Pelton, Jason M (DEC)

From: Hannon, ED [US] (AS) <Edward.Hannon@ngc.com>
Sent: Tuesday, May 11, 2021 1:23 PM
To: Pelton, Jason M (DEC)
Cc: Wolfert, Mike
Subject: FW: RW-21 Area Monitoring Wells - 13 - 14 - 15 - 16-OU3
Attachments: Table 2A_ Well Survey and Construction Details.pdf; MW-14 Well Construction Log.pdf; MW-15 Well Construction Log.pdf; MW-16 Well Construction Log.pdf; MW-13 Well Construction Log.pdf; RW-21 _VP-16.pdf; RW-21_VP-13.pdf; RW-21_VP-14.pdf; RW-21_VP-15.pdf; RW-21_VP-16 geophysical log.pdf; RW-21_VP-13 Geophysical Log.pdf; RW-21_VP-14 Geophysical Log.pdf; RW-21_VP-15 Geophysical Log.pdf

Jason

Attached are the well construction logs, soil logs, geophysical logs, and a table summarizing well construction and survey details that you requested for NG OU3 Monitoring Wells RW-21-MW-13, 14, 15, and 16.

These wells were not part of the original Hot Spot drilling (they were installed later) and therefore, were not included in the PDI report for the OU3 Hot Spot.

Let us know if you have any questions or require any additional information.

Regards
Ed

From: Pelton, Jason M (DEC) <jason.pelton@dec.ny.gov>
Sent: Friday, May 7, 2021 7:57 AM
To: Hannon, ED [US] (AS) <Edward.Hannon@ngc.com>; Wolfert, Mike <Mike.Wolfert@arcadis.com>
Subject: EXT :RW-21 Area Monitoring Wells - 13 - 14 - 15 - 16

Ed and Mike:

Do you know if there was a separate report that captured the drilling and installation of monitoring wells RW-21-MW-13, RW-21-MW-14, RW-21-MW-15, and RW-21-MW-16? I am looking for the boring logs, monitoring well construction details, and the geophysical logs for these wells. I am not seeing any documentation on these wells in the 2/2016 PDI report.

If there was a separate report for these borings/wells could you please send me a copy. If there was no report, could you just send me copies of the boring logs, monitoring well construction details, and the geophysical logs for these wells?

Thanks for the help and call with any questions.

Jason

Jason Pelton, P.G.
Project Manager, Division of Environmental Remediation

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Table 2A
Monitoring Well Construction Details, RW-21 Project Area,
Northrop Grumman Systems Corporation
Operable Unit 3 (Former Grumman Settling Ponds),
Bethpage, New York.

ARCADIS Design & Consultancy for natural and built assets

Well Identification	Casing/Screen Material [1]	Well Diameter (in)	Surface Casing	Land Surface Elevation (ft msl)	Measuring Point Elevation [2] (ft msl)	Monitoring Well Screened Interval (ft bls)	Monitoring Well Screened Elevation [3] (ft msl)	Total Depth (ft bls)	Installation Date	Easting	Northing
RW-21_MW-1	Sch. 80 PVC/SS	4	FM	101.20	101.29	615 - 625	-513.71 - -523.71	630	9/2/2015	208881.8951	1127553.4758
RW-21_MW-2	Sch. 80 PVC/SS	4	FM	96.30	96.28	600 - 610	-503.72 - -513.72	615	9/10/2015	208791.7513	1128067.7396
RW-21_MW-3-1	Sch. 80 PVC/SS	4	FM	97.30	97.37	556 - 566	-458.63 - -468.63	568	3/23/2015	208817.2785	1128668.6002
RW-21_MW-3-2	Sch. 80 PVC/SS	4	FM	97.50	97.53	595 - 605	-497.47 - -507.47	610	6/5/2015	208825.3031	1128671.0207
RW-21_MW-4	Sch. 80 PVC/PVC	4	FM	102.30	102.31	369 - 384	-266.69 - -281.69	389	12/2/2014	209294.5626	1129040.9556
RW-21_MW-5-1	Sch. 40 PVC/SS	2	FM	96.80	96.84	300 - 310	-203.16 - -213.16	315	5/20/2015	207865.1152	1127799.8648
RW-21_MW-5-2	Sch. 40 PVC/SS	2	FM	96.80	96.84	560 - 570	-463.16 - -473.16	575	5/20/2015	207865.1824	1127799.6306
RW-21_MW-6	Sch. 80 PVC/SS	4	FM	94.00	94.02	604 - 624	-509.98 - -529.98	629	7/8/2015	208130.2012	1128363.4712
RW-21_MW-7	Sch. 80 PVC/PVC	4	FM	96.60	96.57	580 - 590	-483.43 - -493.43	595	3/19/2015	208050.2982	1128845.8452
RW-21_MW-8	Sch. 80 PVC/SS	4	Stick Up	96.60	98.51	460 - 470	-361.49 -371.49	475	11/21/2015	207946.307	1129530.4140
RW-21_MW-9	Sch. 80 PVC/PVC	4	FM	91.60	91.60	630 - 640	-538.40 - -548.40	645	4/23/2015	207306.0451	1128312.9746
RW-21_MW-11	Sch. 80 PVC/PVC	4	FM	94.30	94.35	638 - 648	-543.65 - -553.65	653	3/25/2015	207341.3501	1128811.6969
RW-21_MW-12-1	Sch. 40 PVC/SS	2	FM	74.80	74.69	415 - 425	-340.31 - -350.31	430	10/23/2015	207768.9912	1130115.4222
RW-21_MW-12-2	Sch. 40 PVC/SS	2	FM	74.80	74.69	590 - 600	-515.31 - -525.31	605	10/23/2015	207768.8816	1130115.6128
RW-21_MW-13	Sch. 80 PVC/SS	4	FM	87.40	87.48	716 - 726	-628.52 - -638.52	731	9/1/2016	205575.3196	1129021.8756
RW-21_MW-14	Sch. 80 PVC/SS	4	FM	85.10	85.26	630 - 640	-544.74 - -554.74	645	10/11/2016	206626.7755	1129583.3380
RW-21_MW-15	Sch. 80 PVC/SS	4	FM	92.00	92.20	676 - 686	-583.80 - -593.80	691	10/10/2016	206379.8848	1128831.0956
RW-21_MW-16	Sch. 80 PVC/SS	4	FM	89.40	89.46	636 - 646	-546.54 - -556.54	651	10/11/2016	206381.8293	1129323.7567

Notes and Abbreviations:

Elevations were surveyed to North American Vertical Datum (NAVD) (1988). Northing and easting surveyed to North American Datum (NAD) (1983).

[1] All monitoring wells have a 0.01 in. slot screen openings.

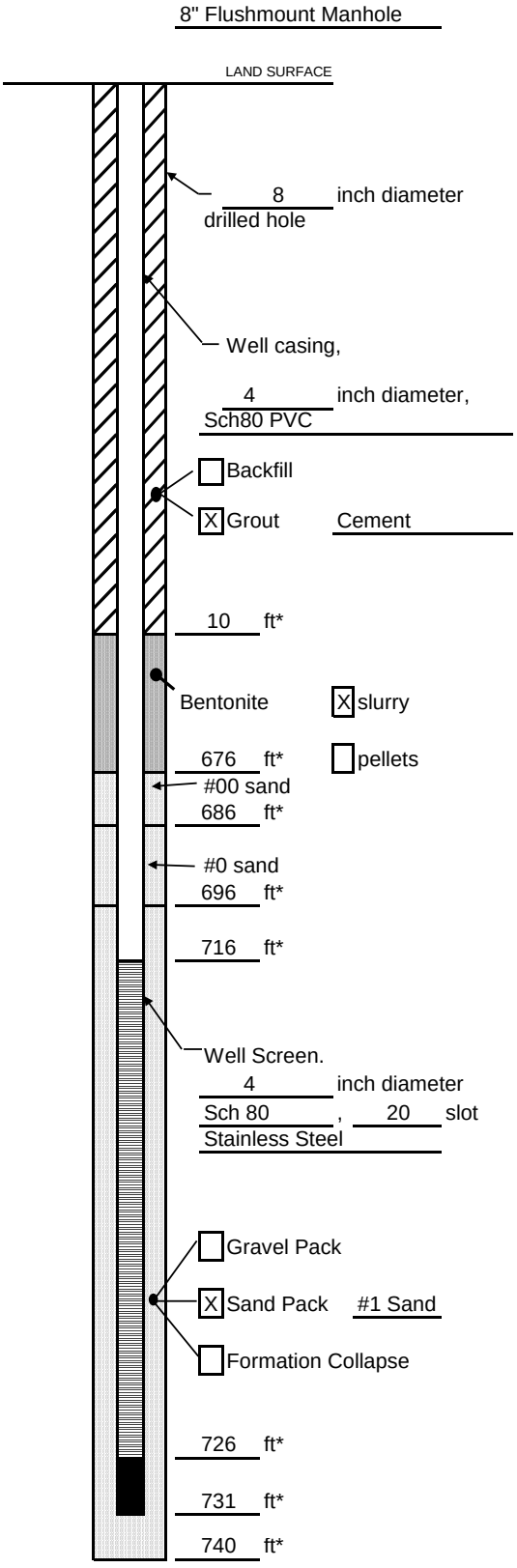
[2] Measuring point elevation is top of inner casing.

[3] Screen elevation calculated using measuring point elevation.

ft bmp Feet below measuring point
ft msl Feet relative to mean sea level
Sch. Schedule
PVC Polyvinyl chloride
SS Stainless steel
FM Flush mount

WELL CONSTRUCTION LOG

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project Northrop Grumman OU3 Well RW-21_MW-13

Town/City Bethpage, NY

County Nassau State NY

Permit No. NA

Land-Surface (LS) Elevation and Datum:

Not surveyed yet feet ☐ Surveyed

☐ Estimated

Installation Date(s) 9/1/2016

Drilling Method Mud Rotary

Drilling Contractor Uni-Tech Drilling

Drilling Fluid Portable Water and Bentonite

Development Technique(s) and Date(s)

Air-lifiting with surge block,
followed by pump & surge using submersible pump

Fluid Loss During Drilling ~500 gallons

Water Removed During Development 7000 gallons

Static Depth to Water 50.53 feet below M.P.

Pumping Depth to Water 52.53 feet below M.P.

Pumping Duration 9 hours

Yield 22 gpm Date 9/8/2016

Specific Capacity 11 gpm/ft

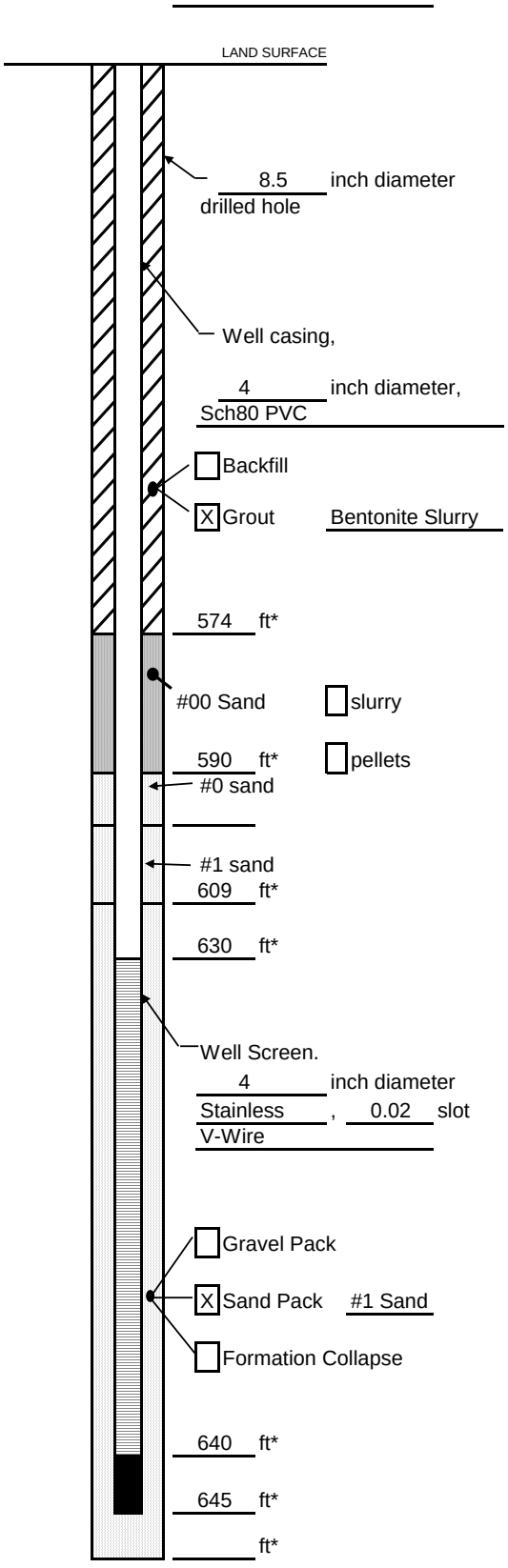
Well Purpose Monitoring Well

Remarks Borehole was drilled to 945ft.
Backfilled from 945 ft up to 920 ft with high solids bentonite chips; from 920 ft to 770ft using #1 sand; from 770-750 ft with high solids bentonite chips; 750ft to 740ft with #1 sand.

Prepared by Xuan Xu

WELL CONSTRUCTION LOG

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project Northrop Grumman OU3 Well RW-21_MW-14

Town/City Bethpage, NY

County Nassau State NY

Permit No. NA

Land-Surface (LS) Elevation and Datum:

Not surveyed yet feet ☐ Surveyed

☐ Estimated

Installation Date(s) 0/18/2016 - 10/21/201

Drilling Method Mud Rotary

Drilling Contractor Uni-Tech Drilling

Drilling Fluid Bentonite Sand

Development Technique(s) and Date(s)

Pump and srge 10/24/16 - 10/26/16

Fluid Loss During Drilling _____ gallons

Water Removed During Development 4800 gallons

Static Depth to Water 43 feet below M.P.

Pumping Depth to Water 43.5 feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

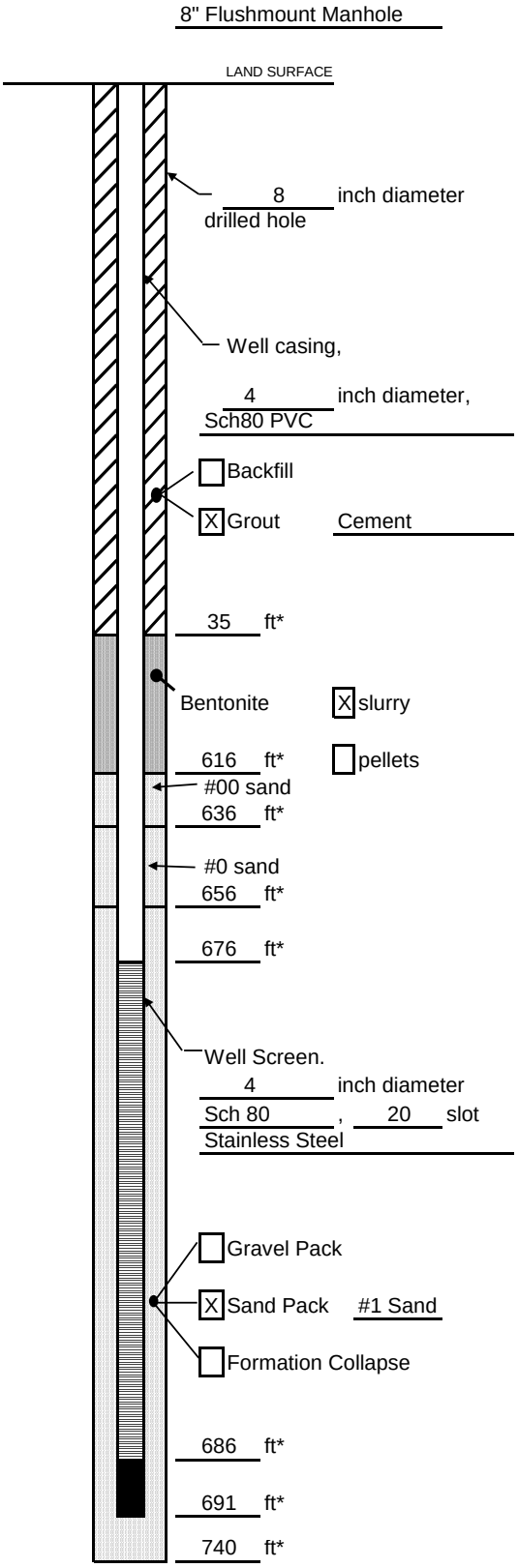
Well Purpose Monitoring Well

Remarks _____

Prepared by Steven Lamante

WELL CONSTRUCTION LOG

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project Northrop Grumman OU3 Well RW-21_MW-15

Town/City Bethpage, NY

County Nassau State NY

Permit No. NA

Land-Surface (LS) Elevation and Datum:

Not surveyed yet feet ☐ Surveyed

☐ Estimated

Installation Date(s) 8/11/2016

Drilling Method Mud Rotary

Drilling Contractor Uni-Tech Drilling

Drilling Fluid Portable Water and Bentonite

Development Technique(s) and Date(s)

Air-lifiting with surge block,
followed by pump & surge using submersible pump

Fluid Loss During Drilling ~300 gallons

Water Removed During Development 4750 gallons

Static Depth to Water 50.58 feet below M.P.

Pumping Depth to Water 52.76 feet below M.P.

Pumping Duration 16 hours

Yield 20 gpm Date 8/16-8/17/16

Specific Capacity 7.7 gpm/ft

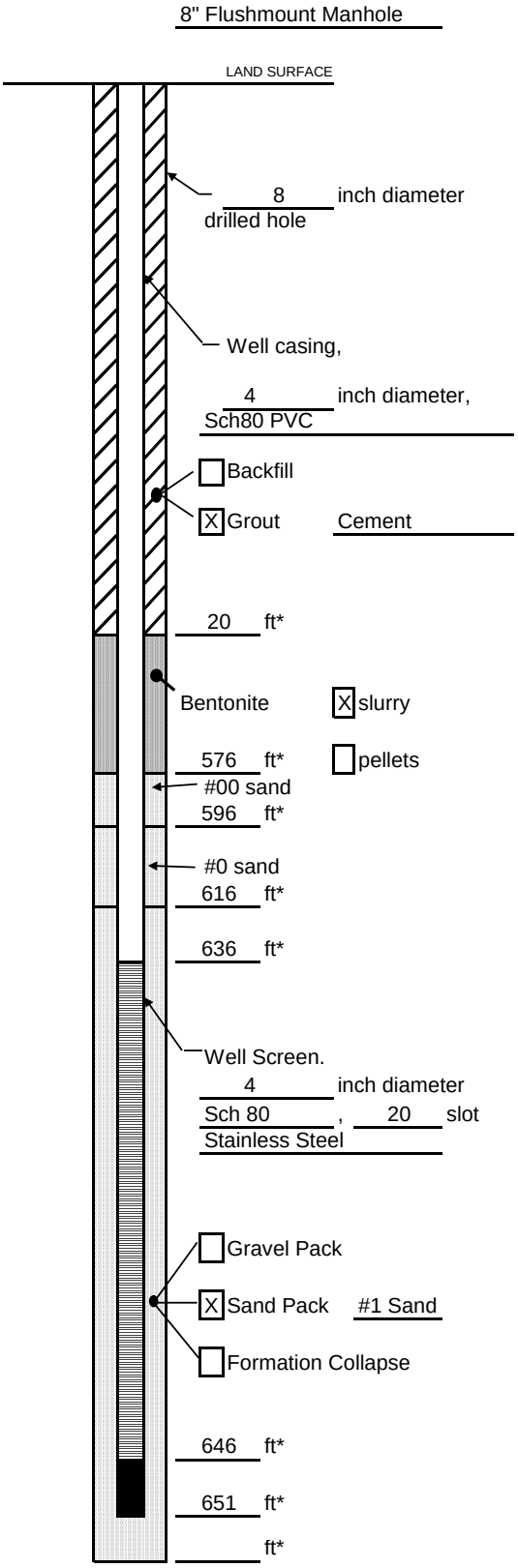
Well Purpose Monitoring Well

Remarks Borehole was drilled to 840ft bls.
Backfilled from 840ft to 780ft with #1 sand; from 780ft to 740ft with high solids bentonite chips; from 740ft to 700ft with #1 sand.

Prepared by Kevin Swiadek

WELL CONSTRUCTION LOG

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project Northrop Grumman OU3 Well RW-21_MW-16

Town/City Bethpage, NY

County Nassau State NY

Permit No. NA

Land-Surface (LS) Elevation and Datum:

Not surveyed yet feet ☐ Surveyed

☐ Estimated

Installation Date(s) 10/11/2016

Drilling Method Mud Rotary

Drilling Contractor Uni-Tech Drilling

Drilling Fluid Portable Water and Bentonite

Development Technique(s) and Date(s)

Air-lifiting with surge block,

followed by pump & surge using submersible pump

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Monitoring Well

Remarks Borehole was drilled to 760ft.

Backfilled from 760 ft up to 740 ft with high solids bentonite chips; from 740 ft to 651ft using #1 sand.

