

**APPENDIX A1**  
**Borehole Lithologic Logs**

***GEOSCIENCE***

**APPENDIX A1:**

**BOREHOLE LITHOLOGIC LOGS**

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BOREHOLE NAME CX-B1
------------------------

**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER		California American Water 13017-13		LOCATION <b>Marina, CA</b> <b>CEMEX Lapis Plant</b> 36°42' 47.3796", -121°48' 21.2364" Geographic NAD83			
REPORT DATE		7/8/2014					
DRILLING CONTRACTOR DRILLER		Cascade Drilling Jose Munguia		LOGGED BY <b>B. Villalobos</b>			
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	10/22/13	BOREHOLE DIAMETER	9 in/8 in
SURFACE ELEVATION	28.0 ft	TOTAL DEPTH	306 ft bgs	FINISH DATE	10/29/13	CORE SIZE	6 in
Lithologic Log							
Depth bgs (feet)	GAMMA (GAPI) 0 110 1500	CLID (mmho/m) 0	Zone* Test	Graphic Log	NOTE: Grain size distribution percentages are approximate. Material code (e.g. SP) reference Unified Soil Classification visual method. Color code (e.g. 10YR 5/2) reference Munsell Soil Color Charts.		Depth bgs (feet)
0					SAND (SP): brown (10YR 4/3), 100% fine to medium grained sand, subrounded, poorly graded, <5% dark mineral sand grains; trace silt, interbedded; medium sorted; dry sample; contains feldspar and amphibole.		
5							5
10					SAND (SP): yellowish brown (10YR 5/8), 100% fine grained sand, subrounded, poorly graded, <2% dark mineral sand grains; well sorted; dry sample; contains quartz.		10
15					SAND (SP): yellowish brown (10YR 5/4), 100% fine to medium grained sand, subrounded; trace silt, silty sand interbedding; medium sorted; dry sample; contains feldspar and amphibole.		15
20					SAND (SP): yellowish brown (10YR 5/6), 100% fine to medium grained sand, subrounded; medium sorted; moist sample; contains quartz, feldspar and amphibole.		20
25					SAND (SP): dark yellowish brown (10YR 4/6), 100% medium grained sand; trace silt, trace gray silt lenses; wet sample; contains quartz, feldspar and amphibole.		25
30					SAND (SP): greenish gray (5GY 5/1), 100% medium grained sand, subrounded, <5% dark mineral sand grains, <0.5% coarse sand grains; well sorted; wet sample; contains quartz, feldspar and amphibole. SAND (SP): yellowish brown (10YR 5/8), 100% medium grained sand, subrounded, poorly graded, <5% dark mineral sand grains; well sorted; wet sample; contains quartz, feldspar and amphibole.		30
35					SAND (SP): yellowish brown (10YR 5/4), 100% medium grained sand, subrounded, poorly graded, beds of medium to coarse sand; trace fine gravel up to 12.7 mm, subrounded; trace silt, brown and gray streaks of silty sand; medium sorted; wet sample; contains quartz, feldspar, amphibole, siltstones, and chert.		35
40							40
45					SAND (SP): grayish brown (2.5Y 5/2), 100% medium to coarse grained sand, subrounded to rounded; trace fine gravel up to 4.8 mm, subrounded to rounded; poorly sorted; wet sample; contains quartz, feldspar, and chert; granitic.		45
50					SAND (SP): yellowish brown (10YR 5/4), 90% medium to coarse grained sand, subrounded;		50

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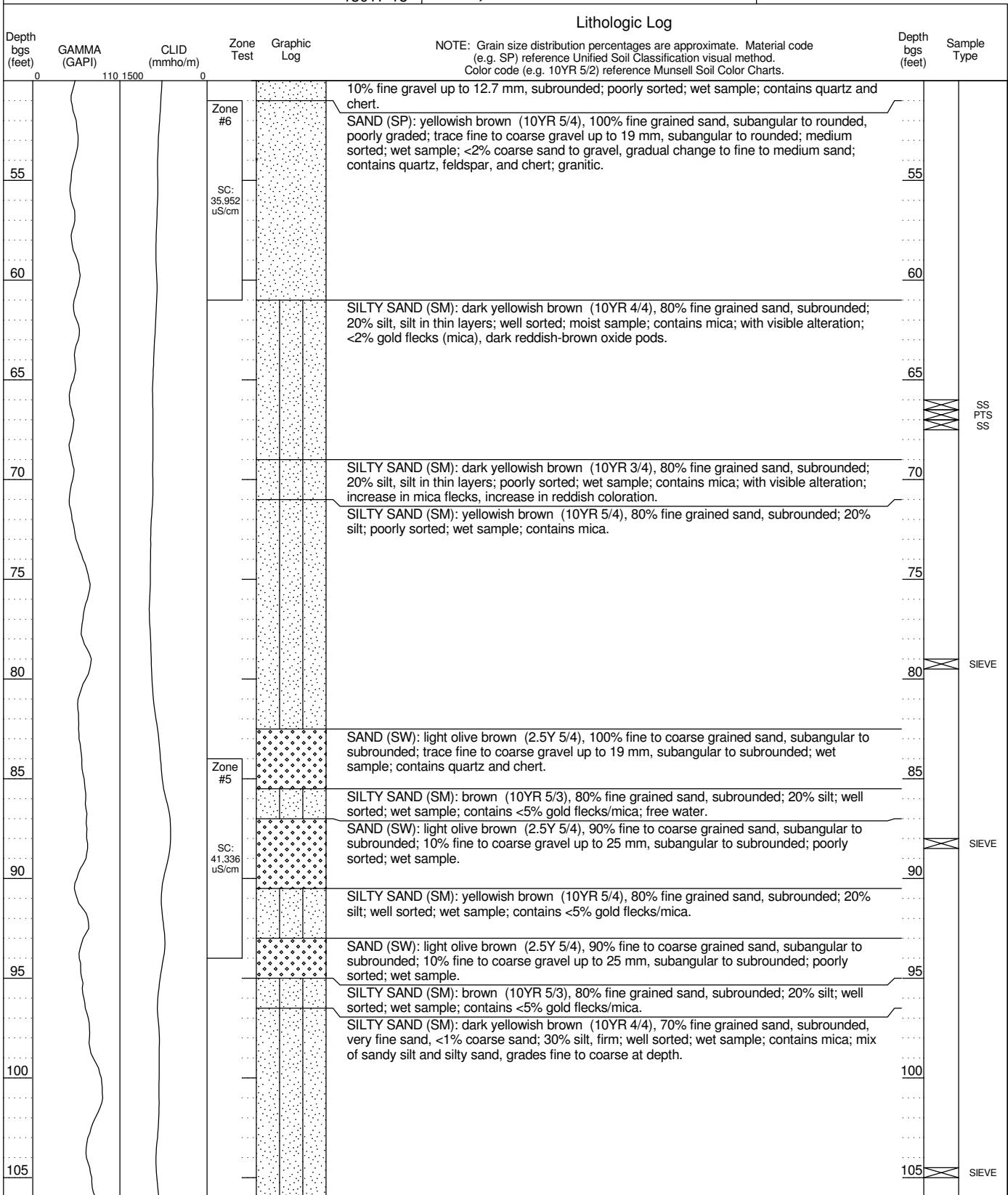
BOREHOLE NAME  
**CX-B1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**



Geoscience Support Services, Inc.

\*Zone test details are for CX-B1WQ, approximately 80 ft west of CX-B1

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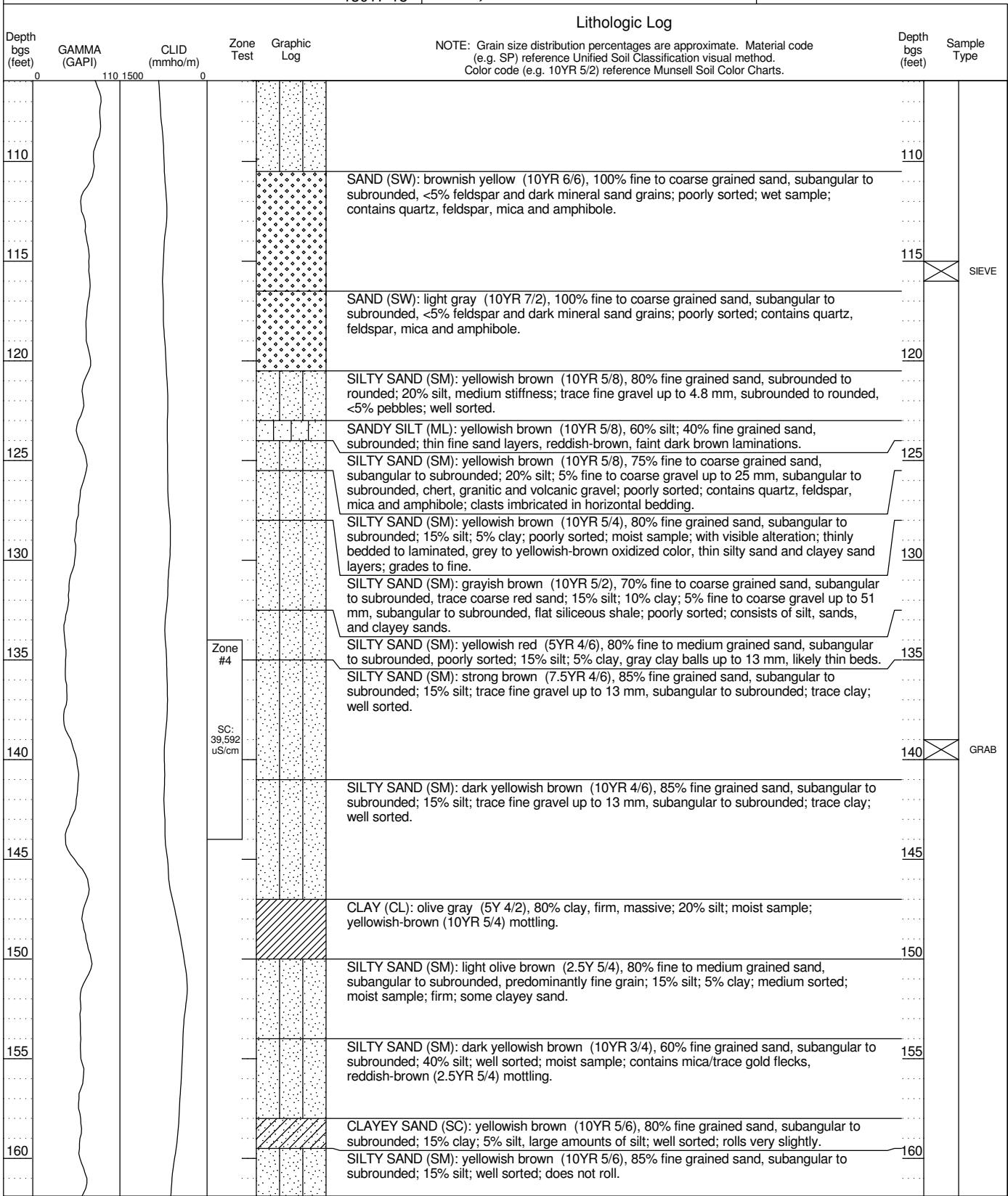
BOREHOLE NAME  
**CX-B1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
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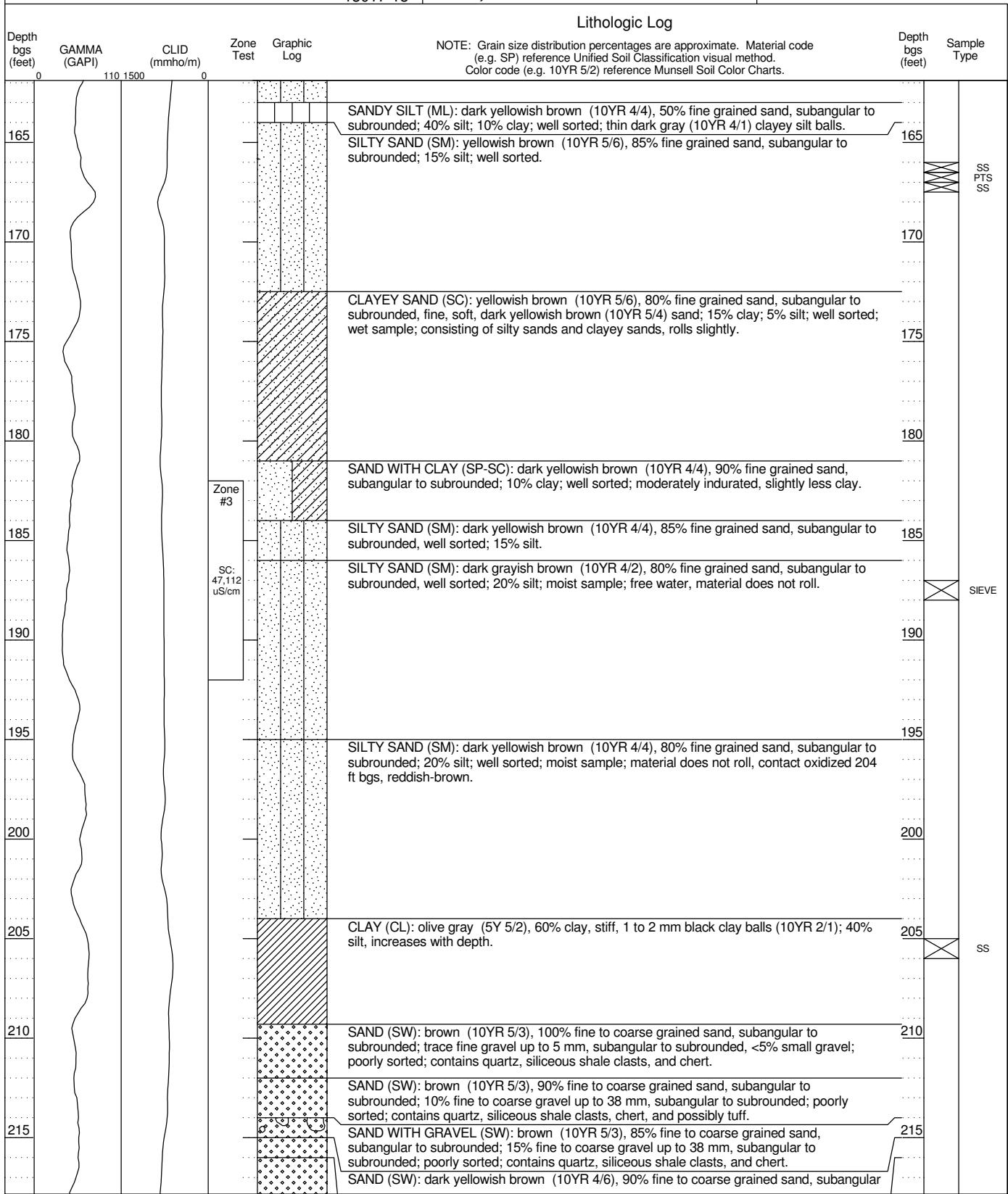
BOREHOLE NAME  
**CX-B1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
 PROJECT NUMBER

California American Water  
 13017-13

LOCATION  
**Marina, CA**



Geoscience Support Services, Inc.

\*Zone test details are for CX-B1WQ, approximately 80 ft west of CX-B1

SS: Splitspoon sample GRAB: Grab sample PTS: Splitspoon submitted for analysis SIEVE: Grab sieved by GSSI

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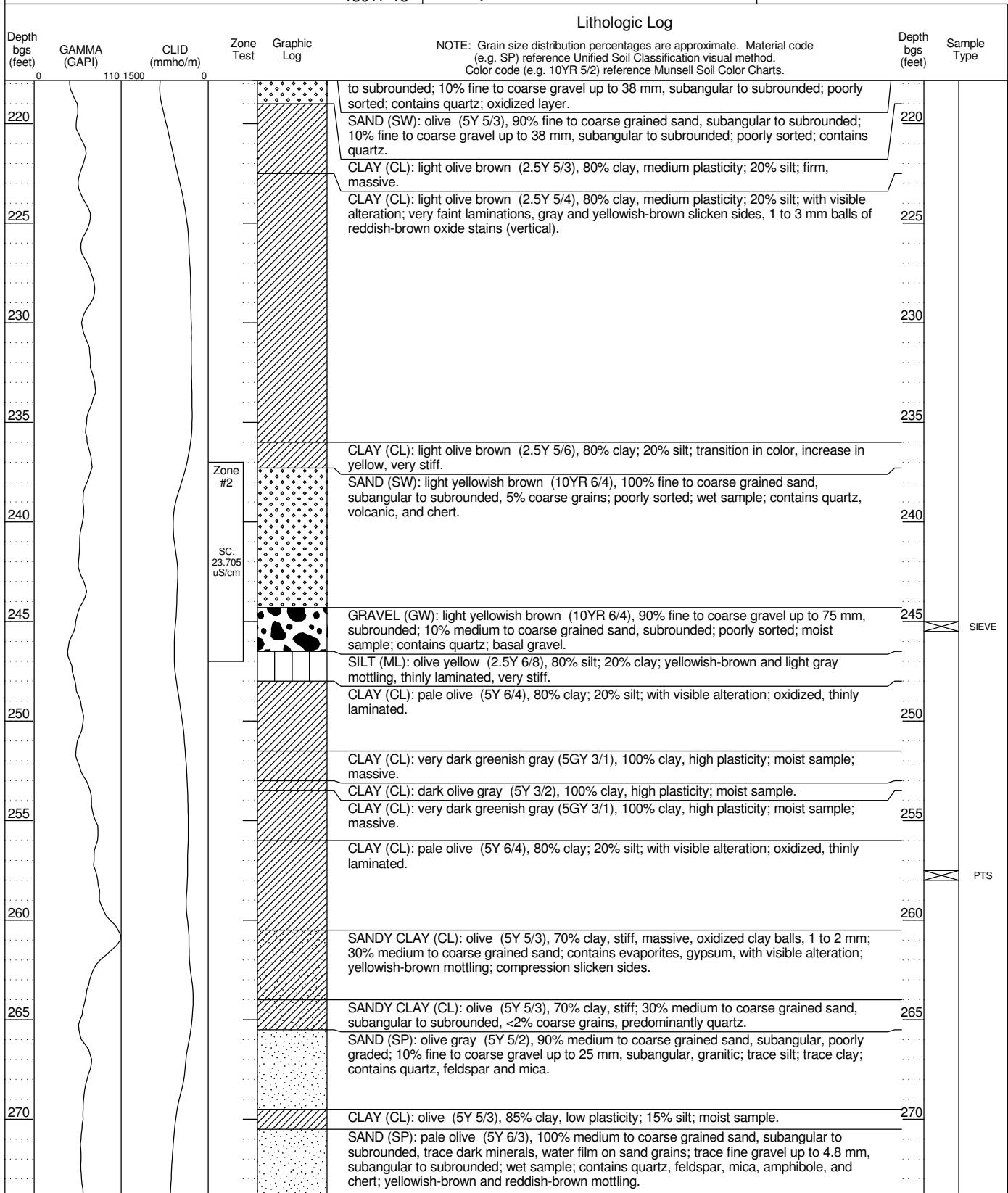
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BOREHOLE NAME  
**CX-B1**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**

**BOREHOLE LITHOLOGIC LOG (continued)**

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\*Zone test details are for CX-B1WQ, approximately 80 ft west of CX-B1

SS: Splitspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

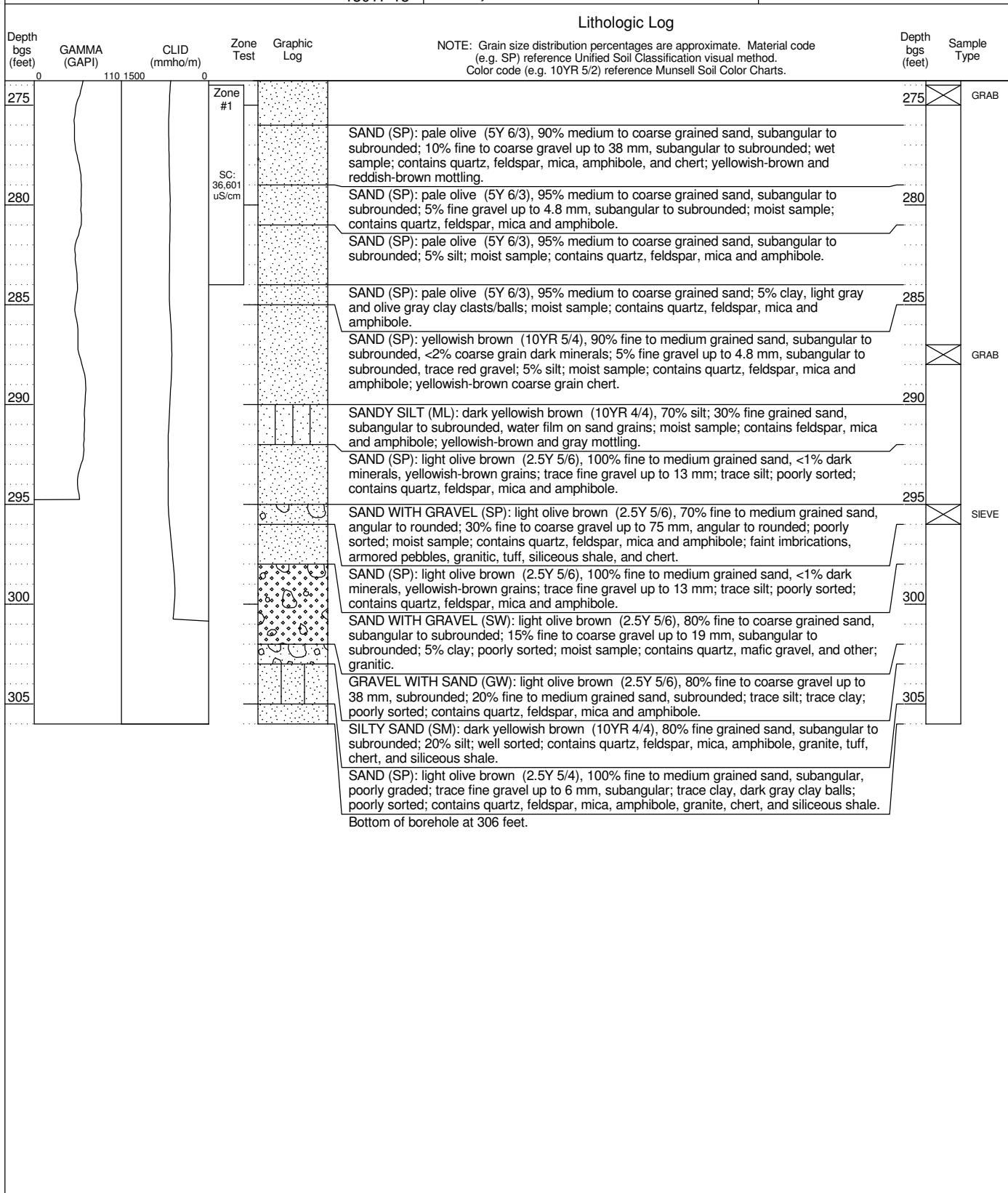
## **BOREHOLE LITHOLOGIC LOG (continued)**

BOREHOLE NAME  
**CX-B1**

EX B

California American Water  
13017-13

**LOCATION**  
**Marina, CA**



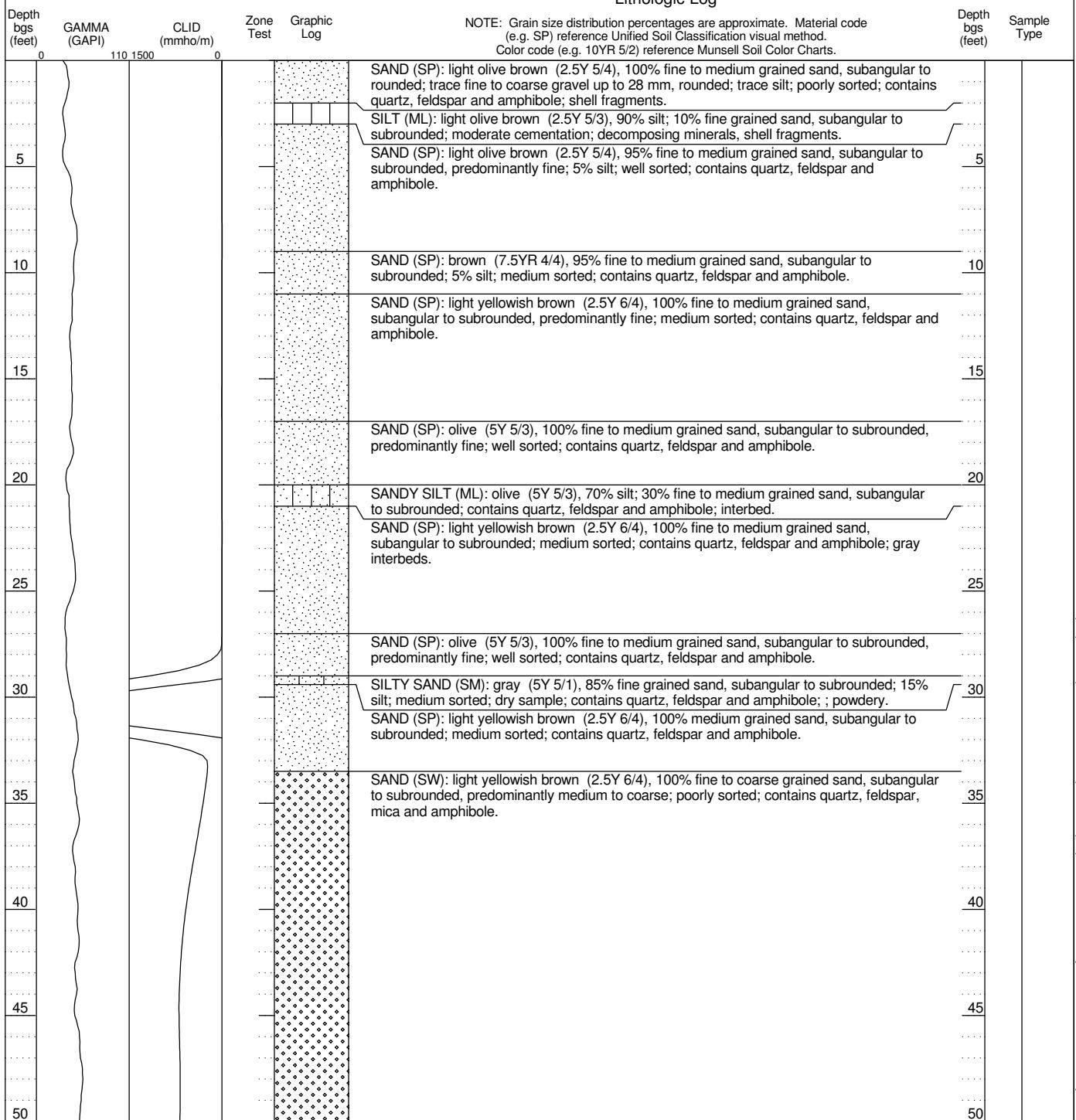
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BOREHOLE NAME CX-B2
------------------------

**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER	California American Water 13017-13		LOCATION <b>Marina, CA</b>	Geographic NAD83	
REPORT DATE	7/8/2014				
DRILLING CONTRACTOR DRILLER	Cascade Drilling Jose Munguia		LOGGED BY <b>N. Reynolds</b>		
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE 11/04/13	BOREHOLE DIAMETER 6.25 in
SURFACE ELEVATION	32.0 ft	TOTAL DEPTH	307 ft bgs	FINISH DATE 11/07/13	CORE SIZE 4 in

**Lithologic Log**

SS: Spillspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

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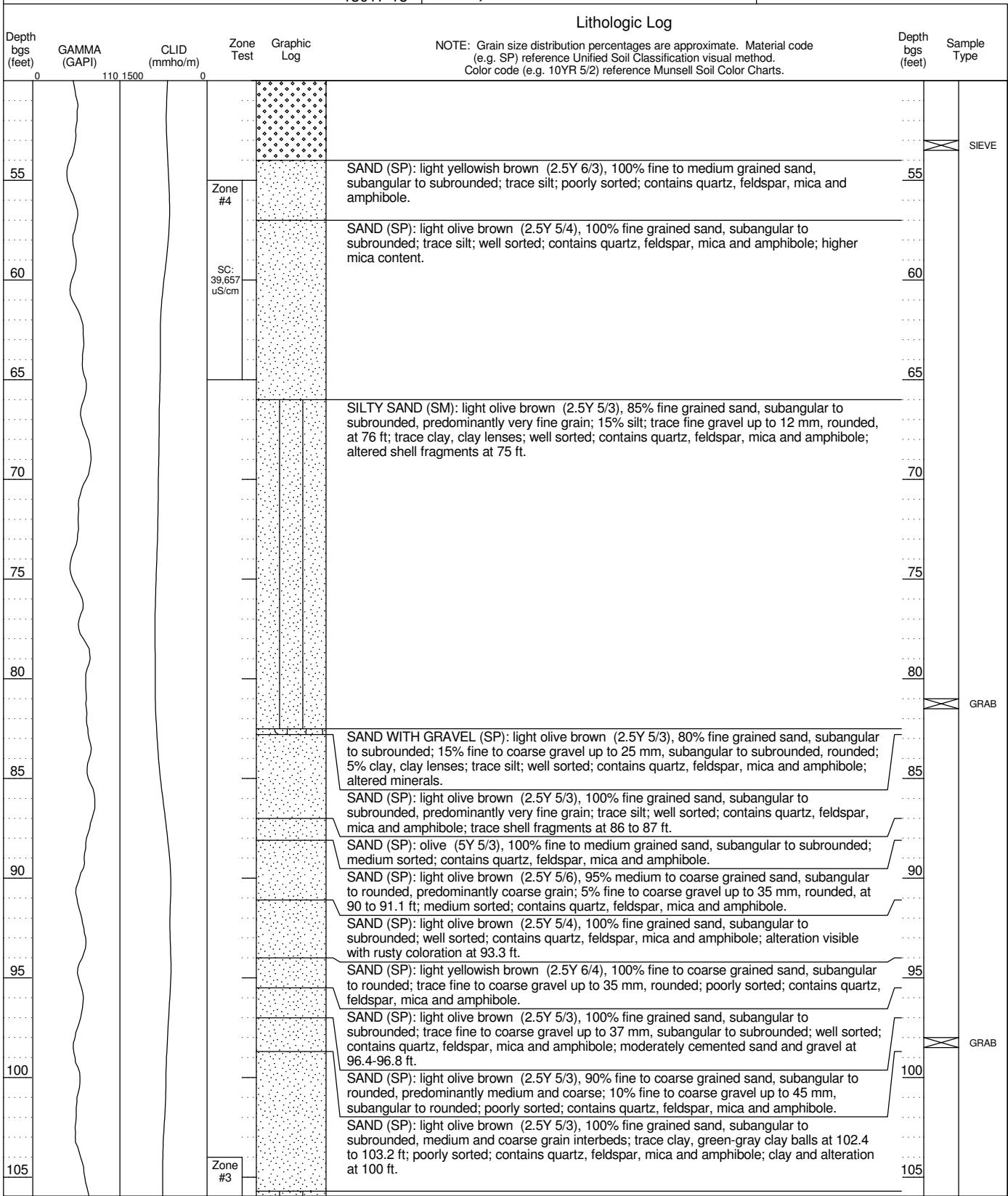
BOREHOLE NAME  
**CX-B2**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**



Geoscience Support Services, Inc.

\*Zone test details are for CX-B2WQ, approximately 60 ft west of CX-B2

SS: Spilspoon sample GRAB: Grab sample PTS: Spilspoon submitted for analysis SIEVE: Grab sieved by GSSI

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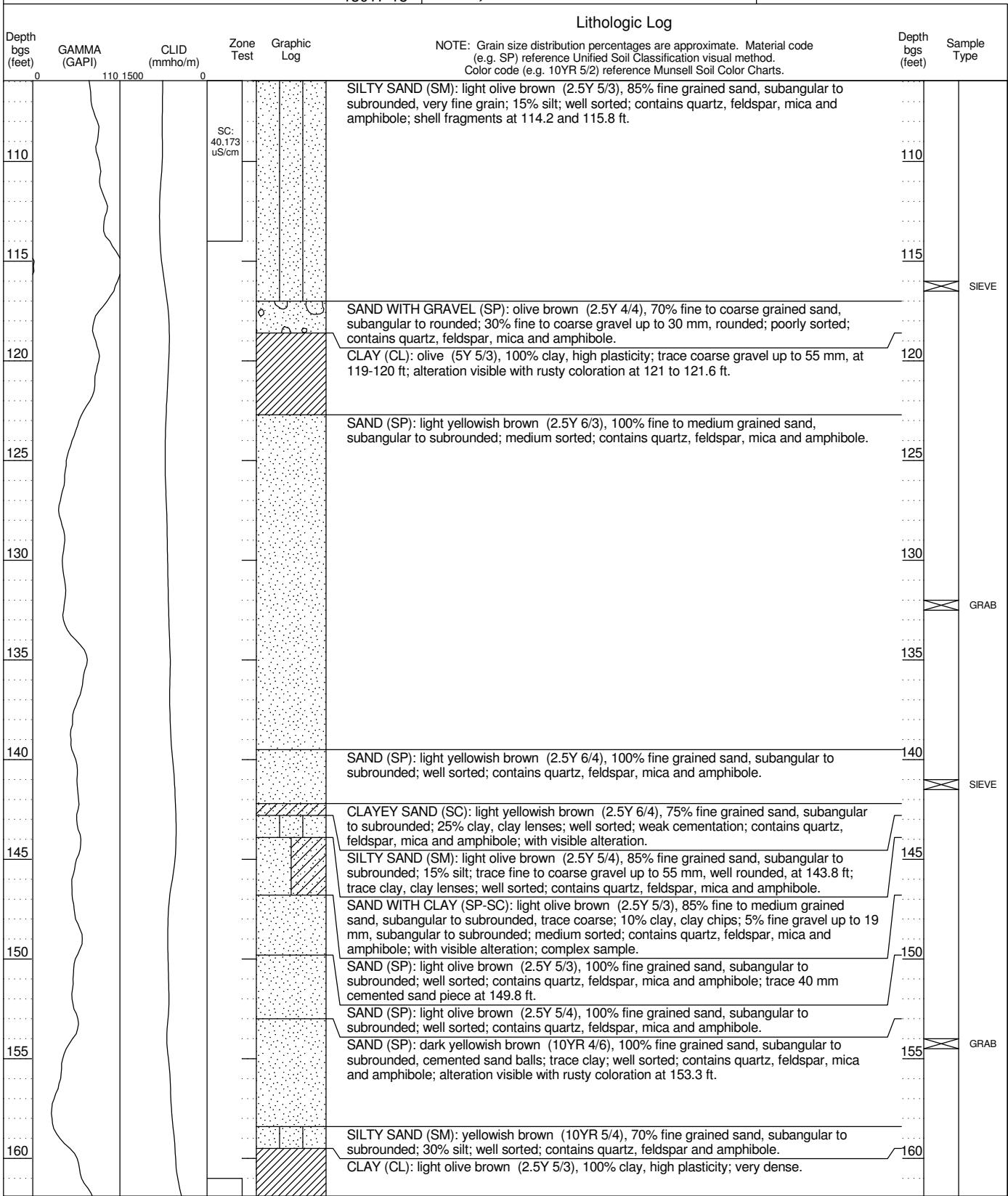
BOREHOLE NAME  
**CX-B2**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
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\*Zone test details are for CX-B2WQ, approximately 60 ft west of CX-B2

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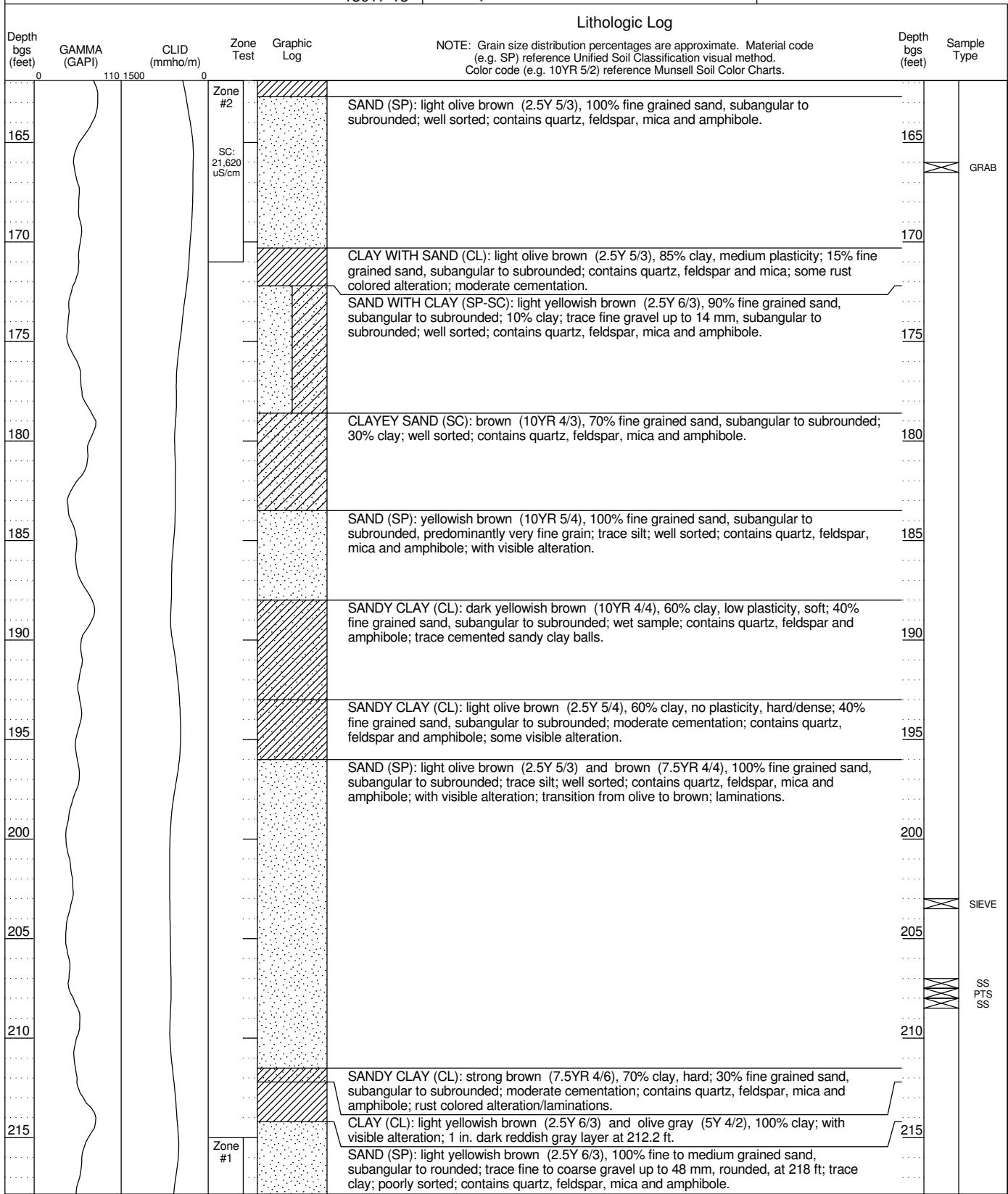
BOREHOLE NAME  
**CX-B2**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**



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\*Zone test details are for CX-B2WQ, approximately 60 ft west of CX-B2

