**INNOVATIVE TECHNICAL SOLUTIONS, Inc.**

ITSI

December 28, 1998

Project Number 97-037.02

Mr. Joseph Cotton
City of Oakland
Environmental Services
1333 Broadway, Suite 330
Oakland, CA 94612

**Completion Report**
**Treatment of Groundwater Impacted with Petroleum Hydrocarbons**
**Using Enhanced Natural Bioremediation**
**2662 Fruitvale Avenue**
**Oakland, California**

Dear Mr. Cotton:

Innovative Technical Solutions, Inc. (ITSI) is pleased to provide this Completion Report for treatment of groundwater impacted with petroleum hydrocarbons using enhanced natural bioremediation for the site at 2662 Fruitvale Avenue in Oakland, California. The work was performed consistent with the September 18, 1998 *Workplan for Treatment of Groundwater Impacted with Petroleum Hydrocarbons Using Enhanced Natural Bioremediation.*

## Field Activities

In October 1998, ITSI implemented the field activities described in the Workplan. The following activities were performed:

- Prepared site-specific Health and Safety Plan.
- Obtained drilling permit number 98WR449 from Alameda County Public Works Agency.
- Notified Underground Service Alert (USA) and performed subsurface utility clearance of proposed boring locations.
- Advanced soil borings along downgradient portion of the site and placed ORC®



1330 Broadway, Suite 1625, Oakland, CA 94612 (510) 286-8888 (510) 286-8889 fax

Oakland
All-America City
1993

CITY OF OAKLAND

DALZIEL BUILDING • 250 FRANK H. OGAWA PLAZA, SUITE 5301 • OAKLAND, CALIFORNIA 94612

Public Works Agency
Environmental Services

(510) 238-6688
FAX (510) 238-7286
TDD (510) 238-7644

# 4457

January 4, 1999

Mr. Barney Chan
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Completion Report: Treatment of Groundwater Impacted with Petroleum Hydrocarbons Using Enhanced Natural Bioremediation
2662 Fruitvale Avenue
Oakland, California

Dear Barney:

The City of Oakland Environmental Services Division is pleased to present this report describing treatment of hydrocarbon-impacted groundwater at the above-referenced site. Oxygen releasing compounds (ORC) were injected into shallow groundwater to augment natural degradation of petroleum hydrocarbons and associated aromatic compounds. The effectiveness of the treatment will be monitored as part of on-going semi-annual groundwater monitoring activities at the site. An upcoming groundwater monitoring report will be submitted to your office in early February 1999.

Should you have any questions or require additional information, please do not hesitate to contact me at (510) 238-6259.

Sincerely,

Joseph A. Cotton
Environmental Program Specialist

2662GW COV
01-04-99

grout under pressure.

- Placed absorbent sock in MW-13 to remove floating product.

Health and Safety Plan

A site-specific Health and Safety plan was prepared prior to implementation of the proposed field work. A copy of the Health and Safety Plan is provided as Attachment A.

Permitting

A Drilling Permit Application was submitted and permit number 98WR449 was obtained from the Alameda County Public Works Department for the drilling of 10 soil borings. A copy of the permit is provided as Attachment B.

Subsurface Utility Clearance

Underground Service Alert (USA) was notified 48-hours prior to drilling activities at the site. In addition, California Utility Survey, an independent utility locating contractor experienced in working within the City of Oakland, was also retained to clear the locations of the soil borings on October 28, 1998.

Advancement of Soil Borings and Placement of ORC®

Ten soil borings were advanced along the downgradient edge of the site on October 30, 1998, for the purpose of injecting oxygen-releasing compounds (ORC®) into the upper water-bearing zone underlying the site. The borings were located near the western corner of the site along the upgradient edge of the impacted groundwater, as shown in the attached Figure 1. Soil borings were placed by direct-push technique, hydraulically pushing a small-diameter (1/2-inch diameter) Geoprobe® drill rod into the subsurface. The total depth of the borings was approximately 20 feet, extending approximately 10 feet below the top of the groundwater.