Prepared by Kate Duffy/Patricia Prezorski

Well/Boring: RW-21_VP-13 | Project Name and No.: NY001496.2515

Site Location: Bethpage, NY | Drilling Started: | Drilling Completed:

Total Depth Drilled: 947 feet | Hole Diameter: 8 inches | Sampling Interval: feet

Length and Diameter of Sampling Device: 2ft / 2 in | Type of Sampling Device: Split spoon

Drilling Method: Mud-rotary | Drilling Fluid Used: Portable water and bentonite

Drilling Contractor: Uni-Tech Drilling | Driller: | Helper:

Prepared By: | Hammer Weight: | Hammer Drop: inches

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
20	25	N/A		Auger cuttings, Medium Pebble, small pebble, poorly-sorted, low sphericity, subrounded, some (21-35%), little (10-20%), Very Coarse Sand, poorly-sorted, subangular,	
25	30	N/A		Small Pebble, poorly-sorted, low sphericity, subrounded, Auger cuttings, some (21-35%), granule, poorly-sorted, low sphericity, subangular, little (10-20%), Very Coarse Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Medium S	
30	35	N/A		Granule, poorly-sorted, low sphericity, angular, Auger cuttings, some (21-35%), very coarse sand, poorly-sorted, low sphericity, subangular, little (10-20%), Coarse Sand, poorly-sorted, low sphericity, angular, trace (< 10%), Medium Sand, p	
35	40	N/A		Same as above, Auger cuttings,,,, ,,,,	
40	45	N/A		Auger cuttings, Medium Pebble, well-sorted, subrounded, little (10-20%), small pebble, angular,,, ,,,,	
45	55	N/A		Medium Pebble, Auger cuttings, Medium Sand, poorly-sorted, subrounded, some (21-35%), small pebble, subangular,,, ,,,,	
55	60	N/A		Auger cuttings, Small Pebble, subrounded, and (36-50%), granule, some (21-35%), Medium Pebble, trace (< 10%), Medium Pebble, Coarse Sand,, ,,,,	
60	65	N/A		Medium Sand, round, Auger cuttings, and (36-50%), coarse sand, subrounded, little (10-20%), Granule, subangular,, ,,,,	
65	70	N/A		Coarse Sand, round, and (36-50%), medium sand, round, little (10-20%), Granule, subangular,, ,,,,	
70	75	N/A		Auger cuttings, Medium Sand, round, and (36-50%), fine sand, round, some (21-35%), Granule, subrounded,, ,,,,	
75	80	N/A		Auger cuttings, Very Coarse Sand, angular, some (21-35%), medium sand, subrounded,,, ,,,,	
80	85	N/A		Auger cuttings, Medium Sand, subrounded, and (36-50%), granule, subangular, little (10-20%), Small Pebble, subangular, trace (< 10%), Medium Pebble, angular,,	
85	90	N/A		Medium Sand, subrounded, Auger cuttings, and (36-50%), fine sand, subrounded, some (21-35%), Very Coarse Sand, Coarse Sand, subrounded, trace (< 10%), Granule, subangular,, ,,,,	
90	95	N/A		Auger cuttings, Coarse Sand, poorly-sorted, subangular, and (36-50%), medium sand, poorly-sorted, low sphericity, subangular, little (10-20%), Very Coarse Sand, poorly-sorted, subangular, trace (< 10%), Granule, poorly-sorted, subangular, t	
95	100	N/A		Same as above, Auger cuttings,,,, ,,,,	
200	205	N/A		Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), silt,, wet, poorly-sorted, med dense, no odor, micaceous, ,,,,	

Well/Boring RW-21_VP-13 Project Name and No. NY001496.2515

Prepared By

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
201.5	205	N/A		Very Coarse Sand, Auger cuttings, Coarse Sand, well-sorted, high sphericity, subrounded, and (36-50%), coarse sand, well-sorted, high sphericity, subrounded, little (10-20%), Granule, low sphericity, subrounded, trace (< 10%), Small Pebble,	
205	210	N/A		Auger cuttings, Coarse Sand, well-sorted, high sphericity, subrounded, and (36-50%), very coarse sand, well-sorted, high sphericity, subrounded, little (10-20%), trace (< 10%), Small Pebble, Granule, low sphericity, subrounded,, ,,,,	
210	212	1.5		210-211.5: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), very fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), poorly-sorted, low sphericity, subangular, little (10-20%), Clay, wet, poorly-sorted, med dense	
220	222	1		220-221: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), very fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), Medium Sand, poorly-sorted,, poorly-sorted, subrounded, wet, poorly-sorted, loose, micaceous, ,	
220	225	N/A		Auger cuttings, Very Coarse Sand, subrounded, and (36-50%), coarse sand, high sphericity, subrounded, little (10-20%), Medium Sand, high sphericity, round,, ,,,,	
225	230	N/A		Same as above, Auger cuttings,,,, ,,,,	
235	240	N/A		Auger cuttings, Granule, low sphericity, angular, little (10-20%), very coarse sand, high sphericity, round, trace (< 10%), Small Pebble, low sphericity, subrounded, micaceous, ,,,,	
240	242	1		240-241: Fine Sand, poorly-sorted, low sphericity, subangular, little (10-20%), very fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), Silt, wet, poorly-sorted, loose, no odor, micaceous, ,,,, Tan	
240	245	N/A		Auger cuttings, Fine Sand, low sphericity, subangular, little (10-20%), very fine sand, low sphericity, subangular, little (10-20%), Silt,, ,,,,	
245	250	N/A		Same as above, Auger cuttings,,,, ,,,,	
250	255	N/A		Same as above, Auger cuttings,,,, ,,,,	
255	260	N/A		Same as above, Auger cuttings,,,, ,,,,	
260	262	1		260-261: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), silt, little (10-20%), Very Fine Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), clay, wet, loose, micaceous, ,,,, tan/buff	
260	265	N/A		Auger cuttings, Fine Sand, low sphericity, subangular, some (21-35%), very fine sand, low sphericity, subangular, trace (< 10%), Clay,, ,,,,	
265	270	N/A		Auger cuttings, Fine Sand, low sphericity, subangular, little (10-20%), silt, trace (< 10%), Clay,, ,,,,	
270	275	N/A		Auger cuttings, Very Fine Sand, low sphericity, subangular, and (36-50%), clay,,, ,,,,	
275	280	N/A		Auger cuttings, Fine Sand, low sphericity, subangular, some (21-35%), clay, little (10-20%) lignite,, ,,,, dark gray	
280	282	0.5		280-280.5: Very Fine Sand, poorly-sorted, low sphericity, subangular, and (36-50%), silt, some (21-35%), Clay, trace (< 10%), Fine Sand, moist, poorly-sorted, dense, very stiff, micaceous, ,,,,	
280	282	1.5		280.5-281.5: Silt, some (21-35%), very fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Clay, wet, soft, low plasticity, micaceous, ,,,, Medium grey	
280	285	N/A		Auger cuttings, Very Fine Sand, low sphericity, subangular, some (21-35%), silt, little (10-20%), Clay,, ,,,,	
285	290	N/A		Auger cuttings, Clay, some (21-35%), silt, little (10-20%), Very Fine Sand, trace (< 10%), Very Coarse Sand,, ,,,,	
290	295	N/A		Same as above, Auger cuttings,,,, ,,,,	
295	300	N/A		Auger cuttings, Clay, little (10-20%), silt, little (10-20%), Very Fine Sand,, ,,,,	
300	302	0.5		300-300.5: Fine Sand, poorly-sorted, low sphericity, subangular, little (10-20%), medium sand, poorly-sorted, low sphericity, subrounded, little (10-20%), Very Fine Sand, poorly-sorted, low sphericity, subangular, wet, poorly-sorted, med dense, micace	

Well/Boring RW-21_VP-13 Project Name and No. NY001496.2515

Prepared By

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
300	305	N/A		Auger cuttings, Fine Sand, low sphericity, subangular, some (21-35%), silt, little (10-20%), Clay,, ,,,,	
305	310	N/A		Clay, some (21-35%), very fine sand,,, ,,,, Dark grey	
310	315	N/A		Auger cuttings, Fine Sand, low sphericity, subangular, little (10-20%), medium sand, low sphericity, subangular,,, ,,,,	
315	320	N/A		Same as above, Auger cuttings,,,, ,,,,	
320	322	0.75		320-320.75: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), very fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), Medium Sand, poorly-sorted, low sphericity, subangular,lignite seam @ 320.7, ,,,, Tan 330-330.33:	
330	332	0.33		330-330.33: Fine Sand, poorly-sorted, low sphericity, subangular, little (10-20%), very fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Medium Sand, poorly-sorted, low sphericity, subangular, wet, med dense, ,,,, tan/buff	
330	335	N/A		Auger cuttings, Clay, some (21-35%), silt, little (10-20%), Fine Sand,, ,,,,	
335	340	N/A		Auger cuttings, Silt, some (21-35%), very fine sand, low sphericity, subangular, some (21-35%), Clay,, ,,,,	
340	342	0.75		340-340.75: Very Fine Sand, poorly-sorted, low sphericity, angular, and (36-50%), clay, some (21-35%), Silt, trace (< 10%), Fine Sand, poorly-sorted, low sphericity, angular, wet, med dense, stiff, ,,,, Grey 340.75-341.5: Very Fine Sand, poorly-sorted, low sphericity, angular, and (36-50%), silt, little (10-20%), Clay, wet, med dense,	
340	345	N/A		Auger cuttings, Silt, and (36-50%), very fine sand, low sphericity, subangular, some (21-35%), Clay,, ,,,,	
345	350	N/A		Auger cuttings, Very Fine Sand, low sphericity, subangular, and (36-50%), silt, some (21-35%), Clay,, ,,,,	
350	355	N/A		Auger cuttings, Clay, some (21-35%), silt, little (10-20%), Very Fine Sand,, ,,,, Light grey	
355	360	N/A		Same as above, Auger cuttings,,,, ,,,,	
360	362	0.66		360-360.66: Very Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Medium Sand, poorly-sorted, low sphericity, subangular, wet, med dense, micaceous, lignite, seams	
360	365	N/A		Auger cuttings, Fine Sand, low sphericity, subangular, some (21-35%), silt,,lignite, ,,,,	
365	370	1		Same as above, Auger cuttings,,,, ,,,,	
370	375	1.1		Auger cuttings, Fine Sand, and (36-50%), silt, little (10-20%), Clay,, ,,,,	
375	380	N/A		Same as above, Auger cuttings,,,, ,,,,	
380	382	1.2		380-381.2: Fine Sand, poorly-sorted, low sphericity, subangular, and (36-50%), very fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Silt, Medium Sand, low sphericity, subangular, moist, med dense, micaceous, ,,,, Light grey	
400	402	0.66		400-400.66: Very Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Silt, moist, med dense, micaceous, lignite, ,,,, light brown	
400	405	1.5		400.66-405: Auger cuttings, Fine Sand, some (21-35%), very fine sand, little (10-20%), Silt,,	
405	410	N/A		Auger cuttings, Clay, some (21-35%), very fine sand, some (21-35%), Silt,, ,,,,	
410	415	N/A		Auger cuttings, Clay, little (10-20%), very fine sand,lignite,, ,,,,	
415	420	N/A		Same as above, Auger cuttings,,,, ,,,,	
420	422	1.5		420-421.5: Silt, and (36-50%), very fine sand, poorly-sorted, low sphericity, subangular, some (21-35%), Clay, trace (< 10%), Fine Sand, poorly-sorted, low sphericity, subangular, moist, stiff, low plasticity, ,,,, Medium grey	

Well/Boring RW-21_VP-13 Project Name and No. NY001496.2515

Prepared By

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
420	430	N/A		Same as above, Auger cuttings,,,, ,,,,	
430	432	0.75		430-430.75: Fine Sand, poorly-sorted, low sphericity, subangular, little (10-20%), very fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Medium Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Silt, wet, loose, micac	
430	440	N/A		Auger cuttings, Fine Sand, low sphericity, subangular, some (21-35%), very fine sand, low sphericity, subangular,lignite,, ,,,,	
440	442	0.5		440-440.5: Fine Sand, poorly-sorted, low sphericity, subangular, little (10-20%), very fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Medium Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Silt,, ,,,, Light grey	
445	447	0.5		445-445.5: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), medium sand, poorly-sorted, low sphericity, subangular, little (10-20%), Very Fine Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Silt, wet, loose	
445	450	N/A		Auger cuttings, Fine Sand, some (21-35%), medium sand,,, ,,,,	
450	455	N/A		Auger cuttings, Fine Sand, low sphericity, subangular, some (21-35%), very fine sand,	
455	460	N/A		Same as above, Auger cuttings,	
460	462	0.75		460-460.75: Fine Sand, poorly-sorted, low sphericity, subangular, very fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Medium Sand, poorly-sorted, low sphericity, subangular, wet, loose, micaceous, lignite, ,,,, Medium grey	
480	482	0.5		480-480.5: Very Fine Sand, poorly-sorted, low sphericity, subangular, little (10-20%), fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), Silt, wet, med dense, micaceous, ,,,, Medium grey	
480	485	N/A		Auger cuttings, Fine Sand, some (21-35%), clay,,, ,,,,	
485	490	N/A		Same as above, Auger cuttings,,,, ,,,,	
490	495	N/A		Auger cuttings, Medium Sand, some (21-35%), coarse sand, trace (< 10%), Clay,, ,,,,	
495	500	N/A		Same as above, Auger cuttings,,,, ,,,,	
500	502	0.66		500-500.66: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), very fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), Medium Sand, poorly-sorted, low sphericity, subangular, wet, loose, micaceous, ,,,, Light grey	
500	505	N/A		Medium Sand, low sphericity, subangular, Auger cuttings, some (21-35%), fine sand, trace (< 10%), Coarse Sand,, ,,,,	
505	510	N/A		Same as above, Auger cuttings,,,, ,,,,	
510	515	N/A		Auger cuttings, Coarse Sand, low sphericity, subangular, some (21-35%), very coarse sand, low sphericity, subangular, some (21-35%) lignite,, ,,,,	
515	520	N/A		Same as above, Auger cuttings,,,, ,,,,	
520	522	0.6		520-520.6: Very Fine Sand, poorly-sorted, low sphericity, subangular, and (36-50%), silt, trace (< 10%), Fine Sand, poorly-sorted, low sphericity, subangular, wet, med dense, micaceous, ,,,, Medium grey	
520	525	N/A		Auger cuttings, Medium Sand, and (36-50%) lignite, trace (< 10%), Coarse Sand, trace (< 10%), clay,, ,,,,	
525	530	N/A		Same as above, Auger cuttings,,,, ,,,,	
530	535	N/A		Same as above, Auger cuttings,,,, ,,,,	
535	540	N/A		Coarse Sand, some (21-35%), medium sand,,, ,,,,	

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Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
540	545	N/A		Coarse Sand, some (21-35%), medium sand,,, ,,,,	
545	550	N/A		Same as above, Auger cuttings,,,, ,,,,	
550	552	0.1		550-500.1: Fine Sand, poorly-sorted, low sphericity, subangular, little (10-20%), medium sand, poorly-sorted, low sphericity, subangular,,, ,,,, Medium grey	
570	572	2		570-572: Very Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), silt, trace (< 10%), Clay, trace (< 10%), Fine Sand, poorly-sorted, low sphericity, subangular, wet, poorly-sorted, med dense, low plasticity, ,,,, Light grey	
570	580	N/A		Auger cuttings, Coarse Sand, low sphericity, subangular, some (21-35%), medium sand, low sphericity, subangular, trace (< 10%), Clay.	
580	585	N/A		Coarse Sand, low sphericity, subangular, some (21-35%) lignite, little (10-20%), medium sand, low sphericity, subangular,, ,,,,	
585	590	N/A		Same as above, Auger cuttings,,,, ,,,,	
590	592	1		590-591: Very Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Medium Sand, poorly-sorted, low sphericity, subangular,, ,,,, Grey	
590	595	N/A		Auger cuttings, Coarse Sand, some (21-35%) lignite, little (10-20%), Medium Sand, trace (< 10%), Very Coarse Sand,, ,,,,	
595	600	N/A		Same as above, Auger cuttings,,,, ,,,,	
600	605	N/A		Same as above, Auger cuttings,,,, ,,,,	
605	610	N/A		Same as above, Auger cuttings,,,, ,,,,	
610	612	0.6		610-610.6: Very Fine Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Silt, wet, loose, micaceous, ,,,, tan/buff	
630	632	1		630-631: Fine Sand, poorly-sorted, low sphericity, angular, and (36-50%), very fine sand, poorly-sorted, low sphericity, angular, little (10-20%), Silt, trace (< 10%), Medium Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Clay, wet	
650	652	0.5		650-650.5: Fine Sand, poorly-sorted, low sphericity, subangular, little (10-20%), very fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), Medium Sand, poorly-sorted, low sphericity, subangular, moist, loose, ,,,, Light grey	
650	655	N/A		Auger cuttings, Very Coarse Sand, low sphericity, angular, some (21-35%), coarse sand, low sphericity, angular, little (10-20%), Clay, little (10-20%), Granule, trace (< 10%), Small Pebble,, ,,,, tan/buff	
655	660	N/A		Auger cuttings, Very Coarse Sand, low sphericity, angular, some (21-35%), clay, little (10-20%), Silt, little (10-20%), Coarse Sand, low sphericity, angular, trace (< 10%), Granule,, ,,,,	
660	665	N/A		Auger cuttings, Coarse Sand, low sphericity, angular, some (21-35%), very coarse sand, low sphericity, angular, little (10-20%), Small Pebble, little (10-20%), Silt, Clay, trace (< 10%), Medium Pebble,, ,,,, Dark grey	
665	670	N/A		Same as above, Auger cuttings,,,, ,,,,	
670	672	0.5		670-670.5: Medium Sand, poorly-sorted, low sphericity, angular, some (21-35%), fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), coarse sand, poorly-sorted, low sphericity, angular, trace (< 10%), Granule, poorly-sorted, low sphericity	
670	675	N/A		Auger cuttings, Very Coarse Sand, poorly-sorted, low sphericity, subangular, some (21-35%), coarse sand, low sphericity, subangular, little (10-20%), Granule,, ,,,,	
675	680	N/A		Auger cuttings, Very Coarse Sand, little (10-20%), granule, little (10-20%), Small Pebble,, ,,,,	
680	685	N/A		Auger cuttings, Small Pebble, some (21-35%), medium pebble, some (21-35%), Very Coarse Sand,, ,,,,	

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Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
685	690	N/A		Auger cuttings, Coarse Sand, low sphericity, angular, some (21-35%), very coarse sand, low sphericity, angular, little (10-20%), Small Pebble,, ,,,,	
690	692	0.5		690-690.5: Very Fine Sand, poorly-sorted, low sphericity, subangular, and (36-50%), fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Clay, trace lignite, wet, med dense, micaceous, ,,,, tan/buff	
690	695	N/A		Auger cuttings, Very Coarse Sand, low sphericity, angular, some (21-35%), coarse sand, low sphericity, subangular, little (10-20%), Clay, trace (< 10%), Granule,, ,,,,	
695	700	N/A		Same as above, Auger cuttings,,,, ,,,,	
700	705	N/A		Auger cuttings, Very Coarse Sand, low sphericity, subangular, and (36-50%), coarse sand, low sphericity, subangular, little (10-20%), Granule, trace (< 10%), Small Pebble,, ,,,,	
705	710	N/A		Same as above, Auger cuttings,,,, ,,,,	
710	712	0.4		710-710.4: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), medium sand, poorly-sorted, low sphericity, subangular, some (21-35%), Clay, trace (< 10%), Coarse Sand, poorly-sorted, low	
710	715	N/A		Auger cuttings, Very Coarse Sand, low sphericity, angular, some (21-35%), granule, low sphericity, subangular, little (10-20%), Medium Pebble, poorly-sorted, subrounded,, ,,,,	
715	720	N/A		Same as above, Auger cuttings,,,, ,,,,	
720	725	N/A		Same as above, Auger cuttings,,,, ,,,,	
725	730	N/A		Same as above, Auger cuttings,,,, ,,,,	
730	732	0.4		730-730.4: Coarse Sand, poorly-sorted, low sphericity, angular, some (21-35%), very coarse sand, poorly-sorted, low sphericity, angular, little (10-20%), granule, poorly-sorted, low sphericity, angular, little (10-20%), Small Pebble, poorly-sorted, l	
735	740	N/A		Auger cuttings, Very Coarse Sand, poorly-sorted, low sphericity, subangular, and (36-50%), coarse sand, low sphericity, angular, little (10-20%), Granule, little (10-20%), Small Pebble, low sphericity, subangular, trace (< 10%), Medium Pebbl	
740	745	N/A		, Auger cuttings, Coarse Sand, low sphericity, angular,, some (21-35%), very coarse sand, low sphericity, angular, some (21-35%), Granule, low sphericity, subangular, little (10-20%), Small Pebble, low sphericity, subangular, trace (< 10%),	
745	750	N/A		Same as above, Auger cuttings,,,, ,,,,	
750	752	0.5		750-750.2: Clay, some (21-35%), very coarse sand, poorly-sorted, low sphericity, angular, little (10-20%), Very Large Pebble, poorly-sorted, low sphericity, round, trace (< 10%), Medium Pebble, poorly-sorted, low sphericity, subrounded, trace (< 10%),	
755	757	0.5		755-755.5: Clay, and (36-50%), silt, some (21-35%), very fine sand, poorly-sorted, low sphericity, subangular, some (21-35%), Very Large Pebble, low sphericity, subrounded, little (10-20%), Medium Pebble, low sphericity, subrounded,, ,,,, White	
755	760	N/A		Auger cuttings, Clay,,,, ,,,,	
760	765	N/A		Auger cuttings, Clay,,,, ,,,, Dark grey	
765	770	N/A		Auger cuttings, Small Pebble, low sphericity, subrounded, some (21-35%), medium pebble, low sphericity, subrounded, little (10-20%), Clay, little (10-20%), Coarse Sand,, ,,,, White	
770	772	0.5		770-770.5: Clay, trace (< 10%), silt, trace (< 10%) lignite,, ,,,, Medium grey	
775	777	0.5		775-775.5: Silt, and (36-50%), very fine sand, poorly-sorted, low sphericity, subangular,,, ,,,, Light grey	
775	780	N/A		Auger cuttings, Silt, some (21-35%), very fine sand, little (10-20%), Medium Sand,, ,,,,	
780	785	N/A		Same as above, Auger cuttings,,,, ,,,,	

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Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
785	790	N/A		Same as above, Auger cuttings,,,, ,,,,	
790	792	0.5		790-790.5: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), very fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), Medium Sand, poorly-sorted, low sphericity, subangular, little (10-20%), Clay, trace (< 10%),	
790	795	N/A		Auger cuttings, Silt, some (21-35%), very fine sand, trace (< 10%), Clay,, ,,,,	
795	800	N/A		Same as above, Auger cuttings,,,, ,,,,	
800	805	N/A		Same as above, Auger cuttings,,,, ,,,,	
805	810	N/A		Same as above, Auger cuttings,,,, ,,,,	
810	812	1.5		810-811.5: Very Fine Sand, poorly-sorted, low sphericity, angular, some (21-35%), silt, little (10-20%), Fine Sand, low sphericity, angular, trace (< 10%), Clay, trace (< 10%), Medium Sand, low sphericity, subangular, wet, loose, ,,,, Light grey	
830	832	1		830-830.66: Silt, and (36-50%), clay, little (10-20%), Very Fine Sand, low sphericity, subangular,, ,,,, Medium grey 830.6-831: Clay,,, dry, hard, med plasticity, ,,,, Medium grey	
835	840	N/A		Auger cuttings, Silt, and (36-50%), very fine sand, little (10-20%), Fine Sand, trace (< 10%), Clay,, ,,,,	
840	845	N/A		Same as above, Auger cuttings,,,, ,,,,	
845	850	N/A		Same as above, Auger cuttings,,,, ,,,,	
850	852	1.33		850-851.33: Silt, and (36-50%), very fine sand, low sphericity, subangular, trace (< 10%), Fine Sand, poorly-sorted, low sphericity, angular, trace (< 10%) lignite, wet, stiff, nonplastic, micaceous, ,,,, Grey	
850	855	N/A		Auger cuttings, Silt, some (21-35%), very fine sand, little (10-20%) lignite,, ,,,,	
855	860	N/A		Auger cuttings, Silt, and (36-50%), very fine sand, little (10-20%), Fine Sand,, ,,,,	
860	865	N/A		Auger cuttings, Silt, some (21-35%), very fine sand, little (10-20%) lignite, trace (< 10%), Clay,, ,,,,	
865	870	N/A		Same as above, Auger cuttings,,,, ,,,,	
870	872	1		870-871: Clay,,, dry, hard, low plasticity, no dilatancy, ,,,, Grey	
875	877	1.5		875-876.5: Silt, and (36-50%), very fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Fine Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Clay, trace (< 10%) lignite, moist, medium stiff, micaceous, ,,,, Light grey	
880	882	1.5		880-881.5: Silt, and (36-50%), very fine sand, poorly-sorted, low sphericity, subangular,, moist, poorly-sorted, stiff, micaceous, ,,,, Light grey	
885	887	1.5		885-886.5: Same as above,,,, ,,,,	
890	892	2		890-892: Silt, and (36-50%), very fine sand, poorly-sorted, low sphericity, angular, trace (< 10%), Fine Sand, low sphericity, subangular, wet, medium stiff, nonplastic, micaceous, ,,,, Light grey	
895	897	1.33		895-896.33: Silt, and (36-50%), very fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Fine Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Clay,, ,,,, Light grey	
900	902	1.5		900-901.5: Very Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), Clay, trace (< 10%), Silt, wet, loose, soft, ,,,, Medium	
905	907	1.25		905-906.25: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), very fine sand, poorly-sorted, low sphericity, little (10-20%), Medium Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Coarse Sand, poorly-sorted, low sphericity	

