

**DRAFT**

# AIR SAMPLING AND VAPOR INTRUSION TIER RESPONSE EVALUATION REPORT

Former Naval Air Station Moffett Field, Moffett Field, California



**Base Realignment and Closure  
Program Management Office West  
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**October 23, 2012**

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**Prepared for:  
U.S. DEPARTMENT OF THE NAVY**

***REVIEW AND APPROVAL***

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## **ACRONYMS AND ABBREVIATIONS**

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%R	percent recovery
µg/m <sup>3</sup>	microgram(s) per cubic meter
µg/L	microgram(s) per liter
AC	air conditioning
AM8AJV	Accord MACTEC 8A Joint Venture
Ames	Ames Research Center
BRAC	Base Realignment and Closure
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
DCA	dichloroethane
DCE	dichloroethene
DCN	document control number
DoD ELAP	U.S. Department of Defense Environmental Laboratory Accreditation Program
DSITMS	direct sample ion-trap mass spectrometer
EC	engineering control
Final Work Plan	<i>Air Sampling Work Plan for Vapor Intrusion Tier Response Evaluation, Former Naval Air Station Moffett Field (AM8AJV 2012)</i>
HP	horsepower
EPA	United States Environmental Protection Agency
HVAC	heating, ventilation, and air conditioning
IC	institutional control
MEW	Middlefield-Ellis-Whisman
MEW Site	MEW Superfund Study Area
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
Navy	U.S. Department of the Navy
Navy Area	Navy Vapor Intrusion Area of Responsibility
NELAP	National Environmental Laboratory Accreditation Program

## **ACRONYMS AND ABBREVIATIONS (CONTINUED)**

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PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
PCE	perchloroethene
PID	photoionization detector
ppb	part(s) per billion
QA	quality assurance
QC	quality control
ROD	Record of Decision
ROD Amendment	<i>Record of Decision Amendment of the Vapor Intrusion Pathway, Middlefield-Ellis-Whisman (MEW) Superfund Study Area, Mountain View and Moffett Field, California (EPA 2010)</i>
ROICC	Resident Officer in Charge of Construction
RPD	relative percent difference
SCAPS	Site Characterization Analysis Penetrometer System
SF	square foot
SIM	Selected Ion Monitoring
Summary Report	<i>Air Sampling and Vapor Intrusion Tier Response Evaluation Report</i>
TCE	trichloroethene
VOC	volatile organic compound
Water Board	California Regional Water Quality Control Board, San Francisco Bay Region
WATS	West-Side Aquifer Treatment System

## **EXECUTIVE SUMMARY**

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Accord MACTEC 8A Joint Venture (AM8AJV), comprised of Accord Engineering, Inc., and AMEC Environment & Infrastructure, Inc. (formerly MACTEC Engineering and Consulting, Inc.), has prepared this *Air Sampling and Vapor Intrusion Tier Response Evaluation Report* (Summary Report) for the United States Department of the Navy's (Navy's) Vapor Intrusion Area of Responsibility (Navy Area) at the former Naval Air Station (NAS) Moffett Field, California. The work was performed for the Navy Base Realignment and Closure Program Management Office West under Contract Number N62473-10-D-0814, Task Order Number 0010. This Summary Report documents air sampling events conducted during the performance of this task order and evaluates the buildings using the tiering system pursuant to an agreement between the Navy, the United States Environmental Protection Agency (EPA), and the California Regional Water Quality Control Board, San Francisco Bay Region (Water Board) for the Navy to implement the vapor intrusion remedy in the Navy Area.

### **Background**

Moffett Field is located at the northern end of the Santa Clara Valley Basin, approximately 1 mile south of San Francisco Bay. NAS Moffett Field is a National Priorities List site (EPA ID: CA2170090078). Groundwater at the Middlefield-Ellis-Whisman (MEW) Superfund Study Area (MEW Site) has been contaminated with volatile organic compounds (VOCs), primarily the solvent trichloroethene (TCE). Portions of the former NAS Moffett Field are owned and operated by the National Aeronautics and Space Administration (NASA) Ames Research Center (Ames). The Navy is responsible for implementing a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-mandated vapor intrusion remedy within the area of the MEW Site on Moffett Field that is impacted by Navy sources (Navy Area). The Navy Area is within the Vapor Intrusion Study Area on Moffett Field, and the Vapor Intrusion Study Area is generally defined as the area where TCE concentrations in shallow groundwater are greater than 5 micrograms per liter ( $\mu\text{g/L}$ ), or parts per billion (ppb). Potential sources of groundwater contamination by chlorinated solvents in the Navy Area included a former dry cleaning facility and former manufacturing facilities south of Moffett Field. In 1994, the Navy removed the on base contaminant sources, tank, sumps, and impacted soil and then began groundwater extraction and treatment.

In August 2010, EPA (2010) amended the MEW Site 1989 Record of Decision (ROD) to select a remedy for the vapor intrusion pathway to prevent subsurface volatile contaminants in groundwater from migrating into indoor air or accumulating in enclosed building spaces at levels exceeding its indoor air cleanup criteria for long-term exposure for residential and commercial buildings (ROD Amendment). The ROD Amendment provides a tiering system to determine the appropriate response action for each building/property within the Vapor Intrusion Study Area. The tiering system for existing buildings is based on indoor air sampling with or without engineering controls (ECs) in place and other lines of evidence.

Based on the results of groundwater and air sampling results collected since 2002 for both commercial and residential areas (as provided in Table 1 and Table 2 of the ROD Amendment), TCE is the primary chemical of concern (COC) for the vapor intrusion pathway along with perchloroethene (PCE), cis- and trans-1,2-dichloroethene (DCE), vinyl chloride, 1,1-

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dichloroethane (DCA), and 1,1-DCE. Vapors from the COCs are dissolved in groundwater and have been detected in some buildings overlying the shallow groundwater.

### **Air Sampling Activities**

Building surveys were conducted on November 14, 2011, to identify each building's structural condition, observe the ventilation system layout and use by the building occupants, observe operational procedures in laboratory and maintenance areas, and gather information about building use schedules. Prior to conducting the surveys, information on basic heating, ventilation, and air conditioning (HVAC) systems and chemical use and storage were collected from NASA Facilities Division. On April 24–25, 2012, the buildings were revisited to observe modifications that had been made to HVAC systems since the original building surveys. The building survey results were used to select potential sampling locations within each building for the indoor air sampling work plan.

To determine the appropriate tier and corresponding response action for the nonresidential buildings within the Navy Area, a vapor intrusion investigation was conducted consisting of indoor air sampling and background air sampling and analysis of COCs by EPA Method TO-15 SIM. All field activities, including sample collection, were conducted from May 18–28, 2012, and on June 12, 2012. The work involved the collection of indoor air samples from 23 buildings and outdoor air samples at Moffett Field as per the *Final Air Sampling Work Plan for Vapor Intrusion Tier Response Evaluation, Former Naval Air Station Moffett Field, California* (AM8AJV 2012). Samples were collected in the breathing zone of work areas (office areas, meeting rooms, and high-traffic areas such as hallways), at potential vapor intrusion pathways (foundation cracks, expansion joints, crawl spaces, drains, and pipe inlets), and in ambient outdoor air. Grab samples were collected in elevator shafts (ventilation pathways between floors). In selecting sample locations, priority was given to basement and first-floor work areas, followed by potential pathways, then second- through fourth-floor work areas. In buildings with HVAC systems, indoor air samples were collected during normal work hours with the HVAC system operating and at the end of a three-day holiday weekend after the HVAC system had been shut down for 36 to 48 hours. The sample duration for the indoor air samples was either 8, 10, or 24 hours depending on the length of daily occupancy in each building. Grab samples were collected over 1 minute.

A total of 255 indoor air samples (including duplicates) were collected from 131 locations within the 23 buildings. Indoor air and ambient outdoor air samples were collected using 6-liter canisters, each equipped with a fixed-rate flow controller and a particulate filter. The number of sample locations per building varied from 2 in Building 76 to 47 in Building 239.

A total of 29 outdoor air samples were collected to provide information on ambient background air and air concentrations near outdoor air ventilation system intakes, where possible. Outdoor ambient air samples were collected outside the building, including near the air ventilation system air intake, for comparison to indoor air to evaluate the potential contribution of VOCs from outdoor air to indoor air. The outdoor air samples were collected concurrent with the indoor air samples, except the sample duration for the outdoor air samples was 24 hours.

## ***EXECUTIVE SUMMARY (CONTINUED)***

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### **Air Sampling Results**

A total of 287 air samples, including indoor and outdoor air samples, were collected from May 18–28, 2012, and on June 12, 2012 to evaluate the vapor intrusion pathways in 23 fully or partially occupied buildings at Moffett Field, where partially occupied infers that only a part of a building is occupied or utilized. Indoor and outdoor air samples were analyzed by a U.S. Department of Defense Environmental Laboratory Accreditation Program– and National Environmental Laboratory Accreditation Program–certified analytical laboratory using EPA Method TO-15 SIM for the COCs (TCE, PCE, vinyl chloride, 1,1-DCE, 1,1-DCA, cis-1,2-DCE, and trans-1,2-DCE) and results were reported in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ).

Of the 23 buildings sampled, only two buildings (10 and 126) had samples from work areas with concentrations exceeding the commercial use air cleanup levels in the ROD Amendment. For Building 10, samples from work areas ranged in concentrations from 4 to 26  $\mu\text{g}/\text{m}^3$  for TCE and from 1.2 to 19  $\mu\text{g}/\text{m}^3$  for PCE. Results for Building 10 samples from the access to the utility corridor tunnel to Hangar 1 exceeded cleanup levels with the following ranges:

- 1,1-DCA: 24 to 28  $\mu\text{g}/\text{m}^3$  (cleanup level – 6  $\mu\text{g}/\text{m}^3$ );
- cis-1,2-DCE: 270 to 310  $\mu\text{g}/\text{m}^3$  (cleanup level – 210  $\mu\text{g}/\text{m}^3$ );
- TCE: 820 to 960  $\mu\text{g}/\text{m}^3$  (cleanup level – 5  $\mu\text{g}/\text{m}^3$ );
- PCE: 650 to 770  $\mu\text{g}/\text{m}^3$  (cleanup level – 2  $\mu\text{g}/\text{m}^3$ ).

For Building 126, only PCE exceeded the cleanup level in work area samples, with concentrations ranging from 1.9 to 4.4  $\mu\text{g}/\text{m}^3$ .

Buildings 3, 12, N210, and N239A had samples from a single location in each building that exceeded TCE indoor commercial cleanup levels. These samples were pathway samples which are non-work area samples and include crawlspaces, hallways, utility rooms, conduit penetrations, etc. In Building 3, TCE was detected in concentrations exceeding the cleanup level, ranging from 7.6 to 7.9  $\mu\text{g}/\text{m}^3$  for pathway samples that were collected from a utility conduit to the crawl space that underlies the floor in Room 105A. In Building 12, TCE was detected exceeding the cleanup level at a concentration of 6.1  $\mu\text{g}/\text{m}^3$  for a crawl space sample collected under Room 110. These samples exceeding the cleanup level for TCE from Buildings 3 and 12 were collected with the HVAC systems on; however, all results were below the cleanup level for samples collected from the same locations in Buildings 3 and 12 with the HVAC systems off.

In Building N210, TCE was detected exceeding the cleanup level at a concentration of 17  $\mu\text{g}/\text{m}^3$  in a sample from the space beneath the raised floor in the work area near cubicles 019 and 021 in Room 145. A vapor extraction system is used to capture these vapors under normal building operations; the vapor extraction system was turned off for at least 24 hours prior to collection of the sample.

## ***EXECUTIVE SUMMARY (CONTINUED)***

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In Building N239A, TCE was detected exceeding the cleanup level at a concentration of 6.8  $\mu\text{g}/\text{m}^3$  for a sample collected in hallway C102 with the HVAC system off. The TCE result for the sample collected from this location with the HVAC system operating was below the cleanup level. This location is adjacent to two utility rooms and a door to outside the building.

### **Response Action Tiering System Evaluation**

Using the indoor air sampling results and Tables 6A and 6B of the ROD Amendment, the buildings were tiered to determine the need for a response action in accordance with EPA's Response Action Tiering System. Indoor air quality for COCs was compared to the ROD Amendment cleanup levels and to ambient outdoor air with consideration of whether or not an air quality EC is in place and operating correctly. Of the 23 buildings evaluated, only Buildings 10 and Building 126 were classified as Tier 1, which would mandate that an appropriate EC be implemented as a remedy to meet indoor air cleanup levels. After the sampling event, an interim measure was installed for Building 10 that changed the ranking to Tier 2. Building N210 is classified as Tier 2 as it has a required engineering control. All other buildings were classified as Tier 3A (17 buildings) or Tier 3B (3 buildings) due to indoor air concentrations meeting indoor air cleanup levels in work areas.

### **Recommendations and Planned Actions**

Interim mitigation measures can be used for buildings that had one or more samples with concentrations exceeding the air cleanup levels.

Interim mitigation measures that can be used in Building 3 include sealing conduits in Room 105A that penetrate the floors and installing ventilation systems. Passive venting of the crawl space will be considered as a long-term remedy. After the interim mitigation measures are in place for Building 3, additional data near the conduits can be collected in Room 105A to confirm the effectiveness of the mitigation measures as well as characterize the nearby areas in Building 3 for confirming the tier classification.

There is a subsurface utility tunnel that runs from Building 10 to Hangar 1. A primary vapor intrusion pathway into Building 10 is by vapors entering the tunnel and migrating into Building 10. At EPA's request, NASA installed a blower system in early May at the tunnel access in Building 10 as an interim measure to control vapors. The sampling event conducted by the Navy on May 18 in Building 10 after the blower system installation reported PCE and TCE above cleanup levels in Building 10 near the tunnel entrance. Due to the continued high COC levels, the Navy installed a cutoff wall and blower in the tunnel at a vault access located approximately 300 feet east of Building 10 on July 11–12, 2012, as a part of the interim action.

Air monitoring conducted in Building 10 on July 18 and August 9, 2012, after implementing the interim action vapor control shows that the interim action successfully reduced VOC concentrations in work areas at Building 10 to below cleanup levels. The Navy will maintain the interim measures while the building is in use and until a final remedy is implemented for Building 10. The Navy will be monitoring indoor air quarterly (every 3 months) at Building 10, including in the utility corridor tunnel access area, as long as the current interim measure is in

## ***EXECUTIVE SUMMARY (CONTINUED)***

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place. A reduction in monitoring frequency will be recommended if quarterly monitoring results are consistently below cleanup levels. Other remedial measures will be evaluated for a long-term remedy.

Interim mitigation measures that can be used in Building 12 include sealing conduits penetrating the floor slab above the crawl space and passive venting of the crawl space.

The Navy is conducting an investigation during October to December 2012 to further characterize the extent of PCE in groundwater in the area of Buildings 6 and 126. This investigation consists of two phases: 1) a direct push investigation using the Navy's Site Characterization Analysis Penetrometer System (SCAPS) outfitted with a membrane interface probe (MIP) and direct sample ion-trap mass spectrometer (DSITMS) to generate vertical profiles of relative VOC concentrations in the subsurface area, and 2) installation of up to 12 new monitoring wells. The Phase I SCAPS survey will be completed by the end of October 2012. Soils will be screened at several locations near Buildings 6 and 126 from ground surface to depths of up to 65 ft. below ground surface (bgs). The Phase II well installations are expected to be completed by the end of December. The first and second groundwater sampling events for the new wells are scheduled for late January 2013 and late April 2013. The investigation and monitoring results will be used to develop an in-situ groundwater treatment to remedy the PCE in groundwater in 2014. An indoor air monitoring program will be developed for Building 126. Building 6 is vacant and will be demolished.

Additional indoor air sampling is recommended in hallway C102 and in adjacent utility rooms U101 and U102 in Building N239A. Conduits through the floors in the utility rooms should be sealed.

Soil vapor samples from the perimeter of buildings, subslab samples, and/or shallow groundwater samples will be collected in the future from about and beneath buildings that are potentially outside the limits of the groundwater contaminant plume to provide additional lines of evidence to evaluate the feasibility of a Tier 4 (no further action) ranking for the Buildings 29, N243, and N243A.

### **Conclusions**

Of the 23 buildings evaluated, only Buildings 10, 126, and N210 were classified as Tier 1 or Tier 2 and need an appropriate EC implemented as a remedy to meet indoor air cleanup levels. Building N210 needs a final remedy developed and implemented so the HVAC system can be adjusted for better climate control during operation. The air quality exceedances at solitary locations in Buildings 3 and N239A are expected to be resolved after sealing of conduits and follow-up sampling.

All other buildings are classified as Tier 3A or Tier 3B as indoor air concentrations meet indoor air cleanup levels in work areas without an EC in place or operating. The response action required for buildings classified as Tier 3A will require the development and implementation of long-term monitoring as per the ROD Amendment. A total of 20 buildings (Buildings 2, 3, 10, 12, 13, 14, 15, 16, 29, 45, 107, 126, N210, N239, N239A, N243, N243A, 510, 555, and 567) were classified as either Tiers 1, 2, or 3A and will need long-term monitoring. No engineered

***EXECUTIVE SUMMARY (CONTINUED)***

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remedy or long-term monitoring is required for buildings classified as Tier 3B (Buildings 67, 76, and 566).

Additional lines of evidence, such as soil vapor samples from the perimeter of buildings, subslab samples, and shallow groundwater samples can be collected to supplement existing data for buildings in Tier 3B to evaluate the feasibility of reclassification to Tier 4 (no further action) by demonstrating there is no potential for vapor intrusion to cause indoor air to exceed indoor air cleanup levels and ambient/background levels.

## Section 1 Introduction

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Accord MACTEC 8A Joint Venture (AM8AJV), comprised of Accord Engineering, Inc., and AMEC Environment & Infrastructure, Inc. (formerly MACTEC Engineering and Consulting, Inc.), has prepared this *Air Sampling and Vapor Intrusion Tier Response Evaluation Report* (Summary Report) for the United States Department of the Navy's (Navy's) Vapor Intrusion Area of Responsibility (Navy Area) at the former Naval Air Station (NAS) Moffett Field, California. The work was performed for the Navy Base Realignment and Closure (BRAC) Program Management Office West under Contract Number N62473-10-D-0814, Task Order Number 0010.

Moffett Field is located at the northern end of the Santa Clara Valley Basin, approximately 1 mile south of San Francisco Bay (Figure 1). Groundwater at the Middlefield-Ellis-Whisman (MEW) Superfund Study Area (MEW Site) has been contaminated with volatile organic compounds (VOCs), primarily the solvent trichloroethene (TCE) (Figure 2). Portions of the former NAS Moffett Field are owned and operated by the National Aeronautics and Space Administration (NASA) Ames Research Center (Ames). The Navy is responsible for implementing a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-mandated vapor intrusion remedy within the area of the MEW Site on Moffett Field that is impacted by Navy sources (Navy Area). The Navy Area is shown on Figure 3.

In June 1989, the United States Environmental Protection Agency (EPA), Region 9, issued a Record of Decision (ROD) selecting the soil and groundwater cleanup remedy for the MEW Site. The groundwater cleanup remedy that has been implemented in the Navy Area includes extraction and treatment systems to clean up groundwater contamination. The California Regional Water Quality Control Board, San Francisco Bay Region (Water Board) provides oversight of Navy activities for the State of California at former NAS Moffett Field.

In August 2010, EPA (2010) amended the 1989 ROD to select a remedy for the vapor intrusion pathway to prevent subsurface contaminants from migrating into indoor air or accumulating in enclosed building spaces at levels exceeding its indoor air cleanup criteria for long-term exposure (ROD Amendment). As specified in the ROD Amendment, the Vapor Intrusion Study Area is defined as the area where TCE concentrations in shallow groundwater are greater than 5 micrograms per liter ( $\mu\text{g/L}$ ). The Navy is responsible for implementing the ROD Amendment within the Navy Area.

This Summary Report was prepared to document air sampling events conducted during the performance of this task order and to evaluate the buildings using the tiering system pursuant to an agreement between the Navy, EPA, and the Water Board for the Navy to implement the vapor intrusion remedy in the Navy Area.

### 1.1 Purpose

Some of the existing buildings in the Navy Area were not characterized sufficiently to apply the ROD Amendment Response Action Tiering System to determine the appropriate response actions. As a result, on EPA's request, the buildings were sampled in order to collect sufficient information for evaluation of the buildings using the tiering system. The appropriate response actions for existing buildings in the Navy Area are to be determined by evaluation of indoor-air

sampling results and other lines of evidence for each building, as specified in the ROD Amendment (EPA 2010).

The samples were collected from predetermined locations as per the *Final Air Sampling Work Plan for Vapor Intrusion Tier Response Evaluation* (Final Work Plan; AM8AJV 2012) based on building construction and use, previous indoor air sample results, previous mitigation actions, and additional information about the buildings including the design and operation of building ventilation systems, potential operational and maintenance sources for VOCs, and identified potential vapor intrusion pathways.

The purpose of this Summary Report is to present indoor air samples results for comparison to outdoor air quality and indoor air cleanup levels (as provided in Table 3 of the ROD Amendment) for use in placing the buildings in response action tiers as provided in the ROD Amendment. The Tier ranking determines the response action required for each building, using Tables 6A and 6B in the ROD Amendment.

## 1.2 Scope of Work

All buildings with a vapor intrusion pathway within the Navy Area that are in use or may be occupied in the future were included in the indoor air sampling program. Abandoned buildings that are scheduled for demolition were excluded. A list of the buildings that were sampled is provided in Table 1 and the building locations are shown on Figure 3.

The scope of work consisted of collecting and analyzing air samples and evaluating the buildings using the tiering system. Specific tasks included the following activities:

- Coordinating with NASA Ames to collect the basic heating, ventilation, and air conditioning (HVAC) system information for all buildings planned for sampling. Information provided by NASA on the HVAC systems of the buildings in the Navy Area is summarized in summary Table D-1 of Appendix D.
- Performing a walk-through survey of each building during the week of November 14, 2011, to identify each building's structural condition, observe the ventilation system layout and use by the building occupants, observe operational procedures in laboratory and maintenance areas, and gather information about building use schedules.
- Developing a work plan taking into consideration the sampling design and rationale of previous indoor air sample results (Science Applications International Corporation 2000; Harding ESE, Inc. 2001; Neptune 2005, 2006, 2008, and 2009), building construction and use, previous mitigation actions, and additional information about the buildings, including the design and operation of building ventilation systems, potential operational and maintenance sources for VOCs, and identified potential vapor intrusion pathways.
- Resurveying the buildings on April 24–25, 2012, to observe modifications that had been made to HVAC systems since the original building surveys, resolve building access issues, address concerns on operation of computer servers during the air sampling event, and finalize building sample locations.

- Coordinating with Columbia Analytical Services, Inc.'s Simi Valley, California, laboratory to ensure timely delivery of the sampling equipment at Moffett Field and for receipt and processing of the samples at the laboratory.
- Collecting air samples using 6-liter canisters, each equipped with a fixed-rate flow controller and a particulate filter. The sample canisters were placed 36 to 60 inches above the floor. A total of 255 indoor air samples (including duplicates) were collected from 131 locations within 23 buildings. A total of 29 outdoor air samples were also collected to provide information on ambient background air and air concentrations near outdoor air ventilation system intakes. Sampling was conducted between May 18 and June 12, 2012.
  - Buildings without an HVAC system were sampled for 8, 10, or 24 hours, depending on use and occupancy. Selected pathway samples were collected as grab samples. Buildings with an HVAC system that supplies outdoor air to a portion or all of a building were sampled twice: once during work hours with the HVAC system operating and once after the building ventilation system had been shut down for 36 to 48 hours. The sampling duration was 8 or 10 hours for buildings that only operate between roughly 7 a.m. to 6 p.m. The sampling duration was 24 hours for buildings that are unoccupied or may be occupied 24 hours/day.
  - Building 210 had a vapor collection system in operation beneath a raised floor in Room 145. An 8-hour sample was collected from within the crawl space beneath the raised floor after the vapor collection system had been shut down for at least 48 hours.
  - Selected ambient 24-hour outdoor air samples were collected during each indoor air sampling date.
- Having the air samples analyzed by a U.S. Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP) – and National Environmental Laboratory Accreditation Program (NELAP)–certified laboratory by EPA Method TO-15 SIM (Selected Ion Monitoring) for the chemicals of concern (COCs) that are listed in Table 3 as per the ROD Amendment (EPA 2010). These COCs are TCE, perchloroethene (PCE), cis- and trans-1,2-dichloroethene (DCE), vinyl chloride, 1,1-dichloroethane (DCA), and 1,1-DCE.
- Having a third-party validation quality assurance review conducted of the laboratory analytical results.
- Comparing the analytical results to the indoor air cleanup levels that are presented in Table 3 of the ROD Amendment (EPA 2010) and to ambient outdoor air concentrations.
- Evaluating the indoor air data using the Response Action Tiering System criteria as presented in Table 6A and 6B of the ROD Amendment (EPA 2010). Detailed operation and performance information was requested from NASA for the HVAC systems for buildings that had results that exceeded the indoor air cleanup levels.

- Identifying buildings that may require collection of additional information for vapor intrusion assessment (such as collection of subsurface soil vapor samples) either as a result of not being able to collect indoor air samples without the HVAC system operating or where buildings were classified as Tier 1 and NASA would not consider modification of the HVAC system to control vapor intrusion.
- Preparing this Summary Report to document sampling activities and provide the sampling results, laboratory reports, the tiering system evaluation and results, recommendations based on the results of the tiering system evaluation, and the available information on the HVAC systems for the Tier 1 buildings. This Summary Report includes the following additional information as listed in Administrative Order Docket Number 91-4A (EPA 2011).
  - Building conditions, occupancy and use conditions, summary of building/property-specific data, including identification of potential pathways for subsurface vapor intrusion
  - Evaluation of current indoor air ventilation system (e.g., HVAC) operations and building and property surveys as provided by NASA
  - Descriptions of any interim vapor intrusion mitigation measures taken at the buildings to date and the tasks being performed to monitor the ongoing effectiveness of the measures
  - Descriptions and summaries of all lines of evidence and specific data collected to determine response action tier
  - Maps of building/property layouts and actual sampling locations
  - Photographs of the sampling locations
  - Sampling and data collection results and summary of data
  - Laboratory analytical data
  - Proposed response action tier designation and, where necessary, identification of what additional information is needed to determine the response action tier
  - Quality assurance (QA)/quality control (QC) data and activities
  - Description of access requirements for the work that was performed, existing access conditions, and additional tasks necessary and scheduled to obtain access
  - Description and schedule if an existing engineered vapor intrusion control system will be utilized that may not require a Building/Property-Specific Remedial Design
  - Recommendations for collection of additional lines of evidence, interim measures, and proposed remedial response actions.

## Section 2 Site Background

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The Navy Area is within the Vapor Intrusion Study Area on Moffett Field (Figure 3). NAS Moffett Field is a National Priorities List site (EPA ID: CA2170090078). EPA is the lead regulatory agency responsible for directing the cleanup process under CERCLA and per a Federal Facility Agreement. The Water Board is the state lead agency.

### 2.1 History

The former NAS Moffett Field site was originally commissioned as NAS Sunnyvale in 1933. In 1935, the facility was transferred to the U.S. Army Air Corps. In 1939, Ames Aeronautical Laboratory obtained a permit to use a portion of the property. NAS Sunnyvale was returned to the Navy in 1942 and was renamed NAS Moffett Field. In 1991, the BRAC Commission designated NAS Moffett Field for decommissioning and transfer to NASA. On July 1, 1994, NAS Moffett Field was transferred to NASA Ames with the exception of the military housing. The military housing was assigned first to the U.S. Air Force and then to the U.S. Army. Part of the former air station was designated for a NASA Research Park (SES-Tech 2010; Haley & Aldrich 2011).

The NASA area is comprised of 213 acres that are planned for redevelopment as a collaborative research and educational campus, with associated facilities. The buildings are located on the original NASA Ames Campus and the NASA Research Park. Several buildings on Moffett Field are unoccupied and designated to be demolished. The occupied buildings are used primarily as office, research, or maintenance space (Haley & Aldrich 2011).

The MEW Site was brought into the Superfund program due to soil and groundwater contaminated with chlorinated solvents (primarily TCE). The MEW Site extends from approximately 1 mile south of U.S. Highway 101 along East Middlefield Road to within approximately 0.7 mile of the north end of former NAS Moffett Field (Figure 2). Source areas for the solvents have been identified on several former industrial properties located south of Highway 101 and in former Navy and NASA areas of operation. The Navy is responsible for groundwater cleanup from its sources and operates a groundwater cleanup facility west of Hangar 1 in the area of Installation Restoration Site 28, known as the West-Side Aquifer Treatment System (WATS) Area. The groundwater contamination in the WATS Area is commingled with similar contaminants from the regional groundwater plume.

Vapors from site COCs dissolved in groundwater have off-gassed and been detected in buildings overlying the shallow groundwater. The ROD Amendment (EPA 2010) was issued to address vapor intrusion into buildings that overlie shallow subsurface contamination. Within the Navy Area (Figure 3), the Navy has the responsibility for implementing the vapor intrusion remedy as described in the ROD Amendment (EPA 2010).

Potential sources of groundwater contamination by chlorinated solvents in the Navy Area included a former dry cleaning facility and former manufacturing facilities south of Moffett Field. In 1994, the Navy removed the contaminant sources, tank, sumps, and impacted soil and then began groundwater extraction and treatment.

## 2.2 Conditions and Constituents of Concern

The Navy Area is within the Vapor Intrusion Study Area on Moffett Field and the Vapor Intrusion Study Area is generally defined as the area where TCE concentrations in shallow groundwater are greater than 5 µg/L, or parts per billion (ppb). The estimated extent of TCE in shallow groundwater and the Vapor Intrusion Study Area are shown on Figure 2. Shallow groundwater beneath the NAS Moffett Field is approximately 5 to 10 feet below ground surface (bgs) and generally flows in a northerly direction (EPA 2010).

Based on the results of groundwater and air sampling results collected since 2002 for both commercial and residential areas (as provided in Table 1 and Table 2 of the ROD Amendment), TCE is the primary COC for the vapor intrusion pathway along with PCE, cis-1,2- DCE, trans-1,2-DCE, 1,1-DCE, 1,1- DCA, and vinyl chloride.

Groundwater aquifers beneath the Vapor Intrusion Study Area consist of shallow and deep aquifer systems, separated by a laterally extensive aquitard approximately 40-feet thick (Table 2). The shallow aquifer system is generally less than 160 feet bgs. Subdivisions within the shallow aquifer are designated as the upper A (also known as A), lowerA (also known as B1), B2, and B3 aquifers. The regional aquitard is designated as the B/C aquitard. The zones below the B/C aquitard are termed the C aquifer and the Deep aquifers. Groundwater flow in the shallow aquifer zone is generally to the north, while flows in the C and Deep aquifers are generally to the northeast. The shallow and deep aquifer systems in the Moffett Field and MEW Site are not used for drinking water (Haley & Aldrich 2011).

In the Navy Area, the seasonal variations in water elevations may range from 0.5 to 4.4 feet but more typically range from 0.8 to 1.0 foot, with higher levels in the spring and lower levels in the autumn. The hydraulic gradient is 0.005 to 0.007 foot per foot to the north (ERS-JV and Brown and Caldwell 2011).

## 2.3 Conceptual Site Model for Vapor Intrusion

The vapor intrusion pathway refers to the migration of volatile chemicals (i.e., chemicals that easily evaporate) from the subsurface soils and groundwater upwards as vapors, through conduits and preferential pathways, and into overlying buildings. These vapors can then collect inside the buildings and affect indoor air quality (Figure 4). A conceptual model was developed to aid the evaluation of the vapor intrusion pathway by identifying the potential sources of VOCs in indoor air, site COCs, and potential pathways and receptors (EPA 2010).

Indoor exposure to VOCs can result from one or more of the following potential sources:

- Volatilization from subsurface shallow soil or groundwater contamination into a building structure (vapor intrusion);
- Occupational, household, or consumer product use or storage inside or outside of the building/workplace;
- Contribution from outdoor air moving into a building through opened doors or windows or from air intakes of HVAC systems. This outdoor air can include contributions from off-site background concentrations, nearby industrial emissions, and volatilization from the subsurface to outdoor air near the building.

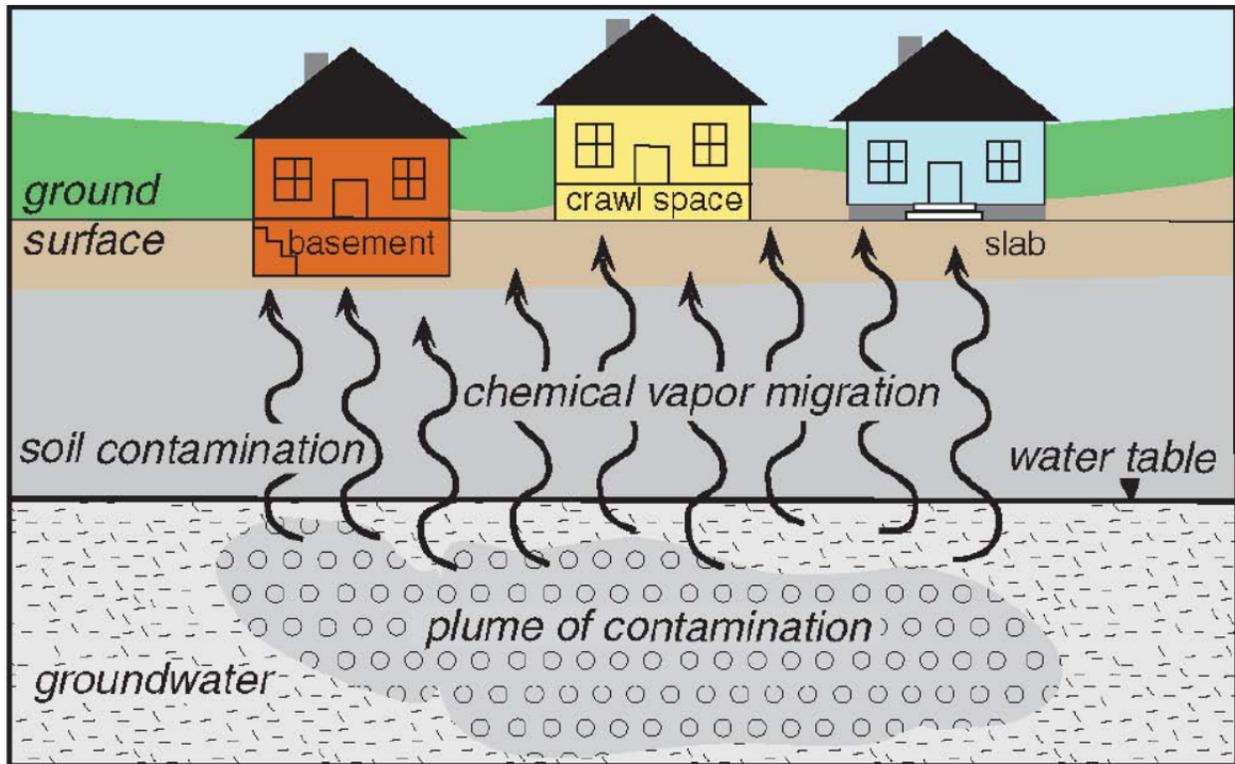


Figure 4. Vapor Intrusion Pathway - Conceptual Diagram (EPA 2010)

*Pathways:* Chemicals may volatilize from the groundwater and soil, migrate upward and enter buildings through voids and cracks in the floors, dry conduits, or subsurface structures (e.g., basements and other subsurface structures), and then enter buildings. For buildings with basements, VOCs may volatilize from groundwater directly through the basement floor and walls; receptors inside the buildings could inhale these vapors.

*Potential Receptors:* Potential receptors are persons in current and future buildings in the Vapor Intrusion Study Area. While there are no immediate or short-term health or ecological concerns, the response action in the ROD Amendment (EPA 2010) ensures building occupants are protected from potential long-term inhalation exposure to COCs.

## 2.4 Vapor Intrusion ROD Amendment

In August 2010, EPA (2010) amended the MEW Site 1989 ROD to select a remedy for the vapor intrusion pathway to prevent subsurface volatile contaminants in groundwater from migrating into indoor air or accumulating in enclosed building spaces at levels exceeding its indoor air cleanup criteria for long-term exposure for residential and commercial buildings. The ROD Amendment provides a tiering system to determine the appropriate response action for each building/property within the Vapor Intrusion Study Area. The tiering system for existing buildings is based on indoor air sampling with or without engineering controls (ECs) in place and other lines of evidence. The corresponding response action may include both engineering and institutional controls (ICs) (EPA 2010).

## 2.5 Building Surveys

Building surveys were conducted on November 14 through 18, 2011, in accordance with an approved survey plan (AM8AJV 2011) to identify each building's structural condition, observe the ventilation system layout and use by the building occupants, observe operational procedures in laboratory and maintenance areas, and gather information about building use schedules. Prior to conducting the surveys, information on HVAC systems and chemical use and storage were collected from NASA Facilities Division. Information gathered before and during the inspections was recorded on Building Survey Forms. The Building Survey Forms and a summary table are provided in Appendix D.

During the inspections, the survey teams observed building construction and integrity, mechanical systems and operations, tenant use and activities, and use and storage of chemicals. In addition, interviews were conducted with building tenants/occupants to understand hours of use/occupancy, tenant activities, system operations, existing vapor intrusion ECs, and historical building uses. The survey team conducted the following activities during the building surveys:

- Examine ground floor rooms to identify areas where COCs were used or are present.
- Locate plumbing or piping systems, power conduits, communication conduits, elevator shafts, sumps, or floor drains that penetrate the base slab.
- Obtain information on the foundation and base slab construction, including information on foundation treatments such as vapor barriers, lime treatment of subsoils, fiber cement, additional reinforcing bars, or other measures that were incorporated into the base slab design that might act as barriers to vapor migration or to minimize slab cracking.
- Identify the building structural condition, determine whether the base slab is accessible, and, if possible, locate areas where the floor is cracked or seamed.
- Collect information on chemical use and storage in the building, including operational procedures in laboratory and maintenance areas.
- Obtain information on ventilation design and operation, observe the ventilation system layout and use by the building occupants, and observe the configuration and operation of HVAC systems.
- Gather information about building use schedules.
- Screen work areas and chemical use and storage areas for VOCs using a photoionization detector (PID).
- Take photographs, where permissible, of the ventilation systems, floor and wall cracks, crawl spaces, storage areas, and potential VOC sources, including laboratories.
- Identify potential sample locations inside and outside the buildings.
- Survey the building exterior for chemical and waste storage areas, loading docks, and ventilation system intake and exhaust areas, including building roofs (where permissible) containing vent and exhaust systems.

- Identify potential outdoor locations where ambient background air samples may be collected during the planned vapor intrusion sampling events.

The building survey results were used to select potential sampling locations within each building for the indoor air sampling work plan.

On April 24–25, 2012, the buildings were revisited to observe modifications that had been made to HVAC systems since the original building surveys. Also, meetings were held with the building managers to resolve building access issues during the sampling event, to address concerns on operation of computer servers while HVAC systems were shut down, and to finalize sample locations.

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## **Section 3 Response Action Tiering System**

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The Response Action Tiering System in the ROD Amendment (EPA 2010) classifies buildings by the need for response action according to the detected concentrations of COCs in indoor air as specified in Tables 6A and 6B of the ROD Amendment. Table 6A is for existing commercial and residential buildings with passive or active ECs in place. Table 6B is for existing commercial and residential buildings with no EC in place. Table 8 of the ROD Amendment provides EPA's selected vapor intrusion remedy for existing and future buildings in the Vapor Intrusion Study Area. The tiering descriptions, response actions, and selected remedies provided in Tables 6A, 6B, and 8 of the ROD Amendment are compiled and presented in Table 4 of this Summary Report.

Using the indoor air sampling results and Tables 6A and 6B of the ROD Amendment (EPA 2010), the buildings were tiered in accordance with the Response Action Tiering System (see Section 7). Recommendations were prepared based on Table 8 of the ROD Amendment. If the data were inconclusive, then additional lines of evidence were considered and/or additional sampling efforts were recommended (see Section 8).

### **3.1 Tier 1**

Buildings are classified as Tier 1 if the indoor air concentrations for any of the seven COCs exceed the outdoor air concentrations and the indoor air cleanup levels. Tier 1 buildings need an appropriate EC implemented as a remedy to meet indoor air cleanup levels. Governmental, proprietary, and informational ICs will be implemented as needed.

### **3.2 Tier 2**

Buildings are classified as Tier 2 if indoor air concentrations are below cleanup levels with an EC in place or in operation. For Tier 2, operation and maintenance of active ventilation systems will be continued or other selected engineered remedies will be implemented to meet remedial action objectives. Long-term monitoring and governmental, proprietary, and informational ICs will be implemented. If the remedy is achieved through operation of an active ventilation system, then agreement of the property owner must be contained in a recorded agreement.

### **3.3 Tiers 3A and B**

For a building without an effective EC in place or in operation, if the indoor air concentrations exceed the outdoor air concentrations but are below the indoor air cleanup level for any of the seven COCs, then the building is classified as Tier 3A. If the indoor air concentrations are at or within the outdoor air concentrations, then the building is Tier 3B. Tier 3A and 3B buildings do not need an engineered remedy. Long-term monitoring is required for Tier 3A, but not for Tier 3B. Governmental ICs will be implemented for both Tier 3A and 3B.

### **3.4 Tier 4**

Buildings are classified as Tier 4 when converging lines of evidence demonstrate there is no longer the potential for vapor intrusion to exceed the indoor air cleanup levels. For Tier 4 buildings, no action is required after EPA approves confirmation sampling results and documentation that no action is necessary.

The sampling program was not designed to determine if a building qualifies for Tier 4. Addendums to the original sampling plan will be prepared as needed for collection of additional samples to provide multiple lines of evidence, to provide mitigation and remediation design parameters, and to establish interim monitoring programs.

## Section 4 Air Sampling Methodology

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Indoor air sampling was conducted at all buildings within the Navy Area that are currently in use or will be used in the future. Buildings that are not in use and planned for demolition were not part of the sampling program. The list of buildings that were sampled are listed in Table 1 and shown on Figure 3.

### 4.1 Sampling Program

To determine the appropriate tier and corresponding response action for the nonresidential buildings within the Navy Area, a vapor intrusion investigation was conducted consisting of indoor air sampling and background air sampling and analysis of COCs by EPA Method TO-15 SIM. Based on a review of current and future use of the buildings in the Navy Area, the historical indoor air sampling data, and the results of the building surveys, 23 nonresidential buildings (Figure 3) were selected for vapor intrusion sampling.