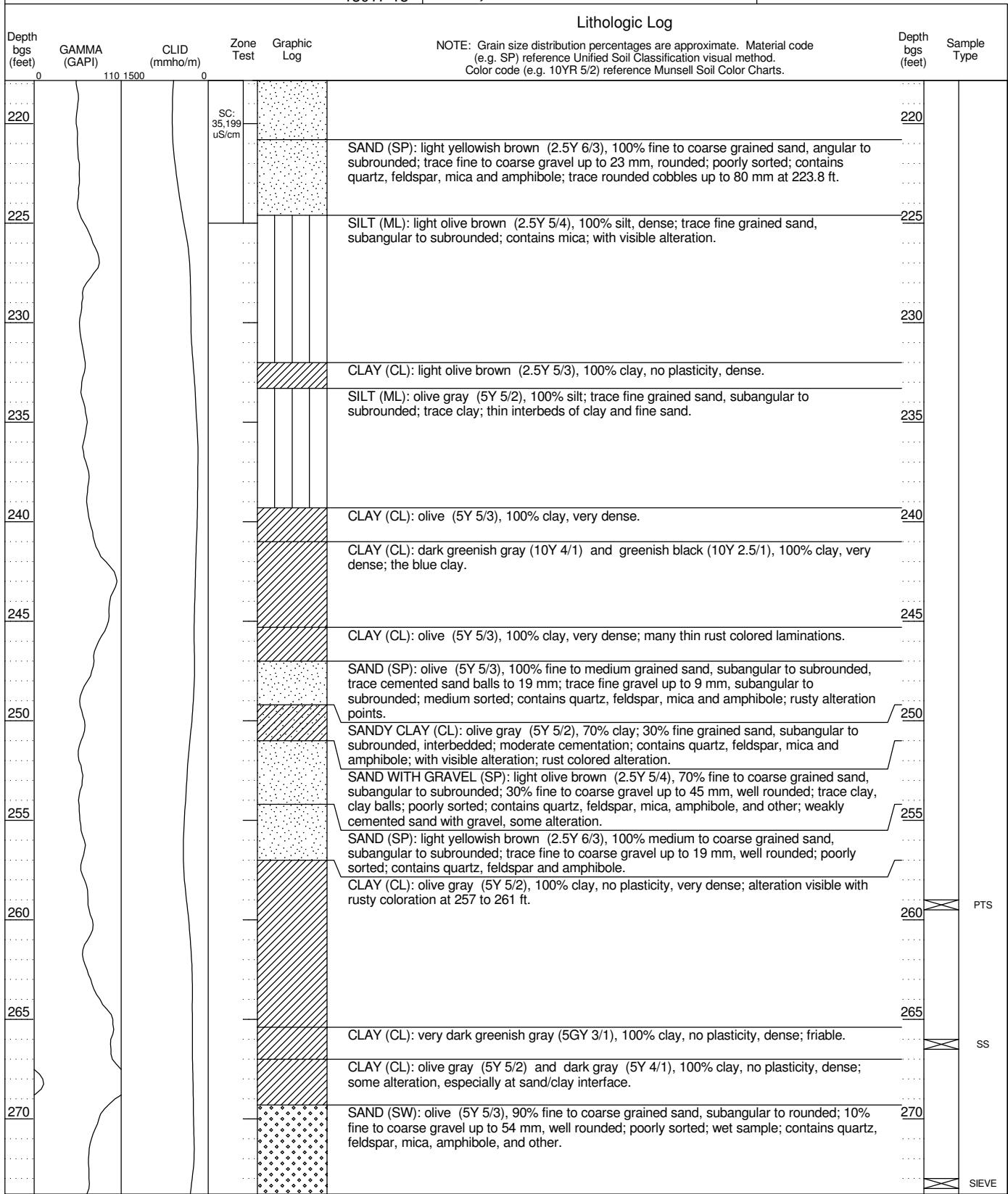
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BOREHOLE NAME  
**CX-B2**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT California American Water  
PROJECT NUMBER 13017-13 LOCATION **Marina, CA**



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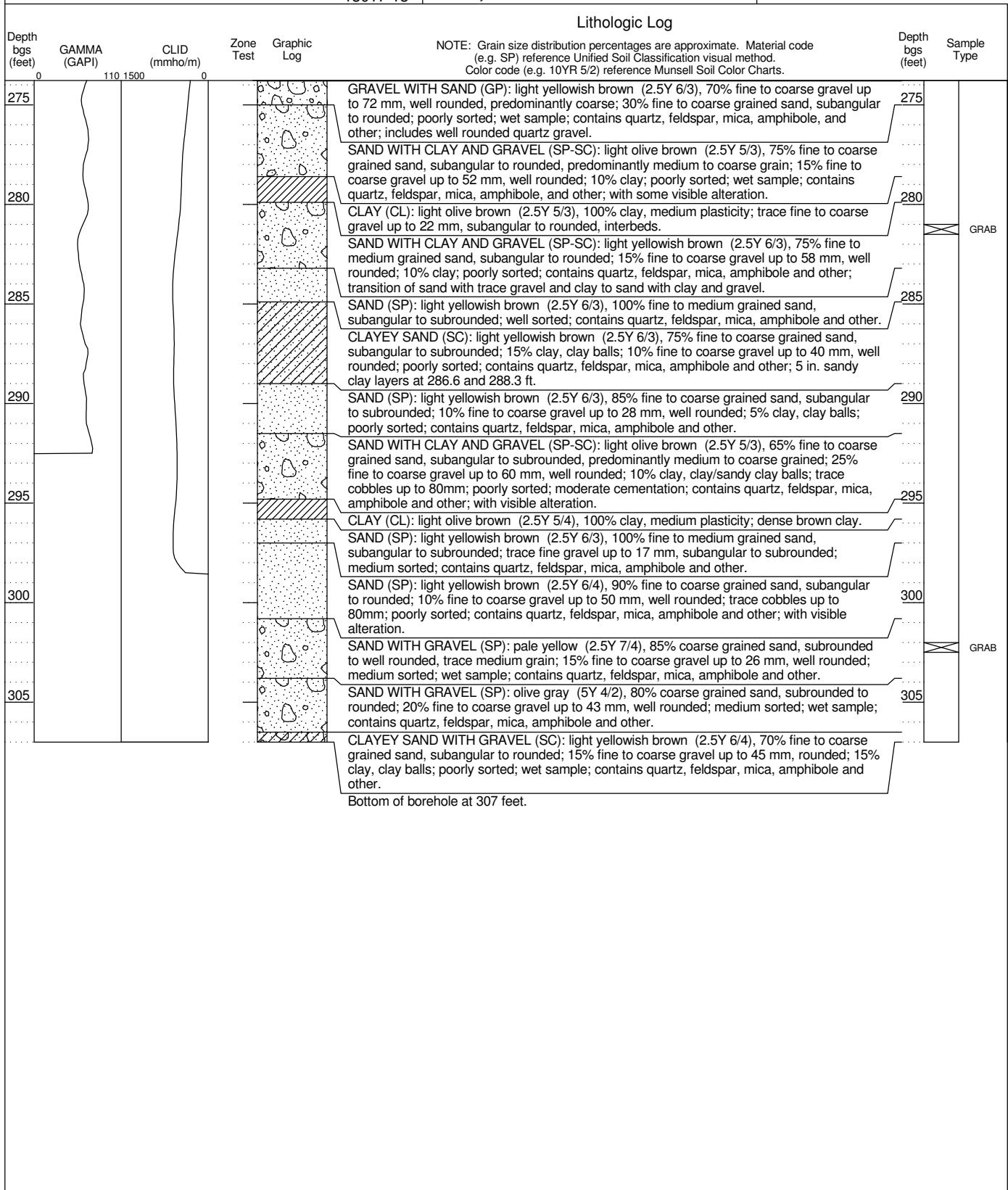
BOREHOLE NAME  
**CX-B2**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**



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BOREHOLE NAME  
**CX-B3**

**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER		California American Water 13017-13		LOCATION <b>Marina, CA</b> <b>CEMEX Lapis Plant</b> 36°42' 43.1316", -121°47' 59.9316" Geographic NAD83			
REPORT DATE		7/8/2014					
DRILLING CONTRACTOR DRILLER		Cascade Drilling Jose Munguia		LOGGED BY <b>N. Reynolds</b>			
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	11/09/13	BOREHOLE DIAMETER	6.25 in
SURFACE ELEVATION	39.0 ft	TOTAL DEPTH	347 ft bgs	FINISH DATE	11/14/13	CORE SIZE	4 in
<b>Lithologic Log</b>							
Depth bgs (feet)	GAMMA (GAPI) 0 110 1500	CLID (mmho/m) 0	Zone Test	Graphic Log	NOTE: Grain size distribution percentages are approximate. Material code (e.g. SP) reference Unified Soil Classification visual method. Color code (e.g. 10YR 5/2) reference Munsell Soil Color Charts.	Depth bgs (feet)	Sample Type
0					SAND (SP): dark brown (10YR 3/3), 95% fine to medium grained sand, subangular to rounded, predominantly fine grained; 5% silt; medium sorted; contains quartz, feldspar and amphibole; first 7 ft disturbed sample.		
5						5	
10						10	
15					SAND (SP): pale yellow (2.5Y 7/4), 100% fine to medium grained sand, subangular to subrounded, predominantly fine grained; medium sorted; contains quartz, feldspar and amphibole.	15	
20					SAND (SP): light olive brown (2.5Y 5/3), 100% fine to medium grained sand, subangular to rounded, predominantly fine grained; medium sorted; contains quartz, feldspar and amphibole.	20	
25					SILT WITH SAND (ML): light gray (5Y 7/2), 85% silt; 15% fine grained sand, subrounded; dry sample/powdery.	25	
30					SAND (SP): pale yellow (2.5Y 7/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole.	30	
35					SAND (SP): light yellowish brown (2.5Y 6/4), 95% fine to medium grained sand, subangular to subrounded; 5% silt; medium sorted; contains quartz, feldspar and amphibole.	35	
40					SAND (SP): light olive brown (2.5Y 5/3), 100% fine to medium grained sand, subangular to rounded, predominantly fine grained; medium sorted; contains quartz, feldspar and amphibole.	40	
45					SILT (ML): light gray (5Y 7/2), 100% silt; trace fine grained sand; dry sample; powdery.	45	
50					SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subrounded to rounded; medium sorted; contains quartz, feldspar and amphibole.	50	
							SIEVE

SS: Splitspoon sample GRAB: Grab sample PTS: Splitspoon submitted for analysis SIEVE: Grab sieved by GSSI

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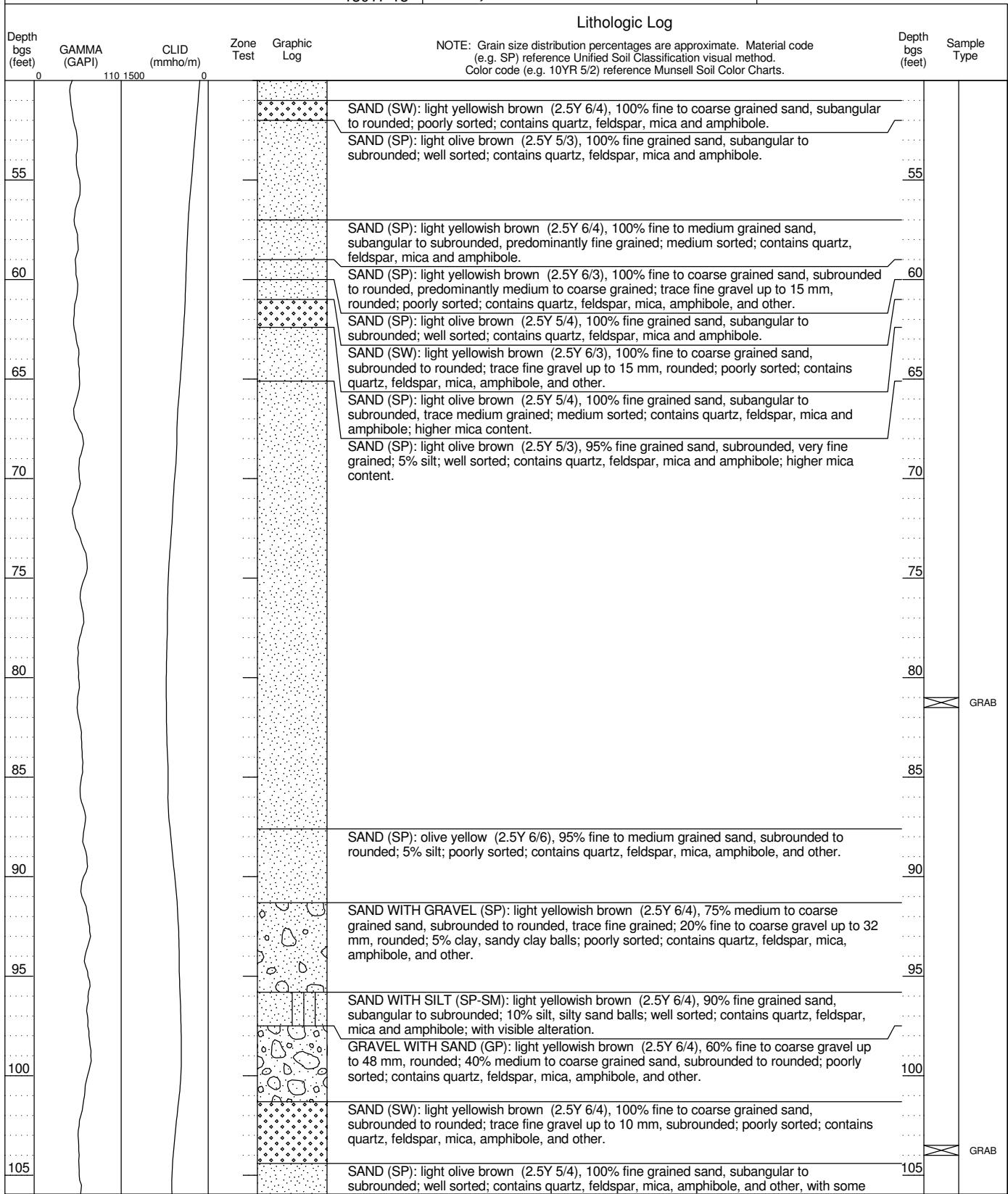
BOREHOLE NAME  
**CX-B3**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**



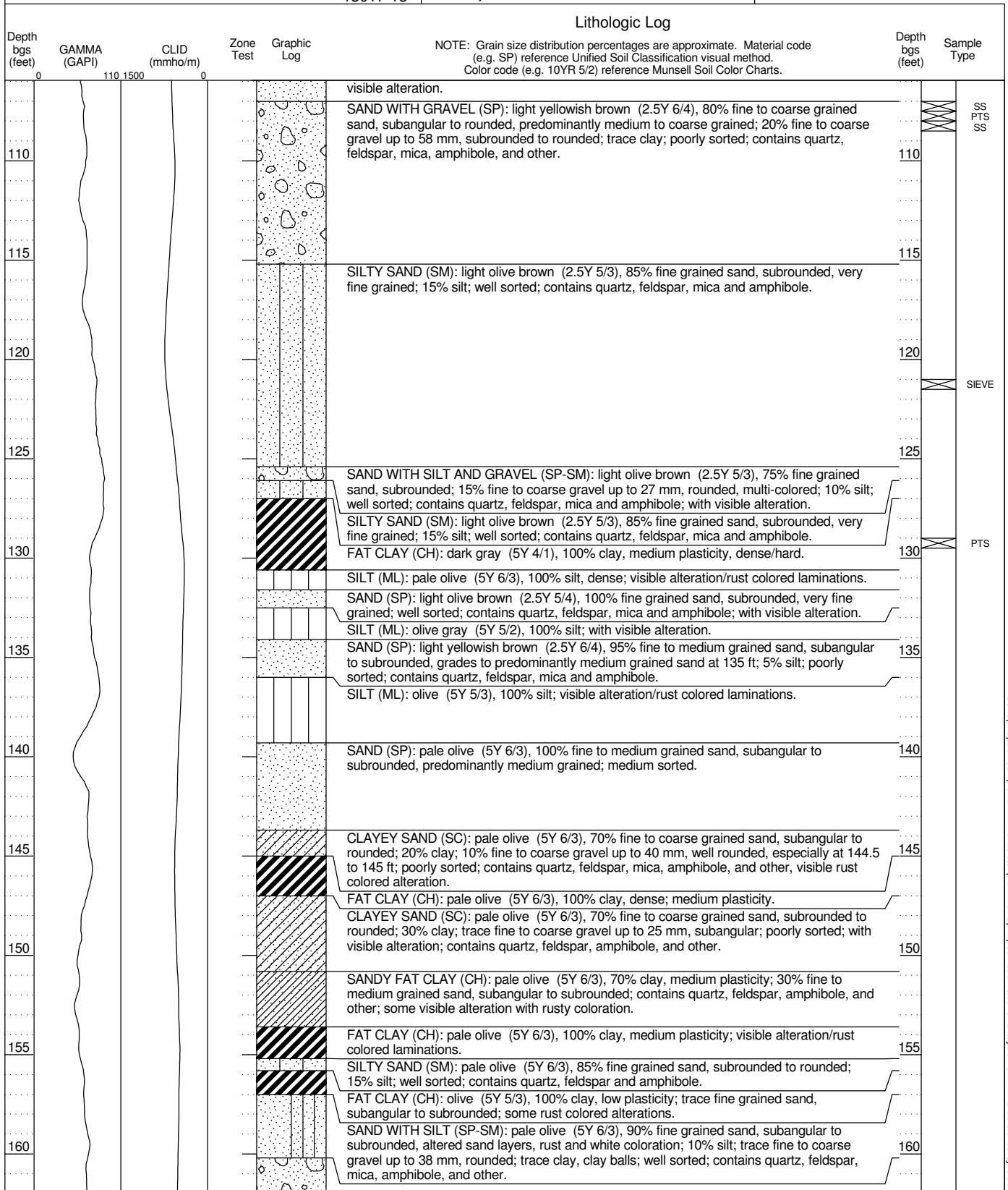
## **BOREHOLE LITHOLOGIC LOG (continued)**

**BOREHOLE NAME**  
**CX-B3**

EX B6

California American Water  
13017-13

**LOCATION**  
**Marina, CA**



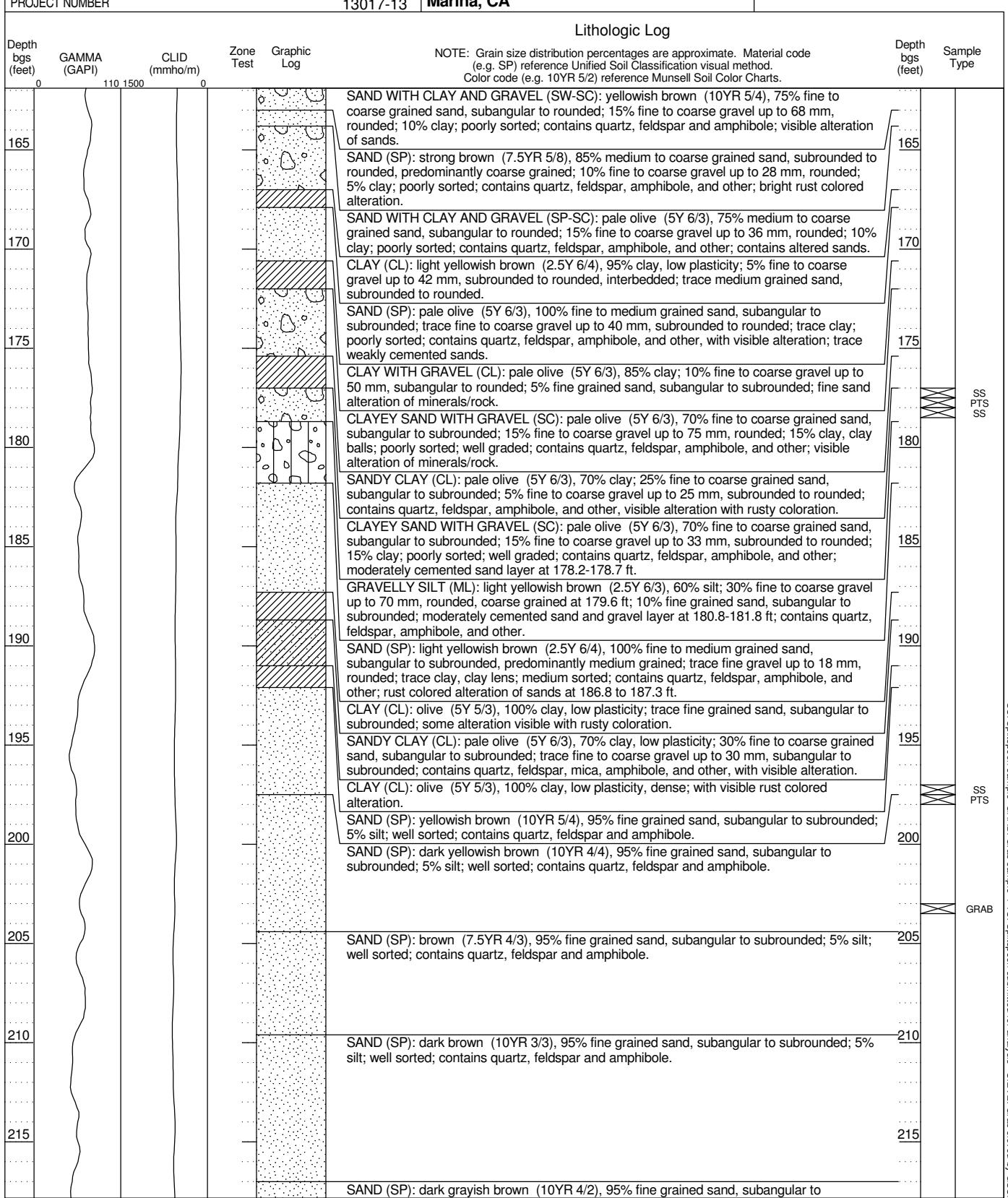
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BOREHOLE NAME  
**CX-B3**

CLIENT  
PROJECT NUMBER  
California American Water  
13017-13

LOCATION  
**Marina, CA**

**BOREHOLE LITHOLOGIC LOG (continued)**

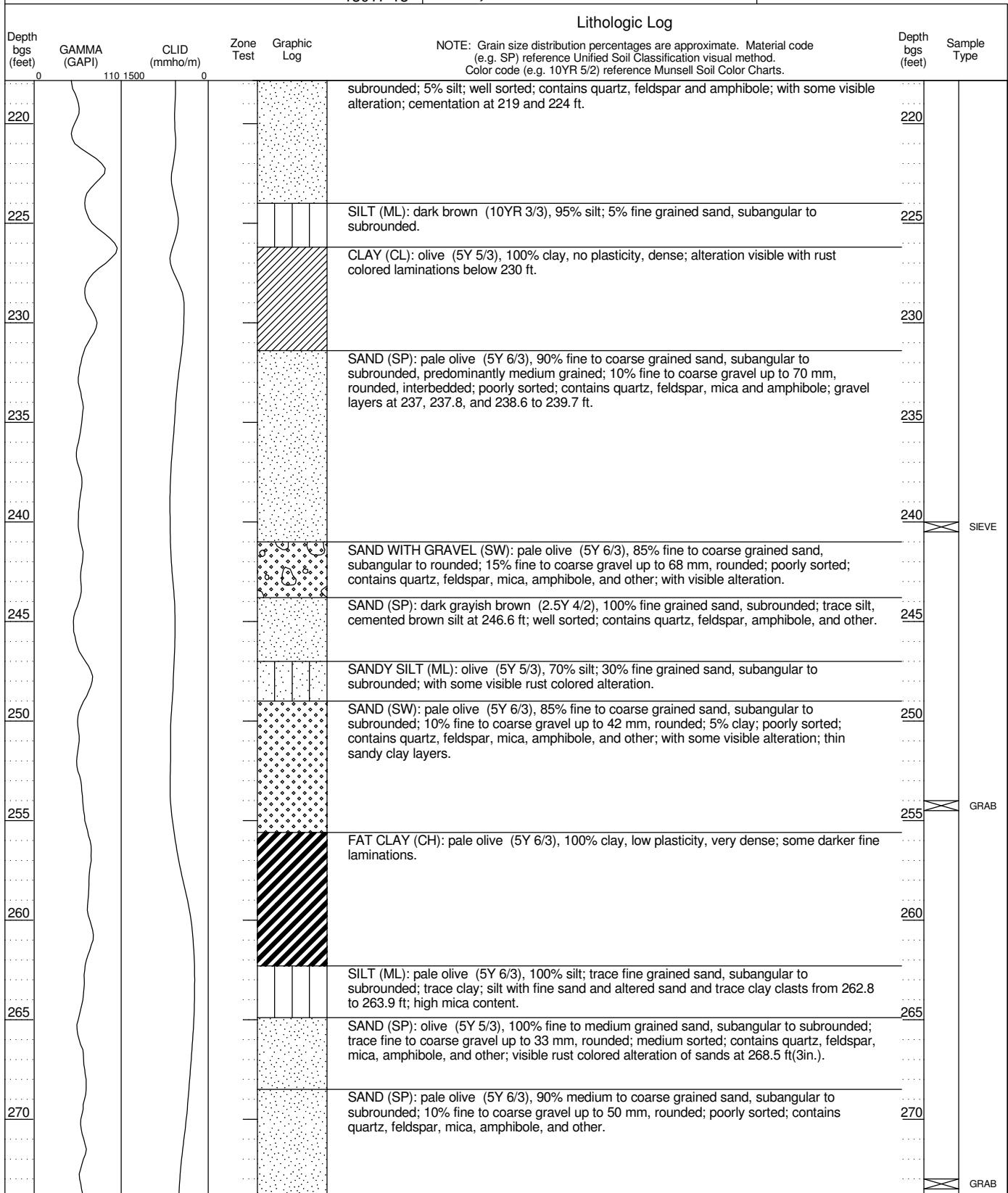
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BOREHOLE NAME  
**CX-B3**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT California American Water  
PROJECT NUMBER 13017-13 LOCATION **Marina, CA**



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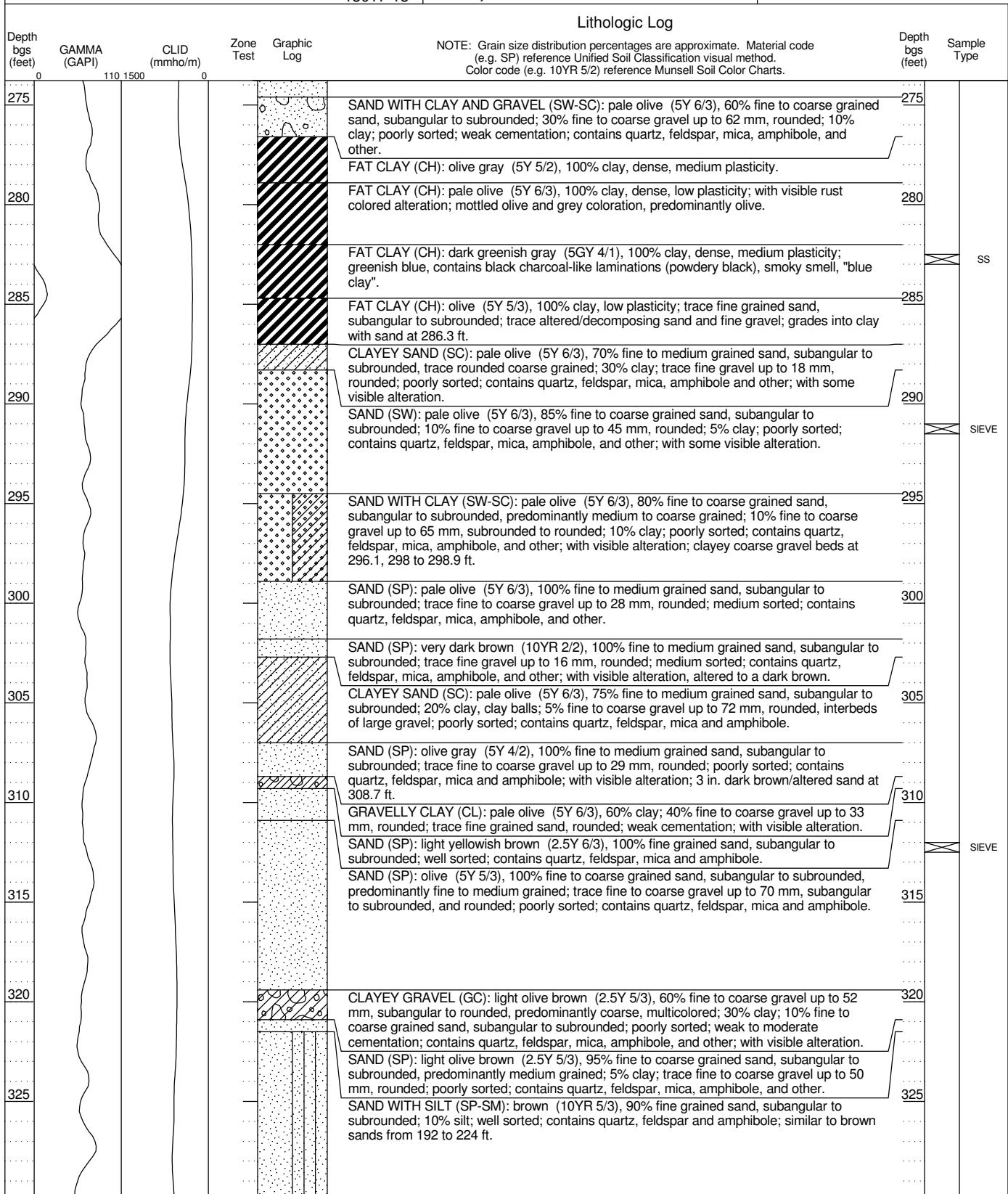
BOREHOLE NAME  
**CX-B3**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**



SS: Spillspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

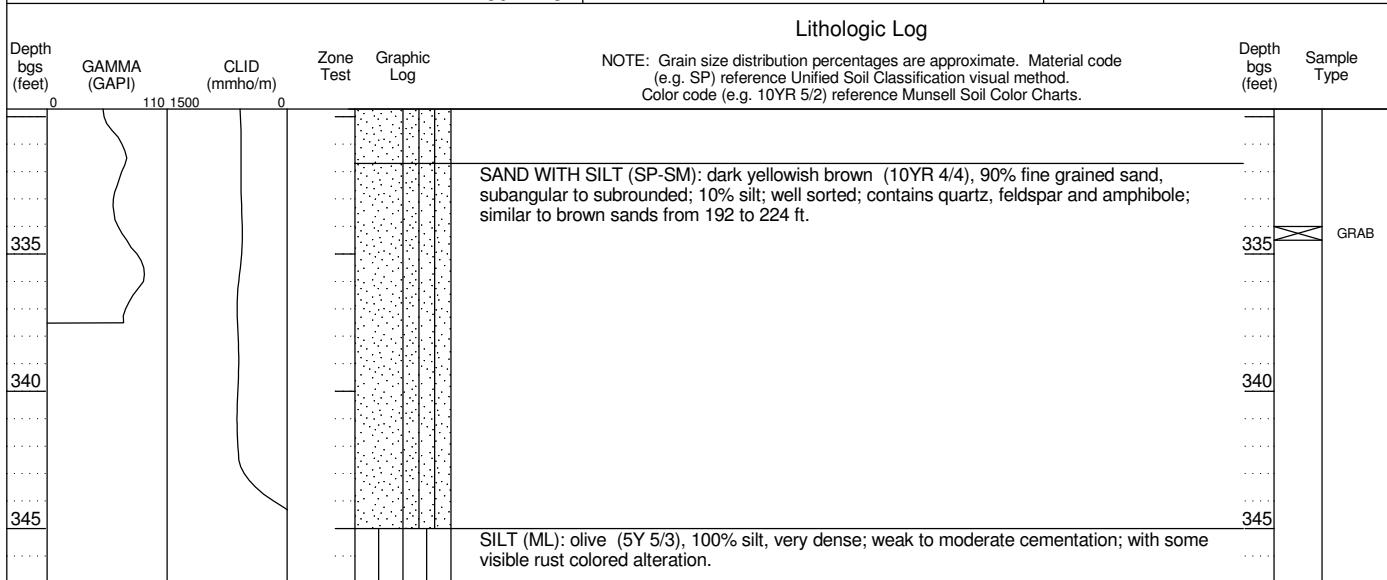
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BOREHOLE NAME  
**CX-B3**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT California American Water  
 PROJECT NUMBER 13017-13 LOCATION  
**Marina, CA**



SS: Splitspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

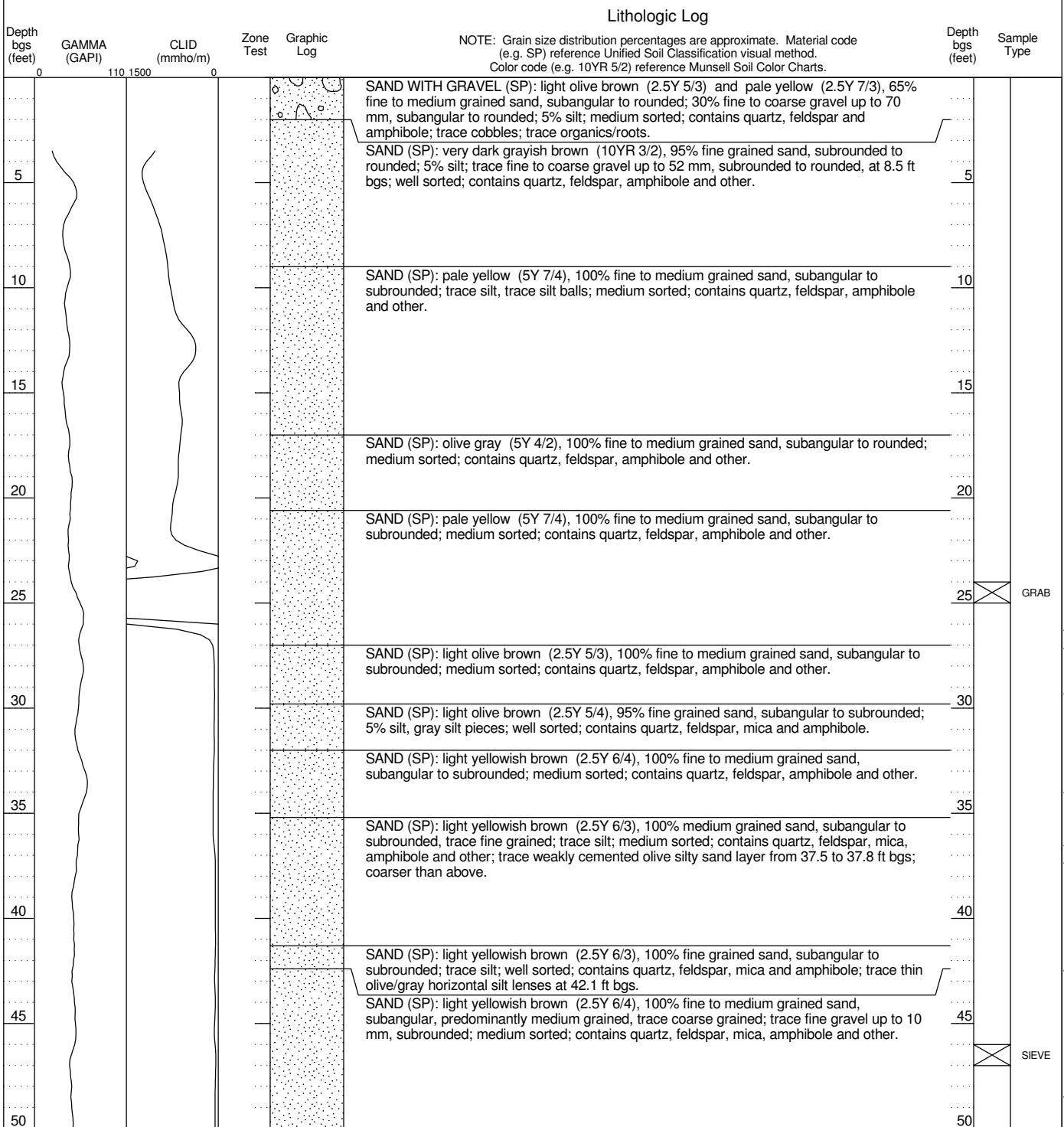
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BOREHOLE NAME  
**CX-B4**

**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER		California American Water 13017-13		LOCATION <b>Marina, CA</b> <b>CEMEX Lapis Plant</b> 36°42' 42.1848", -121°47' 55.2192" Geographic NAD83			
REPORT DATE		7/8/2014					
DRILLING CONTRACTOR DRILLER		Cascade Drilling Jose Munguia		LOGGED BY <b>N. Reynolds</b>			
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	3/20/14	BOREHOLE DIAMETER	8 in
SURFACE ELEVATION	39.0 ft	TOTAL DEPTH	350 ft bgs	FINISH DATE	4/10/14	CORE SIZE	6 in



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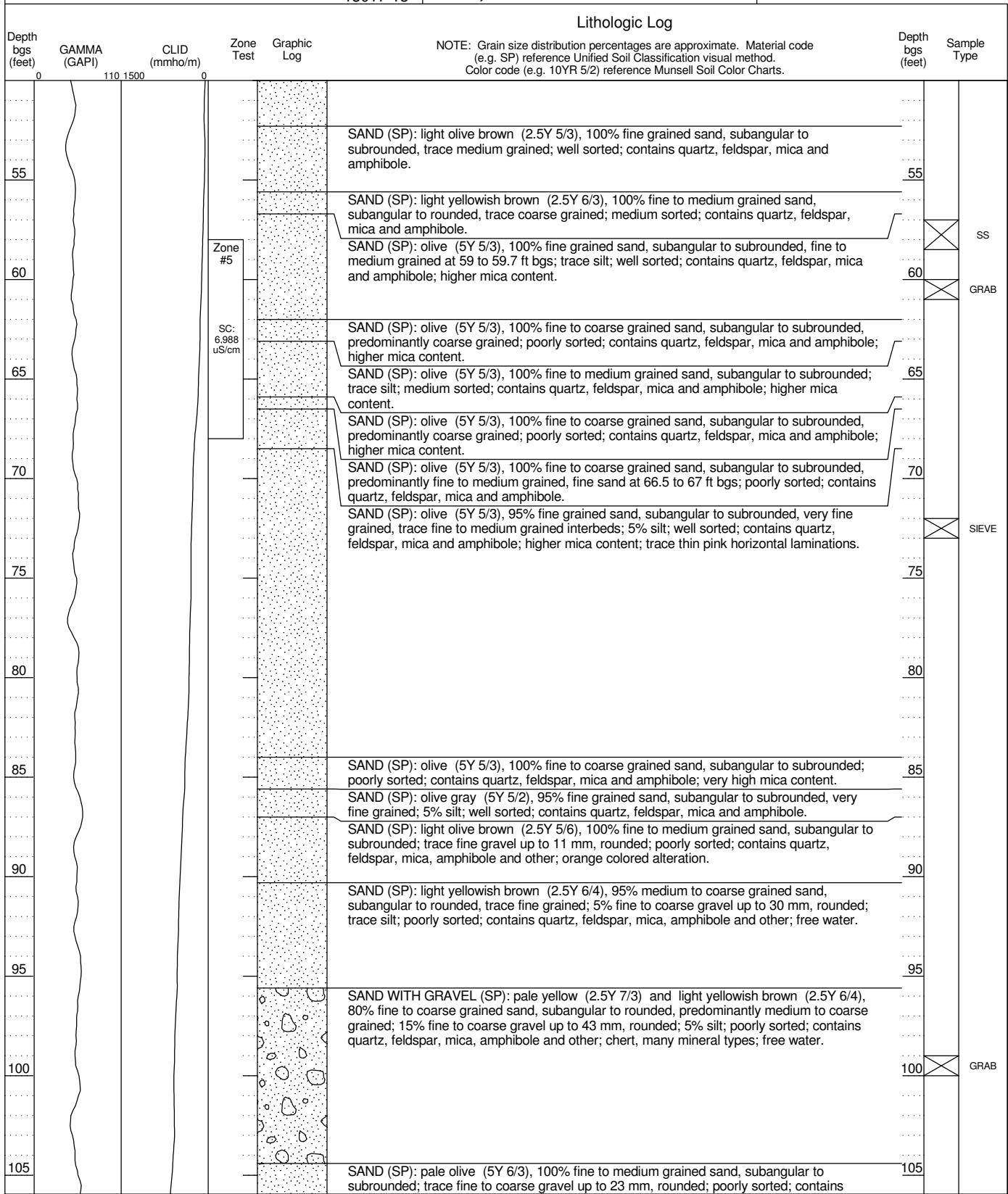
BOREHOLE NAME  
**CX-B4**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**



