APPENDIX A1

Borehole Lithologic Logs

GEOSCIENCE

APPENDIX A1:

BOREHOLE LITHOLOGIC LOGS

CONTENTS

Description **Page**

Borehole CX-B1 ..... *A1-1*

Borehole CX-B2 ..... *A1-7*

Borehole CX-B3 ..... *A1-13*

Borehole CX-B4 ..... *A1-20*

Borehole MDW-1 ..... *A1-27*

Borehole ML-1 ..... *A1-33*

Borehole ML-2 ..... *A1-37*

Borehole ML-3 ..... *A1-41*

Borehole ML-4 ..... *A1-45*

Borehole ML-6 ..... *A1-49*

Borehole PR-1 ..... *A1-53*

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BOREHOLE LITHOLOGIC LOG

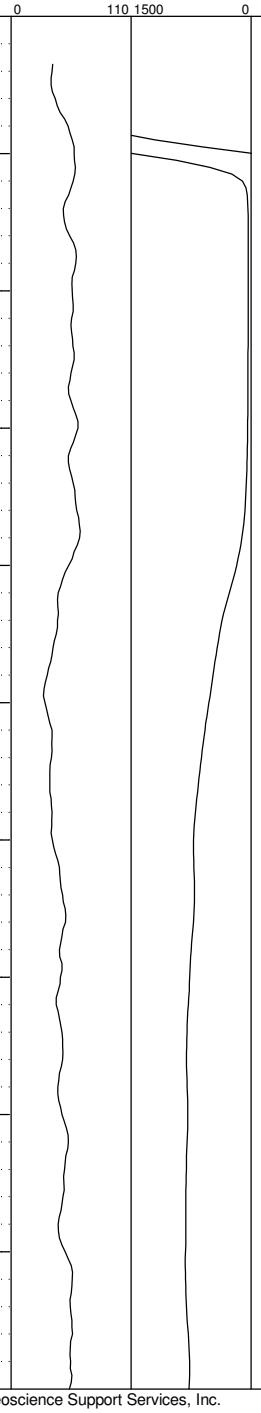
BOREHOLE NAME **CX-B1**			
CLIENT	California American Water	LOCATION **Marina, CA**	
PROJECT NUMBER	13017-13	**CEMEX Lapis Plant**	
REPORT DATE	5/23/2014	**36° 42' 47.3796", -121° 48' 21.2364"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY **B. Villalobos**	
DRILLER	Jose Munguia		

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

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) | GAMMA (GAPI) 0–110 | CLID (mmho/m) 1500–0 | Zone* Test | Graphic Log



Depth bgs (feet)	Description
	SAND (SP): brown (10YR 4/3) and dark grayish brown (10YR 4/2), 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	
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.
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.
	SAND (SP): yellowish brown (10YR 5/6), 100% fine to medium grained sand, subrounded; medium sorted; moist sample; contains quartz, feldspar and amphibole.
20	
	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	
	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.
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.
50	SAND (SP): yellowish brown (10YR 5/4), 90% medium to coarse grained sand, subrounded;

Sample Type

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

Geoscience Support Services, Inc.

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

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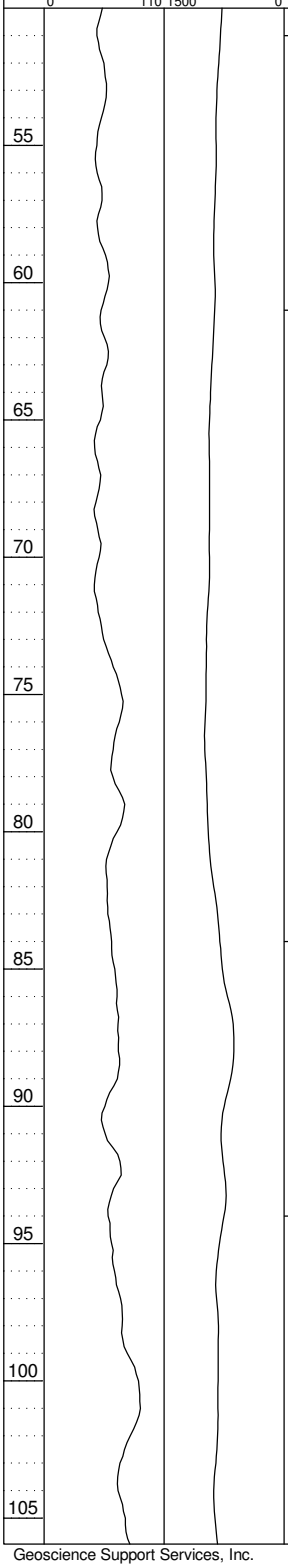
BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME	CLIENT	LOCATION
CX-B1	California American Water	Marina, CA
	PROJECT NUMBER 13017-13	



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.

10% fine gravel up to 12.7 mm, subrounded; poorly sorted; wet sample; contains quartz and chert.

SAND (SP): yellowish brown (10YR 5/4), 100% fine grained sand, subangular to rounded, poorly graded; trace fine to coarse gravel up to 19 mm, subangular to rounded; medium sorted; wet sample; <2% coarse sand to gravel, gradual change to fine to medium sand; contains quartz, feldspar, and chert; granitic.

SILTY SAND (SM): dark yellowish brown (10YR 4/4), 80% fine grained sand, subrounded; 20% silt, silt in thin layers; well sorted; moist sample; contains mica; with visible alteration; <2% gold flecks (mica), dark reddish-brown oxide pods.

SS
PTS
SS

SILTY SAND (SM): dark yellowish brown (10YR 3/4), 80% fine grained sand, subrounded; 20% silt, silt in thin layers; poorly sorted; wet sample; contains mica; with visible alteration; increase in mica flecks, increase in reddish coloration.

SILTY SAND (SM): yellowish brown (10YR 5/4), 80% fine grained sand, subrounded; 20% silt; poorly sorted; wet sample; contains mica.

SIEVE

SAND (SW): light olive brown (2.5Y 5/4), 100% fine to coarse grained sand, subangular to subrounded; trace fine to coarse gravel up to 19 mm, subangular to subrounded; wet sample; contains quartz and chert.

SILTY SAND (SM): brown (10YR 5/3), 80% fine grained sand, subrounded; 20% silt; well sorted; wet sample; contains <5% gold flecks/mica; free water.

SAND (SW): light olive brown (2.5Y 5/4), 90% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 25 mm, subangular to subrounded; poorly sorted; wet sample.

SIEVE

SILTY SAND (SM): yellowish brown (10YR 5/4), 80% fine grained sand, subrounded; 20% silt; well sorted; wet sample; contains <5% gold flecks/mica.

SAND (SW): light olive brown (2.5Y 5/4), 90% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 25 mm, subangular to subrounded; poorly sorted; wet sample.

SILTY SAND (SM): brown (10YR 5/3), 80% fine grained sand, subrounded; 20% silt; well sorted; wet sample; contains <5% gold flecks/mica.

SILTY SAND (SM): dark yellowish brown (10YR 4/4), 70% fine grained sand, subrounded, very fine sand, <1% coarse sand; 30% silt, firm; well sorted; wet sample; contains mica; mix of sandy silt and silty sand, grades fine to coarse at depth.

SIEVE

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

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

Depth bgs (feet) | GAMMA (GAPI) 0 – 110 | CLID (mmho/m) 1500 – 0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type

110

SAND (SW): brownish yellow (10YR 6/6), 100% fine to coarse grained sand, subangular to subrounded, <5% feldspar and dark mineral sand grains; poorly sorted; wet sample; contains quartz, feldspar, mica and amphibole.

115 — SIEVE

SAND (SW): light gray (10YR 7/2), 100% fine to coarse grained sand, subangular to subrounded, <5% feldspar and dark mineral sand grains; poorly sorted; contains quartz, feldspar, mica and amphibole.

120

SILTY SAND (SM): yellowish brown (10YR 5/8), 80% fine grained sand, subrounded to rounded; 20% silt, medium stiffness; trace fine gravel up to 4.8 mm, subrounded to rounded, <5% pebbles; well sorted.

SANDY SILT (ML): yellowish brown (10YR 5/8), 60% silt; 40% fine grained sand, subrounded; thin fine sand layers, reddish-brown, faint dark brown laminations.

125

SILTY SAND (SM): yellowish brown (10YR 5/8), 75% fine to coarse grained sand, subangular to subrounded; 20% silt; 5% fine to coarse gravel up to 25 mm, subangular to subrounded, chert, granitic and volcanic gravel; poorly sorted; contains quartz, feldspar, mica and amphibole; clasts imbricated in horizontal bedding.

SILTY SAND (SM): yellowish brown (10YR 5/4), 80% fine grained sand, subangular to subrounded; 15% silt; 5% clay; poorly sorted; moist sample; with visible alteration; thinly bedded to laminated, grey to yellowish-brown oxidized color, thin silty sand and clayey sand layers; grades to fine.

130

SILTY SAND (SM): grayish brown (10YR 5/2), 70% fine to coarse grained sand, subangular to subrounded, trace coarse red sand; 15% silt; 10% clay; 5% fine to coarse gravel up to 51 mm, subangular to subrounded, flat siliceous shale; poorly sorted; consists of silt, sands, and clayey sands.

135 — Zone #4

SILTY SAND (SM): yellowish red (5YR 4/6), 80% fine to medium grained sand, subangular to subrounded, poorly sorted; 15% silt; 5% clay, gray clay balls up to 13 mm, likely thin beds.

SILTY SAND (SM): strong brown (7.5YR 4/6), 85% fine grained sand, subangular to subrounded; 15% silt; trace fine gravel up to 13 mm, subangular to subrounded; trace clay; well sorted.

SC: 39,592 uS/cm

140 — GRAB

SILTY SAND (SM): dark yellowish brown (10YR 4/6), 85% fine grained sand, subangular to subrounded; 15% silt; trace fine gravel up to 13 mm, subangular to subrounded; trace clay; well sorted.

145

CLAY (CL): olive gray (5Y 4/2), 80% clay, firm, massive; 20% silt; moist sample; yellowish-brown (10YR 5/4) mottling.

150

SILTY SAND (SM): light olive brown (2.5Y 5/4), 80% fine to medium grained sand, subangular to subrounded, predominantly fine grain; 15% silt; 5% clay; medium sorted; moist sample; firm; some clayey sand.

155

SILTY SAND (SM): dark yellowish brown (10YR 3/4), 60% fine grained sand, subangular to subrounded; 40% silt; well sorted; moist sample; contains mica/trace gold flecks, reddish-brown (2.5YR 5/4) mottling.

CLAYEY SAND (SC): yellowish brown (10YR 5/6), 80% fine grained sand, subangular to subrounded; 15% clay; 5% silt, large amounts of silt; well sorted; rolls very slightly.

160

SILTY SAND (SM): yellowish brown (10YR 5/6), 85% fine grained sand, subangular to subrounded; 15% silt; well sorted; does not roll.

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

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BOREHOLE NAME
CX-B1

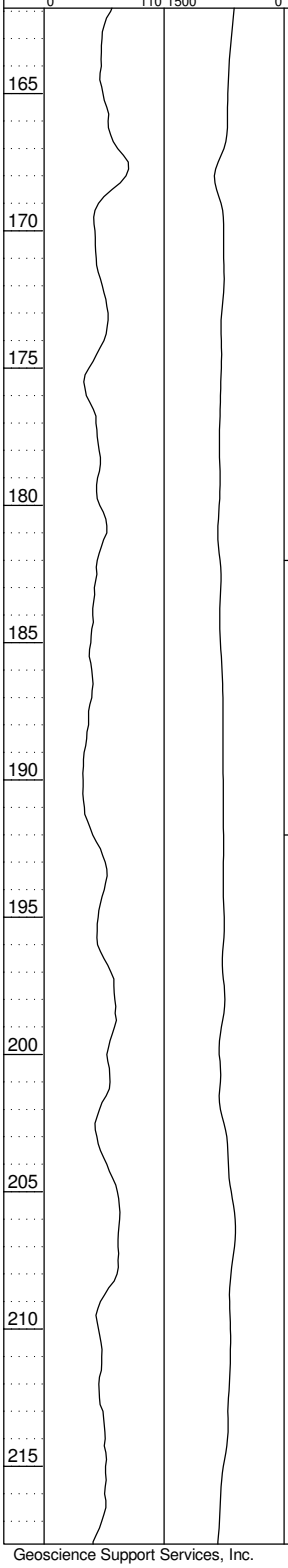
BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | GAMMA (GAPI) 0 – 110 | CLID (mmho/m) 1500 – 0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type



Zone Test: Zone #3 — SC: 47,112 uS/cm

Depth bgs (feet)	Description	Sample Type
	SANDY SILT (ML): dark yellowish brown (10YR 4/4), 50% fine grained sand, subangular to subrounded; 40% silt; 10% clay; well sorted; thin dark gray (10YR 4/1) clayey silt balls.	
165	SILTY SAND (SM): yellowish brown (10YR 5/6), 85% fine grained sand, subangular to subrounded; 15% silt; well sorted.	SS, PTS, SS
170		
175	CLAYEY SAND (SC): yellowish brown (10YR 5/6), 80% fine grained sand, subangular to subrounded, fine, soft, dark yellowish brown (10YR 5/4) sand; 15% clay; 5% silt; well sorted; wet sample; consisting of silty sands and clayey sands, rolls slightly.	
180		
	SAND WITH CLAY (SP-SC): dark yellowish brown (10YR 4/4), 90% fine grained sand, subangular to subrounded; 10% clay; well sorted; moderately indurated, slightly less clay.	
185	SILTY SAND (SM): dark yellowish brown (10YR 4/4), 85% fine grained sand, subangular to subrounded, well sorted; 15% silt.	
	SILTY SAND (SM): dark grayish brown (10YR 4/2), 80% fine grained sand, subangular to subrounded, well sorted; 20% silt; moist sample; free water, material does not roll.	SIEVE
190		
195	SILTY SAND (SM): dark yellowish brown (10YR 4/4), 80% fine grained sand, subangular to subrounded; 20% silt; well sorted; moist sample; material does not roll, contact oxidized 204 ft bgs, reddish-brown.	
200		
205	CLAY (CL): olive gray (5Y 5/2), 60% clay, stiff, 1 to 2 mm black clay balls (10YR 2/1); 40% silt, increases with depth.	SS
210	SAND (SW): brown (10YR 5/3), 100% fine to coarse grained sand, subangular to subrounded; trace fine gravel up to 5 mm, subangular to subrounded, <5% small gravel; poorly sorted; contains quartz, siliceous shale clasts, and chert.	
	SAND (SW): brown (10YR 5/3), 90% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 38 mm, subangular to subrounded; poorly sorted; contains quartz, siliceous shale clasts, chert, and possibly tuff.	
215	SAND WITH GRAVEL (SW): brown (10YR 5/3), 85% fine to coarse grained sand, subangular to subrounded; 15% fine to coarse gravel up to 38 mm, subangular to subrounded; poorly sorted; contains quartz, siliceous shale clasts, and chert.	
	SAND (SW): dark yellowish brown (10YR 4/6), 90% fine to coarse grained sand, subangular	

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

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

Depth bgs (feet) | Sample Type

to subrounded; 10% fine to coarse gravel up to 38 mm, subangular to subrounded; poorly sorted; contains quartz; oxidized layer.

SAND (SW): olive (5Y 5/3), 90% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 38 mm, subangular to subrounded; poorly sorted; contains quartz.

CLAY (CL): light olive brown (2.5Y 5/3), 80% clay, medium plasticity; 20% silt; firm, massive.

CLAY (CL): light olive brown (2.5Y 5/4), 80% clay, medium plasticity; 20% silt; with visible alteration; very faint laminations, gray and yellowish-brown slicken sides, 1 to 3 mm balls of reddish-brown oxide stains (vertical).

CLAY (CL): light olive brown (2.5Y 5/6), 80% clay; 20% silt; transition in color, increase in yellow, very stiff.

SAND (SW): light yellowish brown (10YR 6/4), 100% fine to coarse grained sand, subangular to subrounded, 5% coarse grains; poorly sorted; wet sample; contains quartz, volcanic, and chert.

GRAVEL (GW): light yellowish brown (10YR 6/4), 90% fine to coarse gravel up to 75 mm, subrounded; 10% medium to coarse grained sand, subrounded; poorly sorted; moist sample; contains quartz; basal gravel. — SIEVE

SILT (ML): olive yellow (2.5Y 6/8), 80% silt; 20% clay; yellowish-brown and light gray mottling, thinly laminated, very stiff.

CLAY (CL): pale olive (5Y 6/4), 80% clay; 20% silt; with visible alteration; oxidized, thinly laminated.

CLAY (CL): very dark greenish gray (5GY 3/1), 100% clay, high plasticity; moist sample; massive.

CLAY (CL): dark olive gray (5Y 3/2), 100% clay, high plasticity; moist sample.

CLAY (CL): very dark greenish gray (5GY 3/1), 100% clay, high plasticity; moist sample; massive.

CLAY (CL): pale olive (5Y 6/4), 80% clay; 20% silt; with visible alteration; oxidized, thinly laminated. — PTS

SANDY CLAY (CL): olive (5Y 5/3), 70% clay, stiff, massive, oxidized clay balls, 1 to 2 mm; 30% medium to coarse grained sand; contains evaporites, gypsum, with visible alteration; yellowish-brown mottling; compression slicken sides.

SANDY CLAY (CL): olive (5Y 5/3), 70% clay, stiff; 30% medium to coarse grained sand, subangular to subrounded, <2% coarse grains, predominantly quartz.

SAND (SP): olive gray (5Y 5/2), 90% medium to coarse grained sand, subangular, poorly graded; 10% fine to coarse gravel up to 25 mm, subangular, granitic; trace silt; trace clay; contains quartz, feldspar and mica.

CLAY (CL): olive (5Y 5/3), 85% clay, low plasticity; 15% silt; moist sample.

SAND (SP): pale olive (5Y 6/3), 100% medium to coarse grained sand, subangular to subrounded, trace dark minerals, water film on sand grains; trace fine gravel up to 4.8 mm, subangular to subrounded; wet sample; contains quartz, feldspar, mica, amphibole, and chert; yellowish-brown and reddish-brown mottling.

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

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

Depth bgs (feet) | GAMMA (GAPI) 0 110 | CLID (mmho/m) 1500 0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type

Zone #1
SC: 36,601 uS/cm

275 — GRAB

SAND (SP): pale olive (5Y 6/3), 90% medium to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 38 mm, subangular to subrounded; wet sample; contains quartz, feldspar, mica, amphibole, and chert; yellowish-brown and reddish-brown mottling.

280

SAND (SP): pale olive (5Y 6/3), 95% medium to coarse grained sand, subangular to subrounded; 5% fine gravel up to 4.8 mm, subangular to subrounded; moist sample; contains quartz, feldspar, mica and amphibole.

SAND (SP): pale olive (5Y 6/3), 95% medium to coarse grained sand, subangular to subrounded; 5% silt; moist sample; contains quartz, feldspar, mica and amphibole.

285

SAND (SP): pale olive (5Y 6/3), 95% medium to coarse grained sand; 5% clay, light gray and olive gray clay clasts/balls; moist sample; contains quartz, feldspar, mica and amphibole.

SAND (SP): yellowish brown (10YR 5/4), 90% fine to medium grained sand, subangular to subrounded, <2% coarse grain dark minerals; 5% fine gravel up to 4.8 mm, subangular to subrounded, trace red gravel; 5% silt; moist sample; contains quartz, feldspar, mica and amphibole; yellowish-brown coarse grain chert. — GRAB

290

SANDY SILT (ML): dark yellowish brown (10YR 4/4), 70% silt; 30% fine grained sand, subangular to subrounded, water film on sand grains; moist sample; contains feldspar, mica and amphibole; yellowish-brown and gray mottling.

SAND (SP): light olive brown (2.5Y 5/6), 100% fine to medium grained sand, <1% dark minerals, yellowish-brown grains; trace fine gravel up to 13 mm; trace silt; poorly sorted; contains quartz, feldspar, mica and amphibole.

295

SAND WITH GRAVEL (SP): light olive brown (2.5Y 5/6), 70% fine to medium grained sand, angular to rounded; 30% fine to coarse gravel up to 75 mm, angular to rounded; poorly sorted; moist sample; contains quartz, feldspar, mica and amphibole; faint imbrications, armored pebbles, granitic, tuff, siliceous shale, and chert. — SIEVE

SAND (SP): light olive brown (2.5Y 5/6), 100% fine to medium grained sand, <1% dark minerals, yellowish-brown grains; trace fine gravel up to 13 mm; trace silt; poorly sorted; contains quartz, feldspar, mica and amphibole.

300

SAND WITH GRAVEL (SW): light olive brown (2.5Y 5/6), 80% fine to coarse grained sand, subangular to subrounded; 15% fine to coarse gravel up to 19 mm, subangular to subrounded; 5% clay; poorly sorted; moist sample; contains quartz, mafic gravel, and other; granitic.

GRAVEL WITH SAND (GW): light olive brown (2.5Y 5/6), 80% fine to coarse gravel up to 38 mm, subrounded; 20% fine to medium grained sand, subrounded; trace silt; trace clay; poorly sorted; contains quartz, feldspar, mica and amphibole.

305

SILTY SAND (SM): dark yellowish brown (10YR 4/4), 80% fine grained sand, subangular to subrounded; 20% silt; well sorted; contains quartz, feldspar, mica, amphibole, granite, tuff, chert, and siliceous shale.

SAND (SP): light olive brown (2.5Y 5/4), 100% fine to medium grained sand, subangular, poorly graded; trace fine gravel up to 6 mm, subangular; trace clay, dark gray clay balls; poorly sorted; contains quartz, feldspar, mica, amphibole, granite, chert, and siliceous shale.

Bottom of borehole at 306 feet.

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

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

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BOREHOLE LITHOLOGIC LOG

BOREHOLE NAME **CX-B2**			
CLIENT	California American Water	LOCATION **Marina, CA**	
PROJECT NUMBER	13017-13	**CEMEX Lapis Plant**	
REPORT DATE	5/23/2014	**36° 42' 46.2636", -121° 48' 13.4316"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY **N. Reynolds**	
DRILLER	Jose Munguia		

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

Depth bgs (feet) | GAMMA (GAPI) 0–110 | CLID (mmho/m) 1500–0 | 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)	Description
	SAND (SP): light olive brown (2.5Y 5/4), 100% fine to medium grained sand, subangular to rounded; trace fine to coarse gravel up to 28 mm, rounded; trace silt; poorly sorted; contains quartz, feldspar and amphibole; shell fragments.
	SILT (ML): light olive brown (2.5Y 5/3), 90% silt; 10% fine grained sand, subangular to subrounded; moderate cementation; decomposing minerals, shell fragments.
5	SAND (SP): light olive brown (2.5Y 5/4), 95% fine to medium grained sand, subangular to subrounded, predominantly fine; 5% silt; well sorted; contains quartz, feldspar and amphibole.
10	SAND (SP): brown (7.5YR 4/4), 95% fine to medium grained sand, subangular to subrounded; 5% silt; medium sorted; contains quartz, feldspar and amphibole.
	SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subangular to subrounded, predominantly fine; medium sorted; contains quartz, feldspar and amphibole.
15	
	SAND (SP): olive (5Y 5/3), 100% fine to medium grained sand, subangular to subrounded, predominantly fine; well sorted; contains quartz, feldspar and amphibole.
20	
	SANDY SILT (ML): olive (5Y 5/3), 70% silt; 30% fine to medium grained sand, subangular to subrounded; contains quartz, feldspar and amphibole; interbed.
	SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar and amphibole; gray interbeds.
25	
	SAND (SP): olive (5Y 5/3), 100% fine to medium grained sand, subangular to subrounded, predominantly fine; well sorted; contains quartz, feldspar and amphibole.
30	SILTY SAND (SM): gray (5Y 5/1), 85% fine grained sand, subangular to subrounded; 15% silt; medium sorted; dry sample; contains quartz, feldspar and amphibole; ; powdery.
	SAND (SP): light yellowish brown (2.5Y 6/4), 100% medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar and amphibole.
35	SAND (SW): light yellowish brown (2.5Y 6/4), 100% fine to coarse grained sand, subangular to subrounded, predominantly medium to coarse; poorly sorted; contains quartz, feldspar, mica and amphibole.
40	
45	
50	

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

Geoscience Support Services, Inc.

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

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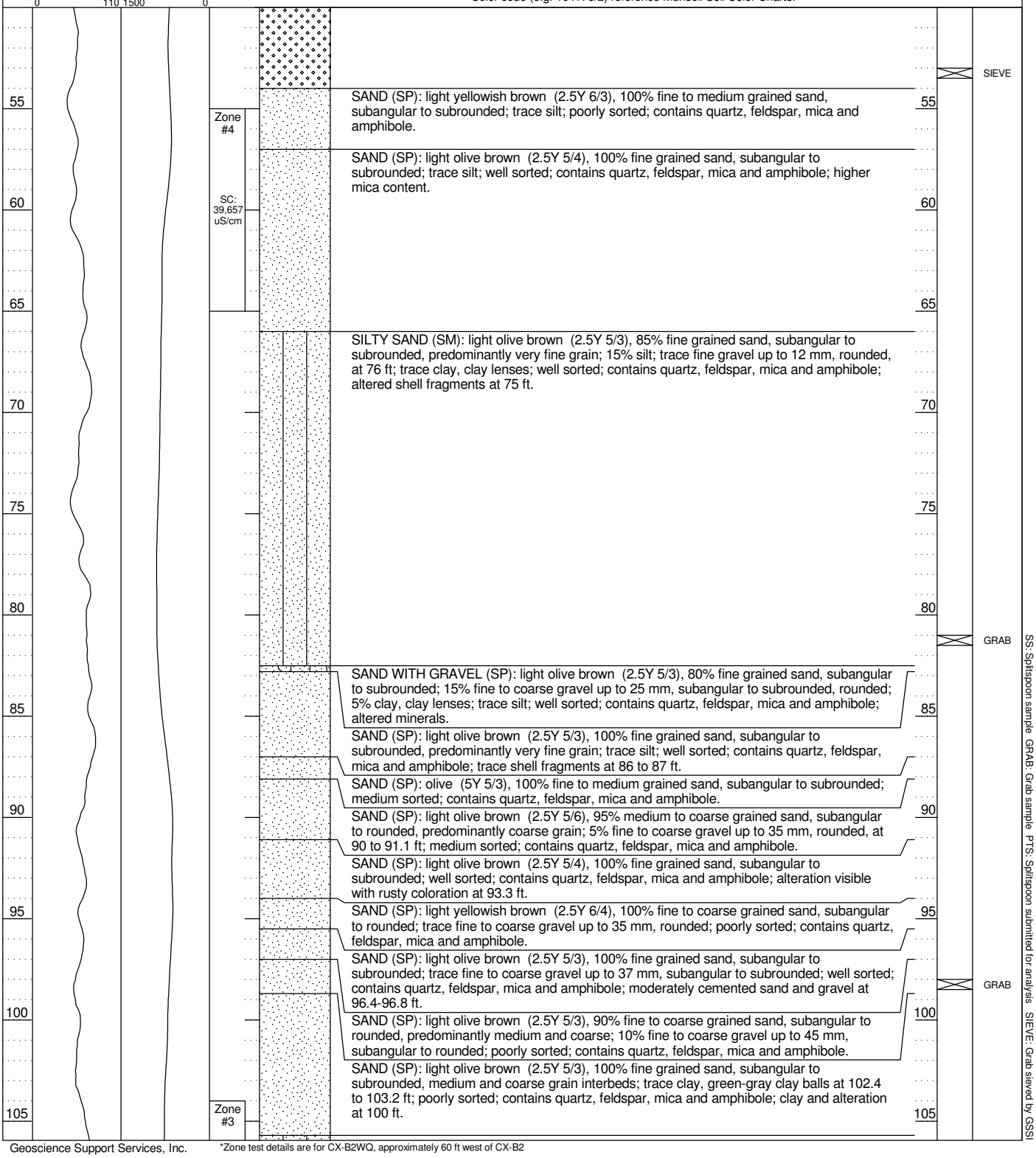
BOREHOLE NAME
CX-B2

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | GAMMA (GAPI) 0 110 | CLID (mmho/m) 1500 0 | Zone Test | Graphic Log | Lithologic Log | Depth bgs (feet) | Sample Type

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.



SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine to medium grained sand, subangular to subrounded; trace silt; poorly sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): light olive brown (2.5Y 5/4), 100% fine grained sand, subangular to subrounded; trace silt; well sorted; contains quartz, feldspar, mica and amphibole; higher mica content.

SILTY SAND (SM): light olive brown (2.5Y 5/3), 85% fine grained sand, subangular to subrounded, predominantly very fine grain; 15% silt; trace fine gravel up to 12 mm, rounded, at 76 ft; trace clay, clay lenses; well sorted; contains quartz, feldspar, mica and amphibole; altered shell fragments at 75 ft.

SAND WITH GRAVEL (SP): light olive brown (2.5Y 5/3), 80% fine grained sand, subangular to subrounded; 15% fine to coarse gravel up to 25 mm, subangular to subrounded, rounded; 5% clay, clay lenses; trace silt; well sorted; contains quartz, feldspar, mica and amphibole; altered minerals.

SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded, predominantly very fine grain; trace silt; well sorted; contains quartz, feldspar, mica and amphibole; trace shell fragments at 86 to 87 ft.

SAND (SP): olive (5Y 5/3), 100% fine to medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): light olive brown (2.5Y 5/6), 95% medium to coarse grained sand, subangular to rounded, predominantly coarse grain; 5% fine to coarse gravel up to 35 mm, rounded, at 90 to 91.1 ft; medium sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): light olive brown (2.5Y 5/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole; alteration visible with rusty coloration at 93.3 ft.

SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to coarse grained sand, subangular to rounded; trace fine to coarse gravel up to 35 mm, rounded; poorly sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded; trace fine to coarse gravel up to 37 mm, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole; moderately cemented sand and gravel at 96.4-96.8 ft.

SAND (SP): light olive brown (2.5Y 5/3), 90% fine to coarse grained sand, subangular to rounded, predominantly medium and coarse; 10% fine to coarse gravel up to 45 mm, subangular to rounded; poorly sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded, medium and coarse grain interbeds; trace clay, green-gray clay balls at 102.4 to 103.2 ft; poorly sorted; contains quartz, feldspar, mica and amphibole; clay and alteration at 100 ft.

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

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BOREHOLE NAME
CX-B2

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | Sample Type

SILTY SAND (SM): light olive brown (2.5Y 5/3), 85% fine grained sand, subangular to subrounded, very fine grain; 15% silt; well sorted; contains quartz, feldspar, mica and amphibole; shell fragments at 114.2 and 115.8 ft.

SIEVE

SAND WITH GRAVEL (SP): olive brown (2.5Y 4/4), 70% fine to coarse grained sand, subangular to rounded; 30% fine to coarse gravel up to 30 mm, rounded; poorly sorted; contains quartz, feldspar, mica and amphibole.

CLAY (CL): olive (5Y 5/3), 100% clay, high plasticity; trace coarse gravel up to 55 mm, at 119-120 ft; alteration visible with rusty coloration at 121 to 121.6 ft.

SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine to medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar, mica and amphibole.

GRAB

SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole.

SIEVE

CLAYEY SAND (SC): light yellowish brown (2.5Y 6/4), 75% fine grained sand, subangular to subrounded; 25% clay, clay lenses; well sorted; weak cementation; contains quartz, feldspar, mica and amphibole; with visible alteration.

SILTY SAND (SM): light olive brown (2.5Y 5/4), 85% fine grained sand, subangular to subrounded; 15% silt; trace fine to coarse gravel up to 55 mm, well rounded, at 143.8 ft; trace clay, clay lenses; well sorted; contains quartz, feldspar, mica and amphibole.

SAND WITH CLAY (SP-SC): light olive brown (2.5Y 5/3), 85% fine to medium grained sand, subangular to subrounded, trace coarse; 10% clay, clay chips; 5% fine gravel up to 19 mm, subangular to subrounded; medium sorted; contains quartz, feldspar, mica and amphibole; with visible alteration; complex sample.

SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole; trace 40 mm cemented sand piece at 149.8 ft.

SAND (SP): light olive brown (2.5Y 5/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole.

GRAB

SAND (SP): dark yellowish brown (10YR 4/6), 100% fine grained sand, subangular to subrounded, cemented sand balls; trace clay; well sorted; contains quartz, feldspar, mica and amphibole; alteration visible with rusty coloration at 153.3 ft.

SILTY SAND (SM): yellowish brown (10YR 5/4), 70% fine grained sand, subangular to subrounded; 30% silt; well sorted; contains quartz, feldspar and amphibole.

CLAY (CL): light olive brown (2.5Y 5/3), 100% clay, high plasticity; very dense.

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

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BOREHOLE NAME **CX-B2**

BOREHOLE LITHOLOGIC LOG (continued)

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

Zone Test: Zone #2 — SC: 21,620 uS/cm; Zone #1

Graphic Log

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.

SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole.

CLAY WITH SAND (CL): light olive brown (2.5Y 5/3), 85% clay, medium plasticity; 15% fine grained sand, subangular to subrounded; contains quartz, feldspar and mica; some rust colored alteration; moderate cementation.

SAND WITH CLAY (SP-SC): light yellowish brown (2.5Y 6/3), 90% fine grained sand, subangular to subrounded; 10% clay; trace fine gravel up to 14 mm, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole.

CLAYEY SAND (SC): brown (10YR 4/3), 70% fine grained sand, subangular to subrounded; 30% clay; well sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): yellowish brown (10YR 5/4), 100% fine grained sand, subangular to subrounded, predominantly very fine grain; trace silt; well sorted; contains quartz, feldspar, mica and amphibole; with visible alteration.

SANDY CLAY (CL): dark yellowish brown (10YR 4/4), 60% clay, low plasticity, soft; 40% fine grained sand, subangular to subrounded; wet sample; contains quartz, feldspar and amphibole; trace cemented sandy clay balls.

SANDY CLAY (CL): light olive brown (2.5Y 5/4), 60% clay, no plasticity, hard/dense; 40% fine grained sand, subangular to subrounded; moderate cementation; contains quartz, feldspar and amphibole; some visible alteration.

SAND (SP): light olive brown (2.5Y 5/3) and brown (7.5YR 4/4), 100% fine grained sand, subangular to subrounded; trace silt; well sorted; contains quartz, feldspar, mica and amphibole; with visible alteration; transition from olive to brown; laminations.

SANDY CLAY (CL): strong brown (7.5YR 4/6), 70% clay, hard; 30% fine grained sand, subangular to subrounded; moderate cementation; contains quartz, feldspar, mica and amphibole; rust colored alteration/laminations.

CLAY (CL): light yellowish brown (2.5Y 6/3) and olive gray (5Y 4/2), 100% clay; with visible alteration; 1 in. dark reddish gray layer at 212.2 ft.

SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine to medium grained sand, subangular to rounded; trace fine to coarse gravel up to 48 mm, rounded, at 218 ft; trace clay; poorly sorted; contains quartz, feldspar, mica and amphibole.

Depth bgs (feet): 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215

Sample Type: GRAB, SIEVE, SS, PTS, SS

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

Geoscience Support Services, Inc.

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

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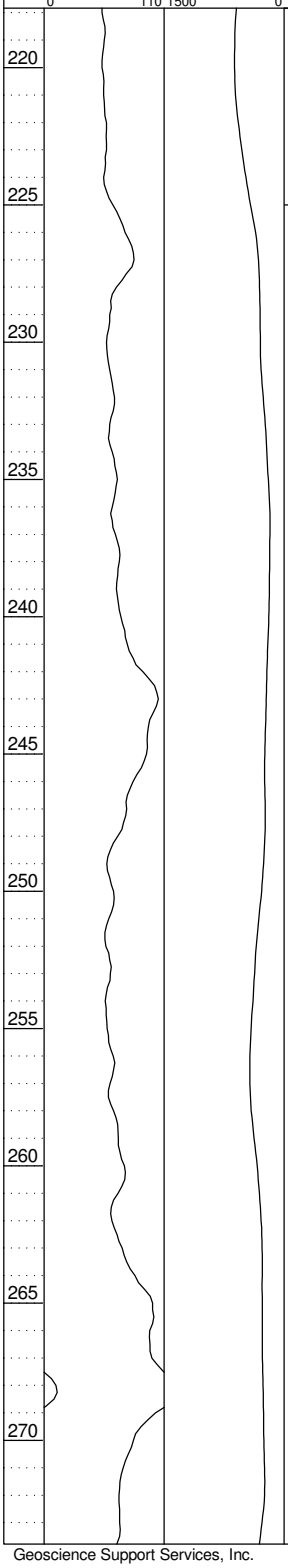
BOREHOLE NAME **CX-B2**

BOREHOLE LITHOLOGIC LOG (continued)

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



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.

Depth bgs (feet) | Sample Type

220–225: SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine to coarse grained sand, angular to subrounded; trace fine to coarse gravel up to 23 mm, rounded; poorly sorted; contains quartz, feldspar, mica and amphibole; trace rounded cobbles up to 80 mm at 223.8 ft.

225–230: SILT (ML): light olive brown (2.5Y 5/4), 100% silt, dense; trace fine grained sand, subangular to subrounded; contains mica; with visible alteration.

230–235: CLAY (CL): light olive brown (2.5Y 5/3), 100% clay, no plasticity, dense.

235–240: SILT (ML): olive gray (5Y 5/2), 100% silt; trace fine grained sand, subangular to subrounded; trace clay; thin interbeds of clay and fine sand.

240–245: CLAY (CL): olive (5Y 5/3), 100% clay, very dense.

245–250: CLAY (CL): dark greenish gray (10Y 4/1) and greenish black (10Y 2.5/1), 100% clay, very dense; the blue clay.

250–255: CLAY (CL): olive (5Y 5/3), 100% clay, very dense; many thin rust colored laminations.

SAND (SP): olive (5Y 5/3), 100% fine to medium grained sand, subangular to subrounded, trace cemented sand balls to 19 mm; trace fine gravel up to 9 mm, subangular to subrounded; medium sorted; contains quartz, feldspar, mica and amphibole; rusty alteration points.

SANDY CLAY (CL): olive gray (5Y 5/2), 70% clay; 30% fine grained sand, subangular to subrounded, interbedded; moderate cementation; contains quartz, feldspar, mica and amphibole; with visible alteration; rust colored alteration.

SAND WITH GRAVEL (SP): light olive brown (2.5Y 5/4), 70% fine to coarse grained sand, subangular to subrounded; 30% fine to coarse gravel up to 45 mm, well rounded; trace clay, clay balls; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; weakly cemented sand with gravel, some alteration.

SAND (SP): light yellowish brown (2.5Y 6/3), 100% medium to coarse grained sand, subangular to subrounded; trace fine to coarse gravel up to 19 mm, well rounded; poorly sorted; contains quartz, feldspar and amphibole.

255–265: CLAY (CL): olive gray (5Y 5/2), 100% clay, no plasticity, very dense; alteration visible with rusty coloration at 257 to 261 ft.

260 — PTS

265–270: CLAY (CL): very dark greenish gray (5GY 3/1), 100% clay, no plasticity, dense; friable.

SS

CLAY (CL): olive gray (5Y 5/2) and dark gray (5Y 4/1), 100% clay, no plasticity, dense; some alteration, especially at sand/clay interface.

270–SIEVE: SAND (SW): olive (5Y 5/3), 90% fine to coarse grained sand, subangular to rounded; 10% fine to coarse gravel up to 54 mm, well rounded; poorly sorted; wet sample; contains quartz, feldspar, mica, amphibole, and other.

SIEVE

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BOREHOLE NAME
CX-B2

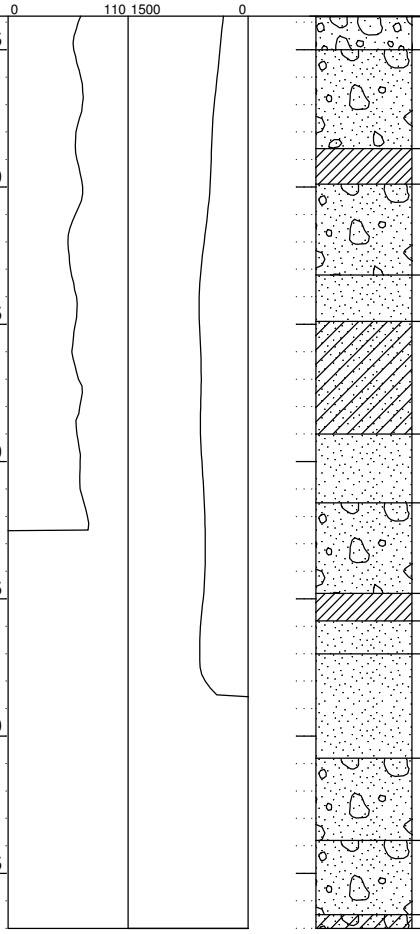
BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | GAMMA (GAPI) 0 110 | CLID (mmho/m) 1500 0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type



Depth bgs (feet)	Description	Sample Type
275	GRAVEL WITH SAND (GP): light yellowish brown (2.5Y 6/3), 70% fine to coarse gravel up to 72 mm, well rounded, predominantly coarse; 30% fine to coarse grained sand, subangular to rounded; poorly sorted; wet sample; contains quartz, feldspar, mica, amphibole, and other; includes well rounded quartz gravel.	
	SAND WITH CLAY AND GRAVEL (SP-SC): light olive brown (2.5Y 5/3), 75% fine to coarse grained sand, subangular to rounded, predominantly medium to coarse grain; 15% fine to coarse gravel up to 52 mm, well rounded; 10% clay; poorly sorted; wet sample; contains quartz, feldspar, mica, amphibole, and other; with some visible alteration.	
280	CLAY (CL): light olive brown (2.5Y 5/3), 100% clay, medium plasticity; trace fine to coarse gravel up to 22 mm, subangular to rounded, interbeds.	GRAB
	SAND WITH CLAY AND GRAVEL (SP-SC): light yellowish brown (2.5Y 6/3), 75% fine to medium grained sand, subangular to rounded; 15% fine to coarse gravel up to 58 mm, well rounded; 10% clay; poorly sorted; contains quartz, feldspar, mica, amphibole and other; transition of sand with trace gravel and clay to sand with clay and gravel.	
285	SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine to medium grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica, amphibole and other.	
	CLAYEY SAND (SC): light yellowish brown (2.5Y 6/3), 75% fine to coarse grained sand, subangular to subrounded; 15% clay, clay balls; 10% fine to coarse gravel up to 40 mm, well rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; 5 in. sandy clay layers at 286.6 and 288.3 ft.	
290	SAND (SP): light yellowish brown (2.5Y 6/3), 85% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 28 mm, well rounded; 5% clay, clay balls; poorly sorted; contains quartz, feldspar, mica, amphibole and other.	
	SAND WITH CLAY AND GRAVEL (SP-SC): light olive brown (2.5Y 5/3), 65% fine to coarse grained sand, subangular to subrounded, predominantly medium to coarse grained; 25% fine to coarse gravel up to 60 mm, well rounded; 10% clay, clay/sandy clay balls; trace cobbles up to 80mm; poorly sorted; moderate cementation; contains quartz, feldspar, mica, amphibole and other; with visible alteration.	
295	CLAY (CL): light olive brown (2.5Y 5/4), 100% clay, medium plasticity; dense brown clay.	
	SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine to medium grained sand, subangular to subrounded; trace fine gravel up to 17 mm, subangular to subrounded; medium sorted; contains quartz, feldspar, mica, amphibole and other.	
300	SAND (SP): light yellowish brown (2.5Y 6/4), 90% fine to coarse grained sand, subangular to rounded; 10% fine to coarse gravel up to 50 mm, well rounded; trace cobbles up to 80mm; poorly sorted; contains quartz, feldspar, mica, amphibole and other; with visible alteration.	
	SAND WITH GRAVEL (SP): pale yellow (2.5Y 7/4), 85% coarse grained sand, subrounded to well rounded, trace medium grain; 15% fine to coarse gravel up to 26 mm, well rounded; medium sorted; wet sample; contains quartz, feldspar, mica, amphibole and other.	GRAB
305	SAND WITH GRAVEL (SP): olive gray (5Y 4/2), 80% coarse grained sand, subrounded to rounded; 20% fine to coarse gravel up to 43 mm, well rounded; medium sorted; wet sample; contains quartz, feldspar, mica, amphibole and other.	
	CLAYEY SAND WITH GRAVEL (SC): light yellowish brown (2.5Y 6/4), 70% fine to coarse grained sand, subangular to rounded; 15% fine to coarse gravel up to 45 mm, rounded; 15% clay, clay balls; poorly sorted; wet sample; contains quartz, feldspar, mica, amphibole and other.	
	Bottom of borehole at 307 feet.	

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

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BOREHOLE LITHOLOGIC LOG

BOREHOLE NAME **CX-B3**			
CLIENT	California American Water	LOCATION **Marina, CA**	
PROJECT NUMBER	13017-13	**CEMEX Lapis Plant**	
REPORT DATE	5/23/2014	**36° 42' 43.1316", -121° 47' 59.9316"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY **N. Reynolds**	
DRILLER	Jose Munguia		

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

Lithologic Log

Depth bgs (feet) | GAMMA (GAPI) 0–110 | CLID (mmho/m) 1500–0 | 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)	Description	Sample Type
	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.	
	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.	
	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.	
	SILT WITH SAND (ML): light gray (5Y 7/2), 85% silt; 15% fine grained sand, subrounded; dry sample/powdery.	
	SAND (SP): pale yellow (2.5Y 7/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole.	
	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.	
	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.	
	SILT (ML): light gray (5Y 7/2), 100% silt; trace fine grained sand; dry sample; powdery.	
	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.	
	SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine grained sand, subangular to subrounded, trace medium grained; well sorted; contains quartz, feldspar, mica and amphibole.	SIEVE

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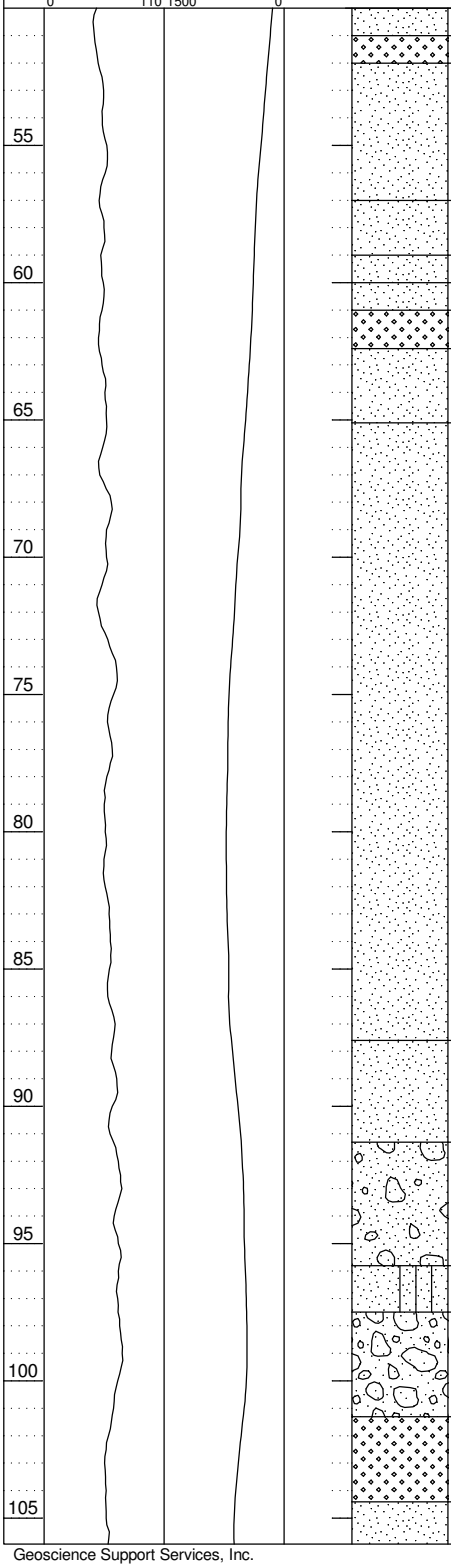
BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME	CLIENT	LOCATION
CX-B3	California American Water	Marina, CA
	PROJECT NUMBER 13017-13	



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.

Depth bgs (feet) | Sample Type

SAND (SW): light yellowish brown (2.5Y 6/4), 100% fine to coarse grained sand, subangular to rounded; poorly sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subangular to subrounded, predominantly fine grained; medium sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine to coarse grained sand, subrounded to rounded, predominantly medium to coarse grained; trace fine gravel up to 15 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND (SP): light olive brown (2.5Y 5/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole.

SAND (SW): light yellowish brown (2.5Y 6/3), 100% fine to coarse grained sand, subrounded to rounded; trace fine gravel up to 15 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND (SP): light olive brown (2.5Y 5/4), 100% fine grained sand, subangular to subrounded, trace medium grained; medium sorted; contains quartz, feldspar, mica and amphibole; higher mica content.

SAND (SP): light olive brown (2.5Y 5/3), 95% fine grained sand, subrounded, very fine grained; 5% silt; well sorted; contains quartz, feldspar, mica and amphibole; higher mica content.

GRAB

SAND (SP): olive yellow (2.5Y 6/6), 95% fine to medium grained sand, subrounded to rounded; 5% silt; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND WITH GRAVEL (SP): light yellowish brown (2.5Y 6/4), 75% medium to coarse grained sand, subrounded to rounded, trace fine grained; 20% fine to coarse gravel up to 32 mm, rounded; 5% clay, sandy clay balls; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND WITH SILT (SP-SM): light yellowish brown (2.5Y 6/4), 90% fine grained sand, subangular to subrounded; 10% silt, silty sand balls; well sorted; contains quartz, feldspar, mica and amphibole; with visible alteration.

GRAVEL WITH SAND (GP): light yellowish brown (2.5Y 6/4), 60% fine to coarse gravel up to 48 mm, rounded; 40% medium to coarse grained sand, subrounded to rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND (SW): light yellowish brown (2.5Y 6/4), 100% fine to coarse grained sand, subrounded to rounded; trace fine gravel up to 10 mm, subrounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

GRAB

SAND (SP): light olive brown (2.5Y 5/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica, amphibole, and other, with some

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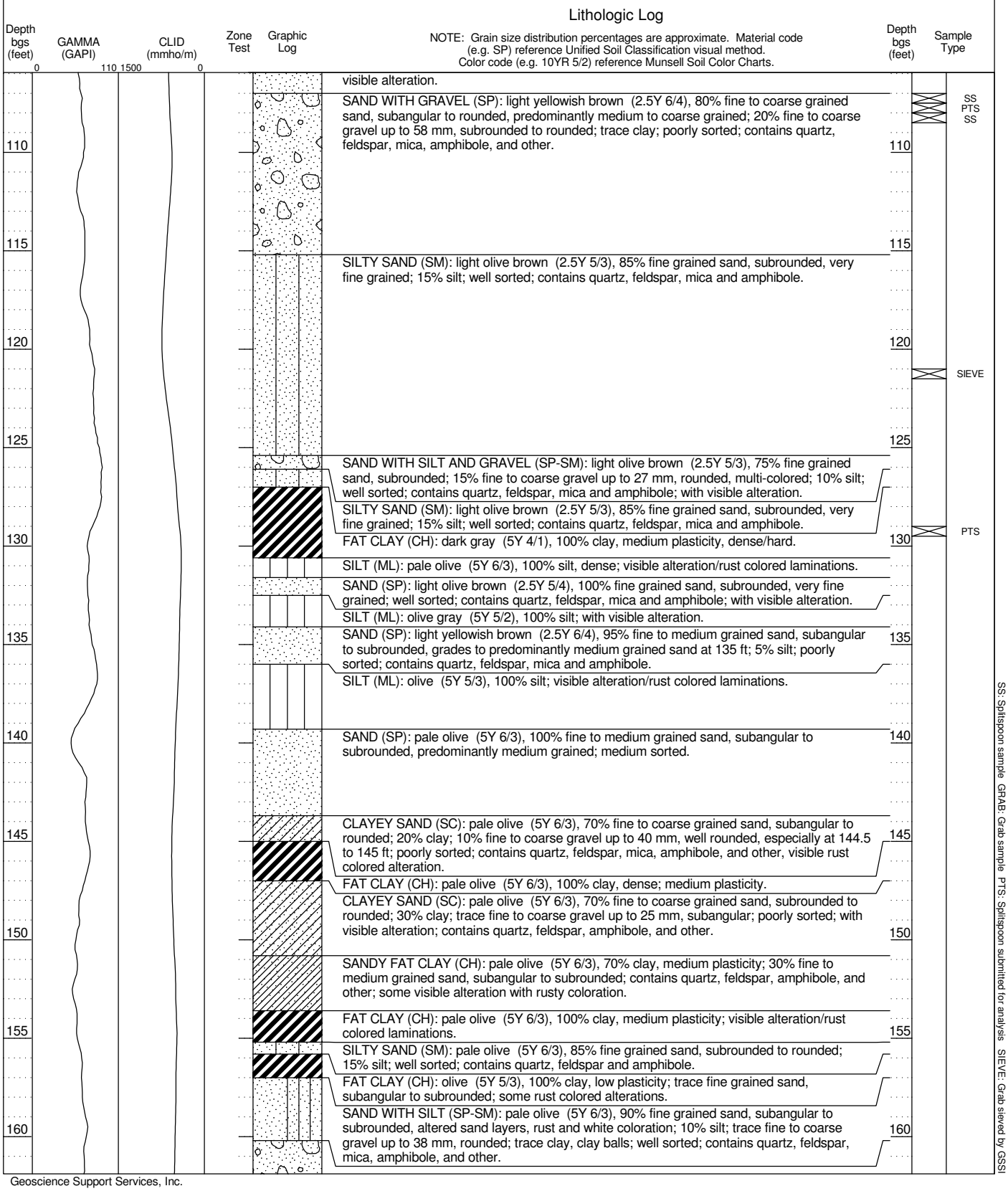
BOREHOLE NAME
CX-B3

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

Depth bgs (feet) | GAMMA (GAPI) 0 110 | CLID (mmho/m) 1500 0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type

SAND WITH CLAY AND GRAVEL (SW-SC): yellowish brown (10YR 5/4), 75% fine to coarse grained sand, subangular to rounded; 15% fine to coarse gravel up to 68 mm, rounded; 10% clay; poorly sorted; contains quartz, feldspar and amphibole; visible alteration of sands.

SAND (SP): strong brown (7.5YR 5/8), 85% medium to coarse grained sand, subrounded to rounded, predominantly coarse grained; 10% fine to coarse gravel up to 28 mm, rounded; 5% clay; poorly sorted; contains quartz, feldspar, amphibole, and other; bright rust colored alteration.

SAND WITH CLAY AND GRAVEL (SP-SC): pale olive (5Y 6/3), 75% medium to coarse grained sand, subangular to rounded; 15% fine to coarse gravel up to 36 mm, rounded; 10% clay; poorly sorted; contains quartz, feldspar, amphibole, and other; contains altered sands.

CLAY (CL): light yellowish brown (2.5Y 6/4), 95% clay, low plasticity; 5% fine to coarse gravel up to 42 mm, subrounded to rounded, interbedded; trace medium grained sand, subrounded to rounded.

SAND (SP): pale olive (5Y 6/3), 100% fine to medium grained sand, subangular to subrounded; trace fine to coarse gravel up to 40 mm, subrounded to rounded; trace clay; poorly sorted; contains quartz, feldspar, amphibole, and other, with visible alteration; trace weakly cemented sands.

CLAY WITH GRAVEL (CL): pale olive (5Y 6/3), 85% clay; 10% fine to coarse gravel up to 50 mm, subangular to rounded; 5% fine grained sand, subangular to subrounded; fine sand alteration of minerals/rock.

CLAYEY SAND WITH GRAVEL (SC): pale olive (5Y 6/3), 70% fine to coarse grained sand, subangular to subrounded; 15% fine to coarse gravel up to 75 mm, rounded; 15% clay, clay balls; poorly sorted; well graded; contains quartz, feldspar, amphibole, and other; visible alteration of minerals/rock.

SANDY CLAY (CL): pale olive (5Y 6/3), 70% clay; 25% fine to coarse grained sand, subangular to subrounded; 5% fine to coarse gravel up to 25 mm, subrounded to rounded; contains quartz, feldspar, amphibole, and other, visible alteration with rusty coloration.

CLAYEY SAND WITH GRAVEL (SC): pale olive (5Y 6/3), 70% fine to coarse grained sand, subangular to subrounded; 15% fine to coarse gravel up to 33 mm, subrounded to rounded; 15% clay; poorly sorted; well graded; contains quartz, feldspar, amphibole, and other; moderately cemented sand layer at 178.2-178.7 ft.

GRAVELLY SILT (ML): light yellowish brown (2.5Y 6/3), 60% silt; 30% fine to coarse gravel up to 70 mm, rounded, coarse grained at 179.6 ft; 10% fine grained sand, subangular to subrounded; moderately cemented sand and gravel layer at 180.8-181.8 ft; contains quartz, feldspar, amphibole, and other.

SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subangular to subrounded, predominantly medium grained; trace fine gravel up to 18 mm, rounded; trace clay, clay lens; medium sorted; contains quartz, feldspar, amphibole, and other; rust colored alteration of sands at 186.8 to 187.3 ft.

CLAY (CL): olive (5Y 5/3), 100% clay, low plasticity; trace fine grained sand, subangular to subrounded; some alteration visible with rusty coloration.

SANDY CLAY (CL): pale olive (5Y 6/3), 70% clay, low plasticity; 30% fine to coarse grained sand, subangular to subrounded; trace fine to coarse gravel up to 30 mm, subangular to subrounded; contains quartz, feldspar, mica, amphibole, and other, with visible alteration.

CLAY (CL): olive (5Y 5/3), 100% clay, low plasticity, dense; with visible rust colored alteration.

SAND (SP): yellowish brown (10YR 5/4), 95% fine grained sand, subangular to subrounded; 5% silt; well sorted; contains quartz, feldspar and amphibole.

SAND (SP): dark yellowish brown (10YR 4/4), 95% fine grained sand, subangular to subrounded; 5% silt; well sorted; contains quartz, feldspar and amphibole.

SAND (SP): brown (7.5YR 4/3), 95% fine grained sand, subangular to subrounded; 5% silt; well sorted; contains quartz, feldspar and amphibole.

SAND (SP): dark brown (10YR 3/3), 95% fine grained sand, subangular to subrounded; 5% silt; well sorted; contains quartz, feldspar and amphibole.

SAND (SP): dark grayish brown (10YR 4/2), 95% fine grained sand, subangular to

Depth bgs (feet): 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215

Sample Type: SS, PTS, SS; SS, PTS; GRAB

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

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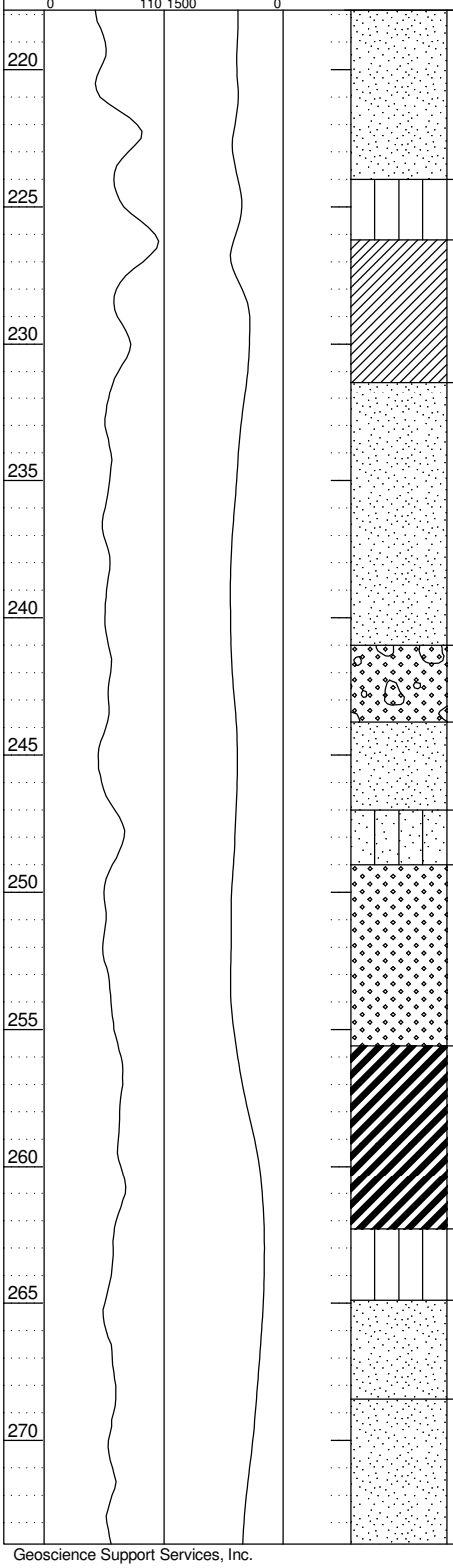
BOREHOLE NAME
CX-B3

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | GAMMA (GAPI) 0 110 | CLID (mmho/m) 1500 0 | Zone Test | Graphic Log | Lithologic Log | Depth bgs (feet) | Sample Type

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.



subrounded; 5% silt; well sorted; contains quartz, feldspar and amphibole; with some visible alteration; cementation at 219 and 224 ft.

220

SILT (ML): dark brown (10YR 3/3), 95% silt; 5% fine grained sand, subangular to subrounded.

225

CLAY (CL): olive (5Y 5/3), 100% clay, no plasticity, dense; alteration visible with rust colored laminations below 230 ft.

230

SAND (SP): pale olive (5Y 6/3), 90% fine to coarse grained sand, subangular to subrounded, predominantly medium grained; 10% fine to coarse gravel up to 70 mm, rounded, interbedded; poorly sorted; contains quartz, feldspar, mica and amphibole; gravel layers at 237, 237.8, and 238.6 to 239.7 ft.

235

240 SIEVE

SAND WITH GRAVEL (SW): pale olive (5Y 6/3), 85% fine to coarse grained sand, subangular to rounded; 15% fine to coarse gravel up to 68 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; with visible alteration.

245

SAND (SP): dark grayish brown (2.5Y 4/2), 100% fine grained sand, subrounded; trace silt, cemented brown silt at 246.6 ft; well sorted; contains quartz, feldspar, amphibole, and other.

SANDY SILT (ML): olive (5Y 5/3), 70% silt; 30% fine grained sand, subangular to subrounded; with some visible rust colored alteration.

250

SAND (SW): pale olive (5Y 6/3), 85% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 42 mm, rounded; 5% clay; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; with some visible alteration; thin sandy clay layers.

255 GRAB

FAT CLAY (CH): pale olive (5Y 6/3), 100% clay, low plasticity, very dense; some darker fine laminations.

260

SILT (ML): pale olive (5Y 6/3), 100% silt; trace fine grained sand, subangular to subrounded; trace clay; silt with fine sand and altered sand and trace clay clasts from 262.8 to 263.9 ft; high mica content.

265

SAND (SP): olive (5Y 5/3), 100% fine to medium grained sand, subangular to subrounded; trace fine to coarse gravel up to 33 mm, rounded; medium sorted; contains quartz, feldspar, mica, amphibole, and other; visible rust colored alteration of sands at 268.5 ft(3in.).

270

SAND (SP): pale olive (5Y 6/3), 90% medium to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 50 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

GRAB

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BOREHOLE NAME
CX-B3

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | GAMMA (GAPI) 0 110 | CLID (mmho/m) 1500 0 | Zone Test | Graphic Log

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.

Depth bgs (feet) | Sample Type

275

SAND WITH CLAY AND GRAVEL (SW-SC): pale olive (5Y 6/3), 60% fine to coarse grained sand, subangular to subrounded; 30% fine to coarse gravel up to 62 mm, rounded; 10% clay; poorly sorted; weak cementation; contains quartz, feldspar, mica, amphibole, and other.

FAT CLAY (CH): olive gray (5Y 5/2), 100% clay, dense, medium plasticity.

280

FAT CLAY (CH): pale olive (5Y 6/3), 100% clay, dense, low plasticity; with visible rust colored alteration; mottled olive and grey coloration, predominantly olive.

FAT CLAY (CH): dark greenish gray (5GY 4/1), 100% clay, dense, medium plasticity; greenish blue, contains black charcoal-like laminations (powdery black), smoky smell, "blue clay". — SS

285

FAT CLAY (CH): olive (5Y 5/3), 100% clay, low plasticity; trace fine grained sand, subangular to subrounded; trace altered/decomposing sand and fine gravel; grades into clay with sand at 286.3 ft.

CLAYEY SAND (SC): pale olive (5Y 6/3), 70% fine to medium grained sand, subangular to subrounded, trace rounded coarse grained; 30% clay; trace fine gravel up to 18 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; with some visible alteration.

290

SAND (SW): pale olive (5Y 6/3), 85% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 45 mm, rounded; 5% clay; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; with some visible alteration. — SIEVE

295

SAND WITH CLAY (SW-SC): pale olive (5Y 6/3), 80% fine to coarse grained sand, subangular to subrounded, predominantly medium to coarse grained; 10% fine to coarse gravel up to 65 mm, subrounded to rounded; 10% clay; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; with visible alteration; clayey coarse gravel beds at 296.1, 298 to 298.9 ft.

300

SAND (SP): pale olive (5Y 6/3), 100% fine to medium grained sand, subangular to subrounded; trace fine to coarse gravel up to 28 mm, rounded; medium sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND (SP): very dark brown (10YR 2/2), 100% fine to medium grained sand, subangular to subrounded; trace fine gravel up to 16 mm, rounded; medium sorted; contains quartz, feldspar, mica, amphibole, and other; with visible alteration, altered to a dark brown.

305

CLAYEY SAND (SC): pale olive (5Y 6/3), 75% fine to medium grained sand, subangular to subrounded; 20% clay, clay balls; 5% fine to coarse gravel up to 72 mm, rounded, interbeds of large gravel; poorly sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): olive gray (5Y 4/2), 100% fine to medium grained sand, subangular to subrounded; trace fine to coarse gravel up to 29 mm, rounded; poorly sorted; contains quartz, feldspar, mica and amphibole; with visible alteration; 3 in. dark brown/altered sand at 308.7 ft.

310

GRAVELLY CLAY (CL): pale olive (5Y 6/3), 60% clay; 40% fine to coarse gravel up to 33 mm, rounded; trace fine grained sand, rounded; weak cementation; with visible alteration.

SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole. — SIEVE

SAND (SP): olive (5Y 5/3), 100% fine to coarse grained sand, subangular to subrounded, predominantly fine to medium grained; trace fine to coarse gravel up to 70 mm, subangular to subrounded, and rounded; poorly sorted; contains quartz, feldspar, mica and amphibole.

315

320

CLAYEY GRAVEL (GC): light olive brown (2.5Y 5/3), 60% fine to coarse gravel up to 52 mm, subangular to rounded, predominantly coarse, multicolored; 30% clay; 10% fine to coarse grained sand, subangular to subrounded; poorly sorted; weak to moderate cementation; contains quartz, feldspar, mica, amphibole, and other; with visible alteration.

SAND (SP): light olive brown (2.5Y 5/3), 95% fine to coarse grained sand, subangular to subrounded, predominantly medium grained; 5% clay; trace fine to coarse gravel up to 50 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

325

SAND WITH SILT (SP-SM): brown (10YR 5/3), 90% fine grained sand, subangular to subrounded; 10% silt; well sorted; contains quartz, feldspar and amphibole; similar to brown sands from 192 to 224 ft.

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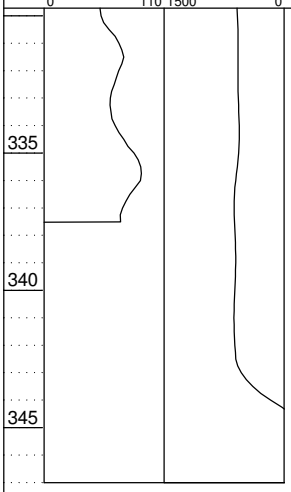
BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME	CLIENT	LOCATION
CX-B3	California American Water	Marina, CA
	PROJECT NUMBER 13017-13	



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.

SAND WITH SILT (SP-SM): dark yellowish brown (10YR 4/4), 90% fine grained sand, subangular to subrounded; 10% silt; well sorted; contains quartz, feldspar and amphibole; similar to brown sands from 192 to 224 ft.

SILT (ML): olive (5Y 5/3), 100% silt, very dense; weak to moderate cementation; with some visible rust colored alteration.

Bottom of borehole at 347 feet.

Depth bgs (feet)	Sample Type
335	GRAB
340	
345	

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BOREHOLE LITHOLOGIC LOG

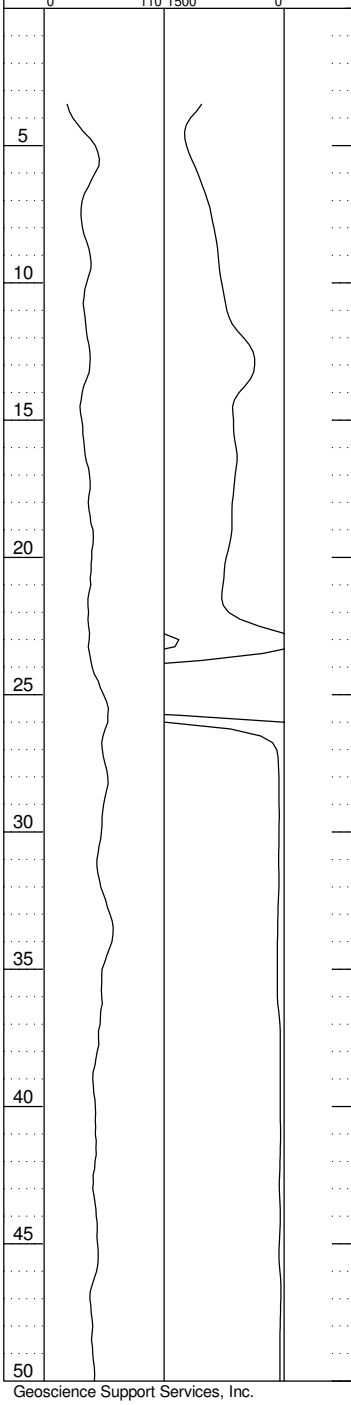
BOREHOLE NAME **CX-B4**			
CLIENT	California American Water	LOCATION **Marina, CA**	
PROJECT NUMBER	13017-13	**CEMEX Lapis Plant**	
REPORT DATE	5/23/2014	**36° 42' 42.1848", -121° 47' 55.2192"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY **N. Reynolds**	
DRILLER	Jose Munguia		

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

Lithologic Log

Depth bgs (feet) | GAMMA (GAPI) 0–110 | CLID (mmho/m) 1500–0 | 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)	Description	Sample Type
	SAND WITH GRAVEL (SP): light olive brown (2.5Y 5/3) and pale yellow (2.5Y 7/3), 65% fine to medium grained sand, subangular to rounded; 30% fine to coarse gravel up to 70 mm, subangular to rounded; 5% silt; medium sorted; contains quartz, feldspar and amphibole; trace cobbles; trace organics/roots.	
5	SAND (SP): very dark grayish brown (10YR 3/2), 95% fine grained sand, subrounded to rounded; 5% silt; trace fine to coarse gravel up to 52 mm, subrounded to rounded, at 8.5 ft bgs; well sorted; contains quartz, feldspar, amphibole and other.	
10	SAND (SP): pale yellow (5Y 7/4), 100% fine to medium grained sand, subangular to subrounded; trace silt, trace silt balls; medium sorted; contains quartz, feldspar, amphibole and other.	
15		
	SAND (SP): olive gray (5Y 4/2), 100% fine to medium grained sand, subangular to rounded; medium sorted; contains quartz, feldspar, amphibole and other.	
20	SAND (SP): pale yellow (5Y 7/4), 100% fine to medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar, amphibole and other.	
25		GRAB
	SAND (SP): light olive brown (2.5Y 5/3), 100% fine to medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar, amphibole and other.	
30	SAND (SP): light olive brown (2.5Y 5/4), 95% fine grained sand, subangular to subrounded; 5% silt, gray silt pieces; well sorted; contains quartz, feldspar, mica and amphibole.	
	SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar, amphibole and other.	
35	SAND (SP): light yellowish brown (2.5Y 6/3), 100% medium grained sand, subangular to subrounded, trace fine grained; trace silt; medium sorted; contains quartz, feldspar, mica, amphibole and other; trace weakly cemented olive silty sand layer from 37.5 to 37.8 ft bgs; coarser than above.	
40		
	SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine grained sand, subangular to subrounded; trace silt; well sorted; contains quartz, feldspar, mica and amphibole; trace thin olive/gray horizontal silt lenses at 42.1 ft bgs.	
45	SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subangular, predominantly medium grained, trace coarse grained; trace fine gravel up to 10 mm, subrounded; medium sorted; contains quartz, feldspar, mica, amphibole and other.	SIEVE
50		

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**

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.

Depth bgs (feet)	GAMMA (GAPI) 0 – 110	CLID (mmho/m) 1500 – 0	Zone Test	Graphic Log	Lithologic Log	Depth bgs (feet)	Sample Type
55					SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded, trace medium grained; well sorted; contains quartz, feldspar, mica and amphibole.	55	
					SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine to medium grained sand, subangular to rounded, trace coarse grained; medium sorted; contains quartz, feldspar, mica and amphibole.		SS
60			Zone #5		SAND (SP): olive (5Y 5/3), 100% fine grained sand, subangular to subrounded, fine to medium grained at 59 to 59.7 ft bgs; trace silt; well sorted; contains quartz, feldspar, mica and amphibole; higher mica content.	60	GRAB
			SC: 6,988 uS/cm		SAND (SP): olive (5Y 5/3), 100% fine to coarse grained sand, subangular to subrounded, predominantly coarse grained; poorly sorted; contains quartz, feldspar, mica and amphibole; higher mica content.		
65					SAND (SP): olive (5Y 5/3), 100% fine to medium grained sand, subangular to subrounded; trace silt; medium sorted; contains quartz, feldspar, mica and amphibole; higher mica content.	65	
					SAND (SP): olive (5Y 5/3), 100% fine to coarse grained sand, subangular to subrounded, predominantly coarse grained; poorly sorted; contains quartz, feldspar, mica and amphibole; higher mica content.		
70					SAND (SP): olive (5Y 5/3), 100% fine to coarse grained sand, subangular to subrounded, predominantly fine to medium grained, fine sand at 66.5 to 67 ft bgs; poorly sorted; contains quartz, feldspar, mica and amphibole.	70	
					SAND (SP): olive (5Y 5/3), 95% fine grained sand, subangular to subrounded, very fine grained, trace fine to medium grained interbeds; 5% silt; well sorted; contains quartz, feldspar, mica and amphibole; higher mica content; trace thin pink horizontal laminations.		SIEVE
75						75	
80						80	
85					SAND (SP): olive (5Y 5/3), 100% fine to coarse grained sand, subangular to subrounded; poorly sorted; contains quartz, feldspar, mica and amphibole; very high mica content.	85	
					SAND (SP): olive gray (5Y 5/2), 95% fine grained sand, subangular to subrounded, very fine grained; 5% silt; well sorted; contains quartz, feldspar, mica and amphibole.		
90					SAND (SP): light olive brown (2.5Y 5/6), 100% fine to medium grained sand, subangular to subrounded; trace fine gravel up to 11 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; orange colored alteration.	90	
95					SAND (SP): light yellowish brown (2.5Y 6/4), 95% medium to coarse grained sand, subangular to rounded, trace fine grained; 5% fine to coarse gravel up to 30 mm, rounded; trace silt; poorly sorted; contains quartz, feldspar, mica, amphibole and other; free water.	95	
100					SAND WITH GRAVEL (SP): pale yellow (2.5Y 7/3) and light yellowish brown (2.5Y 6/4), 80% fine to coarse grained sand, subangular to rounded, predominantly medium to coarse grained; 15% fine to coarse gravel up to 43 mm, rounded; 5% silt; poorly sorted; contains quartz, feldspar, mica, amphibole and other; chert, many mineral types; free water.	100	GRAB
105					SAND (SP): pale olive (5Y 6/3), 100% fine to medium grained sand, subangular to subrounded; trace fine to coarse gravel up to 23 mm, rounded; poorly sorted; contains	105	

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BOREHOLE NAME **CX-B4**

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | GAMMA (GAPI) 0 110 | CLID (mmho/m) 1500 0 | Zone Test | Graphic Log | Lithologic Log | Depth bgs (feet) | Sample Type

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.

quartz, feldspar, mica, amphibole and other.

SAND (SP): light yellowish brown (2.5Y 6/3), 90% fine to coarse grained sand, subangular to rounded; 10% fine to coarse gravel up to 30 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other.

110

Zone #4

SAND (SP): light olive brown (2.5Y 5/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole.

115

SC: 29,933 uS/cm

SAND (SP): light olive brown (2.5Y 5/4), 95% fine grained sand, subangular to subrounded, very fine grained; 5% silt; well sorted; contains quartz, feldspar, mica and amphibole.

SIEVE

120

SAND (SP): olive (5Y 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole; increase in olive coloration.

125

SILT (ML): pale olive (5Y 6/3), 95% silt; 5% fine grained sand, subangular to subrounded, highly altered, rust, tan and black from 124.1 to 124.9 ft bgs; low plasticity; thin rusty and black horizontal alteration/lamination.

SAND WITH SILT AND GRAVEL (SP-SM): pale olive (5Y 6/3), 75% fine grained sand, subangular to subrounded, fine grained grading to medium to coarse grained silty gravelly sand; 15% fine to coarse gravel up to 41 mm, rounded; 10% silt; poorly sorted; contains quartz, feldspar, mica and amphibole; highly altered at 127.5 ft bgs.

130

CLAY (CL): dark gray (5Y 4/1), 100% clay, medium plasticity, dense; trace thin rust colored horizontal lamination; highly altered at 129.2 ft bgs.

SILT WITH SAND (ML): olive (5Y 5/3), 80% silt, silt bed from 132.2 to 132.7 ft bgs; 20% fine grained sand, subangular to subrounded, very fine grained; contains quartz, feldspar and mica; trace thin rust colored horizontal alteration/lamination.

135

SAND (SP): pale olive (5Y 6/3), 100% fine grained sand, subangular to subrounded, grades to fine to medium grained; trace silt; poorly sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): olive (5Y 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole; highly altered/rust colored at 137.1 ft bgs.

FAT CLAY (CH): olive gray (5Y 5/2), 100% clay, high plasticity, dense; trace black and rust colored lamination; trace black ashy deposits.

140

SANDY CLAY (CL): pale olive (5Y 6/3), 60% clay, no plasticity; 40% fine grained sand, subangular to subrounded; contains quartz and feldspar; thin black and rust colored lamination.

FAT CLAY (CH): pale olive (5Y 6/3), 100% clay, high plasticity, dense; thin black and rust colored lamination.

SAND (SP): pale yellow (2.5Y 7/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; trace rust colored alteration.

145

SS

150

SANDY CLAY (CL): pale olive (5Y 6/3), 60% clay, no plasticity; 40% fine grained sand, subangular to subrounded; contains quartz and feldspar; thin black and rust colored lamination.

155

SAND (SP): pale olive (5Y 6/3), 95% fine to medium grained sand, subangular to subrounded; 5% silt; trace fine to coarse gravel up to 22 mm, subangular; poorly sorted; contains quartz, feldspar, mica and amphibole; 2.5 in. horizontal rusty/altered band at 154 ft bgs.

Zone #3

SAND WITH GRAVEL (SP): pale olive (5Y 6/3), 80% fine to coarse grained sand, subangular; rusty/altered from 160.4 to 160.7 ft bgs; 15% fine to coarse gravel up to 52 mm, subrounded to rounded; 5% clay; poorly sorted; contains quartz, feldspar, amphibole and other.

160

SC: 28,707 uS/cm

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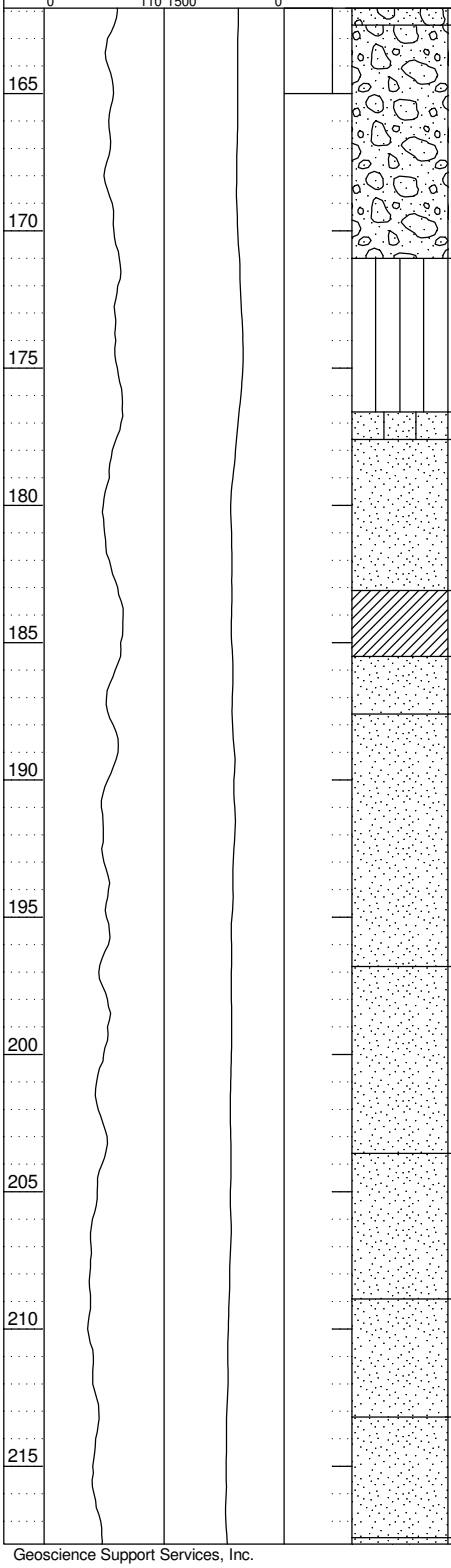
BOREHOLE NAME
CX-B4

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | Sample Type

165 — GRAVEL WITH CLAY AND SAND (GP-GC): pale olive (5Y 6/3), 60% fine to coarse gravel up to 60 mm, subrounded to rounded; 30% medium to coarse grained sand, subangular; 10% clay; trace cobbles; poorly sorted; contains quartz, feldspar, amphibole and other; trace round cobbles up to 85 mm at 163 to 166 ft bgs; many mineral types; trace rusty alteration.

GRAB

170 — SILT (ML): olive (5Y 5/3), 100% silt, very dense; friable; rust colored alteration and lamination.

175 — SILTY SAND (SM): pale olive (5Y 6/3), 85% fine grained sand, subangular to subrounded; 15% silt, from 177.3 to 177.6 ft bgs; no plasticity; well sorted; contains quartz, feldspar and amphibole.

180 — SAND (SP): light olive gray (5Y 6/2), 100% fine grained sand, subangular to subrounded, grades to fine to medium grained; trace fine gravel up to 18 mm, rounded; well sorted; contains quartz, feldspar, mica and amphibole; rusty alteration at 177.6 ft bgs.

185 — CLAY WITH SAND (CL): pale olive (5Y 6/3), 85% clay, low plasticity; 10% fine to medium grained sand, subangular to subrounded; 5% fine to coarse gravel up to 36 mm, rounded; contains quartz, mica and amphibole; clay with sand and gravel interbeds; weakly cemented clay and gravel at 183.5 ft bgs; trace rusty alteration/nodules.

SAND (SP): olive gray (5Y 5/2), 100% fine to medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): yellowish brown (10YR 5/6), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; start of "the brown sand".

190

SIEVE

195

200 — SAND (SP): dark yellowish brown (10YR 4/6), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; redder coloration than above.

205 — SAND (SP): dark yellowish brown (10YR 3/4), 95% fine grained sand, subangular to subrounded; 5% silt; well sorted; contains quartz, feldspar and amphibole; trace weakly cemented sands and sand nodules; mottled coloration.

210 — SAND (SP): brown (10YR 4/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole.

GRAB

215 — SAND (SP): strong brown (7.5YR 4/6), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; faint thin rusty horizontal lamination; more red.

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BOREHOLE NAME
CX-B4

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet)	GAMMA (GAPI) 0 – 110	CLID (mmho/m) 1500 – 0	Zone Test	Graphic Log	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.	Depth bgs (feet)	Sample Type
220					SAND (SP): grayish brown (2.5Y 5/2), 95% fine grained sand, subangular to subrounded; 5% silt; well sorted; contains quartz, feldspar and amphibole; weakly cemented sand and sand nodules at 220.0 to 220.3 ft bgs.	220	
					SAND (SP): olive brown (2.5Y 4/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; trace thin reddish horizontal laminations.		
225					SAND (SP): dark olive brown (2.5Y 3/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; darker color/more black minerals.	225	
230					SILT (ML): pale olive (5Y 6/3), 100% silt, very dense; less dense from 233.4 to 234.1 ft bgs; low plasticity; rusty/highly altered at 228.6 to 229.3 ft bgs; trace thin black horizontal lamination especially at 232.5 to 233.4 ft bgs.	230	
235					SAND (SP): olive (5Y 5/3), 95% fine to medium grained sand, subangular to subrounded; 5% fine to coarse gravel up to 26 mm, well rounded; trace silt, siltstone; poorly sorted; contains quartz, feldspar, mica, amphibole and other; high mica content.	235	
					SAND (SP): dark grayish brown (2.5Y 4/2), 95% medium to coarse grained sand, trace fine grained, subangluar to subrounded; 5% fine to coarse gravel up to 26 mm, well rounded; trace silt, siltstone; poorly sorted; contains quartz, feldspar, mica, amphibole and other; altered to a dark brown.		
240					SAND (SP): pale olive (5Y 6/3), 90% fine to medium grained sand, subangular to subrounded; 10% fine to coarse gravel up to 65 mm, subrounded to rounded, coarse grained gravel bed at 238.4 ft bgs; poorly sorted; contains quartz, feldspar, mica, amphibole and other; includes flat siltstone and granite.	240	
245					SAND (SP): dark brown (7.5YR 3/3), 90% fine to coarse grained sand, predominantly medium to coarse grained, subangular to subrounded; 10% fine to coarse gravel up to 26 mm, subrounded to rounded; trace silt; poorly sorted; contains quartz, feldspar, mica, amphibole and other; altered to a dark brown.	245	
					SAND (SP): light yellowish brown (2.5Y 6/3), 90% medium to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 72 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; trace weakly cemented silt chips; siltstones; many mineral types.		SIEVE
250			Zone #2		SAND (SP): pale olive (5Y 6/3), 95% fine to medium grained sand, subangular to subrounded; 5% fine to coarse gravel up to 30 mm, subangular to subrounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; medium to coarse sand and gravelly interbeds; many mineral types.	250	
255			SC: 38,354 uS/cm		SAND WITH GRAVEL (SP): pale olive (5Y 6/3), 70% fine to coarse grained sand, subangular to subrounded; 30% fine to coarse gravel up to 45 mm, well rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; trace 70 mm clay ball at 252.3 ft bgs; siltstone; many mineral types.	255	
					GRAVEL WITH CLAY AND SAND (GP-GC): pale olive (5Y 6/3), 50% fine to coarse gravel up to 55 mm, well rounded, predominantly coarse grained, coarse grained gravel and cobble bed from 254.9 to 255.6 ft bgs; trace cobble measured at 83 mm; 40% fine to coarse grained sand, subangular to subrounded; 10% clay, trace clay balls; trace cobbles; poorly sorted; contains quartz, feldspar, mica, amphibole and other; siltstone; many mineral types.		
260					SILT (ML): pale olive (5Y 6/3), 100% silt, very dense; low plasticity; trace thin horizontal black/ashy laminations.	260	
					CLAY (CL): olive gray (5Y 5/2), 100% clay, low plasticity, dense.		SS
265					SILT (ML): pale olive (5Y 6/3), 100% silt, dense; trace thin ashy black colored horizontal laminations; trace small rusty globular deposits.	265	
270					SILT (ML): pale olive (5Y 6/3), 90% silt, less dense than above; 10% fine grained sand, subangular to subrounded, very fine grained; silt with interbedded very fine grained sands; high mica content.	270	
					SAND (SP): light olive gray (5Y 6/2), 90% fine to coarse grained sand, subangular to subrounded, predominantly medium to coarse grained; 10% fine to coarse gravel up to 50 mm, subrounded to rounded, coarse gravel deposit at 279.4 ft bgs; trace silt, flat/round siltstones; poorly sorted; contains quartz, feldspar, amphibole and other.		

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BOREHOLE NAME **CX-B4**

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | GAMMA (GAPI) 0 110 | CLID (mmho/m) 1500 0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type

275

GRAB

280 SILT (ML): pale olive (5Y 6/3), 100% silt; low plasticity; thin rusty and black laminations.

SAND (SP): pale yellow (5Y 7/3), 100% fine to coarse grained sand, subangular to subrounded; trace fine to coarse gravel up to 22 mm, rounded; trace silt, silt balls; poorly sorted; contains quartz, feldspar, amphibole and other; trace well rounded 90 mm cobble at 281.8 ft bgs.

