

Sheet 1 of 2

JOB NUMBER: 104194

ROCK FABRIC
MF -massive
BF -bedded
FF -foliated
CF -cleaved
SF -schistose
GF -gneissose
LF -laminated

GRAIN SIZE
FG -fine grained
MG -medium grain
CG -coarse grain

JOINT SPACING
VCJ-very close spacg
CJ -close spacing
MJ -medium spacing
WJ -wide spacing
VWJ-very wide spacng

JOINT ROUGHNESS
SLJ-slickensided
SJ -smooth
RJ -rough

JOINT INFILL
CLN-clean
ST-stained
CLY-clay filled
SND-sand filled
GVL-gravel filled

WEATHERING GRAPH
 100%-completely weathered
 75%-highly weathered
 50%-moderately weathered
 25%-slightly weathered
 0% -unweathered



DWA
MCWAP FEASIBILITY STUDY

**VLIEEPOORT
ABSTRACTION WEIR**

Sheet 1 of 2

JOB NUMBER: 104194

46	0	0		N=20								Scale 1:75		0.00	Dark brown, sandy <u>clay</u> becoming clay from 1,45 – 5,24m then reddish brown <u>sand</u> from 6,96 – 7,54 m. Alluvium.
122	0	0													
56	0	0													
78	0	0													
64	0	0													
42	0	0													
53	0	0													
28	0	0													
71	0	0													
62	0	0													
41	0	0													
9	7	0													
46	34	0	>20												
68	0	0													
154	154	0	15												
80	80	34													
53	53	0	>20												
154	113	0													
48	37	19	>20												
76	76	76													
90	90	49	19												
84	84	0													
94	94	55	14												
82	82	0													
65	53	19													
Material Recovery (%)	Core Recovery (%)	RQD (%)	FRAC. FREQ.	SPT-N Is50 (D/A)	ROCK FABRIC AND GRAIN	JOINT NO OF SETS	JOINT INCLIN (deg)	JOINT SPACING	JOINT ROUGH-NESS	JOINT FILLING	WEATH-ERING	DEPTH Scale 1:75			

HOLE No: **VBA 9A**
Sheet 2 of 2

JOB NUMBER: 104194

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MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: **VBA 9A**
Sheet 2 of 2

JOB NUMBER: 104194

A horizontal number line with three tick marks. Above each tick mark is the number 0.

11.6.2 16.75

END OF HOLE

NOTES

1) Water table at 5,80m.

2) Rockhead at 11,36m.

Material Recovery (%)	Core Recovery (%)	RQD (%)	FRAC. FREQ.	SPT-N Is50 (D/A)	ROCK FABRIC AND GRAIN	JOINT NO OF SETS	JOINT INCLIN (deg)	JOINT SPACING	JOINT ROUGH- NESS	JOINT FILLING	WEATH- ERING
-----------------------------	-------------------------	------------	----------------	------------------------	--------------------------------	------------------------	--------------------------	------------------	-------------------------	------------------	-----------------

