ES ENGINEERING-SCIENCE

LETTER OF TRANSMITTAL

DATE 11/8/94	JOB NO. 726104
ATTENTION	Well Log File.
RE:	Redwood Regional Park Site Investigation

TO Confidential Well Log File
Dept of Water Resources - Central District - 4
3251 "S" Street
Sacramento CA 95816 - 9897

WE ARE SENDING YOU THE FOLLOWING ITEMS: ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of Letter ☐ Change order ☐ _____

Dated _____

COPIES	DATE	NO.	DESCRIPTION
1	10/28/94		Well Completion Report for wells MW-1 through MW-6, including site plan, location map, boring geologic logs and well completion diagrams.

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ For checking ☐ Resubmit _____ copies for approval

☒ For your use ☐ Approved as submitted ☐ Design only, not for construction

☐ As requested ☐ Approved as noted ☐ Return _____ corrected prints

☐ For review and comment ☐ Returned for corrections ☐ _____

☐ For Your Action

REMARKS: _____

COPY TO Wyman Hong - Zone 7 Water Agency
Juliet Shin - Alameda County Health
W. Lee - EBRPD

SIGNED: Bruce M. Rucker

If enclosures are not as noted, please notify us at once.

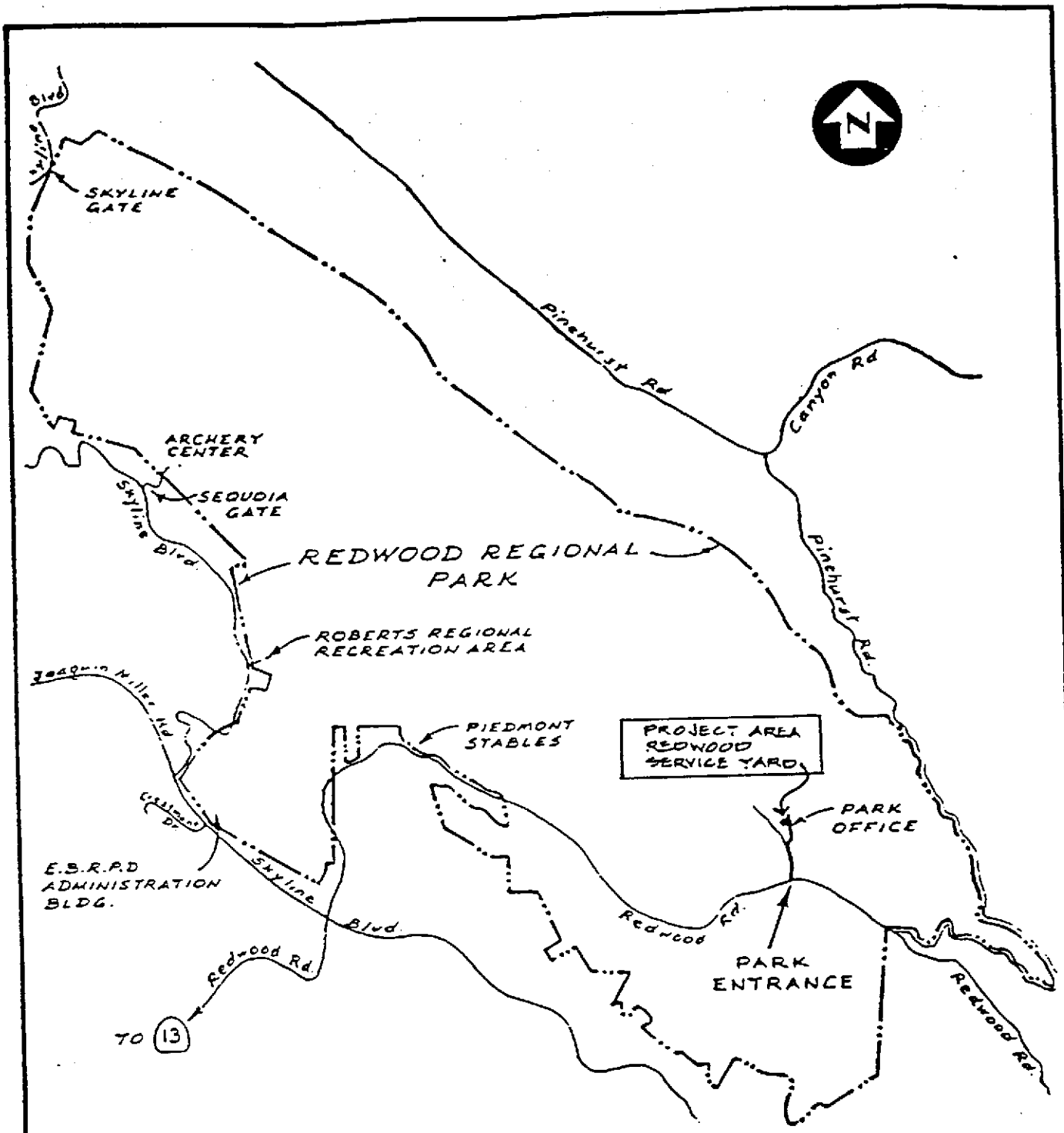
Bruce Rucker, Proj. Mgr.