The results of the building surveys were used to develop the sampling program. There were three types of samples: work areas, potential pathways and background (ambient and ventilation intake). Samples were collected in the breathing zone of work areas (offices areas, meeting rooms and high-traffic areas such as hallways), at vapor intrusion pathways (foundation cracks, expansion joints, crawl spaces, drains, and pipe inlets), and in ambient outdoor air. Grab samples were collected in elevator shafts (ventilation pathways between floors). In selecting sample locations, priority was given to basement and first-floor work areas, followed by potential pathways, then second- through fourth-floor work areas.

In buildings with HVAC systems, indoor air samples were collected during normal work hours with the HVAC system operating and at the end of a three-day holiday weekend after the HVAC system had been shut down for 36 to 48 hours. The sampling duration was 8 or 10 hours for buildings that operate between roughly 7 a.m. to 6 p.m., depending on the length of a regular work day for the employees in the building. The sampling duration was 24 hours for buildings that were occupied irregularly 24 hours/day, 7 days/week, outside of daytime work hours. Buildings that have consecutive 8-hour shifts throughout the 24-hour day (such as Building 15 – Security) were sampled for 24 hours. The number of samples collected per building is provided in Table 5. Table 6 lists the sample names, locations, durations, types of samples, sampling rationales, and the sample collection dates.

Outdoor air samples were also collected to establish background or ambient air concentrations at the time of sampling. The duration of all the outdoor air samples was 24 hours, except for one outdoor air sample of 10-hour duration collected just outside Building 10.

All field activities, including sample collection, were conducted from May 18–28, 2012, and on June 12, 2012. The work involved the collection of indoor air samples from 23 buildings and outdoor air samples at Moffett Field as per the Final Work Plan (AM8AJV 2012).

Indoor and outdoor air samples were analyzed by a DoD ELAP– and NELAP-certified analytical laboratory using EPA Method TO-15 SIM for the COCs and results were reported in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). The samples were analyzed with a standard turnaround time of 10 business days for the initial e-mail report. The hard copy Level D report was provided within 21

days of receipt of the samples. A QA/QC evaluation of the data was performed upon receipt of the analytical results.

Each sample collected was assigned a unique sample identification number used to record and report the results. Each sample was identified on the sample label by the building, sample location code (where the sample was collected), a sequential two-digit sample ID code as a reference, and EC (HVAC) operation code at each location as described below.

N210 (Building Number)	1 (Floor Level)	01 (Sample Location ID)	N (HVAC Operation Code)
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A 3-digit building number beginning with a 3 or 4 (300 and 400 series) was used to indicate a duplicate sample. A floor level of “A” indicates an ambient air sample. A floor level of “B” indicates a basement sample. The HVAC operation code was identified for each building sample as follows:

- N – EC (HVAC) is on or operating
- F – EC (HVAC) is off or shut down, or
- [none] – the building is without an operational EC (e.g., HVAC system).

## 4.2 Indoor Air Samples

Sample locations and number of samples collected for each building were selected using the results of the building surveys. A total of 255 indoor air samples (including duplicates) were collected from 131 locations within the 23 buildings. The number of samples per building varies from 2 in Building 76 to 47 in Building 239. The number of samples for individual buildings and sample locations are provided in Tables 5 and 6, respectively. The sampling location maps for each building are provided in Appendix A. Indoor air samples focused on the basement and ground floor of the building, but also included samples from upper floors in areas of vertical conduits and where HVAC distribution vents were supplied from the basement or first floor. The inlet of the indoor air sampling devices was placed within the breathing zone. Duplicate samples were collected at a rate of 10% for a total of 30.

Indoor air samples were collected using 6-liter canisters, each equipped with a fixed-rate flow controller and a particulate filter. Prior to use, the analytical laboratory cleaned and individually certified the canisters and flow controllers to be used for indoor air analysis. The indoor air vapor intrusion investigation included the following types of samples: indoor air (work area), outdoor ambient air, pathway air, and crawl space air. For work area samples, the sample canisters were placed 36 to 60 inches above the floor in occupied or potentially occupied areas. Pathway samples were collected in areas where potential conduits (such as penetrations through the slab, drains, utility lines, or vaults) into the building were observed that might provide a direct route for VOC vapor migration into the building. For vapor pathway samples, the tubing attached to the canisters was placed within crawl spaces; hoses were used to sample within cracks and from the Building 10 tunnel; and grab samples were collected from within elevator shafts. After collection of the air samples, the sample canisters were collected, packed, and labeled in the field and then submitted to the analytical laboratory under chain of custody in accordance with the Final Work Plan (AM8AJV 2012).

Buildings sampled in the Vapor Intrusion Study Area were tiered based on whether the building was sampled with or without an operating EC:

1. Buildings sampled with an operating EC (e.g., HVAC system); and
2. Buildings sampled without an operating EC or with the EC turned off.

#### **4.2.2 Group 1: Buildings Sampled with Engineering Control (HVAC System) Operating**

Buildings with an EC (e.g., HVAC system) were sampled while the EC (HVAC system) was in operation during normal working hours and at the end of the weekend after the HVAC system was shut down for 36 to 48 hours. Building N210 has an HVAC system and a separate vapor collection system in operation beneath a raised floor in Room 145. The Room 145 system was also shut down for at least 48 hours prior to collection of the HVAC shut down samples. Building N210 was the only building with a HVAC system that was not sampled with the HVAC system operating, as there have been numerous historical sampling events for this building with the HVAC system operating.

Time-integrated 8-, 10-, or 24-hour air samples were collected for the ventilation system operation samples to coincide with building-specific, normal workday occupancy. The sample period for the EC (HVAC) shutdown samples matched the duration of the EC (HVAC) operation samples.

Information regarding EC (HVAC) operations was verified with NASA to provide a basis for proper shutdown and sample duration criteria. The available shutdown and sampling period was limited to weekend hours. The EC (HVAC) shutdown air samples were collected at the same locations as the EC (HVAC) operating samples. Air samples were collected using 6-liter canisters to provide consistent data collection methods during both sample events. Pathway samples from the elevator shafts were collected as grab samples.

#### **4.2.3 Group 2: Buildings Sampled without Engineering Control Systems**

Air samples were collected during normal occupancy hours using 6-liter canisters, with the building windows shut to the extent possible. These samples were collected over 8 to 24 hours after the building was closed up, with the windows shut, for over 48 hours. Building 14 was the only building without an HVAC system that was sampled with the windows open.

Sampling was conducted between May 18 and May 28, 2012, with a final sample event for Buildings 14 and 126 on June 12, 2012. Initially, samples were collected from buildings without an EC and then from buildings with an operating EC (e.g., HVAC system). Buildings with an EC (HVAC system) were also sampled after the EC (HVAC system) had been shut down for minimum of 36 to 48 hours. Duplicate samples were collected at a rate of 10%.

### **4.3 Outdoor Air Samples**

A total of 29 outdoor air samples were collected to provide information on ambient background air and air concentrations near outdoor air ventilation system intakes. Outdoor ambient air samples were collected outside the buildings, including near the air ventilation system air intakes, for comparison to indoor air to evaluate the potential contribution of VOCs from outdoor air to indoor air.

For each event of indoor air sample collection, one to six outdoor air samples were collected. The samples were collected at outdoor locations near the building(s) being sampled for indoor air and near HVAC system intakes, when possible. A map showing the ambient air sample locations is provided in Appendix A. The outdoor air samples were collected concurrent with the indoor air samples, except the sample duration for the outdoor air samples was 24 hours.

Outdoor air samples were collected using the same sampling methodology used for the indoor air samples (e.g., 6-liter canister equipped with individually certified, fixed-rate flow controller and a particulate filter). Outdoor air samples were analyzed and reported in  $\mu\text{g}/\text{m}^3$  by a DoD ELAP- and NELAP-certified analytical laboratory using EPA Method TO-15 SIM for the COCs.

#### **4.4 Access Requirements**

AM8AJV personnel arranged for access to each of the 23 buildings through the Facility Site Managers of each building prior to finalizing the sampling schedule. Access was required for setting up the sample equipment, checking of samples following setup, and for final collection of sampling equipment. The Facility Site Managers or tenants of each building provided access to the buildings for collection of samples during standard work hours (buildings with HVAC on, or buildings without HVAC systems). Access during the Memorial Day weekend was provided by NASA security personnel, with the exception of Building N239, which required the presence of the Facility Site Manager for security and access to locked portions of the building.

Availability of Facility Site Managers or tenants and access restrictions such as locked rooms or buildings required schedule changes and alternate placement of several samples and a startup of sample collections over a greater-than-one-hour period. Changes to the sampling schedule, sample placement, and/or sampling date were made due to the access restrictions. Some of the samples were moved within the originally planned room or to locations that better represent the conditions within the building. Sample location adjustments within a room were made because of the location of furniture or to avoid a busy work area. Section 4.5 discusses the deviations in sampling locations from the proposed locations.

#### **4.5 Deviations from the Sampling Plan**

This section describes the deviations from the sampling activities specified in the Final Work Plan (AM8AJV 2012). Table 7 presents the sampling location deviations. Nine locations as proposed in the Final Work Plan were not sampled, 31 locations were moved, and 15 samples were collected from new locations. Eight of the new samples were from Building 14, which was added to the sampling program. The sampling location deviations were due to access restrictions and preventing obstruction to the occupants of the building during sampling events.

One or more samples in Buildings 2, 3, 12, 14, 15, 16, 210, 239, 239A, 243, and 510 were moved from their proposed locations to nearby locations due to inaccessibility. The specific details of the deviations in sampling locations are provided in Table 7.

Building 14 was added in the sampling program after Final Work Plan was published. A total of eight samples (including the duplicate sample) were collected from Building 14, of which two samples were collected from within the crawl space beneath the raised floor. An additional outdoor air sample (M126-A-07-F) was collected immediately outside Building 126 along with other ambient air samples as per the Final Work Plan. Two additional samples, N239-1-04-N

and N239-1-06-N, were collected within the crawl space beneath the raised floor of Building N239. A new sample, N210-1-12-F, was collected within the crawl space beneath the raised floor of Building N210.

One proposed ambient air sample just outside Building 45 was not collected, and two proposed basement samples (N243-B-01-F and N243-B-07-F) at Building N243 were not collected. Some of the duplicate samples were not collected from their preplanned locations; however, enough total duplicate samples were collected from the other locations in the same buildings.

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## Section 5 Air Sampling Results

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Indoor and outdoor air samples were analyzed by a DoD ELAP- and NELAP-certified analytical laboratory using EPA Method TO-15 SIM for the COCs (TCE, PCE, vinyl chloride, 1,1-DCE, 1,1-DCA, cis-1,2-DCE, and trans-1,2-DCE). This method provides detection limits below the cleanup levels and typical background outdoor air concentrations. A QA/QC evaluation and data validation (see Section 6 and Appendix C) were performed upon receipt of the analytical results, which are provided in Appendix B.

The sampled buildings and the sample results are listed in Table 8. The following sections provide the building details and the air sampling results.

### 5.1 Ambient Air Samples

A total of 29 outdoor air samples were collected to provide information on ambient background air and air concentrations near outdoor air ventilation system intakes at the time of indoor air sampling. Outdoor ambient air samples were collected immediately outside the buildings, including near the air ventilation system air intakes, for comparison to indoor air values to evaluate the potential contribution of VOCs from outdoor air to indoor air. A map showing the outdoor air sample locations is provided in Appendix A.

Based on the validated results for ambient air samples collected from May 18 to June 12, 2012, outdoor concentrations of TCE and PCE ranged from 0.00830J<sup>1</sup> to 0.24 µg/m<sup>3</sup> and 0.0180J to 0.21 µg/m<sup>3</sup>, respectively. Table 9 provides the ambient air concentration ranges for all COCs.

### 5.2 Building 2

A walk-through inspection of Building 2 was conducted on November 16, 2011. A completed Building Survey Form for Building 2 is included in Appendix D. The indoor air samples at Building 2 were collected on May 18, 2012.

#### 5.2.1 Building Condition

Building 2 is an approximately 17,000-square-foot (SF), two-story structure. It is currently not occupied but has potential future occupancy for recreational basketball, including the intermittent occupation of the basketball court, bathrooms, locker rooms, and showers. Building 2 has a raised wooden floor in the basketball court (main gym floor) and tiled floors in bathroom and locker rooms. There are no visible breaks in the wooden or tile floors.

Electrical conduits penetrating the floor slab are present in eastern corner of Room 100. Sewer and plumbing conduits penetrating the floor slab are also present in Rooms 103 and 111A.

#### 5.2.2 HVAC System

Building 2 does not have a central HVAC system. However, ventilation systems such as open windows, restroom fans, and an air conditioning (AC) unit in Room 110 are present. A steam heating system is used in the building. Fans are used for cooling and air circulation.

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<sup>1</sup>J flag indicates an estimated concentration between the method detection and method reporting limits.

### 5.2.3 Existing Mitigation Measures

Currently, no mitigation measures are in place at Building 2.

### 5.2.4 Sample Locations and Results

A total of four indoor air samples were collected in Building 2 on May 18, 2012: one from the main gym floor; two rooms (Rooms 107 and 109) where potential future occupancy is expected; and one pathway sample in the Boiler Room (Room 104). The sampling location details are provided in Table 6. No outdoor samples were collected immediately outside the building. An indoor air sample location map for Building 2 is provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

TCE, PCE, and cis-1,2-DCE were detected in indoor air samples from Building 2 at significantly lower concentrations than EPA's indoor cleanup levels. No other COCs were detected in indoor air. Indoor air sample results were also compared to the outdoor air concentration range. The ROD Amendment (EPA 2010) states that indoor air concentrations higher than outdoor air concentrations may be indicative of indoor sources and/or vapor intrusion. Only one pathway sample, collected beneath the raised floor in Room 104, exceeded the ambient air concentration range for TCE; however, all COC detections were within ambient concentration ranges for samples collected in work areas. TCE, PCE, and cis-1,2-DCE were measured in indoor air at concentrations ranging from 0.049 to 0.34  $\mu\text{g}/\text{m}^3$ , 0.033 to 0.066  $\mu\text{g}/\text{m}^3$ , and 0.012J to 0.025J  $\mu\text{g}/\text{m}^3$ , respectively. The sample results are listed in Table 8.

### 5.2.5 Response Action Tier Designation

TCE was detected above the ambient air range concentration for only one pathway sample. All COC detections were within ambient concentrations ranges for samples collected in work areas. Building 2 is classified as Tier 3A.

## 5.3 Building 3

A walk-through inspection of Building 3 was conducted on November 14, 2011. A completed Building Survey Form for Building 3 is included in Appendix D. The indoor air samples at Building 3 were collected on May 18 and May 28, 2012.

### 5.3.1 Building Condition

Building 3 is an approximately 25,000-SF, one-story structure and is used as a conference center and cafeteria. The cafeteria operates Monday through Friday for breakfast and lunch. The facility intermittently hosts various meetings and functions. The offices operate Monday through Friday 8 a.m. to 6 p.m. There is one occupied floor and an unoccupied partial basement housing utilities. The basement walls are constructed of wood and the floor is constructed of concrete with visible cracks and seams. The basement has a partial crawl space approximately 3 feet bgs and a raised wooden floor above the crawl space. The crawl space is present beneath Rooms 124, C110, and 110 to the northeastern end of the building.

Floor drains are present in Rooms 126, 110, R102M, and R110W. Electrical conduits are present in the northeastern corner of Room 110 (kitchen) and in Room 112. Phone line conduits penetrating the floor are present in Room 105A (communication room).

### **5.3.2 HVAC System**

Building 3 has an HVAC system (zoned heating/cooling). Air intakes and all HVAC equipment are mounted on the roof. There are 20 exhaust fans. Fans in the two kitchen areas are 3 to 5 horsepower (HP); all other fans are 1 HP. The exhaust fans are located in Rooms 102 (1 fan), 103 (1), 104 (2), 105 (1), 106 (1), 110 (6), 113 (1), 122 (1), 124 (1), 127 (2), and 128 (2). Nine AC units are located on the roof with capacity from 5 to 20 tons.

A steam heating system is used in the building. Fans are used for cooling and air circulation.

### **5.3.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building 3.

### **5.3.4 Sample Locations and Results**

#### **5.3.4.1 Previous Sampling Results**

Four indoor air samples were collected in February 2008 from Building 3. TCE was measured at concentrations ranging from 0.212 to 2.683  $\mu\text{g}/\text{m}^3$  (Neptune 2008).

#### **5.3.4.2 Current (2012) Sampling Results**

A total of 20 indoor air samples were collected at Building 3 with the HVAC system operating and with the HVAC system off. Two ambient air samples of 24-hour duration were collected on the roof of Building 3. Indoor and ambient air samples were collected on May 18, 2012, with the HVAC system operating and on May 28, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor and outside air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results for Building 3 were below indoor air cleanup levels except one pathway sample collected near the conduits penetrating the floor in Room 105A (sample M003-1-06-N), where TCE was detected at a concentration of 7.9  $\mu\text{g}/\text{m}^3$ , exceeding the indoor air cleanup level of 5  $\mu\text{g}/\text{m}^3$ . All other COC (PCE, cis-1,2-DCE, 1,1-DCA, trans-1,2-DCE, 1,1-DCE, and vinyl chloride) detections were significantly lower than EPA's indoor air cleanup levels. TCE was measured in indoor air at concentrations ranging from 0.12 to 3.9  $\mu\text{g}/\text{m}^3$  for all work area samples collected at Building 3. Table 8 provides the indoor air and ambient air sample results.

### **5.3.5 Response Action Tier Designation**

TCE was detected exceeding indoor air cleanup level of 5  $\mu\text{g}/\text{m}^3$  for one pathway sample (M003-1-06-N) at a concentration of 7.9  $\mu\text{g}/\text{m}^3$ ; however, all work area sample results for all COCs were below indoor air cleanup levels with both the HVAC system off and on. TCE was detected exceeding the ambient air concentration range in most of the samples at Building 3. Building 3 is classified as Tier 3A due to indoor air concentrations for TCE exceeding the ambient air concentration range and one pathway sample exceeding the indoor air cleanup level.

## **5.4 Building 10**

A walk-through inspection of Building 10 was conducted on November 16, 2011. A completed Building Survey Form for Building 10 is included in Appendix D. The indoor air samples at Building 10 were collected on May 18, 2012.

### **5.4.1 Building Condition**

Building 10 is an approximately 12,000-SF, one-story structure and includes the boiler plant for the steam lines at NASA Ames. The facility operates from Monday through Friday for 8 hours/day with no weekend use. It has one occupied floor with a maintenance shop, the boiler room, two offices, and a break room. There is a utility corridor tunnel that runs from Building 10 to Hangar 1 that contained the helium supply lines to the dirigibles in Hangar 1 and steam lines for heating. The helium plant was formerly in Building 10. The tunnel access is at the east end of Room 101. The tunnel is 6 feet x 5 feet with the walls and floor constructed of concrete. The tunnel access is covered by a metal access plate. Building 10 has a concrete slab floor with some cracks and seams. There are numerous concrete trenches in the floor of the building that serve as utility conduits and are covered by metal plates.

There is a sump in Room N104 with water at 3 feet bgs and a sump in Room 101 with unknown depth. Floor drains are present in Rooms 101 (3 drains) and R106. Electrical conduits penetrating the floor slab are present in Rooms 107 and Room N104. Toilet conduits penetrating the floor are present in Room R106.

### **5.4.2 HVAC System**

Building 10 does not have an HVAC system. Ventilation systems such as open windows, restroom fans, and two AC units are present. A steam heating system is used in the building.

### **5.4.3 Existing Mitigation Measures**

EPA sampled air in Building 10 in February 2012. Based on the results, EPA requested that the Navy and NASA install a temporary measure to reduce indoor air concentrations in the building. NASA installed a blower system in early May 2012 at the tunnel access in Building 10 to control vapor intrusion from the tunnel into the building. The sampling event conducted by the Navy on May 18 in Building 10 after the blower system installation reported PCE and TCE above action levels in Building 10. The Navy installed a cutoff wall and a blower in the tunnel at a vault access point located approximately 300 feet east of Building 10 from July 11–12, 2012, as part of an interim action to remove vapors from the tunnel and control COC concentrations in Building 10. The results of sampling conducted on July 18 and August 9, 2012, after implementing the interim action vapor control, showed the successful reduction of COC concentrations in work areas at Building 10 to below action levels.

### **5.4.4 Sample Locations and Results**

A total of seven indoor air samples (including one duplicate) were collected from Building 10 on May 18, 2012, from the main work area, the boiler room, and near the tunnel access area including one pathway sample from within the tunnel access. One outside air sample of 24-hour duration was collected immediately outside Building 10, along with indoor air samples. The

sampling location details are provided in Table 6 and the sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

For the May 18 sample event, TCE and PCE were detected at concentrations exceeding EPA's indoor air cleanup level in all the samples except one (M010-1-06). 1,1-DCA and cis-1,2-DCE (along with TCE and PCE) were detected at concentrations exceeding EPA's indoor air cleanup levels for only one pathway sample (M010-T-04), which was collected in the tunnel access area. The maximum concentrations of TCE, PCE, cis-1,2-DCE, and 1,1-DCA were detected at this sample location (M010-T-04) in Building 10. TCE and PCE were measured in work area samples at concentrations ranging from 4 to 26  $\mu\text{g}/\text{m}^3$  and 1.2 to 19  $\mu\text{g}/\text{m}^3$ , respectively at Building 10. Results for samples from the tunnel access that exceeded cleanup levels had the following ranges:

- 1,1-DCA: 24 to 28  $\mu\text{g}/\text{m}^3$
- cis-1,2-DCE: 270 to 310  $\mu\text{g}/\text{m}^3$
- TCE: 820 to 960  $\mu\text{g}/\text{m}^3$
- PCE: 650 to 770  $\mu\text{g}/\text{m}^3$

All other COC (trans-1,2-DCE, 1,1-DCE, and vinyl chloride) detections were significantly lower than EPA's indoor air cleanup levels. Table 8 provides the indoor air and ambient air sample results.

The results for samples collected on July 18 and August 9, 2012, as a follow-up to the interim action vapor control on July 11, are provided in Table 11. TCE was measured in indoor air at concentrations ranging from 0.89 to 1.1  $\mu\text{g}/\text{m}^3$  for all work area samples collected at Building 10. The VOC results for samples collected at the tunnel access were reduced considerably in comparison to the May sampling results.

#### **5.4.5 Response Action Tier Designation**

For May 18, 2012 sample results for Building 10, TCE and PCE were detected exceeding the indoor air cleanup levels for all samples except one (M010-1-06). cis-1,2-DCE and 1,1-DCA (along with TCE and PCE) were also detected exceeding indoor air cleanup levels and the ambient air concentration ranges for the sample collected in tunnel access area (M010-T-04). TCE and PCE were measured above ambient air concentration ranges at all the locations in Building 10.

For July 18 and August 9, 2012 results, TCE and PCE were detected exceeding indoor cleanup levels only in samples collected from tunnel access area. All work area samples collected from Building 10 had results lower than indoor air cleanup levels as discussed in Section 5.4.4, but still above the outdoor ambient air concentrations.

Building 10 would be classified as Tier 1 based on the May 18 sample results. However, with the success of the July 11 interim action and considering that the blower will remain in place as an interim measure until another remedy is implemented, Building 10 is classified as Tier 2.

## **5.5 Building 12**

A walk-through inspection of Building 12 was conducted on November 16, 2011. A completed Building Survey Form for Building 12 is included in Appendix D. The indoor air samples at Building 10 were collected on May 18, 2012.

### **5.5.1 Building Condition**

Building 12 is an approximately 59,000-SF, two-story structure and is used as a military commissary and warehouse. Building 12 is used 24 hours per day, Monday through Sunday evening, and is closed from Sunday at 9 p.m. to Monday at 5 a.m. The commissary operates Monday through Saturday generally from 9 a.m. to 6 p.m.

Building 12 has a raised floor throughout and a crawl space under the raised floor. The floor is carpeted or tiled except in Room 119. Room 119 is warehouse storage and has a concrete floor. The floor condition of tile and carpeted areas is unknown. There are cracks and seams in the concrete floor of Room 119.

Floor drains are present in Rooms 118 and 117 (meat kitchen), 104C, and 105D (bathrooms). Electrical conduits penetrate the floor slab in Rooms 110 and 117, along with other utility conduits in Room 110.

New tile was installed within Room 109C and the room was repainted within two months of the survey date.

### **5.5.2 HVAC System**

Building 12 has a HVAC system (zoned heating/cooling). There are nine old 3-ton AC units (1 or 2 in use) and a new 10-ton unit mounted on the roof with an air intake. There are 6 exhaust fans located on the roof. There are other ventilation systems such as open windows, mechanical fans, and restroom fans present in the building. A steam heating system is used in the building.

### **5.5.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building 12.

### **5.5.4 Sample Locations and Results**

#### **5.5.4.1 Previous Sampling Results**

Two indoor air samples were collected in February 2008 from Building 12. TCE was measured at concentrations ranging from 0.345 to 0.447  $\mu\text{g}/\text{m}^3$  (Neptune 2008).

#### **5.5.4.2 Current (2012) Sampling Results**

A total of 13 indoor air samples (including one duplicate) were collected from two floors including the crawl space beneath the raised floor of Building 12 with both the HVAC system operating and the HVAC system off. One outdoor air sample (M012-A-01-N) was collected at the roof of Building 12. Indoor air and outdoor air samples were collected on May 21, 2012, with the HVAC system operating, and on May 27, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor and outdoor air sample location maps

are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels except one pathway sample (M012-C-05-N) collected in crawl space beneath Room 110 where TCE was detected at a concentration of  $6.1 \mu\text{g}/\text{m}^3$ , exceeding the cleanup level of  $5 \mu\text{g}/\text{m}^3$ . All other COC (PCE, cis-1,2-DCE, 1,1-DCA, trans-1,2-DCE, 1,1-DCE, and vinyl chloride) detections were significantly lower than EPA's indoor air cleanup levels. TCE was only COC detected exceeding the ambient outdoor air concentration range for all pathway samples collected in the crawl space. PCE was only detected slightly above the ambient air concentration range at a couple of locations in the work area (M012-1-03-N and M012-1-01-N) with the HVAC system operating and one pathway sample (M014-C-04-F) with the HVAC system off. TCE was measured in in all work area samples at concentrations ranging from 0.017 to  $0.2 \mu\text{g}/\text{m}^3$  at Building 12 (within the ambient air concentration range). Table 8 provides the indoor air and ambient air sample results.

### **5.5.5 Response Action Tier Designation**

TCE was detected exceeding indoor air cleanup level of  $5 \mu\text{g}/\text{m}^3$  for one pathway sample (M012-C-05-N) collected in the crawl space ( $6.1 \mu\text{g}/\text{m}^3$ ); however, all work area sample results were below the indoor air cleanup level for all COCs with both the HVAC system off and on. Building 12 is classified as Tier 3A due to the indoor air concentrations for PCE exceeding the ambient air concentration range in the work area.

## **5.6 Building 13**

A walk-through inspection of Building 13 was conducted on November 16, 2011. A completed Building Survey Form for Building 13 is included in Appendix D. The indoor air samples at Building 13 were collected on May 27, 2012.

### **5.6.1 Building Condition**

Building 13 is an approximately 16,000-SF, one-story structure and is used as a food storage warehouse to support the Building 12 commissary. Building 13 is open 24 hours per day, except from 9 p.m. Sunday to 5 a.m. Monday.

There is a concrete slab floor (with cracks and seams) in Room 103, raised floor in Room 102, and the floor details of Room 101 are unknown. No floor drains/sumps are present. Electrical conduits penetrating the concrete floor slab in the northern side are present in Room 102.

### **5.6.2 HVAC System**

Building 13 does not have an HVAC system. Building 13 has open air ventilation and open windows. A steam heating system is used in the building.

### **5.6.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building 13.

#### **5.6.4 Sample Locations and Results**

A total of three indoor air samples (including one duplicate) were collected at Building 13. The sampling location details are provided in Table 6. Indoor air samples were collected on May 27, 2012. Indoor air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels for all COCs. Only TCE was detected slightly above the ambient air concentration range for one sample (M013-1-02); all other sample results were within the ambient air concentration ranges for all COCs. TCE was measured in indoor air at concentrations ranging from 0.093 to 0.32  $\mu\text{g}/\text{m}^3$  at Building 13. Table 8 provides the indoor air and ambient air sample results.

#### **5.6.5 Response Action Tier Designation**

Building 13 is classified as Tier 3A due to indoor air concentrations for TCE exceeding the outdoor ambient air concentration range at one location (M013-1-02).

### **5.7 Building 14**

A walk-through inspection of Building 14 was conducted on June 5, 2012. A completed Building Survey Form is included in Appendix D. The indoor air samples at Building 14 were collected on June 12, 2012.

#### **5.7.1 Building Condition**

Building 14 is an approximately 15,000-SF, one-story structure. Approximately half of the building is unoccupied. The southern portion of the building is occupied by SkyTran, an alternative transportation firm, as a demonstration facility. Two tran lines are installed in the building. The slab of the floor is approximately 12 inches thick, based on the installation of the tran line. The building is typically operated 5 to 6 hours a month as a demonstration facility. There is a crawl space located under most of the building except under the northern storage room.

The concrete floor in the building is covered with carpet or linoleum tile throughout most of the facility. Seams are visible in the uncovered portions of the concrete floor.

No floor drains/sumps are present. Communications and electrical conduits that penetrate the slab are located in a closet near the demonstration room and the abandoned storage room at the north end of the building.

#### **5.7.2 HVAC System**

Building 14 does not have an HVAC system. Open windows and fans are used for cooling and air circulation.

A steam boiler system that is fueled by natural gas is used in the building to generate steam for distribution to other buildings through below grade steam lines. NASA plans to discontinue operation of the steam system in the future.

### 5.7.3 Existing Mitigation Measures

Currently, no mitigation measures are in place at Building 14.

### 5.7.4 Sample Locations and Results

A total of 8 indoor air samples (including one duplicate) were collected at Building 14 on June 12, 2012, of which 2 samples were collected in the crawl space beneath the raised floor. All samples at Building 14 were collected with the doors and windows open. The sampling location details are provided in Table 6. Indoor air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels for all COCs. Only TCE (five of eight samples) and trans-1,2-DCE (three of eight samples) were detected exceeding the ambient air concentration range. TCE and trans-1,2-DCE were measured in indoor air at concentrations ranging from 0.02 to 2.3  $\mu\text{g}/\text{m}^3$  and 0.014 to 0.064  $\mu\text{g}/\text{m}^3$ , respectively, at Building 14. All other COC (PCE, cis-1,2-DCE, 1,1-DCA, 1,1-DCE, and vinyl chloride) detections were within the ambient air concentration ranges. Table 8 provides the indoor air and ambient air sample results.

### 5.7.5 Response Action Tier Designation

Only TCE and trans-1,2-DCE were detected exceeding their ambient air concentration ranges; all other COCs were within their ambient air concentration ranges. Building 14 is classified as Tier 3A due to the indoor air concentrations for these two COCs exceeding the ambient air concentration ranges. All COC results were significantly lower than indoor air cleanup levels.

## 5.8 Building 15

A walk-through inspection of Building 15 was conducted on November 16, 2011. A completed Building Survey Form for Building 15 is included in Appendix D. The indoor air and ambient samples at Building 15 were collected on May 22 and May 27, 2012.

### 5.8.1 Building Condition

Building 15 is an approximately 17,000-SF, one-story structure and is used by NASA security. The majority of offices operate 8 hours per day, 5 days a week, with infrequent weekend use; however, the Lieutenant office (Room 135D) is staffed 24 hours per day, 7 days per week.

The building has a concrete slab floor (with cracks and seams). Floor drains are present in Rooms 101, R102W, R104M, 146, and 150. Conduits penetrating the floor slab are present in Rooms R113, R115, R102W, and R104M (toilet conduits).

### 5.8.2 HVAC System

Building 15 has a chiller in Room 118 and two air handlers: A/H-1 is in Room 163 in the southwest corner of the building; A/H-2 is in Room 108 in the east side of the building. The air intake source is outside of the mechanical rooms at approximately 8 feet above ground surface.

The building has five exhaust fans, three in the east wing (one at the northeast corner, two in the central area of the east wing) and two in the west wing (one at the northwest corner and one at the southwest corner).

Open windows, fans, and a window-mounted AC unit in Room 111 are used for cooling and air circulation. Heating is provided by hot water coils located throughout the building.

### **5.8.3 Existing Mitigation Measures**

NASA adjusted the HVAC system in 2004 to increase the make-up air supplied into the building after indoor air sampling results ranged from 0.23 to 7.22  $\mu\text{g}/\text{m}^3$  for TCE (Haley & Aldrich 2009b; NASA 2012).

### **5.8.4 Sample Locations and Results**

#### **5.8.4.1 Previous Sampling Results**

Indoor air samples were collected from 6 locations in Building 15 between 2003 and 2009. Prior to September 2003, TCE concentrations were between 0.3 and 2.0  $\mu\text{g}/\text{m}^3$ . Between mid-September 2003 and mid-February 2004, TCE concentrations generally doubled in concentration, with concentrations exceeding 5  $\mu\text{g}/\text{m}^3$  in three events. After adjusting the make-up air supply, TCE concentrations reduced to less than 1.0  $\mu\text{g}/\text{m}^3$  by early May 2004 (Neptune 2005). Five indoor air samples were collected in March 2009 in the last air sampling event conducted at Building 15. TCE was measured at concentrations ranging from 0.047 to 0.135  $\mu\text{g}/\text{m}^3$  (NASA 2012).

#### **5.8.4.2 Current (2012) Sampling Results**

A total of 13 indoor air samples (including one duplicate) were collected at six sampling locations with the HVAC system operating and with the HVAC system off at Building 15. Three outside air samples (including one duplicate) of 24-hour duration were collected immediately outside Building 15. The sampling location details are provided in Table 6. Indoor air samples were collected on May 22, 2012, with the HVAC system operating and on May 27, 2012, with the HVAC system off. Indoor and outside air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels. Only TCE (six of six samples) and PCE (one of six samples) were detected exceeding their ambient air concentration ranges in the samples collected with the HVAC system off. PCE was also detected exceeding the ambient air concentration range in one sample collected with the HVAC system on. TCE and PCE were measured in indoor air at concentrations ranging from 0.033 to 2.5  $\mu\text{g}/\text{m}^3$  and 0.022 to 0.51  $\mu\text{g}/\text{m}^3$ , respectively, at Building 15. All other COC (cis-1,2-DCE, 1,1-DCA, trans-1,2-DCE, 1,1-DCE, and vinyl chloride) detections were within their ambient air concentration ranges. Table 8 provides the indoor air and ambient air sample results.

### **5.8.5 Response Action Tier Designation**

Only TCE (with HVAC system off) and PCE (with both HVAC system on and off) were detected exceeding their ambient air concentration ranges (as discussed in above paragraph); all other COCs were within their ambient air concentration ranges. All COC results were significantly lower than indoor air cleanup levels. Building 15 is, therefore, classified as Tier 3A.

## 5.9 Building 16

A walk-through inspection of Building 16 was conducted on November 15, 2011. A completed Building Survey Form for Building 16 is included in Appendix D. The indoor air and ambient air samples at Building 16 were collected on May 24 and May 28, 2012.

### 5.9.1 Building Condition

Building 16 is a historic single-story building on a slab-on-grade foundation. The building consists of offices, a wood shop, and a machine shop. Building 16 is an approximately 15,000-SF, two-story structure and is currently occupied by a maintenance contractor (IAP World Services) operating from Monday through Friday from 8 a.m. to 6 p.m.

The building has a concrete slab floor with cracks and seams. No floor drains or sumps are present. Electrical conduits penetrate the concrete floor slab in Room 118. Sink drain and toilet plumbing conduits are present in Rooms R101 and R102.

### 5.9.2 HVAC System

Building 16 has an HVAC system (zoned heating/cooling). It also has an air handler in Room 111 and a small exhaust fan in Room 106. Open windows, restroom fans, and a window-mounted AC unit in Room 110A provide cooling and air circulation. A steam heating system is used in the building.

### 5.9.3 Existing Mitigation Measures

NASA adjusted the HVAC system in 2004 to increase the make-up air supplied into the building after indoor air sampling results ranged from 0.21 to 15.11  $\mu\text{g}/\text{m}^3$  for TCE (NASA 2012).

### 5.9.4 Sample Locations and Results

#### 5.9.4.1 Previous Sampling Results

Indoor air samples have been collected previously from two locations at Building 16 (NASA 2012; Neptune 2009). TCE concentrations were between 0.6 and 15.1  $\mu\text{g}/\text{m}^3$  between December 2003 and April 2004. After adjusting the make-up air supply, TCE concentrations reduced to less than 1.0  $\mu\text{g}/\text{m}^3$  by mid-May 2004 (Neptune 2005). Samples collected on February 28, 2007 reported TCE at 1.334 and 3.667  $\mu\text{g}/\text{m}^3$ . However, samples collected in 2008 and 2009 found TCE was less than 1.0  $\mu\text{g}/\text{m}^3$  (Neptune 2009; NASA 2012).

#### 5.9.4.2 Current (2012) Sampling Results

A total of 12 indoor air samples (including 2 duplicates) and 2 outdoor air samples were collected with the HVAC system operating and with the HVAC system off at Building 16. Indoor air samples were collected on May 24, 2012, with the HVAC system operating and on May 28, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor and outside air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels with both HVAC system operating and shut down. Only TCE was detected exceeding the ambient air concentration range in all the

samples collected with the HVAC system off. All of the COC results were within their ambient air concentration ranges with the HVAC system on. TCE was measured in indoor air at concentrations ranging from 0.066 to 1.9  $\mu\text{g}/\text{m}^3$  at Building 16. Table 8 provides the indoor air and ambient air sample results.

### **5.9.5 Response Action Tier Designation**

All sample results at Building 16 were significantly lower than the indoor air cleanup levels. Building 16 is classified as Tier 3A. All other COCs were within their ambient air concentration ranges.

## **5.10 Building 29**

A walk-through inspection of Building 29 was conducted on November 16, 2011. A completed Building Survey Form for the building is included in Appendix D. The indoor air and ambient air samples at Building 29 were collected on May 21, 2012.

### **5.10.1 Building Condition**

Building 29 is an approximately 1,400-SF, one-story structure with a basement and is currently used as bicycle repair shop. Building operating hours are unknown but the building was not occupied during the building survey week.

The building has a half basement under Room 106. The basement is used for storage and utilities. Building 29 has concrete slab floor (with cracks and seams), tile floor, and raised wood floor in Room 106.

There is a drain present in basement below Room 106. Unknown conduits penetrate the floor slab in the basement.

### **5.10.2 HVAC System**

Building 29 does not have an HVAC system. Ventilation systems such as open windows and restroom fans are present in the building.

A steam system is used in the building for heating purposes and the steam is dispersed using a mechanical fan and no outside air is used.

### **5.10.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building 29.

### **5.10.4 Sample Locations and Results**

A total of two indoor air samples (including one in basement) were collected at Building 29. One ambient air sample was collected just outside Building 29. Indoor air and outdoor air samples were collected on May 21, 2012. The sampling location details are provided in Table 6. Indoor air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels for all COCs. Only one sample contained PCE ( $0.23 \mu\text{g}/\text{m}^3$ ) exceeding the ambient air concentration range. TCE and PCE were

measured in indoor air at concentrations ranging from 0.13 to 0.18  $\mu\text{g}/\text{m}^3$  and 0.19 to 0.23  $\mu\text{g}/\text{m}^3$ , respectively. Table 8 provides the indoor air sample results.

The groundwater beneath Building 29 is likely outside the contaminant plume (Figure 3). There may be no potential for vapor intrusion for Building 29.

### **5.10.5 Response Action Tier Designation**

Only PCE was detected slightly above the outdoor air concentration range for one sample (M013-1-02) and all other sample results were within ambient air concentration ranges for all COCs. Building 29 is, therefore, classified as Tier 3A.

## **5.11 Building 45**

A walk-through inspection of Building 45 was conducted on November 15, 2011. A completed Building Survey Form for Building 45 is included in Appendix D. The indoor air samples at Building 45 were collected on May 24, 2012.

### **5.11.1 Building Condition**

Building 45 is an approximately 9,000-SF, one-story structure. Building 45 is a former paint shop and currently used as a storage facility and for the purpose of housing technical demonstrations of a mechanical rover. Building 45 is used only for a few days per month for a short duration of time (3 to 4 hours).

Building 45 has a concrete slab floor with visible cracks and seams.

There is a sump approximately 6 feet deep in Room 107A. Electrical conduits and a utility corridor trench are present in Room 101A. The corridor trench traverses the building from east to west at an unknown depth.

### **5.11.2 HVAC System**

Building 45 does not have an HVAC system. There are several exhaust vents but fans may not be operational. Ventilation systems such as open windows and restroom fans are present in the building. A steam heating system is in the building.

### **5.11.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building 45.

### **5.11.4 Sample Locations and Results**

A total of three indoor air samples (including one duplicate) were collected at Building 45. Indoor air samples were collected on May 24, 2012. The sampling location details are provided in Table 6. Indoor air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels for all COCs. Only TCE was detected exceeding the ambient air concentration range. TCE was measured in indoor air at concentrations ranging from 0.37 to 0.44  $\mu\text{g}/\text{m}^3$ . Table 8 provides the indoor air and ambient air sample results.

### **5.11.5 Response Action Tier Designation**

Only TCE was detected slightly above the ambient air concentration range and all other COCs results were within their ambient air concentration ranges. Building 45 is classified as Tier 3A. All sample results were below indoor air cleanup levels for all COCs.

## **5.12 Building 67**

A walk-through inspection of Building 67 was conducted on November 15, 2011. A completed Building Survey Form for Building 67 is included in Appendix D. The indoor air and ambient air samples at Building 67 were collected on May 21, 2012.

### **5.12.1 Building Condition**

Building 67 is an approximately 2,000-SF, one-story structure and is occupied by the United States Post Office, which operates from Monday through Friday, 7 a.m. to 4 p.m., with no weekend use.

The building has a concrete slab floor with visible seams and a break between the slab on southwest portion of the building.

There are no drains/sumps present in the building. Toilet conduits penetrate the slab floor in Rooms 101 and 102.

### **5.12.2 HVAC System**

Building 67 does not have an HVAC system. There is a single window-mounted AC unit. Open windows and fans are used for ventilation and to circulate air. A steam heating system is used in the building.

