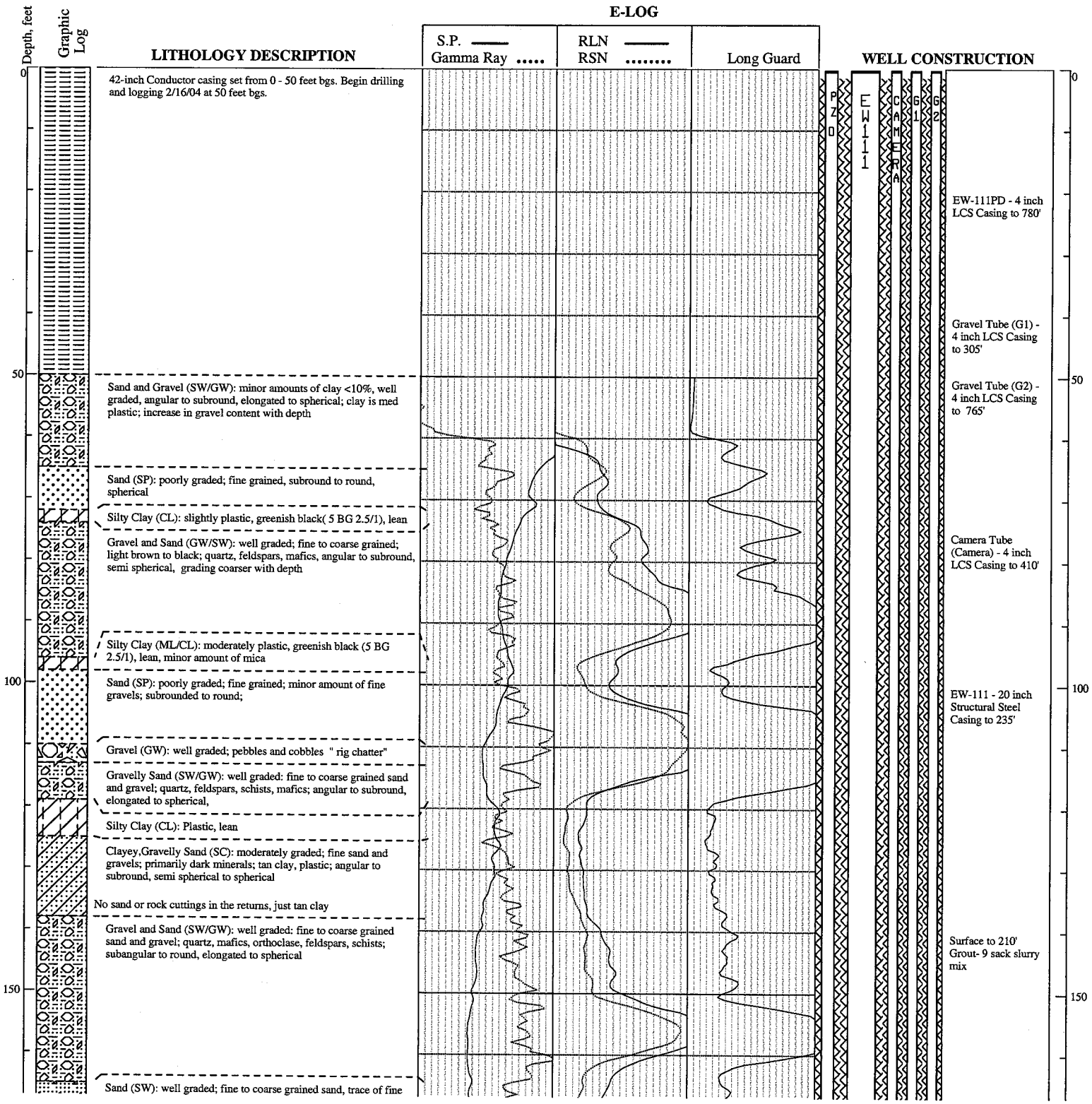
Project: Muscoy RA

Location: San Bernardino, CA **Project Number: 18600069.06010**

Log of Extraction Well: EW-111
Piezometer EW-111PD

Dates Drilled: 2/16/04 - 3/04/04	Total Depth Drilled: 1505'	Logged By: URS - PAC, HEP
Drilling Contractor: Layne Christensen Company	Borehole Diameter: 36"	Checked By: DLB
Drill Rig Type	Well Construction Dates: 3/05/04 - 3/10/04	Screen Slot Size: .080-inch EW/.020-inch PZ
Drilling Method: Reverse Circulation Mud Rotary	Well Diameter: 20" EW/ 4" PZ	
Drill Bit: Mill Bit	Well Casing: Structural Low Carbon Steel and Stainless Steel	