285 GRAVEL WITH CLAY (GP-GC): pale olive (5Y 6/3), 90% fine to coarse gravel up to 55 mm, rounded, predominantly coarse grained; 10% clay; trace fine grained sand; poorly sorted; contains quartz, feldspar and other.

SAND (SP): pale yellow (5Y 7/3), 90% medium to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 60 mm, well rounded; poorly sorted; contains quartz, feldspar and other.

290 CLAY (CL): pale olive (5Y 6/3), 100% clay, low plasticity, very dense/hard; thin black/ashy horizontal laminations; trace rusty/altered layers, especially at 288.7 to 289.4 ft bgs.

CLAYEY SAND (SC): light yellowish brown (2.5Y 6/3), 65% fine grained sand, trace medium to coarse grained, subangular to subrounded; 30% clay; 5% fine to coarse gravel up to 35 mm, well rounded; medium sorted; contains quartz, feldspar and other; trace 0.25 in. gray and rusty bands; siltstone.

295 SAND WITH CLAY AND GRAVEL (SP-SC): light yellowish brown (2.5Y 6/3), 70% fine to coarse grained sand, subangular to subrounded; 20% fine to coarse gravel up to 65 mm, well rounded; 10% clay, trace clay balls; poorly sorted; contains quartz, feldspar, mica, amphibole and other.

GRAB

SAND (SP): pale olive (5Y 6/3), 100% fine to medium grained sand, subangular to subrounded; trace fine to coarse gravel up to 31 mm, well rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other.

300 SAND WITH GRAVEL (SP): pale olive (5Y 6/3), 60% medium to coarse grained sand, subangular to subrounded; 35% fine to coarse gravel up to 70 mm, subrounded to well rounded, coarse grained bed at 300.3 to 301.0 ft bgs; 5% clay; trace cobbles; poorly sorted; contains quartz, feldspar, mica, amphibole and other; trace cobble to 75 mm at 298.0 ft bgs.

CLAYEY GRAVEL WITH SAND (GC): pale olive (5Y 6/3), 60% fine to coarse gravel up to 70 mm, subrounded to well rounded; 25% fine to medium grained sand, subangular to subrounded; 15% clay; poorly sorted; contains quartz, feldspar, mica, amphibole and other; trace siltstone gravel.

305 SAND (SP): light olive gray (5Y 6/2), 95% fine to medium grained sand, subangular to subrounded; 5% fine to coarse gravel up to 45 mm, subrounded to rounded, some flat rounded; trace clay; poorly sorted; contains quartz, feldspar, mica, amphibole and other.

Zone #1

SS

GRAVELLY CLAY (CL): pale olive (5Y 6/3), 55% clay, low plasticity; 40% fine to coarse gravel up to 25 mm, rounded; 5% fine to medium grained sand; contains quartz, feldspar, mica, amphibole and other.

GRAB

310 SAND (SP): light olive gray (5Y 6/2), 95% fine to medium grained sand, trace coarse grained, subangular to subrounded; 5% fine to coarse gravel up to 33 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other.

SC: 37,688 uS/cm

GRAVELLY CLAY (CL): pale olive (5Y 6/3), 50% clay, low plasticity; 40% fine to coarse gravel up to 60 mm, rounded; 10% fine to medium grained sand, subangular to rounded; contains quartz, feldspar, mica, amphibole and other; altered brown sand layer from 305.8 to 306.0 ft bgs.

315 SAND (SP): pale olive (5Y 6/3), 90% fine to coarse grained sand, subangular to rounded; 5% fine to coarse gravel up to 39 mm, rounded; 5% clay; poorly sorted; contains quartz, feldspar, amphibole and other; rusty/altered clay and gravel bed 309.0 to 309.2 ft bgs.

FAT CLAY (CH): pale olive (5Y 6/3), 100% clay, high plasticity, soft; thin rusty horizontal lamination and point deposits.

320 SAND (SP): pale olive (5Y 6/3), 100% fine to medium grained sand, subangular to rounded; medium sorted; contains quartz, feldspar, mica, amphibole and other; rusty/altered medium to coarse grained sand at 312.9 ft bgs.

GRAVELLY CLAY (CL): light yellowish brown (2.5Y 6/4), 70% clay, low plasticity; 30% coarse gravel up to 55 mm, well rounded; trace fine grained sand; contains quartz and feldspar; rusty horizontal alteration/lamination.

325 CLAY (CL): pale olive (5Y 6/3), 100% clay, low plasticity, dense; trace fine grained sand; rusty horizontal alteration/lamination; silty/sandy clay layer from 321.8 to 323.6 ft bgs; rusty nodules.

GRAB

SILTY SAND (SM): pale olive (5Y 6/3), 85% fine grained sand, very fine grained; 15% silt; well sorted; contains quartz, feldspar, mica and amphibole.

CLAY (CL): pale olive (5Y 6/3), 100% clay, low plasticity; trace silt; trace very fine grained sand; thin interbeds of silt and fine grained sand with some thin rusty horizontal

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BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME	CX-B4
CLIENT	California American Water
PROJECT NUMBER	13017-13
LOCATION	Marina, CA

Depth bgs (feet)	GAMMA (GAPI) 0 – 110	CLID (mmho/m) 1500 – 0	Zone Test	Graphic Log	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.	Depth bgs (feet)	Sample Type
					lamination/alteration.		
					SAND (SP): pale olive (5Y 6/3), 100% fine grained sand, subangular to subrounded, trace clay pods; well sorted; contains quartz, feldspar, mica and amphibole; higher mica content; more black minerals.		
335					CLAY (CL): olive gray (5Y 5/2), 70% clay, medium plasticity; 30% silt; trace fine grained sand; clay with 2 to 3 in. silt/fine grained sand with thin rusty horizontal lamination/alteration.	335	
					FAT CLAY (CH): light olive gray (5Y 6/2), 100% clay, medium plasticity.		
340					SAND (SP): brown (10YR 4/3), 100% fine grained sand, subangular to subrounded; trace silt; well sorted; contains quartz, feldspar and amphibole; weakly cemented, especially near rusty horizontal laminations; start of the second "brown sand" layer, similar to sand at 187.6 ft bgs.	340	
345					SAND (SP): brown (10YR 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; less red, more gray-brown.	345	
350					SAND (SP): brown (10YR 4/3), 100% fine grained sand, subangular to subrounded; trace silt; well sorted; contains quartz, feldspar and amphibole; faint thin rusty horizontal laminations; weak to moderately cemented below 348.3 ft bgs, especially in areas of rusty alteration; more red; moderately cemented at 350 ft bgs.	350	GRAB

Bottom of borehole at 350 feet.

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BOREHOLE LITHOLOGIC LOG

BOREHOLE NAME **MDW-1**			
CLIENT	California American Water	LOCATION **Castroville, CA**	
PROJECT NUMBER	13017-13	**Salinas River State Beach**	
REPORT DATE	5/23/2014	**36° 46' 32.3688", -121° 47' 41.4816"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY	
DRILLER	Jose Munguia	**N. Reynolds**	

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

Depth bgs (feet) | GAMMA (GAPI) 0 – 110 | CLID (mmho/m) 1500 – 0 | Zone Test | Graphic Log

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.

Depth bgs (feet)	Lithologic Log	Sample Type
	NO SAMPLE: asphalt.	
	NO SAMPLE: gravel road base.	
	SAND (SP): dark grayish brown (2.5Y 4/2), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole.	
5	SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole.	
	SAND (SP): very dark grayish brown (2.5Y 3/2), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole.	
10		
15	SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole.	
20		SIEVE
25		
	SILTY SAND (SM): black (10YR 2/1) and dark gray (5Y 4/1), 80% fine grained sand, subangular to subrounded; 20% silt; well sorted; contains quartz, feldspar and amphibole; organic rich (wood).	
30	SAND (SP): olive gray (5Y 5/2), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole.	
	SAND (SP): dark greenish gray (10Y 4/1), 100% fine grained sand, subangular to subrounded, trace medium grained; well sorted; contains quartz, feldspar and amphibole.	
35	CLAY (CL): dark greenish gray (10Y 4/1), 100% clay, medium plasticity, soft, silty; trace silt; abundance of horizontal black/ashy deposits between 34.5 - 36.4 ft bgs; mica present; trace white flakes (shells?); bluish coloration.	
40	SILT (ML): dark greenish gray (10Y 4/1), 100% silt; no to low plasticity; clayey interbeds with horizontal black/ashy laminations; trace white ashy deposits from 39.5 -40.0 ft bgs; mica present.	SS
45	CLAY (CL): very dark greenish gray (10Y 3/1), 95% clay, medium plasticity, soft, trace horizontal black/ashy deposits; 5% fine grained sand, subangular to subrounded, interbedded; contains quartz, feldspar and amphibole.	
50	SAND (SP): dark greenish gray (10Y 4/1), 95% fine grained sand, subangular to subrounded, trace medium grained; 5% clay, clayey interbeds at 52.8 - 53.4 ft bgs and 54.4	

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

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BOREHOLE NAME **MDW-1**

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet)	GAMMA (GAPI) 0–110	CLID (mmho/m) 1500–0	Zone Test	Graphic Log	Lithologic Log	Depth bgs (feet)	Sample Type
					- 54.8 ft bgs; well sorted; contains quartz, feldspar and amphibole.		GRAB
55					SAND (SP): pale olive (5Y 6/3), 100% fine to medium grained sand, subangular to subrounded, predominantly fine grained; medium sorted; contains quartz, feldspar, mica, amphibole and other; trace gray mottling.	55	
60			Zone #4			60	SIEVE
65			SC: 32,970 uS/cm		SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to coarse grained sand, subrounded to rounded; trace fine to coarse gravel up to 50 mm, subrounded to rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; trace shell fragments; orange interbed at 64.8 - 65.5 ft bgs.	65	
					SAND (SP): dark gray (5Y 4/1), 100% fine to medium grained sand, subrounded to rounded, tan mottling; trace fine gravel up to 12 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; trace shell fragments.		SS
70					SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to coarse grained sand, predominantly medium grained, subrounded to rounded; trace fine gravel up to 17 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; contains shells and shell fragments.	70	SIEVE
75					SILT (ML): very dark greenish gray (5GY 3/1), 95% silt; 5% sand, very fine grained, subangular to subrounded; trace clay; contains quartz, feldspar and mica; trace shell fragments and black/ashy point deposits.	75	
					SILTY SAND (SM): very dark greenish gray (5GY 3/1), 85% fine grained sand, subangular to subrounded; 15% silt; well sorted; contains quartz and feldspar; abundance of shells and shell fragments.		
					SILT (ML): very dark greenish gray (5GY 3/1), 90% silt; 10% fine grained sand, subangular to subrounded; trace clay, no to low plasticity; trace shell fragments.		
80					FAT CLAY (CH): very dark greenish gray (5GY 3/1), 100% clay, high plasticity, soft; trace horizontal black/ashy laminations.	80	
					SANDY SILT (ML): dark greenish gray (5GY 4/1), 70% silt; 30% sand, very fine grained, subangular to subrounded; contains quartz and mica; trace thin clay layers; trace horizontal black/ashy deposits; trace shell fragments.		
85					SILTY SAND (SM): dark greenish gray (10Y 4/1), 85% sand, very fine to fine grained, subangular to subrounded; 15% silt; trace clay, trace clay layers, clayey beds at 82.8 - 83.3 ft bgs and 89.5 - 90.2 ft bgs; well sorted; contains quartz, feldspar and mica; trace horizontal black/ashy deposits; higher mica content; trace shell fragments.	85	
90					CLAY (CL): dark greenish gray (5GY 4/1), 100% clay, medium plasticity; trace silt; horizontal black/ashy laminations; trace shell fragments and possible organic matter.	90	
					SILT (ML): dark greenish gray (10Y 4/1), 100% silt; trace sand, very fine grained, subangular to subrounded; trace clay; contains mica; trace horizontal black/ashy laminations.		
95					CLAY (CL): dark greenish gray (5GY 4/1), 100% clay, medium to high plasticity; trace silt; trace horizontal and point black/ashy deposits; trace organic matter.	95	
100					SILT (ML): dark greenish gray (5GY 4/1), 100% silt; trace sand, very fine grained, subangular to subrounded; trace mica.	100	
					CLAY (CL): dark greenish gray (10Y 4/1), 100% clay, medium plasticity, dense; trace silt, 1 - 3 in. interbeds between 102 - 103.7 ft bgs; trace shell fragments below 106.0 ft bgs; trace black/ashy point deposits.		
105						105	

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BOREHOLE NAME **MDW-1**

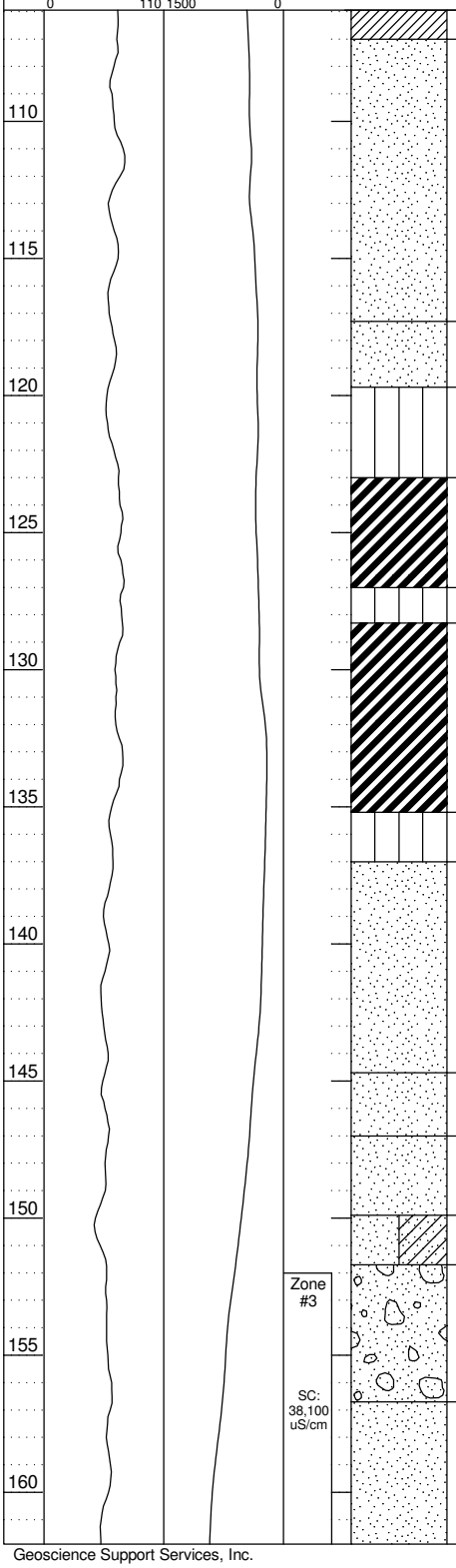
BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | GAMMA (GAPI) 0 – 110 | CLID (mmho/m) 1500 – 0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type



Depth bgs (feet)	Description	Sample Type
110	SAND (SP): greenish gray (10Y 5/1), 100% sand, very fine grained, subangular to subrounded; trace silt; well sorted; contains quartz, feldspar and mica.	
115		
120	SAND (SP): greenish gray (5GY 5/1), 100% fine to coarse grained sand, predominantly medium grained, subrounded to rounded; trace fine to coarse gravel up to 32 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; includes siltstone and chert.	
	SILT (ML): dark greenish gray (5GY 4/1), 100% silt; trace fine grained sand; trace clay, 1 in. clay interbeds; contains mica; thin horizontal black/ashy laminations in clays.	
125	FAT CLAY (CH): dark greenish gray (5GY 4/1), 100% clay, high plasticity, dense; very dense from 124.3 - 127.0 ft bgs; thin rusty and black/ashy horizontal lamination from 126.0 - 127.0 ft bgs.	SS
	SILT (ML): dark greenish gray (10Y 4/1), 100% silt; trace thin clayey interbeds; thin horizontal black/ashy lamination.	
130	FAT CLAY (CH): dark greenish gray (10Y 4/1), 100% clay, medium to high plasticity, soft clay from 128.3 - 129.6 ft bgs, dense clay from 129.6 - 135.2 ft bgs; trace silt, dark brown silty deposit from 132.2 - 133.4 ft bgs within clay; trace horizontal laminations and point black/ashy deposits.	
135	SILT (ML): dark greenish gray (10Y 4/1), 95% silt; 5% sand, very fine grained, subangular to subrounded; trace clay; contains mica; trace thin horizontal black/ashy laminations.	
140	SAND (SP): greenish gray (5GY 5/1), 95% fine to medium grained sand, subangular to subrounded, trace rounded coarse grained; 5% fine to coarse gravel up to 25 mm, rounded; medium sorted; contains quartz, feldspar, mica, amphibole and other; many mineral types.	GRAB
145	SAND (SP): greenish gray (10Y 5/1), 100% fine to medium grained sand, subangular to rounded; trace fine to coarse gravel up to 35 mm, rounded; medium sorted; contains quartz, feldspar, mica, amphibole and other; trace rounded cobbles up to 75 mm at 145.2 ft bgs; includes chert and siltstone; many mineral types.	SS
150	SAND (SP): dark greenish gray (10Y 4/1), 100% fine to medium grained sand, subrounded to rounded; trace fine gravel up to 17 mm, rounded; well sorted; contains quartz, feldspar, mica, amphibole and other; trace clay balls; includes siltstone.	GRAB
	SAND WITH CLAY (SP-SC): dark greenish gray (5GY 4/1), 85% fine to medium grained sand, subangular to rounded, trace coarse grained; 10% clay; 5% fine to coarse gravel up to 65 mm, rounded; contains quartz, feldspar, mica, amphibole and other; many mineral types; included siltstone.	
155	Zone #3 — SAND WITH GRAVEL (SP): light olive gray (5Y 6/2), 60% fine to coarse grained sand, subangular to rounded; 40% fine to coarse gravel up to 70 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; gravel with sand from 152.6 - 153.5 ft bgs.	SIEVE
160	SC: 38,100 uS/cm — SAND (SP): olive gray (5Y 5/2), 100% fine grained sand, subangular to subrounded; trace fine to coarse gravel up to 21 mm, subrounded to rounded; well sorted; contains quartz, feldspar, amphibole and other; silt at 156.7 - 157 ft bgs.	

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BOREHOLE NAME
MDW-1

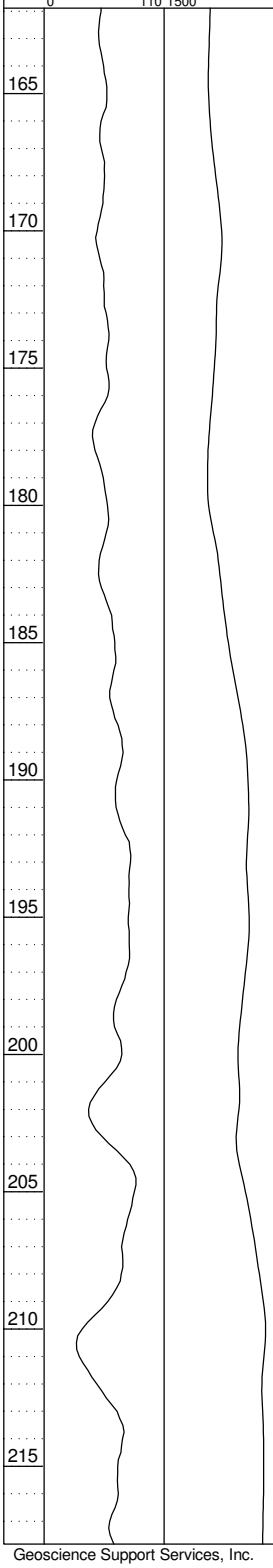
BOREHOLE LITHOLOGIC LOG (continued)

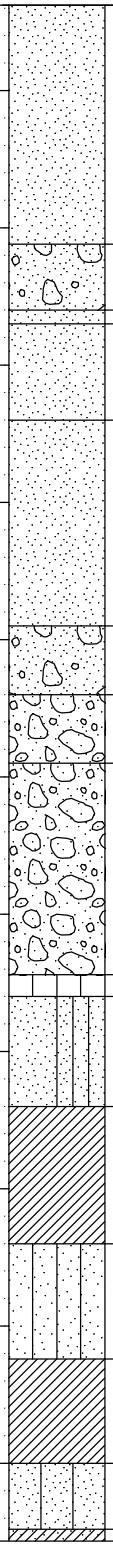
CLIENT California American Water
PROJECT NUMBER 13017-13
LOCATION **Castroville, CA**

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.

Depth bgs (feet) | GAMMA (GAPI) 0 – 110 | CLID (mmho/m) 1500 – 0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type





Zone #2

SC: 45,230 uS/cm

165

170

SAND WITH GRAVEL (SP): light olive gray (5Y 6/2), 70% fine to coarse grained sand, subangular to rounded; 30% fine to coarse gravel up to 58 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole and other; trace clay balls; many mineral types; includes siltstone.

175

SAND (SP): olive gray (5Y 5/2), 100% fine grained sand, subangular to subrounded, trace medium and coarse grained; trace fine gravel up to 18 mm, subrounded to rounded; well sorted; contains quartz, feldspar, amphibole and other; contains chert.

SAND (SP): light olive gray (5Y 6/2), 100% fine to medium grained sand, subrounded to rounded; trace fine to coarse gravel up to 35 mm, rounded; trace clay; contains quartz, feldspar, amphibole and other.

180

SAND (SP): olive gray (5Y 5/2), 95% fine to coarse grained sand, subangular to rounded; 5% fine to coarse gravel up to 55 mm, rounded; poorly sorted; wet sample; contains quartz, feldspar, mica, amphibole and other.

185

SAND WITH GRAVEL (SP): olive gray (5Y 5/2), 60% medium to coarse grained sand, subangular to rounded; 40% fine to coarse gravel up to 50 mm, subrounded to rounded; contains quartz, feldspar, mica, amphibole and other; many mineral types, includes chert, siltstone, and granite.

GRAVEL WITH SAND (GP): olive gray (5Y 5/2), 60% fine to coarse gravel up to 50 mm, subrounded to rounded; 40% medium to coarse grained sand, subangular to rounded, predominantly coarse grained; trace cobbles, trace cobble up to 99 mm; contains quartz, feldspar, mica, amphibole and other; many mineral types, includes granite and chert.

190

GRAVEL WITH SAND AND COBBLES (GP): olive (5Y 5/3), 55% fine to coarse gravel up to 75 mm, subangular to rounded; 30% fine to coarse grained sand, subangular to rounded; 15% cobbles, cobbles up 120 mm; trace clay; poorly sorted; contains quartz, feldspar, mica, amphibole and other; many mineral types, includes granite, and chert.

195

SILT (ML): light olive brown (2.5Y 5/4), 100% silt; trace fine grained sand, subangular to subrounded; contains mica; clayey and dense from 197.2 - 197.6 ft bgs; rusty orange mottling.

200

SAND WITH SILT (SP-SM): light olive brown (2.5Y 5/3), 90% fine grained sand, subangular to subrounded; 10% silt; trace fine to coarse gravel up to 32 mm, rounded; well sorted; contains quartz, feldspar, mica and amphibole; some orange mottling.

CLAY (CL): light olive brown (2.5Y 5/4), 100% clay, very dense/hard; orangish brown mottling; trace thin horizontal black/ashy laminations; possible evaporites at 204.3 - 205.0 ft bgs; moderate cementation.

205

SANDY SILT (ML): light olive brown (2.5Y 5/3), 70% silt; 30% sand, very fine grained; contains quartz, mica and amphibole.

210

CLAY (CL): light olive brown (2.5Y 5/3), 100% clay, no plasticity, dense/hard; trace thin black/ashy and rust colored lamination and point deposits.

215

SILTY SAND (SM): yellowish brown (10YR 5/4), 80% fine grained sand, subangular to subrounded; 20% silt; well sorted; contains quartz, feldspar, mica and amphibole.

Sample Type: GRAB, SS, SIEVE, GRAB, GRAB, SS

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

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BOREHOLE NAME **MDW-1**

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet)	GAMMA (GAPI) 0 – 110	CLID (mmho/m) 1500 – 0	Zone Test	Graphic Log	Lithologic Log	Depth bgs (feet)	Sample Type
220					SANDY CLAY (CL): brown (7.5YR 4/4) and yellowish red (5YR 4/6), 60% clay, no plasticity, dense/hard; 40% fine grained sand, subangular to subrounded; contains quartz, feldspar and amphibole; rust colored mottling.	220	
225					CLAYEY SAND (SC): strong brown (7.5YR 4/6), 80% fine grained sand, subangular to subrounded; 20% clay; well sorted; contains quartz, feldspar and amphibole; some rust colored mottling.	225	
					SAND (SP): yellowish brown (10YR 5/4), 95% fine grained sand, subangular to subrounded; 5% clay; well sorted; contains quartz, feldspar and amphibole; compact/tight.		
230					SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, amphibole and other; moderately cemented sand pieces from 229.0 - 229.6 ft bgs.	230	
					SAND (SP): grayish brown (2.5Y 5/2) and weak red (2.5YR 5/2), 100% fine grained sand, subangular to subrounded; trace clay; well sorted; contains quartz, feldspar, amphibole and other; purplish mottling with some fines.		GRAB
235						235	
240			Zone #1 SC: 44,180 uS/cm		SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, amphibole and other; abundance of spherical (~5/8 in.) cemented sand balls from 240.5 - 242.0 ft bgs, up to 3 balls fused, possible storm event; small irregular cemented sand balls at 248.0 -248.7 ft bgs, moderately cemented.	240	
							GRAB
245						245	
250					SAND (SP): olive brown (2.5Y 4/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, amphibole and other; small moderately cemented sand balls at 249.8 ft bgs and 254.4 - 256.5 ft bgs.	250	
255						255	
260					SAND (SP): dark yellowish brown (10YR 4/4), 100% fine to medium grained sand, subangular to subrounded; trace clay; well sorted; contains quartz, feldspar, amphibole and other; abundance (~1/2) of moderately to strongly cemented sand pieces/fragments up to 65 mm; some rusty/brown lamination; no cementation from 260 - 262 ft bgs.	260	
							GRAB
265						265	
270					SAND (SP): brown (10YR 4/3), 100% fine to medium grained sand, subangular to subrounded; trace clay; well sorted; contains quartz, feldspar, amphibole and other; some small moderately to strongly cemented sand balls and fragments at 272.0 - 272.4 ft bgs and 273.5 - 274.5 ft bgs.	270	

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BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME		LOCATION
MDW-1		
CLIENT	California American Water	
PROJECT NUMBER	13017-13	**Castroville, 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.

Depth bgs (feet)	GAMMA (GAPI) 0 – 110	CLID (mmho/m) 1500 – 0	Zone Test	Graphic Log	Lithologic Log	Depth bgs (feet)	Sample Type
275					SANDY CLAY (CL): dark yellowish brown (10YR 4/4), 60% clay, no plasticity, dense/hard; 40% fine grained sand; moderately cemented.	275	
					SAND WITH CLAY (SP-SC): yellowish brown (10YR 5/4), 90% fine grained sand, subangular to subrounded; 10% clay; well sorted; contains quartz, feldspar, amphibole and other; color transition.		
280					SAND (SP): brown (7.5YR 4/4), 95% fine grained sand, subangular to subrounded; 5% clay; well sorted; contains quartz, feldspar, amphibole and other; tight; moderately cemented sand pieces up to 80 mm at 283.2 - 285.6 ft bgs; rusty mottled coloration and lamination.	280	GRAB
285					SAND (SP): dark grayish brown (10YR 4/2), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, amphibole and other.	285	
290						290	GRAB
295						295	
300					SAND (SP): brown (7.5YR 4/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, amphibole and other; some weak cementation.	300	
					Bottom of borehole at 300 feet.		

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BOREHOLE LITHOLOGIC LOG

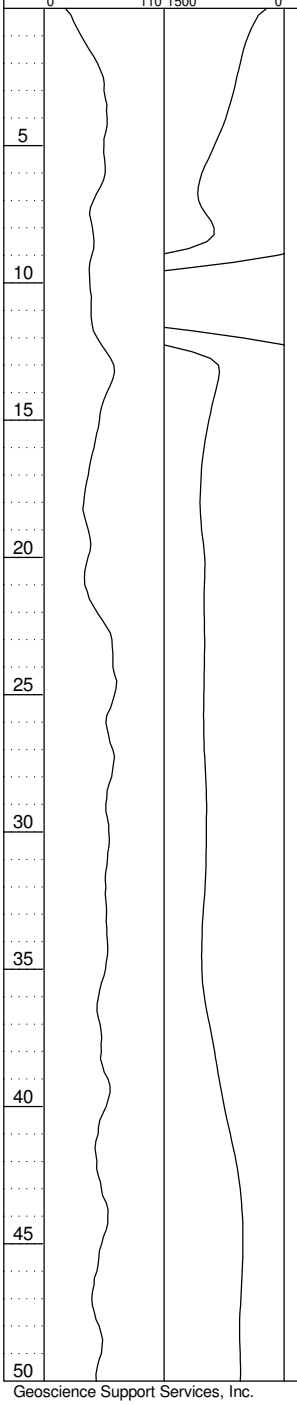
BOREHOLE NAME **ML-1**			
CLIENT	California American Water	LOCATION **Moss Landing, CA**	
PROJECT NUMBER	13017-13	**Sandholdt Rd**	
REPORT DATE	5/23/2014	**36° 47' 58.0632", -121° 47' 20.31"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY **N. Reynolds**	
DRILLER	Jose Munguia		

DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	10/02/13	BOREHOLE DIAMETER	8 in
SURFACE ELEVATION	8.0 ft	TOTAL DEPTH	200 ft bgs	FINISH DATE	10/07/13	CORE SIZE	6 in

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.

Depth bgs (feet) | GAMMA (GAPI) 0–110 | CLID (mmho/m) 1500–0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type



Depth bgs (feet)	Description
	SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subrounded, trace medium to coarse grained; trace fine to coarse gravel up to 35 mm, subrounded; medium sorted.
	SILT (ML): dark gray (5Y 4/1), 100% silt.
5	
10	
	CLAY (CL): dark gray (5Y 4/1), 100% clay, high plasticity; with visible alteration.
	SILT (ML): very dark gray (5Y 3/1), 100% silt; with shells.
15	
	SAND (SP): light yellowish brown (2.5Y 6/4), 100% medium to coarse grained sand, subangular to rounded; trace fine to coarse gravel up to 30 mm, rounded; poorly sorted; trace shells up to 120 mm.
20	CLAY WITH SAND (CL): very dark gray (5Y 3/1), 85% clay; 10% fine to coarse grained sand, subrounded to rounded; 5% fine to coarse gravel up to 25 mm, rounded; trace shell fragments.
	SANDY SILT (ML): very dark gray (2.5Y 3/1), 60% silt; 40% fine grained sand, subangular to subrounded; shells at 31.6 and 34.0 ft, trace organics at 29.4 ft.
25	
30	
35	CLAY (CL): very dark gray (5Y 3/1), 100% clay, medium plasticity.
	SAND (SP): dark gray (5Y 4/1), 100% fine to medium grained sand, subangular; poorly sorted.
	CLAY (CL): very dark gray (2.5Y 3/1), 100% clay, high plasticity; trace shell fragments.
40	
	SANDY SILT (ML): very dark gray (2.5Y 3/1), 70% silt; 30% fine grained sand, subrounded; abundant shell fragments.
45	SAND (SP): dark gray (5Y 4/1), 100% fine to medium grained sand, subangular, trace coarse grained; trace fine to coarse gravel up to 25 mm, subrounded to rounded; poorly sorted; abundance of shells and shell fragments.
50	

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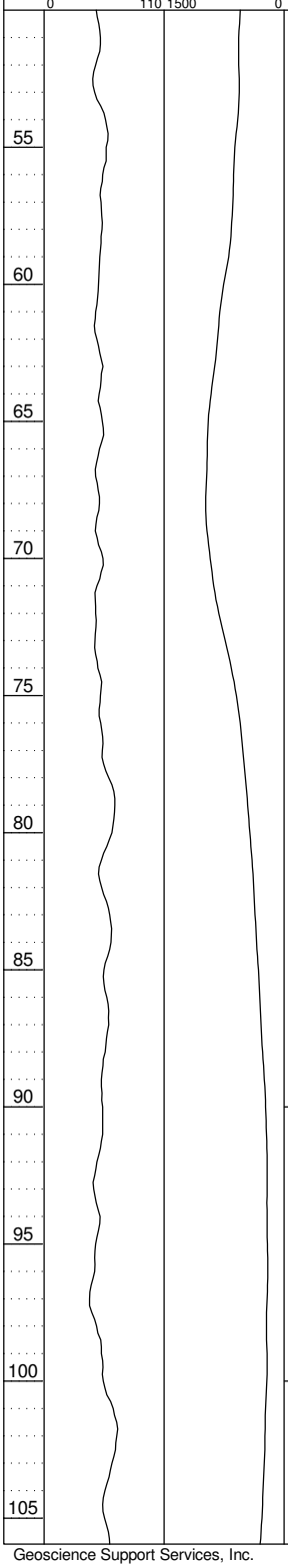
BOREHOLE NAME **ML-1**

BOREHOLE LITHOLOGIC LOG (continued)

CLIENT California American Water
PROJECT NUMBER 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.

Depth bgs (feet) | Sample Type

SIEVE

55 — SAND (SP): dark gray (5Y 4/1), 100% fine grained sand, subrounded; trace fine to coarse gravel up to 45 mm, rounded, at 54.5 ft; well sorted; trace shell fragments.

SIEVE

60 — SILTY SAND (SM): very dark gray (5Y 3/1), 70% fine grained sand, subrounded; 30% silt; well sorted.

65 — SAND (SP): dark greenish gray (10Y 4/1), 100% fine grained sand, subrounded; well sorted; trace shell fragments.

SIEVE

FAT CLAY (CH): very dark greenish gray (10Y 3/1), 100% clay, high plasticity, very dense; trace shell fragments.

70

75

PTS

80

85 — SANDY CLAY (CL): very dark greenish gray (10Y 3/1), 70% clay; 30% fine grained sand, subrounded; trace shell fragments.

CLAY (CL): very dark greenish gray (10Y 3/1), 100% clay, high plasticity, dense; trace shell fragments.

SAND (SP): very dark greenish gray (10Y 3/1), 100% fine to medium grained sand, subrounded; poorly sorted; abundant shell fragments.

SIEVE

90

SANDY CLAY (CL): very dark greenish gray (10Y 3/1), 60% clay; 40% fine grained sand, subrounded; abundance of shells.

95

SAND (SP): very dark greenish gray (10Y 3/1), 100% fine grained sand, subangular to subrounded; trace fine to coarse gravel up to 45 mm, subangular to rounded, includes quartz and black minerals; medium sorted; contains quartz and amphibole; trace shell fragments and organics.

SILT (ML): olive gray (5Y 5/2), 100% silt; trace fine grained sand, subangular to subrounded; alteration visible with streaks of rust coloration (10YR 5/8).

100

105 — SAND (SP): yellowish brown (10YR 5/8) and olive (5Y 5/3), 100% fine grained sand, subangular to subrounded; trace fine to coarse gravel up to 23 mm, subangular to rounded, includes quartz and black minerals; well sorted; contains quartz and amphibole, with visible

SIEVE

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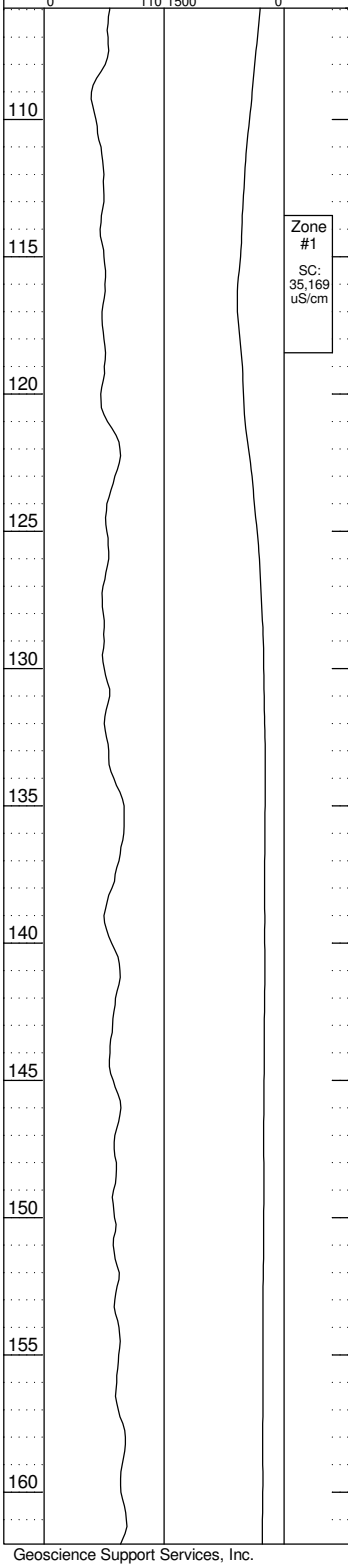
BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME	CLIENT	LOCATION
ML-1	California American Water	Moss Landing, CA
	PROJECT NUMBER 13017-13	



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.

alteration (2.5Y 5/6).

SAND (SP): olive gray (5Y 5/2), 100% fine grained sand, subrounded; trace fine to coarse gravel up to 20 mm, subrounded; well sorted.

SAND WITH SILT AND GRAVEL (SP-SM): greenish gray (10Y 5/1), 75% medium to coarse grained sand, subangular to subrounded; 15% fine to coarse gravel up to 60 mm, well rounded; 10% silt; poorly sorted; contains quartz and amphibole.

SILT (ML): greenish gray (10GY 5/1), 100% silt; with visible alteration/streaks (10R 4/1).

SAND WITH GRAVEL (SP): greenish gray (10GY 5/1), 80% fine to coarse grained sand, subangular to rounded; 15% fine to coarse gravel up to 60 mm, rounded; 5% silt; poorly sorted.

SILT (ML): dark greenish gray (10Y 4/1), 100% silt; higher mica content at 124.2 ft, shell fragments at 137 ft, moderately cemented siltstone fragments at 131 ft.

CLAY (CL): very dark greenish gray (10Y 3/1), 100% clay.

SILT (ML): very dark greenish gray (10Y 3/1), 100% silt; trace shell fragments.

CLAY (CL): dark gray (5Y 4/1), 100% clay.

Depth bgs (feet): 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160

Sample Type: SS, PTS, SIEVE; SIEVE; PTS, SS, SS

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

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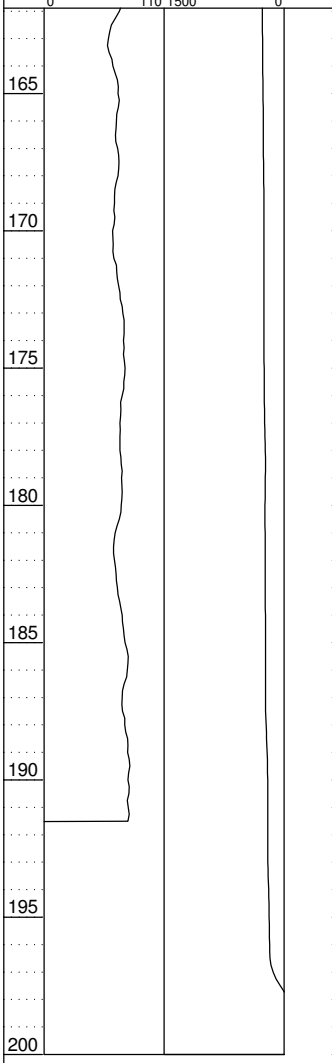
BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME	ML-1
CLIENT	California American Water
PROJECT NUMBER	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.

Depth bgs (feet) | Sample Type

CLAY (CL): dark greenish gray (10Y 4/1), 100% clay, dense.

SS

CLAY (CL): dark greenish gray (5GY 4/1), 100% clay; trace silt.

CLAY (CL): dark greenish gray (5GY 4/1), 100% clay; trace shell fragments at 182.5 ft.

CLAY (CL): dark greenish gray (5GY 4/1), 100% clay, very dense; trace shell fragments.

SILT (ML): dark greenish gray (10Y 4/1), 100% silt; trace clay, interbedded.

CLAY (CL): dark greenish gray (5GY 4/1), 100% clay.

Bottom of borehole at 200 feet.

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

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BOREHOLE LITHOLOGIC LOG

BOREHOLE NAME **ML-2**			
CLIENT	California American Water	LOCATION **Moss Landing, CA**	
PROJECT NUMBER	13017-13	**Del Mar Fisheries**	
REPORT DATE	5/23/2014	**36° 48' 11.7648", -121° 47' 12.4368"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY **N. Reynolds**	
DRILLER	Jose Munguia		

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

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) | GAMMA (GAPI) 0–110 | CLID (mmho/m) 1500–0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type

SANDY SILT (ML): olive gray (5Y 4/2), 65% silt; 25% fine to medium grained sand, subangular; 10% fine to coarse gravel up to 26 mm, subangular; contains quartz, feldspar, and other; asphalt present.

SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subangular to subrounded, predominantly fine grained; trace silt; medium sorted; contains quartz and feldspar.

5

SANDY SILT (ML): very dark grayish brown (10YR 3/2), 60% silt; 40% fine grained sand, subangular to subrounded; trace fine to coarse gravel up to 29 mm, subangular to subrounded; contains quartz and feldspar; red brick and concrete block to 90 mm.

SAND (SP): very dark grayish brown (2.5Y 3/2) and dark grayish brown (2.5Y 4/2), 100% fine to medium grained sand, subrounded to rounded, trace coarse grained; trace fine to coarse gravel up to 41 mm, subangular; trace silt; poorly sorted; contains quartz, feldspar, amphibole, and other.

10

SAND (SW): light yellowish brown (2.5Y 6/4), 100% fine to coarse grained sand, subrounded to rounded; trace fine to coarse gravel up to 27 mm, subrounded to rounded; poorly sorted; contains quartz, feldspar, amphibole, and other; well rounded coarse sand and fine gravel layer with shells at 13.7 ft.

15

SAND (SP): olive gray (5Y 4/2), 100% fine to medium grained sand, subangular to rounded; trace silt; medium sorted; contains quartz, feldspar, amphibole, and other; trace shell fragments.

20

SAND (SP): light olive gray (5Y 6/2), 100% fine to medium grained sand, subangular to rounded; trace silt, trace thin silt lens; medium sorted; contains quartz, feldspar, amphibole, and other; trace organics/wood.

SILT (ML): very dark greenish gray (10Y 3/1), 100% silt; trace fine grained sand, subrounded; contains mica; organics/wood.

25 — SIEVE

SAND (SW): light yellowish brown (2.5Y 6/3), 100% fine to coarse grained sand, subrounded to rounded; trace fine gravel up to 5 mm, rounded; poorly sorted; contains quartz, feldspar, amphibole, and other; trace shell fragments.

CLAY (CL): dark greenish gray (5GY 4/1), 80% clay, medium plasticity, soft; 20% silt; silty clay with an abundance of shells.

30

SILT (ML): dark greenish gray (5G 4/1), 100% silt, low plasticity; abundant shells and shell fragments.

SANDY SILT (ML): dark greenish gray (5GY 4/1), 51% silt; 49% fine grained sand, subrounded; trace fine gravel up to 18 mm, rounded; contains quartz, feldspar, and other; alternating fine sand and silt; abundance of shells and shell fragments; thin black/dark brown laminations (organics/wood).

35

FAT CLAY (CH): dark greenish gray (5GY 4/1), 100% clay, high plasticity; trace shells.

SAND (SP): greenish gray (5GY 5/1) and dark greenish gray (5GY 4/1), 100% fine grained sand, subangular to subrounded; trace silt; trace clay; well sorted; interbeded clays and silts approx. every foot, thin black laminations in clays, trace shell and organics(wood), large shells up to 61 mm at 39.0 ft; silt at 41.0 to 41.5, 46.3 to 46.6, 50.6 to 51.5 ft; clay at 52.5 to 54.1 ft.

40

45

50

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BOREHOLE NAME **ML-2**

BOREHOLE LITHOLOGIC LOG (continued)

CLIENT California American Water
PROJECT NUMBER 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.

Depth bgs (feet)	GAMMA (GAPI) 0–110	CLID (mmho/m) 1500–0	Zone Test	Graphic Log	Lithologic Log	Depth bgs (feet)	Sample Type
							SIEVE
55					FAT CLAY (CH): greenish black (10Y 2.5/1), 100% clay, medium plasticity.	55	
					SILT (ML): dark greenish gray (5GY 4/1), 100% silt; low plasticity; trace fine grained sand, subrounded, 56.5 to 57.0 ft; trace thin black lamination.		
60					FAT CLAY (CH): dark greenish gray (10Y 4/1), 100% clay, medium plasticity, dense.	60	
					FAT CLAY (CH): dark greenish gray (10Y 4/1) and black (N2.5), 100% clay, medium plasticity; dense, heavily banded/laminated, alternating 1-inch black and gray bands; ashy, possible organics, organics/wood at 61.5 ft.		
65					FAT CLAY (CH): dark greenish gray (5GY 4/1), 100% clay, low plasticity, dense; trace black ashy deposits.	65	SS
					SILT (ML): dark greenish gray (10Y 4/1), 100% silt; trace clay, more dense/clayey below 69.6 ft; thin black and dark gray laminations.		
70						70	
					FAT CLAY (CH): dark greenish gray (5GY 4/1), 100% clay, low plasticity; thin ashy dark gray to black laminations and pt. deposits; dark brown organic rich lenses(wood) from 76.5 to 76.8 ft.		
75						75	
					SAND WITH CLAY (SP-SC): greenish gray (10Y 5/1), 90% fine grained sand, subangular to subrounded; 10% clay; well sorted; contains quartz, feldspar and amphibole.		
80					FAT CLAY (CH): dark greenish gray (10Y 4/1), 60% clay, medium and high plasticity, clay at 78.9 to 79.3, 79.6 to 80.1, 82.5 to 84.3 ft; 40% silt, low plasticity, silt at 79.3 to 79.6, 80.1 to 82.5 ft; interbeded clays and silts, rusty alteration at 84.3 ft.	80	
85					SAND (SP): light brownish gray (2.5Y 6/2), 100% fine to medium grained sand, subangular to subrounded; trace fine to coarse gravel up to 25 mm, at 84.3 to 84.7 ft, rounded; trace silt, lenses; medium sorted; contains quartz, feldspar, amphibole, and other; some horizontal rusty lamination.	85	
					SILT (ML): light brownish gray (10YR 6/2), 100% silt; trace fine grained sand, subrounded; thin horizontal rusty laminations.		PTS SS SS
90					CLAY (CL): dark greenish gray (10Y 4/1), 100% clay, medium plasticity, silty; ashy/black and rusty lamination.	90	
			Zone #2		SILT (ML): light olive gray (5Y 6/2), 100% silt; trace fine grained sand, subrounded; rusty deposits/lamination.		
					SAND (SP): light olive brown (2.5Y 5/3), 100% fine to medium grained sand, subangular to subrounded; trace silt; poorly sorted.		
95			SC: 11,825 uS/cm		SAND (SW): light gray (5Y 7/2), 90% fine to coarse grained sand, subangular to rounded, predominantly medium and coarse grained; 10% fine to coarse gravel up to 45 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and many other mineral types.	95	GRAB
100					SAND (SP): light olive gray (5Y 6/2), 100% fine to medium grained sand, subangular to subrounded, trace coarse grained; trace fine to coarse gravel up to 38 mm, subangular to subrounded; trace clay, trace clay balls up to 70 mm; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.	100	
					SAND (SW): pale olive (5Y 6/3), 90% fine to coarse grained sand, subangular to rounded; 10% fine to coarse gravel up to 44 mm, subrounded to rounded, beds at 99.3 and 107.2 to 107.8 ft; trace silt, trace silt beds at 99.4 to 100.0, 104.0 to 104.6, and 106.5 to 107.0 ft; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.		GRAB
105						105	

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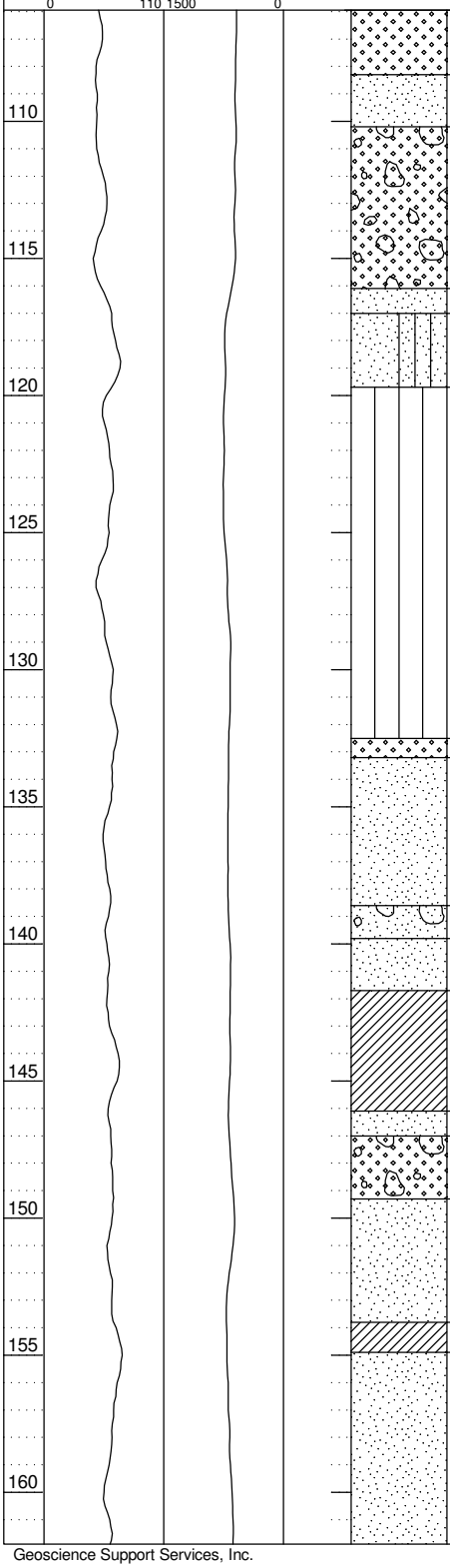
BOREHOLE NAME
ML-2

BOREHOLE LITHOLOGIC LOG (continued)

CLIENT California American Water
PROJECT NUMBER 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.

Depth bgs (feet) | Sample Type

SAND (SP): olive gray (5Y 5/2), 100% fine grained sand, subangular to subrounded; trace fine to coarse gravel up to 26 mm, rounded; trace clay; well sorted; clayey gravel layer at 108.7 ft.

SAND WITH GRAVEL (SW): pale olive (5Y 6/4), 85% fine to coarse grained sand, subangular to rounded, altered sand to dark brown at 115.3 to 115.7 ft; 15% fine to coarse gravel up to 71 mm, rounded; trace cobbles; trace clay; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; cobbles to 80 mm at 111.0 ft. — SIEVE

SAND (SP): olive gray (5Y 5/2), 100% fine grained sand, subangular to subrounded, very fine grained; trace fine to coarse gravel up to 31 mm, well rounded; well sorted; contains quartz, feldspar, mica, amphibole, and other. — SS

SAND WITH SILT (SP-SM): olive gray (5Y 5/2), 90% fine to medium grained sand, subangular to subrounded; 10% silt; trace fine gravel up to 5 mm, subangular to subrounded; poorly sorted; contains quartz, feldspar, amphibole, and other. — PTS, SS

SILT (ML): olive gray (5Y 5/2), 100% silt; trace fine to coarse gravel up to 51 mm, well rounded; trace fine to coarse grained sand, subangular to subrounded; trace clay; gravel and silt bed at 121.3 to 122.2 ft; clays at 123.4 to 123.8 , 130.2 to 130.5, and 131.4 to 131.6 ft; altered rusty sand at 125.5 to 126.2 ft. — GRAB

SAND (SW): olive gray (5Y 5/2), 90% fine to coarse grained sand, subangular to rounded, predominantly fine grains; 10% fine to coarse gravel up to 42 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND (SP): olive gray (5Y 5/2), 95% fine grained sand, subangular to subrounded; 5% fine to coarse gravel up to 40 mm, rounded; trace clay, trace clay layer at 136.2 to 136.5 ft; well sorted; contains quartz, feldspar, mica, amphibole, and other; thin rusty laminations, transition from olive brown to gray at 138.6 ft.

SAND WITH SILT AND GRAVEL (SP-SM): greenish gray (5GY 5/1), 70% fine grained sand, subangular to subrounded, trace medium and coarse grains; 20% fine to coarse gravel up to 45 mm, rounded; 10% silt; trace clay; well sorted; contains quartz, feldspar, mica, amphibole, and other; clay and gravel at 139.3 to 139.8 ft.

SAND (SP): greenish gray (5GY 5/1), 100% fine grained sand, subangular to subrounded; trace clay; well sorted; contains quartz, feldspar, and other; clay at 140.1 to 140.4 ft.

CLAY (CL): dark gray (N4), 60% clay, low plasticity; 40% silt; trace fine grained sand, subrounded; alternating silt and clay beds with black and dark gray horizontal laminations; contains organics/wood; trace thin fine sand beds.

SAND (SP): pale olive (5Y 6/3), 100% fine grained sand, subangular to subrounded; trace fine gravel up to 18 mm, subangular to rounded; trace clay, trace clay lens at 146.1 ft; well sorted. — GRAB

SAND WITH GRAVEL (SW): light olive gray (5Y 6/2), 70% fine to coarse grained sand, subangular to rounded; 25% fine to coarse gravel up to 37 mm, rounded; 5% silt; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND (SP): olive gray (5Y 5/2), 95% fine grained sand, subangular to subrounded; 5% silt; trace fine to coarse gravel up to 19 mm, rounded; well sorted; contains quartz, feldspar, mica, amphibole, and other. — SIEVE

CLAY (CL): olive gray (5Y 5/2), 70% clay; 30% silt; dense silty clay; no plasticity; olive brown with gray lamination, trace rusty deposits.

SAND (SP): olive (5Y 5/3), 90% fine grained sand, subangular to subrounded; 10% fine to coarse gravel up to 68 mm, subrounded to rounded; trace clay; well sorted; contains quartz, feldspar, mica, amphibole, and other; higher mica; contains chert, many mineral types, gravel from 157.0-158.5 ft; clay from 162.2 to 163.1 and 164.2 to 164.6 ft. — SS, PTS, SS

160 — GRAB

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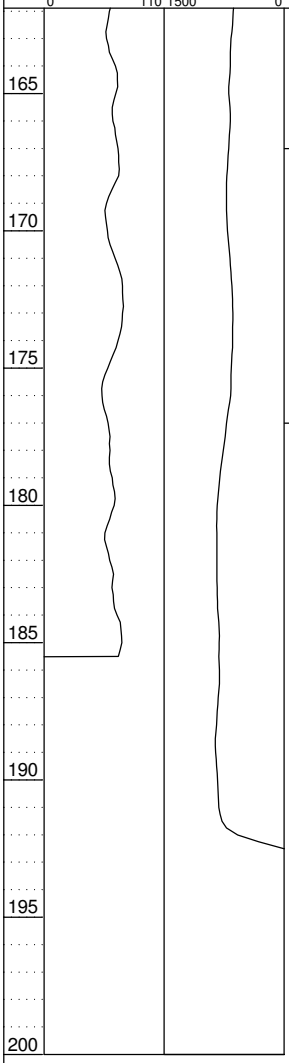
BOREHOLE NAME
ML-2

BOREHOLE LITHOLOGIC LOG (continued)

CLIENT California American Water
PROJECT NUMBER 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.

Depth bgs (feet) | Sample Type

165–170: SAND WITH GRAVEL (SP): olive gray (5Y 5/2), 85% fine grained sand, subangular to subrounded; 15% fine to coarse gravel up to 60 mm, subrounded to rounded, predominantly coarse grained; trace cobbles; well sorted; trace cobbles, contains quartz, feldspar, mica, amphibole, and other; coarse grained gravel and cobble bed at 173.7 ft; well rounded cobbles up to 96 mm, gravel increases at 171.0 to 177.0 ft; chert, granite, and siltstone.

170: GRAB

170–180: SAND (SP): dark greenish gray (5GY 4/1), 95% fine grained sand, subangular to subrounded; 5% fine to coarse gravel up to 35 mm, rounded and flat, gravelly from 180.5 to 182.0 ft; trace clay, clay at 182.0 to 182.3 ft; well sorted; contains quartz, feldspar, mica, and amphibole; high mica; more purple and green minerals; contains rounded siltstones.

180: GRAB

180–195: SAND WITH SILT (SP-SM): dark gray (N4), 90% fine grained sand, subangular to subrounded; 10% silt, thin silty laminations (black and gray); trace fine to coarse gravel up to 60 mm, rounded and flat; trace clay, laminated clay at 184.2 to 184.5 ft, and 186.0 to 186.4 ft; well sorted.

190: SIEVE

195–200: SAND (SP): dark gray (N4), 100% fine to coarse grained sand, subangular to rounded, alternating well sorted and well graded beds; trace fine to coarse gravel up to 45 mm, rounded and flat; contains quartz, feldspar, mica, amphibole, and other; trace shell fragments.

SANDY CLAY (CL): dark greenish gray (10Y 4/1), 51% clay; 49% fine grained sand, subangular to subrounded; contains quartz, feldspar, mica, amphibole, and other; alternating 1-inch bands of clay and fine sand; thin black/ashy lamination.

SAND (SP): dark gray (N4), 100% fine to medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar, mica, amphibole, and other; trace shell fragments.

Bottom of borehole at 200 feet.

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

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BOREHOLE LITHOLOGIC LOG

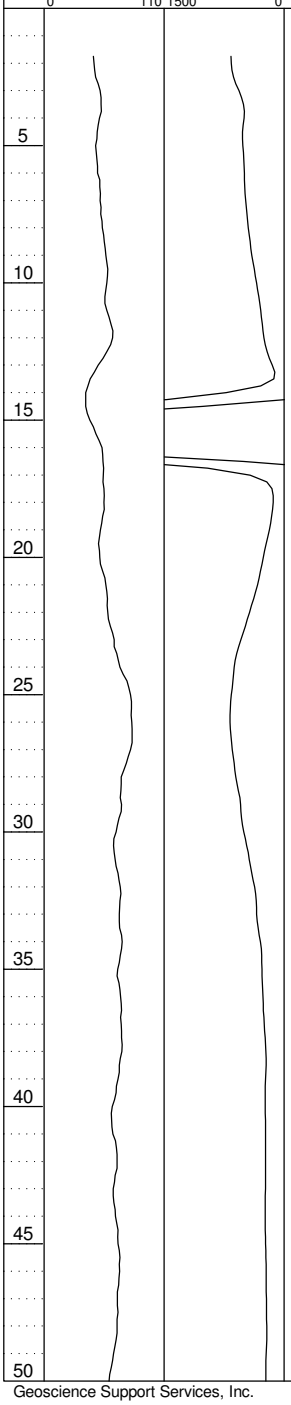
BOREHOLE NAME **ML-3**			
CLIENT	California American Water	LOCATION **Moss Landing, CA**	
PROJECT NUMBER	13017-13	**Nadar Agha Property**	
REPORT DATE	5/23/2014	**36° 48' 00.6768", -121° 47' 00.7656"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY **N. Reynolds**	
DRILLER	Jose Munguia		

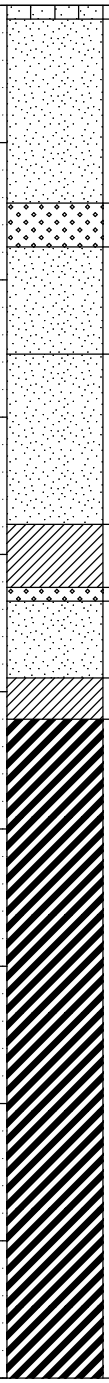
DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	1/07/14	BOREHOLE DIAMETER	8 in
SURFACE ELEVATION	16.0 ft	TOTAL DEPTH	200 ft bgs	FINISH DATE	1/13/13	CORE SIZE	6 in

Lithologic Log

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) | GAMMA (GAPI) 0–110 | CLID (mmho/m) 1500–0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type





SANDY SILT (ML): light olive brown (2.5Y 5/3), 70% silt; 30% fine grained sand, subangular to subrounded; trace fine to coarse gravel up to 22 mm, subangular; contains quartz, feldspar, mica and amphibole.

SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, predominantly fine, subangular to subrounded; trace fine to coarse gravel up to 25 mm, flat and rounded; trace silt; medium sorted; contains quartz, feldspar, mica and amphibole.

SAND (SW): light yellowish brown (2.5Y 6/3), 100% fine to coarse grained sand, subangular to subrounded; trace fine gravel up to 15 mm, subrounded; trace silt, some silty sand beds; poorly sorted; contains quartz, feldspar, mica and amphibole.

SAND (SP): light brownish gray (2.5Y 6/2), 95% fine to medium grained sand, subangular to subrounded; 5% silt, 1-inch alternating dry powdery grey silt beds from 10.3 to 11.1 ft; trace coarse gravel up to 60 mm, rounded, at 10.5 ft; medium sorted; contains quartz, feldspar and mica.

SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine to medium grained sand, subangular to subrounded; trace coarse gravel up to 60 mm, rounded; medium sorted; contains quartz, feldspar, mica and amphibole; higher mica content; rust colored altered sand at 18.9 ft contact.

CLAY (CL): light yellowish brown (2.5Y 6/3), 95% clay, medium plasticity, silty clay; 5% fine to coarse grained sand, subrounded to rounded; trace fine to coarse gravel up to 30 mm, rounded, interbeds; contains quartz, feldspar, mica and amphibole; high mica content, some horizontal ashy deposits.

SAND (SW): light olive gray (5Y 6/2), 95% fine to coarse grained sand, subangular to rounded; 5% fine gravel up to 18 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other, higher mica content. — GRAB

SAND (SP): olive (5Y 5/3), 95% fine grained sand, subangular to subrounded; 5% fine to coarse gravel up to 39 mm, subrounded to rounded; well sorted; contains quartz, feldspar, mica, amphibole, and other, high mica content.

CLAY (CL): pale olive (5Y 6/3), 85% clay, no plasticity; 15% silt, thin silty interbeds; thin black and rust colored laminations.

FAT CLAY (CH): dark greenish gray (10Y 4/1), 100% clay, medium plasticity, dense; trace fine grained sand, subangular to subrounded, sand layer from 32.0 to 32.3 ft; dense clay with trace ashy deposits/horizontal laminations; organics (wood) at 32.7, 36.0, 38.1, 40.1, and 46.6 ft.

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

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BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME	ML-3
CLIENT	California American Water
PROJECT NUMBER	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.

Depth bgs (feet)	GAMMA (GAPI) 0–110	CLID (mmho/m) 1500–0	Zone Test	Graphic Log	Lithologic Log	Depth bgs (feet)	Sample Type
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						75	
80					FAT CLAY (CH): dark greenish gray (10Y 4/1), 100% clay, low plasticity, dense; high ashy organic/wood content; dark horizontal laminations.	80	
85						85	
90					SAND (SP): gray (N5), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz and feldspar. SILT (ML): greenish gray (10Y 5/1), 85% silt; 15% clay; clayey silt; trace organics/wood. 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.	90	
95					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.	95	
100					FAT CLAY WITH SAND (CH): black (5Y 2.5/1), 85% clay, no plasticity; 15% fine to medium grained sand, subangular to subrounded. 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.	100	
105			Zone #2		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.	105	GRAB

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

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BOREHOLE NAME **ML-3**

BOREHOLE LITHOLOGIC LOG (continued)

CLIENT California American Water
PROJECT NUMBER 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.

Depth bgs (feet)	GAMMA (GAPI) 0 – 110	CLID (mmho/m) 1500 – 0	Zone Test	Graphic Log	Lithologic Log	Depth bgs (feet)	Sample Type
			SC: 7,439 uS/cm		SAND (SP): olive gray (5Y 5/2), 100% fine grained sand, subangular to subrounded; trace fine to coarse gravel up to 30 mm, subrounded; trace clay, trace clay lenses; well sorted; contains quartz, feldspar, amphibole, and other; trace rust and purple colored lamination/alteration.		SS, PTS, SS
110						110	SIEVE
					SAND (SW): pale olive (5Y 6/3), 100% fine to coarse grained sand, subangular to subrounded, fining upward; trace fine to coarse gravel up to 25 mm, subrounded; poorly sorted; contains quartz, feldspar, amphibole, and other.		SIEVE
115					SILT (ML): dark greenish gray (5GY 4/1), 100% silt; trace clay; trace thin ashy laminations; shell fragments from 116.1 to 117.0, 117.8 to 118.2, and 119.6 ft; clayey from 122.7 to 123.3 and 124.6 to 125.1 ft.	115	
120						120	
125						125	
					SILT (ML): dark greenish gray (10Y 4/1), 85% silt, dense; 15% clay; trace thin black ashy lamination/deposits; clayey.		
130						130	
135						135	
140					FAT CLAY (CH): dark greenish gray (5GY 4/1), 85% clay, low plasticity; 15% silt; silty; trace thin horizontal ashy laminations.	140	
					SILT (ML): dark greenish gray (5GY 4/1), 100% silt; contains mica; trace thin horizontal ashy laminations; trace shell fragments.		
145						145	
					SILT (ML): dark greenish gray (5GY 4/1), 85% silt, clayey; 15% clay; trace round gravel to 21mm at 157.6 ft; trace thin horizontal ashy laminations/deposits.		
150						150	
155						155	
160					FAT CLAY (CH): dark greenish gray (5GY 4/1), 100% clay, low plasticity; trace silt; horizontal ashy black lamination.	160	
					SILT (ML): dark greenish gray (5GY 4/1), 100% silt; trace clay; trace thin horizontal ashy laminations; organics/wood at 163.5 ft.		

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

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BOREHOLE NAME **ML-3**

BOREHOLE LITHOLOGIC LOG (continued)

CLIENT California American Water
PROJECT NUMBER 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.

Depth bgs (feet)	GAMMA (GAPI) 0–110	CLID (mmho/m) 1500–0	Zone Test	Graphic Log	Lithologic Log	Sample Type
165						
					SAND (SP): dark greenish gray (5GY 4/1), 100% fine grained sand, subangular to subrounded; trace fine gravel up to 13 mm, rounded; well sorted; contains quartz and feldspar.	SS, PTS
170					SILT (ML): dark greenish gray (5GY 4/1), 100% silt, low to no plasticity; trace fine gravel up to 16 mm, rounded, at 169.5 ft; trace fine grained sand, subrounded; trace clay, clayey from 168.8 to 169.8 ft; trace horizontal ashy laminations.	
175					SAND WITH SILT (SP-SM): dark greenish gray (10Y 4/1), 85% fine to medium grained sand, subangular to subrounded, trace rounded coarse grains; 10% silt; 5% fine to coarse gravel up to 40 mm, rounded; medium sorted; contains quartz, feldspar, mica, amphibole, and other; many mineral types; siltstone.	
					SAND (SW): greenish gray (10Y 5/1), 85% fine to coarse grained sand, subangular to rounded; 10% fine to coarse gravel up to 37 mm, rounded; 5% silt; poorly sorted; contains quartz, feldspar, mica, amphibole, siltstone, and other; many mineral types.	GRAB
180			Zone #1		SAND WITH GRAVEL (SW): pale olive (5Y 6/3), 80% fine to coarse grained sand, subangular to rounded; 20% fine to coarse gravel up to 57 mm, rounded; trace cobbles; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; many mineral types; trace rounded cobbles up to 77 mm.	SIEVE
185			SC: 11,704 uS/cm		SAND (SP): olive (5Y 5/3), 95% fine to medium grained sand, subangular to rounded, trace coarse grained; 5% clay; trace fine gravel up to 18 mm, rounded; poorly sorted; dense, weak cementation; contains quartz, feldspar, mica, amphibole, and other; many mineral types.	
					SAND WITH CLAY AND GRAVEL (SW-SC): pale olive (5Y 6/3), 70% fine to coarse grained sand, subangular to rounded; 20% fine to coarse gravel up to 45 mm, rounded; 10% clay; poorly sorted; dense, weak cementation; contains quartz, feldspar, mica, amphibole, and other; many mineral types.	
190					SAND (SP): pale olive (5Y 6/3), 100% fine to medium grained sand, subangular to subrounded, trace coarse grained; trace fine to coarse gravel up to 45 mm, rounded; medium sorted; contains quartz, feldspar, mica and amphibole; contains quartz, feldspar, mica, amphibole, siltstone, and other; many mineral types.	SIEVE
195					SAND WITH GRAVEL (SW): pale olive (5Y 6/3), 70% fine to coarse grained sand, subangular to subrounded; 25% fine to coarse gravel up to 44 mm, subrounded to rounded; 5% clay; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; many mineral types.	SIEVE
200					SAND WITH GRAVEL (SW): olive (5Y 5/4), 85% fine to coarse grained sand, subangular to subrounded; 15% fine to coarse gravel up to 35 mm, subrounded to rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; many mineral types.	GRAB

Bottom of borehole at 200 feet.

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

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BOREHOLE LITHOLOGIC LOG

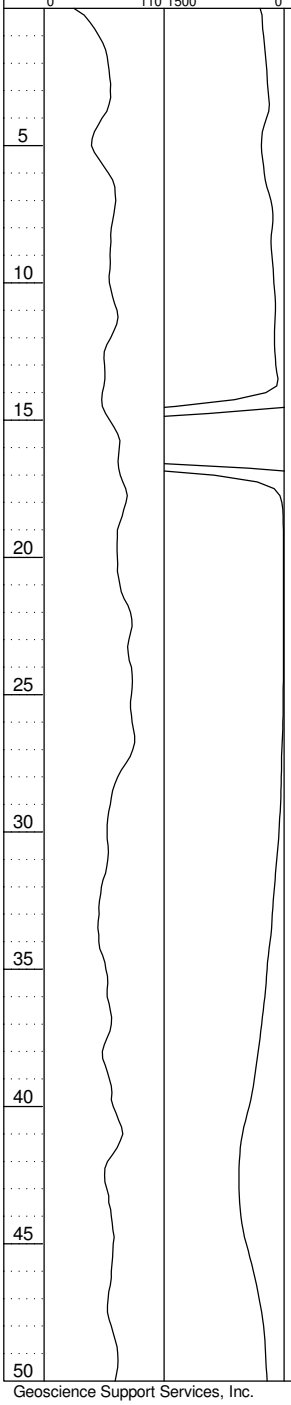
BOREHOLE NAME **ML-4**			
CLIENT	California American Water	LOCATION **Moss Landing, CA**	
PROJECT NUMBER	13017-13	**Nadar Agha Property**	
REPORT DATE	5/23/2014	**36° 48' 09.342", -121° 47' 02.526"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY **N. Reynolds**	
DRILLER	Jose Munguia		

DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	12/02/13	BOREHOLE DIAMETER	8 in
SURFACE ELEVATION	32.0 ft	TOTAL DEPTH	201 ft bgs	FINISH DATE	12/06/13	CORE SIZE	7 in

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.

Depth bgs (feet) | GAMMA (GAPI) 0–110 | CLID (mmho/m) 1500–0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type



Depth bgs (feet)	Description	Sample Type
	SILTY SAND (SM): yellowish brown (10YR 5/4), 80% fine grained sand, subangular to subrounded; 20% silt; trace fine to coarse gravel up to 20 mm, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole; trace organics/roots.	
	SANDY SILT (ML): dark brown (10YR 3/3), 70% silt; 30% fine grained sand, subangular to subrounded; trace fine gravel up to 5 mm, subangular to subrounded; contains quartz and feldspar; trace organics/roots.	
5	SANDY SILT (ML): very dark brown (10YR 2/2), 70% silt; 30% fine grained sand, subangular to subrounded; trace fine gravel up to 5 mm, subangular to rounded; contains quartz and feldspar; trace organics/roots.	
	CLAY (CL): olive (5Y 5/3), 90% clay, low plasticity; 10% fine grained sand, subangular to subrounded; contains quartz and feldspar; some rusty alteration.	
10	CLAY (CL): light yellowish brown (2.5Y 6/4), 90% clay, low plasticity, trace cemented clay; 10% silt; trace fine grained sand, subangular to subrounded; friable, organics (black), evaporite minerals (spherical).	
	SILT (ML): light yellowish brown (2.5Y 6/3), 90% silt, clayey silt; 10% fine to medium grained sand, subangular to subrounded, 4-inch rusty sand interbeds; contains quartz and feldspar; trace rusty alteration and organics.	
15	SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine grained sand, subangular to subrounded; well sorted; dry sample; contains quartz, feldspar, mica and amphibole; with visible rust colored alteration.	
	CLAY (CL): olive (5Y 5/3), 100% clay, clay with silty interbeds; trace fine grained sand, subangular to subrounded, rusty alteration; rust and black horizontal laminations.	
20	SAND (SP): light yellowish brown (2.5Y 6/4), 95% fine to medium grained sand, subangular to subrounded, predominantly fine grained, some rusty alteration; 5% silt; trace fine gravel up to 18 mm, rounded; medium sorted; dry sample; contains quartz, feldspar, mica and amphibole; trace weakly cemented sand and silt interbeds.	
25	SAND (SP): pale olive (5Y 6/3), 100% fine to medium grained sand, subangular to subrounded, trace coarse grained; trace fine gravel up to 18 mm, subangular to rounded; medium sorted; contains quartz, feldspar, mica and amphibole.	SIEVE
30	SAND (SW): pale olive (5Y 6/3), 95% fine to coarse grained sand, subangular to rounded; 5% fine to coarse gravel up to 65 mm, subangular to rounded, coarse subrounded gravel at 30.7 and 32.1 ft; poorly sorted; contains quartz, feldspar, mica and amphibole.	
35	SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; higher mica content.	
	SAND (SP): light olive gray (5Y 6/2), 100% fine to medium grained sand, subangular to rounded, trace coarse grained; trace fine gravel up to 18 mm, rounded; trace clay, trace clay balls; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.	
40	SAND (SP): olive gray (5Y 5/2), 100% fine grained sand, subangular to subrounded, trace coarse black grains; well sorted; contains quartz, feldspar, mica and amphibole; high mica.	GRAB
	CLAY (CL): olive gray (5Y 5/2), 100% clay, low to no plasticity; alteration visible, rusty horizontal laminations.	
45	FAT CLAY (CH): dark greenish gray (5GY 4/1), 100% clay, medium plasticity, dense; alteration visible, dark gray laminations.	
	SILT WITH SAND (ML): olive gray (5Y 5/2), 85% silt; 15% fine grained sand, subangular to subrounded; alteration visible, rusty horizontal laminations; contains mica.	
	CLAY (CL): olive gray (5Y 5/2), 100% clay, medium plasticity; trace silt; alteration visible, rusty horizontal laminations (silt).	
50	CLAY (CL): dark greenish gray (10Y 4/1), 100% clay, medium plasticity; gray to black	

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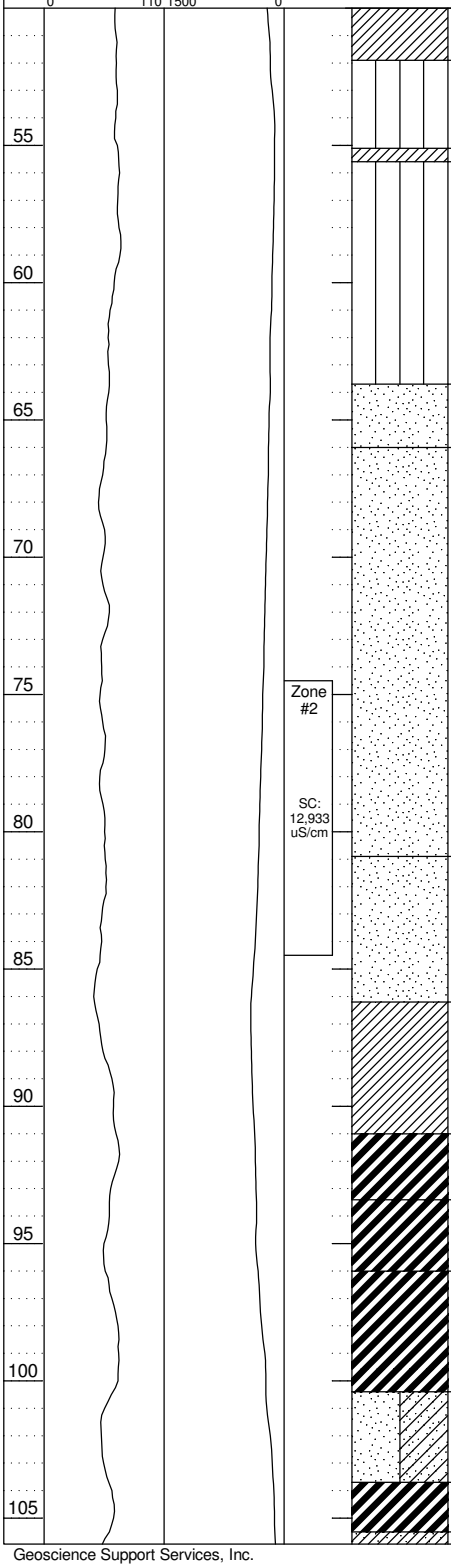
BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME	ML-4
CLIENT	California American Water
PROJECT NUMBER	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.

Zone Test: Zone #2 — SC: 12,933 uS/cm

Sample Type: SIEVE; SS PTS SS

horizontal laminations.

SILT (ML): dark greenish gray (10Y 4/1), 100% silt; grey silt with black horizontal laminations, trace mica.

CLAY (CL): dark greenish gray (10Y 4/1), 80% clay, low plasticity; 20% silt; silty clay, trace mica.

SILT WITH SAND (ML): dark greenish gray (10Y 4/1), 80% silt; 15% fine grained sand, subangular to subrounded; 5% clay, trace clay lenses; silt with alternating thin fine sand lenses and thin black horizontal laminations; trace woody organics.

SAND (SP): greenish gray (5GY 5/1), 100% fine to medium grained sand, subangular to rounded; trace fine to coarse gravel up to 44 mm, flat and rounded; medium sorted; contains quartz, feldspar and amphibole; contains quartz, feldspar, amphibole, and other; trace organics/wood at 65.5 ft.

SAND (SP): greenish gray (5GY 5/1), 100% fine grained sand, subangular to subrounded; trace silt, silt lenses; trace clay, clay lenses; well sorted; contains quartz, feldspar and mica; trace organics/wood at 75.2 and 80.2 ft.

SAND (SP): greenish gray (5GY 6/1), 100% fine grained sand, subangular to subrounded; trace fine gravel up to 10 mm, rounded; trace silt, silt lenses; trace clay, clay lenses; well sorted; contains quartz, feldspar and mica; trace organics/wood 83.3 ft.

CLAY (CL): dark greenish gray (10Y 4/1), 100% clay, low plasticity; dense clay with black horizontal laminations.

FAT CLAY (CH): dark greenish gray (10Y 4/1), 100% clay, high plasticity, very dense and waxy.

FAT CLAY (CH): dark greenish gray (5GY 4/1) to greenish black (10Y 2.5/1), 100% clay, high plasticity; very dense and waxy clay with partially cemented black/brown laminations (3/4-inch alternating).

FAT CLAY (CH): dark greenish gray (10Y 4/1), 100% clay, medium plasticity, dense and waxy; brownish gray laminations from 98.5 to 100.4 ft.

SAND WITH CLAY (SP-SC): greenish gray (10Y 5/1), 90% fine to medium grained sand, subangular to subrounded; 10% clay, 4 to 6 inch sandy clay interbeds; medium sorted; contains quartz, feldspar, mica and amphibole.

FAT CLAY (CH): dark greenish gray (5GY 4/1), 100% clay, medium plasticity, dense; trace black laminations/ashy deposits.

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BOREHOLE NAME
ML-4

BOREHOLE LITHOLOGIC LOG (continued)

CLIENT California American Water
PROJECT NUMBER 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.

Depth bgs (feet) | GAMMA (GAPI) 0 – 110 | CLID (mmho/m) 1500 – 0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type

SANDY CLAY (CL): dark greenish gray (5GY 4/1), 70% clay, low plasticity; 30% fine to coarse grained sand, subangular; contains quartz and feldspar; trace small black ashy deposits; trace organics/wood at 106 ft.

SAND (SP): dark greenish gray (10Y 4/1) to greenish gray (5GY 5/1), 100% fine to medium grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; trace organics/wood; high quartz content.

110

SIEVE

115

CLAY (CL): dark greenish gray (10G 4/1), 80% clay, low plasticity; 20% silt; trace fine grained sand, subangular to subrounded; trace small black/ashy deposits; silty clay.

SAND (SP): dark greenish gray (10Y 4/1), 100% fine to medium grained sand, subangular to subrounded, predominantly fine grained; trace fine gravel up to 17 mm, subrounded to rounded; trace clay, clay lens at 119.0 ft; medium sorted; contains quartz, feldspar, mica, amphibole, and other; trace organics/wood.

120

CLAY (CL): dark greenish gray (5GY 4/1), 95% clay, low plasticity, silty clay; 5% fine grained sand, subangular to subrounded; contains quartz and feldspar; trace black ashy deposits.

CLAYEY SAND (SC): greenish gray (10G 5/1), 70% fine grained sand, subrounded; 30% clay, medium plasticity; well sorted; contains quartz, feldspar and amphibole; alternating beds of sand and clay.

125

FAT CLAY (CH): very dark greenish gray (10Y 3/1), 100% clay, medium plasticity, dense.

SS
PTS
SS

CLAY WITH SAND (CL): dark greenish gray (10G 4/1), 80% clay, no plasticity; 20% fine grained sand, subrounded; trace organics/wood.

FAT CLAY (CH): greenish gray (10G 5/1), 100% clay, medium plasticity, dense and waxy; trace sand balls; highly altered/rusty laminations at 131.3 ft.

130

SAND (SP): pale yellow (2.5Y 7/3), 100% fine to medium grained sand, subangular to subrounded, predominantly fine grained, trace coarse; trace fine to coarse gravel up to 43 mm, subrounded to rounded, flat; trace silt, 2.5-inch silt at 133.8 ft; medium sorted; contains quartz, feldspar, mica, amphibole, and other; some purple colored alteration.

GRAB

135

SANDY CLAY WITH GRAVEL (CL): light yellowish brown (2.5Y 6/3), 60% clay, no plasticity; 25% fine to coarse grained sand, subangular to subrounded; 15% fine to coarse gravel up to 40 mm, subrounded to rounded; contains quartz, feldspar, mica, amphibole, and other; with visible alteration of sands.

GRAB

SAND (SW): light yellowish brown (2.5Y 6/3), 100% fine to coarse grained sand, subangular to rounded, predominantly medium to coarse grained; trace fine to coarse gravel up to 32 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

140

SAND (SP): pale olive (5Y 6/3), 100% fine grained sand, subangular to subrounded, coarse grained from 138.8 to 139.2 ft; well sorted; contains quartz, feldspar, mica and amphibole; trace rust colored laminations.

SILT (ML): olive (5Y 5/3), 100% silt; rusty and black/ashy laminations/alteration (at 139.2 ft).

SILTY SAND (SM): olive (5Y 5/3), 85% fine grained sand, subangular to subrounded; 15% silt; trace fine to coarse gravel up to 57 mm, subangular to rounded; trace clay, 1-inch clay lens at 141.3 ft; well sorted; contains quartz, feldspar and amphibole; rust colored horizontal laminations.

145

SS
PTS
SS

SILT (ML): olive (5Y 5/3), 100% silt; trace fine grained sand, subrounded; contains mica; rust colored horizontal laminations.

SAND (SP): light yellowish brown (2.5Y 6/3), 100% fine to coarse grained sand, subangular to rounded, predominantly fine to medium grained; trace fine to coarse gravel up to 39 mm, rounded, quartz-rich and sandstone, higher gravel content at 144.5 to 146 ft and 149.5 to 150.5 ft; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; many mineral types.

150

SIEVE

SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subangular to subrounded; trace fine to coarse gravel up to 24 mm, rounded; medium sorted; contains quartz, feldspar, mica, amphibole, and other.

155

SAND (SP): olive (5Y 5/3), 100% fine to coarse grained sand, subangular to rounded, predominantly fine to medium grained; trace fine gravel up to 15 mm, rounded; trace clay; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

160

SAND WITH CLAY AND GRAVEL (SW-SC): light yellowish brown (2.5Y 6/3), 65% fine to

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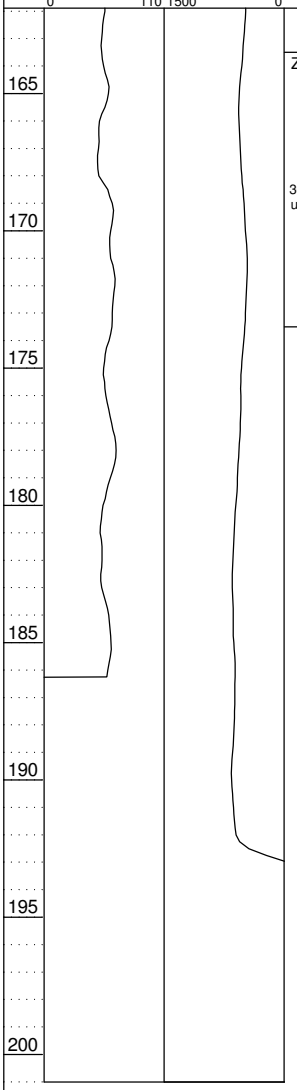
BOREHOLE NAME
ML-4

BOREHOLE LITHOLOGIC LOG (continued)

CLIENT California American Water
PROJECT NUMBER 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.

coarse grained sand, subangular to rounded; 25% fine to coarse gravel up to 28 mm, rounded; 10% clay; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND (SP): olive (5Y 5/3), 90% fine to coarse grained sand, subangular to rounded, predominantly fine to medium grained; 5% fine to coarse gravel up to 20 mm, subrounded to rounded; 5% silt; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

CLAYEY GRAVEL WITH SAND (GC): yellowish brown (10YR 5/4), 60% fine to coarse gravel up to 33 mm, rounded; 25% fine to coarse grained sand, subrounded to rounded, predominantly coarse grained; 15% clay; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; pink colored deposit.

SAND (SW): olive (5Y 5/4), 95% fine to coarse grained sand, subangular to rounded; 5% fine to coarse gravel up to 43 mm, rounded; trace clay; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; well rounded coarse grained sand and fine gravel interbed from 171.4 to 171.9 ft. — GRAB

SAND (SP): olive (5Y 5/4), 100% fine to medium grained sand, subangular to subrounded, predominantly fine grained, trace coarse grained; trace fine to coarse gravel up to 34 mm, flat and rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND (SP): light olive brown (2.5Y 5/3), 100% fine to coarse grained sand, subangular to rounded, predominantly medium grained; trace fine to coarse gravel up to 32 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; abundance of minerals.

SAND (SP): pale olive (5Y 6/4), 100% fine to medium grained sand, subangular to subrounded, predominantly fine grained; trace fine to coarse gravel up to 31 mm, flat and rounded; medium sorted; contains quartz, feldspar, mica, amphibole, and other;. — SIEVE

SAND (SP): olive (5Y 5/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica, amphibole, and other.

SAND (SP): greenish gray (5GY 6/1), 100% fine grained sand, subangular to subrounded, trace medium grained; trace fine to coarse gravel up to 22 mm, rounded; well sorted; contains quartz, feldspar, mica and amphibole; contains quartz, feldspar, mica, amphibole, and other; trace orange alteration.

SILT (ML): greenish gray (5GY 5/1), 100% silt; trace fine to coarse gravel up to 22 mm, rounded; trace fine grained sand, subrounded; contains quartz, feldspar, mica and amphibole; some rust colored horizontal laminations. — GRAB

SAND (SP): dark gray (N4), 95% fine grained sand, subrounded, very fine grained; 5% silt, thin silt lenses; trace fine to coarse gravel up to 56 mm, well rounded, predominantly green and purple minerals; well sorted; contains quartz, feldspar, mica, amphibole, and other; high mica content.

SAND (SP): gray (N5), 100% fine to coarse grained sand, subangular to rounded; trace fine to coarse gravel up to 69 mm, well rounded; well sorted; contains quartz, feldspar, mica and amphibole; alternating fine to coarse well graded sand and well sorted fine grained sand beds; fine to coarse grained sand beds at 188.9 to 189.7, 190.2 to 191.2, 192.0 to 193.1 ft; fine grained sand beds at 189.7 to 190.2, 191.2 to 192.0 ft; trace shells.

CLAY (CL): dark gray (N4), 100% clay; trace silt; trace horizontal black/ashy laminations.

SILT (ML): dark gray (N4), 100% silt; trace clay; trace horizontal black/ashy laminations, trace organics.

SAND (SP): dark gray (N4), 100% fine grained sand, subrounded; well sorted; contains quartz, feldspar, mica and amphibole; high mica content.

CLAY (CL): dark greenish gray (10Y 4/1), 100% clay, medium plasticity; trace silt; trace black/ashy deposits.

SILT (ML): dark greenish gray (10Y 4/1), 100% silt; trace clay; trace black/ashy deposits.

CLAY (CL): dark greenish gray (10Y 4/1), 100% clay; trace silt; trace black/ashy deposits.

SILT (ML): dark gray (N4), 70% silt; 30% clay; clayey silt.

