Jw
4/27/93

CERTIFIED ENVIRONMENTAL CONSULTING INC.

January 25, 1993

REF: 92-173-979.021

how was gradient determined for this quarter.

Ms. Eva Chu
80 Swan Way
Room 200
Oakland, CA 94621

RE: Quarterly groundwater sampling results for the VA Medical Center Fire Station at 4951 Arroyo Road Livermore, CA.

Dear Ms. Chu:

Enclosed is a copy of the fourth quarter groundwater monitoring results for Livermore VA, 4951 Arroyo Road, Livermore, CA. Three wells were sampled using CEC's standard water sampling protocols as contained in Appendix A of this report. The samples were analyzed for Oil & Grease, TPH-diesel and BTX&E. The analysis for Oil & Grease Hydrocarbons was completed at your request. The samples were below detection limits on all parameters, results are included on table 1. The site map, water level data, field observations and data, laboratory results and a chain of custody are attached.

The samples were found to be below detection limits so no further remedial actions are recommended. CEC would like to request that the subject site be considered for case closure based on the previous groundwater data.

Please let us know if you have any questions.

Yours truly,

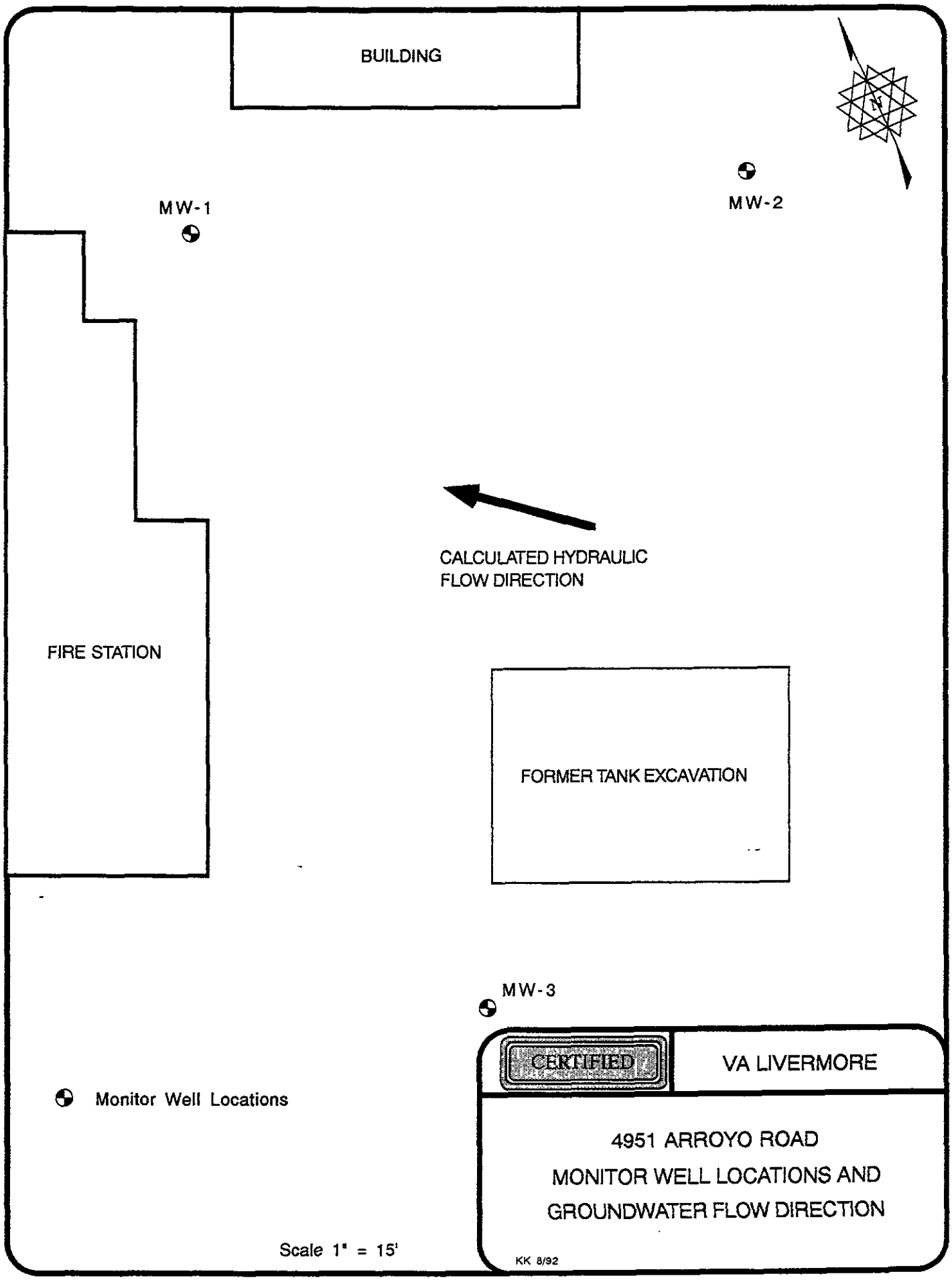
Scott L. Parker
Project Manager

Bradley G. Erskine Ph.D.
Benicia Branch Manager

Enclosures

140 West Industrial Way
Benicia, California 94510

Ofc (707) 745-0171
Fax (707) 745-0163
(800) 447-0171


BUILDING
N
MW-1
MW-2
CALCULATED HYDRAULIC
FLOW DIRECTION
FIRE STATION
FORMER TANK EXCAVATION
MW-3
Monitor Well Locations
CERTIFIED
VA LIVERMORE
4951 ARROYO ROAD
MONITOR WELL LOCATIONS AND
GROUNDWATER FLOW DIRECTION