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Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
910	912	2		910-912: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), very fine sand, poorly-sorted, low sphericity, little (10-20%), Medium Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Coarse Sand,subangular,trace (< 10%)	
915	917	0.5		915-915.5: Fine Sand, poorly-sorted, low sphericity, subangular, little (10-20%), very fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), Silt, trace (< 10%), Clay, wet, loose, micaceous, ,,,,	
920	922	0.8		920-920.8: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), very fine sand, poorly-sorted, low sphericity, subangular, little (10-20%), Medium Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Granule, poorly-sorted,	
925	927	1.5		925-926.5: Fine Sand, poorly-sorted, low sphericity, subangular, some (21-35%), very fine sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Medium Sand, poorly-sorted, low sphericity, subangular, trace (< 10%), Clay,, ,,,, Grey	
930	932	1		930-931: Clay, trace (< 10%), silt,trace (< 10%) lignite, dry, hard, slight red hue, ,,,, Dark grey	
935	937	0.33		935-935.33: Clay,,,, ,,,, Light grey	
937	939	0.5		937-937.5: Clay,,, dry, very stiff, ,,,, Medium grey	
939	941	0.66		939-939.66: Clay,,, dry, very stiff, ,,,, Medium grey	
941	943	0.5		941-941.5: Clay, little (10-20%) lignite,,, ,,,, Dark grey	
943	945	1.5		943-944.5: Clay, little (10-20%), silt,, dry, very stiff, ,,,, Medium grey	
945	947	1		945-946: Clay, trace (< 10%), silt,,, ,,,, Medium grey	

Design & Consultancy for natural and built assets

Well/Boring: RW-21_VP-14 | Project Name and No.: NY001496.2515

Site Location: Bethpage, NY | Drilling Started: | Drilling Completed:

Total Depth Drilled: 791.5 feet | Hole Diameter: 8 inches | Sampling Interval: feet

Length and Diameter of Sampling Device: 2ft / 2 in | Type of Sampling Device: Split spoon

Drilling Method: Mud-rotary | Drilling Fluid Used: Portable water and bentonite

Drilling Contractor: Uni-Tech Drilling | Driller: | Helper:

Prepared By: | Hammer Weight: | Hammer Drop: inches

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
0	20	N/A		Coarse Gravel, poorly-sorted, subangular, subrounded, some (21-35%), medium sand, poorly-sorted, subangular, subrounded,, wet, very loose, no odor, ,,,, tan/buff	
20	40	N/A		Coarse Sand, Medium Sand, poorly-sorted, subangular, subrounded, little (10-20%), silt,, wet, loose, no odor, ,,,, light brown	
40	60	N/A		Silt, poorly-sorted, and (36-50%), fine sand, poorly-sorted, subangular, subrounded,, wet, soft, med plasticity, no odor, ,,,, light brown	
60	80	N/A		60-68', Silty Sand, poorly-sorted 68-80', Silty Clay, poorly-sorted,,, wet, soft, med plasticity, organic, ,,,, light gray	
80	100	N/A		Medium Sand, Fine Sand, poorly-sorted, subangular, subrounded, little (10-20%), silt,, wet, loose, no odor, ,,,, light brown	
100	110	N/A		Auger cuttings, Small Cobble, poorly-sorted, and (36-50%), granule,,, ,,,,	
100	110	N/A		Coarse Sand, Medium Sand, poorly-sorted, subangular, subrounded, trace (< 10%), silt,, wet, loose, no odor, ,,,, light brown	
110	115	N/A		Auger cuttings, Coarse Sand, poorly-sorted, low sphericity, subangular, medium sand, poorly-sorted, low sphericity, subangular, Clay,, ,,,, Grey	
110	130	N/A		Medium Sand, Fine Sand, poorly-sorted, subangular, subrounded, some (21-35%), silt,, wet, loose, no odor, ,,,, reddish brown	
115	120	N/A		Same as above, Auger cuttings,,,, ,,,,	
120	125	N/A		Same as above, Auger cuttings,,,, ,,,,	
125	130	N/A		Auger cuttings, Coarse Sand, poorly-sorted, low sphericity, subangular, granule, poorly-sorted, low sphericity, subangular, Silt, Clay,, ,,,, light brown	
130	150	N/A		Medium Sand, Fine Sand, poorly-sorted, and (36-50%), silty clay, interbedded from 142-147'; med. plasticity,, wet, loose, no odor, ,,,, Dark grey	
130	135	N/A		Auger cuttings, Medium Sand, low sphericity, subangular, granule, poorly-sorted, low sphericity, subangular, Silt, Clay,, ,,,,	
135	140	N/A		Auger cuttings, Coarse Sand, low sphericity, subangular, some (21-35%), medium sand, poorly-sorted, low sphericity, subangular, little (10-20%), Clay, moist, med dense, soft, ,,,, Medium grey	
140	145	N/A		Auger cuttings, Medium Sand, low sphericity, subangular, fine sand, poorly-sorted, low sphericity, Silt, Clay,, ,,,,	

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Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
145	150	N/A		Auger cuttings, Clay, little (10-20%), fine sand, poorly-sorted, low sphericity, subangular,,, ,,,,	
150	155	N/A		Auger cuttings, Clay, some (21-35%), medium sand, subangular, little (10-20%), Fine Sand, subangular,, ,,,,	
150	170	N/A		Medium Sand, Fine Sand, poorly-sorted, subangular, subrounded, some (21-35%), clay, interbedded,, wet, loose, no odor, ,,,, Dark grey	
155	160	N/A		Same as above, Auger cuttings,,,, ,,,,	
165	170	N/A		Auger cuttings, Fine Sand, low sphericity, subangular, some (21-35%), medium sand, low sphericity, subangular, little (10-20%), Coarse Sand, low sphericity, subangular, trace (< 10%), Clay,, ,,,,	
170	180	N/A		Same as above, Auger cuttings,,,, ,,,,	
170	190	N/A		Same as above,	
180	190	N/A		Same as above, Auger cuttings,,,, ,,,,	
190	210	N/A		Coarse Sand, Medium Sand, poorly-sorted, subangular, subrounded,,, wet, loose, no odor, ,,,, light brown	
210	230	N/A		Same as above,,,, ,,,,	
230	250	N/A		Same as above,,,, ,,,,	
250	270	N/A		Medium Sand, Fine Sand, poorly-sorted, subangular, subrounded, some (21-35%) lignite fragments,,, ,,,, Medium grey	
270	290	N/A		Silty Sand, poorly-sorted, subangular, subrounded,,, wet, no odor, ,,,, Medium grey	
310	311	1		Medium Sand, Fine Sand, well-sorted, subangular, subrounded, little (10-20%), silty clay,, moist, med dense, no odor, ,,,, light brown	
330	331.5	1.5		330-331.5: Same as above,,,, ,,,,	
340	341.5	1.5		340-341.5: Same as above,,,, ,,,,	
350	351	1		350-350.2, gray Clay 350.2-351, Coarse Sand, Medium Sand, well-sorted, subangular, subrounded,,, moist, dense, no odor, ,,,, light brown	
370	372	N/A		Auger cuttings, Coarse Sand,,, wet, poorly-sorted, ,,,, light brown	
390	392	2		390-392: Fine Sand, Silty Sand, well-sorted, subangular, subrounded,,, moist, med dense, no odor, ,,,, light gray	
410	411.5	1		Coarse Sand, Medium Sand, well-sorted, subangular, subrounded, little (10-20%), silt,, moist, loose, no odor, ,,,, light brown	
430	431	0.7		Same as above,,,, ,,,,	
450	451.5	N/A		Medium Sand, Fine Sand, well-sorted, subangular, subrounded, some (21-35%), silt,, moist, med dense, no odor, ,,,, light brown	

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Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
460	461	1.5		Coarse Sand, Medium Sand, well-sorted, subangular, subrounded, little (10-20%), silt,, moist, med dense, no odor, ,,,, light brown	
470	471.5	N/A		Coarse Sand, well-sorted, subangular, subrounded, little (10-20%), silt,, moist, loose, no odor, ,,,, Light grey	
490	491.5	1.5		Medium Sand, Fine Sand, well-sorted, subangular, subrounded, little (10-20%), silt,, moist, med dense, no odor, ,,,, light brown	
510	511.5	0.8		Medium Sand, Fine Sand, poorly-sorted, subangular, subrounded, some (21-35%), silty clay black, interbedded,, moist, med dense, no odor, ,,,, light brown	
520	521.5	1.5		Coarse Sand, Medium Sand, poorly-sorted, subangular, subrounded, some (21-35%), clay medium plasticity,, moist, dense, no odor, ,,,, light brown	
530	531.5	0.8		Coarse Sand, well-sorted, subangular, subrounded, trace (< 10%), silt,, moist, loose, no odor, ,,,, light brown	
540	541.5	0.6		Coarse Sand, well-sorted, subangular, subrounded, trace (< 10%), silt,, moist, loose, no odor, ,,,, light brown	
550	551	0.9		Medium Sand, Fine Sand, well-sorted, subangular, subrounded, some (21-35%), clay. orange,, moist, med dense, no odor, ,,,, light brown	
560	561	0.7		Coarse Sand, well-sorted, subangular, subrounded,,, moist, loose, no odor, ,,,, light brown	
570	571	N/A		570-570.5: Clay, med plasticity, stiff	
570	571	1		570-571: Medium Sand, Fine Sand, poorly-sorted, subangular, subrounded	
600	601.5	1		Coarse Sand, well-sorted, subangular, subrounded, trace (< 10%), silt,, moist, loose, no odor, ,,,, light brown	
610	610.5	0.5		Fine Gravel, Coarse Sand, poorly-sorted, subangular, subrounded, and (36-50%), clay, med plasticity, stiff,, moist, no odor, ,,,, light brown	
630	631	1		Coarse Sand, Medium Sand, well-sorted, subangular, subrounded, little (10-20%), clay, dark gray, med plasticity,, moist, loose, no odor, ,,,, light brown	
650	651	1		650-650.4: Clay, gray, dense	
670	671	1		Coarse Sand, Silty Sand, poorly-sorted, subangular, subrounded,,, moist, loose, soft, no odor, ,,,, Grey	
690	691.5	1.5		690-691: Medium Sand, Silty Sand, poorly-sorted, subangular, subrounded	
700	701	1		Coarse Sand, Medium Sand, poorly-sorted, subangular, subrounded, little (10-20%), clay,, moist, loose, no odor, ,,,, Light brown	
710	711	N/A		Coarse Gravel, Fine Gravel, poorly-sorted, subangular, subrounded, some (21-35%), silt,, wet, very loose, no odor, ,,,, Light brown	
720	721	1		720-720.5: SAA	
730	731	1		Medium Sand, Fine Sand, well-sorted, subangular, subrounded, some (21-35%), silt,, moist, loose, no odor, ,,,, Light brown	
750	751.5	1		750-750.5: Clay, gray, dense, med plasticity	
770	771.5	1.5		Medium Sand, Fine Sand, well-sorted, subangular, subrounded, and (36-50%), silt,, moist, loose, no odor, ,,,, light brown	
790	791.5	1.2		Same as above,,,, ,,,,	

Design & Consultancy for natural and built assets

Well/Boring: RW-21_VP-15 | Project Name and No.: NY001496.2515

Site Location: Bethpage, NY | Drilling Started: | Drilling Completed:

Total Depth Drilled: 842 feet | Hole Diameter: 8 inches | Sampling Interval: feet

Length and Diameter of Sampling Device: 2ft / 2 in | Type of Sampling Device: Split spoon

Drilling Method: Mud-rotary | Drilling Fluid Used: Portable water and bentonite

Drilling Contractor: Uni-Tech Drilling | Driller: | Helper:

Prepared By: | Hammer Weight: | Hammer Drop: inches

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
0	40	N/A		Auger cuttings, Small Pebble, Granule, Very Coarse Sand, Coarse Sand, well-sorted, subangular, subrounded,,,, ,,,, 5.00YR 6/8 reddish yellow	
40	60	N/A		Auger cuttings, Coarse Sand, Medium Sand, well-sorted, subrounded, round, small pebble, granule, well-sorted, subrounded, round,,, ,,,, 7.50YR 5/8 strong brown	
60	80	N/A		Auger cuttings, Coarse Sand, Medium Sand, well-sorted, angular, subangular, some (21-35%), small pebble, granule,, loose, no odor, ,,,, 2.50YR 4/8 red	
80	100	N/A		Auger cuttings, Very Coarse Sand, Coarse Sand, Medium Sand, well-sorted, angular, subangular, large pebble, medium pebble, small pebble, granule, poorly-sorted, subrounded, round,,, ,,,, 2.50YR 4/8 red	
100	105	N/A		Auger cuttings, Coarse Sand, little (10-20%), medium sand,, wet, well-sorted, med dense, angular, subangular, ,,,, 2.50YR 5/8 red	
105	110	N/A		Auger cuttings, Very Coarse Sand, little (10-20%), medium sand, fine sand, trace (< 10%), Granule, wet, well-sorted, med dense, subangular, subrounded, ,,,, 7.50YR 6/6 reddish yellow	
110	120	N/A			
120	130	N/A		Auger cuttings, Granule, Very Coarse Sand, poorly-sorted, angular, subangular, subrounded,,,, ,,,, 10.00YR 8/6 yellow	
130	140	N/A		Auger cuttings, Granule, poorly-sorted, angular, subrounded, some (21-35%), very coarse sand, poorly-sorted, angular, subangular, trace (< 10%), Medium Sand, Fine Sand, wet, loose, ,,,, 5.00Y 5/6 olive	
150	160	N/A		Auger cuttings, Granule, some (21-35%), very coarse sand, coarse sand, trace (< 10%), Medium Sand, wet, poorly-sorted, loose, angular, subangular, ,,,, 10.00YR 5/8 yellowish brown	
160	170	N/A		Auger cuttings, Granule, subangular, subrounded, and (36-50%), very coarse sand, little (10-20%), Medium Sand, wet, poorly-sorted, loose, angular, subangular, ,,,, 10.00YR 6/6 brownish yellow	
180	190	N/A		Auger cuttings, Granule, and (36-50%), very coarse sand, little (10-20%), Coarse Sand, Medium Sand, wet, poorly-sorted, loose, angular, subrounded, ,,,, 10.00YR 6/8 brownish yellow	
200	210	N/A		Auger cuttings, Granule,,, organic, ,,,, 2.50YR 2/1 reddish black	
210	212	1.5		210-211: Clay, trace (< 10%), silt,, dry, stiff, high plasticity, slow dilatancy, ,,,, 7.50YR 3/1 very dark gray 211-211.5: Clay, and (36-50%), silt, trace (< 10%), Fine Sand, moist, medium stiff, low plasticity, slow dilatancy, ,,,, 7.50YR 3/1 very dark gray	
220	222	2		Clay, some (21-35%), silt, trace (< 10%), Fine Sand, moist, very stiff, low plasticity, slow dilatancy, ,,,, 10.00YR 3/1 very dark gray	
230	232	2		230-231: Fine Sand, some (21-35%), silt, trace (< 10%), Clay, moist, well-sorted, dense, ,,,, 5.00G 7/1 light greenish gray 231-232: Medium Sand, little (10-20%), coarse sand, trace (< 10%), Fine Sand, wet, well-sorted, med dense, angular, subangular, ,,,, 2.50Y 4/1 dark gray	

Well/Boring RW-21_VP-15 Project Name and No. NY001496.2515

Prepared By

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
240	242	2		Medium Sand, some (21-35%), coarse sand, little (10-20%), Silt, wet, well-sorted, med dense, angular, subangular, ,,,, 7.50YR 7/6 reddish yellow	
250	255	N/A		Auger cuttings, Coarse Sand, some (21-35%), very coarse sand, trace (< 10%), Granule, wet, poorly-sorted, loose, angular, subangular, organic, ,,,, 10.00YR 5/1 gray	
255	260	N/A		Auger cuttings, Very Coarse Sand, some (21-35%), coarse sand, little (10-20%), Granule, wet, poorly-sorted, loose, angular, subangular, ,,,, 10.00YR 6/2 light brownish gray	
260	262	1.1		260-261.1: Medium Sand, some (21-35%), coarse sand, trace (< 10%), Very Fine Sand, Silt, wet, well-sorted, dense, angular, subangular, ,,,, 7.50YR 8/4 pink	
270	280	N/A		Auger cuttings, Very Coarse Sand, and (36-50%), granule, little (10-20%), Coarse Sand, wet, poorly-sorted, loose, angular, subangular, ,,,, 2.50YR 5/2 weak red	
280	282	2		Fine Sand, some (21-35%), medium sand, little (10-20%), Very Fine Sand, Silt, wet, well-sorted, dense, angular, subangular, ,,,, 10.00YR 7/4 very pale brown	
290	295	N/A		Auger cuttings, Granule, some (21-35%), very coarse sand, little (10-20%), Coarse Sand, wet, poorly-sorted, loose, angular, ,,,, 2.50Y 6/8 olive yellow	
300	302	2		Fine Sand, some (21-35%), very fine sand, little (10-20%), Silt, wet, well-sorted, dense, subangular, subrounded, ,,,, 2.50Y 6/4 light yellowish brown	
305	310	N/A		Auger cuttings, Fine Sand, and (36-50%), very fine sand, little (10-20%), Coarse Sand, wet, well-sorted, med dense, subangular, subrounded, ,,,, 2.50Y 7/8 yellow	
315	320	N/A		Auger cuttings, Fine Sand, some (21-35%), very fine sand, trace (< 10%), Coarse Sand, Medium Sand, wet, well-sorted, med dense, subangular, ,,,, 2.50Y 7/8 yellow	
320	322	1.2		320-321.2: Fine Sand, and (36-50%), very fine sand, trace (< 10%), Silt, wet, well-sorted, dense, subangular, subrounded, ,,,, 10.00YR 5/6 yellowish brown	
340	342	1.5		340-341.5: Medium Sand, little (10-20%), fine sand, poorly-sorted, subrounded,, wet, dense, no odor, ,,,, 10.00YR 5/6 yellowish brown	
350	355	N/A		Auger cuttings, Coarse Sand, Medium Sand, well-sorted, subangular, subrounded, some (21-35%), fine sand,, no odor, ,,,, 10.00YR 5/6 yellowish brown	
360	362	1.5		360-361.5: Very Fine Sand, and (36-50%), very fine sand, silt, well-sorted,, wet, dense, no odor, ,,,, 5.00Y 6/2 light olive gray	
380	382	2		380-381.6: Very Fine Sand, and (36-50%), silt, some (21-35%), Very Fine Sand, wet, loose, no odor, parting, seam, laminated, ,,,, 5.00Y 6/1 light gray/gray	
385	390	N/A		Same as above, Auger cuttings,,,, ,,,, 5.00Y 6/1 light gray/gray	
400	402	1.7		400-401.7: Medium Sand, little (10-20%), fine sand, trace (< 10%), Very Fine Sand, Silt, well-sorted, subangular, subrounded, wet, loose, no odor, seam, layer, ,,,, 5.00Y 6/1 light gray/gray	
405	410	N/A		Auger cuttings, Coarse Sand, Medium Sand, poorly-sorted, angular, some (21-35%), fine sand, very fine sand, silt, well-sorted, subangular, subrounded,, no odor, ,,,, 5.00Y 6/1 light gray/gray	
420	422	2		Same as above,,,, ,,,, 10.00YR 6/4 light yellowish brown	
440	442	1.8		440-441.8: Medium Sand, and (36-50%), fine sand, very fine sand, trace (< 10%), Silt, well-sorted, subangular, subrounded, wet, loose, seam, ,,,, 10.00YR 6/1 light gray/gray	
460	462	1.4		460-461.4: Medium Sand, some (21-35%), very fine sand, well-sorted, angular, subangular, trace (< 10%), Silt, wet, dense, no odor, ,,,, 10.00YR 6/1 light gray/gray	

Well/Boring RW-21_VP-15 Project Name and No. NY001496.2515

Prepared By

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
480	482	2		Medium Sand, trace (< 10%), fine sand, very fine sand, silt, well-sorted, angular, subangular,, wet, med dense, no odor, ,,,, 10.00YR 6/1 light gray/gray	
485	490	N/A		Same as above, Auger cuttings,,,, ,,,, 10.00YR 6/1 light gray/gray	
500	502	2		Coarse Sand, little (10-20%), medium sand, fine sand, poorly-sorted, angular, subangular,, wet, med dense, no odor, seam, ,,,, 10.00YR 6/1 light gray/gray	
520	522	2		520-521.5: Very Fine Sand, and (36-50%), silt, little (10-20%), Fine Sand, trace (< 10%), Medium Sand, poorly-sorted, subangular, wet, med dense, no odor, parting, seam, laminated, ,,,, 2.50Y 5/1 gray	
525	530	N/A		Same as above, Auger cuttings,,,, ,,,, 5.00Y 6/1 light gray/gray	
540	542	2		Medium Sand, trace (< 10%), fine sand, very fine sand, silt, well-sorted, angular,, wet, loose, no odor, homogeneous, ,,,, 5.00Y 6/2 light olive gray	
550	552	2		550-550.5: Medium Sand, little (10-20%), fine sand, well-sorted, angular, subangular,, wet, loose, no odor, ,,,, 550.5-552: Coarse Sand, trace (< 10%), medium sand, well-sorted,, wet,	
560	562	2		560-561: Medium Sand, well-sorted, angular, subangular, trace (< 10%), fine sand, silt, well-sorted, subangular,, moist, no odor, laminated, ,,,, 2.50Y 7/1 light gray 561-561.3: Very Fine Sand, Silt, well-sorted,,, moist, laminated, ,,,, 2.50Y 2/1 black 561.3-561.4: Medium Sand, well-sorted, angular, subangular, Coarse Sand,,, moist, no odor, ,,,, 10.00YR 5/6 yellowish brown 561.4-561.6: Same as above,,,, ,,,, 5.00Y 6/3 pale olive 561.6-562: Medium Sand, well-sorted, angular, subangular, trace (< 10%), fine sand, very fine sand, silt, well-sorted,, moist, no odor, ,,,, GLEY 1 7/N light gray	
565	570	N/A		Same as above, Auger cuttings,,,, ,,,, GLEY 1 7/N light gray	
580	582	1.8		580-581.8: Very Fine Sand, Silt, some (21-35%), fine sand, very fine sand, trace (< 10%), Clay, dry, medium stiff, low plasticity, no odor, ,,,, GLEY 1 2/N greenish black	
585	587	2		Coarse Sand, Medium Sand, well-sorted, angular, subangular, little (10-20%), fine sand, subangular,, wet, loose, no odor, ,,,, GLEY 1 6/N greenish gray	
590	592	2		Coarse Sand, Medium Sand, well-sorted, angular, subangular,,, moist, med dense, no odor, layer, ,,,, GLEY 1 6/N greenish gray	
600	602	0		,,,, ,,,,	
605	607	2		Medium Sand, well-sorted, subangular, little (10-20%), fine sand, well-sorted, subangular,, moist, med dense, no odor, laminated, ,,,, 10.00YR 7/1 light gray	
605	610	N/A		Auger cuttings, Very Coarse Sand, Coarse Sand, Medium Sand, poorly-sorted, angular, subangular, little (10-20%), fine sand, very fine sand, silt, well-sorted,, no odor, ,,,, 10.00YR 7/1 light gray	
610	615	N/A		Auger cuttings, Small Pebble, Granule, Very Coarse Sand, poorly-sorted, angular, subangular, and (36-50%), coarse sand, medium sand,, no odor, ,,,, 5.00Y 7/1 light gray	
620	622	2		Coarse Sand, Medium Sand, well-sorted, subangular, trace (< 10%), fine sand, very fine sand,, moist, well-sorted, med dense, no odor, ,,,, 5.00Y 7/1 light gray	
620	625	N/A		Same as above, Auger cuttings,,,, ,,,, 5.00Y 7/1 light gray	
625	630	N/A		Auger cuttings, Medium Sand, well-sorted, little (10-20%), fine sand, very fine sand,, well-sorted, no odor, ,,,, 10.00YR 7/2 light gray	
640	642	0		No recovery,,,, ,,,,	
640	645	N/A		Auger cuttings, Fine Sand, Very Fine Sand, and (36-50%), silt,,, ,,,, 10.00YR 7/2 light gray	