Comments:



URS
2870 Gateway Oaks Dr., Ste 300
Sacramento, CA 95833
916-679-2000

Project: Muscoy RA

Location: San Bernardino, CA Project Number: 18600069.06010

Log of Extraction Well: EW-111
Piezometer EW-111PD

Depth, feet | Graphic Log | LITHOLOGY DESCRIPTION | E-LOG | WELL CONSTRUCTION

E-LOG: S.P. ——, Gamma Ray ····· | RLN ——, RSN ····· | Long Guard

gravel and clay; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

Gravel and Sand (SW/GW): well graded; fine to coarse grained gravel and sand; quartz, mafics, orthoclase, feldspars, schists; subangular to round elongated to spherical

Clayey Sand (SC): moderately graded; fine to medium grained sand; minor clay; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

200

Sand (SW): multicolored; well graded; fine to coarse grained; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

"rig chatter " increasing gravels

Clay (CL): yellowish brown 10YR 5/4; fat, highly plastic; coarsening downward

rig chatter

Gravel and Sand (SW/GW): multicolored: well graded; fine to coarse grained sand, fine to medium gravel; Quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

250

Clay (CL): very dark gray 10 YR 3/1; firm, highly plastic

Sand (SW): well graded; fine to coarse grained sand, trace of fine gravel ; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

300

Sandy Gravel (GW): well graded; fine to coarse grained gravel, minor fine to coarse grained sand; quartz, mafics, feldspars, orthoclase, schists; subangular to round, elongated to spherical

slow drilling

Clay (CL): Gley 1 3/N; some fine to coarse sand; firm, highly plastic

Gravel and Sand (SW/GW): multicolored; well graded; fine to coarse grained sand and gravels; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

350

Sand (SP): poorly graded; fne to medium grained sand, trace fine gravel; quartz, mafics, orthoclase, feldspars, schists, subangular to round, elongated to spherical

WELL CONSTRUCTION:

Bentonite Chip/ #0 Sand - Seal 210 - 217'

#3 Monterey Transition Sand 217 -228'

EW-111 - 20 inch Roscoe Moss Full Flo, 0.080" Louvered Slot Screen 235 - 265' 4x12 Kelland Gravel Pack 228 - 270'

Bentonite Chip/ #0 Sand, Seal 270 - 291'

#3 Monterey Transition Sand 291 - 301'

