Western Operations

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Clayton
ENVIRONMENTAL
CONSULTANTS

February 28, 1991

Clayton Project No. 33299.00

Ms. Cynthia Chapman
ALAMEDA COUNTY HEALTH AGENCY
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

Dear Ms. Chapman:

We are sending you the Work Plan for Groundwater Remedial Investigation for the property owned by Harsch Investment Corporation and located at Shore Line Drive and Park Street in Alameda, California.

This plan addresses all the tasks that we feel will be necessary to implement a remediation system at the site. Our client, Harsch, hopes that this will be satisfactory evidence of their intentions to remediate the site, and that a permit to begin construction of the Lyon's restaurant on the former Texaco site can be issued.

Thank you for your assistance; we will be calling you in a couple of days regarding this matter. If you have any questions, please call me at (415) 426-2676 or Ms. Compton at (415) 426-2671.

Sincerely,

Alan D. Gibbs, R.G.
Supervisor, Geology

ADG/lc
Enclosure

cc: Ms. Rose Coughlin, Texaco
Mr. Michael Dosen, Harsch
Mr. Lester Feldman, RWQCB
Mr. Roy Ikeda, Crosby, Heafey, Roach & May
Mr. Murray Stevens, South Shore Carwash

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Clayton
ENVIRONMENTAL
CONSULTANTS

Work Plan for Groundwater Remedial Investigation at Shore Line Drive and Park Street Alameda, California for Harsch Investment Corporation

Clayton Project No. 33299.00
February 28, 1991

PLTF/DEFT Exhibit 16
WIT. DENNIS BYRNE
DATE 11/22/91 EAG
ELYSE R. GARDNER, CSR

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1.0 INTRODUCTION

Clayton Environmental Consultants, Inc. was retained by Harsch Investment Corporation to develop a work plan and schedule for a groundwater remedial investigation at the properties located at 2351 and 2375 Shore Line Drive, northwest of the intersection with Park Street in Alameda, California. The project was authorized by Mr. Michael Dosen, vice president for Harsch.

Parties involved in activities at the site include the following:

Harsch Investment Corporation, owner of subject site
Contact: Mr. Michael Dosen, vice president
235 W. MacArthur Boulevard
Oakland, CA 94611
Phone: (415) 658-1400

Consultant for Harsch:
Clayton Environmental Consultants
Contact: Mr. Alan Gibbs, supervisor, geology group
1252 Quarry Lane
Pleasanton, CA 94566
Phone: (415) 426-2600

Texaco Refining and Marketing, Inc., former tenant
Contact: Ms. Rose Coughlin, project manager
10 Universal Plaza, Suite 724
Universal City, CA 91608-7812
Phone: (818) 505-2719

South Shore Car Wash, tenant
Contact: Mr. Murray Stevens, owner
2351 Shore Line Drive
Alameda, CA 94501
Phone: (415) 523-7866

Consultant for the South Shore Car Wash:
Soil Tech Engineering, Inc.
Contact: Mr. Frank Hamedi, general manager
298 Brokaw Road
Santa Clara, CA 95050
Phone: (408) 496-0265

2.0 BACKGROUND

The following subsections provide information on the results of previous investigations at the site and the site hydrogeology.

2.1 SITE INVESTIGATION

In 1989, Harsch contracted Woodward-Clyde Consultants to conduct a Phase I environmental assessment at the subject site (Figures 1 & 2). This property had previously been leased to the following five tenants:

- Pet hospital
- Dry cleaner/laundromat
- South Shore Car Wash/service station
- Goodyear
- Texaco service station
- Auto repair shop (on the former Texaco site)

All of the structures previously leased to the above tenants have been removed, except for the Goodyear building which was remodeled into a Big 5 sporting goods store.

In the subsequent Phase II site investigation (Woodward-Clyde Project No. 8910116A, 7/18/89), Woodward-Clyde found the following:

1. Shallow groundwater at the former Texaco station had been impacted by petroleum hydrocarbons in the following concentrations: 2,500 ppb TPH as gasoline, 3,800 ppb TPH as diesel, 10,000 ppb benzene, 260 ppb toluene, 2,600 ppb ethylbenzene, and 1,600 ppb xylenes (BTEX was analyzed using EPA Method 8240).

2. Groundwater at the former dry cleaning site had been impacted by 43 ppb TPH as gasoline, 2 ppb benzene, 48 ppb tetrachloroethene (PCE), 26 ppb 1,2-dichloroethene (1,2-DCE), and 160 ppb trichloroethene (TCE).

3. Shallow soils (less than 5 feet bgs) under the former Goodyear building had been impacted by oil and grease in concentrations ranging from 30 to 340 parts per million (ppm).

In November 1989, soils at the former dry cleaning site were contaminated by a release of 10 to 50 gallons of dry cleaning fluid that was spilled when the aboveground storage tank was perforated during removal in November 1989. Soils were excavated by Woodward-Clyde on November 22, 1989 and stockpiled on the former Texaco site (Woodward-Clyde Project No. 8910116A, 6/8/90).

Clayton conducted further soil and groundwater investigation at the Texaco site (Clayton Project No. 29196.00) and the dry cleaning site (Clayton Project No. 30493.00) and discovered the following:

1. The concentration of total recoverable hydrocarbons in a soil sample from borehole MW-5 was 160 ppm. Based on the fact that concentrations of gasoline and diesel were both below detectable levels, this concentration is probably due to hydrocarbon oil and grease. This exceeds the RWQCB's "Recommendations for the Evaluation and Investigation of Underground Storage Tanks" level of 100 ppm.

2. Concentrations of 2,100 ppb benzene and 820 ppb ethylbenzene in groundwater samples from MW-5 exceed the State of California maximum contaminant level (MCL) for drinking water standard of 1 part per billion (ppb) and 680 ppb, respectively. 100 ppb toluene in groundwater from MW-5 is equal to the State of California Department of Health Services (CA DHS) regulatory levels of 100 ppb for water quality goals for human health and welfare.

3. A PCE concentration of 20 ppb was detected in groundwater from MW-1. This concentration exceeds the California MCL for drinking water standard for PCE of 5 ppb. A PCE concentration of 0.7 ppb was detected in groundwater from MW-9.

4. Of seven soil samples collected by Clayton from the former dry cleaning site, one had a PCE concentration of 0.07 ppm. PCE was not detected in the other soil samples. Clayton did not recommend any further investigation or remediation of the soil at this site.

5. Groundwater samples collected from the former dry cleaning site in November 1990 revealed concentrations of 1,900 ppb of PCE, 520 ppb of TCE, and 440 ppb of 1,2-DCE in monitoring well MW-7. The downgradient well on this site, MW-8, had concentrations of 1.2 ppb of 1,2-DCE, 3.0 ppb of TCE, and 0.9 ppb of PCE. The levels detected in MW-7 exceed the California MCLs of 5 ppb for PCE, 5 ppb for TCE, and 6 ppb for 1,2-DCE. The levels detected in MW-8 are below the MCLs.

In addition to the studies described above, the underground storage tanks at the South Shore Car Wash/Chevron service station were removed on July 12, 1990 by Zacor Corporation. Soil sampling was conducted by Environmental Bio-System, Inc. Soil in the vicinity of the USTs showed concentrations of gasoline ranging from 360 to 9,500 ppm. High levels of BTEX were also revealed.

ACHA has requested a preliminary soil/groundwater investigation, which is in progress. This study is being undertaken by Soil Tech Engineering.

2.2 HYDROGEOLOGY

The site is underlain by dredged fill put in place in the 1950's by Utah International. The medium-grained sand fill material overlies "bay mud", the native sandy clays. While drilling wells MW-1 through MW-5 on the former Texaco site, we generally encountered the bay mud at 14 feet below ground surface (bgs)(Clayton Project No. 29196.00).

Depth to groundwater ranges from 5 to 7 feet bgs. Well elevations for MW-1 through MW-9 were surveyed to datum sea level by Tronoff & Associates, a licensed land surveyor. From the well elevation data, groundwater flow direction was calculated to be S5°E, or almost directly south. The groundwater gradient on the site ranges from 0.1 to 0.6 feet of elevation drop per 100 feet horizontal distance. Groundwater flow direction and gradient may vary locally due to the non-homogeneous nature of the fill material used at the site.

3.0 PURPOSE

Harsch owns the subject site and is in the process of redeveloping it. It is Clayton's understanding that the Alameda County Health Agency (ACHA) will not issue a permit to redevelop the property without assurance that the groundwater at the site will be remediated. This work plan is intended to satisfy ACHA's concerns that groundwater at the subject site will be remediated in a proper and timely manner, thereby expediting permit approval for the construction of a Lyon's Restaurant on the former Texaco site.

4.0 SCOPE OF WORK

This work plan addresses the issues discussed with ACHA and the Regional Water Quality Control Board (RWQCB) in the meeting held on December 19, 1991. The meeting was attended by:

Name	Affiliation
1. Mr. Alan D. Gibbs	Clayton Environmental Consultants, Inc.
2. Ms. Julie Menack	McLaren Hart
3. Ms. Rose Coughlin	Texaco Environmental Services
4. Ms. Cynthia Chapman	ACHA
5. Mr. Lester Feldman	RWQCB - San Francisco Bay Region
6. Mr. Richard Hyatt	RWQCB

The discussion covered ongoing groundwater monitoring, definition of the plume of contamination, aquifer characterization, groundwater remedial options, and a schedule for accomplishing these activities.

This work plan addresses the following tasks:

Task 1: (A) Installation of 3 monitoring wells on the South Shore Car Wash by Soil Tech Engineering.
(B) Installation of two monitoring wells by Clayton Environmental Consultants: one downgradient of the former Texaco station, and a 4-inch well drilled until clay is intersected that will replace monitoring well MW-8.
Reports and remedial plans at the site will include results of work conducted at the South Shore Car Wash by other consultants, as well as all other work conducted on the property.
Task 2: Proper abandonment of monitoring well MW-6
Task 3: Tidal influence study
Task 4: Investigation of underground utility trenches
Task 5: Survey of all wells within 1/2-mile radius of the subject site
Task 6: Monthly groundwater monitoring of monitoring well MW-8B
Task 7: Quarterly groundwater monitoring of all wells onsite
Task 8: Pump test
Task 9: Feasibility Study
Task 10: Remedial Action Plan
Task 11: Implementation of the Remedial Action Plan

A schedule for implementation of the tasks listed above is included as Section 11.0 of this report.

5.0 ADDITIONAL GROUNDWATER INVESTIGATION

The vertical and lateral extent of petroleum hydrocarbons or purgeable halocarbons at the former Texaco station, former dry cleaners, former Goodyear site, and the South Shore Car Wash/service station have not yet been defined. This section describes the tasks necessary to further define the extent of groundwater contamination.

