



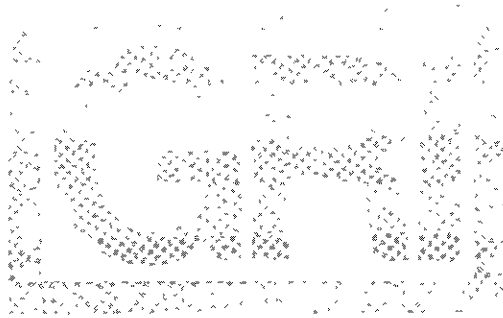
groundwater resources inc.

5610 DISTRICT BLVD., SUITE 106
BAKERSFIELD, CALIFORNIA 93313

General Engineering Contractor
Class A License No. 520768

SCOTSMAN CORPORATION
6055 SCARLETT COURT
DUBLIN, CA 94568

SITE CHARACTERIZATION PLAN



PERMITS
AUG 1 1988
HAZARDOUS MATERIALS/
WASTE PROGRAM

MAILING ADDRESS: P.O. BOX 9383, BAKERSFIELD, CA 93389 (805) 835-7700
OTHER LOCATIONS: LOS ANGELES (213) 724-3147 PLACENTIA (714) 528-2415



groundwater resources inc.

5610 DISTRICT BLVD., SUITE 106
BAKERSFIELD, CALIFORNIA 93313

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Class A License No. 520768

August 11, 1988

Mr. Storm Goranson
Alameda County
Health Care Services
Department of Environmental Health
470-27th Street, Third Floor
Oakland, CA 94612

Re: Scotsman Corporation
6055 Scarlett Ct.
Dublin, CA 94568

Dear Mr. Goranson,

Groundwater Resources, Inc. (GRI) has been retained to investigate possible soil and groundwater contamination at the above referenced facility.

Two 500 gallon underground storage tanks of single wall steel construction were removed on October 23, 1987. The tanks contained gasoline. During the removal a hole in Tank A was observed by the representatives of the removal contractor, W. D. Construction, Inc. In addition, some corrosion was noted on Tank B and the water table was observed near the tank bottoms. Soil samples were taken underneath each tank at a depth of 8.5 feet. Laboratory results indicate Total Volatile Hydrocarbons under Tank A at 150 ppm and under Tank B at 62 ppm. Laboratory determinations during the removal project were unable to detect Benzene concentrations less than 100 ppb raising some doubt as to accuracy of existing data. Therefore, a Site Characterization is required to determine the vertical and horizontal extent of potential contamination due to the unauthorized release of petroleum product from leaking underground storage tanks.

Due to site specific conditions such as shallow groundwater (approximately 8-10 feet below ground level), a thin vadose zone possibly between the bottom of the former tanks and groundwater and the historical water levels of two to four feet from surface, GRI has developed a plan to characterize the extent of potential contamination at this facility.

Literature sources and conversations with State Water Quality Control Board in Sacramento, indicate groundwater levels fluctuate between one to ten feet from surface based on annual rainfall. We have planned four borings which are planned to be

Mr. Storm Goranson
Alameda County
Health Care Services
August 11, 1988
Page Two

converted to groundwater monitoring wells. Proposed well locations are shown in Plate 2. One well near the fence at the former location of Tank B and one well north of the former tank setting are needed to confirm contamination. The other two proposed locations may need to be altered based on results from the initial borings. It is possible that in order to obtain data for flow gradient and direction the proposed locations may need to be altered. Proposed well completion detail is enclosed as Plate 3.

After the borings are conducted, wells completed, and samples analyzed, a report will be prepared for your office with all results, logs, laboratory analysis, hydrogeology, definition of contamination, well completion details, well development data, and a recommendation of remedial action alternatives.

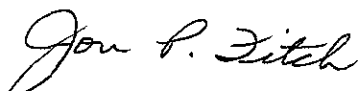
Upon completion of the proposed work, we will explore the site specific alternatives. The final mitigation technique, if needed, will be designed on field results as outlined above.