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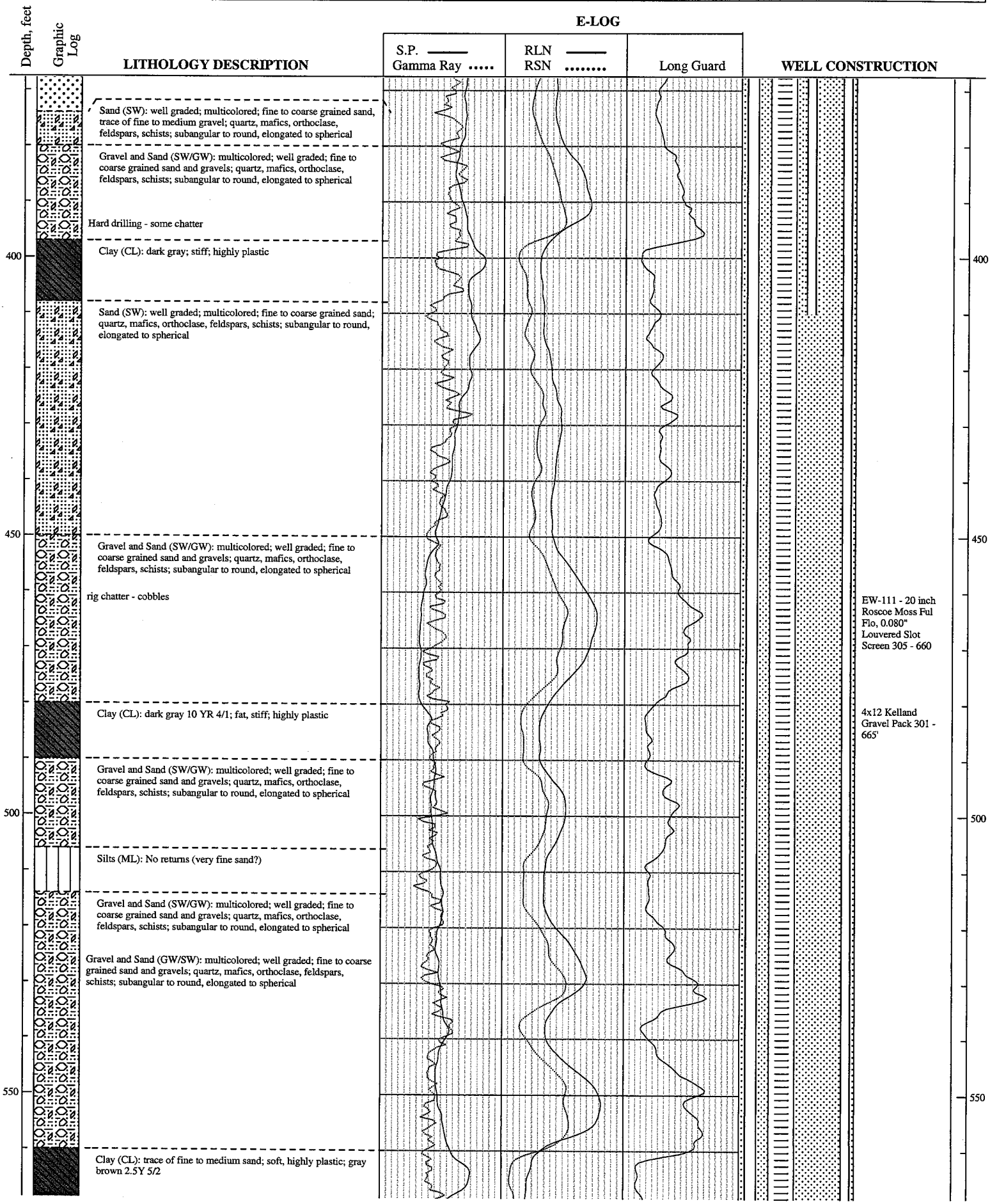

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Depth, feet | Graphic Log | LITHOLOGY DESCRIPTION | E-LOG | WELL CONSTRUCTION

E-LOG: S.P. ——— Gamma Ray ..... | RLN ——— RSN ..... | Long Guard

Sandy Gravel (GW): multicolored well graded; minor- fine to coarse grained sand; fine to coarse grained gravel; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

slow drilling

600

Clay (CL): trace of fine to medium sand; stiff, highly plastic; gray brown 2.5Y 5/3

Sand (SP): poorly graded; mediun to coarse grained sand, trace fine gravel; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

Gravel (GP): poorly graded; fine grained ,minor coarse sand; quartz, mafics, orthoclase, feldspars, schists, subangular to round elongated to spherical

slow drilling

Sand (SP): poorly graded; medium to coarse grained sand, trace fine gravel; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

650

Clay (CL): trace of fine to medium sand; stiff, highly plastic; gray brown 2.5Y 5/3

Sand (SP): Poorly graded; medium to coarse grained; trace of clay; quartz, mafics, feldspars, schist; subangular to round;

700

Layers of Clayey Silt (CL/ML) and Sand (SW): 3 to 5 feet in thickness; sands- fine to coarse grained, round to spherical; clays and silts- moderately plastic, soft to stiff

rig chatter

750

WELL CONSTRUCTION:

Bentonite Chip/ #0 Sand, Seal 665 - 750'

#3 Monterey Transition Sand 750 - 761'

600 650 700 750

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E-LOG: S.P. —— Gamma Ray ..... | RLN —— RSN ..... | Long Guard

LITHOLOGY DESCRIPTION

Sand (SW): well graded; multicolored; fine to coarse grained sand; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

Sandy Gravel (SW/GW): multicolored well graded; minor- fine to coarse grained sand; fine to coarse grained gravel; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical ; "rig chatter"

Clay (CL): trace of sand; stiff; highly plastic; gray brown 2.5Y 4/2

Sand (SW): well graded; little clay 20%; multicolored; fine to coarse grained sand; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical

Clay (CL): trace of sand; moderately stiff; highly plastic; gray brown 2.5Y 4/2

Gravelly Clay with Sand (SC/GC): well graded gravel & sand; stiff clay; fine to medium grained sand & gravel; subangular to round, elongated to spherica;

Sandy Gravel (SW/GW): multicolored well graded; minor- fine to coarse grained sand; fine to coarse grained gravel; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical ; "rig chatter"

WELL CONSTRUCTION

EW-111PD - 4 inch Stainless Steel, 0.020" Slot, Continous Wire wrap Screen 780 - 800'

4x12 Kelland Gravel Pack 761 - 1286'

EW-111 - 20 inch Roscoe Moss Ful Flo, 0.080" Louvered Slot Screen 765 - 1250'

800 850 900 950

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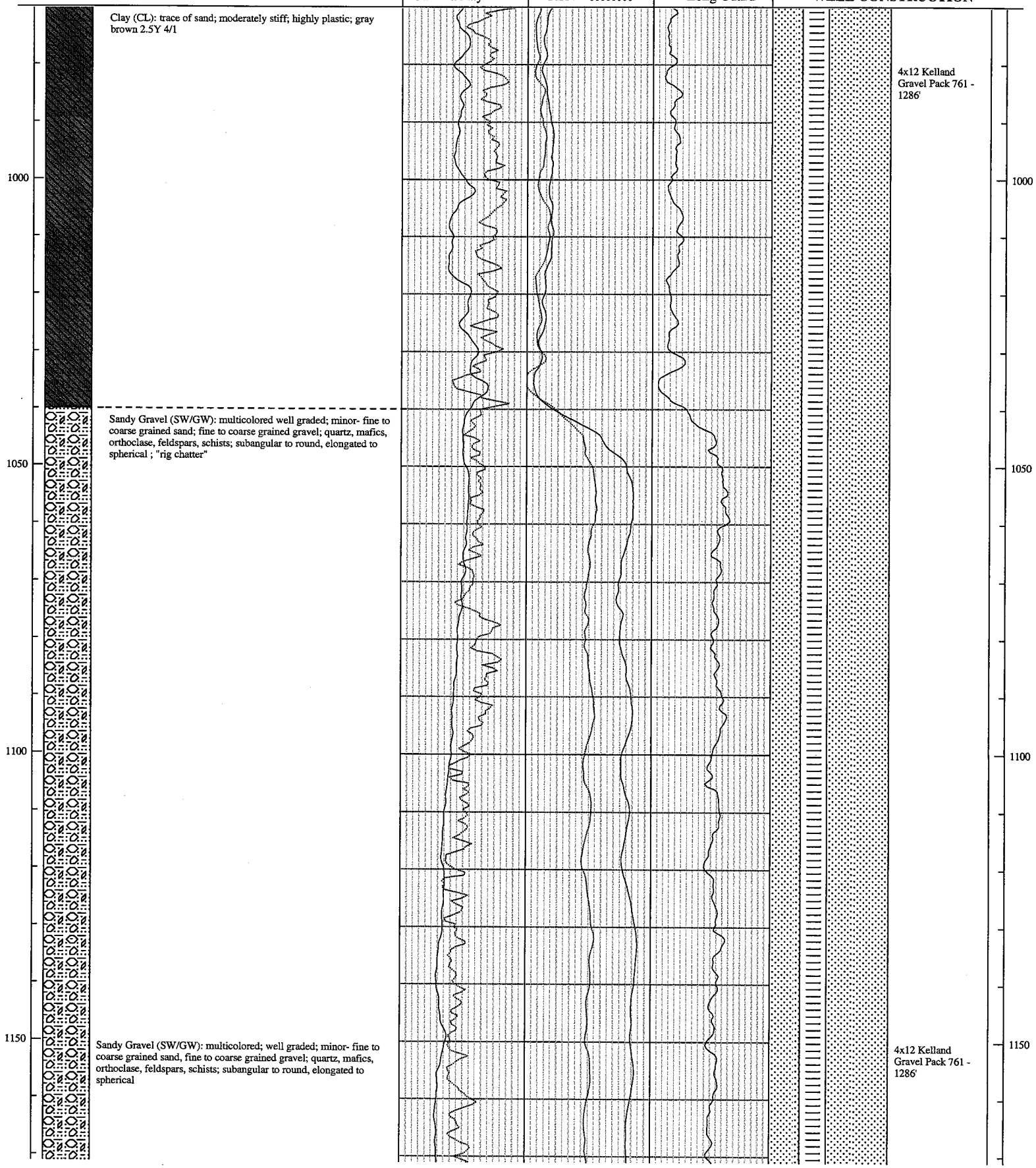
E-LOG: S.P. —— Gamma Ray ..... | RLN —— RSN ..... | Long Guard

