BLYMYER
ENGINEERS, INC.

BEI

June 26, 1992
BEI Job No. 91175

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, California 94621

01

Subject: Subsurface Investigation
Lanaidor, Inc.
925 89th Avenue
Oakland, California

Dear Mr. Chan:

Blymyer Engineers, Inc., *Workplan for an Initial Subsurface Investigation - Lanaidor, Inc.*, dated December 16, 1991, proposed conducting a groundwater investigation at the subject site that consisted of installing a single groundwater monitoring well 10-feet downgradient of the former underground storage tank (UST), from which soil and groundwater samples would be collected for laboratory analyses. The purpose of the investigation was to gather enough information to determine: 1) if soil contamination existed beyond the extent of the overexcavation that was conducted in November 1990, and 2) if groundwater at the subject site has been impacted by petroleum hydrocarbons.

The single monitoring well at the subject site was placed using gradient information from the three monitoring wells located at 910 89th Avenue, which is across 89th Avenue from the subject site. Measurements taken by Terratech, the firm that originally installed these wells in August 1989, indicated a south-southwesterly gradient, as shown in Figure 1. Measurements in the wells at this site, taken in March and April 1992, after their locations and elevations were resurveyed by Blymyer Engineers to insure accuracy, indicated that the groundwater gradient in the area was in the same general direction, as shown on Figures 2 and 3.

Based on this information Blymyer Engineers installed a single monitoring well, MW-1, on the subject site south of the UST emplacement, as shown on Figures 2 through 4. The analytical results of soil and groundwater samples collected during installation of this monitoring well are shown in Tables I and II.

(510) 521-3773 • 1829 Clement Avenue, Alameda, California 94501-1395 • FAX (510) 865-2594

These results indicate that the overexcavation conducted in November 1990 removed the majority of petroleum-hydrocarbon-contaminated soil from the site, and that the levels of petroleum hydrocarbons in the groundwater in MW-1 are below the Maximum Contaminant Levels established by the United States Environmental Protection Agency (EPA).

Well MW-1 was subsequently surveyed to determine its' location and elevation relative to the wells at 910 89th Avenue. Measurements of the depth to groundwater in this well were made, and the groundwater gradient was calculated using this well and the wells from 910 89th Avenue. The results indicated that the groundwater gradient was to the northwest, as shown on Figure 4, a shift of over 90 degrees from the direction previously indicated by measurements in the wells at 910 89th Avenue. Depth to groundwater data for all of the monitoring wells is presented in Table III.

There are two possible explanations for the difference in the groundwater gradient:

1. The wells at 910 89th Avenue are almost in a straight line, and do not provide a good triangle for determining the groundwater gradient.

2. The well at the subject site is not in hydraulic communication with the wells at 910 89th Avenue.

The wells at 910 89th Avenue were used to attempt to establish the gradient at the subject site because they provided the only groundwater gradient information in the vicinity of the subject site. Blymyer Engineers believe that the alignment of the wells at 910 89th Avenue have led to the conflicting indications of the groundwater gradient in the area. Based on bore log information, Blymyer Engineers also believe that the gradient indicated by monitoring wells MW-1 (at the subject site), MW-2, MW-3, and MW-4 is an accurate indication of the groundwater gradient at the subject site, and that monitoring well MW-1 is in hydraulic communication with the wells at 910 89th Avenue. Copies of the bore logs and well construction diagrams for wells MW-1, MW-2, MW-3, and MW-4 are attached.

During a meeting at your office on June 15, 1992, you indicated that you did not think that the Regional Water Quality Control Board (RWQCB) would agree to closure of the site based on information from well MW-1 because of its' cross-gradient location.

In that meeting the following modifications to the Workplan were discussed:

- Installation of a second groundwater monitoring well (MW-2L) at the subject site, 10 feet downgradient of the maximum extent of the excavation of the former UST, where the downgradient direction is defined by groundwater depth measurements in wells MW-1, MW-2, MW-3 and MW-4. The proposed location of this well is shown on Figure 4.

- Collection of three soil samples from the well bore to confirm that contaminants have not spread laterally or vertically through the soil at the site.

- Collection of a groundwater sample from the new well to determine if petroleum-hydrocarbons are present downgradient of the former UST emplacement.

- Since gasoline was the only material stored in the former UST, the soil and groundwater samples will be analyzed for Total Petroleum Hydrocarbons as gasoline (TPH-g) by EPA Method 8015 (modified), benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA Method 8020/602. In addition, the groundwater sample from MW-2L will be analyzed for Total Recoverable Petroleum Hydrocarbons (TRPH) by EPA Method 418.1 because of a positive indication by this method in soil samples collected in November 1990.

- Survey the location and elevation of, and measure the depth to groundwater in the new well (MW-2L), to confirm the groundwater gradient at the site.

- Modification of the groundwater monitoring program for the subject site in accordance with your April 2, 1992 letter to include:

  Quarterly groundwater sampling of well MW-2L with laboratory analyses for TPH-g, and BTEX only; TRPH analysis will be included if any is detected during the initial analysis.

  Calculation of the groundwater gradient from depth to groundwater measurements in wells MW-1, MW-2L, MW-3, and MW-4.

In that meeting you also mentioned that you would discuss the proposed modifications to the workplan with representatives of the RWQCB to confirm that the placement of well MW-2L, if confirmed to be downgradient of the former UST at the site by three subsequent quarters of groundwater sampling, would provide acceptable data to the RWQCB for site closure. This, of course, assumes that the data reveals non-significant levels of groundwater contamination.

If you have any questions about the information presented, or any aspect of this project, please do not hesitate to call me at (510) 521 - 3773.

Cordially,

Blymyer Engineers, Inc.

Craig Drizin
Environmental Engineer

Enclosures

cc: Rich Hiett, San Francisco Bay Regional Water Quality Control Board
William Raymond, Lanaidor, Inc.

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Table I, Summary of Soil Sample Analytical Results
Lanaidor, Inc., 925 89th Avenue, Oakland, Ca.