Scale 1" = 15'
KK 8/92

SAMPLING RESULTS FOR THE VA MEDICAL CENTER FIRE STATION
NOVEMBER 1991 TO JANUARY 1993

WELL NUMBER	SAMPLE DATE	TPH-Diesel ppm	Benzene ppb	Toluene ppb	Ethyl Benzene ppb	Xylene ppb	Oil & Grease mg/L
MW-1	11/06/91	ND	15	0.8	4	76	-
	03/03/92	ND	ND	ND	ND	ND	-
	07/31/92	ND	ND	ND	ND	ND	ND
	1/08/93	ND	ND	ND	ND	ND	ND
MW-2	11/06/91	ND	ND	ND	ND	ND	-
	03/03/92	ND	ND	ND	ND	ND	-
	07/31/92	ND	ND	ND	ND	ND	ND
	1/08/93	ND	ND	ND	ND	ND	ND
MW-3	11/06/91	ND	ND	ND	ND	ND	-
	03/03/92	ND	ND	ND	ND	ND	-
	07/31/92	ND	ND	ND	ND	ND	ND
	1/08/93	ND	ND	ND	ND	ND	ND

ND - Non-detectable levels

4w GC315

CONTINENTAL ENVIRONMENTAL CONSULTING INC.
140 West Industrial Way, Benicia, CA, 94510-1016
Ofc. (707) 745-0171 (800) 447-0171 Fax. (707) 745-0163

Chain of Custody Record

Date: 1-8-93 Sheet 1 of 1

Project Number:
Project Name: VA Med Center
Address: Livermore

Sampler's Name: Troy W. Pew
Sampler's Signature: Troy W. Pew

Lab Name: McCampbell
Address: Concord, Ca
Phone Number:

Turnaround Time: ☐ Rush ☐ 24 Hour ☐ 48 Hour ☒ 5-Day
Report to: Scott Parker

Comments: Jones Rd

Sample Number	Location	Date	Time	TPH as Gasoline 8015	TPH as Diesel 8015	TPH-G and B,T,E,X 8015/8020	B,T,E,X & E 8020	Oil and Grease 5520	Volatile Organics (8010)	CAM Metals (17)	Pr. Pollutant Metals (13)	Base/Neu/Acids (Organic)	Pesticides 8140/8141	Matrix (Soil/Water)
MW-1		1-8-93	2:15		X		X	X	X					
MW-2		↓	2:21		↓		↓	↓	↓					
MW-3		↓	2:00		↓		↓	↓	↓					

No. 21224
No. 21225
No. 21226

Relinquished By	Date	Time	Received By	Date	Time
Troy W. Pew	1-8-93	5:20	1.	1-8-93	5:20
2.			2.		
3.			3.		
Dispatched By	Date	Time	Received for Lab By	Date	Time

