFERENCES

ASTM, 1998, Standard Test Method for Particle-Size Analysis of Soils: ASTM Designation: D422–63.

Britt, S. L., 2005, Testing the In-Well Horizontal Laminar Flow Assumption with a Sand-Tank Well Model: Ground Water Monitoring and Remediation, Vol. 25, no. 3, p73-81.

Britt, S.L., Parker, B.L. ad J.A. Cherry, A Downhole Passive Sampling System to Avoid Bias and Error from Groundwater Sample Handling: Environmental Science and Technology, Vol. 44, no 13, p.4917-4923.

Feenstra, S., 2003, Spatial Variability of Non-Aqueous Phase Liquid Chemicals in Soil-Implications for Source Zone Mass Estimates: Environmental & Engineering Geoscience, Vol. IX, No. 1, February 2003, pp. 19–23.

Hewitt, A. D., Ramsey, C. and S. Bigl, 2008, Multi-Increment TCE Vadose-Zone Investigation: Remediation. Winter 2008, p. 125-140.

HDOH, 2007, Use of laboratory batch tests to evaluate potential leaching of contaminants from soil (April 2007): Hawai‘i Department of Health, Office of Hazard Evaluation and Emergency Response, http://www.hawaii.gov/health/environmental/hazard/eal2005.html

HIDOH, 2009, *Technical Guidance Manual*: Hawai’i Department of Health, Office of Hazard Evaluation and Emergency Response, http://www.hawaiidoh.org/

HDOH, 2010, Sampling and Analysis Plan, Subsurface Investigation of VOC Contamination, Site CG110, Hickam Air Force Base, Honolulu, Hawai‘i (June 10, 2010): Hawai’i Department of Health, Office of Hazard Evaluation and Emergency Response.

HDOH, 2011, Technical Guidance Manual Notes: Decision Unit and Multi-Increment Sample Investigations (February 2011): Hawai’i Department of Health, Office of Hazard Evaluation and Emergency Response, http://www.hawaiidoh.org/

Schumacher, B.A. and M.M. Minnich, 2000, Extreme Short-Range Variability in VOC-Contaminated Soils: Environmental Science and Technology, Vol. 34, No. 17, pp 3611-3616.

USAF, 2007, Final Remedial Investigation Report for CG110, Hickam Air Force Base (March 9, 2007): U.S. Air Force, 15th Airlift Wing, Environmental Restoration Program (prepared by CH2M HILL, Honolulu, Hawai‘i).

USAF, 2010, Summary of Bioaugmentation Monitoring, September 2009, Site CG110 (April 2010): U.S. Air Force, 15th Airlift Wing, Environmental Restoration Program (prepared by CH2M HILL, Honolulu, Hawai‘i).

USEPA, 2002, Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites: U.S. Environmental Protection Agency, Solid Waste and Emergency Response, OSWER 9355.4-24, December 2002, http://www.epa.gov/superfund/resources/soil/ssg_main.pdf

USAF, 2008, Final Remedial Investigation Report for CG110, Hickam Air Force Base (May 8, 2008): U.S. Air Force, 15th Airlift Wing, Environmental Restoration Program (prepared by CH2M HILL, Honolulu, Hawai‘i).

USEPA, 2009, Screening Levels for Chemical Contaminants: U.S. Environmental Protection Agency, prepared by Oak Ridge National Laboratories, http://www.epa.gov/region09/waste/sfund/prg/

TABLES

Table 1. DU layers encountered in borings and estimated DU layer volume.

Boring #	Total Depth Sampled (feet bgs)	Approximate Volume of Soil Represented by Boring (yds^3)	Decision Unit Layers Encountered and Sampled ("1" = "Yes") Layer A (6-10'bgs)	Layer B (10-12' bgs)	Layer C (12-14'bgs)	Layer D (14-16'bgs)	Layer E (16-18'bgs)	Layer F (18-20'bgs)	Layer G (20'+ bgs)	Total Number of CI Samples
B1	22	2,904	1	1	1	1	1	1	1	7
B2	24	3,267	1	1	1	1	1	1	1	7
B3	22	2,904	1	1	1	1	1	1	1	7
B4	22	2,904	1	1	1	1	1	1	1	7
B5	24	3,267	1	1	1	1	1	1	1	7
B6	23	3,085	1	1	1	1	1	1	1	7
B7	25	3,448	1	1	1	1	1	1	1	7
B8	22	2,904	1	1	1	1	1	1	1	7
B9	22	2,904	1	1	1	1	1	1	1	7
B10	22	2,904	1	1	1	1	1	1	1	7
B11	22	2,904	1	1	1	1	1	1	1	7
B12	21	2,722	1	1	1	1	1	1	1	7
B13	20	2,541	1	1	1	1	1	1		6
B14	20	2,541	1	1	1	1	1	1		6
B15	20	2,541	1	1	1	1	1	1		6
[1]B16	20	2,541	1	1	1	1	1	1		6
B17	18	2,178	1	1	1	1	1			5
[2]B18	18	2,178	1	1	1	1	1			5
B19	18	2,178	1	1	1	1	1			5
B20	18	2,178	1	1	1	1	1			5
[3]B21	16	1,815	1	1	1	1				4
B22	15	1,633	1	1	1	1				4
B23	15	1,633	1	1	1	1				4
B24	16	1,815	1	1	1	1				4
B25	16	1,815	1	1	1	1				4
[4]B26	(abandoned)	-	-	-	-	-				0
B27	15	1,633	1	1	1	1				4
[3]B28	16	1,815	1	1	1	1				4
[3]B29	16	1,815	1	1	1	1				4
B30	16	1,815	1	1	1	1				4
Total Number of Core Increment Samples:			29	29	29	29	20	16	12	**164**
DU Layer Volume (yds^3):			21,052	10,526	10,526	9,981	7,259	5,807	5,626	**70,778**

Table 2 Notes:

1. Boring 16: Less than one-foot thickness of DU Layer G encountered below 20' bgs to collect separate sample.
2. Boring 18: Less than one-foot thickness of DU Layer F encountered below 18' bgs to collect separate sample.
3. Borings 21 & 28: Less than one-foot thickness of DU Layer E encountered below 16' bgs to sample. Isolated pocket of deeper sediment in Boring 29 not sampled.
4. Borehole 26 abandoned due to obstruction at two-feet bgs.

Table 2. Summary of sampling scheme for each borehole.

Boring #	[1]DU Layer Core Increment (primary)	[2]DU Layer Core Increment (replicates)	[3]Soil Moisture Analysis Samples	[4]Borehole Field MI Samples (6" & 12" spacing)	[5]DU Layer Field MI Samples (6" & 12" spacing)	[6]TOC & Grain Size Field MI Sample
B1	X				X	X
B2	X				X	X
B3	X				X	X
B4	X				X	X
B5	X	X		X	X	X
B6	X		X		X	X
B7	X	X	X	X	X	X
B8	X	X		X	X	X
B9	X				X	X
B10	X				X	X
B11	X				X	X
B12	X				X	X
B13	X				X	X
B14	X				X	X
B15	X				X	X
B16	X		X		X	X
B17	X		X			X
B18	X					X
B19	X					X
B20	X					X
B21	X					X
B22	X					X
B23	X					X
B24	X					X
B25	X					X
[7]B26	-					
B27	X		X			X
B28	X					X
B29	X					X
B30	X					X

Notes:

1. One primary, Core Increment (CI) sample collected from each DU Layer encountered in each borehole using two-inch plug spacing.
2. Triplicate DU Layer core increment subsamples collected from Borings 5, 7 and 8 using two-inch plug spacing.
3. Core increments collected for soil moisture determination in saturated zone from each DU layer in Boreholes B6 and B7. Core increments from vadose zone at 4-6 ft. bgs (immediately above the water table) collected from B6, B7, B16, B17, and B27.
4. Two sets of MI samples representing combined DU layers within a borehole prepared in field for boreholes 5, 7 and 8. First set with six-inch plug spacing, second set with twelve-inch plug spacing per borehole.
5. DU Layer plugs from noted borings combined in methanol from Layers E, F, and G to prepare a single MI sample for that layer. Refer to Table 2 for specific borings included in each DU Layer Field MI sample. Two separate MI samples prepared per layer; first set with six-inch plug spacing and second set with twelve-inch plug spacing.
6. Field MI samples collected from each DU layer using two-inch plug spacing. Grain-size analysis and Total Organic Carbon tests carried out on each bulk DU Layer MI sample.
7. Borehole 26 abandoned due to obstruction at two-feet bgs.

Table 3a. Summary of field and laboratory MI sample mass (wet weight).

*Field-Prepared DU Layer MI Samples	Sample Mass (grams)
Layer E-FMIS-VOC6	508
Layer E-FMIS-VOC12	283
Layer F-FMIS-VOC6	453
Layer F-FMIS-VOC12	234
Layer G-FMIS-VOC6	441
Layer G-FMIS-VOC12	238

*Number at end of ID name indicates plug spacing in inches.

*Lab-Prepared DU Layer MI Samples	Sample Mass (grams)
Layer E lab composite B1-B20 (Rep1)	1,236
Layer F lab composite B1-B16 (Rep1)	997
Layer G lab composite B1-B12 (Rep1)	1,101

*Total mass of individual core increments included in MI sample.

Field-Prepared Borehole MIS Samples	Sample Mass (grams)
B5MIS-VOC6	219
B5MIS-VOC12	100
B7MIS-VOC6	265
B7MIS-VOC12	143
B8MIS-VOC6	188
B8MIS-VOC12	86

*Number at end of ID name indicates plug spacing in inches.

Table 3b. Average mass of subsample collected from borehole core Increment samples across noted DU layer.

DU Layer	***Average CI Sample Mass (grams)**
DU Layer A	127
DU Layer B	61
DU Layer C	63
DU Layer D	61
DU Layer E	62
DU Layer F	62
DU Layer G	92

Table 3c. Borehole core increment mass (wet weight, two-inch plug spacings).

Borehole Core Increment Sample ID	Increment Mass (grams)
B1-A-(MIC-VOC)	132
B1-B-(MIC-VOC)	61
B1-C-(MIC-VOC)	63
B1-D-(MIC-VOC)	64
B1-E-(MIC-VOC)	54
B1-F-(MIC-VOC)	59
B1-G-(MIC-VOC)	56
B2-A-(MIC-VOC)	116
B2-B-(MIC-VOC)	77
B2-C-(MIC-VOC)	87
B2-D-(MIC-VOC)	57
B2-E-(MIC-VOC)	60
B2-F-(MIC-VOC)	54
B2-G-(MIC-VOC)	63
B3-A-(MIC-VOC)	143
B3-B-(MIC-VOC)	76
B3-C-(MIC-VOC)	63
B3-D-(MIC-VOC)	64
B3-E-(MIC-VOC)	58
B3-F-(MIC-VOC)	74
B3-G-(MIC-VOC)	117
B4-A-(MIC-VOC)	119
B4-B-(MIC-VOC)	59
B4-C-(MIC-VOC)	65
B4-D-(MIC-VOC)	72
B4-E-(MIC-VOC)	60
B4-F-(MIC-VOC)	74
B4-G-(MIC-VOC)	76
B5-A-(MIC-VOC)	122
B5-B-(MIC-VOC)	57
B5-C-(MIC-VOC)	62
B5-D-(MIC-VOC)	63
B5-E-(MIC-VOC)	59
B5-F-(MIC-VOC)	72
B5-G-(MIC-VOC)	125
B6-A-(MIC-VOC)	129
B6-B-(MIC-VOC)	50
B6-C-(MIC-VOC)	60
B6-D-(MIC-VOC)	65
B6-E-(MIC-VOC)	64
B6-F-(MIC-VOC)	61
B6-G-(MIC-VOC)	142

Borehole Core Increment Sample ID	Increment Mass (grams)
B7-A-(MIC-VOC)	148
B7-B-(MIC-VOC)	78
B7-C-(MIC-VOC)	64
B7-D-(MIC-VOC)	64
B7-E-(MIC-VOC)	74
B7-F-(MIC-VOC)	53
B7-G-(MIC-VOC)	204
B8-A-(MIC-VOC)	106
B8-B-(MIC-VOC)	59
B8-C-(MIC-VOC)	67
B8-D-(MIC-VOC)	51
B8-E-(MIC-VOC)	62
B8-F-(MIC-VOC)	68
B8-G-(MIC-VOC)	72
B9-A-(MIC-VOC)	122
B9-B-(MIC-VOC)	55
B9-C-(MIC-VOC)	65
B9-D-(MIC-VOC)	50
B9-E-(MIC-VOC)	62
B9-F-(MIC-VOC)	57
B9-G-(MIC-VOC)	59
B10-A-(MIC-VOC)	145
B10-B-(MIC-VOC)	54
B10-C-(MIC-VOC)	58
B10-D-(MIC-VOC)	61
B10-E-(MIC-VOC)	61
B10-F-(MIC-VOC)	61
B10-G-(MIC-VOC)	68
B11-A-(MIC-VOC)	132
B11-B-(MIC-VOC)	66
B11-C-(MIC-VOC)	61
B11-D-(MIC-VOC)	56
B11-E-(MIC-VOC)	57
B11-F-(MIC-VOC)	61
B11-G-(MIC-VOC)	62
B12-A-(MIC-VOC)	99
B12-B-(MIC-VOC)	58
B12-C-(MIC-VOC)	67
B12-D-(MIC-VOC)	62
B12-E-(MIC-VOC)	62
B12-F-(MIC-VOC)	62
B12-G-(MIC-VOC)	57

Borehole Core Increment Sample ID	Increment Mass (grams)
B13-A-(MIC-VOC)	140
B13-B-(MIC-VOC)	69
B13-C-(MIC-VOC)	73
B13-D-(MIC-VOC)	75
B13-E-(MIC-VOC)	67
B13-F-(MIC-VOC)	58
B14-A-(MIC-VOC)	154
B14-B-(MIC-VOC)	60
B14-C-(MIC-VOC)	59
B14-D-(MIC-VOC)	60
B14-E-(MIC-VOC)	60
B14-F-(MIC-VOC)	64
B15-A-(MIC-VOC)	182
B15-B-(MIC-VOC)	55
B15-C-(MIC-VOC)	59
B15-D-(MIC-VOC)	56
B15-E-(MIC-VOC)	59
B15-F-(MIC-VOC)	63
B16-A-(MIC-VOC)	126
B16-B-(MIC-VOC)	61
B16-C-(MIC-VOC)	76
B16-D-(MIC-VOC)	58
B16-E-(MIC-VOC)	61
B16-F-(MIC-VOC)	56
B17-A-(MIC-VOC)	147
B17-B-(MIC-VOC)	65
B17-C-(MIC-VOC)	63
B17-D-(MIC-VOC)	54
B17-E-(MIC-VOC)	66
B18-A-(MIC-VOC)	139
B18-B-(MIC-VOC)	57
B18-C-(MIC-VOC)	57
B18-D-(MIC-VOC)	62
B18-E-(MIC-VOC)	67
B19-A-(MIC-VOC)	128
B19-B-(MIC-VOC)	72
B19-C-(MIC-VOC)	62
B19-D-(MIC-VOC)	57
B19-E-(MIC-VOC)	60
B20-A-(MIC-VOC)	147
B20-B-(MIC-VOC)	58
B20-C-(MIC-VOC)	63
B20-D-(MIC-VOC)	63
B20-E-(MIC-VOC)	62

Borehole Core Increment Sample ID	Increment Mass (grams)
B21-A-(MIC-VOC)	113
B21-B-(MIC-VOC)	65
B21-C-(MIC-VOC)	59
B21-D-(MIC-VOC)	60
B22-A-(MIC-VOC)	59
B22-B-(MIC-VOC)	70
B22-C-(MIC-VOC)	55
B22-D-(MIC-VOC)	54
B23-A-(MIC-VOC)	136
B23-B-(MIC-VOC)	58
B23-C-(MIC-VOC)	59
B23-D-(MIC-VOC)	58
B24-A-(MIC-VOC)	130
B24-B-(MIC-VOC)	68
B24-C-(MIC-VOC)	65
B24-D-(MIC-VOC)	63
B25-A-(MIC-VOC)	125
B25-B-(MIC-VOC)	51
B25-C-(MIC-VOC)	60
B25-D-(MIC-VOC)	60
B27-A-(MIC-VOC)	131
B27-B-(MIC-VOC)	62
B27-C-(MIC-VOC)	55
B27-D-(MIC-VOC)	62
B28-A-(MIC-VOC)	105
B28-B-(MIC-VOC)	52
B28-C-(MIC-VOC)	60
B28-D-(MIC-VOC)	58
B29-A-(MIC-VOC)	90
B29-B-(MIC-VOC)	60
B29-C-(MIC-VOC)	51
B29-D-(MIC-VOC)	74
B30-A-(MIC-VOC)	111
B30-B-(MIC-VOC)	39
B30-C-(MIC-VOC)	56
B30-D-(MIC-VOC)	61

Borehole Core Increment Sample ID	Increment Mass (grams)
B31-A-(MIC-VOC)	121
B31-B-(MIC-VOC)	64
B31-C-(MIC-VOC)	58
B31-D-(MIC-VOC)	54
B31-E-(MIC-VOC)	58
B31-F-(MIC-VOC)	67
B31-G-(MIC-VOC)	50
B32-A-(MIC-VOC)	174
B32-B-(MIC-VOC)	56
B32-C-(MIC-VOC)	73
B32-D-(MIC-VOC)	55
B32-E-(MIC-VOC)	68
B32-F-(MIC-VOC)	61
B32-G-(MIC-VOC)	55
B33-A-(MIC-VOC)	125
B33-B-(MIC-VOC)	61
B33-C-(MIC-VOC)	52
B33-D-(MIC-VOC)	58
B33-E-(MIC-VOC)	66
B33-F-(MIC-VOC)	61
B33-G-(MIC-VOC)	134
B34-A-(MIC-VOC)	119
B34-B-(MIC-VOC)	56
B34-C-(MIC-VOC)	56
B34-D-(MIC-VOC)	54
B34-E-(MIC-VOC)	67
B34-F-(MIC-VOC)	58
B34-G-(MIC-VOC)	106
B35-A-(MIC-VOC)	149
B35-B-(MIC-VOC)	60
B35-C-(MIC-VOC)	65
B35-D-(MIC-VOC)	53
B35-E-(MIC-VOC)	59
B35-F-(MIC-VOC)	55
B35-G-(MIC-VOC)	127
B36-A-(MIC-VOC)	129
B36-B-(MIC-VOC)	58
B36-C-(MIC-VOC)	65
B36-D-(MIC-VOC)	72
B36-E-(MIC-VOC)	59
B36-F-(MIC-VOC)	58
B36-G-(MIC-VOC)	154

Notes

Replicate Sets: (B5-B35-B36); (B7-B33-B34); (B8-B31-B32)

Table 4. Summary of core increment sample data (ug/kg, wet weight).

Sample ID (Boring, DU Layer)	Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride
B1 Layer A	204	<11.4	187	<22.7
B1 Layer B	335	21	271	43
B1 Layer C	133	13	111	<18.9
B1 Layer D	32	<9.30	18.3	<18.6
B1 Layer E	22	<11.0	<11.0	<22.0
B1 Layer F	20	<10.2	<10.2	<20.3
B1 Layer G	22	<10.8	<10.8	<21.5
B2 Layer A	251	<12.9	232	<25.8
B2 Layer B	335	241	86	<15.6
B2 Layer C	658	613	39	<13.7
B2 Layer D	759	663	85	<21.0
B2 Layer E	526	452	64	<20.0
B2 Layer F	22	<11.0	<11.0	<22.0
B2 Layer G	19	<9.47	<9.47	<18.9
B3 Layer A	60	<8.39	<8.39	52
B3 Layer B	45	<7.85	<7.85	37
B3 Layer C	52	<9.51	<9.51	43
B3 Layer D	50	<9.32	<9.32	40
B3 Layer E	55	<10.3	<10.3	45
B3 Layer F	46	<8.07	<8.07	38
B3 Layer G	47	<10.2	<10.2	36
B4 Layer A	-	<10.1	<10.1	<20.2
B4 Layer B	-	<10.2	<10.2	<20.4
B4 Layer C	-	<9.25	<9.25	<18.5
B4 Layer D	-	<8.37	<8.37	<16.7
B4 Layer E	-	<10.1	<10.1	<20.1
B4 Layer F	-	<8.13	<8.13	<16.3
B4 Layer G	-	<7.87	<7.87	<15.7
B5 Layer A	35	<9.87	20.3	<19.7
B5 Layer B	35	<10.4	<10.4	24
B5 Layer C	48	<9.61	18.2	25
B5 Layer D	1,362	180	997	185
B5 Layer E	2,750	1400	1260	90
B5 Layer F	2,728	1770	888	70
B5 Layer G	1,467	868	559	40
B6 Layer A	109	<9.32	85	19
B6 Layer B	119	<12.0	101	<23.9
B6 Layer C	86	32	44	<20.1
B6 Layer D	25	11	<9.18	<18.4
B6 Layer E	42	18	14	<18.7
B6 Layer F	20	<9.77	<9.77	<19.5
B6 Layer G	1,472	486	977	<17.0
B7 Layer A	49	16	<8.11	29
B7 Layer B	786	675	103	<15.3
B7 Layer C	1,378	1190	179	<18.9
B7 Layer D	1,190	1010	171	<18.7
B7 Layer E	905	766	131	<16.1

Table 4. Summary of core increment sample data (ug/kg, wet weight).

Sample ID (Boring, DU Layer)	Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride
B7 Layer F	64	46	<11.4	<22.8
B7 Layer G	12	<5.90	<5.90	<11.8
B8 Layer A	14	5.9	<5.66	<11.3
B8 Layer B	10	<5.12	<5.12	<10.2
B8 Layer C	9	<4.48	<4.48	<8.97
B8 Layer D	12	<5.91	<5.91	<11.8
B8 Layer E	10	<4.81	<4.81	<9.62
B8 Layer F	18	<8.77	<8.77	<17.5
B8 Layer G	26	<8.31	<8.31	18
B9 Layer A	37	<12.3	19	<24.6
B9 Layer B	75	<10.9	58	<21.7
B9 Layer C	113	<9.25	99	<18.5
B9 Layer D	242	130	100	<23.9
B9 Layer E	61	41	<9.64	<19.3
B9 Layer F	129	108	<10.5	<21.1
B9 Layer G	157	137	<10.2	<20.4
B10 Layer A	17	<8.25	<8.25	<16.5
B10 Layer B	145	<11.0	116	24
B10 Layer C	207	14	143	51
B10 Layer D	381	<9.88	57	319
B10 Layer E	748	<9.89	306	437
B10 Layer F	993	<9.87	786	202
B10 Layer G	1,450	<8.79	1230	216
B11 Layer A	14	<4.54	7.3	<9.07
B11 Layer B	82	<9.10	47.6	29.6
B11 Layer C	20	<9.84	<9.84	<19.7
B11 Layer D	21	<10.7	<10.7	<21.4
B11 Layer E	45	<10.5	<10.5	34.5
B11 Layer F	134	<9.87	21.7	107
B11 Layer G	470	<9.63	217	248
B12 Layer A	-	<15.2	<15.2	<30.4
B12 Layer B	-	<10.3	<10.3	<20.7
B12 Layer C	-	<8.98	<8.98	<18.0
B12 Layer D	-	<9.69	<9.69	<19.4
B12 Layer E	-	<9.63	<9.63	<19.3
B12 Layer F	-	<9.68	<9.68	<19.4
B12 Layer G	-	<10.5	<10.5	<21.1
B13 Layer A	-	<10.7	<10.7	<21.5
B13 Layer B	-	<8.75	<8.75	<17.5
B13 Layer C	-	<8.25	<8.25	<16.5
B13 Layer D	-	<7.96	<7.96	<15.9
B13 Layer E	-	<8.97	<8.97	<17.9
B13 Layer F	-	<10.3	<10.3	<20.5
B14 Layer A	29	<9.72	<9.72	19
B14 Layer B	27	12	<9.99	<20.0
B14 Layer C	58	42	<10.2	<20.4
B14 Layer D	129	114	<9.98	<20.0

Table 4. Summary of core increment sample data (ug/kg, wet weight).

Sample ID (Boring, DU Layer)	Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride
B14 Layer E	161	146	<9.97	<19.9
B14 Layer F	55	41	<9.38	<18.8
B15 Layer A	29	16	<8.25	<16.5
B15 Layer B	41	25	<11.0	<21.9
B15 Layer C	30	15	<10.2	<20.3
B15 Layer D	123	107	<10.8	<21.6
B15 Layer E	514	484	19	<20.3
B15 Layer F	1,108	1070	29	<19.2
B16 Layer A	37	19	<11.9	<23.9
B16 Layer B	20	<9.79	<9.79	<19.6
B16 Layer C	16	<7.89	<7.89	<15.8
B16 Layer D	21	<10.3	<10.3	<20.6
B16 Layer E	20	<9.86	<9.86	<19.7
B16 Layer F	22	<10.8	<10.8	<21.5
B17 Layer A	46	<10.2	<10.2	36
B17 Layer B	42	<9.24	<9.24	33
B17 Layer C	34	<9.50	<9.50	25
B17 Layer D	41	<11.2	<11.2	30
B17 Layer E	18	<9.11	<9.11	<18.2
B18 Layer A	-	<10.8	<10.8	<21.6
B18 Layer B	-	<10.6	<10.6	<21.1
B18 Layer C	-	<10.6	<10.6	<21.2
B18 Layer D	-	<9.72	<9.72	<19.4
B18 Layer E	-	<8.92	<8.92	<17.8
B19 Layer A	-	<11.7	<11.7	<23.4
B19 Layer B	-	<8.36	<8.36	<16.7
B19 Layer C	-	<9.74	<9.74	<19.5
B19 Layer D	-	<10.5	<10.5	<21.1
B19 Layer E	-	<10.0	<10.0	<20.0
B20 Layer A	57	10.8	<10.2	41
B20 Layer B	57	<10.3	<10.3	47
B20 Layer C	54	<9.51	<9.51	44
B20 Layer D	63	<9.45	<9.45	54
B20 Layer E	51	<9.76	<9.76	41
B21 Layer A	-	<13.2	<13.2	<26.5
B21 Layer B	-	<9.24	<9.24	<18.5
B21 Layer C	-	<10.2	<10.2	<20.4
B21 Layer D	-	<10.0	<10.0	<20.1
B22 Layer A	-	<10.2	<10.2	<20.4
B22 Layer B	-	<8.53	<8.53	<17.1
B22 Layer C	-	<10.9	<10.9	<21.7
B22 Layer D	-	<11.0	<11.0	<22.1
B23 Layer A	-	<8.82	<8.82	<17.6
B23 Layer B	-	<10.4	<10.4	<20.8
B23 Layer C	-	<10.2	<10.2	<20.4
B23 Layer D	-	<10.4	<10.4	<20.8
B24 Layer A	-	<9.22	<9.22	<18.4

Table 4. Summary of core increment sample data (ug/kg, wet weight).

Sample ID (Boring, DU Layer)	Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride
B24 Layer B	-	<8.85	<8.85	<17.7
B24 Layer C	-	<9.20	<9.20	<18.4
B24 Layer D	-	<9.55	<9.55	<19.1
B25 Layer A	-	<4.81	<4.81	<9.62
B25 Layer B	-	<5.90	<5.90	<11.8
B25 Layer C	-	<4.96	<4.96	<9.93
B25 Layer D	-	<4.99	<4.99	<9.98
B27 Layer A	-	<9.17	<9.17	<18.3
B27 Layer B	-	<9.75	<9.75	<19.5
B27 Layer C	-	<10.8	<10.8	<21.6
B27 Layer D	-	<9.70	<9.70	<19.4
B28 Layer A	-	<5.69	<5.69	<11.4
B28 Layer B	-	<5.83	<5.83	<11.7
B28 Layer C	-	<9.92	<9.92	<19.8
B28 Layer D	-	<10.3	<10.3	<20.6
B29 Layer A	-	<6.65	<6.65	<13.3
B29 Layer B	-	<5.01	<5.01	<10.0
B29 Layer C	-	<5.87	<5.87	<11.7
B29 Layer D	-	<4.07	<4.07	<8.14
B30 Layer A	-	<5.42	<5.42	<10.8
B30 Layer B	-	<7.77	<7.77	<15.5
B30 Layer C	-	<5.35	<5.35	<10.7
B30 Layer D	-	<4.90	<4.90	<9.79

Notes

1. MRL noted in parentheses if VOC was not detected in sample. Total VOCs calculated using 1/2 the MRL for borings where one or more VOCs were detected above the MRL.
2. 1,2 DCE *trans* data not considered; only reported in one sample and only marginally above the method reporting limit.

Table 5. Summary of MI sample VOC data for targeted DU layers (ug/kg, wet weight).

	Sample ID	Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride
DU Layer	**Field-Based MI Sample Data**				
Layer E	LAYER E-FMIS-VOC6	193	120	65	8.3
	LAYER E-FMIS-VOC12	218	141	63	14
Layer F	LAYER F-FMIS-VOC6	287	160	101	26
	LAYER F-MIS-VOC12	273	179	94	<10
Layer G	LAYER G-FMIS-VOC6	450	176	251	23
	LAYER G-FMIS-VOC12	402	94	308	<10
Laboratory-Based MI Sample Data					
Layer E	Layer E lab (Rep1)	312	215	97	<6.6
	Layer E lab (Rep2)	304	209	95	<6.6
	Layer E lab (Rep3)	307	210	97	<6.6
Layer F	Layer F lab (Rep1)	366	236	130	<6.5
	Layer F lab (Rep2)	343	221	122	<6.5
	Layer F lab (Rep3)	352	227	125	<6.5
Layer G	Layer G lab (Rep1)	383	127	249	7.0
	Layer G lab (Rep2)	375	125	243	6.9
	Layer G lab (Rep3)	398	131	257	10
Computed MI Sample Data					
Layer A	-	34	4	20	10
Layer B	-	74	35	28	11
Layer C	-	100	67	23	9
Layer D	-	154	78	51	25
Layer E	-	297	167	92	37
Layer F	-	335	192	111	32
Layer G	-	476	170	263	43

Notes

1. Field-based MI samples collected and prepared in field by combining soil plugs from targeted DU layers across boreholes in methanol. Samples collected for Layers E, F and G only. Duplicate samples collected using a six-inch (VOC6) and twelve-inch plug spacing (VOC12).
2. Laboratory-based MI samples prepared by combining 20 microliter aliquots of methanol from individual CI samples for targeted DU Layers. Samples collected for Layers E, F and G only. Triplicate samples prepared for each layer.
3. MI Samples for DU Layers E , F and G collected from Borings B1-20, B1-16 and B1-12, respectively.
4. MI data computed as average of individual Core Increment samples collected in targeted DU layers and reflect two-inch plug spacing. Averages calculated for all layers. Averages for DU Layers E-G calculated using same borings as noted above to allow comparison with field-based and laboratory-based sample data.

Table 6. Summary of MI VOC sample data for targeted borings (ug/kg, wet weight).

DU Layer	Sample ID	Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride
	[1,3]**Field-Based MI Sample Data**				
Boring 5	B5MIS-VOC6	1,424	698	656	70
	B5MIS-VOC12	1,463	749	638	76
Boring 7	B7MIS-VOC6	526	436	74	16
	B7MIS-VOC12	522	436	75	11
[4]Boring 8	B12MIS-VOC6	32	<6.4	<6.4	26
	B12MIS-VOC12	30	<7.0	<7.0	23
	[2,3]**Computed MI Sample Data**				
Boring 1	-	110	8.5	86	15
Boring 2	-	367	284	74	10
Boring 3	-	51	4.5	4.5	41
Boring 4	-	54	5.1	5.1	44
Boring 5	-	1,203	605	535	63
Boring 6	-	267	80	176	11
Boring 7	-	626	529	85	12
[4]Boring 8	-	14	3.5	3.1	7.5
Boring 9	-	116	62	44	11
Boring 10	-	563	6.1	377	180
Boring 11	-	112	4.6	44	63
Boring 12	-	nd	nd	nd	nd
Boring 13	-	nd	nd	nd	nd
Boring 14	-	76	60	4.9	11
Boring 15	-	307	286	11	10
Boring 16	-	22	7.3	5.0	10.1
Boring 17	-	36	5	4.9	27
Boring 18	-	nd	nd	nd	nd
Boring 19	-	nd	nd	nd	nd
Boring 20	-	12	2.0	2.0	7.8
Boring 21	-	nd	nd	nd	nd
Boring 22	-	nd	nd	nd	nd
Boring 23	-	nd	nd	nd	nd
Boring 24	-	nd	nd	nd	nd
Boring 25	-	nd	nd	nd	nd
Boring 27	-	nd	nd	nd	nd
Boring 28	-	nd	nd	nd	nd
Boring 29	-	nd	nd	nd	nd
Boring 30	-	nd	nd	nd	nd

Notes

1. Field-based MI samples collected and prepared in field by combining soil plugs from targeted boreholes in methanol. Duplicate samples collected using a six-inch (VOC6) and twelve-inch plug spacing (VOC12).
2. MI data computed as average of individual core increments collected in targeted DU layers and reflect two-inch plug spacing. Averages calculated for all layers. Averages for DU Layers E-G calculated using same borings as noted above to allow comparison with field-based and laboratory-based sample data.

3. Total VOCs calculated using 1/2 the MRL for borings where VOCs were detected. Refer to Table 4 for MRLs used in synthetic MI sample calculations. Non-Detect ("nd") generally MRLS <10 ug/kg for TCE and DCE and <20 ug/kg for vinyl chloride.

Table 7a. DU layer grain-size distribution and TOC (dry weight) originally reported by TestAmerica Burlington lab for subsampled DU layer MIS samples. Reported distribution did not correlate with a finer soil sequence at deeper layers that was observed in the field, prompting an analysis of the original MI samples. Refer to Tables 8 and 9 for corrected data and text for discussion.

				Fines Subgroups Breakdown			
DU Layer	**Gravel (>2mm)**	**Sand (<2mm)**	**Fines (<250um)**	**Fine Sand (<250um)**	**Silt (<50um)**	**Clay (<2um)**	**Total Organic Carbon (mg/kg)**
Layer A	50.5%	16.9%	32.6%	8.1%	15.5%	9.0%	2,250
Layer B	46.1%	17.6%	36.3%	7.3%	17.1%	11.9%	1,690
Layer C	45.2%	14.4%	40.4%	7.7%	18.4%	14.3%	1,570
Layer D	43.7%	16.0%	40.3%	7.3%	16.2%	16.8%	1,500
Layer E	41.1%	12.2%	46.7%	6.5%	19.8%	20.4%	1,710
Layer F	46.7%	10.1%	43.2%	8.7%	19.4%	15.1%	2,610
Layer G	43.7%	15.1%	41.3%	16.5%	15.0%	9.8%	1,900

Table 7b. Mass of particle size groups (dry weight) and total organic carbon and estimated concentration of TOC in fines, based on TestAmerica Burlington data.

Sample ID	**Total Mass (grams)**	**Gravel (>2mm)**	**Sand (<2mm)**	**Fines (<250um)**	**Total Organic Carbon (mg)**	**Concentration of TOC in Fines (mg/kg)**
Layer A	110	56	19	36	248	6,902
Layer B	70	32	12	25	118	4,656
Layer C	114	52	16	46	179	3,886
Layer D	102	45	16	41	153	3,722
Layer E	83	34	10	39	142	3,662
Layer F	86	40	9	37	224	6,042
Layer G	59	26	9	24	112	4,600

1. Assumes 100% of reported Total Organic Carbon in fines.

Table 7c. Particle size distribution based on analysis performed at TestAmerica Burlington using MI subsamples from original samples (dry weight).

DU Layer	MI Subsample Mass (grams)	Gravel (>2mm)	Sand (≤2mm to >250um)	Fines (≤250um)
Layer A	110	51%	17%	33%
Layer B	70	46%	18%	36%
Layer C	114	45%	14%	40%
Layer D	102	44%	16%	40%
Layer E	83	41%	12%	47%
Layer F	86	47%	10%	43%
Layer G	59	44%	15%	41%

Fines = Fine sand + Silt + Clay

Table 7d. Relative proportions of fines to total fines reported by TestAmerica Burlington lab.

		Proportions of Subgroups Relative to Total Fines		
Sample ID	**Total Fines**	**Fine Sand (<250um)**	**Silt (<50um)**	**Clay (<2um)**
Layer A	33%	25%	48%	28%
Layer B	36%	20%	47%	33%
Layer C	40%	19%	46%	35%
Layer D	40%	18%	40%	42%
Layer E	47%	14%	42%	44%
Layer F	43%	20%	45%	35%
Layer G	41%	40%	36%	24%

Table 8a.Grain-size distribution of original MI samples by mass (dry weight) minus subsample sent to Burlington lab.

Sample ID	[1]MI Sample Mass (grams)	Gravel (>2mm)	Sand (<2mm)	Fines (<250um)
Layer A	957	769	97	92
Layer B	910	698	117	95
Layer C	926	602	208	117
Layer D	1,005	601	265	139
Layer E	1,103	651	330	122
Layer F	1,064	543	290	231
Layer G	1,173	587	248	337

1. Minus subsample mass sent to Burlington lab for grain-size analysis.

Table 8b. Particle size distribution of original MI samples, minus subsample sent to Burlington lab.

DU Layer	Gravel (>2mm)	Sand (≤2mm to >250um)	Fines (≤250um)
Layer A	80%	10%	10%
Layer B	77%	13%	10%
Layer C	65%	22%	13%
Layer D	60%	26%	14%
Layer E	59%	30%	11%
Layer F	51%	27%	22%
Layer G	50%	21%	29%

Table 9a. Revised MI sample mass (dry weight) and grain-size distribution based on combined TestAmerica Burlington and TestAmerica Honolulu data.

Sample ID	Total Mass (grams)	Gravel (>2mm)	Sand (<2mm)	Fines (<250um)
Layer A	1,067	824	115	128
Layer B	980	730	130	120
Layer C	1,040	653	224	163
Layer D	1,107	646	282	180
Layer E	1,186	685	340	161
Layer F	1,150	583	299	268
Layer G	1,232	613	257	362

Table 9b. Adjusted particle size distribution and total organic carbon concentration based on combined TestAmerica Burlington and TestAmerica Honolulu data.

				[1]Fines Subgroups Breakdown			
DU Layer	**Gravel (>2mm)**	**Sand (<2mm)**	**Fines (<250um)**	**Fine Sand (<250um)**	**Silt (<50um)**	**Clay (<2um)**	**[2]Total Organic Carbon (mg/kg)**
Layer A	77%	11%	12%	3%	6%	3%	829
Layer B	75%	13%	12%	2%	6%	4%	570
Layer C	63%	22%	16%	3%	7%	6%	610
Layer D	58%	25%	16%	3%	7%	7%	605
Layer E	58%	29%	14%	2%	6%	6%	496
Layer F	51%	26%	23%	5%	10%	8%	1,409
Layer G	50%	21%	29%	13%	4%	12%	1,350

1. Based on relative proportions of fines subgroups reported by TestAmerica Burlington lab (see Table 8c).

2. Calculated as: Concentration of TOC in Fines (Table 8a) x Corrected Percentage of Fines in Sample (this table).

Table 10. Soil moisture data.

Sample Number	Mass (g)	Percent Moisture	Average of five gram aliquots	RSD (%) of five gram aliquots	Weighted average of all samples (%)	Bias
B27-4-6	5.53	25%				-0.03
B27-4-6	5.55	28%				0.09
B27-4-6	6.79	29%	27%	8%	25%	0.14
B27-4-6	80.46	25%				
B7-4-6	5.68	14%				-0.07
B7-4-6	5.14	17%				0.12
B7-4-6	5.85	17%	26%	11%	15%	0.16
B7-4-6	88.8	15%				
B6-4-6	5.77	18%				0.03
B6-4-6	5.16	17%				-0.04
B6-4-6	5.1	17%	17%	4.0%	17%	-0.03
B6-4-6	56.78	17%				
B17-4-6	5.57	19%				-0.18
B17-4-6	5.66	19%				-0.16
B17-4-6	5.6	23%	20%	10%	23%	-0.01
B17-4-6	62.71	24%				
B16-4-6	5.84	17%				0.01
B16-4-6	6.07	20%				0.15
B16-4-6	5.52	16%	18%	11%	17%	-0.08
B16-4-6	54.21	17%				

Table 11a. Replicate data for borehole core increment samples.

Sample ID	Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride
B5 Layer A	35	<9.87	20	<19.7
B5 Layer B	35	<10.4	<10.4	24
B5 Layer C	48	<9.61	18	25
B5 Layer D	1,362	180	997	185
B5 Layer E	2,750	1,400	1,260	90
B5 Layer F	2,728	1,770	888	70
B5 Layer G	1,467	868	559	40
B35 Layer A	42	<8.04	21	17
B35 Layer B	37	<10.1	<10.1	27
B35 Layer C	64	<9.25	27	32
B35 Layer D	1,652	271	1,150	231
B35 Layer E	3,511	1,750	1,500	261
B35 Layer F	4,031	2,610	1,310	111
B35 Layer G	1,526	892	591	43
B36 Layer A	44	<9.33	21	19
B36 Layer B	21	<10.3	<10.3	<20.5
B36 Layer C	50	<9.2	25	21
B36 Layer D	1,315	175	942	198
B36 Layer E	4,327	2,660	1,510	157
B36 Layer F	3,151	2,080	998	73
B36 Layer G	1,524	885	561	<156

Sample ID	Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride
B7 Layer A	49	16	<8.11	29
B7 Layer B	786	675	103	<15.3
B7 Layer C	1,378	1,190	179	<18.9
B7 Layer D	1,190	1,010	171	<18.7
B7 Layer E	905	766	131	<16.1
B7 Layer F	64	46	<11.4	<22.8
B7 Layer G	12	<5.90	<5.90	<11.8
B33 Layer A	47	18	<9.56	24
B33 Layer B	781	662	109	<19.7
B33 Layer C	1,207	1,030	166	<22.9
B33 Layer D	1,263	1,070	179	<27
B33 Layer E	954	801	144	<18.1
B33 Layer F	65	50	<9.89	<19.8
B33 Layer G	18	<8.95	<8.95	<17.2
B34 Layer A	37	22	<10.1	<20.1
B34 Layer B	776	663	102	<21.4
B34 Layer C	1,025	876	138	<21.3
B34 Layer D	1,123	956	156	<22.4
B34 Layer E	903	773	121	<17.8
B34 Layer F	48	<32.8	<10.4	<20.8
B34 Layer G	23	<11.3	<11.3	<22.7

Table 11a (cont.) Replicate data for Borehole Core Increment samples.

Sample ID	Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride
B8 Layer A	14	5.9	<5.66	<11.3
B8 Layer B	10	<5.12	<5.12	<10.2
B8 Layer C	9	<4.48	<4.48	<8.97
B8 Layer D	12	<5.91	<5.91	<11.8
B8 Layer E	10	<4.81	<4.81	<9.62
B8 Layer F	18	<8.77	<8.77	<17.5
B8 Layer G	26	<8.31	<8.31	18
B31 Layer A	13	5.27	<4.95	<9.9
B31 Layer B	10	<4.7	<4.7	<9.7
B31 Layer C	10	<5.18	<5.18	<10.4
B31 Layer D	11	<5.51	<5.51	<11
B31 Layer E	10	<5.19	<5.19	<10.4
B31 Layer F	18	<8.94	<8.94	<17.9
B31 Layer G	48	<11.9	<11.9	36
B32 Layer A	10	4.64	<3.45	<6.9
B32 Layer B	11	<5.37	<5.37	<10.7
B32 Layer C	8	<4.09	<4.09	<8.17
B32 Layer D	11	<5.44	<5.44	<10.9
B32 Layer E	18	<8.95	<8.95	<17.7
B32 Layer F	20	<9.91	<9.91	<19.8
B32 Layer G	53	<11	<11	42

Table 11b. Evaluation of borehole CI sample replicate data (see Table 11a, Total VOCs, in ug/kg).

[1]Sample	B5	B35	B36	Average	[2]RSD
DU Layer A	35	42	44	40	12%
DU Layer B	35	37	21	31	28%
DU Layer C	48	64	50	54	16%
DU Layer D	1,362	1,652	1,315	1,443	13%
DU Layer E	2,750	3,511	4,327	3,529	22%
DU Layer F	2,728	4,031	3,151	3,303	20%
DU Layer G	1,467	1,526	1,524	1,506	2.2%

[1]Sample	B7	B33	B34	Average	[2]RSD
DU Layer A	49	47	37	44	15%
DU Layer B	786	781	776	781	0.01%
DU Layer C	1,378	1,207	1,025	1,203	15%
DU Layer D	1,190	1,263	1,123	1,192	5.9%
DU Layer E	905	954	903	921	3.1%
DU Layer F	64	65	48	59	16%
DU Layer G	12	18	23	18	31%

[1]Sample	B8	B31	B32	Average	[2]RSD
DU Layer A	14	13	10	12	17%
DU Layer B	10	10	11	10	5.6%
DU Layer C	9	10	8.2	9.0	11%
DU Layer D	12	11	11	11	5.1%
DU Layer E	10	10	18	13	36%
DU Layer F	18	18	20	19	6.2%
DU Layer G	26	48	53	42	34%

1. Based on testing of individual core increment samples for noted borehole and target DU Layer.
2. Relative Standard Deviation.

Table 12. Replicate data for laboratory-prepared MI samples (Total VOCs, in ug/kg).

[1]Sample	A	B	C	Average	[2]RSD
DU Layer E	312	304	307	308	1.3%
DU Layer F	366	343	352	354	3.3%
DU Layer G	383	375	398	385	3.0%

1. Prepared by combination of extracts from preserved, core increment samples for noted DU layers (see Table 11).
2. Relative Standard Deviation.

Table 13. [1]Comparison of field, laboratory and computed MI data for total VOCs (Total VOCs, in ug/kg).

Sample	[2,3]Computed MI (2 inch)	[2,4]Laboratory MI (2 inch)	[5]Computed vs Laboratory MI RPD (2 inch)	[2]Field MI (6 inch)	[2]Field MI (12 inch)	[6]Computed vs Laboratory vs Field MI SD
DULayer E	297	308	7.1%	193	218	22.4%
DU Layer F	335	354	8.9%	287	273	12.3%
DU Layer G	476	385	8.5%	450	402	9.8%
Borehole 5	1,203	-		1,415	1,463	10.2%
Borehole 7	626	-		525	522	10.6%
Borehole 8	14	-		26	23	-

1. See Tables 5 (DU layers) and 6 (Boreholes).
2. Increment subsampling plug spacing noted.
3. Computed MI sample data based on average of individually analyzed CI samples for noted DU layers and Boreholes.
4. Average of three Laboratory MI sample replicates prepared by combination of extracts from preserved, core increment samples for noted DU layers (see Table 11b).
5. Relative Percent Difference between computed and laboratory-prepared MI sample data for noted DU layers.
6. Relative Standard Deviation between field, laboratory and computed MI data for Total VOCs.

Table 14. Estimated mass of soil and total VOCs in each DU layer.

a. Total Study DU Area (Boreholes 1-30).

DU Layer	[1]DU Layer Volume (cubic yards)	[2]DU Layer Mass (kg)	[3]Mean Total VOC Concentration (ug/kg)	[4]Total VOC Mass (Kg)	Percent Total Mass	Percent Total DU Volume	Cumulative VOC Mass
Layer A	21,052	25,262,222	34	0.86	6.6%	30%	6.6%
Layer B	10,526	12,631,111	74	0.94	7.2%	15%	14%
Layer C	10,526	12,631,111	100	1.3	10%	15%	23%
Layer D	9,981	11,977,778	153	1.8	14%	14%	38%
Layer E	7,259	8,711,111	296	2.6	20%	10%	57%
Layer F	5,807	6,968,889	335	2.3	18%	8.2%	75%
Layer G	5,626	6,751,111	476	3.2	25%	7.9%	100%
Total:	**70,778**	**84,933,333**	**153**	**13.0**	**100%**	**100%**	

b. 95% VOC Mass area (Boreholes 1-2, 5-7, 9-11, 15).

DU Layer	[1]DU Layer Volume (cubic yards)	[2]DU Layer Mass (kg)	[3]Mean Total VOC Concentration (ug/kg)	[4]Total VOC Mass (Kg)	Percent Total Mass	Percent Total DU Volume	Cumulative VOC Mass
Layer A	6,533	7,840,000	83	0.65	5.2%	24%	5.2%
Layer B	3,267	3,920,000	217	0.85	6.8%	12%	12%
Layer C	3,267	3,920,000	297	1.2	9.3%	12%	21%
Layer D	3,267	3,920,000	460	1.8	14%	12%	36%
Layer E	3,267	3,920,000	623	2.4	20%	12%	55%
Layer F	3,267	3,920,000	580	2.3	18%	12%	73%
Layer G	4,356	5,226,667	638	3.3	27%	16%	100%
Total:	**27,222**	**32,666,667**	**383**	**12.5**	**100%**	**100%**	

c. 80% VOC Mass area (Boreholes 2, 5, 6, 7, 10).

DU Layer	[1]DU Layer Volume (cubic yards)	[2]DU Layer Mass (kg)	[3]Mean Total VOC Concentration (ug/kg)	[4]Total VOC Mass (Kg)	Percent Total Mass	Percent Total DU Volume	Cumulative VOC Mass
Layer A	3,630	4,355,556	92	0.40	3.7%	23%	3.7%
Layer B	1,815	2,177,778	284	0.62	5.6%	11%	9%
Layer C	1,815	2,177,778	476	1.0	9.4%	11%	19%
Layer D	1,815	2,177,778	743	1.6	15%	11%	33%
Layer E	1,815	2,177,778	994	2.2	20%	11%	53%
Layer F	1,815	2,177,778	765	1.7	15%	11%	68%
Layer G	3,267	3,920,000	884	3.5	32%	20%	100%
Total:	**15,970**	**19,164,444**	**572**	**11.0**	**100%**	**100%**	

Notes:

1. See Table 2.
2. Assumes soil density of 1,200 kg/cubic yard (100 lbs/ft^3 or 2,700 lbs/cy^3).
3. See Table 5; based on synthetic MIS data for DU layers. Estimated mean VOC concentration and total VOC mass for Layers E-G weighted in order to address the variance in thickness between boreholes (i.e., higher concentration in thin DU layer at one borehole weighted against lower concentration in thicker DU layer in another borehole): [(Borehole #1 CI Sample Concentration x Borehole #1 DU Layer Mass + (Borehole #2 CI Sample Concentration x Borehole #2 DU Layer Mass ...] Divided By Total DU Layer Mass. Weighting would not be necessary if field MI samples using consistent plug spacings were collected.
4. Total VOC concentration times DU layer mass, converted to kilograms. May not fully account for the dissolved-phase mass in DU Layers, due to partial drainage of groundwater from cores during sample collection

Table 15. Borehole MIS data for total VOCs calculated as weighted average of corresponding borehole core increments.

Boring ID	[1]DU Layer Volume Represented by Boring (cubic yards)	[2]DU Layer Mass Represented by Boring (kg)	[3]Total VOCs (ug/kg)	Total VOC Mass (Kg)	Percent Total VOC Mass	Cumulative Total VOC Mass	Cumulative DU Volume Represented (cy)
5	3,267	3,920,000	1,103	4.32	32.9%	33%	3,267
7	3,448	4,137,778	469	1.94	14.8%	48%	6,715
10	2,904	3,484,444	495	1.72	13.1%	61%	9,619
2	3,267	3,920,000	316	1.24	9.4%	70%	12,885
6	3,085	3,702,222	320	1.18	9.0%	79%	15,970
15	2,541	3,048,889	268	0.82	6.2%	85%	18,511
1	2,904	3,484,444	122	0.42	3.2%	89%	21,415
9	2,904	3,484,444	106	0.37	2.8%	92%	24,319
11	2,904	3,484,444	100	0.35	2.7%	94%	27,222
14	2,541	3,048,889	70	0.21	1.6%	96%	29,763
3	2,904	3,484,444	52	0.18	1.4%	97%	32,667
20	2,178	2,613,333	56	0.15	1.1%	98%	34,844
17	2,178	2,613,333	38	0.10	0.8%	99%	37,022
16	2,541	3,048,889	25	0.07	0.6%	99.6%	39,563
8	2,904	3,484,444	14	0.05	0.4%	100%	42,467
4	2,904	3,484,444	-	-	-	-	45,370
12	2,722	3,266,667	-	-	-	-	48,093
13	2,541	3,048,889	-	-	-	-	50,633
18	2,178	2,613,333	-	-	-	-	52,811
19	2,178	2,613,333	-	-	-	-	54,989
21	1,815	2,177,778	-	-	-	-	-
22	1,633	1,960,000	-	-	-	-	-
23	1,633	1,960,000	-	-	-	-	-
24	1,815	2,177,778	-	-	-	-	-
25	1,815	2,177,778	-	-	-	-	-
26	-	-	-	-	-	-	-
27	1,633	1,960,000	-	-	-	-	-
28	1,815	2,177,778	-	-	-	-	-
29	1,815	2,177,778	-	-	-	-	-
30	1,815	2,177,778	-	-	-	-	-
Total Volume:	**70,778**	**84,933,333**		**13**	**100%**		

1. Approximate volume of soil represented by borehole based on borehole spacing and total thickness of DU layers encountered in the subject boring (see Table 2 and Figure 6; boreholes spacing approximately 70 ft).

2. Assumes soil density of 1,200 kg/cubic yard (100 lbs/ft3 or 2,700lbs/cy^3).

3. See Table 5; based on MIS data for Boreholes layers computed from core increment samples. Estimated mean VOC concentration and total VOC mass weighted with respect to mean VOC concentration for individual DU Layer vs thickness of DU Layer: [(DU Layer A Concentration x DU Layer A Mass + (DU Layer B Concentration x DU Layer B Mass ...] Divided By Total Combined DU Layer Mass represented by borehole. This was necessary in order to address the variance in thickness of DU layers within a borehole (i.e., higher concentration in thin DU layer weighted against lower concentration in thicker DU layer). Weighting would not be necessary if field MI samples using consistent plug spacings were collected.

4. Total VOC concentration times DU layer mass, converted to kilograms. May not fully account for the dissolved-phase mass in DU Layers, due to partial drainage of groundwater from cores during sample collection

Table 16. DU layer VOC concentrations across full investigation area in comparison to the 100%, 95%, and 80% mass primary plume areas (based on computed core increment MIS data for DU layers).

A. Total Investigation Area

DU Layer	Total VOCs (ug/kg)	TCE (ug/kg)	1,2 DCE(cis) (ug/kg)	Vinyl Chloride (ug/kg)
Layer A	34	4	20	10
Layer B	74	35	28	11
Layer C	100	67	23	9
Layer D	153	78	51	25
Layer E	296	167	92	37
Layer F	335	192	111	32
Layer G	476	170	263	43
Layers A through G	198	93	83	23
Layers A+B+C+D	78	37	28	13
Layers E+F+G	379	176	165	38

Includes Borings 1-30 (total twenty nine borings - see Table 2; Borehole 26 abandoned). Layers E, F and G identified only in Borings 1-20, Borings 1-16 and Borings 1-12, respectively. Concentrations reported identical to 100% contaminant mass area noted below for same borings.
Individual DU Layers: Total 29 increments.
Combined DU Layers A+B+C+D+E+F+G: Total 164 increments.

B. Primary Plume Area - 100% Contaminant Mass

DU Layers	Total VOCs (ug/kg)	TCE (ug/kg)	1,2 DCE(cis) (ug/kg)	Vinyl Chloride (ug/kg)
Layers A through G	219	103	90	26
Layers A+B+C+D	114	54	41	19
Layers E+F+G	379	176	165	38

Includes Borings 1-20 (total twenty borings, see Table 2).
Combined DU Layers A+B+C+D: Total 80 increments.
Combined DU Layers E+F+G: Total 48 increments.
Combined DU Layers A+B+C+D+E+F+G: Total 128 increments.

C. Primary Plume Area - 95% Contaminant Mass

DU Layers	Total VOCs (ug/kg)	TCE (ug/kg)	1,2 DCE(cis) (ug/kg)	Vinyl Chloride (ug/kg)
Layers A through G	381	181	160	40
Layers A+B+C+D	225	113	88	24
Layers E+F+G	616	284	268	63

Includes Borings: 1,2,5,6,7,9,10,11 & 15 (total nine borings, see Table 2).
Combined DU Layers A+B+C+D: Total 36 increments.
Combined DU Layers E+F+G: Total 25 increments.
Combined DU Layers A+B+C+D+E+F+G: Total 61 increments.

D. Primary Plume Area - 80% Contaminant Mass

DU Layers	Total VOCs (ug/kg)	TCE (ug/kg)	1,2 DCE(cis) (ug/kg)	Vinyl Chloride (ug/kg)
Layers A through G	552	264	238	50

Includes Borings: 2,5,6,7 & 10 (total five borings, see Table 2).
Combined DU Layers A+B+C+D+E+F+G: Total 35 increments.

Table 17. Volume of DU layer soil represented by 80%, 95%, and 100% VOC mass areas (see also Figure 13).

		80% VOC Mass Area		95% VOC Mass Area		100% VOC Mass Area	
DU Layer	**Cumulative VOC Mass (from base)**	**Soil Volume (cy)**	**Cumulative Percent**	**Soil Volume (cy)**	**Cumulative Percent**	**Soil Volume (cy)**	**Cumulative Percent**
Layer A	100%	3,630	100%	6,533	100%	14,519	100%
Layer B	93%	1,815	77%	3,267	76%	7,259	74%
Layer C	86%	1,815	66%	3,267	64%	7,259	60%
Layer D	76%	1,815	55%	3,267	52%	7,259	47%
Layer E	62%	1,815	43%	3,267	40%	7,259	34%
Layer F	43%	1,815	32%	3,267	28%	5,807	21%
Layer G	25%	3,267	20%	4,356	16%	5,626	10%
Totals:		15,970		27,222		54,989	

Notes (see Table 15)

80% VOC mass captured by Borings 2,5,6,7 and 10.

95% VOC mass captured by Borings 1,2,5,6,7,9,10,11 and 15.

100% VOC mass captured by Borings 1-20.

Table 18. Predicted partitioning of VOC between sorbed phase (organic carbon only) and dissolved phase (i.e., groundwater) in noted combinations of DU layers.

DU Layer	Total Organic Carbon (mg/kg)	TCE (ug/L)		1,2 DCE(cis) (ug/L)		Vinyl Chloride (ug/L)	
		Dissolved	Sorbed to OC	Dissolved	Sorbed to OC	Dissolved	Sorbed to OC
Layers A+B+C+D	689	72%	28%	92%	8%	96%	4%
Layers E+F+G	1,109	61%	39%	88%	12%	93%	7%
Layers A through G	857	67%	33%	90%	10%	95%	5%

1. Based on noted concentration of organic carbon in soil and published sorption coefficient (koc in L/kg) for targeted chemicals (HDOH 2009, TCE = 166, 1,2 DCEcis = 36, vinyl chloride = 19).

Table 19. Predicted VOC concentrations in DU layer groundwater based on corresponding sediment VOC data and total organic carbon data (see Table 15).