Bottom of borehole at 201 feet.

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

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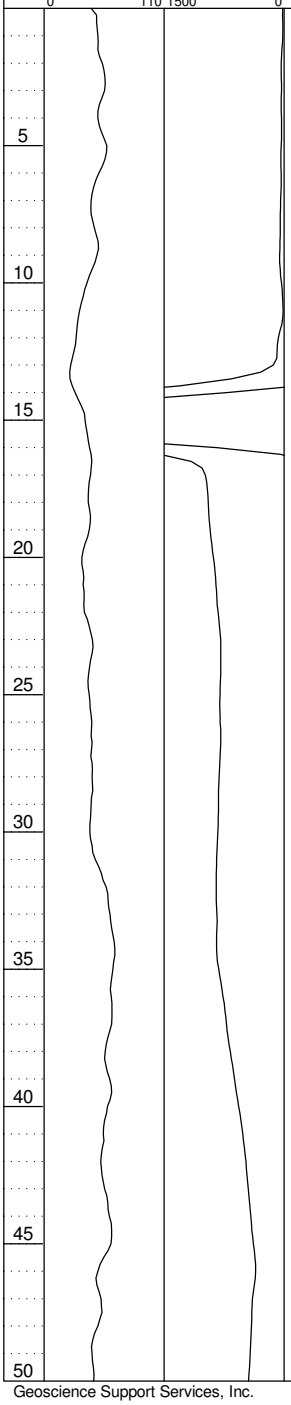
BOREHOLE LITHOLOGIC LOG

BOREHOLE NAME **ML-6**			
CLIENT	California American Water	LOCATION **Moss Landing, CA**	
PROJECT NUMBER	13017-13	**MBARI**	
REPORT DATE	5/23/2014	**36° 48' 21.4992", -121° 47' 16.0188"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY **N. Reynolds**	
DRILLER	Jose Munguia		

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



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.

Depth bgs (feet) | Sample Type

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.

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.

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.

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.

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.

CLAY (CL): olive brown (2.5Y 4/4), 100% clay, low plasticity; with visible rust and black colored alteration.

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.

CLAY (CL): very dark greenish gray (5GY 3/1), 100% clay, low plasticity; dark gray/black laminations.

SILT (ML): very dark greenish gray (10Y 3/1), 95% silt; 5% fine grained sand, subrounded, very fine grained; contains mica; thin black laminations.

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.

CLAY (CL): greenish black (10Y 2.5/1), 100% clay, medium plasticity; trace silt, silt interbed at 42.4 to 42.8 ft.

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

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BOREHOLE NAME
ML-6

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | GAMMA (GAPI) 0 110 | CLID (mmho/m) 1500 0 | Zone Test | Graphic Log | Lithologic Log | Depth bgs (feet) | Sample Type

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.

visible alteration.

SAND (SP): light yellowish brown (2.5Y 6/3), 95% medium to coarse grained sand, subangular to rounded; 5% fine to coarse gravel up to 45 mm, rounded; poorly sorted; contains quartz, feldspar, mica and amphibole; with visible alteration; gravelly sand from 53.7 to 54.9 ft.

55

CLAY (CL): olive (5Y 5/3), 100% clay; trace silt; silt/fine sand laminations, rusty altered laminations.

SAND (SP): light yellowish brown (2.5Y 6/3), 95% fine grained sand, subangular to subrounded, very fine grained; 5% silt; trace fine to coarse gravel up to 23 mm, subrounded; trace clay; well sorted; contains quartz, feldspar, mica and amphibole; with visible alteration; thin altered rusty laminations.

60

SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subangular to subrounded, predominantly fine; medium sorted; contains quartz, feldspar, amphibole, and other.

SAND (SW): light yellowish brown (2.5Y 6/4), 100% fine to coarse grained sand, subangular to rounded; trace fine to coarse gravel up to 32 mm, subangular to rounded; trace clay, clay balls; poorly sorted; contains quartz, feldspar, amphibole, and other.

65

SAND (SP): light yellowish brown (2.5Y 6/4), 100% fine to medium grained sand, subangular to subrounded, predominantly fine; medium sorted; contains quartz, feldspar, amphibole, and other.

SILT (ML): olive (5Y 5/4), 95% silt, olive and gray laminated silt; 5% medium grained sand, subangular to subrounded; oxidized silt laminations and sand interbeds.

70

SAND (SP): strong brown (7.5YR 4/6), 100% fine to medium grained sand, subangular to subrounded; well sorted; contains quartz, feldspar and amphibole; highly oxidized sand.

CLAY (CL): olive (5Y 4/4), 100% clay, no plasticity, silty clay; black/grey and rusty colored laminations.

CLAY (CL): very dark greenish gray (10Y 3/1), 95% clay, low plasticity; 5% fine grained sand, subangular to subrounded; dark gray clay with 1-inch gray sand interbeds, black and rusty colored laminations, organics.

75

CLAY (CL): black (N2.5), 100% clay, low plasticity; black clay with dark brown and gray laminations; trace organics (seed).

SAND (SP): olive (5Y 4/4), 100% fine to medium grained sand, subangular to subrounded; medium sorted; contains quartz, feldspar, mica and amphibole; higher mica content; with visible alteration/oxidation.

80 — PTS

CLAY (CL): very dark greenish gray (10Y 3/1), 100% clay, low plasticity, dense; rich in organics (wood) especially from 78.0 to 79.0 ft, laminated.

SAND (SP): light olive brown (2.5Y 5/4), 100% fine grained sand, subangular to subrounded; well sorted; contains quartz, feldspar, mica and amphibole; alteration visible, rusty colored lamination.

85

CLAY (CL): olive (5Y 5/3), 100% clay, medium plasticity; trace fine grained sand, subrounded, interbedded; contains quartz, feldspar, mica and amphibole; alteration visible, rusty colored laminations in sand and clay.

SAND WITH SILT (SP-SM): light olive brown (2.5Y 5/3), 90% fine grained sand, subrounded, very fine grained; 10% silt; well sorted; contains quartz, feldspar, mica and amphibole.

90

SILT WITH SAND (ML): light olive brown (2.5Y 5/4), 85% silt; 15% fine grained sand, subrounded, fine sand bed from 89.2 to 89.6 ft; contains quartz, feldspar and mica; alteration visible, rusty laminations.

SILT (ML): light olive brown (2.5Y 5/4), 100% silt, clayey silt, dense; trace clay; trace alteration/oxidizing.

SAND WITH SILT (SP-SM): light yellowish brown (2.5Y 6/4), 90% fine grained sand, subrounded; 10% silt; well sorted. — SIEVE

95

CLAY (CL): light olive brown (2.5Y 5/4), 100% clay, low plasticity; trace alteration including rusty colored and small black ashy deposits.

SAND WITH SILT (SP-SM): light olive brown (2.5Y 5/3), 90% fine grained sand, subrounded, very fine grained; 10% silt; well sorted; contains quartz, feldspar, mica and amphibole; trace purple alteration. — SS SS SS

CLAY (CL): olive (5Y 4/4), 100% clay, no plasticity; trace fine grained sand, subrounded; trace silt; with trace rust colored alteration.

100

Zone #2

SAND WITH SILT (SP-SM): light olive brown (2.5Y 5/3), 90% fine grained sand, subrounded; 10% silt; well sorted; contains quartz, feldspar, mica and amphibole; with some rust colored alteration.

SILT (ML): olive (5Y 5/4), 100% silt; rounded; trace coarse gravel up to 30 mm, rounded, flat; alternating 1/2-inch bands of oxidized/rust color and olive brown.

105 — SC: 42,650 uS/cm — SIEVE

SAND (SP): light olive brown (2.5Y 5/3), 100% fine grained sand, subrounded, trace medium to coarse grained; trace fine gravel up to 5 mm, subrounded; trace silt; well sorted;

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BOREHOLE NAME
ML-6

BOREHOLE LITHOLOGIC LOG (continued)

CLIENT California American Water
PROJECT NUMBER 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.

Depth bgs (feet)	GAMMA (GAPI) 0–110	CLID (mmho/m) 1500–0	Zone Test	Graphic Log	Lithologic Log	Depth bgs (feet)	Sample Type
					contains quartz, feldspar, mica and amphibole.		
					SAND (SW): light olive brown (2.5Y 5/4), 95% fine to coarse grained sand, subangular to subrounded; 5% fine to coarse gravel up to 70 mm, rounded; poorly sorted; contains quartz, feldspar, mica and amphibole.		SS PTS SS
110					SAND (SP): olive (5Y 4/4), 100% fine grained sand, subrounded to rounded; trace fine gravel up to 18 mm, rounded; well sorted; contains quartz, feldspar and amphibole.	110	
					SAND WITH GRAVEL (SW): light olive brown (2.5Y 5/3), 60% fine to coarse grained sand, subangular to rounded; 40% fine to coarse gravel up to 58 mm, rounded; trace rounded cobbles to 108 mm; trace clay; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; many mineral types.		
115					SILT (ML): olive (5Y 5/4), 90% silt; 10% fine grained sand, subrounded, very fine grained; some visible alteration, purple alteration.	115	
					SAND (SP): light olive brown (2.5Y 5/3), 90% fine to medium grained sand, subangular to subrounded, trace coarse grained; 10% fine to coarse gravel up to 55 mm, rounded; poorly sorted; contains quartz, feldspar, amphibole, and other; alteration visible at 111.8 ft.		
120					SAND (SP): olive (5Y 5/3), 100% fine grained sand, subrounded; trace fine to coarse gravel up to 36 mm, rounded; well sorted; contains quartz, feldspar, mica, amphibole, and other; high mica content; sand with gravel interbeds at 114.4, 115.4, 115.9, 116.4, and 120.4 ft; weakly cemented from 124.1 to 125.5 ft.	120	
							SIEVE
125						125	
					SAND WITH GRAVEL (SW): pale olive (5Y 6/3), 60% fine to coarse grained sand, subangular to subrounded; 40% fine to coarse gravel up to 35 mm, well rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other, many mineral types.		
130					SAND (SP): pale olive (5Y 6/4), 100% fine to medium grained sand, subangular to subrounded; trace fine gravel up to 10 mm, rounded; well sorted; contains quartz, feldspar and amphibole.	130	
					SILTY SAND (SM): olive (5Y 5/3), 70% fine grained sand, subrounded; 30% silt; well sorted; contains quartz, feldspar, mica and amphibole; higher mica content; sandy silt with rusty alteration at 130.0 to 130.5 ft.		
135					SAND (SP): pale olive (5Y 6/3), 100% fine to medium grained sand, subangular to subrounded, trace coarse grained; trace fine to coarse gravel up to 25 mm, rounded; medium sorted; contains quartz, feldspar, mica, amphibole, and other.	135	
					SAND (SP): pale olive (5Y 6/3), 95% fine grained sand, subrounded, very fine grained; 5% silt; well sorted; contains quartz, feldspar, mica and amphibole.		
140						140	
							SIEVE
145						145	
					SAND (SP): light olive brown (2.5Y 5/6), 100% fine to medium grained sand, subangular to subrounded, trace coarse grained; trace fine to coarse gravel up to 38 mm, rounded; medium sorted; contains quartz, feldspar, mica, amphibole, and other, higher mica content; alteration visible, partially oxidized/rusty sand.		
150						150	
					SAND (SW): olive (5Y 5/3), 90% fine to coarse grained sand, subangular to rounded; 5% fine to coarse gravel up to 45 mm, rounded; 5% silt; poorly sorted; weak cementation; contains quartz, feldspar, mica, amphibole, and other; gravel and coarse grained sand interbeds.		
			Zone #1				
155					SAND (SP): greenish gray (10Y 5/1), 100% fine to medium grained sand, subangular to subrounded; trace fine to coarse gravel up to 33 mm, rounded; medium sorted; contains quartz, feldspar, mica, amphibole, and other; with visible alteration; first sign of green/grey color change.	155	
			SC: 48,132 uS/cm		SAND WITH GRAVEL (SW): greenish gray (5GY 5/1), 85% fine to coarse grained sand, subangular to rounded; 15% fine to coarse gravel up to 45 mm, rounded; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; sandy gravel from 154.1 to 154.6 ft.		
160					SAND (SP): very dark greenish gray (5GY 3/1), 95% fine grained sand, subangular to subrounded; 5% silt; trace fine to coarse gravel up to 75 mm, rounded; well sorted; contains quartz, feldspar, mica, amphibole, and other, high mica content.	160	

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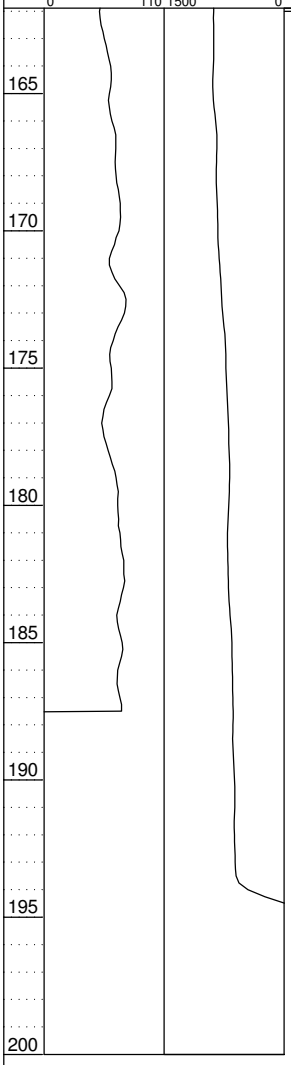
BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME		LOCATION
ML-6		
CLIENT	California American Water	
PROJECT NUMBER	13017-13	**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.

SAND (SP): dark greenish gray (5G 4/1), 95% fine to coarse grained sand, subangular to rounded; 5% fine to coarse gravel up to 74 mm, rounded, interbeds at 159.8 and 161.9 ft; trace silt, silt balls; poorly sorted; contains quartz, feldspar, mica, amphibole, and other; trace black/sooty laminations.

SILT (ML): very dark greenish gray (10Y 3/1), 95% silt; 5% coarse gravel up to 55 mm, flat, rounded, gravel interbeds, trace fine gravel; trace fine grained sand, subrounded to rounded; contains mica; high mica content.

SAND (SP): dark greenish gray (5G 4/1), 100% fine grained sand, subangular to subrounded; trace fine gravel up to 18 mm, rounded; well sorted; contains quartz, feldspar, mica and amphibole.

SILTY SAND (SM): very dark greenish gray (5GY 3/1), 65% fine grained sand, subrounded to rounded; 30% silt; 5% fine to coarse gravel up to 40 mm, rounded, with gravel fragments; well sorted; contains quartz, feldspar, mica, amphibole, and other.

SILT (ML): dark greenish gray (5G 4/1), 100% silt; trace fine to coarse gravel up to 60 mm, subangular to rounded, coarse gravel bed at 173.0 ft; trace fine grained sand, subrounded to rounded, well sorted; interbedded fine sands and clay with black laminations; organics (wood) at 173.3 ft.

SILT (ML): dark greenish gray (5G 4/1), 100% silt; trace fine to coarse gravel up to 33 mm, subrounded; trace fine to medium grained sand, subrounded, thin sand bed at 176.2 ft; trace clay; thin black/sooty laminations and clay layers.

SILT (ML): greenish gray (10GY 5/1), 50% silt, dense; 40% clay; 10% fine grained sand, subrounded; alternating silt, clay and fine sand laminations, fine sand interbeds (2 to 3 inch) at 181.9 and 182.3 ft.

SILT (ML): dark greenish gray (5G 4/1), 60% silt; 40% clay, no plasticity; trace fine grained sand, subrounded; alternating olive and black/sooty laminations; 1 to 4 inch fine sand interbeds at 191.5, 194.8, 195.6, and 198.5 ft; moderately cemented silt at 193.5 ft; trace shells and shell fragments at 196.3 ft.

Bottom of borehole at 200 feet.

Depth bgs (feet): 165, 170, 175, 180, 185, 190, 195, 200

Sample Type: SIEVE; PTS; PTS; PTS

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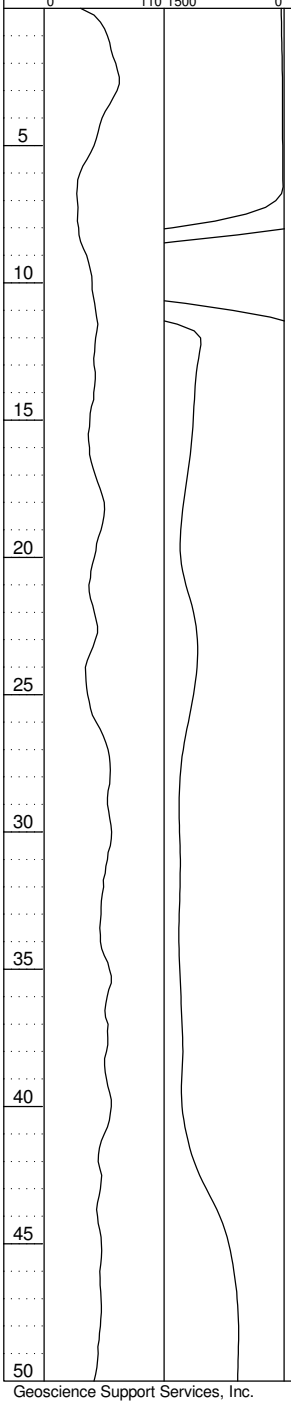
BOREHOLE LITHOLOGIC LOG

BOREHOLE NAME **PR-1**			
CLIENT	California American Water	LOCATION **Castroville, CA**	
PROJECT NUMBER	13017-13	**Potrero Rd**	
REPORT DATE	5/23/2014	**36° 47' 25.9368", -121° 47' 30.7248"** **Geographic NAD83**	
DRILLING CONTRACTOR	Cascade Drilling	LOGGED BY	
DRILLER	Jose Munguia	**B. Villalobos**	

DRILLING RIG TYPE	Prosonic 600T	DRILLING METHOD	Sonic	START DATE	9/21/13	BOREHOLE DIAMETER	8 in
SURFACE ELEVATION	9.0 ft	TOTAL DEPTH	201.5 ft bgs	FINISH DATE	9/25/13	CORE SIZE	6 in



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.

Depth bgs (feet) | Sample Type

NO SAMPLE.

SAND (SP): brown (7.5YR 5/3), 100% fine to medium grained sand, subangular to subrounded; poorly sorted; moist sample.

SILTY SAND (SM): dark brown (10YR 3/3), 80% fine to medium grained sand, subangular to subrounded; 20% silt; poorly sorted; moist sample.

SANDY CLAY (CL): greenish black (5GY 2.5/1), 70% clay, organic clay; 30% fine grained sand, subrounded, very fine grained; moist sample; contains quartz, feldspar, mica and amphibole.

SAND (SP): brown (7.5YR 5/3), 95% medium to coarse grained sand, subangular to subrounded; 5% fine gravel up to 5 mm, subangular to subrounded; poorly sorted; contains quartz, feldspar, mica and amphibole.

SILTY SAND (SM): dark greenish gray (5GB 4/1), 80% fine grained sand, subangular to subrounded, very fine grained; 20% silt; well sorted; moist sample.

NO SAMPLE.

SAND (SP): dark greenish gray (5GB 4/1), 100% medium to coarse grained sand, subangular to subrounded; poorly sorted; moist sample.

SILTY SAND (SM): dark greenish gray (5GB 4/1), 85% fine to medium grained sand, subangular to subrounded; 15% silt; trace fine gravel up to 5 mm; poorly sorted; few clayey silt beds.

SAND (SP): light olive brown (2.5Y 5/4), 100% medium to coarse grained sand, subangular to subrounded; trace fine gravel up to 5 mm; poorly sorted; moist sample.

SAND (SP): dark olive gray (5Y 3/2), 100% fine grained sand, subangular to subrounded; well sorted; moist sample.

SANDY SILT (ML): dark greenish gray (5GB 4/1), 70% silt; 30% fine grained sand, subangular to subrounded, very fine grained; moist to wet sample; contains mica.

SILT (MH): dark greenish gray (5GB 4/1), 90% silt, organic silt; 10% fine grained sand, subangular to subrounded, very fine grained; moist to wet sample; contains mica.

SAND (SP): dark greenish gray (5GB 4/1), 100% medium grained sand, subangular to subrounded; well sorted; moist to wet sample; contains quartz and feldspar.

CLAY (CL): dark greenish gray (5GB 4/1), 80% clay, medium plasticity; 20% silt; moist sample; moderately firm; massive; few 3 mm black organic stringers.

SILTY SAND (SM): dark greenish gray (5GB 4/1), 80% medium to coarse grained sand, subangular to subrounded; 20% silt; trace fine gravel up to 5 mm; poorly sorted; moist to wet sample; contains quartz, feldspar, mica and amphibole; abundant shell fragments including 1 inch bi-valve shells.

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BOREHOLE LITHOLOGIC LOG (continued)

BOREHOLE NAME	PR-1		
CLIENT	California American Water	LOCATION	Castroville, CA
PROJECT NUMBER	13017-13		

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.

Depth bgs (feet)	Lithologic Log	Sample Type
55	SAND (SP): light olive brown (2.5Y 5/4), 100% fine to medium grained sand, subangular to subrounded; trace fine to coarse gravel up to 25 mm; poorly sorted; moist to wet sample; contains quartz, feldspar, mica, amphibole, and chert.	SIEVE
60	SAND WITH GRAVEL (SP): light olive brown (2.5Y 5/4), 80% fine to medium grained sand, subangular to subrounded; 20% fine to coarse gravel up to 74 mm, subangular to rounded, gravel includes chert, quartz, and granite; poorly sorted; moist to wet sample; contains quartz, feldspar, mica and amphibole; ; several 6-inch beds with larger gravel and small cobbles up to 76 mm at 58.5, 59.5, and 61.0 ft.	
65		SIEVE PTS
70	GRAVEL (GW): olive yellow (2.5Y 6/8), 100% fine to coarse gravel up to 64 mm, subangular to rounded; poorly sorted; contains quartz, feldspar, mica and amphibole. SAND WITH GRAVEL (SP): light olive brown (2.5Y 5/4) and olive yellow (2.5Y 6/8), 85% fine to medium grained sand, subangular to subrounded; 15% fine to coarse gravel up to 74 mm, subangular to subrounded; poorly sorted; contains quartz, feldspar, mica and amphibole; 6 inch gravel bed at 71 ft.	
75	SILTY SAND WITH GRAVEL (SM): light olive brown (2.5Y 5/3), 40% medium to coarse grained sand, subangular to subrounded; 30% fine to coarse gravel up to 51 mm, subangular to subrounded; 20% silt; 10% clay; poorly sorted; contains quartz, feldspar, mica and amphibole; chert and siliceous shale.	SIEVE
80	SAND WITH GRAVEL (SP): light olive brown (2.5Y 5/6), 70% medium to coarse grained sand, subangular to subrounded; 30% fine to coarse gravel up to 51 mm, subangular to subrounded, gravel beds at 80.0 and 83.0 ft; trace silt; poorly sorted; moist to wet sample; contains quartz, feldspar, mica and amphibole.	
85		
90	SAND (SW): light olive brown (2.5Y 5/6), 90% fine to coarse grained sand, subangular to subrounded; 10% fine to coarse gravel up to 25 mm, subangular to subrounded, gravel bed at 93.5 ft; trace silt; poorly sorted; contains quartz, feldspar, mica and amphibole; chert and siliceous shale and granitic material.	
95	NO SAMPLE.	
100	SAND (SP): light olive brown (2.5Y 5/3), 100% medium to coarse grained sand, subangular to subrounded; poorly sorted; moist to wet sample; contains quartz, feldspar, mica and amphibole.	
105	SAND WITH GRAVEL (SW): light olive brown (2.5Y 5/3), 80% fine to coarse grained sand, subangular to subrounded; 20% fine to coarse gravel up to 25 mm, subangular to subrounded, bed of coarse gravel to 38 mm from 105-106 ft; poorly sorted; contains quartz, feldspar, mica, amphibole, siliceous shale, granitic, volcanic and epidote bearing quartz.	

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

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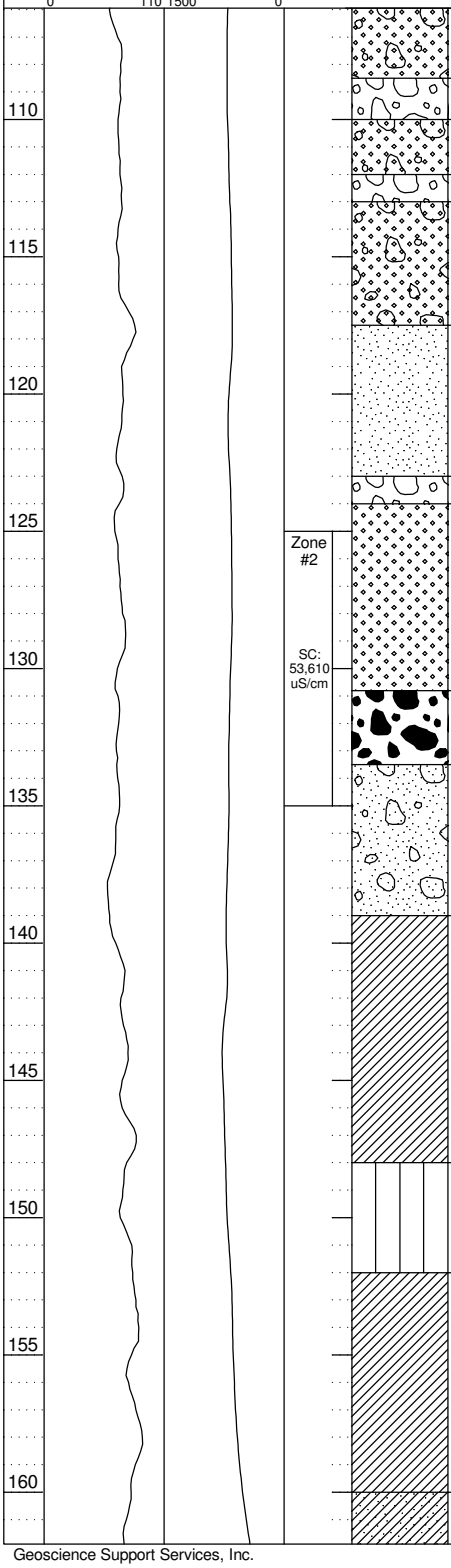
BOREHOLE NAME **PR-1**

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet)	Lithologic Log	Sample Type
110	GRAVEL (GP): light olive brown (2.5Y 5/3), 100% fine to coarse gravel up to 38 mm, subangular to subrounded; poorly sorted; contains quartz, feldspar, mica, amphibole and siliceous shale; granitic, volcanic and epidote bearing quartz.	SIEVE
	SAND WITH GRAVEL (SW): light olive brown (2.5Y 5/3), 80% fine to coarse grained sand, subangular to subrounded; 20% fine to coarse gravel up to 25 mm, subangular to subrounded; poorly sorted; contains quartz, feldspar, mica and amphibole.	
115	GRAVEL (GP): light olive brown (2.5Y 5/3), 100% fine to coarse gravel up to 38 mm, subangular to subrounded; subangular to rounded; poorly sorted; contains quartz, feldspar, mica and amphibole.	
	SAND WITH GRAVEL (SW): light olive brown (2.5Y 5/3), 80% fine to coarse grained sand, subangular to subrounded; 20% fine to coarse gravel up to 25 mm, subangular to subrounded; poorly sorted; contains quartz, feldspar, mica and amphibole.	
120	SAND (SP): light olive brown (2.5Y 5/4), 100% medium to coarse grained sand, subangular to subrounded; trace fine to coarse gravel up to 25 mm, subangular to subrounded; poorly sorted; moist to wet sample; contains quartz, feldspar, mica and amphibole.	
125	GRAVEL (GP): light olive brown (2.5Y 5/4), 100% coarse gravel up to 75 mm, subangular to rounded; trace silt; trace clay; poorly sorted; contains quartz, feldspar, mica and amphibole.	SIEVE
	SAND (SW): light olive brown (2.5Y 5/4), 100% medium to coarse grained sand, subangular to subrounded; trace fine to coarse gravel up to 25 mm, subangular to subrounded; poorly sorted; moist to wet sample; contains quartz, feldspar, mica and amphibole.	
130		
	GRAVEL (GW): light olive brown (2.5Y 5/4), 100% fine to coarse gravel up to 38 mm, subangular to rounded; trace silt; trace clay; poorly sorted; contains quartz, feldspar, mica and amphibole.	
135	SAND WITH GRAVEL (SP): light olive brown (2.5Y 5/4), 85% medium to coarse grained sand, subangular to subrounded; 15% fine to coarse gravel up to 25 mm, subangular to subrounded, predominantly fine; coarse gravel bed from 138.5-139.0 ft; poorly sorted; contains quartz, feldspar, mica and amphibole.	
140	CLAY (CL): olive brown (2.5Y 4/3) and light olive brown (2.5Y 5/3), 70% clay, medium plasticity, stiff; 30% silt; massive, black organic streaks, very faint grey mottling, 4.6 - 6.4 mm elongated carbonate pods, 4.6 mm reddish brown sandy pods.	
145		PTS
150	SILT (ML): olive brown (2.5Y 4/3), 60% silt, soft to firm; 30% clay; 10% fine grained sand, subangular to subrounded; moist sample; contains mica.	
	CLAY (CL): dark greenish gray (5GB 4/1), 70% clay, medium plasticity; 30% silt; trace fine grained sand, subrounded, very fine grained elongate sand pods to 6.4 mm; massive, compression slicken sides, small carbonate flecks, very faint yellow-blue mottling.	PTS
155		
160	SANDY CLAY (CL): grayish brown (2.5Y 5/2), 70% clay; 30% fine grained sand, subrounded; contains quartz, feldspar, mica and amphibole; ; sand increases at 161.5 ft with	

SS: Splitspoon sample GRAB: Grab sample PTS: Splitspoon 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

BOREHOLE NAME **PR-1**

BOREHOLE LITHOLOGIC LOG (continued)

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

Depth bgs (feet) | GAMMA (GAPI) 0–110 | CLID (mmho/m) 1500–0 | Zone Test | Graphic Log | Depth bgs (feet) | Sample Type

Depth bgs (feet)	Description	Zone Test	Sample Type
	faint reddish brown mottling.		
165	SAND WITH CLAY (SP-SC): light olive brown (2.5Y 5/4), 90% fine to medium grained sand, subangular to subrounded; 10% clay; poorly sorted; contains quartz, feldspar, mica and amphibole; ; micaceous.		
	SANDY CLAY (CL): olive brown (2.5Y 4/3) and dark brown (7.5YR 3/2), 70% clay, medium plasticity, firm; 30% fine grained sand, subangular to subrounded; horizontal and verticle mottling.		
170	CLAY (CL): dark yellowish brown (10YR 4/6), 70% clay, medium plasticity, stiff; 30% silt, 13 mm silt pods; very faint grey mottling-compression slicken sides; trace fine sand lens at 170 ft, black flecs and white pods.		
175	SANDY CLAY (CL): strong brown (7.5YR 4/6), 70% clay, medium plasticity, stiff, firm; 30% medium grained sand, subangular to subrounded; moist sample; very faintly bedded to laminated.		
	CLAYEY SAND (SC): strong brown (7.5YR 4/6), 70% fine grained sand, subangular to subrounded, very soft; 25% clay; 5% silt; well sorted; wet sample.		
180	SANDY CLAY (CL): strong brown (7.5YR 4/6), 70% clay, medium plasticity; 30% medium grained sand, subangular to subrounded; moist sample; very faintly bedded to laminated.		
	CLAYEY SAND (SC): strong brown (7.5YR 4/6), 70% fine grained sand, subangular to subrounded, soft; 25% clay; 5% silt; well sorted; moist sample.		
185	CLAYEY SAND (SC): dark gray (10YR 4/1), 70% fine grained sand, subangular to subrounded, soft; 25% clay; 5% silt; well sorted.		
190	SILTY SAND (SM): dark greenish gray (5GY 4/1), 80% fine to medium grained sand, subangular to subrounded; 20% silt; trace fine gravel up to 5 mm, subangular to subrounded; poorly sorted; wet sample; unit contains beds that are indurated, 0.25-inches thick--breaks into gravel-sized pieces under firm finger pressure.	Zone #1	SIEVE
195	SILTY SAND (SM): olive brown (2.5Y 4/3), 80% medium grained sand, subangular to subrounded; 20% silt; well sorted; wet sample; unit contains beds that are indurated, 0.25-inches thick - breaks into gravel-sized pieces under firm pressure; contains quartz, amphibole, and biotite.	SC: 1,296 uS/cm	SIEVE
200			PTS SS

Bottom of borehole at 201.5 feet.

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

APPENDIX A2

Well Logs Used for Cross-Sections

GEOSCIENCE

APPENDIX A2:

WELL LOGS USED FOR CROSS-SECTIONS

CONTENTS

Description **Page**

13S/1E-36H (Monterey Dunes Colony Well) *A2-1*

14S/1E-24L2-5 (DMW1) *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

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Direct Rotary FLUID Bentonite

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	80	Fine to course sand
80	90	Fine to course sand w/blue clay
90	100	Fine to med. sand
100	123	Fine to med. sand w/clay lenses
123	143	Blue clay w/fine to med. sand
143	154	Blue clay w/fine to course sand and gravel
154	165	Fine to course sand w/gravel and rock
165	187	Fine to med. sand & cobbles with clay lenses
187	197	Fine to med. sand
197	219	Fine to course sand
219	250	Fine to course sand & gravel
250	304	Fine to course sand & cobbles
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: 1422 (Feet)

TOTAL DEPTH OF COMPLETED WELL 1364 (Feet)

WELL OWNER

Name Monterey Dunes Colony

Mailing Address 195 Monterey Dunes Way

Castroville, CA 95012

CITY STATE ZIP

WELL LOCATION

Address 195 Monterey Dunes Way

City Castroville

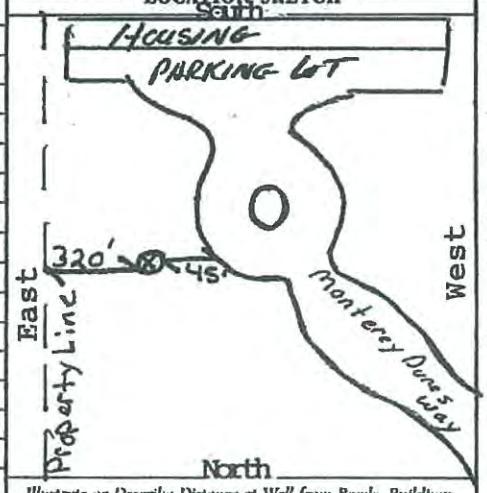
County Monterey

APN Book 229 Page 041 Parcel 004

Township ___ Range ___ Section ___

Latitude ___ NORTH (DEG. MIN. SEC.) Longitude ___ WEST (DEG. MIN. SEC.)

LOCATION SKETCH



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.***

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) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER N/A (Ft.) BELOW SURFACE

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

ESTIMATED YIELD * 200 (GPM) & TEST TYPE Pump

TEST LENGTH 24 (Hrs.) TOTAL DRAWDOWN 42 (Ft.)

** May not be representative of a well's long-term yield.* 24 hour Test

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	60	36			x		A53B	29.260	.375	
0	321	28			x		A53B	19.260	.375	
+2	1221	18	x				A53B	8"	.322	
1221	1301	18	x				304ss	8"	.322	
1301	1361	18		x			304ss	8"	XXHD	.040
1361	1364	18	x				304ss	8"	.322	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
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
X Geophysical Log(s)
___ Soil/Water Chemical Analyses
X Other Site map

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

46471 N Division, Lancaster, CA 93535
ADDRESS CITY STATE ZIP

Signed Larry W. Rottman, President 03/19/04 316599
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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 LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Direct Rotary FLUID Bentonite

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
		lenses
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

TOTAL DEPTH OF BORING: 1422 (Feet)

TOTAL DEPTH OF COMPLETED WELL 1364 (Feet)

WELL OWNER

Name Monterey Dunes Colony

Mailing Address 195 Monterey Dunes Way

Castroville, CA 95012

CITY STATE ZIP

WELL LOCATION

Address 195 Monterey Dunes Way

City Castroville

County Monterey

APN Book 229 Page 041 Parcel 004

Township ___ Range ___ Section ___

Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH

WEST EAST

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.

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) ___

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)

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-TRACTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	60	36			x		A53B	29.260	.375	
0	321	28			x		A53B	19.260	.375	
+2	1221	18	x				A53B	8"	.322	
1221	1301	18	x				304ss	8"	.322	
1301	1361	18		x			304ss	8"	XXHD	.040
1361	1364	18	x				304ss	8"	.322	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
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

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

46471 N Division, Lancaster, CA 93535
ADDRESS CITY STATE ZIP

Signed [signature] Pres.
WELL DRILLER/AUTHORIZED REPRESENTATIVE

03/19/04 DATE SIGNED

316599 C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

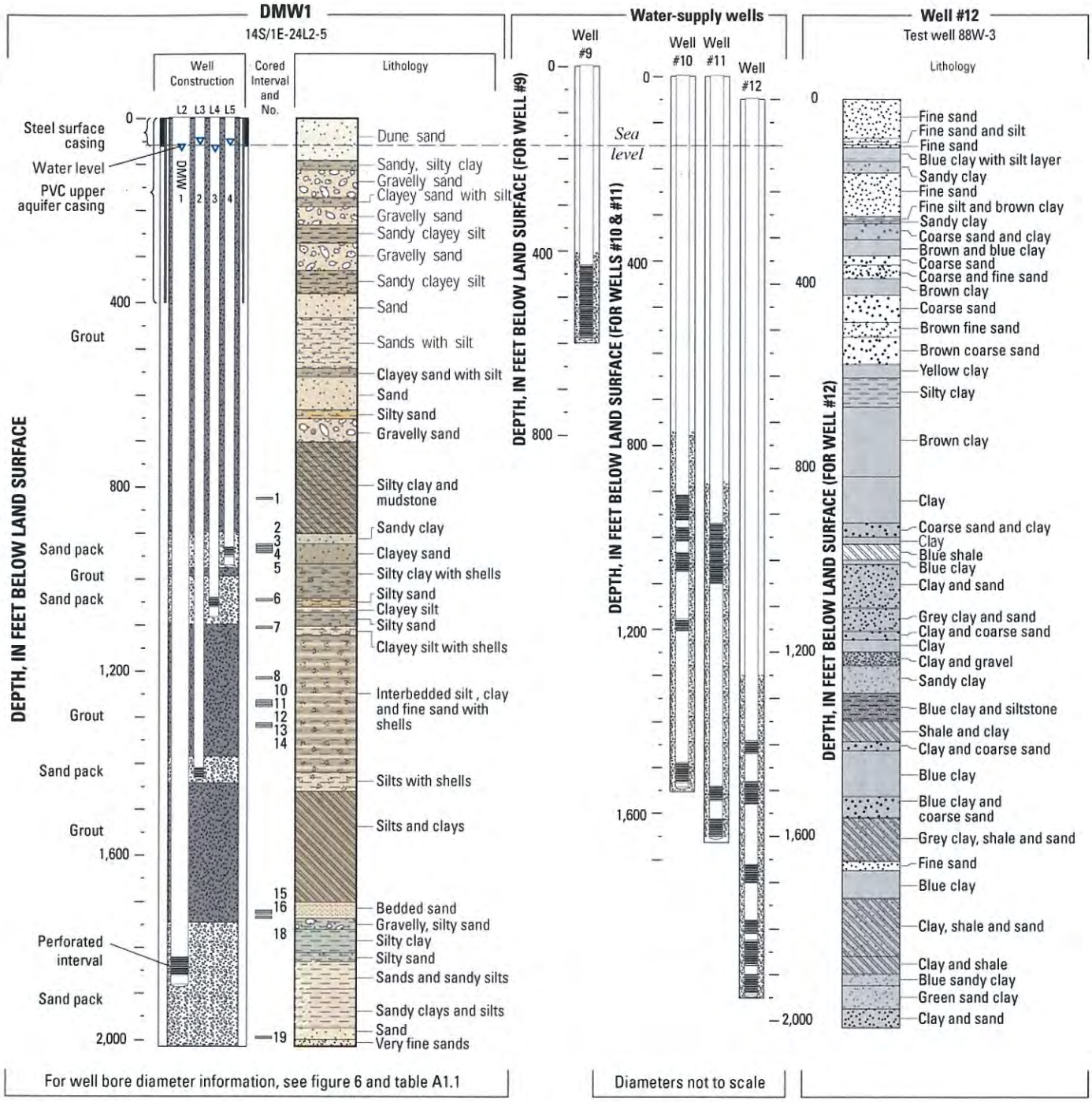


Figure 3. Well construction and lithology for the deep-aquifer monitoring well and selected nearby water-supply wells, Marina, California.

Dennis Haugen
PLICATE Gene Taylor
tain copy

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Appendix A2
Do Not Fill In

№ 141763

State Well No. 19S/2E-6L1

Other Well No.

) OWNER:

me Monterey County Flood Control Dist
dress County Courthouse
Salinas, Ca. 93901

) LOCATION OF WELL:

unty Monterey Owner's number, if any
nship, Range, and Section Mulligan Hill
tance from cities, roads, railroads, etc. See attached map

) TYPE OF WORK (*check*):

w Well [x] Deepening [ ] Reconditioning [ ] Destroying [ ]
destruction, describe material and procedure in Item 11.

4) PROPOSED USE (*check*):

Domestic [ ] Industrial [ ] Municipal [ ]
rrigation [ ] Test Well [ ] Other [x]

(5) EQUIPMENT:

Rotary [x]
Cable [ ]
Other [ ]

6) CASING INSTALLED:

STEEL: OTHER
SINGLE [x] DOUBLE [ ]

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

If gravel packed

Size of shoe or well ring: Size of gravel Spec sand
Describe joint Weld

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen Shroud

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
~~850~~ 880 per Dick	1540			3/32 Horz. Louvre Full Flo

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes [x] No [ ] To what depth 800 ft.
Were any strata sealed against pollution? Yes [x] No [ ] If yes, note depth of strata
From ft. to ft.
From ft. to ft.
Method of sealing Concrete and 30" steel conductor

(9) WATER LEVELS:

Depth at which water was first found, if known 100' ft.
Standing level before perforating, if known ft.
Standing 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 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*

ft. to	Formation
0 - 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 19 76. Completed 11/12 19 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) (*Typed or printed*)

Address 1128 Madison Lane
Salinas, Ca. 93901

[SIGNED] [signature]
(Well Driller)

License No. 273053 Dated , 19

SKETCH LOCATION OF WELL ON REVERSE SIDE

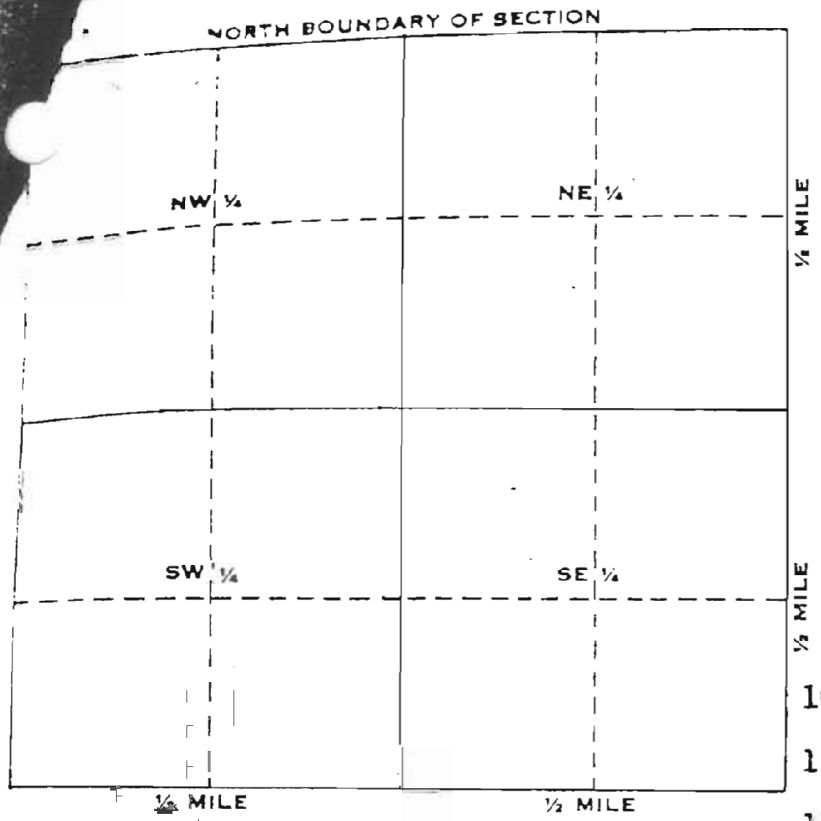
OVER
CONTINUED ON BACK

6-72 30M YRIP OF DBP

WELL LOCATION SKETCH

Appendix A2

145/2E-6L1

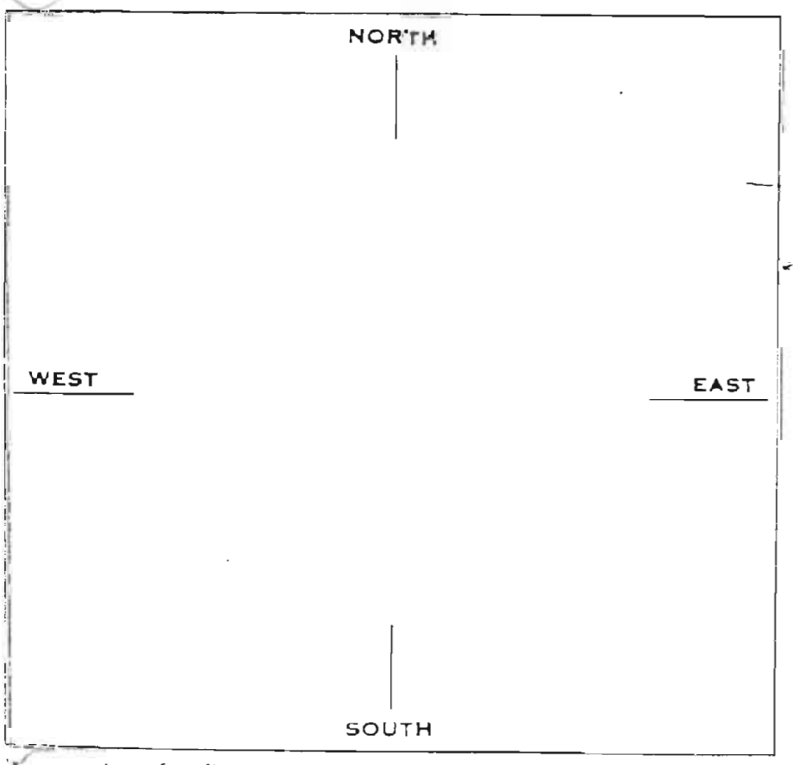


A. Location of well in sectionized areas.
Sketch roads, railroads, streams, or other features as necessary.

Township 14 N/S

Range 2 E/W

Section No. 6L1



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

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 1545'
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

145/02E-17K1

Appendix A2

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

TRIPLICATE
Owner's Copy

Do not fill in

No. 286024

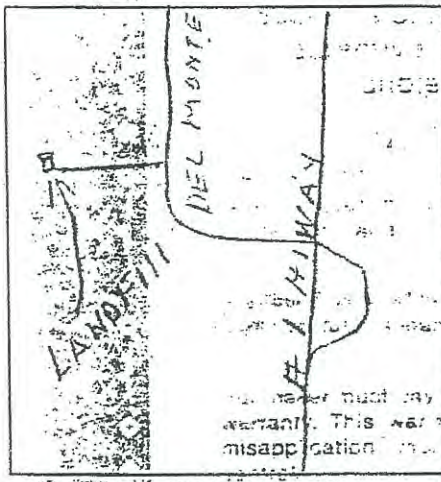
Notice of Intent No. 239439
Local Permit No. or Date 7-28-89 69712

[NEW WATER SUPPLY WELL LOCATED SOUTH OF SCALEHOUSE]

State Well No. 145/02E-17K01
Other Well No. PRESSURE-180 Ft.

(1) OWNER: Name Marina Landfill-Mtry Regional Waste Mgmnt. Dist.
Address P.O. Box 609
City Marina, CA 93933 ZIP

(2) LOCATION OF WELL (See instructions):
County Monterey Owner's Well Number
Well address if different from above Marina Disposal site
Township Range Section
Distance from cities, roads, railroads, fences, etc.



WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic ☐
Irrigation ☐
Industrial ☐
Test Well ☐
Municipal ☐
Other ☐
(Describe)

(5) EQUIPMENT:
Rotary ☒ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK: Yes ☒ No ☐ Size 6
Diameter of bore 14
Packed from 180 to 250 ft.
well pack pea gravel & sand

(7) CASING INSTALLED:
Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS:
Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	210	6	pvc SDR21	480 210	250	.030 pvc sand screen

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 180 ft.
Were strata sealed against pollution? Yes ☒ No ☐, at intervals solid ft.
Method of sealing neat cement

(10) WATER LEVELS:
Depth of first water, if known 131 ft.
Standing level after well completion ~~136~~ 131 ft.

(11) WELL TESTS:
Was well test made? Yes ☒ No ☐ If yes, by whom? Self
Type of test: Pump ☒ Bailer ☐ Air lift ☐
Depth to water at start of test 131 ft. At end of test 136 ft.
Discharge gal/min after 33 hours Water temperature 67
Chemical analysis made? Yes ☒ No ☐ If yes, by whom? Nitrate Al Lab
Was electric log made? Yes ☐ No ☐ If yes, attach copy to this report

(12) WELL LOG: Total depth 255 ft. Completed depth 250 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	4	Top soil
4	35	Beach sand
35	56	Brown silt
56	91	Loose red sand
91	126	Green clay & sand
126	152	Red sand water bearing
152	159	Green clay
159	194	Coarse sand
194	205	Sticky green clay
205	255	Coarse gravel

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Signed James I. Ash (Well Driller)
NAME FRED ASH & SONS, INC. (Person, firm, or corporation) (Typed or printed)
Address 16339 Castroville Blvd.
City Salinas, CA 93907 ZIP
License No. 391942 Date of this report 8-9-89
Work started 8-3-89 19 Completed 8-4-89 19

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

DWR 188 (REV. 12-86) 86-96355

P. O. BOX 170
1608 ABBOTT ST.

TELEPHONE
408 424.2987

5-17-74

Appendix A2

ROY V. ALSOP & SON

SINCE 1873
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

145/2E-17L1

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 I	"	303	Sand & gravel
303	"	305	Yellow clay
305	"	320	Mucky sand
320 I	"	351	Sand & gravel
351	"	354	Soft sand stone

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

Concrete Plug - 6 ft.

Static Water Level - 139½ ft.

= = = gallons per minute =
= ~~1100~~ =

Pumps 1090 gal per minute

Ground elev. approx 90 feet

14/2-18E1

Appendix A2

Do Not Fill In

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

CONFIDENTIAL LOG
Water Code Sec. 13752

WATER WELL DRILLERS REPORT

33

№ 121665

State Well No. 14S/2E-18E1

Other Well No.

(1) OWNER: Armstrong Ranch
Name c/o M. L. Dubach, Inc.
Address PO Box P, Davis, Ca. 95616

(2) LOCATION OF WELL:
County Monterey Owner's number, if any
Township, Range, and Section Between Marina & Castroville
Distance from cities, roads, railroads, etc. 2 miles from Bridges on Hwy 1, off Lopis Road

(3) TYPE OF WORK *(check)*:
New Well ☒ Deepening ☐ Reconditioning ☐ Destroying ☐
If 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 ☐

From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.
	303	14"	1/4	26	300	870
303	306	14"x12" reducer				
306	870	12	1/4			

If gravel packed

Size of shoe or well ring:
Size of gravel: 1/4 pea
Describe joint: Welded

(7) PERFORATIONS OR SCREEN:
Type of perforation or name of screen

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
666	834	8	4½	1/8" std louvre
7.8.				

(8) CONSTRUCTION:
Was a surface sanitary seal provided? Yes ☒ No ☐ To what depth 600 ft.
Were any strata sealed against pollution? Yes ☒ No ☐ If yes, note depth of strata
From 0 ft. to 300 ft.
From ft. to ft.
Method of sealing cemented

(9) WATER LEVELS:
Depth at which water was first found, if known ft.
Standing level before perforating, if known ft.
Standing level after perforating and developing ft.

(10) WELL TESTS: to be tested
Was pump test made? Yes ☐ No ☐X If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
Temperature of water Was a chemical analysis made? Yes ☐ No ☐
Was electric log made of well? Yes ☐ No ☐ If yes, attach copy

(11) WELL LOG:
Total depth ft. Depth of completed well 870 ft.
Formation: *Describe by color, character, size of material, and structure*

ft. to		
0	75	fine sand
75	100'	coarse gravel
100	125	gravel-streaks clay
125	150	clay rock
150	175	coarse gravel
175	200	~~gravel 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	890	yellow clay
890	913	yellow clay

Work started 7-2-74 19, Completed 7-9-74 19

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) (Typed or printed)
Address 1128 Madison Lane, Salinas, Ca.93901
[SIGNED] [illegible] (Well Driller)
License No. 273053 Dated 715-74, 19

SKETCH LOCATION OF WELL ON REVERSE SIDE

TRIPLICATE
Owner's Copy
Page 1 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 419777

DWR USE ONLY — DO NOT FILL IN
Appendix A2
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. 701471
Date Work Began 06/18/97, Ended 06/26/97
Local Permit Agency ~~MONTEREY COUNTY DEPARTMENT OF HEALTH~~
Permit No. ~~WSAL 97-067~~ Permit Date ~~04/07/97~~

GEOLOGIC LOG

ORIENTATION (✓) ___ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	3	TOP SOIL
3	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

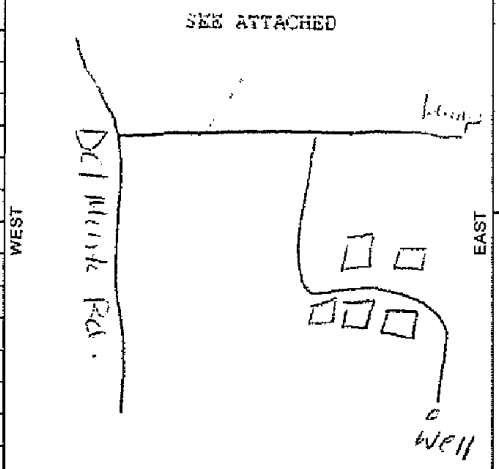
Name ~~HINTCH~~
Mailing Address 5 HARRIS COURT
MONTEREY, CA. 93940
CITY STATE ZIP

WELL LOCATION

Address 14011 DEL MONTE AVE.
City MONTEREY
County MONTEREY
APN Book 175 Page 011 Parcel 041
or Township ___ Range ___ Section ___
or Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. WES

LOCATION SKETCH

NORTH
SEE ATTACHED



SOUTH
Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materia Under "GEOLOGIC LOG

PLANNED USE(S) (✓)
___ MONITORING
WATER SUPPLY
X Domestic
X Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTEC TION
___ OTHER (Specify)

DRILLING METHOD REVERSE ROTARY FLUID WATER

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.) 5.5 TOTAL DRAWDOWN 19.33 (Ft.)
** May not be representative of a well's long-term yield.*

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

DEPTH FROM SURFACE Ft.	to Ft.	ANNULAR MATERIAL TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	650	XX			
650	840			XX	8X16

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 MAGGIORA BROS. DRILLING, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
595 AIRPORT BLVD. WATSONVILLE, CA 95076
ADDRESS CITY STATE ZIP

Signed ___ 11/14/97 243957
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

TRIPLICATE
Owner's Copy
Page 2 of 2

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 419779

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Appendix A2

Owner's Well No. 201471
Date Work Began 06/18/97, Ended 06/26/97
Local Permit Agency MONTEREY COUNTY DEPARTMENT OF HEALTH
Permit No. WSAL 97-067 Permit Date 04/07/97

GEOLOGIC LOG

ORIENTATION (✓) ___ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
660	680	COARSE SAND AND GRAVEL
680	700	COARSE SAND
700	715	HARD SAND
715	720	SAND AND GRAVEL
720	730	SAND AND GRAVEL
730	740	CLAY
740	780	HARD CLAY
780	785	CLAY
785	790	SAND AND GRAVEL
790	800	HARD SAND
800	840	CLAY

TOTAL DEPTH OF BORING 840 (Feet)
TOTAL DEPTH OF COMPLETED WELL 825 (Feet)

WELL OWNER

Name MBWPCA
Mailing Address 5 HARRIS COURT
CITY MONTEREY, CA. STATE 93940 ZIP

WELL LOCATION

Address 14811 DEL MONTE AVE.
City MONTEREY
County MONTEREY
APN Book 175 Page 011 Parcel 041
or Township ___ Range ___ Section ___
or Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH
SEE ATTACHED
WEST EAST
SOUTH
Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE(S) (✓)
___ MONITORING
WATER SUPPLY
___ Domestic
X Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD REVERSE ROTARY FLUID WATER

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 5.5 (Hrs.) TOTAL DRAWDOWN 19.33 (Ft.)
* *May not be representative of a well's long-term yield.*

CASING(S)

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

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	650	XX			
650	840			XX	8X16

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 MAGGIORA BROS. DRILLING, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 595 AIRPORT BLVD. CITY WATSONVILLE, CA STATE 95076 ZIP
Signed [signature] WELL DRILLER/AUTHORIZED REPRESENTATIVE
DATE SIGNED 11/14/97
C-57 LICENSE NUMBER 249957

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' Well Names	Top (feet bgs)	Bottom (feet bgs)	Boring log record	GEOBASE Code
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' Well Names	Top (feet bgs)	Bottom (feet bgs)	Boring log record	GEOBASE Code
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)

STATE OF CALIFORNIA

32
12 57

Do Not Fill In
No. 751

Appendix A2

State Well No.
Other Well No. 14/2 - 21F
1C-74

(1) 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 Breschini Ranch 2½ 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 ☐

(6) CASING INSTALLED:

SINGLE ☐ DOUBLE ☒

From ft.	to ft.	Diam.	Gage or Wall
0	300	12"	12

If gravel packed

Diameter of Bore	from ft.	to ft.

Type and size of shoe or well ring
Size of gravel:
Describe joint

(7) PERFORATIONS:

Type of perforator used Mills
Size of perforations 3½ in., length, by 1 in.

From ft.	to ft.	Perf. per row	Rows per ft.
200	261	6	1

(8) CONSTRUCTION:

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

Were any strata sealed against pollution? ☐ Yes ☐ No If yes, note depth of strata

From ft.	to ft.

Method of Sealing

(9) WATER LEVELS:

Depth at which water was first found ft.
Standing level before perforating ft.
Standing level after perforating ft.

(10) WELL TESTS:

Was a pump test made? ☐ Yes ☐ No If yes, by whom?
Yield: gal./min. with ft. draw down after hrs.
Temperature of water Was a chemical analysis made? ☐ Yes ☐ No
Was electric log made of well? ☐ Yes ☐ No

(11) WELL LOG:

Total depth 300 ft. Depth of completed well 300 ft.

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

ft. to	ft.	
0	2	Top soil
2	65	Sediment
65	90	Blue sandy clay
90	116	Yellow clay
116	130	Mucky sand
130	134	Sandy yellow clay
134	140	River gravel
140	166	Yellow clay
166	186	Sand & gravel
186	194	Sand & fine gravel
194	263	Heavy gravel
264	277	Red sand
277	280	Yellow clay
280	297	Gravel & yellow clay
297	300	Yellow clay

Work started 19 , Completed 19

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 Roy V. Alsop & Son
(Person, firm, or corporation) (Typed or printed)
Address 1508 Abbott Street
Salinas, California

[SIGNED] [signature] Well Driller
License No. 132870 Dated: October 22, 1956

Water Code Section 7

DWR FORM NO. 246 (REV. 3-54)

STAAL, GARDNER & DUNNE, INC.

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

SGD

DRILLING LOG

CLIENT: Monterey Peninsula Water Management District			M91157
WELL: Monterey Sand (TH-1)	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 analysis, contractor supervision.	
LOCATION: Abandoned Monterey Sand Plant, Marina, CA		DATE BEGUN: 12/10/91	DATE RELEASED: 12/10/91
ELEVATION: 10 (per GE)	TOTAL DEPTH: 260'	INTERVAL LOGGED: 0-260'	FOOTAGE:
SPUD DATE: 12/10/91	FINAL DATE: 12/10/91	REMARKS: Drilling fluid - Supermud; E-, & 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.)

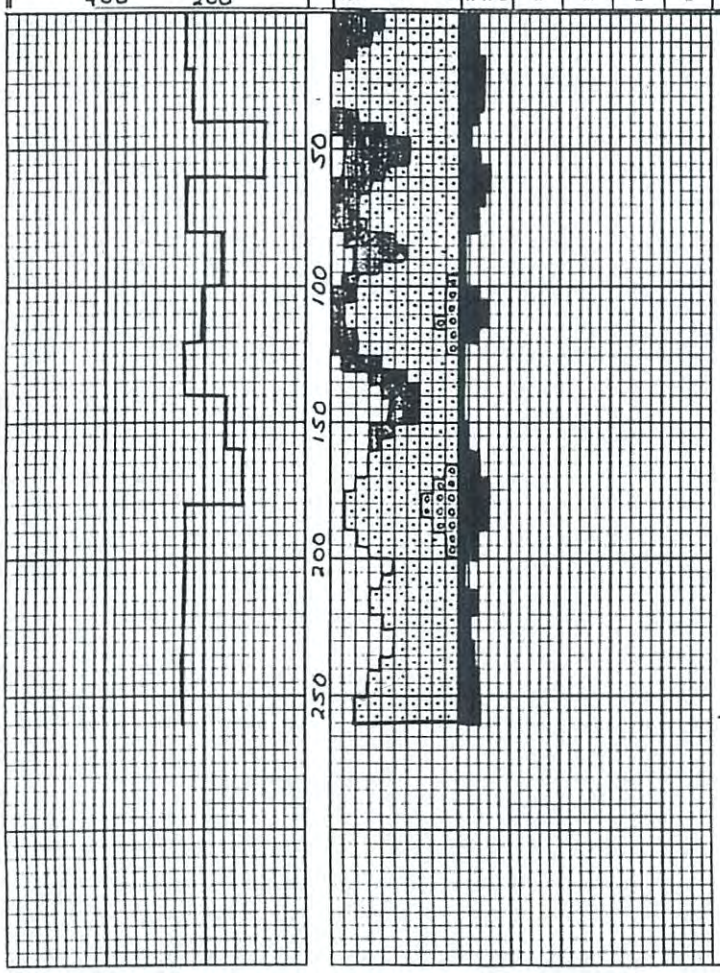
CLAY SILT SAND GRAVEL

DRILLING RATE (FT/HR) 400 200

LITHOLOGY — SAND CONCENTRATION 100 50 0

VIS POR — POOR FAIR GOOD

GRAIN-SIZE DISTRIBUTION (Value x 10 = %) — COARSE MEDIUM FINE VERY FINE



RIG ACTIVITY MUD ADDITIONS AND PROPERTIES	DESCRIPTION AND REMARKS
4 3/4" Tricone Bit	SAND, orangish brown, medium grained, subrounded to rounded, predom. quartz, yellowish orange staining on grains, minor brown silt.
Losing circulation, thickening mud & adding water. Circ. reestablished	SANDY SILT, reddish brown, slightly clayey w/ sand a/a, sl. coarser.
	SAND, yellowish/grayish brown, predom. coarse grained granitic quartz, yellowish orange staining, subrounded.
	SILTY CLAY, dark olive/brownish gray, sl. sticky w/few grains of sand.
	SAND, brownish gray, coarse to v. coarse w/ some fine gravel, predom. quartz & granitic grains, subrounded, minor gravel
Heavy rig chatter 168-180'	SILTY CLAY, brownish gray/olive gray. w/ occasional coarse to v. coarse grains of quartz sand.
	SAND, grayish brown, fine to coarse grained, subang. to subrnd, predom. granitic quartz w/ some chert fragments (sharp & rounded edges)
	CLAY, medium to light brownish gray, sticky, low plasticity, flocculated appearance, slightly silty/sandy.
	SAND, a/a, w/ more chert grains & fragments
	CLAY, a/a
	SAND, a/a
TD 260'	

TH-2

STAAL, GARDNER & DUNNE, INC.

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

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.		DATE BEGUN: 12/18/91	DATE RELEASED: 12/18/91
ELEVATION: 19 ft (PERGE)	TOTAL DEPTH: 277'	INTERVAL LOGGED: 0 - 277'	FOOTAGE: 277'
SPUD DATE: 12/18/91	FINAL DATE: 12/18/91	REMARKS: Drilling fluid - Revert, E- & Gamma logs performed, test hole abandoned w/ neat cement.	
DRILLING COMPANY: Pitcher Drilling, Palo Alto, CA.			
PUSHER: Wayne Baker, Garry Foppiona (asst)			

HOLE SIZE	
0 - 277'	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.)

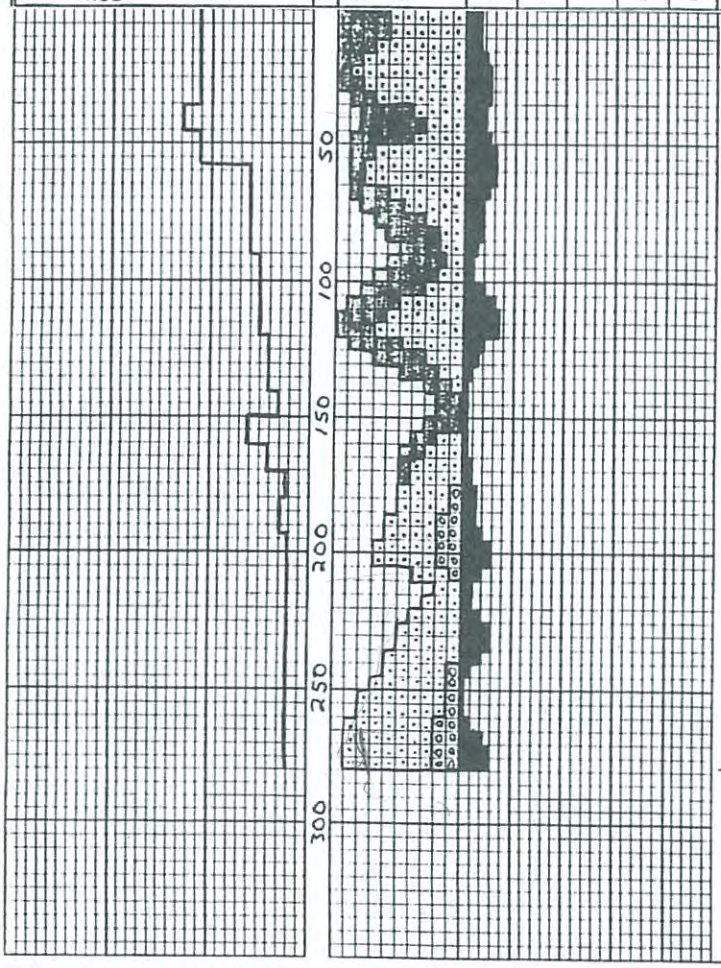
CLAY SILT SAND GRAVEL

DRILLING RATE (FT/HR) 200 100

LITHOLOGY — SAND CONCENTRATION 100 50 0

VIS PDR — POOR FAIR GOOD

GRAIN-SIZE DISTRIBUTION (Value x 10 = %) — COARSE MEDIUM FINE VERY FINE



RIG ACTIVITY MUD ADDITIONS AND PROPERTIES

Begin @ 750
5 1/4" rock bit, revert
Thick mud @ first, cuttings wouldn't drop for first 35'.

TD 277, 1345

DESCRIPTION AND REMARKS

SAND, pale brown to brown, fine to med. grained, predom. subangular quartz, silty.

SANDY SILTY, brown to dark brown, w/ sand a/a

SAND, grayish brown, f. to c. grained, subrounded to subang., predom quartz grains w/ abdt mafic flecks, some yellowish-orange staining, silty, sl. clay.

CLAYEY SILT, lt. brownish gray w/ some fine grained sand

Dark brownish gray.

SANDY SILT, dk brownish gray silt a/a, w/ f. to med. grained, subrounded quartz sand.

SAND, dk yellowish brown, f. to c. grained w/ abdt coarse, subrnd granitic quartz w/ yellowish brown silt.

SANDY SILT, pale brown to brown, sl. clayey w/ fine quartz sand.

CLAY, grayish brown, sl. to mod. sticky, high plasticity, little silt, no sand, tight

SANDY CLAY, clay a/a w/ some silt, sticky, low plasticity, more coarse grained sand. (subang quartz w/ some orange staining) (common chert gravel fragments (rounded & sharp edges). Few coarse grains & fine gravel (chert & granite)

Coarse to very coarse.

SANDY CLAY, grayish brown, sticky, w/ sand a/a, lt brownish gray @ 220' w/ spongy consistency

SAND a/a w/ brown clay.

CLAY, bluish gray, tight, sticky, high plastic. color change to brownish gray @ 260.

SAND, brownish gray to yellowish brown predom quartz (2/3) w/ chert (1/3) some gravel, minor clay.

STAAL, GARDNER & DUNNE, INC.

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

SGD

DRILLING LOG

CLIENT: Monterey Peninsula Water Management District			M91157
WELL: Granite Rock Co. (TH-3)	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 supervision.	
LOCATION: On the beach at the Granite Rock Co. property in Marina, CA		DATE BEGUN: 12/19/91	DATE RELEASED: 12/19/91
ELEVATION: 7ft (per GE)	TOTAL DEPTH: 250'	INTERVAL LOGGED: 0-250'	FOOTAGE: 250'
SPUD DATE: 12/19/91	FINAL DATE: 12/19/91	REMARKS: Drilling fluid - Revert. E & Gamma logs performed. Test hole abandoned w/ neat cement.	
DRILLING COMPANY: Pitcher Drilling, Palo Alto, CA.			
PUSHER: Wayne Baker, asstd by Garry Foppiono			

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.)

CLAY SILT SAND GRAVEL

DRILLING RATE (FT/HR)	LITHOLOGY: SAND CONCENTRATION	VIS POR: POOR / FAIR / GOOD	GRAIN-SIZE DISTRIBUTION (Value x 10 = %): COARSE / MEDIUM / FINE / VERY FINE	RIG ACTIVITY MUD ADDITIONS AND PROPERTIES	DESCRIPTION AND REMARKS
400 200	100 50 0			Begin drilling @ 855 w/ drag bit.	SAND, brown, fine to coarse gr., predom. med grained, subrounded, predom. quartz w/ many brown/olive gray grains, silty.
					SAND, brownish gray, a/a, though coarser grained granitic source for quartz, less silt, some fine gravel.
				Wiper run, 11^30 - 12^00, "mud rings" forming in bore hole.	CLAYEY SILT, olive gray to dark olive gray, micaceous, sl. sandy
					SAND, fine to coarse grained, though predom. med brown, predom. granitic quartz, subang to subround, silty, w/ minor/~~poorly~~ chert grains & few f. chert gravel (rounded)
					CLAY, bluish gray to olive gray, moderately tight, sticky, silty.
					Very tight, less silt.
				Change to rock bit.	SAND, pale brown, fine to coarse grained, subangular to subrounded, predom quartz w/ about grains of chert, common chert gravel frags w/ sharp & rounded edges.
					CLAY, olive to olive gray, sticky, low plastic, silty, sl. sandy.
					Tighter, less silt & sand.
					SAND, a/a
				TD 250', 14^50	CLAY, olive brown to grayish brown, sticky, tight, very little sand or silt

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

CONTENTS

Description **Page**

Cover Letter (October 14, 2013) *C-1*

Cover Letter (March 5, 2014) *C-2*

Soil Physical Properties Data Reports *C-3*

Chain of Custody Records *C-10*

PTS Laboratories, Inc.

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.

PTS Laboratories, Inc.

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.

Michael Mark Brady, P.G.
District Manager

Encl.

PTS Laboratories, Inc.

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 Laboratories

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

		METHODS:	API RP 40 / ASTM D2216	API RP 40		API RP 40		API RP 40	API RP 40; EPA 9100	
									25 PSI CONFINING STRESS	
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	MOISTURE CONTENT, % weight	DENSITY		POROSITY, %Vb (2)		TOTAL PORE FLUID SATURATIONS (3), % Pv	EFFECTIVE (4,5) PERMEABILITY TO WATER, millidarcy	HYDRAULIC CONDUCTIVITY (4,5), cm/s
				DRY BULK, g/cc	GRAIN, g/cc	TOTAL	AIR-FILLED			
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 Laboratories

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

				25 PSI CONFINING STRESS		
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	EFFECTIVE PERMEABILITY TO WATER (2,3), millidarcy	HYDRAULIC CONDUCTIVITY (3), cm/s	INTRINSIC PERMEABILITY TO WATER (3), cm^2
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		
TOTALS:	4 cores	2.00	4	2		4

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 Laboratories

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

		METHODS:	API RP 40 / ASTM D2216	API RP 40		API RP 40		API RP 40	API RP 40; EPA 9100	
									25 PSI CONFINING STRESS	
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	MOISTURE CONTENT, % weight	DENSITY		POROSITY, %Vb (2)		TOTAL PORE FLUID SATURATIONS (3), % Pv	EFFECTIVE (4,5) PERMEABILITY TO WATER, millidarcy	HYDRAULIC CONDUCTIVITY (4,5), cm/s
				DRY BULK, g/cc	GRAIN, g/cc	TOTAL	AIR-FILLED			
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 Laboratories

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

				25 PSI CONFINING STRESS		
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	EFFECTIVE PERMEABILITY TO WATER (2,3), millidarcy	HYDRAULIC CONDUCTIVITY (3), cm/s	INTRINSIC PERMEABILITY TO WATER (3), cm^2
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.

PTS Laboratories, Inc.

CHAIN OF CUSTODY RECORD

PAGE Appendix OF

COMPANY	Geoscience Support Services
ADDRESS	PO 220
CITY	Claremont, CA
ZIP CODE	91711
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	

PO# 13017-13

TURNAROUND TIME
24 HOURS ☐ 5 DAYS ☐
48 HOURS ☐ NORMAL ☑
72 HOURS ☐
OTHER: _____

SAMPLE INTEGRITY (CHECK):
INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 44073

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
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				2 inches of sample missing
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

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Nathan Reynolds	Andrew Lieta		
COMPANY: GEOSCIENCE	COMPANY: Geoscience	COMPANY: Geoscience	COMPANY: PTS LABS
DATE: 2-3-14 TIME: 17:00	DATE: 2-3-14 TIME: 17:00	DATE: 2-4-14 TIME: 10:26	DATE: 2/4/14 TIME: 10:26

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PTS Laboratories, Inc.

CHAIN OF CUSTODY RECORD

PAGE Appendix OF

COMPANY	Geoscience Support Services
ADDRESS	PO 220
CITY	Claremont, CA
ZIP CODE	91711
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	Sandholdt dr area, Moss Landing
SAMPLER SIGNATURE	

PO# 13017-13

TURNAROUND TIME
24 HOURS ☐ 5 DAYS ☐
48 HOURS ☐ NORMAL ☑
72 HOURS ☐
OTHER: _____

SAMPLE INTEGRITY (CHECK):
INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 44073

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
✓ ML-1 76-76.5	10/3/13	10:30	76-76.5	1		X																X				
✓ ML-1 107.5-108	10/3/13	13:10	107.5-108	1		X																X				
✓ ML-1 147-147.5	10/3/13	14:00	147-147.5	1		X																X				
																										76°F

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Nathan Reynolds	Andrew Kieta		
COMPANY GEOSCIENCE	COMPANY Geoscience	COMPANY Geoscience	COMPANY PTS LABS
DATE 2-3-14 TIME 17:00	DATE 2-3-14 TIME 17:00	DATE 2-4-14 TIME 10:26	DATE 2/4/14 TIME 10:26

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PTS Laboratories, Inc.

CHAIN OF CUSTODY RECORD

PAGE Appendix OF

COMPANY	Geoscience Support Services
ADDRESS	PO 220
CITY	Claremont, CA
ZIP CODE	91711
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	Del Mar Fisheries, Moss Landing
SAMPLER SIGNATURE	

PO# 13017-13

TURNAROUND TIME: 24 HOURS ☐ 48 HOURS ☐ 72 HOURS ☐ 5 DAYS ☐ NORMAL ☑ OTHER: _____

SAMPLE INTEGRITY (CHECK): INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 44073

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
ML-2 87-87.5	12/9/13	1610	87-87.5	1		X															X				
ML-2 117.5-118	12/10/13	0935	117.5-118	1		X															X				
ML-2 157.5-158	12/10/13	1430	157.5-158	1		X															X				

76°F

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Nathan Reynolds	Andrew Kieta		
COMPANY: GEOSCIENCE	COMPANY: Geoscience	COMPANY: Geoscience	COMPANY: PTS LABS
DATE: 2-3-14 TIME: 17:00	DATE: 2-3-14 TIME: 17:00	DATE: 2-4-14 TIME: 10:26	DATE: 2/4/14 TIME: 10:26

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PTS Laboratories, Inc.

CHAIN OF CUSTODY RECORD

PAGE Appendix OF

COMPANY: Geoscience Support Services

ADDRESS: PO 220 | CITY: Claremont, CA | ZIP CODE: 91711

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: Moss Landing, Nadar Agha property

SAMPLER SIGNATURE:

PO# 13017-13

TURNAROUND TIME: 24 HOURS ☐ 48 HOURS ☐ 72 HOURS ☐ 5 DAYS ☐ NORMAL ☑ OTHER: _____

SAMPLE INTEGRITY (CHECK): INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 44073

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
ML-3 106.5-107	1/7/14	1600	106.5-107	1		X																X				
ML-3 166.5-167	1/8/14	1350	166.5-167	1		X																X				
ML-4 76.5-77	11/26/13	1320	76.5-77	1		X																X				
ML-4 126.5-127	12/2/13	1350	126.5-127	1		X																X				
ML-4 146.5-147	12/2/13	1745	146.5-147	1		X																X				

76 °F

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Nathan Reynolds	Andrew Kirta		
COMPANY: GEOSCIENCE	COMPANY: Geoscience	COMPANY: Geoscience	COMPANY: PTS LABS
DATE: 2-3-14 TIME: 17:00	DATE: 2-3-14 TIME: 17:00	DATE: 2-4-14 TIME: 10:26	DATE: 2/4/14 TIME: 10:26

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PTS Laboratories, Inc.

CHAIN OF CUSTODY RECORD

PAGE Appendix OF

COMPANY	Geoscience Support Services
ADDRESS	PO 220
CITY	Claremont, CA
ZIP CODE	91711
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	MBARI, Moss Landing
SAMPLER SIGNATURE	

PO# 13017-13

TURNAROUND TIME
24 HOURS ☐ 5 DAYS ☐
48 HOURS ☐ NORMAL ☑
72 HOURS ☐
OTHER: _____

SAMPLE INTEGRITY (CHECK):
INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 44073

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
ML-6 79.5-80	11/19/13	1310	79.5-80	1		X																X				
ML-6 107.5-108	11/19/13	1320	107.5-108	1		X																X				
ML-6 167-168.5	11/20/13	0935	167-168.5	1		X																X				
																										76°F

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Nathan Reynolds / Matt Ryan	Andrew Kieta / [illegible]	[illegible]	[illegible]
COMPANY: GEOSCIENCE	COMPANY: Geoscience	COMPANY: Geoscience	COMPANY: PTS LABS
DATE: 2-3-14 TIME: 17:00	DATE: 2-3-14 TIME: 17:00	DATE: 2-4-14 TIME: 10:26	DATE: 2/4/14 TIME: 10:26

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PTS Laboratories, Inc. • 4242 W. 10th St. • Houston, TX 77055 • Phone (713) 216-1800 • Fax (713) 216-1880

PTS Laboratories, Inc.

CHAIN OF CUSTODY RECORD

PAGE ~~OF~~ Appendix C

COMPANY	Geoscience Support Services
ADDRESS	PO 220
CITY	Claremont, CA
ZIP CODE	91711
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	Potrero Rd Parking Area, Moss Landing
SAMPLER SIGNATURE	

PO#

TURNAROUND TIME
24 HOURS ☐ 5 DAYS ☐
48 HOURS ☐ NORMAL ☐
72 HOURS ☐
OTHER: _____

SAMPLE INTEGRITY (CHECK):
INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 43626

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
PR-1 67 ft - 67.5 ft	9/21/13	1500	67 - 67.5	1		X															X					Rcvd @ 74°F
PR-1 145.5 ft -146 ft	9/22/13	1400	145.5 - 146	1		X															X					
PR-1 152 ft - 152.5 ft	9/22/13	1420	152 -152.5	1		X															X					
PR-1 200.5 ft - 201 ft	9/22/13	1730	200.5 -201	1		X															X					

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
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

PTS Laboratories, Inc. • 8100 Secura Way • Santa Fe Springs, CA 90670 • Phone (562) 347-2500 • Fax (562) 907-3610
PTS Laboratories, Inc. • 4242 W. 12th St. • Houston, TX 77055 • Phone (713) 216-1800 • Fax (713) 216-1882

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 Laboratories

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

		METHODS:	API RP 40 / ASTM D2216	API RP 40		API RP 40		API RP 40	API RP 40; EPA 9100	
									25 PSI CONFINING STRESS	
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	MOISTURE CONTENT, % weight	DENSITY		POROSITY, %Vb (2)		TOTAL PORE FLUID SATURATIONS (3), % Pv	EFFECTIVE (4,5) PERMEABILITY TO WATER, millidarcy	HYDRAULIC CONDUCTIVITY (4,5), cm/s
				DRY BULK, g/cc	GRAIN, g/cc	TOTAL	AIR-FILLED			
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 Laboratories, Inc.

CHAIN OF CUSTODY RECORD

PAGE Appendix OF

COMPANY	Geoscience Support Services
ADDRESS	PO 220
CITY	Claremont, CA
ZIP CODE	91711
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	

ANALYSIS REQUEST

PO# 13017-13

TURNAROUND TIME
24 HOURS ☐ 5 DAYS ☐
48 HOURS ☐ NORMAL ☑
72 HOURS ☐
OTHER: _____

SAMPLE INTEGRITY (CHECK):
INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 44073

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
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				2 inches of sample missing
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

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Nathan Reynolds	Andrew Lieta		
COMPANY: GEOSCIENCE	COMPANY: Geoscience	COMPANY: Geoscience	COMPANY: PTS LABS
DATE: 2-3-14 TIME: 17:00	DATE: 2-3-14 TIME: 17:00	DATE: 2-4-14 TIME: 10:26	DATE: 2/4/14 TIME: 10:26

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

PAGE Appendix OF

COMPANY: Geoscience Support Services

ADDRESS: PO 220 | CITY: Claremont, CA | ZIP CODE: 91711

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: Sandholdt dr area, Moss Landing

SAMPLER SIGNATURE:

PO# 13017-13

TURNAROUND TIME: 24 HOURS ☐ 48 HOURS ☐ 72 HOURS ☐ 5 DAYS ☐ NORMAL ☑ OTHER: _____

SAMPLE INTEGRITY (CHECK): INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 44073

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
✓ ML-1 76-76.5	10/3/13	10:30	76-76.5	1		X																X				
✓ ML-1 107.5-108	10/3/13	13:10	107.5-108	1		X																X				
✓ ML-1 147-147.5	10/3/13	14:00	147-147.5	1		X																X				
																										76°F

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Nathan Reynolds	Andrew Kieta		
COMPANY: GEOSCIENCE	COMPANY: Geoscience	COMPANY: Geoscience	COMPANY: PTS LABS
DATE: 2-3-14 TIME: 17:00	DATE: 2-3-14 TIME: 17:00	DATE: 2-4-14 TIME: 10:26	DATE: 2/4/14 TIME: 10:26

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

CHAIN OF CUSTODY RECORD

PAGE Appendix OF

COMPANY	Geoscience Support Services
ADDRESS	PO 220
CITY	Claremont, CA
ZIP CODE	91711
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	Del Mar Fisheries, Moss Landing
SAMPLER SIGNATURE	

PO# 13017-13

TURNAROUND TIME: 24 HOURS ☐ 48 HOURS ☐ 72 HOURS ☐ 5 DAYS ☐ NORMAL ☑ OTHER: _____

SAMPLE INTEGRITY (CHECK): INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 44073

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
ML-2 87-87.5	12/9/13	1610	87-87.5	1		X															X				
ML-2 117.5-118	12/10/13	0935	117.5-118	1		X															X				
ML-2 157.5-158	12/10/13	1430	157.5-158	1		X															X				

76°F

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Nathan Reynolds	Andrew Kieta		
COMPANY: GEOSCIENCE	COMPANY: Geoscience	COMPANY: Geoscience	COMPANY: PTS LABS
DATE: 2-3-14 TIME: 17:00	DATE: 2-3-14 TIME: 17:00	DATE: 2-4-14 TIME: 10:26	DATE: 2/4/14 TIME: 10:26

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CHAIN OF CUSTODY RECORD

PAGE Appendix OF

COMPANY	Geoscience Support Services
ADDRESS	PO 220
CITY	Claremont, CA
ZIP CODE	91711
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	Moss Landing, Nadar Agha property
SAMPLER SIGNATURE	

PO# 13017-13

TURNAROUND TIME
24 HOURS ☐ 5 DAYS ☐
48 HOURS ☐ NORMAL ☑
72 HOURS ☐
OTHER: _____

SAMPLE INTEGRITY (CHECK):
INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 44073

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
ML-3 106.5-107	1/7/14	1600	106.5-107	1		X																X				
ML-3 166.5-167	1/8/14	1350	166.5-167	1		X																X				
ML-4 76.5-77	11/26/13	1320	76.5-77	1		X																X				
ML-4 126.5-127	12/2/13	1350	126.5-127	1		X																X				
ML-4 146.5-147	12/2/13	1745	146.5-147	1		X																X				

76 °F

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Nathan Reynolds	Andrew Kirta		
COMPANY GEOSCIENCE	COMPANY Geoscience	COMPANY Geoscience	COMPANY PTS LABS
DATE 2-3-14 TIME 17:00	DATE 2-3-14 TIME 17:00	DATE 2-4-14 TIME 10:26	DATE 2/4/14 TIME 10:26

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

CHAIN OF CUSTODY RECORD

PAGE Appendix OF

COMPANY	Geoscience Support Services
ADDRESS	PO 220
CITY	Claremont, CA
ZIP CODE	91711
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	MBARI, Moss Landing
SAMPLER SIGNATURE	

PO# 13017-13

TURNAROUND TIME
24 HOURS ☐ 5 DAYS ☐
48 HOURS ☐ NORMAL ☑
72 HOURS ☐
OTHER: _____

SAMPLE INTEGRITY (CHECK):
INTACT X ON ICE ____

PTS QUOTE NO.