Total Number of Containers This Sheet: 12

Method of Shipment:

Special Shipment / Handling or Storage Requirements:

VOAS | O&G | METALS | OTHER | PESTICIDES | PHENOLS | VOLATILES | SEMIVOLATILES

ICE ✓ PRESERVATIVE ✓
GOOD CONDITION ✓ APPROPRIATE
HEAD SPACE ABSENT ✓ CONTAINERS ✓

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 510-798-1620 Fax: 510-798-1622

Certified Environmental Consultants 140 West Industrial Way Benecia, CA 94510-1016	Client Project ID: VA Med Center, Livermore	Date Sampled: 01/08/93
		Date Received: 01/08/93
	Client Contact: Scott Parker	Date Extracted: 01/22/93
	Client P.O:	Date Analyzed: 01/22/93

Total Recoverable Petroleum Hydrocarbons as Oil & Grease (with Silica Gel Clean-up) by Scanning IR Spectrometry*

EPA method 418.1 for liquids; AZ DLS-181 for solids

Lab ID	Client ID	Matrix	TRPH *
21224	MW-1	W	ND
21225	MW-2	W	ND
21226	MW-3	W	ND
Detection Limit unless otherwise stated; ND means Not Detected		W	0.5 mg/L
		S	5 mg/kg

*water samples are reported in mg/L and solls in mg/kg

Edward Hamilton, Lab Director

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Tele: 510-798-1620 Fax: 510-798-1622

Certified Environmental Consultants 140 West Industrial Way Benecia, CA 94510-1016	Client Project ID: VA Med Center, Livermore	Date Sampled: 01/08/93
		Date Received: 01/08/93
	Client Contact: Scott Parker	Date Extracted: 01/15/93
	Client P.O:	Date Analyzed: 01/15-01/16/93

Medium Boiling Point (C10-C23) TPH* as Diesel

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(D)+
21224	MW-1	W	ND,a,b
21225	MW-2	W	ND
21226	MW-3	W	ND,b
Detection Limit unless otherwise stated; ND means Not Detected		W	50 ug/L
		S	10 mg/kg

*water samples are reported in ug/L and solids in mg/kg

cluttered chromatogram; sample peak co-elutes with surrogate peak

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) predominately unmodified or weakly modified diesel; b) diesel range compounds predominate; no recognizable pattern; c) diesel range compounds together with gasoline range compounds; d) gasoline range compounds predominate; e) medium boiling point pattern that does not match diesel(aged diesel?); f) one to a few isolated peaks present; g) oil range compounds predominate.

Edward Hamilton, Lab Director

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Tele: 510-798-1620 Fax: 510-798-1622

Certified Environmental Consultants 140 West Industrial Way Benecia, CA 94510-1016	Client Project ID: VA Med Center, Livermore	Date Sampled: 01/08/93
		Date Received: 01/08/93
	Client Contact: Scott Parker	Date Extracted:
	Client P.O:	Date Analyzed: 01/13/93

Low Boiling Point (C6-C12) TPH* as Gasoline and BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(G)+	Benzene	Toluene	Ethyl Benzene	Xylenes	% Rec. Surrogate
21224	MW-1	W	ND	ND	ND	ND	ND	104
21225	MW-2	W	ND	ND	ND	ND	ND	104
21226	MW-3	W	ND	ND	ND	ND	ND	103
Detection Limit unless otherwise stated; ND means Not Detected		W	50 ug/L	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.005	0.005	0.005	0.005	

*water samples are reported in ug/L and soils in mg/kg

#cluttered chromatogram; sample peak co-elutes with surrogate peak

+ The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) predominately unmodified or weakly modified gasoline; b) heavier gasoline range compounds predominate (aged gasoline?); c) lighter gasoline range compounds predominate (the most mobile gasoline compounds); d) heavy and light gasoline range compounds predominate (aged gasoline together with introduced light compounds?); e) gasoline range compounds predominate; no recognizable pattern; f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds predominate.