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

FIGURE



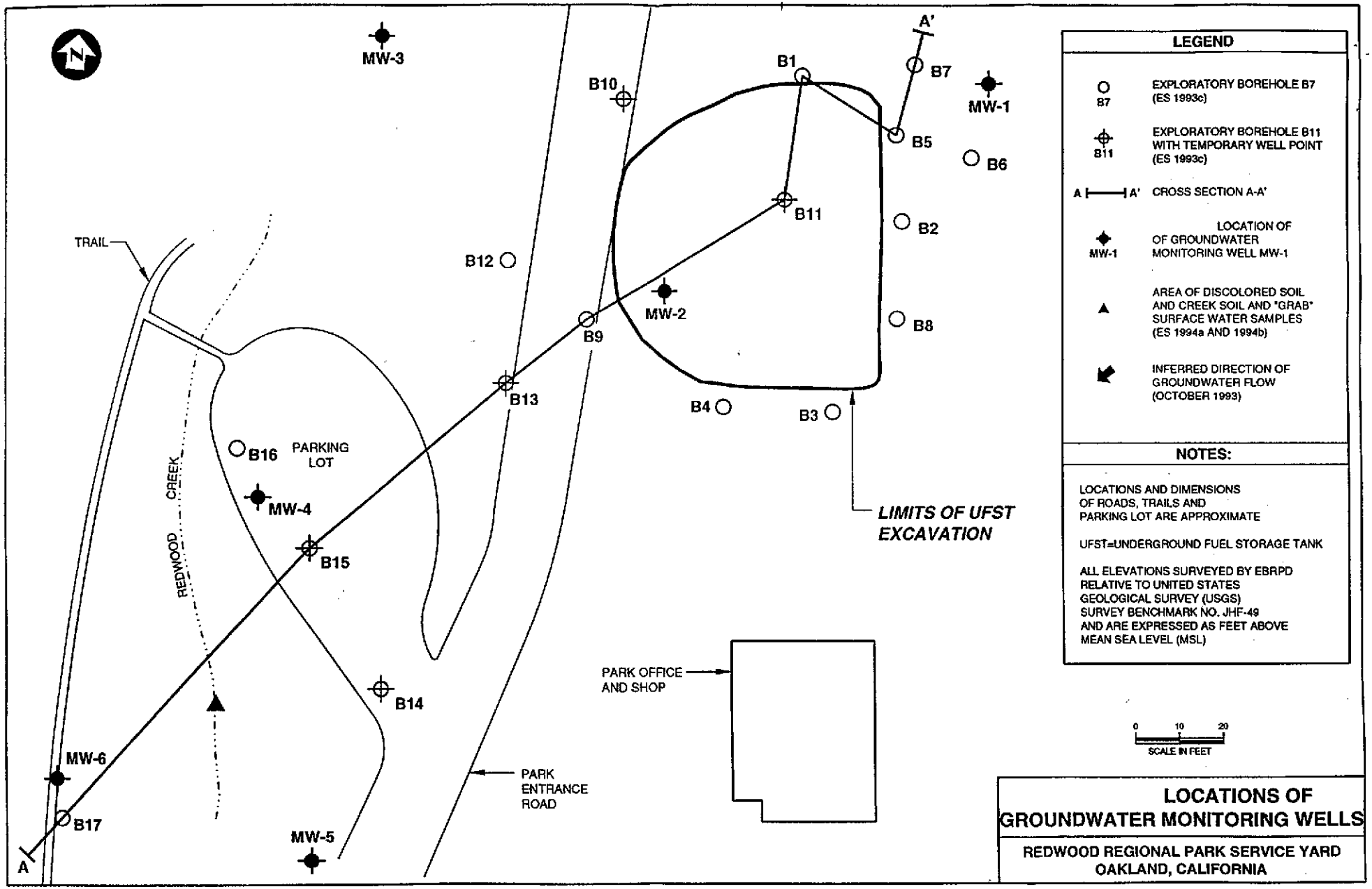
SITE LOCATION MAP

REDWOOD REGIONAL PARK
SERVICE YARD

OAKLAND, CALIFORNIA

ENGINEERING-SCIENCE

FIGURE



LEGEND

- B7 — EXPLORATORY BOREHOLE B7 (ES 1993c)
- B11 — EXPLORATORY BOREHOLE B11 WITH TEMPORARY WELL POINT (ES 1993c)
- A — A' — CROSS SECTION A-A'
- MW-1 — LOCATION OF OF GROUNDWATER MONITORING WELL MW-1
- AREA OF DISCOLORED SOIL AND CREEK SOIL AND "GRAB" SURFACE WATER SAMPLES (ES 1994a AND 1994b)
- INFERRED DIRECTION OF GROUNDWATER FLOW (OCTOBER 1993)

NOTES:

LOCATIONS AND DIMENSIONS OF ROADS, TRAILS AND PARKING LOT ARE APPROXIMATE

UFST=UNDERGROUND FUEL STORAGE TANK

ALL ELEVATIONS SURVEYED BY EBRPD RELATIVE TO UNITED STATES GEOLOGICAL SURVEY (USGS) SURVEY BENCHMARK NO. JHF-49 AND ARE EXPRESSED AS FEET ABOVE MEAN SEA LEVEL (MSL)

LOCATIONS OF GROUNDWATER MONITORING WELLS

REDWOOD REGIONAL PARK SERVICE YARD
OAKLAND, CALIFORNIA

REV. 1 C274-34.DWG 09/16/94

ENGINEERING-SCIENCE, INC.

