



Instituto Tecnológico  
GeoMinero de España

**CUATERNARIO DEL EBRO Y SUS  
AFLUENTES. 1989 - 1990**

**ANEXO - 1**

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**MINISTERIO DE INDUSTRIA Y ENERGIA**

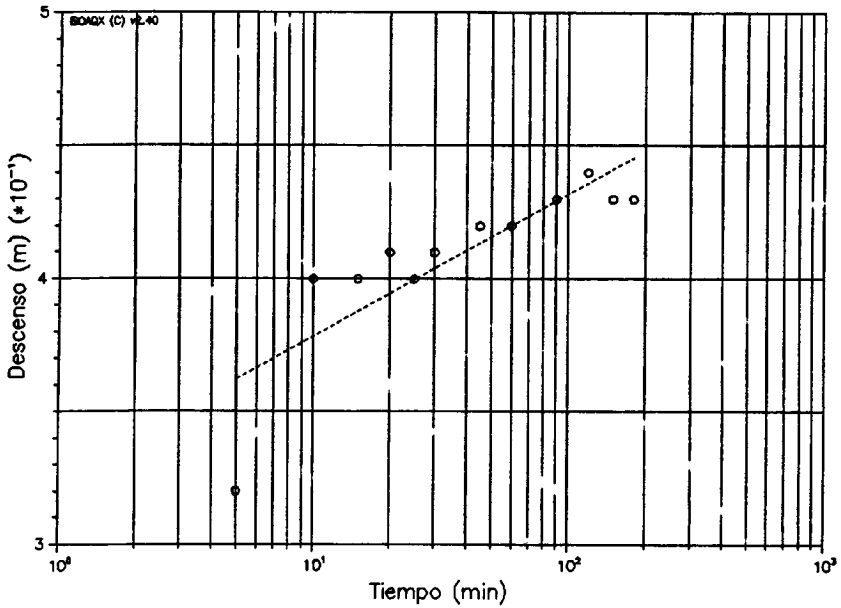
ENSAYO DE BOMBEO  
SONDEO DE ALFARO (1989)  
(ABASTECIMIENTO)







Alfaro (la Rioja)  
 Analisis del primer escalon de bombeo

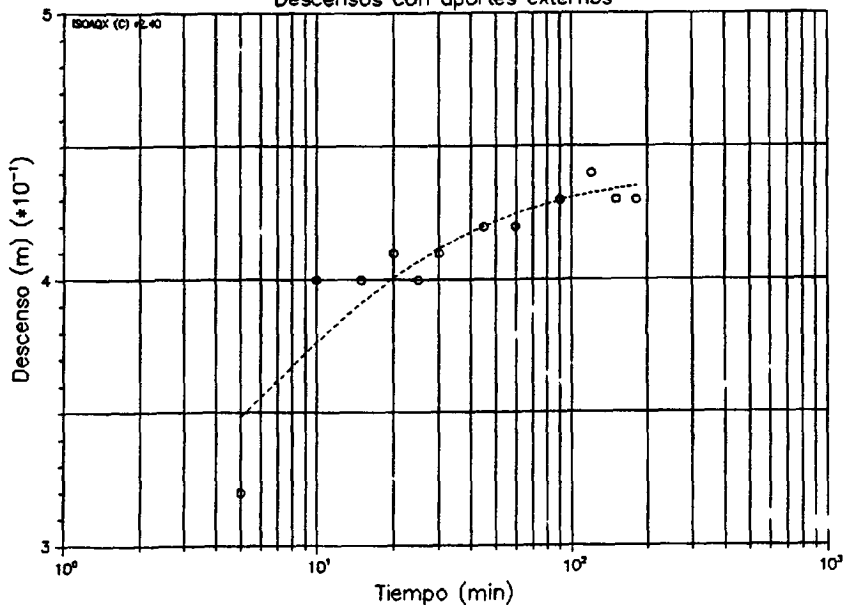


-----  
 ISOAQX (C) v2.40 --- FILE is temporary  
 test R comb: 1  
 unbiased THEISSIAN MODEL:  
 full analysis: all active data points used  
 using closure tolerance setting = 1.00E-03  
 root mean squared error (m) = 1.61E-02  
 transmissivity ( m\*\*2/day) = 20689.05  
 storativity (dimensionless) = 3.72E-04  
 -----

Press Enter to Continue.

INTERPRETACION SIN POZO IMAGEN

Alfaró (la Rioja)  
 Analisis del primer escalon de bombeo  
 Descensos con aportes externos



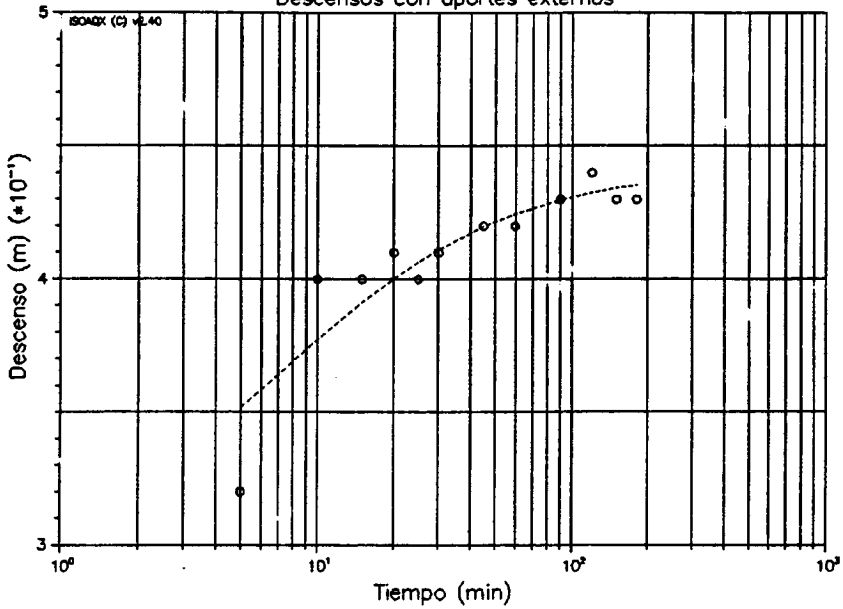
```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 1
unbiased THEISSIAN MODEL:
full analysis:                all active data points used
distance to C-H-B image well (m)      =      50.00
using closure tolerance setting        =      1.00E-03
root mean squared error (m)           =      1.18E-02
transmissivity ( m**2/day)            =     11367.50
storativity (dimensionless)           =      3.13E-01
-----
  
```

Press Enter to Continue.

INTERPRETACION CON POZO IMAGEN A 50 MTS.

Alfaro (la Rioja)  
 Analisis del primer escalon de bombeo  
 Descensos con aportes externos



```

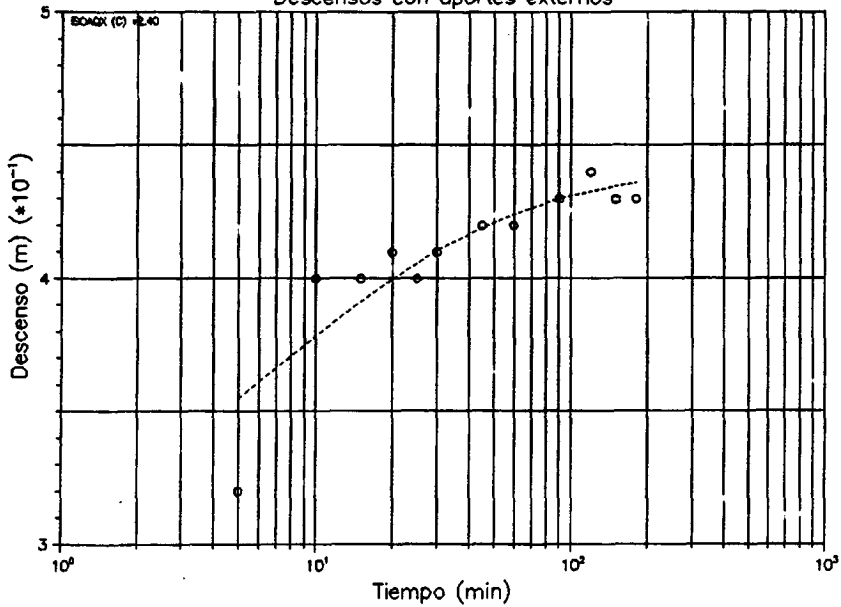
-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb:  1
unbiased THEISSIAN MODEL:
full analysis:                all active data points used
distance to C-H-B image well (m)      =    100.00
using closure tolerance setting        =    1.00E-03
root mean squared error (m)           =    1.25E-02
transmissivity ( m**2/day)            =   12856.46
storativity (dimensionless)           =    1.11E-01
-----
  
```

P\_ess Enter to Continue.

INTERPRETACION CON POZO IMAGEN A 100 MTS.



Alfaro (la Rioja)  
 Analisis del primer escalon de bombeo  
 Descensos con aportes externos



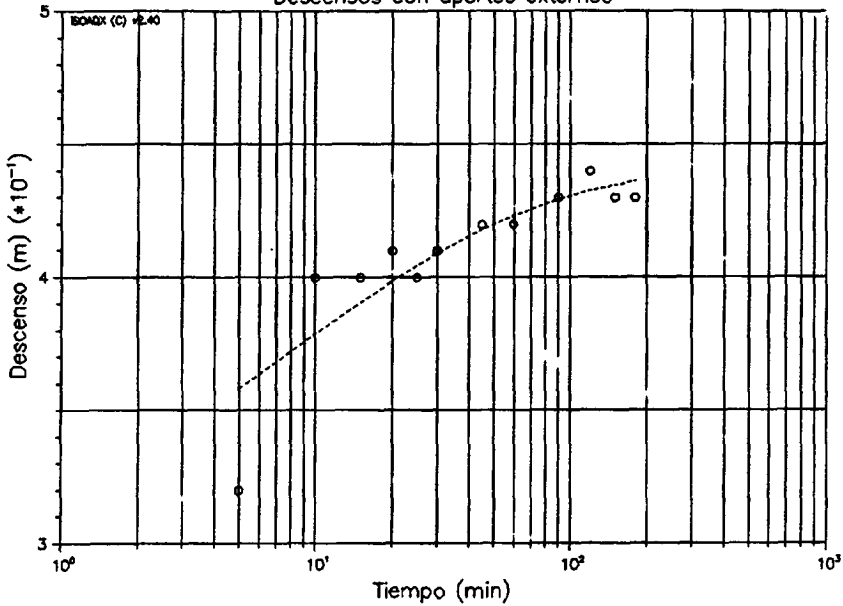
```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 1
unbiased THEISSIAN MODEL:
full analysis:           all active data points used
distance to C-H-B image well (m)      = 200.00
using closure tolerance setting        = 1.00E-03
root mean squared error (m)           = 1.31E-02
transmissivity ( m**2/day)             = 14336.35
storativity (dimensionless)            = 3.83E-02
-----
  
```

Press Enter to Continue.

INTERPRETACION CON POZO IMAGEN A 200 MTS.

Alfaro (la Rioja)  
 Analisis del primer escalon de bombeo  
 Descensos con aportes externos



```

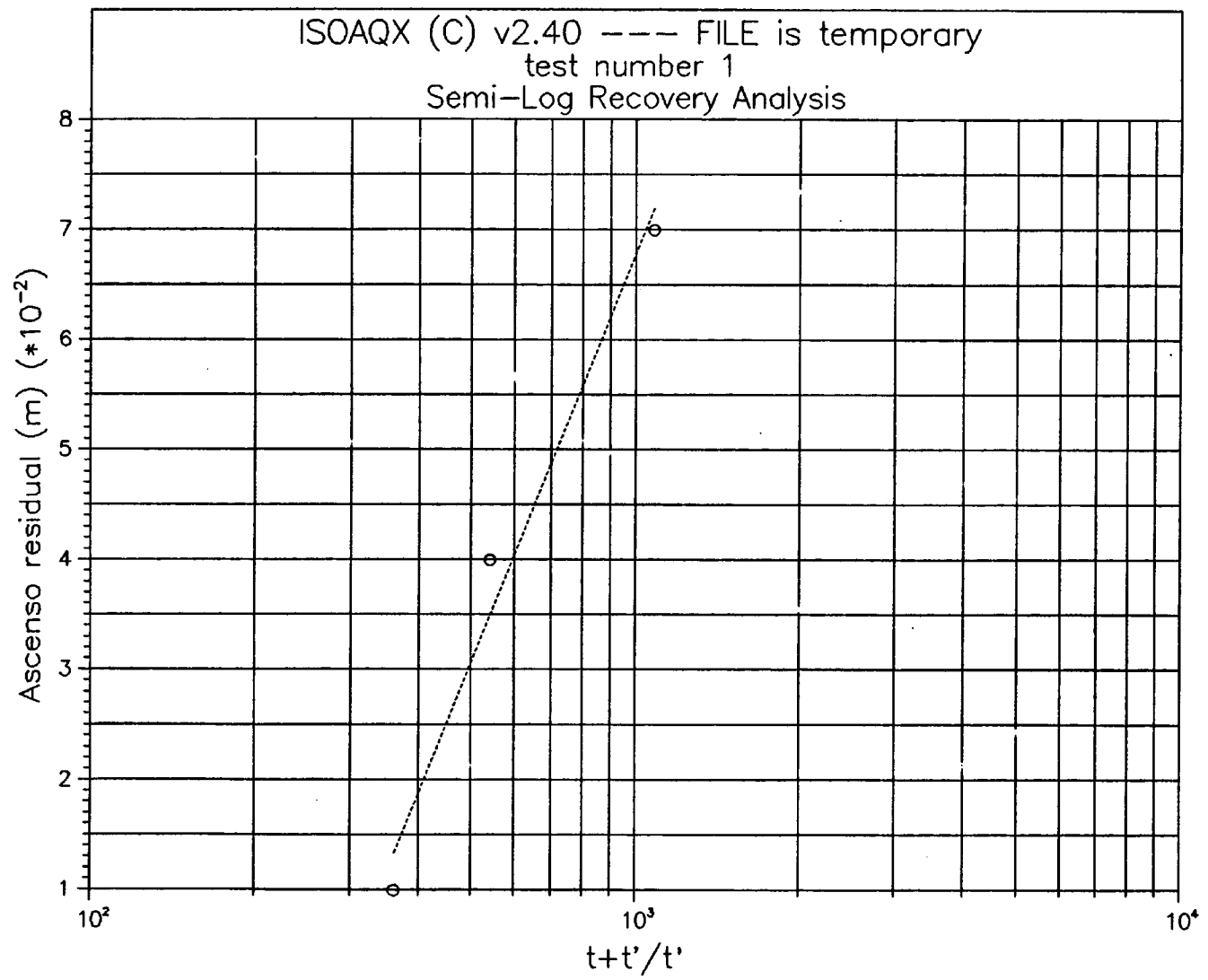
-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb:  1
unbiased THEISSIAN MODEL:
full analysis:                all active data points used
distance to C-H-B image well (m)      =      500.00
using closure tolerance setting        =      1.00E-03
root mean squared error (m)           =      1.38E-02
transmissivity ( m**2/day)            =      16276.68
storativity (dimensionless)           =      9.23E-03
-----
  
```

Press Enter to Continue.

INTERPRETACION CON POZO IMAGEN A 500 MTS.

test N comb: 1  
 SEMI-LOG RECOVERY ANALYSIS:  
 root mean squared error (m) = 3.67E-03  
 pump on time "To" (min.) = 0.000  
 pump off time "Te" (min.) = 1080.000  
 transmissivity ( m\*\*2/day) = 14141.84

Press Enter to Continue.