Design & Consultancy for natural and built assets

Well/Boring RW-21_VP-15 **Project Name and No.** NY001496.2515

Prepared By

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
660	662	2		660-660.7: Coarse Sand, Medium Sand, poorly-sorted, angular, subangular, some (21-35%), fine sand, poorly-sorted, trace (< 10%), Silt, Clay, moist, med dense, no odor, ,,,, 10.00YR 7/3 very pale brown 660.7-661: Silt, little (10-20%), fine sand, very fine sand, clay, trace (< 10%), Very Fine Sand, moist, soft, low plasticity, slow dilatancy, no odor, ,,,, 5.00Y 7/1 light gray 661-662: Granule, Very Coarse Sand, poorly-sorted, angular, subangular, some (21-35%), medium sand, fine sand, well-sorted, angular, subangular, little (10-20%), Silt, moist, poorly-sorted, med dense, no odor, ,,,, GLEY 1 7/N light gray	
680	682	2		Fine Sand, Very Fine Sand, some (21-35%), silt, trace (< 10%), Clay, moist, poorly-sorted, ,,,, 5.00Y 6/1 light gray/gray	
700	702	2		Coarse Sand, and (36-50%), medium sand, some (21-35%), Very Coarse Sand, wet, well-sorted, dense, angular, subangular, ,,,, 10.00Y 6/2 light grayish olive	
710	715	N/A		Auger cuttings, Small Pebble, and (36-50%), medium pebble, some (21-35%), Large Pebble, Coarse Sand, wet, poorly-sorted, loose, angular, ,,,, 10.00YR 6/6 brownish yellow	
720	722	2		Granule, and (36-50%), small pebble, some (21-35%), Medium Pebble, Coarse Sand, wet, poorly-sorted, loose, subangular, subrounded, ,,,,	
725	730	N/A		Auger cuttings, Granule, some (21-35%), coarse sand, some (21-35%), Silt, Clay, wet, poorly-sorted, med dense, subangular, subrounded, ,,,, 2.50YR 8/2 pinkish white	
730	740	N/A		Auger cuttings, Small Pebble, and (36-50%), silt, clay, some (21-35%), Medium Pebble, Granule, wet, poorly-sorted, dense, angular, subangular, ,,,, 2.50YR 8/1 white	
740	742	1.5		740-741.5: No recovery from split spoon, likely fine sands were washed out	
745	747	1.7		745-746.7 Very Fine Sand, and (36-50%), clay, some (21-35%), Silt, moist, well-sorted, very dense, subangular, subrounded, ,,,, 5.00YR 6/1 light gray/gray	
755	760	N/A		Auger cuttings, Clay, some (21-35%), silt,, very stiff, high plasticity, slow dilatancy, no odor, ,,,,	
760	762	2		Clay, little (10-20%), silt, trace (< 10%), Very Fine Sand, moist, very stiff, med plasticity, slow dilatancy, ,,,, 7.50YR 4/1 dark gray	
765	767	1.1		765-766.1: Clay, some (21-35%), silt, little (10-20%), Very Fine Sand, dry, very stiff, med plasticity, slow dilatancy, no odor, ,,,, 5.00YR 6/1 light gray/gray	
766	770	N/A		,,,, ,,,,	
780	782	1.2		780-781.2: Coarse Sand, and (36-50%), medium sand, some (21-35%), Fine Sand, wet, well-sorted, med dense, no odor, subangular, subrounded, ,,,, 5.00YR 8/1 white	
800	802	2		Medium Sand, little (10-20%), coarse sand, fine sand, trace (< 10%), Very Fine Sand, Silt, wet, well-sorted, dense, subangular, subrounded, ,,,, GLEY 1 8/N pale green	
820	822	2		Fine Sand, some (21-35%), medium sand, little (10-20%), Very Fine Sand, Silt, wet, well-sorted, dense, subangular, ,,,, 5.00YR 7/1 light gray	
840	842	2		Fine Sand, some (21-35%), clay, little (10-20%), Very Fine Sand, wet, well-sorted, dense, no odor, subangular, subrounded, ,,,, 5.00YR 6/1 light gray/gray	

Design & Consultancy for natural and built assets

Well/Boring: RW-21_VP-16 | Project Name and No.: NY001496.2515

Site Location: Bethpage, NY | Drilling Started: | Drilling Completed:

Total Depth Drilled: 680.7 feet | Hole Diameter: 8 inches | Sampling Interval: feet

Length and Diameter of Sampling Device: 2ft / 2 in | Type of Sampling Device: Split spoon

Drilling Method: Mud-rotary | Drilling Fluid Used: Portable water and bentonite

Drilling Contractor: Uni-Tech Drilling | Driller: | Helper:

Prepared By: | Hammer Weight: | Hammer Drop: inches

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
20	25	N/A		Auger cuttings, Very Coarse Sand, Coarse Sand, poorly-sorted, angular, subangular, some (21-35%), small pebble, granule, poorly-sorted, subangular,, loose, no odor, ,,,, 10.00YR 5/4 yellowish brown	
25	35	N/A		Auger cuttings, Small Pebble, Granule, Very Coarse Sand, poorly-sorted, angular, subangular, some (21-35%), coarse sand, medium sand, poorly-sorted,, no odor, ,,,, 7.50YR 5/8 strong brown	
35	50	N/A		Auger cuttings, Large Pebble, Medium Pebble, poorly-sorted, subangular, subrounded, some (21-35%), small pebble, granule, little (10-20%), Very Coarse Sand, Coarse Sand, no odor, ,,,, 7.50YR 5/8 strong	
50	65	N/A		Same as above, Auger cuttings,,,, ,,,, 5.00YR 5/8 yellowish red	
65	70	N/A		Auger cuttings, Clay, and (36-50%), silt, little (10-20%), Medium Sand, Fine Sand, well-sorted, soft, med plasticity, no odor, ,,,, 10.00YR 2/1 black	
70	80	N/A		Auger cuttings, Very Coarse Sand, Coarse Sand, Medium Sand, well-sorted, subangular, some (21-35%), large pebble, medium pebble, small pebble, granule, poorly-sorted,, no odor, ,,,, 2.50YR 4/8 red	
80	100	N/A		Same as above, Auger cuttings,,,, ,,,, 2.50YR 4/8 red	
100	120	N/A		Auger cuttings, Medium Pebble, Small Pebble, Granule, poorly-sorted, subangular, subrounded, some (21-35%), granule, very coarse sand, coarse sand, poorly-sorted, little (10-20%), Medium Sand, Fine Sand, no odor, ,,,, Brown	
120	140	N/A		Auger cuttings, Granule, Very Coarse Sand, poorly-sorted, angular, subangular, some (21-35%), coarse sand, medium sand, poorly-sorted, angular, subangular,,, ,,,, Brown	
140	160	N/A		Auger cuttings, Coarse Sand, Medium Sand, poorly-sorted, angular, subangular, and (36-50%), medium pebble, small pebble, granule, little (10-20%), Fine Sand, poorly-sorted, ,,,, olive gray	
160	180	N/A		Auger cuttings, Granule, Very Coarse Sand, poorly-sorted, angular, subangular, some (21-35%), coarse sand, medium sand, poorly-sorted, angular, subangular, subrounded,, no odor, ,,,, Medium brown	
180	200	N/A		Auger cuttings, Coarse Sand, Medium Sand, poorly-sorted, subangular, and (36-50%), medium pebble, small pebble, granule, poorly-sorted,,, ,,,, Brown	
200	202	0.7		Medium Sand, well-sorted, subangular, and (36-50%), fine sand,, wet, no odor, ,,,, light brown	
205	215	N/A		Same as above, Auger cuttings,,,, ,,,,	
220	222	N/A		Medium Sand, Fine Sand, well-sorted, subrounded, trace (< 10%), very fine sand, silt,,, ,,,, light gray	
225	235	N/A		Same as above, Auger cuttings,,,, ,,,,	

Well/Boring RW-21_VP-16 Project Name and No. NY001496.2515

Prepared By

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
240	242	0.75		Fine Sand, well-sorted, subrounded,,,, ,,,, Medium red	
245	255	N/A		Auger cuttings, Fine Sand, well-sorted, subrounded, little (10-20%), very fine sand,,, ,,,, light brown	
260	262	1.33		Fine Sand, Very Fine Sand, well-sorted, subrounded, trace (< 10%), medium sand, silt,, parting, laminated, reddish brown color change, ,,,, Light grey	
265	275	N/A		Same as above, Auger cuttings,,,, ,,,,	
280	280.5	N/A		Very Fine Sand, Silt, some (21-35%), clay,, soft, low plasticity, no odor, ,,,, dark gray	
280	282	0.7		Coarse Sand, Medium Sand, well-sorted, subangular,,, moist, loose, ,,,, reddish brown	
285	300	N/A		Auger cuttings, Medium Sand, Fine Sand, trace (< 10%), coarse sand, well-sorted,,, ,,,, light brown	
300	302	1		Fine Sand, well-sorted, subrounded, little (10-20%), clay, note clay is thin 1" layer with interbedded sand, approximately 4 inches from bottom of spoon, trace (< 10%), Medium Sand, wet, no odor, layer clay, medium	
310	312	N/A		Medium Sand, well-sorted, trace (< 10%), coarse sand, fine sand, subangular, subrounded,, wet, no odor, ,,,, light brown	
320	321	0.3		Medium Sand, well-sorted, subangular, subrounded, trace (< 10%), fine sand, very fine sand, silt,, wet, no odor, ,,,, reddish brown	
330	332	0.8		Medium Sand, Fine Sand, well-sorted, subrounded, little (10-20%), very fine sand, silt,, wet, no odor, laminated, ,,,, Light grey	
340	342	0.4		Medium Sand, well-sorted, subangular, subrounded, some (21-35%), fine sand, trace (< 10%), Very Fine Sand,, ,,,, orange brown	
360	361.5	0.3		Coarse Sand, Medium Sand, well-sorted, subangular, and (36-50%), clay, little (10-20%), Silt, wet, soft, med plasticity, no odor, gray clay,, ,,,, reddish brown	
380	382	0.7		Coarse Sand, Medium Sand, well-sorted, subangular, subrounded, little (10-20%), silt, clay,, wet, soft, low plasticity, no odor black colored sand bottom recoery, ,,,, Grey	
385	395	N/A		Auger cuttings, Medium Sand, well-sorted, subangular, subrounded,,, wet, loose, no odor, ,,,, light gray	
400	402	1.3		Fine Sand, Very Fine Sand, Silt, well-sorted, subrounded, some (21-35%), clay,, wet, laminated, ,,,, light gray	
401	401.5	N/A		Medium Sand, well-sorted, subangular, subrounded, trace (< 10%), fine sand, very fine sand, silt,, wet, no odor, ,,,, orange brown	
401.5	402	N/A		Medium Sand, well-sorted, subangular, subrounded, trace (< 10%), fine sand, very fine sand,, wet, parting, homogeneous, ,,,, light gray	
420	421.1	0.5		Medium Sand, well-sorted, subangular, subrounded, little (10-20%), fine sand, very fine sand, trace (< 10%), Silt, wet, well-sorted, no odor, ,,,, tan/buff	
425	440	N/A		Same as above, Auger cuttings,,,, ,,,, light gray	

Well/Boring RW-21_VP-16 Project Name and No. NY001496.2515

Prepared By

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
440	441.3	0.7		Medium Sand, poorly-sorted, subangular, subrounded, little (10-20%), very fine sand, silt, clay, trace (< 10%), Coarse Sand, wet, dense, no odor, laminated, ,,,, Medium grey	
445	455	N/A		Auger cuttings, Medium Sand, Fine Sand, little (10-20%), very coarse sand, coarse sand, poorly-sorted,, wet, no odor, ,,,, Medium grey	
460	461.2	1		Coarse Sand, well-sorted, subangular, subrounded, some (21-35%), medium sand, trace (< 10%), Fine Sand, moist, no odor, ,,,, Medium grey	
462	480	N/A		Auger cuttings, void, fluid loss approximately 1300-1500 gallons,,,, ,,,,	
480	481.3	0.5		Medium Sand, Fine Sand, poorly-sorted, subrounded, little (10-20%), coarse sand, trace (< 10%), Silt, wet, dense, no odor, ,,,, Brown	
500	501.4	1		Very Coarse Sand, Coarse Sand, poorly-sorted, subangular, subrounded, little (10-20%), medium sand, fine sand, trace (< 10%), Silt, wet, no odor, parting, ,,,, Light grey	
520	520.9	0.5		Silt, little (10-20%), fine sand, very fine sand, trace (< 10%), Clay, soft, nonplastic, low plasticity, no odor, ,,,, Light grey	
540	542	1		Coarse Sand, Medium Sand, well-sorted, subrounded, trace (< 10%), fine sand,, wet, no odor, ,,,, Light grey	
550	550.8	0.8		Medium Sand, well-sorted, angular, subangular, subrounded, little (10-20%), coarse sand, fine sand,, wet, parting, laminated, ,,,, Light grey	
560	560.8	0.5		Coarse Sand, Medium Sand, well-sorted, angular, subangular, subrounded, trace (< 10%), fine sand,, wet, no odor, ,,,, Grey	
580	580.9	0.5		Silt, little (10-20%), clay,, moist, medium stiff, nonplastic, slow dilatancy, no odor, ,,,, dark gray	
580.2	580.9	N/A		Medium Sand, well-sorted, subangular, subrounded, little (10-20%), fine sand, well-sorted,, moist, very dense, no odor, ,,,, Dark tan	
600	600.8	N/A		Fine Sand, Very Fine Sand, well-sorted, little (10-20%), silt,, wet, no odor, laminated, ,,,, Light grey	
610	610.9	1.1		Medium Sand, Fine Sand, poorly-sorted, angular, subangular, and (36-50%), coarse sand, silt, poorly-sorted, angular, subangular, little (10-20%), Very Coarse Sand, trace (< 10%), Clay, wet, poorly-sorted, no	
620	621.3	2		Medium Sand, well-sorted, angular, subangular, subrounded, little (10-20%), coarse sand, trace (< 10%), Silt, wet, no odor, ,,,, Light brown	
620.7	621	N/A		Very Fine Sand, Silt, little (10-20%), medium sand, trace (< 10%), Clay, moist, low plasticity, slow dilatancy, no odor, parting, laminated, ,,,, Light grey	
621	621.3	N/A		Medium Sand, well-sorted, subangular, subrounded, trace (< 10%), fine sand, subangular, subrounded,, wet, no odor, ,,,, Light grey	
640	640.9	0.8		Medium Sand, well-sorted, subangular, subrounded, little (10-20%), fine sand, well-sorted, subangular, subrounded, trace (< 10%), Coarse Sand, Very Fine Sand, Silt, wet, no odor, homogeneous, ,,,, Light grey	
645	646.8	1.2		Medium Sand, Fine Sand, well-sorted, subangular, subrounded, trace (< 10%), coarse sand, very fine sand, silt, clay,, wet, well-sorted, no odor, seam, ,,,, Light grey	
650	650.5	N/A		Silt, trace (< 10%), fine sand, very fine sand, clay,,, ,,,, Grey	

Well/Boring RW-21_VP-16 Project Name and No. NY001496.2515

Prepared By

Sample Depth (feet below land surface) From	To	Sample Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample Description	PID (ppm)
650	652	2		650.5-651: Very Coarse Sand, Coarse Sand, poorly-sorted, subangular, little (10-20%), medium sand, fine sand, poorly-sorted, trace (< 10%), Small Pebble, Granule, wet, poorly-sorted, no odor, ,,,, Grey	
651	651.5	N/A		Fine Sand, poorly-sorted, subangular, subrounded, little (10-20%), medium sand, very fine sand, silt, trace (< 10%), Clay, moist, poorly-sorted, no odor, parting, laminated, ,,,, Dark grey	
651.5	652	N/A		Medium Sand, well-sorted, subangular, subrounded, little (10-20%), fine sand,, wet, well-sorted, no odor, homogeneous, ,,,, Grey	
655	657	2		Same as above,,,, ,,,, Grey	
655	655.7	N/A		Very Coarse Sand, Coarse Sand, poorly-sorted, angular, subangular, little (10-20%), medium sand, trace (< 10%), Small Pebble, Granule, Fine Sand, wet, no odor, ,,,, Grey	
655.7	656.2	N/A		Very Coarse Sand, poorly-sorted, subangular, subrounded, little (10-20%), coarse sand, medium sand, trace (< 10%), Silt, wet, poorly-sorted, ,,,, orange brown	
656.2	656.7	N/A		Silt, and (36-50%), clay, trace (< 10%), Granule, dry, soft, med plasticity, no odor, ,,,, Grey	
656.7	657	N/A		Small Pebble, Granule, poorly-sorted, subangular, subrounded, some (21-35%), very coarse sand, little (10-20%), Medium Sand, Fine Sand, Silt, wet, poorly-sorted, no odor, ,,,, Medium brown	
660	661	0.8		Coarse Sand, Medium Sand, trace (< 10%), fine sand, well-sorted, angular, subangular,, wet, well-sorted, no odor, ,,,, Grey	
660.7	661	N/A		Very Coarse Sand, Coarse Sand, well-sorted, angular, subangular, trace (< 10%), granule, coarse sand, medium sand, fine sand,, wet, very dense, no odor, homogeneous, ,,,, Grey	
665	666.4	1		Granule, Very Coarse Sand, poorly-sorted, angular, subangular, subrounded, little (10-20%), small pebble, coarse sand, poorly-sorted, angular, subangular, subrounded, trace (< 10%), Medium Sand, Fine	
665.3	666.4	N/A		Same as above,,,, ,,,, orange brown	
670	671	1.2		Medium Sand, well-sorted, subangular, subrounded, trace (< 10%), fine sand, well-sorted,, wet, well-sorted, very dense, no odor, laminated, ,,,, Light grey	
675	676	1		Same as above,,,, ,,,, Light grey	
680	680.7	0.1		Small Pebble, Granule, well-sorted, angular, trace (< 10%), large pebble, medium pebble, subangular,, wet, loose, no odor, ,,,, Light grey	

AQUA TERRA GEOPHYSICS INC.

COMPANY	ARCADIS		
WELL ID	RW-21_VP13		
PROJECT	RW 21 PROJECT AREA		
TOWN	BETHPAGE	STATE	NEW YORK

LOCATION
BROADWAY & WILSON

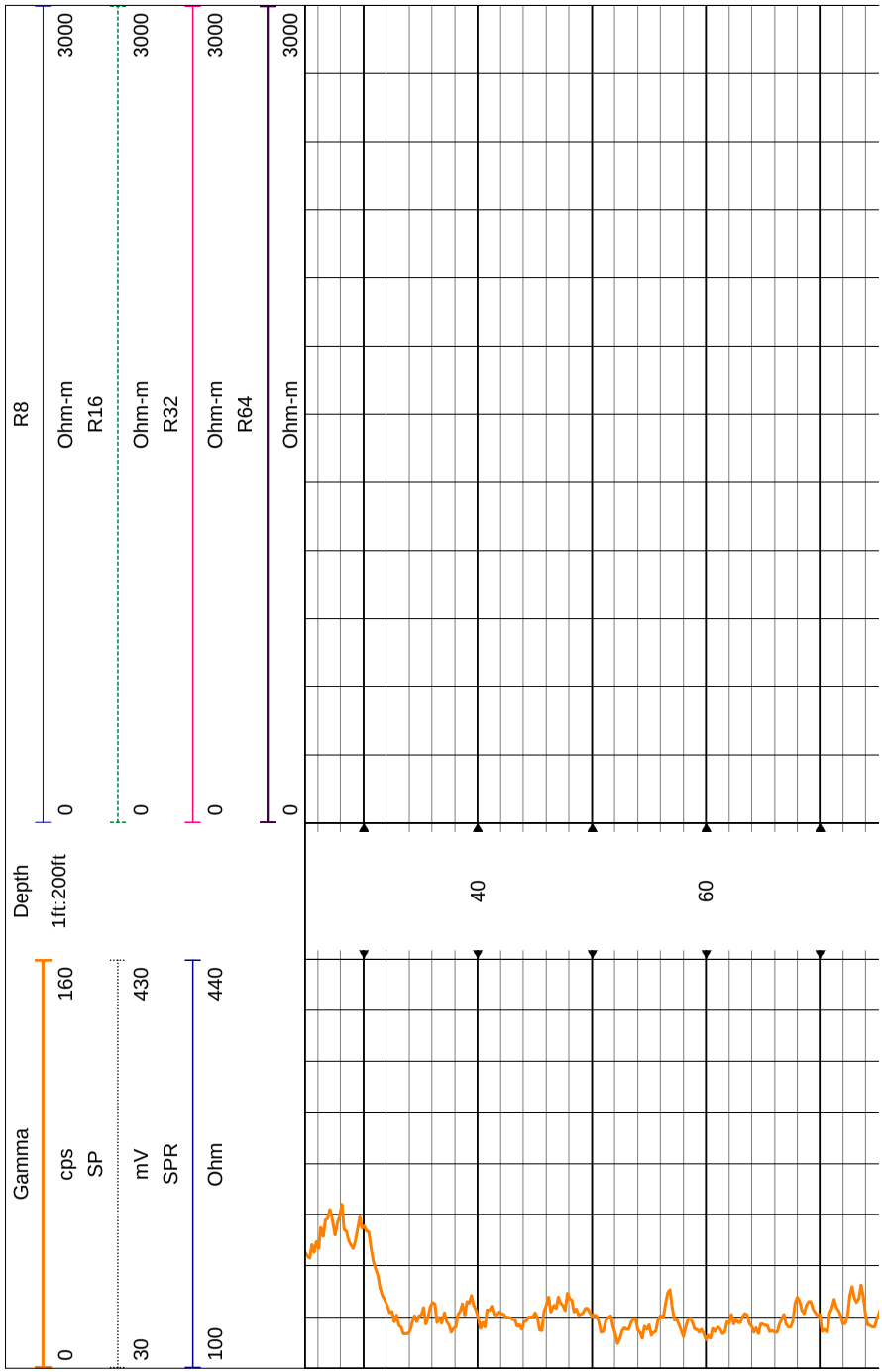
SEC TWP RGE

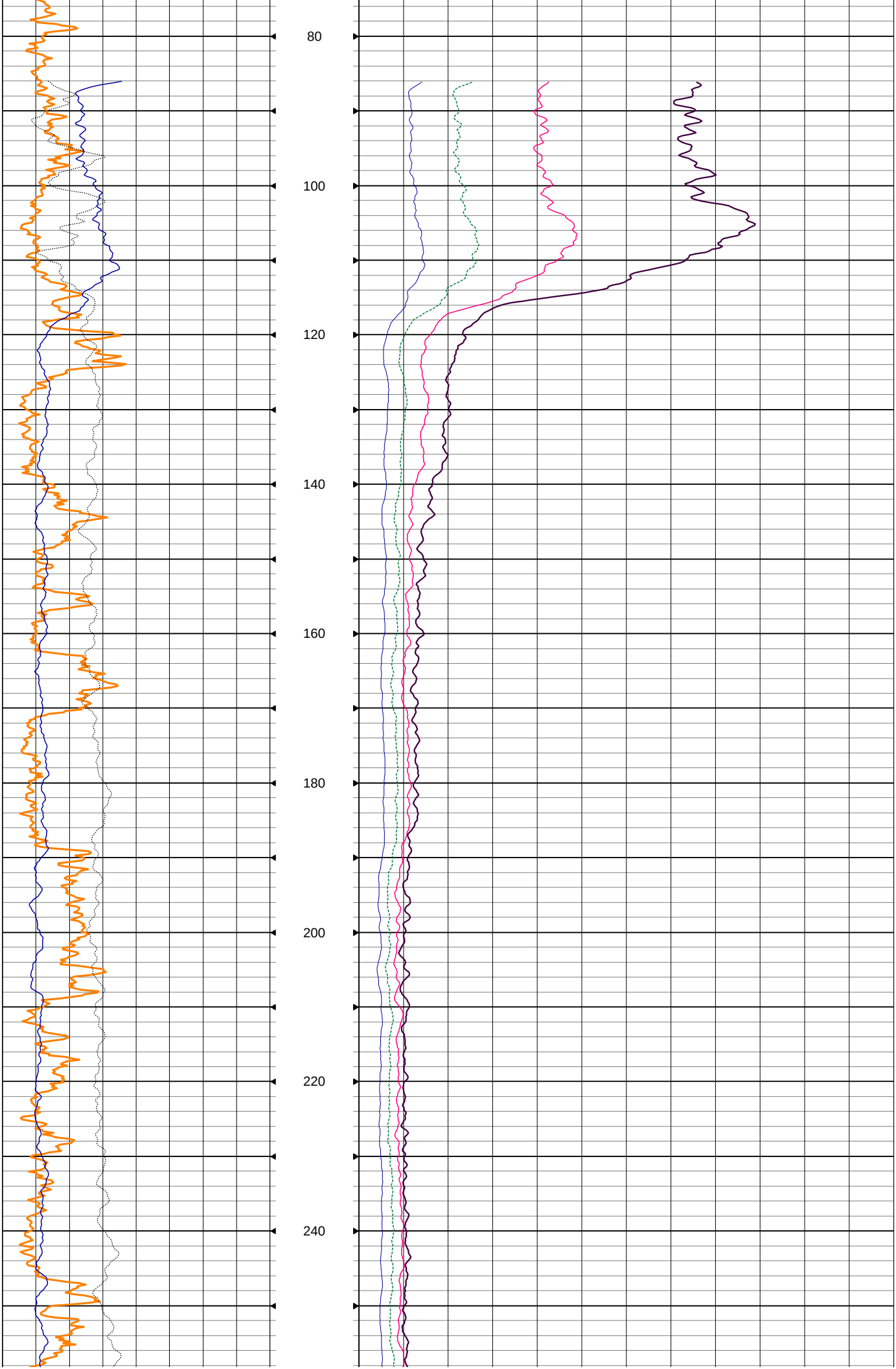
OTHER SERVICES

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND SURFACE	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM			G.L.

