welenco

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

DUAL INDUCTION - GAMMA RAY LOG

FILING NO.

COMPANY Mactec

WELL RGPZ-10B2

FIELD Casmalia

STATE California COUNTY Santa Barbara

LOCATION:
Casmalia Landfill

OTHER SERVICES:
Video
OPTV

JOB NO.
39779

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	Nov. 29, 2004			
Type Of Log	Dual Ind			
Run No.	One	Two	Three	Four
Depth-Driller	75 Ft	Ft	Ft	Ft
Depth-Logger	75 Ft	Ft	Ft	Ft
Top Logged Interval	6 Ft	Ft	Ft	Ft
Btm. Logged Interval	70 Ft	Ft	Ft	Ft
Type Fluid In Hole	Water			
Fluid Level	69.35 Ft	Ft	Ft	Ft
Max Temp	N/A °F	°F	°F	°F
Operating Rig Time	1 Hr	Hr	Hr	Hr
Van No. / Location	L-23 / Bfld			
Recorded By	Craig Corbell			
Witnessed By				

RUN NO.	BOREHOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	TYPE	FROM	TO
1	6 In	8.5 Ft	75 Ft	8 In	Steel	0 Ft	8.5 Ft
2	In	Ft	Ft	In		Ft	Ft
3	In	Ft	Ft	In		Ft	Ft

Miscellaneous Information

Remarks:

Perforated Intervals:

Line Speed:

Borehole Volume Calculations:

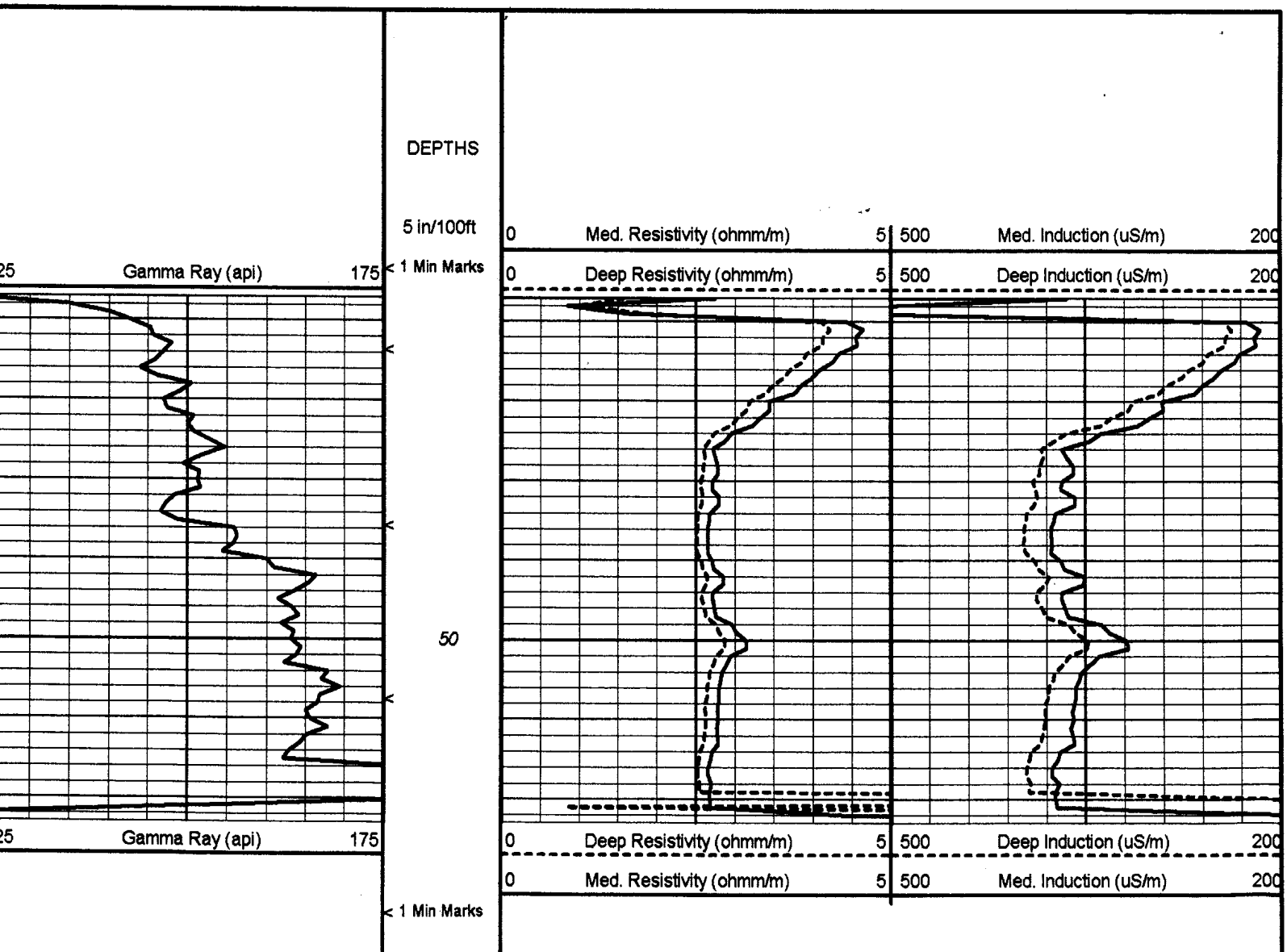
Other Information:

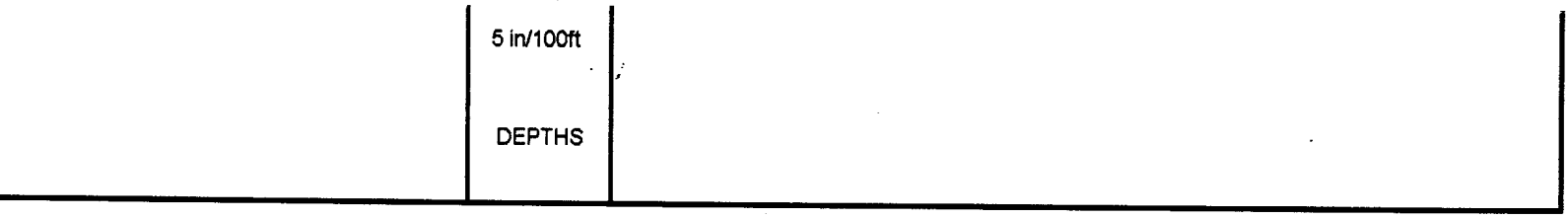
NOTICE

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. November 30, 2004

Mactec RGPZ-10B2 Nov 29, 2004 L:\Craig C\Logs\39779\ind.lhf




5 in/100ft
DEPTHS

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OPTV DATA PROCESSING
RGLDIP vsn 6.1
BOREHOLE IMAGE LOG