Edward Hamilton, Lab Director

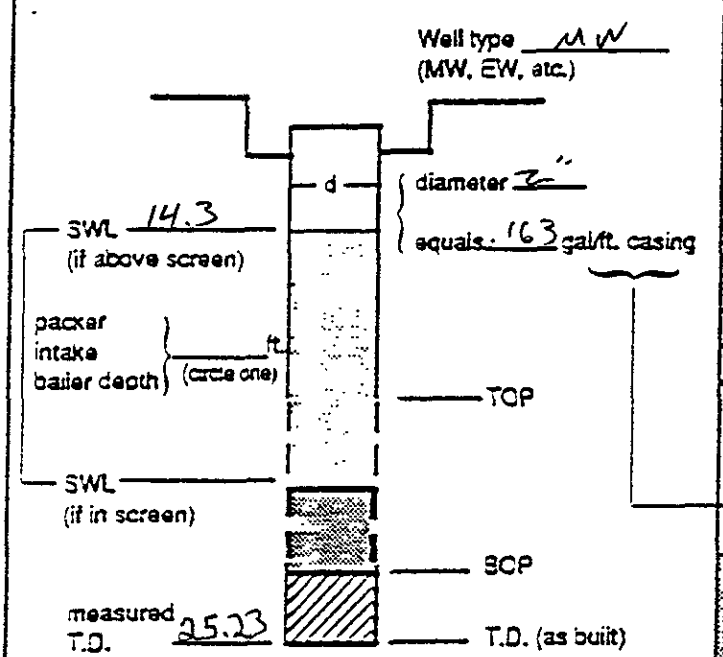
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-1

PROJECT VA Med Ctr. EVENT Quarterly SAMPLER T. Pew DATE 1-8-93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	12:53		
Stop	1:20		
Sampled	2:15		
(Final IWL)	14.32		

Purge calculation

.163 gal/ft. * 10.93 ft. = 1.8 gals x 3 = 5.4 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

_____ gal/ft. * _____ ft. = _____ gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

SWL: static water level

Actual gallons purged 20

Actual volumes purged 12

Well yield ⊕ MY
(see below)

CCC # _____

Sample I.D.	Analysis	Lab
MW-1		

Additional comments:

Gallons purged *		TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1.	1	62.8	3960	Not	30.4		
2.	3	64.4	3840	Sufficient	11.25		
3.	6	64.7	4410	Volume	.69		
4.	9	66.5	4320	Removed	.22		
5.	12	64.9	4040		-.48		

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

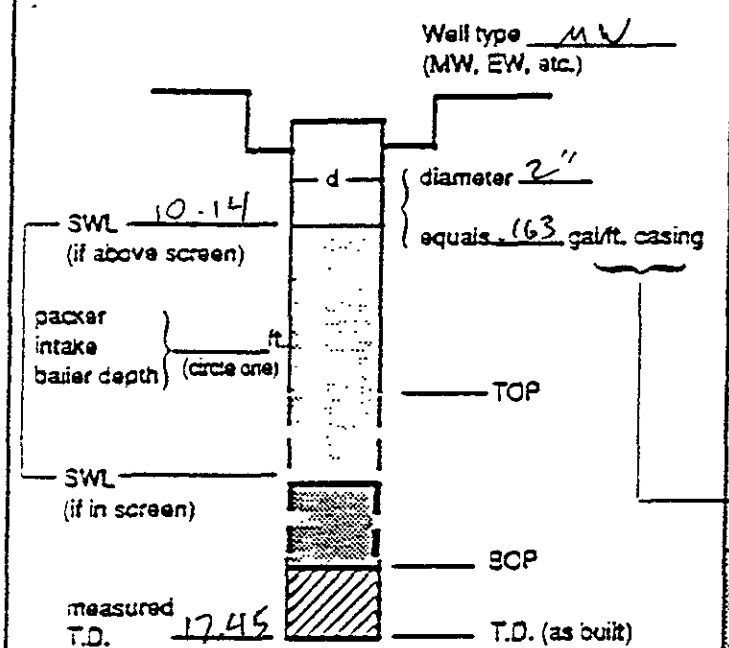
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-2

PROJECT VA Med CTR. EVENT Quarterly SAMPLER T. Pew DATE 1-8-93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1:30		
Stop	1:45		
Sampled	2:21		
(Final IWL)	10.27		

Purge calculation

.163 gal/ft. * 7.31 ft. = 1.2 gals x 3 = 3.6 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

___ gal/ft. * ___ ft. = ___ gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

Actual gallons purged 15

Actual volumes purged 15

Well yield ⊕ MY
(see below)

CCC #

Sample I.D.	Analysis	Lab
MW-2		

Additional comments:

Gallons purged *		TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1.	1	62.1	3426	Not Functioning	87.4		
2.	3	64.1	3610		140.8		
3.	6	63.1	3370		15.64		
4.	9	65.0	3430		11.49		
5.							