BORING LOG

BORING NO.: MW-1

PROJECT NO. 726104	PROJECT NAME: Redwood Regional Park Service Yard		PAGE 1 OF 1
CONTRACTOR: Eng. Science	DRILLER: SES	DATE STARTED: 10/10/94	DATE COMPLETED: 10/10/94
METHOD: H-S Auger	AUGER DIA. 10.75 inch	PID: Photoionization Detector	PROTECTION LEVEL: D
GROUND ELEV: 563.6 MSL	THVA: Total Hydrocarbon Vapor Analyzer		TOTAL DEPTH: 18 feet
LOGGED BY: HP	▼ FIRST OCCURENCE OF GROUNDWATER (feet below ground surface): 9 feet		

(Elevations are feet above mean seal level [MSL]) HAMMER WEIGHT: 140 lbs HAMMER DROP: 30 inches

SOIL SAMPLE LOCATION AND NO.	DEPTH IN FEET	BLOWS PER 6 IN.	THVA SPLIT SPOON (ppmv)	PID SPLIT SPOON (ppmv)	SOIL DESCRIPTION AND COMMENTS ON ADVANCE OF BORING
	0				Upper 6 inches asphalt Brown top soil and gravel
	2				
	4				Dark brown fractured siltstone, weathering to clay, damp, friable
MW1-5	6	8 16 24	0	0	
	8				
	10	7 10 14	0	0	Light gray-brown siltstone, friable, particles of clay, moist to wet
	12				
	14				
	16	Not Rec.	0	0	
	18				Bottom of boring at 18 feet below ground surface

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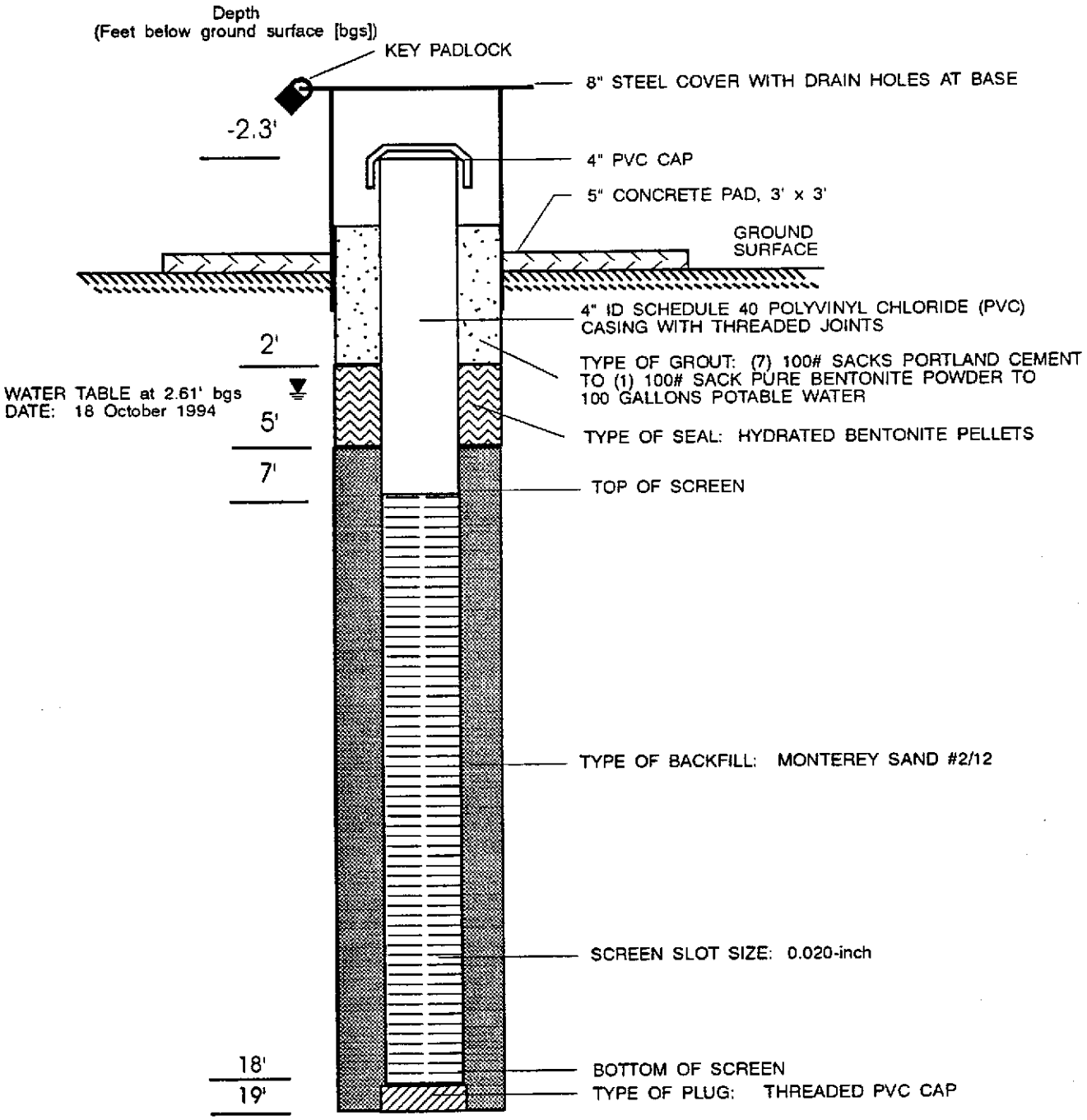
REDWOOD REGIONAL PARK SERVICE YARD

MONITORING WELL INSTALLATION DATA RECORD

PROJECT NAME: Redwood Regional	BORING DIAMETER: 10.75 inches	WELL NO: MW-1
PROJECT NO: 726104	WELL INSIDE DIAMETER: 4.0 inches	
CONTRACTOR: Engineering-Science	WELL MATERIAL: Polyvinyl chloride	DATE INSTALLED: 10 October 1994
DRILLING CO: Soils Exploration Service	TOP OF CASING ELEVATION: 565.9	DRILLING METHOD: Hollow-stem Auger
FIELD GEOLOGIST: H. Pietropaoli	GROUND SURFACE ELEVATION: 563.6	DEVELOPMENT METHOD: Bail

