

HALLIBURTON

FOUR INDEPENDENT ARM  
CALIPER TOOL

COMPANY		CHEVRON	
WELL		M. B. LARSON C#4	
FIELD		RANGELY	
COUNTY		RIO BLANCO	
STATE		CO	
Permanent Datum Log measured from Drilling measured from		GL KB KB Elev. 5585.0 ft D.F. G.L. 5607.0 ft 5606.0 ft 5585.0 ft	
Date		19-Mar-09	
Run No.		ONE	
Depth - Driller		6876.00 ft	
Depth - Logger		6464.0 ft	
Bottom - Logged Interval		6450.0 ft	
Top - Logged Interval		100.0 ft	
Casing - Driller		7.000 in @ 6482.0 ft	
Casing - Logger		6464.0 ft @	
Bit Size		6.125 in @	
Type Fluid in Hole		BRINE	
Density		10.0 ppG	
PH			
Source of Sample			
Rm @ Meas. Temperature		@	
Rmf @ Meas. Temperature		@	
Rmc @ Meas. Temperature		@	
Source Rmf		Rmc	
Rm @ BHT		@	
Time Since Circulation		0.0 hr	
Time on Bottom		19-Mar-09 12:38	
Max. Rec. Temperature		150.0 degF @ 6450.0 ft	
Equipment		Location	
Recorded By		K. WOOD	
Witnessed By		G. COLLINS	

Fold here

Service Ticket No.: 6573226		API Serial No.: 0510311397		PGM Version: WL INSITE R2.4 (Build 11)			
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE				RESISTIVITY SCALE CHANGES			
Date	Sample No.			Type Log	Depth	Scale Up Hole	Scale Down Hole
Depth-Driller							
Type Fluid in Hole							
Density	Viscosity						
Ph	Fluid Loss						
Source of Sample				RESISTIVITY EQUIPMENT DATA			
Rm @ Meas. Temp	@	@		Run No.	Tool Type & No.	Pad Type	Tool Pos.
Rmf @ Meas. Temp.	@	@					
Rmc @ Meas. Temp.	@	@					
Source Rmf	Rmc						
Rm @ BHT	@	@					
Rmf @ BHT	@	@					
Rmc @ BHT	@	@					
EQUIPMENT DATA							
GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.		Run No.		Run No.	
Serial No.	044	Serial No.		Serial No.		Serial No.	
Model No.	D4TGX	Model No.		Model No.		Model No.	
Diameter	3.625"	No. of Cent.		Diameter		Diameter	
Detector Model No.	D4TG	Spacing		Log Type		Log Type	
Type	SCINT.			Source Type		Source Type	
Length	8"	LSA [Y/N]		Serial No.		Serial No.	
Distance to Source	N/A	FWDA [Y/N]		Strength		Strength	
LOGGING DATA							

GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON					
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	6450	SURF	REC	0	150									
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks: RWCH-CCL-D4TGX-CBL-FIAC WERE RUN IN COMBINATION.														
HOLE RUGOSITY AND TENSION PULLS MAY AFFECT LOG QUALITY.														
FIAC S/N: A066														
LATITUDE: 40.12 ° N // LONGITUDE: 108.93 ° W														
YOUR CREW TODAY: A. LEWIS, K. LAUCK AND E. KEEN.								RIG: AESC #7						
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES - GRAND JUNCTION, CO (970) 523-3600														
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.														
HALLIBURTON														

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	6.125	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDWT	Borehole Fluid Weight	10.000	ppg
	SHARED	RMUD	Mud Resistivity	2.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	OBM	Oil Based Mud System?	No	
	SHARED	CSD	Logging Interval is Cased?	Yes	
	SHARED	CSOD	Inner Casing OD size	7.000	in
	SHARED	CSWT	Casing Weight	23.00	lbpf
	SHARED	ISOC	Is Outer Casing Present?	No	
	SHARED	CSCM	Casing Cemented	Yes	
	SHARED	CMWT	Cement Weight	16.500	ppg
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	6876.00	ft
	SHARED	BHT	Bottom Hole Temperature	150.0	degF
	CCLD4	CLOK	Process CCL?	Yes	
	CCLD4	CCLS	CCL Processing Selection	Raw	
	D4TGX	GROK	Process Gamma Ray?	Yes	
	D4TGX	GRSO	Gamma Tool Standoff	0.000	in
	D4TGX	GEOK	Process Gamma Ray EVR?	No	
	CBL-M305	TTLV	Travel Time threshold.	5.0	mV
	CBL-M305	TTOF	CBL Travel Time Offset from Calibration.	0	us
	CBL-M305	ISFM	Is foam cement type?	No	
	CBL-M305	CCTP	Cementing Cement Type	1000.00	in

CBL-M305	CSTR	Compressive Strength	1000.00	psia
CBL-M305	BIOK	Calculate Bond Index?	Yes	
CBL-M305	ISMD	Is borehole fluid Mud?	No	
CBL-M305	SHGT	Show Gate on VDL?	No	
CBL-M305	OGOF	Override CBL Gain and Offset?	No	
FIAC	CLOK	Process Caliper Outputs?	Yes	

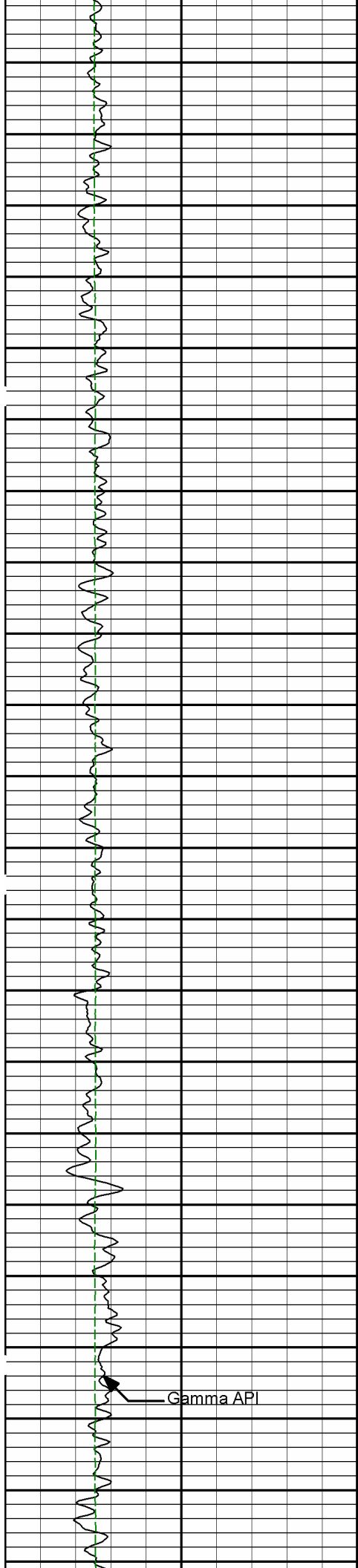
BOTTOM-

Data: CHV\_MBLARSON\_C4\0002 CBL-FIACT\IDLE

Date: 19-Mar-09 17:29:48

MAIN PASS 5" = 100'

		<div>14 Casing OD 4 4 14</div> <div>inches inches</div>	
		<div>14 C24 4 4 14</div> <div>inches inches</div>	
<div>4 CALA 14</div> <div>inches</div> <div>0 Gamma API 200</div> <div>api</div>		<div>14 C13 4 4 14</div> <div>inches inches</div>	

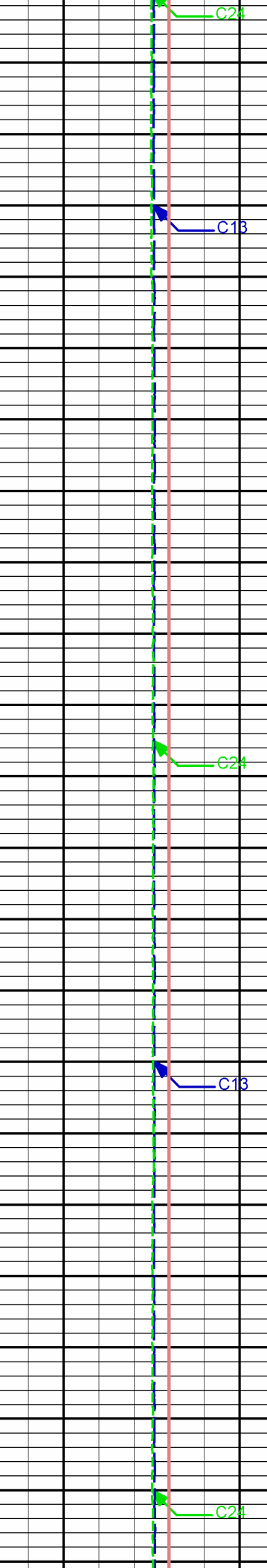
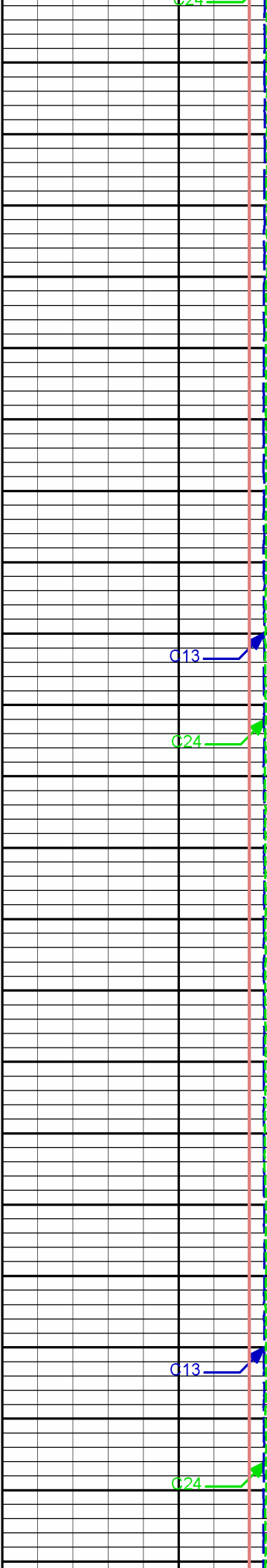