DATE	AUGUST 11, 2016	TYPE FLUID IN HOLE	BENTONITE
LOGGING SPEED	16 FEET / MINUTE	SALINITY	
TYPE LOG		DENSITY	
DEPTH-DRILLER	947 FEET	LEVEL	
DEPTH-LOGGER	941 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME			
RECORDED BY	BENJAMIN RICE		
WITNESSED BY	AARON MAAS		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
	6 INCH	86 FEET	TOTAL DEPTH	10 INCH	PVC	0 FEET	86 FEET

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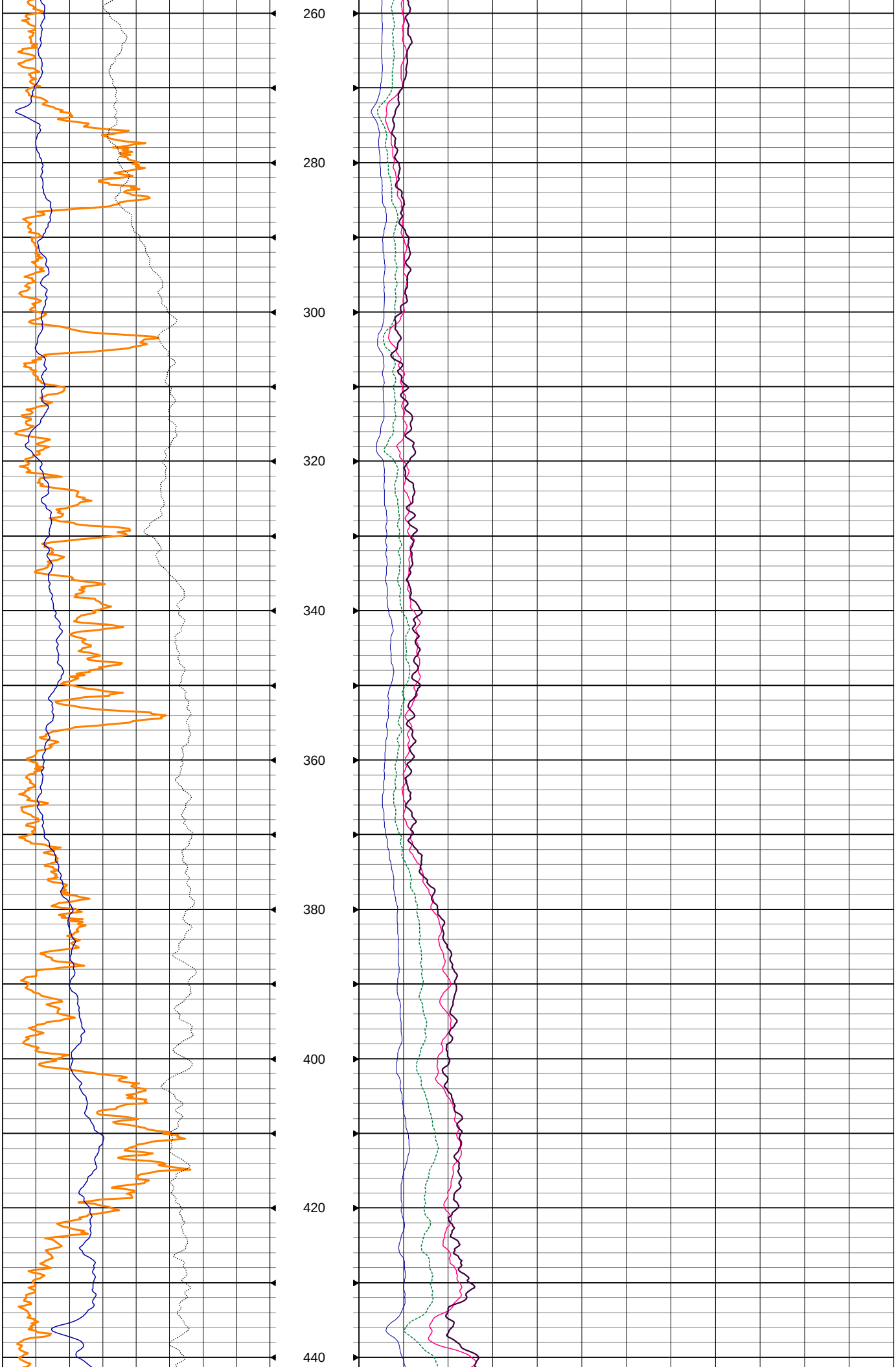
200
220
240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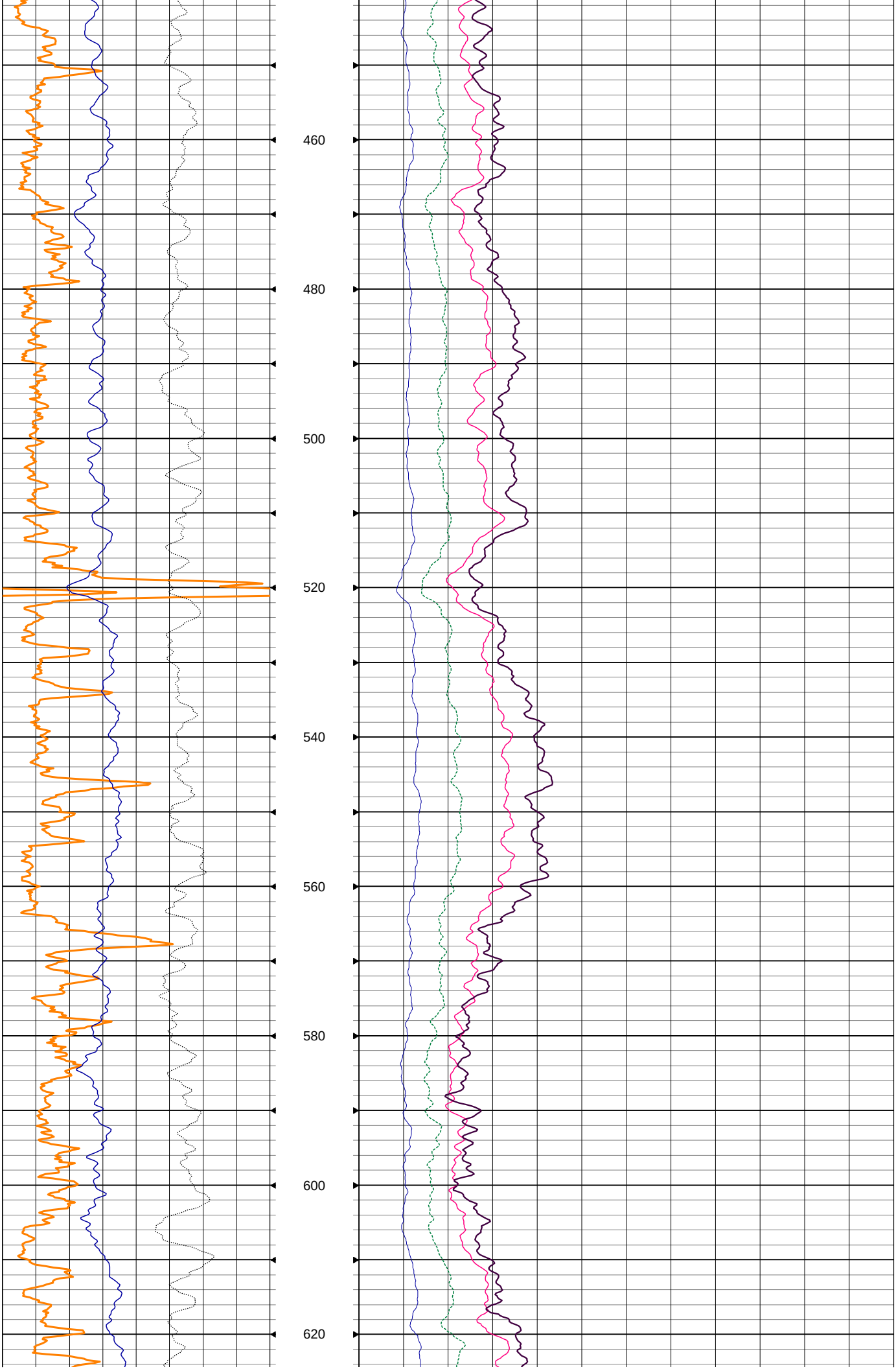
380
400
420
440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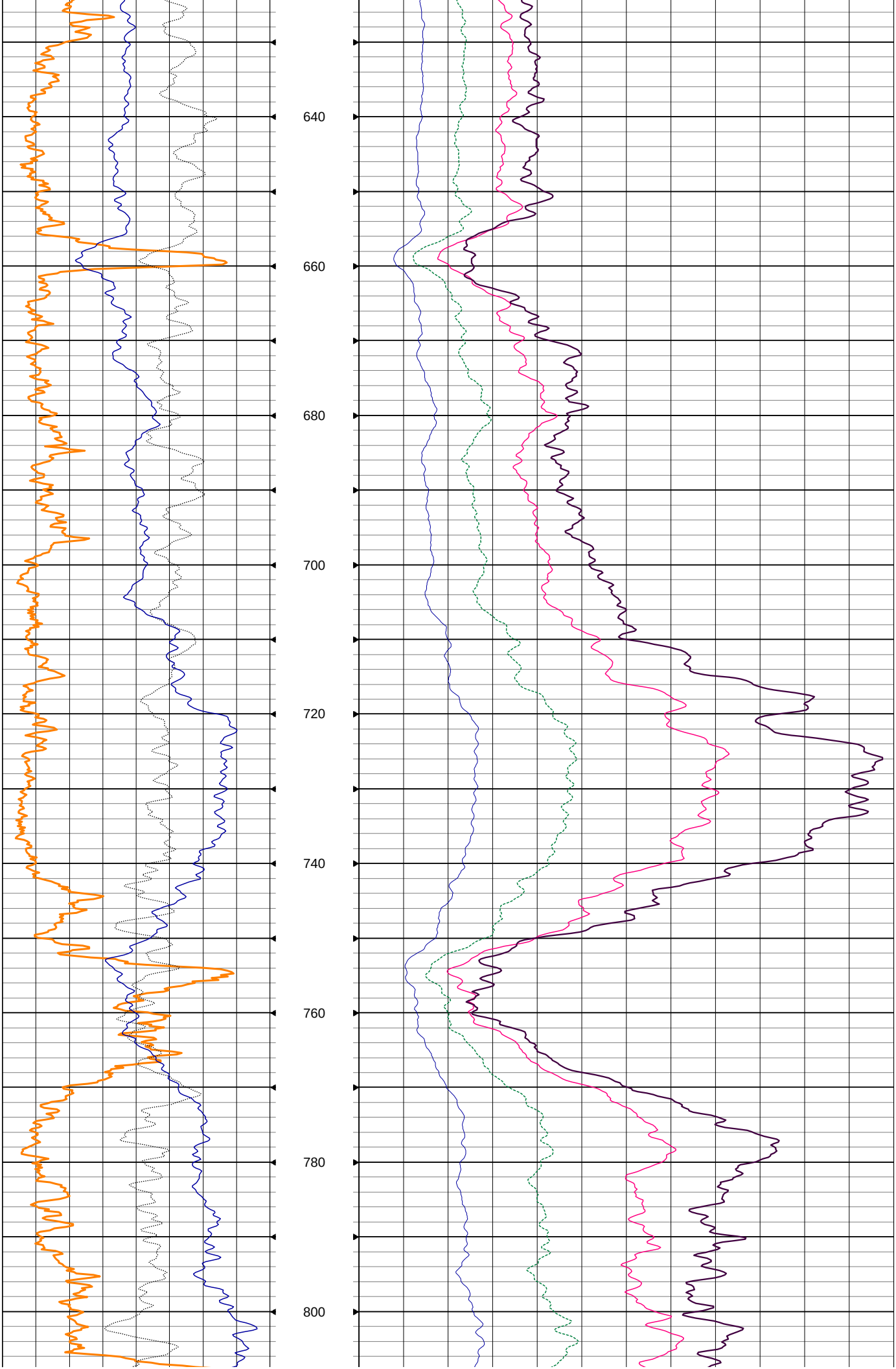
500
520
540
560
580
600
620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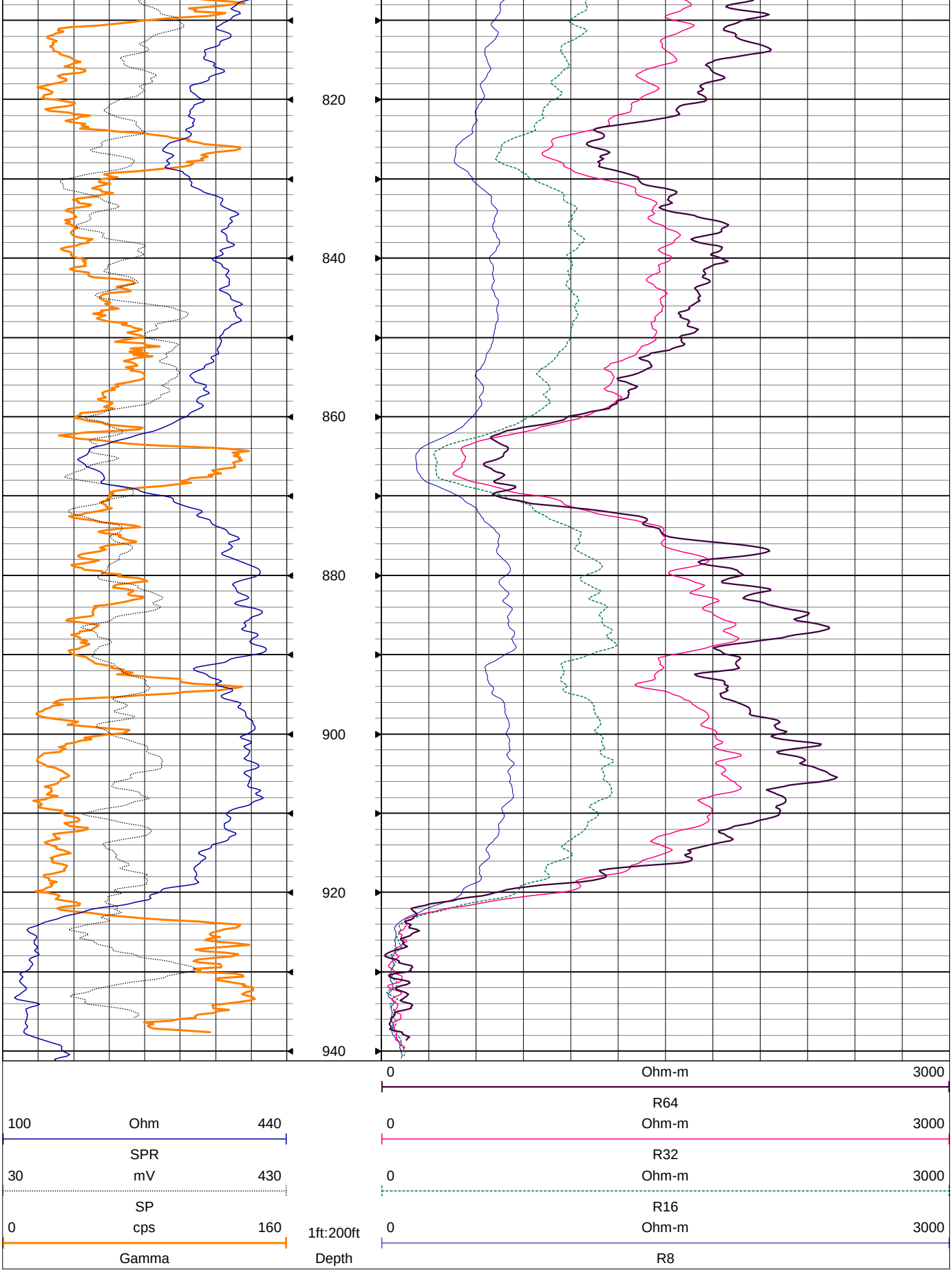
660
680
700
720
740
760
780
800


820
840
860
880
900
920
940
0
Ohm-m
3000
R64
100
Ohm
440
SPR
0
Ohm-m
3000
R32
30
mV
430
SP
0
Ohm-m
3000
R16
0
cps
160
Gamma
1ft:200ft
Depth
0
Ohm-m
3000
R8

ALT

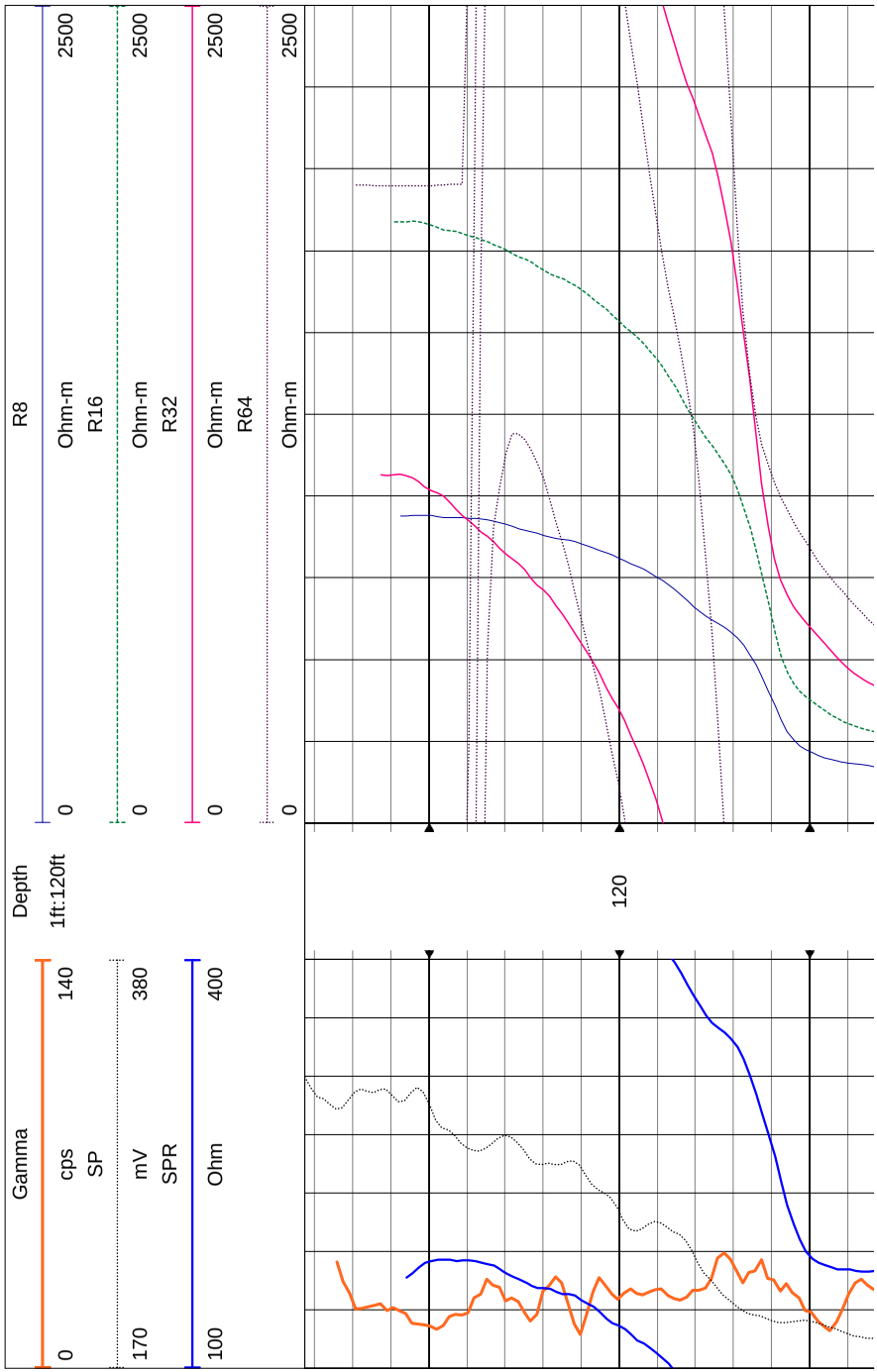
CO	COMPANY ARCADIS
WELL	WELL ID RW21_VP-14
FLD	FIELD
CTY	COUNTRY
STE	STATE
FILING No	

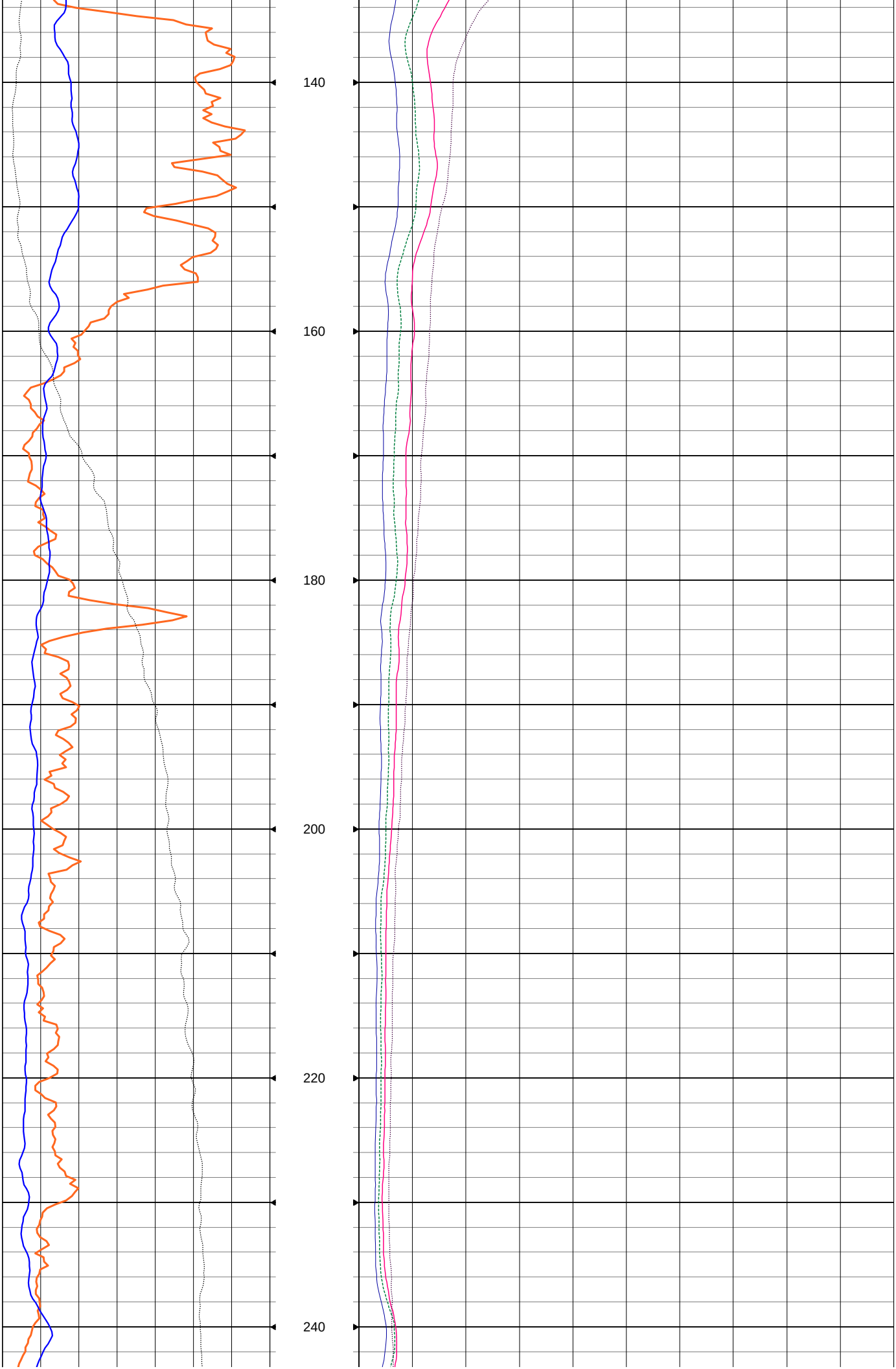
LOCATION	OTHER SERVICES
SEC TWP RGE	

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GRADE	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM			G.L.

