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TRANSMITTAL

TO: Mr. Scott Seery
Alameda County Health Care
80 Swan Way, Room 200
Oakland, California 94621

DATE: February 19, 1993
PROJECT NUMBER: 69013.11
SUBJECT: ARCO Station 2152,
22141 Center Street, Castro Valley, CA

FROM: Valli Voruganti
TITLE: Project Engineer

WE ARE SENDING YOU:

COPIES	DATED	NO.	DESCRIPTION
1	2/19/93	69013.11	Shutdown of Operating Interim Soil Vapor Extraction System at the above subject site.

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- For review and comment Approved as submitted Resubmit ___ copies for approval
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 For your files

REMARKS: cc: Mr. Michael Whelan, ARCO Products Company
Mr. Joel Coffman, RESNA Industries Inc.
Mr. Scott Owen, BAAQMD

Copies: 1 to RESNA project file no. 69013.11

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February 19, 1993
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69013.11

Mr. Scott Seery
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94624

Subject: Shutdown of Operating Interim Soil Vapor Extraction System at ARCO
Station 2152, 22141 Center Street, Castro Valley, California.

Dear Mr. Seery:

As stated in the January 26, 1993 facsimile to ACHCSA, the interim soil vapor extraction system (VES) at the above subject site was started up on January 25, 1993. The system extracts petroleum hydrocarbon vapor from subsurface soils by using a 7.5 horsepower (hp) positive displacement blower that pulls extracted vapor from four vapor extraction wells (VW-2 through VW-5). Extracted vapor is then abated by three 2,000 pound vapor phase granular activated carbon filters in series, prior to being discharged to the atmosphere.

The VES has been in continuous operation since January 25, 1993. The system has been monitored on a daily basis pursuant to the requirements of Bay Area Air Quality Management District (BAAQMD) Application Number 8270, which calls for daily monitoring for the first ten days of operation, followed by weekly monitoring. Organic vapor concentrations are monitored weekly using a portable photo-ionization detector (PID).

The VES has been able to extract no more than 30 to 109.5 standard cubic feet per minute (scfm) of extracted vapor from subsurface soils. Laboratory analyses of air samples collected reported average TPHg concentrations of 340 milligrams per cubic meter (mg/m^3 , 86 parts per million by volume (ppmv)). Based on the above-detailed extraction air flow rates and TPHg concentrations, estimated hydrocarbon removal rates by the VES ranged from 0.91 pounds per day (lb/day, 0.15 gallons per day [gal/day]) to 3.3 lbs/day (0.5 gals/day) from onsite subsurface soils. Based on a vapor extraction test (VET) conducted

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EXPLANATION TO ARCO 2152 REMEDICATION SCHEDULE

1). ONSITE SUBSURFACE INVESTIGATION

Preliminary investigations including a vapor extraction test (VET) were completed prior to October 1991. Results of the onsite investigations were summarized in a report issued to the Alameda County Health Care Services Agency (ACHCSA) in July 1991.

2). ADDITIONAL ONSITE INVESTIGATION

A work plan for additional onsite investigation and soil remediation was submitted to ACHCSA and the Regional Water Quality Control Board (RWQCB) on October 21, 1991, to date, approval of work plan has not been granted. To date, an offsite investigation has not been necessary as hydrocarbons are limited to soils onsite.

3). REMEDIAL ACTION PLAN

Results of the VET performed at the site prior to October 1991 indicated that vapor extraction is a viable soil remedial alternative at this site. Based on VET results, a Remedial Action Plan (RAP) was submitted as described above in October 1991, for approval by the RWQCB and the ACHCSA before the proposed vapor extraction system (VES) can be installed. The RAP describes the proposed VES, its design, installation, and operation and maintenance. A preliminary schedule of work, including a construction schedule was presented. The work plan for soil remediation including onsite investigation has not been approved to date. It is anticipated that the regulatory agencies will review and approve the work plan at the earliest by February or March 1992. The estimated remediation schedule for this site will be delayed if review of the work plan is delayed or, if after review of the work plan, the regulatory agencies involved have comments and require submittal of a revised RAP.

A groundwater remediation system will not be necessary since onsite groundwater has not been impacted by petroleum hydrocarbons at concentrations exceeding currently known State cleanup levels.