DEPTH
Scale
1:75

CONTRACTOR : WEPPELMAN
MACHINE : D 90 R
DRILLED BY : STUMI
PROFILED BY : G.D / C.A

TYPE SET BY : C.A
SETUP FILE : Y.SET

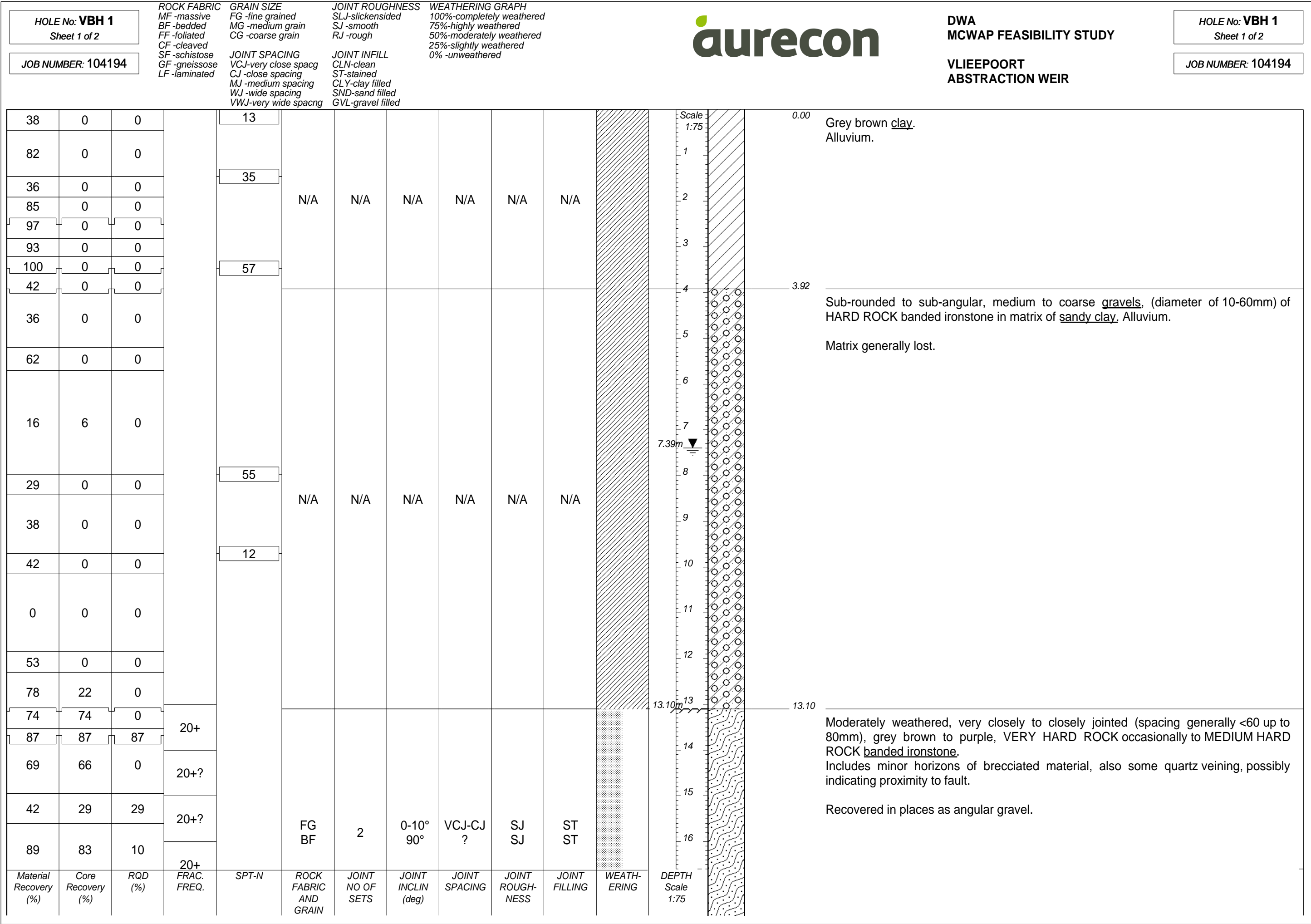
INCLINATION : VERTICAL

DIAM :
DATE : 08/05/2009 – 13/05/2009
DATE : 03/06/2009

DATE : 02/11/09 12:08
TEXT : ..C:\DOT5000\104194~1.DOC

ELEVATION :
X-COORD : 2 725 441
Y-COORD : -32 036

HOLE No: VBA 9A



HOLE No: **VBH 1**
Sheet 2 of 2

JOB NUMBER: 104194

ROCK FABRIC
 MF -massive
 BF -bedded
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 CF -cleaved
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 GF -gneissose
 LF -laminated

ROCK FABRIC	GRAIN SIZE
MF -massive	FG -fine grained
BF -bedded	MG -medium grain
FF -foliated	CG -coarse grain

<i>SF</i> -schistose	<i>JOINT SPACING</i>
<i>GF</i> -gneissose	<i>VCJ</i> -very close spacg
<i>LF</i> -laminated	<i>CJ</i> -close spacing
	<i>MJ</i> -medium spacing
	<i>WJ</i> -wide spacing
20+	<i>VWJ</i> -very wide spacng

GRAIN SIZE
FG -fine grained
MG -medium grain
CG -coarse grain

JOINT SPACING	JOINT INFILL
<i>VCJ-very close spacg</i>	<i>CLN-clean</i>
<i>CJ-close spacing</i>	<i>ST-stained</i>
<i>MJ-medium spacing</i>	<i>CLY-clay filled</i>
<i>WJ-wide spacing</i>	<i>SND-sand filled</i>
<i>VWJ-very wide spacng</i>	<i>GVL-gravel filled</i>

JOINT ROUGHNESS
SLJ-slickensided
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DWA
MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: **VBH 1**
Sheet 2 of 2

JOB NUMBER: 104194

[illegible]

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HOLE No: **VBH 2**
Sheet 1 of 2

JOB NUMBER: **104194**

ROCK FABRIC
MF -massive
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DWA
MCWAP FEASIBILITY STUDY

