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BTW-nummer
NL8048.57.544.B01

uw ref: -

onze ref: 140.23.0510/R1

Panheel, 10 januari 2024

Betreft : Infiltratieonderzoek Tiskesweg te Nederweert-Eind
Opgesteld door : [REDACTED]

Geachte [REDACTED]

Hierbij ontvangt u de resultaten van het infiltratie onderzoek (bepalen k-waarden) voor het projectgebied Tiskesweg te Nederweert-Eind.

Onderzoeksopzet

Het onderzoek wordt uitgevoerd volgens de Aardvark methode (constant-Head-boorgat-permeameter) in de onverzadigde zone ter plaatse van 5 meetpunten. Per meetpunt vindt een meting plaats in de bodemlaag van 1,0-1,5 m-mv en 2,0-2,5 m-mv. Per bodemlaag wordt vervolgens een k-waarde in m/d bepaald.

Uitvoering veldwerk

Het veldwerk is door [REDACTED] (protocol 2001 erkend) uitgevoerd op 18 en 22 december 2023. Per meetpunt is minimaal 1 meting uitgevoerd. Een schets met de meetpunten is opgenomen in bijlage 1. In verband met de hoge grondwaterstand (a.g.v. zeer natte periode) is gekozen voor een hogere infiltratiediepte dan voorzien bij de onderzoeksopzet. Een meting in de onverzadigde zone op 2 verschillende dieptes heeft niet kunnen plaatsvinden. De boorprofielen zijn opgenomen in bijlage 2. Uit de boorprofielen blijkt dat de bodem bestaat uit zeer fijn zand met laagjes leem.

Resultaten

De meetresultaten zijn per boorpunt in tabel 1 samengevat. De volledige meetresultaten zijn opgenomen in bijlage 3.

Tabel 1: Overzicht gegevens infiltratiemetingen en grondwaterstanden

Meetpunt	Meting	Grondwaterstand in m-mv	Infiltratiediepte in m-mv	K-waarde in m/d
01	1d	1,05	0,55	Geen betrouwbare meting
02	2a	0,86	0,45	0,1
03	3a	1,05	0,55	Geen betrouwbare meting
04	4a	1,60	1,05	0,00995
05	5a	1,65	1,15	Geen betrouwbare meting



Bespreking resultaten

Uit de resultaten blijkt dat ter plaatse van meetpunt 01, 03 en 05 geen betrouwbare meting mogelijk was. Ter plaatse van boring 02 en 04 is een zeer lage k-waarde gemeten.

Conclusie

Gezien de aangetroffen bodemopbouw (zeer fijn zand met laagjes leem) worden geen hoge k-waarden (= goed doorlatende bodemlagen) verwacht. Een aantal metingen heeft dit bevestigd. In de diepere bodem heeft, omdat geen sprake was van een onverzadigde zone, geen meting kunnen plaatsvinden met de Aardvark methode. Mogelijk dat dit op een later moment in een drogere periode wel nog mogelijk is.

Wij vertrouwen erop u hiermee voldoende te hebben geïnformeerd. Mocht u naar aanleiding van deze rapportage nog vragen hebben dan hoor ik het graag.

Met vriendelijke groet,
Milieutechnisch Adviesbureau Heel BV

Voor akkoord, d.d.



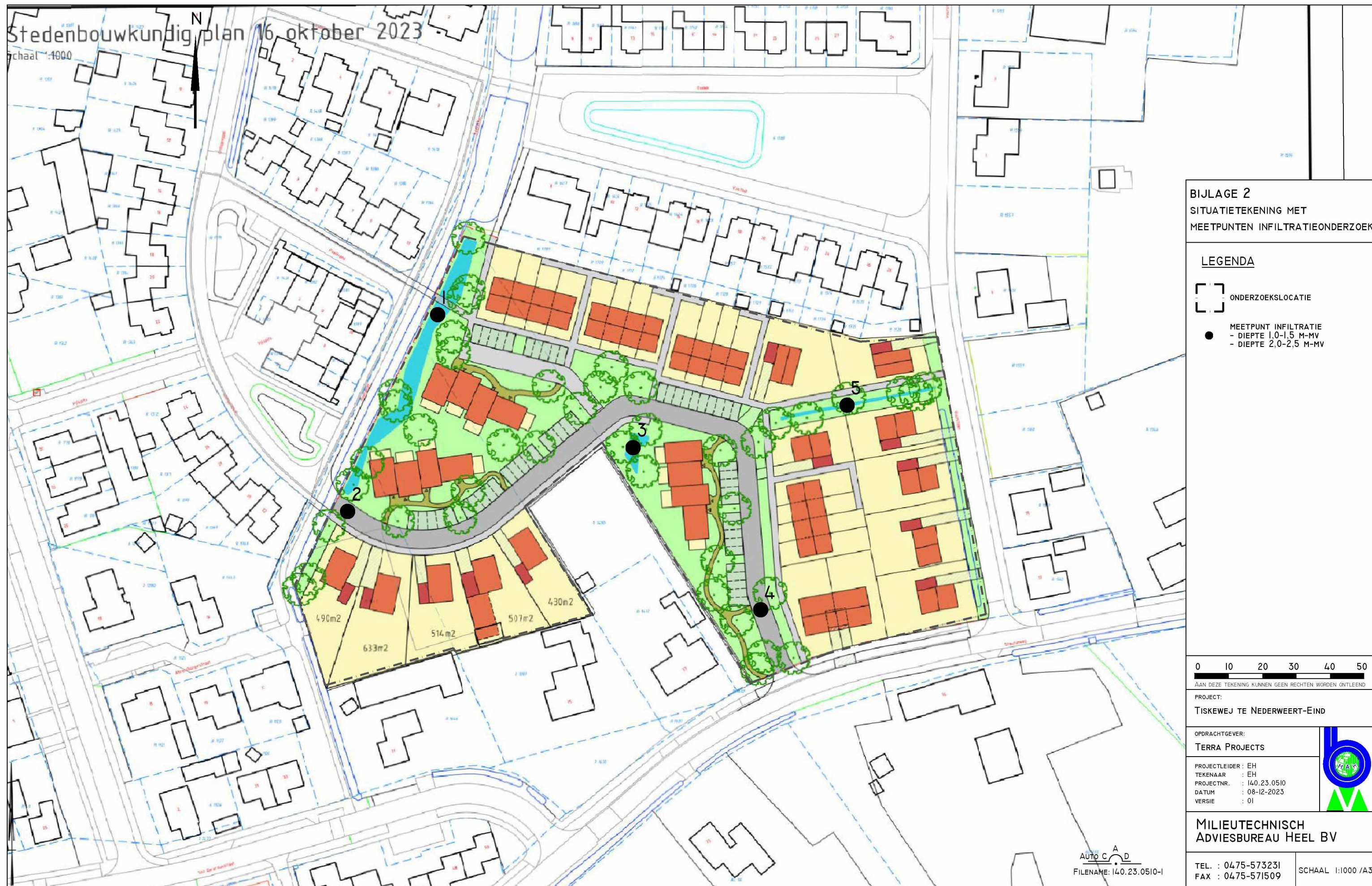
Directeur

Bijlage(n)

