

APPENDIX G

Quality Assurance Project Plan (QAPP)

QUALITY ASSURANCE PROJECT PLAN

HITACHI GLOBAL STORAGE TECHNOLOGIES, INC.
CHLOROFORM IN SUBSURFACE AT FORMER BUILDING 028J
5600 COTTLE ROAD, SAN JOSE, CALIFORNIA

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LIST OF ACRONYMS

BAAQMD	Bay Area Air Quality Management District
CalEPA	California Environmental Protection Agency
CARB	California Air Resources Board
CMS	Corrective Measures Study
COC	chain of custody
DOT	Department of Transportation
DTSC	Department of Toxic Substance Control
GAC	Granular Activated Carbon
GST	Global Storage Technologies
LCS	laboratory control sample
OD	outer diameter
PID	photoionization detector
PVC	polyvinyl chloride
OMMP	Operations, Monitoring, and Maintenance Plan
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RPD	Relative Percent Difference
STL	Severn Trent Laboratories
TVH	Total Volatile Hydrocarbons
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
L	liter
ml	milliliter
min	minute
µg	microgram

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared on behalf of Hitachi Global Storage Technologies, Inc. (Hitachi GST) by ENVIRON International Corporation (ENVIRON) to implement sampling activities described in the Corrective Measure Study Report for the Chloroform Release Area prepared by ENVIRON for the property located at 5600 Cottle Road in San Jose, California (the “Site”). The purpose of this QAPP is to:

- (1) describe the scope of work for sampling and laboratory analysis;
- (2) describe the quality assurance/quality control (QA/QC) procedures the project team will follow during analysis of samples collected at the Site; and,
- (3) assure reporting of data that are representative of field conditions, and are legally defensible.

The QAPP is based on guidelines issued by the United States Environmental Protection Agency (USEPA) (USEPA 1988, 1989, 1994, 1998, 2001), and reflects the selection of Severn Trent Laboratories-San Francisco (STL) and Forensic Analytical of Hayward, California for analysis of samples.

2.0 SCOPE OF SAMPLING

2.1 Problem Definition and Background

The problem definition and background details for this project are discussed in Section 4.0 of the Corrective Measures Study.

2.2 Sampling Project/Task Description

A summary of work to be performed for this project is provided in detail in Section 7.0 of Corrective Measures Study.

2.3 Sampling Methods

Prior to initiating field activities, ENVIRON will conduct a survey of underground utilities at proposed sampling locations (if necessary), arrange for drilling and/or analytical laboratory subcontractors, and update the Site-specific health and safety plan (if scope has significantly changed).

The general scope and frequency of sampling is outlined in the Operations, Monitoring, and Maintenance Plan (OMMP). Samples will be collected according to the general procedures described below.

2.3.1 Collection of Extracted Vapor Samples

Extracted vapors will be separated in the knockout tank of the 2-PHASE™ Extraction System and routed into a series of two 1,000-pound granular activated carbon (GAC) beds. Vapor sampling ports consist of a valve connected to a short piece of nylon tubing. To collect a vapor sample, the inlet to the Tedlar bag is inserted in the end of the tubing, the valve is opened, and the Tedlar bag valve is unscrewed to allow air to enter the bag. If sufficient flow is not available, a decontaminated hand-held sampling pump may be used. The sampling port construction is the same for influent, midpoint, and effluent sampling locations. If SUMMA™ Canisters are used, the canisters will be equipped with laboratory-supplied flow regulators. The SUMMA™ canister will be linked to the vapor effluent sampling port and the flow regulator set to between 100 to 200 milliliters/min per Department of Toxic Substance Control (DTSC) soil gas investigation guidelines. In all cases, samples will be placed in the laboratory-prepared glassware, sealed, labeled, and stored in a closed, cool container protected from light.

As specified in the OMMP vapor samples will be collected and analyzed by Photo Ionization Detector (PID) from the influent of the first GAC vessel (“C1”) and the effluent of the second GAC vessel (“C2”) and elsewhere as necessary to assess system performance. Breakthrough is suspected when the first carbon vessel effluent shows a significant change from previous PID reading. If ENVIRON observes evidence of breakthrough from the first GAC vessel, a vapor sample will be collected at the mid point (between the two GAC vessels) for laboratory analysis by USEPA Method TO-15. Once breakthrough is confirmed by the analytical results, or carbon change out conditions as specified in the Bay Area Air Quality Management District (BAAQMD) permit, the extraction system will be shut down and carbon change out will be scheduled. Additional sampling may be performed to evaluate system performance.

2.3.2 Collection of Extracted Groundwater Samples

Ground water that is extracted through the use of the 2-PHASE™ Extraction System will be separated from the extracted vapors and routed into a holding tank for subsequent treatment and discharge. Sampling ports consist of a valve that is opened, allowing water to flow through a nozzle where it is collected in the appropriate sampling containers. If the sample is collected at the inlet to the holding tank, the sample is referred to as effluent water. Samples collected from other areas of the system will be so noted. However, the sample collection methods are the same.

Samples will be collected by placing the sampling container as specified at the outlet of the sampling port. Vials used for the collection of samples for volatile organic compound (VOC) analysis will be filled so that no headspace is present. The sampler will wear clean, powderless surgical (or similar) gloves appropriate for the chemicals of concern while collecting the sample(s). Samples will be collected in laboratory-prepared bottles directly from the sampling port and will be immediately labeled, placed in plastic bags, and stored on ice in a closed container.

2.3.3 Collection of Groundwater Samples

Groundwater samples will be collected by a sampling subcontractor using the methods described below. An ENVIRON geologist or engineer will be present for on-site and off-site access coordination, to make observations of the work area conditions, conduct health and safety monitoring of organic vapors, prepare and oversee chain-of-custody proceedings, and provide technical assistance as required.

Prior to collection of groundwater samples, water level measurements will be recorded using Solinst electronic water level probes or equivalents with gradations marked at 0.01 foot intervals. Multiple readings will be measured from a surveyed reference point (the top of the polyvinyl chloride (PVC) well casing) until agreement is reached between two consecutive readings to the nearest 0.01 foot.

For each well to be sampled, water level and total depth will be measured and the casing volume calculated. A minimum of three casing volumes of water will be purged from each well prior to sampling to ensure that samples represent aquifer conditions as much as possible. Low yielding wells will be purged until dryness and then sampled as soon as the well has recovered sufficiently.

During purging, field water quality parameters (temperature, pH, specific conductance, turbidity) are monitored to evaluate the onset of steady- state conditions, which indicate that representative groundwater is being sampled. This information will be recorded by the sampler. Field water quality parameters will be measured with a hand-held meter (pH, specific conductivity, temperature) and a HACH 2100P meter (or similar) for turbidity. Each of the meters will be calibrated daily with the appropriate standard, and the calibration information recorded on a sampling log. Typically, a minimum of four sets of readings is taken, three during purging and one immediately prior to sampling. If water quality parameters do not reach equilibrium following the evacuation of three casing volumes, purging continues until equilibrium is reached or five casing volumes have been evacuated. Equilibrium is reached when field water quality parameters measurements are within 10 percent of each measurement.

Monitoring wells will be sampled for VOC analysis when the water quality parameters have stabilized and a minimum of three casing volumes of water evacuated or, in the case of low-yielding wells, after the well has recovered sufficiently, using a disposable PVC bailer gently lowered down the well by hand. A disposable, low flow, VOC sampling device will be attached to the end of the bailer and used to fill the VOC sample containers. The sampling bailer is designed with a small pouring port near the top of the bailer that allows for controlled pouring of samples and minimal aeration. Collected groundwater samples will be placed in laboratory-prepared glassware, sealed, labeled, placed in plastic bags, and stored on ice in a closed container.

2.3.4 Collection of Soil Gas Samples

Soil gas samples will be collected from temporary soil vapor probes installed using a direct push drilling rig, from permanent soil vapor wells installed by other drilling methods including hollow-stem auger, or from existing extraction wells. Soil gas samples will be collected in general conformance with the California Environmental Protection Agency (CalEPA) DTSC *Advisory on Active Soil Gas Investigations*, dated January 28, 2003 (the "CalEPA Advisory").

At each sampling location, soil gas samples will be collected from the desired depth via temporary probes or through permanent installations. Temporary soil gas probes will be constructed of 1-inch outer diameter (OD) chrom-moly steel with an inert 1/8-inch diameter nylaflo tube that runs down the center of the probe to sampling ports beneath the tip. The temporary probe will be driven into the ground with an electric rotary hammer or similar apparatus. Once the desired depth is reached, the probe will be retracted slightly, which opens the tip and exposes the vapor sampling port. Following equilibration, soil gas will be withdrawn from the nylaflo tubing using a small calibrated syringe connected via a shut-off valve. The first three dead volumes of vapor will be discarded to purge the sample tubing. The next 20 cubic centimeters of soil gas will be withdrawn in the syringe, plugged and immediately transferred to a Summa™ canister if a fixed base laboratory is to be used. Per Cal/EPA's Advisory, the flowrate for purging or sampling shall not exceed 200 milliliters per minute (ml/min).

The temporary soil gas probe will be sealed as described in the CalEPA Advisory. During installation of the probe, hydrated bentonite will be used to seal around the drive rod at ground surface, and the inner soil gas pathway from probe tip to the surface will be sealed via an adapter fitted with an o-ring and connected to the probe tip. Leak tests will be conducted using 1,1,1-difluoroethane gas that is sprayed during sampling at locations where there is the potential for ambient air to enter the sampling system.

If permanent installations are used for collection of soil gas, the methods of sampling from soil vapor wells or existing extraction wells will be performed in general conformance with the CalEPA Advisory.

The soil gas samples will be analyzed using a mobile laboratory that is brought to the Site. The samples will be analyzed for VOCs and total volatile hydrocarbons (TVH) using the USEPA Method 8260B. The target detection limit for VOCs will be 0.08

micrograms per liter ($\mu\text{g/L}$). Roughly 10 percent of the samples will be sent to a fixed base laboratory for confirmation of mobile laboratory results. These duplicate samples will be collected in SummaTM canisters and analyzed using USEPA Method TO-15.

2.3.5 Collection of Soil Samples

The CMS and OMMP do not specify any additional soil sampling for the Site. However, if soil sampling is deemed necessary at some future time, the following sampling protocols will be used.

Drilling will be performed using either a Geoprobe or Vibra-push direct-push drilling rig. In cases where access is very limited, or when a drilling rig is otherwise impractical, soil sampling will be performed using a stainless steel hand auger and hand-operated AMS-brand slide hammer core sampler.

Samples will be collected in either stainless steel or acetate sleeves, capped with TeflonTM-lined caps, placed in ZiplocTM-type plastic bags, and stored on ice in a cooler. Samples will be submitted to STL, a California State-certified analytical laboratory under chain of custody (COC) protocol. If STL is not available for the sample analyses, another California State-certified analytical laboratory will be retained.