### **5.12.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building 67.

### **5.12.4 Sample Locations and Results**

A total of two indoor air samples and two outdoor air samples (including one duplicate) were collected at Building 67. Indoor air and ambient air samples were collected on May 21, 2012. The sampling location details are provided in Table 6. Indoor air and outdoor air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels and within the ambient air concentration range for all COCs. TCE was measured in indoor air at concentrations ranging from 0.046 to 0.086  $\mu\text{g}/\text{m}^3$ . Table 8 provides the indoor air and ambient air sample results.

### **5.12.1 Response Action Tier Designation**

All COC results were significantly lower than indoor air cleanup levels and within the ambient outdoor air concentration ranges. Building 67 is classified as Tier 3B.

## **5.13 Building 76**

A walk-through inspection of Building 76 was conducted on November 16, 2011. A completed Building Survey Form for Building 76 is included in Appendix D. The indoor air samples at Building 76 were collected on May 21 and June 12, 2012.

### **5.13.1 Building Condition**

Building 76 is an approximately 400-SF, one-story structure and is used as a locksmith shop that operates from Monday through Friday, 8 a.m. to 4 p.m.

The building has a concrete slab floor and carpeting. Slab conditions are unknown.

Toilet (sewer and water) conduits penetrate the slab floor in Room R102.

### **5.13.2 HVAC System**

Building 76 does not have an HVAC system. There is a single window-mounted AC unit located in Room 101. Open windows and restroom fans provide ventilation and air circulation. A steam heating system is used in the building.

### **5.13.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building 76.

### **5.13.4 Sample Locations and Results**

#### **5.13.4.1 Previous Sampling Results**

One indoor air sample was collected in February 2008 from Building 76. TCE was measured at a concentration of  $0.233 \mu\text{g}/\text{m}^3$  (Neptune 2008).

#### **5.13.4.2 Current (2012) Sampling Results**

A total of two indoor air samples were collected at Building 76 with the window-mounted AC off and on. One indoor air sample was collected on May 21, 2012, with the AC off and another one on June 12, 2012, with the AC on. The sampling location details are provided in Table 6. Indoor air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels and within the ambient air concentration ranges for all COCs. TCE was measured in indoor air at concentrations ranging from 0.12 to  $0.15 \mu\text{g}/\text{m}^3$ . Table 8 provides the indoor air and ambient air sample results.

### **5.13.5 Response Action Tier Designation**

All COC results were below indoor air cleanup levels and within ambient air concentration ranges. Building 76 is classified as Tier 3B.

## **5.14 Building 107**

A walk-through inspection of Building 107 was conducted on November 16, 2011. A completed Building Survey Form for Building 107 is included in Appendix D. The indoor air samples at Building 76 were collected on May 23 and May 28, 2012.

### **5.14.1 Building Condition**

Building 107 is an approximately 1,800-SF, one-story structure and is used as the Navy Resident Officer in Charge of Construction (ROICC) management office which operates on weekdays.

The building has a concrete slab floor and carpeting. Slab conditions are unknown.

Toilet (sewer and water) conduits penetrate the slab floor in Room R101. Electrical and communication conduits are present in the eastern corner of Room 107.

### **5.14.2 HVAC System**

Building 107 has a HVAC system (zoned heating/cooling) with the intake on the roof. The building has open windows for ventilation purposes. Natural gas is used in the building for heating purposes.

### **5.14.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building 107.

### **5.14.4 Sample Locations and Results**

#### **5.14.4.1 Previous Sampling Results**

Five indoor air samples were collected in March 2009 at Building 107. TCE was measured at concentrations ranging from 0.433 to 1.9  $\mu\text{g}/\text{m}^3$  (NASA 2012).

Indoor air samples were also collected in February and May 2008 from Building 107. In May 2008, TCE and PCE were measured in indoor air at concentrations ranging from 2.553 to 2.825  $\mu\text{g}/\text{m}^3$  and 1.122 to 1.539  $\mu\text{g}/\text{m}^3$ , respectively (Neptune 2009). February 2008 sampling results for TCE and PCE were higher than the May 2008 sampling results likely due to open windows during the warmer May event, which provided better ventilation and may have decreased or eliminated the negative pressure in the building, resulting in decreased vapor intrusion (Neptune 2009).

#### **5.14.4.2 Current Sampling Results**

A total of four indoor air samples were collected at two sampling locations with the HVAC system operating and with the HVAC system off at Building 107. Indoor air samples were collected on May 23, 2012, with the HVAC system operating and on May 28, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were significantly below indoor air cleanup levels and within the ambient air concentration ranges for all COCs. TCE was measured in indoor air at concentrations ranging from 0.043 to 0.11  $\mu\text{g}/\text{m}^3$ . Table 8 provides the indoor air and ambient air sample results.

#### **5.14.1 Response Action Tier Designation**

All COC results were significantly below indoor air cleanup levels and within the ambient air concentration ranges in the current sampling event. Building 107 is classified as Tier 3A due to relatively higher concentrations of TCE and PCE historically.

### **5.15 Building 126**

A walk-through inspection of Building 126 was conducted on November 15, 2011. A completed Building Survey Form for Building 126 is included in Appendix D. Indoor air and ambient air samples were collected at Building 126 on May 18 and June 12, 2012. Additional ambient air samples were collected on May 22, 23, 24, 27, and 28, 2012.

#### **5.15.1 Building Condition**

Building 126 is an approximately 13,000-SF, one-story structure and is occupied by the Moffett Historical Society Museum, which operates from Wednesday through Saturday, 10 a.m. to 2 p.m.

The building has a concrete slab floor and carpeting, with seams on the floor slab where visible.

Floor drains are present in Rooms 104 and 106A, and there is a sink drain in Room 105. Sewer conduits penetrate the slab floor in Rooms 104 and 106A.

#### **5.15.2 HVAC System**

In spring 2012, a new HVAC system was installed in Building 126, including natural-gas heating.

#### **5.15.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building 126.

#### **5.15.4 Sample Locations and Results**

##### **5.15.4.1 Previous Sampling Results**

Five indoor air samples were collected in March 2009 at Building 126. TCE was measured at concentrations ranging from 2.869 to 5.729  $\mu\text{g}/\text{m}^3$  (NASA 2012).

Indoor air samples were also collected in February and May 2008 from Building 126 (Neptune 2008; 2009). In May 2008, TCE and PCE were reported in indoor air samples at concentrations ranging from 4.606 to 6.647  $\mu\text{g}/\text{m}^3$  and 3.645 to 4.898  $\mu\text{g}/\text{m}^3$ , respectively (Neptune 2009). February 2008 sampling results for TCE and PCE were higher than May 2008 sampling results likely due to open windows and doors providing better ventilation during the warmer May event (Neptune 2009).

#### **5.15.4.2 Current (2012) Sampling Results**

A total of 11 indoor air samples (including 1 duplicate) were collected from 5 sampling locations with the HVAC system operating and with the HVAC system off at Building 126. A total of seven ambient air samples were also collected just outside Building 126. The outdoor samples were collected within the same time period as when the indoor air samples were collected. Indoor air and outdoor air samples were collected on May 18, 2012, with the HVAC system operating and on June 12, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor and outside air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

Only PCE was detected exceeding its indoor air cleanup level ( $2 \mu\text{g}/\text{m}^3$ ) at four locations (out of five) with both the HVAC system operating and shut down. All other COC (TCE, cis-1,2-DCE, 1,1-DCA, trans-1,2-DCE, 1,1-DCE, and vinyl chloride) detections were significantly lower than EPA's indoor air cleanup levels. COC detections exceeding the ambient air concentration ranges included TCE (11 out of 11 samples), cis-1,2-DCE (2 out of 11), trans-1,2-DCE (5 out of 11 – only samples with HVAC system off), 1,1-DCA (3 out of 11), and vinyl chloride (1 out of 11). PCE and TCE were measured in indoor air at concentrations ranging from 1.9 to  $4.4 \mu\text{g}/\text{m}^3$  and 1.4 to  $3.1 \mu\text{g}/\text{m}^3$ , respectively, at Building 126. Table 8 provides the indoor air and ambient air sample.

#### **5.15.5 Response Action Tier Designation**

PCE was detected exceeding the indoor air cleanup level of  $2 \mu\text{g}/\text{m}^3$  for all but one location within Building 126, with both the HVAC system operating and shut down. TCE, PCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCA, and vinyl chloride were measured exceeding their respective ambient air concentration ranges as discussed in Section 5.15.4. Building 126 is classified as Tier 1.

### **5.16 Building N210**

A walk-through inspection of Building N210 was conducted on November 14, 2011. A completed Building Survey Form for Building N210 is included in Appendix D. The indoor air and outdoor air samples at Building N210 were collected on May 28, 2012.

#### **5.16.1 Building Condition**

Building N210 is an approximately 95,000-SF, three-story structure that was formerly used as an aircraft hangar and later converted to office space. It operates from Monday through Friday, 8 a.m. to 5 p.m. The building has a concrete slab floor and carpet, tile, and raised flooring over the concrete floor slab. The cracks and seams are present on the slab floor where visible.

Floor drains are present in Rooms 259B, 255B, 256A&B, R249, and R250. There are two elevators in the building. Electrical conduits penetrate the slab floor in Room 240.

#### **5.16.2 HVAC System**

Building N210 has a zoned heating/cooling system with two separate HVAC systems. The first and second floors have a chiller and hot water boiler providing heating and cooling to these levels. There are also three air handlers (fans) providing a continuous supply of fresh air to both

of these levels of the building (with no recirculated air). Outside air is collected from intakes on the roof. There is an air handler on the east roof with a 5 HP roof fan. There are two air handlers in the attic above Room 257 that separately supply the east and west sides of the first and second floors; each have 40 HP and run off variable frequency drives.

The other, separate HVAC system is a self-contained air heating and cooling unit that uses recycled air and services only the “penthouse” (a third floor addition to this building); there is no makeup air: the air supply is through the stairwell. There is an alarm to notify of shutdown; the alarm system operates 24 hours each day.

There are eight exhaust fans on the roof; seven are in service. Two of the exhaust fans are for Room 134 (the main chiller room); one is for Room 131; and three are for restrooms.

Ventilation systems such as open windows and restroom fans are present in the building. The building has a heating system that runs on natural gas.

### **5.16.3 Existing Mitigation Measures**

The original HVAC system supplied air through ducts in the subfloor with floor grates, which enhanced vapor migration into the building. TCE concentrations in indoor air ranged from 0.22 to 176  $\mu\text{g}/\text{m}^3$  (Haley & Aldrich 2009b). The HVAC system was adjusted in 2005 to supply air through a duct system through the ceiling and to run at a high-capacity flow rate to maintain positive pressure in the building. The air intake, which was originally at ground level, was changed to the roof to prevent the intake of air impacted by vapor intrusion. The original subfloor system was modified under Rooms 143, 145, and L139 on the first floor to capture the vapors beneath the raised floor area, with the system exhaust on the roof (Haley & Aldrich 2009b). The adjustments in operation of the HVAC system were successful in lowering COC concentrations to below cleanup levels presented in the ROD Amendment (EPA 2010). The HVAC system has difficulty maintaining temperatures at the high-capacity flow rate. Also, the building occupants have noted odors inside the building when aircraft are taking off from the runway at Moffett Field.

### **5.16.4 Sample Locations and Results**

#### **5.16.4.1 Previous Sampling Results**

In 40 indoor air samples collected in March 2009 at Building N210, TCE was measured at concentrations ranging from 0.034 to 0.505  $\mu\text{g}/\text{m}^3$  (NASA 2012).

#### **5.16.4.2 Current Sampling Results**

A total of 18 indoor air samples (including 3 duplicates and 4 pathway samples) were collected with the HVAC system off from two floors including the crawl space beneath the raised floor at Building N210. One outdoor air sample (M210-A-01-F) was collected immediately outside Building N210. The sampling location details are provided in Table 6. Samples were not collected with the HVAC system operating. Indoor air and outdoor air samples were collected on May 28, 2012, with the HVAC system off. Indoor and outside air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels except for one pathway sample (N210-1-11-F) collected from the space beneath the raised floor in the work area of Room 145 near cubicles 019 and 021, where TCE was detected at a concentration of  $17 \mu\text{g}/\text{m}^3$ , exceeding the cleanup level of  $5 \mu\text{g}/\text{m}^3$ . A vapor extraction system is used to capture the vapors beneath the raised floor area under normal building operations; the vapor extraction was turned off for at least 24 hours prior to collection of the samples. All other COC (PCE, cis-1,2-DCE, 1,1-DCA, trans-1,2-DCE, 1,1-DCE, and vinyl chloride) detections were significantly lower than EPA's indoor air cleanup levels. All work area sample results were below indoor air cleanup levels. TCE was detected in indoor air for work area samples at concentrations ranging from 0.14 to  $1.7 \mu\text{g}/\text{m}^3$  at Building N210. TCE (15 of 18 samples), PCE (1 of 18), 1,1-DCA (1 of 18), and trans-1,2-DCE (1 of 18) were detected slightly above their respective ambient air concentration ranges. Table 8 provides the indoor air and ambient air sample results.

### **5.16.5 Response Action Tier Designation**

TCE was detected exceeding the indoor air cleanup level of  $5 \mu\text{g}/\text{m}^3$  for one pathway sample (N210-1-11-F) with a concentration of  $6.1 \mu\text{g}/\text{m}^3$ ; however, all work area sample results were below indoor air cleanup levels for all COCs. TCE (15 of 18 samples), PCE (1 of 18), 1,1-DCA (1 of 18), and trans-1,2-DCE (1 of 18) were detected slightly exceeding their respective ambient air concentration ranges at Building N210. Building N210 is classified as Tier 2 due to indoor air concentrations for TCE exceeding the air cleanup level for one pathway sample and the COCs discussed above exceeding the outdoor air concentrations at a few locations in the work area.

## **5.17 Building N239**

A walk-through inspection of Building N239 was conducted on November 17, 2011. A completed Building Survey Form for Building N239 is included in Appendix D. The indoor air and ambient air samples at Building N239 were collected on May 24 and May 27, 2012.

### **5.17.1 Building Condition**

Building N239 is an approximately 150,000-SF, four-story structure with a basement. The building is occupied by NASA's Life Sciences Department which operates from Monday through Friday, 9 a.m. to 7 p.m. The building is always open with sporadic weekend and after-hours use by researchers and lab technicians.

Building N239 has a full basement that is used for office space, storage, and utilities. The basement floor and walls are constructed of concrete. Moisture conditions are dry in the basement.

The building has a concrete slab, carpet, and tile floors. The cracks and seams are visible on the slab floor.

There are two sumps in the building: one in Room B11 with depth to water approximately 3 feet below the floor and another one in Room N074 with depth to water approximately 4 to 5 feet below floor. Floor drains are present in Rooms N067 (three drains), N076A (three drains), and all bathrooms throughout the building.

There is a freight elevator (V002) at the northeast side of the building and a service elevator (V001) on the southwest side of the building. PID readings at both elevators were non-detect.

Utility conduits that penetrate the floor and walls are present in Rooms N076B, N076A, N076, and E075. Sewer conduits penetrate the floor in all the bathrooms throughout the building. All utilities (HVAC, water, electricity) are routed through the floors via utility corridors (Rooms U101, U102, U201, U202, etc.). A slight vacuum (1 Pascal) was observed at Room U102.

Solvents are used in the laboratories throughout the building. Chlorinated solvents are used in laboratories in Rooms 128, 234, 347, 364, and 432. PID detections were observed in association with solvents and chemicals, with high VOC concentrations located in many laboratories in the building. The chemicals were typically stored in the flammable cabinets within the laboratories. The laboratories have hooded vents in work areas.

### **5.17.2 HVAC System**

Building N239 has a HVAC system (zoned heating/cooling). There are two 60 HP air handlers (intake) in the basement and an intake on the outside northern corner of the first floor of the building at ground level. There are 35 exhaust fans and 52 fume hoods. The flume hoods and their exhausts operate separate from the HVAC system. Makeup air for the HVAC system is 100% intake, with no recycling of air.

The building has other ventilation systems such as mechanical fans, restroom fans, and chemical fume hoods. The building has natural-gas and steam heating systems.

### **5.17.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building N239.

### **5.17.4 Sample Locations and Results**

A total of 47 indoor air samples (including 3 duplicates) were collected from the four floors and basement of Building N239 with the HVAC system operating and with the HVAC system off. Two outdoor air samples of 24-hour duration were collected immediately outside Building N239. Indoor air and outdoor air samples were collected on May 24, 2012, with the HVAC system operating and on May 27, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor and outside air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels with both HVAC system operating and shut down. TCE was detected exceeding ambient the air concentration range for five samples collected in the basement and one sample each collected at the second and third floors (N239-2-04-F [pathway sample] and N239-3-01-F) with the HVAC system shut down. TCE was not detected exceeding the ambient air concentration range in any of the samples collected with the HVAC system operating. PCE was detected exceeding the ambient air concentration range for three samples (two samples for one location [N239-B-05] with the HVAC system both off and on and M239-B-01-F) collected in the basement and two other samples (N239-1-06-F and N239-3-03-F) collected with the HVAC system shut down. TCE and PCE were measured in indoor air at concentrations ranging from 0.0083 to 0.26  $\mu\text{g}/\text{m}^3$  and 0.025 to 0.94  $\mu\text{g}/\text{m}^3$ , respectively, for work area samples at Building N239. TCE and PCE were detected in basement samples at

concentrations ranging from 0.0077 to 3.8  $\mu\text{g}/\text{m}^3$  and 0.021 to 0.22  $\mu\text{g}/\text{m}^3$ , respectively, for work area samples at Building N239. Table 8 provides the indoor air and ambient air sample results.

### **5.17.5 Response Action Tier Designation**

Building N239 is classified as Tier 3A due to indoor air concentrations for COCs exceeding the ambient air concentration ranges (as discussed in Section 5.17.4), including in the basement. All sample results at Building N239 are lower than the indoor air cleanup levels.

## **5.18 Building N239A**

A walk-through inspection of Building N239A was conducted on November 18, 2011. A completed Building Survey Form for Building N239A is included in Appendix D. The indoor air and ambient air samples at Building N239A were collected on May 22, May 27, and May 28, 2012.

### **5.18.1 Building Condition**

Building N239 is an approximately 34,000-SF, three-story structure including a basement. The building is currently used for offices and centrifuge operations. Two offices on the second floor operate from Monday through Friday, 9 a.m. to 5 p.m. with possible weekend use. Centrifuge testing areas have not been used regularly for the past two years.

Building N239 has a basement consisting of two large open vaults located in a highbay (Room 120), which is used for storage and a bio-dome station. The highbay area has frequent activities with possible weekend use. The basement floor and walls are constructed of concrete. Moisture conditions are dry in the basement.

The building has a concrete slab and tile floors. The cracks and seams are visible on the slab floor.

There is a sump approximately 8 feet below the floor in Room 144. The sump was dry and PID readings were 250 to 270 ppb. Floor drains are present in all bathrooms. There is an elevator located near Room 160. The PID reading was non-detect in the elevator.

There are electrical conduits present in the highbay area. Unknown conduits penetrate the wall of the bio-dome vault area at an elevation that is below grade.

### **5.18.2 HVAC System**

Building N239A has a HVAC system (zoned heating/cooling). No information has been provided about the HVAC system. There was limited access within the building during the building survey, and the building contact did not have knowledge about the HVAC system. Aerial photos available from Google indicate three possible intake air handlers on the north end of the building. The building also contains one intake on the south end and 12 possible vent locations. The large handler and supply and return vents are located in the north end of the building.

Ventilation systems such restroom fans and fume hoods are present in the building. The building has natural-gas and steam heating systems.

### **5.18.3 Existing Mitigation Measures**

No mitigation measures are in place at Building N239.

### **5.18.4 Sample Locations and Results**

#### **5.18.4.1 Previous Sampling Results**

A total of nine samples were collected from Building N239A during the air sampling event conducted in July 2005. TCE was detected at low concentrations (less than  $1.0 \mu\text{g}/\text{m}^3$ ) in all samples (Neptune 2006).

#### **5.18.4.2 Current Sampling Results**

A total of 21 indoor air samples (including 2 duplicates) were collected from the two floors and the basement of Building N239A with the HVAC system operating and with the HVAC system off. Indoor air samples were collected on May 22, 2012, with the HVAC system operating and on May 27, 2012, with the HVAC system off. One grab pathway sample was collected on May 28, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels with both the HVAC system operating and shut down, except one sample (N239A-1-06-F) collected in hallway C102 with the HVAC system off where TCE was detected at a concentration of  $6.8 \mu\text{g}/\text{m}^3$ , exceeding the indoor air cleanup level of  $5 \mu\text{g}/\text{m}^3$ . The result for the sample collected from this location with the HVAC system on was below the TCE cleanup level. This location is adjacent to two utility rooms and a door to outside the building. All COCs except PCE were detected exceeding their respective ambient air concentration ranges at this location.

TCE was detected exceeding the ambient air concentration range for 15 samples (out of 21) collected in the building with the HVAC system operating and shut down. PCE was only detected exceeding the ambient air concentration range in one basement sample collected with the HVAC system off. TCE was measured in indoor air at concentrations ranging from  $0.025$  to  $6.8 \mu\text{g}/\text{m}^3$  at Building N239A. Table 8 provides the indoor air and ambient air sample results.

### **5.18.5 Response Action Tier Designation**

Building N239A is classified as Tier 3A as all sample results are significantly below indoor air cleanup levels with both the HVAC system operating and shut down, except for one sample (N239A-1-06-F) collected in hallway C102 with the HVAC system off. The source of the elevated TCE in hallway C102 may be something other than vapors from beneath the floor as the location is adjacent to two utility rooms and an access door to outside the building. Additional characterization is needed to identify the TCE source and verify the tentative Tier classification.

## **5.19 Building N243**

A walk-through inspection of Building N243 was conducted on November 17, 2011. A completed Building Survey Form for Building N243 is included in Appendix D. The indoor air and ambient air samples at Building N243 were collected on May 24 and May 27, 2012.

### **5.19.1 Building Condition**

Building N243 is an approximately 130,000-SF, three-story structure used as a flight guidance and simulation lab that operates from Monday through Friday, 8 a.m. to 7 p.m. The building is not frequently occupied on the weekends. The building has a half basement at approximately 4.5 feet bgs that is used for office space, storage, and utilities. The basement floor and walls are constructed of concrete.

The building has concrete slab floor. Cracks and seams are present on the slab floor.

There is a sump in Room N032 with water at approximately 3 to 4 feet below the floor. Floor drains are present in Rooms N032 and 039 and all bathrooms. There are two elevators in the building. Electrical conduits penetrate the slab floor in Rooms N032, 039, and E034. Water supply and sewer drains are present in all bathrooms.

During refueling and when aircrafts mobilize for takeoff, fumes often drift onto the facility and are noticeable within the building.

### **5.19.2 HVAC System**

Building N243 has a HAVC system (zoned heating/cooling). Limited information has been provided about the HVAC system. The main intake is located at grade on the western side of the building, near Room 113A. Also an active intake and a large cooling unit are located on the roof. The building has natural-gas and steam heating systems. Fans are used in the building for ventilation and air circulation.

### **5.19.3 Existing Mitigation Measures**

No mitigation measures are in place at Building N243.

### **5.19.4 Sample Locations and Results**

#### **5.19.4.1 Previous Sampling Results**

A total of 31 samples were collected from Building N243 during the air sampling event conducted in March 2004 at Building N243. TCE was measured in indoor air at concentrations ranging from 0.1 to 1.11  $\mu\text{g}/\text{m}^3$  (NASA 2012).

#### **5.19.4.2 Current Sampling Results**

A total of 33 indoor air samples (including 5 duplicates) were collected from three floors and the basement of Building N243 with the HVAC system operating and with the HVAC system off. One ambient air sample from just outside Building 243 and two intake samples from the roof of Building 243 were collected with the HVAC system operating and shut down. Ambient/intake air samples were collected along with indoor samples on May 24, 2012, with the HVAC system operating and on May 27, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor and outside air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels with both the HVAC system operating and shut down. TCE was detected exceeding the ambient air concentration range for only two

samples collected in the basement (N243-B-06-F and N243-B-07-N). PCE was detected slightly exceeding the ambient air concentration range in one basement sample (N243-B-07-N) and one first floor sample (N243-1-01-N) with the HVAC system operating. TCE and PCE were measured in indoor air at concentrations ranging from 0.0075 to 1.6  $\mu\text{g}/\text{m}^3$  and 0.022 to 0.35  $\mu\text{g}/\text{m}^3$ , respectively, in Building N243. The maximum concentration of TCE was detected in a basement sample (N243-B-06-F) collected with the HVAC system shut down. PCE was detected (0.27  $\mu\text{g}/\text{m}^3$ ) exceeding the ambient air concentration range for work area samples at one location. Table 8 provides the indoor air and ambient air sample results.

### **5.19.5 Response Action Tier Designation**

Building N243 is classified as Tier 3A due to indoor air concentration for TCE and PCE slightly exceeding the ambient air concentration range in work area samples. All sample results for all COCs at Building N243 are significantly lower than the indoor air cleanup levels.

## **5.20 Building N243A**

A walk-through inspection of Building N243A was conducted on November 17, 2011. A completed Building Survey Form for Building N243A is included in Appendix D. The indoor air and ambient air samples at Building N210 were collected on May 24 and May 27, 2012.

### **5.20.1 Building Condition**

Building N243A is an approximately 9,000-SF, three-story structure used as a welding and machine shop that operates from Monday through Friday, 8 a.m. to 5 p.m. The building is infrequently used on the weekends. The building has a basement tunnel to the rotunda in Building N243. The basement floor and walls are constructed of concrete.

The building has concrete slab floor. Cracks and seams are present on the slab floor.

No sumps/drains are present in the building. There are unknown conduits penetrating the slab floor in Rooms 101 and 104. New carpet was installed in Room 243 within one month of the survey date.

During refueling and when aircrafts mobilize for takeoff, fumes often drift onto the facility and are noticeable within the building.

### **5.20.2 HVAC System**

Building N243A has a zoned heating/cooling HVAC system. The second floor offices have only active HVAC systems. The cooling units are located outside the northwest side of the building. Limited information has been provided about the HVAC system. Access was not available due to maintenance work being performed in the building.

Ventilation systems such as mechanical fans and open air vents on the northern and western walls are present in the building. The building has a steam heating system.

### **5.20.3 Existing Mitigation Measures**

No mitigation measures are in place at Building N243A.

#### **5.20.4 Sample Locations and Results**

A total of 10 indoor air samples (including 2 duplicates) were collected from two floors and the basement of Building N243A with the HVAC system operating and with the HVAC system off. Two ambient air samples from just outside Building N243A were collected at the same location with the HVAC system operating and shut down. Indoor and ambient air samples were collected on May 22, 2012, with the HVAC system operating and on May 27, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor and outside air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below the indoor air cleanup levels with the HVAC system both operating and shut down. Only PCE was detected slightly exceeding the ambient air concentration range for only one sample collected in Room 104 (N243A-1-01-N) with the HVAC system operating. None of the other COCs including TCE were detected exceeding the ambient air concentration ranges at Building N243A. TCE and PCE were measured in indoor air at concentrations ranging from 0.028 to 0.21  $\mu\text{g}/\text{m}^3$  and 0.026 to 0.26  $\mu\text{g}/\text{m}^3$ , respectively, at Building N243A. Table 8 provides the indoor air and ambient air sample results.

#### **5.20.5 Response Action Tier Designation**

Building N243A is classified as Tier 3A due to indoor air concentrations for PCE exceeding the outdoor air concentration range at only one location. All sample results for all COCs at Building N243A were significantly lower than the indoor air cleanup levels.

### **5.21 Building 510**

A walk-through inspection of Building 510 was conducted on November 15, 2011. A completed Building Survey Form for Building 510 is included in Appendix D. The indoor air and ambient air samples at Building 510 were collected on May 23 and May 27, 2012.

#### **5.21.1 Building Condition**

Building 510 is an approximately 5,000-SF, one-story structure. The building is used as an administration building by a maintenance contractor. The office workers occupy the building from Monday through Friday, 8 a.m. to 5 p.m. The facility communications room (108A) in the building is occupied 24 hours per day/7 days a week/365 days a year.

The building has a concrete slab, carpeting, and a tile floor. The condition of the slab is unknown. The floor drains are in Rooms R101 and R103. There are sink drain conduits penetrating the slab floor in Room 105.

#### **5.21.2 HVAC System**

The Building 510 HVAC system consists of two roof-mounted AC units, one for the east side of the building and one for the west side of the building. The building has exhaust fans in the two bathrooms for ventilation. The building has a natural-gas heating system.

#### **5.21.3 Existing Mitigation Measures**

Currently, no mitigation measures are in place at Building 510.

## **5.21.4 Sample Locations and Results**

### **5.21.4.1 Previous Sampling Results**

One indoor air sample was collected in February 2008 in the last air sampling event conducted at Building 510. TCE was measured below the detection limit and PCE was detected at a concentration of 0.264  $\mu\text{g}/\text{m}^3$  (Neptune 2008).

### **5.21.4.2 Current Sampling Results**

Four indoor air samples (including one duplicate) were collected from Building 510 on May 23, 2012, with the HVAC system operating and three indoor air samples were collected on May 27, 2012, with the HVAC system off. Three ambient air samples (including one duplicate) were collected outside Building 510 in the same 24-hour period as the indoor air samples, one with the HVAC system operating and two with the system shut down. The sampling location details are provided in Table 6. Indoor and outdoor air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels with both the HVAC system operating and shut down. PCE exceeded the ambient air concentration range for only one sample (0.52  $\mu\text{g}/\text{m}^3$ ) collected with the HVAC system operating. None of the other COCs were detected exceeding their ambient air concentration ranges at Building 510. TCE and PCE were measured in indoor air at concentrations ranging from 0.084 to 0.15  $\mu\text{g}/\text{m}^3$  and 0.048 to 0.52  $\mu\text{g}/\text{m}^3$ , respectively. Table 8 provides the indoor air and ambient air sample results.

### **5.21.5 Response Action Tier Designation**

Building 510 is classified as Tier 3A due to indoor air concentrations for PCE exceeding the ambient air concentration range at one location. All sample results for all COCs at Building 510 were significantly lower than the indoor air cleanup levels.

## **5.22 Building 555**

A walk-through inspection of Building 555 was conducted on November 15, 2011. A completed Building Survey Form for Building 555 is included in Appendix D. The indoor air and ambient air samples at Building 555 were collected on May 23 and May 28, 2012.

### **5.22.1 Building Condition**

Building 555 is an approximately 5,000-SF, one-story structure. The building is used as an office by multiple tenants. The office workers occupy the building from Monday through Friday, 8 a.m. to 5 p.m. The building is only partially occupied, where partially occupied infers that only a part of the building is occupied or utilized. .

The building has a concrete slab and tile floors. The condition of the slab is unknown.

Floor drains are present in Room R112B. There are sink drain conduits penetrating the slab floor in Room 108A and conduits for communication lines in Room 107B.

## **5.22.2 HVAC System**

Building 555 has an HVAC system (zoned heating/cooling) with three roof-mounted AC units, one each on the west, south, and the northeast sides of the building. The building has exhaust fans in two bathrooms for ventilation. The heating system uses natural gas.

## **5.22.3 Existing Mitigation Measures**

No mitigation measures are in place for Building 555.

## **5.22.4 Sample Locations and Results**

Three indoor air samples were collected from Building 555 with the HVAC system operating and three samples were collected with the HVAC system off. An ambient air sample was collected with each indoor air sampling event. Indoor and ambient air samples were collected on May 23, 2012, with the HVAC system operating and on May 28, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor and outside air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below the indoor air cleanup levels. TCE and vinyl chloride exceeded the ambient air concentration ranges for samples collected with the HVAC system shut down. None of the other COCs were detected exceeding their ambient air concentration ranges at Building 555. TCE was detected in indoor air at concentrations ranging from 0.17 to 1.3  $\mu\text{g}/\text{m}^3$ . Table 8 provides the indoor air and ambient air sample results.

## **5.22.5 Response Action Tier Designation**

Building 555 is classified as Tier 3A due to indoor air concentrations for TCE and vinyl chloride exceeding the outdoor air concentration range for samples collected with the HVAC system shut down. All sample results for all COCs at Building 555 were significantly lower than the indoor air cleanup levels.

## **5.23 Building 566**

A walk-through inspection of Building 566 was conducted on November 14, 2011. A completed Building Survey Form for Building 566 is included in Appendix D. The indoor air samples at Building 566 were collected on May 23 and May 28, 2012.

### **5.23.1 Building Condition**

Building 566 is an approximately 6,000-SF, one-story structure. The building is used as an office by multiple tenants. Rooms 111, 112, and 113 are occupied from Monday through Friday, 7 a.m. to 3 p.m. with occasional weekend use. Rooms 100, 101, 102, 106C, 106E, 107, 109, and 110 are occupied from Monday through Friday, 8 a.m. to 5 p.m.

The building has a concrete slab and tile floors. The condition of the slab is unknown.

Floor drains are present in Rooms R101 and R102. Electrical conduits penetrate the slab floor in Room U101. There are electrical outlets located in the floor of Rooms C103, 106, and 103. Sink conduits are present in Room J103.

### **5.23.2 HVAC System**

Building 566 has a HVAC system (zoned heating/cooling), with one AC unit mounted in the center of the roof. A direct expansion AC unit is mounted on the ground at the northwest corner of the building. There are fans in the restrooms that provide ventilation. The building has a natural-gas heating system.

### **5.23.3 Existing Mitigation Measures**

No mitigation measures are in place at Building 566.

### **5.23.4 Sample Locations and Results**

#### **5.23.4.1 Previous Sampling Results**

Five indoor air samples were collected in the air sampling event conducted in March 2009 at Building 510. TCE was measured at concentrations ranging from 0.0335 to 1.15  $\mu\text{g}/\text{m}^3$  (NASA 2012).

#### **5.23.4.2 Current Sampling Results**

Three indoor air samples were collected from Building 566 with the HVAC system operating and three samples were collected with the HVAC system off. No ambient air samples were collected outside Building 566. Indoor air samples were collected on May 23, 2012, with the HVAC system operating and on May 28, 2012, with the HVAC system off. The sampling location details are provided in Table 6. Indoor and outside air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels as well as within ambient air concentration ranges for both the HVAC system operating and the HVAC system shut down. None of the COCs were detected exceeding their ambient air concentration ranges at Building 566. TCE was detected in indoor air at concentrations ranging from 0.012 to 0.097  $\mu\text{g}/\text{m}^3$  at Building 566. Table 8 provides the indoor air and ambient air sample results.

### **5.23.5 Response Action Tier Designation**

Building 566 is classified as Tier 3B as none of the COCs exceed the outdoor ambient air concentrations.

## **5.24 Building 567**

A walk-through inspection of Building 567 was conducted on November 16, 2011. A completed Building Survey Form for Building 567 is included in Appendix D. The indoor air samples at Building 567 were collected on May 21, 2012.

### **5.24.1 Building Condition**

Building 567 is an approximately 9,000-SF, one-story structure. The building is used as a warehouse and operates from Monday through Friday, 7 a.m. to 4 p.m. The building has concrete slab floors with cracks and seams in the slab. Floor drains are present in Room R101.

Holes for former bollard locations exist near the bay doors and extend to a depth of approximately 2.5 feet below the floor.

#### **5.24.2 HVAC System**

Building 567 does not have an HVAC system. There is a window-mounted AC unit in an enclosed office located in Room 102. Open windows and fans are used for ventilation and air circulation. A steam heat system is used in the building.

#### **5.24.3 Existing Mitigation Measures**

No mitigation measures are in place at Building 567.

#### **5.24.4 Sample Locations and Results**

A total of three indoor air samples were collected in Building 567 on May 21, 2012. The sampling location details are provided in Table 6. Indoor air sample location maps are provided in Appendix A. Photographs taken during sampling activities are provided in Appendix E.

All sample results were below indoor air cleanup levels for all COCs. TCE and PCE were detected exceeding their respective ambient air concentration ranges in all the samples, and 1,1-DCA exceeded the ambient air concentration range in one sample. TCE and PCE were measured in indoor air at concentrations ranging from 1.2 to 3.9  $\mu\text{g}/\text{m}^3$  and 0.22 to 0.75  $\mu\text{g}/\text{m}^3$ , respectively, at Building 567. Table 8 provides the indoor air and ambient air sample results.

#### **5.24.5 Response Action Tier Designation**

Building 567 is classified as Tier 3A due to the indoor air concentrations for TCE, PCE, and 1,1-DCA exceeding their ambient air concentration ranges. The sample results for all COCs at Building 567 were lower than the indoor air cleanup levels.

## Section 6 QA/QC and Data Validation

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All sampling activities conducted during this investigation were performed under strict adherence to the QA/QC protocols documented in the Final Work Plan (AM8AJV 2012). A total of 287 air samples, including QC samples, were collected from May 18 to May 28, 2012 and on June 12, 2012 to evaluate the vapor intrusion pathways in 23 fully or partially-occupied buildings at Moffett Field, where partially occupied infers that only a part of a building is occupied or utilized. . A field QC audit was conducted on May 24, 2012 by the AM8AJV project Quality Assurance Manager. The purpose of the QC audit was to determine whether the field sampling activities were effectively conducted according to the Final Work Plan (AM8AJV 2012). The audit consisted of observing field work and sampling procedures; reviewing field documentation and field logs; observing sample packaging and shipping procedures; and accompanying field samplers while they demonstrated the sample collection process. The following sections describe the QA/QC procedures applied to this investigation for data evaluation and usability.

### 6.1 Laboratory Quality Control

Laboratory QC is designed to detect, reduce, and correct deficiencies in a laboratory's internal analytical process prior to the release of results and to improve the quality of the results reported. A discussion regarding the precision and accuracy of the laboratory's analytical systems is included in Section 6.2. Analytical services for air samples were provided by Columbia Analytical Services, Inc. A total of 287 air samples, including the associated QC samples (duplicates), were submitted to this DoD ELAP- and NELAP-accredited laboratory for analysis of VOCs by EPA Method TO-15 SIM.

Upon sample arrival, the laboratory verified each sample's physical condition and ensured that all pertinent documentation associated with each sample was complete. Each analyst reviewed the quality of their work based on established protocols specified in the laboratory's standard operating procedures, analytical method protocols, project-specific requirements, and data quality objectives. All air samples were received by the laboratory in good condition. In general, QC sample results that were outside the laboratory acceptance criteria for data accuracy and precision were flagged by the laboratory and further qualified during data validation. Results for laboratory QC samples and reporting limits are discussed in Section 6.2.

### 6.2 Data Validation

Data validation was performed by Laboratory Data Consultants, Inc., of Carlsbad, California, under EPA Level III and IV guidelines on 90% and 10% of the data, respectively (Appendix C). Both levels of validation included review of laboratory QC summaries (blank, calibrations, spike recoveries, duplicates, etc.). The Level IV process incorporates a review of raw data including chromatograms and quantitation reports. This additional information is utilized in the Level IV data validation process for checking calculations of quantified analytical data.

Analytical data was qualified based on data validation reviews. Qualifiers were consistent with the applicable EPA functional guidelines and were used to provide data users with an estimate of the level of uncertainty associated with the qualified results. The project team determined the data usability based on data validation results with respect to the following qualifiers:

- U – not detected at or above the stated limit
- J – estimated concentration
- R – non-usable data because the presence or absence of the analyte could not be determined
- UJ – not detected at or above an estimated sample detection limit

Once the data are reviewed and qualified according to the above mentioned documents, the data set is then evaluated using the precision, accuracy, representativeness, completeness, and comparability (PARCC) criteria. PARCC criteria provide an evaluation of overall data usability. The following is a discussion about PARCC criteria as it relates to the project data quality objectives. All VOC results were assessed to be valid since none of the results were rejected based on QC exceedances.

### **6.2.1 Holding Time**

The sample analysis dates and sample collection dates were compared to ensure samples were analyzed within specified holding times. All samples were received by the subcontract laboratory in good condition, and all samples met the validation criteria.

### **6.2.2 Precision and Accuracy**

Field duplicate were used to assess the overall precision of the sampling effort contaminant variability in the sample matrix. Field duplicates were collected at the same time and from the same location as their corresponding primary samples. Field duplicates were collected at least 10 percent of all field samples. As outlined in the Final Work Plan (AM8AJV 2012), *precision* is evaluated by collecting and analyzing field and laboratory duplicates and then calculating the variance between the samples, typically as a relative percent difference (RPD). For air samples, a RPD threshold of 25% was used as specified in Final Work Plan (AM8AJV 2012). The RPDs of all analyzed compounds (VOCs) for duplicate samples were compared to a threshold value of 25%, and if the RPDs values exceeded 25%, the results for those compounds in that sample were flagged as J. Most samples were within the calibration range, except few samples for which PCE, vinyl chloride, 1,1-DCE, 1,1-DCA, cis-1,2-DCE, and trans-1,2-DCE exceeded the QC criteria due to the estimated result of the primary and duplicate samples. RPD exceedances from these results do not suggest a significant impact on the data quality. Overall, the results from the sampling events indicate very good precision in the analytical method.

### **6.2.3 Representativeness**

Representativeness is the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. It is a qualitative parameter that depends on proper design of the sampling program.

The representativeness of data was maintained by the use of established field and laboratory procedures and their consistent application. Field personnel were responsible for collecting and handling samples according to the procedures in Final Work Plan (AM8AJV 2012) so that samples were representative of field conditions.

#### **6.2.4 Completeness**

Completeness is the ratio of usable results to unusable results in terms of percentage. Unusable results are defined as results rejected because of serious QC deficiencies. The value obtained for project completeness represents the attainment of specific project goals for data used for decision making. All requested parameters were analyzed by the subcontract laboratory. No results were rejected due to serious QC deficiencies. The data set met and exceeded the 85 percent completeness goal.

#### **6.2.5 Comparability**

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another, including whether it was generated by a single or multiple laboratories. The use of standardized field and analytical procedures ensures comparability of analytical data.

Sample collection and handling procedures adhered to EPA-approved protocols. Laboratory procedures followed standard analytical protocols, used standard units and standardized report formats, followed the calculations as referenced in approved analytical methods, and used a standard statistical approach for QC measurements.

#### **6.2.6 Sensitivity**

Sensitivity is a measure of method performance in terms of the ability to detect chemicals of concern at concentrations low enough to eliminate potential false negatives and to ensure the project goals in terms of meeting actionable concentrations. The project target detection limits are based on available, standard methods applicable to air and are below most applicable regulatory criteria.