08 Dec 2004

Mactec

Borehole: RGPZ-10B2

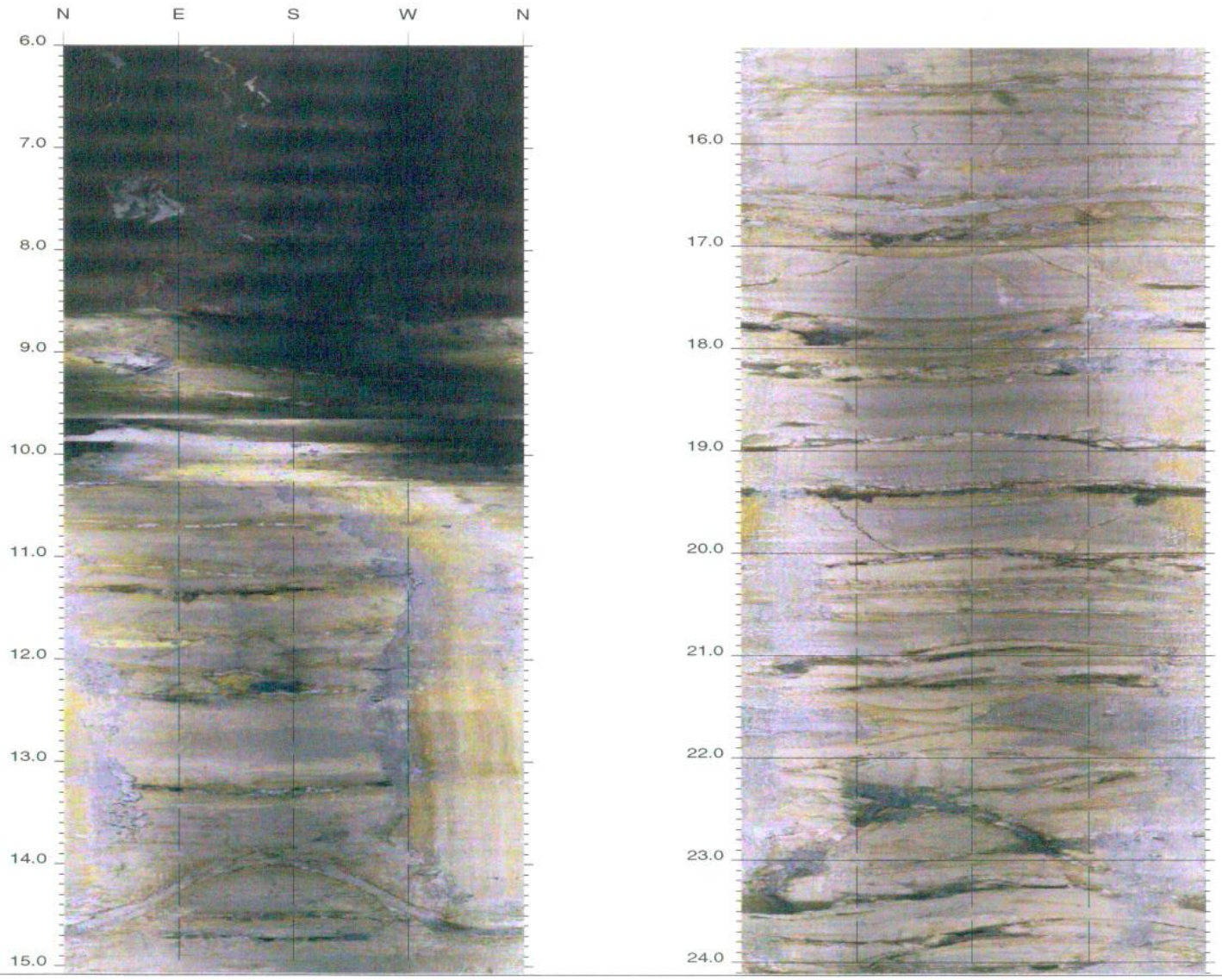
Casmalia Landfill

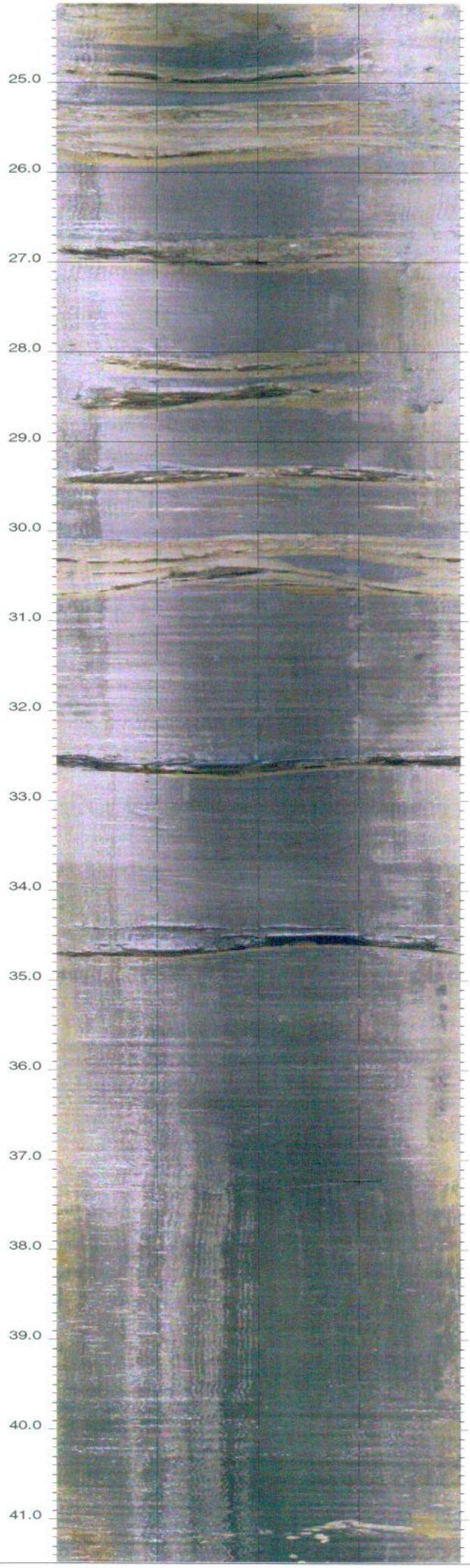
top of borehole.....
East:
North:
Elev:

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

Zone from 6.0000 to 74.4960ft
Format: BHTV NESWN

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

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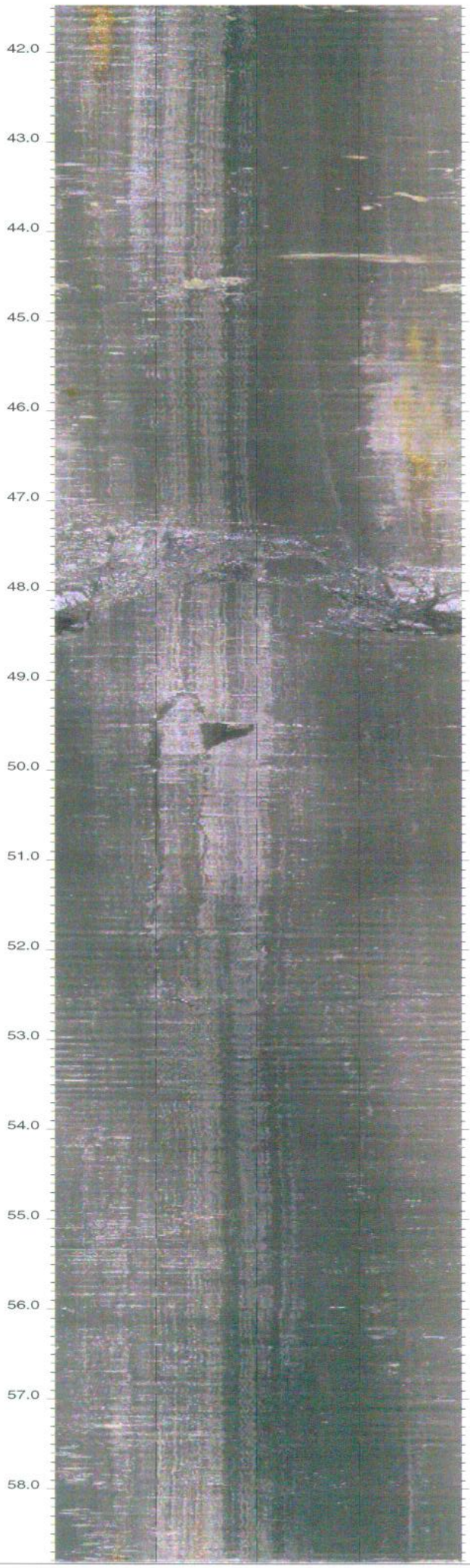
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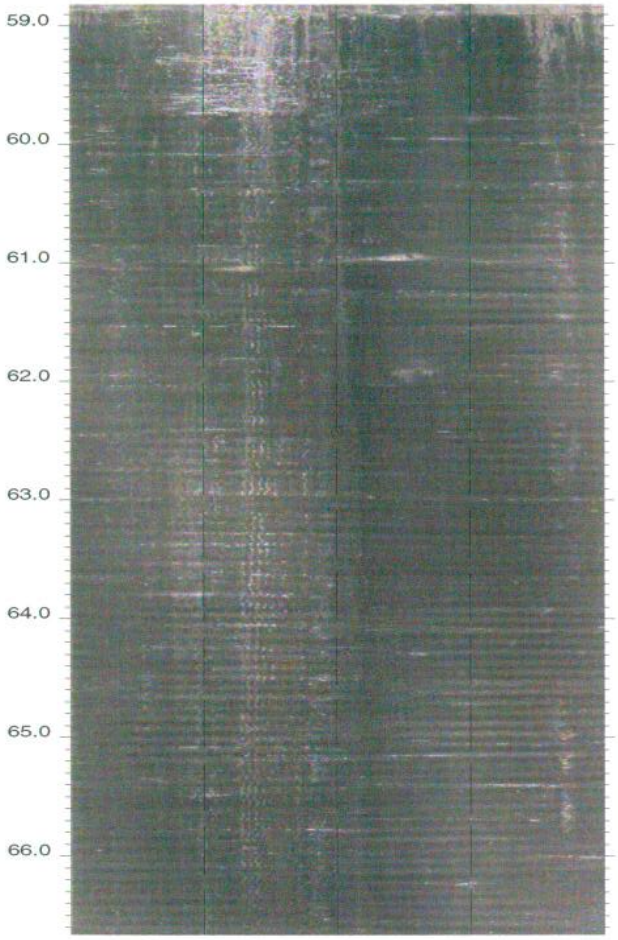
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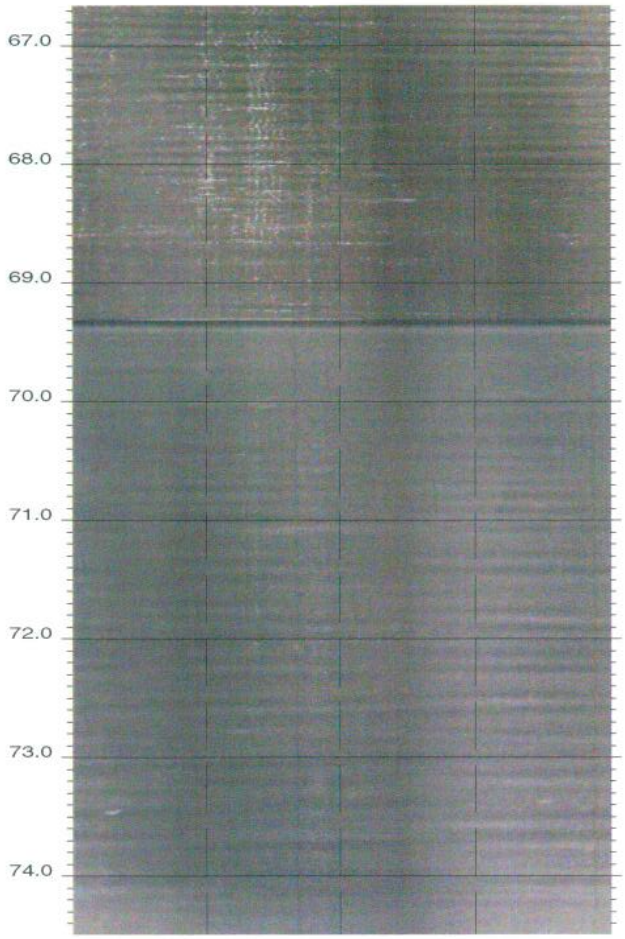
67.0
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RGLDIPv6.1 OPTV results