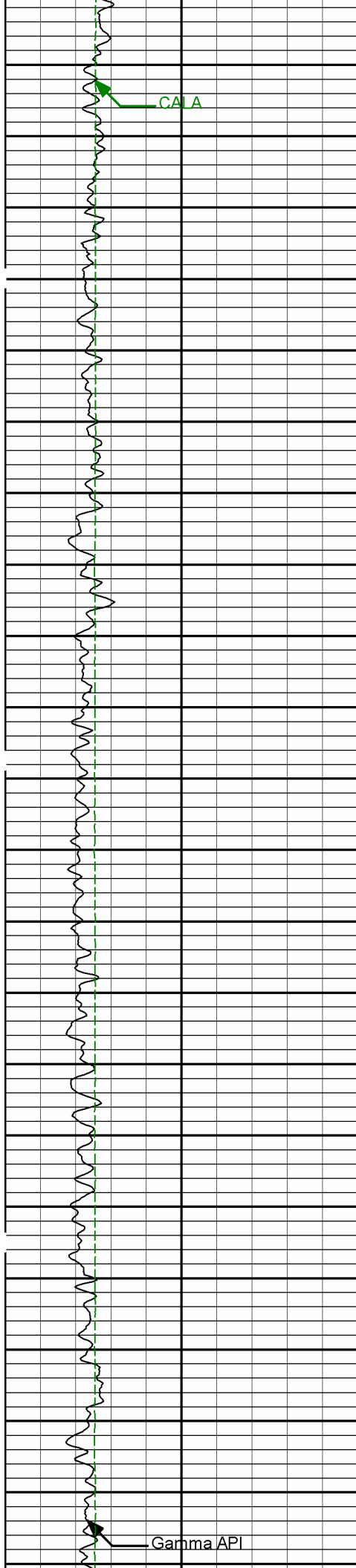
250

300

350

400





450

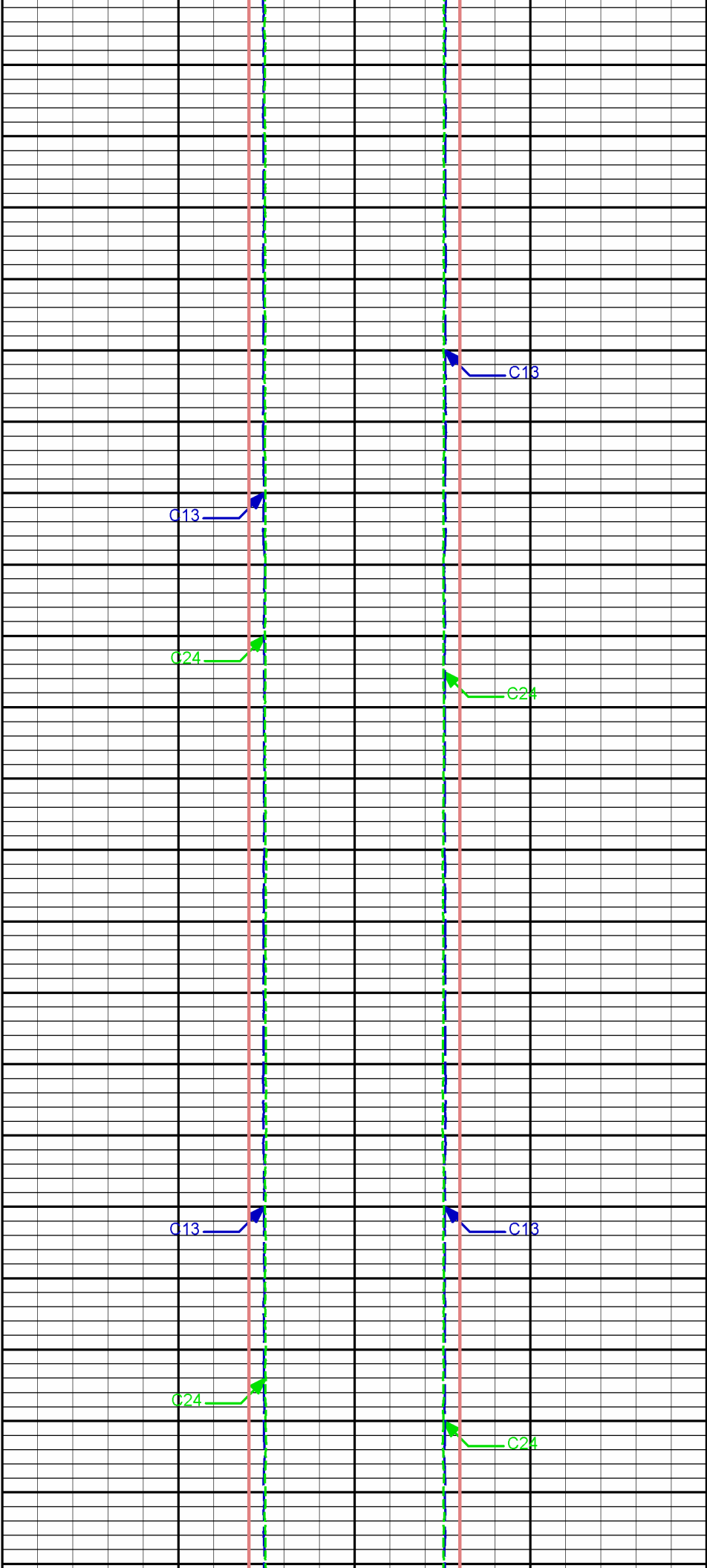
500

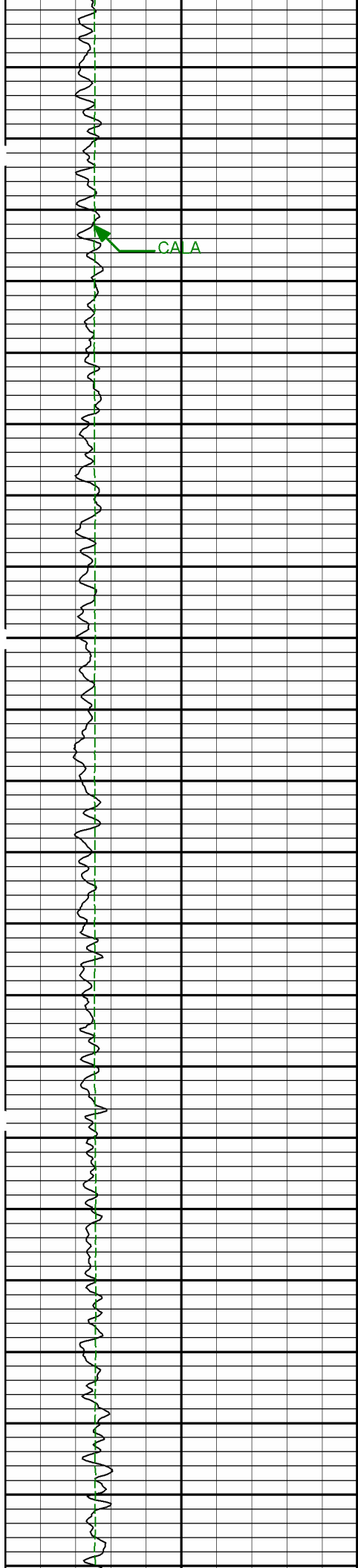
550

600

Gamma API

650



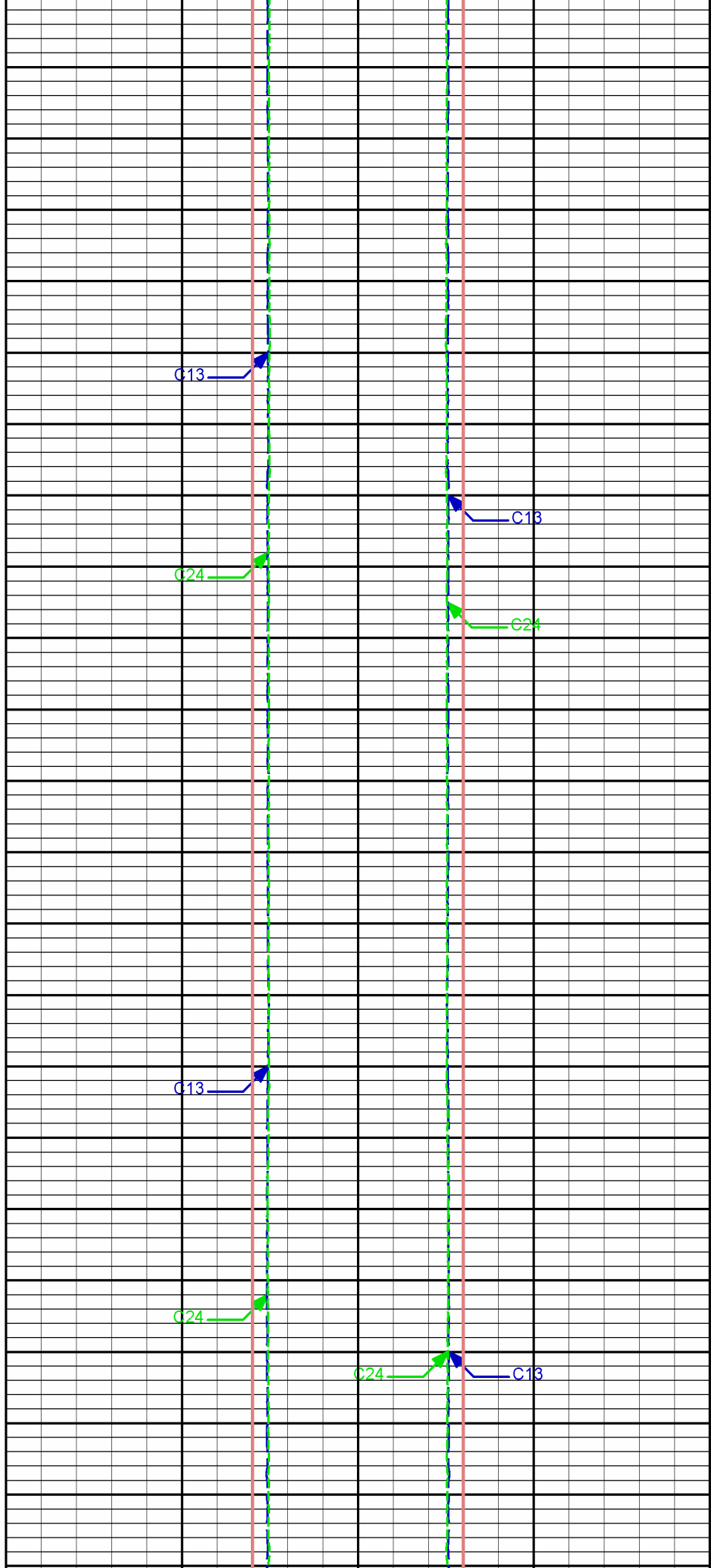


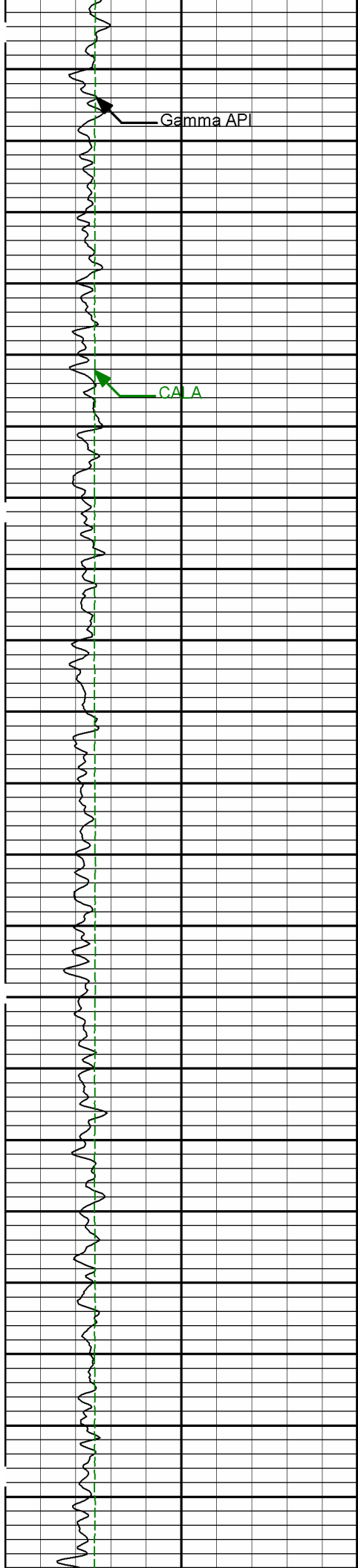
700

750

800

850





900

C13

950

C24

C24

C13

1000

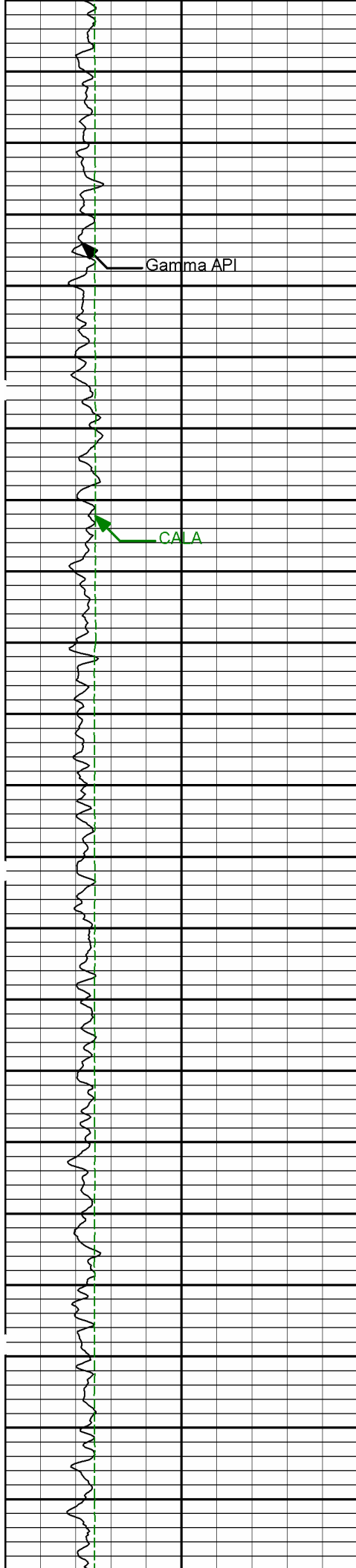
C13

1050

C24

C24

C13



1100

Gamma API

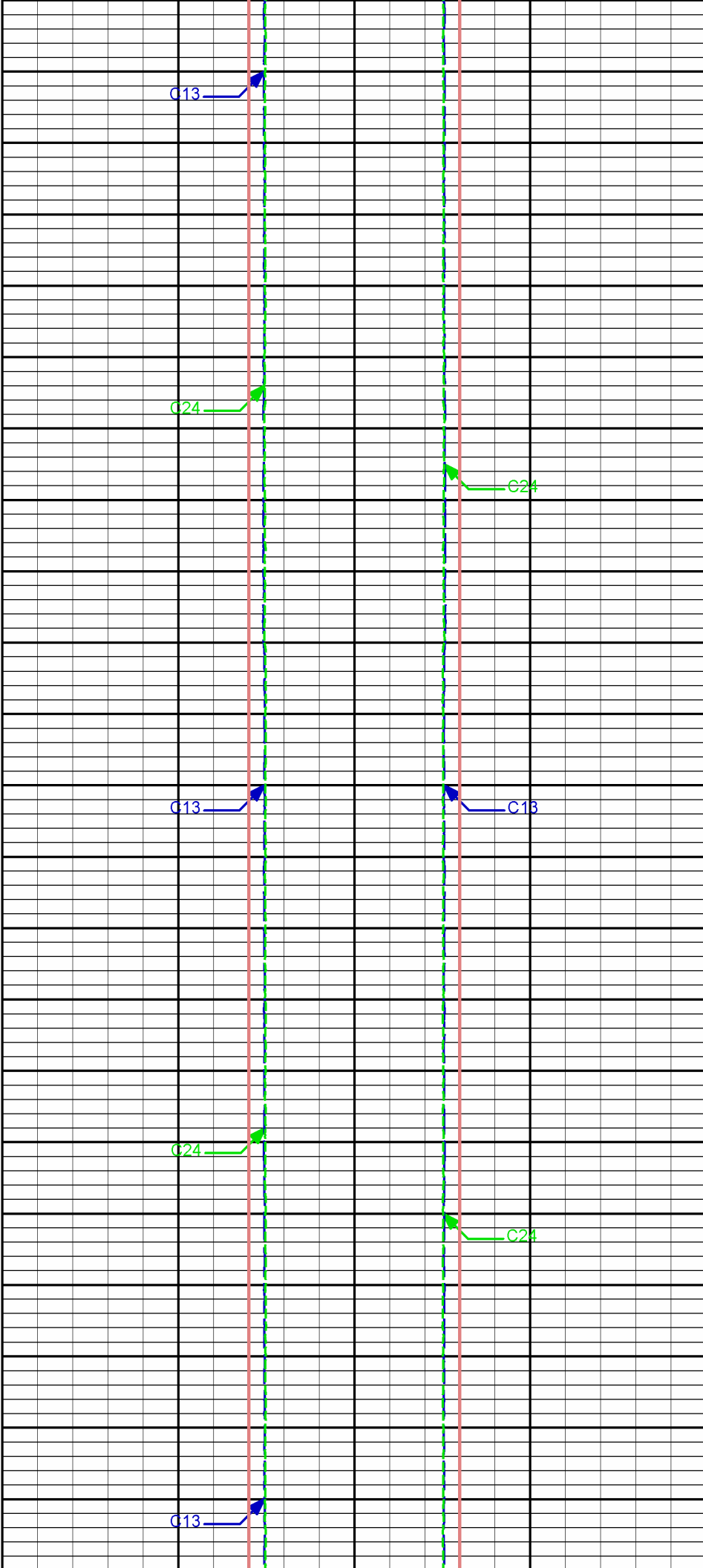
1150

CAL A

1200

1250

1300



C13

C24

C13

C24

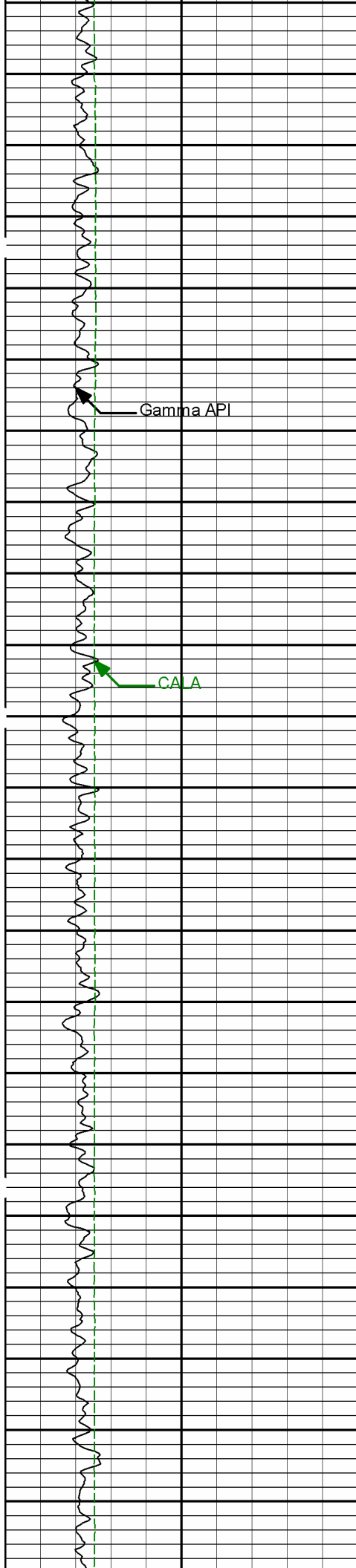
C13

C24

C13

C24





1350

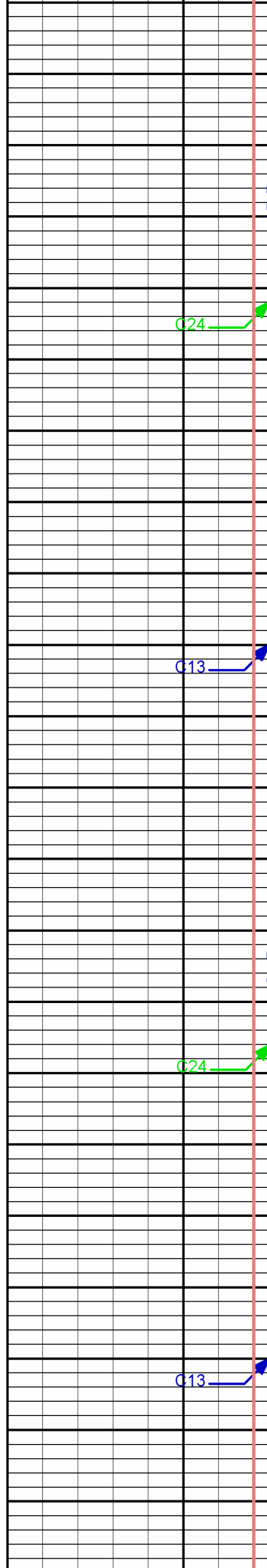
1400

1450

1500

Gamma API

CA A

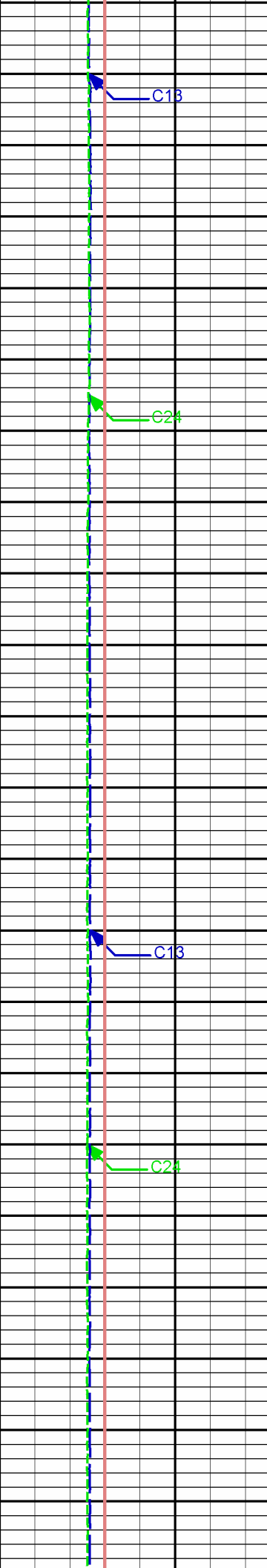


C24

C13

C24

C13

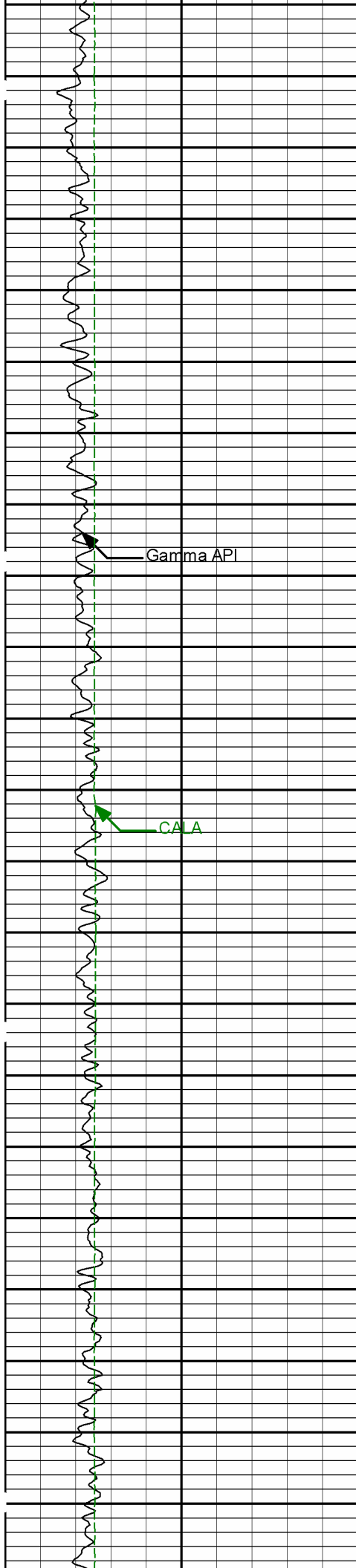


C13

C24

C13

C24



1550

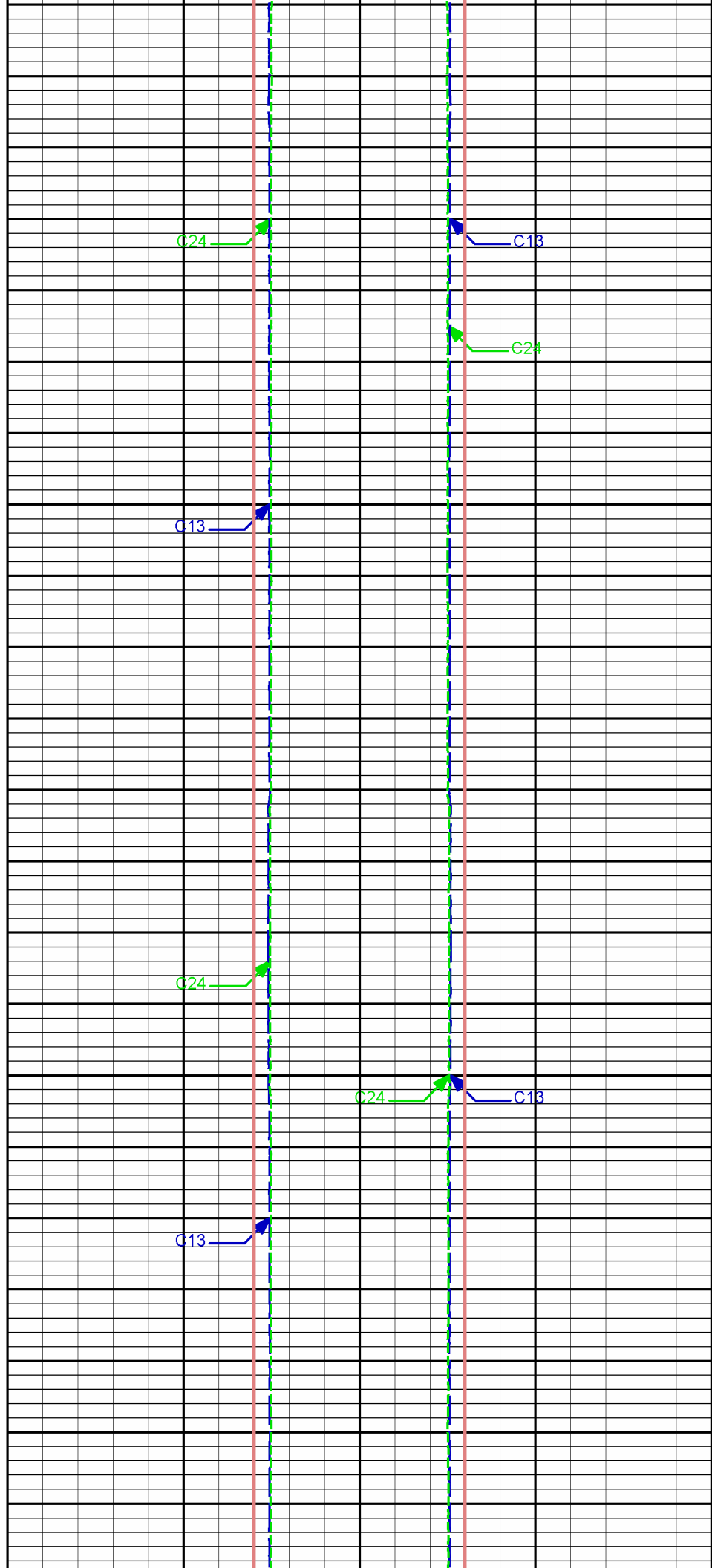
1600

1650

1700

Gamma API

CALA



C24

C13

C13

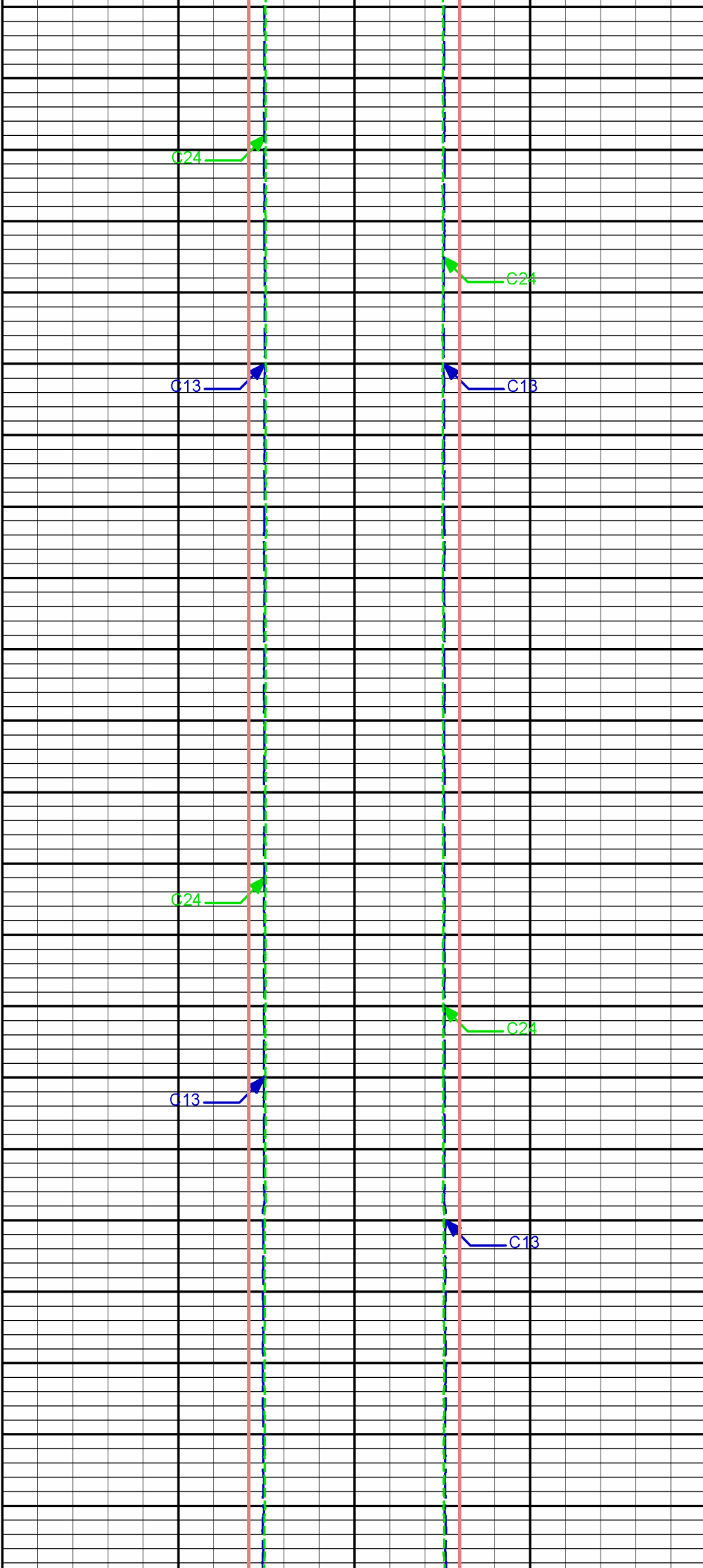
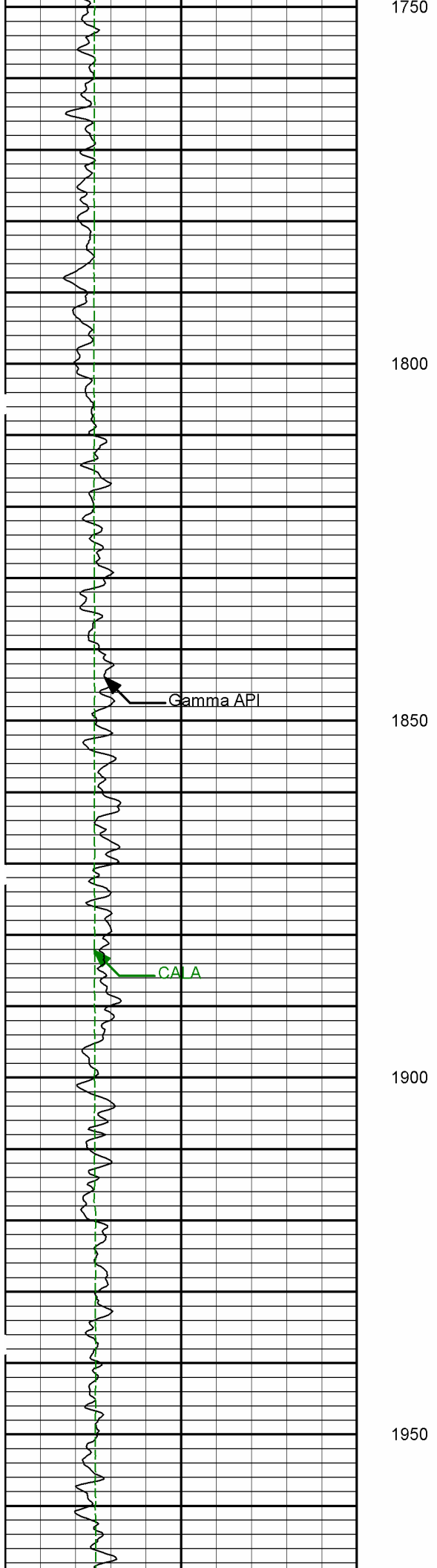
C24