5.1 MONITORING WELL INSTALLATION (Task 1)

As requested by ACHA, three groundwater monitoring wells will be installed on the South Shore Car Wash property to begin to define the extent of soils and groundwater affected by petroleum hydrocarbons. The work is being conducted by Soil Tech Engineering, consultant for the South Shore Car Wash. This work is in progress and should be completed by March 1991. Results of this study will be shared with Harsch and will be taken into account when designing remediation systems.

The RWQCB has requested installation of additional monitoring wells to further define the lateral and vertical extent of groundwater contamination at the site.

Clayton proposes to install one 4-inch monitoring well downgradient of the former Texaco Station near the sidewalk across Shore Line Drive (Figure 2). This well will be anchored in clay. One soil sample will be collected from the borehole at approximately 5 feet bgs.

Clayton also proposes to redrill monitoring well MW-8. This well will be converted to a 4-inch well that is also anchored in clay, to monitor the halocarbons which may sink in the aquifer. Because subsurface soils have been disturbed by the existing well and are not representative, we will not collect a soil sample from this borehole.

If purgeable halocarbons are detected in the new MW-8B, ACHA may require an additional well downgradient of the former dry cleaning site to define the lateral extent of migration.

Appropriate permits will be acquired before beginning work. The site-specific health and safety plan previously written for the site will be updated to address health and safety issues that may be encountered during the implementation of these tasks.

All drilling, soil sampling, monitoring well construction, development, and water sampling will be performed in accordance with Clayton's Drilling, Well Construction, and Sampling Protocols for Borehole/Monitoring Well Installation, which are contained in Appendix A.

A report will be submitted to the ACHA and the RWQCB which conforms to Chapter 8 of the Alameda County Water District Groundwater Monitoring Guidelines, February 1990 revision.

5.2 ABANDONMENT OF MONITORING WELL MW-6 (Task 2)

Monitoring well MW-6 was installed by Woodward-Clyde on June 8, 1989, on the former Texaco site. This well was accidently destroyed during subsequent activities onsite. Clayton proposes to properly abandon this well by overdrilling it and filling the borehole with grout. The proper permits will be obtained for these activities.

5.3 GROUNDWATER FLOW DIRECTION AND GRADIENT

The additional monitoring wells will be mapped by a licensed surveyor and tied into the existing map of monitoring well locations (Figure 3). From this data and measurement of groundwater elevations, we will be able to further define groundwater flow direction and gradient at the site.

5.4 TIDAL INFLUENCE STUDY (Task 3)

The subject site is approximately 200 feet from the San Francisco Bay. Before the hydraulic properties of the aquifer can be defined, it is necessary to determine if groundwater beneath the site is influenced by the tide. On the recommendation of ACHA and the RWQCB, Clayton proposes to conduct a 12-hour tidal influence study.

5.5 IDENTIFICATION OF UNDERGROUND UTILITY TRENCHES (Task 4)

Clayton proposes to investigate the possibility that underground utility trenches, such as sewer lines and storm drains, may act as conduits along which petroleum hydrocarbons or purgeable halocarbons may migrate. A sanitary sewer line runs along the north side of the former Texaco site. It was suggested during meeting on December 19, 1990 that this sewer line trench, although shallow, may have diverted petroleum hydrocarbons migrating from the South Shore Car Wash or the former Goodyear building (now Big 5). Clayton proposes to:

- Contact the City of Alameda and East Bay Municipal Utility District for locations of underground storm drains, water lines, and sewer lines, which may exist beneath the site and adjacent streets.
- Contact South Shore Car Wash to determine the location of the access lines to the former sumps on that parcel.

5.6 1/2-MILE RADIUS WELL SURVEY (Task 5)

Clayton proposes to conduct a survey of all wells that are permitted and for which files are available within a 1/2-mile radius of the subject site. This survey will include locations, uses, depths, diameters, and screened intervals of all wells. This information is important to understand how a remediation system may affect the area around the subject site and vice versa.

6.0 GROUNDWATER MONITORING

once the additional wells are in place, Clayton proposes an initial sampling of all wells onsite for all the suspect constituents to establish a baseline. This baseline study would include the following analyses:

- EPA Method 5030/8015-8020 for gasoline and the volatile hydrocarbons benzene, toluene, ethylbenzene, and xylenes (BTEX)
- EPA Method 3510/8015 for diesel fuel
- Standard Method 503E for total petroleum hydrocarbons
- EPA Method 601/8010 for purgeable halocarbons

Following the baseline study, we would continue to analyze groundwater from individual wells only for those constituents that were recognized initially. Clayton projects the following groundwater monitoring scenario.

6.1 MONTHLY GROUNDWATER MONITORING OF MW-8B (Task 6)

Clayton proposes monthly groundwater monitoring of MW-8B as requested by ACHA and the RWQCB (Figure 2). This well is downgradient of the former dry cleaning site and monitoring will give a good indication of whether purgeable halocarbons from the dry cleaning site have migrated in the groundwater. Groundwater samples from MW-8B will be analyzed by Environmental Protection Agency (EPA) Method 601 for purgeable halocarbons.

6.2 QUARTERLY GROUNDWATER MONITORING OF ALL WELLS (Task 7)

In addition to the monthly monitoring of MW-8B, Clayton proposes to monitor all of the wells onsite on a quarterly basis to include groundwater flow direction and gradient. The minimum laboratory analyses for samples from each monitoring well are listed below. Please see Figure 2 for the locations of the wells.

6.2.1 Monitoring Wells MW-1, MW-2, MW-3, MW-4, MW-5, and MW-9

- EPA Method 5030/8015-8020 for gasoline and the volatile hydrocarbons benzene, toluene, ethylbenzene, and xylenes (BTEX)
- EPA Method 3510/8015 for diesel fuel
- Standard Method 503E for total petroleum hydrocarbons

6.2.2 Monitoring Wells MW-7 and MW-8B

- EPA Method 601 for purgeable halocarbons

6.2.3 Monitoring Wells MW-10, MW-11, and MW-12 (to be installed by South Shore Car Wash in February 1991)

- EPA Method 5030/8015-8020 for gasoline and BTEX
- EPA Method 3510/8015 for diesel fuel

These wells will be installed by Soil Tech Engineering on behalf of the South Shore Car Wash. Results from analyses will be shared with Harsch and will be taken under consideration in future remediation plans at the site.

7.0 AQUIFER HYDRAULIC CHARACTERIZATION

Before an effective groundwater remediation system can be designed and installed, the hydraulic properties of the water-bearing formation beneath the site must be defined. When certain hydraulic properties of an aquifer, such as hydraulic conductivity, transmissivity, storativity, groundwater velocity, and porosity, are defined, we can usually predict (1) drawdown (capture zone) in the aquifer at various distances from the extraction well, (2) how multiple wells in a small area will affect one another, and (3) drawdown in the aquifer at various pumping rates.

This section describes the procedures for the dynamic pumping test that should be conducted at the site.

7.1 STEP PUMP TEST (Task 8, Phase 1)

When pumping from an aquifer, there is an optimum pumping rate that will achieve a maximum drawdown of the aquifer. This maximum drawdown of the water table defines the maximum capture zone that can be achieved. When the optimum pumping rate is reached, groundwater is being pumped from the largest area possible without drying out the extraction well.

Because the actual pump test must run continuously at a constant pumping rate, the most efficient pumping rate must be determined before beginning the pump test. Therefore, before beginning the actual pump test, Clayton will conduct a variable rate well performance test (step test). During the step test we pump at different rates to identify the optimum pumping rate that we will use in the actual pump test.

We will conduct the step pump test with a submersible electric pump. The pump discharge rate will be controlled with a globe valve and monitored with a flow meter. Monitoring well MW-5 will be used as the extraction well. Drawdown in the other monitoring wells onsite will be measured by hand with electric water level meters. Water will be pumped from the well into a temporary portable storage tank and stored onsite. This water will either be processed through the treatment system or discharged to the sewer or storm drain. All appropriate permits will be acquired for the disposal method chosen.

We estimate that an initial pumping rate of 2 to 5 gallons per minute (gpm) will be established. We estimate this rate based on the groundwater purging data collected during well development and sampling. The flow rate will be adjusted based on actual drawdown measurements in the extraction well. The extraction well will be allowed to fully recharge before beginning a new pumping rate.

7.2 PUMP TEST (Task 8, Phase 2)

Before commencing the actual pump test, the static water levels in all of the wells will be measured with an electric water level meter. This will enable Clayton to calibrate drawdown and evaluate capture radius from the extraction well.

We will set up the electric submersible pump in extraction well MW-5. To monitor the drawdown, submersible pressure transducers will be installed in four of the observation wells onsite during the pump test. The transducers will be connected to a HERMIT 2000 Environmental Data Logger. The data logger will continuously record water elevations for drawdown calculation in the four observation wells. A logarithmic time cycle will be used to extrapolate long-term pumping.

A pump test typically runs 24 to 72 hours, depending on the nature of the subsurface conditions. Ideally, the pump test should be run until an equilibrium state is achieved. We will run the pump test for a minimum of 12 hours, or for 3 hours after maximum steady state is achieved. To verify the information recorded by the data logger, water levels in the monitoring wells will be checked occasionally by hand with the electric water level meter.

Clayton will conduct a recovery test immediately after completing the pump test. This test monitors the groundwater recovery of the aquifer in the extraction well and the observation wells. Groundwater levels are monitored in these wells until the water-bearing zone returns to equilibrium condition. The recovery test functions as a quality control measure for the pump test since all the hydraulic properties calculated from pump test data can also be back-calculated from the recovery test data.

If the subsurface investigation now in progress at the South Shore Car Wash reveals groundwater contamination that requires remediation, an additional pump test may be required in one of the wells on that site.

7.3 PUMP TEST DATA ANALYSIS (Task 8, Phase 3)

Water levels (drawdown) versus elapsed time will be plotted for the test period. The Cooper-Jacob straight-line method will be used to calculate the transmissivity. A computer will be used to calculate the aquifer transmissivity, which will be expressed as ft^2/minute. Transmissivity (T) is defined as the volumetric flow rate though a unit width of aquifer under a unit hydraulic gradient, or, how much water will move through the formation over a unit period of time.

The hydraulic conductivity will be determined, based on the transmissivity and the thickness of the zone of saturation, using the equation:

$$K = T/b$$

where: K = hydraulic conductivity in feet per day
T = coefficient of transmissivity, in gallons/day/ft
b = thickness of saturated zone in feet

The storativity (S) of the aquifer will be calculated from the time vs. drawdown plot, by using the zero-drawdown intercept of the straight line as one of the terms in the following equation:

$$S = \frac{0.3(T)(t_0)}{r^2}$$

where: S = storage coefficient
T = coefficient of transmissivity, in gallons/day/ft
t_0 = intercept of the straight line at zero drawdown, in days
r = distance, in feet, from the pumped well to the observation well where the drawdown measurements were made

The groundwater velocity at the site can then be estimated using the following equation:

$$\text{average velocity} = \frac{\text{hydraulic conductivity x gradient}}{\text{total porosity}}$$

The pump test data will allow us to extrapolate the radius of influence of the extraction well over time when using the optimum pumping rate. The extraction well's radius of influence is directly proportional to the capture zone. This means that any contaminants dissolved in the groundwater within this radius of influence will eventually flow toward the extraction well.