K = 0: BEDDING
K = 2: FRACTURE

borehole RGPZ-10B2
zone from 0.008 to 74.504 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	58.832	320	6.0	1.000	3	A	0	58.809	58.854	0.500	193.33	1.72	0.0000	Bedding
2	48.088	345	51.0	0.894	5	D	0	47.799	48.377	0.500	181.33	2.00	0.0000	Bedding
3	34.645	49	20.4	0.989	5	A	2	34.558	34.731	0.500	183.30	2.00	0.0000	Fracture
4	34.389	328	2.6	0.980	4	A	2	34.382	34.395	0.500	182.08	2.00	0.0000	Fracture
5	32.622	129	16.5	0.986	4	A	2	32.545	32.700	0.500	174.19	1.00	0.0000	Fracture
6	30.572	345	35.8	0.967	5	B	2	30.398	30.745	0.500	163.40	1.00	0.0000	Fracture
7	30.252	39	23.2	0.966	4	B	2	30.152	30.353	0.500	172.00	2.00	0.0000	Fracture
8	29.399	46	11.5	0.960	5	B	2	29.353	29.445	0.500	172.00	2.00	0.0000	Fracture
9	28.542	31	18.4	1.000	3	A	2	28.465	28.620	0.500	166.49	1.64	0.0000	Fracture
Discontinuous														
10	28.102	142	17.3	0.974	4	A	2	28.018	28.187	0.500	163.69	1.41	0.0000	Fracture
11	26.924	147	14.8	0.985	4	A	2	26.854	26.995	0.500	161.89	1.00	0.0000	Fracture
12	25.784	75	14.9	1.000	3	A	2	25.715	25.852	0.500	144.61	1.06	4.6318	
Fracture-zone														
13	22.937	336	63.8	0.950	5	B	2	22.449	23.424	0.500	169.00	1.00	0.0000	Fracture
14	20.929	47	20.9	0.922	4	C	2	20.838	21.019	0.500	170.58	2.00	0.0000	
Fracture-zone														
15	20.584	40	6.9	0.998	4	A	2	20.559	20.610	0.500	172.00	2.00	0.0000	Fracture
16	20.338	45	15.9	1.000	3	A	2	20.271	20.404	0.500	168.58	2.00	0.0000	Fracture
17	20.076	11	18.2	0.971	4	B	2	20.002	20.150	0.500	167.00	2.00	0.0000	Fracture
18	19.768	185	64.3	0.983	5	A	2	19.324	20.096	0.500	167.16	2.00	0.0000	Fracture
Discontinuous														
19	19.399	32	8.0	0.969	4	B	2	19.370	19.429	0.500	168.83	2.00	0.0000	Fracture
20	18.907	3	15.4	0.937	4	C	2	18.842	18.972	0.500	147.64	1.00	3.3996	
Fracture-zone														
21	17.186	338	46.7	0.941	6	C	2	16.929	17.443	0.500	148.45	1.00	0.0000	Fracture
22	15.425	67	13.8	0.968	4	B	2	15.364	15.487	0.500	154.23	1.00	0.0000	
Fracture-zone														
23	14.712	160	7.3	0.985	4	A	2	14.675	14.748	0.500	168.06	1.00	0.0000	Fracture
24	14.254	338	55.0	0.993	5	A	2	13.910	14.599	0.500	164.91	1.00	0.0000	Fracture
25	13.246	137	12.2	1.000	3	A	2	13.188	13.305	0.500	117.54	1.00	0.0000	Fracture
26	12.322	26	5.9	0.999	4	A	2	12.296	12.347	0.500	126.78	1.00	0.0000	Fracture

6.0

27	11.297	88	13.9	1.000	3	A	2	11.232	11.363	0.500	133.38	1.00	0.0000 Fracture
28	11.127	183	11.5	0.991	4	A	2	11.074	11.180	0.500	123.31	1.00	0.0000 Fracture
29	10.692	315	9.0	1.000	3	A	2	10.656	10.727	0.500	114.34	1.00	0.0000 Fracture
30	10.183	11	23.9	1.000	3	A	2	10.075	10.290	0.500	234.19	1.00	0.0000 Fracture

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OPTV DATA PROCESSING
RGLDIP vsn 6.1
INTERPRETED OPTV DIPS LOG