Total Investigation Area

DU Layer	Total Organic Carbon (mg/kg)	Total VOCs (ug/L)	TCE (ug/L)	1,2 DCE(cis) (ug/L)	Vinyl Chloride (ug/L)
Layer A	829	106	12	62	32
Layer B	570	234	108	90	36
Layer C	610	310	205	73	31
Layer D	605	481	237	161	83
Layer E	496	943	522	297	124
Layer F	1,409	915	503	313	99
Layer G	1,350	1,334	451	748	135
Layers A through G	857	596	269	253	74
Layers A+B+C+D	689	243	112	89	42
Layers E+F+G	1,109	1,092	487	485	121

Includes Borings 1-30 (total twenty-nine borings; see Figure 11; Borehole 26 abandoned).

Core Plume Area - 100% Contaminant Mass

DU Layers	Total Organic Carbon	Total VOCs (ug/L)	TCE (ug/L)	1,2 DCE(cis) (ug/L)	Vinyl Chloride (ug/L)
Layers A through G	857	660	298	276	85
Layers A+B+C+D	689	352	162	129	61
Layers E+F+G	1,109	1,092	487	485	121

Includes Borings 1-20 (total twenty borings; see Figure 11).

Core Plume Area - 95% Contaminant Mass

DU Layers	Total Organic Carbon	Total VOCs (ug/L)	TCE (ug/L)	1,2 DCE(cis) (ug/L)	Vinyl Chloride (ug/L)
Layers A through G	857	1,145	526	489	130
Layers A+B+C+D	689	695	338	276	81
Layers E+F+G	1,109	1,778	786	790	202

Includes Borings: 1,2,5,6,7,9,10,11 & 15 (total nine borings; see Figure 11).

Core Plume Area - 80% Contaminant Mass

DU Layers	Total Organic Carbon	Total VOCs (ug/L)	TCE (ug/L)	1,2 DCE(cis) (ug/L)	Vinyl Chloride (ug/L)
Layers A through G	857	1,656	765	727	163

Includes Borings: 2,5,6,7 & 10 (total five borings; see Figure 11).

Table 20. [1]Predicted VOC concentrations in borehole groundwater based on corresponding soil VOC data and total organic carbon data (see Table 6).

Boring ID	Total VOCs (ug/L)	TCE (ug/L)	1,2 DCE(cis) (ug/L)	Vinyl Chloride (ug/L)
Boring 1	337	25	263	49
Boring 2	1,080	823	225	32
Boring 3	162	13	14	135
Boring 4	175	15	15	145
Boring 5	3,595	1,754	1,634	206
Boring 6	806	233	537	36
Boring 7	1,834	1,536	260	38
Boring 8	44	10	9	25
Boring 9	348	179	133	35
Boring 10	1,755	18	1,152	585
Boring 11	355	13	135	207
Boring 12	nd	nd	nd	nd
Boring 13	nd	nd	nd	nd
Boring 14	227	174	15	37
Boring 15	897	830	35	33
Boring 16	69	21	15	33
Boring 17	116	14	15	86
Boring 18	nd	nd	nd	nd
Boring 19	nd	nd	nd	nd
Boring 20	37	5.9	6.2	25

1. Hypothetical well screened from water table to top of tuff unit. Reflects weighted average concentration of VOCs across all DU layers encountered in borehole.

Table 21a. Measured concentrations of total VOCs in groundwater within primary plume area (USAF 2007, see Figure 14).

Monitoring Well	Screened Interval	[1]Measured (ug/L) Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride
MW012	14-24' bgs	2,274	1,948	324	1.7
BH017	10-20' bgs	195	170	25	nd
BH019	10-20' bgs	692	526	166	0.2
BH022	11.5-21.5' bgs	2,707	835	1,840	32
BH023	11-21'bgs	165	5.1	157	3
BH024	15-25' bgs	666	439	226	1.4

1.Based on last-measured concentration as presented in 2007 remedial investigation report.

Table 21b. Predicted concentrations of total VOCs in groundwater within primary plume area based on average-weighted soil data from nearby borings (see Table 6 and text).

Nearest Monitoring Well	[1]Corresponding DU Layers	[2]Predicted (ug/L) Total VOCs	TCE	1,2 DCE(cis)	Vinyl Chloride	Referenced Boreholes
MW012	D-G	3,311	1,122	1,773	416	B5,B6,B10
BH017	B-F	681	90	499	93	B3,B4
BH019	B-F	1,894	686	926	282	B5,B6,B10
BH022	B-G	50	4.7	4.7	40	B1
BH023	B-F	1,384	672	634	79	B5
BH024	D-G	1,398	19	795	583	B9

1. DU Layers corresponding to screening interval in noted monitoring well.

2. Predicted VOC concentrations in DU Layer groundwater based on weighted average of corresponding soil VOC data and Total Organic Carbon data (see Tables 9b and 16).

Table 22. [1,2]Predicted VOC concentrations in groundwater in DU Layer A (first 4 feet of saturated zone) at borehole locations within primary plume area.

Boring ID	Total VOCs (ug/L)	TCE (ug/L)	1,2 DCE(cis) (ug/L)	Vinyl Chloride (ug/L)
Boring 1	595	17	546	33
Boring 2	733	19	677	38
Boring 3	175	12	12	151
Boring 4	nd	nd	nd	nd
Boring 5	102	14	59	29
Boring 6	318	14	248	57
Boring 7	144	47	12	85
Boring 8	42	17	8	16
Boring 9	108	18	54	36
Boring 10	48	12	12	24
Boring 11	41	7	21	13
Boring 12	nd	nd	nd	nd
Boring 13	nd	nd	nd	nd
Boring 14	85	14	14	57
Boring 15	84	48	12	24
Boring 16	109	57	17	35
Boring 17	134	15	15	104
Boring 18	nd	nd	nd	nd
Boring 19	nd	nd	nd	nd
Boring 20	165	32	15	119

1. Hypothetical well screened across DU Layer A. Predicted VOC concentrations in DU Layer A groundwater (6-10' bgs) based on corresponding soil VOC data and measured, average Total Organic Carbon concentration of 829 mg/kg (see Table 4 and 9b).

2. One-half of MRL used for "ND"s if one or more VOCs detected above laboratory MRL. All VOCs in soil gas assumed to be "nd" if no individual VOCs detected above MRL in original soil Borehole CI sample.

Table 23. [1]Predicted VOC concentrations in shallow soil gas within primary plume area (based on predicted VOC concentrations in groundwater).

Boring ID	Total VOCs (ug/m^3)	TCE (ug/m^3)	1,2 DCE(cis) (ug/m^3)	Vinyl Chloride (ug/m^3)
Boring 1	238,120	6,652	218,223	13,245
Boring 2	293,317	7,527	270,736	15,054
Boring 3	70,006	4,895	4,895	60,216
Boring 4	nd	nd	nd	nd
Boring 5	40,943	5,759	23,689	11,495
Boring 6	127,386	5,438	99,309	22,639
Boring 7	57,596	18,788	4,732	34,075
Boring 8	16,781	6,885	3,303	6,593
Boring 9	43,119	7,177	21,589	14,354
Boring 10	19,255	4,814	4,814	9,627
Boring 11	16,460	2,649	8,519	5,292
Boring 12	nd	nd	nd	nd
Boring 13	nd	nd	nd	nd
Boring 14	33,982	5,671	5,671	22,639
Boring 15	33,463	19,022	4,814	9,627
Boring 16	43,528	22,639	6,943	13,945
Boring 17	53,564	5,952	5,952	41,661
Boring 18	nd	nd	nd	nd
Boring 19	nd	nd	nd	nd
Boring 20	66,167	12,603	5,952	47,612

1. Based on predicted concentration of VOCs in DU Layer A groundwater with respect to measured concentrations of VOCs in Borehole CI soil samples (see Table 21). Concentration in soil gas equal to concentration in groundwater times VOC Henry's Law constant and adjusted to ug/m^3 (H': TCE = 0.40, 1,2 DCEcis = 0.17, vinyl chloride = 1.1).

Table 24a. Measured concentrations of total VOCs in soil gas within primary plume area (see Figure 3).

	[1]Measured VOCs in Soil Gas (ug/m^3)			
Soil Gas Point	**Total VOCs**	**TCE**	**1,2 DCE(cis)**	**Vinyl Chloride**
SG03	35,603	31,700	3,900	3.5
SG10	2,776	2,650	126	0.20
SG011	817	816	0.79	0.20
SG12	10	9.3	0.69	0.08
SG14	5,334	5,160	165	9.1
SG15	1,882	1,740	142	0.39
SG017	116	114	2.3	0.09
SG018	6,227	5,910	317	0.18
SG019	28,608	4,780	23,800	28
Average:	9,042	5,875	3,162	4.6

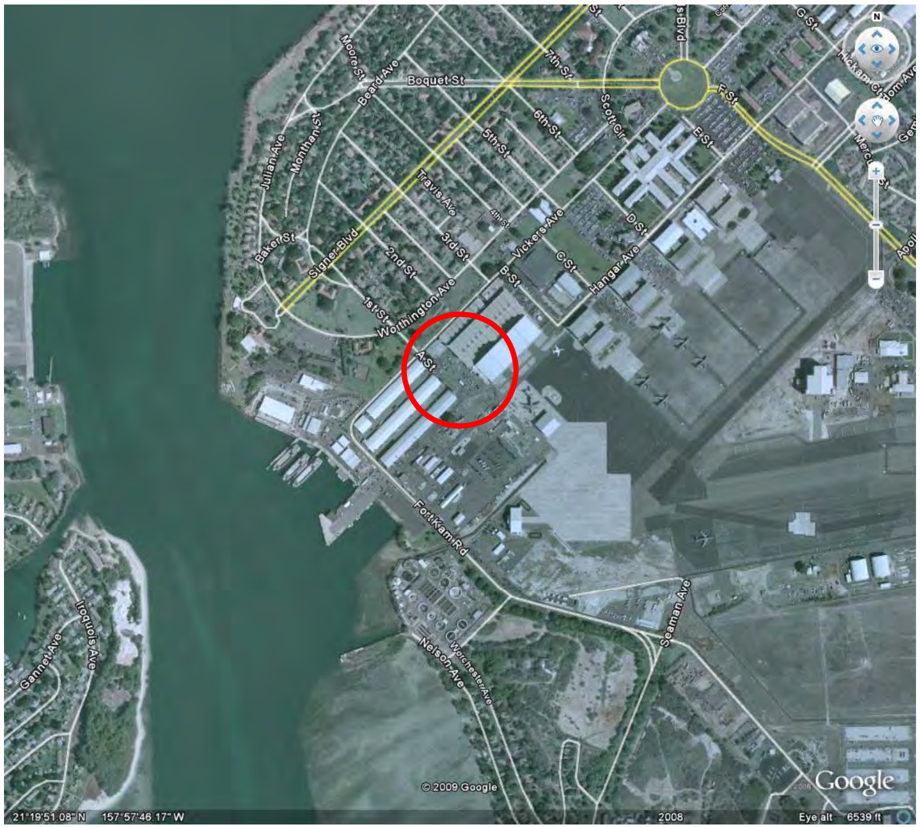
1.Based on concentration of VOCs in soil gas reported in 2008 (depth 3-4' bgs; USAF 2007, 2008). Values for vinyl chloride for soil gas points 10, 15 and 18 represent one-half the laboratory MDL.

Table 24b. Predicted concentrations of total VOCs in soil gas immediately above the groundwater interface within primary plume area, based on soil data from nearby borings.

	[1]Predicted VOCs in Soil Gas (ug/m^3)			
Study Boring Points	**Total VOCs**	**TCE**	**1,2 DCE(cis)**	**Vinyl Chloride**
B1	238,120	6,652	218,223	13,245
B2	293,317	7,527	270,736	15,054
B3	70,006	4,895	4,895	60,216
B4	nd	nd	nd	nd
B5	40,943	5,759	23,689	11,495
B6	127,386	5,438	99,309	22,639
B7	57,596	18,788	4,732	34,075
B8	16,781	6,885	3,303	6,593
B9	43,119	7,177	21,589	14,354
B10	19,255	4,814	4,814	9,627
B11	16,460	2,649	8,519	5,292
B12	nd	nd	nd	nd
Average:	92,298	7,058	65,981	19,259

1. Based on predicted concentration of VOCs in DU Layer A groundwater times Henry's Law Constant (see Table 23).

FIGURES



CG110 Study Area

Figure 1a. Location of CG110 study site at Hickam Air Force Base in Honolulu, Hawai‘i.

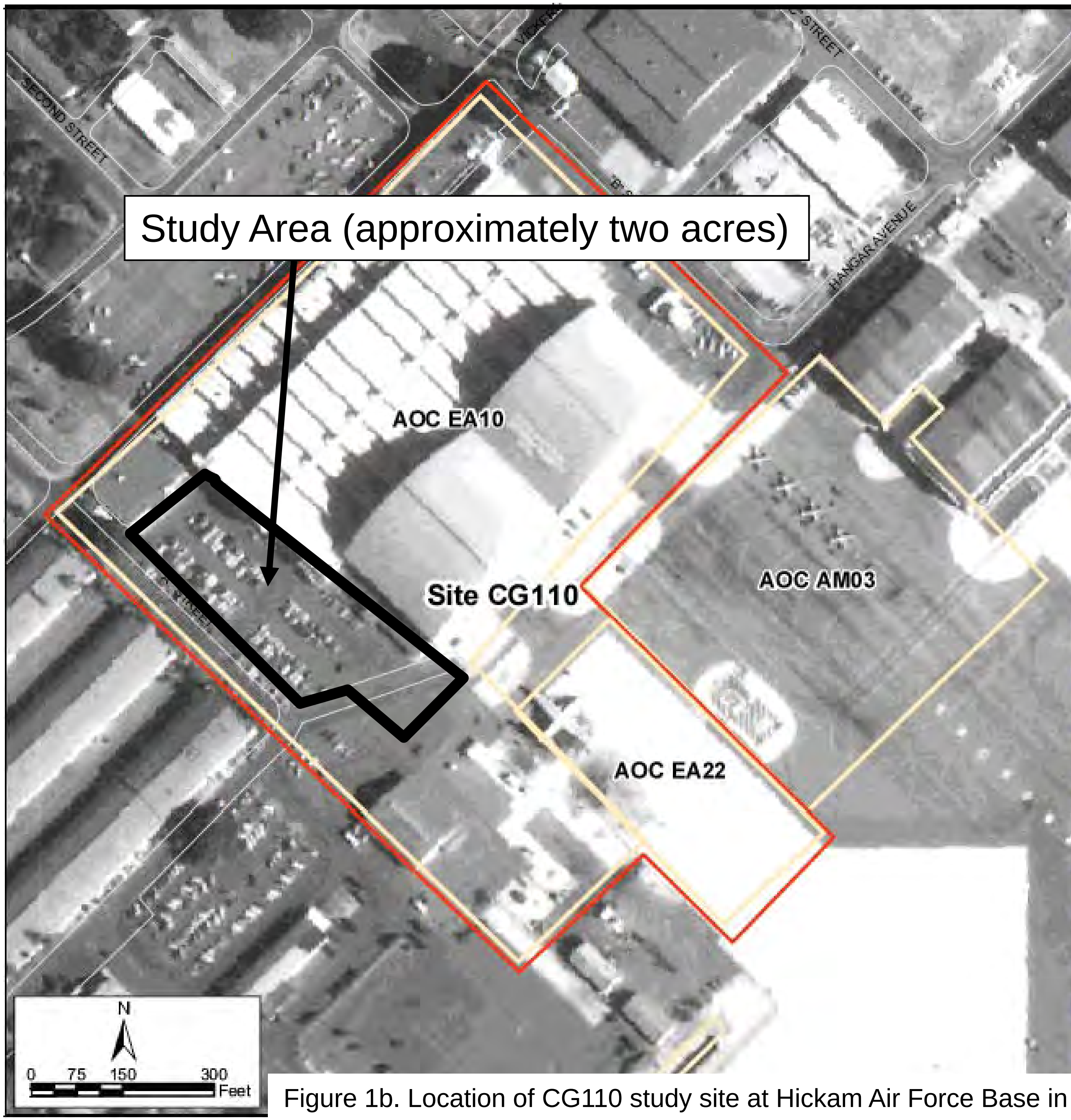


Figure 1b. Location of CG110 study site at Hickam Air Force Base in Honolulu, Hawai‘i.

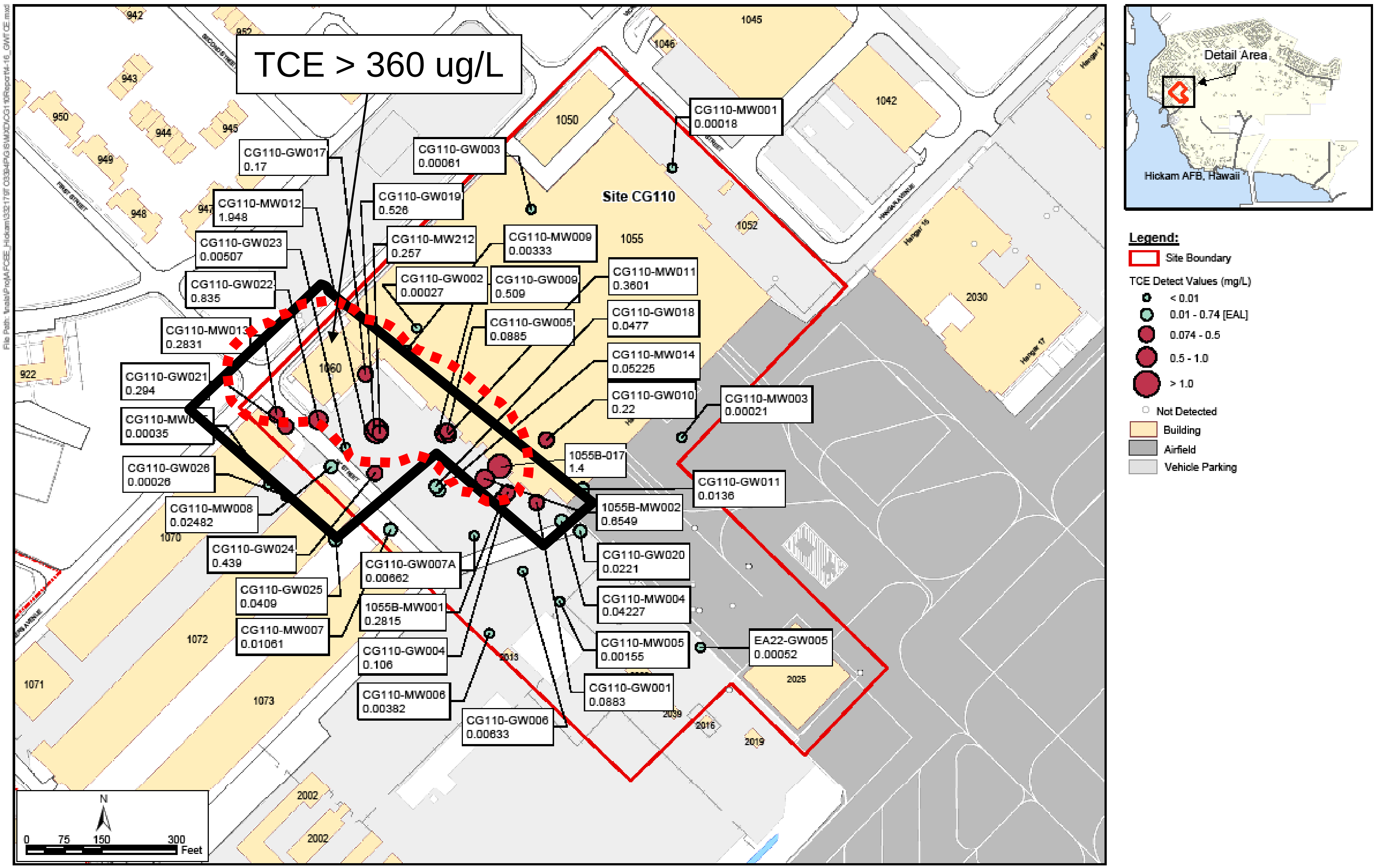


Figure 2. Reported concentrations of TCE in groundwater above 360 ug/L (USAF 2007).

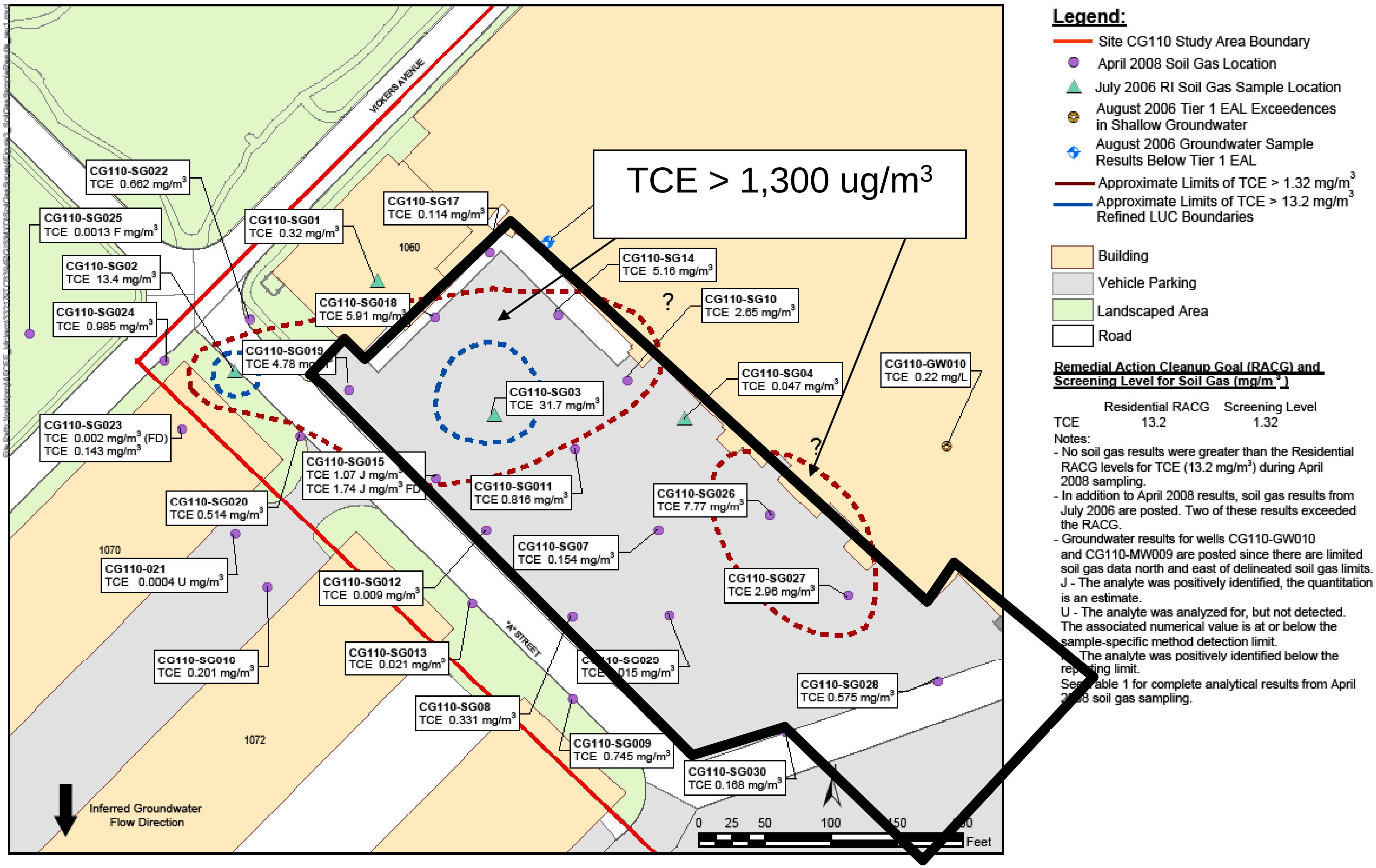


Figure 3. Reported concentrations of TCE in soil gas (USAF 2007).

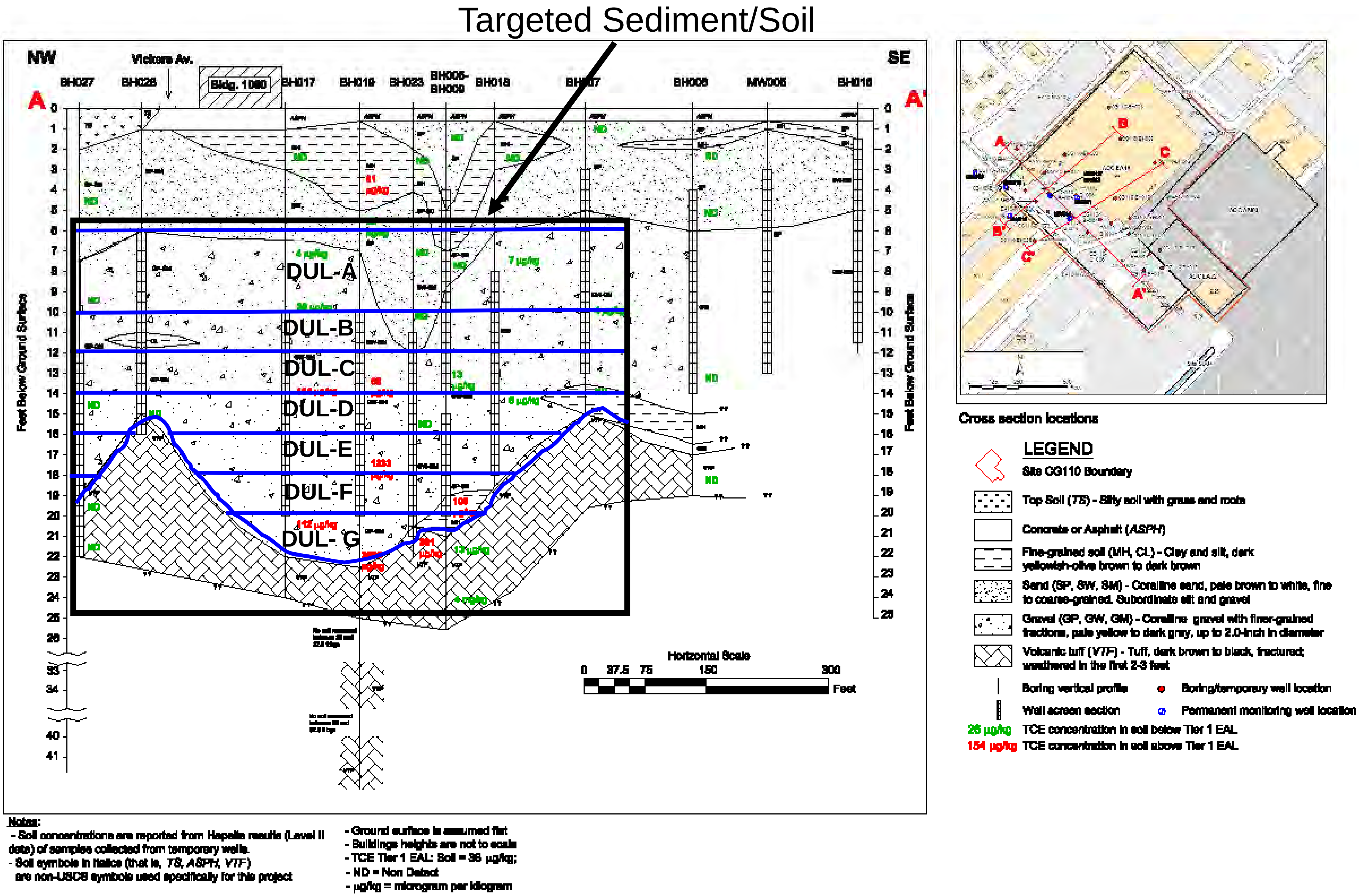


Figure 4a. Cross Section A-A’ from 2007 USAF RI with superimposed DU layers designated for HDOH study.

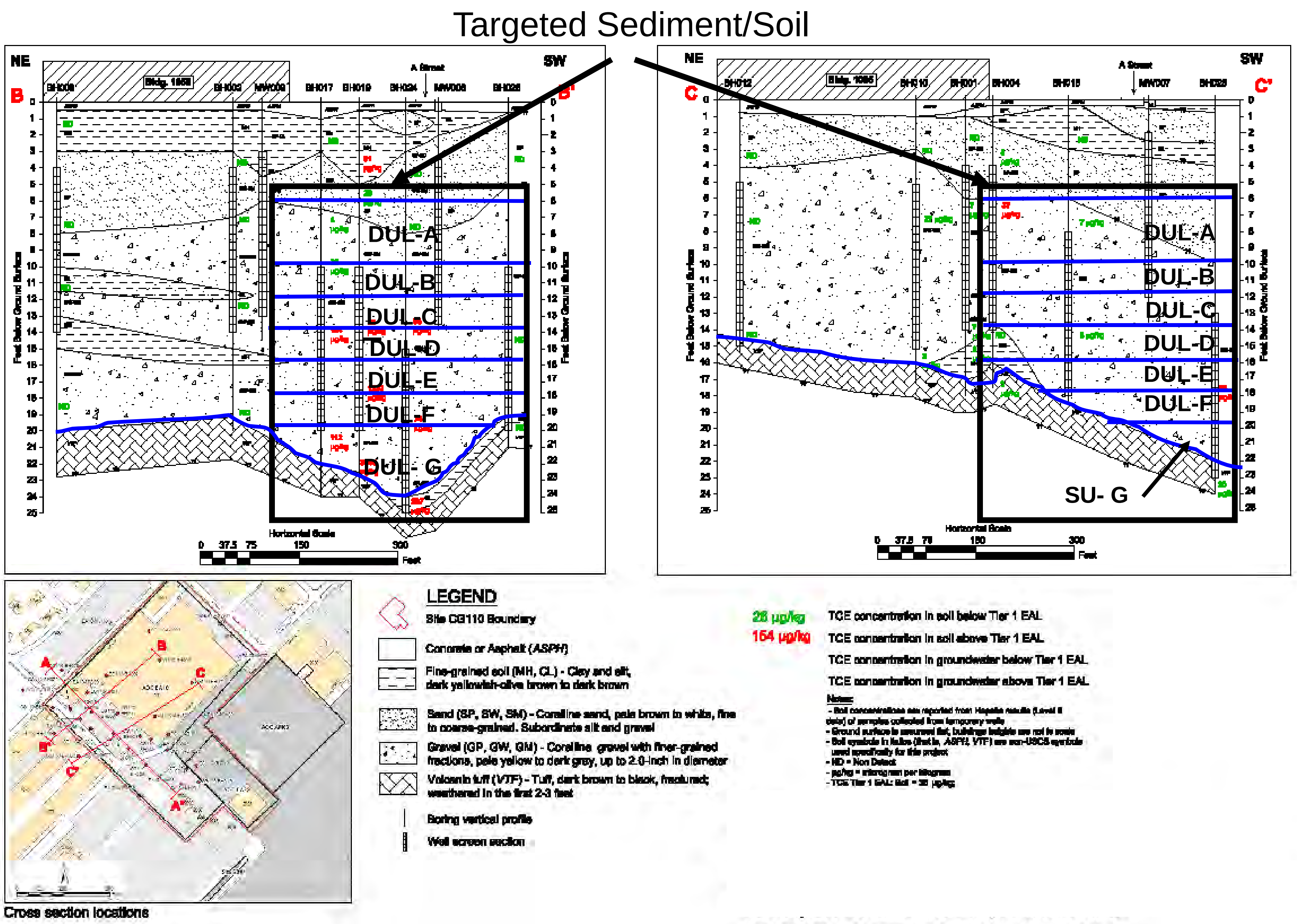


Figure 4b. Cross Sections B-B' and C-C' from 2007 USAF RI with superimposed DU layers designated for HDOH study.

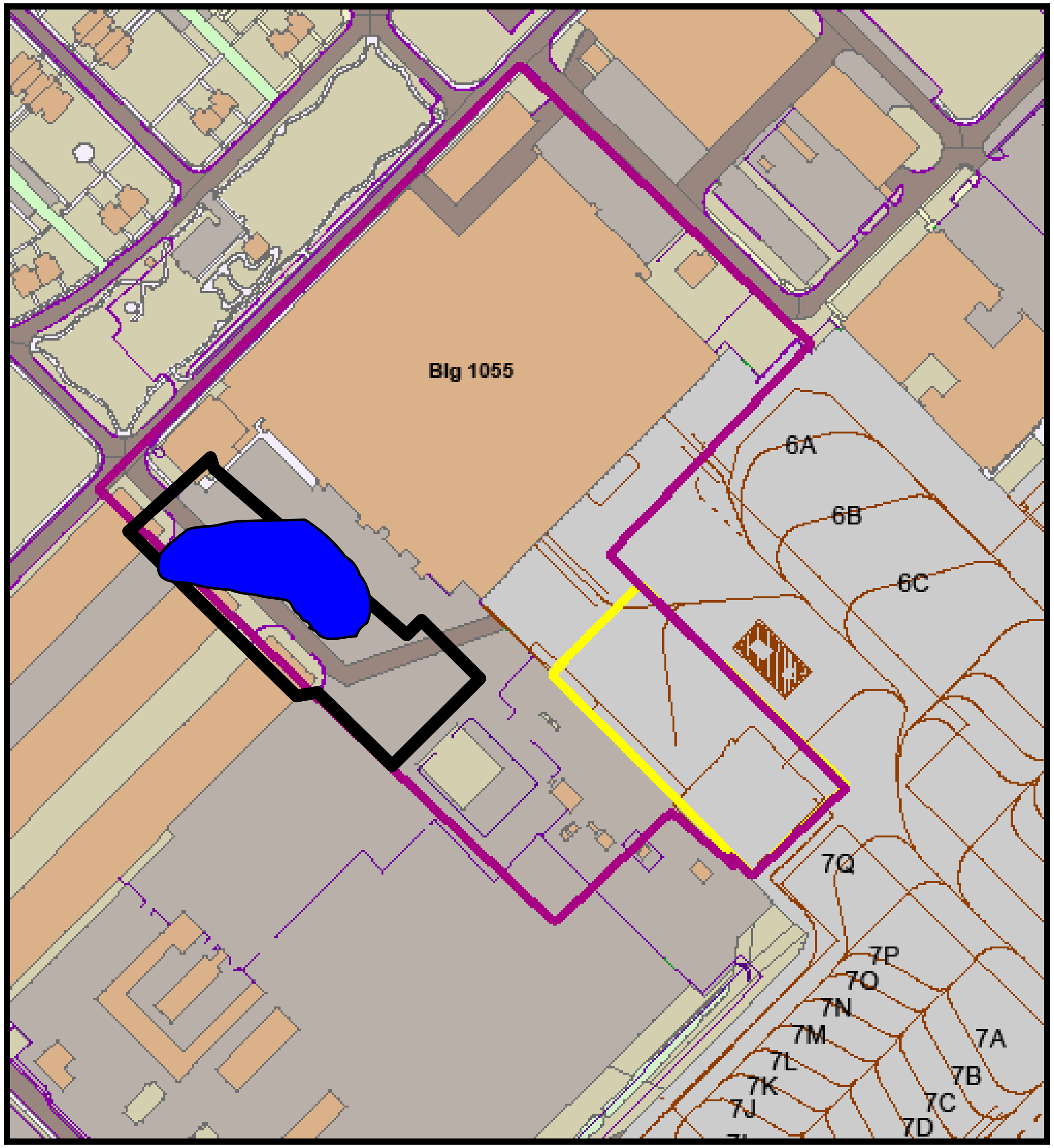


Figure 5. Core area of TCE plume based on previous soil, groundwater and soil gas data summarized in 2007 USAF RI (HDOH interpretation).

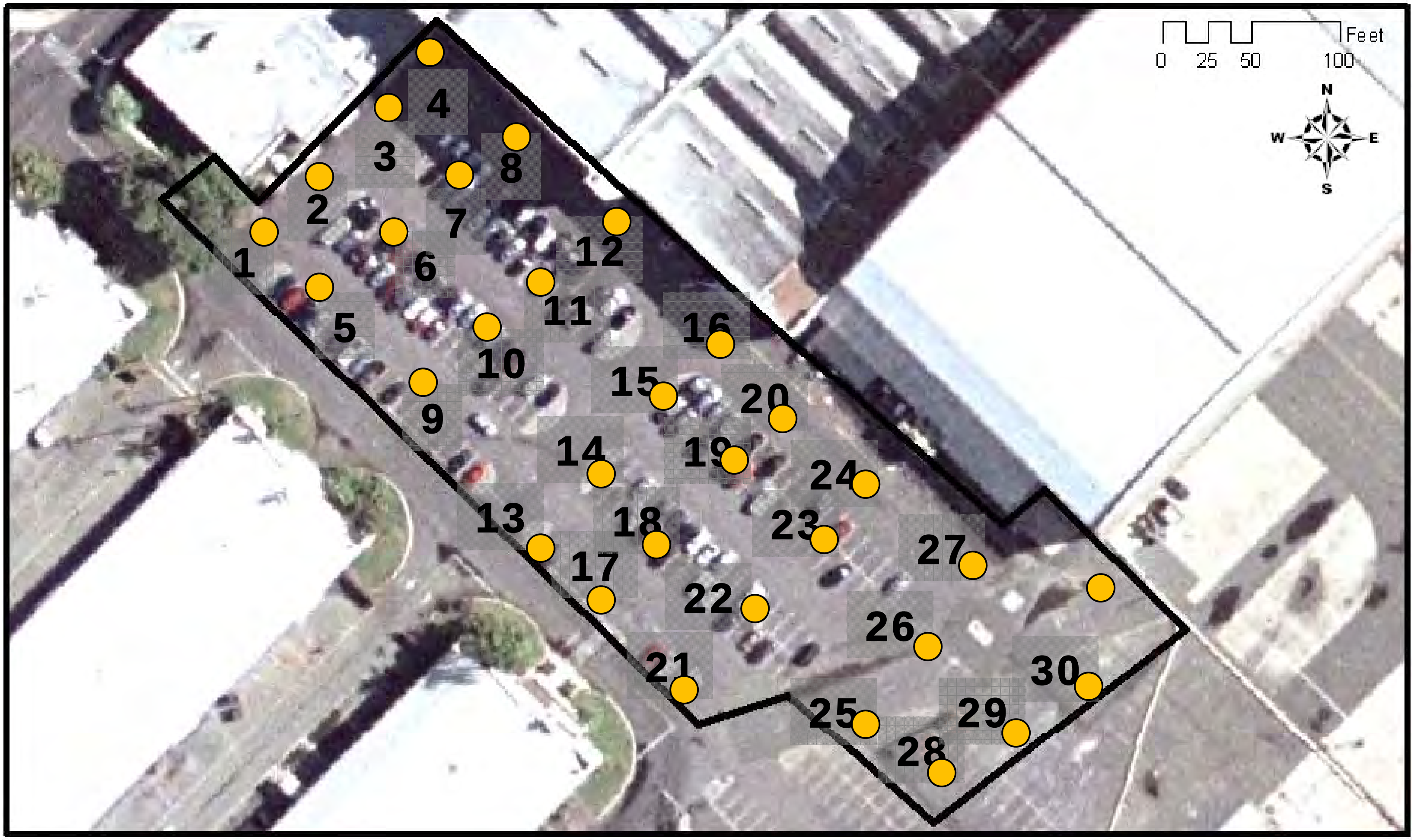


Figure 6. HDOH study DU borehole locations (approximate 70-foot grid).

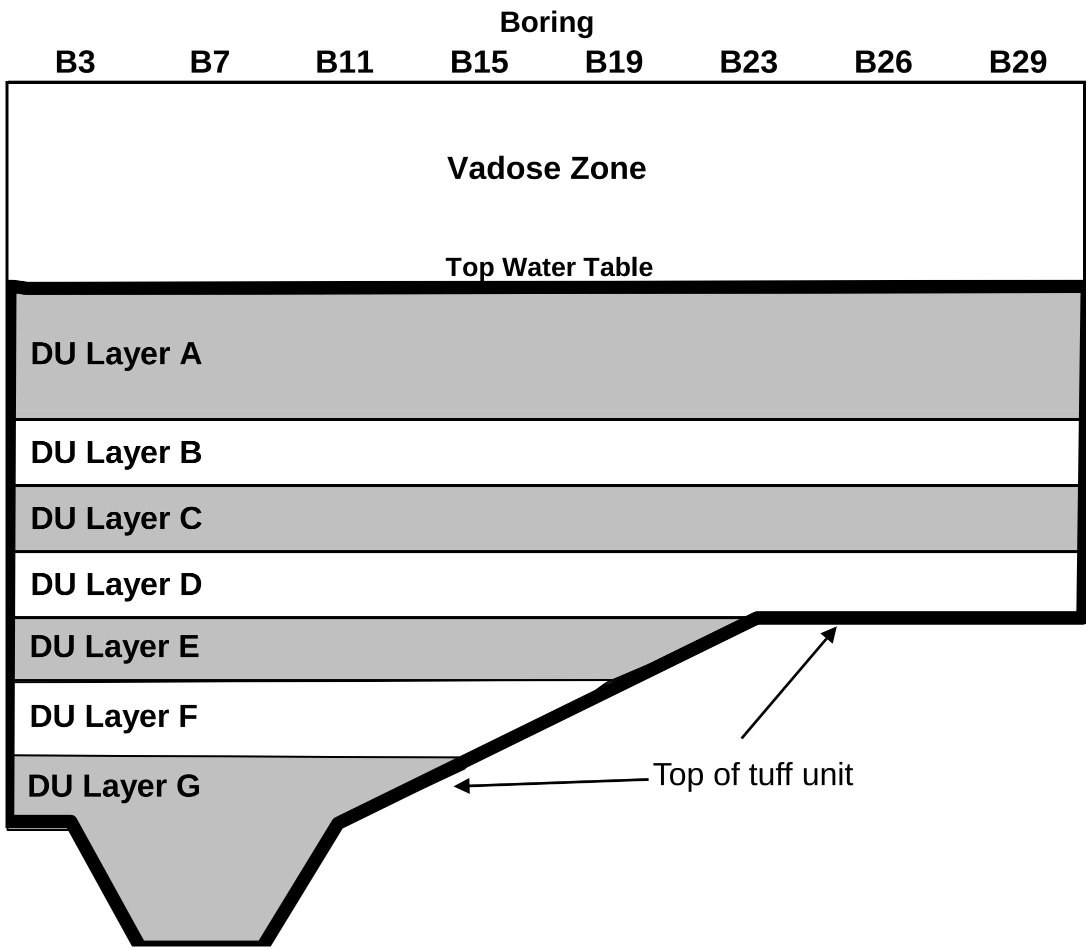


Figure 7. NW-SE cross section of DU layers based on depth to tuff unit identified in this study.

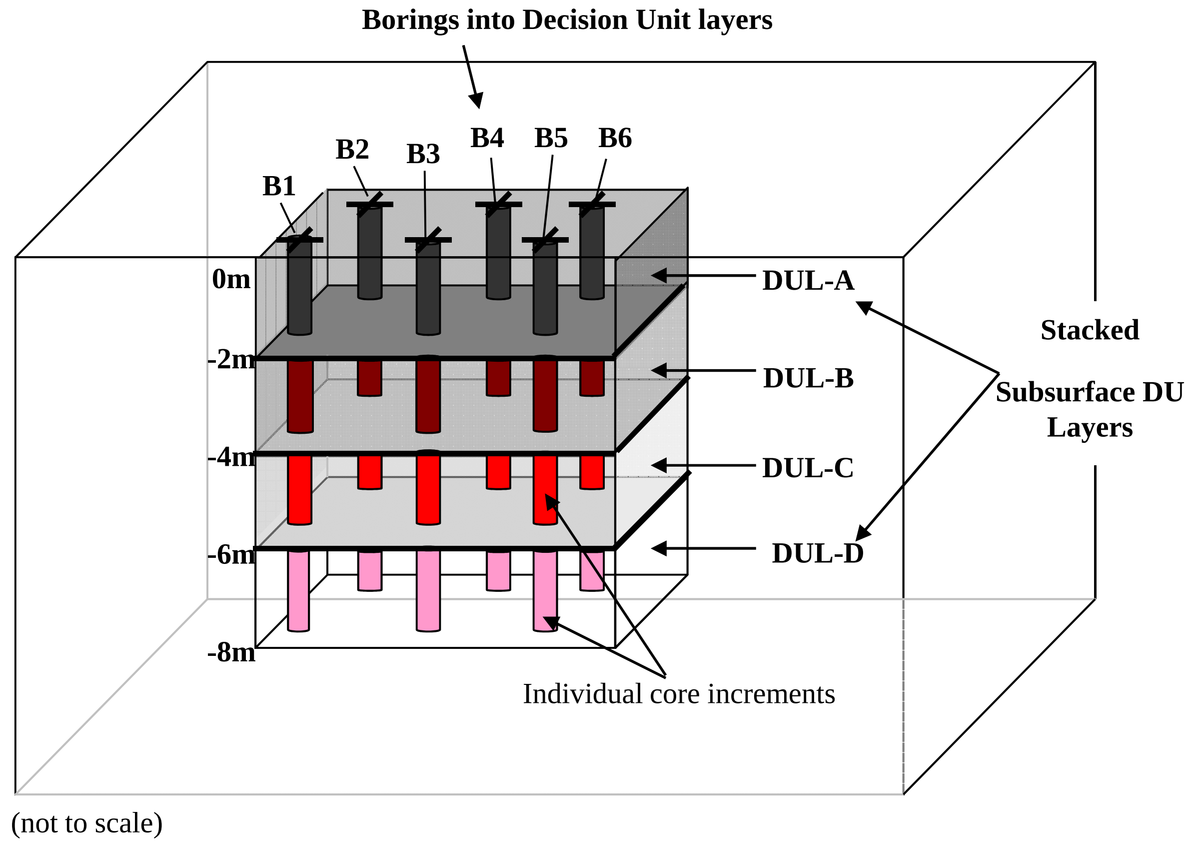
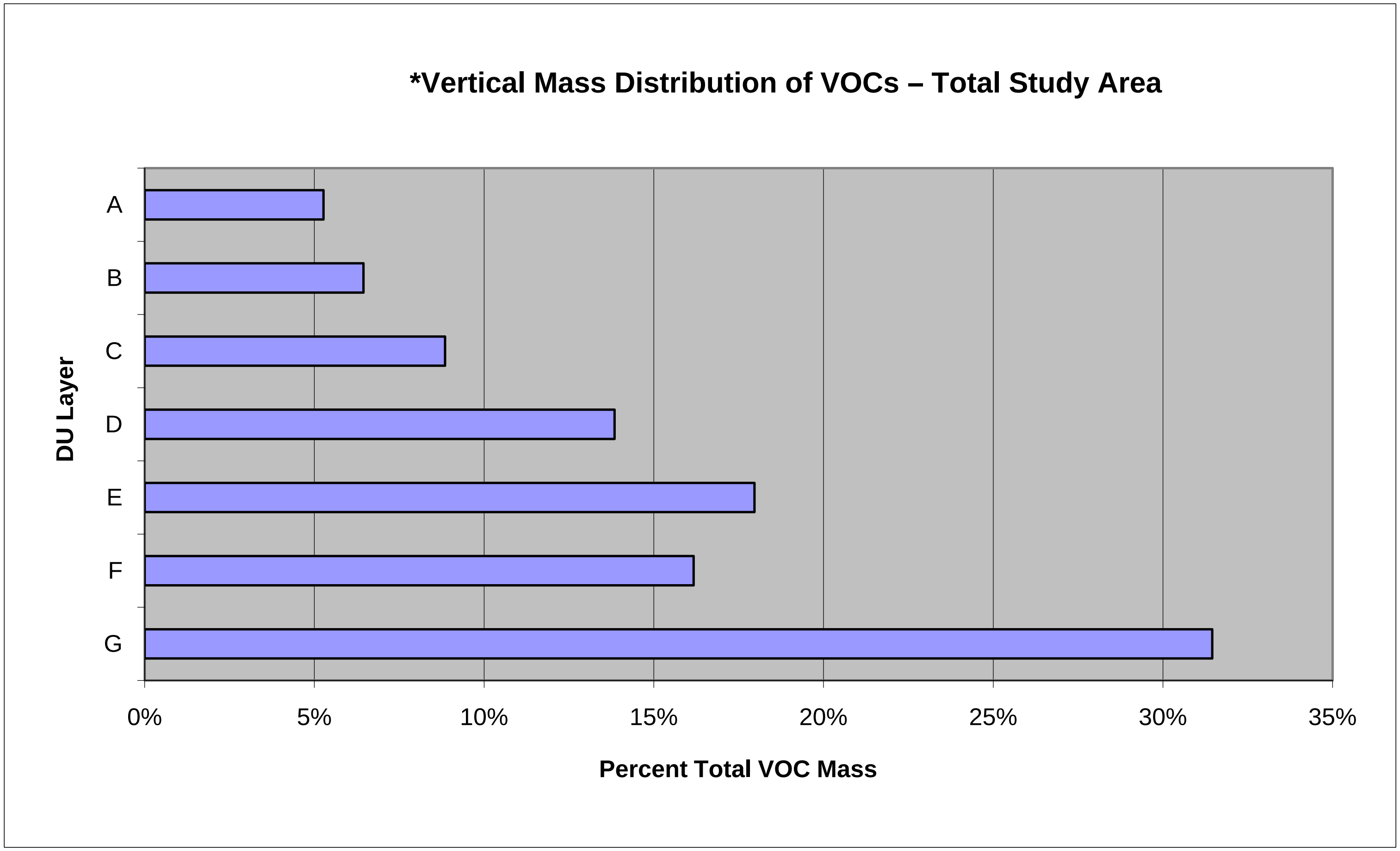


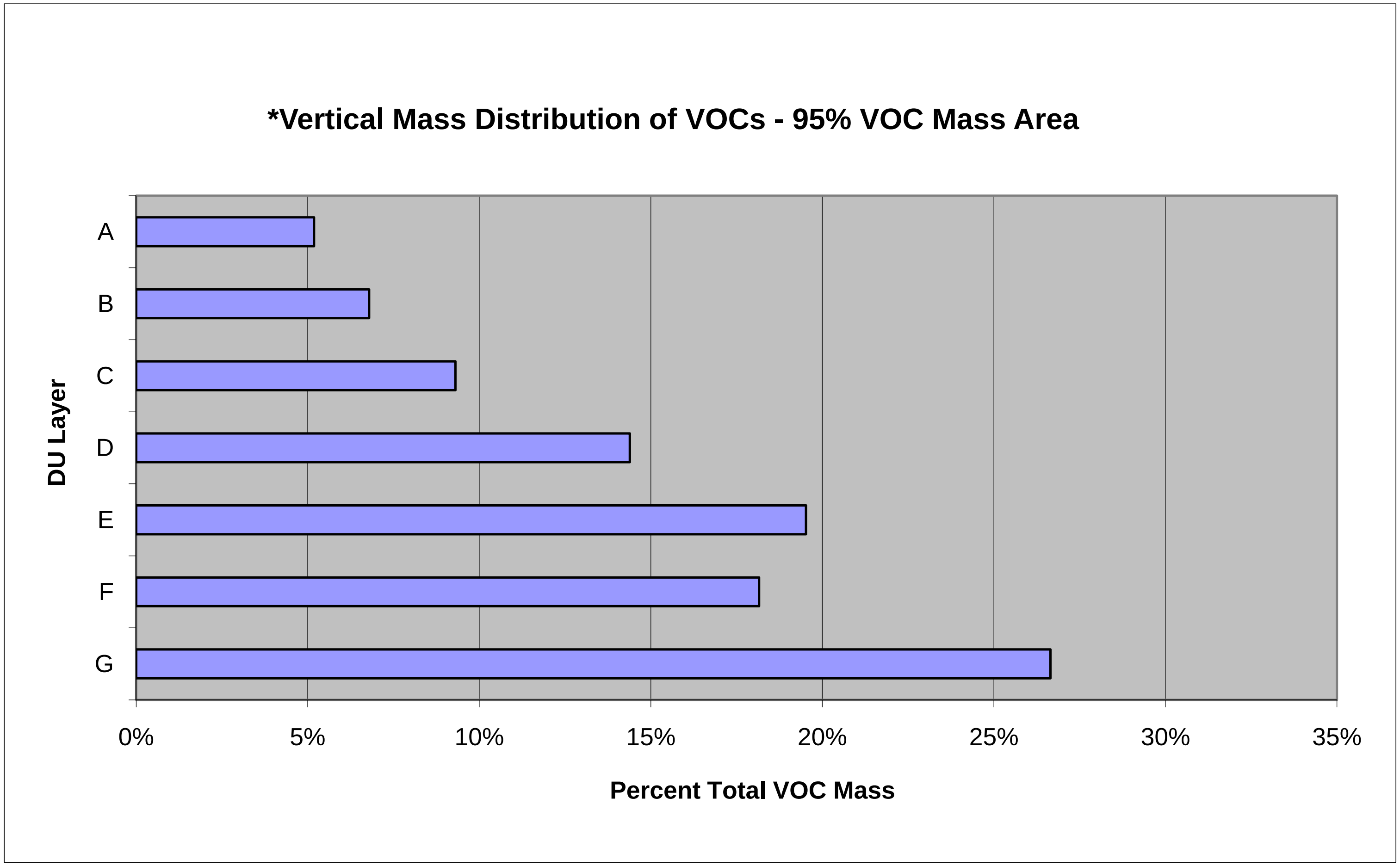
Figure 8. Depiction of borehole core increments collected from targeted, decision unit layers.

Figure 9. Preparation of core increment samples by subsampling targeted DU layer intervals.



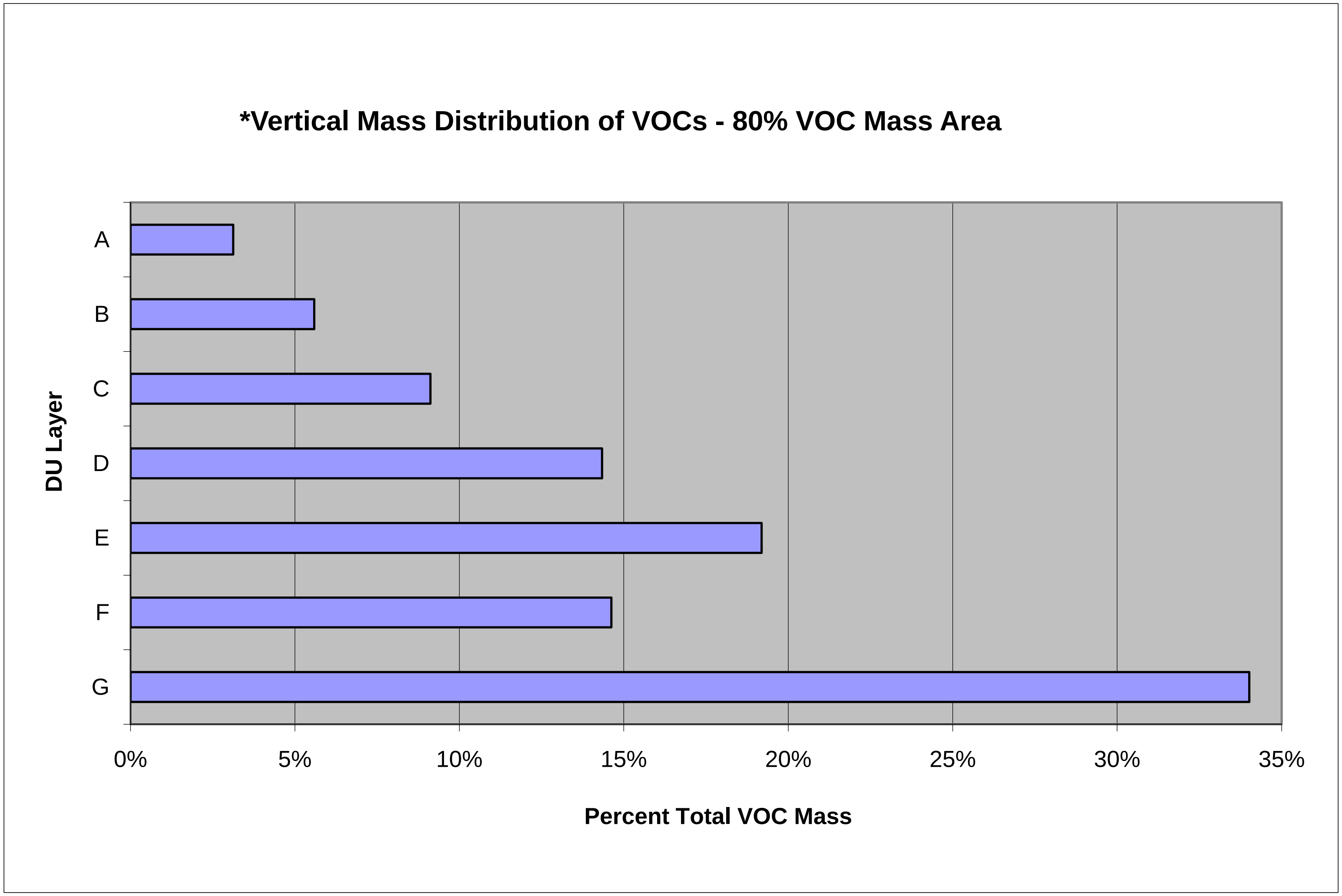
*Based on DU Layer MIS data for Borings 1-30.

Figure 10a. Vertical distribution of total VOCs in DU layers across total study area (see Table 14).



*Based on DU Layer MIS data for Borings 1-2, 5-7, 9-11, 15.

Figure 10b. Vertical distribution of total VOCs within DU layers within 95% mass area (nine borings; see Table 14).



*Based on DU Layer MIS data for Borings 2, 5, 6, 7, 10

Figure 10c. Vertical distribution of Total VOCs within DU layers within 80% mass area (five borings; see Table 14).