We will obtain the appropriate permits before implementing this phase of the study. The site-specific health and safety plan previously written for the site will be updated to address health and safety issues that may be encountered during the implementation of these tasks.

After finishing the pump test, a report detailing methodology, results, and recommendations will be submitted to ACHA and the RWQCB, in accordance with regulatory guidelines.

8.0 FEASIBILITY STUDY (Task 9)

When the pump test is completed and the hydraulic properties of the water-bearing zone underlying the site are more fully defined, a feasibility study (FS) for groundwater remediation will be conducted. This FS will evaluate the effectiveness and costs of possible remedial options. Clayton recommends that the FS include the following possible remedial options:

- Soil remediation using a soil vapor extraction system
- Groundwater pumping (via extraction wells), treatment, and discharge
- Interceptor trenches, groundwater collection, treatment, and discharge
- Biodegradation, enhanced or in situ
- Treatment technologies to include: air stripping, activated carbon, and biodegradation
- An evaluation of discharge options (storm sewer vs. sanitary sewer vs. reinjection of treated water)

In the feasibility study, we will look at the potential for designing a remediation system that will incorporate all portions of the site.

The feasibility study will assess capital and operating costs, permitting, effectiveness to mitigate environmental impact, and the practicality of the selected plan.

We will prepare a report to be submitted to ACHA, RWQCB, and the City of Alameda that will detail the findings of the FS and include our recommendations.

9.0 REMEDIAL ACTION PLAN (Task 10)

When the FS has been reviewed by the appropriate agencies, we will write a Remedial Action Plan (RAP). This report will address the specific tasks involved to implement the remediation system approved in the FS. A schedule of task implementation for remediation efforts will be outlined at that time.

10.0 IMPLEMENTATION OF REMEDIAL ACTION PLAN (Task 11)

Once the RAP has been approved, Clayton will implement the tasks outlined in it.

All the necessary permits for the approved remediation system will be acquired from the RWQCB, ACHA, the Bay Area Air Quality Management District (BAAQMD), and the City of Alameda.

During the remediation process, quarterly reports will be submitted to ACHA, RWQCB, and the City of Alameda detailing work completed to date.

11.0 SCHEDULE FOR THIS REMEDIAL INVESTIGATION WORKPLAN

The implementation of the interim tasks outlined in this workplan will be incorporated into and coordinated with the construction schedule of the Lyon's restaurant. We have attempted to anticipate this in our scheduling of the tasks. Clayton has tentatively scheduled the tasks described in this workplan as follows:

Task		Completion Date
Task 1:	Install one monitoring well downgradient of MW-5 and redrill MW-8	March 1991
Task 2:	Proper abandonment of MW-6	March 1991
Task 3:	Tidal influence study	March 1991
Task 4:	Investigation of underground utilities	March 1991
Task 5:	Survey of wells within 1/2-mile radius	March 1991
Task 6:	Monthly monitoring of MW-8B	To begin March 1991
Task 7:	Quarterly groundwater monitoring of all wells	March 1991
Task 8:	Pump Test	June 1991
Task 9:	Feasibility Study	August 1991
Task 10:	Remedial Action Plan	November 1991
Task 11:	Implementation of the Remedial Action Plan	January 1992

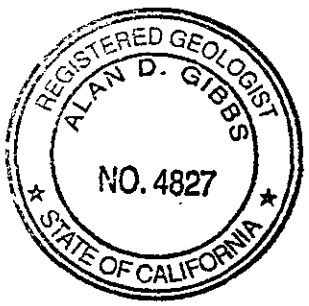
Clayton anticipates that this schedule can be achieved and will make every effort to adhere to it. Delays may arise due to circumstances beyond our control, including, but not limited to, permitting processes, logistical problems, scheduling of subcontractors,

and timely review of reports and work plans. Negotiations with the City of Alameda, ACHA, the RWQCB, and other regulatory agencies, could also impact this schedule. Clayton will present project status updates in quarterly reports to ACHA and the RWQCB.

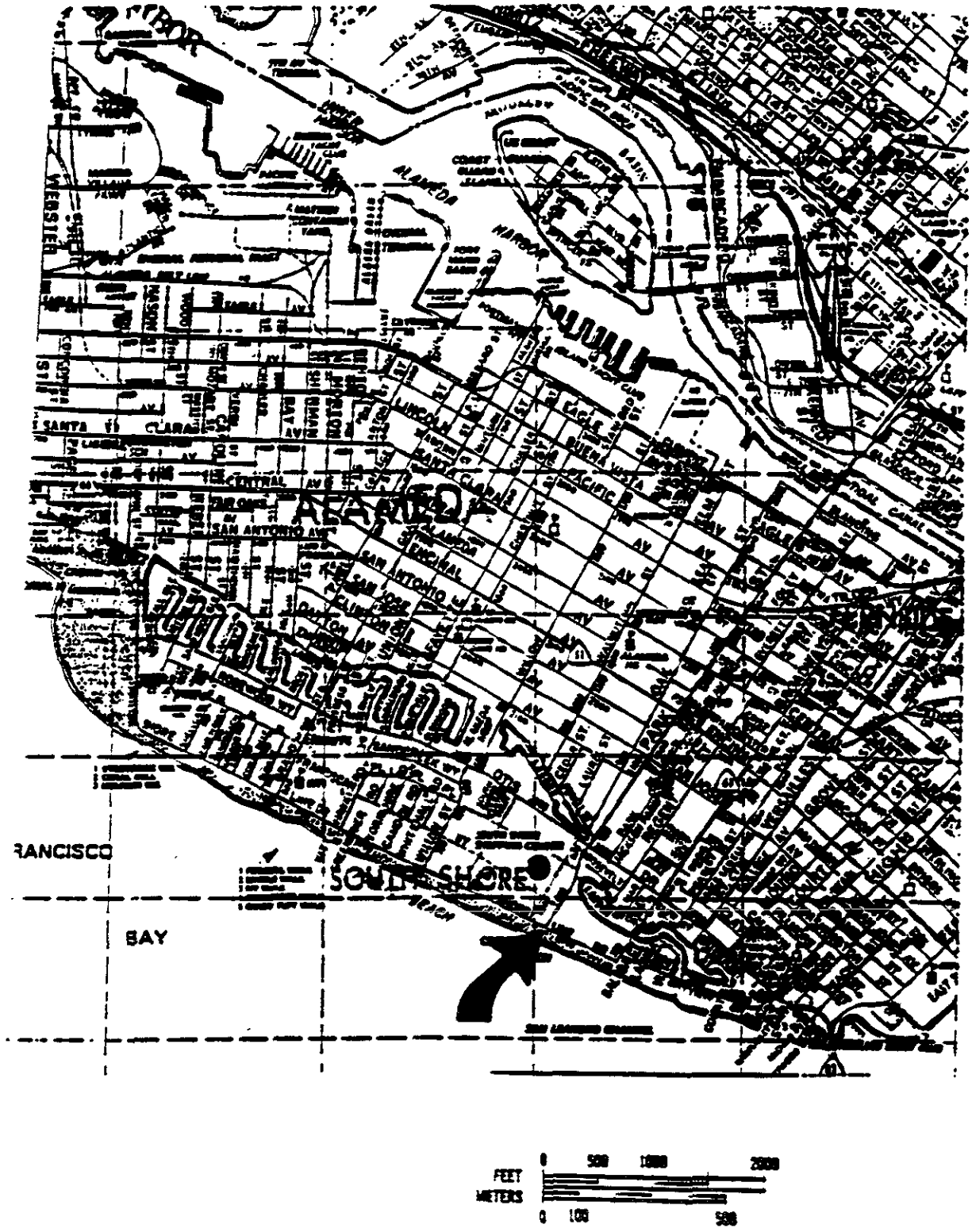
This work plan prepared by: _____
Laurene Compton
Geologist

This work plan reviewed by: _____
Alan D. Gibbs, R.G.
Supervisor, Geology Group

February 28, 1991



FIGURES

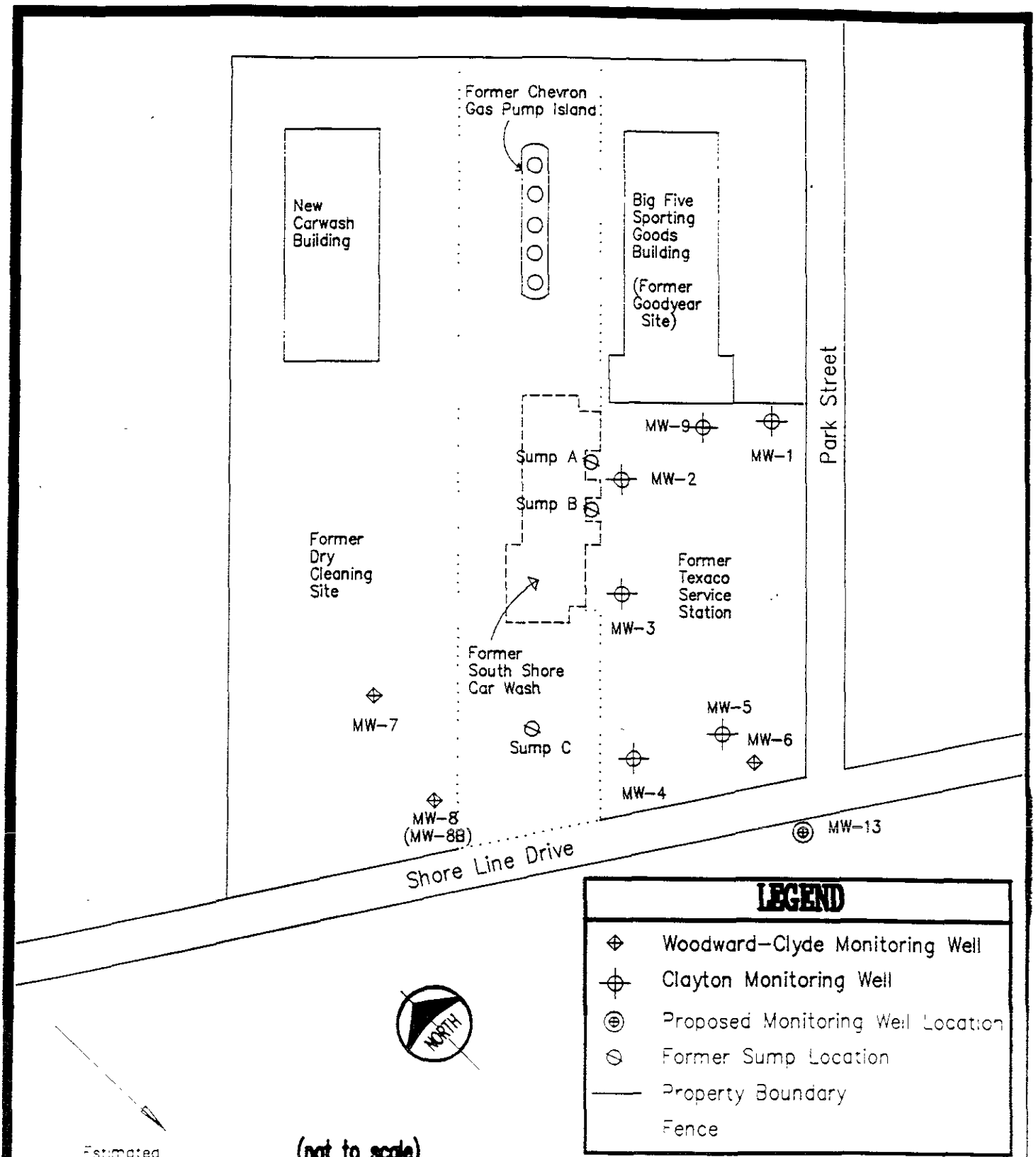


Site Location Map
Harsch Investment Corporation
Park Street and Shore Line Drive
Alameda, California