08 Dec 2004

Mactec

Borehole: RGPZ-10B2

Casmalia Landfill

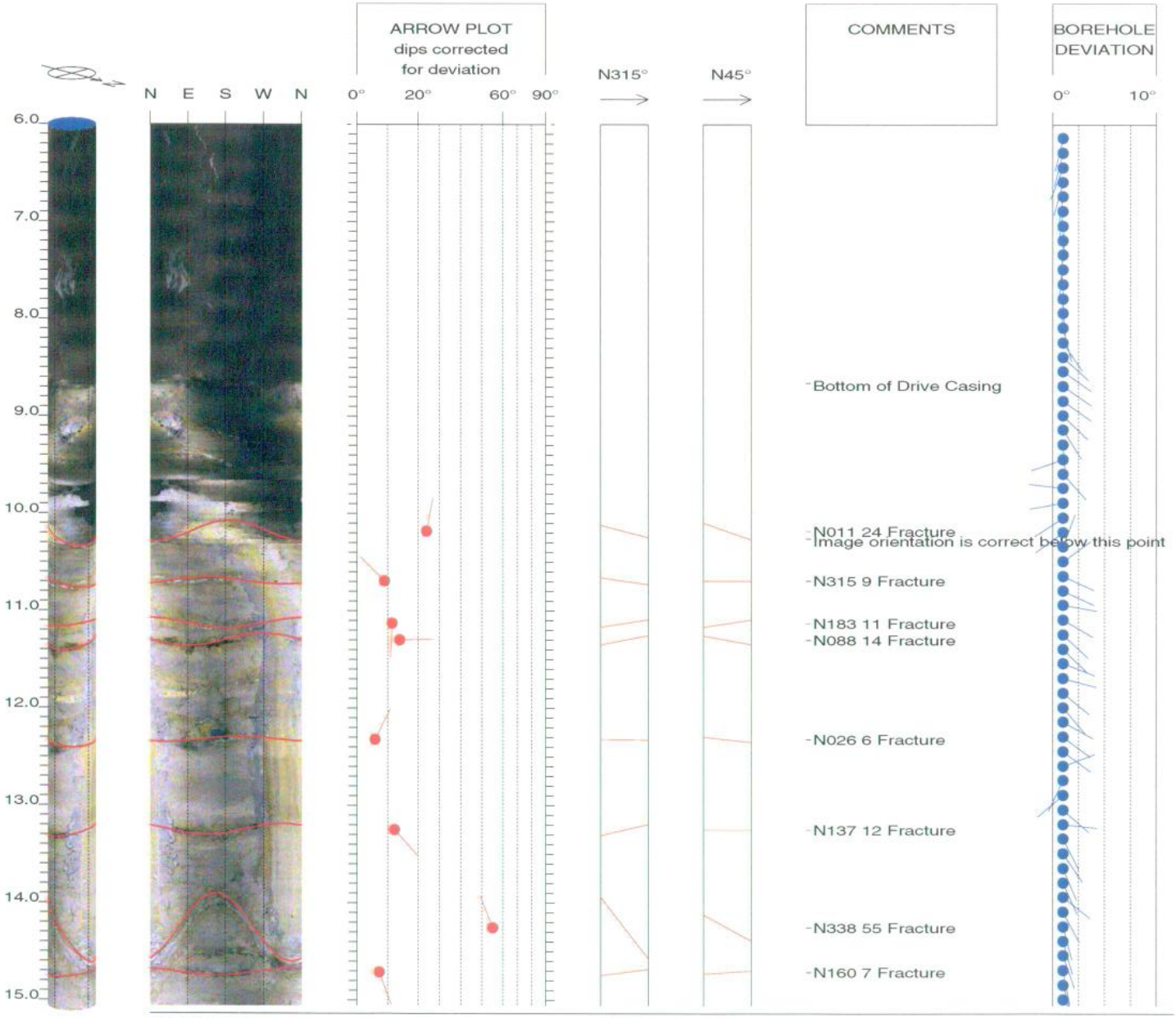
top of borehole.....
East:
North:
Elev:

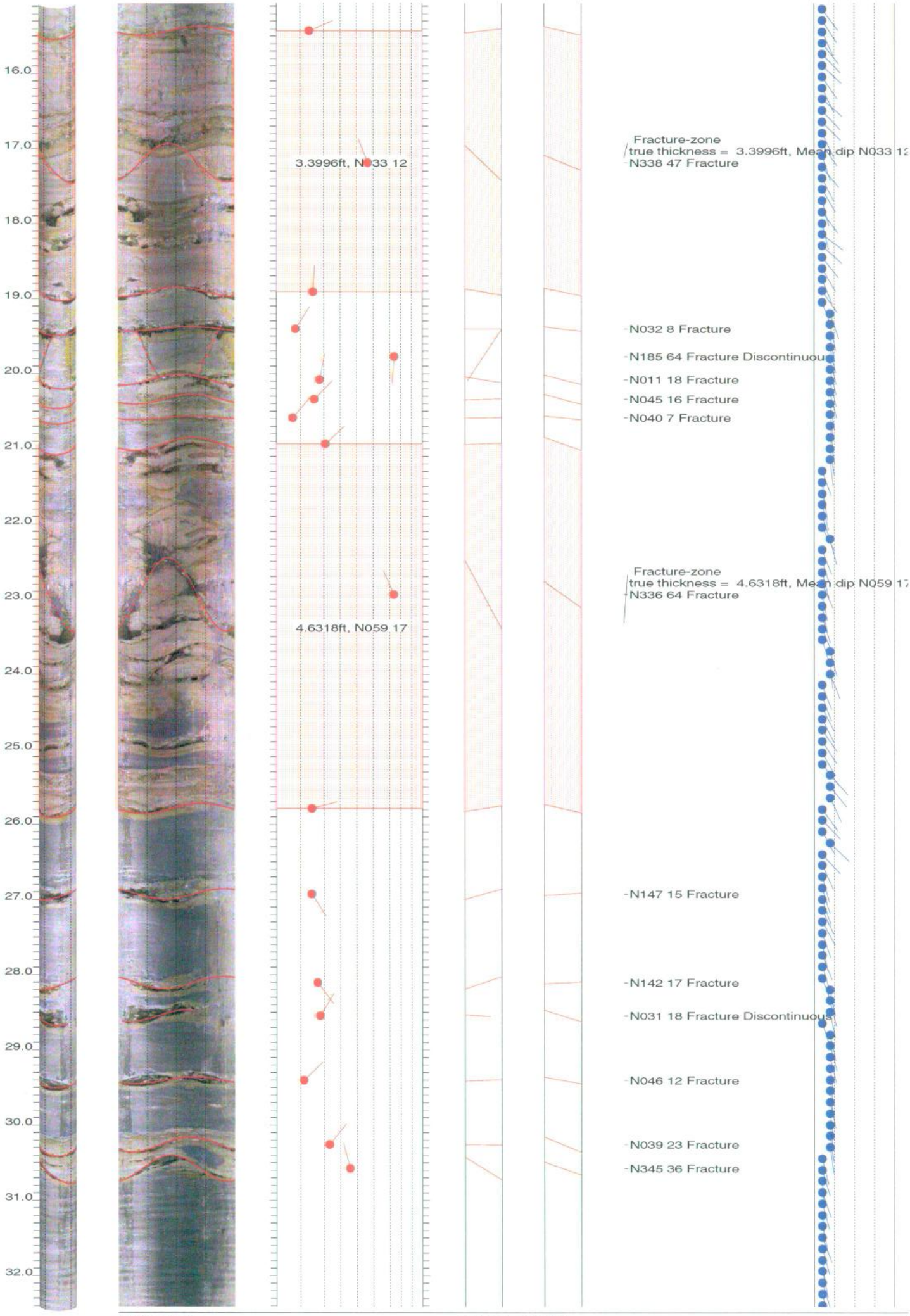
North ref. is magnetic
Depth units are feet
Vertical scale: 1/20
Horiz scale = vert scale