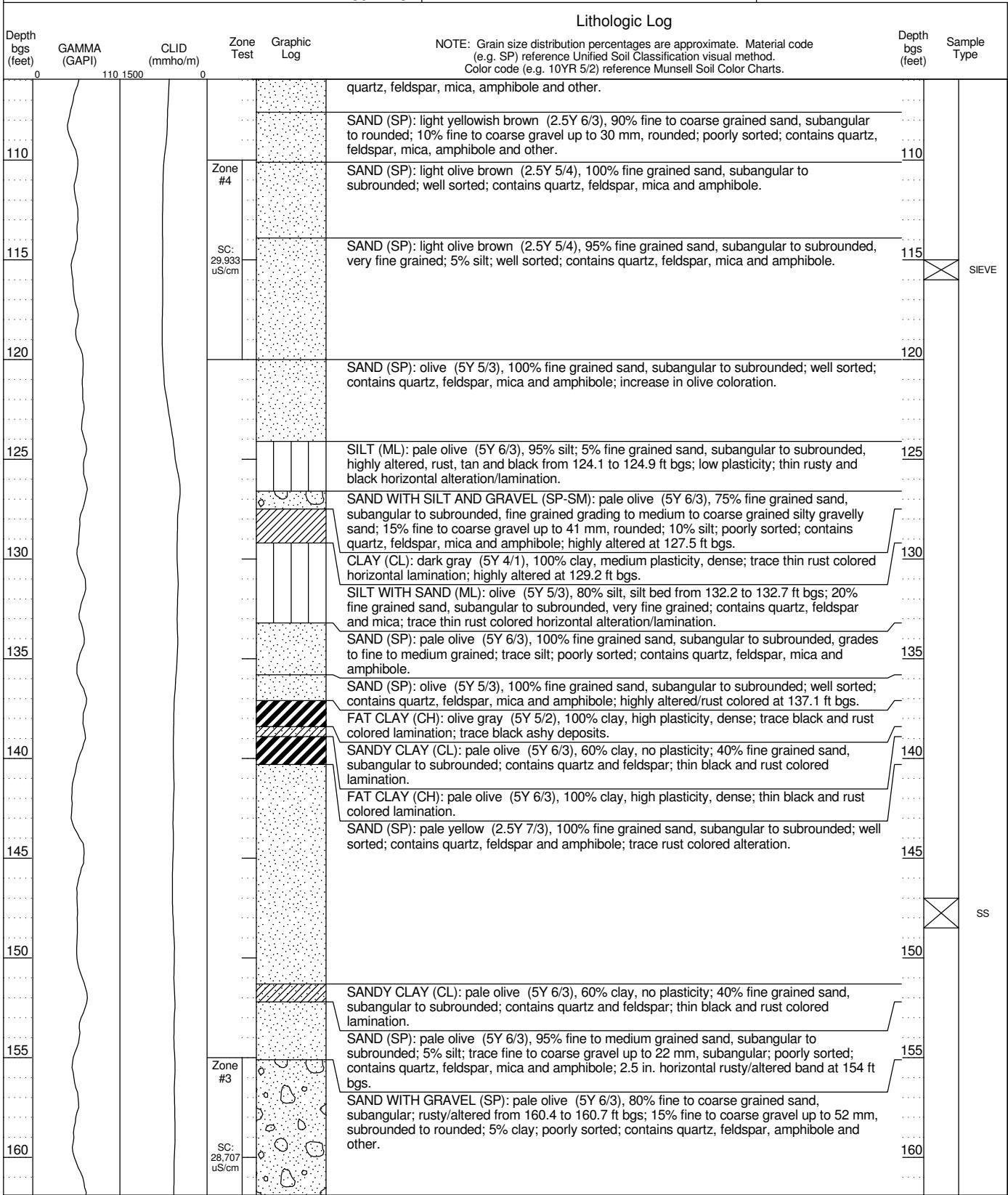
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BOREHOLE NAME  
**CX-B4**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT California American Water  
PROJECT NUMBER 13017-13 LOCATION **Marina, CA**



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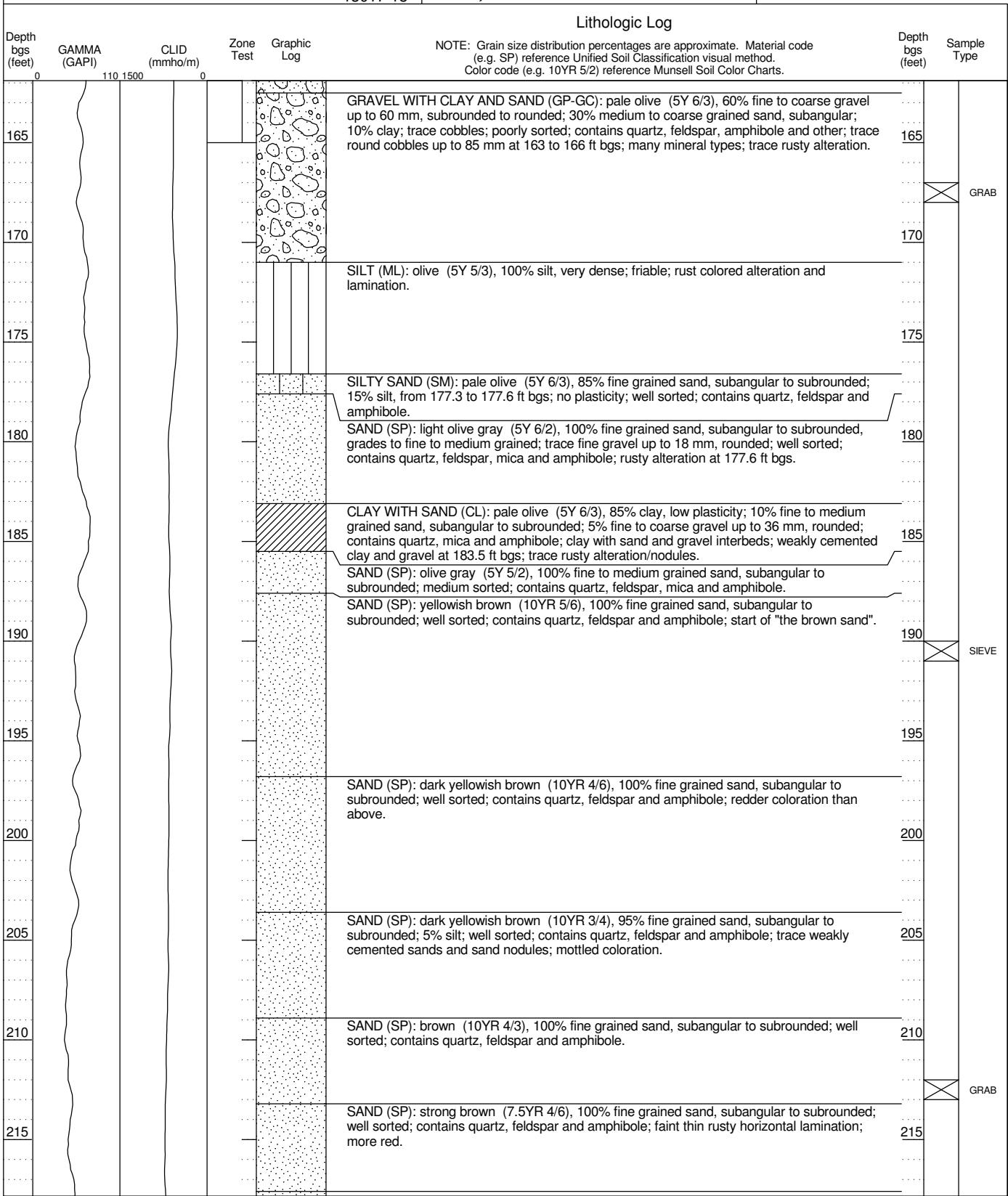
BOREHOLE NAME  
**CX-B4**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**



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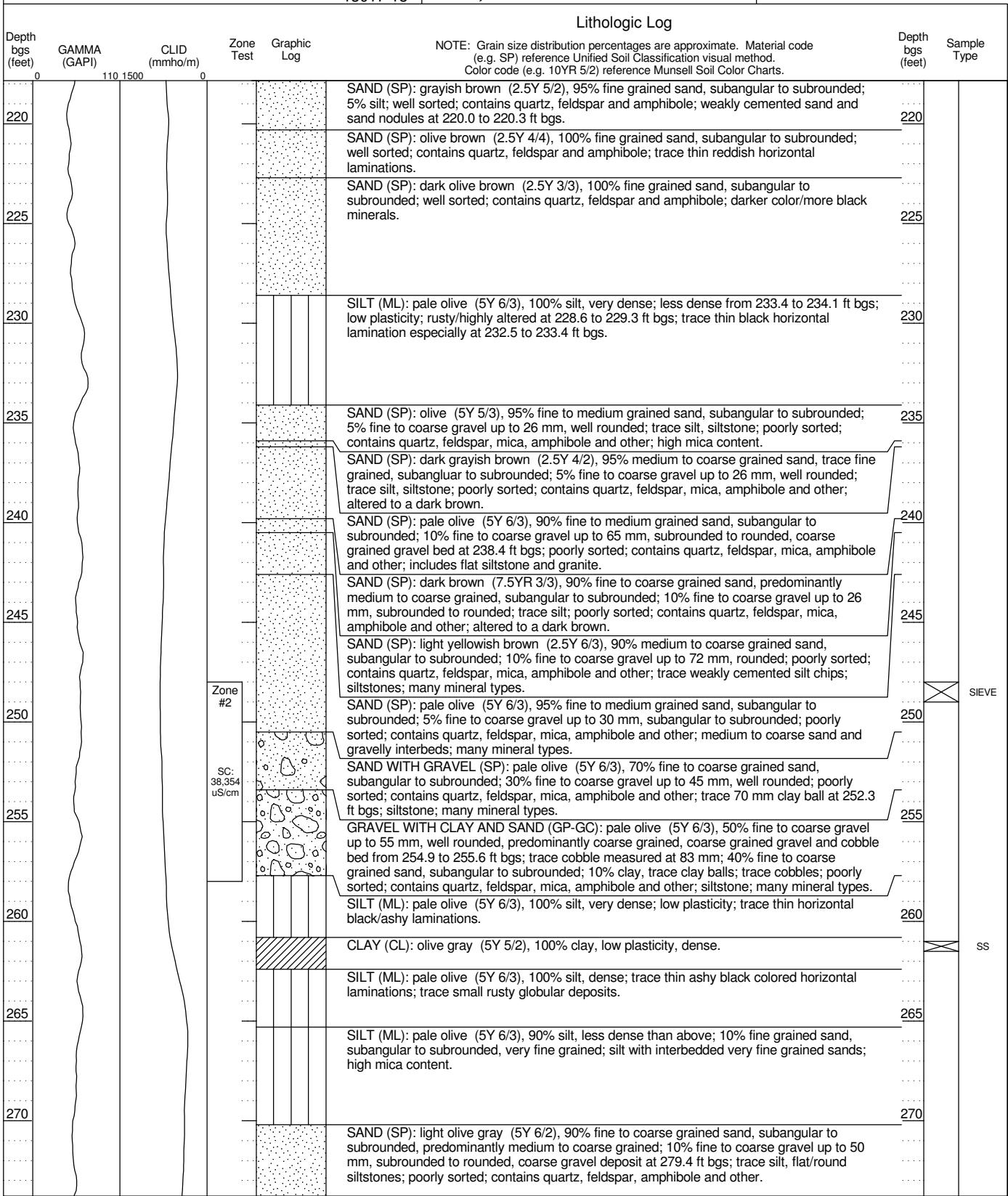
BOREHOLE NAME  
**CX-B4**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**



Geoscience Support Services, Inc.

SS: Splitspoon sample GRAB: Grab sample PTS: Splitspoon submitted for analysis SIEVE: Grab sieved by GSSI

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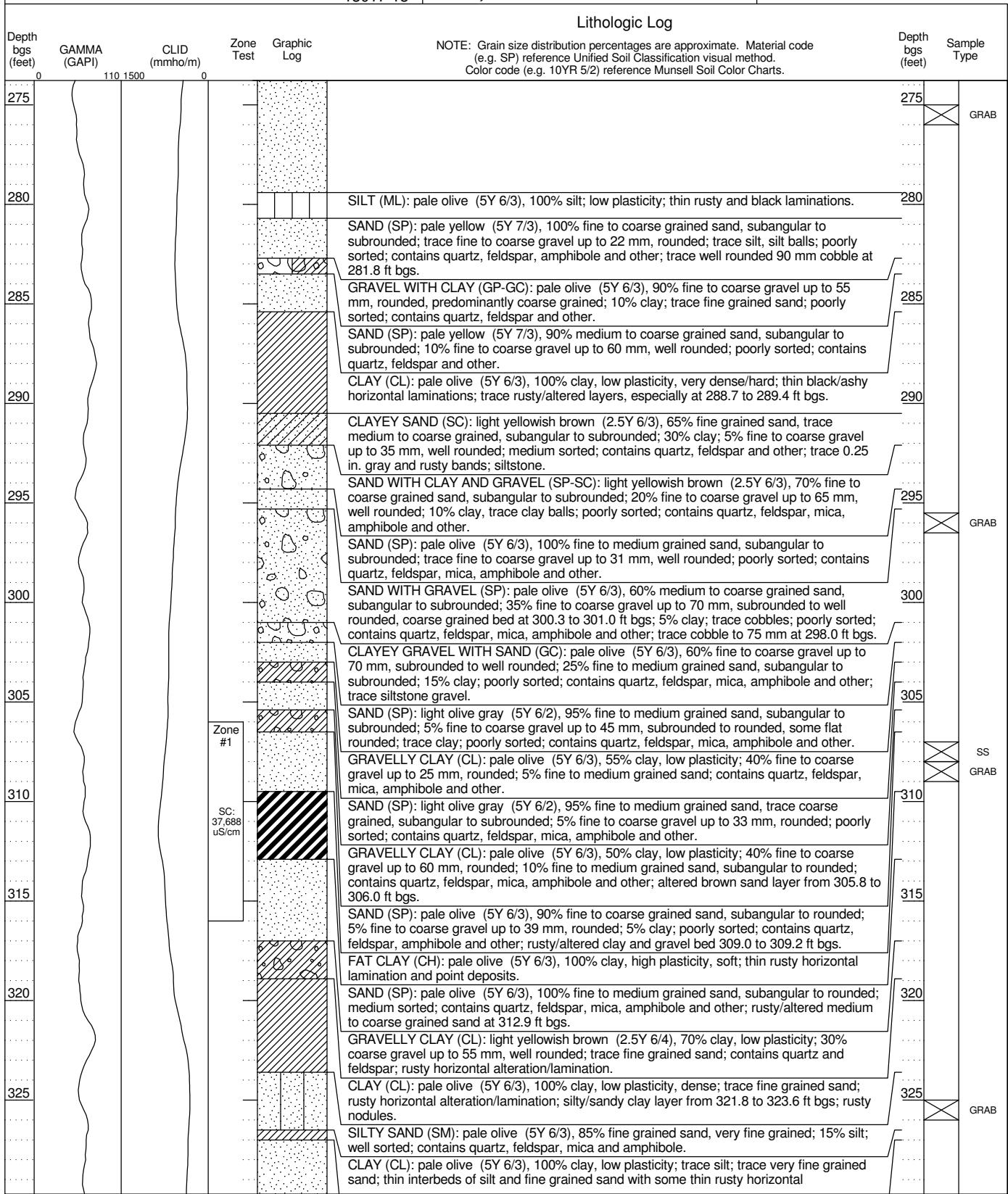
BOREHOLE NAME  
**CX-B4**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Marina, CA**



SS: Splitspoon sample GRAB: Grab sample PTS: Splitspoon submitted for analysis SIEVE: Grab sieved by GSSI

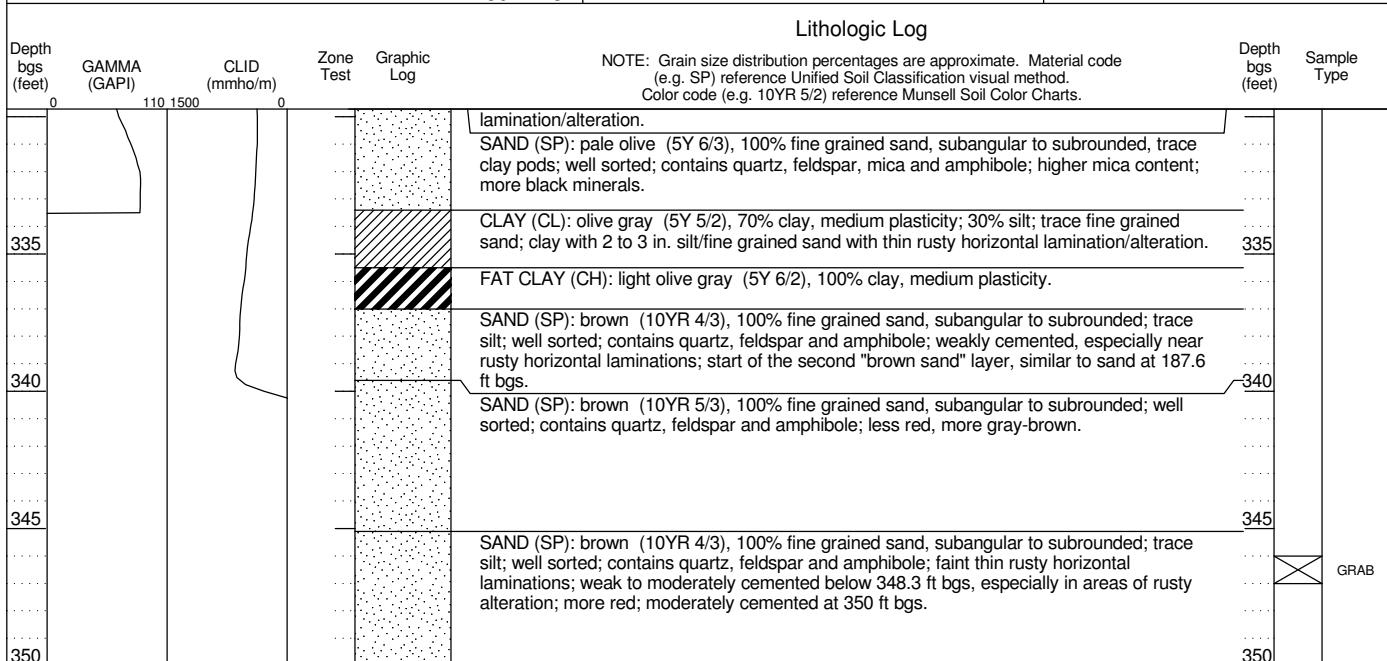
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BOREHOLE NAME  
**CX-B4**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT California American Water  
 PROJECT NUMBER 13017-13 LOCATION **Marina, CA**



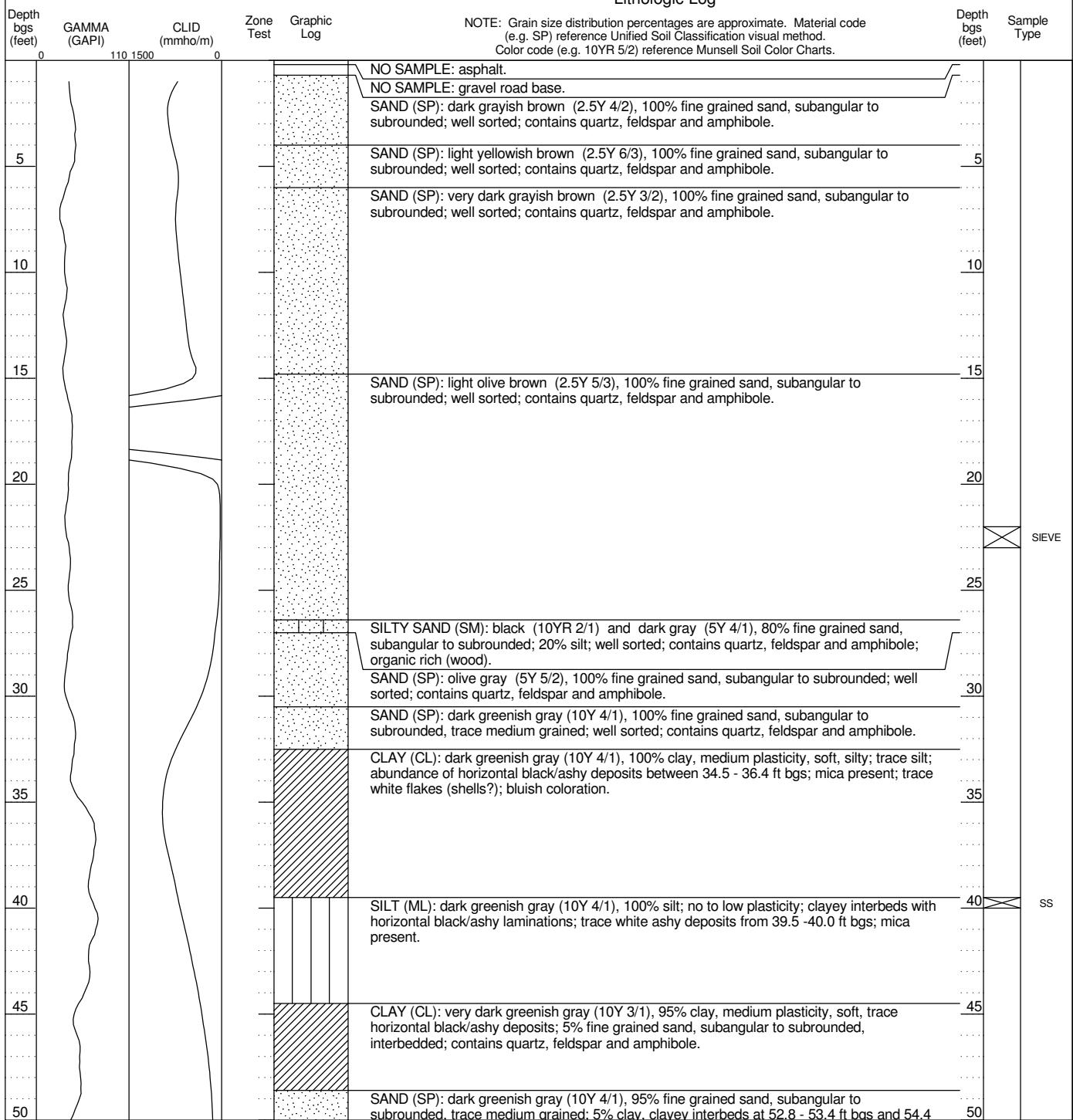
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BOREHOLE NAME <b>MDW-1</b>
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**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER	California American Water 13017-13		LOCATION <b>Castroville, CA</b>	Geographic NAD83	
REPORT DATE	7/8/2014				
DRILLING CONTRACTOR DRILLER	Cascade Drilling Jose Munguia		LOGGED BY <b>N. Reynolds</b>		
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE 4/23/14	BOREHOLE DIAMETER 8 in
SURFACE ELEVATION	20.0 ft	TOTAL DEPTH	300 ft bgs	FINISH DATE 4/27/14	CORE SIZE 6 in

**Lithologic Log**

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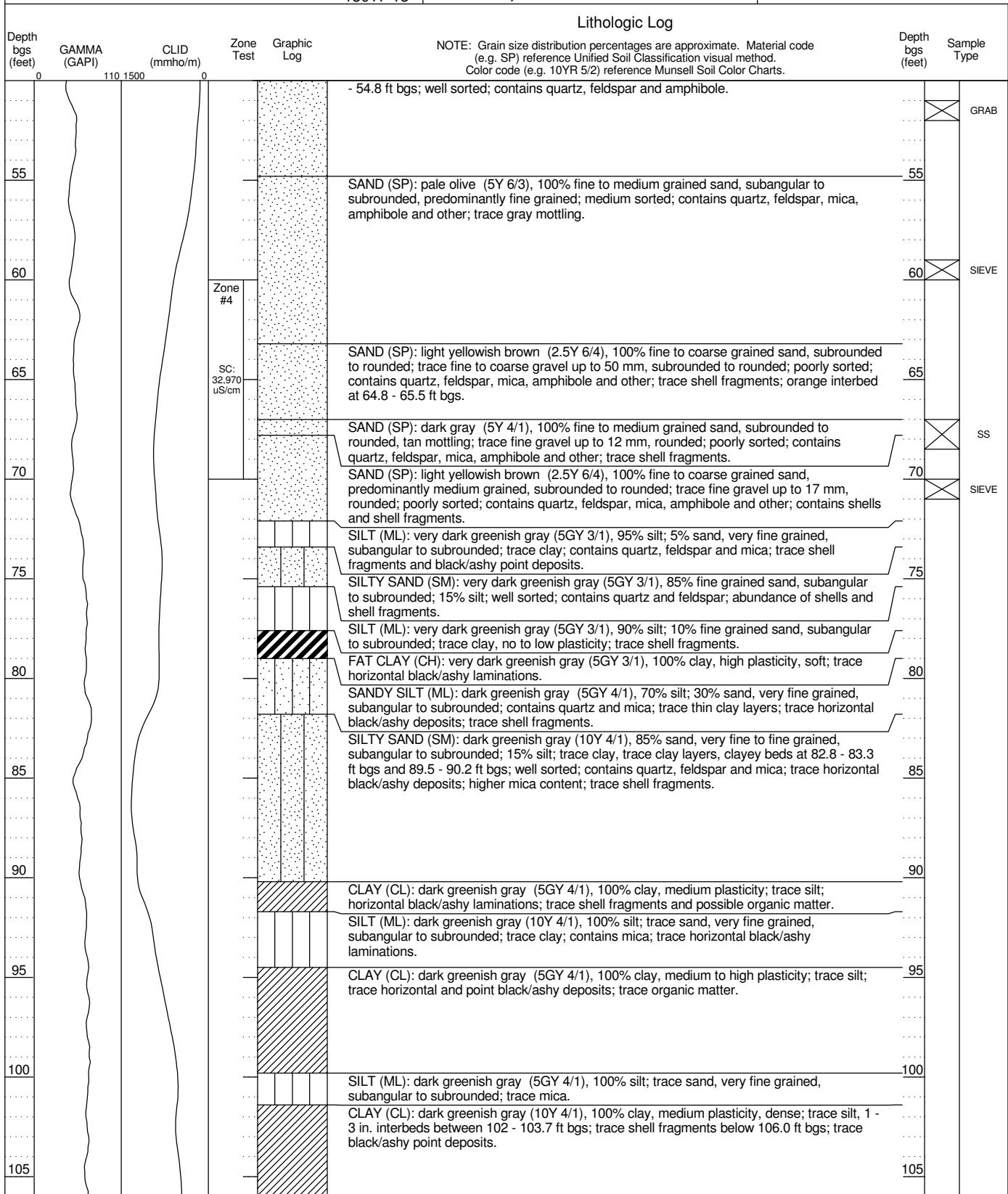
BOREHOLE NAME  
**MDW-1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Castroville, CA**



SS: Spiltspoon sample GRAB: Grab sample PTS: Spiltspoon submitted for analysis SIEVE: Grab sieved by GSSI

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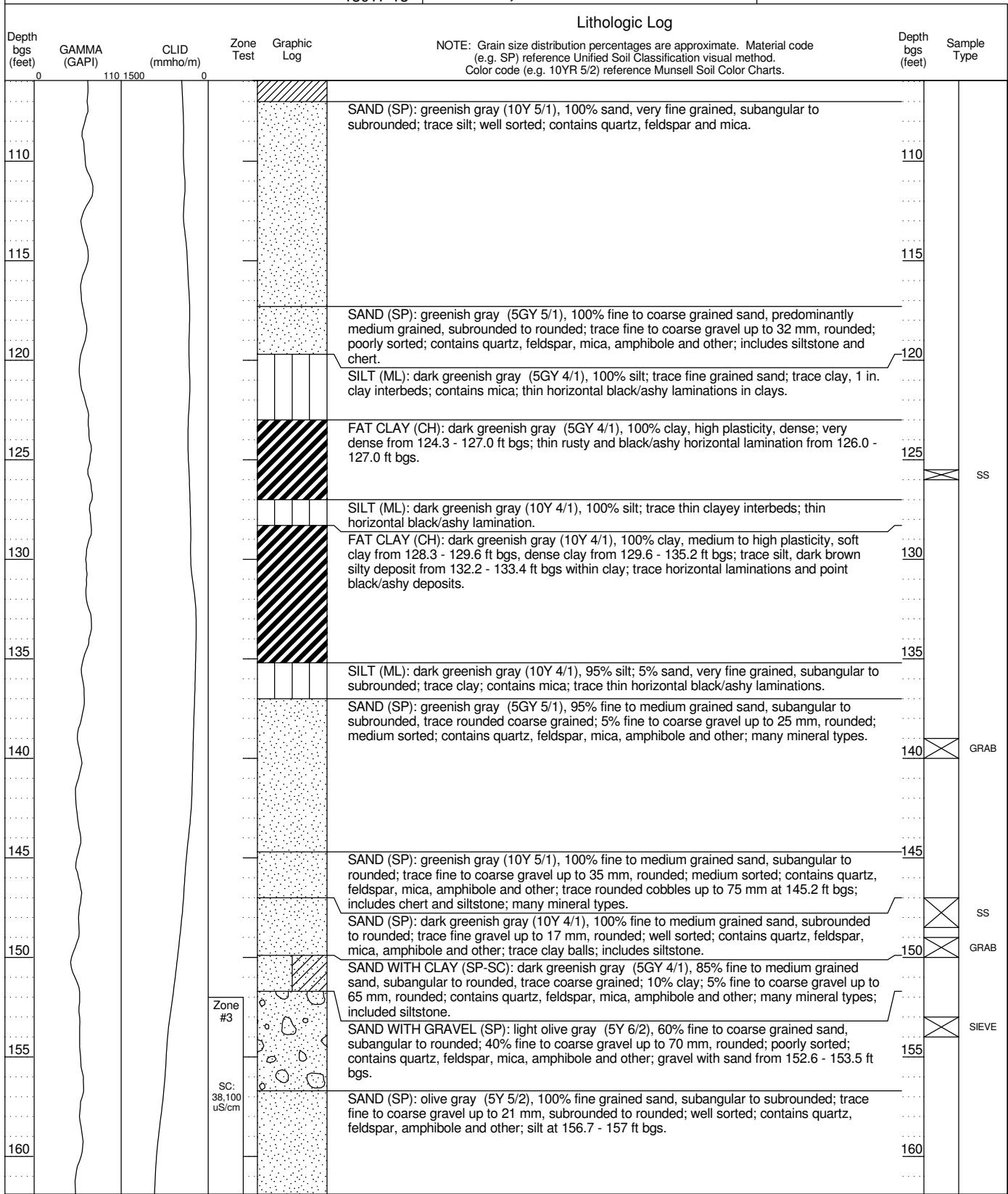
BOREHOLE NAME  
**MDW-1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Castroville, CA**



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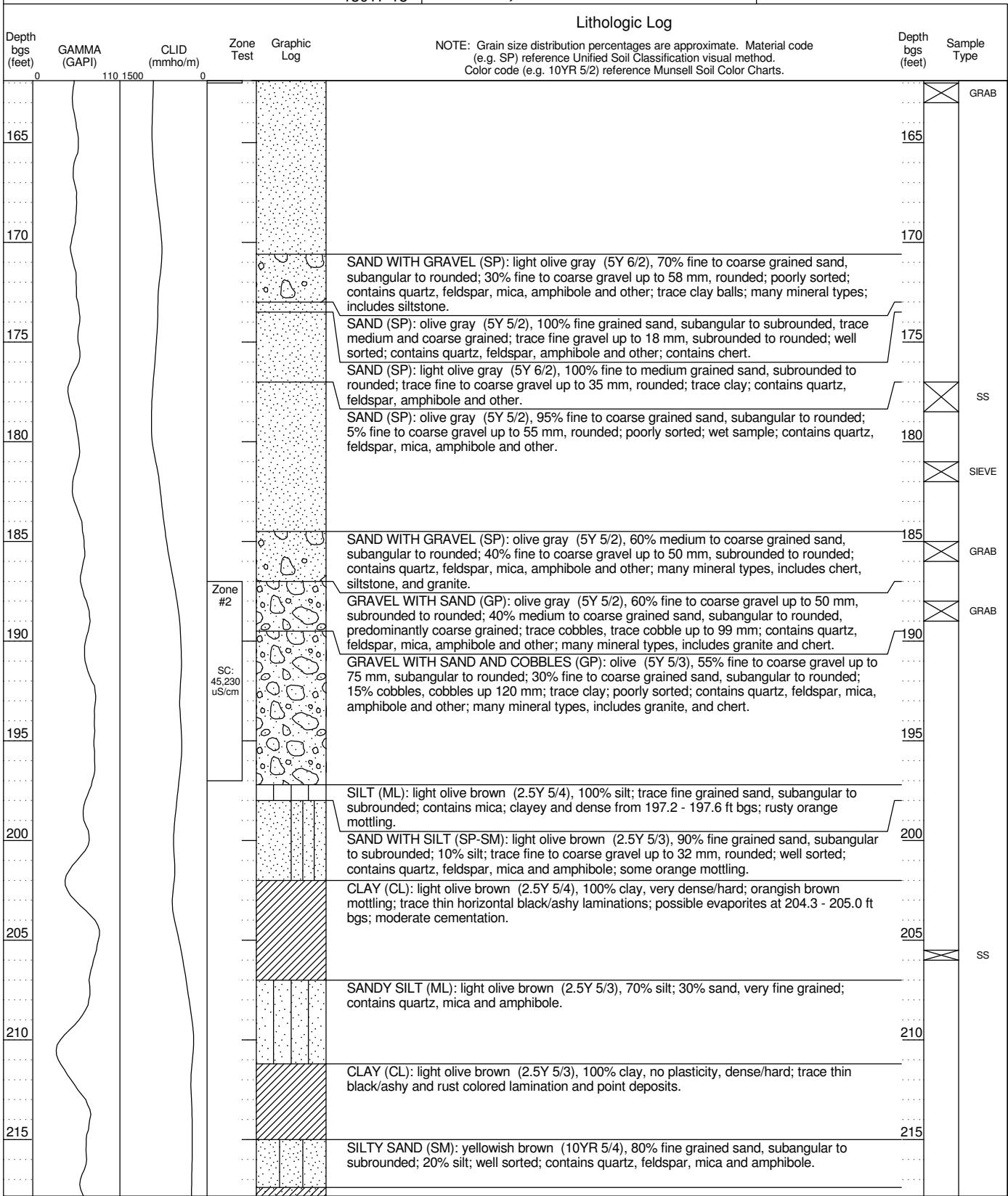
BOREHOLE NAME  
**MDW-1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Castroville, CA**



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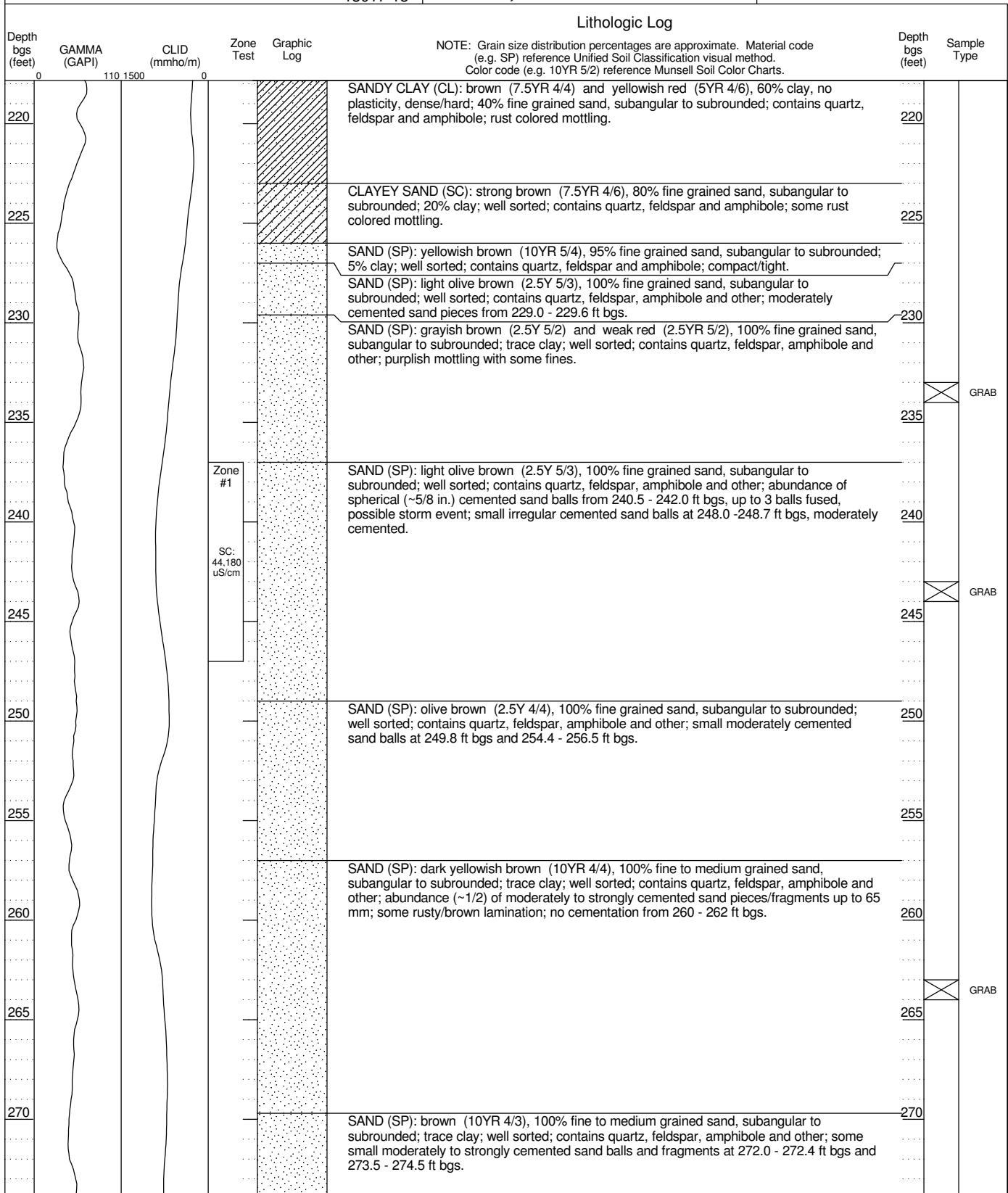
BOREHOLE NAME  
**MDW-1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Castroville, CA**



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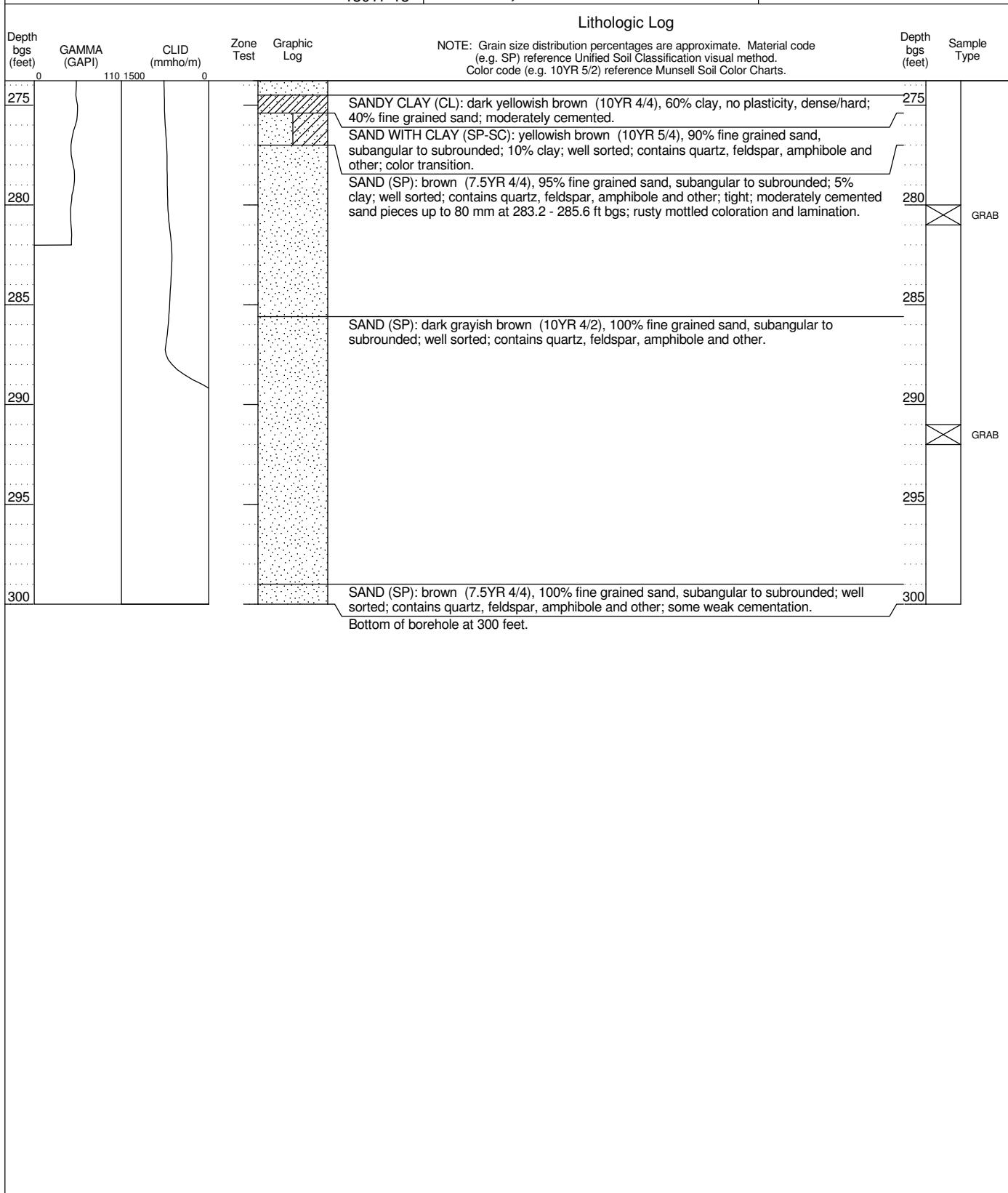
BOREHOLE NAME  
**MDW-1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Castroville, CA**



