welenco

5201 Woodmere Drive, Bakersfield, CA 93313– www.welenco.com–(800) 445-9914

DUAL INDUCTION - GAMMA RAY LOG

FILING NO.

COMPANY Mactec

WELL RIPZ-15

FIELD Casmalia

STATE California COUNTY Santa Barbara

LOCATION:
Casmalia Landfill

OTHER SERVICES:
OPTV
Video

JOB NO.
39527

SEC: ____ TWP: ____ RGE: ____ LONG.: ____ LAT.: ____

Permanent Datum: Ground Level, Elev. ____ Ft.
Log Measured From: Ground Level, 00 Ft. Above Perm. Datum
Drilling Measured From: Ground Level

Elev.: K.B. ____ Ft.
D.F. ____ Ft.
G.L. ____ Ft.

Date	Dec. 10, 2004			
Type Of Log	Dual Ind			
Run No.	One	Two	Three	Four
Depth-Driller	200 Ft	Ft	Ft	Ft
Depth-Logger	199.7 Ft	Ft	Ft	Ft
Top Logged Interval	4 Ft	Ft	Ft	Ft
Btm. Logged Interval	194 Ft	Ft	Ft	Ft
Type Fluid In Hole	Water			
Fluid Level	Unk Ft	Ft	Ft	Ft
Max Temp	N/A °F	°F	°F	°F
Operating Rig Time	1.5 Hr	Hr	Hr	Hr
Van No. / Location	L-23 / Bfld			
Recorded By	Craig Corbell			
Witnessed By	Anna Henke			

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	TYPE	FROM	TO
1	6.5 In	74 Ft	200 Ft	8 In	Steel	0 Ft	74 Ft
2	In	Ft	Ft	In		Ft	Ft
3	In	Ft	Ft	In		Ft	Ft

Miscellaneous Information

Remarks:

Drilled By: WDC

Perforated Intervals:

Line Speed:

Borehole Volume Calculations:

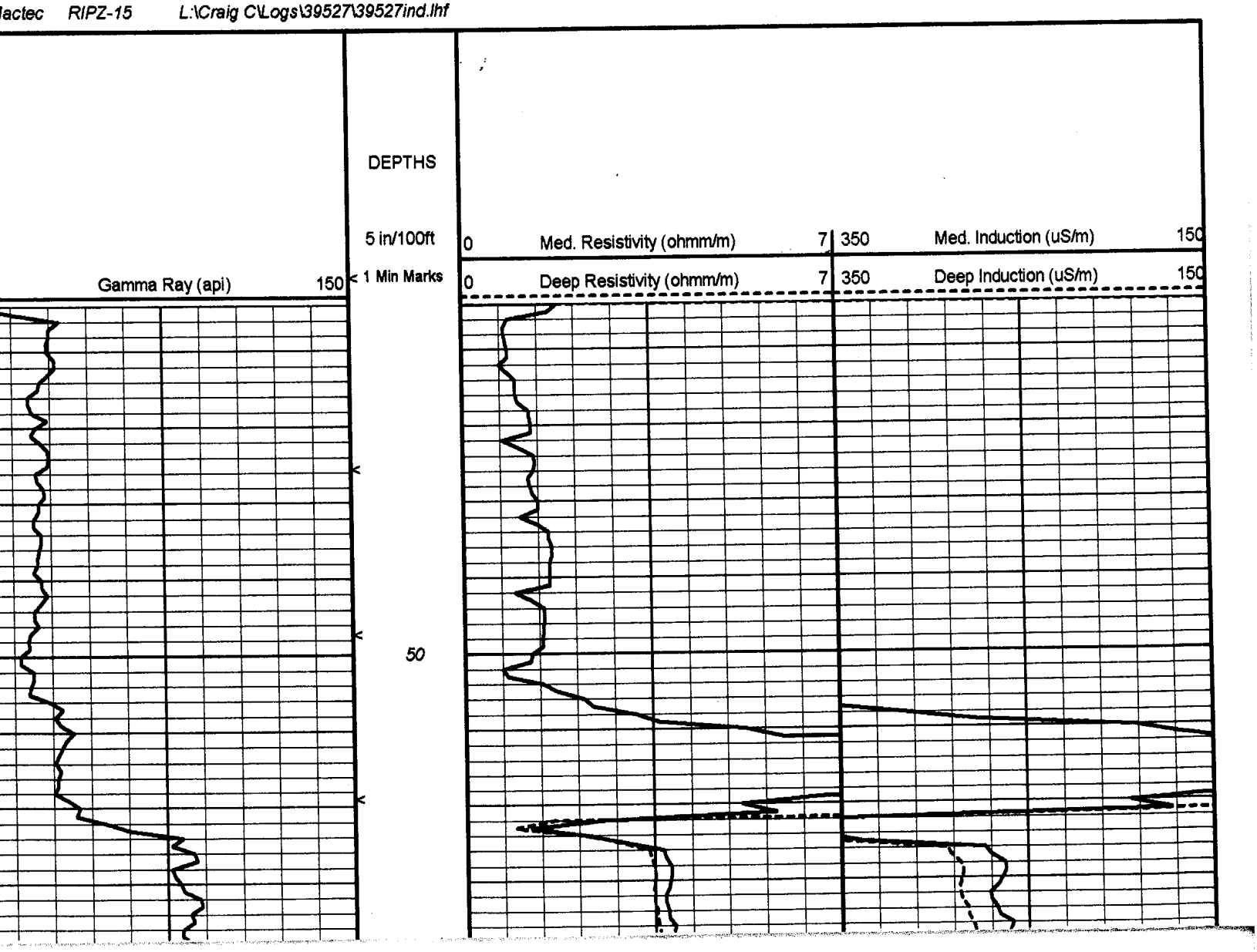
Other Information:

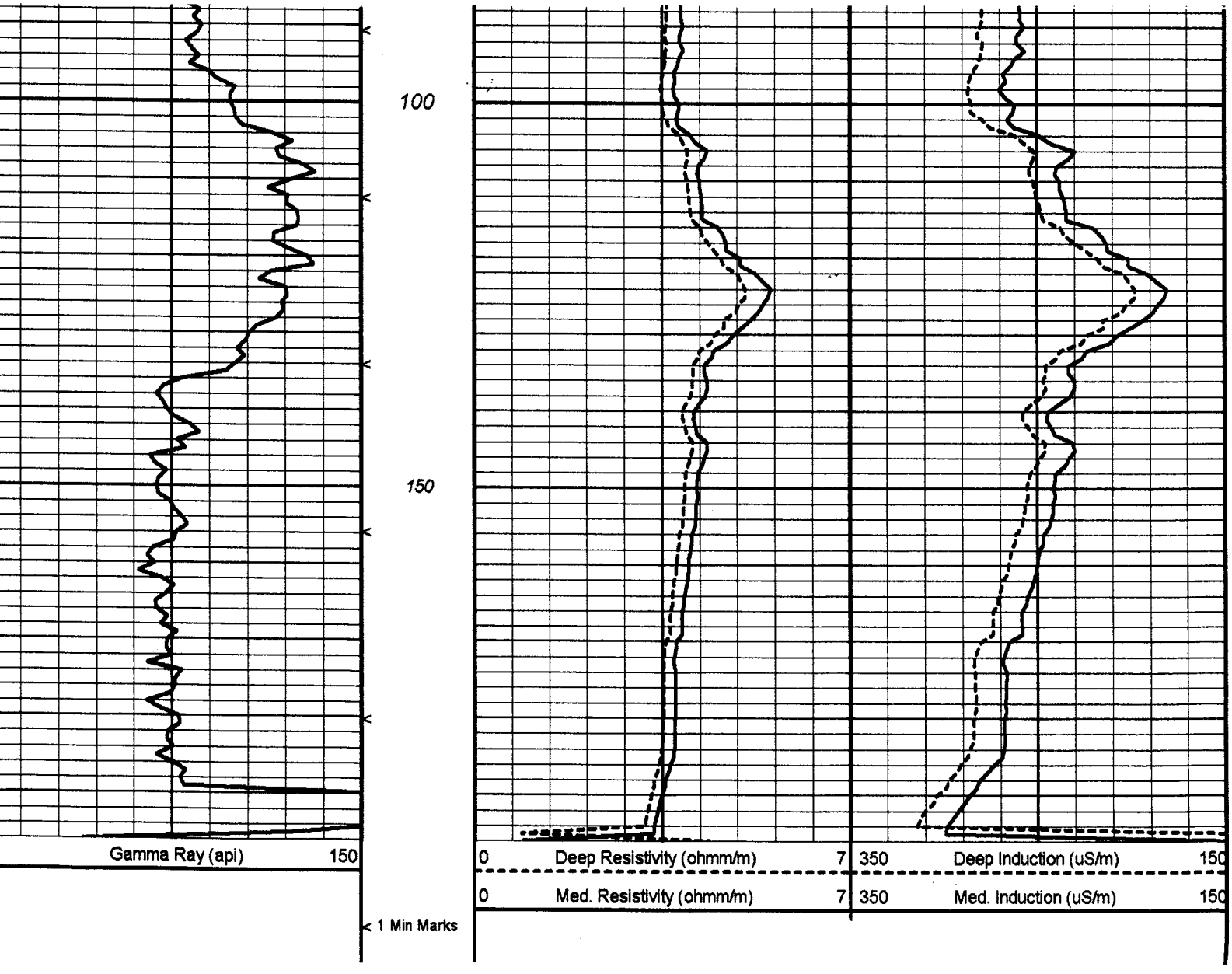
NOTICE

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

welenco, inc. December 15, 2004

lactec RIPZ-15 L:\Craig C\Logs\39527\39527ind.lhf

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Gamma Ray (api)
150
0
Deep Resistivity (ohmm/m)
7
350
Deep Induction (uS/m)
150
0
Med. Resistivity (ohmm/m)
7
350
Med. Induction (uS/m)
150
1 Min Marks

5 in/100ft
DEPTHS

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OPTV DATA PROCESSING
RGLDIP vsn 6.1
BOREHOLE IMAGE LOG