*Vertical Mass Distribution of VOCs Between Nearby, Individual Boreholes

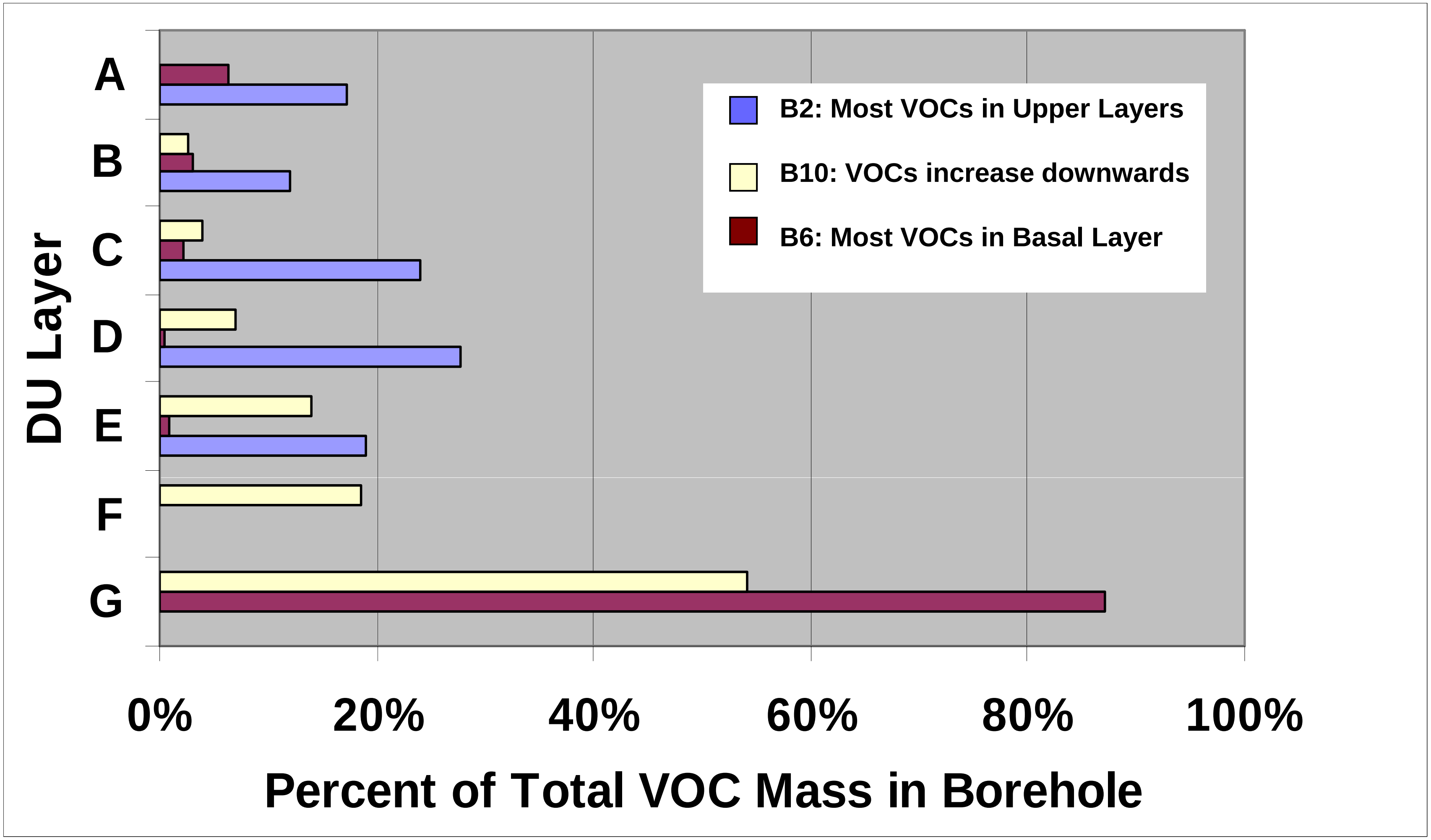


Figure 10d. Vertical distribution of total VOCs between adjacent boreholes in core area of contamination, depicting heterogeneous distribution of contaminants at the scale of a single core increment sample (refer to data in Table 4).

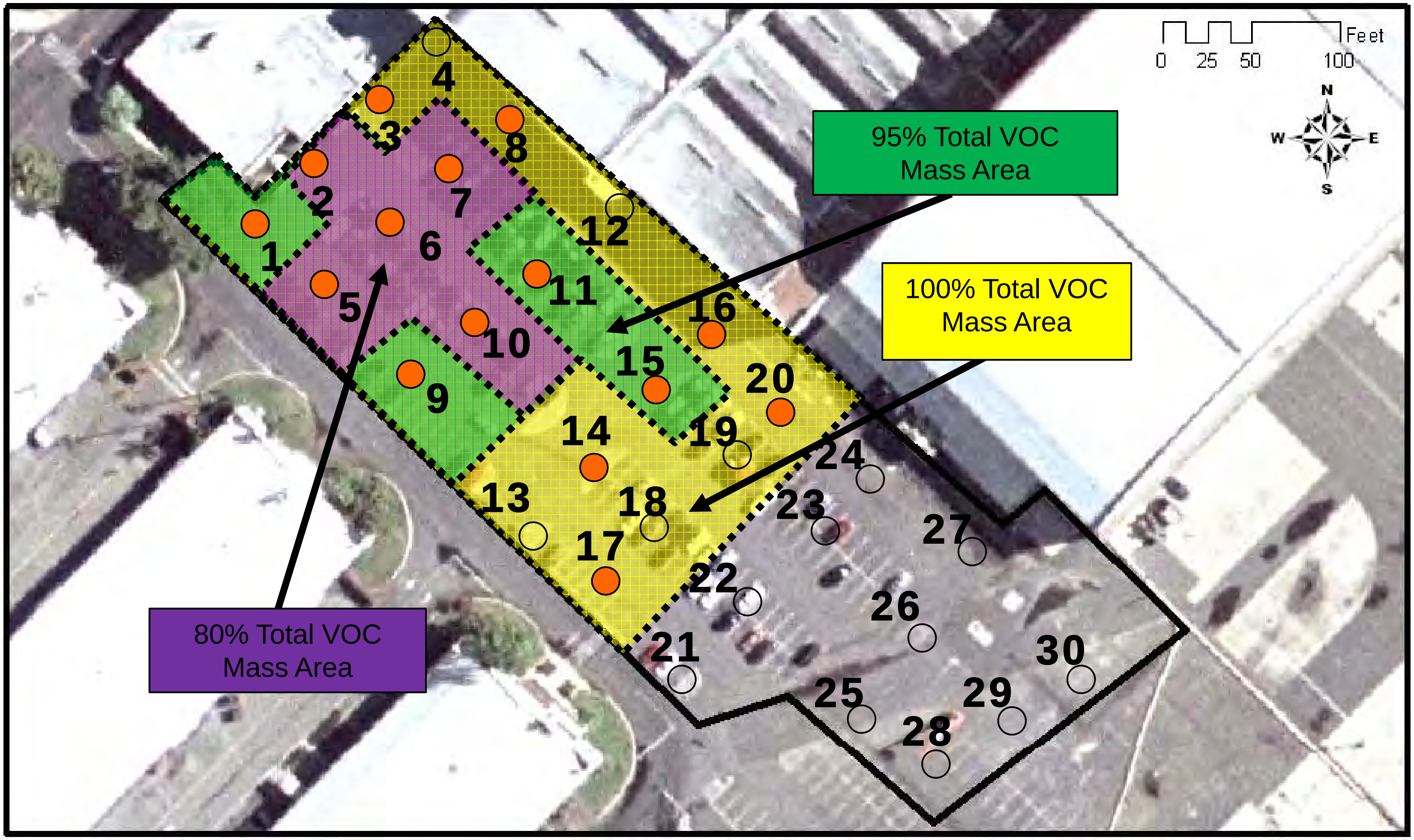


Figure 11. Aerial distribution of total VOCs within study area, depicting areas that incorporate 80%, 95%, and 100% of contaminant mass (aerial view).

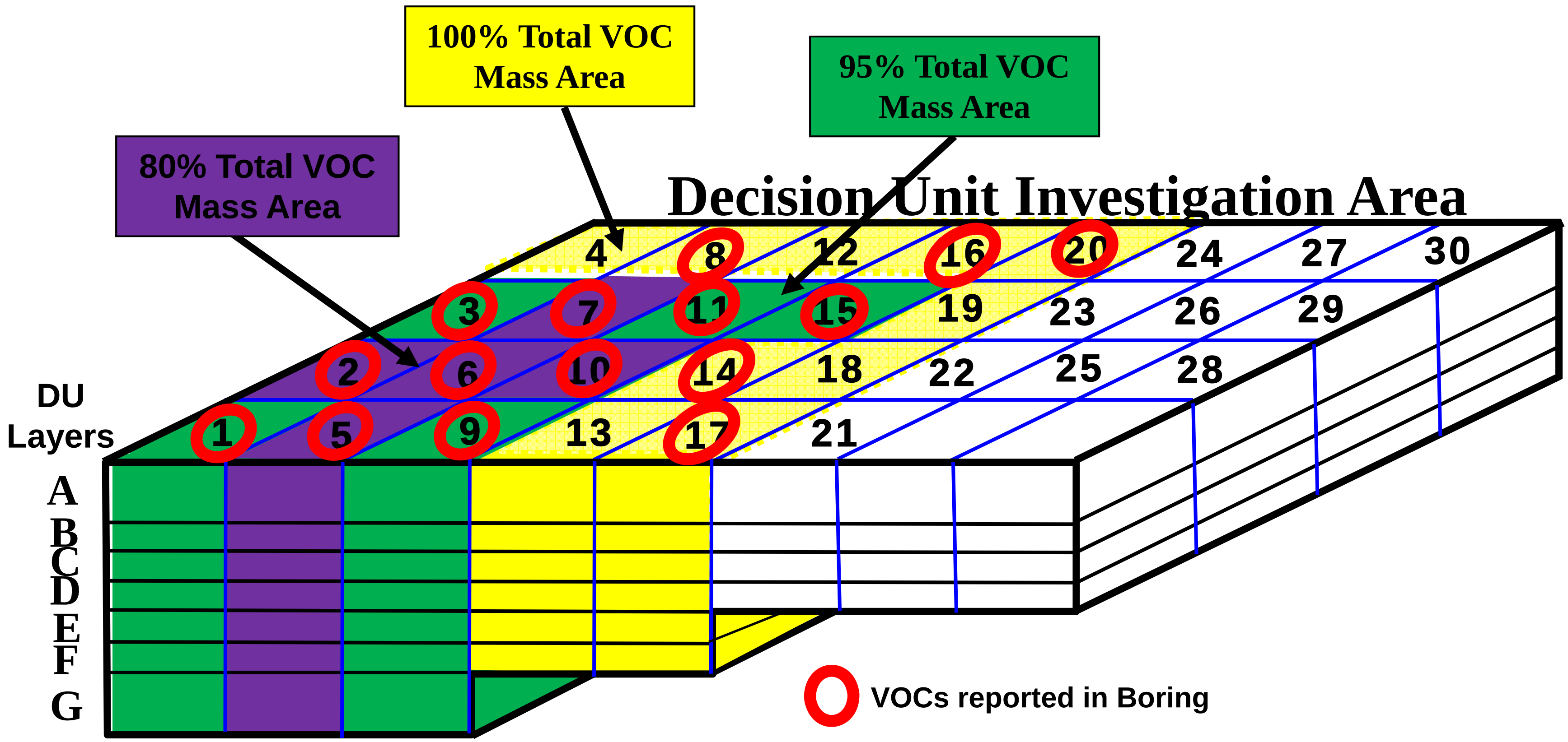


Figure 12. Schematic of aerial distribution of total VOCs within study area, depicting areas that incorporate 80%, 95% and 100% of contaminant mass (mass cutoffs are arbitrary but typical of remedial projects).

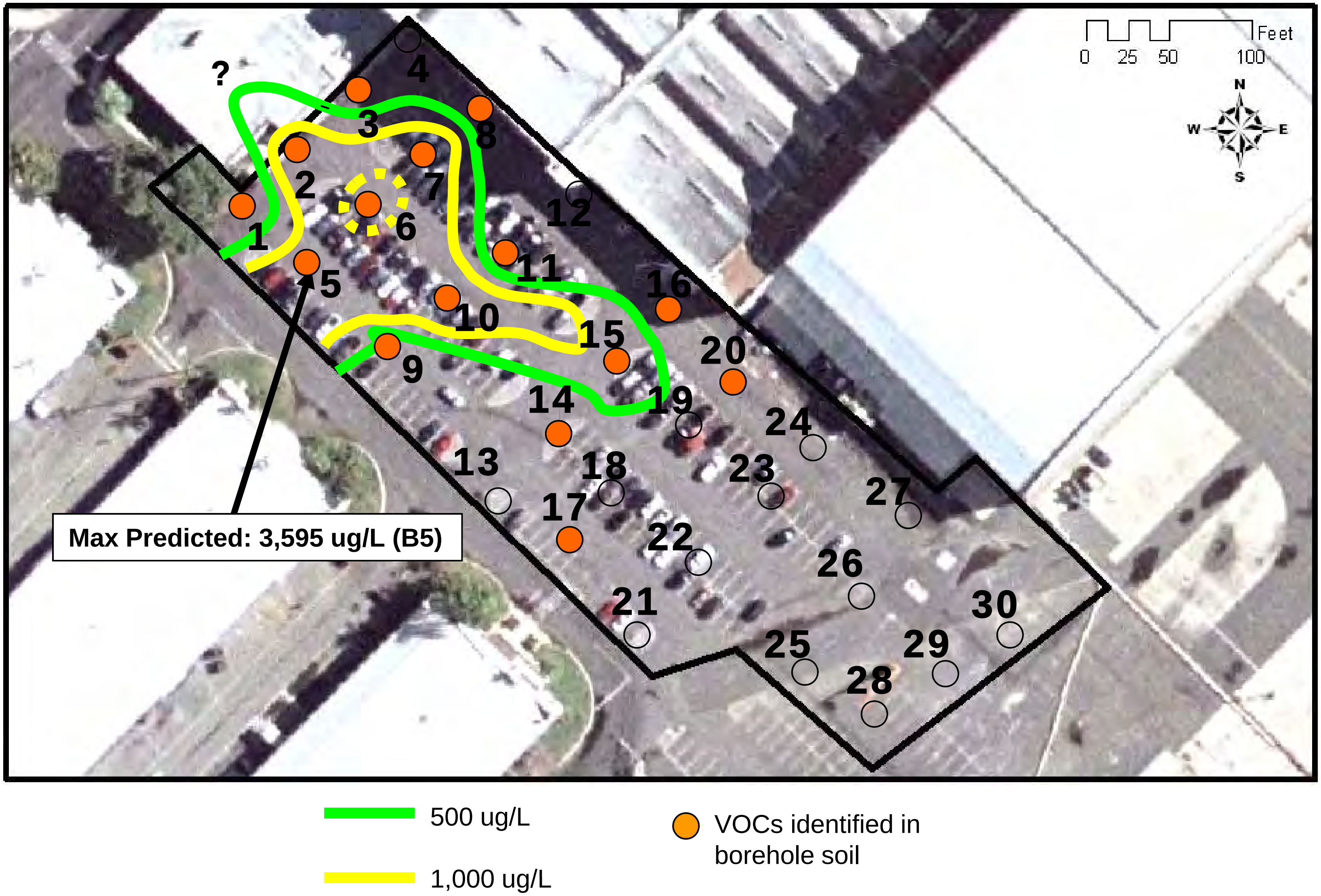


Figure 13. Predicted contour map of total VOCs in groundwater based on borehole MI soil and total organic carbon data (See Table 20).

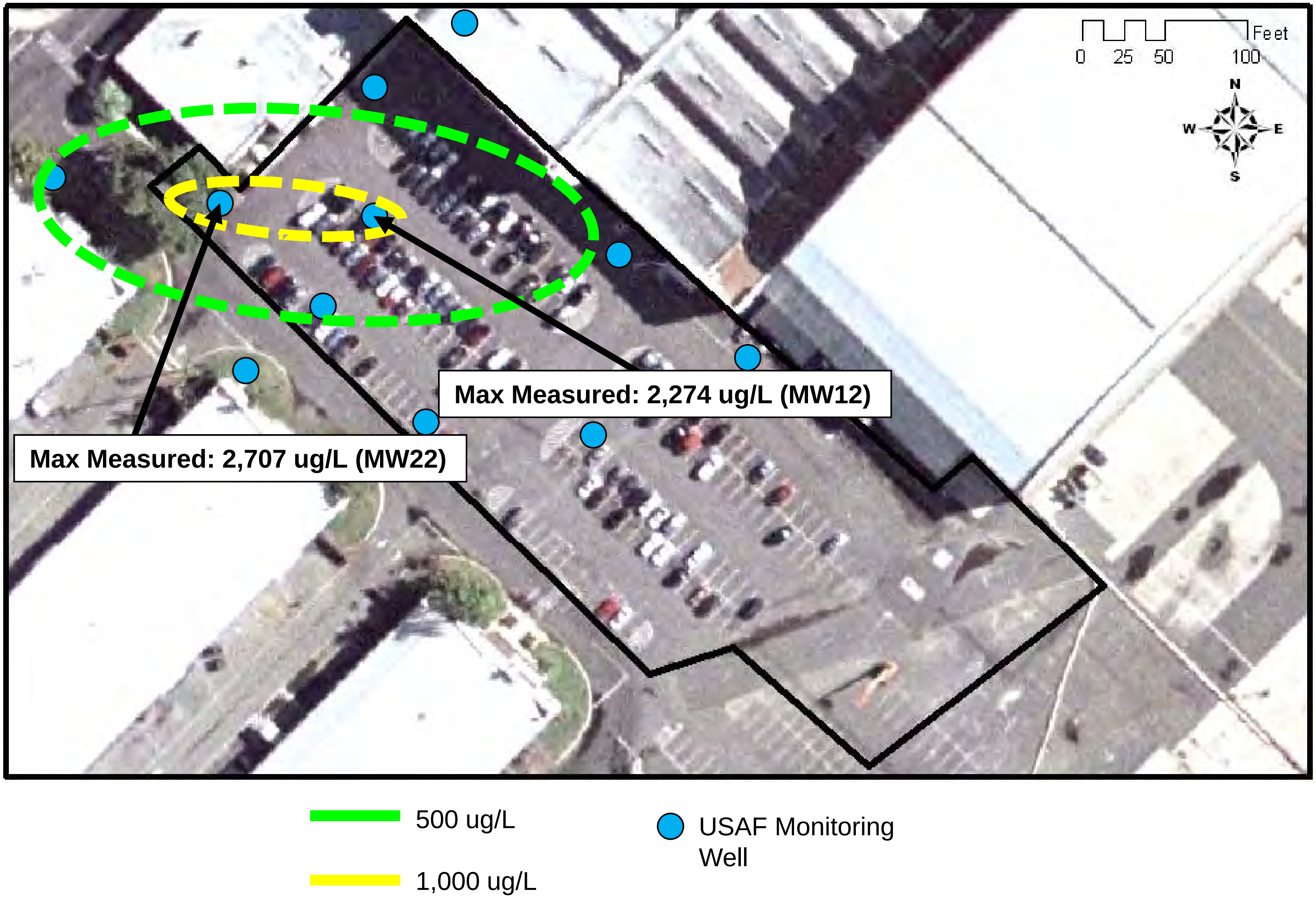


Figure 14. Simplified map of total VOCs in groundwater reported in 2007 RI report (approximate locations of key wells noted; see USAF 2007). Note that only trace VOCs were reported in the study boring closest to MW22 (Boring 1 on Fig 13), reflecting the heterogeneity of subsurface contamination around the perimeter of the main plume area.

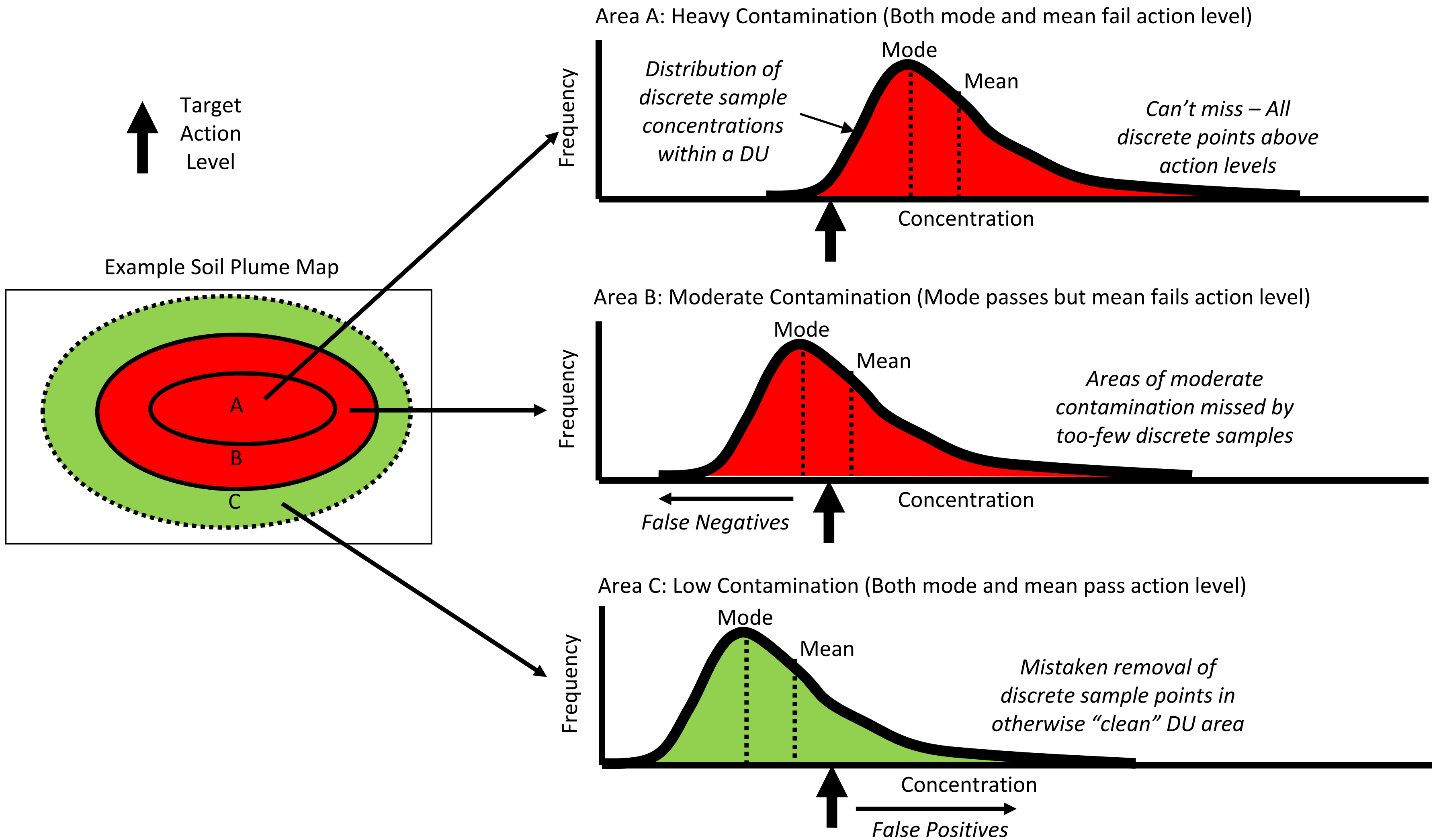


Figure 15. Effect of heterogeneous distribution of contaminant concentrations at the scale of a discrete sample point (or aliquot) on interpretation of DU volume of sediment (or soil) as a whole.

APPENDIX 1

BORING LOGS

Boring ID Number	Total Depth (feet)	Decision Unit Layer (DUL) Description
1	22	DUL-A (6-10' bgs): Sandy, gravely clay (odd, musty odor), >50% fines over lt bn to bn sandy gravel, 1-5% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-D (14-16' bgs): Lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-E (16-18' bgs): Same with increasing fines downward to 10% fines. DUL-F (18-20' bgs): Lt bn to bn clayey sand to sandy clay. DUL-G (20'-TD bgs): Bn sandy gravel to sandy, dense clay with tuff frags; tuff @ 22' bgs.
2	24	DUL-A (6-10' bgs): Lt bn to bn sandy gravel, 1-1-5 fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel, 1-1-5 fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel to gravely sand, 1-1-5 fines; increasing fines at base. DUL-D (14-16' bgs): Lt bn to bn sandy, gravely clay, 50-60% fines. DUL-E (16-18' bgs): Lt bn to bn sandy, gravely clay, 30-40% fines. DUL-F (18-20' bgs): Lt bn to bn sandy, gravely clay, 30-40% fines. DUL-G (20'-TD bgs): Lt bn to bn sandy, gravely clay, 60-70% fines, over drk bn tuffaceous sand; tuff @ 24' bgs.
3	22	DUL-A (6-10' bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel to gravely sand, 20% fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel to gravely sand, 20% fines. DUL-D (14-16' bgs): Lt bn to bn clayey sandy gravel, 10-20% fines. DUL-E (16-18' bgs): Lt bn to bn clayey sandy gravel, 10-20% fines. DUL-F (18-20' bgs): Same with tuff fragments near base. DUL-G (20'-TD bgs): Bn to drk bn clayey sand to sandy clay with shell and tuff frags; tuff @ -22' bgs.
4	22	DUL-A (6-10' bgs): Lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-D (14-16' bgs): Lt bn to bn gravely sand, 30% fines. DUL-E (16-18' bgs): Lt bn to bn gravely sand, 30% fines. DUL-F (18-20' bgs): Lt bn to bn gravely sand, 30% fines, increasing fines at base. DUL-G (20'-TD bgs): Bn to drk bn clayey sand to sandy clay with shell and tuff frags; tuff @ -22' bgs.

Boring ID Number	Total Depth (feet)	Decision Unit Layer (DUL) Description
5	24	DUL-A (6-10' bgs): Lt bn to bn sandy gravel, <<1% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel, <<1% fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-D (14-16' bgs): Same top five inches, over lt bn to bn sandy, gravely clay, >50% fines. DUL-E (16-18' bgs): Lt bn to bn sandy, gravely clay, >50% fines. DUL-F (18-20' bgs): Lt bn to bn sandy, gravely clay, >50% fines. DUL-G (20'-TD bgs): Dk bn sandy clay with gravel fragments, 50-75% fines; dk bn tuff @ 23.5 ft bgs.
6	23	DUL-A (6-10' bgs): Lt bn to bn sandy gravel, <1% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel, <1% fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel, <1% fines, increasing to 1-5% fines at base. DUL-D (14-16' bgs): Same over lt bn to bn sandy, gravely clay, >50% fines. DUL-E (16-18' bgs): Lt bn to bn sandy, gravely clay, >50% fines. DUL-F (18-20' bgs): Lt bn to bn sandy, gravely clay, >50-75% fines DUL-G (20'-TD bgs): Lt bn to bn gravely silt-clay, 30-70% gravel (tuff fragments?); tuff @ -23ft bgs.
7	25	DUL-A (6-10' bgs): Lt bn to bn sandy gravel, est 10% sand, <1% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel to gravelly. clayey sand, 10-15% fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel to gravelly. clayey sand, 10-15% fines (oversaturated, swelled). DUL-D (14-16' bgs): Bn clayey silt with sand and gravel (50-75% fines). DUL-E (16-18' bgs): Bn clayey silt with sand and gravel (50-75% fines). DUL-F (18-20' bgs): Gravely sand-clay mix, et. 30% fines. DUL-G (20'-TD bgs): Lt bwn clayey gravely sand (30% fines) over drk bn, silty sand with shell frags; drk bn tuff/saprolite @ -24' bgs.
8 (31, 32)	22	DUL-A (6-10' bgs): Lt bn to bn sandy gravel, est 10% sand, <1% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-D (14-16' bgs): Lt bn to bn sandy gravel, est 10% sand, <1% fines. DUL-E (16-18' bgs): Lt bn to bn sandy gravel, est 10% sand, <1% fines. DUL-F (18-20' bgs): Lt bn to bn sandy gravel, est 10% sand, <1% fines; sharp boundary with DUL-G. DUL-G (20'-TD bgs): Bn clayey gravel (20-30% fines) to clayey silt overlying drk bn, tuffaceous sand with gravel (saprolite?)

Boring ID Number	Total Depth (feet)	Decision Unit Layer (DUL) Description
9	22	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel, 1-1-5 fines. DUL-B (10-12’ bgs): Lt bn to bn clayey, sandy gravel, 5% fines. DUL-C (12-14’ bgs): Lt bn to bn clayey, sandy gravel, 5% fines. DUL-D (14-16’ bgs): Lt bn to bn sandy gravel, 1-1-5 fines. DUL-E (16-18’ bgs): Lt bn to bn sandy gravel, 1-1-5 fines, increasing fines at base. DUL-F (18-20’ bgs): Lt bn to bn clayey, sandy gravel, 1-5% fines. DUL-G (20’-TD bgs): Dk bn clayey, sandy gravel with tuff frags, 5-10% fines; tuff @ 22 ft bgs.
10	22	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel, <1% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel, <1% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel, <1% fines. DUL-D (14-16’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-E (16-18’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-F (18-20’ bgs): Lt bn to bn gravely, clayey sand, 10-15% fines. DUL-G (20’-TD bgs): Bn sandy gravel to gravely sand, 5-10% fines; tuff @ 22 ft bgs.
11	22	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel, 1-1-5 fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel to gravely sand, 1-1-5 fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-D (14-16’ bgs): Lt bn to bn sandy gravel, 1-1-5 fines. DUL-E (16-18’ bgs): Lt bn to bn sandy gravel, 1-1-5 fines. DUL-F (18-20’ bgs): Lt bn to bn gravely, sandy clay to clayey, sandy gravel, 20-30% fines. DUL-G (20’-TD bgs): Bn sandy gravel with tuff frags, 1-5% fines; tuff @ 22 ft bgs.
12	21	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel, <1% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel, <1% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel, <1% fines. DUL-D (14-16’ bgs): Lt bn to bn sandy gravel, <1% fines grading to DUL E below. DUL-E (16-18’ bgs): Lt bn to bn sandy gravel to gravely sand, over clayey gravely sand, 20% fines. DUL-F (18-20’ bgs): Lt bn to bn gravely sand and clay, >50% fines, swelled to four ft on retrieval. DUL-G (20’-TD bgs): Bn sandy gravel with tuff frags, 1-5% fines; tuff @ 21 ft bgs.

Boring ID Number	Total Depth (feet)	Decision Unit Layer (DUL) Description
13	20	DUL-A (6-10' bgs): Lt bn to bn sandy gravel, <1% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel, <1% fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-D (14-16' bgs): Lt bn to bn clayey sandy gravel, 5% fines. DUL-E (16-18' bgs): Lt bn to bn sandy, gravely clay, est. 30-40% fines. DUL-F (18-20' bgs): Lt bn to bn clayey gravel to gravely, sandy clay, 20-30% fines; over drk bn tuffaceous sand; tuff @ 20 ft bgs.
14	20	DUL-A (6-10' bgs): Lt bn to bn sandy gravel, <1% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel, <1% fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-D (14-16' bgs): Lt bn to bn sandy gravel to gravely sand, 5% fines. DUL-E (16-18' bgs): Lt bn to bn gravely sand, 10% fines; increasing fines downward. DUL-F (18-20' bgs): Lt bn to bn gravely sand to sandy clay, >50% fines; over drk bn tuffaceous sand; tuff @ 20 ft bgs.
15	20	DUL-A (6-10' bgs): Lt bn to bn sandy gravel, <1% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-C (12-14' bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-D (14-16' bgs): Same, overlying lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-E (16-18' bgs): Lt Lt bn to bn clayey sand, 10% fines. DUL-F (18-20' bgs): Lt bn to bn gravely clay, >75% fines; over drk bn tuffaceous sand; tuff @ 20 ft bgs.
16	20	DUL-A (6-10' bgs): Lt bn to bn sandy gravel, <1% fines. DUL-B (10-12' bgs): Lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-C (12-14' bgs): Lt bn to bn clayey, gravely sandy, 10% fines. DUL-D (14-16' bgs): Lt bn to bn clayey, gravely sandy, 10% fines. DUL-E (16-18' bgs): Lt Lt bn to bn clayey, gravely sandy, 10% fines; increasing fines downward. DUL-F (18-20' bgs): Lt bn to bn clayey sandy gravel to gravely sand, 10-20% fines, swelled to four ft on retrieval. DUL-G (20'-TD bgs): Thin, <1 ft layer of drk bn, tuffaceous sand with tuff frags (not sampled).

Boring ID Number	Total Depth (feet)	Decision Unit Layer (DUL) Description
17	18	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel, 5% fines. DUL-D (14-16 bgs): Lt bn to bn sandy gravel to gravely sand, 5-10% fines; 1 ft sandy clay at base, >50% fines. DUL-E (16-TD bgs): Lt bn to bn sandy gravel to gravely sand, 5-10% fines; tuff not encountered but close to TD.
18	18	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel, 5% fines. DUL-D (14-16 bgs): Lt bn to bn sandy gravel, 5% fines. DUL-E (16-TD bgs): Lt bn to bn sandy gravel to gravely sand, 10-20% fines. DUL-F: Thin, <1ft layer of drk bn tuffaceous sand, not sampled; tuff @ 19 ft bgs.
19	18	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel to gravely sand, 5-10% fines. DUL-D (14-16 bgs): Lt bn to bn sandy gravel to gravely sand, 5-10% fines. DUL-E (16-TD bgs): Lt bn to bn gravely sand, 5-10% fines; tuff @-18 ft bgs.
20	18	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel to gravely sand, 1-5% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel to gravely sand, 5% fines. DUL-D (14-16 bgs): Lt bn to bn sandy gravel to gravely sand, 5% fines, sandy, gravely clay at base, >50% fines. DUL-E (16-TD bgs): Same at top 1 ft, over lt bn to bn gravely sand, 1-5% fines. DUL-F: Thin, <1ft layer of gravely sand, not sampled; tuff not obvious but close to TD.
21	16	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-D (14-TD bgs): Lt bn to bn gravelly sand, bottom few inches bn clayey sand, >75% fines.

Boring ID Number	Total Depth (feet)	Decision Unit Layer (DUL) Description
22	15	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-D (14-16 bgs): Lt bn to bn sandy gravel, 1-5% fines. DUL-E: Thin, <1 ft layer of drk bwn tuffaceous sandLt bn to bn gravelly sand, bottom few inches bn clayey sand, >75% fines.
23	15	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines; bottom one ft bn clayey sand. DUL-D (14-TD bgs): Lt bn to bn gravelly sand, bottom one ft bn clayey sand, >50% fines.
24	16	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-D (14-TD bgs): Upper lt bn to bn sandy gravel to gravelly sand over one ft bn clayey sand to sandy clay.
25	16	DUL-A (6-10’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-B (10-12’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines. DUL-C (12-14’ bgs): Lt bn to bn sandy gravel to gravelly sand, 1-5% fines; bottom one ft compact, drk bn clay. DUL-D (14-TD bgs): Bn to drk bn clayey silt to silty clay with some sandy gravel, >75% fines.
26		Abandoned due to subsurface obstruction at one-foot bgs.
27	15	DUL-A (6-10’ bgs): Lt bn to bn gravelly sand to sandy gravel with increasing fines at base, 5-10% fines; DUL-B (10-12’ bgs): Same, sandier near base. DUL-C & D (12-14’ bgs): Poor recovery (two feet), bn clayey silt with gravel, >50% fines.
28	16	DUL-A (6-10’ bgs): Lt bn to bn gravelly sand to sandy gravel with increasing fines at base, 5-10% fines; DUL-B (10-12’ bgs): Same, sandier near base. DUL-C (12-14’ bgs): Lt bn to bn ilty sand to sandy silt with increasing fines downwards, 5-10% clays DUL-D (14-TD bgs): Interlayered lt bn sandy gravel and bn clayey sand, bottom1 ft 30% fines.
29	16	DUL-A (6-10’ bgs): Lt bn gravelly sand to sandy gravel with increasing fines at base, 5-10% fines; DUL-B (10-12’ bgs): Same, sandier near base. DUL-C (12-14’ bgs): Lt bn ilty sand to sandy silt with increasing fines downwards, 5-10% clays DUL-D (14-TD bgs): Lt bn, interlayered sandy gravel and clayey sand, bottom1 ft 50% fines.

Boring ID Number	Total Depth (feet)	Decision Unit Layer (DUL) Description
30	16	DUL-A (6-10’ bgs): Lt bn gravelly sand to sandy gravel, 1-5% fines. DUL-B (10-12’ bgs): Same, sandier near base. DUL-C (12-14’ bgs): Lt bn to bn upper-silty sand to sandy silt grading to lower bn silty clay, 50-60% fines. DUL-D (14-TD bgs): Lt bn to bn, interlayered sandy gravel and clayey sand, 10-15% fines.

Notes.

1. “Gravel” in most cases was angular and could represent fragments of coral broken during drilling.
2. “Fines” mix of fine sand, silt and clay; refer to grain-size analysis in text.
3. Boundaries between coarse and fine units sharp but gradational; no obvious erosional layers except top of tuff.
4. Borehole installation dates: June 14, 2011 - Boreholes 22-30; June 15, 2011 - Boreholes 3-8; June 15, 2011 - Boreholes 1,2, 9-16; June 17, 2011 - Boreholes 17-21.

APPENDIX 2
BOREHOLE GPS LOCATIONS

Project Name: Hickam AFB CG110 MIS VOC Study
Project Number: 103DS148843.H0201

GPS Coordinates* for Soil Borings

Site	Date	Soil Boring ID	Latitude**	Longitude
CG110	6/14/2010	30	21°19'52.9"	157°57'43.8"
"	"	29	21°19'52.6"	157°57'44.2"
"	"	28	21°19'52.3"	157°57'44.6"
"	"	27	21°19'53.5"	157°57'44.4"
"	"	26^	(21°19'53.1")	(157°57'44.6")
"	"	25	21°19'56.6"	157°57'44.9"
"	"	24	21°19'54.0"	157°57'45.1"
"	"	23	21°19'53.6"	157°57'45.5"
"	"	22	21°19'53.3"	157°57'45.9"
"	6/15/2010	8	21°19'55.8"	157°57'46.4"
"	"	7	21°19'55.6"	157°57'46.9"
"	"	6	21°19'55.3"	157°57'47.3"
"	"	5	21°19'54.9"	157°57'46.8"
"	"	4	21°19'56.5"	157°57'47.4"
"	"	3	21°19'56.4"	157°57'47.6"
"	6/16/2010	12	21°19'55.7"	157°57'46.5"
"	"	11	21°19'55.7"	157°57'46.9"
"	"	10	21°19'54.9"	157°57'47.1"
"	"	9	21°19'54.5"	157°57'47.4"
"	"	2	21°19'56.2"	157°57'48.0"
"	"	1	21°19'55.5"	157°57'48.5"
"	"	16	21°19'54.7"	157°57'45.8"
"	"	15	21°19'54.5"	157°57'46.1"
"	"	14	21°19'54.1"	157°57'46.4"
"	"	13	21°19'53.8"	157°57'46.7"
"	6/17/2010	21	21°19'52.9"	157°57'46.0"
"	"	18	21°19'53.9"	157°57'45.9"
"	"	19	21°19'54.0"	157°57'45.6"
"	"	20	21°19'54.4"	157°57'45.1"
"	"	17	21°19'53.4"	157°57'46.2"

NOTES:
* All coordinates recorded using Garmin GPSmap 76Cx.
** Units recorded in degrees, minutes and seconds.
^ Drilling started on borehole 26 but was not completed due to utility concerns. Samples not collected. Coordinates recorded for start of borehole.

APPENDIX 3
LABORATORY REPORTS

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

June 30, 2010

LABORATORY REPORT

Client:			
Tetra Tech EM Inc.		Work Order:	HTF0069
737 Bishop st., Suite 3010		Project Name:	Subsurface Soil Investigation (MIS-VOCs)
Honolulu, HI 96813		Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H
Attn:	Scott Duzan	Date Received:	06/14/10

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica.

TestAmerica Analytical Testing Corporation certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.

The Chain(s) of Custody, 6 pages, are included and are an integral part of this report. This entire report was reviewed and approved for release.

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 1-(808)486-5227

Samples were received into laboratory at a temperature of 8 °C.

NELAC states that samples which require thermal preservation shall be considered acceptable if the arrival temperature is within 2 degrees C of the required temperature or the method specified range. For samples with a temperature requirement of 4 degrees C, an arrival temperature from 0 degrees C to 6 degrees C meets specifications. Samples that are delivered to the laboratory on the same day that they are collected may not meet these criteria. In these cases, the samples are considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The reported results were obtained in compliance with the 2003 NELAC standards unless otherwise noted.

Approved By:

Marvin D. Heskett III
Laboratory Director

NELAC Certification # E87907

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

Sample Summary

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B24-A-(MIC-VOC)	HTF0069-01	Solid/Soil	06/14/10 15:00	06/14/10 17:15	
FIELD BLANK B24-A	HTF0069-02	Solid/Soil	06/14/10 15:01	06/14/10 17:15	
B24-B-(MIC-VOC)	HTF0069-03	Solid/Soil	06/14/10 15:07	06/14/10 17:15	
B24-C-(MIC-VOC)	HTF0069-04	Solid/Soil	06/14/10 15:05	06/14/10 17:15	
B24-D-(MIC-VOC)	HTF0069-05	Solid/Soil	06/14/10 15:15	06/14/10 17:15	
B23-A-(MIC-VOC)	HTF0069-06	Solid/Soil	06/14/10 15:30	06/14/10 17:15	
B23-B-(MIC-VOC)	HTF0069-07	Solid/Soil	06/14/10 15:38	06/14/10 17:15	
B23-C-(MIC-VOC)	HTF0069-08	Solid/Soil	06/14/10 15:42	06/14/10 17:15	
B23-D-(MIC-VOC)	HTF0069-09	Solid/Soil	06/14/10 15:50	06/14/10 17:15	
B22-A-(MIC-VOC)	HTF0069-10	Solid/Soil	06/14/10 16:05	06/14/10 17:15	
TRIP BLANK	HTF0069-11	Solid/Soil	06/14/10 15:54	06/14/10 17:15	
B22-B-(MIC-VOC)	HTF0069-12	Solid/Soil	06/14/10 16:15	06/14/10 17:15	
B22-C-(MIC-VOC)	HTF0069-13	Solid/Soil	06/14/10 16:20	06/14/10 17:15	
B22-D-(MIC-VOC)	HTF0069-14	Solid/Soil	06/14/10 16:25	06/14/10 17:15	
B28-C-(MIC-VOC)	HTF0069-15	Solid/Soil	06/14/10 11:05	06/14/10 17:15	
B28-D-(MIC-VOC)	HTF0069-16	Solid/Soil	06/14/10 11:20	06/14/10 17:15	
B27-A-(MIC-VOC)	HTF0069-17	Solid/Soil	06/14/10 11:45	06/14/10 17:15	
B27-B-(MIC-VOC)	HTF0069-18	Solid/Soil	06/14/10 12:25	06/14/10 17:15	
B27-C-(MIC-VOC)	HTF0069-19	Solid/Soil	06/14/10 12:30	06/14/10 17:15	
B27-D-(MIC-VOC)	HTF0069-20	Solid/Soil	06/14/10 12:35	06/14/10 17:15	
B25-A-(MIC-VOC)	HTF0069-21	Solid/Soil	06/14/10 14:25	06/14/10 17:15	
B25-B-(MIC-VOC)	HTF0069-22	Solid/Soil	06/14/10 14:30	06/14/10 17:15	
B25-C-(MIC-VOC)	HTF0069-23	Solid/Soil	06/14/10 14:35	06/14/10 17:15	
B25-D-(MIC-VOC)	HTF0069-24	Solid/Soil	06/14/10 14:40	06/14/10 17:15	
B27-4-6-SM	HTF0069-25	Solid/Soil	06/14/10 11:35	06/14/10 17:15	
B30-A-(MIC-VOC)	HTF0069-26	Solid/Soil	06/14/10 08:37	06/14/10 17:15	

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B30-B-(MIC-VOC)	HTF0069-27	Solid/Soil	06/14/10 08:45	06/14/10 17:15	
B30-C-(MIC-VOC)	HTF0069-28	Solid/Soil	06/14/10 08:47	06/14/10 17:15	
B30-D-(MIC-VOC)	HTF0069-29	Solid/Soil	06/14/10 09:00	06/14/10 17:15	
B29-A-(MIC-VOC)	HTF0069-30	Solid/Soil	06/14/10 10:25	06/14/10 17:15	
B29-B-(MIC-VOC)	HTF0069-31	Solid/Soil	06/14/10 10:30	06/14/10 17:15	
B29-C-(MIC-VOC)	HTF0069-32	Solid/Soil	06/14/10 10:35	06/14/10 17:15	
B29-D-(MIC-VOC)	HTF0069-33	Solid/Soil	06/14/10 10:40	06/14/10 17:15	
B28-A-(MIC-VOC)	HTF0069-34	Solid/Soil	06/14/10 10:55	06/14/10 17:15	
B28-B-(MIC-VOC)	HTF0069-35	Solid/Soil	06/14/10 11:07	06/14/10 17:15	

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0069	Received: 06/14/10	Reported: 06/30/10 17:30
	Project: Subsurface Soil Investigation (MIS-VOCs)		
	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0069-01 (B24-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 15:00**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.61	9.22	50	06/15/10 17:45	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.61	9.22	"	"	"	"	"
Trichloroethene	ND		"	4.61	9.22	"	"	"	"	"
Vinyl chloride	**12.8**	J	"	6.27	18.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0069-02 (FIELD BLANK B24-A - Solid/Soil)					**Sampled: 06/14/10 15:01**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.00	10.0	50	06/15/10 18:11	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Trichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Vinyl chloride	**11.2**	J	"	6.80	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*91 %*						"	"	"	"
Sample ID: HTF0069-03 (B24-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 15:07**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.42	8.85	50	06/15/10 18:37	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.42	8.85	"	"	"	"	"
Trichloroethene	ND		"	4.42	8.85	"	"	"	"	"
Vinyl chloride	**6.18**	J	"	6.02	17.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0069-04 (B24-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 15:05**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.60	9.20	50	06/15/10 19:56	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.60	9.20	"	"	"	"	"
Trichloroethene	ND		"	4.60	9.20	"	"	"	"	"
Vinyl chloride	ND		"	6.25	18.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0069-05 (B24-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 15:15**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.77	9.55	50	06/15/10 19:05	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.77	9.55	"	"	"	"	"
Trichloroethene	ND		"	4.77	9.55	"	"	"	"	"
Vinyl chloride	ND		"	6.49	19.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0069-06 (B23-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 15:30**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.41	8.82	50	06/15/10 19:31	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.41	8.82	"	"	"	"	"
Trichloroethene	ND		"	4.41	8.82	"	"	"	"	"
Vinyl chloride	ND		"	6.00	17.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0069 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/14/10 Reported: 06/30/10 17:30	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0069-06 (B23-A-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/14/10 15:30**			**Recvd: 06/14/10 17:15**		
Sample ID: HTF0069-07 (B23-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 15:38**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.19	10.4	50	06/15/10 20:22	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.19	10.4	"	"	"	"	"
Trichloroethene	ND		"	5.19	10.4	"	"	"	"	"
Vinyl chloride	ND		"	7.06	20.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0069-08 (B23-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 15:42**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.09	10.2	50	06/15/10 20:48	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.09	10.2	"	"	"	"	"
Trichloroethene	ND		"	5.09	10.2	"	"	"	"	"
Vinyl chloride	ND		"	6.93	20.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*93 %*						"	"	"	"
Sample ID: HTF0069-09 (B23-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 15:50**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.20	10.4	50	06/15/10 21:13	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.20	10.4	"	"	"	"	"
Trichloroethene	ND		"	5.20	10.4	"	"	"	"	"
Vinyl chloride	ND		"	7.07	20.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0069-10 (B22-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 16:05**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.09	10.2	50	06/15/10 21:39	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.09	10.2	"	"	"	"	"
Trichloroethene	ND		"	5.09	10.2	"	"	"	"	"
Vinyl chloride	ND		"	6.93	20.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0069-11 (TRIP BLANK - Solid/Soil)					**Sampled: 06/14/10 15:54**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.00	10.0	50	06/15/10 22:05	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Trichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Vinyl chloride	ND		"	6.80	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0069-12 (B22-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 16:15**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.27	8.53	50	06/15/10 22:31	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.27	8.53	"	"	"	"	"
Trichloroethene	ND		"	4.27	8.53	"	"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0069-12 (B22-B-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/14/10 16:15**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260 - cont.										
Vinyl chloride	**6.32**	J	"	5.80	17.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0069-13 (B22-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 16:20**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.43	10.9	50	06/15/10 22:56	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.43	10.9	"	"	"	"	"
Trichloroethene	ND		"	5.43	10.9	"	"	"	"	"
Vinyl chloride	ND		"	7.38	21.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0069-14 (B22-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 16:25**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.52	11.0	50	06/15/10 23:22	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.52	11.0	"	"	"	"	"
Trichloroethene	ND		"	5.52	11.0	"	"	"	"	"
Vinyl chloride	ND		"	7.51	22.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0069-15 (B28-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 11:05**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.96	9.92	50	06/15/10 23:47	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.96	9.92	"	"	"	"	"
Trichloroethene	ND		"	4.96	9.92	"	"	"	"	"
Vinyl chloride	ND		"	6.75	19.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*101 %*						"	"	"	"
Sample ID: HTF0069-16 (B28-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 11:20**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.14	10.3	50	06/16/10 00:13	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.14	10.3	"	"	"	"	"
Trichloroethene	ND		"	5.14	10.3	"	"	"	"	"
Vinyl chloride	ND		"	6.99	20.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0069-17 (B27-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 11:45**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.59	9.17	50	06/16/10 09:17	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.59	9.17	"	"	"	"	"
Trichloroethene	ND		"	4.59	9.17	"	"	"	"	"
Vinyl chloride	ND		"	6.24	18.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0069-18 (B27-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 12:25**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010			Reported:	06/30/10 17:30
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0069-18 (B27-B-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/14/10 12:25**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260 - cont.										
cis-1,2-Dichloroethene	ND		ug/kg	4.87	9.75	50	06/16/10 10:32	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.87	9.75	"	"	"	"	"
Trichloroethene	ND		"	4.87	9.75	"	"	"	"	"
Vinyl chloride	ND		"	6.63	19.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0069-19 (B27-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 12:30**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.41	10.8	50	06/16/10 10:58	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.41	10.8	"	"	"	"	"
Trichloroethene	ND		"	5.41	10.8	"	"	"	"	"
Vinyl chloride	ND		"	7.35	21.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0069-20 (B27-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 12:35**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.85	9.70	50	06/16/10 11:23	06/15/10	10F0088	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.85	9.70	"	"	"	"	"
Trichloroethene	ND		"	4.85	9.70	"	"	"	"	"
Vinyl chloride	ND		"	6.59	19.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0069-21 (B25-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 14:25**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.40	4.81	50	06/16/10 12:38	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.40	4.81	"	"	"	"	"
Trichloroethene	ND		"	2.40	4.81	"	"	"	"	"
Vinyl chloride	ND		"	3.27	9.62	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0069-22 (B25-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 14:30**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.95	5.90	50	06/16/10 13:04	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.95	5.90	"	"	"	"	"
Trichloroethene	ND		"	2.95	5.90	"	"	"	"	"
Vinyl chloride	ND		"	4.01	11.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*101 %*						"	"	"	"
Sample ID: HTF0069-23 (B25-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 14:35**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.48	4.96	50	06/16/10 14:19	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.48	4.96	"	"	"	"	"
Trichloroethene	ND		"	2.48	4.96	"	"	"	"	"
Vinyl chloride	ND		"	3.38	9.93	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0069 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/14/10 Reported: 06/30/10 17:30	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0069-23 (B25-C-(MIC-VOC) - Solid/Soil) - cont.							**Sampled: 06/14/10 14:35**		**Recvd: 06/14/10 17:15**	
Sample ID: HTF0069-24 (B25-D-(MIC-VOC) - Solid/Soil)							**Sampled: 06/14/10 14:40**		**Recvd: 06/14/10 17:15**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.50	4.99	50	06/16/10 14:44	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.50	4.99	"	"	"	"	"
Trichloroethene	ND		"	2.50	4.99	"	"	"	"	"
Vinyl chloride	ND		"	3.39	9.98	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0069-25 (B27-4-6-SM - Solid/Soil)							**Sampled: 06/14/10 11:35**		**Recvd: 06/14/10 17:15**	
General Chemistry Parameters										
% Moisture	**25.0**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0069-25RE1 (B27-4-6-SM - Solid/Soil)							**Sampled: 06/14/10 11:35**		**Recvd: 06/14/10 17:15**	
General Chemistry Parameters										
% Moisture	**24.7**		"	0.100	0.100	"	"	"	"	"
Sample ID: HTF0069-25RE2 (B27-4-6-SM - Solid/Soil)							**Sampled: 06/14/10 11:35**		**Recvd: 06/14/10 17:15**	
General Chemistry Parameters										
% Moisture	**27.8**		"	0.100	0.100	"	"	"	"	"
Sample ID: HTF0069-25RE3 (B27-4-6-SM - Solid/Soil)							**Sampled: 06/14/10 11:35**		**Recvd: 06/14/10 17:15**	
General Chemistry Parameters										
% Moisture	**29.1**		"	0.100	0.100	"	"	"	"	"
Sample ID: HTF0069-26 (B30-A-(MIC-VOC) - Solid/Soil)							**Sampled: 06/14/10 08:37**		**Recvd: 06/14/10 17:15**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.71	5.42	50	06/16/10 15:09	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.71	5.42	"	"	"	"	"
Trichloroethene	ND		"	2.71	5.42	"	"	"	"	"
Vinyl chloride	ND		"	3.68	10.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0069-27 (B30-B-(MIC-VOC) - Solid/Soil)							**Sampled: 06/14/10 08:45**		**Recvd: 06/14/10 17:15**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	3.88	7.77	50	06/16/10 15:35	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.88	7.77	"	"	"	"	"
Trichloroethene	ND		"	3.88	7.77	"	"	"	"	"
Vinyl chloride	ND		"	5.28	15.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0069-28 (B30-C-(MIC-VOC) - Solid/Soil)							**Sampled: 06/14/10 08:47**		**Recvd: 06/14/10 17:15**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.67	5.35	50	06/16/10 16:00	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.67	5.35	"	"	"	"	"
Trichloroethene	ND		"	2.67	5.35	"	"	"	"	"
Vinyl chloride	ND		"	3.64	10.7	"	"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0069-28 (B30-C-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/14/10 08:47**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260 - cont.										
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0069-29 (B30-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 09:00**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.45	4.90	50	06/16/10 16:25	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.45	4.90	"	"	"	"	"
Trichloroethene	ND		"	2.45	4.90	"	"	"	"	"
Vinyl chloride	ND		"	3.33	9.79	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0069-30 (B29-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 10:25**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	3.33	6.65	50	06/16/10 16:50	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.33	6.65	"	"	"	"	"
Trichloroethene	ND		"	3.33	6.65	"	"	"	"	"
Vinyl chloride	ND		"	4.52	13.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0069-31 (B29-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 10:30**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.51	5.01	50	06/16/10 17:15	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.51	5.01	"	"	"	"	"
Trichloroethene	ND		"	2.51	5.01	"	"	"	"	"
Vinyl chloride	ND		"	3.41	10.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0069-32 (B29-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 10:35**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.94	5.87	50	06/16/10 17:41	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.94	5.87	"	"	"	"	"
Trichloroethene	ND		"	2.94	5.87	"	"	"	"	"
Vinyl chloride	ND		"	3.99	11.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*101 %*						"	"	"	"
Sample ID: HTF0069-33 (B29-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 10:40**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.03	4.07	50	06/16/10 18:06	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.03	4.07	"	"	"	"	"
Trichloroethene	ND		"	2.03	4.07	"	"	"	"	"
Vinyl chloride	ND		"	2.77	8.14	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"
Sample ID: HTF0069-34 (B28-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 10:55**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.84	5.69	50	06/16/10 18:32	06/16/10	10F0095	EPA 8260

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0069-34 (B28-A-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/14/10 10:55**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260 - cont.										
trans-1,2-Dichloroethene	ND		"	2.84	5.69	"	"	"	"	"
Trichloroethene	ND		"	2.84	5.69	"	"	"	"	"
Vinyl chloride	ND		"	3.87	11.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0069-35 (B28-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/14/10 11:07**			**Recvd: 06/14/10 17:15**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.91	5.83	50	06/16/10 19:49	06/16/10	10F0095	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.91	5.83	"	"	"	"	"
Trichloroethene	ND		"	2.91	5.83	"	"	"	"	"
Vinyl chloride	ND		"	3.96	11.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*106 %*						"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

SAMPLE EXTRACTION DATA

Parameter	Batch	Lab Number	Wt/Vol Extracted	Default Wt/Vol	Extracted Vol	Default Vol	Date	Analyst	Extraction Method

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY BLANK QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
General Chemistry Parameters													
Batch\Seq: 10F0126 Extracted: 06/21/10													
Blank Analyzed: 06/22/2010 (10F0126-BLK1)													
% Moisture			Weight %	0.100	0.100	ND							
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0088 Extracted: 06/15/10													
Blank Analyzed: 06/15/2010 (10F0088-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*91*		*80-120*			
Batch\Seq: 10F0095 Extracted: 06/16/10													
Blank Analyzed: 06/16/2010 (10F0095-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.0500	0.100	ND							
trans-1,2-Dichloroethene			ug/kg	0.0500	0.100	ND							
Trichloroethene			ug/kg	0.0500	0.100	ND							
Vinyl chloride			ug/kg	0.0680	0.200	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*100*		*80-120*			

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
General Chemistry Parameters												
Batch\Seq: 10F0126 Extracted: 06/21/10												
Duplicate Analyzed: 06/23/2010 (10F0126-DUP1)				**QC Source Sample: HTF0087-01**								
% Moisture	81.6		Weight %	0.100	0.100	81.9				1	20	

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LCS/LCS DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0088 Extracted: 06/15/10													
LCS Analyzed: 06/15/2010 (10F0088-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	3.31		83		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	3.71		93		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	3.37		84		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.50		88		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*91*		*80-120*			
Batch\Seq: 10F0095 Extracted: 06/16/10													
LCS Analyzed: 06/16/2010 (10F0095-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.0500	0.100	3.41		85		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.0500	0.100	3.83		96		80-120			
Trichloroethene		4.00	ug/kg	0.0500	0.100	3.57		89		80-120			
Vinyl chloride		4.00	ug/kg	0.0680	0.200	3.20		80		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*103*		*80-120*			

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0088 Extracted: 06/15/10													
Matrix Spike Analyzed: 06/16/2010 (10F0088-MS1)				**QC Source Sample: HTF0069-01**									
cis-1,2-Dichloroethene	ND	184	ug/kg	4.61	9.22	140	146	76	79	80-120	4	30	M7
trans-1,2-Dichloroethene	ND	184	ug/kg	4.61	9.22	155	166	84	90	80-120	7	30	
Trichloroethene	ND	184	ug/kg	4.61	9.22	154	176	83	96	80-120	14	30	
Vinyl chloride	12.8	184	ug/kg	6.27	18.4	156	169	77	85	80-120	8	30	M7
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*92*	*95*	*80-120*			
Batch\Seq: 10F0095 Extracted: 06/16/10													
Matrix Spike Analyzed: 06/16/2010 (10F0095-MS1)				**QC Source Sample: HTF0069-21**									
cis-1,2-Dichloroethene	ND	192	ug/kg	2.40	4.81	169	158	88	82	80-120	7	30	
trans-1,2-Dichloroethene	ND	192	ug/kg	2.40	4.81	188	172	98	89	80-120	9	30	
Trichloroethene	ND	192	ug/kg	2.40	4.81	245	226	127	117	80-120	8	30	M7
Vinyl chloride	ND	192	ug/kg	3.27	9.62	225	185	117	96	80-120	19	30	
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*107*	*103*	*80-120*			

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0069	Received:	06/14/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:30
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

CERTIFICATION SUMMARY

TestAmerica Honolulu

Method	Matrix	Nelac	Hawaii
EPA 8260	Solid/Soil	X	
SM 2540G	Solid/Soil		

For information concerning certifications of this facility or another TestAmerica facility, please visit our website at www.TestAmericaInc.com

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
M7	The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).
ND	Not detected at the reporting limit (or method detection limit if shown)

ADDITIONAL COMMENTS

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. MTF0069
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B24-A-(MIC-VOC)	X			X								MeOH	6.14.10	1500	1	X									MTF0069-01
2	Field Blank - B24-A	X			X								MeOH		1501	1	X									-02
3	B24-B-(MIC-VOC)	X			X								MeOH		1507	1	X									-03
4	B24-C-(MIC-VOC)	X			X								MeOH		1509	1	X									-04
5	B24-D-(MIC-VOC)	X			X								MeOH		1515	1	X									-05
6	B23-A-(MIC-VOC)	X			X								MeOH		1530	1	X									-06
7	B23-B-(MIC-VOC)	X			X								MeOH		1538	1	X									-07
8	B23-C-(MIC-VOC)	X			X								MeOH		1542	1	X									-08
9	B23-D-(MIC-VOC)	X			X								MeOH		1550	1	X									-09
10	B22-A-(MIC-VOC)	X			X								MeOH		1605	1	X									-10

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.14.10 / 1715	Hand	[signature]	TestAmerica	6/14/10 / 1715	8.2 °C Wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0069
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 4

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	Trip Blank	X			X								MeOH	6.14.10	1554	1	X										HTF0069-11
2	B22-B-(MIC-VOC)	X			X								MeOH	↓	1615	1	X										-12
3	B22-C-(MIC-VOC)	X			X								MeOH	↓	1620	1	X										-13
4	B22-D-(MIC-VOC)	X			X								MeOH	↓	1625	1	X										-14
5		X			X								MeOH														
6		X			X								MeOH														
7		X			X								MeOH														
8		X			X								MeOH														
9		X			X								MeOH														
10		X			X								MeOH														

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.14.10 / 1715	Hand	[signature]	TestAmerica	6/14/10 / 1715	8 ... 02 Wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. NTF0069
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B28-C-(MIC-VOC)	X			X								MeOH	6-14-10	1105	1	X										NTF0069-15
2	B28-D-(MIC-VOC)	X			X								MeOH		1120	1	X										-16
3	B27-A-(MIC-VOC)	X			X								MeOH		1145	1	X										-17
4	B27-B-(MIC-VOC)	X			X								MeOH		1225	1	X										-18
5	B27-C-(MIC-VOC)	X			X								MeOH		1230	1	X										-19
6	B27-D-(MIC-VOC)	X			X								MeOH		1235	1	X										-20
7	B25-A-(MIC-VOC)	X			X								MeOH		1425	1	X										-21
8	B25-B-(MIC-VOC)	X			X								MeOH		1430	1	X										-22
9	B25-C-(MIC-VOC)	X			X								MeOH		1435	1	X										-23
10	B25-D-(MIC-VOC)	X			X								MeOH		1440	1	X										-24

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.14.10 / 1715	Hand	[signature]	TestAmerica	6/14/10 / 1715	[illegible] 02 wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1b

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY	
LAB JOB NO.	HTF0069
LOCATION	
CONTAINERS	

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com	Project identification
Company name: Tetra Tech EMI	Job name: Hickam AFB CG110 ISM VOC Study
Address: 737 Bishop Street, Suite 3010	Job number: 103DS148843.H0301
City: Honolulu State: HI ZIP: 96813	
Phone: 808.441.6645 Fax	Contact email address: scott.duzan@tetratech.com
Sampler: SD # samples in shipment 1	

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling: Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no. HTF0069
1	~~AD~~ B27-4-6-SM	X			X								NA	6.14.10	1135	1		X									* S.6 SAP-25
2		X			X								NA														~~-26~~
3		X			X								NA														-27
4		X			X								NA														-28
5		X			X								NA														-29
6		X			X								NA														6/15/10 -30
7		X			X								NA														S -31
8		X			X								NA														-32
9		X			X								NA														-33
10		X			X								NA														-34

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.14.10 / 1715	Hand	[signature]	TestAmerica	6/14/10 / 1715	[illegible] 8°2 Wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

See Section S.6 + S.7 of SAP for Soil Moisture protocols – S.6 = Vadose, S.7 Saturated

Please check one:
- ☒ Dispose by lab
- ☐ Return to client
- ☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0069
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling: Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon	Laboratory ID no.
1	B30-A-(MIC-VOC)	X			X								MeOH	6-14-10	0837	1	X					HTF0069 -26 ~~-35~~
2	B30-B-(MIC-VOC)	X			X								MeOH		0845	1	X					-27 ~~-36~~
3	B30-C-(MIC-VOC)	X			X								MeOH		0847	1	X					-28 ~~-37~~
4	B30-D-(MIC-VOC)	X			X								MeOH		0900	1	X					-29 ~~-38~~
5	B29-A-(MIC-VOC)	X			X								MeOH		1025	1	X					-30 ~~-39~~
6	B29-B-(MIC-VOC)	X			X								MeOH		1030	1	X					-31 ~~-40~~
7	B29-C-(MIC-VOC)	X			X								MeOH		1035	1	X					-32 ~~-41~~
8	B29-D-(MIC-VOC)	X			X								MeOH		1040	1	X					-33 ~~-42~~
9	B28-A-(MIC-VOC)	X			X								MeOH		1055	1	X					-34 ~~-43~~
10	B28-B-(MIC-VOC)	X			X								MeOH		1107	1	X					-35 ~~-44~~

6/15/10 S

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6-14-10 / 1715	Hand	[signature]	TestAmerica	6/14/10 / 1715	Ambient °2 Wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
- ☒ Dispose by lab
- ☐ Return to client
- ☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Client Name: Tetra Tech **Date/ Time Received:** 6/14/10 1715

Checklist Completed By: JC **Received By:** JC

Matrices: Soil **Carrier:** Client **Airbill# :**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Chain of Custody present?	Yes ☑	No ☐	☐
Chain of Custody Signed when relinquished and received?	Yes ☑	No ☐	
Chain of Custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sample containers on ice?	Yes ☑	No ☐	Type: Wet
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Water - VOA Vials have Zero Headspace?	Yes ☐	No ☐	No VOA vials present: ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Checked: ☑
pH Adjusted?	Yes ☐	No ☑	Final pH:
Encores / 5035 Vials Present?	Yes ☐	No ☑	
Sample Filtration Needed?	Yes ☐	No ☑	Filtered in Field: ☐
Dry Weight Corrected Results?	Yes ☐	No ☐	Take Action: ☑
DODQSM / QAPP Project?	Yes ☐	No ☐	Type:

Temperature Blank Present? Yes ☑ ~~No ☑~~ 6/14/10

Sample Container/Blank Temperature Range (Minimum 3 sample containers if available): 8 °C

Comments/ Sampling Handling Notes:

500ml Amber for -01 mislabled as "B24-D" used sampling time to confirm ID. JC 6/15/10

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

June 30, 2010

LABORATORY REPORT

Client:
Tetra Tech EM Inc.
737 Bishop st., Suite 3010
Honolulu, HI 96813
Attn: Scott Duzan

Work Order:	HTF0073
Project Name:	Subsurface Soil Investigation (MIS-VOCs)
Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H
Date Received:	06/15/10

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica.