DATE	OCTOBER 5, 2016	TYPE FLUID IN HOLE	BENTONITE
RUN No	DOWN	SALINITY	
TYPE LOG		DENSITY	
DEPTH-DRILLER	790 FEET	LEVEL	
DEPTH-LOGGER	783 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME			
RECORDED BY	BENJAMIN RICE		
WITNESSED BY	JEFF SPRADLIN		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
	6 INCH	100 FEET	TOTAL DEPTH	10 INCH	PVC	0 FEET	100 FEET

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220
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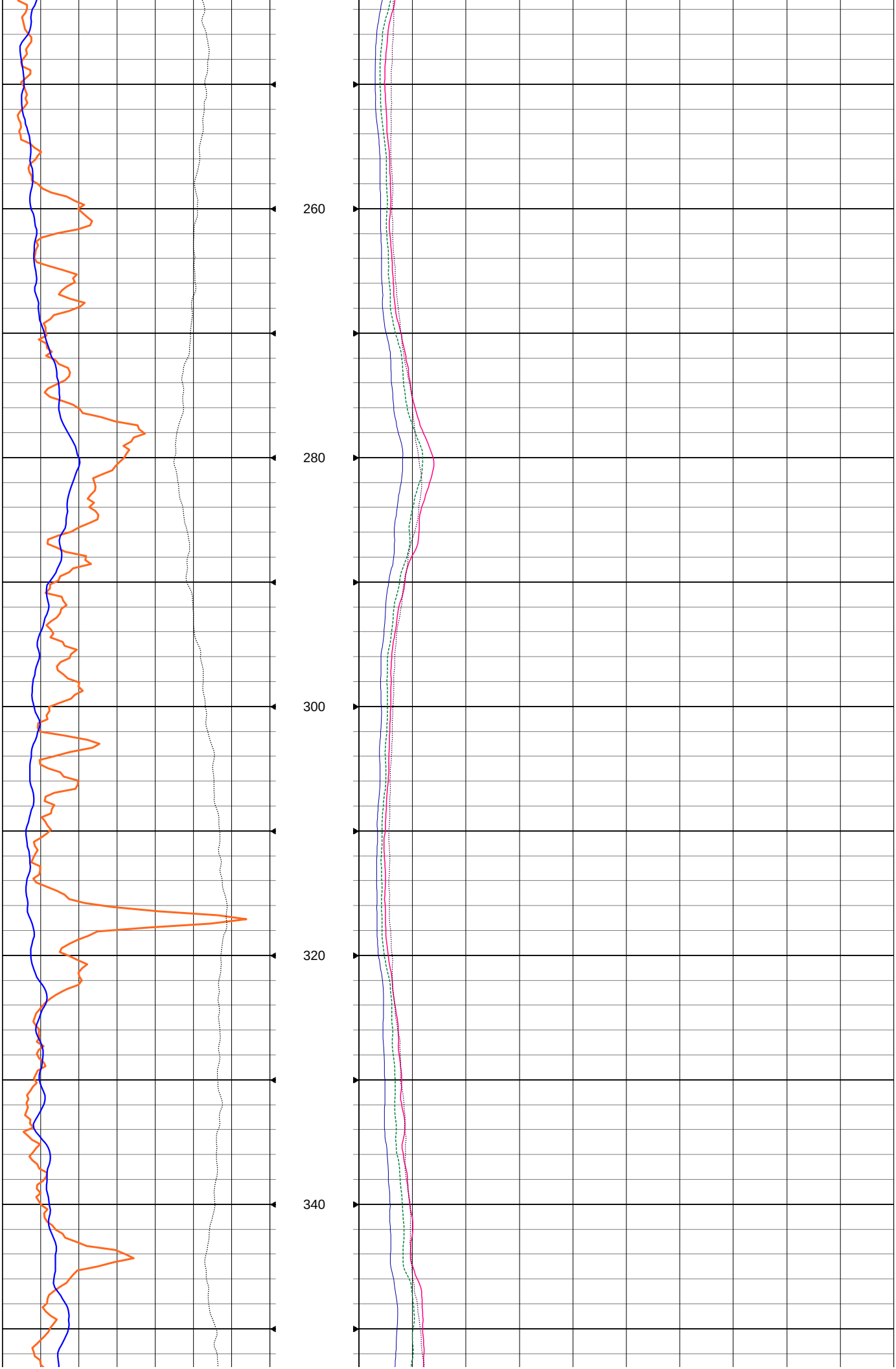
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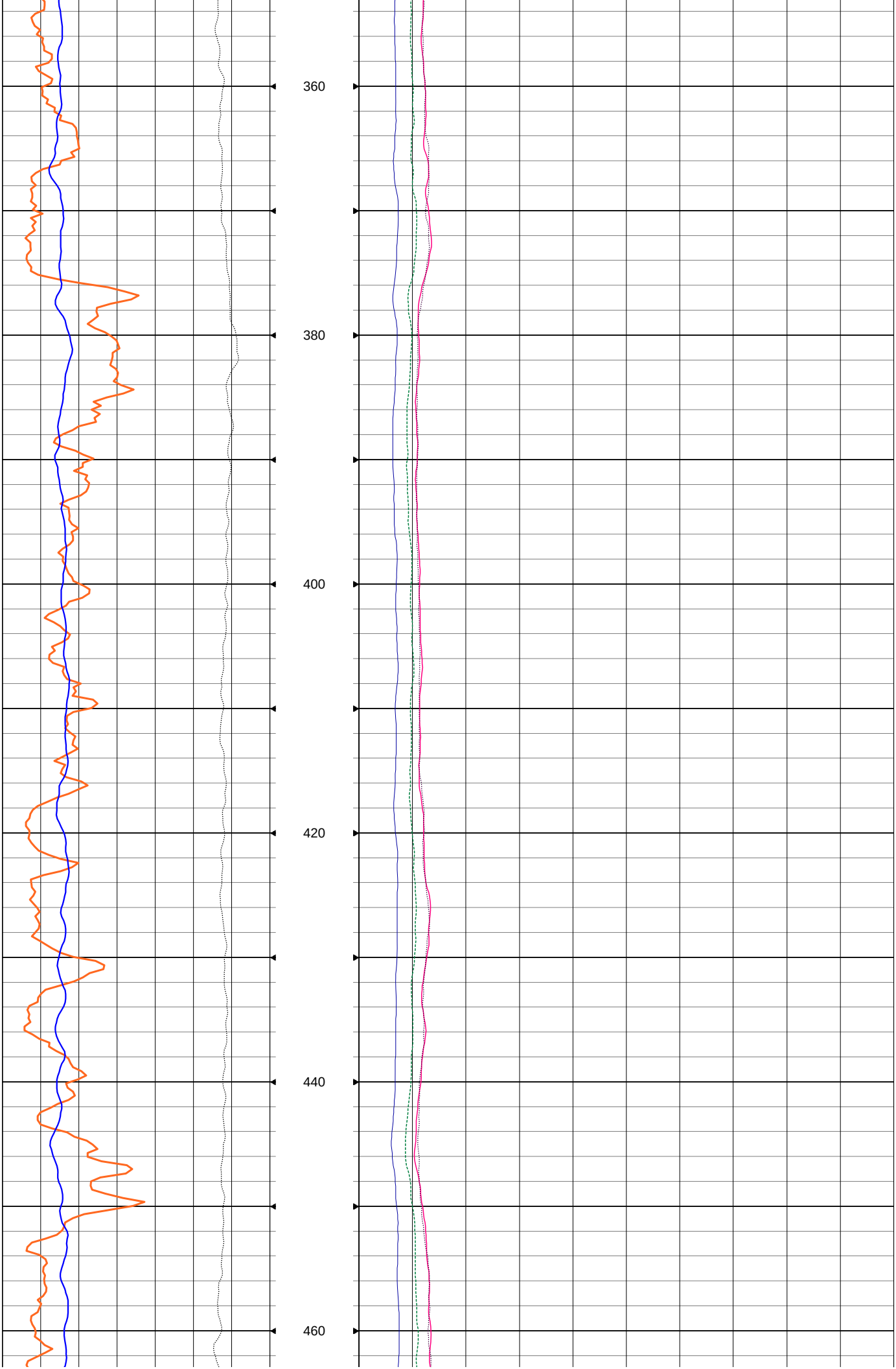
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400
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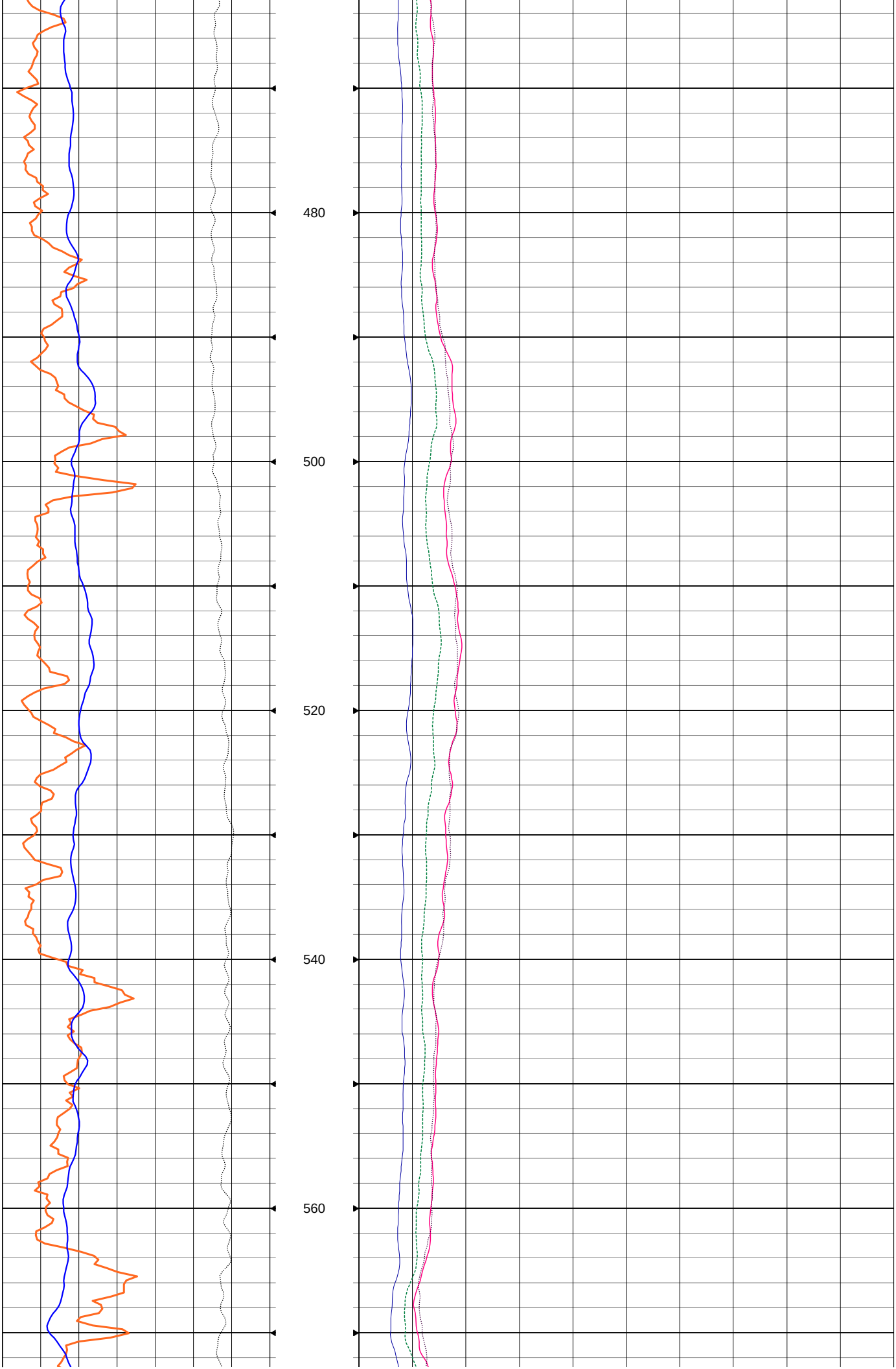
480
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520
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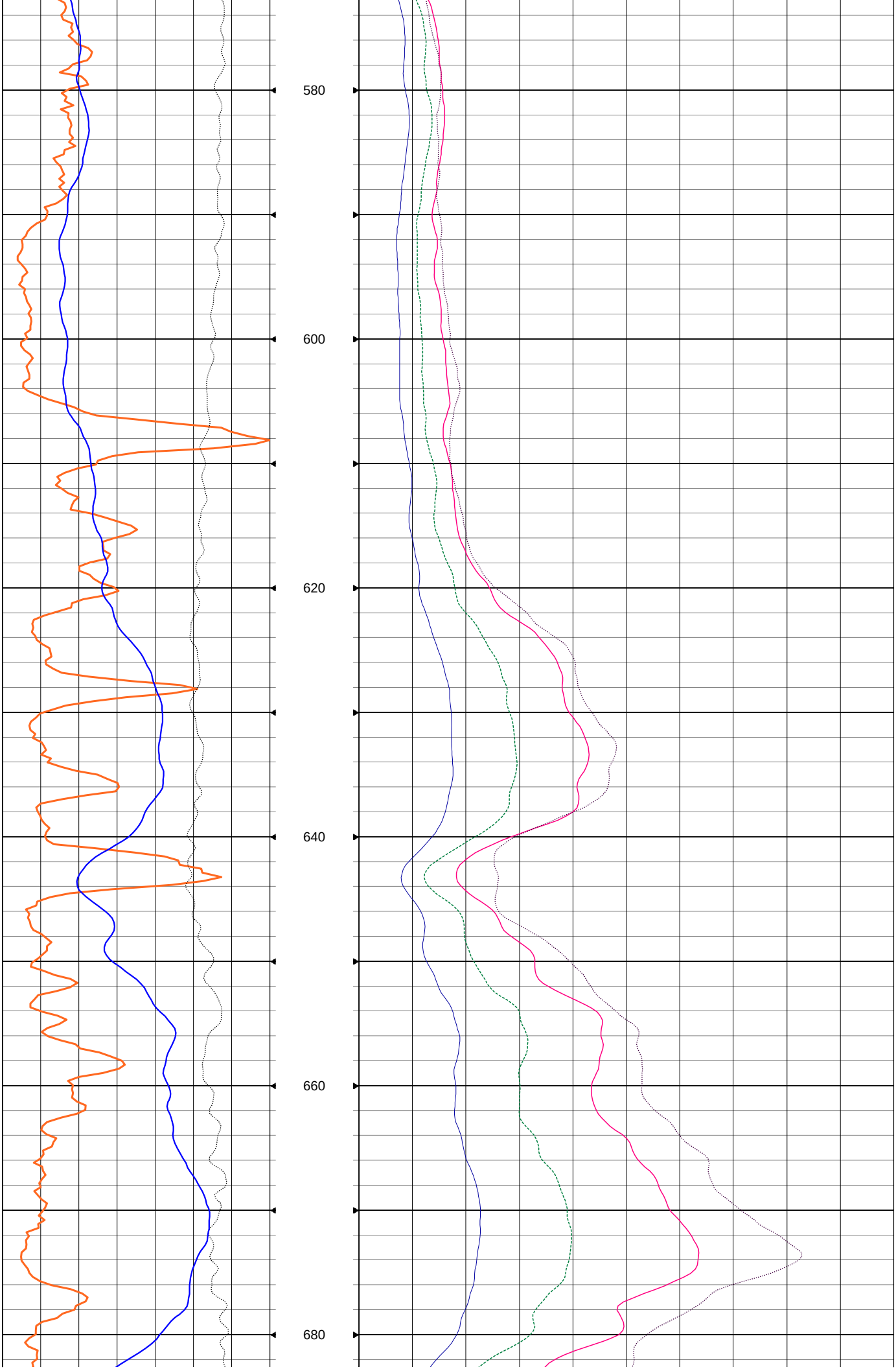
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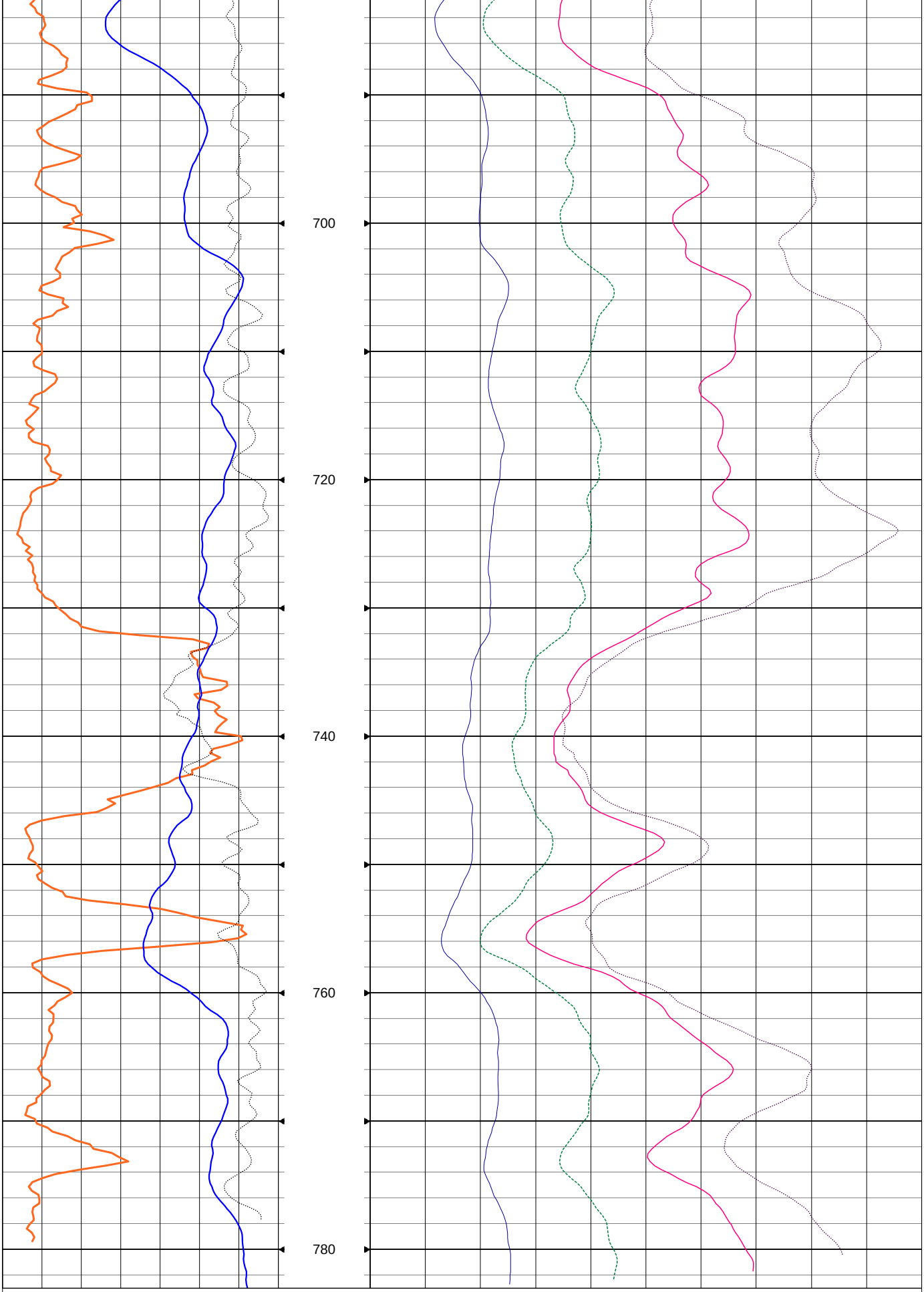
600
620
640
660
680



0 Ohm-m 2500

R64

100 Ohm 400

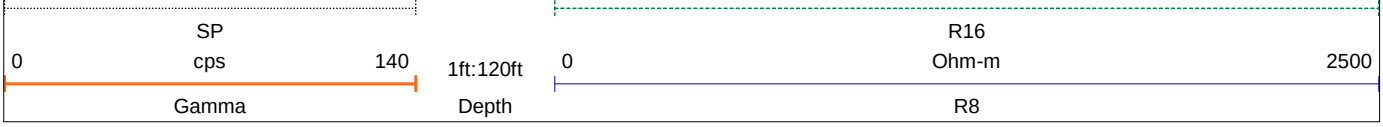
0 Ohm-m 2500

SPR

R32

170 mV 380

0 Ohm-m 2500


SP
0
cps
140
Gamma
1ft:120ft
Depth
R16
0
Ohm-m
2500
R8

AQUA TERRA GEOPHYSICS INC.

