

BIOREMEDIATION PILOT PROJECT
WORK PLAN

SEQUOIA
ENVIRONMENTAL
Serving People and the Environment

Nov. 4, 1992

Prepared for
Mr. Francis Collins
Clement Avenue Project
Alameda, California

Site Located at
2235 Clement Avenue Project
Alameda, California

Sequoia Environmental is a minority-owned small business enterprise and an active participant in government affirmative action programs.



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November 4, 1992
CAP-003-R2

Mr. Francis Collins
Clement Avenue Project
6050 Hollis Street
Emeryville, CA 94608

Post-It™ brand fax transmittal memo 7671		# of pages ▶ 2
To <i>Chris Labuzoh</i>	From <i>Kevin Tinsley</i>	
Co. <i>Sequoia Envir</i>	Co. <i>Alameda Co.</i>	
Dept.	Phone # <i>271-4320</i>	
Fax # <i>654-1611</i>	Fax # <i>569-4757</i>	

RE: Work Plan for Pilot Bioremediation Project
Clement Avenue Project, 2235 Clement Avenue, Alameda, California.

Dear Mr. Collins:

INTRODUCTION

Clement Avenue Project has contracted with Sequoia Environmental Consulting Services to prepare the work plan for a pilot bioremediation program at 2235 Clement Avenue in Alameda, California. The pilot program is a proactive action taken by Clement Avenue Project to maintain a clean environment as encouraged by the Alameda County Environmental Health Agency. The Agency has expressed willingness to review the cleanup pilot program.

SITE BACKGROUND

The subject property is situated in a light industrial and commercial area of the City of Alameda. It is approximately 100 feet from the Oakland Estuary. A warehouse is on the property. The last known tenant was engaged in corrugated metal fabrication.

Previous work performed at the property included a preliminary subsurface investigation conducted on April 11, 1991, by RGA, Inc. of Emeryville, California. Collected soil samples were analyzed by BC Analytical of Emeryville, California. The soil is silty sand to silty clay. Laboratory analyses showed elevated levels of some priority pollutants above background levels. During June 1991, additional subsurface investigations were performed by RGA, Inc., and collected soil and groundwater samples were analyzed by BC Analytical. Depth to groundwater is approximately 5-10 feet below ground surface. Laboratory results showed some of the compounds detected were hydrocarbons found in coal tars, including PNA's. These compounds are reported as carcinogenic by the State Public Health Services Survey.

POTENTIAL HEALTH AND SAFETY IMPACTS

The property is surrounded mostly by light industrial and commercial buildings. A ball park is located about 1,000 feet west of the property. To the north is the Oakland Estuary.

The elevated levels of some of the priority pollutants contained in the soils appear to have impacted the shallow groundwater table. Some of these pollutants are known to the State of California to cause cancer.

Since the groundwater is not used for domestic consumption, there is no immediate danger to the local population. Groundwater in Alameda is mostly used for farm irrigation.

PILOT PROGRAM

The pilot project test area will be constructed in a square configuration around converted monitoring well B-19. Soil and groundwater samples from this monitoring well showed *comparatively high* levels of priority pollutants. Perforated PVC pipes will be inserted into a total of five 3-inch pilot borings which will be used as application points. Four of the pilot borings (PB-1 through PB-4) will be located in the corners of the square configuration around monitoring well B-19 and will be drilled to 15 feet below ground surface. The fifth boring (PB-5) will be located at the center of the configuration square and will be drilled to 1 foot below ground surface. This center boring will be used for bacteria injection, testing, and periodic monitoring. See Figure 1 for proposed boring locations.

Composite soil samples will be collected from the soil borings. The samples will be tested for moisture content, pH, nitrogen, phosphorous and potassium. Depending upon the soil condition, bacteria counts may also be taken.

A mixture of biological materials will be injected into the contaminated area through pilot boring PB-5. The biological materials will consist of unaltered hydrocarbon-consuming bacteria and nutrients. The nutrient mix will consist of a combination of sugar beet, limestone, potash, brewers yeast and/or molasses.