**ENSAYO DE BOMBEO**  
**PUNTO 2210.6.0027**

Punto nº 2210.6.0027

Localidad: Najera

Datos de aforo: Descenso

FECHA	HORA	TIEMPOS EN MINUTOS DESDE EL ORIGEN	CAUDAL l/seg.	NIVEL DINAMICO
26-10-89	11.45	0	33.3	2.99
		1		3.24
		3		3.43
		5		3.53
		7		3.58
		10		3.64
		15		3.69
		20		3.72
		25		3.74
		30		3.76
		40		3.79
		50		3.81
		60		3.83
		70		3.85
		80		3.86
		90		3.87
		100		3.89
		120		3.90
		140		3.92
		160		3.94
		180		3.95
		200		3.96
		220		3.97
		240		3.99
		260		4.00
		300		4.01
		400		4.04
		450		4.05

## Punto 2210.6.0027. RECUPERACION

HORA	TIEMPO DESDE EL ORIGEN. t'	NIVEL DINAMICO
19,15	0	4.06
	1	3.73
	3	3.53
	5	3.45
	7	3.40
	10	3.35
	15	3.30
	20	3.27
	25	3.25
	30	3.23
	40	3.20
	50	3.17
	60	3.15
	70	3.13
	80	3.12
	90	3.11

test R comb: 2

unbiased THEISSIAN MODEL:

full analysis: all active data points used

complex: 2 rates: wlc i m/(lpm)\*\*2 = 2.68E-08

using closure tolerance setting = 1.00E-03

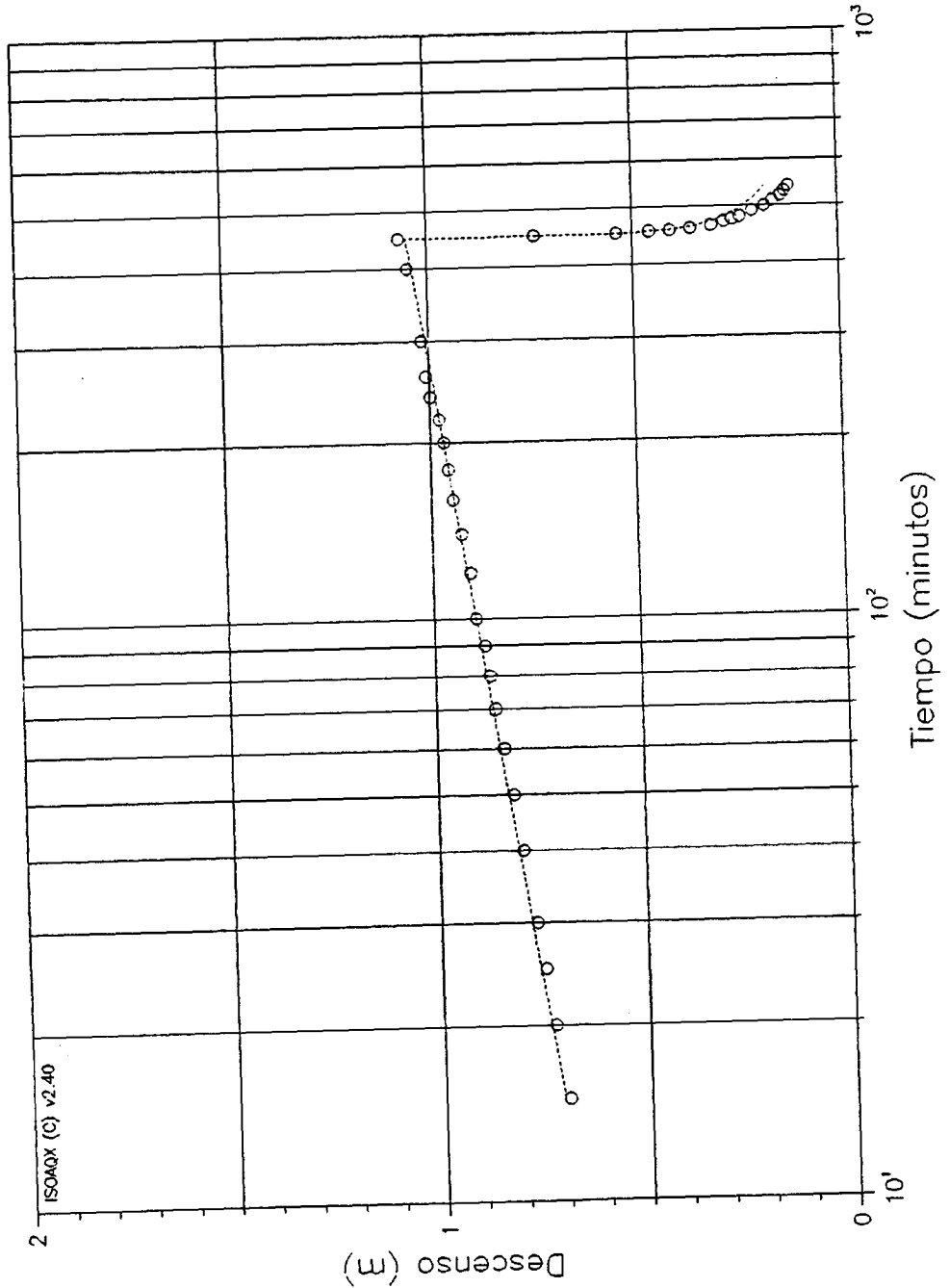
root mean squared error (m) = 3.44E-02

transmissivity ( m\*\*2/day) = 2296.47

storativity (dimensionless) = 1.59E-01

Press Enter to Continue.

AYUNTAMIENTO DE NAJERA  
POZO 221060027



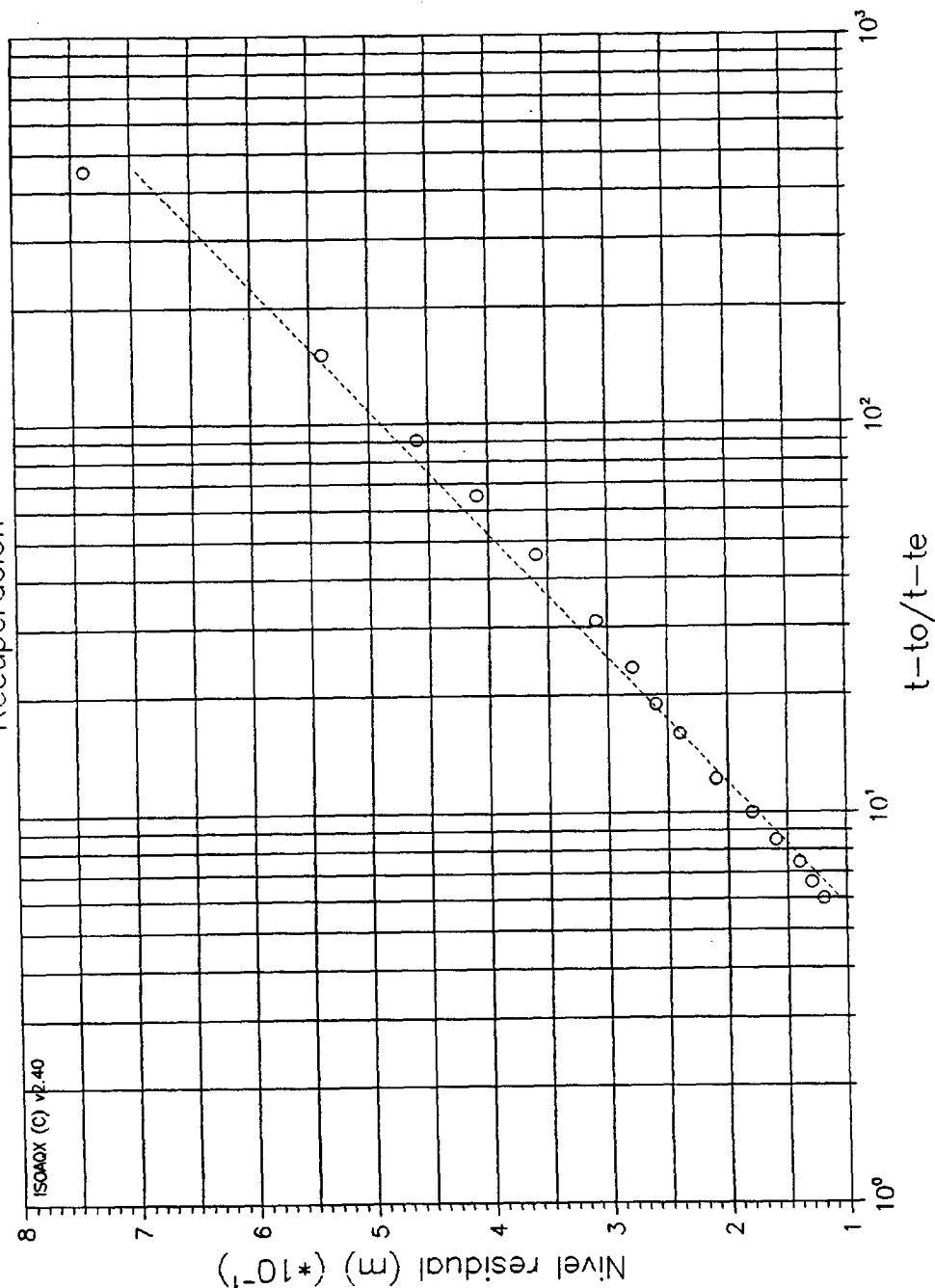
test R comb: 3

SEMI-LOG RECOVERY ANALYSIS:

root mean squared error (m)	=	1.70E-02
pump on time "To" (min.)	=	0.000
pump off time "Te" (min.)	=	450.000
transmissivity ( m**2/day)	=	1678.19

Press Enter to Continue.

AYUNTAMIENTO DE NAJERA  
 POZO 221060027  
 Recuperacion





**ENSAYO DE BOMBEO**  
**PUNTO 2511.5.0012**

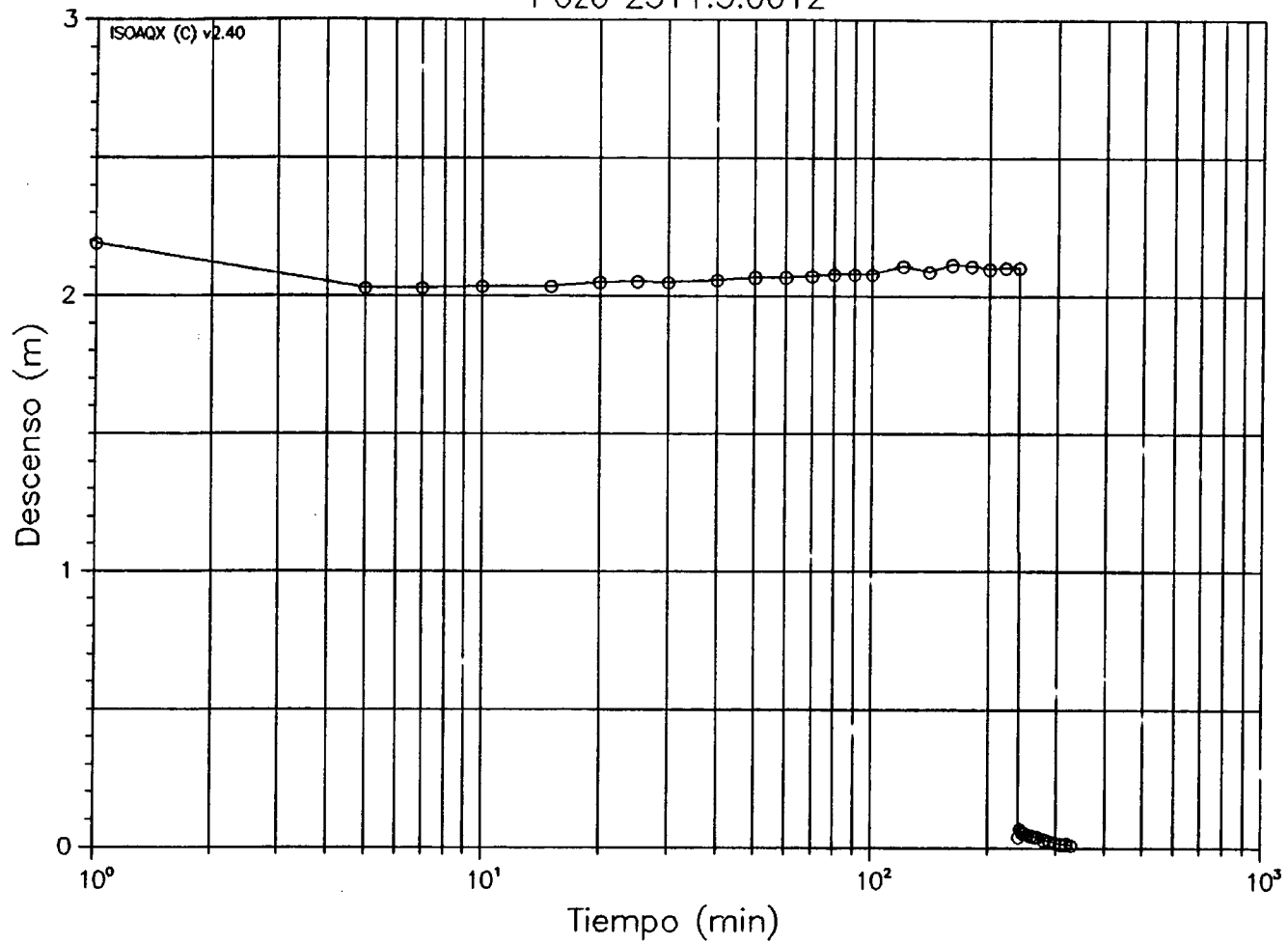
Punto nº 2511.5.0012  
 Localidad: Rincon de Soto  
 Datos de Aforo: Descenso

FECHA	HORA	TIEMPOS EN MINUTOS DESDE EL ORIGEN	CAUDAL l/seg.	NIVEL DINAMICO
23-11-89	11,13	0	27	4,91
		1	"	7,10
		5	"	6,94
		7	"	6,94
		10	"	6,94
		15	"	6,94
		20	"	6,96
		25	"	6,96
		30	"	6,96
		40	"	6,97
		50	"	6,98
		60	"	6,98
		70	"	6,98
		80	"	6,99
		90	"	6,99
		100	"	6,99
		120	"	7,02
		140	"	7,00
		160	"	7,02
		180	"	7,02
		200	"	7,01
		220	"	7,01
		239	"	7,01

## Punto nº 2511.5.0012. RECUPERACION

HORA	TIEMPO DESDE EL ORIGEN. t'	NIVEL DINAMICO
3.12	0	7.01
	1	4.95
	3	4.98
	5	4.97
	7	4.96
	10	4.96
	15	4.96
	20	4.95
	25	4.95
	30	4.95
	40	4.94
	50	4.93
	60	4.93
	70	4.92
	80	4.92
	90	4.92

Rincon de Soto  
Recueja  
Pozo 2511.5.0012



ENSAYO DE BOMBEO  
PUNTO 2210.6.0028

SONDEO 221060028  
LOCALIDAD Arenzana de Abajo

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	4.460	0.000	1.7
1	4.470	0.010	1.7
3	4.470	0.010	1.7
5	4.470	0.010	1.7
7	4.470	0.010	1.7
10	4.480	0.020	1.7
15	4.480	0.020	1.7
20	4.490	0.030	1.7
26	4.485	0.025	1.7
30	4.480	0.020	1.7
40	4.480	0.020	1.7
50	4.480	0.020	1.7
60	4.480	0.020	1.7
70	4.480	0.020	1.7

ENSAYO DE BOMBEO  
PUNTO 2210.2.0029

SONDEO 221020029  
LOCALIDAD Urufuela

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)	
0	6.100	0.000	2.18	Bombeo
1	6.130	0.030	2.18	
3	6.190	0.090	2.18	
5	6.250	0.150	2.18	
7	6.300	0.200	2.18	
10	6.370	0.270	2.18	
15	6.480	0.380	2.18	Parada de 5 min.
0	6.410	0.310		Recuperación
1	6.390	0.290		
3	6.340	0.240		
5	6.290	0.190		
10	6.200	0.100		
15	6.150	0.050		
20	6.130	0.030		
25	6.115	0.015		
30	6.110	0.010		
0	6.100	0.000	2.18	Bombeo
1	6.140	0.040	2.18	
3	6.200	0.100	2.18	
5	6.270	0.170	2.18	
7	6.320	0.220	2.18	
10	6.390	0.290	2.18	
15	6.500	0.400	2.18	
16	6.530	0.430	2.18	
0	6.530	0.430		Recuperación
1	6.490	0.390		
3	6.430	0.330		
5	6.370	0.270		
7	6.320	0.220		
10	6.265	0.165		
15	6.190	0.090		
20	6.155	0.055		
25	6.130	0.030		
30	6.110	0.010		
40	6.105	0.005		
50	6.100	0.000		
60	6.100	0.000		



test R comb: 1

unbiased THEISSIAN MODEL:

full analysis:

all active data points used

complex: 4 rates

using closure tolerance setting

= 1.00E-03

root mean squared error (m)

= 4.80E-02

transmissivity ( m\*\*2/day)