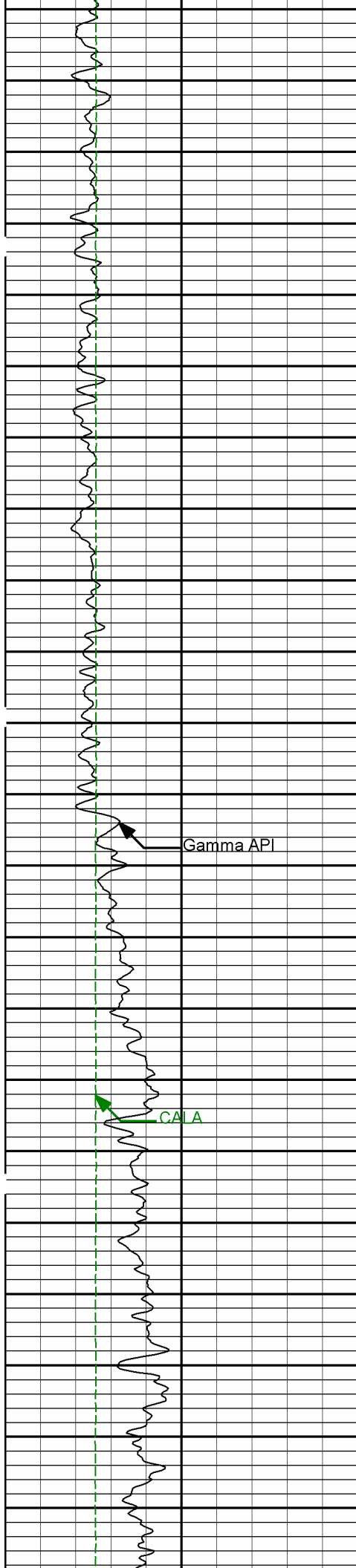
C24

C24

C13

C13





2000

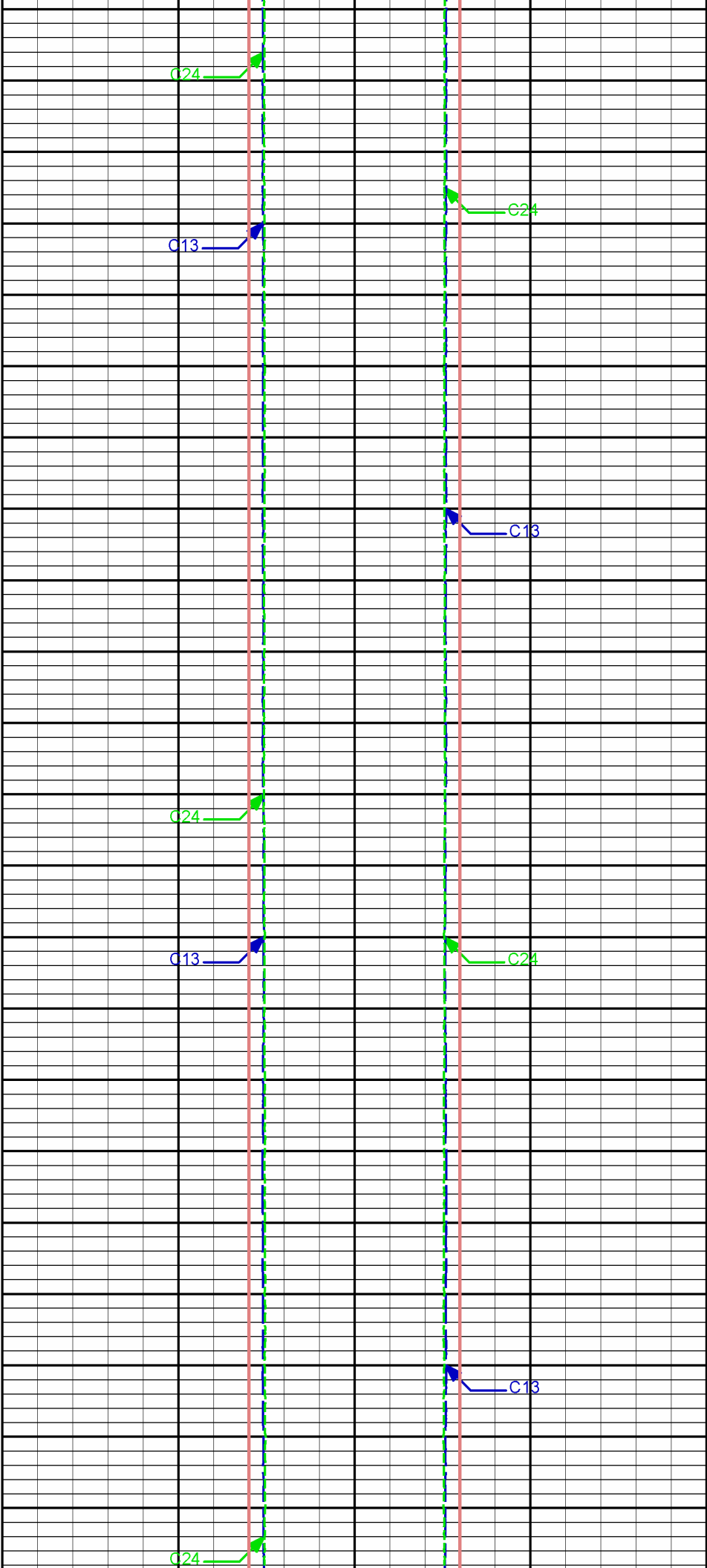
2050

2100

2150

Gamma API

CALA



C24

C13

C24

C13

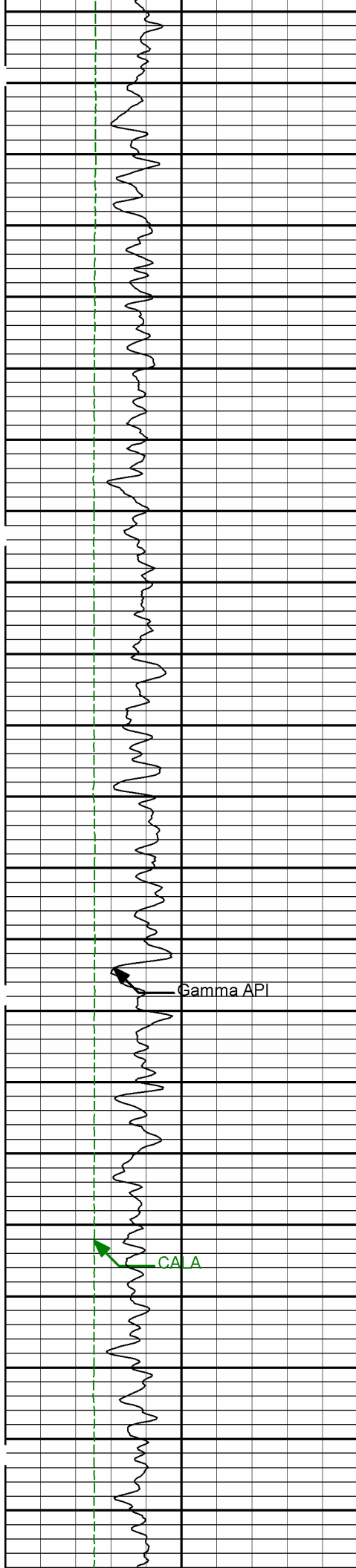
C24

C24

C13

C24

C13



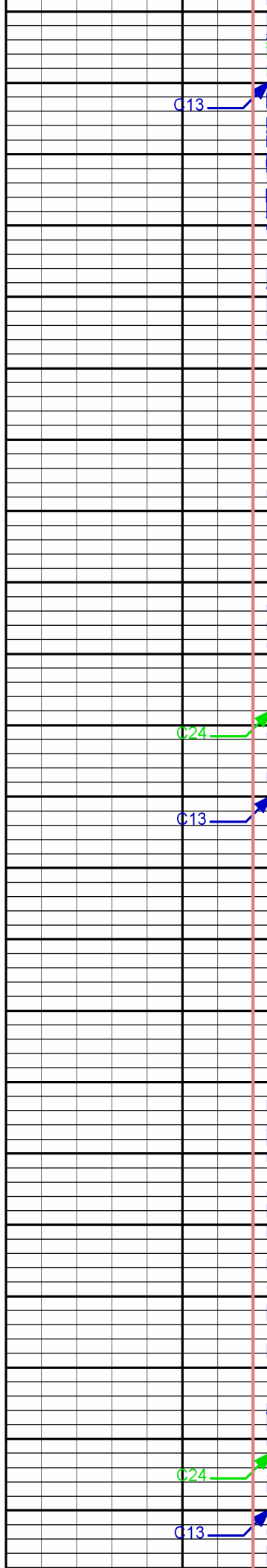
2200

2250

2300

2350

2400



C13

C24

C13

C24

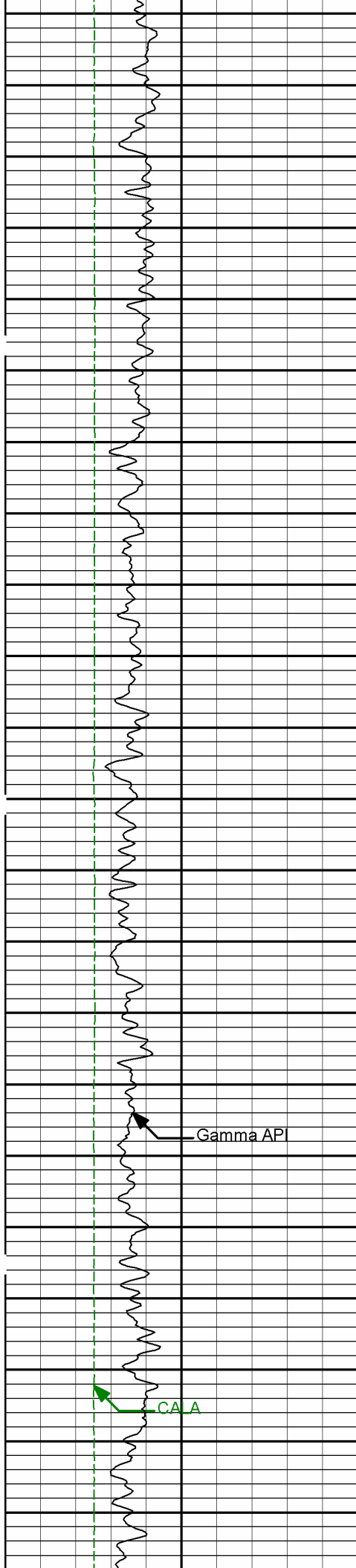
C13

C24

C24

C13

C13



2450

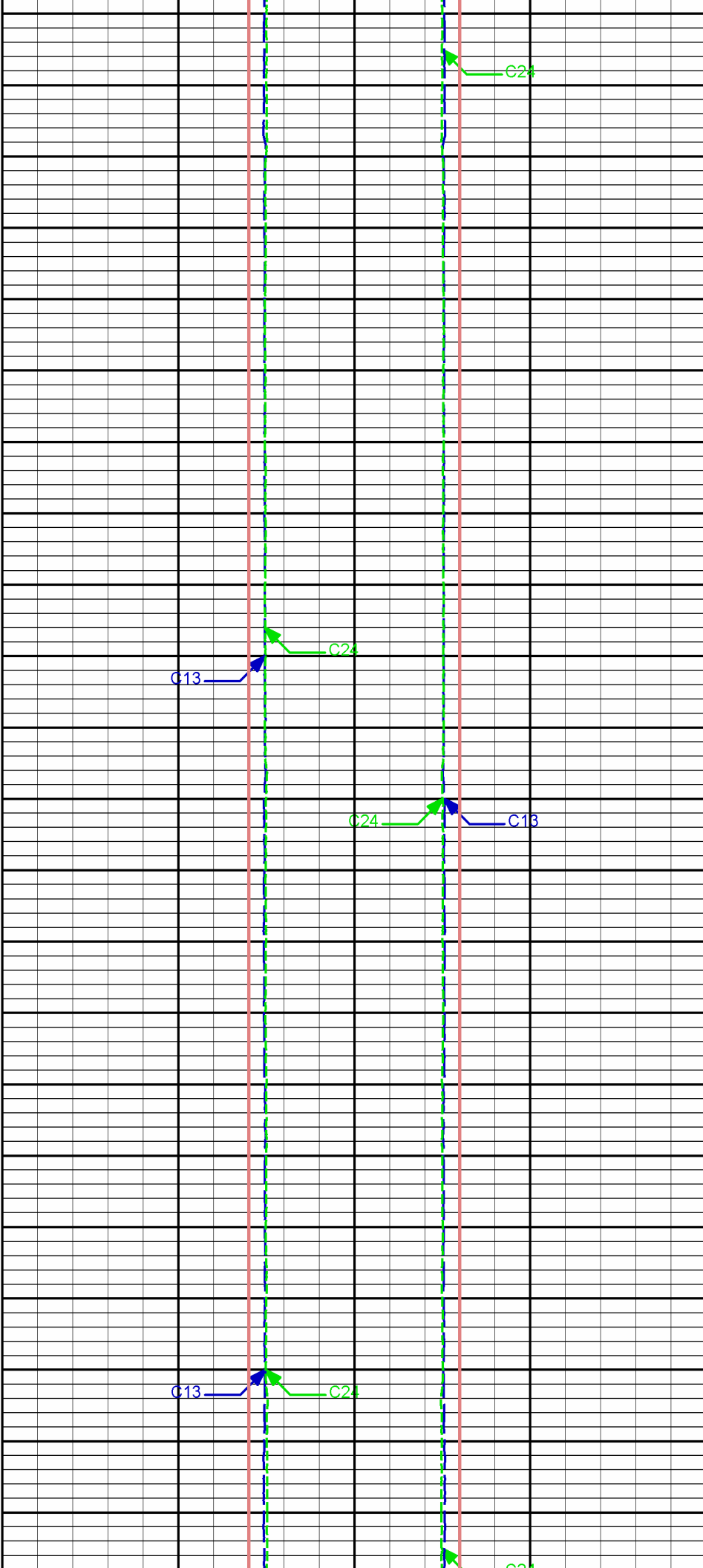
2500

2550

2600

Gamma API

CA A



C24

C13

C24

C24

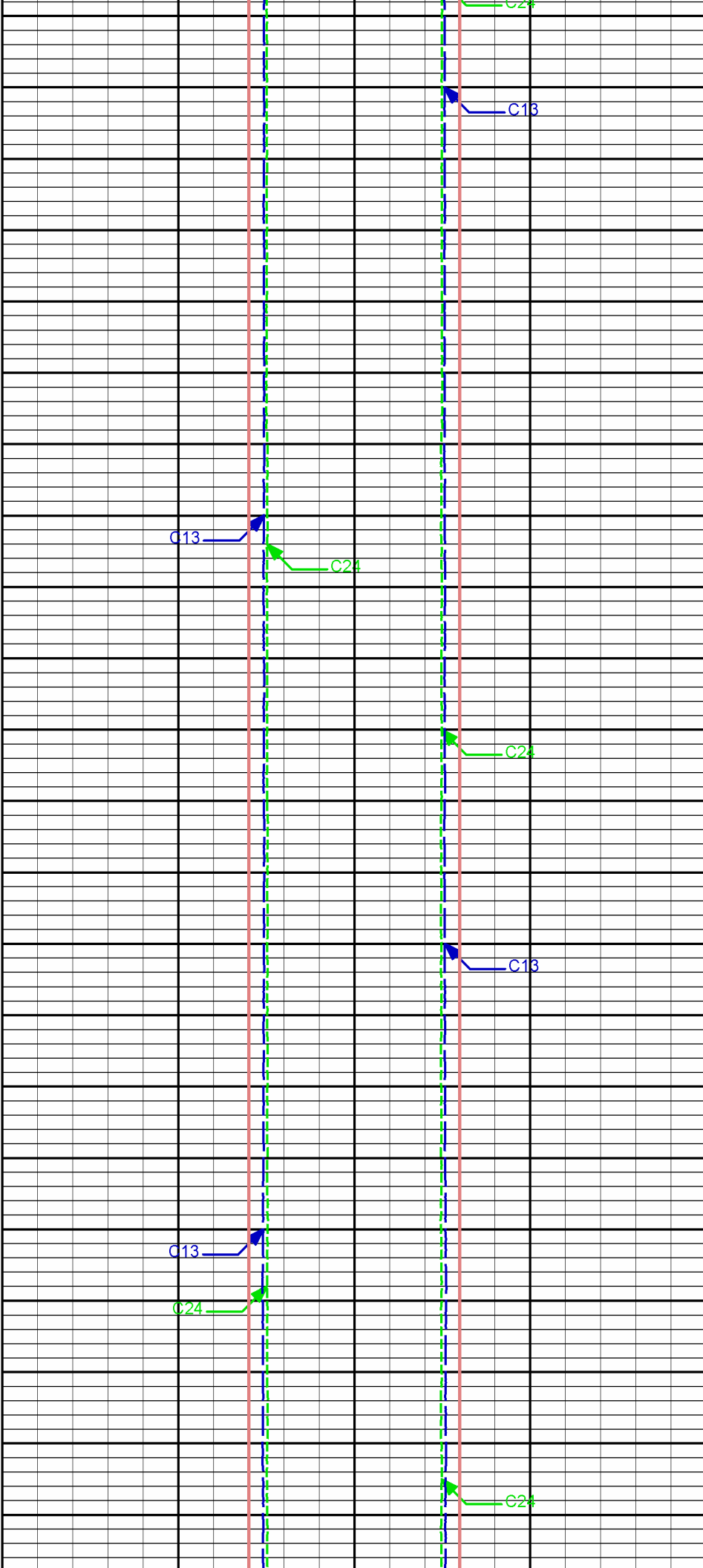
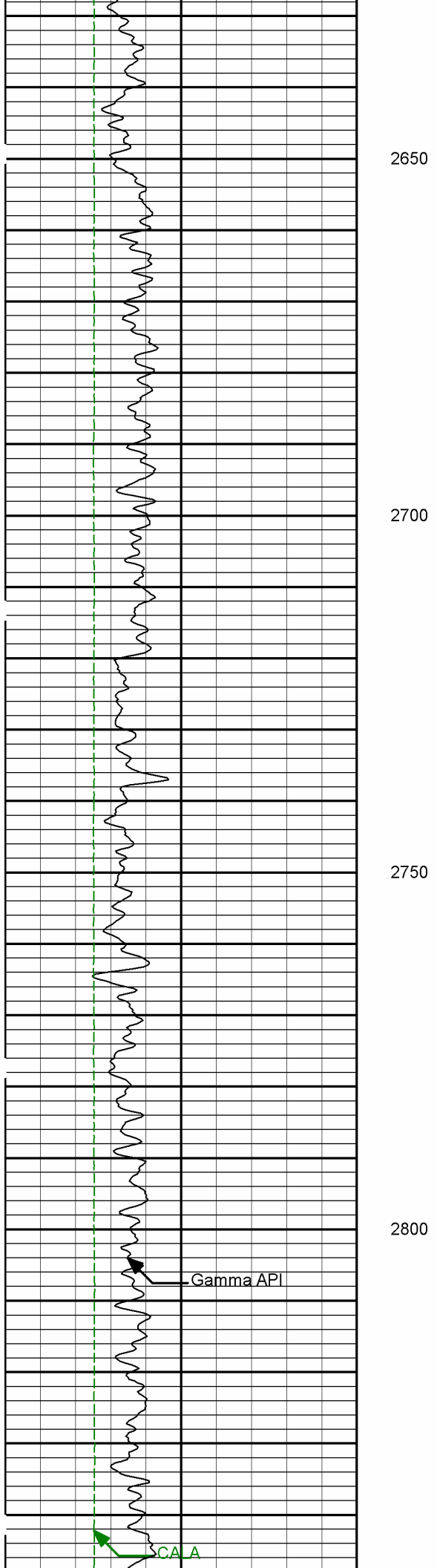
C13