Clayton Project No. 29196.00

Figure 1

Clayton ENVIRONMENTAL CONSULTANTS

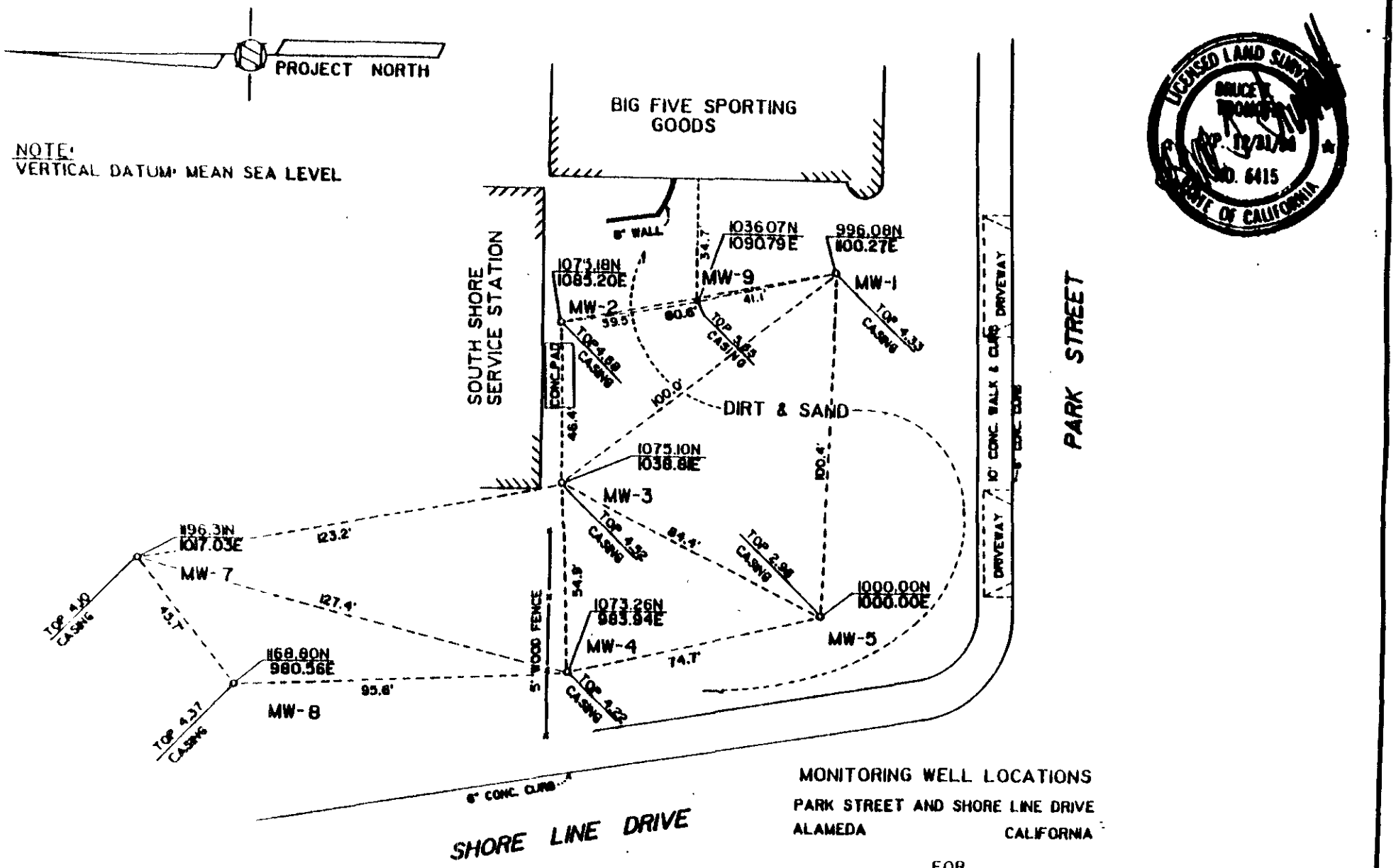


Diagrammatic Site Vicinity Map
Harsch Investment Corporation
Park Street and Shore Line Drive
Alameda, California

Figure 2

Clayton ENVIRONMENTAL CONSULTANTS

33299-00-17



LICENSED LAND SURVEYOR BRUCE THORNTON EXP. 12/31/91 NO. 6415 STATE OF CALIFORNIA

MONITORING WELL LOCATIONS

PARK STREET AND SHORE LINE DRIVE

ALAMEDA CALIFORNIA

FOR

CLAYTON ENVIRONMENTAL CONSULTANTS, INC.

BY

TRONOFF ASSOCIATES - LAND SURVEYORS

560 PINE STREET (415) 392-3215 SAN FRANCISCO

SCALE 1" = 40' JUNE 28, 1990

Figure 3

REVISIONS

1 12/19/90 - Added Monitoring Well - 9

2 01/17/91 - MW-7, MW-8

SURVEY No 3765 BK

APPENDIX A

CLAYTON DRILLING, WELL CONSTRUCTION, AND SAMPLING PROTOCOLS FOR BOREHOLE/MONITORING WELL INSTALLATION

DRILLING, WELL CONSTRUCTION, AND SAMPLING PROTOCOLS FOR BOREHOLE/MONITORING WELL INSTALLATION

BOREHOLE INSTALLATION

Clayton Environmental Consultants, Inc. acquires the proper governmental agency permits to bore, drill, or destroy all proposed boreholes and monitoring wells that intersect with groundwater aquifers and writes a health and safety plan.

Clayton subcontracts only with drillers who possess a current C-57 water well contractor's license issued by the State of California and whose personnel have attended the OSHA 40-hour Hazardous Materials Safety Training. Prior to starting work, a "tailgate" safety meeting including discussion of the safety hazards and precautions relevant to the particular job will be held with all personnel working on the job. Well drillers are identified on permit applications.

Boreholes are drilled dry by hollow- or solid-stem, continuous flight augers. Augers, drill rods, and other working components of the drilling rig are steam-cleaned before arriving onsite to prevent the introduction of contaminants. These components are also steam-cleaned between borings away from boring locations. Cleaned augers, rods, and other components are stored, and/or covered when not in use.

Clayton examines the soil brought to the surface by drilling operations, and samples undisturbed soil every 5 feet or as otherwise specified. Borehole logs are filled out in the field by a geologist who is trained and working under the supervision of an engineer or geologist who is registered in the State of California. Our borehole logs include a detailed description of subsurface stratigraphy using the Unified Soil Classification System. Soil cuttings are screened for volatile hydrocarbon contamination using an organic vapor meter (OVM). Clayton uses two different organic vapor testing field testing methods. One is the open-air method and the other is an ambient temperature headspace method.

When we use the open-air method, we monitor the ambient air above a target area without collecting a physical sample. This method measures the hydrocarbon vapors as they exist in the particular environment at that specific point in time. This method is affected by existing weather conditions, particularly wind and temperature. Using this method, we can monitor the environment for worker safety as well as locate pockets of the more volatile hydrocarbons that may not be visible.

We use the ambient temperature headspace method to screen individual samples for the presence of various hydrocarbon vapors. We gather a soil or water sample and place it in a sample jar or ziplock plastic bag so that there is a vacant headspace in the container. If a sample jar is used, the mouth is covered with foil and the lid is screwed on. The sample is then allowed to reach ambient temperature (usually in 10-15 minutes) causing any hydrocarbon vapors to volatilize into the headspace. Monitoring of the headspace in the jar or plastic bag is done with an OVM by piercing the foil or bag with the OVM probe. This method allows for a rough indication of the presence and concentration of hydrocarbon vapors in a particular sample.

SOIL SAMPLING

Soil samples are taken every 5 feet, at areas of obvious contamination, or as otherwise specified, with a California modified split-spoon sampler that is lined with three six-inch brass tubes. The sampler and rod are inserted into the borehole to the current depth and a hammer of known weight and height above the sampler are allowed to free-fall onto the rod, advancing the assembly 18 inches into undisturbed soil. Clayton uses the number of blows necessary to drive the sampler into the ground to help evaluate the consistency of materials encountered. The sampler is then pulled from the borehole and disassembled, and the three brass tubes are separated for inspection and labeling.

Clayton uses new brass liners or liners cleaned with a trisodium phosphate (TSP) solution, double rinsed with clean tap water, and air dried prior to each sampling. The sampler is also cleaned with TSP and rinsed with tap water between sampling events.

Soil samples selected for laboratory analysis are left in the brass liners, sealed with aluminum foil and plastic caps, taped for air tightness, labeled, and immediately placed into a pre-cooled ice chest chilled to less than 4°C. Labels contain the following information: site name, date and time sampled, borehole number and depth, and the sampler's initials. The samples are transported under chain-of-custody to a state-certified laboratory. The laboratory analyzes soil samples within the prescribed holding time, storing them at temperatures below 4°C at all times.

Pending results of laboratory analysis, excess drilling and sampling cuttings are placed into Department of Transportation (DOT)-approved drums, labeled with the name of the site, address, and well number, and left at the site. Uncontaminated soil may be disposed of by the client. Soil found to contain levels of contaminants above local or state action levels will require that the client dispose of it in accordance with hazardous waste regulations. At the client's request, we will assist with the disposal of contaminated soil.

WELL CONSTRUCTION

Boreholes are converted to monitoring wells by placing 2-inch or 4-inch diameter well casing with flush-threaded joints and slotted screen into the borehole. Construction materials include polyvinyl chloride (PVC), stainless steel, or low carbon steel. The most suitable material for a particular installation will depend on the parameters to be monitored. All

screens and casings used are in a contaminant-free condition when placed in the ground. No thread lubrication is used, other than teflon tape, for connecting the casing segments.