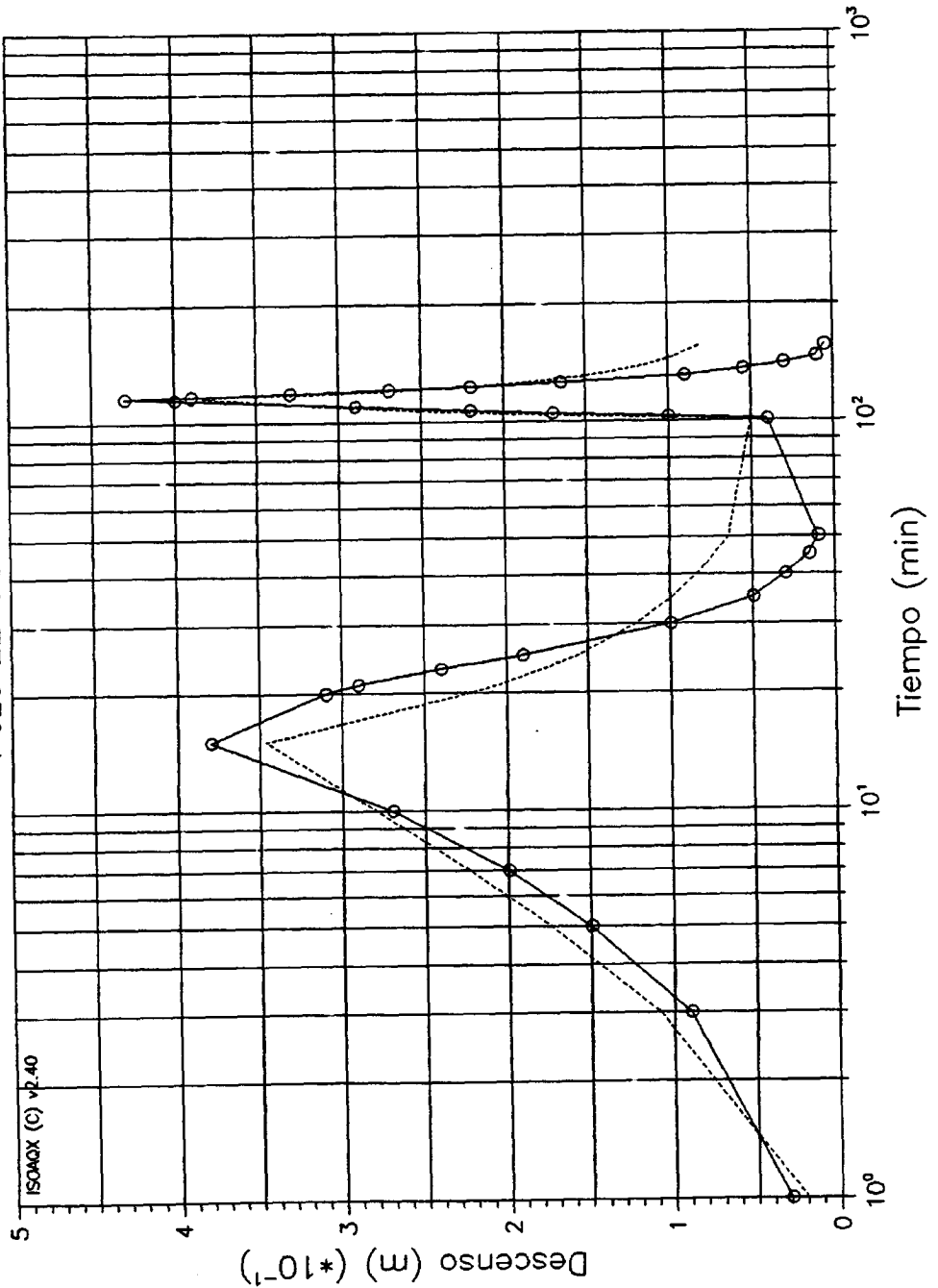
= 80.36

storativity (dimensionless)

= 3.59E+00

Urunuela

Pozo 221020029



ENSAYO DE SONDEO ·  
PUNTO 2310.2.0041

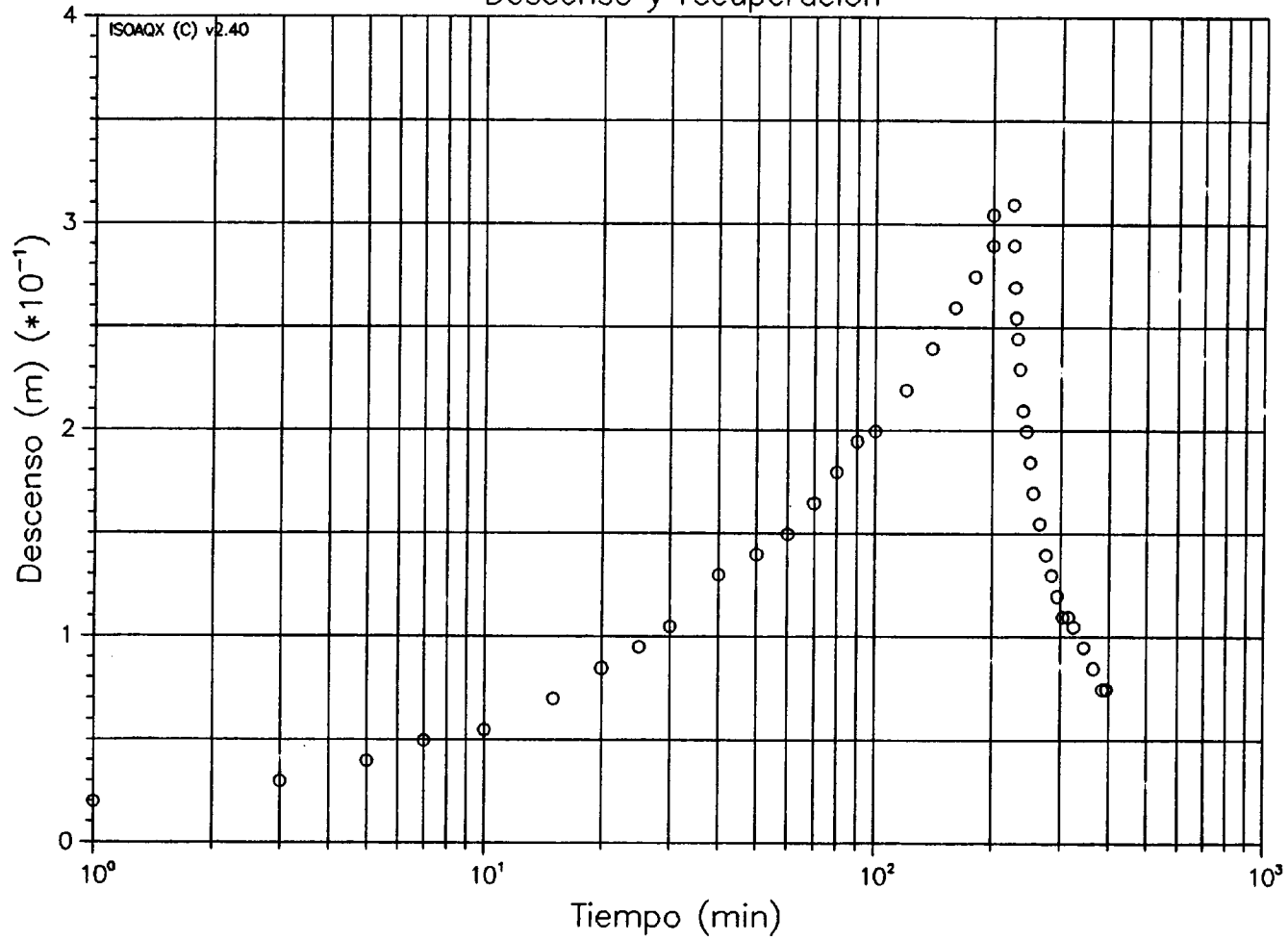
SONDEO 231020041  
LOCALIDAD Logroño (Varea)

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	3.830	0.000	15.0
1	3.850	0.020	15.0
3	3.860	0.030	15.0
5	3.870	0.040	15.0
7	3.880	0.050	15.0
10	3.885	0.055	15.0
15	3.900	0.070	15.0
20	3.915	0.085	15.0
25	3.925	0.095	15.0
30	3.935	0.105	15.0
40	3.960	0.130	15.0
50	3.970	0.140	15.0
60	3.980	0.150	15.0
70	3.995	0.165	15.0
80	4.010	0.180	15.0
90	4.025	0.195	15.0
100	4.030	0.200	15.0
120	4.050	0.220	15.0
140	4.070	0.240	15.0
160	4.090	0.260	15.0
180	4.105	0.275	15.0
200	4.120	0.290	15.0
200	4.135	0.305	15.0
225	4.140	0.310	15.0
0	4.140	0.310	Recuperación
1	4.120	0.290	
3	4.100	0.270	
5	4.085	0.255	
7	4.075	0.245	
10	4.060	0.230	
15	4.040	0.210	
20	4.030	0.200	
25	4.015	0.185	
30	4.000	0.170	
40	3.985	0.155	
50	3.970	0.140	
60	3.960	0.130	
70	3.950	0.120	
80	3.940	0.110	
90	3.940	0.110	
100	3.935	0.105	
120	3.925	0.095	
140	3.915	0.085	
160	3.905	0.075	
170	3.905	0.075	

Pozo 23102041

Varea

Descenso y recuperacion



test R comb: 2

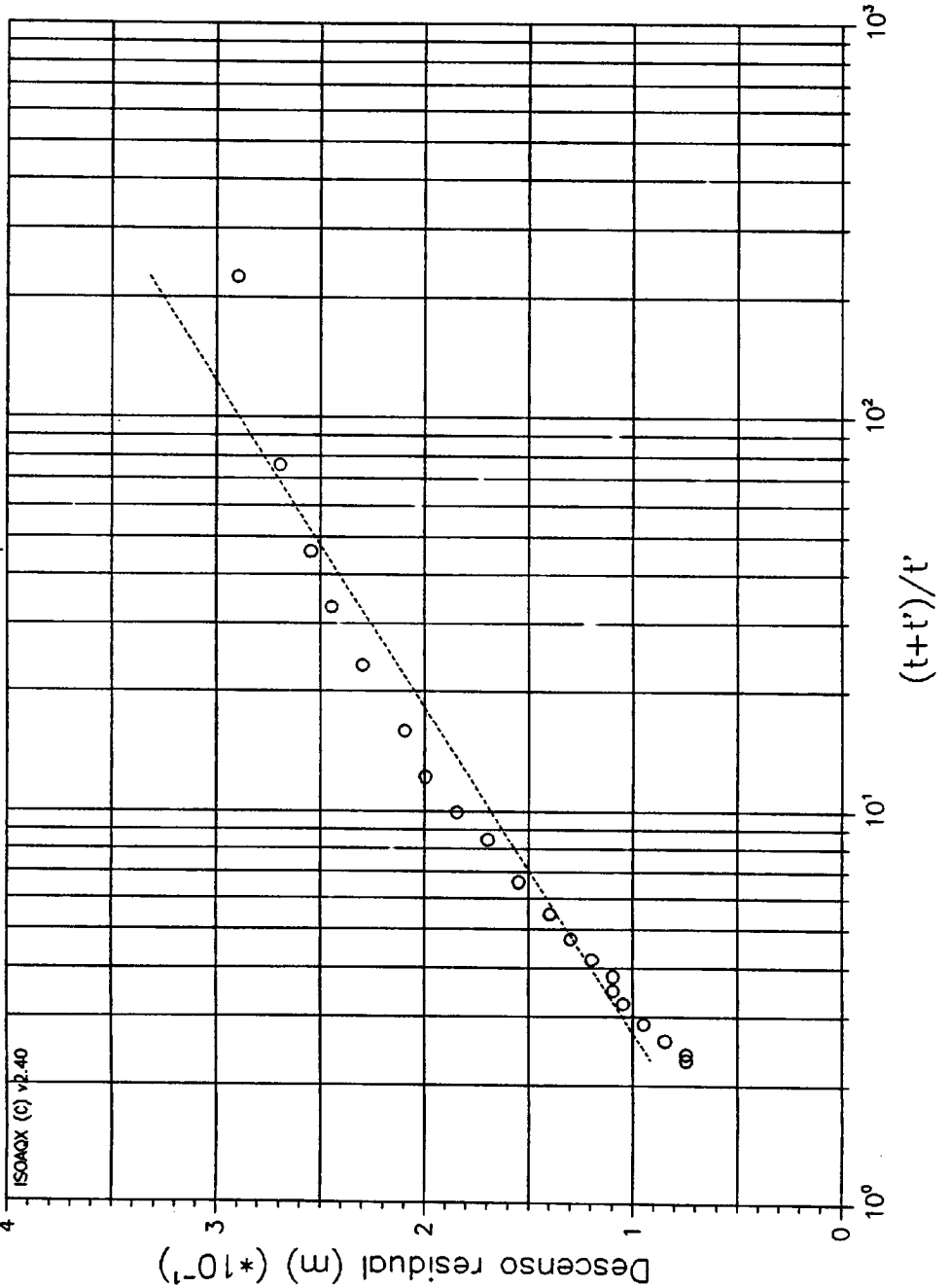
SEMI-LOG RECOVERY ANALYSIS:

root mean squared error (m) = 1.49E-02  
 pump on time "To" (min.) = 1.000  
 pump off time "Te" (min.) = 225.000  
 transmissivity ( m\*\*2/day) = 1963.43

Press Enter to Continue.

Pozo 231020041  
Varea

Analisis de recuperacion



ENSAYO DE BOMBEO  
PUNTO N° 2310.2.0009

SONDEO 231020009  
LOCALIDAD Logroño

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	0.490	0.000	30.0
1	0.885	0.395	30.0
3	1.080	0.590	30.0
5	1.130	0.640	30.0
7	1.170	0.680	30.0
10	1.210	0.720	30.0
15	1.265	0.775	30.0
20	1.310	0.820	30.0
25	1.350	0.860	30.0
30	1.385	0.895	30.0
40	1.440	0.950	30.0
50	1.490	1.000	30.0
60	1.535	1.045	30.0
70	1.580	1.090	30.0
80	1.615	1.125	30.0
90	1.645	1.155	30.0
100	1.690	1.200	30.0
120	1.740	1.250	30.0
140	1.790	1.300	30.0
160	1.835	1.345	30.0
180	1.880	1.390	30.0
200	1.920	1.430	30.0
220	2.010	1.520	30.0
240	2.060	1.570	30.0
260	2.100	1.610	30.0
300	2.180	1.690	30.0
350	2.260	1.770	30.0
400	2.345	1.855	30.0
412	2.360	1.870	30.0
0	2.360	1.870	Recuperación
1	1.880	1.390	
3	1.750	1.260	
5	1.700	1.210	
7	1.655	1.165	
10	1.600	1.110	
15	1.525	1.035	
20	1.460	0.970	
25	1.400	0.910	
30	1.355	0.865	
40	1.265	0.775	
50	1.195	0.705	
60	1.130	0.640	
70	1.075	0.585	
80	1.030	0.540	
90	0.995	0.505	
100	0.955	0.465	

