Watkins-Johnson Environmental, Inc.
LITHOLOGY LOG

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Site ID: 937GW38

Project Name	Project No.	Coordinates	
PS TEPS PRESIDIO IRA	0330.230 IRA		
Drilling Company	**Driller**	**Ground Elevation**	**Total Drilled Depth**
HEW	Jasper Booker		48.5'

Drilling Equipment	Drilling Method	Boring Diameter	Date/Time Drilling Started	Date/Time Total Depth Reached
CME-55	HSA	6"; 12"	10/28/92; 0745	10/28/92; 1430; 48.5'

Type of Sampling Device	Water Level (BGS)
5' continuous; 18" split spoon	First / Final

Sample Hammer	Hydrogeologist	Checked by/Date
Type: Automatic; Driving Wt.: 140; Drop: 30"	Riley Conkin	ERY 11/03/92

Location Description (include sketch in field logbook): East of Building 937 approximately 100', 10' northeast of 937GW12

Depth (ft)	Interval	% Recovery	Blow Counts	Description (include in order lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy (structure, density, consistency, etc. as applicable))	USCS Symbol	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, tag number, odor, organic vapor measurements, etc.)
0				Asphalt		Asphalt	–	–	–	–	0750
1			continuous	FILL MATERIAL; coarse grained gravels clasts up to 1" in diameter with sand and silty, dry	Fi LL		DRY	30	30	40	
2			continuous	SAND, fine to medium grained, lt yellowish brown 2.5Y 6/3, very loose, poorly graded, minor silt.	SP		LM	–	98	2	
3		100	1 2	SAND, as above							0800; collected sample for analysis from 3-4.5', took 2 top 2 tubes (4") 3'-3'
4			2	CLAY, sandy, black 5Y 2.5/2; moderately plastic, soft; abundant organic material-roots	CL		M	–	5	95	
			continuous	~~SAND~~ RC 10-28-92 CLAY, as above, grades to SAND	CL		M	–	5	95	
5		100	continuous	SAND, fine to medium grained, minor silt, dark olive grey 5Y 3/2, v/loose, v/moist to wet, poorly graded, abundant organic material-roots.	SP		v/moist WET	–	98	2	SAND First water at approximately 6'
7		100	3 2 1	SAND, as above, wet, very loose	SP						0815; collected sample for analysis from 6.5-8'
8		90	continuous	SAND, as above	SP			–	98	2	0830
9											
10											
11											
				CLAY, sandy, dark olive grey 5Y 3/2, soft, moderate plasticity	CL				20	80	
12				SAND, minor silt, dark olive grey, fine grained, loose, abundant organics	SP				98	2	
13											

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Watkins-Johnson Environmental, Inc.
LITHOLOGY LOG (continued)

Site ID 9376W38

Depth (ft)	Interval	% Recovery	Blow Counts	Description (include in order lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy (structure, density, consistency, etc. as applicable)	USCS Symbol	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, tag number, odor, organic vapor measurements, etc.)
13		100	Continuous	SAND, medium grained, poorly graded, dark olive grey 5Y3/2, loose, wet, abundant organic material-roots	SP		WET	–	100	–	0840; Drilled to 18', flowing sands inside augers from 13'-18'; pull 6" augers, set-up to ream w/12" augers.
14											
15											
16											
17											
18				SAND, as above from 18' to 45' logged from drill cuttings on augers	SP		WET	–	100	–	
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

Watkins-Johnson Environmental, Inc.
LITHOLOGY LOG (continued)

Site ID: 937GW38

Depth (ft)	Interval	% Recovery	Blow Counts	Description (include in order lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy (structure, density, consistency, etc. as applicable)	USCS Symbol	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (Include all sample types & depth, tag number, odor, organic vapor measurements, etc.)
30				SAND - ~~COLMA FORMATION~~ RC 10-28-92	SP		WET	-	100	-	
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44									SAND		Contact between ~~Colma Formation~~ and weathered bedrock at 45' bgs
45				Weathered Bedrock from 45' to 48.5'							Driller notes harder drilling at 45' bgs Refusal at 47' bgs w/12" augers.
46											
47											

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Watkins-Johnson Environmental, Inc.
LITHOLOGY LOG (continued)

Site ID: 937GW38

Depth (ft)	Interval	% Recovery	Blow Counts	Description (include in order lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy (structure, density, consistency, etc. as applicable))	USCS Symbol	Lithology	Water Content	Estimate % of Gr	Sa	Fi	Remarks (include all sample types & depth, tag number, odor, organic vapor measurements, etc.)
47			25	Weathered Bedrock; fragments of serpentine, subangular in very stiff clay matrix, dark olive grey 5Y3/2, moist, minor sand.				20	5	75	1130; Drove 18" split spoon from 47-48.5'
48		100	23								
			28								
49				RC 10-25-92							
				DPTOT 48.5'							