PTS FILE: 44073

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	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
ML-6 79.5-80	11/19/13	1310	79.5-80	1		X																X				
ML-6 107.5-108	11/19/13	1320	107.5-108	1		X																X				
ML-6 167-168.5	11/20/13	0935	167-168.5	1		X																X				
																										76°F

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Nathan Reynolds / Matt Ryan	Andrew Kieta / [illegible]	[illegible]	[illegible]
COMPANY: GEOSCIENCE	COMPANY: Geoscience	COMPANY: Geoscience	COMPANY: PTS LABS
DATE: 2-3-14 TIME: 17:00	DATE: 2-3-14 TIME: 17:00	DATE: 2-4-14 TIME: 10:26	DATE: 2/4/14 TIME: 10:26

PTS Laboratories, Inc. • 8100 Secura Way • Santa Fe Springs, CA 90670 • Phone (562) 347-2500 • Fax (562) 907-3610
PTS Laboratories, Inc. • 4242 W. 10th St. • Houston, TX 77055 • Phone (713) 216-1800 • Fax (713) 216-1880

APPENDIX D

Mechanical Grading Analyses – Formation Materials

GEOSCIENCE

APPENDIX D:

MECHANICAL GRADING ANALYSES – FORMATION MATERIALS

CONTENTS

Description **Page**

Borehole CX-B1 ..... *D-1*

Borehole CX-B2 ..... *D-2*

Borehole CX-B3 ..... *D-3*

Borehole CX-B4 ..... *D-4*

Borehole MDW-1 ..... *D-5*

Borehole ML-1 ..... *D-6*

Borehole ML-2 ..... *D-7*

Borehole ML-3 ..... *D-8*

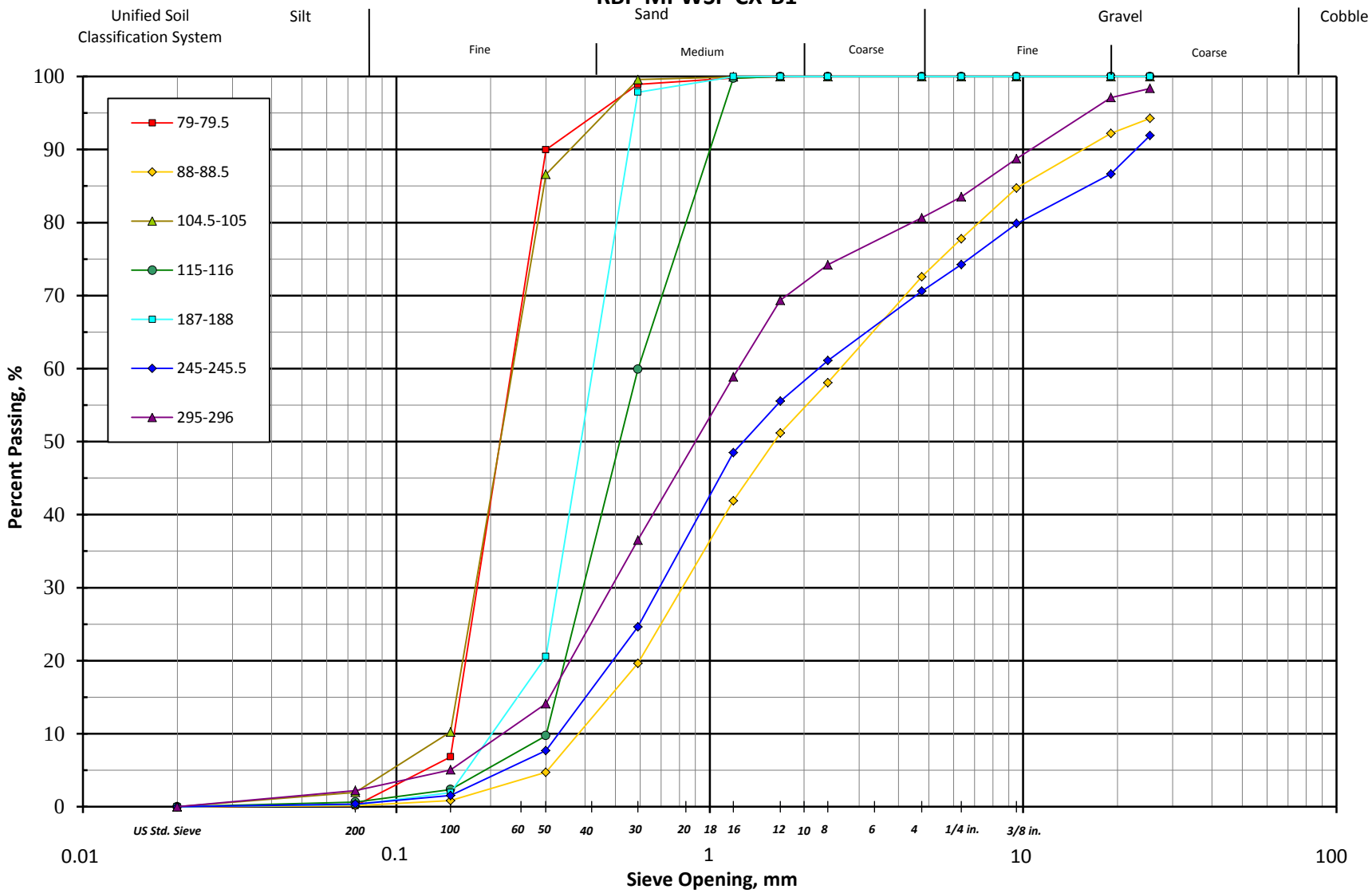
Borehole ML-4 ..... *D-9*

Borehole ML-6 ..... *D-10*

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

DRAFT

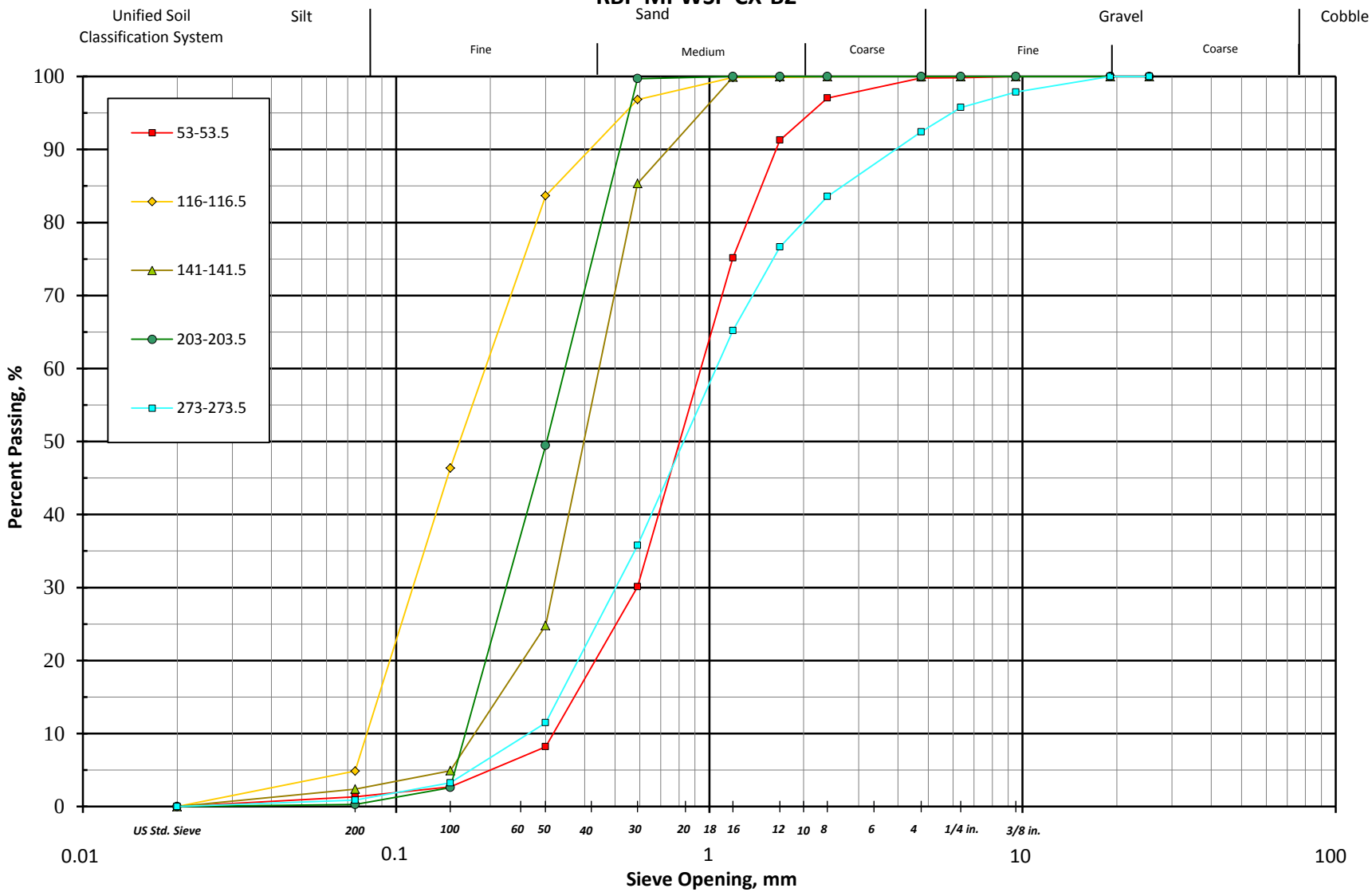
Mechanical Grading Analysis
RBF-MPWSP CX-B1



Appendix D

DRAFT

Mechanical Grading Analysis
RBF-MPWSP CX-B2



Appendix D

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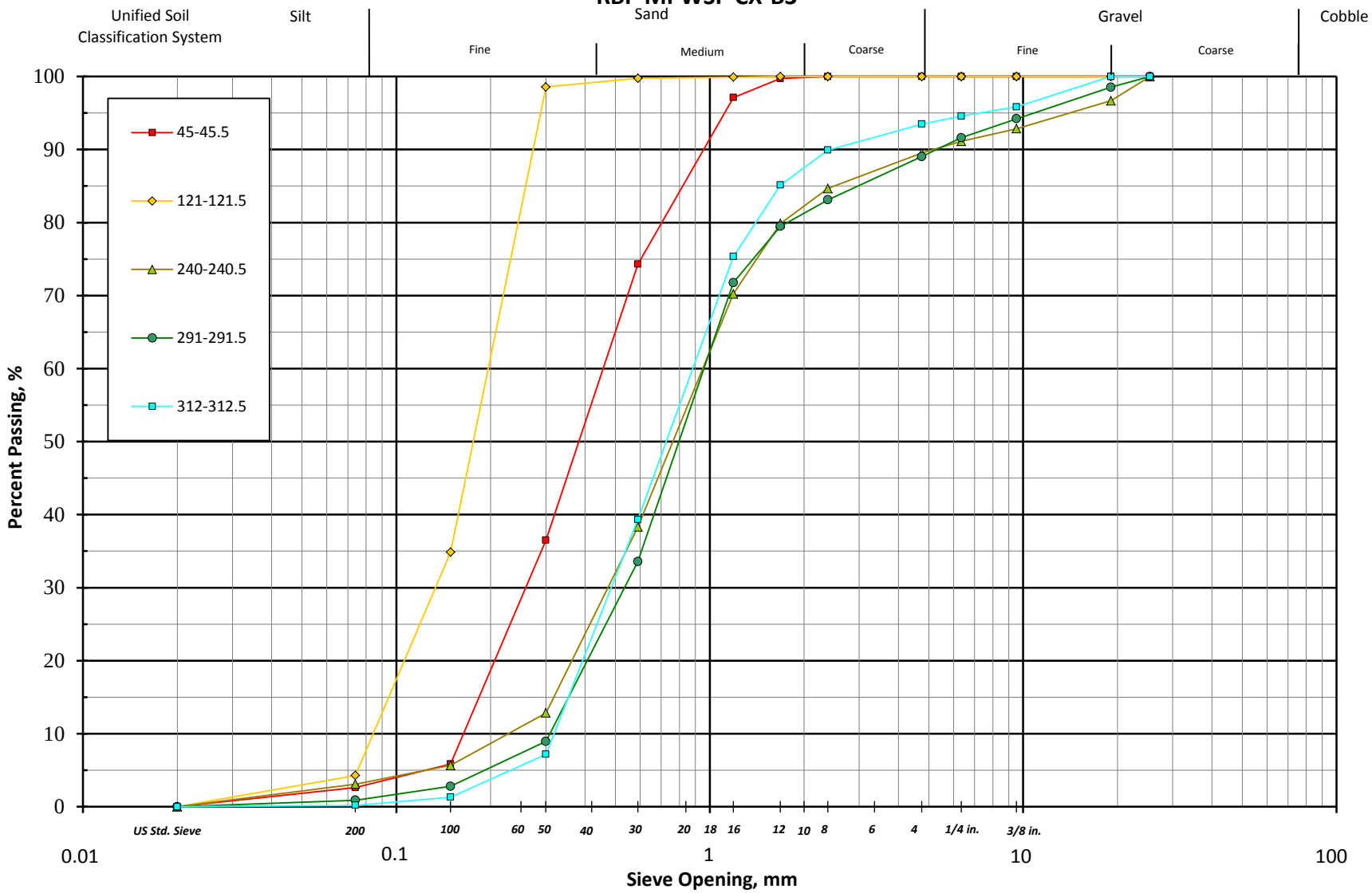
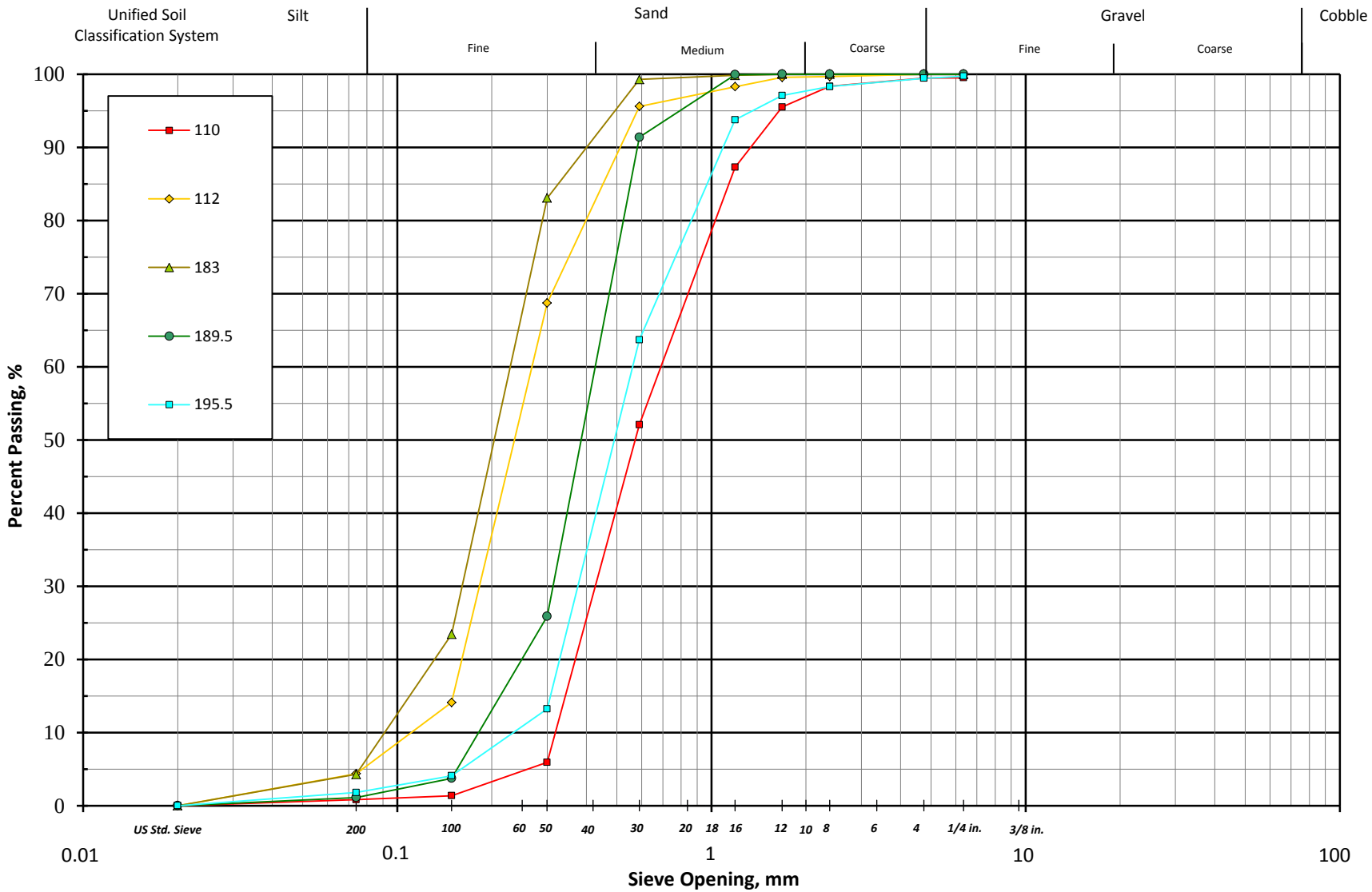
Mechanical Grading Analysis
RBF-MPWSP CX-B3



Appendix D

DRAFT

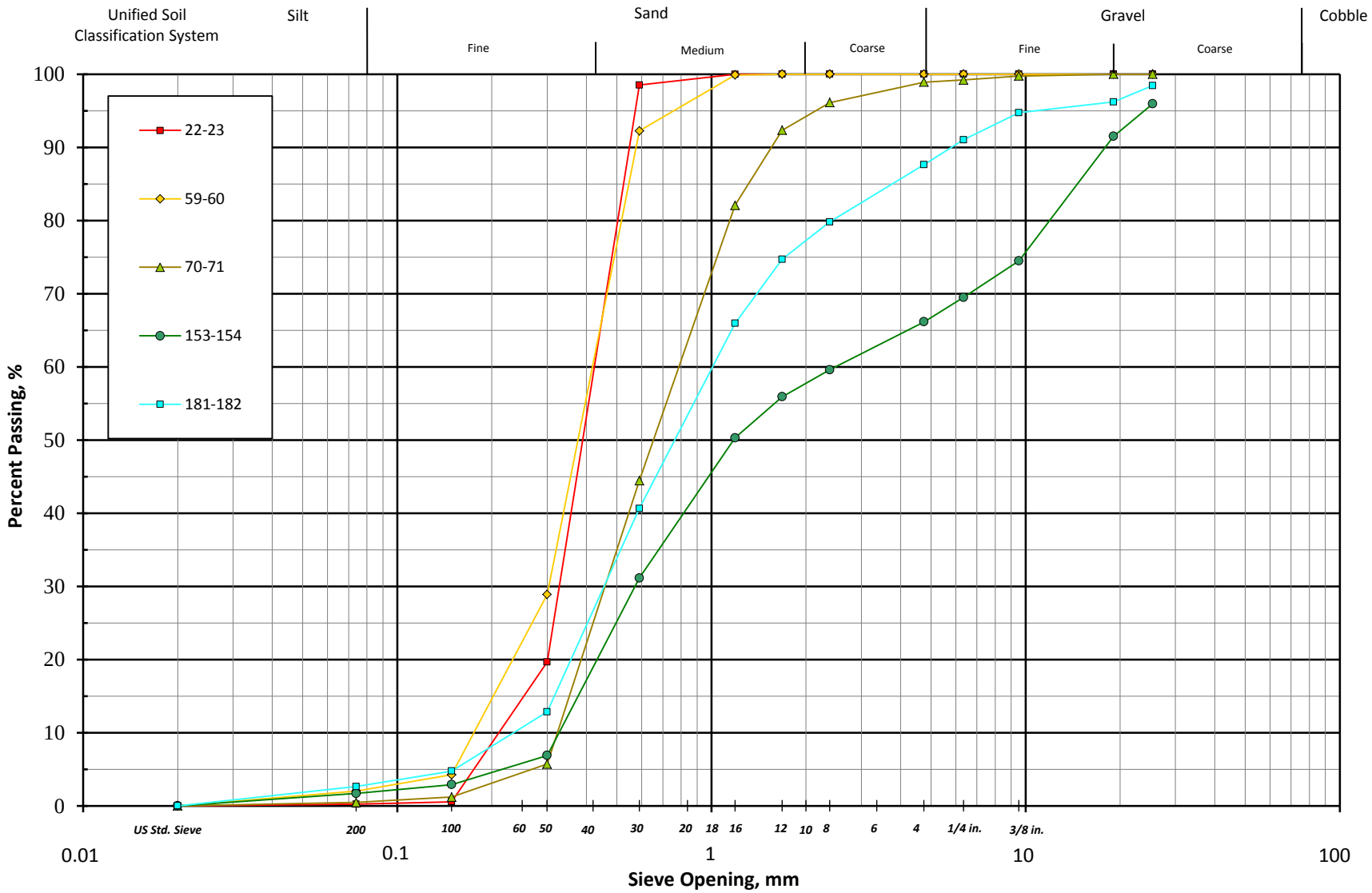
Mechanical Grading Analysis
RBF-MPWSP CX-B4



Appendix D

DRAFT

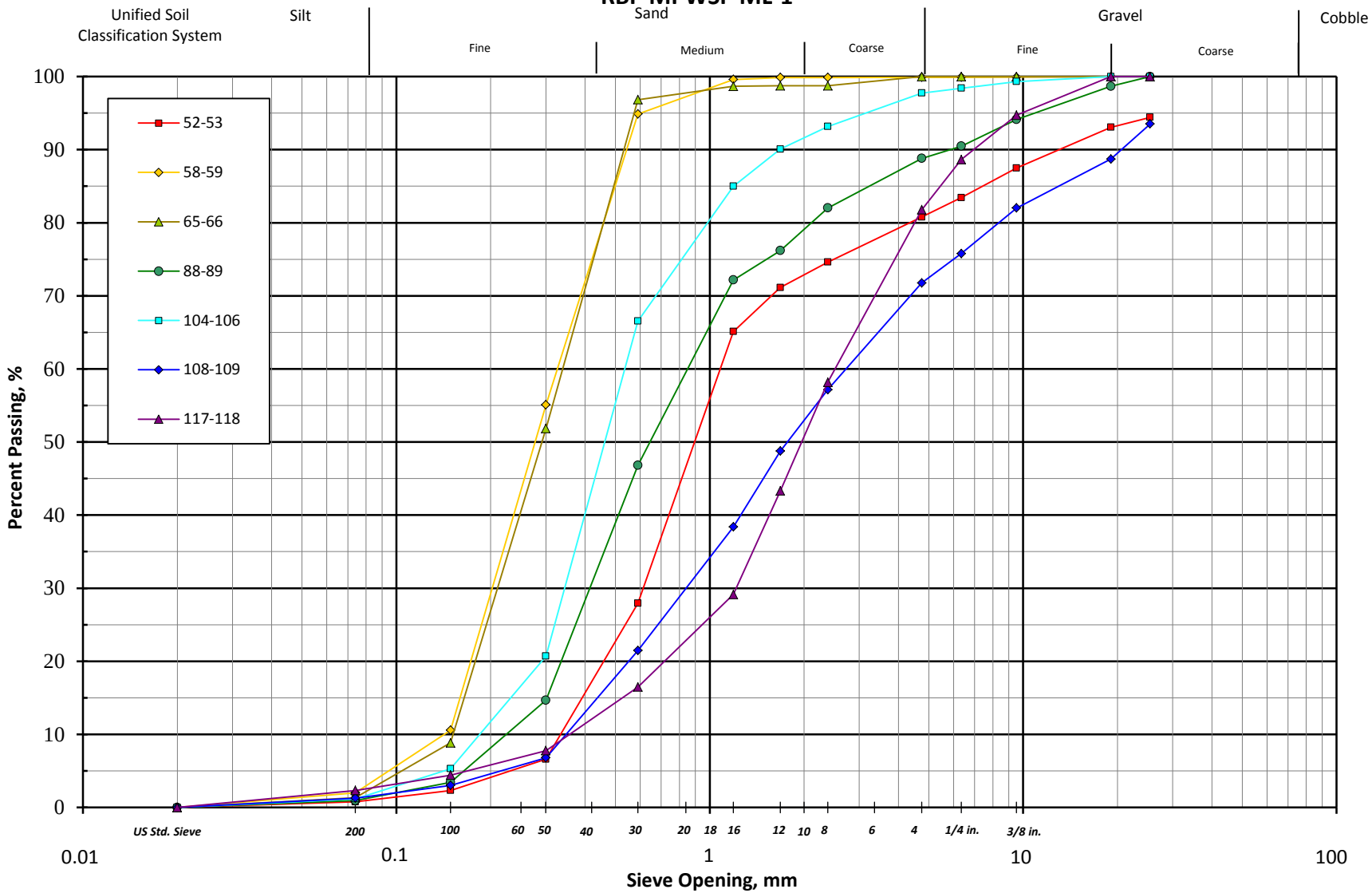
Mechanical Grading Analysis
RBF-MPWSP MDW-1



Appendix D

DRAFT

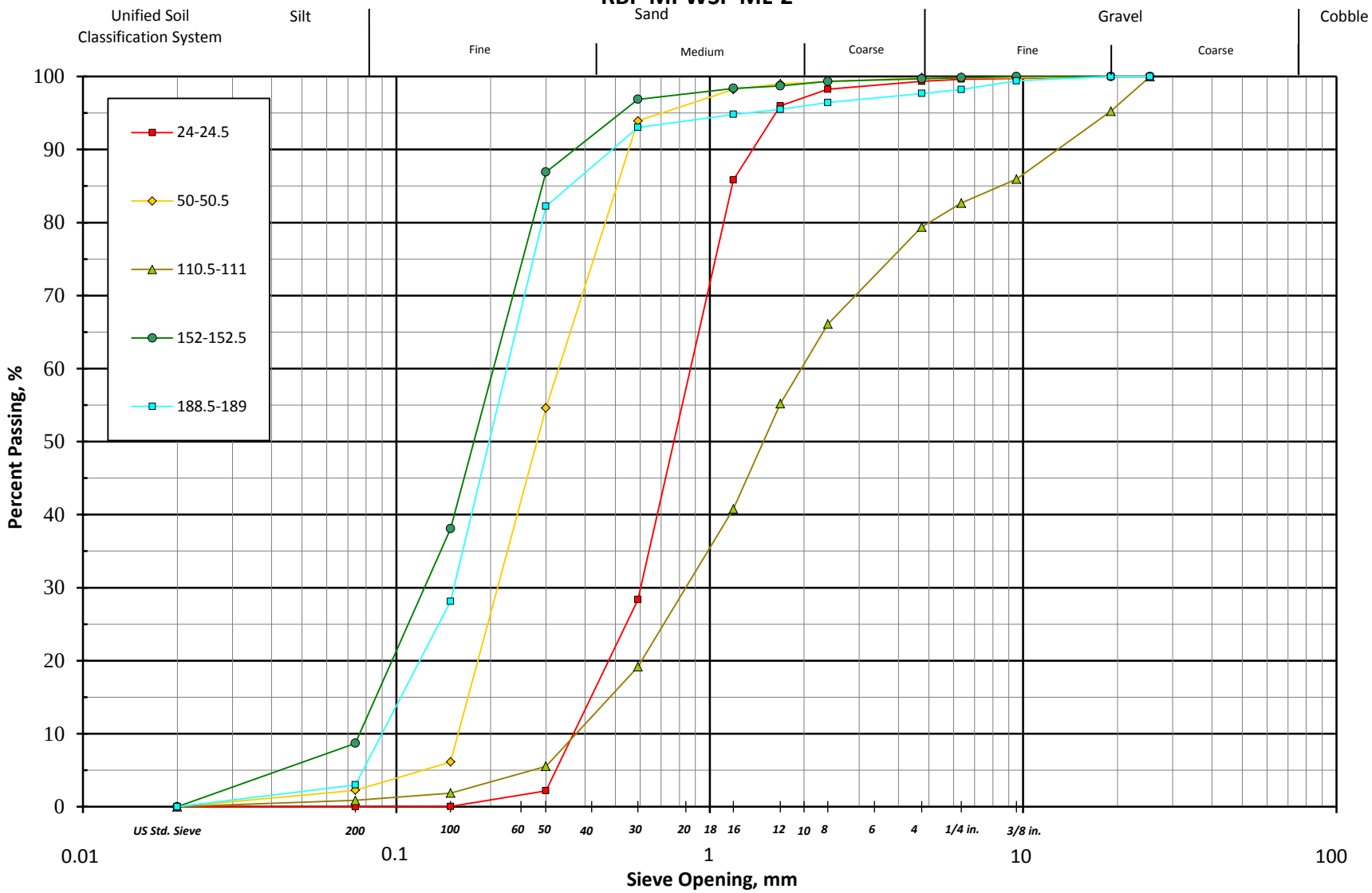
Mechanical Grading Analysis
RBF-MPWSP ML-1



Appendix D

DRAFT

Mechanical Grading Analysis
RBF-MPWSP ML-2



Appendix D

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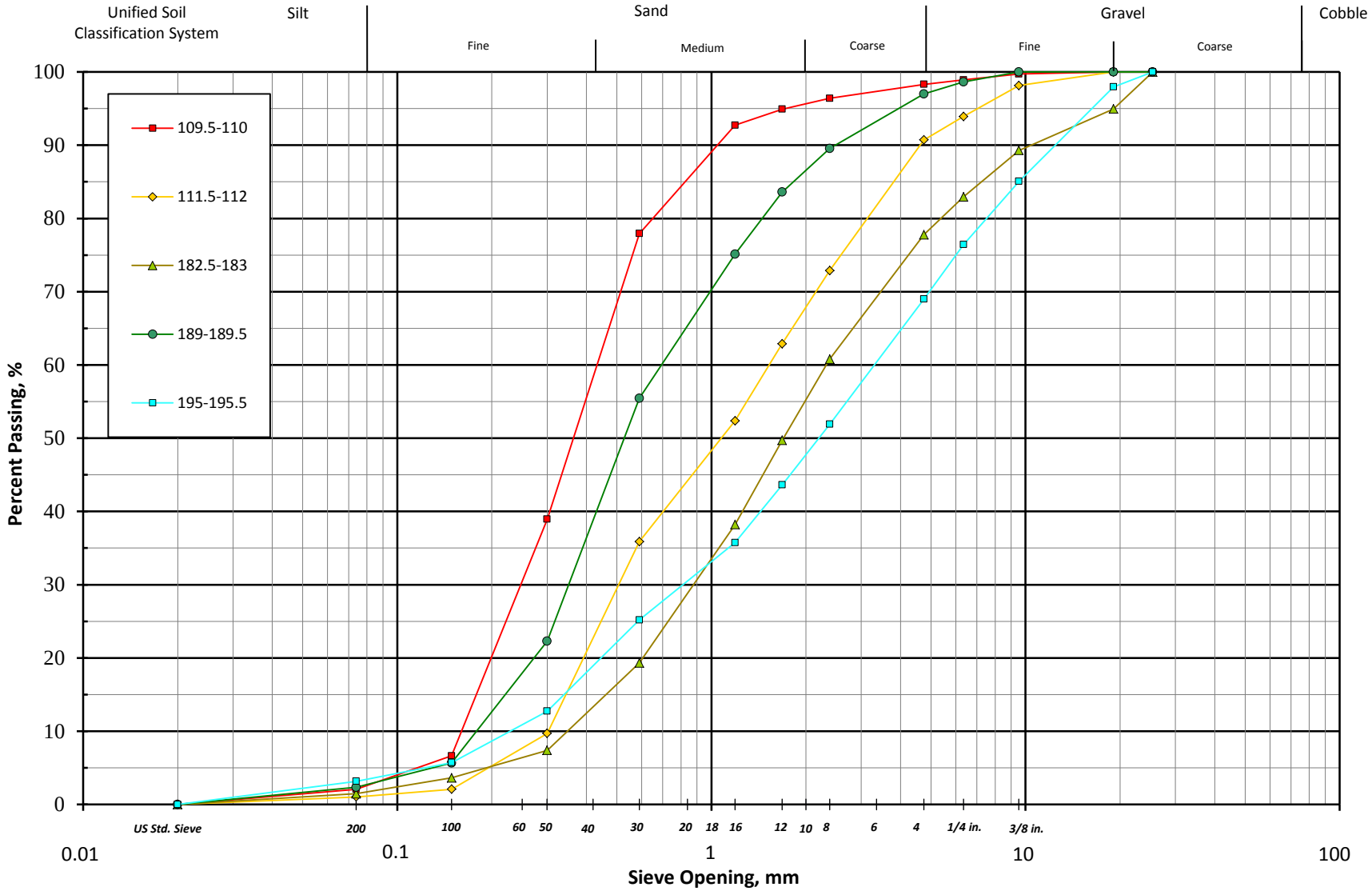
Mechanical Grading Analysis
RBF-MPWSP ML-3



Appendix D

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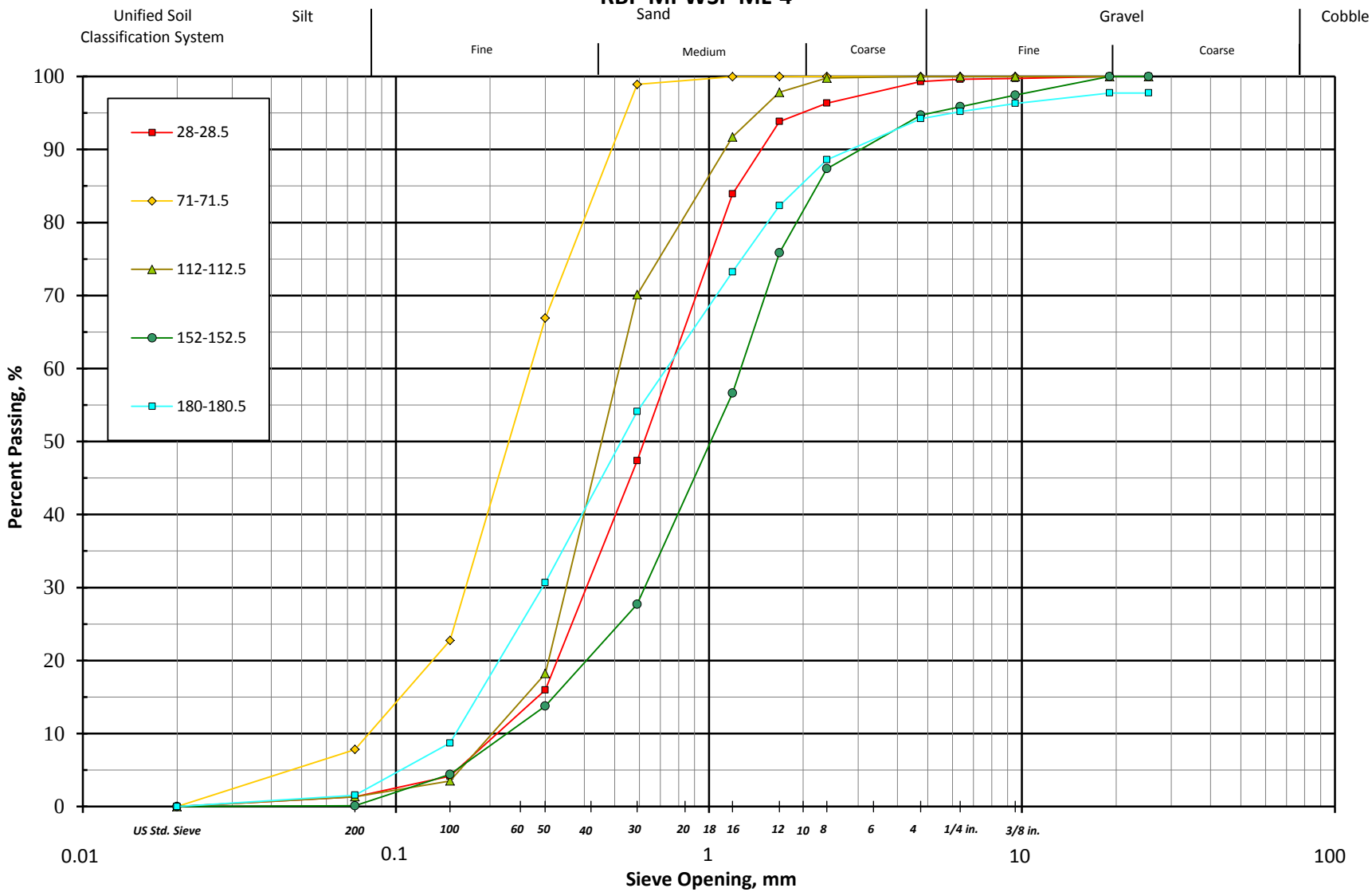
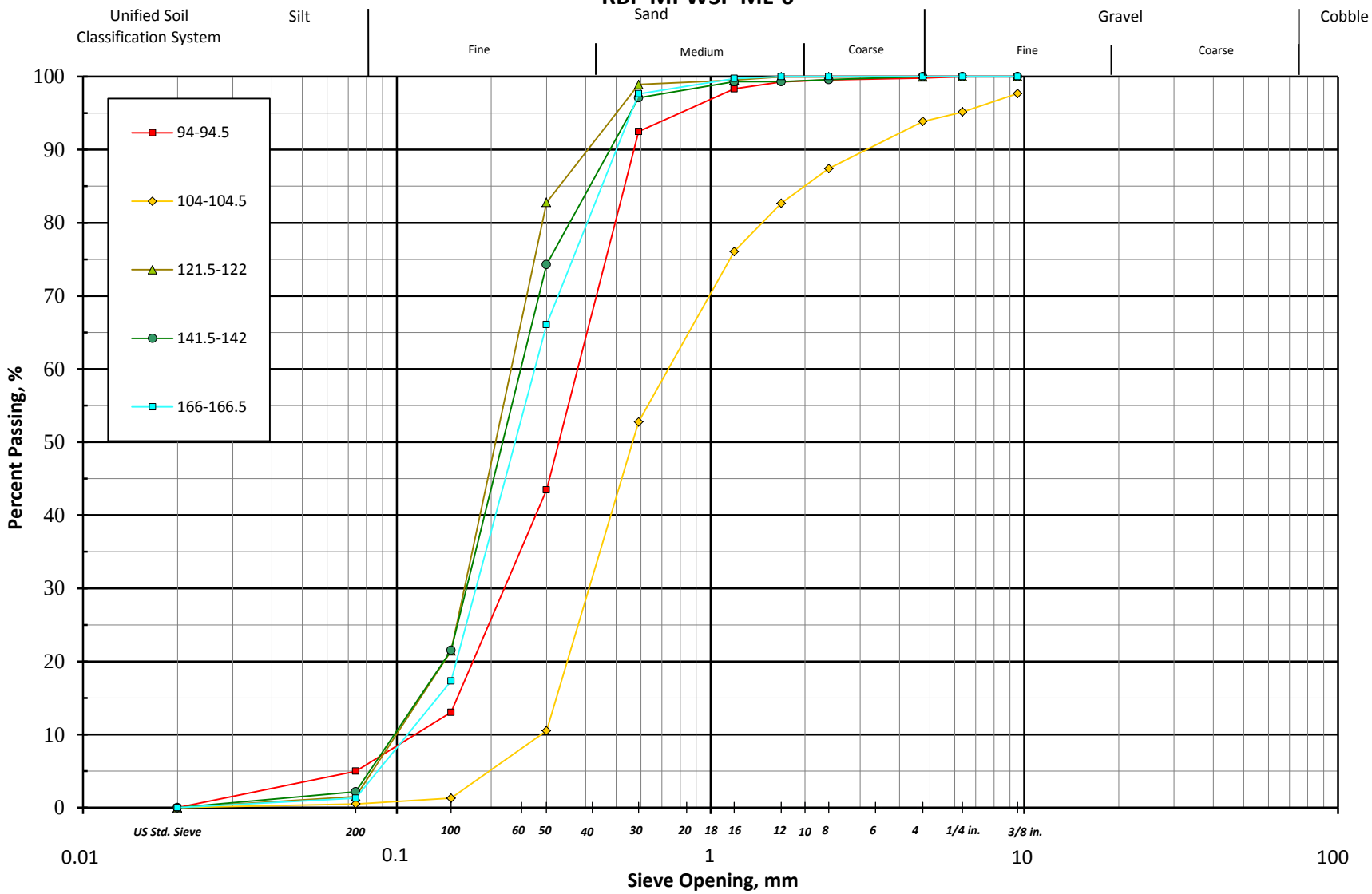
Mechanical Grading Analysis
RBF-MPWSP ML-4



Appendix D

DRAFT

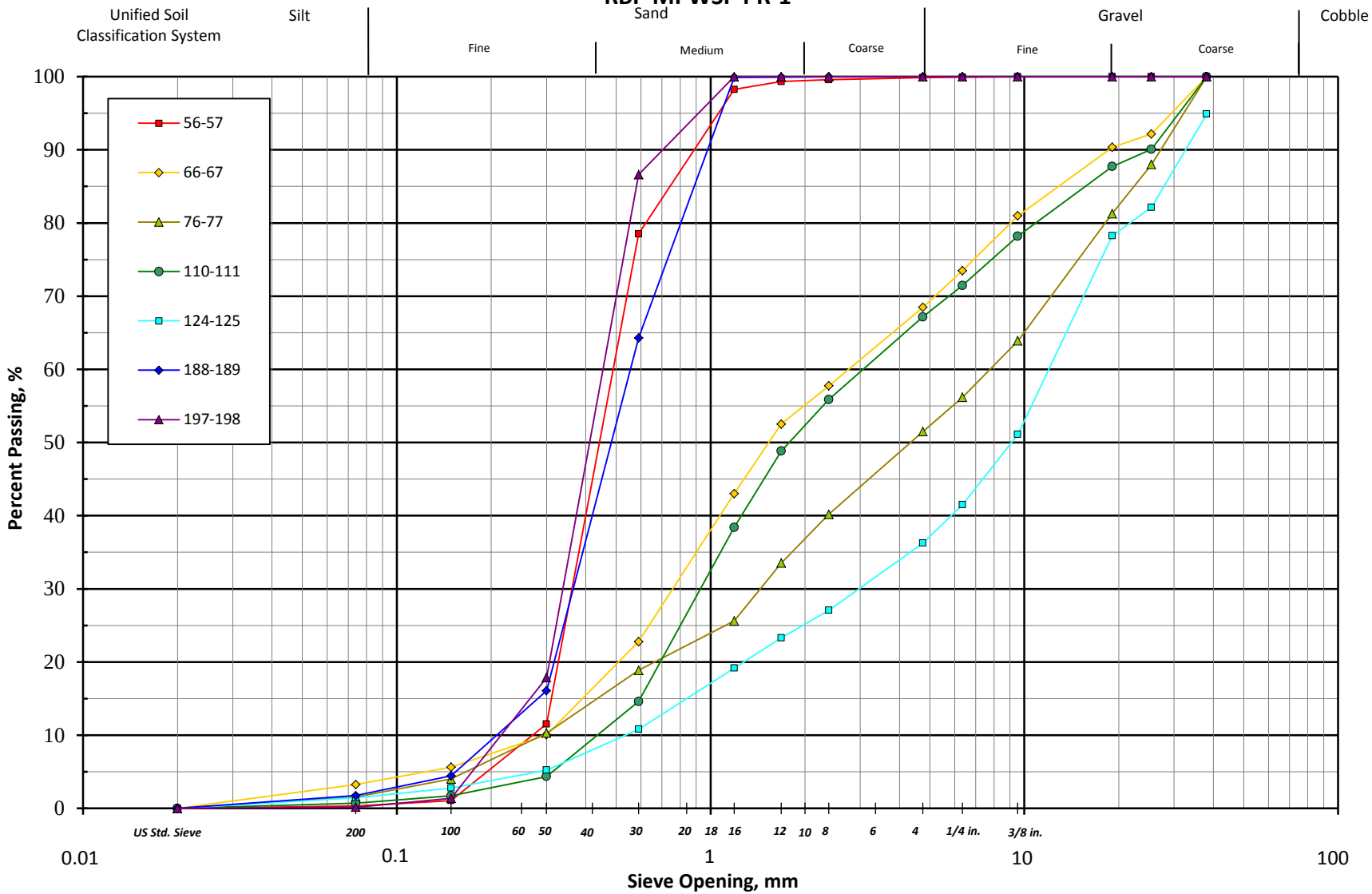
Mechanical Grading Analysis
RBF-MPWSP ML-6



Appendix D

DRAFT

Mechanical Grading Analysis
RBF-MPWSP PR-1



Appendix D

APPENDIX E

Geophysical Borehole Logs

GEOSCIENCE

APPENDIX E:

GEOPHYSICAL BOREHOLE LOGS

CONTENTS

Description **Page**

Borehole CX-B1 ..... *E-1*

Borehole CX-B2 ..... *E-6*

Borehole CX-B3 ..... *E-11*

Borehole CX-B4 ..... *E-17*

Borehole MDW-1 ..... *E-22*

Borehole ML-1 ..... *E-27*

Borehole ML-2 ..... *E-31*

Borehole ML-3 ..... *E-35*

Borehole ML-4 ..... *E-39*

Borehole ML-6 ..... *E-42*

Borehole PR-1 ..... *E-46*

PACIFIC SURVEYS

DUAL INDUCTION GAMMA-RAY

Job No. 17725

File No.

Company CASCADE DRILLING, INC.

Well CX-B1

Field MARINA

County MONTEREY State CA

Location

OFF OF LAPIS RD.
GPS: N 36o 42.797' W 121o 48.360'

Other Services:

TEMPERATURE
FLUID RESISTIVITY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	10-26-2013	
Run Number	ONE	
Depth Driller	305'	
Depth Logger	304'	
Bottom Logged Interval	304'	
Top Log Interval	0'	
Open Hole Size	9" (0'-100')	8" (100'-306')
Type Fluid	N/A	
Density / Viscosity	N/A	
Fluid Level	N/A	
Bentonite Seal	N/A	
Time Well Ready	1330	
Time Logger on Bottom	1400	
Equipment Number	PS-3	
Location	LA	
Recorded By	SCHUMACHER	
Witnessed By	B. VILLALOBOS	

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	9"	0'	100'				
TWO	8"	100'	306'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	9"	N/A	0'	3.5'
Prot. String	4" PVC	N/A	0'	305'
Production String				
Liner				

<< Fold Here >>>

Comments

0.010" SLOT FROM 5'-305' BGS

Calibration Report

Database File 17725.db
Dataset Pathname DIL
Dataset Creation Sat Oct 26 14:46:45 2013

Dual Induction Calibration Report

Serial-Model:	0001-ALT	
Surface Cal Performed:	Wed Aug 31 18:21:15 2011	**Appendix E**

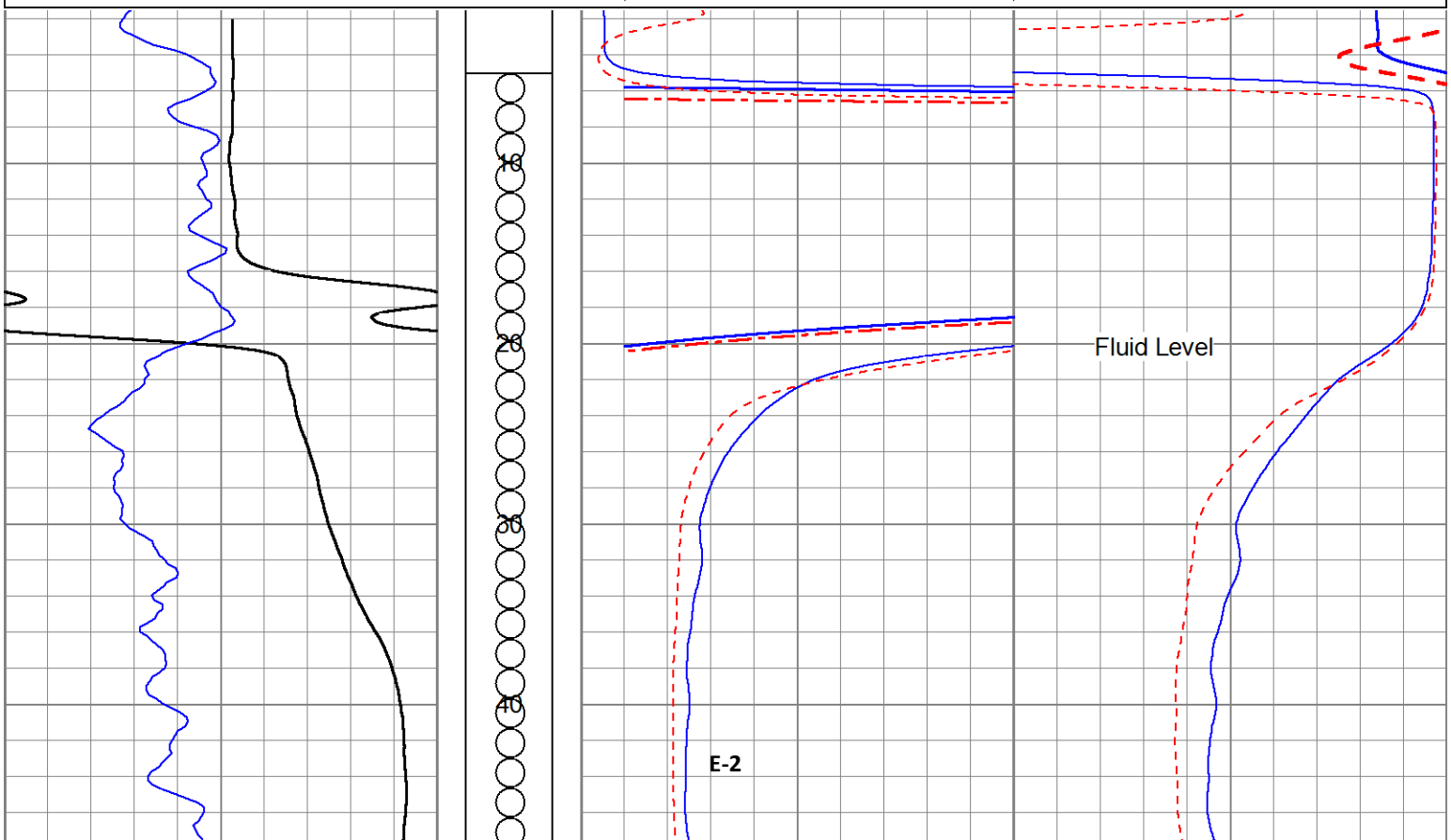
	Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	1407.490	3493.640	cps	0.000	612.000	mmho/m	0.293	-412.905
Medium	1908.120	14487.900	cps	0.000	1960.000	mmho/m	0.156	-297.296

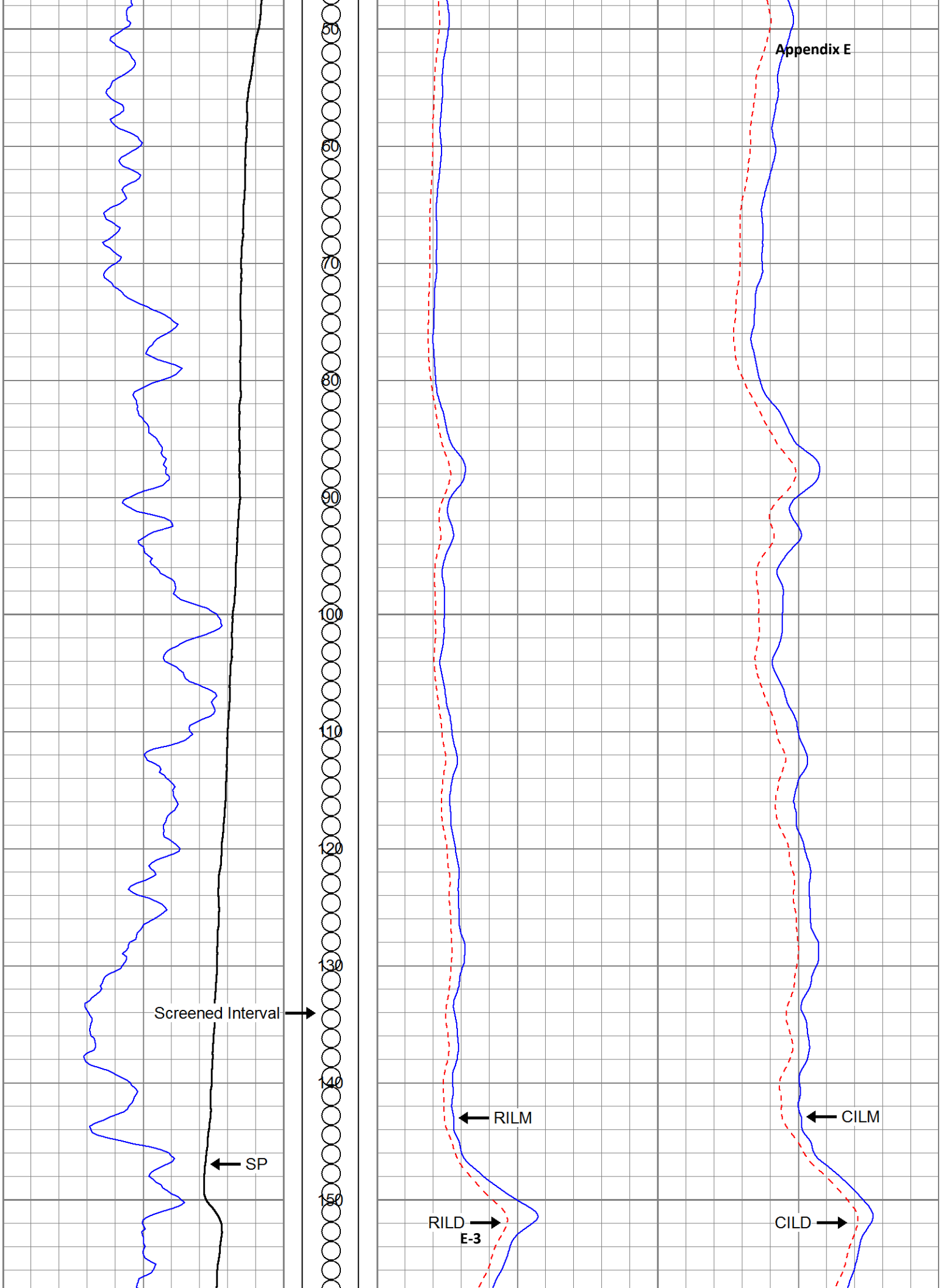
Gamma Ray Calibration Report

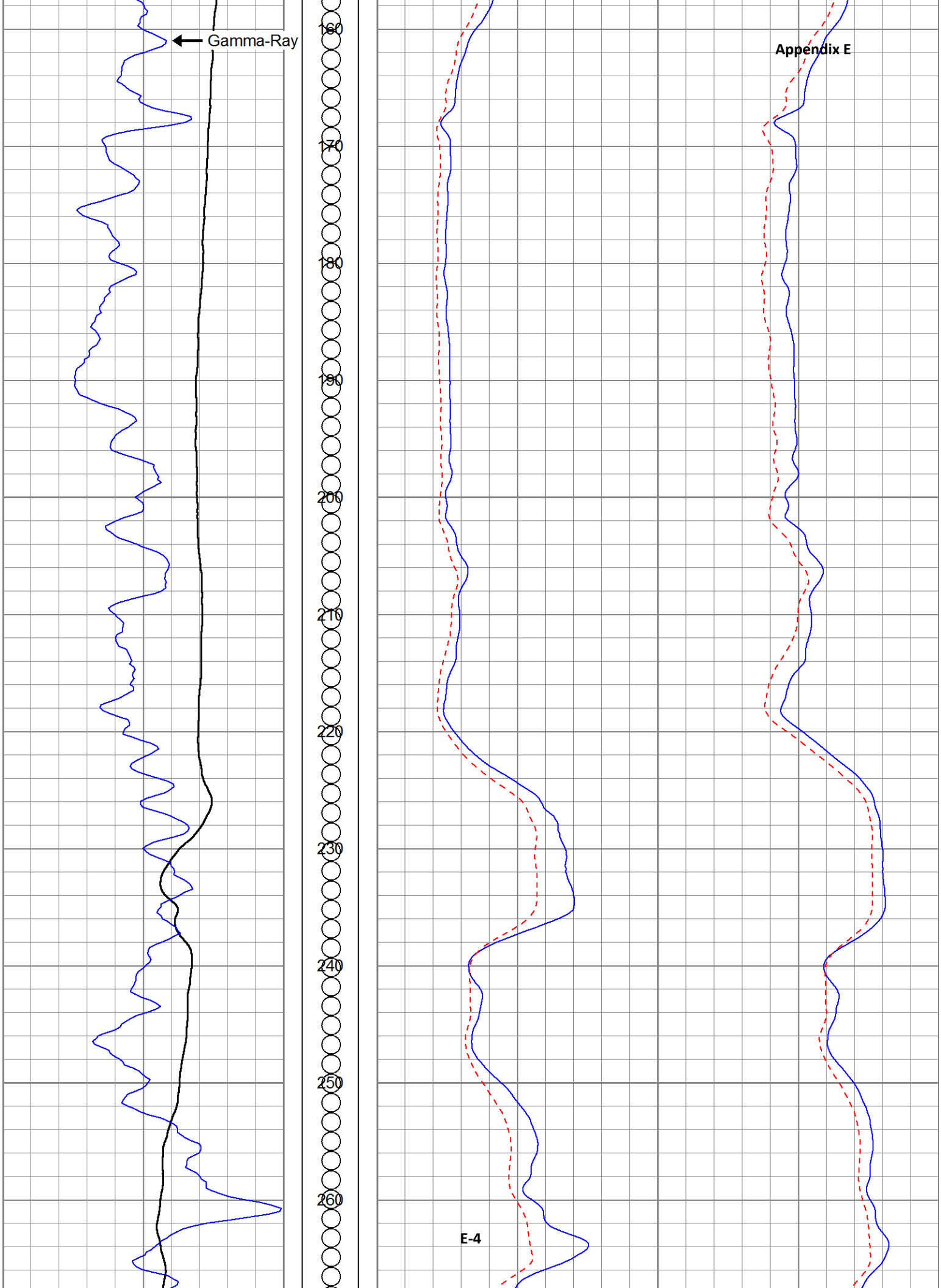
Serial Number:	PS_1	
Tool Model:	01	
Performed:	Wed Aug 31 18:22:13 2011	
Calibrator Value:	162.0	GAPI
Background Reading:	46.1	cps
Calibrator Reading:	180.8	cps
Sensitivity:	1.2020	GAPI/cps

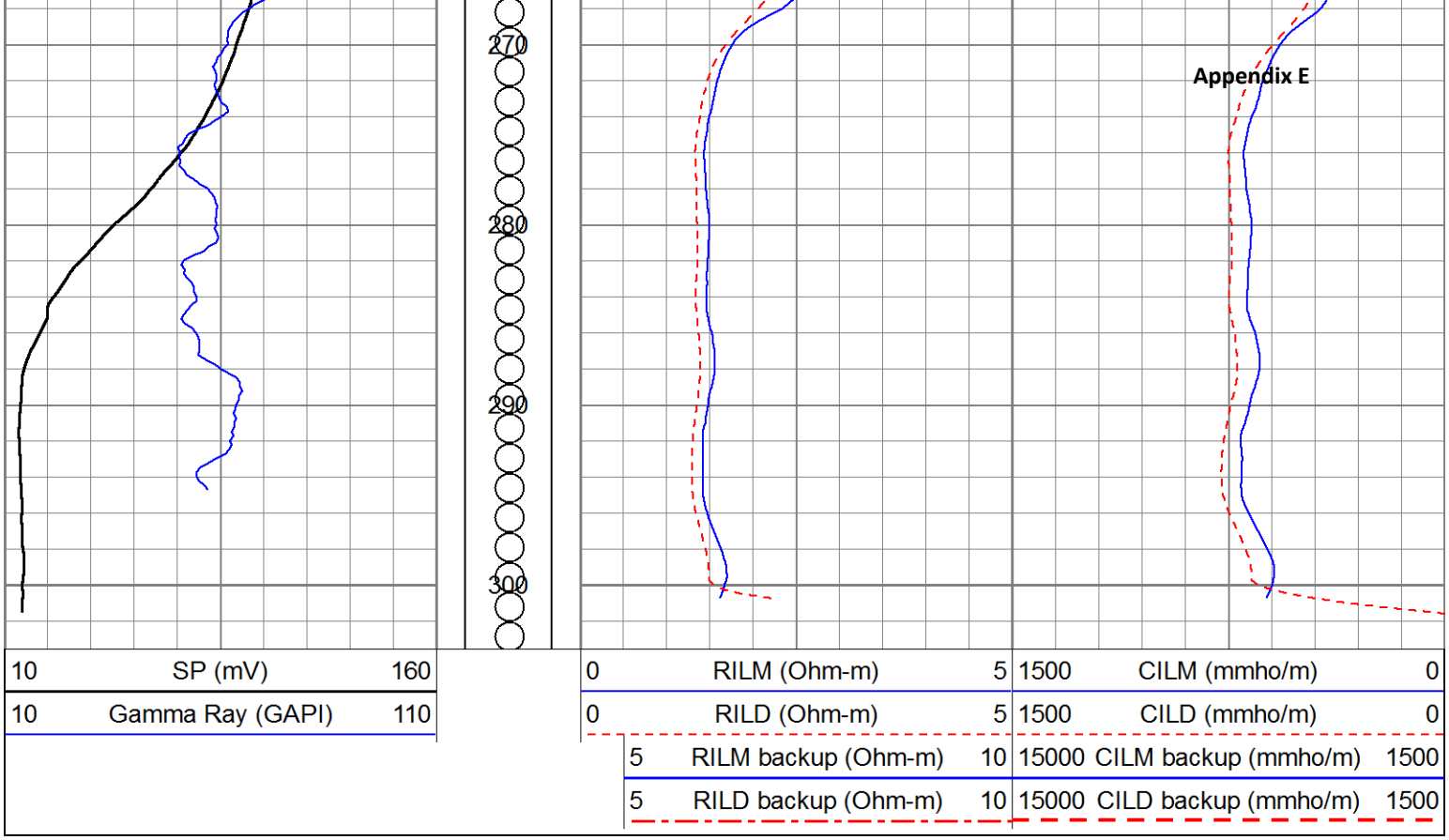
Database File	17725.db
Dataset Pathname	DIL
Presentation Format	dil_ps
Dataset Creation	Sat Oct 26 14:46:45 2013
Charted by	Depth in Feet scaled 1:120

10	SP (mV)	160		0	RILM (Ohm-m)	5	1500	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110		0	RILD (Ohm-m)	5	1500	CILD (mmho/m)	0
				5	RILM backup (Ohm-m)	10	15000	CILM backup (mmho/m)	1500
				5	RILD backup (Ohm-m)	10	15000	CILD backup (mmho/m)	1500




Appendix E
50
60
70
80
90
100
110
120
130
140
150
Screened Interval
SP
RILM
RILD
CILM
CILD


Gamma-Ray
160
170
180
190
200
210
220
230
240
250
260
Appendix E


Appendix E
270
280
290
300
10 SP (mV) 160
10 Gamma Ray (GAPI) 110
0 RILM (Ohm-m) 5
0 RILD (Ohm-m) 5
5 RILM backup (Ohm-m) 10
5 RILD backup (Ohm-m) 10
1500 CILM (mmho/m) 0
1500 CILD (mmho/m) 0
15000 CILM backup (mmho/m) 1500
15000 CILD backup (mmho/m) 1500

PACIFIC SURVEYS

DUAL INDUCTION GAMMA RAY

Job No. 17805

File No.

Company CASCADE DRILLING INC.

Well CX-B2

Field MARINA

County MONTEREY State CA

Location

OFF OF LAPIS RD.
GPS: N36o42.768' W121o48.226'

Other Services:

TEMPERATURE
FLUID RESISTIVITY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	11-07-2013	
Run Number	ONE	
Depth Driller	305.5'	
Depth Logger	301.5'	
Bottom Logged Interval	300'	
Top Log Interval	0'	
Open Hole Size	7" (0'-30')	6.5" (30'-307')
Type Fluid	WATER	
Density / Viscosity	N/A	
Fluid Level	27'	
Bentonite Seal	N/A	
Time Well Ready	11:00 AM	
Time Logger on Bottom	11:30 AM	
Equipment Number	PS-5	
Location	L.A.	
Recorded By	ABREAU	
Witnessed By	N. REYNOLDS	

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	7"	0'	30'				
TWO	6.5"	30'	307'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	7.25"	N/A	0'	30'
Prot. String				
Production String	4" PVC	SCH 40	0'	305.5'
Liner				

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All interpretations are opinions based on inferences from electrical or other measurements and Pacific Surveys cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Pacific Surveys' general terms and conditions set out in our current Price Schedule.

Comments

Calibration Report

Database File 17805.db
Dataset Pathname DIL
Dataset Creation Thu Nov 07 12:02:28 2013

Dual Induction Calibration Report

Serial-Model:	0001-ALT	
Surface Cal Performed:	Tue Feb 19 09:35:46 2013	**Appendix E**

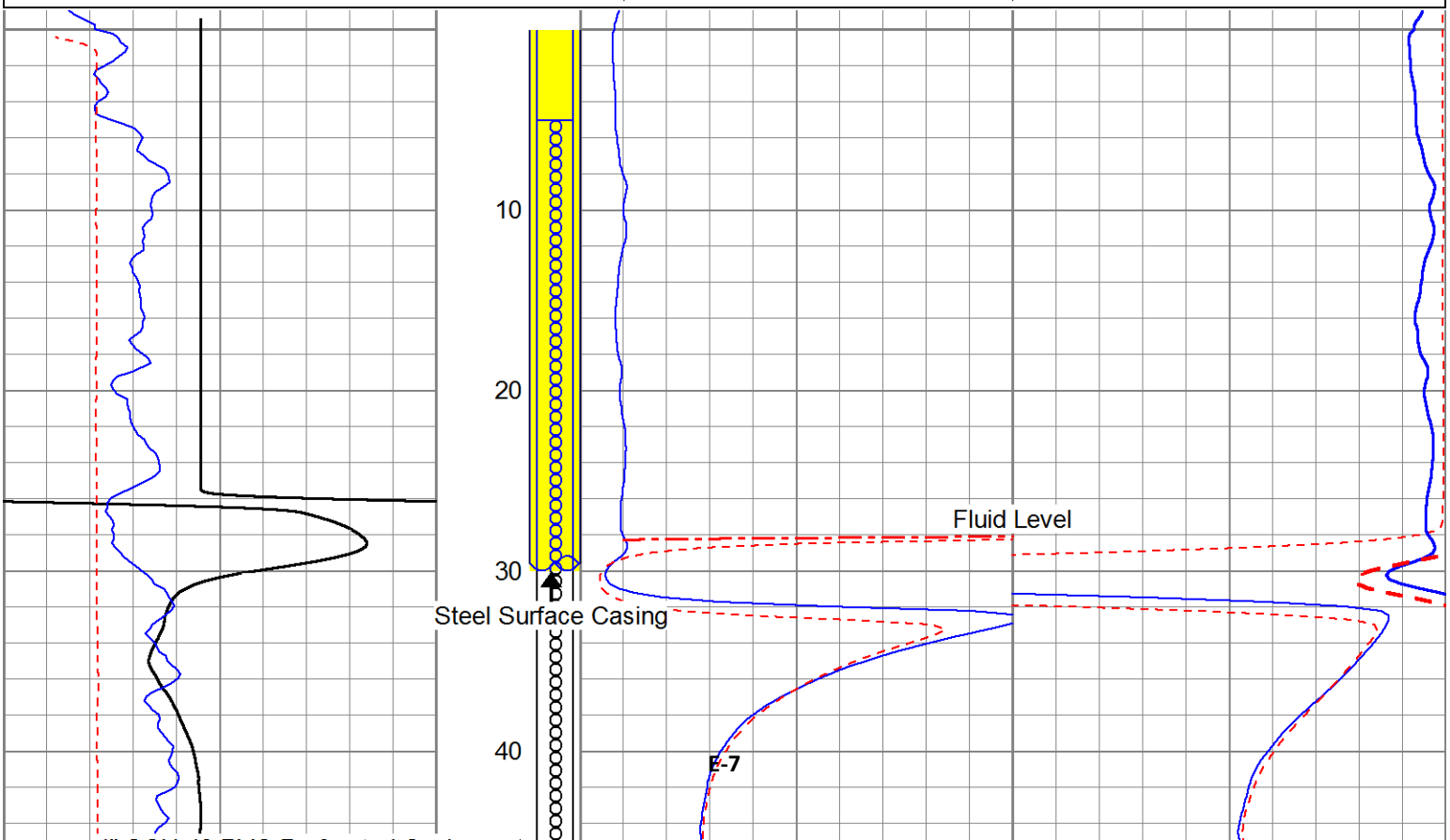
	Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	1421.120	3677.430	cps	0.000	612.000	mmho/m	0.271	-385.466
Medium	2115.060	14165.800	cps	0.000	1960.000	mmho/m	0.163	-344.005

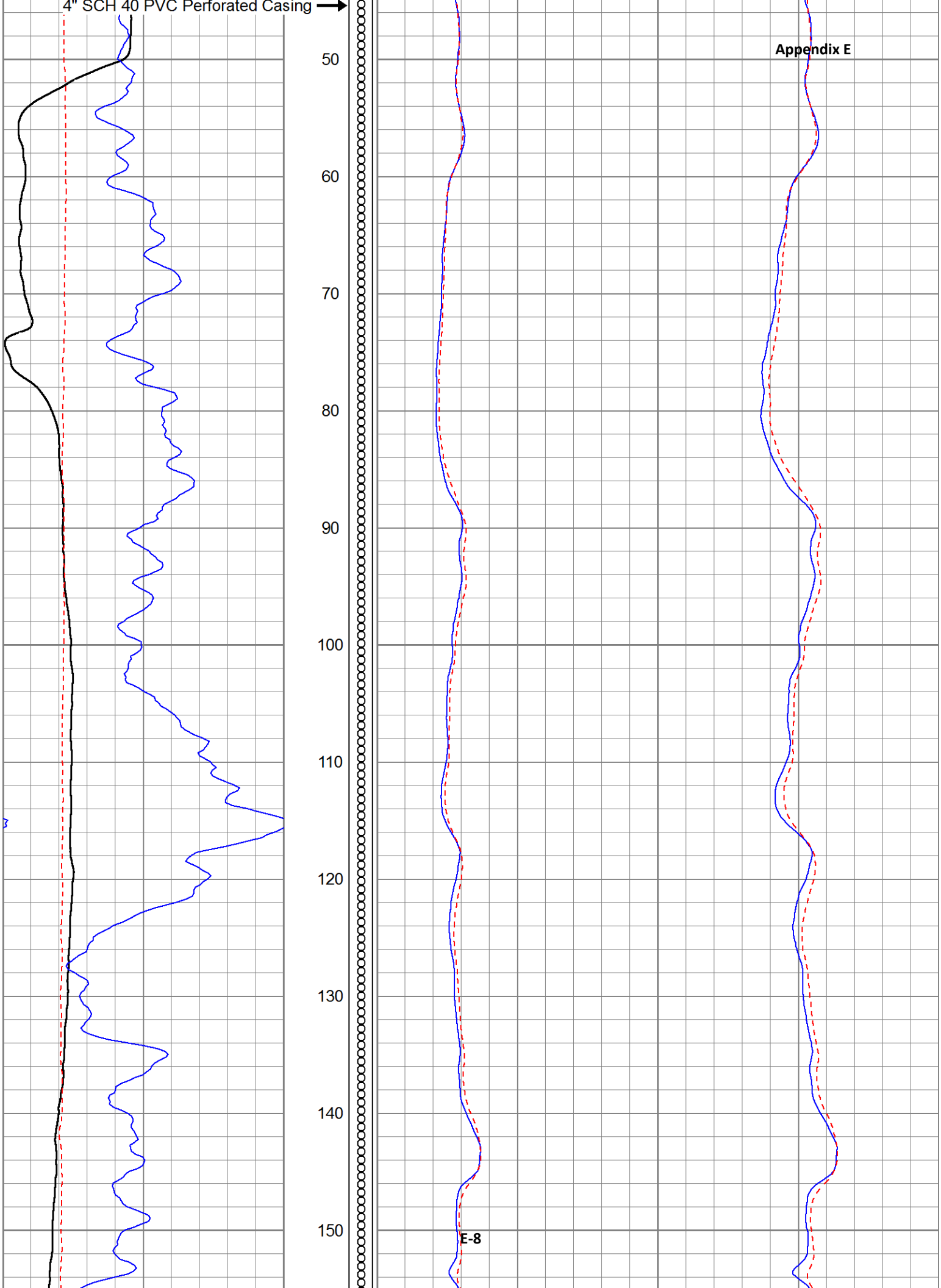
Gamma Ray Calibration Report

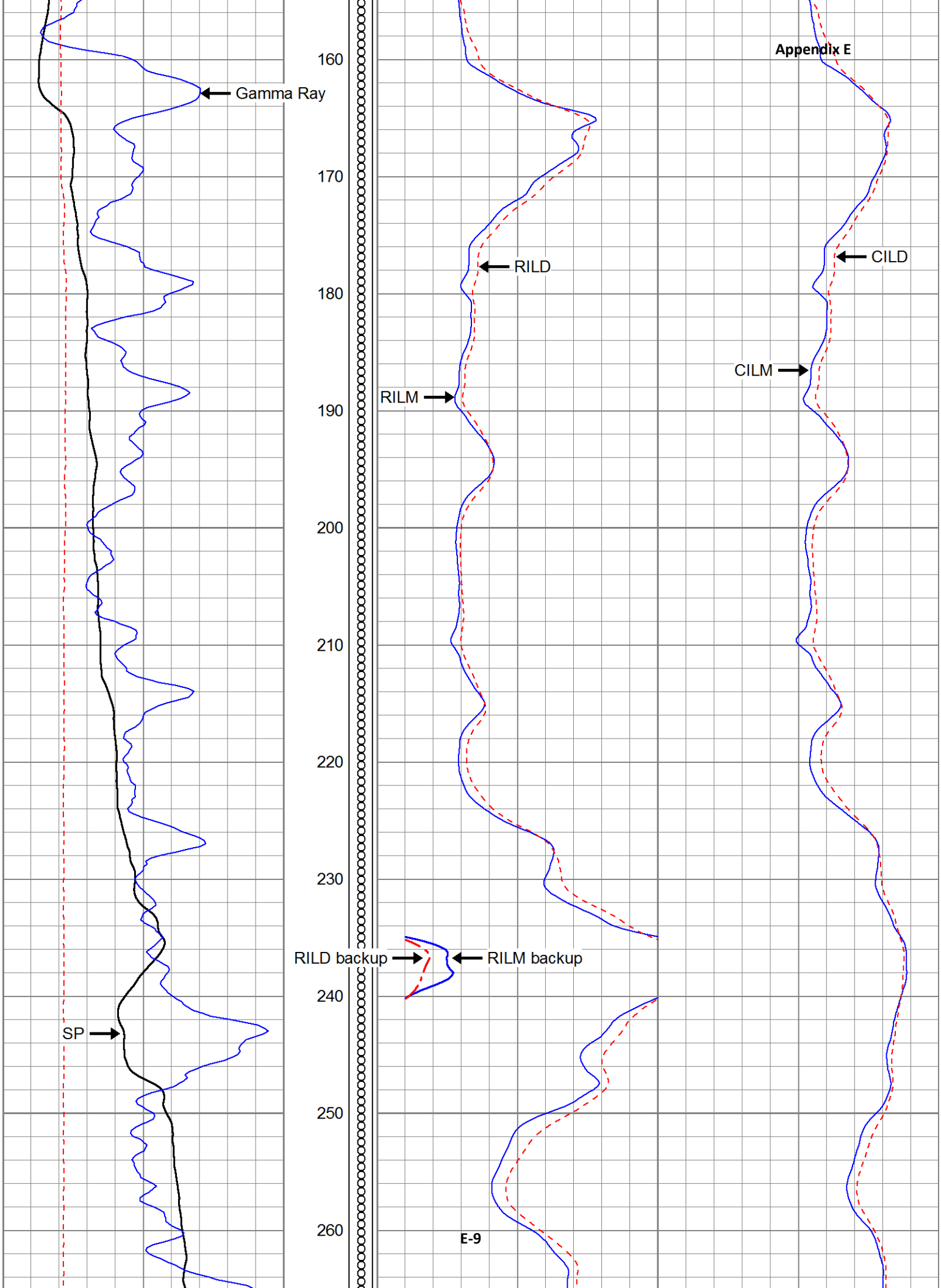
Serial Number:	PS_1	
Tool Model:	01	
Performed:	Tue Feb 19 09:35:55 2013	
Calibrator Value:	162.0	GAPI
Background Reading:	46.1	cps
Calibrator Reading:	180.8	cps
Sensitivity:	1.2020	GAPI/cps

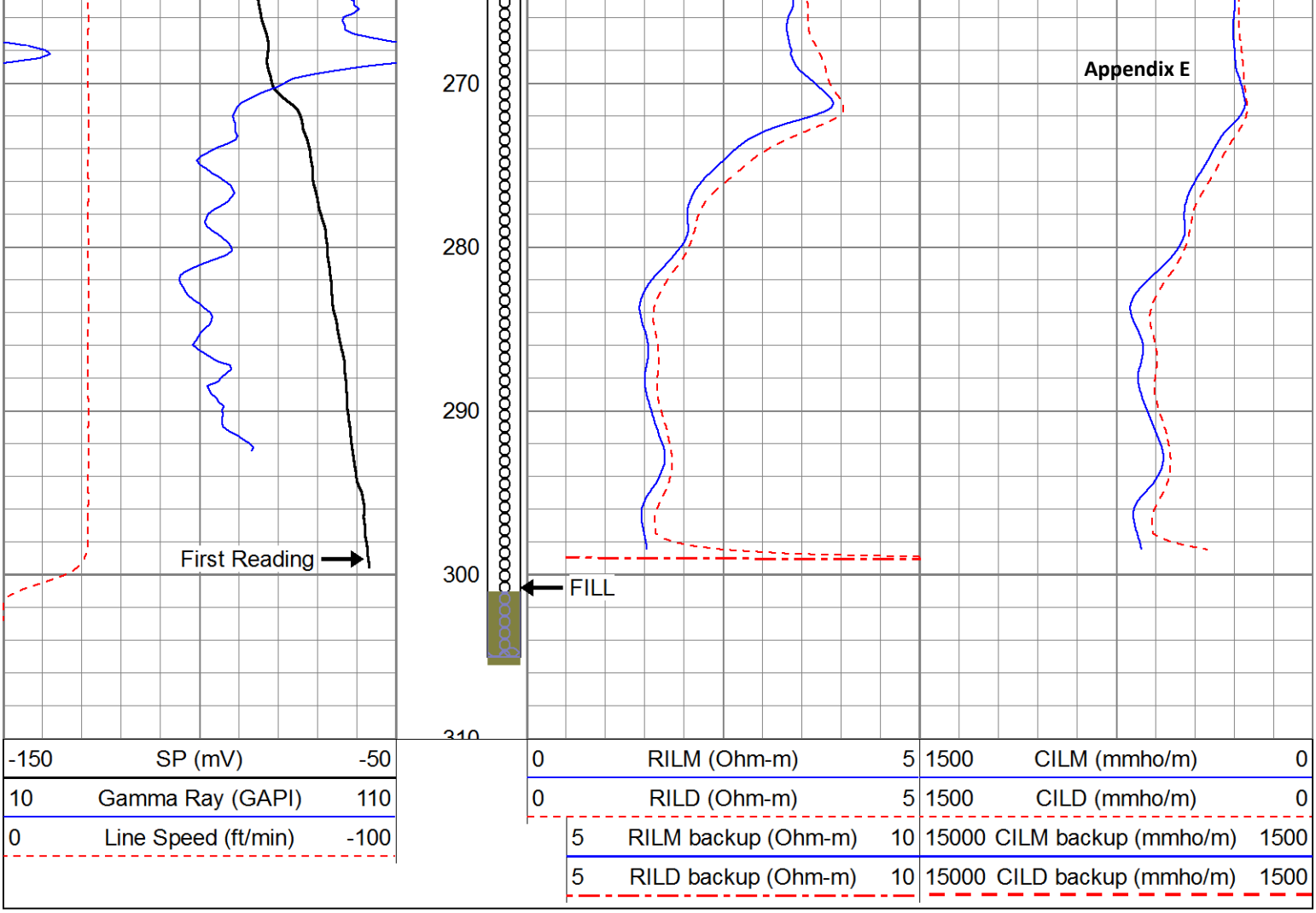
Database File	17805.db
Dataset Pathname	DIL
Presentation Format	dil_ps
Dataset Creation	Thu Nov 07 12:02:28 2013
Charted by	Depth in Feet scaled 1:120

-150	SP (mV)	-50		0	RILM (Ohm-m)	5	1500	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110		0	RILD (Ohm-m)	5	1500	CILD (mmho/m)	0
0	Line Speed (ft/min)	-100		5	RILM backup (Ohm-m)	10	15000	CILM backup (mmho/m)	1500
				5	RILD backup (Ohm-m)	10	15000	CILD backup (mmho/m)	1500




4" SCH 40 PVC Perforated Casing
50
60
70
80
90
100
110
120
130
140
150


Gamma Ray
160
170
180
190
200
210
220
230
240
250
260
RILD
RILM
CILD
CILM
RILD backup
RILM backup
SP


Appendix E
270
280
290
300
310
First Reading
FILL
-150 SP (mV) -50
10 Gamma Ray (GAPI) 110
0 Line Speed (ft/min) -100
0 RILM (Ohm-m) 5
0 RILD (Ohm-m) 5
5 RILM backup (Ohm-m) 10
5 RILD backup (Ohm-m) 10
1500 CILM (mmho/m) 0
1500 CILD (mmho/m) 0
15000 CILM backup (mmho/m) 1500
15000 CILD backup (mmho/m) 1500

PACIFIC SURVEYS

TEMPERATURE
DELTA TEMPERATURE
FLUID RESISTIVITY
DELTA FLUID RESISTIVITY

Job No. 17821

File No.

Company CASCADE DRILLING INC.