The ORC® grout was mixed at the site and injected under pressure (between 500 to 1,000 psi) into the subsurface through a grout pump and pressure rod. The rod was raised from the base of the boring to the top of the saturated zone at around 10 feet in depth, distributing the grout throughout the saturated zone. Approximately 40 pounds of magnesium peroxide was injected into each boring.

Placement of Absorbent Sock

A 1 1/2-inch diameter absorbent sock was placed within monitoring well MW-13 at the top of the groundwater to absorb floating product. A thin layer (0.02 feet) of floating product has been

identified on the surface of the groundwater in monitoring well MW-13 during the last two semi-annual monitoring events.

Monitoring

The effectiveness of the treatment will be monitored as part of the ongoing semi-annual groundwater monitoring activities at the site. The absorbent sock placed in MW-13 will be inspected and replaced, as needed, during the semi-annual groundwater monitoring events until the presence of floating product is no longer observed.

Please give us a call if you have any questions regarding the above information.

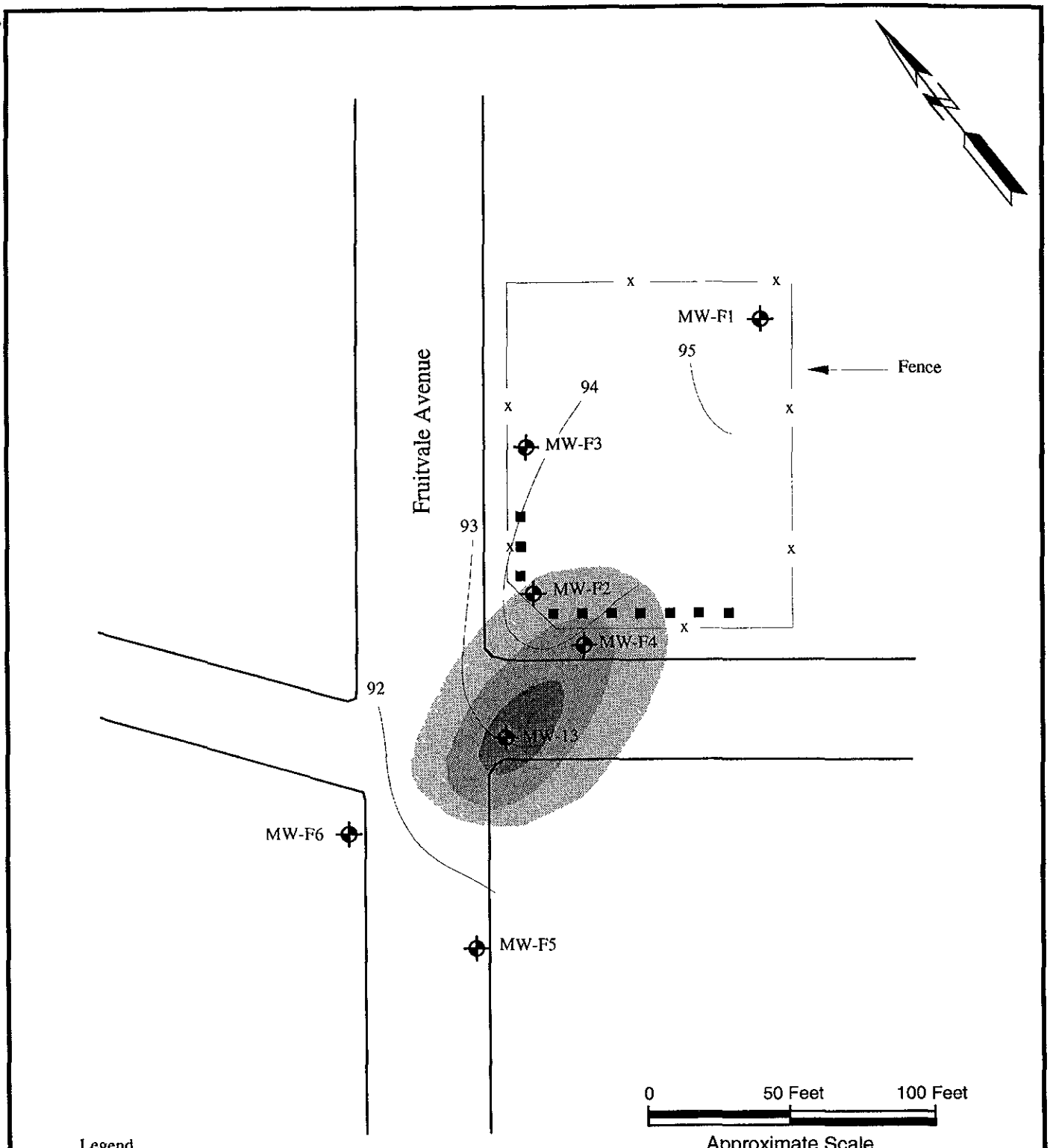
Sincerely,

Jeffrey D. Hess, R.G.
Project Director

Attachments

cc: Kevin O'Dea, Baseline

97-037.02F.1-Bonngs




Legend

- Approximate Location of Monitoring Wells
- Approximate Location of Soil Borings
- TPHg ≥ 0.1 mg/L from March 1998 Quarterly Monitoring
- TPHg ≥ 1 mg/L from March 1998 Quarterly Monitoring
- TPHg ≥ 10 mg/L from March 1998 Quarterly Monitoring
- Groundwater Contours from March 1998 Quarterly Monitoring

Source: Modified from Figure 3, Groundwater Elevation Contour Map, 13 December 1996, BASELINE

**FIGURE 1**

**APPROXIMATE LOCATIONS OF SOIL BORINGS FOR PLACEMENT OF ORC**

2662 Fruitvale Avenue
Oakland, California

**CITY OF OAKLAND**

ITSI
**INNOVATIVE TECHNICAL SOLUTIONS, INC.**

# ATTACHMENT A

# COPY OF HEALTH AND SAFETY PLAN

# HEALTH AND SAFETY PLAN

## ORC INJECTION
## 2662 FRUITVALE AVENUE
## OAKLAND, CA

## INTRODUCTION

This Health and Safety Plan (Plan) will be in effect during drilling activities at 2662 Fruitvale Avenue in Oakland, California. The drilling will be conducted using direct-push technique. The Plan considers the potential exposure to soil and groundwater containing petroleum hydrocarbons during drilling.