1. Situatieschets met meetpunten
2. Profielbeschrijvingen
3. Meetresultaten



BIJLAGE 1
SITUATIESCHETS MET MEETPUNTEN

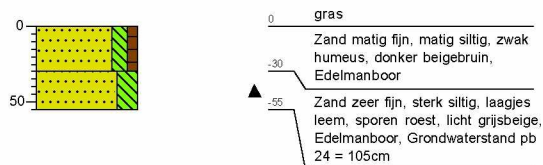




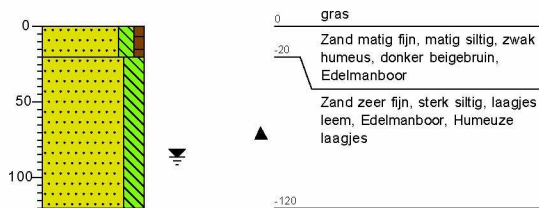
BIJLAGE 2

PROFIELBESCHRIJVINGEN

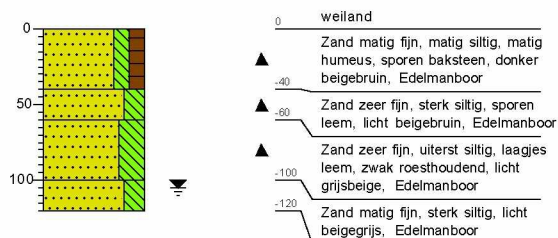
Boring: 01



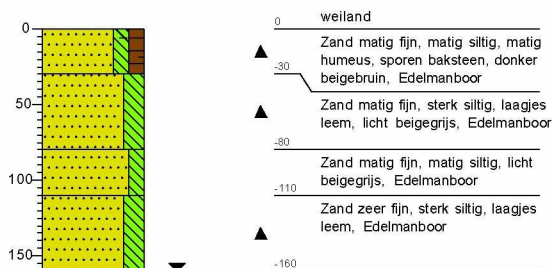
Boring: 02



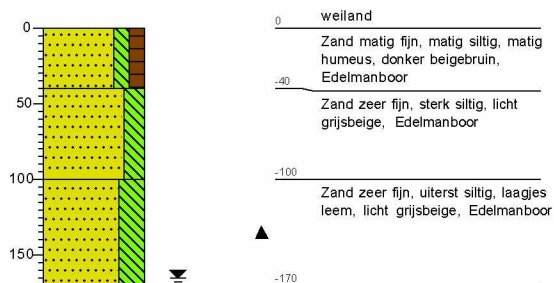
Boring: 03



Boring: 04



Boring: 05





BIJLAGE 3

MEETRESULTATEN



vrijdag 22 december 2023

Location: Nederweert1

Site: 1d

Time interval between readings: 0 minute

Ksat Method: Glover Solution

Steady Flow Rate Condition

Steady Flow Rate achieved when Water Consumption Rate changes less than +/- 50 % for 3 consecutive readings

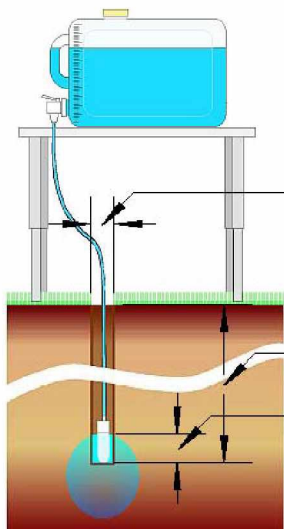
Steady Flow Rate: -5,631 ml/min

Temp. Adj. FR: -5,633 ml/min

Percolation Rate: -13,943 min/cm

Ksat: -1,4014E-1 Meters / day

Notes:



10 cm Hole Diameter

10 ° C Water Temperature

55 cm Hole Depth

8 cm Water Height in Hole

Water Table Depth

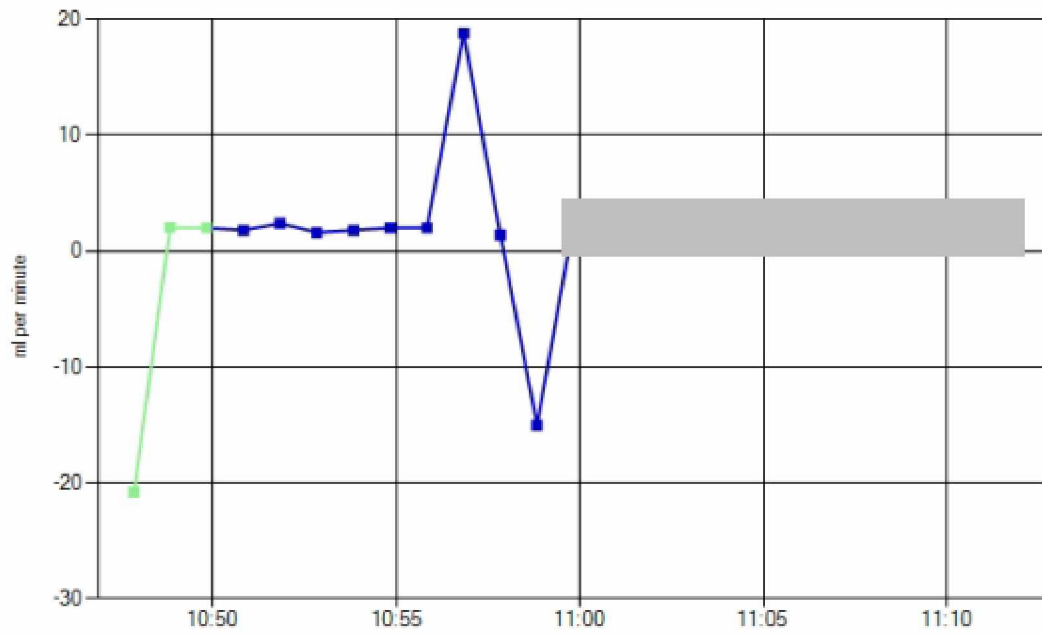
Site GPS Position

	Degrees	Minutes	Seconds	
Longitude:	0	0	0	East
Latitude:	0	0	0	North

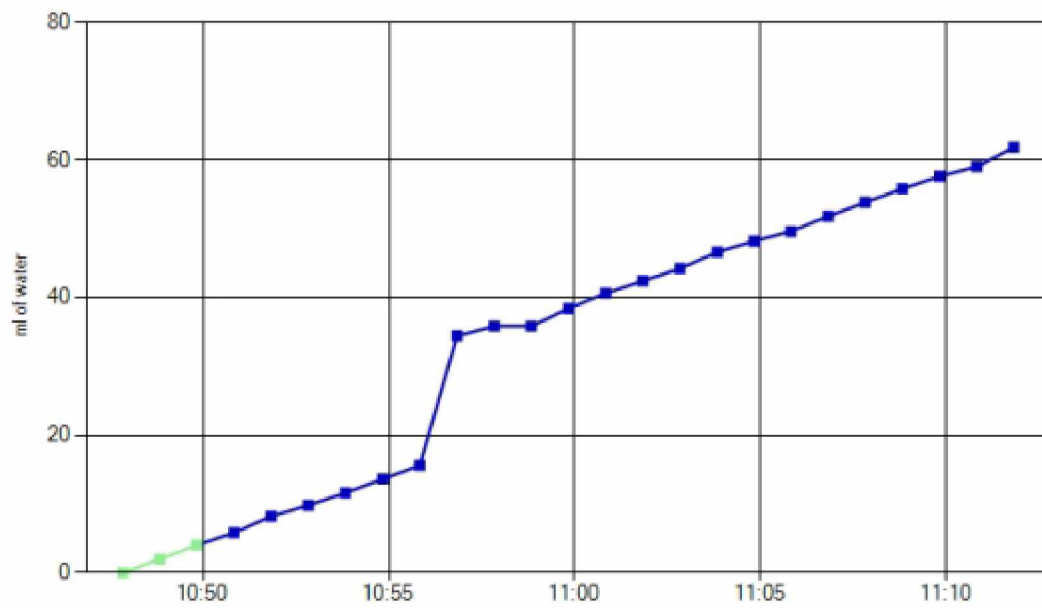
Soil Texture-Structure Category:

Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.

Water Consumption Rate



Total Water Consumed



<u>Time</u>	<u>Reservoir Water Level</u>	<u>Elapsed Time Interval</u>	<u>Interval Water Consumed</u>	<u>Total Water Consumed</u>	<u>Water Consumption Rate</u>	<u>Ignore Reading</u>
10:46:51	7595,2 ml					
10:47:51	7616,0 ml	1 minute	-20,8 ml	,0 ml	-20,800 ml/min	
10:48:50	7614,0 ml	59 seconds	2,0 ml	2,0 ml	2,034 ml/min	
10:49:50	7612,0 ml	1 minute	2,0 ml	4,0 ml	2,000 ml/min	
10:50:50	7610,2 ml	1 minute	1,8 ml	5,8 ml	1,800 ml/min	
10:51:50	7607,8 ml	1 minute	2,4 ml	8,2 ml	2,400 ml/min	
10:52:50	7606,2 ml	1 minute	1,6 ml	9,8 ml	1,600 ml/min	
10:53:50	7604,4 ml	1 minute	1,8 ml	11,6 ml	1,800 ml/min	
10:54:50	7602,4 ml	1 minute	2,0 ml	13,6 ml	2,000 ml/min	
10:55:50	7600,4 ml	1 minute	2,0 ml	15,6 ml	2,000 ml/min	
10:56:50	7581,6 ml	1 minute	18,8 ml	34,4 ml	18,800 ml/min	
10:57:50	7580,2 ml	1 minute	1,4 ml	35,8 ml	1,400 ml/min	
10:58:50	7595,2 ml	1 minute	-15,0 ml	35,8 ml	-15,000 ml/min	
10:59:50	7592,6 ml	1 minute	2,6 ml	38,4 ml	2,600 ml/min	
11:00:50	7590,4 ml	1 minute	2,2 ml	40,6 ml	2,200 ml/min	
11:01:50	7588,6 ml	1 minute	1,8 ml	42,4 ml	1,800 ml/min	
11:02:50	7586,8 ml	1 minute	1,8 ml	44,2 ml	1,800 ml/min	
11:03:50	7584,4 ml	1 minute	2,4 ml	46,6 ml	2,400 ml/min	
11:04:50	7582,8 ml	1 minute	1,6 ml	48,2 ml	1,600 ml/min	
11:05:49	7581,4 ml	59 seconds	1,4 ml	49,6 ml	1,424 ml/min	
11:06:49	7579,2 ml	1 minute	2,2 ml	51,8 ml	2,200 ml/min	
11:07:49	7577,2 ml	1 minute	2,0 ml	53,8 ml	2,000 ml/min	
11:08:49	7575,2 ml	1 minute	2,0 ml	55,8 ml	2,000 ml/min	
11:09:49	7573,4 ml	1 minute	1,8 ml	57,6 ml	1,800 ml/min	
11:10:49	7572,0 ml	1 minute	1,4 ml	59,0 ml	1,400 ml/min	
11:11:49	7569,2 ml	1 minute	2,8 ml	61,8 ml	2,800 ml/min	



vrijdag 22 december 2023

Location: Nederweert1

Site: 2a

Time interval between readings: 0 minute

Ksat Method: Glover Solution

Steady Flow Rate Condition

Steady Flow Rate achieved when Water Consumption Rate changes less than +/- 10 % for 3 consecutive readings

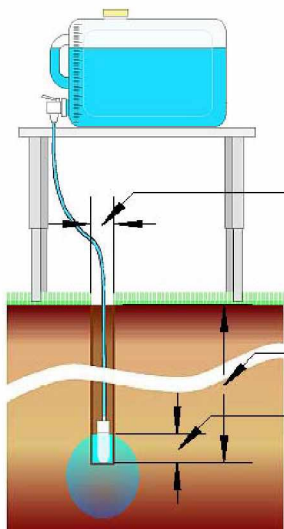
Steady Flow Rate: 4,000 ml/min

Temp. Adj. FR: 4,001 ml/min

Percolation Rate: 19,629 min/cm

Ksat: 0,1 Meters / day

Notes:



10 cm Hole Diameter

10 °C Water Temperature

45 cm Hole Depth

8 cm Water Height in Hole

Water Table Depth

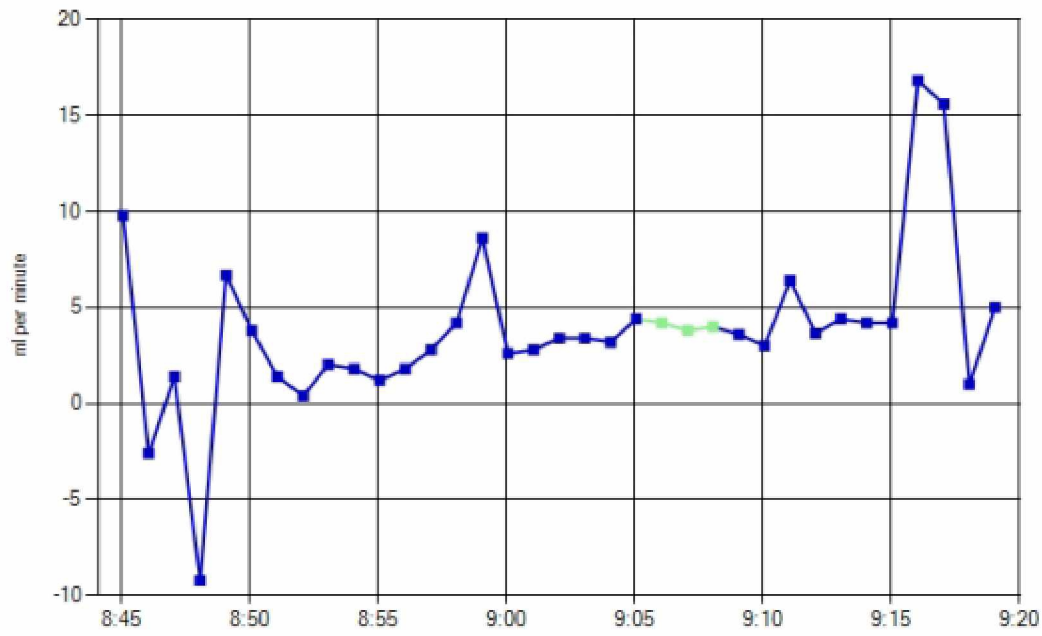
Site GPS Position

	Degrees	Minutes	Seconds	
Longitude:	0	0	0	East
Latitude:	0	0	0	North

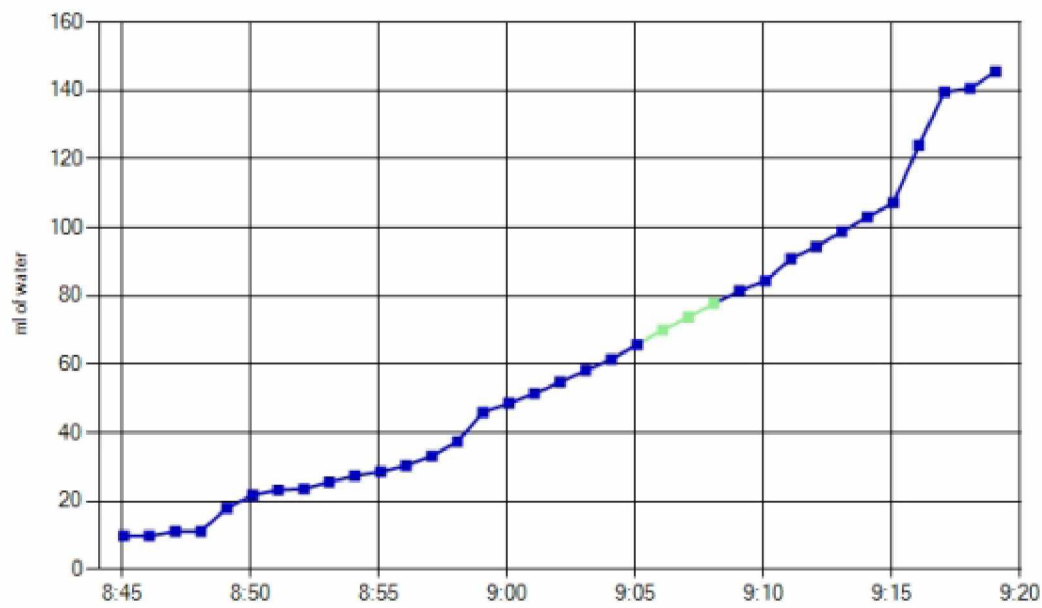
Soil Texture-Structure Category:

Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.

Water Consumption Rate



Total Water Consumed



<u>Time</u>	<u>Reservoir Water Level</u>	<u>Elapsed Time Interval</u>	<u>Interval Water Consumed</u>	<u>Total Water Consumed</u>	<u>Water Consumption Rate</u>	<u>Ignore Reading</u>
08:44:04	8527,8 ml					
08:45:04	8518,0 ml	1 minute	9,8 ml	9,8 ml	9,800 ml/min	
08:46:04	8520,6 ml	1 minute	-2,6 ml	9,8 ml	-2,600 ml/min	
08:47:04	8519,2 ml	1 minute	1,4 ml	11,2 ml	1,400 ml/min	
08:48:04	8528,4 ml	1 minute	-9,2 ml	11,2 ml	-9,200 ml/min	
08:49:05	8521,6 ml	1 minute	6,8 ml	18,0 ml	6,689 ml/min	
08:50:05	8517,8 ml	1 minute	3,8 ml	21,8 ml	3,800 ml/min	
08:51:05	8516,4 ml	1 minute	1,4 ml	23,2 ml	1,400 ml/min	
08:52:05	8516,0 ml	1 minute	,4 ml	23,6 ml	,400 ml/min	
08:53:04	8514,0 ml	59 seconds	2,0 ml	25,6 ml	2,034 ml/min	
08:54:04	8512,2 ml	1 minute	1,8 ml	27,4 ml	1,800 ml/min	
08:55:04	8511,0 ml	1 minute	1,2 ml	28,6 ml	1,200 ml/min	
08:56:04	8509,2 ml	1 minute	1,8 ml	30,4 ml	1,800 ml/min	
08:57:04	8506,4 ml	1 minute	2,8 ml	33,2 ml	2,800 ml/min	
08:58:04	8502,2 ml	1 minute	4,2 ml	37,4 ml	4,200 ml/min	
08:59:04	8493,6 ml	1 minute	8,6 ml	46,0 ml	8,600 ml/min	
09:00:04	8491,0 ml	1 minute	2,6 ml	48,6 ml	2,600 ml/min	
09:01:04	8488,2 ml	1 minute	2,8 ml	51,4 ml	2,800 ml/min	
09:02:04	8484,8 ml	1 minute	3,4 ml	54,8 ml	3,400 ml/min	
09:03:04	8481,4 ml	1 minute	3,4 ml	58,2 ml	3,400 ml/min	
09:04:04	8478,2 ml	1 minute	3,2 ml	61,4 ml	3,200 ml/min	
09:05:04	8473,8 ml	1 minute	4,4 ml	65,8 ml	4,400 ml/min	
09:06:04	8469,6 ml	1 minute	4,2 ml	70,0 ml	4,200 ml/min	
09:07:04	8465,8 ml	1 minute	3,8 ml	73,8 ml	3,800 ml/min	
09:08:04	8461,8 ml	1 minute	4,0 ml	77,8 ml	4,000 ml/min	
09:09:04	8458,2 ml	1 minute	3,6 ml	81,4 ml	3,600 ml/min	
09:10:04	8455,2 ml	1 minute	3,0 ml	84,4 ml	3,000 ml/min	
09:11:04	8448,8 ml	1 minute	6,4 ml	90,8 ml	6,400 ml/min	
09:12:03	8445,2 ml	59 seconds	3,6 ml	94,4 ml	3,661 ml/min	
09:13:03	8440,8 ml	1 minute	4,4 ml	98,8 ml	4,400 ml/min	
09:14:03	8436,6 ml	1 minute	4,2 ml	103,0 ml	4,200 ml/min	
09:15:03	8432,4 ml	1 minute	4,2 ml	107,2 ml	4,200 ml/min	
09:16:03	8415,6 ml	1 minute	16,8 ml	124,0 ml	16,800 ml/min	
09:17:03	8400,0 ml	1 minute	15,6 ml	139,6 ml	15,600 ml/min	
09:18:03	8399,0 ml	1 minute	1,0 ml	140,6 ml	1,000 ml/min	
09:19:03	8394,0 ml	1 minute	5,0 ml	145,6 ml	5,000 ml/min	