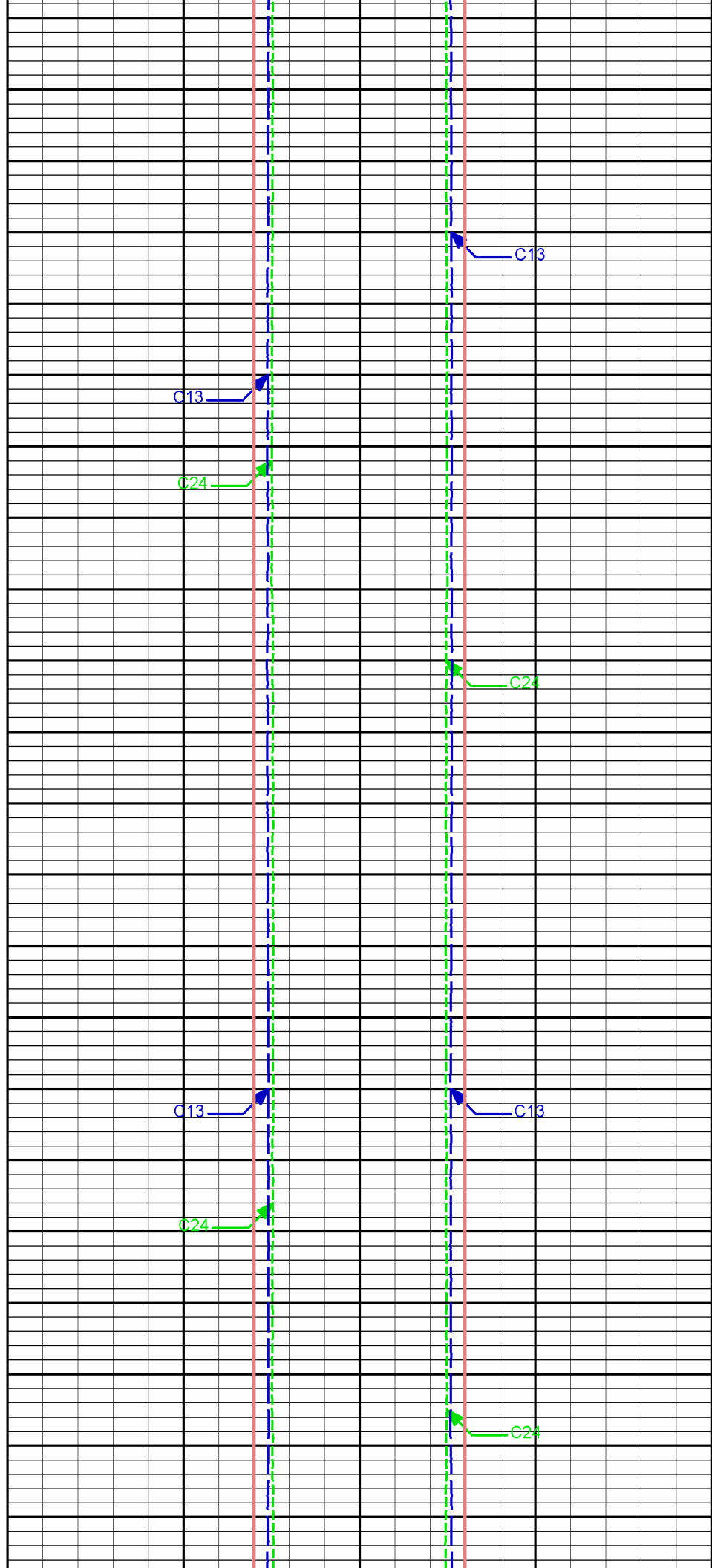
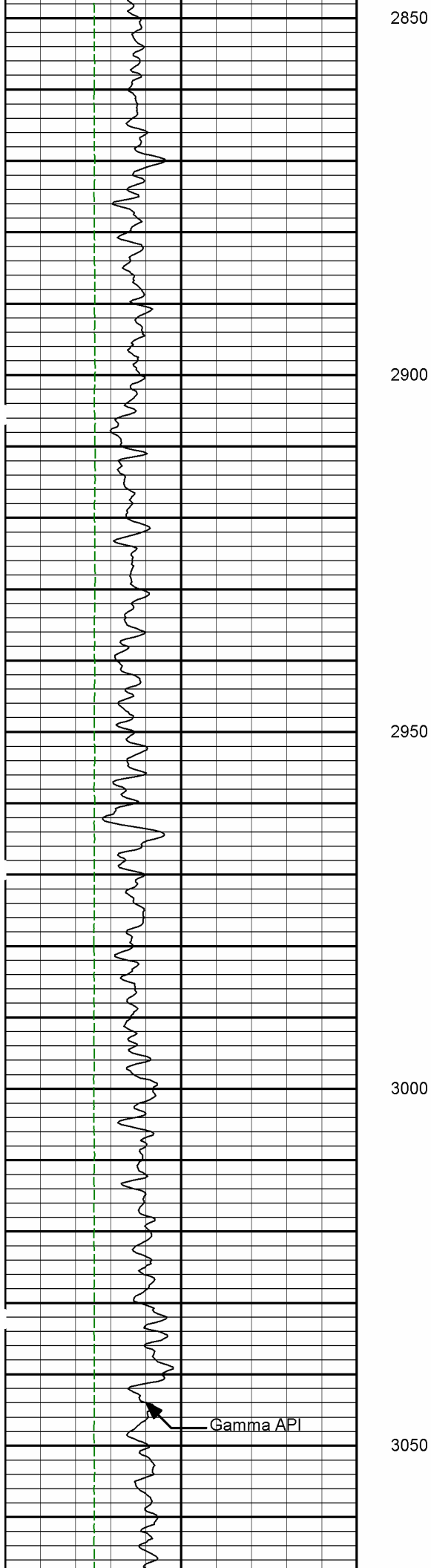
C13