Well CX-B3

Field MARINA

County MONTEREY State CA

Location

OFF OF LAPIS RD.
GPS: N36o42.721' W121o47.985'

Other Services:

DUAL INDUCTION
GAMMA RAY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	11-12-2013		
Run Number	ONE		
Depth Driller	348.5'		
Depth Logger	346.5'		
Bottom Logged Interval	346'		
Top Log Interval	0'		
Open Hole Size	7" (0-30')	6.5" (30'-348.5')	
Type Fluid	WATER		
Density / Viscosity	N/A		
Fluid Level	26'		
Bentonite Seal	N/A		
Time Well Ready	10:00 AM		
Time Logger on Bottom	10:10 AM		
Equipment Number	PS-5		
Location	L.A.		
Recorded By	ABREAU		
Witnessed By	N. REYNOLDS		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	7"	0'	30'				
TWO	6.5"	30'	348.5'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	7.25"	N/A	0'	30'
Prot. String				
Production String	4" PVC	SCH 40	0'	348.5'
Liner				

<< Fold Here >>>

Comments

Calibration Report

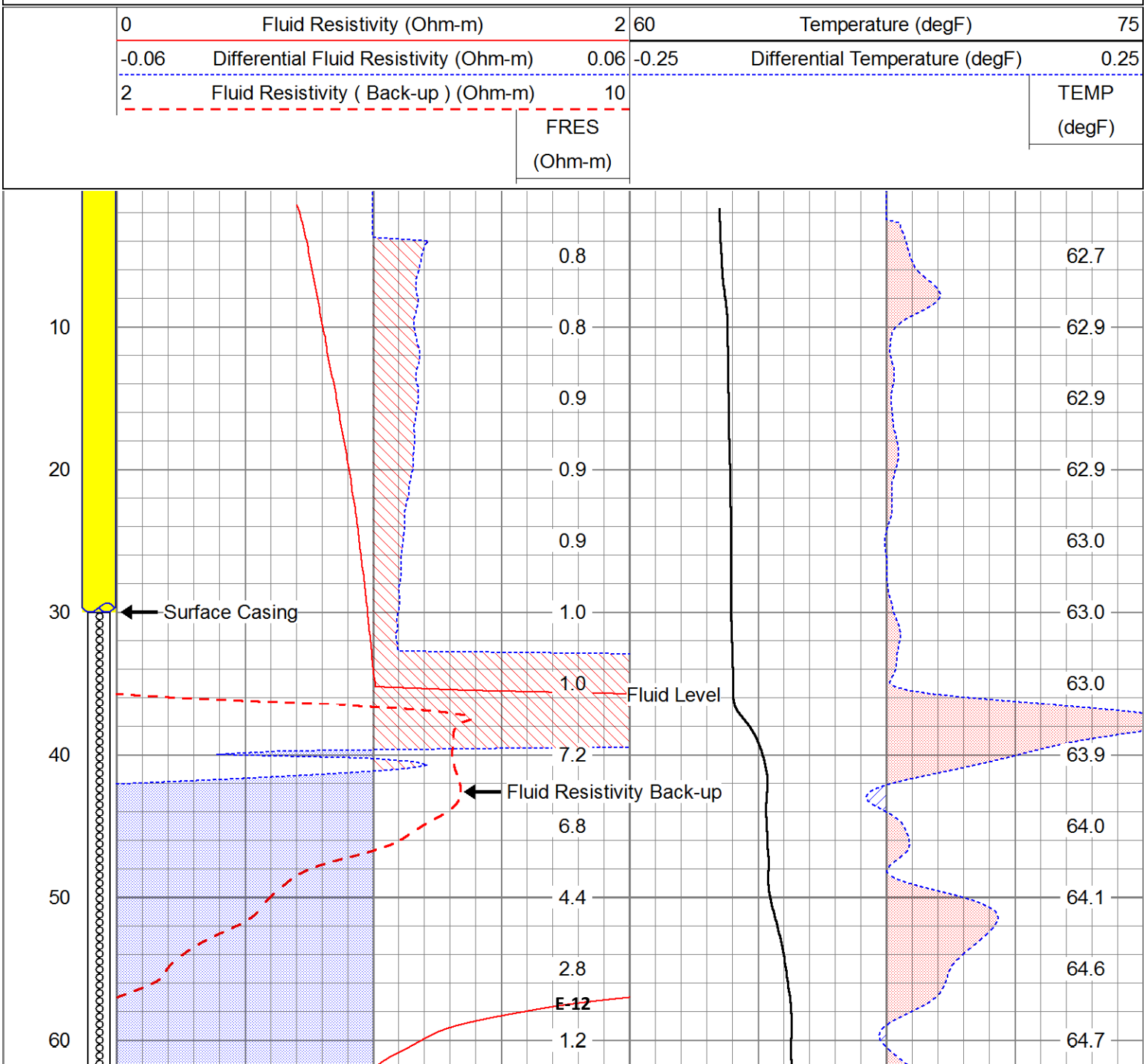
Database File 17821.db
Dataset Pathname tmp
Dataset Creation Tue Nov 12 10:04:04 2013

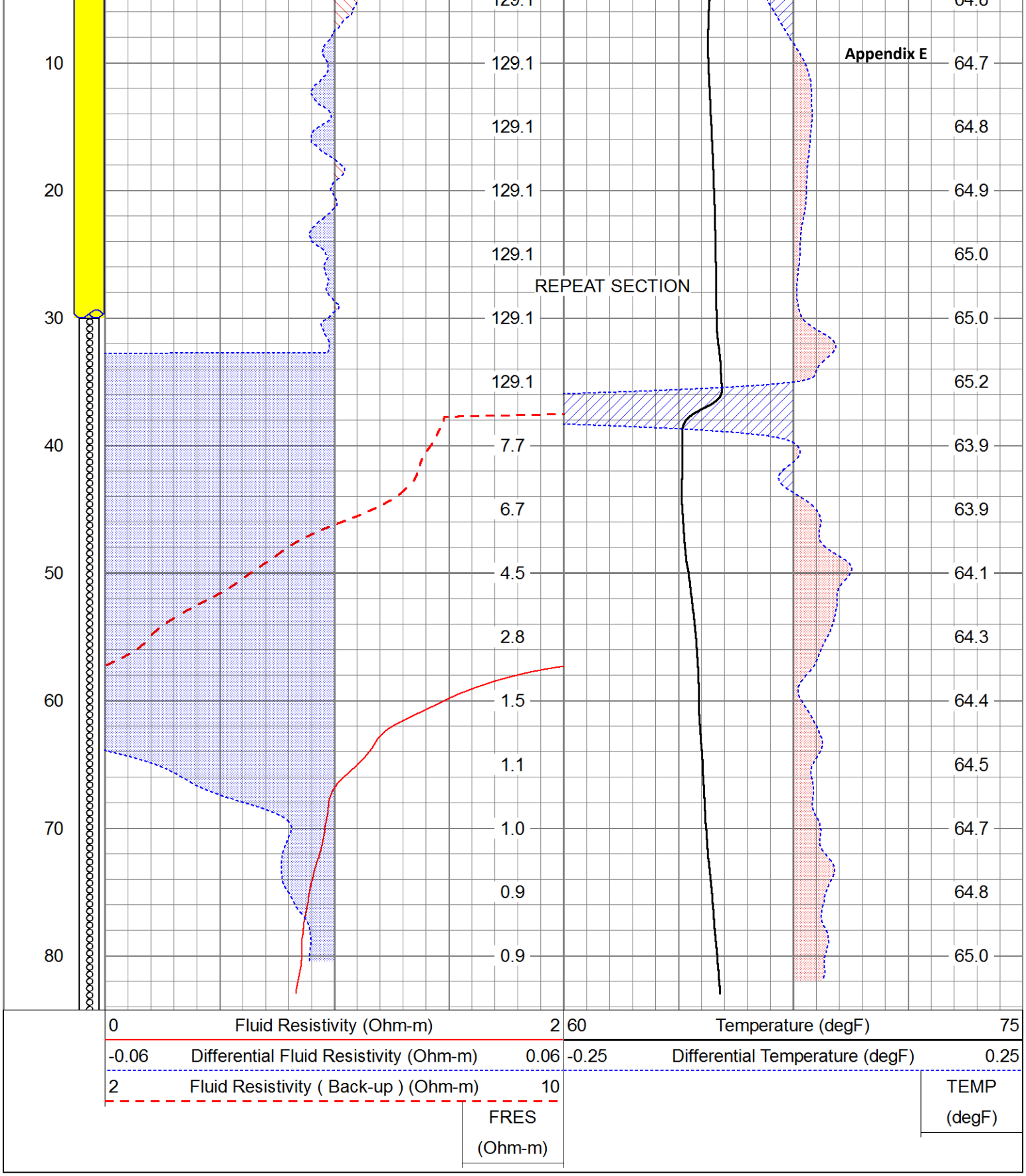
Temperature Calibration Report

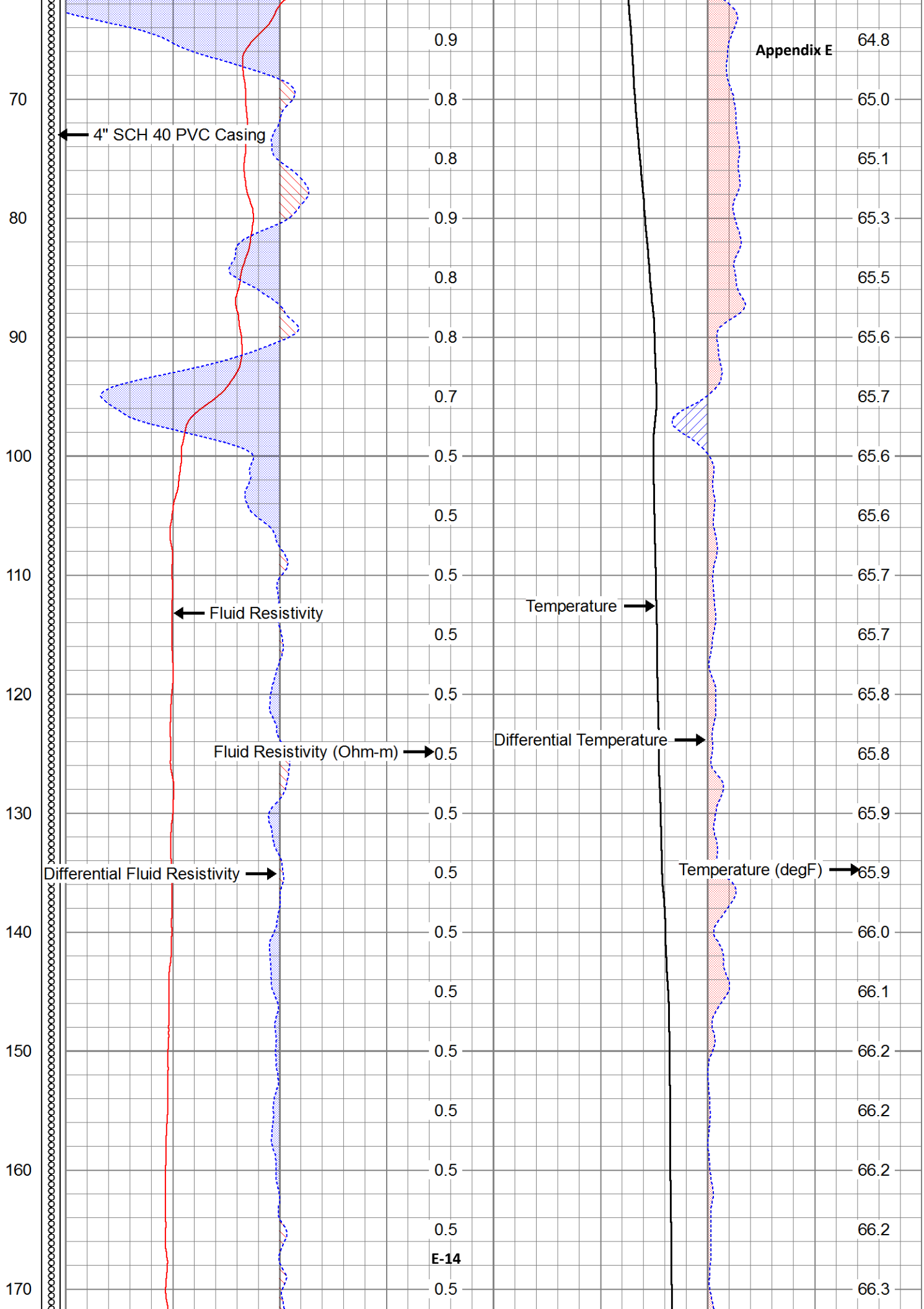
Appendix E

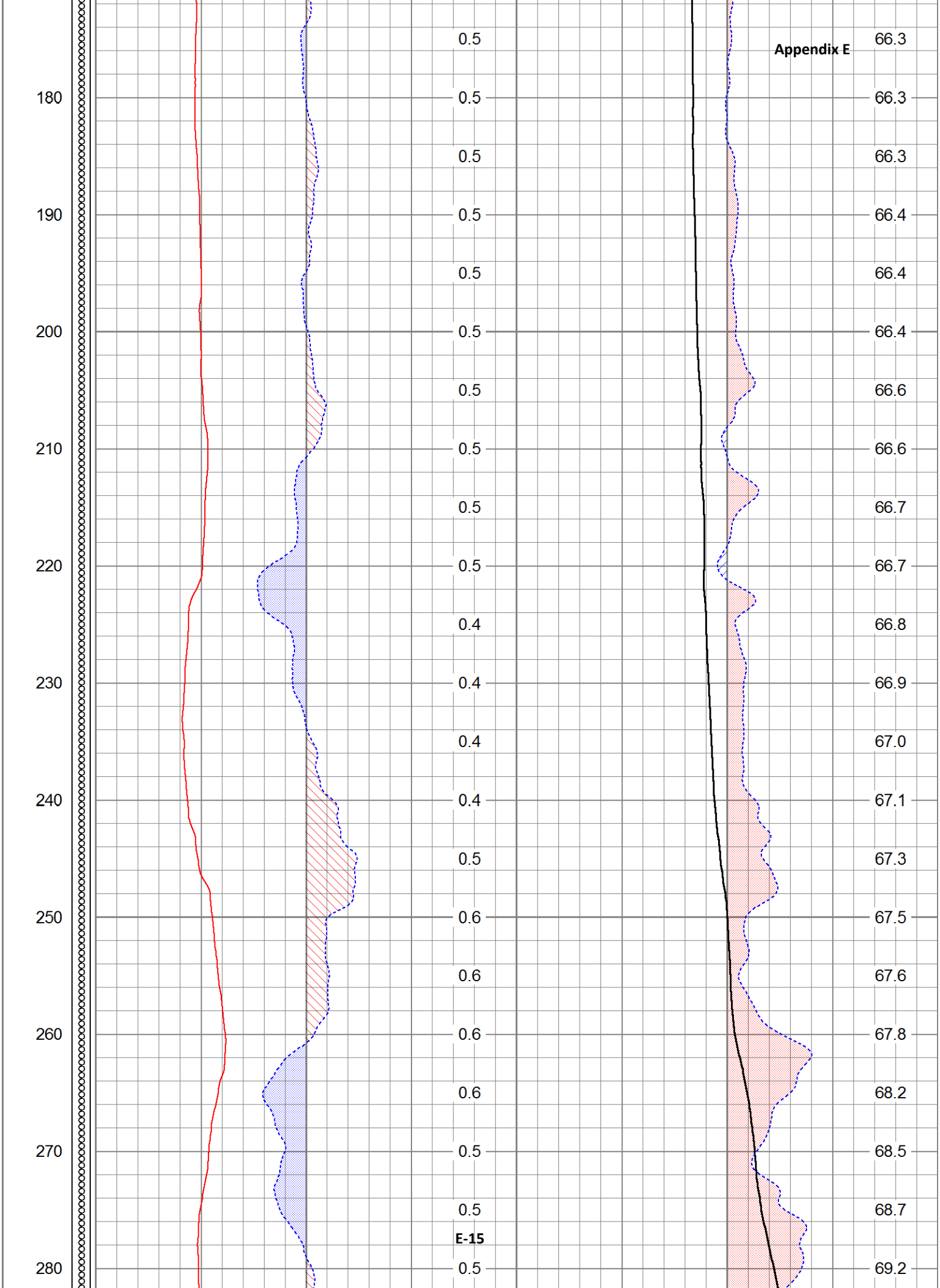
Serial Number:	5269A	
Tool Model:	MLS	
Performed:	Fri Nov 30 10:30:16 2012	
	Reference	Reading
Low Reference:	46.04 degF	1527.00cps
High Reference:	146.30 degF	4253.00cps
Gain:	0.04	
Offset:	-9.42	
Delta Spacing	2	

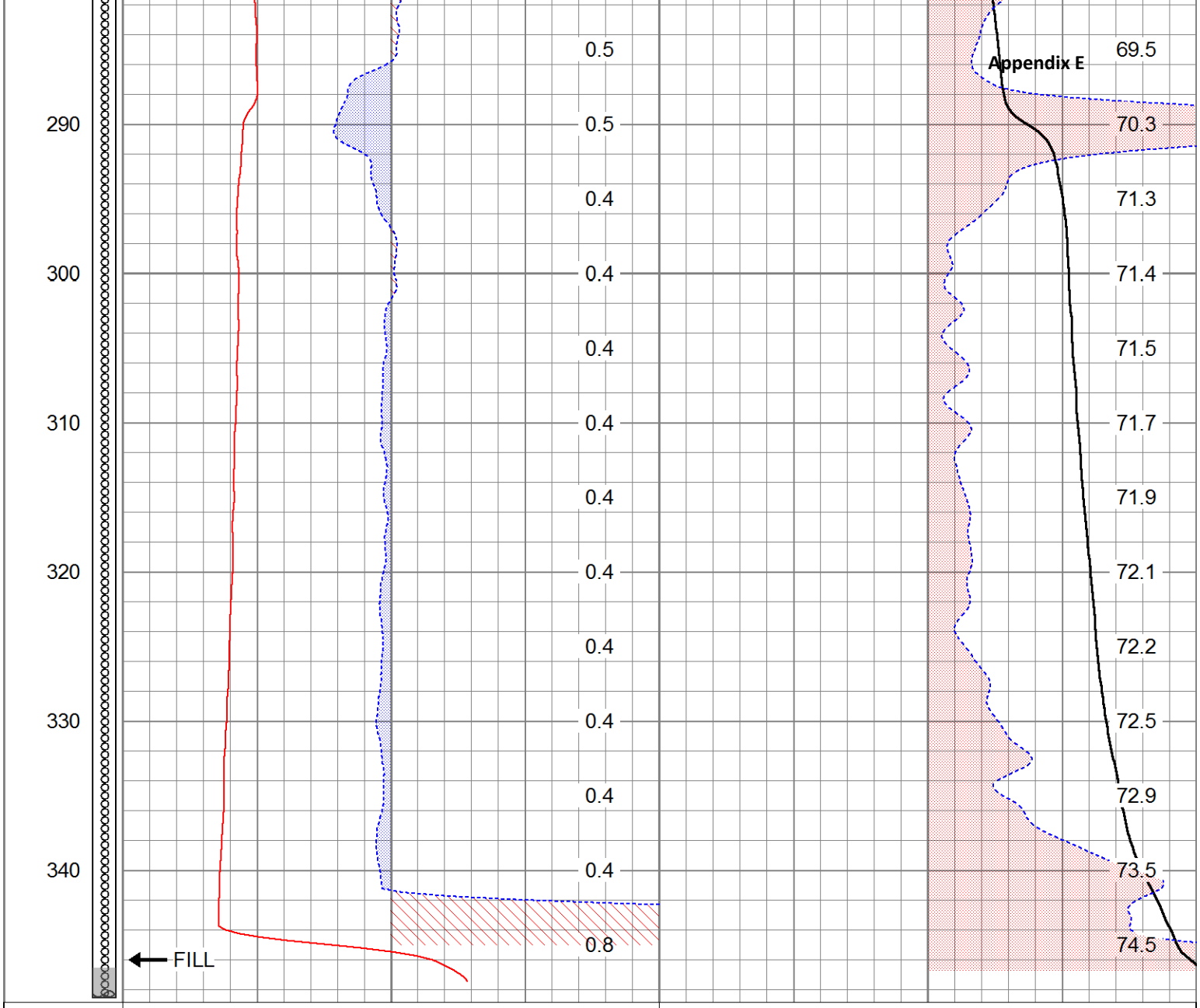
Database File	17821.db
Dataset Pathname	tmp
Presentation Format	frttemp2
Dataset Creation	Tue Nov 12 10:04:04 2013
Charted by	Depth in Feet scaled 1:120




10
20
30
40
50
60
70
80
129.1
129.1
129.1
129.1
REPEAT SECTION
129.1
129.1
7.7
6.7
4.5
2.8
1.5
1.1
1.0
0.9
0.9
64.7
64.8
64.9
65.0
65.0
65.2
63.9
63.9
64.1
64.3
64.4
64.5
64.7
64.8
65.0
0 Fluid Resistivity (Ohm-m) 2
-0.06 Differential Fluid Resistivity (Ohm-m) 0.06
2 Fluid Resistivity (Back-up) (Ohm-m) 10
FRES (Ohm-m)
60 Temperature (degF) 75
-0.25 Differential Temperature (degF) 0.25
TEMP (degF)


Appendix E
4" SCH 40 PVC Casing
Fluid Resistivity
Fluid Resistivity (Ohm-m)
Differential Fluid Resistivity
Temperature
Differential Temperature
Temperature (degF)
70
80
90
100
110
120
130
140
150
160
170
0.9
0.8
0.8
0.9
0.8
0.8
0.7
0.5
0.5
0.5
0.5
0.5
0.5
0.5
0.5
0.5
0.5
0.5
0.5
0.5
0.5
64.8
65.0
65.1
65.3
65.5
65.6
65.7
65.6
65.6
65.7
65.7
65.8
65.8
65.9
65.9
66.0
66.1
66.2
66.2
66.2
66.3

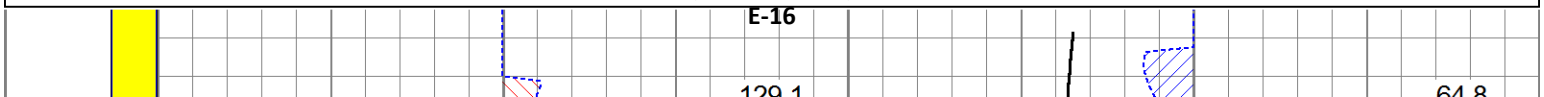

Appendix E
180
190
200
210
220
230
240
250
260
270
280
0.5
0.5
0.5
0.5
0.5
0.5
0.5
0.5
0.5
0.4
0.4
0.4
0.5
0.6
0.6
0.6
0.6
0.5
0.5
0.5
66.3
66.3
66.3
66.4
66.4
66.4
66.6
66.6
66.7
66.7
66.8
66.9
67.0
67.1
67.3
67.5
67.6
67.8
68.2
68.5
68.7
69.2



0	Fluid Resistivity (Ohm-m)	2	60	Temperature (degF)	75
-0.06	Differential Fluid Resistivity (Ohm-m)	0.06	-0.25	Differential Temperature (degF)	0.25
2	Fluid Resistivity (Back-up) (Ohm-m)	10			TEMP (degF)
		FRES (Ohm-m)			

Database File	17821.db
Dataset Pathname	tmp_rpt
Presentation Format	frttemp2
Dataset Creation	Tue Nov 12 10:27:23 2013
Charted by	Depth in Feet scaled 1:120

0	Fluid Resistivity (Ohm-m)	2	60	Temperature (degF)	75
-0.06	Differential Fluid Resistivity (Ohm-m)	0.06	-0.25	Differential Temperature (degF)	0.25
2	Fluid Resistivity (Back-up) (Ohm-m)	10			TEMP (degF)
		FRES (Ohm-m)			



PACIFIC SURVEYS

DUAL INDUCTION GAMMA RAY

Job No. 18145	Company CASCADE DRILLING INC.
	Well CX-B4
	Field MARINA
File No.	County MONTEREY State CA

Location

LAPIS RD
GPS: N36o 42.714' W121o 47.910'

Other Services:

TEMPERATURE
FLUID RESISTIVITY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	3-27-2014		
Run Number	ONE		
Depth Driller	348.5'		
Depth Logger	345'		
Bottom Logged Interval	345'		
Top Log Interval	0'		
Open Hole Size	8" (26-350')		
Type Fluid	WATER		
Density / Viscosity	N/A		
Fluid Level	35'		
Bentonite Seal	N/A		
Time Well Ready	13:00		
Time Logger on Bottom	13:30		
Equipment Number	PS-7		
Location	LA		
Recorded By	WATKINS		
Witnessed By	N. REYNOLDS		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	8"	26'	350'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	10"	N/A	0'	25'
Prot. String				
Production String	4" PVC	N/A	0'	348.5'
Liner				

<< Fold Here >>>

Comments

Calibration Report

Database File 18145.db
Dataset Pathname dil/dil.1
Dataset Creation Thu Mar 27 14:50:26 2014

Dual Induction Calibration Report

Serial-Model: 0001-ALT
Surface Cal Performed:

Appendix E

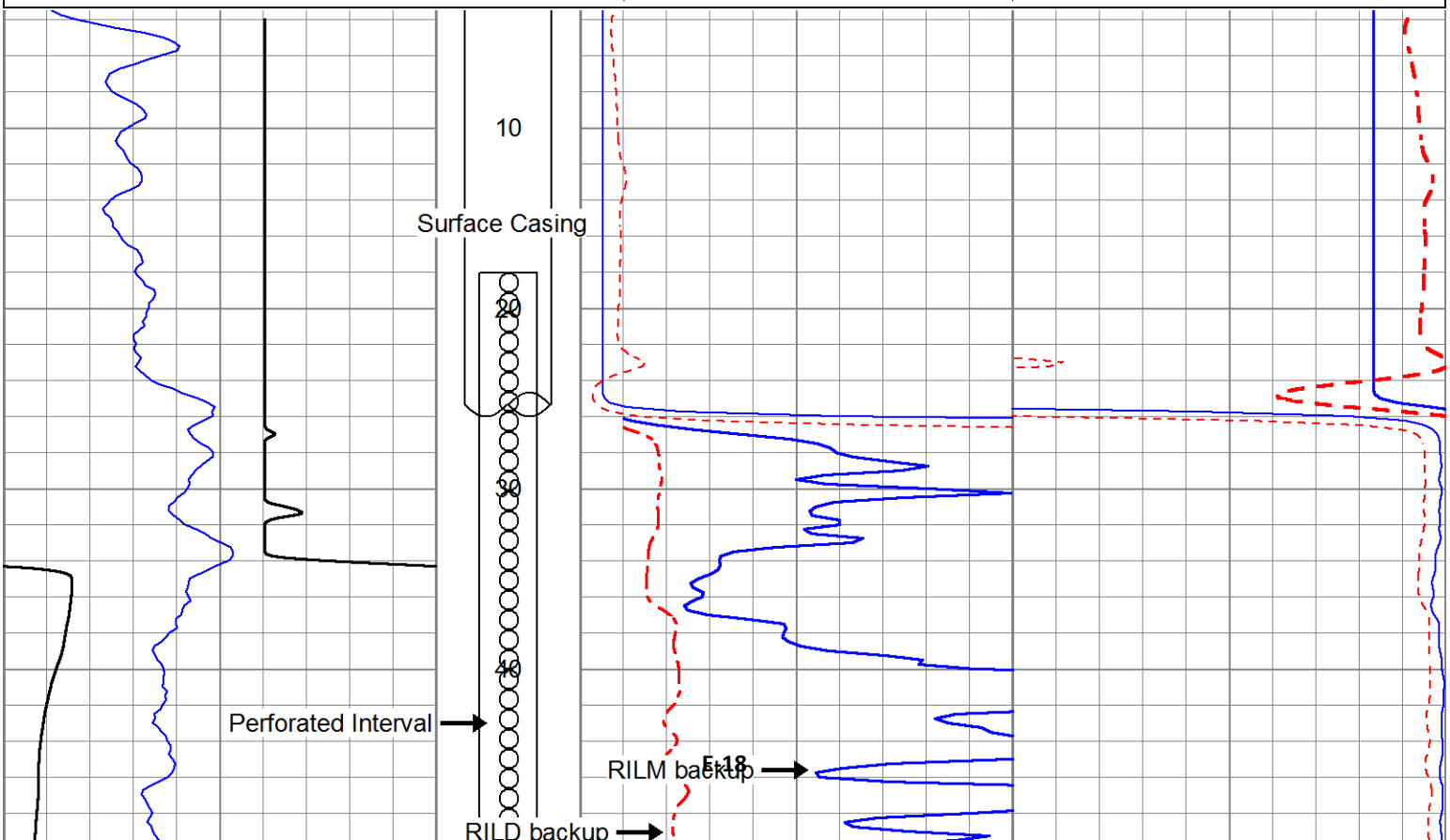
Loop:	Readings Air	Readings Loop		References Air	References Loop		Results m	Results b
Deep	1411.390	3440.570	cps	0.000	612.000	mmho/m	0.302	-425.677
Medium	2379.120	14715.100	cps	0.000	1960.000	mmho/m	0.159	-378.004

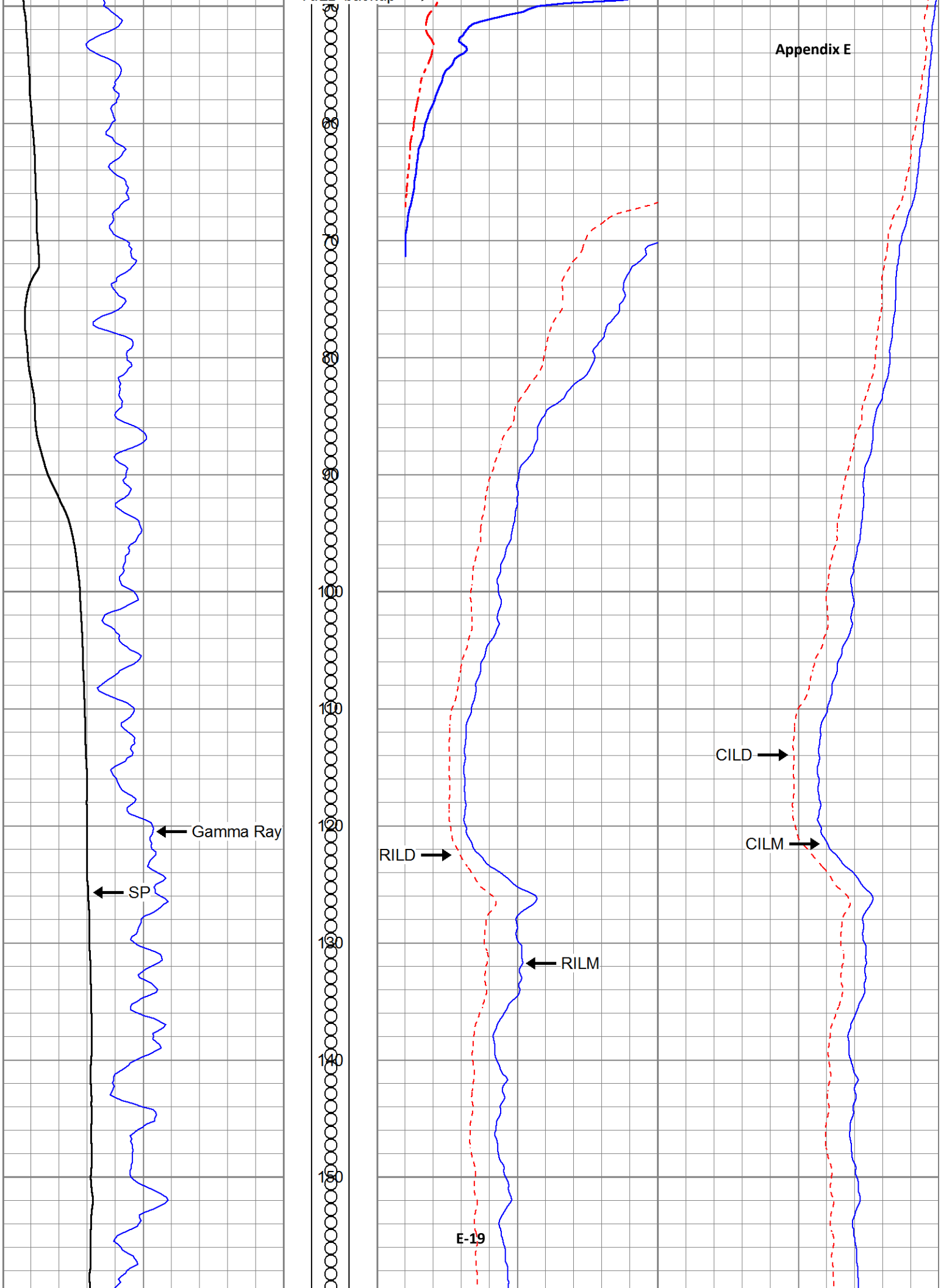
Gamma Ray Calibration Report

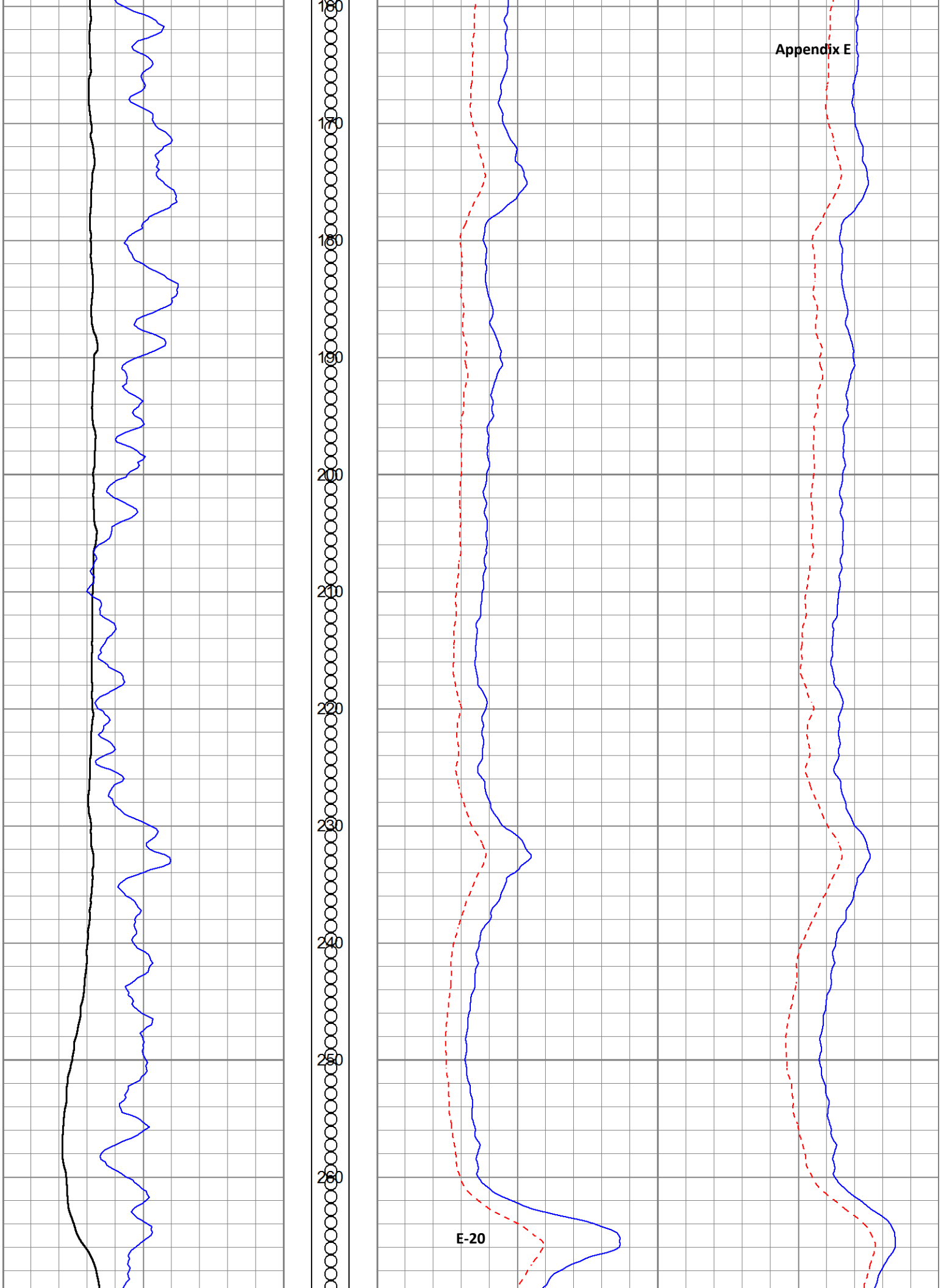
Serial Number:	PS_1	
Tool Model:	01	
Performed:	Wed Sep 19 16:56:13 2012	
Calibrator Value:	162.0	GAPI
Background Reading:	46.1	cps
Calibrator Reading:	180.8	cps
Sensitivity:	1.2020	GAPI/cps

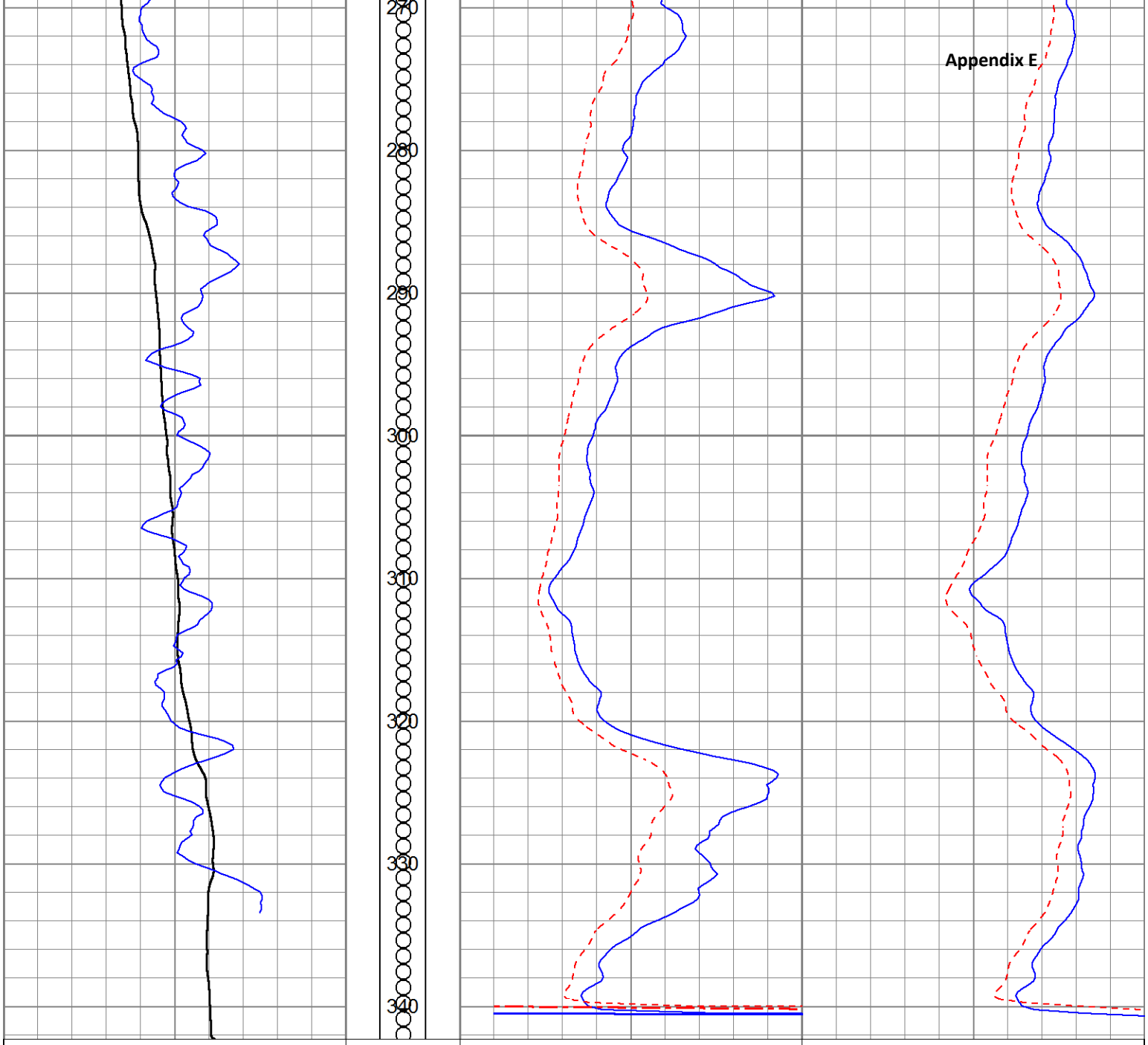
Database File	18145.db
Dataset Pathname	dil/dil.1
Presentation Format	dil_ps
Dataset Creation	Thu Mar 27 14:50:26 2014
Charted by	Depth in Feet scaled 1:120

-125	SP (mV)	75		0	RILM (Ohm-m)	5	1500	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110		0	RILD (Ohm-m)	5	1500	CILD (mmho/m)	0
				5	RILM backup (Ohm-m)	105	15000	CILM backup (mmho/m)	1500
				5	RILD backup (Ohm-m)	105	15000	CILD backup (mmho/m)	1500




60
70
80
90
100
110
120
130
140
150
Gamma Ray
SP
RILD
RILM
CILD
CILM


180
170
160
190
200
210
220
230
240
250
260



-125	SP (mV)	75		0	RILM (Ohm-m)	5		1500	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110		0	RILD (Ohm-m)	5		1500	CILD (mmho/m)	0
				5	RILM backup (Ohm-m)	105		15000	CILM backup (mmho/m)	1500
				5	RILD backup (Ohm-m)	105		15000	CILD backup (mmho/m)	1500

PACIFIC SURVEYS

DUAL INDUCTION GAMMA RAY

Job No. 18298

File No.

Company CASCADE DRILLING INC.

Well MDW-1

Field CASTROVILLE

County MONTEREY State CA

Location

MONTEREY DUNES WAY
GPS: N36o 46.540' W121o 47.694'

Other Services:

TEMPERATURE
FLUID RESISTIVITY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	4-28-2014		
Run Number	ONE		
Depth Driller	292'		
Depth Logger	291'		
Bottom Logged Interval	291'		
Top Log Interval	0'		
Open Hole Size	9" (17-47')	8" (47-300')	
Type Fluid	WATER		
Density / Viscosity	N/A		
Fluid Level	~17'		
Bentonite Seal	N/A		
Time Well Ready	11:00		
Time Logger on Bottom	11:20		
Equipment Number	PS-3		
Location	LA		
Recorded By	WATKINS		
Witnessed By	N. REYNOLDS		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	9"	17'	47'				
ONE	8"	47'	300'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	10"	N/A	0'	17'
Prot. String				
Production String	4"	N/A	0'	292'
Liner				

<<< Fold Here >>>

Comments

4" CASING INSTALLED TO 294'. FILL MATERIAL TAGGED AT 292'. CASING HAD 0.010" SLOTS.

Calibration Report

Database File 18298.db
Dataset Pathname DIL
Dataset Creation Mon Apr 28 12:14:40 2014

Dual Induction Calibration Report

Serial-Model:	0001-ALT	
Surface Cal Performed:	Wed Aug 31 18:21:15 2011	**Appendix E**

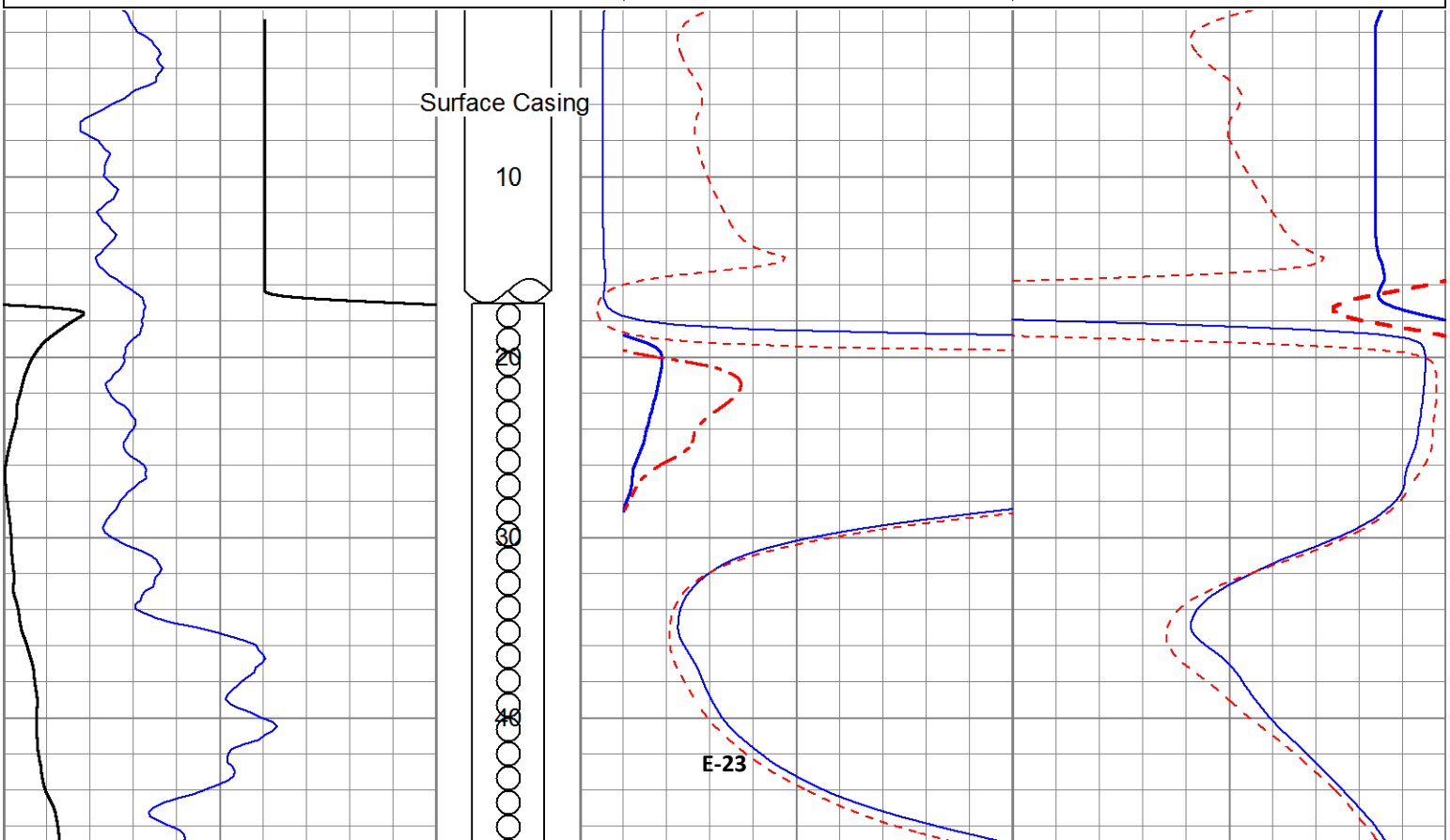
	Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	1407.490	3493.640	cps	0.000	612.000	mmho/m	0.293	-412.905
Medium	1908.120	14487.900	cps	0.000	1960.000	mmho/m	0.156	-297.296

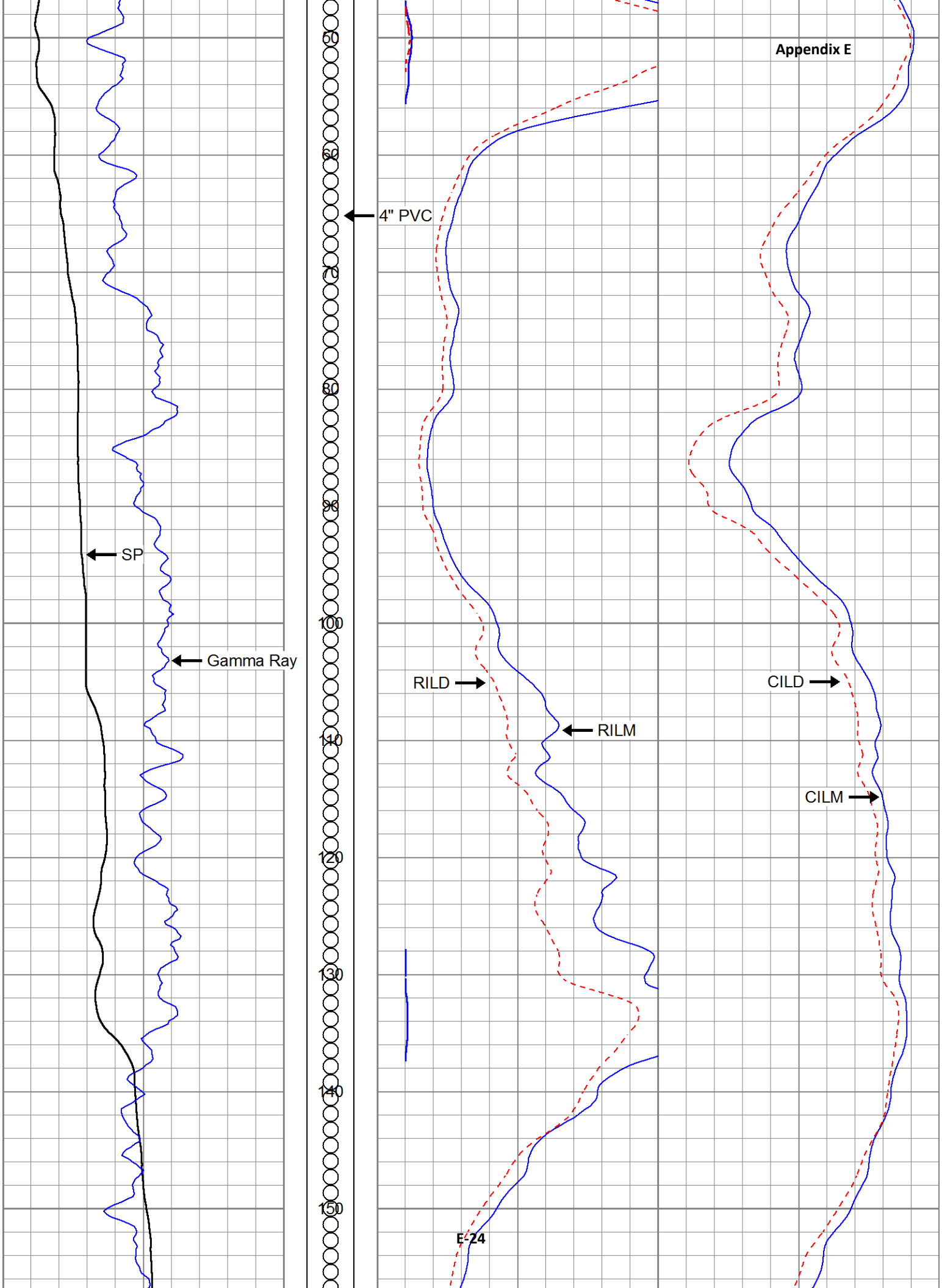
Gamma Ray Calibration Report

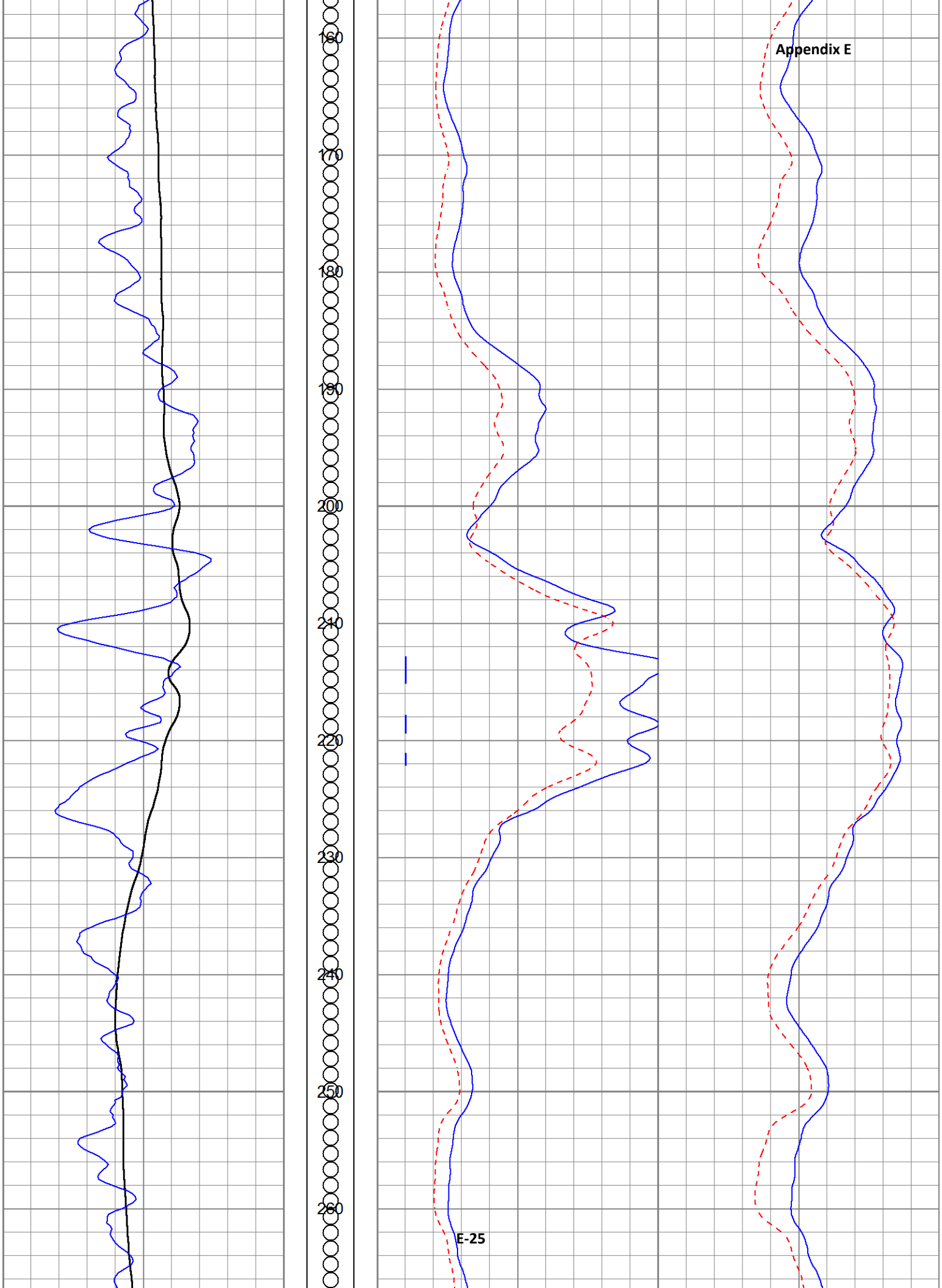
Serial Number:	PS_1	
Tool Model:	01	
Performed:	Wed Aug 31 18:22:13 2011	
Calibrator Value:	162.0	GAPI
Background Reading:	46.1	cps
Calibrator Reading:	180.8	cps
Sensitivity:	1.2020	GAPI/cps

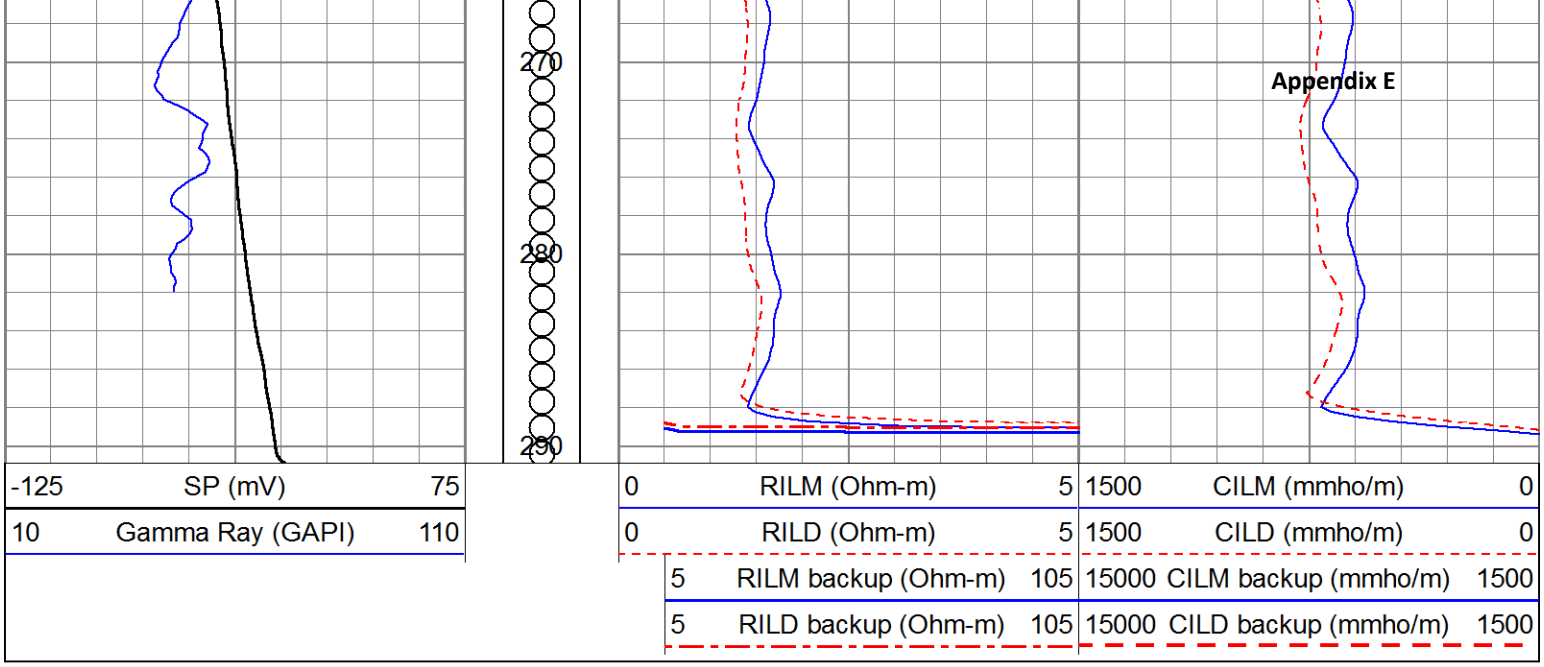
Database File	18298.db
Dataset Pathname	DIL
Presentation Format	dil_ps
Dataset Creation	Mon Apr 28 12:14:40 2014
Charted by	Depth in Feet scaled 1:120

-125	SP (mV)	75		0	RILM (Ohm-m)	5	1500	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110		0	RILD (Ohm-m)	5	1500	CILD (mmho/m)	0
				5	RILM backup (Ohm-m)	105	15000	CILM backup (mmho/m)	1500
				5	RILD backup (Ohm-m)	105	15000	CILD backup (mmho/m)	1500




50
60
70
80
90
100
110
120
130
140
150
4" PVC
SP
Gamma Ray
RILD
RILM
CILD
CILM


160
170
180
190
200
210
220
230
240
250
260


270
280
290
Appendix E
-125 SP (mV) 75
10 Gamma Ray (GAPI) 110
0 RILM (Ohm-m) 5
0 RILD (Ohm-m) 5
5 RILM backup (Ohm-m) 105
5 RILD backup (Ohm-m) 105
1500 CILM (mmho/m) 0
1500 CILD (mmho/m) 0
15000 CILM backup (mmho/m) 1500
15000 CILD backup (mmho/m) 1500

PACIFIC SURVEYS

DUAL INDUCTION GAMMA-RAY

Job No. 17719

File No.

Company CASCADE DRILLING, INC.

Well ML-1

Field MOSS LANDING

County MONTEREY State CA

Location

NEAR SANDHOLDT RD
GPS: N36o 47.967' W121o 47.343'

Other Services:

TEMPERATURE
FLUID RESISTIVITY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	10-4-2013		
Run Number	ONE		
Depth Driller	200'		
Depth Logger	200'		
Bottom Logged Interval	200'		
Top Log Interval	0'		
Open Hole Size	8"		
Type Fluid	N/A		
Density / Viscosity	N/A		
Fluid Level	N/A		
Bentonite Seal	N/A		
Time Well Ready	15:30		
Time Logger on Bottom	15:45		
Equipment Number	PS-3		
Location	LA		
Recorded By	WATKINS		
Witnessed By	N. REYNOLDS		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	8"	0'	200'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	9"	N/A	0'	10'
Prot. String	4"	N/A	0'	200'
Production String				
Liner				

<<< Fold Here >>>

Comments

0.010" SLOT FROM 10-200' BGS

Calibration Report

Database File 17719.db
Dataset Pathname dil
Dataset Creation Fri Oct 04 15:51:34 2013

Dual Induction Calibration Report

Serial-Model:	0001-ALT	
Surface Cal Performed:	Wed Aug 31 18:21:15 2011	**Appendix E**

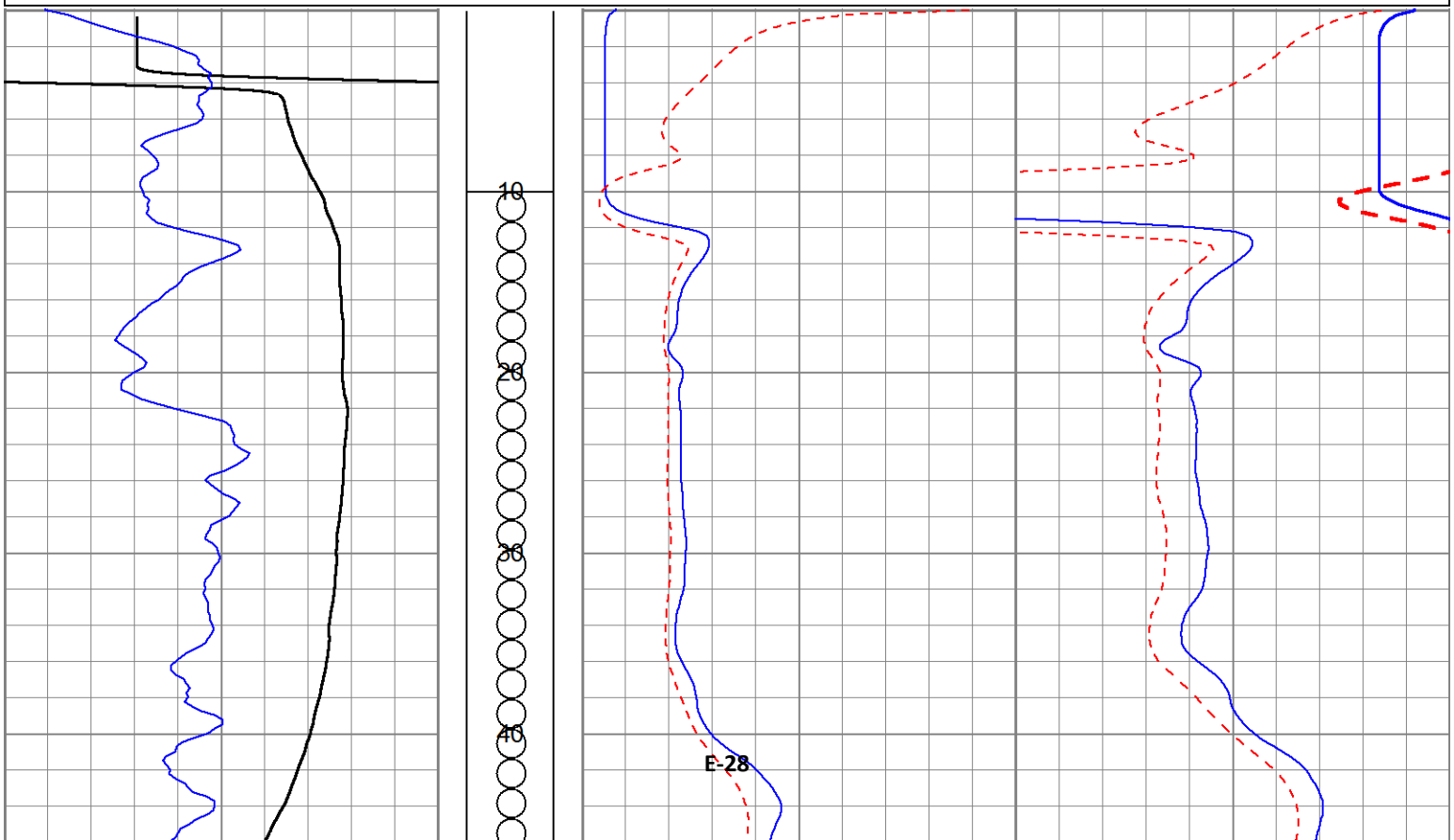
	Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	1407.490	3493.640	cps	0.000	612.000	mmho/m	0.293	-412.905
Medium	1908.120	14487.900	cps	0.000	1960.000	mmho/m	0.156	-297.296

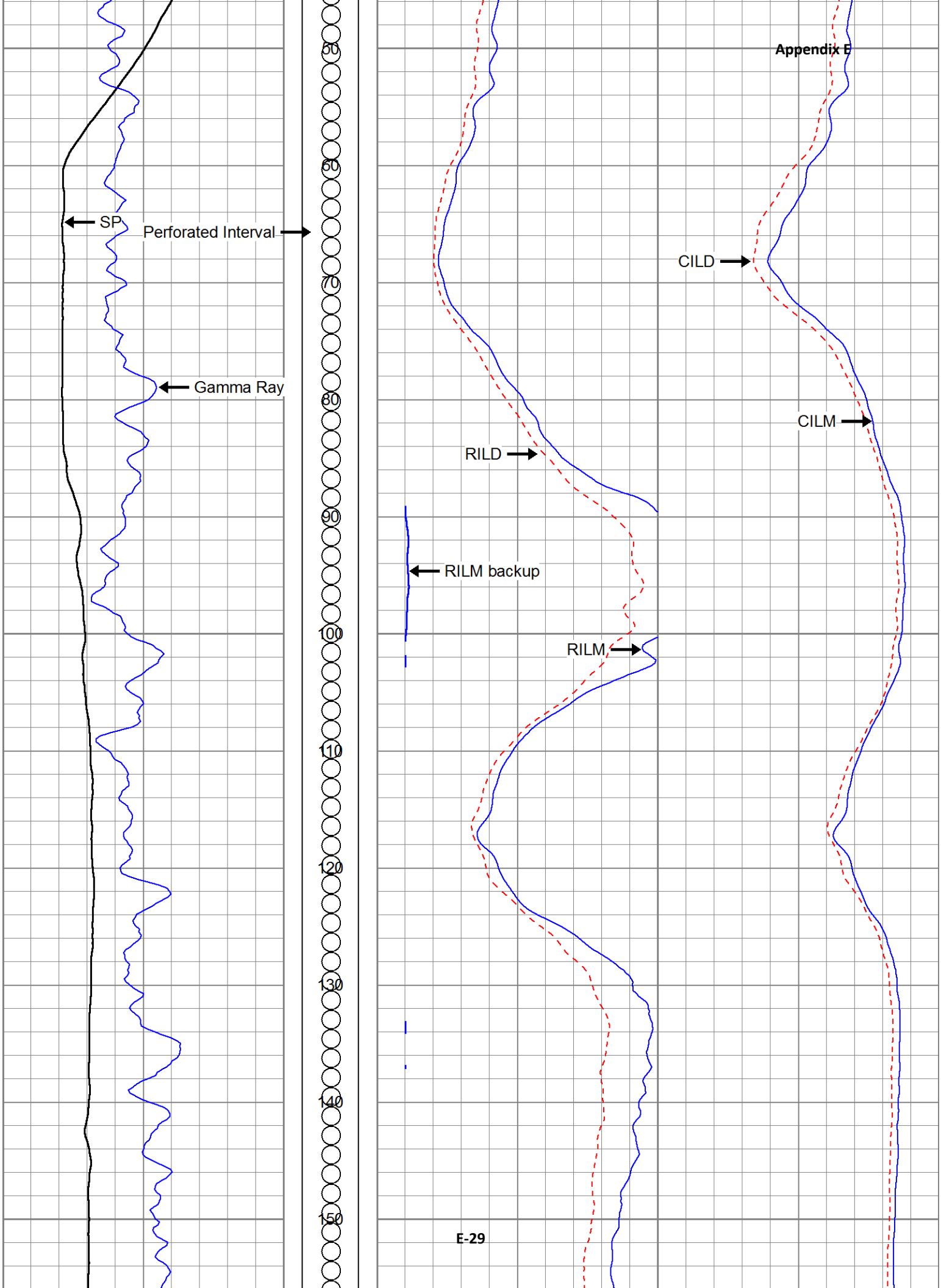
Gamma Ray Calibration Report

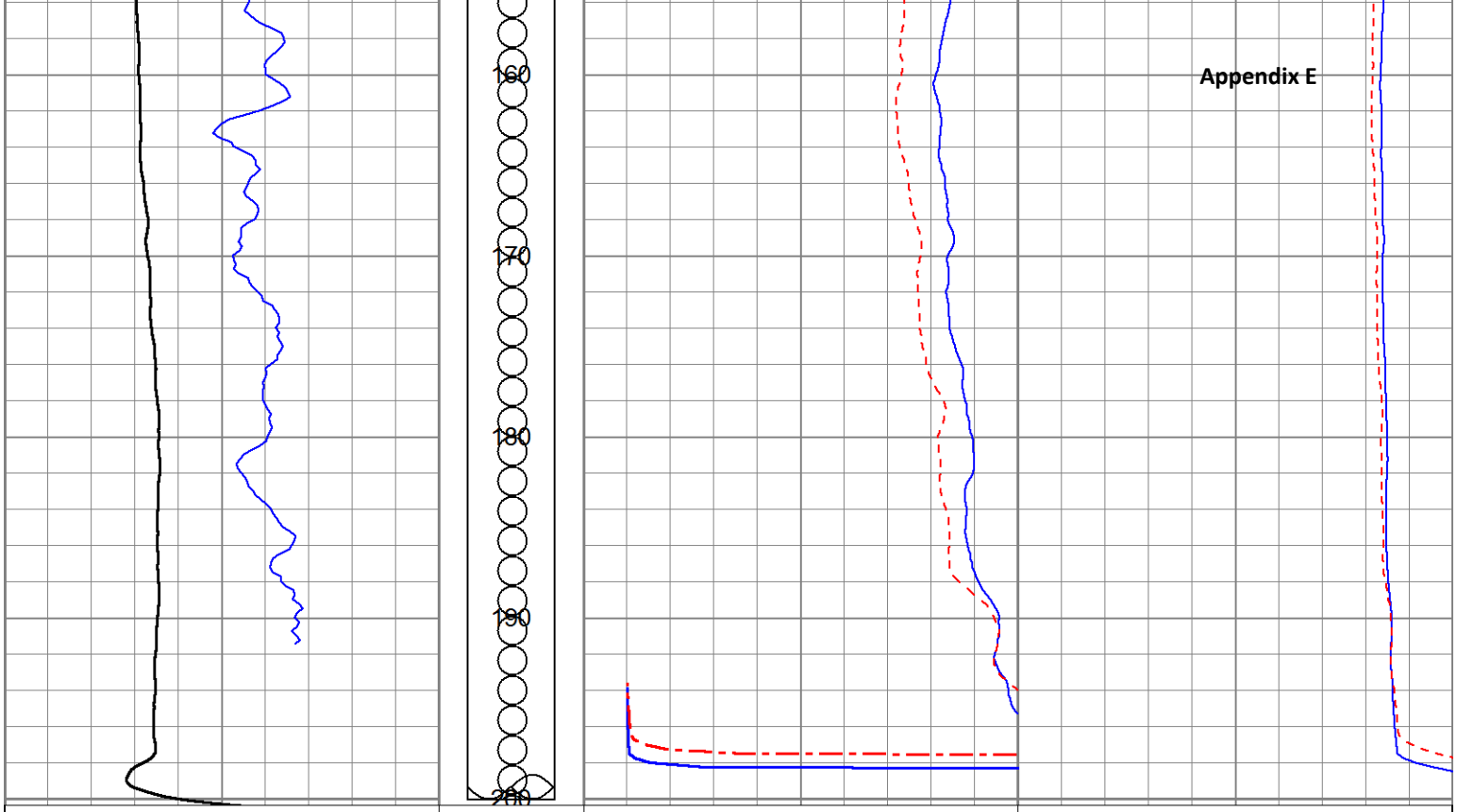
Serial Number:	PS_1	
Tool Model:	01	
Performed:	Wed Aug 31 18:22:13 2011	
Calibrator Value:	162.0	GAPI
Background Reading:	46.1	cps
Calibrator Reading:	180.8	cps
Sensitivity:	1.2020	GAPI/cps

Database File	17719.db
Dataset Pathname	dil
Presentation Format	dil_ps
Dataset Creation	Fri Oct 04 15:51:34 2013
Charted by	Depth in Feet scaled 1:120

-100	SP (mV)	50		0	RILM (Ohm-m)	5	1500	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110		0	RILD (Ohm-m)	5	1500	CILD (mmho/m)	0
				5	RILM backup (Ohm-m)	50	15000	CILM backup (mmho/m)	1500
				5	RILD backup (Ohm-m)	50	15000	CILD backup (mmho/m)	1500




SP
Perforated Interval
Gamma Ray
50
60
70
80
90
100
110
120
130
140
150
CILD
CILM
RILD
RILM backup
RILM



-100	SP (mV)	50	0	RILM (Ohm-m)	5	1500	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110	0	RILD (Ohm-m)	5	1500	CILD (mmho/m)	0
			5	RILM backup (Ohm-m)	50	15000	CILM backup (mmho/m)	1500
			5	RILD backup (Ohm-m)	50	15000	CILD backup (mmho/m)	1500

PACIFIC SURVEYS

DUAL INDUCTION GAMMA-RAY

Job No. 17870

File No.

Company CASCADE DRILLING

Well ML-2

Field MOSS LANDING

County MONTEREY State CA

Location

7549 SANDHOLDT RD.
GPS: N36o 48.205' W121o 47.218'

Other Services:

TEMPERATURE
FLUID RESISTIVITY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	12-11-2013		
Run Number	ONE		
Depth Driller	197'		
Depth Logger	194.5'		
Bottom Logged Interval	194.5'		
Top Log Interval	0'		
Open Hole Size	8"		
Type Fluid	WATER		
Density / Viscosity	N/A		
Fluid Level	3.45'		
Bentonite Seal	N/A		
Time Well Ready	0945		
Time Logger on Bottom	1000		
Equipment Number	PS-7		
Location	LA		
Recorded By	SCHUMACHER		
Witnessed By	N. REYNOLDS		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	8"	0'	200'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	8"	N/A	0'	23.5'
Prot. String				
Production String	4" PVC	SCH 40	0'	198'
Liner				

<< Fold Here >>>

Comments

NOTE: 0.010" SLOT FROM 18.5' TO 198'.

Calibration Report

Database File 17870.db
Dataset Pathname DUAL
Dataset Creation Wed Dec 11 11:54:33 2013

Dual Induction Calibration Report

Serial-Model: 0001-ALT
Surface Cal Performed:

Appendix E

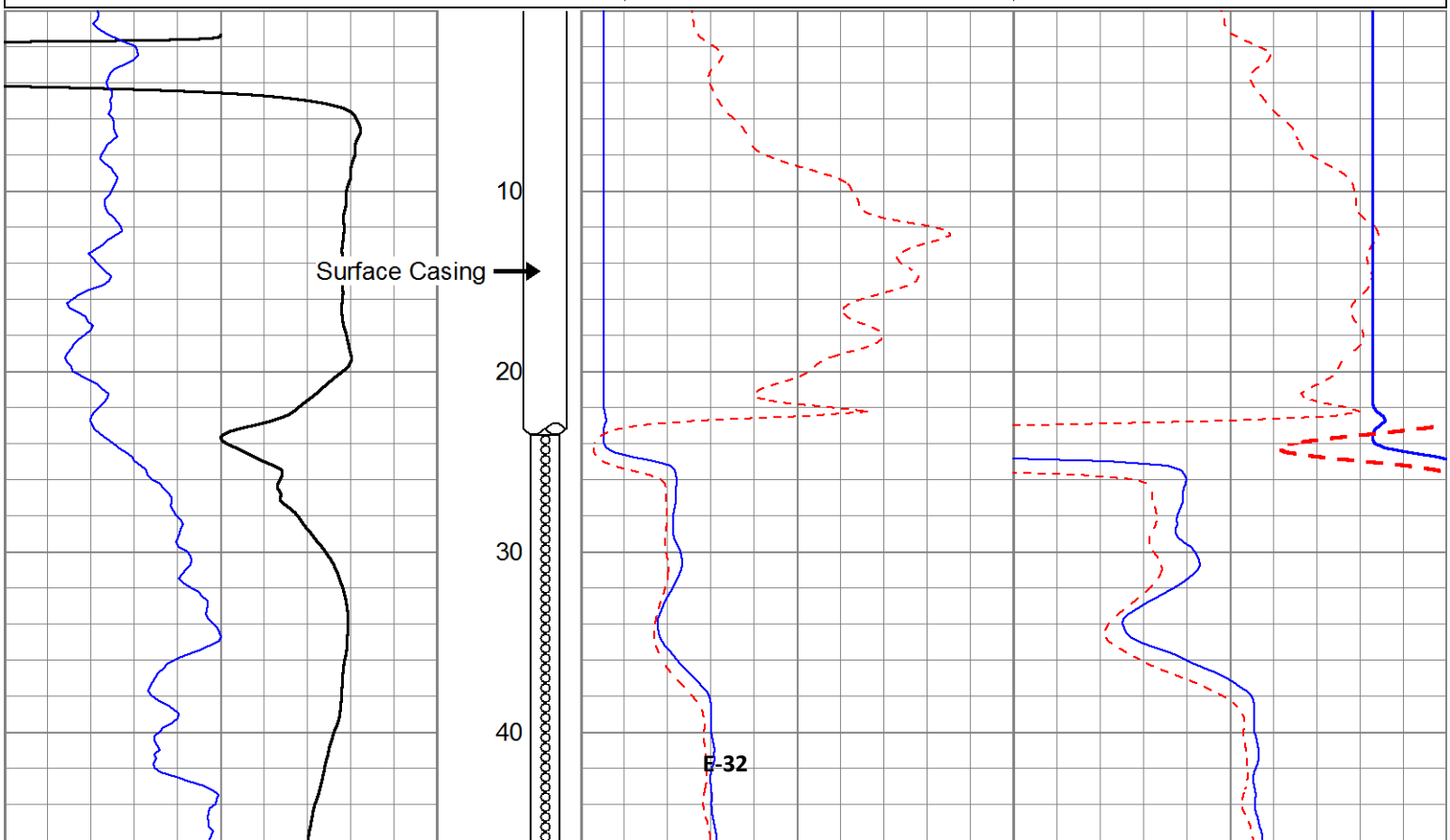
Loop:	Readings Air	Readings Loop		References Air	References Loop		Results m	Results b
Deep	1411.390	3440.570	cps	0.000	612.000	mmho/m	0.302	-425.677
Medium	2379.120	14715.100	cps	0.000	1960.000	mmho/m	0.159	-378.004

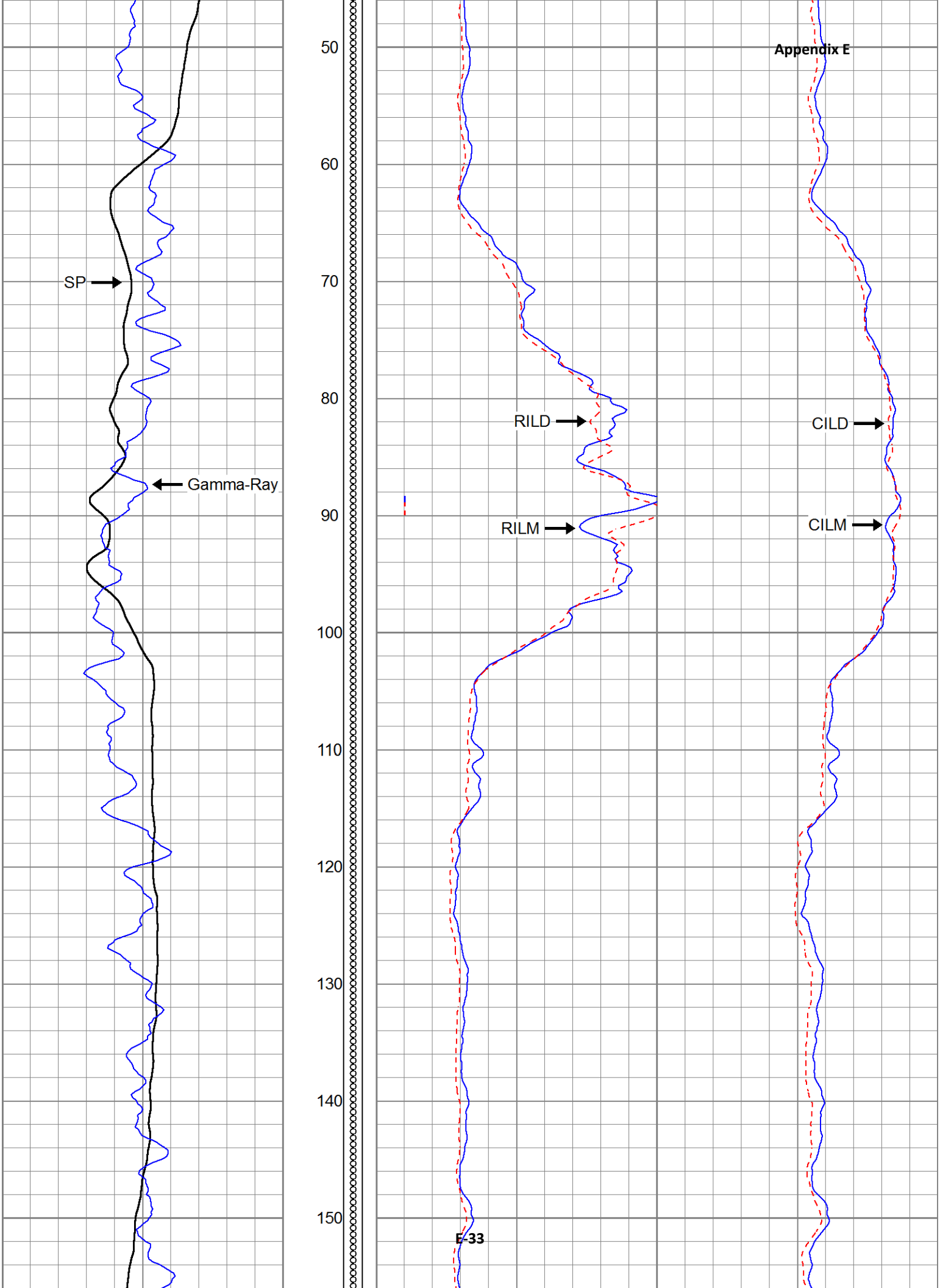
Gamma Ray Calibration Report

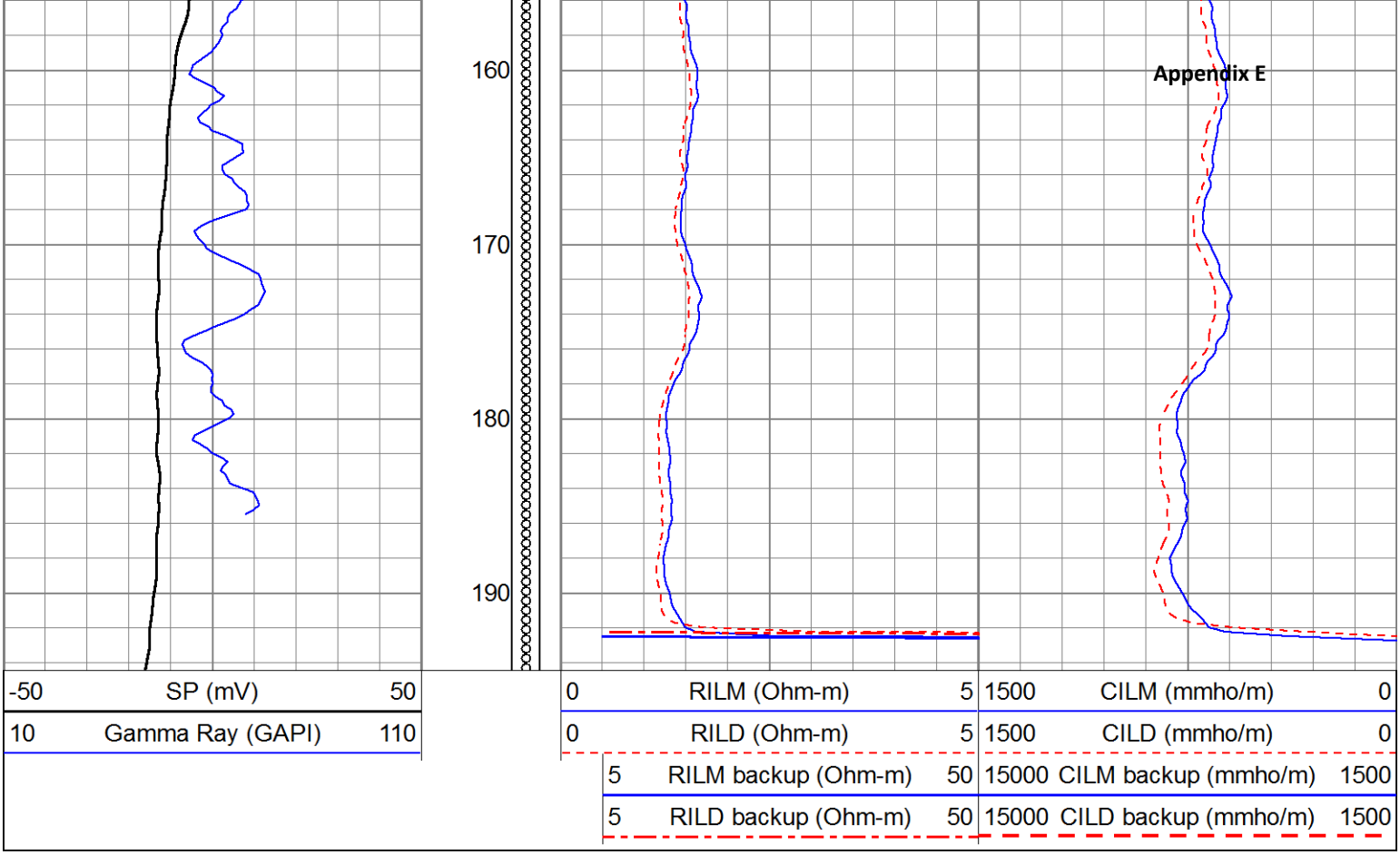
Serial Number:	PS_1	
Tool Model:	01	
Performed:	Wed Sep 19 16:56:13 2012	
Calibrator Value:	162.0	GAPI
Background Reading:	46.1	cps
Calibrator Reading:	180.8	cps
Sensitivity:	1.2020	GAPI/cps

Database File	17870.db
Dataset Pathname	DUAL
Presentation Format	dil_ps
Dataset Creation	Wed Dec 11 11:54:33 2013
Charted by	Depth in Feet scaled 1:120

-50	SP (mV)	50		0	RILM (Ohm-m)	5	1500	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110		0	RILD (Ohm-m)	5	1500	CILD (mmho/m)	0
				5	RILM backup (Ohm-m)	50	15000	CILM backup (mmho/m)	1500
				5	RILD backup (Ohm-m)	50	15000	CILD backup (mmho/m)	1500




Appendix E
SP
Gamma-Ray
RILD
RILM
CILD
CILM
50
60
70
80
90
100
110
120
130
140
150


Appendix E
160
170
180
190
-50 SP (mV) 50
10 Gamma Ray (GAPI) 110
0 RILM (Ohm-m) 5
0 RILD (Ohm-m) 5
5 RILM backup (Ohm-m) 50
5 RILD backup (Ohm-m) 50
1500 CILM (mmho/m) 0
1500 CILD (mmho/m) 0
15000 CILM backup (mmho/m) 1500
15000 CILD backup (mmho/m) 1500

PACIFIC SURVEYS

DUAL INDUCTION GAMMA RAY

Job No. 17939

File No.

Company CASCADE DRILLING

Well ML-3

Field MOSS LANDING

County MONTEREY State CA

Location

Intersection of Moss Landing Rd & Cabrillo Hwy
GPS:N36o48.013' W121o47.021'

Other Services:

TEMPERATURE
FLUID RESISTIVITY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	01-09-2014		
Run Number	ONE		
Depth Driller	198'		
Depth Logger	197.5'		
Bottom Logged Interval	197.5'		
Top Log Interval	0'		
Open Hole Size	8"		
Type Fluid	WATER		
Density / Viscosity	N/A		
Fluid Level	10'		
Bentonite Seal	N/A		
Time Well Ready	9:30 AM		
Time Logger on Bottom	10:00 AM		
Equipment Number	PS-7		
Location	LA		
Recorded By	ABREAU		
Witnessed By	N. REYNOLDS		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	8"	0'	200'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	8"	N/A	0'	14'
Prot. String				
Production String	4" PVC	SCH 40	0'	200'
Liner				

<< Fold Here >>>

Comments

NOTE: 0.010" SLOT FOR LENGTH OF PVC

Calibration Report

Database File 17939.db
Dataset Pathname dil2
Dataset Creation Thu Jan 09 11:22:56 2014

Dual Induction Calibration Report

Serial-Model: 0001-ALT
Surface Cal Performed:

Appendix E

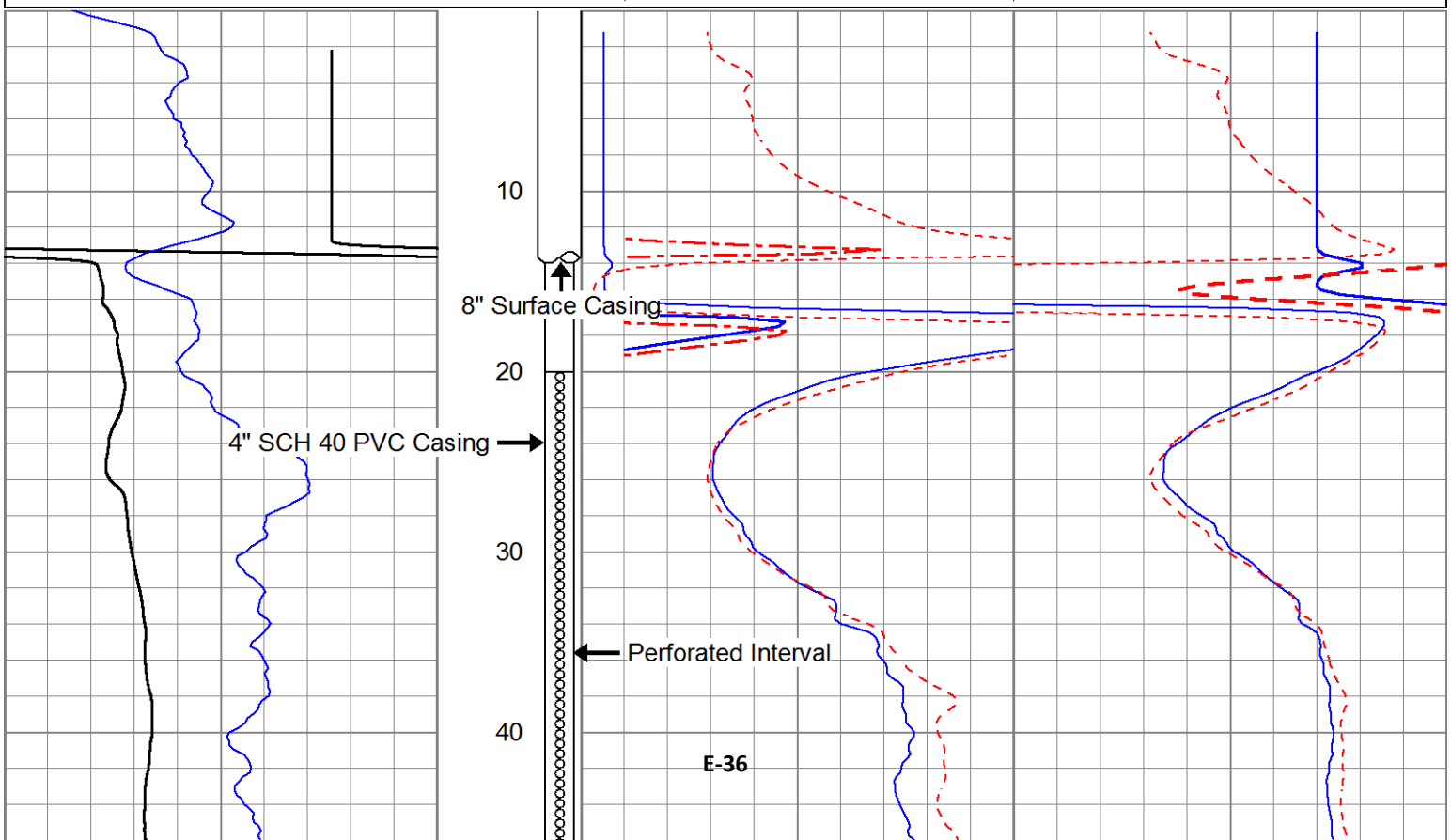
Loop:	Readings Air	Readings Loop		References Air	References Loop		Results m	Results b
Deep	1407.490	3493.640	cps	0.000	612.000	mmho/m	0.293	-412.906
Medium	1908.120	14487.900	cps	0.000	1960.000	mmho/m	0.156	-297.296

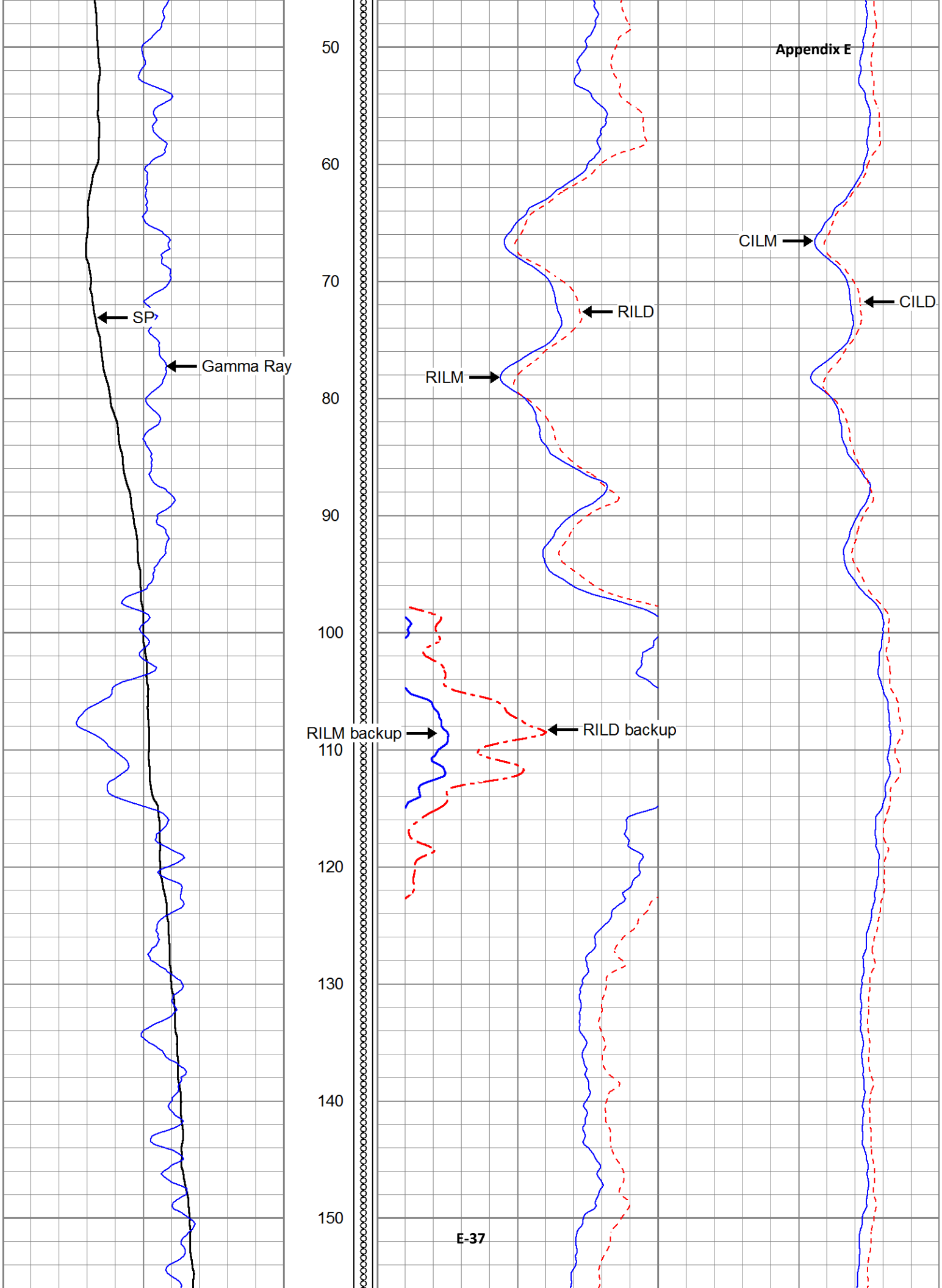
Gamma Ray Calibration Report

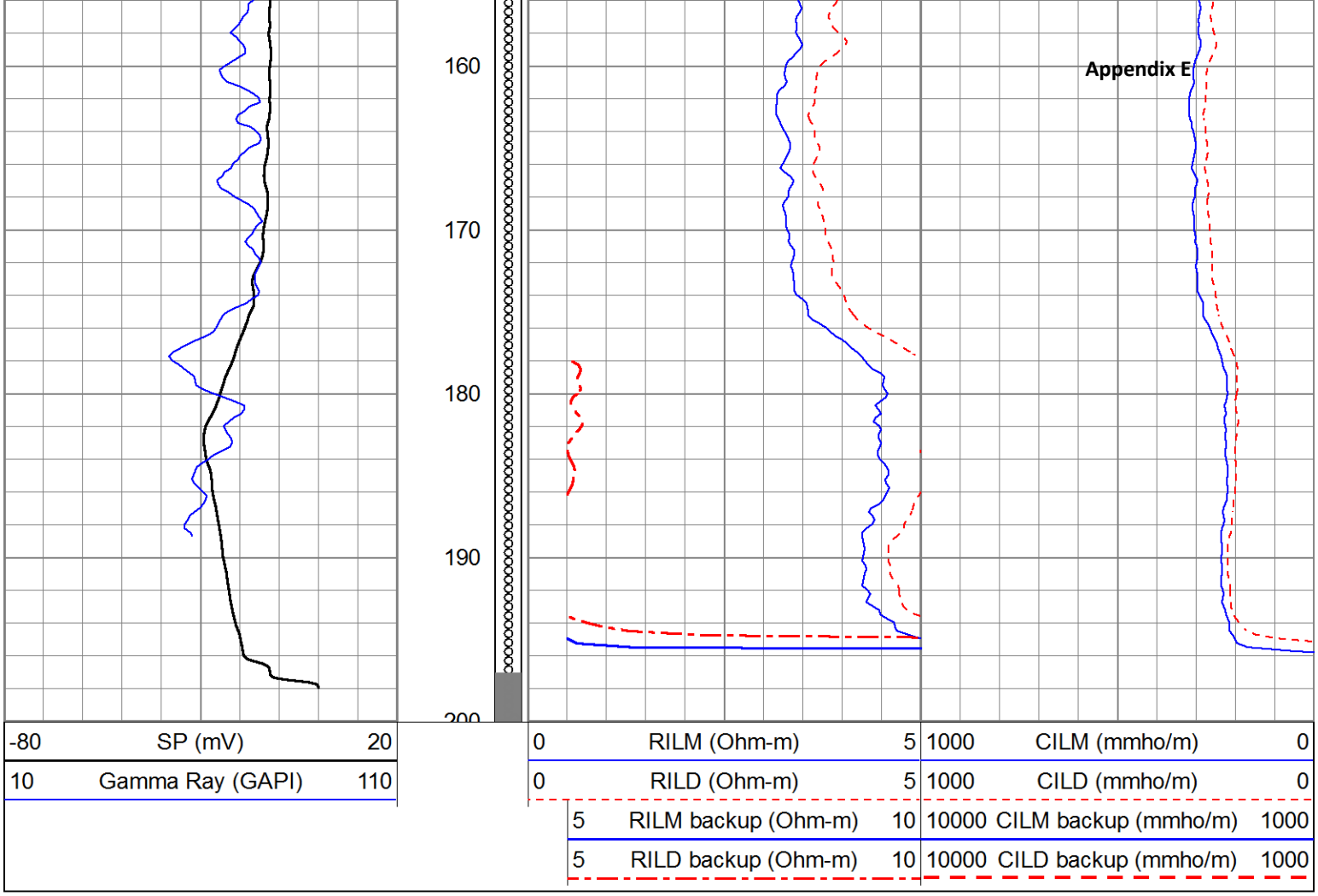
Serial Number:	PS_1	
Tool Model:	01	
Performed:	Wed Sep 19 16:56:13 2012	
Calibrator Value:	162.0	GAPI
Background Reading:	46.1	cps
Calibrator Reading:	180.8	cps
Sensitivity:	1.2020	GAPI/cps

Database File	17939.db
Dataset Pathname	dil2
Presentation Format	dil_ps
Dataset Creation	Thu Jan 09 11:22:56 2014
Charted by	Depth in Feet scaled 1:120

-80	SP (mV)	20		0	RILM (Ohm-m)	5	1000	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110		0	RILD (Ohm-m)	5	1000	CILD (mmho/m)	0
				5	RILM backup (Ohm-m)	10	10000	CILM backup (mmho/m)	1000
				5	RILD backup (Ohm-m)	10	10000	CILD backup (mmho/m)	1000




50
60
70
80
90
100
110
120
130
140
150
SP
Gamma Ray
RILD
RILM
RILM backup
RILD backup
CILM
CILD


160
170
180
190
200
-80 SP (mV) 20
10 Gamma Ray (GAPI) 110
0 RILM (Ohm-m) 5
0 RILD (Ohm-m) 5
5 RILM backup (Ohm-m) 10
5 RILD backup (Ohm-m) 10
1000 CILM (mmho/m) 0
1000 CILD (mmho/m) 0
10000 CILM backup (mmho/m) 1000
10000 CILD backup (mmho/m) 1000

PACIFIC SURVEYS

DUAL INDUCTION GAMMA-RAY

Job No. 17859

File No.