11 Dec 2004

Mactec

Borehole: RIPZ-15

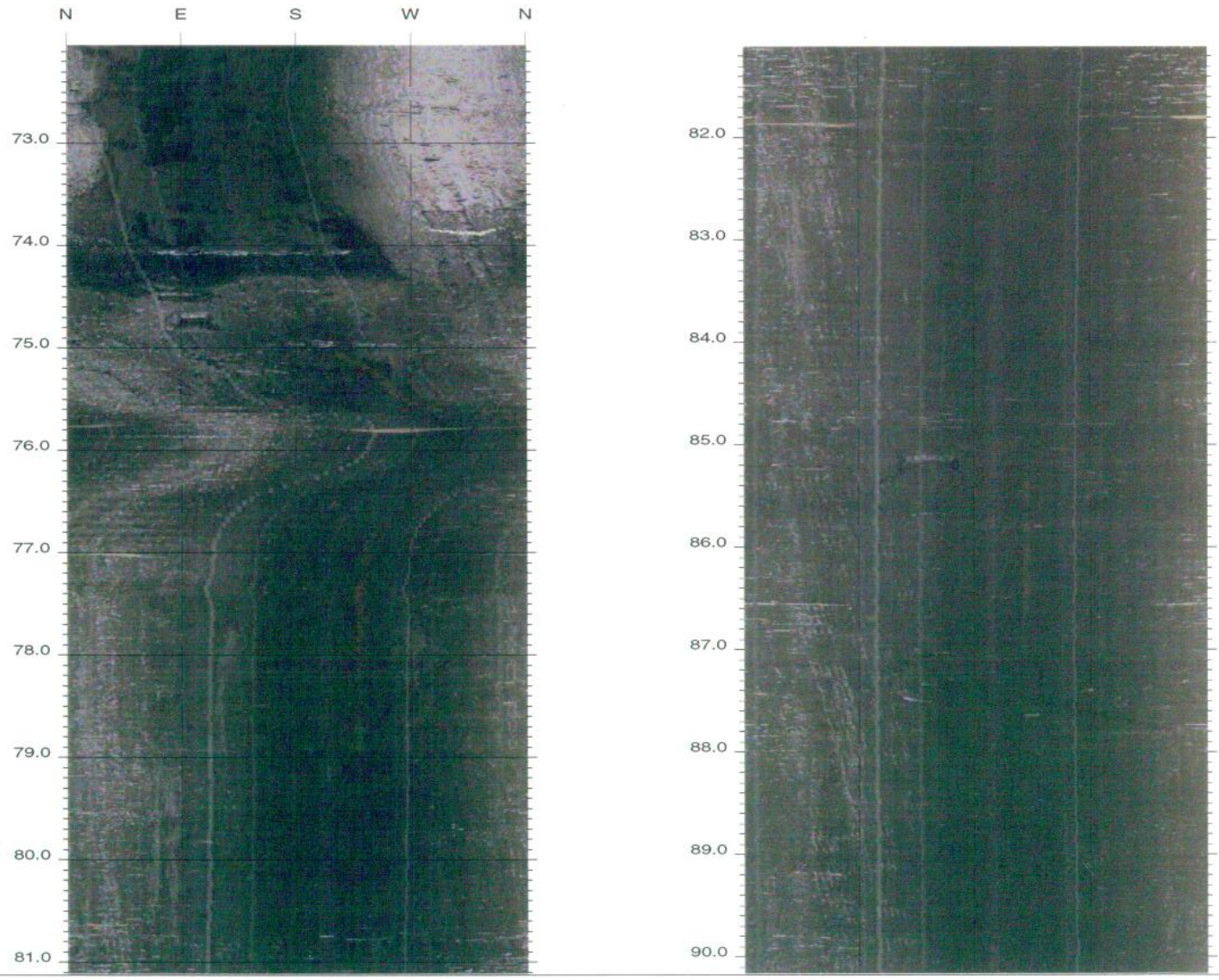
Casmalia Landfill

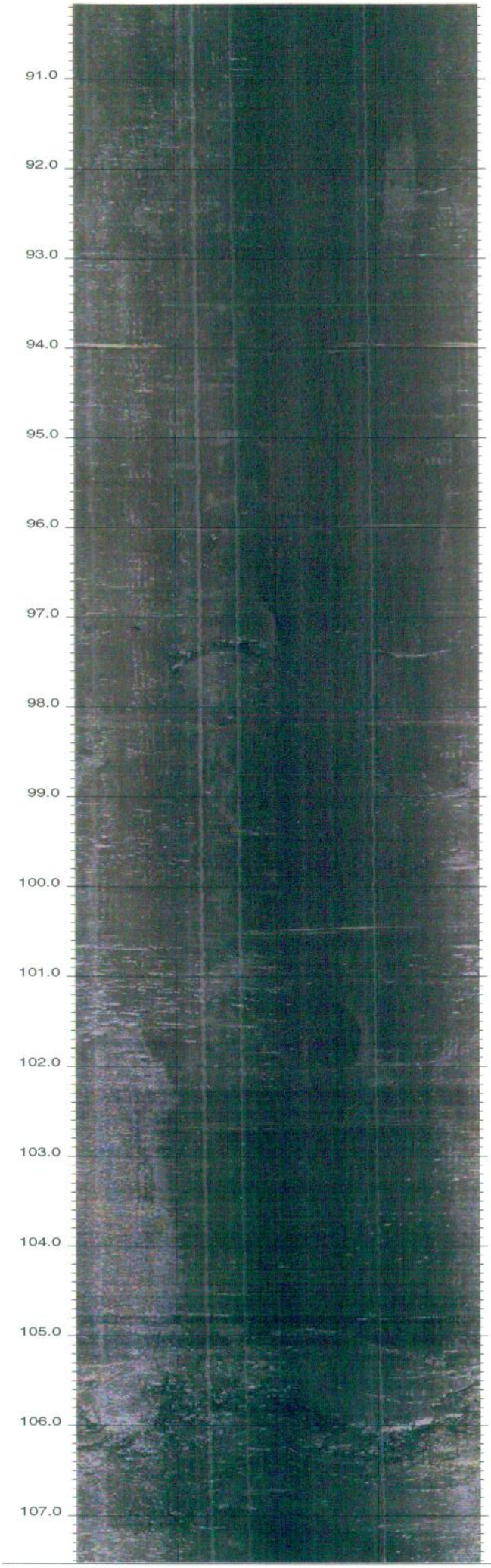
top of borehole.....
East:
North:
Elev:

North ref. is magnetic
Depth units are feet
Vertical scale: 1/20

Zone from 72.0480 to 182.0320ft
Format: BHTV NESWN

Borehole diam: 6.000inch
data intervals.....
Azimuth: 0.5000deg
Depth: 0.0080ft

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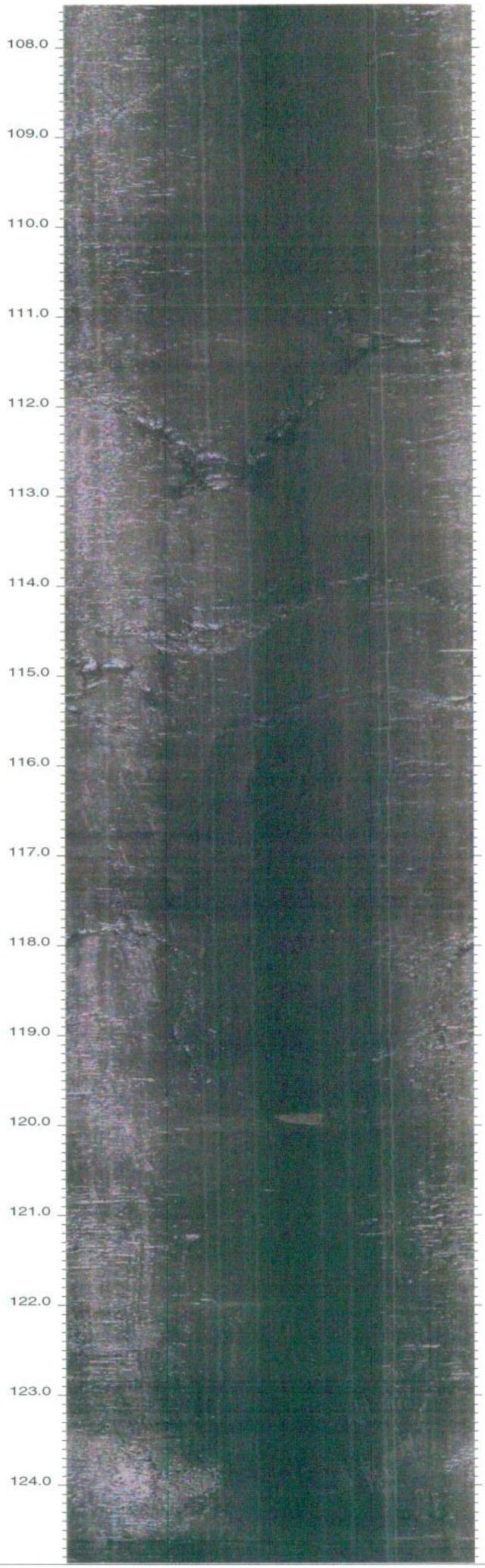
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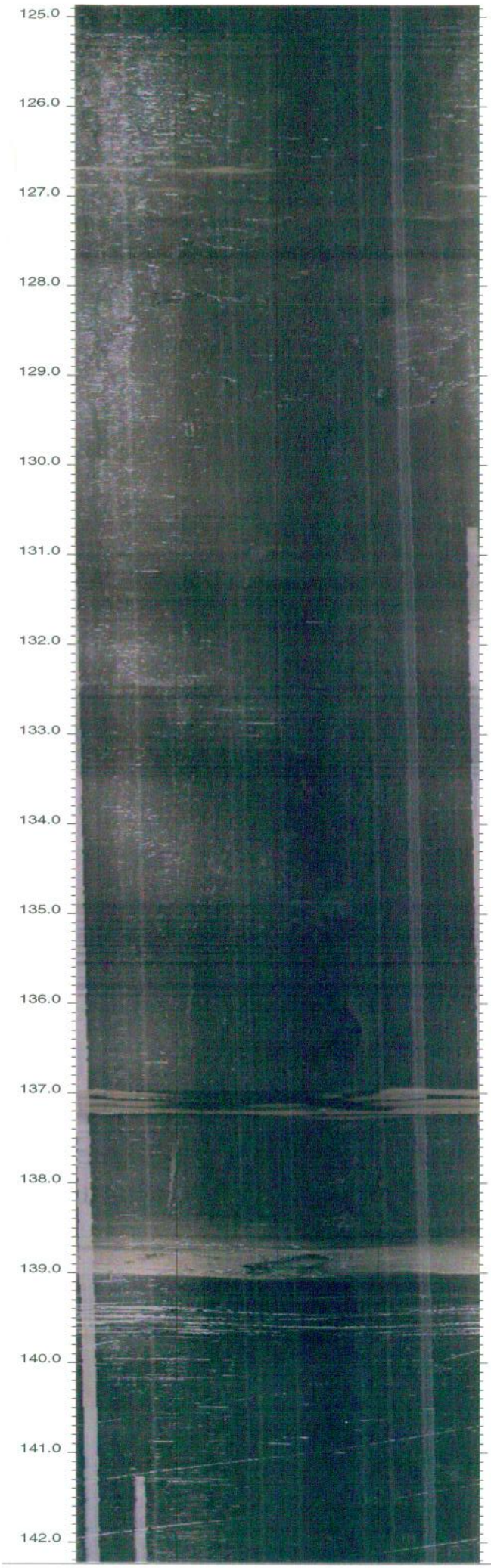
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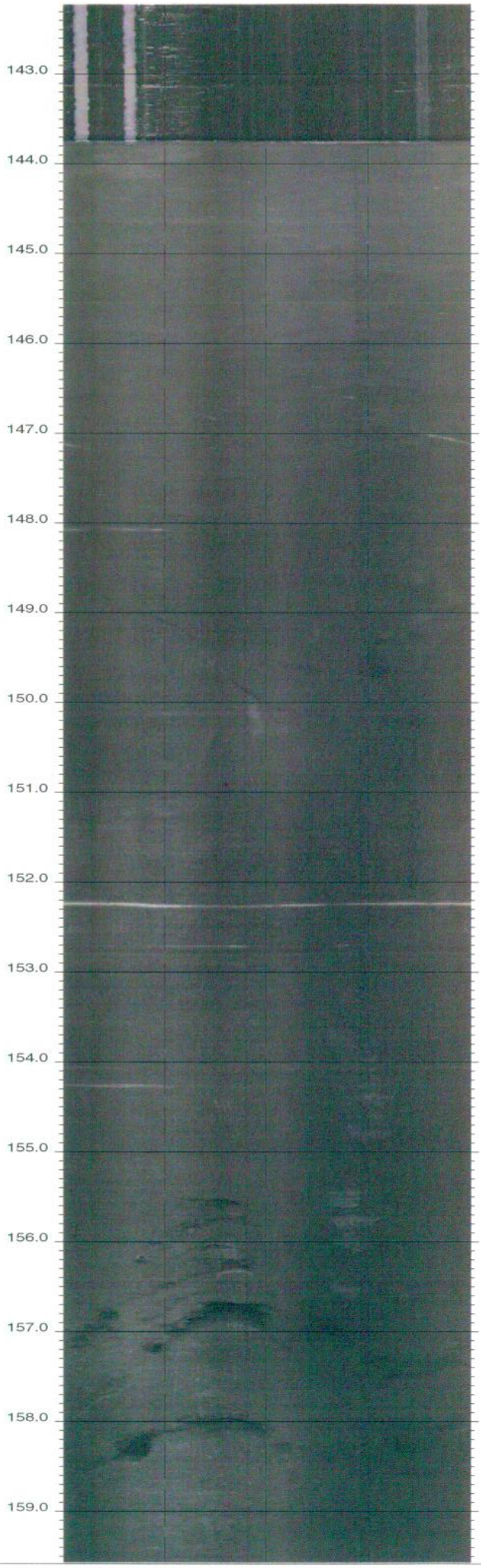
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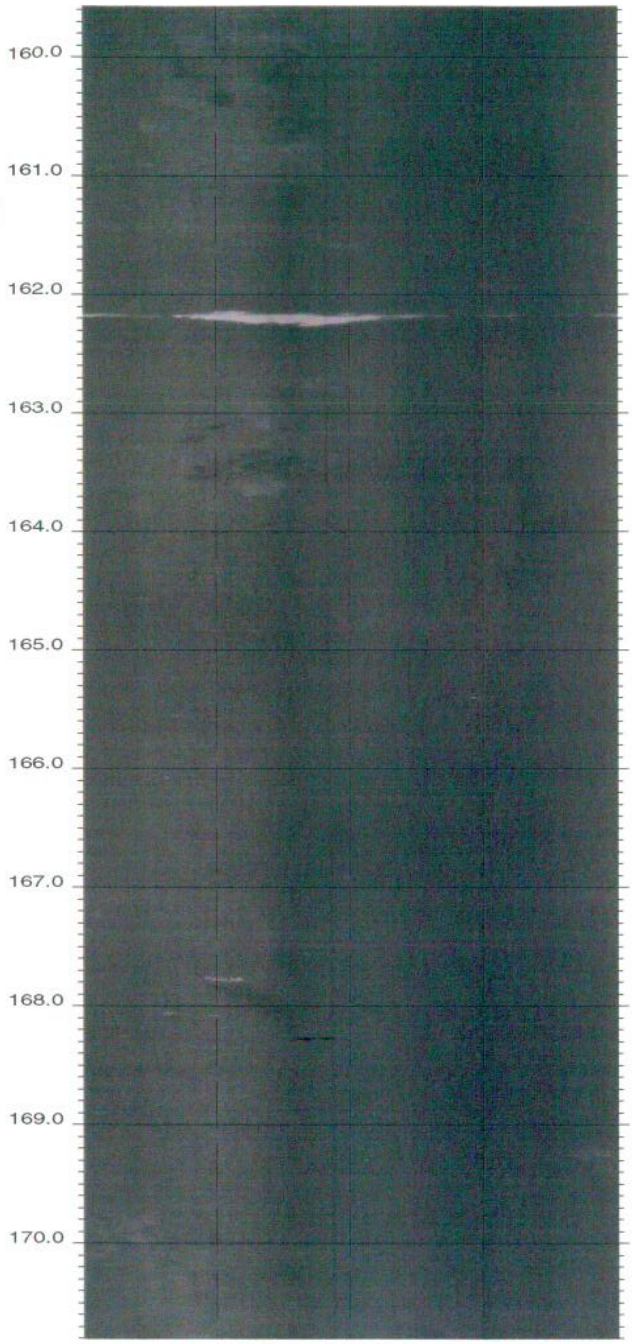
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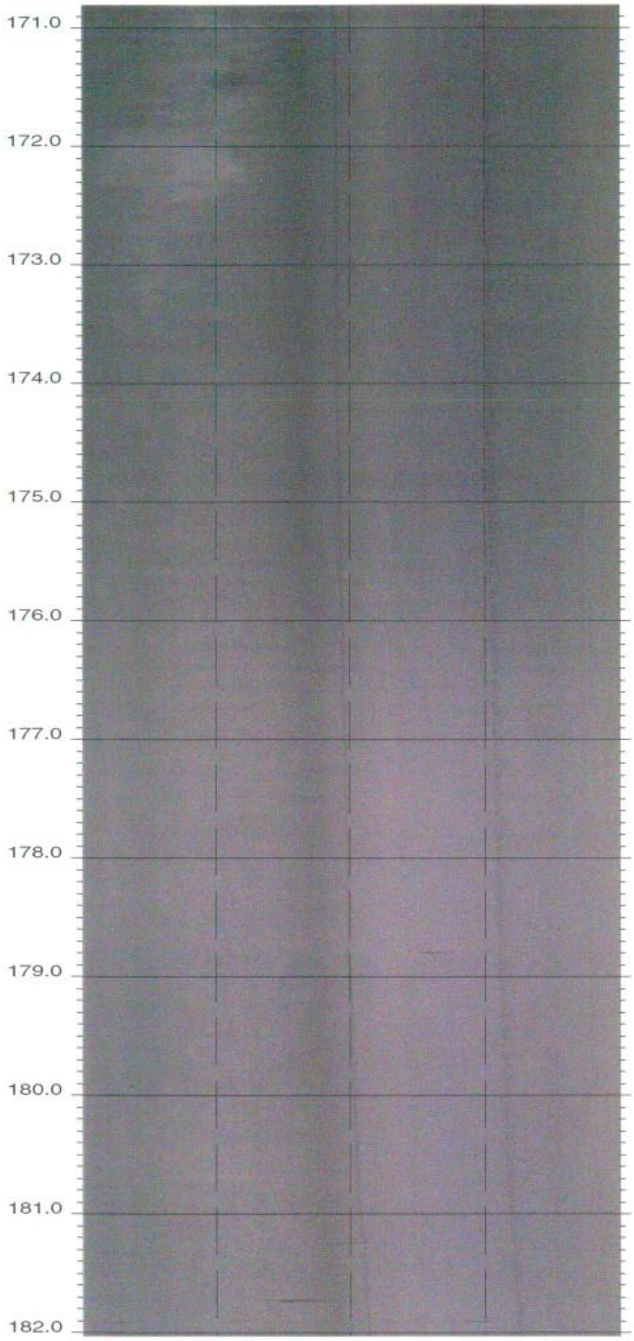
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OPTV DATA PROCESSING
RGLDIP vsn 6.1
INTERPRETED OPTV DIPS LOG