C24

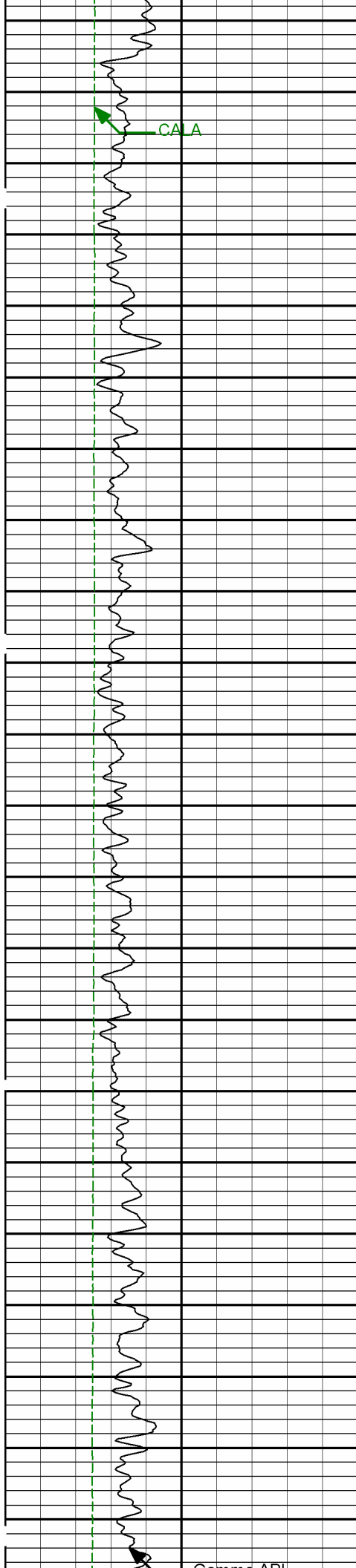
C24

CA A









3100

C13

C24

3150

C13

C24

3200

3250

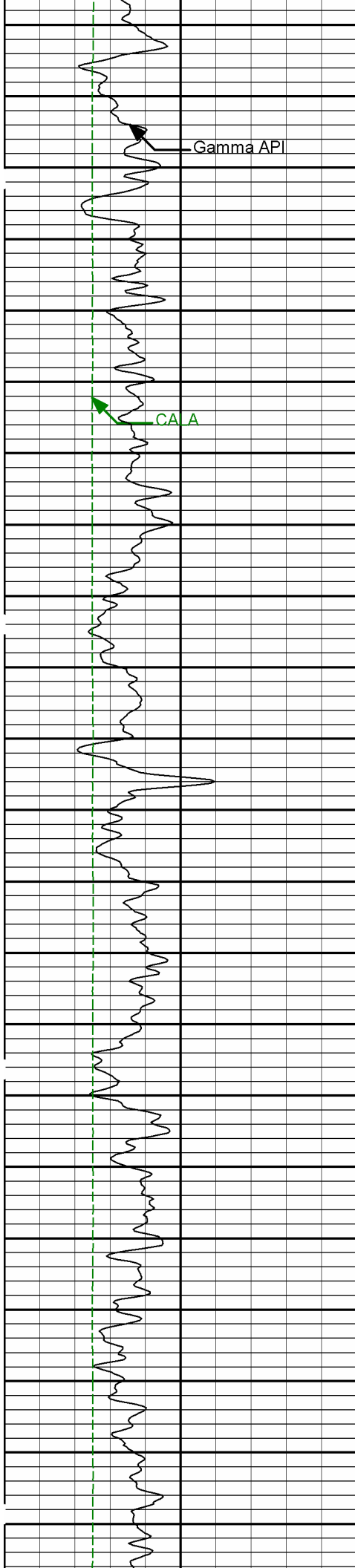
C13

C24

C13

C24



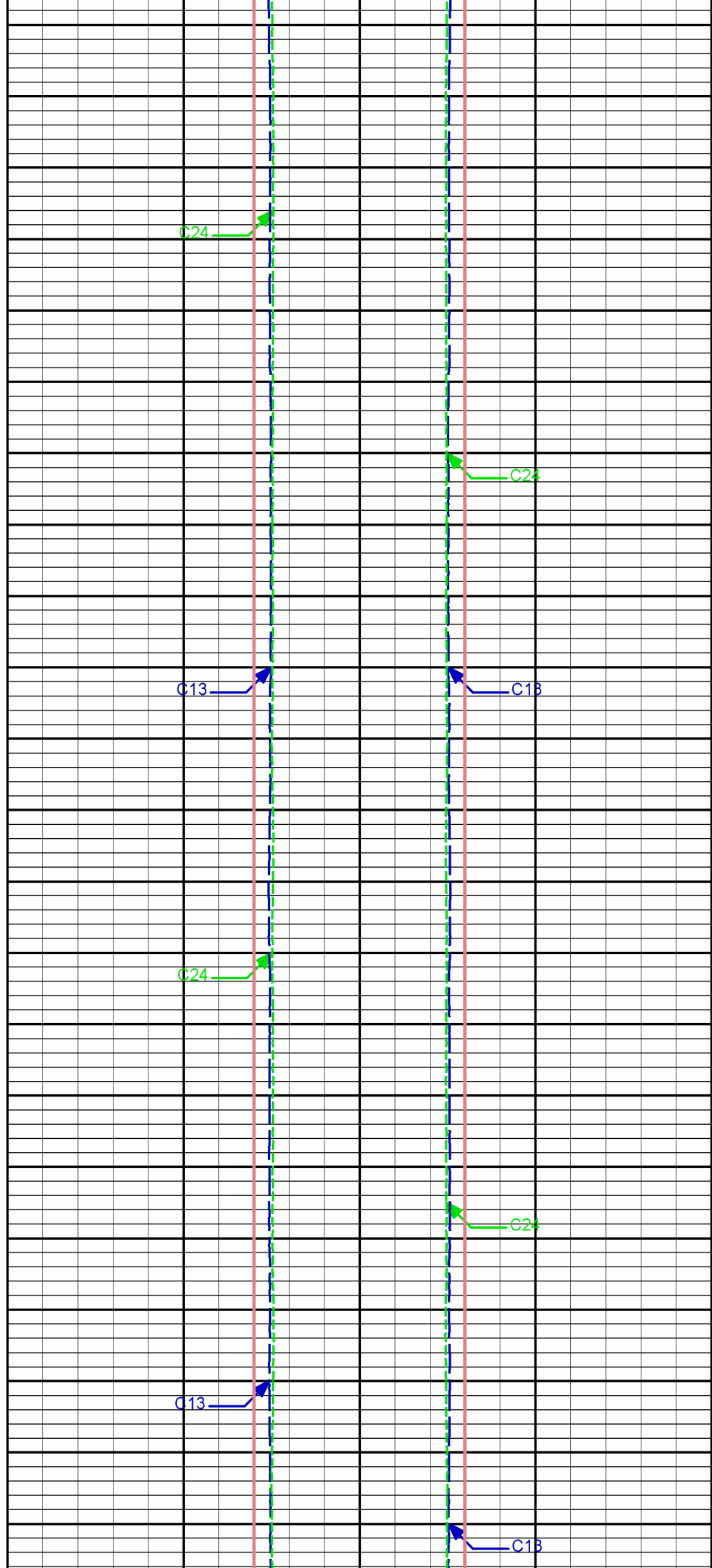


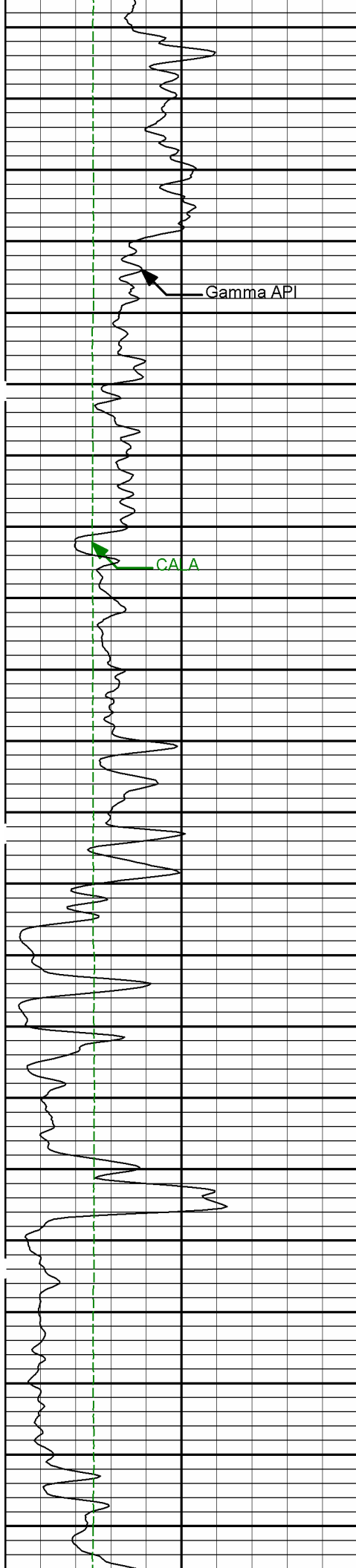
3550

3600

3650

3700





Gamma API

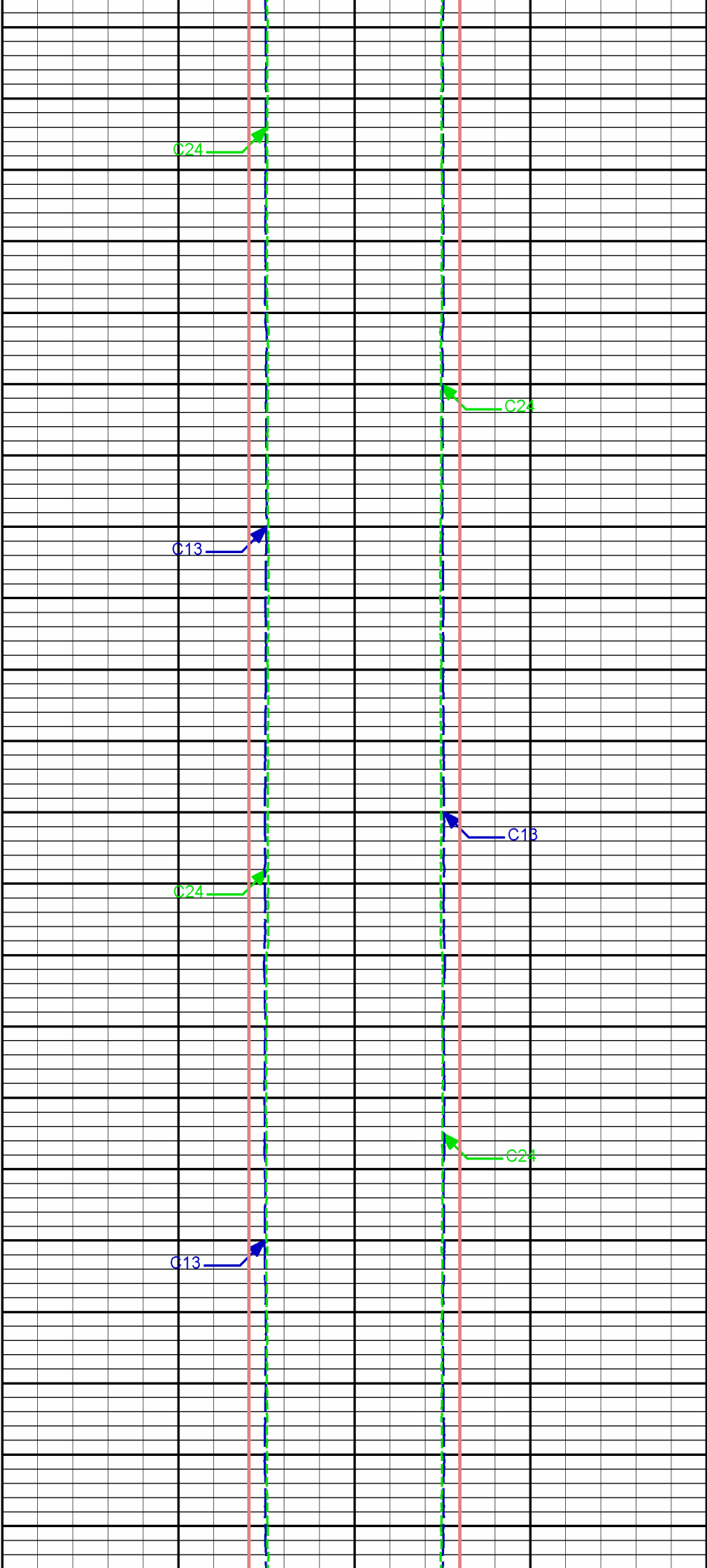
CA 1A

3750

3800

3850

3900



C24

C13

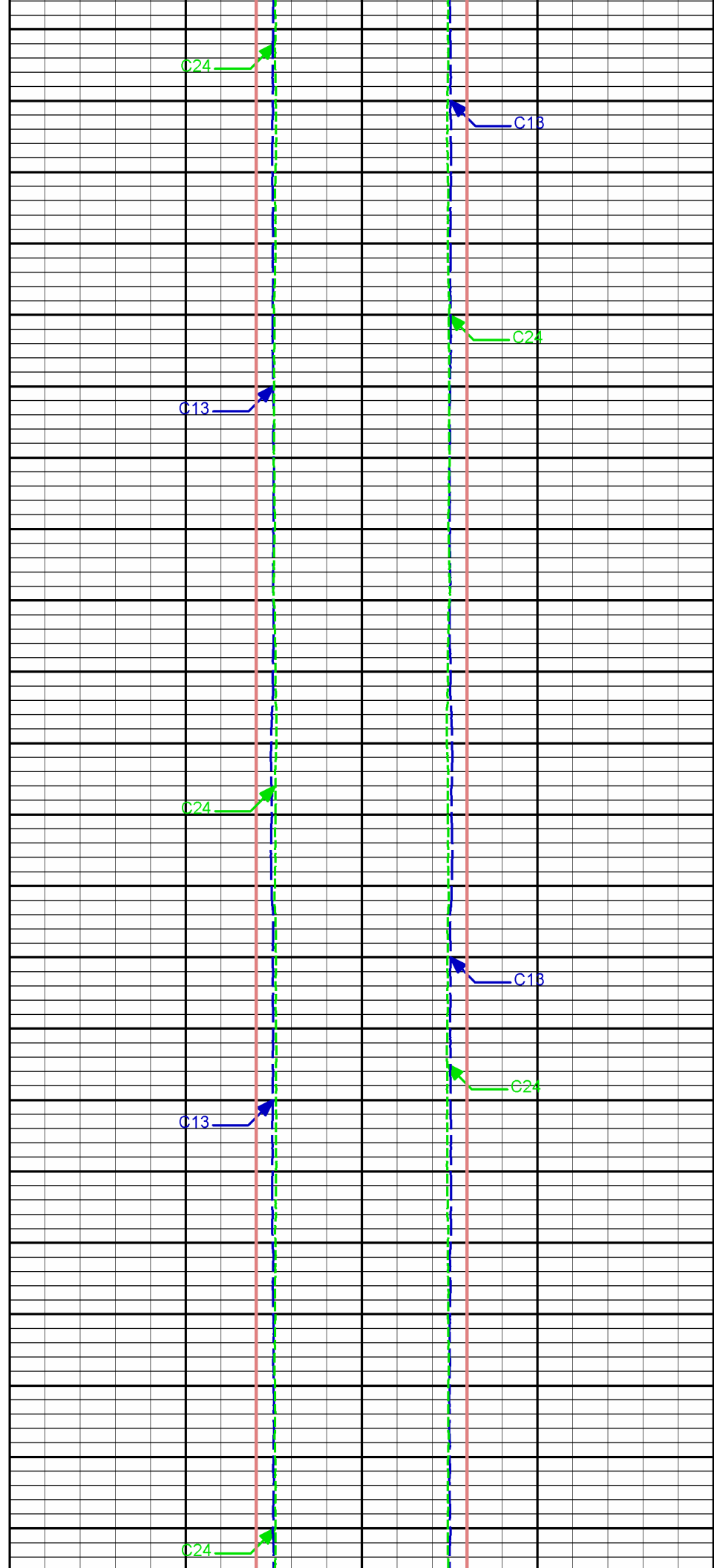
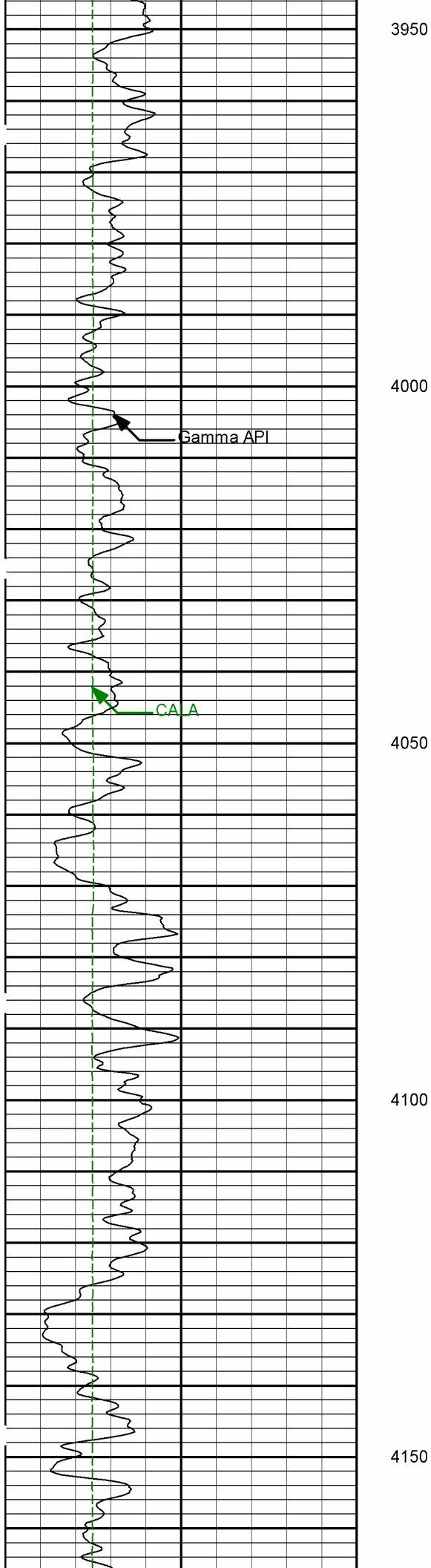
C24