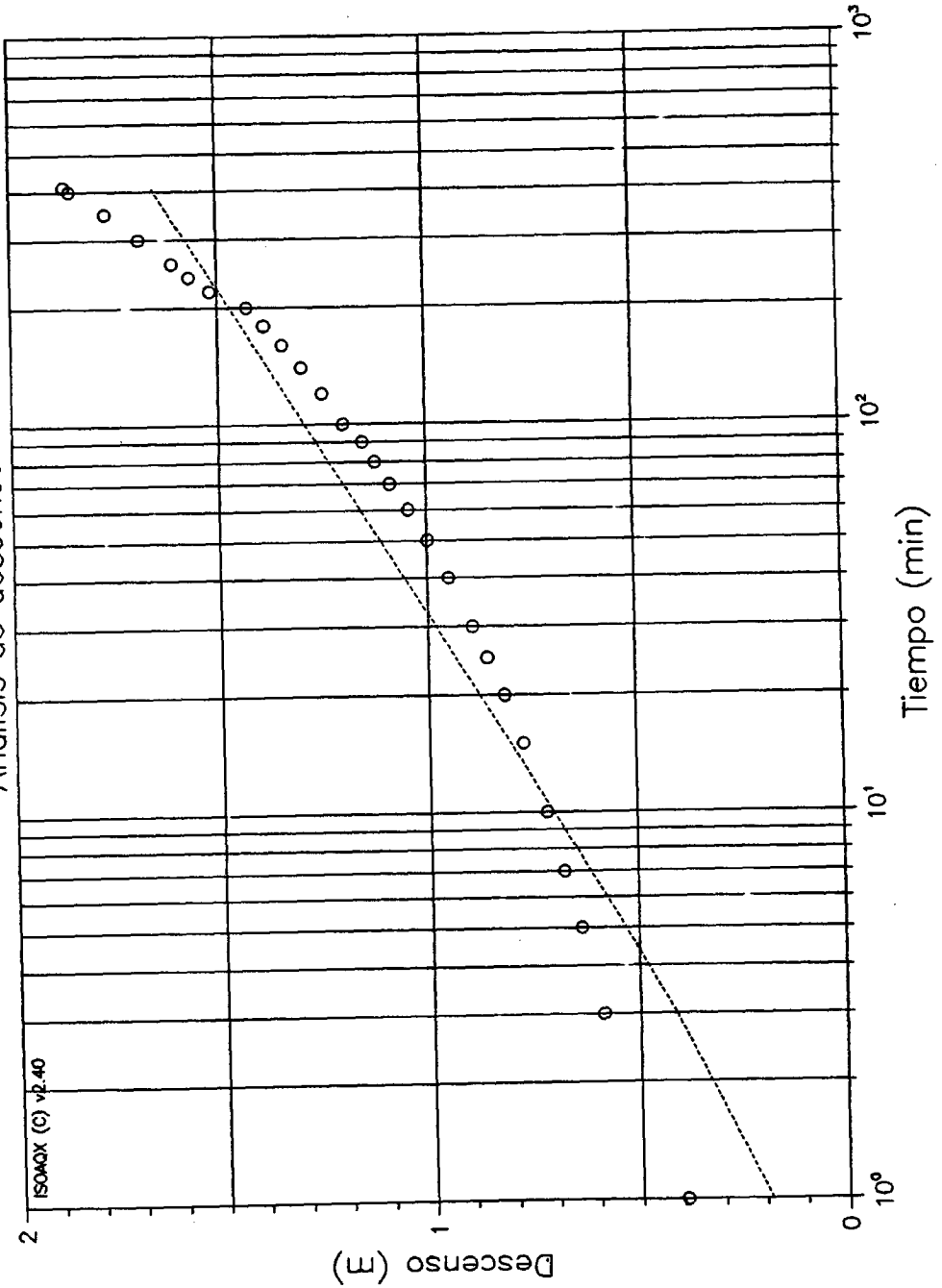
test R comb: 2

unbiased THEISSIAN MODEL:

full analysis:	all active data points used
using closure tolerance setting	= 1.00E-03
root mean squared error (m)	= 1.11E-01
transmissivity ( m**2/day)	= 794.36
storativity (dimensionless)	= 1.53E+00

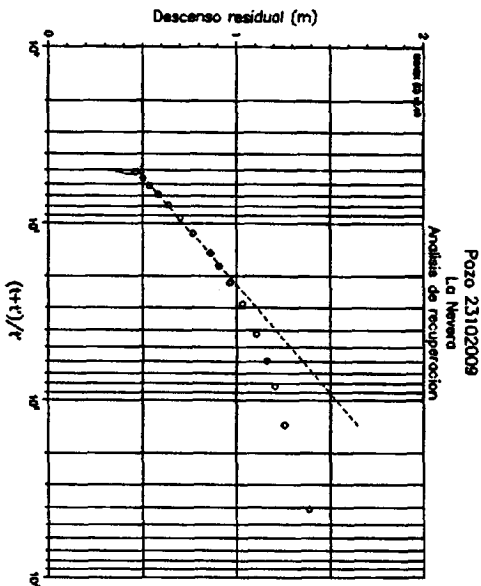
Pozo 23102009  
La Nevera

Análisis de descenso



NOTA: CAUDAL MEDIO DE SONDEO 30 l/seg.





- TO SPECIFY DATA UNITS ..... "0"
- TO LOAD OR ADD NEW DATA ..... "1"
- TO SELECT OR MODIFY DATA ..... "2"
- TO DISPLAY SELECTED DATA ..... "3"
- TO ANALYZE SELECTED DATA ..... "4"
- TO DISPLAY RESULTS TABLE ..... "5"
- TO COMPUTE AQUIFER DRAWDOWN ..... "6"
- TO PICK AUXILIARY OUTPUT UNIT ..... "7"
- TO STORE DATA FILE ON DISKETTE ..... "8"
- TO QUIT ..... "9"

--> 5

```

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ISOAGX (C) v2.40 --- FILE is temporary
test R comb: 3
SEMI-LOG RECOVERY ANALYSIS:
root mean squared error (m)           =      1.16E-02
pump on time "To" (min.)               =      1.000
pump off time "Te" (min.)              =     412.000
transmissivity ( m**2/day)             =     582.08
-----

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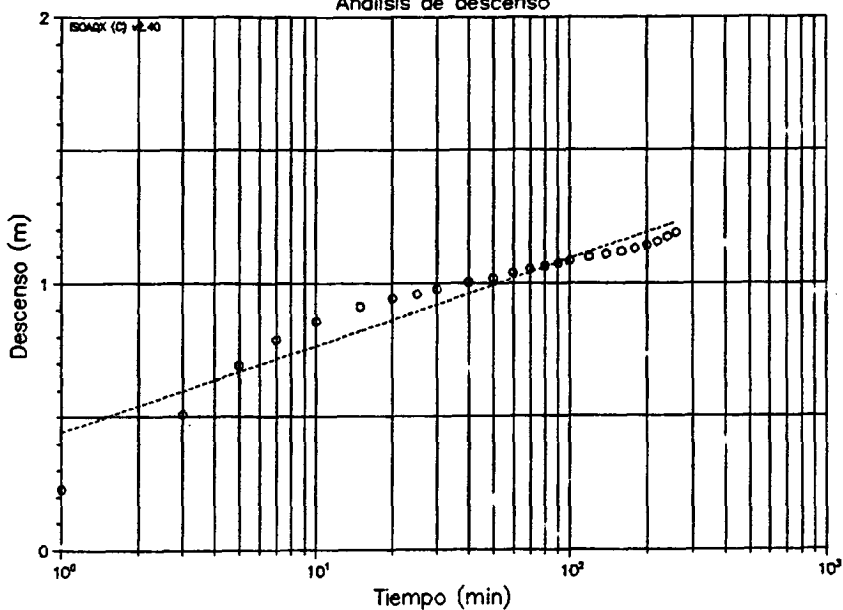
Press Enter to Continue.

ENSAYO DE BOMBEO  
PUNTO 2310.2.0040

SONDEO 231020040  
LOCALIDAD Logroño

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	5.180	0.000	11.1
1	5.410	0.230	11.1
3	5.690	0.510	11.1
5	5.875	0.695	11.1
7	5.970	0.790	11.1
10	6.040	0.860	11.1
15	6.095	0.915	11.1
20	6.125	0.945	11.1
25	6.142	0.962	11.1
30	6.160	0.980	11.1
40	6.185	1.005	11.1
50	6.200	1.020	11.1
60	6.220	1.040	11.1
70	6.235	1.055	11.1
80	6.245	1.065	11.1
90	6.255	1.075	11.1
100	6.265	1.085	11.1
120	6.280	1.100	11.1
140	6.290	1.110	11.1
160	6.300	1.120	11.1
180	6.310	1.130	11.1
200	6.322	1.142	11.1
220	6.335	1.155	11.1
240	6.355	1.175	11.1
260	6.370	1.190	11.1
0	6.320	1.140	Recuperación
1	6.235	1.055	
3	5.840	0.660	
5	5.725	0.545	
7	5.660	0.480	
10	5.605	0.425	
15	5.550	0.370	
20	5.510	0.330	
25	5.480	0.300	
30	5.455	0.275	
40	5.420	0.240	
50	5.400	0.220	
60	5.380	0.200	
70	5.370	0.190	
80	5.355	0.175	
90	5.350	0.170	
100	5.340	0.160	
120	5.325	0.145	
140	5.315	0.135	
160	5.300	0.120	

Pozo 23102040  
 Calaveras  
 Analisis de descenso

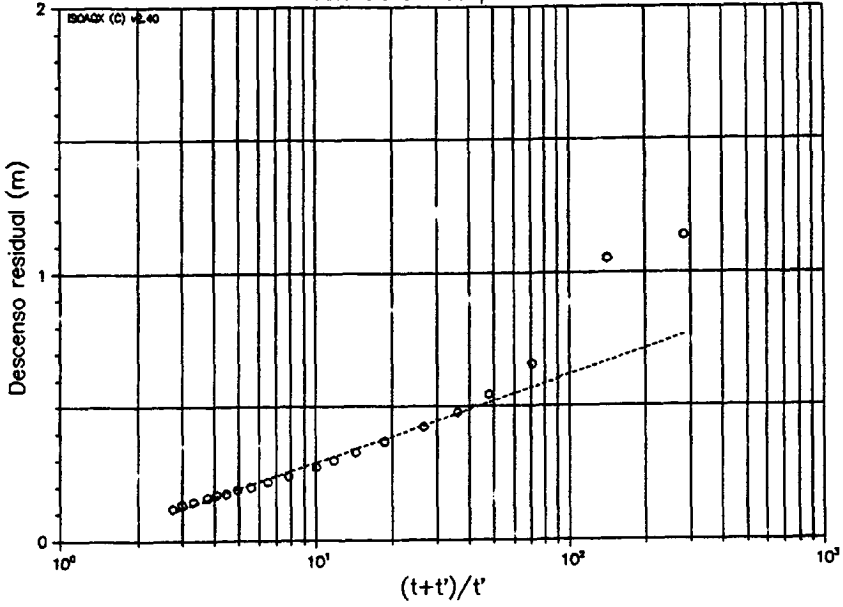


```

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                ISOAUX (C) v2.40 --- FILE is temporary
test R comb: 1
unbiased THEISSIAN MODEL:
full analysis:                all active data points used
using closure tolerance setting = 1.00E-03
root mean squared error (m)   = 6.66E-02
transmissivity ( m**2/day)    = 538.90
storativity (dimensionless)   = 6.72E-02
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```

\_Press Enter to Continue.

Pozo 23102040  
 Calaveras  
 Analisis de recuperacion



```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb:  2
SEMI-LOG RECOVERY ANALYSIS:
root mean squared error (m)           =      1.30E-02
pump on time "To" (min.)              =      1.000
pump off time "Te" (min.)             =     282.000
transmissivity ( m**2/day)            =     538.30
-----
  
```

Press Enter to Continue.

**ENSAYO DE BOMBEO  
PUNTO 2310.4.0003**

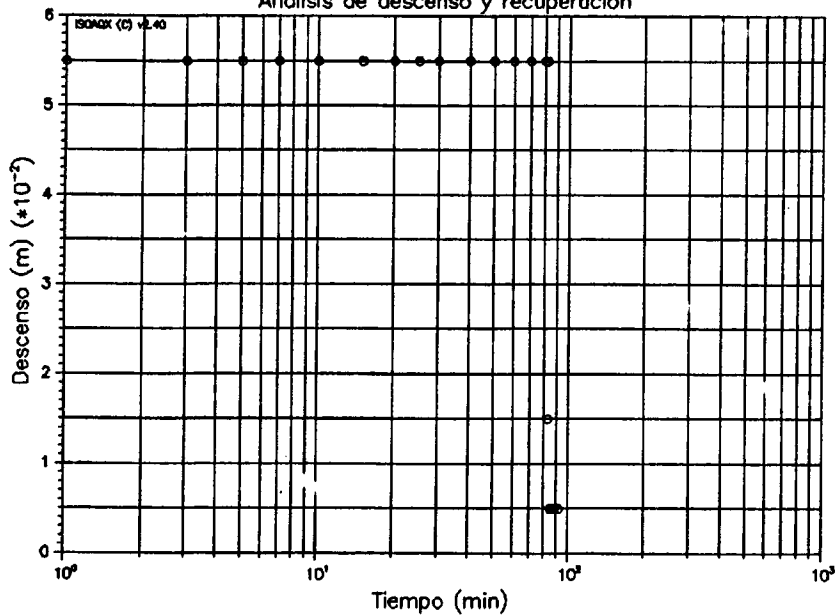
SONDEO 231040003  
LOCALIDAD Arrubal

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	4.495	0.000	3.6
1	4.550	0.055	3.6
3	4.550	0.055	3.6
5	4.550	0.055	3.6
7	4.550	0.055	3.6
10	4.550	0.055	3.6
15	4.550	0.055	3.6
20	4.550	0.055	3.6
25	4.550	0.055	3.6
30	4.550	0.055	3.6
40	4.550	0.055	3.6
50	4.550	0.055	3.6
60	4.550	0.055	3.6
70	4.550	0.055	3.6
80	4.550	0.055	3.6
82	4.550	0.055	3.6
0	4.550	0.055	Recuperación
1	4.510	0.015	
3	4.500	0.005	
5	4.500	0.005	
7	4.500	0.005	
10	4.500	0.005	
15	4.495	0.000	
20	4.495	0.000	
25	4.490	-0.005	
30	4.490	-0.005	
40	4.490	-0.005	

Pozo 23104003

Valhondo

Análisis de descenso y recuperación





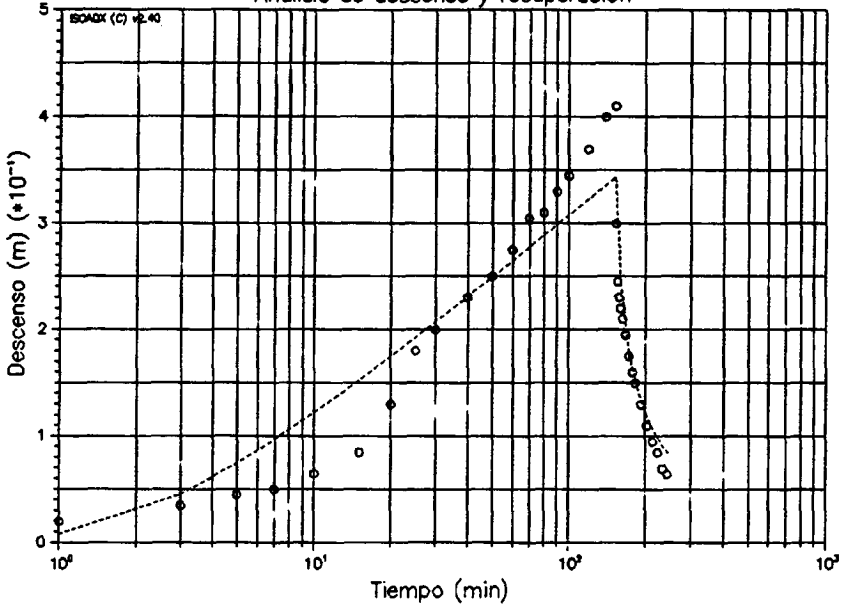
**ENSAYO DE BOMBEO**  
**PUNTO 2410.7.0002**

SONDEO 241070002  
LOCALIDAD Murillo de Calahorra

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	0.850	0.000	25.0
1	0.870	0.020	25.0
3	0.885	0.035	25.0
5	0.895	0.045	25.0
7	0.900	0.050	25.0
10	0.915	0.065	25.0
15	0.935	0.085	25.0
20	0.980	0.130	25.0
25	1.030	0.180	25.0
30	1.050	0.200	25.0
40	1.080	0.230	25.0
50	1.100	0.250	25.0
60	1.125	0.275	25.0
70	1.155	0.305	25.0
80	1.160	0.310	25.0
90	1.180	0.330	25.0
100	1.195	0.345	25.0
120	1.220	0.370	25.0
140	1.250	0.400	25.0
153	1.260	0.410	25.0
0	1.260	0.410	Recuperación
1	1.150	0.300	
3	1.095	0.245	
5	1.080	0.230	
7	1.070	0.220	
10	1.060	0.210	
15	1.045	0.195	
20	1.025	0.175	
25	1.010	0.160	
30	1.000	0.150	
40	0.980	0.130	
50	0.960	0.110	
60	0.945	0.095	
70	0.935	0.085	
80	0.920	0.070	
90	0.915	0.065	

Pozo 24107002  
Murillo de Calahorra

Análisis de descenso y recuperación



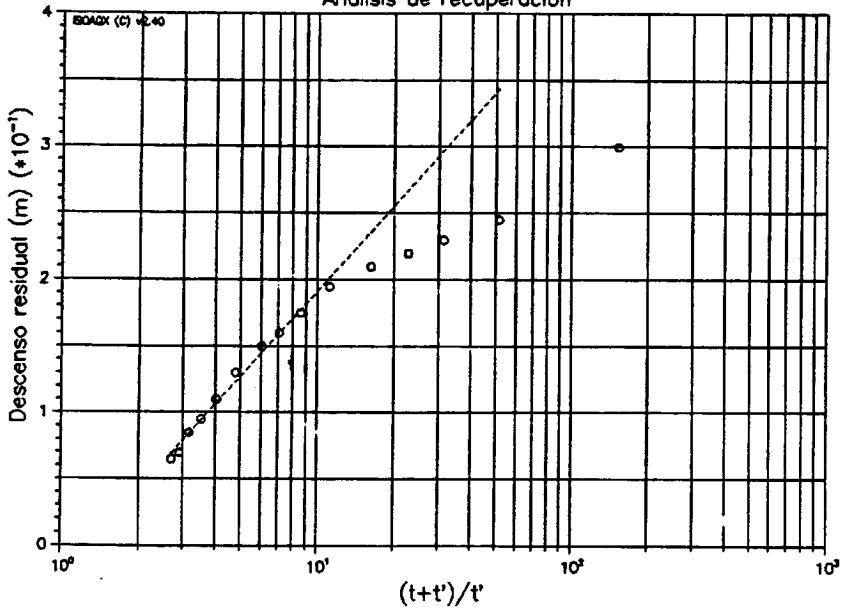
-----  
ISOAQX (C) v2.40 --- FILE is temporary

```

test R comb: 1
unbiased THEISSIAN MODEL:
full analysis:          all active data points used
complex: 2 rates
using closure tolerance setting = 1.00E-03
root mean squared error (m)    = 3.27E-02
transmissivity ( m**2/day)     = 2004.06
storativity (dimensionless)    = 8.82E+00
  
```

-----  
\_Press Enter to Continue.