VLIEEPOORT
ABSTRACTION WEIR

HOLE No: **VBH 2**
Sheet 1 of 2

JOB NUMBER: **104194**

69	0	0		9									Scale 1:75	
67	0	0		30									1	
89	0	0		38									2	
87	0	0		25									3	
84	0	0		55									4	
100	0	0		56									5	
72	0	0		29	N/A	N/A	N/A	N/A	N/A	N/A			6	
69	0	0		62									7	
15	0	0											8	
													9	
													10	
													11	
													12	
													13	
													14	
													15	
													16	
Material Recovery (%)	Core Recovery (%)	RQD (%)	FRAC. FREQ.	SPT-N	ROCK FABRIC AND GRAIN	JOINT NO OF SETS	JOINT INCLIN (deg)	JOINT SPACING	JOINT ROUGH- NESS	JOINT FILLING	WEATH- ERING	DEPTH Scale 1:75		

Grey to brown, silty clay with occasional rounded gravels.
Alluvium.

HOLE No: **VBH 2**
Sheet 2 of 2

JOB NUMBER: 104194

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DWA MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: **VBH 2**
Sheet 2 of 2

JOB NUMBER: 104194

[illegible]

CONTRACTOR : DWA
MACHINE : SECO 12
DRILLED BY : N.v.d Berg
PROFIED BY : G.D

TYPE SET BY : E.R
SETUP FILE : Y.SET

INCLINATION : Vertical
DIAM :
DATE : 2-30/04/2009
DATE : 10/06/2009

DATE : 02/11/09 12:11
TEXT : ..C:\DOT5000\104194~2.DOC

ELEVATION :
X-COORD : 2 725 540
Y-COORD : -31 915

HOLE No: VBH 2

HOLE No: VBH3
Sheet 1 of 3

JOB NUMBER: 104194

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DWA
MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: VBH3
Sheet 1 of 3

JOB NUMBER: 104194

56	0	0	18	<div></div>									0.00	Dark brown, <u>clay</u> . Alluvium.
35	0	0			N/A	N/A	N/A	N/A	N/A	N/A		1		
			12									2	1.95	Grey brown, <u>silty clay</u> . Alluvium.
41	0	0										3		Note: Reddish brown, medium sand at 1.95 – 2.11m; 3.90 – 4.03m; 5.85 – 6.03m; 7.80 – 8.02m; 9.75 – 9.90m.
			14									4		11.63 – 11.70m mainly medium and coarse ironstone gravels (diameter up to 0.02m).
40	0	0										5		
			16		N/A	N/A	N/A	N/A	N/A	N/A		6		
37	0	0										7	7.19m	
			21									8		
31	0	0										9		
			25									10	9.75	Grey to brown, <u>silty clay</u> with occasional rounded gravels. Alluvium.
10	0	0										11		
			13									12		
52	0	0										13		
			23		N/A	N/A	N/A	N/A	N/A	N/A		14		
65	0	0										15		
			22								16			
Material Recovery (%)	Core Recovery (%)	RQD (%)	SPT-N Is50 (D/A)	FRAC. FREQ.	ROCK FABRIC AND GRAIN	JOINT NO OF SETS	JOINT INCLIN (deg)	JOINT SPACING	JOINT ROUGHNESS	JOINT FILLING	WEATHERING	DEPTH Scale 1:75		

HOLE No: VBH3
Sheet 2 of 3

JOB NUMBER: 104194

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MCWAP FEASIBILITY STUDY

VLIEEPOORT
ABSTRACTION WEIR

HOLE No: VBH3
Sheet 2 of 3

JOB NUMBER: 104194

47	0	0	REF									<div><div>17</div><div>18</div><div>19</div><div>20</div><div>21</div><div>22</div><div>23</div><div>24</div><div>25</div><div>26</div><div>27</div><div>28</div><div>29</div><div>30</div><div>31</div><div>32</div><div>33</div></div> <div>DEPTH Scale 1:75</div>	<div><div>17.79</div><div>Sub-rounded medium to coarse <u>gravels</u> and <u>cobbles</u> of HARD ROCK banded ironstone (diameter 10 – 70mm). Alluvium. Matrix generally lost.</div></div>
24	5	0											
39	11	0											
13	6	0											
3	2	0											
3	2	0											
8	4	0											
9	0	0											
11	3	0											
<i>Material Recovery (%)</i>	<i>Core Recovery (%)</i>	<i>RQD (%)</i>	<i>SPT-N Is50 (D/A)</i>	<i>FRAC. FREQ.</i>	<i>ROCK FABRIC AND GRAIN</i>	<i>JOINT NO OF SETS</i>	<i>JOINT INCLIN (deg)</i>	<i>JOINT SPACING</i>	<i>JOINT ROUGH- NESS</i>	<i>JOINT FILLING</i>	<i>WEATH- ERING</i>		