vrijdag 22 december 2023

Location: Nederweert

Site: 3a

Time interval between readings: 0 minute

Ksat Method: Glover Solution

Steady Flow Rate Condition

Steady Flow Rate achieved when Water Consumption Rate changes less than +/- 20 % for 3 consecutive readings

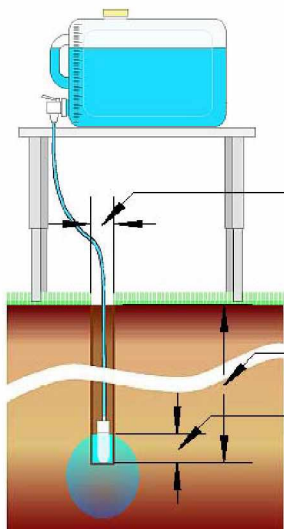
Steady Flow Rate: -0,267 ml/min

Temp. Adj. FR: -0,267 ml/min

Percolation Rate: -294,440 min/cm

Ksat: -6,6361E-3 Meters / day

Notes:



10 cm Hole Diameter

10 ° C Water Temperature

55 cm Hole Depth

8 cm Water Height in Hole

Water Table Depth

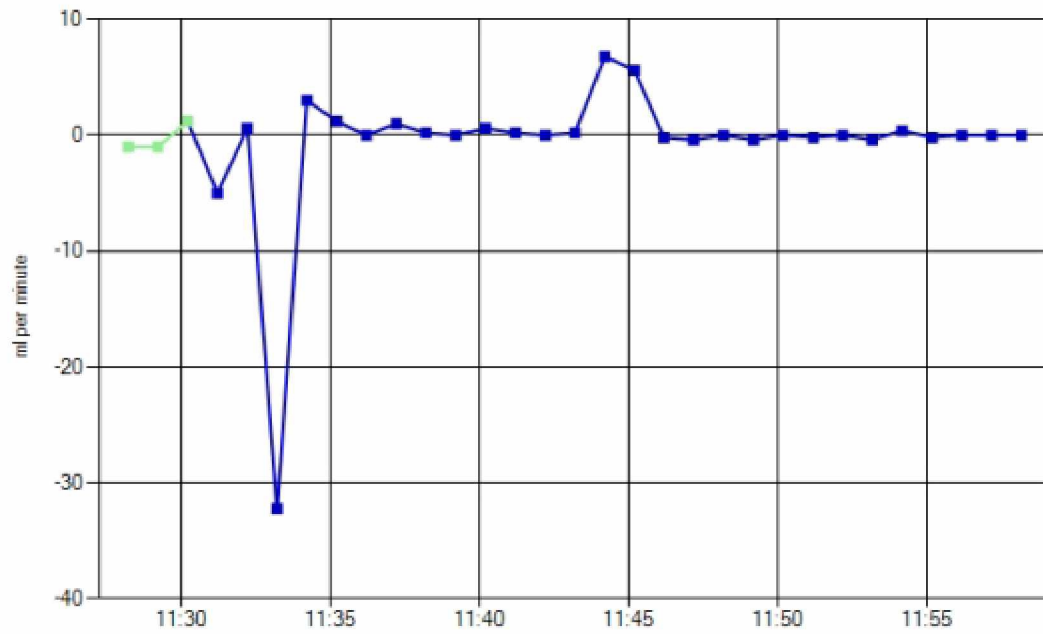
Site GPS Position

	Degrees	Minutes	Seconds	
Longitude:	0	0	0	East
Latitude:	0	0	0	North

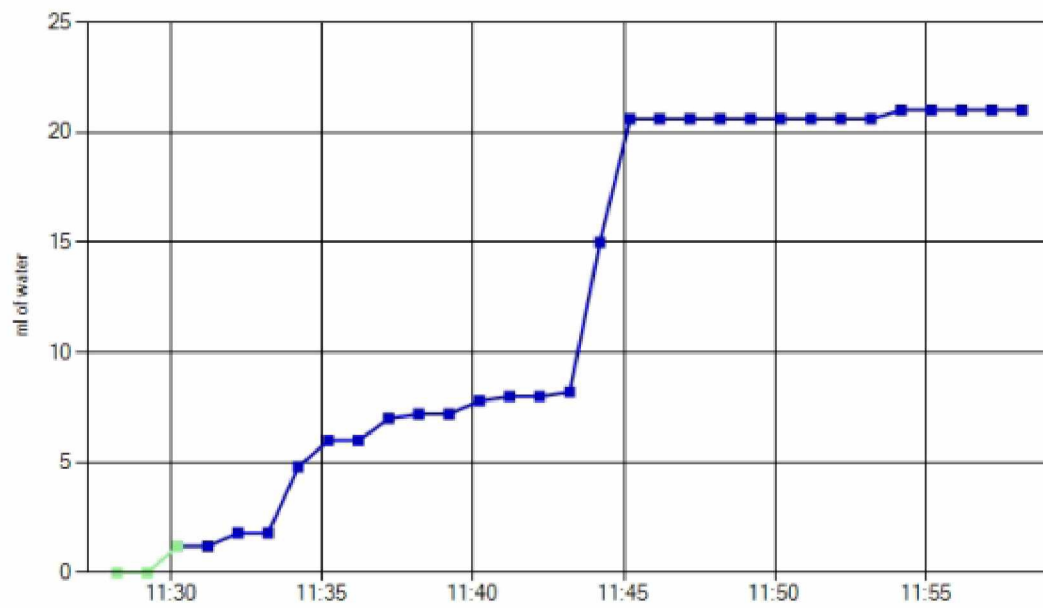
Soil Texture-Structure Category:

Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.