Sample	Date	Depth (feet)	Total Oil & Grease by EPA Method 413.1 (mg/kg)	TRPH by EPA Method 418.1 (mg/kg)	TPH-g by EPA Method 8015 (mg/kg)	Volatile Organic Compounds by EPA Method 8020 (µg/kg)			
						B	T	E	X
MW1-1	4/17/92	5-5.5	NA	NA	<5	7	<5	<5	<5
MW1-3	4/17/92	9-9.5	<10	<10	<5	30	<5	6	6
MW1-4	4/17/92	12-12.5	NA	NA	<5	39	6	18	115

Table II, Summary of Groundwater Sample Analytical Results
Lanaidor, Inc., 925 89th Avenue, Oakland, Ca.

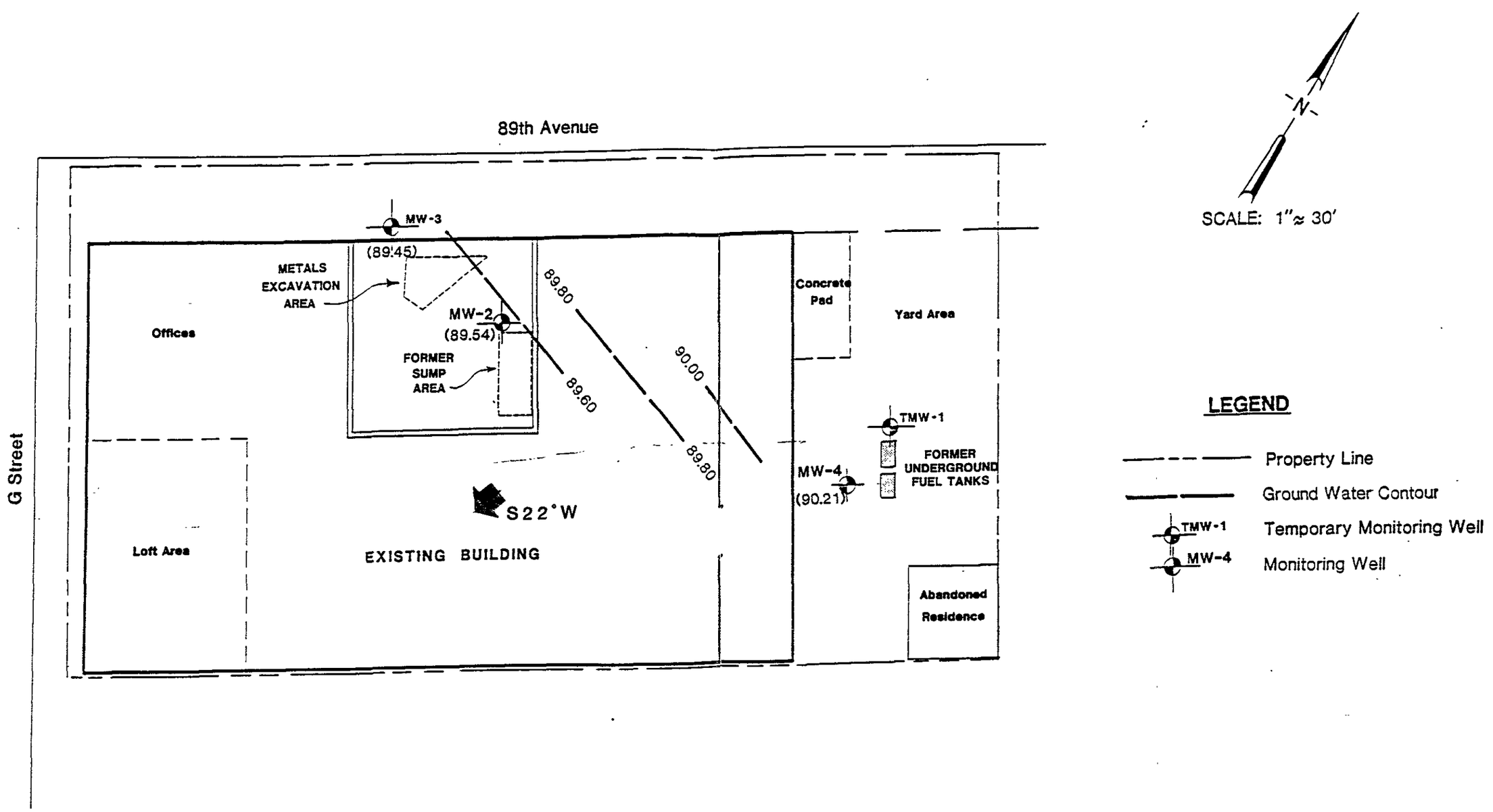
Sample	Date	Total Oil & Grease by EPA Method 413.2 (mg/L)	TRPH by EPA Method 418.1 (mg/L)	TPH-g by EPA Method 8015 (mg/L)	Volatile Organic Compounds by EPA Method 602 (µg/L)			
					B	T	E	X
MW1	4/20-21/92	<1	<1	<1	<1	<1	<1	3

TRPH = Total Recoverable Petroleum Hydrocarbons. TPH-g = Total Petroleum Hydrocarbons as gasoline.
B = Benzene, T = Toluene, E = Ethylbenzene, X = Xylenes.
mg/L = milligrams per liter = parts per million, µg/L = micrograms per liter = parts per billion.
mg/kg = milligrams per kilogram = parts per million, µg/kg = micrograms per kilogram = parts per billion.
NA = Sample Not Analyzed by this Method.