HOLE No: VBH3
Sheet 3 of 3

JOB NUMBER: 104194

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DWA MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: VBH3
Sheet 3 of 3

JOB NUMBER: 104194

[illegible]

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HOLE No: **VBH 5**
Sheet 1 of 3

JOB NUMBER: **104194**

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DWA
MCWAP FEASIBILITY STUDY

VLIEEPOORT
ABSTRACTION WEIR

HOLE No: **VBH 5**
Sheet 1 of 3

JOB NUMBER: **104194**

41	0	0			N/A	N/A	N/A	N/A	N/A	N/A		Scale 1:75	<div></div>	0.00	Moist, dark grey-brown, <u>clay</u> . Alluvium.
60	0	0												1	
93	0	0												2	
45	0	0												3	
22	0	0												4	
50	0	0												5	
34	0	0												6	
21	0	0												7	
38	0	0												8	
26	0	0												9	
27	0	0												10	
143	0	0												11	
22	0	0												12	
														13	
														14	
														15	
														16	
														DEPTH Scale 1:75	
Material Recovery (%)	Core Recovery (%)	RQD (%)	FRAC. FREQ.	SPT-N	ROCK FABRIC AND GRAIN	JOINT NO OF SETS	JOINT INCLIN (deg)	JOINT SPACING	JOINT ROUGH- NESS	JOINT FILLING	WEATH- ERING				

HOLE No: **VBH 5**
Sheet 2 of 3

JOB NUMBER: 104194

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DWA MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: **VBH 5**
Sheet 2 of 3

JOB NUMBER: 104194

[illegible]

HOLE No: **VBH 5**
Sheet 3 of 3

JOB NUMBER: 104194

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**DWA
MCWAP FEASIBILITY STUDY**

VLIEEPOORT ABSTRACTION WEIR

HOLE No: VBH 5
Sheet 3 of 3

JOB NUMBER: 104194

[illegible]

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HOLE No: **VBH 6**
Sheet 1 of 2

JOB NUMBER: 104194

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DWA MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: VBH 6
Sheet 1 of 2

JOB NUMBER: 104194

46	0	0	The very fine spacing of the gravel is not uniformly distributed	N=10	N=9	N/A	N/A	N/A	N/A	N/A	N/A	WEATHERING	<div>Scale 1:75</div> <div><div></div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div><div>10</div><div>11</div><div>12</div><div>13</div><div>14</div><div>15</div><div>16</div></div> <div>DEPTH Scale 1:75</div>	0.00	Dark brown, silty to sandy <u>clay</u> with sand lenses/horizons. Alluvium.												
433	0	0																									
22	0	0																									
83	0	0																									
62	0	0																									
92	0	0																									
67	0	0																									
80	0	0																									
80	0	0																									
94	0	0																									
60	0	0																									
33	0	0																									
36	0	0																									
43	0	0																									
192	0	0																									
107	0	0																									
98	0	0																									
89	0	0																									
69	8	0																									
93	0	0																									
90	0	0																									
64	44	0																									
Material Recovery (%)	Core Recovery (%)	RQD (%)												FRAC. FREQ.		SPT-N Is50 (D/A)	FRAC. FREQ.	ROCK FABRIC AND GRAIN	JOINT NO OF SETS	JOINT INCLIN (deg)	JOINT SPACING	JOINT ROUGHNESS	JOINT FILLING			14.88	Brown, <u>clay</u> and <u>sand</u> and sub-rounded, medium to coarse <u>gravels</u> / angular <u>cobbles</u> of banded ironstone, with some quartz. (Cobble and gravel horizon between 15,75 – 16,73 m) Alluvium.

HOLE No: **VBH 6**
Sheet 2 of 2

JOB NUMBER: 104194

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DWA
MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: **VBH 6**
Sheet 2 of 2

JOB NUMBER: 104194

[illegible]

1) Rockhead at 27,30 m.