Wells extend at least 10 feet into the upper saturated zone, but do not extend through any clay layers greater than 5 feet that are below the shallow water table. Factory-slotted casing is used throughout and extends at least 2 feet above the permeable water-bearing zone. The top of the well is solid casing. The annular space of the borehole is backfilled with washed, kiln-dried sand to a point at least 1 foot above the slotted screen. A seal above the filter pack is formed by placing a 1- to 2-foot layer of bentonite pellets on top of the sand. The bentonite pellets are moistened by pouring clean tap water down the hole so that they can expand and seal the annulus. A neat cement grout is placed above the bentonite seal and brought to the ground surface.

Well casings are protected from surface contamination, accidental damage, and unauthorized entry or tampering with water-tight locking caps on the well casings. The caps are usually surrounded by a concrete vault. Wells are clearly identified with a metal tag or other device where the following information is recorded: well number, depth to water, depth of well, casing data including location of screened interval.

WELL DEVELOPMENT

The well seal in newly developed wells must set up for 48 to 72 hours prior to development. Since development of the well can volatilize contaminants present, the well must also settle for at least 48 to 72 hours between development and the first purging/sampling incident.

All monitoring wells are initially developed to clean the well and stabilize sand, gravel, and disturbed aquifer materials around the screened internal perforations. Wells are developed by pumping (or bailing) and surging until water turbidity and specific conductance stabilize. In some cases, where wells are installed in low permeability formations and the wells purge dry, the well is allowed to recover and is purged dry three times. Clean tap water is introduced into the well if it does not recover rapidly enough.

Pending results by laboratory analysis, purge water from well development and sampling is placed into DOT-approved drums, labeled with the name of the site, address, well number, and left at the site. Uncontaminated water may be disposed of by the client. Water found to contain levels of contaminants above local or state action levels requires that the client dispose of it in accordance with hazardous waste requirements. At the client's request, we can assist with the disposal of contaminated purge water.

GROUNDWATER SAMPLING

To collect a representative sample of the groundwater, stagnant water within the well casing and filter material must be purged and fresh aquifer water allowed to replace it. The water is purged from the well by pumping or bailing at least three well volumes. Well volumes are calculated by measuring depth to groundwater to the nearest 0.01 foot upon arrival at the well before any purging has begun. Groundwater samples are collected only after purging has

been of sufficient duration for pH, temperature, and electrical conductivity to stabilize. When purging low-yield wells, the wells are purged to dryness. When the well recovers to 80% of the depth measured upon arrival, samples are collected.

Field sampling logs maintained for each well include:

- Monitoring well identification
- Static water level, before and after pumping
- Well depth
- Condition of water prior to purging (e.g., amount of free product)
- Purge rate and volume
- pH, temperature, and conductivity during purging
- Time purged
- Time of sample collection
- Sampling method
- Name of sampler
- Climatic conditions

Water samples are collected using clean teflon or disposable bailers. All equipment that contacts samples is thoroughly cleaned before arrival at the site and between sampling events.

Water is collected in clean laboratory-supplied containers, labeled, placed immediately into an ice chest pre-cooled to 4°C, and transported to Clayton's laboratory for analysis. One trip blank will be furnished in accordance with our quality assurance/quality control (QA/QC) program.

All samples are collected in such a manner so as to minimize the volatilization of a sample due to agitation and/or transfer from bailer to sample container. Samples are collected so that contaminants most sensitive to volatilization are sampled first.

Preservatives are not added to any sample, unless instructed. If requested, they are supplied by Clayton's laboratory.

All sample containers are labeled in the field. Labels contain the following information: project name, sample identification number, project number, date and time of collection, and sampler's initials.

Under no circumstances are sealed sample containers opened by anyone other than the laboratory personnel who perform the requested analyses. If it is necessary for samples or sample chests to leave the immediate control of the sampler prior to delivery to the laboratory, for example during shipment by Federal Express, a custody seal is placed on each sample container and/or sample chest to ensure that the samples have not been tampered with during transportation. The custody seal is signed by the sampler, and the date and time that the seal was placed is recorded. The elapsed time between sample collection and delivery to the laboratory never exceeds 48 hours. Water samples are not held for more than 14 days prior to analysis and are kept at 4°C at all times.

To document and trace samples from time of collection, a signed chain-of-custody record is filled out by the sampler and accompanies the samples through the laboratory analyses. The completed chain-of-custody is included with the analytical report from the laboratory.

REFERENCES

Groundwater Monitoring Guidelines, Revised February 1990. Alameda County District Groundwater Protection Program.

Leaking Underground Fuel Tank (LUFT) Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Tank Closure, May 1988. State of California LUFT Task Force.

Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks, Revised November 1989. North Coast, San Francisco Bay, and Central Valley regions of the California State Water Quality Control Board.

Standards for the Construction and Destruction of Wells and Other Deep Excavations in Santa Clara County, Revised June 1989. Santa Clara Valley Water District.

Table 1. LABORATORY ANALYSIS OF SOIL SAMPLES, PARK AVENUE AND SHORE LINE DRIVE, ALAMEDA, CALIFORNIA

Total Petroleum Hydrocarbons and BTEX in mg/kg (ppm) (EPA 5030/8015/8020)

Boring Number	Depth (feet)	LBH[1]	Benzene	Toluene	Ethyl Benzene	Xylenes	HBH[2]	Volatile Organics EPA 8240
B-1	3.5-5	--	--	--	--	--	ND	--
	8.5-10	130	ND[3]	ND	4.1	4.5	--	--
	13.5-15	ND	ND	ND	ND	ND	--	--
B-2	3.5-5	--	--	--	--	--	ND	--
	8.5-10	ND	ND	ND	ND	ND	--	--
	13.5-15	ND	ND	ND	ND	ND	--	--
MW-2	3.5-5	--	--	--	--	--	--	ND
	8.5-10	--	--	--	--	--	--	ND
MW-3	3.5-5	ND	ND	ND	ND	ND	--	--
	8.5-10	ND	ND	ND	ND	--	--	--
Detection Limit		1.0	0.05	0.1	0.1	0.1	1.0	see App.A

Goodyear Building

Boring Number	Depth (feet)	Oil and Grease (EPA 413.1) (ppm)
1	5.2	ND
2	5.1	52
3	5.2	ND
4	5.5	340
5	5.1	30
Detection Limit		30

[1] LBH = Low/Medium Boiling Point Hydrocarbons = TPH (as gasoline)

[2] LBH = High Boiling Point Hydrocarbons = TPH (as diesel)

[3] ND = Not detected

[4] -- = Not tested

Table 2. LABORATORY ANALYSIS OF WATER SAMPLES, PARK AVENUE AND SHORE LINE DRIVE, ALAMEDA, CALIFORNIA

Total Petroleum Hydrocarbons and BTEX in micrograms (ppb) (EPA 5030/8015/8020)

Well Number	LBH[1]	Benzene	Toluene	Ethyl Benzene	Xylenes	HBH[2]	(Other) Ethylene Glycol
MW-1	2,500	400	3.4	7.9	78	3,800	ND
MW-2	43	2	ND	ND	ND	ND	--[3]
MW-3	ND	ND	ND	ND	ND	ND	--
Detection Limit:	30	0.3	0.3	0.3	0.3	50.0	10.0

[1]LBH = Low/Medium Boiling Point Hydrocarbons = TPH (as gasoline)

[2]HBH = High Boiling Point Hydrocarbons = TPH (as diesel)

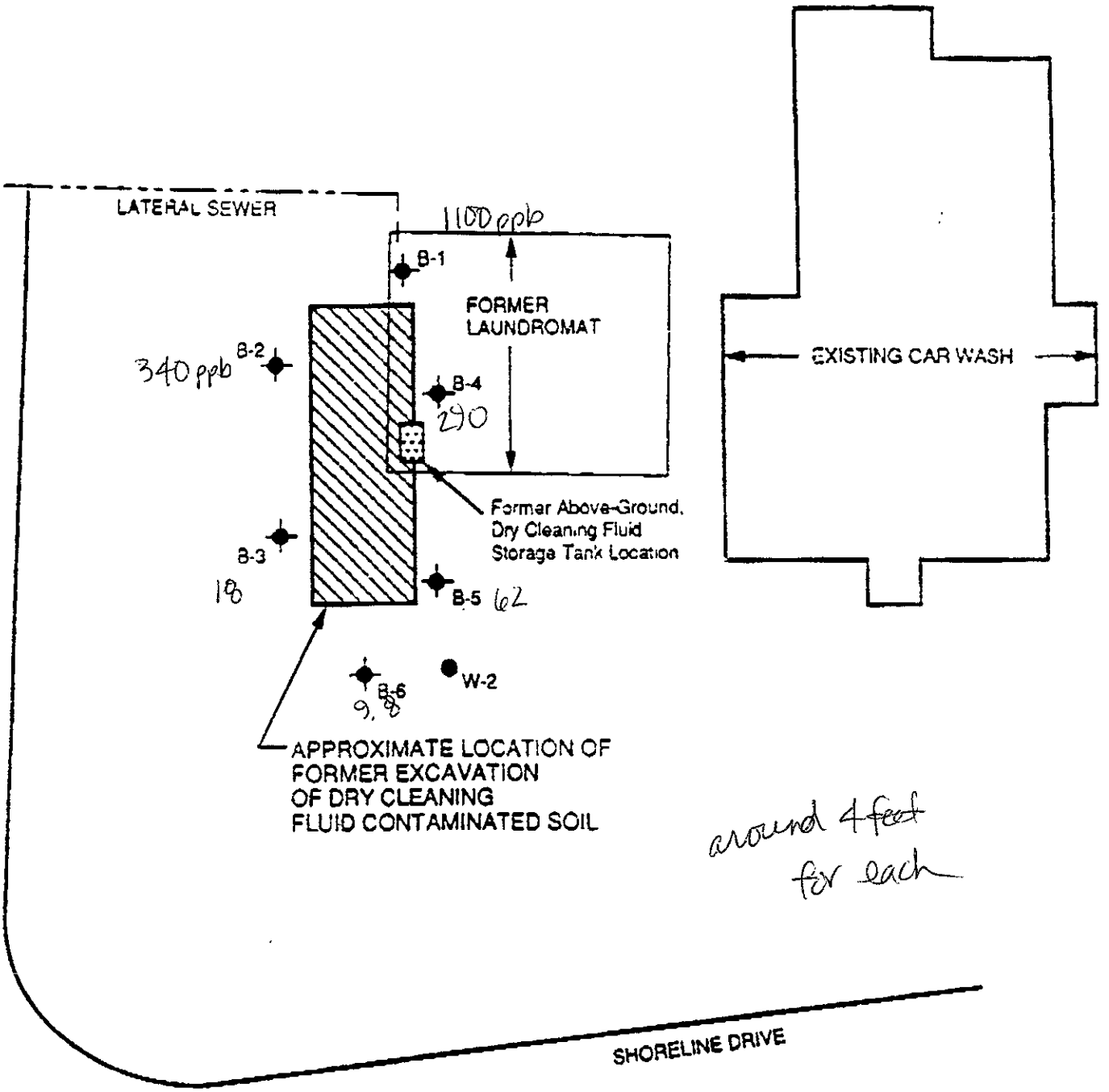
[3] = Not tested

Volatile Organics in micrograms/L (ppb) (EPA 8240)