Table III. Depth to Groundwater Data
910 & 925 89th Avenue, Oakland, California

Well I.D. #	Length of Screen (feet)	Depth Interval of Screen (feet, bgs)	TOC Elevation (assumed datum) (feet)	Depth to Groundwater 3/19/92 (feet)	Computed Groundwater Elevation 3/19/92 (feet)	Depth to Groundwater 4/20/92 (feet)	Computed Groundwater Elevation 4/20/92 (feet)
MW-1	15	7 - 22	99.64	N/A	N/A	9.91	89.73
MW-2	10	9 - 19	100.73	9.93	90.80	10.45	90.28
MW-3	10	10 - 20	100.00 (assumed)	9.38	90.62	9.86	90.14
MW-4	15	10 - 25	100.74	8.74	92.00	9.52	91.22

Note: bgs = Below ground surface, N/A = Not applicable. TOC = Top of Casing



REF. DATUM - TOP OF CASING MW-3 = 100'

TERRATECH

SITE PLAN

GROUND WATER GRADIENT 8-30-89

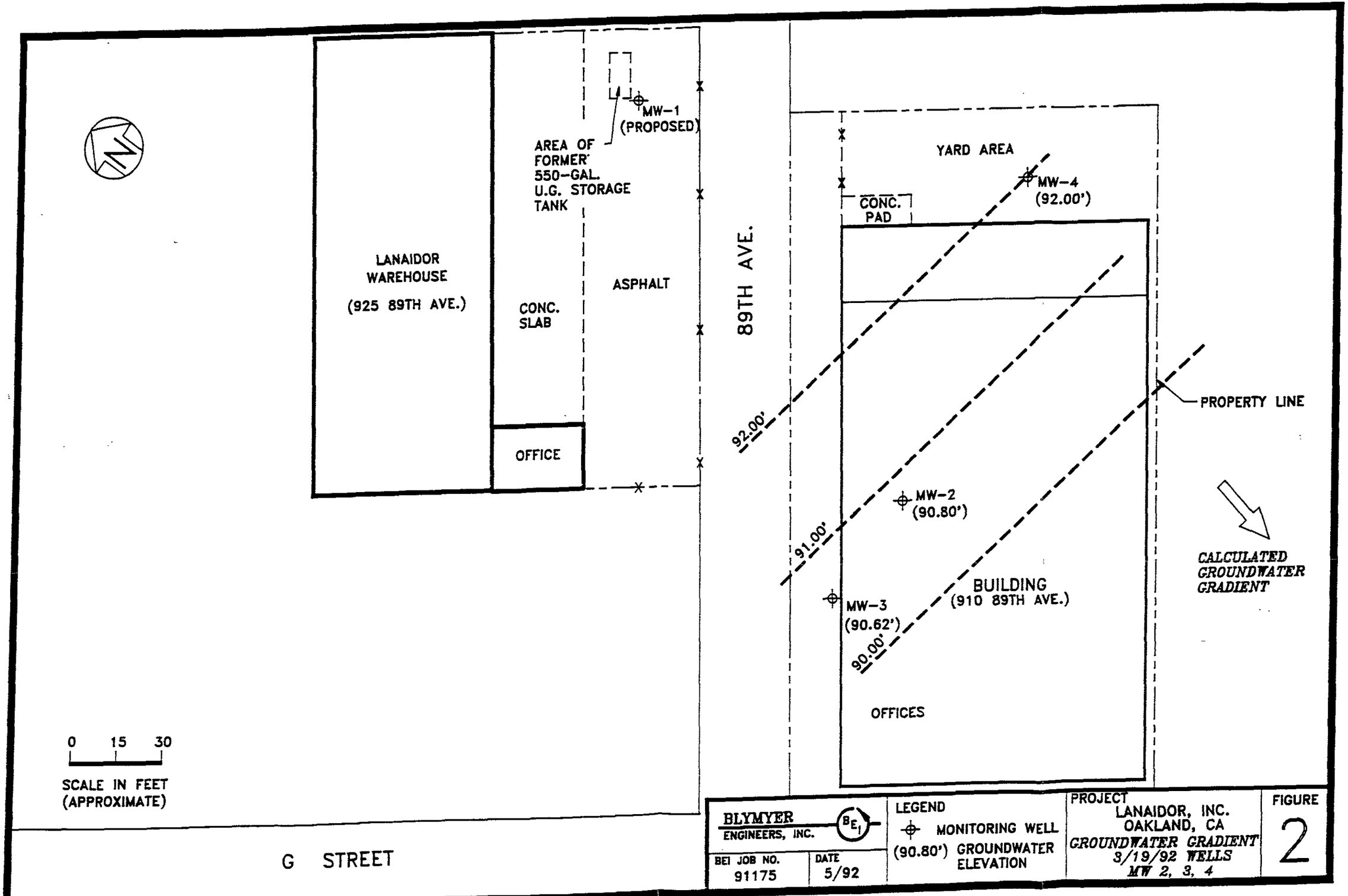
BARRETT'S METAL FINISHING

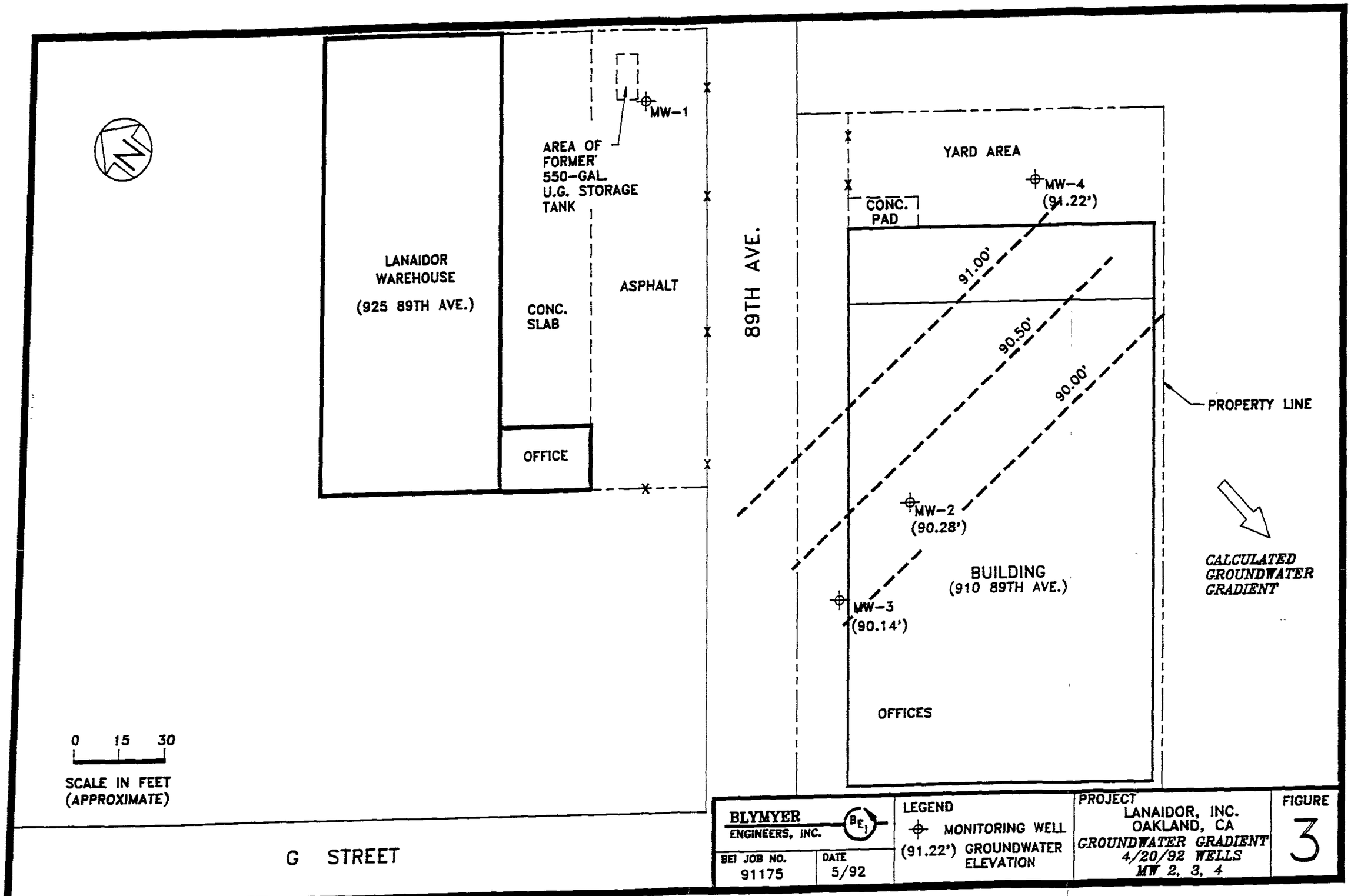
910 89th Avenue

Oakland, California

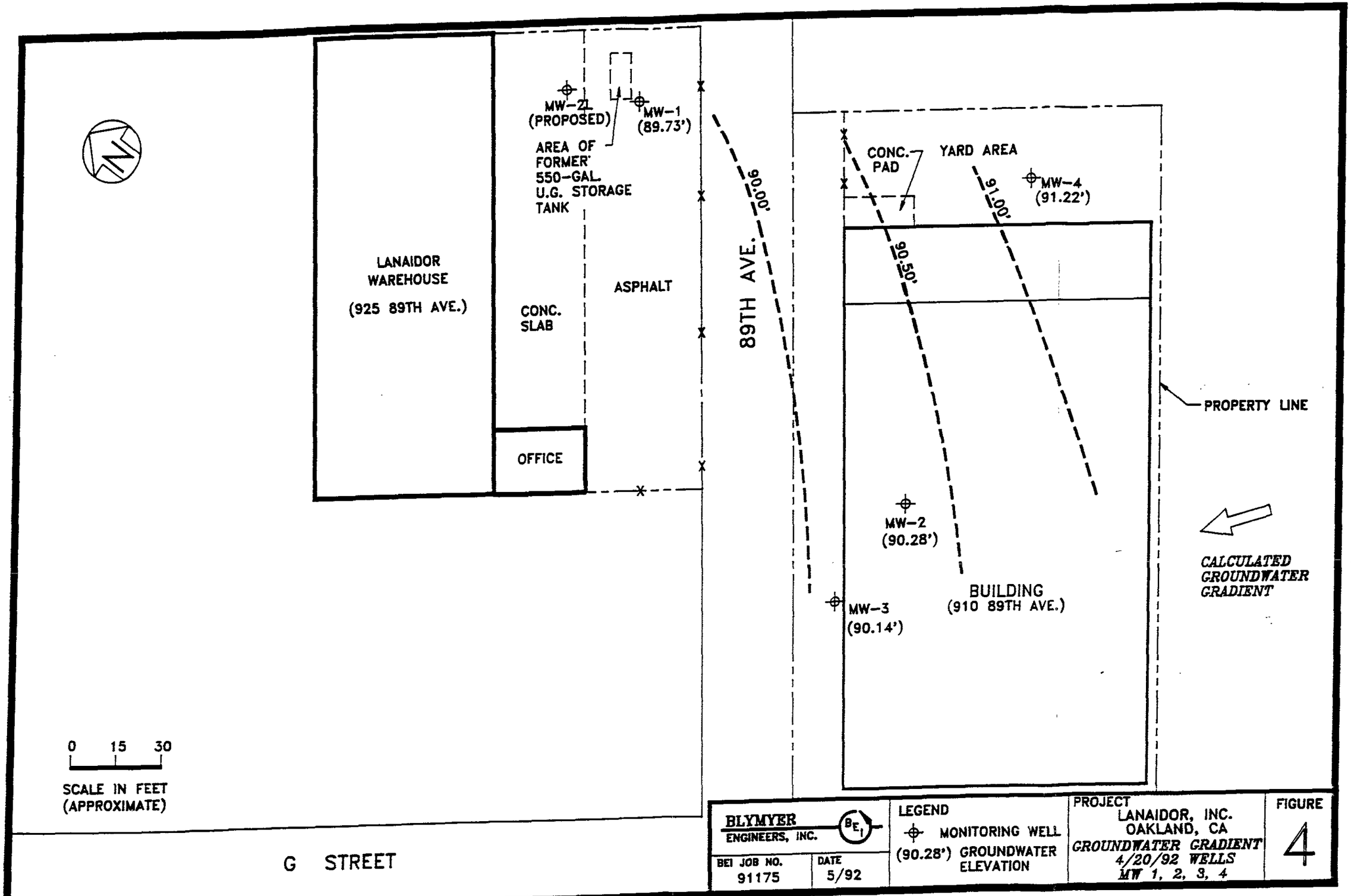
FIGURE 1

PROJECT 4368/1


LANAIDOR
WAREHOUSE
(925 89TH AVE.)
OFFICE
CONC.
SLAB
ASPHALT
AREA OF
FORMER
550-GAL.
U.G. STORAGE
TANK
MW-1
(PROPOSED)
89TH AVE.
YARD AREA
CONC.
PAD
MW-4
(92.00')
92.00'
91.00'
90.00'
MW-2
(90.80')
MW-3
(90.62')
BUILDING
(910 89TH AVE.)
OFFICES
PROPERTY LINE
CALCULATED
GROUNDWATER
GRADIENT
0 15 30
SCALE IN FEET
(APPROXIMATE)
G STREET
BLYMYER
ENGINEERS, INC.
BEI JOB NO.
91175
DATE
5/92
LEGEND
MONITORING WELL
(90.80') GROUNDWATER
ELEVATION
PROJECT
LANAIDOR, INC.
OAKLAND, CA
GROUNDWATER GRADIENT
3/19/92 WELLS
MW 2, 3, 4
FIGURE
2



BLYMYER ENGINEERS, INC. (BEI)	LEGEND: ⊕ MONITORING WELL; (91.22') GROUNDWATER ELEVATION	PROJECT: LANAIDOR, INC. OAKLAND, CA *GROUNDWATER GRADIENT 4/20/92 WELLS MW 2, 3, 4*	FIGURE 3
BEI JOB NO. 91175	DATE 5/92		