Clay (CL): trace of sand; moderately stiff; highly plastic; gray brown 2.5Y 4/1

Sandy Gravel (SW/GW): multicolored well graded; minor- fine to coarse grained sand; fine to coarse grained gravel; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical ; "rig chatter"

Sandy Gravel (SW/GW): multicolored; well graded; minor- fine to coarse grained sand, fine to coarse grained gravel; quartz, mafics, orthoclase, feldspars, schists; subangular to round, elongated to spherical



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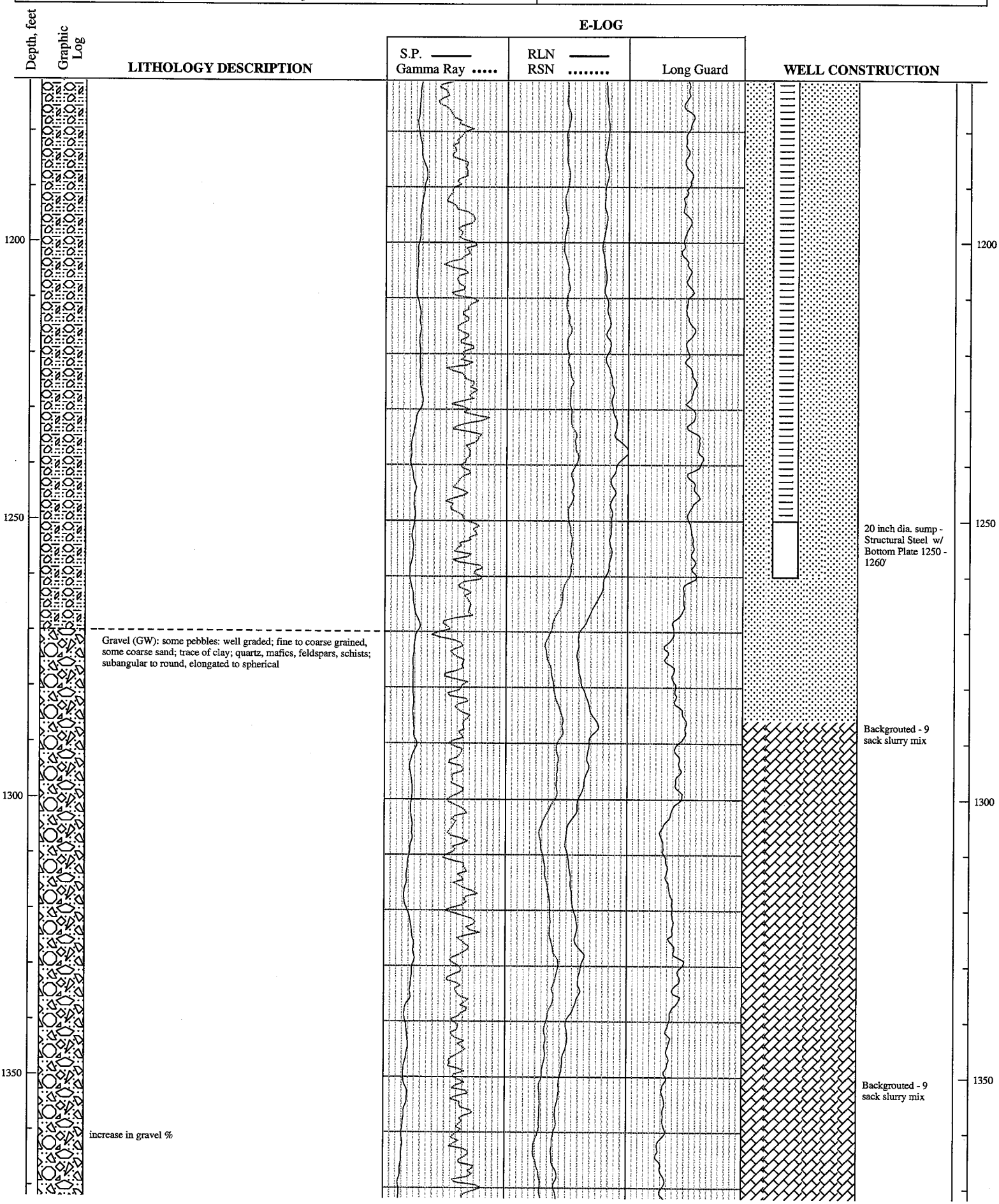