COMPANY	ARCADIS
WELL ID	RW21_VP15
PROJECT	
TOWN	BETHPAGE STATE NEW YORK

LOCATION
BROADWAY & ARTHUR

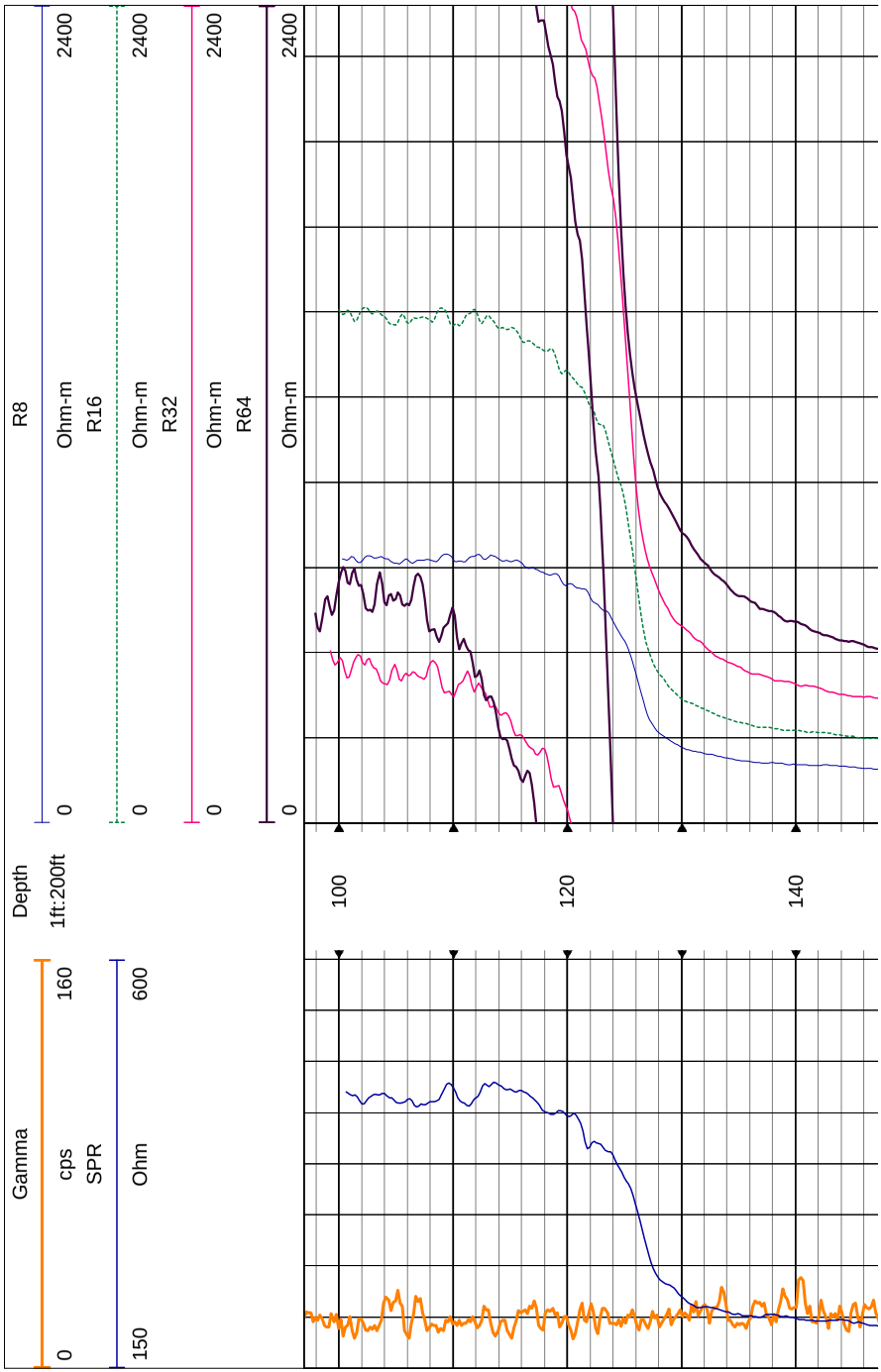
SEC TWP RGE

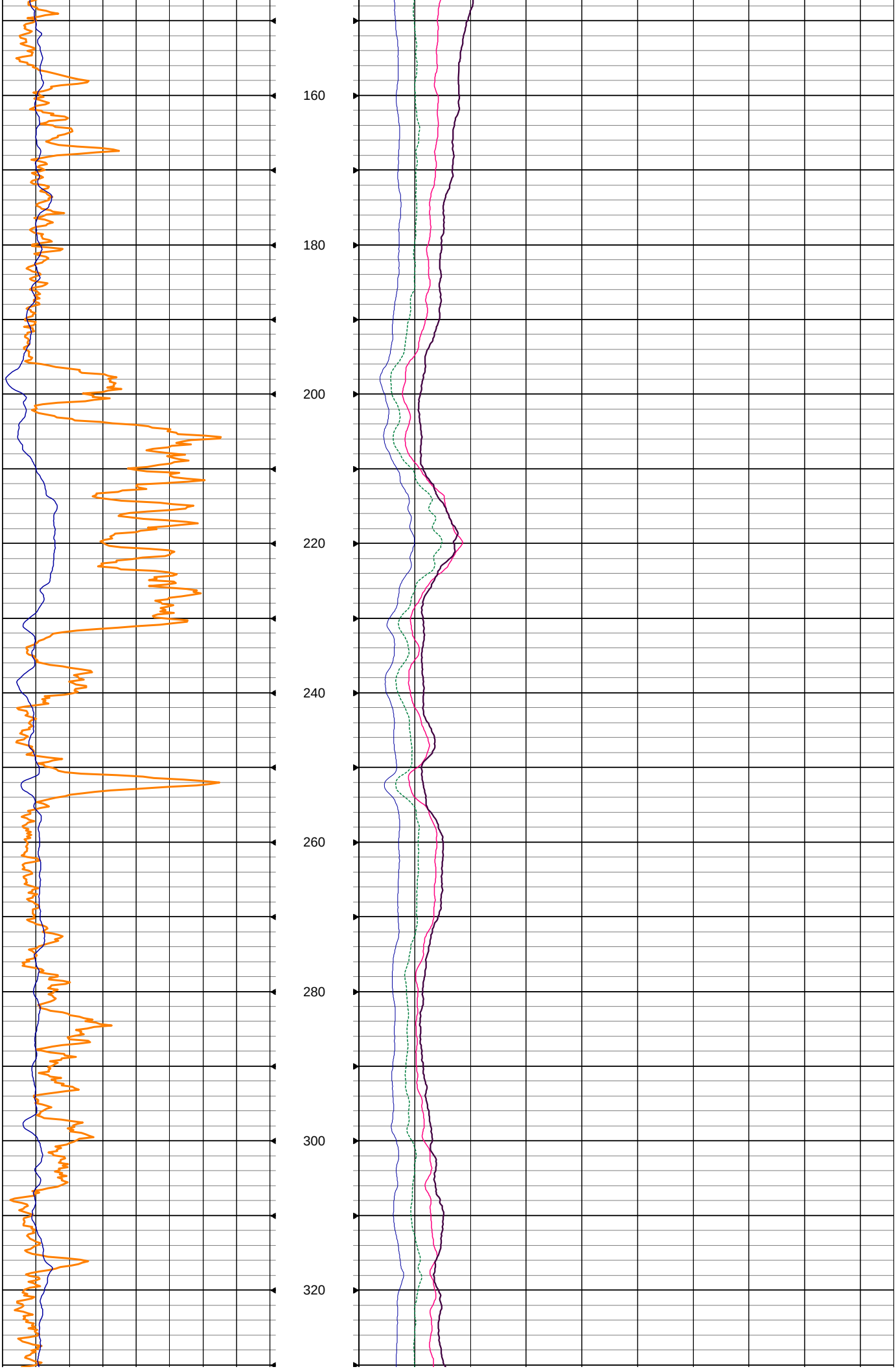
OTHER SERVICES

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND SURFACE	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM			G.L.

DATE	AUGUST 5, 2016	TYPE FLUID IN HOLE	BENTONITE
LOGGING SPEED	16 FEET / MINUTE	SALINITY	
TYPE LOG		DENSITY	
DEPTH-DRILLER	840 FEET	LEVEL	
DEPTH-LOGGER	836 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME			
RECORDED BY	BENJAMIN RICE		
WITNESSED BY	KEVIN SWIADEC		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
	6 INCH	98 FEET	TOTAL DEPTH	10 INCH	PVC	0 FEET	98 FEET

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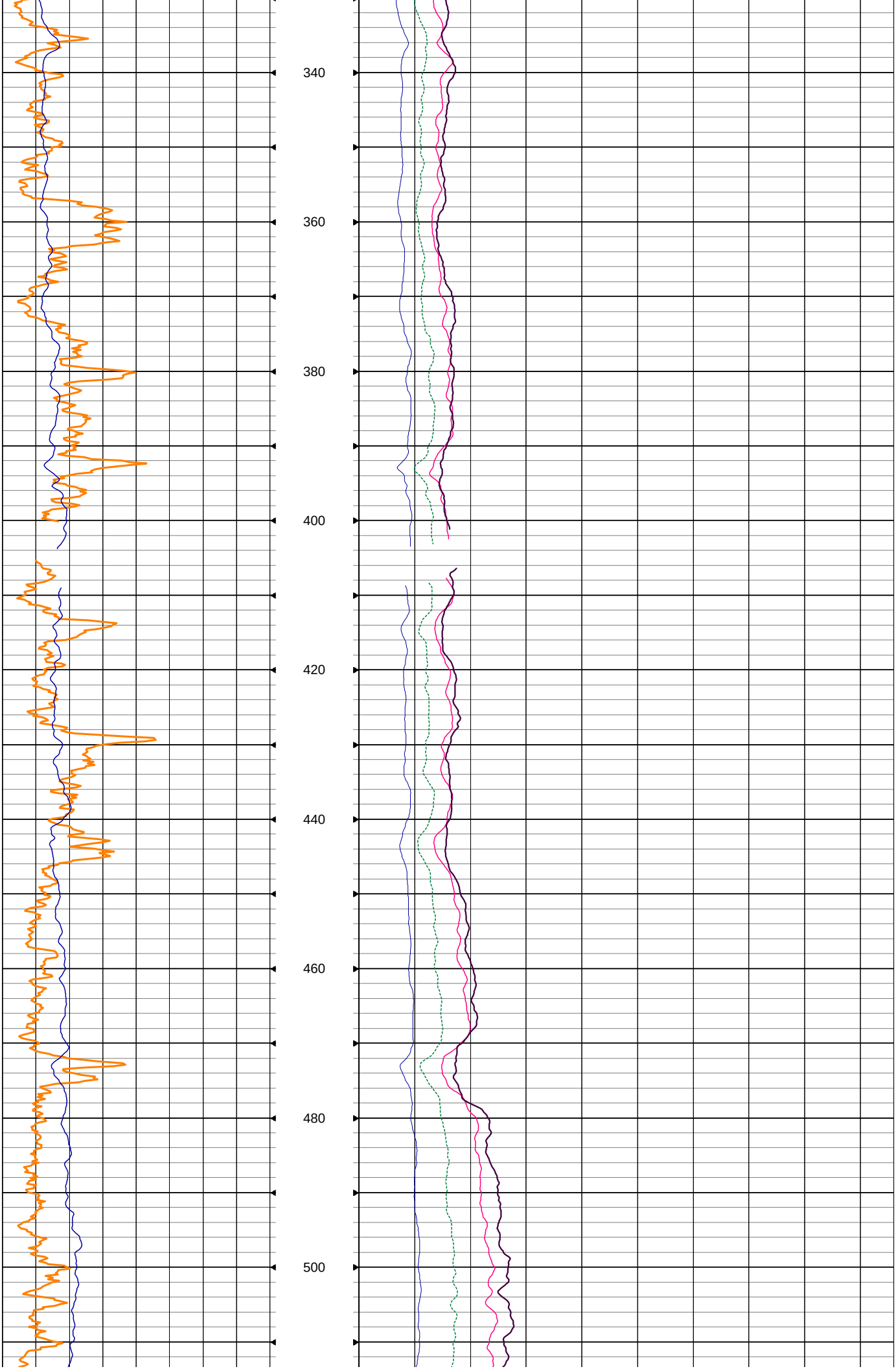
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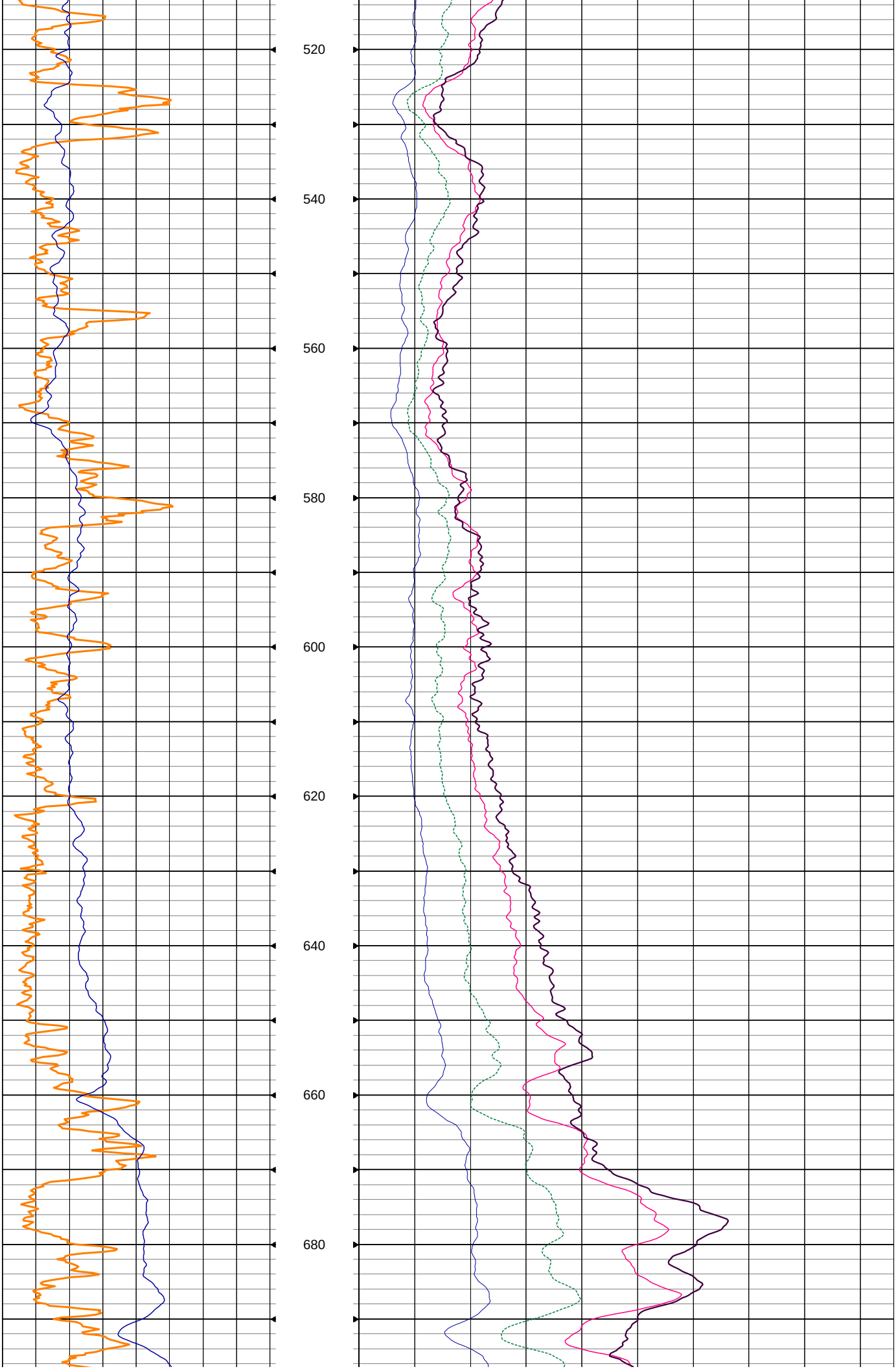
380
400
420
440
460
480
500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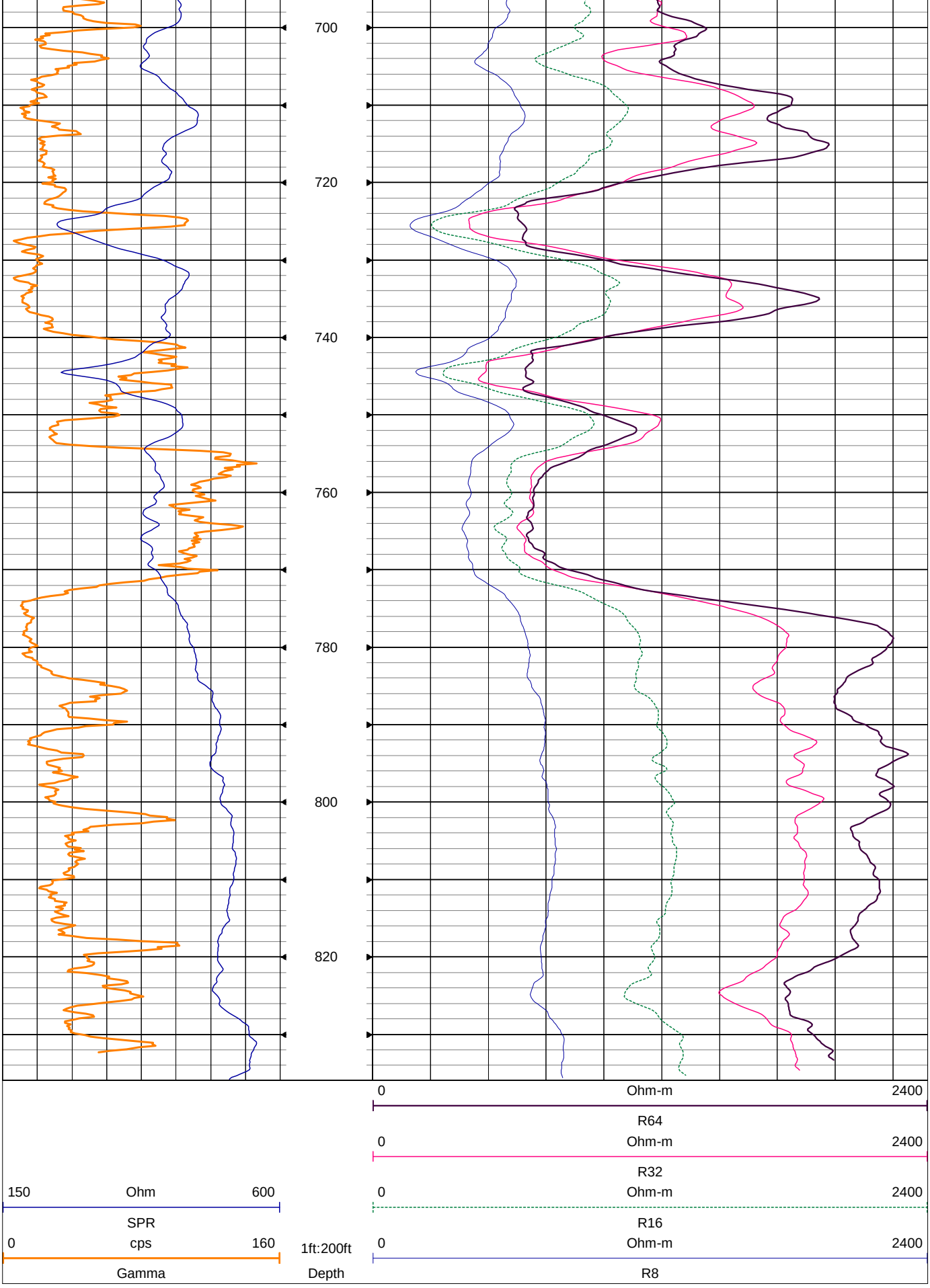
540
560
580
600
620
640
660
680


700
720
740
760
780
800
820
0
Ohm-m
2400
R64
0
Ohm-m
2400
R32
150
Ohm
600
SPR
0
Ohm-m
2400
R16
0
cps
160
Gamma
1ft:200ft
Depth
0
Ohm-m
2400
R8

ALT

CO	
WELL	
FLD	
CTY	
STE	
FILING No	

COMPANY ARCADIS
WELL ID RW-21_VP16
FIELD RW 21 PROJECT AREA
COUNTRY BETHPAGE STATE NEW YORK

LOCATION

SEC TWP RGE

OTHER SERVICES

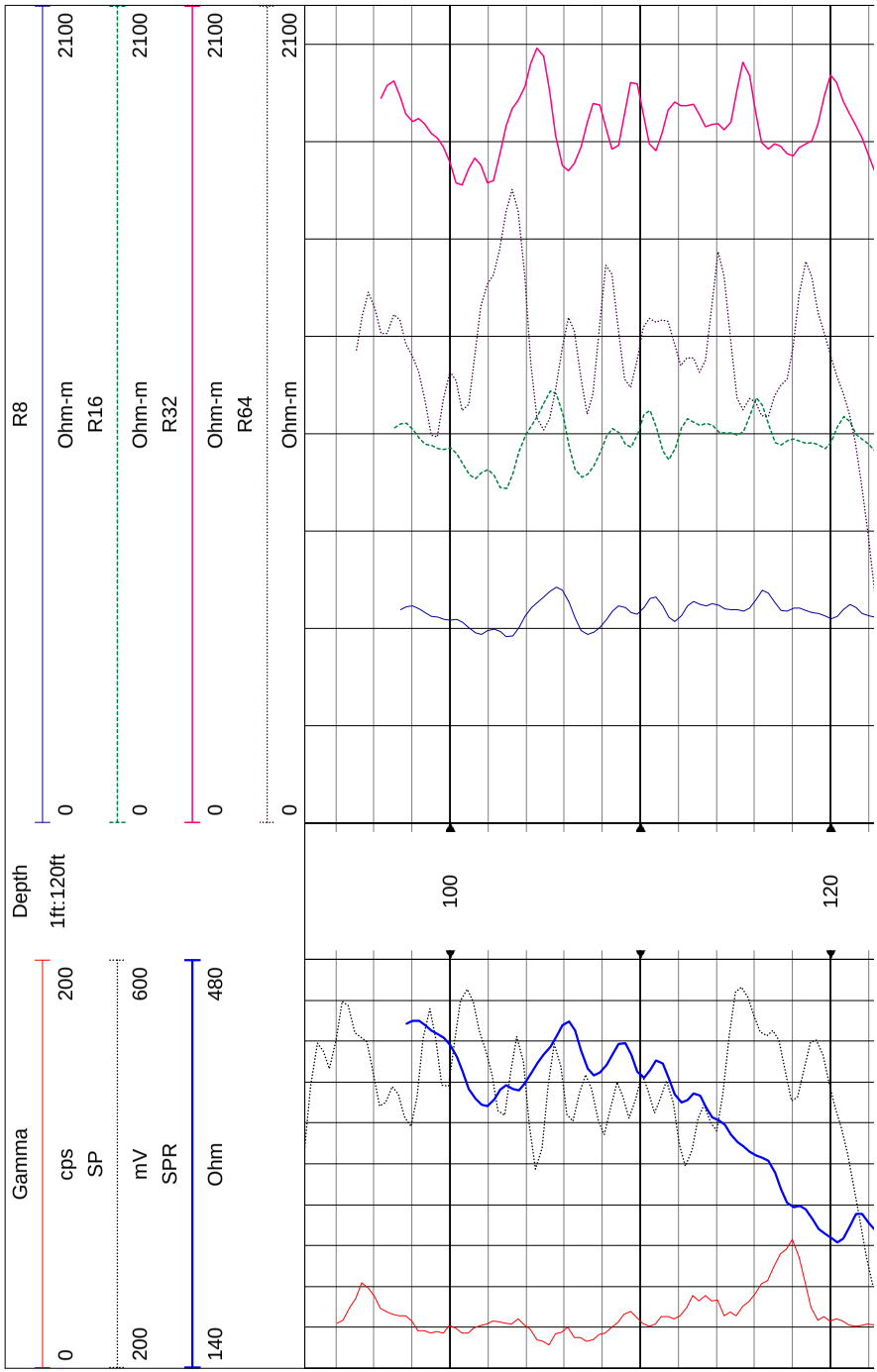
PERMANENT DATUM ELEVATION K.B.