(All elevations are feet above mean sea level [MSL])



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REDWOOD REGIONAL PARK SERVICE YARD

BORING LOG

BORING NO.: MW-2

PROJECT NO. 726104	PROJECT NAME: Redwood Regional Park Service Yard		PAGE 1 OF 2
CONTRACTOR: Eng. Science	DRILLER: SES	DATE STARTED: 10/12/94	DATE COMPLETED: 10/12/94
METHOD: H-S Auger	AUGER DIA. 10.75 inch	PID: Photoionization Detector	PROTECTION LEVEL: D
GROUND ELEV: 564.1 MSL	THVA: Total Hydrocarbon Vapor Analyzer		TOTAL DEPTH: 37 feet
LOGGED BY: HP	▼ FIRST OCCURENCE OF GROUNDWATER (feet below ground surface): 25 feet		

(Elevations are feet above mean sea level [MSL]) HAMMER WEIGHT: 140 lbs HAMMER DROP: 30 inches

SOIL SAMPLE LOCATION AND NO.	DEPTH IN FEET	BLOWS PER 6 IN.	THVA SPLIT SPOON (ppmv)	PID SPLIT SPOON (ppmv)	SOIL DESCRIPTION AND COMMENTS ON ADVANCE OF BORING
	2				Red brown gravelly silt (Fill), dry
	4				
	6	4 6 8	0	0.4	Brown gravelly, silty clay (Fill), dry
	8				
	10	7 10 5	0	2.4	Fill as above; becomes damp at 10 feet
	12				Base of fill at 13.5 feet as evidenced by decreased rate of penetration
	14				Dark brown silty clay to clay (CL), damp, plastic, soft fuel odor
	16	2 2 4	850	2210	
	18	2 4 6 2 6			
	20	8 2 6	200	218	Red yellow brown clayey silt (ML), minor gravel, slightly plastic, damp, minor soft clayey zones
MW2-21	22	10 6 8 7			
	24	Not Recov. 6 5			Brown clayey, silty, gravel (GC), (0.5- to 1-inch), slightly plastic, loose, moist
	▼ 26	3 Not Recov.	0	1.7	

(continued)

BORING LOG

BORING NO.: MW-2

PROJECT NO. 726104	PROJECT NAME: Redwood Regional Park Service Yard		PAGE 2 OF 2
CONTRACTOR: Eng. Science	DRILLER: SES	DATE STARTED: 10/12/94	DATE COMPLETED: 10/12/94
METHOD: H-S Auger	AUGER DIA. 10.75 inch	PID: Photoionization Detector	PROTECTION LEVEL: D
GROUND ELEV: 564.1 MSL	THVA: Total Hydrocarbon Vapor Analyzer		TOTAL DEPTH: 37 feet
LOGGED BY: HP	▼ FIRST OCCURENCE OF GROUNDWATER (feet below ground surface): 25 feet		

(Elevations are feet above mean sea level [MSL]) HAMMER WEIGHT: 140 lbs HAMMER DROP: 30 inches

SOIL SAMPLE LOCATION AND NO.	DEPTH IN FEET	BLOWS PER 6 IN.	THVA SPLIT SPOON (ppmv)	PID SPLIT SPOON (ppmv)	SOIL DESCRIPTION AND COMMENTS ON ADVANCE OF BORING
					Red brown silty clay (CL), soft, damp to wet, plastic
	28	Not Rec			Brown clayey silty gravel (GM), loose, slightly plastic, wet
		3			
		5			
	30	5	0	1.6	
		3			
		5			
		7			
	32	4			
		5			
		6			
		4			
	34	5			Green brown siltstone, weathering to clay, hard, friable, most
		6			
		2			
	36	5			
		15	0	0	
		50			
		0			
	38				Bottom of boring at 37 feet below ground surface