Soil samples requiring analysis of volatile compounds will be collected from the sample tube in three separate, 5-gram samples using the EnCore[®] sampling system. The EnCore[®] sampling system consists of a T-Handle sampler holder, a Teflon[®] sampler cartridge, and a sample cap. To collect an EnCore[®] sample, the EnCore[®] sample cartridge will be loaded in the T-handle and driven by hand into the sampling tube. The EnCore[®] sample cartridge will then be removed from the T-handle, checked to ensure that it has been completely filled, capped with the EnCore[®] sample cap, and placed in a resealable Mylar bag labeled with the project number, boring number, sample depth, sample date, and requested analysis. The three EnCore[®] samples, constituting a single sample, will then be placed in the same sealable sample bag and stored immediately on ice in a closed container for delivery to the laboratory under standard COC protocols.

During drilling, soils contained in the sample tube will be visually inspected for signs of contamination. Soil will be placed in sealable plastic bags and allowed to equilibrate. After approximately five minutes, a PID probe will be inserted into the bag to measure total organic vapors (headspace analysis). The headspace reading will be recorded on the boring log. Background organic vapor concentrations will also be measured and

recorded. The PID equipment will be calibrated according to the manufacturer's instructions prior to use each day of sampling. Calibration gas will be kept on-site for calibration, as needed.

During sampling and logging of the soil samples, the field geologist or engineer will:

- Check the orientation of the sample.
- Record the time of sampling.
- Observe and record sample recovery.
- Observe the soil type(s) and evidence of potential contamination, including staining, odor, and artificial debris.
- Label the samples, including the sample number (boring/well number and depth interval in feet below ground surface), project number, date sampled, and sampler's name.
- Place Teflon liners on ends of tubes and caps; immediately seal and store the two lowermost tubes for possible chemical analysis; use upper tube for organic vapor measurements and for logging and additional field measurements.
- Log and record the soil type(s) according to the Unified Soil Classification System (USCS).
- Conduct organic vapor measurements on samples according to the procedure described above.

2.3.6 Collection of Field Quality Control Samples during Extracted Vapor and Groundwater Sampling

In general, no field QC samples will be collected during collection of extracted vapor and groundwater samples from the 2-PHASE™ Extraction System.

2.3.7 Collection of Field Quality Control Samples during Soil and Groundwater Sampling

A field QC sampling scheme has been established during sampling at the Site and will be implemented during each sampling event. Field QC samples consist of trip blanks, duplicates, and equipment rinsate blanks. Field QC samples will be submitted to the laboratory and analyzed following the same procedures used for original field samples. The standard operating procedures used when collecting trip blanks, duplicates, and equipment rinsate blanks are described below:

2.3.7.1 Trip Blanks

A trip blank consists of a contaminant-free matrix in the appropriate sample container with preservative, if required. These samples are generated by the container preparer at the laboratory, transported to the field along with the sample containers, kept with the sample containers continually, and returned to the laboratory without being opened. Each trip blank is analyzed for VOCs by USEPA Method 8260B only. The frequency of analysis will be a minimum of one per day when VOC parameters are sampled and tested.

2.3.7.2 Duplicates

A duplicate sample is collected at the near-identical time and location of its original. The procedures for obtaining the duplicate are identical to its original; the same container type, preservative, and sampling technique are used. Each of the two samples is labeled with a discrete sample number (i.e., the duplicate sample is submitted to the laboratory blind). Immediately after each original sample glassware is filled, a duplicate sample glassware for the sample analysis will be filled. This procedure continues until all original and duplicate sample glassware is filled. Each duplicate sample is analyzed for all parameters specified for the original sample. The frequency of duplicate samples is one for every 10 samples per sampling event.

2.3.7.3 Equipment Rinsate Blanks

Equipment rinsate blanks are used to confirm that the sample glassware and the sampling procedure are not contaminating the sample. Equipment rinsate blanks are only collected from non-dedicated sampling equipment. After decontamination of sample bailer or soil sampling device and prior to its use, distilled water is poured onto the equipment. The water is then transferred into the sample glassware after it passes over or through the equipment.

Equipment rinsate blanks are analyzed for those parameters specified for samples collected on that day and are assigned a unique sample number (i.e., they are submitted to the laboratory blind). The frequency of equipment rinsate blanks is one per day, provided that non-dedicated sampling equipment is used that same day.

2.3.8 Collection of Field Quality Control Samples during Soil Gas Sampling

A minimum of one method blank will be collected each sampling day to verify the effectiveness of decontamination procedures and to detect any possible interference from ambient air. One duplicate sample will also be collected and analyzed per day. Laboratory Control Samples and Dilution Procedure Duplicates will be done in

accordance with CalEPA's Advisory (Section 2.7.1C). In addition, a purge volume test at a minimum of one location near potential contaminant sources and a probe leak test will be conducted per sampling day as described in Section 2.3 and 2.4 of CalEPA's Advisory. Probe installation times, sample collections times, purge volume times and other pertinent data will be recorded in the field for eventual inclusion in a soil gas report.

To minimize the potential for cross-contamination between sample locations, all external probe parts will be cleaned and decontaminated before insertion. The internal nylaflo tubing and calibrated syringes will be replaced prior to insertion at new sampling locations.

2.4 Sample Handling and Custody

The sample container, preservation, and holding time requirements outlined in USEPA's Publication SW-846, *Test Method for Evaluating Solid Wastes: Physical/Chemical Methods*, Third Edition, Final Update III (December 1996) will be followed. In general, all samples will be handled in a manner that preserves the integrity of the sample. Ice chests will be used as transport containers. Samples will be placed in individual sealable plastic. Samples will be handled using the following procedures:

1. The sampler will don clean gloves appropriate for the chemicals of concern before touching any sample containers, and care will be taken to avoid direct contact with the sample.
2. The sample will be quickly observed for color, appearance, and composition and recorded in the field log as described above in Section 2.3.
3. The sample container will be labeled before or immediately after sampling with a self-adhesive label having the following information written in waterproof ink:
 - Company name
 - Project name
 - Project number
 - Sample ID number
 - Date and time sample was collected
 - Initials of sample collector
4. The sample will be placed in an ice chest kept at 4 °C for transport to the laboratory within 24 hours of collection.

2.5 Analytical Methods

For groundwater, the following analyses are anticipated to be required during the implementation of the Corrective Measures Study:

- VOCs by USEPA Method 8260B

For soil gas, the following analyses are anticipated to be required during the implementation of the Corrective Measures Study:

- VOCs by USEPA Method 8260B (mobile lab)
- VOCs by USEPA Method TO-15 (fixed-based lab)

For soil, the following analyses are anticipated to be required during the implementation of the Corrective Measures Study:

- VOCs by USEPA Method 8260B

Table 1 lists the chemical analytical methods anticipated for this project and the proposed reporting limits for target analytes in soil.

2.6 Equipment Decontamination, Waste Management and Handling

Prior to mobilizing the sampling rigs to the Site, the rigs and all associated equipment will be cleaned with a high-pressure, steam washer to remove any oil, grease, mud, tar, and other foreign matter. In order to minimize the potential for cross-contamination, equipment used during the field investigation (including all non-dedicated sampling equipment) will be decontaminated between uses at each sampling location. Decontamination will consist of a detergent wash (Alconox or equivalent) followed by a clean water wash, and finally a clean water rinse, and distilled water spray.

All soil cuttings and fluids generated as a result of decontamination procedures will be contained separately on-site in 55-gallon Department of Transport (DOT)-approved drums pending appropriate disposal. Analytical results from the samples collected during the investigation will be used to characterize the wastes prior to disposal. Waste disposal/recycling will be the responsibility of the client.

2.7 Quality Control

The requirements and procedures for maintaining laboratory quality control for project data are described in Section 4.3.

3.0 PROJECT/TASK ORGANIZATION

Personnel assigned to the project will be required to familiarize themselves with pertinent protocols and procedures presented in the QAPP. The following paragraphs identify and describe the responsibilities of key project positions related to project management, chemical data quality management and subcontractor relationships.

3.1 Key Project Positions

Project Director and Assistant Project Director - The Project Director is responsible for reviewing technical and policy decisions regarding the project, including interaction and coordination with Hitachi-GST, the regulatory agencies, ENVIRON, and subcontractor personnel.

Technical Peer Reviewer - The Technical Peer Reviewer is responsible for reviewing technical aspects of the work including QA/QC, strategies, methods to be used, and key reports.

Project Manager - The Project Manager is responsible for the scope, cost, and technical considerations related to the project; staff and project coordination; and implementation of review of overall project quality to the collection, completeness, and presentation of data.

Project Quality Assurance Officer - The Project QA Officer is responsible for reviewing the project QA program as it relates to the collection and completeness of data from field and laboratory operations, including the training of personnel to follow established protocols and procedures. This individual is also responsible for maintaining the official, approved QAPP.

Task Leaders - Task Leaders are responsible for formulating a work plan and executing work elements related to an assigned task. Each Task Leader will issue specific instructions for performing assigned work elements and will ensure that work is conducted in compliance with project-specific objectives and applicable QA procedures. Task Leaders will coordinate with the Project Manager and QA Officer to review general work plans and specific work elements.

3.2 Quality Objectives and Criteria for Measurement Data

Measurement performance criteria are outlined in Sections 4.6 through 4.8 in STL San Francisco Quality Assurance Manual, Revision 10, January 2002 (STL QA Manual).

3.3 Special Training and Certification

No specialized training of field personnel is required for this project. All personnel involved in field sampling shall have completed the emergency response and hazardous waste operations training requirements defined in Title 29 Code of Federal Regulations Part 1910.120.

Furthermore, fieldwork personnel for this project are appropriately trained for the sampling activities that will be conducted. The training programs implemented by the laboratory for its personnel are described in Section 8.0 of the STL QA Manual.

3.4 Documentation and Records

The most current, approved version of the QAPP will be provided to the appropriate project personnel prior to the initiation of field activities.

Documents related to field activities conducted will be submitted with the Report of Sampling Results or similar document, which will be completed following field activities. These documents include field investigation daily logs, daily calibration logs, COC records and corrective action reports. Laboratory-specific records will be compiled by STL in a “Level III Report” (USEPA report, “Guidance for Data Usability in Risk Assessment (Part A) Final” [DURA]), which is discussed in Section 4.3.3 of the STL Quality Assurance Manual and includes the following elements:

- Sample data such as sampling date, submission date, extraction and analytical dates, method used, sample results, dilution factors, reporting limits, and GC fingerprint chromatograms
- Sample management records such as cooler receipt forms, COC records, and a sample receipt check list
- Test method records such as method summaries, sample preparation logs, run sequences and injection time logs
- QA/QC documents such as calibration summaries, laboratory control sample results, surrogate recoveries, matrix spike results, method blank results, preparation and instrument analysis logs, and QC reports

According to the STL QA Manual Section 12.4, laboratory-specific records will be kept in storage for a period of at least five years. Project-related documents will be retained by ENVIRON in the Emeryville office for a period of five years.

4.0 DATA GENERATION AND ACQUISITION

4.1 Sample Handling and Custody

Standard USEPA procedures to identify, track, monitor and maintain COC for all samples will be implemented as discussed in Section 2.4.

Laboratory sample handling and custody procedures are described in Section 4.1 of the STL QA Manual .