4). **PRELIMINARY AND DETAILED ENGINEERING DESIGN**

The estimated schedule shows that preliminary design is completed and has been submitted to the involved regulatory agencies with the RAP. The preliminary design assumes that only onsite soil remediation is needed. Preliminary design consists of analyzing site characterization data collected to date and developing a cost-effective conceptual design. The conceptual design consists of specifying the proposed vapor extraction system, the treatment system (type of abatement and location of remediation compound), and development of the process flow diagram (PFD). This information is used for environmental permitting and final design. It is anticipated that a vapor-phase carbon system will be used as the treatment technology for soil remediation at this site.

Work under the detailed engineering design includes: engineering calculations; bill of materials; preparation of Plans and Specifications, including site and remediation compound layouts; trench and section details; process and instrumentation diagram (P&ID) and a one line electrical diagram; in-house plan check and review; and one set of revisions to the Plans and Specifications by ARCO. Once the Plans and Specifications are finalized, planning and building permits are applied for and bids solicited from qualified contractors.

5). **PERMITTING**

Yes { Typically two types of permits are required for installation of the proposed soil and groundwater remediation systems; environmental, and planning and building permits. Environmental permits include: an Authority to Construct and Permit to Operate from the governing Air Board for systems where organic vapor emissions are likely (oil-water separators, aeration tanks, carbon (vapor phase), air strippers, and thermal or catalytic oxidizers); and a ~~Wastewater Discharge Permit from the RWQCB or the local Publicly Owned Treatment Works (POTW) for discharge of treated effluent from the proposed groundwater remediation system to the storm drain or local City sewer.~~ NA

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1/25/92
1/26/92
{ The air and wastewater discharge permit applications can be sent when the soil and groundwater remediation equipment has been identified during preliminary design. The governing Air Board has 60 days to issue the permit (Authority to Construct) or request additional information. ~~If a resubmission of the permit application is required, there will be an additional delay of up to 30 days.~~ Once operation of the remediation system has been initiated, a letter requesting a Permit to Operate is sent to the Air Board. The permit is received with 60 days, although the system can be in operation during this time. Since a vapor-phase carbon system is the anticipated vapor abatement unit for this site, an environmental permit will be required from the Air Board. The environment air permit application was submitted in December 1991.

Since quarterly monitoring results have shown that negligible levels of hydrocarbons have impacted onsite groundwater wells (below currently known State cleanup levels), groundwater remediation is not proposed at this site.

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{ Planning and building permits include submission of the complete set of Plans and Specifications to the local City Planning Building and Fire Departments for approval, prior to construction and installation of the proposed VES. These permits are typically granted within 30 days of receipt of the Plans and Specifications.

Questions, comments and additional requirements are usually handled informally by visits, telephone, or fax. A Hazardous Materials Management Plan (HMMP) is required to be submitted to the City Hazmat Department or Fire Department if hazardous materials are to be stored on site (such as oil-water separators and above ground product storage tanks). This is submitted at the same time the building permit is applied for if necessary, and should be approved within the 30-day timeframe.

The permitting schedule assumes that permitting can be completed within four to six months, provided encroachment permission, if required, is not delayed, and agencies do not require design changes which necessitate additional permitting.

6). EQUIPMENT SELECTION AND PROCUREMENT

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After engineering design is completed, a bid package will be prepared for submittal to construction contractors (a minimum of three). Contractor bids will be evaluated and a contractor shall be selected within one week of receiving the bids. Our consultant will then provide ARCO with an equipment list. ARCO orders equipment directly from the vendor. The schedule assumes that all equipment is available and

can be delivered within four weeks, and that involved regulatory agencies approve of selected equipment.

7). SYSTEM CONSTRUCTION AND STARTUP

Upon approval of the RAP, having secured local City Building, Fire, and Planning permit(s), after equipment procurement, and on selection of a general contractor, systems installation will commence in accordance with the approval Plans and Specifications.

System installation will include: construction of utility trenches to contain all necessary water, vapor, and electrical lines; installation of necessary underground pipes and electrical conduits to and from the proposed remediation compound; pressure testing lines for leaks; City inspection of utility trenches prior to closure; construction of the remediation compound; electrical service; and installation and plumbing of all soil remediation equipment.