#### **6.2.7 Data Usability Summary**

Based on the evaluation of the available QA/QC data and validation reports, the 85-percent-completeness goal was achieved for all analyses based on the ratio of the number of usable data (data not rejected due to serious deficiencies) and the total number of planned samples. The overall findings of the data review and validation indicate that the data are of sufficient quality to support the goals of the Summary Report. There were no other issues associated with sample collection or the results of the analysis of field QC samples that would negatively impact data usability. The data is sufficient and acceptable to support the conclusions of this Summary Report.

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## Section 7 Findings and Conclusions

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A total of 287 air samples, including indoor and outdoor air samples, were collected to evaluate the vapor intrusion pathways in 23 fully or partially occupied buildings at Moffett Field, where partially occupied infers that only a part of a building is occupied or utilized. This section summarizes the results and conclusions.

### 7.1 Summary of Findings

Of the 23 buildings sampled, only two buildings (Buildings 10 and 126) had one or more samples in the work areas with concentrations exceeding the air cleanup levels in the ROD Amendment (EPA 2010). For Building 10, samples from work areas ranged in values from 4 to 26  $\mu\text{g}/\text{m}^3$  for TCE and from 1.2 to 19  $\mu\text{g}/\text{m}^3$  for PCE. Results for samples from the tunnel access that exceeded cleanup levels had the following ranges:

- 1,1-DCA: 24 to 28  $\mu\text{g}/\text{m}^3$  (cleanup level – 6  $\mu\text{g}/\text{m}^3$ );
- cis-1,2-DCE: 270 to 310  $\mu\text{g}/\text{m}^3$  (cleanup level – 210  $\mu\text{g}/\text{m}^3$ );
- TCE: 820 to 960  $\mu\text{g}/\text{m}^3$  (cleanup level – 5  $\mu\text{g}/\text{m}^3$ );
- PCE: 650 to 770  $\mu\text{g}/\text{m}^3$  (cleanup level – 2  $\mu\text{g}/\text{m}^3$ ).

For Building 126, only PCE exceeded the cleanup level of 2  $\mu\text{g}/\text{m}^3$  in work area samples, with concentrations ranging from 1.9 to 4.4  $\mu\text{g}/\text{m}^3$ .

Buildings 3, 12, N210, and N239A had samples from a single location in each building that exceeded TCE indoor commercial cleanup levels. These samples were pathway samples which are non-work area samples and include crawlspaces, hallways, utility rooms, conduit penetrations, etc. In Building 3, TCE was detected in concentrations exceeding the cleanup level ranging from 7.6 to 7.9  $\mu\text{g}/\text{m}^3$  for pathway samples that were collected from a utility conduit to the crawl space that underlies the floor in Room 105A. In Building 12, TCE was detected exceeding the cleanup level at a concentration of 6.1  $\mu\text{g}/\text{m}^3$  for a crawl space sample located under Room 110. These samples exceeding cleanup levels for TCE were collected from Buildings 3 and 12 with the HVAC systems on; however, the results were below cleanup levels for samples collected from these locations when the HVAC systems were off.

In Building N210, TCE was detected exceeding the cleanup level at a concentration of 17  $\mu\text{g}/\text{m}^3$  in a sample from the space beneath the raised floor in the work area near cubicles 019 and 021. A vapor extraction system is used to capture these vapors under normal building operations; the vapor extraction system was turned off for at least 24 hours prior to collection of the samples.

In Building N239A, TCE was detected exceeding the cleanup level at a concentration of 6.8  $\mu\text{g}/\text{m}^3$  for a sample collected in hallway C102 with the HVAC system off. The result for the sample collected from this location with the HVAC system operating was below the TCE cleanup level. This location is adjacent to two utility rooms and a door to outside the building.

## **7.2 Response Action Tiering System Evaluation**

Using the relevant historical data, current indoor air sampling results, and Tables 6A and 6B of the ROD Amendment (EPA 2010), the buildings were tiered to determine the need for a response action in accordance with the Response Action Tiering System. Indoor air quality results for COCs were compared to the ROD Amendment cleanup levels and to ambient outdoor air concentration ranges with consideration of whether or not an air quality EC is in place. Of the 23 buildings evaluated, only Building 126 was classified as Tier 1. The Navy is conducting additional groundwater investigations in the area of Building 126 in preparation of implementing a remedy for PCE in groundwater and soil vapors (see Section 7.3.5). During July 2012, after the air sampling event, an interim measure EC was installed for Building 10 giving the building a Tier 2 ranking (see Section 7.3.2). Building N210 was ranked as Tier 2 based on historic results and the use of an EC to maintain air quality above cleanup levels. All other buildings were classified as Tier 3A (17 buildings) or Tier 3B (3 buildings) due to indoor air concentrations meeting indoor air cleanup levels in work areas. Building N239A is tentatively ranked as Tier 3A as all samples were below cleanup levels, except for a single sample with TCE above the cleanup level; however, the TCE source maybe from maintenance workers that passed through the hallway location, as the site is adjacent to utility rooms with maintenance work areas and an access door to outside. The tier classification for each building, based on the most recent and relevant historical data, is presented in Table 12.

## **7.3 Outstanding Issues**

### **7.3.1 Building 3**

Two pathway samples (including a duplicate sample) collected with the HVAC system operating in Room 105A from a utility conduit to the crawl space that underlies the floor contained TCE exceeding the indoor air cleanup level of  $5 \mu\text{g}/\text{m}^3$  in the range of 7.6 to  $7.9 \mu\text{g}/\text{m}^3$ . Interim mitigation measures that can be used in Building 3 include sealing conduits in Room 105A that penetrate the floors and installing ventilation systems. Additional data will be collected near the conduits to better characterize the nearby areas at Building 3 and to confirm the tier classification.

### **7.3.2 Building 10**

Due to the high concentrations reported for COCs in Building 10 during the May to June 2012 sample event, the Navy installed a cut-off wall and a blower as an interim vapor control measure on July 11-12 to remove air/vapors from the utility corridor tunnel that runs from Building 10 to Hangar 1. Prior to the interim action, VOC vapors in the tunnel had been migrating into Building 10. Air monitoring conducted on July 18 and August 9, 2012, in Building 10 showed that the interim action has successfully reduced COC vapor concentrations in work areas in Building 10 to below cleanup levels (Table 11). The Navy will maintain the interim measure while the building is in use and until a final remedy is implemented. The Navy will be monitoring indoor air quarterly (every 3 months) at Building 10, including in the tunnel access area, as long as the current interim measure is in place. A reduction in monitoring frequency will be recommended if quarterly monitoring results are consistently below cleanup levels. This action changes the tier ranking of Building 10 to Tier 2.

### **7.3.3 Building 126**

The Navy is conducting an investigation during October to December 2012 to further characterize the extent of PCE in groundwater in the area of Buildings 6 and 126. This investigation consists of two phases: 1) a direct push investigation using the Navy's Site Characterization Analysis Penetrometer System (SCAPS) outfitted with a membrane interface probe (MIP) and direct sample ion-trap mass spectrometer (DSITMS) to generate vertical profiles of relative VOC concentrations in the subsurface area, and 2) installation of up to 12 new monitoring wells. The Phase I SCAPS survey will be completed by the end of October 2012. Soils will be screened at several locations near Buildings 6 and 126 from ground surface to depths of up to 65 ft. below ground surface (bgs). The Phase II well installations are expected to be completed by the end of December. The first and second groundwater sampling events for the new wells are scheduled for late January 2013 and late April 2013. The investigation and monitoring results will be used to develop an in-situ groundwater treatment to remedy the PCE in groundwater in 2014. An indoor air monitoring program will be developed for Building 126. Building 6 is vacant and will be demolished. The status of Building 126 will be reevaluated after completion of the Navy's scheduled action.

### **7.3.4 Building N210**

All sample results were below indoor air cleanup levels with the HVAC system shut down except for one sample (N210-1-11-F) collected from the space beneath the raised floor in the work area near cubicles 019 and 021. TCE was detected exceeding the indoor cleanup level at a concentration of  $17 \mu\text{g}/\text{m}^3$  at this location. A vapor extraction system is used to capture these vapors under normal building operations as an interim measure; the vapor extraction was turned off for at least 24 hours prior to collection of the samples. Additional data near this location can be collected with the HVAC system off and operating to better characterize the conditions and to confirm the tier evaluation.

Historically, many areas of Building N210 had indoor air concentrations that exceeded the TCE indoor cleanup level of  $5 \mu\text{g}/\text{m}^3$ . The HVAC system has been modified as an interim measure with the air intake moved to the roof and flow capacity increased to maintain a positive pressure in the building. NASA desires a different long-term remedy than the current configuration for HVAC operation.

### **7.3.5 Building N239A**

All sample results were below indoor air cleanup levels, with both HVAC system operating and shut down, except at one sample location. Sample N239A-1-06-F was collected in hallway C102 with the HVAC system off; TCE was detected at a concentration of  $6.8 \mu\text{g}/\text{m}^3$ , exceeding the indoor air cleanup level of  $5 \mu\text{g}/\text{m}^3$ . The result for the sample collected from this location with the HVAC system on was below the TCE cleanup level. This location is adjacent to two utility rooms and a door to outside the building. The TCE may be from a solvent used in one of the adjacent utility rooms or from utility conduits through the floor in an adjacent room. Additional data near this location will be collected for better characterization and for confirming the tier evaluation.

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## Section 8 Recommendations

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Recommendations presented in this section were prepared based on Table 8 of the ROD Amendment (EPA 2010).

### 8.1 Potential Mitigation Measures

The interim mitigation measures that may be used for each building are provided in Table 12 including sealing cracks, conduits, and/or elevator shafts that penetrate foundations and floors; refurbishing, retrofitting, and/or installing passive or active ventilation systems; and installing air purification systems.

#### 8.1.1 Building 3

Interim mitigation measures that can be used in Building 3 include sealing conduits in Room 105A that penetrate the floors and installing ventilation systems. Two pathway samples (including a duplicate sample) collected with the HVAC system operating in Room 105A from a utility conduit to the crawl space that underlies the floor contained TCE in the range of 7.6 to 7.9  $\mu\text{g}/\text{m}^3$ , exceeding the TCE indoor air cleanup level of 5  $\mu\text{g}/\text{m}^3$ . Passive venting of the crawl space will be considered as a long-term remedy. After the interim mitigation measures are in place for Building 3, additional data near the conduits will be collected in Room 105A to confirm the effectiveness of the mitigation measures as well as characterize the nearby areas in Building 3 for confirming the tier classification.

#### 8.1.2 Building 10

There is a subsurface utility corridor tunnel that runs from Building 10 to Hangar 1. A primary vapor intrusion pathway into Building 10 is by vapors entering the tunnel and migrating into Building 10. At EPA's request, NASA installed a blower system in early May at the tunnel access in Building 10 as an interim measure to control vapors. The sampling event conducted by the Navy on May 18 in Building 10, after the blower system installation, reported PCE and TCE above cleanup levels in Building 10 near the tunnel entrance (see Section 5.4.4). Due to the continued high COC levels, the Navy installed a cutoff wall and blower in the tunnel at a vault access point which is located approximately 300 feet east of Building 10 from July 11–12, 2012, as a part of an interim action.

Air monitoring conducted on July 18 and August 9, 2012, after implementing the interim action vapor control showed that the interim action successfully reduced VOC concentrations in work areas at Building 10 to below cleanup levels (Table 11). The laboratory report is provided in Appendix C and the data validation report is in Appendix D. The Navy will maintain the interim measure while the building is in use and until a final remedy is implemented for Building 10. The Navy will be monitoring indoor air quarterly (every 3 months) at Building 10, including in the tunnel access area, as long as the current interim measure is in place. A reduction in monitoring frequency will be recommended if quarterly monitoring results are consistently below cleanup levels. Other remedial measures, such as cutting off the pathway from the building to tunnel, will be evaluated for a long-term remedy.

### **8.1.1 Building 12**

Interim mitigation measures that can be used in Building 12 include sealing conduits penetrating the floor slab above the crawl space and passive venting of the crawl space.

### **8.1.2 Building 126**

The Navy is conducting an investigation during October to December 2012 to further characterize the extent of PCE in groundwater in the area of Building 126. This investigation consists of two phases: 1) a direct push investigation using the Navy's SCAPS outfitted with a MIP and DSITMS to generate vertical profiles of relative VOC concentrations in the subsurface area, and 2) installation of up to 12 new monitoring wells. The Phase I SCAPS survey will be completed by the end of October 2012. Soils will be screened at several locations near Buildings 6 and 126 from ground surface to depths of up to 65 ft. below ground surface (bgs). The Phase II well installations are expected to be completed by the end of December. The first and second groundwater sampling events for the new wells are scheduled for late January 2013 and late April 2013. The investigation and monitoring results will be used to develop an in-situ groundwater treatment to remedy the PCE in groundwater in 2014. An indoor air monitoring program will be developed for Building 126. The status of Building 126 will be reevaluated after completion of the Navy's scheduled action.

## **8.2 Characterization/Tier Response Data Gaps**

### **8.2.1 Buildings 3, 510, and N243A**

After the interim mitigation measures are in place for Building 3 as discussed in Section 8.1.1, additional data near the conduits can be collected in Room 105A where TCE was detected in pathway samples exceeding the indoor air cleanup level. This will confirm the effectiveness of the mitigation measures as well as characterize the nearby areas in Building 3 to confirm the tier classification. Similarly, confirmation sampling can be conducted for Buildings 510 and N243A after interim mitigation measures are implemented as described in Table 12.

### **8.2.2 Building 16**

Building 16 historically had TCE detections that exceeded indoor air cleanup levels. Build 16 had the HVAC operation converted in 2004 to increase the make-up air supplied into the building to maintain positive pressure in the building to improve indoor air quality. All current sampling results are below the cleanup levels for the building. Additional characterization is needed without the HVAC system operating and/or from soil gas samples around the perimeter of the building or subslab samples to provide additional lines of evidence to better understand the potential for vapor intrusion at Buildings 16.

### **8.2.3 Building N210**

All sample results were below indoor air cleanup levels with the HVAC system shut down except one sample (N210-1-11-F) collected from the space beneath the raised floor in the work area near cubicles 019 and 021. TCE was detected exceeding indoor cleanup level at a concentration of 17  $\mu\text{g}/\text{m}^3$  at this location. A vapor extraction system is used to capture these vapors under normal building operations; the vapor extraction was turned off for at least 24

hours prior to collection of the samples. Additional data near this location can be collected to better characterize the impacts and to confirm the tier evaluation.

#### **8.2.4 Building 239A**

Additional indoor air sampling is recommended in hallway C102 and in adjacent utility rooms U101 and U102 in Building 239A. Conduits through the floors in the utility rooms should be sealed.

#### **8.2.5 Buildings Potentially Outside Groundwater Plume**

Buildings 29, N243, and N243A are potentially outside of the limits of the groundwater contaminant plume. Soil vapor samples, subslab samples, and shallow groundwater samples collected from about and beneath these buildings could provide additional lines of evidence to get a Tier 4 (no further action) ranking.

### **8.3 Vapor Intrusion Monitoring Program**

All sampled buildings (Table 1) have been evaluated and classified under the Response Action Tiering System. Response actions for each building will be implemented as per the ROD Amendment (EPA 2010). Of the 23 buildings evaluated, only Buildings 10, 126, and N210 were classified as Tier 1 or Tier 2 and need an appropriate EC implemented as a remedy to meet indoor air cleanup levels. Building N210 needs a final remedy developed and implemented so the HVAC system can be returned to normal operation. The air quality exceedances at solitary locations in Buildings 3 and N239A are expected to be resolved after follow-up sampling and sealing of conduits. All other buildings are classified as Tier 3A or Tier 3B as indoor air concentrations meet indoor air cleanup levels in work areas without an EC in place or operating. The response action required for buildings classified as Tier 3A will require the development and implementation of long-term monitoring as per the ROD Amendment (EPA 2010). A total of 20 buildings (Buildings 2, 3, 10, 12, 13, 14, 15, 16, 29, 45, 107, 126, N210, N239, N239A, N243, N243A, 510, 555, and 567) were classified as either Tiers 1, 2, or 3A and will need long-term monitoring. No engineered remedy or long-term monitoring is required for buildings classified as Tier 3B (Buildings 67, 76, and 566).

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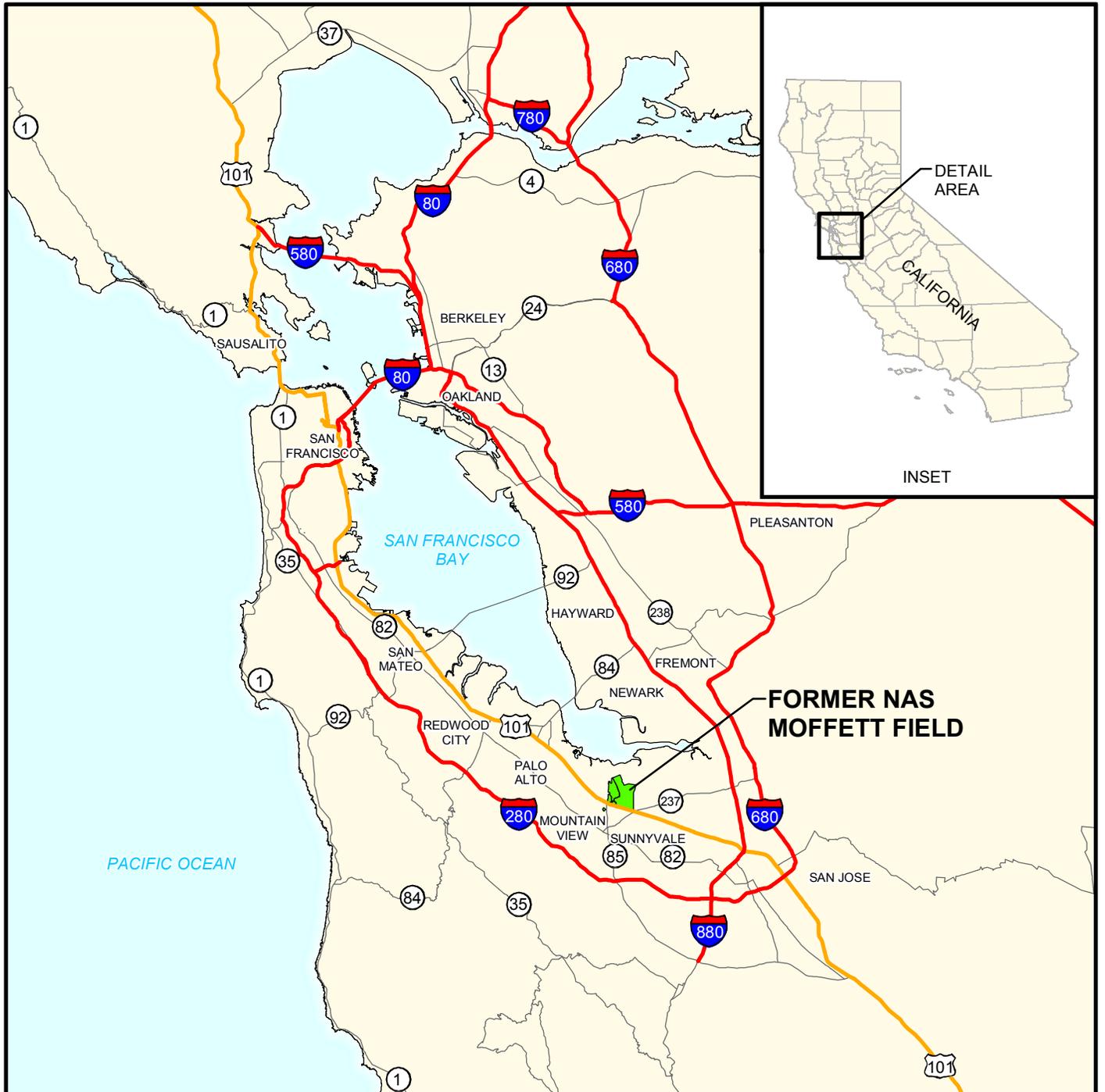
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## **Figures**

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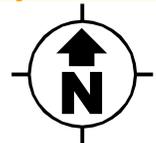
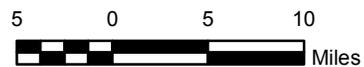


**LEGEND**

- STATE HIGHWAY
- U.S. HIGHWAY
- INTERSTATE HIGHWAY
- FORMER NAS MOFFETT FIELD
- WATER

NOTES:

EATS - EAST-SIDE AQUIFER TREATMENT SYSTEM  
 NAS - NAVAL AIR STATION  
 U.S. - UNITED STATES  
 WATS - WEST-SIDE AQUIFERS TREATMENT SYSTEM

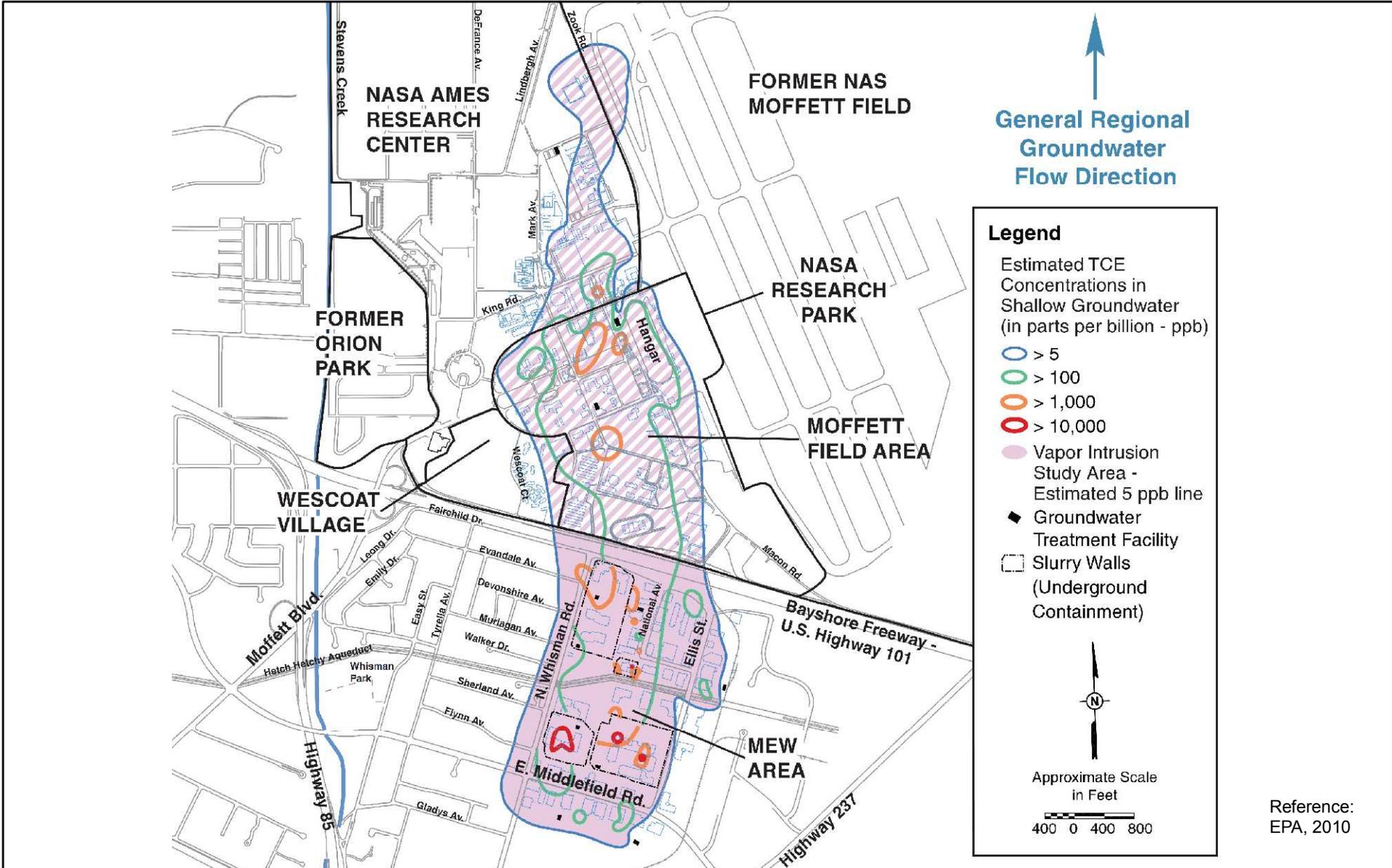


BASE REALIGNMENT AND CLOSURE  
 PROGRAM MANAGEMENT OFFICE WEST  
 SAN DIEGO, CALIFORNIA

Figure 1  
 Moffett Field Location Map

**Accord MACTEC 8A JV**

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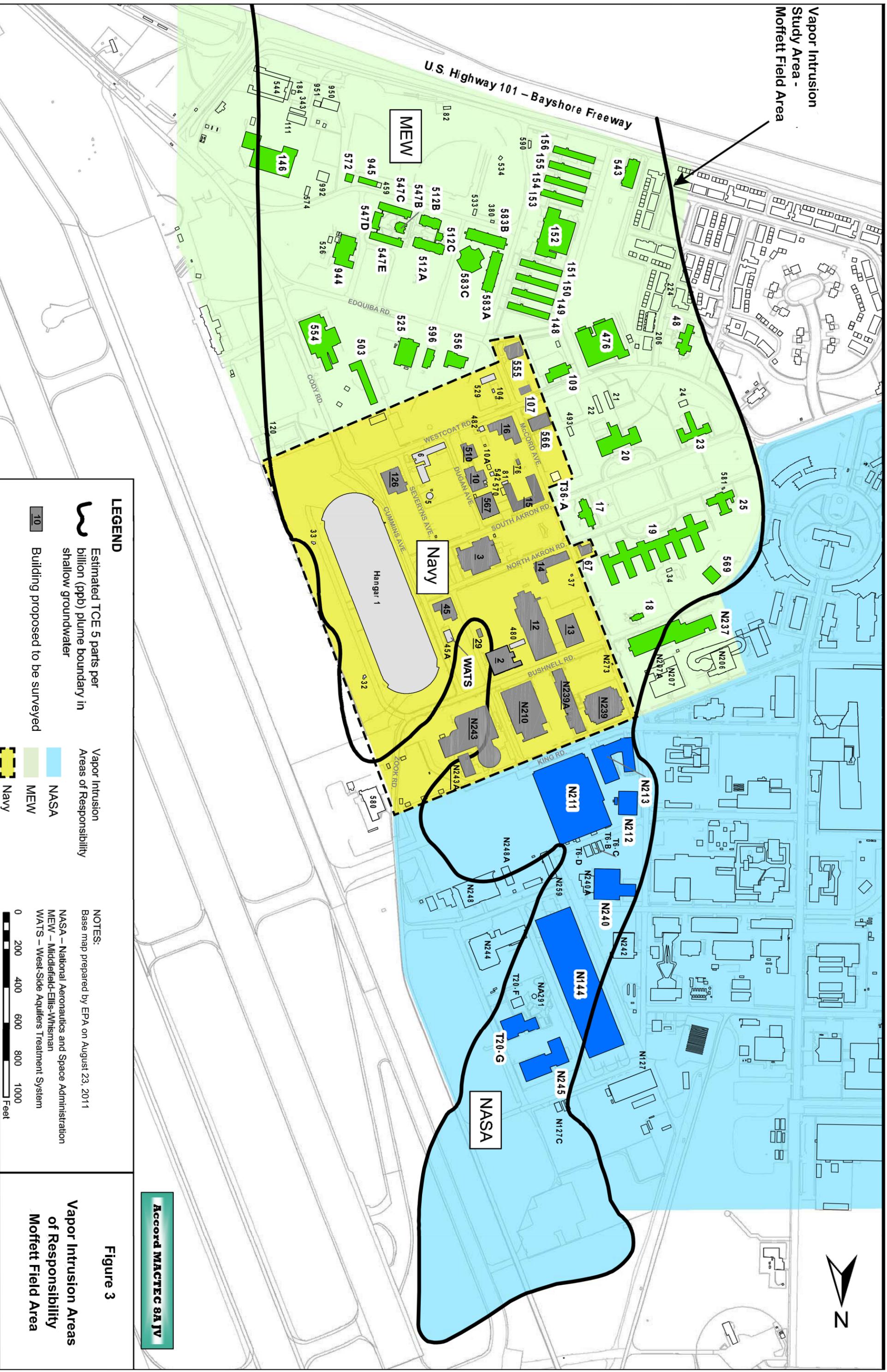
**Extent of TCE Concentrations**  
 Aquifer A/A1 Zone  
 Mew Superfund Study Area  
 Moffett Field, California

Base Realignment and Closure  
 Program Management Office West  
 San Diego, California

FIGURE  
**2**

DRAWN TJH	JOB NUMBER 5012118006	CHECKED	CHECKED DATE 4/2012	APPROVED	APPROVED DATE
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## **Tables**

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**Table 1. Building List for the Navy Area of the Vapor Intrusion Study Area**

<b>Building Number</b>	<b>Building Use</b>	<b>Building Occupancy and Status</b>	<b>Sampled</b>
2	Gymnasium	intermittently occupied	Yes
3	Conference Center and Cafeteria	occupied; to be demolished	Yes
6	Warehouse	abandoned; to be demolished	No
10	Boiler Plant for NASA Research Park	occupied; to stay	Yes
12	Commissary	occupied; to be demolished	Yes
13	Commissary Warehouse	occupied; to be demolished	Yes
14	Offices & Storage	abandoned; to be demolished	Yes
15	NASA Security	occupied; to stay	Yes
16	Maintenance Contractor (IAP) Office & Shops	occupied; to stay	Yes
29	Bicycle Shop	occupied less than 8 hours/day	Yes
45	Storage Facility	Occasionally occupied; to be demolished	Yes
45A	West-Side Aquifer Treatment System – open shelter	unoccupied; to stay	No
67	U.S. Post Office	occupied; to be demolished	Yes
76	Locksmith Shop	occupied less than 8 hours/day	Yes
107	Resident Officer in Charge of Construction Office	occupied; to be demolished	Yes
126	Moffett Historical Society Museum	occupied; to be demolished	Yes
480	Racquetball Court	Unoccupied; ventilated siding	No
510	Maintenance Offices	occupied; to be demolished	Yes
529	Offices & Storage	abandoned; to be demolished	No
555	Tenant Offices	occupied, to stay	Yes
566	Tenant Offices	occupied, to stay	Yes
567	Warehouse	occupied; to be demolished	Yes
N210	Offices & Storage (former hangar)	occupied; to stay	Yes
N239	Life Sciences Building (offices & laboratories)	occupied; to stay	Yes
N239A	Offices & Centrifuge	occupied; to stay	Yes
N243	Flight Guidance & Simulation Laboratory	occupied; to stay	Yes
N243A	Welding & Machine Shop	occupied; to stay	Yes
T36-A	Office Trailer	occupied; above ground on blocks	No

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**Table 2. Hydrostratigraphy of MEW and Moffett Field Areas,  
Mountain View and Moffett Field, California**

Unit	Unit Subdivision	Range of Approximate Depths (feet below ground surface)	
		Top	Bottom
A	Upper portion of A (A) aquifer	0 to 13	15 to 35
	Lower portion of A (B1) aquifer	15 to 45	45 to 77
A/B	A/B (A/B2) aquitard	45 to 65	60 to 85
B	B2 (B2) aquifer zone	60 to 80	95 to 135
	(B2/B3) aquitard	95 to 105	99 to 111
	B3 (B3) aquifer zone	99 to 130	115 to 160
B/C	B/C (B3/C) aquitard	115 to 140	155 to 180
C	Unknown/undefined	155 to 160	250
Deep	Unknown/undefined	Generally deeper than 250	

Note: The equivalent aquifer/aquitard designations for the MEW study area are in parentheses.

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**Table 3. Indoor Air Cleanup Levels for Chemicals of Concern for the Vapor Intrusion Study Area, Moffett Field, California**

Chemical of Concern	Indoor Air Cleanup Level ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>	
	Residential	Commercial
Trichloroethene	1	5
Perchloroethene	0.4	2
cis-1,2-Dichloroethene	60	210
trans-1,2-Dichloroethene	60	210
Vinyl Chloride	0.2	2
1,1-Dichloroethane	2	6
1,1-Dichloroethene	210	700

Notes:

a As presented in the Record of Decision Amendment for the Vapor Intrusion Pathway (EPA 2010)  
 $\mu\text{g}/\text{m}^3$  micrograms per cubic meter

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**Table 4. Summary of Tiering Descriptions and Response Actions for Existing Commercial Buildings in the Vapor Intrusion Study Area**

<b>Tier</b>	<b>Description</b>	<b>Response Action</b>	<b>Selected Remedy</b>
1	Building with indoor air concentrations greater than outdoor (background) air concentrations and indoor air cleanup levels.	Implement selected remedy (appropriate EC) to meet indoor air cleanup levels. Once indoor air cleanup level is achieved and confirmed, building is recategorized as Tier 2. Implement governmental, proprietary and information ICs.	<p>Active subslab/submembrane ventilation, monitoring, and ICs (including conduit sealing).<sup>1</sup> ICs consist of :</p> <ul style="list-style-type: none"> <li>• Permitting and building requirements to install appropriate engineering controls in future construction.</li> <li>• Recorded agreements to ensure installation and operation of engineering controls; require information to be provided to future owners; require information of building changes be provided to EPA and MEW responsible parties. Tracking service to provide information to EPA and MEW responsible parties of occupancy and building changes.</li> </ul>
2	Building with indoor air concentrations below the indoor air cleanup levels, while an EC is in place or in operation. Also, former Tier 1 buildings with confirmed indoor air concentrations that are below the indoor air cleanup levels.	Ensure continued operation and maintenance of active ventilation system or other selected engineered remedy to meet remedial action objectives. Develop and implement long-term monitoring and IC implementation plan. Implement governmental, proprietary and informational ICs. Where remedy is achieved through operation of an active ventilation system, agreement of property owner must be contained in a recorded agreement.	
3A	Building sampled without EC in place or operating with indoor air concentrations below indoor air cleanup levels, but greater than outdoor (background) concentrations.	No engineered remedy required. Develop and implement long-term monitoring plan. Implement governmental ICs.	<p>No engineering control. ICs only. ICs consist of:</p> <ul style="list-style-type: none"> <li>• Permitting and building requirements to install appropriate ECs in future construction.</li> </ul>
3B	Building sampled without EC in place or operating with indoor air concentrations at or within outdoor air (background) concentrations	No engineered remedy or long-term monitoring required. Implement governmental ICs.	
4	Buildings where converging lines of evidence demonstrate that there is no longer the potential for vapor intrusion into the building exceeding indoor air cleanup levels.	No action required after performance of all necessary confirmation sampling and documentation approved by EPA that no action is necessary.	No remedy required.

Notes:

1 Alternatively, active indoor air ventilation system, monitoring and ICs (including conduit sealing) may be selected as the vapor intrusion remedy for Tier 1 and 2 existing commercial building if the property/building owner agrees to use, operate, and monitor the indoor air ventilation system (e.g., HVAC system) in a manner consistent with the operations, maintenance, and monitoring plan developed for that building in a signed recorded agreement.

EC	engineering control	MEW	Middlefield-Ellis-Whisman
IC	institutional control	EPA	United States Environmental Protection Agency

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**Table 5. Number of Samples for Individual Buildings, Moffett Field, California**

Building	Indoor Air Samples				Ambient/Outdoor Air Samples	Duplicate Samples	Total Number of Samples
	8-hour	10-hour	24-hour	Grab	24-hour		
2	4						4
3	1	17			2	2	22
10	6				1 (10-hour)	1	8
12			12		1	1	14
13			2			1	3
14	7					1	8
15			12		2	2	16
16		10			2	2	14
29	2				1		3
45	2					1	3
67			2		1	1	4
76	2						2
107	4						4
126	10				7	1	18
210	14			1	1	3	19
239			40	4	2	3	49
239A			17	2		2	21
243			26	2	3	5	36
243A			8		2	2	12
510			6		2	2	10
555	6				2		8
566	6						6
567			3				3
Totals	64	27	128	9	29	30	287

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Table 6. Indoor Air Sampling Locations, Moffett Field, California

Sample Name	Sample Date (2012)	Sample Day	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale
			Building	Floor	Room		8-hour	10-hour	24-hour	Grab			
<b>Buildings with no HVAC System</b>													
<b>Indoor Air Samples</b>													
M002-1-01	18-May	Friday	2	1	100	NA	x				Work Area	Gymnasium	Main gym floor
M002-1-02	18-May	Friday	2	1	107	NA	x				Work Area	Gymnasium	Potential future occupancy
M002-1-03	18-May	Friday	2	1	109	NA	x				Work Area	Gymnasium	Potential future occupancy
M002-1-04	18-May	Friday	2	1	104	NA	x				Pathway	Gymnasium	Boiler room, not occupied
M045-1-01	18-May	Friday	45	1	101	NA	x				Work Area	Former Paint Shop	Storage, unoccupied
M045-1-02	18-May	Friday	45	1	102	NA	x				Work Area	Former Paint Shop	Storage, unoccupied
M010-1-01	18-May	Friday	10	1	101	NA	x				Work Area	Boiler Plant	Main work area; east side of room
M010-1-02	18-May	Friday	10	1	101	NA	x				Work Area	Boiler Plant	Main work area; near cubes in SW corner
M010-1-03	18-May	Friday	10	1	101	NA	x				Work Area	Boiler Plant	Main work area; near tunnel & sump
M010-T-04	18-May	Friday	10	Tunnel	Tunnel	NA	x				Pathway	Boiler Plant Tunnel	In tunnel near Room 107
M010-1-05	18-May	Friday	10	1	102	NA	x				Work Area	Boiler Plant	Office
M010-1-06	18-May	Friday	10	1	N104	NA	x				Work Area	Boiler Plant	Boiler room, near water lines and sump
M029-B-01	21-May	Monday	29	Basement	Basement	NA	x				Pathway	Bicycle Shop	basement near drain and conduits
M029-1-01	21-May	Monday	29	1	106	NA	x				Work Area	Bicycle Shop	work area
M067-1-01	21-May	Monday	67	1	C101	NA			x		Work Area	U.S. Post Office	Near bathroom and slab break
M067-1-02	21-May	Monday	67	1	104	NA			x		Work Area	U.S. Post Office	Work area near AC unit
M076-1-01	21-May	Monday	76	1	101	NA	x				Work Area	Locksmith Shop	General work area, shut in with AC off
M567-1-01	21-May	Monday	567	1	107	NA			x		Work Area	Warehouse	Main work area, near former bollards
M567-1-02	21-May	Monday	567	1	102	NA			x		Work Area	Warehouse	Main work area, near electrical conduits
M567-1-03	21-May	Monday	567	1	104	NA			x		Work Area	Warehouse	Work area, near bathroom
M013-1-01	27-May	Sunday	13	1	103	NA			x		Work Area	Commissary Warehouse	Food storage, near cracks or seam
M013-1-02	27-May	Sunday	13	1	102	NA			x		Work Area	Commissary Warehouse	Merchandising storage, near crack or seam
M014-1-03	12-Jun	Tuesday	14	1	temp3	NA	x				Work Area	Demonstration Room	Near Women's bathroom
M014-1-04	12-Jun	Tuesday	14	1	temp4	NA	x				Work Area	Demonstration Room	Main work area; east side of room
M014-1-05	12-Jun	Tuesday	14	1	temp5	NA	x				Work Area	Workshop	In middle area of workshop
M014-1-06	12-Jun	Tuesday	14	1	temp6	NA	x				Work Area	Office	west side of room
M014-1-07	12-Jun	Tuesday	14	1	temp7	NA	x				Work Area	Office	Near north corner of room
M014-C-01	12-Jun	Tuesday	14	1	crawl space	NA	x				Pathway	Demonstration Room	middle of room near the wall
M014-C-02	12-Jun	Tuesday	14	1	crawl space	NA	x				Pathway	Near Offices	near offices
<b>Ambient Air Samples</b>													
M010-A-01	18-May	Friday	10	Ambient Air	NA	NA			x		Background		
M029-A-01	21-May	Monday	29	Ambient Air	NA	NA			x		Background		
M067-A-01	21-May	Monday	67	Ambient Air	NA	NA			x		Background		
<b>Duplicate Air Samples</b>													
M345-1-01	18-May	Friday	45	1	101	NA	x				Duplicate	Former Paint Shop	
M310-1-01	18-May	Friday	10	Tunnel	Tunnel	NA	x				Duplicate	Boiler Plant Tunnel	
M367-1-01	21-May	Monday	67	Ambient Air	NA	NA			x		Duplicate	U.S. Post Office	
M314-1-01	12-Jun	Tuesday	14	1	Office	NA	x				Duplicate		
M313-1-01	27-May	Sunday	13	1	103	NA			x		Duplicate	Commissary Warehouse	
<b>Number of Indoor Air Samples = 29</b>			<b>Ambient Air Samples = 3</b>				<b>Duplicate Samples = 5</b>						