All work will be supervised by our Staff Registered Geologist, Mr. Rex Young (State Registration #720).

While conducting the borings, the personnel on site will be equipped with a Draeger PA-80 Air Pack, Gastech D-11 Vaportester or equivalent, a photoionization detector, fire extinguishers and any additionally required equipment for health and safety considerations.

If you have any additional questions or input, please contact our main office at (805) 835-7700.

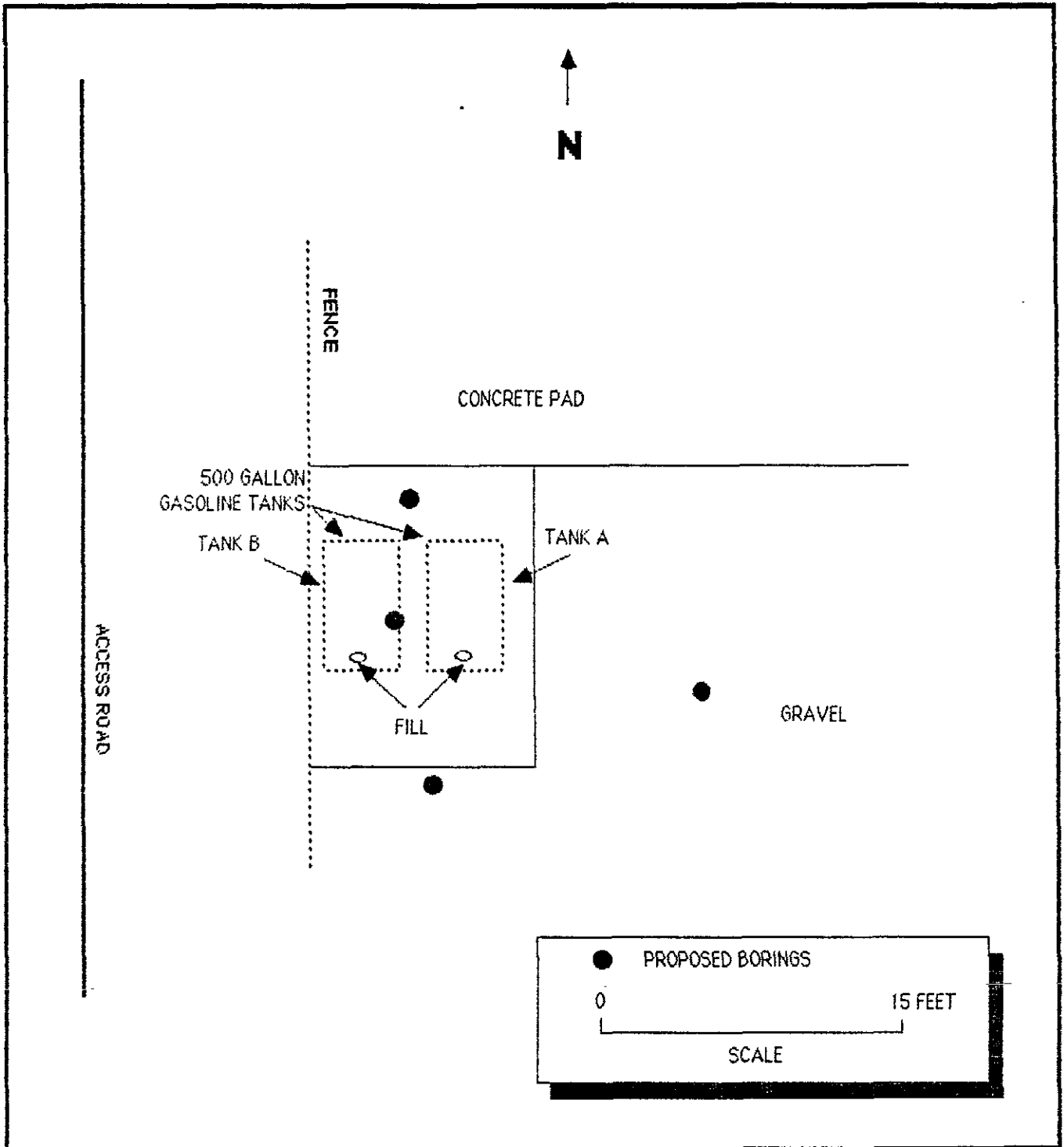
Very truly yours,



Jon P. Fitch
Project Manager

JPF:dji

cc: Mr. Stephen Henderickson



GROUNDWATER RESOURCES, INC.
 (885)835-7700

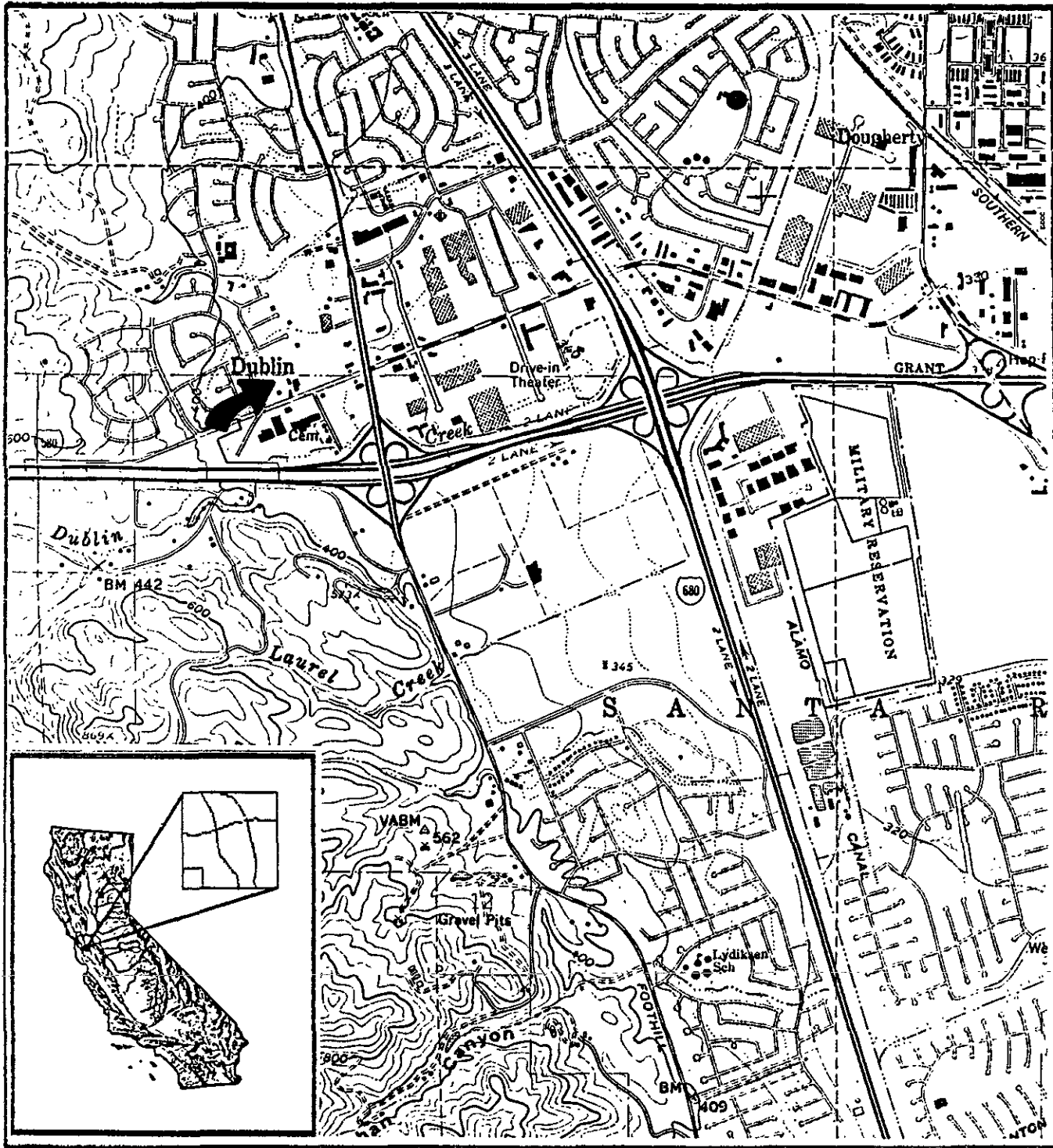
environmental/geotechnical services

Project Number:

SCOTSMAN CORPORATION
DUBLIN, CA

PLOT PLAN
OF PROPOSED BORING
LOCATIONS

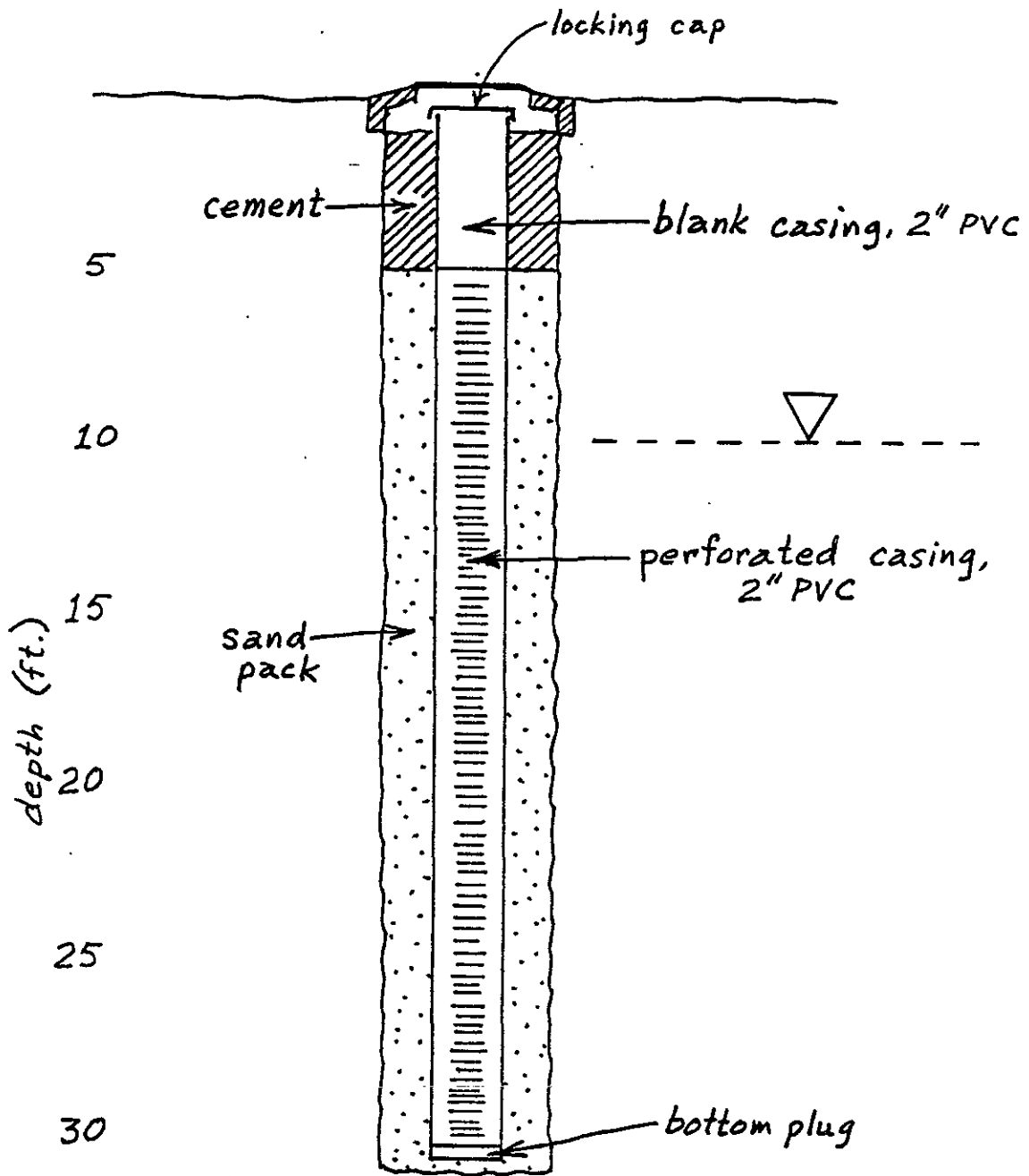
PLATE
1



GROUNDWATER RESOURCES, INC.
 (805) 835-7700
 environmental/geotechnical services
 Project Number:

SCOTSMAN CORPORATION
 DUBLIN, CA
LOCATION MAP

PLATE
2



COMPLETION OF SHALLOW WATER-MONITORING WELL



groundwater resources inc.

S A M P L I N G P R O T O C O L



APPENDIX A
TEST BORING PROCEDURES

I. Soil Sampling Protocol

The following procedures are followed during soil sampling operations utilizing the hollow stem auger drilling technique.

A. Hollow Stem Auger

1. Soil borings drilled by the hollow stem auger utilize continuous flight hollow stem augers.
2. Augers, samplers and all downhole equipment are steam cleaned prior to use. In the field steam cleaning is done between borings to minimize the potential for cross-contamination.
3. A G.R.I. geologist observes the work, visually logs the soils, and collects samples at appropriate intervals.
4. The Unified Soils Classification System is utilized to classify soils encountered. Additional geologist observations are noted as appropriate.
5. Soil samples destined for laboratory analysis are collected by a modified California Split Spoon. This sampler uses three, six inch long, by two inch diameter (o.d) tubes.

Various tubes can be utilized to accommodate the type of analysis necessary:

Brass	-	All organics and general analyses (not to be used for copper or zinc analysis)
Stainless Steel	-	All organics and metals analyses for copper and zinc (not to be used for chrome or nickel analyses)
Plastic	-	All metals analyses (not to be used for organics)



Appendix A (cont'd)