	Benzene	Toluene	Ethyl Benzene	Xylenes	1,2-DCE	PCE	TCE
MW-1	10,000	260	2,600	1,600	ND	ND	ND
MW-2	2.0	ND	ND	ND	26	48	160
MW-3	ND	ND	ND	ND	ND	ND	ND
Detection Limits:	2.0	100	100	100	2.0	2.0	2.0
State Action Level	0.7	100	680	620	16.0	4.0	5.0
State or Federal DWL	1.0	2,000	680	1,750	0.5	5.0	5.0
EPA Saltwater Acute Toxicity	5,000	6,300	430	--	224,000	10,200	2,000

APPENDIX B

WOODWARD-CLYDE TABLE 1 AND FIGURE 1 APRIL 1990 ANALYTICAL RESULTS



April 1990

LEGEND

B-1 ✦ Approximate Boring Locations

W-2 ● Approximate Groundwater Monitoring Well Location

0 10 20
feet
(Approximate Scale)

Project No. 8910116A	Harsh Investments, Inc.	FORMER EXCAVATION AND BORING LOCATION PLAN	June 1990
Woodward-Clyde Consultants			Figure 1

Table 1. SOIL SAMPLES - LABORATORY ANALYTICAL RESULTS

8910116A - Harsh Invesments, Former Dry Cleaners Excavation, Southshore Shopping Center, Alameda, California

PARAMETER	UNITS	Sample Event						Detection Limits
		April 19, 1990						
		B-1-5	B-2-4 5	B-3-4	B-4-4	B-5-4	B -6-4	
Halogenated Volatile Organics (EPA Method 8010) (a)								
tetrachloroethylene/1,1,2,2-tetrachloroethane	µg/kg	1100	340	18	290	62	9.8	5

(a) Only those parameters that were found above the detection limits are listed. All other parameters tested and their corresponding detection limits are listed in the laboratory reports in the attachment.

APPENDIX C

LABORATORY RESULTS AND CHAIN-OF-CUSTODY

Western Operations

1252 Quarry Lane
Pleasanton, CA 94566
(415) 426-2600
Fax (415) 426-0106

Clayton
ENVIRONMENTAL
CONSULTANTS

November 7, 1990

Mr. Richard Silva
CLAYTON ENVIRONMENTAL CONSULTANTS, INC.
1252 Quarry Lane
Pleasanton, CA 94566

Client Ref. 30493.00
Clayton Project No. 90110.39

Dear Mr. Silva:

Attached is our analytical laboratory report for the samples received on November 5, 1990. A copy of the Chain-of-Custody form acknowledging receipt of these samples is attached.

Please note that any unused portion of the samples will be disposed of 30 days after the date of this report, unless you have requested otherwise.

We appreciate the opportunity to be of assistance to you. If you have any questions, please contact Maryann Gambino, Client Services Supervisor, at (415) 426-2657.

Sincerely,

Ronald H. Peters, CIH
Director, Laboratory Services
Western Operations

RHP/tb
Attachments

Results of Analysis
for
Harsch Investments

Client Reference: 30493.00
Clayton Project No. 90110.39

Sample Identification:	V-1	Date Sampled:	11/05/90
Lab Number:	9011039-01A	Date Received:	11/05/90
Sample Matrix/Media:	SOIL	Date Prepared:	11/06/90
Preparation Method:	EPA 5030	Date Extracted:	11/06/90
Extraction Method:	EPA 5030	Date Analyzed:	11/06/90
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
Purgeable Halocarbons			
Chloromethane	74-87-3	ND	0.06
Bromomethane	74-83-9	ND	0.07
Vinyl chloride	75-01-4	ND	0.05
Chloroethane	75-00-3	ND	0.05
Methylene chloride	75-09-2	ND	0.2
1,1-Dichloroethene	75-35-4	ND	0.02
1,1-Dichloroethane	75-35-3	ND	0.04
Trans-1,2-Dichloroethene	156-60-5	ND	0.04
Cis-1,2-Dichloroethene	156-59-2	ND	0.04
1,2-Dichloroethene (total)	540-59-0	ND	0.04
Chloroform	67-66-3	ND	0.05
1,2-Dichloroethane	107-06-2	ND	0.03
1,1,1-Trichloroethane	71-55-6	ND	0.05
Carbon tetrachloride	56-23-5	ND	0.06
Bromodichloromethane	75-27-4	ND	0.07
1,2-Dichloropropane	78-87-5	ND	0.05
Cis-1,3-Dichloropropene	10061-01-5	ND	0.05
Trichloroethene	79-01-6	ND	0.03
Dibromochloromethane	124-48-1	ND	0.06
1,1,2-Trichloroethane	79-00-5	ND	0.06
Trans-1,3-Dichloropropene	10061-02-6	ND	0.06
2-Chloroethylvinylether	100-75-8	ND	0.1
Bromoform	75-25-2	ND	0.07
Tetrachloroethene	127-18-4	ND	0.05
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.05
Chlorobenzene	108-90-7	ND	0.07
1,3-Dichlorobenzene	541-73-7	ND	0.2
1,2-Dichlorobenzene	95-50-1	ND	0.4
1,4-Dichlorobenzene	106-46-7	ND	0.4
Dichlorodifluoromethane	75-71-8	ND	0.1
Trichlorofluoromethane	75-69-4	ND	0.04
Freon 113	76-13-1	ND	0.06

ND Not detected at or above limit of detection
-- Information not available or not applicable

Results of Analysis
for
Harsch Investments

Client Reference: 30493.00
Clayton Project No. 90110.39

Sample Identification:	V-2	Date Sampled:	11/05/90
Lab Number:	9011039-02A	Date Received:	11/05/90
Sample Matrix/Media:	SOIL	Date Prepared:	11/06/90
Preparation Method:	EPA 5030	Date Extracted:	11/06/90
Extraction Method:	EPA 5030	Date Analyzed:	11/06/90
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
Purgeable Halocarbons			
Chloromethane	74-87-3	ND	0.06
Bromomethane	74-83-9	ND	0.07
Vinyl chloride	75-01-4	ND	0.05
Chloroethane	75-00-3	ND	0.05
Methylene chloride	75-09-2	ND	0.2
1,1-Dichloroethene	75-35-4	ND	0.02
1,1-Dichloroethane	75-35-3	ND	0.04
Trans-1,2-Dichloroethene	156-60-5	ND	0.04
Cis-1,2-Dichloroethene	156-59-2	ND	0.04
1,2-Dichloroethene (total)	540-59-0	ND	0.04
Chloroform	67-66-3	ND	0.05
1,2-Dichloroethane	107-06-2	ND	0.03
1,1,1-Trichloroethane	71-55-6	ND	0.05
Carbon tetrachloride	56-23-5	ND	0.06
Bromodichloromethane	75-27-4	ND	0.07
1,2-Dichloropropane	78-87-5	ND	0.05
Cis-1,3-Dichloropropene	10061-01-5	ND	0.05
Trichloroethene	79-01-6	ND	0.03
Dibromochloromethane	124-48-1	ND	0.06
1,1,2-Trichloroethane	79-00-5	ND	0.06
Trans-1,3-Dichloropropene	10061-02-6	ND	0.06
2-Chloroethylvinylether	100-75-8	ND	0.1
Bromoform	75-25-2	ND	0.07
Tetrachloroethene	127-18-4	ND	0.05
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.05
Chlorobenzene	108-90-7	ND	0.07
1,3-Dichlorobenzene	541-73-7	ND	0.2
1,2-Dichlorobenzene	95-50-1	ND	0.4
1,4-Dichlorobenzene	106-46-7	ND	0.4
Dichlorodifluoromethane	75-71-8	ND	0.1
Trichlorofluoromethane	75-69-4	ND	0.04
Freon 113	76-13-1	ND	0.06

ND Not detected at or above limit of detection
-- Information not available or not applicable

Results of Analysis
for
Harsch Investments

Client Reference: 30493.00
Clayton Project No. 90110.39

Sample Identification:	V-3	Date Sampled:	11/05/90
Lab Number:	9011039-03A	Date Received:	11/05/90
Sample Matrix/Media:	SOIL	Date Prepared:	11/06/90
Preparation Method:	EPA 5030	Date Extracted:	11/06/90
Extraction Method:	EPA 5030	Date Analyzed:	11/06/90
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
Purgeable Halocarbons			
Chloromethane	74-87-3	ND	0.06
Bromomethane	74-83-9	ND	0.07
Vinyl chloride	75-01-4	ND	0.05
Chloroethane	75-00-3	ND	0.05
Methylene chloride	75-09-2	ND	0.2
1,1-Dichloroethene	75-35-4	ND	0.02
1,1-Dichloroethane	75-35-3	ND	0.04
Trans-1,2-Dichloroethene	156-60-5	ND	0.04
Cis-1,2-Dichloroethene	156-59-2	ND	0.04
1,2-Dichloroethene (total)	540-59-0	ND	0.04
Chloroform	67-66-3	ND	0.05
1,2-Dichloroethane	107-06-2	ND	0.03
1,1,1-Trichloroethane	71-55-6	ND	0.05
Carbon tetrachloride	56-23-5	ND	0.06
Bromodichloromethane	75-27-4	ND	0.07
1,2-Dichloropropane	78-87-5	ND	0.05
Cis-1,3-Dichloropropene	10061-01-5	ND	0.05
Trichloroethene	79-01-6	ND	0.03
Dibromochloromethane	124-48-1	ND	0.06
1,1,2-Trichloroethane	79-00-5	ND	0.06
Trans-1,3-Dichloropropene	10061-02-6	ND	0.06
2-Chloroethylvinylether	100-75-8	ND	0.1
Bromoform	75-25-2	ND	0.07
Tetrachloroethene	127-18-4	0.07	0.05
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.05
Chlorobenzene	108-90-7	ND	0.07
1,3-Dichlorobenzene	541-73-7	ND	0.2
1,2-Dichlorobenzene	95-50-1	ND	0.4
1,4-Dichlorobenzene	106-46-7	ND	0.4
Dichlorodifluoromethane	75-71-8	ND	0.1
Trichlorofluoromethane	75-69-4	ND	0.04
Freon 113	76-13-1	ND	0.06

ND Not detected at or above limit of detection
-- Information not available or not applicable

