ATTACHMENT WM-82B

PHASE II ENVIRONMENTAL SITE ASSESSMENT

HIGHGROVE GENERATING STATION
12700 TAYLOR STREET
GRAND TERRACE, CALIFORNIA 92324

Prepared for:

Thermo Ecotek Corporation
245 Winter Street, Suite 300
Waltham, MA 02154

Prepared by:

Golder Associates Inc.
17752 Skypark Circle, Suite 280
Irvine, California 92614

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1. INTRODUCTION AND BACKGROUND

This report presents the results of a Phase II Environmental Site Assessment (ESA) conducted by Golder Associates Inc. (Golder) at Highgrove Generating Station (site or subject property) in Grand Terrace, San Bernardino County, California. Highgrove Generating Station (HGS) is located immediately west of the intersection of Pico and Taylor Streets, Grand Terrace, California (Figure 1). The facility is currently owned by Southern California Edison (SCE)

The subject property is under consideration for acquisition by Thermo Ecotek Corporation. This Phase II ESA was performed to provide Thermo Ecotek Corporation with information regarding the environmental status of the property. SCE retained Arcadis Geraghty & Miller (AGM) to observe the field assessment activities.

This report is submitted pursuant to Section 6.4 (d) (Additional Buyer's Due Diligence) of the Asset Sale Agreement between Southern California Edison Company (SCE) and Thermo Ecotek Corporation (Thermo Ecotek or Thermo) dated 7 November 1997. Capitalized terms used in this report which are not otherwise defined shall have the same meaning ascribed to such terms in the Asset Sale Agreement.

As explained in the remainder below, this report provides evidence of the existence of Existing Soils Contamination which is not otherwise described in Schedule 3.7 to the Asset Sale Agreement. As such, the purpose of this report is to add to Seller's Knowledge of Existing Soils Contamination for purposes of the Asset Sale Agreement.

2. SCOPE OF WORK

Woodward Clyde Consultants (WCC) was originally retained by Thermo Ecotek to conduct preliminary or Phase I ESA activities at the site and prepare sampling and analytical recommendations for the subject property based on their site visits and review of documentation conducted during the week of 8 December 1997. These recommendations are contained in Appendix A of this report. It is our understanding that, due to increased year-end work load, WCC could not complete the field work within the requested due diligence period. Thus, Golder was retained by Thermo Ecotek to provide consulting assistance.

The scope of work utilized by Golder relies on the recommendations and specifications originally prepared for Thermo Ecotek by WCC for these property assessments. The laboratory analyses employed in this project are not exhaustive in scope, but were chosen to address possible contaminants within a reasonable budget in the listed areas at the site that could cause significant potential environmental cleanup liability.

As described in Golder's proposal dated 16 December 1997, the scope of work for HGS is as follows (the last two issues were subsequently added to the originally authorized scope of work):

- Former Paint Shed by Chemical Storage Area: Collect soil samples at depths of 5 and 10 feet below ground surface (bgs); analyze for volatile organic compounds (VOCs) by EPA Method 8260 and semi-volatile organic compounds (SVOCs) by EPA Method 8270.
- Oil/Water Separator: Collect soil samples at depths of 10, 15, and 20 feet bgs and analyze for total recoverable petroleum hydrocarbons by EPA Method 418.1 and VOCs by EPA Method 8260.
- Former Tanks by the Demineralization Area: Collect soil samples at 5 and 10 feet bgs and analyze for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, and pH by EPA Method 9045.

- Two Small Tanks by the Cooling Towers: Collect soil samples at 5 and 10 feet bgs and analyze for VOCs by EPA Method 8260 and SVOCs by EPA Method 8270.
- Septic Tanks: Collect soil samples in one boring at 10, 20, 30, 40, 50, 60, and 70 feet bgs. Analyze samples for total metals pursuant to EPA Method 6010 with follow-up analysis for soluble metals as necessary. Analyze up to three samples for VOCs by EPA Method 8260 after field screening.
- Groundwater Monitoring Wells: Install three 4-inch groundwater monitoring wells to depths of 10 feet below first contacted groundwater. Collect soil samples at 5, 10, 20, 40, 60, and 80 feet bgs or similar levels and analyze for VOCs by EPA Method 8260 as field conditions warrant. Analyze groundwater sample for VOCs by EPA Method 8260.
- Collect Groundwater Sample from Production Well No. 1: Collect one groundwater sample from this well and analyze for VOCs pursuant to EPA Method 8260.
- New Excavation Area Between Switchyard and Main Turbine Area: Collect one soil sample at approximately 5 feet bgs and analyze for TRPH by EPA Method 418.1, VOCs by EPA Method 8260, and PCBs by EPA Method 8082. This task was ultimately not conducted when SCE informed Thermo Ecotek that the excavation was the result of the replacement of a (clean) water supply line.
- Review of SCE Retention Basin Reports: Review SCE's *Sump Integrity Report* dated 19 December 1996 and SCE's *Leak Detection Investigation* dated 5 May 1997.

3. HEALTH & SAFETY PLANS AND PERMITS

3.1 Health And Safety Plan

Golder prepared a site-specific Health and Safety Plan (HASP) for the site prior to the initiation of field work. The HASP is consistent with current federal Occupational Safety and Health Administration (OSHA) requirements for hazardous waste operations as contained in Code of Federal Regulations Section 1910.120. The HASP was presented to workers in meetings before initiating field work, and implemented at the site during the field activities. The HASP is available for review upon request.

3.2 Permits

Well construction and abandonment were obtained from the San Bernardino County Department of Environmental Health Services. Copies of the permits are available for review upon request.

3.3 Underground Service Alert

Underground Service Alert was notified more than 48 hours in advance of the initiation of field work as required by California law.

4. SITE INVESTIGATION

4.1 Soil Borings

Five soil borings were installed at the Highgrove Generating Station on 17 December 1997 by Spectrum Exploration, Inc. under the direction of Golder. These borings ranged in depth from 10.5 feet to 70 feet bgs.

The borings were installed at selected sites that were identified by WCC as presenting potential chemical impact concern. The locations of the boreholes are shown on Figure 2. Table 2 indicates the depth of the boreholes and the nature of operations at the sampling site.

Installation of the borings was performed using a hollow-stem auger with 10-inch diameter auger flights. Groundwater was not encountered in any of the borings. Each sample was sealed using Teflon tape, covered with plastic caps, and stored inside a chilled cooler. Labels were affixed to the sample tubes identifying the boring, sample number, sample depth, date sampled, and project information. Headspace readings were taken from each sample with a photoionization detector. The samples were transported to Golder's office in Irvine, California. Samples were subsequently transferred to Advanced Technology Laboratories (ATL) of Long Beach, California for analysis. ATL is a state-certified hazardous materials analytical laboratory. All sampling equipment was decontaminated prior to use and between borings.

Following collection of the soil samples, each boring was backfilled with bentonite slurry.

Soil samples were collected at 10 foot intervals in Boring B-1 and 5 foot intervals in the other borings. Samples were collected with split-spoon samplers. These samples were collected in cylindrical brass tubes that were 6 inches long with a diameter of 2 inches. The sampling interval at each sampling depth comprised 18 inches, yielding three brass

tubes per sampling depth. The three tubes collected at each sampling depth were divided as follows:

- One tube was reserved for possible laboratory analysis of its contents by Golder's subcontract laboratory;
- One tube was provided to AGM for possible laboratory analysis; and
- One tube was reserved for geological logging of its contents.

Geological logging was performed to identify color, range and distribution of particle sizes, cohesion, odor and qualitative moisture content. Also, each sample logged was subjected to a qualitative measure of the hydrocarbon content of soil-gas vapor using a field photo-ionization detector (PID) calibrated against 100 parts per million (ppm) of isobutylene. PID readings were then used to help select which of the soil samples submitted to the analytical laboratory were to be analyzed. The boring logs are contained in Appendix B.

PID readings ranged from 10 ppm to 550 ppm. PID readings in Borings B-3, B-4 and B-5 were all less than or equal to 50 ppm. Readings in Boring B-2 were approximately 100 ppm at depths of 10 feet bgs and 15 feet bgs, but decreased to about half that at 20 feet bgs. Readings at Boring B-1 were all approximately 100 ppm with the exception of the sample at 20 feet bgs. This sample had the highest PID reading at 550 ppm.

4.2 Analysis of Soil Samples from Soil Borings

Selected samples collected from the soil borings were submitted for laboratory analysis to Advanced Technology Laboratories. The only samples not analyzed were those from the 10 foot bgs, 30 foot bgs, and 50 foot bgs depths in Boring B-1.

The analyses performed on individual samples were designed to relate to the nature of the operations at the site from which the sample was collected. The analytical test

methods used consisted of EPA Test Method 6010 (metals), EPA Test Method 418.1 (TRPH), EPA Test Method 8260 (VOCs), EPA Test Method 8270 (SVOCs) and EPA Test Method 9045 (pH). Table 3 indicates which analytical methods were used with the individual samples. None of the samples analyzed contained VOCs or SVOCs in concentrations equal to or greater than the method detection limit (MDL).

Table 4 indicates the results of the analysis for TRPH. The samples analyzed for TRPH were all collected from borings near the oil-water separator.

The results of this analysis suggest that there may be a minor, near-surface impact from petroleum hydrocarbons in the area of the oil-water separator. This same sample did not contain detectable concentrations of volatile organic compounds.

Table 5 indicates the analytical results for those samples tested for pH. These samples were both collected in the area of the demineralization sumps.

These results suggest that the soil in the area of the demineralization sumps is slightly basic. As demineralization processes typically employ acids, this suggests that there has been no impact from the operation of the sumps on the soil collected for analysis.

4.3 Installation of Groundwater Monitoring Wells

Three groundwater monitoring wells were installed at HGS by Spectrum Exploration, Inc. under the direction of Golder. Groundwater was encountered at approximately 96 feet bgs in MW-1, 98 feet bgs in MW-2, and 100 feet in MW-3.

Wells were completed with 4-inch diameter Schedule 40 PVC casing. The bottom 20 feet consisted of well screen with 0.020 inch slots. The remainder of the casing was blank. All connections were threaded flush-joint. The casings were installed such that the well screen extended approximately 10 feet below the depth at which groundwater was first encountered at each site and up to 10 feet above that point.

A filter pack consisting of RMC Lonestar #3 sand was installed in the annular space around the well screens. This filter pack extended from the bottom of the borings to an elevation 3 feet to 5 feet above the top of the well screens. The annular space above that point was filled with bentonite grout to within 5 feet of ground surface. The final 5 feet consisted of a concrete well seal.

Well MW-2 was installed in a paved area. It was outfitted with a well head cover that rose above the surrounding surface to provide drainage away from the well. The concrete well seal was smoothed such that it merged smoothly with both the surrounding surface and the well head cover.

Wells MW-1 and MW-3 were installed in unpaved areas. They were outfitted with stovepipe-type well head covers with locking caps.

All wells had threaded well caps installed on the bottom and top of the casing. Bottom well caps were flush-joint threaded. Top well caps were either slip caps or lockable caps. All lockable well caps and well head covers were outfitted with padlocks.

4.4 Analysis of Soil Samples from Groundwater Monitoring Well Borings

Two soil samples from Well MW-3 were analyzed (these samples were chosen for analysis on the basis of field PID readings). The samples were analyzed for VOCs by EPA Method 8260. The analytical report for these samples is contained in Appendix C. None of the analytes tested for under this method were detected at concentrations equal to or greater than the MDL with the exception of MW-3-20 and MW-3-80. Benzene only was indicated in these soil samples at a concentration of 17 µg/kg each. Subsequent analysis of MW-3-60 and MW-3-100 and groundwater in the developed well did not indicate the presence of benzene or other VOCs.

Soil samples collected from Wells MW-1 and MW-2 were not analyzed. These wells, located in areas removed from chemical impact of soil concern, were selected on the basis of location to sample upgradient and downgradient groundwater only.

4.5 Groundwater Sampling

Following the installation of Wells MW-1, MW-2 and MW-3, these wells were developed by surging and bailing by Spectrum Exploration, Inc. working under the direction of a representative of Golder. Additional development was performed by EnviroMonitoring Services, Inc., also under the direction of Golder. During development, measurements were made of temperature, specific conductivity, pH and turbidity. Development was continued until temperature, specific conductivity and pH stabilized (i.e., three sequential measurements of these parameters were within 10% of each other). In addition to the monitoring wells, Production Well No. 1 (PW-1), was also sampled.

Copies of the field logs describing well development procedures and measurements are contained in Appendix B.

Following development, the water levels in the three wells were allowed to recover to 90% or greater of the original static water level and then sampled. Sampling was performed by EnviroMonitoring Services, Inc. under the direction of a representative of Golder. Samples were collected in disposable polyethylene bailers, one for each well. Sample water was then transferred into 40-mm vials appropriate for samples containing volatile organic compounds. The vials were filled with the minimum possible agitation such that no headspace remained after the vials were capped. The samples were then labeled and placed in a cooler containing blue ice. Following completion of sampling activities, samples were transported under chain-of-custody protocol to Advanced Technology Laboratories. Chain-of-Custody forms for these samples are contained in Appendix C.

4.6 Groundwater Flow Direction

Golder commissioned a survey by Gabel, Cook & Becklund, Inc. of Riverside, California to define the locations of the three wells and the elevations of the northernmost point on the top of each of the respective casings. This point in each well was marked with a permanent marker and defined as the point against which water level measurements would be make. The maps prepared by Gabel, Cook & Becklund, Inc. are presented in Appendix D.

Water level measurements were made in the three wells on 20 February 1998. These data are presented in Table 6.

A contoured map based on these water level measurements of the potentiometric surface underlying the area of measurements on the subject property is presented in Figure 3. The inferred direction of ground water flow is to the south southwest at an approximate gradient of 0.002.

The deposits forming the aquifer underlying the property consisted primarily of silty sands. The hydraulic conductivity of such deposits is typically on the order of 1×10^{-5} to 1×10^{-1} cm/s (Hemond, 1994).

4.7 Groundwater Analytical Results

Groundwater samples from Wells MW-1, MW-2, MW-3, and PW-1 were analyzed for VOCs by EPA Method 8260. The analytical reports for these samples are contained in Appendix C. None of the analytes tested for under this test method were detected at concentrations equal to or greater than the MDL.

4.8 Data Validation Summary

Analytical results and associated quality control (QC) data were reviewed to determine the adequacy of the data for use in support of the project objectives. The review included an evaluation of chain-of-custody, sample holding times, consistency in

reporting and method-specific QC: method blanks, laboratory control samples (LCS), matrix spikes (MS) and matrix spike duplicates (MSD).

- Chain-of-custody. Chain-of-custody forms were included for all samples and proper custody was maintained from the field to the laboratory.
- Holding times. Sample holding times were acceptable for all analyses.
- Reporting consistency. Sample results were reported in the proper units with correct adjustment for dilution.
- Method specific QC. QC results were acceptable for all method blanks, LCS, MS and MSD.

4.9 Abandonment of Monitoring Wells

Well abandonment permits for the destruction of the groundwater monitoring wells at Highgrove Generating Station were obtained from the San Bernardino County Department of Public Health, Division of Environmental Health Services. Copies of these permits are contained in Appendix E. The wells were abandoned 11 March 1998 under the direct oversight of San Bernardino County inspectors. The abandonment methodology consisted of filling the well casing with a bentonite cement slurry and removing the uppermost section of casing. A concrete cap was placed over the bentonite cement slurry. The volume of cement slurry placed in each well was compared to the total well volume to insure that the cement slurry entered and sealed the filter pack.

5. RETENTION BASINS

Golder reviewed the information provided by SCE regarding the retention basins at Highgrove Generating Station. The data summary; a site map, selected pages from a RWQCB *Inspection Report* (8 March 1984), one page from the facility's NPDES permit, SCE's *Leak Detection Investigation* report (5 May 1997), and SCE's *Sump Integrity* report (28 February 1997) are provided in Appendix F.

From the information available, it is unclear when the basins were first lined, although it may pre-date March 1984. The 1994 NPDES permit application indicates that 1,1,1-trichloroethane, benzene and toluene may have been discharged (presumably into the basins). Toluene was detected at least once in a sample collected at a Discharge Point from the facility.

The possible presence of VOCs was assessed beneath the East and West Retention Basins (SCE's *Leak Detection Investigation*). The assessment, however, was limited to depths of 9 feet bgs in moderately permeable soils. Further assessment would be required to assess underlying soil and groundwater quality in both areas unless other data are available. Golder reserves the right to supplement this report once additional data have either been provided or developed as a result of additional sampling conducted subsequent to closing.

SCE's *Sump Integrity Report* indicates that pH in soil below the Demineralizer Basin ranged as low as 3.97 and sulfate levels were elevated. No assessment for VOCs was performed as part of that investigation. The report concluded that a discharge occurred in the area, but it is unclear whether the discharge was from the Demineralizer Basin or a nearby Sulfuric Acid Tank. Further assessment would be required to evaluate underlying soil and groundwater quality unless other data is available. Once again, Golder reserves the right to supplement this report once additional data become available.

Based on recent information received by Golder from SCE, Golder believes that the paragraph under Schedule 3.7(a) regarding the DTSC Stipulated Judgment dated February 1, 1995, should be replaced with the following:

"Edison is a party to the DTSC Stipulated Judgment, dated February 1, 1995, regarding detention basins at the Highgrove Generating Station (as well as certain other generating stations). On June 30, 1997, Edison was informed by the DTSC that corrective action is required to address the release of Hazardous Waste or constituents into the environment based on further investigation of the retention basins at Highgrove Generating Station. At a March 6, 1998, meeting with the DTSC to discuss Edison's progress under the Stipulation, current DTSC Staff has indicated, contrary to Edison's previous understanding, that the corrective action required of Edison may not be limited by the terms of the Stipulation. By letter dated March 17, 1998, from Edison's counsel to counsel for Buyer, Edison has agreed that it will remain responsible (as between the Buyer and Edison) for any environmental remediation of Existing Soils Contamination which may be required by the DTSC, other than Plant Decommissioning Costs (as those terms are defined in the Asset Sale Agreement). Edison also acknowledges that the full extent of required corrective action is not presently known, but agrees to be responsible for any Remediation Measures which may arise now or in the future as a result of the DTSC investigation of the retention basins at the Highgrove Generating Station."

6. RISK ASSESSMENT

Golder reviewed the *Summary Evaluation: Screening-Level Exposure and Health Evaluation for the Highgrove Generating Station* prepared by Environ (reports were not dated). In addition, Golder reviewed summary data provided by Robert Scofield and Lynda Eng of Environ and Ralph De La Parra of Southern California Edison (SCE) at a meeting in Oakland, California on 19 February 1997. Copies of these data are provided in Appendix G.

6.1 General Risk Assessment Approach and Results

The approach used in the exposure and health evaluation conducted by Environ was a comparison of the maximum detected concentrations and concentrations based on the 95% upper confidence limit of the mean to EPA Region IX preliminary remediation goals (PRGs). Environ used analytical data from Phase II Environmental Site Assessment reports prepared by Geraghty and Miller for HGS. The results of the comparison indicated that arsenic exceeded a 1E-06 PRG based on industrial use. It is Golder's understanding that the California Department of Toxic Substances Control (DTSC) enforcement policy is currently under review, and that remedial action may be required based on concentrations which exceed the PRG for category 1E-06. If so, the arsenic concentrations reported above this PRG quality as Existing Soils Contamination under the Asset Sale Agreement.

The use of the PRG approach is a conservative evaluation of exposure and potential risk. The PRGs combine current EPA toxicity values with standard exposure factors to estimate contaminant concentrations in environmental media that are protective of humans, including sensitive groups, over a lifetime. The PRGs incorporate exposures through typical pathways including ingestion of soil, inhalation of particulates from soil, and dermal absorption from contact with the soil. The PRGs based on industrial exposure assume exposure 250 days per year (typical occupational work week of 5 days a week for 50 weeks a year) for 25 years. Thus, the PRGs are sufficiently conservative to evaluate likely exposures for workers at these sites.

A second evaluation by Environ was the potential for arsenic to be present at levels in air that would exceed the Cal-OSHA permissible exposure limit. The concentrations detected during sampling were orders of magnitude less than would have to be present in soil for dusts to exceed the Cal-OSHA standard.

6.2 Methodology Issues

Environ calculated standard upper confidence limits (UCL) for the mean on a series of small data sets. The equation used for the calculations was applied correctly but did not properly provide for the limited data set.

When data include samples which are less than the method detection limit (MDL), it is common practice to use one half of the detection limit for the value. EPA recently has recommended that this replacement method be used only when 15% or less of the data is less than the detection limit (USEPA, 1996, *Guidance for Data Quality Assessment - Practical Methods for Data Analysis,* EPA/600/R-96/084). For some of Environ's UCL calculations, there were only four data values and one was less than the MDL. EPA recommends that Cohen's method be used under these circumstances (where up to 50% of the data is less than the MDL). When one of two samples is less than the MDL, Cohen's method cannot be used since there is only one sample value. Golder's evaluation of the data using Cohen's method when appropriate did not qualitatively change the overall results.

Combining data from less than 2 feet below ground surface (bgs) with data from more than two feet may not appropriately reflect exposure risk. Soil collected from the first 6 inches bgs comprises the most likely soil exposure route. Soil indicated as being collected at greater than 2 feet was actually collected at 6 to 7 feet bgs. The risk of exposure at that level is minimal. When the concentrations are less in the deeper soils, averaging the values from these samples can inappropriately dilute the calculated risk.

In a specific issue, the arsenic concentration that Environ used in the tables for the septic tank and seepage pits areas is incorrect. Environ used 7.5 mg/kg while the value listed in the data tables is 2.9 mg/kg. The other value at this location is less than the MDL. Using 0.5 mg/kg (half the detection limit), the average value would be 1.7 mg/kg and the 95% UCL is 9.28 mg/kg. At the bottom of the table, however, the maximum value (2.9 mg/kg) is used for arsenic exposure. Either way, the risk that is calculated by Environ in this area is twice as large as the risk calculated by appropriate methods.

Summarizing methodology issues, Golder made two observations in the methodology employed by Environ that present potential concern:

- In some locations there were only two sampling locations from which data could be collected. As a result, the lack of data may not have accurately reflected contaminant concentrations present; and

- Using composite analytical data from soil samples collected at varying depths may dilute actual risk levels.

6.3 Limitations of the Environ Risk Assessments

The Environ reports did not include the assessment of data from the sump and retention basins. If such data are currently available, they should be considered as part of a revised Risk Assessment. Golder reserves the right to supplement this report at such time as additional data from the sump and retention basins become available.

6.4 Potential Remediation Issues

Because 11 soil samples at HGS exceeded the PRGs for arsenic, and given that the DTSC is currently evaluating its enforcement policy. Golder believes that the arsenic concentrations which exceeded the PRGs should be treated as Existing Soils Contamination for purposes of the Asset Sale Agreement. As it now stands, PRGs are the applicable regulatory benchmark for determining the priority of remedial action.

Should remediation be required, either SBCDHS or DTSC could serve as the lead regulatory agency.

Given the above limitations and based on the Environ evaluation and Golder's review, it does not appear that arsenic or other metals detected in soil at HGS are present at concentrations that would represent a health risk to workers.

The arsenic concentrations present in 11 soil samples were above PRGs, however. These levels present a potential remediation liability concern.

7. NPDES ISSUES

Golder visited the offices of RWQCB in Riverside, California to review the National Pollutant Discharge Elimination System (NPDES) files for HGS. Neither the SCE application for an NPDES permit for HGS nor the resulting permit were in the files reviewed by Golder. One document reviewed (RWQCB Order 89-39) indicated that the permit was approved on 14 January 1983, however. Golder is concerned that it may not have had access to all pertinent information regarding NPDES issues. Golder reserves the right to supplement this report should additional information become available. Relevant data regarding the NPDES issues are provided in Appendix H.

7.1 Historical Information

Copies of the original NPDES permit application from SCE and the original permit were not found in the site files at the RWQCB reviewed by Golder. Thus, Golder has no information on the range of chemicals discharged from the plant at the time of the permit application. Also, we have no information on operations, procedures and chemicals utilized at the plant from its construction in 1952 through the time of the NPDES permit approval.

The NPDES permit was renewed in 1994, and effluent limits were either added or made more stringent. In a letter dated 29 August 1994 from SCE to the RWQCB, SCE argued against these changes to the permit. Golder found no information in the files regarding the resolution of these issues.

7.2 Notice of Violations

HGS received a Notice of Violation (NOV) from RWQCB on 28 February 1997. The NOV cited two issues:

- Concentrations of lead and copper exceeded effluent limits in August-September 1996.

- Monthly monitoring reports were consistently late.

SCE responded to the RWQCB in a letter dated 14 March 1997 from Mr. Daniel Cobb to Mr. Mark Adelson. Two actions were to be taken:

- A full-time employee was to be hired to handle wastewater discharge compliance.

- SCE's Environmental Engineering Department was to collect wastewater samples for analysis to determine the source(s) of excess lead in the wastewater.

SCE also noted in this letter that zinc and copper were flowing on to the property with stormwater draining from the east.

In a letter dated 21 February 1997 from Mr. Thomas Gross of SCE to Mr. Mark Adelson of RWQCB, Mr. Gross supplied analytical reports of stormwater entering the property. SCE's contention was that the stormwater contained copper at twice the effluent limit and zinc at more than three times the limit.

In another letter dated 14 March 1997, SCE promised to complete a full analysis of the possible sources of these wastewater constituents by 23 May 1997.

In a letter dated 15 June 1997 to RWQCB, Mr. Cobb indicated that SCE had "checked the internal waste streams of our plant and found nothing that would contribute to the concentrations we are reporting." Despite this statement, and in the same letter, Mr. Cobb indicated that the "high copper in August came from sludge that had accumulated in the bottom of the retention pit, leaching into the cooling water."

In another letter from Mr. Gross to RWQCB dated 31 July 1997, it was noted that elevated levels of three metals (copper, lead, and zinc) are present at "different locations across the property".

It is unclear what locations Mr. Gross is referring to in the foregoing letter, nor has Golder been provided with data which would allow it to evaluate the "elevated levels" detected for the three metals. If such data are available, Golder requests that they be furnished promptly in order that Golder can evaluate whether they constitute Existing Soils Contamination based on current enforcement policy. Golder reserves the right to supplement this report once the additional data have been furnished. SCE reportedly investigated the issue further and found that elevated levels of copper and zinc were present in stormwater entering the property. Again, however, copper was indicated in the cooling tower water, presumably due to exfoliation from tubes and leaching from the main condenser.

At present, Golder has no information on the results of lead sampling at the site. Also, it is unclear whether the excess copper concentrations are derived off site or on site. The sludge in the retention pit is clearly at least one source of the copper along with the cooling tower and condenser. Golder has no information on potential zinc sources on site. Off-site stormwater may contribute at least some of the copper and zinc noted in the effluent. Once again, until Golder has been furnished with all relevant information, it is difficult to evaluate whether additional Existing Soils Contamination is present. Golder reserves the right to supplement this report once such additional information is made available, or additional sampling is completed.

8. CONCLUSIONS AND RECOMMENDATIONS

The following provide Golder's conclusions developed as a result of the review of information provided by SCE, other consulting firms, and Golder's own assessment work. Recommendations for further assessment, data review, and/or representation are provided with the following conclusions, as appropriate.

- The results of the Phase II ESA laboratory analyses conducted pursuant to the WCC recommendations indicated that no VOCs nor SVOCs were present above respective MDLs in the representative soil samples analyzed with the exception of two minor benzene indications in soil from the boring for MW-3. Metals, TPH, and pH analyses did not indicate concentrations or levels of concern. Based upon the above analytical results, the soil samples obtained by this Phase II ESA do not indicate significant chemical impacts have occurred in the areas sampled. Analysis of groundwater from the monitoring wells installed and one production well also did not indicate the presence of VOCs above MDLs and thus no chemical impact to groundwater was indicated.

- Pursuant to a review of the risk assessment conducted by Environ, it does not appear that arsenic detected in soil at HGS is present at concentrations that would represent a health risk to workers, but this conclusion must be tempered by the limitations of the Environ analysis, as noted above. The arsenic concentrations present in 11 soil samples at HGS were above preliminary remedial guidelines, however. This issue should be included as "Existing Soils Contamination" for purposes of the Asset Sale Agreement.

  Recommendation: SCE should present the risk assessment prepared by Environ to an appropriate regulatory agency to procure concurrence with the conclusions of the report that "...no further action (e.g. risk management or remediation) is necessary... for continued industrial land use". Sump and retention basin data should be included in this submission. To the extent that SCE is unable to obtain

regulatory concurrence with the Environ findings, the issue should continue to be treated as "Existing Soils Contamination" for purposes of the Asset Sale Agreement.

➢ SCE investigated the possible presence of VOCs beneath the East and West Retention Basins (SCE's *Leak Detection Investigation*). The assessment, however, was limited to depths of 9 feet bgs in moderately permeable soils. SCE's *Sump Integrity Report* indicated low pH levels in soil below the Demineralizer Basin and that sulfate levels were elevated. No assessment for VOCs was performed as part of that investigation. The latter report concludes that a discharge occurred in the area.

Recommendation: Further assessment is required to evaluate underlying soil and groundwater quality in both areas, unless other data are available. Pending full compliance with the DTSC Stipulated Judgment of February 1995, SCE should retain full responsibility to remediate and close these basins as "Existing Soil Contamination" issues, as well as to remediate any adjacent soil or groundwater which has been contaminated by Hazardous Materials introduced into the basins. This responsibility should include any future Remediation Measures required as a result of the on-going DTSC investigation.

➢ HGS has experienced ongoing NPDES violations. While some of the exceedences may be the result of off-site discharges, sufficient data proving that assertion have not been presented by SCE. Because similar exceedences are a similar problem at San Bernardino Generating Station, it appears likely that at least part of the problem is a result of leaching from the condensers and cooling towers.

Recommendation: Unless SCE can provide a letter from the Regional Water Quality Control Board that the plant is in full compliance with its NPDES Permit, SCE should remain responsible for all Remediation Measures imposed by the Regional Water Quality Control Board as a result of on-going NPDES violations, even if operation of the plant is suspended for a period by Buyer. Since the extent of SCE's compliance obligations is currently unknown, SCE must remain responsible for all

future Remediation Measures involving existing plant equipment, as well as Remediation Measures aimed at reducing discharges of Hazardous Materials onto the plant site where such discharges contribute to violations of the NPDES Permit.

9. LIMITATIONS

This assessment represents Golder's professional interpretation and judgment of the existing site conditions based on the facts currently available within the limits of the mutually agreed to scope of work, budget, and schedule, which are not intended to be exhaustive in scope. Golder's work was performed in accordance with generally accepted engineering standards and largely relied upon Phase I ESA recommendations prepared by WCC. All information obtained and herein provided is presented subject to the terms and conditions of the Golder Consulting Agreement. It is Golder's specific intent that the conclusions and recommendations presented herein be used as a guidance and not necessarily as a firm course of action unless explicitly stated as such. We make no warranties, expressed or implied, as to the marketability of the property for a particular purpose. The information provided in this report is not to be construed as legal advice.

Golder Associates is not engaged in environmental reporting for the purpose of advertising, sales promotion, or endorsement of any client's interest, including raising investment capital, recommending investment decisions, or other publicity purposes. Our client acknowledges that this report has been prepared for the exclusive use of the client and agrees that Golder Associates' reports and correspondence will not be used nor relied upon in any prospectus or offerings circular.

TABLES

TABLE 1

GROUND WATER ELEVATION DATA

HIGHGROVE GENERATING STATION

20 FEBRUARY 1998

WELL	ELEVATION AT MEASURING POINT (ft above mean sea level)	MEASURED DEPTH TO GROUND WATER (ft)	ELEVATION OF STATIC WATER LEVEL IN WELL (ft above mean sea level)
MW-1	939.36	97.45	841.91
MW-2	946.42	102.73	843.69
MW-3	940.73	97.18	843.55

TABLE 2

BORING DEPTHS AND LOCATIONS

HIGHGROVE GENERATING STATION

17 DECEMBER 1997

BORING	DEPTH (ft below ground surface)	NATURE OF OPERATIONS AT SAMPLING SITE
B-1	70	Septic Tanks
B-2	20.5	Oil-Water Separator
B-3	10.5	Demineralizer Sump
B-4	10.5	Chemical Storage Area
B-5	11.5	Tanks by Cooling Towers

TABLE 3

APPLICATION OF ANALYTICAL TECHNIQUES

TO SOIL SAMPLES FROM BORINGS

HIGHGROVE GENERATING STATION

SAMPLE	OPERATIONS AT SAMPLING SITE	METHOD 6010	METHOD 418.1	METHOD 8260	METHOD 8270	pH
B-1-20	Septic Tank	X		X		
B-1-40	Septic Tank	X				
B-1-60	Septic Tank	X				
B-1-70	Septic Tank	X		X		
B-2-10	Oil-Water Sep.		X	X		
B-2-15	Oil-Water Sep.		X	X		
B-2-20	Oil-Water Sep.		X	X		
B-3-5	Demineral. Tanks			X	X	X
B-3-10	Demineral. Tanks			X	X	X
B-4-5	Chemical Storage			X	X	
B-4-10	Chemical Storage			X	X	
B-5-5	Cooling Tower Tank			X	X	
B-5-10	Cooling Tower Tank			X	X	

TABLE 4

RESULTS OF LABORATORY ANALYSIS

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

METHOD 418.1

HIGHGROVE GENERATING STATION

SAMPLE	TOTAL RECOVERABLE PETROLEUM HYDROCARBONS (mg/kg)
B-2-10	20
B-2-15	ND
B-2-20	ND

Note: "ND" indicates that the analyte was not present in the sample in a concentration equal to or greater than the method detection limit.