BLYMYER ENGINEERS, INC.

BEI JOB NO. 91175

DATE 5/92

LEGEND

MONITORING WELL

(90.28') GROUNDWATER ELEVATION

PROJECT

LANAIDOR, INC.
OAKLAND, CA
GROUNDWATER GRADIENT
4/20/92 WELLS
MW 1, 2, 3, 4

FIGURE

4

BLYMER ENGINEERS, INC. (BEI)

Job #: 91175
Site: 925 98TH ST, OAKLAND, CA

Log of Boring No.: MW-1
Client: SENECA/LANAIDOR
Driller: C. St. PIERRE
Logged by: H. SHORT/C. DRIZIN

Date: 4/17/92
Rig: SIMCO
Diameter: 8.25"

EXPLANATION
▽ Initial water level.
▼ Stabilized water level.

Depth (Ft.)	Blows/6 In.	P.I.D. (ppm)	Sample Type and Depth	Unified Soil Classification	DESCRIPTION	Graphic Log	Water Depth
				F	0.0-0.2' Asphalt 0.2-1.5' Fill, brown, gravelly sand, dense	F	
				CH	1.5-11.0' Black and brown silty clay, fine-grained with some fine sand, highly plastic, contains plant roots, stiff		
5			1				
					Thin, light gray, plastic seam at 7.0'		
			2				
			3				
10							
				CH	11.0- 14.5' Brown clay, fine-grained, moderately to highly plastic, iron stained and locally mottled gray, stiff		
			4		Thin sandy seam at 13.5'		14.0' ▽
15				SC	14.5-17.5' Brown, clayey sand, fine-grained, moderately plastic, soft, wet, clayey seams		
				CH	17.5- 22.0' Brown clay, fine-grained, highly plastic, very stiff		
20					Note: Strong odor of fuel or solvent at 10.5', faint odor at 12' b.g.s.		
					End of hole 22.0 feet.		
25							
30							

EXPLORATION DRILL HOLE LOG

HOLE No. MW-2

PROJECT BARRETT'S METAL FINISHING | DATE 12/19/88 | LOGGED BY BMK

DRILL RIG SKID RIG – Continuous Flight Auger | HOLE DIA. 6" | SAMPLER Modified Calif.

GROUNDWATER DEPTH INITIAL 13' | FINAL 9'8" | HOLE ELEV. —