Water Consumption Rate



Total Water Consumed



<u>Time</u>	<u>Reservoir Water Level</u>	<u>Elapsed Time Interval</u>	<u>Interval Water Consumed</u>	<u>Total Water Consumed</u>	<u>Water Consumption Rate</u>	<u>Ignore Reading</u>
11:27:12	6058,4 ml					
11:28:12	6059,4 ml	1 minute	-1,0 ml	,0 ml	-1,000 ml/min	
11:29:12	6060,4 ml	1 minute	-1,0 ml	,0 ml	-1,000 ml/min	
11:30:12	6059,2 ml	1 minute	1,2 ml	1,2 ml	1,200 ml/min	
11:31:12	6064,2 ml	1 minute	-5,0 ml	1,2 ml	-5,000 ml/min	
11:32:12	6063,6 ml	1 minute	,6 ml	1,8 ml	,600 ml/min	
11:33:12	6095,8 ml	1 minute	-32,2 ml	1,8 ml	-32,200 ml/min	
11:34:12	6092,8 ml	1 minute	3,0 ml	4,8 ml	3,000 ml/min	
11:35:12	6091,6 ml	1 minute	1,2 ml	6,0 ml	1,200 ml/min	
11:36:12	6091,6 ml	1 minute	,0 ml	6,0 ml	,000 ml/min	
11:37:12	6090,6 ml	1 minute	1,0 ml	7,0 ml	1,000 ml/min	
11:38:12	6090,4 ml	1 minute	,2 ml	7,2 ml	,200 ml/min	
11:39:12	6090,4 ml	1 minute	,0 ml	7,2 ml	,000 ml/min	
11:40:12	6089,8 ml	1 minute	,6 ml	7,8 ml	,600 ml/min	
11:41:12	6089,6 ml	1 minute	,2 ml	8,0 ml	,200 ml/min	
11:42:12	6089,6 ml	1 minute	,0 ml	8,0 ml	,000 ml/min	
11:43:12	6089,4 ml	1 minute	,2 ml	8,2 ml	,200 ml/min	
11:44:12	6082,6 ml	1 minute	6,8 ml	15,0 ml	6,800 ml/min	
11:45:12	6077,0 ml	1 minute	5,6 ml	20,6 ml	5,600 ml/min	
11:46:11	6077,2 ml	59 seconds	-,2 ml	20,6 ml	-,203 ml/min	
11:47:11	6077,6 ml	1 minute	-,4 ml	20,6 ml	-,400 ml/min	
11:48:11	6077,6 ml	1 minute	,0 ml	20,6 ml	,000 ml/min	
11:49:11	6078,0 ml	1 minute	-,4 ml	20,6 ml	-,400 ml/min	
11:50:11	6078,0 ml	1 minute	,0 ml	20,6 ml	,000 ml/min	
11:51:12	6078,2 ml	1 minute	-,2 ml	20,6 ml	-,197 ml/min	
11:52:11	6078,2 ml	59 seconds	,0 ml	20,6 ml	,000 ml/min	
11:53:11	6078,6 ml	1 minute	-,4 ml	20,6 ml	-,400 ml/min	
11:54:11	6078,2 ml	1 minute	,4 ml	21,0 ml	,400 ml/min	
11:55:11	6078,4 ml	1 minute	-,2 ml	21,0 ml	-,200 ml/min	
11:56:11	6078,4 ml	1 minute	,0 ml	21,0 ml	,000 ml/min	
11:57:11	6078,4 ml	1 minute	,0 ml	21,0 ml	,000 ml/min	
11:58:11	6078,4 ml	1 minute	,0 ml	21,0 ml	,000 ml/min	



maandag 18 december 2023

Location: Nederweert

Site: 4a

Time interval between readings: 0 minute

Ksat Method: Glover Solution

Steady Flow Rate Condition

Steady Flow Rate achieved when Water Consumption Rate changes less than +/- 10 % for 3 consecutive readings

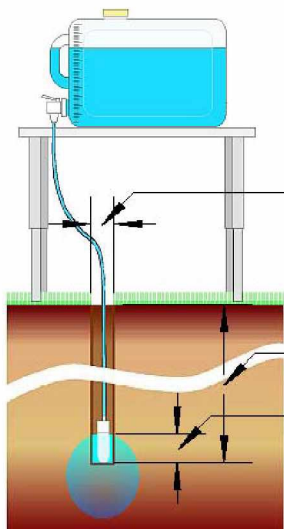
Steady Flow Rate: 0,400 ml/min

Temp. Adj. FR: 0,400 ml/min

Percolation Rate: 196,294 min/cm

Ksat: 9,9542E-3 Meters / day

Notes:



10 cm Hole Diameter

10 ° C Water Temperature

105 cm Hole Depth

8 cm Water Height in Hole

Water Table Depth

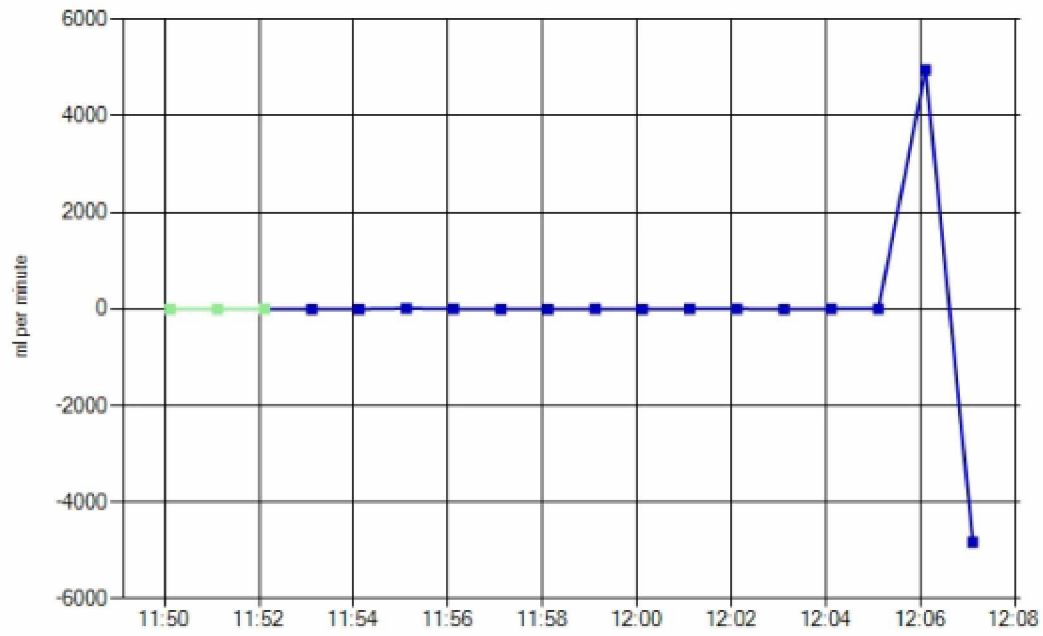
Site GPS Position

	Degrees	Minutes	Seconds	
Longitude:	0	0	0	East
Latitude:	0	0	0	North

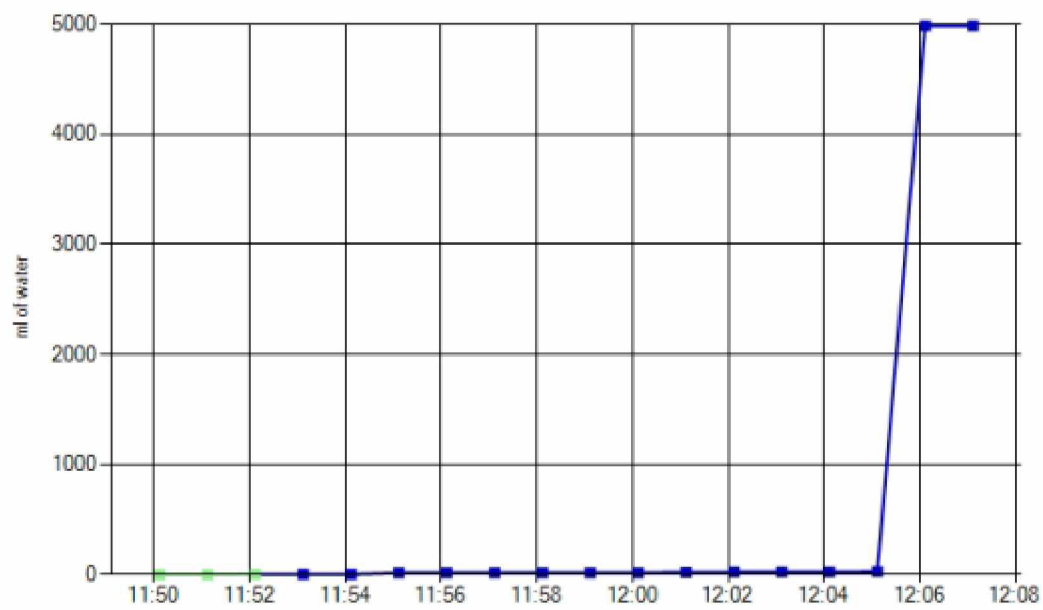
Soil Texture-Structure Category:

Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.

Water Consumption Rate



Total Water Consumed



<u>Time</u>	<u>Reservoir Water Level</u>	<u>Elapsed Time Interval</u>	<u>Interval Water Consumed</u>	<u>Total Water Consumed</u>	<u>Water Consumption Rate</u>	<u>Ignore Reading</u>
11:49:07	8978,8 ml					
11:50:07	8979,2 ml	1 minute	-,4 ml	,0 ml	-,400 ml/min	
11:51:07	8980,0 ml	1 minute	-,8 ml	,0 ml	-,800 ml/min	
11:52:07	8977,6 ml	1 minute	2,4 ml	2,4 ml	2,400 ml/min	
11:53:07	8977,2 ml	1 minute	,4 ml	2,8 ml	,400 ml/min	
11:54:07	8979,0 ml	1 minute	-1,8 ml	2,8 ml	-1,800 ml/min	
11:55:07	8964,8 ml	1 minute	14,2 ml	17,0 ml	14,200 ml/min	
11:56:07	8963,8 ml	1 minute	1,0 ml	18,0 ml	1,000 ml/min	
11:57:07	8965,0 ml	1 minute	-1,2 ml	18,0 ml	-1,200 ml/min	
11:58:07	8967,4 ml	1 minute	-2,4 ml	18,0 ml	-2,400 ml/min	
11:59:07	8966,0 ml	1 minute	1,4 ml	19,4 ml	1,400 ml/min	
12:00:07	8966,8 ml	1 minute	-,8 ml	19,4 ml	-,800 ml/min	
12:01:07	8965,8 ml	1 minute	1,0 ml	20,4 ml	1,000 ml/min	
12:02:07	8962,4 ml	1 minute	3,4 ml	23,8 ml	3,400 ml/min	
12:03:07	8966,4 ml	1 minute	-4,0 ml	23,8 ml	-4,000 ml/min	
12:04:07	8965,0 ml	1 minute	1,4 ml	25,2 ml	1,400 ml/min	
12:05:07	8962,2 ml	1 minute	2,8 ml	28,0 ml	2,800 ml/min	
12:06:07	4005,8 ml	1 minute	4956,4 ml	4984,4 ml	4956,400 ml/min	
12:07:07	8830,6 ml	1 minute	-4824,8 ml	4984,4 ml	-4824,800 ml/min	



maandag 18 december 2023

Location: Nederweert

Site: 5a

Time interval between readings: 0 minute

Ksat Method: Glover Solution

Steady Flow Rate Condition

Steady Flow Rate achieved when Water Consumption Rate changes less than +/- 10 % for 3 consecutive readings

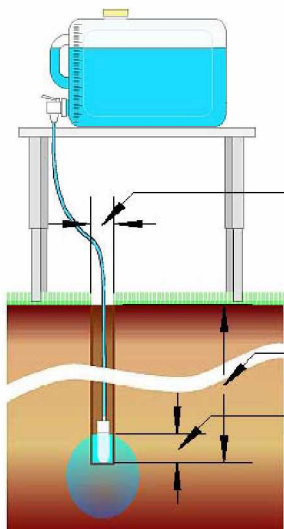
Steady Flow Rate: -8,420 ml/min

Temp. Adj. FR: -8,422 ml/min

Percolation Rate: -9,325 min/cm

Ksat: -2,0953E-1 Meters / day

Notes:



10 cm Hole Diameter

10 ° C Water Temperature

115 cm Hole Depth

8 cm Water Height in Hole

Water Table Depth

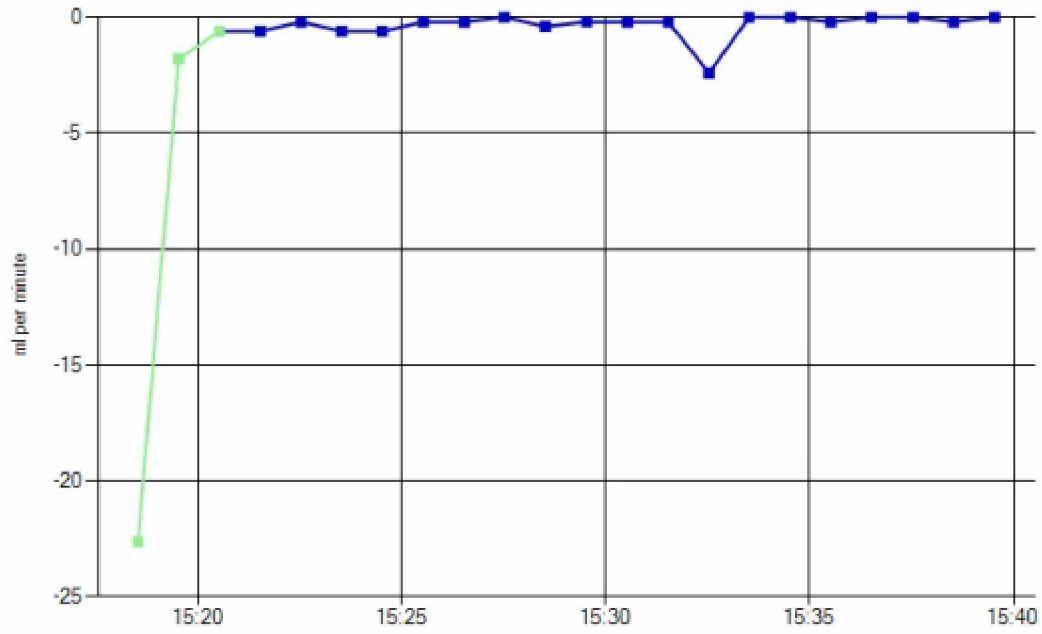
Site GPS Position

	Degrees	Minutes	Seconds	
Longitude:	0	0	0	East
Latitude:	0	0	0	North

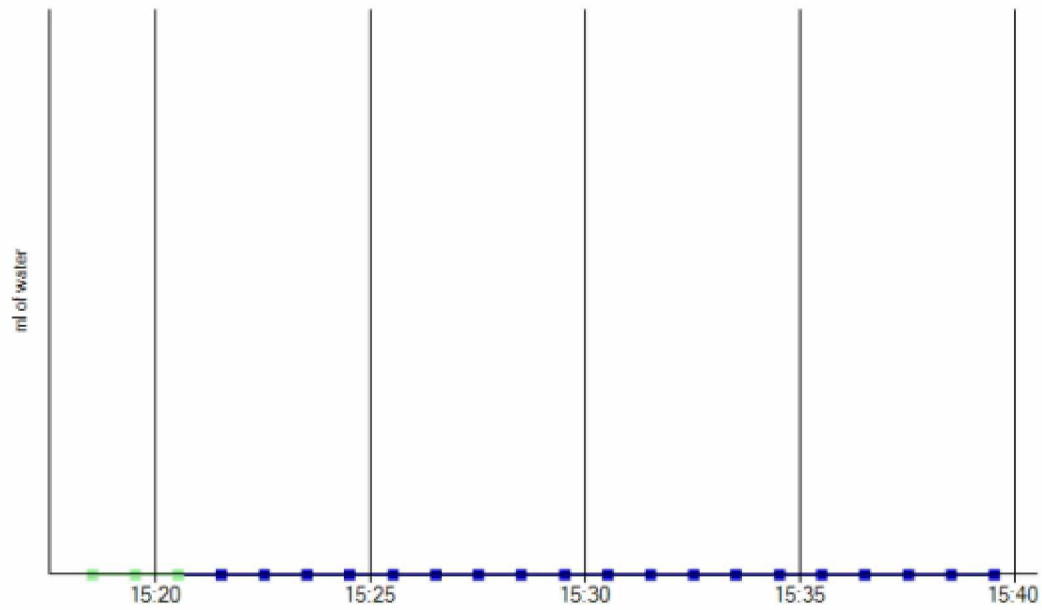
Soil Texture-Structure Category:

Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.

Water Consumption Rate



Total Water Consumed



<u>Time</u>	<u>Reservoir Water Level</u>	<u>Elapsed Time Interval</u>	<u>Interval Water Consumed</u>	<u>Total Water Consumed</u>	<u>Water Consumption Rate</u>	<u>Ignore Reading</u>
15:17:31	4831,0 ml					
15:18:32	4854,0 ml	1 minute	-23,0 ml	,0 ml	-22,623 ml/min	
15:19:32	4855,8 ml	1 minute	-1,8 ml	,0 ml	-1,800 ml/min	
15:20:32	4856,4 ml	1 minute	-,6 ml	,0 ml	-,600 ml/min	
15:21:32	4857,0 ml	1 minute	-,6 ml	,0 ml	-,600 ml/min	
15:22:32	4857,2 ml	1 minute	-,2 ml	,0 ml	-,200 ml/min	
15:23:32	4857,8 ml	1 minute	-,6 ml	,0 ml	-,600 ml/min	
15:24:31	4858,4 ml	59 seconds	-,6 ml	,0 ml	-,610 ml/min	
15:25:32	4858,6 ml	1 minute	-,2 ml	,0 ml	-,197 ml/min	
15:26:32	4858,8 ml	1 minute	-,2 ml	,0 ml	-,200 ml/min	
15:27:31	4858,8 ml	59 seconds	,0 ml	,0 ml	,000 ml/min	
15:28:31	4859,2 ml	1 minute	-,4 ml	,0 ml	-,400 ml/min	
15:29:32	4859,4 ml	1 minute	-,2 ml	,0 ml	-,197 ml/min	
15:30:32	4859,6 ml	1 minute	-,2 ml	,0 ml	-,200 ml/min	
15:31:32	4859,8 ml	1 minute	-,2 ml	,0 ml	-,200 ml/min	
15:32:32	4862,2 ml	1 minute	-2,4 ml	,0 ml	-2,400 ml/min	
15:33:31	4862,2 ml	59 seconds	,0 ml	,0 ml	,000 ml/min	
15:34:32	4862,2 ml	1 minute	,0 ml	,0 ml	,000 ml/min	
15:35:31	4862,4 ml	59 seconds	-,2 ml	,0 ml	-,203 ml/min	
15:36:31	4862,4 ml	1 minute	,0 ml	,0 ml	,000 ml/min	
15:37:32	4862,4 ml	1 minute	,0 ml	,0 ml	,000 ml/min	
15:38:32	4862,6 ml	1 minute	-,2 ml	,0 ml	-,200 ml/min	
15:39:32	4862,6 ml	1 minute	,0 ml	,0 ml	,000 ml/min	