4.2 Analytical Methods

The analyses anticipated to be required during the implementation of this project are listed in Section 2.5. Table 1 lists the chemical analytical methods anticipated for this project and the proposed reporting limits for target analytes. In general, samples will be processed as a batch. Samples will be processed sequentially, and samples to be analyzed by a given method will be generally processed on the same apparatus. Samples will be processed without interruption of samples from other projects. At a minimum, the laboratory will perform matrix spikes on one of each ten project samples, or one per sample delivery batch, per matrix type, whichever is more frequent, and independent of the number of analytical instruments used. Samples will be analyzed so that each detected analyte will be quantified within its respective linear range of calibration of the analytical instrument; if analytes are detected outside the linear range of calibration, the sample will be re-analyzed with an appropriate dilution and within holding times so that the analyte can be properly quantified.

Corrective actions for any failures in the analytical system will be handled by STL San Francisco. Section 6.0 of the STL QA manual identifies the personnel responsible for corrective actions as well as related procedures and documentation.

4.3 Quality Control

The requirements and procedures for maintaining laboratory quality control for project data are described below.

4.3.1 Quality Control Samples

To evaluate the precision and accuracy of analytical data, laboratory quality control samples will be analyzed periodically for this project. The minimum project

requirements for collection and analysis of these samples are listed in the subsections below.

4.3.1.1 Matrix Spikes and Matrix-Spike Duplicates

A matrix spike is an aliquot of a project sample, either soil or water, to which the laboratory adds a known quantity of a compound prior to sample extraction/digestion and analysis. The reported percent recovery of the known compound in the sample indicates the presence or absence of any effects of the matrix on the sample analyses. A matrix-spike duplicate is an aliquot of the matrix-spike sample that is analyzed separately; the results indicate the precision of the analytical method. A matrix-spike and matrix-spike duplicate analysis will be performed on at least one of each ten project samples, or one per sample delivery batch, per matrix type, whichever is more frequent, and independent of the number of analytical instruments used.

4.3.1.2 Method Blanks

A method blank consists of a laboratory-prepared sample that is carried through the entire analytical procedure. Method blanks for soil and water analyses consist of deionized and/or organic-free water, while method blanks for soil gas analyses consist of ambient air. The purpose of method blanks is to check for laboratory contamination during preparation and analysis of soil, water or soil gas samples. Method blanks will be prepared and analyzed at least once with each analytical batch, with a minimum of one for every 20 samples.

4.3.1.3 Laboratory Control Sample

A laboratory control sample (LCS), or check sample, is a sample prepared by the laboratory or a reliable source that contains known concentrations of the analytes of concern. It is subjected to the same preparation/extraction procedures as a soil, soil gas or water sample, and is prepared independently of calibration standards. The LCS recovery checks the accuracy of the analytical methods and equipment, and will be prepared and analyzed at least once with each analytical batch, with a minimum of one for every 20 samples. LCS recoveries should fall within the limits set by the laboratory.

4.3.1.4 Laboratory Surrogate Compounds

A surrogate spike is an addition to the soil, soil gas or water sample of a known concentration of an organic compound that is not expected to be a compound of concern in the sample. Every blank, QC sample, and project sample will be spiked

with surrogate compounds if specified in the particular analytical method (they are not required for metals analyses). Surrogate recovery should fall within the limits set by the laboratory in accordance with procedures specified by the method.

4.3.2 Calculation of QC Statistics

The validity of chemical data will be measured in terms of precision, accuracy, completeness, and representativeness. The ways in which these four parameters will be evaluated for project data are described below.

4.3.2.1 Precision

For chemical data generated by the laboratory, data precision will be estimated by comparing analytical results from duplicate samples and from matrix spikes and matrix-spike duplicates. The comparison will be made by calculating the relative percent difference (RPD) given by the following equation:

$$RPD = \frac{2(S_1 - S_2)}{S_1 + S_2} \times 100$$

Where S_1 = sample

S_2 = duplicate

This information will be calculated and reviewed periodically by the Project Manager and/or Project QA Officer. The goals for data precision are summarized in Table 3. RPD goals are applicable only for samples with detected concentrations greater than five times the reporting limit.

4.3.2.2 Accuracy

Data accuracy will be assessed for laboratory data only and is based on recoveries (R), expressed as the percentage of the true (known) concentration, from laboratory-spiked samples (i.e., matrix spikes, matrix spike duplicates, and laboratory control samples) generated by the analytical laboratory. The equation for calculating recoveries is:

$$R = \frac{(A - B)}{T} \times 100$$

Where A = measured concentration after spiking

B = background concentration

T = known true value of spike

This information will be reviewed periodically by the Project Manager and/or Project QA Officer. The goals for the recovery of selected target analytes in laboratory-spiked samples are presented in Table 2. These goals may need to be modified depending upon potential matrix interferences associated with the site samples. Alteration or failure to meet these preliminary goals should not be construed to indicate that the data is unsuitable for site characterization and risk assessment as long as the uncertainty associated with the data is adequately characterized (USEPA 1992).

4.3.2.3 Completeness

Data generated during the investigation will be evaluated for completeness, that is, the amount of data meeting project precision and accuracy goals presented in Table 2. If data generated via analytical procedures appear to deviate significantly from observed trends, the Project Manager and/or Project QA Officer will review field or laboratory procedures with the appropriate personnel to evaluate the cause of such deviations. Where data anomalies cannot be explained, re-sampling may be necessary.

4.3.2.4 Representativeness

The representativeness of the data is the degree to which data represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Analytical data should represent the sample analyzed regardless of the heterogeneity of the original sample matrix. Field duplicate samples will be collected as a means to assess field representativeness, in addition to being used to assess precision as described in Section 4.3.2.1. Trip blanks will be included in each sample shipment and will contain water samples for volatile organic analysis to evaluate potential cross contamination during transport.

Representativeness will also be ensured by use of proper collection protocols as specified in Section 2.3 and 2.4.

4.3.3 Data Review

The Project Manager, Project QA Officer, or appropriate Task Leader assigned by the Project Manager, will review laboratory data. Section 4.3.2 outlines the procedures for evaluating the precision and accuracy of data. If comparison of data to previous measurements or known conditions at the site indicates anomalies, the laboratory will be instructed to review the submitted data while the methods used to collect and handle the samples is reviewed. If anomalies remain, the laboratory may be asked to re-analyze selected samples; other possible corrective actions are discussed below.

4.3.4 Corrective Actions

Corrective actions may be initiated if the precision or accuracy goals listed in Table 2 are not achieved. The initial step in corrective action will be to instruct the analytical laboratory to examine its procedures to assess whether analytical or computational errors caused the anomalous results. At the same time, sample collection and handling procedures will be reviewed to assess whether they could have contributed to the anomalous results. Based on this evaluation, the Project Manager, with the Project QA Officer, will assess whether re-analysis or re-sampling is required or whether any protocol should be modified for future sampling events. Laboratory corrective actions are described in the laboratory quality assurance manuals. Any changes in laboratory methods, or quality assurance parameters or limits require written approval prior to implementation by the laboratory.

4.4 Instrument/Equipment Testing, Inspection and Maintenance

Information regarding testing, inspection and maintenance of laboratory equipment, including preventative maintenance schedules, is provided in Section 5.3 of the STL QA Manual.

4.5 Instrument/Equipment Calibration and Frequency

Details on calibration procedures for laboratory equipment, including frequency and techniques, are provided in Section 5.2 of the STL QA Manual.

4.6 Inspection/Acceptance of Supplies and Consumables

Project Managers have primary responsibility for identifying the types and quantities of supplies and consumables needed for environmental data collection projects. Supplies and consumables will be received in the field. When supplies are received, the Field Task Leader will inspect the supplies to ensure that they meet the inspection and acceptance requirements. All inspection and acceptance requirements for supplies and consumables (including reagents, standards, water and glassware) used by the laboratory are presented in Section 9 of the STL QA Manual.

4.7 Data Management

New analytical data for the project will be generated and reported by the lab. Information regarding data reduction, validation and reporting by the laboratory is provided in Section 4.3 of the STL QA Manual. Details on the storage of data at the laboratory are presented in Section 12 of the STL QA Manual.

Analytical data will be provided by the laboratory in electronic format via email followed by a mailed hard copy report. The electronic data will be entered and maintained in a project database. Analytical results in the database will be checked against the hard copy report upon their receipt.

5.0 ASSESSMENT AND OVERSIGHT

5.1 Assessments and Response Actions

Assessments that will be performed for this project include laboratory audits, data reviews and peer reviews of data analysis reports. Section 11 of the STL QA Manual describes laboratory audit procedures and related response actions.

The Project Manager, Project QA Officer, or appropriate Task Leader assigned by the Project Manager, will review laboratory data. If comparison of data to previous measurements or known conditions at the site indicates anomalies, the laboratory will be instructed to review the submitted data while the methods used to collect and handle the samples are reviewed. If anomalies remain, the laboratory may be asked to re-analyze selected samples; other possible corrective actions are discussed in Section 4.3.4. Reports related to this project will be peer-reviewed by the Technical Peer Reviewer.

5.2 Reports to Management

The Project Manager will be provided with monthly status reports that will address any work assignment-specific QA issues. Identification of these issues will be facilitated by communication among all project participants.

6.0 DATA VALIDATION AND USABILITY

6.1 Data Review, Verification, and Validation

The criteria for reviewing and validating data are outlined in Sections 4.3, 4.7 and 4.8 of the STL QA Manual. Precision and accuracy goals for data are presented in Table 2.

6.2 Verification and Validation Methods

The validity of chemical data will be measured in terms of precision, accuracy, completeness, and representativeness. Methods to determine these parameters are discussed in Section 4.3.2.

6.3 Reconciliation with User Requirements

Reconciliation of the sampling and analysis results with the requirements defined by the decisions makers will be discussed in the Report of Sampling Results, which will be prepared following completion of field activities and receipt of laboratory analytical data.

7.0 REFERENCES

- ENVIRON International Corporation. 2007. *Corrective Measures Study Report, Chloroform Release Area Former Building 028J Hitachi Global Storage Technologies, 5600 Cottle Road, San Jose, California.*
- California Environmental Protection Agency (CalEPA) and Department of Toxic Substances Control (DTSC). 2003. *Advisory – Active Soil Gas Investigation.* September 28.
- California Regional Water Quality Control Board, 2003, *Screening for Environmental Concerns at Sites with Contaminated Groundwater,* San Francisco Bay Region, July.
- U.S. Environmental Protection Agency (USEPA). 2001. *EPA Requirements for Quality Assurance Project Plans,* EPA QA/R-5.
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- USEPA. 1993b. *Methods for the Determination of Inorganic Substances in Environmental Samples.* USEPA, Office of Research and Development, Washington, D.C. EPA/600/R-93/100. August.
- USEPA. 1992. *Guidance for Data Usability in Risk Assessment (Part A) Final.* USEPA, Office of Emergency and Remedial Response, Washington, D.C. EPA/9285.7-09A.
- USEPA Region IX. 1989. *Guidance for Preparing Quality Assurance Project Plans for Superfund Remedial Projects:* 9QA-03-89, September.
- USEPA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA,* EPA/540/g-89/004, October.