Company CASCADE DRILLING

Well ML-4

Field MOSS LANDING

County MONTEREY State CA

Location

SOUTH OF INTERSECTION OF CABRILLO HWY & DOLAN RD
GPS: N36o 48.156' W121o 47.030'

Other Services:

TEMPERATURE
FLUID RESISTIVITY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	12-3-2013		
Run Number	ONE		
Depth Driller	195.5'		
Depth Logger	195.5'		
Bottom Logged Interval	195.5'		
Top Log Interval	0'		
Open Hole Size	8"		
Type Fluid	WATER		
Density / Viscosity	N/A		
Fluid Level	28'		
Bentonite Seal	N/A		
Time Well Ready	13:00		
Time Logger on Bottom	13:15		
Equipment Number	PS-7		
Location	LA		
Recorded By	WATKINS		
Witnessed By	N. REYNOLDS		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	8"	0'	201'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	8"	N/A	0'	14.5'
Prot. String				
Production String	4" PVC	SCH 40	0'	195.5'
Liner				

<< Fold Here >>>

Comments

NOTE: 0.010" SLOT FOR LENGTH OF PVC

Calibration Report

Database File 17859.db
Dataset Pathname dil
Dataset Creation Tue Dec 03 14:01:05 2013

Dual Induction Calibration Report

Serial-Model: 0001-ALT
Surface Cal Performed:

Appendix E

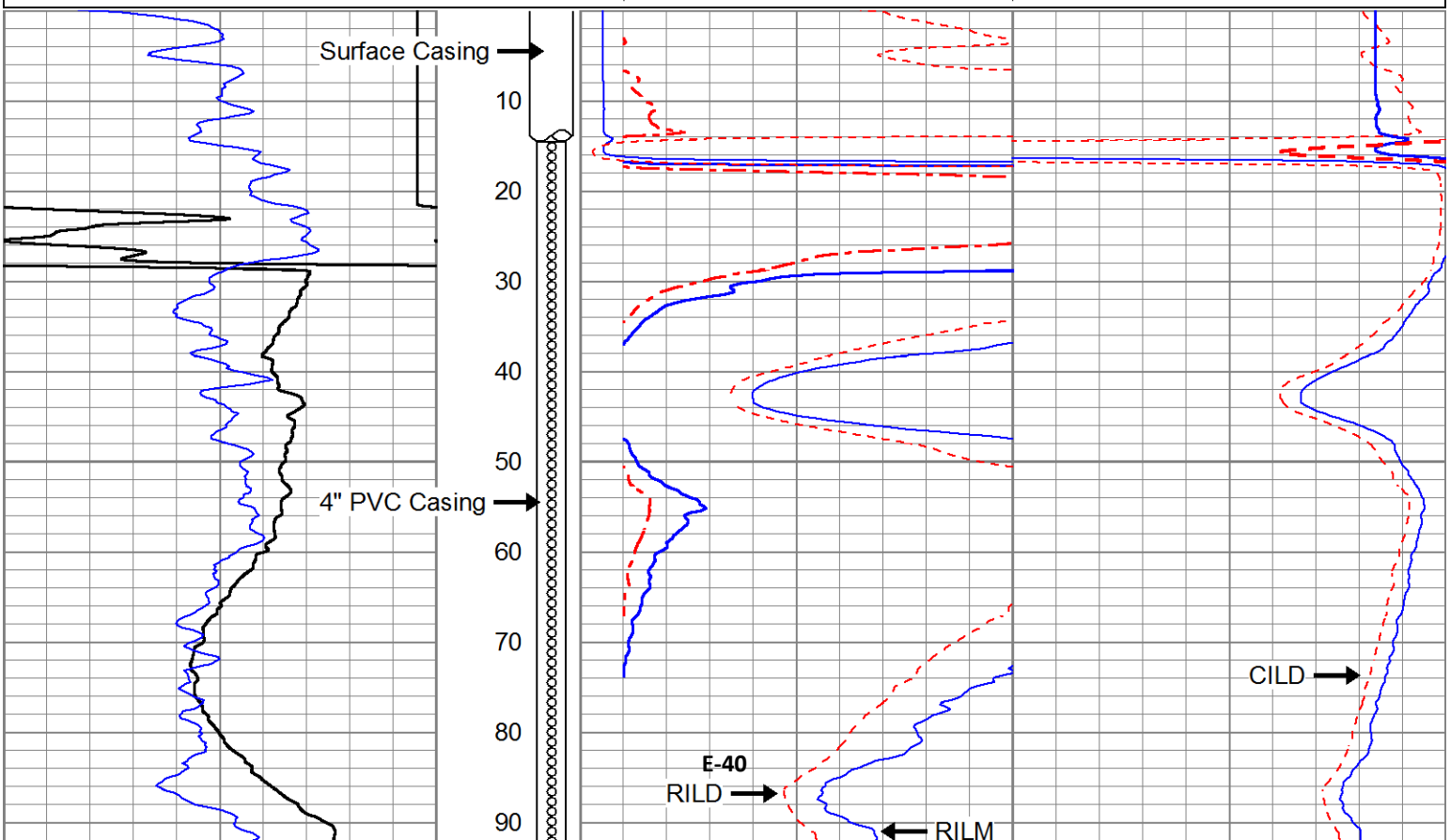
Loop:	Readings Air	Readings Loop		References Air	References Loop		Results m	Results b
Deep	1411.390	3440.570	cps	0.000	612.000	mmho/m	0.302	-425.677
Medium	2379.120	14715.100	cps	0.000	1960.000	mmho/m	0.159	-378.004

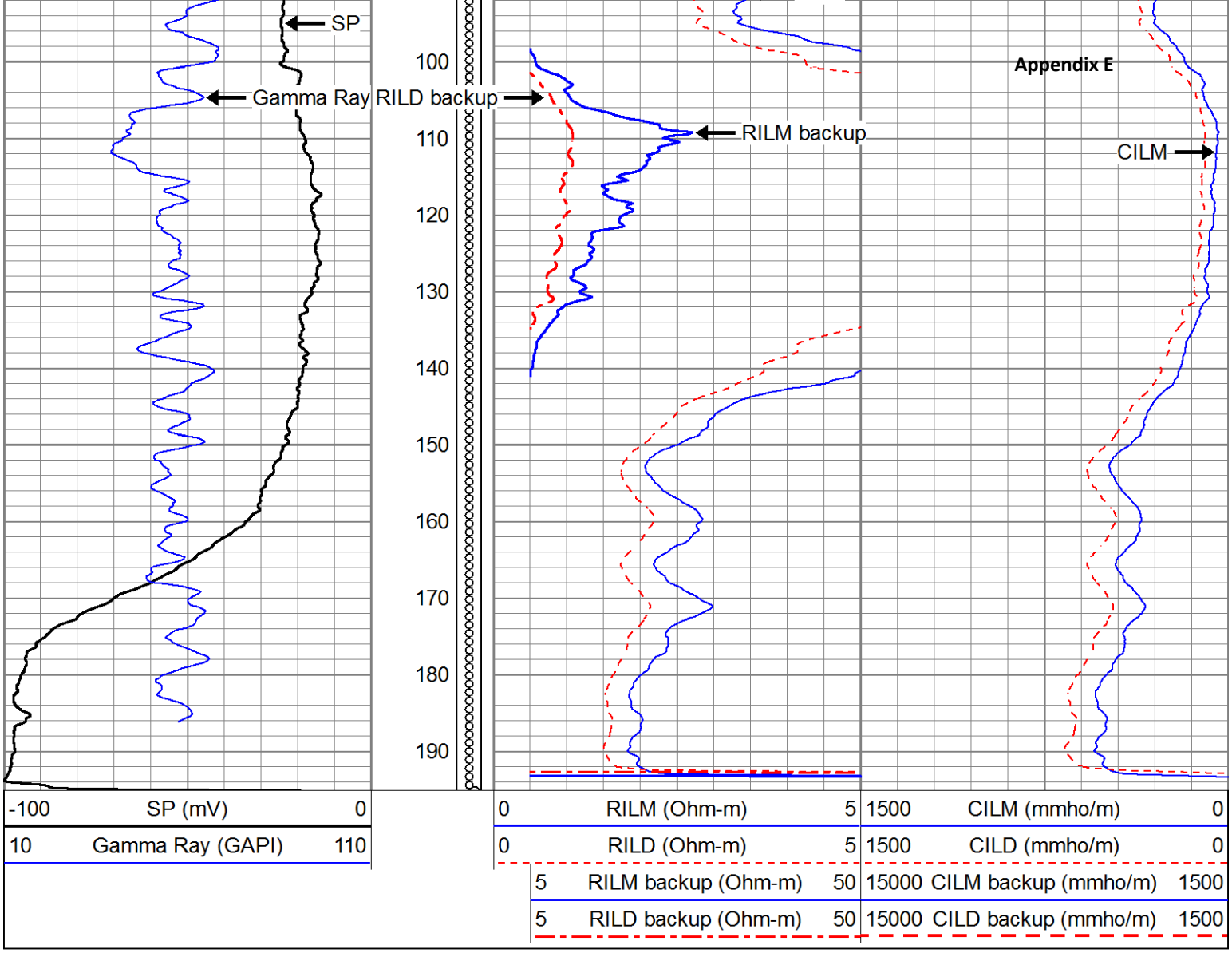
Gamma Ray Calibration Report

Serial Number:	PS_1	
Tool Model:	01	
Performed:	Wed Sep 19 16:56:13 2012	
Calibrator Value:	162.0	GAPI
Background Reading:	46.1	cps
Calibrator Reading:	180.8	cps
Sensitivity:	1.2020	GAPI/cps

Database File	17859.db
Dataset Pathname	dil
Presentation Format	dil_ps
Dataset Creation	Tue Dec 03 14:01:05 2013
Charted by	Depth in Feet scaled 1:240

-100	SP (mV)	0	0	RILM (Ohm-m)	5	1500	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110	0	RILD (Ohm-m)	5	1500	CILD (mmho/m)	0
			5	RILM backup (Ohm-m)	50	15000	CILM backup (mmho/m)	1500
			5	RILD backup (Ohm-m)	50	15000	CILD backup (mmho/m)	1500




SP
Gamma Ray
RILD backup
RILM backup
CILM
100
110
120
130
140
150
160
170
180
190
-100 SP (mV) 0
10 Gamma Ray (GAPI) 110
0 RILM (Ohm-m) 5
0 RILD (Ohm-m) 5
5 RILM backup (Ohm-m) 50
5 RILD backup (Ohm-m) 50
1500 CILM (mmho/m) 0
1500 CILD (mmho/m) 0
15000 CILM backup (mmho/m) 1500
15000 CILD backup (mmho/m) 1500

PACIFIC SURVEYS

DUAL INDUCTION GAMMA-RAY

Job No. 17787

File No.

Company CASCADE DRILLING

Well ML-6

Field MOSS LANDING

County MONTEREY State CA

Location

7500 SANDHOLDT RD.

Other Services:

TEMPERATURE
FLUID RESISTIVITY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	11-20-2013		
Run Number	ONE		
Depth Driller	199.6'		
Depth Logger	199.6'		
Bottom Logged Interval	196.5'		
Top Log Interval	0'		
Open Hole Size	8"		
Type Fluid	WATER		
Density / Viscosity	N/A		
Fluid Level	10'		
Bentonite Seal	N/A		
Time Well Ready	1415		
Time Logger on Bottom	1430		
Equipment Number	PS-7		
Location	LA		
Recorded By	SCHUMACHER		
Witnessed By	N. REYNOLDS		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	8"	0'	200'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	8"	N/A	0'	15'
Prot. String				
Production String	4" PVC	SCH 40	0'	200'
Liner				

<< Fold Here >>>

Comments

NOTE: 0.010" SLOT FOR LENGTH OF PVC

Calibration Report

Database File 17787.db
Dataset Pathname dil2
Dataset Creation Wed Nov 20 15:33:46 2013

Dual Induction Calibration Report

Serial-Model: 0001-ALT
Surface Cal Performed:

Appendix E

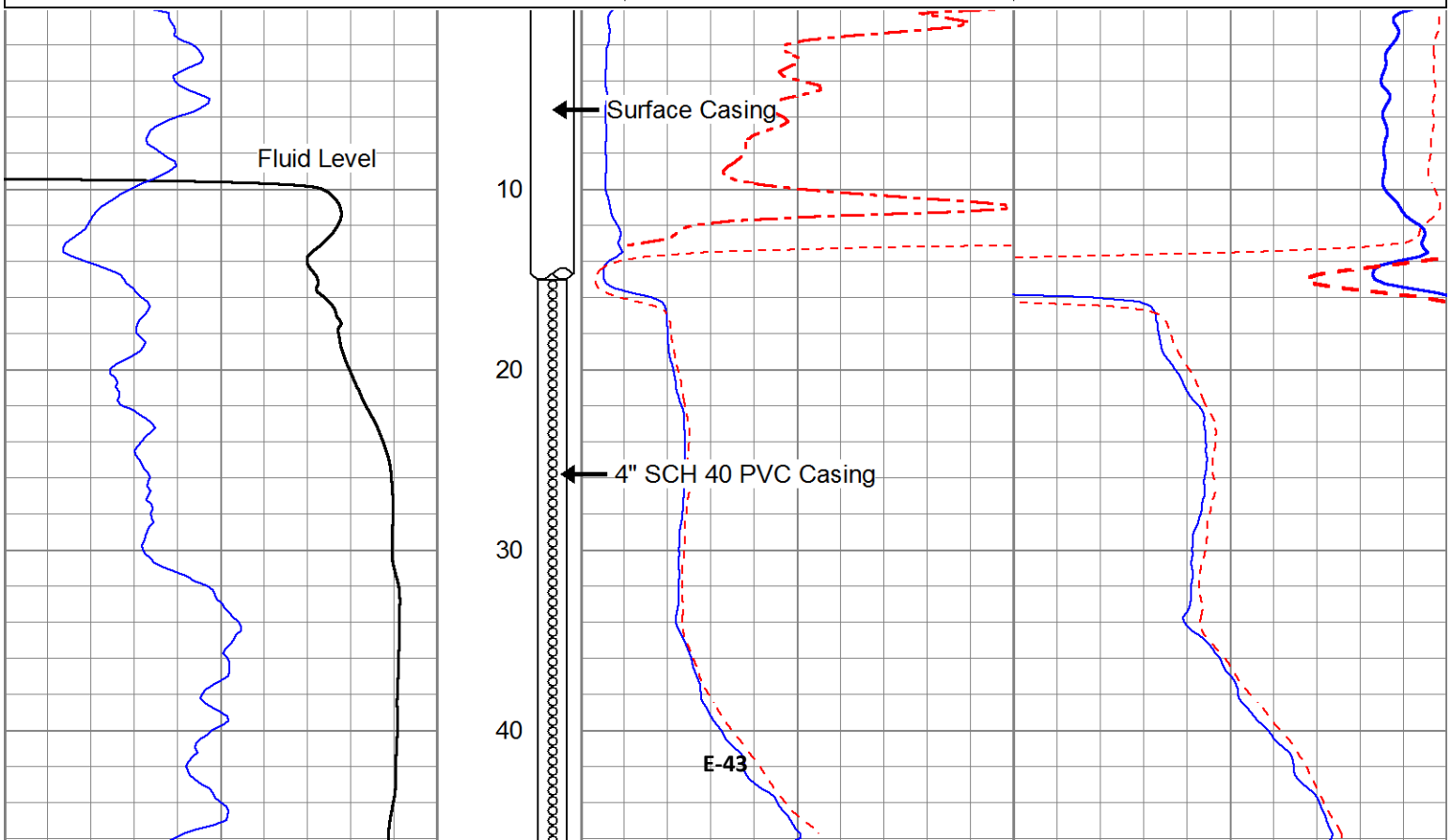
Loop:	Readings Air	Readings Loop		References Air	References Loop		Results m	Results b
Deep	1440.330	3755.270	cps	0.000	612.000	mmho/m	0.264	-380.779
Medium	1967.190	14170.100	cps	0.000	1960.000	mmho/m	0.161	-315.965

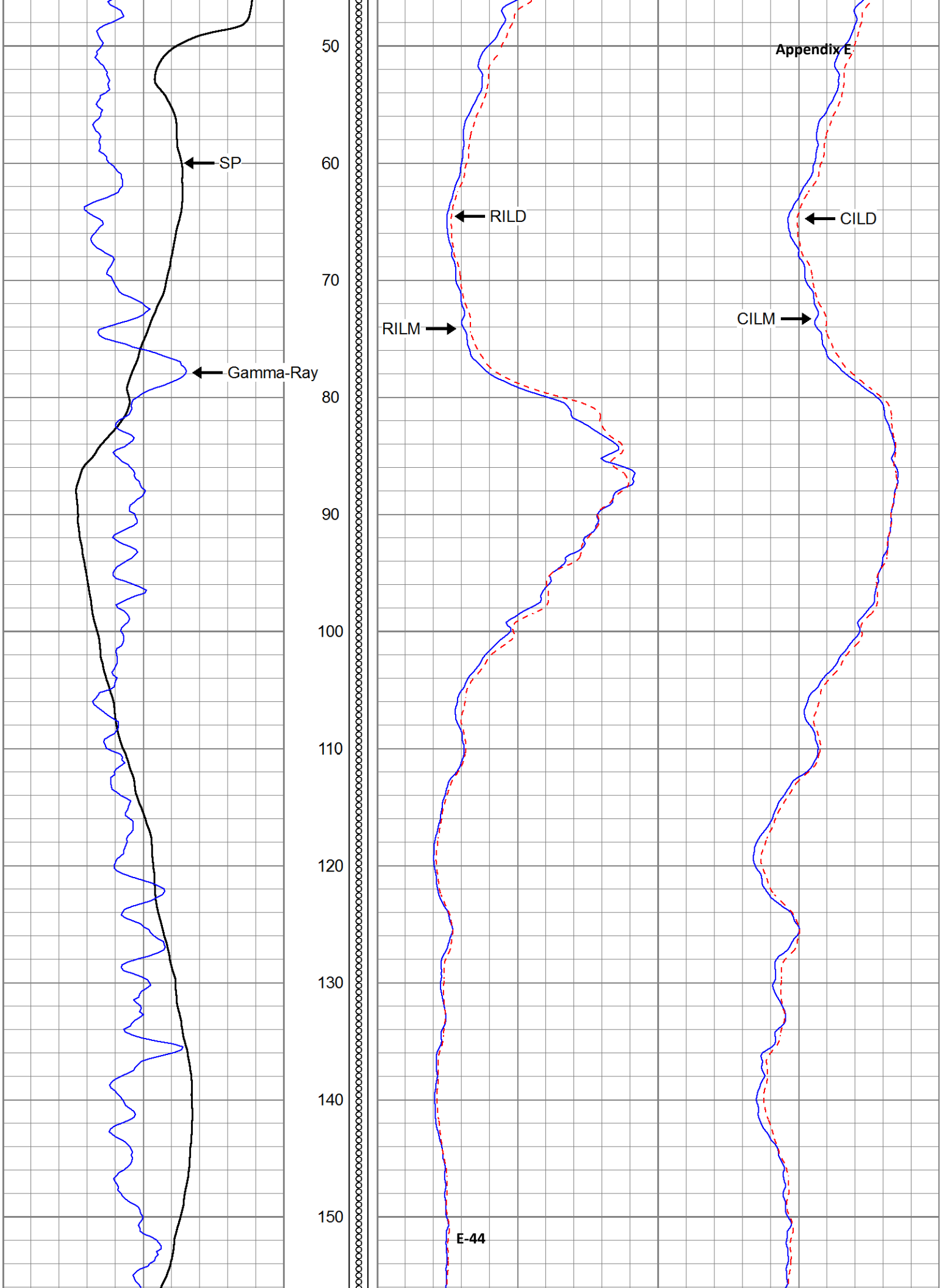
Gamma Ray Calibration Report

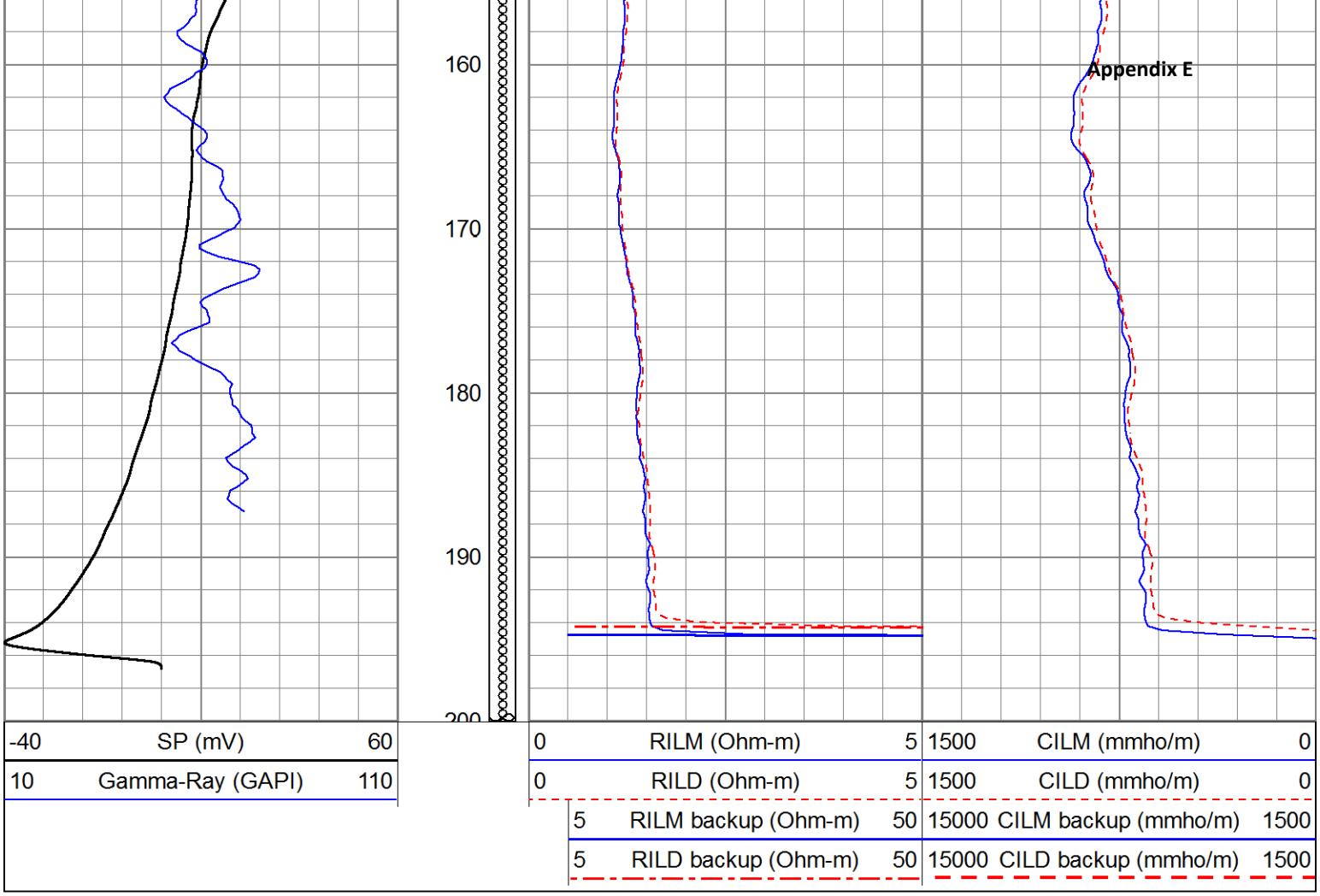
Serial Number:	PS_1	
Tool Model:	01	
Performed:	Wed Sep 19 16:56:13 2012	
Calibrator Value:	162.0	GAPI
Background Reading:	46.1	cps
Calibrator Reading:	180.8	cps
Sensitivity:	1.2020	GAPI/cps

Database File	17787.db
Dataset Pathname	dil2
Presentation Format	dil_ps
Dataset Creation	Wed Nov 20 15:33:46 2013
Charted by	Depth in Feet scaled 1:120

-40	SP (mV)	60	0	RILM (Ohm-m)	5	1500	CILM (mmho/m)	0
10	Gamma-Ray (GAPI)	110	0	RILD (Ohm-m)	5	1500	CILD (mmho/m)	0
			5	RILM backup (Ohm-m)	50	15000	CILM backup (mmho/m)	1500
			5	RILD backup (Ohm-m)	50	15000	CILD backup (mmho/m)	1500




Appendix E
SP
Gamma-Ray
RILD
RILM
CILD
CILM
50
60
70
80
90
100
110
120
130
140
150


Appendix E
160
170
180
190
200
-40 SP (mV) 60
10 Gamma-Ray (GAPI) 110
0 RILM (Ohm-m) 5
0 RILD (Ohm-m) 5
5 RILM backup (Ohm-m) 50
5 RILD backup (Ohm-m) 50
1500 CILM (mmho/m) 0
1500 CILD (mmho/m) 0
15000 CILM backup (mmho/m) 1500
15000 CILD backup (mmho/m) 1500

PACIFIC SURVEYS

DUAL INDUCTION GAMMA-RAY

Job No. 17689

File No.

Company CASCADE DRILLING, INC.

Well PR-1

Field MOSS LANDING

County MONTEREY State CA

Location

POTRERO RD
GPS: N36o 47.439' W121o 47.509'

Other Services:

TEMPERATURE
FLUID RESISTIVITY

Permanent Datum	G.L.	Elevation above perm. datum	Elevation
Log Measured From	G.L. 0'		K.B.
Drilling Measured From	G.L.		D.F.
			G.L.

Date	9-23-2013		
Run Number	ONE		
Depth Driller	200'		
Depth Logger	200'		
Bottom Logged Interval	200'		
Top Log Interval	0'		
Open Hole Size	8"		
Type Fluid	N/A		
Density / Viscosity	N/A		
Fluid Level	N/A		
Bentonite Seal	N/A		
Time Well Ready	10:15		
Time Logger on Bottom	10:30		
Equipment Number	PS-3		
Location	LA		
Recorded By	WATKINS		
Witnessed By	B. VILLALOBOS		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	8"	0'	200'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	9"	N/A	0'	10'
Prot. String	4"	N/A	0'	200'
Production String				
Liner				

<<< Fold Here >>>

Comments

0.010" SLOT FROM 10-180' BGS

Calibration Report

Database File 17689.db
Dataset Pathname dil
Dataset Creation Mon Sep 23 10:40:26 2013

Dual Induction Calibration Report

Serial-Model: 0001-ALT
Surface Cal Performed:

Appendix E

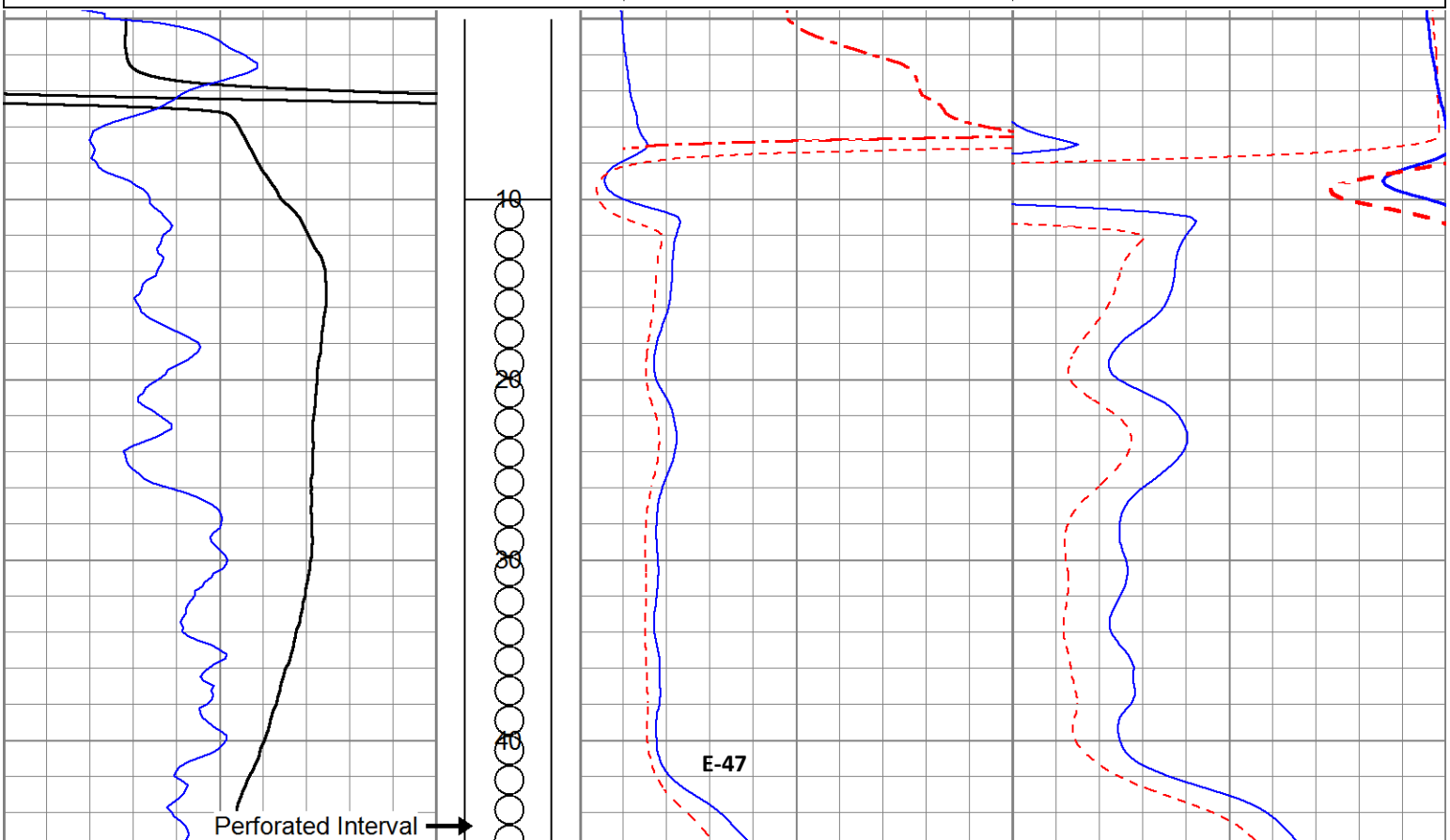
Loop:	Readings Air	Readings Loop		References Air	References Loop		Results m	Results b
Deep	1407.490	3493.640	cps	0.000	612.000	mmho/m	0.293	-412.905
Medium	1908.120	14487.900	cps	0.000	1960.000	mmho/m	0.156	-297.296

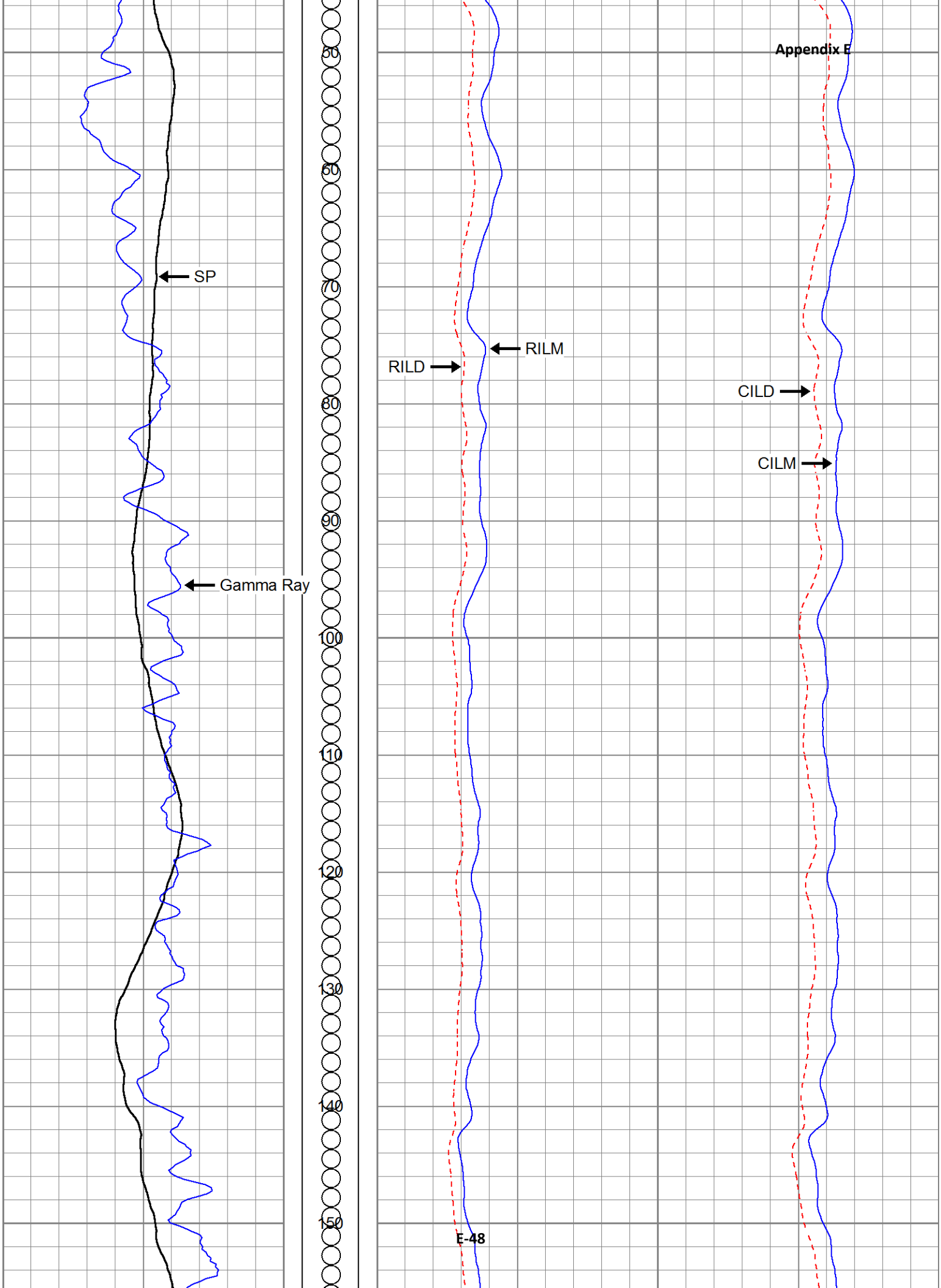
Gamma Ray Calibration Report

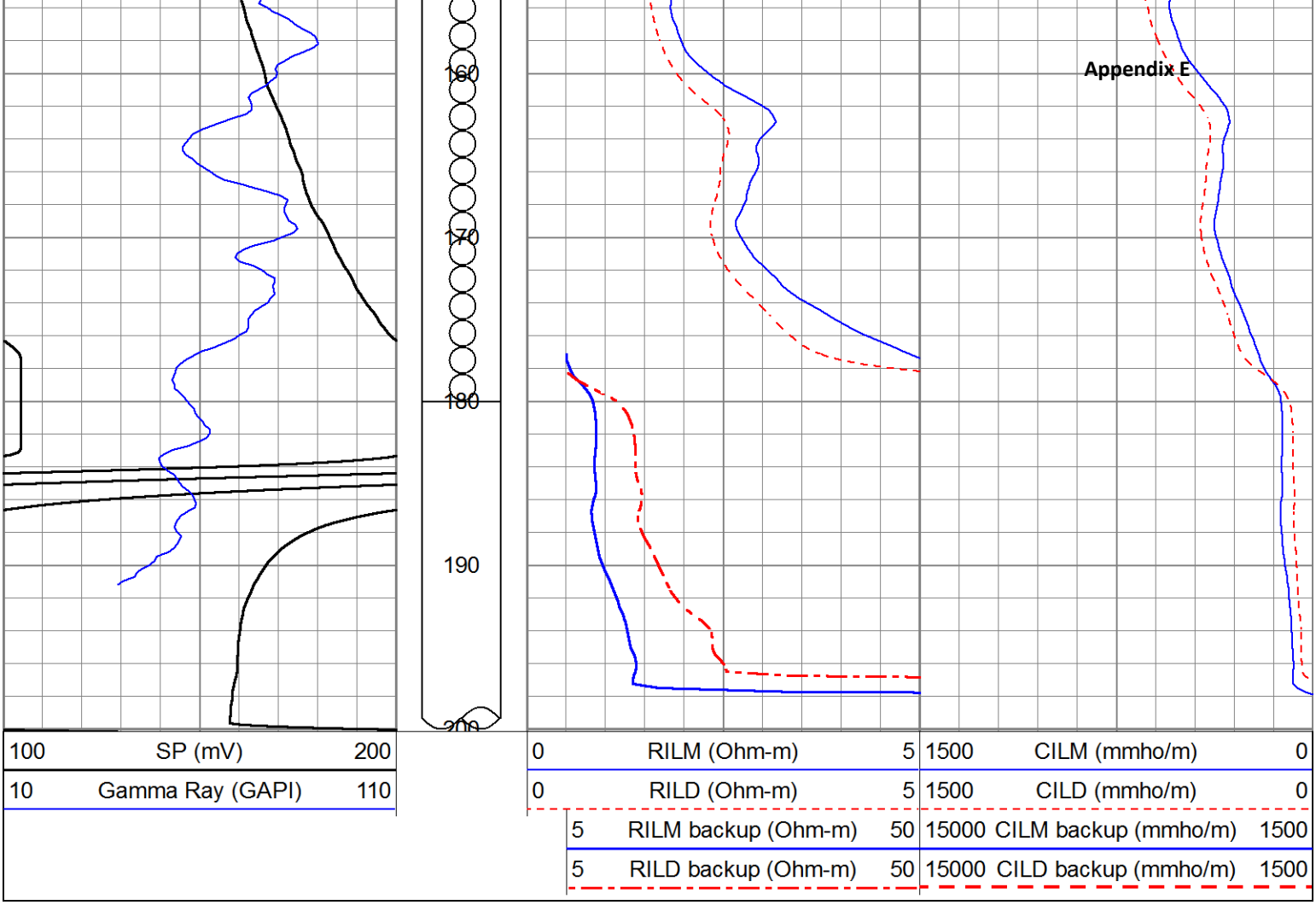
Serial Number:	PS_1	
Tool Model:	01	
Performed:	Wed Aug 31 18:22:13 2011	
Calibrator Value:	162.0	GAPI
Background Reading:	46.1	cps
Calibrator Reading:	180.8	cps
Sensitivity:	1.2020	GAPI/cps

Database File	17689.db
Dataset Pathname	dil
Presentation Format	dil_ps
Dataset Creation	Mon Sep 23 10:40:26 2013
Charted by	Depth in Feet scaled 1:120

100	SP (mV)	200		0	RILM (Ohm-m)	5	1500	CILM (mmho/m)	0
10	Gamma Ray (GAPI)	110		0	RILD (Ohm-m)	5	1500	CILD (mmho/m)	0
				5	RILM backup (Ohm-m)	50	15000	CILM backup (mmho/m)	1500
				5	RILD backup (Ohm-m)	50	15000	CILD backup (mmho/m)	1500




SP
Gamma Ray
50
60
70
80
90
100
110
120
130
140
150
RILM
RILD
CILD
CILM


160
170
180
190
200
100 SP (mV) 200
10 Gamma Ray (GAPI) 110
0 RILM (Ohm-m) 5
0 RILD (Ohm-m) 5
5 RILM backup (Ohm-m) 50
5 RILD backup (Ohm-m) 50
1500 CILM (mmho/m) 0
1500 CILD (mmho/m) 0
15000 CILM backup (mmho/m) 1500
15000 CILD backup (mmho/m) 1500

APPENDIX F

Isolated Aquifer Zones Construction Forms

And Well Sampling Data Forms

GEOSCIENCE

APPENDIX F:

ISOLATED AQUIFER ZONES CONSTRUCTION FORMS AND WELL SAMPLING DATA FORMS

CONTENTS

Description **Page**

Borehole CX-B1 ..... *F-1*

Borehole CX-B2 ..... *F-19*

Borehole CX-B4 ..... *F-28*

Borehole MDW-1 ..... *F-44*

Borehole ML-1 ..... *F-58*

Borehole ML-2 ..... *F-61*

Borehole ML-3 ..... *F-69*

Borehole ML-4 ..... *F-76*

Borehole ML-6 ..... *F-82*

Borehole PR-1 ..... *F-87*

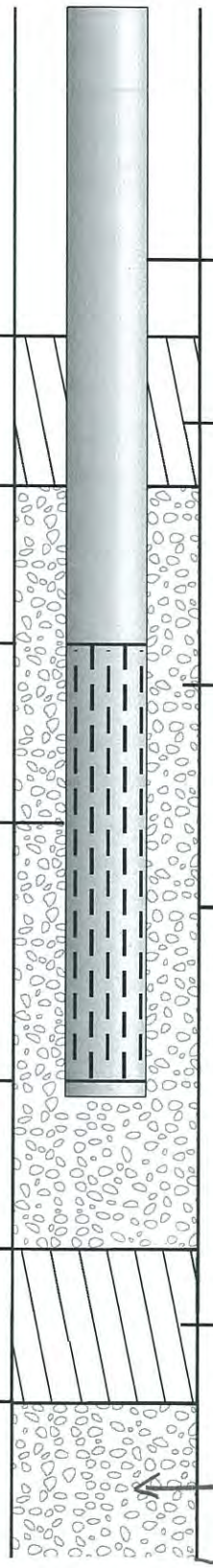
Zone #1 As-Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 1

274 to 284 ft bgs

8" sonic casing to 263 ft bgs. Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ PVC Pipe

264 ft bgs

5 ft

5 -ft Upper Bentonite Seal (3 bags)

MiSWACO Kwik-Plug Medium Bentonite Chips (3/8")

269 ft bgs

5 ft

274 ft bgs

Gravel Pack (CEMEX Monterey #3 15 bags)

10 -ft Perforated Tool (0.050" Slot 4" PVC)

8 -in Diameter Pilot Borehole

284 ft bgs

5 ft

289 ft bgs

5.5 ft

5.5 -ft Lower Bentonite Seal (3 1/4 bags)

294.5 ft bgs

CEMEX Monterey #3 (3 bags)

301 ft bgs (b.h. T.D.)

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Tel: (909) 451-6650 Fax: (909) 451-6638
www.gssiwater.com

Client: RBF Consulting Inc.

Well Name/Number: MPWSP Exploratory Borehole CX-B1WQ

Date: 2-17-14 / Mon

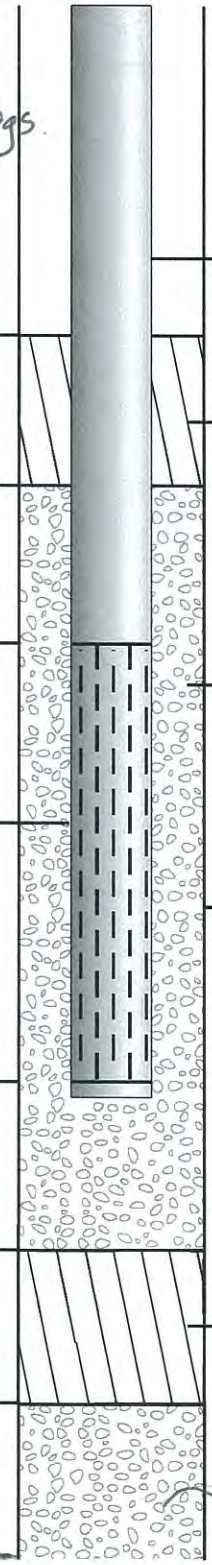
Zone #2 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 2

237 **to** 247 **ft bgs**

8" Sonic casing to 224 ftbgs.
Open annulus above upper bentonite seal



4 -in Diameter ~~Drill~~ PVC Pipe

226 ft bgs

5 ft

5 -ft Upper Bentonite Seal

231 ft bgs

Mi SWACO Kwik-Plug Medium Bentonite Chips (3/8") 13/4 bags

6 ft

237 ft bgs

Gravel Pack CEMEX Monterey #3 (10 bags)

10 -ft Perforated Tool (0.050" Slot 4" PVC)

8 -in Diameter Pilot Borehole

246.5 ft bgs actual

247 ft bgs

5 ft

252 ft bgs

5 ft

5 -ft Lower Bentonite Seal (4 bags)

257 ft bgs

CEMEX Monterey #3 273 - 257 ft bgs

273 ftbgs

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Well Name/Number: MPWSP Exploratory Borehole CX-B1WQ

Date: 2-19-14 / Wed

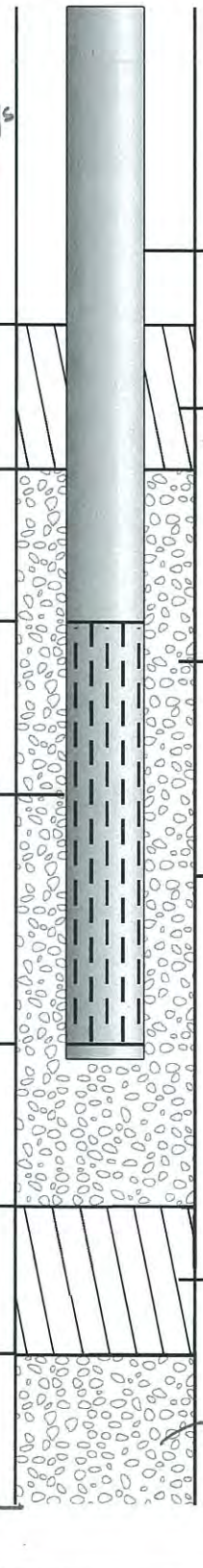
Zone #3 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 3

182 **to** 192 **ft bgs**

8" sonic casing to ~~165~~ 161 ftbgs
Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

168 ft bgs

7 ft

7 -ft Upper Bentonite Seal
MiSWACO Kwik-Plug Medium Bentonite Chips (3/8") (2 1/2 bags)

175 ft bgs

7 ft

182 ft bgs

Gravel Pack CEMEX Monterey #3 Sand (13 bags)

10 -ft Perforated Tool
(4" PVC Screen w/ 0.050" slot)

8 -in Diameter ~~Pilot~~ Sonic Borehole

192 ft bgs

5 ft

197 ft bgs

5 ft

5 -ft Lower Bentonite Seal (2 1/2 bags)

202 ft bgs

Backfill w/ CEMEX Monterey #3 Sand (35 bags)

247 ft bgs

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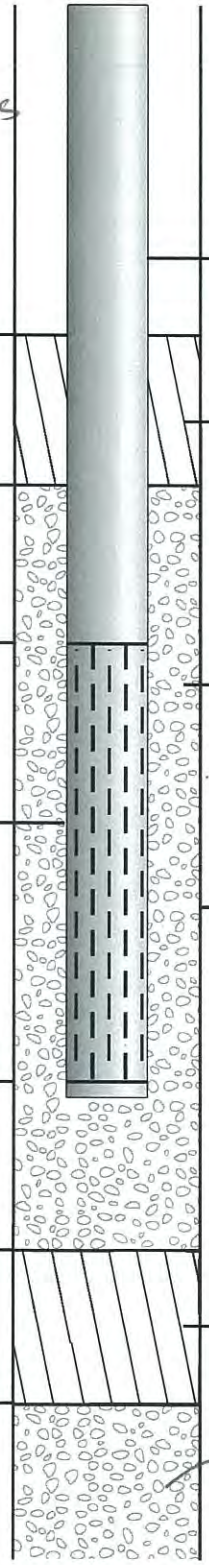
Zone #4 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 4

134 **to** 144 **ft bgs**

8" Sonic casing to 122 ftbgs
Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ PVC Pipe

124 ft bgs

5 ft

5 -ft Upper Bentonite Seal
Mi SWACO Kwik-Plug Medium Bentonite Chips (3/8") (2 bags)

129 ft bgs

5 ft

134 ft bgs

Gravel Pack CEMEX Monterey #3 (10 bags)

10 -ft Perforated Tool
(4" PVC Screen w/ 0.050" slot)

8 -in Diameter ~~Pilot~~ Sonic Borehole

144 ft bgs

5 ft

149 ft bgs

5 ft

5 -ft Lower Bentonite Seal (2½ bags)

154 ft bgs

Backfill w/ #2/12 sand (46 bags) & Monterey #3 (3 bags)

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Client: RBF Consulting Inc.

Well Name/Number: MPWSP Exploratory Borehole CX-B1WQ

Date: 2-22-14/Sat

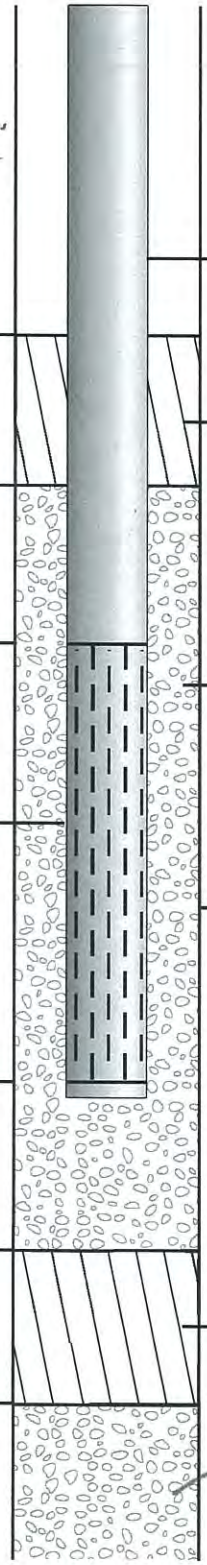
Zone #5 As Built

Zone No. 5

ISOLATED AQUIFER ZONE CONSTRUCTION

84 **to** 94 **ft bgs**

8" Sonic casing to 73 ftbgs. Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

73 ft bgs

6 ft

6 -ft Upper Bentonite Seal

MISWACO Kwik-Plug medium bentonite chips (3/8") (2 bags)

79 ft bgs

5 ft

84.5 actual

84 ft bgs

Gravel Pack CEMEX Monterey #3 (13 bags)

10 -ft Perforated Tool (4" PVC Screen w/ 0.050" slots)

8 -in Diameter ~~Pilot~~ sonic Borehole

94 ft bgs

94.5 actual

5 ft

99 ft bgs

5 ft

5 -ft Lower Bentonite Seal

104 ft bgs

17 bags

Backfill w/ # 2/12 & Monterey #3

13 bags

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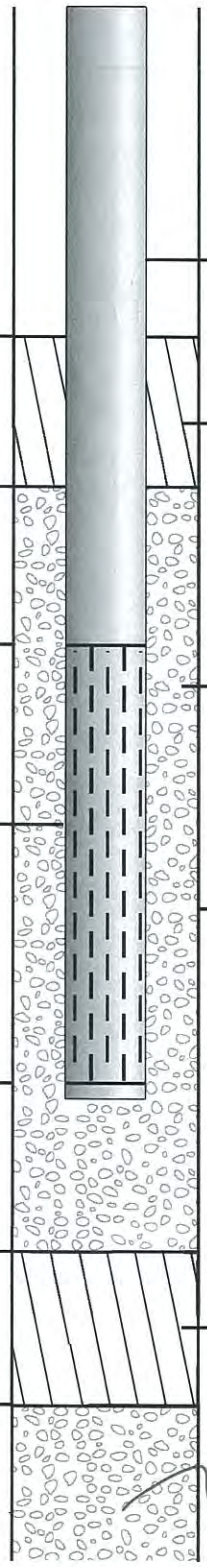
Zone #6 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 6

51 **to** 61 **ft bgs**

9" Sonic casing to 34 ft bgs
Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe

38.5 ft bgs

7 ft

7 -ft Upper Bentonite Seal
MI SWACO Kwik-Plug medium bentonite chips (3/8") (3 bags)

45.5 ft bgs

5.5 ft

51 ft bgs

Gravel Pack CEMEX Monterey #3 (13 bags)

10 -ft Perforated Tool
(4" PVC Screen w/ 0.050" slots)

8 -in Diameter ~~Pilot~~ Sonic Borehole

61 ft bgs

4.5 ft

65.5 ft bgs

5.5 ft

5.5 -ft Lower Bentonite Seal (3 bags)

71 ft bgs

Backfill w/ Monterey #3 (17 bags)

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

W.L.'s

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B1WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 263 ft bgs
Static WL: 21.0 ft brp
RP: 8.0 ft ags (Top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 2-17-14 / Mon
Screened Interval: 274-284 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 212 ft bgs

0.68 Constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
16:22:14	0	21.0	0	64079.5	Pump on ~7.1 gpm.								
16:25	3	57.0	36.0	↑Q to 11.5 gpm									
16:30	8	72.3	51.3	64143.4	17.5	18.9	0.6	14000	12693	10111.6	7.13	-131.1	very turbid
16:36	14	67.4	46.4		16:36:30 ↑Q to ~19.1 gpm, Turb improving some.								
16:40	18	↑Q slightly.		to 19.6 gpm									
16:43	21	90.0	69.0	64338.7	19.6	19.5	0.8	36690	32843	24996.8	6.66	-109.6	"over range"
16:49	27	88.7	67.7	64457.3	19.8	19.4	0.7	37156	33211	25268.8	6.62	-108.7	529
16:53:35	31	pump off.		64546.0							water is aerated.		
		Total Volume pumped today = 466.5 gallons.											

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L.'s taken w/ an electronic W.L. indicator.

Borehole Name/Number: CX-B1WQ

Sonic Casing Dia: 8 in Sonic Casing Depth: 263 ft bgs

Static WL: 34.0 ft brp

RP: 8.0 ft ags (top of 8" Casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Test Date: 2-18-14 / Tue

Screened Interval: 274-284 ft bgs

Reference Point Elevation: ____ ft amsl

Pump Depth: 212 ft bgs

W.L.'s

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
08:01:02	0	34.0	0	64545.1	Pump on @ 31.4 gpm								
08:03	2	88.6	54.6	↓Q to	21.5 gpm								
08:06	5	84.4	50.4										
08:27	26	85.0	51.0	65128.5	21.7								6.52
08:31:41	~31			↑Q to ~	38.5 gpm								
08:36	35	119.5	85.5		38.5	08:37	↑ Q to	39.8 gpm					
08:41	40	119.5	85.5	65571.0	40.2								105
09:20	79	114.6	80.6	67147.8	40.4	19.0	2.5	36509	32312	24820	6.51	96.1	11.7
09:30	89	114.9	80.9	67553.5	40.6	19.0	1.0	36353	32175	24718	6.56	57.6	9.04
09:40	99	114.7	80.7	67959.8	40.6	19.0	1.0	36524	32331	24840.4	6.55	48.6	4.40
09:50	109	114.6	80.6	68365.5	40.6	19.0	1.0	36505	32317	24826.8	6.55	47.6	4.08
10:00	119	114.8	80.8	68771.4	40.6	19.0	1.0	36488	32336	24799.6	6.55	49.0	3.43
10:10	129	114.5	80.5	69177.0	40.6	19.0	1.0	36512	32357	24820.0	6.55	50.6	2.82
10:20	139	115.0	81.0	69583.0	40.6	19.0	1.0	36535	32367	24847.2	6.55	51.7	1.98
10:30	149	115.2	81.2	69990.6	40.8	19.0	1.0	36527	32377	24833.6	6.55	53.8	3.36
10:40	159	115.1	81.1	70398.1	40.8	19.0	1.0	36540	32335	24847.2	6.55	54.6	2.23
10:50	169	115.2	81.2	70805.6	40.8	19.0	1.0	36553	32365	24854	6.55	55.4	0.92
11:00	179	115.17	81.17	71213.3	40.8	19.0	1.0	36564	32364	24860.8	6.54	56.4	0.94
11:10	189	115.1	81.1	71621.8	40.9	19.0	1.0	36570	32374	24867.6	6.54	57.3	0.88
11:20	199	114.95	80.95	72029.2	40.7	19.0	1.0	36567	32379	24867.6	6.54	58.1	0.89

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1548 mL/min

Form Created: 29-Sep-13

27 bottles MTBAS
1 isotope

Sheet 3 Appendix F 3

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1 W.L's

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B1WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 263 ft bgs
Static WL: 34.0 ft brp
RP: 8.0 ft ags

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 2-18-14 / Tue
Screened Interval: 274-284 ft bgs
Reference Point Elevation: ft amsl
Pump Depth: 212 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp) 34.0	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
11:30	209	115.3	81.3	72436.6	40.7	19.0	1.0	36566	32377	24867.6	6.54	58.6	0.93
11:40	219	114.9	80.9	72844.4	40.8	19.0	1.0	36581	32394	24874.4	6.54	59.2	1.49
11:50	229	114.8	80.8	73251.8	40.7	18.9	1.0	36581	32350	24874.4	6.54	59.9	1.20
12:00	239	115.1	81.1	73659.1	40.7	18.9	1.0	36608	32359	24888.0	6.54	60.5	1.16
12:10	249	115.0	81.0	74066.2	40.7	18.9	1.0	36601	32361	24888.0	6.54	61.1	0.57
12:15	Begin	collecting	zone #1	WQ samples	for lab	analysis.							
12:39	278	114.72	80.72	75248.9	40.8	18.9	1.0	36635	32402	24908.4	6.54	62.2	0.56
12:42:07	281			75374.2	Pump off.								
		Total Volume pumped today =				10,829.1 gallons							
13:35	334	34.2	0.2	W.L. after	pulling	pump.							

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L.'s taken w/ an electronic W.L. indicator

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Borehole Name/Number: CX-B1WQ

Test Date: 2-19-14 / Wed

Sonic Casing Dia: 8 in

Sonic Casing Depth: 224 ft bgs

Screened Interval: 237-247 ft bgs

Static WL: _____ ft brp — Note: SWL was 45 ft ags prior to pumping. Recovered W.L. was not recorded by driller on 2-20-14. est. 6 ft bgs by driller

Reference Point Elevation: _____ ft amsl

RP: 6.0 ft ags (Top of 8" casing)

Pump Depth: 199 ft bgs to pump intake

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Total Gallons
10:35:13	0			75374.1	Pump on @ 27 gpm. ↓Q @ 10:36:30 to 22 gpm ↓Q @ 10:38 to 13 gpm									
10:40	5	147.63			13.0	↓Q @ 10:41 to 10.3 gpm. Turbid.								
10:45	10	122.3		75520.7	~10.3								turbid	
10:55	20	108.6		75622.2	10.2	Discharge is aerated.							"over range"	
11:10	35	108.82		75778.8	10.4	"		"					530	
11:25	50	108.37		75936.1	10.5	"		"					196	
11:35	60	110.0		76042.4	10.6	18.9	1.1	21571	19051	14681.2	6.71	-13.9	150	
11:45	70	110.6		76150.7	10.8	18.9	1.1	21776	19254	14817.2	6.77	-54.6	81.4	
11:55	80	110.4		76259.0	10.8	18.9	1.1	22069	19503	15014.4	6.77	-58.8	53.6	884.9
12:05	90	110.3		76367.2	10.8	18.8	1.2	22241	19623	15130.0	6.78	-59.8	52.9	
12:16	101	109.82		76486.4	10.8	18.9	1.2	22432	19803	15252.4	6.77	-58.4	45.8	
12:25	110	109.47		76583.8	10.8	18.8	1.2	22544	19879	15327.2	6.77	-56.8	31.2	
12:35	120	109.6		76692.2	10.8	18.8	1.2	22658	19973	15415.6	6.77	-54.8	37.2	1318.1
12:45	130	108.83		76800.6	10.8	18.8	1.2	22769	20069	15483.6	6.77	-52.0	20.9	
12:55	140	108.4		76908.3	10.8	18.7	1.2	22840	20121	15531.2	6.77	-49.6	17.9	
13:05	150	107.95		77016.0	10.8	18.7	1.2	22922	20184	15585.6	6.77	-46.3	14.4	1641.9
13:15	160	106.95		77122.6	10.7	18.7	1.2	23007	20261	15640.0	6.77	-43.1	14.9	
13:25	170	106.83		77228.9	10.6	18.7	1.2	23068	20308	15687.3	6.77	-40.9	14.9	
13:35	180	106.8		77334.7	10.6	18.7	1.2	23143	20374	15742.0	6.76	-38.2	12.9	
13:45	190	107.0		77440.8	10.6	18.7	1.2	23210	20429	15789.6	6.76	-36.5	12.8	

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1471 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-BIWQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 224 ft bgs
Static WL: _____ ft brp
RP: 6.0 ftags

Logged By: N. Reynolds (GSSI) & Cascade Drilling W.L.'s
Test Date: 2-19-14 / Wed
Screened Interval: 237-247 ft bgs
Reference Point Elevation: _____ ft amsl
Pump Depth: 199 ft bgs pump intake

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L) 0.68 constant	pH	ORP (mV)	Turbitity (NTU)
13:55	200	107.0		77546.8	10.6	18.7	1.2	23243	20447	15810.0	6.76	-33.8	14.7
14:05	210	106.8		77652.8	10.6	18.7	1.2	23296	20485	15837.2	6.76	-31.6	14.5
14:15	220	106.6		77759.2	10.6	18.7	1.2	23326	20516	15864.4	6.76	-29.1	13.6
14:25	230	105.98		77865.7	10.7	18.7	1.2	23382	20555	15898.4	6.76	-26.3	11.6
14:35	240	106.5		77971.8	10.6	18.7	1.2	23406	20578	15912.0	6.76	-24.6	11.4
14:45	250	106.6		78078.2	10.6	18.7	1.2	23444	20606	15939.2	6.76	-22.5	10.7
14:55	260	105.7		78184.5	10.6	18.7	1.2	23466	20631	15952.8	6.76	-20.7	8.56
15:05	270	106.3		78290.7	10.6	18.7	1.2	23480	20644	15966.4	6.76	-18.8	9.23
15:15	280	106.1		78397.2	10.7	18.7	1.2	23516	20669	15986.8	6.76	-17.0	13.2
15:25	290	106.25		78503.6	10.6	18.7	1.2	23547	20700	16007.2	6.76	-15.7	13.1
15:38	303	106.2		78641.7	10.6	18.7	1.2	23592	20737	16041.2	6.76	-13.4	11.2
15:41:42	~307	↓Q to 6.3 gpm		; 15:44:24	↓Q to	5.1 gpm	; 15:46	:53 ↓Q to	3.3 gpm	3.08 NTU			
15:52	317	50.3		78727.2	~3.3	18.6	1.1	23639	20744	16075.2	6.77	-21.8	1.32
16:00	325	39.8		78745.6	2.3	18.6	1.1	23660	20779	16088.8	6.79	-29.1	1.21
16:05	330	39.88		78756.7	2.2	18.7	1.0	23705	20869	16122.8	6.79	-32.4	1.20
16:10	Collect	WQ samples for		lab analysis.	Samples	placed	on ice.						
16:41	366	38.5		78831.8	2.1	19.0	1.0	23926	21194	16272.4	6.80	-40.1	0.91
16:46:13	371			78841.2	Pump	off.							
		Total Volume		pumped=	3,467.1	gallons							

2704.1

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 3 W.L.'s

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B1WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 161 ft bgs
Static WL: 28.2 ft brp
RP: 8.67 ft ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 2-21-14 / Fri
Screened Interval: 182-192 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 168 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	Total Vol pumped
09:47:32	0	28.2	0	78841.1	Pump on ~ 3.1 gpm. discharge is aerated									
09:49	1	119.0	90.8	–	↓Q to 6.4 gpm 9:52 ↑Q to 8.2 gpm. Turbid and aerated. ↑Q to 10.1 gpm									
10:00	12	88.6	60.4	78988.1	10.1	aerated discharge							52.3	
10:15	27	91.5	63.3	79140.1	10.1	18.5	0.1	45654	40030	31082.8	6.75	-183.7	20.8	
10:30	42	90.6	62.4	79292.7	10.2	18.5	0.1	46385	40680	31545.2	6.78	-264.8	10.7	
10:45	57	90.0	61.8	79444.0	10.1	18.5	0.1	46650	40865	31728.8	6.77	-284.2	17.6	602.9
11:00	72	89.9	61.7	79594.9	10.1	18.5	0.1	46900	41060	31892.0	6.77	-283.4	8.57	753.8
11:15	87	89.9	61.7	79745.8	10.1	18.3	0.1	46964	40963	31932.8	6.77	-280.7	6.70	904.7
11:30	102	89.9	61.7	79896.6	10.1	18.2	0.1	46992	40928	31953.2	6.77	-277.8	10.0	
11:45	117	89.85	61.65	80047.3	10.0	18.3	0.1	47016	41014	31973.6	6.77	-274.3	6.13	
12:00	132	89.75	61.55	80198.2	10.1	18.3	0.1	47036	40977	31987.2	6.77	-270.3	15.3	
12:15	147	89.80	61.60	80348.8	10.0	18.2	0.1	47051	40969	31994.0	6.77	-266.8	3.82	
12:30	162	89.65	61.45	80499.6	10.1	18.2	0.1	47059	40962	32000.8	6.77	-262.2	7.50	
12:34:38	167				↓Q to 4.6 gpm ; 12:37:15 ↓Q to 3.2 gpm ~ 12:40 Turb = 4.29 Ntu									
12:45	177	47.45	19.25	80583.7	3.1	18.4	0.1	47074	41134	32014.4	6.79	-249.7	1.03	
12:55	187	46.5	18.3	80615.4	3.2	18.7	0.1	47103	41447	32028.0	6.79	-251.5	0.32	
13:05	197	46.1	17.9	80646.5	3.1	18.8	0.1	47112	41546	32034.8	6.79	-253.3	0.25	
13:10	Begin	collecting	WQ samples for lab	analysis. Samples placed on ice.										
13:33	225	44.75	16.55	80730.6	3.0	18.9	0.1	47122	41627	32041.6	6.80	-255.7	0.14	
13:41:20	233			80753.5	Pump off. Total volume pumped = 1,912.4 gallons									

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1221.5 mL/min

14:24 276 31.95 3.75

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 4

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L.'s taken using an electronic w.l. indicator.

Borehole Name/Number: CX-BIWQ

Sonic Casing Dia: 8 in Sonic Casing Depth: 122 ft bgs

Static WL: 22.9 ft brp 2/23 07:33 recovered W.L. = 21.5 ftbgs

RP: 8.0 ft ags (Top of 8" casing)

Logged By: N. Reynold (GSSI) & Cascade Drilling

Test Date: 2-22-14 / Sat

Screened Interval: 134-144 ft bgs

Reference Point Elevation: _____ ft amsl

Pump Depth: 124 ft bgs

W.L.'s

0.68 Constant

	Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Vol (gal)
2/22	10:49:49	0	22.9	0	80753.5	Pump	on @ 19.0gpm.								
	10:52	2	120.0	97.1		120	↓Q to	3.9 gpm							
	10:56	6	95.8	72.9		3.9								Silty turbid	
	11:00	10	82.0	59.1	80839.1	4.0					highly aerated discharge			157	
	11:20	30	73.65	50.75	80923.2	4.2					"		"	73.6	
	11:35	45	74.4	51.5	80987.1	4.3	18.2	2.8	38044	33127	25846.8	6.80	-149.9	3.42	
	11:50	60	74.9	52.0	81052.4	4.4	18.3	3.0	38686	33712	26295.6	6.82	-127.5	1.55	
	12:05	75	74.8	51.9	81117.8	4.4	18.2	3.3	38950	33868	26479.2	6.82	-113.0	1.65	364.3
	12:20	90	74.8	51.9	81183.2	4.4	18.2	3.4	39056	33956	26560.8	6.82	-103.3	3.62	
	12:40	110	74.5	51.6	81271.6	4.4	18.1	3.6	39201	34053	26656.0	6.82	-94.7	10.7	
	12:55	125	74.6	51.7	81337.2	4.4	18.1	3.7	39344	34192	26751.2	6.81	-84.4	6.83	583.7
	13:10	140	74.35	51.45	81402.6	4.4	18.2	3.8	39394	34270	26785.2	6.81	-77.5	7.13	
	13:25	155	74.3	51.4	81468.2	4.4	18.2	3.8	39413	34300	26798.8	6.81	-72.1	10.5	714.7
	13:40	170	74.3	51.4	81533.8	4.4	18.2	3.7	39432	34276	26798.8	6.81	-66.7	11.6	
	13:55	185	74.35	51.45	81599.6	4.4	18.1	3.7	39481	34312	26846.2	6.81	-62.0	10.5	
	13:59:13	189				↓Q to	2.1gpm								
	14:05	195	55.55	32.65	81630.2	2.1	18.1	3.6	39527	34305	26880.4	6.81	-61.5	5.41	
	14:20	210	49.3	26.4	81662.3	2.1	18.6	3.6	39542	34731	26887.1	6.82	-58.4	0.18	
	14:30	220	48.8	25.9	81683.8	2.2	18.7	3.6	39563	34822	26900.8	6.82	-58.0	0.20	
	14:40	230	48.7	25.8	81705.1	2.1	18.8	3.6	39592	34907	26921.2	6.82	-56.6	0.24	

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1062.3 mL/min

13:59 (↓Q) = 1012.1 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 4

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B1WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 122 ft bgs
Static WL: 22.9 ft brp
RP: 8.0 ft ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 2-22-14 / Sat
Screened Interval: 134-144 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 124 ft bgs

0.68 constant

	Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft) (22.9)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)
2/22	14:45	235	Begin collecting WQ samples for lab analysis. Samples placed on ice.											
	15:13	263	49.7	26.8	81782.0	2.3	18.9	3.6	39597	34967	26928.0	6.82	-55.3	0.39
	15:19:23	269				↑Q to 6.8 gpm; 15:21 ↑Q to 7.8 gpm; 15:22 ↑Q to 10.3 gpm								
	15:25	275	102.9	80.0	81842.7	10.3	18.4	2.4	35364	30732	23936	6.94	-148.0	overrange
	15:29:17	279				↓Q to 5.6 gpm (WL was approaching pump)								
	15:33	283	98.6	75.7	81904.3	5.6	17.9	3.6	39539	34214	26894.0	6.81	-68.3	19.4
	15:47	297	84.8	61.9	81982.7	5.6	17.8	3.8	39627	34163	26941.6	6.80	-41.4	15.6
	15:57	307	84.35	61.45	82039.2	5.7	17.8	3.9	39649	34194	26962.0	6.79	-37.1	1.09
	16:07	317	84.2	61.3	82095.7	5.7	17.9	3.9	39641	34252	26955.2	6.79	-33.6	0.75
	16:09:16	319	Pump off		82108.7									
			Total Volume pumped = 1355.2 gallons											
2/23	07:33		29.5	(21.5 ft bgs) Recovered water level.										

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 5

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L.'s taken using an electronic w.l. indicator.

Borehole Name/Number: CX-B1WQ

Sonic Casing Dia: 8 in Sonic Casing Depth: 73 ft bgs

Static WL: 26.0 ft brp

RP: 7.0 ftags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Test Date: 2-23-14 / Sun

Screened Interval: 84-94 ft bgs

Reference Point Elevation: ____ ft amsl

Pump Depth: 74 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Vol Pumped (gal)
2/23 11:58:38	0	26.0	0	82108.7	Pump on @ ~19gpm.			↓Q to	11.1 gpm					
12:01	2	33.8	7.8		11.1					aerated discharge				
12:05	6	33.8	7.8	82187.8	11.2					"		"	137	
12:20	21	33.8	7.8	82355.5	11.2								6.09	
12:35	36	33.8	7.8	82523.2	11.2								4.24	
12:55	56	34.0	8.0	82748.2	11.3	17.3	3.5	40675	34656	27655.6	7.00	-21.5	3.45	639.5
13:10	71	34.05	8.05	82920.2	11.5	17.3	3.6	40881	34862	27805.2	7.04	-57.6	4.56	
13:25	86	34.0	8.0	83092.2	11.5	17.3	3.6	41062	35002	27920.8	7.05	-54.5	4.94	983.5
13:40	101	34.02	8.02	83264.5	11.5	17.3	3.6	41158	35069	27988.8	7.05	-44.8	4.67	
13:55	116	34.1	8.1	83436.8	11.5	17.3	3.6	41219	35124	28029.6	7.05	-34.7	3.76	
14:10	131	34.1	8.1	83609.5	11.5	17.3	3.6	41258	35155	28056.8	7.05	-25.0	4.00	
14:25	146	34.2	8.2	83782.1	11.5	17.3	3.7	41289	35178	28077.2	7.05	-16.2	4.17	
14:40	161	34.1	8.1	83954.9	11.5	17.3	3.6	41305	35193	28090.8	7.05	-9.0	4.39	1846.2
14:52	173	34.1	8.1	84093.1	11.5	17.2	3.7	41315	35193	28097.6	7.05	-4.4	4.38	
14:55	176				↓Q	to 5.8gpm ; 14:58 ↓Q to			2.8 gpm					
15:02	183	28.27	2.27	84158.2	2.8	17.7	3.5	41317	35647	28097.6	7.06	-7.8	0.16	
15:12	193	28.25	2.25	84186.4	2.8	18.3	3.4	41304	36002	28084.0	7.06	-12.3	3.65	
15:22	203	28.2	2.2	84214.0	2.8	18.4	3.4	41288	36046	28077.2	7.07	-14.3	9.61	
15:32	213	28.2	2.2	84241.6	2.8	18.4	3.4	41270	36070	28063.6	7.07	-15.7	13.5	
15:42	223	28.15	2.15	84269.0	2.7	18.4	3.3	41262	36051	28056.8	7.07	-14.4	17.0	

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1219.5 mL/min
= 1180.2 mL/min (↓Q @ 14:55)

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 5

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-BIWQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 73 ft bgs
Static WL: 26.0 ft brp
RP: 7.0 ft agl

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 2-23-14 / Sun
Screened Interval: 84-94 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 74 ft bgs

0.68 constant

	Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft) (26.0)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)
2/23	15:48	229				↑Q to	11.5 gpm					15:50 →		3.05
	15:55	236	34.0	8.0	84369.2	11.5	17.2	3.6	41312	35180	28090.8	7.06	-2.8	0.40
	16:05	246	34.0	8.0	84485.0	11.6	17.2	3.6	41325	35170	28104.4	7.05	3.6	0.27
	16:15	256	34.05	8.05	84600.5	11.6	17.2	3.6	41336	35167	28111.2	7.05	7.9	0.47
	16:20	Collect WQ Samples for lab analysis. Samples placed on ice.												
	16:43	284	34.1	8.1	84931.0	11.8	17.2	14.0	41346	35171	28118.0	7.05	12.7	0.12
	16:50:24	291			85016.7	Pump off.		← ? not stabilizing.						
			Total Volume pumped = 2908 gallons											
2/24	09:30		26.3	0.3	Recovered water level prior to pulling Zone tool.									

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 6

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L.'s taken using an electronic W.L. indicator

Borehole Name/Number: CX-BIWQ

Sonic Casing Dia: 9 in Sonic Casing Depth: 34 ft bgs

Static WL: 25.25 ft brp

RP: 6.0 ft ags (top of 9" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Test Date: 2-24-14 / Mon

Screened Interval: 51-61 ft bgs

Reference Point Elevation: ____ ft amsl

Pump Depth: 47 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Vol Pumped (gal)
14:01:32	0	25.25	0	85016.7	Pump on @ 10.4 gpm									
14:04	2		–		Pump off. PWL reaches pump.									
14:08:20	0			85048.4	Resume pumping @ 5.2 gpm.									
14:10	2	37.6	12.35		5.2									
14:15	7	38.55	13.30	85087.1	5.2				aerated discharge				684	
14:30	22	38.9	13.65	85166.0	5.3								151	
14:45	37	40.15	14.90	85246.5	5.4	17.7	3.0	32656	28069	22208.8	7.12	-174.7	62.0	
15:00	52	40.1	14.85	85330.5	5.6	17.6	3.1	33784	29013	22990.8	7.17	-159.3	13.4	313.8
15:15	67	40.25	15.00	85412.2	5.4	17.6	3.2	34309	29483	23330.8	7.18	-142.4	6.29	
15:30	82	40.35	15.10	85494.2	5.5	17.6	3.3	34701	29777	23589.2	7.18	-130.1	4.27	
15:45	97	40.4	15.15	85576.5	5.5	17.6	3.5	35076	30098	23847.6	7.18	-120.1	3.87	559.8
16:00	112	40.4	15.15	85658.6	5.5	17.5	3.6	35234	30194	23963.2	7.18	-113.5	4.26	641.9
16:15	127	40.4	15.15	85740.6	5.5	17.5	3.7	35355	30316	24051.6	7.18	-108.0	4.42	
16:30	142	40.7	15.45	85823.1	5.5	17.5	3.7	35451	30377	24099.2	7.18	-102.9	5.41	
16:45	157	40.8	15.55	85906.7	5.6	17.4	3.8	35658	30507	24242.0	7.17	-98.2	4.47	
16:52	164				↓Q to	4.1 gpm						16:55→	0.60	
17:00	172	36.25	11.0	85978.3	4.1	17.8	3.8	35644	30716	24242.0	7.17	-95.3	0.57	
17:10	182	36.35	11.1	86020.7	4.2	17.7	3.8	35703	30750	24282.8	7.17	-93.5	1.34	
17:20	192	36.33	11.08	86063.1	4.2	17.7	3.7	35736	30790	24303.2	7.17	-91.3	2.48	
17:24:32	197			86081.8	Pump off. Total Volume pumped = 1065.1 gallons									

Flow thru cell = 1,145.9 mL/min

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit 17:30 26.0 ftbrp

Cond: +/- 3%

ORP: +/- 10 mV

Turb: +/- 10%

DO: +/- 10%

Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

Sheet 2

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 6

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B1WQ
Sonic Casing Dia: 9 in Sonic Casing Depth: 34 ft bgs
Static WL: 25.9 ft brp
RP: 6.0 ft ags (top of 9" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling (W.L.'s)
Test Date: 2-25-14 / Tue
Screened Interval: 51-61 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 47 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	Vol Pumped (gal)
07:49:48	0	25.9	0	86081.8	Pump on 9.2 gpm			0752 ↓Q to	4.1 gpm.		0755 ↑Q to	5.7 gpm		
08:00	10	37.4	11.5	86141.1	5.8				discharge is aerated				22.6	
08:15	25	38.5	12.6	86231.7	6.0	17.4	3.3	35755	30568	24303.2	7.17	-59.3	5.09	
08:30	40	38.5	12.6	86322.3	6.0	17.5	3.4	35851	30693	24378.0	7.18	-68.6	1.56	240.5
08:45	55	38.6	12.7	86413.0	6.0	17.5	3.4	35906	30751	24425.6	7.18	-69.1	0.62	
08:55	65	38.65	12.75	86473.5	6.1	17.5	3.4	35926	30762	24439.2	7.18	-68.5	0.34	
09:05	75	38.7	12.8	86534.0	6.1	17.5	3.5	35952	30803	24452.8	7.18	-67.3	0.33	
09:10	80	Begin collecting WQ samples for lab analysis. samples placed on ice.												
09:31	101	38.8	12.9	86697.4	6.3	17.5	3.6	35999	30861	24493.6	7.18	-63.4	0.25	
09:36:56	107			86733.5										
		Total volume pumped today = 651.7 gallons												
10:15	145	25.8												

Flow thru cell = 1133.8 mL/min

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

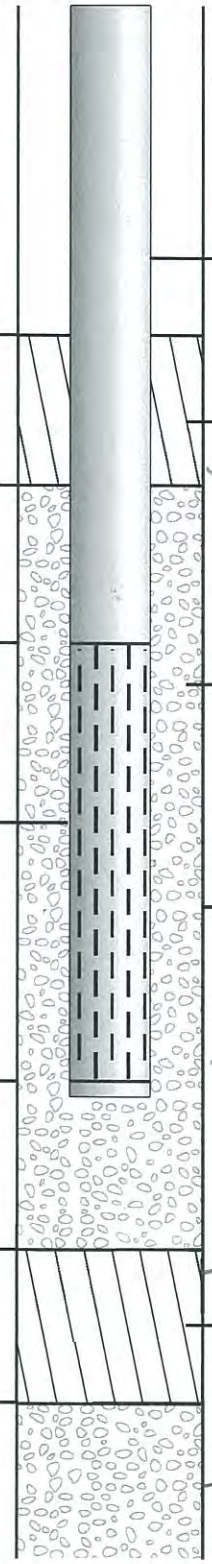
pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 1

204 **to** 236 **ft bgs**



4 -in Diameter ~~Drill~~ Pipe PVC

204 ft bgs

5 -ft Upper Bentonite Seal

MISWACO Kwik Plug Medium Bentonite Chips (3/8") (2 bags

209 ft bgs

215 ft bgs

Gravel Pack

10 -ft Perforated Tool

8" -in Diameter Pilot Borehole

Cemex Monterey Sand #3 (13 bags)

225 ft bgs

MISWACO Hole Plug

229 ft bgs

7 -ft Lower Bentonite Seal (2 1/3)

236 ft bgs

Backfill w/ Cemex Monterey Sand #3 (7 bags)

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Client: RBF Consulting Inc.