MONITORING PROGRAM

The pilot program will be monitored monthly in order to establish contamination levels. The monitoring program will also be used to check and ensure that the bacteria remain active.

When the contamination levels become extremely low, additional nutrients will be injected into the test area in order to keep the bacteria active in cleaning up the remaining *tainted soil*.

DURATION OF PILOT PROGRAM

When the pilot project is completed, final samples will be collected and analyzed at a certified laboratory to confirm the level of cleanup attained. The expected cleanup level will be approximately one part per million or less. This level is expected to be attained within a twenty week period.

If you have any questions about the meeting, please feel free to call me at (510) 654-1600.

Sincerely,



Chris Wabuzoh
Project Geologist
REA #02842

Nov 13, 1992

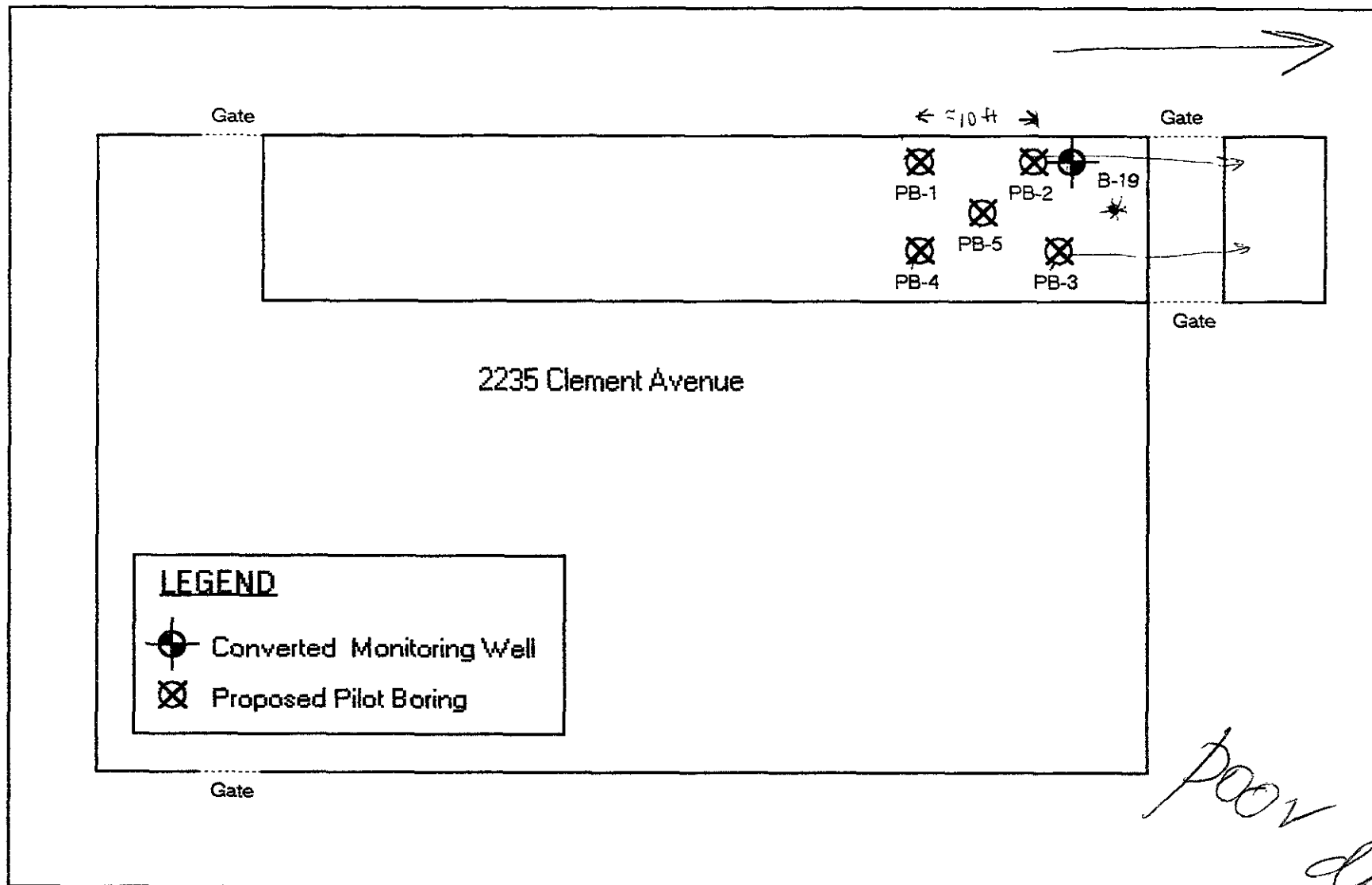


Figure 1
Proposed Boring Locations for Pilot Program

Fax Transmittal Memo 7872

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Today's Date 1-22-93 Time

To KEVIN TINSLEY

From Chris Wabuzoh

Company Alameda County Environ. H. Agency

Company Sequoia Environmental

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Location Emeryville

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Comments

Original
Disposition Destroy Return Call for pickup

January 21, 1993

Mr. Kevin Tinsley
 Hazardous Material Inspector
 Alameda County Environmental Health Agency
 Oakland, California

Re: Work Plan for Pilot Bioremediation Project
 Clement Avenue Project
 2235 Clement Avenue
 Alameda, California

Dear Mr. Tinsley:

INTRODUCTION

This letter is to correct some misrepresentation in the letter of November 4, 1992, sent to you. The letter will also address some of your concerns about the pilot project in the areas of sampling protocol, waste management and site safety plan.

PILOT PROGRAM

The pilot program is designed to use native bacteria at the subject site to remediate the soil contamination due to past usage. The suspected contaminant at the subject site is creosote. This was revealed during previous assessments of the subject site. There is no indication of other contaminant detected at the subject site.