TABLES

Table 1
ESTIMATED REPORTING LIMITS

Analytical Parameters and Analytes	Method Reference and Number	RL(a)
Ground Water		ug/L
<u>Volatile Organic Compounds</u>	8260B	
Acetone		50
Benzene		0.50
Dichlorobromomethane		0.50
Bromobenzene		1.0
Chlorobromomethane		1.0
Bromoform		1.0
Bromomethane		1.0
Methyl Ethyl Ketone		50
n-Butylbenzene		1.0
sec-Butylbenzene		1.0
tert-Butylbenzene		1.0
Carbon disulfide		5.0
Carbon tetrachloride		0.50
Chlorobenzene		0.50
Chloroethane		1.0
Chloroform		1.0
Chloromethane		1.0
2-Chlorotoluene		0.50
4-Chlorotoluene		0.50
Chlorodibromomethane		0.50
1,2-Dichlorobenzene		0.50
1,3-Dichlorobenzene		0.50
1,4-Dichlorobenzene		0.50
1,3-Dichloropropane		1.0
2,2-Dichloropropane		0.50
1,1-Dichloropropene		0.50
1,2-Dibromo-3-Chloropropane		1.0
Ethylene Dibromide		0.50
Dibromomethane		0.50
Dichlorodifluoromethane		0.50
1,1-Dichloroethane		0.50
1,2-Dichloroethane		0.50
1,1-Dichloroethene		0.50
cis-1,2-Dichloroethene		0.50
trans-1,2-Dichloroethene		0.50
1,2-Dichloropropane		0.50
cis-1,3-Dichloropropene		0.50
trans-1,3-Dichloropropene		0.50
Ethylbenzene		0.50
Hexachlorobutadiene		1.0
2-Hexanone		50
Isopropylbenzene		0.50
4-Isopropyltoluene		1.0
Methylene Chloride		5.0
Methyl isobutyl ketone		50
Methyl tert-butyl ether		5.0

Table 1
ESTIMATED REPORTING LIMITS

Analytical Parameters and Analytes	Method Reference and Number	RL(a)
Naphthalene		1.0
N-Propylbenzene		1.0
Styrene		0.50
1,1,1,2-Tetrachloroethane		0.50
1,1,2,2-Tetrachloroethane		0.50
Tetrachloroethene		0.50
Toluene		0.50
1,2,3-Trichlorobenzene		1.0
1,2,4-Trichlorobenzene		1.0
1,1,1-Trichloroethane		0.50
1,1,2-Trichloroethane		0.50
Trichloroethene		0.50
Trichlorofluoromethane		1.0
1,2,3-Trichloropropane		0.50
1,1,2-Trichloro-1,2,2-trifluoroethane		0.50
1,2,4-Trimethylbenzene		0.50
1,3,5-Trimethylbenzene		0.50
Vinyl acetate		50
Vinyl chloride		0.50
Xylenes, Total		1.0
Soil		
<u>Volatile Organic Compounds</u>	8260B	ug/Kg
Acetone		50
Benzene		5.0
Bromodichloromethane		5.0
Bromobenzene		5.0
Bromochloromethane		20
Bromoform		5.0
Bromomethane		10
2-Butanone (MEK)		50
n-Butylbenzene		5.0
sec-Butyl Benzene		5.0
tert-Butyl Benzene		5.0
Carbon disulfide		5.0
Carbon tetrachloride		5.0
Chlorobenzene		5.0
Chloroethane		10
Chloroform		5.0
Chloromethane		10
2-Chlorotoluene		5.0
4-Chlorotoluene		5.0
Dibromochloromethane		5.0
1,2-Dichlorobenzene		5.0
1,3-Dichlorobenzene		5.0
1,4-Dichlorobenzene		5.0
1,3-Dichloropropane		5.0
2,2-Dichloropropane		5.0

Table 1
ESTIMATED REPORTING LIMITS

Analytical Parameters and Analytes	Method Reference and Number	RL(a)
1,1-Dichloropropene		5.0
1,2-Dibromo-3-chloropropane		50
1,2-Dibromoethane		10
Dibromomethane		10
Dichlorodifluoromethane		10
1,1-Dichloroethane		5.0
1,2-Dichloroethane		5.0
1,1-Dichloroethene		5.0
Cis-1,2-Dichloroethene		5.0
Trans-1,2-Dichloroethene		5.0
1,2-Dichloropropane		5.0
cis-1,3-Dichloropropene		5.0
trans-1,3-Dichloropropene		5.0
Ethylbenzene		5.0
Hexachlorobutadiene		5.0
2-Hexanone		50
Isopropylbenzene		5.0
p-Isopropyltoluene		5.0
Methylene chloride		10
4-Methyl-2-pentanone (MIBK)		50
Methyl Tertiary-Butyl Ether		5.0
Napthalene		10
n-Propylbenzene		5.0
Styrene		5.0
1,1,1,2-Tetrachloroethane		5.0
1,1,2,2-Tetrachloroethane		5.0
Tetrachloroethylene (PCE)		5.0
Toluene		5.0
1,1,1-Trichloroethane		5.0
1,1,2-Trichloroethane		5.0
1,2,3-Trichlorobenzene		5.0
1,2,4-Trichlorobenzene		5.0
Trichloroethene		5.0
Trichlorofluoromethane		5.0
Trichlorotrifluoroethane		5.0
1,2,4-Trimethylbenzene		5.0
1,3,5-Trimethylbenzene		5.0
Vinyl acetate		50
Vinyl chloride		5.0
Total Xylenes		5.0
Soil Gas		ug/L
<u>Volatile Organics</u>	8260B	
Dichlorodifluoromethane		0.08
Vinyl Chloride		0.08
Chloroethane		0.08
Trichlorofluoromethane		0.08
1,1-Dichloroethene		0.08

Table 1
ESTIMATED REPORTING LIMITS

Analytical Parameters and Analytes	Method Reference and Number	RL(a)
1,1,2-Trichlorotrifluoroethane		0.08
Methylene Chloride		0.08
trans-1,2-Dichloroethene		0.08
1,1-Dichloroethane		0.08
cis-1,2-Dichloroethene		0.08
Chloroform		0.08
1,1,1-Trichloroethane		0.08
Carbon Tetrachloride		0.08
1,2-Dichloroethane		0.08
Benzene		0.08
Trichloroethene		0.08
Toluene		0.08
1,1,2-Trichloroethane		0.08
Tetrachloroethene		0.08
Ethylbenzene		0.08
1,1,1,2-Tetrachloroethane		0.08
m,p-Xylene		0.08
o-Xylene		0.08
1,1,2,2-Tetrachloroethane		0.08
Soil Gas		ug/m³
<u>Volatile Organics</u>	TO-15	
Benzene		1.6
Carbon Tetrachloride		3.1
Choroethane		1.3
Chloroform		2.4
Dichlorodifluoromethane		2.5
1,1-Dichloroethane		2.0
1,1-Dichloroethene		2.0
1,2-Dichloroethane		2.0
cis-1,2-Dichloroethene		2.0
trans-1,2-Dichloroethene		2.0
Ethylbenzene		2.2
Methylene Chloride		6.9
o-Xylene		2.2
p,m-Xylene		4.3
Tetrachloroethene		3.4
Toluene		1.9
Trichloroethene		2.7
Trichlorofluoromethane		5.6
1,1,2-Trichloro-1,2,2-Trifluoroethane		7.7
1,1,1-Trichloroethane		2.7
1,1,2-Trichloroethane		2.7
1,1,1,2-Tetrachloroethane		3.4
1,1,2,2-Tetrachloroethane		6.9

Table 1
ESTIMATED REPORTING LIMITS

Analytical Parameters and Analytes	Method Reference and Number	RL(a)
Vinyl Chloride		1.3
1,1-Difluoroethane		1.4

Notes:

NA = not available

ug/Kg = microgram per kilogram

ug/L = microgram per liter

ug/m³ = microgram per cubic meter

(a) Reporting limits (RLs) are highly matrix dependent and the values listed are provided for guidance and may not always be achievable. Sample RLs may be higher for samples that require dilution or if matrix interferences are present.

Table 2
QUALITY ASSURANCE GOALS FOR FIELD AND LABORATORY ANALYSES

Tests	Compounds	Spike level	% Recovery (a)	% RPD Limit (b)
Groundwater				
<u>8260B-VOCs</u>		ug/L		
	Acetone		-	
	Benzene	20	69-129	20
	Dichlorobromomethane		-	
	Bromobenzene		-	
	Chlorobromomethane		-	
	Bromoform		-	
	Bromomethane		-	
	Methyl Ethyl Ketone		-	
	n-Butylbenzene		-	
	sec-Butylbenzene		-	
	tert-Butylbenzene		-	
	Carbon disulfide		-	
	Carbon tetrachloride		-	
	Chlorobenzene	20	61-121	20
	Chloroethane		-	
	Chloroform		-	
	Chloromethane		-	
	2-Chlorotoluene		-	
	4-Chlorotoluene		-	
	Chlorodibromomethane		-	
	1,2-Dichlorobenzene		-	
	1,3-Dichlorobenzene		-	
	1,4-Dichlorobenzene		-	
	1,3-Dichloropropane		-	
	2,2-Dichloropropane		-	
	1,1-Dichloropropene		-	
	1,2-Dibromo-3-Chloropropane		-	
	Ethylene Dibromide		-	
	Dibromomethane		-	
	Dichlorodifluoromethane		-	
	1,1-Dichloroethane		-	
	1,2-Dichloroethane		-	
	1,1-Dichloroethene	20	65-125	20
	cis-1,2-Dichloroethene		-	
	trans-1,2-Dichloroethene		-	
	1,2-Dichloropropane		-	
	cis-1,3-Dichloropropene		-	
	trans-1,3-Dichloropropene		-	
	Ethylbenzene		-	
	Hexachlorobutadiene		-	
	2-Hexanone		-	
	Isopropylbenzene		-	
	4-Isopropyltoluene		-	
	Methylene Chloride		-	