TABLE 5

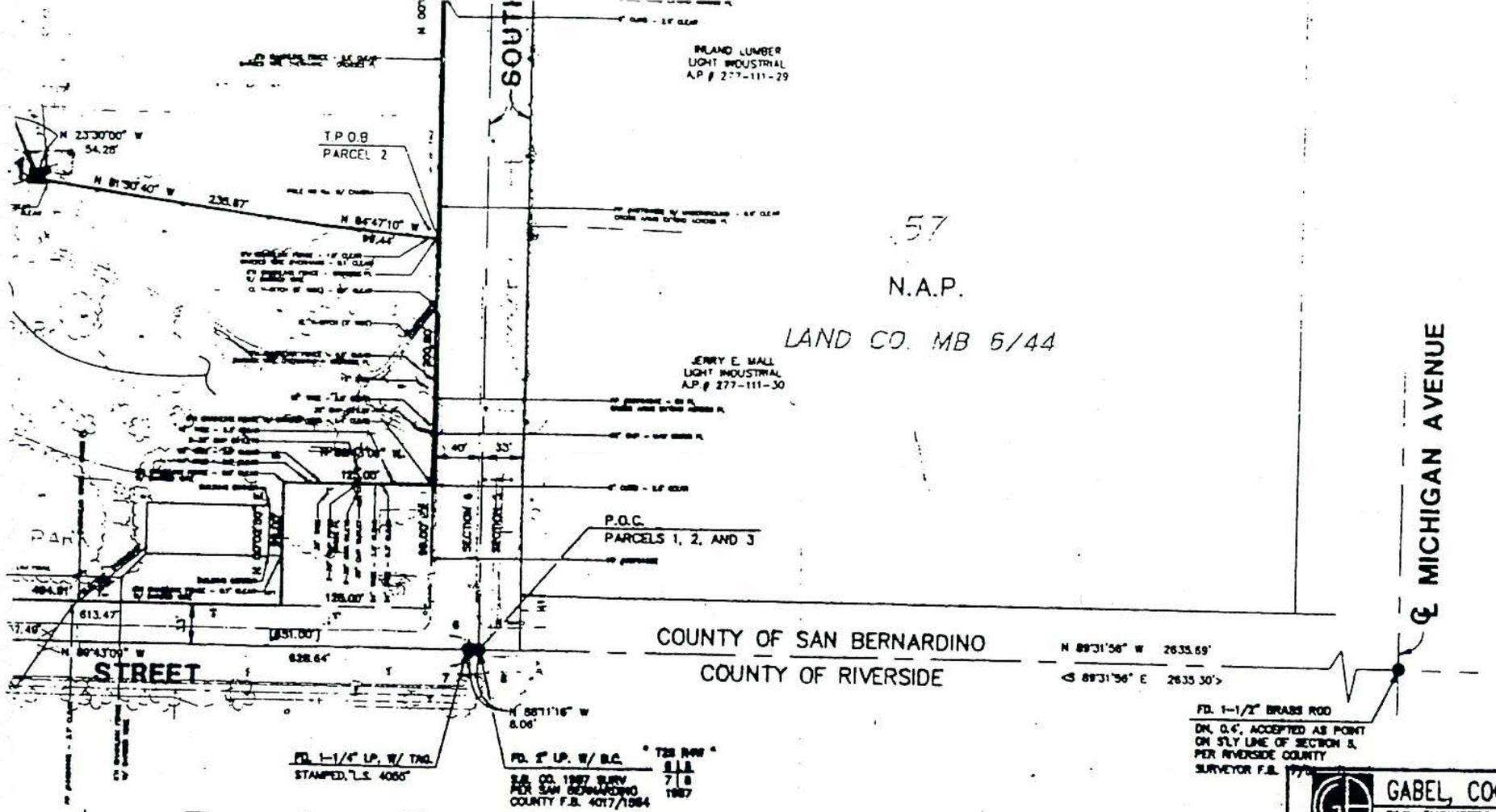
RESULTS OF LABORATORY ANALYSIS

pH

METHOD 9045

HIGHGROVE GENERATING STATION

SAMPLE	pH
B-3-5	8.10
B-3-10	7.98



DETAIL

NO SCA

TOPOGRAPHIC LEGEND

GNV	GROUND NOT VISIBLE
UNO	UNKNOWN OBJECT
FP	FENCE POST
P	POST (MISC)
P	POLE (MISC)
MTR	METER
UTLB	UTILITY BOX
	FULL LIGHT POLE
SP	STAND PIPE
RXR	RAIL ROAD SIGNAL
T/L	TRAFFIC SIGNAL
	LIGHT POLE W/ ARM
	LIGHT POLE
F/H	FIRE HYDRANT
VC	VALVE COVER
MH	MANHOLE
	DEADMAN
	POWER POLE
	RAILROAD TRACKS
	CHAIN LINK FENCE

LEGEND

< > PARCEL MAP P.M.B. 18/2

( ) RECORD OF SURVEY R.S. 88/32

[ ] PRELIMINARY TITLE REPORT NO. 111368529

FOUND MONUMENT AS NOTED

MW#1 ● MONITORING W

GABEL, COOK & BECKLUND
CIVIL ENGINEERS · LAND SURVEYORS
LAND PLANNERS
125 West La Cadena Drive, Suite A, Riverside, CA 92501
Telephone (909) 788-8082 Facsimile (909) 788-5184

11 12

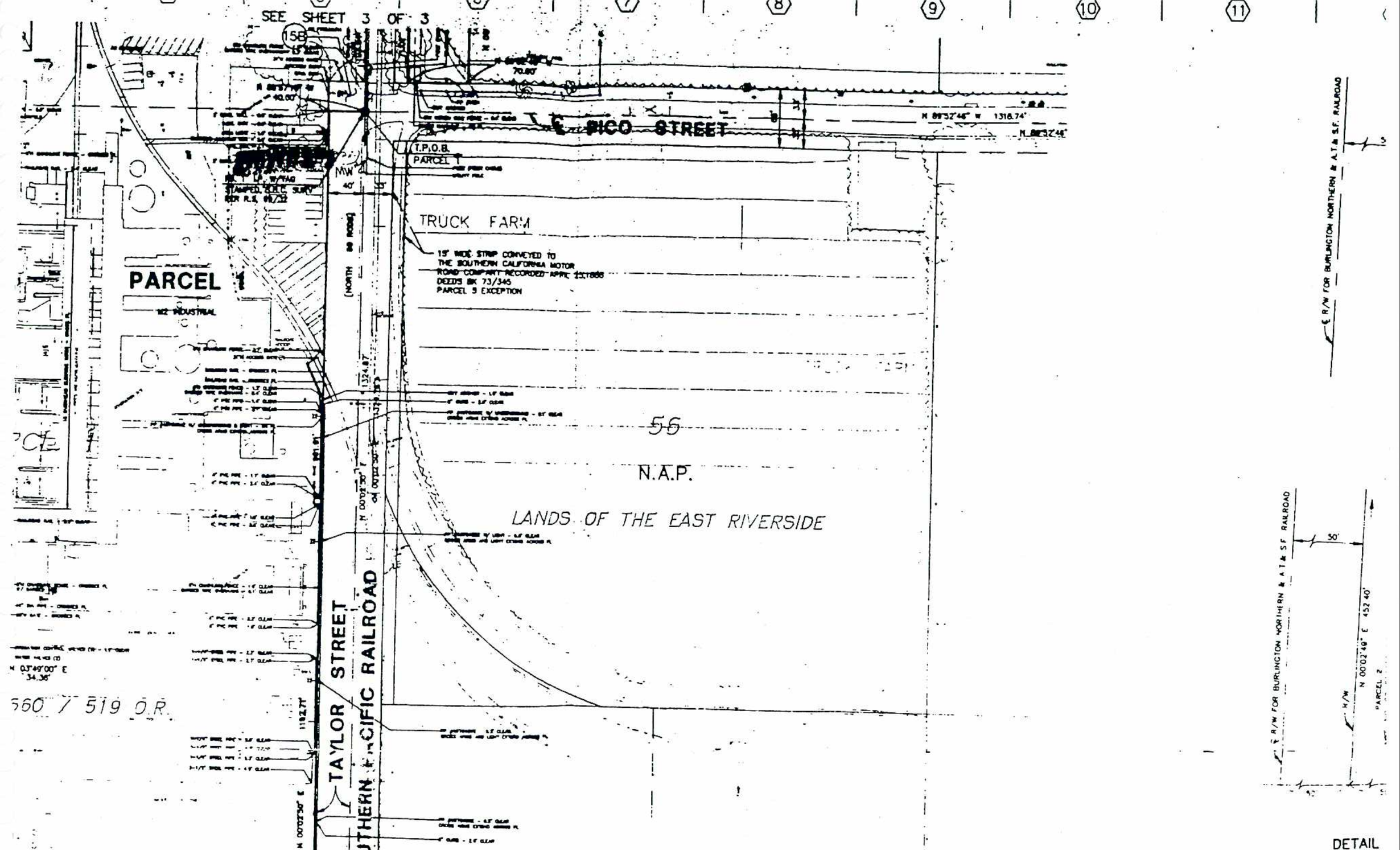
ITE 250
RNIA 92705

HIGHGROVE GENERATING STATION
A.L.T.A.

LOCATION MAP FOR MONITORING WELLS

FEBRUARY 1998 | WO 1793

SOUTI
Real P


SEE SHEET 3 OF 3
15B
E. PICO STREET
N 89°52'46" W 1316.74'
T.P.O.B.
PARCEL 1
TRUCK FARM
15' WIDE STRIP CONVEYED TO
THE SOUTHERN CALIFORNIA MOTOR
ROAD COMPANY RECORDED APRIL 21ST 1888
DEEDS BK 73/345
PARCEL 5 EXCEPTION
PARCEL
M2 INDUSTRIAL
(NORTH 80 RODS)
56
N.A.P.
LANDS OF THE EAST RIVERSIDE
TAYLOR STREET
SOUTHERN PACIFIC RAILROAD
560 / 519 O.R.
℄ R/W FOR BURLINGTON NORTHERN & A.T.& S.F. RAILROAD
50'
N 00°02'40" E 452.40'
PARCEL 2
R/W
DETAIL

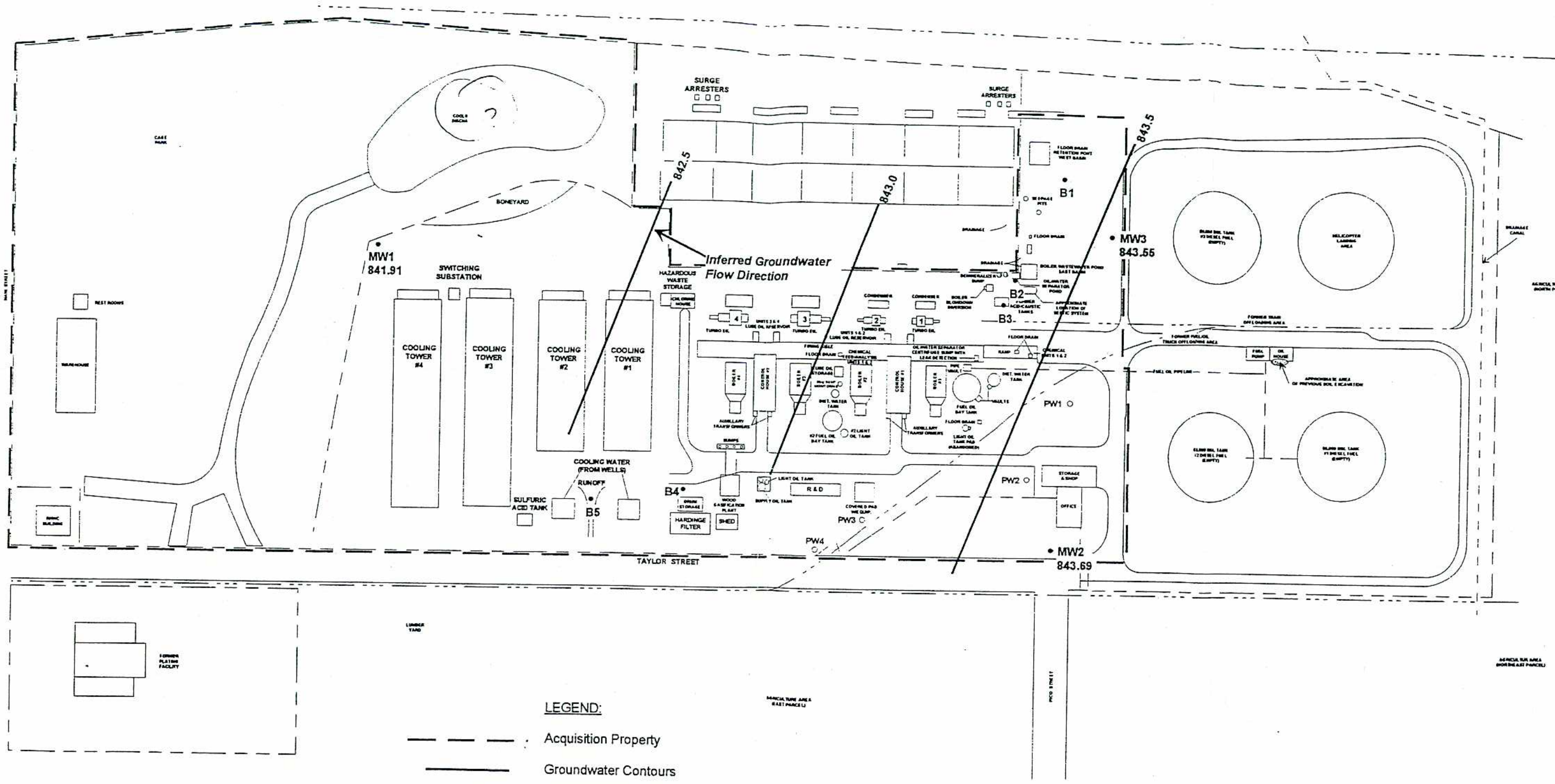


Figure 2
Site Map
Highgrove Generating Station
Grand Terrace, California

PROJECT NO: 973-1967 DATE: 03/11/98 DRAWN BY: BAH

Golder Associates

HIGHGROVE GENERATING S[illegible] DDITIONAL DUE DILIGENCE ISSUES

Additional Investigation Area	Proposed Depth	Justification
Former Paint Shed by the Materials Storage/Chemical Area	10 feet	Sampling did not occur in this area, and concrete in this area was stained with an oily residue.
Oil/Water Separator	20 feet	Sampling did not occur in this area, and the base of the separator (approximate depth of 13 feet) could not be inspected, therefore sampling is recommended.
Former Tanks by the Demineralizer Area	10 feet	Closest sample is approximately 20 feet to this area and there is significant staining on the concrete pad beneath where the tanks were formerly located.
Two smaller Tanks by the Cooling Towers	10 feet	These tanks typically stored chemical additives but are currently emptied and cleaned. However no samples were taken in this area, and there is a potential for impacts to the subsurface.
Septic Tanks	70 feet	Previous investigation identified metal impacts in this area above preliminary remediation goals. Identify the extent of impact for the metals.
Three groundwater monitoring wells (across the site)	First encountered groundwater	To date, the depth of shallow water has not been identified at the site. Review available records of groundwater in the area. If groundwater exists below 100 feet, install three wells to define the groundwater gradient, flow direction and if the groundwater has been groundwater has been impacted from site operations.
Collect groundwater samples from existing groundwater supply well No. 1		Previous Phase II mentioned the presence of PCE and TCE in the well. Confirm the presence of these chemicals.
Review Sampling Data from Demineralization and Retention Basin (Data to be supplied by Edison)	NA	Sample data not available at time of review
Review Cooling Tower Risk Assessment (to be supplied by Edison)	NA	Risk assessment not available at time of site visit.
Attend meeting with Santa Ana Regional Water Quality Contro Board and Edison to discuss NPDES copper violations	NA	Source of copper unknown at this time. Issues still to be resolved.

LOCATION: Highgrove Generating Station | BORING DATE: 12/17/97 | DATUM: Local

DIP: 90 | SAMPLER HAMMER, 140 lb; DROP, 30 in

DEPTH SCALE FEET	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS/ft	RECOVERY %	LAB. TESTING	PID ppm (110, 220, 330, 440)	HYDRAULIC CONDUCTIVITY, k, cm/s	WATER CONTENT, PERCENT (Wp, W, Wl)	MONITORING INSTALLATIONS GROUNDWATER AND ENVIRONMENTAL OBSERVATIONS
0	CME-85 10" Hollow Stem Auger	1" to 2" Gravel		0.0									
5		Sandy Silt (ML) stiff, slightly moist, brown (7.5yr 4/4), trace coarse grained sand, very porous at 2 feet.											
10		SAND (SP), very dense, slightly moist, brown (7.5yr 4/4), fine to coarse grained, micaceous.			10		40/ 44			⊕			
15													
20					20		17/ 57						
25													
30		SAND (SP), very dense, slightly moist, brown (7.5YR 4/4), increasing grain size with depth, poorly sorted to very coarse grained. Driller noted "softening" at approximately 32 feet.			30		33/ 50			⊕			
35													
40		SANDY SILT/SILTY SAND (ML/SM), dense, moist, yellowish brown (10YR 5/6), trace to some very coarse grained sand.			40		32/ 50			⊕			
45													
50		SAND (SP), medium dense, moist, brown (7.5YR 5/4), very fine grained, micaceous.			50		24/ 28			⊕			
55													
60		SAND (SP), very dense, slightly moist, pale brown (10YR 6/3), fine to coarse grained with trace.			60		50/ 50			⊕			
65													
70					70		50/ 50						
75		End of boring at approximately 70 feet. No groundwater observed. Boring backfilled with bentonite slurry.		70.5									
80													

DEPTH SCALE (ALONG HOLE)

1 to 10

Golder Associates

LOGGED: A. Pace

CHECKED: F. Allison

LOCATION: Highgrove Generating Station

BORING DATE: 12/17/97

DATUM: Local

DIP: 90

SAMPLER HAMMER, 140 lb; DROP, 30 in

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS/ft	RECOVERY %	LAB. TESTING	PID PPM (25, 50, 75, 100)	HYDRAULIC CONDUCTIVITY, k, cm/s	WATER CONTENT, PERCENT (Wp, W, Wl)	MONITORING INSTALLATIONS GROUNDWATER AND ENVIRONMENTAL OBSERVATIONS
0	CME-85 10" Hollow Stem Auger	Thin Gravel Cover		0.0									
5		CLAY (CH), soft, moist, brown (7.5YR 4/3).											
10		Clayey SAND (SC), dense, moist, dark reddish brown (5YR 3/4), fine to medium grained, trace coarse grains.			10		23/23						
15		– Brown (7.5Y 4/4)			15		23/40						
20				20.5	20		29/50						
25													
30													
35													
40													

UT_N196782.BHS

DEPTH SCALE (ALONG HOLE)

1 to 5

Golder Associates

LOGGED: A. Pace

CHECKED: F. Allison

PROJECT: 973-1982

RECORD OF BOREHOLE B-3

SHEET 1 OF 1

LOCATION: Highgrove Generating Station

BORING DATE: 12/17/97

DATUM: Local

DIP: 90

SAMPLER HAMMER, 140 lb; DROP 30 in

BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS/ft	RECOVERY %	LAB. TESTING	PID ppm (20, 40)	HYDRAULIC CONDUCTIVITY, k, cm/s	WATER CONTENT, PERCENT (Wp, W, Wl)	MONITORING INSTALLATIONS GROUNDWATER AND ENVIRONMENTAL OBSERVATIONS
	4" AC/6" AB		0.0									
CME-55 10" Hollow Stem Auger	Sandy CLAY (CL), stiff, slightly moist, black (5YR 25/2)			5		16/ 26			⊕			
				10		12/ 16			⊕			
			10.5									

DEPTH SCALE (ALONG HOLE)

1 to 5

Golder Associates

LOGGED: A. Pace

CHECKED: F. Allison

LOCATION: Highgrove Generating Station

DIP: 90

BORING DATE: 12/17/97

DATUM: Local

SAMPLER HAMMER, 140 lb; DROP 30 in

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS/ft	RECOVERY %	LAB TESTING	PID ppm (10, 20, 30)	HYDRAULIC CONDUCTIVITY, K, cm/s	WATER CONTENT, PERCENT (Wp, W, Wl)	MONITORING INSTALLATIONS GROUNDWATER AND ENVIRONMENTAL OBSERVATIONS
0	CME 85 10" Hollow Stem Auger	Asphaltic Concrete		0.0									
5		Silty SAND/Sandy SILT (SM), dense, moist, yellowish brown (10YR 5/6), fine grained			5		39/50						
10		Silty SAND (SM), medium dense, moist, yellowish brown (10YR 5/6), fine grained, trace very coarse grains		10.5	10		11/11						
15													
20													
25													
30													
35													
40													

B-4-5

B-4-10

T: N1987B4 BHS

DEPTH SCALE (ALONG HOLE)

1 to 5

Golder Associates

LOGGED: A. Pace

CHECKED: F. Allison

LOCATION: Highgrove Generating Station
DIP:

BORING DATE: 12/17/97

DATUM: Local

SAMPLER HAMMER, 140 lb; DROP, 30 in.

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS/ft	RECOVERY %	LAB. TESTING	PID ppm (10 20 30 40)	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT, PERCENT Wp W Wl	MONITORING INSTALLATIONS GROUNDWATER AND ENVIRONMENTAL OBSERVATIONS
0	CME 45 10" Hollow Stem Auger	Ground Surface		0.0								
5		SAND (SW), dense, moist, yellowish brown (10YR 5/6), very fine to medium grained			5		30/45			⊕		
10		– Trace gravel, yellowish red (5YR 4/6)			10		30/50			⊕		
				11.5								
15												
20												
25												
30												
35												
40												

N1967B5 BHS

DEPTH SCALE (ALONG HOLE)
1 to 5

Golder Associates

LOGGED: A. Pace
CHECKED: F. Allison

LOCATION: Rightgrove Generating Station
BORING DATE: 12/19/97
DATUM: Local
DIP: 90
SAMPLER HAMMER, 140 lb; DROP, 30 in

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (ft)	SAMPLES: NUMBER	TYPE	BLOWS/ft	RECOVERY %	LAB. TESTING	PID ppm (20, 40)	HYDRAULIC CONDUCTIVITY, k, cm/s	WATER CONTENT, PERCENT (Wp — W — Wl)	MONITORING INSTALLATIONS GROUNDWATER AND ENVIRONMENTAL OBSERVATIONS
0	CME 85 10" Hollow Stem Auger			0.0									Concrete
5													
MW-2-1 10		Gravelly SAND (GP), reddish brown, clasts to 20 mm, no odor, moderately dense drilling, no cohesion			10		21/ 38			⊕			
15													
MW-2-2 20		Yellow gravelly sand with clasts to 8 mm, trace water, no odor, moderately dense drilling, calcareous precipitation in intercalations			20		23/ 50			⊕			4" Sch. 40 PVC Blank Casing
25													
30													
35													
40													
45													
50													
55													Bentonite Slurry
60													
65													
70													
75													
80													
85													
90													Bentonite Seal
95													
100													
105													#3 Monterey Sand
110													4" Sch. 40 PVC .020 Slotted Pipe
115													4" End Cap
120		Bottom of boring at approximately 115 feet. Groundwater encountered at approximately 98 feet. Monitoring well installed.		115.0									

T:_N1997\MW2 BHS

DEPTH SCALE (ALONG HOLE)
1 to 15

Golder Associates

LOGGED: O. Sandowski
CHECKED: F. Allison

DIP: 90

SAMPLER HAMMER, 140 lb; DROP, 30 in.

DEPTH SCALE FEET	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (ft)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/ft	SAMPLES RECOVERY %	LAB. TESTING	PID ppm (10, 20, 30)	HYDRAULIC CONDUCTIVITY, k, cm/s	WATER CONTENT, PERCENT Wp — W — Wl	MONITORING INSTALLATIONS GROUNDWATER AND ENVIRONMENTAL OBSERVATIONS
0		Gravel		0.0									
5	CME-65 10" Hollow Stem Auger	Silty SAND/Sandy SILT (SM/ML), dense, strong brown (7.5YR 5/6), very fine grained			5		50/ 6"						Concrete
10		Silty SAND, fine grained, trace coarse grains			10		16/ 10						
15													
20		Sandy SILT, slightly moist, strong brown, no odor			20		4/ 50						
25													
30													4" Sch. 40 PVC Blank Casing
35													
40		SAND (SM), very dense, slightly moist, yellowish brown (10YR 5/8), trace silt			40		50/ 5"						
45													
50		Clayey cuttings											Bentonite Slurry
55													
60		Clayey SAND (SC) to Sandy CLAY (CL), very dense, slightly moist, dark yellowish brown (10YR 4/4), trace coarse grains			60		20/ 40						
65													
70													
75													
80		SAND (SW), very dense, slightly moist, pale yellow, no odor			80		50/ 4"						
85													Bentonite Seal
90													#3 Monterey Sand
95													
100		SAND (SP), very dense, moist, light olive brown, no odor			100		50/ 5"						4" Sch. 40 PVC .020 Slotted
105													
110		Bottom of boring at approximately 110 feet. Groundwater observed at 100 feet. Well installed.		110.0									4" PVC End Cap
115													
120													

E: N1987MW3 BHS

DEPTH SCALE (ALONG HOLE)

1 to 15

Golder Associates

LOGGED: A. Pace

CHECKED: F. Allison

Laboratories

February 26, 1998 ELAP No.: 1838

Golder Associates
17752 Sky Park Circle Suite 280
Irvine, CA 92614

ATTN: Mr. Fred Allison

Client's Project: Thermo Ecotek, 973-1967
Lab No.: 24021-001/015

Gentlemen:

Enclosed are the results for sample(s) received by Advanced Technology Laboratories and tested for the parameters indicated in the enclosed chain of custody.

Thank you for the opportunity to service the needs of your company. Please feel free to call me at (562) 989 - 4045 if I can be of further assistance to your company.

Sincerely,

Edgar P. Caballero
Laboratory Director
EPC/ms

Enclosures

This cover letter is an integral part of this analytical report.

Mailing Address: P.O. Box 9108 Newport Beach, CA 92658
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Attn: Mr. Fred Allison

Client's Project: Thermo Ecoteck, 973-1967
Date Received: 02/20/98
Matrix: Water
Units: µg/l

EPA Method 8260

Lab No.:	Method Blank		24021-002		24021-004		24021-006		24021-008	
Client Sample I.D.:	–		SBGN MW-3 GW-1		SBGN MW-2-GW		SBGN MW-3A GW-2		HGGN MW-1-GW	
Date Sampled:	–		02/20/98		02/20/98		02/20/98		02/20/98	
QC Batch #:	P98VOCW03		P98VOCW032		P98VOCW032		P98VOCW032		P98VOCW032	
Date Analyzed:	02/24/98		02/24/98		02/24/98		02/24/98		02/24/98	
Analyst Initials:	YP		YP		YP		YP		YP	
Dilution Factor:	1		1		1		1		1	
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results	DLR	Results	DLR	Results
Benzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromodichloromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromoform	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromomethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
n-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
sec-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
tert-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Carbon tetrachloride	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chloroform	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chloromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chlorotoluene	5	5	ND	5	ND	5	ND	5	ND	5	ND
4-Chlorotoluene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Dibromochloromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dibromo-3-chloropropa	10	10	ND	10	ND	10	ND	10	ND	10	ND
1,2-Dibromoethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Dibromomethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,3-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,4-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Dichlorodifluoromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1-Dichloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dichloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND
cis-1,2-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

The cover letter is an integral part of this analytical report.

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Attn: Mr. Fred Allison

Client's Project: Thermo Ecotal, 973-1967
Date Received: 02/20/98
Matrix: Water
Units: µg/l

EPA Method 8260

Lab No.:	Method Blank		24021-002		24021-004		24021-006		24021-008	
Client Sample I.D.:	–		SBGN MW-3 GW-1		SBGN MW-2-GW		SBGN MW-3A GW-2		HGGN MW-1-GW	
ANALYTE	MDL	DLR	DLR	Results	DLR	Results	DLR	Results	DLR	Results
trans-1,2-Dichloroethene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dichloropropane	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,3-Dichloropropane	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
2,2-Dichloropropane	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1-Dichloropropene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Ethylbenzene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Hexachlorobutadiene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Isopropylbenzene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
p-Isopropyltoluene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Methylene Chloride	15	15	15	ND	15	ND	15	ND	15	ND	15	ND
Methyl tert-Butyl Ether	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Naphthalene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
n-Propylbenzene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Styrene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,1,2-Tetrachloroethane	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,2,2-Tetrachloroethane	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Tetrachloroethene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Toluene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2,3-Trichlorobenzene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2,4-Trichlorobenzene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,1-Trichloroethane	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,2-Trichloroethane	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Trichloroethene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Trichlorofluoromethane	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2,3-Trichloropropane	10	10	10	ND	10	ND	10	ND	10	ND	10	ND
1,2,4-Trimethylbenzene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,3,5-Trimethylbenzene	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Vinyl Chloride	5	5	5	ND	5	ND	5	ND	5	ND	5	ND
Xylenes (Total)	5	5	5	ND	5	ND	5	ND	5	ND	5	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

Reviewed/Approved By: _____ Date 2-26-98

Lee Ingvaldson
Department Supervisor

The cover letter is an integral part of this analytical report.

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Client: Golder Associates
Attn: Mr. Fred Allison

Client's Project: Thermo Ecotek, 973-1967
Date Received: 02/20/98
Matrix: Water
Units: µg/l

EPA Method 8260

Lab No.:	24021-010		24021-012		24021-014		24021-015	
Client Sample I.D.:	HGGN MW-2-G		HGGN MW-3-G		SBGN Trip Blank		HGGN Trip Blank	
Date Sampled:	02/20/98		02/20/98		02/20/98		02/20/98	
QC Batch #:	P98VOCW032		P98VOCW032		P98VOCW032		P98VOCW032	
Date Analyzed:	02/24/98		02/24/98		02/24/98		02/24/98	
Analyst Initials:	YP		YP		YP		YP	
Dilution Factor:	1		1		1		1	
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results	DLR	Results
Benzene	5	5	ND	5	ND	5	ND	5	ND
Bromobenzene	5	5	ND	5	ND	5	ND	5	ND
Bromodichloromethane	5	5	ND	5	ND	5	ND	5	ND
Bromoform	5	5	ND	5	ND	5	ND	5	ND
Bromomethane	5	5	ND	5	ND	5	ND	5	ND
n-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND
sec-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND
tert-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND
Carbon tetrachloride	5	5	ND	5	ND	5	ND	5	ND
Chlorobenzene	5	5	ND	5	ND	5	ND	5	ND
Chloroethane	5	5	ND	5	ND	5	ND	5	ND
Chloroform	5	5	ND	5	ND	5	ND	5	ND
Chloromethane	5	5	ND	5	ND	5	ND	5	ND
?-Chlorotoluene	5	5	ND	5	ND	5	ND	5	ND
-Chlorotoluene	5	5	ND	5	ND	5	ND	5	ND
Dibromochloromethane	5	5	ND	5	ND	5	ND	5	ND
1,2-Dibromo-3-chloropropa	10	10	ND	10	ND	10	ND	10	ND
1,2-Dibromoethane	5	5	ND	5	ND	5	ND	5	ND
Dibromomethane	5	5	ND	5	ND	5	ND	5	ND
1,2-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND
1,3-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND
1,4-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND
Dichlorodifluoromethane	5	5	ND	5	ND	5	ND	5	ND
1,1-Dichloroethane	5	5	ND	5	ND	5	ND	5	ND
1,2-Dichloroethane	5	5	ND	5	ND	5	ND	5	ND
1,1-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND
cis-1,2-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

he cover letter is an integral part of this analytical report.

Attn: Mr. Fred Allison

Client's Project: Thermo Ecotal, 973-1967
Date Received: 02/20/98
Matrix: Water
Units: µg/l

EPA Method 8260

Lab No.:		24021-010		24021-012		24021-014		24021-015		
Client Sample I.D.:		HGGN MW-2-G		HGGN MW-3-G		SBGN Trip Blank		HGGN Trip Blan		
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results	DLR	Results	L	Results
trans-1,2-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND		
1,2-Dichloropropane	5	5	ND	5	ND	5	ND	5	ND		
1,3-Dichloropropane	5	5	ND	5	ND	5	ND	5	ND		
2,2-Dichloropropane	5	5	ND	5	ND	5	ND	5	ND		
1,1-Dichloropropene	5	5	ND	5	ND	5	ND	5	ND		
Ethylbenzene	5	5	ND	5	ND	5	ND	5	ND		
Hexachlorobutadiene	5	5	ND	5	ND	5	ND	5	ND		
Isopropylbenzene	5	5	ND	5	ND	5	ND	5	ND		
p-Isopropyltoluene	5	5	ND	5	ND	5	ND	5	ND		
Methylene Chloride	15	15	ND	15	ND	15	ND	15	ND		
Methyl tert-Butyl Ether	5	5	ND	5	ND	5	ND	5	ND		
Naphthalene	5	5	ND	5	ND	5	ND	5	ND		
n-Propylbenzene	5	5	ND	5	ND	5	ND	5	ND		
Styrene	5	5	ND	5	ND	5	ND	5	ND		
1,1,1,2-Tetrachloroethane	5	5	ND	5	ND	5	ND	5	ND		
1,1,2,2-Tetrachloroethane	5	5	ND	5	ND	5	ND	5	ND		
Tetrachloroethene	5	5	ND	5	ND	5	ND	5	ND		
Toluene	5	5	ND	5	ND	5	ND	5	ND		
1,2,3-Trichlorobenzene	5	5	ND	5	ND	5	ND	5	ND		
1,2,4-Trichlorobenzene	5	5	ND	5	ND	5	ND	5	ND		
1,1,1-Trichloroethane	5	5	ND	5	ND	5	ND	5	ND		
1,1,2-Trichloroethane	5	5	ND	5	ND	5	ND	5	ND		
Trichloroethene	5	5	ND	5	ND	5	ND	5	ND		
Trichlorofluoromethane	5	5	ND	5	ND	5	ND	5	ND		
1,2,3-Trichloropropane	10	10	ND	10	ND	10	ND	10	ND		
1,2,4-Trimethylbenzene	5	5	ND	5	ND	5	ND	5	ND		
1,3,5-Trimethylbenzene	5	5	ND	5	ND	5	ND	5	ND		
Vinyl Chloride	5	5	ND	5	ND	5	ND	5	ND		
Xylenes (Total)	5	5	ND	5	ND	5	ND	5	ND		

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

Reviewed/Approved By: _____ Date 2-26-98

Lee Ingvaldson
Department Supervisor

The cover letter is an integral part of this analytical report.

Spike Recovery and RPD Summary Report - WATER (ug/L)

Method : C:\HPCHEM\1\METHODS\VOCW.M (RTE Integrator)
Title : Volatile Organic Compounds
Last Update : Wed Feb 25 14:53:20 1998
Response via : Initial Calibration

Non-Spiked Sample: PB0225A.D

	Spike Sample	Spike Duplicate Sample
File ID :	PMS0224A.D	PMD0224A.D
Sample :	BLK-MS water	BLK-MSD water
Acq Time:	25 Feb 98 12:15 pm	25 Feb 98 12:42 pm

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
1,1-dichloroethene	0.0	50	58	62	116	124	7	19	49-154
benzene	0.0	50	57	55	114	110	3	15	67-128
trichloroethene	0.0	50	51	52	103	104	2	16	67-130
toluene	0.0	50	58	57	115	114	1	15	74-123
chlorobenzene	0.0	50	53	54	105	106	2	14	80-122

QC batch # P98VOCW032

Reviewed/Approved By: _____ Date: 2/26/98

Lee Ingvaldson
Organics Supervisor

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

CHAIN OF CUSTODY RECORD

PROJ. NO. 773-1967 | SITE/LOCATION Thermo Ecotek

SAMPLERS: (Signature) Mark P. Jenni

STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	AMOUNT/ PRESERVATIVE of 2 CO	SEAL NO.	SEAL INTACT? (Y or N)	REMARKS (with initials)
	2/20	0846	VOA	Water	SBGN MW-3A-GW-1	4				No Acidification Add Hold
		1017			SBGN MW-1-GW-1	2	X			
		1017			SBGN MW-1-GW Dup	2				Hold MPM
		1044			SBGN MW-2-GW	2	X			
		1044			SBGN MW-2-GW-Dup	2				Hold MPM
		1107			SBGN MW-3A-GW-3	2	X			
		1107			SBGN MW-3A-GW-2-Dup	2				Hold MPM
		1653			HGGN MW-1-GW	2	X			
		1653			HGGN MW-1-GW Dup	2				Hold MPM
		1728			HGGN MW-2-GW	2	X			
		1728			HGGN MW-2-GW Dup	2				Hold MPM
		1715			HGGN MW-3-GW	2	X			
		1715			HGGN MW-3-GW Dup	2				Hold MPM
		1450			SDGN Trip Blank	1	X			
	↓	1450	↓	↓	HGGN Trip Blank	1	X			

Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)
Mark P. Jenni Golder Assoc.	2/20/98 1700				

Remarks (attachments if necessary)

Laboratories

March 6, 1998 ELAP No.: 1838

Golder Associates
17752 Sky Park Circle Suite 280
Irvine, CA 92614

ATTN: Mr. Fred Allison

Client's Project: Thermo Ecotech, 973-1967
Lab No.: 24230-001/002

Gentlemen:

Enclosed are the results for sample(s) received by Advanced Technology Laboratories and tested for the parameters indicated in the enclosed chain of custody.

Thank you for the opportunity to service the needs of your company. Please feel free to call me at (562) 989 - 4045 if I can be of further assistance to your company.

Sincerely,

Edgar P. Caballero
Laboratory Director
EPC/ms

Enclosures

This cover letter is an integral part of this analytical report.

Mailing Address: P.O. Box 9108 Newport Beach, CA 92658
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Client's Project: Thermo Ecotech, 973-1967
Date Received: 03/03/98
Matrix: Waste Water
its: µg/l

EPA Method 8260

Lab No.:	Method Blank		24230-001		24230-002					
Client Sample I.D.:	–		H6S-PW1-6W		Trip Blank					
Date Sampled:	–		03/03/98		03/03/98					
QC Batch #:	Q98VOCW047		Q98VOCW047		Q98VOCW047					
Date Analyzed:	03/05/98		03/05/98		03/05/98					
Analyst Initials:	YP		YP		YP					
Dilution Factor:	1		1		1					
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results			
Benzene	5	5	ND	5	ND	5	ND			
Bromobenzene	5	5	ND	5	ND	5	ND			
Bromodichloromethane	5	5	ND	5	ND	5	ND			
Bromoform	5	5	ND	5	ND	5	ND			
Bromomethane	5	5	ND	5	ND	5	ND			
n-Butylbenzene	5	5	ND	5	ND	5	ND			
sec-Butylbenzene	5	5	ND	5	ND	5	ND			
tert-Butylbenzene	5	5	ND	5	ND	5	ND			
Carbon tetrachloride	5	5	ND	5	ND	5	ND			
Chlorobenzene	5	5	ND	5	ND	5	ND			
Chloroethane	5	5	ND	5	ND	5	ND			
Chloroform	5	5	ND	5	ND	5	ND			
Chloromethane	5	5	ND	5	ND	5	ND			
2-Chlorotoluene	5	5	ND	5	ND	5	ND			
4-Chlorotoluene	5	5	ND	5	ND	5	ND			
Dibromochloromethane	5	5	ND	5	ND	5	ND			
1,2-Dibromo-3-chloropropane	10	10	ND	10	ND	10	ND			
1,2-Dibromoethane	5	5	ND	5	ND	5	ND			
Dibromomethane	5	5	ND	5	ND	5	ND			
1,2-Dichlorobenzene	5	5	ND	5	ND	5	ND			
1,3-Dichlorobenzene	5	5	ND	5	ND	5	ND			
1,4-Dichlorobenzene	5	5	ND	5	ND	5	ND			
Dichlorodifluoromethane	5	5	ND	5	ND	5	ND			
1,1-Dichloroethane	5	5	ND	5	ND	5	ND			
1,2-Dichloroethane	5	5	ND	5	ND	5	ND			
1,1-Dichloroethene	5	5	ND	5	ND	5	ND			
cis-1,2-Dichloroethene	5	5	ND	5	ND	5	ND			

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

The cover letter is an integral part of this analytical report.

Client's Project: Thermo Ecotech, 973-1967
Date Received: 03/03/98
Matrix: Waste Water
its: µg/l

EPA Method 8260

Lab No.:	Method Blank		24230-001		24230-002					
Client Sample I.D.:	–		H6S-PW1-6W		Trip Blank					
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results			
trans-1.2-Dichloroethene	5	5	ND	5	ND	5	ND			
1.2-Dichloropropane	5	5	ND	5	ND	5	ND			
1.3-Dichloropropane	5	5	ND	5	ND	5	ND			
2.2-Dichloropropane	5	5	ND	5	ND	5	ND			
1.1-Dichloropropene	5	5	ND	5	ND	5	ND			
Ethylbenzene	5	5	ND	5	ND	5	ND			
Hexachlorobutadiene	5	5	ND	5	ND	5	ND			
Isopropylbenzene	5	5	ND	5	ND	5	ND			
p-Isopropyltoluene	5	5	ND	5	ND	5	ND			
Methylene Chloride	15	15	ND	15	ND	15	ND			
Naphthalene	5	5	ND	5	ND	5	ND			
n-Propylbenzene	5	5	ND	5	ND	5	ND			
Styrene	5	5	ND	5	ND	5	ND			
1.1.1.2-Tetrachloroethane	5	5	ND	5	ND	5	ND			
1.1.2.2-Tetrachloroethane	5	5	ND	5	ND	5	ND			
Tetrachloroethene	5	5	ND	5	ND	5	ND			
Toluene	5	5	ND	5	ND	5	ND			
1.2.3-Trichlorobenzene	5	5	ND	5	ND	5	ND			
?.4-Trichlorobenzene	5	5	ND	5	ND	5	ND			
..1-Trichloroethane	5	5	ND	5	ND	5	ND			
.1.2-Trichloroethane	5	5	ND	5	ND	5	ND			
richloroethene	5	5	ND	5	ND	5	ND			
Trichlorofluoromethane	5	5	ND	5	ND	5	ND			
1.2.3-Trichloropropane	10	10	ND	10	ND	10	ND			
1.2.4-Trimethylbenzene	5	5	ND	5	ND	5	ND			
1.3.5-Trimethylbenzene	5	5	ND	5	ND	5	ND			
Vinyl Chloride	5	5	ND	5	ND	5	ND			
Xylenes (Total)	5	5	ND	5	ND	5	ND			

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

Reviewed/Approved By: _____ Date 3/5/98

Lee Ingvaldson
Department Supervisor

The cover letter is an integral part of this analytical report.

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Method : C:\HPCHEM\1\METHODS\VOCS.M
Title : VOC 8240/8260B Advanced Technology Laboratory
Last Update : Thu Mar 05 09:16:33 1998
Response via : Initial Calibration

Non-Spiked Sample: 24230-01.D

	Spike Sample	Spike Duplicate Sample
File ID :	QMS0305A.D	QMD0305A.D
Sample :	24230-002 MS WATER	24230-002 MSD WATER
Acq Time:	5 Mar 98 10:14 am	5 Mar 98 10:42 am

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
1,1-dichloroethene	0.0	50	50	48	100	97	4	19	49-154
benzene	0.0	50	53	55	105	110	4	15	67-128
trichloroethene	0.0	50	50	52	101	103	3	16	67-130
toluene	0.0	50	56	59	112	118	5	15	74-123
chlorobenzene	0.0	50	53	56	105	112	7	14	80-122

QC Batch # Q98VOCW047

Reviewed/Approved By: _____ Date: 3/6/98

Lee Ingvaldson
Organics Supervisor

Advanced Technology Laboratories

1510 E. 33rd Street
Signal Hill, CA 90807
(562) 989-4045 • FAX (562) 989-4040

Batch #: _____ D.O. # _____

P.O.#: _____

Logged By: _____ Date: _____ Time: _____

FOR LABORATORY USE ONLY:

Method of Transport
- Walk-in ☐
- Courier ☐
- UPS ☐
- FED. EXP. ☐
- ATL ☐

Sample Condition Upon Receipt
1. COOLER TEMP °C _____ (2-6) 5. SEALED Y☐ N☐
2. CHILLED Y☐ N☐ 6. # OF SPLS MATCH COC Y☐ N☐
3. HEADSPACE (VOA) Y☐ N☐ 7. PRESERVED Y☐ N☐
4. CONTAINER INTACT Y☐ N☐ 8. CONTR. LOT # _____

Client: Golder Associates, Inc.
Attn: Fred Allison
Address: 17752 Skypark Circle, Suite 220
City State Zip Code
TEL: (714) 474-ASSS-
FAX: (714) 221-5940

Project Name: Thermo Ecotek Project #: 973-1917 Sampler: (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name) Mark R. Muir Date: 3/3/98 Time: 1650 Received by: (Signature and Printed Name)
Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: 3-3-98 Time: 1340
Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: Time:

SHIP TO LAB: (SUB CONTRACT) _____
TEST: _____
ATL #: _____
DATE: _____
CLIENT I.D. _____

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: Fred Allison Date: 3/3/98
Print Name F. Allison
Signature

Send Report To:
Attn: Fred Allison
Co: Golder Associates
Address _____
City _____ State _____ Zip _____

Special Instructions/Comments: RUSH - 48 HR

Unless otherwise requested, all samples will be disposed 45 days after receipt.

Sample Archive/Disposal:
- ☐ Laboratory Standard
- ☐ Other _____
- ☐ Return To: _____

* $10.00 FEE PER HAZARDOUS SAMPLE DISPOSAL.

ITEM	LAB USE ONLY: Batch #: / Lab No.	Sample Description: Sample I.D.	Date	Time	Circle or Add Analysis(es) Requested: 601/8010 (Halogenated Volatiles-GC)	602/8020/BTEX (Aromatic Volatiles-GC)	608/8080 (Pesticides/PCB-GC)	624/8240 (Volatiles-GC/MS)	8260 (Volatiles-GC/MS)	625/8270 (BNA-GC/MS)	8015M TPHG/BTEX(COMBINATION)	8015M TPHD (Diesel-GC)	418.1 (TPH-IR)	Metals-Total (CAC-5010/7000)	CIRCLE APPROPRIATE MATRIX: SOLID • SOIL • SLUDGE	OIL • SOLVENT • LIQUID	WATER • WASTEWATER	DRINKING WATER	AIR	WIPE • FILTER	OTHER	TAT	Container(s) #	Type	PRESERVATION	REMARKS
	24230-001	HGS-PW1-GW	3/3	0938				X									X						4	V	G	H	
	24230-002	Trip Blank	3/3	0938				X									X						1	V	G	H	

QA/QC: RTNE ☐ RWQCB ☐ WIP ☐ NAVY ☐ CT ☐ OTHER _____

• TAT starts 8 a.m. following day if samples received after 5 p.m.

TAT: A= Overnight ≤ 24 hr B= Emergency Next workday C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=Zn(AC)$_2$ O=NaOH T=$Na_2S_2O_3$

December 22, 1997

ELAP No.: 1838

Golder Associates
17752 Sky Park Circle Suite 280
Irvine, CA 92614

ATTN: Mr. Fred Allison

Client's Project: Edison, HGS, 973-1967
Lab No.: 22687-001/007

Gentlemen:

Enclosed are the results for sample(s) received by Advanced Technology Laboratories and tested for the parameters indicated in the enclosed chain of custody.

Thank you for the opportunity to service the needs of your company. Please feel free to call me at (562) 989 - 4045 if I can be of further assistance to your company.

Sincerely,

Edgar P. Caballero
Laboratory Director
EPC/ms

Enclosures

This cover letter is an integral part of this analytical report.

Client's Project: Edison, HGS, 973-1967
Date Received: 12/19/97
Matrix: Soil
Units: µg/kg

EPA Method 8260

Lab No.:	Method Blank		22687-003		22687-006	
Client Sample I.D.:	--		MW-3-20		MW-3-80	
Date Sampled:	--		12/18/97		12/18/97	
QC Batch #:	Q97VOCS312		Q97VOCS312		Q97VOCS312	
Date Analyzed:	12/22/97		12/22/97		12/22/97	
Analyst Initials:	YP		YP		YP	
Dilution Factor:	1		1		1	
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results
Benzene	5	5	ND	5	17	5	17
Bromobenzene	5	5	ND	5	ND	5	ND
Bromodichloromethane	5	5	ND	5	ND	5	ND
Bromoform	5	5	ND	5	ND	5	ND
Bromomethane	5	5	ND	5	ND	5	ND
n-Butylbenzene	5	5	ND	5	ND	5	ND
sec-Butylbenzene	5	5	ND	5	ND	5	ND
tert-Butylbenzene	5	5	ND	5	ND	5	ND
Carbon tetrachloride	5	5	ND	5	ND	5	ND
Chlorobenzene	5	5	ND	5	ND	5	ND
Chloroethane	5	5	ND	5	ND	5	ND
Chloroform	5	5	ND	5	ND	5	ND
Chloromethane	5	5	ND	5	ND	5	ND
Chlorotoluene	5	5	ND	5	ND	5	ND
-Chlorotoluene	5	5	ND	5	ND	5	ND
Dibromochloromethane	5	5	ND	5	ND	5	ND
1,2-Dibromo-3-chloropropane	10	10	ND	10	ND	10	ND
1,2-Dibromoethane	5	5	ND	5	ND	5	ND
Dibromomethane	5	5	ND	5	ND	5	ND
1,2-Dichlorobenzene	5	5	ND	5	ND	5	ND
1,3-Dichlorobenzene	5	5	ND	5	ND	5	ND
1,4-Dichlorobenzene	5	5	ND	5	ND	5	ND
Dichlorodifluoromethane	5	5	ND	5	ND	5	ND
1,1-Dichloroethane	5	5	ND	5	ND	5	ND
1,2-Dichloroethane	5	5	ND	5	ND	5	ND
1,1-Dichloroethene	5	5	ND	5	ND	5	ND
cis-1,2-Dichloroethene	5	5	ND	5	ND	5	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

: cover letter is an integral part of this analytical report.

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Client's Project: Edison, HGS, 973-1967
Date Received: 12/19/97
Matrix: Soil
its: µg/kg

EPA Method 8260

Lab No.:			Method Blank		22687-003		22687-006					
Client Sample I.D.:			–		MW-3-20		MW-3-80					
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results					
trans-1.2-Dichloroethene	5	5	ND	5	ND	5	ND					
1.2-Dichloropropane	5	5	ND	5	ND	5	ND					
1.3-Dichloropropane	5	5	ND	5	ND	5	ND					
2.2-Dichloropropane	5	5	ND	5	ND	5	ND					
1.1-Dichloropropene	5	5	ND	5	ND	5	ND					
Ethylbenzene	5	5	ND	5	ND	5	ND					
Hexachlorobutadiene	5	5	ND	5	ND	5	ND					
Isopropylbenzene	5	5	ND	5	ND	5	ND					
p-Isopropyltoluene	5	5	ND	5	ND	5	ND					
Methylene Chloride	15	15	ND	15	ND	15	ND					
Methyl tert-Butyl Ether	5	5	ND	5	ND	5	ND					
Naphthalene	5	5	ND	5	ND	5	ND					
n-Propylbenzene	5	5	ND	5	ND	5	ND					
Styrene	5	5	ND	5	ND	5	ND					
1.1.1.2-Tetrachloroethane	5	5	ND	5	ND	5	ND					
1.1.2.2-Tetrachloroethane	5	5	ND	5	ND	5	ND					
Tetrachloroethene	5	5	ND	5	ND	5	ND					
Toluene	5	5	ND	5	ND	5	ND					
1.2.3-Trichlorobenzene	5	5	ND	5	ND	5	ND					
1.2.4-Trichlorobenzene	5	5	ND	5	ND	5	ND					
1.1.1-Trichloroethane	5	5	ND	5	ND	5	ND					
1.1.2-Trichloroethane	5	5	ND	5	ND	5	ND					
Trichloroethene	5	5	ND	5	ND	5	ND					
Trichlorofluoromethane	5	5	ND	5	ND	5	ND					
1.2.3-Trichloropropane	10	10	ND	10	ND	10	ND					
1.2.4-Trimethylbenzene	5	5	ND	5	ND	5	ND					
1.3.5-Trimethylbenzene	5	5	ND	5	ND	5	ND					
Vinyl Chloride	5	5	ND	5	ND	5	ND					
Xylenes (Total)	5	5	ND	5	ND	5	ND					

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

Reviewed/Approved By: _____ Date 12/22/97
Lee Ingvaldson
Department Supervisor

The cover letter is an integral part of this analytical report.

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Method : C:\HPCHEM\1\METHODS\VOCS.M
Title : Volatile Organic Compounds
Last Update : Mon Dec 22 14:31:43 1997
Response via : Initial Calibration

Non-Spiked Sample: 22687-06.D

	Spike Sample	Spike Duplicate Sample
File ID :	QMS1222A.D	QMD1222A.D
Sample :	22687-006 MS SOIL	22687-006 MSD SOIL
Acq Time:	22 Dec 97 12:40 pm	22 Dec 97 1:08 pm

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
1,1-dichloroethene	0.0	50	44	45	87	89	3	21	37-166
benzene	17.3	50	53	51	71	68	4	21	68-133
trichloroethene	0.0	50	48	49	96	98	2	23	65-129
toluene	0.0	50	50	50	98	100	1	21	74-136
chlorobenzene	0.0	50	48	49	97	98	2	19	83-122

QC Batch # Q97VOCS312

Reviewed/Approved By: _____ Date: 12/22/97

Lee Ingvaldson
Organics Supervisor

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

CHAIN OF CUSTODY RECORD

PROJ. NO.: 973-1967

SITE/LOCATION: EDISON, HGS

SAMPLERS: (Signature) Ofer Sinbach

STA NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	AMOUNT/PRESERVATIVE 8260						SEAL NO.	SEAL INTACT? (Y or N)	REMARKS (with initials)
MW3	12/18		Soil		MW-3-5	1									Hold
					MW-3-10	1									Hold
					MW-3-20	1	X								
					MW-3-40	1									Hold
					MW-3-60	1									Hold
					MW-3-80	1	X								
					MW-3-100	1									Hold

Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date / Time	Received by: (Signature/Firm)
Ofer Sinbach	12/19/97 9:50	A-T-L			

Remarks (attachments if necessary)

48 Hour Turn Around Time

Advanced Technology
Laboratories

December 22, 1997

ELAP No.: 1838

Golder Associates
17752 Sky Park Circle Suite 280
Irvine, CA 92614

ATTN: Mr. Fred Allison

Client's Project: Edison HGS, 973-1967
Lab No.: 22588-001/016

Gentlemen:

Enclosed are the results for sample(s) received by Advanced Technology Laboratories and tested for the parameters indicated in the enclosed chain of custody.

Thank you for the opportunity to service the needs of your company. Please feel free to call me at (562) 989 - 4045 if I can be of further assistance to your company.

Sincerely,

Edgar P. Caballero
Laboratory Director
EPC/ms

Enclosures

This cover letter is an integral part of this analytical report.

Client: Golder Associates
Attn: Mr. Fred Allison

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
Units: µg/kg

EPA Method 8260

Lab No.:	Method Blank		22588-001		22588-002		22588-007		22588-008	
Client Sample I.D.:	--		B-1-10		B-1-20		B-1-70		B-2-10	
Date Sampled:	--		12/17/97		12/17/97		12/17/97		12/17/97	
QC Batch #:	P97VOCS144		P97VOCS144		P97VOCS144		P97VOCS144		P97VOCS144	
Date Analyzed:	12/19/97		12/18/97		12/18/97		12/18/97		12/18/97	
Analyst Initials:	YP		YP		YP		YP		YP	
Dilution Factor:	1		1		1		1		1	
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results	DLR	Results	DLR	Results
Benzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromodichloromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromoform	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromomethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
n-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
sec-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
tert-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Carbon tetrachloride	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chloroform	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chloromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
2-Chlorotoluene	5	5	ND	5	ND	5	ND	5	ND	5	ND
4-Chlorotoluene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Dibromochloromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dibromo-3-chloropropane	10	10	ND	10	ND	10	ND	10	ND	10	ND
1,2-Dibromoethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Dibromomethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,3-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,4-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Dichlorodifluoromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1-Dichloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dichloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND
cis-1,2-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

The cover letter is an integral part of this analytical report.

Client: Golder Associates
Attn: Mr. Fred Allison

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
nits: µg/kg

EPA Method 8260

Lab No.:		Method Blank		22588-001		22588-002		22588-007		22588-008	
Client Sample I.D.:		–		B-1-10		B-1-20		B-1-70		B-2-10	
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results	DLR	Results	DLR	Results
trans-1,2-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dichloropropane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,3-Dichloropropane	5	5	ND	5	ND	5	ND	5	ND	5	ND
2,2-Dichloropropane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1-Dichloropropene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Ethylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Hexachlorobutadiene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Isopropylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
p-Isopropyltoluene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Methylene Chloride	15	15	ND	15	ND	15	ND	15	ND	15	ND
Naphthalene	5	5	ND	5	ND	5	ND	5	ND	5	ND
n-Propylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Styrene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,1,2-Tetrachloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,2,2-Tetrachloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Tetrachloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Toluene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2,3-Trichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2,4-Trichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,1-Trichloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,2-Trichloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Trichloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Trichlorofluoromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2,3-Trichloropropane	10	10	ND	10	ND	10	ND	10	ND	10	ND
1,2,4-Trimethylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,3,5-Trimethylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Vinyl Chloride	5	5	ND	5	ND	5	ND	5	ND	5	ND
Xylenes (Total)	5	5	ND	5	ND	5	ND	5	ND	5	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

Reviewed/Approved By: _____ Date 12/19/97
Lee Ingvaldson
Department Supervisor

The cover letter is an integral part of this analytical report.

Client: Golder Associates
Attn: Mr. Fred Allison

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
Units: µg/kg

EPA Method 8260

Lab No.:	22588-009		22588-010		22588-011		22588-012		22588-013	
Client Sample I.D.:	B-2-15		B-2-20		B-3-5		B-3-10		B-4-5	
Date Sampled:	12/17/97		12/17/97		12/17/97		12/17/97		12/17/97	
QC Batch #:	P97VOCS144		P97VOCS144		P97VOCS144		P97VOCS144		P97VOCS144	
Date Analyzed:	12/18/97		12/18/97		12/18/97		12/18/97		12/18/97	
Analyst Initials:	YP		YP		YP		YP		YP	
Dilution Factor:	1		1		1		1		1	
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results	DLR	Results	DLR	Results
Benzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromodichloromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromoform	5	5	ND	5	ND	5	ND	5	ND	5	ND
Bromomethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
n-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
sec-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
tert-Butylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Carbon tetrachloride	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chloroform	5	5	ND	5	ND	5	ND	5	ND	5	ND
Chloromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
2-Chlorotoluene	5	5	ND	5	ND	5	ND	5	ND	5	ND
4-Chlorotoluene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Dibromochloromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dibromo-3-chloropropane	10	10	ND	10	ND	10	ND	10	ND	10	ND
1,2-Dibromoethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Dibromomethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,3-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,4-Dichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Dichlorodifluoromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1-Dichloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dichloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND
cis-1,2-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

The cover letter is an integral part of this analytical report.

Attn: Mr. Fred Allison

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
Units: µg/kg

EPA Method 8260

Lab No.:		22588-009		22588-010		22588-011		22588-012		22588-013	
Client Sample I.D.:		B-2-15		B-2-20		B-3-5		B-3-10		B-4-5	
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results	DLR	Results	DLR	Results
trans-1,2-Dichloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2-Dichloropropane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,3-Dichloropropane	5	5	ND	5	ND	5	ND	5	ND	5	ND
2,2-Dichloropropane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1-Dichloropropene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Ethylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Hexachlorobutadiene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Isopropylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
p-Isopropyltoluene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Methylene Chloride	15	15	ND	15	ND	15	ND	15	ND	15	ND
Methyl tert-Butyl Ether	5	5	ND	5	ND	5	ND	5	ND	5	ND
Naphthalene	5	5	ND	5	ND	5	ND	5	ND	5	ND
n-Propylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Styrene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,1,2-Tetrachloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,2,2-Tetrachloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Tetrachloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Toluene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2,3-Trichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2,4-Trichlorobenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,1-Trichloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,1,2-Trichloroethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
Trichloroethene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Trichlorofluoromethane	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,2,3-Trichloropropane	10	10	ND	10	ND	10	ND	10	ND	10	ND
1,2,4-Trimethylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
1,3,5-Trimethylbenzene	5	5	ND	5	ND	5	ND	5	ND	5	ND
Vinyl Chloride	5	5	ND	5	ND	5	ND	5	ND	5	ND
Xylenes (Total)	5	5	ND	5	ND	5	ND	5	ND	5	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

Reviewed/Approved By: _____ Date 12/19/97
Lee Ingvaldson
Department Supervisor

The cover letter is an integral part of this analytical report.

Client: Golder Associates
Attn: Mr. Fred Allison

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
Units: µg/kg
Date Amended: 12/22/97

EPA Method 8260

Lab No.:	22588-014		22588-015		22588-016					
Client Sample I.D.:	B-4-10		B-5-5		B-5-10					
Date Sampled:	12/17/97		12/17/97		12/17/97					
QC Batch #:	P97VOCS144		P97VOCS144		P97VOCS144					
Date Analyzed:	12/18/97		12/18/97		12/18/97					
Analyst Initials:	YP		YP		YP					
Dilution Factor:	1		1		1					
ANALYTE	MD	DLR	Results	DLR	Results	DLR	Results			
Benzene	5	5	ND	5	ND	5	ND			
Bromobenzene	5	5	ND	5	ND	5	ND			
Bromodichloromethane	5	5	ND	5	ND	5	ND			
Bromoform	5	5	ND	5	ND	5	ND			
Bromomethane	5	5	ND	5	ND	5	ND			
n-Butylbenzene	5	5	ND	5	ND	5	ND			
sec-Butylbenzene	5	5	ND	5	ND	5	ND			
tert-Butylbenzene	5	5	ND	5	ND	5	ND			
Carbon tetrachloride	5	5	ND	5	ND	5	ND			
Chlorobenzene	5	5	ND	5	ND	5	ND			
Chloroethane	5	5	ND	5	ND	5	ND			
Chloroform	5	5	ND	5	ND	5	ND			
Chloromethane	5	5	ND	5	ND	5	ND			
2-Chlorotoluene	5	5	ND	5	ND	5	ND			
4-Chlorotoluene	5	5	ND	5	ND	5	ND			
Dibromochloromethane	5	5	ND	5	ND	5	ND			
1,2-Dibromo-3-chloropropane	10	10	ND	10	ND	10	ND			
1,2-Dibromoethane	5	5	ND	5	ND	5	ND			
Dibromomethane	5	5	ND	5	ND	5	ND			
1,2-Dichlorobenzene	5	5	ND	5	ND	5	ND			
1,3-Dichlorobenzene	5	5	ND	5	ND	5	ND			
1,4-Dichlorobenzene	5	5	ND	5	ND	5	ND			
Dichlorodifluoromethane	5	5	ND	5	ND	5	ND			
1,1-Dichloroethane	5	5	ND	5	ND	5	ND			
1,2-Dichloroethane	5	5	ND	5	ND	5	ND			
1,1-Dichloroethene	5	5	ND	5	ND	5	ND			
cis-1,2-Dichloroethene	5	5	ND	5	ND	5	ND			

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

The cover letter is an integral part of this analytical report.

Client: Golder Associates
Attn: Mr. Fred Allison

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
Units: µg/kg
Date Amended: 12/22/97

EPA Method 8260

Lab No.:		22588-014		22588-015		22588-016					
Client Sample I.D.:		B-4-10		B-5-5		B-5-10					
ANALYTE	MD	DLR	Results	DLR	Results	DLR	Results				
trans-1,2-Dichloroethene	5	5	ND	5	ND	5	ND				
1,2-Dichloropropane	5	5	ND	5	ND	5	ND				
1,3-Dichloropropane	5	5	ND	5	ND	5	ND				
2,2-Dichloropropane	5	5	ND	5	ND	5	ND				
1,1-Dichloropropene	5	5	ND	5	ND	5	ND				
Ethylbenzene	5	5	ND	5	ND	5	ND				
Hexachlorobutadiene	5	5	ND	5	ND	5	ND				
Isopropylbenzene	5	5	ND	5	ND	5	ND				
p-Isopropyltoluene	5	5	ND	5	ND	5	ND				
Methylene Chloride	15	15	ND	15	ND	15	ND				
Methyl tert-Butyl Ether	5	5	ND	5	ND	5	ND				
Naphthalene	5	5	ND	5	ND	5	ND				
n-Propylbenzene	5	5	ND	5	ND	5	ND				
Styrene	5	5	ND	5	ND	5	ND				
1,1,1,2-Tetrachloroethane	5	5	ND	5	ND	5	ND				
1,1,2,2-Tetrachloroethane	5	5	ND	5	ND	5	ND				
Tetrachloroethene	5	5	ND	5	ND	5	ND				
Toluene	5	5	ND	5	ND	5	ND				
1,2,3-Trichlorobenzene	5	5	ND	5	ND	5	ND				
1,2,4-Trichlorobenzene	5	5	ND	5	ND	5	ND				
1,1,1-Trichloroethane	5	5	ND	5	ND	5	ND				
1,1,2-Trichloroethane	5	5	ND	5	ND	5	ND				
Trichloroethene	5	5	ND	5	ND	5	ND				
Trichlorofluoromethane	5	5	ND	5	ND	5	ND				
1,2,3-Trichloropropane	10	10	ND	10	ND	10	ND				
1,2,4-Trimethylbenzene	5	5	ND	5	ND	5	ND				
1,3,5-Trimethylbenzene	5	5	ND	5	ND	5	ND				
Vinyl Chloride	5	5	ND	5	ND	5	ND				
Xylenes (Total)	5	5	ND	5	ND	5	ND				

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
NA = Not Analyzed

Reviewed/Approved By: _____ Date 12/17/97
Lee Ingvaldson
Department Supervisor

The cover letter is an integral part of this analytical report.

Client: Golder Associates
Attn: Mr. Fred Golder

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
Units: µg/kg
Extraction Method: 3550

EPA Method 8270

Lab No.:	Method Blank	22588-011	22588-012	22588-013	22588-014	22588-015
Client Sample I.D.:	–	B-3-5	B-3-10	B-4-5	B-4-10	B-5-5
Date Sampled:	–	12/17/97	12/17/97	12/17/97	12/17/97	12/17/97
QC Batch #:	R978270W260	R978270W260	R978270W260	R978270W260	R978270W260	R978270W260
Date Extracted:	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97
Date Analyzed:	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97	12/18/97
Analyst Initials:	SM	SM	SM	SM	SM	SM
Dilution Factor:	1	1	1	1	1	1

ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results	DLR	Results	DLR	Results	DLR	Results
Phenol	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
bis (2-Chloroethyl)ether	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
2-Chlorophenol	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
1,3-Dichlorobenzene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
1,4-Dichlorobenzene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Benzyl Alcohol	660	660	ND	660	ND	660	ND	660	ND	660	ND	660	ND
1,2-Dichlorobenzene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
2-Methylphenol	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
bis(2-chloroisopropyl)ether	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
n-Nitroso-di-n-propylamine	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
4-Methylphenol	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Hexachloroethane	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Nitrobenzene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Isophorone	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
2-Nitrophenol	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
2,4-Dimethylphenol	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
bis(2-Chloroethoxy)methane	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
2,4-Dichlorophenol	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Benzoic Acid	1650	1700	ND	1700	ND	1700	ND	1700	ND	1700	ND	1650	ND
1,2,4-Trichlorobenzene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Naphthalene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
4-Chloroaniline	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Hexachlorobutadiene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
4-Chloro-3-methylphenol	660	660	ND	660	ND	660	ND	660	ND	660	ND	660	ND
2-Methylnaphthalene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Hexachlorocyclopentadiene	660	660	ND	660	ND	660	ND	660	ND	660	ND	660	ND
2,4,6-Trichlorophenol	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
2,4,5-Trichlorophenol	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
2-Chloronaphthalene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
2-Nitroaniline	1650	1700	ND	1700	ND	1700	ND	1700	ND	1700	ND	1650	ND
Dimethylphthalate	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Acenaphthylene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
2,6-Dinitrotoluene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
3-Nitroaniline	1650	1700	ND	1700	ND	1700	ND	1700	ND	1700	ND	1650	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR)
DLR = MDL x Dilution Factor
NA = Not Analyzed

The cover letter is an integral part of this analytical report.

Client: Golder Associates
Attn: Mr. Fred Golder

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
Units: µg/kg
Extraction Method: 3550

EPA Method 8270

Lab No.:	Method Blank		22588-011		22588-012		22588-013		22588-014		22588-015	
Client Sample I.D.:	–		B-3-5		B-3-10		B-4-5		B-4-10		B-5-5	
ANALYTE	MDL	DLR	Results	DLR	Results	DLR	Results	DLR	Results	DLR	Results	DLR	Results
Acenaphthene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
2,4-Dinitrophenol	1650	1700	ND	1700	ND	1700	ND	1700	ND	1700	ND	1650	ND
Dibenzofuran	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
4-Nitrophenol	1650	1700	ND	1700	ND	1700	ND	1700	ND	1700	ND	1650	ND
2,4-Dinitrotoluene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Fluorene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Diethylphthalate	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
4-Chlorophenyl-phenyl ether	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
4-Nitroaniline	1650	1700	ND	1700	ND	1700	ND	1700	ND	1700	ND	1650	ND
4,6-Dinitro-2-methylphenol	1650	1700	ND	1700	ND	1700	ND	1700	ND	1700	ND	1650	ND
n-Nitrosodiphenylamine	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
4-Bromophenyl-phenyl ether	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Hexachlorobenzene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Pentachlorophenol	1650	1700	ND	1700	ND	1700	ND	1700	ND	1700	ND	1650	ND
Phenanthrene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Anthracene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Di-n-butylphthalate	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Fluoranthene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Pyrene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Butylbenzylphthalate	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Benzo[a]anthracene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
3,3'-Dichlorobenzidine	660	660	ND	660	ND	660	ND	660	ND	660	ND	660	ND
Chrysene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
bis(2-Ethylhexyl)phthalate	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Di-n-octylphthalate	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Benzo[b]fluoranthene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Benzo[k]fluoranthene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Benzo[a]pyrene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Indeno[1,2,3-cd]pyrene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Dibenz[a,h,]anthracene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND
Benzo[g,h,i]perylene	330	330	ND	330	ND	330	ND	330	ND	330	ND	330	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR)
DLR = MDL x Dilution Factor
NA = Not Analyzed

Approved/Reviewed By: _____ Date: 12/19/97

Lee Ingvaldson
Department Supervisor

The cover letter is an integral part of this analytical report.

Client: Golder Associates
Attn: Mr. Fred Golder

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
Units: µg/kg
Extraction Method: 3550

EPA Method 8270

Lab No.:	22588-016		
Client Sample I.D.:	B-5-10		
Date Sampled:	12/17/97		
QC Batch #:	R978270W260		
Date Extracted:	12/18/97		
Date Analyzed:	12/18/97		
Analyst Initials:	SM		
Dilution Factor:	1		

ANALYTE	MDL	DLR	Results
Phenol	330	330	ND
bis (2-Chloroethyl)ether	330	330	ND
2-Chlorophenol	330	330	ND
1,3-Dichlorobenzene	330	330	ND
1,4-Dichlorobenzene	330	330	ND
Benzyl Alcohol	660	660	ND
1,2-Dichlorobenzene	330	330	ND
2-Methylphenol	330	330	ND
bis(2-chloroisopropyl)ether	330	330	ND
n-Nitroso-di-n-propylamine	330	330	ND
4-Methylphenol	330	330	ND
Hexachloroethane	330	330	ND
Nitrobenzene	330	330	ND
Isophorone	330	330	ND
2-Nitrophenol	330	330	ND
2,4-Dimethylphenol	330	330	ND
bis(2-Chloroethoxy)methane	330	330	ND
2,4-Dichlorophenol	330	330	ND
Benzoic Acid	1650	1700	ND
1,2,4-Trichlorobenzene	330	330	ND
Naphthalene	330	330	ND
4-Chloroaniline	330	330	ND
Hexachlorobutadiene	330	330	ND
4-Chloro-3-methylphenol	660	660	ND
2-Methylnaphthalene	330	330	ND
Hexachlorocyclopentadiene	660	660	ND
2,4,6-Trichlorophenol	330	330	ND
2,4,5-Trichlorophenol	330	330	ND
2-Chloronaphthalene	330	330	ND
2-Nitroaniline	1650	1700	ND
Dimethylphthalate	330	330	ND
Acenaphthylene	330	330	ND
2,6-Dinitrotoluene	330	330	ND
3-Nitroaniline	1650	1700	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR)
DLR = MDL x Dilution Factor
NA = Not Analyzed

The cover letter is an integral part of this analytical report.

Attn: Mr. Fred Golder

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
Units: µg/kg
Extraction Method: 3550

EPA Method 8270

Lab No.:	22588-016		
Client Sample I.D.:	B-5-10		
ANALYTE	MDL	DLR	Results
Acenaphthene	330	330	ND
2,4-Dinitrophenol	1650	1700	ND
Dibenzofuran	330	330	ND
4-Nitrophenol	1650	1700	ND
2,4-Dinitrotoluene	330	330	ND
Fluorene	330	330	ND
Diethylphthalate	330	330	ND
4-Chlorophenyl-phenyl ether	330	330	ND
4-Nitroaniline	1650	1700	ND
4,6-Dinitro-2-methylphenol	1650	1700	ND
n-Nitrosodiphenylamine	330	330	ND
4-Bromophenyl-phenyl ether	330	330	ND
Hexachlorobenzene	330	330	ND
Pentachlorophenol	1650	1700	ND
Phenanthrene	330	330	ND
Anthracene	330	330	ND
Di-n-butylphthalate	330	330	ND
Fluoranthene	330	330	ND
Pyrene	330	330	ND
Butylbenzylphthalate	330	330	ND
Benzo[a]anthracene	330	330	ND
3,3'-Dichlorobenzidine	660	660	ND
Chrysene	330	330	ND
bis(2-Ethylhexyl)phthalate	330	330	ND
Di-n-octylphthalate	330	330	ND
Benzo[b]fluoranthene	330	330	ND
Benzo[k]fluoranthene	330	330	ND
Benzo[a]pyrene	330	330	ND
Indeno[1,2,3-cd]pyrene	330	330	ND
Dibenz[a,h,]anthracene	330	330	ND
Benzo[g,h,i]perylene	330	330	ND

MDL = Method Detection Limit
ND = Not Detected (Below DLR)
DLR = MDL x Dilution Factor
NA = Not Analyzed

Approved/Reviewed By: _____ Date: 12/19/97

Lee Ingvaldson
Department Supervisor

The cover letter is an integral part of this analytical report.

Spike Recovery and RPD Summary Report - SOIL (ug/kg)

Method : C:\HPCHEM\1\METHODS\VOCW.M (RTE Integrator)
Title : Volatile Organic Compounds
Last Update : Wed Dec 17 10:20:56 1997
Response via : Initial Calibration

Non-Spiked Sample: 22588-07.D

	Spike Sample	Spike Duplicate Sample
File ID :	PMS1219A.D	PMD1219A.D
Sample :	22588-007 MS SOIL	22588-007 MSD SOIL
Acq Time:	19 Dec 97 9:34 am	19 Dec 97 10:01 am

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
1,1-dichloroethene	0.0	50	51	50	102	100	2	19	49-154
benzene	0.0	50	51	50	102	99	3	15	67-128
trichloroethene	0.0	50	54	52	108	103	5	16	67-130
toluene	0.0	50	44	43	88	85	3	15	74-123
chlorobenzene	0.0	50	54	54	108	108	0	14	80-122

QC Batch # P97VOCS143

Reviewed/Approved By: _____ Date: 12/19/97

Lee Ingvaldson
Organics Supervisor

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Method : C:\HPCHEM\1\METHODS\8270C.M
Title : 8270C Advanced Technology Laboratory
Last Update : Fri Dec 19 09:04:37 1997
Response via : Initial Calibration

Non-Spiked Sample: RB1219A.D

	Spike Sample	Spike Duplicate Sample
File ID :	RMS1219B.D	RMD1219B.D
Sample :	soil spike e:12/18/97	soil spike dup e:12/18/97
Acq Time:	19 Dec 97 12:05 pm	19 Dec 97 12:46 pm

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
Phenol	0.0	200	114	122	57	61	7	35	26- 90
2-Chlorophenol	0.0	200	113	120	56	60	7	50	25-102
1,4-Dichlorobenzene	0.0	100	47	52	47	52	9	27	28-104
N-Nitroso-di-n-propy	0.0	100	82	89	82	89	9	38	41-126
1,2,4-Trichlorobenze	0.0	100	58	62	58	62	6	23	38-107
4-Chloro-3-methylphe	0.0	200	125	132	63	66	5	33	26-103
Acenaphthene	0.0	100	58	63	58	63	9	19	31-137
4-Nitrophenol	0.0	200	109	117	54	58	7	50	11-114
2,4-Dinitrotoluene	0.0	100	71	76	71	75	6	47	28- 89
Pentachlorophenol	0.0	200	110	113	55	57	3	47	17-109
Pyrene	0.0	100	71	73	71	72	3	36	35-142

QCBATCH#R978270S260

Reviewed/Approved By: _____ Date: 12/19/97
Lee Ingvaldson
Department Supervisor

Client: Golder Associates
Attn: Mr. Fred Allison

Client's Project: Edison HGS, 973-1967
Date Received: 12/17/97
Matrix: Soil
Units: mg/kg
Digestion Method: EPA 3050

EPA 6010 (CCR Metals)									
Lab No.:		22588-002	22588-004	22588-006	22588-007				
Client Sample I.D.:		B-1-20	B-1-40	B-1-60	B-1-70				
Date Sampled:		12/17/97	12/17/97	12/17/97	12/17/97				
Date Digested:		12/18/97	12/18/97	12/18/97	12/18/97				
Date Analyzed:		12/19/97	12/19/97	12/19/97	12/19/97				
Analyst Initials:		LP	LP	LP	LP				
Dilution Factor:		1	1	1	1				
ANALYTE*	DLR	RESULTS							
Antimony	0.25	0.63	0.73	0.47	1.2				
Arsenic	0.25	1.6	1.6	0.38	0.32				
Barium	0.050	90	92	26	88				
Beryllium	0.050	ND	ND	ND	ND				
Cadmium	0.15	ND	ND	ND	ND				
Chromium	0.15	8.4	12	2.4	6.0				
Cobalt	0.15	6.6	8.3	2.0	6.0				
Copper	0.15	6.5	13	7.4	14				
Lead	0.25	3.9	2.8	0.95	0.76				
Mercury **	0.10	ND	ND	ND	ND				
Molybdenum	0.25	0.43	0.57	ND	0.77				
Nickel	0.15	5.7	10	2.9	4.4				
Selenium	0.25	0.32	0.43	0.30	0.80				
Silver	0.050	ND	ND	ND	ND				
Thallium	0.25	0.80	1.5	0.43	2.0				
Vanadium	0.15	25	32	8.4	14				
Zinc	0.50	26	31	12	60				

MDL = Method Detection Limit
ND = Not Detected (Below DLR).
DLR = MDL X Dilution Factor
* = Only listed constituents designated with TTLC and STLC under CCR Title 22
** = Analysis by EPA Method 7471, Date Analyzed: 12/18/97.

Reviewed/Approved By: Cheryl de L
Cheryl De Los Reyes
Department Supervisor

Date: 12/19/97

The cover letter is an integral part of this analytical report.

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Client: Golder Associates
Attn: Mr. Fred Allison

Client's Project: Edison HGS, 973-1967

Date Received: 12/17/97
Date Sampled: 12/17/97

Lab No.	Sample ID	Analysis	Date Analyze	Results	Matrix Units	MDL	DLR	Analyst
22588-008	B-2-10	EPA 418.1 (TRPH)	12/09/97	20	Soil, mg/kg	10	10	MO
22588-009	B-2-15	EPA 418.1 (TRPH)	12/09/97	ND	Soil, mg/kg	10	10	MO
22588-010	B-2-20	EPA 418.1 (TRPH)	12/09/97	ND	Soil, mg/kg	10	10	MO
22588-011	B-3-5	EPA 9045 (pH)	12/19/97	8.10	Soil, pH units	—	—	DG
22588-012	B-3-10	EPA 9045 (pH)	12/19/97	7.98	Soil, pH units	—	—	DG

MDL = Method Detection Limit
ND = Not Detected (Below DLR)
DF = Dilution Factor (DLR/MDL)

Reviewed/Approved By: Cheryl de los Reyes Date: 12/19/97
Cheryl De Los Reyes
Department Supervisor

The cover letter is an integral part of this analytical report.

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Spike Recovery and RPD Summary Report

Method: 6010
Analyst: LP/OL
QA File: 7353-1SS
Data File: ICAP71219-1

Date Analyzed: 12/19/1997
Date Digested: 12/18/1997
Sample ID: 22529-009
Matrix: Soil/Solid

ANALYTE	UNITS	LCS Conc	LCS Res	LCS Rec.	METH BLANK	SPL CONC	SPK ADDED	MS RESULT	MSD RESULT	%MS REC	%MSD REC	% REC Limit	RPD	RPD Limit	MDL
Antimony	mg/kg	1.0	1.0	100	ND	0.90	125	104	106	82	84	41 - 129	2	31	0.25
Arsenic	mg/kg	1.0	0.94	94	ND	1.4	125	107	108	84	85	62 - 119	1	13	0.25
Barium	mg/kg	1.0	0.79	79	ND	46	125	163	166	94	96	59 - 135	3	44	0.05
Beryllium	mg/kg	1.0	0.90	90	ND	ND	125	102	103	82	82	49 - 122	1	12	0.05
Cadmium	mg/kg	1.0	0.91	91	ND	ND	125	101	102	81	82	66 - 110	1	12	0.15
Chromium	mg/kg	1.0	0.95	95	ND	9.4	125	114	115	84	84	52 - 136	1	39	0.15
Cobalt	mg/kg	1.0	0.95	95	ND	3.3	125	115	116	89	90	67 - 113	1	13	0.15
Copper	mg/kg	1.0	0.90	90	ND	6.0	125	117	119	89	90	70 - 124	2	18	0.15
Lead	mg/kg	1.0	0.94	94	ND	7.3	125	113	113	85	85	54 - 124	0	24	0.25
Molybdenum	mg/kg	1.0	0.99	99	ND	0.27	125	108	110	86	88	71 - 109	2	19	0.25
Nickel	mg/kg	1.0	0.90	90	ND	10	125	118	115	87	84	47 - 136	3	37	0.15
Selenium	mg/kg	1.0	0.92	92	ND	0.28	125	102	102	81	81	50 - 120	0	22	0.25
Silver	mg/kg	1.0	0.91	91	ND	ND	125	85	86	68	69	31 - 138	1	38	0.05
Thallium	mg/kg	1.0	0.96	96	ND	0.48	125	103	104	82	83	59 - 114	1	21	0.25
Vanadium	mg/kg	1.0	0.98	98	ND	12	125	126	127	91	92	68 - 121	1	15	0.15
Zinc	mg/kg	1.0	0.96	96	ND	27	125	132	133	84	85	35 - 138	1	30	0.50

Approved by: Cheryl de los Reyes
Cheryl De Los Reyes
Inorganics Supervisor

Date: 12/19/97

Spike Recovery and RPD Summary Report

Method: EPA7471
Analyst: CDR/DJ
Data File: 71218-1
QA File: 7352-1

Date: 12-18-97
Sample ID: 22588-007
Matrix: soil/soild/liquid

ANALYTE	UNITS	LCS Conc	LCS Res	% Rec	METH BLANK	SPL CONC	SPK ADDED	MS RESULT	MSD RESULT	%MS REC	%MSD REC	% REC Limit	RPD	RPD Limit	DLR
Mercury	mg/kg	0.50	0.53	106	ND	ND	0.83	0.92	0.89	111	107	44-139	3	33	0.10

Approved by: Cheryl De Los Reyes
Cheryl De Los Reyes
Inorganics Supervisor

Date: 12/19/97

Spike Recovery and RPD Summary Report

Method: 418.1
Analyst: MO
Data File: 7360-1S

Date: 12-19-97
Sample ID: 22565-006
Matrix: SOIL

ANALYTE	UNITS	LCS	LCS Res	% Rec	METH BLANK	SPL CONC	SPK ADDED	MS RESULT	MSD RESULT	%MS REC	%MSD REC	REC Limit	RPD	RPD Limit	MDL
TRPH	mg/kg	400	390	98	ND	25	400	408	400	96	94	65-123	2	20	10

Approved by: Cheryl De Los Reyes
Cheryl De Los Reyes
Inorganics Supervisor

Date: 12/19/97

CHAIN Or JSTODY RECORD

PROJ. NO.	SITE/LOCATION
973-1967	EDISON HGS

SAMPLERS: (Signature) Alan Pace

STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	AMOUNT/PRESERVATIVE 6010	8260	418.1					SEAL NO.	SEAL INTACT? (Y or N)	REMARKS (with initials)
B-1	12/17		Brass Tube		B-1-10	1		X								Hold Septi
B-1	↓		↓		B-1-20	1	X	X								
B-1	↓		↓		B-1-30	1										Hold
B-1	↓		↓		B-1-40	1	X									
B-1	↓		↓		B-1-50	1										Hold
B-1	↓		↓		B-1-60	1	X									
B-1	↓		↓		B-1-70	1	X	X								
B-2	↓		↓		B-2-10	1		X	X							oil-water sy
B-2	↓		↓		B-2-15	1		X	X							
B-2	↓		↓		B-2-20	1		X	X							

Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)
Alan Pace	12/17 4:30	Ofer [signature]			
Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)
	12/17/97 5:30	[signature] ATL			
Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)	Date/Time	Remarks (attachments if necessary)	
				48 Hour Turn-Around-Time Hold all samples that are not analyzed	

CHAIN OF CUSTODY RECORD

PROJ. NO.	SITE / LOCATION
973-1967	EDISON HGS

SAMPLERS: (Signature)
Allen Pace

STA NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	AMOUNT / PRESERVATIVE	6010	8260	418.1	8270	PH + 9045	SEAL NO.	SEAL INTACT? (Y or N)	REMARKS (with initials)
B-3	12/17	2:20	Brass Tube		B-3-5	1		X		X	X				
B-3	↓	2:30	↓		B-3-10	1		X		X	X				
B-4		3:15			B-4-5	1		X		X					Demin. A
B-4		3:20			B-4-10	1		X		X					
B-5		4:05			B-5-5	1		X		X					Chem. Strg. A
B-5		4:15	↓		B-5-10	1		X		X					
															Tanks by Cooling

Relinquished by: (Signature / Firm)	Date / Time	Received by: (Signature / Firm)	Relinquished by: (Signature / Firm)	Date / Time	Received by: (Signature / Firm)
Allen Pace	12/17 4:30				
	12/17/17 5:20	Alliance ATL			

Remarks (attachments if necessary)
48 Hour Turn-around-time

San Bernardino County Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES
385 North Arrowhead Avenue, San Bernardino, CA 92415-0160

VERBAL OK TO W. HINTON 12-17-97 11:30 a.m.

WELL PERMIT
(Please Print)

DO NOT FILL IN
Permit Number 12179701
Expiration 12-17-98
FF
FA
SN

DO NOT FILL IN
Date 12-16-97
Amount $ 235.00 ($175.00 + $60)
Receipt Number 10576 & 10579
Paid By O. Sendowski CR# 5404 54

1. OWNER: Name Southern California Edison
Mailing Address 2244 Walnut Grove Ave.
City Rosemead Zip 91770
Site Address 12700 Taylor St.
City Colton, CA Zip 92324
Telephone Number ( )

2. WELL DRILLER: Spectrum Exploration (Business Name)
12/17/97 (Start Date) 12/19/97 (Completion Date)

3. WELL USE (check):
☐ Community ☐ Individual ☐ Agricultural
☐ Horizontal ☑ Monitoring ☐ Public Water Supply
☐ Test ☐ Dairy ☐ Other

TYPE OF WORK (check):
☑ New ☐ Reconstruction ☐ Destruction

Items 5 through 10 to be submitted for new wells, exact for all other wells

5. ANNULAR SEAL: Seal Depth 96
Furnished by: ☐ Owner ☑ Contractor
☐ Driven Conductor Dia. ____ In., Wall (Gage) ____
☐ Sealing Material Bentonite, Thickness 24 to 36

6. DEPTH OF WELL (feet):
Proposed 120 Existing ____
DIAMETER OF BORE (In.): 10"

7. CASING INSTALLED:
☐ Steel ☐ Plastic ☑ Other PVC

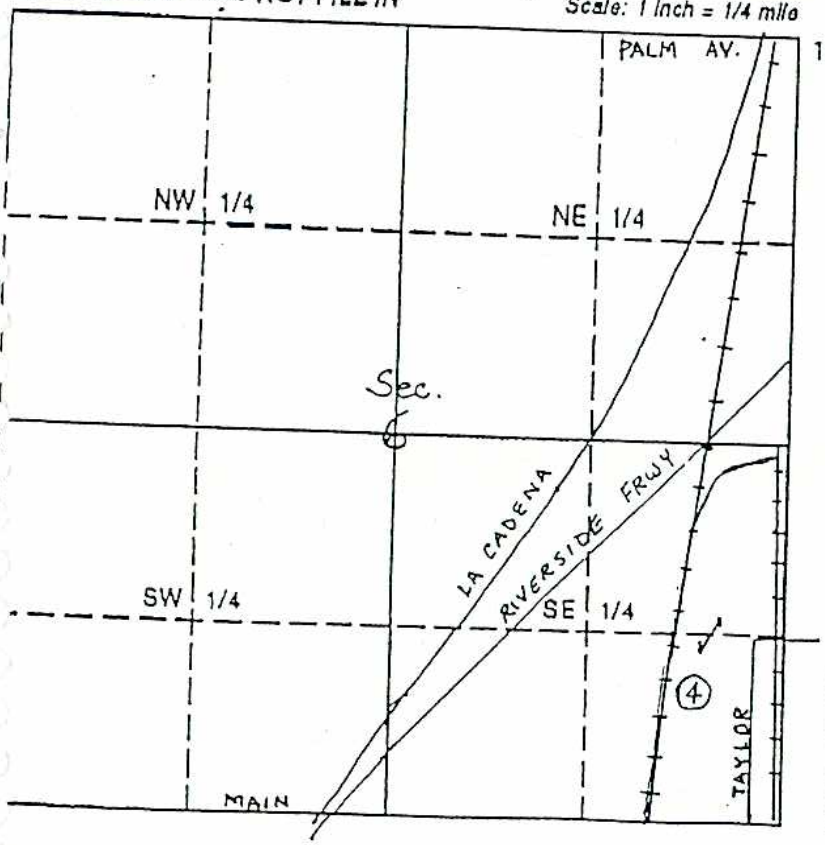
From (ft.)	To (ft.)	Dia. (in.)	Wall (Gage)
0	100	4"	Sch 40

Gravel Pack: ☑ Yes ☐ No
From 120 to 98 ft.

8. PERFORATIONS (if applicable):
From 100.5 to 119.5 ft. .020 Slot

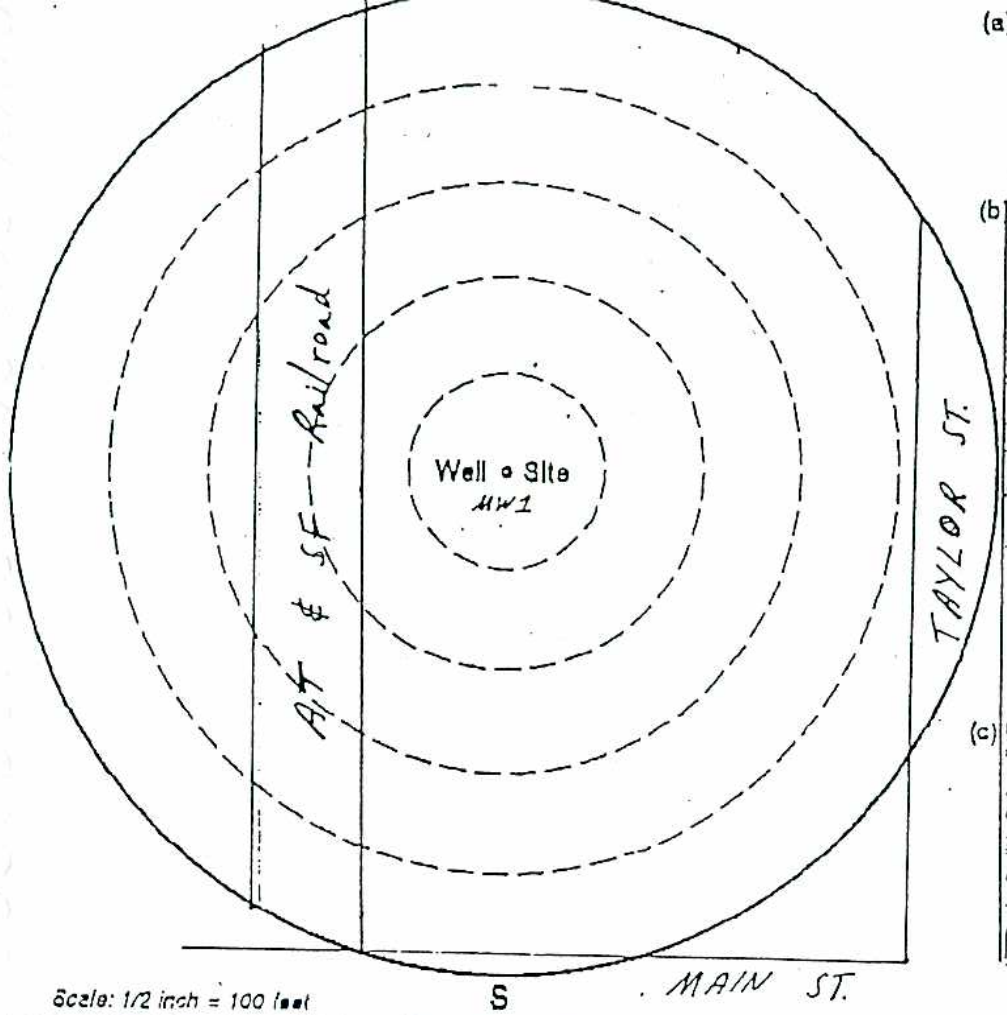
9. SEALED ZONES (if applicable): NA
From ____ to ____ ft.

SECTION MAP - DO NOT FILL IN
Scale: 1 inch = 1/4 mile



10. LOCATION INFORMATION: 42 - A 1
(a) Township:
Tier 2S N/S Range 4W E/W Section 6
(b) Assessor's Parcel No. 2770710400 00
(c) Latitude and Longitude
Lat: 34 ° 1 ' 22 " N/S
Long: 117 ° 19 ' 19 " E/W
(d) Solid or Liquid Disposal Site within Two Miles
☐ Yes ☑ No
Location ____

DO NOT FILL IN
Seal ____
Cap ____
Check Valve ____
Electricals ____
Slab ____
Tag ____
Building & Safety Notified ____



Scale: 1/2 inch = 100 feet

(a) In perspective to the well site, sketch and label the following items: well lot property lines, other wells *(include abandoned wells)*, sewage disposal systems *(sewers, septic tanks, leaching fields, seepage pits, cesspools)*, lakes and ponds, watercourses and animals or fowl kept.

(b) Indicate the distance, in **feet**, of any of the following which are within 500 ft. of the well site:

Other _____
Sewers _____
Septic tanks _____
Leaching fields _____
Seepage pits _____
Cesspools _____
Lakes and ponds _____
Watercourses _____
Animals or fowl kept _____

(c) ☐ None of the above are within 500 feet of the well site.

ave read this application and agree to comply with all laws regulating the type of work being performed.

C-57 Contractor's Signature X _____ Date 12-15-97

County Registration No. _____ California License No. 572224

DISPOSITON OF PERMIT

(For Department Use Only)

1. Sent to Water Agency for review.
2. Water Agency conditions or recommendations attached.
3. Denied _____
4. Approved subject to the following:
   a. ☒ Notify the Department, Mike Farrell (909) 387-4666, twenty-four (24) hours in advance to make an inspection of the following operations:
      - ☐ Prior to sealing of the annular space or filling of the conductor casing.
      - ☒ After installation of the surface protective slab ~~and pumping equipment.~~
      - ☐ During destruction of wells, prior to pouring the sealing material.
   b. ☒ Submit to the Department, within thirty (30) days after completion of work, a copy of:
      - ☒ Water Well Driller's Report
      - ☐ Bacterial Analysis
      - ☐ Inorganic Chemical Analysis
      - ☐ Radiological Analysis
      - ☐ General Mineral
      - ☐ Organic Chemical Analysis
      - ☐ General Physical

Comments _____

San Bernardino County Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES
385 North Arrowhead Avenue, San Bernardino, CA 92415-0160

VERBAL OK TO W. HINTON 12-17-97 11:30 a.m.

WELL PERMIT
(Please Print)

DO NOT FILL IN
Permit Number 12179702
Expiration 12-17-98
F
FA
SN

DO NOT FILL IN
Date 12-16-97
Amount $ 235.00 ($175.00 + $60.00)
Receipt Number 10576 & 10579
Paid By Ofer Seandowski CK# 540 & 541

1. OWNER: Name Southern California Edison
Mailing Address 2244 Walnut Grove Ave.
City Rosemead. Zip 91770
Site Address 12700 Taylor St.
City Colton, CA Zip 92324
Telephone Number ( )

Items 5 through 10 to be submitted for new wells, exact for all other wells.

5. ANNULAR SEAL: Seal Depth 96 ft.
Furnished by: ☐ Owner ☑ Contractor
☐ Driven Conductor Dia. In., Wall (Gage)
☐ Sealing Material Bentonite, Thickness 24 to 36 in.

6. DEPTH OF WELL *(feet)*:
Proposed 120 Existing
DIAMETER OF BORE *(in.)*: 10"

WELL DRILLER: Spectrum Exploration
Business Name
12/17/97 *Start Date* 12/19/97 *Completion Date*

7. CASING INSTALLED:
☐ Steel ☐ Plastic ☑ Other PVC

From (ft.)	To (ft.)	Dia. (in.)	Wall (Gage)
0	100	4"	Sch 40

Gravel Pack: ☑ Yes ☐ No
From 120 to 98 ft.

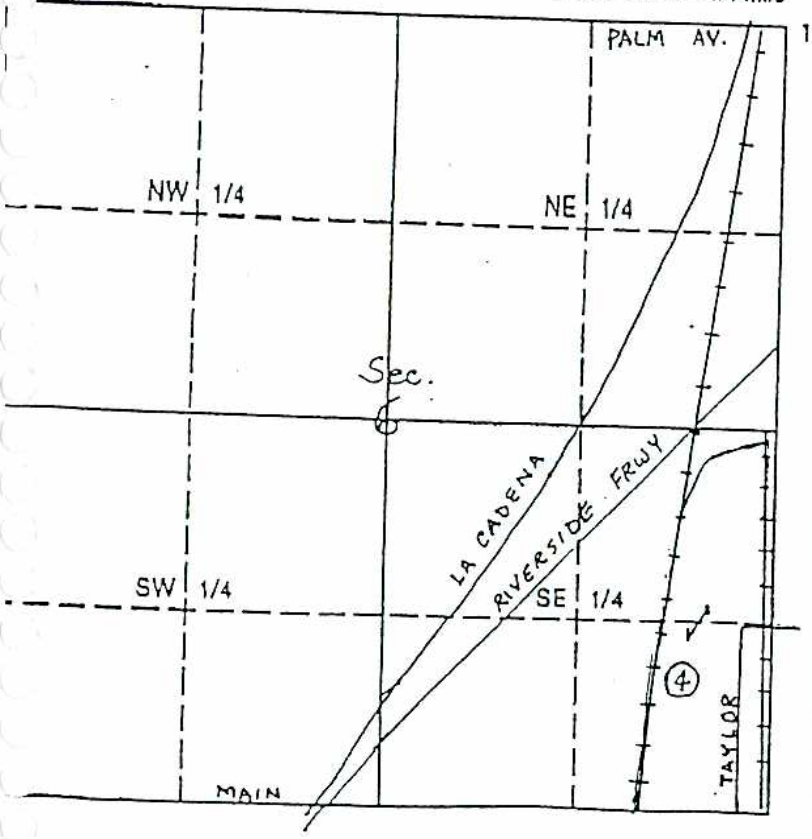
WELL USE *(check)*:
☐ Community ☐ Individual ☐ Agricultural
☐ Horizontal ☑ Monitoring ☐ Public Water Supply
☐ Test ☐ Dairy ☐ Other

8. PERFORATIONS *(if applicable)*:
From 100.5 to 119.5 ft. .020 Slot

TYPE OF WORK *(check)*:
☑ New ☐ Reconstruction ☐ Destruction

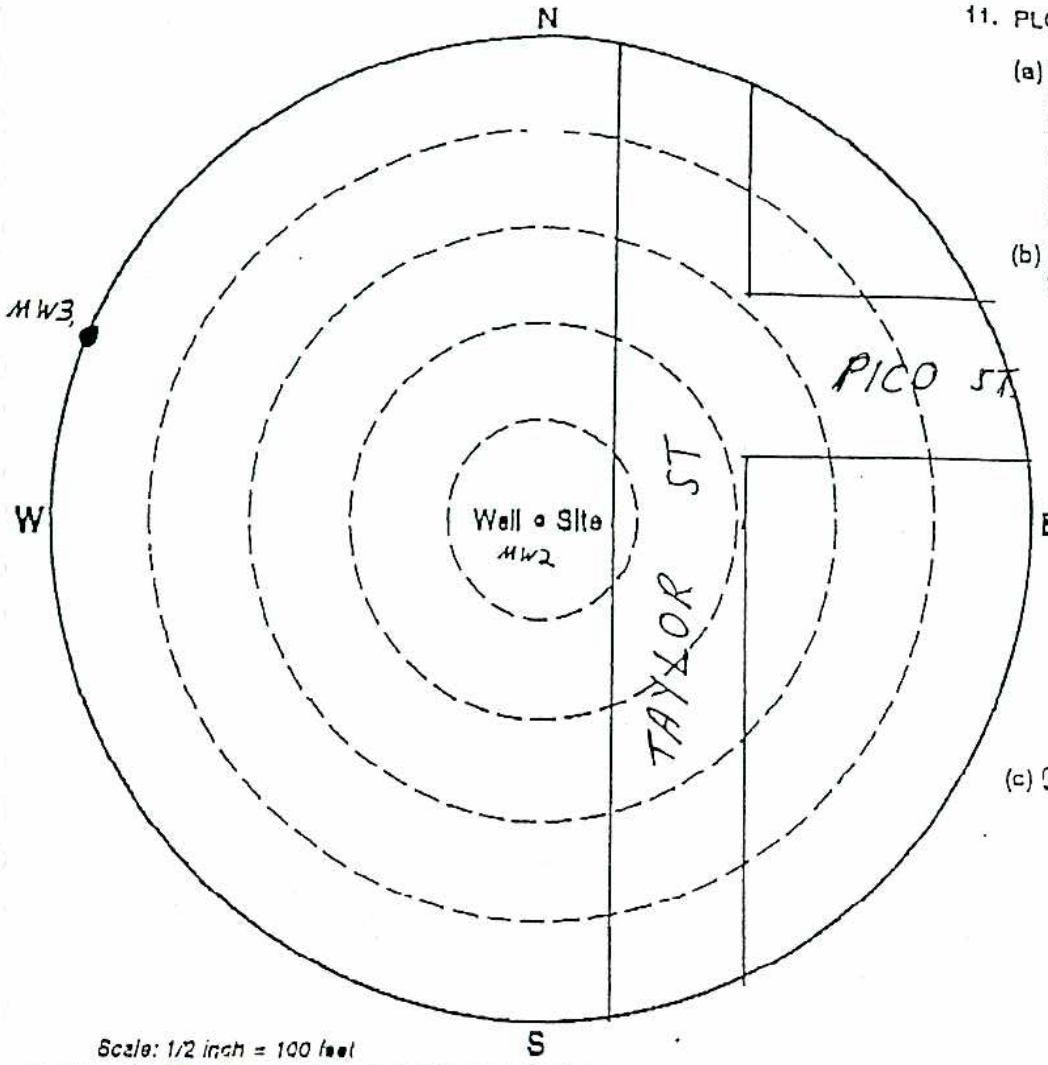
9. SEALED ZONES *(if applicable)*: NA
From to ft.

SECTION MAP - DO NOT FILL IN *Scale: 1 inch = 1/4 mile*



10. LOCATION INFORMATION: 42-A1
(a) Township:
Tier 2S N/S Range 4W E/W Section
(b) Assessor's Parcel No. 2770710400000
(c) Latitude and Longitude
Lat: 34 °, 1 ', 22 " N/S
Long: 117 °, 19 ', 19 " E/W
(d) Solid or Liquid Disposal Site within Two Miles
☐ Yes ☑ No
Location

DO NOT FILL IN
Seal
Cap
Check Valve
Electricals
Slab
Tag
Building & Safety Notified



11. PLOT PLAN: 12179702

(a) In perspective to the well site, sketch and labe the following items: well lot property lines, oth wells *(include abandoned wells)*, sewage disposal systems *(sewers, septic tanks, leachi fields, seepage pits, cesspools)*, lakes and ponds, watercourses and animals or fowl kept.

(b) Indicate the distance, in **feet**, of any of the following which are within 500 ft. of the well sit

Other _____
Sewers _____
Septic tanks _____
Leaching fields _____
Seepage pits _____
Cesspools _____
Lakes and ponds _____
Watercourses _____
Animals or fowl kept _____

(c) ☐ None of the above are within 500 feet of th well site.

12. I have read this application and agree to comply with all laws regulating the type of work being performed.

C-57 Contractor's Signature Wells B Inc. Date 12-05-97

County Registration No. _____ California License No. 512268

DISPOSITON OF PERMIT

(For Department Use Only)

☐ Sent to Water Agency for review.

☐ Water Agency conditions or recommendations attached.

☐ Denied _____

☒ Approved subject to the following:

A. ☒ Notify the Department, Mike Farrell (909) 387-4666, twenty-four (24) hours in adva to make an inspection of the following operations:

☐ Prior to sealing of the annular space or filling of the conductor casing.

☒ After installation of the surface protective slab ~~and pumping equipment~~.

☐ During destruction of wells, prior to pouring the sealing material.

B. ☒ Submit to the Department, within thirty (30) days after completion of work, a copy of:

☒ Water Well Driller's Report ☐ Bacterial Analysis ☐ Inorganic Chemical Analysis

☐ Radiological Analysis ☐ General Mineral ☐ Organic Chemical Analysis ☐ General Physical

Comments _____

San Bernardino County Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES
385 North Arrowhead Avenue, San Bernardino, CA 92415-0160

DO NOT FILL IN
Permit Number 12179703
Expiration 12-17-98
FF
FA
SN

WELL PERMIT
(Please Print)

DO NOT FILL IN
Date 12-16-97
Amount $ 235.00 ~~$175.00~~ + $60.00
Receipt Number 10576 + 10579
Paid By Ofer Sandowski CK, 54045

1. OWNER: Name Southern California Edison
Mailing Address 2244 Walnut Grove Ave.
City Rosemead Zip 91770
Site Address 12700 Taylor St.
City Colton, CA Zip 92324
Telephone Number ( )

2. WELL DRILLER: Spectrum Exploration
Business Name
12/17/97 Start Date
12/19/97 Completion Date

3. WELL USE *(check)*:
☐ Community ☐ Horizontal ☐ Test
☐ Individual ☑ Monitoring ☐ Dairy
☐ Agricultural ☐ Public Water Supply ☐ Other

4. TYPE OF WORK *(check)*:
☑ New ☐ Reconstruction ☐ Destruction

Items 5 through 10 to be estimated for new wells, exact for all other wells

5. ANNULAR SEAL: Seal Depth 96
Furnished by: ☐ Owner ☑ Contractor
☐ Driven Conductor Dia. ____ In., Wall (Gage) ____
☐ Sealing Material Bentonite, Thickness 24 to 36

6. DEPTH OF WELL *(feet)*:
Proposed 120 Existing ____
DIAMETER OF BORE *(in.)*: 10"

7. CASING INSTALLED:
☐ Steel ☐ Plastic ☑ Other PVC

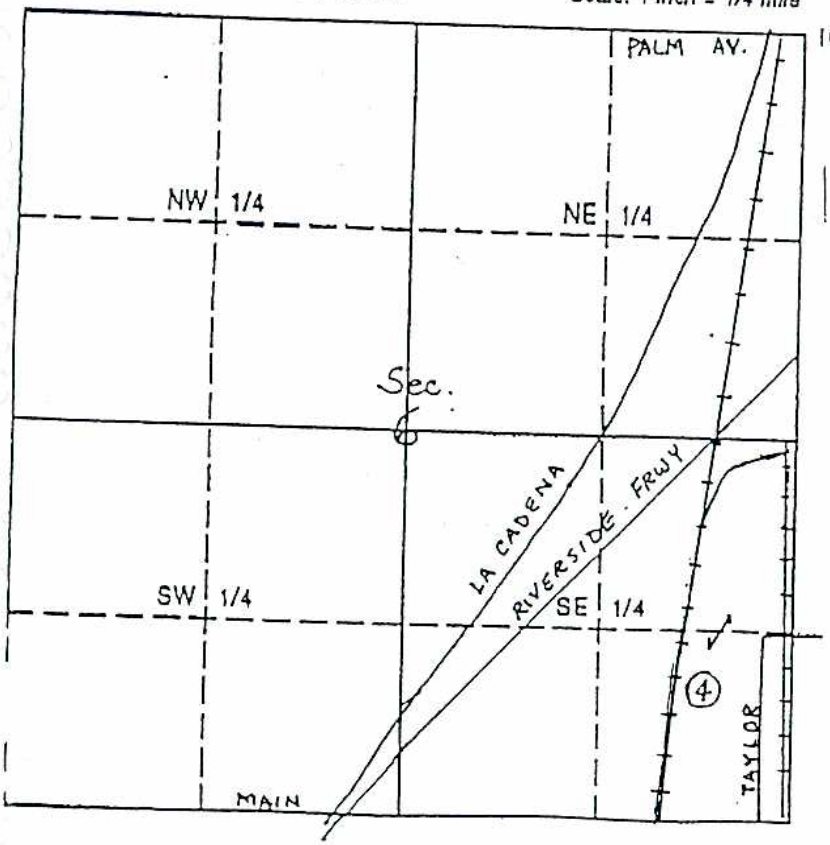
From (ft.)	To (ft.)	Dia. (in.)	Wall (Gage)
0	100	4"	Sch 40

Gravel Pack: ☑ Yes ☐ No
From 120 to 98 ft.

8. PERFORATIONS *(if applicable)*:
From 100.5 to 119.5 ft .020 Slot

9. SEALED ZONES *(if applicable)*: NA
From ____ to ____ ft.

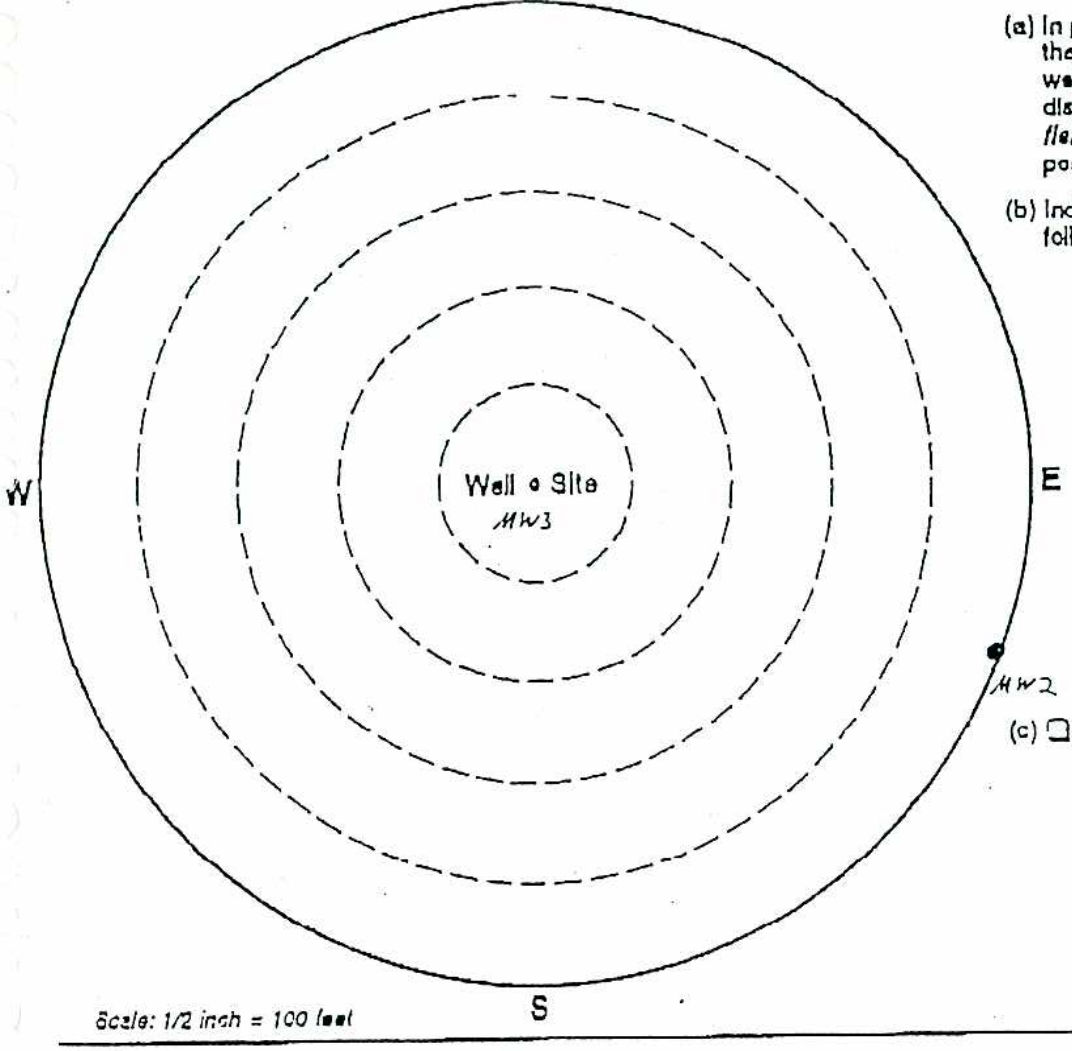
SECTION MAP - DO NOT FILL IN
Scale: 1 inch = 1/4 mile



10. LOCATION INFORMATION: 42-A1
(a) Township:
Tier 2S N/S Range 4W E/W Section ____
(b) Assessor's Parcel No. 2770710400000
(c) Latitude and Longitude
Lat: 34 ° 1 ' 22 " N/S
Long: 117 ° 19 ' 19 " E/W
(d) Solid or Liquid Disposal Site within Two Miles
☐ Yes ☑ No
Location ____

DO NOT FILL IN
Seal
Cap
Check Valve
Electricals
Slab
Tag
Building & Safety Notified

D:\WATER\WELLPRMT.P
Revised August 1



Scale: 1/2 inch = 100 feet

(a) In perspective to the well site, sketch and label the following items: well lot property lines, other wells *(include abandoned wells)*, sewage disposal systems *(sewers, septic tanks, leaching fields, seepage pits, cesspools)*, lakes and ponds, watercourses and animals or fowl kept.

(b) Indicate the distance, in feet, of any of the following which are within 500 ft. of the well site:

Other _____

Sewers _____

Septic tanks _____

Leaching fields _____

Seepage pits _____

Cesspools _____

Lakes and ponds _____

Watercourses _____

Animals or fowl kept _____

(c) ☐ None of the above are within 500 feet of the well site.

I have read this application and agree to comply with all laws regulating the type of work being performed.

C-57 Contractor's Signature Wells 3 LLC Date 11-05-97

County Registration No. _____ California License No. 572248

DISPOSITON OF PERMIT

(For Department Use Only)

☐ Sent to Water Agency for review.

☐ Water Agency conditions or recommendations attached.

☐ Denied _____

☒ Approved subject to the following:

A. ☒ Notify the Department, Mike Farrell (909) 387-4666, twenty-four (24) hours in advance to make an inspection of the following operations:

☐ Prior to sealing of the annular space or filling of the conductor casing.

☒ After installation of the surface protective slab ~~and pumping equipment.~~

☐ During destruction of wells, prior to pouring the sealing material.

B. ☒ Submit to the Department, within thirty (30) days after completion of work, a copy of:

☒ Water Well Driller's Report ☐ Bacterial Analysis ☐ Inorganic Chemical Analysis

☐ Radiological Analysis ☐ General Mineral ☐ Organic Chemical Analysis ☐ General Physical

Comments _____

DIVISION OF ENVIRONMENTAL HEALTH SERVICES
385 North Arrowhead Avenue, San Bernardino, CA 92415-0160

DO NOT FILL IN

Permit Number 03029802
Expiration 3/02/99
cF
FA
SN

WELL PERMIT
(Please Print)

DO NOT FILL IN

Date 2/26/98
Amount $ 135.00
Receipt Number 11463
Paid By : Golder Associates Inc.

1. OWNER: Name Southern California Edison
Mailing Address 2244 Walnut Grove Ave.
City Rosemead Zip 91770
Site Address 13700 Taylor St.
City Colton Zip 92324
Telephone Number ( ) _____

2. WELL DRILLER: Duxbury Drilling
Business Name
3/2/98 Start Date
3/6/98 Completion Date

3. WELL USE *(check)*:
☐ Community ☐ Horizontal ☐ Test
☐ Individual ☑ Monitoring ☐ Dairy
☐ Agricultural ☐ Public Water Supply ☐ Other

TYPE OF WORK *(check)*:
☐ New ☐ Reconstruction ☑ Destruction

Items 5 through 10 to be estimated for new wells, exact for all other wells.

5. ANNULAR SEAL: Seal Depth 88 ft.
Furnished by: ☐ Owner ☐ Contractor
☐ Driven Conductor Dia. _____ in., Wall (Gage) _____
☐ Sealing Material Bentonite. Thickness 24-36 in.

6. DEPTH OF WELL *(feet)*:
Proposed _____ Existing 110
DIAMETER OF BORE *(in.)*: 10

7. CASING INSTALLED:
☐ Steel ☐ Plastic ☑ Other PVC

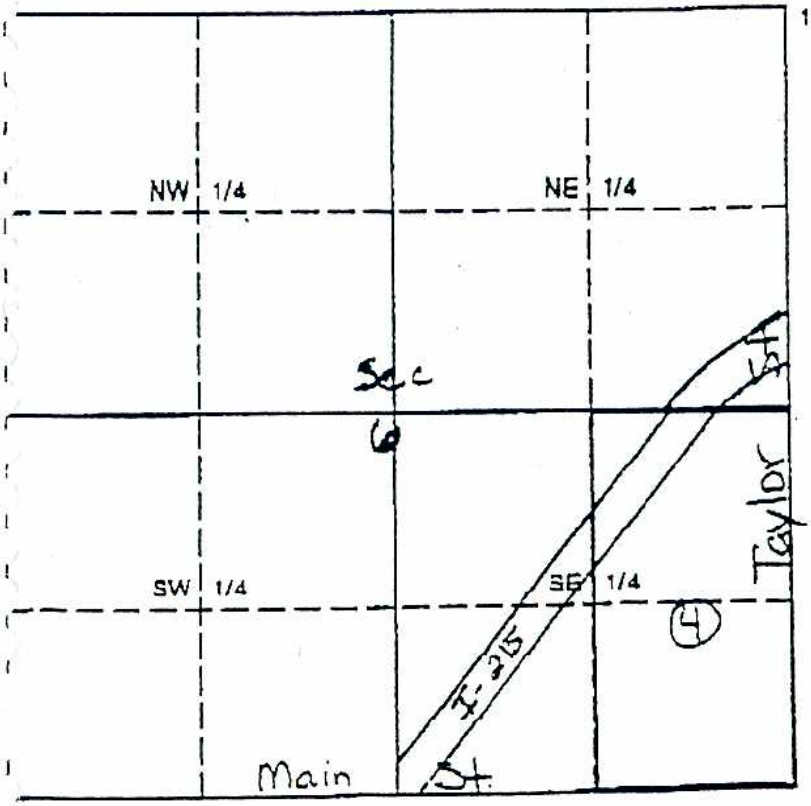
From (ft.)	To (ft.)	Dia. (in.)	Wall (Gage)
0	88	4	Sch 40

Gravel Pack ☑ Yes ☐ No
From 88 to 110 ft.

8. PERFORATIONS *(if applicable)*:
From 89 to 109 ft.

9. SEALED ZONES *(if applicable)*: NA
From _____ to _____ ft.

SECTION MAP - DO NOT FILL IN *Scale: 1 inch = 1/4 mile*

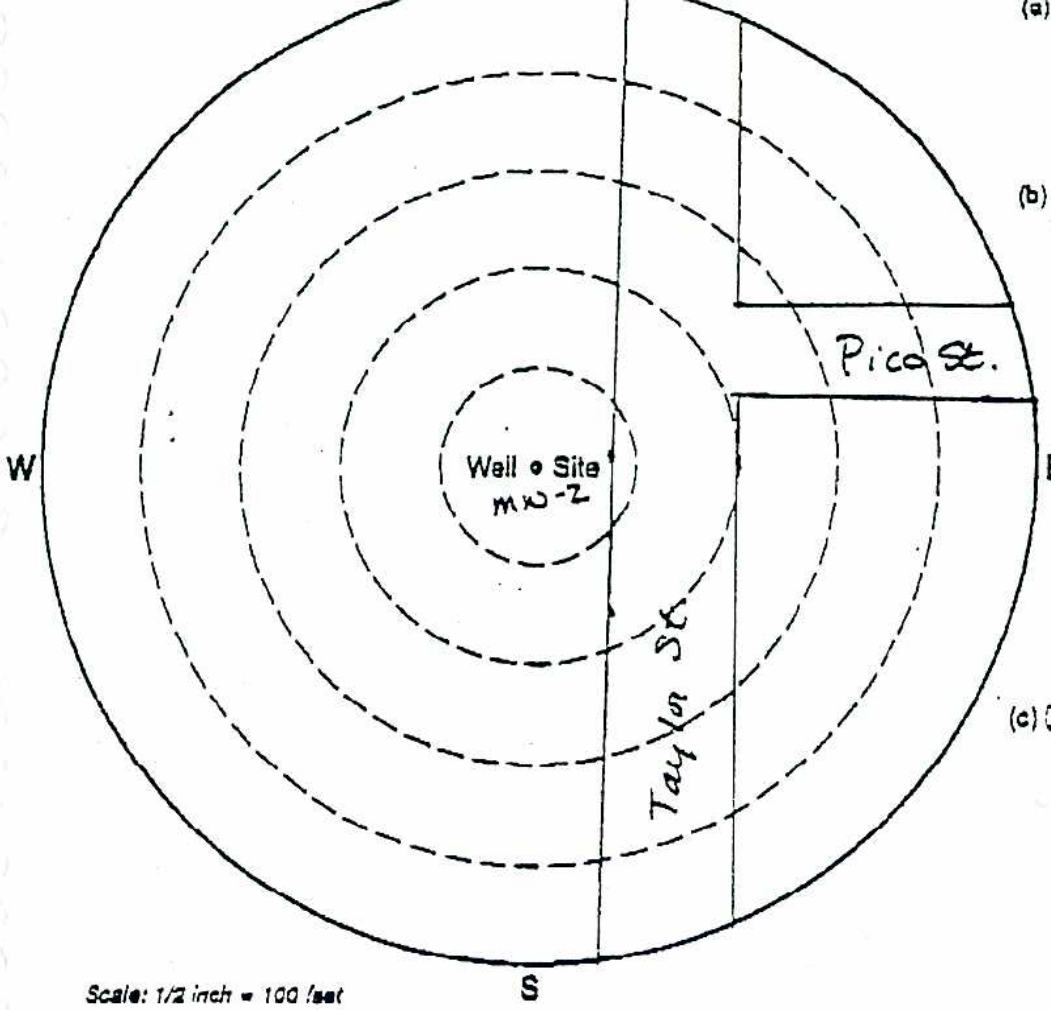


10. LOCATION INFORMATION: 42-A1
(a) Township:
Tier 2S N/S Range 4W E/W Section 6
(b) Assessor's Parcel No. 2770710400 00
(c) Latitude and Longitude
Lat: 34 ° 1 ' 22 " N/S
Long: 117 ° 19 ' 19 " E/W
(d) Solid or Liquid Disposal Site within Two Miles
☐ Yes ☐ No
Location _____

DO NOT FILL IN

Seal _____
Cap _____
Check Valve _____
Electricals _____
Slab _____
Tag _____
Building & Safety Notified _____

D:\WATER\WELLPRMT.P
Revised August 19



Scale: 1/2 inch = 100 feet

(a) In perspective to the well site, sketch and lab: the following items: well lot property lines, oth wells *(include abandoned wells)*, sewage disposal systems *(sewers, septic tanks, leachi fields, seepage pits, cesspools)*, lakes and ponds, watercourses and animals or fowl kept

(b) Indicate the distance, in feet, of any of the following which are within 500 ft. of the well si

Other	
Sewers	
Septic tanks	
Leaching fields	
Seepage pits	
Cesspools	
Lakes and ponds	
Watercourses	
Animals or fowl kept	

(c) ☐ None of the above are within 500 feet of th well site.

I have read this application and agree to comply with all laws regulating the type of work being performed.

C-57 Contractor's Signature [signature] Date 2/24/98

County Registration No. _____ California License No. 674591

DISPOSITON OF PERMIT

(For Department Use Only)

☐ Sent to Water Agency for review.

☐ Water Agency conditions or recommendations attached.

☐ Denied _____

☒ Approved subject to the following:

A. ☒ Notify the Department, Duane Dorcito (909) 387-4666, twenty-four (24) hours in advanc to make an inspection of the following operations:

- ☐ Prior to sealing of the annular space or filling of the conductor casing.
- ☒ After installation ~~of the surface protective slab and pumping equipment.~~
- ☐ During destruction of wells, prior to pouring the sealing material.

B. ☒ Submit to the Department, within thirty (30) days after completion of work, a copy of:

- ☒ Water Well Driller's Report
- ☐ Bacterial Analysis
- ☐ Inorganic Chemical Analysis
- ☐ Radiological Analysis
- ☐ General Mineral
- ☐ Organic Chemical Analysis
- ☐ General Physical

Comments _____

DIVISION OF ENVIRONMENTAL HEALTH SERVICES
385 North Arrowhead Avenue, San Bernardino, CA 92415-0160

DO NOT FILL IN
Permit Number 0302980l
Expiration 3/02/99
FA
SN

WELL PERMIT
(Please Print)

DO NOT FILL IN
Date 2/23/98
Amount $ 175.00
Receipt Number 11463
Paid By: Geodar Associates Inc.

1. OWNER: Name Southern California Edison
Mailing Address 2244 Walnut Grove Ave
City Rosemead Zip 91770
Site Address 12700 Taylor St
City Colton Zip 92324
Telephone Number ( )

2. WELL DRILLER: Durbury Drilling
Business Name
3/2/98 *Start Date* 3/6/98 *Completion Date*

3. WELL USE *(check)*:
☐ Community ☐ Horizontal ☐ Test
☐ Individual ☑ Monitoring ☐ Dairy
☐ Agricultural ☐ Public Water Supply ☐ Other

TYPE OF WORK *(check)*:
☐ New ☐ Reconstruction ☑ Destruction

Items 5 through 10 to be estimated for new wells, exact for all other wells.

5. ANNULAR SEAL: Seal Depth 89 ft.
Furnished by: ☐ Owner ☑ Contractor
☐ Driven Conductor Dia. ____ In., Wall (Gage) ____
☐ Sealing Material Bentonite, Thickness 24 to 36 In.

6. DEPTH OF WELL *(feet)*:
Proposed ____ Existing 109
DIAMETER OF BORE *(In.)*: 10

7. CASING INSTALLED:
☐ Steel ☐ Plastic ☑ Other: PVC

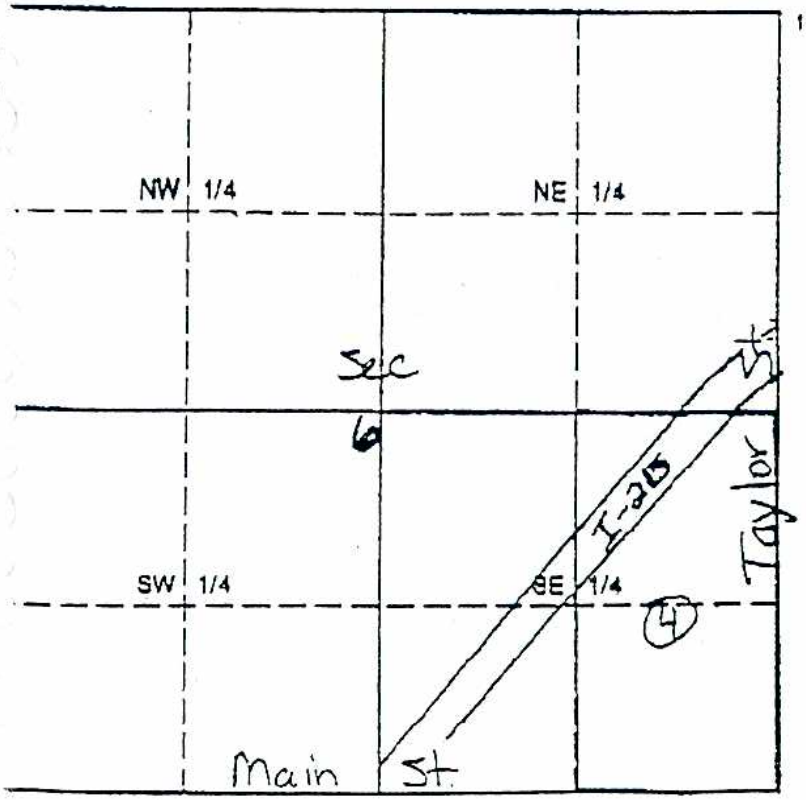
From (ft.)	To (ft.)	Dia. (In.)	Wall (Gage)
0	89	4	Sch 40

Gravel Pack: ☑ Yes ☐ No
From 89 to 110 ft.

8. PERFORATIONS *(If applicable)*:
From 89 to 109 ft. 0.020 Slot

9. SEALED ZONES *(If applicable)*: NA
From ____ to ____ ft.

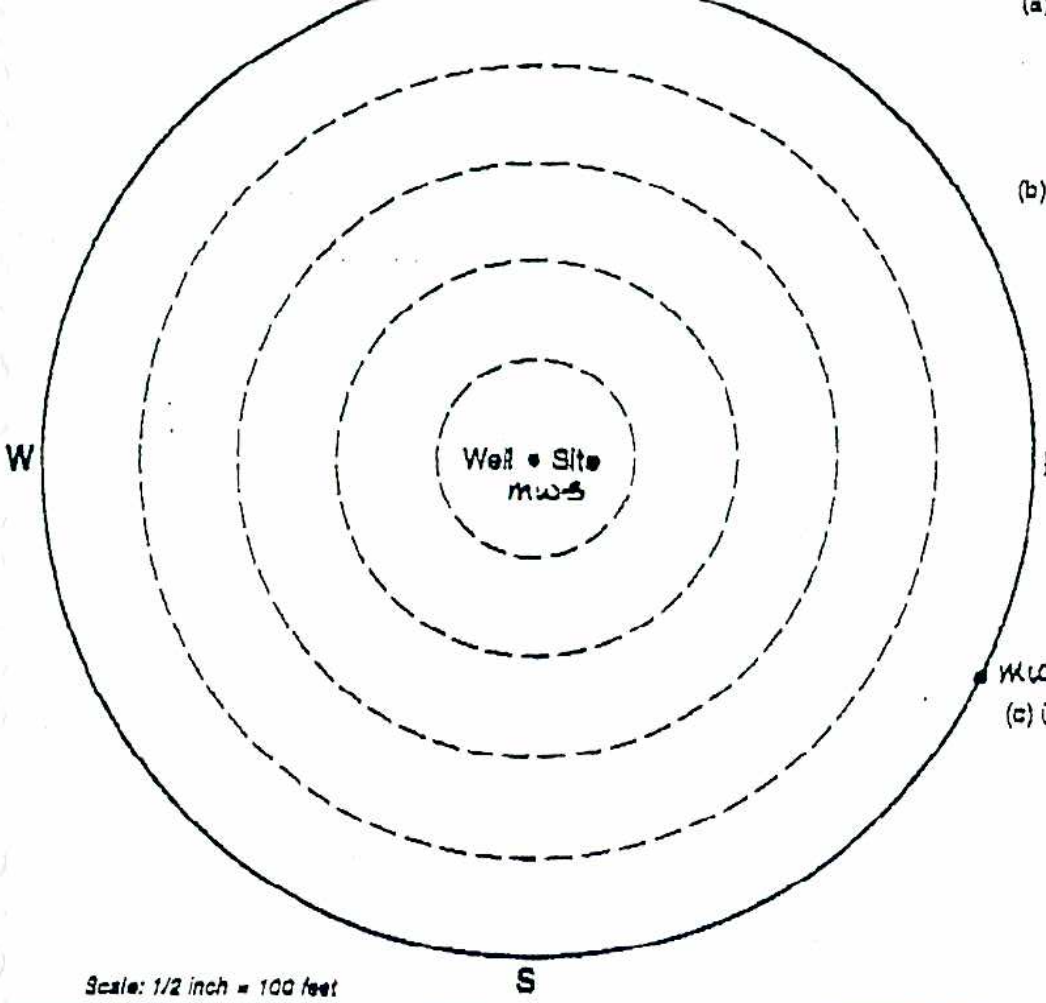
SECTION MAP - DO NOT FILL IN *Scale: 1 inch = 1/4 mile*



10. LOCATION INFORMATION: 42-A1
(a) Township:
Tier 3S N/S Range 4W E/W Section 6
(b) Assessor's Parcel No. 1770716400
(c) Latitude and Longitude
Lat: 34 °, 1 ', 22 " N/S
Long: 117 °, 19 ', 19 " E/W
(d) Solid or Liquid Disposal Site within Two Miles
☐ Yes ☑ No
Location ____

DO NOT FILL IN
Seal
Cap
Check Valve
Electricals
Slab
Tag
Building & Safety Notified

D:\WATER\WELLPRMT.PMS
Revised August 1997



Scale: 1/2 inch = 100 feet

(a) In perspective to the well site, sketch and lab
the following items: well lot property lines, oth
wells *(include abandoned wells)*, sewage
disposal systems *(sewers, septic tanks, leach
fields, seepage pits, cesspools)*, lakes and
ponds, watercourses and animals or fowl kept

(b) Indicate the distance, in feet, of any of the following which are within 500 ft. of the well si

Other	
Sewers	
Septic tanks	
Leaching fields	
Seepage pits	
Cesspools	
Lakes and ponds	
Watercourses	
Animals or fowl kept	

(c) ☐ None of the above are within 500 feet of th
well site.

I have read this application and agree to comply with all laws regulating the type of work being performed.

C-57 Contractor's Signature Dan Duley Date 2/24/98

County Registration No. _____ California License No. 674591

DISPOSITON OF PERMIT

(For Department Use Only)

☐ Sent to Water Agency for review.

☐ Water Agency conditions or recommendations attached.

☐ Denied _____

☒ Approved subject to the following:

A. ☒ Notify the Department, Duane Pianalto (909) 387-4606, twenty-four (24) hours in advanc
to make an inspection of the following operations:

☐ Prior to sealing of the annular space or filling of the conductor casing.

☒ After installation of ~~the surface protective slab and pumping equipment~~.

☐ During destruction of wells, prior to pouring the sealing material.

B. ☒ Submit to the Department, within thirty (30) days after completion of work, a copy of:

☒ Water Well Driller's Report ☐ Bacterial Analysis ☐ Inorganic Chemical Analysis

☐ Radiological Analysis ☐ General Mineral ☐ Organic Chemical Analysis ☐ General Physical

Comments _____

San Bernardino County Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES
385 North Arrowhead Avenue, San Bernardino, CA 92415-0160

DO NOT FILL IN
Permit Number 05029803
Expiration 3/02/99
PF
FA
SN

WELL PERMIT
(Please Print)

DO NOT FILL IN
Date 2/23/98
Amount $ 175.00
Receipt Number 11463
Paid By Golder Associates Inc.

1. OWNER: Name Southern California Edison
Mailing Address 2244 Walnut Grove Ave
City Rosemead Zip 91770
Site Address 12700 Taylor St.
City Colton Zip 92324
Telephone Number ( )

2. WELL DRILLER: Duxbury Drilling
Business Name
3/2/98 *Start Date* 3/6/98 *Completion Date*

3. WELL USE *(check)*:
☐ Community ☐ Horizontal ☐ Test
☐ Individual ☑ Monitoring ☐ Dairy
☐ Agricultural ☐ Public Water Supply ☐ Other

4. TYPE OF WORK *(check)*:
☐ New ☐ Reconstruction ☑ Destruction

Items 5 through 10 to be estimated for new wells, exact for all other wells.

5. ANNULAR SEAL: Seal Depth 89
Furnished by: ☐ Owner ☑ Contractor
☐ Driven Conductor Dia. _____ In., Wall (Gage) _____
☐ Sealing Material Bentonite, Thickness 24 - 36

6. DEPTH OF WELL *(feet)*:
Proposed _____ Existing 115
DIAMETER OF BORE *(in.)*: 10

7. CASING INSTALLED:
☐ Steel ☐ Plastic ☑ Other PVC

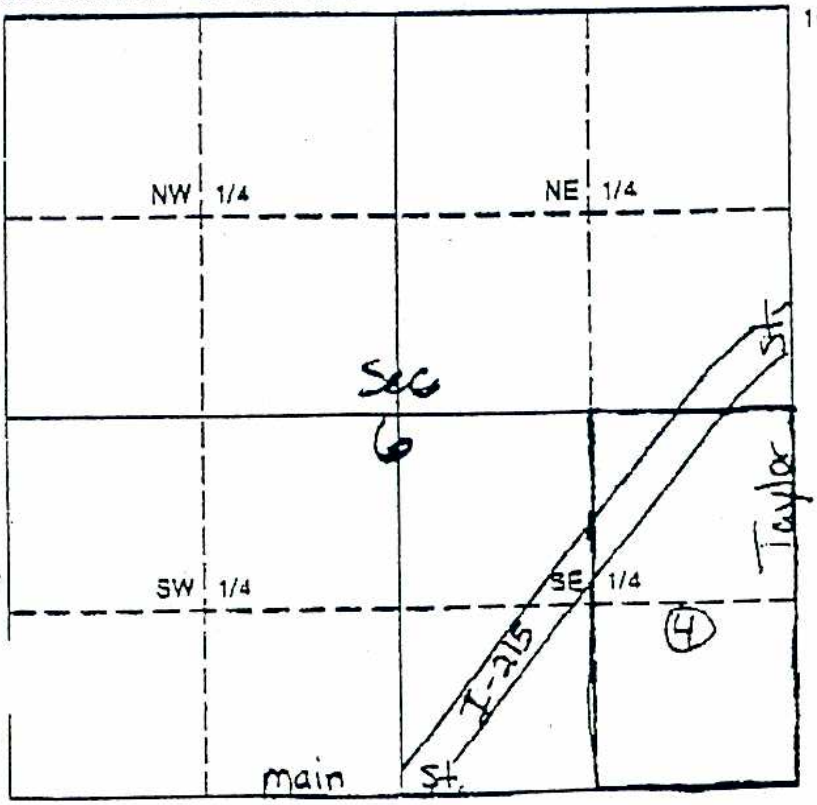
From (ft.)	To (ft.)	Dia. (in.)	Wall (Gage)
0	89	4	Sch 40

Gravel Pack: ☐ Yes ☐ No
From 115 to 89 ft.

8. PERFORATIONS *(if applicable)*:
From 89 to 117 ft.

9. SEALED ZONES *(if applicable)*: N/A
From _____ to _____ ft.

SECTION MAP - DO NOT FILL IN *Scale: 1 inch = 1/4 mile*



10. LOCATION INFORMATION: 42-A1 (1993ed)
p. 646-C6 (1996ed)
(a) Township:
Tier 2S N/S Range 4W E/W Section 6
(b) Assessor's Parcel No. 2770710400000
(c) Latitude and Longitude
Lat: 34 ° 1 ' 22 " N/S
Long: 117 ° 19 ' 19 " E/W
(d) Solid or Liquid Disposal Site within Two Miles
☐ Yes ☑ No
Location _____

DO NOT FILL IN
Seal
Cap
Check Valve
Electricals
Slab
Tag
Building & Safety Notified

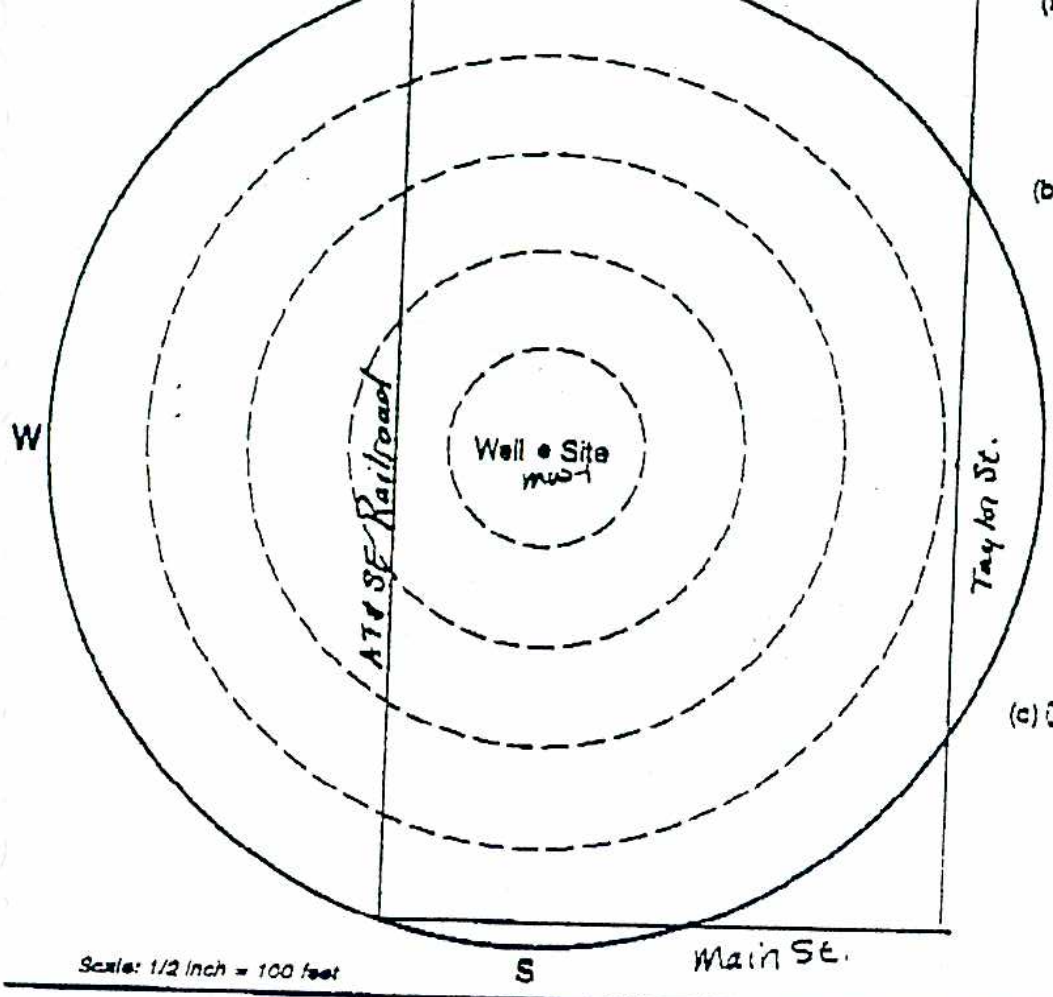
C:\WATER\WELLPRMT
Revised August

(a) In perspective to the well site, sketch and lal
the following items: well lot property lines, ot
wells *(include abandoned wells)*, sewage
disposal systems *(sewers, septic tanks, leac*
fields, seepage pits, cesspools), lakes and
ponds, watercourses and animals or fowl kep

(b) Indicate the distance, in feet, of any of the
following which are within 500 ft. of the well s

Other	
Sewers	
Septic tanks	
Leaching fields	
Seepage pits	
Cesspools	
Lakes and ponds	
Watercourses	
Animals or fowl kept	

(c) ☐ None of the above are within 500 feet of ths well site.



Scale: 1/2 inch = 100 feet

have read this application and agree to comply with all laws regulating the type of work being performed.

C-57 Contractor's Signature _____ Date 2/24/98

County Registration No. _____ California License No. 674591

DISPOSITON OF PERMIT

(For Department Use Only)

☐ Sent to Water Agency for review.

☐ Water Agency conditions or recommendations attached.

☐ Denied _____

☒ Approved subject to the following:

A. ☒ Notify the Department, Duane Picarello 387-4656, twenty-four (24) hours in advance to make an inspection of the following operations:

- ☐ Prior to sealing of the annular space or filling of the conductor casing.
- ☒ After installation of ~~the surface protective slab and pumping equipment~~.
- ☐ During destruction of wells, prior to pouring the sealing material.

B. ☒ Submit to the Department, within thirty (30) days after completion of work, a copy of:

- ☒ Water Well Driller's Report
- ☐ Bacterial Analysis
- ☐ Inorganic Chemical Analysis
- ☐ Radiological Analysis
- ☐ General Mineral
- ☐ Organic Chemical Analysis
- ☐ General Physical

ments _____

CA UCU1210

$3980.00 Pg 8.7807 7-15-86

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

I. EPA I.D. NUMBER: F C A D 0 0 0 6 3 1 1 5 0

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affi it in the designated space. Review the inform ation carefully; if any of it is incorrect, cro through it and enter the correct data in th appropriate fill-in area below. Also, if any o the preprinted data is absent (the area to th left of the label space lists the information that should appear), please provide it in th proper fill-in area(s) below. If the label is complete and correct, you need not complete items I, III, V, and VI (except VI-B which must be completed regardless). Complete a items if no label has been provided. Refer to the instructions for detailed item descrip tions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK "X" YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X	
B. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X		X
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

SPECIFIC QUESTIONS	MARK "X" YES	NO	FORM ATTACHED
C. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP: SAN BERNARDINO GENERATING STATION

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)

2 ROBERT GOODSON ENVIRN. SPCLST

B. PHONE (area code & no.): 3 1 8 | 3 0 2 | 1 8 3 1

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 2 2 4 4 WALNUT GROVE AVE.

B. CITY OR TOWN

4 ROSEMEAD

C. STATE: C A | D. ZIP CODE: 9 1 7 7 0

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 2 5 7 7 0 SAN BERNARDINO

B. COUNTY NAME

SAN BERNARDINO

C. CITY OR TOWN

6 SAN BERNARDINO

D. STATE: C A | E. ZIP CODE: 9 2 4 0 8 | F. COUNTY CODE (if known):

CA COO1210

Use print or type in the unshaded areas only

EPA I.D. NUMBER (copy from Item 1 of Form 1)
CAD 000 631 150

Form Approved OMB No. 158-R0173

FORM 2C NPDES

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS
Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (list)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (name)
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
001	34	05	01	117	14	27	Santa Ana River
002	34	04	28	117	17	03	Riverside Canal

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined *(e.g., for certain mining activities)*, provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

A. OUTFALL NO. (list)	B. OPERATION(S) CONTRIBUTING FLOW		C. TREATMENT		
	1. OPERATION (list)	2. AVERAGE FLOW (include units)	1. DESCRIPTION *	2. LIST CODES FROM TABLE 2C-1	
001	Cooling Tower Blowdown	1.075 MGD	Discharge to Santa Ana River		4A
	Demineralizer Backwash	0.001 MGD	Discharge to Santa Ana River		4A
	Misc. In-Plant Drains	0.115 MGD	Oil Removal and Discharge	1H	
			to Santa Ana River		4A
	Cooling Tower Area Drain	0.011 MGD	Discharge to Santa Ana River		4A
002	Cooling Tower Blowdown	1.075 MGD	Discharge to Riverside Canal		4A
	Demineralizer Backwash	0.001 MGD	Discharge to Riverside Canal		4A

OFFICIAL USE ONLY *(effluent guidelines sub-categories)*

CA 0001210

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☐ YES (complete the following table) ☐ NO (go to Section III)

1. OUTFALL NUMBER (list)	2. OPERATION(s) CONTRIBUTING FLOW (list)	3. FREQUENCY		4. FLOW			
		a. DAYS PER WEEK (specify average)	b. MONTHS PER YEAR (specify average)	a. FLOW RATE (in mgd)		b. TOTAL VOLUME (specify with units)	
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY
							(Gals.)
001	Demineralizer Backwash	*	*	*	*	*	1,000
002	Demineralizer Backwash	*	*	*	*	*	1,000

III. MAXIMUM PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☒ YES (complete Item III-B) ☐ NO (to to Section IV)

B. Are the limitations in the applicable effluent guideline expressed in terms of production (or other measure of operation)?

☐ YES (complete Item III-C) ☒ NO (go to Section IV)

C. If you answered "Yes" to Item III-B, list the quantity which represents an actual measurement of your maximum level of production, expressed in the and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. MAXIMUM QUANTITY			2. AFFECTI OUTFALL
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. (specify)	(list outfall num

IV. IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of water treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This inc but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and or loan conditions.

☐ YES (complete the following table) ☐ NO (go to Item IV-B)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL C PLIANCE
	a. NO.	b. SOURCE OF DISCHARGE		a. REQUIRED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may a your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your acti planned schedules for construction. ☐ MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

CONTINUED FROM THE FRONT

CA 0001210

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ YES (Identify the test(s) and describe their purposes below) ☒ NO (go to Section VIII)

VIII CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☒ YES (List the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below) ☐ NO (go to Section IX)

A. NAME	B. ADDRESS	C. TELEPHONE (area code & no.)	D. POLLUTANTS ANALYZED (list)
IT Analytical Services	17605 Fabrica Way Cerritos, CA 90701	(213) 921-9831	All pollutants listed in Part V except flow, pH, chlorine, Winter temperature, and Summer temperature

IX. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. PHONE NO. (area code & no.)
GLENN J. BJORKLUND, VICE PRESIDENT	(818) 302-4173
C. SIGNATURE	D. DATE SIGNED
	7/11/86

CONTINUED FROM PAGE 2

EPA I.D. NUMBER (copy from Item 1 of Form 1)
CAD 000 631 150

CA 0001210

Form Approved OMB No. 158-R0173

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding — Complete one set of tables for each outfall — Annotate the outfall number in the space provided. NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
None believed present.			

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

A. Is any pollutant listed in Item V-C a substance or a component of a substance which you do or expect that you will over the next 5 years use or manufacture as an intermediate or final product or byproduct?

☒ YES (list all such pollutants below) ☐ NO (go to Item VI-B)

1,1,1 - Trichloroethane

B. Are your operations such that your raw materials, processes, or products can reasonably be expected to vary so that your discharges of pollutants may during the next 5 years exceed two times the maximum values reported in Item V?

XX YES (complete Item VI-C below) ☐ NO (go to Section VII)

C. If you answered "Yes" to Item VI-B, explain below and describe in detail the sources and expected levels of such pollutants which you anticipate will be discharged from each outfall over the next 5 years, to the best of your ability at this time. Continue on additional sheets if you need more space.

Variations in the characteristics of the intake water (well water) may cause pollutant levels of the discharge to exceed two times the maximum values reported in Item V.

CONTINUED FROM THE FRONT

CA 0001210

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ YES (Identify the test(s) and describe their purposes below) ☒ NO (go to Section VIII)

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A. NAME & OFFICIAL TITLE (type or print)

GLENN J. BJORKLUND, VICE PRESIDENT

B. PHONE NO. (area code & no.)

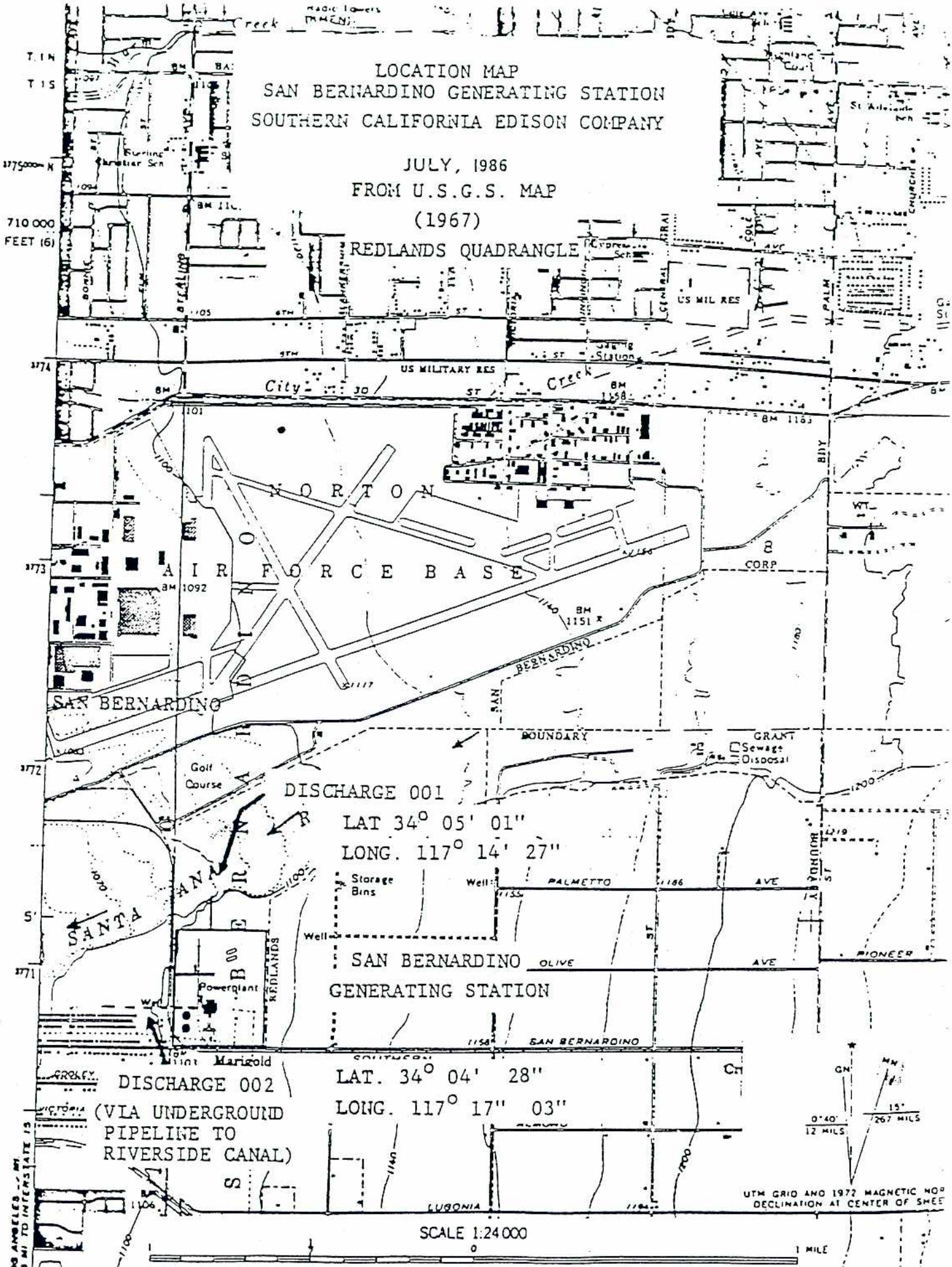
(818) 302-4173

C. SIGNATURE

D. DATE SIGNED

7/11/86

CA 0001210


LOCATION MAP
SAN BERNARDINO GENERATING STATION
SOUTHERN CALIFORNIA EDISON COMPANY
JULY, 1986
FROM U.S.G.S. MAP
(1967)
REDLANDS QUADRANGLE
NORTON AIR FORCE BASE
SAN BERNARDINO
DISCHARGE 001
LAT 34° 05' 01"
LONG. 117° 14' 27"
SAN BERNARDINO GENERATING STATION
DISCHARGE 002
(VIA UNDERGROUND PIPELINE TO RIVERSIDE CANAL)
LAT. 34° 04' 28"
LONG. 117° 17" 03"
SCALE 1:24000
1 MILE
UTM GRID AND 1972 MAGNETIC NOR
DECLINATION AT CENTER OF SHEE

CA 0001210

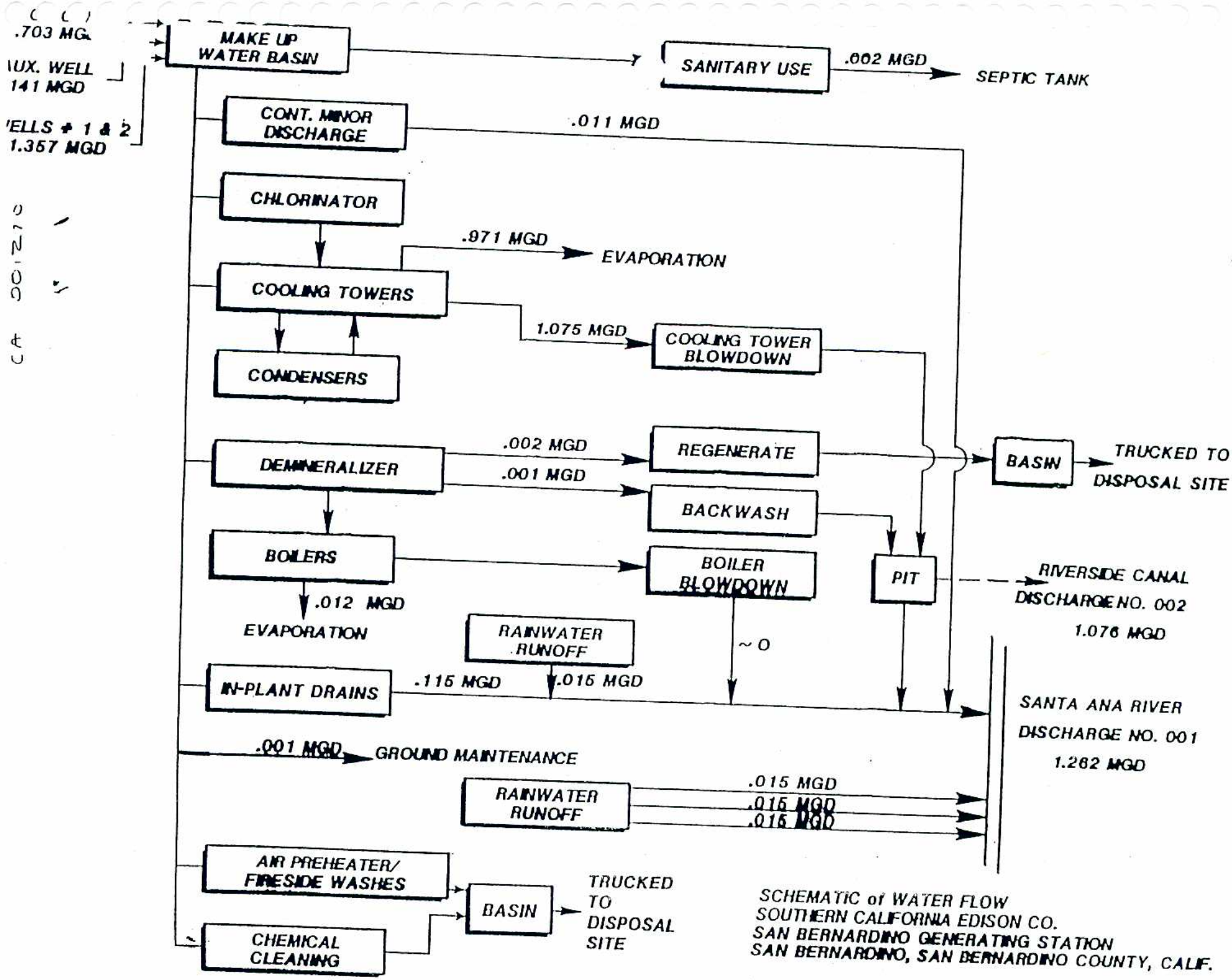
JUN 15 [illegible]

APPENDIX A

FURTHER EXPLANATION ON ITEM II.B.3.a.

Operation	Treatment Process	Remarks
Outfall No. 001	Discharge to Santa Ana River	All waste streams listed under outfall No. 001 discharge into the Santa Ana River.
Miscellaneous In-Plant Drains	Oil removal	All the in-plant drains are routed through a flotation-type oil/water separator.
Outfall No. 002	Discharge to Riverside Canal	All waste streams listed under outfall No. 002 discharge into the Riverside Canal.

RMG:gm
6RMG103.B:1
06/22/81



SCHEMATIC of WATER FLOW
SOUTHERN CALIFORNIA EDISON CO.
SAN BERNARDINO GENERATING STATION
SAN BERNARDINO, SAN BERNARDINO COUNTY, CALIF.

JULY, 1986

#20D

LEAK DETECTION INVESTIGATION

Highgrove Generating Station

May 5, 1997

Prepared by:

P. Hamilton

P. Hamilton, CEG #998
Engineering Geologist

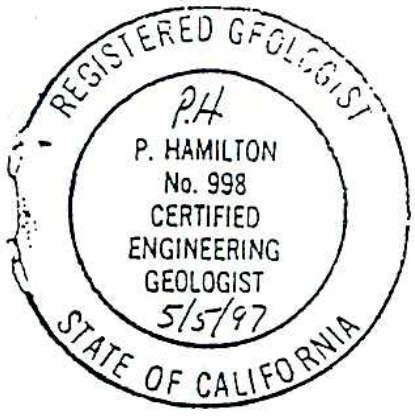


Table of Contents

1. Introduction

Southern California Edison Company (Edison) implemented an investigation in response to a Consent Agreement with the Department of Toxic Substances Control (BC 121219). The purpose of the investigation was to execute a study to demonstrate that no environmental contamination has resulted from the operation of two surface impoundments at the Highgrove Generating Station. Edison owns and operates the Highgrove Generating Station.

The investigation was designed to determine if the basins at the site had released any water containing abnormal pH values or metals to the soil leading to ground water. Due to the size of the basins and the minor usage, it was proposed that an extensive soil sampling program be performed below the liners. If the soils directly beneath the basins can be demonstrated to be free of abnormal pH and metal concentration values, then a ground water monitoring program would not be necessary.

This report compiles all of the data and information derived during the soil exploration in compliance with the Work Plan submitted to the DTSC. The Work Plan was part of the Edison submittal titled "Leak Detection Investigation, Highgrove Generating Station," dated April 1996. Any deviation or field change to the plan is described in this report.

2. Exploration

The soil beneath the East and West basins were investigated using two methods: a soil gas survey and soil sampling. Three exploratory borings were advanced within each basin for a total of six holes. The locations of the holes are

shown on Figures 2 and 3. The location of the basins and background boring (H-1) are shown on Figure 1.

On September 17, a soil gas survey was performed by Hydro Geo Spectrum, a RWQCB approved contractor. The company presented in the Work Plan was no longer performing soil gas surveys. A total of six soil gas samples was collected for analysis; three in each basin. The proposed depth of for the samples was 5 feet. However, for a few samples, the cemented soil would not allow the gas sampling tube to be driven past 3.5 feet.

Two types of drilling equipment was used to advance the bore holes: hand auger and track mounted drill rig. The exploratory holes within the basins were drilled using a minimum 3-inch diameter, hand auger. Three samples were taken in each hole at 1, 5, and 9 feet with a drive sampler attached on the hand auger equipment. The samples were retrieved in the plastic inter tube within the drive sampler.

A drill rig was used to advance the background boring due to the required depth. Soil samples were taken through the 6-inch hollow stem auger by using the drive sampler from the hand augering process. Again, the samples were captured in the plastic inter tube.

The drilling and soil gas contractors mobilized on September 17. The exploratory hole locations were chosen and a circular opening cut in the liner. The soil gas survey was performed in the six locations. The soil sampling in the basins occurred on the 18th with the East basin completed first. The background soil sampling was accomplished on the September 20.

The pH meter failed on the day soil sampling occurred in the basins. No field screening was performed on the samples. A new meter was acquired before the background boring was drilled.

3. Results

The basins were constructed with a base of asphaltic tile placed on the excavated native soil. The tile was covered by a coating of thin hypalon fabric. The HDPE was applied over the hypalon in one or two layers. The second layer was overlap in the corner sections. In the East Basin, a third layer of the HDPE was discovered on the bottom.

Water was encountered when the liner was opened at the West Basin. It was not determined if the water was between the liners or below. Faint rainbows were observed on the water indicating the presence of petroleum products. The petroleum could have been a by-product of the asphaltic tiles.

The methods, quality control, and results of the soil gas survey are presented in a report prepared by Hydro Geo Spectrum. The complete report is contained in Appendix 1. The survey detected small amounts of TCE in two samples collected from the West Basin. The values were near the detection limit at 1 ug/L. The three samples from the West Basin also had similar concentrations of a gasoline additive, MTBE. All soil gas samples from the East Basin did not detect any volatile organic constituents.

The field forms generated during the soil sampling are contained in Appendix 2. These include the Daily Reports for the two sampling days and the Calibration Log for the pH meter on the second day. The boring logs for the six exploratory holes and the background boring are submitted in Appendix 3.

The soil beneath the basins is layered silty to clayey sand that are locally cemented causing difficult hand augering. The fine grained portion of the soil below the West Basin appeared to be clay rather than the silt at the East Basin. A distinct, 1-foot layer of red-brown clayey sand was encountered at 7 feet beneath the West Basin. The horizon was very dense and dry. It was not observed below

the East Basin but was crossed in the background boring, H-1. This horizon appears to be naturally occurring rather than from the operation of the basin.

Nine soil samples were removed from three exploratory holes in each basin. The samples were delivered to Weck Laboratories to be tested for the following parameters: pH, metals, chromium 6, chloride, fluoride, iron, and TCE. The resultant data from the lab analysis is arranged by boring on Tables 1 and 3 for the East and West basins, respectively. The same data is arranged by depth on Tables 2 and 4. The background data has been highlighted. The laboratory data sheets and Chain of Custody forms are contained in Appendix 4. The TCE findings are shown on the tables. The remainder of the lab data sheets for the 8260 analysis is presented in Appendix 5.

The tables show that no abnormal values for the tested parameters exist below the basins. The 8260 analysis indicated a non-detect for all parameters in all samples. It is concluded that there has been no leakage of basin liquids to the soil beneath the liners.

East Retention Basin -- Data Arranged by Boring

Table 1

	Boring ID		1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	B-2	B--4	B-5
	Depth (feet)		0.5	5	9	1	5	9	0.66	5	9	1	5	9
Parameter	PQL	Units												
pH		units	9.95	8.82	8.5	9.73	9.64	9.61	9.65	8.69	7.54	8.43	8.05	8.56
TCE	2.5	ug/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Antimony	5	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	6	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	0.7	mg/Kg	65.4	90.3	86	82.6	122	120	62	106	38.3	105	104	80
Beryllium	0.7	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.7	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloride	2	mg/L	ND	ND	ND	ND	ND	ND	ND	2.58	ND	ND	ND	ND
Chromium, Total	1.5	mg/Kg	5.66	5.46	9.06	4.35	5.06	5.82	5.09	5.48	3.1	3.95	7.1	12.8
Chromium 6	5	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	1.5	mg/Kg	6.69	4.36	7.35	6.02	5.6	4.13	7.33	7.15	1.66	5.22	4.37	7.63
Cobalt	2.5	mg/Kg	3.05	3.77	5.6	4.89	4.57	5.69	ND	5.07	ND	4.66	3.76	5.71
Fluoride	1	mg/L	ND	3.33	1.34	ND	1.84	1.55	ND	ND	ND	1.31	ND	1.27
Iron	50	mg/Kg	14,400	13,400	16,000	14,300	16,300	19,700	14,000	15,400	6,010	20,900	19,900	22,800
Lead	1.5	mg/Kg	3.27	2.8	4.16	2.89	3.6	4.08	5.43	3.69	ND	3.86	3.2	4.83
Mercury	0.06	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	2.5	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	2.5	mg/Kg	4.33	5.16	8.16	4.64	6.78	6.11	5.38	5.75	ND	4.9	6.6	10.4
Selenium	0.06	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	0.7	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	1.5	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	2.5	mg/Kg	13.4	18.3	13.2	5.06	6.95	5.86	7.41	13	ND	46.1	49.8	55.1
Zinc	1.5	mg/Kg	36.2	37.5	41.8	37	51.9	53.4	28.3	50.1	18.4	41.1	40.9	30.5

East Retention Basin -- Data Arranged by Depth

Table 2

	Boring ID		1-1	2-1	3-1	B-2		1-2	2-2	3-2	B--4		1-3	2-3	3-3	B-5
	Depth (feet)		0.5	0.66	1	1		5	5	5	5		9	9	9	9
Parameter	PQL	Units														
pH		units	9.95	9.73	9.65	8.43		8.82	9.64	8.69	8.05		8.5	9.61	7.54	8.56
TCE	2.5	ug/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Antimony	5	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Arsenic	6	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Barium	0.7	mg/Kg	65.4	82.6	62	105		90.3	122	106	104		86	120	38.3	80
Beryllium	0.7	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Cadmium	0.7	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Chloride	2	mg/L	ND	ND	ND	ND		ND	ND	2.58	ND		ND	ND	ND	ND
Chromium, Total	1.5	mg/Kg	5.66	4.35	5.09	3.95		5.46	5.06	5.48	7.1		9.06	5.82	3.1	12.8
Chromium 6	5	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Copper	1.5	mg/Kg	6.69	6.02	7.33	5.22		4.36	5.6	7.15	4.37		7.35	4.13	1.66	7.63
Cobalt	2.5	mg/Kg	3.05	4.89	ND	4.66		3.77	4.57	5.07	3.76		5.6	5.69	ND	5.71
Fluoride	1	mg/L	ND	ND	ND	1.31		3.33	1.84	ND	ND		1.34	1.55	ND	1.27
Iron	50	mg/Kg	14,400	14,300	14,000	20,900		13,400	16,300	15,400	19,900		16,000	19,700	6,010	22,800
Lead	1.5	mg/Kg	3.27	2.89	5.43	3.86		2.8	3.6	3.69	3.2		4.16	4.08	ND	4.83
Mercury	0.06	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Molybdenum	2.5	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Nickel	2.5	mg/Kg	4.33	4.64	5.38	4.9		5.16	6.78	5.75	6.6		8.16	6.11	ND	10.4
Selenium	0.06	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Silver	0.7	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Thallium	1.5	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Vanadium	2.5	mg/Kg	13.4	5.06	7.41	46.1		18.3	6.95	13	49.8		13.2	5.86	ND	55.1
Zinc	1.5	mg/Kg	36.2	37	28.3	41.1		37.5	51.9	50.1	40.9		41.8	53.4	18.4	30.5

West Retention Basin -- Data Arranged by Boring

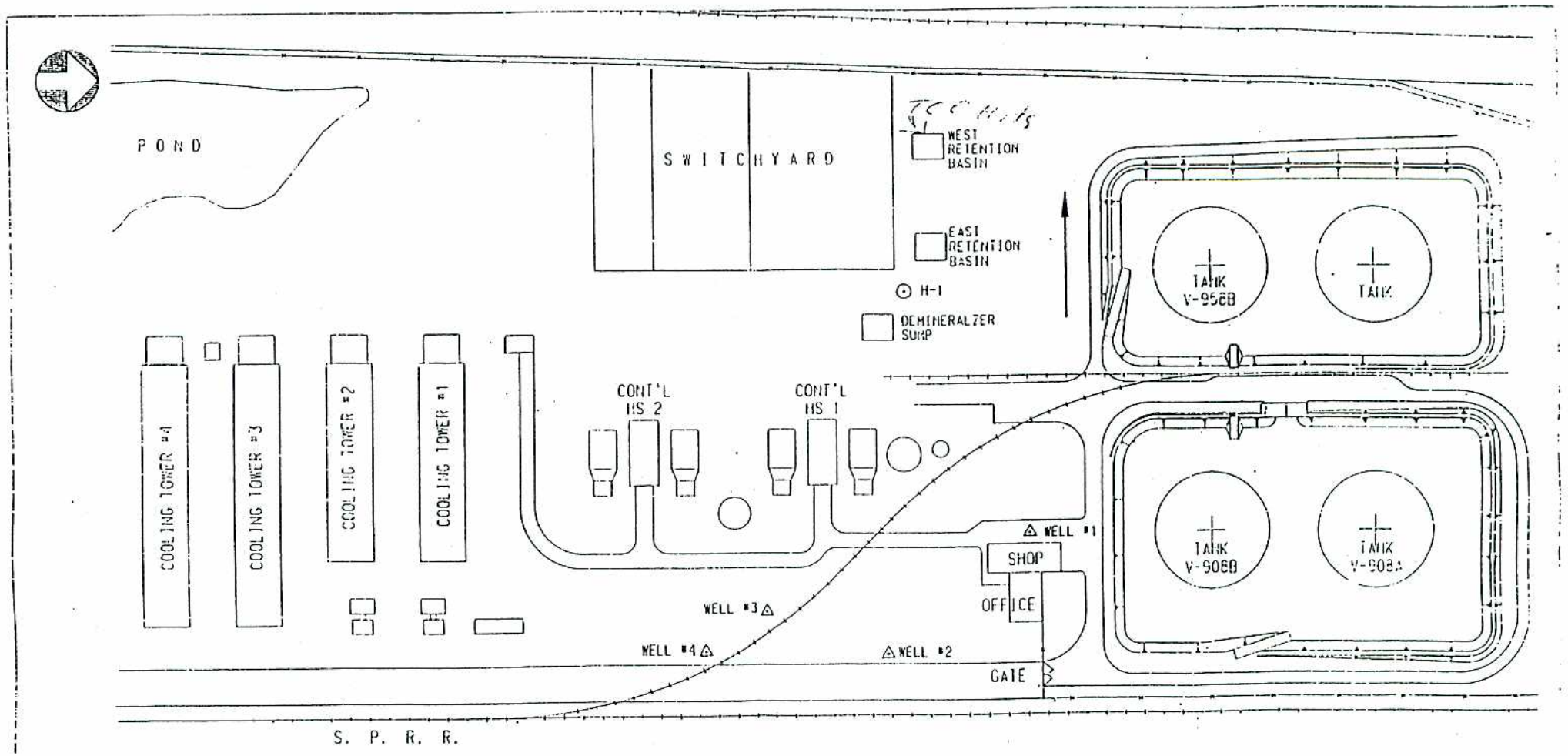
Table 3

	Boring ID		4-1	4-2	4-3		5-1	5-2	5-3		6-1	6-2	6-3		B-2	B--4	B-5
	Depth (feet)		1	5	9		1	5	9		1	5	9		1	5	9
Parameter	PQL	Units															
pH		units	8.6	9.25	8.82		8.28	8.78	8.5		8.43	8.44	8.28		8.43	8.05	8.56
TCE	2.5	ug/Kg	ND	ND	ND		ND	ND	ND		ND	ND	ND		ND	ND	ND
Antimony	5	mg/Kg	ND	ND	ND		ND	ND	ND		ND	ND	ND		ND	ND	ND
Arsenic	6	mg/Kg	ND	ND	ND		ND	ND	9.03		ND	ND	ND		ND	ND	ND
Barium	0.7	mg/Kg	134	105	102		91	122	108		102	94.7	90.2		105	104	80
Beryllium	0.7	mg/Kg	ND	ND	ND		ND	ND	ND		ND	ND	ND		ND	ND	ND
Cadmium	0.7	mg/Kg	ND	ND	ND		ND	ND	ND		ND	ND	ND		ND	ND	ND
Chloride	2	mg/L	ND	ND	ND		ND	ND	ND		2.74	ND	ND		ND	ND	ND
Chromium, Total	1.5	mg/Kg	7	7.01	8.14		4.68	7.05	9.6		6.64	10.1	2.03		3.95	7.1	12.8
Chromium 6	5	mg/Kg	ND	ND	ND		ND	ND	ND		ND	ND	ND		ND	ND	ND
Copper	1.5	mg/Kg	9.43	4.42	6.49		4.89	4.74	7.4		5.25	4.39	2.67		5.22	4.37	7.63
Cobalt	2.5	mg/Kg	8.32	4.25	5.28		5.16	4.91	6.71		5.19	2.79	3.77		4.66	3.76	5.71
Fluoride	1	mg/L	ND	1.17	ND		ND	ND	ND		ND	ND	ND		1.31	ND	1.27
Iron	50	mg/Kg	16,600	12,600	15,200		13,100	14,400	16,400		15,400	12,000	12,500		20,900	19,900	22,800
Lead	1.5	mg/Kg	4.05	2.51	4.26		3.16	3.03	3.99		3.7	2.52	1.98		3.86	3.2	4.83
Mercury	0.06	mg/Kg	ND	ND	ND		ND	ND	ND		ND	ND	ND		ND	ND	ND
Molybdenum	2.5	mg/Kg	ND	ND	ND		ND	ND	ND		ND	ND	ND		ND	ND	ND
Nickel	2.5	mg/Kg	31.4	7.47	8.07		5.99	6.47	9.27		6.39	6.73	3.14		4.9	6.6	10.4
Selenium	0.06	mg/Kg	ND	ND	ND		ND	ND	ND		ND	ND	ND		ND	ND	ND
Silver	0.7	mg/Kg	ND	ND	ND		ND	ND	ND		ND	ND	ND		ND	ND	ND
Thallium	1.5	mg/Kg	ND	ND	ND		ND	ND	ND		ND	ND	ND		ND	ND	ND
Vanadium	2.5	mg/Kg	28.3	26.9	27.9		13.9	27.2	32.6		22.3	18.8	20.7		46.1	49.8	55.1
Zinc	1.5	mg/Kg	60.7	38.6	43.9		37.5	48.3	48.1		41.6	34.3	38.4		41.1	40.9	30.5

West Retention Basin -- Data Arranged by Depth

Table 4

	Boring ID		4-1	5-1	6-1	B-2		4-2	5-2	6-2	B--4		4-3	5-3	6-3	B-5
	Depth (feet)		1	1	1	1		5	5	5	5		9	9	9	9
Parameter	PQL	Units														
pH		units	8.6	8.28	8.43	8.43		9.25	8.78	8.44	8.05		8.82	8.5	8.28	8.56
TCE	2.5	ug/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Antimony	5	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Arsenic	6	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	9.03	ND	ND
Barium	0.7	mg/Kg	134	91	102	105		105	122	94.7	104		102	108	90.2	80
Beryllium	0.7	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Cadmium	0.7	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Chloride	2	mg/L	ND	ND	2.74	ND		ND	ND	ND	ND		ND	ND	ND	ND
Chromium, Total	1.5	mg/Kg	7	4.68	6.64	3.95		7.01	7.05	10.1	7.1		8.14	9.6	2.03	12.8
Chromium 6	5	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Copper	1.5	mg/Kg	9.43	4.89	5.25	5.22		4.42	4.74	4.39	4.37		6.49	7.4	2.67	7.63
Cobalt	2.5	mg/Kg	8.32	5.16	5.19	4.66		4.25	4.91	2.79	3.76		5.28	6.71	3.77	5.71
Fluoride	1	mg/L	ND	ND	ND	1.31		1.17	ND	ND	ND		ND	ND	ND	1.27
Iron	50	mg/Kg	16,600	13,100	15,400	20,900		12,600	14,400	12,000	19,900		15,200	16,400	12,500	22,800
Lead	1.5	mg/Kg	4.05	3.16	3.7	3.86		2.51	3.03	2.52	3.2		4.26	3.99	1.98	4.83
Mercury	0.06	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Molybdenum	2.5	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Nickel	2.5	mg/Kg	31.4	5.99	6.39	4.9		7.47	6.47	6.73	6.6		8.07	9.27	3.14	10.4
Selenium	0.06	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Silver	0.7	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Thallium	1.5	mg/Kg	ND	ND	ND	ND		ND	ND	ND	ND		ND	ND	ND	ND
Vanadium	2.5	mg/Kg	28.3	13.9	22.3	46.1		26.9	27.2	18.8	49.8		27.9	32.6	20.7	55.1
Zinc	1.5	mg/Kg	60.7	37.5	41.6	41.1		38.6	48.3	34.3	40.9		43.9	48.1	38.4	30.5



LEGEND

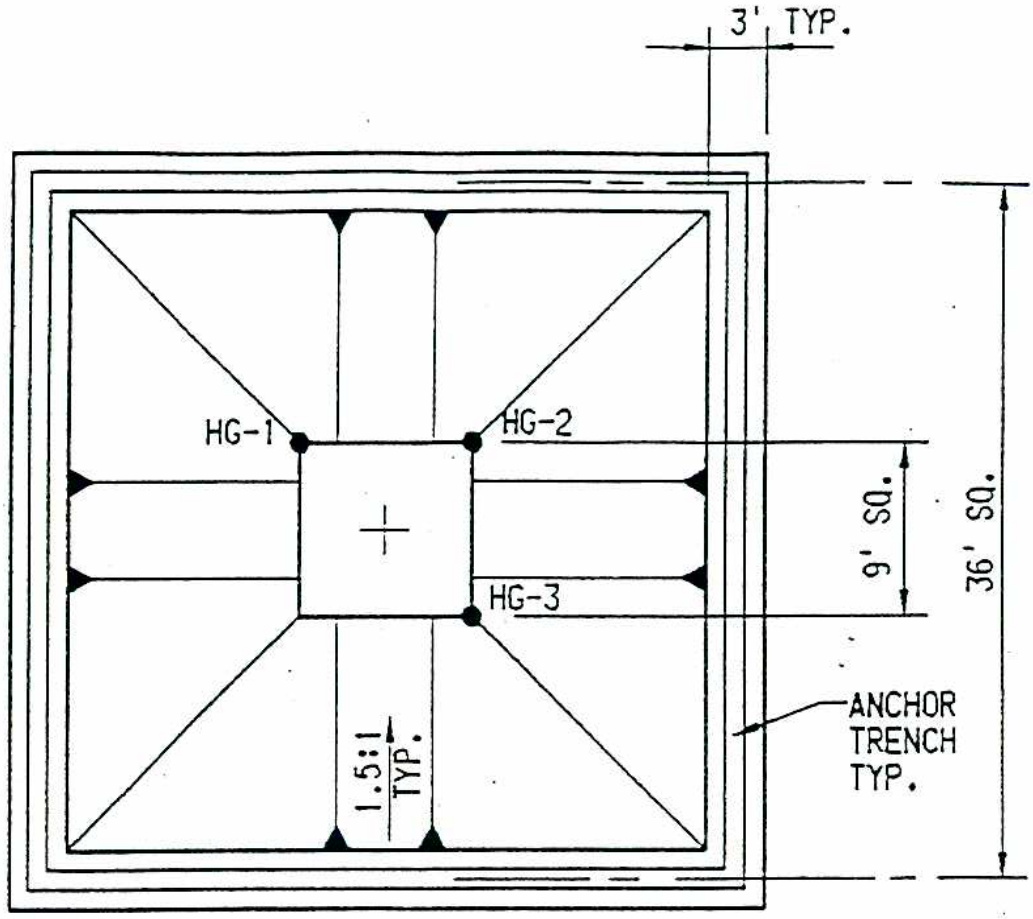
- EXISTING WATER WELL
- PROPOSED BACKGROUND BORING
- TYPICAL GROUND WATER FLOW DIRECTION

0 50 100

HIGHGROVE GENERATING STATION

LOCATION OF BASINS

FIGURE 1



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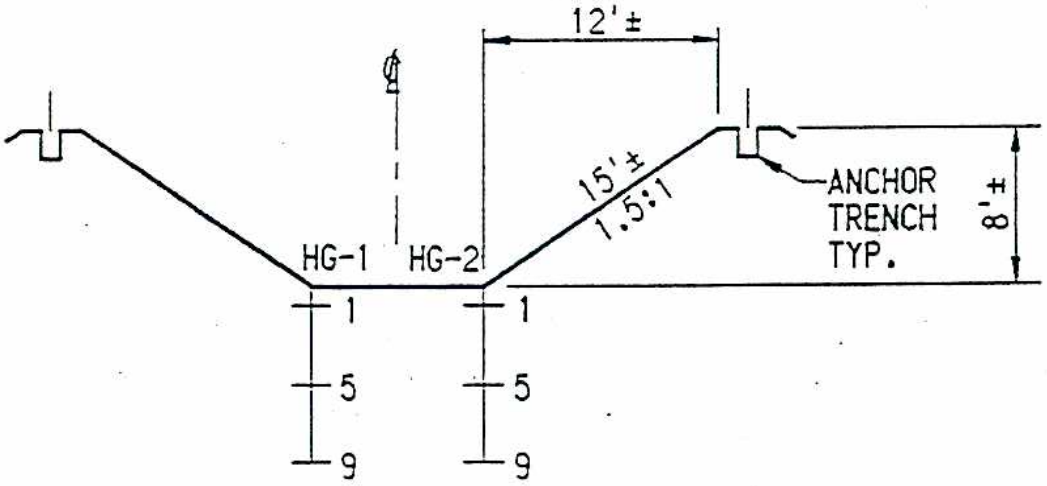

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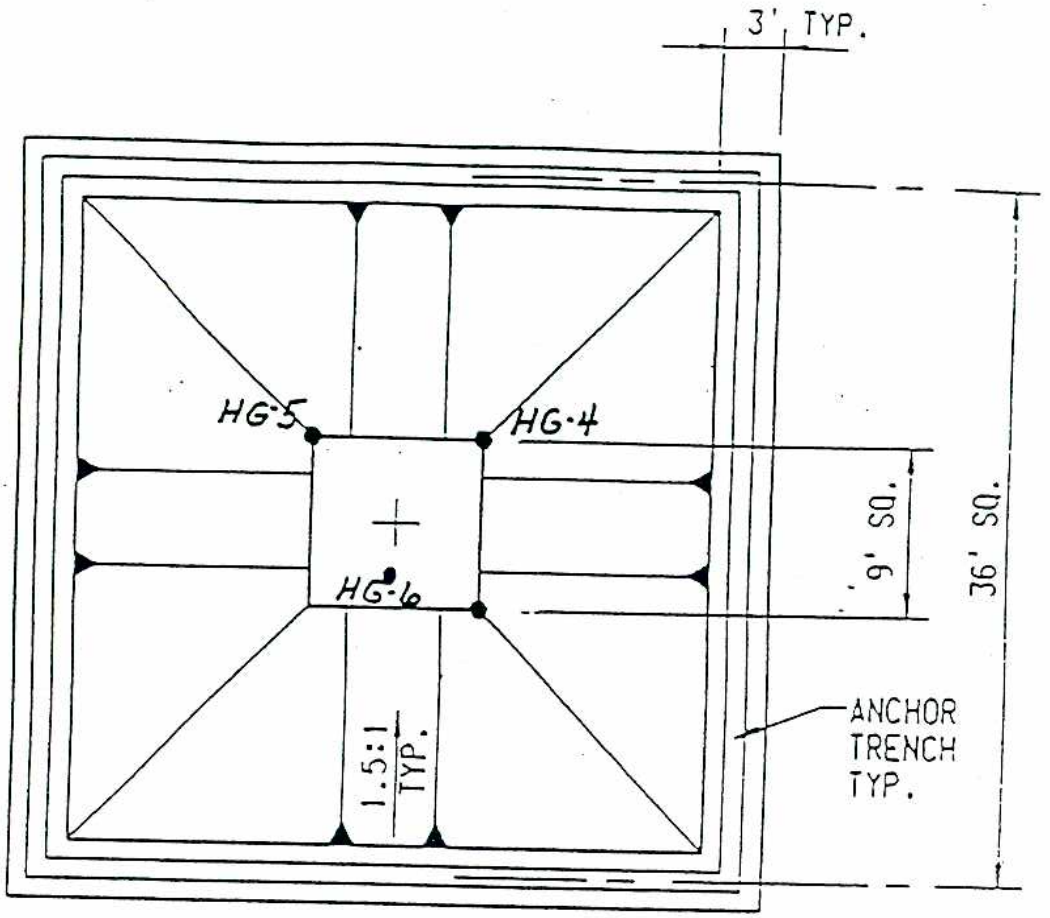
HIGHGROVE GENERATING STATION

EAST RETENTION BASIN
FIGURE 2

SK011596.DGN



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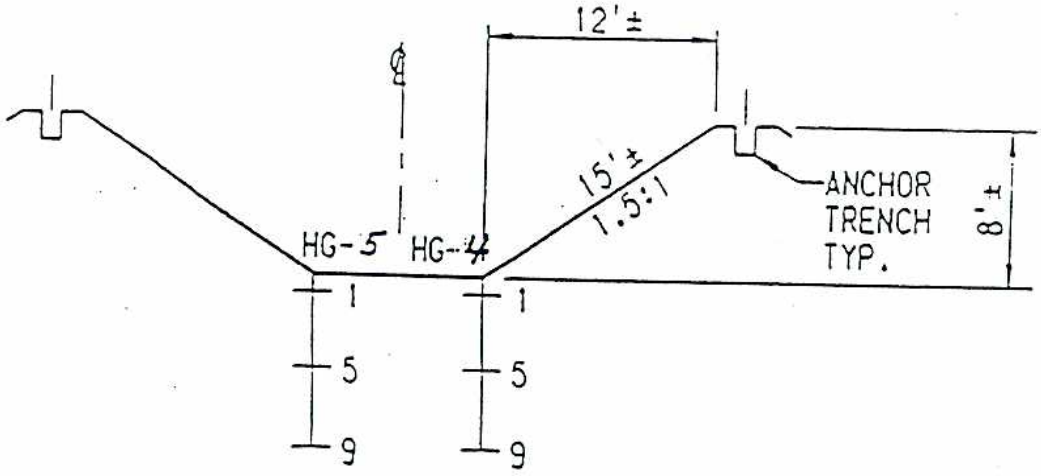

SECTION
1" = 10'

HIGHGROVE GENERATING STATION

WEST RETENTION BASIN
FIGURE 3

SK011596.DGN

Table of Contents

December 11, 1996

On Site Soil • Soil Vapor • GH_2O
Sampling and GCMS Analysis

Hydro Geo Spectrum

Pat Hamilton
Southern California Edison
2131 Walnut Grove Avenue
Rosemead, CA 91770

Dear Pat:

Enclosed please find the report on the soil vapor investigation performed at the Southern California Edison facility in Highlands performed on September 24, 1996. I have produced one bound copy and have forwarded one unbound copy to Rod Loftis of Odyssey Engineering for inclusion into his report. My reports consist of the following sections:

i. Technical approach with results and discussion.

ii. Map of probe locations.

iii. Raw data in LARWQCB format.

iv. QA/QC section in LARWQCB format.

v. Chromatograms (unbound copy only).

vi. Chains of Custody (unbound copy only).

vii. Raw data in laboratory format (unbound copy only).

If you have any questions or additional requirements, please do not hesitate to call. It was a pleasure working with you, and I look forward to future projects.

Sincerely,

Raphe Pavlick

Director

400 So. Barrington • Suite #3 • P.O. Box 49931 • Los Angeles, CA 90049
Phone • (310) 440 - 5077 • Fax (310) 471 - 6879

RESUL

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The analyses of the soil vapor samples proceeded as follows. A 1 ml aliquot of soil vap withdrawn from each bulb and injected into a Hewlett-Packard model 5890 gas chroma interfaced to a Hewlett-Packard model 5972 mass spectrometer. Chromatography was p in such a way that the combination of retention times and mass fragmentation allowed complete separation of all the target compounds. The mass spec was operated in *full sc* between 35 and 350 amu. This allows for the identification of any volatile organic spec may be present in the soil vapor.

The following laboratory QA/QC was performed. An initial six-point calibration was r September 9, 1996 A laboratory control standard (LCS) from *Absolute Standards* 824 run at the end of the same day and at the end of the sampling days. The daily standard the sampling day, was made from a different lot and mixture from *Absolute Standards* initial calibration was also run on this standard stock. The surrogate calibration curve w Aldrich certified material. All results were within the LAWQCB and HGS requirement

Two notable additions to the LAWQCB requirements were deemed necessary:

i. Five isotopically-labeled surrogates, D6-Benzene, D6-Acetone, D2-Methylene D8-Tetrahydrofuran and D-Chloroform, were added to the collection vessel, a glass bulb fitted with Teflon stopcocks and a viton rubber septum, to measure r percentages. The benzene and chloroform surrogates are used to verify the reco BTEX and chlorinated hydrocarbons respectively; a recovery of at least 90% is The deuterated acetone is a measure of the possible presence of water vapor in and general condition of the chromatographic system in terms of hydration; a re 70% indicates acceptability of the complete sampling and analysis procedure; b level, water vapor presence in the sampling line should be investigated or chromatographic dehydration procedures should be considered.

ii. Pentane vapor was used to surround the sampling train at the surface to identify ambient intrusion into the sampling train or down the outside surface of the sam tubing connected to the subsurface.

SOIL VAPOR TECHNICAL APPROACH

Soil vapor probes were installed using a manual installation system (either a Bosch rotary hammer or more simply when possible, a large hammer). Using this system, a ½ inch steel pipe with a drop-off well point on the lead end is inserted to depth of between 3.5 and 5 feet. Upon reaching depth, the pipe is withdrawn approximately six inches, allowing the well point to drop off and thus exposing the pipe to the open annulus at depth. Polyethylene tubing (1/4 inch) equipped with an *anchor* is inserted through the tubing into the open annulus. A small amount of coarse sand is allowed to flow through the inside of the steel pipe so as to form a permeable sand pack at depth. At this point the steel pipe is withdrawn using a specially-adapted jack while grouting the upper part of the hole with bentonite slurry formed *in situ* from granular bentonite. The polyethylene tubing is connected to the sampling train, and soil vapor sampling is initiated.

The actual collection of soil vapor is done as follows. The tubing exiting the surface of the ground is connected to a glass sampling bulb fitted with Teflon stopcocks and a viton rubber sampling port. This bulb is connected in turn to a vacuum gauge, flowmeter, and portable sampling pump. Initially both stopcocks are closed, and the absence of flow and the presence of a slight vacuum is noted. This demonstrates that the sampling train on the far end of the bulb is leak-tight. Then the first stopcock (pump end) is opened; the absence of flow demonstrates that the sampling bulb itself is leaktight. The ground end of the bulb is then opened, and a flow of 150 ml/min is maintained for seven to ten purge volumes. During the sampling an open container containing pentane is exposed to the sampling train. Any trace of pentane detected in the sample indicates the intrusion of ambient air into the sampling train, invalidating the results of that sample. No such leaks were detected with any of the samples. The stopcocks were then closed (pump end first), and the sample retained in the container. Approximately 25 NG each of deutero-chloroform, deutero-acetone, deutero-tetrahydrofuran, deutero-methylene chloride and deutero-benzene were added through the septum into the bulb. The recovery of these isotopically-labeled surrogate compounds demonstrates that the bulbs have remained leak-free up until the actual analysis. A recovery of 90% For the deuterated-benzene and the deuterated chloroform is desirable; a recovery of less than 75% invalidates the sample results. The deuterated acetone is added as a measure of water vapor in the sampling and analysis systems; a recovery of greater than 70% is acceptable, although levels of the water-soluble compounds (ketones) may be affected. All recoveries during this project were within acceptable range. These bulbs were then delivered to the mobile laboratory for analysis by GCMS.

RESUL

nloroethene (TCE
ine additive, was

both HydroGeoS

un

The analyses of the soil vapor samples proceeded as follows. A 1 ml aliquot of soil vap withdrawn from each bulb and injected into a Hewlett-Packard model 5890 gas chroma interfaced to a Hewlett-Packard model 5972 mass spectrometer. Chromatography was in such a way that the combination of retention times and mass fragmentation allowed complete separation of all the target compounds. The mass spec was operated in *full sc* between 35 and 350 amu. This allows for the identification of any volatile organic spec may be present in the soil vapor.

The following laboratory QA/QC was performed. An initial six-point calibration was r September 9, 1996 A laboratory control standard (LCS) from *Absolute Standards* 824 run at the end of the same day and at the end of the sampling days. The daily standard the sampling day, was made from a different lot and mixture from *Absolute Standards* initial calibration was also run on this standard stock. The surrogate calibration curve w Aldrich certified material. All results were within the LAWQCB and HGS requiremen

Two notable additions to the LAWQCB requirements were deemed necessary:

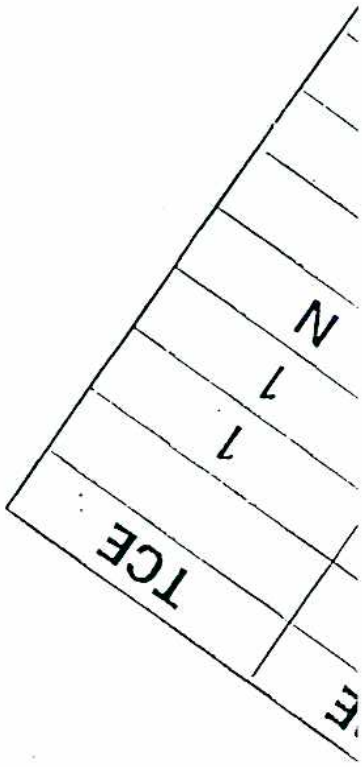
i. Five isotopically-labeled surrogates, D6-Benzene, D6-Acetone, D2-Methylene D8-Tetrahydrofuran and D-Chloroform, were added to the collection vessel, a glass bulb fitted with Teflon stopcocks and a viton rubber septum, to measure r percentages. The benzene and chloroform surrogates are used to verify the reco BTEX and chlorinated hydrocarbons respectively; a recovery of at least 90% is The deuterated acetone is a measure of the possible presence of water vapor in and general condition of the chromatographic system in terms of hydration; a re 70% indicates acceptability of the complete sampling and analysis procedure; b level, water vapor presence in the sampling line should be investigated or chromatographic dehydration procedures should be considered.

ii. Pentane vapor was used to surround the sampling train at the surface to identif ambient intrusion into the sampling train or down the outside surface of the sar tubing connected to the subsurface.

RESULTS AND

Small amounts of Trichloroethene (TCE) n
samples. MTBE, a gasoline additive, was
samples.

All QA/QC requirements of both H



ISON SOIL VAPOR (UG/L)

SOUTHERN CAL EDISON SOIL VAPOR (μG/L)

LOCATION	MTBE	TCE
GENSTWEST-SV1	3.7	1
GENSTWEST-SV2	0.6	1
GENSTWEST-SV3	1.8	N
GENSTEAST-SV4	N	N
GENSTEAST-SV5	N	N
GENSTEAST-SV6	N	N

EDISON
An EDISON INTERNATIONAL Company

P. O. Box 800
2244 Walnut Grove Ave.
Rosemead, CA 91770
818-302-2216
Fax 818-302-9750
beckergm@sce.com

George M. Becker
Senior Environmental
Specialist
Environmental Affairs

#20

SUMP INTEGRITY REPORT

for Southern California Edison Facilities

December 19, 1996
Revised (2/28/97)

Prepared by:

P. Hamilton

P. Hamilton, CEG #998
Engineering Geologist

REGISTERED GEOLOGIST
PH
P. HAMILTON
No. 998
CERTIFIED
ENGINEERING
GEOLOGIST
2/28/97
STATE OF CALIFORNIA

REGISTERED GEOLOGIST
P. Hamilton
PH
2/28/97
No. 3416
STATE OF CALIFORNIA

4. Highgrove Generating Station

4.1 Demineralizer Sump

4.1.1 Exploration

The investigation of the sump occurred on September 19, 1996. The two liners, hypalon and HDPE, were completely removed. The concrete floor was in good condition and the side walls showed minor amounts of pitting indicating some attack by acidified water. The plan was to drill four holes through the bottom of the sump with samples at 3 and 5 feet. Work began at Hole 2 where it was discovered that there are two, 1-foot thick concrete floors separated by an epoxy coating. The exposed floor appeared to have large patched areas where the concrete had been worked. Each floor slab had a rebar grid. In the case of Hole 1, the grid overlapped and the lower slab could not be penetrated. The background data was obtained from a hole drilled near the switchyard some 100 feet to the northwest.

4.1.2 Results

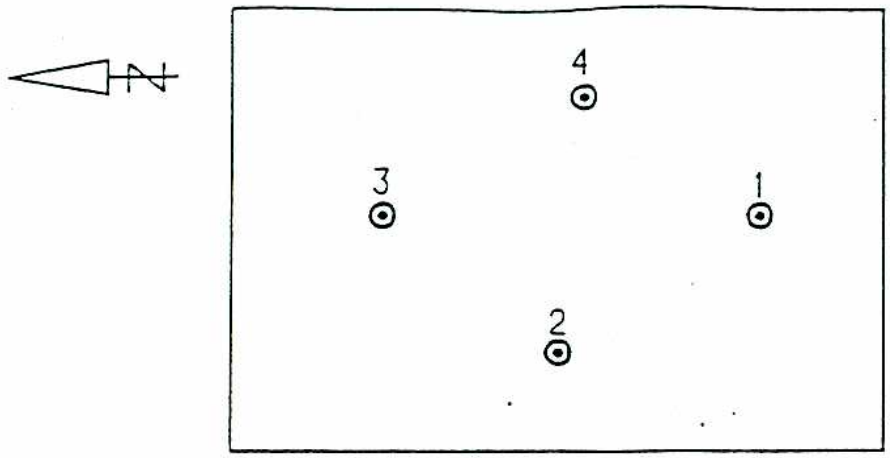
The exploration indicated the native soil is a clayey and silty sand, brown in color, dry, and very hard. The resultant data from the lab analysis is shown on Table 9 that is arranged by boring. The same data is arranged by depth on Table 10 and illustrated on Figure 4. The background data has been highlighted. Holes 2 and 3 indicate normal pH values. However, low pH values were recorded for the samples in Hole 4. The low pH values continued with depth as Hole 4 was

extended 2 additional feet. Besides having low pH values, all three soil samples from Hole 4 also had an elevated sulfate level.

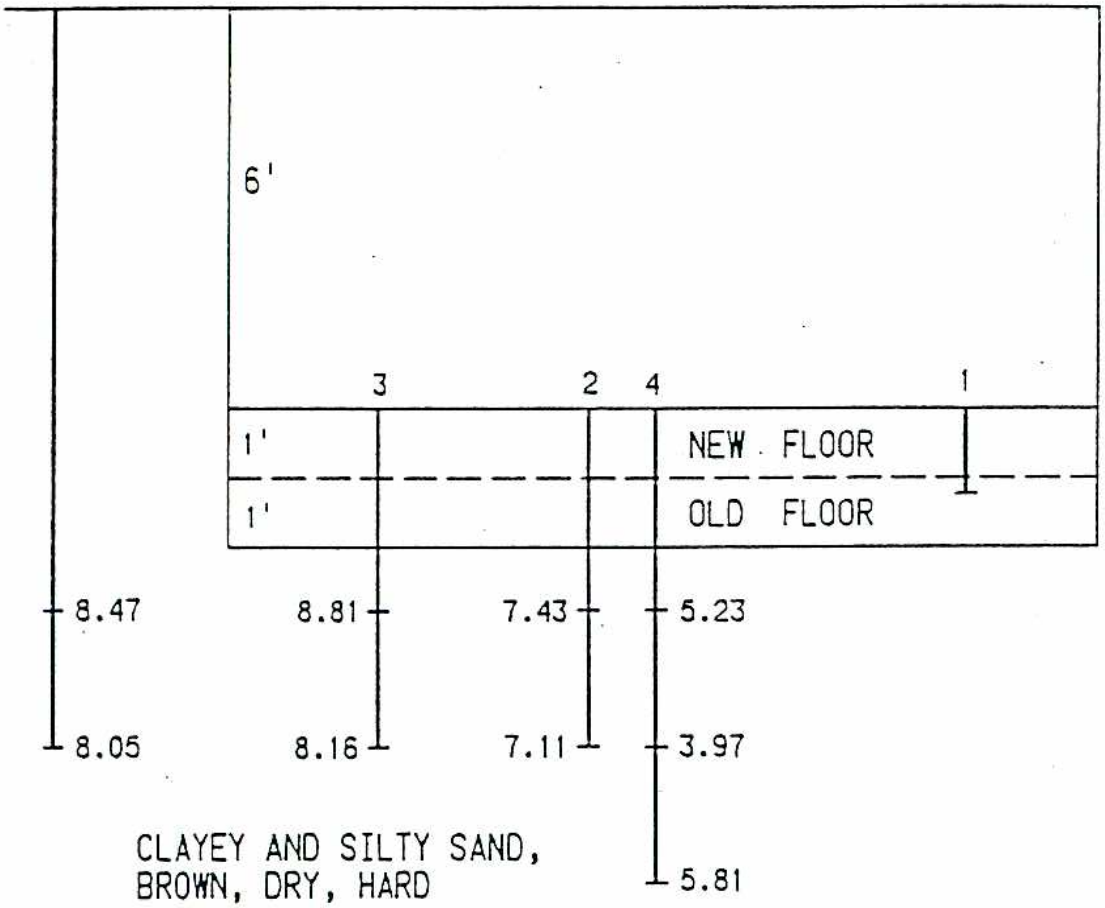
The borings penetrated the areas where the floor had possibly been patched. There were no areas of weaknesses in the concrete.

4.1.3 Conclusions

The pH values from Hole 4 indicate that acidic fluids had passed through the soils. It was also discovered that the floor had been modified for an unknown reason. However, the sump may not have leaked. There is a tank east of the sump marked sulfuric acid that is presently not empty. Since high levels of sulfate were determined to be in the soil, the tank may have leaked rather than the sump. Regardless of the cause, a release has occurred with evidence below the sump.



PLAN VIEW
1"=4'



SECTION VIEW
1"=3'

HIGHGROVE GENERATING STATION

DEMINERALIZER SUMP

FIGURE 5

SUMPSK2

Table 9

Demineralizer Sump -- Highgrove Generating Station

Data Arranged by Boring

Sample	Depth (ft)	pH (field)	pH (lab)	Calcium	Magnesium	Sodium	Potassium	Sulfate	Chloride	Nitrate	Fluoride
B-3	3	8.81	8.47	18.5	9.85	7.5	6.59	ND	ND	ND	1.13
B-4	5	8.63	8.05	9.64	8.55	7.5	6.82	ND	ND	ND	ND
2-1	3	8.42	7.43	11	14.6	18	10.9	ND	ND	ND	1.28
2-2	5	8.23	7.11	7.72	6.19	9.01	5.68	ND	ND	ND	1.35
3-1	3	9.14	8.81	9.65	16.7	39.7	13.3	ND	ND	ND	1.3
3-2	5	10.09	8.16	5.7	6.26	17.4	4.93	ND	ND	ND	ND
4-1	3	4.22	5.23	10.7	15.4	22.8	13.9	82	ND	ND	ND
4-2	5	3.60	3.97	47.2	4.13	16.4	2.2	290	0.57	ND	ND
4-3	7	4.37	5.81	145	7.32	15.1	2.21	704	0.57	ND	3.1

Table 10

Demineralizer Sump -- Highgrove Generating Station

Data Arranged by Depth

Sample	Depth (ft)	pH (field)	pH (lab)	Calcium	Magnesium	Sodium	Potassium	Sulfate	Chloride	Nitrate	Fluoride
2-1	3	8.42	7.43	11	14.6	18	10.9	ND	ND	ND	1.28
3-1	3	9.14	8.81	9.65	16.7	39.7	13.3	ND	ND	ND	1.3
4-1	3	4.22	5.23	10.7	15.4	22.8	13.9	82	ND	ND	ND
B-3	3	8.81	8.47	18.5	9.85	7.5	6.59	ND	ND	ND	1.13
2-2	5	8.23	7.11	7.72	6.19	9.01	5.68	ND	ND	ND	1.35
3-2	5	10.09	8.16	5.7	6.26	17.4	4.93	ND	ND	ND	ND
4-2	5	3.60	3.97	47.2	4.13	16.4	2.2	290	0.57	ND	ND
B-4	5	8.63	8.05	9.64	8.55	7.5	6.82	ND	ND	ND	ND
4-3	7	4.37	5.81	145	7.32	15.1	2.21	704	0.57	ND	3.1

EDISON

An EDISON INTERNATIONAL Company

Daily Report

Date: 9/19/96 Page 1 of 1

I have read and completely understand the approved procedures in the SAP. P Hamilton

Weather: [illegible]

Equipment Used: [illegible]

Visitors: Gene Seal

Sampling Completed

Boring No.	Sample Depth	Type Soil or Water	Field pH	Sample Temp	Backfilled
[illegible]	~~3'~~	SOIL	[illegible]	[illegible]	Bentonite
[illegible]	5'	SOIL	8.23	21.9	✓
HGS-3-1	3'	SOIL	9.14	27.1	✓
HGS-3-2	5'	SOIL	10.09	26.7	✓
—	—	CEMENT COTTINGS	12.02	26.1	✓
HGS-4-1	3'	SOIL	4.22	32.3	✓
HGS-4-2	5'	SOIL	3.60	27.6	✓
HGS-4-3	7'	SOIL	4.37	30.6	✓

Special Conditions/Problems/Comments: ~~32.3, 27.6~~

I have completed the sampling using the approved procedures described in the SAP. P Hamilton

Weck Laboratories, Inc.
Analytical & Environmental Services

Client: Southern California Edison
2131 Walnut Grove Avenue
Rosemead, CA 91770

Report Date: September 30, 199
Received Date: September 19, 199
Thursday 15:56/TG

Attn.: P Hamilton G03-3-G10 (818) 302-8758 x FAX (818) 302-8747

Project Name: Highgrove Sump
Project #:
Purchase Order #: Z3046902 Normal Turnaround

Certificate of Analysis

Lab#: 9619497 Sample ID: HGS-2-1 Matrix: Soil
Sampled By: P. Hamilton Date: 09/19/1996 Time: 09:30

Parameter	Result	Units	PQL	Method	Analyzed	Run #
pH	7.43	Units		EPA 9045	09/30/1996	96113212
Water Leachable Sulfate (1:5)	ND	mg/L	20	EPA 300	09/24/1996	96113148
Water Leachable Chloride (1:5)	ND	mg/L	2	EPA 300	09/24/1996	96113148
Water Leachable Nitrate as NO3 (1:5)	ND	mg/L	2	EPA 300	09/24/1996	96113148
Water Leachable Fluoride (1:5)	1.28	mg/L	1	EPA 300	09/24/1996	96113148
Water Leachable Calcium (1:5)	11	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Magnesium (1:5)	14.6	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Sodium (1:5)	18	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Potassium (1:5)	10.9	mg/L	0.5	EPA 200.7	09/20/1996	96113031

Lab#: 9619498 Sample ID: HGS-2-2 Matrix: Soil
Sampled By: P. Hamilton Date: 09/19/1996 Time: 09:50

Parameter	Result	Units	PQL	Method	Analyzed	Run #
pH	7.11	Units		EPA 9045	09/30/1996	96113212
Water Leachable Sulfate (1:5)	ND	mg/L	20	EPA 300	09/24/1996	96113148
Water Leachable Chloride (1:5)	ND	mg/L	2	EPA 300	09/24/1996	96113148
Water Leachable Nitrate as NO3 (1:5)	ND	mg/L	2	EPA 300	09/24/1996	96113148
Water Leachable Fluoride (1:5)	1.35	mg/L	1	EPA 300	09/24/1996	96113148
Water Leachable Calcium (1:5)	7.72	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Magnesium (1:5)	6.19	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Sodium (1:5)	9.01	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Potassium (1:5)	5.68	mg/L	0.5	EPA 200.7	09/20/1996	96113031

Lab#: 9619499 Sample ID: HGS-3-1 Matrix: Soil
Sampled By: P. Hamilton Date: 09/19/1996 Time: 10:45

Parameter	Result	Units	PQL	Method	Analyzed	Run #

Client: Southern California Edison
Project Name: Highgrove Sump
Purchase Order #Z3046902 Normal Turnaround

Report Date: September 30, 199
Project #:
Page

Certificate of Analysis (Continued)

Lab#: 9619502 Sample ID: HGS-4-2 Matrix: Soil
Sampled By: P. Hamilton Date: 09/19/1996 Time: 12:35

Parameter	Result	Units	PQL	Method	Analyzed	Run #
pH	3.97	Units		EPA 9045	09/30/1996	96113212
Water Leachable Sulfate (1:5)	290	mg/L	20	EPA 300	09/24/1996	96113148
Water Leachable Chloride (1:5)	0.57	mg/L	0.2	EPA 300	09/24/1996	96113148
Water Leachable Nitrate as NO3 (1:5)	ND	mg/L	0.20	EPA 300	09/24/1996	96113148
Water Leachable Fluoride (1:5)	ND	mg/L	1	EPA 300	09/24/1996	96113148
Water Leachable Calcium (1:5)	47.2	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Magnesium (1:5)	4.13	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Sodium (1:5)	16.4	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Potassium (1:5)	2.2	mg/L	0.5	EPA 200.7	09/20/1996	96113031

Lab#: 9619503 Sample ID: HGS-4-3 Matrix: Soil
Sampled By: P. Hamilton Date: 09/19/1996 Time: 13:40

Parameter	Result	Units	PQL	Method	Analyzed	Run #
pH	5.81	Units		EPA 9045	09/30/1996	96113212
Water Leachable Sulfate (1:5)	704	mg/L	20	EPA 300	09/24/1996	96113148
Water Leachable Chloride (1:5)	0.57	mg/L	0.2	EPA 300	09/24/1996	96113148
Water Leachable Nitrate as NO3 (1:5)	ND	mg/L	0.20	EPA 300	09/24/1996	96113148
Water Leachable Fluoride (1:5)	3.1	mg/L	1	EPA 300	09/24/1996	96113148
Water Leachable Calcium (1:5)	145	mg/L	2	EPA 200.7	09/20/1996	96113031
Water Leachable Magnesium (1:5)	7.32	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Sodium (1:5)	15.1	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Potassium (1:5)	2.21	mg/L	0.5	EPA 200.7	09/20/1996	96113031

ND = Not Detected
PQL = Practical Quantifiable Limit
e = Estimated (> MDL, but < PQL)

Authorized Signature

Any remaining sample(s) for testing will be disposed of three weeks from the final repor
date unless other arrangements are made in advance.

Client: Southern California Edison
Project Name: Highgrove Sump
Purchase Order #Z3046902 Normal Turnaround

Report Date: September 30, 199
Project #:
Page

Certificate of Analysis (Continued)

Lab#: 9619499 **Sample ID:** HGS-3-1 **Matrix:** Soil
Sampled By: P. Hamilton **Date:** 09/19/1996 **Time:** 10:45

Parameter	Result	Units	PQL	Method	Analyzed	Run #
pH	8.81	Units		EPA 9045	09/30/1996	96113212
Water Leachable Sulfate (1:5)	ND	mg/L	20	EPA 300	09/24/1996	96113148
Water Leachable Chloride (1:5)	ND	mg/L	2	EPA 300	09/24/1996	96113148
Water Leachable Nitrate as NO3 (1:5)	ND	mg/L	2	EPA 300	09/24/1996	96113148
Water Leachable Fluoride (1:5)	1.3	mg/L	1	EPA 300	09/24/1996	96113148
Water Leachable Calcium (1:5)	9.65	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Magnesium (1:5)	16.7	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Sodium (1:5)	39.7	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Potassium (1:5)	13.3	mg/L	0.5	EPA 200.7	09/20/1996	96113031

Lab#: 9619500 **Sample ID:** HGS-3-2 **Matrix:** Soil
Sampled By: P. Hamilton **Date:** 09/19/1996 **Time:** 11:00

Parameter	Result	Units	PQL	Method	Analyzed	Run #
pH	8.16	Units		EPA 9045	09/30/1996	96113212
Water Leachable Sulfate (1:5)	ND	mg/L	20	EPA 300	09/24/1996	96113148
Water Leachable Chloride (1:5)	ND	mg/L	2	EPA 300	09/24/1996	96113148
Water Leachable Nitrate as NO3 (1:5)	ND	mg/L	2	EPA 300	09/24/1996	96113148
Water Leachable Fluoride (1:5)	ND	mg/L	1	EPA 300	09/24/1996	96113148
Water Leachable Calcium (1:5)	5.7	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Magnesium (1:5)	6.26	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Sodium (1:5)	17.4	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Potassium (1:5)	4.93	mg/L	0.5	EPA 200.7	09/20/1996	96113031

Lab#: 9619501 **Sample ID:** HGS-4-1 **Matrix:** Soil
Sampled By: P. Hamilton **Date:** 09/19/1996 **Time:** 12:20

Parameter	Result	Units	PQL	Method	Analyzed	Run #
pH	5.23	Units		EPA 9045	09/30/1996	96113212
Water Leachable Sulfate (1:5)	82	mg/L	20	EPA 300	09/24/1996	96113148
Water Leachable Chloride (1:5)	ND	mg/L	2	EPA 300	09/24/1996	96113148
Water Leachable Nitrate as NO3 (1:5)	ND	mg/L	2	EPA 300	09/24/1996	96113148
Water Leachable Fluoride (1:5)	ND	mg/L	1	EPA 300	09/24/1996	96113148
Water Leachable Calcium (1:5)	10.7	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Magnesium (1:5)	15.4	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Sodium (1:5)	22.8	mg/L	0.5	EPA 200.7	09/20/1996	96113031
Water Leachable Potassium (1:5)	13.9	mg/L	0.5	EPA 200.7	09/20/1996	96113031

CHAIN OF CUSTODY RECORD

Weck Laboratories, Inc.

ENVIRONMENTAL SERVICES

14859 E. Clark Ave. • Industry, CA 91745 • Tel: (818) 336-2139 Fax: (818) 336-2634

CLIENT NAME: So CAL EDISON

PROJECT: HIGHGROVE SUMP

ADDRESS: 2131 WALNUT GROVE AVE

PHONE #: (818) 302-8758

PROJECT MANAGER

SAMPLER: P. Hamilton

P.O.#

ANALYSIS REQUESTED: GEN MINERALS, DHS

SPECIAL HANDLING
- ☐ Same Day Rush (60%)
- ☐ 24 HRS (40%)
- ☐ 48 - 72 HRS (30%)
- ☐ 7 - 10 Business Days
- ☐ QA/QC Package

Reporting Agency _____

Method of Shipment: _____

LAB I.D.#	DATE SAMPLED	TIME SAMPLED	SMPL TYPE*	SAMPLE IDENTIFICATION	# OF CONT.	GEN MINERALS	DHS	REMARKS
91497	9/19/96	0930	SO	HGS-2-1	1	X	X	5:1 Leach
98		0950		HGS-2-2	1	X	X	
99		1045		HGS-3-1	1	X	X	
500		1100		HGS-3-2	1	X	X	
501		1220		HGS-4-1	1	X	X	
502		1235		HGS-4-2	1	X	X	
503		1340		HGS-4-3	1	X	X	

RELINQUISHED BY	DATE / TIME	RECEIVED BY
P. Hamilton	9/19/96 1555	
RELINQUISHED BY	DATE / TIME	RECEIVED BY
RELINQUISHED BY	DATE / TIME	RECEIVED BY

SPECIAL REQUIREMENTS OR INSTRUCTIONS

* = AQ - Aqueous NA - Nonaqueous SL-Sludge DW - Drinking Water WW-Wastewater GW-Groundwater SO-Soil SW-Solid Waste OT-Other

Sample Condition:
- Precooled (Y) N
- Preserved Y (N)
- Evidence seals Intact Y / N
- Container Attacked Y (N)
- Preserved at Lab Y (N)

Disposition of samples:
- Pick Up by client: _____
- Return*: _____
- Dispose by Lab*: _____

* Extra charge added

SUMMARY EVALUATION:
SCREENING-LEVEL EXPOSURE AND HEALTH EVALUATION FOR THE HIGHGROVE GENERATING STATION SOUTHERN CALIFORNIA EDISON GRAND TERRACE, CALIFORNIA

Summary of the Screening-Level Exposure and Health Evaluation

Based on screening-level exposure and health assessment approaches, ENVIRON concluded that the levels of arsenic in soils at the cooling towers, pipelines, septic tank and seepage pits, and Hardinge filter water processor area at the Highgrove Generating Station (the "Site") do not represent a significant health risk to future workers. This conclusion is based on a quantitative screening-level evaluation of the potential for arsenic to cause cancer or other adverse noncancer health effects and an evaluation of the potential for workers to be exposed to arsenic at levels above the California Occupational Safety and Health Administration (Cal/OSHA) standard. Because the levels of arsenic measured in soil do not pose a significant health risk and correspond to exposure levels well below Cal/OSHA standards, we believe no further action (e.g., remediation or other risk management actions) is necessary at the cooling towers, pipelines, septic tank and seepage pits, and Hardinge filter water processor area of the Site to allow the continued industrial use of the property. No evaluation has been completed for arsenic levels in soils at the agricultural area (North Parcel).

A. Introduction

In this Summary Evaluation, ENVIRON presents an overview of the process and a summary of the results of the screening-level exposure and health evaluation conducted for Southern California Edison's (SCE's) Highgrove Generating Station (the "Site"), located in Grand Terrace, California. In 1997, Geraghty & Miller completed a Phase II Environmental Site Assessment (ESA) for the Site. Geraghty & Miller (1997) reported that arsenic was detected during the Phase II ESA in soils located at the cooling towers, near pipelines, in the septic tanks and seepage pits, and in the Hardinge filter water processor area at concentrations above a soil screening level of 2.4 mg/kg (i.e., the preliminary remediation goal (PRG) developed by Region 9 of the U.S. Environmental Protection Agency (USEPA 1996) for an industrial setting). Geraghty & Miller (1997) also reported that previous site investigations showed that arsenic exceeded its soil screening level in soils at the cooling towers and the agricultural area of the

North Parcel. Based on the arsenic exceedances in soil, Geraghty & Miller (1997) identified the cooling towers, pipelines, the septic tanks and seepage pits, the Hardinge filter water processor area, and the agricultural area (North Parcel) as site features where chemicals were detected at concentrations above screening levels.

As discussed by the USEPA (1996), finding samples with concentrations of chemicals above screening levels such as the PRG values does not necessarily mean a health risk is present. Rather, it indicates that further evaluation is warranted to determine if a health risk is posed. For those site features where chemicals were detected at levels above screening levels, SCE has requested that ENVIRON perform such further evaluations. Based on this request, ENVIRON performed a screening-level exposure and health evaluation to determine whether or not levels of arsenic detected in soils at the cooling towers, near pipelines, in the septic tanks and seepage pits, and in the Hardinge filter water processor area at the Highgrove Generating Station could adversely impact the health of potential future workers and if further action is required at these site features for continued industrial land use of the Site. ENVIRON's evaluation consisted of a focused assessment of the areas identified by the initial screening as warranting further evaluation. Because the initial screening and our focused assessment indicated a comprehensive risk assessment for the entire Site is not necessary, ENVIRON has not performed a comprehensive risk assessment for the Site as a whole.

B. Identification of Site Areas Where Chemical Concentrations Exceed Screening Levels

Geraghty & Miller (1997) conducted a Phase II ESA at the SCE Highgrove Generating Station. As part of this evaluation, Geraghty & Miller (1997) identified the cooling towers, pipelines, septic tank and seepage pits, and Hardinge filter water processor area as site features where chemicals were present in soil at concentrations above its screening level. The data which lead to the identification of the cooling towers, pipelines, septic tank and seepage pits, and Hardinge filter water processor area as site features warranting further evaluation are summarized below. The agricultural area (North Parcel) where arsenic was detected at concentrations above its screening level during previous investigations is located off-site to the north and has not been included in this evaluation.

B.1 Soil Investigations

Geraghty & Miller (1997) conducted soil investigations at the Site during the Phase II ESA. Results of these investigations showed that only arsenic in soils at the cooling towers, pipelines, septic tank and seepage pits, and the Hardinge filter water processor area exceeded its screening

level. Results of the previous investigations also indicated that only arsenic was present above its screening level in sludge sampled at the cooling towers and in soils sampled at the agricultural area (North Parcel) (Geraghty & Miller 1997).

During the previous investigations at the Site in June 1996, two composite sludge samples were collected from cooling towers 1 and 2 and cooling towers 3 and 4 and analyzed for metals. Geraghty & Miller (1997) reported that arsenic was detected in exceedance of the soil screening level of 2.4 mg/kg at elevated concentrations of 45 and 16 mg/kg in the two composite sludge samples. SCE removed the remaining sludge from within the four cooling tower basins and disposed of the sludge at an off-site disposal facility. During the Phase II ESA, 11 soil samples were collected at depths ranging from 0.85 to 7.5 feet below ground surface (bgs) from five cooling towers and analyzed for metals. Geraghty & Miller (1997) reported that metals were present below soil screening levels, with the exception of arsenic. Arsenic was detected in all five soil samples collected from the cooling towers at a depth of 1 foot bgs or less at concentrations ranging from 2.9 to 3.5 mg/kg, all in exceedance of its soil screening level. Geraghty & Miller (1997) also reported that arsenic was detected in all six samples collected at the cooling towers at depths greater than 1 foot bgs at concentrations ranging from 1.1 to 3.6 mg/kg, with three samples containing arsenic in exceedance of its soil screening level (3, 3.1, and 3.6 mg/kg). Polychlorinated biphenyls (PCBs) were analyzed for in two soil samples collected from the transformer at cooling tower 1 but were not detected.

Four samples were collected from soils at three locations along pipelines at depths ranging from 5 to 10 feet bgs and analyzed for metals and total petroleum hydrocarbons (TPHs) in all four samples, as well as for volatile organic compounds (VOCs) in one soil boring, during the Phase II ESA. Geraghty & Miller (1997) reported that no VOCs were detected and TPHs and metals were present below soil screening levels, with the exception of arsenic. Arsenic was detected in three samples from all three pipeline sample locations at concentrations ranging from 1.2 to 7.6 mg/kg, with only the maximum detected concentration in exceedance of its soil screening level.

During the Phase II ESA, two soil samples were collected at depths of 55 and 60 feet at the former septic tank and seepage pits and analyzed for TPHs, VOCs, and metals. Geraghty & Miller (1997) reported that no TPHs or VOCs were detected and metals were present below soil screening levels, with the exception of arsenic. Arsenic was detected in one soil sample at a depth of 60 feet in exceedance of its soil screening level at a concentration of 7.5 mg/kg.

Two soil samples were collected at the Hardinge filter water processor area and analyzed for metals during the Phase II ESA. Geraghty & Miller (1997) reported that metals were present

below soil screening levels, with the exception of arsenic. Arsenic was detected in exceedance of its soil screening level at a concentration of 2.5 mg/kg in the shallow soil sample collected at a depth of 0.5 feet bgs. Arsenic was detected below its soil screening level at a concentration of 1.8 mg/kg in the 5 foot sample.

Geraghty & Miller (1997) reported that during previous soil sampling at the agricultural area (North Parcel) metals were present below soil screening levels, except for arsenic, which was detected at concentrations (unreported in available data) in exceedance of the soil screening level of 2.4 mg/kg.

B.2 Remedial Activities

Following earlier investigations of the cooling towers, SCE removed sludge containing elevated concentrations of arsenic for off-site disposal (Geraghty & Miller 1997).

C. Exposure and Health Evaluation

C.1 General Approach

In response to finding individual samples with chemical concentrations above screening levels, ENVIRON performed further evaluation of the areas in which these samples were collected. The additional evaluation included three separate assessments. First, we looked to see if the average concentration (i.e., the 95 percent upper confidence limit (95% UCL) of the arithmetic mean) of any chemical detected in an area within the Site exceeded the screening concentration. Second, we estimated the health risk posed by the average (i.e., 95% UCL of the arithmetic mean) concentration of the chemicals detected above screening levels in areas (i.e., site features) within the Site identified as having chemical concentrations above screening levels. Finally, we looked to see if the levels of any chemicals detected above screening levels would cause exposures in excess of California Occupational Safety and Health Administration (Cal/OSHA) standards.

The screening concentrations used in the ESAs performed for the generating stations are conservative estimates of concentrations below which there would be no or insignificant risk of adverse health effects. However, adverse health effects would only be expected if the average concentration of chemical a person were exposed to over a prolonged period of time exceeds the screening concentration (e.g., PRG). For example, the average concentration of the chemical over an area in which a worker would be expected to be exposed for 25 years would have to exceed the PRG level before an adverse health effect or a lifetime incremental cancer risk of one-in-one million (1×10^{-6}) would be expected. Accordingly, the discovery of a single sample with

a chemical above its screening concentration does not by itself indicate an adverse health effect would be expected. We have used the detection of a chemical above the PRG in a single sample as an indicator that further evaluation of the average concentration of the chemical in an area within a Site should be more closely evaluated. In accordance with standard practice of regulatory agencies, we have used the 95% UCL of the arithmetic average as the measure of the average concentration to be compared to the PRG. Such a comparison is still conservative because it is unlikely that any individual would spend 25 years working exclusively at any of the site features of the generating station we have evaluated.

State and Federal agencies have established acceptable probabilities of cancer for lifetime exposures to be within the range of one-in-one million (1×10^{-6}) and one-in-ten thousand (1×10^{-4}). The Department of Toxic Substances Control (DTSC) typically requires remediation to levels of one-in-one hundred thousand (1×10^{-5}). While we have concentrations corresponding to cancer risks of 1×10^{-6} for our screening concentrations, we have used 1×10^{-5} as a risk target for judging where an agency would be expected to require further remediation or other risk management actions.

C.2 Results of Evaluation

Based on the results of the Phase II ESA, Geraghty & Miller (1997) identified the cooling towers, pipelines, septic tank and seepage pits, Hardinge filter water processor area, and the agricultural area (North Parcel) as areas where chemical concentrations exceeded soil screening levels for industrial exposures. Because we assume future land use will remain industrial, ENVIRON assumed that the population potentially exposed to chemicals in the identified areas includes a future on-site industrial worker. Although exposures to an on-site intrusive worker may occur, exposures to the intrusive worker are expected to be lower than a long-term, on-site industrial worker due to less frequent exposures and shorter exposure durations. The evaluation conducted here for an industrial worker, thus, is considered to be protective of an intrusive worker. ENVIRON also assumed that exposure may occur to chemicals in shallow surface soils (i.e., to depths of 1 foot bgs or less) by direct ingestion and dermal contact as well as by inhalation of airborne dusts containing arsenic that is generated from disturbed soils.

As discussed above, results reported by Geraghty & Miller (1997) indicate that the only chemical detected above soil screening levels in shallow and subsurface soils at the identified site features is arsenic, which was detected in soil down to 1 foot bgs at the cooling towers and Hardinge filter water processor area. No shallow soil samples were collected along the pipelines or in the septic tank and seepage pits area. Arsenic also was detected above its soil screening

level in subsurface soils below 1 foot bgs in at the cooling towers, pipelines, and septic tank and seepage pits area. Subsurface soil in the Hardinge filter water processor area also contained arsenic but at a concentration below its soil screening level, as indicated by the result reported for the one sample collected at a depth of 5 feet bgs at this site feature. No samples were collected in the agricultural area (North Parcel) during the Phase II ESA.

As mentioned above, we further evaluated arsenic in the vicinity of the cooling towers, pipelines, septic tank and seepage pits, and Hardinge filter water processor area by determining if the 95% UCL of the mean concentration exceeded the screening level and by estimating the health risk to workers associated with the 95% UCL of the mean arsenic concentration. We also evaluated the likelihood that arsenic in soils would cause the Cal/OSHA standard to be violated. The results of these three evaluations are presented below.

First, ENVIRON reviewed the site investigation data for the identified site features for chemicals at levels in exceedance of soil screening levels. Results showed that the maximum and the 95% UCL of the average concentrations of arsenic in shallow soils at several site features exceeded the soil screening level of 2.4 mg/kg. In shallow soils at the cooling towers, the maximum and the 95% UCL of the average concentrations are 3.5 and about 3.4 mg/kg, respectively. In subsurface soils at the cooling towers, the maximum and the 95% UCL of the average concentrations are 3.6 and 3.2 mg/kg, respectively. Arsenic also was detected in the areas of pipelines at a maximum and a 95% UCL of the average concentrations of 7.6 and 6.7 mg/kg, respectively. In subsurface soils at the septic tank and seepage pits area, arsenic was detected in one out of two samples at a maximum concentration of 7.5 mg/kg. Arsenic was detected in surface soils at the Hardinge filter water processor area at a maximum concentration of 2.5 mg/kg. In subsurface soils at the Hardinge filter water processor area, arsenic also was detected but at a concentration below its soil screening level at a maximum concentration of 1.8 mg/kg.

Second, ENVIRON estimated health risks posed by the chemicals that exceeded soil screening concentrations. This approach involved comparing site concentrations in shallow soils at the identified site features to the USEPA soil PRG of 2.4 mg/kg developed to be protective of the carcinogenic and noncarcinogenic effects of arsenic for an industrial setting. Results of the evaluation indicate that the probability that a future worker will develop cancer as a result of exposure to arsenic in soils is just over 1×10^{-6}. A cancer probability of 1.4×10^{-6} is estimated for exposures to the 95% UCL of the average arsenic concentration found in shallow soils at the cooling towers basins. A cancer probability of 1.0×10^{-6} is estimated for exposures to the maximum arsenic concentration detected in shallow soils at the Hardinge filter water processor.

For the evaluations, assuming exposure concentrations equal to the 95% UCL of the average concentration and the maximum concentration in shallow soils of the cooling towers and the Hardinge filter water processor area, respectively, the estimated cancer probability levels for a future worker are just above 1×10^{-6} but within the range of 1×10^{-6} and 1×10^{-4} and below the DTSC target level of 1×10^{-5}.

For those areas where arsenic levels exceed the PRG in subsurface soils (i.e., 95% UCL of the mean arsenic levels at the cooling towers and the pipelines and the maximum arsenic levels at the septic tank and seepage pits area and Hardinge filter water processor area), the risks to the worker would be less than 1×10^{-5}, if the subsurface soils were somehow to be brought to the surface where workers could come into direct contact with them on a daily basis. The 95% UCL of the average concentration estimated for arsenic in the subsurface soils in the septic tank and seepage pits area of the Site is greater than the maximum detected concentration. In accordance with standard regulatory agency practice for such a situation, the risk estimate is based on the maximum detected level and not the 95% UCL of the mean. It was not possible to estimate a 95% UCL of the average arsenic concentration for the Hardinge filter water processor area because only one subsurface soil sample was collected, and, thus, the maximum concentration was used in the evaluation.

ENVIRON's third screening-level assessment was to compare shallow soil concentrations detected at the identified site features to a concentration in soil corresponding to the Cal/OSHA permissible exposure limit (PEL). A soil concentration of 2,000 mg of arsenic/kg of soil is calculated as corresponding to the PEL of 0.01 mg/m^3 (8 CCR § 5155) for inorganic arsenic assuming a constant respirable dust concentration of 5 mg/m^3, as set by Cal/OSHA (8 CCR § 5155). Assuming that respirable dust in the work place will be 5 mg/m^3 is an extremely conservative assumption. Dust levels would be expected to be well below the Cal/OSHA respirable dust limit of 5 mg/m^3. Results of this evaluation show that the 95% UCL of the average concentration at the cooling towers and the maximum concentration at the Hardinge filter water processor area do not exceed the soil concentration of 2,000 mg/kg, corresponding to the Cal/OSHA standard.

For those areas where arsenic levels exceed the PRG in subsurface soils, ENVIRON also compared subsurface soil arsenic concentrations to the soil concentration corresponding to the OSHA standard if the subsurface soils were somehow to be brought to the surface where workers could come into direct contact with them on a daily basis. The 95% UCL of the mean arsenic levels at the cooling towers and the pipelines and the maximum arsenic levels at the septic tank and seepage pits area and Hardinge filter water processor area do not exceed the soil

concentration of 2,000 mg/kg, corresponding to the Cal/OSHA standard. As stated above, the evaluation is based on the 95% UCL of the average arsenic concentration. In accordance with standard regulatory agency practice, the maximum detected level was used in the evaluation when it was not possible to estimate a 95% UCL of the mean.

D. Conclusion

Arsenic was the only chemical detected in soil at concentrations exceeding its soils screening level. Arsenic concentrations in shallow and subsurface soils collected during the Phase II ESA at the cooling towers, pipelines, septic tank and seepage pits area, and Hardinge filter water processor area of the Highgrove Generating Station are not expected to adversely impact the health of potential future workers. Thus, no further action (e.g., risk management or remediation) is necessary for the any of these areas within the Site for continued industrial land use. No evaluation has been completed for arsenic exceedances reported for previous investigations at the agricultural area (North Parcel).

E. References

California Code of Regulations (CCR). Title 8, *Industrial Relations*. Division I, *Department of Industrial Relations*. Ch. 16, *Control of Hazardous Substances*. Article 107, *Dusts, Fumes, Mists, Vapors, and Gases*. Section 5155, *Airborne Contaminants*. (8 § 5155).

Geraghty & Miller. 1997. *Highgrove Generating Station Phase II Environmental Site Assessment.* Submitted to Southern California Edison, Rosemead, California.

U.S. Environmental Protection Agency (USEPA). 1996. *Region 9 Preliminary Remediation Goals (PRGs) 1996.* San Francisco, CA. August 1.

Summary of Arsenic Concentrations in Soils
Highgrove Generating Station

Type of Samples	Number of Samples	Number of Detects	Concentration (mg/kg) Minimum	Maximum	Average	95% UCL
Cooling Towers						
Total	11	11	1.1	3.6	2.69	3.16
<2 feet	5	5	2.9	3.5	3.12	3.35
>2 feet	6	6	1.1	3.6	2.33	3.19
Pipelines						
>2 feet	4	3	<1	7.6	2.88	6.67
Septic Tank and Seepage Pits Area						
>2 feet	2	1	<1	7.5	4	26.10
Hardinge Filter Water Processor Area						
Total	2	2	1.8	2.5	2.15	4.36
<2 feet	1	1	2.5	2.5	NA	NA
>2 feet	1	1	1.8	1.8	NA	NA

Site Features	Arsenic Exposure Concentrations (mg/kg) Shallow Soil (<2 feet)		Total Soil	
Cooling Towers	3.35	95% UCL	3.16	95% UCL
Pipelines	NA	NA	6.67	95% UCL
Septic Tank and Seepage Pits Area	NA	NA	7.5	Maximum
Hardinge Filter Water Processor Area	2.5	Maximum	2.5	Maximum

Notes:

NA = Not applicable.

Arsenic Soil Concentrations
Highgrove Generating Station

Sample ID	Sample Depth (feet)	Sample Date	Soil Screening Level	Result	PQL	Units
COOLING TOWERS						
CT1-1.0	1	10/23/96	2.4	2.9	1	mg/kg
CT1-7.0	7	10/23/96	2.4	3.6	1	mg/kg
CT2-1.0	1	10/23/96	2.4	3.2	1	mg/kg
CT2-3.0	3	10/23/96	2.4	3.1	1	mg/kg
CT2-6	6	10/24/96	2.4	1.3	1	mg/kg
CT3-1.0	1	10/23/96	2.4	3.5	1	mg/kg
CT3-7.5	7.5	10/23/96	2.4	3	1	mg/kg
CT4-1.0	1	10/23/96	2.4	3	1	mg/kg
CT4-7.5	7.5	10/23/96	2.4	1.9	1	mg/kg
CT5-0.85	0.85	10/23/96	2.4	3	1	mg/kg
CT5-6	6	10/24/96	2.4	1.1	1	mg/kg
PLANT WASTEWATER DISCHARGE/SURFACE WATER DISCHARGE						
CTDP1-0.5	0.5	10/24/96	2.4	2.2	1	mg/kg
CTDP1-5	5	10/24/96	2.4	2.3	1	mg/kg
CTDP2-0.5	0.5	10/24/96	2.4	2	1	mg/kg
CTDP2-5	5	10/24/96	2.4	2	1	mg/kg
CTDP3-3	3	10/24/96	2.4	ND	1	mg/kg
CTDP-4-0.5	0.5	2/3/97	2.4	ND	1	mg/kg
PIPELINES						
OM1-9	9	10/24/96	2.4	7.6	1	mg/kg
FOP1-10	10	10/24/96	2.4	ND	1	mg/kg
FOP1-5	5	10/24/96	2.4	2.2	1	mg/kg
RP1-8	8	11/1/96	2.4	1.2	1	mg/kg
SEPTIC TANK AND SEEPAGE PITS						
SP-1-55	55	2/3/97	2.4	ND	1	mg/kg
SP-1-60	60	2/3/97	2.4	2.9	1	mg/kg
HARDINGE FILTER WATER PROCESSOR AREA						
CT/WS-1-0.5	0.5	10/24/96	2.4	2.5	1	mg/kg
CT/WSB-1-5	5	10/24/96	2.4	1.8	1	mg/kg
AGRICULTURAL AREA (NORTH PARCEL)						
?						
BLANKS						
EB-HA3		10/23/96	NA	ND	0.01	mg/L
OM1-EB		10/24/96	NA	ND	0.1	mg/L

Notes:

**	PQLs were not available with TIC report.
ID	Identification
mg/kg	Milligrams per kilogram
NA	Not available
ND	Not detected at or above practical quantitation limit.
PQL	Practical Quantitation Limit

Arsenic Soil Concen...ations for the Cooling Towers
Highgrove Generating Station

Sample ID	Sample Date	Sample Depth (feet)	Arsenic Concentration (mg/kg)	PQL (mg/kg)
CT1-1.0	10/23/96	1	2.9	1
CT1-7.0	10/23/96	7	3.6	1
CT2-1.0	10/23/96	1	3.2	1
CT2-3.0	10/23/96	3	3.1	1
CT2-6	10/24/96	6	1.3	1
CT3-1.0	10/23/96	1	3.5	1
CT3-7.5	10/23/96	7.5	3	1
CT4-1.0	10/23/96	1	3	1
CT4-7.5	10/23/96	7.5	1.9	1
CT5-0.85	10/23/96	0.85	3	1
CT5-6	10/24/96	6	1.1	1

Summary Statistics

Statistical Parameter	Total Samples	Sample Depth <= 2 feet	Sample Depth > 2 feet
Number of Samples	11	5	6
Arithmetic Mean	2.690909091	3.12	2.333333333
Standard Deviation	0.856101099	0.238746728	1.040512694
95% UCL on Mean	3.158630129	3.347635308	3.189280203
Maximum Concentration	3.6	3.5	3.6
Minimum Concentration	1.1	2.9	1.1

Notes:

ID Identification
PQL Practical Quantitation Limit

Arsenic Soil Concentrations for the Pipelines
Highgrove Generating Station

Sample ID	Sample Date	Sample Depth (feet)	Arsenic Concentration (mg/kg)	PQL (mg/kg)
OM1-9	10/24/96	9	7.6	1
FOP1-10	10/24/96	10	<1.0	1
FOP1-5	10/24/96	5	2.2	1
RP1-8	11/1/96	8	1.2	1

Summary Statistics

Statistical Parameter	Total Samples	Sample Depth > 2 feet	Sample Depth > 2 feet (FOP)
Number of Samples	4	4	2
Arithmetic Mean	2.875	2.875	1.35
Standard Deviation	3.226324018	3.226324018	1.202081528
95% UCL on Mean	6.670770207	6.670770207	6.7169
Maximum Concentration	7.6	7.6	2.2
Minimum Concentration	<1.0	<1.0	<1.0

Notes:

ID	Identification
PQL	Practical Quantitation Limit

Arsenic Soil Concentratic .or the Septic Tank and Seep Pits
Highgrove Generating Station

Sample ID	Sample Date	Sample Depth (feet)	Arsenic Concentration (mg/kg)	PQL (mg/kg)
SP-1-55	2/3/97	55	<1.0	1
SP-1-60	2/3/97	60	7.5	1

Summary Statistics

Statistical Parameter	Total Samples	Sample Depth > 2 feet
Number of Samples	2	2
Arithmetic Mean	4	4
Standard Deviation	4.949747468	4.949747468
95% UCL on Mean	26.099	26.099
Maximum Concentration	7.5	7.5
Minimun Concentration	<1.0	<1.0

Notes:

ID	Identification
PQL	Practical Quantitation Limit

Arsenic Soil Concentrations for the Hardinge Filter Water Processor Area
Highgrove Generating Station

Sample ID	Sample Date	Sample Depth (feet)	Arsenic Concentration (mg/kg)	PQL (mg/kg)
CT/WS-1-0.5	10/24/96	0.5	2.5	1
CT/WSB-1-5	10/24/96	5	1.8	1

Summary Statistics

Statistical Parameter	Total Samples	Sample Depth <= 2 feet	Sample Depth > 2 feet
Number of Samples	2	1	1
Arithmetic Mean	2.15	2.5	1.8
Standard Deviation	0.494974747	NA	NA
95% UCL on Mean	4.3599	NA	NA
Maximum Concentration	2.5	2.5	1.8
Minimum Concentration	1.8	2.5	1.8

Notes:

ID	Identification
PQL	Practical Quantitation Limit
NA	Not applicable.

Table 4A

Analytical Results Exceeding Screening Criteria
Highgrove Generating Station

Sample ID	Sample Depth (Feet)	Sample Date	Analyte	Soil Screening Level	Result	Flag	PQL	Units
COOLING TOWERS								
CT1-1.0	1	10/23/96	Arsenic	2.4	2.9		1.00	mg/kg
CT1-7.0	7	10/23/96	Arsenic	2.4	3.6		1.00	mg/kg
CT2-1.0	1	10/23/96	Arsenic	2.4	3.2		1.00	mg/kg
CT2-3.0	3	10/23/96	Arsenic	2.4	3.1		1.00	mg/kg
CT3-1.0	1	10/23/96	Arsenic	2.4	3.5		1.00	mg/kg
CT3-7.5	8	10/23/96	Arsenic	2.4	3.0		1.00	mg/kg
CT4-1.0	1	10/23/96	Arsenic	2.4	3.0		1.00	mg/kg
CT5-0.85	1	10/23/96	Arsenic	2.4	3.0		1.00	mg/kg
PIPELINES								
OM1-9	9	10/24/96	Arsenic	2.4	7.6		1.00	mg/kg
SEPTIC TANK AND SEEPAGE PITS								
SP-1-60	60	2/3/97	Arsenic	2.4	2.9		1.0	mg/kg mg/kg
HARDINGE FILTER WATER PROCESSOR AREA								
CT/WS-1-0.5	0.5	10/24/96	Arsenic	2.4	2.5		1.00	mg/kg

ID Identification
PQL Practical Quantitation Limit
mg/kg Milligrams per kilogram

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SANTA ANA REGION

MEMORANDUM

TO: FILE SCE San Bdno. & SCE Highgrove

FROM: Mark Adelson MCA

DATE: April 2, 1997

SUBJECT: March 28, 1997 meeting with SCE staff re: low level violations of Cu, Pb, Cr at the S.Bdno. & Highgrove Stations

I met with Dan Cobb, the manager of the stations, Tom Gross, SCE Rosemead environ. compliance dept., and Paul Lacroix , SCE environ. specialist, to get acquainted, and to discuss the violations. SCE has hired a REA/PE to look into the cause of the violations.

S. Bdno. Station

We cited them for low level violations of TDS, chloride, Cu and Cr. They report that one of the two wells that supply the station exceeds the Cu limit in their wdr's. The two wells are at the northeast and southwest corners of the station site, and they weren't sure which was which. I advised that they get their consultant to look at historic water quality data from both wells, and at the Redlands Landfill, a known leaker, a little more than a mile upgradient from the station. I told them that we have groundwater monitoring data for the landfill.

Highgrove Station

We cited them for low level violations of Cu and Pb. They believe that discharges from the station, which includes nuisance runoff from off-station, up slope areas, are a major factor in the violations. See sketch, attached. They claim that dry weather and wet weather runoff from a lumber yard across Taylor St., which flows onto the station and into station yard drains, is polluted. Since what is collected in yard drains is discharged (along with other station waste) through one of the permitted discharge points, where violations have occurred, they believe the run-on is a factor in the violations. They want us to investigate the discharge from the lumber yard.

They also pointed out that runoff from Main St. enters the station and flows through the "lake" at the station's "park," where it commingles with station cooling tower basin discharges, if any, and discharges at another discharge point. Since the cooling towers are rarely used (the station is only operated 1 day/ year, and to satisfy very high peak or emergency demand - it operated for a week following the August 1996 brown out) the only time there is a discharge from the "lake" is when there is run off entering it, usually only during seasonal rains. They would like us to consider the Main St. runoff issue, as well.

cc: Tom M'beke Ekamen
Dixie Lass
Michael Adackapara
Bruce Paine

OK

February 21, 1997

Mr. Mark Adelson
California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street Suite 500
Riverside, California 92501

Re: Highgrove Generating Station of May 20, 1996

Dear Mr. Adelson:

This letter is a follow up to our letter dated May 20th, 1996 regarding water containing high levels of zinc and copper in non process water discharged under the NPDES permit for Highgrove Generating Station which is operated by Southern California Edison. In last year's letter we referred to sampling which was conducted of stormwater runoff from adjacent facilities. These samples indicated high levels of copper and zinc in the stormwater which was flowing onto the Highgrove facility.

We have completed additional samples of stormwater entering our property from the east and south. At the present time we are still finding high levels of zinc and copper flowing onto the property as indicated in the enclosed analytical reports. These reports indicate levels of copper at twice the permitted average level and zinc at over three times the permitted average level.

We would appreciate the opportunity to discuss the specific findings with you and to answer any questions you might have. If you feel there would be value in discussing this, please contact me at 818-302-9545.

Sincerely,

Thomas Gross

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

March 14, 1997

Mr. Mark Adelson
California Regional Water quality Control Board
Santa Ana Region
3737 Main Street Suite 500
Riverside, Ca 92501

Re: San Bernardino Generating Station and Highgrove Generating Station

Dear Mr. Adelson:

This letter is in response to the Notice of Violations to the above referenced generating stations operated by Southern California Edison. The notice describes two problem areas at both facilities which require attention.

The first problem concerns late reporting for both stations. This problem came about as result of the retirement of the person responsible for water discharge compliance. While another person had been given the assignment there was a period in which reports were not completed in a timely manner while the new employee became familiar with the reporting details. The employee has become familiar with the report preparation requirements and the reports are being completed accurately and on time. Additionally, we plan on hiring a full time person who will have responsibility for all wastewater discharge compliance. If it becomes apparent that additional resources are needed to accomplish this task, they will be allocated when necessary.

The second problem concerns the exceedences of discharge limits for both Highgrove Generating Station and San Bernadino Generating Station. As noted in the February 21, 1997 letter from Tom Gross, we have sampled stormwater which enters the Highgrove Generating Station from the east. We have detected levels of zinc and copper in excess of our permit limits in this stormwater and we feel this is the main source of these two metals. To determine the sources of lead in the wastewater discharge, we will have an analysis conducted by a Registered Environmental Assessor from the Edison Environmental Engineering Department.

At San Bernardino Generating Station our action is to have additional analysis conducted by the Edison Environmental Engineering Department to determine possible sources of the chromium, copper, TDS, and chloride. Once the sources of these constituents are identified, appropriate action will be taken to make the needed repairs.

The timetable for these actions is as follows:

1. Hiring of water compliance person by April 15, 1997
2. Analysis for Highgrove and San Bernadino will be completed by May 23, 1997.

If you have any questions concerning this response, please contact Tom Gross at (818) 302-9545.

Sincerely,

Daniel B. Cobb

July 31, 1997

Mr. Mark Adelson
Santa Ana Regional Water Quality Control Board
3737 Main Street Suite 500
Riverside, CA 92501-3339

Dear Mr. Adelson:

The following outlines the analysis and conclusions related to the study which Southern California Edison conducted to determine the sources of metals in our wastewater discharges at Highgrove Generating Station and San Bernardino Generating Station.

HIGHGROVE GENERATING STATION

I. Summary of Analysis Methods

A. Soil Samples

Samples of soil were taken at different locations on the property to determine existing levels of copper, lead, and zinc

Results indicate elevated levels of these three metals at different locations across the property.

B. Air samples

High volume air sampling equipment was utilized to determine if copper was being deposited on the property from the atmosphere. Additionally, heavy metal deposition sampling was employed for added clarification of the nature of any potential air contamination.

The data which resulted from this testing showed the potential for .41 ppb of copper to be picked up from the atmosphere in the cooling tower water. Over 24 hours this would increase copper levels by 9.04 ppb. While we attach some significance to these data, it is our opinion additional testing would have to be completed to verify this number.

C. Sludge in the Cooling Tower Basin

Existing sludge in the cooling tower basin was sampled for metals and showed high levels of copper. This sludge was removed from the basins. However, there was little impact on copper levels in the cooling tower water.

D. Water Analysis

There were three sources of water which were analyzed: storm water flow onto the property, low volume waste water, and cooling tower water.

1. Storm water flow onto the property showed elevated levels of copper, and zinc.
2. Low volume waste water samples indicate levels of copper and zinc are impacted by local soil and off-property stormwater.
3. Cooling tower water samples indicate copper levels increase after circulation through the main condenser. The main condenser is made of copper and studies by the manufacturer indicate copper levels do increase in cooling tower water under normal operating conditions.

II. Possible Solutions to Cooling Tower Water Discharge.

A. Frequent blowdown of cooling tower water.

1. This would require discharge of 1.2 million gallons of water per week to attain current copper permit levels.
2. This would also use large amounts of electricity to run four large pumps to circulate the cooling tower water and the well pumps for water replenishment.
3. This is considered highly inefficient.

B. Contain and drain condensers before circulation.

1. Less frequent blowdown.
2. Pay for disposal of water.
3. Tests indicate this may not improve the situation.

C. Constant circulation with one pump per system.

1. Cost of running four pumps.
2. Costs of installing four new pumps.

D. Mini flow through condenser with auxiliary pump.

1. Cost of additional plumbing and pump installation.
2. Cost of running the pump.

E. Leave system drained and dry.

1. System would not be readily available for load requirements.

2. Fire hazard to the cooling towers.

SAN BERNARDINO GENERATING STATION

I Sampling

Water from leaking pumps and other plant equipment was sampled to determine if this could be a potential source of copper. Water from the service air compressor did have copper at the 1600 ppb level and could be the major source of copper in the low volume waste flow. Additionally, copper at varying levels was found at other sources throughout the plant.

Testing of the cooling tower water as was accomplished at Highgrove Generating Station has not been completed. Currently, the condenser is coated with calcium carbonate and this may cloud the test results. Therefore, maintenance work must first be completed on the condenser prior to any water quality sampling.

II Corrective Action

Any corrective action concerning the cooling tower water will have to wait until repairs are completed on the main condenser. The Generating Station Maintenance Staff will have to evaluate the service air compressor to determine if repairs will reduce the copper flow from this source.

It is anticipated the maintenance evaluation will be completed by September 15, 1997. Results of that evaluation will be forwarded to your office upon completion.

Sincerely

Thomas Gross

Attachments