TestAmerica Analytical Testing Corporation certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.

The Chain(s) of Custody, 4 pages, are included and are an integral part of this report. This entire report was reviewed and approved for release.

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 1-(808)486-5227

Samples were received into laboratory at a temperature of 5 °C.

NELAC states that samples which require thermal preservation shall be considered acceptable if the arrival temperature is within 2 degrees C of the required temperature or the method specified range. For samples with a temperature requirement of 4 degrees C, an arrival temperature from 0 degrees C to 6 degrees C meets specifications. Samples that are delivered to the laboratory on the same day that they are collected may not meet these criteria. In these cases, the samples are considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The reported results were obtained in compliance with the 2003 NELAC standards unless otherwise noted.

Approved By:

Marvin D. Heskett III
Laboratory Director

NELAC Certification # E87907

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0073		Received:	06/15/10
737 Bishop st., Suite 3010				Reported:	06/30/10 17:42
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)			
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301			

Sample Summary

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B8MIS-VOC6	HTF0073-01	Solid/Soil	06/15/10 09:12	06/15/10 17:36	
B8MIS-VOC12	HTF0073-02	Solid/Soil	06/15/10 09:12	06/15/10 17:36	
B7MIS-VOC6	HTF0073-03	Solid/Soil	06/15/10 09:53	06/15/10 17:36	
B7MIS-VOC12	HTF0073-04	Solid/Soil	06/15/10 10:14	06/15/10 17:36	
B5MIS-VOC6	HTF0073-05	Solid/Soil	06/15/10 12:14	06/15/10 17:36	
B5MIS-VOC12	HTF0073-06	Solid/Soil	06/15/10 12:14	06/15/10 17:36	
B7-4-6-SM	HTF0073-07	Solid/Soil	06/15/10 09:53	06/15/10 17:36	
B7-A-SM	HTF0073-08	Solid/Soil	06/15/10 10:14	06/15/10 17:36	
B7-B-SM	HTF0073-09	Solid/Soil	06/15/10 10:27	06/15/10 17:36	
B7-C-SM	HTF0073-10	Solid/Soil	06/15/10 10:30	06/15/10 17:36	
B7-D-SM	HTF0073-11	Solid/Soil	06/15/10 10:44	06/15/10 17:36	
B7-E-SM	HTF0073-12	Solid/Soil	06/15/10 10:48	06/15/10 17:36	
B7-F-SM	HTF0073-13	Solid/Soil	06/15/10 10:58	06/15/10 17:36	
B7-G-SM	HTF0073-14	Solid/Soil	06/15/10 11:08	06/15/10 17:36	
B6-4-6-SM	HTF0073-15	Solid/Soil	06/15/10 14:04	06/15/10 17:36	
B6-A-SM	HTF0073-16	Solid/Soil	06/15/10 14:12	06/15/10 17:36	
B6-B-SM	HTF0073-17	Solid/Soil	06/15/10 14:19	06/15/10 17:36	
B6-C-SM	HTF0073-18	Solid/Soil	06/15/10 14:19	06/15/10 17:36	
B6-D-SM	HTF0073-19	Solid/Soil	06/15/10 14:26	06/15/10 17:36	
B6-E-SM	HTF0073-20	Solid/Soil	06/15/10 14:27	06/15/10 17:36	
B6-F-SM	HTF0073-21	Solid/Soil	06/15/10 14:34	06/15/10 17:36	
B6-G-SM	HTF0073-22	Solid/Soil	06/15/10 14:44	06/15/10 17:36	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order:	HTF0073	Received: Reported:	06/15/10 06/30/10 17:42
	Project: Project Number:	Subsurface Soil Investigation (MIS-VOCs) Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0073-01 (B8MIS-VOC6 - Solid/Soil)					**Sampled: 06/15/10 09:12**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	3.19	6.37	50	06/23/10 12:02	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.19	6.37	"	"	"	"	"
Trichloroethene	ND		"	3.19	6.37	"	"	"	"	"
Vinyl chloride	**25.8**		"	4.33	12.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0073-02 (B8MIS-VOC12 - Solid/Soil)					**Sampled: 06/15/10 09:12**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	3.49	6.97	50	06/23/10 12:27	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.49	6.97	"	"	"	"	"
Trichloroethene	ND		"	3.49	6.97	"	"	"	"	"
Vinyl chloride	**22.9**		"	4.74	13.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*93 %*						"	"	"	"
Sample ID: HTF0073-03 (B7MIS-VOC6 - Solid/Soil)					**Sampled: 06/15/10 09:53**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**73.6**		ug/kg	2.26	4.52	50	06/23/10 12:52	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.26	4.52	"	"	"	"	"
Vinyl chloride	**15.5**		"	3.07	9.04	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0073-03RE1 (B7MIS-VOC6 - Solid/Soil)					**Sampled: 06/15/10 09:53**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**436**		"	11.3	22.6	250	06/23/10 15:23	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*90 %*						"	"	"	"
Sample ID: HTF0073-04 (B7MIS-VOC12 - Solid/Soil)					**Sampled: 06/15/10 10:14**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**74.6**		ug/kg	2.10	4.19	50	06/23/10 13:17	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.10	4.19	"	"	"	"	"
Vinyl chloride	**11.0**		"	2.85	8.38	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0073-04RE1 (B7MIS-VOC12 - Solid/Soil)					**Sampled: 06/15/10 10:14**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**436**		"	10.5	21.0	250	06/23/10 15:49	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*89 %*						"	"	"	"
Sample ID: HTF0073-05 (B5MIS-VOC6 - Solid/Soil)					**Sampled: 06/15/10 12:14**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	**3.85**	J	ug/kg	2.74	5.48	50	06/23/10 13:42	06/23/10	10F0147	EPA 8260
Vinyl chloride	**69.7**		"	3.73	11.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0073-05RE1 (B5MIS-VOC6 - Solid/Soil)					**Sampled: 06/15/10 12:14**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260										

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0073	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:42
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0073-05RE1 (B5MIS-VOC6 - Solid/Soil) - cont.					**Sampled: 06/15/10 12:14**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260 - cont.										
cis-1,2-Dichloroethene	**656**		"	13.7	27.4	250	06/23/10 16:14	"	"	"
Trichloroethene	**689**		"	13.7	27.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0073-06 (B5MIS-VOC12 - Solid/Soil)					**Sampled: 06/15/10 12:14**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	2.99	5.99	50	06/23/10 14:08	06/23/10	10F0147	EPA 8260
Vinyl chloride	**76.3**		"	4.07	12.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*93 %*						"	"	"	"
Sample ID: HTF0073-06RE1 (B5MIS-VOC12 - Solid/Soil)					**Sampled: 06/15/10 12:14**			**Recvd: 06/15/10 17:36**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**638**		"	15.0	29.9	250	06/23/10 16:39	"	"	"
Trichloroethene	**749**		"	15.0	29.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*93 %*						"	"	"	"
Sample ID: HTF0073-07 (B7-4-6-SM - Solid/Soil)					**Sampled: 06/15/10 09:53**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**14.6**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-07RE1 (B7-4-6-SM - Solid/Soil)					**Sampled: 06/15/10 09:53**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**13.8**		"	0.100	0.100	"	"	"	"	"
Sample ID: HTF0073-07RE2 (B7-4-6-SM - Solid/Soil)					**Sampled: 06/15/10 09:53**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**16.6**		"	0.100	0.100	"	"	"	"	"
Sample ID: HTF0073-07RE3 (B7-4-6-SM - Solid/Soil)					**Sampled: 06/15/10 09:53**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**17.2**		"	0.100	0.100	"	"	"	"	"
Sample ID: HTF0073-08 (B7-A-SM - Solid/Soil)					**Sampled: 06/15/10 10:14**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**24.1**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-09 (B7-B-SM - Solid/Soil)					**Sampled: 06/15/10 10:27**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**30.2**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-10 (B7-C-SM - Solid/Soil)					**Sampled: 06/15/10 10:30**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**31.1**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-11 (B7-D-SM - Solid/Soil)					**Sampled: 06/15/10 10:44**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**31.9**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0073		Received:	06/15/10
737 Bishop st., Suite 3010				Reported:	06/30/10 17:42
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)			
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301			

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0073-11 (B7-D-SM - Solid/Soil) - cont.					**Sampled: 06/15/10 10:44**			**Recvd: 06/15/10 17:36**		
Sample ID: HTF0073-12 (B7-E-SM - Solid/Soil)					**Sampled: 06/15/10 10:48**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**29.5**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-13 (B7-F-SM - Solid/Soil)					**Sampled: 06/15/10 10:58**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**26.4**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-14 (B7-G-SM - Solid/Soil)					**Sampled: 06/15/10 11:08**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**37.5**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-15 (B6-4-6-SM - Solid/Soil)					**Sampled: 06/15/10 14:04**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**17.3**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-15RE1 (B6-4-6-SM - Solid/Soil)					**Sampled: 06/15/10 14:04**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**17.8**		"	0.100	0.100	"	"	"	"	"
Sample ID: HTF0073-15RE2 (B6-4-6-SM - Solid/Soil)					**Sampled: 06/15/10 14:04**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**16.5**		"	0.100	0.100	"	"	"	"	"
Sample ID: HTF0073-15RE3 (B6-4-6-SM - Solid/Soil)					**Sampled: 06/15/10 14:04**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**16.8**		"	0.100	0.100	"	"	"	"	"
Sample ID: HTF0073-16 (B6-A-SM - Solid/Soil)					**Sampled: 06/15/10 14:12**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**21.9**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-17 (B6-B-SM - Solid/Soil)					**Sampled: 06/15/10 14:19**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**27.4**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-18 (B6-C-SM - Solid/Soil)					**Sampled: 06/15/10 14:19**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**31.0**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-19 (B6-D-SM - Solid/Soil)					**Sampled: 06/15/10 14:26**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**27.3**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-20 (B6-E-SM - Solid/Soil)					**Sampled: 06/15/10 14:27**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**24.5**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0073	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:42
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0073-21 (B6-F-SM - Solid/Soil)					**Sampled: 06/15/10 14:34**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**21.2**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0073-22 (B6-G-SM - Solid/Soil)					**Sampled: 06/15/10 14:44**			**Recvd: 06/15/10 17:36**		
General Chemistry Parameters										
% Moisture	**30.2**		Weight %	0.100	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0073	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:42
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

SAMPLE EXTRACTION DATA

Parameter	Batch	Lab Number	Wt/Vol Extracted	Default Wt/Vol	Extracted Vol	Default Vol	Date	Analyst	Extraction Method

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0073	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:42
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY BLANK QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
General Chemistry Parameters													
Batch\Seq: 10F0126 Extracted: 06/21/10													
Blank Analyzed: 06/22/2010 (10F0126-BLK1)													
% Moisture			Weight %	0.100	0.100	ND							
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0147 Extracted: 06/23/10													
Blank Analyzed: 06/23/2010 (10F0147-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*90*		*80-120*			

Tetra Tech EM Inc.	Work Order:	HTF0073		Received:	06/15/10
737 Bishop st., Suite 3010				Reported:	06/30/10 17:42
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)			
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301			

LABORATORY DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
General Chemistry Parameters												
Batch\Seq: 10F0126 Extracted: 06/21/10												
Duplicate Analyzed: 06/23/2010 (10F0126-DUP1)				**QC Source Sample: HTF0087-01**								
% Moisture	81.6		Weight %	0.100	0.100	81.9				1	20	

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0073	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:42
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LCS/LCS DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0147 Extracted: 06/23/10													
LCS Analyzed: 06/23/2010 (10F0147-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.31		108		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	5.00		125		80-120			L
Trichloroethene		4.00	ug/kg	0.100	0.200	4.64		116		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.76		94		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*118*		*80-120*			

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0073	Received:	06/15/10
737 Bishop st., Suite 3010			Reported:	06/30/10 17:42
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0147 Extracted: 06/23/10													
Matrix Spike Analyzed: 06/23/2010 (10F0147-MS1)				**QC Source Sample: HTF0072-80**									
cis-1,2-Dichloroethene	ND	168	ug/kg	4.19	8.39	182	175	108	104	80-120	4	30	
trans-1,2-Dichloroethene	ND	168	ug/kg	4.19	8.39	208	201	124	120	80-120	4	30	M7
Trichloroethene	ND	168	ug/kg	4.19	8.39	230	213	137	127	80-120	7	30	M7
Vinyl chloride	51.6	168	ug/kg	5.71	16.8	191	188	83	81	80-120	2	30	
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*118*	*112*	*80-120*			

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0073	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:42
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

CERTIFICATION SUMMARY

TestAmerica Honolulu

Method	Matrix	Nelac	Hawaii
EPA 8260	Solid/Soil	X	
SM 2540G	Solid/Soil		

For information concerning certifications of this facility or another TestAmerica facility, please visit our website at www.TestAmericaInc.com

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
L	Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was above the acceptance limits. Analyte not detected, data not impacted.
M7	The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).
ND	Not detected at the reporting limit (or method detection limit if shown)

ADDITIONAL COMMENTS

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0073
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 6

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B8 MIS - VOC6	X			X								MeOH	6/15/10	9:12	1	X									HTF0073-1
2	B8 MIS - VOC12	X			X								MeOH		9:12	1	X									-2
3	B7 MIS - VOC6	X			X								MeOH		9:53	1	X									-3
4	B7 MIS - VOC12	X			X								MeOH		10:14	1	X									-4
5	B5 MIS - VOC6	X			X								MeOH		12:14	1	X									-5
6	B5 MIS - VOC12	X			X								MeOH		12:14	1	X									-6
7		X			X								MeOH													
8		X			X								MeOH													
9		X			X								MeOH													
10		X			X								MeOH													

Rosiland Selbach 6/15/10

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
~~Scott Duzan~~	/	~~Hand~~	[illegible]	TestAmerica	6/15/10 1736	5°C intact / wet
Rosiland Selbach / [signature]	6/15/10 17:36	Hand			/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1b

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY	
LAB JOB NO.	HTF0013
LOCATION	
CONTAINERS	

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 8

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B7-4-6-SM	X			X								NA	6.15.10	9:53	1		X							HTF0013-7	* 5.6 SAP
2	B7-A-SM	X			X								NA	6.15.10	10:14	1			X						-8	* 5.7 SAP
3	B7-B-SM	X			X								NA		10:27	1									-9	
4	B7-C-SM	X			X								NA		10:30	1									-10	
5	B7-D-SM	X			X								NA		10:44	1									-11	
6	B7-E-SM	X			X								NA		10:48	1									-12	
7	B7-F-SM	X			X								NA		10:58	1									-13	
8	B7-G-SM	X			X								NA		11:08	1									-14	
9		X			X								NA												~~-15~~	
10		X			X								NA													

Rusiland 6/15/10

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
~~Scott Duzan~~		~~Hand~~				
Rusiland Selbach / [signature]	6/15/10 17:37	Hand	[signature] EL	TestAmerica	6/15/10, 1736	5°C intact/wet
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

See section 5.6 + 5.7 of SAP for soil moisture protocols - 5.6 = Vadose
5.7 = Saturated

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1b

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY U' NLY
LAB JOB NO.
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com	Project identification
Company name: Tetra Tech EMI	Job name: Hickam AFB CG110 ISM VOC Study
Address: 737 Bishop Street, Suite 3010	Job number: 103DS148843.H0301
City: Honolulu State: HI ZIP: 96813	
Phone: 808.441.6645 Fax	Contact email address: scott.duzan@tetratech.com
Sampler: SD # samples in shipment 8	

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling: Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B6-4-6-SM	X			X								NA	6.15.10	14:04	1		X								4TF0073-1615	* 5,6 SAP
2	B6-A-SM	X			X								NA		14:12	1			X							-1716	*5,7 SAP
3	B6-B-SM	X			X								NA		14:19	1										-1817	
4	B6-C-SM	X			X								NA		14:19	1										-1918	
5	B6-D-SM	X			X								NA		14:26	1										-2019	
6	B6-E-SM	X			X								NA		14:27	1										-2120	
7	B6-F-SM	X			X								NA		14:34	1										-2321	
8	B6-G-SM	X			X								NA		14:44	1										-2422	
9		X			X								NA														
10		X			X								NA														

Rosiland Selbach 6.15.10

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
~~Scott Duzan~~	/	~~Hand~~	Quezon ELAtel	TestAmerica	6/15/10, 1736	5 · Cintact / wet
Rosiland Selbach/[signature]	6/15/10 7:37	Hand			/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

See section 5.6 + 5.7 for soil moisture protocols - 5.6 = Vadose
5.7 = saturated

Please check one:
- ✱ Dispose by lab
- ☐ Return to client
- ☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Client Name: Tetra Tech **Date/ Time Received:** 6/15/10 1736

Checklist Completed By: ea **Received By:** ea

Matrices: Soil **Carrier:** client **Airbill# :**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Chain of Custody present?	Yes ☑	No ☐	☐
Chain of Custody Signed when relinquished and received?	Yes ☑	No ☐	
Chain of Custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sample containers on ice?	Yes ☑	No ☐	Type: wet
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Water - VOA Vials have Zero Headspace?	Yes ☐	No ☐	No VOA vials present: ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Checked: ☑
pH Adjusted?	Yes ☐	No ☑	Final pH:
Encores / 5035 Vials Present?	Yes ☑	No ☐	
Sample Filtration Needed?	Yes ☐	No ☑	Filtered in Field: ☐
Dry Weight Corrected Results?	Yes ☐	No ☐	Take Action: ☑
DODQSM / QAPP Project?	Yes ☐	No ☐	Type:

Temperature Blank Present? Yes ☑ No ☐

Sample Container/Blank Temperature Range (Minimum 3 sample containers if available): 5 °C

Comments/ Sampling Handling Notes:

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

June 30, 2010

LABORATORY REPORT

Client:
Tetra Tech EM Inc.
737 Bishop st., Suite 3010
Honolulu, HI 96813
Attn: Scott Duzan

Work Order: HTF0072
Project Name: Subsurface Soil Investigation (MIS-VOCs)
Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H
Date Received: 06/15/10

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica.

TestAmerica Analytical Testing Corporation certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.

The Chain(s) of Custody, 10 pages, are included and are an integral part of this report. This entire report was reviewed and approved for release.

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 1-(808)486-5227

Samples were received into laboratory at a temperature of 5 °C.

NELAC states that samples which require thermal preservation shall be considered acceptable if the arrival temperature is within 2 degrees C of the required temperature or the method specified range. For samples with a temperature requirement of 4 degrees C, an arrival temperature from 0 degrees C to 6 degrees C meets specifications. Samples that are delivered to the laboratory on the same day that they are collected may not meet these criteria. In these cases, the samples are considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The reported results were obtained in compliance with the 2003 NELAC standards unless otherwise noted.

Approved By:

Marvin D. Heskett III
Laboratory Director

NELAC Certification # E87907

Tetra Tech EM Inc.	Work Order:	HTF0072		Received:	06/15/10
737 Bishop st., Suite 3010				Reported:	06/30/10 17:39
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)			
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301			

Sample Summary

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
TRIP BLANK	HTF0072-01	Solid/Soil	06/15/10 09:50	06/15/10 17:33	
B8-A-(MIC-VOC)	HTF0072-02	Solid/Soil	06/15/10 08:26	06/15/10 17:33	
B31-A-(MIC-VOC)	HTF0072-03	Solid/Soil	06/15/10 08:28	06/15/10 17:33	
B32-A-(MIC-VOC)	HTF0072-04	Solid/Soil	06/15/10 08:30	06/15/10 17:33	
B8-B-(MIC-VOC)	HTF0072-05	Solid/Soil	06/15/10 08:40	06/15/10 17:33	
B31-B-(MIC-VOC)	HTF0072-06	Solid/Soil	06/15/10 08:40	06/15/10 17:33	
B32-B-(MIC-VOC)	HTF0072-07	Solid/Soil	06/15/10 08:44	06/15/10 17:33	
B8-C-(MIC-VOC)	HTF0072-08	Solid/Soil	06/15/10 08:46	06/15/10 17:33	
B31-C-(MIC-VOC)	HTF0072-09	Solid/Soil	06/15/10 08:48	06/15/10 17:33	
B32-C-(MIC-VOC)	HTF0072-10	Solid/Soil	06/15/10 08:50	06/15/10 17:33	
B8-D-(MIC-VOC)	HTF0072-11	Solid/Soil	06/15/10 08:56	06/15/10 17:33	
B31-D-(MIC-VOC)	HTF0072-12	Solid/Soil	06/15/10 08:58	06/15/10 17:33	
B32-D-(MIC-VOC)	HTF0072-13	Solid/Soil	06/15/10 09:00	06/15/10 17:33	
B8-E-(MIC-VOC)	HTF0072-14	Solid/Soil	06/15/10 09:02	06/15/10 17:33	
B31-E-(MIC-VOC)	HTF0072-15	Solid/Soil	06/15/10 09:04	06/15/10 17:33	
B32-E-(MIC-VOC)	HTF0072-16	Solid/Soil	06/15/10 09:06	06/15/10 17:33	
B8-F-(MIC-VOC)	HTF0072-17	Solid/Soil	06/15/10 09:14	06/15/10 17:33	
B31-F-(MIC-VOC)	HTF0072-18	Solid/Soil	06/15/10 09:16	06/15/10 17:33	
B32-F-(MIC-VOC)	HTF0072-19	Solid/Soil	06/15/10 09:18	06/15/10 17:33	
B8-G-(MIC-VOC)	HTF0072-20	Solid/Soil	06/15/10 09:20	06/15/10 17:33	
B31-G-(MIC-VOC)	HTF0072-21	Solid/Soil	06/15/10 09:22	06/15/10 17:33	
B32-G-(MIC-VOC)	HTF0072-22	Solid/Soil	06/15/10 09:24	06/15/10 17:33	
B7-A-(MIC-VOC)	HTF0072-23	Solid/Soil	06/15/10 10:10	06/15/10 17:33	
B33-A-(MIC-VOC)	HTF0072-24	Solid/Soil	06/15/10 10:12	06/15/10 17:33	
B34-A-(MIC-VOC)	HTF0072-25	Solid/Soil	06/15/10 10:14	06/15/10 17:33	
B7-B-(MIC-VOC)	HTF0072-26	Solid/Soil	06/15/10 10:22	06/15/10 17:33	

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B33-B-(MIC-VOC)	HTF0072-27	Solid/Soil	06/15/10 10:24	06/15/10 17:33	
B34-B-(MIC-VOC)	HTF0072-28	Solid/Soil	06/15/10 10:26	06/15/10 17:33	
B7-C-(MIC-VOC)	HTF0072-29	Solid/Soil	06/15/10 10:30	06/15/10 17:33	
B33-C-(MIC-VOC)	HTF0072-30	Solid/Soil	06/15/10 10:32	06/15/10 17:33	
B34-C-(MIC-VOC)	HTF0072-31	Solid/Soil	06/15/10 10:34	06/15/10 17:33	
B7-D-(MIC-VOC)	HTF0072-32	Solid/Soil	06/15/10 10:42	06/15/10 17:33	
B33-D-(MIC-VOC)	HTF0072-33	Solid/Soil	06/15/10 10:44	06/15/10 17:33	
B34-D-(MIC-VOC)	HTF0072-34	Solid/Soil	06/15/10 10:46	06/15/10 17:33	
B7-E-(MIC-VOC)	HTF0072-35	Solid/Soil	06/15/10 10:48	06/15/10 17:33	
B33-E-(MIC-VOC)	HTF0072-36	Solid/Soil	06/15/10 10:50	06/15/10 17:33	
B34-E-(MIC-VOC)	HTF0072-37	Solid/Soil	06/15/10 10:52	06/15/10 17:33	
B7-F-(MIC-VOC)	HTF0072-38	Solid/Soil	06/15/10 10:56	06/15/10 17:33	
B33-F-(MIC-VOC)	HTF0072-39	Solid/Soil	06/15/10 10:58	06/15/10 17:33	
B34-F-(MIC-VOC)	HTF0072-40	Solid/Soil	06/15/10 11:00	06/15/10 17:33	
B7-G-(MIC-VOC)	HTF0072-41	Solid/Soil	06/15/10 11:10	06/15/10 17:33	
B33-G-(MIC-VOC)	HTF0072-42	Solid/Soil	06/15/10 11:12	06/15/10 17:33	
B34-G-(MIC-VOC)	HTF0072-43	Solid/Soil	06/15/10 11:14	06/15/10 17:33	
B5-A-(MIC-VOC)	HTF0072-44	Solid/Soil	06/15/10 11:24	06/15/10 17:33	
B35-A-(MIC-VOC)	HTF0072-45	Solid/Soil	06/15/10 11:26	06/15/10 17:33	
B36-A-(MIC-VOC)	HTF0072-46	Solid/Soil	06/15/10 11:28	06/15/10 17:33	
B5-B-(MIC-VOC)	HTF0072-47	Solid/Soil	06/15/10 11:34	06/15/10 17:33	
B35-B-(MIC-VOC)	HTF0072-48	Solid/Soil	06/15/10 11:36	06/15/10 17:33	
B36-B-(MIC-VOC)	HTF0072-49	Solid/Soil	06/15/10 11:38	06/15/10 17:33	
B5-C-(MIC-VOC)	HTF0072-50	Solid/Soil	06/15/10 11:40	06/15/10 17:33	
B35-C-(MIC-VOC)	HTF0072-51	Solid/Soil	06/15/10 11:42	06/15/10 17:33	
B36-C-(MIC-VOC)	HTF0072-52	Solid/Soil	06/15/10 11:44	06/15/10 17:33	
B5-D-(MIC-VOC)	HTF0072-53	Solid/Soil	06/15/10 11:48	06/15/10 17:33	
B35-D-(MIC-VOC)	HTF0072-54	Solid/Soil	06/15/10 11:50	06/15/10 17:33	
B36-D-(MIC-VOC)	HTF0072-55	Solid/Soil	06/15/10 11:52	06/15/10 17:33	
B5-E-(MIC-VOC)	HTF0072-56	Solid/Soil	06/15/10 11:54	06/15/10 17:33	
B35-E-(MIC-VOC)	HTF0072-57	Solid/Soil	06/15/10 11:56	06/15/10 17:33	
B36-E-(MIC-VOC)	HTF0072-58	Solid/Soil	06/15/10 11:58	06/15/10 17:33	
B5-F-(MIC-VOC)	HTF0072-59	Solid/Soil	06/15/10 12:02	06/15/10 17:33	
B35-F-(MIC-VOC)	HTF0072-60	Solid/Soil	06/15/10 12:04	06/15/10 17:33	
B36-F-(MIC-VOC)	HTF0072-61	Solid/Soil	06/15/10 12:06	06/15/10 17:33	
B5-G-(MIC-VOC)	HTF0072-62	Solid/Soil	06/15/10 12:18	06/15/10 17:33	
B35-G-(MIC-VOC)	HTF0072-63	Solid/Soil	06/15/10 12:20	06/15/10 17:33	
B36-G-(MIC-VOC)	HTF0072-64	Solid/Soil	06/15/10 12:22	06/15/10 17:33	
FIELD BLANK B5	HTF0072-65	Solid/Soil	06/15/10 12:25	06/15/10 17:33	
B6-A-(MIC-VOC)	HTF0072-66	Solid/Soil	06/15/10 14:10	06/15/10 17:33	
B6-B-(MIC-VOC)	HTF0072-67	Solid/Soil	06/15/10 14:16	06/15/10 17:33	
B6-C-(MIC-VOC)	HTF0072-68	Solid/Soil	06/15/10 14:18	06/15/10 17:33	
B6-D-(MIC-VOC)	HTF0072-69	Solid/Soil	06/15/10 14:24	06/15/10 17:33	

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B6-E-(MIC-VOC)	HTF0072-70	Solid/Soil	06/15/10 14:26	06/15/10 17:33	
B6-F-(MIC-VOC)	HTF0072-71	Solid/Soil	06/15/10 14:32	06/15/10 17:33	
B6-G-(MIC-VOC)	HTF0072-72	Solid/Soil	06/15/10 14:40	06/15/10 17:33	
B4-A-(MIC-VOC)	HTF0072-73	Solid/Soil	06/15/10 15:10	06/15/10 17:33	
B4-B-(MIC-VOC)	HTF0072-74	Solid/Soil	06/15/10 15:20	06/15/10 17:33	
B4-C-(MIC-VOC)	HTF0072-75	Solid/Soil	06/15/10 15:22	06/15/10 17:33	
B4-D-(MIC-VOC)	HTF0072-76	Solid/Soil	06/15/10 15:34	06/15/10 17:33	
B4-E-(MIC-VOC)	HTF0072-77	Solid/Soil	06/15/10 15:36	06/15/10 17:33	
B4-F-(MIC-VOC)	HTF0072-78	Solid/Soil	06/15/10 15:40	06/15/10 17:33	
B4-G-(MIC-VOC)	HTF0072-79	Solid/Soil	06/15/10 15:46	06/15/10 17:33	
B3-A-(MIC-VOC)	HTF0072-80	Solid/Soil	06/15/10 16:10	06/15/10 17:33	
B3-B-(MIC-VOC)	HTF0072-81	Solid/Soil	06/15/10 16:14	06/15/10 17:33	
B3-C-(MIC-VOC)	HTF0072-82	Solid/Soil	06/15/10 16:16	06/15/10 17:33	
B3-D-(MIC-VOC)	HTF0072-83	Solid/Soil	06/15/10 16:22	06/15/10 17:33	
B3-E-(MIC-VOC)	HTF0072-84	Solid/Soil	06/15/10 16:24	06/15/10 17:33	
B3-F-(MIC-VOC)	HTF0072-85	Solid/Soil	06/15/10 16:30	06/15/10 17:33	
B3-G-(MIC-VOC)	HTF0072-86	Solid/Soil	06/15/10 16:36	06/15/10 17:33	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-01 (TRIP BLANK - Solid/Soil)					**Sampled: 06/15/10 09:50**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.50	5.00	50	06/16/10 21:31	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.50	5.00	"	"	"	"	"
Trichloroethene	ND		"	2.50	5.00	"	"	"	"	"
Vinyl chloride	ND		"	3.40	10.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0072-02 (B8-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:26**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.83	5.66	50	06/16/10 21:56	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.83	5.66	"	"	"	"	"
Trichloroethene	**5.90**		"	2.83	5.66	"	"	"	"	"
Vinyl chloride	ND		"	3.85	11.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0072-03 (B31-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:28**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.47	4.95	50	06/16/10 22:22	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.47	4.95	"	"	"	"	"
Trichloroethene	**5.27**		"	2.47	4.95	"	"	"	"	"
Vinyl chloride	ND		"	3.36	9.90	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0072-04 (B32-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:30**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	1.73	3.45	50	06/16/10 22:48	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	1.73	3.45	"	"	"	"	"
Trichloroethene	**4.64**		"	1.73	3.45	"	"	"	"	"
Vinyl chloride	ND		"	2.35	6.90	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*108 %*						"	"	"	"
Sample ID: HTF0072-05 (B8-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:40**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.56	5.12	50	06/16/10 23:15	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.56	5.12	"	"	"	"	"
Trichloroethene	ND		"	2.56	5.12	"	"	"	"	"
Vinyl chloride	ND		"	3.48	10.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*101 %*						"	"	"	"
Sample ID: HTF0072-06 (B31-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:40**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.35	4.70	50	06/16/10 23:40	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.35	4.70	"	"	"	"	"
Trichloroethene	ND		"	2.35	4.70	"	"	"	"	"
Vinyl chloride	ND		"	3.20	9.40	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/15/10 Reported: 06/30/10 17:39

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-06 (B31-B-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/15/10 08:40**			**Recvd: 06/15/10 17:33**		
Sample ID: HTF0072-07 (B32-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:44**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.69	5.37	50	06/17/10 00:06	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.69	5.37	"	"	"	"	"
Trichloroethene	ND		"	2.69	5.37	"	"	"	"	"
Vinyl chloride	ND		"	3.65	10.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*105 %*						"	"	"	"
Sample ID: HTF0072-08 (B8-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:46**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.24	4.48	50	06/17/10 00:32	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.24	4.48	"	"	"	"	"
Trichloroethene	ND		"	2.24	4.48	"	"	"	"	"
Vinyl chloride	ND		"	3.05	8.97	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*105 %*						"	"	"	"
Sample ID: HTF0072-09 (B31-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:48**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.59	5.18	50	06/17/10 00:57	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.59	5.18	"	"	"	"	"
Trichloroethene	ND		"	2.59	5.18	"	"	"	"	"
Vinyl chloride	ND		"	3.52	10.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"
Sample ID: HTF0072-10 (B32-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:50**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.04	4.09	50	06/17/10 01:23	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.04	4.09	"	"	"	"	"
Trichloroethene	ND		"	2.04	4.09	"	"	"	"	"
Vinyl chloride	ND		"	2.78	8.17	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0072-11 (B8-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:56**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.96	5.91	50	06/17/10 01:48	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.96	5.91	"	"	"	"	"
Trichloroethene	ND		"	2.96	5.91	"	"	"	"	"
Vinyl chloride	ND		"	4.02	11.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0072-12 (B31-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 08:58**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.75	5.51	50	06/17/10 02:14	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.75	5.51	"	"	"	"	"
Trichloroethene	ND		"	2.75	5.51	"	"	"	"	"

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-12 (B31-D-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/15/10 08:58**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260 - cont.										
Vinyl chloride	ND		"	3.75	11.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0072-13 (B32-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 09:00**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.72	5.44	50	06/17/10 02:39	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.72	5.44	"	"	"	"	"
Trichloroethene	ND		"	2.72	5.44	"	"	"	"	"
Vinyl chloride	ND		"	3.70	10.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0072-14 (B8-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 09:02**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.41	4.81	50	06/17/10 03:05	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.41	4.81	"	"	"	"	"
Trichloroethene	ND		"	2.41	4.81	"	"	"	"	"
Vinyl chloride	ND		"	3.27	9.62	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0072-15 (B31-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 09:04**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.59	5.19	50	06/17/10 03:31	06/16/10	10F0096	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.59	5.19	"	"	"	"	"
Trichloroethene	ND		"	2.59	5.19	"	"	"	"	"
Vinyl chloride	ND		"	3.53	10.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"
Sample ID: HTF0072-16 (B32-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 09:06**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.42	8.85	50	06/17/10 11:41	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.42	8.85	"	"	"	"	"
Trichloroethene	ND		"	4.42	8.85	"	"	"	"	"
Vinyl chloride	ND		"	6.02	17.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0072-17 (B8-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 09:14**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.39	8.77	50	06/17/10 12:06	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.39	8.77	"	"	"	"	"
Trichloroethene	ND		"	4.39	8.77	"	"	"	"	"
Vinyl chloride	ND		"	5.97	17.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0072-18 (B31-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 09:16**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-18 (B31-F-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/15/10 09:16**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260 - cont.										
cis-1,2-Dichloroethene	ND		ug/kg	4.47	8.94	50	06/17/10 12:31	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.47	8.94	"	"	"	"	"
Trichloroethene	ND		"	4.47	8.94	"	"	"	"	"
Vinyl chloride	ND		"	6.08	17.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"
Sample ID: HTF0072-19 (B32-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 09:18**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.96	9.91	50	06/17/10 12:57	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.96	9.91	"	"	"	"	"
Trichloroethene	ND		"	4.96	9.91	"	"	"	"	"
Vinyl chloride	ND		"	6.74	19.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0072-20 (B8-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 09:20**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.15	8.31	50	06/17/10 13:22	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.15	8.31	"	"	"	"	"
Trichloroethene	ND		"	4.15	8.31	"	"	"	"	"
Vinyl chloride	**18.1**		"	5.65	16.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0072-21 (B31-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 09:22**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.96	11.9	50	06/17/10 13:47	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.96	11.9	"	"	"	"	"
Trichloroethene	ND		"	5.96	11.9	"	"	"	"	"
Vinyl chloride	**36.3**		"	8.10	23.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0072-22 (B32-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 09:24**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.48	11.0	50	06/17/10 14:12	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.48	11.0	"	"	"	"	"
Trichloroethene	ND		"	5.48	11.0	"	"	"	"	"
Vinyl chloride	**42.3**		"	7.46	21.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0072-23 (B7-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:10**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.05	8.11	50	06/17/10 14:38	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.05	8.11	"	"	"	"	"
Trichloroethene	**16.1**		"	4.05	8.11	"	"	"	"	"
Vinyl chloride	**29.2**		"	5.51	16.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072	Received: 06/15/10 Reported: 06/30/10 17:39	
	Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-23 (B7-A-(MIC-VOC) - Solid/Soil) - cont.						**Sampled: 06/15/10 10:10**		**Recvd: 06/15/10 17:33**		
Sample ID: HTF0072-24 (B33-A-(MIC-VOC) - Solid/Soil)						**Sampled: 06/15/10 10:12**		**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.78	9.56	50	06/17/10 15:03	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.78	9.56	"	"	"	"	"
Trichloroethene	**18.0**		"	4.78	9.56	"	"	"	"	"
Vinyl chloride	**24.2**		"	6.50	19.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0072-25 (B34-A-(MIC-VOC) - Solid/Soil)						**Sampled: 06/15/10 10:14**		**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.03	10.1	50	06/17/10 15:28	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.03	10.1	"	"	"	"	"
Trichloroethene	**21.8**		"	5.03	10.1	"	"	"	"	"
Vinyl chloride	**13.0**	J	"	6.84	20.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0072-26 (B7-B-(MIC-VOC) - Solid/Soil)						**Sampled: 06/15/10 10:22**		**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**103**		ug/kg	3.84	7.67	50	06/17/10 15:53	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.84	7.67	"	"	"	"	"
Vinyl chloride	**6.58**	J	"	5.22	15.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0072-26RE1 (B7-B-(MIC-VOC) - Solid/Soil)						**Sampled: 06/15/10 10:22**		**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**675**		"	19.2	38.4	250	06/18/10 12:55	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0072-27 (B33-B-(MIC-VOC) - Solid/Soil)						**Sampled: 06/15/10 10:24**		**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**109**		ug/kg	4.93	9.87	50	06/17/10 16:18	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.93	9.87	"	"	"	"	"
Vinyl chloride	**8.79**	J	"	6.71	19.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0072-27RE1 (B33-B-(MIC-VOC) - Solid/Soil)						**Sampled: 06/15/10 10:24**		**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**662**		"	9.87	19.7	100	06/18/10 13:20	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0072-28 (B34-B-(MIC-VOC) - Solid/Soil)						**Sampled: 06/15/10 10:26**		**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**102**		ug/kg	5.35	10.7	50	06/17/10 16:43	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.35	10.7	"	"	"	"	"
Vinyl chloride	ND		"	7.28	21.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/15/10 Reported: 06/30/10 17:39	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-28 (B34-B-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/15/10 10:26**			**Recvd: 06/15/10 17:33**		
Sample ID: HTF0072-28RE1 (B34-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:26**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**633**		"	10.7	21.4	100	06/18/10 13:46	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0072-29 (B7-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:30**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**179**		ug/kg	4.72	9.43	50	06/17/10 17:09	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.72	9.43	"	"	"	"	"
Vinyl chloride	ND		"	6.41	18.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0072-29RE1 (B7-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:30**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**1190**		"	23.6	47.2	250	06/18/10 14:11	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0072-30 (B33-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:32**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**166**		ug/kg	5.73	11.5	50	06/17/10 17:34	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.73	11.5	"	"	"	"	"
Vinyl chloride	ND		"	7.80	22.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*101 %*						"	"	"	"
Sample ID: HTF0072-30RE1 (B33-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:32**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**1030**		"	28.7	57.3	250	06/18/10 14:36	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0072-31 (B34-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:34**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**138**		ug/kg	5.32	10.6	50	06/17/10 18:00	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.32	10.6	"	"	"	"	"
Vinyl chloride	ND		"	7.23	21.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0072-31RE1 (B34-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:34**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**876**		"	26.6	53.2	250	06/18/10 15:01	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0072-32 (B7-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:42**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**171**		ug/kg	4.68	9.36	50	06/17/10 18:26	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.68	9.36	"	"	"	"	"
Vinyl chloride	**6.66**	J	"	6.37	18.7	"	"	"	"	"

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-32 (B7-D-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/15/10 10:42**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260 - cont.										
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0072-32RE1 (B7-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:42**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**1010**		"	23.4	46.8	250	06/18/10 15:26	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0072-33 (B33-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:44**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**179**		ug/kg	5.17	10.3	50	06/17/10 18:51	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.17	10.3	"	"	"	"	"
Vinyl chloride	ND		"	7.02	20.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"
Sample ID: HTF0072-33RE1 (B33-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:44**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**1070**		"	25.8	51.7	250	06/18/10 15:51	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0072-34 (B34-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:46**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**156**		ug/kg	5.61	11.2	50	06/17/10 19:17	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.61	11.2	"	"	"	"	"
Vinyl chloride	ND		"	7.62	22.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0072-34RE1 (B34-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:46**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**956**		"	28.0	56.1	250	06/18/10 16:16	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0072-35 (B7-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:48**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**131**		ug/kg	4.03	8.07	50	06/17/10 19:42	06/17/10	10F0110	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.03	8.07	"	"	"	"	"
Vinyl chloride	ND		"	5.49	16.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0072-35RE1 (B7-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:48**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**766**		"	20.2	40.3	250	06/18/10 16:42	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0072-36 (B33-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:50**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**144**		ug/kg	4.53	9.05	50	06/17/10 22:16	06/17/10	10F0111	EPA 8260

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/15/10 Reported: 06/30/10 17:39	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-36 (B33-E-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/15/10 10:50**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260 - cont.										
trans-1,2-Dichloroethene	ND		"	4.53	9.05	"	"	"	"	"
Vinyl chloride	ND		"	6.16	18.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*105 %*						"	"	"	"
Sample ID: HTF0072-36RE1 (B33-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:50**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**801**		"	22.6	45.3	250	06/18/10 17:07	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0072-37 (B34-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:52**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**121**		ug/kg	4.45	8.90	50	06/17/10 22:45	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.45	8.90	"	"	"	"	"
Vinyl chloride	ND		"	6.05	17.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"
Sample ID: HTF0072-37RE1 (B34-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:52**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**723**		"	22.3	44.5	250	06/18/10 17:33	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0072-38 (B7-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:56**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**6.99**	J	ug/kg	5.70	11.4	50	06/17/10 23:10	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.70	11.4	"	"	"	"	"
Vinyl chloride	ND		"	7.75	22.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*105 %*						"	"	"	"
Sample ID: HTF0072-38RE1 (B7-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:56**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**46.4**		"	5.70	11.4	50	06/18/10 17:58	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0072-39 (B33-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:58**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**7.33**	J	ug/kg	4.95	9.89	50	06/17/10 23:36	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.95	9.89	"	"	"	"	"
Vinyl chloride	**6.83**	J	"	6.73	19.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0072-39RE1 (B33-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 10:58**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**50.3**		"	4.95	9.89	50	06/18/10 18:24	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*105 %*						"	"	"	"
Sample ID: HTF0072-40 (B34-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:00**			**Recvd: 06/15/10 17:33**		

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: Reported:	06/15/10 06/30/10 17:39

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-40 (B34-F-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/15/10 11:00**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.19	10.4	50	06/18/10 00:02	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.19	10.4	"	"	"	"	"
Vinyl chloride	ND		"	7.06	20.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"
Sample ID: HTF0072-40RE1 (B34-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:00**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**32.8**		"	5.19	10.4	50	06/18/10 18:50	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"
Sample ID: HTF0072-41 (B7-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:10**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	2.95	5.90	50	06/18/10 00:27	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.95	5.90	"	"	"	"	"
Vinyl chloride	ND		"	4.01	11.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"
Sample ID: HTF0072-41RE1 (B7-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:10**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	2.95	5.90	50	06/18/10 19:16	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0072-42 (B33-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:12**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.47	8.95	50	06/18/10 00:53	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.47	8.95	"	"	"	"	"
Vinyl chloride	ND		"	6.08	17.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"
Sample ID: HTF0072-42RE1 (B33-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:12**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	4.47	8.95	50	06/18/10 19:42	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0072-43 (B34-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:14**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.67	11.3	50	06/18/10 01:18	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.67	11.3	"	"	"	"	"
Vinyl chloride	ND		"	7.71	22.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*105 %*						"	"	"	"
Sample ID: HTF0072-43RE1 (B34-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:14**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	5.67	11.3	50	06/18/10 20:07	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-44 (B5-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:24**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**20.3**		ug/kg	4.93	9.87	50	06/18/10 01:44	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.93	9.87	"	"	"	"	"
Vinyl chloride	**7.03**	J	"	6.71	19.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*107 %*						"	"	"	"
Sample ID: HTF0072-44RE1 (B5-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:24**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	4.93	9.87	50	06/18/10 20:33	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"
Sample ID: HTF0072-45 (B35-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:26**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**20.9**		ug/kg	4.02	8.04	50	06/18/10 02:10	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.02	8.04	"	"	"	"	"
Vinyl chloride	**17.3**		"	5.47	16.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*101 %*						"	"	"	"
Sample ID: HTF0072-45RE1 (B35-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:26**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	4.02	8.04	50	06/18/10 20:59	06/18/10	10F0133	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0072-46 (B36-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:28**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**21.1**		ug/kg	4.67	9.33	50	06/18/10 02:35	06/17/10	10F0111	EPA 8260
Vinyl chloride	**9.27**	J	"	6.35	18.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*107 %*						"	"	"	"
Sample ID: HTF0072-46RE1 (B36-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:28**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**20.2**		"	4.67	9.33	50	06/18/10 23:32	06/18/10	10F0134	"
Trichloroethene	ND		"	4.67	9.33	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0072-47 (B5-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:34**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.22	10.4	50	06/18/10 03:01	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.22	10.4	"	"	"	"	"
Vinyl chloride	**24.2**		"	7.10	20.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*107 %*						"	"	"	"
Sample ID: HTF0072-47RE1 (B5-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:34**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	5.22	10.4	50	06/18/10 23:58	06/18/10	10F0134	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0072		Received:	06/15/10
737 Bishop st., Suite 3010				Reported:	06/30/10 17:39
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)			
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301			

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-48 (B35-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:36**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.03	10.1	50	06/18/10 03:26	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.03	10.1	"	"	"	"	"
Vinyl chloride	**27.2**		"	6.84	20.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"
Sample ID: HTF0072-48RE1 (B35-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:36**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	5.03	10.1	50	06/19/10 00:23	06/18/10	10F0134	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"
Sample ID: HTF0072-49 (B36-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:38**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.13	10.3	50	06/18/10 03:52	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.13	10.3	"	"	"	"	"
Vinyl chloride	**16.4**	J	"	6.98	20.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"
Sample ID: HTF0072-49RE1 (B36-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:38**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	5.13	10.3	50	06/19/10 00:49	06/18/10	10F0134	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0072-50 (B5-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:40**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**18.2**		ug/kg	4.81	9.61	50	06/18/10 04:17	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.81	9.61	"	"	"	"	"
Vinyl chloride	**24.6**		"	6.54	19.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"
Sample ID: HTF0072-50RE1 (B5-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:40**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	4.81	9.61	50	06/19/10 01:14	06/18/10	10F0134	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*105 %*						"	"	"	"
Sample ID: HTF0072-51 (B35-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:42**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**27.3**		ug/kg	4.62	9.25	50	06/18/10 04:43	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.62	9.25	"	"	"	"	"
Vinyl chloride	**32.1**		"	6.29	18.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*107 %*						"	"	"	"
Sample ID: HTF0072-51RE1 (B35-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:42**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	4.62	9.25	50	06/19/10 01:40	06/18/10	10F0134	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/15/10 Reported: 06/30/10 17:39	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-52 (B36-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:44**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**24.6**		ug/kg	4.60	9.20	50	06/18/10 05:08	06/17/10	10F0111	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.60	9.20	"	"	"	"	"
Vinyl chloride	**21.2**		"	6.26	18.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"
Sample ID: HTF0072-52RE1 (B36-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:44**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	ND		"	4.60	9.20	50	06/19/10 02:05	06/18/10	10F0134	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*101 %*						"	"	"	"
Sample ID: HTF0072-53 (B5-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:48**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	**11.3**		ug/kg	4.79	9.57	50	06/18/10 05:34	06/17/10	10F0111	EPA 8260
Vinyl chloride	**185**		"	6.51	19.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0072-53RE1 (B5-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:48**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**997**		"	23.9	47.9	250	06/19/10 02:31	06/18/10	10F0134	"
Trichloroethene	**180**		"	23.9	47.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"
Sample ID: HTF0072-54 (B35-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:50**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**1150**		ug/kg	28.2	56.5	250	06/19/10 03:22	06/18/10	10F0134	EPA 8260
Trichloroethene	**271**		"	28.2	56.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0072-54RE1 (B35-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:50**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	**5.91**	J	"	5.65	11.3	50	06/21/10 15:57	06/21/10	10F0143	"
Vinyl chloride	**231**		"	7.68	22.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*110 %*						"	"	"	"
Sample ID: HTF0072-55 (B36-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:52**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**942**		ug/kg	20.8	41.5	250	06/19/10 04:14	06/18/10	10F0134	EPA 8260
Trichloroethene	**175**		"	20.8	41.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0072-55RE1 (B36-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:52**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		"	4.15	8.30	50	06/21/10 16:23	06/21/10	10F0143	"
Vinyl chloride	**198**		"	5.65	16.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*115 %*						"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: Reported:	06/15/10 06/30/10 17:39

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-56 (B5-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:54**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	5.08	10.2	50	06/21/10 16:48	06/21/10	10F0143	EPA 8260
Vinyl chloride	**89.5**		"	6.91	20.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*114 %*						"	"	"	"
Sample ID: HTF0072-56RE1 (B5-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:54**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**1260**		"	50.8	102	500	06/21/10 17:13	"	"	"
Trichloroethene	**1400**		"	50.8	102	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*113 %*						"	"	"	"
Sample ID: HTF0072-57 (B35-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:56**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	**12.1**		ug/kg	5.12	10.2	50	06/21/10 17:39	06/21/10	10F0143	EPA 8260
Vinyl chloride	**261**		"	6.96	20.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*129 %*	*Z2*					"	"	"	"
Sample ID: HTF0072-57RE1 (B35-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:56**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**1500**		"	51.2	102	500	06/21/10 18:04	"	"	"
Trichloroethene	**1750**		"	51.2	102	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*117 %*						"	"	"	"
Sample ID: HTF0072-58 (B36-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:58**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	**7.31**	J	ug/kg	5.07	10.1	50	06/21/10 18:30	06/21/10	10F0143	EPA 8260
Vinyl chloride	**157**		"	6.90	20.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*117 %*						"	"	"	"
Sample ID: HTF0072-58RE1 (B36-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 11:58**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**1510**		"	50.7	101	500	06/21/10 18:55	"	"	"
Trichloroethene	**2660**		"	50.7	101	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*122 %*	*Z2*					"	"	"	"
Sample ID: HTF0072-59 (B5-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:02**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	4.16	8.32	50	06/21/10 19:21	06/21/10	10F0143	EPA 8260
Vinyl chloride	**70.1**		"	5.66	16.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*119 %*						"	"	"	"
Sample ID: HTF0072-59RE1 (B5-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:02**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**888**		"	41.6	83.2	500	06/21/10 19:47	"	"	"
Trichloroethene	**1770**		"	41.6	83.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*123 %*	*Z2*					"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/15/10 Reported: 06/30/10 17:39	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-60 (B35-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:04**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	5.41	10.8	50	06/21/10 20:12	06/21/10	10F0143	EPA 8260
Vinyl chloride	**111**		"	7.36	21.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*120 %*						"	"	"	"
Sample ID: HTF0072-60RE1 (B35-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:04**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**1310**		"	54.1	108	500	06/21/10 20:38	"	"	"
Trichloroethene	**2610**		"	54.1	108	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*119 %*						"	"	"	"
Sample ID: HTF0072-61 (B36-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:06**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	5.21	10.4	50	06/21/10 21:03	06/21/10	10F0143	EPA 8260
Vinyl chloride	**72.8**		"	7.08	20.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*116 %*						"	"	"	"
Sample ID: HTF0072-61RE1 (B36-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:06**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**998**		"	52.1	104	500	06/21/10 21:29	"	"	"
Trichloroethene	**2080**		"	52.1	104	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*119 %*						"	"	"	"
Sample ID: HTF0072-62 (B5-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:18**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	4.80	9.60	50	06/21/10 21:55	06/21/10	10F0143	EPA 8260
Vinyl chloride	**40.2**		"	6.53	19.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*117 %*						"	"	"	"
Sample ID: HTF0072-62RE1 (B5-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:18**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**559**		"	48.0	96.0	500	06/21/10 22:21	"	"	"
Trichloroethene	**868**		"	48.0	96.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*117 %*						"	"	"	"
Sample ID: HTF0072-63 (B35-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:20**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	4.71	9.42	50	06/21/10 22:46	06/21/10	10F0143	EPA 8260
Vinyl chloride	**42.9**		"	6.41	18.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*116 %*						"	"	"	"
Sample ID: HTF0072-63RE1 (B35-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:20**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**591**		"	47.1	94.2	500	06/21/10 23:12	"	"	"
Trichloroethene	**892**		"	47.1	94.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*117 %*						"	"	"	"