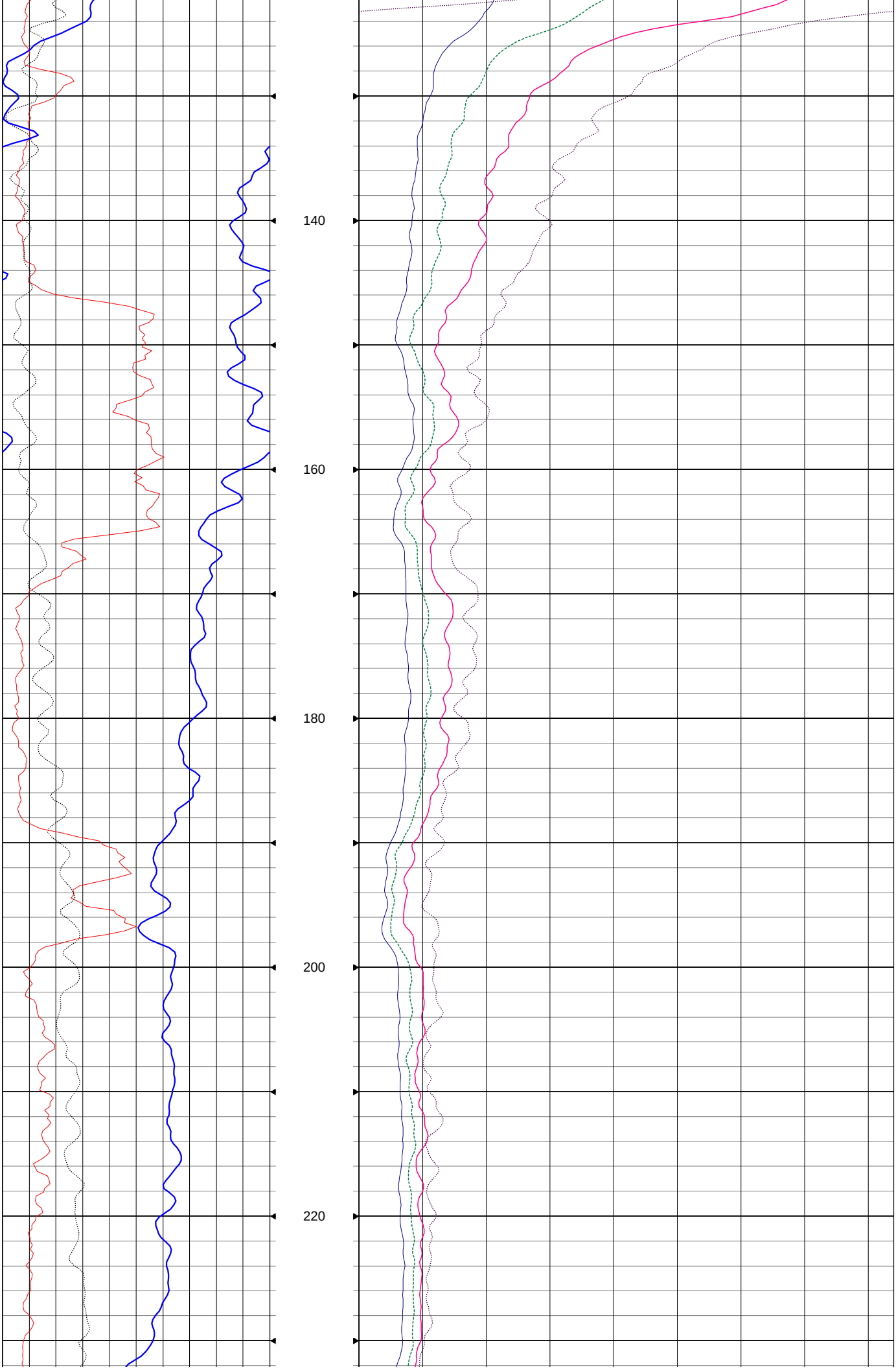
LOG MEAS. FROM GROUND SURFACE ABOVE PERM. DATUM D.F.

DRILLING MEAS. FROM G.L.

DATE	OCTOBER 3, 2016	TYPE FLUID IN HOLE	BENTONITE
RUN No	DOWN	SALINITY	
TYPE LOG		DENSITY	
DEPTH-DRILLER	765 FEET	LEVEL	
DEPTH-LOGGER	761 FEET	MAX. REC. TEMP.	
BTM LOGGED INTERVAL			
TOP LOGGED INTERVAL			
OPERATING RIG TIME			
RECORDED BY	BENJAMIN RICE		
WITNESSED BY	MAG RYCHTECKA		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
	6 INCH	93 FEET	TOTAL DEPTH	10 INCH	PVC	0 FEET	93 FEET

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200
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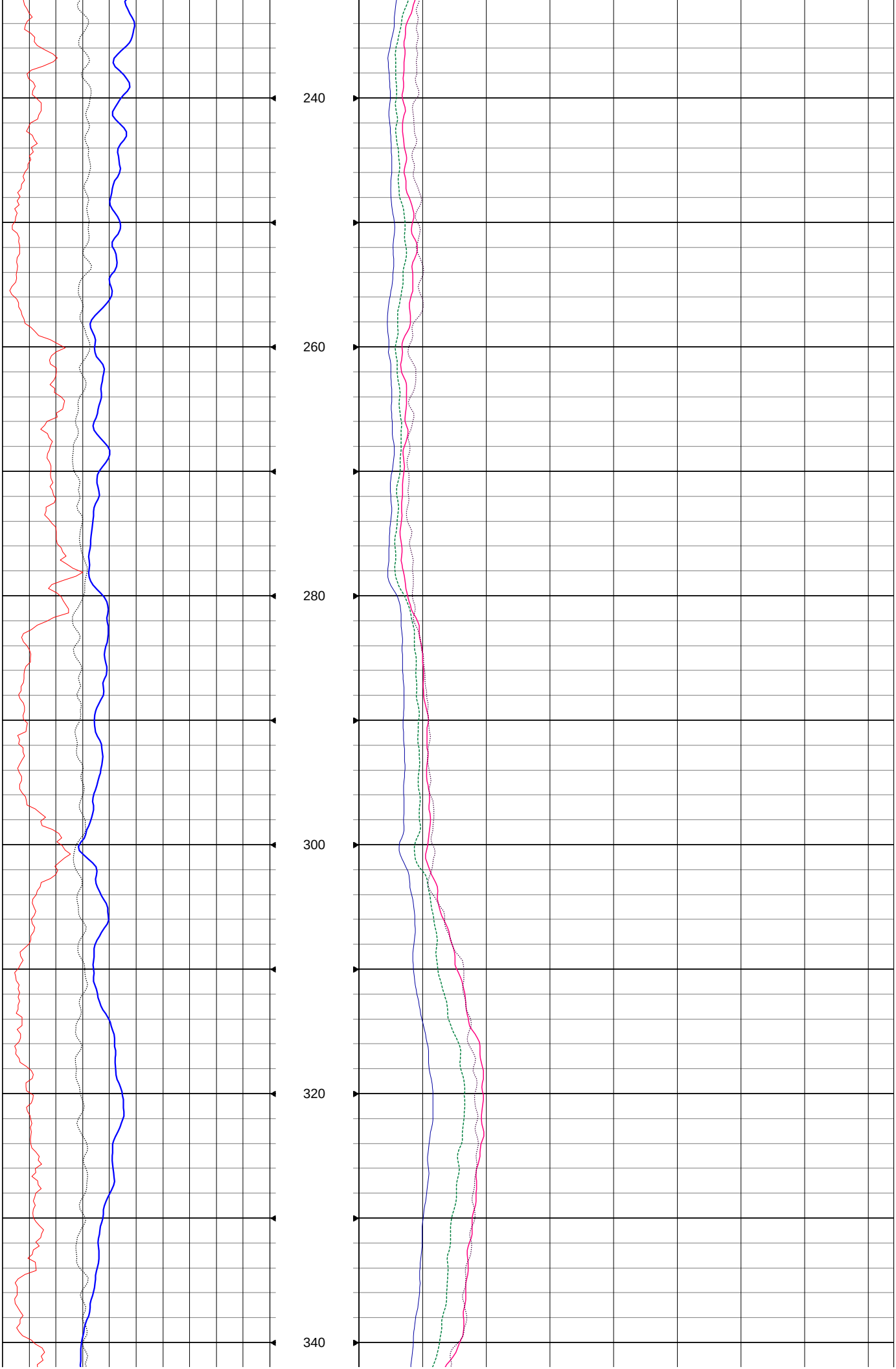
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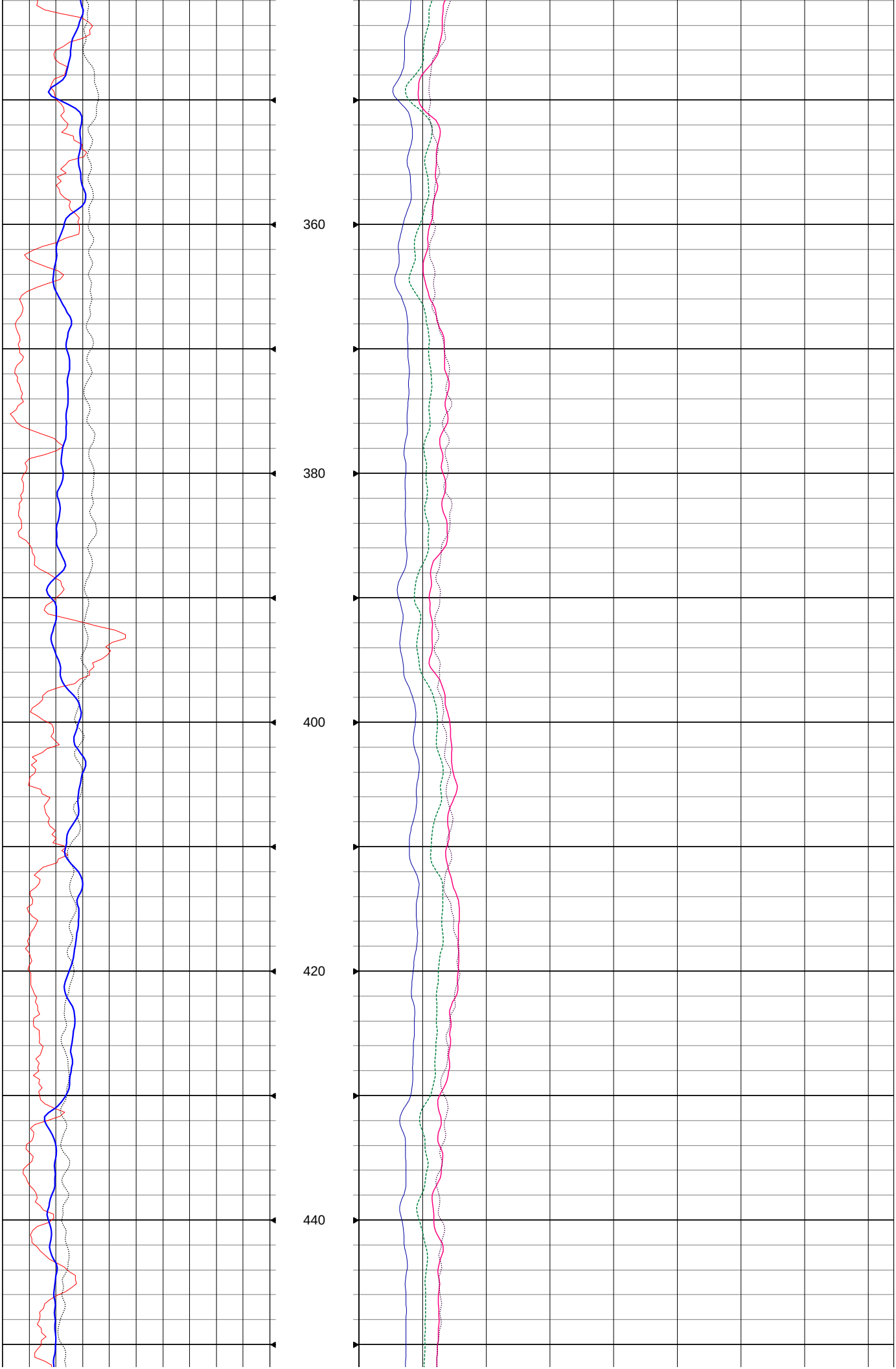
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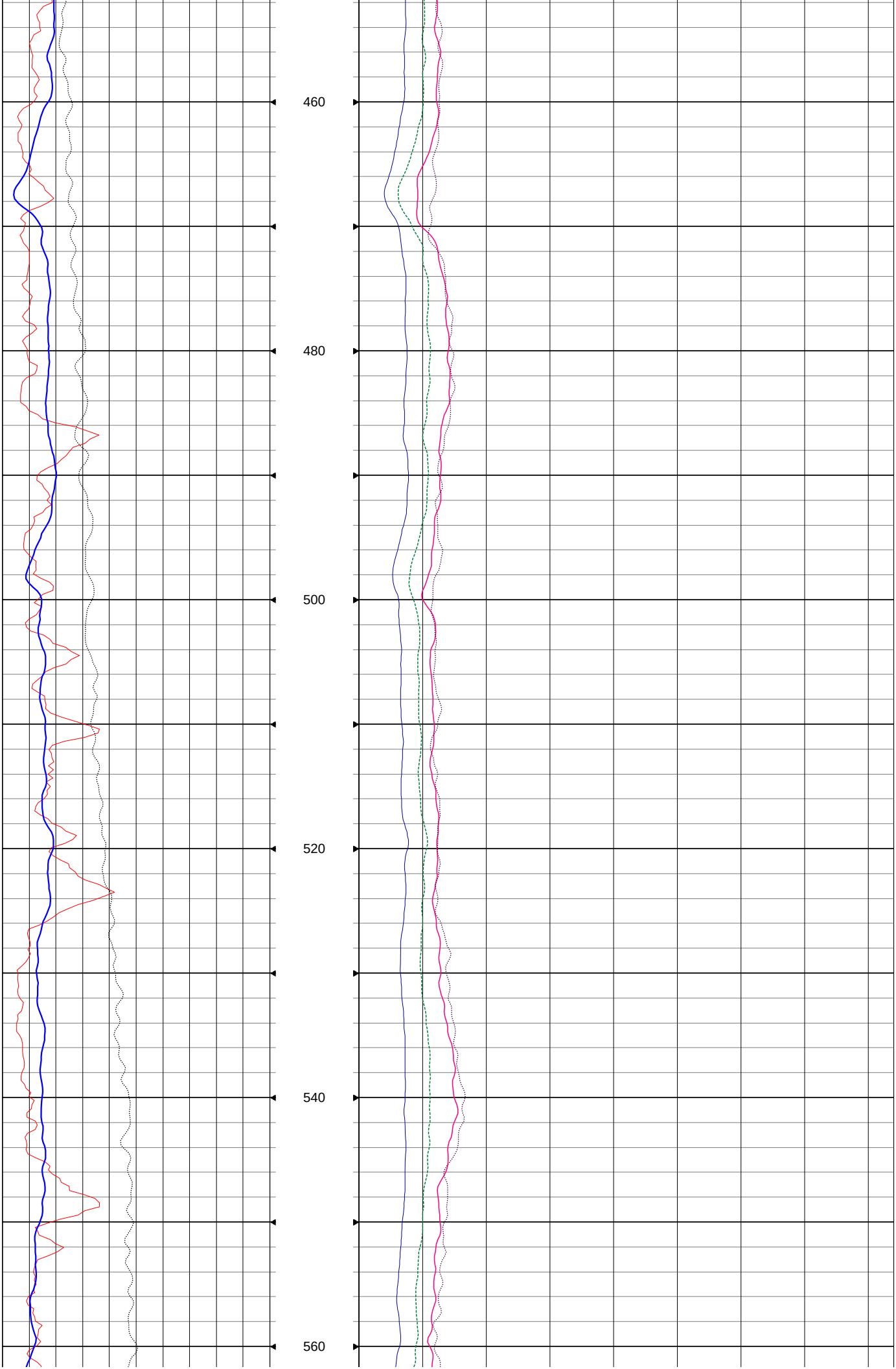
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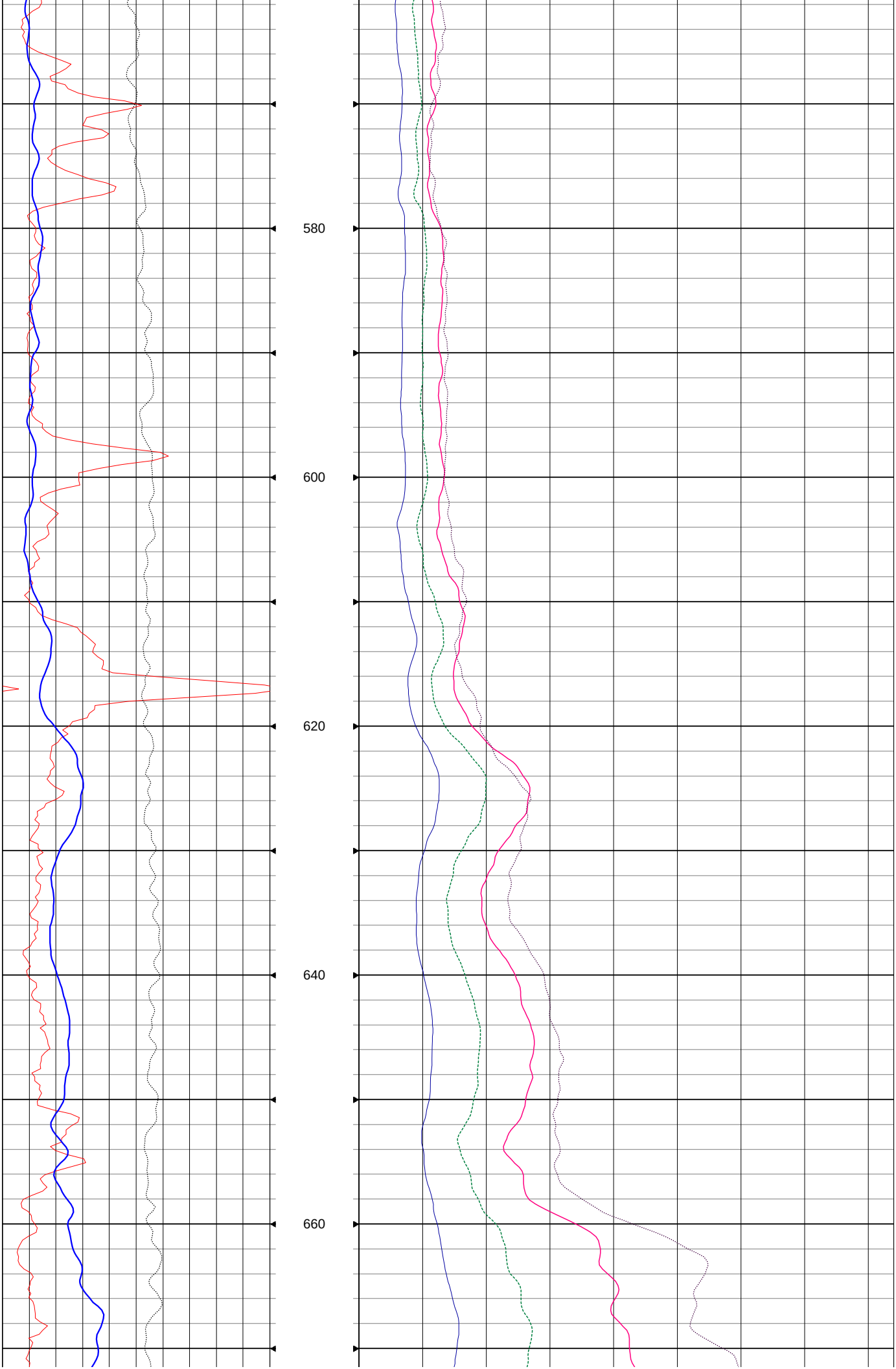
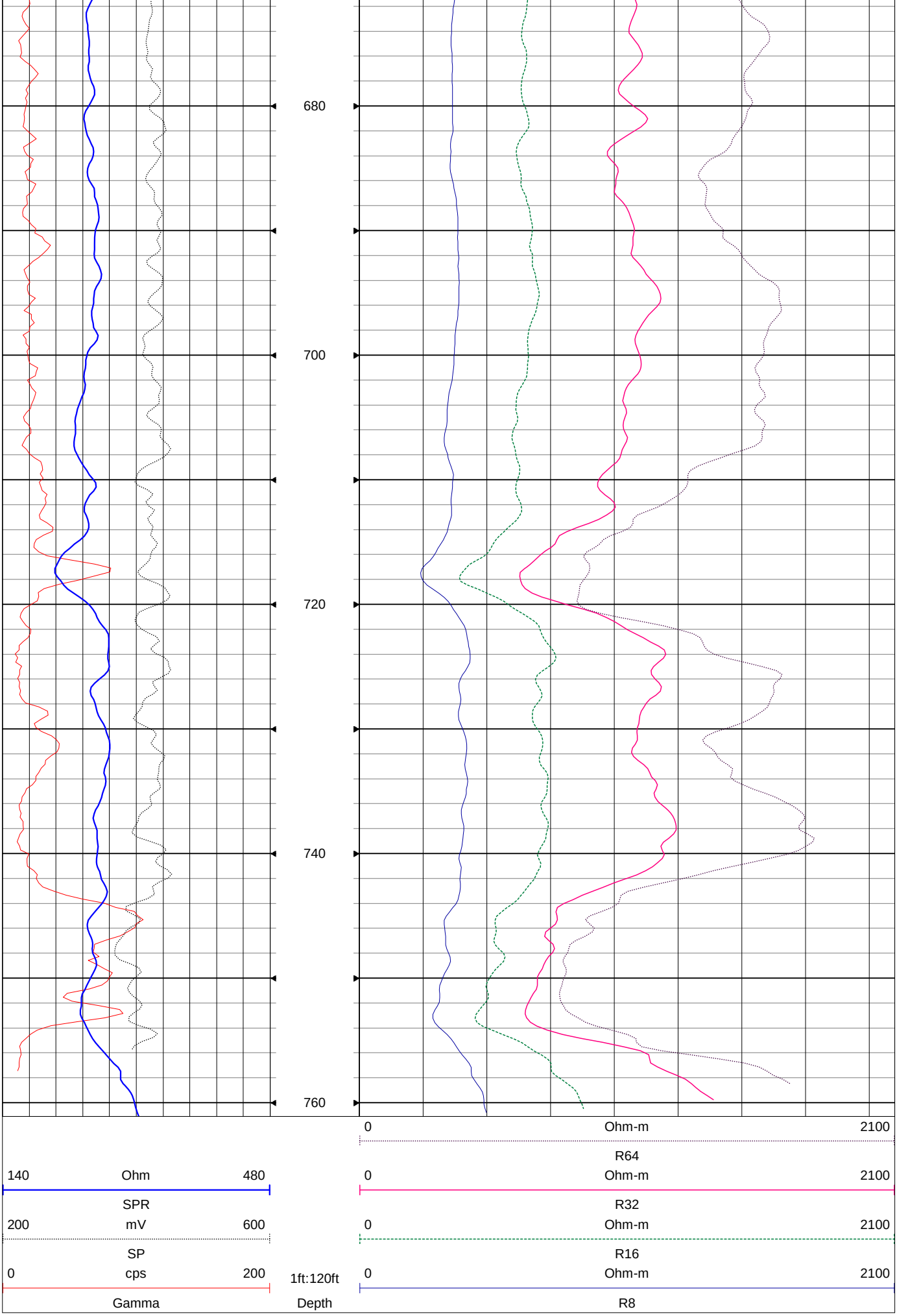

580
600
620
640
660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700
720
740
760
0
Ohm-m
2100
R64
140
Ohm
480
SPR
200
mV
600
SP
0
cps
200
Gamma
1ft:120ft
Depth
R32
R16
R8