Table 6. Indoor Air Sampling Locations, Moffett Field, California

Sample Name	Sample Date (2012)	Sample Day	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale
			Building	Floor	Room		8-hour	10-hour	24-hour	Grab			
<b>Buildings with HVAC Systems - HVAC in Operation</b>													
<i>Indoor Air Samples</i>													
M126-1-01-N	18-May	Friday	126	1	103	on	x				Work Area	Museum	Main room in northern corner, near closet opening
M126-1-02-N	18-May	Friday	126	1	103	on	x				Work Area	Museum	Main room, south area
M126-1-03-N	18-May	Friday	126	1	102	on	x				Work Area	Museum	Previous sample location
M126-1-04-N	18-May	Friday	126	1	106	on	x				Work Area	Museum	Access area for bathrooms
M126-1-05-N	18-May	Friday	126	1	101	on	x				Work Area	Museum	Previous sample location
M003-1-01-N	18-May	Friday	3	1	105	on		x			Work Area	Conference Center/Cafeteria	Hallway, outside of kitchen
M003-1-02-N	18-May	Friday	3	1	C104	on		x			Work Area	Conference Center/Cafeteria	Kitchen; near floor drains
M003-1-03-N	18-May	Friday	3	1	104A	on		x			Work Area	Conference Center/Cafeteria	Office
M003-1-04-N	18-May	Friday	3	1	122	on		x			Work Area	Conference Center/Cafeteria	Banquet Room
M003-C-05-N	18-May	Friday	3	1	Crawl Space	on		x			Pathway	Conference Center/Cafeteria	Beneath Room 105
M003-1-06-N	18-May	Friday	3	1	105A	on		x			Pathway	Conference Center/Cafeteria	Near conduit; phone lines penetrate floor
M003-1-07-N	18-May	Friday	3	1	108	on		x			Work Area	Conference Center/Cafeteria	Dining Room
M003-1-08-N	18-May	Friday	3	1	111	on		x			Work Area	Conference Center/Cafeteria	Office; near kitchen
M003-1-09-N	18-May	Friday	3	1	128	on		x			Work Area	Conference Center/Cafeteria	Work area with fire place
M012-1-01-N	21-May	Monday	12	1	109D	on			x		Work Area	Commissary Warehouse	Cashier office
M012-1-02-N	21-May	Monday	12	1	109	on			x		Work Area	Commissary Warehouse	By Cashier
M012-1-03-N	21-May	Monday	12	1	119	on			x		Work Area	Commissary Warehouse	Warehouse; near cracks or seams
M012-C-04-N	21-May	Monday	12	1	Crawl Space	on			x		Pathway	Commissary Warehouse	Under Room 119, warehouse area
M012-C-05-N	21-May	Monday	12	1	Crawl Space	on			x		Pathway	Commissary Warehouse	Under Room 110
M012-2-01-N	21-May	Monday	12	2	214	on			x		Work Area	Commissary Warehouse	Office, near stairwell
M015-1-01-N	22-May	Tuesday	15	1	135D	on			x		Work Area	NASA Security	Office; staffed 24/7/365
M015-1-02-N	22-May	Tuesday	15	1	117	on			x		Work Area	NASA Security	Office, near electrical conduits
M015-1-03-N	22-May	Tuesday	15	1	C107	on			x		Work Area	NASA Security	Hallway, near Room 163 (HVAC) and Room 166 (office), near cubes
M015-1-04-N	22-May	Tuesday	15	1	C107	on			x		Work Area	NASA Security	Hallway, near Room 163 (HVAC) and Room 166 (office), near cubes
M015-1-05-N	22-May	Tuesday	15	1	128	on			x		Work Area	NASA Security	Office
M015-1-06-N	22-May	Tuesday	15	1	C104	on			x		Work Area	NASA Security	Hallway, near Room 101 (drain), R102W and R104M (bathrooms) and N108 (HVAC)
N239A-B-01-N	22-May	Tuesday	239A	Basement	Basement	on			x		Work Area	Centrifuge and Offices	On bio-dome scaffolding
N239A-1-08-N	22-May	Tuesday	239A	1	125	on			x		Work Area	Centrifuge and Offices	Opposite flammable cabinet in highbay floor area
N239A-1-09-N	22-May	Tuesday	239A	1	144	on			x		Work Area	Centrifuge and Offices	Near sump with PID detections
N239A-1-02-N	22-May	Tuesday	239A	1	145	on			x		Work Area	Centrifuge and Offices	Lab with no chemicals
N239A-1-03-N	22-May	Tuesday	239A	1	120	on			x		Work Area	Centrifuge and Offices	Near bio-dome equipment
N239A-1-04-N	22-May	Tuesday	239A	1	120	on			x		Work Area	Centrifuge and Offices	Near storage basement & conduits penetrating floor
N239A-1-06-N	22-May	Tuesday	239A	1	C102	on			x		Work Area	Centrifuge and Offices	Hallway near utility rooms U101 and U102
N239A-G-07-N	22-May	Tuesday	239A	1	142	on				x	Pathway	Centrifuge and Offices	Elevator Grab
N239A-2-01-N	22-May	Tuesday	239A	2	226	on			x		Work Area	Centrifuge and Offices	Office
N243A-B-01-N	22-May	Tuesday	243A	Basement	1	on			x		Pathway	Welding and Machine Shop	Within Tunnel

Table 6. Indoor Air Sampling Locations, Moffett Field, California

Sample Name	Sample Date (2012)	Sample Day	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale
			Building	Floor	Room		8-hour	10-hour	24-hour	Grab			
N243A-1-01-N	22-May	Tuesday	243A	1	104	on			x		Work Area	Welding and Machine Shop	Main work area; near 10-inch vent conduit
N243A-1-02-N	22-May	Tuesday	243A	1	101	on			x		Work Area	Welding and Machine Shop	Main work area; near electrical conduits
N243A-2-01-N	22-May	Tuesday	243A	2	201	on			x		Work Area	Welding and Machine Shop	Office
M107-1-01-N	23-May	Wednesday	107	1	106	on	x				Work Area	ROICC Office	Conference room near comm. conduits
M107-1-02-N	23-May	Wednesday	107	1	C101	on	x				Work Area	ROICC Office	Near Room 102
M510-1-01-N	23-May	Wednesday	510	1	108A	on			x		Work Area	Maintenance Contractor Admin Offices	Communication Room, occupied 24/7/365
M510-1-02-N	23-May	Wednesday	510	1	110	on			x		Work Area	Maintenance Contractor Admin Offices	Cubical Area
M510-1-03-N	23-May	Wednesday	510	1	C101	on			x		Work Area	Maintenance Contractor Admin Offices	Near R101 and 103 (bathrooms)
N555-1-01-N	23-May	Wednesday	555	1	112	on	x				Work Area	Former hangar, now offices	Office, near Room 112B (drain)
N555-1-02-N	23-May	Wednesday	555	1	C101	on	x				Work Area	Former hangar, now offices	Near office 100A, 101
N555-1-03-N	23-May	Wednesday	555	1	107A	on	x				Work Area	Former hangar, now offices	Near Room 107B (communications)
M566-1-01-N	23-May	Wednesday	566	1	111	on	x				Work Area	Tenant Offices	Offices near 112 and 113
M566-1-02-N	23-May	Wednesday	566	1	C103	on	x				Work Area	Tenant Offices	Hallway, near electrical outlets in the floor
M566-1-03-N	23-May	Wednesday	566	1	C104	on	x				Work Area	Tenant Offices	Near offices 100, 101, 102
M016-1-01-N	24-May	Thursday	16	1	106	on			x		Work Area	Maintenance Contractor (IAP) Offices	Office
M016-1-02-N	24-May	Thursday	16	1	110	on			x		Work Area	Maintenance Contractor (IAP) Offices	Wood shop near cracks and seams
M016-1-03-N	24-May	Thursday	16	1	111	on			x		Work Area	Maintenance Contractor (IAP) Offices	HVAC area, near cracks or seams
M016-1-04-N	24-May	Thursday	16	1	113	on			x		Work Area	Maintenance Contractor (IAP) Offices	Office area; shallow groundwater
M016-1-05-N	24-May	Thursday	16	1	103	on			x		Work Area	Maintenance Contractor (IAP) Offices	Office
N239-B-01-N	24-May	Thursday	239	Basement	53A	on				x	Work Area	Life Sciences Building	Library; SW area, stagnant air
N239-B-02-N	24-May	Thursday	239	Basement	053	on				x	Work Area	Life Sciences Building	Break area for library staff
N239-B-03-N	24-May	Thursday	239	Basement	C001	on				x	Work Area	Life Sciences Building	Hallway near Rooms R001 and R002 (bathrooms)
N239-G-04-N	24-May	Thursday	239	Basement	C001	on					Pathway	Life Sciences Building	Elevator Grab
N239-B-05-N	24-May	Thursday	239	Basement	C001	on				x	Work Area	Life Sciences Building	Hallway near N089 (or B11); near sump
N239-B-06-N	24-May	Thursday	239	Basement	C002	on				x	Work Area	Life Sciences Building	Hallway near Room 030
N239-G-07-N	24-May	Thursday	239	Basement	C004	on					Pathway	Life Sciences Building	Elevator Grab
N239-1-01-N	24-May	Thursday	239	1	C103	on				x	Work Area	Life Sciences Building	Hallway near stairwell and elevator
N239-1-02-N	24-May	Thursday	239	1	C104	on				x	Work Area	Life Sciences Building	Hallway near Room 178
N239-1-03-N	24-May	Thursday	239	1	191	on				x	Work Area	Life Sciences Building	Office near chem lab
N239-1-04-N	24-May	Thursday	239	1	U102	on				x	Pathway	Life Sciences Building	
N239-1-05-N	24-May	Thursday	239	1	138S	on				x	Work Area	Life Sciences Building	Chem area near Room R103 (bathroom)
N239-1-06-N	24-May	Thursday	239	1	U101	on				x	Pathway	Life Sciences Building	
N239-1-07-N	24-May	Thursday	239	1	102	on				x	Work Area	Life Sciences Building	Cubicals; away from labs
N239-1-08-N	24-May	Thursday	239	1	C101	on				x	Work Area	Life Sciences Building	Hallway near stairwell and elevator
N239-2-01-N	24-May	Thursday	239	2	211	on				x	Work Area	Life Sciences Building	Office near chem labs
N239-2-03-N	24-May	Thursday	239	2	275	on				x	Work Area	Life Sciences Building	Office near chem labs
N239-3-01-N	24-May	Thursday	239	3	355	on				x	Work Area	Life Sciences Building	Conference room

Table 6. Indoor Air Sampling Locations, Moffett Field, California

Sample Name	Sample Date (2012)	Sample Day	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale
			Building	Floor	Room		8-hour	10-hour	24-hour	Grab			
N239-3-02-N	24-May	Thursday	239	3	C303	on			x		Work Area	Life Sciences Building	Hallway near Room 383 (autoclave), chem area
N239-4-01-N	24-May	Thursday	239	4	C401	on			x		Work Area	Life Sciences Building	Hallway, near stairwell and elevator
N243-B-01-N	24-May	Thursday	243	Basement	063	on			x		Work Area	Flight Guidance/ Simulation Lab	Highbay area; near cracks
N243-B-02-N	24-May	Thursday	243	Basement	C002	on			x		Work Area	Flight Guidance/ Simulation Lab	Main corridor for offices
N243-B-03-N	24-May	Thursday	243	Basement	N032	on			x		Pathway	Flight Guidance/ Simulation Lab	Utility room
N243-B-04-N	24-May	Thursday	243	Basement	C008	on			x		Work Area	Flight Guidance/ Simulation Lab	Hallway near Office 083
N243-G-05-N	24-May	Thursday	243	Basement	C001	on				x	Pathway	Flight Guidance/ Simulation Lab	Elevator Grab
N243-B-06-N	24-May	Thursday	243	Basement	050	on			x		Work Area	Flight Guidance/ Simulation Lab	Machine shop near sump
N243-B-07-N	24-May	Thursday	243	Basement	054	on			x		Work Area	Flight Guidance/ Simulation Lab	Near below grade hydraulic equipment
N243-B-08-N	24-May	Thursday	243	Basement	C010	on			x		Pathway	Flight Guidance/ Simulation Lab	Within Tunnel
N243-1-01-N	24-May	Thursday	243	1	136	on			x		Work Area	Flight Guidance/ Simulation Lab	Office, near R102 and R103 (bathrooms)
N243-1-02-N	24-May	Thursday	243	1	C104	on			x		Work Area	Flight Guidance/ Simulation Lab	Rotunda hallway, previous sample location
N243-1-03-N	24-May	Thursday	243	1	C103	on			x		Work Area	Flight Guidance/ Simulation Lab	Hallway near stairwell
N243-2-01-N	24-May	Thursday	243	2	C202	on			x		Work Area	Flight Guidance/ Simulation Lab	Hallway near stairwell
N243-2-02-N	24-May	Thursday	243	2	248	on			x		Work Area	Flight Guidance/ Simulation Lab	Office
N243-2-03-N	24-May	Thursday	243	2	C207	on			x		Work Area	Flight Guidance/ Simulation Lab	Hallway near Room 208 and 209S
N243-3-01-N	24-May	Thursday	243	3	N310	on			x		Pathway	Simulation Lab	HVAC Room
M076-1-01-N	12-Jun	Tuesday	76	1	101	NA			x		Work Area	Locksmith Shop	General work area with AC unit on
<b>Ambient Air Samples</b>													
M126-A-01-N	15-May	Monday	126	Ambient Air	NA	NA			x		Background		
M003-A-01-N	18-May	Friday	3	Ambient Air	NA	NA			x		Background		
M012-A-01-N	21-May	Monday	12	Ambient Air	NA	NA			x		Background		
M015-A-01-N	22-May	Tuesday	15	Ambient Air	NA	NA			x		Background		
M243A-A-01-N	22-May	Tuesday	243A	Ambient Air	NA	NA			x		Background		
M510-A-01-N	23-May	Wednesday	510	Ambient Air	NA	NA			x		Background		
M555-A-01-N	23-May	Wednesday	555	Ambient Air	NA	NA			x		Background		
M126-A-03-N	23-May	Wednesday	126	Ambient Air	NA	NA			x		Background		
M016-A-01-N	24-May	Thursday	16	Ambient Air	NA	NA			x		Background		
N239-A-01-N	24-May	Thursday	239	Ambient Air	NA	NA			x		Background		
M126-A-04-N	24-May	Thursday	126	Ambient Air	NA	NA			x		Background		
M243-A-01-N	24-May	Thursday	243	Ambient Air	NA	NA			x		Intake		
M243-A-02-N	24-May	Thursday	243	Ambient Air	NA	NA			x		Background		

Table 6. Indoor Air Sampling Locations, Moffett Field, California

Sample Name	Sample Date (2012)	Sample Day	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale
			Building	Floor	Room		8-hour	10-hour	24-hour	Grab			
<b>Duplicate Samples</b>													
M403-1-01-N	18-May	Tuesday	3	1	105A	on		x			Duplicate	Conference Center/Cafeteria	
M412-1-01-N	21-May	Monday	12	1	119	on			x		Duplicate	Commissary Warehouse	
M415-1-01-N	22-May	Tuesday	15	1	118	on			x		Duplicate	NASA Security	
M439-1-01-N	22-May	Tuesday	239A	2	144	on			x		Duplicate	Centrifuge and Offices	
M343A-B-01-N	22-May	Tuesday	243A	Basement	1	on			x		Duplicate	Welding and Machine Shop	
M410-1-01-N	23-May	Wednesday	510	1	108A	on			x		Duplicate	Maintenance Contractor Admin Offices	
M416-1-01-N	24-May	Thursday	16	1	111	on		x			Duplicate	Maintenance Contractor (IAP) Offices	
M343-B-03-N	24-May	Thursday	243	Basement	N032	on			x		Duplicate	Flight Guidance/Simulation Lab	
M343-B-08-N	24-May	Thursday	243	Basement	C010	on			x		Duplicate	Flight Guidance/Simulation Lab	
M343-1-01-N	24-May	Thursday	243	1	C103	on			x		Duplicate	Flight Guidance/Simulation Lab	
<b>Number of Indoor Air Samples = 91</b>			<b>Ambient Air Samples = 13</b>				<b>Duplicate Samples = 10</b>						
<b>Buildings with HVAC Systems - HVAC system shut down</b>													
<b>Indoor Air Samples</b>													
M126-1-01-F	15-May	Monday	126	1	103	NA	x				Work Area	Museum	Main room in northern corner, near closet opening
M126-1-02-F	15-May	Monday	126	1	103	NA	x				Work Area	Museum	Main room, south area
M126-1-03-F	15-May	Monday	126	1	102	NA	x				Work Area	Museum	Previous sample location
M126-1-04-F	15-May	Monday	126	1	106	NA	x				Work Area	Museum	Access area for bathrooms
M126-1-05-F	15-May	Monday	126	1	101	NA	x				Work Area	Museum	Previous sample location
M012-1-01-F	27-May	Sunday	12	1	109D	off			x		Work Area	Commissary Warehouse	Cashier office
M012-1-02-F	27-May	Sunday	12	1	109	off			x		Work Area	Commissary Warehouse	By Cashier
M012-1-03-F	27-May	Sunday	12	1	119	off			x		Work Area	Commissary Warehouse	Warehouse; near cracks or seams
M012-C-04-F	27-May	Sunday	12	1	Crawl Space	off			x		Pathway	Commissary Warehouse	Under Room 119, warehouse area
M012-C-05-F	27-May	Sunday	12	1	Crawl Space	off			x		Pathway	Commissary Warehouse	Under Room 110
M012-2-01-F	27-May	Sunday	12	2	214	off			x		Work Area	Commissary Warehouse	Office, near stairwell
M015-1-01-F	27-May	Sunday	15	1	135D	off			x		Work Area	NASA Security	Office; staffed 24/7/365
M015-1-02-F	27-May	Sunday	15	1	117	off			x		Work Area	NASA Security	Office, near electrical conduits
M015-1-03-F	27-May	Sunday	15	1	C107	off			x		Work Area	NASA Security	Hallway, near Room 163 (HVAC) and Room 166 (office), near cubes
M015-1-04-F	27-May	Sunday	15	1	C107	off			x		Work Area	NASA Security	Hallway, near Room 163 (HVAC) and Room 166 (office), near cubes
M015-1-05-F	27-May	Sunday	15	1	128	off			x		Work Area	NASA Security	Office
M015-1-06-F	27-May	Sunday	15	1	C104	off			x		Work Area	NASA Security	Hallway, near Room 101 (drain), R102W and R104M (bathrooms) and N108 (HVAC)
N239-B-01-F	27-May	Sunday	239	Basement	053	off			x		Work Area	Life Sciences Building	Library; SW area, stagnant air
N239-B-02-F	27-May	Sunday	239	Basement	071	off			x		Work Area	Life Sciences Building	Break area for library staff
N239-B-03-F	27-May	Sunday	239	Basement	C001	off			x		Work Area	Life Sciences Building	Hallway near Rooms R001 and R002 (bathrooms)
N239-G-04-F	27-May	Sunday	239	Basement	C001	off				x	Pathway	Life Sciences Building	Elevator Grab Sample
N239-B-05-F	27-May	Sunday	239	Basement	C001	off			x		Work Area	Life Sciences Building	Hallway near N089 (or B11); near sump
N239-B-06-F	27-May	Sunday	239	Basement	C002	off			x		Work Area	Life Sciences Building	Hallway near Room 030
N239-G-07-F	27-May	Sunday	239	Basement	C004	off				x	Pathway	Life Sciences Building	Elevator Grab Sample
N239-1-01-F	27-May	Sunday	239	1	C103	off			x		Work Area	Life Sciences Building	Hallway near stairwell and elevator
N239-1-02-F	27-May	Sunday	239	1	C104	off			x		Work Area	Life Sciences Building	Hallway near Room 178

Table 6. Indoor Air Sampling Locations, Moffett Field, California

Sample Name	Sample Date (2012)	Sample Day	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale	
			Building	Floor	Room		8-hour	10-hour	24-hour	Grab				
N239-1-03-F	27-May	Sunday	239	1	191	off				x	Work Area	Life Sciences Building	Office near chem lab	
N239-1-04-F	27-May	Sunday	239	1	U102	off					Pathway	Life Sciences Building	Central utility corridor, slight negative pressure	
N239-1-05-F	27-May	Sunday	239	1	1385	off				x	Work Area	Life Sciences Building	Chem area near Room R103 (bathroom)	
N239-1-06-F	27-May	Sunday	239	1	U101	off				x	Pathway	Life Sciences Building	Central utility corridor	
N239-1-07-F	27-May	Sunday	239	1	102	off				x	Work Area	Life Sciences Building	Cubicals; away from labs	
N239-1-08-F	27-May	Sunday	239	1	C101	off				x	Work Area	Life Sciences Building	Hallway near stairwell and elevator	
N239-2-01-F	27-May	Sunday	239	2	211	off				x	Work Area	Life Sciences Building	Office near chem labs	
N239-2-02-F	27-May	Sunday	239	2	U202	off				x	Pathway	Life Sciences Building	South utility corridor	
N239-2-03-F	27-May	Sunday	239	2	275	off				x	Work Area	Life Sciences Building	Office near chem labs	
N239-2-04-F	27-May	Sunday	239	2	U201	off				x	Pathway	Life Sciences Building	North utility corridor	
N239-3-01-F	27-May	Sunday	239	3	355	off				x	Work Area	Life Sciences Building	Conference room	
N239-3-02-F	27-May	Sunday	239	3	C303	off				x	Work Area	Life Sciences Building	Hallway near Room 383 (autoclave), chem area	
N239-3-03-F	27-May	Sunday	239	3	U302	off				x	Work Area	Life Sciences Building	South utility corridor	
N239-4-01-F	27-May	Sunday	239	4	C401	off				x	Work Area	Life Sciences Building	Hallway, near stairwell and elevator	
N239-4-02-F	27-May	Sunday	239	4	U401	off				x	Pathway	Life Sciences Building	North utility corridor	
N239A-B-01-F	27-May	Sunday	239A	Basement	Basement	off				x	Pathway	Centrifuge and Offices	On bio-dome scaffolding	
N239A-1-09-F	27-May	Sunday	239A	1	144	off				x	Pathway	Centrifuge and Offices	Near sump with PID detections	
N239A-1-02-F	27-May	Sunday	239A	1	145	off				x	Work Area	Centrifuge and Offices	Lab with no chemicals	
N239A-1-03-F	27-May	Sunday	239A	1	120	off				x	Work Area	Centrifuge and Offices	Near bio-dome equipment	
N239A-1-04-F	27-May	Sunday	239A	1	120	off				x	Work Area	Centrifuge and Offices	Near storage basement & conduits penetrating floor	
N239A-1-05-F	27-May	Sunday	239A	1	C102	off				x	Work Area	Centrifuge and Offices	Office	
N239A-1-06-F	27-May	Sunday	239A	1	C102	off				x	Work Area	Centrifuge and Offices	Hallway near utility rooms U101 and U102	
N239A-G-07-F	27-May	Sunday	239A	1	C101	off					x	Pathway	Centrifuge and Offices	Elevator Grab
N239A-1-08-F	27-May	Sunday	239A	1	125	off				x	Work Area	Centrifuge and Offices	Opposite flammable cabinet in highbay floor area	
N239A-2-01-F	27-May	Sunday	239A	2	226	off				x	Work Area	Centrifuge and Offices	Office	
N243-B-02-F	27-May	Sunday	243	Basement	C002	off				x	Work Area	Flight Guidance/ Simulation Lab	Main corridor for offices	
N243-B-03-F	27-May	Sunday	243	Basement	N032	off				x	Pathway	Flight Guidance/ Simulation Lab	Utility room	
N243-B-04-F	27-May	Sunday	243	Basement	C008	off				x	Work Area	Flight Guidance/ Simulation Lab	Hallway near Office 083	
N243-G-05-F	27-May	Sunday	243	Basement	C001	off					x	Pathway	Flight Guidance/ Simulation Lab	Near stair wall and V001 (elevator)
N243-B-06-F	27-May	Sunday	243	Basement	050	off				x	Work Area	Flight Guidance/ Simulation Lab	Machine shop near sump	
N243-B-08-F	27-May	Sunday	243	Basement	C010	off				x	Pathway	Flight Guidance/ Simulation Lab	Within Tunnel	
N243-1-01-F	27-May	Sunday	243	1	136	off				x	Work Area	Flight Guidance/ Simulation Lab	Office, near R102 and R103 (bathrooms)	
N243-1-02-F	27-May	Sunday	243	1	C104	off				x	Work Area	Flight Guidance/ Simulation Lab	Rotunda hallway, previous sample location	
N243-1-03-F	27-May	Sunday	243	1	C103	off				x	Work Area	Flight Guidance/ Simulation Lab	Hallway near stairwell	
N243-2-01-F	27-May	Sunday	243	2	C202	off				x	Work Area	Flight Guidance/ Simulation Lab	Hallway near stairwell	
N243-2-02-F	27-May	Sunday	243	2	248	off				x	Work Area	Flight Guidance/ Simulation Lab	Office	
N243-2-03-F	27-May	Sunday	243	2	C207	off				x	Work Area	Flight Guidance/ Simulation Lab	Hallway near Room 208 and 209S	

Table 6. Indoor Air Sampling Locations, Moffett Field, California

Sample Name	Sample Date (2012)	Sample Day	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale
			Building	Floor	Room		8-hour	10-hour	24-hour	Grab			
N243-3-01-F	27-May	Sunday	243	3	N310	off				x	Pathway	Flight Guidance/ Simulation Lab	HVAC Room
N243A-B-01-F	27-May	Sunday	243A	Basement	1	off					Work Area	Welding and Machine Shop	Within Tunnel
N243A-1-01-F	27-May	Sunday	243A	1	104	off					Work Area	Welding and Machine Shop	Main work area; near 10-inch vent conduit
N243A-1-02-F	27-May	Sunday	243A	1	101	off					Work Area	Welding and Machine Shop	Main work area; near electrical conduits
N243A-2-01-F	27-May	Sunday	243A	2	201	off					Work Area	Welding and Machine Shop	Office
M510-1-01-F	27-May	Sunday	510	1	108A	off					Work Area	Maintenance Contractor Admin Offices	Communication Room, occupied 24/7/365
M510-1-02-F	27-May	Sunday	510	1	110	off					Work Area	Maintenance Contractor Admin Offices	Cubical Area
M510-1-03-F	27-May	Sunday	510	1	C101	off					Work Area	Maintenance Contractor Admin Offices	Near R101 and 103 (bathrooms)
M003-1-01-F	28-May	Monday	3	1	105	off					Work Area	Conference Center/Cafeteria	Office; above crawl space sample
M003-1-02-F	28-May	Monday	3	1	C101	off					Work Area	Conference Center/Cafeteria	Hallway outside of kitchen
M003-1-03-F	28-May	Monday	3	1	104A	off					Work Area	Conference Center/Cafeteria	Office
M003-1-04-F	28-May	Monday	3	1	122	off					Work Area	Conference Center/Cafeteria	Banquet Room
M003-C-05-F	28-May	Monday	3	1	Crawl Space	off					Pathway	Conference Center/Cafeteria	Beneath Room 105
M003-1-06-F	28-May	Monday	3	1	105A	off					Pathway	Conference Center/Cafeteria	Near conduit; phone lines penetrate floor
M003-1-07-F	28-May	Monday	3	1	108	off					Work Area	Conference Center/Cafeteria	Dining Room
M003-1-08-F	28-May	Monday	3	1	110	off					Work Area	Conference Center/Cafeteria	Office; near kitchen
M003-1-09-F	28-May	Monday	3	1	128	off					Work Area	Conference Center/Cafeteria	Work area with fire place
M016-1-01-F	28-May	Monday	16	1	106	off					Work Area	Maintenance Contractor (IAP) Offices	Office
M016-1-02-F	28-May	Monday	16	1	110	off					Work Area	Maintenance Contractor (IAP) Offices	Wood shop near cracks and seams
M016-1-03-F	28-May	Monday	16	1	111	off					Work Area	Maintenance Contractor (IAP) Offices	HVAC area, near cracks or seams
M016-1-04-F	28-May	Monday	16	1	113	off					Work Area	Maintenance Contractor (IAP) Offices	Office area; shallow groundwater
M016-1-05-F	28-May	Monday	16	1	103	off					Work Area	Maintenance Contractor (IAP) Offices	Office
M107-1-01-F	28-May	Monday	107	1	106	off	x				Work Area	ROICC Office	Conference room near comm. conduits
M107-1-02-F	28-May	Monday	107	1	C101	off	x				Work Area	ROICC Office	Near Room 102
N210-1-01-F	28-May	Monday	210	1	143	off	x				Work Area	Former hangar, now offices	Near communications & offices
N210-1-02-F	28-May	Monday	210	1	C117A	off	x				Work Area	Former hangar, now offices	Hallway near cubicals
N210-G-03-F	28-May	Monday	210	1	near V101	off					Pathway	Former hangar, now offices	Elevator Grab Sample
N210-1-04-F	28-May	Monday	210	1	138E	off	x				Work Area	Former hangar, now offices	Office

Table 6. Indoor Air Sampling Locations, Moffett Field, California

Sample Name	Sample Date (2012)	Sample Day	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale
			Building	Floor	Room		8-hour	10-hour	24-hour	Grab			
N210-1-05-F	28-May	Monday	210	1	146	off	x				Work Area	Former hangar, now offices	Display in stairwell; previous sample location
N210-1-06-F	28-May	Monday	210	1	Q134	off	x				Pathway	Former hangar, now offices	AC Room
N210-1-07-F	28-May	Monday	210	1	100A	off	x				Work Area	Former hangar, now offices	Access room
N210-1-08-F	28-May	Monday	210	1	C10	off	x				Work Area	Former hangar, now offices	Near 010
N210-1-09-F	28-May	Monday	210	1	148	off	x				Work Area	Former hangar, now offices	Near wall of hanger pit
N210-1-10-F	28-May	Monday	210	1	near 033 & 036	off	x				Work Area	Former hangar, now offices	Cubicals
N210-1-11-F	28-May	Monday	210	1	145	off	x				Pathway	Crawl Space where vapor extraction system is located	Crawl Space beneath raised floor
N210-1-12-F	28-May	Monday	210	1	143	off	x				Pathway		Crawl Space beneath raised floor
N210-2-01-F	28-May	Monday	210	2	L244	off	x				Work Area	Former hangar, now offices	Former Sample Location
N210-2-02-F	28-May	Monday	210	2	C248	off	x				Work Area	Former hangar, now offices	Hallway near V201 (elevator)
N210-2-03-F	28-May	Monday	210	2	255A	off	x				Work Area	Former hangar, now offices	Near wall opening to void
N555-1-01-F	28-May	Monday	555	1	112	off	x				Work Area	Former hangar, now offices	Office, near Room 112B (drain)
N555-1-02-F	28-May	Monday	555	1	C101	off	x				Work Area	Former hangar, now offices	Near office 100A, 101
N555-1-03-F	28-May	Monday	555	1	107A	off	x				Work Area	Former hangar, now offices	Near Room 107B (communications)
M566-1-01-F	28-May	Monday	566	1	111	off	x				Work Area	Tenant Offices	Offices near 112 and 113
M566-1-02-F	28-May	Monday	566	1	C103	off	x				Work Area	Tenant Offices	Hallway, near electrical outlets in the floor
M566-1-03-F	28-May	Monday	566	1	C104	off	x				Work Area	Tenant Offices	Near offices 100, 101, 102
<b>Ambient Air Samples</b>													
M126-A-02-N	22-May	Tuesday	126		Ambient Air	NA				x			Background
M015-A-01-F	27-May	Sunday	15		Ambient Air	NA				x			Background
N239-A-01-F	27-May	Sunday	239		Ambient Air	NA				x			Background
M126-A-05-F	27-May	Sunday	126		Ambient Air	NA				x			Background
M243-A-01-F	27-May	Sunday	243		Intake	NA				x			Background
N243A-A-01-F	27-May	Sunday	243A		Ambient Air	NA				x			Background
M510-A-01-F	27-May	Sunday	510		Ambient Air	NA				x			Background
M003-A-01-F	28-May	Monday	3		Ambient Air	NA				x			Background
M016-A-01-F	28-May	Monday	16		Ambient Air	NA				x			Background
M210-A-01-F	28-May	Monday	210		Ambient Air	NA				x			Background
M555-A-01-F	27-May	Monday	555		Ambient Air	NA				x			Background
M126-A-06-F	28-May	Monday	126		Ambient Air	NA				x			Background
M126-A-07-F	12-Jun	Tuesday	127		Ambient Air	NA				x			Background
<b>Duplicate Air Samples</b>													
M310-G-03-F	28-May	Monday	210	1	near V101	off					x		Duplicate Former hangar, now offices Elevator Grab Sample
M315-1-01-F	27-May	Sunday	15		Ambient Air	NA				x			Duplicate NASA Security
M326-1-01-F	12-Jun	Tuesday	126	1	102	NA	x						Duplicate Museum
M339-B-01-F	27-May	Sunday	239		Basement	053	off			x			Duplicate Life Sciences Building
M339-1-01-F	27-May	Sunday	239	1	102	off				x			Duplicate Life Sciences Building
M339-3-01-F	27-May	Sunday	239	3	U302	off				x			Duplicate Life Sciences Building
M439-1-01-F	27-May	Sunday	239A	2	144	off				x			Duplicate Centrifuge and Offices

**Table 6. Indoor Air Sampling Locations, Moffett Field, California**

Sample Name	Sample Date (2012)	Sample Day	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale
			Building	Floor	Room		8-hour	10-hour	24-hour	Grab			
M343-B-01-F	27-May	Sunday	243	Basement	032	off				x	Duplicate	Flight Guidance/ Simulation Lab	
M343-1-01-F	27-May	Sunday	243	1	C136	off				x	Duplicate	Flight Guidance/ Simulation Lab	
M343A-B-01-F	27-May	Sunday	243A	Basement	1	off				x	Duplicate	Welding and Machine Shop Conference	
M403-1-01-F	28-May	Monday	3	1	105A	off		x			Duplicate	Center/Cafeteria	
M416-1-01-F	28-May	Monday	16	1	111	off			x		Duplicate	Maintenance Contractor (IAP) Offices	
M310-1-02-F	28-May	Monday	210	1	148	off	x				Duplicate	Former hangar	
M310-1-01-F	28-May	Monday	210	1	100	off	x				Duplicate	Former hangar	
M410-1-01-F	27-May	Sunday	510	Ambient Air	NA	NA				x	Duplicate	Maintenance Contractor Admin Offices	
<b>Number of Indoor Air Samples = 108</b>			<b>Ambient Air Samples = 13</b>			<b>Duplicate Samples = 15</b>							
<b>Total Indoor Air Samples = 228</b>			<b>Total Ambient Air Samples = 29</b>			<b>Total Duplicate Samples = 30</b>							

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Table 7. Deviations in Sampling Locations from Sampling Plan, Moffett Field, California

Sample Name	Sample Date (2012)	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale	Deviation in Sampling Location
		Building	Floor	Room		8-hour	10-hour	24-hour	Grab				
M002-1-01	18-May	2	1	100	NA	x				Work Area	Gymnasium	Main gym floor	Moved up north about 25 feet in middle of the room
M003-1-03-F	28-May	3	1	104A	off		x			Work Area	Conference Center/Cafeteria	Office	Moved to the opposite corner in the same room
M003-1-03-N	18-May	3	1	104A	on		x			Work Area	Conference Center/Cafeteria	Office	Moved to the opposite corner in the same room
M003-1-06-F	28-May	3	1	105A	off		x			Pathway	Conference Center/Cafeteria	Near conduit; phone lines penetrate floor	Moved a little towards the corner in Room 105A
M003-1-06-N	18-May	3	1	105A	on		x			Pathway	Conference Center/Cafeteria	Near conduit; phone lines penetrate floor	Moved a little toward the corner in Room 105A
M003-1-08-F	28-May	3	1	111	off		x			Work Area	Conference Center/Cafeteria	Office; near kitchen	Moved outside Room 111
M003-C-05-F	28-May	3	1	Crawl Space	off		x			Pathway	Conference Center/Cafeteria	Beneath Room 105	Moved to the opposite corner beneath the same Room 105
M003-C-05-N	18-May	3	1	Crawl Space	on		x			Pathway	Conference Center/Cafeteria	Beneath Room 105	Moved to the opposite corner in the same Room 105
M012-C-04-F	27-May	12	1	Crawl Space	off			x		Pathway	Commissary Warehouse	Under Room 119, warehouse area	Sample was taken outside Room 119 and in the corner of C102 near Room 102
M014-1-03	6/12/2012	14	1	temp3		x				Work Area	Demonstration Room	Near Women's bathroom	New Sample – Not Proposed in Final Work Plan
M014-1-04	6/12/2012	14	1	temp4		x				Work Area	Demonstration Room	Main work area; east side of room	New Sample – Not Proposed in Final Work Plan
M014-1-05	6/12/2012	14	1	temp5		x				Work Area	Workshop	In middle area of workshop	New Sample – Not Proposed in Final Work Plan
M014-1-06	6/12/2012	14	1	temp6		x				Work Area	Office	west side of room	New Sample – Not Proposed in Final Work Plan
M014-1-07	6/12/2012	14	1	temp7		x				Work Area	Office	Near north corner of room	New Sample – Not Proposed in Final Work Plan
M014-C-01	6/12/2012	14	1	crawl space		x				Pathway	Demonstration Room	middle of room near the wall	New Sample – Not Proposed in Final Work Plan
M014-C-02	6/12/2012	14	1	crawl space		x				Pathway	Near Offices	near offices	New Sample – Not Proposed in Final Work Plan
M015-1-02-F	27-May	15	1	118	off			x		Work Area	NASA Security	Office, near electrical conduits	Moved to Room 117 from 118
M015-1-02-N	22-May	15	1	118	on			x		Work Area	NASA Security	Office, near electrical conduits	Moved to Room 117 from 118
M015-A-01-F	27-May	15	Ambient Air	NA	NA			x		Background			Moved a little closer toward Building 15 corner compared to sample location M015-A-01-N
M016-1-01-F	28-May	16	1	106	off		x			Work Area	Maintenance Contractor (IAP) Offices	Office	Moved to the corner of opposite wall (shared wall C102 & Room 106) away from the door

Table 7. Deviations in Sampling Locations from Sampling Plan, Moffett Field, California

Sample Name	Sample Date (2012)	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale	Deviation in Sampling Location
		Building	Floor	Room		8-hour	10-hour	24-hour	Grab				
M016-1-01-N	24-May	16	1	106	on		x			Work Area	Maintenance Contractor (IAP) Offices	Office	Moved to the corner of opposite wall (shared wall C102 & Room 106) away from the door
M016-A-01-F	28-May	16	Ambient Air	NA	NA				x	Background			Moved to south side of the building
M016-A-01-N	24-May	16	Ambient Air	NA	NA				x	Background			Moved to south side of the building
M045-A-01	NA	45	Ambient Air	NA	NA				x	Background			Not sampled
M076-1-02	NA	76	1	101	NA	x				Work Area	Locksmith Shop	General work area with AC unit on	Not sampled; this sample was in the Final Work Plan table but not figure.
M076-1-01-N	12-Jun	76	1	101					x	Work Area			Originally proposed as 8-hr sample (M076-1-01) with AC off. This seems to be the above sample (M076-1-02) that was supposed to be taken with AC on.
M126-A-07-F	12-Jun	126	Ambient Air	NA	NA				x	Background			New Sample – Not Proposed in Final Work Plan
M210-A-01-F	28-May	210	Ambient Air	NA	NA				x	Background			Moved just outside the building; earlier map shows this location inside the building
M239-A-01-F	27-May	239	Ambient Air	NA	NA				x	Background			Reported as N239-A-01-F, I think WP was correct in naming these samples starting with 'M'
M239-A-01-N	24-May	239	Ambient Air	NA	NA				x	Background			Reported as N239-A-01-N
M243A-A-01-F	27-May	243A	Ambient Air	NA	NA				x	Background			Reported as N243A-A-01-F
M310-1-01		10											Duplicate sample collected at the sample location M010-T-04
M314-1-01	12-Jun	14	1	temp7		x				Duplicate			New Sample – Not Proposed in Final Work Plan
M315-1-01-F	27-May	15	Ambient Air	NA	NA				x	Duplicate	NASA Security		Moved a little closer toward Building 15 corner compared to sample location M015-A-01-N
M326-1-01-N	15-May	126	1	102	NA	x				Duplicate	Museum		Was sampled as M326-1-01-F (with HVAC system off)
M339-1-01-N	NA	239	1	102	on				x	Duplicate	Life Sciences Building		Not Sampled
M339-3-01-F	27-May	239	3	U302	off				x	Duplicate			Duplicate Sample for location N239-3-01-F – Not Proposed in Final Work Plan
M339-B-01-N	NA.	239	Basement	053	on				x	Duplicate	Life Sciences Building		Not sampled
M343-1-01-F	27-May	243	1	C103	off				x	Duplicate	Flight Guidance/ Simulation Lab		Duplicate Sample taken at location of N243-1-03
M343-B-01-N	NA	243	Basement	N032	on				x	Duplicate	Flight Guidance/ Simulation Lab		Duplicate Sample not taken here as proposed
M343-B-03-N	24-May	244	Basement	N033	on				x	Duplicate			Duplicate Sample – Not Proposed in Final Work Plan
M343-B-08-N	24-May	245	Basement	C010	on				x	Duplicate			Duplicate Sample – Not Proposed in Final Work Plan

Table 7. Deviations in Sampling Locations from Sampling Plan, Moffett Field, California

Sample Name	Sample Date (2012)	Location			HVAC (on or off)	Sample Duration				Sample Type	Building Information	Sampling Rationale	Deviation in Sampling Location
		Building	Floor	Room		8-hour	10-hour	24-hour	Grab				
M416-1-01-F	28-May	16	1	111	off		x			Duplicate	Maintenance Contractor (IAP) Offices	Moved to the corner of opposite wall (shared wall C102 & Room 106) away from the door	
M510-1-03-F	27-May	510	1	C101	off				x	Work Area	Maintenance Contractor Admin Offices	Near R101 and 103 (bathrooms)	Moved in the same room to the corner of wall Room R101 and J102
M510-1-03-N	23-May	510	1	C101	on				x	Work Area	Maintenance Contractor Admin Offices	Near R101 and 103 (bathrooms)	Moved in the same room to the corner of wall in Room R101 and J102
N210-1-10-F	28-May	210	1	near 033 & 036	off	x				Work Area	Former hangar, now offices	Cubicals	Moved to the entrance of nearby cubicle
N210-1-12-F	28-May	210	1	143	off	x				pathway			New sample location – sample taken in Room 143 near Cubicle #027
N239-1-04-N	24-May	239	1	U102	on				x	pathway			
N239-1-06-N	24-May	239	1	U101	on				x	Pathway	Life Sciences Building		Sample taken with HVAC in operation – Not Proposed in Final Work Plan
N239A-1-05-N	24-May	239	1	102	on				x	Work Area	Centrifuge and Offices	Office	Sample not collected as proposed.
N239A-2-01-F	27-May	239A	2	227	off				x	Work Area	Centrifuge and Offices	Office	Moved to adjacent Room 226 from 227
N239A-2-01-N	22-May	239A	2	227	on				x	Work Area	Centrifuge and Offices	Office	Moved to adjacent Room 226 from 227
N239A-B-01-F	27-May	239A	Basement	Basement	off				x	Pathway	Centrifuge and Offices	On bio-dome scaffolding	Moved approx. 50 feet to east side of the room
N239A-B-01-N	22-May	239A	Basement	Basement	on				x	Work Area	Centrifuge and Offices	On bio-dome scaffolding	Moved approx. 50 feet to east side of the room
N243-B-01-F	27-May	243	Basement	063	on				x	Work Area	Flight Guidance/ Simulation Lab	Highbay area; near cracks	Not Sampled
N243-B-07-F	27-May	243	Basement	054	on				x	Work Area	Flight Guidance/ Simulation Lab	Near below grade hydraulic equipment	Not Sampled

Notes:

Not Sampled

New Sample

Change from proposed location as per Final Work Plan

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Table 8. Indoor and Outdoor Air Sampling Results  
Moffett Field, California