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.
737 Bishop st., Suite 3010
Honolulu, HI 96813
Scott Duzan

Work Order: HTF0072
Received: 06/15/10
Reported: 06/30/10 17:39
Project: Subsurface Soil Investigation (MIS-VOCs)
Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-64 (B36-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:22**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	3.90	7.80	50	06/21/10 23:38	06/21/10	10F0143	EPA 8260
Vinyl chloride	**40.0**		"	5.30	15.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*123 %*	*Z2*					"	"	"	"
Sample ID: HTF0072-64RE1 (B36-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 12:22**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**561**		"	39.0	78.0	500	06/22/10 00:03	"	"	"
Trichloroethene	**885**		"	39.0	78.0	"	"	"	"	"
Vinyl chloride	ND		"	53.0	156	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*115 %*						"	"	"	"
Sample ID: HTF0072-65 (FIELD BLANK B5 - Solid/Soil)					**Sampled: 06/15/10 12:25**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.00	10.0	50	06/22/10 02:40	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Trichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Vinyl chloride	ND		"	6.80	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*123 %*	*Z2*					"	"	"	"
Sample ID: HTF0072-66 (B6-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 14:10**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**85.1**		ug/kg	4.66	9.32	50	06/22/10 03:06	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.66	9.32	"	"	"	"	"
Trichloroethene	ND		"	4.66	9.32	"	"	"	"	"
Vinyl chloride	**19.4**		"	6.34	18.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*122 %*	*Z2*					"	"	"	"
Sample ID: HTF0072-67 (B6-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 14:16**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**101**		ug/kg	5.99	12.0	50	06/22/10 03:31	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.99	12.0	"	"	"	"	"
Trichloroethene	**7.47**	J	"	5.99	12.0	"	"	"	"	"
Vinyl chloride	**18.5**	J	"	8.14	23.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*123 %*	*Z2*					"	"	"	"
Sample ID: HTF0072-68 (B6-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 14:18**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**44.0**		ug/kg	5.03	10.1	50	06/22/10 03:57	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.03	10.1	"	"	"	"	"
Trichloroethene	**31.8**		"	5.03	10.1	"	"	"	"	"
Vinyl chloride	ND		"	6.84	20.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*123 %*	*Z2*					"	"	"	"
Sample ID: HTF0072-69 (B6-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 14:24**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/15/10 Reported: 06/30/10 17:39	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-69 (B6-D-(MIC-VOC) - Solid/Soil) - cont.							**Sampled: 06/15/10 14:24**		**Recvd: 06/15/10 17:33**	
Volatile Organic Compounds by EPA 8260 - cont.										
cis-1,2-Dichloroethene	**4.82**	J	ug/kg	4.59	9.18	50	06/22/10 04:22	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.59	9.18	"	"	"	"	"
Trichloroethene	**11.4**		"	4.59	9.18	"	"	"	"	"
Vinyl chloride	ND		"	6.25	18.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*123 %*	*Z2*					"	"	"	"
Sample ID: HTF0072-70 (B6-E-(MIC-VOC) - Solid/Soil)							**Sampled: 06/15/10 14:26**		**Recvd: 06/15/10 17:33**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**13.9**		ug/kg	4.68	9.37	50	06/22/10 04:48	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.68	9.37	"	"	"	"	"
Trichloroethene	**18.3**		"	4.68	9.37	"	"	"	"	"
Vinyl chloride	ND		"	6.37	18.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*119 %*						"	"	"	"
Sample ID: HTF0072-71 (B6-F-(MIC-VOC) - Solid/Soil)							**Sampled: 06/15/10 14:32**		**Recvd: 06/15/10 17:33**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.89	9.77	50	06/22/10 05:14	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.89	9.77	"	"	"	"	"
Trichloroethene	ND		"	4.89	9.77	"	"	"	"	"
Vinyl chloride	ND		"	6.64	19.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*123 %*	*Z2*					"	"	"	"
Sample ID: HTF0072-72 (B6-G-(MIC-VOC) - Solid/Soil)							**Sampled: 06/15/10 14:40**		**Recvd: 06/15/10 17:33**	
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	**4.86**	J	ug/kg	4.24	8.48	50	06/22/10 05:39	06/21/10	10F0144	EPA 8260
Vinyl chloride	**14.2**	J	"	5.77	17.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*124 %*	*Z2*					"	"	"	"
Sample ID: HTF0072-72RE1 (B6-G-(MIC-VOC) - Solid/Soil)							**Sampled: 06/15/10 14:40**		**Recvd: 06/15/10 17:33**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**977**		"	42.4	84.8	500	06/23/10 08:38	06/23/10	10F0147	"
Trichloroethene	**486**		"	42.4	84.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0072-73 (B4-A-(MIC-VOC) - Solid/Soil)							**Sampled: 06/15/10 15:10**		**Recvd: 06/15/10 17:33**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.06	10.1	50	06/22/10 06:05	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.06	10.1	"	"	"	"	"
Trichloroethene	ND		"	5.06	10.1	"	"	"	"	"
Vinyl chloride	ND		"	6.88	20.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*119 %*						"	"	"	"
Sample ID: HTF0072-74 (B4-B-(MIC-VOC) - Solid/Soil)							**Sampled: 06/15/10 15:20**		**Recvd: 06/15/10 17:33**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.11	10.2	50	06/22/10 06:30	06/21/10	10F0144	EPA 8260

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-74 (B4-B-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/15/10 15:20**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260 - cont.										
trans-1,2-Dichloroethene	ND		"	5.11	10.2	"	"	"	"	"
Trichloroethene	ND		"	5.11	10.2	"	"	"	"	"
Vinyl chloride	ND		"	6.95	20.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*120 %*						"	"	"	"
Sample ID: HTF0072-75 (B4-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 15:22**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.63	9.25	50	06/22/10 06:55	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.63	9.25	"	"	"	"	"
Trichloroethene	ND		"	4.63	9.25	"	"	"	"	"
Vinyl chloride	ND		"	6.29	18.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*117 %*						"	"	"	"
Sample ID: HTF0072-76 (B4-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 15:34**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.19	8.37	50	06/22/10 07:20	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.19	8.37	"	"	"	"	"
Trichloroethene	ND		"	4.19	8.37	"	"	"	"	"
Vinyl chloride	ND		"	5.69	16.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*118 %*						"	"	"	"
Sample ID: HTF0072-77 (B4-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 15:36**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.03	10.1	50	06/22/10 07:45	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.03	10.1	"	"	"	"	"
Trichloroethene	ND		"	5.03	10.1	"	"	"	"	"
Vinyl chloride	ND		"	6.83	20.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*120 %*						"	"	"	"
Sample ID: HTF0072-78 (B4-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 15:40**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.07	8.13	50	06/22/10 08:10	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.07	8.13	"	"	"	"	"
Trichloroethene	ND		"	4.07	8.13	"	"	"	"	"
Vinyl chloride	ND		"	5.53	16.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*118 %*						"	"	"	"
Sample ID: HTF0072-79 (B4-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 15:46**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	3.93	7.87	50	06/22/10 08:35	06/21/10	10F0144	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.93	7.87	"	"	"	"	"
Trichloroethene	ND		"	3.93	7.87	"	"	"	"	"
Vinyl chloride	ND		"	5.35	15.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*118 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-80 (B3-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 16:10**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.19	8.39	50	06/23/10 09:03	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.19	8.39	"	"	"	"	"
Trichloroethene	ND		"	4.19	8.39	"	"	"	"	"
Vinyl chloride	**51.6**		"	5.71	16.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0072-81 (B3-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 16:14**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	3.93	7.85	50	06/23/10 09:30	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.93	7.85	"	"	"	"	"
Trichloroethene	ND		"	3.93	7.85	"	"	"	"	"
Vinyl chloride	**37.0**		"	5.34	15.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0072-82 (B3-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 16:16**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.76	9.51	50	06/23/10 09:56	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.76	9.51	"	"	"	"	"
Trichloroethene	ND		"	4.76	9.51	"	"	"	"	"
Vinyl chloride	**42.5**		"	6.47	19.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0072-83 (B3-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 16:22**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.66	9.32	50	06/23/10 10:21	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.66	9.32	"	"	"	"	"
Trichloroethene	ND		"	4.66	9.32	"	"	"	"	"
Vinyl chloride	**40.3**		"	6.34	18.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0072-84 (B3-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 16:24**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.17	10.3	50	06/23/10 10:46	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.17	10.3	"	"	"	"	"
Trichloroethene	ND		"	5.17	10.3	"	"	"	"	"
Vinyl chloride	**44.8**		"	7.03	20.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*91 %*						"	"	"	"
Sample ID: HTF0072-85 (B3-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/15/10 16:30**			**Recvd: 06/15/10 17:33**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.04	8.07	50	06/23/10 11:11	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.04	8.07	"	"	"	"	"
Trichloroethene	ND		"	4.04	8.07	"	"	"	"	"
Vinyl chloride	**37.7**		"	5.49	16.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072		Received: 06/15/10 Reported: 06/30/10 17:39
	Project: Subsurface Soil Investigation (MIS-VOCs)		
	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0072-85 (B3-F-(MIC-VOC) - Solid/Soil) - cont.							**Sampled: 06/15/10 16:30**		**Recvd: 06/15/10 17:33**	
Sample ID: HTF0072-86 (B3-G-(MIC-VOC) - Solid/Soil)							**Sampled: 06/15/10 16:36**		**Recvd: 06/15/10 17:33**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.12	10.2	50	06/23/10 11:36	06/23/10	10F0147	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.12	10.2	"	"	"	"	"
Trichloroethene	ND		"	5.12	10.2	"	"	"	"	"
Vinyl chloride	**36.3**		"	6.96	20.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*91 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY BLANK QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0096 Extracted: 06/16/10													
Blank Analyzed: 06/16/2010 (10F0096-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.0500	0.100	ND							
trans-1,2-Dichloroethene			ug/kg	0.0500	0.100	ND							
Trichloroethene			ug/kg	0.0500	0.100	ND							
Vinyl chloride			ug/kg	0.0680	0.200	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*99*		*80-120*			
Batch\Seq: 10F0110 Extracted: 06/17/10													
Blank Analyzed: 06/17/2010 (10F0110-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	0.315							J
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*101*		*80-120*			
Batch\Seq: 10F0111 Extracted: 06/17/10													
Blank Analyzed: 06/17/2010 (10F0111-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*104*		*80-120*			
Batch\Seq: 10F0133 Extracted: 06/18/10													
Blank Analyzed: 06/18/2010 (10F0133-BLK1)													
Trichloroethene			ug/kg	0.100	0.200	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*96*		*80-120*			
Batch\Seq: 10F0134 Extracted: 06/18/10													
Blank Analyzed: 06/18/2010 (10F0134-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*98*		*80-120*			
Batch\Seq: 10F0143 Extracted: 06/21/10													
Blank Analyzed: 06/21/2010 (10F0143-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*110*		*80-120*			
Batch\Seq: 10F0144 Extracted: 06/21/10													
Blank Analyzed: 06/22/2010 (10F0144-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*120*		*80-120*			
Batch\Seq: 10F0147 Extracted: 06/23/10													
Blank Analyzed: 06/23/2010 (10F0147-BLK1)													

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY BLANK QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0147 Extracted: 06/23/10													
Blank Analyzed: 06/23/2010 (10F0147-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*90*		*80-120*			

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0072 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: Reported:	06/15/10 06/30/10 17:39

LCS/LCS DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0096 Extracted: 06/16/10													
LCS Analyzed: 06/16/2010 (10F0096-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.0500	0.100	3.31		83		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.0500	0.100	3.84		96		80-120			
Trichloroethene		4.00	ug/kg	0.0500	0.100	3.45		86		80-120			
Vinyl chloride		4.00	ug/kg	0.0680	0.200	3.55		89		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*100*		*80-120*			
Batch\Seq: 10F0110 Extracted: 06/17/10													
LCS Analyzed: 06/17/2010 (10F0110-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	3.60		90		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.17		104		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	3.85		96		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.37		84		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*110*		*80-120*			
Batch\Seq: 10F0111 Extracted: 06/17/10													
LCS Analyzed: 06/17/2010 (10F0111-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	3.65		91		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.16		104		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.97		99		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*115*		*80-120*			
Batch\Seq: 10F0133 Extracted: 06/18/10													
LCS Analyzed: 06/18/2010 (10F0133-BS1)													
Trichloroethene		4.00	ug/kg	0.100	0.200	3.41		85		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*176*		*80-120*			A-01
Batch\Seq: 10F0134 Extracted: 06/18/10													
LCS Analyzed: 06/18/2010 (10F0134-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	3.34		83		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	3.40		85		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*101*		*80-120*			
Batch\Seq: 10F0143 Extracted: 06/21/10													
LCS Analyzed: 06/21/2010 (10F0143-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.06		102		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.73		118		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	4.30		107		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.87		97		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*107*		*80-120*			
Batch\Seq: 10F0144 Extracted: 06/21/10													
LCS Analyzed: 06/22/2010 (10F0144-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	3.86		96		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.33		108		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	4.01		100		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.82		95		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*109*		*80-120*			
Batch\Seq: 10F0147 Extracted: 06/23/10													
LCS Analyzed: 06/23/2010 (10F0147-BS1)													

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LCS/LCS DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0147 Extracted: 06/23/10													
LCS Analyzed: 06/23/2010 (10F0147-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.31		108		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	5.00		125		80-120			L
Trichloroethene		4.00	ug/kg	0.100	0.200	4.64		116		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.76		94		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*118*		*80-120*			

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0096 Extracted: 06/16/10													
Matrix Spike Analyzed: 06/17/2010 (10F0096-MS1)				**QC Source Sample: HTF0072-02**									
cis-1,2-Dichloroethene	ND	226	ug/kg	2.83	5.66	179	177	79	78	80-120	1	30	M7
trans-1,2-Dichloroethene	ND	226	ug/kg	2.83	5.66	200	198	88	87	80-120	1	30	
Trichloroethene	5.90	226	ug/kg	2.83	5.66	193	188	83	81	80-120	2	30	
Vinyl chloride	ND	226	ug/kg	3.85	11.3	223	217	98	96	80-120	3	30	
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*97*	*98*	*80-120*			
Batch\Seq: 10F0110 Extracted: 06/17/10													
Matrix Spike Analyzed: 06/17/2010 (10F0110-MS1)				**QC Source Sample: HTF0072-16**									
cis-1,2-Dichloroethene	ND	177	ug/kg	4.42	8.85	162	161	92	91	80-120	1	30	
trans-1,2-Dichloroethene	ND	177	ug/kg	4.42	8.85	185	180	105	102	80-120	3	30	
Trichloroethene	ND	177	ug/kg	4.42	8.85	177	167	100	94	80-120	6	30	
Vinyl chloride	ND	177	ug/kg	6.02	17.7	214	200	121	113	80-120	7	30	M7
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*112*	*114*	*80-120*			
Batch\Seq: 10F0111 Extracted: 06/17/10													
Matrix Spike Analyzed: 06/18/2010 (10F0111-MS1)				**QC Source Sample: HTF0072-36**									
cis-1,2-Dichloroethene	144	181	ug/kg	4.53	9.05	299	313	86	93	80-120	5	30	
trans-1,2-Dichloroethene	ND	181	ug/kg	4.53	9.05	177	187	98	103	80-120	5	30	
Vinyl chloride	ND	181	ug/kg	6.16	18.1	221	227	122	125	80-120	2	30	M7
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*110*	*115*	*80-120*			
Batch\Seq: 10F0133 Extracted: 06/18/10													
Matrix Spike Analyzed: 06/18/2010 (10F0133-MS1)				**QC Source Sample: HTF0072-38RE1**									
Trichloroethene	46.4	228	ug/kg	5.70	11.4	260	246	94	87	80-120	6	30	
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*111*	*105*	*80-120*			
Batch\Seq: 10F0134 Extracted: 06/18/10													
Matrix Spike Analyzed: 06/19/2010 (10F0134-MS1)				**QC Source Sample: HTF0072-46RE1**									
cis-1,2-Dichloroethene	20.2	187	ug/kg	4.67	9.33	170	171	80	81	80-120	0	30	
Trichloroethene	ND	187	ug/kg	4.67	9.33	153	160	82	86	80-120	5	30	
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*101*	*101*	*80-120*			
Batch\Seq: 10F0143 Extracted: 06/21/10													
Matrix Spike Analyzed: 06/22/2010 (10F0143-MS1)				**QC Source Sample: HTF0072-56RE1**									
cis-1,2-Dichloroethene	1260	2050	ug/kg	51.2	102	3020	3310	86	100	80-120	9	30	
trans-1,2-Dichloroethene	ND	2050	ug/kg	51.2	102	2190	2360	107	115	80-120	8	30	
Trichloroethene	1400	2050	ug/kg	51.2	102	3210	3560	89	105	80-120	10	30	
Vinyl chloride	706	2050	ug/kg	69.6	205	2060	2240	66	75	80-120	8	30	M7
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*106*	*112*	*80-120*			
Batch\Seq: 10F0144 Extracted: 06/21/10													
Matrix Spike Analyzed: 06/22/2010 (10F0144-MS1)				**QC Source Sample: HTF0072-66**									
cis-1,2-Dichloroethene	85.1	186	ug/kg	4.66	9.32	254	255	90	91	80-120	1	30	
trans-1,2-Dichloroethene	ND	186	ug/kg	4.66	9.32	195	195	105	105	80-120	0	30	
Trichloroethene	ND	186	ug/kg	4.66	9.32	253	232	135	125	80-120	8	30	M7
Vinyl chloride	19.4	186	ug/kg	6.34	18.6	240	216	118	105	80-120	11	30	
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*103*	*104*	*80-120*			
Batch\Seq: 10F0147 Extracted: 06/23/10													
Matrix Spike Analyzed: 06/23/2010 (10F0147-MS1)				**QC Source Sample: HTF0072-80**									

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0147 Extracted: 06/23/10													
Matrix Spike Analyzed: 06/23/2010 (10F0147-MS1)				**QC Source Sample: HTF0072-80**									
cis-1,2-Dichloroethene	ND	168	ug/kg	4.19	8.39	182	175	108	104	80-120	4	30	
trans-1,2-Dichloroethene	ND	168	ug/kg	4.19	8.39	208	201	124	120	80-120	4	30	M7
Trichloroethene	ND	168	ug/kg	4.19	8.39	230	213	137	127	80-120	7	30	M7
Vinyl chloride	51.6	168	ug/kg	5.71	16.8	191	188	83	81	80-120	2	30	
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*118*	*112*	*80-120*			

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0072	Received:	06/15/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:39
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

CERTIFICATION SUMMARY

TestAmerica Honolulu

Method	Matrix	Nelac	Hawaii
EPA 600/R-03/027	Solid/Soil		
EPA 8260	Solid/Soil	X	

For information concerning certifications of this facility or another TestAmerica facility, please visit our website at www.TestAmericaInc.com

DATA QUALIFIERS AND DEFINITIONS

A-01	True Value 3500 HT00644 + HT00653
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
L	Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was above the acceptance limits. Analyte not detected, data not impacted.
M7	The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).
Z2	Surrogate recovery was above the acceptance limits. Data not impacted.
ND	Not detected at the reporting limit (or method detection limit if shown)

ADDITIONAL COMMENTS

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY U[illegible] [illegible]NLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling: Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon	Laboratory ID no.
1	Trip Blank	X			X								MeOH	6.15.10	0950	1	X					HTF0072-01
2	B8-A-(MIC-VOC)	X			X								MeOH		0826	1	X					-02
3	B31-A-(MIC-VOC)	X			X								MeOH		0828	1	X					-03
4	B32-A-(MIC-VOC)	X			X								MeOH		0830	1	X					-04
5	B8-B-(MIC-VOC)	X			X								MeOH		0840	1	X					-05
6	B31-B-(MIC-VOC)	X			X								MeOH		0842	1	X					-06
7	B32-B-(MIC-VOC)	X			X								MeOH		0844	1	X					-07
8	B8-C-(MIC-VOC)	X			X								MeOH		0846	1	X					-08
9	B31-C-(MIC-VOC)	X			X								MeOH		0848	1	X					-09
10	B32-C-(MIC-VOC)	X			X								MeOH		0850	1	X					-10

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] ELAder	TestAmerica	6/15/10 / 1733	5C intact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY U NLY	
LAB JOB NO.	HTF0072
LOCATION	
CONTAINERS	

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B8-D-(MIC-VOC)	X			X								MeOH	6.15.10	0856	1	X										HTF0072-11
2	B31-D-(MIC-VOC)	X			X								MeOH		0858	1	X										-12
3	B32-D-(MIC-VOC)	X			X								MeOH		0900	1	X										-13
4	B8-E-(MIC-VOC)	X			X								MeOH		0902	1	X										-14
5	B31-E-(MIC-VOC)	X			X								MeOH		0904	1	X										-15
6	B32-E-(MIC-VOC)	X			X								MeOH		0906	1	X										-16
7	B8-F-(MIC-VOC)	X			X								MeOH		0914	1	X										-17
8	B31-F-(MIC-VOC)	X			X								MeOH		0916	1	X										-18
9	B32-F-(MIC-VOC)	X			X								MeOH		0918	1	X										-19
10	B8-G-(MIC-VOC)	X			X								MeOH		0920	1	X										-20

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] EL Adler	TestAmerica	6/15/10 / 1733	5 C intact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling: Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B31-G-(MIC-VOC)	X			X								MeOH	6.15.10	0922	1	X									HTF0072-21
2	B32-G-(MIC-VOC)	X			X								MeOH		0924	1	X									-22
3	B7-A-(MIC-VOC)	X			X								MeOH		1010	1	X									-23
4	B33-A-(MIC-VOC)	X			X								MeOH		1012	1	X									-24
5	B34-A-(MIC-VOC)	X			X								MeOH		1014	1	X									-25
6	B7-B-(MIC-VOC)	X			X								MeOH		1022	1	X									-26
7	B33-B-(MIC-VOC)	X			X								MeOH		1024	1	X									-27
8	B34-B-(MIC-VOC)	X			X								MeOH		1026	1	X									-28
9	B7-C-(MIC-VOC)	X			X								MeOH		1030	1	X									-29
10	B33-C-(MIC-VOC)	X			X								MeOH		1032	1	X									-30

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] E Lttdd	TestAmerica	6/15/10 / 1733	5 °C intact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY U[illegible] [illegible]NLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling: Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B34-C-(MIC-VOC)	X			X								MeOH	6.15.10	1034	1	X									HTF0072-31
2	B7-D-(MIC-VOC)	X			X								MeOH		1042	1	X									-32
3	B33-D-(MIC-VOC)	X			X								MeOH		1044	1	X									-33
4	B34-D-(MIC-VOC)	X			X								MeOH		1046	1	X									-34
5	B7-E-(MIC-VOC)	X			X								MeOH		1048	1	X									-35
6	B33-E-(MIC-VOC)	X			X								MeOH		1050	1	X									-36
7	B34-E-(MIC-VOC)	X			X								MeOH		1052	1	X									-37
8	B7-F-(MIC-VOC)	X			X								MeOH		1056	1	X									-38
9	B33-F-(MIC-VOC)	X			X								MeOH		1058	1	X									-39
10	B34-F-(MIC-VOC)	X			X								MeOH		1100	1	X									-40

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] El-Mor	TestAmerica	6/15/10 / 1733	5°C intact [illegible]
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B7-G-(MIC-VOC)	X			X								MeOH	6.15.10	1110	1	X									HTF0072-41
2	B33-G-(MIC-VOC)	X			X								MeOH		1112		X									-42
3	B34-G-(MIC-VOC)	X			X								MeOH		1114		X									-43
4	B5-A-(MIC-VOC)	X			X								MeOH		1124		X									-44
5	B35-A-(MIC-VOC)	X			X								MeOH		1126		X									-45
6	B36-A-(MIC-VOC)	X			X								MeOH		1128		X									-46
7	B5-B-(MIC-VOC)	X			X								MeOH		1134		X									-47
8	B35-B-(MIC-VOC)	X			X								MeOH		1136		X									-48
9	B36-B-(MIC-VOC)	X			X								MeOH		1138		X									-49
10	B5-C-(MIC-VOC)	X			X								MeOH		1140		X									-50

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] ELAdd	TestAmerica	6/15/10, 1735	5C intact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

Page 5 of 9

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B35-C-(MIC-VOC)	X			X								MeOH	6.15.10	1142	1	X										HTF0072-51
2	B36-C-(MIC-VOC)	X			X								MeOH		1144		X										-52
3	B5-D-(MIC-VOC)	X			X								MeOH		1148		X										-53
4	B35-D-(MIC-VOC)	X			X								MeOH		1150		X										-54
5	B36-D-(MIC-VOC)	X			X								MeOH		1152		X										-55
6	B5-E-(MIC-VOC)	X			X								MeOH		1154		X										-56
7	B35-E-(MIC-VOC)	X			X								MeOH		1156		X										-57
8	B36-E-(MIC-VOC)	X			X								MeOH		1158		X										-58
9	B5-F-(MIC-VOC)	X			X								MeOH		1202		X										-59
10	B35-F-(MIC-VOC)	X			X								MeOH		1204		X										-60

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] EL Ahl	TestAmerica	6/15/10 / 1733	5 C intact / wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B36-F-(MIC-VOC)	X			X								MeOH	6.15.10	1206	1	X									HTF0072-61
2	BS-G-(MIC-VOC)	X			X								MeOH		1218		X									-62
3	B35-G-(MIC-VOC)	X			X								MeOH		1220		X									-63
4	B36-G-(MIC-VOC)	X			X								MeOH		1222		X									-64
5	Field Blank-B5	X			X								MeOH		1225		X									-65
6	B6-A-(MIC-VOC)	X			X								MeOH		1410		X									-66
7	B6-B-(MIC-VOC)	X			X								MeOH		1416		X									-67
8	B6-C-(MIC-VOC)	X			X								MeOH		1418		X									-68
9	B6-D-(MIC-VOC)	X			X								MeOH		1424		X									-69
10	B6-E-(MIC-VOC)	X			X								MeOH		1426		X									-70

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] EL Adol	TestAmerica	6/15/10 / 1733	5C intact / wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 9

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B6-F-(MIC-VOC)	X			X								MeOH	6.15.10	1432	1	X										HTF0072-11
2	B6-G-(MIC-VOC)	X			X								MeOH		1440		X										-12
3	B4-A-(MIC-VOC)	X			X								MeOH		1510		X										-13
4	B4-B-(MIC-VOC)	X			X								MeOH		1520		X										-14
5	B4-C-(MIC-VOC)	X			X								MeOH		1522		X										-15
6	B4-D-(MIC-VOC)	X			X								MeOH		1534		X										-16
7	B4-E-(MIC-VOC)	X			X								MeOH		1536		X										-17
8	B4-F-(MIC-VOC)	X			X								MeOH		1540		X										-18
9	B4-G-(MIC-VOC)	X			X								MeOH		1546		X										-19
10	~~AD~~	~~X~~			~~X~~								~~MeOH~~										AD				-80

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] EL Abel	TestAmerica	6/15/10 / 1733	5 Contact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 7

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B3-A-(MIC-VOC)	X			X								MeOH	6.15.10	1610	1	X										HTF0072-81
2	B3-B-(MIC-VOC)	X			X								MeOH		1614		X										-82
3	B3-C-(MIC-VOC)	X			X								MeOH		1616		X										-83
4	B3-D-(MIC-VOC)	X			X								MeOH		1622		X										-84
5	B3-E-(MIC-VOC)	X			X								MeOH		1624		X										-85
6	B3-F-(MIC-VOC)	X			X								MeOH		1630		X										-86
7	B3-G-(MIC-VOC)	X			X								MeOH		1636		X										-87
8	AD	X			X								MeOH														
9		X			X								MeOH								AD						
10		X			X								MeOH														

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] ELAdel	TestAmerica	6/15/10 / 1733	5°C intact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Client Name: Tetra Tech **Date/ Time Received:** 6/15/10

Checklist Completed By: ea **Received By:** ea

Matrices: **Carrier:** Client **Airbill# :**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Chain of Custody present?	Yes ☑	No ☐	☐	
Chain of Custody Signed when relinquished and received?	Yes ☑	No ☐		
Chain of Custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sample containers on ice?	Yes ☑	No ☐	Type:	
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Water - VOA Vials have Zero Headspace?	Yes ☐	No ☐	No VOA vials present:	☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Checked:	☑
pH Adjusted?	Yes ☐	No ☑	Final pH:	
Encores / 5035 Vials Present?	Yes ☑	No ☐		
Sample Filtration Needed?	Yes ☐	No ☑	Filtered in Field:	☐
Dry Weight Corrected Results?	Yes ☐	No ☐	Take Action:	☐
DODQSM / QAPP Project?	Yes ☐	No ☐	Type:	

Temperature Blank Present? Yes ☑ No ☐

Sample Container/Blank Temperature Range (Minimum 3 sample containers if available): 5 °C

Comments/ Sampling Handling Notes:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	Trip Blank	X			X								MeOH	6.15.10	0950	1	X									HTF0072-01
2	B8-A-(MIC-VOC)	X			X								MeOH		0826	1	X									-02
3	B31-A-(MIC-VOC)	X			X								MeOH		0828	1	X									-03
4	B32-A-(MIC-VOC)	X			X								MeOH		0830	1	X									-04
5	B8-B-(MIC-VOC)	X			X								MeOH		0840	1	X									-05
6	B31-B-(MIC-VOC)	X			X								MeOH		0842	1	X									-06
7	B32-B-(MIC-VOC)	X			X								MeOH		0844	1	X									-07
8	B8-C-(MIC-VOC)	X			X								MeOH		0846	1	X									-08
9	B31-C-(MIC-VOC)	X			X								MeOH		0848	1	X									-09
10	B32-C-(MIC-VOC)	X			X								MeOH		0850	1	X									-10

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] EL Ador	TestAmerica	6/15/10 / 1733	5C intact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

Page 1 of 9

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B8-D-(MIC-VOC)	X			X								MeOH	6.15.10	0856	1	X									HTF0072-11
2	B31-D-(MIC-VOC)	X			X								MeOH		0858	1	X									-12
3	B32-D-(MIC-VOC)	X			X								MeOH		0900	1	X									-13
4	B8-E-(MIC-VOC)	X			X								MeOH		0902	1	X									-14
5	B31-E-(MIC-VOC)	X			X								MeOH		0904	1	X									-15
6	B32-E-(MIC-VOC)	X			X								MeOH		0906	1	X									-16
7	B8-F-(MIC-VOC)	X			X								MeOH		0914	1	X									-17
8	B31-F-(MIC-VOC)	X			X								MeOH		0916	1	X									-18
9	B32-F-(MIC-VOC)	X			X								MeOH		0918	1	X									-19
10	B8-G-(MIC-VOC)	X			X								MeOH		0920	1	X									-20

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] EL Adler	TestAmerica	6/15/10 / 1733	5.C intact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B31-G-(MIC-VOC)	X			X								MeOH	6.15.10	0922	1	X									HTF0072-21
2	B32-G-(MIC-VOC)	X			X								MeOH		0924	1	X									-22
3	B7-A-(MIC-VOC)	X			X								MeOH		1010	1	X									-23
4	B33-A-(MIC-VOC)	X			X								MeOH		1012	1	X									-24
5	B34-A-(MIC-VOC)	X			X								MeOH		1014	1	X									-25
6	B7-B-(MIC-VOC)	X			X								MeOH		1022	1	X									-26
7	B33-B-(MIC-VOC)	X			X								MeOH		1024	1	X									-27
8	B34-B-(MIC-VOC)	X			X								MeOH		1026	1	X									-28
9	B7-C-(MIC-VOC)	X			X								MeOH		1030	1	X									-29
10	B33-C-(MIC-VOC)	X			X								MeOH		1032	1	X									-30

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] E Lttdel	TestAmerica	6/15/10 / 1733	5 °C intact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
- [x] Dispose by lab
- [ ] Return to client
- [ ] Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B34-C-(MIC-VOC)	X			X								MeOH	6.15.10	1034	1	X									HTF0072-31
2	B7-D-(MIC-VOC)	X			X								MeOH		1042	1	X									-32
3	B33-D-(MIC-VOC)	X			X								MeOH		1044	1	X									-33
4	B34-D-(MIC-VOC)	X			X								MeOH		1046	1	X									-34
5	B7-E-(MIC-VOC)	X			X								MeOH		1048	1	X									-35
6	B33-E-(MIC-VOC)	X			X								MeOH		1050	1	X									-36
7	B34-E-(MIC-VOC)	X			X								MeOH		1052	1	X									-37
8	B7-F-(MIC-VOC)	X			X								MeOH		1056	1	X									-38
9	B33-F-(MIC-VOC)	X			X								MeOH		1058	1	X									-39
10	B34-F-(MIC-VOC)	X			X								MeOH		1100	1	X									-40

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] EL Ator	TestAmerica	6/15/10 / 1733	5°C intact [initials]
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
- [x] Dispose by lab
- [ ] Return to client
- [ ] Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY	
LAB JOB NO.	HTF0072
LOCATION	
CONTAINERS	

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B7-G-(MIC-VOC)	X			X								MeOH	6.15.10	1110	1	X									HTF0072-41
2	B33-G-(MIC-VOC)	X			X								MeOH		1112		X									-42
3	B34-G-(MIC-VOC)	X			X								MeOH		1114		X									-43
4	B5-A-(MIC-VOC)	X			X								MeOH		1124		X									-44
5	B35-A-(MIC-VOC)	X			X								MeOH		1126		X									-45
6	B36-A-(MIC-VOC)	X			X								MeOH		1128		X									-46
7	B5-B-(MIC-VOC)	X			X								MeOH		1134		X									-47
8	B35-B-(MIC-VOC)	X			X								MeOH		1136		X									-48
9	B36-B-(MIC-VOC)	X			X								MeOH		1138		X									-49
10	B5-C-(MIC-VOC)	X			X								MeOH		1140		X									-50

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] ELAdd	TestAmerica	6/15/10, 1735	5C intact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
- ☐ Return to client
- ☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY U NLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B35-C-(MIC-VOC)	X			X								MeOH	6.15.10	1142	1	X										HTF0072-51
2	B36-C-(MIC-VOC)	X			X								MeOH		1144		X										-52
3	B5-D-(MIC-VOC)	X			X								MeOH		1148		X										-53
4	B35-D-(MIC-VOC)	X			X								MeOH		1150		X										-54
5	B36-D-(MIC-VOC)	X			X								MeOH		1152		X										-55
6	B5-E-(MIC-VOC)	X			X								MeOH		1154		X										-56
7	B35-E-(MIC-VOC)	X			X								MeOH		1156		X										-57
8	B36-E-(MIC-VOC)	X			X								MeOH		1158		X										-58
9	B5-F-(MIC-VOC)	X			X								MeOH		1202		X										-59
10	B35-F-(MIC-VOC)	X			X								MeOH		1204		X										-60

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] EL Add	TestAmerica	6/15/10 / 1733	5 C intact / wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B36-F-(MIC-VOC)	X			X								MeOH	6.15.10	1206	1	X									HTF0072-61
2	BS-G-(MIC-VOC)	X			X								MeOH		1218		X									-62
3	B35-G-(MIC-VOC)	X			X								MeOH		1220		X									-63
4	B36-G-(MIC-VOC)	X			X								MeOH		1222		X									-64
5	Field Blank-B5	X			X								MeOH		1225		X									-65
6	B6-A-(MIC-VOC)	X			X								MeOH		1410		X									-66
7	B6-B-(MIC-VOC)	X			X								MeOH		1416		X									-67
8	B6-C-(MIC-VOC)	X			X								MeOH		1418		X									-68
9	B6-D-(MIC-VOC)	X			X								MeOH		1424		X									-69
10	B6-E-(MIC-VOC)	X			X								MeOH		1426		X									-70

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] EZAdd	TestAmerica	6/15/10 / 1733	5C intact / wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY U[illegible] [illegible]LY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 9

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling: Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon	Laboratory ID no.
1	B6-F-(MIC-VOC)	X			X								MeOH	6.15.10	1432	1	X					HTF0072-71
2	B6-G-(MIC-VOC)	X			X								MeOH		1440		X					-72
3	B4-A-(MIC-VOC)	X			X								MeOH		1510		X					-73
4	B4-B-(MIC-VOC)	X			X								MeOH		1520		X					-74
5	B4-C-(MIC-VOC)	X			X								MeOH		1522		X					-75
6	B4-D-(MIC-VOC)	X			X								MeOH		1534		X					-76
7	B4-E-(MIC-VOC)	X			X								MeOH		1536		X					-77
8	B4-F-(MIC-VOC)	X			X								MeOH		1540		X					-78
9	B4-G-(MIC-VOC)	X			X								MeOH		1546		X					-79
10	~~AD~~	~~X~~			~~X~~								~~MeOH~~									-80

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] EL Abd	TestAmerica	6/15/10 / 1733	5 Contact / wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* [x] Dispose by lab
* [ ] Return to client
* [ ] Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0072
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com	Project identification
Company name: Tetra Tech EMI	Job name: Hickam AFB CG110 ISM VOC Study
Address: 737 Bishop Street, Suite 3010	Job number: 103DS148843.H0301
City: Honolulu State: HI ZIP: 96813	
Phone: 808.441.6645 Fax	Contact email address: scott.duzan@tetratech.com
Sampler: SD # samples in shipment 7	

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B3-A-(MIC-VOC)	X			X								MeOH	6.15.10	1610	1	X										HTF0072-81
2	B3-B-(MIC-VOC)	X			X								MeOH		1614		X										-82
3	B3-C-(MIC-VOC)	X			X								MeOH		1616		X										-83
4	B3-D-(MIC-VOC)	X			X								MeOH		1622		X										-84
5	B3-E-(MIC-VOC)	X			X								MeOH		1624		X										-85
6	B3-F-(MIC-VOC)	X			X								MeOH		1630		X										-86
7	B3-G-(MIC-VOC)	X			X								MeOH		1636		X										-87
8	AD	X			X								MeOH														
9		X			X								MeOH					AD									
10		X			X								MeOH														

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.15.10 / 1733	Hand	[signature] E. Adel	TestAmerica	6/15/10 / 1733	5°C intact/wet
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
- ☒ Dispose by lab
- ☐ Return to client
- ☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Client Name: Tetra Tech **Date/ Time Received:** 6/15/10

Checklist Completed By: ea **Received By:** ea

Matrices: **Carrier:** Client **Airbill# :**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Chain of Custody present?	Yes ☑	No ☐	☐	
Chain of Custody Signed when relinquished and received?	Yes ☑	No ☐		
Chain of Custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sample containers on ice?	Yes ☑	No ☐	Type:	
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Water - VOA Vials have Zero Headspace?	Yes ☐	No ☐	No VOA vials present:	☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Checked:	☑
pH Adjusted?	Yes ☐	No ☑	Final pH:	
Encores / 5035 Vials Present?	Yes ☑	No ☐		
Sample Filtration Needed?	Yes ☐	No ☑	Filtered in Field:	☐
Dry Weight Corrected Results?	Yes ☐	No ☐	Take Action:	☐
DODQSM / QAPP Project?	Yes ☐	No ☐	Type:	

Temperature Blank Present? Yes ☑ No ☐

Sample Container/Blank Temperature Range (Minimum 3 sample containers if available): 5 °C

Comments/ Sampling Handling Notes:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

June 30, 2010

LABORATORY REPORT

Client:
Tetra Tech EM Inc.
737 Bishop st., Suite 3010
Honolulu, HI 96813
Attn: Scott Duzan

Work Order: HTF0092
Project Name: Subsurface Soil Investigation (MIS-VOCs)
Project Number: Subsurface Soil Investigation (MIS-VOCs)
Date Received: 06/16/10

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica.

TestAmerica Analytical Testing Corporation certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.

The Chain(s) of Custody, 9 pages, are included and are an integral part of this report. This entire report was reviewed and approved for release.

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 1-(808)486-5227

Samples were received into laboratory at a temperature of 5 °C.

NELAC states that samples which require thermal preservation shall be considered acceptable if the arrival temperature is within 2 degrees C of the required temperature or the method specified range. For samples with a temperature requirement of 4 degrees C, an arrival temperature from 0 degrees C to 6 degrees C meets specifications. Samples that are delivered to the laboratory on the same day that they are collected may not meet these criteria. In these cases, the samples are considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The reported results were obtained in compliance with the 2003 NELAC standards unless otherwise noted.

Approved By:

Marvin D. Heskett III
Laboratory Director

NELAC Certification # E87907

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0092	Received:	06/16/10
737 Bishop st., Suite 3010			Reported:	06/30/10 17:49
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number:	Subsurface Soil Investigation (MIS-VOCs)		

Sample Summary

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B12-A-(MIC-VOC)	HTF0092-01	Solid/Soil	06/16/10 08:55	06/16/10 17:28	
B12-B-(MIC-VOC)	HTF0092-02	Solid/Soil	06/16/10 08:58	06/16/10 17:28	
B12-C-(MIC-VOC)	HTF0092-03	Solid/Soil	06/16/10 09:00	06/16/10 17:28	
B12-D-(MIC-VOC)	HTF0092-04	Solid/Soil	06/16/10 09:04	06/16/10 17:28	
B12-E-(MIC-VOC)	HTF0092-05	Solid/Soil	06/16/10 09:06	06/16/10 17:28	
B12-F-(MIC-VOC)	HTF0092-06	Solid/Soil	06/16/10 09:10	06/16/10 17:28	
B12-G-(MIC-VOC)	HTF0092-07	Solid/Soil	06/16/10 09:18	06/16/10 17:28	
B11-A-(MIC-VOC)	HTF0092-08	Solid/Soil	06/16/10 09:34	06/16/10 17:28	
B11-B-(MIC-VOC)	HTF0092-09	Solid/Soil	06/16/10 09:40	06/16/10 17:28	
B11-C-(MIC-VOC)	HTF0092-10	Solid/Soil	06/16/10 09:42	06/16/10 17:28	
B11-D-(MIC-VOC)	HTF0092-11	Solid/Soil	06/16/10 09:48	06/16/10 17:28	
B11-E-(MIC-VOC)	HTF0092-12	Solid/Soil	06/16/10 09:50	06/16/10 17:28	
B11-F-(MIC-VOC)	HTF0092-13	Solid/Soil	06/16/10 10:00	06/16/10 17:28	
B11-G-(MIC-VOC)	HTF0092-14	Solid/Soil	06/16/10 09:57	06/16/10 17:28	
B10-A-(MIC-VOC)	HTF0092-15	Solid/Soil	06/16/10 10:05	06/16/10 17:28	
B10-B-(MIC-VOC)	HTF0092-16	Solid/Soil	06/16/10 10:10	06/16/10 17:28	
B10-C-(MIC-VOC)	HTF0092-17	Solid/Soil	06/16/10 10:12	06/16/10 17:28	
B10-D-(MIC-VOC)	HTF0092-18	Solid/Soil	06/16/10 10:15	06/16/10 17:28	
B10-E-(MIC-VOC)	HTF0092-19	Solid/Soil	06/16/10 10:17	06/16/10 17:28	
B10-F-(MIC-VOC)	HTF0092-20	Solid/Soil	06/16/10 10:22	06/16/10 17:28	
B10-G-(MIC-VOC)	HTF0092-21	Solid/Soil	06/16/10 10:24	06/16/10 17:28	
B9-A-(MIC-VOC)	HTF0092-22	Solid/Soil	06/16/10 10:30	06/16/10 17:28	
B9-B-(MIC-VOC)	HTF0092-23	Solid/Soil	06/16/10 10:33	06/16/10 17:28	
B9-C-(MIC-VOC)	HTF0092-24	Solid/Soil	06/16/10 10:35	06/16/10 17:28	
B9-D-(MIC-VOC)	HTF0092-25	Solid/Soil	06/16/10 10:39	06/16/10 17:28	
B9-E-(MIC-VOC)	HTF0092-26	Solid/Soil	06/16/10 10:41	06/16/10 17:28	

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0092	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:49
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Subsurface Soil Investigation (MIS-VOCs)		

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B9-F-(MIC-VOC)	HTF0092-27	Solid/Soil	06/16/10 10:45	06/16/10 17:28	
B9-G-(MIC-VOC)	HTF0092-28	Solid/Soil	06/16/10 10:47	06/16/10 17:28	
B1-H-(MIC-VOC)	HTF0092-29	Solid/Soil	06/16/10 11:05	06/16/10 17:28	
B2-A-(MIC-VOC)	HTF0092-30	Solid/Soil	06/16/10 11:36	06/16/10 17:28	
B2-B-(MIC-VOC)	HTF0092-31	Solid/Soil	06/16/10 11:38	06/16/10 17:28	
B2-C-(MIC-VOC)	HTF0092-32	Solid/Soil	06/16/10 11:40	06/16/10 17:28	
B2-D-(MIC-VOC)	HTF0092-33	Solid/Soil	06/16/10 11:46	06/16/10 17:28	
B2-E-(MIC-VOC)	HTF0092-34	Solid/Soil	06/16/10 11:48	06/16/10 17:28	
B2-F-(MIC-VOC)	HTF0092-35	Solid/Soil	06/16/10 11:54	06/16/10 17:28	
B2-G-(MIC-VOC)	HTF0092-36	Solid/Soil	06/16/10 11:56	06/16/10 17:28	
TRIP BLANK	HTF0092-37	Solid/Soil	06/16/10 13:25	06/16/10 17:28	
B1-A-(MIC-VOC)	HTF0092-38	Solid/Soil	06/16/10 13:30	06/16/10 17:28	
B1-B-(MIC-VOC)	HTF0092-39	Solid/Soil	06/16/10 13:32	06/16/10 17:28	
B1-C-(MIC-VOC)	HTF0092-40	Solid/Soil	06/16/10 13:34	06/16/10 17:28	
B1-D-(MIC-VOC)	HTF0092-41	Solid/Soil	06/16/10 13:36	06/16/10 17:28	
B1-E-(MIC-VOC)	HTF0092-42	Solid/Soil	06/16/10 13:38	06/16/10 17:28	
B1-F-(MIC-VOC)	HTF0092-43	Solid/Soil	06/16/10 13:42	06/16/10 17:28	
B1-G-(MIC-VOC)	HTF0092-44	Solid/Soil	06/16/10 13:46	06/16/10 17:28	
LAYER G-FMIS-VOC12	HTF0092-45	Solid/Soil	06/16/10 13:45	06/16/10 17:28	
LAYER G-FMIS-VOC6	HTF0092-46	Solid/Soil	06/16/10 13:45	06/16/10 17:28	
FIELD BLANK-B16-F	HTF0092-47	Solid/Soil	06/16/10 14:51	06/16/10 17:28	
B16-A-(MIC-VOC)	HTF0092-48	Solid/Soil	06/16/10 14:35	06/16/10 17:28	
B16-B-(MIC-VOC)	HTF0092-49	Solid/Soil	06/16/10 14:40	06/16/10 17:28	
B16-C-(MIC-VOC)	HTF0092-50	Solid/Soil	06/16/10 14:42	06/16/10 17:28	
B16-D-(MIC-VOC)	HTF0092-51	Solid/Soil	06/16/10 14:44	06/16/10 17:28	
B16-E-(MIC-VOC)	HTF0092-52	Solid/Soil	06/16/10 14:46	06/16/10 17:28	
B16-F-(MIC-VOC)	HTF0092-53	Solid/Soil	06/16/10 14:52	06/16/10 17:28	
B15-A-(MIC-VOC)	HTF0092-54	Solid/Soil	06/16/10 15:02	06/16/10 17:28	
B15-B-(MIC-VOC)	HTF0092-55	Solid/Soil	06/16/10 15:07	06/16/10 17:28	
B15-C-(MIC-VOC)	HTF0092-56	Solid/Soil	06/16/10 15:09	06/16/10 17:28	
B15-D-(MIC-VOC)	HTF0092-57	Solid/Soil	06/16/10 15:11	06/16/10 17:28	
B15-E-(MIC-VOC)	HTF0092-58	Solid/Soil	06/16/10 15:13	06/16/10 17:28	
B15-F-(MIC-VOC)	HTF0092-59	Solid/Soil	06/16/10 15:16	06/16/10 17:28	
B14-A-(MIC-VOC)	HTF0092-60	Solid/Soil	06/16/10 15:23	06/16/10 17:28	
B14-B-(MIC-VOC)	HTF0092-61	Solid/Soil	06/16/10 15:26	06/16/10 17:28	
B14-C-(MIC-VOC)	HTF0092-62	Solid/Soil	06/16/10 15:28	06/16/10 17:28	
B14-D-(MIC-VOC)	HTF0092-63	Solid/Soil	06/16/10 15:31	06/16/10 17:28	
B14-E-(MIC-VOC)	HTF0092-64	Solid/Soil	06/16/10 15:33	06/16/10 17:28	
B14-F-(MIC-VOC)	HTF0092-65	Solid/Soil	06/16/10 15:38	06/16/10 17:28	
B13-A-(MIC-VOC)	HTF0092-66	Solid/Soil	06/16/10 15:54	06/16/10 17:28	
B13-B-(MIC-VOC)	HTF0092-67	Solid/Soil	06/16/10 16:03	06/16/10 17:28	
B13-C-(MIC-VOC)	HTF0092-68	Solid/Soil	06/16/10 16:05	06/16/10 17:28	
B13-D-(MIC-VOC)	HTF0092-69	Solid/Soil	06/16/10 16:08	06/16/10 17:28	

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0092 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Subsurface Soil Investigation (MIS-VOCs)	Received: Reported:	06/16/10 06/30/10 17:49

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B13-E-(MIC-VOC)	HTF0092-70	Solid/Soil	06/16/10 16:10	06/16/10 17:28	
B13-F-(MIC-VOC)	HTF0092-71	Solid/Soil	06/16/10 16:17	06/16/10 17:28	

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0092	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:49
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Subsurface Soil Investigation (MIS-VOCs)		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-01 (B12-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 08:55**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	7.59	15.2	50	06/24/10 21:51	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	7.59	15.2	"	"	"	"	"
Trichloroethene	ND		"	7.59	15.2	"	"	"	"	"
Vinyl chloride	**22.5**	J	"	10.3	30.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0092-02 (B12-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 08:58**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.16	10.3	50	06/24/10 22:17	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.16	10.3	"	"	"	"	"
Trichloroethene	ND		"	5.16	10.3	"	"	"	"	"
Vinyl chloride	**10.7**	J	"	7.02	20.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0092-03 (B12-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:00**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.49	8.98	50	06/24/10 22:42	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.49	8.98	"	"	"	"	"
Trichloroethene	ND		"	4.49	8.98	"	"	"	"	"
Vinyl chloride	**17.9**	J	"	6.10	18.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0092-04 (B12-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:04**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.84	9.69	50	06/24/10 23:08	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.84	9.69	"	"	"	"	"
Trichloroethene	ND		"	4.84	9.69	"	"	"	"	"
Vinyl chloride	**17.0**	J	"	6.59	19.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0092-05 (B12-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:06**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.81	9.63	50	06/24/10 23:34	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.81	9.63	"	"	"	"	"
Trichloroethene	**6.34**	J	"	4.81	9.63	"	"	"	"	"
Vinyl chloride	ND		"	6.55	19.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0092-06 (B12-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:10**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.84	9.68	50	06/24/10 23:59	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.84	9.68	"	"	"	"	"
Trichloroethene	**9.28**	J	"	4.84	9.68	"	"	"	"	"
Vinyl chloride	ND		"	6.58	19.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.
737 Bishop st., Suite 3010
Honolulu, HI 96813
Scott Duzan

Work Order: HTF0092
Project: Subsurface Soil Investigation (MIS-VOCs)
Project Number: Subsurface Soil Investigation (MIS-VOCs)

Received: 06/16/10
Reported: 06/30/10 17:49

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-06 (B12-F-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/16/10 09:10**			**Recvd: 06/16/10 17:28**		
Sample ID: HTF0092-07 (B12-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:18**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.27	10.5	50	06/25/10 00:25	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.27	10.5	"	"	"	"	"
Trichloroethene	**10.4**	J	"	5.27	10.5	"	"	"	"	"
Vinyl chloride	ND		"	7.17	21.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0092-08 (B11-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:34**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**7.30**		ug/kg	2.27	4.54	50	06/25/10 00:51	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.27	4.54	"	"	"	"	"
Trichloroethene	**4.41**	J	"	2.27	4.54	"	"	"	"	"
Vinyl chloride	**8.54**	J	"	3.08	9.07	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0092-09 (B11-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:40**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**47.6**		ug/kg	4.55	9.10	50	06/25/10 01:16	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.55	9.10	"	"	"	"	"
Trichloroethene	ND		"	4.55	9.10	"	"	"	"	"
Vinyl chloride	**29.6**		"	6.19	18.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0092-10 (B11-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:42**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.92	9.84	50	06/25/10 02:33	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.92	9.84	"	"	"	"	"
Trichloroethene	ND		"	4.92	9.84	"	"	"	"	"
Vinyl chloride	**18.2**	J	"	6.69	19.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0092-11 (B11-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:48**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.35	10.7	50	06/25/10 02:58	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.35	10.7	"	"	"	"	"
Trichloroethene	ND		"	5.35	10.7	"	"	"	"	"
Vinyl chloride	ND		"	7.27	21.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0092-12 (B11-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:50**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.23	10.5	50	06/25/10 03:24	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.23	10.5	"	"	"	"	"
Trichloroethene	ND		"	5.23	10.5	"	"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0092 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Subsurface Soil Investigation (MIS-VOCs)	Received: 06/16/10 Reported: 06/30/10 17:49	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-12 (B11-E-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/16/10 09:50**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260 - cont.										
Vinyl chloride	**34.5**		"	7.11	20.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"
Sample ID: HTF0092-13 (B11-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:00**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**21.7**		ug/kg	4.93	9.87	50	06/25/10 03:50	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.93	9.87	"	"	"	"	"
Trichloroethene	ND		"	4.93	9.87	"	"	"	"	"
Vinyl chloride	**107**		"	6.71	19.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-14 (B11-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 09:57**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**217**		ug/kg	4.82	9.63	50	06/25/10 04:15	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.82	9.63	"	"	"	"	"
Trichloroethene	ND		"	4.82	9.63	"	"	"	"	"
Vinyl chloride	**248**		"	6.55	19.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*101 %*						"	"	"	"
Sample ID: HTF0092-15 (B10-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:05**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**7.06**	J	ug/kg	4.12	8.25	50	06/25/10 04:41	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.12	8.25	"	"	"	"	"
Trichloroethene	**4.89**	J	"	4.12	8.25	"	"	"	"	"
Vinyl chloride	**9.81**	J	"	5.61	16.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0092-16 (B10-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:10**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**116**		ug/kg	5.51	11.0	50	06/25/10 05:07	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.51	11.0	"	"	"	"	"
Trichloroethene	**8.48**	J	"	5.51	11.0	"	"	"	"	"
Vinyl chloride	**23.8**		"	7.49	22.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0092-17 (B10-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:12**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**143**		ug/kg	5.19	10.4	50	06/25/10 05:32	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.19	10.4	"	"	"	"	"
Trichloroethene	**13.8**		"	5.19	10.4	"	"	"	"	"
Vinyl chloride	**50.5**		"	7.06	20.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0092-18 (B10-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:15**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0092	Received:	06/16/10
737 Bishop st., Suite 3010			Reported:	06/30/10 17:49
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number:	Subsurface Soil Investigation (MIS-VOCs)		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-18 (B10-D-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/16/10 10:15**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260 - cont.										
cis-1,2-Dichloroethene	**57.0**		ug/kg	4.94	9.88	50	06/25/10 05:58	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.94	9.88	"	"	"	"	"
Trichloroethene	ND		"	4.94	9.88	"	"	"	"	"
Vinyl chloride	**319**		"	6.72	19.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0092-19 (B10-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:17**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**306**		ug/kg	4.95	9.89	50	06/25/10 10:15	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.95	9.89	"	"	"	"	"
Trichloroethene	ND		"	4.95	9.89	"	"	"	"	"
Vinyl chloride	**437**		"	6.73	19.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*86 %*						"	"	"	"
Sample ID: HTF0092-20 (B10-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:22**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	4.94	9.87	50	06/25/10 10:41	06/25/10	10F0158	EPA 8260
Trichloroethene	ND		"	4.94	9.87	"	"	"	"	"
Vinyl chloride	**202**		"	6.71	19.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*90 %*						"	"	"	"
Sample ID: HTF0092-20RE1 (B10-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:22**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**786**		"	24.7	49.4	250	06/25/10 19:32	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0092-21 (B10-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:24**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	4.39	8.79	50	06/25/10 11:06	06/25/10	10F0158	EPA 8260
Trichloroethene	ND		"	4.39	8.79	"	"	"	"	"
Vinyl chloride	**216**		"	5.98	17.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*87 %*						"	"	"	"
Sample ID: HTF0092-21RE1 (B10-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:24**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**1230**		"	22.0	43.9	250	06/25/10 19:58	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0092-22 (B9-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:30**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**18.5**		ug/kg	6.14	12.3	50	06/25/10 11:31	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	6.14	12.3	"	"	"	"	"
Trichloroethene	ND		"	6.14	12.3	"	"	"	"	"
Vinyl chloride	ND		"	8.35	24.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*93 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0092 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Subsurface Soil Investigation (MIS-VOCs)	Received: 06/16/10 Reported: 06/30/10 17:49	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-23 (B9-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:33**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**58.2**		ug/kg	5.43	10.9	50	06/25/10 11:56	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.43	10.9	"	"	"	"	"
Trichloroethene	ND		"	5.43	10.9	"	"	"	"	"
Vinyl chloride	**7.41**	J	"	7.38	21.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*90 %*						"	"	"	"
Sample ID: HTF0092-24 (B9-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:35**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**99.4**		ug/kg	4.62	9.25	50	06/25/10 12:21	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.62	9.25	"	"	"	"	"
Trichloroethene	ND		"	4.62	9.25	"	"	"	"	"
Vinyl chloride	ND		"	6.29	18.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*89 %*						"	"	"	"
Sample ID: HTF0092-25 (B9-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:39**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**99.7**		ug/kg	5.97	11.9	50	06/25/10 12:46	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.97	11.9	"	"	"	"	"
Trichloroethene	**130**		"	5.97	11.9	"	"	"	"	"
Vinyl chloride	ND		"	8.12	23.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0092-26 (B9-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:41**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.82	9.64	50	06/25/10 13:12	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.82	9.64	"	"	"	"	"
Trichloroethene	**41.3**		"	4.82	9.64	"	"	"	"	"
Vinyl chloride	ND		"	6.55	19.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0092-27 (B9-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:45**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.26	10.5	50	06/25/10 13:37	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.26	10.5	"	"	"	"	"
Trichloroethene	**108**		"	5.26	10.5	"	"	"	"	"
Vinyl chloride	ND		"	7.16	21.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-28 (B9-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 10:47**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.09	10.2	50	06/25/10 14:02	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.09	10.2	"	"	"	"	"
Trichloroethene	**137**		"	5.09	10.2	"	"	"	"	"
Vinyl chloride	ND		"	6.92	20.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0092	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:49
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Subsurface Soil Investigation (MIS-VOCs)		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-28 (B9-G-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/16/10 10:47**			**Recvd: 06/16/10 17:28**		
Sample ID: HTF0092-29 (B1-H-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 11:05**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**32.9**		ug/kg	4.33	8.65	50	06/25/10 14:28	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.33	8.65	"	"	"	"	"
Trichloroethene	**10.3**		"	4.33	8.65	"	"	"	"	"
Vinyl chloride	ND		"	5.88	17.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*90 %*						"	"	"	"
Sample ID: HTF0092-30 (B2-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 11:36**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**232**		ug/kg	6.46	12.9	50	06/25/10 14:53	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	6.46	12.9	"	"	"	"	"
Trichloroethene	ND		"	6.46	12.9	"	"	"	"	"
Vinyl chloride	ND		"	8.78	25.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0092-31 (B2-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 11:38**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**85.8**		ug/kg	3.91	7.82	50	06/25/10 16:08	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.91	7.82	"	"	"	"	"
Trichloroethene	**241**		"	3.91	7.82	"	"	"	"	"
Vinyl chloride	ND		"	5.32	15.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0092-32 (B2-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 11:40**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**38.5**		ug/kg	3.43	6.86	50	06/25/10 16:33	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.43	6.86	"	"	"	"	"
Vinyl chloride	ND		"	4.67	13.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*90 %*						"	"	"	"
Sample ID: HTF0092-32RE1 (B2-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 11:40**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**613**		"	6.86	13.7	100	06/28/10 20:38	06/28/10	10F0172	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0092-33 (B2-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 11:46**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**85.3**		ug/kg	5.24	10.5	50	06/25/10 16:59	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.24	10.5	"	"	"	"	"
Vinyl chloride	ND		"	7.13	21.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*93 %*						"	"	"	"
Sample ID: HTF0092-33RE1 (B2-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 11:46**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**663**		"	10.5	21.0	100	06/28/10 21:04	06/28/10	10F0172	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0092 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Subsurface Soil Investigation (MIS-VOCs)	Received: 06/16/10 Reported: 06/30/10 17:49	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-33RE1 (B2-D-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/16/10 11:46**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260 - cont.										
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0092-34 (B2-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 11:48**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**64.0**		ug/kg	4.99	9.98	50	06/25/10 17:24	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.99	9.98	"	"	"	"	"
Trichloroethene	**452**		"	4.99	9.98	"	"	"	"	"
Vinyl chloride	ND		"	6.78	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0092-35 (B2-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 11:54**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.51	11.0	50	06/25/10 17:50	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.51	11.0	"	"	"	"	"
Trichloroethene	**6.13**	J	"	5.51	11.0	"	"	"	"	"
Vinyl chloride	ND		"	7.49	22.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-36 (B2-G-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 11:56**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.74	9.47	50	06/25/10 18:16	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.74	9.47	"	"	"	"	"
Trichloroethene	ND		"	4.74	9.47	"	"	"	"	"
Vinyl chloride	ND		"	6.44	18.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0092-37 (TRIP BLANK - Solid/Soil)					**Sampled: 06/16/10 13:25**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.00	10.0	50	06/25/10 18:41	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Trichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Vinyl chloride	ND		"	6.80	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*93 %*						"	"	"	"
Sample ID: HTF0092-38 (B1-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 13:30**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**187**		ug/kg	5.68	11.4	50	06/25/10 19:06	06/25/10	10F0158	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.68	11.4	"	"	"	"	"
Trichloroethene	**10.2**	J	"	5.68	11.4	"	"	"	"	"
Vinyl chloride	**14.9**	J	"	7.72	22.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0092-39 (B1-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 13:32**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**271**		ug/kg	4.95	9.91	50	06/25/10 21:40	06/25/10	10F0159	EPA 8260