15 Dec 2004

Mactec

Borehole: RIPZ-15

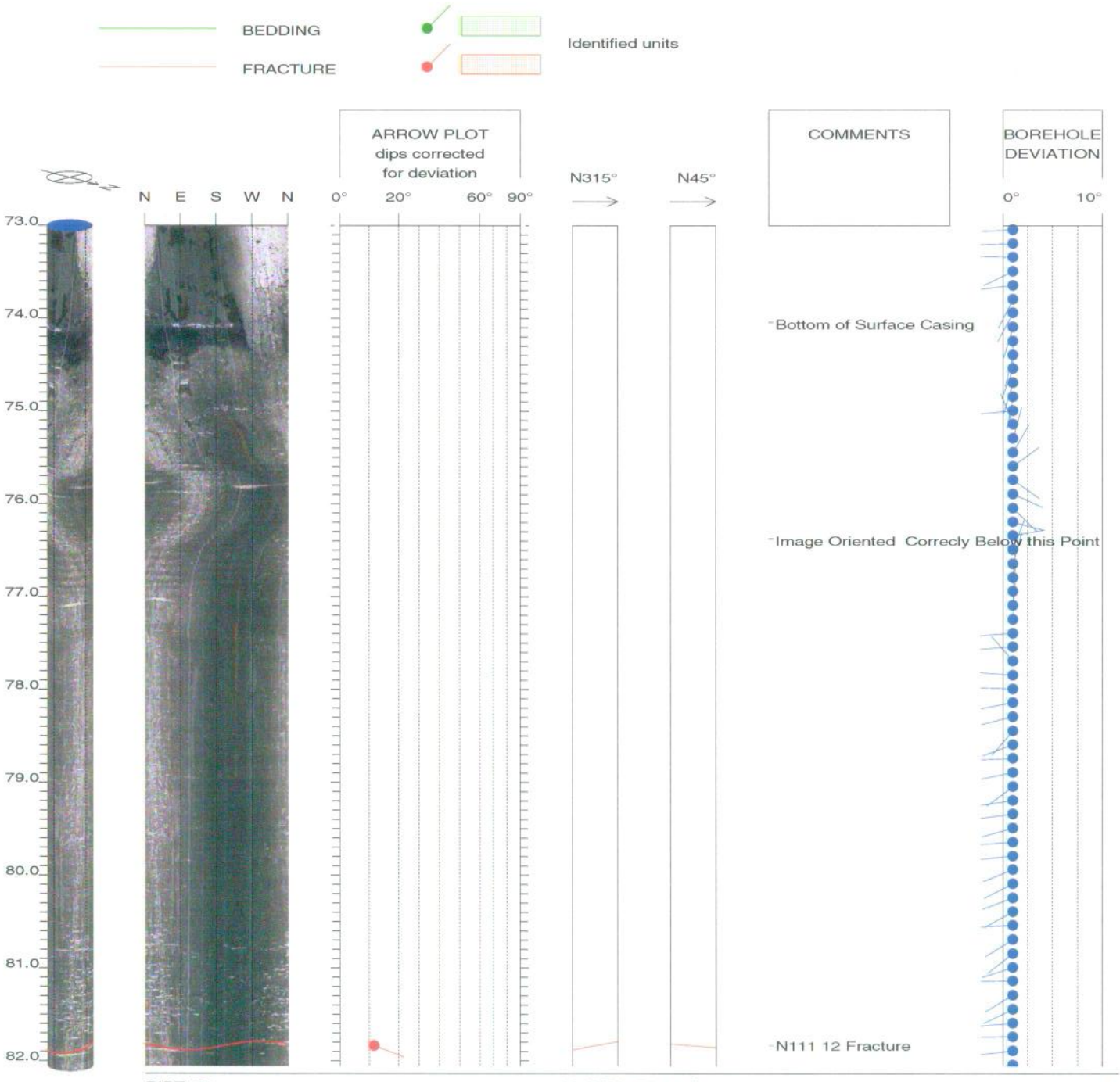
Casmalia Landfill

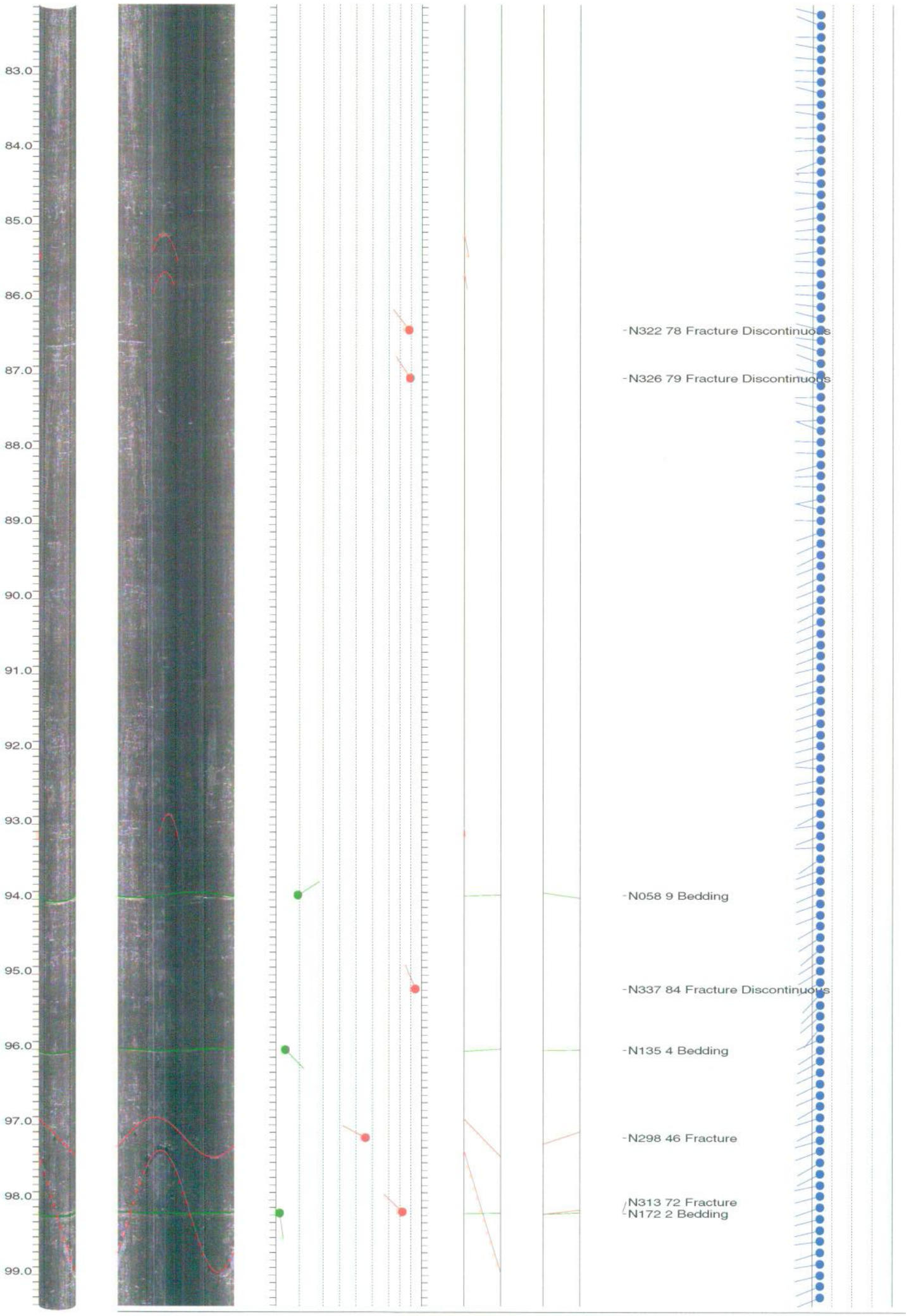
top of borehole.....
East:
North:
Elev:

North ref. is magnetic
Depth units are feet
Vertical scale: 1/20
Horiz scale = vert scale