Well Name/Number: CX-B2WQ

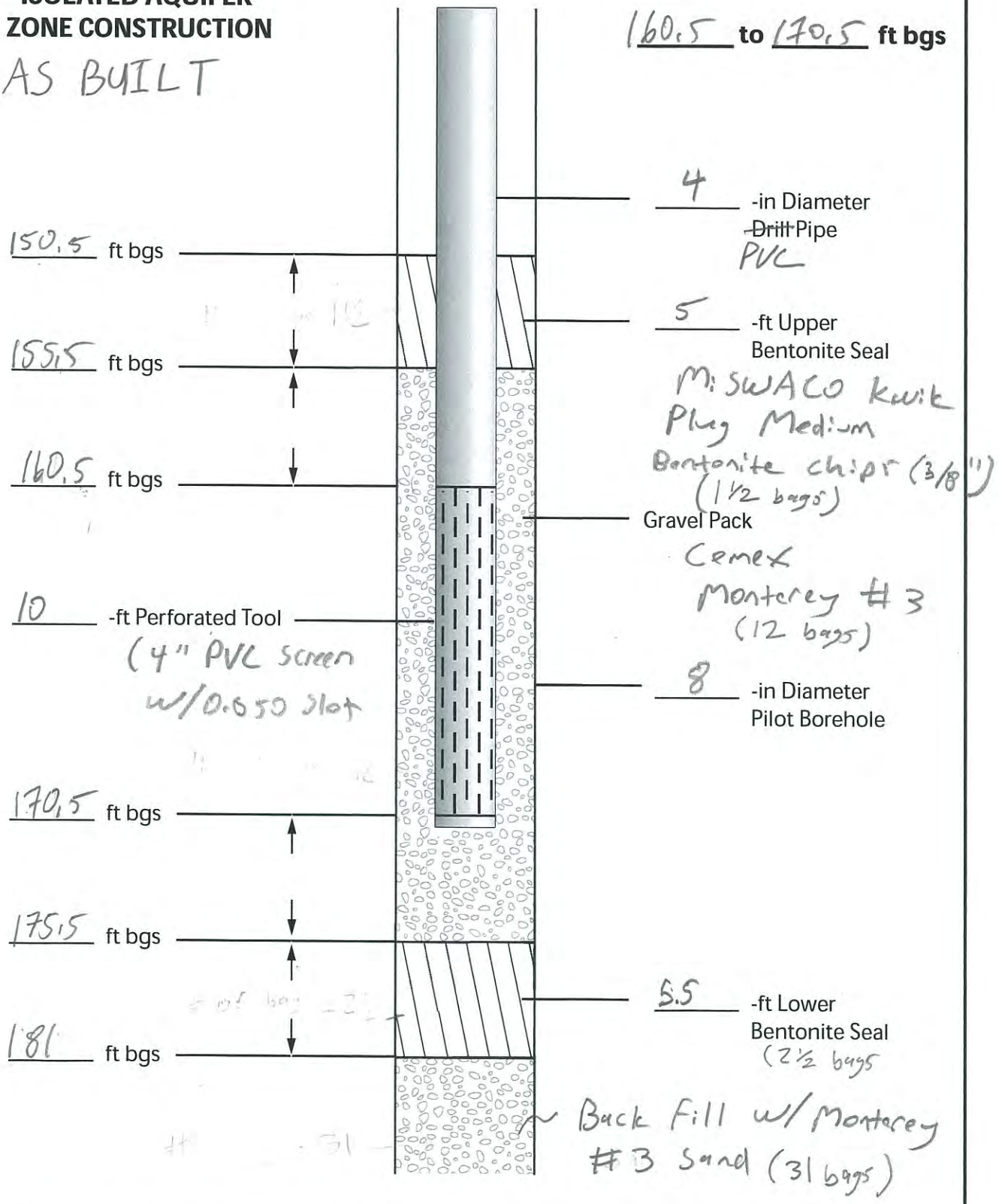
Date: 3/7/14

ISOLATED AQUIFER ZONE CONSTRUCTION

AS BUILT

Zone No. 2

160.5 **to** 170.5 **ft bgs**



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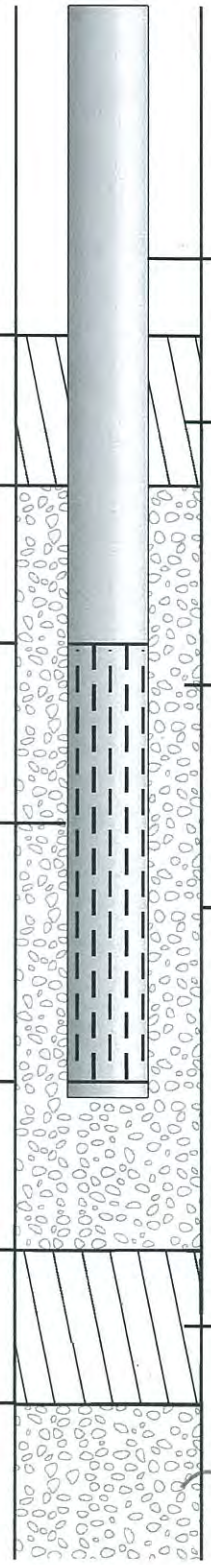
	Well Name/Number: MRWSP Exploratory Borehole CX-B2WQ
	Date: 3/9/14 Sunday

ISOLATED AQUIFER ZONE CONSTRUCTION

AS BUILT

Zone No. 3

104 **to** 114 **ft bgs**



4 -in Diameter ~~Drill~~ Pipe PVC

94 ft bgs

5 -ft Upper Bentonite Seal

99 ft bgs

MISWACO Kwik Plug Medium Bentonite Chips (3/8") (1 1/2 bags)

104 ft bgs

Gravel Pack

Cemex Monterey #3 (10½ bags)

10 -ft Perforated Tool

8 -in Diameter Pilot Borehole

114 ft bgs

116 ft bgs

5 -ft Lower (2½ bags) Bentonite Seal

121 ft bgs

Backfill w/ Monterey #3 Sand (33 bags)

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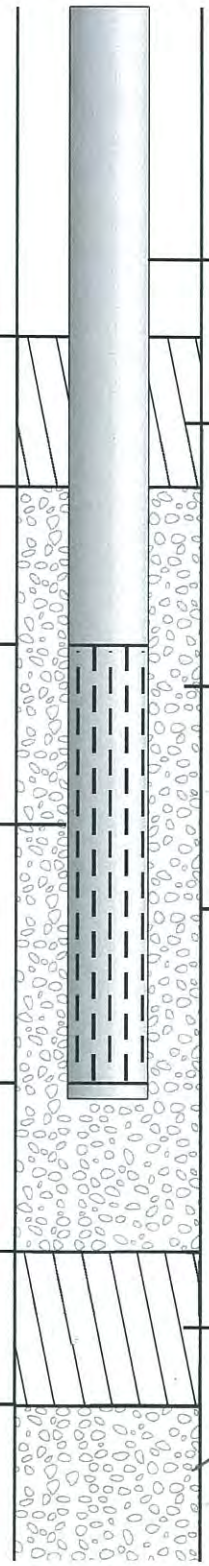
ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 4

55 **to** 65 **ft bgs**



4 -in Diameter ~~Drill~~ Pipe PVC

44 ft bgs

5.5 -ft Upper Bentonite Seal

49.5 ft bgs

Mi SWACO Kwik Plug Medium Bentonite Chips (3/8") (1 ½ bags)

55 ft bgs

Gravel Pack

Cemex Monterey #3 (10½ bags)

10 -ft Perforated Tool

8 -in Diameter Pilot Borehole

65 ft bgs

70 ft bgs

2½ bags

5 -ft Lower Bentonite Seal

75 ft bgs

Backfill w/ Monterey #3 Sand (14 bags)

GEOSCIENCE GEOSCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909) 451-6650 Fax: (909) 451-6638 www.gssiwater.com	Client: RBF Consulting Inc Well Name/Number: MPWSP Exploratory Bore hole CX-B2WQ Date: 3/12/14

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B2WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 210 ft bgs
Static WL: 36.4 ft brp
RP: 8 ft

Logged By: J. Sebder (GSSI) & Cascada WL's
Test Date: 3/8/14 / Saturday
Screened Interval: 215-225 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 197 ft bgs

	Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal x10)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L) 0.68 constant	pH	ORP (mV)	Turbidity (NTU)	Vol (gal)
	0755	0	36.4	0	8678	Pump on @ 0755									
	0757	2	46.2	9.8	8679.5	7.5									
Q↑.	0801	6	48.9	12.5	8683	8.75									
Q↑	0805	10	51.5	15.1	8691.5	21.25									
	0825	30	51.7	15.3	8730.5	19.5									
	0840	45	51.85	15.45	8760.5	20									
	0855	60	51.5	15.1	8790	19.66								24.0	
	0910	75	52	15.6	8820	20	19°C	2.9	35366	31322	24058	6.64	103.9	3.98	1570
	0925	90	52.2	15.8	8849.5	19.67	18.8	1.2	35364	31223	24051.6	6.70	79.2	2.85	
	0940	105	52.3	15.9	8879.5	20	18.9	0.9	35254	31127	23970	6.71	71.1	2.47	
Q↓	0955	120	52.35	15.95	8909	19.67	18.9	0.9	35159	31057	23908.7	6.71	67.7	1.90	
	1010	135	43.6	7.2	8927.5	12.33	19.1	0.9	35318	31339	24010	6.72	57.5	1.47	
	1025	150	43.55	7.15	8941.5	9.33	19.2	0.9	35319	31408	24017	6.72	52.1	1.45	
	1040	165	43.50	7.10	8956	9.67	19.3	0.9	35311	31455	24010.8	6.72	48.7	0.91	
	1050	175	43.55	7.15	8960	10	19.2	0.9	35319	31410	24010.8	6.73	45.1	0.78	
	1100	185	43.50	7.10	8976.5	10.5	19.2	0.9	35342	31380	24030.2	6.74	43.4	1.45	
	1115	200	43.55	7.15	8990.5	9.33	19.3	0.9	35349	31471	24058.0	6.74	41.6	1.62	
	1130	215	43.55	7.15	9005.5	10	19.4	0.9	35337	31352	24024.1	6.77	36.0	2.09	
	1145	230	43.60	7.20	9020.5	10	19.3	0.9	35297	31454	24004	6.83	30.3	3.09	
	1200	245	43.60	7.20	9034.5	9.33	19.2	0.9	35299	31398	23997.2	6.72	37.6	3.15	

Stabilization Criteria:

~~3 to 5 minute~~ recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Flow thru cell = 940 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B2WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 210 ft bgs
Static WL: 36.4 ft brp
RP: 8 ft

Logged By: J. Schooler (GSSI) & Cascade - WL's
Test Date: 3/8/14 Saturday
Screened Interval: 215-225 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 197 ft bgs
0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal x10)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
1215	260	43.55	7.15	9049.5	10	19.2	0.9	35272	31384	23983.6	6.72	40.1	3.90
1230	275	43.55	7.15	9064.5	10	19.1	0.9	35269	31308	23976.8	6.71	39.3	2.44
1245	290	43.50	7.10	9078.5	9.33	19.2	0.9	35308	31417	24010.0	6.71	41.5	1.89
1300	305	43.50	7.10	9093.5	10	19.2	0.9	35305	31312	24004.0	6.71	43.4	3.6
1315	320	41.30	4.90	9106.5	9	19.2	0.8	35309	31382	24004	6.71	40.8	2.53
1330	350	43.80	7.40	9116.5	6.67	19.3	0.8	35413	31544	24072	6.71	35.4	4.29
1345	365	40.80	4.40	9129.0	8.33	19.1	0.8	35284	31347	23997	6.72	38.2	3.65
1400	380	40.70	4.30	9138.5	6.33	19.3	0.8	35335	31483	24031.2	6.72	32.1	5.43
1415	395	40.65	4.25	9147.5	6	19.3	0.8	35313	31470	24017.6	6.72	30.5	7.45
1430	410	40.85	4.45	9156.5	6	19.3	0.8	35310	31473	24012.8	6.72	28.3	11.0
1445	425	44.75	8.35	9170.9	9.6	19.0	0.8	35250	31202	23970.0	6.71	36.8	5.28
1500	440	44.85	8.44	9188.1	11.47	18.9	0.9	35238	31145	23963.2	6.71	42.5	5.86
1515	455	44.90	8.50	9206.4	12.2	18.8	0.9	35221	31059	23949.6	6.71	44.8	2.39
1530	470	44.90	8.50	9224.6	12.13	18.9	0.9	35212	31087	23942.8	6.71	46.2	1.29
1545	485	44.90	8.50	9242.8	12.13	18.8	0.9	35226	31097	23949.6	6.71	47.8	0.46
1555	495	44.95	8.55	9255.0	12.20	18.8	0.9	35210	31027	23942.8	6.71	48.5	0.69
1605	505	44.95	8.55	9267.1	12.10	18.8	0.9	35199	31029	23936.0	6.71	49.0	0.91
WQ Sampling @ 1606						Finished Sampling @ 1635							
1638	538	44.90	8.50	9307.5	12.42	18.8	0.9	35152	30973	23902	6.71	49.4	0.90
1645	545	44.90	8.50	9316.0	13.07	18.8	0.9	35143	30951	23895.2	6.71	49.4	0.70

Q↑ Q↑ Q↓ Q↑

final totalizer = 9319.20 gals

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Form Created: 29-Sep-13

Sheet 1 2

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2 WL's

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B2 WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 147 ft bgs
Static WL: 34.25 ft brp
RP: 8 ft ags (Top of Casing)

Logged By: J. Sobolew & Cascade Drilling
Test Date: 3/9/14 Sunday
Screened Interval: 161-171 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 151 ft bgs

0.68 constant

	Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal x10)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	VOL (mL/min)
3/9	1454	0	34.25	Ø	9319	~10gpm									
	1456	2	65.2	30.95	9321	~10gpm	missed correct totalizer times								
	1500	6	68.7	34.45	9325.7	~10gpm									
	1504	10	69.0	34.75	9329.8	10.25								16.5	
	1524	30	69.3	35.05	9350.0	10.6								7.38	
	1539	45	69.35	35.10	9365.3	10.2								6.78	
	1554	60	70.00	35.75	9380.7	10.27								2.90	
	1609	75	69.80	35.55	9396.1	10.27	18.6	1.80	21420	18790	14572	6.86	-41.1	3.24	
	1624	90	70.0	35.75	9411.8	10.96			21.34 mS/cm					4.63	
	1639	105	69.20	34.95	9426.7	9.93								5.82	
	1654	120	69.75	35.50	9442.3	10.40	18.4°C	2.2	21506	18800	14620	6.66	78.0	21.3	1,000
	1659	125	70.1	35.85	9447.5	10.40	18.4	1.6	21545	18831	14668.8	6.73	37.5	5.17	
	1704	130	70.00	35.75	9452.6	10.20	18.4	1.6	21582	18849	14654.7.2	6.74	21.8	3.22	
					9454.85	final	totalizer								
3/10	0803	0	34.31	Ø	9454.85										
	0805	2	51.6	17.23	9455.3	2.25			33.36 mS/cm						
	0809	6	52.3	17.93	9458.8	8.75			36.03 mS/cm					Out of Range	
	0813	10	55.1	20.79	9462.1	8.25			33.10 mS/cm					128	
	0833	30	67.25	32.94	9483.5	10.7	18.2	1.5	25558	22238	17333.20	6.67	45.2	3.76	1,000
	0848	45	67.1	32.79	9499.1		18.2	1.5	22493	19597	15293	6.79	32.0	2.24	

Flow through cell - 1,000 mL/min

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Form Created: 29-Sep-13

Sheet 2 2

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B2 WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 142 ft bgs
Static WL: 34.31 ft brp
RP: 8ft ags (Top of casing)

Logged By: J. Sobolew & Cascade Drilling, WL's
Test Date: 3/10/14 Monday
Screened Interval: 161-171 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 151 ft bgs
0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal x10) 9499.1	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	Vol ML/min
0903	60	67.45	33.14	9515.0	10.6	18.2	1.4	21701	18900	14762.8	6.70	25.1	2.03	1,100
0918	75	67.50	33.19	9530.8	10.53	18.3	1.4	21502	18739	14620.0	6.69	25.1	1.93	
0933	90	67.60	33.29	9546.6	10.53	18.3	1.4	21467	18755	14606.40	6.69	26.8	1.17	
0948	105	67.60	33.29	9563.7	11.40	18.3	1.5	21634	18887	14715.00	6.69	29.3	0.76	
0958	115	67.60	33.29	9573.0	9.30	18.3	1.4	21646	18879	14708.40	6.69	29.9	0.74	
1008	125	67.70	33.39	9583.60	10.6	18.3	1.4	21620	18875	14708.40	6.69	30.9	0.49	
1012	WQ	Sampling												
1044	161	67.85	33.54	9622.40	10.78	18.4	1.4	21681	18965	14749.2	6.68	35.8	0.29	1,000
1054	171	67.85	33.54	9633.0	10.60	18.4	1.4	21686	18960	14762.8	6.68	36.2	0.44	
1104	181	68.10	33.79	9643.5	10.50	18.4	1.4	21710	18952	14749.0	6.68	36.7	0.28	
1114	191	68.0	33.69	9654.1	10.50	18.4	1.4	21715	18996	14776.4	6.68	37.5	0.24	
1117	Final	totalizer		9656.8	pump off									
1220	WL	Recovery	= 35.30 ft brp											

Stabilization Criteria:
3 to 5 minute recordings with 3 consecutive readings within:
pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Flow through cell = 1,100 mL/min

Form Created: 29-Sep-13

Sheet 1 of 3

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 3

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B2WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 92 ft bgs
Static WL: 31.70 ft brp
RP: 8 ft ags (Top of Casing)

Logged By: J. Sobolew & Cascade WL's
Test Date: 3/10-11/14
Screened Interval: 104-114 ft bgs
Reference Point Elevation: _____ ft amsl
Pump Depth: 91 ft bgs

	Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal x10)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	VOL (mL/min)
3/10	1627	0	31.70	0	9656.4		Myron L								
	1629	2	47.00	15.30	9658.8	12.0	19.3		8632 µS/cm					047 off range	
	1633	6	47.00	15.30	9664.9	15.25	18.2		31.73 mS/cm					" "	
	1637	10	45.30	13.60	9668.2	8.25	17.9		32.52 mS/cm					291	
	1642	15	45.70	14.0	9673.6	10.80	18.1		35.68 mS/cm					94.3	
	1643	Pump	off	<	9674.2										
3/11	0754	0	32.30	0	9674.2										
highly aerated	0756	2	45.70	13.40	9676.7	12.50								81.60	
	0800	6	45.65	13.35	9681.3	11.50								11.90	
	0804	10	45.85	13.55	9685.9	11.50	17.8	5.7	39363	33919	26751.2	6.69	127.3	5.29	
	0824	30	45.90	13.60	9709.0	11.55	17.8	4.6	38170	32980	25976.0	7.01	8.1	5.26	1,400
	0839	45	45.85	13.55	9726.3	11.53	17.8	4.6	38848	33526	26424.6	7.00	-3.3	5.05	
	0854	60	45.90	13.60	9743.6	11.53	17.9	4.7	39263	33912	26696.0	6.98	2.9	2.39	
	0909	75	45.95	13.65	9761.2	11.60	17.9	5.0	39662	34262	26975.6	6.98	12.6	2.45	
	0924	90	45.95	13.65	9778.4	11.47	17.9	5.1	39796	34408	27057.2	6.97	21.2	2.69	
	0939	105	45.95	13.65	9796.1	11.80	18.0	5.1	39821	34467	27077.6	6.97	27.9	2.65	1,000
	0954	120	46.0	13.70	9813.1	11.33	18.0	5.3	39909	34539	27132.0	6.97	33.6	1.53	
	1009	135	46.0	13.70	9830.6	11.66	18.0	5.3	39946	34607	27166.2	6.96	38.8	1.97	
	1024	150	46.0	13.70	9848.0	11.60	18.0	5.4	39974	34662	27179.6	6.96	42.2	2.52	
	1039	165	46.05	13.75	9865.4	11.60	18.0	5.4	33998	34666	27193.2	6.97	44.6	2.30	

Stabilization Criteria:
3 to 5 minute recordings with 3 consecutive readings within:
pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Flow through cell = 1,100 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 3

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B2WQ
Sonic Casing Dia: 8 in (3/10, 3/11) Sonic Casing Depth: 12 ft bgs
Static WL: 31.7, 32.3 ft brp
RP: 8 ft ags (Top of Casing)

Logged By: J. Sobolew & Cascade Drilling / WL's
Test Date: 3/10-11/14
Screened Interval: 104-114 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 91 ft bgs
0.68 Constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal) 9865.4	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	VOL (mL/min)
1054	180	46.00	13.70	9882.9	11.67	18.1	5.4	40044	34733	27234.2	6.96	46.5	1.25	1,050
1109	195	46.05	13.75	9900.3	11.60	18.1	5.3	40057	34741	27234.0	6.96	47.3	0.49	
1119	210	46.00	13.70	9912.0	11.70	18.1	5.3	40017	34769	27220.4	6.97	48.0	1.07	
1129	220	46.00	13.70	9923.6	11.60	18.1	5.4	40025	34769	27213.0	6.97	47.9	1.89	
1144	235	46.05	13.75	9941.1	11.66	18.1	5.3	40029	34781	27213.6	6.96	48.5	1.80	
1159	250	46.00	13.70	9958.4	11.53	18.1	5.3	40022	34794	27213.6	6.96	48.1	0.94	
1209	260	46.00	13.70	9970.1	11.70	18.2	5.3	40061	34807	27247.6	6.97	47.5	1.87	
1224	275	46.00	13.70	9987.5	11.60	18.1	5.3	40069	34712	27247.6	6.96	47.2	2.38	
Q↓ 1239	210	46.10	13.80	10004.9	11.60	18.2	5.3	40037	34710	27227.2	6.97	46.0	3.04	
1254	305	37.70	5.40	10016.0	7.4	18.7	5.2	40125	35342	27281.6	6.98	36.6	5.66	
1309	320	37.70	5.40	10023.5	5.0	18.8	5.2	40133	35349	27288.4	6.97	31.7	3.72	
1324	335	37.70	5.40	10031.0	5.0	18.9	5.2	40133	35339	27288.8	6.98	30.9	3.06	
1339	350	37.70	5.40	10038.4	4.93	18.8	5.2	40126	35380	27281.6	6.97	29.7	1.90	
1354	365	37.70	5.40	10045.86	4.97	18.7	5.2	40150	35342	27308.8	6.97	29.1	1.90	
1409	380	37.70	5.40	10053.32	4.97	18.7	5.3	40155	35332	27302.0	6.97	28.2	1.70	
1424	395	37.70	5.40	10060.78	4.97	18.6	5.2	40156	35279	27308.8	6.97	27.0	4.24	
1439	410	37.70	5.40	10068.23	4.97	18.6	5.3	40159	35288	27308.8	6.97	26.4	3.19	
Q↑ 1454	425	37.60	5.30	10075.57	4.89	18.6	5.3	40166	35265	27308.8	6.97	25.5	4.58	1,200
1509	440	51.35	19.05	10097.08	14.34	17.7	5.6	40159	34555	27308	6.96	39.8	0.86	
1524	455	51.4	19.1	10121.98	16.60	17.7	5.6	40166	34536	27315.6	6.95	44.2	0.69	

Flow through cell = 1,050 mL/min

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 3

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-BZ WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 92 ft bgs
Static WL: 31.7 (3/10), 32.3 (3/11) ft brp
RP: 8 ft agl (Top of casing)

Logged By: J. Sobolew & Cascade Drilling WL's
Test Date: 3/10-11/14
Screened Interval: 104-114 ft bgs
Reference Point Elevation: _____ ft amsl
Pump Depth: 91 ft bgs
0.68 Constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal) 10121.98	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	VOL (mL/min)
1534	465	51.40	19.10	10137.35	15.37	17.7	5.6	40170	34534	27315.6	6.96	45.1	0.73	1,200
1544	475	51.40	19.10	10153.56	16.21	17.6	5.7	40173	34532	27315.6	6.96	45.6	0.57	
1545	* WQ Sampling													
1614	505	51.3	19.00	10203.05	16.50	17.7	5.6	40185	34550	27322.4	6.96	45.5	0.58	
1624	515	51.40	19.10	10218.13	15.08	17.6	5.7	40188	34534	27329.2	6.96	45.9	0.45	
1634	525	51.35	19.05	10234.26	16.13	17.6	5.6	40189	34534	27329.2	6.96	45.9	0.35	
1637	pump	off	@	10237.43										
3/12 0745		32.60	WL Recovery											

Stabilization Criteria:
3 to 5 minute recordings with 3 consecutive readings within:
pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Flow through Cell = 1,200 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 4

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B2WQ
Sonic Casing Dia: 18 in Sonic Casing Depth: 44 ft bgs
Static WL: 29.75 ft brp 30.80 w/pump in
RP: 6.5 ft ags (top of casing)

Logged By: J. Sobolew & Cascade - WL's
Test Date: 3/12/14 Wednesday
Screened Interval: 55-65 ft bgs
Reference Point Elevation: ft amsl
Pump Depth: 54 ft bgs
0.68 Constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gals)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	VOL (mL/min)
1205	0	30.80	0	102374.2										
1207	2	34.80	4.00	102395.1	10.45								Out of Range	
1211	6	35.00	4.20	102424.4	7.33								Out of Range	
QT 1215	10	35.00	4.20	102453.6	7.30								Out of Range	
1235	30	36.50	5.70	102634.7	9.06								71.5	1,100
1250	45	36.65	5.85	102781.7	9.80	18.3	4.4	39400	34377	26771.6	7.11	-34.7	9.59	
1305	60	36.65	5.85	102930.0	9.89	18.3	4.5	39553	34531	26918.4	7.11	-27.3	7.64	
QT 1320	75	36.65	5.85	103078.4	9.89	18.3	4.6	39691	34643	26996.0	7.11	-20.1	6.52	
1335	90	37.90	7.10	103247.9	11.30	18.2	4.5	39727	34565	27016.4	7.12	-13.7	7.57	
1350	105	37.85	7.05	103427.8	11.99	18.2	4.6	39745	34616	27030.8	7.11	-9.1	5.30	1,100
1405	120	37.85	7.05	103607.8	12.00	18.2	4.6	39771	34581	27043.6	7.12	-6.6	5.64	
1420	135	37.85	7.05	103788.0	12.01	18.2	4.6	39762	34578	27043.6	7.12	-3.3	4.15	
1435	150	37.85	7.05	103968.2	12.01	18.1	4.7	39752	34555	27023.3	7.12	-0.5	3.04	
1450	165	37.85	7.05	104148.4	12.01	18.1	4.7	39725	34520	27016.4	7.12	2.1	2.63	1,000
1505	180	37.85	7.05	104328.7	12.02	17.9	4.8	39721	34358	27016.4	7.12	4.3	2.53	
1520	195	37.85	7.05	104508.9	12.01	17.8	4.8	39742	34309	27030.0	7.12	7.0	1.21	
1535	210	37.85	7.05	104689.3	12.03	17.8	4.7	39729	34273	27016.4	7.12	8.7	0.98	
1545	220	37.85	7.05	104809.5	12.02	17.8	4.7	39703	34237	27002.8	7.10	10.1	0.87	
1555	230	37.85	7.05	104939.8	12.97	17.8	4.8	39704	34240	27002.8	7.12	11.1	1.79	
1610	245	37.85	7.05	105110.0	11.35	17.9	4.7	39610	34276	26989.2	7.12	12.8	1.75	

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Flow Through Cell = 1,100 mL/min

Form Created: 29-Sep-13

Sheet 2 . 2

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 4

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: Cx-B2WQ
Sonic Casing Dia: 8 in Sonic Casing Depth: 44 ft bgs
Static WL: 29.75 ft brp 30.80 w/pump in
RP: 6.5 ft agl (top of casing)

Logged By: J. Sobolew & Cascade Drilling - WL's
Test Date: 3/12/14 Wednesday
Screened Interval: 55-65 ft bgs
Reference Point Elevation: _____ ft amsl
Pump Depth: 54 ft bgs
0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal) 105110.0	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	VOL (mL/min) 1,000
1625	260	37.85	7.05	105290.5	12.03	17.7	4.7	39696	34194	26989.2	7.10	13.4	0.83	
1635	270	37.85	7.05	105410.6	12.01	17.7	4.7	39694	34162	26996.0	7.12	13.9	1.22	
1645	280	37.85	7.05	105530.7	12.01	17.7	4.7	39676	34155	26982.4	7.13	14.1	0.99	
1655	290	37.85	7.05	105651.0	12.03	17.8	4.7	39660	34141	26975.6	7.12	15.7	0.42	
1705	300	37.85	7.05	105771.2	12.02	17.8	4.7	39657	34162	26968.8	7.12	16.2	0.63	
1715	WQ	Sampling												
1730	325	37.85	7.05	106071.9	12.03	17.7	4.7	39650	34100	26962.0	7.13	17.5	0.98	
1740	335	37.85	7.05	106191.6	11.97	17.6	4.7	39642	34077	26962.0	7.13	18.3	0.85	
				106219.3										
3/13 0735	Recovery	31.20 ft	brp											

Stabilization Criteria:
3 to 5 minute recordings with 3 consecutive readings within:
pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Flow through cell = 1,000 mL/min

Form Created: 29-Sep-13

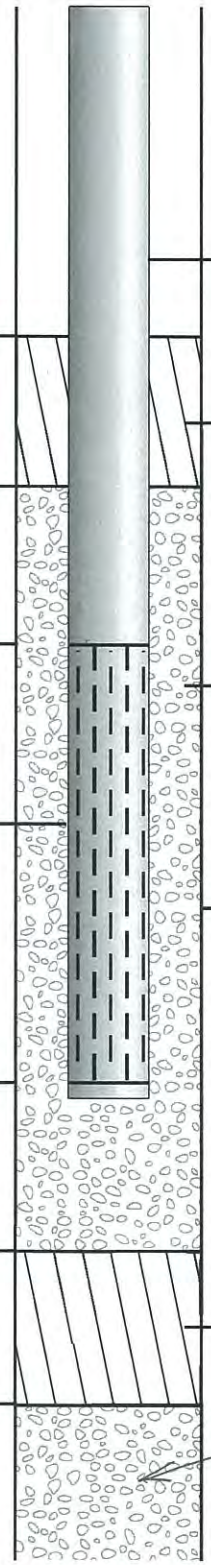
Zone # 1 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 1

306 **to** 316 **ft bgs**

8" Sonic Casing to 285 ftbgs. Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

289.5 ft bgs

10.0 ft

10.0 -ft Upper Bentonite Seal

MiSWACO Kwik-Plug Medium (3/8") Bentonite Chips (2 bags)

299.5 ft bgs

6.5 ft

306 ft bgs

Gravel Pack CEMEX Monterey #3 (15 bags)

10 -ft Perforated Tool (4" PVC Screen w/ 0.050" slot)

8 -in Diameter Pilot Borehole

316 ft bgs

5.5 ft

321.5 ft bgs

7.5 ft

7.5 -ft Lower Bentonite Seal (3 bags)

329 ft bgs

native material

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Client: RBF Consulting Inc.

Well Name/Number: MPWSP Exploratory Borehole CX-B4

Date: 4-3-14 / Thu & 4-4-14 / Fr.

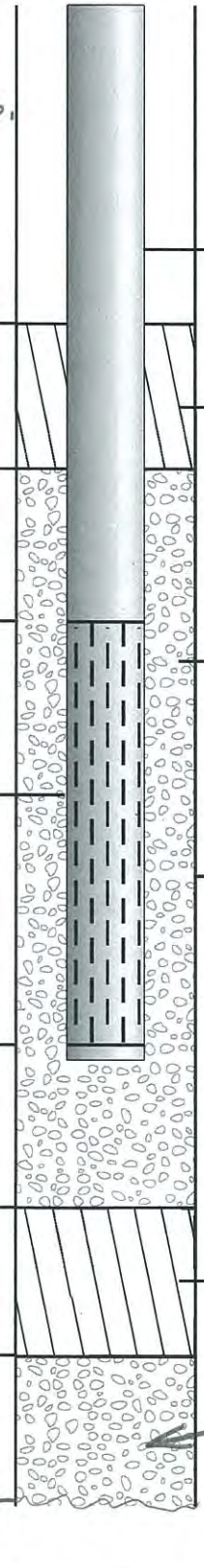
Zone #2 As-Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 2

248 **to** 258 **ft bgs**

8" Sonic Casing to 236 ftbgs. Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

236 ft bgs

6.5 ft

6.5 -ft Upper Bentonite Seal

Mi SWACO Kwik-Plug Medium (3/8") Bentonite Chips (2 bags)

242.5 ft bgs

5.5 ft

248 ft bgs

Gravel Pack CEMEX Monterey #3 (13.5 bags)

10 -ft Perforated Tool (4" PVC Screen w/ 0.050" slots)

8 -in Diameter Pilot Borehole

258 ft bgs

5 ft

263 ft bgs

6 ft

6 -ft Lower Bentonite Seal (2.5 bags)

269 ft bgs

33 bags of CEMEX Monterey #3

800 gal H_2O

300 ftbgs

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Client: RBF Consulting Inc.

Well Name/Number: MPWSP Exploratory Borehole CX-B4

Date: 4-5-14 / Sat

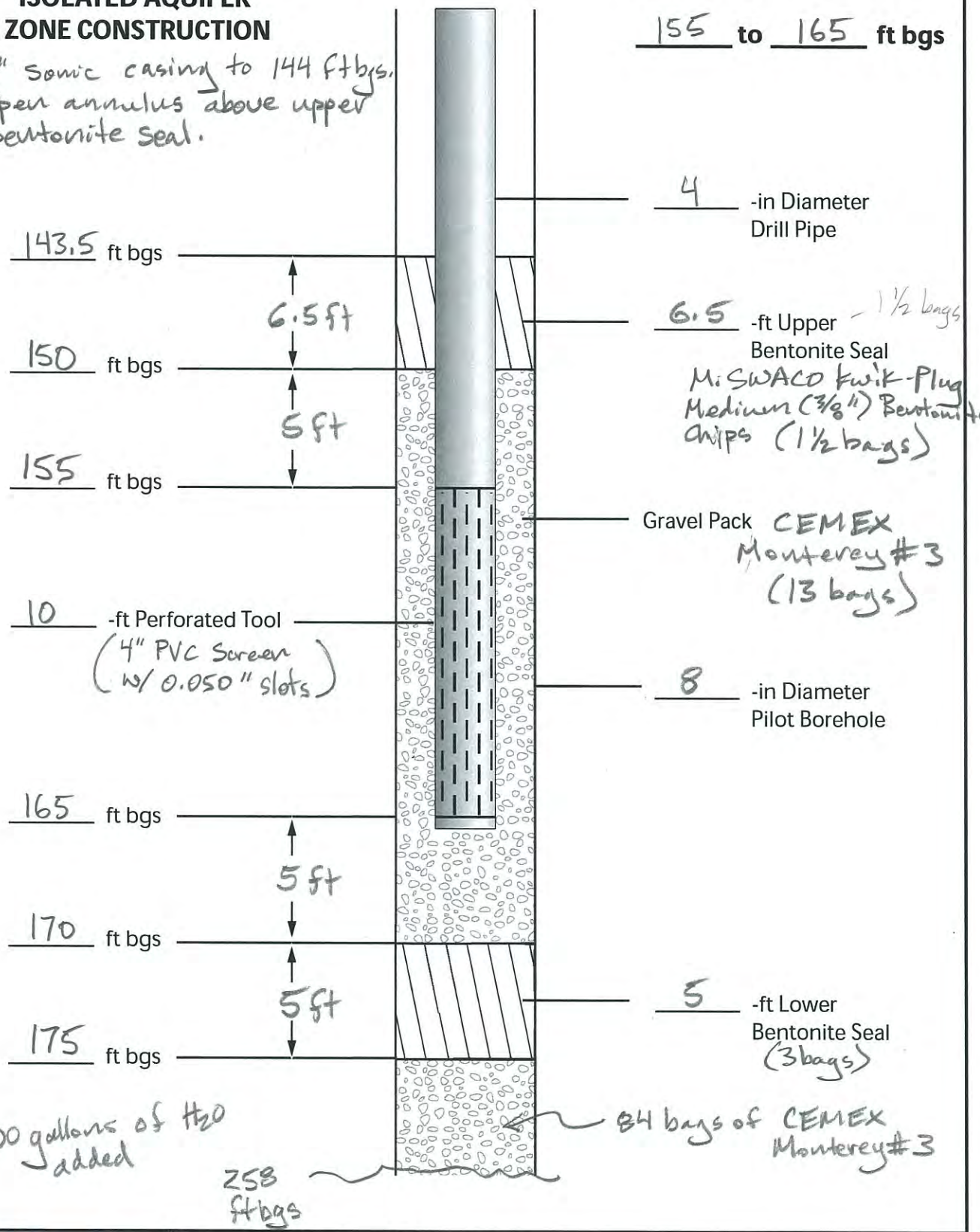
Zone#3 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 3

155 to 165 ft bgs

8" sonic casing to 144 ftbgs. Open annulus above upper bentonite seal.



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Client: RBF Consulting Inc.

Well Name/Number: MPWSP Exploratory Borehole CX-B4

Date: 4-7-14 / Mon

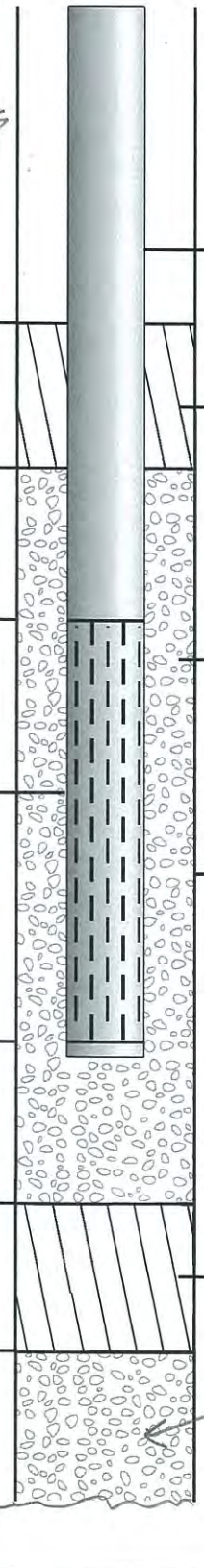
Zone #4 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 4

110 **to** 120 **ft bgs**

8" sonic casing to 95.8 ft bgs
Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ PVC Pipe

99 ft bgs

6.0 ft

6 -ft Upper Bentonite Seal
MiSWACO Kwik-Plug Medium (3/8") Bentonite Chips (2½ bags)

105 ft bgs

5.0 ft

110 ft bgs

Gravel Pack — CEMEX Monterey #3 (12 bags)

10 -ft Perforated Tool
(4" PVC Screen w/0.050" slots)

8 -in Diameter Pilot Borehole

120 ft bgs

4.0 ft

124 ft bgs

7.0 ft

7 -ft Lower Bentonite Seal (3 bags)

131 ft bgs

24 bags of Monterey #3

600 gallons H_2O added

166 ft bgs

GEOSCIENCE GEOSCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909) 451-6650 Fax: (909) 451-6638 www.gssiwater.com	Client: RBF Consulting Inc. Well Name/Number: MPWSP Exploratory Borehole CX-B4 Date: 4-8-14 / Tue

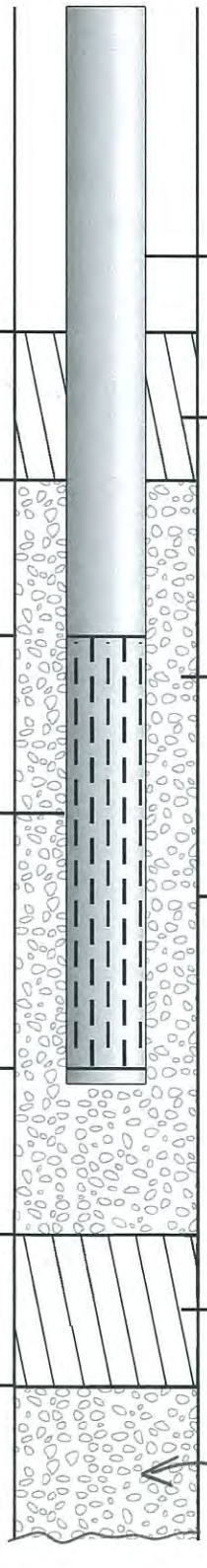
Zone #5 As-Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 5

58 **to** 68 **ft bgs**

8" sonic casing to 45.7ft bgs. Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ PVC Pipe

45 ft bgs

8.0 ft

8.0 -ft Upper Bentonite Seal

Mi SWACO Kwik-Plug Medium (3/8") Bentonite chips. (2 bags)

53 ft bgs

5.0 ft

58 ft bgs

Gravel Pack

CEMEX Monterey #3 (12 bags)

10 -ft Perforated Tool

(4" PVC Screen w/ 0.050" slots)

8 -in Diameter Pilot Borehole

68 ft bgs

5.5 ft

73.5 ft bgs

4.5 ft

4.5 -ft Lower Bentonite Seal (2 bags)

78 ft bgs

Added 700 gal of fresh water

21 bags of CEMEX Monterey #3

95 ftbgs

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Client: RBF Consulting Inc.

Well Name/Number: MPWSP Exploratory Borehole CX-B4

Date: 4-9-14 / Wed

Sheet 1 2

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling

N.L.'s taken using an electronic W.L. indicator.

Borehole Name/Number: CX-B4

Sonic Casing Dia: 8 in Sonic Casing Depth: 285 ft bgs

Static WL: 45.9 ft brp

RP: 7.5 ft ags (Top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling — W.L.'s

Test Date: 4-4-14 / Fri

Screened Interval: 306-316 ft bgs

Reference Point Elevation: ____ ft amsl

Pump Depth: 193.3 ft bgs — intake

Stable

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
12:44:15	0	45.9	0	106218.9	Pump on @~12 gpm.			12:46	↓Q to 9.2 gpm.				
12:50	6	138.0	92.1	—	9.2	↑Q to 9.8 gpm. Rate decreasing on it's own.							
13:05	21	175.8	129.9	—	9.3		water aerated & turbid.						overrange
13:15	31	175.95	130.05	106513.0	9.5		water	milky/aerated					257
13:30	46	175.45	129.55	106653.3	9.4		"		"				47.6
13:45	61	177.25	131.35	106794.6	9.4	21.0	0.6	34260	31679	23334.0	6.73	-32.0	35.7
14:00	76	178.1	132.2	106937.6	9.5	21.1	0.6	35603	32931	24214.8	6.69	-69.4	37.5
14:15	91	176.7	130.8	107080.5	9.5	21.0	0.7	36247	33452	24650.0	6.72	-79.1	29.7
14:30	106	177.5	131.6	107223.4	9.5	21.0	0.7	36662	33834	24935.6	6.66	-82.7	17.4
14:45	121	176.3	130.4	107366.3	9.5	20.9	0.7	37024	34156	25173.6	6.64	-83.2	14.6
15:00	136	177.6	131.7	107508.9	9.5	21.0	0.7	37222	34370	25309.6	6.67	-82.2	8.63
15:15	151	178.2	132.3	107651.2	9.5	21.0	0.7	37434	34581	25459.2	6.69	-80.6	9.05
15:30	166	179.0	133.1	107793.6	9.5	21.0	0.8	37445	34601	25466.0	6.69	-80.5	21.6
15:45	181	179.3	133.4	107936.0	9.5	20.9	0.8	37708	34804	25642.8	6.67	-79.3	5.09
16:00	196	179.1	133.2	108078.4	9.5	20.9	0.8	37807	34902	25704.0	6.65	-77.6	3.80
16:15	211	179.0	133.1	108220.6	9.5	20.9	0.7	37890	34963	25772	6.64	-75.6	3.61
16:30	226	177.7	131.8	108362.1	9.4	20.9	0.7	37977	35004	25826.4	6.63	-73.7	2.31
16:37:57	234			108437.2	Pump off.								
					Total Volume pumped today = 2,218.3 gallons								

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B4
Sonic Casing Dia: 8 in Sonic Casing Depth: 285 ft bgs
Static WL: 50.25 ft brp
RP: 7.5 flags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling (W.L.'s)
Test Date: 4-5-14/Sat
Screened Interval: 306-316 ft bgs
Reference Point Elevation: ft amsl
Pump Depth: 193.3 ft bgs (intake)

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L) (0.68 constant)	pH	ORP (mV)	Turbitity (NTU)
7:48:43	0	50.25	0	108437.2	Pump on @ 9.8 gpm. 7:54 ↑Q to 8.0 gpm (Q dropping)								2.0
8:04	15	129.6	79.35	108566.6	7.7								31.2
8:19	30	133.35	83.10	108681.7	7.7								3.78
8:34	45	134.3	84.05	108796.2	7.6								1.10
8:49	60	134.4	84.15	108910.5	7.6								0.94
9:04	75	135.9	85.65	109026.0	7.7	20.9	1.0	37568	34576	25547.6	6.58	77.3	1.19
9:19	90	138.4	88.15	109145.5	8.0	20.9	0.6	37587	34620	25561.2	6.63	-9.1	0.91
9:34	105	138.85	88.60	109264.9	8.0	20.8	0.6	37654	34619	25602.0	6.62	-28.9	0.63
9:49	120	139.80	89.55	109384.4	8.0	20.9	0.6	37641	34702	25595.2	6.61	-36.4	0.50
9:59	130	139.50	89.25	109464.1	8.0	20.9	0.6	37688	34754	25629.2	6.61	-38.4	0.54
10:00	131	Begin collecting water samples for laboratory analysis. Samples placed on ice.											
10:28	159	140.60	90.35	109699.1	8.1	21.0	0.6	37646	34755	25602.0	6.61	-38.5	0.43
10:35	166	–	–	109754.5	Pump off.								
					Total Volume pumped today = 1317.3 gallons								
11:25	216	48.35	-1.90	recovered	W.L. after pulling pump.								

Flow thru cell = 1480.8 mL/min

Stabilization Criteria:
3 to 5 minute recordings with 3 consecutive readings within:
pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2

Client: RBF/MPWSP - Exploratory Borehole Drilling

WL's taken using an electronic WL indicator.

Logged By: N. Reynolds (GSSI) & Cascade Drilling — W.L.'s

Borehole Name/Number: CX-B4

Test Date: 4-6-14 / Sun

Sonic Casing Dia: 8 in Sonic Casing Depth: 236 ft bgs

Screened Interval: 248 - 258 ft bgs

Static WL: 45.25 ft brp

Reference Point Elevation: _____ ft amsl

RP: 6.7 ft ags (Top of 8" Casing)

Pump Depth: 193.5 ft bgs (intake)

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Tot Vol (gal)
09:27	0	45.25	0	109754.5	Pump on @ 8.7 gpm. 9:29 ↑Q to 14.4 gpm. 0932 ↑Q to 21.3 gpm									
09:35	8	74.25	29.00	109866.5	21.0						aerated.		turbid	
09:45	18	76.05	30.80	110076.5	21.0	Good zone. Higher producing. Aerated.							35.1	
09:50	23				↓Q to 11.8 gpm. 0951 ↓Q to 10.6 gpm									
09:55	28	60.5	15.25	110233.2	10.7								10.8	
10:10	43	60.7	15.45	110395.1	10.8								1.12	
10:25	58	60.8	15.55	110557.3	10.8								0.41	
10:40	73	60.95	15.70											
10:45	78	61.00	15.75	110773.7	10.8								0.67	
11:00	93	61.45	16.20	110936.5	10.9	19.8	3.0	35439	31916	24099.2	6.58	117.0	3.61	1182.0
11:10	103	61.50	16.25	111047.5	11.1	19.7	2.2	35705	32106	24282.8	6.68	47.1	2.35	1293.0
11:20	113	61.60	16.35	111158.5	11.1	19.7	2.2	35944	32340	24446.0	6.68	20.4	2.83	1404.0
11:30	123	61.60	16.35	111269.4	11.1	19.8	2.2	36168	32575	24595.6	6.68	9.7	2.36	
11:45	138	61.60	16.35	111435.6	11.1	19.8	2.2	36450	32845	24792.8	6.68	2.7	2.55	
12:00	153	61.70	16.45	111601.8	11.1	19.8	2.2	36688	33053	24956.0	6.69	-0.9	1.89	
12:15	168	61.70	16.45	111767.8	11.1	19.8	2.3	36915	33269	25105.6	6.68	-0.7	2.48	2013.3
12:30	183	61.75	16.50	111933.7	11.1	19.8	2.3	37081	33434	25214.4	6.68	0.4	1.80	
12:45	198	61.75	16.50	112099.6	11.1	19.8	2.3	37210	33528	25309.6	6.70	1.8	2.34	
13:00	213	61.80	16.55	112265.5	11.1	19.8	2.3	37564	33851	25540.8	6.69	5.0	1.72	
13:15	228	61.80	16.55	112431.5	11.1	19.8	2.3	37658	33967	25608.8	6.74	3.9	2.25	

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Flow thru cell = 1294.2 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B4
Sonic Casing Dia: 8 in Sonic Casing Depth: 236 ft bgs
Static WL: 45.25 ft brp
RP: 6.7 ftags

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 4-6-14 / Sun
Screened Interval: 248-258 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 193.5 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft) (45.25)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Tot Vol (gal)
13:23	236	↓Q to 5.4 gpm							Some fluctuation					
13:30	243	53.60	8.35	112559.8	5.3	20.1	2.3	37738	34242	25663	6.71	3.6	1.89	
13:45	258	53.55	8.30	112641.5	5.4	20.2	2.2	37844	34410	25731.2	6.72	4.9	1.00	
14:00	273	53.55	8.30	112723.0	5.4	20.2	2.2	37882	34414	25758.4	6.74	0.3	2.16	
14:15	288	53.55	8.30	112804.6	5.4	20.2	2.2	37937	34493	25799.2	6.74	0.0	2.98	
14:25	298	↑Q to 21.6 gpm												
14:30	303	77.60	32.35	112962.9	21.2	19.6	2.3	37703	33824	25663.2	6.74	2.3	4.17	
14:45	318	77.70	32.45	113282.4	21.3	19.4	2.3	37947	33924	25806.0	6.70	10.1	2.71	3527.9
15:00	333	77.90	32.65	113602.2	21.3	19.5	2.4	38122	34087	25928.4	6.67	21.7	2.26	
15:15	348	78.00	32.75	113922.2	21.3	19.4	2.4	38213	34164	25982.8	6.66	28.1	1.88	4167.7
15:30	363	78.20	32.95	114242.6	21.4	19.4	2.4	38278	34205	26030.4	6.66	30.6	1.96	
15:45	378	78.30	33.05	114563.5	21.4	19.4	2.4	38324	34231	26057.6	6.66	34.0	1.70	
16:00	393	78.30	33.05	114884.3	21.4	19.4	2.5	38354	34291	26084.8	6.66	36.8	1.46	
16:05	398	Begin collecting WQ samples for laboratory analysis. Samples placed on ice.												
16:33	426	78.50	33.25	115594.2	21.5	19.4	2.5	38426	34384	26132.4	6.66	41.7	1.18	
16:39:48	433			115749.5	Pump off.									
					Total Volume pumped = 5995.0 gallons									
4/7 7:30		47.15												

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 3 (Day 1)

Client: RBF/MPWSP - Exploratory Borehole Drilling

WL's taken using an electronic WL indicator

Borehole Name/Number: CX-B4

Sonic Casing Dia: 8 in Sonic Casing Depth: 144 ft bgs

Static WL: 42.05 ft brp

RP: 6.0 ft ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling (W.L.'s)

Test Date: 4-7-14 / Mon

Screened Interval: 155-165 ft bgs

Reference Point Elevation: _____ ft amsl

Pump Depth: 142.0 ft bgs (intake)

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	Total Vol (gal)
13:48:28	0	42.05	0	115749.5	Pump on @ ~ 10gpm.			Turbid						
13:55	7	85.80	43.75	115815.2	9.9								overrange	
14:00	12	87.85	45.80	115864.7	9.9								466	
14:15	27	89.70	47.65	116011.9	9.8								148	
14:30	42	89.90	47.85	116159.5	9.8								143	
14:45	57	90.10	48.05	116307.0	9.8								18.1	
15:00	72	90.00	47.95	116454.7	9.8								3.97	
15:15	87	91.5	49.45	116603.6	9.9	19.1	4.7	27888	24761	18978.8	6.72	95.0	19.2	
15:30	102	91.6	49.55	116755.7	10.1	19.1	4.5	28361	25158	19284.8	6.77	46.6	2.90	1006.2
15:45	117	92.1	50.05	116908.1	10.2	19.1	4.6	28421	25214	19339.2	6.77	31.8	2.60	1158.6
16:00	132	92.05	50.00	117060.2	10.1	19.1	4.6	28527	25296	19400.4	6.78	25.1	3.36	1310.7
16:15	147	92.15	50.10	117212.3	10.1	19.1	4.6	28580	25347	19434.4	6.78	21.1	3.82	
16:30	162	92.10	50.05	117364.1	10.1	19.1	4.6	28609	25371	19454.8	6.78	17.9	2.71	
16:34:28	166			117419.2	Pump off.									
				Total Volume pumped today =				1669.7	gallons					

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit

Cond: +/- 3%

ORP: +/- 10 mV

Turb: +/- 10%

DO: +/- 10%

28.03 mS/cm 15:42

Flow thru cell = 1419.1 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 3 (Day 2) WL's

Client: RBF/MPWSP - Exploratory Borehole Drilling — W.L.'s taken using an electronic WL indicator

Borehole Name/Number: CX-B4

Sonic Casing Dia: 8 in Sonic Casing Depth: 144 ft bgs

Static WL: 43.3 ft brp

RP: 6.0 ftags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Test Date: 4-8-14 (Tue)

Screened Interval: 155-165 ft bgs

Reference Point Elevation: _____ ft amsl

Pump Depth: 142.0 ft bgs (intake)

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Tot Vol. (gal)
07:29:33	0	43.3	0	117419.2	Pump on @ 8.1 gpm. 7:32 ↑Q to 10.8 gpm					Some aeration.				
07:45	15	92.2	48.9	117577.9	10.5								16.4	
08:00	30	93.4	50.1	117735.1	10.5								15.9	
08:15	45	93.4	50.1	117891.7	10.5								11.2	
08:30	60	92.9	49.6	118050.6	10.5								24.5	
08:45	75	94.3	51.0	118210.2	10.6	18.8	4.9	28822	25407	19618.0	6.67	123.0	19.3	
09:00	90	94.4	51.1	118373.0	10.9	18.8	4.7	28984	25548	19713.2	6.72	85.3	3.89	953.8
09:15	105	94.55	51.25	118536.0	10.9	18.8	4.7	28927	25515	19672.4	6.73	69.4	3.84	
09:30	120	94.55	51.25	118698.4	10.8	18.8	4.6	28849	25424	19618.0	6.74	56.6	2.53	
09:46	136	94.65	51.35	118871.9	10.8	18.8	4.5	28766	25375	19556.0	6.74	44.4	4.77	
10:00	150	94.55	51.25	119023.8	10.9	18.9	4.5	28717	25354	19529.6	6.74	36.6	5.78	
10:15	165	94.65	51.35	119186.8	10.9	18.9	4.5	28657	25321	19488.8	6.74	31.3	3.89	1767.6
10:31	181	94.65	51.35	119360.6	10.9	19.0	4.5	28643	25335	19475.2	6.74	28.7	6.05	
10:45	195	94.70	51.40	119512.8	10.9	19.0	4.5	28609	25326	19454.8	6.74	27.6	3.51	
11:00	210	94.85	51.55	119675.9	10.9	19.0	4.5	28599	25310	19448.0	6.74	27.3	5.02	
11:15	225	94.90	51.60	119839.0	10.9	19.0	4.5	28585	25335	19434.4	6.75	28.0	5.24	
11:30	240	95.00	51.70	120002.0	10.9	19.0	4.6	28574	25304	19427.6	6.75	28.5	4.04	2582.8
11:44:32	254	↓Q to	5.5 gpm		5.5									
11:45	255	84.40	41.10	120163.5	5.5	19.0	4.6	28577	25329	19434.4	6.75	28.7	2.58	2744.3
12:00	270	68.00	24.70	120248.2	5.6	19.4	4.5	28690	25629	19509.2	6.75	28.9	0.25	

Flow thru cell = 1329.8 mL/min

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 3 (Day 2)

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B4
Sonic Casing Dia: 8 in Sonic Casing Depth: 144 ft bgs
Static WL: 43.3 ft brp
RP: 6.0 flags

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 4-8-14 / Tue
Screened Interval: 155-165 ft bgs
Reference Point Elevation: _____ ft amsl
Pump Depth: 142.0 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
12:15	285	68.00	24.70	120330.6	5.5	19.4	4.5	28716	25672	19522.6	6.75	32.6	0.14
12:25	295	68.05	24.75	120385.5	5.5	19.4	4.5	28707	25663	19522.8	6.75	34.0	0.18
12:30	300	Begin collecting VOQ samples for laboratory analysis. Samples placed on ice.											
12:50	320	68.20	24.90	120527.8	5.7	19.5	4.5	28695	25655	19509.2	6.74	36.1	0.15
12:53:04	323			120544.5	Pump off.								
					Total Volume pumped today = 3125.3 gallons								
13:27	357	43.85	0.55	← Recovered W.L. after pulling pump.									

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 4

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L.'s taken using an electronic W.L. indicator.

Borehole Name/Number: CX-B4

Sonic Casing Dia: 8 in Sonic Casing Depth: 95.8 ft bgs

Static WL: 41.20 ft brp

RP: 6.7 ft ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Test Date: 4-9-14 / Wed

Screened Interval: 110-120 ft bgs

Reference Point Elevation: _____ ft amsl

Pump Depth: 196 ft bgs

W.L.'s

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Total Vol (gal)
7:59:56	0	41.20	0	120544.6	Pump on @ 10.4 gpm. Brown / turbid. Good yield.									
08:03	3	45.40	4.20		Turbid but improving.									
08:15	15	45.45	4.25	120706.1	10.0	Milky / aerated.							39.0	
08:30	30	45.50	4.30	120856.6	10.0	"	"						16.0	
08:37:50 ~38				~120919.0	Pump off. Pump died.									
08:43	43	41.10	-0.10	Recovering W.L. 08:50 Begin pulling pump to check. Wires pinched.										
10:07:40	0	41.55	0.35	120913.1	Resume pumping @ 10.7 gpm. Q dropping slowly.									
10:15	7	44.50	3.30	120979.1	8.8								7.61	434.5
10:30	22	44.60	3.40	121110.7	8.8	19.0	4.8	29701	26333	20202.8	6.65	85.1	5.07	566.1
10:45	37	44.65	3.45	121243.2	8.8	19.0	4.9	29805	26405	20277.6	6.65	72.0	7.50	698.6
11:00	52	44.65	3.45	121375.8	8.8	19.0	5.0	29865	26428	20311.6	6.64	70.6	1.13	831.2
11:15	67	44.65	3.45	121508.7	8.9	19.0	5.0	29908	26473	20332.0	6.64	72.1	0.69	
11:25	77	44.65	3.45	121597.6	8.9	18.9	5.1	29926	26423	20352.4	6.64	72.8	0.58	
11:35	87	44.65	3.45	121686.3	8.9	18.9	5.1	29933	26466	20352.4	6.63	74.9	0.85	
11:40	92	Begin collecting WQ samples for lab analysis. Samples placed on ice.												
12:01	113	44.65	3.45	121922.3	9.1	18.9	5.1	29954	26471	20366.0	6.63	76.9	1.70	
12:07:04	119			121976.0	Pump off.									
					Total Volume pumped = 1431.4 gallons									
12:45	157	41.5	0.30	Recovered water level.										

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Flow thru cell = 1306.6 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 5 (Day 1)

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L.'s taken using an electronic W.L. indicator.

Borehole Name/Number: CX-B4

Sonic Casing Dia: 8 in Sonic Casing Depth: 45.7 ft bgs

Static WL: 42.20 ft brp

RP: 7.4 ft ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Test Date: 4-9-14 / Wed

Screened Interval: 58-68 ft bgs

Reference Point Elevation: ____ ft amsl

Pump Depth: 57.5 ft bgs (intake)

W.L.'s

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
16:18:15	0	42.20	0	121975.9	Pump on @ 7.5 gpm. Turbid / brown.								
16:23	5	48.25	6.05	122019.0	7.5	Turbid but improving. Aerated.							
16:33	15	48.70	6.50	122094.2	7.5	19.8	3.3	5343	4828	3651.6	6.80	-33.8	130
16:48	30	48.80	6.60	122209.8	7.7	19.3	4.7	5834	5192	3978.0	7.02	-85.6	42.2
17:03	45	48.90	6.70	122324.9	7.7	19.1	5.5	6134	5442	4161.6	7.02	-70.8	23.8
17:07:00	49	–	–	122355.9	Pump off.								
					Total Volume pumped = 380.0 gallons								

Stabilization Criteria: Note: 200 gal fresh water added during construction. Flow thru cell = 1173.7 mL/min

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit

Cond: +/- 3%

ORP: +/- 10 mV

Turb: +/- 10%

DO: +/- 10%

16:39 5641

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 5 (Day 2) W.L.'s

Client: RBF/MPWSP - Exploratory Borehole Drilling

WL's taken using an electronic WL indicator.

Borehole Name/Number: CX-B4

Sonic Casing Dia: 8 in Sonic Casing Depth: 45.7 ft bgs

Static WL: 42.20 ft brp

RP: 7.4 ft ags (top of 8" casing)

602.1

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Test Date: 4-10-14 / thru

Screened Interval: 58-68 ft bgs

Reference Point Elevation: ft amsl

Pump Depth: 57.5 ft bgs (intake)

0.68 Constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	Total Vol. (gal)
07:14:11	0	42.20	0	122355.9	Pump	on @	~5gpm.	07:20	↑Q to	~7gpm	. Clear/aerated.			
07:19	5	46.05	3.85	122399.7	~5						aerated		30.1	
07:24	10	48.20	6.00	122432.7	7.4						aerated		14.1	
07:29	15	48.20	6.00	122469.0	7.3						"	"	8.90	
07:46	32	48.25	6.05	122592.1	7.2						"	"	5.29	
08:00	46	48.30	6.10	122693.6	7.3						"	"	4.34	
08:15	61	48.30	6.10	122802.6	7.3						"	"	2.62	446.7
08:30	76	48.30	6.10	122911.8	7.3		discharge is aerated				"	"	1.98	555.9
08:45	91	48.65	6.45	123024.8	7.5	18.6	6.1	6789	5959	4617.2	6.91	25.1	1.84	
09:00	106	48.65	6.45	123140.0	7.7	18.7	6.2	6848	6022	4664.8	6.92	9.2	1.61	
09:15	121	48.70	6.50	123254.2	7.6	18.6	6.3	6856	6023	4664.8	6.93	9.7	1.75	898.3
09:30	136	48.70	6.50	123368.6	7.6	18.6	6.4	6884	6045	4685.2	6.93	13.8	1.62	
09:36	142				↓Q to 4.8 gpm									
09:40	146	46.0	3.80	123433.4	4.8	19.0	6.4	6911	6116	4705.6	6.93	16.0	1.16	1077.5
09:50	156	46.0	3.80	123480.5	4.7	19.0	6.3	6914	6127	4705.6	6.94	17.6	1.31	
10:00	166	46.0	3.80	123527.4	4.7	19.1	6.3	6922	6139	4712.4	6.95	18.6	1.32	
10:10	176	46.0	3.80	123574.3	4.7	19.1	6.3	6932	6154	4719.2	6.94	20.2	1.21	1218.4
10:20	186	46.0	3.80	123621.1	4.7	19.1	6.3	6951	6168	4726.0	6.93	21.6	1.21	
10:30	196	46.0	3.80	123668.1	4.7	19.1	6.4	6946	6159	4726.0	6.92	23.7	1.23	
10:40	206	46.0	3.80	123714.9	4.7	19.1	6.4	6944	6170	4726.0	6.92	24.8	1.23	

Flow thru cell = 1,400.6 mL/min

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

6708
8:50

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 5 (Day 2) WL's

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: CX-B4
Sonic Casing Dia: 8 in Sonic Casing Depth: 45.7 ft bgs
Static WL: 42.20 ft brp
RP: 7.4 ft ags

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 4-10-14 / Thu
Screened Interval: 58-68 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 57.5 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
10:50	216	46.0	3.80	123761.7	4.7	19.1	6.4	6978	6193	4732.8	6.92	25.7	1.17
11:00	226	46.0	3.80	123808.5	4.7	19.1	6.4	6970	6186	4732.8	6.92	26.5	1.24
11:07	233	Recalibrate Hach 2100Q. (3pt: 20, 100, & 800 NTU).											
11:15	241	46.0	3.80	123878.3	4.7	19.1	6.4	6967	6182	4739.6	6.92	27.7	1.21
11:25	251	46.0	3.80	123924.9	4.7	19.1	6.5	6988	6208	4760.0	6.92	28.3	1.12
11:30	256	Begin WQ sampling for lab analysis. Samples placed on ice.											
11:49	275	46.0	3.80	124042.5	4.9	19.1	6.6	7044	6258	4794.0	6.92	30.1	1.01
11:55:35	282			124073.2	Pump off.								
					Total volume pumped today =					1717.3 gallons			
12:26	312	42.25	0.05	Recovered water level.									

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

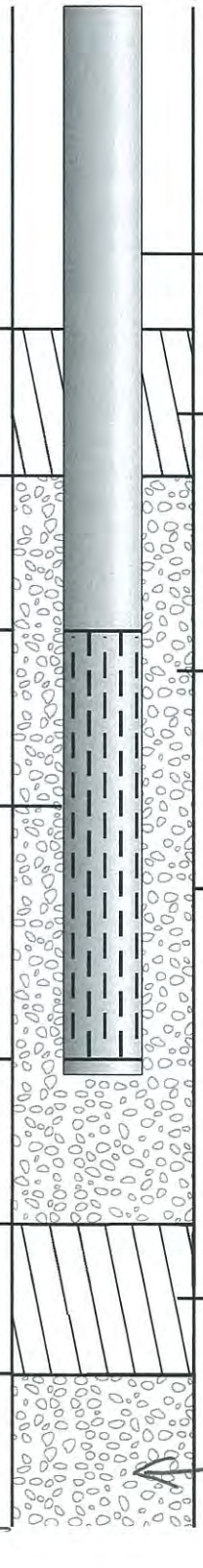
Zone #1 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 1

237 **to** 247 **ft bgs**

8" Sonic Casing to 226 ftbgs. Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

225 ft bgs

7.0 ft

7.0 -ft Upper Bentonite Seal

MISWACO Kwik-Plug Medium (3/8") Bentonite Chips (3 bags)

232 ft bgs

5.0 ft

237 ft bgs

Gravel Pack CEMEX Monterey #3 (14 bags)

10 -ft Perforated Tool (4" PVC Screen w/ 0.050" slots)

8 -in Diameter Pilot Borehole

247 ft bgs

4.5 ft

251.5 ft bgs

8.5 ft

8.5 -ft Lower Bentonite Seal (4 bags)

260 ft bgs

1000 gal H_2O used.

backfill/formation

300 ftbgs

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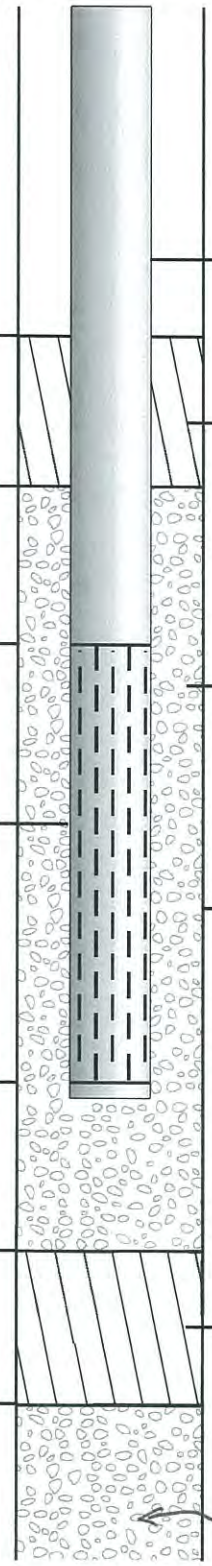
Zone #2 As Built

Zone No. 2

ISOLATED AQUIFER ZONE CONSTRUCTION

187 **to** 197 **ft bgs**

8" Sonic Casing to 173 ftbgs.
Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

175 ft bgs

6.0

6 -ft Upper Bentonite Seal
CETCO Pure gold
~~M. SWACO Kwik Plug~~
Medium (~~3/8"~~)
Bentonite Chips
(2 bags)

181 ft bgs

6.0

187 ft bgs

Gravel Pack

10 -ft Perforated Tool
(4" Dia PVC w/ 0.050" Slots)

8 -in Diameter Pilot Borehole

Cemex
Monterey #3
(13 bags)

197 ft bgs

5.0

202 ft bgs

5.5

5.5 -ft Lower Bentonite Seal
(2½ bags)

207.5 ft bgs

backfill

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Client: RBF Consulting Inc

Well Name/Number: MPWSP Exploratory Borehole MW-1

Date: 5/6/14 Tuesday

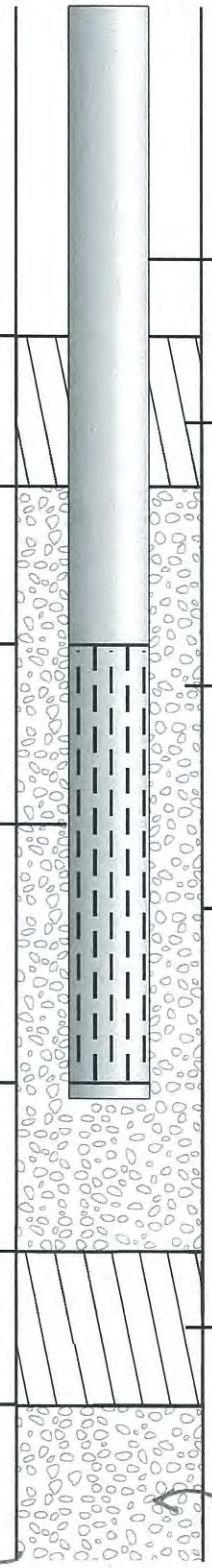
Zone #3 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 3

152 **to** 162 **ft bgs**

8" sonic casing to 142 ftbgs.
Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

139.5 ft bgs

5.5

5.5 -ft Upper Bentonite Seal
CETCO Puregold Medium ~~(3/8")~~ Bentonite chips (2 bags)

145 ft bgs

7.0

152 ft bgs

Gravel Pack CEMEX Monterey #3 (14 bags)

10 -ft Perforated Tool
(4" PVC Screen w/ 0.050" slots)

8 -in Diameter Pilot Borehole

162 ft bgs

5.0

167 ft bgs

5.0

5.0 -ft Lower Bentonite Seal (2 bags)

172 ft bgs

500 gallons of H_2O used

4 bags of Monterey #3

177 ftbgs

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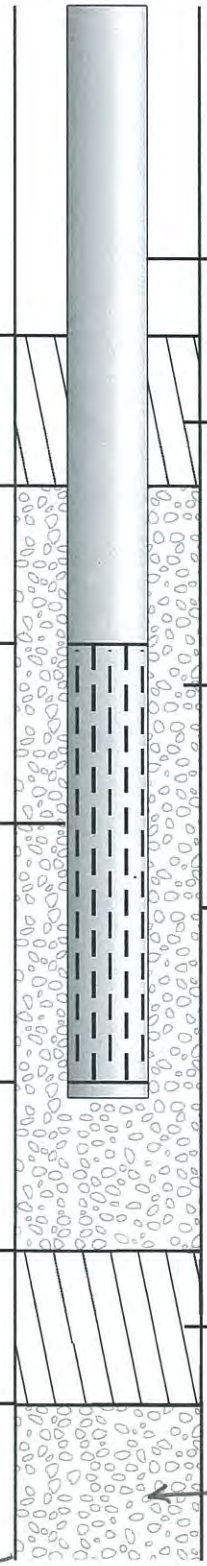
Zone # 4 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 4

60 **to** 70 **ft bgs**

9" sonic casing to 44 ftbgs.
Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

47.5 ft bgs

6.5 ft

6.5 -ft Upper Bentonite Seal
Mi SWACO Kwik Plug Medium (3/8") Bentonite chips (3 bags)

54 ft bgs

6.0 ft

60 ft bgs

Gravel Pack CEMEX Monterey #3 (13 bags)

10 -ft Perforated Tool
(4" PVC Screen w/ 0.050" slots)

8 -in Diameter Pilot Borehole

70 ft bgs

5.0 ft

75 ft bgs

5.0 ft

5.0 -ft Lower Bentonite Seal (2.5 bags)

80 ft bgs

38 bags of Monterey #3

350 gallons of H_2O used

143 ftbgs

5" pump

GEOSCIENCE	Client: RBF Consulting Inc.
GEOSCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909) 451-6650 Fax: (909) 451-6638 www.gssiwater.com	Well Name/Number: MPWSP Exploratory Borehole MPW-1
	Date: 5-9-14 / Fri

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Day 1

ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: MDW-1
Sonic Casing Dia: 8 in Sonic Casing Depth: 226 ft bgs
Static WL: 26.05 ft brp (falling slowly)
RP: 7.2 ft ags (Top 8" casing)

W.L.'s taken w/ electronic W.L. indicator.

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 4-30-14 / Wed (Day 1)
Screened Interval: 237-247 ft bgs
Reference Point Elevation: _____ ft amsl
Pump Depth: 226 ft bgs (intake)

W.L.'s

Myron L readings (Not YSI)

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. ~~(µS/cm)~~ mS/cm	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	
15:21:01	0	26.05	0	124073.1	Pump on @ ?. gpm.			15:22	Pump off. Totalizer reversed.					
15:26:56	0	–	–	124054.6	Pump on @ 10.8 gpm									
15:29	2	34.9	8.85	–	10.8	15:30:13 ↑Q to								
15:33	6	45.0	18.95	124143.0	18.7	turbid / brown								
15:38	11	46.3	20.25	124249.8	21.4	Water clearing, aerated 15:39:05 ↑Q. Valve wide open.								
15:41	14	56.8	30.75	–	31.5	turbid								
15:44	17	57.6	31.55	124427.4	31.5	Some	brown	fine sand.					229	
16:00	33	58.55	32.50	124931.0	31.5				41.20	tr fine sand			33.3	894.9
16:15	48	58.80	32.75	125403.2	31.5				41.57				21.0	
16:30	63	58.90	32.85	125875.6	31.5				42.09				18.1	1839.5
16:45	78	59.00	32.95	126347.9	31.5				42.30				14.0	
17:00	93	59.05	33.00	126820.2	31.5				42.48				14.0	
17:06	99			127011.2	Pump off.									
				Total volume pumped today = 2975.1 gallons										

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

24.85

Form Created: 29-Sep-13

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Day 2

ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: MDW-1
Sonic Casing Dia: 8 in Sonic Casing Depth: 226 ft bgs
Static WL: 28.00 ft brp
RP: 7.2 ft ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling (W.L's)
Test Date: 5-1-14 / Thu
Screened Interval: 237-247 ft bgs
Reference Point Elevation: ft amsl
Pump Depth: 226 ft bgs (intake)

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
07:30:53	0	28.00	0	127010.6	Pump	on @	9.9 gpm						
07:34	3	35.40	7.40		9.9			Turbid. Aerated.					
07:45	14	35.25	7.25	127149.2	9.8								39.9
08:00	29	35.20	7.20	127295.4	9.7								17.6
08:15	44	35.15	7.15	127441.9	9.8								9.43
08:30	59	35.15	7.15	127588.3	9.8								5.76
08:45	74	35.15	7.15	127735.0	9.8								7.71
09:00	89	35.10	7.10	127882.1	9.8								5.83
09:15	104	35.10	7.10	128029.3	9.8								6.74
09:30	119	35.30	7.30	128180.1	10.1	17.4	0.2	42697	36454	29036.0	7.11	-13.9	6.84
09:45	134	35.25	7.25	128333.7	10.2	17.4	0.2	42742	36529	29063.2	7.14	-42.1	6.82
10:00	149	35.20	7.20	128486.7	10.2	17.3	0.2	42773	36481	29083.6	7.13	-57.2	6.33
10:15	164	35.10	7.10	128639.7	10.2	17.3	0.2	42789	36510	29097.2	7.13	-67.8	3.22
10:30	179	35.00	7.00	128792.9	10.2	17.3	0.2	42807	36496	29110.8	7.13	-75.5	5.65
10:45	194	34.95	6.95	128946.8	10.3	17.3	0.2	42817	36505	29117.6	7.12	-81.2	5.89
11:00	209	34.90	6.90	129100.1	10.2	17.3	0.2	42831	36556	29124.4	7.13	-85.6	4.42
11:15	224	34.85	6.85	129253.5	10.2	17.3	0.2	42840	36577	29131.2	7.13	-89.1	4.71
11:22:18	231	↑Q to	15.7 gpm.										
11:30	239	39.75	11.75	129438.6	15.7	17.1	0.2	42879	36414	29158.4	7.13	-91.7	12.1
11:45	254	39.90	11.90	129674.5	15.7	17.1	0.2	42868	36416	29151.6	7.13	-92.2	5.05

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1498.5 mL/min

Form Created: 29-Sep-13

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Day 2

ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1 W.L.'s

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: MDW-1
Sonic Casing Dia: 8 in Sonic Casing Depth: 226 ft bgs
Static WL: 28.00 ft brp
RP: 7.2 ft ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 5-1-14 / Thu
Screened Interval: 237-247 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 226 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)
12:00	269	39.75	11.75	129909.8	15.7	17.1	0.2	42864	36394	29144.8	7.13	-94.1	3.66
12:15	284	39.65	11.65	130144.7	15.7	17.1	0.2	42862	36389	29144.8	7.12	-96.1	4.98
12:30	299	39.65	11.65	130380.6	15.7	17.1	0.2	42853	36383	29138.0	7.12	-98.0	3.26
12:45	314	39.60	11.60	130617.5	15.8	17.0	0.2	42856	36342	29144.8	7.11	-100.2	2.79
13:00	329	39.40	11.40	130853.5	15.7	17.1	0.2	42845	36382	29138.0	7.12	-101.4	2.35
13:15	344	39.35	11.35	131087.8	15.6	17.1	0.2	42841	36363	29131.2	7.12	-102.7	1.80
13:30	359	39.30	11.30	131322.5	15.6	17.1	0.2	42836	36397	29124.4	7.12	-103.9	1.50
13:45	374	39.45	11:45	131557.2	15.6	17.1	0.2	42826	36400	29124.4	7.12	-105.1	1.79
14:00	389	39.25	11.25	131793.1	15.7	17.1	0.2	42819	36386	29117.6	7.12	-106.2	1.53
14:15	404	39.40	11:40	132027.9	15.7	17.1	0.2	42813	36351	29110.8	7.12	-107.3	2.49
14:30	419	39.45	11.45	132264.8	15.8	17.1	0.2	42811	36322	29110.8	7.12	-108.0	2.28
14:45	434	39.45	11.45	132501.8	15.8	17.1	0.2	42802	36328	29104.0	7.12	-107.6	1.96
15:00	449	39.45	11.45	132738.8	15.8	17.0	0.2	42797	36307	29104.0	7.12	-107.6	2.22
15:15	464	39.45	11.45	132976.0	15.8	17.0	0.2	42787	36295	29097.2	7.12	-107.6	1.95
15:30	479	39.45	11.45	133212.5	15.8	17.1	0.2	42788	36308	29097.2	7.12	-107.5	2.33
15:45	494	39.50	11.50	133449.2	15.8	17.0	0.2	42787	36237	29097.2	7.12	-107.6	2.33
15:56	499	Begin collecting WQ samples for lab analysis. Samples placed on ice.											
16:15	524	39.45	11.45	133927.1	15.9	17.0	0.2	42777	36216	29090.4	7.11	-108.0	1.95
16:22:18	531			134041.7	Pump off.								
					Total volume pumped today = 7031.1 gallons								

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Day 1

Zone No. 2 (187-197 ft bgs)

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: MDW-1
Sonic Casing Dia: 8 in Sonic Casing Depth: 173 ft bgs
Static WL: 26.24 ft brp
RP: 7 ft agl

Logged By: J. Sobolow (GSSI) & Cascade Drilling - WKS
Test Date: 5/6/14 / Tuesday
Screened Interval: 187-197 ft bgs
Reference Point Elevation: _____ ft amsl
Pump Depth: 173 ft bgs

0.68 Constant

Time	Time Step (min)	Water Level (ft brp) Pump in	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Vol (mL/min)
1433	0	26.02	0	134041.7										
1435	2	27.70	1.68	134080.5	19.4									
Q↑ 1439	6	28.80	2.78	134136.2	13.93									
1443	10	29.10	3.08	134213.9	19.43								139/21	
1503	30	29.15	3.13	134618.4	20.23	16.5	0.4	43281	36227	29444	6.81	-53.5	12.2	1200
1518	45	29.15	3.13	134923.3	20.33	16.3	0.2	44131	36836	30015.20	6.82	-71.5	8.92	
1533	60	29.05	3.03	135228.4	20.34	16.3	0.3	44601	37196	30328	6.82	-79.6	7.01	
1548	75	29.00	2.98	135534.9	20.43	16.2	0.2	44797	37296	30464	6.82	-85.3	6.04	1000
1603	90	28.95	2.93	135841.2	20.42	16.2	0.1	44969	37378	30572.8	6.82	-90.6	4.90	1500
1618	105	28.90	2.88	136149.8	20.57	16.1	0.1	45152	37459	30702	6.83	-94.7	3.57	1360
1620	Pump off			136216.5										

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Flow through cell:

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2 WL's Day 2

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L.'s taken using an electronic WL indicator.

Borehole Name/Number: MPW-1

Sonic Casing Dia: 8 in Sonic Casing Depth: 173 ft bgs

Static WL: 26.20 ft brp

RP: 7.0 ft ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Test Date: 5-7-14 / Wed

Screened Interval: 187 - 197 ft bgs

Reference Point Elevation: _____ ft amsl

Pump Depth: 173 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Total Vol. (gal)
7:50:35	0	26.20	0	136216.5	Pump	on @	10.2 gpm						turbid	
7:55	5	-	-	136280.9	10:56	↓ Q slightly to		9.5 gpm					125	
8:05	15	27.30	1.10	136374.5	9.1	Aerated							3.96	
8:20	30	27.40	1.20	136511.1	9.1	"	"						3.11	
8:35	45	27.45	1.25	136648.2	9.1								3.80	
8:50	60	27.50	1.30	136785.5	9.2								3.04	
9:05	75	27.55	1.35	136922.6	9.1	16.3	1.7	45594	38005	31008.0	6.62	-14.7	1.95	706.1
9:20	90	27.65	1.45	137062.4	9.3	16.3	0.1	45626	38019	31028.4	6.78	-62.3	1.92	845.9
9:35	105	27.70	1.50	137202.8	9.4	16.3	0.1	45633	38044	31028.4	6.80	-79.7	1.98	
9:50	120	27.75	1.55	137343.5	9.4	16.3	0.1	45684	38094	31062.4	6.80	-86.9	1.84	
10:05	135	27.80	1.60	137483.6	9.3	16.3	0.1	45724	38136	31089.6	6.80	-91.0	1.50	
10:20	150	27.85	1.65	137623.6	9.3	16.3	0.1	45736	38180	31096.4	6.80	-93.9	2.57	
10:35	165	27.90	1.70	137763.8	9.3	16.3	0.1	45750	38166	31110.0	6.80	-96.0	1.72	
10:50	180	27.95	1.75	137903.9	9.3	16.3	0.1	45765	38171	31116.8	6.80	-97.7	1.68	
11:05	195	28.00	1.80	138044.1	9.3	16.3	0.1	45776	38221	31130.4	6.80	-99.0	1.87	
11:20	210	28.00	1.80	138184.4	9.4	16.3	0.1	45790	38227	31137.2	6.80	-100.1	1.80	
11:35	225	28.05	1.85	138324.7	9.4	16.3	0.1	45802	38239	31144.0	6.80	-101.1	1.58	2108.2
11:50	240	28.05	1.85	138465.0	9.4	16.4	0.1	45806	38281	31144.0	6.80	-102.1	1.68	
12:05	255	28.05	1.85	138605.2	9.3	16.4	0.1	45812	38278	31150.8	6.80	-103.1	1.61	
12:10:36	260				↓ Q to	5.4 gpm								

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1099.7 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2 Day 2

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: MDW-1
Sonic Casing Dia: 8 in Sonic Casing Depth: 173 ft bgs
Static WL: 26.20 ft brp
RP: 7.0 flags

Logged By: N. Reynolds (GSSI)
Test Date: 3-7-14 / Thu
Screened Interval: 187-197 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 173 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Total Vol (gal)
12:20	270	27.60	1.40	138712.8	5.4	16.7	0.1	45813	38604	31150.8	6.80	-105.3	2.59	
12:35	285	27.60	1.40	138791.6	5.3	16.8	0.1	45841	38653	31171.2	6.81	-105.6	2.84	
12:42:05	292	–	–	138828.1	Pump shuts off. Stop to fix generator.									
13:07:13	317	–	–	138828.1	Resume pumping @ 6.9 gpm.									
13:15	325	27.60	1.40	138888.5	7.2	16.7	0.1	45859	38636	31178.0	6.81	-99.4	3.85	
13:30	340	27.60	1.40	138996.5	7.2	16.8	0.1	45854	38686	31178.0	6.81	-102.0	2.40	
13:45	355	27.55	1.35	139104.5	7.2	16.8	0.1	45862	38716	31184.8	6.80	-103.9	2.37	
14:00	370	27.50	1.30	139212.2	7.2	16.8	0.1	45873	38728	31191.6	6.80	-104.9	0.68	
14:10	380	27.45	1.25	139284.1	7.2	16.8	0.1	45882	38735	31198.4	6.80	-105.5	0.51	
14:20	390	27.40	1.20	139356.0	7.2	16.8	0.2	45875	38793	31198.4	6.80	-106.0	0.64	
14:25	395	Begin collecting WQ samples for laboratory sis. Samples placed on ice.												
14:44	414	27.30	1.10	139533.3	7.4	16.8	0.2	45896	38714	31205.2	6.80	-106.6	0.30	
14:48:26	418			139565.3	Pump off.									
					Total Volume pumped today = 3348.8 gallons									

Flow thru cell = 1191.4 mL/min (13:13)

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

48:26

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 3

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L's taken w/ an electronic W.L. indicator.

Borehole Name/Number: MPW-1

Sonic Casing Dia: 8 in Sonic Casing Depth: 142 ft bgs

Static WL: 28.25 ft brp

RP: 7.9 flags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Test Date: 5-8-14 / Thu

Screened Interval: 152 - 162 ft bgs

Reference Point Elevation: ____ ft amsl

Pump Depth: 142 ft bgs

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L) 0.68 constant	pH	ORP (mV)	Turbitity (NTU)
11:40:28	0	28.25	0	139565.4	Pump	on @	12.1 gpm						
11:43	3	53.0	24.75	–	12.1	grey	turbid	11:45:30 ↑Q	to 21.6 gpm				
11:48	8	77.00	48.75	–	21.6								
11:55	15	84.85	56.60	139827.7	21.5								107
12:12	32	86.05	57.80	140192.8	21.5		(W.L. @	12:10)					13.0
12:25	45	86.95	58.70	140472.1	21.5								9.02
12:40	60	87.30	59.05	140794.5	21.5								5.07
12:55	75	87.60	59.35	141116.7	21.5								3.91
13:10	90	88.00	59.75	141438.7	21.5								3.30
13:25	105	88.20	59.95	141760.3	21.4								2.40
13:40	120	88.90	60.65	142082.6	21.5	16.1	0.2	36220	30067	24629.6	6.84	-73.4	2.33
13:55	135	89.00	60.75	142406.6	21.6	16.1	0.2	36462	30250	24779.2	6.91	-102.4	1.77
14:05	145	–	–	142622.4	21.6	16.1	0.1	36521	30316	24867.6	6.91	-110.6	1.39
14:10	150	89.10	60.85	142730.3	21.6	16.1	0.1	36583	30336	24881.2	6.91	-113.2	1.35
14:25	165	89.10	60.85	143053.7	21.6	16.1	0.1	36728	30472	24969.6	6.91	-118.6	1.00
14:40	180	89.25	61.00	143378.0	21.6	16.1	0.1	36826	30554	25078.4	6.91	-122.1	1.05
14:55	195	89.20	60.95	143701.8	21.6	16.1	0.1	36953	30670	25119.2	6.91	-124.6	1.22
15:10	210	89.25	61.00	144025.6	21.6	16.0	0.1	37063	30733	25214.4	6.91	-126.4	0.95
15:20	220	89.30	61.05	144241.6	21.6	16.0	0.1	37132	30745	25228.0	6.91	-127.2	0.93
15:30	230	89.20	60.95	144457.6	21.6	16.0	0.1	37196	30803	25309.6	6.91	-128.1	1.14

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV

Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1290.9 mL/min

36.36

got Myron's reading

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 3

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: MDW-1
Sonic Casing Dia: 8 in Sonic Casing Depth: 142 ft bgs
Static WL: 28.25 ft brp
RP: 7.9 ft ags

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 5-8-14 / thu
Screened Interval: 152-162 ft bgs
Reference Point Elevation: _____ ft amsl
Pump Depth: 142 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
15:40	240	89.25	61.00	144673.3	21.6	16.0	0.1	37247	30853	25323.2	6.91	-128.8	2.40
15:50	250	89.30	61.05	144889.2	21.6	16.0	0.1	37260	30885	25330.0	6.91	-129.3	1.70
16:00	260	89.35	61.10	145105.0	21.6	16.0	0.1	37344	30916	25377.6	6.91	-129.3	1.95
16:10	270	89.50	61.25	145320.7	21.6	16.0	0.1	37363	30928	25404.8	6.91	-129.2	0.98
16:20	280	89.25	61.00	145536.6	21.6	15.9	0.1	37414	30941	25432.0	6.91	-129.7	2.82
16:30	290	89.20	60.95	145752.3	21.6	15.9	0.1	37451	30928	25459.2	6.91	-130.4	1.30
16:40	300	89.30	61.05	145968.2	21.6	15.9	0.1	37515	30985	25479.6	6.90	-131.2	0.78
16:50	310	89.25	61.00	146184.0	21.6	15.9	0.1	37546	31014	25513.6	6.90	-131.8	0.84
16:55	315	Begin collecting WQ samples for lab analysis. Samples placed on ice.											
17:10	330	89.25	61.00	146618.1	21.7	15.9	0.1	37642	31053	25595.2	6.90	-132.4	1.37
17:15:45	336			146740.4	Pump off.								
					Total volume pumped = 7,175 gallons								
5/9 07:30		28.80	0.55										

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Day 1

Zone No. 4

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L.'s taken w/an electronic W.L. indicator.

Borehole Name/Number: MDW-1

Sonic Casing Dia: 9 in Sonic Casing Depth: 44 ft bgs

Static WL: 20.70 ft brp

RP: 6.0 ft ags (top of 9" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling

Test Date: 5-9-14 / Fri

Screened Interval: 60 - 70 ft bgs

Reference Point Elevation: ____ ft amsl

Pump Depth: 59.0 ft bgs

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm) Myron L (not YSI)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Total Vol. (gal)
15:30:15	0	20.70	0	146740.3	Pump on @ 7.9 gpm. Very turbid/gray.									
15:35	5	24.00	3.30	146785.8	7.9	Turbid but improving.								
15:40	10	24.10	3.40	146825.2	7.9	15:43:38 ↑Q to 16.7gpm (PWL = 28.4 ftbrp). 15:45:45 ↑Q to 20.4gpm (PWL = 30.1 ftbrp)							446	
15:50	20	35.40	14.70	146986.3	30.5	← max pump Q						250	246.0	
16:00	30	35.65	14.95	147291.1	30.5				30.32				34.5	550.8
16:15	45	35.85	15.15	147748.5	30.5				30.70				11.2	1008.2
16:30	60	35.90	15.20	148207.2	30.6				31.00				7.11	
16:45	75	35.95	15.25	148666.0	30.6				31.26				4.95	
16:49:45	~80			148810.9	Pump off.									
					Total volume pumped today = 2070.6 gallons									

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Day 2

Zone No. 4

Client: RBF/MPWSP - Exploratory Borehole Drilling

W.L.'s taken using an electronic W.L. indicator.