Zone from 74.496 to 6.000ft
Format: BHTV-NESWN

Borehole diam: 6.000inch
Vertical = borehole-axis

BEDDING
FRACTURE
Identified units

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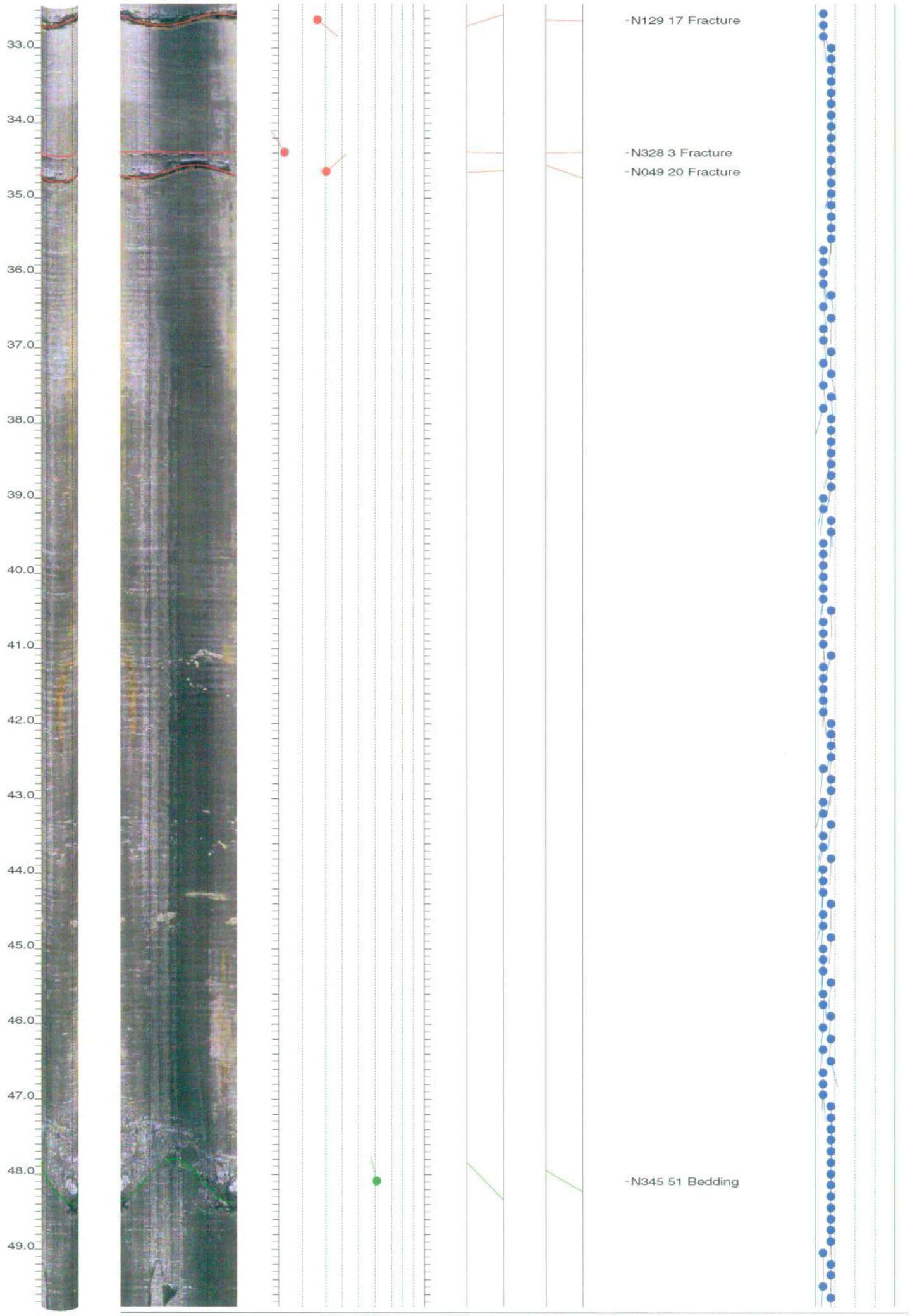
28.0
29.0
30.0
31.0
32.0
3.3996ft, N033 12
4.6318ft, N059 17
Fracture-zone
true thickness = 3.3996ft, Mean dip N033 12
N338 47 Fracture
N032 8 Fracture
N185 64 Fracture Discontinuous
N011 18 Fracture
N045 16 Fracture
N040 7 Fracture