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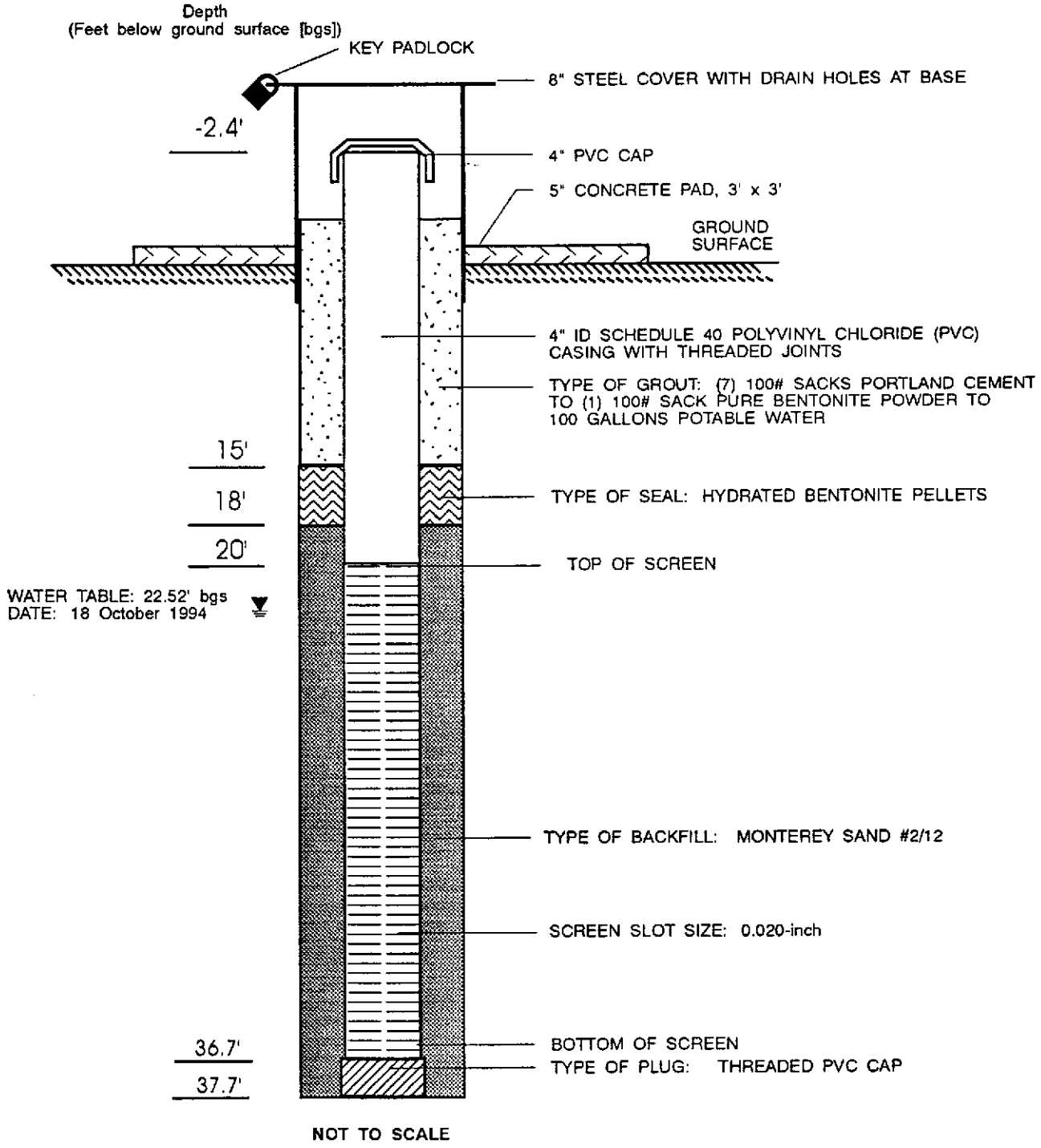
REDWOOD REGIONAL PARK SERVICE YARD

MONITORING WELL INSTALLATION DATA RECORD

PROJECT NAME: Redwood Regional	BORING DIAMETER: 10.75 inches	WELL NO: MW-2
PROJECT NO: 726104	WELL INSIDE DIAMETER: 4.0 inches	
CONTRACTOR: Engineering-Science	WELL MATERIAL: Polyvinyl chloride	DATE INSTALLED: 13 October 1994
DRILLING CO: Soils Exploration Service	TOP OF CASING ELEVATION: 566.5	DRILLING METHOD: Hollow-stem Auger
FIELD GEOLOGIST: H. Pietropaoli	GROUND SURFACE ELEVATION: 564.1	DEVELOPMENT METHOD: Bail

(All elevations are feet above mean sea level [MSL])



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REDWOOD REGIONAL PARK SERVICE YARD

BORING LOG

BORING NO.: MW-3

PROJECT NO. 726104	PROJECT NAME: Redwood Regional Park Service Yard		PAGE 1 OF 2
CONTRACTOR: Eng. Science	DRILLER: SES	DATE STARTED: 10/10/94	DATE COMPLETED: 10/11/94
METHOD: H-S Auger	AUGER DIA. 10.75 inch	PID: Photoionization Detector	PROTECTION LEVEL: D
GROUND ELEV: 558.1 MSL	THVA: Total Hydrocarbon Vapor Analyzer		TOTAL DEPTH: 42 feet
LOGGED BY: HP	▼ FIRST OCCURENCE OF GROUNDWATER (feet below ground surface): 34.5 feet		

(Elevations are feet above mean sea level [MSL]) HAMMER WEIGHT: 140 lbs HAMMER DROP: 30 inches

SOIL SAMPLE LOCATION AND NO.	DEPTH IN FEET	BLOWS PER 6 IN.	THVA SPLIT SPOON (ppmv)	PID SPLIT SPOON (ppmv)	SOIL DESCRIPTION AND COMMENTS ON ADVANCE OF BORING
	2				Light brown silt (Fill), loose, dry to damp, fragments of fractured siltstone (2- to 24-inches)
	4				
	6	3 6 8	0	2.9	Becomes slightly plastic and dry
	8				
MW3-10	10	9 9 9	0	7.6	Same as above
	12				
	14				Red brown clayey silt (ML), slightly plastic, soft, damp to moist
	16	3 3 6	0	1.9	
	18				
	20	3 4 5	0	0.7	Mottled yellow red silty clay (CL), soft,, plastic, damp to wet
	22				
	24				Blue-grey silty clay (CL), soft,, plastic, damp to wet, wood fragments
MW3-25	26	1 2	0	11.1	(Continued)

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REDWOOD REGIONAL PARK SERVICE YARD

BORING LOG

BORING NO.: MW-3

PROJECT NO. 726104	PROJECT NAME: Redwood Regional Park Service Yard		PAGE 2 OF 2
CONTRACTOR: Eng. Science	DRILLER: SES	DATE STARTED: 10/10/94	DATE COMPLETED: 10/11/94
METHOD: H-S Auger	AUGER DIA. 10.75 inch	PID: Photoionization Detector	PROTECTION LEVEL: D
GROUND ELEV: 558.1 MSL	THVA: Total Hydrocarbon Vapor Analyzer		TOTAL DEPTH: 42 feet
LOGGED BY: HP	▼ FIRST OCCURENCE OF GROUNDWATAER (feet below ground surface): 34.5 feet		