## PERSONNEL

Site Health and Safety Officer- The Site Health and Safety Officer, Jeff Hess, will be responsible for briefing field personnel and contractors prior to project initiation on hazard assessment, personal protective equipment, and implementation of the Plan.

The Site Health and Safety Officer will also conduct tailgate safety meetings, as appropriate during field operations, to inform the field personnel and contractors of changing field conditions and any potential changes in the Plan.

Project Manager- The Project Manager, Jeff Hess, will be responsible for all technical aspects of the project, and will assure that the requirements of the Plan are implemented.

Field Personnel- Field personnel will be responsible for understanding and complying with requirements of the Plan. They will acknowledge and sign a copy of this Plan, and will attend tailgate safety meetings, as required.

## CONTAMINANTS

This Plan considers potential exposure to soil and groundwater containing petroleum hydrocarbons during drilling. Toxicological information for the potential contaminants at the site are listed below:

| Chemical | PEL or TLV (ppm) | Carcinogen? | Absorbed through skin? |
|---|---|---|---|
| TPH - gasoline | 300 | No | No |
| TPH - diesel | None | No | Yes |
| Benzene | 1 | Yes | Yes |
| Toluene | 50 | No | Yes |
| Ethylbenzene | 100 | No | No |
| Xylenes | 100 | No | No |

## POTENTIAL EXPOSURE AND ROUTES OF ENTRY

Potential exposure to petroleum hydrocarbons may occur during sampling of monitoring wells. The primary routes of entry would be:

- Inhalation
- Ingestion
- Dermal contact

Potential exposure via inhalation should be minimal during this project. Ingestion exposure will be controlled by strict limitation of eating, drinking, and smoking in work areas. Dermal exposure will be controlled by limiting contact through safe work pactices, personal protective clothing, and personal hygeine.