CONTRACTOR : WEPPELMAN
MACHINE : Seco
DRILLED BY : Willem
PROFILED BY : G.D

TYPE SET BY : C.A
SETUP FILE : Y.SET

INCLINATION: VERTICAL

DIAM :
DATE : 16/03/2009 – 27/03/2009
DATE : 03/06/2009

ELEVATION :
X-COORD : 2 725 508
Y-COORD : -32 066

HOLE No: VBH 6

HOLE No: **VBH 7**
Sheet 1 of 2

JOB NUMBER: 104194

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DWA MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: **VBH 7**
Sheet 1 of 2

JOB NUMBER: 104194

72	0	0		N=25	N/A	N/A	N/A	N/A	N/A	N/A	<div></div>	<div>DEPTH Scale 1:75</div> <div><div></div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div><div>10</div><div>11</div><div>12</div><div>13</div><div>14</div><div>15</div><div>16</div></div>	0.00	Moist, grey-brown, <u>clay</u> . Alluvium.
106	0	0												
60	0	0												
101	0	0												
62	0	0												
39	0	0												
67	0	0												
50	0	0												
62	0	0												
65	0	0												
67	0	0												
60	0	0												
25	14	0		N=7	N/A	N/A	N/A	N/A	N/A	N/A	<div></div>	<div>DEPTH Scale 1:75</div> <div><div></div><div>10</div><div>11</div><div>12</div><div>13</div><div>14</div><div>15</div><div>16</div></div>	7.50	Moist to wet, brown to grey brown, <u>clayey sand</u> . Alluvium.
13	13	0												
20	0	0												
40	0	0												
13	5	0												
28	16	0												
20	6	0												
22	0	0												
Material Recovery (%)	Core Recovery (%)	RQD (%)	FRAC. FREQ.	SPT-N Is50 (D/A)	ROCK FABRIC AND GRAIN	JOINT NO OF SETS	JOINT INCLIN (deg)	JOINT SPACING	JOINT ROUGH-NESS	JOINT FILLING	WEATH-ERING	DEPTH Scale 1:75		

HOLE No: **VBH 7**
Sheet 2 of 2

JOB NUMBER: 104194

ROCK FABRIC
MF -massive
BF -bedded
FF -foliated
CF -cleaved
SF -schistose
GF -gneissose
LF -laminated

GRAIN SIZE
FG -fine grained
MG -medium grain
CG -coarse grain

JOINT SPACING
VCJ-very close spacg
CJ -close spacing
MJ -medium spacing
WJ -wide spacing
VWJ-very wide spacng

JOINT ROUGHNESS
SLJ-slickensided
SJ -smooth
RJ -rough

JOINT INFILL
CLN-clean
ST-stained
CLY-clay filled
SND-sand filled
GVL-gravel filled

WEATHERING GRAPH
 100%-completely weathered
 75%-highly weathered
 50%-moderately weathered
 25%-slightly weathered
 0% -unweathered



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MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: VBH 7
Sheet 2 of 2

JOB NUMBER: 104194

[illegible]

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HOLE No: **VBH 8**
Sheet 1 of 3

JOB NUMBER: **104194**

ROCK FABRIC
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DWA
MCWAP FEASIBILITY STUDY

VLIEEPOORT
ABSTRACTION WEIR

HOLE No: **VBH 8**
Sheet 1 of 3

JOB NUMBER: **104194**

50	0	0		N/A	N/A	N/A	N/A	N/A	N/A		Scale 1:75	0.00	Red brown, <u>sandy clay</u> with gravel. Topsoil (Colluvium).
41	0	0									1	0.90	
47	16	0									2		Angular to sub-angular, medium to coarse <u>gravels</u> (generally diameter of 20 – 50 mm, occasionally up to 120 mm), occasional cobbles of weathered, purplish, hard rock, banded ironstone; in places recovered in matrix of sandy <u>clay</u> . Matrix generally lost. Boundaries uncertain.
100	100	0									3		
34	12	0									4		
74	0	0									5		
54	23	0									6		
22	8	0									7		
48	0	0									8		
18	0	0									9		
21	15	0		N/A	N/A	N/A	N/A	N/A	N/A		10		
129	57	46									11		
95	19	0									12		
117	11	0									13		
76	39	32									14		
158	67	0									15		
68	0	0									16		
150	150	150									17		
38	8	0									18		
138	82	0									19		
80	57	27									20		
84	0	0									21		
49	9	0									22		
110	10	0									23		
64	17	0									24		Angular, medium to coarse <u>gravels</u> , occasional cobbles and boulders, of highly to completely weathered brecciated, HARD ROCK banded ironstone in matrix of gravelly <u>clay</u> . Talus /possible fault breccia?
91	40	0									25		
3	2	0									26		
42	16	0									27		
29	5	0									28		
35	0	0									29		
81	0	0									30		
100	0	0									31		
26	0	0									32		
34	3	0									33		
Material Recovery (%)	Core Recovery (%)	RQD (%)	FRAC. FREQ.	ROCK FABRIC AND GRAIN	JOINT NO OF SETS	JOINT INCLIN (deg)	JOINT SPACING	JOINT ROUGH-NESS	JOINT FILLING	WEATH-ERING	DEPTH Scale 1:75		