Fracture-zone
true thickness = 4.6318ft, Mean dip N059 17
N336 64 Fracture
N147 15 Fracture
N142 17 Fracture
N031 18 Fracture Discontinuous
N046 12 Fracture
N039 23 Fracture
N345 36 Fracture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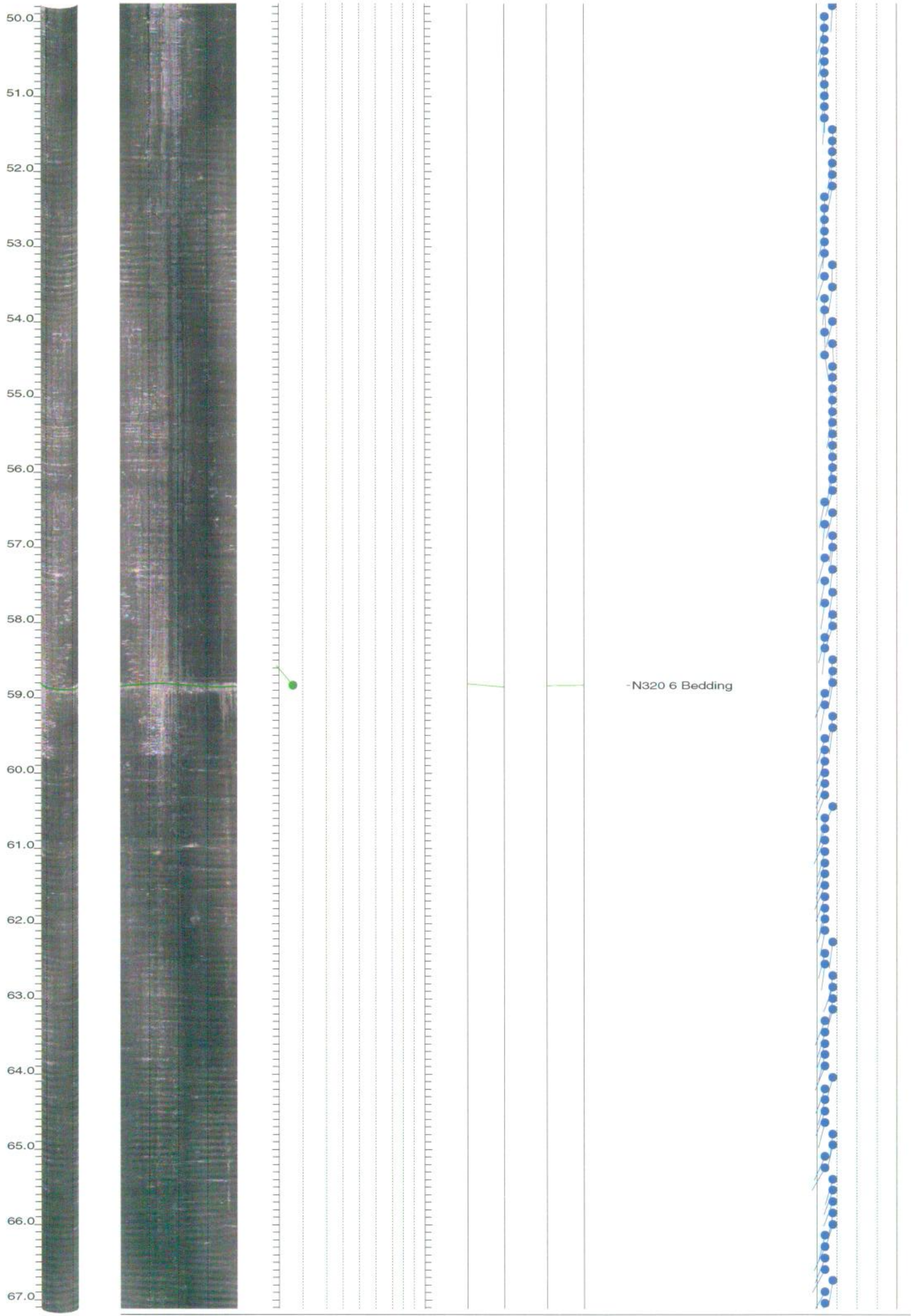
49.0
N129 17 Fracture
N328 3 Fracture
N049 20 Fracture
N345 51 Bedding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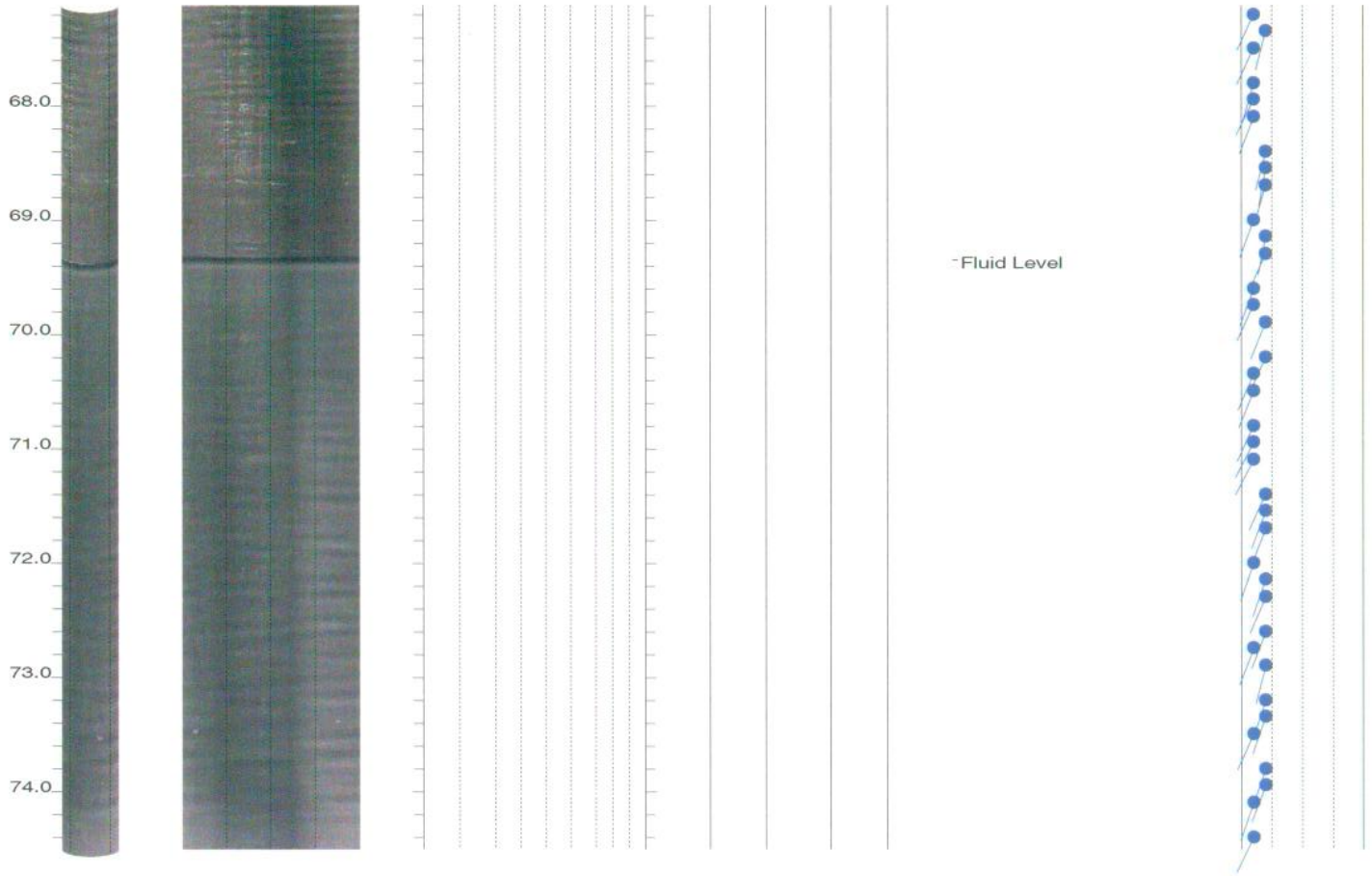
N320 6 Bedding