Zone from 182.000 to 73.000ft
Format: BHTV-NESWN

Borehole diam: 6.000inch
Vertical = borehole-axis

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92.0
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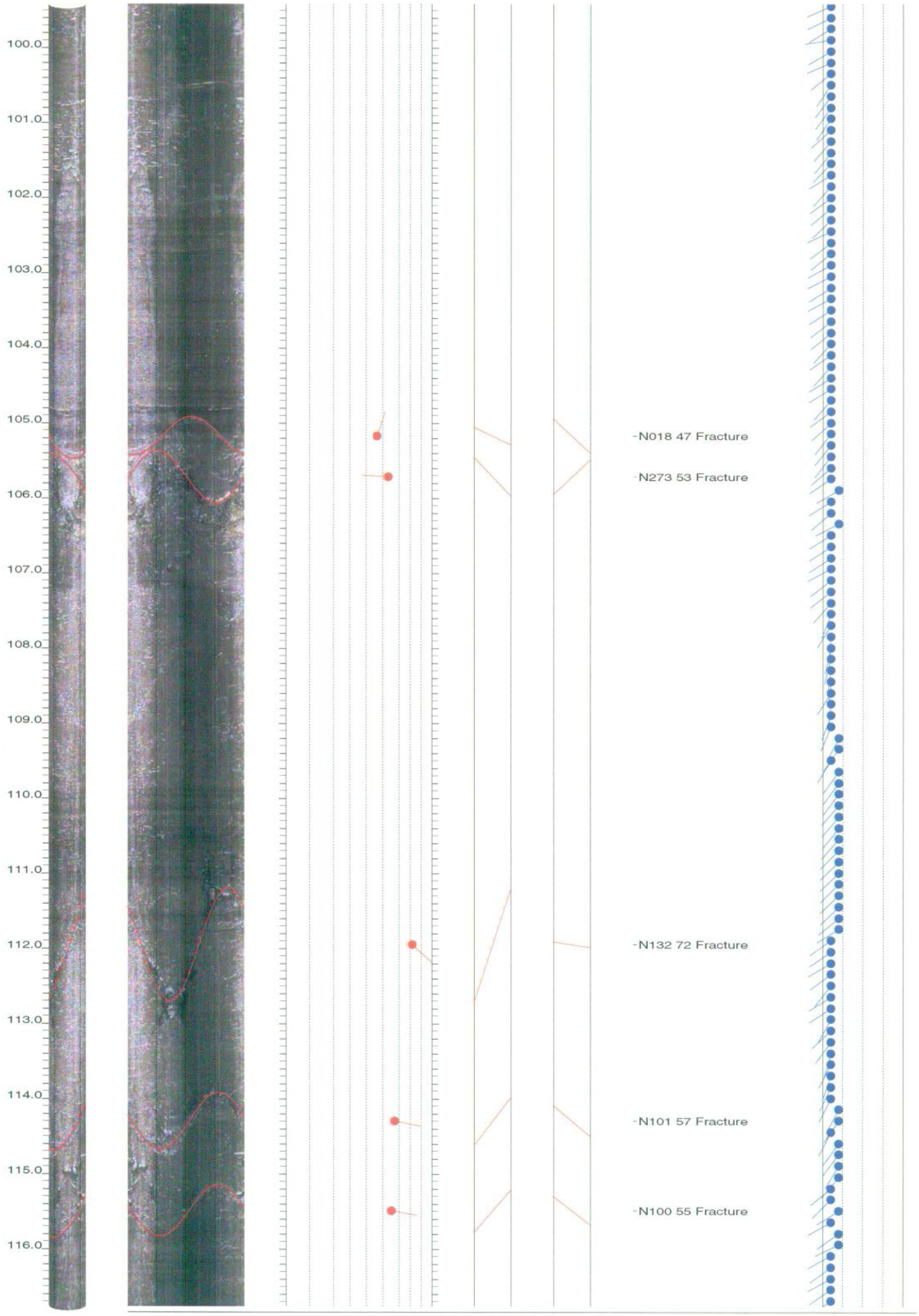
95.0
96.0
97.0
98.0
99.0
N322 78 Fracture Discontinuous
N326 79 Fracture Discontinuous
N058 9 Bedding
N337 84 Fracture Discontinuous
N135 4 Bedding
N298 46 Fracture
N313 72 Fracture
N172 2 Bedding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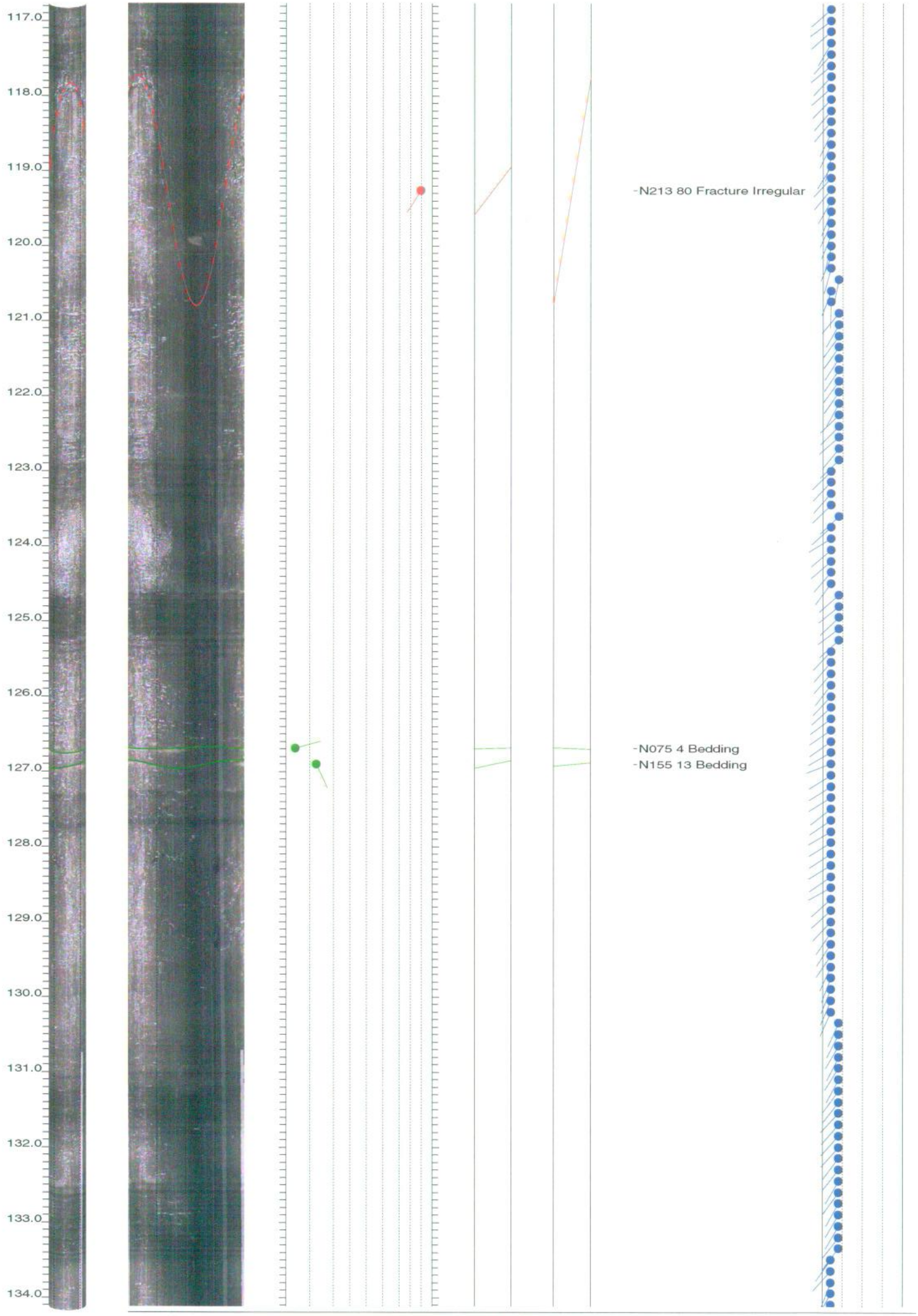
116.0
N018 47 Fracture
N273 53 Fracture
N132 72 Fracture
N101 57 Fracture
N100 55 Fracture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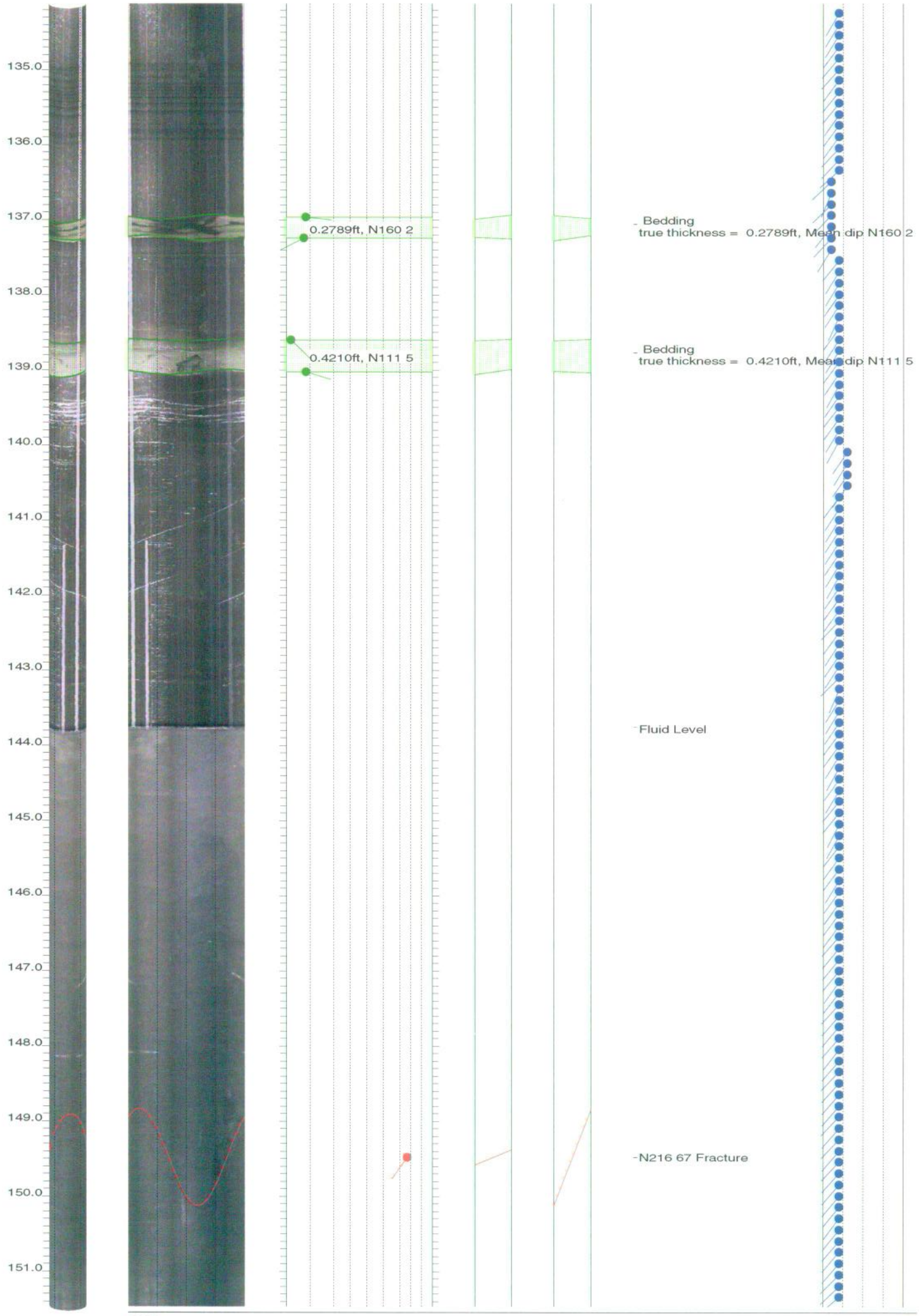
-N213 80 Fracture Irregular
-N075 4 Bedding
-N155 13 Bedding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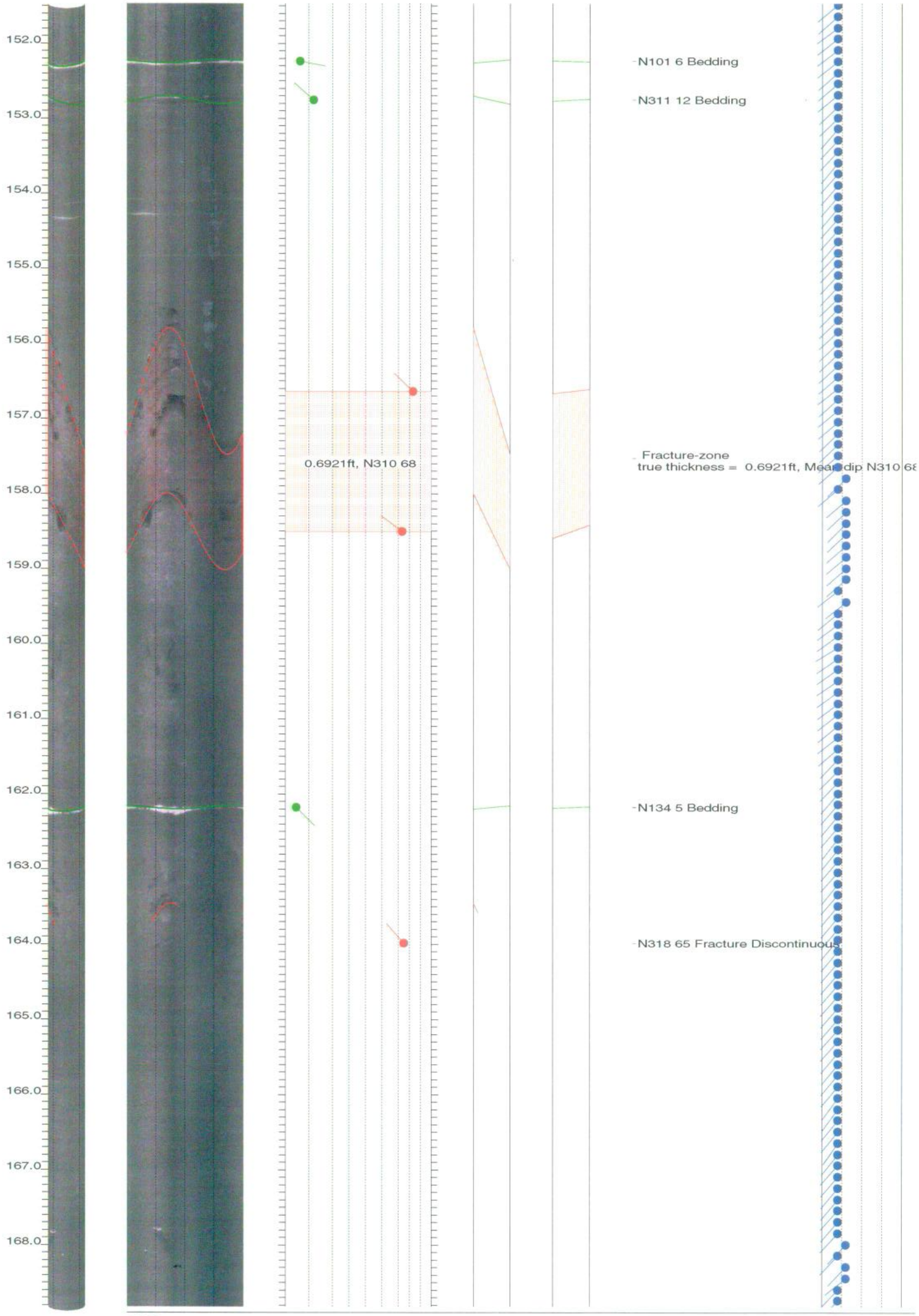
150.0
151.0
0.2789ft, N160 2
0.4210ft, N111 5
Bedding
true thickness = 0.2789ft, Mean dip N160 2
Bedding
true thickness = 0.4210ft, Mean dip N111 5
Fluid Level
N216 67 Fracture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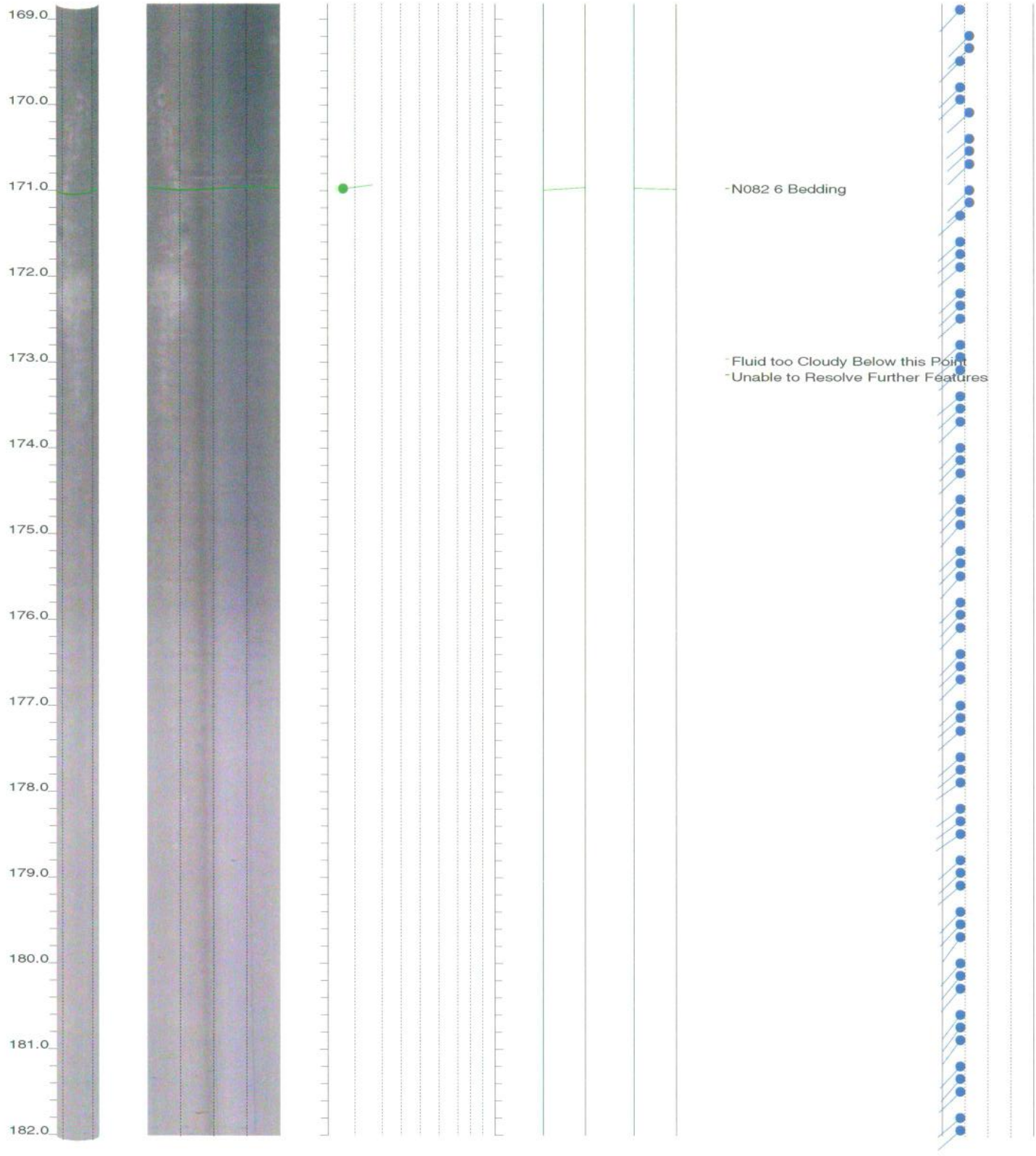
165.0
166.0
167.0
168.0
N101 6 Bedding
N311 12 Bedding
0.6921ft, N310 68
Fracture-zone
true thickness = 0.6921ft, Mean dip N310 68
N134 5 Bedding
N318 65 Fracture Discontinuous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181.0
182.0
N082 6 Bedding
Fluid too Cloudy Below this Point
Unable to Resolve Further Features