Building	Sample Name	Sample Location		HVAC (on/off)	Sample Type	Sample Duration	Sample Date & Time	VOCs by TO-15 SIM						
		Floor	Room					Vinyl Chloride	1,1-DCE	trans-1,2-DCE	1,1-DCA	cis-1,2-DCE	TCE	PCE
<b>Indoor Commercial Screening Level</b>								<b>2</b>	<b>700</b>	<b>210</b>	<b>6</b>	<b>210</b>	<b>5</b>	<b>2</b>
2	M002-1-01	1	100	NA	Work Area	8 hr	5/18/2012 9:14	<0.01400	<0.01600	<0.01500	<0.01500	0.02500J	0.15	0.03300J
2	M002-1-02	1	107	NA	Work Area	8 hr	5/18/2012 9:24	<0.01500	<0.01700	<0.01500	<0.01500	0.01200J	0.049	0.066
2	M002-1-03	1	109	NA	Work Area	8 hr	5/18/2012 9:21	<0.01500	<0.01700	<0.01600	<0.01600	0.02000J	0.12	0.03300J
2	M002-1-04	1	104	NA	Pathway	8 hr	5/18/2012 9:17	<0.01500	<0.01700	<0.01500	<0.01500	0.02200J	0.34	0.03300J
3	M003-1-01-F	1	105	off	Work Area	10 hr	5/28/2012 7:03	<0.01400	<0.01600	<0.01500	<0.01500	0.03600J	0.39	0.02100J
3	M003-1-01-N	1	105	on	Work Area	8 hr	5/18/2012 11:32	<0.01800	<0.02000	<0.01800	0.00770J	0.048	0.59	0.03200J
3	M003-1-02-F	1	C101	off	Work Area	10 hr	5/28/2012 7:37	<0.01200	0.1	0.02000J	0.081	0.72	3	0.02100J
3	M003-1-02-N	1	C104	on	Work Area	10 hr	5/18/2012 6:57	<0.01800	<0.02000	<0.01800	0.01000J	0.057	0.31	0.096
3	M003-1-03-F	1	104A	off	Work Area	10 hr	5/28/2012 7:04	0.02100J	<0.01700	<0.01500	0.00630J	0.03100J	0.25	0.066
3	M003-1-03-N	1	104A	on	Work Area	10 hr	5/18/2012 6:52	0.01100J	<0.01700	<0.01600	<0.01600	0.04000J	0.39	0.03300J
3	M003-1-04-F	1	122	off	Work Area	10 hr	5/28/2012 7:32	0.04	<0.01700	<0.01600	0.00760J	0.03800J	0.18	0.02000J
3	M003-1-04-N	1	122	on	Work Area	10 hr	5/18/2012 7:03	0.02900J	<0.01800	<0.01700	0.00910J	0.054	0.33	0.03200J
3	M003-1-06-F	1	105A	off	Pathway	10 hr	5/28/2012 7:15	0.09800J	<0.02000	<0.01800	0.01900J	0.13	1.4	0.07
3	M003-1-06-N	1	105A	on	Pathway	10 hr	5/18/2012 7:10	0.043	0.066	0.03500J	0.065	0.53	<b>7.9</b>	0.12
3	M003-1-07-F	1	108	off	Work Area	10 hr	5/28/2012 7:11	0.06	0.02900J	0.00860J	0.03200J	0.23	3.9	0.03200J
3	M003-1-07-N	1	108	on	Work Area	10 hr	5/18/2012 6:55	0.12	0.02300J	0.01100J	0.02500J	0.22	2.7	0.056
3	M003-1-08-F	1	111	off	Work Area	10 hr	5/28/2012 7:34	0.2	0.02200J	<0.02000	0.02700J	0.25	2	0.03900J
3	M003-1-08-N	1	111	on	Work Area	10 hr	5/18/2012 7:06	0.01200J	<0.01700	<0.01600	<0.01600	0.02100J	0.12	0.03200J
3	M003-1-09-F	1	128	off	Work Area	10 hr	5/28/2012 7:27	0.56	<0.01700	<0.01600	0.00870J	0.045	0.22	0.073
3	M003-1-09-N	1	128	on	Work Area	10 hr	5/18/2012 6:59	0.21	<0.01600	0.00760J	0.01400J	0.14	0.78	0.044
3	M003-A-01-F	Ambient Air	NA	off	Background	24 hr	5/28/2012 7:55	<0.01400	<0.01600	<0.01500	0.00860J	0.063	0.24	0.094
3	M003-A-01-N	Ambient Air	NA	on	Background	24 hr	5/18/2012 7:18	<0.01300	<0.01400	<0.01300	0.00600J	0.04	0.14	0.081
3	M003-C-05-F	1	Crawl Space	off	Pathway	10 hr	5/28/2012 7:47	<0.02000	<0.02300	<0.02100	<0.02100	0.12	1.8	0.053
3	M003-C-05-N	1	Crawl Space	on	Pathway	10 hr	5/18/2012 7:23	<0.02900	<0.03300	<0.03000	<0.03000	0.18	2	0.078
10	M010-1-01	1	101	NA	Work Area	8 hr	5/18/2012 9:40	<0.01900	0.19	0.053	0.21	2.3	<b>8</b>	<b>5.4</b>
10	M010-1-02	1	101	NA	Work Area	8 hr	5/18/2012 9:27	<0.01400	0.2	0.059	0.22	2.6	<b>8.2</b>	<b>5.9</b>
10	M010-1-03	1	101	NA	Work Area	8 hr	5/18/2012 9:58	0.02100J	0.61	0.18	0.69	7.9	<b>26</b>	<b>19</b>
10	M010-1-05	1	102	NA	Work Area	8 hr	5/18/2012 9:45	0.00800J	0.22	0.063	0.24	2.7	<b>8.9</b>	<b>6.3</b>
10	M010-1-06	1	N104	NA	Work Area	8 hr	5/18/2012 9:42	<0.01400	0.076	0.02000J	0.068	0.87	4	1.2
10	M010-A-01	Ambient Air	NA	NA	Background	10 hr	5/18/2012 12:33	<0.01400	<0.01600	<0.01500	0.00660J	0.056	0.057	0.13
10	M010-T-04	Tunnel	Tunnel	NA	Pathway	8 hr	5/18/2012 9:53	<0.92000	24	7.1	<b>28</b>	<b>310</b>	<b>960</b>	<b>770</b>
12	M012-1-01-F	1	109D	off	Work Area	24 hr	5/27/2012 12:24	<0.01500	<0.01700	<0.01600	0.00670J	0.02200J	0.16	0.088
12	M012-1-01-N	1	109D	on	Work Area	24 hr	5/21/2012 11:23	<0.01500	0.02200J	<0.01500	<0.01500	0.02900J	0.2	0.27000J
12	M012-1-02-F	1	109	off	Work Area	24 hr	5/27/2012 12:22	<0.01600	<0.01800	<0.01600	<0.01600	0.01800J	0.094	0.12
12	M012-1-02-N	1	109	on	Work Area	24 hr	5/21/2012 11:27	<0.01500	0.01800J	<0.01500	<0.01500	0.03000J	0.2	0.081
12	M012-1-03-F	1	119	off	Work Area	24 hr	5/27/2012 12:32	<0.01600	<0.01800	<0.01600	<0.01600	0.00980J	0.01900J	0.15
12	M012-1-03-N	1	119	on	Work Area	24 hr	5/21/2012 11:36	<0.01500	<0.01700	<0.01500	<0.01500	<0.01500	0.01700J	0.46
12	M012-2-01-F	2	214	off	Work Area	24 hr	5/27/2012 12:28	<0.01500	<0.01700	<0.01600	<0.01600	0.02000J	0.062	0.03200J
12	M012-2-01-N	2	214	on	Work Area	24 hr	5/21/2012 11:14	<0.01400	<0.01600	<0.01400	<0.01400	0.01000J	0.053	0.058
12	M012-A-01-N	Ambient Air	NA	on	Background	24 hr	5/21/2012 11:10	<0.01400	<0.01500	<0.01400	<0.01400	<0.01400	0.01400J	0.21
12	M012-C-04-F	1	Crawl Space	off	Pathway	24 hr	5/27/2012 12:42	<0.03000	<0.03500	<0.03100	<0.03100	0.43	3.7	0.33
12	M012-C-04-N	1	Crawl Space	on	Pathway	24 hr	5/21/2012 11:54	<0.03100	<0.03500	<0.03200	<0.03200	0.094	1.4	0.082
12	M012-C-05-F	1	Crawl Space	off	Pathway	24 hr	5/27/2012 12:39	<0.03100	<0.03500	<0.03200	0.03500J	0.086	0.74	0.05000J
12	M012-C-05-N	1	Crawl Space	on	Pathway	24 hr	5/21/2012 11:43	<0.02600	0.05300J	0.03400J	0.079	0.48	<b>6.1</b>	0.12
13	M013-1-01	1	103	NA	Work Area	24 hr	5/27/2012 12:52	<0.01800	<0.02000	<0.01800	<0.01800	0.02100J	0.093	0.02400J
13	M013-1-02	1	102	NA	Work Area	24 hr	5/27/2012 12:47	<0.01300	<0.01500	<0.01300	0.00630J	0.12	0.32	0.15

Table 8. Indoor and Outdoor Air Sampling Results  
Moffett Field, California

Building	Sample Name	Sample Location		HVAC (on/off)	Sample Type	Sample Duration	Sample Date & Time	VOCs by TO-15 SIM						
		Floor	Room					Vinyl Chloride	1,1-DCE	trans-1,2-DCE	1,1-DCA	cis-1,2-DCE	TCE	PCE
<b>Indoor Commercial Screening Level</b>								2	700	210	6	210	5	2
14	M014-1-03	1	Occupied Demo Room	NA	Work Area	8 hr	6/12/2012 10:01	<0.01400	<0.01600	<0.01400	<0.01400	0.00950J	0.02800J	0.12
14	M014-1-04	1	Occupied Demo Room	NA	Work Area	8 hr	6/12/2012 10:02	<0.01600	<0.01900	0.058	<0.01700	<0.01700	0.02400J	0.06
14	M014-1-05	1	Occupied Workshop	NA	Work Area	8 hr	6/12/2012 10:04	<0.01600	<0.01800	0.064	<0.01700	<0.01700	0.02000J	0.042
14	M014-1-06	1	Unoccupied Office	NA	Work Area	8 hr	6/12/2012 10:10	<0.01600	<0.01800	<0.01600	<0.01600	0.05	0.46	0.086
14	M014-1-07	1	Unoccupied Office	NA	Work Area	8 hr	6/12/2012 10:08	<0.01900	<0.02200	0.03200J	<0.02000	0.05000J	0.46	0.11000J
14	M014-C-01	1	Crawl Space	NA	Pathway	8 hr	6/12/2012 9:52	<0.06100	<0.06900	<0.06300	<0.06300	0.22	1.8	0.07900J
14	M014-C-02	1	Crawl Space	NA	Pathway	8 hr	6/12/2012 9:57	<0.06500	<0.07300	<0.06700	<0.06700	0.27	2.3	0.04500J
15	M015-1-01-F	1	135D	off	Work Area	24 hr	5/27/2012 13:31	<0.01500	0.02000J	<0.01600	<0.01500J	0.13	1.6	0.26
15	M015-1-01-N	1	135D	on	Work Area	24 hr	5/22/2012 10:05	<0.01400	<0.01600	<0.01500	<0.01500	0.00820J	0.03200J	0.12
15	M015-1-02-F	1	117	off	Work Area	24 hr	5/27/2012 13:18	<0.01600	0.059	0.00860J	0.02400J	0.24	2.5	0.042
15	M015-1-02-N	1	117	on	Work Area	24 hr	5/22/2012 9:34	<0.01300	<0.01500	<0.01400	<0.01400	0.01700J	0.13	0.03500J
15	M015-1-03-F	1	C107	off	Work Area	24 hr	5/27/2012 13:25	0.01000J	0.01900J	<0.01400	0.01500J	0.12	1.5	0.051
15	M015-1-03-N	1	C107	on	Work Area	24 hr	5/22/2012 9:45	<0.01600	<0.01800	<0.01600	<0.01600	0.00930J	0.03700J	0.51
15	M015-1-04-F	1	C107	off	Work Area	24 hr	5/27/2012 13:28	0.00780J	0.02200J	<0.01200	0.01200J	0.084	1.1	0.19
15	M015-1-04-N	1	C107	on	Work Area	24 hr	5/22/2012 9:55	<0.01600	<0.01900	<0.01700	<0.01700	<0.01700	0.03300J	0.043
15	M015-1-05-F	1	128	off	Work Area	24 hr	5/27/2012 13:34	<0.01700	<0.01900	<0.01800	0.01500J	0.13	1.5	0.05
15	M015-1-05-N	1	128	on	Work Area	24 hr	5/22/2012 10:10	<0.01500	<0.01700	<0.01500	<0.01500	0.00930J	0.04	0.02400J
15	M015-1-06-F	1	C104	off	Work Area	24 hr	5/27/2012 13:40	<0.01400	0.02000J	<0.01400	0.01300J	0.13	1.3	0.05
15	M015-1-06-N	1	C104	on	Work Area	24 hr	5/22/2012 10:14	<0.01600	<0.01800	<0.01600	<0.01600	0.01400J	0.084	0.02200J
15	M015-A-01-F	Ambient Air	NA	off	Background	24 hr	5/27/2012 11:51	<0.01300	<0.01500	<0.01400	<0.01400	0.01700J	0.035	0.09500J
15	M015-A-01-N	Ambient Air	NA	on	Background	24 hr	5/22/2012 8:52	<0.01400	<0.01600	<0.01400	<0.01400	0.00870J	0.02100J	0.16
16	M016-1-01-F	1	111	off	Work Area	10 hr	5/28/2012 7:17	<0.01400	<0.01600	<0.01500	0.01700J	0.13	0.64	0.10000J
16	M016-1-01-N	1	111	on	Work Area	10 hr	5/24/2012 7:17	<0.01500	<0.01700	<0.01500	0.00770J	0.07	0.067	0.03000J
16	M016-1-02-F	1	110	off	Work Area	10 hr	5/28/2012 7:25	<0.01600	0.01900J	<0.01700	0.02400J	0.27	1.1	0.19
16	M016-1-02-N	1	110	on	Work Area	10 hr	5/24/2012 7:18	<0.01500	<0.01700	<0.01500	0.00870J	0.089	0.17	0.072
16	M016-1-03-F	1	106	off	Work Area	10 hr	5/28/2012 7:27	0.00710J	0.02200J	0.00670J	0.02400J	0.33	1.1	0.073
16	M016-1-03-N	1	106	on	Work Area	10 hr	5/24/2012 22:25	<0.01500	<0.01700	<0.01600	0.00840J	0.085	0.18	0.075
16	M016-1-04-F	1	113	off	Work Area	10 hr	5/28/2012 7:24	<0.01500	0.03100J	<0.01600	0.02200J	0.25	1.9	0.071
16	M016-1-04-N	1	113	on	Work Area	10 hr	5/24/2012 22:29	<0.01400	<0.01600	<0.01500	0.00900J	0.11	0.2	0.059
16	M016-1-05-F	1	103	off	Work Area	10 hr	5/28/2012 7:22	<0.01500	0.03200J	0.00790J	0.03100J	0.25	1.2	0.18
16	M016-1-05-N	1	103	on	Work Area	10 hr	5/24/2012 22:20	<0.01500	<0.01700	<0.01600	0.00770J	0.071	0.082	0.03300J
16	M016-A-01-F	Ambient Air	NA	off	Background	24 hr	5/28/2012 8:21	<0.01600	<0.01800	<0.01600	<0.01600	0.02000J	0.03400J	0.03600J
16	M016-A-01-N	Ambient Air	NA	on	Background	24 hr	5/24/2012 7:51	<0.01600	<0.01800	<0.01600	<0.01600	0.01000J	0.02400J	0.03700J
29	M029-1-01	1	106	NA	Work Area	8 hr	5/21/2012 8:17	<0.01400	<0.01600	<0.01400	<0.01400	0.075	0.18	0.23
29	M029-A-01	Ambient Air	NA	NA	Background	24 hr	5/21/2012 7:53	<0.01600	<0.01800	<0.01600	<0.01600	0.03400J	0.056	0.02700J
29	M029-B-01	Basement	Basement	NA	Pathway	8 hr	5/21/2012 8:21	<0.01500	<0.01700	<0.01500	<0.01500	0.053	0.13	0.19
45	M045-1-01	1	101	NA	Work Area	8 hr	5/24/2012 8:19	<0.01500	<0.01700	<0.01500	0.00840J	0.07	0.37	0.04
45	M045-1-02	1	102	NA	Work Area	8 hr	5/24/2012 8:23	0.00960J	<0.01700	<0.01500	0.00980J	0.1	0.44	0.068
67	M067-1-01	1	C101	NA	Work Area	24 hr	5/21/2012 9:33	<0.01300	<0.01500	<0.01400	<0.01400	0.01200J	0.086	0.039
67	M067-1-02	1	104	NA	Work Area	24 hr	5/21/2012 9:36	<0.01500	<0.01700	<0.01600	<0.01600	0.01100J	0.046	0.02500J
67	M067-A-01	Ambient Air	NA	NA	Background	24 hr	5/21/2012 9:23	<0.01600	<0.01800	<0.01700	<0.01700	0.01200J	0.02300J	0.07800J
76	M076-1-01	1	101	NA	Work Area	24 hr	5/21/2012 8:06	<0.01500	0.053	<0.01500	0.00700J	0.078	0.12	0.052
76	M076-1-01-N	1	101	NA	Work Area	24 hr	6/12/2012 10:25	<0.01800	0.03800J	<0.01900	<0.01900	0.048	0.15	0.055

Table 8. Indoor and Outdoor Air Sampling Results  
Moffett Field, California

Building	Sample Name	Sample Location		HVAC (on/off)	Sample Type	Sample Duration	Sample Date & Time	VOCs by TO-15 SIM						
		Floor	Room					Vinyl Chloride	1,1-DCE	trans-1,2-DCE	1,1-DCA	cis-1,2-DCE	TCE	PCE
<b>Indoor Commercial Screening Level</b>								<b>2</b>	<b>700</b>	<b>210</b>	<b>6</b>	<b>210</b>	<b>5</b>	<b>2</b>
107	M107-1-01-F	1	106	off	Work Area	8 hr	5/28/2012 8:20	<0.01600	0.059	<0.01600	<0.01600	0.03700J	0.11	0.058
107	M107-1-01-N	1	106	on	Work Area	8 hr	5/23/2012 7:54	<0.01400	<0.01600	<0.01500	<0.01500	0.02200J	0.1	0.065
107	M107-1-02-F	1	C101	off	Work Area	8 hr	5/28/2012 8:25	<0.01300	0.03000J	<0.01400	<0.01400	0.02800J	0.051	<0.01300
107	M107-1-02-N	1	C101	on	Work Area	8 hr	5/23/2012 7:59	<0.01600	<0.01800	<0.01600	<0.01600	0.01400J	0.043	0.051
126	M126-1-01-F	1	103	off	Work Area	8 hr	6/12/2012 8:27	0.03800J	0.069	0.07	0.054	0.93	2.6	<b>3.2</b>
126	M126-1-01-N	1	103	on	Work Area	8 hr	5/18/2012 8:53	0.02700J	0.044	0.01300J	0.043	0.85	2.2	<b>2.8</b>
126	M126-1-02-F	1	103	off	Work Area	8 hr	6/12/2012 8:31	0.03500J	0.083	0.073	0.044	0.86	2	<b>2.7</b>
126	M126-1-02-N	1	103	on	Work Area	8 hr	5/18/2012 8:56	0.02800J	0.06	0.01300J	0.038	0.87	1.8	<b>2.6</b>
126	M126-1-03-F	1	102	off	Work Area	8 hr	6/12/2012 8:23	0.02300J	0.062	0.09700J	0.03500J	0.54	1.8	<b>2.2</b>
126	M126-1-03-N	1	102	on	Work Area	8 hr	5/18/2012 8:49	0.01700J	0.038	0.01000J	0.02900J	0.52	1.6	1.9
126	M126-1-04-F	1	106	off	Work Area	8 hr	6/12/2012 8:29	0.053	0.044	0.066	0.046	1.1	1.4	2
126	M126-1-04-N	1	106	on	Work Area	8 hr	5/18/2012 8:59	0.053	0.052	0.01600J	0.057	1.4	2.3	<b>2.7</b>
126	M126-1-05-F	1	101	off	Work Area	8 hr	6/12/2012 8:20	0.02300J	0.082	0.081	0.055	0.73	3.1	<b>4.4</b>
126	M126-1-05-N	1	101	on	Work Area	8 hr	5/18/2012 8:46	0.01300J	0.057	0.01000J	0.03800J	0.55	2.8	<b>2.8</b>
126	M126-A-01-N	Ambient Air	NA	on	Background	24 hr	5/18/2012 9:02	<0.01400	<0.01500	<0.01400	<0.01400	0.061	0.065	0.2
126	M126-A-02-N	Ambient Air	NA	on	Background	24 hr	5/22/2012 10:35	<0.01600	<0.01900	<0.01700	<0.01700	0.03000J	0.088	0.088
126	M126-A-03-N	Ambient Air	NA	on	Background	24 hr	5/23/2012 10:49	<0.01300	<0.01500	<0.01400	<0.01400	0.039	0.051	0.07
126	M126-A-04-N	Ambient Air	NA	on	Background	24 hr	5/24/2012 11:29	<0.01600	<0.01900	<0.01700	<0.01700	<0.01700	0.02700J	0.1
126	M126-A-05-F	Ambient Air	NA	off	Background	24 hr	5/27/2012 11:44	<0.01500	<0.01700	<0.01600	<0.01600	0.03300J	0.056	0.11
126	M126-A-06-F	Ambient Air	NA	off	Background	24 hr	5/28/2012 8:52	<0.01600	<0.01800	<0.01700	<0.01700	0.03100J	0.03900J	0.03900J
126	M126-A-07-F	Ambient Air	NA	off	Background	24 hr	6/12/2012 8:33	<0.01700	<0.01900	<0.01700	<0.01700	0.03000J	0.046	0.049
N210	M210-A-01-F	Ambient Air	NA	off	Background	24 hr	5/28/2012 9:30	<0.01600	<0.01800	<0.01600	<0.01600	<0.01600	0.01500J	0.048
N243	M243-A-01-F	Intake	NA	off	Intake	24 hr	5/27/2012 14:30	<0.03000	<0.03400	<0.03100	<0.03100	<0.03100	<0.03000	0.05200J
N243	M243-A-01-N	Ambient Air	NA	on	Background	24 hr	5/24/2012 11:01	<0.01700	<0.01900	<0.01700	<0.01700	<0.01700	0.00830J	0.02400J
N243	M243-A-02-N	Intake	NA	on	Intake	24 hr	5/24/2012 16:57	<0.01200	<0.01400	<0.01300	<0.01300	<0.01300	<0.01300	0.2
N243A	M243A-A-01-N	Ambient Air	NA	on	Background	24 hr	5/22/2012 12:00	<0.01600	<0.01800	<0.01600	<0.01600	<0.01600	0.01300J	0.02200J
10	M310-1-01	Tunnel	Tunnel	NA	Duplicate	8 hr	5/18/2012 9:53	<0.54000	21	6	<b>24</b>	<b>270</b>	<b>820</b>	<b>650</b>
N210	M310-1-01-F	1	100	off	Duplicate	8 hr	5/28/2012 9:43	<0.01600	0.02700J	<0.01700	0.01100J	0.098	1.1	0.08600J
N210	M310-1-02-F	1	148	off	Duplicate	8 hr	5/28/2012 9:28	<0.01600	<0.01800	<0.01700	<0.01700	0.01800J	0.15	0.67000J
N210	M310-G-03-F	1	near V101	off	Duplicate	Grab hr	5/28/2012 9:58	<0.01400	0.01900J	<0.01400	<0.01400	0.12	0.51	0.03000J
13	M313-1-01	1	103	NA	Duplicate	24 hr	5/27/2012 12:53	<0.01600	<0.01800	<0.01600	<0.01600	0.02500J	0.099	0.18000J
14	M314-1-01	1	Unoccupied Office	NA	Duplicate	8 hr	6/12/2012 10:10	<0.01500	<0.01700	0.01400J	<0.01600	0.049	0.44	0.08000J
15	M315-1-01-F	Ambient Air	NA	off	Background Duplicate	24 hr	5/27/2012 11:53	<0.01400	<0.01600	<0.01500	<0.01500	0.01900J	0.038	0.02200J
126	M326-1-01-F	1	102	off	Duplicate	8 hr	6/12/2012 8:24	0.02300J	0.053	0.06500J	0.03500J	0.55	1.8	<b>2.3</b>
N239	M339-1-01-F	1	102	off	Duplicate	24 hr	5/27/2012 17:38	<0.01500	<0.01700	<0.01600	0.016	0.03400J	0.15	0.08700J
N239	M339-3-01-F	3	U302	off	Duplicate	24 hr	5/27/2012 17:56	<0.01600	<0.01800	<0.01600	<0.01600	0.01600J	0.062	0.17000J
N239	M339-B-01-F	Basement	53A	off	Duplicate	24 hr	5/27/2012 17:28	0.059	0.17	0.02400J	0.062	1.1	3.6	0.94000J
N243	M343-1-01-F	1	C103	off	Duplicate	24 hr	5/27/2012 14:58	0.016	0.018	0.017	0.017	0.05200J	0.13	0.084
N243	M343-1-01-N	1	136	off	Duplicate	24 hr	5/24/2012 13:57	<0.02100	<0.02300	<0.02100	<0.02100	<0.02100	0.02200J	0.11000J
N243	M343-B-01-F	Basement	N032	off	Duplicate	24 hr	5/27/2012 14:49	<0.02200	<0.02500	<0.02300	<0.02300	0.023	0.02300J	0.15
N243	M343-B-03-N	Basement	N032	on	Duplicate	24 hr	5/24/2012 11:43	<0.01400	<0.01600	<0.01400	0.014	<0.01400	0.00750J	0.02200J
N243	M343-B-08-N	Basement	C010	on	Duplicate	24 hr	5/24/2012 15:01	0.056	0.01800J	0.015	0.02400J	0.84	0.15	0.12
N243A	M343A-B-01-F	Basement	1	off	Duplicate	24 hr	5/27/2012 15:40	<0.01800	<0.02000	<0.01800	<0.01800	0.062	0.062	0.15
N243A	M343A-B-01-N	Basement	1	on	Duplicate	24 hr	5/22/2012 12:54	<0.03500	<0.04000	<0.03600	<0.03600	0.15	0.04300J	0.098
45	M345-1-01	1	101	NA	Duplicate	8 hr	5/24/2012 8:19	<0.01500	<0.01700	<0.01500	0.00890J	0.071	0.37	0.03700J

Table 8. Indoor and Outdoor Air Sampling Results  
Moffett Field, California

Building	Sample Name	Sample Location		HVAC (on/off)	Sample Type	Sample Duration	Sample Date & Time	VOCs by TO-15 SIM						
		Floor	Room					Vinyl Chloride	1,1-DCE	trans-1,2-DCE	1,1-DCA	cis-1,2-DCE	TCE	PCE
<b>Indoor Commercial Screening Level</b>								2	700	210	6	210	5	2
67	M367-1-01	Ambient Air	NA	NA	Background Duplicate	24 hr	5/21/2012 9:27	<0.01300	<0.01500	<0.01400	<0.01400	0.01100J	0.02100J	0.03400J
3	M403-1-01-F	1	105A	off	Duplicate	10 hr	5/28/2012 7:15	0.014	<0.01600	<0.01500	0.01800J	0.12	1.2	0.09
3	M403-1-01-N	1	105A	on	Duplicate	10 hr	5/18/2012 7:14	0.041	0.062	0.02900J	0.065	0.51	7.6	0.11
510	M410-1-01-F	Ambient Air	NA	off	Background Duplicate	24 hr	5/27/2012 11:57	<0.01600	0.09	0.01900J	0.051	1	0.17	0.16000J
510	M410-1-01-N	1	108A	on	Duplicate	24 hr	5/23/2012 9:14	<0.01600	<0.01800	<0.01600	0.01000J	0.15000J	0.095	0.052
12	M412-1-01-N	1	109D	on	Duplicate	24 hr	5/21/2012 11:25	<0.01600	0.02100J	<0.01700	<0.01700	0.02700J	0.2	0.13000J
15	M415-1-01-N	1	117	on	Duplicate	24 hr	5/22/2012 9:39	<0.01700	<0.02000	<0.01800	<0.01800	0.01900J	0.12	0.02600J
16	M416-1-01-F	1	111	off	Duplicate	10 hr	5/28/2012 7:18	<0.01900	<0.02200	<0.02000	0.02100J	0.14	0.68	0.03100J
16	M416-1-01-N	1	111	on	Duplicate	10 hr	5/24/2012 7:27	<0.01500	<0.01700	<0.01500	0.00770J	0.067	0.066	0.06700J
N239A	M439-1-01-F	1	144	off	Duplicate	24 hr	5/27/2012 12:48	<0.01200	<0.01400	<0.01300	<0.01300	0.087	0.3	0.03300J
N239A	M439-1-01-N	1	144	on	Duplicate	24 hr	5/22/2012 11:26	<0.01600	<0.01800	<0.01600	<0.01600	0.065	0.2	0.02300J
510	M510-1-01-F	1	108A	off	Work Area	24 hr	5/27/2012 12:19	<0.01600	0.03700J	<0.01600	0.01900J	0.33	0.12	0.064
510	M510-1-01-N	1	108A	on	Work Area	24 hr	5/23/2012 9:14	<0.01500	<0.01700	<0.01500	0.00890J	0.11000J	0.084	0.057
510	M510-1-02-F	1	110	off	Work Area	24 hr	5/27/2012 12:10	<0.01600	0.03200J	<0.01700	0.02000J	0.31	0.12	0.049
510	M510-1-02-N	1	110	on	Work Area	24 hr	5/23/2012 9:11	<0.01400	0.01800J	<0.01400	0.01000J	0.13	0.096	0.048
510	M510-1-03-F	1	C101	off	Work Area	24 hr	5/27/2012 12:23	<0.01400	0.044	<0.01500	0.02400J	0.44	0.15	0.058
510	M510-1-03-N	1	C101	on	Work Area	24 hr	5/23/2012 9:15	<0.02000	<0.02300	<0.02100	0.01200J	0.16	0.1	0.52
510	M510-A-01-F	Ambient Air	NA	off	Background	24 hr	5/27/2012 11:57	<0.01400	0.092	0.01800J	0.049	1	0.15	0.09200J
510	M510-A-01-N	Ambient Air	NA	on	Background	24 hr	5/23/2012 7:11	<0.01400	0.045	0.00870J	0.02200J	0.41	0.2	0.11
555	M555-A-01-F	Ambient Air	NA	off	Background	24 hr	5/28/2012 8:08	<0.01700	<0.01900	<0.01700	<0.01700	0.03600J	0.01900J	0.01800J
555	M555-A-01-N	Ambient Air	NA	on	Background	24 hr	5/23/2012 7:05	<0.01600	<0.01800	<0.01700	<0.01700	0.01700J	0.02600J	0.078
566	M566-1-01-F	1	111	off	Work Area	8 hr	5/28/2012 8:32	<0.01500	<0.01700	<0.01600	<0.01600	<0.01600	0.04	0.02800J
566	M566-1-01-N	1	111	on	Work Area	8 hr	5/23/2012 8:15	<0.01600	<0.01800	<0.01600	<0.01600	<0.01600	0.01300J	0.03000J
566	M566-1-02-F	1	C103	off	Work Area	8 hr	5/28/2012 8:26	<0.02000	<0.02200	<0.02000	<0.02000	<0.02000	0.065	0.01900J
566	M566-1-02-N	1	C103	on	Work Area	8 hr	5/23/2012 8:15	<0.01800	<0.02100	<0.01900	<0.01900	<0.01900	0.01200J	0.03300J
566	M566-1-03-F	1	C104	off	Work Area	8 hr	5/28/2012 8:30	<0.01600	<0.01800	<0.01600	<0.01600	<0.01600	0.097	0.02100J
566	M566-1-03-N	1	C104	on	Work Area	8 hr	5/23/2012 8:17	<0.01400	<0.01600	<0.01500	<0.01500	<0.01500	0.01200J	0.082
567	M567-1-01	1	107	NA	Work Area	24 hr	5/21/2012 9:50	<0.01600	0.03700J	<0.01600	0.047	0.24	2.6	0.53
567	M567-1-02	1	102	NA	Work Area	24 hr	5/21/2012 9:56	<0.01600	0.049	0.01100J	0.057	0.36	3.9	0.75
567	M567-1-03	1	104	NA	Work Area	24 hr	5/21/2012 9:52	<0.01500	0.02800J	<0.01500	0.03000J	0.11	1.2	0.22
N210	N210-1-01-F	1	143	off	Work Area	8 hr	5/28/2012 9:35	<0.01600	0.02100J	<0.01700	0.00720J	0.061	0.55	0.03300J
N210	N210-1-02-F	1	C117A	off	Work Area	8 hr	5/28/2012 9:33	<0.01500	0.02500J	<0.01500	0.00810J	0.055	0.49	0.02900J
N210	N210-1-04-F	1	138E	off	Work Area	8 hr	5/28/2012 9:24	<0.01600	0.01800J	<0.01600	0.00780J	0.06	0.58	0.02800J
N210	N210-1-05-F	1	146	off	Work Area	8 hr	5/28/2012 9:31	<0.01700	<0.01900	<0.01700	0.01200J	0.15	0.47	0.03200J
N210	N210-1-06-F	1	Q134	off	Pathway	8 hr	5/28/2012 9:40	<0.01500	<0.01700	<0.01600	<0.01600	<0.01600	0.15	0.046
N210	N210-1-07-F	1	100	off	Work Area	8 hr	5/28/2012 9:09	<0.01500	0.03300J	<0.01500	0.01200J	0.11	1.2	0.04700J
N210	N210-1-08-F	1	C10	off	Work Area	8 hr	5/28/2012 9:45	<0.01600	0.02200J	<0.01600	0.01100J	0.1	1.4	0.03600J
N210	N210-1-09-F	1	148	off	Work Area	8 hr	5/28/2012 9:28	<0.01600	<0.01800	<0.01600	<0.01600	0.01700J	0.14	0.03400J
N210	N210-1-10-F	1	near 033 & 036	off	Work Area	8 hr	5/28/2012 9:40	<0.01500	0.03100J	<0.01500	0.01600J	0.18	2	0.11
N210	N210-1-11-F	1	near 033 & 036	off	Pathway	8 hr	5/28/2012 9:43	<0.01600	0.086	0.02500J	0.056	0.74	17	0.2
N210	N210-1-12-F	1	143	off	Pathway	8 hr	5/28/2012 9:47	<0.01600	0.02200J	<0.01700	<0.01700	0.085	0.8	0.13
N210	N210-2-01-F	2	L244	off	Work Area	8 hr	5/28/2012 9:50	<0.01500	0.03600J	<0.01500	0.01300J	0.14	1.4	0.043
N210	N210-2-02-F	2	C248	off	Work Area	8 hr	5/28/2012 9:52	<0.01500	0.042	<0.01600	0.01400J	0.15	1.7	0.05
N210	N210-2-03-F	2	255A	off	Work Area	8 hr	5/28/2012 9:45	<0.01400	0.01900J	<0.01400	0.01100J	0.1	1.2	0.051
N210	N210-G-03-F	1	near V101	off	Pathway	Grab hr	5/28/2012 9:56	<0.01300	<0.01500	<0.01400	<0.01400	0.1	0.51	0.03200J

Table 8. Indoor and Outdoor Air Sampling Results  
Moffett Field, California

Building	Sample Name	Sample Location		HVAC (on/off)	Sample Type	Sample Duration	Sample Date & Time	VOCs by TO-15 SIM							
		Floor	Room					Vinyl Chloride	1,1-DCE	trans-1,2-DCE	1,1-DCA	cis-1,2-DCE	TCE	PCE	
<b>Indoor Commercial Screening Level</b>								2	700	210	6	210	5	2	
N239	N239-1-01-F	1	C103	off	Work Area	24 hr	5/27/2012 17:20	<0.01500	<0.01700	<0.01600	<0.01600	0.01700J	0.07	0.2	
N239	N239-1-01-N	1	C103	on	Work Area	24 hr	5/24/2012 9:36	<0.01500	<0.01700	<0.01500	<0.01500	<0.01500	0.00900J	0.13	
N239	N239-1-02-F	1	C104	off	Work Area	24 hr	5/27/2012 17:27	<0.01400	<0.01500	<0.01400	<0.01400	0.01200J	0.042	0.12	
N239	N239-1-02-N	1	C104	on	Work Area	24 hr	5/24/2012 10:19	<0.01500	<0.01700	<0.01600	<0.01600	<0.01600	0.00910J	0.02700J	
N239	N239-1-03-F	1	191	off	Work Area	24 hr	5/27/2012 17:46	<0.01500	<0.01700	<0.01600	<0.01600	0.01400J	0.046	0.1	
N239	N239-1-03-N	1	191	on	Work Area	24 hr	5/24/2012 9:46	<0.01500	<0.01700	<0.01600	<0.01600	<0.01600	0.01100J	0.02500J	
N239	N239-1-04-F	1	U102	off	Pathway	24 hr	5/27/2012 17:24	<0.01400	<0.01600	<0.01500	<0.01500	0.01800J	0.064	0.12	
N239	N239-1-04-N	1	U102	on	Pathway	24 hr	5/24/2012 10:04	<0.01600	<0.01800	<0.01600	0.01300J	0.02400J	0.01500J	0.043	
N239	N239-1-05-F	1	138S	off	Work Area	24 hr	5/28/2012 8:23	<0.01400	<0.01600	<0.01400	<0.01400	0.01900J	0.065	0.12	
N239	N239-1-05-N	1	138S	on	Work Area	24 hr	5/24/2012 9:59	<0.01400	<0.01600	<0.01500	<0.01500	<0.01500	0.01400J	0.02700J	
N239	N239-1-06-F	1	U101	off	Pathway	24 hr	5/27/2012 17:18	<0.01500	0.01700J	<0.01600	0.00780J	0.041	0.16	0.23	
N239	N239-1-06-N	1	U101	on	Pathway	24 hr	5/24/2012 10:11	<0.01600	<0.01800	<0.01600	<0.01600	<0.01600	0.01300J	0.16	
N239	N239-1-07-F	1	102	off	Work Area	24 hr	5/27/2012 17:38	<0.01600	<0.01800	<0.01700	0.00740J	0.03700J	0.16	0.16000J	
N239	N239-1-07-N	1	102	on	Work Area	24 hr	5/24/2012 9:29	0.01300J	<0.02200	0.01400J	0.01800J	0.01600J	0.02600J	0.03900J	
N239	N239-1-08-F	1	C101	off	Work Area	24 hr	5/27/2012 17:32	<0.01300	<0.01500	<0.01400	<0.01400	0.02100J	0.082	0.096	
N239	N239-1-08-N	1	C101	on	Work Area	24 hr	5/24/2012 9:23	<0.01500	<0.01700	<0.01600	<0.01600	<0.01600	0.00830J	0.049	
N239	N239-2-01-F	2	211	off	Work Area	24 hr	5/27/2012 17:48	<0.01300	<0.01500	<0.01400	<0.01400	0.01800J	0.095	0.18	
N239	N239-2-01-N	2	211	on	Work Area	24 hr	5/24/2012 10:29	<0.01500	<0.01700	<0.01600	<0.01600	<0.01600	0.01700J	0.02400J	
N239	N239-2-02-F	2	U202	off	Pathway	24 hr	5/27/2012 17:45	<0.01600	<0.01800	<0.01700	<0.01700	0.01900J	0.066	0.12	
N239	N239-2-03-F	2	275	off	Work Area	24 hr	5/27/2012 17:51	<0.01600	<0.01800	<0.01600	<0.01600	0.01600J	0.045	0.061	
N239	N239-2-03-N	2	275	on	Work Area	24 hr	5/24/2012 11:00	<0.01600	<0.01900	<0.01700	<0.01700	<0.01700	0.00930J	0.02300J	
N239	N239-2-04-F	2	U201	off	Pathway	24 hr	5/27/2012 18:12	<0.01400	0.02100J	<0.01500	0.00890J	0.059	0.26	0.13	
N239	N239-3-01-F	3	355	off	Work Area	24 hr	5/27/2012 17:55	<0.01200	<0.01400	<0.01300	0.00530J	0.01900J	0.26	0.076	
N239	N239-3-01-N	3	355	on	Work Area	24 hr	5/24/2012 11:02	<0.01600	<0.01900	<0.01700	<0.01700	<0.01700	0.02500J	0.02100J	
N239	N239-3-02-F	3	C303	off	Work Area	24 hr	5/27/2012 17:56	<0.01500	<0.01700	<0.01600	<0.01600	0.01900J	0.086	0.12	
N239	N239-3-02-N	3	C303	on	Work Area	24 hr	5/24/2012 10:52	<0.01400	<0.01600	<0.01500	<0.01500	<0.01500	0.01100J	0.02300J	
N239	N239-3-03-F	3	U302	off	Work Area	24 hr	5/27/2012 17:56	<0.01300	<0.01500	<0.01300	<0.01300	0.01900J	0.07	0.22000J	
N239	N239-4-01-F	4	C401	off	Work Area	24 hr	5/27/2012 17:58	<0.01600	0.02200J	<0.01700	0.00740J	0.02100J	0.092	0.12	
N239	N239-4-01-N	4	C401	on	Work Area	24 hr	5/24/2012 10:29	<0.01500	<0.01700	<0.01500	<0.01500	<0.01500	0.00920J	0.094	
N239	N239-4-02-F	4	U401	off	Pathway	24 hr	5/27/2012 18:12	<0.01200	<0.01400	<0.01300	<0.01300	0.037	0.064	0.02000J	
N239	N239-A-01-F	Ambient Air	NA	off	Background	24 hr	5/27/2012 12:22	<0.01500	<0.01700	<0.01600	<0.01600	0.01400J	0.02500J	0.02400J	
N239	N239-A-01-N	Ambient Air	NA	on	Background	24 hr	5/24/2012 10:52	<0.01600	<0.01800	<0.01700	<0.01700	<0.01700	0.00990J	0.16	
N239	N239-B-01-F	Basement	53A	off	Work Area	24 hr	5/27/2012 17:26	0.061	0.19	0.01800J	0.058	1.1	3.8	0.05600J	
N239	N239-B-01-N	Basement	53A	on	Work Area	24 hr	5/24/2012 9:10	<0.01700	<0.02000	<0.01800	<0.01800	<0.01800	0.00980J	0.03200J	
N239	N239-B-02-F	Basement	53	off	Work Area	24 hr	5/27/2012 17:30	<0.01800	0.02300J	<0.01800	<0.01800	0.077	0.3	0.098	
N239	N239-B-02-N	Basement	53	on	Work Area	24 hr	5/24/2012 9:17	<0.01300	<0.01500	<0.01400	<0.01400	<0.01400	0.00920J	0.17	
N239	N239-B-03-F	Basement	C001	off	Work Area	24 hr	5/27/2012 17:33	<0.01700	<0.01900	<0.01700	<0.01700	0.03200J	0.14	0.089	
N239	N239-B-03-N	Basement	C001	on	Work Area	24 hr	5/24/2012 9:03	<0.01500	<0.01700	<0.01600	<0.01600	<0.01600	0.00890J	0.046	
N239	N239-B-05-F	Basement	C001	off	Work Area	24 hr	5/27/2012 17:32	<0.01500	0.02700J	0.01300J	0.01100J	0.01800J	0.13	0.55	
N239	N239-B-05-N	Basement	C001	on	Work Area	24 hr	5/24/2012 8:50	<0.01500	<0.01700	<0.01600	<0.01600	<0.01600	0.00930J	0.25	
N239	N239-B-06-F	Basement	C002	off	Work Area	24 hr	5/27/2012 17:17	<0.01400	0.065	<0.01500	0.01700J	0.063	0.29	0.096	
N239	N239-B-06-N	Basement	C002	on	Work Area	24 hr	5/24/2012 9:00	<0.01800	<0.02000	<0.01900	<0.01900	<0.01900	0.00770J	0.02500J	
N239	N239-G-04-F	Basement	C001	off	Pathway	Grab hr	5/27/2012 17:34	<0.01400	<0.01600	<0.01400	<0.01400	<0.01400	0.01100J	1	0.14
N239	N239-G-04-N	Basement	C001	on	Pathway	Grab hr	5/24/2012 16:02	<0.01400	<0.01600	<0.01500	<0.01500	<0.01500	0.13	0.093	
N239	N239-G-07-F	Basement	C004	off	Pathway	Grab hr	5/27/2012 17:41	<0.01300	<0.01500	<0.01300	0.00690J	0.00930J	0.043	0.085	
N239	N239-G-07-N	Basement	C004	on	Pathway	Grab hr	5/24/2012 16:16	<0.01400	<0.01600	<0.01500	<0.01500	<0.01500	0.038	0.14	
N239A	N239A-1-02-F	1	145	off	Work Area	24 hr	5/27/2012 12:43	<0.01400	<0.01600	<0.01500	<0.01500	0.045	0.2	0.088	
N239A	N239A-1-02-N	1	145	on	Work Area	24 hr	5/22/2012 11:31	<0.01400	<0.01600	<0.01500	<0.01500	0.064	0.21	0.11	