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Watkins-Johnson Environmental, Inc.
WELL CONSTRUCTION SUMMARY

Well No.	Combo/Key #
937GW38	

Project Name: PSTEPS Presidio IRA	Project No.: 0330.230	Coordinates:
Drilling Company: HEW	Driller: Jasper Becker	Elevation: Ground Level / Top of Casing
Drilling Equipment: CME-55	Drilling Method: HSA	Total Drilled Depth: 47'
Borehole Diameter: 12"	Drilling Fluid: —	
Drill Bit(s): 12" HSA	Hydrogeologist: Riley Conkin	Checked by/Date: EN 11/3/92

Location Description (include sketch in field logbook): 100' East of Building 937, approximately 10' northeast of 937GW12

ANNULAR CONSTRUCTION

Description	Type	Interval From (ft BGS)	Interval To (ft BGS)	Quantity
Filter Pack	#2/12 LONESTAR SAND	47	33	4.5 bags
Filter Pack Blotter (if applicable)	—	—	—	
Seal	25 SLURRY 1/4" Bentonite Pellets - American Colloid Co.	33	28	
Grout	High Grade WYOMING BENTONITE POWDER (5%) RMC LONESTAR PORTLAND CEMENT Type I/II	28	0	9 bags

CONSTRUCTION TIME LOG

Activity	Start Date	Start Time	Finish Date	Finish Time
Drilling	10/28/92	0745	10/28/92	0840
Reaming	10/28/92	0910	10/28/92	1115
Geophysical Logging				
Casing/Screen Placement	10/28/92	1445	10/28/92	1610
Filter Pack	10/28/92	1610	10/28/92	1645
Seal	10/28/92	1645	10/28/92	1700
Grout	10/28/92	1700	10/28/92	1740
Preliminary Surge/ Development				
Other:				

WELL STRING DESIGN

Surface Casing [length, diameter (OD), thickness]: 3' x 8" x 1/4" steel stove pipe

Casing [type, diameter (ID), thread type]: Stainless steel, 4", Flush Threaded; C4 sch40 PVC, 4" Flush Thread

Screen [type, slot-size, diameter (ID), thread type]: Stainless steel, 0.010", 4", Flush Threaded.

Casing/Screen Sequence & Interval (starting at bottom):

	BLANK CASING From (ft BGS)	BLANK CASING To (ft BGS)		SCREEN From (ft BGS)	SCREEN To (ft BGS)
C1	37.0	27.0	S1	47.0	37.0
C2	27.0	17.0	S2		
C3	17.0	7.0	S3		
C4	7.0	+2.0 above grade	S4		
C5			S5		
C6					
C7					
C8					
C9					
C10					
C11					

WATER ADDED DURING DRILLING/CONSTRUCTION

Total Amount (gals): 25

COMMENTS:
- Pumped down a bentonite powder slurry as a seal from approximately 33' to 28' bgs.
- Encountered flowing sands from 18' to 45'.

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Watkins-Johnson Environmental, Inc.
WELL DEVELOPMENT DATA

SITE ID: 937 GW 38

PROJECT:

PROJECT NO.:

HYDROGEOLOGIST: Jay Hazel

DRILLER:

DATE(S) INSTALLED:

DATE(S) DEVELOPED: 11-2-92

Casing Diameter	4 in.
Borehole Diameter	12 in.
Total Well Depth	48.92 ft.
Static Water Level	6.52 ft.
Saturated Thickness	42.40 ft.
Casing volume	28.0 gal.
Annulus Volume (Assume 30% porosity)	180 ~~67.42~~ gal.
Total Well Volume	410 ~~95.42~~ gal.

DEVELOPMENT EQUIPMENT: 9 foot Stainless Steel Bailer, Steel Cable, Winch Truck

DEVELOPMENT METHODS/NOTES: No problems with purging. Water cleared up, last bailer removed from bottom of well, Otherwise parameters were stabilized w/in 10%.