The schedule assumes that construction will not be delayed by inclement weather, negotiations with lessor, and delays in utility installation.

After completion of system installation, operation of the proposed soil remediation system will be initiated in compliance with all applicable regulatory agencies. Startup procedures will include daily system monitoring, maintenance, sampling, analysis of system influent and effluent as required by the site specific environmental permits.

8). SYSTEM OPERATION AND MAINTENANCE

Systems operation and maintenance includes: site visits once every week of the first month; once every two weeks for the next month; and monthly visits for the remainder of the life of the remediation system. Site inspections will include: monitoring and adjustment of system parameters to optimize soil remediation system efficiency; periodic sampling and analysis of influent and effluent to the remediation system as required by the environmental permits; other periodic maintenance procedures including inspection and cleaning of all lines, process equipment, etc.; and monthly (or as required), reporting of results of systems operations to involved regulatory agencies.

The schedule assumes that soil remediation can be completed in one year, it is technically feasible to achieve State cleanup levels, no offsite wells are needed to complete remediation; and no significant equipment breakdowns occur.

The progress and expected duration of the soil and groundwater cleanup is dependent on physical and chemical factors such as: fluctuating groundwater levels both naturally and/or artificially induced (pumping of other wells near the site), and the correlation of data from specific points (wells and borings) with the actual conditions across the site. Variations in site geology and transmissivity of the aquifer may have an affect on the groundwater remediation schedule. Chemical factors such as the absorption potential of gasoline to soil can also affect the schedule for soil remediation. Duration of cleanup can be more accurately predicated after a performance evaluation on the system has been completed.

9). PERFORMANCE EVALUATION

Yielded vapor extraction flow rates, radius of influence, influent and effluent analytical data are reviewed to evaluate the efficiency of the soil remediation system. On the basis of this evaluation, it may be necessary to add new vapor extraction wells and/or adjust treatment system parameters.

The schedule assumes that the performance evaluation will show that the remediation system will effectively remove hydrocarbons from areas of impacted soil and will reduce extracted concentrations significantly over time. It also assumes that additional on or offsite vapor extraction wells are not required to effectively remediate impacted areas, once the treatment system is operational.

10). SYSTEM SHUTDOWN: SOIL REMEDIATION SYSTEM

Based on our consultant's experience, hydrocarbons concentrations in the soil can be significantly reduced to currently known State cleanup levels at most sites in approximately one year. After reviewing historical soil-vapor data collected from the extraction wells during system operation, the remediation system will be shut down after agency concurrence.

11). SYSTEM SHUTDOWN: GROUNDWATER REMEDIATION SYSTEM. BEGIN ONE-YEAR VERIFICATION MONITORING

The schedule assumes that installation of a groundwater remediation system is not necessary and that the existing low levels of hydrocarbons in onsite wells will be nondetectable and below state cleanup levels within one year of operation of the soil remediation system. The soil remediation system will be shut down when analytical data from impacted groundwater wells show that hydrocarbon concentrations have been reduced significantly and are below currently known agency-prescribed cleanup levels and after agency concurrence. Based on current regulations, the groundwater

must be monitored for a minimum of one year to verify cleanup, prior to applying for site closure.

The schedule assumes that cleanup will be completed one year after startup of the soil remediation system and only one year of verification monitoring is required.

12). **SITE CLOSURE**

Site closure is typically granted after an extensive RWQCB review of all historical data at the site. Closure involves cleanup of both soil and groundwater and is not addressed independently. To verify cleanup of previously impacted soil, verification borings will be drilled and samples collected and analyzed to shown that the soil has been remediated below State cleanup levels. To verify groundwater cleanup, verification monitoring data will be reviewed.

The schedule assumes that site closure involves only drilling of confirmation borings, confirmation of verification monitoring data and that no risk assessment will be required. It also assumes that site closure is dependent on agency concurrence within one year following completion of verification monitoring.