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop | MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. | LY - Able to purge 3 volumes by returning later or next day. | VLY - Minimal recharge - unable to purge 3 volumes.

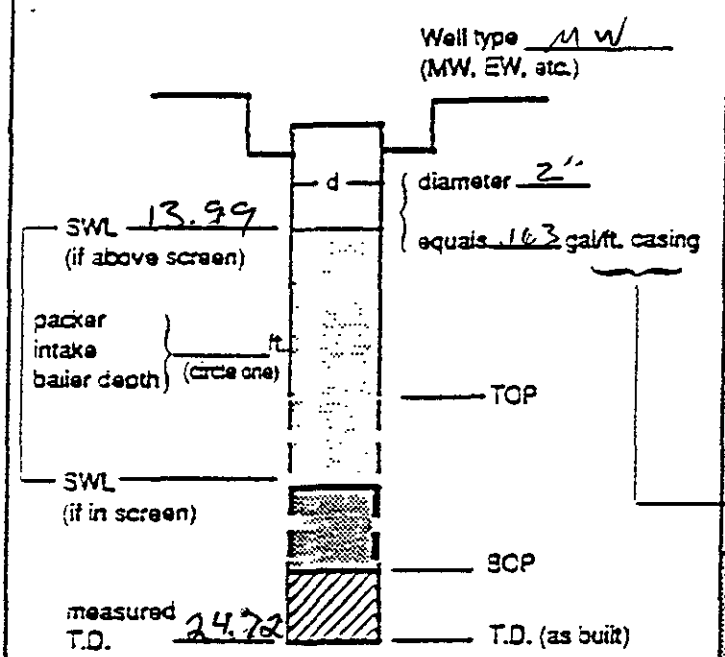
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-3

PROJECT VA Med Ctr. EVENT Quarterly SAMPLER T. Pew DATE 1-8-93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	12:07		
Stop	12:37		
Sampled	2:00		
(Final IWL)	14.0		

Purge calculation

.163 gal/ft. * 10.73 ft. = 1.8 gals x 3 = 5.4 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

____ gal/ft. * ____ ft. = ____ gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

Actual gallons purged 20

Actual volumes purged 12

Well yield ⊕ MY
(see below)

CCC # _____

Sample I.D.	Analysis	Lab
MW-3		

Additional comments:

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	65.3	2520	NOT	69.3		
2. 3	66.0	2180	FUEL	7.40		
3. 9	67.4	2180		45.9		
4. 12	67.5	2890	TIGHTENING	18.13		
5. 15	68.7	2860		11.93		

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop | MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. | LY - Able to purge 3 volumes by returning later or next day. | VLY - Minimal recharge - unable to purge 3 volumes.

APPENDIX A

Water Sampling in Wells and Boreholes

GENERAL CONSIDERATIONS

In general, the composition of water within the well casing and in close proximity to the well is not representative of groundwater quality. This may be due to contamination by drilling fluids or drilling equipment or to disparities between the oxidation-reduction potential in the well and the redox potential in the aquifer. To obtain a representative sample of groundwater, therefore, the well should be pumped or bailed until the well is thoroughly flushed of standing water and contains fresh water from the aquifer. One common procedure is to pump or bail the well until a minimum of three bore volumes (or alternatively, 10 well volumes) have been removed.

At the least, pumping should continue until water in casing storage has been removed. There are at least two common methods for determining that water in casing storage has been removed and water is flowing freely from the aquifer: (1) Monitor water level while pumping. When the pumping water level has "stabilized," it is likely that little or no water from casing storage is being pumped. (2) The temperature, pH, conductivity, and turbidity of the water should be monitored while pumping. When these parameters "stabilize," it is probable that little or no water from casing storage is being pumped and most of the water is coming from the aquifer.