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MCWAP FEASIBILITY STUDY

VLIEEPOORT
ABSTRACTION WEIR

HOLE No: **VBH 8**
Sheet 2 of 3

JOB NUMBER: 104194

HOLE No: **VBH 8**
Sheet 2 of 3

JOB NUMBER: 104194

ROCK FABRIC
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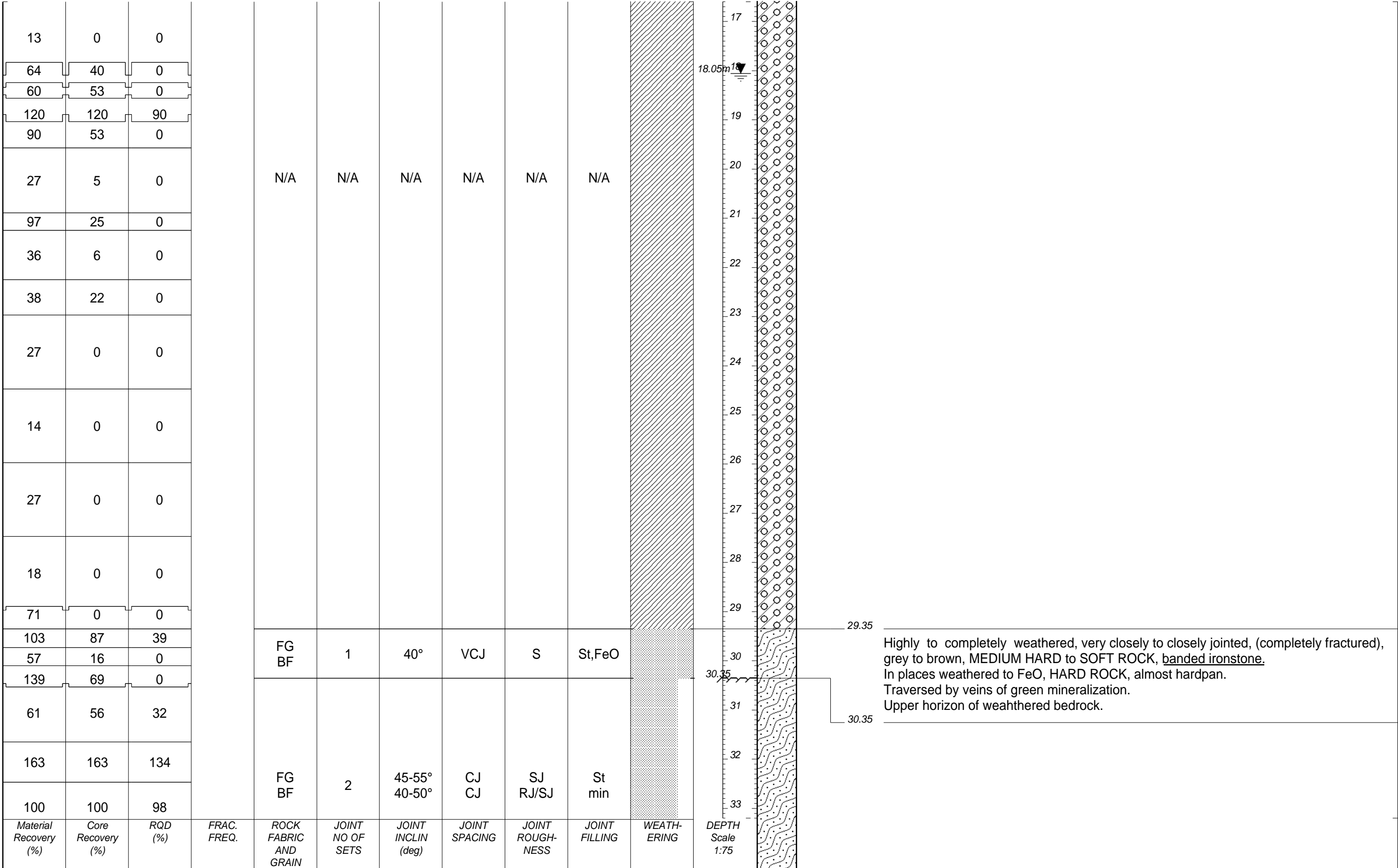
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HOLE No: **VBH 8**
Sheet 3 of 3

JOB NUMBER: 104194

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MCWAP FEASIBILITY STUDY

VLIEEPOORT ABSTRACTION WEIR

HOLE No: VBH 8
Sheet 3 of 3

JOB NUMBER: 104194

[illegible]

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HOLE No: VBH DAM1
Sheet 1 of 1