## PHYSICAL HAZARDS

Notable physical hazards will be posed by the physical hazards associated with drilling activities. Excessive noise may be encountered while working around heavy equipment.

## PERSONAL PROTECTIVE EQUIPMENT

All personnel in the active work area will be required to wear a hard hat, steel-toe boots, and safety glasses to protect against injury. Additionally, all personnel working in vehicle traffic areas will wear orange reflective vests for improved visibility.

## EMERGENCIES IN THE FIELD

In case an accident should occur in the field, the nearest appropriate emergency facility will be notified immediately. The locations of the nearest emergency facilities to the project site are:

Hospital

- Highland Hospital (510) 437-4261
  1411 East 31st Street, Oakland

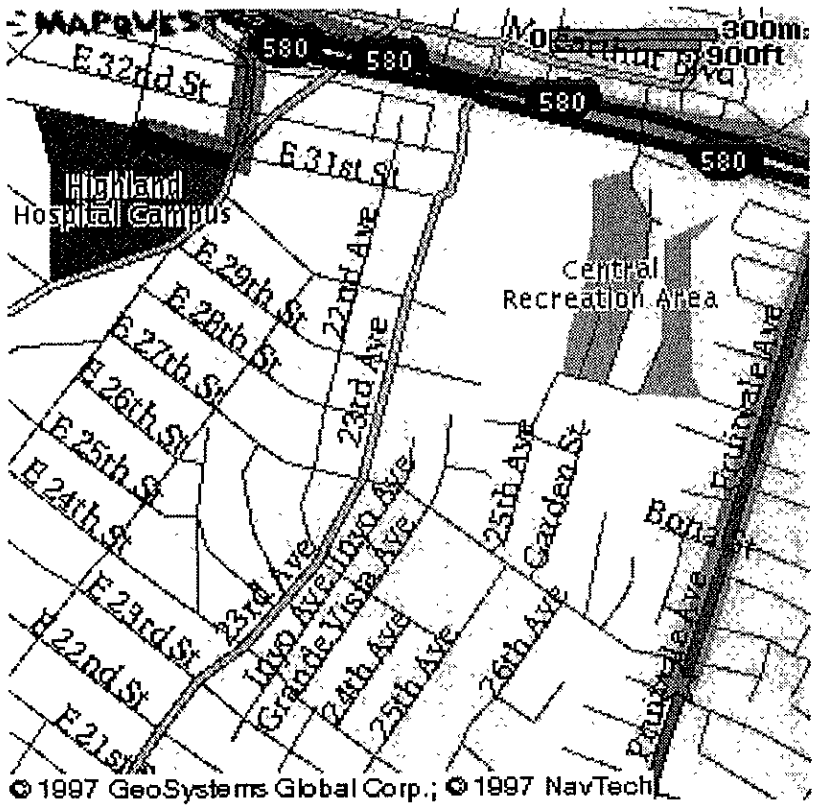
Police Department

- Oakland Police Department 911 or (510) 238-3481

Fire Department

- Oakland Fire Department 911 or (510) 238-3851

Directions from the project site to the hospital are shown below:




Go north on Fruitvale Avenue to I-580. Take the I-580 west onramp and merge onto I-580 west. Take the exit towards 14th Avenue/Park Boulevard. Turn left onto Beaumont Avenue, then turn right onto East 31st Street.

## ACCIDENT REPORT

In case of accident, the Site Health and Safety Officer will provide a report to the Project Manager describing the following:

- The nature of the event that required notification of off site personnel or agencies
- The date, time and names of personnel and agencies notified, and their response.
- A description of personnel injury and/or property damage.
- A description of the resolutions of the incident.