PURGING

During each round of sampling, static water level will be measured prior to purging using an electronic sounder. All water-level measurements will be recorded to the nearest 0.01 foot with respect to mean sea level.

A minimum of three bore volumes will be purged from the well prior to sampling. To insure that water in the well has been exchanged pumping or bailing shall commence at the top and work downward. The well will be allowed to return to 80 percent of the original water level before sampling.

Temperature, pH, specific conductance, and turbidity will be measured for each bore volume pumped. Purging will continue until these field-measured water quality parameters have stabilized and the water is, in the judgment of the geologist, representative of water in the aquifer. Data obtained from field water quality measurements will be recorded in the field log book or data sheets. A separate aliquot of groundwater collected from the purge water outlet stream will be used for field measurements; samples intended for laboratory analysis will not be used.

Temperature will be measured with a good grade mercury-filled Centigrade thermometer, bimetallic-element thermometer, or electronic thermistor.

Acidity/alkalinity (pH) will be measured by dipping the conductivity probe in the water source or sample; pH will be measured as soon as possible after collection of the sample, preferably within a few minutes.

Conductivity will be measured by dipping the conductivity probe in the water source or sample. The temperature of the sample will be used to calculate specific conductance from the conductivity measurement. Measurements shall be reported in units of micromhos per centimeter at 25 degrees Centigrade.

Turbidity will be measured using a vial of development/purge water and a turbidity meter. The instrument will be calibrated to read between 1 and 400 Nephelometric turbidity units (NTUs). This is a measure of the amount of light scattered at right angles to the path of light passing through the water. The greater the NTU reading, the greater the amount of light scattered by particles in the water, therefore, the greater the turbidity.

SAMPLE COLLECTION

Wells and borings will be sampled using a new, clean, disposable Teflon bailer attached to new, clean string. Sample vials and bottles will be filled to overflowing and sealed so that no air is trapped in the vial or bottle. Once filled, samples shall be inverted and tapped to test for air bubbles. Samples will be contained in vial and bottles approved by the US EPA and the RWQCB, San Francisco Bay Region. Some analyses may require separate sample containers in accordance with EPA methods described in 40 CFR Part 136 and SW-846.

Water samples intended for volatile hydrocarbon analysis will be contained in 40 ml VOA vials prepared according to EPA SW 849 and capped with Teflon-lined septa caps. Samples intended analysis is EPA 602 will contain a small amount of preservative (HCl). Samples intended for EPA 601 and EPA 624 GCMS procedures will not be preserved. Water samples intended for low level diesel analysis will be stored in dark glass 1-liter bottles to reduce degradation by sunlight. Antimicrobial preservative (HCl) may be added to the sample if a prolonged holding time is expected prior to analysis.

Sample containers will be labelled with self-adhesive, preprinted tags. Labels will contain the following information in waterproof ink:

1. Project number (or name)
2. Sample number (or name)
3. Sample location (well number, etc.)
4. Date and time samples were obtained
5. Treatment (preservative added, filtered, etc.)
6. Name of sample collector

All purged water will be stored on site in steel DOT approved drums. Drums will be labeled as to contents, suspected contaminants, date container filled, expected removal date, company name, contact and phone number, sealed and left on-site for subsequent disposal pending analytical results.

DOCUMENTATION

DOCUMENTATION

Sampling information will be recorded in ink in a bound notebook with consecutively number pages. Pages will not be removed for any reason. Alternatively, specially formatted field data sheets may be used to record the information collected during water quality sampling. Errata may be marked out with a single line, and initials of person making the change. The log book and data sheets will be placed in the project file when sampling is completed.

FIELD EQUIPMENT DECONTAMINATION PROCEDURES

Bailers and string will be properly disposed of off site. All other sampling equipment, such as buckets and stands, will be decontaminated after each use by washing in an Alconox solution.

All rinseate used in the decontamination process will be stored on site in steel DOT approved drums. Drums will be labeled as to contents, suspected contaminants, date container filled, expected removal date, company name, contact and phone number, sealed and left on-site for subsequent disposal pending analytical results.