68.0
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70.0
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73.0
74.0
Fluid Level

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
FRACTURE ANALYSIS LOG

06 Dec 2004

Mactec

Borehole: RGPZ-10B2

Casmalia Landfill

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

North ref: magnetic
Depth units are feet
Vertical scale: 1/100

Zone from 35.000 to 9.000ft
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

06 Dec 2004

Mactec

Borehole: RGPZ-10B2

Casmalia Landfill

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

North ref: magnetic
Depth units are feet

Zone from 35.000 to 9.000ft
Mean dip format: dip-azimuth and dip

Interpretation 1

Dip data sets .....
OPTV dips

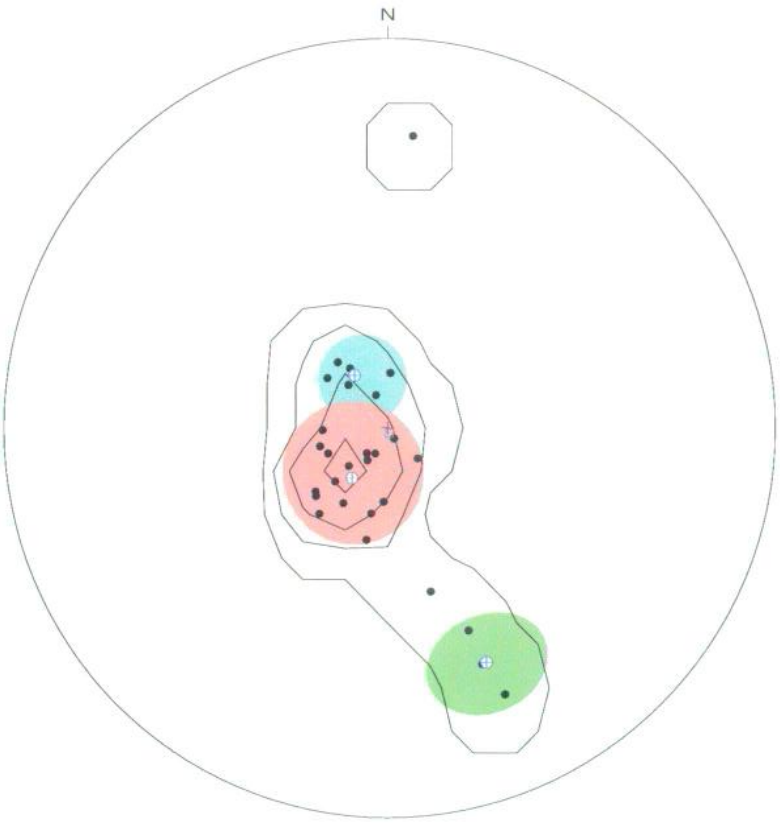
RGPZ-10B2
Zone 0. 9.000 - 35.000ft
Deviation 1.20 N161.40

dipdata sets.....
OPTV dips

	mean dip	n	f
N147 13	N147 13	6	0.24
N036 13	N036 13	17	0.68
N337 55	N337 55	3	0.20

intersections

	N147 13	N036 13	N337 55
N147 13		07 N091	02 N066
N036 13	07 N091		12 N058
N337 55	02 N066	12 N058	



mean dip
well axis

equal-area lower-hemisphere 0-90

contour-levels 1,3,6,10,

RGLDIPv6.1 DIP DATA INTERPRETATION: FRACTURE ANALYSIS

borehole RGPZ-10B2
zone from 9.000 to 35.000 m
North ref is magnetic
06 Dec 2004

Data is classed into 1 types
5 OPTV_dips

Quality cut-off level: *

Mean well deviation: 1.2deg to N161.4

3 small-circles defined

	SEARCH AREA			MEAN DIP			
	azim	pl	cone	strike	dip	n	f
1	331.9	78.5	9.4	57	13	6	0.24
2	218.2	78.0	15.0	306	13	17	0.68
3	157.0	34.3	11.6	247	55	3	0.20

Total number of data = 26
Number of data unaccounted for = 2

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	Str	Dip	n	f
1	1.2	161.2	9.68		35.00		28	57	13	6	0.24	306	13	17	0.69	247	55	3	0.20	0	0	0
0.00	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
FRACTURE DIP-AZIMUTH ROSE-DIAGRAM

06 Dec 2004

Mactec

Borehole: RGPZ-10B2

Casmalia Landfill

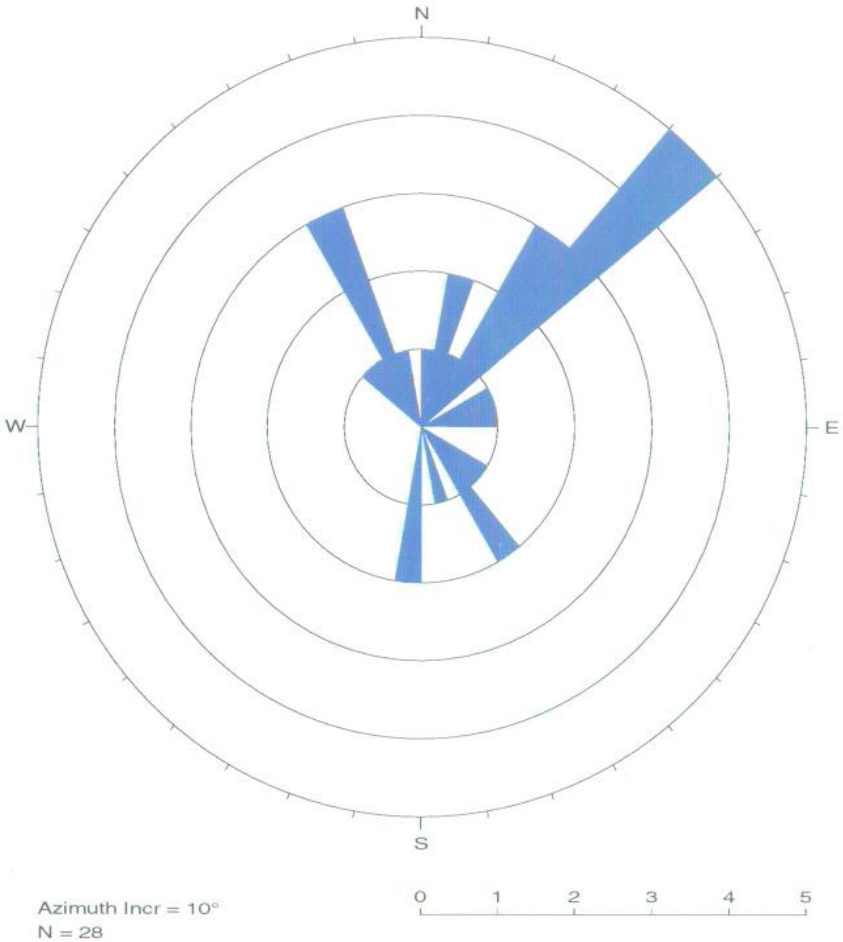
top of borehole.....
East:
North:
Alt:

North ref. is magnetic
Depth units are feet

Zone from 35.000 to 9.000ft

Dip data sets .....
OPTV dips

RGPZ-10B2
9.000 - 35.000ft
Dip-azimuth rose-diagram



Azimuth Incr = 10°
N = 28