Native bacteria at the subject site will be cultured to increase their population. This process will also be achieved by the use of other native occurring bacteria such as Lactobacillus and Arthrobacter. To maintain an optimum environment for the bacteria to function and to balance the soil nutrients sugar beets will be applied periodically.

The pilot project test area will be constructed in a square configuration around monitoring well B-19. Soil and groundwater samples from this monitoring well showed comparatively high levels of priority pollutants. Four 3-inch pilot borings will be located at the corners of the configured square. The borings will be drilled to 5-feet below ground surface. Perforated PVC pipes will be inserted into the four pilot borings. These four borings will be used as application points for nutrients. A fifth pilot boring will be located at the center of the square. The fifth boring will be drilled to 1 foot below ground surface. This fifth boring will be used for bacteria injection, testing point, and periodic monitoring point. The effect of periodic tide on the project will be monitored in monitoring well B-19. Based previous site assessment the depth to groundwater at the subject site is between 5 feet to 8 feet below ground surface. It is anticipated that tidal influence may affect future measurements of the depth to groundwater.

SAMPLING PROTOCOL

Prior to the injection of nutrients and bacteria soil and water samples will be collected. The soil samples will be collected in brass sleeves using a hand auger. The brass sleeves ends will be covered with aluminium foil, capped with Teflon caps and taped with duct tape. The water samples will be collected with Teflon bailer into a 40-ml vials. All samples will be placed on ice pending transportation to a state-certified laboratory. All sampling equipment will be washed in trisodium phosphate solution and double rinsed in water and distilled water. Subsequent monitoring will be performed on a monthly basis. A report will be generated describing all field activities, field observations and, laboratory results and chain of custody.

WASTE MANAGEMENT

The bioremediation process will not generate hazardous waste. The bacteria will not generate any hazardous waste because they feed on the contaminants are their natural source of food. The normal waste to be expected are those of by-product of nutrition which are carbon dioxide and water. All remediation processes are in-situ or below ground. All soil cuttings and purged water well when generated will be