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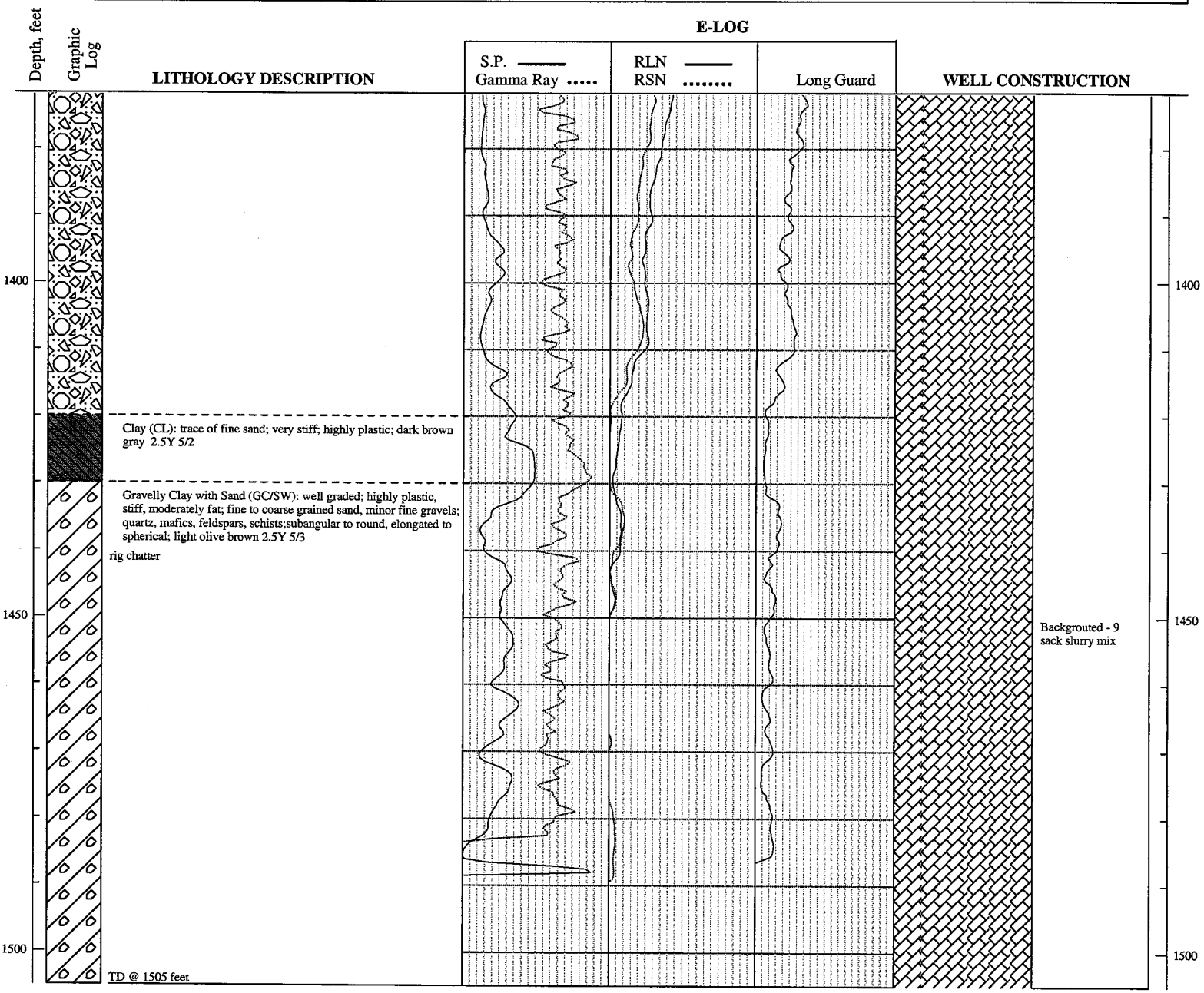

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