TURBIDITY METER: HF Scientific, Serial No. 000308

pH/TEMP METER: Type: Orion SA 2-30, Serial Number: 4938

Calibration: pH 7.00 = 7.01 at 18.8 °C, Time 9:09; pH 10.00 = 10.00 at 18.6 °C, Time 9:10

CONDUCTIVITY METER: Type: Orion 122, Serial Number: 9811077

Conductance Standard: 1000 µS/cm at 25 °C

Measured Value: 1027 µS/cm at 21.2 °C, Time 9:12

Calibrated Conductivity = Measured Conductance + (0.02) (measured conductance) (25°C - Actual Temp): N/A µS/cm at 25°C, Time

Time	Number of Well Casings	Gallons Removed	°C	E.C. µS/cm	Turbidity NTU	~~Pump Rate GPM~~ pH	Approx. Pump Depth ft.	Visual Description
11:52	Initial	—	19.8	1410	>200	8.17	N/A	Turbid Lt. Gray
12:05	1	~~47~~ 48	~~18.8~~	1503	>200	8.17	N/A	Turbid Lt. Gray
12:16	2	94	18.5	1477	134.4	8.07	N/A	Cloudy Pale Yellow
12:31	3	141	17.8	1457	50.6	8.05	N/A	Slightly Cloudy Colorless
12:42	4	188	17.9	1440	25.6	8.00	N/A	Clear
12:54	5	235	17.9	1499	188.5	8.29	N/A	Slightly Cloudy Pale Yellow
		Development Complete					N/A	

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GROUND-WATER SAMPLING FIELD DATA SHEET

Environmental Program at Presidio of San Francisco

IRA

Log Book # PSC SR 18

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Well ID No.	Date	Purge Equipment:	pH Meter:	Conductivity Meter:
937GW38	11/5/92	Type Grundfos pump	Type Orion SA 230	Type ~~HF Sci~~ Orion 11/5/92 etr 122
Samplers' Initials: etr/lmo	Time: 0800	Serial No. P192062535	Serial No. 4938	Serial No. 9811077
Casing Diameter: 4" in.	Casing Stickup: ~3' ft.	Sample Equipment: ☐ Same as purge ☑ Other PVC 4" Type ~~SS~~ bailer	Turbidity Meter: Type HF Sci DRT 15C	Temperature Meter: Type same as pH
Total Well Depth: 49.25 ft-btoc	Screened Interval: ~39-49' ft-bgs	Serial No. ____	Serial No. 000308	Serial No. ____
Initial Water Level: 6.44 ft-btoc	Top of Filter Pack: ~37' ft-bgs		.02 NTU of Standard	
Saturated Thickness: [H]= 42.81 ft.	Filter Pack Thickness: [F]= ~2' ft.	Filtration Equipment: ☑ Peristaltic Pump with 0.45 micron filter		
Wellbore Volume: — gal.	Casing Volume: 28.3 gal.	☐ Other Type ____		
Final Water Level: 7.14' ft-btoc	Sample Depth: 44' ft-bgs	Serial No. ____		

Meter Calibration/Check (circle one)

Standard	Reading	Temperature °C/F (circle one)	Time
1000 uS/cm at 25 °C	1020	15.5	0825
pH 4.0	4.00	14.3 etr	0820
pH 7.0	7.00	14.3 etr	0820
pH 10.0			

Water-Level Meter Type solinst Serial No. WLM 2i

Time	Number of Casing Volumes	Gallons Removed	Temp °C/F	EC uS/cm	pH	Turbidity NTU	Pump Rate GPM	Approx. Pump Depth ft.	Visual Description
0830	0	0	19.7	2090	6.38	12.19	4	~~44'~~ 12 etr	
0837	1	28	15.2	1451	7.47	2.97	4	44'	br clear, sl cloudy
0844	2	56	17.4	1447	7.54	2.33	4	44'	"
0851	3	84	17.6	1446	7.62	1.69	4	44'	"
0858	4	112	17.7	1436	7.66	1.73	4	44'	"
						~~33.4~~ etr 11/5/92			
Post-Sample Water: 0942			18.2	1452	7.94	33.4	N/A	N/A	sl cloudy.

HS Comments: Background 2ppm
BZ 2ppm
Hex 10ppm
Lead 5ppm

HS Signature: Lynn Malone

☑ Full Sample Suite Obtained
☐ Partial Sample Suite Obtained
☐ No Sample Obtained
☐ QC Samples D, R, TB, MS, MSD (circle)

See chain-of-custody for analyses requested.

Condition of Well, Remarks:

Samplers Signature: Elnora Pooley

Protective Level Dermal: (C) B
Respiratory: (D) B

☐ Metal sample(s) filtered in accordance with chain-of-custody

Checked by/Date:

ft-btoc = feet-below top of casing
ft-bgs = feet-below ground surface

Tyvek

FORM014/AUG 1992

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