RGLDIPv6.1 OPTV results

K = 0: BEDDING
K = 2: FRACTURE

borehole RIPZ-15
zone from 72.048 to 182.040 ft
North ref is magnetic

	Depth	Azimuth	Dip	1-P0/100	n	Q	K	Upper Depth	Lower Depth	Well Diam	Well deviation Azimuth	Dev	Thickness	
1	170.976	82	5.8	1.000	3	A	0	170.960	170.993	0.500	227.00	3.00	0.0000	Bedding
2	163.983	318	65.0	0.992	6	A	2	163.454	163.703	0.500	220.00	2.00	0.0000	Fracture Discontinuous
3	162.177	134	4.6	0.969	4	B	0	162.154	162.199	0.500	220.73	2.00	0.0000	Bedding
4	158.502	307	63.3	0.919	4	C	2	157.992	159.012	0.500	226.53	3.00	0.6921	Fracture-zone
5	156.636	314	73.2	0.938	5	C	2	155.794	157.479	0.500	230.77	2.00	0.0000	Fracture-zone
6	152.755	311	12.1	1.000	3	A	0	152.699	152.811	0.500	229.24	2.00	0.0000	Bedding
7	152.238	101	6.4	1.000	3	A	0	152.215	152.261	0.500	232.01	2.00	0.0000	Bedding
8	149.479	216	66.8	0.984	4	A	2	148.834	150.124	0.500	222.20	2.00	0.0000	Fracture
9	139.023	106	8.3	1.000	3	A	0	138.988	139.057	0.500	214.34	2.00	0.4210	Bedding
10	138.600	134	1.9	0.959	4	B	0	138.587	138.614	0.500	212.88	2.00	0.0000	Bedding
11	137.240	243	7.4	1.000	3	A	0	137.204	137.277	0.500	222.97	1.00	0.2789	Bedding
12	136.961	96	8.2	1.000	3	A	0	136.928	136.995	0.500	223.00	1.00	0.0000	Bedding
13	126.900	155	12.7	1.000	3	A	0	126.844	126.956	0.500	248.13	1.00	0.0000	Bedding
14	126.687	75	4.0	1.000	3	A	0	126.674	126.700	0.500	238.29	1.00	0.0000	Bedding
15	119.259	213	79.8	0.975	6	A	2	117.720	120.798	0.500	218.73	1.00	0.0000	Fracture Irregular
16	115.489	100	55.3	0.978	4	A	2	115.147	115.831	0.500	238.01	2.00	0.0000	Fracture
17	114.294	101	57.2	0.954	5	B	2	113.917	114.671	0.500	214.68	1.96	0.0000	Fracture
18	111.945	132	71.9	0.944	6	C	2	111.189	112.701	0.500	235.38	1.00	0.0000	Fracture
19	105.715	273	53.3	0.994	4	A	2	105.369	106.060	0.500	235.12	1.00	0.0000	Fracture
20	105.172	18	46.6	0.958	4	B	2	104.916	105.428	0.500	218.24	1.00	0.0000	Fracture
21	98.172	172	1.6	1.000	3	A	0	98.163	98.181	0.500	253.76	1.00	0.0000	Bedding
22	98.152	313	72.4	1.000	3	A	2	97.340	98.964	0.500	253.11	1.00	0.0000	Fracture
23	97.165	298	45.8	1.000	3	A	2	96.902	97.429	0.500	252.08	1.00	0.0000	Fracture
24	95.995	135	4.1	1.000	3	A	0	95.978	96.013	0.500	237.10	1.00	0.0000	Bedding
25	95.183	337	84.2	1.000	3	A	2	92.861	93.292	0.500	229.36	1.00	0.0000	Fracture Discontinuous
26	93.937	58	9.3	1.000	3	A	0	93.900	93.973	0.500	248.28	1.00	0.0000	Bedding
27	87.043	326	79.2	1.000	3	A	2	85.636	85.890	0.500	286.83	1.00	0.0000	Fracture