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)		LIQUID LIMIT	WATER CONTENT	PLASTIC LIMIT	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED SHEAR STRENGTH (psf)
CONCRETE SLAB FILL - SILT W/SAND; brown, damp, firm; fine grained, odorless.	ML	1											
SILTY SAND; brown, damp-moist, loose; fine-grained, odorless.	SM	2 3 4 5											
		6 7 8 9											
CLAY; black, moist, stiff, trace silt; odorless.	CI	10 11 12											
CLAY; gray w/mottled brown, moist stiff; odorless.	CI	13 14 15 16 17 18 19 20											

BORING TERMINATED AT 20'

EXPLORATION DRILL HOLE LOG

HOLE No. MW-3

PROJECT BARRETT'S METAL FINISHING DATE 12/19/88 LOGGED BY BMK

DRILL RIG SKID RIG - Continuous Flight Auger HOLE DIA. 6" SAMPLER Modified Calif.

GROUNDWATER DEPTH INITIAL 13' FINAL 9'8" HOLE ELEV. —

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)		LIQUID LIMIT	WATER CONTENT	PLASTIC LIMIT	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED SHEAR STRENGTH (psf)
FILL: SILT W/SAND; brown, damp, stiff; fine-ground; odorless.		1											
SILTY SAND; brown, dry, loose; odorless; fine-ground.	SM	2											
		3											
		4											
		5											
		6											
		7											
		8											
		9											
FAT CLAY; brown, moist, stiff; odorless.	CH	10											
		11											
		12											
CLAY W/SAND; gray/mottled brown; moist, stiff; trace fine sand; odorless.	CL	13					▽						
		14											
		15											
		16											
		17											
		18											
		19											
		20											

BORING TERMINATED AT 20'

EXPLORATION DRILL HOLE LOG

HOLE No. MW-4

PROJECT BARRETT'S FUEL TANK | DATE 8/11/89 | LOGGED BY BMK

DRILL RIG CME 55 - Hollow Stem | HOLE DIA. 8" | SAMPLER X = Modified Calif.