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0092	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:49
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Subsurface Soil Investigation (MIS-VOCs)		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-39 (B1-B-(MIC-VOC) - Solid/Soil) - cont.						**Sampled: 06/16/10 13:32**			**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260 - cont.										
trans-1,2-Dichloroethene	ND		"	4.95	9.91	"	"	"	"	"
Trichloroethene	**20.5**		"	4.95	9.91	"	"	"	"	"
Vinyl chloride	**43.4**		"	6.74	19.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0092-40 (B1-C-(MIC-VOC) - Solid/Soil)						**Sampled: 06/16/10 13:34**			**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**111**		ug/kg	4.74	9.47	50	06/25/10 22:06	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.74	9.47	"	"	"	"	"
Trichloroethene	**12.9**		"	4.74	9.47	"	"	"	"	"
Vinyl chloride	**16.1**	J	"	6.44	18.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-41 (B1-D-(MIC-VOC) - Solid/Soil)						**Sampled: 06/16/10 13:36**			**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**18.3**		ug/kg	4.65	9.30	50	06/25/10 22:31	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.65	9.30	"	"	"	"	"
Trichloroethene	ND		"	4.65	9.30	"	"	"	"	"
Vinyl chloride	ND		"	6.33	18.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-42 (B1-E-(MIC-VOC) - Solid/Soil)						**Sampled: 06/16/10 13:38**			**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.51	11.0	50	06/25/10 22:57	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.51	11.0	"	"	"	"	"
Trichloroethene	ND		"	5.51	11.0	"	"	"	"	"
Vinyl chloride	ND		"	7.49	22.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-43 (B1-F-(MIC-VOC) - Solid/Soil)						**Sampled: 06/16/10 13:42**			**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.09	10.2	50	06/25/10 23:23	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.09	10.2	"	"	"	"	"
Trichloroethene	ND		"	5.09	10.2	"	"	"	"	"
Vinyl chloride	ND		"	6.92	20.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-44 (B1-G-(MIC-VOC) - Solid/Soil)						**Sampled: 06/16/10 13:46**			**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.39	10.8	50	06/25/10 23:48	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.39	10.8	"	"	"	"	"
Trichloroethene	ND		"	5.39	10.8	"	"	"	"	"
Vinyl chloride	ND		"	7.33	21.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0092	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:49
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Subsurface Soil Investigation (MIS-VOCs)		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-45 (LAYER G-FMIS-VOC12 - Solid/Soil)					**Sampled: 06/16/10 13:45**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	2.52	5.05	50	06/26/10 00:14	06/25/10	10F0159	EPA 8260
Trichloroethene	**93.5**		"	2.52	5.05	"	"	"	"	"
Vinyl chloride	**9.07**	J	"	3.43	10.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-45RE1 (LAYER G-FMIS-VOC12 - Solid/Soil)					**Sampled: 06/16/10 13:45**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**308**		"	12.6	25.2	250	06/28/10 21:29	06/28/10	10F0172	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0092-46 (LAYER G-FMIS-VOC6 - Solid/Soil)					**Sampled: 06/16/10 13:45**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
trans-1,2-Dichloroethene	ND		ug/kg	2.27	4.54	50	06/26/10 00:40	06/25/10	10F0159	EPA 8260
Trichloroethene	**176**		"	2.27	4.54	"	"	"	"	"
Vinyl chloride	**22.6**		"	3.08	9.07	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0092-46RE1 (LAYER G-FMIS-VOC6 - Solid/Soil)					**Sampled: 06/16/10 13:45**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**251**		"	11.3	22.7	250	06/28/10 21:55	06/28/10	10F0172	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0092-47 (FIELD BLANK-B16-F - Solid/Soil)					**Sampled: 06/16/10 14:51**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	60.0	120	50	06/26/10 01:05	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	60.0	120	"	"	"	"	"
Trichloroethene	ND		"	60.0	120	"	"	"	"	"
Vinyl chloride	ND		"	81.6	240	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0092-48 (B16-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 14:35**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.97	11.9	50	06/26/10 01:31	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.97	11.9	"	"	"	"	"
Trichloroethene	**19.4**		"	5.97	11.9	"	"	"	"	"
Vinyl chloride	ND		"	8.12	23.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0092-49 (B16-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 14:40**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.90	9.79	50	06/26/10 01:56	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.90	9.79	"	"	"	"	"
Trichloroethene	ND		"	4.90	9.79	"	"	"	"	"
Vinyl chloride	ND		"	6.66	19.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0092 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Subsurface Soil Investigation (MIS-VOCs)	Received: 06/16/10 Reported: 06/30/10 17:49	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-50 (B16-C-(MIC-VOC) - Solid/Soil)							**Sampled: 06/16/10 14:42**		**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	3.95	7.89	50	06/26/10 02:22	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.95	7.89	"	"	"	"	"
Trichloroethene	ND		"	3.95	7.89	"	"	"	"	"
Vinyl chloride	ND		"	5.37	15.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0092-51 (B16-D-(MIC-VOC) - Solid/Soil)							**Sampled: 06/16/10 14:44**		**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.15	10.3	50	06/26/10 02:47	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.15	10.3	"	"	"	"	"
Trichloroethene	ND		"	5.15	10.3	"	"	"	"	"
Vinyl chloride	ND		"	7.00	20.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0092-52 (B16-E-(MIC-VOC) - Solid/Soil)							**Sampled: 06/16/10 14:46**		**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.93	9.86	50	06/26/10 03:13	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.93	9.86	"	"	"	"	"
Trichloroethene	ND		"	4.93	9.86	"	"	"	"	"
Vinyl chloride	ND		"	6.71	19.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0092-53 (B16-F-(MIC-VOC) - Solid/Soil)							**Sampled: 06/16/10 14:52**		**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.38	10.8	50	06/26/10 03:39	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.38	10.8	"	"	"	"	"
Trichloroethene	ND		"	5.38	10.8	"	"	"	"	"
Vinyl chloride	ND		"	7.32	21.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0092-54 (B15-A-(MIC-VOC) - Solid/Soil)							**Sampled: 06/16/10 15:02**		**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.13	8.25	50	06/26/10 04:04	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.13	8.25	"	"	"	"	"
Trichloroethene	**16.3**		"	4.13	8.25	"	"	"	"	"
Vinyl chloride	ND		"	5.61	16.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-55 (B15-B-(MIC-VOC) - Solid/Soil)							**Sampled: 06/16/10 15:07**		**Recvd: 06/16/10 17:28**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.48	11.0	50	06/26/10 04:30	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.48	11.0	"	"	"	"	"
Trichloroethene	**24.7**		"	5.48	11.0	"	"	"	"	"
Vinyl chloride	ND		"	7.46	21.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0092 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Subsurface Soil Investigation (MIS-VOCs)	Received: Reported:	06/16/10 06/30/10 17:49

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-55 (B15-B-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/16/10 15:07**			**Recvd: 06/16/10 17:28**		
Sample ID: HTF0092-56 (B15-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:09**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.08	10.2	50	06/26/10 04:56	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.08	10.2	"	"	"	"	"
Trichloroethene	**14.7**		"	5.08	10.2	"	"	"	"	"
Vinyl chloride	ND		"	6.90	20.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0092-57 (B15-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:11**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.40	10.8	50	06/26/10 05:21	06/25/10	10F0159	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.40	10.8	"	"	"	"	"
Trichloroethene	**107**		"	5.40	10.8	"	"	"	"	"
Vinyl chloride	ND		"	7.34	21.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0092-58 (B15-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:13**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**19.4**		ug/kg	5.07	10.1	50	06/28/10 15:32	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.07	10.1	"	"	"	"	"
Vinyl chloride	ND		"	6.90	20.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0092-58RE1 (B15-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:13**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**484**		"	10.1	20.3	100	06/28/10 23:12	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*105 %*						"	"	"	"
Sample ID: HTF0092-59 (B15-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:16**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**28.7**		ug/kg	4.79	9.59	50	06/28/10 15:57	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.79	9.59	"	"	"	"	"
Vinyl chloride	ND		"	6.52	19.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0092-59RE1 (B15-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:16**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
Trichloroethene	**1070**		"	24.0	47.9	250	06/28/10 23:37	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0092-60 (B14-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:23**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.86	9.72	50	06/28/10 16:22	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.86	9.72	"	"	"	"	"
Trichloroethene	ND		"	4.86	9.72	"	"	"	"	"
Vinyl chloride	ND		"	6.61	19.4	"	"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0092 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Subsurface Soil Investigation (MIS-VOCs)	Received: 06/16/10 Reported: 06/30/10 17:49	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-60 (B14-A-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/16/10 15:23**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260 - cont.										
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-61 (B14-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:26**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.99	9.99	50	06/28/10 16:48	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.99	9.99	"	"	"	"	"
Trichloroethene	**12.3**		"	4.99	9.99	"	"	"	"	"
Vinyl chloride	ND		"	6.79	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0092-62 (B14-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:28**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.10	10.2	50	06/28/10 17:13	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.10	10.2	"	"	"	"	"
Trichloroethene	**42.2**		"	5.10	10.2	"	"	"	"	"
Vinyl chloride	ND		"	6.94	20.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0092-63 (B14-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:31**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.99	9.98	50	06/28/10 17:39	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.99	9.98	"	"	"	"	"
Trichloroethene	**114**		"	4.99	9.98	"	"	"	"	"
Vinyl chloride	ND		"	6.78	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0092-64 (B14-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:33**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.98	9.97	50	06/28/10 18:04	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.98	9.97	"	"	"	"	"
Trichloroethene	**146**		"	4.98	9.97	"	"	"	"	"
Vinyl chloride	ND		"	6.78	19.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0092-65 (B14-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:38**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.69	9.38	50	06/28/10 18:30	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.69	9.38	"	"	"	"	"
Trichloroethene	**40.5**		"	4.69	9.38	"	"	"	"	"
Vinyl chloride	ND		"	6.38	18.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0092-66 (B13-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 15:54**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.37	10.7	50	06/28/10 18:56	06/28/10	10F0172	EPA 8260

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0092 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Subsurface Soil Investigation (MIS-VOCs)	Received: Reported:	06/16/10 06/30/10 17:49

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0092-66 (B13-A-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/16/10 15:54**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260 - cont.										
trans-1,2-Dichloroethene	ND		"	5.37	10.7	"	"	"	"	"
Trichloroethene	ND		"	5.37	10.7	"	"	"	"	"
Vinyl chloride	ND		"	7.30	21.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0092-67 (B13-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 16:03**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.38	8.75	50	06/28/10 19:21	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.38	8.75	"	"	"	"	"
Trichloroethene	ND		"	4.38	8.75	"	"	"	"	"
Vinyl chloride	ND		"	5.95	17.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*100 %*						"	"	"	"
Sample ID: HTF0092-68 (B13-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 16:05**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.13	8.25	50	06/28/10 19:47	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.13	8.25	"	"	"	"	"
Trichloroethene	ND		"	4.13	8.25	"	"	"	"	"
Vinyl chloride	ND		"	5.61	16.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0092-69 (B13-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 16:08**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	3.98	7.96	50	06/28/10 20:12	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	3.98	7.96	"	"	"	"	"
Trichloroethene	ND		"	3.98	7.96	"	"	"	"	"
Vinyl chloride	ND		"	5.41	15.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*101 %*						"	"	"	"
Sample ID: HTF0092-70 (B13-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 16:10**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.49	8.97	50	06/28/10 14:17	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.49	8.97	"	"	"	"	"
Trichloroethene	ND		"	4.49	8.97	"	"	"	"	"
Vinyl chloride	ND		"	6.10	17.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*93 %*						"	"	"	"
Sample ID: HTF0092-71 (B13-F-(MIC-VOC) - Solid/Soil)					**Sampled: 06/16/10 16:17**			**Recvd: 06/16/10 17:28**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.13	10.3	50	06/28/10 15:07	06/28/10	10F0172	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.13	10.3	"	"	"	"	"
Trichloroethene	ND		"	5.13	10.3	"	"	"	"	"
Vinyl chloride	ND		"	6.98	20.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*89 %*						"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.
737 Bishop st., Suite 3010
Honolulu, HI 96813
Scott Duzan

Work Order: HTF0092
Received: 06/16/10
Reported: 06/30/10 17:49
Project: Subsurface Soil Investigation (MIS-VOCs)
Project Number: Subsurface Soil Investigation (MIS-VOCs)

LABORATORY BLANK QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0154 Extracted: 06/24/10													
Blank Analyzed: 06/24/2010 (10F0154-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							M7
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*97*		*80-120*			
Batch\Seq: 10F0158 Extracted: 06/25/10													
Blank Analyzed: 06/25/2010 (10F0158-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*87*		*80-120*			
Batch\Seq: 10F0159 Extracted: 06/25/10													
Blank Analyzed: 06/25/2010 (10F0159-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*95*		*80-120*			
Batch\Seq: 10F0172 Extracted: 06/28/10													
Blank Analyzed: 06/28/2010 (10F0172-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*96*		*80-120*			

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0092	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:49
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Subsurface Soil Investigation (MIS-VOCs)		

LCS/LCS DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0154 Extracted: 06/24/10													
LCS Analyzed: 06/24/2010 (10F0154-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.05		101		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.58		115		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	4.13		103		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.54		88		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*108*		*80-120*			
Batch\Seq: 10F0158 Extracted: 06/25/10													
LCS Analyzed: 06/25/2010 (10F0158-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	3.88		97		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.57		114		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	4.05		101		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.34		84		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*98*		*80-120*			
Batch\Seq: 10F0159 Extracted: 06/25/10													
LCS Analyzed: 06/25/2010 (10F0159-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	3.71		93		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.16		104		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	3.78		95		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	2.88		72		80-120			L2
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*100*		*80-120*			
Batch\Seq: 10F0172 Extracted: 06/28/10													
LCS Analyzed: 06/28/2010 (10F0172-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	3.85		96		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.53		113		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	4.16		104		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.26		81		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*106*		*80-120*			

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0092	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:49
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Subsurface Soil Investigation (MIS-VOCs)		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0154 Extracted: 06/24/10													
Matrix Spike Analyzed: 06/25/2010 (10F0154-MS1)				**QC Source Sample: HTF0092-01**									
cis-1,2-Dichloroethene	ND	304	ug/kg	7.59	15.2	307	295	101	97	80-120	4	30	
trans-1,2-Dichloroethene	ND	304	ug/kg	7.59	15.2	351	328	115	108	80-120	7	30	
Trichloroethene	ND	304	ug/kg	7.59	15.2	444	416	146	137	80-120	7	30	M7
Vinyl chloride	22.5	304	ug/kg	10.3	30.4	277	251	84	75	80-120	10	30	M7
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*112*	*108*	*80-120*			
Batch\Seq: 10F0158 Extracted: 06/25/10													
Matrix Spike Analyzed: 06/25/2010 (10F0158-MS1)				**QC Source Sample: HTF0092-19**									
cis-1,2-Dichloroethene	306	198	ug/kg	4.95	9.89	461	460	78	78	80-120	0	30	M7
trans-1,2-Dichloroethene	ND	198	ug/kg	4.95	9.89	208	207	105	105	80-120	1	30	
Trichloroethene	ND	198	ug/kg	4.95	9.89	187	187	95	95	80-120	0	30	
Vinyl chloride	437	198	ug/kg	6.73	19.8	562	547	63	56	80-120	3	30	MHA
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*99*	*98*	*80-120*			
Batch\Seq: 10F0159 Extracted: 06/25/10													
Matrix Spike Analyzed: 06/26/2010 (10F0159-MS1)				**QC Source Sample: HTF0092-39**									
cis-1,2-Dichloroethene	271	198	ug/kg	4.95	9.91	456	443	93	87	80-120	3	30	
trans-1,2-Dichloroethene	ND	198	ug/kg	4.95	9.91	214	202	108	102	80-120	6	30	
Trichloroethene	20.5	198	ug/kg	4.95	9.91	216	204	99	93	80-120	6	30	
Vinyl chloride	43.4	198	ug/kg	6.74	19.8	191	178	74	68	80-120	7	30	M8
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*103*	*97*	*80-120*			
Batch\Seq: 10F0172 Extracted: 06/28/10													
Matrix Spike Analyzed: 06/28/2010 (10F0172-MS1)				**QC Source Sample: HTF0092-60**									
cis-1,2-Dichloroethene	ND	194	ug/kg	4.86	9.72	215	209	110	108	80-120	3	30	
trans-1,2-Dichloroethene	ND	194	ug/kg	4.86	9.72	239	231	123	119	80-120	3	30	M7
Trichloroethene	ND	194	ug/kg	4.86	9.72	246	233	126	120	80-120	5	30	M7
Vinyl chloride	ND	194	ug/kg	6.61	19.4	204	193	105	99	80-120	6	30	
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*123*	*121*	*80-120*			Z1

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0092	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:49
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Subsurface Soil Investigation (MIS-VOCs)		

CERTIFICATION SUMMARY

TestAmerica Honolulu

Method	Matrix	Nelac	Hawaii
EPA 8260	Solid/Soil	X	

For information concerning certifications of this facility or another TestAmerica facility, please visit our website at www.TestAmericaInc.com

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
L2	Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was below acceptance limits.
M7	The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).
M8	The MS and/or MSD were below the acceptance limits. See Blank Spike (LCS).
MHA	Due to high levels of analyte in the sample, the MS/MSD calculation does not provide useful spike recovery information. See Blank Spike (LCS).
Z1	Surrogate recovery was above acceptance limits.
ND	Not detected at the reporting limit (or method detection limit if shown)

ADDITIONAL COMMENTS

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. ____
LOCATION HTF0092
CONTAINERS ____

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B12-A-(MIC-VOC)	X			X								MeOH	6.16.10	0855	1	X										HTF0092-01
2	B12-B-(MIC-VOC)	X			X								MeOH		0858		X										-02
3	B12-C-(MIC-VOC)	X			X								MeOH		0900		X										-03
4	B12-D-(MIC-VOC)	X			X								MeOH		0904		X										-04
5	B12-E-(MIC-VOC)	X			X								MeOH		0906		X										-05
6	B12-F-(MIC-VOC)	X			X								MeOH		0910		X										-06
7	B12-G-(MIC-VOC)	X			X								MeOH		0918		X										-07
8	B11-A-(MIC-VOC)	X			X								MeOH		0934		X										-08
9	B11-B-(MIC-VOC)	X			X								MeOH		0940		X										-09
10	B11-C-(MIC-VOC)	X			X								MeOH		0942		X										-10

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.16.10 / 1728	Hand	Mrleskett / [signature]	TestAmerica	6-16-10 17:28	Intact
	/				/	5°C
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO.
LOCATION HTF0092
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon	Laboratory ID no.
1	B11-D-(MIC-VOC)	X			X								MeOH	6.16.10	0948	1	X					HTF0092-11
2	B11-E-(MIC-VOC)	X			X								MeOH		0950		X					-12
3	B11-F-(MIC-VOC)	X			X								MeOH		1000		X					-13
4	B11-G-(MIC-VOC)	X			X								MeOH		0957		X					-14
5	B10-A-(MIC-VOC)	X			X								MeOH		1005		X					-15
6	B10-B-(MIC-VOC)	X			X								MeOH		1010		X					-16
7	B10-C-(MIC-VOC)	X			X								MeOH		1012		X					-17
8	B10-D-(MIC-VOC)	X			X								MeOH		1015		X					-18
9	B10-E-(MIC-VOC)	X			X								MeOH		1017		X					-19
10	B10-F-(MIC-VOC)	X			X								MeOH		1022		X					-20

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.16.10 / 1728	Hand	[signature] / [signature]	TestAmerica	6-16-10 / 17:28	Intact 5°C
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
- ☐ Return to client
- ☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY U[illegible] [illegible]NLY
LAB JOB NO.
LOCATION HTF0092
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon	TPH Fuel Scan 8015m				Laboratory ID no.
1	B10-G-(MIC-VOC)	X			X								MeOH	6.16.10	1024	1	X									HTF0092-21
2	B9-A-(MIC-VOC)	X			X								MeOH		1030		X									-22
3	B9-B-(MIC-VOC)	X			X								MeOH		1033		X									-23
4	B9-C-(MIC-VOC)	X			X								MeOH		1035		X									-24
5	B9-D-(MIC-VOC)	X			X								MeOH		1039		X									-25
6	B9-E-(MIC-VOC)	X			X								MeOH		1041		X									26
7	B9-F-(MIC-VOC)	X			X								MeOH		1045		X									-27
8	B9-G-(MIC-VOC)	X			X								MeOH		1047		X									-28
9	B1-H-(MIC-VOC)	X			X								MeOH		1105		X					X				* Full Suite VOCs -29
10	B2-A-(MIC-VOC)	X			X								MeOH		1136		X									-30

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.16.10 / 1728	Hand	M Heskett / [signature]	TestAmerica	6-16-10 17:28	Intact 5°C
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

B1-H-(MIC-VOC) = Full Suite VOCs + TPH Fuel Scan 8015m

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. ____
LOCATION HTF0092
CONTAINERS ____

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B2-B-(MIC-VOC)	X			X								MeOH	6.16.10	1138	1	X									HTF0092-31
2	B2-C-(MIC-VOC)	X			X								MeOH		1140		X									-32
3	B2-D-(MIC-VOC)	X			X								MeOH		1146		X									-33
4	B2-E-(MIC-VOC)	X			X								MeOH		1148		X									-34
5	B2-F-(MIC-VOC)	X			X								MeOH		1154		X									-35
6	B2-G-(MIC-VOC)	X			X								MeOH		1156		X									-36
7	TRIP BLANK	X			X								MeOH		1325		X									-37
8	B1-A-(MIC-VOC)	X			X								MeOH		1330		X									-38
9	B1-B-(MIC-VOC)	X			X								MeOH		1332		X									-39
10	B1-C-(MIC-VOC)	X			X								MeOH		1334		X									-40

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6-16-10 / 1728	Hand	MHeskett / [signature]	TestAmerica	6-16-10 17:28	Intact 5°C
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY	
LAB JOB NO.	HTF0092
LOCATION	
CONTAINERS	

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com	Project identification
Company name: Tetra Tech EMI	Job name: Hickam AFB CG110 ISM VOC Study
Address: 737 Bishop Street, Suite 3010	Job number: 103DS148843.H0301
City: Honolulu State: HI ZIP: 96813	
Phone: 808.441.6645 Fax	Contact email address: scott.duzan@tetratech.com
Sampler: SD # samples in shipment 9	

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling: Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon	Laboratory ID no.
1	BI-D-(MIC-VOC)	X			X								MeOH	6-16-10	1336	1	X					HTF0092-41
2	BI-E-(MIC-VOC)	X			X								MeOH		1338		X					-42
3	BI-F-(MIC-VOC)	X			X								MeOH		1342		X					-43
4	BI-G-(MIC-VOC)	X			X								MeOH		1346		X					-44
5	Layer G-FMIS-VOC12	X			X								MeOH		1345		X					-45
6	Layer G-FMIS-VOC6	X			X								MeOH		1345		X					-46
7	Field Blank-B16-F	X			X								MeOH		1451		X					-47
8	B16-A-(MIC-VOC)	X			X								MeOH		1435		X					-48
9	B16-B-(MIC-VOC)	X			X								MeOH		1440		X					-49
10	~~B16-4-6-SA~~ AD	~~X~~			~~X~~								~~MeOH~~		~~1431~~					AD		

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6-16-10 / 1728	Hand	M Hesketh / [signature]	TestAmerica	6-16-10 / 17:25	Intact 5°C
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0092
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B16-C-(MIC-VOC)	X			X								MeOH	6-16-10	1442	1	X									HTF0092-50
2	B16-D-(MIC-VOC)	X			X								MeOH		1444		X									-51
3	B16-E-(MIC-VOC)	X			X								MeOH		1446		X									-52
4	B16-F-(MIC-VOC)	X			X								MeOH		1452		X									-53
5	~~B16~~ B15-A-(MIC-VOC)	X			X								MeOH		1502		X									-54
6	B15-B-(MIC-VOC)	X			X								MeOH		1507		X									-55
7	B15-C-(MIC-VOC)	X			X								MeOH		1509		X									-56
8	B15-D-(MIC-VOC)	X			X								MeOH		1511		X									-57
9	B15-E-(MIC-VOC)	X			X								MeOH		1513		X									-58
10	B15-F-(MIC-VOC)	X			X								MeOH		1516		X									-59

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6-16-10 / 1728	Hand	M Hesketh / [signature]	TestAmerica	6-16-10 17:28	Intact 5°C
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0092
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B14-A-(MIC-VOC)	X			X								MeOH	6-16-10	1523	1	X									HTF0092-60
2	B14-B-(MIC-VOC)	X			X								MeOH		1526		X									-61
3	B14-C-(MIC-VOC)	X			X								MeOH		1528		X									-62
4	B14-D-(MIC-VOC)	X			X								MeOH		1531		X									-63
5	B14-E-(MIC-VOC)	X			X								MeOH		1533		X									-64
6	B14-F-(MIC-VOC)	X			X								MeOH		1538		X									-65
7	B13-A-(MIC-VOC)	X			X								MeOH		1554		X									-66
8	B13-B-(MIC-VOC)	X			X								MeOH		1603		X									-67
9	B13-C-(MIC-VOC)	X			X								MeOH		1605		X									-68
10	B13-D-(MIC-VOC)	X			X								MeOH		1608		X									-69

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6-16-10 / 1728	Hand	M Hoskot / [signature]	TestAmerica	6-16-10 17:28	Intact 5°C
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY	
LAB JOB NO.	HTF0092
LOCATION	
CONTAINERS	

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 2

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B13-E-(MIC-VOC)	X			X								MeOH	6.16.10	1610	1	X										HTF0092-70
2	B13-F-(MIC-VOC)	X			X								MeOH	↓	1617	1	X										-71
3	AD	X			X								MeOH						AD								
4		X			X								MeOH														
5		X			X								MeOH														
6		X			X								MeOH														
7		X			X								MeOH														
8		X			X								MeOH														
9		X			X								MeOH														
10		X			X								MeOH														

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6-16-10 / 1728	Hand	M Heskett / MOR	TestAmerica	6-16-10 17:28	Intact 5°C
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

Page 8 of 8

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Client Name: Tetratech **Date/ Time Received:** 6/16/10 17:28

Checklist Completed By: [illegible] **Received By:** [illegible]

Matrices: Soil **Carrier:** **Airbill# :**

Shipping container/cooler in good condition?	Yes ☑ No ☐	Not Present ☐
Chain of Custody present?	Yes ☑ No ☐	☐
Chain of Custody Signed when relinquished and received?	Yes ☑ No ☐	
Chain of Custody agrees with sample labels?	Yes ☑ No ☐	
Samples in proper container/bottle?	Yes ☑ No ☐	
Sample containers intact?	Yes ☑ No ☐	
Sample containers on ice?	Yes ☑ No ☐	Type:
Sufficient sample volume for indicated test?	Yes ☑ No ☐	
All samples received within holding time?	Yes ☑ No ☐	
Water - VOA Vials have Zero Headspace?	Yes ☐ No ☐	No VOA vials present: ☑
Water - pH acceptable upon receipt?	Yes ☐ No ☐	Not Checked: ☑
pH Adjusted?	Yes ☐ No ☑	Final pH:
Encores / 5035 Vials Present?	Yes ☐ No ☑	
Sample Filtration Needed?	Yes ☐ No ☑	Filtered in Field: ☐
Dry Weight Corrected Results?	Yes ☐ No ☑	Take Action: ☐
DODQSM / QAPP Project?	Yes ☑ No ☐	Type: DoD MS

Temperature Blank Present? Yes ☑ No ☐

Sample Container/Blank Temperature Range (Minimum 3 sample containers if available): 5 °C

Comments/ Sampling Handling Notes:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

June 30, 2010

LABORATORY REPORT

Client:
Tetra Tech EM Inc.
737 Bishop st., Suite 3010
Honolulu, HI 96813
Attn: Scott Duzan

Work Order: HTF0088
Project Name: Subsurface Soil Investigation (MIS-VOCs)
Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H
Date Received: 06/17/10

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica.

TestAmerica Analytical Testing Corporation certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.

The Chain(s) of Custody, 5 pages, are included and are an integral part of this report. This entire report was reviewed and approved for release.

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 1-(808)486-5227

Samples were received into laboratory at a temperature of 4 °C.

NELAC states that samples which require thermal preservation shall be considered acceptable if the arrival temperature is within 2 degrees C of the required temperature or the method specified range. For samples with a temperature requirement of 4 degrees C, an arrival temperature from 0 degrees C to 6 degrees C meets specifications. Samples that are delivered to the laboratory on the same day that they are collected may not meet these criteria. In these cases, the samples are considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The reported results were obtained in compliance with the 2003 NELAC standards unless otherwise noted.

Approved By:

Marvin D. Heskett III
Laboratory Director

NELAC Certification # E87907

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0088 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/17/10 Reported: 06/30/10 17:46	

Sample Summary

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B21-A-(MIC-VOC)	HTF0088-01	Solid/Soil	06/17/10 08:46	06/17/10 11:46	
B21-B-(MIC-VOC)	HTF0088-02	Solid/Soil	06/17/10 08:45	06/17/10 11:46	
B21-C-(MIC-VOC)	HTF0088-03	Solid/Soil	06/17/10 08:47	06/17/10 11:46	
B21-D-(MIC-VOC)	HTF0088-04	Solid/Soil	06/17/10 08:49	06/17/10 11:46	
B18-A-(MIC-VOC)	HTF0088-05	Solid/Soil	06/17/10 08:55	06/17/10 11:46	
B18-B-(MIC-VOC)	HTF0088-06	Solid/Soil	06/17/10 08:59	06/17/10 11:46	
B18-C-(MIC-VOC)	HTF0088-07	Solid/Soil	06/17/10 09:01	06/17/10 11:46	
B18-D-(MIC-VOC)	HTF0088-08	Solid/Soil	06/17/10 09:04	06/17/10 11:46	
B18-E-(MIC-VOC)	HTF0088-09	Solid/Soil	06/17/10 09:06	06/17/10 11:46	
B19-A-(MIC-VOC)	HTF0088-10	Solid/Soil	06/17/10 09:16	06/17/10 11:46	
B19-B-(MIC-VOC)	HTF0088-11	Solid/Soil	06/17/10 09:19	06/17/10 11:46	
B19-C-(MIC-VOC)	HTF0088-12	Solid/Soil	06/17/10 09:20	06/17/10 11:46	
B19-D-(MIC-VOC)	HTF0088-13	Solid/Soil	06/17/10 09:26	06/17/10 11:46	
B19-E-(MIC-VOC)	HTF0088-14	Solid/Soil	06/17/10 09:28	06/17/10 11:46	
FIELD BLANK - B19	HTF0088-15	Solid/Soil	06/17/10 09:29	06/17/10 11:46	
B20-A-(MIC-VOC)	HTF0088-16	Solid/Soil	06/17/10 09:41	06/17/10 11:46	
B20-B-(MIC-VOC)	HTF0088-17	Solid/Soil	06/17/10 09:46	06/17/10 11:46	
B20-C-(MIC-VOC)	HTF0088-18	Solid/Soil	06/17/10 09:48	06/17/10 11:46	
B20-D-(MIC-VOC)	HTF0088-19	Solid/Soil	06/17/10 09:51	06/17/10 11:46	
B20-E-(MIC-VOC)	HTF0088-20	Solid/Soil	06/17/10 09:53	06/17/10 11:46	
B17-A-(MIC-VOC)	HTF0088-21	Solid/Soil	06/17/10 10:05	06/17/10 11:46	
B17-B-(MIC-VOC)	HTF0088-22	Solid/Soil	06/17/10 10:09	06/17/10 11:46	
B17-C-(MIC-VOC)	HTF0088-23	Solid/Soil	06/17/10 10:10	06/17/10 11:46	
B17-D-(MIC-VOC)	HTF0088-24	Solid/Soil	06/17/10 10:14	06/17/10 11:46	
B17-E-(MIC-VOC)	HTF0088-25	Solid/Soil	06/17/10 10:16	06/17/10 11:46	
LAYER E-FMIS-VOC6	HTF0088-26	Solid/Soil	06/17/10 10:15	06/17/10 11:46	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0088		Received:	06/17/10
737 Bishop st., Suite 3010				Reported:	06/30/10 17:46
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)			
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301			

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
LAYER E-FMIS-VOC12	HTF0088-27	Solid/Soil	06/17/10 10:15	06/17/10 11:46	
LAYER F-FMIS-VOC6	HTF0088-28	Solid/Soil	06/16/10 16:17	06/17/10 11:46	
LAYER F-FMIS-VOC12	HTF0088-29	Solid/Soil	06/16/10 16:17	06/17/10 11:46	
B37-A-(MIC-VOC)	HTF0088-30	Solid/Soil	06/17/10 10:20	06/17/10 11:46	
B38-A-(MIC-VOC)	HTF0088-31	Solid/Soil	06/17/10 10:30	06/17/10 11:46	
TRIP BLANK	HTF0088-32	Solid/Soil	06/17/10 10:35	06/17/10 11:46	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0088 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/17/10 Reported: 06/30/10 17:46	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0088-01 (B21-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 08:46**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	6.61	13.2	50	06/23/10 23:58	06/23/10	10F0149	EPA 8260
trans-1,2-Dichloroethene	ND		"	6.61	13.2	"	"	"	"	"
Trichloroethene	ND		"	6.61	13.2	"	"	"	"	"
Vinyl chloride	ND		"	9.00	26.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0088-02 (B21-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 08:45**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.62	9.24	50	06/24/10 00:23	06/23/10	10F0149	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.62	9.24	"	"	"	"	"
Trichloroethene	ND		"	4.62	9.24	"	"	"	"	"
Vinyl chloride	ND		"	6.28	18.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0088-03 (B21-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 08:47**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.09	10.2	50	06/24/10 00:49	06/23/10	10F0149	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.09	10.2	"	"	"	"	"
Trichloroethene	ND		"	5.09	10.2	"	"	"	"	"
Vinyl chloride	ND		"	6.93	20.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0088-04 (B21-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 08:49**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.02	10.0	50	06/24/10 01:15	06/23/10	10F0149	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.02	10.0	"	"	"	"	"
Trichloroethene	ND		"	5.02	10.0	"	"	"	"	"
Vinyl chloride	**10.8**	J	"	6.83	20.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0088-05 (B18-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 08:55**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.40	10.8	50	06/24/10 01:40	06/23/10	10F0149	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.40	10.8	"	"	"	"	"
Trichloroethene	ND		"	5.40	10.8	"	"	"	"	"
Vinyl chloride	ND		"	7.34	21.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0088-06 (B18-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 08:59**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.28	10.6	50	06/24/10 02:06	06/23/10	10F0149	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.28	10.6	"	"	"	"	"
Trichloroethene	ND		"	5.28	10.6	"	"	"	"	"
Vinyl chloride	ND		"	7.18	21.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0088 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/17/10 Reported: 06/30/10 17:46	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0088-06 (B18-B-(MIC-VOC) - Solid/Soil) - cont.					**Sampled:**		**06/17/10 08:59**		**Recvd: 06/17/10 11:46**	
Sample ID: HTF0088-07 (B18-C-(MIC-VOC) - Solid/Soil)					**Sampled:**		**06/17/10 09:01**		**Recvd: 06/17/10 11:46**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.29	10.6	50	06/24/10 02:31	06/23/10	10F0149	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.29	10.6	"	"	"	"	"
Trichloroethene	ND		"	5.29	10.6	"	"	"	"	"
Vinyl chloride	ND		"	7.20	21.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0088-08 (B18-D-(MIC-VOC) - Solid/Soil)					**Sampled:**		**06/17/10 09:04**		**Recvd: 06/17/10 11:46**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.86	9.72	50	06/24/10 02:57	06/23/10	10F0149	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.86	9.72	"	"	"	"	"
Trichloroethene	ND		"	4.86	9.72	"	"	"	"	"
Vinyl chloride	ND		"	6.61	19.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0088-09 (B18-E-(MIC-VOC) - Solid/Soil)					**Sampled:**		**06/17/10 09:06**		**Recvd: 06/17/10 11:46**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.46	8.92	50	06/24/10 03:22	06/23/10	10F0149	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.46	8.92	"	"	"	"	"
Trichloroethene	ND		"	4.46	8.92	"	"	"	"	"
Vinyl chloride	ND		"	6.06	17.8	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0088-10 (B19-A-(MIC-VOC) - Solid/Soil)					**Sampled:**		**06/17/10 09:16**		**Recvd: 06/17/10 11:46**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.84	11.7	50	06/24/10 03:48	06/23/10	10F0149	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.84	11.7	"	"	"	"	"
Trichloroethene	ND		"	5.84	11.7	"	"	"	"	"
Vinyl chloride	ND		"	7.94	23.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0088-11 (B19-B-(MIC-VOC) - Solid/Soil)					**Sampled:**		**06/17/10 09:19**		**Recvd: 06/17/10 11:46**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.18	8.36	50	06/24/10 10:01	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.18	8.36	"	"	"	"	"
Trichloroethene	ND		"	4.18	8.36	"	"	"	"	"
Vinyl chloride	ND		"	5.69	16.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0088-12 (B19-C-(MIC-VOC) - Solid/Soil)					**Sampled:**		**06/17/10 09:20**		**Recvd: 06/17/10 11:46**	
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.87	9.74	50	06/24/10 10:26	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.87	9.74	"	"	"	"	"
Trichloroethene	ND		"	4.87	9.74	"	"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0088		Received:	06/17/10
737 Bishop st., Suite 3010				Reported:	06/30/10 17:46
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)			
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301			

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0088-12 (B19-C-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/17/10 09:20**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260 - cont.										
Vinyl chloride	ND		"	6.62	19.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0088-13 (B19-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 09:26**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.27	10.5	50	06/24/10 10:51	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.27	10.5	"	"	"	"	"
Trichloroethene	ND		"	5.27	10.5	"	"	"	"	"
Vinyl chloride	ND		"	7.17	21.1	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*91 %*						"	"	"	"
Sample ID: HTF0088-14 (B19-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 09:28**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.00	10.0	50	06/24/10 11:17	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Trichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Vinyl chloride	ND		"	6.80	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*90 %*						"	"	"	"
Sample ID: HTF0088-15 (FIELD BLANK - B19 - Solid/Soil)					**Sampled: 06/17/10 09:29**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.00	10.0	50	06/24/10 11:42	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Trichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Vinyl chloride	**19.6**	J	"	6.80	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*91 %*						"	"	"	"
Sample ID: HTF0088-16 (B20-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 09:41**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.09	10.2	50	06/24/10 12:07	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.09	10.2	"	"	"	"	"
Trichloroethene	**10.8**		"	5.09	10.2	"	"	"	"	"
Vinyl chloride	**40.8**		"	6.93	20.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*91 %*						"	"	"	"
Sample ID: HTF0088-17 (B20-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 09:46**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.15	10.3	50	06/24/10 12:32	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.15	10.3	"	"	"	"	"
Trichloroethene	**9.04**	J	"	5.15	10.3	"	"	"	"	"
Vinyl chloride	**46.7**		"	7.01	20.6	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"
Sample ID: HTF0088-18 (B20-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 09:48**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0088	Received:	06/17/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:46
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0088-18 (B20-C-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/17/10 09:48**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260 - cont.										
cis-1,2-Dichloroethene	ND		ug/kg	4.76	9.51	50	06/24/10 12:57	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.76	9.51	"	"	"	"	"
Trichloroethene	ND		"	4.76	9.51	"	"	"	"	"
Vinyl chloride	**44.2**		"	6.47	19.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*91 %*						"	"	"	"
Sample ID: HTF0088-19 (B20-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 09:51**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.73	9.45	50	06/24/10 13:22	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.73	9.45	"	"	"	"	"
Trichloroethene	ND		"	4.73	9.45	"	"	"	"	"
Vinyl chloride	**53.8**		"	6.43	18.9	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0088-20 (B20-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 09:53**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.88	9.76	50	06/24/10 13:48	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.88	9.76	"	"	"	"	"
Trichloroethene	ND		"	4.88	9.76	"	"	"	"	"
Vinyl chloride	**41.4**		"	6.63	19.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*93 %*						"	"	"	"
Sample ID: HTF0088-21 (B17-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 10:05**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.11	10.2	50	06/24/10 14:13	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.11	10.2	"	"	"	"	"
Trichloroethene	ND		"	5.11	10.2	"	"	"	"	"
Vinyl chloride	**35.7**		"	6.95	20.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0088-22 (B17-B-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 10:09**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.62	9.24	50	06/24/10 14:38	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.62	9.24	"	"	"	"	"
Trichloroethene	ND		"	4.62	9.24	"	"	"	"	"
Vinyl chloride	**33.0**		"	6.29	18.5	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*91 %*						"	"	"	"
Sample ID: HTF0088-23 (B17-C-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 10:10**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.75	9.50	50	06/24/10 15:03	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.75	9.50	"	"	"	"	"
Trichloroethene	ND		"	4.75	9.50	"	"	"	"	"
Vinyl chloride	**24.9**		"	6.46	19.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*94 %*						"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0088	Received:	06/17/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:46
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0088-23 (B17-C-(MIC-VOC) - Solid/Soil) - cont.					**Sampled: 06/17/10 10:10**			**Recvd: 06/17/10 11:46**		
Sample ID: HTF0088-24 (B17-D-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 10:14**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.58	11.2	50	06/24/10 15:28	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.58	11.2	"	"	"	"	"
Trichloroethene	ND		"	5.58	11.2	"	"	"	"	"
Vinyl chloride	**29.8**		"	7.59	22.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0088-25 (B17-E-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 10:16**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	4.56	9.11	50	06/24/10 15:53	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.56	9.11	"	"	"	"	"
Trichloroethene	ND		"	4.56	9.11	"	"	"	"	"
Vinyl chloride	**10.7**	J	"	6.20	18.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*92 %*						"	"	"	"
Sample ID: HTF0088-26 (LAYER E-FMIS-VOC6 - Solid/Soil)					**Sampled: 06/17/10 10:15**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**64.5**		ug/kg	1.97	3.94	50	06/24/10 16:18	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	1.97	3.94	"	"	"	"	"
Trichloroethene	**120**		"	1.97	3.94	"	"	"	"	"
Vinyl chloride	**8.34**		"	2.68	7.88	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*91 %*						"	"	"	"
Sample ID: HTF0088-27 (LAYER E-FMIS-VOC12 - Solid/Soil)					**Sampled: 06/17/10 10:15**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**62.7**		ug/kg	2.12	4.25	50	06/24/10 16:44	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.12	4.25	"	"	"	"	"
Trichloroethene	**141**		"	2.12	4.25	"	"	"	"	"
Vinyl chloride	**14.4**		"	2.89	8.49	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"
Sample ID: HTF0088-28 (LAYER F-FMIS-VOC6 - Solid/Soil)					**Sampled: 06/16/10 16:17**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**101**		ug/kg	2.21	4.41	50	06/24/10 17:09	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.21	4.41	"	"	"	"	"
Trichloroethene	**160**		"	2.21	4.41	"	"	"	"	"
Vinyl chloride	**25.6**		"	3.00	8.83	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*95 %*						"	"	"	"
Sample ID: HTF0088-29 (LAYER F-FMIS-VOC12 - Solid/Soil)					**Sampled: 06/16/10 16:17**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**93.5**		ug/kg	2.57	5.13	50	06/24/10 17:35	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	ND		"	2.57	5.13	"	"	"	"	"
Trichloroethene	**179**		"	2.57	5.13	"	"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0088	Received:	06/17/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:46
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0088-29 (LAYER F-FMIS-VOC12 - Solid/Soil) - cont.					**Sampled: 06/16/10 16:17**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260 - cont.										
Vinyl chloride	**9.71**	J	"	3.49	10.3	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*97 %*						"	"	"	"
Sample ID: HTF0088-30 (B37-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 10:20**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**14.8**		ug/kg	5.00	10.0	50	06/24/10 18:00	06/24/10	10F0153	EPA 8260
trans-1,2-Dichloroethene	**13.2**		"	5.00	10.0	"	"	"	"	"
Trichloroethene	**13.3**		"	5.00	10.0	"	"	"	"	"
Vinyl chloride	**27.1**		"	6.80	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*107 %*						"	"	"	"
Sample ID: HTF0088-31 (B38-A-(MIC-VOC) - Solid/Soil)					**Sampled: 06/17/10 10:30**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**174**		ug/kg	5.00	10.0	50	06/24/10 21:00	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	**203**		"	5.00	10.0	"	"	"	"	"
Trichloroethene	**184**		"	5.00	10.0	"	"	"	"	"
Vinyl chloride	**195**		"	6.80	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*238 %*	*A-01b*					"	"	"	"
Sample ID: HTF0088-32 (TRIP BLANK - Solid/Soil)					**Sampled: 06/17/10 10:35**			**Recvd: 06/17/10 11:46**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	ND		ug/kg	5.00	10.0	50	06/24/10 21:25	06/24/10	10F0154	EPA 8260
trans-1,2-Dichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Trichloroethene	ND		"	5.00	10.0	"	"	"	"	"
Vinyl chloride	ND		"	6.80	20.0	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*96 %*						"	"	"	"

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0088	Received:	06/17/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:46
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY BLANK QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0149 Extracted: 06/23/10													
Blank Analyzed: 06/24/2010 (10F0149-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*90*		*80-120*			
Batch\Seq: 10F0153 Extracted: 06/24/10													
Blank Analyzed: 06/24/2010 (10F0153-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*95*		*80-120*			
Batch\Seq: 10F0154 Extracted: 06/24/10													
Blank Analyzed: 06/24/2010 (10F0154-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							M7
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*97*		*80-120*			

Tetra Tech EM Inc.	Work Order: HTF0088	Received:	06/17/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:46
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LCS/LCS DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0149 Extracted: 06/23/10													
LCS Analyzed: 06/23/2010 (10F0149-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.13		103		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.77		119		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	4.55		114		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.45		86		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*110*		*80-120*			
Batch\Seq: 10F0153 Extracted: 06/24/10													
LCS Analyzed: 06/24/2010 (10F0153-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.12		103		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.78		119		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	4.33		108		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.84		96		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*105*		*80-120*			
Batch\Seq: 10F0154 Extracted: 06/24/10													
LCS Analyzed: 06/24/2010 (10F0154-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.05		101		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.58		115		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	4.13		103		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.54		88		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*108*		*80-120*			

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0088 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/17/10 Reported: 06/30/10 17:46	

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0149 Extracted: 06/23/10													
Matrix Spike Analyzed: 06/24/2010 (10F0149-MS1)				**QC Source Sample: HTF0088-01**									
cis-1,2-Dichloroethene	ND	265	ug/kg	6.61	13.2	271	249	102	94	80-120	8	30	
trans-1,2-Dichloroethene	ND	265	ug/kg	6.61	13.2	312	283	118	107	80-120	10	30	
Trichloroethene	ND	265	ug/kg	6.61	13.2	293	269	111	102	80-120	9	30	
Vinyl chloride	ND	265	ug/kg	9.00	26.5	249	214	94	81	80-120	15	30	
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*110*	*101*	*80-120*			
Batch\Seq: 10F0153 Extracted: 06/24/10													
Matrix Spike Analyzed: 06/24/2010 (10F0153-MS1)				**QC Source Sample: HTF0088-11**									
cis-1,2-Dichloroethene	ND	167	ug/kg	4.18	8.36	184	189	110	113	80-120	2	30	
trans-1,2-Dichloroethene	ND	167	ug/kg	4.18	8.36	209	212	125	126	80-120	1	30	M7
Trichloroethene	ND	167	ug/kg	4.18	8.36	192	198	115	118	80-120	3	30	
Vinyl chloride	ND	167	ug/kg	5.69	16.7	182	182	109	109	80-120	0	30	
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*200*	*207*	*80-120*			A-01,A-01a
Batch\Seq: 10F0154 Extracted: 06/24/10													
Matrix Spike Analyzed: 06/25/2010 (10F0154-MS1)				**QC Source Sample: HTF0092-01**									
cis-1,2-Dichloroethene	ND	304	ug/kg	7.59	15.2	307	295	101	97	80-120	4	30	
trans-1,2-Dichloroethene	ND	304	ug/kg	7.59	15.2	351	328	115	108	80-120	7	30	
Trichloroethene	ND	304	ug/kg	7.59	15.2	444	416	146	137	80-120	7	30	M7
Vinyl chloride	22.5	304	ug/kg	10.3	30.4	277	251	84	75	80-120	10	30	M7
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*112*	*108*	*80-120*			

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0088	Received:	06/17/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:46
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

CERTIFICATION SUMMARY

TestAmerica Honolulu

Method	Matrix	Nelac	Hawaii
EPA 8260	Solid/Soil	X	

For information concerning certifications of this facility or another TestAmerica facility, please visit our website at www.TestAmericaInc.com

DATA QUALIFIERS AND DEFINITIONS

A-01	True Value 3.5ug/l, 114% Recovery
A-01a	True Value 3.5ug/l, 118% Recovery
A-01b	True Value 4.0ug/l, 87% Recovery
J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
M7	The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).
ND	Not detected at the reporting limit (or method detection limit if shown)

ADDITIONAL COMMENTS

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0033
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Matrix: Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling: Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	B21-A-(MIC-VOC)	X			X								MeOH	6.17.10	0846	1	X										HTF0033-01
2	B21-B-(MIC-VOC)	X			X								MeOH		0845		X										-02
3	B21-C-(MIC-VOC)	X			X								MeOH		0847		X										-03
4	B21-D-(MIC-VOC)	X			X								MeOH		0849		X										-04
5	B18-A-(MIC-VOC)	X			X								MeOH		0855		X										-05
6	B18-B-(MIC-VOC)	X			X								MeOH		0859		X										-06
7	B18-C-(MIC-VOC)	X			X								MeOH		0901		X										-07
8	B18-D-(MIC-VOC)	X			X								MeOH		0904		X										-08
9	B18-E-(MIC-VOC)	X			X								MeOH		0906		X										-09
10	B19-A-(MIC-VOC)	X			X								MeOH		0916		X										-10

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.17.10 / 1130	Hand	[signature]	TestAmerica	6/17/10 / 1146	[illegible]
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY	
LAB JOB NO.	HTF0038
LOCATION	
CONTAINERS	

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 10

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Date	Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon	Laboratory ID no.
1	B19-B-(MIC-VOC)	X			X								MeOH	6.17.10	0919	1	X					HTF0038-11
2	B19-C-(MIC-VOC)	X			X								MeOH		0920		X					-12
3	B19-D-(MIC-VOC)	X			X								MeOH		0926		X					-13
4	B19-E-(MIC-VOC)	X			X								MeOH		0928		X					-14
5	Field Blank B19	X			X								MeOH		0929		X					-15
6	B20-A-(MIC-VOC)	X			X								MeOH		0941		X					-16
7	B20-B-(MIC-VOC)	X			X								MeOH		0946		X					-17
8	B20-C-(MIC-VOC)	X			X								MeOH		0948		X					-18
9	B20-D-(MIC-VOC)	X			X								MeOH		0951		X					-19
10	B20-E-(MIC-VOC)	X			X								MeOH		0953		X					-20

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.17.10 / 1130	Hand	[signature] Sim...	TestAmerica	6/17/10 / 1146	Rube wet 4°
	/				6/17/10 /	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY	
LAB JOB NO.	HTF0088
LOCATION	
CONTAINERS	

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com	**Project identification**
Company name: Tetra Tech EMI	Job name: Hickam AFB CG110 ISM VOC Study
Address: 737 Bishop Street, Suite 3010	Job number: 103DS148843.H0301
City: Honolulu State: HI ZIP: 96813	
Phone: 808.441.6645 Fax	Contact email address: scott.duzan@tetratech.com
Sampler: SD # samples in shipment 9	

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon	Laboratory ID no.
1	B17-A-(MIC-VOC)	X			X								MeOH	6.17.10	1005	1	X					HTF0088-21
2	B17-B-(MIC-VOC)	X			X								MeOH		1009		X					-22
3	B17-C-(MIC-VOC)	X			X								MeOH		1010		X					-23
4	B17-D-(MIC-VOC)	X			X								MeOH		1014		X					-24
5	B17-E-(MIC-VOC)	X			X								MeOH		1016		X					-25
6	Layer E-FMIS-VOC6	X			X								MeOH		1015		X					-26
7	Layer E-FMIS-VOC12	X			X								MeOH		1015		X					-27
8	Layer F-FMIS-VOC6	X			X								MeOH	6-16-10	1617		X					-28
9	Layer F-FMIS-VOC12	X			X								MeOH	6-16-10	1617		X					-29
10	~~SD~~	X			X								MeOH									

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6.17.10 / 1130	Hand	[signature]	TestAmerica	6/17/10 / 1146	[illegible] Wet 4°2
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
- ☒ Dispose by lab
- ☐ Return to client
- ☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1a

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY
LAB JOB NO. HTF0030
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon						Laboratory ID no.
1	~~B37A-(~~ AD B37-A-(MIC-VOC)	X			X								MeOH	6.17.10	1020	1	X										HTF0030-30
2	B38-A-(MIC-VOC)	X			X								MeOH	↓	1030	↓	X										-31
3	Trip Blank	X			X								MeOH	↓	1035	↓	X					AD					-32
4	AD	X			X								MeOH														
5		X			X								MeOH														
6		X			X								MeOH														
7		X			X								MeOH														
8		X			X								MeOH														
9		X			X								MeOH														
10		X			X								MeOH														

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6-17-10 / 1130	Hand	[signature]	TestAmerica	6/17/10 / 1146	Bulk Wet 4°C
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Client Name: Tetra Tech **Date/ Time Received:** 6/17/16 1146

Checklist Completed By: JL **Received By:** JL

Matrices: Soil **Carrier:** Client **Airbill# :**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Chain of Custody present?	Yes ☑	No ☐	☐
Chain of Custody Signed when relinquished and received?	Yes ☑	No ☐	
Chain of Custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sample containers on ice?	Yes ☑	No ☐	Type: Wet
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Water - VOA Vials have Zero Headspace?	Yes ☐	No ☐	No VOA vials present: ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Checked: ☑
pH Adjusted?	Yes ☐	No ☑	Final pH:
Encores / 5035 Vials Present?	Yes ☐	No ☑	
Sample Filtration Needed?	Yes ☐	No ☑	Filtered in Field: ☐
Dry Weight Corrected Results?	Yes ☐	No ☐	Take Action: ☑
DODQSM / QAPP Project?	Yes ☐	No ☐	Type:

Temperature Blank Present? Yes ☑ ~~No ☑~~ 6/17/16

Sample Container/Blank Temperature Range (Minimum 3 sample containers if available): 4 °C

Comments/ Sampling Handling Notes:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

July 06, 2010

LABORATORY REPORT

Client:			
Tetra Tech EM Inc.		Work Order:	HTF0154
737 Bishop st., Suite 3010		Project Name:	Subsurface Soil Investigation (MIS-VOCs)
Honolulu, HI 96813		Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H
Attn:	Scott Duzan	Date Received:	06/28/10

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica.

TestAmerica Analytical Testing Corporation certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.

This entire report was reviewed and approved for release.

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 1-(808)486-5227

Samples were received into laboratory at a temperature of 5 °C.

NELAC states that samples which require thermal preservation shall be considered acceptable if the arrival temperature is within 2 degrees C of the required temperature or the method specified range. For samples with a temperature requirement of 4 degrees C, an arrival temperature from 0 degrees C to 6 degrees C meets specifications. Samples that are delivered to the laboratory on the same day that they are collected may not meet these criteria. In these cases, the samples are considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The reported results were obtained in compliance with the 2003 NELAC standards unless otherwise noted.