SS: Spillspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

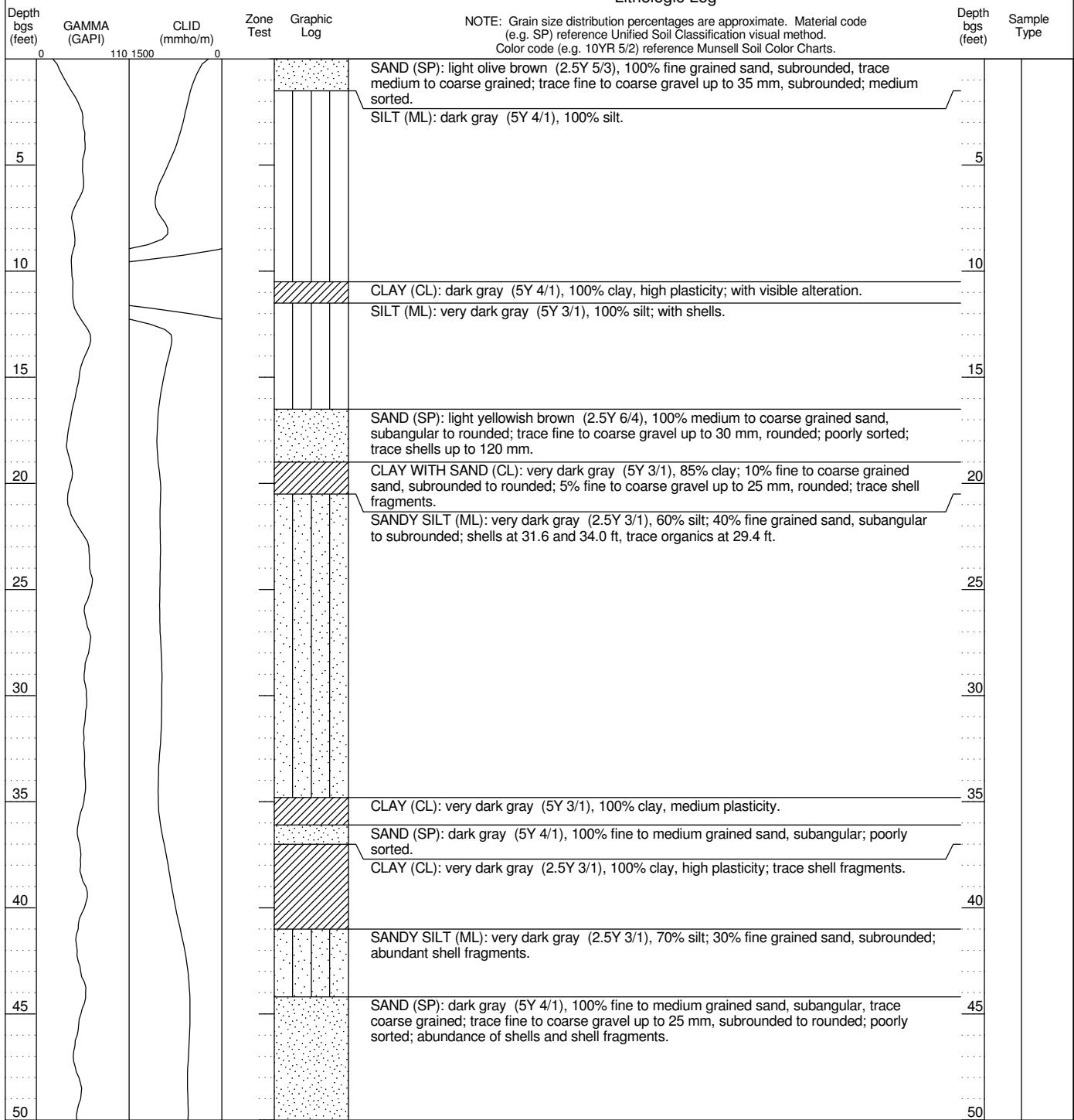
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BOREHOLE NAME ML-1
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**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER		California American Water 13017-13		LOCATION <b>Moss Landing, CA</b> <b>Sandholdt Rd</b> 36° 47' 58.0632", -121° 47' 20.31"		Geographic NAD83
REPORT DATE		7/8/2014				
DRILLING CONTRACTOR DRILLER		Cascade Drilling Jose Munguia		LOGGED BY <b>N. Reynolds</b>		
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	10/02/13	BOREHOLE DIAMETER
SURFACE ELEVATION	8.0 ft	TOTAL DEPTH	200 ft bgs	FINISH DATE	10/07/13	CORE SIZE

**Lithologic Log**

SS: Splitspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

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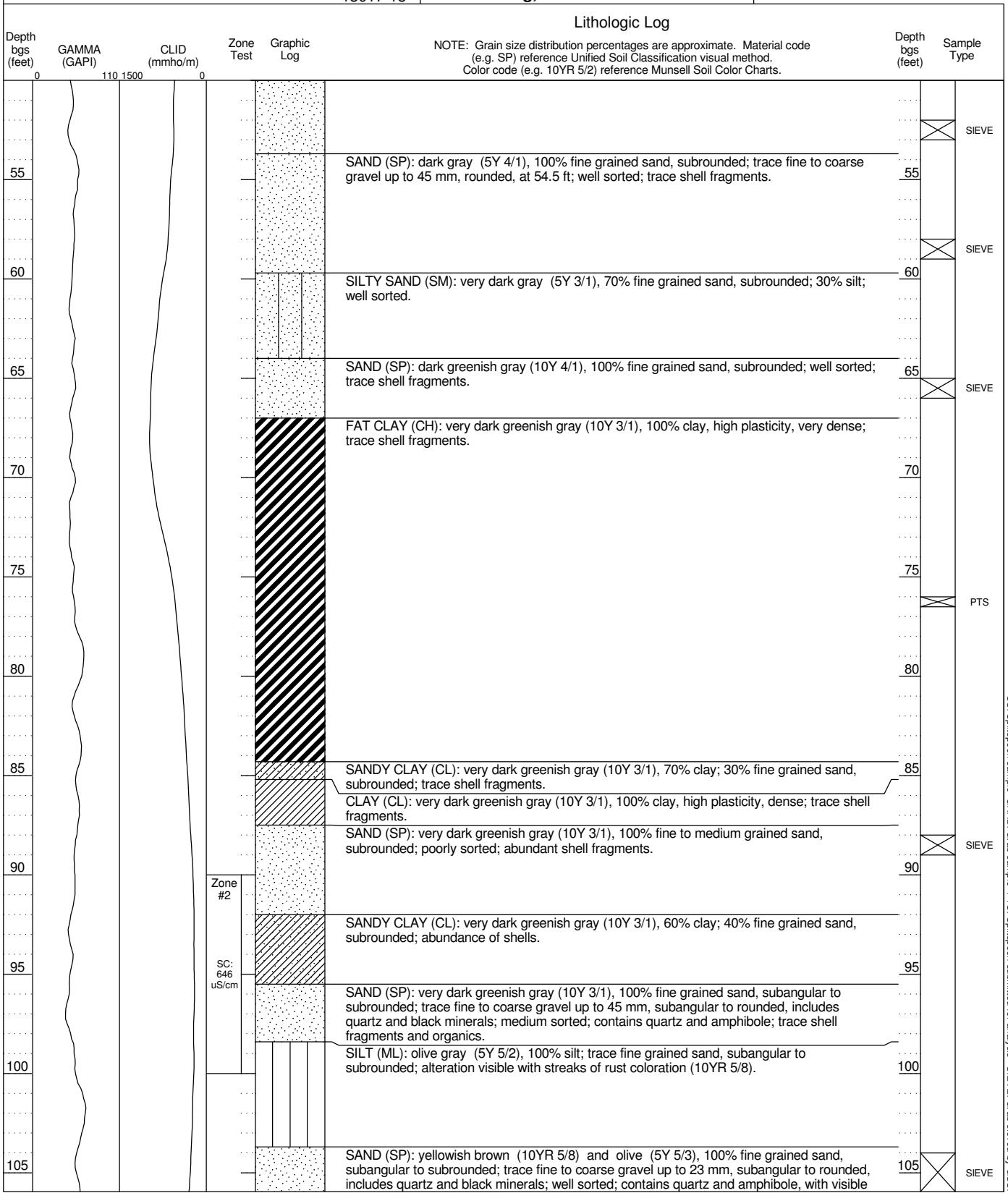
BOREHOLE NAME  
**ML-1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Moss Landing, CA**



Geoscience Support Services, Inc.

SS: Splitspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

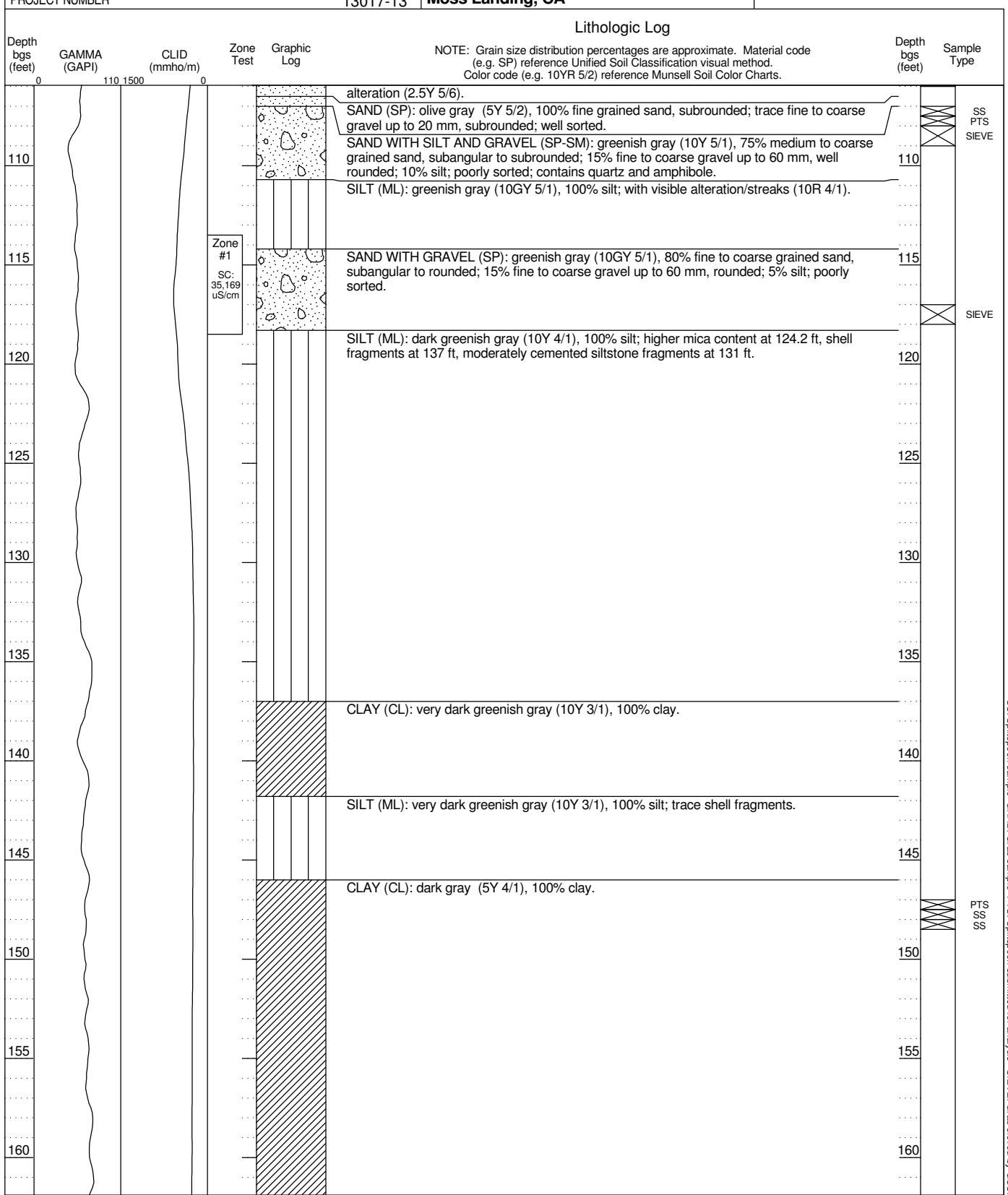
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BOREHOLE NAME  
**ML-1**

CLIENT  
 PROJECT NUMBER  
 California American Water  
 13017-13

LOCATION  
**Moss Landing, CA**

**BOREHOLE LITHOLOGIC LOG (continued)**

**GEOSCIENCE**

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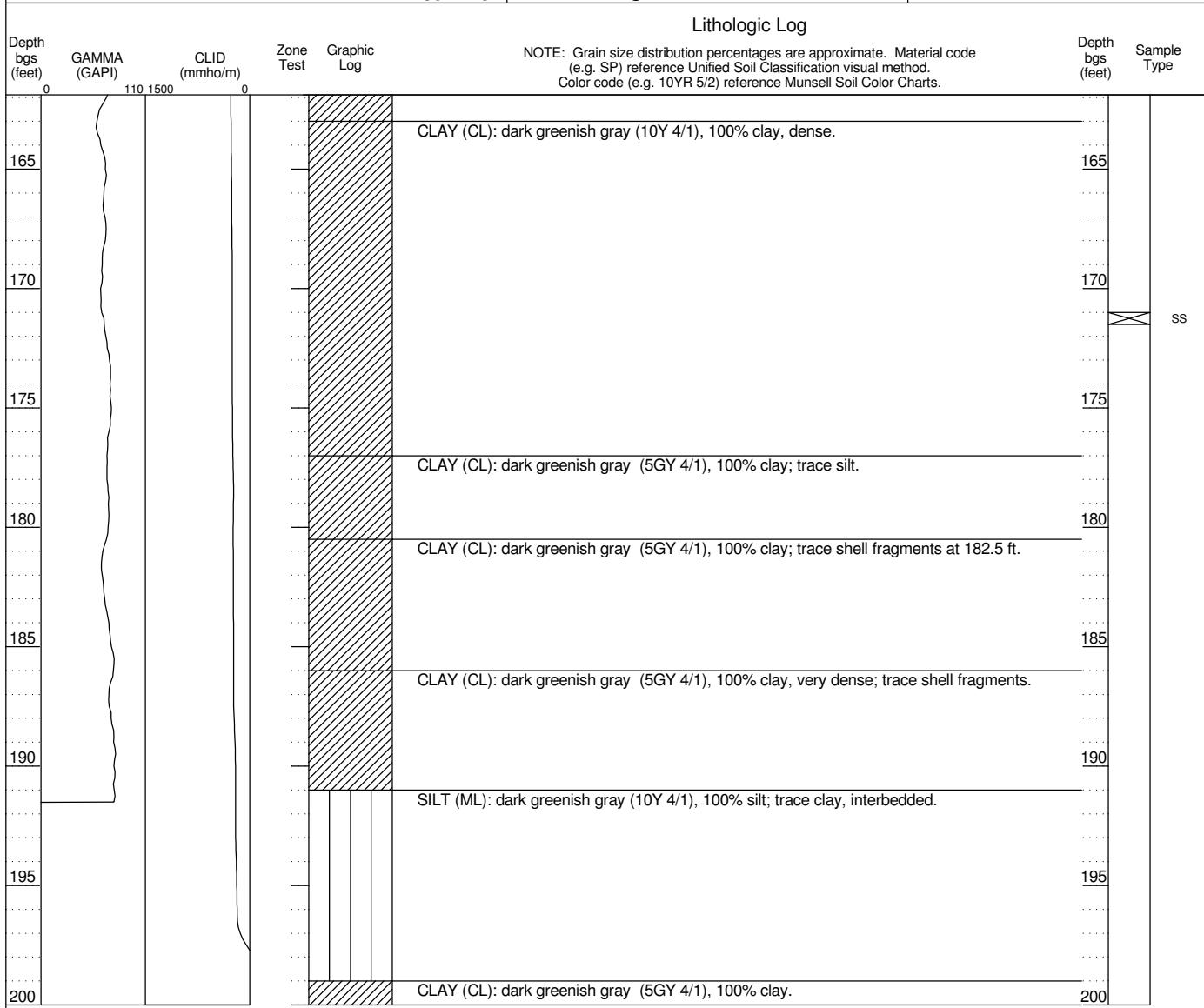
BOREHOLE NAME  
**ML-1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
 PROJECT NUMBER

California American Water  
 13017-13

LOCATION  
**Moss Landing, CA**



SS: Splitspoon sample GRAB: Grab sample PTS: Splitspoon submitted for analysis SIEVE: Grab sieved by GSSI

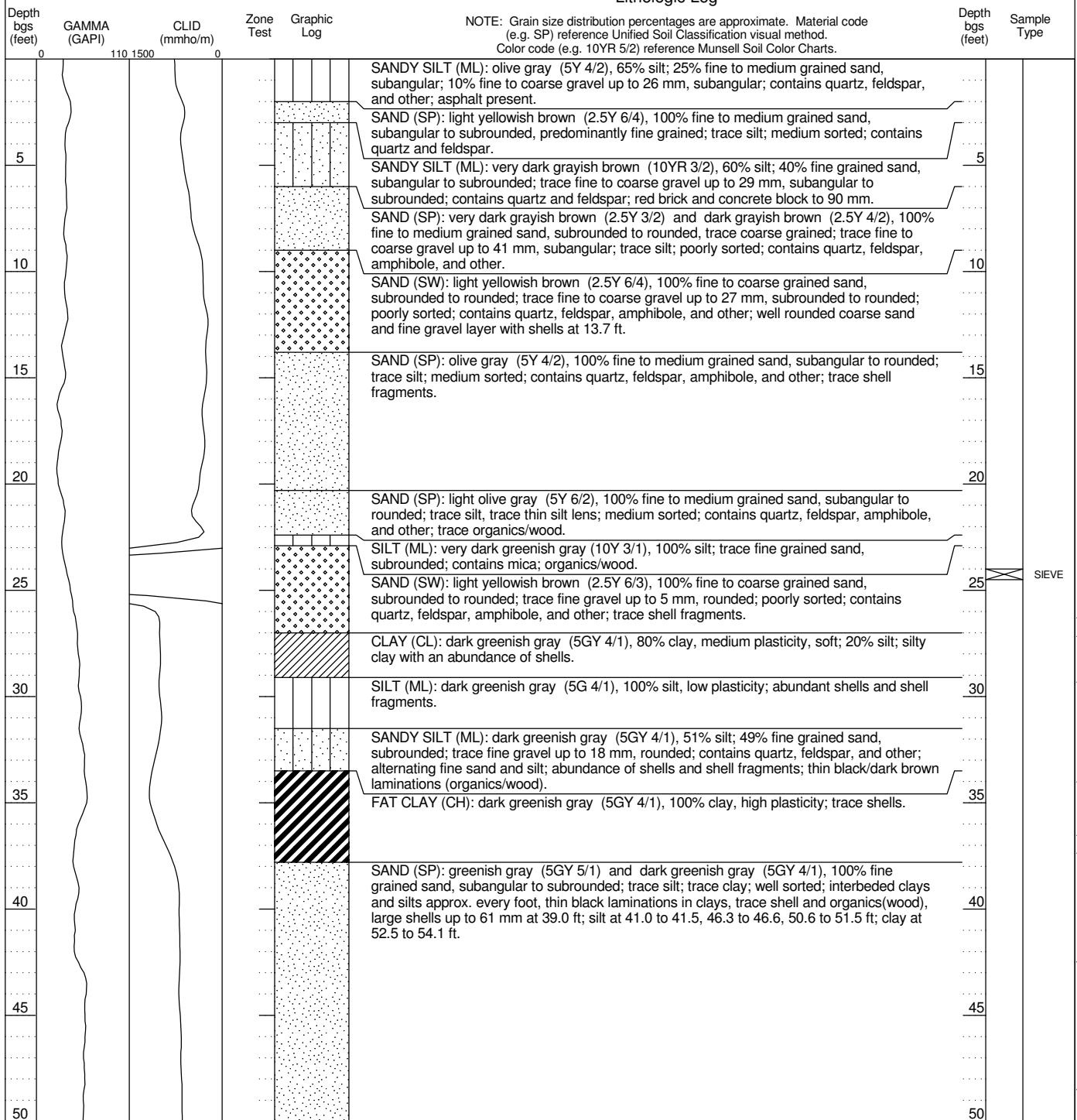
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BOREHOLE NAME ML-2
-----------------------

**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER		California American Water 13017-13		LOCATION <b>Moss Landing, CA</b> <b>Del Mar Fisheries</b> 36° 48' 11.7648", -121° 47' 12.4368" Geographic NAD83	
REPORT DATE		7/8/2014			
DRILLING CONTRACTOR DRILLER		Cascade Drilling Jose Munguia		LOGGED BY <b>N. Reynolds</b>	
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE 12/09/13	BOREHOLE DIAMETER 8 in
SURFACE ELEVATION	7.0 ft	TOTAL DEPTH	200 ft bgs	FINISH DATE 12/19/13	CORE SIZE 6 in

**Lithologic Log**

**GEOSCIENCE**

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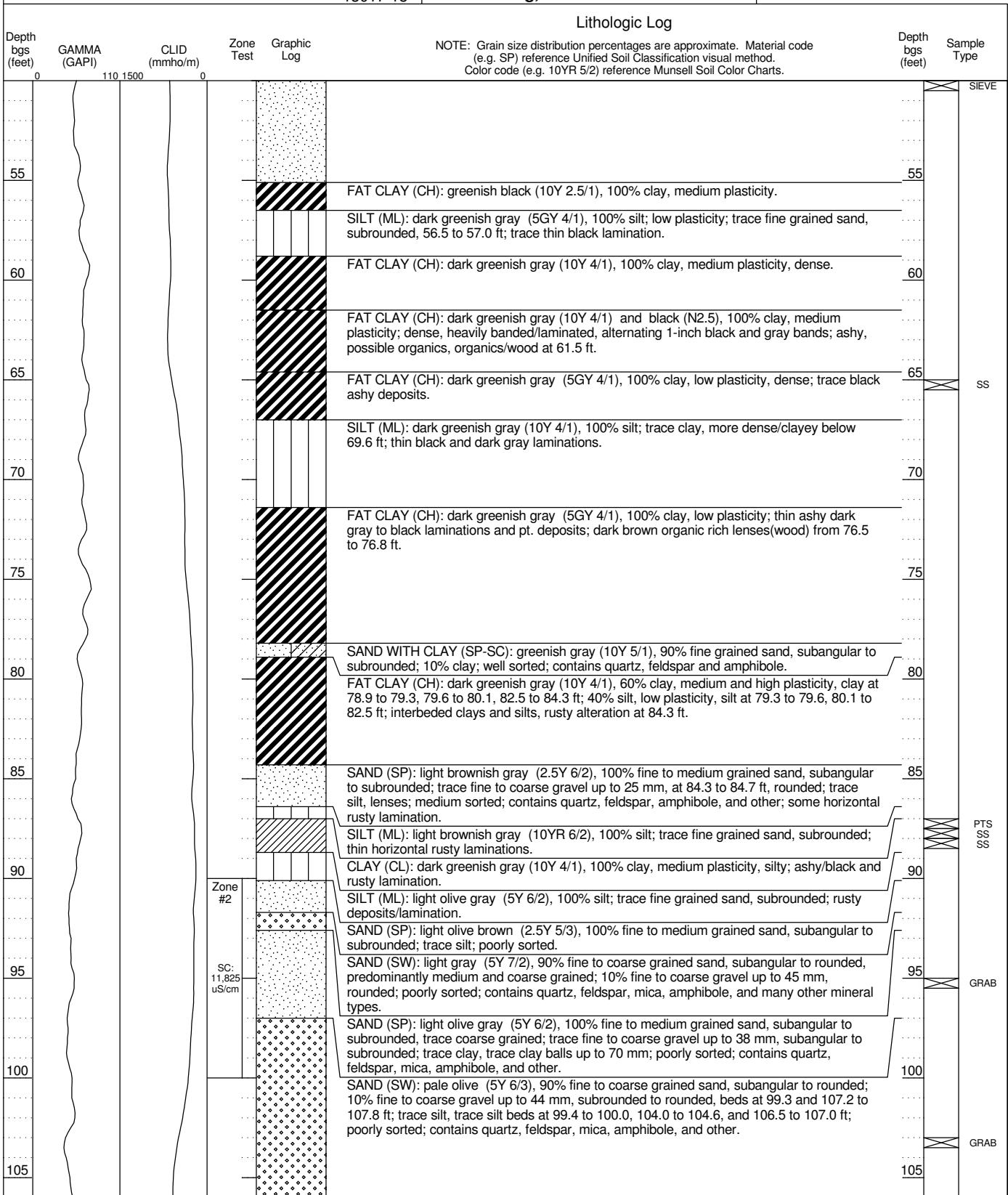
BOREHOLE NAME  
**ML-2**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Moss Landing, CA**



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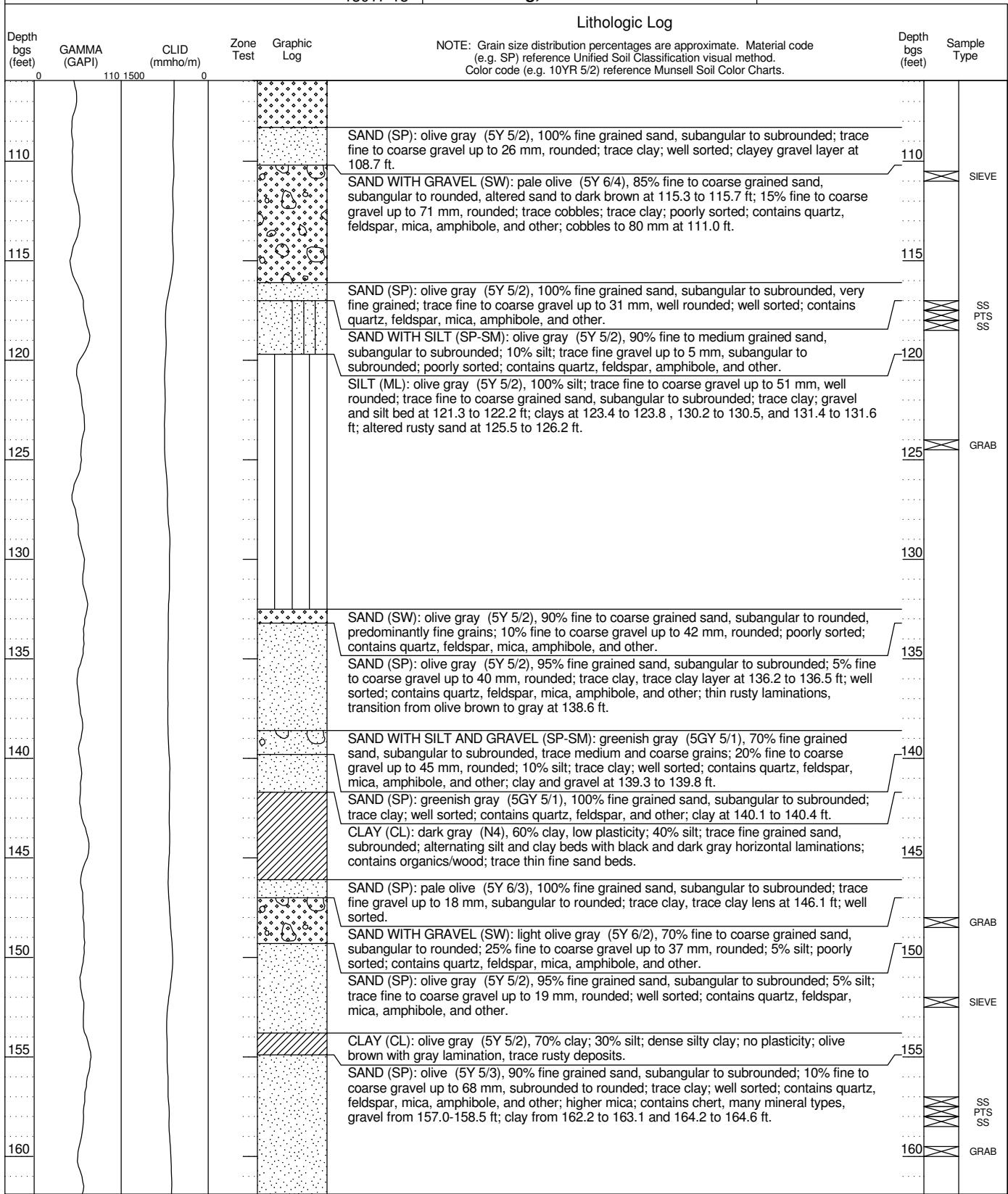
BOREHOLE NAME  
**ML-2**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Moss Landing, CA**



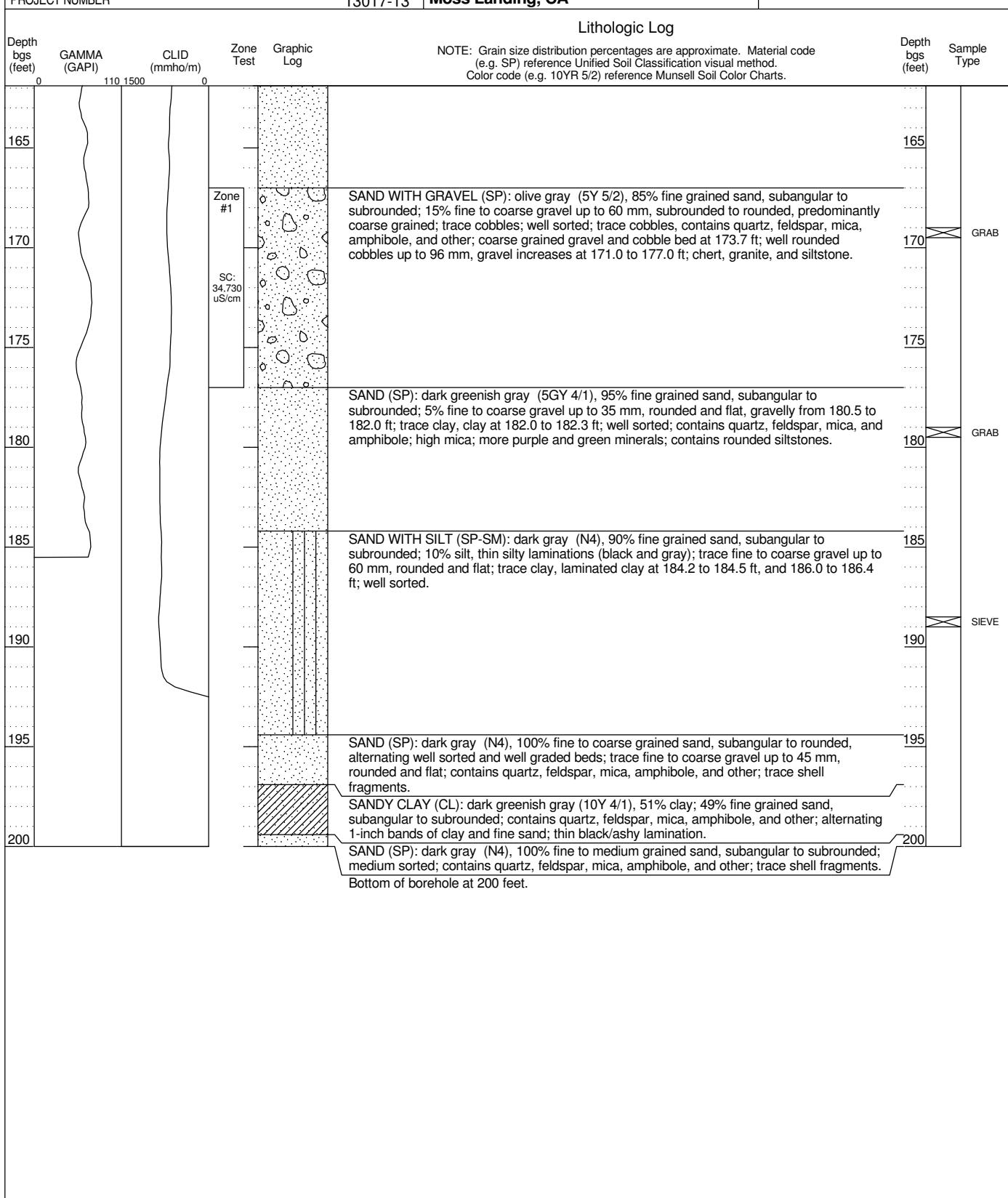
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BOREHOLE NAME  
**ML-2**

CLIENT  
PROJECT NUMBER  
California American Water  
13017-13

LOCATION  
**Moss Landing, CA**

**BOREHOLE LITHOLOGIC LOG (continued)**

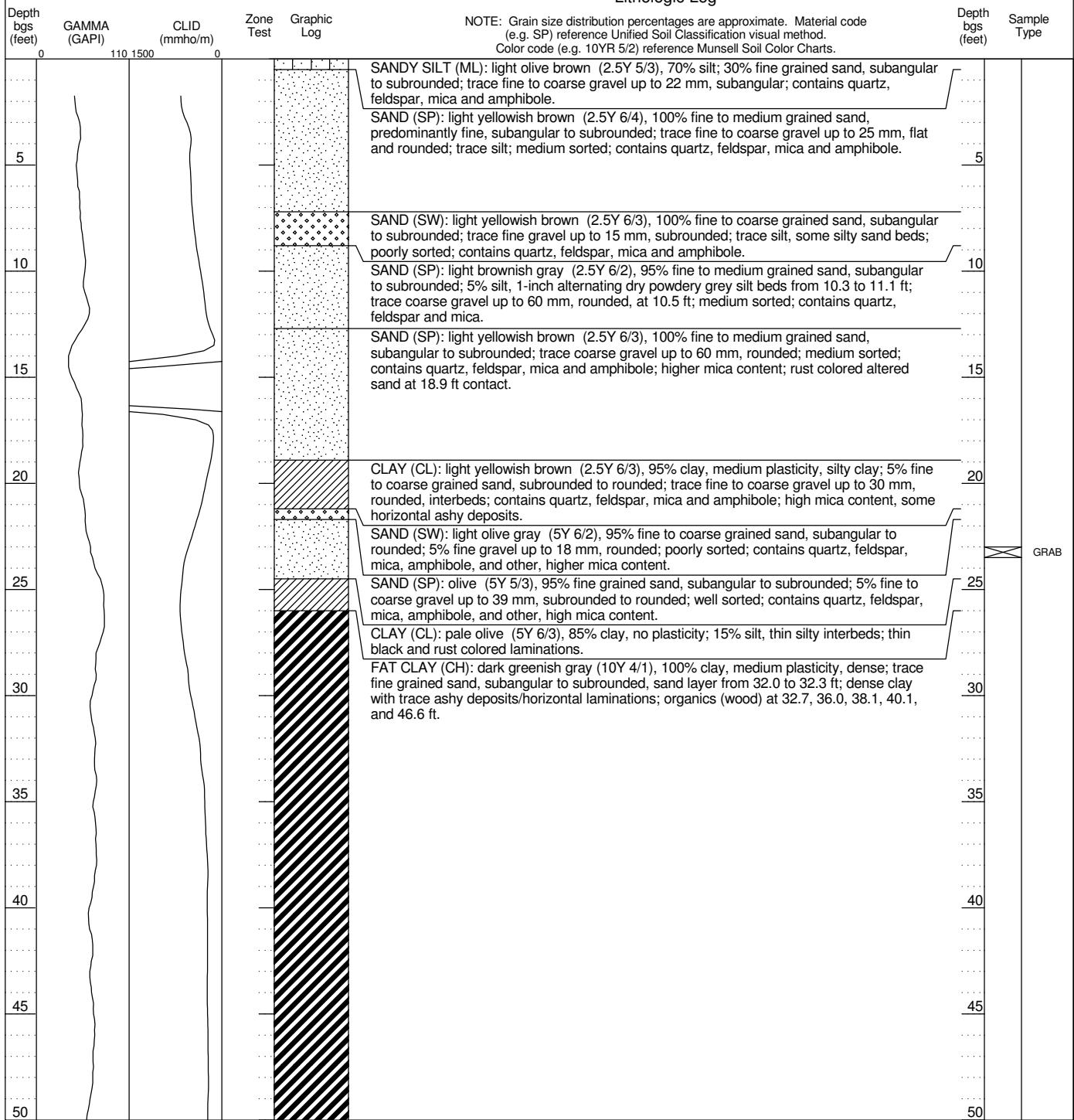
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BOREHOLE NAME ML-3
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**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER		California American Water 13017-13		LOCATION <b>Moss Landing, CA</b> <b>Nadar Agha Property</b> 36° 48' 00.6768", -121° 47' 00.7656" Geographic NAD83			
REPORT DATE		7/8/2014					
DRILLING CONTRACTOR DRILLER		Cascade Drilling Jose Munguia		LOGGED BY <b>N. Reynolds</b>			
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	1/07/14	BOREHOLE DIAMETER	8 in
SURFACE ELEVATION	16.0 ft	TOTAL DEPTH	200 ft bgs	FINISH DATE	1/13/13	CORE SIZE	6 in

**Lithologic Log**

## **BOREHOLE LITHOLOGIC LOG (continued)**

**BOREHOLE NAME**

CLIENT PROJECT NUMBER	California American Water 13017-13	LOCATION <b>Moss Landing, CA</b>
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American Water

**LOCATION**

M

CLIENT

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

**LOCATION**  
**Moss Landing, CA**

## Lithologic Log

**NOTE:** Grain size distribution percentages are approximate. Material code (e.g. SP) reference Unified Soil Classification visual method. Color code (e.g. 10YR 5/2) reference Munsell Soil Color Charts.

**Lithologic Log**

Depth bgs (feet)	GAMMA (GAPI)	CLID (mmho/m)	Zone Test	Graphic Log	NOTE: Grain size distribution percentages are approximate. Material code (e.g. SP) reference Unified Soil Classification visual method. Color code (e.g. 10YR 5/2) reference Munsell Soil Color Charts.		Depth bgs (feet)	Sample Type
0	110 1500	0						
55					SILT (ML): dark greenish gray (10Y 4/1), 85% silt, clayey silt with clay interbeds, no plasticity; 15% clay; trace horizontal laminations.		55	
60					FAT CLAY (CH): dark greenish gray (10Y 4/1), 85% clay, dense, silty, low plasticity; 15% silt; trace horizontal ashy laminations.		60	
65					FAT CLAY (CH): dark greenish gray (5GY 4/1), 100% clay, low plasticity; dense clay with higher organic/ashy content and some 1-inch horizontal dark banding.		65	
70					FAT CLAY (CH): dark greenish gray (10Y 4/1), 100% clay, medium plasticity, dense.		70	
75					FAT CLAY (CH): dark greenish gray (10Y 4/1), 100% clay, low plasticity, dense; high ashy organic/wood content; dark horizontal laminations.		75	
80							80	
85					SAND (SP): gray (N5), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz and feldspar.		85	
90					SILT (ML): greenish gray (10Y 5/1), 85% silt; 15% clay; clayey silt; trace organics/wood.		90	
95					FAT CLAY (CH): dark greenish gray (10Y 4/1), 100% clay, dense clay, no plasticity; trace horizontal ashy laminations; trace ashy organics/wood at 86.9 ft.		95	
100					FAT CLAY (CH): greenish black (10Y 2.5/1), 100% clay, low to no plasticity; dense clay with brownish grey banding and lamination, very dense from 93.5 to 94.7 ft.		100	
105			Zone #2		FAT CLAY WITH SAND (CH): black (5Y 2.5/1), 85% clay, no plasticity; 15% fine to medium grained sand, subangular to subrounded.		105	
					FAT CLAY WITH SAND (CH): dark greenish gray (10Y 4/1), 80% clay, no plasticity; 20% fine grained sand, subrounded; contains quartz and feldspar; trace black ashy deposits.			
					SILTY SAND (SM): greenish gray (10Y 5/1), 85% fine grained sand, subangular to subrounded; 15% silt; well sorted; contains quartz, feldspar and amphibole.			
					SILT (ML): dark greenish gray (5GY 4/1), 100% silt; trace thin horizontal ashy laminations.			
					SAND WITH SILT (SP-SM): dark greenish gray (10Y 4/1), 90% fine grained sand, subangular to subrounded; 10% silt; well sorted; contains quartz, feldspar and amphibole; trace black ashy deposits.			
					FAT CLAY (CH): very dark greenish gray (10Y 3/1), 100% clay, medium plasticity, dense.			
					SAND (SP): olive (5Y 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; transition from grey to olive sand at 104.7 ft.			