GROUNDWATER DEPTH INITIAL 17' | FINAL 14' | HOLE ELEV. —

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)		LIQUID LIMIT	WATER CONTENT	PLASTIC LIMIT	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED SHEAR STRENGTH (psf)
SILT W/SAND; brown, dry, stiff; fine grained; odorless.	ML	1											
		2											
		3											
		4											
		5											
CLAY; dark brown, damp, stiff; trace fine sand; odorless.	CI	6	X	15									
		7											
SILT W/SAND; brown, dry, stiff; fine grained; odorless.	ML	8											
		9											
		10											
		11	X										
LEAN CLAY W/SAND; brown, damp, stiff; fine to medium sand; odorless.	CL	12											
CLAY; gray w/mottled brown, moist to very moist, stiff; odorless.		13											
		14					▼						
		15											
		16	X										
POORLY GRADED SAND; wet; odorless.	SP	17					▽						
CLAY; gray w/mottled brown, moist to very moist, stiff; odorless.	CI	18											
		19											
POORLY GRADED SAND; wet; odorless.	SP	20											

Lic # C57-500139

EXPLORATION DRILL HOLE LOG

HOLE No. MW-4

PROJECT BARRETT'S FUEL TANK DATE 8/11/89 LOGGED BY BMK

DRILL RIG CME 55 - Hollow Stem HOLE DIA 8" SAMPLER X = Modified Calif.

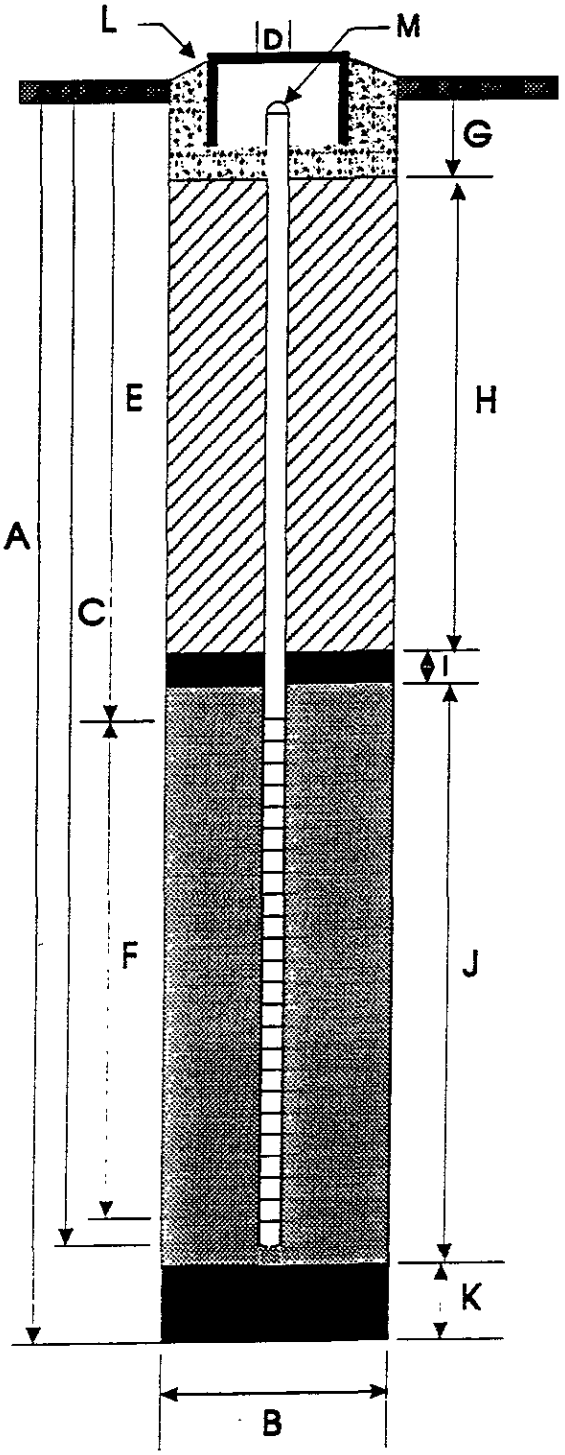
GROUNDWATER DEPTH INITIAL 17' FINAL 14' HOLE ELEV ___

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)		LIQUID LIMIT	WATER CONTENT	PLASTIC LIMIT	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED SHEAR STRENGTH (psf)
FAT CLAY; blue-gray, very moist w/wet pockets, stiff; odorless.		21	X	10									
POORLY GRADED SAND; brown, wet		22											
FAT CLAY; blue-gray, very moist w/wet pockets, stiff; odorless.		23											
		24											
		25											
BOTTOM OF HOLE @ 25' Monitoring Well Constructed		26											
		27											
		28											
		29											
		30											
		31											
		32											
		33											
		34											
		35											
		36											
		37											
		38											
		39											
		40											

BLYMYER ENGINEERS, INC.

CLIENT: SENECA/LANAIDOR
SITE: 925 89TH AVE.
OAKLAND, CA
JOB# 91175
DRILLER: CHRIS ST. PIERRE
LOGGED BY: HARRY SHORT/CRAIG DRIZIN