Pozo 24107002  
Murillo de Calahorra  
Análisis de recuperación



```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 2
SEMI-LOG RECOVERY ANALYSIS:
root mean squared error (m)           = 4.30E-03
pump on time "To" (min.)              = 1.000
pump off time "Te" (min.)            = 153.000
transmissivity ( m**2/day)            = 1852.11
-----

```

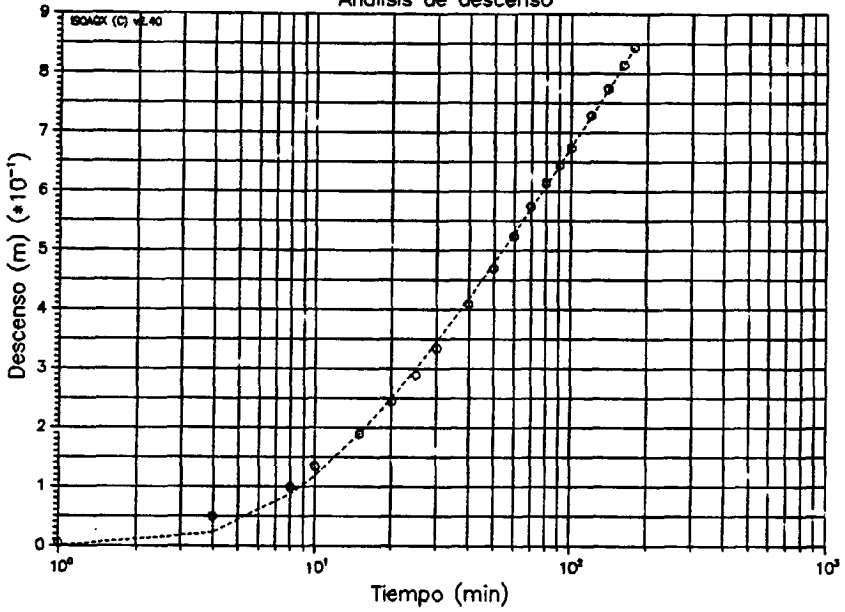
-Press Enter to Continue.

ENSAYO DE BOMBEO  
PUNTO 2411.7.0009

SONDEO 241170009  
LOCALIDAD Autol

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	1.960	0.000	7.5
1	1.965	0.005	7.5
4	2.010	0.050	7.5
8	2.060	0.100	7.5
10	2.095	0.135	7.5
15	2.150	0.190	7.5
20	2.205	0.245	7.5
25	2.250	0.290	7.5
30	2.295	0.335	7.5
40	2.370	0.410	7.5
50	2.430	0.470	7.5
60	2.485	0.525	7.5
70	2.535	0.575	7.5
80	2.575	0.615	7.5
90	2.605	0.645	7.5
100	2.635	0.675	7.5
120	2.690	0.730	7.5
140	2.735	0.775	7.5
161	2.775	0.815	7.5
177	2.805	0.845	7.5
0	2.805	0.845	Recuperación
1	2.790	0.830	
3	2.770	0.810	
5	2.750	0.790	
7	2.730	0.770	
10	2.700	0.740	
15	2.665	0.705	
20	2.630	0.670	
25	2.600	0.640	
30	2.575	0.615	
40	2.530	0.570	
50	2.490	0.530	
60	2.460	0.500	
70	2.430	0.470	
80	2.405	0.445	
90	2.385	0.425	

Pozo 24117009  
Autol  
Análisis de descenso



```

-----
                ISQAQX (C) v2.40 --- FILE is temporary
test R comb: 3
  unbiased THEISSIAN MODEL:
  full analysis:                all active data points used
  using closure tolerance setting = 1.00E-03
  root mean squared error (m)    = 9.56E-03
  transmissivity ( m**2/day)     = 165.50
  storativity (dimensionless)    = 5.65E+00
-----

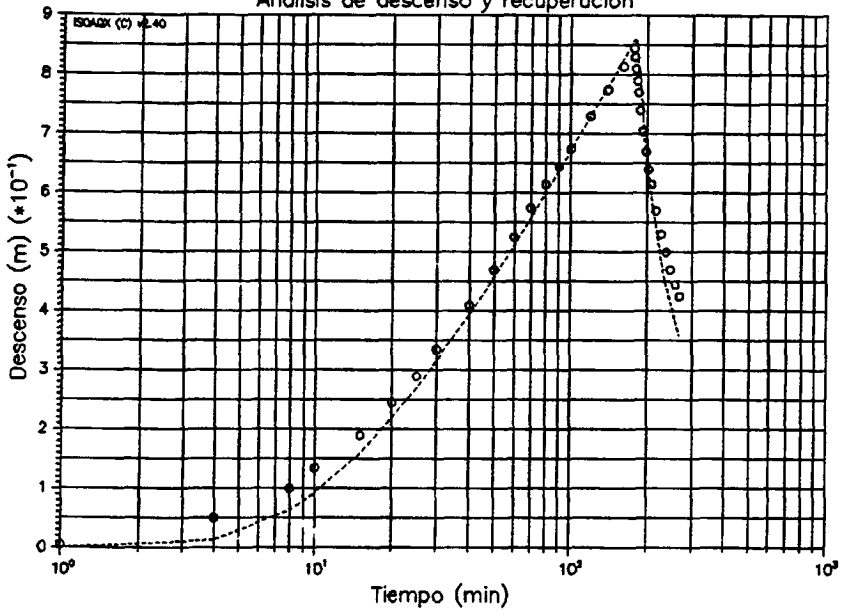
```

Press Enter to Continue.

Pozo 24117009

Autol

Analisis de descenso y recuperacion



-----  
 ISOAQX (C) v2.40 --- FILE is temporary

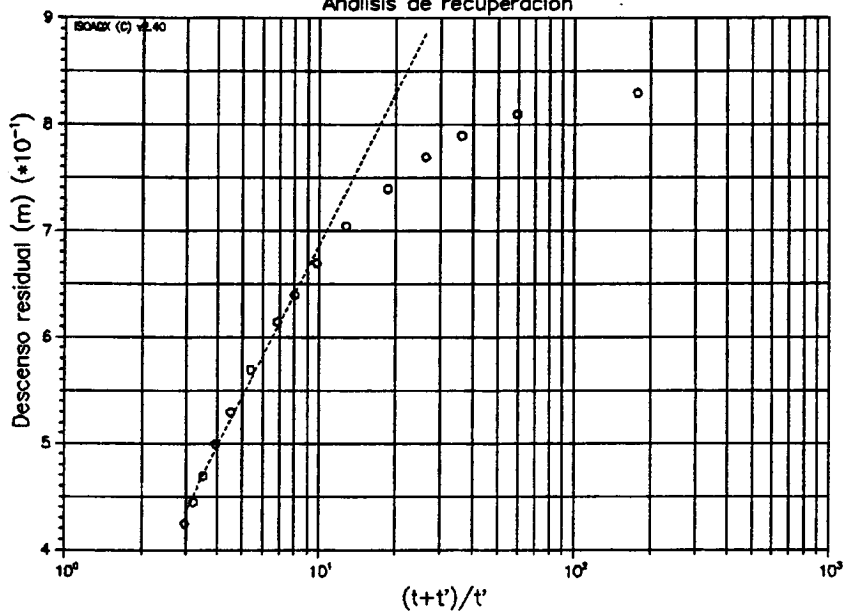
test R comb: 1  
 unbiased THEISSIAN MODEL:  
 full analysis: all active data points used  
 complex: 2 rates  
 using closure tolerance setting = 1.00E-03  
 root mean squared error (m) = 3.41E-02  
 transmissivity ( m\*\*2/day) = 147.14  
 storativity (dimensionless) = 6.58E+00

-----

Press Enter to Continue.



Pozo 24117009  
Autol  
Análisis de recuperación



```

-----
                ISOAUX (C) v2.40 --- FILE is temporary
test R comb: 2
SEMI-LOG RECOVERY ANALYSIS:
root mean squared error (m)           = 7.72E-03
pump on time "To" (min.)              = 1.000
pump off time "Te" (min.)             = 177.000
transmissivity ( m**2/day)            = 250.00
-----

```

Press Enter to Continue.

**ENSAYO DE BOMBEO**  
**PUNTO 2411.4.0007**

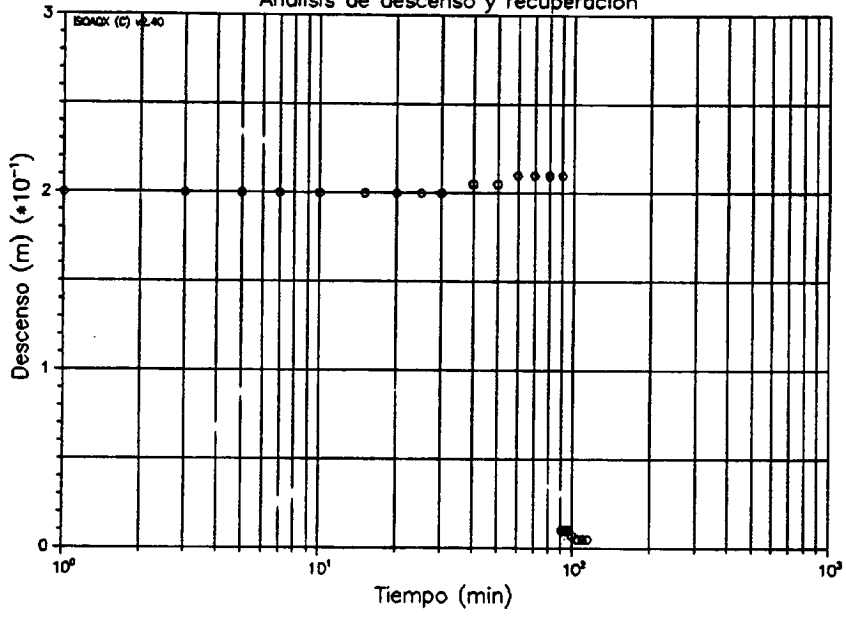
SONDEO 241140007  
LOCALIDAD Aldeanueva de Ebro

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	6.510	0.000	41.0
1	6.710	0.200	41.0
3	6.710	0.200	41.0
5	6.710	0.200	41.0
7	6.710	0.200	41.0
10	6.710	0.200	41.0
15	6.710	0.200	41.0
20	6.710	0.200	41.0
25	6.710	0.200	41.0
30	6.710	0.200	41.0
40	6.715	0.205	41.0
50	6.715	0.205	41.0
60	6.720	0.210	41.0
70	6.720	0.210	41.0
80	6.720	0.210	41.0
90	6.720	0.210	41.0
0	6.720	0.210	Recuperación
1	6.520	0.010	
3	6.520	0.010	
5	6.520	0.010	
7	6.520	0.010	
10	6.517	0.007	
15	6.515	0.005	
20	6.515	0.005	
25	6.515	0.005	
30	6.510	0.000	
40	6.510	0.000	
50	6.510	0.000	

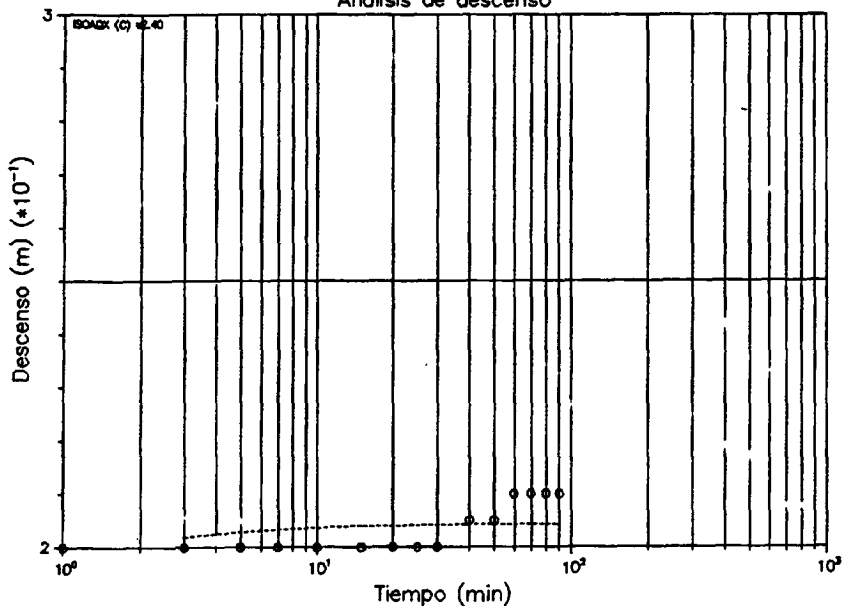
Pozo 24114007

Soto Castelluelo

Análisis de descenso y recuperación



Pozo 24114007  
 Soto Castilluelo  
 Analisis de descenso



-----  
 ISOAQX (C) v2.40 --- FILE is temporary  
 test R comb: 3  
 unbiased THEISSIAN MODEL:  
 full analysis: all active data points used  
 distance to C-H-B image well (m) = 20.00  
 using closure tolerance setting = 1.00E-03  
 root mean squared error (m) = 4.00E-03  
 transmissivity ( m\*\*2/day) = 12705.61 ←  
 storativity (dimensionless) = 3.07E-02  
 -----

Press Enter to Continue.