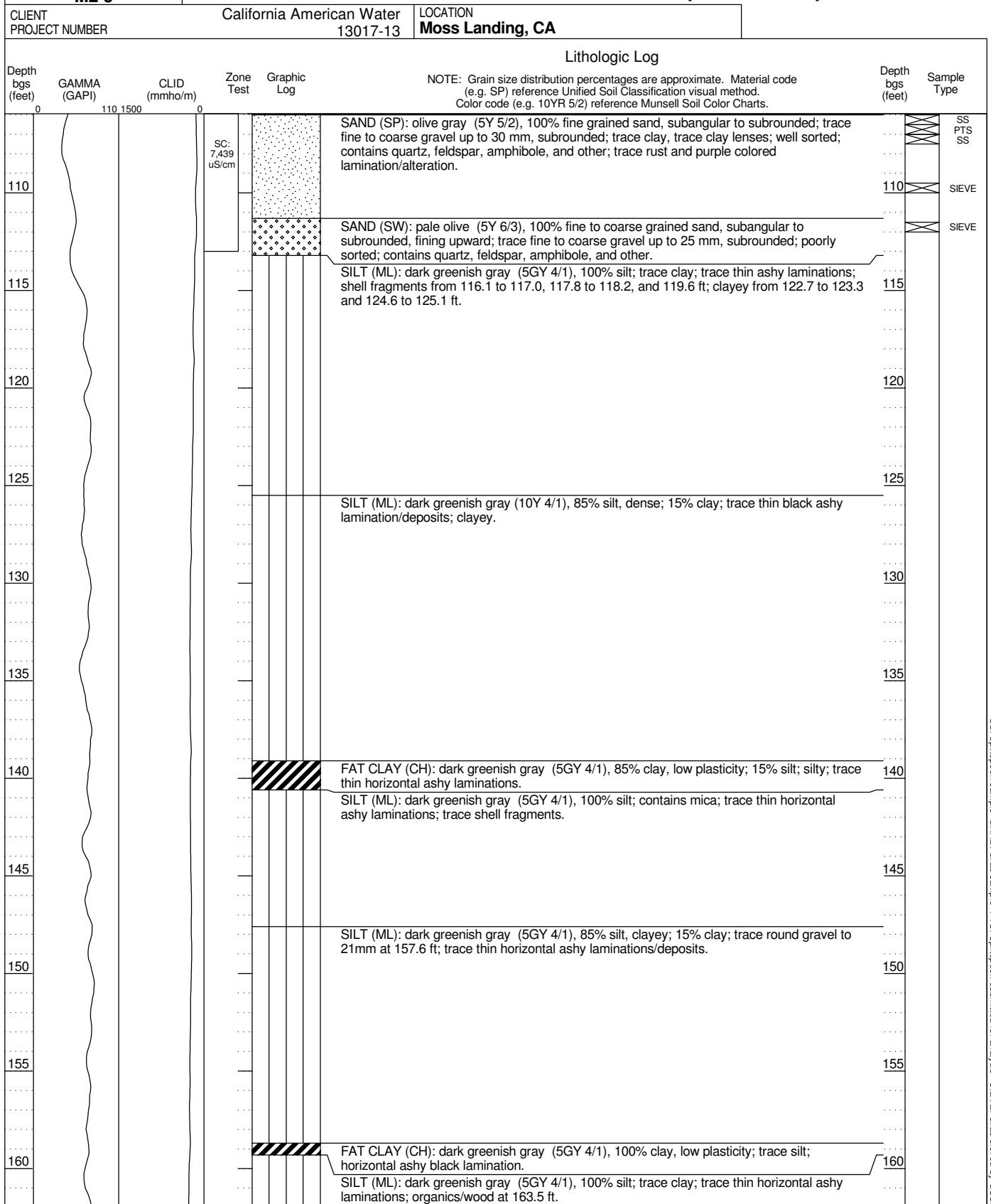
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BOREHOLE NAME  
**ML-3**

California American Water  
13017-13

**BOREHOLE LITHOLOGIC LOG (continued)**

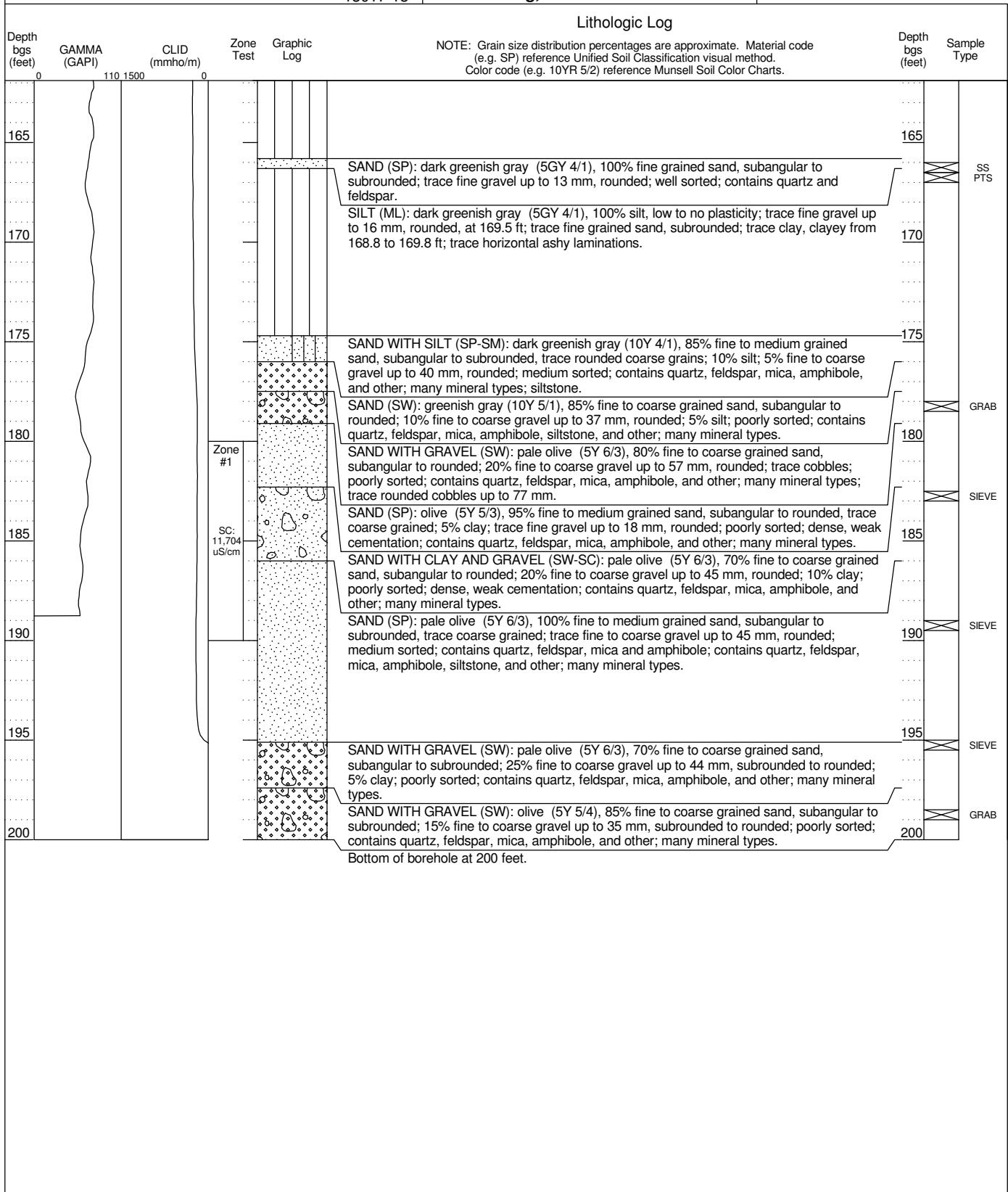
SS: Splitspoon sample GRAB: Grab sample PTS: Splitspoon submitted for analysis SIEVE: Grab sieved by GSSI

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BOREHOLE NAME  
**ML-3**

CLIENT  
PROJECT NUMBER California American Water  
13017-13 LOCATION  
**Moss Landing, CA**

**BOREHOLE LITHOLOGIC LOG (continued)**

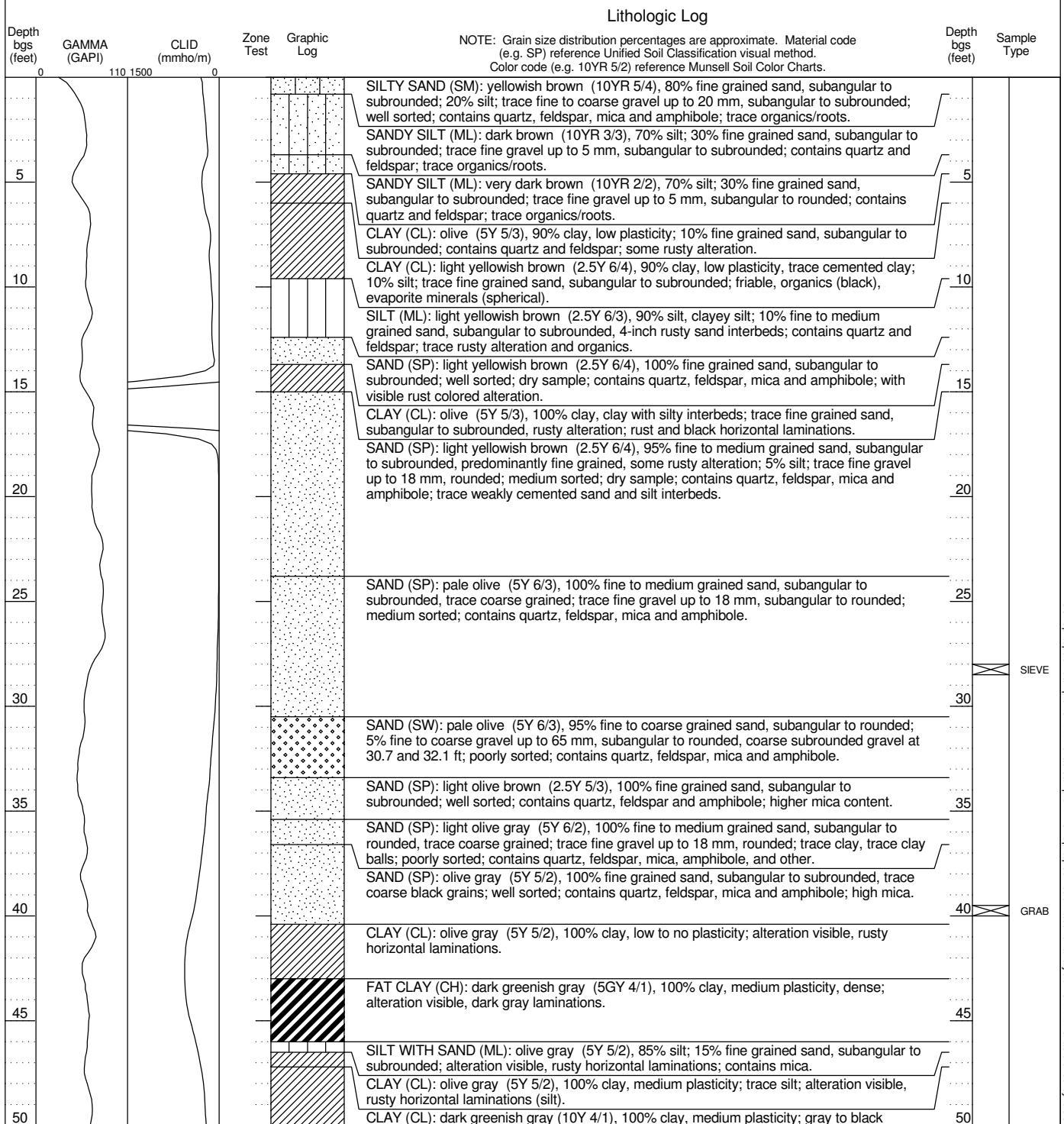
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BOREHOLE NAME ML-4
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**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER		California American Water 13017-13		LOCATION <b>Moss Landing, CA</b> <b>Nadar Agha Property</b> 36° 48' 09.342", -121° 47' 02.526"		Geographic NAD83	
REPORT DATE		7/8/2014					
DRILLING CONTRACTOR DRILLER		Cascade Drilling Jose Munguia		LOGGED BY <b>N. Reynolds</b>			
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	12/02/13	BOREHOLE DIAMETER	
SURFACE ELEVATION	32.0 ft	TOTAL DEPTH	201 ft bgs	FINISH DATE	12/06/13	CORE SIZE	



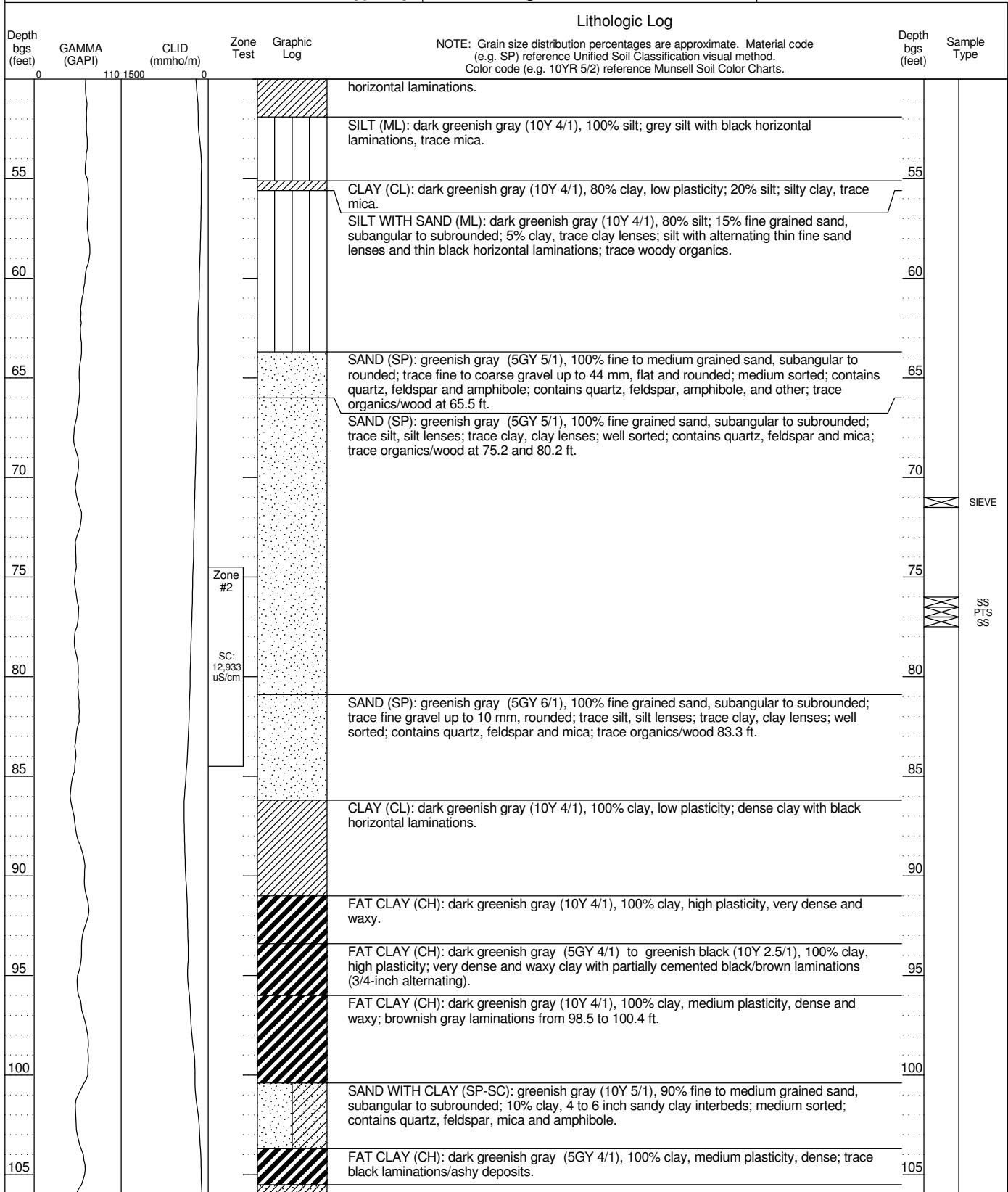
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BOREHOLE NAME  
**ML-4**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER California American Water  
13017-13 LOCATION  
**Moss Landing, CA**



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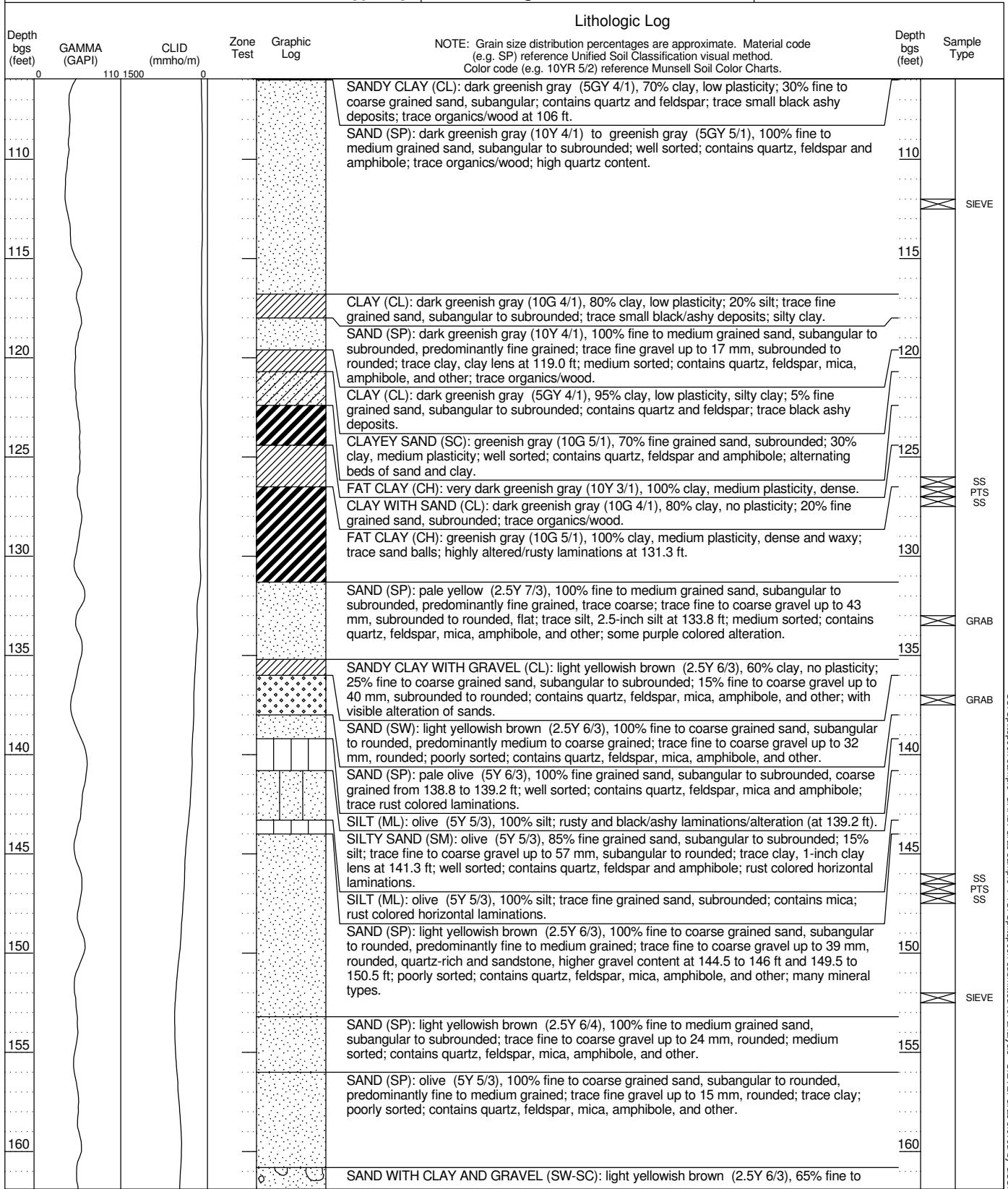
BOREHOLE NAME  
**ML-4**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Moss Landing, CA**



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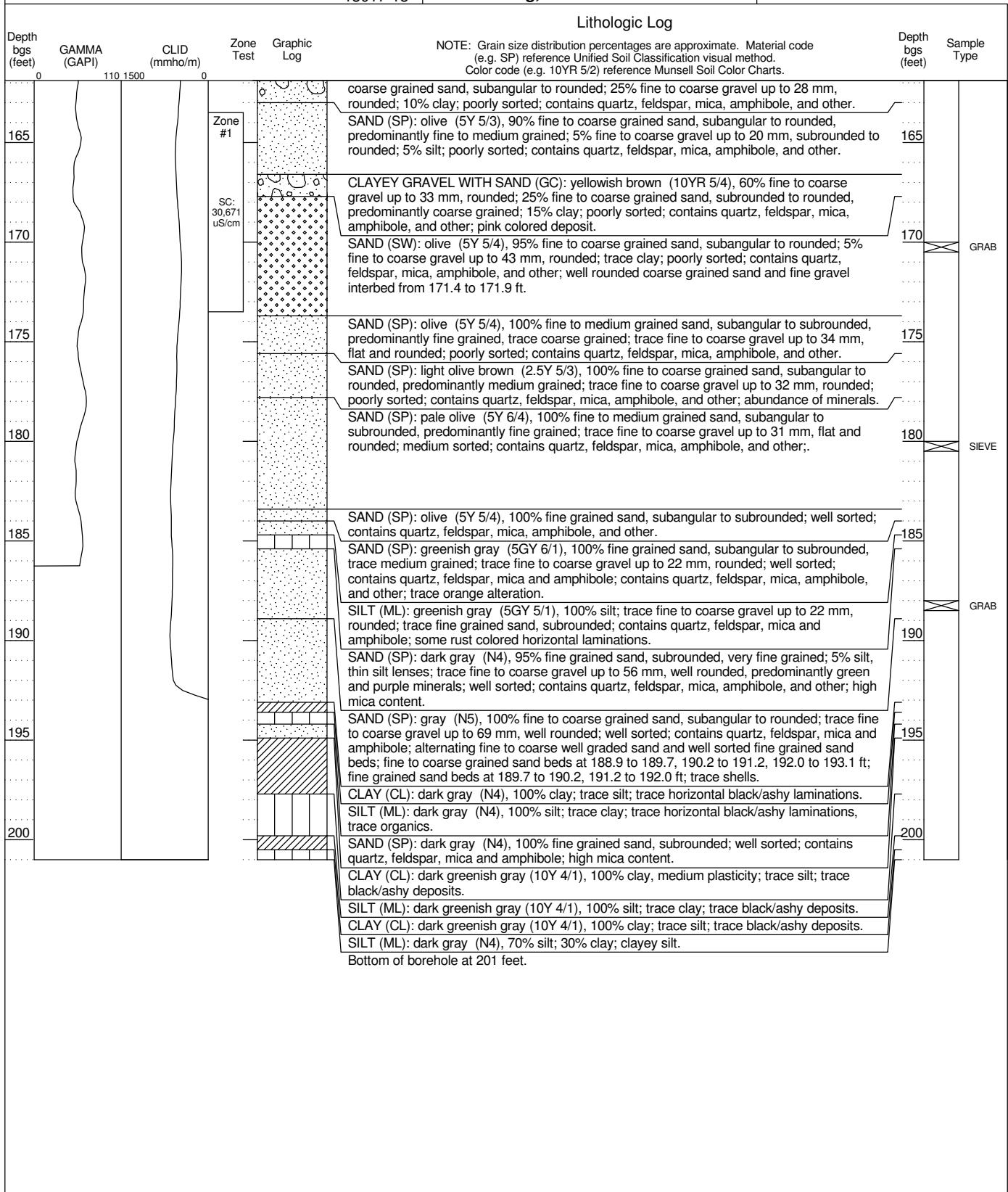
BOREHOLE NAME  
**ML-4**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Moss Landing, CA**



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BOREHOLE NAME ML-6
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**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER		California American Water 13017-13		LOCATION <b>Moss Landing, CA</b> <b>MBARI</b> 36° 48' 21.4992", -121° 47' 16.0188"      Geographic NAD83			
REPORT DATE		7/8/2014					
DRILLING CONTRACTOR DRILLER		Cascade Drilling Jose Munguia		LOGGED BY <b>N. Reynolds</b>			
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	11/18/13	BOREHOLE DIAMETER	8 in
SURFACE ELEVATION	15.0 ft	TOTAL DEPTH	200 ft bgs	FINISH DATE	11/23/13	CORE SIZE	7 in
<b>Lithologic Log</b>							
Depth bgs (feet)	GAMMA (GAPI) 110 1500	CLID (mmho/m) 0	Zone Test	Graphic Log	NOTE: Grain size distribution percentages are approximate. Material code (e.g. SP) reference Unified Soil Classification visual method. Color code (e.g. 10YR 5/2) reference Munsell Soil Color Charts.	Depth bgs (feet)	Sample Type
0					CLAYEY SAND (SC): olive (5Y 4/4), 85% fine to medium grained sand, subangular to rounded; 15% clay, sandy clay balls; trace fine gravel up to 5 mm, rounded; poorly sorted; contains quartz, feldspar, mica and amphibole; trace shells and shell fragments.		
5					CLAYEY SAND (SC): olive (5Y 4/4), 70% fine to medium grained sand, subangular to rounded; 30% clay; trace fine to coarse gravel up to 62 mm, angular to rounded; poorly sorted; contains quartz, feldspar, mica and amphibole; contains shells.	5	
10					SAND (SP): olive (5Y 4/4), 100% fine to medium grained sand, subangular to subrounded; trace coarse gravel rounded, interbedded; trace silt, silt from 8.7 to 9.2 ft with high mica content and some alteration; poorly sorted; contains quartz, feldspar and amphibole.	10	
15					SAND (SP): olive gray (5Y 5/2), 100% fine to medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar, mica and amphibole; altered rust and black colored sands from 22.0 to 23.5 ft.	15	
20					SAND (SP): olive (5Y 5/4), 95% medium to coarse grained sand, subangular to rounded; 5% fine to coarse gravel up to 40 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; trace shells and shell fragments.	20	
25					CLAY (CL): olive brown (2.5Y 4/4), 100% clay, low plasticity; with visible rust and black colored alteration.	25	
30					CLAY (CL): very dark greenish gray (5GY 3/1), 100% clay, medium plasticity; trace organics, altered black and dark gray and weakly cemented from 33.7 to 34.2 ft.	30	
35					CLAY (CL): very dark greenish gray (5GY 3/1), 100% clay, low plasticity; dark gray/black laminations.	35	
40					SILT (ML): very dark greenish gray (10Y 3/1), 95% silt; 5% fine grained sand, subrounded, very fine grained; contains mica; thin black laminations.	40	
45					FAT CLAY (CH): very dark greenish gray (10Y 3/1), 100% clay, medium plasticity; trace fine grained sand, subrounded, fine sand layer at 40.2 to 40.4 ft; trace black/gray laminations, trace organics.	45	
50					CLAY (CL): greenish black (10Y 2.5/1), 100% clay, medium plasticity; trace silt, silt interbed at 42.4 to 42.8 ft.	50	
					CLAY (CL): olive (5Y 4/3), 100% clay, low plasticity; trace fine grained sand, subangular to subrounded; alteration visible with black/grey and brown coloration.		
					SANDY CLAY (CL): yellowish red (5YR 4/6), 50% fine grained sand, subangular to subrounded; 50% clay; with visible rust colored alteration; sandy clay to clayey sand.		
					CLAY (CL): light olive brown (2.5Y 5/3), 95% clay; 5% fine grained sand, subangular to subrounded; trace silt; with visible rust colored alteration.		
					SAND (SP): light yellowish brown (2.5Y 6/3), 95% fine grained sand, subangular to subrounded; 5% silt; well sorted; contains quartz, feldspar, mica and amphibole; with trace		

SS: Splitspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

**GEOSCIENCE**

P.O. Box 220  
 Claremont, CA 91711  
 Telephone: (909) 451-6650  
 Fax: (909) 451-6638  
[www.gssiwwater.com](http://www.gssiwwater.com)

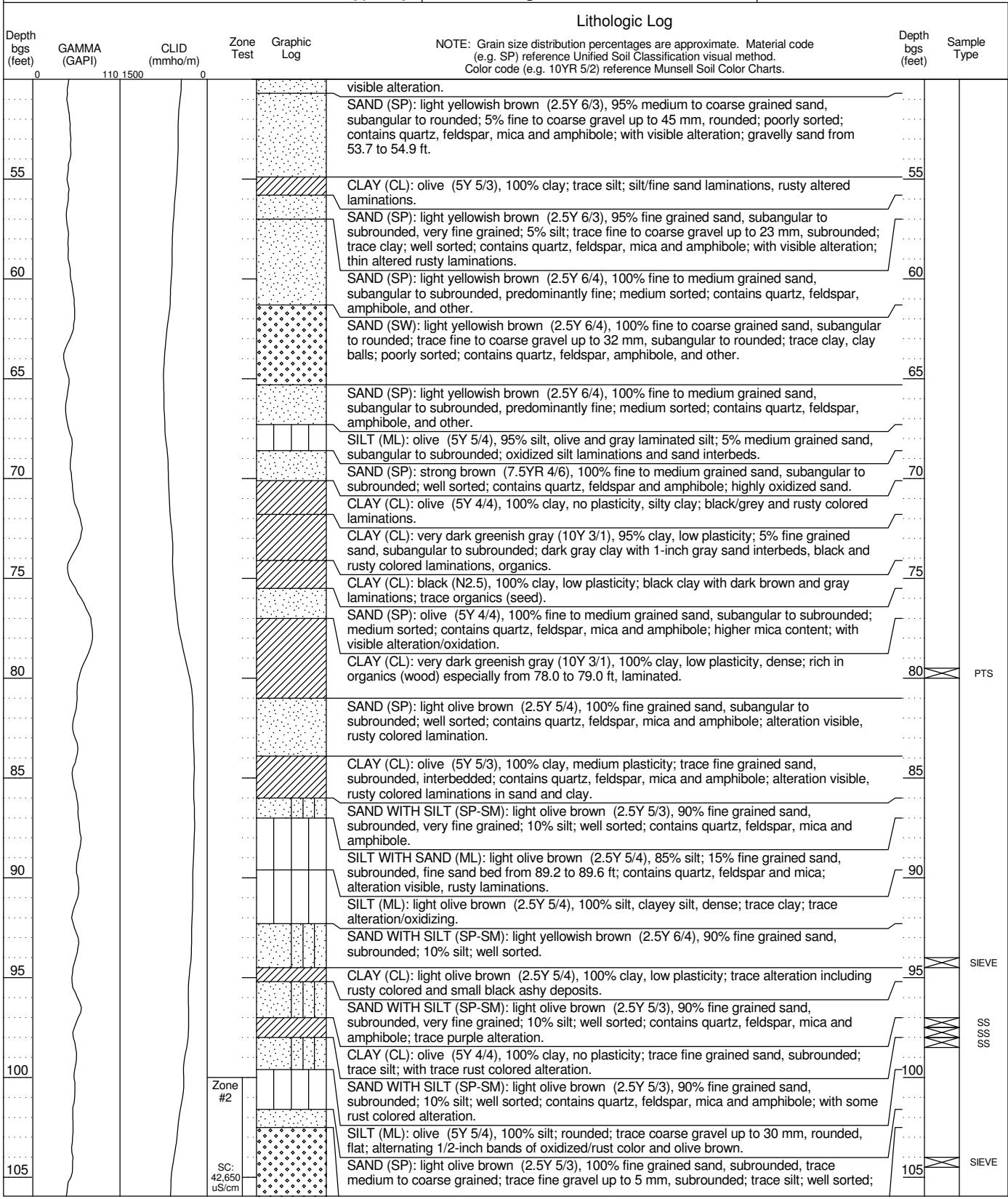
BOREHOLE NAME  
**ML-6**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Moss Landing, CA**



**GEOSCIENCE**

P.O. Box 220  
 Claremont, CA 91711  
 Telephone: (909) 451-6650  
 Fax: (909) 451-6638  
[www.gssiwater.com](http://www.gssiwater.com)

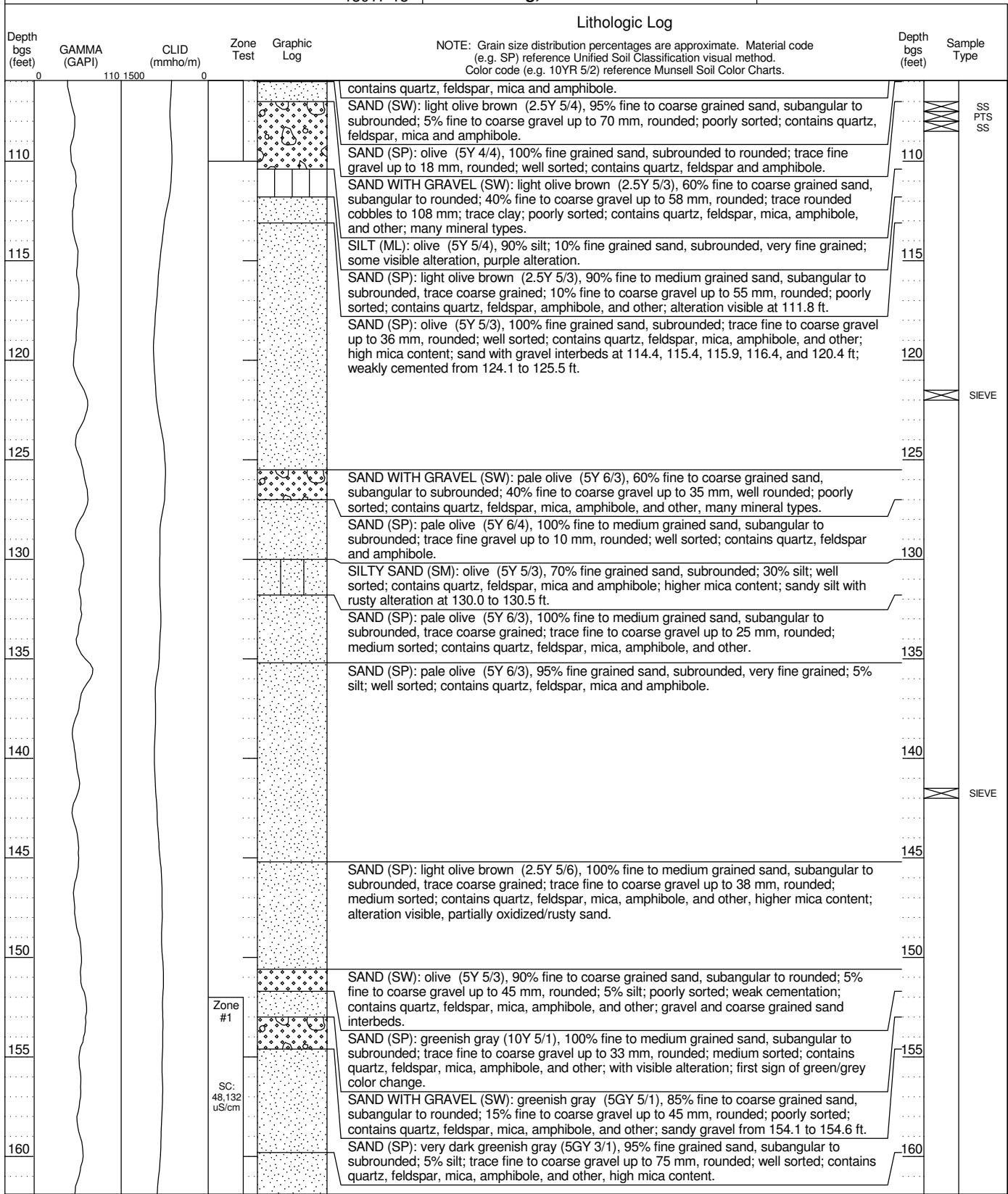
BOREHOLE NAME  
**ML-6**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Moss Landing, CA**



**GEOSCIENCE**

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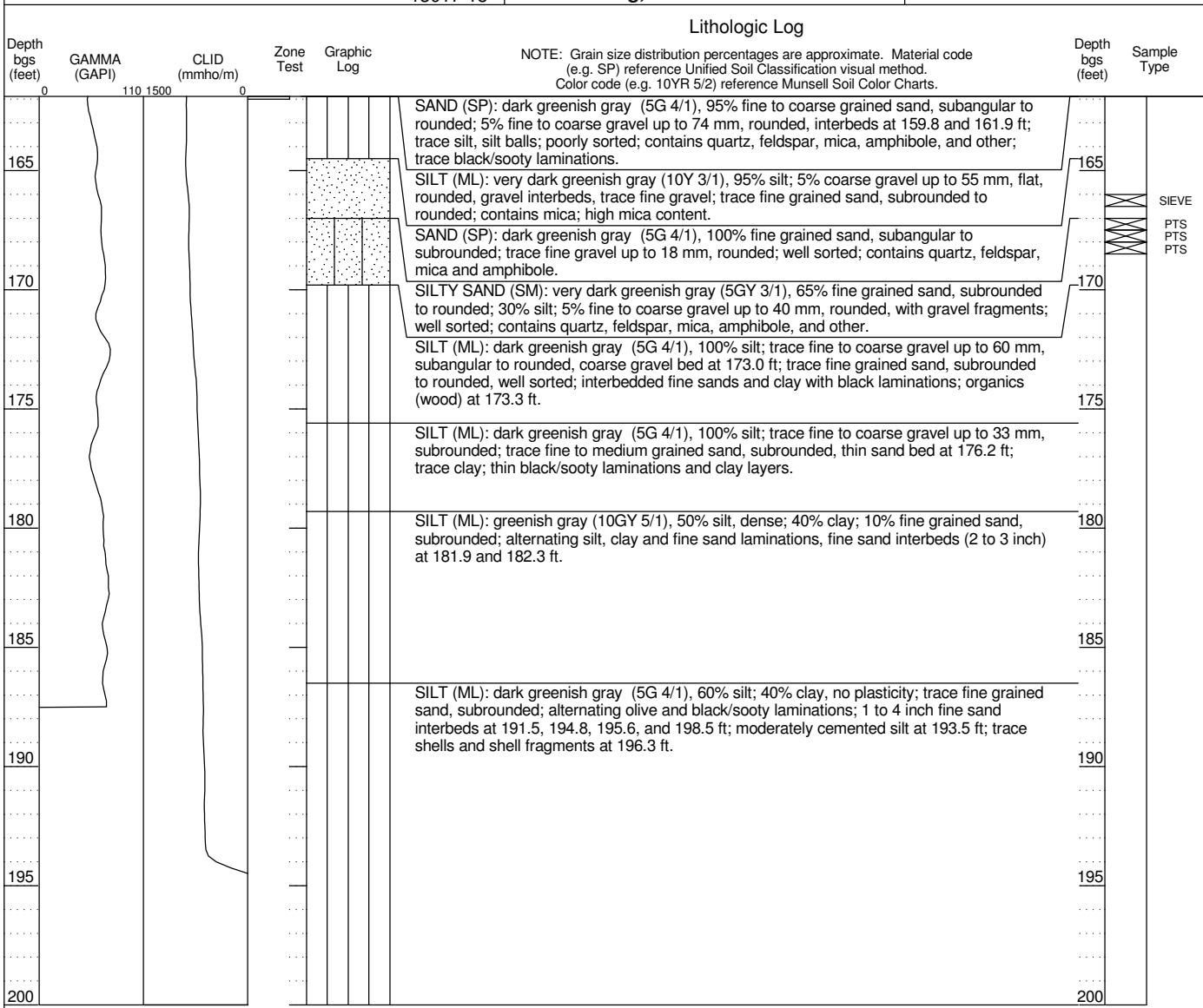
BOREHOLE NAME  
**ML-6**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
PROJECT NUMBER