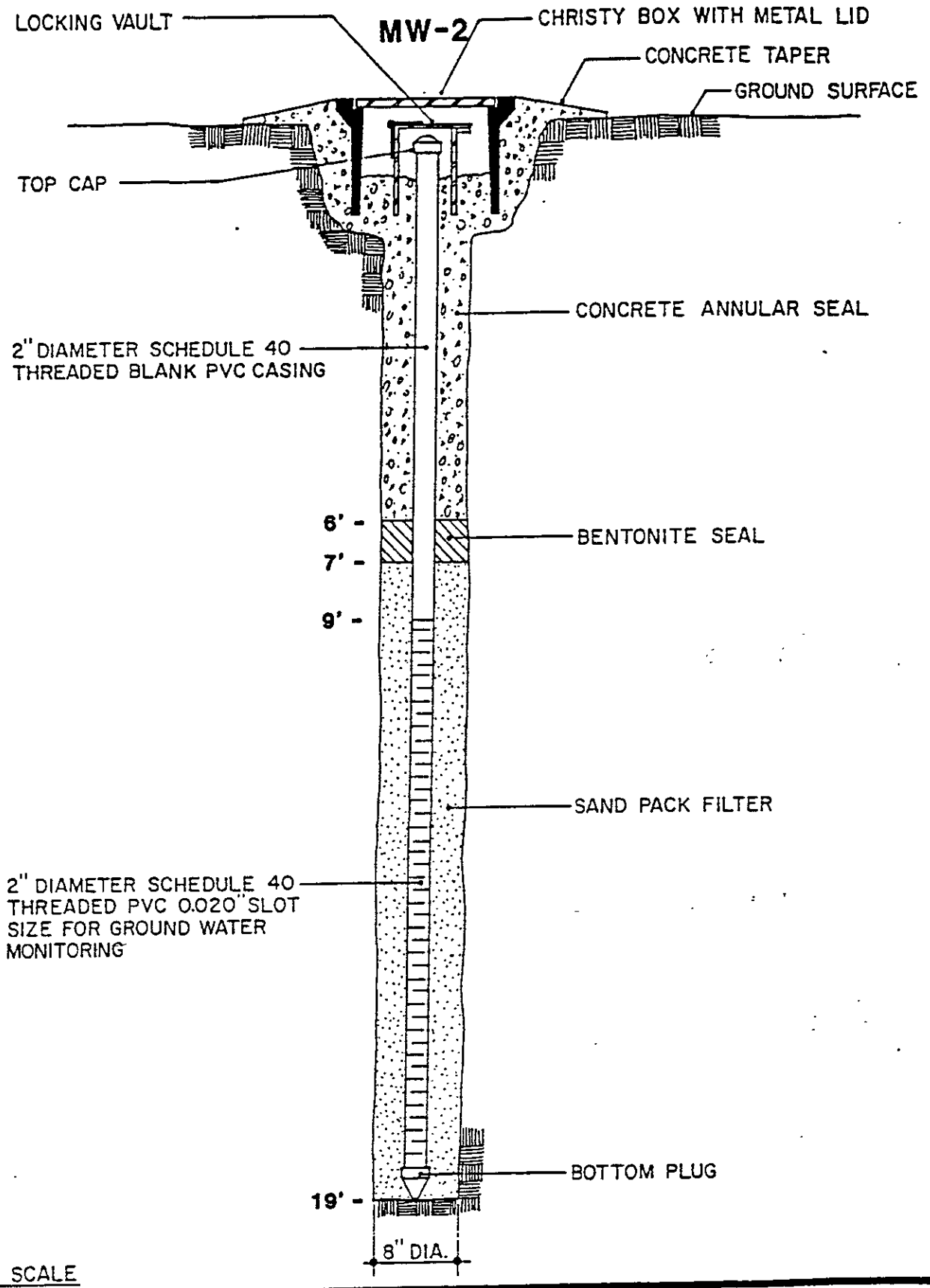
BORING/WELL NO.: MW-1
TOP OF CASING ELEV.:
GROUND SURFACE ELEV.:
DATUM:



WELL CONSTRUCTION

A. Total Depth 22'
B. Diameter 8-1/4"
Drilling Method Hollow stem auger
C. Casing Length 22'
Material P.V.C.
D. Casing Diameter 2"
E. Depth to Top Perforations 7'
F. Perforated Length 15'
Perforated Interval from 22' to 7' b.g.s.
Perforation Type Slot
Perforation Size 0.020"
G. Surface Seal 0 to 1' b.g.s.
Seal Material Sack-crete
H. Backfill 5.5' to 1' b.g.s.
Backfill Material Neat cement
I. Seal 6.5 to 5.5' b.g.s.
Seal Material Bentonite
J. Sand Pack 22' to 6.5' b.g.s.
Pack Material #3 sand
K. Bottom Seal N/A
Seal Material N/A
L.
M.