ENSAYO DE BOMBEO  
PUNTO 2411.3.0002 CON PIEZOMETRO  
(ABASTECIMIENTO DE CALAHORRA)

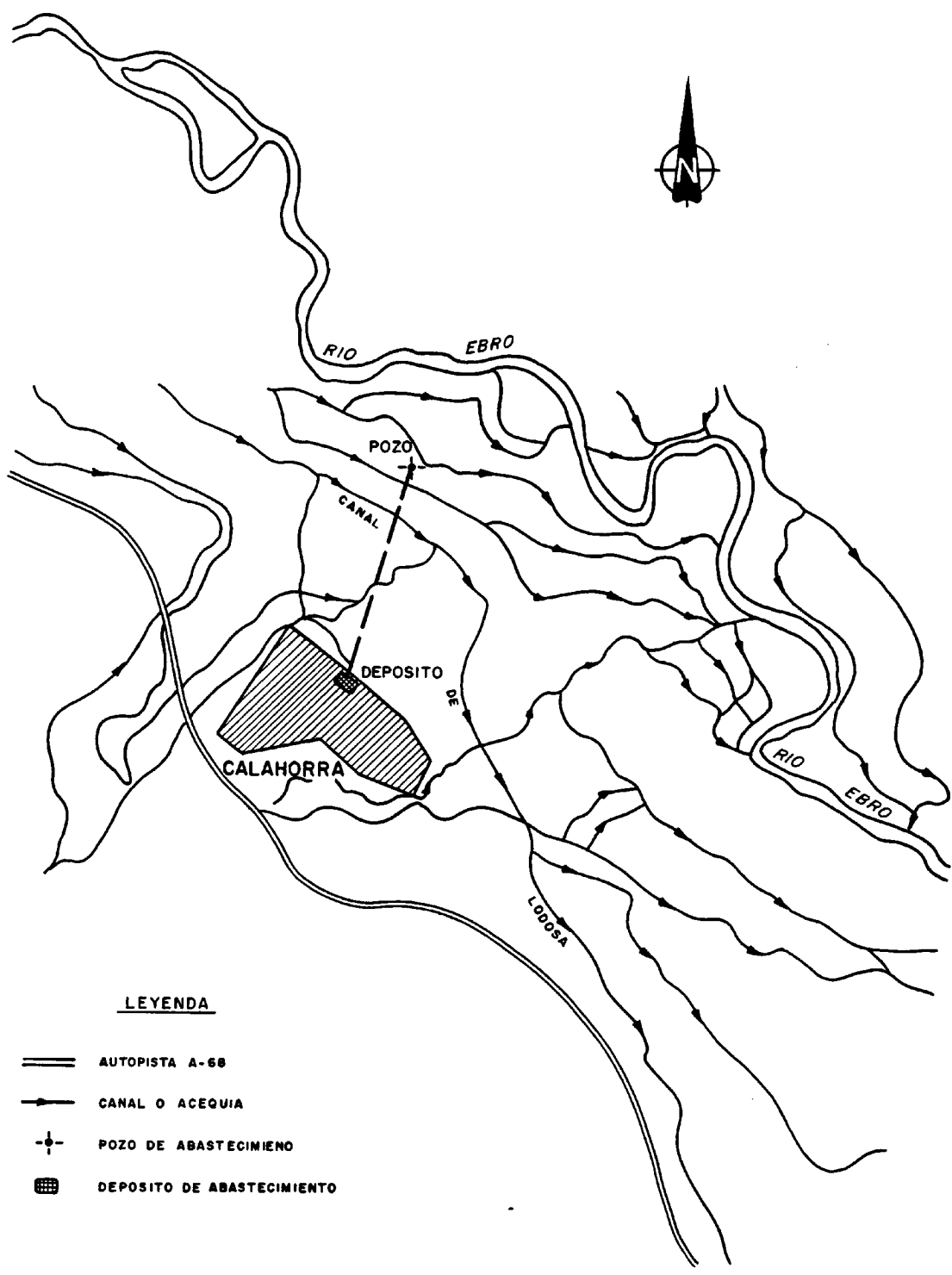
SONDEO 241130002  
LOCALIDAD Calahorra

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	4.395	0.000	210
1	4.560	0.165	210
3	4.735	0.340	210
5	4.795	0.400	210
7	4.820	0.425	210
10	4.840	0.445	210
15	4.850	0.455	210
20	4.860	0.465	210
25	4.865	0.470	210
30	4.875	0.480	210
40	4.880	0.485	210
50	4.885	0.490	210
60	4.890	0.495	210
70	4.895	0.500	210
80	4.895	0.500	210
90	4.900	0.505	210
100	4.905	0.510	210
120	4.905	0.510	210
140	4.905	0.510	210
160	4.910	0.515	210
180	4.915	0.520	210
0	4.915	0.520	Recuperación
1	4.665	0.270	
3	4.530	0.135	
6	4.485	0.090	
7	4.480	0.085	
10	4.470	0.075	
15	4.455	0.060	
20	4.445	0.050	
25	4.435	0.040	
30	4.430	0.035	
40	4.420	0.025	
50	4.415	0.020	
60	4.405	0.010	
70	4.400	0.005	
80	4.395	0.000	
90	4.390	-0.005	
100	4.385	-0.010	
120	4.380	-0.015	





SONDEO Piezómetro a 9 m del 241130002  
LOCALIDAD Calahorra

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	3.785	0.000	
8	4.015	0.230	
16	4.040	0.255	
21	4.050	0.265	
27	4.050	0.265	
41	4.055	0.270	
62	4.075	0.290	
72	4.075	0.290	
92	4.085	0.300	
113	4.085	0.300	
141	4.095	0.310	
161	4.100	0.315	
181	4.100	0.315	
0	4.100	0.315	Recuperación
4	3.890	0.105	
11	3.850	0.065	
16	3.835	0.050	
21	3.830	0.045	
26	3.820	0.035	
31	3.815	0.030	
41	3.805	0.020	
51	3.795	0.010	
61	3.790	0.005	
71	3.785	0.000	
81	3.780	-0.005	
91	3.775	-0.010	
101	3.770	-0.015	
121	3.760	-0.025	



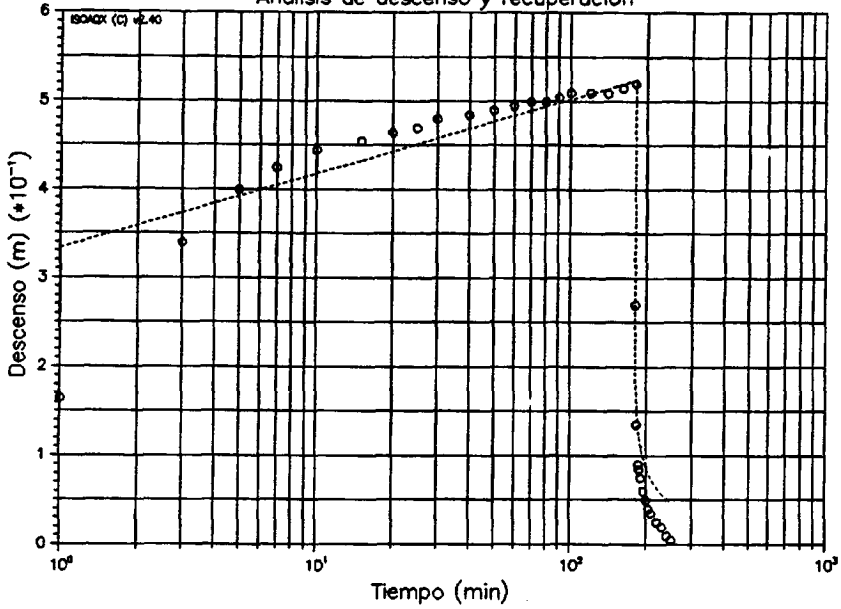


**LEYENDA**

-  AUTOPISTA A-68
-  CANAL O ACEQUIA
-  POZO DE ABASTECIMIENTO
-  DEPOSITO DE ABASTECIMIENTO

ESCALA 1:50.000

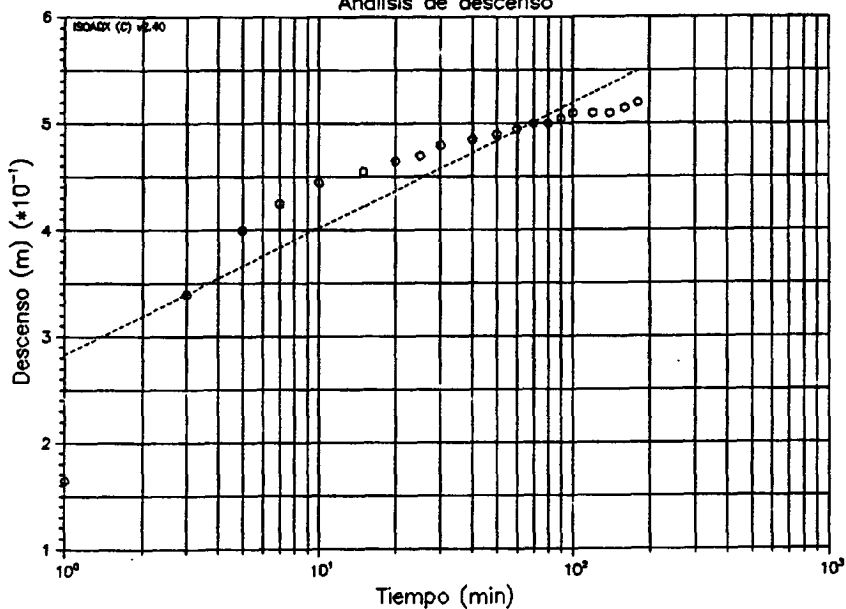
Pozo 24113002  
 Abastecimiento a Calahorra  
 Analisis de descenso y recuperacion



-----  
 ISOAQX (C) v2.40 --- FILE is temporary  
 test R comb: 1  
 unbiased THEISSIAN MODEL:  
 full analysis: all active data points used  
 complex: 2 rates  
 using closure tolerance setting = 1.00E-03  
 root mean squared error (m) = 4.08E-02  
 transmissivity ( m\*\*2/day) = 39400.84  
 storativity (dimensionless) = 6.88E-03  
 -----

Press Enter to Continue.

Pozo 24113002  
 Abastecimiento a Calahorra  
 Analisis de descenso



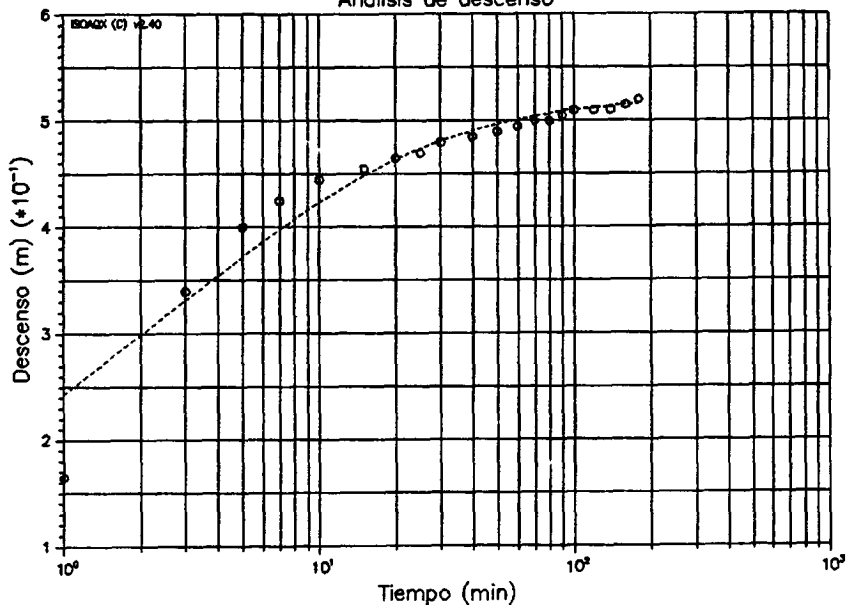
```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 2
unbiased THEISSIAN MODEL:
full analysis:          all active data points used
using closure tolerance setting      = 1.00E-03
root mean squared error (m)          = 3.53E-02
transmissivity ( m**2/day)           = 28134.34
storativity (dimensionless)          = 1.77E-01
-----
  
```

Press Enter to Continue.

ANALISIS DE DESCENSO SIN POZO IMAGEN

Pozo 24113002  
 Abastecimiento a Calahorra  
 Analisis de descenso



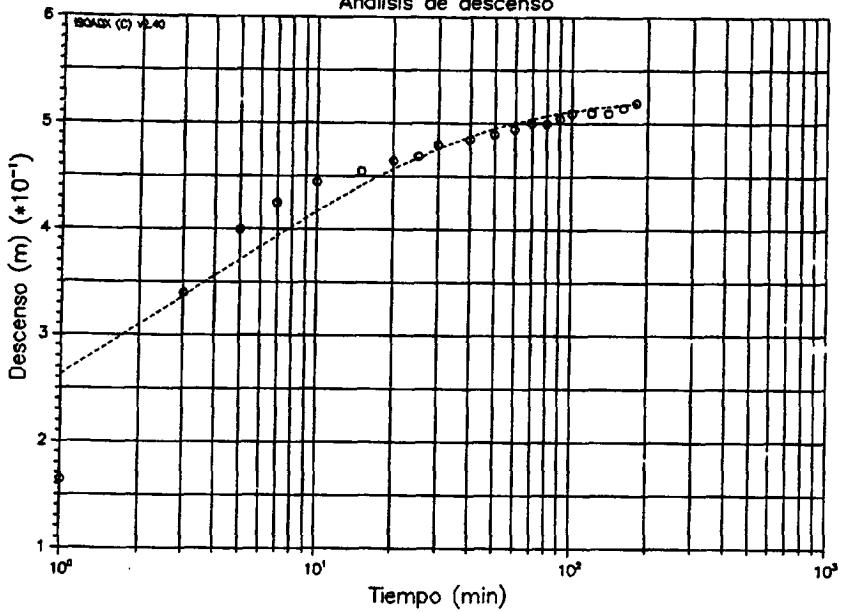
```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test # comb: 2
  unbiased THEISSIAN MODEL:
  full analysis:                all active data points used
  distance to C-H-B image well (m)      =      25.00
  using closure tolerance setting        =      1.00E-03
  root mean squared error (m)           =      2.06E-02
  transmissivity ( m**2/day)            =     17740.22
  storativity (dimensionless)           =      1.44E+00
-----
  
```

Press Enter to Continue.

ANALISIS DE DESCENSO CON POZO IMAGEN A 25 MTS.

Pozo 24113002  
 Abastecimiento a Calahorra  
 Analisis de descenso



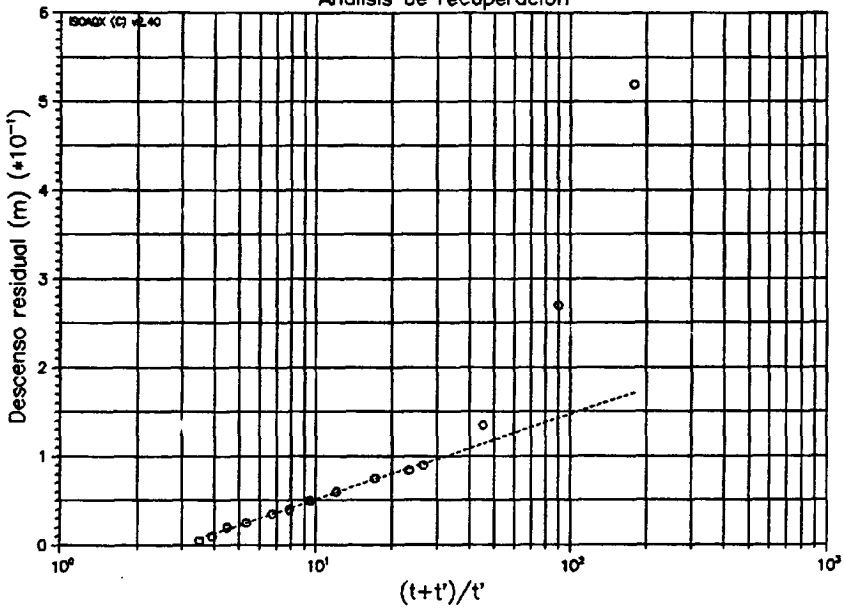
```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 2
unbiased THEISSIAN MODEL:
full analysis:                all active data points used
distance to C-H-B image well (m)      =      50.00
using closure tolerance setting        =      1.00E-03
root mean squared error (m)           =      2.51E-02
transmissivity ( m**2/day)            =      21321.41
storativity (dimensionless)           =      6.96E-01
-----
  
```

Press Enter to Continue.

ANALISIS DE DESCENSO CON POZO IMAGEN A 50 MTS.

Pozo 24113002  
 Abastecimiento a Calahorra  
 Analisis de recuperacion

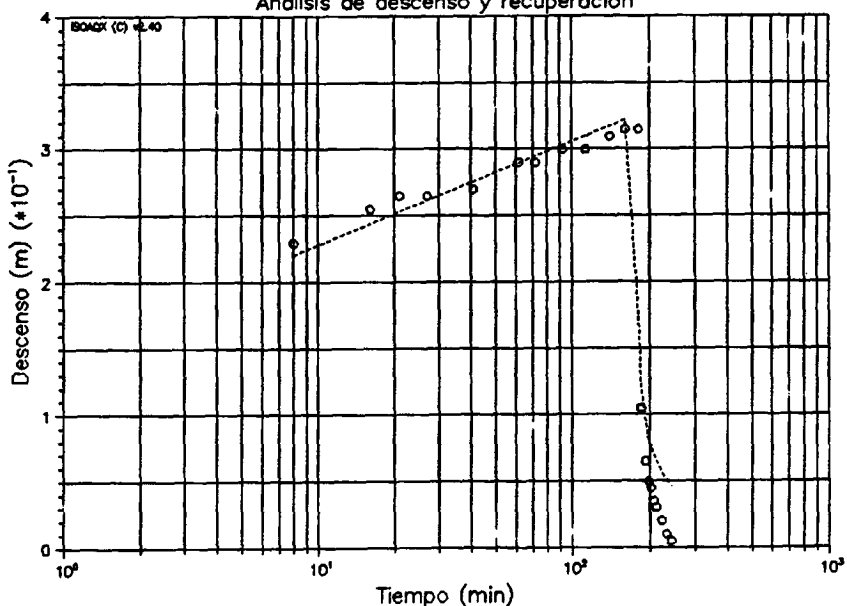


-----  
 ISOAQX (C) v2.40 --- FILE is temporary  
 test R comb: 3  
 SEMI-LOG RECOVERY ANALYSIS:  
 root mean squared error (m) = 1.47E-03  
 pump on time "To" (min.) = 1.000  
 pump off time "Te" (min.) = 179.000  
 transmissivity ( m\*\*2/day) = 34542.37  
 -----

Press Enter to Continue.