Discontinuous													
28	86.404	322	78.1	0.995	4	A	2	85.130	85.495	0.500	283.41	1.00	0.0000	Fracture
Discontinuous													
29	81.834	111	11.7	0.965	4	B	2	81.786	81.881	0.500	265.14	1.00	0.0000	Fracture

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
FRACTURE ANALYSIS LOG

15 Dec 2004

Mactec

Borehole: RIPZ-15

Casmalia Landfill

top of borehole.....
East:
North:
Alt:

North ref: magnetic
Depth units are feet
Vertical scale: 1/150

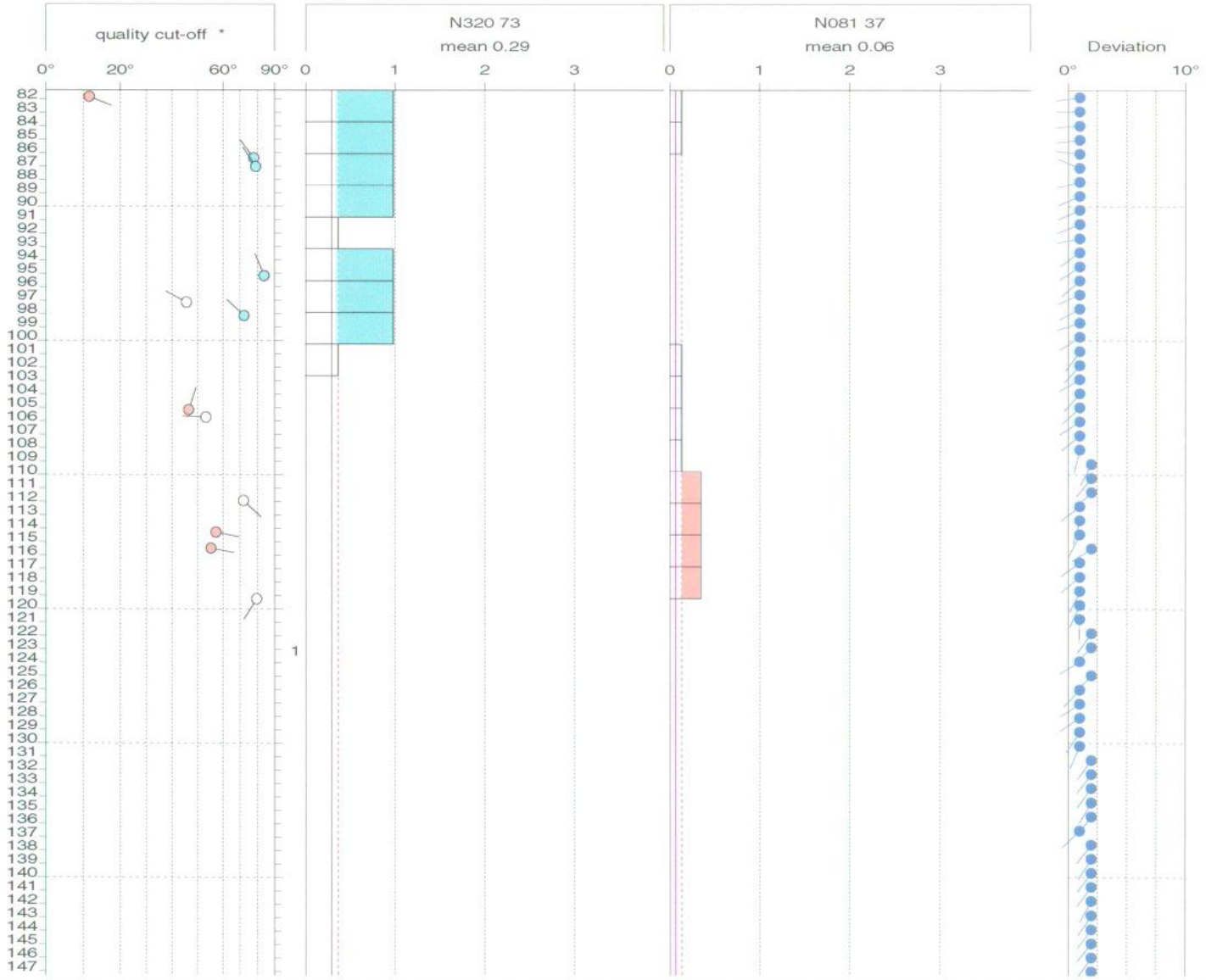
Zone from 164.483 to 81.334ft
Mean dip format: dip-azimuth and dip
Frequency histogram parameters:

measurement distance 7.101ft
step distance 2.367ft

Interpretation 1

Dip data sets .....
OPTV dips

open symbols not used in mean-dip/zone-axis calculation



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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
FRACTURE ANALYSIS STEREOGRAMS

15 Dec 2004

Mactec

Borehole: RIPZ-15

Casmalia Landfill

top of borehole.....
East:
North:
Alt:

North ref: magnetic
Depth units are feet

Zone from 164.483 to 81.334ft
Mean dip format: dip-azimuth and dip

Interpretation 1

Dip data sets .....
OPTV dips

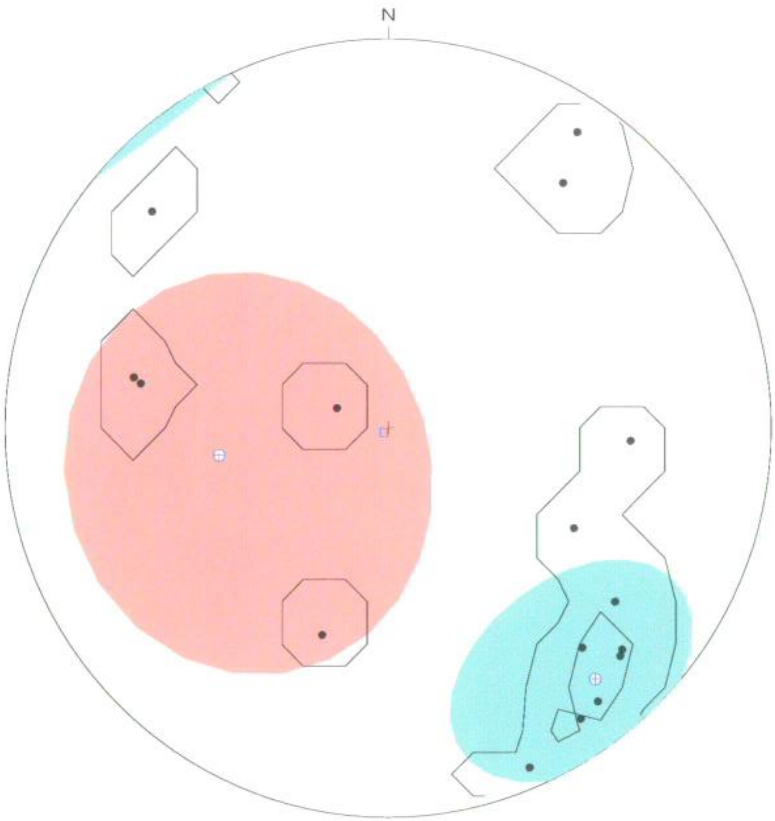
RIPZ-15
Zone 0. 81.334 - 164.483ft
Deviation 1.40 N226.40

dipdata sets.....
OPTV dips

	mean dip	n	f
N320 73	N320 73	7	(0.29)
N081 37	N081 37	4	(0.06)

intersections

	N320 73	N081 37
N320 73		30 N040
N081 37	30 N040	



⊕ mea
□ well a

equal-area lower-hemisphere 0-90

contour-levels 1,3,

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
FRACTURE DIP-AZIMUTH ROSE-DIAGRAM

15 Dec 2004

Mactec

Borehole: RIPZ-15

Casmalia Landfill

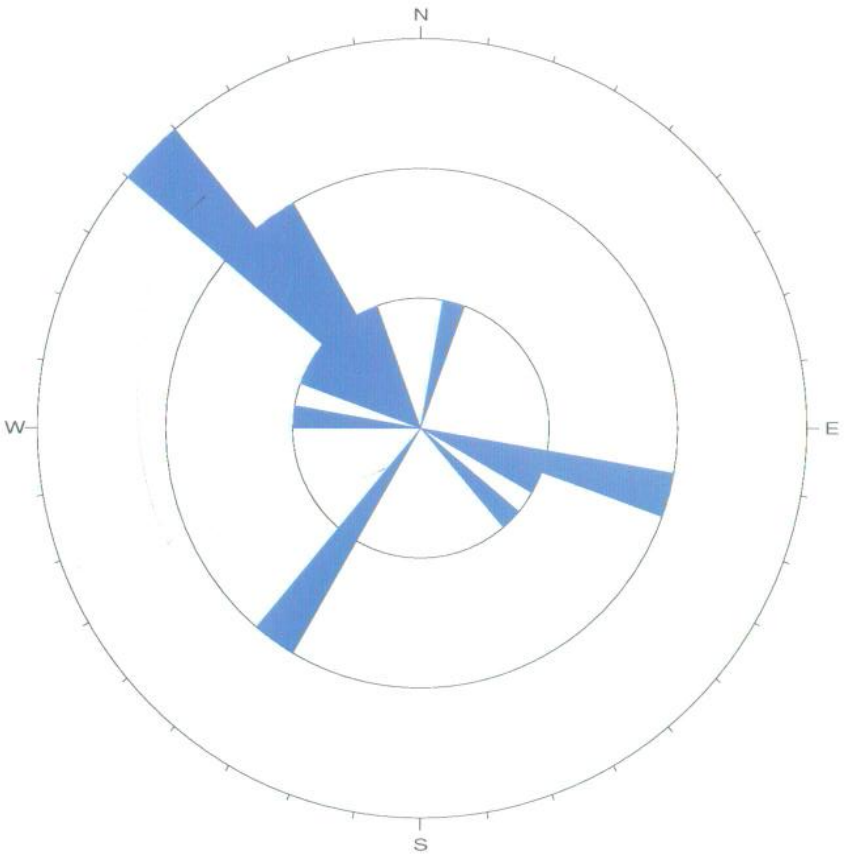
top of borehole.....
East:
North:
Alt:

North ref. is magnetic
Depth units are feet

Zone from 164.483 to 81.334ft

Dip data sets .....
OPTV dips

RIPZ-15
81.334 - 164.483ft
Dip-azimuth rose-diagram



Azimuth Incr = 10°
N = 16

RGLDIPv6.1 DIP DATA INTERPRETATION: FRACTURE ANALYSIS

borehole RIPZ-15
zone from 81.000 to 164.000 m
North ref is magnetic
15 Dec 2004

Data is classed into 1 types
5 OPTV_dips

Quality cut-off level: *

Mean well deviation: 1.4deg to N226.4

2 small-circles defined

	SEARCH AREA			MEAN DIP			
	azim	pl	cone	strike	dip	n	f
1	142.5	20.3	23.7	230	73	7	0.29
2	252.3	56.2	41.4	351	37	4	0.06

Total number of data = 11
Number of data unaccounted for = 5

ZONE No.	DEVIATION Dev	Azim	DEPTHS m TOP	BASE	No. DATA	MEAN DIPS and FREQUENCIES Str Dip	n	f	Str Dip	n	f	Str Dip	n	f	Str Dip	n	f
1	1.4	226.4	81.33	164.48	16	230	73	7	0.29	351	37	4	0.06	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
STRUCTURAL INTERPRETATION LOG

15 Dec 2004

Mactec

Borehole: RIPZ-15

Casmalia Landfill

top of borehole.....
East:
North:
Alt:

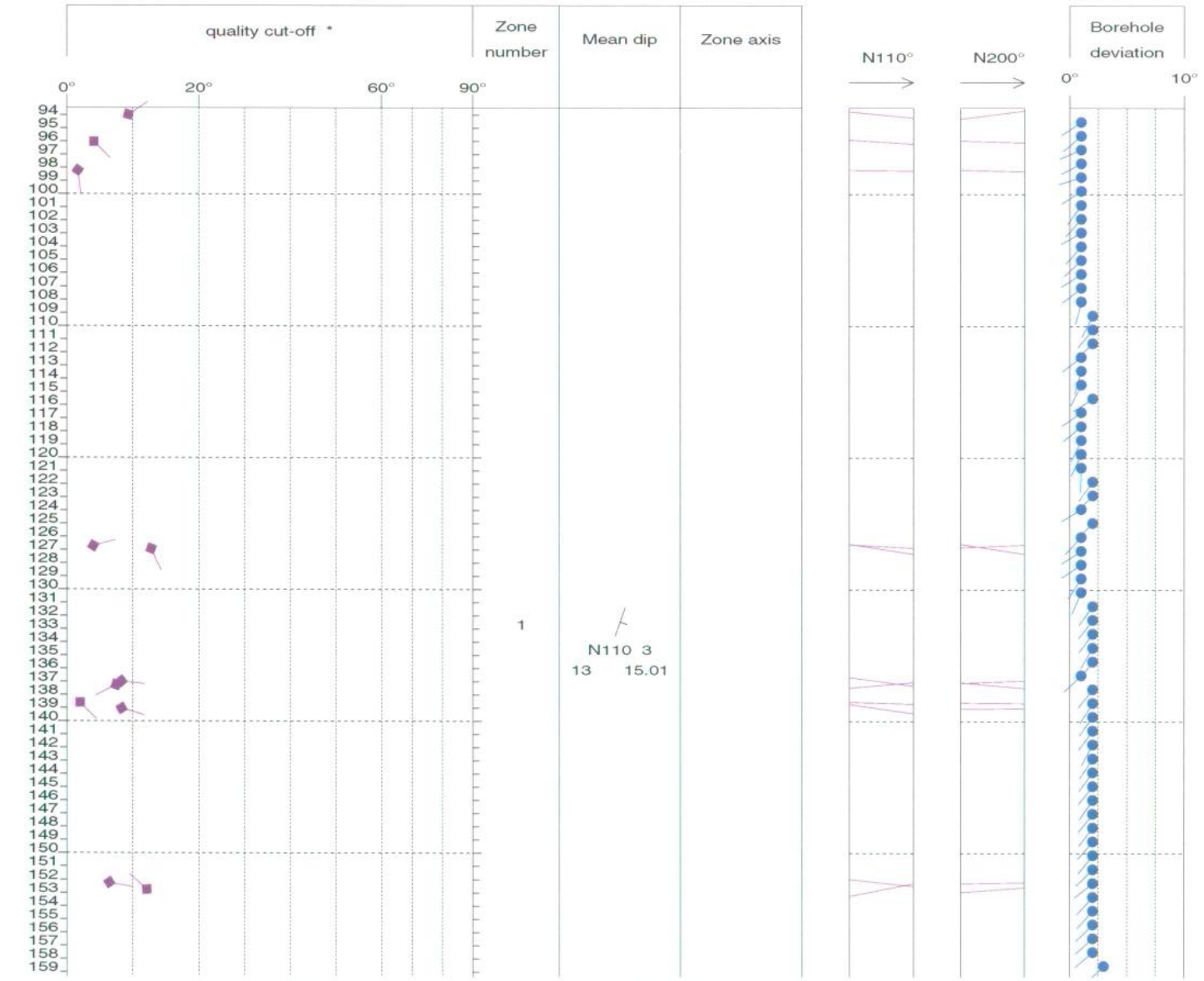
North ref: magnetic
Depth units are feet
Vertical scale: 1/150

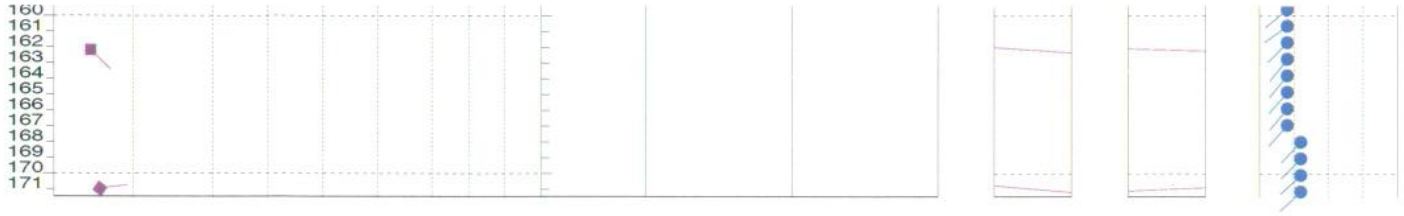
Zone from 171.476 to 93.447ft
Mean dip format: dip-azimuth and dip

Interpretation 1

Dip data sets .....
OPTV dips

open symbols not used in mean-dip/zone-axis calculation

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
STRUCTURAL INTERPRETATION STEREOGRAMS

15 Dec 2004

Mactec

Borehole: RIPZ-15

Casmalia Landfill

top of borehole.....
East:
North:
Alt:

North ref: magnetic
Depth units are feet

Zone from 171.476 to 93.447ft
Mean dip format: dip-azimuth and dip

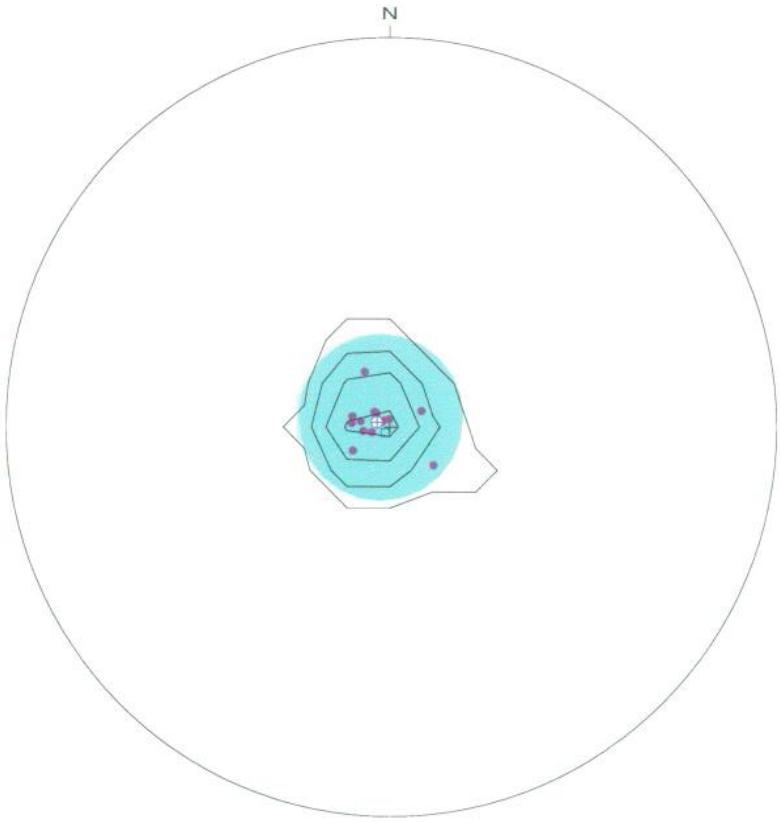
Interpretation 1

Dip data sets .....
OPTV dips

RIPZ-15
Zone 0. 93.447 - 171.476ft
Deviation 1.60 N222.70

dipdata sets.....
OPTV dips

	mean dip	n	dsp	zone axis	n	dev
N110 3	N110 3	13	15.0			



mean dip
zone axis
well axis

equal-area lower-hemisphere 0-90

contour-levels 1,3,6,10,

RGLDIPv6.1 DIP DATA INTERPRETATION: STRUCTURAL

borehole RIPZ-15
zone from 93.000 to 171.000 m
North ref is magnetic
15 Dec 2004

Data is classed into 1 types
5 OPTV_dips

Quality cut-off level: *

Mean well deviation: 1.6deg to N222.7

1 small-circles defined

	SEARCH AREA			MEAN DIP		
	azim	pl	cone	strike	dip	n
1	315.0	87.1	17.5	20	3	13

Total number of data = 13
Number of data unaccounted for = 0

ZONE No.	DEVIATION Dev	Azim	DEPTHS m TOP			BASE			No. DATA	MEAN DIPS and ZONE AXES												
			Str Dip	n	Disp	Str Dip	n	Disp	Str Dip	n	Disp	Str Dip	n	Disp	Str Dip	n	Disp	Str Dip	n	Disp			
									Azm Pl	n	Dev	Azm Pl	n	Dev	Azm Pl	n	Dev	Azm Pl	n	Dev			
			Azm Pl	n	Dev	Azm Pl	n	Dev	Azm Pl	n	Dev												
1	1.6	222.7	93.45	171.48	13	20	3	13	15.01	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
			0	0	0	0.00	0	0	0	0.00	0	0	0	0.00											
									0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
			0	0	0	0.000	0	0	0	0.000	0	0	0	0.000											