Table 2
QUALITY ASSURANCE GOALS FOR FIELD AND LABORATORY ANALYSES

Tests	Compounds	Spike level	% Recovery (a)	% RPD Limit (b)
	Methyl isobutyl ketone		-	
	Methyl tert-butyl ether		-	
	Naphthalene		-	
	N-Propylbenzene		-	
	Styrene		-	
	1,1,1,2-Tetrachloroethane		-	
	1,1,2,2-Tetrachloroethane		-	
	Tetrachloroethene		-	
	Toluene	20	74-134	20
	1,2,3-Trichlorobenzene		-	
	1,2,4-Trichlorobenzene		-	
	1,1,1-Trichloroethane		-	
	1,1,2-Trichloroethane		-	
	Trichloroethene	20	74-134	20
	Trichlorofluoromethane		-	
	1,2,3-Trichloropropane		-	
	1,1,2-Trichloro-1,2,2-trifluoroethane		-	
	1,2,4-Trimethylbenzene		-	
	1,3,5-Trimethylbenzene		-	
	Vinyl acetate		-	
	Vinyl chloride		-	
	Xylenes, Total		-	
Surrogate	1,2-Dichloroethane-d4	500	78-117	-
	4-Bromofluorobenzene	500	79-118	-
	Toluene-d8	500	77-121	-
Soil				
<u>8260B-VOCs</u>		ug/Kg		
	Acetone		-	
	Benzene	500	69-129	20
	Bromodichloromethane		-	
	Bromobenzene		-	
	Bromochloromethane		-	
	Bromoform		-	
	Bromomethane		-	
	2-Butanone (MEK)		-	
	n-Butylbenzene		-	
	sec-Butyl Benzene		-	
	tert-Butyl Benzene		-	
	Carbon disulfide		-	
	Carbon tetrachloride		-	
	Chlorobenzene	500	61-121	20
	Chloroethane		-	
	Chloroform		-	
	Chloromethane		-	
	2-Chlorotoluene		-	

Table 2
QUALITY ASSURANCE GOALS FOR FIELD AND LABORATORY ANALYSES

Tests	Compounds	Spike level	% Recovery (a)	% RPD Limit (b)
	4-Chlorotoluene		-	
	Dibromochloromethane		-	
	1,2-Dichlorobenzene	250	61-121	20
	1,3-Dichlorobenzene	250	61-121	20
	1,4-Dichlorobenzene	250	61-121	20
	1,3-Dichloropropane		-	
	2,2-Dichloropropane		-	
	1,1-Dichloropropene		-	
	1,2-Dibromo-3-chloropropane		-	
	1,2-Dibromomethane		-	
	Dibromomethane		-	
	Dichlorodifluoromethane		-	
	1,1-Dichloroethane		-	
	1,2-Dichloroethane		-	
	1,1-Dichloroethene	500	65-125	20
	Cis-1,2-Dichloroethene		-	
	Trans-1,2-Dichloroethene		-	
	1,2-Dichloropropane		-	
	cis-1,3-Dichloropropene		-	
	trans-1,3-Dichloropropene		-	
	Ethylbenzene	250	70-130	20
	Hexachlorobutadiene		-	
	2-Hexanone		-	
	Isopropylbenzene		-	
	p-Isopropyltoluene		-	
	Isobutanol		-	
	Methylene chloride		-	
	4-Methyl-2-pentanone (MIBK)		-	
	Methyl Tertiary-Butyl Ether	500	65-165	20
	Napthalene		-	
	n-Propylbenzene		-	
	Styrene		-	
	1,1,1,2-Tetrachloroethane		-	
	1,1,2,2-Tetrachloroethane		-	
	Tetrachloroethylene (PCE)		-	
	Toluene	500	70-130	20
	1,1,1-Trichloroethane		-	
	1,1,2-Trichloroethane		-	
	1,2,3-Trichlorobenzene		-	
	1,2,4-Trichlorobenzene	30	38-107	35
	Trichloroethene	500	74-134	20
	Trichlorofluoromethane		-	
	Trichlorotrifluoromethane		-	
	1,2,4-Trimethylbenzene		-	
	1,3,5-Trimethylbenzene		-	
	Vinyl acetate		-	
	Vinyl chloride		-	
	Total Xylenes	250	70-130	20

Table 2
QUALITY ASSURANCE GOALS FOR FIELD AND LABORATORY ANALYSES

Tests	Compounds	Spike level	% Recovery (a)	% RPD Limit (b)
Surrogate	1,2-Dichloroethane-d4		-	
	4-Bromofluorobenzene		-	
	Toluene-d8		-	

NA = not available

ug/Kg = microgram per kilogram

ug/L = microgram per liter

(a) % Recovery is the percent recovery of spiked compound in Laboratory Control Sample.

(b) RPD is the Relative Percent Difference between Matrix Spike/Matrix Spike Duplicate.

APPENDIX H

Health and Safety Plan (HASP)

**ENVIRON International Corporation
SITE HEALTH AND SAFETY PLAN**

**This Site Health and Safety Plan (HASP) is specifically prepared for:
Hitachi Global Storage Technology (GST) Facility; San Jose, California
Project Location: 5600 Cottle Road; San Jose, California
Case Number: 03-11903E**

ALL PERSONNEL PARTICIPATING IN THE FIELD MUST BE TRAINED IN THE GENERAL AND SPECIFIC HAZARDS UNIQUE TO THE JOB AND, IF APPLICABLE, MEET RECOMMENDED MEDICAL EXAMINATION REQUIREMENTS. ALL SITE PERSONNEL AND VISITORS SHALL FOLLOW THE GUIDELINES, RULES, AND PROCEDURES CONTAINED IN THIS SAFETY PLAN. THE PROJECT MANAGER OR SITE HEALTH AND SAFETY OFFICER MAY IMPOSE ANY OTHER PROCEDURES OR PROHIBITIONS BELIEVED TO BE NECESSARY FOR SAFE OPERATIONS.

THIS PLAN IS PREPARED TO INFORM ALL FIELD PERSONNEL, INCLUDING ENVIRON CONTRACTORS AND ENVIRON SUBCONTRACTORS, OF THE POTENTIAL HAZARDS ON THE SITE. HOWEVER, EACH CONTRACTOR OR SUBCONTRACTOR MUST ASSUME DIRECT RESPONSIBILITY FOR ITS OWN EMPLOYEES' HEALTH AND SAFETY.

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Figure 6: Map to Kaiser Santa Teresa Medical Center

I. INTRODUCTION

- A. SITE LOCATION: 5600 Cottle Road; San Jose, CA (“the Site”)
- B. PLAN PREPARED: Nicholas Markman Date: April 10, 2007
- C. PLAN APPROVED: _____ Date: _____
Jessica Donovan
Principal

Anne Gates
Project Manager

Christopher Ritchie
Health and Safety Coordinator
- D. PLAN REVISED: Not Applicable Date: Not Applicable
- E. REVISION APPROVED: Project Manager Date: _____
Health and Safety Date: _____
Coordinator

F. POSSIBLE HAZARDS:

Mechanical hazards include those associated with the planned subsurface investigations (cone penetrometer test (CPT) probing and groundwater well drilling, installation, and sampling); operations of an on-site groundwater remediation system; and the activities of nearby demolition and construction operations. Electrical hazards include operation of aboveground electric motor-driven pumps and blowers. Physical hazards include, trip and fall. Chemical hazards include possible inhalation or contact exposure to soil and groundwater containing low concentrations of volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), asbestos, and metals.

G. REQUIRED PERSONAL PROTECTIVE ITEMS AND EQUIPMENT:

Level D Protection, upgraded to Level C if warranted by air monitoring results.

II. PERSONS RESPONSIBLE AND INVOLVED

- A. **PROJECT MANAGER:** Anne Gates
Health and Safety Responsibilities:
Familiarity with all aspects of the HASP. Coordination with office Health and Safety Coordinator as necessary.
- B. **SITE SUPERVISOR:** Christopher Ritchie
Health and Safety Responsibilities:
Ensure that guidelines set forth in the HASP are followed.
- C. **SITE HEALTH AND SAFETY OFFICERS (SHSO):** Christopher Ritchie, Nic Markman, and Ross Russell
Health and Safety Responsibilities:
Ensure compliance with the HASP. Provide point of contact for employees working at the Site who have questions regarding the HASP.
- D. **HEALTH AND SAFETY COORDINATOR (HSC):** Christopher Ritchie
Health and Safety Responsibilities:
Review and approve the HASP. Provide office contact for employees working at the Site who have questions regarding the HASP.
- E. **SUBCONTRACTORS:** Holguin, Fahan & Associates (HFA), Gregg Drilling and Testing, Inc., Drewelow Remediation Equipment, Inc., and others to be determined.
Health and Safety Responsibilities:
Subcontractors performing work for ENVIRON International Corporation (ENVIRON) are responsible for compliance with all new and existing federal, California, and local statutes, ordinances, or regulations regarding health and safety. Subcontractors are encouraged to follow procedures at least as stringent as those outlined in this HASP. Subcontractors can be dismissed if they persist on working in what ENVIRON feels is an unsafe manner.

III. FACILITY BACKGROUND

A. FACILITY BACKGROUND AND DESCRIPTION:

The Site is located in a mixed industrial, commercial and residential area in San Jose, California (Figures 1 and 2). Prior to demolition activities, the Site contained asphalt-paved parking lots, driveways, and orchard areas (Figure 3). Presently, the Site consists of rough graded soil, with debris stockpiles located along the Site perimeter. The area around former Building 028J has been cleared of all structures (Figure 4).

B. SITE HISTORY:

The Site is located at 5600 Cottle Road in San Jose, Santa Clara County, California. The Site, which is currently zoned industrial, is approximately 321 acres in size. Prior to 1955, the Site was agricultural land, primarily tree orchards, with associated residences. In 1955, IBM purchased the Site. The Storage Technology Division of IBM owned and operated the Site from 1955 through 2002. IBM designed, developed, and manufactured computer storage devices, including hard disk drives, read/write heads, and disk storage media at the Site. On or about January 1, 2003, Hitachi GST, a new company formed as a result of a strategic combination of IBM and Hitachi's storage technology businesses, bought the Site.

Hitachi GST has since moved its research and development (R&D) and administrative office operations to a different location in San Jose (3403 Yerba Buena Road). A portion of land has been rezoned and will be sold and redeveloped into a mixed residential, commercial, and recreational open space area.

Additional Site history information is available in the *Corrective Measures Study (CMS) Report, Chloroform Release Area at Former Building 028J, Hitachi Global Storage Technology (GST), 5600 Cottle Road, San Jose, California* report prepared by ENVIRON in July 2007.

C. HAZARDOUS INCIDENCE HISTORY:

There have been no known hazardous incidences at the Site.

D. OBJECTIVE OF WORK:

Site investigation activities will include piezometric cone penetrometer testing (CPT) at eight (8) locations; fifteen (15) monitoring well installations; 2-PHASE™ Extraction pilot testing within the immediate vicinity of former Building 028J; installation and operation of a full-scale 2-PHASE™ Extraction system; and sampling of soil, groundwater, and vapor. The work is anticipated to be completed during the months of April 2007 through April 2008. This plan will be updated as necessary to address changes in scope and schedule.

E. SURROUNDINGS:

The Site is located near the intersections of Monterey Highway, Blossom Hill Road, and U.S. Route 101, approximately seven miles southeast of downtown San Jose. Work will be performed on the eastern side of the Site.

F. POTENTIAL CHEMICALS EXPECTED TO BE PRESENT AT SOME LOCATIONS:

Based on information provided to ENVIRON and the results of subsequent field investigations performed by ENVIRON, probable contaminants include VOCs, PAHs, OCPs, asbestos, and metals are expected to be present in soil, soil gas, and aggregate fill beneath the Site. During February and March 2007, ENVIRON tested soil gas, soil, and ground water within the vicinity of former Building 028J. During this investigation chloroform was found at maximum concentrations of 34micrograms per liter ($\mu\text{g/L}$), 17micrograms per kilogram ($\mu\text{g/kg}$) and 890 $\mu\text{g/L}$ in soil gas, soil, and groundwater respectively.