JOB NUMBER: 104194

ROCK FABRIC
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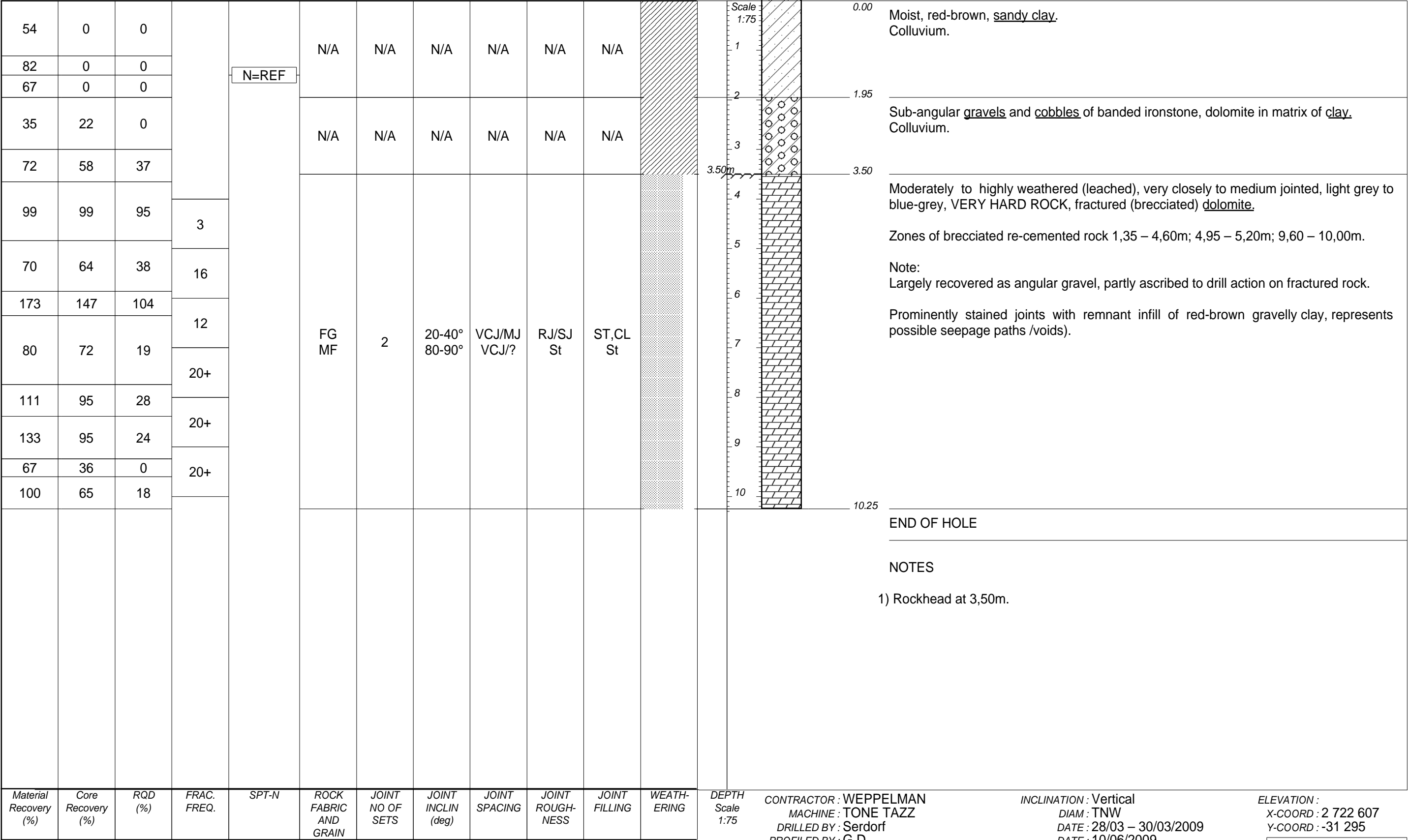


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MCWAP FEASIBILITY STUDY

VLIEEPOORT
BALANCING DAM

HOLE No: VBH DAM1
Sheet 1 of 1

JOB NUMBER: 104194



HOLE No: VBH DAM2
Sheet 1 of 1

JOB NUMBER: 104194

ROCK FABRIC
MF -massive
BF -bedded
FF -foliated
CF -cleaved
SF -schistose
GF -gneissose
LF -laminated

GRAIN SIZE
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CLY-clay filled
SND-sand filled
GVL-gravel filled

WEATHERING GRAPH
100%-completely weathered
75%-highly weathered
50%-moderately weathered
25%-slightly weathered
0% -unweathered