California American Water  
13017-13

LOCATION  
**Moss Landing, CA**



SS: Splitspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

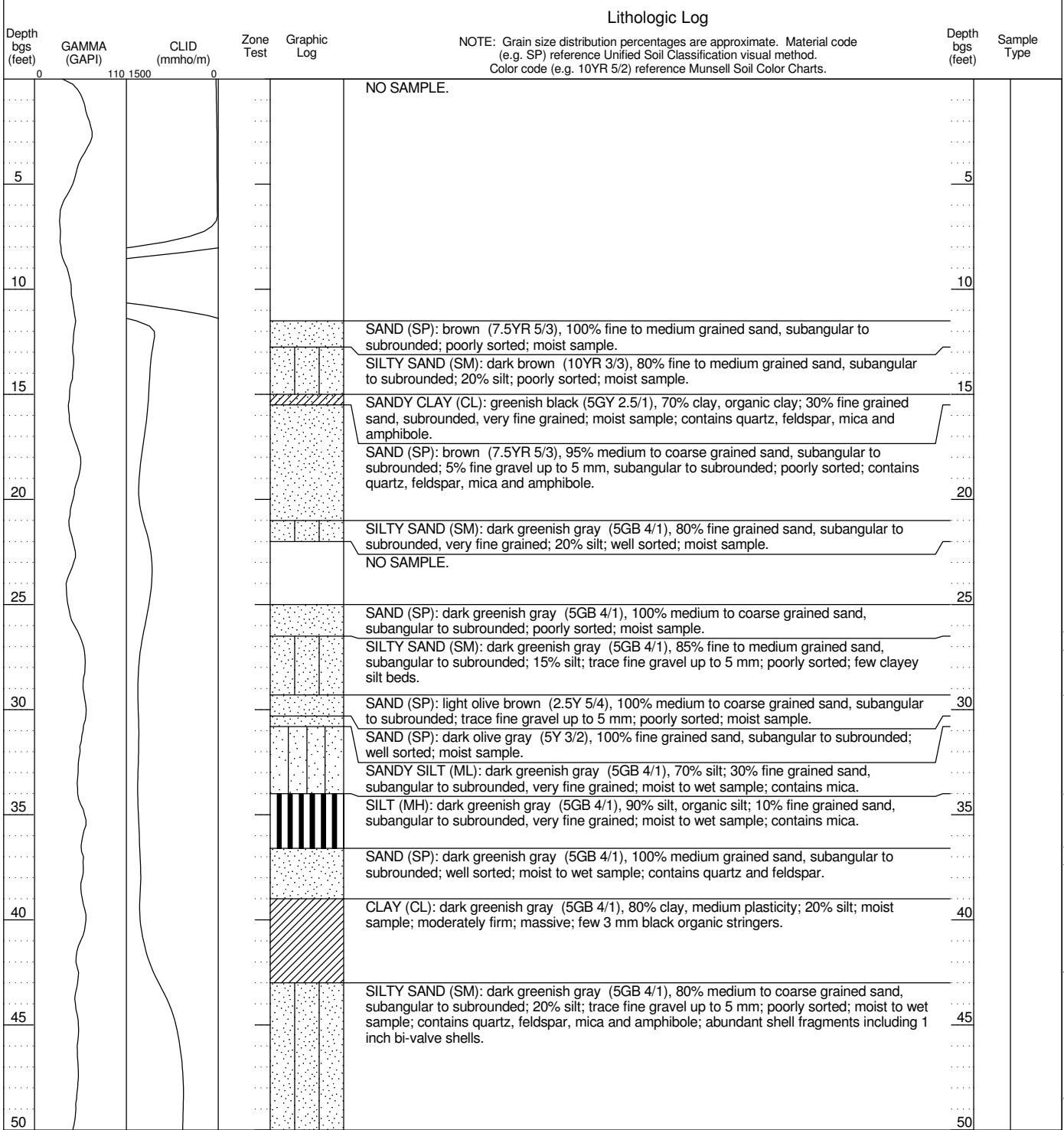
**GEOSCIENCE**

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 Claremont, CA 91711  
 Telephone: (909) 451-6650  
 Fax: (909) 451-6638  
[www.gssiwater.com](http://www.gssiwater.com)

BOREHOLE NAME PR-1
-----------------------

**BOREHOLE LITHOLOGIC LOG**

CLIENT PROJECT NUMBER		California American Water 13017-13		LOCATION <b>Castroville, CA</b>			
REPORT DATE		7/8/2014		<b>Potrero Rd</b> 36° 47' 25.9368", -121° 47' 30.7248" Geographic NAD83			
DRILLING CONTRACTOR DRILLER		Cascade Drilling Jose Munguia		LOGGED BY <b>B. Villalobos</b>			
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	9/21/13	BOREHOLE DIAMETER	
SURFACE ELEVATION	9.0 ft	TOTAL DEPTH	201.5 ft bgs	FINISH DATE	9/25/13	CORE SIZE	



SS: Spillspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

**GEOSCIENCE**

P.O. Box 220  
 Claremont, CA 91711  
 Telephone: (909) 451-6650  
 Fax: (909) 451-6638  
[www.gssiwwater.com](http://www.gssiwwater.com)

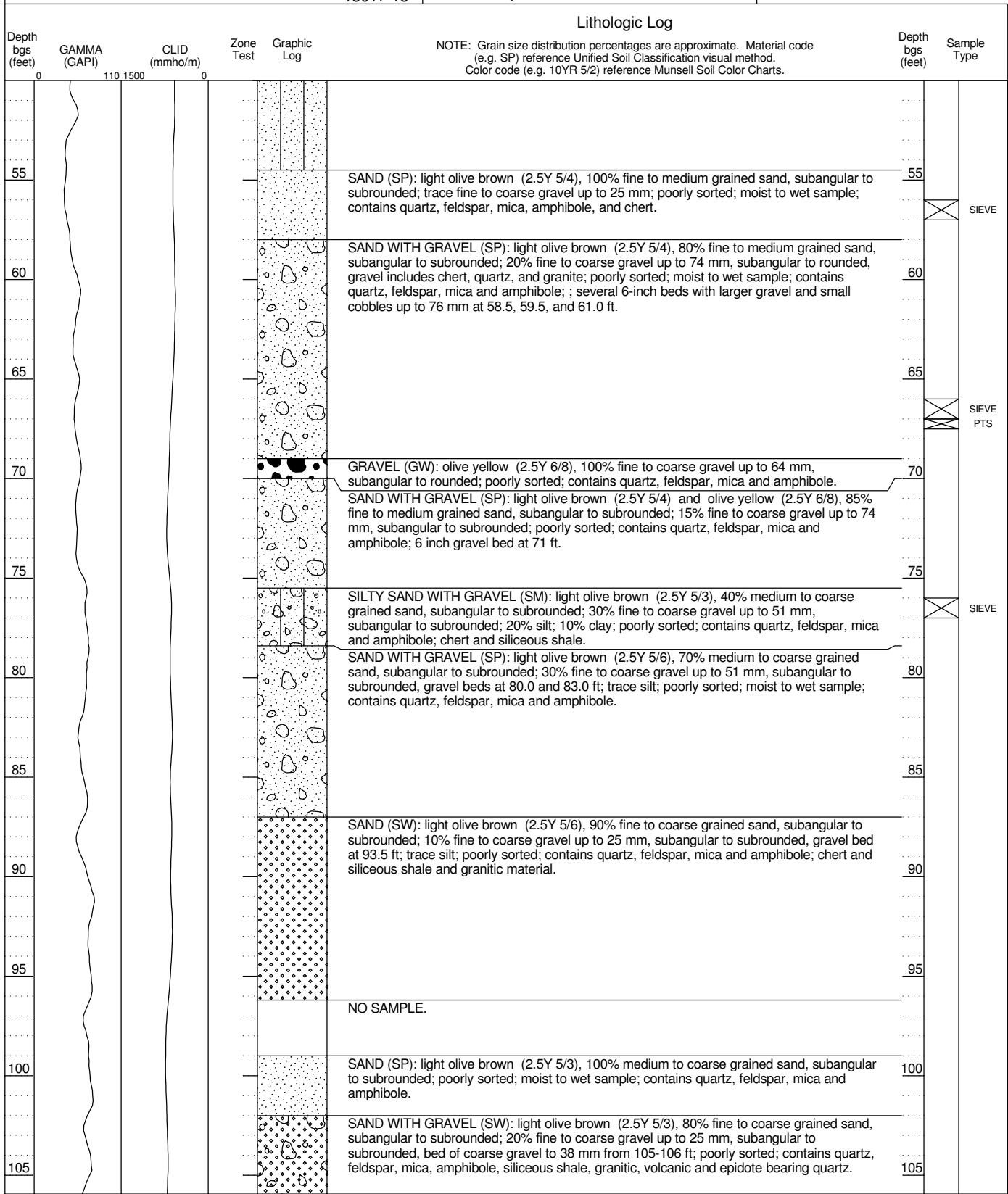
BOREHOLE NAME  
**PR-1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
 PROJECT NUMBER

California American Water  
 13017-13

LOCATION  
**Castroville, CA**



SS: Spillspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

**GEOSCIENCE**

P.O. Box 220  
 Claremont, CA 91711  
 Telephone: (909) 451-6650  
 Fax: (909) 451-6638  
[www.gssiwwater.com](http://www.gssiwwater.com)

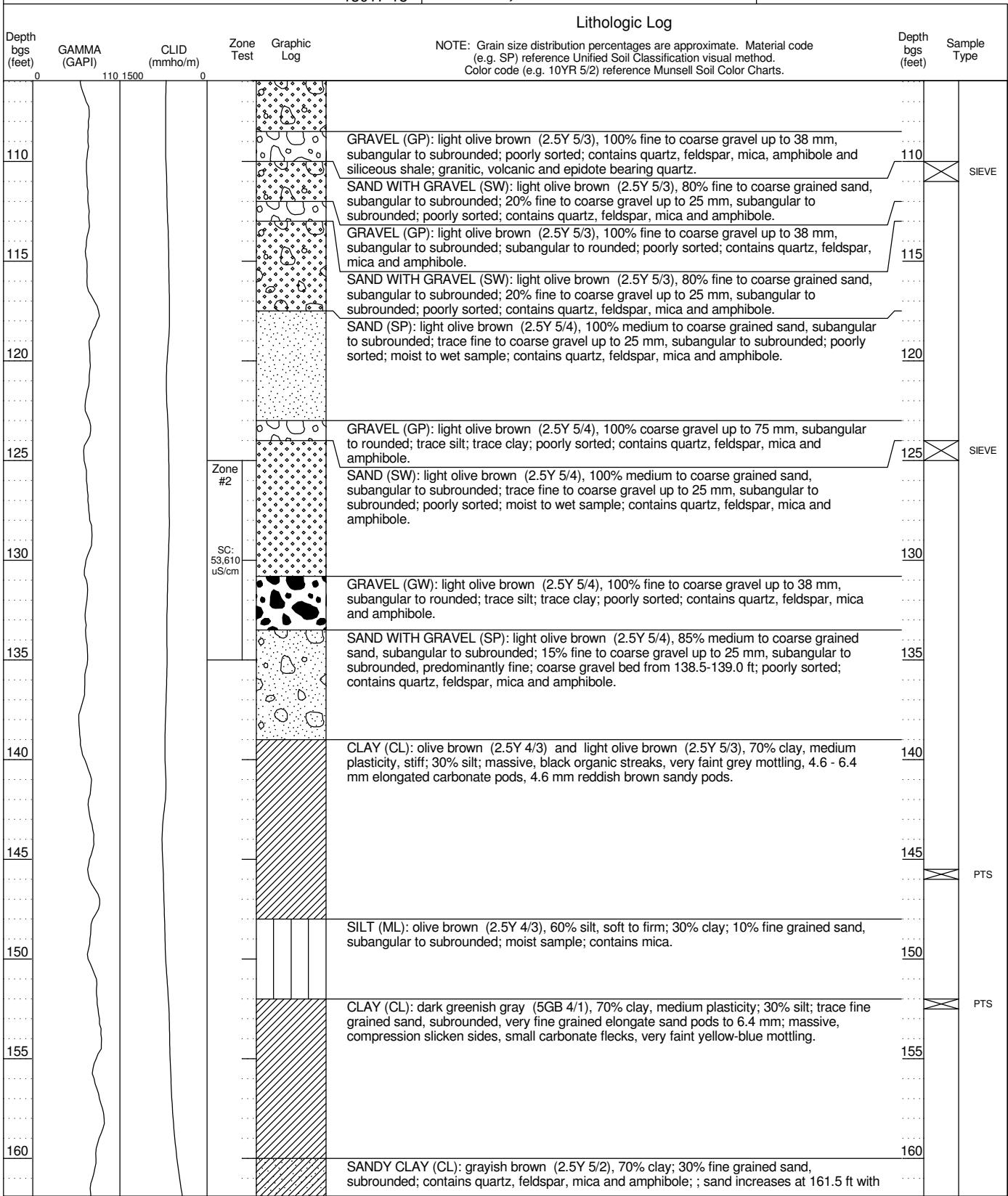
BOREHOLE NAME  
**PR-1**

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT  
 PROJECT NUMBER

California American Water  
 13017-13

LOCATION  
**Castroville, CA**



Geoscience Support Services, Inc.

SS: Splitspoon sample GRAB: Grab sample PTS: Spillspoon submitted for analysis SIEVE: Grab sieved by GSSI

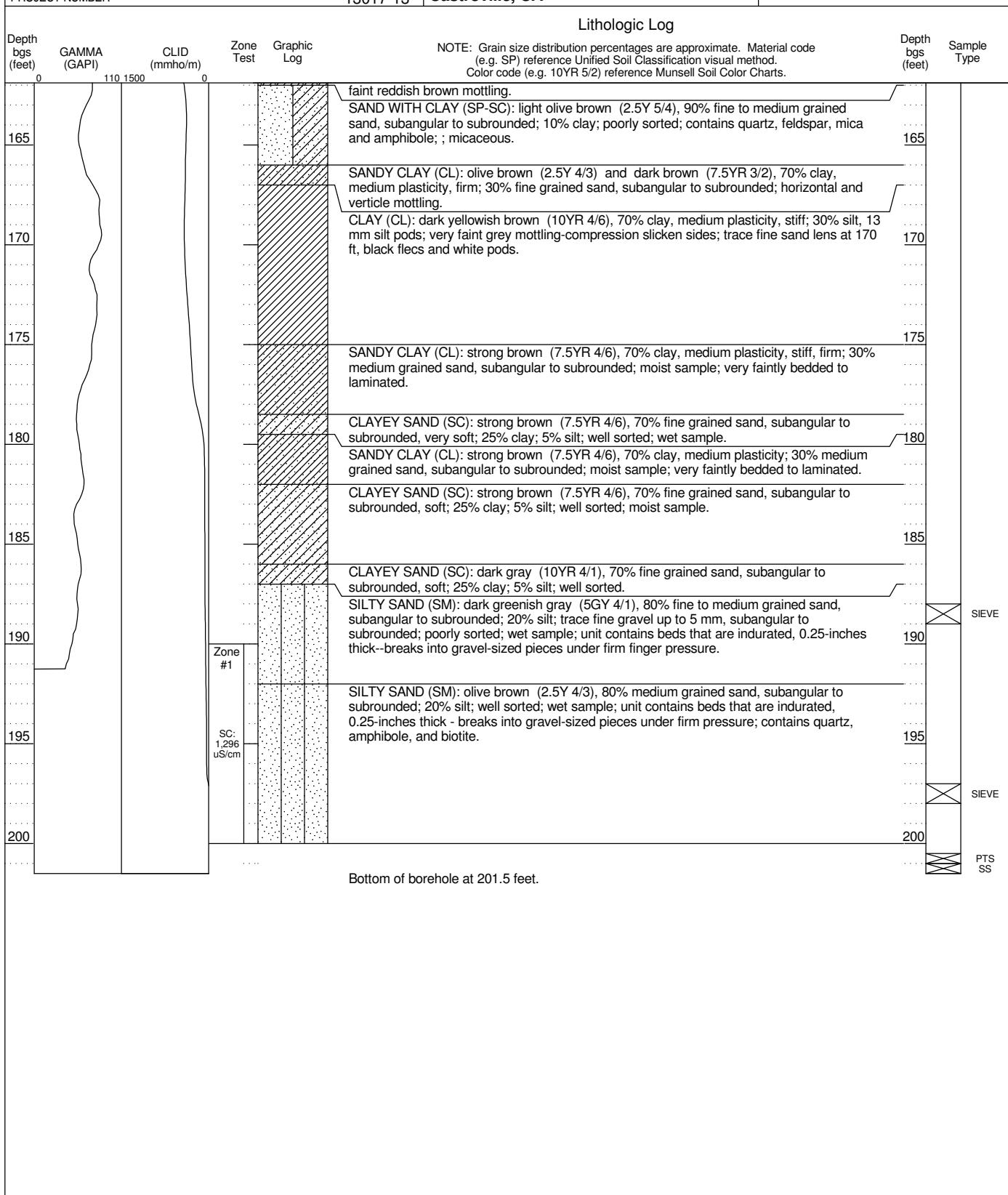
**GEOSCIENCE**

P.O. Box 220  
 Claremont, CA 91711  
 Telephone: (909) 451-6650  
 Fax: (909) 451-6638  
[www.gssiwater.com](http://www.gssiwater.com)

BOREHOLE NAME PR-1
-----------------------

**BOREHOLE LITHOLOGIC LOG (continued)**

CLIENT PROJECT NUMBER	California American Water 13017-13	LOCATION Castroville, CA
--------------------------	---------------------------------------	-----------------------------



**APPENDIX A2**  
**Well Logs Used for Cross-Sections**

***GEOSCIENCE***



**APPENDIX A2:**  
**WELL LOGS USED FOR CROSS-SECTIONS**  
**CONTENTS**

Description	Page
13S/1E-36H ( <i>Monterey Dunes Colony Well</i> ) .....	A2-1
14S/1E-24L2-5 ( <i>DMW1</i> ) .....	A2-3
14S/2E-6L1 .....	A2-4
14S/2E-17K1 .....	A2-6
14S/2E-17L1 .....	A2-7
14S/2E-18E1 .....	A2-8
14S/2E-20B3 (?) .....	A2-9
14S/2E-21E1 .....	A2-11
14S/2E-21F2 .....	A2-11
Borehole TH-1 .....	A2-14
Borehole TH-2 .....	A2-15
Borehole TH-3 .....	A2-16

ORIGINAL  
File with DWR

Page 1 of 2

Owner's Well No. #4

Date Work Began 01/24/04, Ended 03/10/04

Local Permit Agency Monterey Dunes Health Dept.

Permit No. 03-01231 Permit Date 11/18/03

## STATE OF CALIFORNIA WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. e011049

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE

LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG		WELL OWNER	
ORIENTATION (±)	X VERTICAL    HORIZONTAL    ANGLE (SPECIFY)	Name <u>Monterey Dunes Colony</u>	
DEPTH FROM SURFACE	DRILLING METHOD <u>Direct Rotary</u> FLUID <u>Bentonite</u>	Mailing Address <u>195 Monterey Dunes Way</u>	
FL. to FL.	DESCRIPTION <i>Describe material, grain size, color, etc.</i>	CITY <u>Castroville, CA 95012</u> STATE <u>CA</u> ZIP <u>95012</u>	
0	80 Fine to course sand	WELL LOCATION	
80	90 Fine to course sand w/blue clay	Address <u>195 Monterey Dunes Way</u>	
90	100 Fine to med. sand	City <u>Castroville</u>	
100	123 Fine to med. sand w/clay lenses	County <u>Monterey</u>	
123	143 Blue clay w/fine to med. sand	APN Book <u>229</u> Page <u>041</u> Parcel <u>004</u>	
143	154 Blue clay w/fine to coarse sand and gravel	Township _____ Range _____ Section _____	
154	165 Fine to course sand w/gravel and rock	Latitude <u>36° 45' N</u> Longitude <u>121° 45' W</u>	
165	187 Fine to med. sand & cobbles with clay lenses	DEG. MIN. SEC. DEG. MIN. SEC.	
187	197 Fine to med. sand	LOCATION SKETCH	
197	219 Fine to course sand	<i>Scrub</i>	
219	250 Fine to course sand & gravel	<i>Housing</i>	
250	304 Fine to course sand & cobbles	<i>Parking Lot</i>	
304	314 Fine to course sand w/clay and cobbles		
314	355 Fine to course sand w/90% clay		
355	366 Fine to course sand w/clay		
366	387 Fine to med. sand w/clay lenses		
387	408 Fine to med. sand w/50% clay		
408	418 Fine to course sand		
418	440 Fine to course sand & gravel		
440	455 Fine to course sand w/40% clay		
455	461 Fine to course sand & gravel with 50% clay		
461	485 Fine to course sand & gravel		
485	505 Fine to course sand		
505	556 Fine to course sand & gravel		
556	577 Fine to course sand w/red clay		
TOTAL DEPTH OF BORING: <u>1422</u> (Feet)			
TOTAL DEPTH OF COMPLETED WELL <u>1364</u> (Feet)			
		ACTIVITY (±) X NEW WELL	
		MODIFICATION/REPAIR — Deepen — Other (Specify)	
		DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")	
		PLANNED USES (±)	
		WATER SUPPLY — Domestic    Public — Irrigation    Industrial	
		MONITORING — TEST WELL — CATHODIC PROTECTION — HEAT EXCHANGE — DIRECT PUSH — INJECTION — VAPOR EXTRACTION — SPARGING — REMEDIATION — OTHER (SPECIFY)	
		Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.	
		WATER LEVEL & YIELD OF COMPLETED WELL	
		DEPTH TO FIRST WATER <u>N/A</u> (ft.) BELOW SURFACE	
		DEPTH OF STATIC <u>13</u> (ft.) & DATE MEASURED <u>03/04/04</u>	
		ESTIMATED YIELD <u>200</u> (GPM) & TEST TYPE <u>Pump</u>	
		TEST LENGTH <u>24</u> (Hrs.) TOTAL DRAWDOWN <u>42</u> (ft.)	
		* May not be representative of a well's long-term yield. <u>24 hour Test</u>	

DEPTH FROM SURFACE	BORE-HOLE DIA. (Inches)	CASING (S)					
		TYPE (±)	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	
FL. to FL.	BLANK SCREEN CONDUIT FIL PIPE						
0	60	X	A53B	29.260	.375		
0	321	X	A53B	19.260	.375		
+2	1221	X	A53B	8"	.322		
1221	1301	X	304ss	8"	.322		
1301	1361	X	304ss	8"	XXHD .040		
1361	1364	X	304ss	8"	.322		

DEPTH FROM SURFACE	ANNULAR MATERIAL			
	CEMENT (±)	BENTONITE (±)	FILL (±)	FILTER PACK (TYPE/SIZE)
FL. to FL.				
0	60	X		10 sack
0	321	X		10 sack
0	1220	X		Neat cem.
1220	1370		X	8x16

### ATTACHMENTS (±)

- Geologic Log
- Well Construction Diagram
- Geophysical Log(s)
- Soil/Water Chemical Analyses
- Other Site map

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Rottman Drilling Co.  
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 46471 N Division, Lancaster, CA 93535

CITY Lancaster STATE CA ZIP 93535  
SIGNED Jerry W. Rottman DATE SIGNED 03/19/04 C-57 LICENSE NUMBER 316599  
WELL DRILLER/AUTHORIZED REPRESENTATIVE

ORIGINAL  
File with DWR

Page 2 of 2

Owner's Well No. #4

Date Work Began 01/24/04, Ended 03/10/04

Local Permit Agency Monterey Dunes Health Dept.

Permit No. 03-01231 Permit Date 11/18/03

# STATE OF CALIFORNIA WELL COMPLETION REPORT

*Refer to Instruction Pamphlet*

No. e011049

DWR USE ONLY - DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE

LONGITUDE

APN/TRS/OTHER

## GEOLOGIC LOC

## WELL OWNER

ORIENTATION (✓)	X VERTICAL	HORIZONTAL	ANGLE	(SPECIFY)
DEPTH FROM SURFACE	DRILLING METHOD	Direct Rotary	FLUID	Peritonite
DESCRIPTION <i>Describe material, grain size, color, etc.</i>				
577	610	Fine to course sand, rock & clay		
610	620	Fine to course sand		
620	630	Fine to course sand & gravel		
630	650	Fine to course sand & gravel with clay lenses		
650	661	Fine to med. sand with clay		
661	681	Fine sand with clay		
681	693	Fine sand & gravel w/clay lenses		
693	725	80% Silty clay w/20% hard sand		
725	737	90% Hard silty clay & sand lenses		
737	767	90% Hard silty clay w/sand rock lenses		
767	791	95% Hard packed clay - cemented		
791	820	Brown silty clay (hard packed)		
820	882	Grayish brown clay w/blue stricks		
882	945	Clay with rock		
945	1011	Clay w/fine sand & silt		
1011	1105	20% Clay w/fine to med. sand		
1105	1170	Fine sand and silt		
1170	1190	Clay w/fine sand, silt & rock		
1190	1230	Fine sand, silt & rock		
1230	1270	Clay with fine sand		
1270	1290	Silt & clay		
1290	1365	Fine sand		
1365	1391	Clay w/fine sand lenses		
1391	1422	Fine sand		

Name Monterey Dunes Colony  
Mailing Address 195 Monterey Dunes Way  
City Castroville, CA 95012

STATE ZIP

WELL LOCATION  
Address 195 Monterey Dunes Way  
City Castroville  
County Monterey  
APN Book 229 Page 041 Parcel 004  
Township \_\_\_\_\_ Range \_\_\_\_\_ Section \_\_\_\_\_  
Latitude \_\_\_\_\_ NORTH Longitude \_\_\_\_\_ WEST

DEG. MIN. SEC. DEG. MIN. SEC.

## LOCATION SKETCH

NORTH

ACTIVITY (✓)  
 NEW WELL

MODIFICATION/REPAIR  
 Deepen  
 Other (Specify)

DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY  
 Domestic  Public  
 Irrigation  Industrial

MONITORING  
 TEST WELL

CATHODIC PROTECTION  
 HEAT EXCHANGE

DIRECT PUSH  
 INJECTION

VAPOR EXTRACTION  
 SPARGING

REMEDIATION  
 OTHER (Specify)

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

## WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 12 (ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 13 (ft.) & DATE MEASURED 03/02/04

ESTIMATED YIELD 500 (GPM) & TEST TYPE Pump

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN 102 (ft.)

\* May not be representative of a well's long-term yield. (Step Test)

TOTAL DEPTH OF BORING: 1422 (Feet)  
TOTAL DEPTH OF COMPLETED WELL 1364 (Feet)

DEPTH FROM SURFACE	BORE-HOLE DIA. (Inches)	CASING (S)				
		TYPE (✓)	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
ft. to ft.	BLANK	SCREEN CONDUCTOR	PIPE			
0	60	X	A53B	29.260	.375	
0	321	X	A53B	19.260	.375	
+2	1221	X	A53B	8"	.322	
1221	1301	X	304ss	8"	.322	
1301	1361	X	304ss	8"	XXHD	.040
1361	1364	X	304ss	8"	.322	

## ATTACHMENTS (✓)

- Geologic Log
- Well Construction Diagram
- Geophysical Log(s)
- Soil/Water Chemical Analyses
- Other

ATTACH ADDITIONAL INFORMATION, IF EXISTS.

DEPTH FROM SURFACE	ANNULAR MATERIAL				
	TYPE	CEMENT	BENTONITE	FILL	FILTER PACK (TYPE/SIZE)
ft. to ft.	(✓)	(✓)	(✓)		
0 : 60	X				10 sack
0 : 321	X				10 sack
0 : 1220	X				Neat cem.
1220 : 1370	X				8x16

## CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

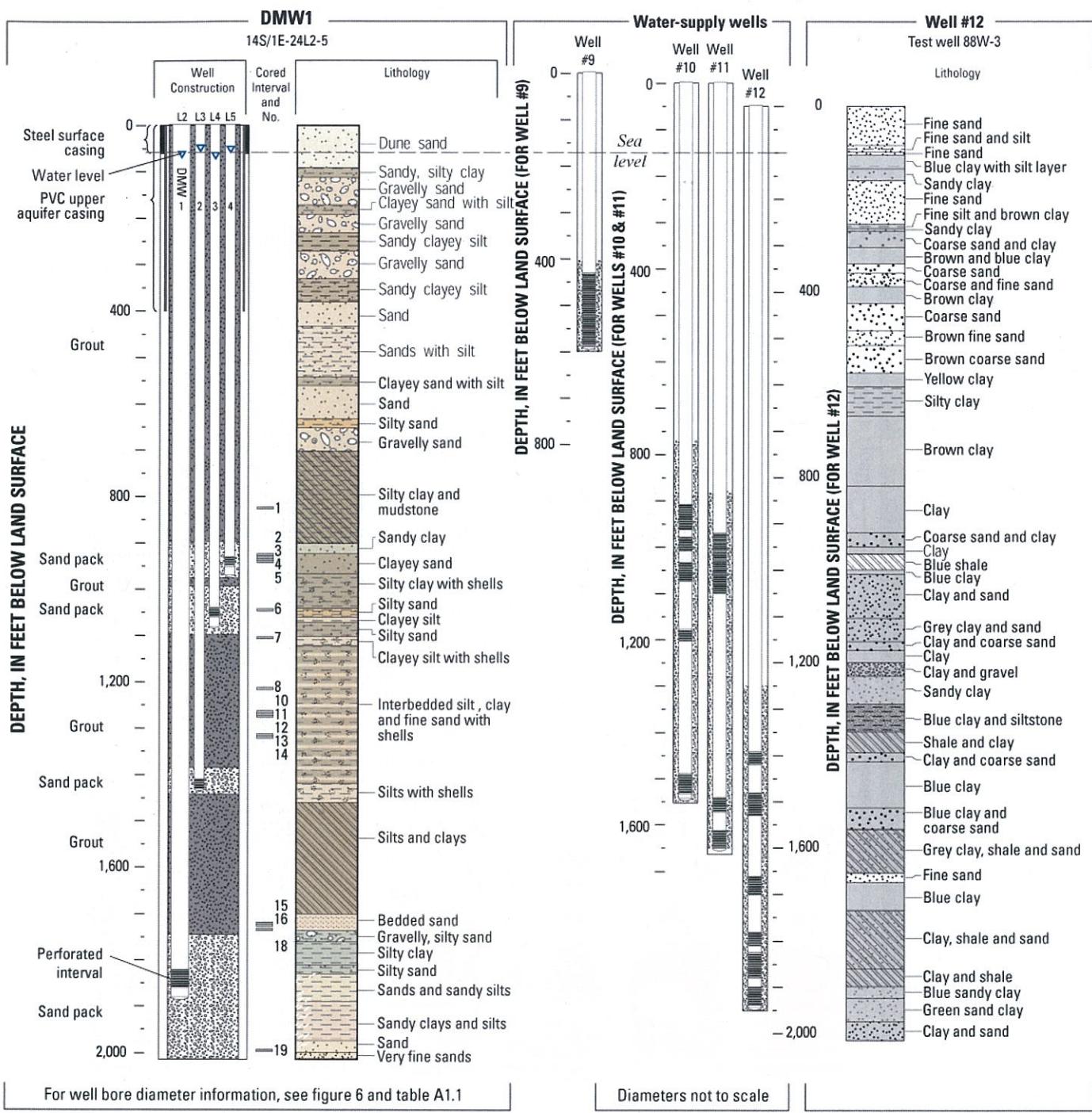
NAME Rottman Drilling Co.  
(PERSON, FIRM OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 46471 N Division, Lancaster, CA 93535

SIGNED

*Jerry Rottman P.D.*  
WELL DRILLER/AUTHORIZED REPRESENTATIVE

CITY Castroville STATE CA ZIP 95012  
DATE SIGNED 03/19/04 C-57 LICENSE NUMBER 316599



**Figure 3.** Well construction and lithology for the deep-aquifer monitoring well and selected nearby water-supply wells, Marina, California.

*Minis Haugen*  
*Glenn Taylor*

STATE OF CALIFORNIA  
THE RESOURCES AGENCY  
DEPARTMENT OF WATER RESOURCES  
WATER WELL DRILLERS REPORT

PPLICATE  
Main copy

Do Not Fill In

NO. 141763

State Well No. 195ZE-6L1

Other Well No. \_\_\_\_\_

(1) OWNER:

Name Monterey County Flood Control Dist.  
Address County Courthouse  
Salinas, Ca. 93901

(2) LOCATION OF WELL:

City Monterey Owner's number, if any  
County, Range, and Section Mulligan Hill  
Distance from cities, roads, railroads, etc. See attached map

(3) TYPE OF WORK (check):

Drill Well  Deepening  Reconditioning  Destroying   
destruction, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic  Industrial  Municipal   
Irrigation  Test Well  Other

(5) EQUIPMENT:

Rotary   
Cable   
Other

(6) CASING INSTALLED:

STEEL OTHER  
SINGLE  DOUBLE  -

If gravel packed

From ft.	To ft.	Gage or Wall	Diameter of Bore	From ft.	To ft.
600'	16	3/8	28-1/2	0	600
600	603	16-2	reducer	26	600
603	1563	12"	3"	26	603

Size of bore in well tank: 3 1/2

Describe joints: Weld

(7) PERFORATIONS OR SCREEN:

Type of perforations or name of screen: *Group*

From ft.	To ft.	Dia. per row	Row per ft.	Size in. x in.
880	1540	3/32 Horz.		
		Louvre Full		
		Flo		

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes  No  To what depth 800 ft

Were any walls sealed against pollution? Yes  No  If yes, how deep of strata

From ft. to ft.

From ft. to ft.

Method of sealing: Concrete and 30" steel conductor

(9) WATER LEVELS:

100

Depth at which water was first found, if known ft.

Standing level before perforating, if known ft.

Water level after perforating and developing ft.

WELL TESTS:

Was pump test made? Yes  No  If yes, by whom?

Gal./min. with ft. drawdown after hrs.

Temperature of water °F

Was a chemical analysis made? Yes  No

Was electric log made of well? Yes  No  If yes, attach copy

(11) WELL LOG:

Total depth 1809 ft. Depth of completed well 1560 ft.

Formation: Describe by color, character, size of material, and structure

0 ft. 6 Top Soil

6' - 15' Blue sandy clay

15' - 32' Fine blue sand

32' - 60' Blue clay w/ sea shell

60' - 75' Blue soft sand

75' - 100' Blue clay

100' - 184' Blue clay & sand streak

184' - 278' Coarse sand & gravel

278' - 300' Yellow Clay

300' - 330' Blue clay

330' - 360' Coarse yellow sand, streak

of clay

360' - 434' Yellow clay, streaks blue & brown shale

434' - 440' Yellow clay, streaks blue & brown shale

440' - 490' White coarse sand

490' - 528' Blue clay

528' - 590' Sand & gravel, streak clay

590' - 610' Yellow Clay

610' - 621' Sand & gravel

621' - 715' Yellow clay w/streak of sand

715' - 747' Yellow clay w/streak gravel

747' - 778' Yellow clay w/streak gravel

778' - 795' yellow clay w/streak gravel

blue clay

795' - 840' Yellow clay w/streak gravel

blue clay

840' - 872' Blue clay

872' - 903' Blue clay

903' - 934' Brown clay

934' - 965' Hard brown clay & shale

965' - 997' Hard brown clay & shale

997' - 1028' Hard brown clay & shale

1028' - 1059' Blue clay

1059' - 1090' Blue & brown clay

Work started 9/20 '76 Completed 11/12 '76

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Salinas Pump Co.

(Person, firm or corporation) (Type or printed)

Address 1128 Madison Lane

Salinas, Ca. 93901

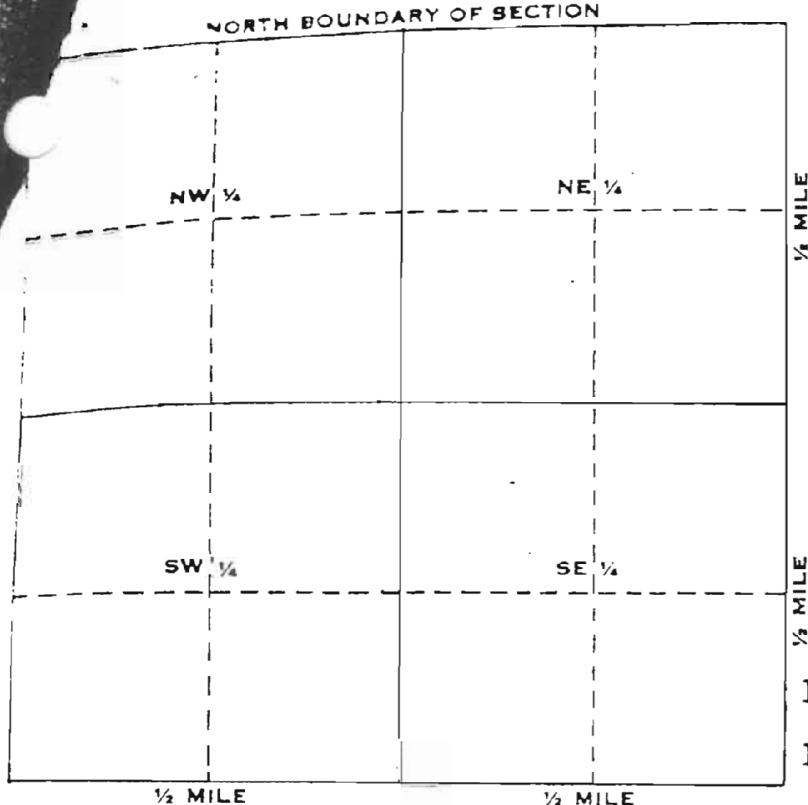
[SIGNED] *Glenn Taylor* (Well Driller)
 REF ID: PE

License No. 273053 Dated \_\_\_\_\_

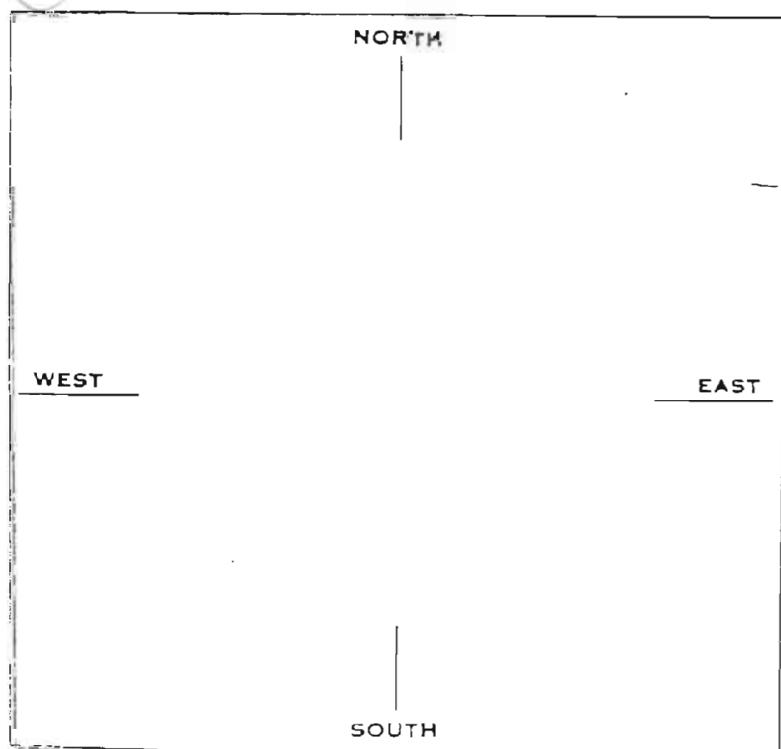
SKETCH LOCATION OF WELL ON REVERSE SIDE

OVER  
CONTINUED ON BACK

14S/ZE-6L1



A. Location of well in sectionized areas.  
Sketch roads, railroads, streams, or other features as necessary.



B. Location of well in areas not sectionized.  
Sketch roads, railroads, streams, or other features as necessary.  
Indicate distances.

Township 14 N/S  
Range 2 E/W  
Section No. C L 1

1090'	-	1122'	Blue & brown shaley clay
1122'	-	1153'	Blue & brown shaley clay
1153'	-	1184'	Blue shaley clay with streak hard sandstone
1184'	-	1247'	Blue shale streak sand
1247'	-	1300'	Blue clay, streak sand
1300'	-	1340'	Blue clay streak sand
1340'	-	1372'	blue clay & shale
1372'	-	1403'	Blue clay, strk gravel & sand
1403'	-	1435'	Strk gravel & sand
1435'	-	1466'	Strk gravel & sand
1466'	-	1498'	Strk gravel & sand
1498'	-	1529'	Strk gravel & sand
1529'	-	1561'	Strk gravel & sand
1561'	-	1592'	Strk gravel & sand
1592'	-	1600'	Strk gravel & sand
1600'	-	1630'	XX Blue clay
1630'	-	1645'	Blue clay & sand
1645'	-	1660'	Brown clay & Blue clay
1660'	-	1675'	Shale, blue clay
1675'	-	1690'	Shale, blue clay
1690'	-	1705'	Brown clay, blue clay
1705'	-	1720'	Brown clay, sand streak
1720'	-	1735'	Blue clay
1735'	-	1750'	Blue clay
1750'	-	1809'	Blue shale



5-17-74

# ROY V. ALSOP & SON

SINCE 1973

Well Drilling

FAIRBANKS-MORSE PUMPS AND PRESSURE SYSTEMS POMONA  
INDUSTRIAL PUMPS  
SALES AND SERVICE  
SALINAS, CALIFORNIA 93901

Dia. 14" #10 ga.

## LOG OF WELL

for

Monterey Peninsula Garbage & Refuse Disposal District

June 3, 1972

0 ft.	to	108 ft.	Sand
108	"	132	Blue clay
132	"	144	Yellow sandy sediment
144	"	148	Blue clay
148	"	162	Sandy yellow sediment
162	"	176	Fine packed sand
176	"	188	Yellow clay
188	"	200	Sand & fine gravel
200	"	206	Fine silty sand
206	"	214	Fine sand & float rock
214	"	226	Blue clay
226	"	236	Yellow clay
-146 > 236	"	240	Fine gravel
240	"	303	Sand & gravel
303	"	305	Yellow clay
305	"	320	Mucky sand
320	"	351	Sand & gravel
351	"	354	Soft sand stone

Perforations: 244 ft. to 303 ft.  
328 " 338.