Results of Analysis
for
Harsch Investments

Client Reference: 30493.00
Clayton Project No. 90110.39

Sample Identification:	V-4	Date Sampled:	11/05/90
Lab Number:	9011039-04A	Date Received:	11/05/90
Sample Matrix/Media:	SOIL	Date Prepared:	11/06/90
Preparation Method:	EPA 5030	Date Extracted:	11/06/90
Extraction Method:	EPA 5030	Date Analyzed:	11/06/90
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
Purgeable Halocarbons			
Chloromethane	74-87-3	ND	0.06
Bromomethane	74-83-9	ND	0.07
Vinyl chloride	75-01-4	ND	0.05
Chloroethane	75-00-3	ND	0.05
Methylene chloride	75-09-2	ND	0.2
1,1-Dichloroethene	75-35-4	ND	0.02
1,1-Dichloroethane	75-35-3	ND	0.04
Trans-1,2-Dichloroethene	156-60-5	ND	0.04
Cis-1,2-Dichloroethene	156-59-2	ND	0.04
1,2-Dichloroethene (total)	540-59-0	ND	0.04
Chloroform	67-66-3	ND	0.05
1,2-Dichloroethane	107-06-2	ND	0.03
1,1,1-Trichloroethane	71-55-6	ND	0.05
Carbon tetrachloride	56-23-5	ND	0.06
Bromodichloromethane	75-27-4	ND	0.07
1,2-Dichloropropane	78-87-5	ND	0.05
Cis-1,3-Dichloropropene	10061-01-5	ND	0.05
Trichloroethene	79-01-6	ND	0.03
Dibromochloromethane	124-48-1	ND	0.06
1,1,2-Trichloroethane	79-00-5	ND	0.06
Trans-1,3-Dichloropropene	10061-02-6	ND	0.06
2-Chloroethylvinylether	100-75-8	ND	0.1
Bromoform	75-25-2	ND	0.07
Tetrachloroethene	127-18-4	ND	0.05
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.05
Chlorobenzene	108-90-7	ND	0.07
1,3-Dichlorobenzene	541-73-7	ND	0.2
1,2-Dichlorobenzene	95-50-1	ND	0.4
1,4-Dichlorobenzene	106-46-7	ND	0.4
Dichlorodifluoromethane	75-71-8	ND	0.1
Trichlorofluoromethane	75-69-4	ND	0.04
Freon 113	76-13-1	ND	0.06

ND Not detected at or above limit of detection
-- Information not available or not applicable

Results of Analysis
for
Harsch Investments

Client Reference: 30493.00
Clayton Project No. 90110.39

Sample Identification:	V-5	Date Sampled:	11/05/90
Lab Number:	9011039-05A	Date Received:	11/05/90
Sample Matrix/Media:	SOIL	Date Prepared:	11/06/90
Preparation Method:	EPA 5030	Date Extracted:	11/06/90
Extraction Method:	EPA 5030	Date Analyzed:	11/06/90
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
Purgeable Halocarbons			
Chloromethane	74-87-3	ND	0.06
Bromomethane	74-83-9	ND	0.07
Vinyl chloride	75-01-4	ND	0.05
Chloroethane	75-00-3	ND	0.05
Methylene chloride	75-09-2	ND	0.2
1,1-Dichloroethene	75-35-4	ND	0.02
1,1-Dichloroethane	75-35-3	ND	0.04
Trans-1,2-Dichloroethene	156-60-5	ND	0.04
Cis-1,2-Dichloroethene	156-59-2	ND	0.04
1,2-Dichloroethene (total)	540-59-0	ND	0.04
Chloroform	67-66-3	ND	0.05
1,2-Dichloroethane	107-06-2	ND	0.03
1,1,1-Trichloroethane	71-55-6	ND	0.05
Carbon tetrachloride	56-23-5	ND	0.06
Bromodichloromethane	75-27-4	ND	0.07
1,2-Dichloropropane	78-87-5	ND	0.05
Cis-1,3-Dichloropropene	10061-01-5	ND	0.05
Trichloroethene	79-01-6	ND	0.03
Dibromochloromethane	124-48-1	ND	0.06
1,1,2-Trichloroethane	79-00-5	ND	0.06
Trans-1,3-Dichloropropene	10061-02-6	ND	0.06
2-Chloroethylvinylether	100-75-8	ND	0.1
Bromoform	75-25-2	ND	0.07
Tetrachloroethene	127-18-4	ND	0.05
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.05
Chlorobenzene	108-90-7	ND	0.07
1,3-Dichlorobenzene	541-73-7	ND	0.2
1,2-Dichlorobenzene	95-50-1	ND	0.4
1,4-Dichlorobenzene	106-46-7	ND	0.4
Dichlorodifluoromethane	75-71-8	ND	0.1
Trichlorofluoromethane	75-69-4	ND	0.04
Freon 113	76-13-1	ND	0.06

ND Not detected at or above limit of detection
-- Information not available or not applicable

Results of Analysis
for
Harsch Investments

Client Reference: 30493.00
Clayton Project No. 90110.39

Sample Identification:	V-6	Date Sampled:	11/05/90
Lab Number:	9011039-06A	Date Received:	11/05/90
Sample Matrix/Media:	SOIL	Date Prepared:	11/06/90
Preparation Method:	EPA 5030	Date Extracted:	11/06/90
Extraction Method:	EPA 5030	Date Analyzed:	11/06/90
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
Purgeable Halocarbons			
Chloromethane	74-87-3	ND	0.06
Bromomethane	74-83-9	ND	0.07
Vinyl chloride	75-01-4	ND	0.05
Chloroethane	75-00-3	ND	0.05
Methylene chloride	75-09-2	ND	0.2
1,1-Dichloroethene	75-35-4	ND	0.02
1,1-Dichloroethane	75-35-3	ND	0.04
Trans-1,2-Dichloroethene	156-60-5	ND	0.04
Cis-1,2-Dichloroethene	156-59-2	ND	0.04
1,2-Dichloroethene (total)	540-59-0	ND	0.04
Chloroform	67-66-3	ND	0.05
1,2-Dichloroethane	107-06-2	ND	0.03
1,1,1-Trichloroethane	71-55-6	ND	0.05
Carbon tetrachloride	56-23-5	ND	0.06
Bromodichloromethane	75-27-4	ND	0.07
1,2-Dichloropropane	78-87-5	ND	0.05
Cis-1,3-Dichloropropene	10061-01-5	ND	0.05
Trichloroethene	79-01-6	ND	0.03
Dibromochloromethane	124-48-1	ND	0.06
1,1,2-Trichloroethane	79-00-5	ND	0.06
Trans-1,3-Dichloropropene	10061-02-6	ND	0.06
2-Chloroethylvinylether	100-75-8	ND	0.1
Bromoform	75-25-2	ND	0.07
Tetrachloroethene	127-18-4	ND	0.05
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.05
Chlorobenzene	108-90-7	ND	0.07
1,3-Dichlorobenzene	541-73-7	ND	0.2
1,2-Dichlorobenzene	95-50-1	ND	0.4
1,4-Dichlorobenzene	106-46-7	ND	0.4
Dichlorodifluoromethane	75-71-8	ND	0.1
Trichlorofluoromethane	75-69-4	ND	0.04
Freon 113	76-13-1	ND	0.06

ND Not detected at or above limit of detection
-- Information not available or not applicable

Results of Analysis
for
Harsch Investments

Client Reference: 30493.00
Clayton Project No. 90110.39

Sample Identification:	V-7	Date Sampled:	11/05/90
Lab Number:	9011039-07A	Date Received:	11/05/90
Sample Matrix/Media:	SOIL	Date Prepared:	11/06/90
Preparation Method:	EPA 5030	Date Extracted:	11/06/90
Extraction Method:	EPA 5030	Date Analyzed:	11/06/90
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
Purgeable Halocarbons			
Chloromethane	74-87-3	ND	0.06
Bromomethane	74-83-9	ND	0.07
Vinyl chloride	75-01-4	ND	0.05
Chloroethane	75-00-3	ND	0.05
Methylene chloride	75-09-2	ND	0.2
1,1-Dichloroethene	75-35-4	ND	0.02
1,1-Dichloroethane	75-35-3	ND	0.04
Trans-1,2-Dichloroethene	156-60-5	ND	0.04
Cis-1,2-Dichloroethene	156-59-2	ND	0.04
1,2-Dichloroethene (total)	540-59-0	ND	0.04
Chloroform	67-66-3	ND	0.05
1,2-Dichloroethane	107-06-2	ND	0.03
1,1,1-Trichloroethane	71-55-6	ND	0.05
Carbon tetrachloride	56-23-5	ND	0.06
Bromodichloromethane	75-27-4	ND	0.07
1,2-Dichloropropane	78-87-5	ND	0.05
Cis-1,3-Dichloropropene	10061-01-5	ND	0.05
Trichloroethene	79-01-6	ND	0.03
Dibromochloromethane	124-48-1	ND	0.06
1,1,2-Trichloroethane	79-00-5	ND	0.06
Trans-1,3-Dichloropropene	10061-02-6	ND	0.06
2-Chloroethylvinylether	100-75-8	ND	0.1
Bromoform	75-25-2	ND	0.07
Tetrachloroethene	127-18-4	ND	0.05
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.05
Chlorobenzene	108-90-7	ND	0.07
1,3-Dichlorobenzene	541-73-7	ND	0.2
1,2-Dichlorobenzene	95-50-1	ND	0.4
1,4-Dichlorobenzene	106-46-7	ND	0.4
Dichlorodifluoromethane	75-71-8	ND	0.1
Trichlorofluoromethane	75-69-4	ND	0.04
Freon 113	76-13-1	ND	0.06

ND Not detected at or above limit of detection
-- Information not available or not applicable

Results of Analysis
for
Harsch Investments

Client Reference: 30493.00
Clayton Project No. 90110.39

Sample Identification:	METHOD BLANK	Date Sampled:	--
Lab Number:	9011039-08A	Date Received:	--
Sample Matrix/Media:	SOIL	Date Prepared:	11/06/90
Preparation Method:	EPA 5030	Date Extracted:	11/06/90
Extraction Method:	EPA 5030	Date Analyzed:	11/06/90
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (mg/kg)	Limit of Detection (mg/kg)
Purgeable Halocarbons			
Chloromethane	74-87-3	ND	0.06
Bromomethane	74-83-9	ND	0.07
Vinyl chloride	75-01-4	ND	0.05
Chloroethane	75-00-3	ND	0.05
Methylene chloride	75-09-2	ND	0.2
1,1-Dichloroethene	75-35-4	ND	0.02
1,1-Dichloroethane	75-35-3	ND	0.04
Trans-1,2-Dichloroethene	156-60-5	ND	0.04
Cis-1,2-Dichloroethene	156-59-2	ND	0.04
1,2-Dichloroethene (total)	540-59-0	ND	0.04
Chloroform	67-66-3	ND	0.05
1,2-Dichloroethane	107-06-2	ND	0.03
1,1,1-Trichloroethane	71-55-6	ND	0.05
Carbon tetrachloride	56-23-5	ND	0.06
Bromodichloromethane	75-27-4	ND	0.07
1,2-Dichloropropane	78-87-5	ND	0.05
Cis-1,3-Dichloropropene	10061-01-5	ND	0.05
Trichloroethene	79-01-6	ND	0.03
Dibromochloromethane	124-48-1	ND	0.06
1,1,2-Trichloroethane	79-00-5	ND	0.06
Trans-1,3-Dichloropropene	10061-02-6	ND	0.06
2-Chloroethylvinylether	100-75-8	ND	0.1
Bromoform	75-25-2	ND	0.07
Tetrachloroethene	127-18-4	ND	0.05
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.05
Chlorobenzene	108-90-7	ND	0.07
1,3-Dichlorobenzene	541-73-7	ND	0.2
1,2-Dichlorobenzene	95-50-1	ND	0.4
1,4-Dichlorobenzene	106-46-7	ND	0.4
Dichlorodifluoromethane	75-71-8	ND	0.1
Trichlorofluoromethane	75-69-4	ND	0.04
Freon 113	76-13-1	ND	0.06

ND Not detected at or above limit of detection
-- Information not available or not applicable

Clayton ENVIRONMENTAL CONSULTANTS

A Marsh & McLennan Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

For Clayton Use Only	Page ____ of ____
Project No.	30493.00 MB 11/8/90 per RAL
Batch No.	9011039
Client No.	
Date Logged In	11/5/90 By RAL

REPORT RESULTS TO

Name: RICHARD SILVA | Title:
Company: HARSCH | Dept.:
Mailing Address:
City, State, Zip:
Telephone No.: | Telefax No.:

Purchase Order No.: | Client Job No.:

SEND INVOICE TO

Name: RICHARD SILVA
Company: ~~HARSCH~~ CLAYTON | Dept.:
Address:
City, State, Zip:

Date Results Required: 48 HR. T.A.T. | Rush Charges Authorized? ☒ Yes ☐ No | Phone Results ☐

Special Instructions: (method, limit of detection, etc.)
48 HR. TURNAROUND TIME PER JOE MUNYER VERBAL OK.