(Elevations are feet above mean sea level [MSL]) HAMMER WEIGHT: 140 lbs HAMMER DROP: 30 inches

SOILS SAMPLE LOCATION AND NO.	DEPTH IN FEET	BLOWS PER 6 IN.	THVA SPLIT SPOON (ppmv)	PID SPLIT SPOON (ppmv)	SOIL DESCRIPTION AND COMMENTS ON ADVANCE OF BORING
	28				
	30	2	0	0	
		2			
		3			Same as above, 10-30% organics (wood)
	32				
	34	▼			
	36				
	38				
	40	3			Clayey gravel (GC), angular, 0.25- to 2-inch, med. dense to loose, wet, organics, iron staining
		4			
	42	4	0	1.9	
					Bottom of boring at 42 feet below ground surface

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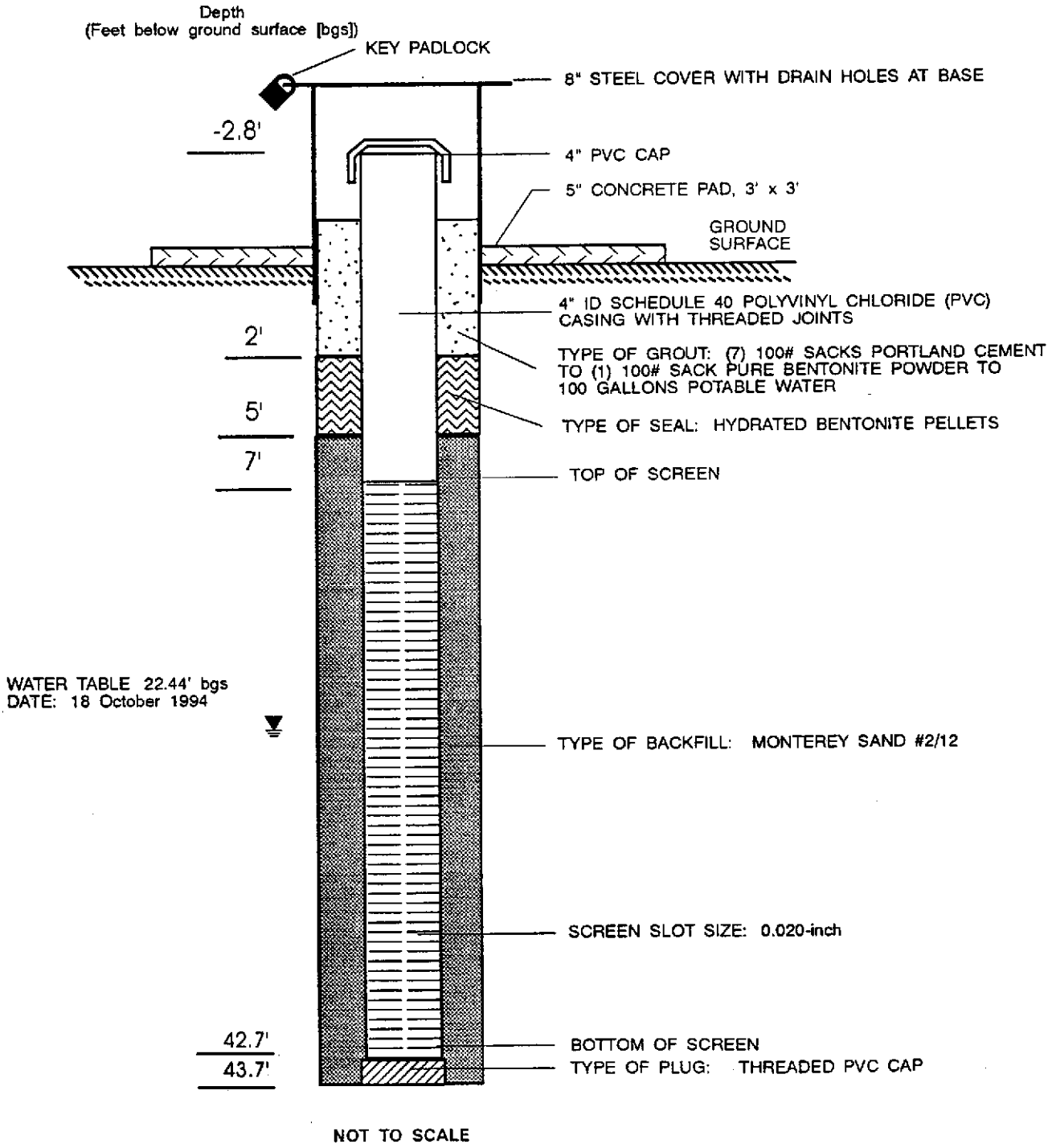
REDWOOD REGIONAL PARK SERVICE YARD

MONITORING WELL INSTALLATION DATA RECORD

PROJECT NAME: Redwood Regional	BORING DIAMETER: 10.75 inches	WELL NO: MW-3
PROJECT NO: 726104	WELL INSIDE DIAMETER: 4.0 inches	
CONTRACTOR: Engineering-Science	WELL MATERIAL: Polyvinyl chloride	DATE INSTALLED: 10 October 1994
DRILLING CO: Soils Exploration Service	TOP OF CASING ELEVATION: 560.9	DRILLING METHOD: Hollow-stem Auger
FIELD GEOLOGIST: H. Pietropaoli	GROUND SURFACE ELEVATION: 558.1	DEVELOPMENT METHOD: Bail