ANALISIS DE RECUPERACION

Piezometro a 9 m de 24113002  
 Abastecimiento a Calahorra  
 Analisis de descenso y recuperacion



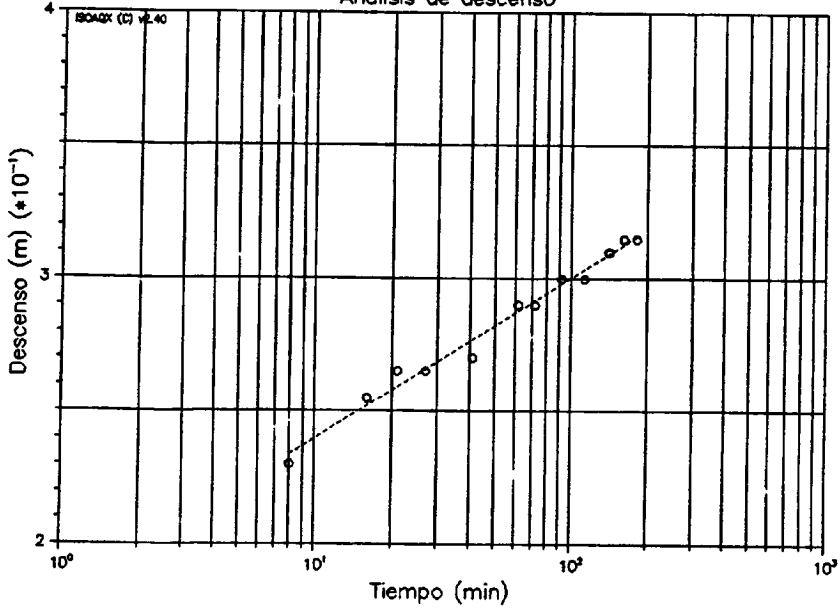
```

-----
      ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 1
unbiased THEISSIAN MODEL:
full analysis:           all active data points used
complex: 2 rates
using closure tolerance setting = 1.00E-03
root mean squared error (m)    = 3.81E-02
transmissivity ( m**2/day)     = 42745.70
storativity (dimensionless)    = 9.64E-03
-----
  
```

Press Enter to Continue.

ANALISIS DE DESCENSO Y RECUPERACION EN EL PIEZOMETRO A 9 MTS.

Piezometro a 9 m de 24113002  
 Abastecimiento a Calahorra  
 Analisis de descenso



```

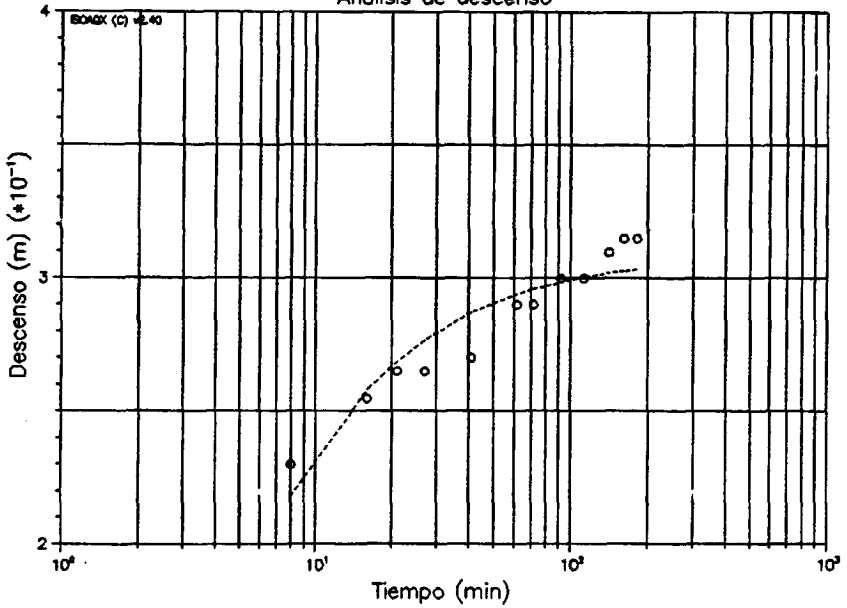
-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 2
unbiased THEISSIAN MODEL:
full analysis:                all active data points used
using closure tolerance setting = 1.00E-03
root mean squared error (m)    = 3.34E-03
transmissivity ( m**2/day)     = 54694.26
storativity (dimensionless)    = 1.21E-03
-----
  
```

Press Enter to Continue.

ANALISIS DE DESCENSO EN EL PIEZOMETRO SIN  
SUPONER POZO IMAGEN



Piezometro a 9 m de 24113002  
 Abastecimiento a Calahorra  
 Analisis de descenso

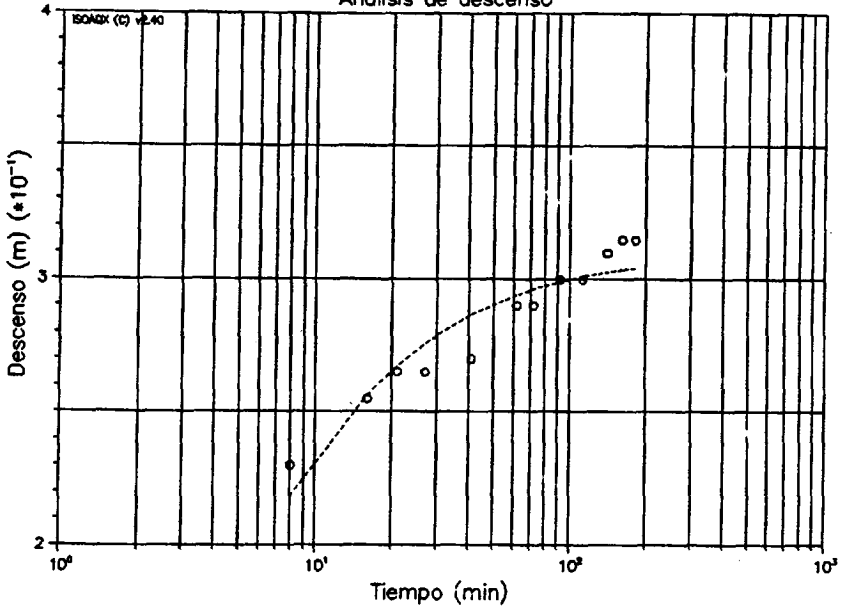


-----  
 ISOAQX (C) v2.40 --- FILE is temporary  
 test R comb: 2  
 unbiased THEISSIAN MODEL:  
 full analysis: all active data points used  
 distance to C-H-B image well (m) = 25.00  
 using closure tolerance setting = 1.00E-03  
 root mean squared error (m) = 9.19E-03  
 transmissivity ( m\*\*2/day) = 9571.62  
 storativity (dimensionless) = 2.95E-01  
 -----

Press Enter to Continue.

ANALISIS DE DESCENSOS EN PIEZOMETRO CON POZO IMAGEN A 25 MTS.

Piezometro a 9 m de 24113002  
 Abastecimiento a Calahorra  
 Analisis de descenso



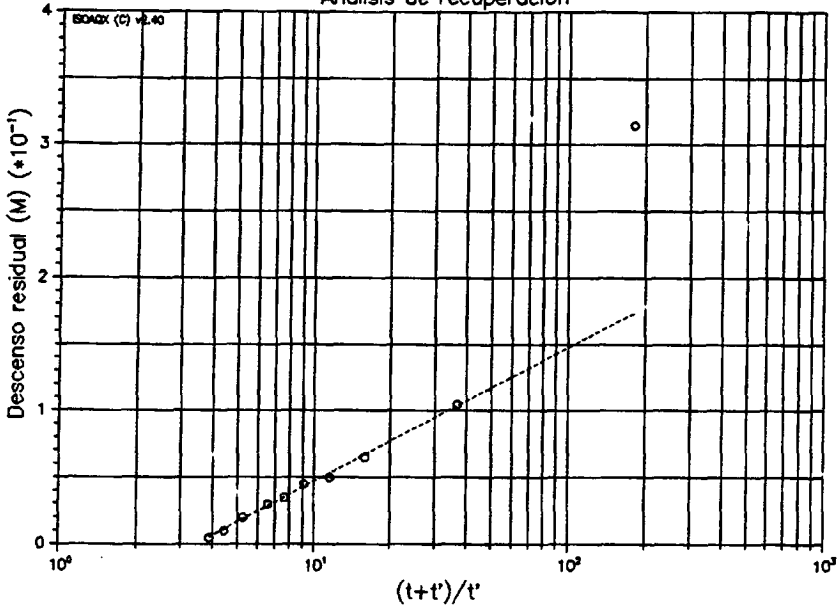
```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 2
unbiased THEISSIAN MODEL:
full analysis:                all active data points used
distance to C-H-B image well (m) = 50.00
using closure tolerance setting = 1.00E-03
root mean squared error (m) = 8.65E-03
transmissivity ( m**2/day) = 15987.02
storativity (dimensionless) = 2.08E-01
-----
  
```

Press Enter to Continue.

ANALISIS DE DESCENSOS EN PIEZOMETRO CON POZO IMAGEN A 50 MTS

Piezometro a 9 m de 24113002  
 Abastecimiento a Calahorra  
 Analisis de recuperacion



```

-----
      ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 3
SEMI-LOG RECOVERY ANALYSIS:
root mean squared error (m)           =      1.68E-03
pump on time "To" (min.)              =      1.000
pump off time "Te" (min.)             =     180.000
transmissivity ( m**2/day)            =    33023.88
-----
  
```

Press Enter to Continue.

ANALISIS DE LA RECUPERACION EN EL PIEZOMETRO

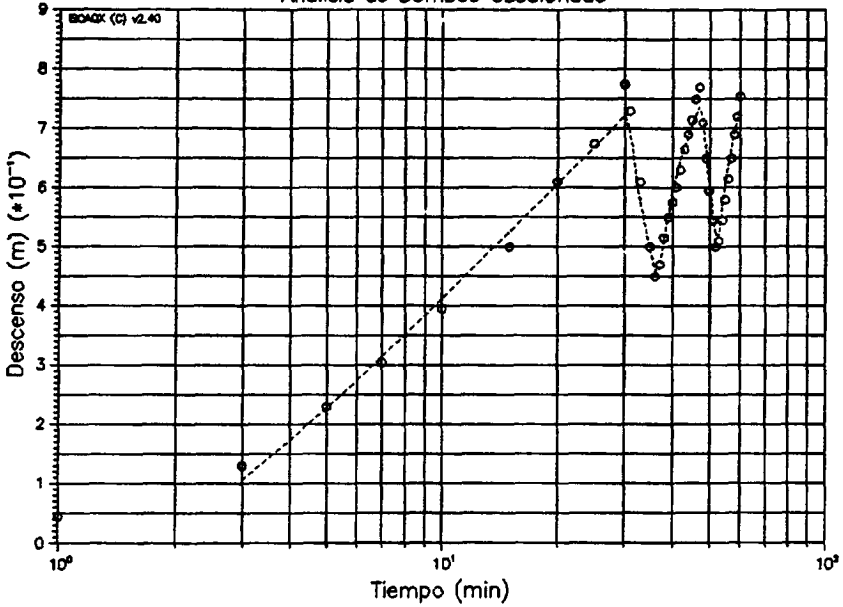
ENSAYO DE BOMBEO  
PUNTO 2411.7.0012

SONDEO 241170012  
LOCALIDAD Autol

TIEMPO (min)	NIVEL DINAMICO	DESCENSO (m)	CAUDAL (l/s)
0	6.070	0.000	9.0
1	6.115	0.045	9.0
3	6.200	0.130	9.0
5	6.300	0.230	9.0
7	6.375	0.305	9.0
10	6.465	0.395	9.0
15	6.570	0.500	9.0
20	6.680	0.610	9.0
25	6.745	0.675	9.0
30	6.845	0.775	9.0
0	6.845	0.775	Recuperación
1	6.800	0.730	
3	6.680	0.610	
5	6.570	0.500	
6	6.520	0.450	
0	6.520	0.450	9.0
1	6.540	0.470	9.0
2	6.585	0.515	9.0
3	6.620	0.550	9.0
4	6.645	0.575	9.0
5	6.670	0.600	9.0
6	6.700	0.630	9.0
7	6.735	0.665	9.0
8	6.760	0.690	9.0
9	6.785	0.715	9.0
10	6.820	0.750	9.0
11	6.840	0.770	9.0
0	6.840	0.770	Recuperación
1	6.780	0.710	
2	6.720	0.650	
3	6.665	0.595	
4	6.615	0.545	
5	6.570	0.500	
0	6.570	0.500	9.0
1	6.580	0.510	9.0
2	6.615	0.545	9.0
3	6.650	0.580	9.0
4	6.685	0.615	9.0
5	6.720	0.650	9.0
6	6.760	0.690	9.0
7	6.790	0.720	9.0
8	6.825	0.755	9.0

Pozo 24117012  
Autol

Análisis de bombeo escalonado



-----  
ISOAQX (C) v2.40 --- FILE is temporary

test R comb: 1

unbiased THEISSIAN MODEL:

full analysis:

all active data points used

complex: 5 rates

using closure tolerance setting

= 1.00E-03

root mean squared error (m)

= 2.07E-02

transmissivity ( m\*\*2/day)

= 213.27

storativity (dimensionless)

= 8.44E-01

-----  
Press Enter to Continue.

ENSAYO DE BOMBEO  
PUNTO 2310.5.0046

SONDEO 231050046  
LOCALIDAD Albelda de Iregua

TIEMPO NIVEL DESCENSO CAUDAL  
(min) DINAMICO (m) (l/s)

0	6.205	0.000	1.5
1	6.230	0.025	1.5
3	6.255	0.050	1.5
5	6.280	0.075	1.5
7	6.295	0.090	1.5
10	6.310	0.105	1.5

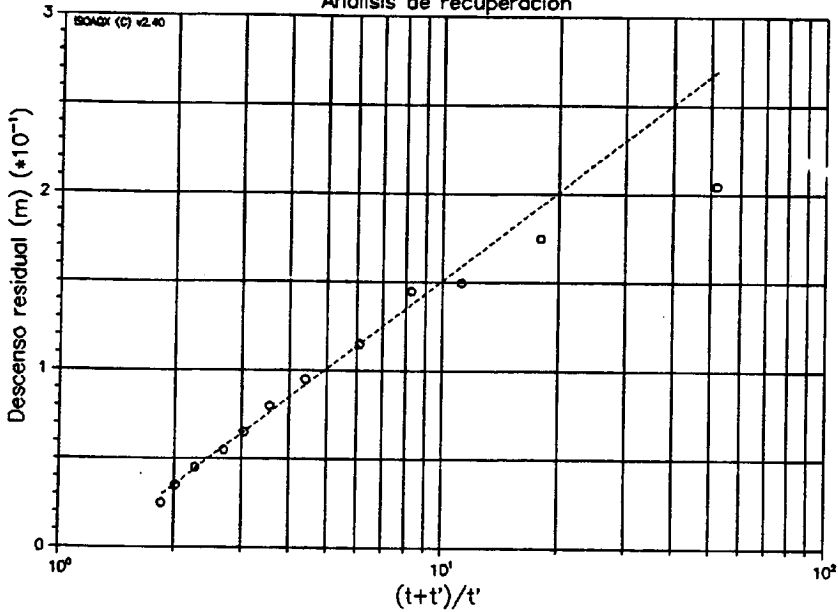
Parada de 2 min.