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ACTIVITIES	1991			1992					1993					1994					1995																
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A
1) Onsite Subsurface Investigation	COMPLETED																																		
2) Additional Onsite Investigation	[Hatched pattern]																																		
3) Remedial Action Plan	[Hatched pattern]																																		
4) Preliminary and Detailed Engineering Design	[Hatched pattern]																																		
5) Soil Remediation Permitting	[Hatched pattern]																																		
6) Equipment Selection and Procurement (including Bid Package Preparation and Selection)	[Hatched pattern]																																		
7) System Construction and Startup: Soil and Groundwater	[Hatched pattern]																																		
8) Soil Remediation System Operation and Maintenance (1 year)	[Hatched pattern]																																		
8a) Groundwater Remediation System: Operation and Maintenance (3 to 6 years)	[Hatched pattern] <i>Sooner? ←</i>																																		
9) Performance Evaluation	[Hatched pattern]																																		
10) System Shut Down: Soil Remediation	[Hatched pattern]																																		
11) Begin One Year Groundwater Verification Monitoring	Estimated completion of verification monitoring: 1995-1996																																		
12) Site Closure: Soil and Groundwater (1 year)	Estimated completion of site closure: 1995-1997																																		
EXPLANATION:	[Hatched pattern] Probable schedule based on current deadlines and reasonable time necessary to complete the task. Assumes no delays.															[Hatched pattern] Estimated schedule based on consultant's experience, on receiving regulatory and other approvals on time, and on other related work being completed on time.																			

- 1) Onsite Subsurface Investigation:**
 Preliminary investigations, including a vapor extraction test, were completed prior to October 1991.
- 2) Additional Onsite Investigation:**
 A workplan for additional onsite investigation and soil remediation was submitted in October 1991.
 The workplan has not been approved to date, but it is anticipated that approval can be received by February or March 1992.
 To date, an offsite investigation has not been necessary, as hydrocarbons are limited to soils onsite.
- 3) Remedial Action Plan:**
 It is anticipated that the ACHCSA can review and approve the remedial action plan (RAP) submitted in October 1991 by February or March 1992.
 No RAP revisions are necessary.
 No changes to design after regulatory comments.
 Vapor extraction test performed prior to October 1991 indicated that vapor extraction is a viable remedial alternative.
 Groundwater remediation will not be needed since onsite groundwater has not been impacted by hydrocarbons at concentrations exceeding currently known State cleanup levels.
- 4) Preliminary and Detailed Engineering Design:**
 Soil remediation design basis from pre- and post-1992 data.
 Only onsite remediation needed.

- 5) Permitting:**
 It is anticipated that permitting can be completed within 4 to 5 months.
 No design changes necessitating additional permitting, including modification of treatment system.
- 6) Equipment Selection and Procurement:**
 All equipment is available from stock up to 4 to 6 weeks.
 Selected equipment approved by ACHCSA.
- 7) System Construction and Startup:**
 No delays due to weather.
 No delays due to negotiation with property owners.
 No delays due to utility installation.
- 8 and 8a) System Operation and Maintenance:**
 It is technically feasible to achieve cleanup levels.
 No offsite remediation will be necessary.
 No significant equipment breakdowns.
 It is anticipated that soil remediation can be completed within one year.

- 9) Performance Evaluation:**
 Evaluation shows that system will effectively remove hydrocarbons from soil and groundwater impacted areas and will reduce concentrations significantly over time.
 Evaluation shows that additional vapor extraction wells are not required to effectively remediate impacted areas once the treatment system is operational.
- 10) Shut Down of Soil Remediation System:**
 Cleanup will be completed in approximately 1 year after startup.
- 11) Groundwater Verification Monitoring:**
 Cleanup will be completed at the end of the operation of the soil remediation system.
 Only one year of verification groundwater monitoring will be required before site closure can be initiated.
- 12) Site Closure: Soil and Groundwater:**
 Requirements for soil closure involve only drilling of confirmation borings and performance evaluation at time of system shutoff.
 Requirements for groundwater closure involves only groundwater monitoring.
 Closure dependent on agency concurrence within 1 year following completion of verification monitoring.
 No risk assessment will be required.

Note: Obtaining nondetect levels in groundwater and "low-level" cleanup levels in soil may not be technically feasible.

RESNA	ESTIMATED SOIL AND GROUNDWATER REMEDIATION IMPLEMENTATION SCHEDULE ARCO Station 2152 22141 Center Street Castro Valley, California	PLATE A
PROJECT 61078.01	Revision 1, 01/22/92	

12/15/92 - 12/14/91
 Castro Valley