Approved By:

Marvin D. Heskett III
Laboratory Director

NELAC Certification # E87907

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0154	Received:	06/28/10
737 Bishop st., Suite 3010		Reported:	07/06/10 16:14
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

Sample Summary

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
Layer E lab composite B1-B20 Rep1	HTF0154-01	Solid/Soil	06/15/10	06/28/10 16:26	
Layer E lab composite B1-B20 Rep2	HTF0154-02	Solid/Soil	06/15/10	06/28/10 16:26	
Layer E lab composite B1-B20 Rep3	HTF0154-03	Solid/Soil	06/15/10	06/28/10 16:26	
Layer F lab composite B1-B16 Rep1	HTF0154-04	Solid/Soil	06/15/10	06/28/10 16:26	
Layer F lab composite B1-B16 Rep2	HTF0154-05	Solid/Soil	06/15/10	06/28/10 16:26	
Layer F lab composite B1-B16 Rep3	HTF0154-06	Solid/Soil	06/15/10	06/28/10 16:26	
Layer G lab composite B1-B12 Rep1	HTF0154-07	Solid/Soil	06/15/10	06/28/10 16:26	
Layer G lab composite B1-B12 Rep2	HTF0154-08	Solid/Soil	06/15/10	06/28/10 16:26	
Layer G lab composite B1-B12 Rep3	HTF0154-09	Solid/Soil	06/15/10	06/28/10 16:26	

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0154 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/28/10 Reported: 07/06/10 16:14	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0154-01 (Layer E lab composite B1-B20 Rep1 - Solid/Soil)					**Sampled: 06/15/10**			**Recvd: 06/28/10 16:26**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**97.2**		ug/kg	4.85	9.71	50	06/29/10 11:16	06/29/10	10F0184	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.85	9.71	"	"	"	"	"
Trichloroethene	**215**		"	4.85	9.71	"	"	"	"	"
Vinyl chloride	ND		"	6.60	19.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0154-02 (Layer E lab composite B1-B20 Rep2 - Solid/Soil)					**Sampled: 06/15/10**			**Recvd: 06/28/10 16:26**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**95.3**		ug/kg	4.85	9.71	50	06/29/10 11:41	06/29/10	10F0184	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.85	9.71	"	"	"	"	"
Trichloroethene	**209**		"	4.85	9.71	"	"	"	"	"
Vinyl chloride	ND		"	6.60	19.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*98 %*						"	"	"	"
Sample ID: HTF0154-03 (Layer E lab composite B1-B20 Rep3 - Solid/Soil)					**Sampled: 06/15/10**			**Recvd: 06/28/10 16:26**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**96.6**		ug/kg	4.85	9.71	50	06/29/10 12:06	06/29/10	10F0184	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.85	9.71	"	"	"	"	"
Trichloroethene	**210**		"	4.85	9.71	"	"	"	"	"
Vinyl chloride	ND		"	6.60	19.4	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*102 %*						"	"	"	"
Sample ID: HTF0154-04 (Layer F lab composite B1-B16 Rep1 - Solid/Soil)					**Sampled: 06/15/10**			**Recvd: 06/28/10 16:26**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**130**		ug/kg	4.81	9.62	50	06/29/10 12:32	06/29/10	10F0184	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.81	9.62	"	"	"	"	"
Trichloroethene	**236**		"	4.81	9.62	"	"	"	"	"
Vinyl chloride	ND		"	6.54	19.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*105 %*						"	"	"	"
Sample ID: HTF0154-05 (Layer F lab composite B1-B16 Rep2 - Solid/Soil)					**Sampled: 06/15/10**			**Recvd: 06/28/10 16:26**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**122**		ug/kg	4.81	9.62	50	06/29/10 12:57	06/29/10	10F0184	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.81	9.62	"	"	"	"	"
Trichloroethene	**221**		"	4.81	9.62	"	"	"	"	"
Vinyl chloride	ND		"	6.54	19.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0154-06 (Layer F lab composite B1-B16 Rep3 - Solid/Soil)					**Sampled: 06/15/10**			**Recvd: 06/28/10 16:26**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**125**		ug/kg	4.81	9.62	50	06/29/10 13:22	06/29/10	10F0184	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.81	9.62	"	"	"	"	"
Trichloroethene	**227**		"	4.81	9.62	"	"	"	"	"
Vinyl chloride	ND		"	6.54	19.2	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*103 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0154	Received:	06/28/10
737 Bishop st., Suite 3010		Reported:	07/06/10 16:14
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0154-06 (Layer F lab composite B1-B16 Rep3 - Solid/Soil) - cont.					**Sampled: 06/15/10**			**Recvd: 06/28/10 16:26**		
Sample ID: HTF0154-07 (Layer G lab composite B1-B12 Rep1 - Solid/Soil)					**Sampled: 06/15/10**			**Recvd: 06/28/10 16:26**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**249**		ug/kg	4.43	8.86	50	06/29/10 13:47	06/29/10	10F0184	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.43	8.86	"	"	"	"	"
Trichloroethene	**127**		"	4.43	8.86	"	"	"	"	"
Vinyl chloride	**7.04**	J	"	6.03	17.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"
Sample ID: HTF0154-08 (Layer G lab composite B1-B12 Rep2 - Solid/Soil)					**Sampled: 06/15/10**			**Recvd: 06/28/10 16:26**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**243**		ug/kg	4.43	8.86	50	06/29/10 14:12	06/29/10	10F0184	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.43	8.86	"	"	"	"	"
Trichloroethene	**125**		"	4.43	8.86	"	"	"	"	"
Vinyl chloride	**6.89**	J	"	6.03	17.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*99 %*						"	"	"	"
Sample ID: HTF0154-09 (Layer G lab composite B1-B12 Rep3 - Solid/Soil)					**Sampled: 06/15/10**			**Recvd: 06/28/10 16:26**		
Volatile Organic Compounds by EPA 8260										
cis-1,2-Dichloroethene	**257**		ug/kg	4.43	8.86	50	06/29/10 14:38	06/29/10	10F0184	EPA 8260
trans-1,2-Dichloroethene	ND		"	4.43	8.86	"	"	"	"	"
Trichloroethene	**131**		"	4.43	8.86	"	"	"	"	"
Vinyl chloride	**10.0**	J	"	6.03	17.7	"	"	"	"	"
Surr: 1,2-Dichloroethane-d4 (80-120%)	*104 %*						"	"	"	"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0154	Received:	06/28/10
		Reported:	07/06/10 16:14
	Project: Subsurface Soil Investigation (MIS-VOCs)		
	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY BLANK QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0184 Extracted: 06/29/10													
Blank Analyzed: 06/29/2010 (10F0184-BLK1)													
cis-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
trans-1,2-Dichloroethene			ug/kg	0.100	0.200	ND							
Trichloroethene			ug/kg	0.100	0.200	ND							
Vinyl chloride			ug/kg	0.136	0.400	ND							
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*95*		*80-120*			

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0154	Received:	06/28/10
737 Bishop st., Suite 3010		Reported:	07/06/10 16:14
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LCS/LCS DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
Volatile Organic Compounds by EPA 8260													
Batch\Seq: 10F0184 Extracted: 06/29/10													
LCS Analyzed: 06/29/2010 (10F0184-BS1)													
cis-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	3.99		100		80-120			
trans-1,2-Dichloroethene		4.00	ug/kg	0.100	0.200	4.62		115		80-120			
Trichloroethene		4.00	ug/kg	0.100	0.200	4.17		104		80-120			
Vinyl chloride		4.00	ug/kg	0.136	0.400	3.73		93		80-120			
Surrogate: 1,2-Dichloroethane-d4			ug/kg					*110*		*80-120*			

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0154	Received:	06/28/10
737 Bishop st., Suite 3010		Reported:	07/06/10 16:14
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

CERTIFICATION SUMMARY

TestAmerica Honolulu

Method	Matrix	Nelac	Hawaii
EPA 8260	Solid/Soil	X	

For information concerning certifications of this facility or another TestAmerica facility, please visit our website at www.TestAmericaInc.com

DATA QUALIFIERS AND DEFINITIONS

J Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

ND Not detected at the reporting limit (or method detection limit if shown)

ADDITIONAL COMMENTS

Particle Size Results

CASE NARRATIVE

Client: TestAmerica Laboratories, Inc

Project: Dual System

Report Number: 200-663-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 07/01/2010; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.6 C.

D422 GRAIN SIZE
Samples LAYERG(FMIS70CGS) (200-663-1), LAYER F (FMIS-70CGS) (200-663-2), LAYERA(FMIS70CGS) (200-663-3), LAYER B (FMIS-70CGS) (200-663-4), LAYER C (FMIS-70CGS) (200-663-5), LAYER D (FMIS-70CGS) (200-663-6) and LAYER E (FMIS-70CGS) (200-663-7) were analyzed for D422 grain size in accordance with D422 grain size. The samples were analyzed on 07/08/2010 and 07/09/2010.

No difficulties were encountered during the D422 grain size analyses.

All quality control parameters were within the acceptance limits.

SAMPLE SUMMARY

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
200-663-1	LAYERG(FMIS70CGS)	Solid	06/16/2010 1345	07/01/2010 1020
200-663-2	LAYER F (FMIS-70CGS)	Solid	06/16/2010 1617	07/01/2010 1020
200-663-3	LAYERA(FMIS70CGS)	Solid	06/17/2010 1005	07/01/2010 1020
200-663-4	LAYER B (FMIS-70CGS)	Solid	06/17/2010 1009	07/01/2010 1020
200-663-5	LAYER C (FMIS-70CGS)	Solid	06/17/2010 1010	07/01/2010 1020
200-663-6	LAYER D (FMIS-70CGS)	Solid	06/17/2010 1014	07/01/2010 1020
200-663-7	LAYER E (FMIS-70CGS)	Solid	06/17/2010 1016	07/01/2010 1020

METHOD SUMMARY

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Grain Size	TAL BUR	ASTM D422	

Lab References:

TAL BUR = TestAmerica Burlington

Method References:

ASTM = ASTM International

METHOD / ANALYST SUMMARY

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Method	Analyst	Analyst ID
ASTM D422	Peterson, David J	DJP

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYERG(FMIS70CGS)**

Lab Sample ID: 200-663-1
Client Matrix: Solid

Date Sampled: 06/16/2010 1345
Date Received: 07/01/2010 1020

D422 Grain Size

Method:	D422	Analysis Batch: 200-4218	Instrument ID:	D422_import
Preparation:	N/A		Lab File ID:	200-663-A-1.txt
Dilution:	1.0		Initial Weight/Volume:	
Date Analyzed:	07/08/2010 2354		Final Weight/Volume:	
Date Prepared:				

Analyte	DryWt Corrected: N	Result (% Passing)	Qualifier	NONE	NONE
Sieve Size 3 inch - Percent Finer		100.0			
Sieve Size 2 inch - Percent Finer		100.0			
Sieve Size 1.5 inch - Percent Finer		100.0			
Sieve Size 1 inch - Percent Finer		100.0			
Sieve Size 0.75 inch - Percent Finer		100.0			
Sieve Size 0.375 inch - Percent Finer		64.5			
Sieve Size #4 - Percent Finer		56.3			
Sieve Size #10 - Percent Finer		51.9			
Sieve Size #20 - Percent Finer		45.6			
Sieve Size #40 - Percent Finer		41.2			
Sieve Size #60 - Percent Finer		38.0			
Sieve Size #80 - Percent Finer		34.2			
Sieve Size #100 - Percent Finer		32.8			
Sieve Size #200 - Percent Finer		24.7			
Hydrometer Reading 1 - Percent Finer		17.9			
Hydrometer Reading 2 - Percent Finer		15.2			
Hydrometer Reading 3 - Percent Finer		13.8			
Hydrometer Reading 4 - Percent Finer		11.1			
Hydrometer Reading 5 - Percent Finer		9.8			
Hydrometer Reading 6 - Percent Finer		8.4			
Hydrometer Reading 7 - Percent Finer		4.3			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYERG(FMIS70CGS)**

Lab Sample ID: 200-663-1
Client Matrix: Solid

Date Sampled: 06/16/2010 1345
Date Received: 07/01/2010 1020

D422 Grain Size

Method: D422
Preparation: N/A
Dilution: 1.0
Date Analyzed: 07/08/2010 2354
Date Prepared:

Analysis Batch: 200-4218

Instrument ID: D422_import
Lab File ID: 200-663-A-1.txt
Initial Weight/Volume:
Final Weight/Volume:

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE	NONE
Gravel		43.7			
Sand		31.6			
Coarse Sand		4.4			
Medium Sand		10.7			
Fine Sand		16.5			
Silt		15.0			
Clay		9.8			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYER F (FMIS-70CGS)**

Lab Sample ID:	200-663-2	Date Sampled:	06/16/2010 1617
Client Matrix:	Solid	Date Received:	07/01/2010 1020

D422 Grain Size

Method:	D422	Analysis Batch: 200-4218	Instrument ID:	D422_import
Preparation:	N/A		Lab File ID:	200-663-A-2.txt
Dilution:	1.0		Initial Weight/Volume:	
Date Analyzed:	07/08/2010 2356		Final Weight/Volume:	
Date Prepared:				

Analyte	DryWt Corrected: N	Result (% Passing)	Qualifier	NONE	NONE
Sieve Size 3 inch - Percent Finer		100.0			
Sieve Size 2 inch - Percent Finer		100.0			
Sieve Size 1.5 inch - Percent Finer		100.0			
Sieve Size 1 inch - Percent Finer		100.0			
Sieve Size 0.75 inch - Percent Finer		70.1			
Sieve Size 0.375 inch - Percent Finer		63.1			
Sieve Size #4 - Percent Finer		53.3			
Sieve Size #10 - Percent Finer		47.7			
Sieve Size #20 - Percent Finer		44.9			
Sieve Size #40 - Percent Finer		43.2			
Sieve Size #60 - Percent Finer		42.1			
Sieve Size #80 - Percent Finer		40.4			
Sieve Size #100 - Percent Finer		39.7			
Sieve Size #200 - Percent Finer		34.5			
Hydrometer Reading 1 - Percent Finer		26.5			
Hydrometer Reading 2 - Percent Finer		22.7			
Hydrometer Reading 3 - Percent Finer		19.0			
Hydrometer Reading 4 - Percent Finer		17.0			
Hydrometer Reading 5 - Percent Finer		15.1			
Hydrometer Reading 6 - Percent Finer		11.4			
Hydrometer Reading 7 - Percent Finer		6.7			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYER F (FMIS-70CGS)**

Lab Sample ID: 200-663-2
Client Matrix: Solid

Date Sampled: 06/16/2010 1617
Date Received: 07/01/2010 1020

D422 Grain Size

Method:	D422	Analysis Batch: 200-4218	Instrument ID:	D422_import
Preparation:	N/A		Lab File ID:	200-663-A-2.txt
Dilution:	1.0		Initial Weight/Volume:	
Date Analyzed:	07/08/2010 2356		Final Weight/Volume:	
Date Prepared:				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE	NONE
Gravel		46.7			
Sand		18.8			
Coarse Sand		5.6			
Medium Sand		4.5			
Fine Sand		8.7			
Silt		19.4			
Clay		15.1			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYERA(FMIS70CGS)**

Lab Sample ID: 200-663-3
Client Matrix: Solid

Date Sampled: 06/17/2010 1005
Date Received: 07/01/2010 1020

D422 Grain Size

Method:	D422	Analysis Batch: 200-4218		Instrument ID:	D422_import
Preparation:	N/A			Lab File ID:	200-663-A-3.txt
Dilution:	1.0			Initial Weight/Volume:	
Date Analyzed:	07/08/2010 2358			Final Weight/Volume:	
Date Prepared:					

Analyte	DryWt Corrected: N	Result (% Passing)	Qualifier	NONE	NONE
Sieve Size 3 inch - Percent Finer		100.0			
Sieve Size 2 inch - Percent Finer		100.0			
Sieve Size 1.5 inch - Percent Finer		100.0			
Sieve Size 1 inch - Percent Finer		100.0			
Sieve Size 0.75 inch - Percent Finer		82.6			
Sieve Size 0.375 inch - Percent Finer		62.1			
Sieve Size #4 - Percent Finer		49.5			
Sieve Size #10 - Percent Finer		40.3			
Sieve Size #20 - Percent Finer		35.3			
Sieve Size #40 - Percent Finer		32.6			
Sieve Size #60 - Percent Finer		31.0			
Sieve Size #80 - Percent Finer		28.9			
Sieve Size #100 - Percent Finer		28.2			
Sieve Size #200 - Percent Finer		24.5			
Hydrometer Reading 1 - Percent Finer		14.8			
Hydrometer Reading 2 - Percent Finer		13.4			
Hydrometer Reading 3 - Percent Finer		11.9			
Hydrometer Reading 4 - Percent Finer		10.5			
Hydrometer Reading 5 - Percent Finer		9.0			
Hydrometer Reading 6 - Percent Finer		7.4			
Hydrometer Reading 7 - Percent Finer		4.5			

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYERA(FMIS70CGS)**

Lab Sample ID:	200-663-3	Date Sampled:	06/17/2010 1005
Client Matrix:	Solid	Date Received:	07/01/2010 1020

D422 Grain Size

Method:	D422	Analysis Batch: 200-4218	Instrument ID:	D422_import
Preparation:	N/A		Lab File ID:	200-663-A-3.txt
Dilution:	1.0		Initial Weight/Volume:	
Date Analyzed:	07/08/2010 2358		Final Weight/Volume:	
Date Prepared:				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE	NONE
Gravel		50.5			
Sand		25.0			
Coarse Sand		9.2			
Medium Sand		7.7			
Fine Sand		8.1			
Silt		15.5			
Clay		9.0			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYER B (FMIS-70CGS)**

Lab Sample ID: 200-663-4
Client Matrix: Solid

Date Sampled: 06/17/2010 1009
Date Received: 07/01/2010 1020

D422 Grain Size

Method:	D422	Analysis Batch: 200-4218	Instrument ID:	D422_import
Preparation:	N/A		Lab File ID:	200-663-A-4.txt
Dilution:	1.0		Initial Weight/Volume:	
Date Analyzed:	07/09/2010 0000		Final Weight/Volume:	
Date Prepared:				

Analyte	DryWt Corrected: N	Result (% Passing)	Qualifier	NONE	NONE
Sieve Size 3 inch - Percent Finer		100.0			
Sieve Size 2 inch - Percent Finer		100.0			
Sieve Size 1.5 inch - Percent Finer		100.0			
Sieve Size 1 inch - Percent Finer		100.0			
Sieve Size 0.75 inch - Percent Finer		89.5			
Sieve Size 0.375 inch - Percent Finer		70.9			
Sieve Size #4 - Percent Finer		53.9			
Sieve Size #10 - Percent Finer		44.2			
Sieve Size #20 - Percent Finer		38.9			
Sieve Size #40 - Percent Finer		36.3			
Sieve Size #60 - Percent Finer		34.9			
Sieve Size #80 - Percent Finer		33.1			
Sieve Size #100 - Percent Finer		32.5			
Sieve Size #200 - Percent Finer		29.0			
Hydrometer Reading 1 - Percent Finer		18.8			
Hydrometer Reading 2 - Percent Finer		16.5			
Hydrometer Reading 3 - Percent Finer		14.2			
Hydrometer Reading 4 - Percent Finer		14.2			
Hydrometer Reading 5 - Percent Finer		11.9			
Hydrometer Reading 6 - Percent Finer		9.4			
Hydrometer Reading 7 - Percent Finer		4.8			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYER B (FMIS-70CGS)**

Lab Sample ID: 200-663-4
Client Matrix: Solid

Date Sampled: 06/17/2010 1009
Date Received: 07/01/2010 1020

D422 Grain Size

Method: D422
Preparation: N/A
Dilution: 1.0
Date Analyzed: 07/09/2010 0000
Date Prepared:

Analysis Batch: 200-4218

Instrument ID: D422_import
Lab File ID: 200-663-A-4.txt
Initial Weight/Volume:
Final Weight/Volume:

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE	NONE
Gravel		46.1			
Sand		24.9			
Coarse Sand		9.7			
Medium Sand		7.9			
Fine Sand		7.3			
Silt		17.1			
Clay		11.9			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYER C (FMIS-70CGS)**

Lab Sample ID:	200-663-5	Date Sampled:	06/17/2010 1010
Client Matrix:	Solid	Date Received:	07/01/2010 1020

D422 Grain Size

Method:	D422	Analysis Batch: 200-4218	Instrument ID:	D422_import
Preparation:	N/A		Lab File ID:	200-663-A-5.txt
Dilution:	1.0		Initial Weight/Volume:	
Date Analyzed:	07/09/2010 0002		Final Weight/Volume:	
Date Prepared:				

Analyte	DryWt Corrected: N	Result (% Passing)	Qualifier	NONE	NONE
Sieve Size 3 inch - Percent Finer		100.0			
Sieve Size 2 inch - Percent Finer		100.0			
Sieve Size 1.5 inch - Percent Finer		100.0			
Sieve Size 1 inch - Percent Finer		100.0			
Sieve Size 0.75 inch - Percent Finer		100.0			
Sieve Size 0.375 inch - Percent Finer		64.9			
Sieve Size #4 - Percent Finer		54.8			
Sieve Size #10 - Percent Finer		47.6			
Sieve Size #20 - Percent Finer		43.0			
Sieve Size #40 - Percent Finer		40.4			
Sieve Size #60 - Percent Finer		38.9			
Sieve Size #80 - Percent Finer		37.0			
Sieve Size #100 - Percent Finer		36.4			
Sieve Size #200 - Percent Finer		32.7			
Hydrometer Reading 1 - Percent Finer		22.9			
Hydrometer Reading 2 - Percent Finer		21.4			
Hydrometer Reading 3 - Percent Finer		17.1			
Hydrometer Reading 4 - Percent Finer		15.7			
Hydrometer Reading 5 - Percent Finer		14.3			
Hydrometer Reading 6 - Percent Finer		10			
Hydrometer Reading 7 - Percent Finer		5.8			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYER C (FMIS-70CGS)**

Lab Sample ID: 200-663-5
Client Matrix: Solid

Date Sampled: 06/17/2010 1010
Date Received: 07/01/2010 1020

D422 Grain Size

Method: D422
Preparation: N/A
Dilution: 1.0
Date Analyzed: 07/09/2010 0002
Date Prepared:

Analysis Batch: 200-4218

Instrument ID: D422_import
Lab File ID: 200-663-A-5.txt
Initial Weight/Volume:
Final Weight/Volume:

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE	NONE
Gravel		45.2			
Sand		22.1			
Coarse Sand		7.2			
Medium Sand		7.2			
Fine Sand		7.7			
Silt		18.4			
Clay		14.3			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYER D (FMIS-70CGS)**

Lab Sample ID: 200-663-6
Client Matrix: Solid

Date Sampled: 06/17/2010 1014
Date Received: 07/01/2010 1020

D422 Grain Size

Method:	D422	Analysis Batch: 200-4218	Instrument ID:	D422_import
Preparation:	N/A		Lab File ID:	200-663-A-6.txt
Dilution:	1.0		Initial Weight/Volume:	
Date Analyzed:	07/09/2010 0005		Final Weight/Volume:	
Date Prepared:				

Analyte	DryWt Corrected: N	Result (% Passing)	Qualifier	NONE	NONE
Sieve Size 3 inch - Percent Finer		100.0			
Sieve Size 2 inch - Percent Finer		100.0			
Sieve Size 1.5 inch - Percent Finer		100.0			
Sieve Size 1 inch - Percent Finer		100.0			
Sieve Size 0.75 inch - Percent Finer		88.8			
Sieve Size 0.375 inch - Percent Finer		68.3			
Sieve Size #4 - Percent Finer		56.3			
Sieve Size #10 - Percent Finer		46.9			
Sieve Size #20 - Percent Finer		42.5			
Sieve Size #40 - Percent Finer		40.3			
Sieve Size #60 - Percent Finer		39.0			
Sieve Size #80 - Percent Finer		37.2			
Sieve Size #100 - Percent Finer		36.6			
Sieve Size #200 - Percent Finer		33.0			
Hydrometer Reading 1 - Percent Finer		25.6			
Hydrometer Reading 2 - Percent Finer		23.2			
Hydrometer Reading 3 - Percent Finer		20.1			
Hydrometer Reading 4 - Percent Finer		18.5			
Hydrometer Reading 5 - Percent Finer		16.8			
Hydrometer Reading 6 - Percent Finer		12.9			
Hydrometer Reading 7 - Percent Finer		6.4			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYER D (FMIS-70CGS)**

Lab Sample ID: 200-663-6
Client Matrix: Solid

Date Sampled: 06/17/2010 1014
Date Received: 07/01/2010 1020

D422 Grain Size

Method: D422
Preparation: N/A
Dilution: 1.0
Date Analyzed: 07/09/2010 0005
Date Prepared:

Analysis Batch: 200-4218

Instrument ID: D422_import
Lab File ID: 200-663-A-6.txt
Initial Weight/Volume:
Final Weight/Volume:

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE	NONE
Gravel		43.7			
Sand		23.3			
Coarse Sand		9.4			
Medium Sand		6.6			
Fine Sand		7.3			
Silt		16.2			
Clay		16.8			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYER E (FMIS-70CGS)**

Lab Sample ID: 200-663-7
Client Matrix: Solid

Date Sampled: 06/17/2010 1016
Date Received: 07/01/2010 1020

D422 Grain Size

Method:	D422	Analysis Batch: 200-4218	Instrument ID:	D422_import
Preparation:	N/A		Lab File ID:	200-663-A-7.txt
Dilution:	1.0		Initial Weight/Volume:	
Date Analyzed:	07/09/2010 0006		Final Weight/Volume:	
Date Prepared:				

Analyte	DryWt Corrected: N	Result (% Passing)	Qualifier	NONE	NONE
Sieve Size 3 inch - Percent Finer		100.0			
Sieve Size 2 inch - Percent Finer		100.0			
Sieve Size 1.5 inch - Percent Finer		100.0			
Sieve Size 1 inch - Percent Finer		100.0			
Sieve Size 0.75 inch - Percent Finer		82.3			
Sieve Size 0.375 inch - Percent Finer		65.2			
Sieve Size #4 - Percent Finer		58.9			
Sieve Size #10 - Percent Finer		52.2			
Sieve Size #20 - Percent Finer		48.7			
Sieve Size #40 - Percent Finer		46.7			
Sieve Size #60 - Percent Finer		45.6			
Sieve Size #80 - Percent Finer		44.1			
Sieve Size #100 - Percent Finer		43.6			
Sieve Size #200 - Percent Finer		40.2			
Hydrometer Reading 1 - Percent Finer		31.2			
Hydrometer Reading 2 - Percent Finer		28.3			
Hydrometer Reading 3 - Percent Finer		23.5			
Hydrometer Reading 4 - Percent Finer		21.5			
Hydrometer Reading 5 - Percent Finer		20.4			
Hydrometer Reading 6 - Percent Finer		15.6			
Hydrometer Reading 7 - Percent Finer		8.8			

Analytical Data

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

Client Sample ID: **LAYER E (FMIS-70CGS)**

Lab Sample ID:	200-663-7	Date Sampled:	06/17/2010 1016
Client Matrix:	Solid	Date Received:	07/01/2010 1020

D422 Grain Size

Method:	D422	Analysis Batch: 200-4218	Instrument ID:	D422_import
Preparation:	N/A		Lab File ID:	200-663-A-7.txt
Dilution:	1.0		Initial Weight/Volume:	
Date Analyzed:	07/09/2010 0006		Final Weight/Volume:	
Date Prepared:				

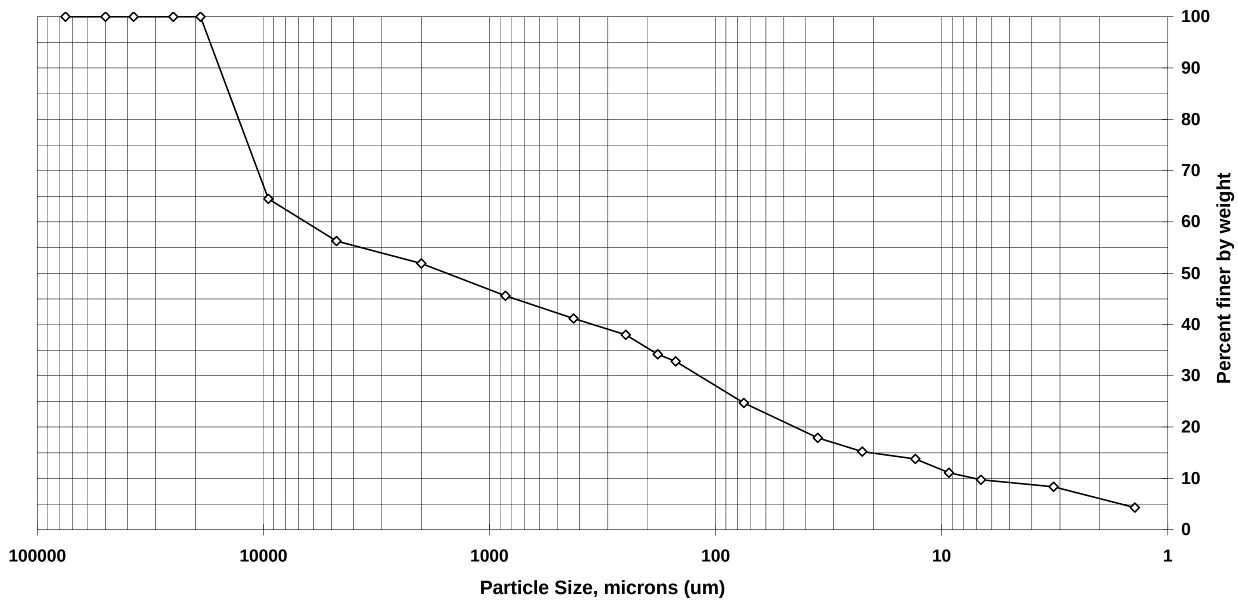
Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE	NONE
Gravel		41.1			
Sand		18.7			
Coarse Sand		6.7			
Medium Sand		5.5			
Fine Sand		6.5			
Silt		19.8			
Clay		20.4			

Particle Size of Soils by ASTM D422

				Date Received:	7/1/2010
Sample ID:	LAYERG(FMIS70CGS)	**Percent Solids:**	71.5%	**Start Date:**	7/8/2010
Lab ID:	200-663-A-1	**Specific Gravity:**	2.650	**End Date:**	7/12/2010

Shape (> #10): subrounded

Non-soil material: plant
Hardness (> #10): soft



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	64.5	35.5
#4	4750	56.3	8.2
#10	2000	51.9	4.4
#20	850	45.6	6.3
#40	425	41.2	4.4
#60	250	38.0	3.2
#80	180	34.2	3.8
#100	150	32.8	1.4
#200	75	24.7	8.1
Hyd1	35.3	17.9	6.8
Hyd2	22.5	15.2	2.7
Hyd3	13.1	13.8	1.4
Hyd4	9.3	11.1	2.7
Hyd5	6.7	9.8	1.3
Hyd6	3.2	8.4	1.4
Hyd7	1.4	4.3	4.1

Soil Classification	Percent of sample
Gravel	43.7
Sand	31.6
Coarse Sand	4.4
Medium Sand	10.7
Fine Sand	16.5
Silt	15.0
Clay	9.8

Particle Size of Soils by ASTM D422

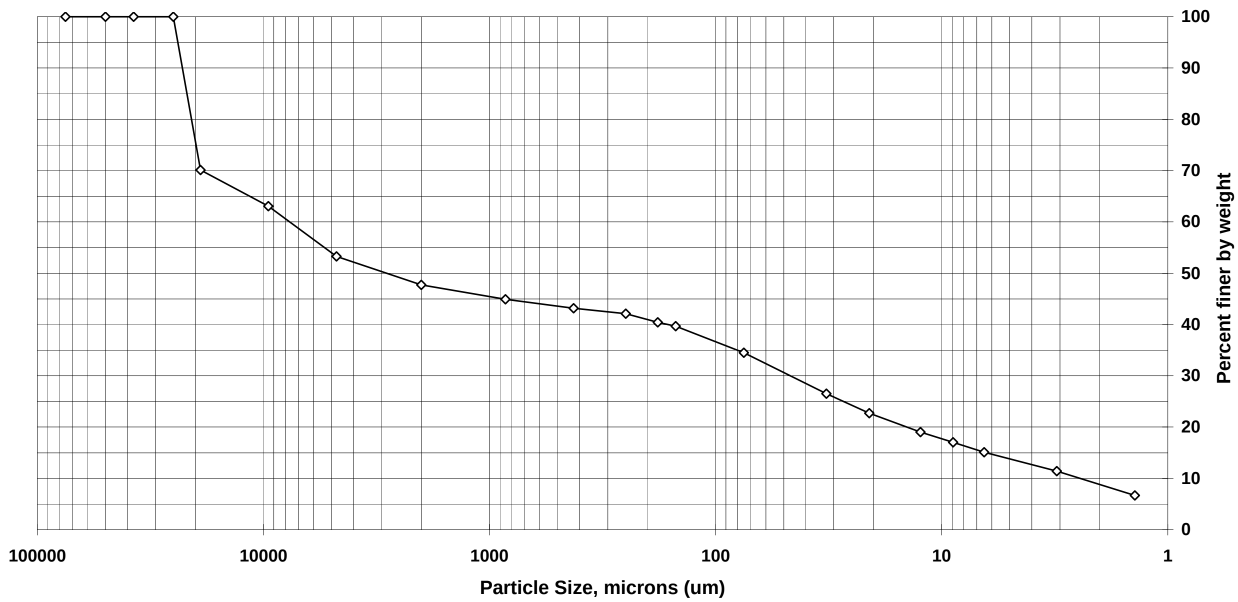
Sample ID: LAYER F (FMIS-70CGS)
Lab ID: 200-663-A-2

Percent Solids: 75.0%
Specific Gravity: 2.650

Date Received: 7/1/2010
Start Date: 7/8/2010
End Date: 7/12/2010

Shape (> #10): subrounded

Non-soil material: na
Hardness (> #10): soft



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	70.1	29.9
3/8 inch	9500	63.1	7.0
#4	4750	53.3	9.8
#10	2000	47.7	5.6
#20	850	44.9	2.8
#40	425	43.2	1.7
#60	250	42.1	1.1
#80	180	40.4	1.7
#100	150	39.7	0.7
#200	75	34.5	5.2
Hyd1	32.4	26.5	8.0
Hyd2	20.9	22.7	3.8
Hyd3	12.4	19.0	3.7
Hyd4	8.9	17.0	2.0
Hyd5	6.5	15.1	1.9
Hyd6	3.1	11.4	3.7
Hyd7	1.4	6.7	4.7

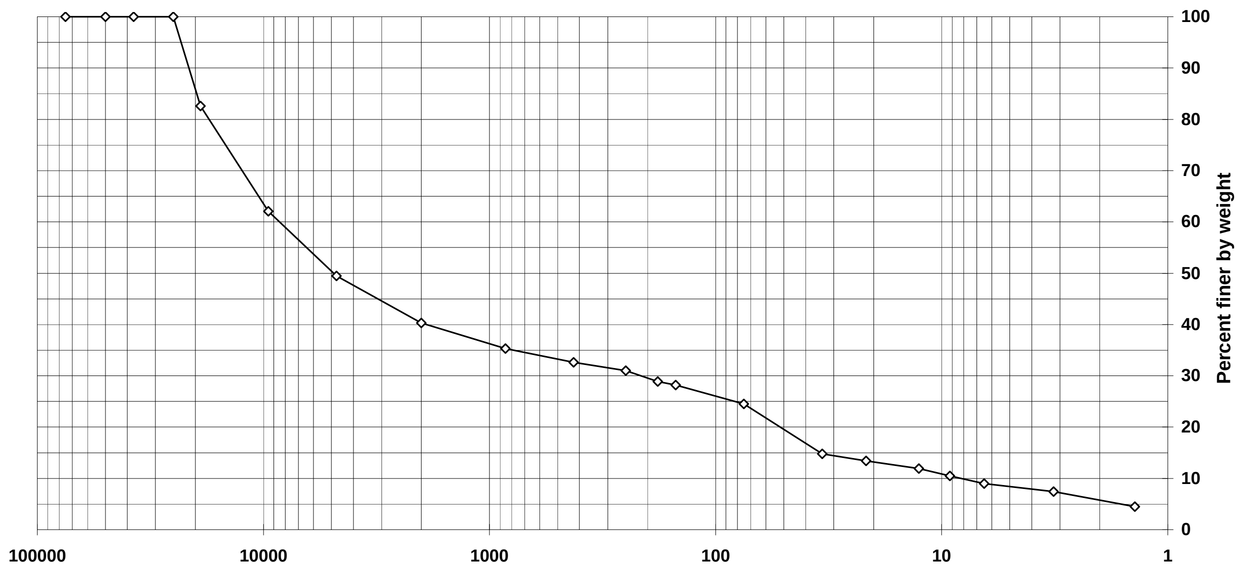
Soil Classification	Percent of sample
Gravel	46.7
Sand	18.8
Coarse Sand	5.6
Medium Sand	4.5
Fine Sand	8.7
Silt	19.4
Clay	15.1

Particle Size of Soils by ASTM D422

				Date Received:	7/1/2010
Sample ID:	LAYERA(FMIS70CGS)	**Percent Solids:**	82.7%	**Start Date:**	7/8/2010
Lab ID:	200-663-A-3	**Specific Gravity:**	2.650	**End Date:**	7/12/2010

Shape (> #10): subrounded

Non-soil material: na
Hardness (> #10): soft



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	82.6	17.4
3/8 inch	9500	62.1	20.5
#4	4750	49.5	12.6
#10	2000	40.3	9.2
#20	850	35.3	5.0
#40	425	32.6	2.7
#60	250	31.0	1.6
#80	180	28.9	2.1
#100	150	28.2	0.7
#200	75	24.5	3.7
Hyd1	33.8	14.8	9.7
Hyd2	21.6	13.4	1.4
Hyd3	12.6	11.9	1.5
Hyd4	9.2	10.5	1.4
Hyd5	6.5	9.0	1.5
Hyd6	3.2	7.4	1.6
Hyd7	1.4	4.5	2.9

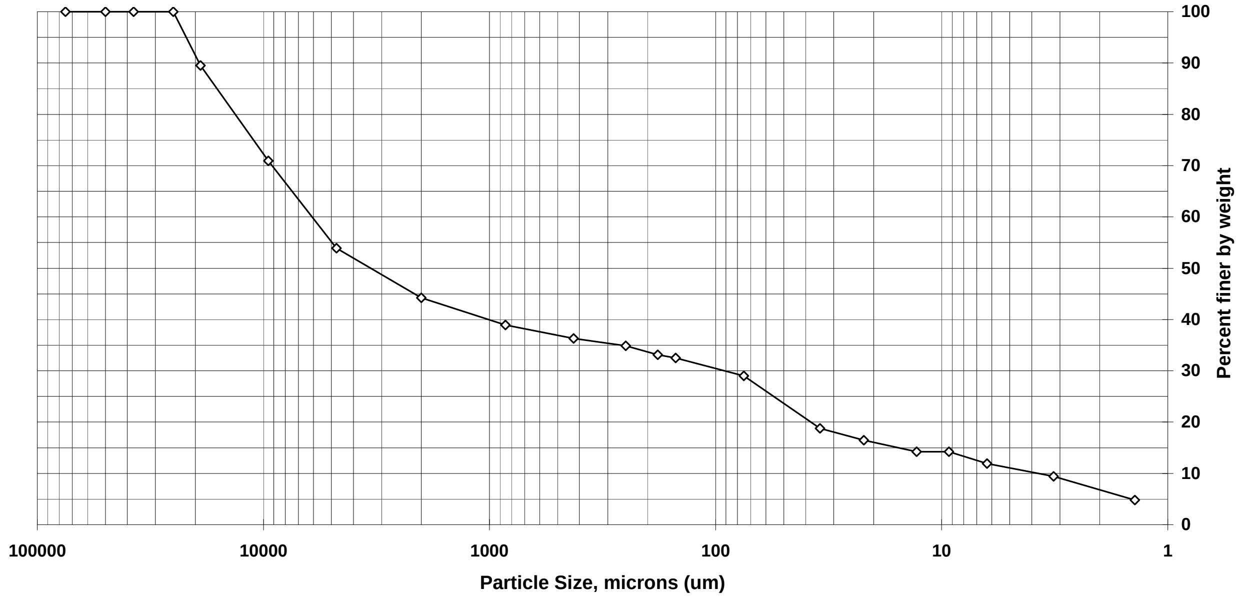
Soil Classification	Percent of sample
Gravel	50.5
Sand	25.0
Coarse Sand	9.2
Medium Sand	7.7
Fine Sand	8.1
Silt	15.5
Clay	9.0

Particle Size of Soils by ASTM D422

				Date Received:	7/1/2010
Sample ID:	LAYER B (FMIS-70CGS)	**Percent Solids:**	81.4%	**Start Date:**	7/9/2010
Lab ID:	200-663-A-4	**Specific Gravity:**	2.650	**End Date:**	7/12/2010

Shape (> #10): subrounded

Non-soil material: na
Hardness (> #10): soft



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	89.5	10.5
3/8 inch	9500	70.9	18.6
#4	4750	53.9	17.0
#10	2000	44.2	9.7
#20	850	38.9	5.3
#40	425	36.3	2.6
#60	250	34.9	1.4
#80	180	33.1	1.8
#100	150	32.5	0.6
#200	75	29.0	3.5
Hyd1	34.5	18.8	10.2
Hyd2	22.1	16.5	2.3
Hyd3	12.9	14.2	2.3
Hyd4	9.3	14.2	0.0
Hyd5	6.3	11.9	2.3
Hyd6	3.2	9.4	2.5
Hyd7	1.4	4.8	4.6

Soil Classification	Percent of sample
Gravel	46.1
Sand	24.9
Coarse Sand	9.7
Medium Sand	7.9
Fine Sand	7.3
Silt	17.1
Clay	11.9

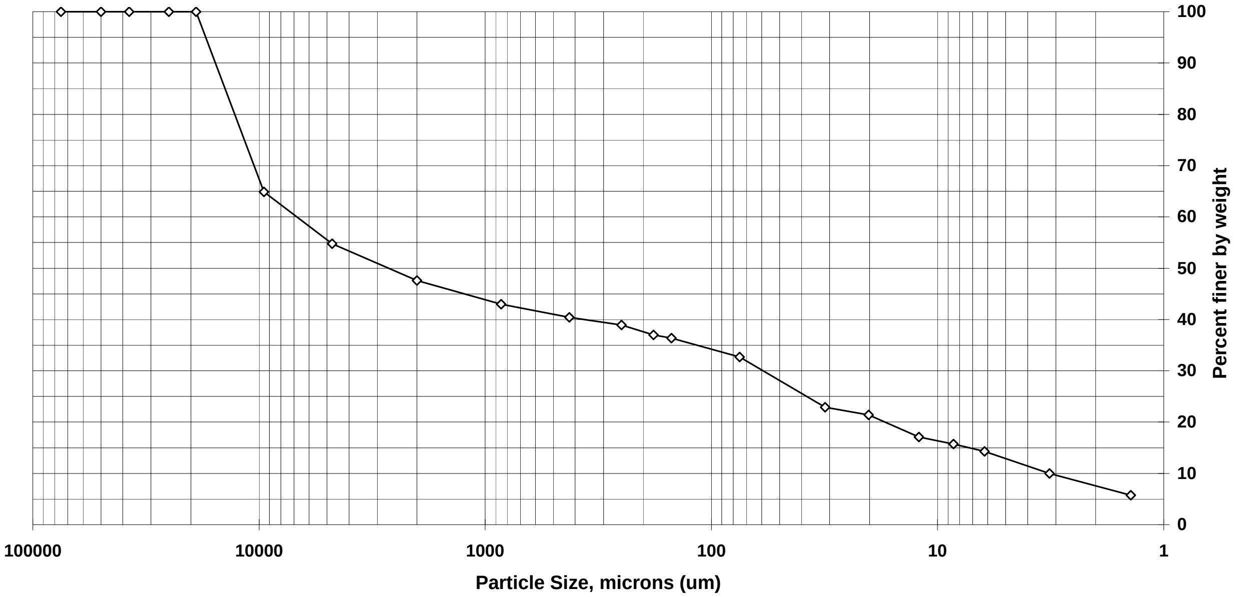
Particle Size of Soils by ASTM D422

				Date Received:	7/1/2010
Sample ID:	LAYER C (FMIS-70CGS)	**Percent Solids:**	77.3%	**Start Date:**	7/9/2010
Lab ID:	200-663-A-5	**Specific Gravity:**	2.650	**End Date:**	7/12/2010

Shape (> #10): subrounded

Non-soil material: na

Hardness (> #10): soft



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	64.9	35.1
#4	4750	54.8	10.1
#10	2000	47.6	7.2
#20	850	43.0	4.6
#40	425	40.4	2.6
#60	250	38.9	1.5
#80	180	37.0	1.9
#100	150	36.4	0.6
#200	75	32.7	3.7
Hyd1	31.4	22.9	9.8
Hyd2	20.2	21.4	1.5
Hyd3	12.1	17.1	4.3
Hyd4	8.5	15.7	1.4
Hyd5	6.2	14.3	1.4
Hyd6	3.2	10.0	4.3
Hyd7	1.4	5.8	4.2

Soil Classification	Percent of sample
Gravel	45.2
Sand	22.1
Coarse Sand	7.2
Medium Sand	7.2
Fine Sand	7.7
Silt	18.4
Clay	14.3

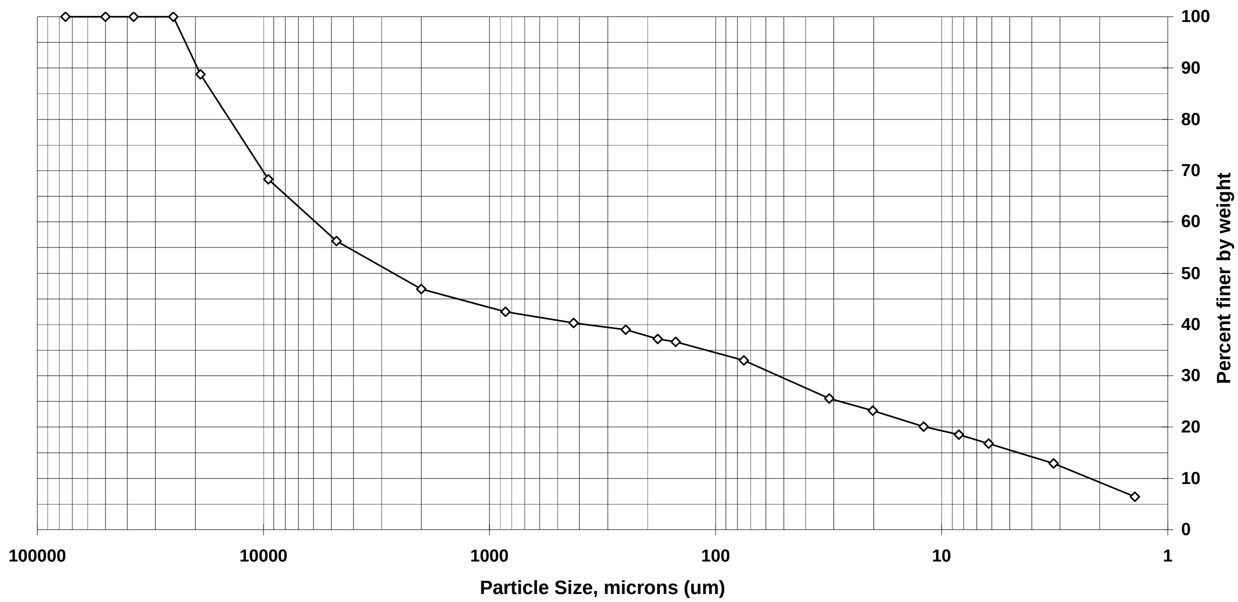
Particle Size of Soils by ASTM D422

				Date Received:	7/1/2010
Sample ID:	LAYER D (FMIS-70CGS)	**Percent Solids:**	75.3%	**Start Date:**	7/9/2010
Lab ID:	200-663-A-6	**Specific Gravity:**	2.650	**End Date:**	7/12/2010

Shape (> #10): subrounded

Non-soil material: na

Hardness (> #10): soft



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	88.8	11.2
3/8 inch	9500	68.3	20.5
#4	4750	56.3	12.0
#10	2000	46.9	9.4
#20	850	42.5	4.4
#40	425	40.3	2.2
#60	250	39.0	1.3
#80	180	37.2	1.8
#100	150	36.6	0.6
#200	75	33.0	3.6
Hyd1	31.4	25.6	7.4
Hyd2	20.2	23.2	2.4
Hyd3	12	20.1	3.1
Hyd4	8.4	18.5	1.6
Hyd5	6.2	16.8	1.7
Hyd6	3.2	12.9	3.9
Hyd7	1.4	6.4	6.5

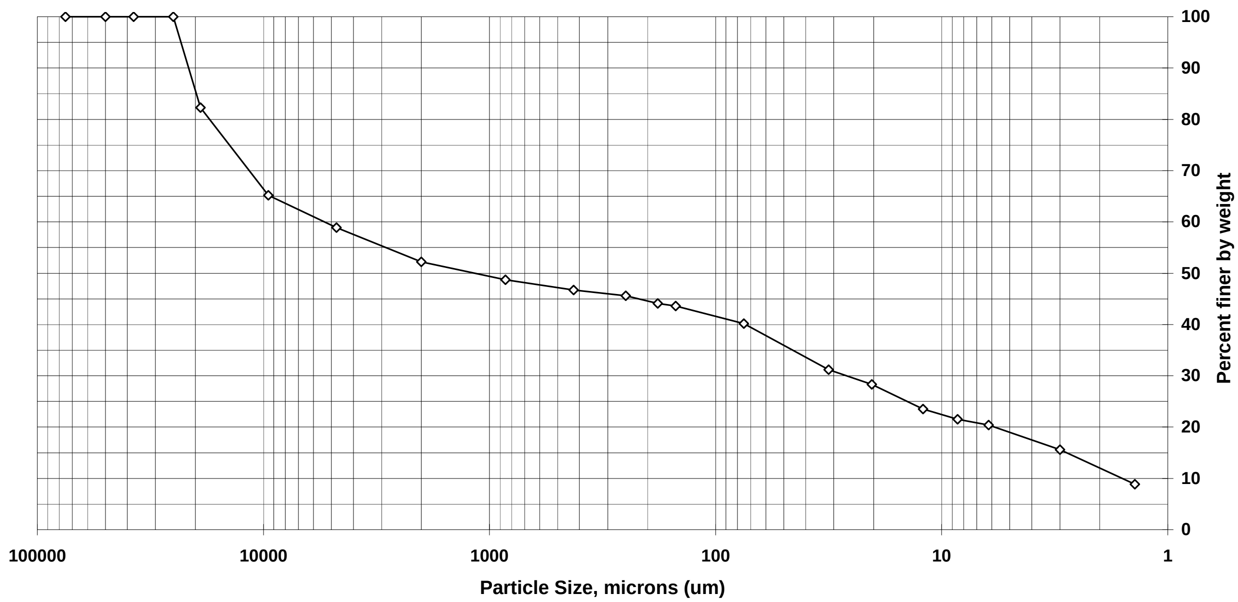
Soil Classification	Percent of sample
Gravel	43.7
Sand	23.3
Coarse Sand	9.4
Medium Sand	6.6
Fine Sand	7.3
Silt	16.2
Clay	16.8

Particle Size of Soils by ASTM D422

				Date Received:	7/1/2010
Sample ID:	LAYER E (FMIS-70CGS)	**Percent Solids:**	75.7%	**Start Date:**	7/9/2010
Lab ID:	200-663-A-7	**Specific Gravity:**	2.650	**End Date:**	7/12/2010

Shape (> #10): subrounded

Non-soil material: shell
Hardness (> #10): soft



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	82.3	17.7
3/8 inch	9500	65.2	17.1
#4	4750	58.9	6.3
#10	2000	52.2	6.7
#20	850	48.7	3.5
#40	425	46.7	2.0
#60	250	45.6	1.1
#80	180	44.1	1.5
#100	150	43.6	0.5
#200	75	40.2	3.4
Hyd1	31.6	31.2	9.0
Hyd2	20.4	28.3	2.9
Hyd3	12.1	23.5	4.8
Hyd4	8.5	21.5	2.0
Hyd5	6.2	20.4	1.1
Hyd6	3	15.6	4.8
Hyd7	1.4	8.8	6.8

Soil Classification	Percent of sample
Gravel	41.1
Sand	18.7
Coarse Sand	6.7
Medium Sand	5.5
Fine Sand	6.5
Silt	19.8
Clay	20.4

TestAmerica Burlington

Sediment Grain Size - D422

Client		Date Received	7/1/2010
Client Sample ID	LAYERG(FMIS70CGS)	Start Date	7/8/2010
Lab Sample ID	200-663-A-1	End Date	7/12/2010

Dry Weight Determination

Tin Weight	1.01	g
Wet Sample + Tin	51.04	g
Dry Sample + Tin	36.76	g
% Moisture	28.54	%

Non-soil material:	plant
Shape (> #10):	subrounded
Hardness (> #10):	soft

Default Soil Gravity	2.6500

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	58.19	140.78	82.59
Sample Weight (Oven Dried)			59

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			28.4
Sample <#10			30.6
% Passing #10			37.1

Hydrometer Data

Serial Number	741402
Calib. Date (mm/dd/yyyy)	01/06/2009
Low Temp (C)	17.0
Reading at Low Temp	1.0045
High Temp (C)	23.0
Reading at High Temp	1.0035
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.007333333

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.53	468.50	20.97	g	64.5	Gravel	
#4	4750	488.27	493.08	4.81	g	56.3	Gravel	
#10	2000	462.97	465.54	2.57	g	51.9	Sand	Coarse
#20	850	383.64	387.33	3.69	g	45.6	Sand	Medium
#40	425	346.16	348.77	2.61	g	41.2	Sand	Medium
#60	250	335.80	337.70	1.90	g	38.0	Sand	Fine
#80	180	304.77	307.04	2.27	g	34.2	Sand	Fine
#100	150	332.80	333.60	0.80	g	32.8	Sand	Fine
#200	75	325.39	330.19	4.80	g	24.7	Sand	Fine
				0.00	g	24.7		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	59

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0105	20.5	35.3	17.9	Silt	
5	5	1.0095	20.5	22.5	15.2	Silt	
15	15	1.0090	20.5	13.1	13.8	Silt	
30	30	1.0080	20.5	9.3	11.1	Silt	
60	59	1.0075	20.5	6.7	9.75	Silt	
250	256	1.0070	20.5	3.2	8.39	Clay	
1440	1440	1.0055	20.5	1.4	4.31	Clay	

TestAmerica Burlington

Sediment Grain Size - D422

Client		Date Received	7/1/2010
Client Sample ID	LAYER F (FMIS-70CGS)	Start Date	7/8/2010
Lab Sample ID	200-663-A-2	End Date	7/12/2010

Dry Weight Determination

Tin Weight	1.03	g
Wet Sample + Tin	46.61	g
Dry Sample + Tin	35.21	g
% Moisture	25.01	%

Non-soil material:	na
Shape (> #10):	subrounded
Hardness (> #10):	soft
Default Soil Gravity	2.6500

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	57.96	172.71	114.75
Sample Weight (Oven Dried)			86

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			45
Sample <#10			41
% Passing #10			35.7

Hydrometer Data

Serial Number	741402
Calib. Date (mm/dd/yyyy)	01/06/2009
Low Temp (C)	17.0
Reading at Low Temp	1.0045
High Temp (C)	23.0
Reading at High Temp	1.0035
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.007333333

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.85	483.59	25.74	g	70.1	Gravel	
3/8 inch	9500	447.53	453.56	6.03	g	63.1	Gravel	
#4	4750	488.27	496.74	8.47	g	53.3	Gravel	
#10	2000	462.97	467.77	4.80	g	47.7	Sand	Coarse
#20	850	383.64	386.03	2.39	g	44.9	Sand	Medium
#40	425	346.16	347.62	1.46	g	43.2	Sand	Medium
#60	250	335.80	336.77	0.97	g	42.1	Sand	Fine
#80	180	304.77	306.22	1.45	g	40.4	Sand	Fine
#100	150	332.80	333.41	0.61	g	39.7	Sand	Fine
#200	75	325.39	329.87	4.48	g	34.5	Sand	Fine
				0.00	g	34.5		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	86

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0180	21.0	32.4	26.5	Silt	
5	5	1.0160	21.0	20.9	22.7	Silt	
15	15	1.0140	21.0	12.4	19	Silt	
30	30	1.0130	20.5	8.9	17	Silt	
60	58	1.0120	20.5	6.5	15.1	Silt	
250	256	1.0100	20.5	3.1	11.4	Clay	
1440	1440	1.0075	20.5	1.4	6.69	Clay	

TestAmerica Burlington

Sediment Grain Size - D422

Client		Date Received	7/1/2010
Client Sample ID	LAYERA(FMIS70CGS)	Start Date	7/8/2010
Lab Sample ID	200-663-A-3	End Date	7/12/2010

Dry Weight Determination		
Tin Weight	1.01	g
Wet Sample + Tin	41.14	g
Dry Sample + Tin	34.20	g
% Moisture	17.29	%

Non-soil material:	na
Shape (> #10):	subrounded
Hardness (> #10):	soft
Default Soil Gravity	2.6500

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	57.51	190.58	133.07
Sample Weight (Oven Dried)			110

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			65.6
Sample <#10			44.4
% Passing #10			33.4

Hydrometer Data	
Serial Number	741402
Calib. Date (mm/dd/yyyy)	01/06/2009
Low Temp (C)	17.0
Reading at Low Temp	1.0045
High Temp (C)	23.0
Reading at High Temp	1.0035
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.007333333

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.85	476.99	19.14	g	82.6	Gravel	
3/8 inch	9500	447.53	470.03	22.50	g	62.1	Gravel	
#4	4750	488.27	502.13	13.86	g	49.5	Gravel	
#10	2000	462.97	473.04	10.07	g	40.3	Sand	Coarse
#20	850	383.64	389.16	5.52	g	35.3	Sand	Medium
#40	425	346.16	349.18	3.02	g	32.6	Sand	Medium
#60	250	335.80	337.51	1.71	g	31.0	Sand	Fine
#80	180	304.77	307.09	2.32	g	28.9	Sand	Fine
#100	150	332.80	333.55	0.75	g	28.2	Sand	Fine
#200	75	325.39	329.49	4.10	g	24.5	Sand	Fine
				0.00	g	24.5		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	110

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0140	21.0	33.8	14.8	Silt	
5	5	1.0130	21.0	21.6	13.4	Silt	
15	15	1.0120	21.0	12.6	11.9	Silt	
30	29	1.0110	21.0	9.2	10.5	Silt	
60	58	1.0100	21.0	6.5	9	Silt	
250	250	1.0090	20.5	3.2	7.42	Clay	
1440	1434	1.0070	20.5	1.4	4.5	Clay	