IV. GENERAL WORK PRACTICES

- No one will be permitted to engage in work operations alone.
- Smoking, eating, drinking, and chewing gum or tobacco will not be permitted within the work zones.
- Personnel should keep track of weather conditions and wind direction to the extent they could affect potential exposure.
- Personnel should be alert to any abnormal behavior on the part of other workers that might indicate distress, disorientation, or other ill effects.
- Personnel should never ignore symptoms that could indicate potential exposure to chemical contaminants. These should be immediately reported to their supervisor or the Site Health and Safety Officer.
- Personnel should pay attention to all activity occurring around drill rig, especially when equipment is being pulled from or lowered into the borehole.
- Field activities will be performed during daylight hours only. When work is to be performed in indoor areas, the work area will be properly illuminated.
- A copy of the HASP will be in the possession of each ENVIRON employee in the field.

V. CONTROL ZONES AND DECONTAMINATION PROCEDURES

A. WORK ZONES:

Exclusion zone will be a 10 to 20 foot perimeter around each work activity. Perimeter will be maintained with yellow CAUTION tape as necessary.

B. SITE CONTROL/SECURITY MEASURES:

Investigation activities will be performed during daylight working hours, expected to be 7:00 AM to 6:00 PM. All work will be done on rough-graded soils.

C. EQUIPMENT DECONTAMINATION:

Non-dedicated drilling equipment and soil and ground water sampling equipment will be decontaminated in a self-contained decontamination basin located at the Site. Decontamination water will be collected and stored in buckets or drums for later disposal.

D. PERSONNEL DECONTAMINATION:

While Level C PPE is not expected, any contaminated clothing (gloves, Tyvek coveralls, etc.) will be removed and placed in a designated area prior to leaving the contaminant reduction zone.

E. INVESTIGATION-DERIVED MATERIAL DISPOSAL

Decontamination solutions, contaminated clothing, and/or soil cuttings will be contained in drums on-site for characterization and disposal. Appropriate disposal methods of these materials will be determined following receipt of the results of the sample testing.

F. SITE RESOURCES LOCATIONS

Toilet facilities:	Portable toilets on-site provided by contractors
Drinking water supply:	Field vehicles
Telephone:	Mobile phones

VI. HAZARD MITIGATION

Expectation of particular hazards and the procedures to mitigate the hazards are listed below. Listing of mitigation procedures is not inclusive.

- Expected A. Mechanical Hazards
Verify that all equipment is in good condition.
Use caution when working around a coring, drilling, development, or sampling rig.
Keep a neat and clean workplace.
Do not stand or walk under elevated loads or ladders.
Consult HSC if other mechanical hazards exist.
- Expected B. Electrical Hazards
Maintain at least 10-foot clearance from overhead power lines.
Contact utility company for minimum clearance from high power lines.
If unavoidably close to buried or overhead power lines, have power turned off, with circuit breaker locked and tagged.
Properly ground all electrical equipment.
Avoid standing in water when operating electrical equipment.
If equipment must be connected by splicing wires, make sure all connections are properly insulated.
Be familiar with specific operating instructions for each piece of equipment.
- Expected C. Chemical Hazards
As previously described, a limited number of chemicals may be present at the Site as the result of on-site industrial activities. The chemicals that may be detected at low concentrations include various volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), asbestos, and metals (including arsenic, chromium and hex chromium).
Inhalation hazards are not expected at the Site due to the low concentrations of chemicals expected to be encountered. Exposure from dermal contact will be prevented by the use of appropriate PPE.
Conduct air monitoring for these compounds as described in Section VII, and wear appropriate Personal Protection Equipment (PPE), as specified in Section VIII. Conduct direct reading air monitoring to evaluate respiratory and explosion hazards (list instrument, action level, monitoring location, and action to be taken in Section VII). Consult HSC for personal air monitoring.
- Expected D. Temperature Hazards
ENVIRON personnel should consume plenty of liquids such as water or non-caffeinated sport drinks. During periods of hot weather, personnel shall be aware of the symptoms of and appropriate response actions for heat sickness and heat stroke. During periods of cold weather, field personnel shall acquaint themselves with the symptoms of cold stress, frostbite, and hypothermia. Dressing in layers is

recommended for cold weather work. If cold temperatures are extreme, personnel should have a source of heat (heated building or vehicle).

Heat stress in workers may be a concern at the Site. Although the use of protective equipment will reduce the risk of exposure to toxic chemicals, its use can “create significant worker hazards, such as heat stress, physical and psychological stress, and impaired vision, mobility, and communication” (NIOSH 1985). Of these hazards, heat stress is perhaps the most common and the most serious. In the early stages, heat stress causes rashes, drowsiness, cramps, and discomfort, threatening the safety of both the individual and his co-workers. In more severe cases, heat stroke and death can result (NIOSH 1985).

Daytime temperatures at the Site may be expected to range from 65°F to 75°F. Wearing an impermeable suit with rubber boots, gloves, hard hat, and full-face respirator imposes an additional 10°F to 20°F burden on the worker (Paull 1987). For the purposes of this Health and Safety Plan, it is assumed that workers at the Site wearing Level C protective gear (if required) with impermeable suits will experience the same additional temperature burdens as described above. It is therefore possible, although unlikely, that workers wearing Level C safety gear will be exposed to working temperatures inside their suits of approximately 85°F to 95°F).

Protective Measures

Regular monitoring and other precautions relating to heat stress have been prescribed by NIOSH. The following protective measures will be taken by workers at the Site as necessary.

- 1) Rest periods will be taken by workers every two to four hours. Rest periods will be a minimum of fifteen minutes. Liquids (particularly electrolyte-replenishing fluids) will be available to all workers during rest periods.
- 2) Workers will wear light-weight clothing under impervious suits (i.e. short sleeve shirts are acceptable depending on anticipated chemical exposure levels).
- 3) NIOSH recommends that workers wearing impervious clothing receive physiological monitoring at regular intervals when the ambient air temperature approaches or exceeds 70°F. Physiological monitoring will consist of the following measurements (taken during prescribed rest periods):
 - a) Measure heart rate (HR) as early as possible in the rest period and record.

- b) Check for the physical reactions related to heat stress. Physical reactions include fatigue, irritability, anxiety, and decreased concentration, dexterity or movement.
- c) Check for other heat-related problems, including:
 - i) Heat Rash caused by continuous exposure to hot and humid air and aggravated by chafing clothes. Decreases ability to tolerate heat.
 - ii) Heat Cramps caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs include muscle spasm and pain in the extremities and abdomen.
 - iii) Heat Exhaustion caused by increased stress on various organs to meet increased demands to cool the body. Signs include shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; and listlessness.
 - iv) Heat Stroke is the most severe form of heat stress. Body must be cooled immediately to prevent severe injury or death. Signs and symptoms are red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; and coma.

If the measured HR exceeds 110 beats per minute, or any of the above physical symptoms are noted, the work period will be shortened by 30 percent (NIOSH 1985). Work may resume after the HR and physical condition of the worker has returned to normal.

Temperature Hazard References:

National Institute for Occupational Safety and Health (NIOSH). 1985. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. October.

Paull, J.M., F.S. Rosenthal. 1987. Heat Strain and Heat Stress for Workers Wearing Protective Suits at a Hazardous Waste Site. American Industrial Hygiene Association Journal. p. 458-463.

Not Expected E. Biohazards
 Rabid animals.
 Ticks, mosquitoes, and other insects (disease carriers or poisonous).
 Avoid breathing dust in dry desert or Central Valley areas (valley fever).

Not Expected F. Confined Space / O₂ Deficiency
 Oxygen deficiency is generally concerned with confined spaces. Confined spaces include trenches, pits, sumps, elevator shafts, tunnels, or any other

area where circulation of fresh air is restricted or ability to readily escape from the area is restricted. Consult HSC prior to entering confined space.

- Obtain permit for confined space entry.
- Monitor O₂ and organic vapors before entering. If following values are exceeded, do not enter:
 1. O₂ less than 19.5% or greater than 25%.
 2. Total hydrocarbons greater than 5 ppm above background, if all air contaminants have not been identified.
 3. Concentrations of specific contaminants exceeding action level in Section IX if all contaminants are identified.
- Monitor O₂ and organic vapors continuously while inside confined space. If values cited in Section IX are exceeded, evacuate immediately. Record instrument readings.
- At least one person must be on standby outside the confined space who is capable of pulling workers out of confined space in an emergency.
- Use portable fans or blowers to introduce fresh air to confined spaces whenever use of respirator is required.
- Work involving the use of flame, arc, spark, or other source of ignition is prohibited within a confined space.

Not Expected G.

Inadequate Illumination

Indoor work areas must be illuminated to a minimum intensity of 5 foot-candles, as per 8 CCR 5192(m). Indoor work areas will be illuminated by opening doors and window coverings to enable sunlight to enter indoor areas, and by using indoor lighting. If indoor light intensity remains insufficient, floodlights will be brought into the building.

Expected H

Noise Hazard

Wear hearing protection when working near heavy equipment such as drill rigs, or in other noisy conditions. As a general rule, hearing protection should be worn when two people standing within two feet of each other cannot communicate at normal conversational voice levels.

Expected I.

Vehicular and Foot Traffic

When vehicle and foot traffic is expected, the following hazard mitigation procedures will be implemented:

- Personnel will be required to don high-visibility reflective vests when working in vehicle traffic areas including parking lots.

- Traffic cones and/or yellow caution tape will be used to define boundaries or work areas and direct traffic, as necessary.
- Only personnel directly involved with the removal activities will be allowed in the designated work area.
- Personnel other than those of the designated removal action staff will be required to remain outside of the defined work areas.

VII. AIR MONITORING

Air monitoring should be conducted with instruments selected to measure contaminants to which employees may be exposed. The primary contaminant of concern is chloroform, measured at concentration in excess of the Risk Based Target Concentrations (RBTCs) during subsurface investigations. Approximately every 5-10 minutes during drilling or other ground-disturbing activities, measurements should be taken within the breathing zones of workers. If action levels are reached for a 1-minute reading, appropriate action must be taken.

A. GASES AND VAPORS

Instrument & Date of Calibration	Calibration Gas Standard	Frequency/ Duration Of Air Monitoring	Action Level ^{(a)(b)} Above Background (Breathing Zone)	Action
OVM Calibrated Daily	100 ppm isobutylene	Every 5-10 minutes, take a 1-minute reading.	> 1 ppm	Introduce engineering controls (i.e., blower fans) (Level D) Evaluate controls (see below)
After Introduction of Engineering Controls				
OVM Calibrated Daily	100 ppm isobutylene	Every 5-10 minutes, take a 1-minute reading.	< 1 ppm	Continue work (Level D)
			1-5 ppm	Don respirator (Level C) or identify gas with Draeger tubes to determine if upgrade to level C is necessary
			> 5 ppm	Discontinue work (Level C)
Draeger Tubes		Immediately following OVM/OVA reading above background in Breathing Zone	> OSHA-PEL (OSHA-PEL is 50 ppm for chloroform)	Don respirator (Level C)

(a) Action Levels for “Known contaminants” should be based upon each contaminant's Permissible Exposure Limit (PEL) or Threshold Limit Value (TLV).