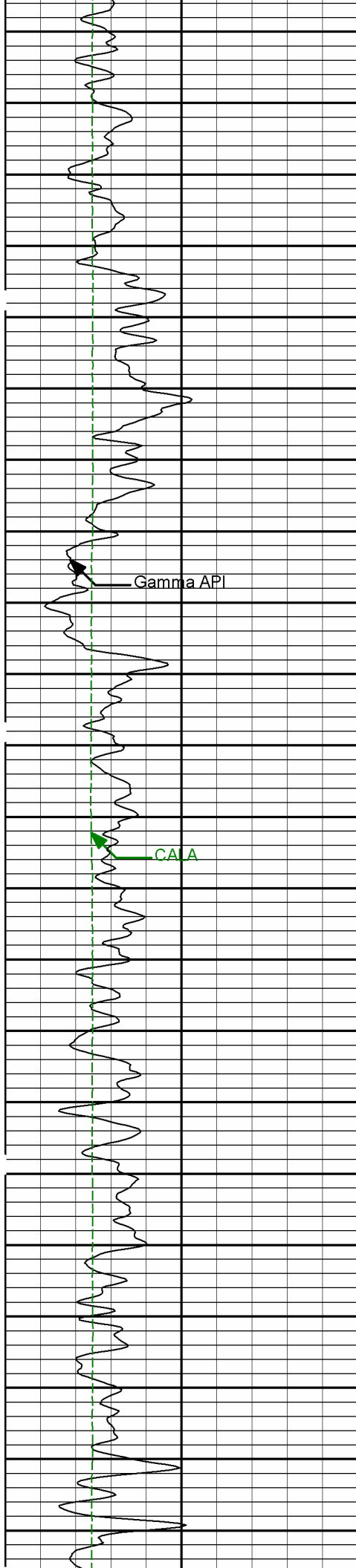
C13

C24

C13

C24



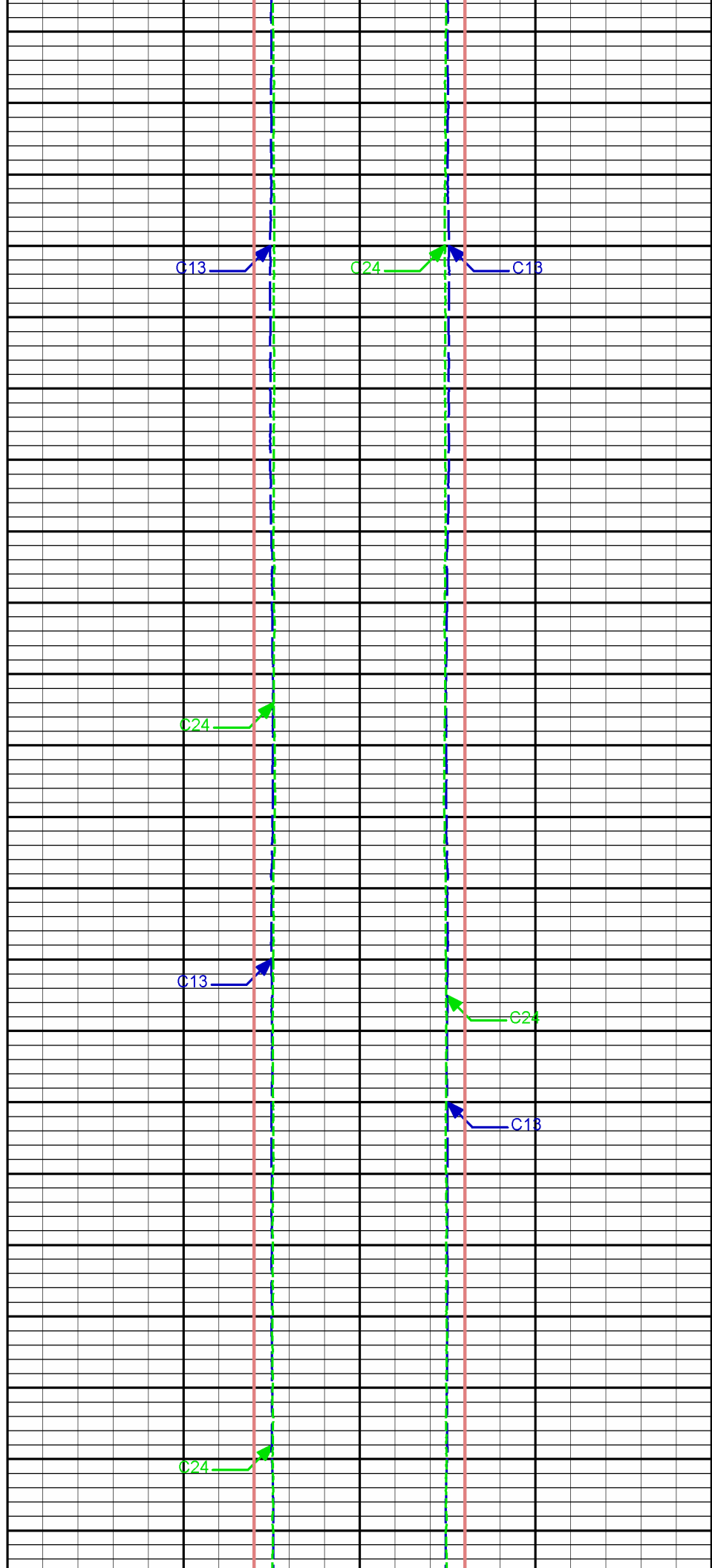


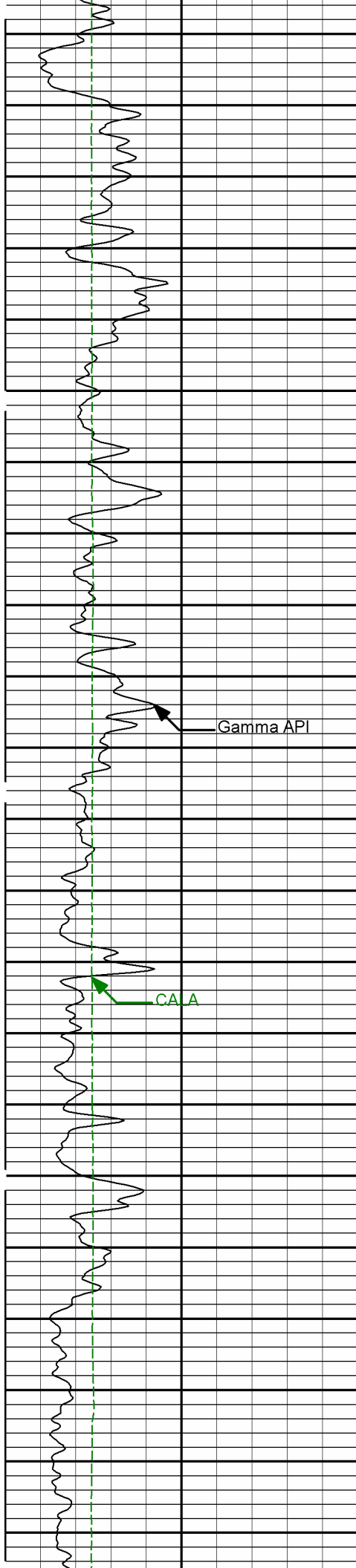
4200

4250

4300

4350





4400

4450

4500

4550

4600

C13

C24

C13

C24

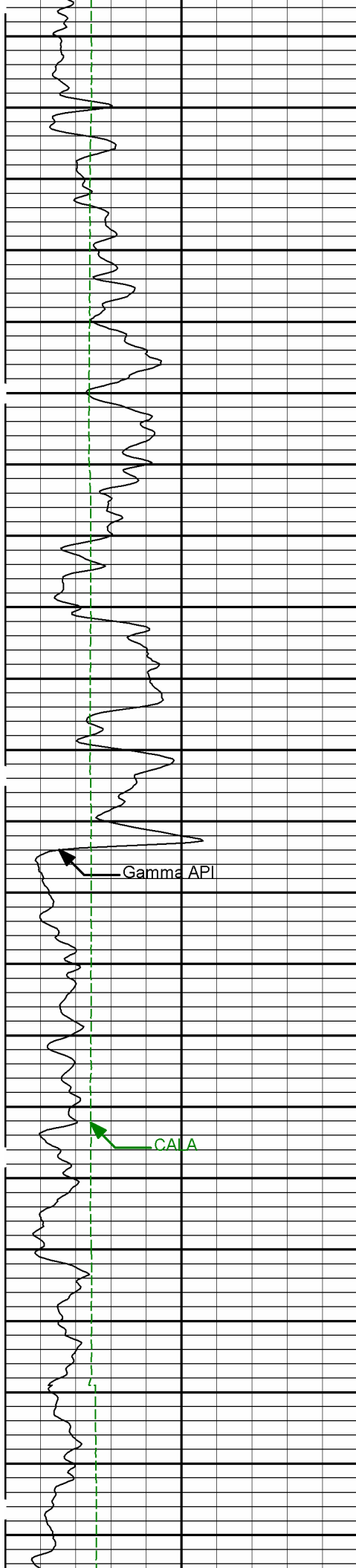
C13

C24

C13

C24

C13

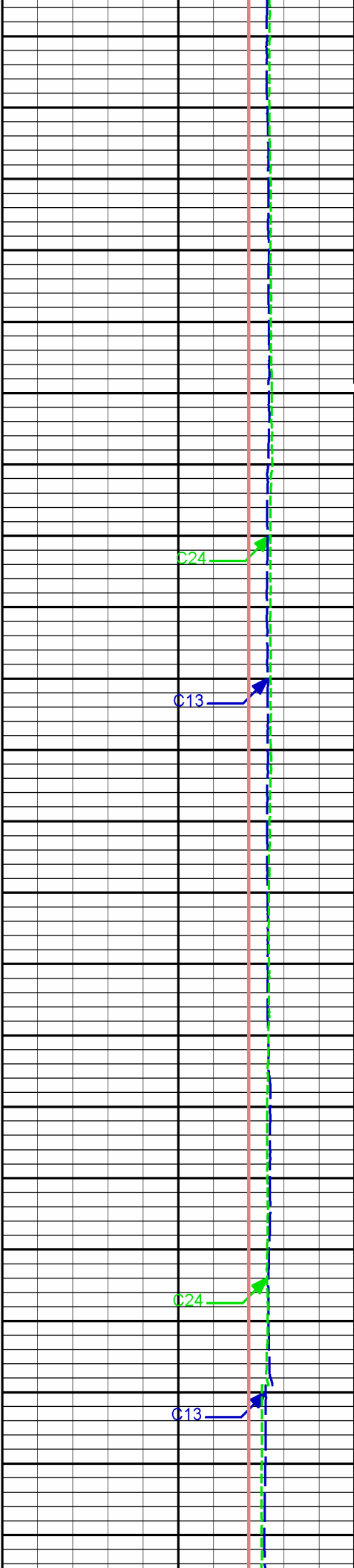


4650

4700

4750

4800

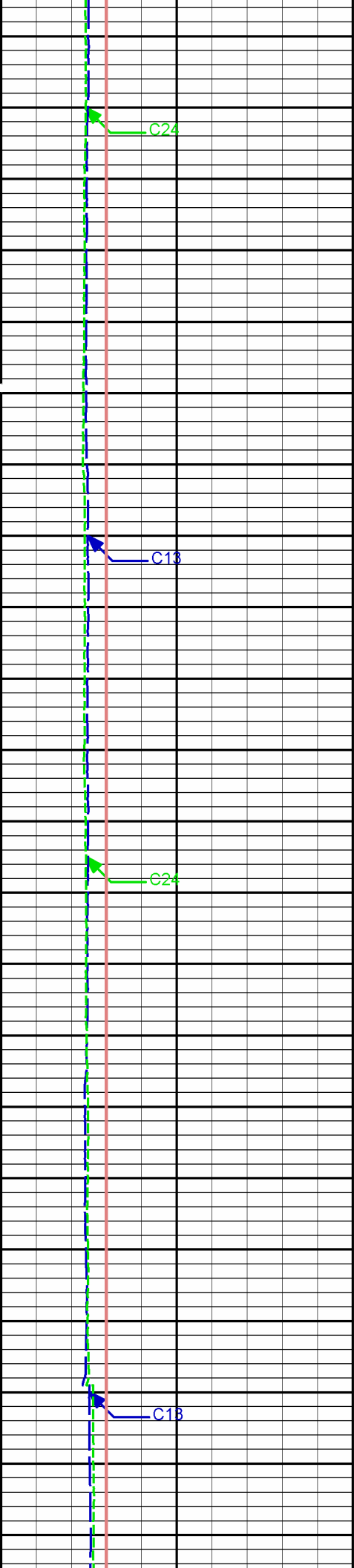


C24

C13

C24

C13



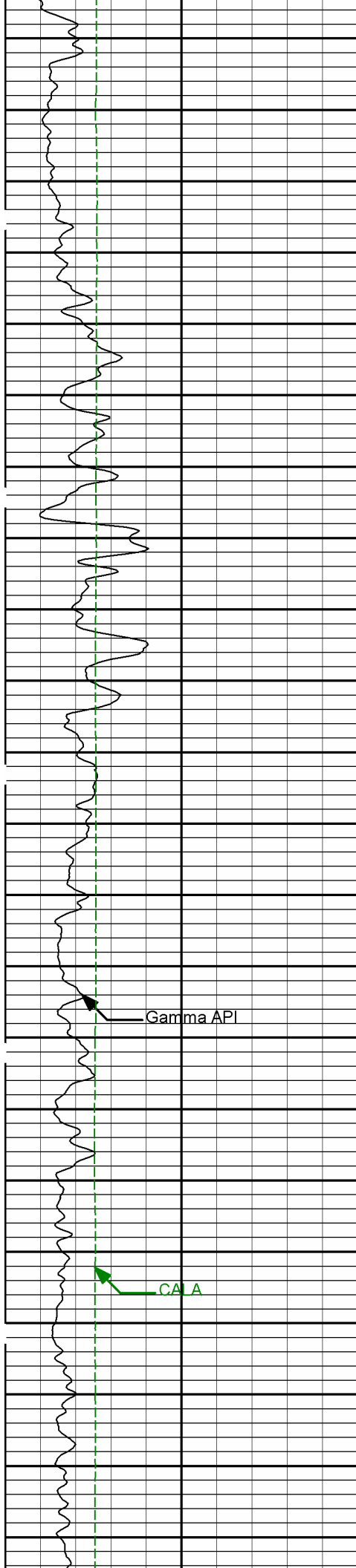
C24

C13

C24

C13





4850

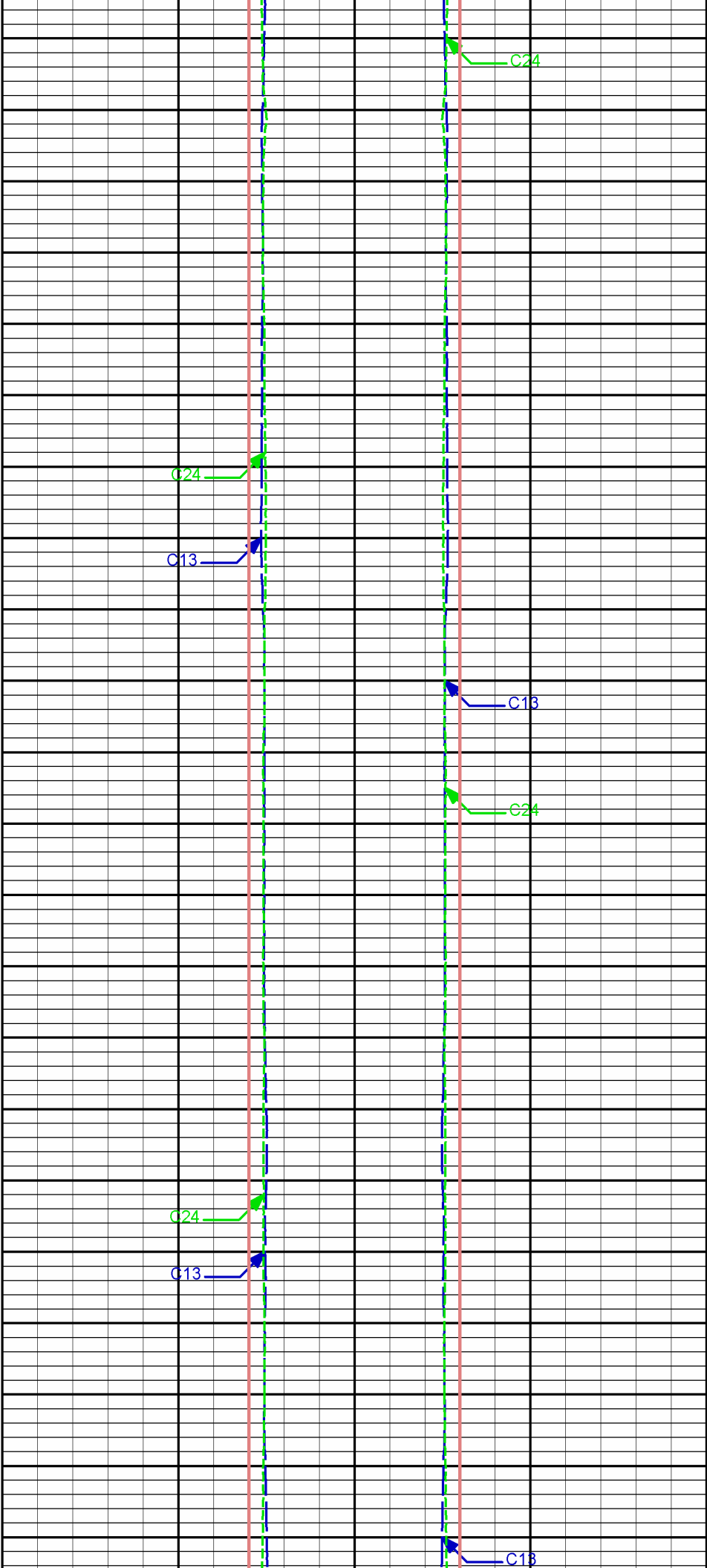
4900

4950

Gamma API

5000

CA A



C24

C24

C13

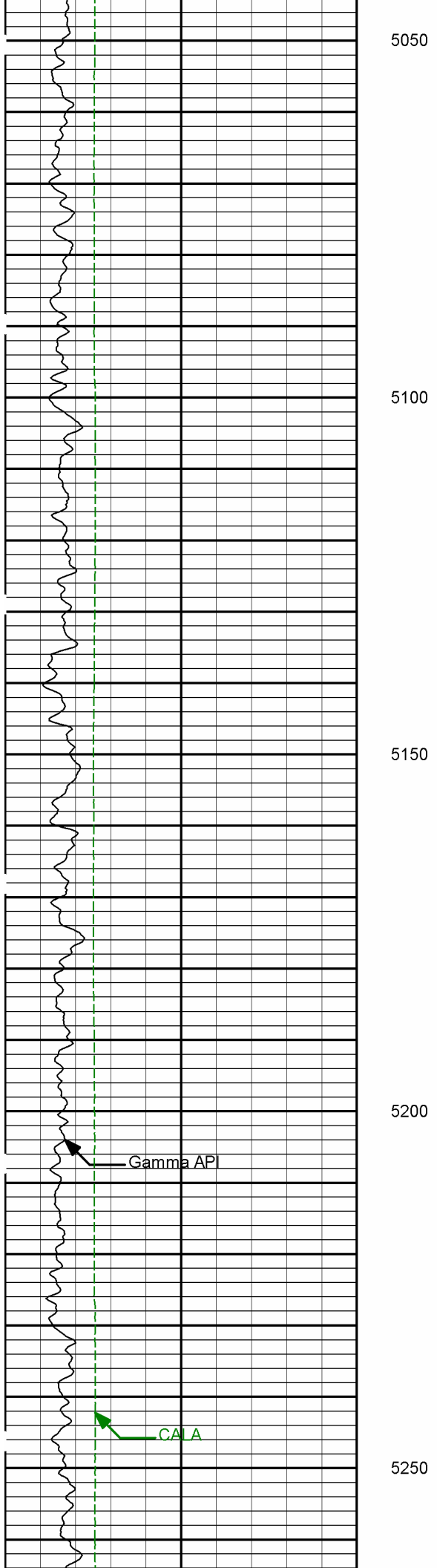
C13

C24

C24

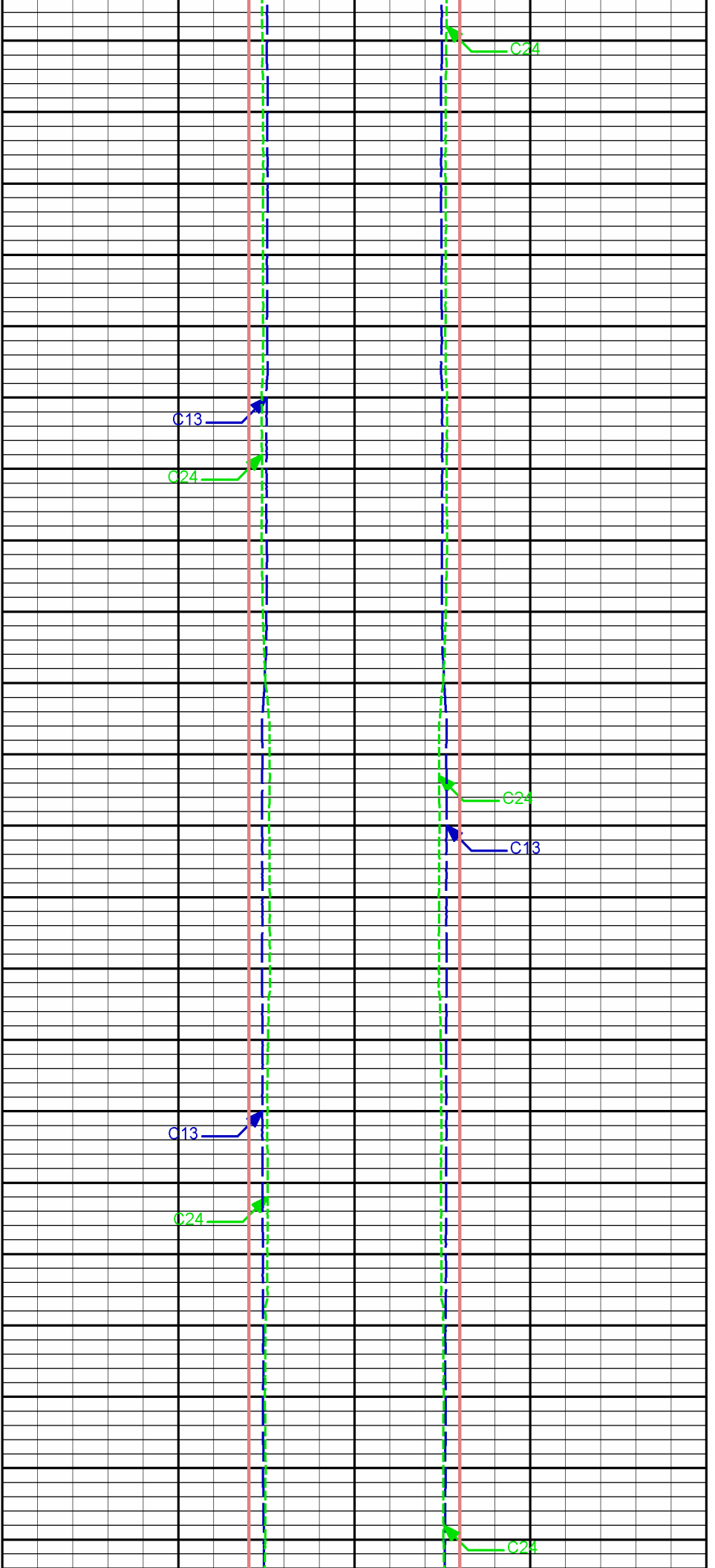
C13

C18



Gamma API

CALA



C13

C24

C13

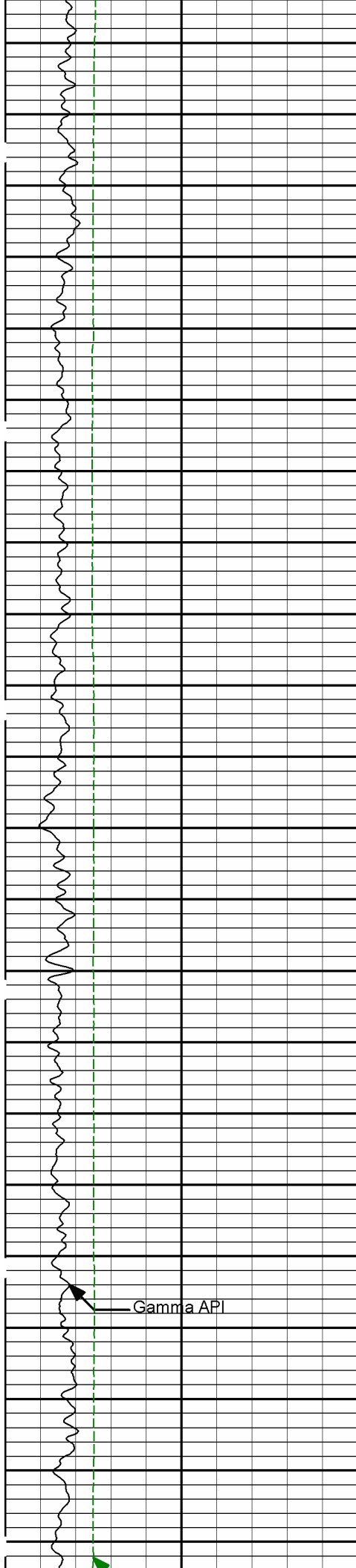
C24

C24

C24

C13

C24



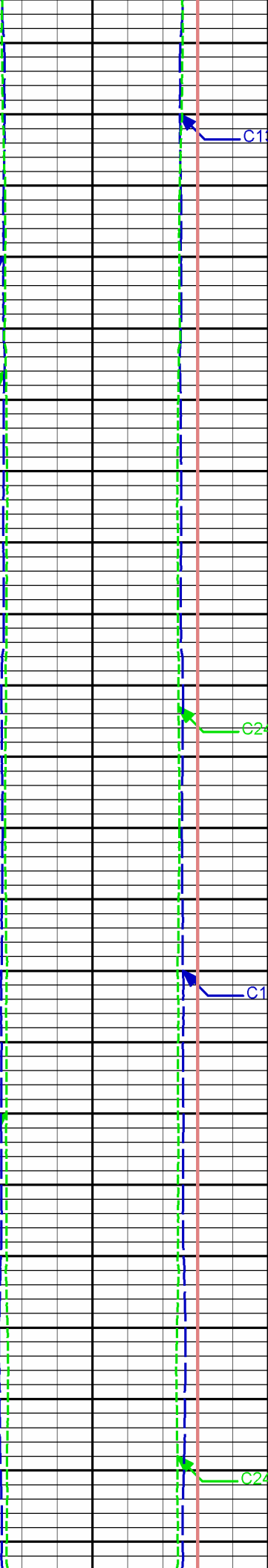
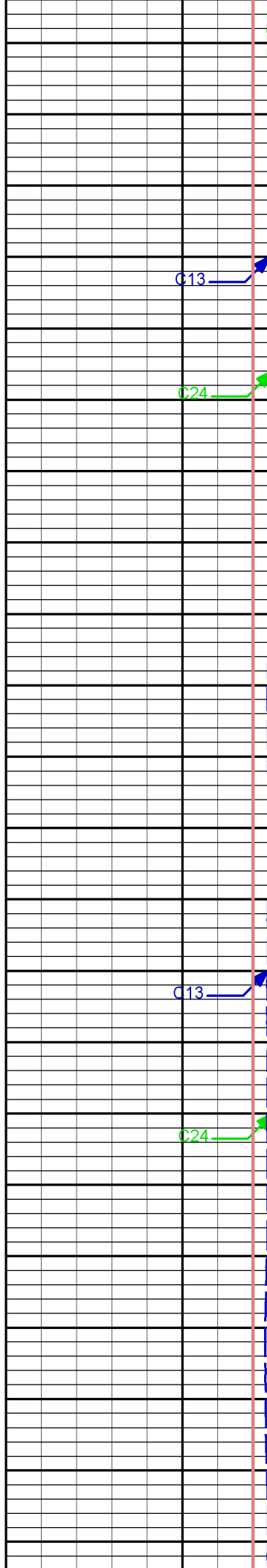
5300

5350

5400

5450

Gamma API



C13

C13

C24

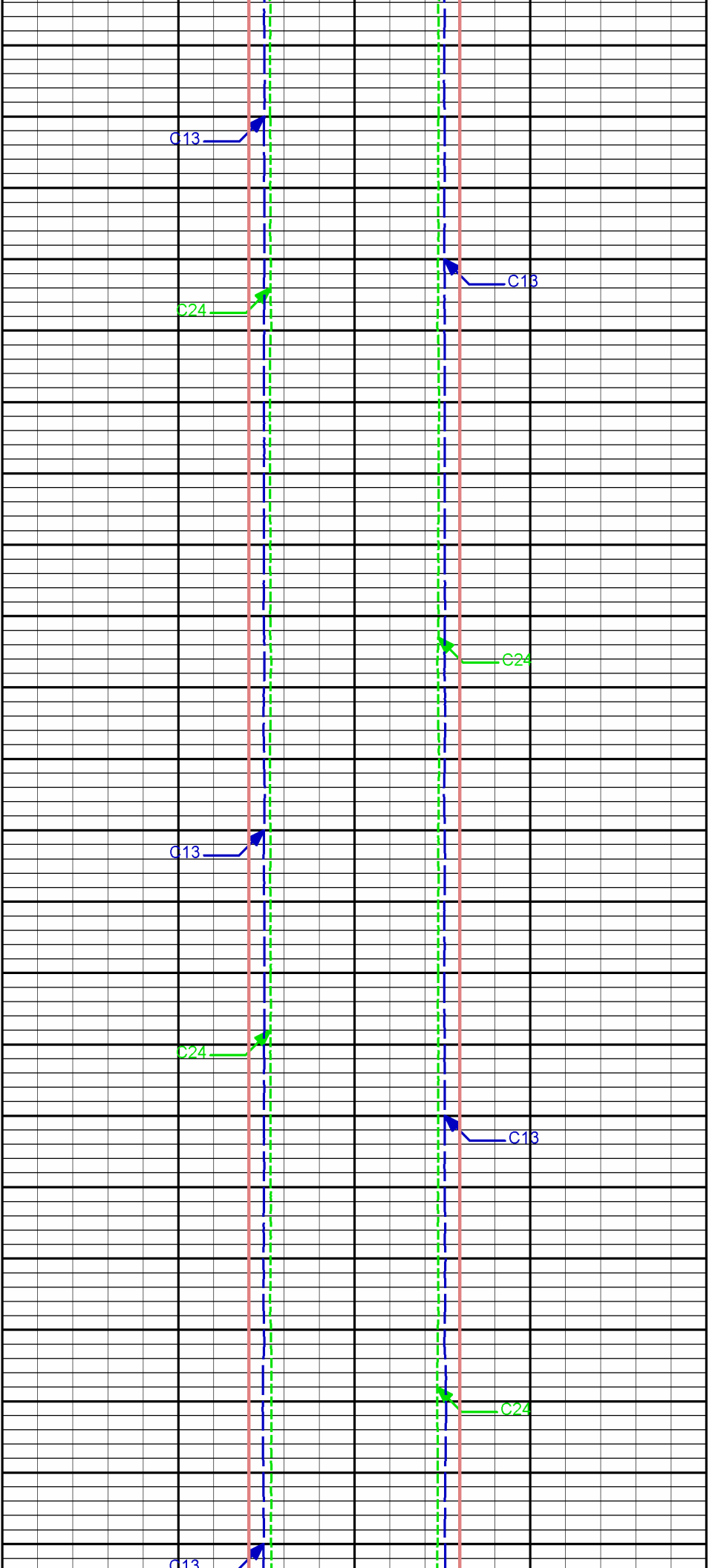
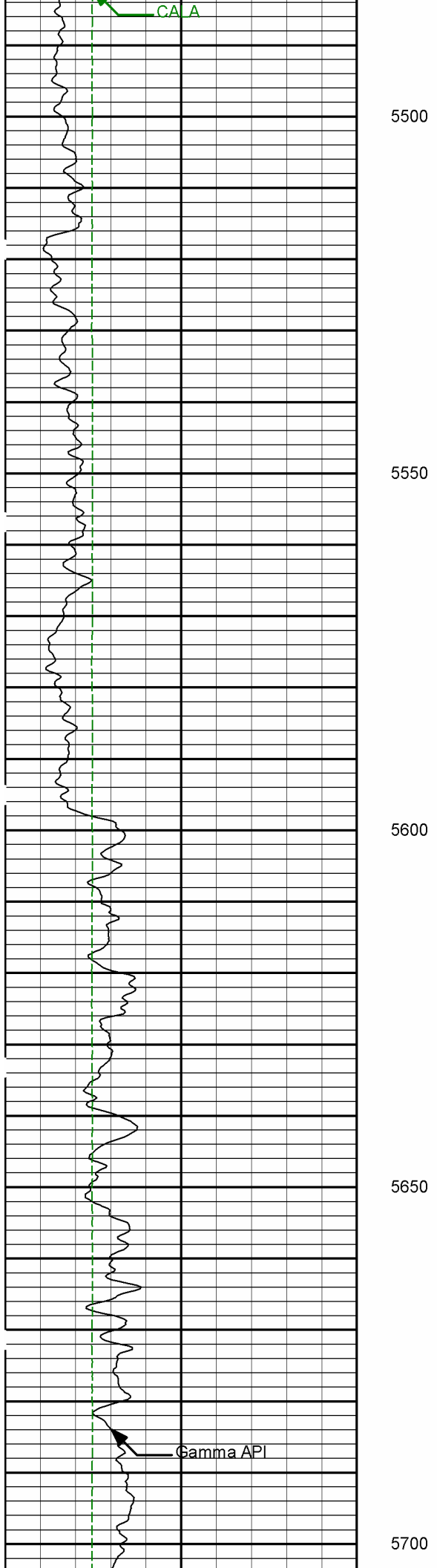
C24