22C2



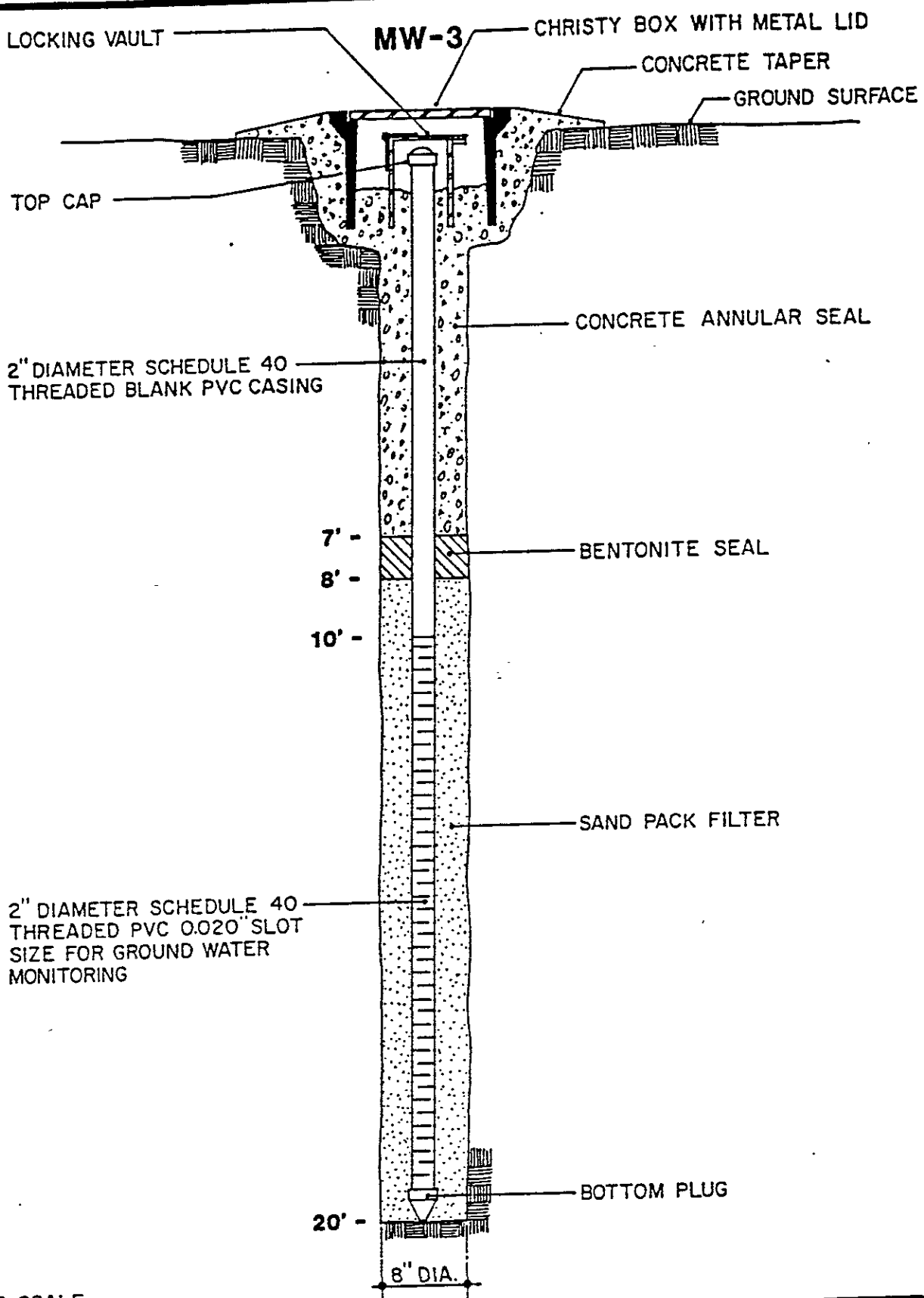
NOT TO SCALE

TERRATECH

AS-BUILT WELL DIAGRAM

BARRETT'S METAL FINISHING
OAKLAND, CALIFORNIA

FIGURE
2
PROJECT
4368/1



NOT TO SCALE

TERRATECH

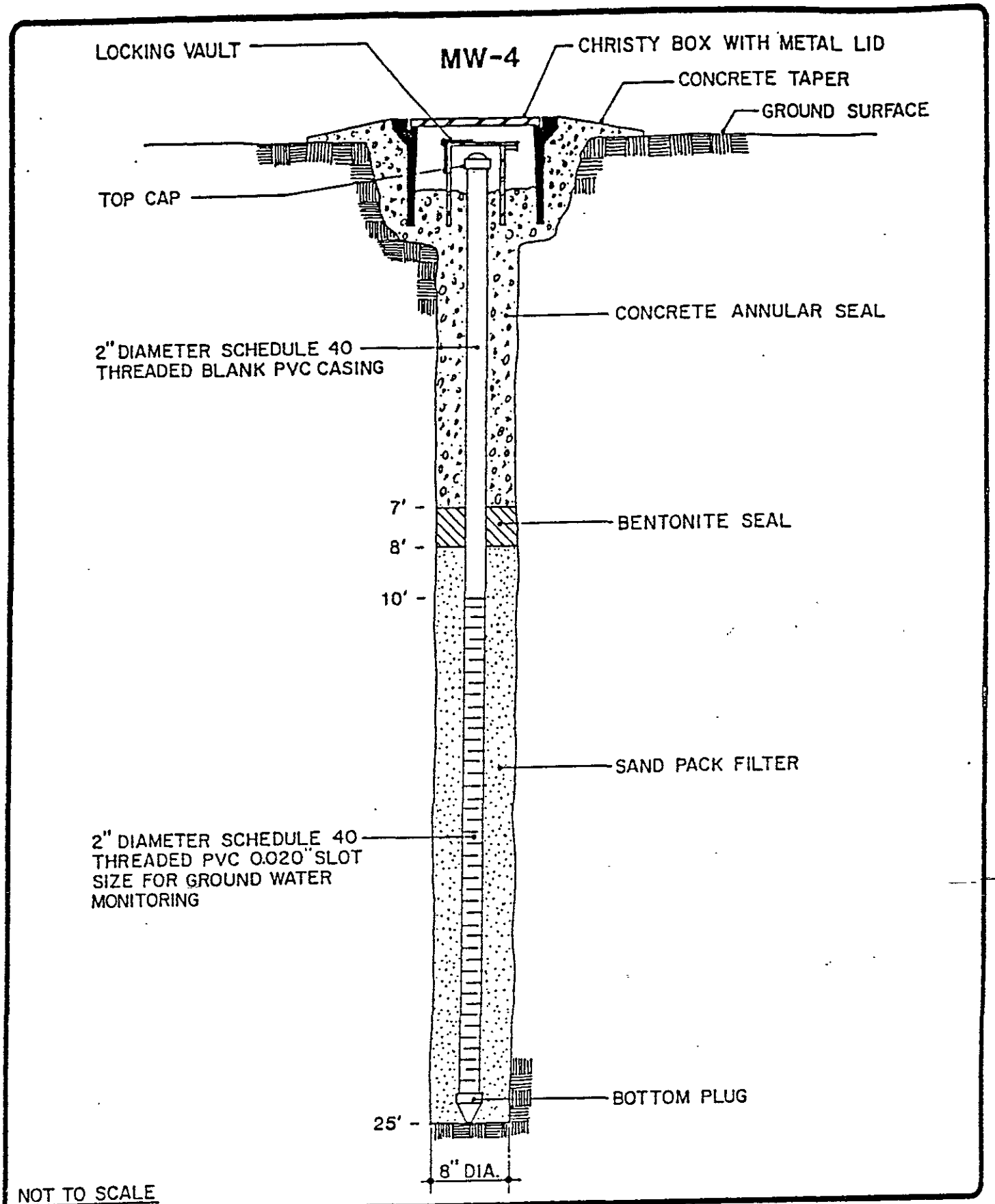
AS-BUILT WELL DIAGRAM

BARRETT'S METAL FINISHING

OAKLAND, CALIFORNIA

FIGURE 3

PROJECT 4368/1



NOT TO SCALE

TERRATECH

AS-BUILT WELL DIAGRAM

BARRETT'S METAL FINISHING
OAKLAND, CALIFORNIA

FIGURE
2

PROJECT
4368/1