(b) Action Levels are set relative to background levels. Background levels are measured at a nearby location upwind of the exclusion zone. Ambient conditions, such as precipitation or high humidity, can affect the readings of an OVM; therefore, background levels should be assessed frequently and whenever ambient conditions change.

B. EXPLOSION HAZARD

Under monitoring for gases and vapors (Section VII.A), work will be discontinued if measurements taken within the breathing zones of workers is 5 ppm or greater, well below the LEL for methane.

VIII. REQUIRED PERSONAL PROTECTIVE AND RELATED SAFETY EQUIPMENT

LEVEL	A	B	C	D
<u>Head</u>				
Hardhat			X	X
<u>Eye/Face</u>				
Safety Glasses			X	X
<u>Hand</u>				
Neoprene Nitrile			X	X
<u>Body</u>				
Tyvek Suit Long Sleeve Shirt			X	X
<u>Lung</u>				
Full Face Respirator, cartridge = HEPA/Organic Half Face Respirator, cartridge = HEPA/Organic			X	
<u>Ear</u>				
Earplugs			X	X
<u>Foot</u>				
Steel-toed Boots, type = rubber (Level C), leather (Level D)			X	X
<u>Other Safety Equipment</u>				
Ventilation blower/fan				
Barricades (as necessary)			X	X
Barrier tape (as necessary)			X	X

IX. DOCUMENTATION

ENVIRON PERSONNEL TRAINING AND MEDICAL RECORDS ARE AT ENVIRON OFFICE AT 6001 SHELLMOUND STREET, SUITE 700, EMERYVILLE, CA 94608
RECORDS WILL BE MAINTAINED ON-SITE AS NECESSARY.

As part of ENVIRON's Health and Safety Policy Program, all ENVIRON employees on-site with the potential for exposure to hazardous substances have received the initial 40-hour and, if appropriate, the 8-hour refresher health and safety training courses, meeting both 29 CFR 1910.120 (e) and Title 8 CCR § 5192 (b)(4)(B)2 requirements.

As part of ENVIRON's Health and Safety Policy Program, all employees working on-site have received a baseline and periodic physical in accordance with 29 CFR 1910.120(f) and Title 8 § 5192 (b)(4)(B)4. Additionally, all such individuals have been certified as medically able to use an air purifying respirator in accordance with 29 CFR 1910.134 (Respiratory Protection) and Title 8 § 5192 (f)(4)(A).

A. PROJECT PERSONNEL LIST AND SAFETY PLAN DISTRIBUTION RECORD

1. ENVIRON Employees

All project staff must sign indicating they have read and understand the Site Health and Safety Plan. A copy of this Site Health and Safety Plan must be made available for their review and readily available at the job Site.

Date Distributed	Employee Name/Job Title	Signature
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2. Contractors, Subcontractors

A copy of this HASP shall be provided to contractors and subcontractors who may be affected by activities covered under the scope of this Site Health and Safety Plan for their information only, although the contractors and subcontractors remain responsible for the safety of their own employees. All contractors and subcontractors must comply with applicable OSHA, EPA, and local government rules and regulations.

Date Distributed	Firm Name	Contract Person
_____	_____	_____
_____	_____	_____
_____	_____	_____

HEALTH AND SAFETY MEETING - ALL PERSONNEL PARTICIPATING IN THE PROJECT MUST RECEIVE INITIAL HEALTH AND SAFETY ORIENTATION. THEREAFTER, A BRIEF TAILGATE SAFETY MEETING IS REQUIRED AS DEEMED NECESSARY BY THE SITE HEALTH AND SAFETY OFFICER (OR AT LEAST ONCE EVERY 10 WORKING DAYS).

Date	Name (Printed)	Signature of Attendee	Firm Name
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

- C. VISITOR - IT IS ENVIRON'S POLICY THAT VISITORS MUST FURNISH THEIR OWN PERSONAL PROTECTIVE EQUIPMENT. ALL VISITORS ARE REQUIRED TO SIGN THE VISITOR LOG AND COMPLY WITH HEALTH AND SAFETY PLAN REQUIREMENTS. IF THE VISITOR REPRESENTS A REGULATORY AGENCY CONCERNED WITH SITE HEALTH AND SAFETY ISSUES, THE SITE HEALTH AND SAFETY OFFICER SHALL ALSO IMMEDIATELY NOTIFY HEALTH AND SAFETY COORDINATOR.

VISITOR LOG

Name of Visitor	Firm Name	Date of Visit	Signature
<hr/>			

X. CONTINGENCY/EMERGENCY INFORMATION

A. REQUIRED EMERGENCY EQUIPMENT LOCATION

Safety shower/eyewash:	NA
First aid kit:	Truck
Fire extinguisher:	Truck
Other:	

B. EMERGENCY TELEPHONE NUMBERS

Ambulance:	911
Police:	911
Fire department:	911
Hospital:	911 or Kaiser Santa Teresa Medical Center (408) 362-4740

Site contact: Marian Duncan (408) 717-5856

Poison Control Center:	
Within California	(800) 876-4766 (800-8-POISON)
Outside California	(800) 222-1222
CHEMTREC (spill):	(800) 424-9300
Project Manager: Anne Gates	(510) 420-2524 or (415) 877-0123
HSC: Christopher Ritchie	(510) 420-2542

C. STANDARD PROCEDURES FOR REPORTING EMERGENCIES

When calling for assistance in an emergency situation, the following information should be provided:

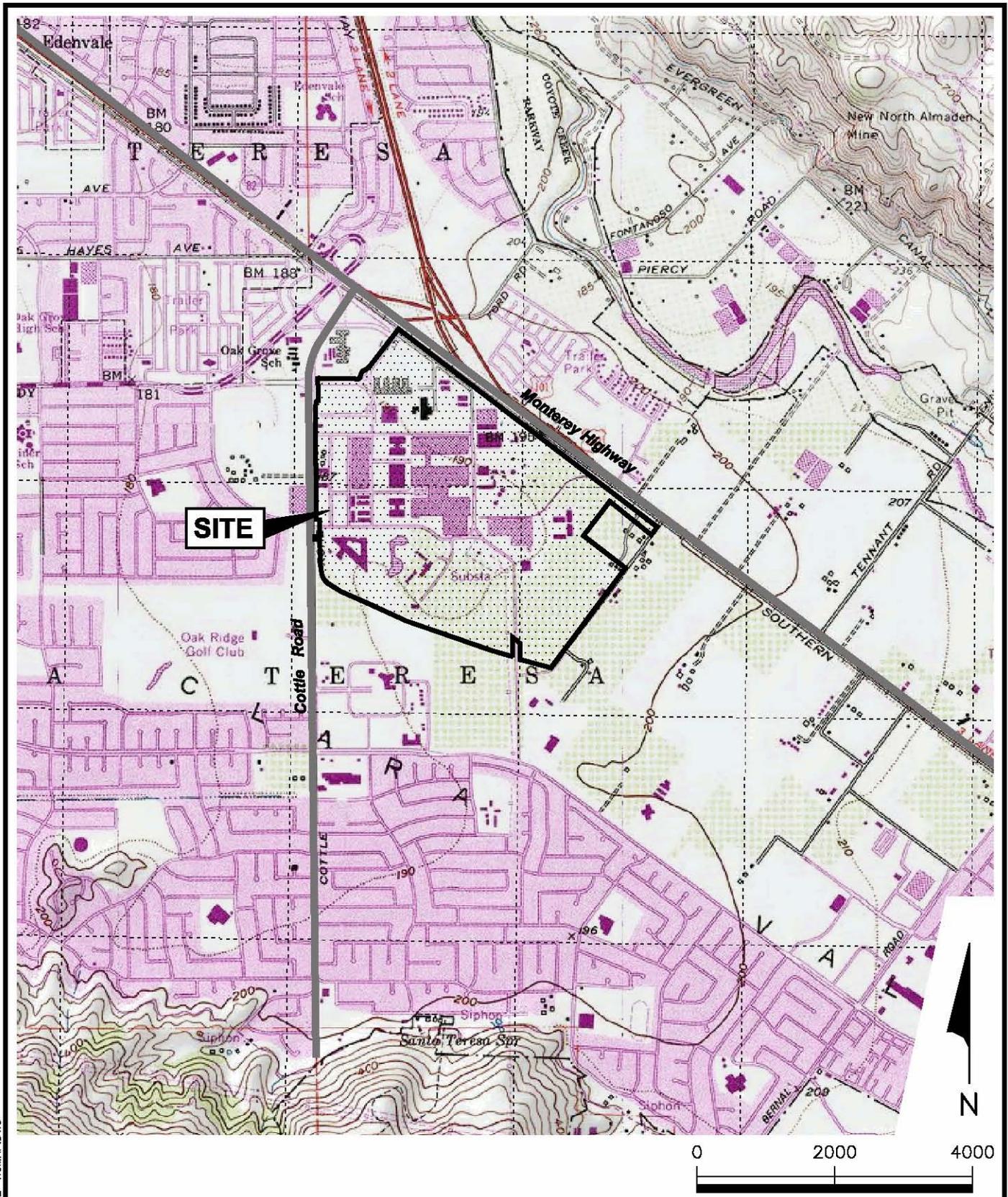
1. Name of person making call
2. Telephone number at location of person making call
3. Name of person(s) exposed or injured
4. Nature of emergency
5. Actions already taken

Recipient of call should hang up first. The caller should not hang up first.

D. EMERGENCY ROUTES:

Figure 4 shows the route and directions to the nearest hospital. The hospital has been contacted and they have the means to handle a chemical exposure.

FIGURES



SOURCE: USGS Map 7.5 Min Series (Topographic) San Jose East QUAD, California, Photorevised 1980, National Geographic Topo 2001.