Concrete Plug - 6 ft.

Static Water Level - 139 $\frac{1}{2}$  ft.

= = = gallons per minute =  
= H~~O~~ =

Pump 1090 gal per minute

Ground elev. approx 90 feet

STATE OF CALIFORNIA  
THE RESOURCES AGENCY

Do Not Fill In

ORIGINAL

File with DWR

## WATER WELL DRILLERS REPORT

Nº 121665

State Well No. 145/2E-18E1

Other Well No. \_\_\_\_\_

(1) OWNER: Armstrong Ranch  
 Name c/o M. L. Dubach, Inc.  
 Address PO Box P, DAVIS, Ca. 95516

## (11) WELL LOG:

Total depth ft. Depth of completed well 870 ft.

Formation: Describe by color, character, size of material, and structure

0 ft. to 75 fine sand ft.

75 to 100' coarse gravel

100 125 gravel-streaks clay

125 150 clay rock

150 175 coarse gravel

175 200 fine sand streak clay

200 225 fine sand streak clay

225 250 fine sand streak clay

250 275 gravel

275 300 fine sand - streak clay

300 325 white sand

325 350 sand-clay streaks

350 375 sand

375 400 fine sand

400 425 sand gravel

425 450 sand gravel

450 475 sand streaks clay

475 500 coarse gravel-clay

500 525 sand clay

525 550 sand clay

550 575 sandy clay

575 600 fine sand clay

600 625 sand

625 650 Red clay gravel

650 675 yellow clay

675 700 yellow clay

700 725 fine gravel

725 750 coarse gravel

750 775 coarse gravel

775 800 fine gravel

800 825 coarse gravel

825 850 coarse gravel

850 875 yellow clay

875 900 yellow clay

900 925 yellow clay

925 950 yellow clay

950 975 yellow clay

975 1000 yellow clay

1000 1025 yellow clay

1025 1050 yellow clay

1050 1075 yellow clay

1075 1100 yellow clay

1100 1125 yellow clay

1125 1150 yellow clay

1150 1175 yellow clay

1175 1200 yellow clay

1200 1225 yellow clay

1225 1250 yellow clay

1250 1275 yellow clay

1275 1300 yellow clay

1300 1325 yellow clay

1325 1350 yellow clay

1350 1375 yellow clay

1375 1400 yellow clay

1400 1425 yellow clay

1425 1450 yellow clay

1450 1475 yellow clay

1475 1500 yellow clay

1500 1525 yellow clay

1525 1550 yellow clay

1550 1575 yellow clay

1575 1590 yellow clay

1590 1600 yellow clay

1600 1610 yellow clay

1610 1620 yellow clay

1620 1630 yellow clay

1630 1640 yellow clay

1640 1650 yellow clay

1650 1660 yellow clay

1660 1670 yellow clay

1670 1680 yellow clay

1680 1690 yellow clay

1690 1700 yellow clay

1700 1710 yellow clay

1710 1720 yellow clay

1720 1730 yellow clay

1730 1740 yellow clay

1740 1750 yellow clay

1750 1760 yellow clay

1760 1770 yellow clay

1770 1780 yellow clay

1780 1790 yellow clay

1790 1800 yellow clay

1800 1810 yellow clay

1810 1820 yellow clay

1820 1830 yellow clay

1830 1840 yellow clay

1840 1850 yellow clay

1850 1860 yellow clay

1860 1870 yellow clay

1870 1880 yellow clay

1880 1890 yellow clay

1890 1900 yellow clay

1900 1910 yellow clay

1910 1920 yellow clay

1920 1930 yellow clay

1930 1940 yellow clay

1940 1950 yellow clay

1950 1960 yellow clay

1960 1970 yellow clay

1970 1980 yellow clay

1980 1990 yellow clay

1990 2000 yellow clay

2000 2010 yellow clay

2010 2020 yellow clay

2020 2030 yellow clay

2030 2040 yellow clay

2040 2050 yellow clay

2050 2060 yellow clay

2060 2070 yellow clay

2070 2080 yellow clay

2080 2090 yellow clay

2090 2100 yellow clay

2100 2110 yellow clay

2110 2120 yellow clay

2120 2130 yellow clay

2130 2140 yellow clay

2140 2150 yellow clay

2150 2160 yellow clay

2160 2170 yellow clay

2170 2180 yellow clay

2180 2190 yellow clay

2190 2200 yellow clay

2200 2210 yellow clay

2210 2220 yellow clay

2220 2230 yellow clay

2230 2240 yellow clay

2240 2250 yellow clay

2250 2260 yellow clay

2260 2270 yellow clay

2270 2280 yellow clay

2280 2290 yellow clay

2290 2300 yellow clay

2300 2310 yellow clay

2310 2320 yellow clay

2320 2330 yellow clay

2330 2340 yellow clay

2340 2350 yellow clay

2350 2360 yellow clay

2360 2370 yellow clay

2370 2380 yellow clay

2380 2390 yellow clay

2390 2400 yellow clay

2400 2410 yellow clay

2410 2420 yellow clay

2420 2430 yellow clay

2430 2440 yellow clay

2440 2450 yellow clay

2450 2460 yellow clay

2460 2470 yellow clay

2470 2480 yellow clay

2480 2490 yellow clay

2490 2500 yellow clay

2500 2510 yellow clay

2510 2520 yellow clay

2520 2530 yellow clay

2530 2540 yellow clay

2540 2550 yellow clay

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2680 2690 yellow clay

2690 2700 yellow clay

2700 2710 yellow clay

2710 2720 yellow clay

2720 2730 yellow clay

2730 2740 yellow clay

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2760 2770 yellow clay

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2780 2790 yellow clay

2790 2800 yellow clay

2800 2810 yellow clay

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2890 2900 yellow clay

2900 2910 yellow clay

2910 2920 yellow clay

2920 2930 yellow clay

2930 2940 yellow clay

2940 2950 yellow clay

2950 2960 yellow clay

2960 2970 yellow clay

2970 2980 yellow clay

2980 2990 yellow clay

2990 3000 yellow clay

3000 3010 yellow clay

3010 3020 yellow clay

3020 3030 yellow clay

3030 3040 yellow clay

3040 3050 yellow clay

3050 3060 yellow clay

3060 3070 yellow clay

3070 3080 yellow clay

3080 3090 yellow clay

3090 3100 yellow clay

3100 3110 yellow clay

3110 3120 yellow clay

3120 3130 yellow clay

3130 3140 yellow clay

3140 3150 yellow clay

3150 3160 yellow clay

3160 3170 yellow clay

3170 3180 yellow clay

3180 3190 yellow clay

3190 3200 yellow clay

3200 3210 yellow clay

3210 3220 yellow clay

3220 3230 yellow clay

3230 3240 yellow clay

3240 3250 yellow clay

3250 3260 yellow clay

3260 3270 yellow clay

3270 3280 yellow clay

3280 3290 yellow clay

3290 3300 yellow clay

3300 3310 yellow clay

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3340 3350 yellow clay

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3360 3370 yellow clay

3370 3380 yellow clay

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3570 3580 yellow clay

3580 3590 yellow clay

3590 3600 yellow clay

3600 3610 yellow clay

3610 3620 yellow clay

3620 3630 yellow clay

3630 3640 yellow clay

3640 3650 yellow clay

3650 3660 yellow clay

3660 3670 yellow clay

3670 3680 yellow clay

3680 3690 yellow clay

## TRIPPLICATE

Owner's Copy

Page 1 of 2Owner's Well No. 701471Date Work Began 06/18/97, Ended 06/26/97STATE OF CALIFORNIA  
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No.

**419777**

DWR USE ONLY - DO NOT FILL IN

		STATE WELL NO./STATION NO.	
		LATITUDE	LONGITUDE
		APN/TRS/OTHER	

Local Permit Agency MONTEREY COUNTY DEPARTMENT OF HEALTH  
Permit No. WSEL 97-067 Permit Date 04/07/97

## GEOLOGIC LOG

ORIENTATION (✓)		VERTICAL	HORIZONTAL	ANGLE	(SPECIFY)
DEPTH FROM SURFACE		DEPTH TO FIRST WATER (Ft.) BELOW SURFACE			
Ft. to Ft.		DESCRIPTION			
Describe material, grain size, color, etc.					
4	31	TOP SOIL			
5	60	CLEAN HOLE			
60	90	SAND			
90	100	SANDY CLAY AND CLAY			
100	120	BLUE CLAY AND SANDY CLAY			
120	155	CLAY			
155	160	SANDY CLAY AND SAND			
160	180	SAND AND GRAVEL			
180	200	SAND			
200	220	CLAY			
220	230	CLAY AND SAND			
230	240	SAND AND GRAVEL			
240	245	SAND			
245	255	CLAY			
255	260	SAND			
260	280	SAND AND LITTLE CLAY			
280	345	SAND AND GRAVEL			
345	360	CLAY			
360	380	CLAY AND SAND			
380	400	BROWN AND BLUE CLAY			
400	480	CLAY			
480	520	CLAY AND SANDY CLAY			
520	540	CLAY AND GRAVEL			
540	560	CLAY AND SAND			
560	562	SAND			
562	600	SANDY CLAY			
600	640	CLAY AND FINE SANDY CLAY			
640	655	CLAY			
655	660	SAND			
TOTAL DEPTH OF BORING		840	(Feet)		
TOTAL DEPTH OF COMPLETED WELL		825	(Feet)		

WELL OWNER			
Name <u>MAGGIORA</u>	5 HARRIS COURT		
Mailing Address <u>MONTEREY, CA 93940</u>			
CITY	WELL LOCATION		
Address <u>14311 DEL MONTE AVE.</u>	STATE <u>CA</u>		
City <u>MONTEREY</u>	ZIP <u>93940</u>		
County <u>MONTEREY</u>			
APN Book <u>175</u>	Page <u>011</u>		
Township <u></u>	Parcel <u>041</u>		
Latitude <u></u>	Range <u></u>		
Longitude <u></u>	Section <u></u>		
DEG. <u></u>	MIN. <u></u>	SEC. <u></u>	WES
LOCATION SKETCH			
ACTIVITY (✓) -			
<input checked="" type="checkbox"/> NEW WELL <input type="checkbox"/> MODIFICATION/REPAIR <input type="checkbox"/> Deepen <input type="checkbox"/> Other (Specify)			
DESTROY (Describe Procedures and Material Under "GEOLOGIC LOG")			
PLANNED USE(S) (✓)			
<input type="checkbox"/> MONITORING <input type="checkbox"/> WATER SUPPLY <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="checkbox"/> "TEST WELL" <input type="checkbox"/> CATHODIC PROTECTION <input type="checkbox"/> OTHER (Specify)			
Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.			
WEST	SOUTH		
EAST			
DRILLING METHOD <u>PEVERSE ROTARY</u> FLUID <u>WATER</u>			
WATER LEVEL & YIELD OF COMPLETED WELL			
DEPTH OF STATIC WATER LEVEL	162.25 (Ft.)	& DATE MEASURED	08/18/97
ESTIMATED YIELD*	250 (GPM)	& TEST TYPE	PUMP
TEST LENGTH	(Hrs.) <sup>5</sup>	TOTAL DRAWDOWN	19.33 (Ft.)

\* May not be representative of a well's long-term yield.

DEPTH FROM SURFACE	BORE-HOLE DIA. (Inches)	CASING(S)					DEPTH FROM SURFACE	ANNUULAR MATERIAL					
		TYPE (✓)	BLANK	SCREEN	CONDUCTOR	FILL PIPE		MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	CEMENT (✓)	TYPE
0	50	32	X				0	STEEL	.250	STAINLESS	.040		
0	670	22	X				0	STEEL	.250	STAINLESS			
670	730	22	X				670	STEEL	.250	STAINLESS	.040		
730	785	22	X				730	STEEL	.250	STAINLESS			
785	805	22	X				785	STEEL	.250	STAINLESS	.040		
805	825	22	X				805	STEEL	.250	STAINLESS			

## ATTACHMENTS (✓)

- Geologic Log
- Well Construction Diagram
- Geophysical Log(s)
- Soil/Water Chemical Analyses
- Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT			
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.			
NAME <u>MAGGIORA BROS. DRILLING, INC.</u>			
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)			
595 AIRPORT BLVD. WATSONVILLE, CA 95076			
ADDRESS	CITY	STATE	ZIP
Signed	WELL DRILLER/AUTHORIZED REPRESENTATIVE	DATE SIGNED	C-57 LICENSE NUMBER



**Appendix A. Summary of Lithology Recorded on Cross-Section Well Logs**  
**Hydrogeologic Investigation of the Salinas Valley Basin in the Vicinity of Fort Ord and Marina**  
**Monterey County Water Resources Agency**

Cross-Section B-B'	Top (feet bgs)	Bottom (feet bgs)	Boring log record	GEOBASE Code
Well Names				
14S/2E-21N01	438	498	sand and gravel (pea to 1") clay at top-streaks	snd/grvl/cly
14S/2E-21N01	498	510	yellow brown clay	yellow clay
14S/2E-21N01	510	534	sand and gravel (1-3" rocks)	gravel/sand
14S/2E-21N01	534	564	sand	sand
14S/2E-21N01	564	580	sand and gravel (1-4" rocks)	gravel/sand
14S/2E-21N01	580	596	red sand	red sand
14S/2E-21N01	596	600	red sandstone	red sand
14S/2E-21E01	0	128	yellow dry sand	yellow sand
14S/2E-21E01	128	130	yellow clay w/streaks of red	yellow clay
14S/2E-21E01	130	144	blue clay - hard	blue clay
14S/2E-21E01	144	156	hard yellow clay	yellow clay
14S/2E-21E01	156	180	fine yellow clay	yellow sand
14S/2E-21E01	180	188	blue clay	blue clay
14S/2E-21E01	188	196	blue sand	blue sand
14S/2E-21E01	196	218	coarse sand w/some gravel	gravel/sand
14S/2E-21E01	218	242	brown sand - fine/some gravel	gravel/sand
14S/2E-21E01	242	272	hard yellow clay w/some sand	sandy clay
14S/2E-21E01	272	280	sand w/some rock	gravel/sand
14S/2E-21E01	280	396	sand/gravel rock (3-6")	gravel/sand
14S/2E-21E01	396	408	yellow clay	yellow clay
14S/2E-21E01	408	428	sand and some gravel	gravel/sand
14S/2E-21E01	428	442	sand and heavy gravel/rock (1-3")	gravel/sand
14S/2E-21E01	442	450	sand and heavy gravel/clay streaks	snd/grvl/cly
14S/2E-21E01	450	456	sand and gravel (1-3")	gravel/sand
14S/2E-21E01	456	460	yellow clay	yellow clay
14S/2E-21E01	460	466	sand	sand
14S/2E-21E01	466	470	yellow clay	yellow clay
14S/2E-21E01	470	484	fine sand and some gravel	gravel/sand
14S/2E-21E01	484	492	coarse sand and heavy gravel	gravel/sand
14S/2E-21E01	492	508	coarse sand and some gravel	gravel/sand
14S/2E-21E01	508	514	hard yellow clay	yellow clay
14S/2E-21E01	514	518	white sandstone w/yellow clay	sandy clay
14S/2E-21E01	518	532	fine sand	fine sand
14S/2E-21E01	532	542	coarse sand and gravel/rocks (1-4")	gravel/sand
14S/2E-21E01	542	550	sandy clay	sandy clay
14S/2E-21E01	550	562	sand and gravel w/clay streaks	gravel/sand
14S/2E-21E01	562	576	sand and heavy gravel	gravel/sand
14S/2E-21E01	576	592	fine sand	fine sand
14S/2E-21E01	592	612	sand and gravel (1-5" rock)	gravel/sand
14S/2E-21E01	612	614	red sandstone	red sand
14S/2E-21F02	0	8	top soil	topsoil
14S/2E-21F02	8	65	sediment	sediment
14S/2E-21F02	65	90	blue sandy clay	blue clay
14S/2E-21F02	90	116	yellow clay	yellow clay
14S/2E-21F02	116	130	mucky sand	sand
14S/2E-21F02	130	134	sandy yellow clay	yellow clay
14S/2E-21F02	134	140	river gravel	gravel
14S/2E-21F02	140	166	yellow clay	yellow clay
14S/2E-21F02	166	186	sand and gravel	gravel/sand
14S/2E-21F02	186	194	sand and fine gravel	gravel/sand
14S/2E-21F02	194	263	heavy gravel	gravel

**Appendix A. Summary of Lithology Recorded on Cross-Section Well Logs**  
**Hydrogeologic Investigation of the Salinas Valley Basin in the Vicinity of Fort Ord and Marina**  
**Monterey County Water Resources Agency**

Cross-Section B-B'	Top (feet bgs)	Bottom (feet bgs)	Boring log record	GEOBASE Code
Well Names				
14S/2E-21F02	263	277	red sand	red sand
14S/2E-21F02	277	280	yellow clay	yellow clay
14S/2E-21F02	280	297	gravel and yellow clay	gravelly clay
14S/2E-21F02	297	300	yellow clay	yellow clay
14S/2E-16G01	0	100	clay	clay
14S/2E-16G01	100	170	coarse sand	coarse sand
14S/2E-16G01	170	220	gravel	gravel
14S/2E-16G01	220	230	gravel/brown clay	gravelly clay
14S/2E-16G01	230	240	gravel/clay	gravelly clay
14S/2E-16G01	240	260	coarse sand/clay	sandy clay
14S/2E-16G01	260	360	clay/sand	sandy clay
14S/2E-16G01	360	370	sand/clay	sandy clay
14S/2E-16G01	370	420	coarse sand	coarse sand
14S/2E-16G01	420	440	clay/sand	sandy clay
14S/2E-16G01	440	470	coarse sand	coarse sand
14S/2E-16G01	470	490	sand/clay	sandy clay
14S/2E-16G01	490	520	sand/clay	sandy clay
14S/2E-16G01	520	540	clay	clay
14S/2E-16G01	540	570	sand	sand
14S/2E-16G01	570	610	coarse sand	coarse sand
14S/2E-16G01	610	630	sand/clay	sandy clay
14S/2E-09D04	0	150	brown clay	brown clay
14S/2E-09D04	150	180	coarse sand	coarse sand
14S/2E-09D04	180	220	coarse sand/gravel	gravel/sand
14S/2E-09D04	220	230	clay/gravel	gravelly clay
14S/2E-09D04	230	260	silt stone/clay	clay
14S/2E-09D04	260	270	clay	clay
14S/2E-09D04	270	280	coarse sand/clay	sandy clay
14S/2E-09D04	280	330	clay	clay
14S/2E-09D04	330	420	sand/clay	sandy clay
14S/2E-09D04	420	430	coarse sand/clay	sandy clay
14S/2E-09D04	430	440	coarse sand	coarse sand
14S/2E-09D04	440	460	coarse sand/clay	sandy clay
14S/2E-09D04	460	490	coars sand	coarse sand
14S/2E-09D04	490	500	coarse sand/clay	sandy clay
14S/2E-09D04	500	540	sand/clay	sandy clay
14S/2E-09D04	540	550	hard clay	clay
14S/2E-09D04	550	570	hard clay/sand	sandy clay
14S/2E-09D04	570	580	coarse sand	coarse sand
14S/2E-09D04	580	610	coarse sand/clay	sandy clay
14S/2E-09D04	610	630	clay/sand	sandy clay

**Notes:**

\* a partial boring log description is provided for this well

ORIGINAL  
File Original, Duplicate and Triplicate with the  
REGIONAL WATER POLLUTION  
CONTROL BOARD No. 3  
(Insert appropriate number)

WATER WELL DRILLERS REPORT  
(Sections 7076, 7077, 7078, Water Code)

Do Not Fill In  
No. 751

STATE OF CALIFORNIA

State Well No. 1412-21F  
Other Well No. 1C-74

32  
12/31

OWNER:

Name Mrs. A. Warcken  
Address Pomber Street  
Castroville, California

(2) LOCATION OF WELL:

County Monterey Owner's number, if any—  
R. F. D. or Street No.

On Brescchini Ranch 2 1/2 Mi. E. SE of  
Twin Bridges & State Highway 1.  
50 ft. NE of old well # 46 on Map

(3) TYPE OF WORK (check):

New well  Deepening  Reconditioning  Abandon

If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic  Industrial  Municipal

Irrigation  Test Well  Other

(5) EQUIPMENT:

Rotary   
Cable   
Dug Well

Code (6) CASING INSTALLED:

Water Single  Double

From ft. to ft. Diam. Gage or Wall

" 0 " 300 12" 12 "

If gravel packed

Diameter of Bore ft. from ft. to ft.

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## **STAAL, GARDNER & DUNNE, INC.**

Consulting Engineers and Geologists  
5855 Olivas Park Drive • Ventura, California 93003-7672

TH-1

## DRILLING LOG

SGD

CLIENT: Monterey Peninsula Water Management District			M91157
WELL: Monterey Sand (TH-1)	No.:	GEOLOGIST: M.S. Burke, M.B. Feeley	
COUNTY: Monterey	STATE: CA	LOGGING PERSONNEL: M.S. Burke	
TOWNSHIP:	RANGE:	SECTION:	SERVICES PERFORMED: Project management, lithologic logging, hydrogeologic analysis, contractor supervision.
LOCATION: Abandoned Monterey Sand Plant, Marina, CA			DATE BEGUN: 12/10/91 DATE RELEASED: 12/10/91
ELEVATION: 10 (PER GEE)	TOTAL DEPTH: 260'		INTERVAL LOGGED: 0-260' FOOTAGE:
SPUD DATE: 12/10/91	FINAL DATE: 12/10/91		REMARKS: Drilling fluid - Supermud; E-, i Gamma logs performed; Test hole abandoned by pumping neat cement from bottom of hole.
DRILLING COMPANY: R.L. Redfearn, Bakersfield, CA			
PUSHER: Rick Redfearn, Asst'd By John O'Tool			

HOLE SIZE	
0 - 260	4-3/4"

## CASING RECORD

## ABBREVIATIONS

CO	CIRCULATE OUT	PR	POOR RETURNS
LAT	LOGGED AFTER TRIP	SC	SAND CONTENT (%)
NB	NEW BIT	VIS	VISCOSITY (SECONDS)
NCB	NEW CORE BIT	WL	WATER LOSS (CC/30 MIN)
NR	NO RETURN	WT	FLUID WEIGHT (LBS/CU.FT.)



## **STAAL, GARDNER & DUNNE, INC.**

Consulting Engineers and Geologists  
5855 Olivas Park Drive • Ventura, California 93003-7672

TH-2

## **DRILLING LOG**

CLIENT: Monterey Peninsula Water Management District			M91157
WELL: Regional Park (TH-2)	No.:	GEOLOGIST: M. S. Burke, M. B. Feeney	
COUNTY: Monterey	STATE: CA	LOGGING PERSONNEL: M. S. Burke	
TOWNSHIP:	RANGE:	SECTION:	SERVICES PERFORMED: Project management, lithologic logging, hydrogeologic consultation, contractor observation.
LOCATION: Regional Park District, Marina, CA. Edge of bluff at end of road starting at end of Dune Dr.			
ELEVATION: 19 ft (per GE)	TOTAL DEPTH: 277'		
SPUD DATE: 12/18/91	FINAL DATE: 12/18/91		
DATE BEGUN: 12/18/91 DATE RELEASED: 12/18/91			
INTERVAL LOGGED: 0 - 277' FOOTAGE: 277'			
REMARKS: Drilling fluid- Revert, E- i Gamma logs performed, test hole abandoned w/ neat cement.			
DRILLING COMPANY: Pitcher Drilling, Palo Alto, CA.			
PUSHER: Wayne Baker, Garry Foppiano/usst)			

HOLE SIZE

ABBREVIATIONS			
CO	CIRCULATE OUT	PR	POOR RETURNS
LAT	LOGGED AFTER TRIP	SC	SAND CONTENT (%)
NB	NEW BIT	VIS	VISCOSITY (SECONDS)
NCB	NEW CORE BIT	WL	WATER LOSS (CC/30 MIN)
NR	NO RETURN	WT	FLUID WEIGHT (LBS./CU.FT.)



CLAY



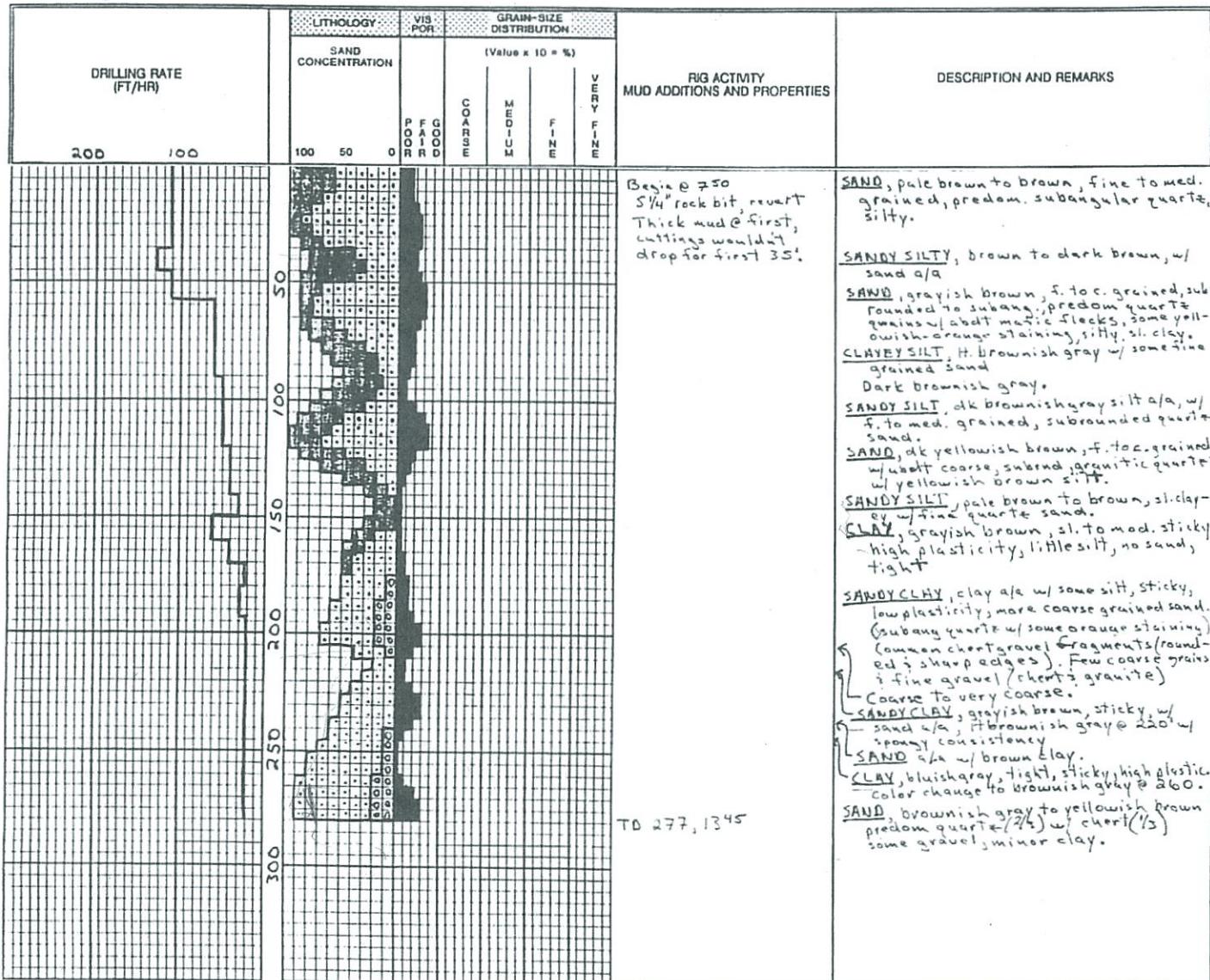
SILT



SAND



#### GRAVEL



**STAAL, GARDNER & DUNNE, INC.**

Consulting Engineers and Geologists  
5855 Olivas Park Drive • Ventura, California 93003-7672

TH-3

**SGD**

## DRILLING LOG

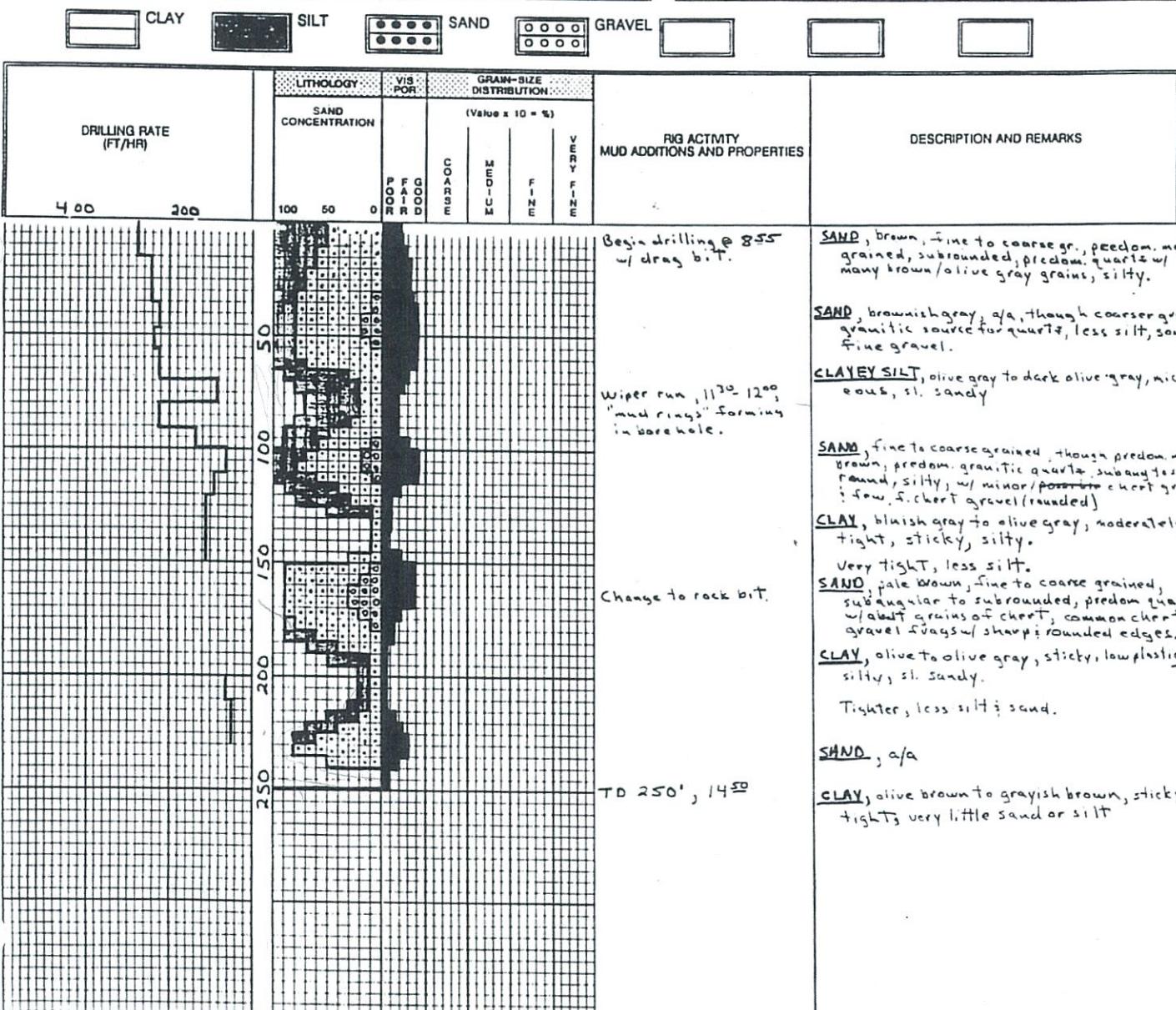
CLIENT: Monterey Peninsula Water Management District			M91157
WELL: Granite Rock Co. (TH-3)	No.:	GEOLOGIST: M. S. Burke, M. B. Feeley	
COUNTY: Monterey	STATE: CA	LOGGING PERSONNEL: M. S. Burke	
TOWNSHIP:	RANGE:	SECTION:	SERVICES PERFORMED: Project management, lithologic logging, hydrogeologic consultation, contractor supervision.
LOCATION: On the beach at the Granite Rock Co. property in Marina, CA			
ELEVATION: 7'ft (per GE)	TOTAL DEPTH: 250'		
SPUD DATE: 12/19/91	FINAL DATE: 12/19/91		
DRILLING COMPANY: Pitcher Drilling, Palo Alto, CA.			
PUSHER: Wayne Baker, ass'td by Garry Foppiano			
DATE BEGUN: 12/19/91 DATE RELEASED: 12/19/91			
INTERVAL LOGGED: 0 - 250' FOOTAGE: 250'			
REMARKS: Drilling fluid - Revert, E & Gamma logs performed. Test hole abandoned w/ neat cement.			

**HOLE SIZE**

0-250'	5 1/4"

**CASING RECORD**

ABBREVIATIONS			
CO	CIRCULATE OUT	PR	POOR RETURNS
LAT	LOGGED AFTER TRIP	SC	SAND CONTENT (%)
NB	NEW BIT	VIS	VISCOSITY (SECONDS)
NCB	NEW CORE BIT	WL	WATER LOSS (CC/30 MIN.)
NR	NO RETURN	WT	FLUID WEIGHT (LBS/CU.FT.)



**APPENDIX B**  
**Photographs of Cores and Chip Trays**  
**(See attached DVD)**

**GEOSCIENCE**  


**APPENDIX C**  
**Soil Physical Properties Data Reports**

***GEOSCIENCE***  


**APPENDIX C:**

**SOIL PHYSICAL PROPERTIES DATA REPORTS**

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<i>Soil Physical Properties Data Reports</i> .....	<i>C-3</i>
<i>Chain of Custody Records</i> .....	<i>C-10</i>



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8100 Secura Way • Santa Fe Springs, CA 90670  
Telephone (562) 347-2500 • Fax (562) 907-3610

October 14, 2013

Brian Villalobos  
Geoscience Support Services  
P.O. Box 220  
Claremont, CA 91711

Re: PTS File No: 43626  
Physical Properties Data  
MPWSP; 13017-13

Dear Mr. Villalobos:

Please find enclosed report for Physical Properties analyses conducted upon samples received from your MPWSP; 13017-13 project. All analyses were performed by applicable ASTM, EPA, or API methodologies. An electronic version of the report has previously been sent to your attention via the internet. The samples are currently in storage and will be retained for thirty days past completion of testing at no charge. Please note that the samples will be disposed of at that time. You may contact me regarding storage, disposal, or return of the samples.

PTS Laboratories appreciates the opportunity to be of service. If you have any questions or require additional information, please contact Rachel Spitz at (562) 347-2504.

Sincerely,  
PTS Laboratories, Inc.



Michael Mark Brady, P.G.  
District Manager

Encl.



---

8100 Secura Way • Santa Fe Springs, CA 90670  
Telephone (562) 347-2500 • Fax (562) 907-3610

March 5, 2014

Brian Villalobos  
Geoscience Support Services  
P.O. Box 220  
Claremont, CA 91711

Re: PTS File No: 44073  
Physical Properties Data  
MPWSP; 13017-13

Dear Mr. Villalobos:

Please find enclosed report for Physical Properties analyses conducted upon samples received from your MPWSP; 13017-13 project. All analyses were performed by applicable ASTM, EPA, or API methodologies. An electronic version of the report has previously been sent to your attention via the internet. The samples are currently in storage and will be retained for thirty days past completion of testing at no charge. Please note that the samples will be disposed of at that time. You may contact me regarding storage, disposal, or return of the samples.

PTS Laboratories Inc. appreciates the opportunity to be of service. If you have any questions or require additional information, please contact Morgan Richards at (562) 347-2509.

Sincerely,  
PTS Laboratories, Inc.

A handwritten signature in blue ink, appearing to read "Michael Mark Brady". A blue oval is drawn around the signature, and a blue line extends from the bottom right of the oval across the page.

Michael Mark Brady, P.G.  
District Manager

Encl.



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8100 Secura Way • Santa Fe Springs, CA 90670  
Telephone (562) 347-2500 • Fax (562) 907-3610

March 13, 2014

Brian Villalobos  
Geoscience Support Services  
P.O. Box 220  
Claremont, CA 91711

Re: PTS File No: 44073  
Revised Physical Properties Data Rev.01  
MPWSP; 13017-13

Dear Mr. Villalobos:

Please find enclosed revised report for Physical Properties analyses conducted upon samples received from your MPWSP; 13017-13 project. The report has been revised to correct a unit calculation error for horizontal Hydraulic Conductivity for sample ML-4 146.5-147 at 146.95. All analyses were performed by applicable ASTM, EPA, or API methodologies. An electronic version of the report has previously been sent to your attention via the internet. The samples are currently in storage and will be retained for thirty days past completion of testing at no charge. Please note that the samples will be disposed of at that time. You may contact me regarding storage, disposal, or return of the samples.

PTS Laboratories Inc. appreciates the opportunity to be of service. If you have any questions or require additional information, please contact Morgan Richards at (562) 347-2509.

Sincerely,  
PTS Laboratories, Inc.



Michael Mark Brady, P.G.  
District Manager

Encl.

Project Name: MPWSP  
 Project Number: 13017-13

PTS File No: 44073  
 Client: Geoscience Support Services

## TEST PROGRAM - 20140206

CORE ID	Depth ft.	Core Recovery ft.	Hydraulic Conductivity Pkg.	Hydraulic Conductivity API RP40/EPA 9100		Notes
		Plugs:	Vert. 1"	Horz. 1"		
Date Received: 20140204						
CX-B1 66.5-67	66.5-67	0.50	X	X		
CX-B1 166.5-167.0	166.5-167.0	0.50	X	X		
CX-B1 257.5-258	257.5-258	0.50	X			
CX-B2 207.5-208	207.5-208	0.50	X	X		
CX-B2 259-259.5	259-259.5	0.50	X			
CX-B3 107.5-108	107.5-108	0.50	X	X		
CX-B3 129-129.5	129-129.5	0.50	X			
CX-B3 177.5-178	177.5-178	0.50				
CX-B3 197.5-198	197.5-198	0.50	X	X		
ML-1 76-76.5	76-76.5	0.50	X			
ML-1 107.5-108	107.5-108	0.50	X	X		
ML-1 147-147.5	147-147.5	0.50	X			
ML-2 87-87.5	87-87.5	0.50	X			
ML-2 117.5-118	117.5-118	0.50	X	X		
ML-2 157.5-158	157.5-158	0.50	X	X		
ML-3 106.5-107	106.5-107	0.50	X	X		
ML-3 166.5-167	166.5-167	0.50	X	X		
ML-4 76.5-77	76.5-77	0.50	X	X		
ML-4 126.5-127	126.5-127	0.50	X			
ML-4 146.5-147	146.5-147	0.50	X	X		
ML-6 79.5-80	79.5-80	0.50	X			
ML-6 107.5-108	107.5-108	0.50	X	X		
ML-6 167-168.5	167-168.5	0.50	X	X		
TOTALS:	23 cores	11.50	22	14		23

Project Name: MPWSP  
Project Number: 13017-13

PTS File No: 44073  
Client: Geoscience Support Services

## TEST PROGRAM - 20140206

CORE ID	Depth ft.	Core Recovery ft.	Hydraulic Conductivity Pkg.	Hydraulic Conductivity API RP40/EPA 9100		Notes
		Plugs:	Vert. 1"	Horz. 1"		

## Laboratory Test Program Notes

Contaminant identification: NONE

Standard TAT for basic analysis is 10 business days.

**Hydraulic Conductivity Package – Saturated Zone:** Native-state permeability to water, total and air-filled porosity, grain and bulk density, moisture content, total pore fluid (water only) saturation.