Table 8. Indoor and Outdoor Air Sampling Results  
Moffett Field, California

Building	Sample Name	Sample Location		HVAC (on/off)	Sample Type	Sample Duration	Sample Date & Time	VOCs by TO-15 SIM						
		Floor	Room					Vinyl Chloride	1,1-DCE	trans-1,2-DCE	1,1-DCA	cis-1,2-DCE	TCE	PCE
<b>Indoor Commercial Screening Level</b>								2	700	210	6	210	5	2
N239A	N239A-1-03-F	1	120	off	Work Area	24 hr	5/27/2012 12:59	0.01700J	0.036	<0.01300	0.01600J	0.26	1.4	0.088
N239A	N239A-1-03-N	1	120	on	Work Area	24 hr	5/22/2012 11:14	0.01600J	0.02400J	0.00750J	0.02400J	0.34	1.7	0.11
N239A	N239A-1-04-F	1	120	off	Work Area	24 hr	5/27/2012 13:00	0.02000J	0.044	<0.01500	0.02000J	0.31	1.6	0.082
N239A	N239A-1-04-N	1	120	on	Work Area	24 hr	5/22/2012 11:17	0.02100J	0.02900J	<0.01600	0.02700J	0.42	2	0.055
N239A	N239A-1-05-F	1	102	off	Work Area	24 hr	5/27/2012 12:56	<0.01400	<0.01600	<0.01400	<0.01400	0.01300J	0.02500J	0.02100J
N239A	N239A-1-06-F	1	C102	off	Work Area	24 hr	5/27/2012 13:02	0.1	0.15	0.02500J	0.073	1.6	<b>6.8</b>	0.052
N239A	N239A-1-06-N	1	C102	on	Work Area	24 hr	5/22/2012 11:20	0.03400J	0.043	0.00960J	0.02300J	0.49	1.8	0.03200J
N239A	N239A-1-08-F	1	125	off	Work Area	24 hr	5/27/2012 13:06	0.03700J	0.071	0.02000J	0.03500J	0.41	1.9	0.1
N239A	N239A-1-08-N	1	125	on	Work Area	24 hr	5/22/2012 11:22	<0.01600	0.02300J	<0.01600	0.02100J	0.34	1.5	0.04000J
N239A	N239A-1-09-F	1	144	off	Pathway	24 hr	5/27/2012 12:48	<0.01600	<0.01800	<0.01700	<0.01700	0.088	0.31	0.06400J
N239A	N239A-1-09-N	1	144	on	Work Area	24 hr	5/22/2012 11:28	<0.01600	<0.01800	<0.01600	<0.01600	0.072	0.22	0.02400J
N239A	N239A-2-01-F	2	226	off	Work Area	24 hr	5/27/2012 13:08	0.04400J	0.058	0.00930J	0.03400J	0.49	2	0.055
N239A	N239A-2-01-N	2	226	on	Work Area	24 hr	5/22/2012 11:43	0.01400J	0.03200J	<0.01500	0.02200J	0.45	1.6	0.21
N239A	N239A-B-01-F	Basement	Basement	off	Pathway	24 hr	5/27/2012 13:04	0.03200J	0.03700J	<0.01800	0.01700J	0.26	1.2	0.42
N239A	N239A-B-01-N	Basement	Basement	on	Work Area	24 hr	5/22/2012 11:09	0.00850J	<0.01600	<0.01400	0.00830J	0.074	0.34	0.083
N239A	N239A-G-07-F	1	142	off	Pathway	Grab hr	5/28/2012 13:34	<0.02200	<0.02500	<0.02300	0.01000J	0.13	0.82	0.04100J
N239A	N239A-G-07-N	1	142	on	Pathway	Grab hr	5/22/2012 13:12	<0.02000	<0.02200	<0.02000	<0.02000	0.01900J	0.15	0.03200J
N243	N243-1-01-F	1	136	off	Work Area	24 hr	5/27/2012 14:54	<0.01600	<0.01800	<0.01700	0.01300J	0.12	0.24	0.069
N243	N243-1-01-N	1	136	on	Work Area	24 hr	5/24/2012 13:56	<0.01600	<0.01800	<0.01600	<0.01600	<0.01600	0.02100J	0.27000J
N243	N243-1-02-F	1	C104	off	Work Area	24 hr	5/27/2012 14:35	<0.01600	<0.01900	<0.01700	<0.01700	0.02600J	0.054	0.03300J
N243	N243-1-02-N	1	C104	on	Work Area	24 hr	5/24/2012 13:07	<0.01400	<0.01600	<0.01500	<0.01500	<0.01500	0.02000J	0.1
N243	N243-1-03-F	1	C103	off	Work Area	24 hr	5/27/2012 14:58	0.03600J	0.04100J	0.03200J	0.03800J	0.08600J	0.16	0.096
N243	N243-1-03-N	1	C103	on	Work Area	24 hr	5/24/2012 13:16	<0.01300	<0.01400	<0.01300	0.00610J	0.01300J	0.038	0.076
N243	N243-2-01-F	2	C202	off	Work Area	24 hr	5/27/2012 15:10	<0.01300	0.049	<0.01400	<0.01400	0.1	0.21	0.06
N243	N243-2-01-N	2	C202	on	Work Area	24 hr	5/24/2012 12:52	<0.01500	<0.01700	<0.01600	<0.01600	<0.01600	0.02200J	0.045
N243	N243-2-02-F	2	248	off	Work Area	24 hr	5/27/2012 15:15	<0.01600	0.046	<0.01600	0.01300J	0.097	0.2	0.15
N243	N243-2-02-N	2	248	on	Work Area	24 hr	5/24/2012 12:50	<0.01500	<0.01700	<0.01500	<0.01500	<0.01500	0.02100J	0.047
N243	N243-2-03-F	2	C207	off	Work Area	24 hr	5/27/2012 14:30	<0.01600	<0.01800	<0.01600	<0.01600	0.02800J	0.063	0.08
N243	N243-2-03-N	2	C207	on	Work Area	24 hr	5/24/2012 13:00	<0.01700	<0.01900	<0.01700	<0.01700	<0.01700	0.01800J	0.062
N243	N243-3-01-F	3	N310	off	Pathway	24 hr	5/27/2012 14:40	<0.01400	<0.01500	<0.01400	0.00740J	0.084	0.14	0.03400J
N243	N243-3-01-N	3	N310	on	Pathway	24 hr	5/24/2012 14:53	<0.01500	<0.01700	<0.01500	<0.01500	<0.01500	0.01300J	0.02200J
N243	N243-B-01-N	Basement	63	on	Work Area	24 hr	5/24/2012 13:55	<0.01600	<0.01800	<0.01700	<0.01700	0.01300J	0.02900J	0.047
N243	N243-B-02-F	Basement	C002	off	Work Area	24 hr	5/27/2012 14:51	<0.01600	<0.01800	<0.01700	<0.01700	0.01800J	0.04100J	0.03200J
N243	N243-B-02-N	Basement	C002	on	Work Area	24 hr	5/24/2012 13:20	<0.01500	<0.01700	<0.01600	<0.01600	<0.01600	0.02300J	0.079
N243	N243-B-03-F	Basement	N032	off	Pathway	24 hr	5/27/2012 14:47	<0.01600	<0.01800	<0.01600	<0.01600	0.01300J	0.02200J	0.14
N243	N243-B-03-N	Basement	N032	on	Pathway	24 hr	5/24/2012 11:40	<0.01200	<0.01400	<0.01300	0.00530J	<0.01300	0.00750J	0.06600J
N243	N243-B-04-F	Basement	C008	off	Work Area	24 hr	5/27/2012 14:45	<0.01700	<0.01900	<0.01700	<0.01700	0.02000J	0.04200J	0.03000J
N243	N243-B-04-N	Basement	C008	on	Work Area	24 hr	5/24/2012 12:15	<0.01500	<0.01700	<0.01500	0.00690J	<0.01500	0.01500J	0.02300J
N243	N243-B-06-F	Basement	50	off	Work Area	24 hr	5/27/2012 15:15	0.02300J	0.067	<0.01600	0.02700J	0.64	1.6	0.21
N243	N243-B-06-N	Basement	50	on	Work Area	24 hr	5/24/2012 14:00	<0.01600	<0.01800	<0.01700	<0.01700	0.00990J	0.02700J	0.03300J
N243	N243-B-07-N	Basement	54	on	Work Area	24 hr	5/24/2012 12:00	<0.01500	<0.01700	<0.01600	0.01500J	0.18	0.6	0.35
N243	N243-B-08-F	Basement	C010	off	Pathway	24 hr	5/27/2012 14:42	0.06	0.01900J	0.00810J	0.02400J	0.85	0.17	0.096
N243	N243-B-08-N	Basement	C010	on	Pathway	24 hr	5/24/2012 15:01	0.058	0.02100J	0.00810J	0.02600J	0.92	0.15	0.14
N243	N243-G-05-F	Basement	C001	off	Pathway	Grab hr	5/27/2012 15:10	<0.01600	<0.01800	<0.01600	0.01500J	0.02900J	0.15	0.041
N243	N243-G-05-N	Basement	C001	on	Pathway	Grab hr	5/24/2012 14:21	<0.01400	<0.01600	<0.01400	<0.01400	<0.01400	0.02500J	0.044
N243A	N243A-1-01-F	1	104	off	Work Area	24 hr	5/27/2012 15:34	<0.01500	<0.01700	<0.01500	0.01000J	0.052	0.058	0.04
N243A	N243A-1-01-N	1	104	on	Work Area	24 hr	5/22/2012 12:55	<0.01400	<0.01600	<0.01400	0.00920J	0.03300J	0.02800J	0.26

**Table 8. Indoor and Outdoor Air Sampling Results  
Moffett Field, California**

Building	Sample Name	Sample Location		HVAC (on/off)	Sample Type	Sample Duration	Sample Date & Time	VOCs by TO-15 SIM						
		Floor	Room					Vinyl Chloride	1,1-DCE	trans-1,2-DCE	1,1-DCA	cis-1,2-DCE	TCE	PCE
<b>Indoor Commercial Screening Level</b>								<b>2</b>	<b>700</b>	<b>210</b>	<b>6</b>	<b>210</b>	<b>5</b>	<b>2</b>
N243A	N243A-1-02-F	1	101	off	Work Area	24 hr	5/27/2012 15:32	<0.01600	<0.01800	<0.01700	0.00750J	0.03900J	0.067	0.03200J
N243A	N243A-1-02-N	1	101	on	Work Area	24 hr	5/22/2012 12:52	<0.01600	<0.01800	<0.01600	<0.01600	0.01500J	0.03300J	0.02600J
N243A	N243A-2-01-F	2	201	off	Work Area	24 hr	5/27/2012 15:32	<0.01600	0.02200J	<0.01600	0.01200J	0.061	0.21	0.087
N243A	N243A-2-01-N	2	201	on	Work Area	24 hr	5/22/2012 12:57	<0.01600	<0.01800	<0.01600	0.00950J	0.03800J	0.11	0.12
N243A	N243A-A-01-F	Ambient Air	NA	off	Background	24 hr	5/27/2012 15:28	<0.01600	<0.01800	<0.01600	<0.01600	0.01200J	0.02400J	0.17
N243A	N243A-B-01-F	Basement	1	off	Work Area	24 hr	5/27/2012 15:40	<0.01700	0.02000J	<0.01800	<0.01800	0.063	0.061	0.15
N243A	N243A-B-01-N	Basement	1	on	Pathway	24 hr	5/22/2012 12:54	<0.02900	0.04100J	<0.03000	<0.03000	0.16	0.04700J	0.1
555	N555-1-01-F	1	112	off	Work Area	8 hr	5/28/2012 8:04	0.01700J	0.02100J	<0.01500	0.02300J	0.49	0.85	0.038
555	N555-1-01-N	1	112	on	Work Area	8 hr	5/23/2012 8:05	<0.01600	<0.01800	<0.01700	0.00900J	0.047	0.17	0.03600J
555	N555-1-02-F	1	C101	off	Work Area	8 hr	5/28/2012 8:06	0.01800J	0.02300J	<0.01600	0.02400J	0.5	0.87	0.14
555	N555-1-02-N	1	C101	on	Work Area	8 hr	5/23/2012 8:05	<0.01500	<0.01700	<0.01500	0.00780J	0.052	0.21	0.03800J
555	N555-1-03-F	1	107A	off	Work Area	8 hr	5/28/2012 8:00	0.02600J	0.03200J	0.00990J	0.03200J	0.72	1.3	0.11
555	N555-1-03-N	1	107A	on	Work Area	8 hr	5/23/2012 8:02	<0.01500	<0.01700	<0.01600	0.00840J	0.06	0.23	0.04

**Notes:**

Values exceeding the Indoor Commercial/Residential level are bolded.

J = the result is an estimated concentration that is less than the limit of quantitation but greater than or equal to the method detection limit.

µg/m<sup>3</sup> = micrograms per cubic meter.

Sampling Identification Number Example:

N210            1                            1                            N  
 (Building Number (Floor Level))            (Sample Location ID)            (HVAC Operation Code Status)

Samples names ending with N – Engineering Control (HVAC) is operating

Sample names ending with F – Engineering Control (HVAC) is shut down, or

If the HVAC code is absent, the building is without an operational engineering control (e.g., HVAC system)

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**Table 9. Ambient Air Concentration Ranges  
Moffett Field, California**

<b>Chemical of Concern</b>	<b>Ambient Air Concentration Range (<math>\mu\text{g}/\text{m}^3</math>)<sup>a</sup></b>
Vinyl Chloride	<0.01200 to <0.03000
1,1-Dichloroethene	<0.01400 to 0.092
trans-1,2-Dichloroethene	<0.01300 to 0.019J
1,1-Dichloroethane	<0.01300 to 0.051
cis-1,2-Dichloroethene	0.00870J to 1
Trichloroethene	0.00830J to 0.24
Perchloroethene	0.0180J to 0.21

Notes:

<sup>a</sup>Established from the results of outdoor air samples collected as per the Final Work Plan.

J = the result is an estimated concentration that is less than the limit of quantitation but greater than or equal to the method detection limit

$\mu\text{g}/\text{m}^3$  = micrograms per cubic meter

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**Table 10. Indoor Air Sampling Results Summary  
Moffett Field, California**

Building Number	Number & Type of Samples	COCs Detected	Concentration Range ( $\mu\text{g}/\text{m}^3$ )	Detected COCs (one or more samples) Exceeding Indoor Air Cleanup Levels?	Detected COCs (one or more samples) Exceeding Ambient Air Concentration Range? <sup>a</sup>
<b>Buildings with no HVAC System</b>					
2	4 indoor (1 pathway)	TCE PCE cis-1,2-DCE	0.049-0.34 0.033-0.066 0.012-0.025	No No No	Yes No No
10	7 indoor (1 duplicate and 1 pathway), 1 ambient	TCE PCE cis-1,2-DCE 1,1-DCA trans-1,2-DCE 1,1-DCE Vinyl Chloride	4-960 1.2-770 0.87-310 0.068-28 0.02-7.1 0.076-24 0.008-0.021	Yes Yes Yes Yes Yes Yes Yes	Yes Yes Yes Yes Yes Yes Yes
13	3 indoor (1 duplicate)	TCE PCE cis-1,2-DCE 1,1-DCA	0.093-0.32 0.024-0.18 0.021-0.12 0.0063-0.0063	No No No No	Yes No No No
14	8 indoor (2 pathway and 1 duplicate)	TCE PCE cis-1,2-DCE trans-1,2-DCE	0.042-0.12 0.042-0.12 0.0095-0.027 0.014-0.064	No No No No	Yes No No Yes
29	2 indoor (1 pathway) 1 ambient	TCE PCE cis-1,2-DCE	0.13-0.18 0.19-0.23 0.053-0.075	No No No	No Yes No
45	3 indoor (1 duplicate)	TCE PCE cis-1,2-DCE 1,1-DCA	0.37-0.44 0.037-0.068 0.07-0.1 0.0084-0.0098	No No No No	Yes No No No
67	2 indoor 2 ambient (1 duplicate)	TCE PCE cis-1,2-DCE	0.046-0.086 0.025-0.039 0.011-0.012	No No No	No No No
76	2 indoor	TCE PCE cis-1,2-DCE 1,1-DCA 1,1-DCE	0.12-0.15 0.052-0.055 0.048-0.078 0.007 0.038-0.053	No No No No No	No No No No No
567	3 indoor	TCE PCE cis-1,2-DCE 1,1-DCA trans-1,2-DCE 1,1-DCE	1.2-3.9 0.22-0.75 0.11-0.36 0.03-0.057 0.01100J 0.028-0.049	No No No No No No	Yes Yes No No No No
N210	18 indoor (3 duplicates and 4 pathways), 1 ambient	TCE PCE cis-1,2-DCE 1,1-DCA 1,1-DCE trans-1,2-DCE	0.14-17.0 0.028-0.67 0.017-0.74 0.0072-0.056 0.018-0.086 0.025J	Yes No No No No No	Yes Yes No Yes No Yes

**Table 10. Indoor Air Sampling Results Summary  
Moffett Field, California**

Building Number	Number & Type of Samples	COCs Detected	Concentration Range ( $\mu\text{g}/\text{m}^3$ )	Detected COCs (one or more samples) Exceeding Indoor Air Cleanup Levels?	Detected COCs (one or more samples) Exceeding Ambient Air Concentration Range? <sup>a</sup>
<b>Buildings with HVAC Systems</b>					
3	20 indoor (2 duplicates and 4 pathway), 2 ambient	TCE PCE cis-1,2-DCE 1,1-DCA trans-1,2-DCE 1,1-DCE Vinyl Chloride	0.12-7.9 0.02-0.12 0.021-0.72 0.006-0.081 0.0076-0.035 0.022-0.1 0.011-0.56	Yes No No No No No No	Yes Yes No Yes Yes Yes Yes
12	13 indoor (1 duplicate and 4 pathway)	TCE PCE cis-1,2-DCE 1,1-DCA trans-1,2-DCE 1,1-DCE	0.017-6.1 0.032-0.46 0.0098-0.48 0.0067-0.079 0.034 0.018-0.053	Yes No No No No No	Yes Yes Yes Yes Yes No
15	13 indoor (1 duplicate) 3 ambient (1 duplicate)	TCE PCE cis-1,2-DCE 1,1-DCA trans-1,2-DCE 1,1-DCE Vinyl Chloride	0.032-2.5 0.024-0.51 0.0082-0.24 0.012-0.024 0.0086 0.019-0.059 0.0078-0.01	No No No No No No No	Yes Yes No No No No Yes
16	12 indoor (2 duplicates) 2 ambient	TCE PCE cis-1,2-DCE 1,1-DCA trans-1,2-DCE 1,1-DCE Vinyl Chloride	0.066-0.19 0.03-0.19 0.067-0.33 0.0077-0.031 0.0067-0.0079 0.019-0.032 0.0071	No No No No No No No	Yes No No No No No Yes
107	4 indoor	TCE PCE cis-1,2-DCE 1,1-DCE	0.043-0.11 0.051-0.065 0.014-0.037 0.03-0.059	No No No No	No No No No
126	11 indoor (1 duplicate) 7 ambient	TCE PCE cis-1,2-DCE 1,1-DCA trans-1,2-DCE 1,1-DCE Vinyl Chloride	1.4-3.1 1.9-4.4 0.52-1.4 0.029-0.057 0.01-0.097 0.038-0.083 0.013-0.053	No Yes No No No No No	Yes Yes Yes No No No Yes
510	7 indoor (1 duplicate) 3 ambient (1 duplicate)	TCE PCE cis-1,2-DCE 1,1-DCA 1,1-DCE	0.084-0.15 0.048-0.52 0.11-0.44 0.0089-0.024 0.018-0.044	No No No No No	No Yes No No No

**Table 10. Indoor Air Sampling Results Summary  
Moffett Field, California**

Building Number	Number & Type of Samples	COCs Detected	Concentration Range ( $\mu\text{g}/\text{m}^3$ )	Detected COCs (one or more samples) Exceeding Indoor Air Cleanup Levels?	Detected COCs (one or more samples) Exceeding Ambient Air Concentration Range? <sup>a</sup>
555	6 indoor 2 ambient	TCE	0.17-1.3	No	Yes
		PCE	0.036-0.14	No	No
		cis-1,2-DCE	0.047-0.72	No	No
		1,1-DCA	0.0078-0.032	No	No
		trans-1,2-DCE	0.0099	No	No
		1,1-DCE	0.021-0.032	No	No
		Vinyl Chloride	0.017-0.026	No	Yes
566	6 indoor	TCE	0.012-0.097	No	No
		PCE	0.019-0.082	No	No
N239	49 indoor (3 duplicates and 11 pathway), 2 ambient	TCE	0.0077-3.8	No	Yes
		PCE	0.02-0.94	No	Yes
		cis-1,2-DCE	0.0093-1.1	No	Yes
		1,1-DCA	0.0053-0.062	No	Yes
		trans-1,2-DCE	.013-0.024	No	Yes
		1,1-DCE	0.017-0.19	No	Yes
		Vinyl Chloride	0.013-0.061	No	Yes
N239A	21 indoor (2 duplicates and 4 pathway)	TCE	0.025-6.8	Yes	Yes
		PCE	0.021-0.42	No	Yes
		cis-1,2-DCE	0.013-1.6	No	Yes
		1,1-DCA	0.0083-0.073	No	Yes
		trans-1,2-DCE	0.0075-0.025	No	Yes
		1,1-DCE	0.023-0.15	No	Yes
		Vinyl Chloride	0.0085-0.1	No	Yes
N243	33 indoor (5 duplicates and 8 pathway), 3 ambient	TCE	0.0075-1.6	No	Yes
		PCE	0.022-0.35	No	Yes
		cis-1,2-DCE	0.0099-0.92	No	No
		1,1-DCA	0.0053-0.038	No	No
		trans-1,2-DCE	0.0081-0.032	No	No
		1,1-DCE	0.018-0.067	No	No
		Vinyl Chloride	0.016-0.06	No	Yes
N243A	10 indoor (2 duplicate and 1 pathway), 2 ambient	TCE	0.028-0.21	No	No
		PCE	0.026-0.26	No	Yes
		cis-1,2-DCE	0.015-0.16	No	No
		1,1-DCA	0.0075-0.012	No	No
		1,1-DCE	0.02-0.041	No	No

Note:

<sup>a</sup>Ambient air concentration range was established from the results of outdoor air samples collected as per the Final Work Plan.

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**Table 11. Building 10 Indoor Air Sampling Results**  
**July 18 and August 9, 2012**  
**Moffett Field, California**

Sample Name	Sample Location			Sample Type	Sample Duration	Sample Date	VOCs by EPA TO-15 SIM						
	Building	Floor	Room				Vinyl Chloride	1,1-DCE	trans-1,2-DCE	1,1-DCA	cis-1,2-DCE	TCE	PCE
<b>July 18, 2012 Sampling Event</b>													
<b>M010-1-01-R-E1</b>	10	1 - Rm 101	101	Work Area	8 hr	7/18/2012	<0.015	0.018	0.0075	0.014	0.16	<b>1.1</b>	0.21
<b>M010-1-03-R-E1</b>	10	1 - Rm 101	101	Work Area	8 hr	7/18/2012	<0.014	<0.016	<0.015	<0.015	0.11	0.89	0.098
<b>M010-T-04-R-E1</b>	10	Tunnel	Tunnel	Pathway	8 hr	7/18/2012	<0.015	2.2	0.55	<b>2.2</b>	23	<b>160</b>	<b>34</b>
<b>M310-1-01-R-E1</b>	10	Tunnel Dup.	Tunnel	Duplicate	8 hr	7/18/2012	<0.014	2.3	0.59	<b>2.4</b>	24	<b>160</b>	<b>37</b>
<b>M010-1-07-R-E1</b>	10	Air discharge	Pathway	Work Area	8 hr	7/18/2012	<0.015	0.024	0.012	0.031	0.3	<b>1.2</b>	<b>0.63</b>
<b>August 9, 2012 Sampling Event</b>													
<b>M010-1-01-R-E2</b>	10	1 - Rm 101	101	Work Area	8 hr	8/9/2012	<0.016	<0.018	<0.016	<0.016	0.097	0.73	0.076
<b>M010-T-03-R-E2</b>	10	1-Rm 101	101	Work Area	8 hr	8/9/2012	<0.016	<0.018	<0.016	<0.016	0.083	0.65	0.11
<b>M010-T-04-R-E2</b>	10	Tunnel	Tunnel	Pathway	8 hr	8/9/2012	<0.014	0.92	0.25 J	0.92	9.4	<b>59</b>	<b>12</b>
<b>M310-1-01-R-E2</b>	10	Tunnel Dup.	Tunnel	Duplicate	8 hr	8/9/2012	<0.013	0.78	0.22	0.79	8	<b>49</b>	<b>10</b>
<b>M010-1-07-R-E2</b>	10	Air discharge	Pathway	Work Area	8 hr	8/9/2012	<0.017	0.024 J	<0.017	0.028 J	0.29	1.1	0.61
<b>Indoor Residential Cleanup Level</b>							0.2	210	60	2	60	1	0.4
<b>Indoor Commercial Screening Level</b>							2	700	210	6	210	5	2

**Notes:**

Values exceeding the indoor commercial/residential level are bolded.

J = the result is an estimated concentration that is less than the limit of quantitation but greater than or equal to the method detection limit.

µg/m<sup>3</sup> = micrograms per cubic meter

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**Table 12. Tier Evaluation Summary and Potential Mitigation Measures  
Moffett Field, California**

<b>Building Number</b>	<b>Building Use</b>	<b>Tier Classification</b>	<b>Results Summary</b>	<b>Potential Mitigation Measures</b>
<b>Buildings with no HVAC Systems</b>				
2	Gymnasium	Tier 3A	TCE exceeded outdoor air concentration range for only one pathway sample.	Seal conduits in Boiler Room (Room 104) that penetrate the floors and install ventilation systems.
10	Boiler Plant for NASA Research Park	Tier 2	TCE, PCE, cis-1,2-DCE, and 1,1-DCA exceeded indoor air cleanup levels for all indoor air samples except one with no engineering controls. Ranking is Tier 1 without the interim measure (engineering control) in place and Tier 2 with the interim measure (see Section 7).	The Navy installed a cutoff wall and blower in the tunnel at a vault access located approximately 300 feet east of Building 10 as part of the emergency action. Other interim mitigation measures may include cutting off the pathway from Building to Tunnel.
13	Commissary Warehouse	Tier 3A	TCE exceeded outdoor air concentration range for only one sample.	Seal cracks and seams in concrete floor of Room 102 and 103; seal conduits penetrating the floor slab in Room 102 where sample exceeded outdoor air range for TCE.
14	Offices & Storage	Tier 3A	TCE (5 out of 8 samples) and trans-1,2-DCE (3 out of 8 samples) exceeded the outdoor air concentration range.	Seal cracks and seams in concrete floor; seal conduits penetrating the floor slab.
29	Bicycle Shop	Tier 3A	PCE exceeded the outdoor air concentration range for only one sample.	Seal cracks & seams present in the slab floor; seal conduits that are present in the building basement.
45	Storage Facility	Tier 3A	TCE exceeded the outdoor air concentration range for all samples.	Seal cracks & seams present in the slab floor; seal conduits in Room 101A and ensure air ventilation in the building.
67	U.S. Post Office	Tier 3B	None of the samples exceeded outdoor air concentration ranges or indoor cleanup levels	None
76	Locksmith Shop	Tier 3B	None of the samples exceeded outdoor air concentration ranges or indoor cleanup levels	None
567	Warehouse	Tier 3A	TCE and PCE exceeded the outdoor air concentration ranges for all samples.	Seal cracks & seams present in the slab floor; seal conduits in Room 101A and ensure air ventilation in the building.
<b>Buildings with HVAC Systems</b>				
3	Conference Center and Cafeteria	Tier 3A	TCE exceeded the indoor air cleanup level for two pathway samples (including a duplicate). TCE also exceeded the ambient outdoor air concentration range at multiple locations with both HVAC system off and on.	Seal conduits in Room 105A that penetrate the floors and install ventilation systems. Passively vent the crawl space.
12	Commissary	Tier 3A	TCE exceeded the indoor air screening level for one pathway (crawl space) sample collected with HVAC system on. PCE exceeded the ambient outdoor air concentration range for two work area samples with HVAC system on. TCE (4 out of 4 samples) and PCE (1 out of 4 sample) exceeded the ambient outdoor air concentration ranges for pathway samples collected in the crawl space with both HVAC system on and off.	Seal conduits penetrating the floor slab in Room 110 beneath which pathway samples (crawl space) were taken. Passively vent the crawl space.
15	NASA Security	Tier 3A	PCE exceeded the outdoor air concentration range for only one sample with HVAC system on. TCE (6 out of 6 samples) and PCE (1 out of 6 samples) exceeded the ambient outdoor air concentration ranges in samples taken with the HVAC system off.	Keep operating ventilation and HVAC system. Seal cracks and seams in the concrete floor slab; seal conduits penetrating the floor slab in Rooms R113, R115, R102W, and R104M.
16	Maintenance Contractor (IAP) Office & Shops	Tier 3A	All sample results were below the outdoor air concentration ranges and indoor air screening levels with the HVAC system on. TCE exceeded the ambient outdoor air concentration range for all samples taken with HVAC system off.	Keep operating ventilation and HVAC system. Seal cracks and seams in the concrete floor slab; seal conduits penetrating the floor slab.
107	ROICC Office	Tier 3A	None of the samples exceeded the outdoor air concentration ranges or indoor screening levels with both HVAC system on and off.	None
				The Navy is planning to conduct an investigation and treatment action

**Table 12. Tier Evaluation Summary and Potential Mitigation Measures  
Moffett Field, California**

Building Number	Building Use	Tier Classification	Results Summary	Potential Mitigation Measures
126	Moffett Historical Society Museum	Tier 1	PCE exceeded the indoor screening level for indoor air samples (9 out of 11) with both the HVAC system on and off.	for the PCE source area near Building 126 followed by air monitoring due to the concentrations of PCE in the May and June indoor air samples (just above cleanup levels). The building status will be reevaluated after completion of the Navy's scheduled action.
N210	Offices & Storage (former hangar)	Tier 2	TCE exceeded the indoor air cleanup level for only one sample with the HVAC system off. The building was not sampled with the HVAC system on.	Keep operating the current vapor extraction system that is used to capture the vapors beneath the raised floor.
510	Maintenance Offices	Tier 3A	PCE exceeded the outdoor air concentration range at only one location with the HVAC system on. None of the samples exceeded the ambient air concentration range with the HVAC system off.	Seal conduits penetrating the floor slab in Room 105 and install ventilation systems, if necessary, to keep the building ventilated. The building can be designated as Tier 3B if the interim mitigation measures are successful and the confirmation sample in Room 105 is within the ambient air concentration range.
555	Tenant Offices	Tier 3A	None of the samples exceeded the ambient outdoor air concentration ranges or indoor screening levels with the HVAC system on. TCE and vinyl chloride exceeded the ambient outdoor air concentration ranges in all samples taken with the HVAC system off.	Keep operating ventilation and HVAC system.
566	Tenant Offices	Tier 3B	None of the samples exceeded the outdoor air concentration ranges or indoor screening levels with both the HVAC system on and off.	None
N239	Life Sciences Building (offices & laboratories)	Tier 3A	TCE and PCE exceeded the ambient outdoor concentration ranges only for a few samples collected in basement with the HVAC system off. PCE also exceeded the outdoor air concentration range for only one sample collected in the basement with the HVAC system on. None of the samples collected in the work area except basement work area exceeded the ambient outdoor concentration ranges with both the HVAC system on and off.	Keep operating ventilation and HVAC system.
N239A	Offices & Centrifuge	Tier 3A	TCE exceeded the indoor cleanup level for one sample with the HVAC system off. TCE also exceeded the ambient air concentration range for 15 samples (out of 21) collected in the building with the HVAC system on and off. PCE exceeded the ambient air concentration range for one basement sample collected with the HVAC system off.	Seal cracks and seams in the concrete floor, seal conduits penetrating the floor slab, keep operating the HVAC system in the building, and install ventilation systems, if necessary, to keep the building ventilated.
N243	Flight Guidance & Simulation Laboratory	Tier 3A	TCE exceeded the ambient air concentration range for only two samples collected in the basement (one with the HVAC system off and another with the HVAC system on). PCE was detected slightly exceeding the ambient air concentration range in one basement sample and one first-floor sample with the HVAC system on.	Seal cracks and seams in the concrete floor, seal conduits penetrating the floor slab, and keep the building ventilated with a positive (passive) pressure to not allow the outside fumes to enter the building during refueling and when aircrafts mobilize for takeoff on the runway near the building.
N243A	Welding & Machine Shop	Tier 3A	PCE exceeded the outdoor air concentration range at only one location with the HVAC system on. None of the samples exceeded the ambient outdoor air concentration ranges or indoor cleanup levels for any of the COCs.	Seal conduits penetrating the floor slab in Room 104 where PCE exceeded the ambient air concentration range. The building can be designated Tier 3B if the interim mitigation measures are successful and the confirmation sample in Room 104 is within the ambient air concentration range.

**Note:**

Outdoor air concentration range was established from the results of outdoor air samples collected as per the Final Work Plan.

## **Appendix A. Sample Location Maps**

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Provided on CD

***[The building floor plans are confidential for building security. Copies of the building floor plans may be provided upon request at the discretion of the Project Manager and NASA.]***

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## **Appendix B. Laboratory Analytical Reports**

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**[Provided on CD; Index sheets (Detail Summary sheets from the lab reports) are included in the hard copy to identify the lab report that contains the results for specific samples.]**

**DETAIL SUMMARY REPORT**

Client: Accord Engineering  
 Project ID: Air Sampling for Vapor Intrusion, former NAS Moffett Field, CA / 110803-03

Service Request: P1202044

Date Received: 5/23/2012  
 Time Received: 09:55

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pf1 (psig)	Pf1 (psig)	
M029-B-01	P1202044-001	Air	5/21/2012	16:22	AS00164	-2.78	3.61	X
M076-1-01	P1202044-002	Air	5/21/2012	16:29	AC00637	-2.82	3.55	X
M029-1-01	P1202044-003	Air	5/21/2012	16:36	AS00176	-1.71	3.76	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for Vapor Intrusion, former NAS Moffett Field, CA / 110803-03

Service Request: P1202045

Date Received: 5/23/2012  
 Time Received: 09:55

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M002-1-01	P1202045-001	Air	5/18/2012	16:00	AC01493	-2.24	3.54	X
M003-1-09-N	P1202045-002	Air	5/18/2012	16:39	AC01577	-2.07	3.52	X
M003-1-07-N	P1202045-003	Air	5/18/2012	16:53	AC00765	-2.83	3.50	X
M003-1-03-N	P1202045-004	Air	5/18/2012	16:55	AC01378	-3.14	3.55	X
M003-1-02-N	P1202045-005	Air	5/18/2012	17:02	AC01813	-4.75	3.50	X
M003-1-08-N	P1202045-006	Air	5/18/2012	17:04	AC01489	-3.20	3.55	X
M003-1-04-N	P1202045-007	Air	5/18/2012	17:06	AC01392	-3.70	3.53	X
M003-1-06-N	P1202045-008	Air	5/18/2012	17:08	AC01236	-2.18	3.50	X
M403-1-01-N	P1202045-009	Air	5/18/2012	17:09	AC00274	-3.20	3.51	X
M003-1-01-N	P1202045-010	Air	5/18/2012	17:10	AC01570	-4.65	3.54	X
M126-1-05-N	P1202045-011	Air	5/18/2012	17:16	AC00695	-2.97	3.50	X
M126-1-03-N	P1202045-012	Air	5/18/2012	17:18	AC01145	-2.39	3.54	X
M126-1-01-N	P1202045-013	Air	5/18/2012	17:19	AC00614	-2.31	3.50	X
M126-1-04-N	P1202045-014	Air	5/18/2012	17:21	AC01110	-2.48	3.50	X

## DETAIL SUMMARY REPORT

 Client: Accord Engineering, Inc.  
 Project ID: Air Sampling for Vapor Intrusion, former NAS Moffett Field, CA / 110803-03

Service Request: P1202046

 Date Received: 5/23/2012  
 Time Received: 09:55

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M126-1-02-N	P1202046-001	Air	5/18/2012	17:23	AS00170	-1.74	3.82	X
M002-1-03	P1202046-002	Air	5/18/2012	17:29	AC00907	-2.92	3.62	X
M002-1-04	P1202046-003	Air	5/18/2012	17:30	AC00580	-2.43	3.73	X
M002-1-02	P1202046-004	Air	5/18/2012	17:32	AS00153	-2.79	3.50	X
M003-C-05-N	P1202046-005	Air	5/18/2012	17:38	AC00988	-2.52	3.59	X
M310-1-01	P1202046-006	Air	5/18/2012	17:43	AC01760	-1.33	3.71	X
M010-T-04	P1202046-007	Air	5/18/2012	17:45	AC01802	-1.86	3.53	X
M010-1-06	P1202046-008	Air	5/18/2012	17:46	AC01809	-1.89	3.55	X
M010-1-02	P1202046-009	Air	5/18/2012	17:59	AC01779	-2.29	3.52	X
M010-1-05	P1202046-010	Air	5/18/2012	18:00	AC00926	-2.44	3.64	X
M010-1-01	P1202046-011	Air	5/18/2012	18:02	AC01806	-5.12	3.67	X
M010-1-03	P1202046-012	Air	5/18/2012	18:05	AC01131	-3.12	3.50	X
M126-A-01-N	P1202046-013	Air	5/19/2012	11:08	AC01883	-1.67	3.56	X
M003-A-01-N	P1202046-014	Air	5/19/2012	11:17	AC01810	-0.50	3.71	X
M010-A-01	P1202046-015	Air	5/19/2012	12:33	AC01877	-2.20	3.52	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for Vapor Intrusion, former NAS Moffe / 110803-03

Service Request: P1202141

Date Received: 5/29/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M029-A-01	P1202141-001	Air	5/22/2012	07:47	AC00699	-3.63	3.47	X
M367-1-01	P1202141-002	Air	5/22/2012	08:59	AC01879	-0.84	4.00	X
M067-A-01	P1202141-003	Air	5/22/2012	09:31	AS00123	-3.64	3.60	X
M067-1-02	P1202141-004	Air	5/22/2012	09:33	AC00943	-3.14	3.54	X
M067-1-01	P1202141-005	Air	5/22/2012	09:35	AC01225	-1.55	3.53	X
M567-1-03	P1202141-006	Air	5/22/2012	09:48	AC01874	-2.77	3.68	X
M567-1-01	P1202141-007	Air	5/22/2012	09:50	AC01632	-3.48	3.50	X
M567-1-02	P1202141-008	Air	5/22/2012	09:52	AC01666	-3.38	3.54	X
M012-A-01-N	P1202141-009	Air	5/22/2012	11:22	AS00200	-1.68	3.52	X
M012-2-01-N	P1202141-010	Air	5/22/2012	11:29	AS00195	-1.69	3.66	X
M412-1-01-N	P1202141-011	Air	5/22/2012	11:36	AS00183	-3.89	3.58	X
M012-1-01-N	P1202141-012	Air	5/22/2012	11:38	AS00198	-2.65	3.50	X
M012-1-02-N	P1202141-013	Air	5/22/2012	11:42	AC00949	-2.79	3.62	X
M012-1-03-N	P1202141-014	Air	5/22/2012	11:49	AC01878	-2.63	3.54	X
M012-C-05-N	P1202141-015	Air	5/22/2012	11:57	AC00993	-0.87	3.56	X
M012-C-04-N	P1202141-016	Air	5/22/2012	12:04	AC01282	-3.30	3.59	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202142