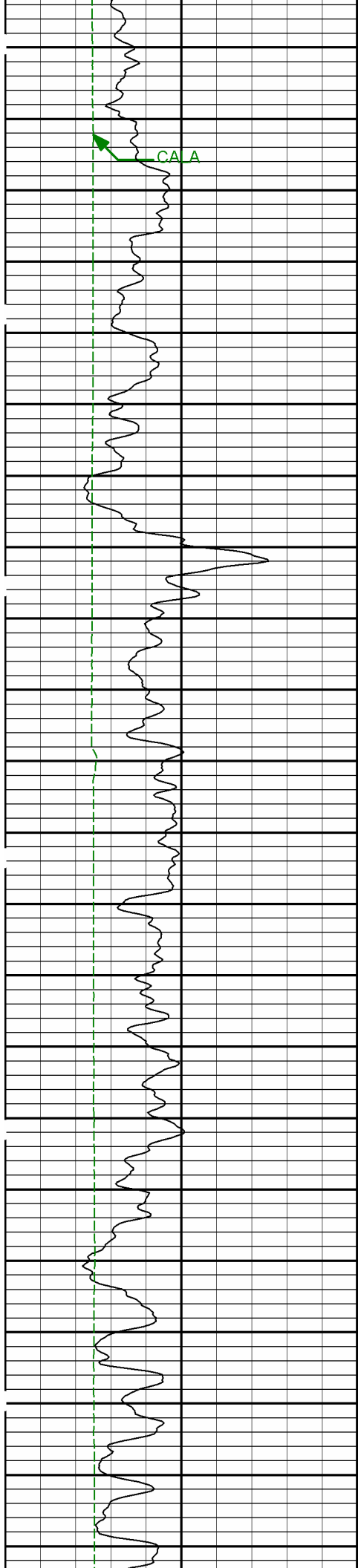
C13

C13

C24

C24



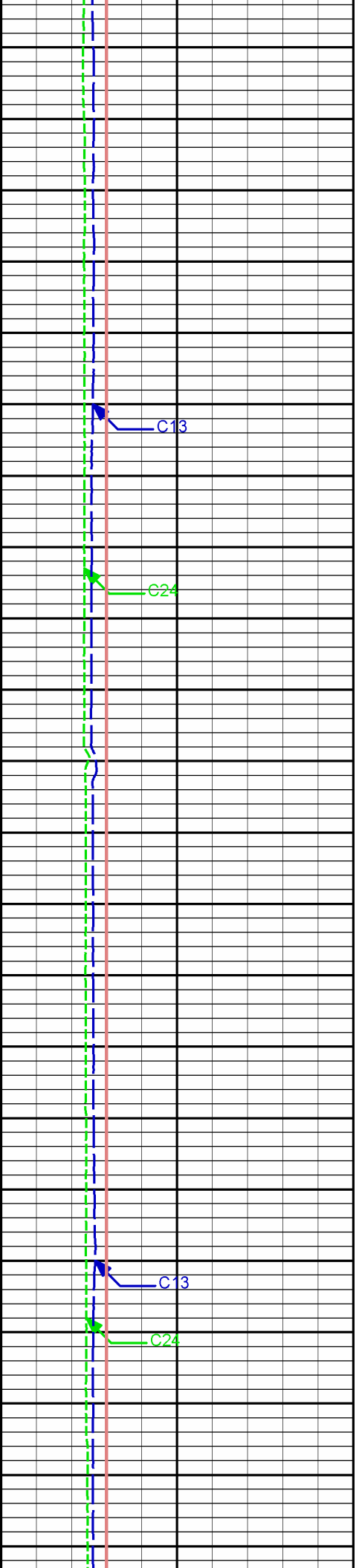
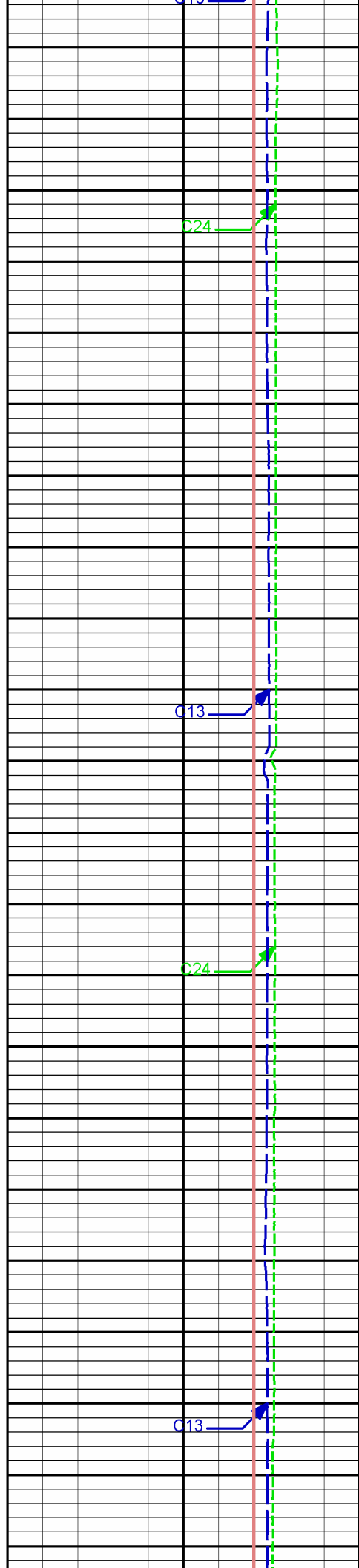