(All elevations are feet above mean sea level [MSL])



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REDWOOD REGIONAL PARK SERVICE YARD

BORING LOG

BORING NO.: MW-4

PROJECT NO. 726104	PROJECT NAME: Redwood Regional Park Service Yard		PAGE 1 OF 1
CONTRACTOR: Eng. Science	DRILLER: SES	DATE STARTED: 10/12/94	DATE COMPLETED: 10/12/94
METHOD: H-S Auger	AUGER DIA. 10.75 inch	PID: Photoionization Detector	PROTECTION LEVEL: D
GROUND ELEV: 546.0 MSL	THVA: Total Hydrocarbon Vapor Analyzer		TOTAL DEPTH: 26 feet
LOGGED BY: HP	▼ FIRST OCCURENCE OF GROUNDWATER (feet below ground surface): 17 feet		

(Elevations are feet above mean sea level [MSL]) HAMMER WEIGHT: 140 lbs HAMMER DROP: 30 inches

SOIL SAMPLE LOCATION AND NO.	DEPTH IN FEET	BLOWS PER 6 IN.	THVA SPLIT SPOON (ppmv)	PID SPLIT SPOON (ppmv)	SOIL DESCRIPTION AND COMMENTS ON ADVANCE OF BORING
	2	11 7 5			Silt with gravel (Fill)
	4	10 9 7	0	45.7	Brown clayey silt to silt (ML), dry, dense, slightly plastic
	6	6 6 3			Color change to brown
	8	4 5 12			Color change to light brown
	10	10 9 7			
	12	7 7 5	0	28	Mottleded orange-brown silty clay to clayey silt (CL/ML), damp, slightly plastic, <2% organics, red silty patches (0.12- to 0.25-inches)
	14	7 8 8			Blue discolored silty clay (CL), 2% gravel (0.1- to 0.5-inch) damp, slightly plastic, fuel odor
MW4-16.5	16	5 7 8			
MW4-16.5		7 5 3	680	816	
	▼ 18	5 13 4			Light brown siltstone, dense, hard, moist
	20	3 2 2	0	4.8	Gray clayey coarse sand (SC), 2% gravel (0.25- to 1-inch) saturated, organics, red and yellow siltstone patches (0.1- to 0.25-inches)
	22	3 2 2			
	24	2 3 2			Brown clayey gravelly silt (ML), wet, red siltstone clasts (0.25- to 1-inch), loose, slightly plastic
	26	3 4 2 2 5	0	0	Bottom of boring at 26 feet below ground surface

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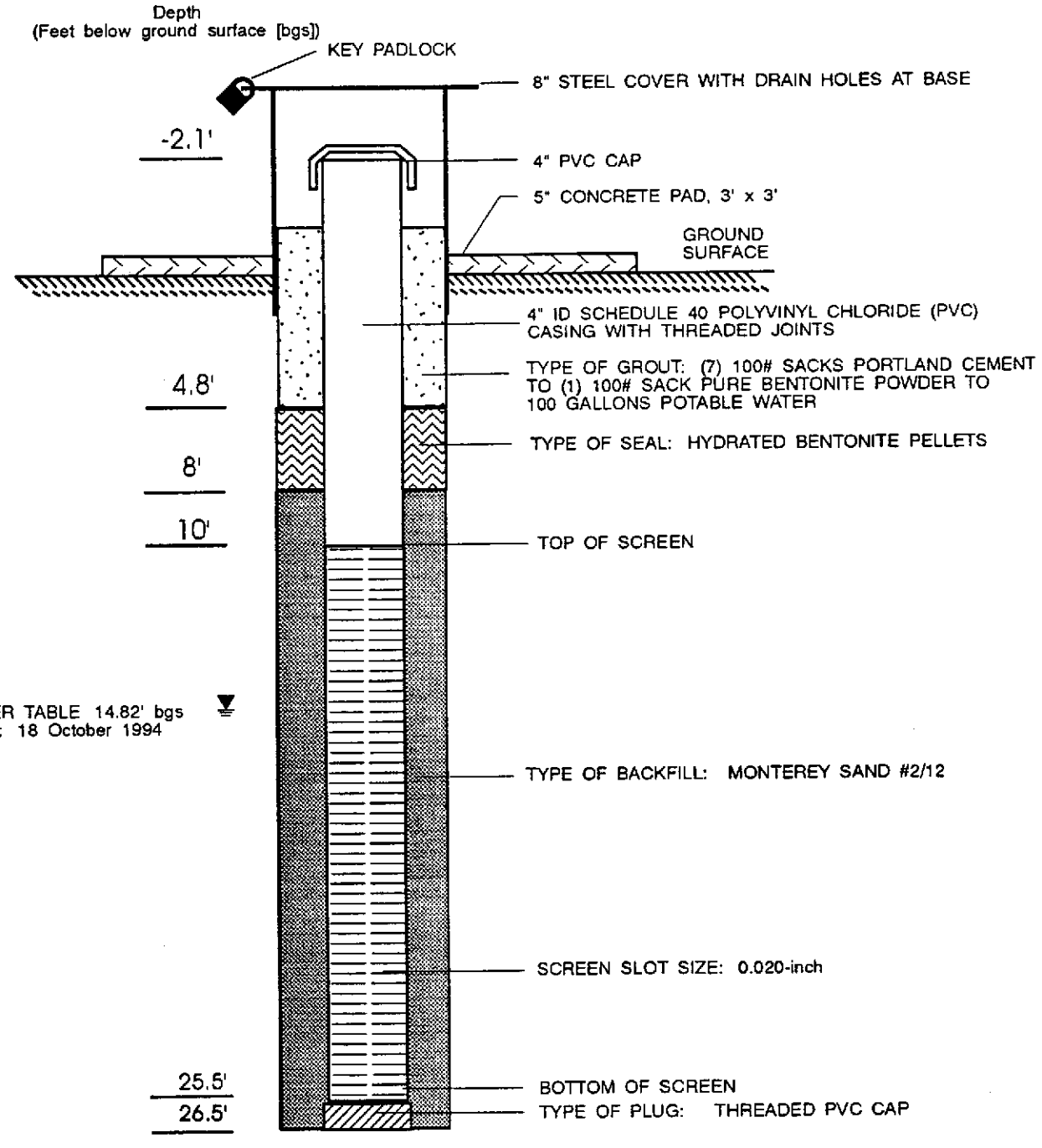
REDWOOD REGIONAL PARK SERVICE YARD