TestAmerica Burlington

Sediment Grain Size - D422

Client		Date Received	7/1/2010
Client Sample ID	LAYER B (FMIS-70CGS)	Start Date	7/9/2010
Lab Sample ID	200-663-A-4	End Date	7/12/2010

Dry Weight Determination

Tin Weight	1.01	g
Wet Sample + Tin	48.04	g
Dry Sample + Tin	39.29	g
% Moisture	18.61	%

Non-soil material:	na
Shape (> #10):	subrounded
Hardness (> #10):	soft
Default Soil Gravity	2.6500

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	57.96	143.72	85.76
Sample Weight (Oven Dried)			69.8

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			38.9
Sample <#10			30.9
% Passing #10			36

Hydrometer Data

Serial Number	741402
Calib. Date (mm/dd/yyyy)	01/06/2009
Low Temp (C)	17.0
Reading at Low Temp	1.0045
High Temp (C)	23.0
Reading at High Temp	1.0035
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.007333333

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.85	465.17	7.32	g	89.5	Gravel	
3/8 inch	9500	447.53	460.52	12.99	g	70.9	Gravel	
#4	4750	488.27	500.13	11.86	g	53.9	Gravel	
#10	2000	462.97	469.72	6.75	g	44.2	Sand	Coarse
#20	850	383.64	387.31	3.67	g	38.9	Sand	Medium
#40	425	346.16	347.96	1.80	g	36.3	Sand	Medium
#60	250	335.80	336.79	0.99	g	34.9	Sand	Fine
#80	180	304.77	306.02	1.25	g	33.1	Sand	Fine
#100	150	332.80	333.21	0.41	g	32.5	Sand	Fine
#200	75	325.39	327.86	2.47	g	29.0	Sand	Fine
				0.00	g	29.0		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	69.8

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0120	21.0	34.5	18.8	Silt	
5	5	1.0110	21.0	22.1	16.5	Silt	
15	15	1.0100	21.0	12.9	14.2	Silt	
30	29	1.0100	21.0	9.3	14.2	Silt	
60	63	1.0090	21.0	6.3	11.9	Silt	
250	250	1.0080	20.5	3.2	9.4	Clay	
1440	1434	1.0060	20.5	1.4	4.79	Clay	

TestAmerica Burlington

Sediment Grain Size - D422

Client		Date Received	7/1/2010
Client Sample ID	LAYER C (FMIS-70CGS)	Start Date	7/9/2010
Lab Sample ID	200-663-A-5	End Date	7/12/2010

Dry Weight Determination

Tin Weight	1.03	g
Wet Sample + Tin	55.30	g
Dry Sample + Tin	42.99	g
% Moisture	22.68	%

Non-soil material:	na
Shape (> #10):	subrounded
Hardness (> #10):	soft
Default Soil Gravity	2.6500

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	58.01	206.02	148.01
Sample Weight (Oven Dried)			114

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			59.6
Sample <#10			54.4
% Passing #10			36.8

Hydrometer Data

Serial Number	741402
Calib. Date (mm/dd/yyyy)	01/06/2009
Low Temp (C)	17.0
Reading at Low Temp	1.0045
High Temp (C)	23.0
Reading at High Temp	1.0035
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.007333333

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.53	487.49	39.96	g	64.9	Gravel	
#4	4750	488.27	499.74	11.47	g	54.8	Gravel	
#10	2000	462.97	471.14	8.17	g	47.6	Sand	Coarse
#20	850	383.64	388.90	5.26	g	43.0	Sand	Medium
#40	425	346.16	349.10	2.94	g	40.4	Sand	Medium
#60	250	335.80	337.53	1.73	g	38.9	Sand	Fine
#80	180	304.77	306.94	2.17	g	37.0	Sand	Fine
#100	150	332.80	333.49	0.69	g	36.4	Sand	Fine
#200	75	325.39	329.64	4.25	g	32.7	Sand	Fine
				0.00	g	32.7		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	114

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0200	21.5	31.4	22.9	Silt	
5	5	1.0190	21.0	20.2	21.4	Silt	
15	15	1.0160	21.0	12.1	17.1	Silt	
30	31	1.0150	21.0	8.5	15.7	Silt	
60	60	1.0140	21.0	6.2	14.3	Silt	
250	240	1.0110	20.5	3.2	9.98	Clay	
1440	1424	1.0080	20.5	1.4	5.75	Clay	

TestAmerica Burlington

Sediment Grain Size - D422

Client		Date Received	7/1/2010
Client Sample ID	LAYER D (FMIS-70CGS)	Start Date	7/9/2010
Lab Sample ID	200-663-A-6	End Date	7/12/2010

Dry Weight Determination

Tin Weight	1.02	g
Wet Sample + Tin	52.79	g
Dry Sample + Tin	40.00	g
% Moisture	24.71	%

Non-soil material:	na
Shape (> #10):	subrounded
Hardness (> #10):	soft
Default Soil Gravity	2.6500

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	58.30	194.22	135.92
Sample Weight (Oven Dried)			102

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			54.2
Sample <#10			47.8
% Passing #10			35.2

Hydrometer Data

Serial Number	741402
Calib. Date (mm/dd/yyyy)	01/06/2009
Low Temp (C)	17.0
Reading at Low Temp	1.0045
High Temp (C)	23.0
Reading at High Temp	1.0035
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.007333333

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.85	469.28	11.43	g	88.8	Gravel	
3/8 inch	9500	447.53	468.43	20.90	g	68.3	Gravel	
#4	4750	488.27	500.52	12.25	g	56.3	Gravel	
#10	2000	462.97	472.54	9.57	g	46.9	Sand	Coarse
#20	850	383.64	388.15	4.51	g	42.5	Sand	Medium
#40	425	346.16	348.45	2.29	g	40.3	Sand	Medium
#60	250	335.80	337.16	1.36	g	39.0	Sand	Fine
#80	180	304.77	306.65	1.88	g	37.2	Sand	Fine
#100	150	332.80	333.45	0.65	g	36.6	Sand	Fine
#200	75	325.39	329.09	3.70	g	33.0	Sand	Fine
				0.00	g	33.0		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	102

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0200	21.5	31.4	25.6	Silt	
5	5	1.0185	21.5	20.2	23.2	Silt	
15	15	1.0165	21.5	12	20.1	Silt	
30	31	1.0155	21.5	8.4	18.5	Silt	
60	59	1.0145	21.0	6.2	16.8	Silt	
250	234	1.0120	21.0	3.2	12.9	Clay	
1440	1418	1.0080	20.5	1.4	6.43	Clay	

TestAmerica Burlington

Sediment Grain Size - D422

Client		Date Received	7/1/2010
Client Sample ID	LAYER E (FMIS-70CGS)	Start Date	7/9/2010
Lab Sample ID	200-663-A-7	End Date	7/12/2010

Dry Weight Determination

Tin Weight	1.01	g
Wet Sample + Tin	43.61	g
Dry Sample + Tin	33.27	g
% Moisture	24.27	%

Non-soil material:	shell
Shape (> #10):	subrounded
Hardness (> #10):	soft
Default Soil Gravity	2.6500

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	58.07	168.08	110.01
Sample Weight (Oven Dried)			83.3

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			39.8
Sample <#10			43.5
% Passing #10			39.5

Hydrometer Data

Serial Number	741402
Calib. Date (mm/dd/yyyy)	01/06/2009
Low Temp (C)	17.0
Reading at Low Temp	1.0045
High Temp (C)	23.0
Reading at High Temp	1.0035
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.007333333

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.85	472.60	14.75	g	82.3	Gravel	
3/8 inch	9500	447.53	461.79	14.26	g	65.2	Gravel	
#4	4750	488.27	493.53	5.26	g	58.9	Gravel	
#10	2000	462.97	468.52	5.55	g	52.2	Sand	Coarse
#20	850	383.64	386.59	2.95	g	48.7	Sand	Medium
#40	425	346.16	347.79	1.63	g	46.7	Sand	Medium
#60	250	335.80	336.71	0.91	g	45.6	Sand	Fine
#80	180	304.77	306.02	1.25	g	44.1	Sand	Fine
#100	150	332.80	333.25	0.45	g	43.6	Sand	Fine
#200	75	325.39	328.23	2.84	g	40.2	Sand	Fine
				0.00	g	40.2		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	83.3

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0200	21.0	31.6	31.2	Silt	
5	5	1.0185	21.0	20.4	28.3	Silt	
15	15	1.0160	21.0	12.1	23.5	Silt	
30	31	1.0150	21.0	8.5	21.5	Silt	
60	59	1.0145	20.5	6.2	20.4	Silt	
250	265	1.0120	20.5	3	15.6	Clay	
1440	1412	1.0085	20.5	1.4	8.84	Clay	

DATA REPORTING QUALIFIERS

Lab Section	Qualifier	Description

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
Sdg Number: HTF0095 TVAX

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Geotechnical					
Analysis Batch:200-4218					
200-663-1	LAYERG(FMIS70CGS)	T	Solid	D422	
200-663-2	LAYER F (FMIS-70CGS)	T	Solid	D422	
200-663-3	LAYERA(FMIS70CGS)	T	Solid	D422	
200-663-4	LAYER B (FMIS-70CGS)	T	Solid	D422	
200-663-5	LAYER C (FMIS-70CGS)	T	Solid	D422	
200-663-6	LAYER D (FMIS-70CGS)	T	Solid	D422	
200-663-7	LAYER E (FMIS-70CGS)	T	Solid	D422	

Report Basis

T = Total

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
SDG: HTF0095 TVAX

Laboratory Chronicle

Lab ID: **200-663-1** **Client ID:** **LAYERG(FMIS70CGS)**

Sample Date/Time: 06/16/2010 13:45 Received Date/Time: 07/01/2010 10:20

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:D422	200-663-A-1		200-4218		07/08/2010 23:54	1	TAL BUR	DJP

Lab ID: **200-663-2** **Client ID:** **LAYER F (FMIS-70CGS)**

Sample Date/Time: 06/16/2010 16:17 Received Date/Time: 07/01/2010 10:20

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:D422	200-663-A-2		200-4218		07/08/2010 23:56	1	TAL BUR	DJP

Lab ID: **200-663-3** **Client ID:** **LAYERA(FMIS70CGS)**

Sample Date/Time: 06/17/2010 10:05 Received Date/Time: 07/01/2010 10:20

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:D422	200-663-A-3		200-4218		07/08/2010 23:58	1	TAL BUR	DJP

Lab ID: **200-663-4** **Client ID:** **LAYER B (FMIS-70CGS)**

Sample Date/Time: 06/17/2010 10:09 Received Date/Time: 07/01/2010 10:20

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:D422	200-663-A-4		200-4218		07/09/2010 00:00	1	TAL BUR	DJP

Lab ID: **200-663-5** **Client ID:** **LAYER C (FMIS-70CGS)**

Sample Date/Time: 06/17/2010 10:10 Received Date/Time: 07/01/2010 10:20

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:D422	200-663-A-5		200-4218		07/09/2010 00:02	1	TAL BUR	DJP

Lab ID: **200-663-6** **Client ID:** **LAYER D (FMIS-70CGS)**

Sample Date/Time: 06/17/2010 10:14 Received Date/Time: 07/01/2010 10:20

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:D422	200-663-A-6		200-4218		07/09/2010 00:05	1	TAL BUR	DJP

Lab ID: **200-663-7** **Client ID:** **LAYER E (FMIS-70CGS)**

Sample Date/Time: 06/17/2010 10:16 Received Date/Time: 07/01/2010 10:20

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:D422	200-663-A-7		200-4218		07/09/2010 00:06	1	TAL BUR	DJP

A = Analytical Method P = Prep Method

Client: TestAmerica Laboratories, Inc

Job Number: 200-663-1
SDG: HTF0095 TVAX

Laboratory Chronicle

Lab References:
TAL BUR = TestAmerica Burlington

COVER PAGE
GEOTECHNICAL

Lab Name: TestAmerica Burlington   Job Number: 200-663-1

SDG No.: HTF0095 TVAX

Project: Dual System

Client Sample ID	Lab Sample ID
LAYERG(FMIS70CGS)	200-663-1
LAYER F (FMIS-70CGS)	200-663-2
LAYERA(FMIS70CGS)	200-663-3
LAYER B (FMIS-70CGS)	200-663-4
LAYER C (FMIS-70CGS)	200-663-5
LAYER D (FMIS-70CGS)	200-663-6
LAYER E (FMIS-70CGS)	200-663-7

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GEOTECHNICAL

Client Sample ID: LAYERG(FMIS70CGS)

Lab Sample ID: 200-663-1

Lab Name: TestAmerica Burlington

Job No.: 200-663-1

SDG ID.: HTF0095 TVAX

Matrix: Solid

Date Sampled: 06/16/2010 13:45

Reporting Basis: WET

Date Received: 07/01/2010 10:20

CAS No.	Analyte	Conc.			Units	C	Q	DIL	Method
	Gravel	43.7			%			1	D422
	Sieve Size 3 inch - Percent Finer	100.0			% Passing			1	D422
	Sand	31.6			%			1	D422
	Sieve Size 2 inch - Percent Finer	100.0			% Passing			1	D422
	Coarse Sand	4.4			%			1	D422
	Sieve Size 1.5 inch - Percent Finer	100.0			% Passing			1	D422
	Medium Sand	10.7			%			1	D422
	Sieve Size 1 inch - Percent Finer	100.0			% Passing			1	D422
	Fine Sand	16.5			%			1	D422
	Sieve Size 0.75 inch - Percent Finer	100.0			% Passing			1	D422
	Sieve Size 0.375 inch - Percent Finer	64.5			% Passing			1	D422
	Silt	15.0			%			1	D422
	Clay	9.8			%			1	D422
	Sieve Size #4 - Percent Finer	56.3			% Passing			1	D422
	Sieve Size #10 - Percent Finer	51.9			% Passing			1	D422
	Sieve Size #20 - Percent Finer	45.6			% Passing			1	D422
	Sieve Size #40 - Percent Finer	41.2			% Passing			1	D422
	Sieve Size #60 - Percent Finer	38.0			% Passing			1	D422
	Sieve Size #80 - Percent Finer	34.2			% Passing			1	D422
	Sieve Size #100 - Percent Finer	32.8			% Passing			1	D422
	Sieve Size #200 - Percent Finer	24.7			% Passing			1	D422
	Hydrometer Reading 1 - Percent Finer	17.9			% Passing			1	D422
	Hydrometer Reading 2 - Percent Finer	15.2			% Passing			1	D422
	Hydrometer Reading 3 - Percent Finer	13.8			% Passing			1	D422
	Hydrometer Reading 4 - Percent Finer	11.1			% Passing			1	D422
	Hydrometer Reading 5 - Percent Finer	9.8			% Passing			1	D422
	Hydrometer Reading 6 - Percent Finer	8.4			% Passing			1	D422
	Hydrometer Reading 7 - Percent Finer	4.3			% Passing			1	D422

1B-IN
INORGANIC ANALYSIS DATA SHEET
GEOTECHNICAL

Client Sample ID: LAYER F (FMIS-70CGS)

Lab Sample ID: 200-663-2

Lab Name: TestAmerica Burlington

Job No.: 200-663-1

SDG ID.: HTF0095 TVAX

Matrix: Solid

Date Sampled: 06/16/2010 16:17

Reporting Basis: WET

Date Received: 07/01/2010 10:20

CAS No.	Analyte	Conc.			Units	C	Q	DIL	Method
	Gravel	46.7			%			1	D422
	Sieve Size 3 inch - Percent Finer	100.0			% Passing			1	D422
	Sand	18.8			%			1	D422
	Sieve Size 2 inch - Percent Finer	100.0			% Passing			1	D422
	Coarse Sand	5.6			%			1	D422
	Sieve Size 1.5 inch - Percent Finer	100.0			% Passing			1	D422
	Medium Sand	4.5			%			1	D422
	Sieve Size 1 inch - Percent Finer	100.0			% Passing			1	D422
	Fine Sand	8.7			%			1	D422
	Sieve Size 0.75 inch - Percent Finer	70.1			% Passing			1	D422
	Sieve Size 0.375 inch - Percent Finer	63.1			% Passing			1	D422
	Silt	19.4			%			1	D422
	Clay	15.1			%			1	D422
	Sieve Size #4 - Percent Finer	53.3			% Passing			1	D422
	Sieve Size #10 - Percent Finer	47.7			% Passing			1	D422
	Sieve Size #20 - Percent Finer	44.9			% Passing			1	D422
	Sieve Size #40 - Percent Finer	43.2			% Passing			1	D422
	Sieve Size #60 - Percent Finer	42.1			% Passing			1	D422
	Sieve Size #80 - Percent Finer	40.4			% Passing			1	D422
	Sieve Size #100 - Percent Finer	39.7			% Passing			1	D422
	Sieve Size #200 - Percent Finer	34.5			% Passing			1	D422
	Hydrometer Reading 1 - Percent Finer	26.5			% Passing			1	D422
	Hydrometer Reading 2 - Percent Finer	22.7			% Passing			1	D422
	Hydrometer Reading 3 - Percent Finer	19.0			% Passing			1	D422
	Hydrometer Reading 4 - Percent Finer	17.0			% Passing			1	D422
	Hydrometer Reading 5 - Percent Finer	15.1			% Passing			1	D422
	Hydrometer Reading 6 - Percent Finer	11.4			% Passing			1	D422
	Hydrometer Reading 7 - Percent Finer	6.7			% Passing			1	D422

1B-IN
INORGANIC ANALYSIS DATA SHEET
GEOTECHNICAL

Client Sample ID: LAYERA(FMIS70CGS) Lab Sample ID: 200-663-3

Lab Name: TestAmerica Burlington Job No.: 200-663-1

SDG ID.: HTF0095 TVAX

Matrix: Solid Date Sampled: 06/17/2010 10:05

Reporting Basis: WET Date Received: 07/01/2010 10:20

CAS No.	Analyte	Conc.			Units	C	Q	DIL	Method
	Gravel	50.5			%			1	D422
	Sieve Size 3 inch - Percent Finer	100.0			% Passing			1	D422
	Sand	25.0			%			1	D422
	Sieve Size 2 inch - Percent Finer	100.0			% Passing			1	D422
	Coarse Sand	9.2			%			1	D422
	Sieve Size 1.5 inch - Percent Finer	100.0			% Passing			1	D422
	Medium Sand	7.7			%			1	D422
	Sieve Size 1 inch - Percent Finer	100.0			% Passing			1	D422
	Fine Sand	8.1			%			1	D422
	Sieve Size 0.75 inch - Percent Finer	82.6			% Passing			1	D422
	Sieve Size 0.375 inch - Percent Finer	62.1			% Passing			1	D422
	Silt	15.5			%			1	D422
	Clay	9.0			%			1	D422
	Sieve Size #4 - Percent Finer	49.5			% Passing			1	D422
	Sieve Size #10 - Percent Finer	40.3			% Passing			1	D422
	Sieve Size #20 - Percent Finer	35.3			% Passing			1	D422
	Sieve Size #40 - Percent Finer	32.6			% Passing			1	D422
	Sieve Size #60 - Percent Finer	31.0			% Passing			1	D422
	Sieve Size #80 - Percent Finer	28.9			% Passing			1	D422
	Sieve Size #100 - Percent Finer	28.2			% Passing			1	D422
	Sieve Size #200 - Percent Finer	24.5			% Passing			1	D422
	Hydrometer Reading 1 - Percent Finer	14.8			% Passing			1	D422
	Hydrometer Reading 2 - Percent Finer	13.4			% Passing			1	D422
	Hydrometer Reading 3 - Percent Finer	11.9			% Passing			1	D422
	Hydrometer Reading 4 - Percent Finer	10.5			% Passing			1	D422
	Hydrometer Reading 5 - Percent Finer	9.0			% Passing			1	D422
	Hydrometer Reading 6 - Percent Finer	7.4			% Passing			1	D422
	Hydrometer Reading 7 - Percent Finer	4.5			% Passing			1	D422

1B-IN
INORGANIC ANALYSIS DATA SHEET
GEOTECHNICAL

Client Sample ID: LAYER B (FMIS-70CGS)

Lab Sample ID: 200-663-4

Lab Name: TestAmerica Burlington

Job No.: 200-663-1

SDG ID.: HTF0095 TVAX

Matrix: Solid

Date Sampled: 06/17/2010 10:09

Reporting Basis: WET

Date Received: 07/01/2010 10:20

CAS No.	Analyte	Conc.			Units	C	Q	DIL	Method
	Gravel	46.1			%			1	D422
	Sieve Size 3 inch - Percent Finer	100.0			% Passing			1	D422
	Sand	24.9			%			1	D422
	Sieve Size 2 inch - Percent Finer	100.0			% Passing			1	D422
	Coarse Sand	9.7			%			1	D422
	Sieve Size 1.5 inch - Percent Finer	100.0			% Passing			1	D422
	Medium Sand	7.9			%			1	D422
	Sieve Size 1 inch - Percent Finer	100.0			% Passing			1	D422
	Fine Sand	7.3			%			1	D422
	Sieve Size 0.75 inch - Percent Finer	89.5			% Passing			1	D422
	Sieve Size 0.375 inch - Percent Finer	70.9			% Passing			1	D422
	Silt	17.1			%			1	D422
	Clay	11.9			%			1	D422
	Sieve Size #4 - Percent Finer	53.9			% Passing			1	D422
	Sieve Size #10 - Percent Finer	44.2			% Passing			1	D422
	Sieve Size #20 - Percent Finer	38.9			% Passing			1	D422
	Sieve Size #40 - Percent Finer	36.3			% Passing			1	D422
	Sieve Size #60 - Percent Finer	34.9			% Passing			1	D422
	Sieve Size #80 - Percent Finer	33.1			% Passing			1	D422
	Sieve Size #100 - Percent Finer	32.5			% Passing			1	D422
	Sieve Size #200 - Percent Finer	29.0			% Passing			1	D422
	Hydrometer Reading 1 - Percent Finer	18.8			% Passing			1	D422
	Hydrometer Reading 2 - Percent Finer	16.5			% Passing			1	D422
	Hydrometer Reading 3 - Percent Finer	14.2			% Passing			1	D422
	Hydrometer Reading 4 - Percent Finer	14.2			% Passing			1	D422
	Hydrometer Reading 5 - Percent Finer	11.9			% Passing			1	D422
	Hydrometer Reading 6 - Percent Finer	9.4			% Passing			1	D422
	Hydrometer Reading 7 - Percent Finer	4.8			% Passing			1	D422

1B-IN
INORGANIC ANALYSIS DATA SHEET
GEOTECHNICAL

Client Sample ID: LAYER C (FMIS-70CGS)

Lab Sample ID: 200-663-5

Lab Name: TestAmerica Burlington

Job No.: 200-663-1

SDG ID.: HTF0095 TVAX

Matrix: Solid

Date Sampled: 06/17/2010 10:10

Reporting Basis: WET

Date Received: 07/01/2010 10:20

CAS No.	Analyte	Conc.			Units	C	Q	DIL	Method
	Gravel	45.2			%			1	D422
	Sieve Size 3 inch - Percent Finer	100.0			% Passing			1	D422
	Sand	22.1			%			1	D422
	Sieve Size 2 inch - Percent Finer	100.0			% Passing			1	D422
	Coarse Sand	7.2			%			1	D422
	Sieve Size 1.5 inch - Percent Finer	100.0			% Passing			1	D422
	Medium Sand	7.2			%			1	D422
	Sieve Size 1 inch - Percent Finer	100.0			% Passing			1	D422
	Fine Sand	7.7			%			1	D422
	Sieve Size 0.75 inch - Percent Finer	100.0			% Passing			1	D422
	Sieve Size 0.375 inch - Percent Finer	64.9			% Passing			1	D422
	Silt	18.4			%			1	D422
	Clay	14.3			%			1	D422
	Sieve Size #4 - Percent Finer	54.8			% Passing			1	D422
	Sieve Size #10 - Percent Finer	47.6			% Passing			1	D422
	Sieve Size #20 - Percent Finer	43.0			% Passing			1	D422
	Sieve Size #40 - Percent Finer	40.4			% Passing			1	D422
	Sieve Size #60 - Percent Finer	38.9			% Passing			1	D422
	Sieve Size #80 - Percent Finer	37.0			% Passing			1	D422
	Sieve Size #100 - Percent Finer	36.4			% Passing			1	D422
	Sieve Size #200 - Percent Finer	32.7			% Passing			1	D422
	Hydrometer Reading 1 - Percent Finer	22.9			% Passing			1	D422
	Hydrometer Reading 2 - Percent Finer	21.4			% Passing			1	D422
	Hydrometer Reading 3 - Percent Finer	17.1			% Passing			1	D422
	Hydrometer Reading 4 - Percent Finer	15.7			% Passing			1	D422
	Hydrometer Reading 5 - Percent Finer	14.3			% Passing			1	D422
	Hydrometer Reading 6 - Percent Finer	10			% Passing			1	D422
	Hydrometer Reading 7 - Percent Finer	5.8			% Passing			1	D422

1B-IN
INORGANIC ANALYSIS DATA SHEET
GEOTECHNICAL

Client Sample ID: LAYER D (FMIS-70CGS)

Lab Sample ID: 200-663-6

Lab Name: TestAmerica Burlington

Job No.: 200-663-1

SDG ID.: HTF0095 TVAX

Matrix: Solid

Date Sampled: 06/17/2010 10:14

Reporting Basis: WET

Date Received: 07/01/2010 10:20

CAS No.	Analyte	Conc.			Units	C	Q	DIL	Method
	Gravel	43.7			%			1	D422
	Sieve Size 3 inch - Percent Finer	100.0			% Passing			1	D422
	Sand	23.3			%			1	D422
	Sieve Size 2 inch - Percent Finer	100.0			% Passing			1	D422
	Coarse Sand	9.4			%			1	D422
	Sieve Size 1.5 inch - Percent Finer	100.0			% Passing			1	D422
	Medium Sand	6.6			%			1	D422
	Sieve Size 1 inch - Percent Finer	100.0			% Passing			1	D422
	Fine Sand	7.3			%			1	D422
	Sieve Size 0.75 inch - Percent Finer	88.8			% Passing			1	D422
	Sieve Size 0.375 inch - Percent Finer	68.3			% Passing			1	D422
	Silt	16.2			%			1	D422
	Clay	16.8			%			1	D422
	Sieve Size #4 - Percent Finer	56.3			% Passing			1	D422
	Sieve Size #10 - Percent Finer	46.9			% Passing			1	D422
	Sieve Size #20 - Percent Finer	42.5			% Passing			1	D422
	Sieve Size #40 - Percent Finer	40.3			% Passing			1	D422
	Sieve Size #60 - Percent Finer	39.0			% Passing			1	D422
	Sieve Size #80 - Percent Finer	37.2			% Passing			1	D422
	Sieve Size #100 - Percent Finer	36.6			% Passing			1	D422
	Sieve Size #200 - Percent Finer	33.0			% Passing			1	D422
	Hydrometer Reading 1 - Percent Finer	25.6			% Passing			1	D422
	Hydrometer Reading 2 - Percent Finer	23.2			% Passing			1	D422
	Hydrometer Reading 3 - Percent Finer	20.1			% Passing			1	D422
	Hydrometer Reading 4 - Percent Finer	18.5			% Passing			1	D422
	Hydrometer Reading 5 - Percent Finer	16.8			% Passing			1	D422
	Hydrometer Reading 6 - Percent Finer	12.9			% Passing			1	D422
	Hydrometer Reading 7 - Percent Finer	6.4			% Passing			1	D422

1B-IN
INORGANIC ANALYSIS DATA SHEET
GEOTECHNICAL

Client Sample ID: LAYER E (FMIS-70CGS)

Lab Sample ID: 200-663-7

Lab Name: TestAmerica Burlington

Job No.: 200-663-1

SDG ID.: HTF0095 TVAX

Matrix: Solid

Date Sampled: 06/17/2010 10:16

Reporting Basis: WET

Date Received: 07/01/2010 10:20

CAS No.	Analyte	Conc.			Units	C	Q	DIL	Method
	Gravel	41.1			%			1	D422
	Sieve Size 3 inch - Percent Finer	100.0			% Passing			1	D422
	Sand	18.7			%			1	D422
	Sieve Size 2 inch - Percent Finer	100.0			% Passing			1	D422
	Coarse Sand	6.7			%			1	D422
	Sieve Size 1.5 inch - Percent Finer	100.0			% Passing			1	D422
	Medium Sand	5.5			%			1	D422
	Sieve Size 1 inch - Percent Finer	100.0			% Passing			1	D422
	Fine Sand	6.5			%			1	D422
	Sieve Size 0.75 inch - Percent Finer	82.3			% Passing			1	D422
	Sieve Size 0.375 inch - Percent Finer	65.2			% Passing			1	D422
	Silt	19.8			%			1	D422
	Clay	20.4			%			1	D422
	Sieve Size #4 - Percent Finer	58.9			% Passing			1	D422
	Sieve Size #10 - Percent Finer	52.2			% Passing			1	D422
	Sieve Size #20 - Percent Finer	48.7			% Passing			1	D422
	Sieve Size #40 - Percent Finer	46.7			% Passing			1	D422
	Sieve Size #60 - Percent Finer	45.6			% Passing			1	D422
	Sieve Size #80 - Percent Finer	44.1			% Passing			1	D422
	Sieve Size #100 - Percent Finer	43.6			% Passing			1	D422
	Sieve Size #200 - Percent Finer	40.2			% Passing			1	D422
	Hydrometer Reading 1 - Percent Finer	31.2			% Passing			1	D422
	Hydrometer Reading 2 - Percent Finer	28.3			% Passing			1	D422
	Hydrometer Reading 3 - Percent Finer	23.5			% Passing			1	D422
	Hydrometer Reading 4 - Percent Finer	21.5			% Passing			1	D422
	Hydrometer Reading 5 - Percent Finer	20.4			% Passing			1	D422
	Hydrometer Reading 6 - Percent Finer	15.6			% Passing			1	D422
	Hydrometer Reading 7 - Percent Finer	8.8			% Passing			1	D422

Geotechnical Worksheet

Batch Number: 200-4218
Method: D422
Analyst: Peterson, David J

Date Open: Jul 08 2010 11:54PM
Batch End:

Comments

Lab ID	Client ID	Method Chain	Basis	Analysis comment
200-663-A-1	LAYERG(FMIS70CGS)	D422	T	SEE-SAMPLE-DATASHEETS
200-663-A-2	LAYER F (FMIS-70CGS)	D422	T	SEE-SAMPLE-DATASHEETS
200-663-A-3	LAYERA(FMIS70CGS)	D422	T	SEE-SAMPLE-DATASHEETS
200-663-A-4	LAYER B (FMIS-70CGS)	D422	T	SEE-SAMPLE-DATASHEETS
200-663-A-5	LAYER C (FMIS-70CGS)	D422	T	SEE-SAMPLE-DATASHEETS
200-663-A-6	LAYER D (FMIS-70CGS)	D422	T	SEE-SAMPLE-DATASHEETS
200-663-A-7	LAYER E (FMIS-70CGS)	D422	T	SEE-SAMPLE-DATASHEETS

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

June 30, 2010

LABORATORY REPORT

Client:
Tetra Tech EM Inc.
737 Bishop st., Suite 3010
Honolulu, HI 96813
Attn: Scott Duzan

Work Order: HTF0094
Project Name: Subsurface Soil Investigation (MIS-VOCs)
Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H
Date Received: 06/16/10

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica.

TestAmerica Analytical Testing Corporation certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.

The Chain(s) of Custody, 2 pages, are included and are an integral part of this report. This entire report was reviewed and approved for release.

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 1-(808)486-5227

Samples were received into laboratory at a temperature of 5 °C.

NELAC states that samples which require thermal preservation shall be considered acceptable if the arrival temperature is within 2 degrees C of the required temperature or the method specified range. For samples with a temperature requirement of 4 degrees C, an arrival temperature from 0 degrees C to 6 degrees C meets specifications. Samples that are delivered to the laboratory on the same day that they are collected may not meet these criteria. In these cases, the samples are considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The reported results were obtained in compliance with the 2003 NELAC standards unless otherwise noted.

Approved By:

Marvin D. Heskett III
Laboratory Director

NELAC Certification # E87907

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0094	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:52
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

Sample Summary

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B16-4-6-SM	HTF0094-01	Solid/Soil	06/16/10 14:31	06/16/10 17:28	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0094 Project: Subsurface Soil Investigation (MIS-VOCs) Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	Received: 06/16/10 Reported: 06/30/10 17:52	

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0094-01 (B16-4-6-SM - Solid/Soil)				**Sampled:**	**06/16/10 14:31**		**Recvd: 06/16/10 17:28**		
General Chemistry Parameters									
% Moisture	**17.0**		Weight %	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0094-01RE1 (B16-4-6-SM - Solid/Soil)				**Sampled:**	**06/16/10 14:31**		**Recvd: 06/16/10 17:28**		
General Chemistry Parameters									
% Moisture	**17.3**		"	0.100	"	"	"	"	"
Sample ID: HTF0094-01RE2 (B16-4-6-SM - Solid/Soil)				**Sampled:**	**06/16/10 14:31**		**Recvd: 06/16/10 17:28**		
General Chemistry Parameters									
% Moisture	**19.7**		"	0.100	"	"	"	"	"
Sample ID: HTF0094-01RE3 (B16-4-6-SM - Solid/Soil)				**Sampled:**	**06/16/10 14:31**		**Recvd: 06/16/10 17:28**		
General Chemistry Parameters									
% Moisture	**15.8**		"	0.100	"	"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0094	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:52
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

SAMPLE EXTRACTION DATA

Parameter	Batch	Lab Number	Wt/Vol Extracted	Default Wt/Vol	Extracted Vol	Default Vol	Date	Analyst	Extraction Method

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0094	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:52
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY BLANK QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
General Chemistry Parameters													
Batch\Seq: 10F0126 Extracted: 06/21/10													
Blank Analyzed: 06/22/2010 (10F0126-BLK1)													
% Moisture			Weight %	N/A	0.100	ND							

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0094	Received:	06/16/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:52
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
General Chemistry Parameters												
Batch\Seq: 10F0126 Extracted: 06/21/10												
Duplicate Analyzed: 06/23/2010 (10F0126-DUP1)				**QC Source Sample: HTF0087-01**								
% Moisture	81.6		Weight %	N/A	0.100	81.9				1	20	

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc. 737 Bishop st., Suite 3010 Honolulu, HI 96813 Scott Duzan	Work Order: HTF0094		Received: 06/16/10 Reported: 06/30/10 17:52
	Project:	Subsurface Soil Investigation (MIS-VOCs)	
	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301	

CERTIFICATION SUMMARY

TestAmerica Honolulu

Method	Matrix	Nelac	Hawaii
SM 2540G	Solid/Soil		

For information concerning certifications of this facility or another TestAmerica facility, please visit our website at www.TestAmericaInc.com

DATA QUALIFIERS AND DEFINITIONS

ND Not detected at the reporting limit (or method detection limit if shown)

ADDITIONAL COMMENTS

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1b

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY USE ONLY	
LAB JOB NO.	
LOCATION	HTF0094
CONTAINERS	

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com	**Project identification**
Company name: Tetra Tech EMI	Job name: Hickam AFB CG110 ISM VOC Study
Address: 737 Bishop Street, Suite 3010	Job number: 103DS148843.H0301
City: Honolulu State: HI ZIP: 96813	
Phone: 808.441.6645 Fax	Contact email address: scott.duzan@tetratech.com
Sampler: SD # samples in shipment 1	

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no.
1	B16-4-6-SM	X			X								NA	6-16-10	1431	1		*								HTF0094-01 *SAP Section 5.6
2	AD	X			X								NA													
3		X			X								NA													
4		X			X								NA													
5		X			X								NA													
6		X			X								NA													
7		X			X								NA													
8		X			X								NA													
9		X			X								NA													
10		X			X								NA													

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
Scott Duzan [signature]	6-16-10 / 1728	Hand	M. Leskett / [signature]	TestAmerica	6-16-10 / 17:28	Intact 5°C
	/				/	
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

See Section 5.5 of SAP for soil moisture protocols - 5.6 = Vadose.

Please check one:
* Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008

Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Client Name: Tetratech **Date/ Time Received:** 6/16/10 17:28

Checklist Completed By: MGH **Received By:** MGH

Matrices: Soil **Carrier:** **Airbill# :**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Chain of Custody present?	Yes ☑	No ☐	☐
Chain of Custody Signed when relinquished and received?	Yes ☑	No ☐	
Chain of Custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sample containers on ice?	Yes ☑	No ☐	Type:
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Water - VOA Vials have Zero Headspace?	Yes ☐	No ☐	No VOA vials present: ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Checked: ☑
pH Adjusted?	Yes ☐	No ☑	Final pH:
Encores / 5035 Vials Present?	Yes ☐	No ☑	
Sample Filtration Needed?	Yes ☐	No ☑	Filtered in Field: ☐
Dry Weight Corrected Results?	Yes ☐	No ☑	Take Action: ☐
DODQSM / QAPP Project?	Yes ☑	No ☐	Type: DoD MIS

Temperature Blank Present? Yes ☑ No ☐

Sample Container/Blank Temperature Range (Minimum 3 sample containers if available): 5 °C

Comments/ Sampling Handling Notes:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

June 30, 2010

LABORATORY REPORT

Client:
Tetra Tech EM Inc.
737 Bishop st., Suite 3010
Honolulu, HI 96813
Attn: Scott Duzan

Work Order:	HTF0090
Project Name:	Subsurface Soil Investigation (MIS-VOCs)
Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H(
Date Received:	06/17/10

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica.

TestAmerica Analytical Testing Corporation certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.

The Chain(s) of Custody, 2 pages, are included and are an integral part of this report. This entire report was reviewed and approved for release.

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 1-(808)486-5227

Samples were received into laboratory at a temperature of 4 °C.

NELAC states that samples which require thermal preservation shall be considered acceptable if the arrival temperature is within 2 degrees C of the required temperature or the method specified range. For samples with a temperature requirement of 4 degrees C, an arrival temperature from 0 degrees C to 6 degrees C meets specifications. Samples that are delivered to the laboratory on the same day that they are collected may not meet these criteria. In these cases, the samples are considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

The reported results were obtained in compliance with the 2003 NELAC standards unless otherwise noted.

Approved By:

Marvin D. Heskett III
Laboratory Director

NELAC Certification # E87907

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0090		Received:	06/17/10
737 Bishop st., Suite 3010				Reported:	06/30/10 17:47
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)			
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301			

Sample Summary

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
B17-4-6-SM	HTF0090-01	Solid/Soil	06/17/10 10:01	06/17/10 11:46	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order:	HTF0090	Received:	06/17/10
737 Bishop st., Suite 3010			Reported:	06/30/10 17:47
Honolulu, HI 96813	Project:	Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number:	Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	Rpt Limit	Dil	Date Analyzed	Prep Date	Seq/ Batch	Method
Sample ID: HTF0090-01 (B17-4-6-SM - Solid/Soil)				**Sampled: 06/17/10 10:01**			**Recvd: 06/17/10 11:46**		
General Chemistry Parameters									
% Moisture	**23.7**		Weight %	0.100	1	06/23/10 09:00	06/21/10	10F0126	SM 2540G
Sample ID: HTF0090-01RE1 (B17-4-6-SM - Solid/Soil)				**Sampled: 06/17/10 10:01**			**Recvd: 06/17/10 11:46**		
General Chemistry Parameters									
% Moisture	**18.9**		"	0.100	"	"	"	"	"
Sample ID: HTF0090-01RE2 (B17-4-6-SM - Solid/Soil)				**Sampled: 06/17/10 10:01**			**Recvd: 06/17/10 11:46**		
General Chemistry Parameters									
% Moisture	**19.3**		"	0.100	"	"	"	"	"
Sample ID: HTF0090-01RE3 (B17-4-6-SM - Solid/Soil)				**Sampled: 06/17/10 10:01**			**Recvd: 06/17/10 11:46**		
General Chemistry Parameters									
% Moisture	**22.7**		"	0.100	"	"	"	"	"

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0090	Received:	06/17/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:47
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

SAMPLE EXTRACTION DATA

Parameter	Batch	Lab Number	Wt/Vol Extracted	Default Wt/Vol	Extracted Vol	Default Vol	Date	Analyst	Extraction Method

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0090	Received:	06/17/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:47
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY BLANK QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	Dup Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
General Chemistry Parameters													
Batch\Seq: 10F0126 Extracted: 06/21/10													
Blank Analyzed: 06/22/2010 (10F0126-BLK1)													
% Moisture			Weight %	N/A	0.100	ND							

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

99-193 Aiea Heights Drive, Suite 121 Aiea, HI 96701 * 808-486-5227 * Fax 808-486-2456

Tetra Tech EM Inc.	Work Order: HTF0090	Received:	06/17/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:47
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

LABORATORY DUPLICATE QC DATA

Analyte	Source Result	Spike Level	Units	MDL	MRL	Result	% REC	Dup %REC	% REC Limits	RPD	RPD Limit	Q
General Chemistry Parameters												
Batch\Seq: 10F0126 Extracted: 06/21/10												
Duplicate Analyzed: 06/23/2010 (10F0126-DUP1)				**QC Source Sample: HTF0087-01**								
% Moisture	81.6		Weight %	N/A	0.100	81.9				1	20	

Tetra Tech EM Inc.	Work Order: HTF0090	Received:	06/17/10
737 Bishop st., Suite 3010		Reported:	06/30/10 17:47
Honolulu, HI 96813	Project: Subsurface Soil Investigation (MIS-VOCs)		
Scott Duzan	Project Number: Hickam AFB CG110 ISM VOC Study, 103DS148843.H0301		

CERTIFICATION SUMMARY

TestAmerica Honolulu

Method	Matrix	Nelac	Hawaii
SM 2540G	Solid/Soil		

For information concerning certifications of this facility or another TestAmerica facility, please visit our website at www.TestAmericaInc.com

DATA QUALIFIERS AND DEFINITIONS

ND Not detected at the reporting limit (or method detection limit if shown)

ADDITIONAL COMMENTS

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

rev1b

Honolulu
99-193 Aiea Heights Drive Suite 121 • Aiea, HI 96701-3900
808-486-LABS (5227) • Fax 808-486-2456

LABORATORY U[illegible] NLY
LAB JOB NO. HTF0090
LOCATION
CONTAINERS

Chain of Custody / Analysis Request Form

Report to: Scott Duzan, scott.duzan@tetratech.com
Company name: Tetra Tech EMI
Address: 737 Bishop Street, Suite 3010
City: Honolulu State: HI ZIP: 96813
Phone: 808.441.6645 Fax
Sampler: SD # samples in shipment 1

Project identification
Job name: Hickam AFB CG110 ISM VOC Study
Job number: 103DS148843.H0301
Contact email address: scott.duzan@tetratech.com

Indicate analyses requested

Item no.	Client sample ID	MIS	GRAB	Water	Soil	Wastewater	Drinking water	Sludge	Liquid	Solid	Oil	Other	Preservation method	Sampling Date	Sampling Time	No. of containers	8260B-SIM	Vadose Zone Moisture Content	Saturated Zone Moisture Content	Grain Size	Total Organic Carbon					Laboratory ID no. HTF0090-01
1	B17-4-6-SM	X			X								NA	6/17/16	10:01	4		X								*See Sec 5.6 of SAP
2		X			X								NA													
3		X			X								NA													
4		X			X								NA													
5		X			X								NA													
6		X			X								NA													
7		X			X								NA													
8		X			X								NA													
9		X			X								NA													
10		X			X								NA													6/17/16

Released by (print / sign)	Date / time released	Delivery method	Received by (print / sign)	Company / Agency affiliation	Date / time received	Condition noted
~~Scott Duzan~~	~~/~~	~~Hand~~		TestAmerica	/	
[signature] ROSILAND SELBACH	6/17/16 / 11:46	Hand	[signature]	TA [signature]	6/17/16 / 1146	[illegible] 42
	/				/	

Comments: 8260B-SIM: Only analyze for TCE; cis-DCE; trans-DCE; and Vinyl chloride

See Sec 5.6 of SAP for soil moisture protocols.

Please check one:
☒ Dispose by lab
☐ Return to client
☐ Archive

COC REV 04/2008 Distribution: White - TestAmerica Yellow - TestAmerica Pink - Client

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Receipt Checklist

Client Name: Tetra Tech **Date/ Time Received:** 6/17/10 1146

Checklist Completed By: JL **Received By:** JL

Matrices: Soil **Carrier:** Client **Airbill# :**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Chain of Custody present?	Yes ☑	No ☐	☐
Chain of Custody Signed when relinquished and received?	Yes ☑	No ☐	
Chain of Custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sample containers on ice?	Yes ☑	No ☐	Type: Wet
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Water - VOA Vials have Zero Headspace?	Yes ☐	No ☐	No VOA vials present: ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Checked: ☑
pH Adjusted?	Yes ☐	No ☑	Final pH:
Encores / 5035 Vials Present?	Yes ☐	No ☑	
Sample Filtration Needed?	Yes ☐	No ☑	Filtered in Field: ☐
Dry Weight Corrected Results?	Yes ☑	No ☐	Take Action: ☐
DODQSM / QAPP Project?	Yes ☐	No ☐	Type:

Temperature Blank Present? Yes ☑ ~~No ☑~~ 6/17/10

Sample Container/Blank Temperature Range (Minimum 3 sample containers if available): 4 °C

Comments/ Sampling Handling Notes:

Logbook No.: IN-2010-14
Oven: Oven 2
Scale: SAR1

TestAmerica

% Solids/% Moisture Determination

Method: SW 2540G
MRL: 0.10%
Analyst: JM

Time Recording of crucible drying prior to analysis:
Date / Time on: 6/15/10 1000
Oven Temp °C: 105
Date / Time off: 6/15/10 1220
Oven Temp °C: 105

	Sample ID/Crucible #			Dry Crucible Weight (g) (after drying in oven 2-3 hrs and cooling)	Wet residue weight (placed in crucible) (g)	Dry Residue weight + Dry Crucible Weight (g) No. 1	Dry Residue weight + Dry Crucible Weight (g) No. 2
					Analyst: JM	Analyst: JM	Analyst: JM
					Date on: 6/21/10	Date off: 6/22/10	Date off: 6/23/10
					Time on: 1630	Time off: 1000	Time off: 0900
					Oven temp °C: 105	Oven temp °C: 105	Oven temp °C: 105
		70	BLK	1.0226	0	1.0224	
1	HTF0069-25A	1	OS	4.2845	~~98.6734~~ 80.4578 JM 6/22/10	64.6814	64.6359
	HTF0073-07A	2	~~DUP~~ JM 6/22/10	4.2390	88.8012	80.1356	80.1024
2	HTF0073-08A	3		4.1662	133.1632	105.2124	105.1783
3	HTF0073-09A	4		~~4.1668~~ JM 6/12/10 4.1700	122.0315	89.4516	89.3832
4	HTF0073-10A	5		4.0728	115.3568	83.5655	83.5241
5	HTF0073-11A	6		4.1979	86.3714	63.0111	62.9832
6	HTF0073-12A	7		4.2582	65.0130	50.0909	50.0814
7	HTF0073-13A	8		4.2050	73.9664	58.6704	58.6384
8	HTF0073-14A	9		4.1795	97.2537	64.8841	64.9971
9	HTF0073-15A	10		4.1646	56.7775	51.1559	51.1466
10	HTF0073-16A	11		4.1006	72.7859	60.9642	60.9796
11	HTF0073-17A	12		4.2154	81.9252	63.7416	63.7237
12	HTF0073-18A	13		4.0625	64.0194	48.2427	48.2300
13	HTF0073-19A	14		4.0689	75.4341	58.8964	58.9176
14	HTF0073-20A	15		4.0765	64.0930	52.3750	52.4916
15	HTF0073-21A	16		4.2137	65.2210	55.6741	55.6119
16	HTF0073-22A	17		4.1866	94.8383	70.3729	70.4217
17	HTF0090-01A	18		4.2176	62.7059	52.0478	52.0895
18	HTF0094-01A	19		4.1975	53.2058	48.3933	48.3698
19							
20							

Reviewed by: [signature]

Date: 06/24/10

Continued on next page...

2 column not needed if overnight analysis was performed

... continued from previous page

Logbook No.: IN-2010-14
Oven: Oven 2
Scale: SAR1

TestAmerica

% Solids/% Moisture Determination

Method: SW 2540G
MRL: 0.10%
Analyst: JM

Time Recording of crucible drying prior to analysis:
Date / Time on: 6/15/10 1000
Oven Temp °C: 105
Date / Time off: 6/15/10 1220
Oven Temp °C: 105

	Sample ID/Crucible #	Dry Crucible Weight (g) (after drying in oven 2- 3 hrs and cooling)	Wet residue weight (placed in crucible) (g)	Dry Residue weight + Dry Crucible Weight (g) No. 1	Dry Residue weight + Dry Crucible Weight (g) No. 2
			Analyst: JM	Analyst: JM	Analyst: JM
			Date on: 6/21/10	Date off: 6/22/10	Date off: 6/23/10
			Time on: 1630	Time off: 1000	Time off: 0900
			Oven temp °C: 105	Oven temp °C: 105	Oven temp °C: 105
	HTF0069-25RE1 23 ~~BLK~~ JM 6/21/10	1.0164	5.5277	5.1828	5.1801
1	HTF0069-25RE2 80 ~~OS~~	0.9937	5.5471	5.0698	4.9986
	HTF0069-25RE3 84 ~~DUP~~	1.0103	6.7920	5.8150	5.8286
2					
3	HTF0073-07 RE1 48	1.0187	5.6791	5.9128	5.9131
4	HTF0073-07 RE2 43	1.0265	5.1413	5.3128	5.3137
5	HTF0073-07 RE3 42	1.0284	5.8479	5.8725	5.8732
6					
7	HTF0073-15 RE1 64	1.0552	5.7686	5.7905	5.7977
8	HTF0073-15 RE2 41	1.0309	5.1588	5.3345	5.3397
9	HTF0073-15 RE3 24	1.0160	5.0996	5.2546	5.2588
10					
11	HTF0090-01 RE1 44	1.0106	5.5719	5.5193	5.5286
12	HTF0090-01 RE2 66	0.9993	5.6640	5.5068	JM 6/23/10 5.5698
13	HTF0090-01 RE3 45	1.0268	5.6034	5.3579	5.3572
14					
15	HTF0094-01 RE1 38	0.9997	5.8433	5.8161	5.8347
16	HTF0094-01 RE2 1	1.0235	6.0713	5.9055	5.8999
17	HTF0094-01 RE3 47	1.0227	5.5194	5.6742	5.6693
18					
19	HTF0087-01 A 46	1.0200	5.8669	2.1023	
20	HTF0087-01 A 40 DUP	0.9784	5.5372	1.9789	

Reviewed by: WM

Date: 06/24/10 JM 6/24/10

2 column not needed if overnight analysis was performed

10F0126

TestAmerica
MOISTURE DETERMINATION

Analyst: JM Date: 6/21/2010 Instrument: SAR1

	Sample ID	Dry Crucible Weight (g)	Wet Residue Weight (g)	Dry Residue + Crucible Weight (g)	Dry Residue Weight (g)	Moisture Results (%)
	BLK	1.0226		1.0224	-0.0002	**#DIV/0!**
1	HTF0069-25	4.2845	80.4578	64.6359	60.3514	**24.990%**
2	HTF0073-07	4.2390	88.8012	80.1024	75.8634	**14.569%**
3	HTF0073-08	4.1662	133.1632	105.1783	101.0121	**24.144%**
4	HTF0073-09	4.1700	122.0315	89.3832	85.2132	**30.171%**
5	HTF0073-10	4.0728	115.3568	83.5241	79.4513	**31.126%**
6	HTF0073-11	4.1979	86.3714	62.9832	58.7853	**31.939%**
7	HTF0073-12	4.2582	65.0130	50.0814	45.8232	**29.517%**
8	HTF0073-13	4.2050	73.9664	58.6384	54.4334	**26.408%**
9	HTF0073-14	4.1795	97.2537	64.9971	60.8176	**37.465%**
10	HTF0073-15	4.1646	56.7775	51.1466	46.9820	**17.252%**
11	HTF0073-16	4.1006	72.7859	60.9796	56.8790	**21.854%**
12	HTF0073-17	4.2154	81.9252	63.7237	59.5083	**27.363%**
13	HTF0073-18	4.0625	64.0194	48.2300	44.1675	**31.009%**
14	HTF0073-19	4.0689	75.4341	58.9176	54.8487	**27.289%**
15	HTF0073-20	4.0765	64.0930	52.4916	48.4151	**24.461%**
16	HTF0073-21	4.2137	65.2210	55.6119	51.3982	**21.194%**
17	HTF0073-22	4.1866	94.8383	70.4217	66.2351	**30.160%**
18	HTF0090-01	4.2176	62.7059	52.0895	47.8719	**23.656%**
19	HTF0094-01	4.1975	53.2058	48.3698	44.1723	**16.978%**

REFERENCE: PG.#10 IN % SOLIDS/MOISTURE DETERMINATION LOG BOOK IN-2010-14

Manual check: Dry residue wt. (g)= [Dry residue + crucible wt. (g)]-[crucible wt. (g)]

%Moisture= [Wet residue wt.(g) - Dry residue wt.(g)] X100%

Wet residue wt.(g)

Sample ID: HTF0094-01 Dry residue wt. (g)= 48.3698 ~~53.2058~~ JM 6/24/10 − 4.1975 = 44.1723

%Moisture= $\frac{53.2058 - 44.1723}{53.2058} \times 100\%$

= 16.98% ✓

printed 6/23/2010 062110PMOIST.xls

10F0126

TestAmerica
MOISTURE DETERMINATION

Analyst: JM Date: 6/21/2010 Instrument: SAR1

	Sample ID	Dry Crucible Weight (g)	Wet Residue Weight (g)	Dry Residue + Crucible Weight (g)	Dry Residue Weight (g)	Moisture Results (%)
1	HTF0069-25RE1	1.0164	5.5277	5.1801	4.1637	**24.676%**
	HTF0069-25RE2	0.9937	5.5471	4.9988	4.0051	**27.798%**
	HTF0069-25RE3	1.0103	6.7920	5.8286	4.8183	**29.059%**
					Average:	**27.178%**
2	HTF0073-07RE1	1.0187	5.6791	5.9131	4.8944	**13.817%**
	HTF0073-07RE2	1.0265	5.1413	5.3137	4.2872	**16.613%**
	HTF0073-07RE3	1.0284	5.8479	5.8732	4.8448	**17.153%**
					Average:	**15.861%**
10	HTF0073-15RE1	1.0552	5.7686	5.7977	4.7425	**17.788%**
	HTF0073-15RE2	1.0309	5.1588	5.3397	4.3088	**16.477%**
	HTF0073-15RE3	1.0160	5.0996	5.2588	4.2428	**16.801%**
					Average:	**17.022%**
18	HTF0090-01RE1	1.0106	5.5719	5.5286	4.5180	**18.915%**
	HTF0090-01RE2	0.9993	5.6640	5.5698	4.5705	**19.306%**
	HTF0090-01RE3	1.0268	5.6034	5.3572	4.3304	**22.718%**
					Average:	**20.313%**
19	HTF0094-01RE1	0.9997	5.8433	5.8347	4.8350	**17.256%**
	HTF0094-01RE2	1.0235	6.0713	5.8999	4.8764	**19.681%**
	HTF0094-01RE3	1.0227	5.5194	5.6693	4.6466	**15.813%**
					Average:	**17.583%**

REFERENCE: PG.#11 IN % SOLIDS/MOISTURE DETERMINATION LOG BOOK IN-2010-14

Manual check: Dry residue wt. (g)= [Dry residue + crucible wt. (g)]-[crucible wt. (g)]

$$\%Moisture = \frac{[\text{Wet residue wt.(g)} - \text{Dry residue wt.(g)}]}{\text{Wet residue wt.(g)}} \times 100\%$$

Sample ID: ________ Dry residue wt. (g)= 5.6693 − 1.0227 = 4.6466

$$\%Moisture = \frac{5.5194 - 4.6466}{5.5194} \times 100$$

= 15.81%

printed 6/23/2010 062110PMOIST RE.xls

10F0126

TestAmerica
MOISTURE DETERMINATION

Analyst: JM   Date: 6/21/2010   Instrument: MET1

Sample ID	Dry Crucible Weight (g)	Wet Residue Weight (g)	Dry Residue + Crucible Weight (g)	Dry Residue Weight (g)	Moisture Results (%)
BLK	1.0226		1.0224	-0.0002	**#DIV/0!**
HTF0087-01A ~~HTF0008-01B~~ OS	1.0200	5.8669	2.1023	1.0823	**81.552%**
HTF0087-01A ~~HTF0008-01B~~ D	0.9784	5.5372	1.9789	1.0005	**81.931%**

JM 6/24/10 1

REFERENCE: PG.#11 IN % SOLIDS DETERMINATION LOG BOOK IN-2010-14

Manual check: Dry residue wt. (g)= [Dry residue + crucible wt. (g)]-[crucible wt. (g)]

%Moisture= $\frac{\text{[Wet residue wt.(g) - Dry residue wt.(g)]}}{\text{Wet residue wt.(g)}}$ X100%

Sample ID: HTF0087-01 Dry residue wt. (g)= 1.9789 - 0.9784 = 1.0005

%Moisture= $\frac{5.5372 - 1.0005}{5.5372} \times 100\%$

= 81.93%

10F0126

printed 6/24/2010   062110PMOIST B

PREPARATION BENCH SHEET

10F0126

TestAmerica Honolulu

'rinted: 6/24/2010 2:14:29PM

Matrix: Solid/Soil **Prepared using: WetChem - Default Prep GenChem** **(No Surrogate)**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
10F0126-BLK1	QC	06/21/10 16:30	5	5						
10F0126-DUP1	QC	06/21/10 16:30	5	5		HTF0087-01				
HTF0069-25	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	VZ large rock in
HTF0069-25RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	VZ Main portion
HTF0069-25RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	VZ
HTF0069-25RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	VZ
HTF0073-07	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz
HTF0073-07RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz
HTF0073-07RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz
HTF0073-07RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz
HTF0073-08	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-09	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-10	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-11	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-12	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-13	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-14	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-15	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz One large piece of
HTF0073-15RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz Coral in main portion
HTF0073-15RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz
HTF0073-15RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz
HTF0073-16	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-17	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat

Spiking Witnessed By ____ Date ____

Preparation Reviewed By JM Date 6/24/10

Extracts Received By ____ Date ____

PREPARATION BENCH SHEET

10F0126

TestAmerica Honolulu

'rinted: 6/24/2010 2:14:29PM

Matrix: Solid/Soil

Prepared using: WetChem - Default Prep GenChem

(No Surrogate)

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
HTF0073-18	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-19	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-20	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-21	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0073-22	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	sat
HTF0087-01	Moisture (%)	06/21/10 16:30	5	5					ewit Pacific Co. (Rail Proj	
HTF0090-01	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz Two large rocks
HTF0090-01RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz present in main portion
HTF0090-01RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz
HTF0090-01RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	vz
HTF0094-01	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	VZ
HTF0094-01RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	VZ
HTF0094-01RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	VZ
HTF0094-01RE	Moisture (%)	06/21/10 16:30	5	5					Tetra Tech EM Inc.	VZ

Spiking Witnessed By _______ Date _______

Preparation Reviewed By JM Date 6/24/10

Extracts Received By _______ Date _______