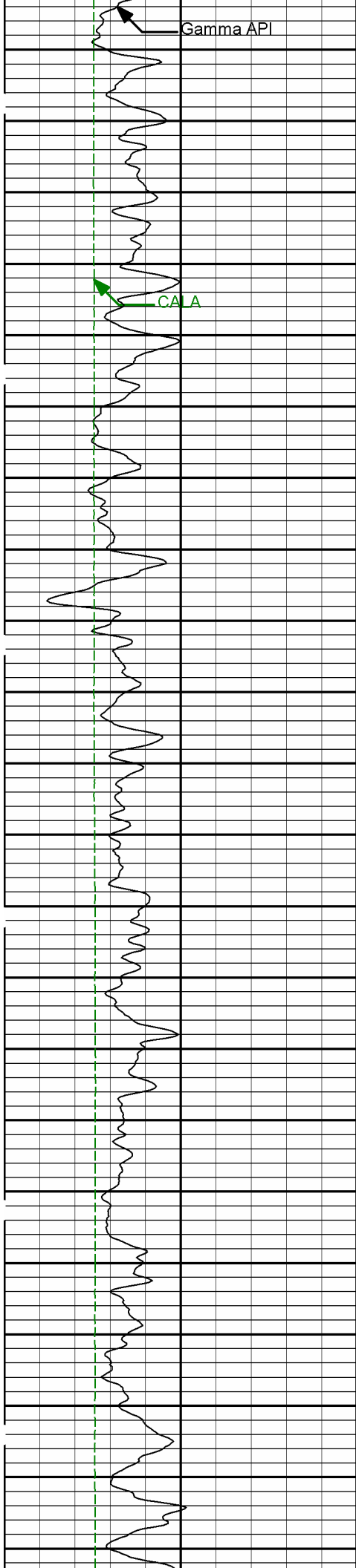
5750

5800

5850

5900



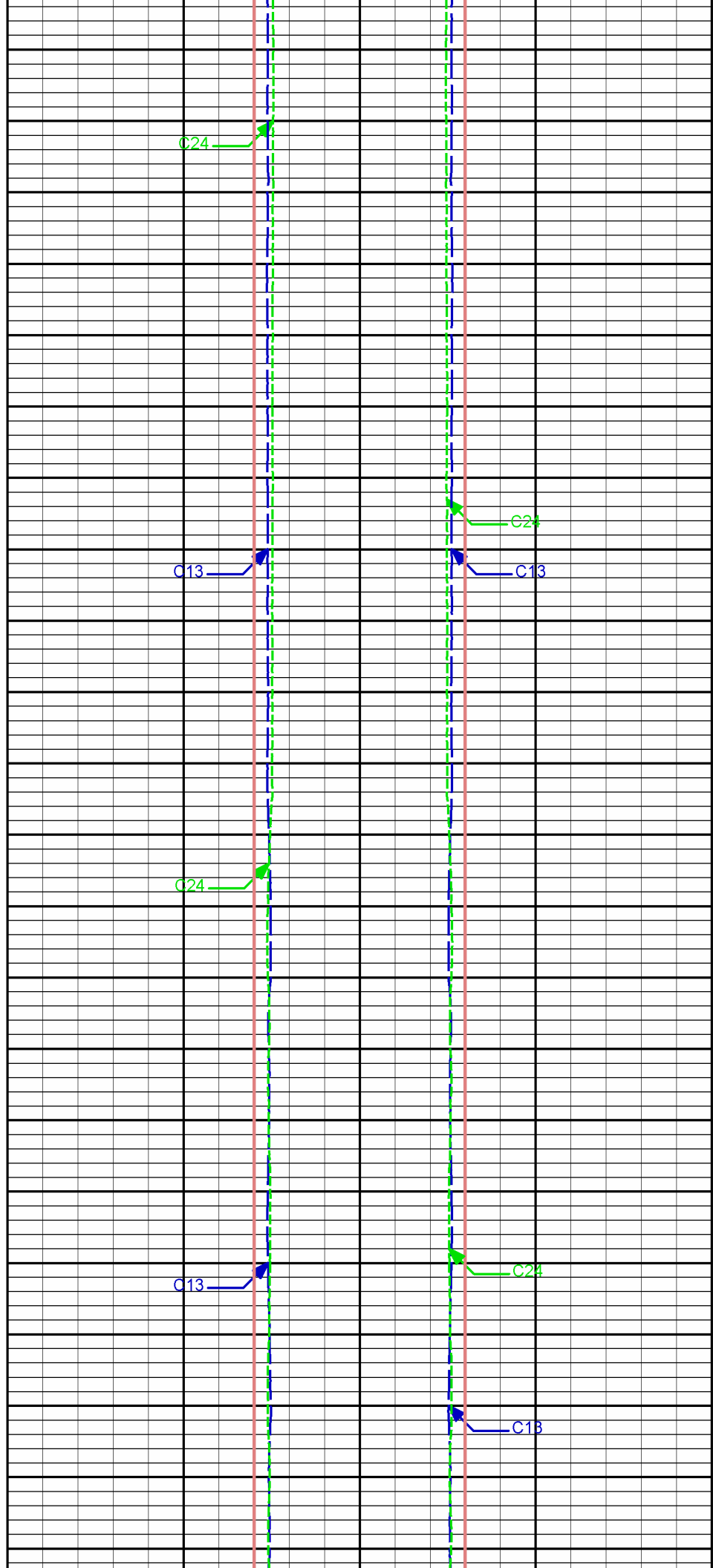


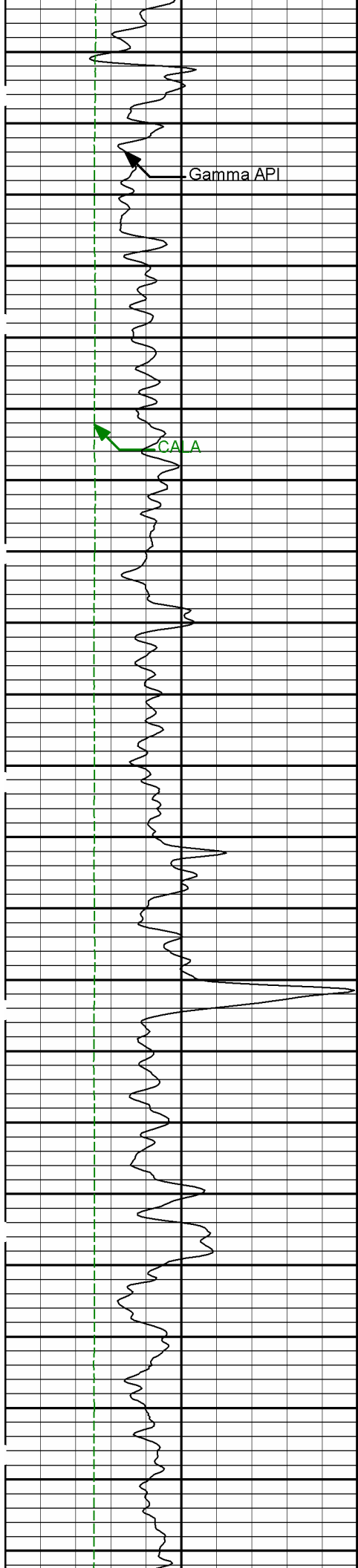
5950

6000

6050

6100





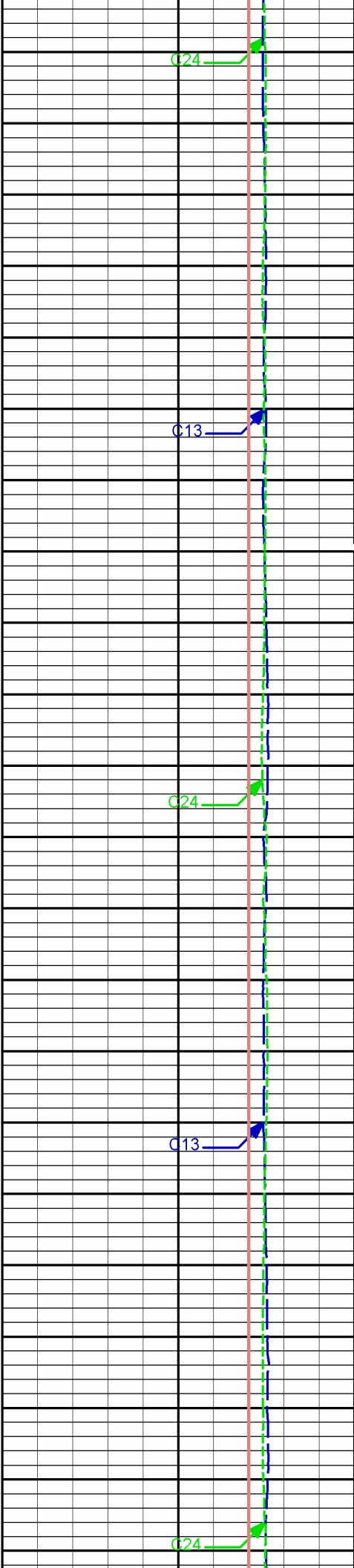
6150

6200

6250

6300

6350



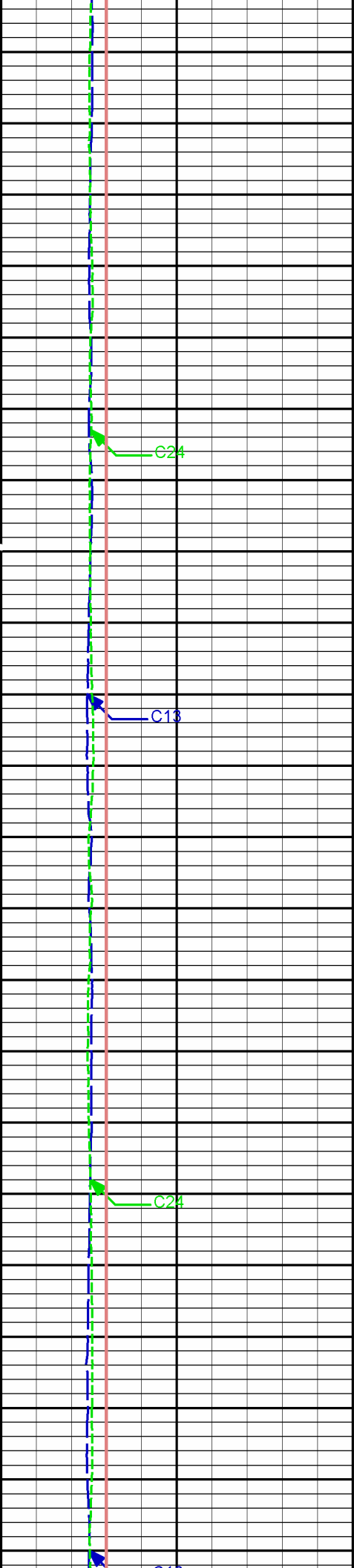
C24

C13

C24

C13

C24

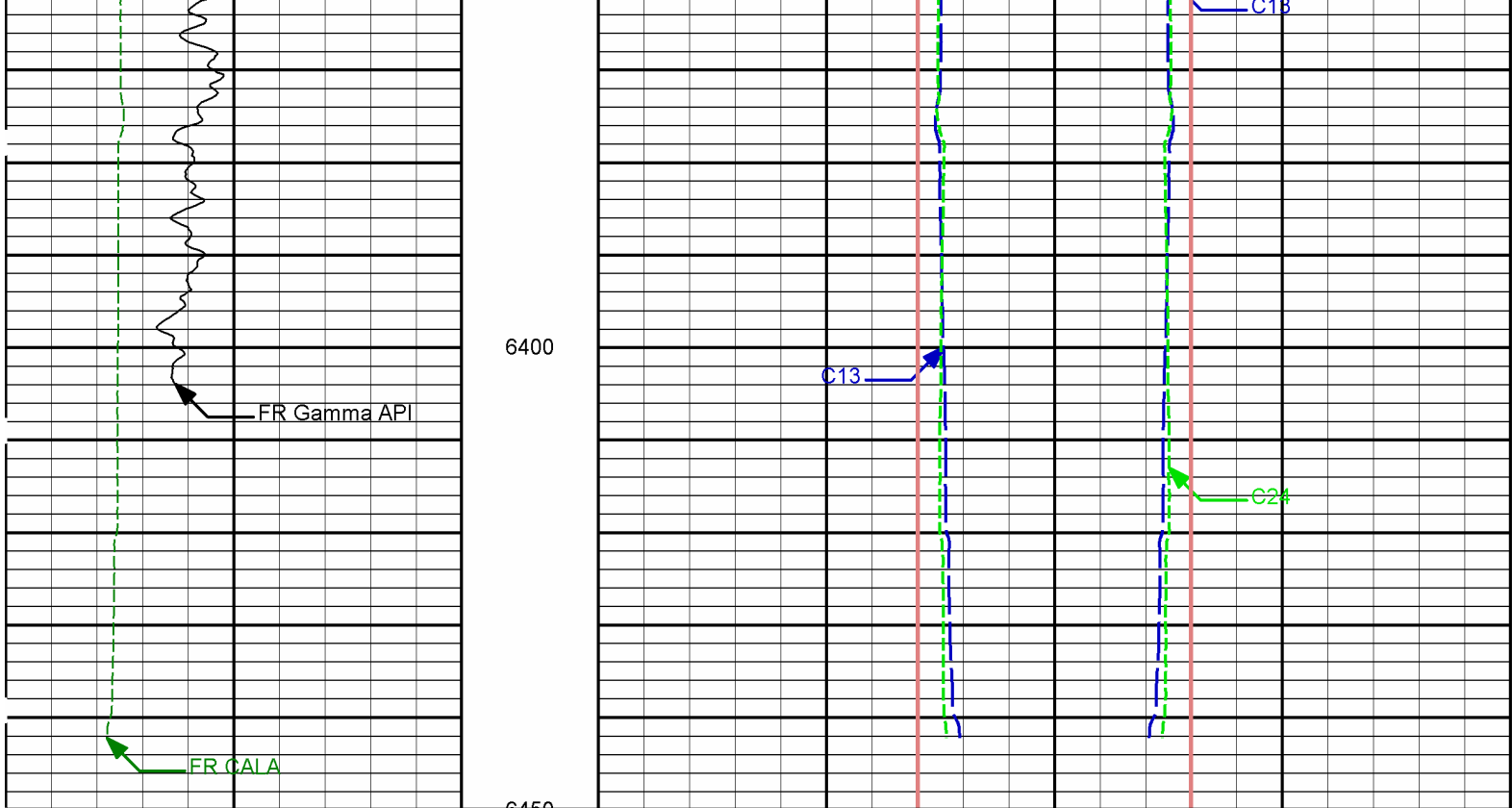


C24

C13

C24

C13



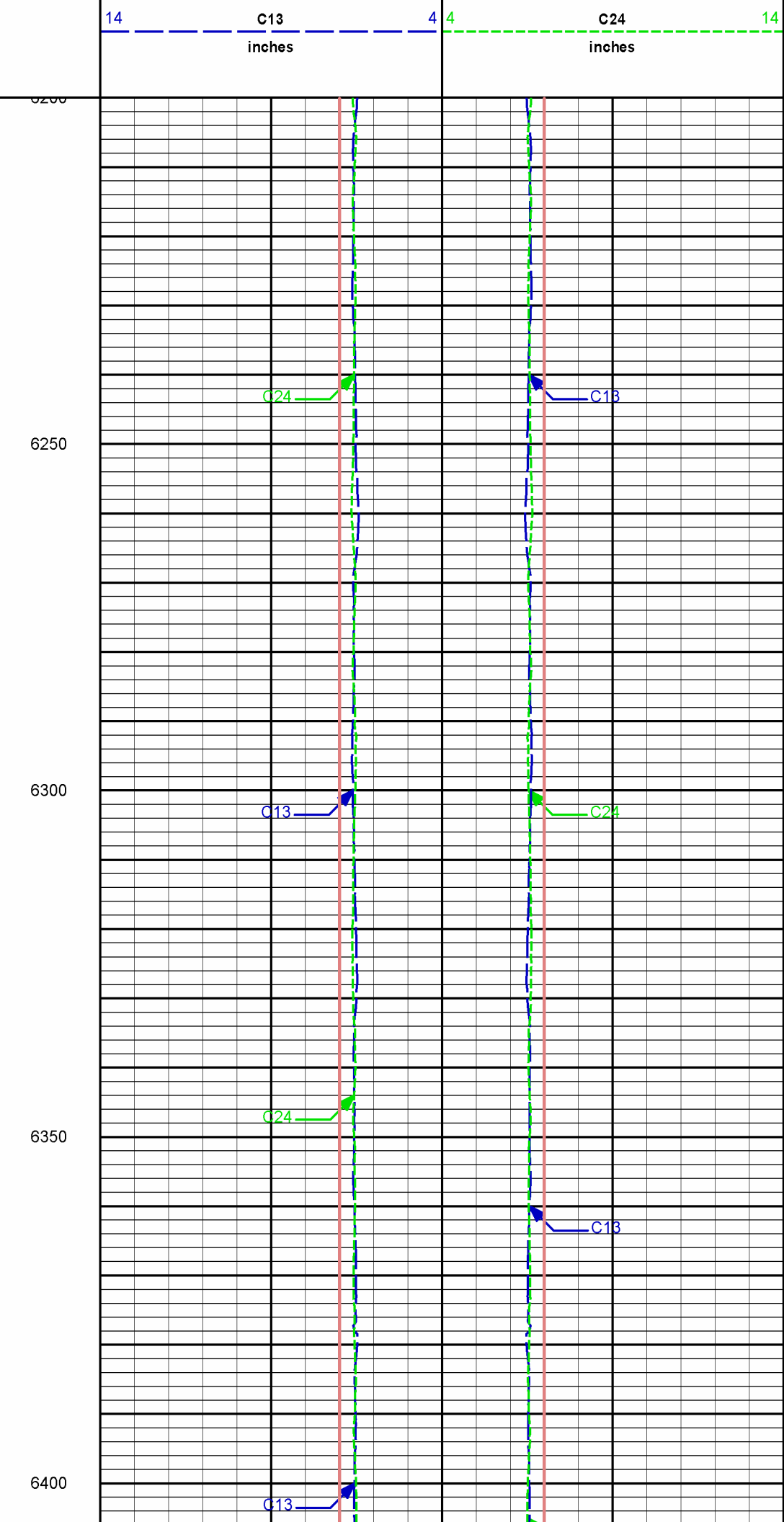
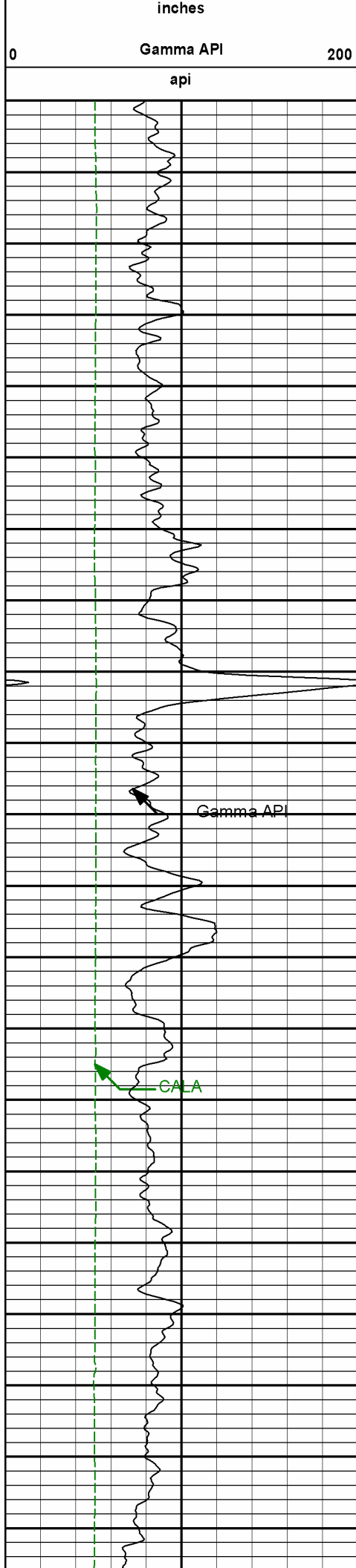
0	Gamma API	200	14	C13	4	4	C24	14
	api			inches			inches	
4	CALA	14	14	C24	4	4	C13	14
	inches			inches			inches	
			14	Casing OD	4	4	Casing OD	14
				inches			inches	

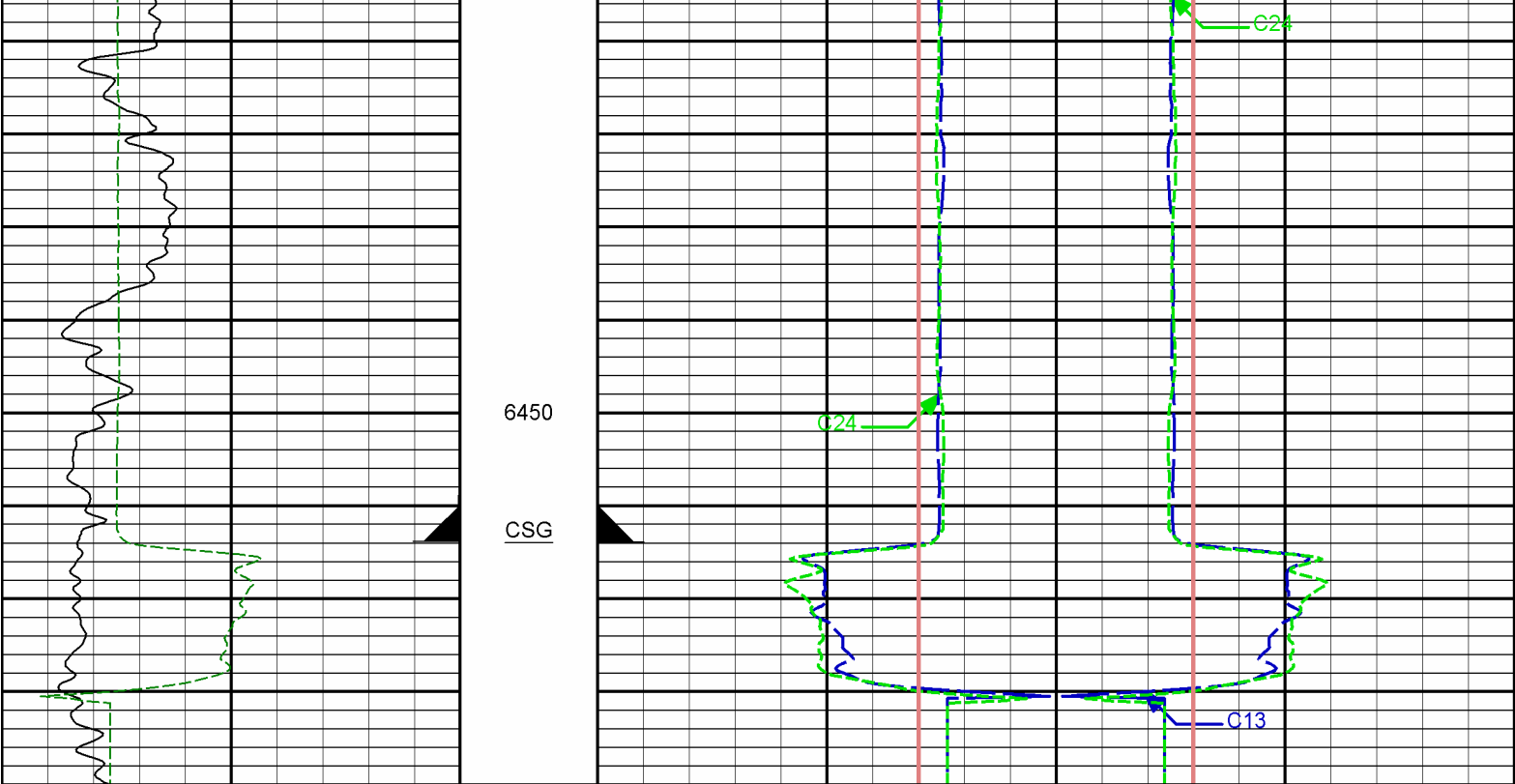
MAIN PASS 5" = 100'

REPEAT PASS 5" = 100'

			14	Casing OD	4	4	Casing OD	14
				inches			inches	
			14	C24	4	4	C13	14
				inches			inches	
4	CALA	14						







0	Gamma API	200	14	C13	4	4	C24	14
	api			inches			inches	
4	CALA	14	14	C24	4	4	C13	14
	inches			inches			inches	
			14	Casing OD	4	4	Casing OD	14
				inches			inches	

REPEAT PASS 5" = 100'

HALLIBURTON

CALIBRATION REPORT

DITS 4 TELEMETRY GAMMA SHOP CALIBRATION (GIBRALTAR)			
Tool Name:	D4TGX - 044	Reference Calibration Date:	15-Dec-06 20:41:52
Engineer:	M. LEE	Calibration Date:	06-Feb-09 03:09:06
Software Version:	WL INSITE R2.4 (Build 1)	Calibration Version:	1

Calibrator Source S/N: TB-110  
Calibrator API Reference:239.00 api

Measurement	Measured	Calibrated	Units
Background	36.8	35.4	api
Background + Calibrator	285.0	274.4	api
Calibrator	237.6	239.0	api

DITS 4 TELEMETRY GAMMA FIELD CALIBRATION (GIBRALTAR)

Tool Name: D4TGX - 044

Engineer: K. WOOD

Software Version: WL INSITE R2.4 (Build 11)

Reference Calibration Date: 06-Feb-09 03:09:06

Calibration Date: 19-Mar-09 10:30:49

Calibration Version: 1

Calibrator Source S/N: TB-110  
Calibrator API Reference:239.00 api

Field Verification	Shop	Field	Units
Background	35.4	36.2	api
Background + Calibrator	274.4	271.5	api
Calibrator	239.0	235.3	api
Shop	Field	Difference	Tolerance
239.0	235.3	3.7	+/- 9.00

DITS 4 TELEMETRY GAMMA POST CALIBRATION (GIBRALTAR)

Tool Name: D4TGX - 044

Engineer: K. WOOD

Software Version: WL INSITE R2.4 (Build 11)

Reference Calibration Date: 19-Mar-09 10:30:49

Calibration Date: 19-Mar-09 18:10:48

Calibration Version: 1

Calibrator Source S/N: TB-110  
Calibrator API Reference:239.00 api

Post Verification		Field	Post	Units
Background		36.2	29.8	api
Background + Calibrator		271.5	265.6	api
Calibrator		235.3	235.8	api
Shop	Field	Post	Difference	Tolerance
239.0	235.3	235.8	-0.5	+/- 9.00

FIAC SHOP CALIBRATION

Tool Name: FIAC - A066

Engineer: K. WOOD

Software Version: WL INSITE R2.4 (Build 11)

Reference Calibration Date: 19-Mar-09 10:25:40

Calibration Date: 19-Mar-09 10:31:28

Calibration Version: 1

CALIPERS AND RINGS			
Ring	Measured	Calibrated	Units
CALIPER 1:			
Small Ring	3.60	3.63	in
Medium Ring	7.97	8.00	in
Large Ring	15.00	15.00	in
X-Large Ring	21.00	21.00	in
CALIPER 2:			
Small Ring	3.63	3.63	in
Medium Ring	8.01	8.00	in
Large Ring	15.00	15.00	in
X-Large Ring	21.00	21.00	in
CALIPER 3:			
Small Ring	3.62	3.63	in
Medium Ring	7.99	8.00	in
Large Ring	14.99	15.00	in
X-Large Ring	20.99	21.00	in
CALIPER 4:			
Small Ring	3.62	3.63	in

Small Ring	5.02	5.03	in
Medium Ring	7.99	8.00	in
Large Ring	15.00	15.00	in
X-Large Ring	21.00	21.00	in

FIAC FIELD CALIBRATION			
Tool Name:	FIAC - A066	Reference Calibration Date:	19-Mar-09 10:31:28
Engineer:	K. WOOD	Calibration Date:	19-Mar-09 10:32:55
Software Version:	WL INSITE R2.4 (Build 11)	Calibration Version:	1

CALIPERS			
Caliper	Shop	Field	Units
Caliper 1	8.00	8.00	in
Caliper 2	8.00	8.01	in
Caliper 3	8.00	8.00	in
Caliper 4	8.00	8.00	in

FIAC POST CALIBRATION			
Tool Name:	FIAC - A066	Reference Calibration Date:	19-Mar-09 10:32:55
Engineer:	K. WOOD	Calibration Date:	19-Mar-09 18:09:49
Software Version:	WL INSITE R2.4 (Build 11)	Calibration Version:	1

CALIPERS			
Caliper	Field	Post	Units
Caliper 1	8.00	8.10	in
Caliper 2	8.01	7.92	in
Caliper 3	8.00	7.97	in
Caliper 4	8.00	8.08	in

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
D4TGX-044						
Gamma Ray Calibrator	239.0	235.3	235.8	-0.5	+/- 9.00	api
FIAC-A066						
CALIPER 1	8.00	8.00	8.10	-0.10	+/-0.25	in
CALIPER 2	8.00	8.01	7.92	0.09	+/-0.25	in
CALIPER 3	8.00	8.00	7.97	0.03	+/-0.25	in
CALIPER 4	8.00	8.00	8.08	-0.08	+/-0.25	in

Data: CHV_MBLARSON_C410002 CBL-FIAC IDLE	Date: 19-Mar-09 18:11:48
--	--------------------------

HALLIBURTON	
CUSTOMER EVENT LOG	

Event Type	Time & Date	Depth (ft)	Event Description
	19-Mar-09 11:13:08	10.00	Logging 001 19-Mar-09 11:13 Dn @10.0f
	19-Mar-09 11:15:07	227.43	Halting 001 19-Mar-09 11:13 Dn @10.0f
	19-Mar-09 11:16:54	467.50	Logging 002 19-Mar-09 11:16 Dn @467.5f
	19-Mar-09 11:19:37	968.41	Halting 002 19-Mar-09 11:16 Dn @467.5f
	19-Mar-09 11:19:43	968.00	Logging 003 19-Mar-09 11:19 Up @968.0f
	19-Mar-09 11:25:07	865.54	Halting 003 19-Mar-09 11:19 Up @968.0f
	19-Mar-09 11:32:35	829.00	Logging 004 19-Mar-09 11:32 Dn @829.0f

19-Mar-09 12:11:07	6600.33	Halting 004	19-Mar-09 11:32 Dn @829.0f
19-Mar-09 12:11:16	6600.50	Logging 005	19-Mar-09 12:11 Up @6600.5f
19-Mar-09 12:35:19	6191.97	Halting 005	19-Mar-09 12:11 Up @6600.5f
19-Mar-09 12:38:11	6450.25	Logging 006	19-Mar-09 12:38 Up @6450.3f
19-Mar-09 14:55:18	1196.64	Halting 006	19-Mar-09 12:38 Up @6450.3f
19-Mar-09 14:59:12	1800.50	Logging 007	19-Mar-09 14:59 Up @1800.5f
19-Mar-09 14:59:20	1800.48	Halting 007	19-Mar-09 14:59 Up @1800.5f
19-Mar-09 14:59:59	1881.00	Logging 008	19-Mar-09 14:59 Up @1881.0f
19-Mar-09 15:01:57	1791.99	Halting 008	19-Mar-09 14:59 Up @1881.0f
19-Mar-09 15:09:12	1765.00	Logging 009	19-Mar-09 15:09 Dn @1765.0f
19-Mar-09 15:10:27	2044.42	Halting 009	19-Mar-09 15:09 Dn @1765.0f
19-Mar-09 15:10:35	2044.50	Logging 010	19-Mar-09 15:10 Up @2044.5f
19-Mar-09 15:29:39	1529.99	Halting 010	19-Mar-09 15:10 Up @2044.5f

Data: CHV\_MBLARSON\_C4I0001 CBL-FIAC\HW11047

Date: 19-Mar-09 17:50:59

**HALLIBURTON**

## CUSTOMER EVENT LOG

Event Type	Time & Date	Depth (ft)	Event Description
	19-Mar-09 15:39:03	1527.75	Logging 001 19-Mar-09 15:39 Up @1527.8f
	19-Mar-09 15:42:00	1435.46	Halting 001 19-Mar-09 15:39 Up @1527.8f
	19-Mar-09 15:45:34	1472.00	Logging 002 19-Mar-09 15:45 Up @1472.0f
	19-Mar-09 15:48:25	1389.80	Halting 002 19-Mar-09 15:45 Up @1472.0f
	19-Mar-09 15:50:25	1450.50	Logging 003 19-Mar-09 15:50 Up @1450.5f
	19-Mar-09 15:56:57	1200.69	Halting 003 19-Mar-09 15:50 Up @1450.5f
	19-Mar-09 16:02:37	1318.50	Logging 004 19-Mar-09 16:02 Up @1318.5f
	19-Mar-09 16:08:18	1043.57	Halting 004 19-Mar-09 16:02 Up @1318.5f
	19-Mar-09 16:13:16	6450.25	Relogging 006.02 19-Mar-09 16:12 Up
	19-Mar-09 16:13:57	4800.01	Halting 006.02 19-Mar-09 16:12 Up
	19-Mar-09 16:25:57	4850.50	Logging 005 19-Mar-09 16:25 Up @4850.5f
	19-Mar-09 17:03:25	6600.50	Relogging 005.01 19-Mar-09 17:03 Up
	19-Mar-09 17:03:46	6191.97	Halting 005.01 19-Mar-09 17:03 Up
	19-Mar-09 17:42:12	95.17	Halting 005 19-Mar-09 16:25 Up @4850.5f

Data: CHV\_MBLARSON\_C4I0002 CBL-FIAC\HW11047

Date: 19-Mar-09 17:51:17

**HALLIBURTON**

## TOOL STRING DIAGRAM REPORT

Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
RWCH-C11013846 135.00 lbs	Ø 3.625 in →		Load Cell @ 51.46 ft BH Temperature @ 50.89 ft	6.25 ft	55.14 ft
CCLD4-CCL 15.00 lbs	Ø 3.675 in →		CCL @ 48.18 ft	2.00 ft	48.89 ft
			GammaRay @ 45.21 ft		46.89 ft

D4TGX-044  
221.00 lbs

Ø 3.625 in →

9.63 ft

← Z-Accelerometer @ 38.48 ft

37.26 ft

CBL-M305-112510  
475.00 lbs

Ø 3.625 in →

20.50 ft

← Tx1 Amp & TT @ 24.00 ft

← Tx1 MSG @ 23.00 ft

16.76 ft

FIAC-A066  
250.00 lbs

Ø 3.625 in →

13.76 ft

← FACT Caliper 1 & 3 @ 6.63 ft

← FACT Caliper 2 & 4 @ 6.38 ft

3.00 ft

CENT-GJ01  
35.00 lbs

Ø 3.625 in →

3.00 ft

0.00 ft

Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH	Releasable Wireline Cable Head		C11013846	135.00	6.25	48.89	300.00
CCL	Casing Collar Locator D4TG		CCL	15.00	2.00	46.89	300.00
D4TGX	DITS Telemetry Gamma - Gibraltar Class		044	221.00	9.63	37.26	60.00
CBL-M305	M305 - CBL		112510	475.00	20.50	16.76	60.00
OBCEN	Centralizer - 29 in.Overbody		GJ01	12.00	2.42	*	31.93
FIAC	Four Independent Arm Caliper		A066	250.00	13.76	3.00	60.00
CENT	Bottom Centralizer		GJ01	35.00	3.00	0.00	300.00

Total

1,143.00 55.14

\* Not included in Total Length and Length Accumulation.

Data: CHV\_MBLARSON\_C4\0001 CBL-FIAC\IDLE

Date: 19-Mar-09 11:01:34

COMPANY	CHEVRON		
WELL	M. B. LARSON C#4		
FIELD	RANGELY		
COUNTY	RIO BLANCO	STATE	CO

**HALLIBURTON**

FOUR INDEPENDENT ARM  
CALIPER TOOL