6. The tubes were cleaned and prepared in the G.R.I. laboratory. Tubes were scrubbed, inside and outside, with a brush and TSP, air dried, and packed in clean containers with seals. Tubes are delivered to the drilling site in these closed containers to preserve the state of cleanliness.
7. After the sample(s) have been removed from the sampler, the sampler is completely disassembled and scrubbed in TSP and tap water. It is then rinsed in clean tapwater and reassembled with three clean tubes.
8. Dirty tubes are field washed in TSP, rinsed with water, and returned to the G.R.I. lab for cleaning and preparation.
9. The sampler is driven by a 140 pound hammer with a 30 inch free fall. Blow counts are recorded as number of blows per inch of drive.
10. The sampler is driven 18 inches at each sampling interval. The first (or lowest) tube is generally retained as the sample for analysis. The other two tubes are retained for back-up or split samples.
11. A sand catcher is used in the sampler where loose soils are anticipated. This will prevent the soil from falling out of the sampler.
12. After retrieval, the sample is visually logged and immediately sealed with aluminum foil lined caps, labeled, and chilled. Clean ice chests and chemical ice ("blue ice") are used to keep the samples cold until delivered to the chemical laboratory. Teflon seals are also available for field samples.
13. Samples are delivered to the laboratory the same day they are taken, if physically possible. If the samples must be held until the next day, they are kept frozen in a secure freezer at the G.R.I. facility.
14. Sample control is maintained by a Chain of Custody form which accompanies the sample. The form documents the time, date, and responsible person during each step in the transportation process.