Date Received: 5/29/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M015-A-01-N	P1202142-001	Air	5/23/2012	08:53	AC01616	-1.88	3.55	X
M415-1-01-N	P1202142-002	Air	5/23/2012	09:31	AC01284	-4.50	3.55	X
M015-1-02-N	P1202142-003	Air	5/23/2012	09:31	AC01243	-1.37	3.64	X
M015-1-03-N	P1202142-004	Air	5/23/2012	09:42	AC01783	-3.42	3.54	X
M015-1-04-N	P1202142-005	Air	5/23/2012	09:52	AC01462	-3.88	3.57	X
M015-1-01-N	P1202142-006	Air	5/23/2012	09:56	AC01808	-2.23	3.61	X
M015-1-05-N	P1202142-007	Air	5/23/2012	10:00	AC01645	-2.49	3.64	X
M015-1-06-N	P1202142-008	Air	5/23/2012	10:05	AC01104	-3.32	3.68	X
M126-A-02-N	P1202142-009	Air	5/23/2012	10:35	AC01247	-3.82	3.67	X
N239A-B-01-N	P1202142-010	Air	5/23/2012	11:09	AC01040	-1.94	3.60	X
N239A-1-06-N	P1202142-011	Air	5/23/2012	11:14	AC01157	-2.16	3.50	X
N239A-1-03-N	P1202142-012	Air	5/23/2012	11:14	AS00143	-2.62	3.52	X
N239A-1-04-N	P1202142-013	Air	5/23/2012	11:16	AC01096	-3.06	3.69	X
M439-1-01-N	P1202142-014	Air	5/23/2012	11:18	AC01125	-3.31	3.68	X

**DETAIL SUMMARY REPORT**

 Client: Accord Engineering  
 Project ID: Moffett Field Air Sampling / 110803

Service Request: P1203264

 Date Received: 8/10/2012  
 Time Received: 10:15

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M010-1-03-R-E2	P1203264-001	Air	8/9/2012	15:57	AC01396	-3.38	3.50	X
M010-T-04-R-E2	P1203264-002	Air	8/9/2012	15:58	AC01556	-1.99	3.57	X
M310-1-01-R-E2	P1203264-003	Air	8/9/2012	15:58	AC00718	-0.63	3.60	X
M010-1-01-R-E2	P1203264-004	Air	8/9/2012	16:00	AC00974	-3.40	3.60	X
M010-1-07-R-E2	P1203264-005	Air	8/9/2012	16:03	AC01215	-4.24	3.50	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202190

Date Received: 5/31/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pfi (psig)	
N239A-G-07-F	P1202190-001	Air	5/27/2012	13:34	AS00203	-6.60	3.70	X
N243-G-05-F	P1202190-002	Air	5/27/2012	15:10	AC01533	-3.51	3.59	X
N239-G-04-F	P1202190-003	Air	5/27/2012	17:34	AS00208	-1.82	3.53	X
N239-G-07-F	P1202190-004	Air	5/27/2012	17:41	AC00603	-0.99	3.64	X

## DETAIL SUMMARY REPORT

 Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202192

 Date Received: 5/31/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pf1 (psig)	Pf1 (psig)	
M003-A-01-F	P1202192-001	Air	5/29/2012	07:55	AS00209	-2.20	3.58	X
M016-A-01-F	P1202192-002	Air	5/29/2012	08:20	AS00044	-3.27	3.59	X
M555-A-01-F	P1202192-003	Air	5/29/2012	08:26	AC01235	-4.19	3.61	X
M126-A-06-F	P1202192-004	Air	5/29/2012	08:52	AC00416	-3.67	3.62	X
M210-A-01-F	P1202192-005	Air	5/29/2012	09:28	AS00205	-3.13	3.87	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202195

Date Received: 5/31/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pfi (psig)	
M555-A-01-N	P1202195-001	Air	5/24/2012	07:05	AS00103	-3.84	3.54	X
M510-A-01-N	P1202195-002	Air	5/24/2012	07:11	AS00199	-2.19	3.63	X
M510-1-03-N	P1202195-003	Air	5/24/2012	09:15	AC01669	-5.73	3.74	X
M126-A-03-N	P1202195-004	Air	5/24/2012	11:25	AC01614	-1.37	3.73	X
M045-1-02	P1202195-005	Air	5/24/2012	16:12	AC01129	-2.55	3.50	X
M045-1-01	P1202195-006	Air	5/24/2012	16:16	AC01305	-2.70	3.69	X
M345-1-01	P1202195-007	Air	5/24/2012	16:18	AC00813	-2.56	3.67	X
M016-1-04-N	P1202195-008	Air	5/24/2012	17:16	AC01630	-2.28	3.62	X
M016-1-03-N	P1202195-009	Air	5/24/2012	17:18	AC00594	-2.86	3.61	X
M016-1-02-N	P1202195-010	Air	5/24/2012	17:20	AC01287	-2.54	3.74	X
M416-1-01-N	P1202195-011	Air	5/24/2012	17:22	AC01049	-2.79	3.60	X
M016-1-01-N	P1202195-012	Air	5/24/2012	17:23	AC00640	-2.40	3.69	X
M016-1-05-N	P1202195-013	Air	5/24/2012	17:26	AC01376	-2.55	4.08	X
N243-G-05-N	P1202195-014	Air	5/24/2012	14:21	AS00158	-1.96	3.59	X
M510-1-01-N	P1202195-015	Air	5/24/2012	09:14	AS00131	-2.70	3.54	X
M410-1-01-N	P1202195-016	Air	5/24/2012	09:14	AC01154	-3.36	3.52	X
M510-1-02-N	P1202195-017	Air	5/24/2012	09:11	AC01158	-1.68	3.67	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for Vapor Intrusion, former NAS Moffe / 110803-03

Service Request: P1202205

Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M016-A-01-N	P1202205-001	Air	5/25/2012	07:52	AC01794	-3.40	3.55	X
M126-A-04-N	P1202205-002	Air	5/25/2012	11:33	AS00132	-3.90	3.54	X
N239-1-01-N	P1202205-003	Air	5/25/2012	09:36	AS00194	-2.78	3.48	X
N239-1-02-N	P1202205-004	Air	5/25/2012	10:20	AC00588	-3.15	3.50	X
N239-1-03-N	P1202205-005	Air	5/25/2012	09:43	AC00674	-3.08	3.53	X
N239-1-04-N	P1202205-006	Air	5/25/2012	10:04	AC00610	-3.31	3.55	X
N239-1-05-N	P1202205-007	Air	5/25/2012	09:59	AC00968	-2.16	3.50	X
N239-1-06-N	P1202205-008	Air	5/25/2012	10:11	AC01819	-3.29	3.57	X
N239-1-07-N	P1202205-009	Air	5/25/2012	09:29	AC00846	-5.42	3.67	X
N239-1-08-N	P1202205-010	Air	5/25/2012	09:23	AS00196	-3.26	3.51	X
N239-2-01-N	P1202205-011	Air	5/25/2012	11:05	AC00977	-3.07	3.48	X
N239-2-03-N	P1202205-012	Air	5/25/2012	11:24	AC01140	-3.80	3.75	X
N239-3-01-N	P1202205-013	Air	5/25/2012	11:22	AC01057	-3.94	3.50	X
N239-3-02-N	P1202205-014	Air	5/25/2012	10:52	AC01250	-2.18	3.61	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for Vapor Intrusion, former NAS Moffe / 110803-03

Service Request: P1202206

Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pfi (psig)	
N239-4-01-N	P1202206-001	Air	5/25/2012	10:29	AC01858	-2.68	3.67	X
N239-A-01-N	P1202206-002	Air	5/25/2012	11:36	AC01796	-3.72	3.63	X
N239-B-01-N	P1202206-003	Air	5/25/2012	09:10	AC01400	-4.45	3.71	X
N239-B-02-N	P1202206-004	Air	5/25/2012	09:17	AS00193	-1.32	3.51	X
N239-B-03-N	P1202206-005	Air	5/25/2012	09:03	AC01867	-2.99	3.73	X
N239-B-05-N	P1202206-006	Air	5/25/2012	08:54	AC01836	-3.08	3.70	X
N239-B-06-N	P1202206-007	Air	5/25/2012	09:00	AC01216	-4.84	3.62	X
M243-A-01-N	P1202206-008	Air	5/25/2012	11:40	AC01044	-3.98	3.66	X
M243-A-02-N	P1202206-009	Air	5/25/2012	16:57	AC01107	-0.02	4.00	X
N243-1-01-N	P1202206-010	Air	5/25/2012	13:56	AC01626	-3.26	3.66	X
N243-1-02-N	P1202206-011	Air	5/25/2012	13:37	AC01880	-2.21	3.61	X
N243-1-03-N	P1202206-012	Air	5/25/2012	13:30	AC01115	-0.56	3.72	X
N243-2-01-N	P1202206-013	Air	5/25/2012	13:25	AC01527	-3.03	3.64	X
N243-2-02-N	P1202206-014	Air	5/25/2012	13:20	AC00781	-2.79	3.67	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for Vapor Intrusion, former NAS Moffe / 110803-03

Service Request: P1202207

Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	PH (psig)	PH (psig)	
N243-2-03-N	P1202207-001	Air	5/25/2012	13:34	AC01223	-4.03	3.54	X
N243-3-01-N	P1202207-002	Air	5/25/2012	14:59	AC00575	-2.52	3.72	X
N243-B-01-N	P1202207-003	Air	5/25/2012	13:55	AC00779	-3.70	3.68	X
N243-B-02-N	P1202207-004	Air	5/25/2012	13:20	AC00440	-3.17	3.58	X
N243-B-03-N	P1202207-005	Air	5/25/2012	11:53	AC01822	0.01	3.84	X
N243-B-04-N	P1202207-006	Air	5/25/2012	12:15	AC00612	-2.63	3.58	X
N243-B-06-N	P1202207-007	Air	5/25/2012	14:04	AC01330	-3.61	3.61	X
N243-B-07-N	P1202207-008	Air	5/25/2012	12:20	AS00197	-2.93	3.65	X
N243-B-08-N	P1202207-009	Air	5/25/2012	15:02	AC00142	-2.36	3.62	X
M343-I-01-N	P1202207-010	Air	5/25/2012	13:57	AS00141	-6.14	3.50	X
M343-B-03-N	P1202207-011	Air	5/25/2012	11:53	AC00762	-1.80	3.62	X
M343-B-08-N	P1202207-012	Air	5/25/2012	15:01	AS00182	-2.31	3.61	X
N239-G-04-N	P1202207-013	Air	5/25/2012	16:02	AC01559	-2.36	3.58	X
N239-G-07-N	P1202207-014	Air	5/25/2012	16:16	AC01869	-2.25	3.64	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for Vapor Intrusion, former NAS Moffe / 110803-03

Service Request: P1202209

Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	2nd Pi (psig)	2nd Pf (psig)	TO-15 - VOC SIM
M003-1-01-F	P1202209-001	Air	5/28/2012	17:05	AC00957	-2.33	3.55			X
M003-1-02-F	P1202209-002	Air	5/28/2012	17:35	AC01119	0.50	4.34			X
M003-1-03-F	P1202209-003	Air	5/28/2012	17:06	AC01887	-2.64	3.53			X
M003-1-04-F	P1202209-004	Air	5/28/2012	17:30	AC01657	-3.06	3.67			X
M003-1-06-F	P1202209-005	Air	5/28/2012	17:12	AC01790	-4.57	3.60			X
M003-1-07-F	P1202209-006	Air	5/28/2012	17:11	AC00721	-2.98	3.73			X
M003-1-08-F	P1202209-007	Air	5/28/2012	17:34	AC00691	-5.39	3.63			X
M003-1-09-F	P1202209-008	Air	5/28/2012	17:24	AC01890	-2.93	3.60			X
M003-C-05-F	P1202209-009	Air	5/28/2012	17:38	AC00862	-0.96	-0.48	-0.48	2.09	X
M012-1-01-F	P1202209-010	Air	5/28/2012	12:27	AC00372	-3.14	3.63			X
M012-1-02-F	P1202209-011	Air	5/28/2012	12:25	AS00002	-3.22	3.68			X
M012-1-03-F	P1202209-012	Air	5/28/2012	12:31	AC00803	-3.47	3.67			X
M012-2-01-F	P1202209-013	Air	5/28/2012	12:28	AC01210	-3.13	3.60			X
M012-C-04-F	P1202209-014	Air	5/28/2012	12:37	AC01629	-3.03	3.66	-0.58	2.07	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for Vapor Intrusion, former NAS Moffe / 110803-03

Service Request: P1202210

Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M012-C-05-F	P1202210-001	Air	5/28/2012	12:33	AC01573	-1.25	3.63	X
M013-1-01	P1202210-002	Air	5/28/2012	12:49	AC00791	-4.59	3.74	X
M013-1-02	P1202210-003	Air	5/28/2012	12:47	AS00083	-0.91	3.64	X
M015-1-01-F	P1202210-004	Air	5/28/2012	13:28	AS00201	-3.15	3.50	X
M015-1-02-F	P1202210-005	Air	5/28/2012	13:25	AC01617	-2.89	4.37	X
M015-1-03-F	P1202210-006	Air	5/28/2012	13:25	AC00688	-1.55	3.60	X
M015-1-04-F	P1202210-007	Air	5/28/2012	13:27	AC01670	0.23	3.53	X
M015-1-05-F	P1202210-008	Air	5/28/2012	13:34	AC01507	-4.24	3.68	X
M015-1-06-F	P1202210-009	Air	5/28/2012	13:38	AC01350	-1.76	3.69	X
M015-A-01-F	P1202210-010	Air	5/28/2012	11:51	AC01640	-1.09	3.68	X
M016-1-01-F	P1202210-011	Air	5/28/2012	17:15	AC01886	-2.49	3.55	X
M016-1-02-F	P1202210-012	Air	5/28/2012	17:25	AS00168	-3.71	3.69	X
M016-1-03-F	P1202210-013	Air	5/28/2012	17:27	AC00861	-0.39	3.74	X
M016-1-04-F	P1202210-014	Air	5/28/2012	17:23	AC01610	-2.95	3.74	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202211

Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M016-1-05-F	P1202211-001	Air	5/28/2012	17:20	AC01761	-3.11	3.66	X
M107-1-01-F	P1202211-002	Air	5/28/2012	16:20	AC01414	-3.42	3.65	X
M107-1-02-F	P1202211-003	Air	5/28/2012	16:22	AC00734	-1.36	3.64	X
M126-A-05-F	P1202211-004	Air	5/28/2012	11:44	AS00210	-2.92	3.58	X
N210-1-01-F	P1202211-005	Air	5/28/2012	17:36	AC01477	-3.72	3.60	X
N210-1-02-F	P1202211-006	Air	5/28/2012	17:38	AC00662	-2.49	3.64	X
N210-1-04-F	P1202211-007	Air	5/28/2012	17:21	AC01379	-3.17	3.75	X
N210-1-05-F	P1202211-008	Air	5/28/2012	17:25	AC00623	-4.20	3.54	X
N210-1-06-F	P1202211-009	Air	5/28/2012	17:23	AC01825	-3.15	3.68	X
N210-1-07-F	P1202211-010	Air	5/28/2012	17:18	AC00969	-2.77	3.54	X
N210-1-08-F	P1202211-011	Air	5/28/2012	17:30	AC01338	-3.38	3.68	X
N210-1-09-F	P1202211-012	Air	5/28/2012	17:27	AC01807	-3.28	3.66	X
N210-1-10-F	P1202211-013	Air	5/28/2012	17:31	AS00191	-2.83	3.53	X
N210-1-11-F	P1202211-014	Air	5/28/2012	17:32	AC01458	-3.35	3.75	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202212

Date Received: 6/8/2012  
 Time Received: 09:40

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pfi (psig)	
N210-1-12-F	P1202212-001	Air	5/28/2012	17:34	AC00819	-3.96	3.51	X
N210-2-01-F	P1202212-002	Air	5/28/2012	17:41	AC00946	-2.66	3.62	X
N210-2-02-F	P1202212-003	Air	5/28/2012	17:43	AC01114	-2.86	3.80	X
N210-2-03-F	P1202212-004	Air	5/28/2012	17:17	AC01505	-1.67	3.57	X
N210-G-03-F	P1202212-005	Air	5/28/2012	09:56	AC01864	-1.57	3.58	X
N239-1-01-F	P1202212-006	Air	5/28/2012	17:20	AS00136	-3.20	3.63	X
N239-1-02-F	P1202212-007	Air	5/28/2012	17:48	AC01892	-1.71	3.54	X
N239-1-03-F	P1202212-008	Air	5/28/2012	17:55	AC00709	-2.93	3.66	X
N239-1-04-F	P1202212-009	Air	5/28/2012	17:29	AC01425	-2.33	3.54	X
N239-1-05-F	P1202212-010	Air	5/28/2012	17:28	AC01888	-1.89	3.55	X
N239-1-06-F	P1202212-011	Air	5/28/2012	17:20	AS00202	-2.96	3.60	X
N239-1-07-F	P1202212-012	Air	5/28/2012	17:47	AC01894	-3.62	3.58	X
N239-1-08-F	P1202212-013	Air	5/28/2012	17:45	AC01204	-1.26	3.66	X
N239-2-01-F	P1202212-014	Air	5/28/2012	18:06	AC01786	-1.53	3.63	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202213

Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pf1 (psig)	Pf1 (psig)	
N239-2-02-F	P1202213-001	Air	5/28/2012	18:02	AC00033	-3.67	3.66	X
N239-2-03-F	P1202213-002	Air	5/28/2012	18:00	AC01328	-3.23	3.67	X
N239-2-04-F	P1202213-003	Air	5/28/2012	18:16	AC01623	-2.35	3.71	X
N239-3-01-F	P1202213-004	Air	5/28/2012	18:11	AC01113	-0.02	3.90	X
N239-3-02-F	P1202213-005	Air	5/28/2012	18:15	AC01664	-2.96	3.73	X
N239-3-03-F	P1202213-006	Air	5/28/2012	18:18	AC01830	-1.11	3.49	X
N239-4-01-F	P1202213-007	Air	5/28/2012	18:28	AC01241	-3.67	3.72	X
N239-4-02-F	P1202213-008	Air	5/28/2012	18:30	AC00745	-0.41	3.51	X
N239-A-01-F	P1202213-009	Air	5/28/2012	12:22	AC01401	-2.91	3.71	X
N239A-1-02-F	P1202213-010	Air	5/28/2012	12:43	AS00192	-2.35	3.68	X
N239A-1-03-F	P1202213-011	Air	5/28/2012	12:54	AC01101	0.39	4.22	X
N239A-1-04-F	P1202213-012	Air	5/28/2012	12:58	AC01173	-2.16	3.67	X
N239A-1-05-F	P1202213-013	Air	5/28/2012	12:53	AC01036	-1.99	3.64	X
N239A-1-06-F	P1202213-014	Air	5/28/2012	13:00	AC01448	-2.95	3.64	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202214

Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pf1 (psig)	Pf1 (psig)	2nd Pf (psig)	2nd Pf (psig)	TO-15 - VOC SIM
N239A-1-08-F	P1202214-001	Air	5/28/2012	13:06	AC00947	-3.26	5.10			X
N239A-1-09-F	P1202214-002	Air	5/28/2012	12:44	AC00539	-2.85	5.12			X
N239A-2-01-F	P1202214-003	Air	5/28/2012	13:07	AC00540	-3.37	5.28			X
N239A-B-01-F	P1202214-004	Air	5/28/2012	13:02	AC01464	-1.71	5.12	-0.34	2.13	X
N239-B-01-F	P1202214-005	Air	5/28/2012	17:33	AC00702	-2.42	5.07			X
N239-B-02-F	P1202214-006	Air	5/28/2012	17:39	AC01839	-1.58	5.09	-0.93	2.00	X
N239-B-03-F	P1202214-007	Air	5/28/2012	17:41	AC01009	-3.24	5.21			X
N239-B-05-F	P1202214-008	Air	5/28/2012	17:41	AC01583	-1.51	5.13			X
N239-B-06-F	P1202214-009	Air	5/28/2012	17:10	AC01202	-1.42	5.02			X
M243-A-01-F	P1202214-010	Air	5/28/2012	14:35	AC01537	-1.89	5.09			X
N243-1-01-F	P1202214-011	Air	5/28/2012	14:49	AC01885	-2.68	5.15			X
N243-1-02-F	P1202214-012	Air	5/28/2012	14:30	AC00902	-3.05	5.15			X
N243-1-03-F	P1202214-013	Air	5/28/2012	14:50	AC00768	-3.12	5.13			X
N243-2-01-F	P1202214-014	Air	5/28/2012	15:10	AC00590	-0.17	5.11			X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202215

Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pf1 (psig)	Pf2 (psig)	
N243-2-02-F	P1202215-001	Air	5/28/2012	15:15	AC01895	-2.27	5.27	X
N243-2-03-F	P1202215-002	Air	5/28/2012	14:25	AS00064	-2.36	5.21	X
N243-3-01-F	P1202215-003	Air	5/28/2012	14:42	AC01005	-0.53	5.13	X
N243A-1-01-F	P1202215-004	Air	5/28/2012	15:32	AC01178	-1.71	5.29	X
N243A-1-02-F	P1202215-005	Air	5/28/2012	15:30	AC01257	-2.86	5.21	X
N243A-2-01-F	P1202215-006	Air	5/28/2012	15:33	AC01862	-2.66	5.07	X
N243A-A-01-F	P1202215-007	Air	5/28/2012	15:26	AS00134	-2.56	5.03	X
N243A-B-01-F	P1202215-008	Air	5/28/2012	15:38	AC00639	-3.39	5.38	X
N243-B-02-F	P1202215-009	Air	5/28/2012	14:59	AC00794	-2.81	5.23	X
N243-B-03-F	P1202215-010	Air	5/28/2012	14:55	AC01800	-2.57	5.14	X
N243-B-04-F	P1202215-011	Air	5/28/2012	14:40	AC00679	-3.23	5.06	X
N243-B-06-F	P1202215-012	Air	5/28/2012	15:11	AC01893	-2.37	5.01	X
N243-B-08-F	P1202215-013	Air	5/28/2012	14:36	AC01628	-2.86	5.01	X
M310-1-01-F	P1202215-014	Air	5/28/2012	17:18	AC01857	-3.74	3.62	X

## DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202223

Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M510-1-01-F	P1202223-001	Air	5/28/2012	12:19	AC01861	-3.51	3.70	X
M510-1-02-F	P1202223-002	Air	5/28/2012	12:10	AC00726	-3.68	3.54	X
M510-1-03-F	P1202223-003	Air	5/28/2012	12:23	AC01452	-2.33	3.60	X
M510-A-01-F	P1202223-004	Air	5/28/2012	11:57	AS00207	-2.32	3.62	X
N555-1-01-F	P1202223-005	Air	5/28/2012	16:03	AC01672	-2.38	3.69	X
N555-1-02-F	P1202223-006	Air	5/28/2012	16:04	AC01847	-2.88	3.73	X
N555-1-03-F	P1202223-007	Air	5/28/2012	16:01	AC01459	-2.53	3.57	X
M566-1-01-F	P1202223-008	Air	5/28/2012	16:28	AC01419	-2.98	3.61	X
M566-1-02-F	P1202223-009	Air	5/28/2012	16:24	AC01244	-5.60	3.70	X
M566-1-03-F	P1202223-010	Air	5/28/2012	16:26	AC00760	-3.27	3.58	X

## DETAIL SUMMARY REPORT

 Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202224

 Date Received: 5/30/2012  
 Time Received: 09:50

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M310-1-02-F	P1202224-001	Air	5/28/2012	17:27	AC01172	-3.54	3.72	X
M310-G-03-F	P1202224-002	Air	5/28/2012	09:58	AC00528	-1.69	3.72	X
M313-1-01	P1202224-003	Air	5/28/2012	12:49	AC01872	-3.39	3.65	X
M315-1-01-F	P1202224-004	Air	5/28/2012	11:52	AC00992	-2.05	3.63	X
M339-1-01-F	P1202224-005	Air	5/28/2012	17:47	AC00705	-3.04	3.59	X
M339-3-01-F	P1202224-006	Air	5/28/2012	18:18	AS00187	-3.52	3.60	X
M339-B-01-F	P1202224-007	Air	5/28/2012	17:33	AC01787	-2.86	3.83	X
M343-1-01-F	P1202224-008	Air	5/28/2012	14:50	AC01896	-3.59	3.64	X
M343A-B-01-F	P1202224-009	Air	5/28/2012	15:38	AC01309	-4.69	3.64	X
M343-B-01-F	P1202224-010	Air	5/28/2012	14:55	AC01124	-6.76	3.64	X
M403-1-01-F	P1202224-011	Air	5/28/2012	17:13	AC01829	-2.10	3.53	X
M410-1-01-F	P1202224-012	Air	5/28/2012	11:58	AS00118	-3.63	3.63	X
M416-1-01-F	P1202224-013	Air	5/28/2012	17:16	AC01397	-5.27	3.76	X
M439-1-01-F	P1202224-014	Air	5/28/2012	12:41	AC00848	-0.15	3.80	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: P1202400

Date Received: 6/14/2012  
 Time Received: 17:28

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi (psig)	Pf (psig)	
M126-A-07-F	P1202400-001	Air	6/13/2012	08:31	AC00716	-4.08	3.50	X

DETAIL SUMMARY REPORT

Client: Accord Engineering  
 Project ID: Air Sampling for VI, former NAS Moffett Field, CA / 110803-03

Service Request: PI202401

Date Received: 6/14/2012  
 Time Received: 10:05

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M126-1-05-F	P1202401-001	Air	6/12/2012	16:19	AC01870	-3.78	3.70	X
M126-1-03-F	P1202401-002	Air	6/12/2012	16:22	AC01584	-4.61	3.74	X
M326-1-01-F	P1202401-003	Air	6/12/2012	16:22	AC01461	-3.46	3.68	X
M126-1-01-F	P1202401-004	Air	6/12/2012	16:25	AC00914	-2.73	3.70	X
M126-1-04-F	P1202401-005	Air	6/12/2012	16:27	AC00717	-3.30	3.65	X
M126-1-02-F	P1202401-006	Air	6/12/2012	16:29	AC01386	-3.95	3.72	X
M076-1-01-N	P1202401-007	Air	6/12/2012	16:48	AC00784	-4.77	3.70	X
M014-C-01	P1202401-008	Air	6/12/2012	17:52	AC01043	-2.91	3.77	X
M014-C-02	P1202401-009	Air	6/12/2012	17:55	AC01200	-3.62	3.78	X
M014-1-04	P1202401-010	Air	6/12/2012	17:57	AC01259	-3.83	3.75	X
M014-1-03	P1202401-011	Air	6/12/2012	18:00	AC00660	-1.84	3.75	X
M014-1-05	P1202401-012	Air	6/12/2012	18:04	AC01324	-3.51	3.78	X
M314-1-01	P1202401-013	Air	6/12/2012	18:07	AC01434	-2.88	3.67	X
M014-1-07	P1202401-014	Air	6/12/2012	18:07	AC00615	-5.54	3.74	X
M014-1-06	P1202401-015	Air	6/12/2012	18:08	AC01443	-3.28	3.71	X

## DETAIL SUMMARY REPORT

 Client: Accord Engineering  
 Project ID: Moffett Field Air Sampling / 110803

Service Request: P1202939

 Date Received: 7/19/2012  
 Time Received: 10:05

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pfi (psig)	Pfi (psig)	
M010-1-01-R-E1	P1202939-001	Air	7/18/2012	16:40	AC01872	-2.76	3.51	X
M010-1-03-R-E1	P1202939-002	Air	7/18/2012	16:42	AC01309	-2.37	3.61	X
M010-T-04-R-E1	P1202939-003	Air	7/18/2012	06:45	AC01829	-2.96	3.47	X
M310-1-01-R-E1	P1202939-004	Air	7/18/2012	16:45	AC01351	-2.12	3.47	X
M010-1-07-R-E1	P1202939-005	Air	7/18/2012	16:50	AC01283	-3.19	3.53	X

**DETAIL SUMMARY REPORT**

 Client: Accord Engineering  
 Project ID: Moffett Field Air Sampling / 110803

Service Request: P1203264

 Date Received: 8/10/2012  
 Time Received: 10:15

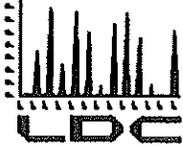
TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
M010-1-03-R-E2	P1203264-001	Air	8/9/2012	15:57	AC01396	-3.38	3.50	X
M010-T-04-R-E2	P1203264-002	Air	8/9/2012	15:58	AC01556	-1.99	3.57	X
M310-1-01-R-E2	P1203264-003	Air	8/9/2012	15:58	AC00718	-0.63	3.60	X
M010-1-01-R-E2	P1203264-004	Air	8/9/2012	16:00	AC00974	-3.40	3.60	X
M010-1-07-R-E2	P1203264-005	Air	8/9/2012	16:03	AC01215	-4.24	3.50	X

## **Appendix C. Data Validation Reports**

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**[Provided on CD; Index sheets (the cover sheets to the validation reports) are included in the hard copy to identify the report that contains the validation results for specific samples.]**



## Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437

Web [www.lab-data.com](http://www.lab-data.com)

Fax 760.634.0439

Accord Engineering, Inc.  
6050 Santo Road, Suite 175  
San Diego, CA 92124  
ATTN: Ms. Yu Zeng

July 12, 2012

SUBJECT: NAS Moffett Field, Data Validation

Dear Ms. Zeng,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on June 21, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 27853:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P1202141, P1202142, P1202143 P1202044, P1202045, P1202046 P1202190, P1202192, P1202195 P1202205, P1202206, P1202207 P1202209, P1202210, P1202211 P1202212, P1202213, P1202214 P1202215, P1202223, P1202224	Volatiles

The data validation was performed under EPA Level III/IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Sampling and Analysis Plan, Air Sampling for Vapor Intrusion Tier Response Evaluation, Former Naval Air Station Moffett Field, Moffett Field, CA, May 2012
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

Please feel free to contact us if you have any questions.

Sincerely,



Andrew Kong  
Project Manager/Chemist

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 22, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202141

**Sample Identification**

M029-A-01  
M367-1-01  
M067-A-01  
M067-1-02  
M067-1-01  
M567-1-03  
M567-1-01  
M567-1-02  
M012-A-01-N  
M012-2-01-N  
M412-1-01-N  
M012-1-01-N  
M012-1-02-N  
M012-1-03-N  
M012-C-05-N  
M012-C-04-N  
M012-1-02-NDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 23, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202142

**Sample Identification**

M015-A-01-N  
M415-1-01-N  
M015-1-02-N  
M015-1-03-N  
M015-1-04-N  
M015-1-01-N  
M015-1-05-N  
M015-1-06-N  
M126-A-02-N  
N239A-B-01-N  
N239A-1-06-N  
N239A-1-03-N  
N239A-1-04-N  
M439-1-01-N

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 23, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.

**Sample Delivery Group (SDG):** P1202143

**Sample Identification**

N239A-1-09-N                    M107-1-01-NDUP  
N239A-1-02-N  
N239A-2-01-N  
N239A-1-08-N  
M243A-A-01-N  
N243A-1-02-N  
M343A-B-01-N  
N243A-2-01-N  
N243A-B-01-N  
N243A-1-01-N  
M107-1-02-N  
M107-1-01-N  
N555-1-03-N  
N555-1-02-N  
N555-1-01-N  
M566-1-01-N  
M566-1-03-N  
M566-1-02-N  
N239A-6-07-N  
N239A-1-09-NDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 21, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202044

**Sample Identification**

M029-B-01  
M076-1-01  
M029-1-01

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 18, 2012  
**LDC Report Date:** July 10, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level IV  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202045

### Sample Identification

M002-1-01  
M003-1-09-N  
M003-1-07-N  
M003-1-03-N  
M003-1-02-N  
M003-1-08-N  
M003-1-04-N  
M003-1-06-N  
M403-1-01-N  
M003-1-01-N  
M126-1-05-N  
M126-1-03-N  
M126-1-01-N  
M126-1-04-N  
M126-1-01-NDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 18 through May 19, 2012  
**LDC Report Date:** July 10, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level IV  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202046

**Sample Identification**

M126-1-02-N  
M002-1-03  
M002-1-04  
M002-1-02  
M003-C-05-N  
M310-1-01  
M010-T-04  
M010-1-06  
M010-1-02  
M010-1-05  
M010-1-01  
M010-1-03  
M126-A-01-N  
M003-A-01-N  
M010-A-01  
M310-1-01DUP  
M003-A-01-NDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 27, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202190

**Sample Identification**

N239A-G-07-F  
N243-G-05-F  
N239-G-04-F  
N239-G-07-F  
N243-G-05-FDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 29, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202192

**Sample Identification**

M003-A-01-F  
M016-A-01-F  
M555-A-01-F  
M126-A-06-F  
M210-A-01-F

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 24, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202195

**Sample Identification**

M555-A-01-N  
M510-A-01-N  
M510-1-03-N  
M126-A-03-N  
M045-1-02  
M045-1-01  
M345-1-01  
M016-1-04-N  
M016-1-03-N  
M016-1-02-N  
M416-1-01-N  
M016-1-01-N  
M016-1-05-N  
N243-G-05-N  
M510-1-01-N  
M410-1-01-N  
M510-1-02-N  
M510-1-02-NDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 25, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202205

**Sample Identification**

M016-A-01-N  
M126-A-04-N  
N239-1-01-N  
N239-1-02-N  
N239-1-03-N  
N239-1-04-N  
N239-1-05-N  
N239-1-06-N  
N239-1-07-N  
N239-1-08-N  
N239-2-01-N  
N239-2-03-N  
N239-3-01-N  
N239-3-02-N  
M126-A-04-NDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 25, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202206

**Sample Identification**

N239-4-01-N  
N239-A-01-N  
N239-B-01-N  
N239-B-02-N  
N239-B-03-N  
N239-B-05-N  
N239-B-06-N  
M243-A-01-N  
M243-A-02-N  
N243-1-01-N  
N243-1-02-N  
N243-1-03-N  
N243-2-01-N  
N243-2-02-N  
M243-A-02-NDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 25, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202206

**Sample Identification**

N239-4-01-N  
N239-A-01-N  
N239-B-01-N  
N239-B-02-N  
N239-B-03-N  
N239-B-05-N  
N239-B-06-N  
M243-A-01-N  
M243-A-02-N  
N243-1-01-N  
N243-1-02-N  
N243-1-03-N  
N243-2-01-N  
N243-2-02-N  
M243-A-02-NDUP

## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 25, 2012  
**LDC Report Date:** July 10, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202207

### Sample Identification

N243-2-03-N  
N243-3-01-N  
N243-B-01-N  
N243-B-02-N  
N243-B-03-N  
N243-B-04-N  
N243-B-06-N  
N243-B-07-N  
N243-B-08-N  
M343-1-01-N  
M343-B-03-N  
M343-B-08-N  
N239-G-04-N  
N239-G-07-N  
N239-G-07-NDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 28, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202209

**Sample Identification**

M003-1-01-F  
M003-1-02-F  
M003-1-03-F  
M003-1-04-F  
M003-1-06-F  
M003-1-07-F  
M003-1-08-F  
M003-1-09-F  
M003-C-05-F  
M012-1-01-F  
M012-1-02-F  
M012-1-03-F  
M012-2-01-F  
M012-C-04-F

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 28, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202210

**Sample Identification**

M012-C-05-F  
M013-1-01  
M013-1-02  
M015-1-01-F  
M015-1-02-F  
M015-1-03-F  
M015-1-04-F  
M015-1-05-F  
M015-1-06-F  
M015-A-01-F  
M016-1-01-F  
M016-1-02-F  
M016-1-03-F  
M016-1-04-F  
M015-1-03-FDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 28, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202211

**Sample Identification**

M016-1-05-F  
M107-1-01-F  
M107-1-02-F  
M126-A-05-F  
N210-1-01-F  
N210-1-02-F  
N210-1-04-F  
N210-1-05-F  
N210-1-06-F  
N210-1-07-F  
N210-1-08-F  
N210-1-09-F  
N210-1-10-F  
N210-1-11-F  
N210-1-01-FDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 28, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202212

**Sample Identification**

N210-1-12-F  
N210-2-01-F  
N210-2-02-F  
N210-2-03-F  
N210-G-03-F  
N239-1-01-F  
N239-1-02-F  
N239-1-03-F  
N239-1-04-F  
N239-1-05-F  
N239-1-06-F  
N239-1-07-F  
N239-1-08-F  
N239-2-01-F

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 28, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202213

**Sample Identification**

N239-2-02-F  
N239-2-03-F  
N239-2-04-F  
N239-3-01-F  
N239-3-02-F  
N239-3-03-F  
N239-4-01-F  
N239-4-02-F  
N239-A-01-F  
N239A-1-02-F  
N239A-1-03-F  
N239A-1-04-F  
N239A-1-05-F  
N239A-1-06-F

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 28, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202214

**Sample Identification**

N239A-1-08-F  
N239A-1-09-F  
N239A-2-01-F  
N239A-B-01-F  
N239-B-01-F  
N239-B-02-F  
N239-B-03-F  
N239-B-05-F  
N239-B-06-F  
M243-A-01-F  
N243-1-01-F  
N243-1-02-F  
N243-1-03-F  
N243-2-01-F

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 28, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202215

**Sample Identification**

N243-2-02-F  
N243-2-03-F  
N243-3-01-F  
N243A-1-01-F  
N243A-1-02-F  
N243A-2-01-F  
N243A-A-01-F  
N243A-B-01-F  
N243-B-02-F  
N243-B-03-F  
N243-B-04-F  
N243-B-06-F  
N243-B-08-F  
M310-1-01-F  
N243-2-03-FDUP  
N243A-A-01-FDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 28, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202223

**Sample Identification**

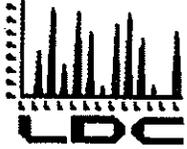
M510-1-01-F  
M510-1-02-F  
M510-1-03-F  
M510-A-01-F  
N555-1-01-F  
N555-1-02-F  
N555-1-03-F  
M566-1-01-F  
M566-1-02-F  
M566-1-03-F  
M510-1-02-FDUP

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** May 28, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** Columbia Analytical Services, Inc.  
**Sample Delivery Group (SDG):** P1202224

**Sample Identification**

M310-1-02-F  
M310-G-03-F  
M313-1-01  
M315-1-01-F  
M339-1-01-F  
M339-3-01-F  
M339-B-01-F  
M343-1-01-F  
M343A-B-01-F  
M343-B-01-F  
M403-1-01-F  
M410-1-01-F  
M416-1-01-F  
M439-1-01-F  
M343-1-01-FDUP  
M343-B-01-FDUP



**Laboratory Data Consultants, Inc.**

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437

Web [www.lab-data.com](http://www.lab-data.com)

Fax 760.634.0439

Accord Engineering, Inc.  
6050 Santo Road, Suite 175  
San Diego, CA 92124  
ATTN: Ms. Yu Zeng

July 10, 2012

SUBJECT: NAS Moffett Field, Data Validation

Dear Ms. Zeng,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on June 29, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 27906:**

<u>SDG #</u>	<u>Fraction</u>
P1202400, P1202401	Volatiles

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Sampling and Analysis Plan, Air Sampling for Vapor Intrusion Tier Response Evaluation, Former Naval Air Station Moffett Field, Moffett Field, CA, May 2012
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

Please feel free to contact us if you have any questions.

Sincerely,

Andrew Kong  
Project Manager/Chemist

**Laboratory Data Consultants, Inc.**  
**Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** June 13, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** ALS Environmental  
**Sample Delivery Group (SDG):** P1202400

**Sample Identification**

M126-A-07-F

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** June 12, 2012  
**LDC Report Date:** July 5, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** ALS Environmental

**Sample Delivery Group (SDG):** P1202401

**Sample Identification**

M126-1-05-F  
M126-1-03-F  
M326-1-01-F  
M126-1-01-F  
M126-1-04-F  
M126-1-02-F  
M076-1-01-N  
M014-C-01  
M014-C-02  
M014-1-04  
M014-1-03  
M014-1-05  
M314-1-01  
M014-1-07  
M014-1-06  
M014-C-02DUP  
M014-1-05DUP



**Laboratory Data Consultants, Inc.**

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

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Accord Engineering, Inc.  
6050 Santo Road, Suite 175  
San Diego, CA 92124  
ATTN: Ms. Yu Zeng

October 19, 2012

SUBJECT: NAS Moffett Field, Data Validation

Dear Ms. Zeng,

Enclosed is the final validation report for the fraction listed below. This SDG was received on October 18, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 28606:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
P1202939	Volatiles

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Sampling and Analysis Plan, Air Sampling for Vapor Intrusion Tier Response Evaluation, Former Naval Air Station Moffett Field, Moffett Field, CA, May 2012
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda Rauto  
Operations Manager/Senior Chemist

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** July 18, 2012  
**LDC Report Date:** October 19, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III  
**Laboratory:** ALS Environmental

**Sample Delivery Group (SDG):** P1202939

**Sample Identification**

M010-1-01-R-E1  
M010-1-03-R-E1  
M010-T-04-R-E1  
M310-1-01-R-E1  
M010-1-07-R-E1  
M010-T-04-R-E1DUP



## Laboratory Data Consultants, Inc.

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Fax 760.634.0439

Accord Engineering, Inc.  
6050 Santo Road, Suite 175  
San Diego, CA 92124  
ATTN: Ms. Yu Zeng

August 28, 2012

SUBJECT: NAS Moffett Field, Data Validation

Dear Ms. Zeng,

Enclosed is the final validation report for the fraction listed below. This SDG was received on August 15, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 28188:**

<u>SDG #</u>	<u>Fraction</u>
P1203264	Volatiles

The data validation was performed under EPA Level III/IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Sampling and Analysis Plan, Air Sampling for Vapor Intrusion Tier Response Evaluation, Former Naval Air Station Moffett Field, Moffett Field, CA, May 2012
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

Please feel free to contact us if you have any questions.

Sincerely,

Andrew Kong  
Project Manager/Chemist

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** NAS Moffett Field  
**Collection Date:** August 9, 2012  
**LDC Report Date:** August 28, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level III & IV  
**Laboratory:** ALS Environmental  
**Sample Delivery Group (SDG):** P1203264

**Sample Identification**

M010-1-03-R-E2\*\*  
M010-T-04-R-E2  
M310-1-01-R-E2  
M010-1-01-R-E2  
M010-1-07-R-E2  
M010-1-03-R-E2DUP

\*\*Indicates sample underwent EPA Level IV review

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## **Appendix D. Building Survey Forms and Summary Table**

**The Building Survey Forms are provided on CD**

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## **Appendix E. Photographs of Sampling Locations**

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**Provided on CD**

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