## ACKNOWLEDGMENT AND UNDERSTANDING OF PLAN

Field personnel will be briefed on the nature of work at the site, potential hazards, and protective clothing requirements prior to site work. The personnel will then be asked to sign the following statement:

**This Health and Safety Plan has been explained to me. I agree to abide by the Plan and procedures outlined herein. I understand that non-compliance with the Plan may lead to termination of my employment.**

| Signature: | Date: |
|---|---|
| [signature] | 10-30-98 |
| [signature] | 10/30/98 |
| [signature] | 10/30/98 |
| | |
| | |
| | |

# ATTACHMENT B

# COPY OF ALAMEDA COUNTY PUBLIC WORKS DEPARTMENT DRILLING PERMIT

**COUNTY OF ALAMEDA**
**PUBLIC WORKS AGENCY**
**951 TURNER COURT, SUITE 300**
**HAYWARD, CA 94545-2651**
**(510) 670-5543**

**DATE:** 10/27/98

No. of Pages (including cover): 2

# FAX TRANSMITTAL

| | |
|---|---|
| **T** | Jeff Hess |
| **O** | Innovative Tech Sol. |
| | |
| | **FAX:** (925) 256-8998 |

| | |
|---|---|
| **F** | ALVIN KAN |
| **R** | WATER RESOURCES |
| **O** | |
| **M** | **FAX: (510) 670-5262** |

Should you have problems receiving this FAX transmittal, please call: (510) 670-5248

SUBECT: WELL PERMIT APPLICATION

TRANSMITTING THE FOLLOWING:

POO - Fax form

# ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
951 TURNER COURT, SUITE 300, HAYWARD, CA 94545-2651
PHONE (510) 670-5575 ANDREAS GODFREY FAX (510) 670-5262
(510) 670-5248 ALVIN KAN

## DRILLING PERMIT APPLICATION

**FOR APPLICANT TO COMPLETE**

LOCATION OF PROJECT 2662 Fruitvale Ave, Oakland, CA 94649

California Coordinates Source _____ ft. Accuracy ± ____ ft.
CCN _____ ft. CCE _____ ft.
APN 027 0846016001

CLIENT
Name City of Oakland
Address 1333 Broadway #350 Phone 238-6259
City Oakland Zip 94612

APPLICANT
Name Innovative Technical Solutions
attn Jeff Hess Fax (925)256-8998
Address 2955 Mitchell #111 Phone (925)256-8998 x104
City Walnut Creek Zip 94598

TYPE OF PROJECT

| Well Construction | | Geotechnical Investigation | |
|---|---|---|---|
| Cathodic Protection | ☐ | General | ☐ |
| Water Supply | ☐ | Contamination | ☒ ORC grout placement |
| Monitoring | ☐ | Well Destruction | ☐ |

PROPOSED WATER SUPPLY WELL USE

| | | | |
|---|---|---|---|
| New Domestic | ☐ | Replacement Domestic | ☐ |
| Municipal | ☐ | Irrigation | ☐ |
| Industrial | ☐ | Other _____ | ☐ |

DRILLING METHOD:

| | | | | | |
|---|---|---|---|---|---|
| Mud Rotary | ☐ | Air Rotary | ☐ | Auger | ☐ |
| Cable | ☐ | Other | ☒ | Geoprobe | |

DRILLER'S LICENSE NO. #589008 (C-57) (Fast-Tek)

WELL PROJECTS
Drill Hole Diameter _____ in. Maximum
Casing Diameter _____ in. Depth _____ ft.
Surface Seal Depth _____ ft. Number ____

GEOTECHNICAL PROJECTS
Number of Borings 10 Maximum
Hole Diameter 1 in Depth 20 ft.

ESTIMATED STARTING DATE 10/30/98
ESTIMATED COMPLETION DATE 10/30/98

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Jeffrey Hess DATE 10/26/98

**FOR OFFICE USE**

PERMIT NUMBER 98WR449
WELL NUMBER _____
APN _____

**PERMIT CONDITIONS**

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
(2.) Submit to ACPWA within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
(3.) Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

(D.) GEOTECHNICAL.
Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

E. CATHODIC
Fill hole above anode zone with concrete placed by tremie.

F. WELL DESTRUCTION
See attached.

G. SPECIAL CONDITIONS

APPROVED Alvin Kan DATE 10/27/98