APPENDIX A

MONITORING WELL SAMPLING PROTOCOL

II. Groundwater Sampling

A. Decontamination

All equipment that is used in a monitoring well for purging, sampling, or depth measurement is decontaminated by steam cleaning or a TSP wash and rinse procedure prior to use and before re-using when more than one sample is collected.

B. Purge Volume Determination

The following procedure is following to determine the appropriate purging volume prior to well sampling.

1. The depth-to-water is measured by a clean, electric level indicator. Measurement datum is the top of fill ring or top of well protector.
2. Depth to the bottom of the well is measured by a clean tape and plumb bob. If possible, this is compared to the well construction log to determine inconsistencies, i.e. damaged casing, sediment in casing, etc.
3. Water volume is calculated by multiplying total water depth by the inside diameter of the casing. This figure is one well volume.

C. Well Purging and Sampling

1. Prior to sampling, a minimum of three to five well volumes are purged from each well to ensure that water sampled is representative of the groundwater within the formation.
2. Measurements of pH, conductivity and temperature are taken at frequent intervals during the purge. Stabilization of these values indicates that representative formation fluids are being removed from the well.



Appendix A (cont'd)

3. In the event that the well is pumped dry, an alternate procedure will be followed. Once a well is pumped dry, the after that enters the well during recovery is, by definition, representative formation water. The well will, therefore, by pumped dry and allowed to recover to 80% or more of the original water level.
4. Purge water is pumped directly into barrels on site until the proper method of disposal is determined,.
5. Samples pumped directly into sampling bottles prepared by the state certified laboratory contracted for the particular job are labeled and placed in refrigerated coolers for transport to the laboratory.
6. Samples are delivered directly to the lab on the same day of sampling by courier, whenever practical. If next day delivery is necessary, the samples are kept refrigerated at 4 degrees C overnight and delivered to the laboratory the following morning.
7. Samples are accompanied by a Chain of Custody form which documents the time, date and responsible person during each step of the transportation process.
8. The G.R.I. coded sample numbering system allows identification of sample and client to G.R.I., while not revealing the client to the laboratory or other interested parties.

STATE OF CALIFORNIA
STATE AND CONSUMER SERVICES AGENCY CONTRACTORS STATE LICENSE BOARD
DEPARTMENT OF



Building Quality



HAZARDOUS SUBSTANCES REMOVAL AND REMEDIAL ACTIONS CERTIFICATION

Pursuant to the provisions of Section 7058.7 of the Business and Professions Code, the Registrar of Contractors does hereby certify that the following qualifying person has successfully completed the hazardous substances removal and remedial actions examination.



Qualifier: ANTHONY M. RAMIREZ
License No.: 520768
Namestyle: G R I

WITNESS my hand and official seal this
14 day of JULY, 1988

J. M. Aloney
Registrar of Contractors

13L-36 (1/88)

This certification is the property of the Registrar of Contractors, is not transferable, and shall be returned to the Registrar upon demand when suspended, revoked, or invalidated for any reason.

A1530



**GROUNDWATER
RESOURCE
INDUSTRIES**

GROUNDWATER RESOURCE INDUSTRIES
(G.R.I.)

HEALTH AND SAFETY PLAN



**GROUNDWATER
RESOURCE
INDUSTRIES**

**GROUNDWATER RESOURCE INDUSTRIES
(G.R.I.)
HEALTH AND SAFETY PLAN**

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1.0 PURPOSE

The purpose of this Plan is to assign responsibilities, establish personnel protection standards and mandatory safety procedures, and provide for contingencies that may arise while operations are being conducted at the site.

2.0 APPLICABILITY

The provisions of the Plan are mandatory for all on-site Groundwater Resource Industries (GRI) employees and subcontractors engaged in hazardous material management activities including, but not limited to, initial site reconnaissance, preliminary field investigation, mobilization, project operations, and demobilization.