* Explanation of Preservative.

Samples are: (check if applicable)
☐ Drinking Water
☐ Collected in the State of New York

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	ANALYSIS REQUESTED: 8010	FOR LAB USE ONLY
V-1 @ 5 ft TIME 1130	11-5-90	SOIL	12" BRASS	1	X	-01A
V-2 @ 6 ft. 1140				1	X	-02
V-3 @ 5 ft. 1230				1	X	-03
V-4 @ 4½ ft. 1315				1	X	-04
V-5 @ 5 ft 1400				1	X	-05
V-6 @ 5.5 ft 1410				1	X	-06
V-7 @ 5 ft. 1420	↓	↓	↓	1	X	-07

CHAIN OF CUSTODY

Relinquished by: Richard Silva | Date/Time 11-5-90/4:10
Relinquished by: | Date/Time
Method of Shipment:

Authorized by: Richard Silva Date 11-5-90
(Client Signature Must Accompany Request)

Received by: | Date/Time
Received at Lab by: Rebecca & Tina Clarke | Date/Time 11/5/90 4:10
Sample Condition Upon Receipt: ☒ Acceptable ☐ Other (explain)

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive
Novi, MI 48050
(313) 344-1770

Raritan Center
160 Fieldcrest Ave.
Edison, NJ 08837
(201) 225 6040

400 Chastain Center Blvd., N.W.
Suite 490
Kennesaw, GA 30144
(404) 499-7500

1252 Quarry Lane
Pleasanton, CA 94566
(415) 426-2600

6/90

DISTRIBUTION:
WHITE - Clayton Laboratory
YELLOW - Clayton Accounting
PINK - Client Copy

Western Operations

1252 Quarry Lane
Pleasanton, CA 94566
(415) 426-2600
Fax (415) 426-0106

Clayton
ENVIRONMENTAL
CONSULTANTS

November 8, 1990

Mr. Richard Silva
CLAYTON ENVIRONMENTAL CONSULTANTS, INC.
1252 Quarry Lane
Pleasanton, Ca. 94566

Client Ref. 30493.00
Clayton Project No. 90110.52

Dear Mr. Silva:

Attached is our analytical laboratory report for the samples received on November 6, 1990. A copy of the Chain-of-Custody form acknowledging receipt of these samples is attached.

Please note that any unused portion of the samples will be disposed of 30 days after the date of this report, unless you have requested otherwise.

We appreciate the opportunity to be of assistance to you. If you have any questions, please contact Maryann Gambino, Client Services Supervisor, at (415) 426-2657.

Sincerely,

Ronald H. Peters, CIH
Director, Laboratory Services
Western Operations

RHP/dt
Attachments

Results of Analysis
for
Harsch Investments

Client Reference: 30493.00
Clayton Project No. 90110.52

Sample Identification: GW-1
Lab Number: 9011052-01A
Sample Matrix/Media: WATER
Analytical Method: EPA 601

Date Sampled: 11/06/90
Date Received: 11/06/90
Date Analyzed: 11/06/90

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
Purgeable Halocarbons			
Chloromethane	74-87-3	ND	0.6
Bromomethane	74-83-9	ND	0.7
Vinyl chloride	75-01-4	ND	0.5
Chloroethane	75-00-3	ND	0.5
Methylene chloride	75-09-2	ND	2
1,1-Dichloroethene	75-35-4	ND	0.2
1,1-Dichloroethane	75-35-3	ND	0.4
Trans-1,2-Dichloroethene	156-60-5	ND	0.4
Cis-1,2-Dichloroethene	156-59-2	ND	0.4
1,2-Dichloroethene (total)	540-59-0	ND	0.4
Chloroform	67-66-3	ND	0.5
1,2-Dichloroethane	107-06-2	ND	0.3
1,1,1-Trichloroethane	71-55-6	ND	0.5
Carbon tetrachloride	56-23-5	ND	0.6
Bromodichloromethane	75-27-4	ND	0.7
1,2-Dichloropropane	78-87-5	ND	0.5
Cis-1,3-Dichloropropene	10061-01-5	ND	0.5
Trichloroethene	79-01-6	ND	0.3
Dibromochloromethane	124-48-1	ND	0.6
1,1,2-Trichloroethane	79-00-5	ND	0.6
Trans-1,3-Dichloropropene	10061-02-6	ND	0.6
2-Chloroethylvinylether	100-75-8	ND	1
Bromoform	75-25-2	ND	0.7
Tetrachloroethene	127-18-4	ND	0.5
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Chlorobenzene	108-90-7	ND	0.7
1,3-Dichlorobenzene	541-73-7	ND	2
1,2-Dichlorobenzene	95-50-1	ND	4
1,4-Dichlorobenzene	106-46-7	ND	4
Dichlorodifluoromethane	75-71-8	ND	1
Trichlorofluoromethane	75-69-4	ND	0.4
Freon 113	76-13-1	ND	0.6

ND Not detected at or above limit of detection
-- Information not available or not applicable

Results of Analysis
for
Harsch Investments

Client Reference: 30493.00
Clayton Project No. 90110.52

Sample Identification: METHOD BLANK
Lab Number: 9011052-03A
Sample Matrix/Media: WATER
Analytical Method: EPA 601

Date Sampled: --
Date Received: --
Date Analyzed: 11/06/90

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
Purgeable Halocarbons			
Chloromethane	74-87-3	ND	0.6
Bromomethane	74-83-9	ND	0.7
Vinyl chloride	75-01-4	ND	0.5
Chloroethane	75-00-3	ND	0.5
Methylene chloride	75-09-2	ND	2
1,1-Dichloroethene	75-35-4	ND	0.2
1,1-Dichloroethane	75-35-3	ND	0.4
Trans-1,2-Dichloroethene	156-60-5	ND	0.4
Cis-1,2-Dichloroethene	156-59-2	ND	0.4
1,2-Dichloroethene (total)	540-59-0	ND	0.4
Chloroform	67-66-3	ND	0.5
1,2-Dichloroethane	107-06-2	ND	0.3
1,1,1-Trichloroethane	71-55-6	ND	0.5
Carbon tetrachloride	56-23-5	ND	0.6
Bromodichloromethane	75-27-4	ND	0.7
1,2-Dichloropropane	78-87-5	ND	0.5
Cis-1,3-Dichloropropene	10061-01-5	ND	0.5
Trichloroethene	79-01-6	ND	0.3
Dibromochloromethane	124-48-1	ND	0.6
1,1,2-Trichloroethane	79-00-5	ND	0.6
Trans-1,3-Dichloropropene	10061-02-6	ND	0.6
2-Chloroethylvinylether	100-75-8	ND	1
Bromoform	75-25-2	ND	0.7
Tetrachloroethene	127-18-4	ND	0.5
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Chlorobenzene	108-90-7	ND	0.7
1,3-Dichlorobenzene	541-73-7	ND	2
1,2-Dichlorobenzene	95-50-1	ND	4
1,4-Dichlorobenzene	106-46-7	ND	4
Dichlorodifluoromethane	75-71-8	ND	1
Trichlorofluoromethane	75-69-4	ND	0.4
Freon 113	76-13-1	ND	0.6

ND Not detected at or above limit of detection
-- Information not available or not applicable

Clayton ENVIRONMENTAL CONSULTANTS

A Marsh & McLennan Company

REQUEST FOR LABORATORY ANALYTICAL SERVICES

For Clayton Use Only	Page ____ of ____
Project No.	30493.00
Batch No.	9011052
Client No.	
Date Logged In	11/6/90 By RDR

REPORT RESULTS TO

Name: RICHARD SILVA | Title:
Company: HARSCH | Dept.:
Mailing Address:
City, State, Zip:
Telephone No.: | Telefax No.:

SEND INVOICE TO

Purchase Order No.: | Client Job No.:
Name: RICHARD SILVA
Company: CLAYTON | Dept.:
Address:
City, State, Zip:

Date Results Required: 48 HR. TAT. | Rush Charges Authorized? ☒ Yes ☐ No | Phone Results ☐

Special Instructions: (method, limit of detection, etc.)
48 HOUR TURNAROUND TIME

* Explanation of Preservative: JOE MUNYER VERBAL OK.

Samples are: (check if applicable)
☐ Drinking Water
☐ Collected in the State of New York

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added *)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	601 Halocarbons	Halocarbons Hold	FOR LAB USE ONLY
GW-1 TIME - 1445	11-6-90	H_2O	40 mL	2	X		-01A, B
TRIP BLANK (0101990)	11-6-90	H_2O	40 mL	1		X	-02

CHAIN OF CUSTODY

Relinquished by: Richard Silva | Date/Time 11-6-90/1600
Relinquished by: | Date/Time
Method of Shipment:

Authorized by: Richard Silva Date 11-6-90
(Client Signature Must Accompany Request)

Received by: | Date/Time
Received at Lab by: Rebecca L Tuzzo Ciarello | Date/Time 11/6/90 4:00
Sample Condition Upon Receipt: ☑ Acceptable ☐ Other (explain)

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive
Novi, MI 48050
(313) 344-1770

Raritan Center
160 Fieldcrest Ave.
Edison, NJ 08837
(201) 225-6040

400 Chastain Center Blvd., N.W.
Suite 490
Kennesaw, GA 30144
(404) 499-7500

1252 Quarry Lane
Pleasanton, CA 94566
(415) 426-2600

6/90

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