PTS File No: 44073  
 Client: Geoscience Support Services  
 Report Date: 03/05/14

**PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY PACKAGE**

Project Name: MPWSP  
 Project No: 13017-13

SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	MOISTURE CONTENT, % weight	API RP 40 /		API RP 40		API RP 40		API RP 40; EPA 9100	
				METHODS: ASTM D2216		DENSITY	POROSITY, %Vb (2)	TOTAL	AIR-FILLED	TOTAL PORE FLUID SATURATIONS (3), % Pv	25 PSI CONFINING STRESS
CX-B1 66.5-67	66.6	V	22.9	1.46	2.66	45.0	11.6	74.2		273	2.76E-04
CX-B1 166.5-167.0	166.6	V	24.7	1.58	2.82	43.8	4.7	89.3		484	4.87E-04
CX-B1 257.5-258	257.5-258	V	41.1	1.11	2.61	57.7	12.2	78.8		1.75	1.75E-06
CX-B2 207.5-208	207.6	V	21.5	1.48	2.67	44.6	12.9	71.1		3820	3.76E-03
CX-B2 259-259.5	259.1	V	31.0	1.33	2.63	49.3	7.9	83.9		1.83	1.85E-06
CX-B3 107.5-108	107.6	V	20.6	1.43	2.64	45.8	16.4	64.2		5210	5.26E-03
CX-B3 129-129.5	129.1	V	35.5	1.25	2.62	52.1	7.6	85.5		2.83	2.86E-06
CX-B3 197.5-198	197.6	V	18.1	1.66	2.69	38.2	8.1	78.8		101	1.00E-04
ML-1 76-76.5	76.1	V	42.4	1.17	2.67	56.1	6.3	88.7		4.89	4.83E-06
ML-1 107.5-108	107.6	V	15.0	1.53	2.65	42.1	19.0	54.8		8540	8.52E-03
ML-1 147-147.5	147.1	V	32.4	1.31	2.66	50.8	8.4	83.4		1.97	1.98E-06
ML-2 87-87.5	87.1	V	20.5	1.50	2.66	43.4	12.7	70.8		101	1.00E-04
ML-2 117.5-118	117.6	V	24.3	1.43	2.64	45.8	11.0	76.0		47.3	4.70E-05
ML-2 157.5-158	157.6	V	19.2	1.52	2.61	41.6	12.3	70.5		110	1.10E-04
ML-3 106.5-107	106.6	V	12.9	1.53	2.64	42.0	22.3	47.0		1900	1.87E-03
ML-3 166.5-167	166.6	V	28.6	1.31	2.65	50.7	13.2	73.9		9.6	9.51E-06
ML-4 76.5-77	76.6	V	21.4	1.41	2.62	46.3	16.2	65.1		954	9.49E-04
ML-4 126.5-127	126.6	V	25.0	1.44	2.64	45.5	9.5	79.1		1.18	1.18E-06
ML-4 146.5-147	146.6	V	14.1	1.45	2.61	44.3	23.8	46.3		6180	6.10E-03
ML-6 79.5-80	79.6	V	32.2	1.33	2.64	49.7	6.9	86.0		2.43	2.43E-06
ML-6 107.5-108	107.6	V	15.0	1.41	2.64	46.3	25.2	45.6		4710	4.65E-03
ML-6 167-168.5	167.6	V	25.6	1.38	2.62	47.4	12.1	74.3		72.6	7.23E-05

(1) Sample Orientation: H = horizontal; V = vertical; R = remold

(2) Total Porosity = all interconnected pore channels; Air Filled = pore channels not occupied by pore fluids.

(3) Fluid density used to calculate pore fluid saturations: Water = 0.9996 g/cc.

(4) Effective (Native) = With as-received pore fluids in place.

(5) Permeability to water and hydraulic conductivity measured at saturated conditions.

Vb = Bulk Volume, cc; Pv = Pore Volume, cc; ND = Not Detected

Water = filtered Laboratory Fresh (tap) or Site water.

PTS File No: 44073  
 Client: Geoscience Support Services  
 Report Date: 03/13/14

**PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY Rev.01**

(Methodology: API RP 40; EPA 9100)

Project Name: MPWSP  
 Project No: 13017-13

SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	25 PSI CONFINING STRESS		
				EFFECTIVE PERMEABILITY TO WATER (2,3), millidarcy	HYDRAULIC CONDUCTIVITY (3), cm/s	INTRINSIC PERMEABILITY TO WATER (3), cm <sup>2</sup>
CX-B1 66.5-67	66.95	H	20140305	1560	1.53E-03	1.54E-08
CX-B1 166.5-167.0	466.95	H	20140305	622	6.10E-04	6.14E-09
CX-B2 207.5-208	207.95	H	20140305	1440	1.41E-03	1.42E-08
CX-B3 107.5-108	107.95	H	20140305	5200	5.12E-03	5.13E-08
CX-B3 197.5-198	197.95	H	20140305	644	6.34E-04	6.35E-09
ML-1 107.5-108	107.95	H	20140305	6330	6.26E-03	6.25E-08
ML-2 117.5-118	117.95	H	20140305	111	1.10E-04	1.10E-09
ML-2 157.5-158	157.95	H	20140305	3270	3.21E-03	3.23E-08
ML-3 106.5-107	106.95	H	20140305	851	8.42E-04	8.40E-09
ML-3 166.5-167	166.95	H	20140305	7.59	7.53E-06	7.49E-11
ML-4 76.5-77	76.95	H	20140305	873	8.68E-04	8.62E-09
ML-4 146.5-147	146.95	H	20140305	12900	1.29E-02	1.28E-07
ML-6 107.5-108	107.95	H	20140305	3990	4.00E-03	3.94E-08
ML-6 167-168.5	167.95	H	20140305	130	1.30E-04	1.28E-09

(1) Sample Orientation: H = horizontal; V = vertical; R = remold

(2) Effective (Native) = With as-received pore fluids in place.

(3) Permeability to water and hydraulic conductivity measured at saturated conditions.

Water = filtered Laboratory Fresh (tap) or Site water.

Project Name: MPWSP  
 Project Number: 13017-13

PTS File No: 43626  
 Client: Geoscience Support Services

### TEST PROGRAM - 20131002

CORE ID	Depth ft.	Core Recovery ft.	Hydraulic Conductivity Pkg.	Hydraulic Conductivity API RP40/EPA 9100		Notes
		Plugs:	Vert. 1"	Horz. 1"		
Date Received: 20130926						
PR-1 67 ft - 67.5 ft	67-67.5	0.50	X	X		
PR-1 145.5 ft - 146 ft	145.5-146	0.50	X			
PR-1 152 ft - 152.5 ft	152-152.5	0.50	X			
PR-1 200.5 ft - 201 ft	200.5-201	0.50	X	X		
<b>TOTALS:</b>	<b>4 cores</b>	<b>2.00</b>	<b>4</b>	<b>2</b>		<b>4</b>

#### Laboratory Test Program Notes

Contaminant identification:

Standard TAT for basic analysis is 10 business days.

**Hydraulic Conductivity Package – Saturated Zone:** Native-state permeability to water, total and air-filled porosity, grain and bulk density, moisture content, total pore fluid (water only) saturation.

PTS File No: 43626  
 Client: Geoscience Support Services  
 Report Date: 10/14/13

**PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY PACKAGE**

Project Name: MPWSP  
 Project No: 13017-13

			API RP 40 / METHODS: ASTM D2216		API RP 40		API RP 40		API RP 40; EPA 9100		
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	MOISTURE CONTENT, % weight	DENSITY		POROSITY, %Vb (2)		TOTAL PORE FLUID SATURATIONS (3), % Pv		25 PSI CONFINING STRESS	
				DRY BULK, g/cc	GRAIN, g/cc	TOTAL	AIR-FILLED			EFFECTIVE (4,5) PERMEABILITY TO WATER, millidarcy	HYDRAULIC CONDUCTIVITY (4,5), cm/s
PR-1 67 ft - 67.5 ft	67.2	V	15.1	1.69	2.59	34.8	9.4	73.0	91.1	9.13E-05	
PR-1 145.5 ft - 146 ft	145.6	V	28.6	1.38	2.68	48.5	9.0	81.4	2.08	2.08E-06	
PR-1 152 ft - 152.5 ft	152.1	V	27.1	1.45	2.72	46.5	7.1	84.8	2.03	2.04E-06	
PR-1 200.5 ft - 201 ft	200.65	V	16.5	1.61	2.67	39.8	13.3	66.6	5120	5.10E-03	

(1) Sample Orientation: H = horizontal; V = vertical; R = remold

(2) Total Porosity = all interconnected pore channels; Air Filled = pore channels not occupied by pore fluids.

(3) Fluid density used to calculate pore fluid saturations: Water = 0.9996 g/cc.

(4) Effective (Native) = With as-received pore fluids in place.

(5) Permeability to water and hydraulic conductivity measured at saturated conditions.

Vb = Bulk Volume, cc; Pv = Pore Volume, cc; ND = Not Detected

Water = filtered Laboratory Fresh (tap) or Site water.

PTS File No: 43626  
 Client: Geoscience Support Services  
 Report Date: 10/14/13

### **PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY**

(Methodology: API RP 40; EPA 9100)

Project Name: MPWSP  
 Project No: 13017-13

SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	25 PSI CONFINING STRESS		
				EFFECTIVE PERMEABILITY TO WATER (2,3), millidarcy	HYDRAULIC CONDUCTIVITY (3), cm/s	INTRINSIC PERMEABILITY TO WATER (3), cm <sup>2</sup>
PR-1 67 ft - 67.5 ft	67.05	H	20131010	61.1	6.03E-05	6.03E-10
PR-1 200.5 ft - 201 ft	200.55	H	20131010	269	2.73E-04	2.65E-09

(1) Sample Orientation: H = horizontal; V = vertical; R = remold

(2) Effective (Native) = With as-received pore fluids in place.

(3) Permeability to water and hydraulic conductivity measured at saturated conditions.

Water = filtered Laboratory Fresh (tap) or Site water.

COMPANY Geoscience Support Services				ANALYSIS REQUEST										PO# 13017-13									
ADDRESS PO 220		CITY Claremont, CA	ZIP CODE 91711	NUMBER OF SAMPLES	SOIL PROPERTIES PACKAGE	HYDRAULIC CONDUCTIVITY PACKAGE	PORE FLUID SATURATIONS PACKAGE	TCEQ/TNRCC PROPERTIES PACKAGE	CAPILLARITY PACKAGE	FLUID PROPERTIES PACKAGE	PHOTOLOG: CORE PHOTOGRAPHY	MOISTURE CONTENT, ASTM D2216	POROSITY: TOTAL, API RP40	POROSITY: EFFECTIVE, ASTM D425M	SPECIFIC GRAVITY, ASTM D854	BULK DENSITY (DRY), API RP40 or ASTM D2937	AIR PERMEABILITY, API RP40	HYDRAULIC CONDUCTIVITY, EPA9100, API RP40, D5084	GRAIN SIZE DISTRIBUTION, ASTM D422/4464M	TOC: WALKLEY-BLACK	ATTERBERG LIMITS, ASTM D4318	Horizontal Conductivity	COMMENTS
PROJECT MANAGER Brian Villalobos		bvillalobos@geoscience-water.com																					
PROJECT NAME MPWSP		PHONE NUMBER 909-451-6650																					
PROJECT NUMBER 13017-13		FAX NUMBER 909-451-6638																					
SITE LOCATION CEMEX																							
SAMPLER SIGNATURE																							
SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT																				
CX-B1 66.5-67	10/22/13	1500	66.5-67		1	X															X		
CX-B1 166.5-167.0	10/23/13	1500	166.5-167		1		X														X		
CX-B1 257.5-258	10/25/13	1500	257.5-258		1			X													X		
CX-B2 207.5-208	11/5/13	1345	207.5-208	1				X												X			
CX-B2 259-259.5	11/6/13	1000	259-259.5	1					X											X			
CX-B3 107.5-108	11/10/13	1500	107.5-108	1					X											X			
CX-B3 129-129.5	11/10/13	1500	129-129.5	1					X											X			
CX-B3 177.5-178	11/10/13	1500	177.5-178	1					X											X			
CX-B3 197.5-198	11/10/13	1500	197.5-198	1					X											X			

76°F

76°F

**1. RELINQUISHED BY**

**NATIONAL BANK  
COMPANY**

**COMPANY**

DATE

**2. RECEIVED BY**

THE WILSON COMPANY

Geoscier

DATE  
7-2-11d

**3. RELINQUISHED BY**

COMPANY

→ coscilver

DATE  
7-4-14

4. RECEIVED BY

COMPANY

PTS LABS

DATE  
2/4/14

PTS Laboratories, Inc. • 8100 Secura Way • Santa Fe Springs, CA 90670 • Phone (562) 347-2500 • Fax (562) 907-3610

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**1. RELINQUISHED BY**

Nathan Reyn  
COMPANY  
GEOGRAPHICAL

DATE  
2-3-14

2. RECEIVED

*John Andrew*  
COMPANY  
GPOSC

DATE  
7-3-14

**3. RELINQUISHED BY**

*[Signature]*  
COMPANY  
GeoScience

DATE  
2-4-14

4. RECEIVED BY

COMPANY  
PFS

DATE  
2/4/14



## CHAIN OF CUSTODY RECORD

COMPANY Geoscience Support Services				ANALYSIS REQUEST												PO#																								
				NUMBER OF SAMPLES  1	SOIL PROPERTIES PACKAGE	HYDRAULIC CONDUCTIVITY PACKAGE	PORE FLUID SATURATIONS PACKAGE	TCEQ/TNFFC PROPERTIES PACKAGE	CAPILLARITY PACKAGE	FLUID PROPERTIES PACKAGE	PHOTOLOG: CORE PHOTOGRAPHY	MOISTURE CONTENT, ASTM D2216	POROSITY: TOTAL, API RP40	POROSITY: EFFECTIVE, ASTM D425M	SPECIFIC GRAVITY, ASTM D854	BULK DENSITY (DRY), API RP40 or ASTM D2937	AIR PERMEABILITY, API RP40	HYDRAULIC CONDUCTIVITY, EPA9100, API RP40, D5084	GRAIN SIZE DISTRIBUTION, ASTM D422/4464M	TOC: WALKLEY-BLACK	ATTERBERG LIMITS, ASTM D4318	<i>Horizontal Conductivity</i>	TURNAROUND TIME 24 HOURS <input type="checkbox"/> 5 DAYS <input type="checkbox"/> 48 HOURS <input type="checkbox"/> NORMAL <input type="checkbox"/> 72 HOURS <input type="checkbox"/>																	
ADDRESS PO 220					CITY Claremont, CA				ZIP CODE 91711				PROJECT MANAGER Brian Villalobos				PROJECT NAME MPWSP				PHONE NUMBER 909-451-6650				PROJECT NUMBER 13017-13				FAX NUMBER 909-451-6638				SITE LOCATION Potrero Rd Parking Area, Moss Landing				OTHER:			
SAMPLE SIGNATURE																													SAMPLE INTEGRITY (CHECK): INTACT <input checked="" type="checkbox"/> ON ICE _____											
SAMPLE ID NUMBER					DATE				TIME				DEPTH, FT																PTS QUOTE NO.											
PR-1 67 ft - 67.5 ft					9/21/13				1500				67 - 67.5																PTS FILE: <i>43626</i>											
PR-1 145.5 ft - 146 ft					9/22/13				1400				145.5 - 146																COMMENTS <i>Rewd @ 74°F</i>											
PR-1 152 ft - 152.5 ft					9/22/13				1420				152 - 152.5																											
PR-1 200.5 ft - 201 ft					9/22/13				1730				200.5 - 201																											
1. RELINQUISHED BY <i>dk</i>				2. RECEIVED BY <i>dk</i>				3. RELINQUISHED BY <i>dk</i>				4. RECEIVED BY <i>dk</i>																												
COMPANY GEO SCIENCE				COMPANY Geoscience				COMPANY Geoscience				COMPANY PTS LABS																												
DATE 9/26/13		TIME 10:40		DATE 9/26/13		TIME 10:40		DATE 9/26/13		TIME 11:45		DATE 9/26/13		TIME 11:45																										

Project Name: MPWSP  
 Project Number: 13017-13

PTS File No: 44073  
 Client: Geoscience Support Services

## TEST PROGRAM - 20140206

CORE ID	Depth ft.	Core Recovery ft.	Hydraulic Conductivity Pkg.	Hydraulic Conductivity API RP40/EPA 9100		Notes
		Plugs:	Vert. 1"	Horz. 1"		
Date Received: 20140204						
CX-B1 66.5-67	66.5-67	0.50	X	X		
CX-B1 166.5-167.0	166.5-167.0	0.50	X	X		
CX-B1 257.5-258	257.5-258	0.50	X			
CX-B2 207.5-208	207.5-208	0.50	X	X		
CX-B2 259-259.5	259-259.5	0.50	X			
CX-B3 107.5-108	107.5-108	0.50	X	X		
CX-B3 129-129.5	129-129.5	0.50	X			
CX-B3 177.5-178	177.5-178	0.50				
CX-B3 197.5-198	197.5-198	0.50	X	X		
ML-1 76-76.5	76-76.5	0.50	X			
ML-1 107.5-108	107.5-108	0.50	X	X		
ML-1 147-147.5	147-147.5	0.50	X			
ML-2 87-87.5	87-87.5	0.50	X			
ML-2 117.5-118	117.5-118	0.50	X	X		
ML-2 157.5-158	157.5-158	0.50	X	X		
ML-3 106.5-107	106.5-107	0.50	X	X		
ML-3 166.5-167	166.5-167	0.50	X	X		
ML-4 76.5-77	76.5-77	0.50	X	X		
ML-4 126.5-127	126.5-127	0.50	X			
ML-4 146.5-147	146.5-147	0.50	X	X		
ML-6 79.5-80	79.5-80	0.50	X			
ML-6 107.5-108	107.5-108	0.50	X	X		
ML-6 167-168.5	167-168.5	0.50	X	X		
TOTALS:	23 cores	11.50	22	14		23

Project Name: MPWSP  
Project Number: 13017-13

PTS File No: 44073  
Client: Geoscience Support Services

**TEST PROGRAM - 20140206**

CORE ID	Depth ft.	Core Recovery ft.	Hydraulic Conductivity Pkg.	Hydraulic Conductivity API RP40/EPA 9100		Notes
		Plugs:	Vert. 1"	Horz. 1"		

**Laboratory Test Program Notes**

Contaminant identification: NONE

Standard TAT for basic analysis is 10 business days.

**Hydraulic Conductivity Package – Saturated Zone:** Native-state permeability to water, total and air-filled porosity, grain and bulk density, moisture content, total pore fluid (water only) saturation.

PTS File No: 44073  
 Client: Geoscience Support Services  
 Report Date: 03/13/14

**PHYSICAL PROPERTIES DATA - HYDRAULIC CONDUCTIVITY PACKAGE Rev.01**

Project Name: MPWSP  
 Project No: 13017-13

SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	MOISTURE CONTENT, % weight	API RP 40 /		API RP 40		API RP 40		API RP 40; EPA 9100	
				METHODS: ASTM D2216		API RP 40		API RP 40		25 PSI CONFINING STRESS	
				DENSITY		POROSITY, %Vb (2)	TOTAL	AIR-FILLED		EFFECTIVE (4,5) PERMEABILITY TO WATER, millidarcy	HYDRAULIC CONDUCTIVITY (4,5), cm/s
CX-B1 66.5-67	66.6	V	22.9	1.46	2.66	45.0	11.6	74.2	273	2.76E-04	
CX-B1 166.5-167.0	166.6	V	24.7	1.58	2.82	43.8	4.7	89.3	484	4.87E-04	
CX-B1 257.5-258	257.5-258	V	41.1	1.11	2.61	57.7	12.2	78.8	1.75	1.75E-06	
CX-B2 207.5-208	207.6	V	21.5	1.48	2.67	44.6	12.9	71.1	3820	3.76E-03	
CX-B2 259-259.5	259.1	V	31.0	1.33	2.63	49.3	7.9	83.9	1.83	1.85E-06	
CX-B3 107.5-108	107.6	V	20.6	1.43	2.64	45.8	16.4	64.2	5210	5.26E-03	
CX-B3 129-129.5	129.1	V	35.5	1.25	2.62	52.1	7.6	85.5	2.83	2.86E-06	
CX-B3 197.5-198	197.6	V	18.1	1.66	2.69	38.2	8.1	78.8	101	1.00E-04	
ML-1 76-76.5	76.1	V	42.4	1.17	2.67	56.1	6.3	88.7	4.89	4.83E-06	
ML-1 107.5-108	107.6	V	15.0	1.53	2.65	42.1	19.0	54.8	8540	8.52E-03	
ML-1 147-147.5	147.1	V	32.4	1.31	2.66	50.8	8.4	83.4	1.97	1.98E-06	
ML-2 87-87.5	87.1	V	20.5	1.50	2.66	43.4	12.7	70.8	101	1.00E-04	
ML-2 117.5-118	117.6	V	24.3	1.43	2.64	45.8	11.0	76.0	47.3	4.70E-05	
ML-2 157.5-158	157.6	V	19.2	1.52	2.61	41.6	12.3	70.5	110	1.10E-04	
ML-3 106.5-107	106.6	V	12.9	1.53	2.64	42.0	22.3	47.0	1900	1.87E-03	
ML-3 166.5-167	166.6	V	28.6	1.31	2.65	50.7	13.2	73.9	9.6	9.51E-06	
ML-4 76.5-77	76.6	V	21.4	1.41	2.62	46.3	16.2	65.1	954	9.49E-04	
ML-4 126.5-127	126.6	V	25.0	1.44	2.64	45.5	9.5	79.1	1.18	1.18E-06	
ML-4 146.5-147	146.6	V	14.1	1.45	2.61	44.3	23.8	46.3	6180	6.10E-03	
ML-6 79.5-80	79.6	V	32.2	1.33	2.64	49.7	6.9	86.0	2.43	2.43E-06	
ML-6 107.5-108	107.6	V	15.0	1.41	2.64	46.3	25.2	45.6	4710	4.65E-03	
ML-6 167-168.5	167.6	V	25.6	1.38	2.62	47.4	12.1	74.3	72.6	7.23E-05	

(1) Sample Orientation: H = horizontal; V = vertical; R = remold

(2) Total Porosity = all interconnected pore channels; Air Filled = pore channels not occupied by pore fluids.

(3) Fluid density used to calculate pore fluid saturations: Water = 0.9996 g/cc.

(4) Effective (Native) = With as-received pore fluids in place.

(5) Permeability to water and hydraulic conductivity measured at saturated conditions.

Vb = Bulk Volume, cc; Pv = Pore Volume, cc; ND = Not Detected

Water = filtered Laboratory Fresh (tap) or Site water.

76°F

1. RELINQUISHED BY  
Nathan Reynolds Nathan Reynolds  
COMPANY  
GEOSCIENCE  
DATE 7-3-14 TIME 7:00

2. RECEIVED BY  
Andrew Keta / *AK*  
COMPANY  
Geoscience

3. RELINQUISHED BY  
  
John L. Johnson

4. RECEIVED BY	<i>J. L. C.</i>
COMPANY	PTS LABS
DATE	TIME
2/4/14	10:26

COMPANY Geoscience Support Services				ANALYSIS REQUEST								PO# 13017-13			
ADDRESS PO 220	CITY Claremont, CA	ZIP CODE 91711										TURNAROUND TIME			
PROJECT MANAGER Brian Villalobos	bvillalobos@geoscience-water.com											24 HOURS <input type="checkbox"/> 5 DAYS <input type="checkbox"/> 48 HOURS <input type="checkbox"/> NORMAL <input checked="" type="checkbox"/> 72 HOURS <input type="checkbox"/>			
PROJECT NAME MPWSP	PHONE NUMBER 909-451-6650											OTHER:			
PROJECT NUMBER 13017-13	FAX NUMBER 909-451-6638											SAMPLE INTEGRITY (CHECK): INTACT <input checked="" type="checkbox"/> ON ICE _____			
SITE LOCATION Sandholdt dr area, Moss Landing												PTS QUOTE NO.			
SAMPLER SIGNATURE												PTS FILE: <i>44073</i>			
SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	NUMBER OF SAMPLES								COMMENTS			
ML-1 76-76.5	10/3/13	10:30	76-76.5	<input checked="" type="checkbox"/> SOIL PROPERTIES PACKAGE											
ML-1 107.5-108	10/3/13	13:10	107.5-108	<input checked="" type="checkbox"/> HYDRAULIC CONDUCTIVITY PACKAGE											
ML-1 147-147.5	10/3/13	14:00	147-147.5	<input checked="" type="checkbox"/> PORE FLUID SATURATIONS PACKAGE											
				<input checked="" type="checkbox"/> TCEQ/TNRCC PROPERTIES PACKAGE											
				<input checked="" type="checkbox"/> CAPILLARITY PACKAGE											
				<input checked="" type="checkbox"/> FLUID PROPERTIES PACKAGE											
				<input checked="" type="checkbox"/> PHOTLOG: CORE PHOTOGRAPHY											
				<input checked="" type="checkbox"/> MOISTURE CONTENT, ASTM D2216											
				<input checked="" type="checkbox"/> POROSITY: TOTAL, API RP40											
				<input checked="" type="checkbox"/> POROSITY: EFFECTIVE, ASTM D425M											
				<input checked="" type="checkbox"/> SPECIFIC GRAVITY, ASTM D854											
				<input checked="" type="checkbox"/> BULK DENSITY (DRY), API RP40 or ASTM D2937											
				<input checked="" type="checkbox"/> AIR PERMEABILITY, API RP40											
				<input checked="" type="checkbox"/> HYDRAULIC CONDUCTIVITY, EPA9100, API RP40, D5084											
				<input checked="" type="checkbox"/> GRAIN SIZE DISTRIBUTION, ASTM D422/4164M											
				<input checked="" type="checkbox"/> TOC: WALKLEY-BLACK											
				<input checked="" type="checkbox"/> ATTERBERG LIMITS, ASTM D4318											
				<input checked="" type="checkbox"/> Horizontal Conductivity											
1. RELINQUISHED BY <i>Nathan Reynolds</i>				2. RECEIVED BY <i>Andrew Kietrys</i>				3. RELINQUISHED BY <i>DK</i>				4. RECEIVED BY <i>DK</i>			
COMPANY GEOSCIENCE		COMPANY Geoscience		COMPANY Geoscience		COMPANY Geoscience		COMPANY Geoscience		COMPANY Geoscience		COMPANY PTS LABS			
DATE 2-3-14	TIME 17:00	DATE 7-8-14	TIME 17:00	DATE 7-4-14	TIME 10:26	DATE 2/4/14	TIME 10:26								

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COMPANY Geoscience Support Services				ANALYSIS REQUEST								PO# 13017-13		
												TURNAROUND TIME		
ADDRESS PO 220				CITY Claremont, CA		ZIP CODE 91711						24 HOURS <input type="checkbox"/> 5 DAYS <input type="checkbox"/> 48 HOURS <input type="checkbox"/> NORMAL <input checked="" type="checkbox"/> 72 HOURS <input type="checkbox"/>		
PROJECT MANAGER Brian Villalobos				bvillalobos@geoscience-water.com								OTHER: _____		
PROJECT NAME MPWSP				PHONE NUMBER 909-451-6650										SAMPLE INTEGRITY (CHECK): INTACT <input checked="" type="checkbox"/> ON ICE _____
PROJECT NUMBER 13017-13				FAX NUMBER 909-451-6638										PTS QUOTE NO.
SITE LOCATION Moss Landing, Nadar Agha property												PTS FILE:		
SAMPLER SIGNATURE												44073		
SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	NUMBER OF SAMPLES								COMMENTS		
ML-3 106.5-107	1/7/14	1600	106.5-107	<input checked="" type="checkbox"/> SOIL PROPERTIES PACKAGE										
ML-3 166.5-167	1/8/14	1350	166.5-167	<input checked="" type="checkbox"/> HYDRAULIC CONDUCTIVITY PACKAGE										
ML-4 76.5-77	11/26/13	1320	76.5-77	<input checked="" type="checkbox"/> PORE FLUID SATURATIONS PACKAGE										
ML-4 126.5-127	12/2/13	1350	126.5-127	<input checked="" type="checkbox"/> TCEQ/TNRCC PROPERTIES PACKAGE										
ML-4 146.5-147	12/2/13	1745	146.5-147	<input checked="" type="checkbox"/> CAPILLARITY PACKAGE										
				<input checked="" type="checkbox"/> FLUID PROPERTIES PACKAGE										
				<input checked="" type="checkbox"/> PHOTOLOG: CORE PHOTOGRAPHY										
				<input checked="" type="checkbox"/> MOISTURE CONTENT, ASTM D2216										
				<input checked="" type="checkbox"/> POROSITY: TOTAL, API RP40										
				<input checked="" type="checkbox"/> POROSITY: EFFECTIVE, ASTM D425M										
				<input checked="" type="checkbox"/> SPECIFIC GRAVITY, ASTM D854										
				<input checked="" type="checkbox"/> BULK DENSITY (DRY), API RP40 or ASTM D2937										
				<input checked="" type="checkbox"/> AIR PERMEABILITY, API RP40										
				<input checked="" type="checkbox"/> HYDRAULIC CONDUCTIVITY, EPA9100, API RP40, D6084										
				<input checked="" type="checkbox"/> GRAIN SIZE DISTRIBUTION, ASTM D422/4464M										
				<input checked="" type="checkbox"/> TOC: WALKLEY-BLACK										
				<input checked="" type="checkbox"/> ATTERBERG LIMITS, ASTM D4318										
				<input checked="" type="checkbox"/> Horizontal Conductivity										
												76 °F		
1. RELINQUISHED BY <i>Nathan Reynolds</i>	2. RECEIVED BY <i>Andrew Kite/Rylee</i>	3. RELINQUISHED BY <i>John Kite</i>	4. RECEIVED BY <i>Dan</i>											
COMPANY GEOSCIENCE	COMPANY Geoscience	COMPANY Geoscience	COMPANY PTS LABS											
DATE 2-3-14	TIME 17:00	DATE 7-3-14	TIME 17:00	DATE 2-4-14	TIME 10:26	DATE 2/4/14	TIME 10:26							
C-23														

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**APPENDIX D**  
**Mechanical Grading Analyses – Formation Materials**

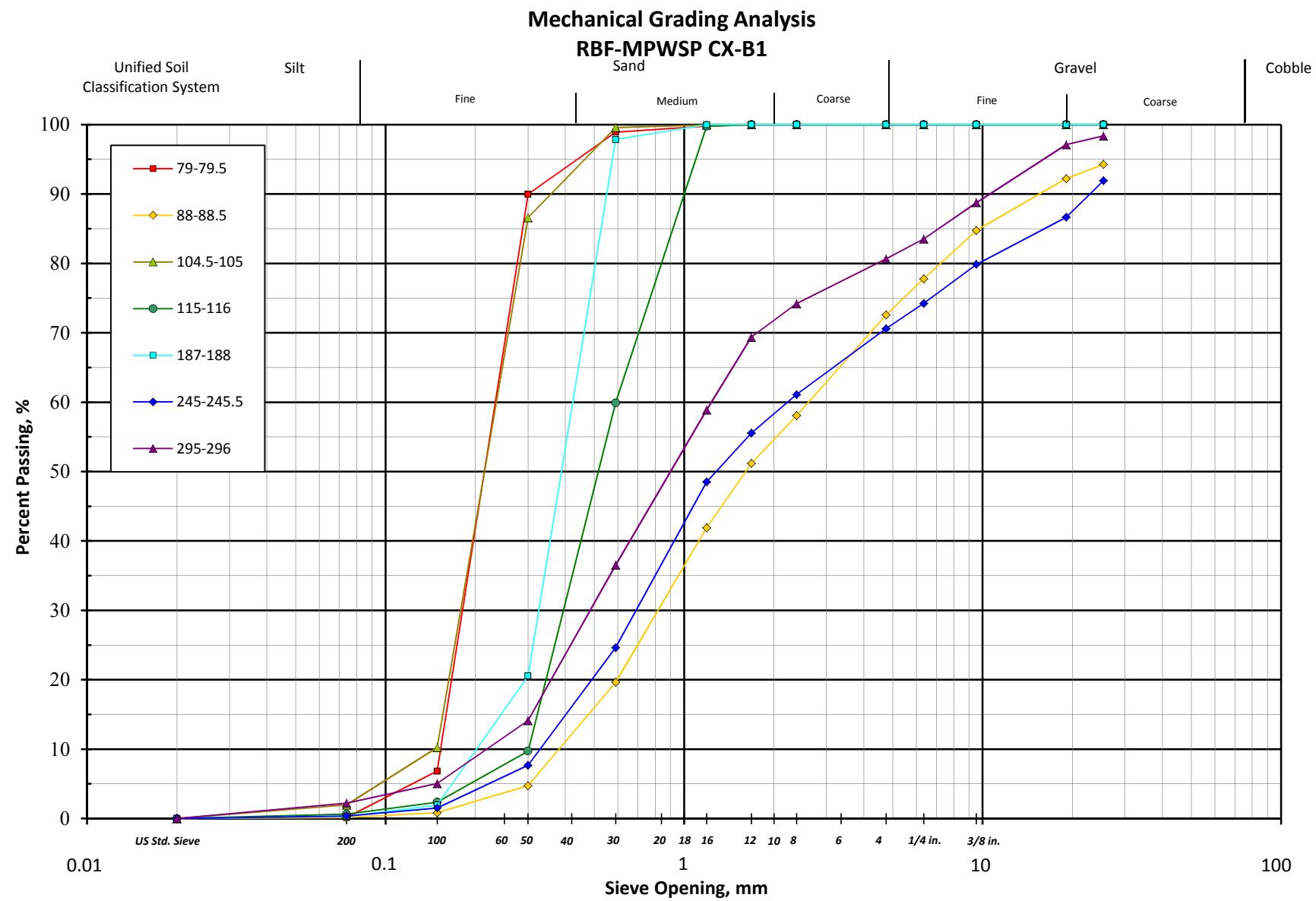
***GEOSCIENCE***  

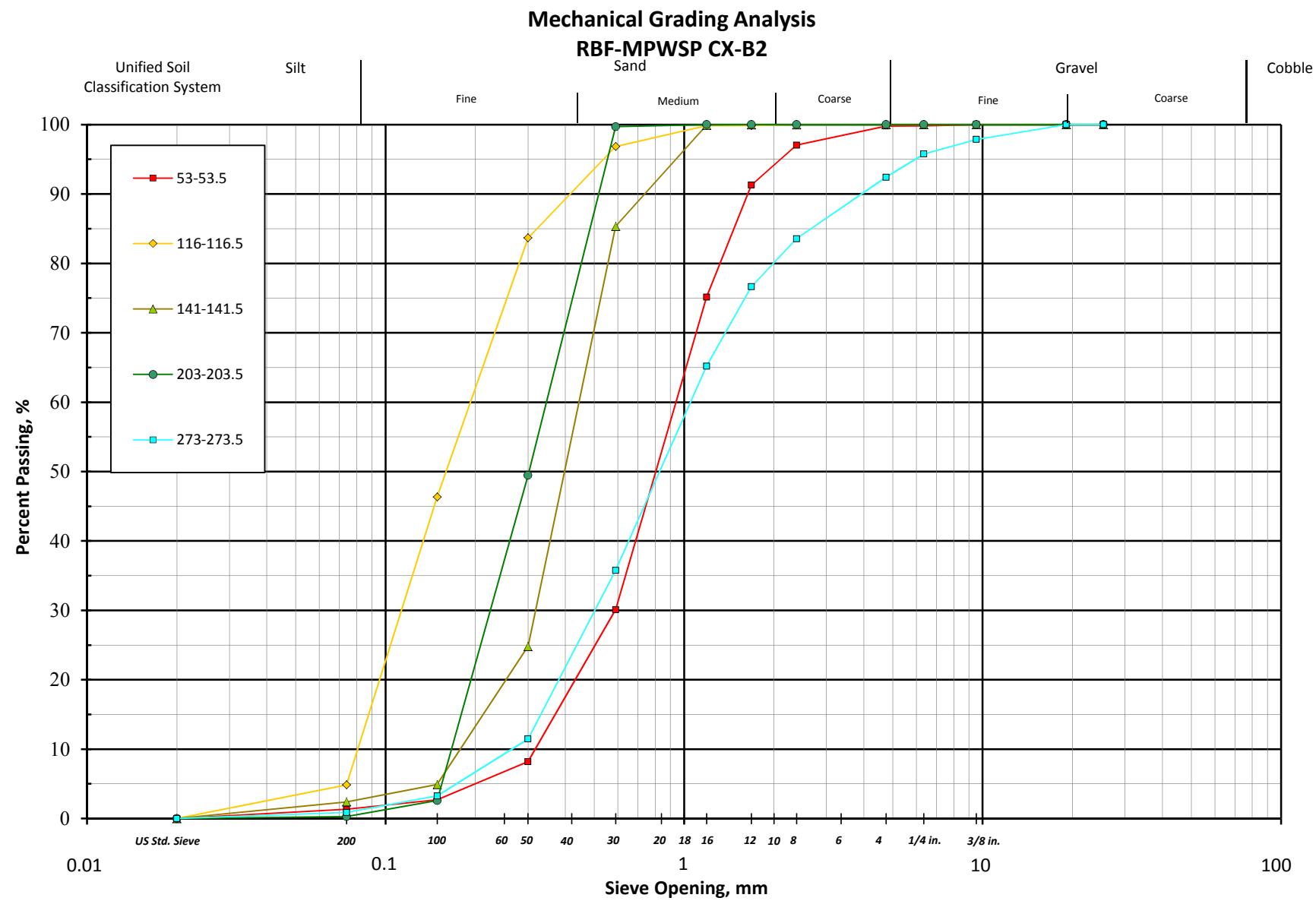

**APPENDIX D:**

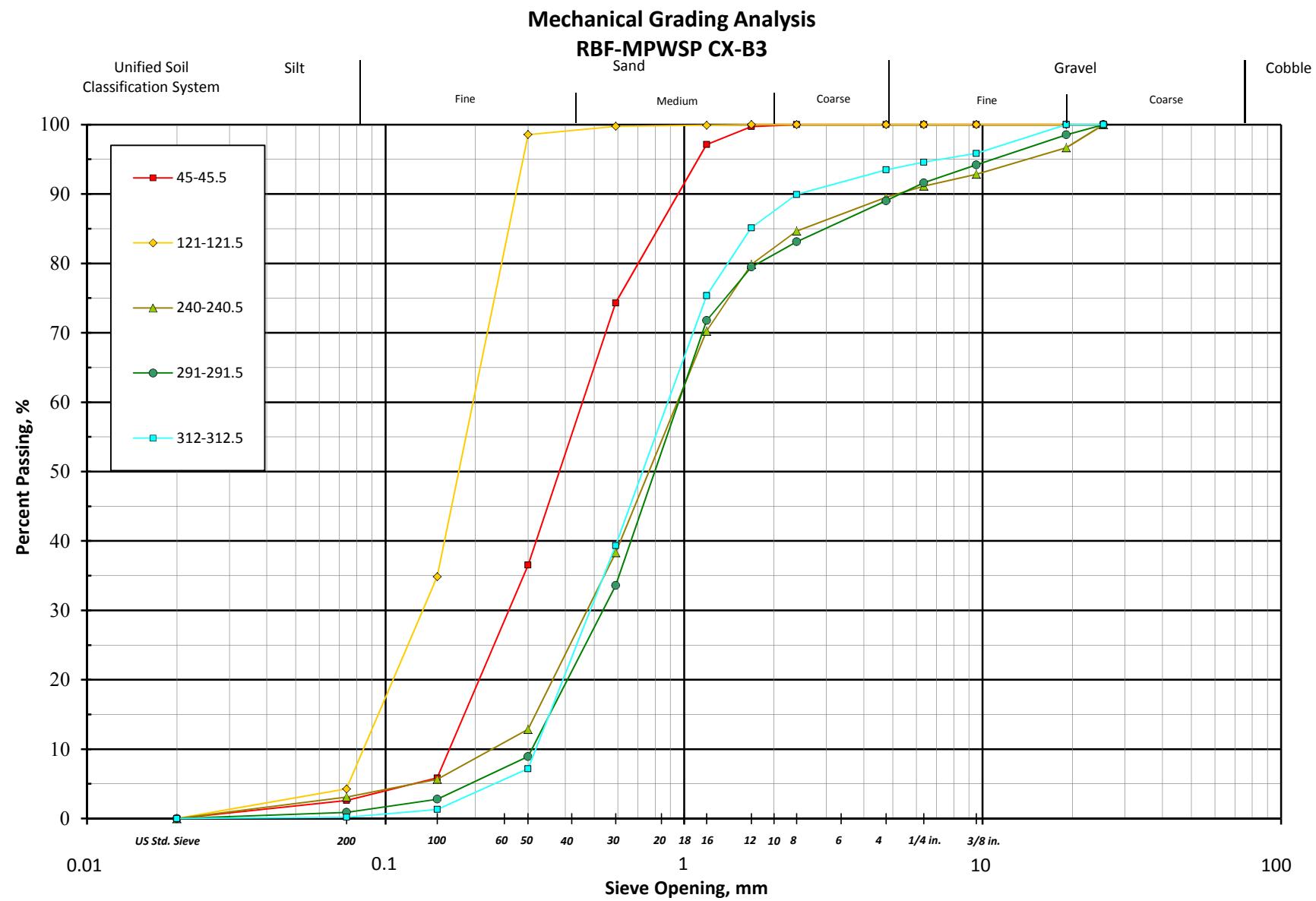
**MECHANICAL GRADING ANALYSES – FORMATION MATERIALS**

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Borehole PR-1.....	D-11







### Mechanical Grading Analysis RBF-MPWSP CX-B4