Subcontractors shall provide a Health and Safety Plan for their employees covering any exposure to hazardous materials and shall complete all work in accordance with that plan. The subcontractor may choose to use the GRI Health and Safety Plan as a guide in developing its own plan or may choose to adopt GRI's plan. In either case, the subcontractor shall hold GRI harmless from, and indemnify it against, all liabilities in the case of any injury. GRI reserves the right to review and approve the subcontractor's plan at any time.

Grossly inadequate Health and Safety practices on the part of the subcontractor or the belief that the subcontractor's personnel are or may be exposed to an immediate health hazard, shall be cause for GRI to suspend the subcontractors site work and ask the subcontractor's personnel to evacuate the hazard area.

The subcontractor shall provide its own safety equipment in accordance with Health and Safety Plan requirements. The subcontractor shall comply with all regulations including OSHA 29 CFR 1910.134 (Respiratory Protection).

3.0 RESPONSIBILITIES

3.1 SAFETY COORDINATOR

The Safety Coordinator (SC) generally shall not be involved directly in onsite activities. However, the SC shall provide the following functions in support of the field activities:

1. Maintain an adequate inventory of equipment in good working order.
2. Maintain all necessary files and records.



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3. Ensure that all monitoring equipment is calibrated on a regular basis and that the results are properly recorded and filed.
4. Ensure monitoring equipment is operating correctly and provide for maintenance if it is not.
5. Be available for consultation by the Project Manager or Safety Officer.

3.2 PROJECT MANAGER

The Project Manager (PM) shall direct on-site investigation operational efforts. At the site the PM, assisted by the Safety Officer (SO), shall have the primary responsibility for:

1. Ensuring that appropriate personal protective equipment is available and properly utilized by all on-site personnel.
2. Ensuring that personnel are aware of the provisions of this plan, are instructed in the work practices necessary to insure safety, and in planned procedures for dealing with emergencies.
3. Ensuring that personnel are aware of the potential hazards associated with on-site operations.
4. Monitoring the safety performance of all personnel to ensure that the required work practices are employed.
5. Correcting any work practices or conditions that may result in injury or exposure to hazardous substances.

3.3 SAFETY OFFICER

The Safety Officer (SO) shall:

1. Implement project Health and Safety Plans, and report any deviations from the anticipated conditions described in the plan.
2. Ensure that all on-site personnel have a minimum of 24 hours safety training.
3. Ensure that all monitoring equipment is recently calibrated.
4. Ensure monitoring equipment is operating correctly. (Report to Safety Coordinator if it is not.)

5. Be responsible for identifying all site personnel with special medical problems.
6. Preparing any accident/incident report.
7. Assume any other duties as directed by the PM.

3.4 PROJECT PERSONNEL

Project personnel involved in on-site operations shall be responsible for:

1. Taking all reasonable precautions to prevent injury to themselves and to their fellow employees.
2. Performing only those tasks that they believe can be done safely, and immediately reporting any accidents and/or unsafe conditions to the SO or PM.
3. Implementing the procedures set forth in the Health and Safety Plan, and reporting any deviations from the procedures described in the Plan to the SO or PM for action.

4.0 BACKGROUND

All personnel shall be knowledgeable concerning the following topics on a site specific basis including, but not limited to:

Site History
Prior Activity
Suspected Hazards

5.0 EMERGENCY CONTACTS AND PROCEDURES

5.1 CONTACTS

Should any situation or unplanned occurrence require outside or support services, the appropriate contact from the following list should be made:

Agency	Contact Person	Telephone
Police	_____	_____
Fire	_____	_____
Ambulance	_____	_____
Hospital	_____	_____



Project Manager _____
Safety Coordinator _____
Safety Officer _____
Client Contact _____

5.2 PROCEDURES

In the event that an emergency develops on site, the procedures described below are to be immediately followed. Emergency conditions are considered to exist if:

--Any of the project personnel are involved in an accident or experiences any adverse effects or symptoms of exposure while on site; or

--A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

The following emergency procedures shall be followed:

1. Personnel onsite shall use the "buddy" system (pairs). Personnel shall pre-arrange hand signals or other means of emergency signals for communication in case of lack of radios or radio breakdown. The following hand signals are suggested:
 - Hand gripping throat: out of air, can't breathe
 - Grip partner's wrist or place both hands around own waist: leave area immediately
 - Hands on top of head: need assistance
 - Thumbs up: OK, I'm all right, I understand
 - Thumbs down: No, negative
2. The Safety Officer shall establish emergency evacuation routes and shall make all project personnel aware of these routes prior to the first onsite activities. In the event of an emergency, selection of the escape route shall be based on the nature of the emergency and wind direction.
3. Visual contact shall be maintained between on-site personnel. Support personnel shall remain in close proximity in order to assist in case of emergencies.
4. In the event that any of the personnel experiences any adverse effects or symptoms of exposure while on site all personnel shall immediately halt work and



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act according to the instructions provided by the Safety Officer.

5. Wind indicators, visible to all on-site personnel, shall be provided by the Safety Officer to indicate possible routes for upwind escape.
6. The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated shall result in the evacuation of the on-site personnel and re-evaluation of the hazard and the level of protection required.
7. In the event that an accident occurs, the SO shall complete an Accident Report Form for submittal to the Safety Coordinator (SC). The SC shall initiate action to correct the situation that caused the accident.

**6.0 HAZARD CHARACTERISTICS, MONITORING METHODS
AND PROTECTION REQUIRED**

All personnel shall be knowledgeable concerning the following topics on a site specific basis including, but not limited to:

Exposure Limits
Recognizable Characteristics
Symptoms of Overexposure
Potential Chronic Effects
First Aid Treatment
Monitoring Methods
Action Levels
Protection Measures

7.0 STANDARD SAFE WORK PRACTICES

7.1 GENERAL

1. Eating, drinking, chewing gum or tobacco, and smoking shall be prohibited in the contaminated or potentially contaminated area or where the possibility for the transfer of contamination exists.
2. Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid, whenever possible, kneeling on the ground, leaning or sitting on equipment or ground. Do not place monitoring equipment on potentially contaminated surface (i.e., ground, etc.).



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3. All field personnel shall make use of all their senses to alert them to potentially dangerous situations which they should avoid (i.e. presence of strong, irritating or nauseating odors).
4. Prevent spillages to the extent possible. In the event that a spillage occurs, contain liquid immediately.
5. Prevent splashing of the contaminated materials.
6. Field personnel shall be familiar with the physical characteristics of the investigation site, including:
 - Wind direction
 - Accessibility to associates, equipment, vehicles
 - Communications
 - Hot zone (areas of known or suspected contamination)
 - Site access
 - Nearest clean water sources
7. The number of personnel and equipment in the contaminated area shall be minimized, but only to the extent consistent with workforce requirements of safe site operations.
8. All wastes generated during on-site activities shall be disposed of in accordance with all applicable laws and regulations.

7.2 EXCAVATION AND WELL INSTALLATION PRACTICES

For all excavation and well installation activities, the following standard safety procedures shall be employed:

1. All equipment shall be cleaned before proceeding to site, and after the excavation and/or well installation has been completed.
2. Only the minimum number of personnel necessary to achieve the objectives shall be within 25 feet of the excavation and/or drilling activity.
3. If the emergency and backup subcontracted personnel are at the site, they shall remain 25 feet from the excavation and/or drilling activity, where practical.



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4. Exclusion zones shall be established with designated hot lines. Delineation of a hot line shall reflect the interface between areas at and below a predetermined threshold contaminant concentration based on available data. This determination shall be made by the Safety Officer.
5. All unauthorized personnel shall remain outside exclusion zones at all times.