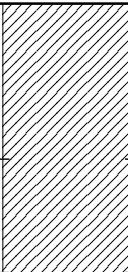
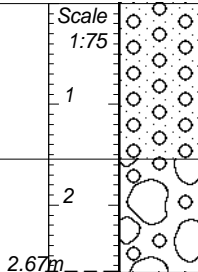
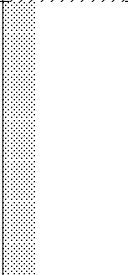
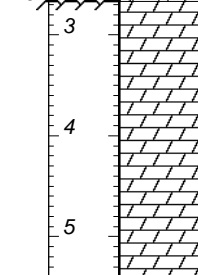
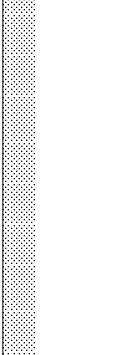
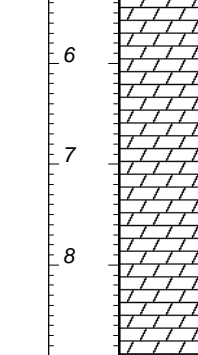


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MCWAP

VLIEEPOORT
BALANCING DAM

HOLE No: VBH DAM2
Sheet 1 of 1

JOB NUMBER: 104194

33	19	19		N/A	N/A	N/A	N/A	N/A	N/A			0.00	Angular, medium to coarse <u>gravels</u> of banded ironstones (with chert gravels below 1,00 m). Clayey <u>sand</u> matrix assume mostly lost (only recovered between 0,54 – 1,54m). Colluvium.									
42	0	0										1										
108	64	21	6	N/A	N/A	N/A	N/A	N/A	N/A			1.54	Angular <u>gravels</u> , <u>cobbles</u> and <u>boulders</u> up to 800 mm of whitish, leached chert, stained reddish brown along fractures and joints. In places, partly re-cemented chert breccia. Dolomite residuum.									
97	97	72										2										
71	71	0	10	FG MF	3	80-90° 60-70° 20-30°	CJ MJ MJ	SJ RJ RJ	CI CI,St CI,St			2.67	Slightly weathered, closely to medium jointed (spacing between 100 – 300 mm), light grey, VERY HARD ROCK, <u>dolomite</u> .									
82	76	76										3										
97	97	85	9									4	Recemented breccia in places, especially between 2,67 – 2,85 m.									
122	122	56	7										5	Prominent fracturing between 4,83 – 5,05 m, 7,10 – 7,20 m and 8,20 – 8,30 m.								
100	100	77											6									
96	92	73	13									7										
111	111	69	9									8										
96	88	84																		8.91		
													END OF HOLE									
													NOTES									
													1) Rockhead at 2,67m.									

Material Recovery (%)	Core Recovery (%)	RQD (%)	FRAC. FREQ.	ROCK FABRIC AND GRAIN	JOINT NO OF SETS	JOINT INCLIN (deg)	JOINT SPACING	JOINT ROUGH-NESS	JOINT FILLING	WEATH-ERING	DEPTH Scale 1:75	CONTRACTOR : WEPPELMAN MACHINE : Seco DRILLED BY : William PROFILLED BY : G.D. & C.A.	INCLINATION : VERTICAL DIAM : 63MM DATE : 27/03/2009 DATE : 03/06/2009	ELEVATION : X-COORD : 2 722 474 Y-COORD : -31 726
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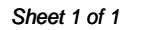
Sheet 1 of 1

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SF -schistose
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25%-slightly weathered
0% -unweathered

[illegible]

DEPTH
Scale
1:75

HOLE No: **VBH DAM3**

JOB NUMBER: 104194

GRAIN SIZE
FG -fine grained
MG -medium grain
CG -coarse grain

JOINT SPACING
VCJ-very close spacg
CJ -close spacing
MJ -medium spacing
WJ -wide spacing
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JOINT ROUGHNESS
SLJ-slickensided
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WEATHERING GRAPH
 100%-completely weathered
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VLIEEPOORT BALANCING DAM

JOB NUMBER: 104194

[illegible]

CONTRACTOR : WEPPELMAN
MACHINE : D 90 R
DRILLED BY : William
PROFILED BY : G.D

TYPE SET BY : C.A
SETUP FILE : Y.SET

INCLINATION : VERTICAL
DIAM : 63MM
DATE : 14-16/05/2009
DATE : 03/06/2009

DATE : 02/11/09 12:08
TEXT : ..C:\DOT5000\104194~1.DOC

ELEVATION :
X-COORD : 2 723 191
Y-COORD : -31 790

HOLE No: **VBH DAM 4**