SCALE IN FEET
CONTOUR INTERVAL 20 FEET

0311903E-VCMAP.DWG

ENVIRON

Site Location Map
Hitachi GST
San Jose, California

Figure
1

Drafter: RS

Date: 7/16/07

Contract Number: 03-11903E

Approved:

Revised:



0311903E-SITE_VICINITY-3.DWG

ENVIRON

Site and Surrounding Area
 Hitachi GST
 San Jose, California

Figure

2

Drafter: RS

Date: 7/16/07

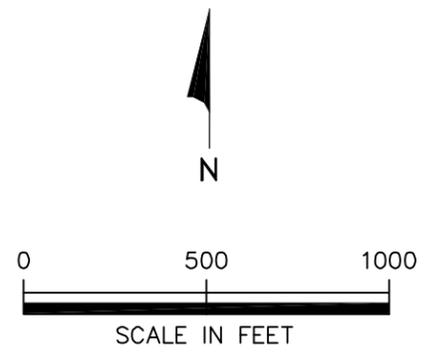
Contract Number: 03-11903E

Approved:

Revised:



- KEY:**
-  Property Boundary
 -  Building 028J Area



0311903E-SITE-LAYOUT-FORMER-2.DWG

ENVIRON

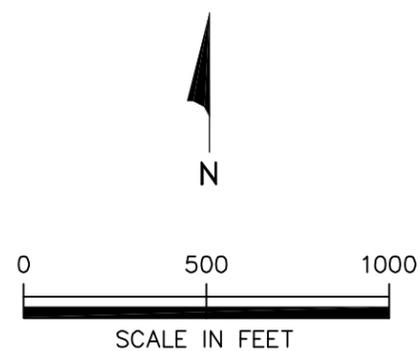
Site Layout - Prior to Redevelopment
 Hitachi GST
 San Jose, California

DATE: 7/16/07	CONTRACT NUMBER: 03-11903E	FIGURE 3
DRAFTER: RS	APPROVED:	REVISED:



EXPLANATION:

- Outline of Redevelopment Property
- Outline of Parcel Boundaries
- Outline of Core Area
- Outline of PG&E Electrical Substation
- Building 028J Area

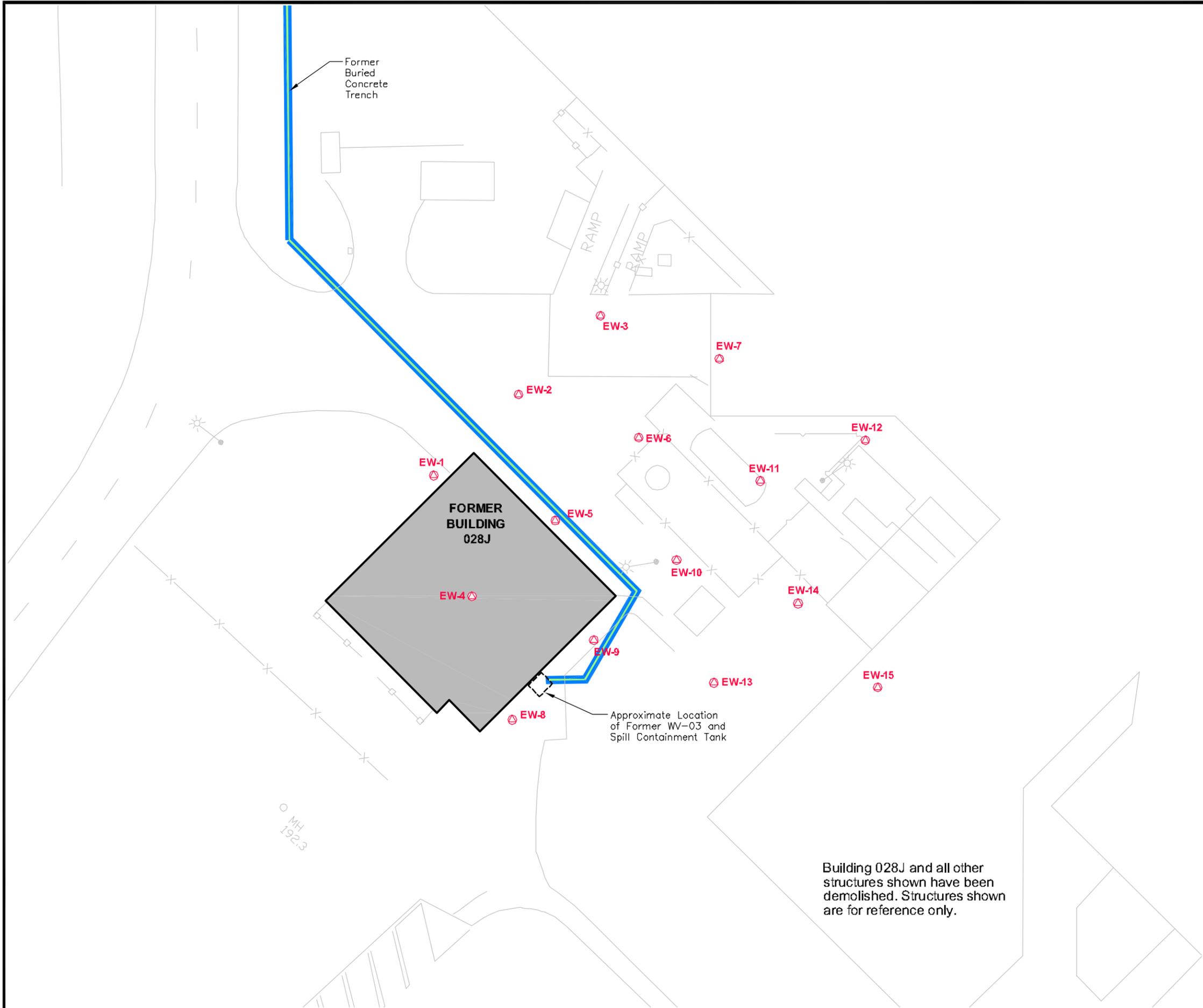


ENVIRON

**Site Layout - Redevelopment Property
and Core Area**
Hitachi GST
San Jose, California

DATE: 7/16/07	CONTRACT NUMBER: 03-11903E	FIGURE 4
DRAFTER: RS	APPROVED:	REVISED:

0311903E-SITE-LAYOUT-CSP-2.DWG

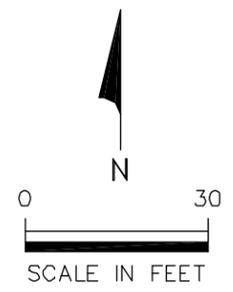


EXPLANATION:
 EW-12
 Groundwater Monitoring / Extraction Well

FORMER BUILDING 028J
 EW-4

Approximate Location of Former WV-03 and Spill Containment Tank

Building 028J and all other structures shown have been demolished. Structures shown are for reference only.

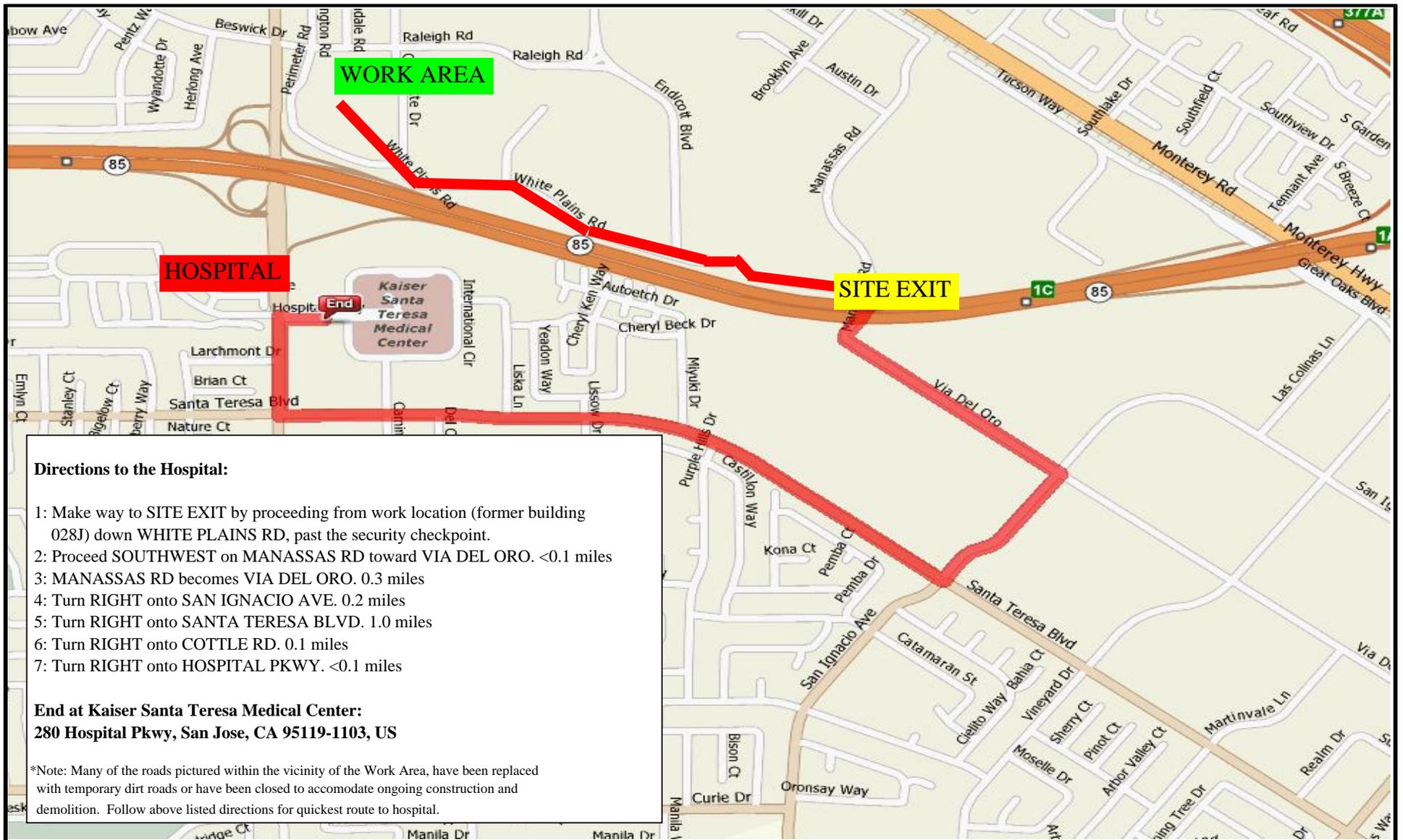


ENVIRON

Groundwater Well Locations in the Former Building 028J Area
 Hitachi GST
 San Jose, California

DATE: 7/18/07	CONTRACT NUMBER: 03-11903E	FIGURE 5
DRAFTER: RS	APPROVED: REVISOR:	

0311903e-B026-28J-cpt-LOCATIONS.DWG



Directions to the Hospital:

- 1: Make way to SITE EXIT by proceeding from work location (former building 028J) down WHITE PLAINS RD, past the security checkpoint.
- 2: Proceed SOUTHWEST on MANASSAS RD toward VIA DEL ORO. <0.1 miles
- 3: MANASSAS RD becomes VIA DEL ORO. 0.3 miles
- 4: Turn RIGHT onto SAN IGNACIO AVE. 0.2 miles
- 5: Turn RIGHT onto SANTA TERESA BLVD. 1.0 miles
- 6: Turn RIGHT onto COTTLE RD. 0.1 miles
- 7: Turn RIGHT onto HOSPITAL PKWY. <0.1 miles

End at Kaiser Santa Teresa Medical Center:
280 Hospital Pkwy, San Jose, CA 95119-1103, US

*Note: Many of the roads pictured within the vicinity of the Work Area, have been replaced with temporary dirt roads or have been closed to accomodate ongoing construction and demolition. Follow above listed directions for quickest route to hospital.

ENVIRON

Counsel in Health and Environmental Science

Map to Kaiser Santa Teresa Medical Center
 280 Hospital Parkway
 San Jose, California

Figure
6

Drafter: NGM Date: 4/10/2007 Contract Number: 03-11903E Approved: Revised: