GETTLER-RYAN INC.

TRANSMITTAL

TO: Ms. Eva Chu
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, Room 250
Alameda, California 94502-6577

DATE: January 18, 2001
PROJ.#: DG91723B.3C01
SUBJECT: Former Chevron #9-1723
9575 San Leandro Avenue
Oakland, California

FROM:
Stephen J. Carter, R.G.
Senior Geologist
Gettler-Ryan Inc.
3140 Gold Camp Drive, Suite 170
Rancho Cordova, California 95670

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1	January 17, 2001	Risk Management Plan (Revised) - text portion only

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COMMENTS:

We are sending this report at the request of Chevron. Please replace the text portion of the original RMP with the attached pages. Please call us at 916.631.1300 if you have questions.

cc: Mr. Thomas Bauhs, Chevron Products Company, P.O. Box 6004, San Ramon, CA 94583
Mr. Jim Brown, Delta Environmental Consultants, Inc, 3164 Gold Camp Drive, Suite 200, Rancho Cordova, CA 95670

GETTLER-RYAN INC.

(Revised)

RISK MANAGEMENT PLAN

Former Chevron Service Station #9-1723
9757 San Leandro Avenue
Oakland, California

GR Report No. DG91723B.3C01
Delta Project No. DG91-723

Prepared for:

Mr. Thomas Bauhs
Chevron Products Company
P.O. Box 6004
San Ramon, California 94583

Prepared by:

DELTA ENVIRONMENTAL CONSULTANTS, INC.
Network Associate **GETTLER-RYAN INC.**
3140 Gold Camp Drive, Suite 170
Rancho Cordova, California 95670

Stephen J. Carter
Senior Geologist
R.G. 5577

REGISTERED GEOLOGIST
STEPHEN J. CARTER
No. 5577
STATE OF CALIFORNIA

for
Greg A. Gurss
Project Manager

January 17, 2001

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APPENDIXES

1.0 INTRODUCTION

A corrective action evaluation was done for the site of the Former Chevron Service Station #9-1723 located at 9757 San Leandro Street, Oakland, California. The evaluation was completed on behalf of Chevron Products Company by Chevron Research and Technology Company (CRTC), presented in a document titled *Risk-Based Corrective Action (RBCA) Summary Report, Tier 2 RBCA Evaluation,* and by Cambria Environmental Technology, Inc., presented in a document titled *Tier 2 RBCA Analysis and Closure Request.* Copies of theses documents are included in Appendix A.

This document provides the Risk Management Plan (RMP) for the site as well as an example health and safety plan. In Section 2, the compounds of concern (COCs), risk, and sources of risk are summarized. In Section 3, risk management measures are developed. The RBCA evaluation that serves as a basis for this work is given in Appendix A, and figures showing the site location and relevant site features are provided in Appendix B. Appendix C contains the example health and safety plan.

2.0 RISK SUMMARY

2.1 Data

Data considered in preparing this RMP were summarized by Delta Environmental Consultants, Inc./Network Associate Gettler-Ryan Inc. (GR) from CRTC's document titled *RBCA Summary Report, Tier 2 RBCA Site Evaluation* and Cambria Environmental Technology, Inc.'s *Tier 2 RBCA Analysis and Closure Request.* Figures showing the hydrocarbon-affected areas are provided in Appendix B. Observations regarding the data are listed below.

- The highest hydrocarbon concentrations detected in soil samples were ~~1,800 parts~~ per million (ppm) of TPHg and 99 ppm of benzene. These samples were collected in the vicinity of the former underground storage tanks (USTs), which have been removed. The vertical and lateral extent of hydrocarbons in unsaturated soil has been well defined by the soil borings drilled around the former UST pit and across the site. Therefore, hydrocarbon impact to soil has been adequately delineated.

- Impacted soil remains in the unsaturated soil (~~0 to 5 feet bgs) in~~ the vicinity of the USTs and dispenser islands. TPHg concentrations up to 880 ppm and benzene concentrations up to 47 ppm have been detected in soil samples collected at approximately ~~5 feet bgs.~~ While natural processes have undoubtedly reduced these concentrations, some level of hydrocarbons likely remain in these areas.

- Soil vapor samples were collected from six vapor borings in 1997. Benzene was detected in all soil vapor samples collected from borings SV-1 through SV-6. Borings SV-5 and SV-6 were advanced adjacent to borings SV-1 and SV-2. The highest benzene concentration reported was ~~100,000 parts per billion by~~ volume (ppbv) in the soil vapor sample collected at five feet below ground surface (bgs) from boring SV-5. However, the benzene soil vapor concentration at 5 ~~feet bgs from adjacent boring~~ SV-1 was 410 ppbv, and the benzene concentrations in two samples collected at 3 feet bgs from boring SV-1 were 96 an94 ppbv. Therefore, the sample collected from boring SV-5 appears to be anomalous. Borings S-1, SV-2, SV-5 and SV-6 were advanced in the locations of the former USTs.

- Groundwater has been gauged and analyzed quarterly since November 1993. Total Petroleum Hydrocarbons as gasoline (TPHg) and benzene have been detected in site wells in steadily decreasing concentrations over this time, indicating a stable and decreasing plume.

- In May 1996, Fluor Daniel GTI conducted a survey of water wells immediately southwest of the site. Two wells, P2 and P3, were identified within 250 feet downgradient (west) of the site. Both were identified as being used for industrial purposes. With the exception of one suspect detection, no hydrocarbons have been detected in off-site monitoring wells MW-9 since its installation in November 1993. Well MW-9 is located about 200 feet downgradient of the source area (former USTs) in the vicinity of well P-2.

- Hydrocarbons have been detected in off-site monitoring well MW-2 and site perimeter monitoring well MW-6, which is also located downgradient of the site. However, TPHg and benzene concentrations have been less than 400 and 20 ppb, respectively. Based on these data and the deep screen interval of the industrial supply well, it is not likely that an off-site water supply well would have been impacted by the hydrocarbons beneath the site. While hydrocarbons have generally detected at low concentrations in wells MW-2, MW-5, MW-6, MW-8 and MW-9, the trend has been a decreasing one.

2.2 Risk Summary

Risks at the site were evaluated by Chevron using Groundwater Services, Inc.'s RBCA Spreadsheet (version 1.0), based on American Society for Testing and Materials (ASTM) Standard E1739 for Risk-Based Corrective Action at Petroleum Release Sites (Appendix C). Risks identified by this evaluation are summarized:

- The RBCA evaluation performed by CRTC indicate that BTEX compounds in groundwater beneath the site do not pose a significant risk to occupants of an on-site building.

- Historical BTEX concentrations in soil exceeded the SSTL calculated by CRTC's analysis. However, soil vapor data collected at the site in October 1997 by Cambria indicated that benzene volatilization from groundwater to indoor air, intrusion of benzene to soil vapor to outdoor air, and intrusion of benzene in soil vapor to indoor air indicated that site-specific source concentrations are less than the SSTL.

- Based on information available in March 1997, CRTC's analysis indicated no complete human or ecological exposure pathways.

Possible scenarios associated with public health and safety concerns include:

- Construction workers engaged in subsurface piping at the site could be exposed to hydrocarbon-impacted soil or groundwater if excavations intersect the water table;
- Construction dewatering could take place at or near the site. Untreated groundwater could be inadvertently discharged to the street;
- A groundwater extraction well could be installed for the purpose of providing an irrigation supply. Residents at the site could be exposed to untreated groundwater, or the irrigation well could act as a conduit to a deeper groundwater supplies;
- Impacted soil excavated from the site as a result of construction activities could be used as fill for landscaping. Workers and residents could be exposed to the soil and/or vapor from soil containing impacted groundwater;
- If construction excavations are deep enough to intersect either impacted unsaturated soil or the water table, atmospheric conditions, such as pressure and temperature, could create a situation where vapor phase hydrocarbons accumulate at the bottom of a trench or excavation. Workers might then be exposed to vapor phase hydrocarbons, or the mixture of air and vapor phase hydrocarbons could reach the lower explosive limit, and an ignition source could cause a fire or explosion.

Several factors suggest that the scenarios listed above have a low probability of taking place; nevertheless, the least probable event must be considered in the effort to protect public health and safety.

3.0 RISK MANAGEMENT

In the previous section, data were reviewed, risks were summarized, and possible public health and safety scenarios were identified. Risk management concerns controlling the identified risks, to the extent that all possible risks were identified. Although petroleum hydrocarbon impact at the site is characterized according to specific source areas, there is a chance that records identifying the locations of source areas may be lost or misplaced. As such, risk management measures should apply to the entire site. Below, risk management measures are recommended along with justification for each measure.

1. The appropriate agency (ACEHS, City of Oakland Emergency Services, or the City of Oakland Permit Tracking System) shall be notified before any general construction takes place at the site where soil and/or groundwater might be handled. This measure will assure that aspects of any construction project for the site are reviewed in light of the fact that residual hydrocarbons have been left in-place at the site.

2. The appropriate agency shall be consulted for approval regarding uses or disposal of soils from the site. This measure is meant to place controls on the use or disposal of soils from the site that may contain petroleum hydrocarbons.

3. The appropriate agency shall be consulted for approval regarding construction dewatering at the site. The purpose of this measure is to assure extracted groundwater is handled properly given the potential that it may be impacted with petroleum hydrocarbons.

4. Groundwater from beneath the site shall not be used for any purpose unless approved by the appropriate agency. This measure will assure that any proposed uses are reviewed by the appropriate regulating authority.

5. Wells shall not be installed at the site unless approved by the appropriate agency. The purpose of this measure is to mitigate the possibility that vertical conduits to deeper groundwater sources are introduced at the site.

6. If the site is redeveloped, the appropriate agency will be notified if contamination is encountered. If redevelopment includes construction of residential property, the future owners or residents will be notified of the contamination encountered.

7. If necessary, dust control measure shall be used during grading or excavation activities at the site. A contingency plan for such measures shall be included in site development plans reviewed by the appropriate agency.

8. The atmosphere in trenches and/or excavations at the site deeper than 2 feet below grade surface shall be monitored using a flame ionization or photo-ionization detector before manual work in the trenches and/or excavation begins. This activity shall happen each day work is to take place in trenches and/or excavations. Monitoring shall occur once in the morning and once in the afternoon, and records shall be kept. Conditions under which work shall stop and mitigation measure take place shall be considered in the site health and safety plan (see Appendix C for example). This measure is meant to protect workers from inhalation risk.

9. The atmosphere in trenches and/or excavations at the site deeper than 2 feet below grade surface shall be monitored for an explosive atmosphere each day work is to take place in trenches and/or excavations. Monitoring shall occur in the morning prior to beginning work and at other times when conditions might be conducive to the formation of explosive atmospheres (e.g. hot afternoons on sunny days). Monitoring records shall be kept. Mitigation measures shall take place (e.g.; ventilate trenches and/or excavation) if it is noted that an explosive atmosphere exists. A contingency plan for such measures shall be included in site development plans reviewed by the appropriate agency. The purpose of this measure is to mitigate the potential for fire/explosion.

10. Records for the site, including investigative reports and the attached RBCA analyses, shall be kept on file with the appropriate agency. Proper documentation can help all parties control potential risks associated with the site.

4.0 LIMITATIONS

Evaluations of the geological conditions at the site that serve as a basis for this RMP are inherently limited due to the limited number of observation points. There may be variations in subsurface conditions in areas away from the sample points. There are no representations, warranties, or guarantees that the points selected for sampling are representative of the entire site. The recommendations provided herein reflect the sample conditions at specific locations at a specific point in time. No other interpretations, representations, warranties, guarantees, express or implied, are included or intended in this RMP. Additional work, including further subsurface investigation, might reduce the inherent uncertainties associated with this RMP.

14.0 RECORDKEEPING

A. General

Recordkeeping shall be consistent with OSHA regulations in all respects. The following permanent records will be maintained in the company offices:

1. Safety Inspection Reports
2. Personnel Exposure Monitoring Records
3. OSHA 200 Form - Current to within 90 days
4. Accident reports consistent with established company procedures

B. Medical Records

Permanent medical records shall be maintained in confidential files by the contract physician/medical clininc. The physician will supply the company with a medical status document, certifying that the personnel assigned to the project are physically capable of performing their individual work tasks.

13.0 MEDICAL SURVEILLANCE

The Contractor personnel and sub-contractors engaged in project operations shall be participants in the Medical Surveillance program, and must be cleared by the examining physician(s) to wear protection devices and protective clothing for working with hazardous materials. The applicable requirements under CCR, Title 8, General Industry Safety Orders, Sections 5192 and 29 CFR 1910 will be observed.

A. Examination Requirements

All Contractor personnel on-site shall have successfully completed a pre-placement or periodic medical examination in accordance with established Contractor policies and procedures, and consistent with the provisions of the OSHA standards. This examination shall include a complete medical and occupational history, physical examination, and selected biological sampling. Laboratory studies include a complete blood count (CBC), urinalysis, chemistry panel (SMAC), pulmonary function (FEV and FVC), chest X-ray, audiometry, and vision screening.

12.0 TRAINING REQUIREMENTS

All personnel assigned to this project will be required to demonstrate that they have completed the Initial Training Requirements (40 hours). An annual 8 hour refresher course is also required in accordance with CCR Title 8, General Industry Safety Orders, Sections 5192.

Field personnel from the Contractor and their sub-contractors will attend a project briefing for safety issues and project work task review before beginning work. All Contractor site personnel shall have completed training relative to the project operations plans, and the materials to be encountered during the project.

EMERGENCY CONTACT LISTING

Nature of Emergency	Phone Number
Ambulance	911
Fire	911
Police	911
Poison Control Center	(900) 662-9886
Office of Emergency Services	(510) 646-5908
Chemical Spills	(800) 852-7550
Hospital	(510) 522-3700
The Contractor	( ) ___-____

6. Upon arrival at the safe locations, a complete head count will be taken by the Project Safety Officer and personnel will stay at the safe locations until the area is secured.

7. Directions to the nearest medical clinic or hospital as well as their telephone numbers will be made available to on-site personnel.

When a field worker is alone in an emergency or hazardous situation, outside contact should be made immediately. The field worker should then attempt to deactivate power equipment, and contact the Company Safety Officer.

D. Personal Injury

If an injury occurs due to an accident or exposure to a hazardous substance, the Contractor's office will be notified. The Company Safety Officer will be given all appropriate information concerning the nature and cause of the injury so that treatment preparations can be initiated. The injured person will be transported to the Contamination Reduction line where appropriate first aid and treatment can begin. The Project Manager will be informed and will investigate the cause of the injury and make any necessary changes in work procedures.

In the event of an accident resulting in physical injury, first aid will administered, and the injured worker will be transported for emergency treatment.

Hospital **San Leandro Hospital**
13855 E. 14th Street
San Leandro, CA 94578

Directions From Site to Alameda Hospital:
SE on San Leandro St. for 0.4 miles
Becomes San Leandro Blvd. for another 0.7 miles
Turn Left (NE) on Davis St. (CA Hwy 61), travel 0.3 miles
Turn Right (SE) on E. 14th Ave./International Dr. (CA Hwy 185)
Travel 1.1 miles to hospital (on the right)

11.0 EMERGENCY PROCEDURES

A. Site Emergency Warnings

Several warning systems may be utilized depending on the work site conditions or emergency involved:

1. Verbal Communications

2. Vehicle Horns

Verbal instructions between crew members are typically adequate to communicate steps that are required in emergency situations. In cases where parts of the crew are distant from the center of activity, vehicle horns may be necessary to indicate site emergencies. This type of communication needs to be followed by verbal instructions on necessary emergency actions.

In cases where a field worker is alone, verbal communication with the company safety officer should be established upon arrival to and exit from the site. The field worker should also present any other field personnel with the Contractor's telephone number and address. Location of the nearest telephone should be within reasonable distance of the field worker. The Contractor will provide the field worker with a field phone if the nearest telephone is not readily available.

B. Emergency Equipment

The following equipment comprises the basic elements for emergency preparedness. All or some of these items will be available at the work site:

1. Fire extinguishers - dry chemical

2. First aid kits

C. General Emergency Procedures

In case of an emergency or hazardous situation, the person that observes this condition shall immediately sound the alarm.

1. Upon hearing an alarm, all non-emergency communications will cease and the person giving the alarm will proceed to give the Project Safety Officer all pertinent information.

2. Power equipment will be shut down and operators will stand by for instruction.

3. Injured personnel will be transported outside of the Exclusion Zone (if possible).

4 The Contractor's office will be notified immediately.

5. In case of a fire, explosion, or hazard alarm, personnel will immediately proceed to assigned pre-arranged safe locations.

10.0 STANDARD OPERATING PROCEDURES

A. Respiratory Protection Program Guidelines

Respirators will be provided by the Contractor when such equipment is deemed necessary to protect the health of employees. The Contractor shall provide respirators which are applicable and suitable for the purpose intended. The employer shall be responsible or the establishment and maintenance of this respiratory protection program. The Company Safety Officer will approve the selection, purchase, and inspection of the models and types of respiratory protective devices.

A medical evaluation is required prior to wearing any respirator, except where emergency escape respirators are provided. The contract physician shall determine if any health or physical conditions exist which would prohibit a worker from being assigned to an area requiring respiratory protection.

Respirators shall not be worn when conditions prevent a facepiece-to-face seal. Such conditions as facial hair, scars, wrinkles, facial diseases, dentures removal, or other disorders could prevent a proper facepiece-to-face seal. In these cases, corrective action will be taken to ensure a proper seal.

For the safe use of any respirator, it is essential that the user be properly instructed in its operation and maintenance. Both supervisors and employees shall be so instructed. Employees shall be instructed and trained in the proper selection and use of respirators and their limitations. The employee shall use the provided respirator in accordance with instructions and training received. All training shall be documented with records retained in the employee's training files.

- Field operations personnel shall be cautioned to inform each other of non-visual effects of the presence of toxics, such as: headaches, dizziness, or nausea.

- On-site personnel shall be aware of symptoms related to heat and cold stress.

9.0 GENERAL SAFE WORK PRACTICES

The project operations shall be conducted with the following minimum safety requirements employed:

1. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand to mouth transfer and ingestion of materials is prohibited in any area where the possibility of contamination exists.

2. Hands must be thoroughly washed upon leaving a contaminated or suspected contaminated area before eating, drinking, or any other activities transpire.

3. Legible and understandable precautionary labels shall be prominently affixed to containers of raw materials, intermediates, products, mixtures, scrap, waste, debris, and contaminated clothing.

4. Contaminated protective equipment shall not be removed from the regulated area until it has been cleaned or properly packaged and labeled.

5. Removal of materials from protective clothing or equipment by blowing, shaking, or any other means which may disperse materials into the air is prohibited.

6. Personnel on-site must use the "buddy" system when wearing any respiratory protective devices. Communication between members must be maintained at all times. Emerency communications shall be prearranged in case of encountering unexpected situations. Visual contact must be maintained between "pairs" on-site, and each team should remain in closed proximity to assist each other if necessary.

7. Personnel should be cautioned to inform each other of subjective symptoms of chemical exposure such as headache, dizziness, nausea, and irritation of the respiratory tract.

8. No excessive facial hair which interferes with a satisfactory fit of the facepiece-to-face seal, will be allowed on personnel required to wear respiratory protective equipment.

9. All respiratory protection selection, use, and maintenance shall meet the requirements of established procedures, recognized consensus standards (AIHA, ANSI, NIOSH,), and shall comply with the requirements set forth in CCR, Title 8, Section 5144 et. seq.

10. Contact with the surface and groundwater shall be minimized.

In addition, the following precautions shall be implemented for all personnel working on the project:

- Gross decontamination and removal of all personal protective equipment shall be performed prior to exiting the facility. Contaminated personal protective clothing will be removed and collected in a drum for disposal.

8.0 DECONTAMINATION PROCEDURES

As part of the system to prevent or reduce the physical transfer of contaminants by people and/or equipment from on-site, procedures will be instituted for decontaminating anything leaving the Exclusion Area and Contamination Reduction Areas. These procedures include the decontamination of personnel, protective equipment, monitoring equipment, clean-up equipment, etc. In cases where the Contamination Reduction Zone is not directly adjacent to the Exclusion Area, gross decontamination will occur in the Exclusion Area, followed by more detailed cleaning in the Contaminant Reduction Area. This gross decontamination will be performed to the extent necessary to keep contaminants from spreading to other "clean" areas of the site. In general, decontamination at the site consists of rinsing equipment, personnel, etc., with copious amounts of water and washing with detergent water solutions. The spent solution, brushes, sponges, containers, stands, etc., used in the decontamination process must be properly disposed.

7.0 WORK ZONES AND SECURITY MEASURES

A. General

A site must be controlled to reduce the possibility of exposure to any contaminants present and their transport by personnel or equipment from the site.

The possibility of exposure or translocation of contaminants can be reduced or eliminated in a number of ways, including:

- Setting up security or physical barriers to exclude unnecessary personnel from the general area
- Minimize the number of personnel and equipment on-site consistent with effective operations
- Establishing work zones within the site
- Conducting operations in a manner to reduce the exposure of personnel and equipment
- Minimizing the airborne dispersion of contaminants
- Implementing the appropriate personnel and equipment decontamination procedures

B. Field Operations Work Area

Work areas (zones) will be established based on anticipated contamination. Within these zones prescribed operations will occur utilizing appropriate personal protective equipment. The planned zones are:

1. Exclusion Area (contaminated). The actual areas where work is being performed are considered to be the exclusion areas. Access to these areas will be strictly limited to the personnel needed to conduct the work being performed.

2. Contamination Reduction Area. An area near each active work zone will be designated as the contamination reduction area. Disposable protective gear will be removed and placed in garbage bags prior to leaving the reduction zone. Heavy equipment and non-disposable gear will be cleaned at a decontamination area within this zone.

3. Support Area (non-contaminated). Areas located away from active work areas and out of the zone of potential impact of hazards will be used for staging and support of the work being performed on site. Any materials, equipment, or clothing of personnel must be fully decontaminated prior to entering these areas.

6.0 PERSONAL PROTECTIVE EQUIPMENT

A. Introduction

It is important that personal protective equipment and safety requirements be appropriate to protect against the potential hazards at the site. Protective equipment will be selected based on the contaminant type(s), concentration(s), and route of entry. In situations where the type of materials and possibilities of contact are unknown or the hazards are not clearly identifiable, a more subjective determination must be made of the personal protective equipment.

A minimum of modified Level D Safety equipment and clothing will be required for all workers and visitors on the site. All personnel must be prepared to step up to higher levels of protective equipment as conditions warrant.

B. Levels of Protection

The basic required work uniform for the site is modified Level D protection which will include :

- hard hat
- steel toed boots
- safety glasses
- polyvinyl gloves for handling soil or liquid samples
- neoprene over gloves for handling augers or other contaminated items

If Level C protection is deemed necessary by the Site Safety Officer based on field conditions, the protective equipment will include:

- modified Level D equipment including gloves and polycoated Tyvek coveralls
- respiratory protection which may include half face respirator with organic vapor cartridges depending on respiratory action levels listed above

The necessity for Level A or Level B protection is not expected to be encountered on this site. If site conditions indicate that Level C protection is inadequate, all site activities are to be ceased pending further review by the Company Safety Officer and the Contractor Senior Management.

5.0 AIR MONITORING PLAN

A. General

An air quality monitoring program shall be implemented to provide baseline and on-going air quality data for site operations. This program shall include an on-going evaluation of on-site atmospheric contaminant concentrations during work site activities that involve significant surface disturbances using organic vapor detection instruments and detector tubes.

Additionally, the program will include a preliminary survey of existing air quality conditions, prior to any surface disturbances and, if possible, under anticipated "worst case" weather conditions, to be used to establish baseline levels for input into the respiratory protection selection process. The Project Safety Officer may also decide to perform perimeter monitoring of downwind air quality conditions during significant surface disturbances.

B. Action Levels

Photo-ionization detector (PID) readings will be taken and recorded once every hour (minimum) during the performance of these work activities. If it is determined, based on PID readings, that organic vapor concentrations in the work area reach 10 ppm in the breathing zone for 5 minutes, half mask respirators with organic vapor cartridges will be required.

If PID readings indicate total hydrocarbon levels reach 20 ppm in the breathing zone for 5 minutes, work activities will be suspended until the airborne hydrocarbon concentrations decrease to less than 10 ppm. If airborne levels remain at 20 ppm or more, all work activities will cease until the Company Safety Officer can be notified, and these levels can be ameliorated.

4.0 RISK ASSESSMENT SUMMARY

It is anticipated that there will be no significant or major potential source of exposures due to the scope of work to be performed on this project. An analyses of site specific hazards with respect to chemical and physical hazards are discussed below.

In general, the principal routes of exposure on any site include inhalation, absorption, dermal contact, and ingestion. With respect to the scope of work to be performed, the potential routes of exposure include inhalation, absorption, and dermal contact. General safe work practices should adequately address the potential for exposure via absorption or dermal contact.

The potential for exposure due to inhalation would probably originate from airborne vapors, gas, or dusts. Due to the nature of this project, it is necessary to perform excavation activities at the site. Dust suppression measures may be required if it is deemed that airborne materials pose a hazard. These measures will include slowing the pace of work to minimize agitation of possible airborne materials and water saturation to minimize airborne materials.

With respect to direct contact, personal protective equipment such as gloves, eye protection, and skin protection will provide protection from potential exposure. Further, the amount of direct contact with potential contaminants, other than airborne dusts, will be limited.

Should respiratory irritation occur, appropriate air-purifying respiratory protective devices will be worn, with organic vapor cartridges and dust pre-filters, or with high efficiency organic vapor/HEPA stack-type cartridge. Typically, the cartridge will require replacement daily. Should direct contact occur in excess of what is anticipated through sample preservation procedures, appropriate protective clothing will be worn.

Physical hazards on-site have been identified as hazards associated with soil and groundwater sampling, soil excavation, and soil disposal activities; fire and explosion due to the presence of petroleum hydrocarbons; and general safety hazards

Xylene Compounds

Xylene compounds (ortho-, meta-, and para-xylene) are colorless liquids with aromatic odors. Inhalation or absorption of xylene compounds can cause irritation to the eyes, skin, nose, throat, dizziness, drowsiness, nausea, vomiting, and dermatitis.

The Cal-OSHA PEL for xylene compounds is 100 ppm; the STEL for xylene compounds is 300 ppm.

3.0 JOB HAZARD ANALYSIS

A. Inhalation Hazards

Contaminants that have been documented to occur in groundwater at the site include gasoline. Site specific hazard indentification with regards to the inhalation of these contaminanants are discussed below.

Gasoline

Gasoline is a clear liquid with a characteristic odor. Inhalation or absorption of gasoline can cause irritation of the eyes, skin, and mucous membranes, dermatitis, headache, fatigue, slurred speech, confusion, and convulsions.

The California Occupational Safety and Health Administration (Cal-OSHA) Permissible Exposure Limit (PEL) (the maximum permitted 8-hour time-weighted average concentration of an airborne contaminant) for gasoline is 300 parts per million (ppm). The Short Term Exposure Limit (STEL) (the maximum permitted 15 minute time weighted exposure) for gasoline is 500 ppm.

Benzene

Benzene is a colorless to light-yellow liquid with an aromatic odor. Inhalation or absorption of benzene can cause irritation of the eyes, skin, nose and respiratory system. Prolonged exposure can cause giddiness, headache, nausea, staggered gait, and fatigue.

The Cal-OSHA PEL for benzene is 1 ppm; the STEL for benzene is 5 ppm.

Toluene

Toluene is a colorless liquid with a sweet, pungent odor. Inhalation or absorption of toluene can cause irritation to the eyes and nose, fatigue, weakness, dizziness, headache, dermatitis, liver, and kidney damage.

The Cal-OSHA PEL for toluene is 100 ppm; the STEL for toluene is 150 ppm. The ceiling limit (The maximum concentration of an airborne contaminant to which an employee may be exposed at any time) for toluene is 500 ppm.

Ethylbenzene

Ethylbenzene is a colorless liquid with an aromatic odor. Inhalation or absorption of ethylbenzene can cause irritation to the eyes, skin, mucous membranes, headache, dermatitis, narcosis, and coma.

The Cal-OSHA PEL for ethylbenzene is 100 ppm; the STEL for ethylbenzene is 125 ppm.

2.0 PROJECT SAFETY AUTHORITY

A. On-Site Project Safety

Personnel responsible for the project safety are:

Mr. Foreman	Project Safety Officer (The Contractor)
Mr. Assistant	Company Safety Officer (The Contractor)

The Project Safety Officer and Company Safety Officer have the authority to upgrade or downgrade the provisions of this Site Safety Plan as site conditions change. In addition, the Project Safety Officer shall be responsible for the following:

- Safety Supplies & Equipment Inventory for the Project Site
- Accident/Incident Reporting
- Decontamination/Contamination Reduction Procedures.

B. Safety Officer

The Company Safety Officer is responsible for assuring on-site safety and loss prevention functions. These responsibilities include:

- Health surveillance of all Contractor employees.
- Assuring that safety procedures in effect are in compliance with all appropriate federal, state, and company regulations.
- Maintenance of personnel exposure monitoring records.
- Assuring appropriate personal protective equipment is adequate for actual hazards of on-site conditions.
- Assuring appropriate exclusion areas are identified and delineated.

1.0 INTRODUCTION

A. Overview

The contractor is providing this site safety plan in order to address various health and safety issues regarding work at the site and to disseminate information about the contractor's health and safety goals, procedures, and policies.

B. Scope of Work

This Site Health and Safety Plan was created for field work being performed at the Former Chevron Service Station #9-1723, 9757 San Leandro Avenue, Oakland, California. The scope of the investigation includes: (1) soil excavation, (2) soil, groundwater, and concrete disposal, and (3) excavation backfill and surfacing.

Subcontractors will be utilized to perform the work associated soil excavation; soil, groundwater, and concrete disposal; and excavation backfilling. Entry into site excavations by site personnel will be expressly prohibited.

C. Site Description

The subject property is located on the southern corner of the intersection of Central and Park Avenues in Alameda, California. A multi-story hotel and office building currently occupy the site.

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SITE HEALTH AND SAFETY PLAN

Former Chevron Service Station #9-1723
9757 San Leandro Avenue
Oakland, California

Prepared for:

_____
_____
_____

Date: _____

SOURCE: U.S.G.S. TOPOGRAPHIC QUADRANGLE.
SAN LEANDRO, CALIFORNIA
7.5 MINUTE SERIES
1959, PHOTREVISED 1980

SITE LOCATION

SCALE 1:24,000

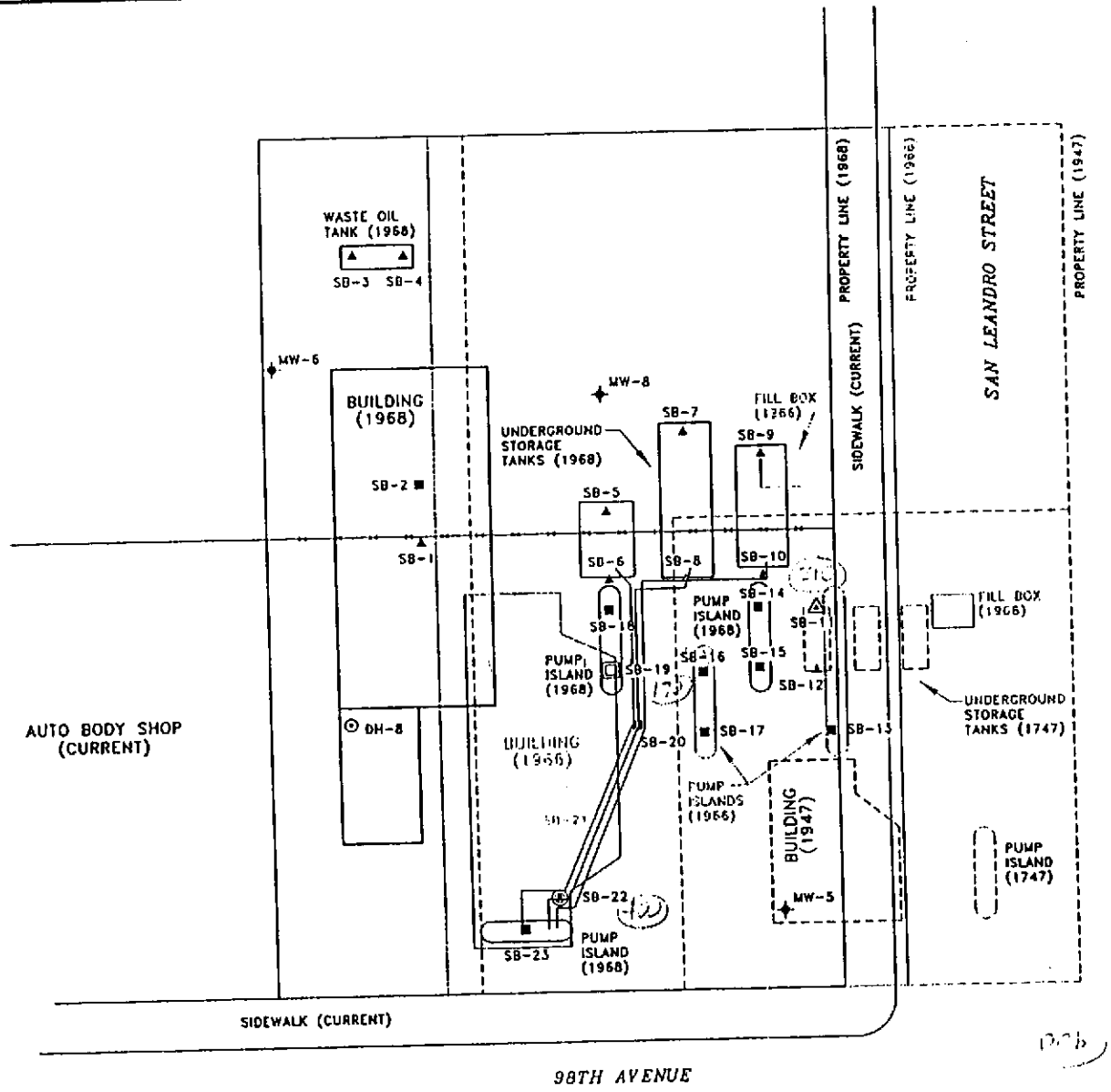
0 2,000 4,000

SCALE FEET

GROUNDWATER TECHNOLOGY

SITE LOCATION MAP

CLIENT: CHEVRON U.S.A. PRODUCTS CO. FORMER SERVICE STATION NO. 9-1723	FILE: 0080SL (1:1)	PROJECT NO.: 02070-0080	PM	PE/RG
	REV.			FIGURE: 1
LOCATION: 9757 SAN LEANDRO BOULEVARD OAKLAND, CALIFORNIA	DES. JF	DET. AJK	DATE: 11/21/94	



LEGEND

- MONITORING WELL
- SOIL BORING
- SOIL BORING, 5-FOOT DEPTH (GTI, 1996)
- SOIL BORING, 10-FOOT DEPTH (GTI, 1996)
- SOIL BORING, 10-FOOT DEPTH WITH GROUNDWATER SAMPLE (GTI, 1996)
- SOIL BORING, 13-FOOT DEPTH WITH GROUNDWATER SAMPLE (GTI, 1996)
- SOIL BORING, 15-FOOT DEPTH
- SOIL BORING, 15-FOOT DEPTH WITH GROUNDWATER SAMPLE (GTI, 1996)
- 1968 STRUCTURES AND PROPERTY LINE
- 1966 STRUCTURES AND PROPERTY LINE
- 1947 STRUCTURES AND PROPERTY LINE

NOTES:

1. STATION BUILDINGS, PUMPS AND TANKS HAVE BEEN REMOVED.
2. SITE IS CURRENTLY USED AS A PARKING LOT FOR AUTOMOBILE REPAIR SHOP (SOUTHERN HALF), AND FOR TRAILER PARKING (NORTHERN HALF).
3. LOCATION OF 1966 UNDERGROUND STORAGE TANKS AND 1947 & 1966 PRODUCT LINES ARE UNKNOWN AT THIS TIME.

GROUNDWATER TECHNOLOGY

FEET 20 SCALE

SOIL BORING LOCATION MAP

CLIENT: CHEVRON U.S.A. PRODUCTS CO. SERVICE STATION NO. 9-1723

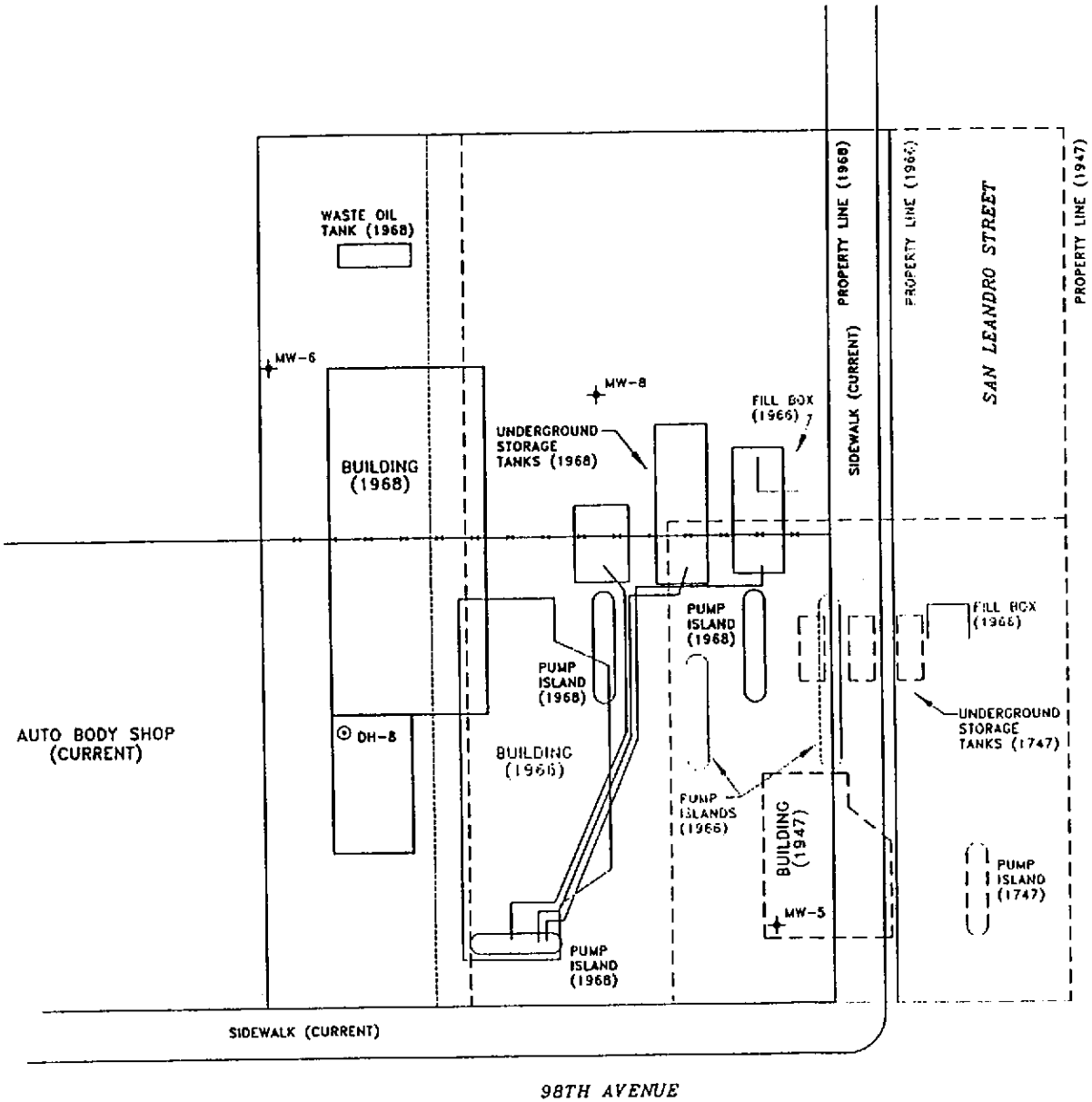
LOCATION: 9757 SAN LEANDRO STREET OAKLAND, CALIFORNIA

FILE:	PROJECT NO.:
0080-SM (1:20)	02070-0080

REV.:

DES.:	DET.:	DATE:	FIGURE:
BMc	EFK	4-26-96	2

PM: PE/RG: 5/7/96



LEGEND

- MONITORING WELL
- SOIL BORING
- 1968 STRUCTURES AND PROPERTY LINE
- 1966 STRUCTURES AND PROPERTY LINE
- 1947 STRUCTURES AND PROPERTY LINE

NOTES:

1. STATION BUILDINGS, PUMPS AND TANKS HAVE BEEN REMOVED.
2. SITE IS CURRENTLY USED AS A PARKING LOT FOR AUTOMOBILE REPAIR SHOP (SOUTHERN HALF), AND FOR TRAILER PARKING (NORTHERN HALF).
3. LOCATION OF 1966 UNDERGROUND STORAGE TANKS AND 1947 & 1966 PRODUCT LINES ARE UNKNOWN AT THIS TIME.

GROUNDWATER TECHNOLOGY

0 FEET 20 SCALE

SITE PLAN 1947/1966/1968

CLIENT: CHEVRON U.S.A. PRODUCTS CO. SERVICE STATION NO. 9-1723

LOCATION: 9757 SAN LEANDRO STREET OAKLAND, CALIFORNIA

ACAD FILE: SP196

PROJECT NO.: 020700080

REV: 2 - RESCALED ALL SITE LINES

DES: CY

DATE: 1/30/96

FIGURE: 1

PM:

PE/RG:

RBCA

SUMMARY REPORT

☐ TIER 1 / ■ TIER 2 RBCA SITE EVALUATION

P R E P A R E D F O R

Former Chevron Station #9-1723
SITE NAME

9757 San Leandro Street, Oakland CA
LOCATION

Chevron Research and Technology Co.,
Curtis A. Peck, Lead Hydrogeologist
PREPARED BY

March 17, 1997
DATE ISSUED

REVIEWED BY _____

DATE _____

Site Name: Former Chevron Station #9-1723
Site Location: 9757 San Leandro St., Oakland CA
Date Completed: 3/7/97
Completed By: Curt Peck, CRTC Hydrogeologist

TIER 1 / TIER 2 RBCA REPORT INDEX

■ = ENCLOSED

		Tier 1	Tier 2
1.0 EXECUTIVE SUMMARY			
1.1 Tier 1 Executive Summary Checklist		☐	
1.2 Tier 2 Executive Summary Checklist	*		■
1.3 Executive Summary Discussion		☐	■ (u)
1.4 Baseline Exposure/Control Strategy Flowchart		☐	☐ (u)
2.0 SITE HISTORY			
2.1 Site Description		☐	☐ (u)
2.2 Site Ownership & Activity Record		☐	☐ (u)
2.3 Past Releases or Source Areas		☐	☐ (u)
2.4 Summary of Current & Completed Site Activities		☐	☐ (u)
2.5 Summary of Potential Near-Term Site Activities		☐	☐ (u)
3.0 SITE ASSESSMENT INFORMATION			
3.1 Regional Hydrogeologic Conditions		☐	☐ (u)
3.2 Hydrogeologic Site Conditions		☐	☐ (u)
3.3 Beneficial Use Summary		☐	☐ (u)
3.4 Well Inventory Survey		☐	☐ (u)
3.5 Ecological Assessment Summary		☐	☐ (u)
4.0 BASELINE EXPOSURE ASSESSMENT			
4.1 Site Classification Summary		☐	☐ (u)
4.2 Baseline Exposure Flowchart		☐	■ (u)
4.3 Tier 2 Exposure Factor Checklist		☐	☐ (u)
4.4 Tier 2 Exposure Pathway Screening	*		■
4.5 Tier 2 Exposure Scenarios & Risk Goals	*		■
5.0 SITE PARAMETERS			
5.1 Site Parameter Checklist for RBSLs		☐	■ (u)
5.2 Summary of Media Investigation and Chemical Analyses		☐	☐ (u)
5.3 Summary of Source Zone Characteristics		☐	☐ (u)
5.4 Surface Soil Concentration Data Summary		☐	☐ (u)
5.5 Subsurface Soil Concentration Data Summary		☐	■ (u)
5.6 Groundwater Concentration Data Summary		☐	■ (u)
5.7 Tier 2 Exposure Pathway Transport Parameters	*		■
6.0 TIER 1 RISK-BASED SCREENING LEVEL EVALUATION			
6.1 Tier 1 RBSL Evaluation: Surface Soil		☐	
6.2 Tier 1 RBSL Evaluation: Subsurface Soil		☐	
6.3 Tier 1 RBSL Evaluation: Groundwater		☐	

* = *Required for Tier 2 Evaluation only* (u) = *For Tier 2, update Tier 1 version as needed.*

Site Name: Former Chevron Station #9-1723 Date Completed: 3/7/97

Site Location: 9757 San Leandro St., CA Completed By: Curt Peck, CRTC

TIER 1 / TIER 2 REPORT INDEX *continued*

		■ = ENCLOSED	
		Tier 1	Tier 2
7.0 NATURAL ATTENUATION FACTORS			
7.1 Tier 2 NAF Calculation Methods & Results	*		
8.0 TIER 2 BASELINE RISK CALCULATION			
8.1 Tier 2 Exposure Concentration & Intake Calculation	*		■
8.2 Tier 2 Pathway Risk Calculation	*		■
8.3 Tier 2 Baseline Risk Summary Table	*		■
9.0 TIER 2 SSTL EVALUATION			
9.1 Surface Soil SSTL Values	*		☐
9.2 Subsurface Soil SSTL Values	*		■
9.3 Groundwater SSTL Values	*		■
10.0 TIER 1 / TIER 2 CORRECTIVE ACTION ASSESSMENT			
10.1 Exposure Control Flowchart		☐	☐ *(u)*
10.2 Soil Remediation Technology Screening Matrix		☐	☐ *(u)*
10.3 Groundwater Remediation Technology Screening Matrix		☐	☐ *(u)*
ATTACHMENTS			
Figure 1 Site Location Map		☐	■ *(u)*
Figure 2 Extended Site Map		☐	☐ *(u)*
Figure 3 Site Plan View		☐	■ *(u)*
Figure 4 Site Photos		☐	☐ *(u)*
Figure 5 Groundwater Elevation Map		☐	■ *(u)*
Figure 6 Geological Cross-Section(s)		☐	☐ *(u)*
Figure 7 Groundwater Plume Maps	*		■
Figure 8 Time Series Groundwater Data	*		■
APPENDICES			
Appendix A Chemical Analysis Data Tables		☐	■ *(u)*
Appendix B		☐	☐ *(u)*
(SPECIFY)			

* = *Required for Tier 2 Evaluation only* *(u) = For Tier 2, update Tier 1 version as needed.*

Site Name: Former Chevron Station #9-1723 Date Completed: 3/7/97

Site Location: 9757 San Leandro, St., Oakland CA Completed By: Curt Peck, CRTC

TIER 2 EXECUTIVE SUMMARY CHECKLIST

TIER 2 SSTL CALCULATION METHOD (■ OR ● TO SELECT)

SSTL Calculation Option

- ☐ Option 1: Site-Specific Screening Levels
- ■ Option 2: Individual Constituent SSTL Values
- ☐ Option 3: Cumulative Constituent SSTL Values

NAF Calculation Method

- ☐ Fate and Transport Modeling:
  - ● RBCA Spreadsheet System
  - ○ Other Model(s)
- ☐ Empirical NAF Calculation

SITE DATA INVENTORY

Source Zone Investigation Complete:

- ☐ Surface Soil (e.g., ≤ 3 ft BGS)
- ■ Subsurface Soil (e.g., > 3 ft BGS)
- ■ Groundwater

Exposure Pathway Information Compiled:

- ■ Air Pathway
- ☐ Groundwater Pathway
- ☐ Soil Pathway
- ☐ Surface Water Pathway
- ☐ Land Use Classification (on-site and off-site)

TIER 1 WORKSHEETS 1.3 - 4.2 AND 5.2 - 5.6 HAVE BEEN UPDATED TO INCLUDE NEW TIER 2 INFORMATION.

TASKS COMPLETED

- ☐ Tier 1 Evaluation
- ☐ Tier 1 Interim Corrective Action
- ■ Tier 2 Evaluation
- ☐ Tier 2 Interim Corrective Action
- ☐ Tier 2 Final Corrective Action
- ☐ Tier 3 Evaluation

CURRENT SITE CLASSIFICATION

Classification No.	Scenario Description	Prescribed Interim Action	Date Implemented

TIER 2 CORRECTIVE ACTION CRITERIA

Affected Medium	Tier 2 SSTL Exceeded ?		Applicable Excess Risk Limits (specify value)				Other Applicable Exposure Limit
	Yes	No	Indiv. Risk	Total Risk	Hazard Index	Hazard Quotient	(specify, if any)
• Surface Soil (≤ 3ft BGS)	☐	☐					
• Subsurface Soil (>3ft BGS	☐	■	10^{-5}	10^{-5}	1.0		
• Groundwater	☐	■	10^{-5}	10^{-5}	1.0		

PROPOSED ACTION

- ☐ *No Action:* Tier 2 SSTLs not exceeded. Apply for closure.
- ☐ *Interim Corrective Action:* Address principal, near-term risks sources.
- ■ *Final Corrective Action:* Remediate/control site to meet Tier 2 criteria.
- ☐ *Tier 3 Evaluation:* Improve baseline risk and SSTL estimates.

NOTE:

Rationale for proposed action documented on Worksheets 1.3 and 10.1-10.3.

ALL WORKSHEETS ENCLOSED IN THIS REPORT ARE IDENTIFIED ON THE TABLE OF CONTENTS FORM

Site Name: Former Chevron Station #9-1723 Date Completed: 3/17/97

Site Location: 9757 San Leandro St., Oakland CA Completed By: Curt Peck, CRTC

EXECUTIVE SUMMARY DISCUSSION

Instructions: *Provide brief description of site history, hydrogeologic conditions, ecological assessment, possible exposure pathways, RBSL / SSTL results, and the scope of work for proposed corrective action activity. Address proposed methods, implementation schedule, cost, and anticipated risk reduction at or near the site.*

SITE DESCRIPTION AND HISTORY

• **Worksheets 2.1 - 2.5** • **Figures 1 - 4**

Briefly discuss site chronology, operations, features of potential concern, and future plans for site use.

N/A

SITE ASSESSMENT INFORMATION

GEOLOGIC AND HYDROGEOLOGIC SUMMARY

• **Worksheets 3.1 - 3.4** • **Figures 5 and 6**

Briefly describe regional site features, climate, vadose zone soils, and groundwater depth, quality, and use.

N/A

BASELINE EXPOSURE ASSESSMENT

COMPLETE EXPOSURE PATHWAYS AND APPLICABLE RECEPTORS

• **Worksheets 4.1 - 4.5**

Discuss current or potentially complete pathways for human or ecological exposure to site constituents.

There are no current complete exposure pathways. Potentially complete future exposure pathways include:
1) Onsite commercial worker inhalation of indoor air (Vapor intrusion to buildings from subsurface soil)
2) Onsite commercial worker inhalation of indoor air (Vapor intrusion to buildings from groundwater)

There are no identified complete ecological exposure pathways

ECOLOGICAL ASSESSMENT SUMMARY

• **Worksheet 3.5**

Discuss potentially sensitive ecological receptors and habitat in the vicinity of site, if any.

Potentially sensitive ecological receptors are not known.

Site Name: Former Chevron Station #9-1723 Date Completed: 3/17/97

Site Location: 9757 San Leandro St., Oakland CA Completed By: Curt Peck, CRTC

EXECUTIVE SUMMARY DISCUSSION Continued

TIER 1 RBSL OR TIER 2 SSTL EVALUATION

COMPARISON TO SOURCE MEDIA CONCENTRATIONS

- **Worksheets 5.1 - 5.7** • **Figures 7 and 8**

For complete pathways, compare representative source concentrations to applicable RBSL or SSTL values.

Calculated SSTL soil concentration at a 1×10^{-5} risk level for exposure to benzene vapors from soil was 0.45 mg/Kg. The calculated SSTL groundwater concentration at a 1×10^{-5} risk level for exposure to benzene vapors from groundwater was 6.7 mg/L. Representative arithmetic soil benzene concentration of 5.8 mg/Kg exceeded the SSTL for soil. The representative arithmetic groundwater benzene concentration of 0.137 mg.L was below the SSTL for groundwater.

QUALITATIVE UNCERTAINTY ASSESSMENT

- **Worksheets 4.2, 4.4, and 5.1 - 5.7**

Discuss uncertainty / conservatism of the site data and calculation methods used in deriving RBSL or SSTL values.

The potential for human health or ecological exposure to hydrocarbon impacted soil, air and groundwater is minimal at this site because the calculated SSTL values maintain a degree of conservatism that would be protective of human health and the environment. The SSTL values were calculated for a 1×10^{-5} Target Risk (commercial worker) and it is very unlikely that this property would ever be residential. The vapor inhalation equations contained in this software package tend to err on the conservative side of default parameters and it is likely that generated values represent maximum expected risks. The arithmetic average of the soils data is highly biased by the 99 mg/Kg sample result in SB-10 and is one of the main reasons that the site exceeds the 1×10^{-5} Target Risk value.

PROPOSED CORRECTIVE ACTION

- **Worksheets 10.1 - 10.3**

Describe rationale for proposed action (i.e., no action, interim action, final action, or tier upgrade), considering site classification and land use. Discuss basis for remedy selection, if applicable.

Based on the results of this risk based site review, the vapors from benzene in the capillary zone of the site soils may pose a potential future health threat to future commercial workers at the site. Because excavation of the site is not warranted, it is recommended that the site have institutional controls placed on it to reduce the future commercial worker exposure to calculated benzene vapors from site soils. These controls may range from limiting development directly over the impacted soils to placement of a vapor barrier beneath any future site development. In addition, the groundwater monitoring data indicates a stable to shrinking BTEX plume and the residual groundwater contamination does not pose a health threat to potential future occupants through the vapor inhalation pathway. Additionally, natural attenuation of residual hydrocarbons will continue to decrease contaminant concentrations.

Continued groundwater monitoring on a semi-annual to annual basis of site wells MW-2, -5, -6, -8, -9 and MW-11 is recommended.

REFERENCE DOCUMENTS

- **Appendices**

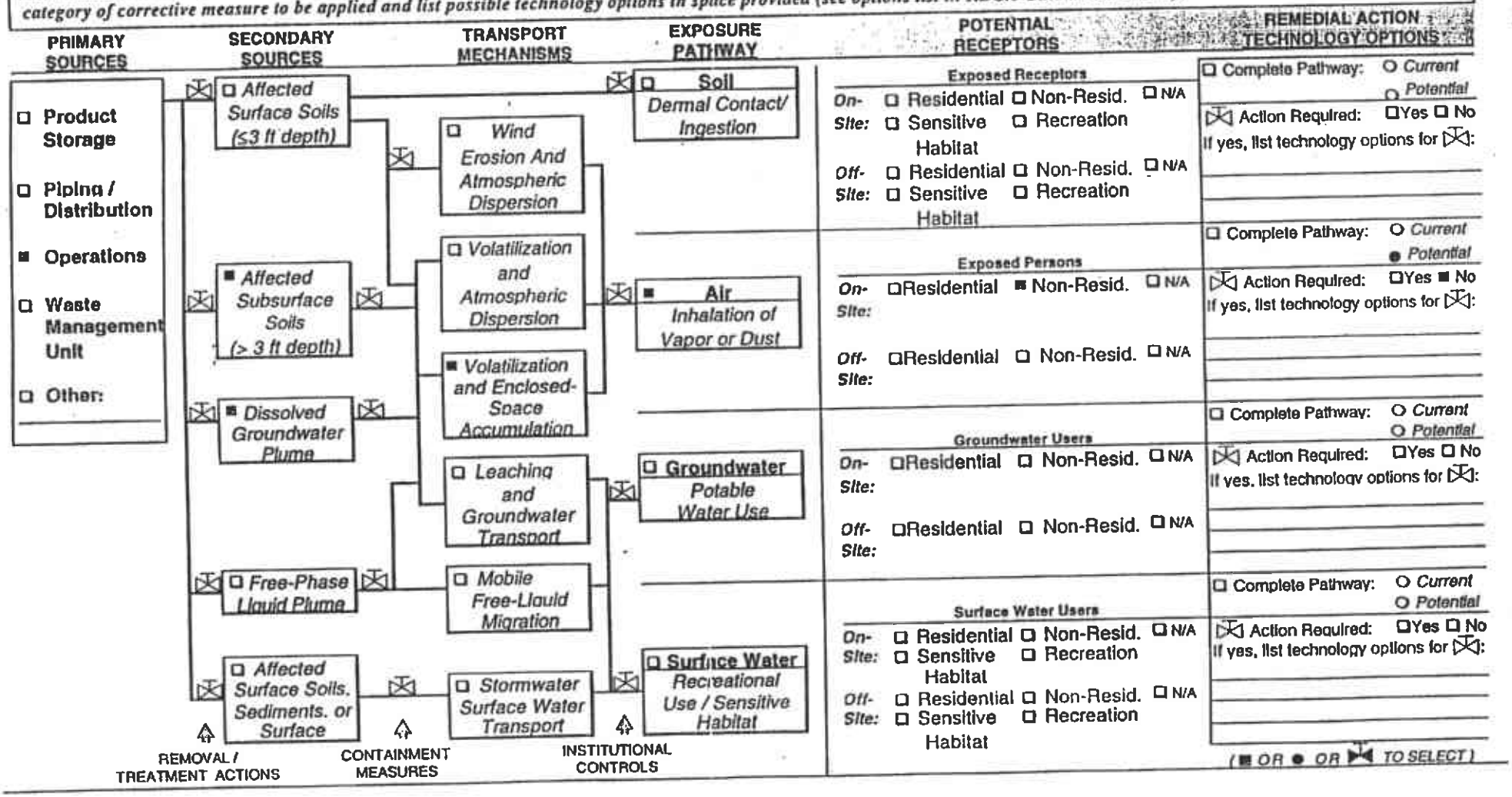
List the document sources for the data cited in this report.

1) Blaine Tech Groundwater Monitoring Reports - submitted 1/24/97
2) Fluor-Daniel GTI Soil Analytical Results - 5/15/96 Report
3) Fluor-Daniel GTI Soil Physical Parameter Results - 5/15/96 Report
4) Arithmetic Groundwater Concentration Calculations - C. Peck 3/97

Site Name: Former Chevron Station #9-1723
Site Location: 9757 San Leandro St., Oakland CA
Date Completed: 3/7/97
Completed By: Curt Peck, CRTC

EXPOSURE CONTROL FLOWCHART

Instructions: *Identify remedial measures to be implemented to prevent exposure, as follows:* • Step 1 – *Baseline Exposure: Identify applicable sources, transport mechanisms, and receptors as shown on Worksheet 4.2 (■ = applicable to site).* • Step 2 – *Remedial Measures: Fill in shut-off valves (⋈) to indicate removal / treatment action, containment measure, or institutional controls to be used to "shut off" exposure pathway.* • Step 3 – *Remedial Technology Options: For each complete pathway, identify category of corrective measure to be applied and list possible technology options in space provided (see options list in RBCA Guidance Manual).*



Site Name: Former Chevron Station #9-1723
Site Location: 9757 San Leandro St , Oakland CA
Date Completed: 3/7/97
Completed by: Curt Peck, CRTC

BASELINE EXPOSURE FLOWCHART

Instructions: *To characterize baseline exposure conditions, check boxes to identify applicable primary sources, secondary sources (affected media), potential transport mechanisms, and current or potential exposure pathways and receptors (■ = applicable to site). Identify types(s) of both on-site and off-site receptors, if applicable. Provide detailed information on complete pathways, exposure factors, and risk goals on Worksheets 4.3 - 4.5.*

PRIMARY SOURCES	SECONDARY SOURCES	TRANSPORT MECHANISMS	EXPOSURE PATHWAY	POTENTIAL RECEPTORS	COMPLETE PATHWAY?
☐ Product Storage ☐ Piping / Distribution ■ Operations ☐ Waste Management Unit ☐ Other:	☐ Affected Surface Soils (≤3 ft depth)	☐ Wind Erosion and Atmospheric Dispersion	☐ Soil — Dermal Contact/ Ingestion	Exposed Receptors On-Site: ☐ Residential ☐ Non-Resid. ■ N/A ☐ Sensitive Habitat ☐ Recreation Off-Site: ☐ Residential ☐ Non-Resid. ■ ☐ Sensitive Habitat ☐ Recreation	■ No ☐ Yes ○ Current ○ Potential ■ No ☐ Yes ○ Current ○ Potential
	■ Affected Subsurface Soils (> 3 ft depth)	☐ Volatilization and Atmospheric Dispersion	■ Air — Inhalation of Vapor or Dust	Exposed Persons On-Site: ☐ Residential ■ Non-Resid. ☐ N/A Off-Site: ☐ Residential ☐ Non-Resid. ■ N/A	☐ No ■ Yes ○ Current ■ Potential ■ No ☐ Yes ○ Current ○ Potential
	■ Dissolved Groundwater Plume	■ Volatilization and Enclosed-Space Accumulation			
		☐ Leaching and Groundwater Transport	☐ Groundwater — Potable Water Use	Groundwater Users On-Site: ☐ Residential ☐ Non-Resid. ■ N/A Off-Site: ☐ Residential ☐ Non-Resid. ■ N/A	■ No ☐ Yes ○ Current ○ Potential ■ No ☐ Yes ○ Current ○ Potential
	☐ Free-Phase Liquid Plume	☐ Mobile Free-Liquid Migration			
	☐ Affected Surface Soils, Sediments, or Surface Water	☐ Stormwater/ Surface Water Transport	☐ Surface Water — Recreational Use / Sensitive Habitat	Surface Water Users On-Site: ☐ Residential ☐ Non-Resid. ■ N/A ☐ Sensitive Habitat ☐ Recreation Off-Site: ☐ Residential ☐ Non-Resid. ■ N/A ☐ Sensitive Habitat ☐ Recreation	■ No ☐ Yes ○ Current ○ Potential ■ No ☐ Yes ○ Current ○ Potential

(■ OR ● TO SELECT)

MAKE ZAPF NOT ITALICS

Site Name: Former Chevron Station #9-1723
Site Location: 9757 San Leandro St., Oakland CA
Date Completed: 3/7/97
Completed By: Curt Peck, CRTC

TIER 2 EXPOSURE PATHWAY SCREENING

Instructions: *Exposure pathways screening involves the following steps:*

1) *Source Medium: Compare maximum constituent concentration in relevant source medium to applicable Tier 1 RBSL value for designated pathway.*

2) *Transport Mechanism: Transport is active at site if: a) relevant source medium is affected, b) exposure medium or receptor exists, and c) constituent transport from source to receptor could occur under current or anticipated future use.*

3) *Exposure Medium: For pathways under steady-state transport conditions (e.g., air), compare measured COC concentration at POE to applicable Tier 1 exposure limit for air, groundwater, or soil. Surface water concentrations should be compared to applicable state or federal water quality criteria.*

4) *Complete Pathway: For screening, pathway considered complete if "Yes" reported in Column A and either Column B or C.*

Notes:
RBSL = Risk-Based Screening Level
POE = Point of Exposure
COC = Constituent of Concern
NM = Not Measured

PATHWAY	A) SOURCE MEDIUM: Type	Pathway Tier 1 RBSL Exceeded? (■ TO SELECT)	B) TRANSPORT MECHANISM: Type	Active at Site?	C) EXPOSURE MEDIUM: Type	Exposure Limit Exceeded at POE?	COMPLETE PATHWAY? (Check if yes & specify status)
AIR EXPOSURE PATHWAYS							
1) *Surface Soils:* Vapor Inhalation and Dust Ingestion	Surface Soil	☐ Yes ☐ No	Volatilization /Dust Transport	■ No ☐ Yes - Current ☐ Yes - Future	Ambient Air	■ NM ☐ No ☐ Yes	☐ Current ☐ Potential
2) *Subsurface Soils:* Volatilization to Ambient Air	Subsurface Soil	☐ Yes ☐ No	Volatilization	■ No ☐ Yes - Current ☐ Yes - Future	Ambient Air	■ NM ☐ No ☐ Yes	☐ Current ☐ Potential
3) *Subsurface Soils:* Volatilization to Enclosed Space	Subsurface Soil	☐ Yes ■ No	Volatilization	☐ No ☐ Yes - Current ■ Yes - Future	Indoor Air	☐ NM ■ No ☐ Yes	☐ Current ■ Potential
4) *Groundwater:* Volatilization to Ambient Air	Groundwater	☐ Yes ☐ No	Volatilization	■ No ☐ Yes - Current ☐ Yes - Future	Ambient Air	■ NM ☐ No ☐ Yes	☐ Current ☐ Potential
5) *Groundwater:* Volatilization to Enclosed Space	Groundwater	☐ Yes ■ No	Volatilization	☐ No ☐ Yes - Current ■ Yes - Future	Indoor Air	☐ NM ■ No ☐ Yes	☐ Current ■ Potential
GROUNDWATER EXPOSURE PATHWAYS							
5) *Soil:* Leaching to Groundwater: Ingestion	Surface or Subsurface Soils	☐ Yes ☐ No	Leaching /Groundwater Flow	■ No ☐ Yes - Current ☐ Yes - Future	Groundwater	■ NM ☐ No ☐ Yes	☐ Current ☐ Potential
1) *Dissolved or Free-Phase Groundwater Plume:* Ingestion	Groundwater	☐ Yes ☐ No	Groundwater Flow	■ No ☐ Yes - Current ☐ Yes - Future	Groundwater	■ NM ☐ No ☐ Yes	☐ Current ☐ Potential
SOIL EXPOSURE PATHWAY							
5) *Surface Soils:* Dermal Contact /Ingestion	Surface Soil	☐ Yes ☐ No	Direct Contact	☐ No ☐ Yes - Current ■ Yes - Future	Soil	■ NM ☐ No ☐ Yes	☐ Current ☐ Potential

Site Name: Former Chevron Station #9-1723
Site Location: 9757 San Leandro St., Oakland CA

Date Completed: 3/7/97
Completed By: Curt Peck, CRTC

TIER 2 EXPOSURE PATHWAY SCREENING *CONTINUED*

PATHWAY	A) SOURCE MEDIUM: Type	Pathway Tier 1 RBSL Exceeded?	B) TRANSPORT MECHANISM: Type	Active at Site?	C) EXPOSURE MEDIUM: Type	Exposure Limit Exceeded at POE?	COMPLETE PATHWAY? (Check if yes & specify status)
SURFACE WATER PATHWAYS							
9) *Soil:* Leaching to Groundwater /Discharge to Surface Water: Recreation or Fish	Surface or Subsurface Soils	☐ Yes ■ No	Leaching /Groundwater Flow	■ No ☐ Yes - Current ☐ Yes - Future	Surface Water	■ NM ☐ No ☐ Yes	☐ Current ☐ Potential
10) *Groundwater Plume:* Discharge to Surface Water: Recreation or Fish	Groundwater	☐ Yes ■ No	Groundwater Flow	■ No ☐ Yes - Current ☐ Yes - Future	Surface Water	■ NM ☐ No ☐ Yes	☐ Current ☐ Potential
11) *Soil :* Leaching to Stormwater / Discharge to Surface Water: Recreation or Fish	Surface Soils	☐ Yes ■ No	Overland Flow	■ No ☐ Yes - Current ☐ Yes - Future	Surface Water	■ NM ☐ No ☐ Yes	☐ Current ☐ Potential

Additional Information: ***Provide necessary background discussion for data provided above. Also, if ecological exposure pathway identified on Worksheet 3.5, identify relevant source medium, transport mechanism, exposure medium, and receptor type below.***

Site Name: Former Chevron Station #9-1723 | Date Completed: 3/7/97

Site Location: 9757 San eandro St., Oakland CA | Completed By: Curt Peck, CRTC

TIER 2 EXPOSURE SCENARIOS AND RISK GOALS

Instructions: *For each exposure pathway, indicate i) Point of Exposure (POE) location (on-site, off-site, or both), ii) applicable exposure scenario at each POE (residential or commercial / industrial), and iii) applicable risk goals. Distance from source corresponds to shortest lateral distance to applicable POE from point of maximum COC concentration in source medium along possible migration pathway. Provide exposure limit information if applicable (e.g., OSHA Limits, MCLs, etc.).* (■ *TO SELECT*)

EXPOSURE PATHWAY	DISTANCE FROM SOURCE	EXPOSURE SCENARIO AT POE	TARGET RKSKS AT POE: Individual Constituent Effects — Indiv. Risk	Indiv. HQ	Cumulative Constituent Effects — Additive Risk	Additive HI	Other Exposure Limit (specify if applicable)
AIR EXPOSURE PATHWAYS		■ COMPLETE (provide data) ☐ NOT COMPLETE (skip to next pathway)					
	■ On-Site POE: 0 ft	☐ Residential / ■ Commercial /Industrial	10^{-5}	1.0			☐ PEL/TLV
	☐ Off-Site POE ____ ft	☐ Residential / Commercial /Industrial					☐ PEL/TLV
GROUNDWATER EXPOSURE PATHWAYS		■ COMPLETE (provide data) ☐ NOT COMPLETE (skip to next pathway)					
	■ On-Site POE: 0 ft	☐ Residential / ☐ Commercial /Industrial					☐ MCL
	☐ Off-Site POE ____ ft	☐ Residential / Commercial /Industrial					☐ MCL
SOIL EXPOSURE PATHWAY		☐ COMPLETE (provide data) ■ NOT COMPLETE (skip to next pathway)					
	■ On-Site POE: (at source)	☐ Residential / ■ Commercial /Industrial	10^{-5}	1.0			☐
	☐ Off-Site POE (at source)	☐ Residential / Commercial /Industrial					☐
SURFACE WATER EXPOSURE PATHWAYS		☐ COMPLETE (provide data) ■ NOT COMPLETE (skip to next pathway)					
	☐ On-Site POE: ____ ft	☐ Recreational / Ecological (specify exp. limit only)					☐
	☐ Off-Site POE ____ ft	☐ Recreational / Ecological (specify exp. limit only)					☐

ADDITIONAL INFORMATION:

If exposure limit is specified, provide reference for concentration limits to be applied to each COC (e.g., OSHA limits, water quality criteria, etc.):

Site Name: Former Chevron Station #9-1723 | Date Completed: 3/7/97
Site Location: 9757 San Leandro St., Oakland CA | Completed By: Curt Peck, CRTC

SITE PARAMETER CHECKLIST FOR RISK-BASED SCREENING LEVELS

Instructions: *For Tier 1 evaluation (generic screening levels), review specified default parameters (*) to ensure values are conservative for site. For Tier 2 Option 1 SSTL calculation (site-specific screening levels), provide site-specific values for sensitive parameters (§). Indicate parameter value used in evaluation by completing check box (■).*

Note: * **Confirm conservatism of these values for Tier 1 evaluation.**
§ **Provide site-specific measurement or estimate for Tier 2 evaluation.**

only unsat soil parameters selected for sandy clay / silt

		Default Value Used	Site-Specific Value Used	
Soil Parameters				
	soil type	☐ sandy soil	■ sandy clay/ silt	*§
Θ_T	Soil porosity	☐ 0.38 (dim)	■ 0.42	§
Θ_{ws}	water content - vadose zone	☐ 0.12 (dim)	■ 0.133	§
Θ_{as}	air content - vadose zone ($= \Theta_T - \Theta_{ws}$)	☐ 0.26 (dim)	■ 0.287	
Θ_{wcap}	water content - capillary fringe	☐ 0.342 (dim)	■ 0.378	
Θ_{acap}	air content - capillary fringe ($= \Theta_T - \Theta_{wcap}$)	☐ 0.038 (dim)	■ 0.042	
ρ_c	Soil density	☐ 1.7 g/cm^3	■ 2.03 1.59	§
foc	mass fraction of organic carbon in soil	☐ 0.01 (dim)	■ 0.0014 .015	§
Ls	Depth to contaminated soil	☐ 100 cm	■ 91 cm	§
Lgw	Depth to groundwater	☐ 300 cm	■ 280 cm	§
h_{cap}	capillary zone thickness	☐ 5 cm	■ 28 cm	
hv	vadose zone thickness (= Lgw - hc)	☐ 295 cm	■ 252 cm	
pH	Soil/water pH	■ 6.5	☐	
Groundwater Parameters				
I	Water infiltration rate	■ 30 cm/yr	☐ 6cm/yr	§
V_{gw}	groundwater velocity	■ 82.0 ft/yr	2 ft/yr ☐ 60 cm/yr	*§
δ_{gw}	groundwater mixing zone depth	■ 200 cm	☐ 762	*§
DF	aquifer dilution factor (= 1 + $V_{gw}\,\delta_{gw}$/(IW))	■ 12.1	☐	
Surface Parameters				
U_{air}	Amb. air velocity in mixing zone	■ 225 cm/s	☐	*§
δ_{air}	Mixing zone height	■ 200 cm	☐	*§
A	Contaminated Area	■ 2250000 cm^2	☐	
W	Width of Contaminated Area	■ 1500 cm	☐	§
d	Thickness of Surficial Soils	■ 100 cm	☐	§
Pe	Particulate areal emission rate	■ 2.17E-10 g/cm^2-s	☐	§
Building Parameters				
L_{crack}	Foundation crack thickness	■ 15 cm	☐	
η	Foundation crack fraction	■ 0.01 (dim)	☐	
Lb_r	Building Volume/Foundation Area Ratio (res.)	☐ 200 cm	☐	
Lb_c	Building Volume/Foundation Area Ratio (com./ind.)	■ 300 cm	☐	
ER_r	Building vapor volume exchange rate (res.)	■ 12 dy^{-1}	☐	
ER_c	Building vapor volume exchange rate (com./ind.)	■ 20 dy^{-1}	☐	

Discussion: *Provide rationale for default parameter revision; discuss additional site-specific features of note; etc.*

*red = Oak default input for Sandy Silt

(continue on next page if needed)

RBCA SITE ASSESSMENT | Tier 2 Worksheet 5.5 | SCREEN 7.3 SUBSURFACE SOILS CONCENTRATION CALCULATOR

Site Name: Former Chevron Station #9-1723 Completed By: Curt Peck
Site Location: 9757 San Leandro St., Oakland CA Date Completed: 2/27/1996

UC

TIER 2 SUBSURFACE SOIL CONCENTRATION DATA SUMMAR (e.g., >3 FT BGS)

CONSTITUENTS DETECTED CAS No.	Name	Analytical Method: Typical Detection Limit (mg/kg)	No. of Samples	No. of Detects	Detected Concentrations: Maximum Conc. (mg/kg)	Mean Conc. (mg/kg)	UCL on Mean Conc. (mg/kg)	Calculated Distribution of Data	Default Detection Limit (mg/L)
71-43-2	Benzene	[illegible]	36	34	9.9E+01	5.7E-01	1.2E+00	Lognormal	0.005
100-41-4	Ethylbenzene	[illegible]	36	30	1.5E+02	6.7E-01	1.8E+00	Lognormal	0.005
108-88-3	Toluene	[illegible]	36	28	6.6E+01	2.0E-01	5.0E-01	Lognormal	0.005
1330-20-7	Xylene (mixed isomers)	[illegible]	36	34	2.6E+02	1.9E+00	4.9E+00	Lognormal	0.005

Sample Name
Date Sampled

Serial: g-303-ydx-938
Software: GSI RBCA Spreadsheet
Version: v 1.0

[redacted] 95% UCL benzene conc. does not exceed Oakland Tier 2 RBSL for Sandy Silts or Clayey Silts for soil to Indoor Air pathway (17ppm) (31ppm)

:L Percentile

[illegible] (must be 0.9 or 0.95)

Analytical Data (Up to 50 Data Points)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
SB-1-10	SB-2-10	SB-3-10	SB-4-10	SB-4-18	SB-6-10	SB-6-10	SB-7-8	SB-7-10	SB-8-5	SB-8-10	[illegible]	SB-9-5	SB-9-12	SB-10-5	SB-10-10	[illegible]	[illegible]	SB-11-10	[illegible]	[illegible]	SB-13-10
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	8.18	8.34	0.89	0.091	[illegible]	0.47	2.2	1.3	[illegible]	[illegible]	0.0054	0.69	[illegible]	[illegible]	[illegible]	[illegible]	0.0012	[illegible]	ND	[illegible]	[illegible]
[illegible]	0.76	[illegible]	[illegible]	0.029	[illegible]	0.42	[illegible]	[illegible]	ND	[illegible]	ND	[illegible]	[illegible]	[illegible]	[illegible]	ND	[illegible]	[illegible]	ND	[illegible]	[illegible]
0.44	[illegible]	0.66	[illegible]	0.036	[illegible]	ND	0.58	[illegible]	ND	[illegible]	ND	0.18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	ND	[illegible]	0.61
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.042	[illegible]	[illegible]	[illegible]	[illegible]	0.018	0.058	[illegible]	ND	[illegible]	[illegible]

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	0.027	0.72	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	0.02	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	0.009	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	0.015	[illegible]	[illegible]	[illegible]	[illegible]

RBCA SITE ASSESSMENT | Tier 2 Worksheet 5.6 | SCREEN 7.1 GROUNDWATER CONCENTRATION CALCULATOR

Site Name: Former Chevron Station #9-1723 Completed By: Curt Peck
Site Location: 9757 San Leandro St., Oakland (Date Completed: 2/27/1996

Choose

Well Name
Date Sampled

TIER 2 GROUNDWATER CONCENTRATION DATA SUMMARY

CONSTITUENTS DETECTED		Analytical Method			Detected Concentrations			Calculated Distribution of Data	Default Detection Limit (mg/L)
CAS No.	Name	Typical Detection Limit (mg/L)	No. of Samples	No. of Detects	Maximum Conc. (mg/L)	Mean Conc. (mg/L)	UCL on Mean Conc. (mg/L)		
71-43-2	Benzene	[illegible]	38	37	2.0E+00	2.9E-02	5.5E-02	Lognormal	0.0005
100-41-4	Ethylbenzene	[illegible]	38	28	8.0E-01	7.1E-03	1.4E-02	Lognormal	0.0005
108-88-3	Toluene	[illegible]	38	23	2.9E+00	2.5E-03	5.1E-03	Lognormal	0.0005
1330-20-7	Xylene (mixed isomers)	[illegible]	38	29	7.9E+00	1.0E-02	2.3E-02	Lognormal	0.0005

Serial: g-303-ydx-938

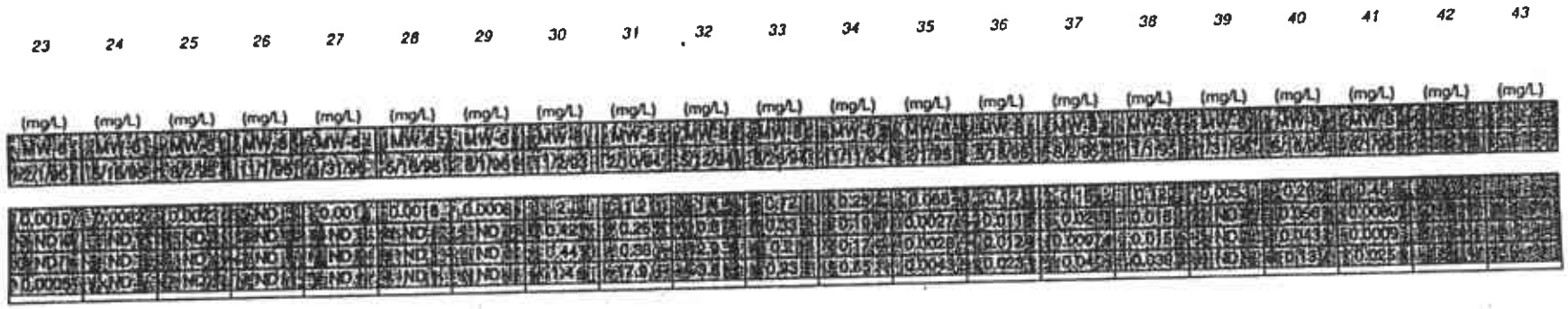
Software: GSI RBCA Spreadsheet
Version: v 1.0

UCL Percentile

95% (must be 0.9 or 0.95)

Analytical Data (Up to 50 Data Points)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
SB-1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MW-4	MW-1	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	[illegible]	MW-6	[illegible]	[illegible]	[illegible]	[illegible]	MW-6	MW-3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11/2/93	2/10/94	5/12/94	11/17/94	2/1/95	5/18/95	8/2/95	11/1/95	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0.2	0.17	0.03	[illegible]	[illegible]	[illegible]	0.043	0.052	0.087	0.015	0.008	0.0293	0.0022	0.0056	0.05	0.0142	0.0014	0.019	0.001	0.012	0.0018	0.001
0.16	0.021	0.11	[illegible]	[illegible]	[illegible]	0.0224	0.057	0.077	0.017	0.021	0.018	0.004	0.0018	0.0109	0.012	ND	0.0025	0.002	0.0012	0.0023	ND
0.097	0.03	ND	[illegible]	[illegible]	[illegible]	0.0034	0.003	0.0062	0.001	0.0006	0.0016	ND	ND	ND	ND	ND	0.001	0.0006	0.0011	0.0015	ND
0.18	0.034	0.07	[illegible]	[illegible]	[illegible]	0.0124	0.044	0.098	0.011	0.017	0.0006	0.0012	ND	0.026	0.0066	ND	0.005	0.004	0.0031	0.0073	0.001



Site Name: Former Chevron Station #9-1723 | Date Completed: 3/7/97

Site Location: 9757 San Leandro St., Oakland CA | Completed By: Curt Peck, CRTC

TIER 2 EXPOSURE PATHWAY TRANSPORT PARAMETERS

Instructions: ***For complete exposure pathways, provide site-specific values for transport parameters. In absence of direct measurements, default values may be selected for some parameters, as shown below. If no default value shown, site-specific value must be provided.***

TRANSPORT PARAMETER		SITE-SPECIFIC VALUE (INPUT VALUE BELOW)	DEFAULT VALUE (■ TO SELECT)
AIR PARAMETERS			
δ_{air}	Air mixing zone height (cm)		■ 200
U_{air}	Ambient air velocity in mixing zone (cm/sec)		■ 225
Pe	Soil particulate areal emission rate (g/cm^2-sec)		■ 2.17E-10
σ_y	Transverse air dispersion coeff. (m)		■ 100
σ_z	Vertical air dispersion coeff. (m)		■ 10
GROUNDWATER PARAMETERS			
δ_{gw}	Groundwater mixing zone depth (cm)	150 cm	☐ 200
I	Water infiltration rate (cm/yr)	0.3	☐ 30
V_{gw}	Groundwater Darcy velocity (ft/yr)	100	
K	Saturated hydraulic conductivity (cm/sec)		
i_{grad}	Lateral groundwater flow gradient (dim)		
$(BC)_i$	Available biodegradation capacity of electron acceptors for constituent *i*		
x	Distance to POE from point of maximum COC concentration in groundwater (ft)	0	
α_x	Longitudinal groundwater dispersion coeff. (cm)		■ 10% of x
α_y	Transverse groundwater dispersion coeff. (cm)		■ 33% of α_x
α_z	Vertical groundwater dispersion coeff. (cm)		■ 5% of α_z
SOIL PARAMETERS			
h_{cap}	Capillary zone thickness (cm)	28 cm	☐ 5
h_v	Vadose zone thickness (cm)	252 cm	
ρ_s	Soil bulk density (g/cm^3)	2.03	☐ 1.7
foc_s	Fraction organic carbon in soil leaching zone (dir	0.0014	☐ 0.01
foc_{gw}	Fraction organic carbon in water-bearing unit (dir	0.0014	☐ 0.001
Lgw	Depth to groundwater (cm)	280 cm	
Θ_T	Soil porosity (dim)	0.42	☐ 0.38
	Soil volumetric water content (dim)	0.133	
Θ_{wcap}	• Capillary zone	0.378	☐ 0.342
Θ_{ws}	• Vadose zone	0.133	☐ 0.12
Θ_{wcrack}	• Foundation crack	0.133	☐ 0.12

Site Name: Date Completed:

Site Location: Completed By:

TIER 2 EXPOSURE PATHWAY TRANSPORT PARAMETERS CONTINUED

TRANSPORT PARAMETER		SITE-SPECIFIC VALUE (INPUT VALUE BELOW)	DEFAULT VALUE (■ TO SELECT)
SOIL PARAMETERS (Continued)			
	Soil volumetric air content (dim)	0.287	
Θ_{acap}	•Capillary zone	0.042	☐ 0.038
Θ_{as}	•Vadose zone	0.287	☐ 0.26
Θ_{acrack}	•Foundation crack	0.287	☐ 0.26
d	Thickness of surficial soil zone (cm)	91 cm	☐ 100 cm
BUILDING PARAMETERS			Resid. / Comm/ Ind.
L_b	Building volume/area ratio (cm)		☐ 200 ■ 300
ER	Building air exchange rate (dy^{-1})		☐ 12 ■ 20
L_{crack}	Foundation crack thickness (cm)		■ 15
η	Foundation crack fraction		■ 0.01

Additional Information:

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.3

Site Name: Former Chevron Station #9-1723
Site Location: 9757 San Leandro St., Oakland CA

Completed By: Curt Peck
Date Completed: 2/27/1996

TIER 2 BASELINE RISK SUMMARY TABLE

EXPOSURE PATHWAY	BASELINE CARCINOGENIC RISK: Individual COC Risk – Maximum Value	Individual COC Risk – Target Risk	Cumulative COC Risk – Total Value	Cumulative COC Risk – Target Risk	Risk Limit(s) Exceeded?	BASELINE TOXIC EFFECTS: Hazard Quotient – Maximum Value	Hazard Quotient – Applicable Limit	Hazard Index – Total Value	Hazard Index – Applicable Limit	Toxicity Limit(s) Exceeded?
AIR EXPOSURE PATHWAYS										
Complete:	1.3E-4	1.0E-5	0.0E+0	N/A	■	0.0E+0	1.0E+0	0.0E+0	N/A	☐
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	0.0E+0	1.0E-5	0.0E+0	N/A	☐	0.0E+0	1.0E+0	0.0E+0	N/A	☐
SOIL EXPOSURE PATHWAYS										
Complete:	0.0E+0	1.0E-5	0.0E+0	N/A	☐	0.0E+0	1.0E+0	0.0E+0	N/A	☐
CRITICAL EXPOSURE PATHWAY: (Select Maximum Values From Complete Pathways)										
	1.3E-4	1.0E-5	0.0E+0	N/A	■	0.0E+0	1.0E+0	0.0E+0	N/A	☐

NOTE: Calculated Risk is for Arithmetic Average of Soil (5.8mg/Kg) and Groundwater (0.51 mg/L).

Serial: g-303-ydx-9:

Software: GSI RBCA Spreadsheet
Version: v 1.0

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Former Chevron Station #9-1723 Former Chevron Station #9-1723b Identification: 9-1723ra
Site Location: 9757 San Leandro St., Oakland 9757 San Leandro St., Oakland Date Completed: 2/27/06
Completed By: Curt Peck

Software: GSI RBCA Spreadsheet
Version: v 1.0

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

DEFAULT PARAMETERS

Exposure Parameter	Definition (Units)	Residential Adult	Residential (1-6yrs)	Residential (1-16 yrs)	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (l/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m^3/day)	15			20	
IRa.out	Inhalation rate outdoor (m^3/day)	20			20	***20***
SA	Skin surface area (dermal) (cm^2)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm^2-yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
Groundwater Pathways:				
GW.i	Groundwater Ingestion	FALSE	FALSE	
GW.v	Volatilization to Outdoor Air	FALSE	FALSE	
GW.b	Vapor Intrusion to Buildings	FALSE	TRUE	
Soil Pathways				
S.v	Volatiles from Subsurface Soils	FALSE	FALSE	
SS.v	Volatiles and Particulate Inhalation	FALSE	FALSE	FALSE
SS.d	Direct Ingestion and Dermal Contact	FALSE	TRUE	FALSE
S.l	Leaching to Groundwater from all Soils	FALSE	FALSE	
S.b	Intrusion to Buildings - Subsurface Soils	FALSE	TRUE	

Matrix of Receptor Distance and Location on- or off-site		Residential Distance	Residential On-Site	Commercial/Industrial Distance	Commercial/Industrial On-Site
GW	Groundwater receptor (cm)		FALSE		FALSE
S	Inhalation receptor (cm)		FALSE		FALSE

Matrix of Target Risks		Individual	Cumulative
TRsb	Target Risk (class A&B carcinogens)	***1.0E-05***	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	2	
Tier	RBCA Tier	2	

Surface Parameters	Definition (Units)	Residential	Commercial/Industrial Chronic	Commercial/Industrial Construction
t	Exposure duration (yr)	30	25	1
A	Contaminated soil area (cm^2)	2.2E+06		1.0E+06
W	Length of affected soil parallel to wind (cm)	1.5E+03		1.0E+03
W.gw	Length of affected soil parallel to groundwater (cm	1.5E+03		
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02		
delta	Air mixing zone height (cm)	2.0E+02		
Lss	Definition of surficial soils (cm)	***9.1E+01***		
Pe	Particulate areal emission rate (g/cm^2/s)	2.2E-10		

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	***1.5E+02***
I	Groundwater infiltration rate (cm/yr)	***3.0E-01***
Ugw	Groundwater Darcy velocity (cm/yr)	***3.0E+02***
Ugw.tr	Groundwater Transport velocity (cm/yr)	***3.0E+02***
Ks	Saturated Hydraulic Conductivity(cm/s)	
grad	Groundwater Gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
BC	Biodegradation Capacity (mg/L)	
BIO?	Is Bioattenuation Considered	FALSE
phi.eff	Effective Porosity in Water-Bearing Unit	3.0E-01
foc.sat	Fraction organic carbon in water-bearing unit	***1.4E-03***

Soil	Definition (Units)	Value		
hc	Capillary zone thickness (cm)	***1.0E+02***		
hv	Vadose zone thickness (cm)	***2.8E+02***		
rho	Soil density (g/cm^3)	***2.03***		
foc	Fraction of organic carbon in vadose zone	***0.0014***		
phi	Soil porosity in vadose zone	***0.42***		
Lgw	Depth to groundwater (cm)	***3.9E+02***		
Ls	Depth to top of affected soil (cm)	***9.1E+01***		
Lsubs	Thickness of affected subsurface soils (cm)	***2.9E+02***		
pH	Soil/groundwater pH	6.5		
		capillary	vadose	foundation
phi.w	Volumetric water content	***0.378***	***0.133***	***0.133***
phi.a	Volumetric air content	***0.042***	***0.287***	***0.287***

Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Dispersive Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersion coefficient (cm)		
ay	Transverse dispersion coefficient (cm)		
az	Vertical dispersion coefficient (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.3**

Site Name: Former Chevron Station #9-1723 | Completed By: Curt Peck
Site Location: 9757 San Leandro St., Oakland CA | Date Completed: 2/27/1996

TIER 2 BASELINE RISK SUMMARY TABLE

	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
EXPOSURE PATHWAY	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
AIR EXPOSURE PATHWAYS										
Complete:	2.7E-5	1.0E-5	0.0E+0	N/A	■	0.0E+0	1.0E+0	0.0E+0	N/A	☐
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	0.0E+0	1.0E-5	0.0E+0	N/A	☐	0.0E+0	1.0E+0	0.0E+0	N/A	☐
SOIL EXPOSURE PATHWAYS										
Complete:	0.0E+0	1.0E-5	0.0E+0	N/A	☐	0.0E+0	1.0E+0	0.0E+0	N/A	☐

CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways):										
	2.7E-5	1.0E-5	0.0E+0	N/A	■	0.0E+0	1.0E+0	0.0E+0	N/A	☐

NOTE: Calculated Risk is for 95% UCL of Geometic Mean of Soil (1.2 mg/Kg) and Groundwater (0.055 mg/L).

Serial: g-303-ydx-93 Software: GSI RBCA Spreadsheet
Version: v 1.0

RBCA SITE ASSESSMENT | Input Screen 7

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration					
	in Groundwater		In Surface Soil		In Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note
Benzene	5.1E-1	AVG			5.8E+0	AVG
Ethylbenzene	1.7E-1	AVG			1.1E+1	AVG
Toluene	3.2E-1	AVG			5.2E+0	AVG
Xylene (mixed isomers)	1.2E+0	AVG			3.2E+1	AVG

Site Name: Former Chevron Station #9-1723
Site Location: 9757 San Leandro St., Oakland CA

Completed By: Curt Peck
Date Completed: 2/27/1996

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 9.2**

Site Name: Former Chevron Station #9-1723 | Completed By: Curt Peck

Site Location: 9757 San Leandro St., Oakland CA | Date Completed: 2/27/1996

SUBSURFACE SOIL SSTL VALUES (> 3 FT BGS)

Target Risk (Class A & B) 1.0E-5 ☐ MCL exposure limit?

Target Risk (Class C) 1.0E-5 ☐ PEL exposure limit?

Target Hazard Quotient 1.0E+0

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration		Soil Leaching to Groundwater			X	Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-2	Benzene	5.8E+0	NA	NA	NA		NA	4.5E-1	NA	NA	4.5E-1	■	1.3E+01
100-41-4	Ethylbenzene	1.1E+1	NA	NA	NA		NA	>Res	NA	NA	>Res	☐	<1
108-88-3	Toluene	5.2E+0	NA	NA	NA		NA	5.3E+1	NA	NA	5.3E+1	☐	<1
1330-20-7	Xylene (mixed isomers)	3.2E+1	NA	NA	NA		NA	>Res	NA	NA	>Res	☐	<1

Software: GSI RBCA Spreadsheet Serial: g-303-ydx-938

Version: v 1.0

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: Former Chevron Station #9-1723
Site Location: 9757 San Leandro St., Oakland CA

Completed By: Curt Peck
Date Completed: 2/27/1996

GROUNDWATER SSTL VALUES

Target Risk (Class A & B): 1.0E-5
Target Risk (Class C): 1.0E-5
Target Hazard Quotient: 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration		Groundwater Ingestion			X	Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/L)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL) (on-site)		Residential: (on-site)	Commercial: (on-site)	Residential (on-site)	Commercial: (on-site)	(mg/L	"■" if yes	Only if "yes" left
71-43-2	Benzene	5.1E-1	NA	NA	NA		NA	6.7E+0	NA	NA	6.7E+0	☐	<1
100-41-4	Ethylbenzene	1.7E-1	NA	NA	NA		NA	>Sol	NA	NA	>Sol	☐	<1
108-88-3	Toluene	3.2E-1	NA	NA	NA		NA	>Sol	NA	NA	>Sol	☐	<1
1330-20-7	Xylene (mixed isomers)	1.2E+0	NA	NA	NA		NA	>Sol	NA	NA	>Sol	☐	<1

Software: GSI RBCA Spreadsheet
Version: v 1.0

Serial: g-303-ydx-938

TABLE E-6
POTENTIAL HEALTH RISKS VIA INHALATION OF BENZENE MIGRATED INTO COMMERCIAL BUILDING VIA FOUNDATION CRACKS ESTIMATED FROM MEASURED SOIL GAS LEVELS

VOC Inhalation Equation: CDI (mg/kg-day) = C_a x IR x FC x EF x ED) / (BW x AT)

	RME
CDI = Chronic Daily Intake (mg/kg-day)	
C_a = Chemical Concentration in Air (mg/m^3)	
IR = Inhalation Rate (m^3/day) =	2E+01
FC = Fraction from Contaminated Source =	1
EF = Exposure Frequency (days/year) =	250
ED = Exposure Duration (years) =	25

	RME
BW_c = Body Weight (Carcinogenic Effects) (kg) =	70
BW_{nc} = Body Weight (Noncarcinogenic Effects) (kg) =	70
AT_c = Averaging Time (Carcinogenic Effects) (days) =	25,550
AT_{nc} = Averaging Time (Noncarcinogenic Effects) (days) =	9,125
TR = Target Excess Cancer Risk =	1E-05
THI = Target Hazard Index =	1

Chemical	Concentration (mg/m^3)	Carcinogenic CDI (mg/kg-day)	Noncarcinogenic CDI (mg/kg-day)	Cal-EPA Slope Factor (mg/kg-day)$^{-1}$	Reference Dose mg/kg-day	Excess Cancer Risk	Hazard Quotient	RME - % Risk Contribution		1.00E-05 RBSL.* mg/m^3	HI = 1 RBSL.* mg/m^3
								Cancer	Hazard		
Benzene	1.7E-04	1.2E-05	3.4E-05	1.0E-01	1.7E-03	1E-06	2.0E-02	100%	100%	1.90E+01	1.16E+02
Toluene	7.7E-08	5.4E-09	1.5E-08		1.1E-01		1.4E-07		0%		1.62E+06
Ethylbenzene	2.5E-07	1.7E-08	4.9E-08		2.9E-01		1.7E-07		0%		5.80E+06
Xylenes	1.4E-07	9.5E-09	2.6E-08		2.0E-01		1.3E-07		0%		3.62E+06
TOTAL						1E-06	2.0E-02	100%	100%		

Notes: Blank means no data available or not determined.
Excess cancer risk = Carcinogenic CDI x Slope factor.
Hazard quotient = Noncarcinogenic CDI / Reference dose.
* RBSL for soil gas

TABLE E-4
POTENTIAL HEALTH RISKS VIA INHALATION OF AMBIENT BENZENE FROM SOIL GAS
ONSITE COMMERCIAL SCENARIO

VOC Inhalation Equation: CDI (mg/kg-day) = C_a x IR x FC x EF x ED) / (BW x AT)

	RME
CDI = Chronic Daily Intake (mg/kg-day)	
C_a = Chemical Concentration in Air (mg/m^3)	
IR = Inhalation Rate (m^3/day) =	2E+01
FC = Fraction from Contaminated Source =	1
EF = Exposure Frequency (days/year) =	250
ED = Exposure Duration (years) =	25

	RME
BW_c = Body Weight (Carcinogenic Effects) (kg) =	70
BW_{nc} = Body Weight (Noncarcinogenic Effects) (kg) =	70
AT_c = Averaging Time (Carcinogenic Effects) (days) =	25,550
AT_{nc} = Averaging Time (Noncarcinogenic Effects) (days) =	9,125
TR = Target Excess Cancer Risk =	1E-05
THI = Target Hazard Index =	1

Chemical	Concentration (mg/m^3)	Carcinogenic CDI (mg/kg-day)	Noncarcinogenic CDI (mg/kg-day)	Cal-EPA Slope Factor (mg/kg-day)$^{-1}$	Reference Dose mg/kg-day	Excess Cancer Risk	Hazard Quotient	RME - % Risk Contribution		1.00E-05 RBSL* mg/m^3	HI = 1 RBSL* mg/m^3
								Cancer	Hazard		
Benzene	7.0E-06	4.9E-07	1.4E-06	1.0E-01	1.7E-03	5E-08	8.0E-04	100%	100%	4.73E+02	1.25E+03
Toluene	6.1E-07	4.2E-08	1.2E-07		1.1E-01		1.1E-06		0%		9.24E+05
Ethylbenzene	2.4E-06	1.7E-07	4.7E-07		2.9E-01		1.6E-06		0%		6.18E+05
Xylenes	1.1E-06	7.9E-08	2.2E-07		2.0E-01		1.1E-06		0%		9.09E+05
TOTAL						5E-08	8.0E-04	100%	100%		

Notes:
Commercial exposure parameters are the USEPA standard default values.
* RBSL for soil gas

TABLE E-2
TIER 2 RBCA - POTENTIAL HEALTH RISKS VIA INHALATION OF INDOOR BENZENE VOLATILIZED FROM GROUND WATER INTO ON-SITE COMMERCIAL BUILDING

VOC Inhalation Equation: CDI (mg/kg-day) = C_a x IR x FC x EF x ED) / (BW x AT)

	RME		RME
CDI = Chronic Daily Intake (mg/kg-day)		BW_c = Body Weight (Carcinogenic Effects) (kg) =	70
C_a = Chemical Concentration in Air (mg/m^3)		BW_{nc} = Body Weight (Noncarcinogenic Effects) (kg) =	70
IR = Inhalation Rate (m^3/day) =	20	AT_c = Averaging Time (Carcinogenic Effects) (days) =	25,550
FC = Fraction from Contaminated Sou	1	AT_{nc} = Averaging Time (Noncarcinogenic Effects) (days) =	9,125
EF = Exposure Frequency (days/year)	250	TR = Target Excess Cancer Risk =	1E-05
ED = Exposure Duration (years) =	25	THI = Target Hazard Index =	1

Chemical	Concentration (mg/m^3)	Carcinogenic CDI (mg/kg-day)	Noncarcinogenic CDI (mg/kg-day)	Cal-EPA Slope Factor $(mg/kg-day)^{-1}$	Reference Dose mg/kg-day	Excess Cancer Risk	Hazard Quotient	RME - % Risk Contribution		1.00E-05 RBSL mg/L	HI = 1 RBSL mg/L
								Cancer	Hazard		
Benzene	1.1E-04	7.7E-06	2.2E-05	1.0E-01	1.7E-03	8E-07	1.3E-02	100%	100%	5.94E-01	3.61E+00
Toluene	9.6E-06	6.7E-07	1.9E-06		1.1E-01		1.7E-05		0%		2.35E+02
Ethylbenzene	1.7E-05	1.2E-06	3.4E-06		2.9E-01		1.2E-05		0%		6.00E+02
Xylenes	2.4E-05	1.7E-06	4.8E-06		2.0E-01		2.4E-05		0%		4.59E+02
TOTAL						8E-07	1.3E-02	100%	100%		

Notes: Blank means no data available or not determined.
Excess cancer risk = Carcinogenic CDI x Slope factor
Hazard quotient = Noncarcinogenic CDI / Reference dose

CAMBRIA

COPY

July 7, 1998

Mr. Phil Briggs
Chevron Products Company
6001 Bollinger Canyon Road, Bldg. L
San Ramon, CA 94583-0804

Re: **Tier 2 RBCA Analysis and Closure Request**
Former Chevron Service Station 9-1723
9757 San Leandro Boulevard
Oakland, California

Dear Mr. Briggs:

This report presents the results of a Tier 2 risk-based corrective action (RBCA) analysis conducted by Cambria Environmental Technology, Inc., (Cambria) for the above-referenced site (Attachment A). The objective of the RBCA analysis was to address potential human health risks associated with residual petroleum hydrocarbons beneath the site. The site background and the results of our analysis are summarized below.

SITE BACKGROUND

The site is a former Chevron service station located in a primarily commercial and industrial area at 9759 San Leandro Boulevard in Oakland, California. The site is currently used for automobile and trailer parking. To date, ten ground water monitoring wells have been installed and twenty-nine soil borings have been drilled at the site, including six soil borings that were advanced in October 1997 to collect soil vapor samples. The results of the soil vapor sampling were presented in a Cambria report dated January 5, 1998, and are summarized in Attachment A.

CAMBRIA
ENVIRONMENTAL
TECHNOLOGY, INC.
1144 65TH STREET,
SUITE B
OAKLAND,
CA 94608
PH: (510) 420-0700
FAX: (510) 420-9170

Site Setting, Geology, and Hydrology: The site is essentially flat, approximately 25 feet (ft) above mean sea level, and is located about one-mile east of San Francisco Bay. Site stratigraphy is comprised primarily of alluvial plain and stream channel deposits of low-permeability clayey silt, silt, and sandy silts of low to moderate permeability, with occasional gravel lenses of moderate to high estimated permeability. Historically, depth to ground water has ranged from about 5 to 11 ft below ground surface (bgs), and is currently about 9 ft bgs. Ground water generally flows to the west beneath the site. Ground water monitoring data are presented in Attachment B.

Hydrocarbon Distribution in Soil: The highest hydrocarbon concentrations detected in soil samples collected during previous investigations were 1,800 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPHg) and 99 ppm benzene. These samples were collected in the vicinity of the former underground storage tanks (USTs).

Hydrocarbon Distribution in Ground Water: Ground water has been gauged and analyzed since November 1993. TPHg and benzene have been detected in site wells in steadily decreasing concentrations over time. For example, the maximum benzene concentration was 2,000 ppb in well MW-8 on November 12, 1993, but decreased to 5.3 ppb in this well on May 1, 1998. The maximum benzene concentration detected during the most recent ground water monitoring event was 19 ppb in well MW-5 (Attachment B).

Hydrocarbon Distribution in Soil Vapor: To assess hydrocarbon concentrations in soil vapor near the former USTs, where the highest concentrations of hydrocarbons in soil and ground water have been detected, Cambria advanced six soil vapor borings and collected soil vapor samples. Boring locations and soil vapor concentrations are presented in Attachment A.

Benzene was detected in all soil vapor samples collected from borings SV-1 through SV-6. Borings SV-5 and SV-6 were advanced adjacent to borings SV-1 and SV-2. The highest benzene concentration reported was 100,000 parts per billion by volume (ppbv) in the soil vapor sample collected 5 ft bgs from SV-5. However, the benzene soil vapor concentration at 5 ft depth from adjacent boring SV-1 was 410 ppbv, and benzene concentration in two samples collected at 3 ft bgs from SV-1 were 96 and 94 ppbv, respectively. The second highest benzene concentration reported was 3,100 ppbv in SV-2 (SVD-2) at 8 ft bgs. Borings SV-1, SV-2, SV-5, and SV-6 were advanced in the location of the former USTs. Soil vapor benzene concentrations appear to be localized in the vicinity of the former USTs. Benzene concentrations detected in soil vapor samples from borings SV-3 and SV-4 were less than 5 ppbv (Attachment A).

RISK ASSESSMENT

Cambria's risk assessment followed the guidelines set forth by the American Society for Testing and Materials (E-1739-95)[1] and, in general, used input parameter values that were consistent with a RBCA analysis conducted by Chevron Research and Technology Company (CRTC) prior to collecting soil vapor data at the site. The results of CRTC's RBCA analysis are presented in Attachment C. This section presents a summary of the previous RBCA analysis, the results of our Tier 2 RBCA analysis, and a discussion of the soil vapor data. As shown in Attachment C, results of previous RBCA analysis indicate that BTEX compounds in ground water beneath the site do not pose a significant risk to occupants of an on-site building. Concentrations of petroleum hydrocarbons in ground water beneath the site have continued to decrease since this RBCA analysis was conducted, therefore this conclusion is still valid (Attachment B). However, historical BTEX soil concentrations exceeded the calculated site-specific target level (SSTL) of 0.45 mg/kg for the volatilization of benzene from subsurface soil to indoor air pathway. This SSTL is based on the theoretical partitioning between the sorbed and vapor phases of benzene in soil, which often results in an overestimation of actual soil vapor concentrations. Therefore, to more accurately assess the potential risk of on-site receptors to volatilized BTEX compounds beneath the site, Cambria collected soil vapor samples in October 1997 (Attachment A).

---

[1] **Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites.** E 1739-95 (Revised December 1996): American Society of Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

To evaluate the risk associated with BTEX compounds in soil vapor beneath the site, we calculated soil vapor SSTLs. We also reevaluated the risk associated with BTEX compounds in ground water using the most recent ground water monitoring data. In general, the input parameter values used in our Tier 2 RBCA analysis are consistent with the values used in the previous RBCA analysis (Attachment C). Specifically, Tier 2 input parameter values include:

- Depth to ground water, which was updated to reflect the shallow water table observed in February 1998 (5 ft bgs; Attachment B); and
- A cancer slope factor for benzene of 0.1 kg-day/mg to be consistent with Cal-EPA guidelines.

Table 1 - Conceptual Site Model for Risk Assessment

Item		Comment
Contaminant Source Media:	Soil and Ground Water	Hydrocarbons have been detected in soil, ground water, and soil vapor beneath the site.
Potential Chemicals of Concern (COC):	Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)	All chemicals detected in representative samples.
Representative Source Concentrations in Ground Water (mg/L):	benzene: 0.046 toluene: 0.004 ethylbenzene: 0.007 xylenes: 0.011	Maximum average BTEX concentrations detected in ground water during the previous for quarters (July 1997 through May 1998) (Monitoring Well MW-8; Attachment B).
Representative Source Concentrations in Soil Vapor (mg/m^3):	benzene: 2.3 toluene: 0.22 ethylbenzene: 0.97 xylenes: 0.48	95% UCL of the mean of BTEX concentrations detected in soil vapor (Attachment A).
Target Carcinogenic Risk Level:	Commercial: $1x10^{-5}$	Conservative target risk level, considering a commercial receptor scenario on site.
Non-Carcinogenic Hazard Quotient:	1.0	Consistent with ASTM default value.
Benzene Slope Factor:	0.1 $(mg/kg/day)^{-1}$	Defined by Cal-EPA.

Selection of Representative Concentrations

COCs in Ground Water: For the representative COC concentrations in ground water, we calculated the mean BTEX concentrations detected during the previous four quarters (i.e. July 1997 through May 1998). In the case of non-detections, the concentration was assumed to be one-half of the detection limit value. As shown

in Attachment B, the highest ground water concentrations have been consistently detected in monitoring well MW-8.

COCs in Soil Vapor: For the representative COC concentrations in soil vapor, we calculated the 95% upper confidence level (UCL) of the mean BTEX concentrations detected in soil vapor during the October 1997 site investigation.

The conceptual site model (CSM) is summarized in Table 1 and results of the Tier 2 RBCA analysis are presented in Table 2.

Table 2 - Tier 2 Results

Exposure Scenario	Target Risk Level	Cal-EPA SSTL	COCC	Calculated Risk Level	Result
Benzene volatilization from ground water to indoor air	1E-05	0.59	0.046	8×10^{-7}	Site-specific source concentration is less than SSTL
Intrusion of benzene in soil vapor to outdoor air	1E-05	470	2.3	5×10^{-8}	Site-specific soil vapor concentration is less than soil vapor SSTL
Intrusion of benzene in soil vapor to indoor air	1E-05	19	2.3	1×10^{-6}	Site-specific soil vapor concentration is less than soil vapor SSTL

SSTL - Site-Specific Target Level
COCC - Chemical of Concern Concentration (Benzene)
Ground water concentrations are in mg/l, and soil vapor concentrations are mg/m^3

DISCUSSION

As shown in Table 2, current ground water concentrations beneath the site are less than the SSTL for benzene volatilization from ground water to indoor air. Similarly, with the exception of one sample, SV-5-5.0, all benzene concentrations in soil vapor samples collected beneath the site in October 1997 (Attachment A) are less than the calculated Tier 2 SSTL for soil vapor of 19 mg/m^3, which is equivalent to a concentration of about 5,800 ppbv benzene.

Benzene was detected at a concentration of 410 ppbv in the soil vapor sample collected at 5 ft depth from boring SV-1, which is less than 5 ft west of the SV-5 sample containing 100,000 ppbv benzene. In addition, benzene concentrations of 96 ppbv and 94 ppbv were detected in two samples collected at 3 ft depth from boring SV-1. Hence, the elevated level of benzene reported in sample SV-5-5.0 may be anomalous.

LOW RISK GROUND WATER CASE CRITERIA

The California Regional Water Quality Control Board - San Francisco Bay Region (RWQCB) released guidelines for clean-up of low risk ground water sites impacted by petroleum hydrocarbons. According to the RWQCB, a low-risk ground water site has the following characteristics:

- The leak has stopped and the hydrocarbon source has been removed;
- Ground water is less than 50 ft deep;
- The site is adequately characterized;
- The hydrocarbon plume is defined and stable or decreasing;
- No water wells or other sensitive receptors are likely to be impacted;
- No preferential pathways exist at the site;
- The site presents no significant risk to human health; and
- The site presents no significant risk to the environment.

The leak has stopped and the hydrocarbon source has been removed: Results of a ground-penetrating radar survey and subsequent soil boring investigation conducted in 1988 by Groundwater Technology, Inc., indicated that USTs were no longer present beneath the site.

Ground water is less than 50 ft deep: Historically, ground water depth has been between 5 and 11 ft bgs. The most recent average depth to ground water is at about 9 ft bgs (Attachment B).

The site is adequately characterized: The lateral and vertical extent of hydrocarbons in soil has been well-defined by the soil borings drilled around the former tank pit and across the site. To date, ten ground water monitoring wells have been installed and twenty-nine soil borings have been drilled at the site, including six soil borings that were advanced in October 1997 to collect soil vapor samples for this risk assessment (Attachment A). Decreasing hydrocarbon concentrations in ground water from on- and off-site monitoring wells indicate a shrinking plume (Attachment B).

The hydrocarbon plume is stable or decreasing: As discussed earlier, hydrocarbon concentrations are decreasing in the source area and perimeter wells, indicating a shrinking plume.

No water wells or other sensitive receptors are likely to be impacted: In May 1996, Flour Daniel GTI conducted a survey of water wells immediately southwest of the site. Two wells, P2 and P3, were identified within 250 ft downgradient (west) of the site (Attachment E). Well P2 is located about 100 ft west of the

former Chevron site and was reported to be completed to a depth of 602 ft and screened from 160 to 225 ft bgs (Groundwater Technology, Inc., 1988). As of 1996, this well was operative and on standby service for fire emergencies. Well P3 is located about 230 ft west of the site and, as of 1996, supplied water for industrial purposes. Two other wells were identified during a well survey conducted by Groundwater Technology, Inc., in 1988. Well L1 is located more than 500 ft north of the site and is completed to a depth of 950 ft. Well completion records indicate the gravel pack of this well extends from the ground surface to 950 ft bgs. Well J1 is located more than one-half mile west-northwest of the site and is completed to a depth of 448 ft. Well seal and construction details were not available for well J1 (Groundwater Technology, Inc., 1988). Results of the well surveys are presented in Attachment E.

With the exception of one suspect detection, no hydrocarbons have been detected in off-site monitoring well MW-9 since its installation in November 1993. Well MW-9 is located about 200 ft downgradient (west) of the source area (the former USTs), in the vicinity of well P2. Hydrocarbons have been detected in off-site monitoring well MW-2 and site perimeter monitoring well MW-6, which are also located downgradient of the site, however TPHg and benzene concentrations have been less than 400 and 20 ppb, respectively (Attachment B). Based on these data and that the industrial supply wells are screened in deeper water-bearing zones, it is not likely that an off-site water supply well would be impacted by the hydrocarbons beneath the site.

No preferential pathways exist at the site: No preferential lithologic pathways that would affect downgradient hydrocarbon migration have been identified at the site.

The site presents no significant risk to human health: As indicated by the Tier 2 RBCA, the risk associated with the site-specific ground water and soil vapor BTEX concentrations is less than the target risk level. Hydrocarbon concentrations in ground water are decreasing and, therefore, the residual risk to human health is a minimum.

The site presents no significant risk to the environment: No potential exposure pathways that would adversely impact surface water, wetlands, or other sensitive receptors have been identified in the vicinity of the site. Therefore, there is no risk to the environment.

CASE CLOSURE JUSTIFICATION AND RECOMMENDATIONS

Based on our review of site conditions, we believe this site should be classified as a low-risk ground water case. Cambria's ASTM RBCA analysis indicates that petroleum hydrocarbons beneath the site present no significant risk to human health. The localized hydrocarbon concentrations are decreasing, and the hydrocarbon concentrations in ground water are low. Therefore, no engineered remedial action is necessary at the site and passive bioremediation is an acceptable remedial alternative for residual hydrocarbons beneath the site.

Several ground water monitoring wells have not been monitored since August 1994 (MW-1, MW-4, MW-7, and MW-10). Among the wells that are currently monitored, hydrocarbons have generally been detected at low concentrations in wells MW-2, MW-5, MW-6, MW-8, and MW-9 (Attachment B). Therefore, Cambria recommends discontinuing ground water monitoring, abandoning site wells, and granting full closure of the site. This recommendation is supported by the following considerations:

- The USTs have been removed;
- SPHs have never been detected at the site;
- The site has been characterized and ground water monitoring data suggest that dissolved hydrocarbons are limited to the site vicinity and the plume is shrinking;
- The presence of residual hydrocarbons in ground water do not pose a significant health risk to future site occupants.

CLOSING

We appreciate this opportunity to provide consulting services to Chevron Products Company and we look forward to working with you in the future. Please call if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

Peter F. McKereghan, C.H.G.
Principal Hydrogeologist

Attachments:
A - Soil Vapor Survey Results
B - Ground Water Monitoring Data
C - CRTC RBCA Analysis
D - Cambria Tier 2 RBCA Analysis
E - Well Survey Results

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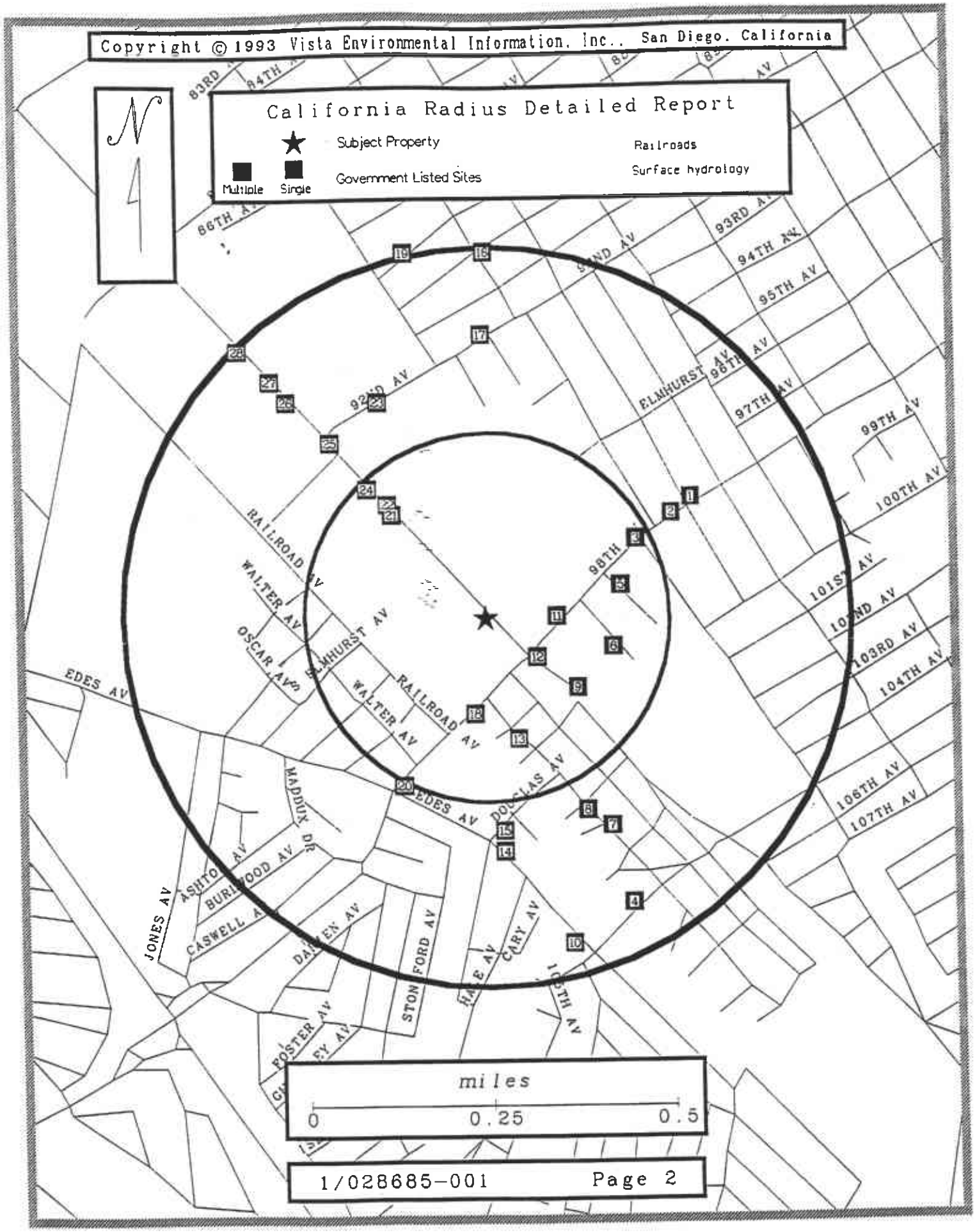

LEAKING UNDERGROUND STORAGE TANKS (LUST)

The information presented in this report is updated to:

Region 1 - June 1993: North Coast

Region 2 - May 1993: San Francisco Bay Area

Region 3 - June 1993: Central Coast

Region 4 - August 1993: Greater Los Angeles Area

Region 5 - July 1993: Central Valley

Region 6 - June 1993: Lahontan Area

Region 7 - April 1993: Colorado River Basin

Region 8 - July 1993: Santa Ana Area

Region 9 - June 1993: Greater San Diego Area

The California State Water Resources Control Board, in cooperation with the Office of Emergency Services, compiles lists of all leaks of hazardous substances from underground storage tanks in the State of California pursuant to Section 25295 (b) of the Health and Safety Code. The nine regional boards maintain information on all reported leak cases within their jurisdiction, both for those where the regional board and where other local agencies take the lead in overseeing investigations and remedial actions. The California Environmental Protection Agency's Department of Hazardous Materials Data Management collects the nine regional lists and publishes them as one database named LUSTIS.
Status codes for some regions are not available directly from the nine boards. For those regions VISTA supplements the region's status codes with state LUSTIS status codes. Information from LUSTIS is placed in parentheses and has been updated to May, 1993.

MAP ID NO.	FACILITY	STREET	CITY	ZIP	SUBSTANCE*	GALLONS LOST	CASE TYPE*	STATUS*	REMEDIAL ACTION CODE*
2	PETERSON PROPERTY	1083 98TH AVE	OAKLAND	N/A	(8006619)		(S)	(O)	(NT)
3	ANGELO PARDISO	1031 98TH AVE	OAKLAND	N/A	(8006619)		(S)	(O)	(NT)
3	PIONEER PACKING	1025 98TH AVE	OAKLAND	N/A	(12034)		(S)	(O)	(ET)
5	BERETTA PROPERTY	9838 GOULD ST.	OAKLAND	N/A	(8006619)		(S)	(3A)	(NT)
8	MELROSE METAL FINISHING INC	10222 PEARMAIN ST	OAKLAND	N/A	(8006619)		(S)	(3A)	(NT)
9	WELLS FARGO BANK	9999 SAN LEANDRO ST	OAKLAND	N/A	(8006619)		(S)	(O)	(NT)
11	FLEISCHMANNS YEAST INC	921 98TH AVE	OAKLAND	N/A	(12034)		(G)	(5C)	(NT)
12	CITY OF OAKLAND	9801 SAN LEANDRO ST	OAKLAND	N/A	(12036)		(G)	(3B)	(NT)
15	ABDO ALLEN CO	718 DOUGLAS AVE	OAKLAND	N/A	(12034)		(S)	(O)	(NT)
16	LIDELL IRON CRAFT	1000 90TH AVE	OAKLAND	N/A	(8006619)		(S)	(O)	(NT)

* See "Key to Terms" on last page of report for definition

LUST continued...

MAP ID NO.	FACILITY	STREET	CITY	ZIP	SUBSTANCE	GALLONS LOST	CASE TYPE*	STATUS*	REMEDIAL ACTION CODE*
18	CITY OF OAKLAND	98TH ST & EDES AVE	OAKLAND	N/A	(12034)		(G)	(3B)	(ED)
18	CITY OF OAKLAND	816 98TH AVE	OAKLAND	N/A	(12034)		(G)	(3B)	(ED)
19	LANAIDOR	925 89TH AVE	OAKLAND	N/A	(8006619)		(S)	(5C)	(NT)
20	N/A	1670 98TH AVE	OAKLAND	N/A	(8006619)		(S)	(0)	(NT)
21	GERBER PRODUCT CO.	9401 SAN LEANDRO ST	OAKLAND	N/A	(12034)		(G)	(3B)	(NT)
24	QUIKRETE	9315 SAN LEANDRO ST	OAKLAND	N/A	(12034)		(S)	(0)	(NT)
25	PACIFIC RAILWAY	92ND & SAN LEANDRO S	OAKLAND	N/A	(12034)		(S)	(0)	(NT)
26	AMERICAN TRACTOR	9131 SAN LEANDRO ST	OAKLAND	N/A	(8006619)		(S)	(5C)	(NT)
27	ALAMEDA CHEMICAL COMPANY	9029 SAN LEANDRO ST	OAKLAND	N/A	(12036)		(S)	(0)	(NT)
28	LOCKUP SELF STORAGE	8855 SAN LEANDRO ST	OAKLAND	N/A	(12034)		(G)	(0)	(NT)

* See "Key to Terms" on last page of report for definition

KEY TO TERMS/ABBREVIATIONS USED IN THIS REPORT:

N/A: An entry having "N/A" in a field indicates no information is available at this time.

CERCLIS:

* *EVENT TYPE* - Evaluation and disposition information:

AR = Administrative Record
AS = Aerial Survey
CO = Combined RI/SI
CR = Remedial Community Relations
CT = Community Relations Technical Assistance
DA = Design Assistance
DS = Discovery
ED = Endangerment Assessment
EO = EDD
ER = Expedited Response Action
ES = Expanded Site Inspection
EV = Evacuation State/Local
FM = Forward Planning/Management Assistance
FP = Forward Planning Activity
(for Historical Purposes only)
FS = Feasibility Study
(Primarily for Historical Purposes)
GS = Geophysical Support/Mapping
HA = Health Assessment
HR = Final Hazard Ranking Determined
IM = Initial Remedial Measure
IR = Immediate Removal
LA = Long-Term Response
LR = Long-Term Response
MA = Management Assistance
NA = NAA
ND = NPL Deletion Process
NF = Final Listing on NPL
NP = Proposal to NPL
NR = Removed from Proposed NPL
OH = Other Event
OM = Operations and Maintenance
OS = Oversight of State by Fund
PA = Preliminary Assessment
PD = Public Comments on Deletion Package
PR = Planned Removal
RA = Remedial Action
RC = Removal Community Relations
RD = Remedial Design
RI = Remedial Investigation
(Primarily for Historical Purposes)
RM = RAMP -- Remedial Action Master Plan
(for Historical Purposes only)
RO = ROD
RS = Removal Investigation
RV = Removal Action
SE = Site Access
SI = Site Inspection
TA = Technical Assistance
TG = Community Relations Technical Assistance
TO = Topographical Mapping
TR = Temporary Relocation
UR = Underground Storage Tank Removal
WP = RI/FS Workplan Approved by HQ
Z_ = (For Internal Office Use only)

* *EVENT QUALIFIER* - Actual or anticipated actions and priorities:

C = Clean up.
D = Deferred.
E = Administrative record compilation / remedial event.
G = Recommended for HRS scoring.
H = Higher priority.
L = Lower priority.
M = Medium priority.
N = No further remedial action planned.
S = Stabilization.
U = Unknown.
V = Administrative record compilation / removal event.

* *REGIONAL UTILITY DESCRIPTION* - Provides information developed by U.S. EPA's regional office about the nature of contamination at a specific site.

NPL:

* *SITE DESCRIPTION* - Provides a brief explanation of the contaminants and circumstances of a particular site.

CAL-SITES (ASPIS)

The information presented in this report is updated to July, 1993.

Developed under Section 25359.6 of the Health and Safety Code, the California EPA Toxic Substance Control Program (TSCP) maintains a listing of potential and known hazardous waste sites. TSCP staff have interviewed officials from county health agencies, local fire departments, county agricultural commissioners, and other local agencies that could reasonably be expected to have information regarding potential waste sites. The Regional Water Quality Control Boards, Department of Fish and Game and other state environmental regulatory agencies' TSCP staffs also review historical land use data sources to generate lists of potentially contaminated sites.

This database was formerly known as the Abandoned Site Program Information System, but was integrated into the CAL-SITES database in 1991. Information concerning most of these sites should be considered preliminary although most confirmed sites from this database are merged into the AWP once they have been hazard ranked. This database currently contains more than 26,000 sites in the State of California.

MAP ID NO.	FACILITY NAME	LOCATION	CITY	ZIP	FACILITY NO.	STATUS CODE*
4	CHEMICALS & SUPPLIES	751 105TH AVENUE	OAKLAND	94603	01280031	NFA
8	GOLDEN GATE DIE CASTING	10201 PEARMAIN STREET	OAKLAND	94603	01330007	NFA
10	CUSTOM COATINGS COMPANY	10441 EDES AVENUE	OAKLAND	94603	01170026	NFA
13	MILLER MACHINE COMPANY	9929 PEARMAIN STREET	OAKLAND	94603	01340050	NFA
14	ACTION PLATING (2W)	10132 EDES AVENUE	OAKLAND	94603	01340116	CNTY
23	PACO PUMPS	845 92ND AVENUE	OAKLAND	94603	01350116	PEARL
25	BALTIMORE AIR COIL COMPANY	9201 SAN LEANDRO BOULEVARD	OAKLAND	94603	01350111	SSR

* See "Key to Terms" on last page of report for definition

HAZARDOUS WASTE INFORMATION SYSTEMS (HWIS)

The information presented in this report is updated to December, 1992.

The California Department of Health Services, Toxic Substances Control Division, has developed and maintained lists of hazardous waste generators and hazardous waste treatment storage and disposal facilities in the State of California, pursuant to the Hazardous Waste Control Law (Health and Safety Code Section 25100 et seq.), and the Hazardous Waste Management Act of 1976 (Health and Safety Code Section 25179.1 et seq). In addition, this law requires all counties to prepare and submit hazardous waste management plans. To assist the counties,the Toxic Substances Control Division maintains lists containing generation and disposal data within each county. This information has been assembled by the Toxic Substances Control Division from manifest reports required from hazardous waste generators. This database currently lists over 20,000 sites in the state of California.

MAP ID NO.	EPA NO.	FACILITY NAME	ADDRESS	CITY	GEN/TSD*
1	CAD049087547	EAST BAY BODY & FENDER	1101 98TH AVENUE	OAKLAND	GEN
4	CAD981687015	HOLCHEM INC	751 105TH AVE	OAKLAND	GEN
6	CAL000040618	HTI TANK WASH	9957 MEDFORD AVE BLDG 11	OAKLAND	GEN
7	CAD066568130	K & L PLATING & MANUFACTURING	10306 PEARMAIN ST	OAKLAND	GEN
8	CAD981991714	MELROSE METAL FINISHING	10222 PEARMAIN ST	OAKLAND	GEN
11	CAD981572373	FLEISCHMANN YEAST INC	921 98TH AVE	OAKLAND	GEN
11	CAD981632615	NABISCO BRANDS INC	921 98TH AVE	OAKLAND	GEN
17	CAD056197809	PACIFIC PUMPING COMPANY	945 92ND AVENUE	OAKLAND	GEN
23	CAL000031115	CHIPMAN CORP MAINT DEPT	850 92ND AVE	OAKLAND	GEN
25	CAD088772629	PACIFIC PUMPING COMPANY	9201 SAN LEANDRO ST.	OAKLAND	GEN
27	CAD981452261	ALAMEDA CHEMICAL & SCIENTIFIC	9029 SAN LEANDRO ST	OAKLAND	GEN

* See "Key to Terms" on last page of report for definition

HAZARDOUS WASTE AND SUBSTANCES SITES LIST
CORTESE

The information presented in this report is updated to November, 1992.

The California Environmental Protection Agency (Cal-EPA) publishes a compilation of sites throughout the State of California. Under Government Code Section 65962.5, these sites are submitted to the Cal-EPA by the State Water Resources Control Board, the Integrated Waste Management Board, and the Department of Toxic Substances Control. The sites are extracted from the following databases:

A1025	Regulated Air Emissions at 10-25 tons/day.	IUR	Inventory Update Rule (Chemical Manufacturers)
AGT25	Regulated Air Emissions greater than 25 tons/day.	LTANK	Leaking Tank
ASPIS	Abandoned Sites Program Information System (included in CALSITES)	S1987 - S1990	California TRIS
DTSCD	Department of Toxic Substance Control Docket	SWRCB	State Water Resources Control Board
FINDS	Facility Index System	UTANK	Underground Tank
HWIS	Hazardous Waste Information System	WB-LF	Waste Board - Leaking Facility (site has known migration)
		WDSE	Waste Discharge System - Enforcement Action

MAP ID NO.	SITE	LOCATION	CITY	ZIP	DATABASE	AGENCY ID
3	PACIFIC BELL	1031 98TH AVE	OAKLAND	N/A	LTANK	N/A
3	PIONEER PACKING	1025 98TH AVE	OAKLAND	94603	LTANK	N/A
5	BERETTA PROPERTY	9838 GOULD ST	OAKLAND	94612	LTANK	N/A
8	MELROSE METAL FINISHING INC	10222 PEARMAIN ST	OAKLAND	94603	LTANK	N/A
8	MELROSE METAL FINISHING	10222 PEARMAIN ST	OAKLAND	94603	FINDS	CAD981991714
8	MELROSE METAL FINISHING	10222 PEARMAIN ST	OAKLAND	94603	HWIS	CAD981991714
9	WELLS FARGO BANK	9999 SAN LEANDRO ST	OAKLAND	94105	LTANK	N/A
11	FLEISCHMANNS YEAST INC	921 98TH AVE	OAKLAND	N/A	LTANK	N/A
11	FLEISCHMANN'S YEAST INC.	921 98TH AVE	OAKLAND	N/A	S1987	10306
11	FLEISCHMANN'S YEAST INC.	921 98TH AVE	OAKLAND	N/A	S1990	10306
11	FLEISCHMANN'S YEAST INC.	921 98TH AVE	OAKLAND	00000	S1988	10306
11	FLEISCHMANN'S YEAST INC.	921 98TH AVE	OAKLAND	00000	S1989	10306
11	NABISCO BRANDS INC.	921 98TH AVE	OAKLAND	N/A	S1989	10429
11	NABISCO BRANDS INC.	921 98TH AVE	OAKLAND	00000	S1987	10429
11	NABISCO BRANDS INC.	921 98TH AVE	OAKLAND	00000	S1988	10429
11	NABISCO BRANDS INC.	921 98TH AVE	OAKLAND	00000	S1990	10429

MAP ID NO.	SITE	LOCATION	CITY	ZIP	DATABASE	AGENCY ID
11	FLEISCHMANN YEAST COMPANY	921 98TH AVE	OAKLAND	N/A	A1025	2300
11	FLEISCHMANN YEAST INC	921 98TH AVE	OAKLAND	N/A	HWIS	CAD981572373
11	NABISCO BRANDS INC	921 98TH AVE	OAKLAND	N/A	HWIS	CAD981632615
11	NABISCO BRANDS INC.	921 98TH AVE	OAKLAND	N/A	HWIS	CAX000048504
12	CITY OF OAKLAND	9801 SAN LEANDRO	OAKLAND	94612	LTANK	N/A
12	THRIFTY OIL STN. #061	9801 SAN LEANDRO	OAKLAND	94612	UTANK	4709
16	LIDELL IRON CRAFT	1000 90TH AVE	OAKLAND	94603	LTANK	N/A
18	CITY OF OAKLAND	816 98TH AVE	OAKLAND	94612	LTANK	N/A
19	LANAIDOR	925 89TH AVE	OAKLAND	94621	LTANK	N/A
20	N/A	670 98TH AVE	OAKLAND	94603	LTANK	N/A
20	UNOCAL SVC STA #2720	670 98TH AVE	OAKLAND	94603	HWIS	CAD982054124
21	OAKLAND PLANT	9401 SAN LEANDRO BLVD	OAKLAND	94604	UTANK	29751
22	GERBER PRODUCT CO.	9401 SAN LEANDRO BLVD	OAKLAND	94604	LTANK	N/A
22	GERBER PROD CO	9401 SAN LEANDRO BLVD	OAKLAND	94604	FINDS	CAD009196502
23	PACO PUMPS	845 92ND AVE	OAKLAND	N/A	ASPIS	01350116
23	PACIFIC PUMPING CO ADMIN OFFIC	845 92ND AVE	OAKLAND	N/A	FINDS	CAD056197809
23	PACO PUMPS INC	845 92ND AVE	OAKLAND	N/A	HWIS	CAL000021790
24	QUIKRETE	9315 SAN LEANDRO ST	OAKLAND	94803	LTANK	N/A
24	QUIKRETE NORTHERN CALIFORNIA	9315 SAN LEANDRO ST	OAKLAND	94803	UTANK	11081
24	NPD-SAN LEANDRO STREET PLANT	9315 SAN LEANDRO ST	OAKLAND	94803	SWRCB	2 019139001
24	WDR-COYOTE HILLS REG PARK	9315 SAN LEANDRO ST	OAKLAND	94803	SWRCB	2 019139001
24	SAKCRETE OF CAL	9315 SAN LEANDRO ST	OAKLAND	94803	HWIS	CAD982007437
24	SAKCRETE OF CALIF	9315 SAN LEANDRO ST	OAKLAND	94803	FINDS	CAD982007437
26	AMERICAN TRACTOR	9131 SAN LEANDRO ST	OAKLAND	94603	LTANK	N/A

CORTESE continued...

MAP ID NO.	SITE	LOCATION	CITY	ZIP	DATABASE	AGENCY ID
27	ALAMEDA CHEMICAL COMPANY	9029 SAN LEANDRO	OAKLAND	94603	LTANK	N/A
27	ALAMEDA CHEM & SCIENTIFIC	9029 SAN LEANDRO	OAKLAND	94603	HWIS	CAX000224055

CERCLIS

The information presented in this report is updated to June, 1993.

Since 1982, U.S. EPA has developed and maintained lists of contaminated properties under the federal Superfund program pursuant to the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C. Section 9601 (1985). U.S. EPA discovers these sites from citizen reports, routine inspection of hazardous waste generators, treatment, storage and disposal facilities, and reporting requirements.

MAP ID NO.	SITE NAME STREET ADDRESS, CITY and ZIP	EVENT* TYPES	EPA ID, REGIONAL UTILITY DESCRIPTION*
14	ACTION PLATING 10132 EDES AVE OAKLAND 94603	RV1	CAD982347676 N/A
25	PACIFIC PUMPING CO MFG SITE 9201 SAN LEANDRO ST OAKLAND 94604	DS1 PA1 SI1 SI2	CAD088772629 OTHER: DISCHARGED LIQUID CHEMICAL WASTE INTO OPEN GROUND ERRIS SITE RCRA REGULATED: GENERATOR (SMALL QUANTITY HANDLER) SEE NOTI SITE INSPECTION REQUIRED MEDIUM PRIORITY

* See key on last page for definition