MONITORING WELL INSTALLATION DATA RECORD

PROJECT NAME: Redwood Regional	BORING DIAMETER: 10.75 inches	WELL NO: MW-4
PROJECT NO: 726104	WELL INSIDE DIAMETER: 4.0 inches	
CONTRACTOR: Engineering-Science	WELL MATERIAL: Polyvinyl chloride	DATE INSTALLED: 12 October 1994
DRILLING CO: Soils Exploration Service	TOP OF CASING ELEVATION: 548.1	DRILLING METHOD: Hollow-stem Auger
FIELD GEOLOGIST: H. Pietropaoli	GROUND SURFACE ELEVATION: 546.0	DEVELOPMENT METHOD: Bail

(All elevations are feet above mean sea level [MSL])



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REDWOOD REGIONAL PARK SERVICE YARD

BORING LOG

BORING NO.: MW-5

PROJECT NO. 726104	PROJECT NAME: Redwood Regional Park Service Yard		PAGE 1 OF 1
CONTRACTOR: Eng. Science	DRILLER: SES	DATE STARTED: 10/11/94	DATE COMPLETED: 10/11/94
METHOD: H-S Auger	AUGER DIA. 10.75 inch	PID: Photoionization Detector	PROTECTION LEVEL: D
GROUND ELEV: 545.2 MSL	THVA: Total Hydrocarbon Vapor Analyzer		TOTAL DEPTH: 26.5 feet
LOGGED BY: HP	▼ FIRST OCCURENCE OF GROUNDWATER (feet below ground surface): 16.5 feet		

(Elevations are feet above mean sea level [MSL]) HAMMER WEIGHT: 140 lbs HAMMER DROP: 30 inches

SOIL SAMPLE LOCATION AND NO.	DEPTH IN FEET	BLOWS PER 6 IN.	THVA SPLIT SPOON (ppmv)	PID SPLIT SPOON (ppmv)	SOIL DESCRIPTION AND COMMENTS ON ADVANCE OF BORING
	2				
	4				
	6	2 2 2	0	0	Brown clayey silt (ML), damp, medium dense, slightly plastic
	8				
	10	3 4 5	0	1.1	As above
	12				
	14				
MW5-15	16 ▼	5 7 8	0	0	Yellow-brown siltstone, friable, dense, saturated (evidenced by wet sampler tip)
	18				
	20	6 3 5	0	0	Brown clayey gravel (GC), wet, poorly sorted, loose
	22				
	24				As above
	26	10 17 27	0	0	Bottom of boring at 26.5 feet below ground surface

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REDWOOD REGIONAL PARK SERVICE YARD

BORING LOG

BORING NO.: MW-6

PROJECT NO. 726104	PROJECT NAME: Redwood Regional Park Service Yard		PAGE 1 OF 1
CONTRACTOR: Eng. Science	DRILLER: SES	DATE STARTED: 10/14/94	DATE COMPLETED: 10/14/94
METHOD: H-S Auger	AUGER DIA. 10.75 inch	PID: Photoionization Detector	PROTECTION LEVEL: D
GROUND ELEV: 543.3 MSL	THVA: Total Hydrocarbon Vapor Analyzer		TOTAL DEPTH: 25 feet
LOGGED BY: HP	▼ FIRST OCCURENCE OF GROUNDWATER (feet below ground surface): 19.5 feet		

(Elevations are feet above mean sea level [MSL]) HAMMER WEIGHT: 140 lbs HAMMER DROP: 30 inches

SOIL SAMPLE LOCATION AND NO.	DEPTH IN FEET	BLOWS PER 6 IN.	THVA SPLIT SPOON (ppmv)	PID SPLIT SPOON (ppmv)	SOIL DESCRIPTION AND COMMENTS ON ADVANCE OF BORING
	2				Light brown silt (Fill), dry, loose
	4				
	6	2 2 2	0	0	Gravelly, clayey silt (ML), dry, loose, slightly plastic
	8				
	10	50 38 50+	0	2.8	Yellow siltstone, dense, dry, red siltstone clasts (0.25- to 0.5-inch) abundant gravel and rock fragments in drill cuttings, slow rate of penetration
	12				
	14				
	16	6 6 21	0	3.5	Mottled yellow-brown-red gravelly, silty clay (CL), moist to wet
	18	18 12 6	0	2.0	
MW6-19	▼ 20	5 4 4			Blue-grey clay (CH), soft, plastic, 20% organics, moist to wet
		7 21	0	0	As above, with minor gravel, wet
	22	20 No Recov			Green-brown coarse sandy, clayey gravel (GC), loose saturated
	24	20 32	0	0	
	26	50			Bottom of boring at 25 feet below ground surface

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REDWOOD REGIONAL PARK SERVICE YARD