Borehole Name/Number: MDW-1

Sonic Casing Dia: 9 in Sonic Casing Depth: 44 ft bgs

Static WL: 20.65 ft brp

RP: 6.0 ft agg (top of 9" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling W.L.'s

Test Date: 5-10-14 / Sat

Screened Interval: 60-70 ft bgs

Reference Point Elevation: ____ ft amsl

Pump Depth: 59.0 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)
8:58:16	0	20.65	0	148810.9	Pump on @ ~15.5 gpm.			Water clear.					
09:03	5	26.80	6.15	–	15.5								
09:08	10	26.80	6.15	148951.8	15.2	slightly aerated							14.0
09:23	25	26.80	6.15	149179.2	15.2	aerated sample							6.50
09:38	40	26.80	6.15	149407.1	15.2	"	"						4.34
09:53	55	26.80	6.15	149634.5	15.2	"	"						2.96
10:08	70	26.90	6.25	149863.0	15.2	16.0	2.4	31624	26190	21515.2	7.25	80.2	1.88
10:23	85	26.90	6.25	150094.3	15.4	16.0	2.4	31699	26270	21562.8	7.33	20.9	1.39
10:38	100	26.95	6.30	150325.7	15.4	16.0	2.4	31805	26336	21624.0	7.33	0.6	1.30
10:53	115	26.95	6.30	150557.1	15.4	16.0	2.4	31858	26393	21658.0	7.33	-5.5	1.23
11:08	130	26.95	6.30	150788.7	15.4	16.0	2.4	31930	26462	21719.2	7.33	-9.1	1.50
11:23	145	27.00	6.35	151020.2	15.4	16.0	2.4	32007	26526	21766.8	7.33	-10.5	1.20
11:38	160	27.00	6.35	151251.7	15.4	16.0	2.4	32065	26591	21814.4	7.33	-10.8	0.92
11:48	170	27.00	6.35	151406.4	15.5	16.0	2.4	32107	26619	21841.6	7.32	-10.6	0.85
11:58	180	27.00	6.35	151560.7	15.4	16.0	2.5	32173	26662	21875.1	7.32	-10.1	0.83
12:05	187	Begin collecting WQ samples for lab analysis. Samples placed on ice.											
12:25	207	27.05	6.40	151982.8	15.6	16.0	2.6	32301	26769	21970.8	7.32	-8.9	0.89
12:32:54	215			152104.7	Pump off.								
					Total Volume pumped today = 3293.8 gallons								
13:53	295	20.90	0.25										

Flow thru cell = 1239.7 mL/min

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%

Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

Zone#1 As-built

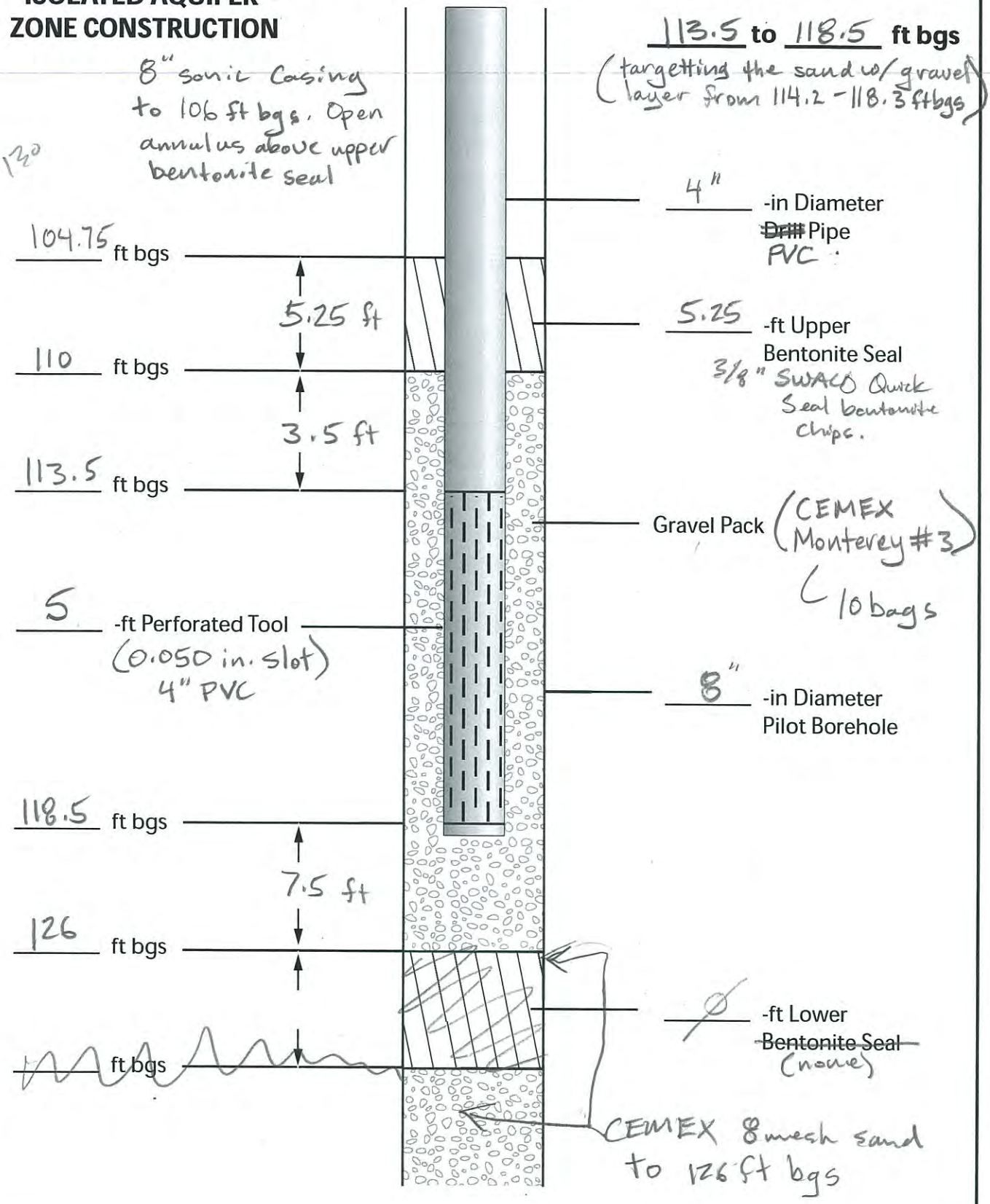
ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 1

113.5 to 118.5 ft bgs
(targetting the sand w/ gravel layer from 114.2 - 118.3 ftbgs)

8" sonic Casing to 106 ft bgs. Open annulus above upper bentonite seal

130



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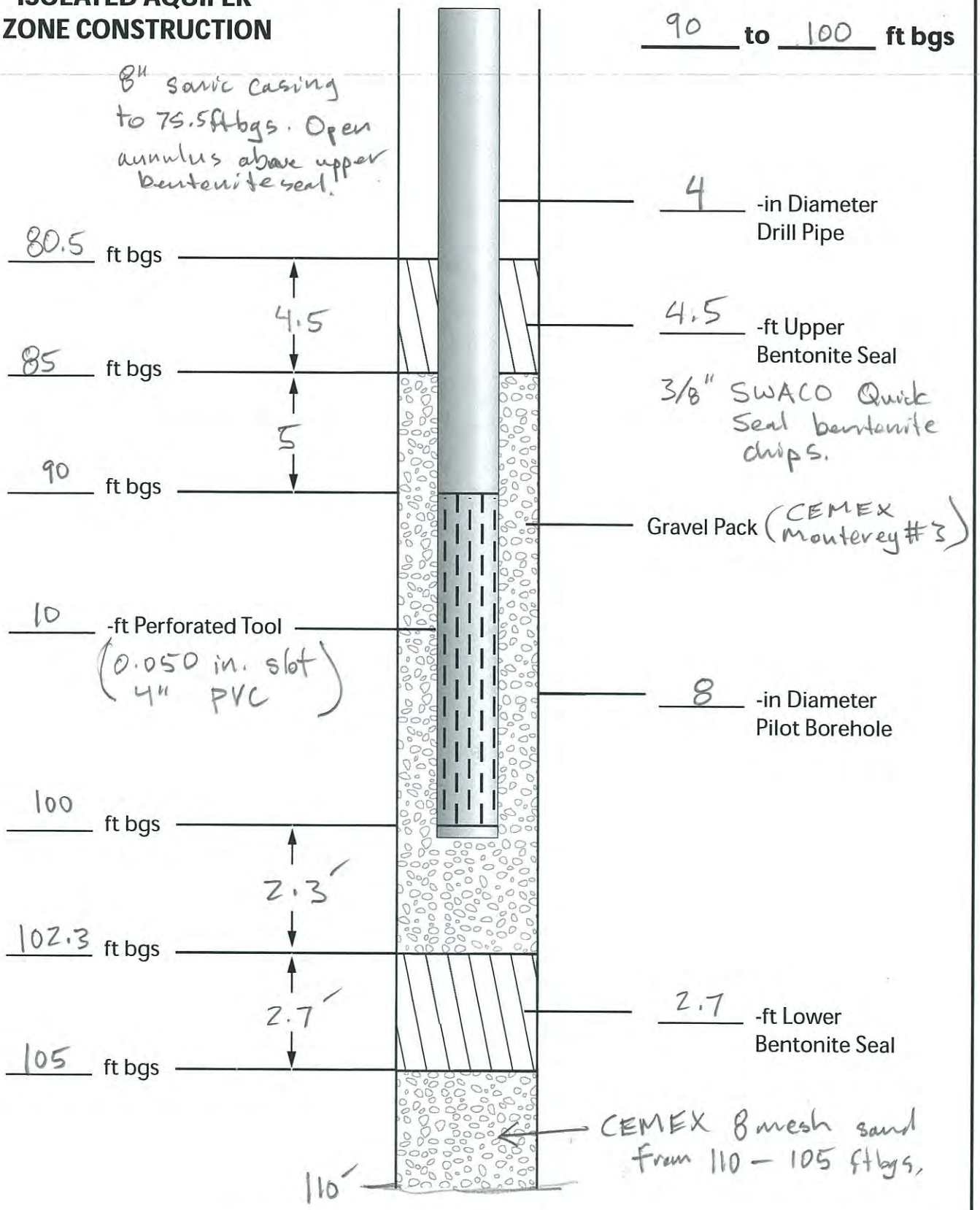
GEOSCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909) 451-6650 Fax: (909) 451-6638 www.gssiwater.com	Client: RBF Consulting Inc. Well Name/Number: MP WSP Exploratory Borehole ML-1 Date: 10-5-13 / Sat

Zone #2 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 2

90 **to** 100 **ft bgs**



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Client: RBF Consulting Inc.

Well Name/Number: MPWSP Exploratory Borehole ML-1

Date: 10-7-13/Mon

Zone #1 (113.5 - 118.5 ftbgs)

Sheet 2

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-1
Sonic Casing Dia: 8 in Sonic Casing Depth: 106 ft bgs
Static WL: 9.6 ft brp
RP: 7.1 ft ags

Logged By: N. Reynolds (GSSI); Cascade Drilling
Test Date: 10-5-13 / Sat
Screened Interval: 113.5 - 118.5 ft bgs
Reference Point Elevation: _____ ft amsl
Pump Depth: 97 ft bgs

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal x 1)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)
10:10	0	9.6	0	7597.6	0	start pumping @ 8gpm turbid but not sandy							
10:15	5	58.6	49.0	7685.4	17	Turb improving							
10:20	10	59.0	49.4	7769.5	16.8	↑ Q							
10:22	12					↓ Q ~~slightly~~ due to drawdown close to pump							
10:25	15			7920.1		Turbidity improving							
10:31	21					↓ Q. sucking air. Turb ok. No							
10:32	22	103.0	93.4	8101.2	22	No aeration							
10:38	26	102.1	92.5		20	↓ Q again. Turb ok							
10:50	40					↓ Q. sucking air. Lower pump 2 ft to 99 ftbgs							
11:12	63	sounder issues?				obstruction getting W.L. @ 97.9 ftbgs							
11:15	65			8978.5		Turn pump off							
11:20:40				8978.5		Pump on							
11:23	73	25.5	15.9		10.3	adjust sounder							
11:26	76				15.3	↑ Q to 15.3 gpm							
11:27	77				17.8	↑ Q to 17.8 gpm							
11:35	85	68.7	59.1			W.L. beginning to stabilize.							12.7
12:38	18			9210.0	∅	Pump off. Cascade stop to install smaller pump.							
13:09		11.25	1.65		∅	SWL after pulling pump.							

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

See page 2 →

Form Created: 29-Sep-13

Zone # 1 (113.5 - 118.5 ft bgs)

Sheet 2 Appendix F 2

YSI Pro series

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1 (113.5 - 118.5 ft bgs)

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-1
Sonic Casing Dia: 8 in Sonic Casing Depth: 106 ft bgs
Static WL: 11.7 ft brp ← 2nd static
RP: 7.1 ft ags

Logged By: N. Reynolds (GSSI); Cascade Drilling
Test Date: 10-5-13 / Sat
Screened Interval: 113.5 - 118.5 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 105 ft bgs ← 2nd Pump (Smaller)

New Static

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal x 1)	Pumping Rate (gpm)	Temp (°C)	sensor bad DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	sensor bad ORP (mV)	Turbidity (NTU)	Salinity (ppt)
14:00:50	0	11.7	ø	9215.5			Pump on.							
14:01							↓Q							
14:04	3	34.5	22.8		12.7								70.0	
14:07	6				11.7		↑Q							
14:15	14	36.6	24.9		13.8									
14:23	22	38.7	27.0	9500.0	~14	17.0	—	35842	30358	23302.5	6.83	—	5.75	
14:31	30	39.3	27.6	9611.8	14.0	16.9	—	35793	30280	23270.0	6.87	—	3.26	22.63
14:40	39	40.15	28.45	9737.4	14.0	17.0	—	35729	30299	23231.0	6.87	—	2.80	22.60
14:50	49	40.05	28.35	9876.5	13.9	16.9	—	35758	30195	23231.5	6.88	—	1.74	22.60
15:00	59	40.33	28.63	10,015.8	13.9	16.9	—	35696	30156	23198.5	6.89	—	1.26	22.55
15:10	69	40.7	29.0	10,155.5	14.0	17.0	—	35615	30180	23140.0	6.89	—	1.14	22.51
15:20	79	40.84	29.14	10,294.2	13.9	17.0	—	35557	30114	23107.5	6.91	—	1.06	22.47
15:30	89	41.0	29.3	10,433.4	13.9	17.0	—	35497	30048	23075.0	6.91	—	1.16	22.41
15:40	99	41.2	29.5	10,572.5	13.9	17.0	—	35429	30002	23029.5	6.91	—	1.04	22.38
15:50	109	41.65	29.95	10,711.4	13.9	16.9	—	35362	29915	22984.0	6.91	—	1.21	22.33
16:00	119	41.6	29.9	10,850.3	13.9	17.0	—	35300	29875	22964.5	6.91	—	0.88	22.30
16:10	129	41.75	30.05	10,989.2	13.9	17.0	—	35270	29827	22919.0	6.91	—	0.75	22.26
16:27	146	41.95	30.25	11,225.1	13.9	16.9	—	35169	29716	22847.5	6.92	—	0.70	22.21
16:45	Water	samples	collected	for laboratory	analysis.	Placed	on ice.							
17:47	226	42.62	30.92	12,356.2	14.1	16.7	—	34707	29195	22561.5	6.91	—	0.42	21.87

Stabilization Criteria: 17:54:43 12,462.0 Turn pump off. 4864.4 gallons pumped total.

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2 (90-100 ft bgs)

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-1
Sonic Casing Dia: 8 in Sonic Casing Depth: 75.5 ft bgs
Static WL: 9.50 ft brp
RP: 7.1 ft ags

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 10-7-13 / Mon
Screened Interval: 90-100 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 80 ft bgs ← smaller pump

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal x1)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Sal ppt
14:09:43	0	9.50	0	12,460.0	Ø		pump on. Turbid, but not sandy. 15.8 gpm							
14:13	3	~63	53.5		15.8		↓Q W.L. dropping quickly							
14:15	5	61.5	52.0		11.0									
14:17	7						↑Q	14:18 ↑Q to 14.8 gpm						
14:27	17						↓Q W.L. approaching pump 13 gpm							
14:55	45						Sucking air. W.L @ pump. ↓Q. Sulfur smell to water. 10.9 gpm							
15:26	136	77.8	70.7	13,409.3	11.1	17.0	—	628	532	409.50	7.21	—	12.5	0.31
		Water is very aerated/milky. Sulfer smell.												
15:41	151	78.9	69.4	13,573.3	10.9	17.0	—	630	534	409.50	7.22	—	10.0	
15:50	160	79.3	69.8	13,671.3	10.9	16.9		643	544	416.00	7.23		9.79	0.31
16:08	178	79.9	70.4	13,867.3	10.9	16.9		646	546	422.50	7.23		8.11	0.32
16:20	190	80.3	70.8	13,997.7	10.9	16.9		645	545	422.50	7.23		9.20	0.32
16:33	203	74.4	64.9	14,127.7	9.9	17.0		644	545	422.50	7.23		5.53	0.32
16:56	226	74.4	64.9	14,352.6	9.8	16.9		646	545	422.50	7.23		5.29	0.32
17:11	241	74.65	65.15	14,499.1	9.8	16.8		646	545	422.50	7.23		5.73	0.32
17:23	↓Q slightly													
17:40	270	64.15	54.65	14,755.0	7.9	16.8		645	545	422.50	7.23		1.82	0.32
18:04	294	64.00	54.50	14,946.8	8.0	16.8		645	544	422.50	7.24		2.06	0.32
18:20	310	64.20	54.70	15,074.5	8.0	16.8		647	545	422.50	7.24		2.52	0.32
19:01	351	64.8	55.30	15,410.1	8.2	16.9		646	546	422.50	7.24		4.48	0.32

19:14 Pump off. 15,551.0

18:25 Take WQ samples for lab analysis.

Stabilization Criteria:
3 to 5 minute recordings with 3 consecutive readings within:
pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

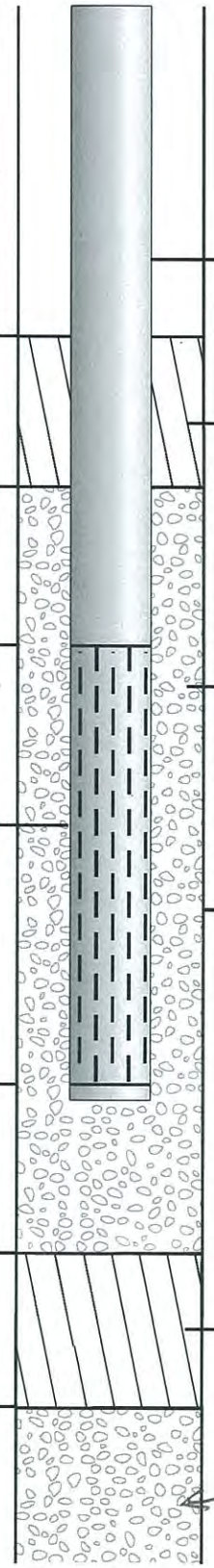
Zone #1 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 1

167 to 177 ft bgs

8" Sonic casing to 155 ftbgs. Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

156 ft bgs

6 ft

6 -ft Upper Bentonite Seal 2 bags 3/8" SWACO Quick Seal bentonite

162 ft bgs

5 ft

167 ft bgs

Gravel Pack (CEMEX Monterey #3) 13 bags

10 -ft Perforated Tool (0.050 in slot Sch. 40 4" PVC)

8 -in Diameter Pilot Borehole

177 ft bgs

5.5 ft

182.5 ft bgs

7.5 ft

7.5 -ft Lower Bentonite Seal 3 bags

190.0 ft bgs

backfill/cuttings from 200 ftbgs

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Client: RBF Consulting Inc.

Well Name/Number: MPWSP ML-2 (Del Mar Fisheries)

Date: 12-16-13/ Mon

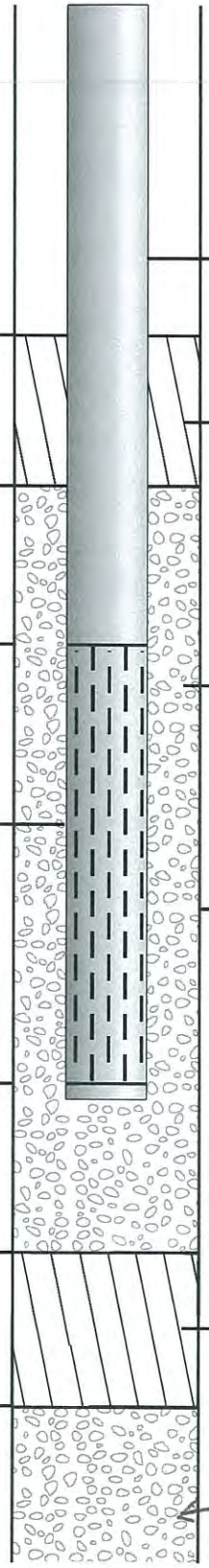
Zone#2 As-Built

Zone No. 2

ISOLATED AQUIFER ZONE CONSTRUCTION

90 to 100 ft bgs

8" sonic casing to 75 ft bgs
Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

80.3 ft bgs

4.4 ft

4.4 -ft Upper Bentonite Seal
3/8" SWACO Quick Seal bentonite

84.7 ft bgs

5.3 ft

90 ft bgs

Gravel Pack (CEMEX Monterey#3)

10 -ft Perforated Tool (0.050 in. slot 4" PVC)

8 -in Diameter Pilot Borehole

100 ft bgs

4.5 ft

104.5 ft bgs

5.5 ft

5.5 -ft Lower Bentonite Seal

110 ft bgs

1'4" fill

2/12 sand from 140 ftbgs

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-2 (Del Mar Fisheries)
Sonic Casing Dia: 8 in Sonic Casing Depth: 155 ft bgs
Static WL: 6.12 ft brp 2nd Static = 9.80 ft brp
RP: 6.0 ft ags (TOC)

Logged By: N. Reynolds (GSSI) & Cascade W.L.
Test Date: 12-17-13 Tue
Screened Interval: 167 - 177 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 165 ft bgs

Time	Time Step (min)	Water Level (ft brp) 9.8 ft	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L) 0.68 constant	pH	ORP (mV)	Turbidity (NTU)
10:10:23	0	6.12	0	51134.6	Pump on to test polarity & DD determination.								
10:13	3	90.0	84.0		21.8								
10:17	7	138.0	132.0		~22	↓Q to 13 gpm							
10:23	13	123.5	117.5	Rolled back	14.3								
10:33	23			51489.0	Pump off. Switch to smaller pump. 354.4 gallons pumped.								
13:08:10	0	9.80	new static	51461.9	Pump on @ 14.8 gpm								
13:11	3	59.3	49.5		14.8	some aeration to water.							
13:17	9	88.0	78.2		14.8								
13:20	12	91.2	81.4	51619.1	~14.8	17.8	0.2	34190	29464	23249.2	6.93	-28.3	12.4
13:24	Pump off to fix hose leak.			51666.5	~14.8								
13:32	Pump on. Adjust Q.			~13.3 gpm.									
13:38	6	94.8	85.0		15.6	↑Q to 17.1 gpm			13:43	↑Q to 18.1 gpm			
13:50	18	130.4	120.6	51982.6	17.8	17.6	1.2	34195	29420	23276.4	6.90	-76.7	21.2
14:00	28	133.3	123.5	52160.4	17.8	17.6	0.4	34484	29612	23453.2	6.92	-94.9	9.79
14:10	38	134.0	124.2	52337.8	17.7	17.6	0.2	34566	29656	23500.8	6.91	-99.0	8.12
14:20	48	134.6	124.8	52515.0	17.7	17.5	0.1	34591	29665	23521.2	6.91	-100.3	5.80
14:30	58	135.0	125.2	52692.1	17.7	17.5	0.1	34614	29682	23534.8	6.90	-100.5	5.80
14:40	68	135.4	125.6	52869.3	17.7	17.5	0.0	34638	29662	23562.0	6.89	-100.6	3.46
14:50	78	135.5	125.7	53046.2	17.7	17.4	0.0	34651	29655	23562.0	6.87	-100.7	2.81
15:00	88	135.7	125.9	53223.1	17.7	17.4	0.0	34672	29638	23575.6	6.87	-100.1	2.44

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1081.5 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-2
Sonic Casing Dia: 8 in Sonic Casing Depth: 155 ft bgs
Static WL: 9.80 ft brp
RP: 6.0 ft ags

Logged By: N. Reynolds (GSSI) & Cascade W.L.
Test Date: 12-17-13 / Tue
Screened Interval: 167 - 177 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 165 ft bgs

0.68 Constant

Time	Time Step (min)	Water Level (ft brp) 9.8 ft	Drawdown (ft)	Totalizer (gal) 53223.1	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)
15:10	98	problem w/ sounder		53400.1	17.7	17.4	0.0	34688	29647	23589.2	6.86	-99.8	1.33
15:20	108	"	"	53577.1	17.7	17.4	0.0	34697	29650	23589.2	6.86	-99.8	3.50
15:30	118	136.7	126.9	53753.9	17.7	17.4	0.0	34716	29649	23602.8	6.86	-99.5	2.75
15:40	128	136.8	127.0	53930.8	17.7	17.4	0.0	34710	29643	23602.8	6.86	-98.9	1.94
15:50	138	136.9	127.1	54107.7	17.7	17.4	0.0	34717	29650	23609.6	6.86	-99.5	2.03
16:00	148	137.0	127.2	54284.5	17.7	17.4	0.0	34716	29646	23602.8	6.86	-99.2	1.70
16:10	158	137.2	127.4	54461.2	17.7	17.3	0.0	34729	29654	23616.4	6.86	-99.5	2.36
16:20	168	137.25	127.45	54638.1	17.7	17.4	0.0	34728	29657	23616.4	6.86	-99.2	2.78
16:30	178	137.24	127.44	54814.8	17.7	17.3	0.0	34734	29656	23616.4	6.86	-99.8	1.72
16:40	188	137.45	127.65	54991.6	17.7	17.3	0.0	34730	29650	23616.4	6.86	-99.2	1.68
16:45	193	Collect WQ samples for lab analysis. Samples placed on ice.											
17:15	223	138.5	128.7	55615.9	17.8	17.3	0.0	34760	29660	23636.8	6.86	-95.7	3.40
17:26	234			55818.4	Pump off.								
							Total volume pumped = 4683.8 gallons.						

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

Sheet 1 of 2

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: MPWSP ML-2 (Del Mar Fisheries)
Sonic Casing Dia: 8 in Sonic Casing Depth: 75 ft bgs
Static WL: 9.6 ft brp (3.6 ft bgs)
RP: 6.0 ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade
Test Date: 12-18-13 / Wed
Screened Interval: 90 - 100 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 80 ft bgs (intake)

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
15:45:19	0	9.6	0	55818.2	~28.2	Pump on.							
15:47	2	35.0	25.4		~28.2								
15:50	5	35.9	26.3	55964.6	~28.2								471
16:00	15	36.1	26.5	56246.2	28.2								25.2
16:10	25	36.2	26.6	56527.8	28.2								12.5
16:23	38	36.3	26.7	56893.9	28.2								5.12
16:25 &	16:26	↑ Q				Max possible rate w/pump							
16:27	42	47.0	37.4		42.4	↑ Q	to ~48 gpm	50.6 ft brp W.L.			16:31 ↑	Q	
16:32	47	55.3	45.7	57258.7	50.4								
16:35	50	55.7	46.1	57408.1	49.8								81.5
16:40	55	56.6	47.0	57656.5	49.7								27.6
16:45	60	57.1	47.5	57904.4	49.6								20.7
16:50	65	57.6	48.0	58151.9	49.5								16.6
16:52	67			58242.0	Pump off.	Volume pumped = 2,423.8 gallons							

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2 W.L.'s

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-2 (Del Mar Fisheries)
Sonic Casing Dia: 8 in Sonic Casing Depth: 75 ft bgs
Static WL: 7.6 ft brp (1.6 ft bgs)
RP: 6.0' ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade
Test Date: 12-19-13 / Thu
Screened Interval: 90 - 100 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 80 ft bgs

high tide = 10:35 5.12'

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
8:22:10	0	7.6	0	58241.0	Pump on 19.6 gpm			08:24	↑ Q to	25.1 gpm			
8:26	4	27.7	20.1	58324.8	25.1	water slightly aerated.							22.6
8:30	8	28.5	20.9	58426.0	25.3								5.03
9:15	53	29.5	21.9	59565.0	25.3	16.3	0.1	10573	8813	7208.0	6.68	73.3	1.95
9:25	63	29.62	22.02	59819.5	25.5	16.3	0.0	10705	8946	7289.6	6.68	63.5	1.43
9:35	73	29.57	21.97	60074.1	25.5	16.4	0.0	10834	9049	7364.4	6.67	55.4	1.35
9:45	83	29.54	21.94	60328.4	25.4	16.4	0.0	10937	9145	7439.2	6.67	49.9	1.22
9:55	93	29.53	21.93	60582.4	25.4	16.4	0.0	11079	9253	7534.4	6.67	44.6	1.03
10:05	103	29.62	22.02	60836.4	25.4	16.4	0.0	11151	9335	7582.0	6.67	40.7	0.77
10:15	113	29.60	22.00	61090.5	25.4	16.4	0.0	11240	9414	7643.2	6.67	37.4	0.63
10:25	123	29.62	22.02	61344.9	25.4	16.4	0.0	11317	9480	7711.2	6.67	34.7	0.52
10:35	133	29.64	22.04	61599.0	25.4	16.4	0.0	11413	9549	7772.4	6.67	32.3	0.50
10:45	143	29.72	22.12	61853.1	25.4	16.4	0.0	11508	9635	7826.8	6.67	30.1	0.72
10:45	Begin	collecting WQ	samples for	laboratory	analysis.	Samples	placed	on	ice.				
11:01	159												0.51
11:22	180	29.97	22.37	62802.6	25.7	16.5	0.0	11825	9896	8037.6	6.68	22.1	0.58
11:30:28	188			63017.3	25.4	Pump	off.	Total Volume	pumped	= 4776.3 gallons			
12:25	243	8.00	0.40	–	0								

rising tide

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1148.5 mL/min

Form Created: 29-Sep-13

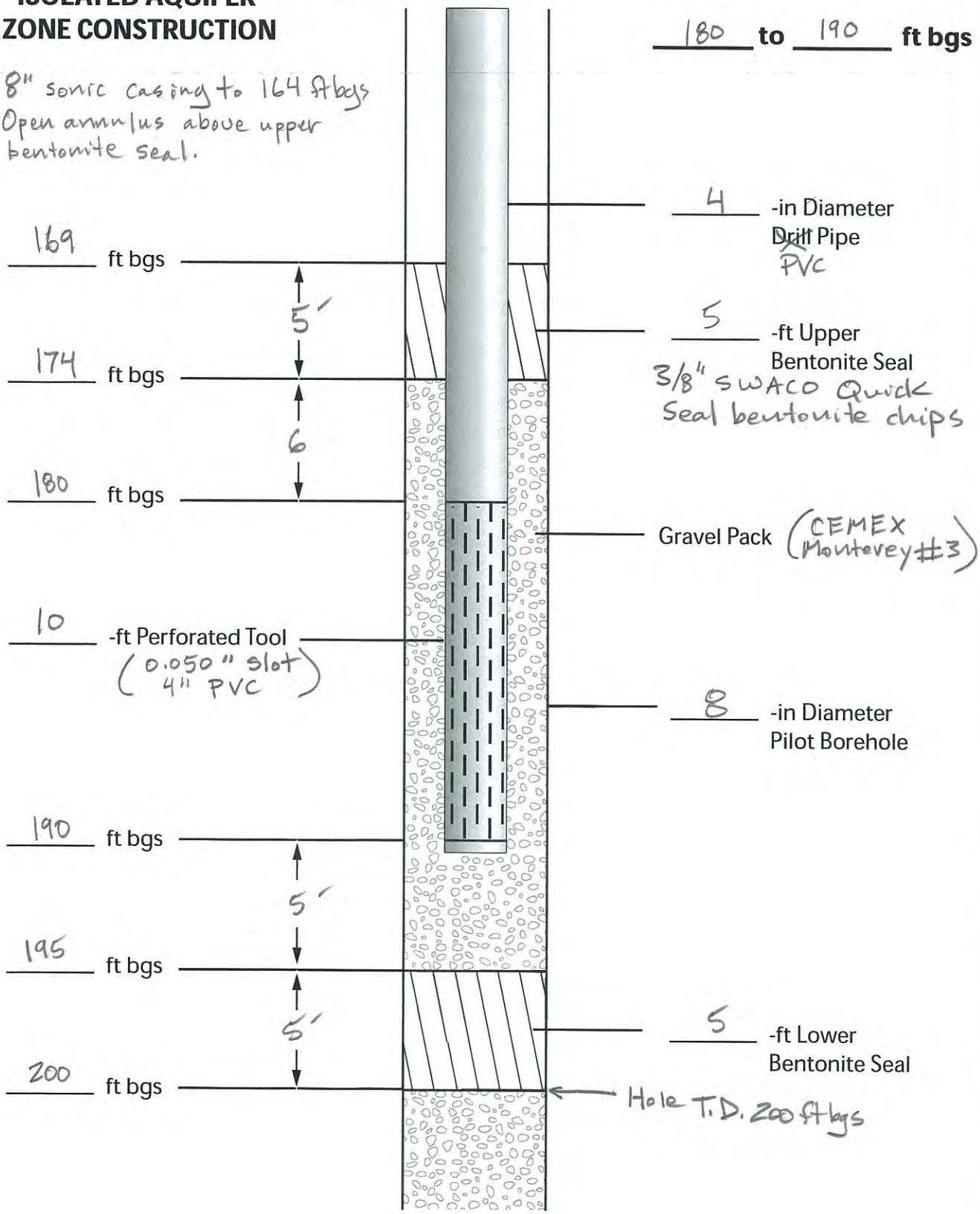
ISOLATED AQUIFER ZONE CONSTRUCTION

Zone #1 - As Built

Zone No. 1

180 **to** 190 **ft bgs**

8" sonic casing to 164 ft bgs
Open annulus above upper bentonite seal.



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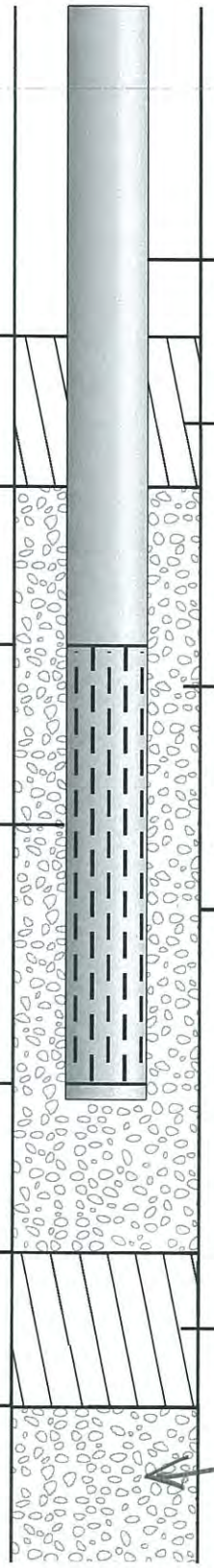
Zone #2 - As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

8" sonic casing to 82 ftbgs
Open annulus above upper bentonite seal.

Zone No. 2

103 **to** 113 **ft bgs**



4 -in Diameter ~~Drill~~ PVC Pipe

93 ft bgs

5 ft

5 -ft Upper Bentonite Seal
CETCO Pure Gold Medium bentonite chips (2½ bags)

98 ft bgs

5 ft

103 ft bgs

Gravel Pack (CEMEX Moterey #3) 13 bags

10 -ft Perforated Tool (0.050" Slot 4" PVC)

8 -in Diameter Pilot Borehole

113 ft bgs

5 ft

118 ft bgs

5.5 ft

5.5 -ft Lower Bentonite Seal 2½ bags

123.5 ft bgs

CEMEX Lapis Lustre Sand #2/12

175 ftbgs

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-3 (Hwy 1 South)
Sonic Casing Dia: 8 in Sonic Casing Depth: 164 ft bgs
Static WL: 14.0 ft brp (8 ft bgs)
RP: 6.0 ft ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 1-10-14 / Fri
Screened Interval: 180-190 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 164.0 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
14:41:21	0	14.0	0	63016.9	Pump on @ 23.5 gpm								
14:44	Stop pumping. PWL reaches pump.												
14:54:52	0 Resume pumping			63057.9	@ ~2 gpm								
14:58	Stop pumping. PWL reaches pump. Recovery is slow. Crew pull pump and swab screen.												
16:56		58.7		63057.9	Recovering. Reinstall pump to 184 ft bgs.								
16:57	Pump on @ ~ 2.5 gpm. Turbid.												
17:00		138.0		8.9 gpm									
17:03	Stop pumping.			63113.5	PWL draws down to pump @ 2.5 gpm.								

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

5/(33.84/60)

Form Created: 29-Sep-13

365 gallons = 3 well Vol.

Sheet 3 of 4 Appendix F

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-3 (Hwy 1 South)
Sonic Casing Dia: 8 in Sonic Casing Depth: 164 ft bgs
Static WL: 18.57 ft brp (12.57 ft bgs)
RP: 6.0 ft ags (top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling (W.L.s)
Test Date: 1-11-14 / Sat
Screened Interval: 180-190 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 184 & 174 ft bgs

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Total gallons
8:21:05	0	18.57	–	63083.3	Pump on @ ~3.8 gpm. Turbid.									
8:26	5	66.0	47.43											
8:31	10	99.0	80.43		3.2									
8:36	15	126.8	108.23		3.2				decreasing					
8:40	19	139.5	120.93	63147.3	silty. Aerated.									
8:45	24	175.0	156.43			19.8	0.6	7744	6955	5222.4	7.43	-332.1	turbid	
~8:46	25	Pump off.		63166.5	W.L. approaching pump intake.									
8:54:30	33	139.9	121.33	Recovering	W.L. (slowly recovering)									
10:54	153	65.7	47.13	Recovering	W.L. after swabbing. Raise/install pump to 174 ft bgs (intake)									
12:20:20	0	41.2	22.63	63166.5	Pump on. 8.2 gpm.			12:21 ↓ Q to 4.5 gpm		12:24 ↓ Q to 2.8 gpm			Turbid.	
12:24	4	95.6	77.03		4.5									
12:30	10	sounder	stuck	63204.6	~2.8									
12:36	16			63215.0	Stop Pumping. PWL @ pump.									
12:37:30		Resume	pumping.											
12:39	19	139.7	121.13											
12:41	21	154.0	135.43	63222.2	2.2	19.7	5.4	9665	8678	6534	7.31	-97.9	turbid.	
12:45	25	169.0	150.43	63231.4	2.3	20.0	5.2	8976	8102	6038	7.31	-100.2	" "	64.9
12:46	26	Stop Pumping. PWL @ pump.												
13:04:15	44	Resume	pumping. ~2.0 gpm											
13:06	46			63233.0	2.0									

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

15:47 573
11:12 573

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-3 (Hwy 1 South)
Sonic Casing Dia: 8 in Sonic Casing Depth: 164 ft bgs
Static WL: 18.57 ft brp
RP: 6.0 flags

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 1-11-14 / Sat
Screened Interval: 180-190 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 174 ft bgs

Time	Time Step (min) (12:20)	Water Level (ft brp) (18.57)	Drawdown (ft)	Totalizer ( ) (63166.5)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Total gallons
13:07	47	151.6	133.03		2.0									
13:10	50	159.5	140.93	63240.7	1.9									
13:13:30	53	168.0	149.43	63247.7	Stop pumping. PWL approaching pump									81.2
14:00:30	100	95.7	77.13	63247.7	Resume pumping @ 3.1 gpm. 14:04 ↓Q to								aerated/milky	
14:05	105	141.5	122.93	63261.9	2.8	19.3	4.8	11,483	10193	7799.6	7.29	-90.1	23.3	
14:10	110	149.0	130.43	63269.3	1.5	19.0	2.9	11,513	10189	7820.0	7.31	-103.9	58.1	
14:15	115	156.2	137.63	63276.2	1.4	19.4	2.5	11,346	10141	7684.0	7.31	-113.6	470	
14:20	120	162.4	143.83	63282.7	1.3	20.0	2.1	10,647	9640	7235.2	7.33	-123.4	432	
14:25	125	167.1	148.53	63288.8	1.2	20.8	1.7	10,578	9726	7194.4	7.32	-128.1	426	
14:28:15	128			63292.1	Stop Pumping. PWL approaching pump									125.6
14:53	153	116.0	97.43											
14:55:47	156			63292.1	Resume pumping @ 3.6 gpm. 14:58 ↓ Q									
15:00	160	145.1	126.53	63298.2	~2.1	20.6	3.1	11079	10282	7738.4	7.32	-118.6	23.0	
15:05	165	160.8	142.23	63308.8	2.1	19.9	1.9	11564	10439	7860.8	7.30	-120.9	31.9	
15:09	169	169.0	150.43	63316.2	2.1	Stop Pumping. PWL approaching pump								149.7
15:59:44	220			63316.2	Resume pumping. Recovering W.L. 96.6 ft brp ~2gpm									
16:00	220	Begin	collecting	Water Samples for laboratory analysis										
16:02	222				~2gpm	20.1	0.6	11848	10722	8058	7.31	-139.3	5.57	
16:05	225	148.5												
16:09:05	229			63348.0	Stop Pumping. PWL approaching pump!									181.5

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-3 (Hwy 1 South)
Sonic Casing Dia: 8 in Sonic Casing Depth: 164 ft bgs
Static WL: 18.57 ft brp
RP: 6.0 ft ags

Logged By: M. Reynolds (GSSI) & Cascade Drilling
Test Date: 1-11-14 / Sat
Screened Interval: 180-190 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 174 ft bgs

Time	Time Step (min) 12:20	Water Level (ft brp) 18.57	Drawdown (ft)	Totalizer (gal) 63166.5	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)	Total gallons
16:22		126.2		63343.4	Recovering W.L. (Totalizer wound back)									
16:22:52	Pump on @		~1.9 gpm			20.2	5.0	11163	10253	7752	7.33	-108.5	24.5	
16:28:45				63357.5	Stop Pumping. PWL approaching pump.									191.0
16:48:11	Pump on @		~2.0 gpm											
16:54					~2.0	19.6	2.9	11438	10196	7697	7.33	-126		
16:57:10	Stop pumping.	PWL by pump		63380.0										213.5
17:15:06	Pump on @		~2 gpm											
17:17						20.2	4.7	10952	9992	7656	7.35	-121.3	92.3	
17:20					1.5	20.3	4.1	11751	10694	7990	7.27	-99.7		
17:23		173.4				19.7	3.7	11704	10507	7942.4	7.28	-105.8	65.2	
17:25:42	Pump off. Complete Sampling			63397.7										231.2

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2 W.L.'s

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-3 (Hwy 1 South)
Sonic Casing Dia: 8 in Sonic Casing Depth: 82 ft bgs
Static WL: 18.86 ft brp (10.86 ftbgs)
RP: 8.0 ft ags (Top of 8" casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 1-13-14/Mon
Screened Interval: 103-113 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 95 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
9:03:55	0	18.86	0	63473.0	Pump on @ 3.5 gpm. Water clear. 0906:50 ↓Q slightly								
9:11	7	49.9	31.04		2.2	9:11:34 ↑Q slightly to 2.4 gpm.							
9:15	11	57.1	38.24		2.4	↑Q slightly.		water aerated. No odor.					11.6
9:21	17	67.2	48.34		2.8								8.90
9:55	51	76.3	57.44	63618.0	3.1	19.8	1.3	7420	6687	5045.6	6.90	-116.4	2.91
10:05	61	78.3	59.44	63649.1	3.1	19.7	0.1	7385	6637	5018.4	6.96	-136.3	24.0
10:15	71	79.9	61.04	63680.4	3.1	19.7	0.1	7402	6653	5032.0	6.96	-142.1	4.56
10:25	81	79.8	60.94	63711.8	3.1	19.7	0.1	7394	6650	5025.2	6.95	-145.3	4.17
10:35	91	79.7	60.84	63743.0	3.1	19.8	0.1	7387	6648	5025.2	6.95	-148.0	1.88
10:45	101	79.9	61.04	63774.2	3.1	19.8	0.1	7363	6632	5011.6	6.95	-150.0	2.10
10:55	111	80.3	61.44	63805.5	3.1	19.8	0.1	7368	6629	5011.6	6.95	-151.0	2.03
11:05	121	80.3	61.44	63836.7	3.1	19.8	0.1	7458	6714	5072.8	6.94	-151.6	1.51
11:15	131	80.3	61.44	63867.9	3.1	19.8	0.1	7434	6696	5052.4	6.94	-151.5	1.02
11:25	141	80.3	61.44	63899.0	3.1	19.8	0.1	7447	6709	5066.0	6.94	-151.7	0.96
11:35	151	80.2	61.34	63930.1	3.1	19.8	0.1	7439	6701	5059.2	6.94	-151.4	0.99
11:45	Begin	collecting	WQ	samples for	lab analysis.	Samples placed	on ice.						
12:05	181	78.9	60.04	64029.3	3.3	19.8	0.0	7473	6721	5079.6	6.93	-149.4	7.24
12:13	189												2.58
12:18:05	194			64079.7	Pump	off.	Total	volume	pumped	= 606.7	gallons		
13:41	277	20.7	1.84										

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow thru cell = 1218.5 mL/min

Form Created: 29-Sep-13

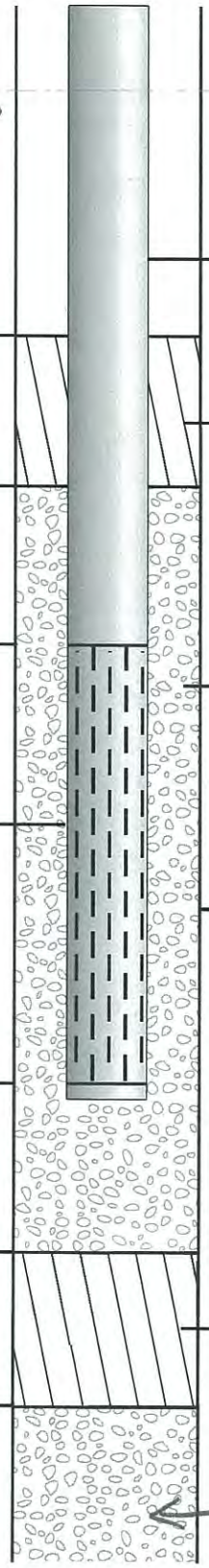
Zone #1 As Built

Zone No. 1

ISOLATED AQUIFER ZONE CONSTRUCTION

163.5 to 173.5 ft bgs

8" Sonic casing to 152 ft bgs.
Open annulus above upper bentonite seal.



4 -in Diameter ~~Drill~~ Pipe PVC

153 ft bgs

5 ft

5 -ft Upper Bentonite Seal
3/8" SWACO Quick Seal bentonite

158 ft bgs

5.5 ft

163.5 ft bgs

Gravel Pack (CEMEX Monterey #3)

10 -ft Perforated Tool
(0.050 in slot 4" PVC)

8 -in Diameter Pilot Borehole

173.5 ft bgs

7.5 ft

181 ft bgs

5 ft

5 -ft Lower Bentonite Seal

186 ft bgs

Cuttings from 201 ft bgs to 186 ft bgs.

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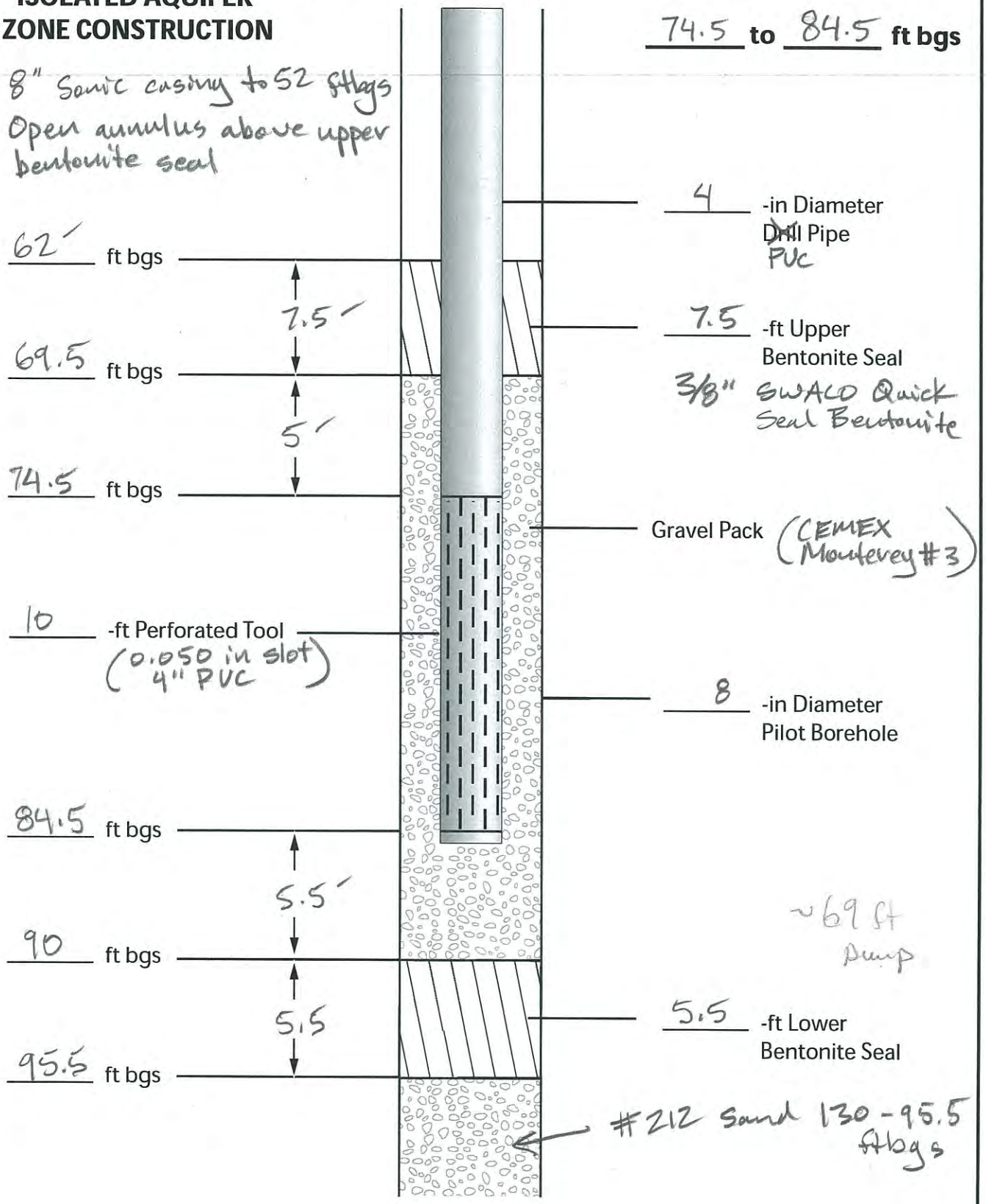
Zone#2 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 2

74.5 **to** 84.5 **ft bgs**

8" Sonic casing to 52 ftbgs
Open annulus above upper bentonite seal



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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-4 (Hwy 1 Middle)
Sonic Casing Dia: 8 in Sonic Casing Depth: 152 ft bgs
Static WL: 35.0 ft brp (27.33 ftbgs)
RP: 7.67 ftags (top of casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 12-4-13 / Wed
Screened Interval: 163.5 - 173.5 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 153.5 ft bgs

Note: TDS constant Set to 0.68

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)
14:21:33	0	35.0	0	36581.3	42.5	Pump on. ↓Q @ 14:23 (drawing down to pump)							
14:26		113.8	78.8	–	17.6								
14:29				↑Q to	18.4								
14:30		105.3	70.3	↑Q to	18.5								
14:35		108.6	73.6	↑Q to	20.2								
14:38		118.0 (drawdown)	83.0	↑Q to	22.7								
14:45		123.25	88.25		21.9								
14:58		123.4	88.40		22.0								
15:00		126.0	91.0	↑Q to	22.8								
15:17				↑Q to	~24								
15:35	73	135.2	100.2	38251.1	24.7	17.6	1.3	30316	26034	20617.60	6.74	49.6	5.13
15:45	83	133.8	98.8	38497.1	24.6	17.6	0.6	30410	26103	20678.8	6.75	17.2	5.63
15:55	93	136.9	101.9	38742.5	24.5	17.6	0.4	30298	26003	20746.8	6.76	-1.7	8.66
16:05	103	136.5	101.5	38993.7	25.1	17.6	0.1	30780	26410	20930.4	6.77	-10.8	5.11
16:15	113	136.2	101.2	39244.8	25.1	17.5	0.1	30802	26416	20944.6	6.77	-17.3	6.84
16:25	123	136.3	101.3	39495.8	25.1	17.5	0.0	30824	26422	20957.6	6.77	-24.3	4.67
16:35	133	135.6	100.6	39746.4	25.1	17.5	0.0	30832	26443	20964.4	6.77	-31.2	3.23
16:45	143	134.4	99.4	39996.0	25.0	17.5	0.0	30845	26438	20971.2	6.77	-37.4	5.16
16:55	153	135.5	100.5	40246.5	25.1	17.5	0.0	30853	26436	20978.0	6.78	-43.4	5.51
17:17	175	135.8	100.8	40799.8	25.2	17.5	0.1	30860	26445	20984.8	6.78	-53.8	3.89

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

762.5 mmHg

Flow through cell 1190.5 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-4
Sonic Casing Dia: 8 in Sonic Casing Depth: 152 ft bgs
Static WL: 35.0 ft brp
RP: 7.67 ftags (Top of casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 12-4-13 / Wed
Screened Interval: 163.5-173.5 ft bgs
Reference Point Elevation: ft amsl
Pump Depth: 153.5 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp) 35.0	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
17:31	189	136.0	101.0	41152.8	25.2	17.5	0.1	30861	26473	20984.8	6.78	-60.1	3.20
17:40	198	136.2	101.2	41379.5	25.2	17.5	0.1	30865	26464	20984.8	6.78	-62.5	3.88
17:50	208	135.9	100.9	41631.9	25.2	17.5	0.1	30871	26469	20991.6	6.78	-64.8	3.77
18:00	218	136.2	101.2	41884.3	25.2	17.5	0.1	30856	26458	20984.8	6.78	-68.4	2.04
18:10	228	136.0	101.0	42136.2	25.2	17.5	0.1	30873	26468	20991.6	6.78	-70.1	2.94
18:20	238	135.7	100.7	42388.0	25.2	17.5	0.1	30873	26476	20991.6	6.78	-72.7	3.24
18:30	248	135.9	100.9	42640.0	25.2	17.5	0.1	30869	26467	20984.8	6.78	-75.3	4.05
18:40	258	135.2	100.2	42891.6	25.2	17.5	0.1	30865	26472	20984.8	6.78	-74.7	6.57
18:50	268	134.0	99.0	43142.5	25.1	17.5	0.1	30871	26478	20991.6	6.78	-76.5	5.45
19:00	278	133.7	98.7	43389.6	24.7	17.5	0.1	30865	26467	20991.6	6.78	-77.9	4.63
19:10	288	133.7	98.7	43637.1	24.8	17.5	0.1	30871	26437	20991.6	6.78	-80.0	9.43
19:20	298	134.1	99.1	43884.6	24.8	17.5	0.1	30867	26440	20991.6	6.78	-81.6	5.42
19:30	308	133.9	98.9	44131.9		17.5	0.1	30866	26451	20991.6	6.78	-83.1	9.59
19:37	315			44305.0	Turn off pump. Turbidity unstable. Will resume tomorrow.								
					7,724 gallons pumped.								

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-4
Sonic Casing Dia: 8 in Sonic Casing Depth: 152 ft bgs
Static WL: 36.35 ft brp (28.68 ft bgs)
RP: 7.67 ft ags (top of casing)

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 12-5-13 / thu
Screened Interval: 163.5 - 173.5 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 153.5 ft bgs

0.68 constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
7:56:04	0	36.35	0	44299.6	Pump on @ 21.3 gpm.								
7:59	3	92.0	55.65										
8:13	17	93.2	56.85		17.9								
8:17	21			↑Q to	18.9								
8:19	23			↑Q to	19.6								
8:22	26	101.4	65.05	↑Q to	20.6								
9:00	64	103.1	66.75	45544.2	20.3	17.7	0.1				6.8	42.7	0.62
9:30	recalibrate YSI pH & Sp. Cond.												
09:40	104	103.5	67.15	46348.5	20.1	17.7	0.0	30680	26411	20855.6	6.77	16.8	0.39
09:50	114	103.3	66.95	46550.7	20.2	17.8	0.0	30678	26444	20855.6	6.76	2.8	0.50
10:00	124	103.7	67.35	46753.7	20.3	17.8	0.0	30674	26436	20855.6	6.76	-6.8	0.50
10:10	134	103.6	67.25	46956.7	20.3	17.8	0.0	30671	26437	20855.6	6.76	-13.8	0.48
10:25	Collect Water Quality samples for laboratory analysis. Place samples on ice.												
11:17	201	104.5	68.15	48324.1	20.4	17.8	0.0	30669	26448	20855.6	6.76	-39.5	0.63
11:24:40	~209			48479.1	Pump off. Total Volume pumped today = 4179.5 gallons								

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

Sheet 1

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-4 (Hwy 1 Middle)
Sonic Casing Dia: 8 in Sonic Casing Depth: 52 ft bgs
Static WL: 35.8 ft brp (27.8 ftbgs)
RP: 8.0 ft ags (Top of 8")

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 12-6-13 / Fri
Screened Interval: 74.5 - 84.5 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 69 ft bgs

0.68 Constant

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
10:00	0	35.8	0	48465.4	9.5	Pump on.							
10:04	4	48.8	13.0	–	9.5								
10:07	7	49.6	13.8	–	9.1								
10:09	9	51.7	15.9	–	10.5	(↑Q @ 10:09)							
10:33	33	59.0	23.2	48855.7	14.4	17.4	0.7	11,694	9995	7962.8	6.65	-12.9	22.5
10:40	40	59.5	23.7	48956.3	14.4	17.4	0.5	12,042	10,295	8187.2	6.64	-34.4	15.5
11:15	75	61.1	25.3	49458.0	14.3	17.6	0.3	12,717	10,914	8649.6	6.59	-61.3	3.38
11:25	85	61.6	25.8	49601.5	14.4	17.6	0.2	12,780	10,965	8697.2	6.59	-64.6	2.75
11:35	95	62.0	26.2	49745.1	14.4	17.5	0.2	12,845	11,025	8731.2	6.58	-69.4	1.74
11:45	105	62.3	26.5	49888.5	14.3	17.6	0.1	12866	11,058	8765.2	6.57	-73.5	1.36
11:55	115	62.5	26.7	50031.9	14.3	17.7	0.1	12899	11,100	8765.2	6.57	-79.7	1.15
12:05	125	62.8	27.0	50175.2	14.3	17.7	0.1	12914	11,131	8792.4	6.57	-86.1	0.92
12:15	135	63.1	27.3	50318.7	14.4	17.7	0.1	12933	11,141	8799.2	6.57	-92.8	0.94
12:25	Collect WQ samples for laboratory analysis. Samples placed on ice. Note: water has sulfur odor.												
13:01	181	64.2	28.4	50986.1	14.5	17.7	0.1	12987	11,168	8840.0	6.56	-124.6	0.78
13:10	190	64.4	28.6										
13:11:56~192		Pump	off.	51141.8									
				Total Volume pumped = 2,676.4 gallons									
13:51		40.75	4.95										
14:20		40.10	4.30										

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow Rate (YSI) = 1371 mL/min

Form Created: 29-Sep-13

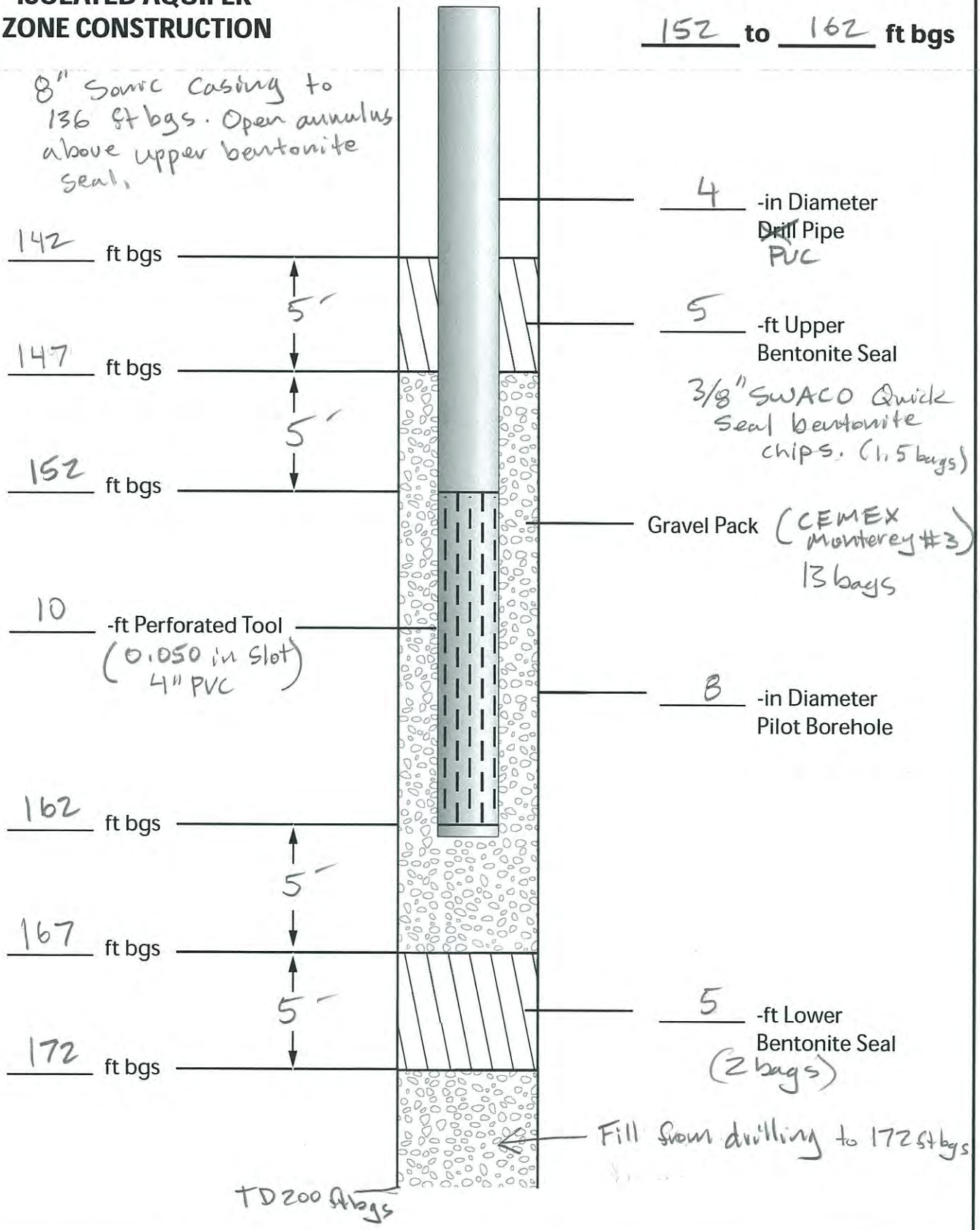
Zone#1 As Built

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. 1

152 **to** 162 **ft bgs**

8" Sonic Casing to 136 ft bgs. Open annulus above upper bentonite seal.



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Client: RBF Consulting Inc.

Well Name/Number: MPWSP Exploratory Borehole ML-6

Date: 11-21-13 / Thu

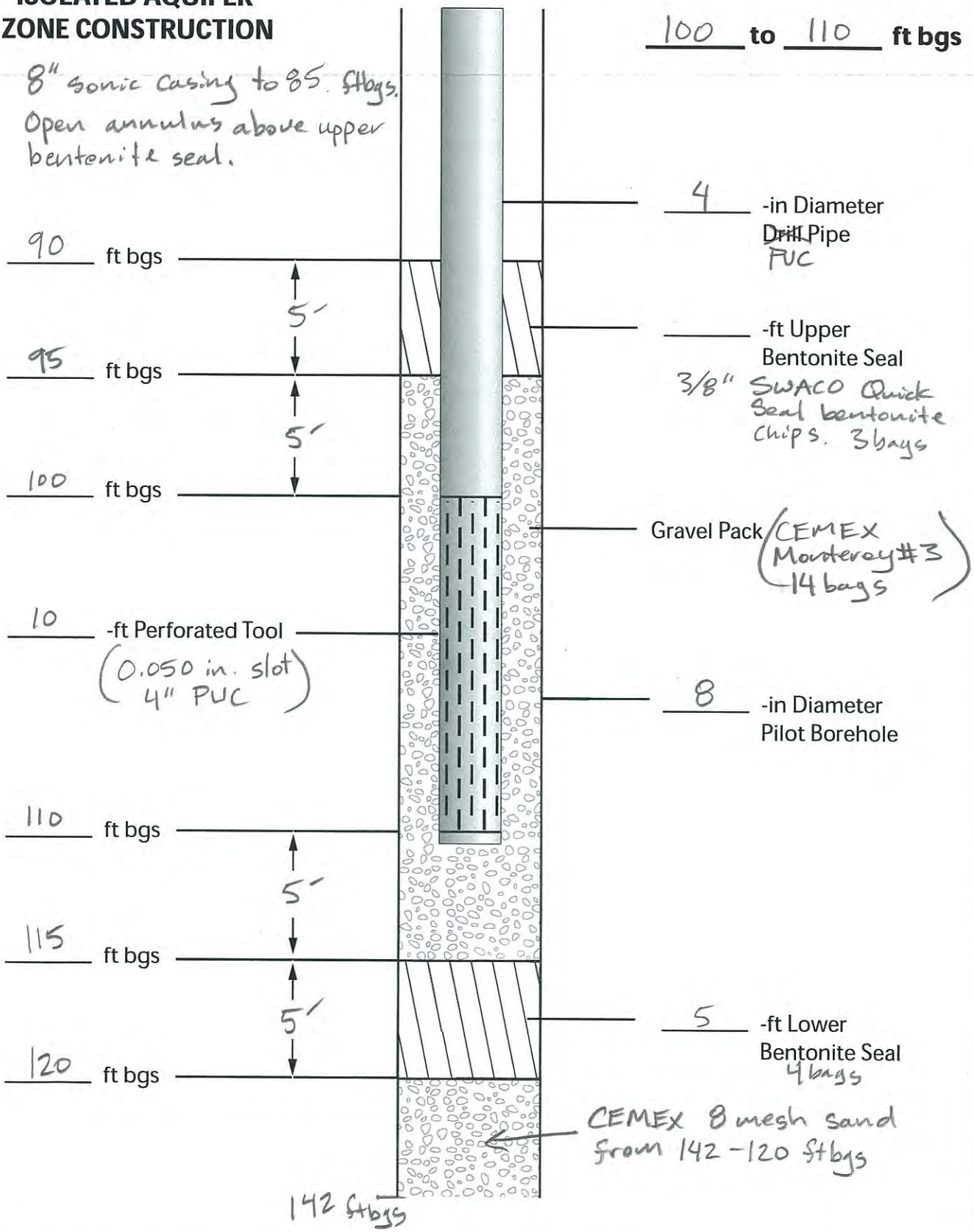
Zone #2 - As-Built

Zone No. 2

ISOLATED AQUIFER ZONE CONSTRUCTION

100 to 110 ft bgs

8" sonic casing to 85 ftbgs. Open annulus above upper bentonite seal.



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Client: RBF Consulting Inc

Well Name/Number: MPWSP ML-6 (MBARI)

Date: 11-22-13/Fri & 11-23-13/Sat

Sheet 7 of 2

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-6 (MBARI)
Sonic Casing Dia: 8 in Sonic Casing Depth: 136 ft bgs
Static WL: 15.74 ft brp
RP: 7.65

Logged By: N. Reynolds (GSSI)
Test Date: 11-22-13 / Fri
Screened Interval: 152-162 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 143 ft bgs

Note: TDS Constant is 0.65

Time	Time Step (min)	Water Level (ft brp) 15.74	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)
12:26	193	120.2	104.46	22381.0	42.9	16.6	0.1	48043	40368	31226	6.63	-73.9	3.23
12:36	203	120.05	104.31	22810.0	42.9	16.5	0.1	48065	40302	31245.5	6.63	-77.4	1.71
12:46	213	120.2	104.46	23238.5	42.9	16.6	0.1	48074	40404	31245.5	6.63	-79.5	2.45
12:56	223	120.4	104.66	23666.4	42.8	16.6	0.1	48074	40377	31245.5	6.63	-81.6	1.48
13:06	233	120.4	104.66	24094.0	42.8	16.6	0.1	48095	40386	31258.5	6.64	-85.1	2.81
13:16	243	120.5	104.76	24521.5	42.8	16.5	0.1	48144	40356	31284.5	6.63	-88.0	2.24
13:26	253	120.4	104.66	24949.0	42.8	16.5	0.1	48132	40389	31284.5	6.63	-90.5	1.26
13:35	Sample	for laboratory		WQ analysis.									
14:16		120.70	104.96	27087.3	42.8	16.4	0.1	48218	40330	31343	6.62	-104.6	1.17
14:22:23				27358.0	Pump off.								

Total gallons pumped = 11,838.5

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 1

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-6 (MBARI)
Sonic Casing Dia: 8 in Sonic Casing Depth: 136 ft bgs
Static WL: 15.74 ft brp 8.09 ftbgs
RP: 7.65 ft ags

Logged By: N. Reynolds (GSSI) & Cascade
Test Date: 11-22-13 / Fri
Screened Interval: 152-162 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 143 ft bgs
YSI Professional plus.

Note: TDS Constant is 0.65

taken by Cascade

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gal)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbitity (NTU)
09:13	0	15.74	0	15519.5		09:13	Pump on						
09:39		54.4	38.66		19.5								
09:54:35		63.1	47.36		~25.0	↑Q							
10:05		68.0	52.26		23.9								
10:06						↑Q							
10:10		76.0	60.26		~29	↑Q							
10:13						↑Q							
10:23	70	116.1	100.36		43.2								
10:26	73			17226.5	~43.2								
10:36	83	118.1	102.36	17658.0	43.2	16.7	0.1	47904	40276	31141.5	6.61	-8.6	11.6
10:46	93	118.8	103.06	18088.5	43.1	16.6	0.4	47463	39864	30849	6.62	-19.6	6.51
10:56	103	119.2	103.46	18518.5	43.0	16.6	0.3	47565	39992	30927	6.62	-34.1	5.73
11:06	113	119.6	103.86	18948.0	43.0	16.6	0.2	47726	40094	31031	6.62	-42.5	5.62
11:16	123	119.9	104.16	19377.3	42.9	16.6	0.2	47791	40169	31063.5	6.63	-49.1	7.49
11:26	133	120.0	104.26	19806.8	43.0	16.5	0.1	47894	40120	31135	6.63	-55.1	8.40
11:36	143	120.0	104.26	20236.4	43.0	16.5	0.1	47920	40161	31148	6.62	-59.2	3.53
11:46	153	120.2	104.46	20665.5	42.9	16.5	0.1	47975	40185	31180.5	6.62	-64.5	8.44
11:56	163	120.0	104.26	21094.5	42.9	16.5	0.1	47990	40231	31193.5	6.63	-64.6	4.55
12:06	173	120.0	104.26	21523.0	42.9	16.5	0.1	48024	40265	31219.5	6.63	-67.1	8.31
12:16	183	120.3	104.56	21952.0	42.9	16.6	0.1	48026	40279	31213.0	6.63	-70.1	2.35

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

1230 mL/min through Flowthru cell.

Form Created: 29-Sep-13

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ISOLATED AQUIFER ZONE SAMPLING DATA SHEET

Zone No. 2

Client: RBF/MPWSP - Exploratory Borehole Drilling
Borehole Name/Number: ML-6 (MBARI)
Sonic Casing Dia: 8 in Sonic Casing Depth: 85 ft bgs
Static WL: 15.00 ft brp 9.58 ft bgs
RP: 5.42 ft ags (ToC)

Logged By: N. Reynolds (GSSI) & Cascade Drilling
Test Date: 11-23-13 / SAT
Screened Interval: 100 - 110 ft bgs
Reference Point Elevation: ____ ft amsl
Pump Depth: 90 ft bgs

Note: TDS Constant set to 0.68

Time	Time Step (min)	Water Level (ft brp)	Drawdown (ft)	Totalizer (gallons)	Pumping Rate (gpm)	Temp (°C)	DO (mg/L)	Specific Cond. (µS/cm)	Cond. (µS/cm)	TDS (mg/L)	pH	ORP (mV)	Turbidity (NTU)
10:19:54	0	15.00	—	27347.0	Pump on @ 36.4 gpm. ↓Q @ 10:21 to 22.0 gpm								
10:49:43	↑Q	to 31.8 gpm PWL=		35.6 ft brp									
10:52	↑Q	to 40.3 gpm PWL		= 40.1 ft brp									
10:54:50	↑Q (valve all the way open) to 49.6 gpm. PWL=						47.4 ft brp.						
11:00	40	48.6	33.6	28472.3	49.3								
11:10	50	49.2	34.2	28979.0	50.7								13.0
11:20	60	49.6	34.6	29464.5	48.6								7.75
11:30	70	49.8	34.8	29960.0	49.6	16.0	0.3	42484	35193	28893.2	6.56	75.3	5.03
11:40	80	49.9	34.9	30455.2	49.5	16.0	0.1	42490	35191	28920.4	6.57	67.8	3.24
11:50	90	50.1	35.1	30950.5	49.5	15.9	0.1	42523	35185	28927.2	6.58	69.0	2.98
12:00	100	50.2	35.2	31445.3	49.5	15.9	0.1	42557	35194	28947.6	6.58	69.1	3.58
12:10	110	50.3	35.3	31940.2	49.5	15.9	0.1	42601	35210	28961.2	6.58	68.8	3.59
12:20	120	50.4	35.4	32435.3	49.5	15.9	0.1	42616	35223	28981.6	6.58	67.4	2.48
12:30	130	50.5	35.5	32930.3	49.5	15.9	0.1	42626	35209	28988.4	6.58	65.6	1.80
12:40	140	50.6	35.6	33425.5	49.5	15.9	0.1	42651	35243	28988.4	6.57	63.5	1.86
12:51	151	50.5	35.5	33969.5	49.5	15.9	0.1	42650	35246	29002.0	6.58	60.6	1.73
13:00	Collect W.Q. samples for laboratory analysis, including MBARI's samples. Samples placed on ice.												
13:36	196	50.8	35.8	36194.4	49.4	15.9	0.1	42650	35274	29042.8	6.57	42.2	1.16
1344	204			36588.5	Pump off.	Total gallons pumped=				9241.5			
1445		16.8											

Stabilization Criteria:

3 to 5 minute recordings with 3 consecutive readings within:

pH: +/- 0.1 unit
Cond: +/- 3%
ORP: +/- 10 mV
Turb: +/- 10%
DO: +/- 10%
Desired Flow Rate: 100 to 500 mL/min

Flow through cell 1223.5 mL/min

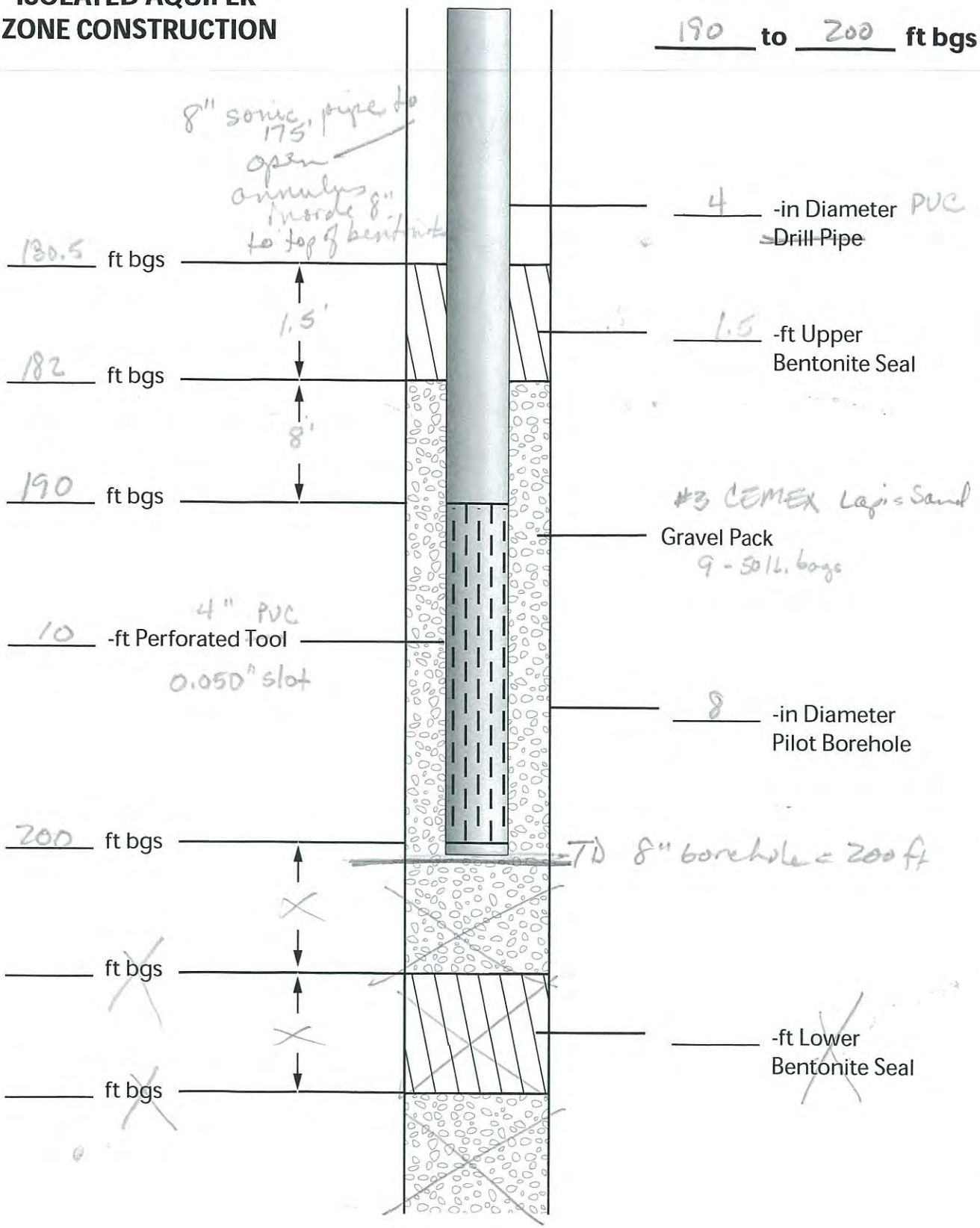
Form Created: 29-Sep-13

24-Sep-13

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. PR-1 Zone 1

190 **to** 200 **ft bgs**



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Client: RBF/MPWSP Expl Boreholes

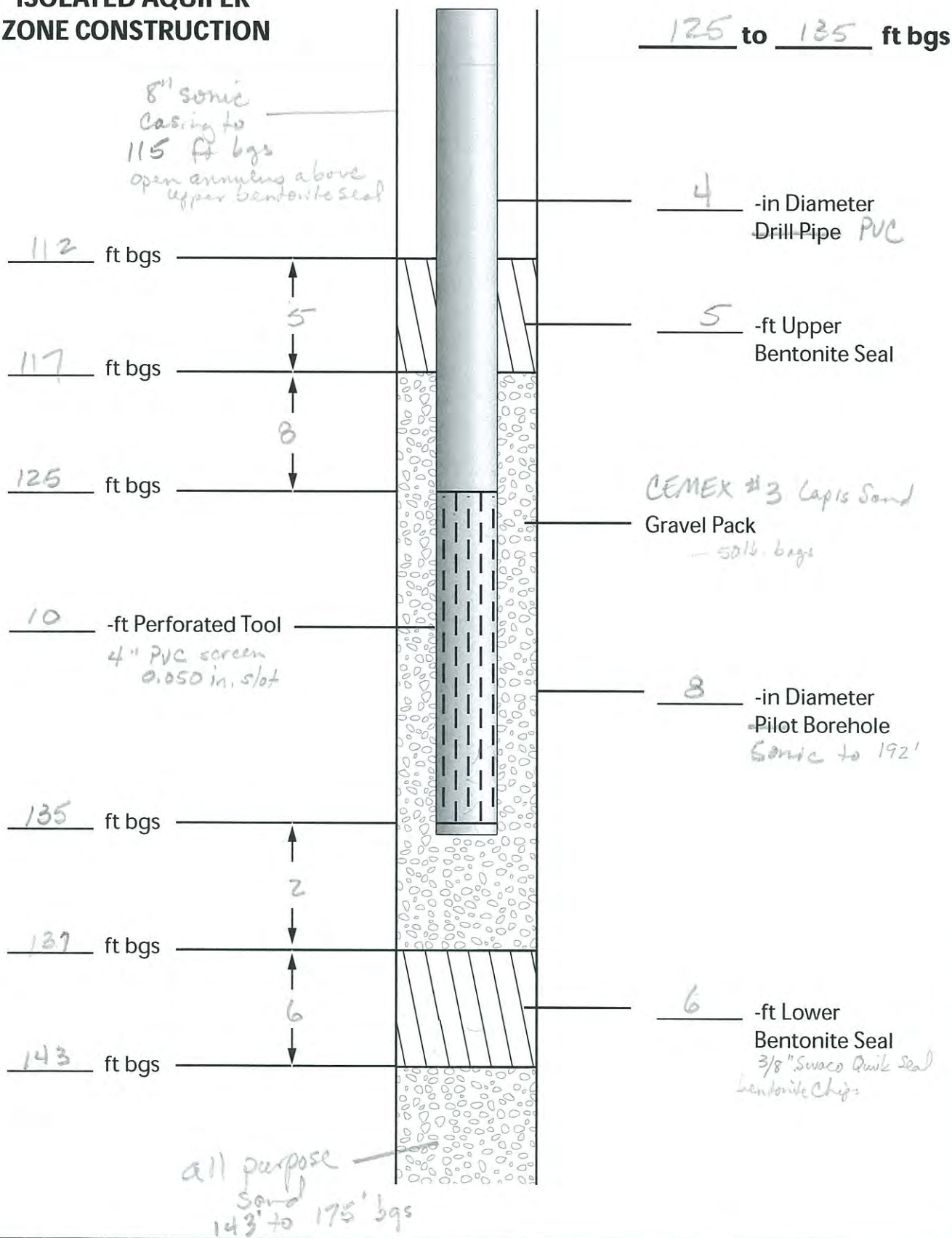
Well Name/Number: PR-1 Zone 1 (190'-200' bgs)

Date: 24-Sep-13

ISOLATED AQUIFER ZONE CONSTRUCTION

Zone No. PR-1 Zone 2

125 **to** 135 **ft bgs**



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	Well Name/Number: PR-1 Zone 2 (125'-135' bgs)
	Date: 25-Sep-13

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WELL SAMPLING DATA SHEET

Client: RBF / MAWSP
Well Name/Number: PR-1 Zone 1 (190'-200' bgs)
Well Dia: 4 in Well Depth: 200 ft bgs
Static WL: 12 ft brp
RP: +6

8" Sonic casing to 175' bgs.

Logged By: Diane Smith
Test Date: 24-Sep-13
Screened Interval: 190-200 ft bgs
Reference Point Elevation: 15 ft amsl
Pump Depth: 120' ft bgs

Time	Water Level (ft brp)	Temp (°C)	Cond (µS/cm) sp cond cond	TDS (g/L)	Sal (ppt)	DO (mg/L)	pH	ORP (mV)	Turbitity (NTU)
4:12pm									
4:16		16.9	1416 1206	923	0.71	5.4	6.85	-45.3	5.73
4:24	See Pumping Test Data Sheet	16.4	1381 1158	897	0.69	—	6.86	-45.2	5.52
4:30		16.3	1363 1136	884	0.69	3.5	6.85	-62.2	3.66
4:45		16.3	1336 1115	871	0.67	3.4	6.85	-52.9	1.80
5:05		16.6	1304 1095	845	0.66		6.87	—	1.65
5:20		16.5	1296 1080	845	0.65		6.87	-50.5	0.89
	Filled sample bottles								
5:32	Pump off								

Sampling Method:
Casing Volume:
Tubing Volume:
Volume Pumped Before Sampling:
Flow Rate:

Stabilization Criteria:
3 to 5 minute recordings with 3 consecutive readings within:
pH: +/- 0.1 unit Turb: +/- 10%
Cond: +/- 3% DO: +/- 10%
ORP: +/- 10 mV Desired Flow Rate: 100 to 500 mL/min

Form Created: 17-Aug-10

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WELL SAMPLING DATA SHEET

8" sonic casing to 115' bgs

Client: RBF / MPWSP
Well Name/Number: PR-1 Zone 2 (125-135' bgs)
Well Dia: 4 in Well Depth: 135 ft bgs
Static WL: 4.7 ft brp
RP: +7.2

Logged By: Diane Smith
Test Date: 25-Sep-13
Screened Interval: 125-135 ft bgs
Reference Point Elevation: 16.2 ft amsl
Pump Depth: 105 ft bgs

Time	Water Level (ft brp)	Temp (°C)	Cond (µS/cm) sp cond Cond	TDS (g/L) mg/L	Sal (ppt)	DO (mg/L)	pH	ORP (mV)	Turbitity (NTU)
4:00	11.9								
4:07	Pump on								
4:10	–	15.5	53123 44289	34541	35.09	–	6.59	-130.1	4.20
4:18	30.8	15.6	53490 44232	34833	35.49	–	6.62	-135	3.17
4:23	31.0								
4:26	–	15.6	53625 43926	34853	35.43	–	6.64	-130.9	2.57
4:34	31.3	15.6	53053 44111	34482	35.02	–	6.65	-88.0	2.37
4:40	31.4	15.5	53449 44183	34736	35.32	–	6.66	-58.2	2.27
4:45	31.6	15.4	53620 44440	34853	35.45	–	6.66	-110.8	1.56
4:55	31.7	15.5	54148 44377	35204	35.83	–	6.65	-119.7	1.34
5:00	31.8	15.4	53824 44074	34911	35.48		6.67	-28.0	1.17
5:08	51.1	15.4	53854 44014	35002	35.60	–	6.65	-73.9	264 cloudy
5:15	56.5	15.3	53790 43988	34931	35.49	–	6.66	-62.4	75.8
5:20	–	15.3	54040 44016	35119	35.73	–	6.65	-63.5	36.7
5:25	58.3	15.3	53943 43827	35009	35.60	–	6.66	-34.1	26.4
5:30	58.8	15.3	53669 43871	34768	35.30	–	6.66	-18.0	19.9
5:35	59.1	15.3	53674 43862	34814	35.35	–	6.65	-46.8	14.7
5:40	59.3	15.3	53739 43932	34918	35.50	–	6.64	-53.3	12.3
5:45	59.7	15.3	53610 43875	34866	35.46	–	6.65	-19.4	10.2
5:53	12.8	–	–	–	–	–	–	–	–
6:00	12.8	–	–	–	–	–	–	–	–

Sampling Method:
Casing Volume:
Tubing Volume:
Volume Pumped Before Sampling:
Flow Rate:

Stabilization Criteria:
3 to 5 minute recordings with 3 consecutive readings within:
pH: +/- 0.1 unit Turb: +/- 10%
Cond: +/- 3% DO: +/- 10%
ORP: +/- 10 mV Desired Flow Rate: 100 to 500 mL/min

Form Created: 17-Aug-10

Appendix F

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PUMPING TEST DATA SHEET

8" sonic casing to 115' bgs

Client: RBF

Logged By: Diane Smith

Well Name: PR-1 Zone 2

Test Date: 25-Sep-13

Circle Well Type: Pumping Observation (r = ft)

Circle Test Type: Step Drawdown Constant Rate Recovery Development

Reference Point Elevation: 47.2 ft

Pump Depth: 105 ft bgs

Static Water Level Depth: 4.7 ft bgs

Totalizer Units: gal

Time of Day	Time min Step	Time min Total	Depth to Water (ft brp)	Draw-down (ft)	Pumping Rate (gpm)	Sand Content Time Interval	Sand Content ppm	Totalizer (gal)	Remarks and other data
4:00	–		11.9	–	–			03790	
4:07	0		–		–			–	Pump On
4:10	3		–		–			–	Cloudy, no odor
4:18	8		30.8	18.9	30		4:19	04150 +1min	clear, foams in cup initially
4:23	16		31.0	19.1	30			4260	
4:34	27		31.3	19.4	30			4610	
4:40	33		31.4	19.5	–			4800	
4:45	38		31.6	19.7	30			4952	
4:55	48		31.7	19.8	–			5220	
5:00	53		31.8	19.9	30			5380	
5:03	56								Incr Q to 50 gpm
5:08	61		51.1	39.2	50			5700	cloudy
5:15	68		56.5	44.6	50			–	
5:20	73		–	–	50			6320	sl. cloudy
5:25	78		53.3	41.4	–			6560	sl. cloudy
5:30	83		58.8	46.9	–			6780	
5:35	88		59.1	47.2	50			7080	
5:40	93		59.3	47.4	50			7310	
5:45	98		59.7	47.8	50			7560	v. sl. cloudy, Pump off
5:52	8		12.8	1.2	–			–	Recovery
6:00	15		12.8	1.2	–			–	"

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APPENDIX G

Groundwater Quality Laboratory Reports

(See attached CD)

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APPENDIX G:

GROUNDWATER QUALITY LABORATORY REPORTS

CONTENTS

Description **Page**

Borehole CX-B1

Zone 1 (274 - 284 ft bgs).....*G-1*

Zone 2 (237 - 247 ft bgs).....*G-58*

Zone 3 (182 - 192 ft bgs).....*G-113*

Zone 4 (134 - 144 ft bgs).....*G-180*

Zone 5 (84 - 94 ft bgs).....*G-248*

Zone 6 (51 - 61 ft bgs).....*G-316*

Borehole ML-1

Zone 1 (113.5 - 118.5 ft bgs).....*G-378*

Zone 2 (90 - 100 ft bgs).....*G-438*

Borehole ML-2

Zone 1 (167 - 177 ft bgs).....*G-502*

Zone 2 (90 - 100 ft bgs).....*G-563*

Borehole ML-3

Zone 1 (180 - 190 ft bgs).....*G-624*

Zone 2 (103 -113 ft bgs).....*G-656*

Borehole ML-4

Zone 1 (163.5 - 173.5 ft bgs)……G-691

Zone 2 (74.5 - 84.5 ft bgs)……G-753

Borehole ML-6

Zone 1 (152 - 162 ft bgs)……G-799

Zone 2 (100 - 110 ft bgs)……G-857

Borehole PR-1

Zone 1 (190 - 200 ft bgs)……G-915

Zone 2 (125 - 135 ft bgs)……G-976

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