0	6.295	0.090	1.5
1	6.305	0.100	1.5
3	6.320	0.115	1.5
5	6.335	0.130	1.5
7	6.340	0.135	1.5
10	6.355	0.150	1.5
15	6.370	0.165	1.5
20	6.385	0.180	1.5
25	6.400	0.195	1.5
30	6.410	0.205	1.5
40	6.430	0.225	1.5

1	6.410	0.205	Recuperación
3	6.380	0.175	
5	6.355	0.150	
7	6.350	0.145	
10	6.320	0.115	
15	6.300	0.095	
20	6.285	0.080	
25	6.270	0.065	
30	6.260	0.055	
40	6.250	0.045	
50	6.240	0.035	
60	6.230	0.025	



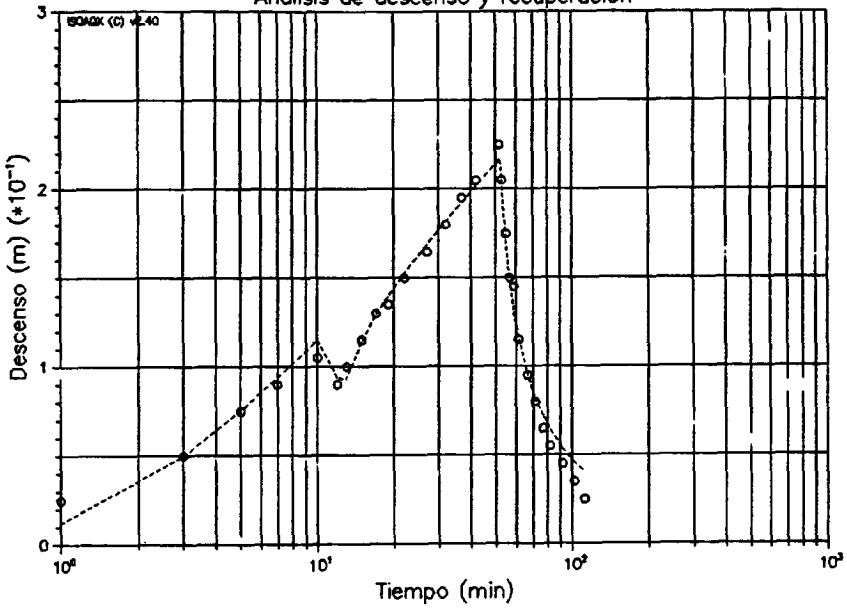
Pozo 231050046  
 Albelda de Iregua  
 Analisis de recuperacion



-----  
 ISOAQX (C) v2.40 --- FILE is temporary  
 test R comb: 3  
 SEMI-LOG RECOVERY ANALYSIS:  
 root mean squared error (m) = 4.33E-03  
 pump on time "To" (min.) = 1.000  
 pump off time "Te" (min.) = 52.000  
 transmissivity ( m\*\*2/day) = 143.18  
 -----

Press Enter to Continue.

Pozo 231050046  
 Albelda de Iregua  
 Analisis de descenso y recuperacion



```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 2
unbiased THEISSIAN MODEL:
full analysis:                all active data points used
complex: 4 rates
using closure tolerance setting = 1.00E-03
root mean squared error (m)    = 6.66E-03
transmissivity ( m**2/day)     = 153.02
storativity (dimensionless)    = 8.64E-01
-----
  
```

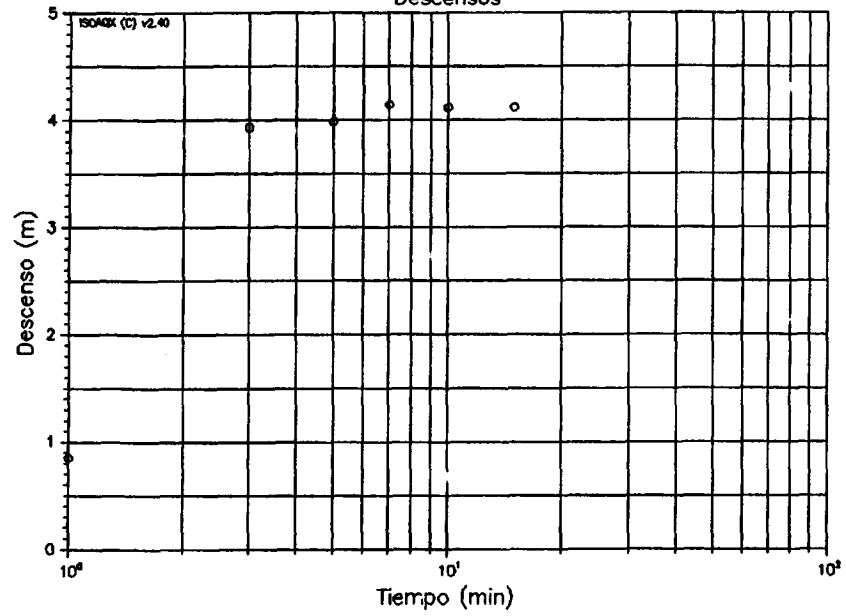
Press Enter to Continue.

**ENSAYO DE BOMBEO**  
**PUNTO 2411.6.0016**

## SONDEO 2411.6.0016

DESCENSO	TIEMPO	NIVEL DINAMICO
	0	2.885
	1	3.740
	3	6.820
	5	6.870
	7	7.030
	10	7.005
	15	7.005

Pozo 241160010  
Arnedo  
Descensos



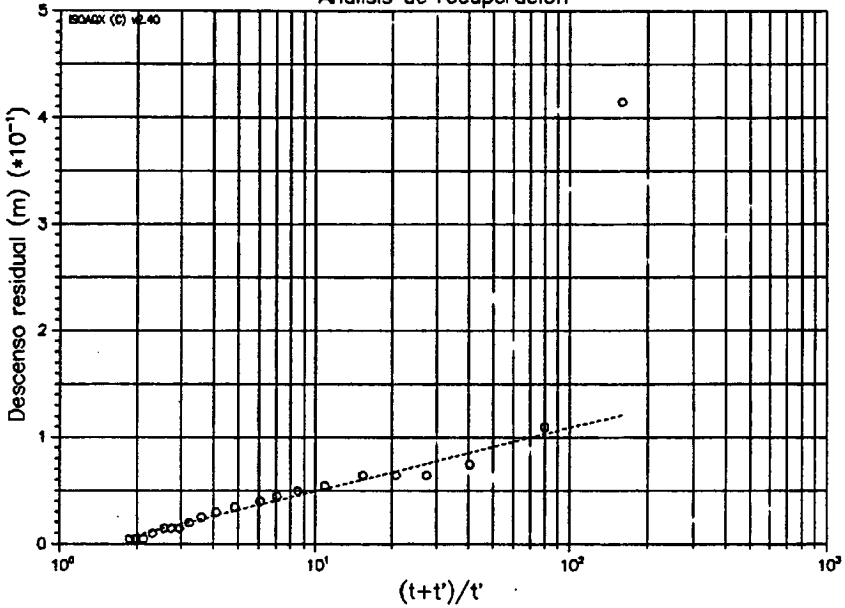
ENSAYO DE BOMBEO  
PUNTO 2310.3.0008

SONDEO 231030008  
TIEMPO NIVEL DINAMICO

DESCENSO	TIEMPO	NIVEL DINAMICO
	0	3.635
	1	3.900
	3	3.960
	5	3.980
	7	3.985
	10	3.990
	15	4.000
	20	4.010
	25	4.020
	30	4.020
	40	4.030
	50	4.030
	60	4.040
	70	4.045
	80	4.050
	90	4.055
	100	4.055
	120	4.050
	140	4.050
	160	4.050

RECUPERACION	TIEMPO	NIVEL DINAMICO
	0	4.050
	1	3.745
	3	3.710
	5	3.700
	7	3.700
	10	3.700
	15	3.690
	20	3.685
	25	3.680
	30	3.675
	40	3.670
	50	3.665
	60	3.660
	70	3.655
	80	3.650
	90	3.650
	100	3.650
	120	3.645
	140	3.640
	160	3.640
	180	3.640

Pozo 231030008  
 Agoncillo - El Reajo  
 Analisis de recuperacion

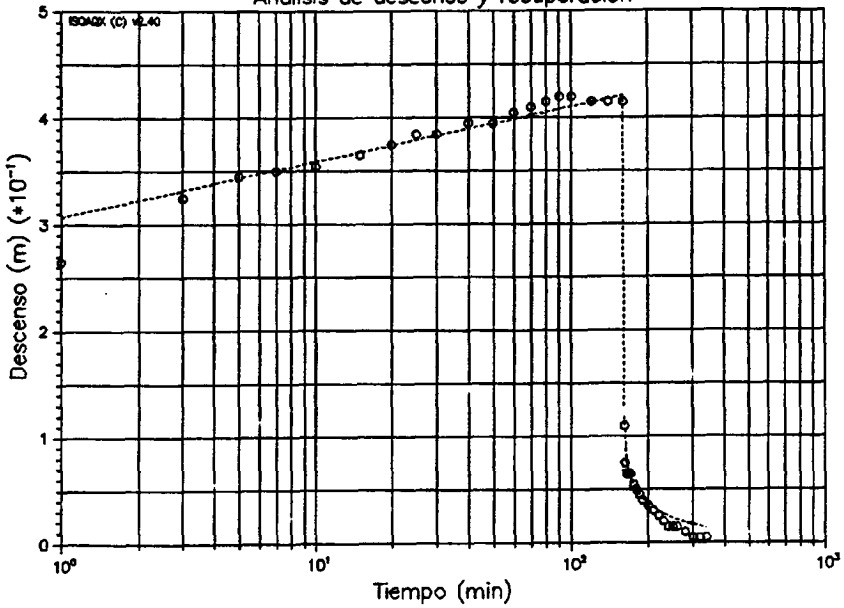


-----  
 ISOAQX (C) v2.40 --- FILE is temporary  
 test R comb: 2  
 SEMI-LOG RECOVERY ANALYSIS:  
 root mean squared error (m) = 4.67E-03  
 pump on time "To" (min.) = 1.000  
 pump off time "Te" (min.) = 159.000  
 transmissivity ( m\*\*2/day) = 992.11  
 -----

-Press Enter to Continue.



Pozo 231030008  
 Agoncillo - El Recajo  
 Analisis de descenso y recuperacion



-----  
 ISOAQX (C) v2.40 --- FILE is temporary  
 test R comb: 1  
 unbiased THEISSIAN MODEL:  
 full analysis: all active data points used  
 complex: 2 rates  
 using closure tolerance setting = 1.00E-03  
 root mean squared error (m) = 9.49E-03  
 transmissivity ( m\*\*2/day) = 1141.97  
 storativity (dimensionless) = 3.22E-06  
 -----

Press Enter to Continue.

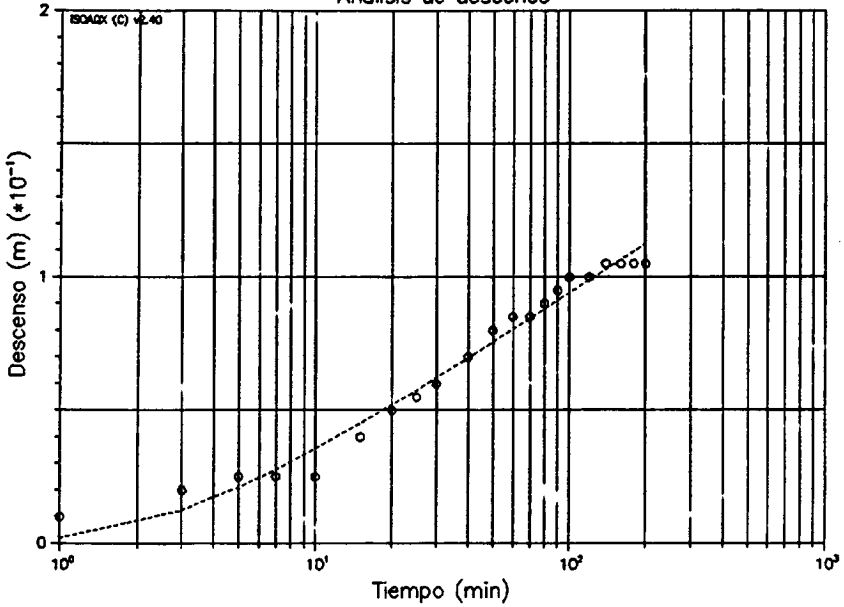
**ENSAYO DE BOMBEO**  
**PUNTO N° 2310.3.0011**

SONDEO 231030011  
TIEMPO NIVEL DINAMICO

DESCENSO	TIEMPO	NIVEL DINAMICO
	0	3.600
	1	3.610
	3	3.620
	5	3.625
	7	3.625
	10	3.625
	15	3.640
	20	3.650
	25	3.655
	30	3.660
	40	3.670
	50	3.680
	60	3.685
	70	3.685
	80	3.690
	90	3.695
	100	3.700
	120	3.700
	140	3.705
	160	3.705
	180	3.705
	200	3.705

RECUPERACION	TIEMPO	NIVEL DINAMICO
	0	3.705
	1	3.705
	3	3.700
	5	3.690
	7	3.685
	10	3.680
	15	3.670
	20	3.660
	25	3.650
	30	3.645
	40	3.635
	50	3.630
	60	3.620
	70	3.620
	80	3.615
	90	3.615
	100	3.615

Pozo 231030011  
 Agoncillo  
 Analisis de descenso

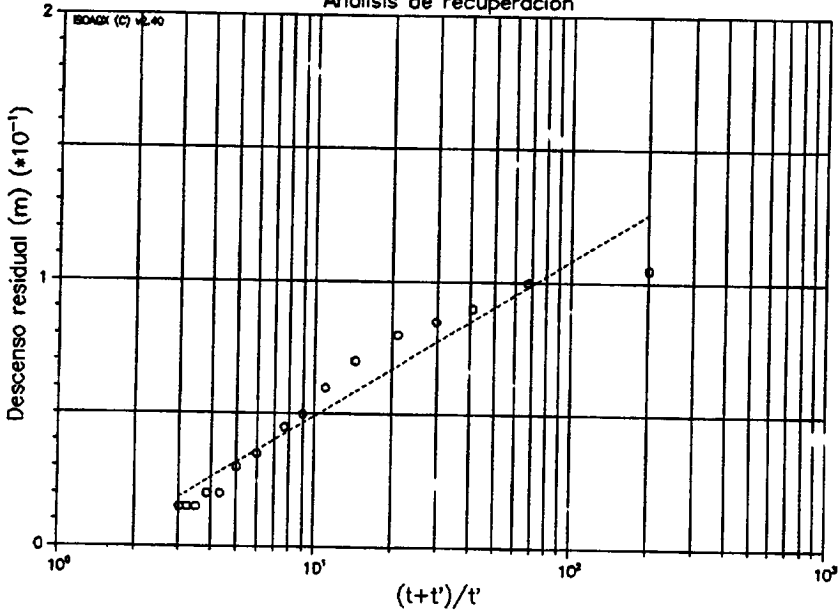


```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb: 2
unbiased THEISSIAN MODEL:
full analysis:                all active data points used
using closure tolerance setting = 1.00E-03
root mean squared error (m)    = 4.82E-03
transmissivity ( m**2/day)     = 35.38
storativity (dimensionless)    = 3.18E-01
-----
  
```

-Press Enter to Continue.

Pozo 231030011  
 Agoncillo  
 Analisis de recuperacion



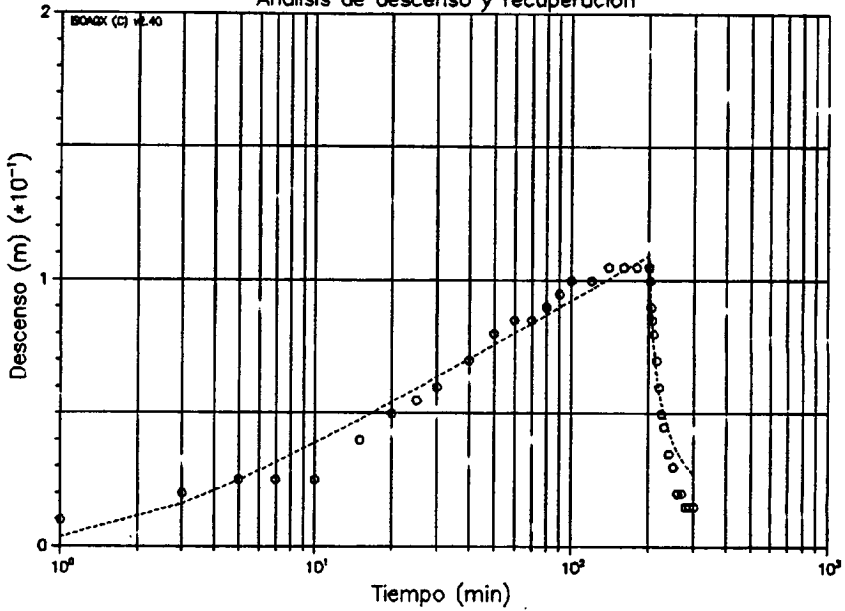
-----  
 ISOAQX (C) v2.40 --- FILE is temporary  
 test R comb: 3  
 SEMI-LOG RECOVERY ANALYSIS:  
 root mean squared error (m) = 8.19E-03  
 pump on time "To" (min.) = 0.000  
 pump off time "Te" (min.) = 200.000  
 transmissivity ( m\*\*2/day) = 37.68  
 -----

Press Enter to Continue.

Pozo 231030011

Agoncillo

Analisis de descenso y recuperacion



-----  
ISOAUX (C) v2.40 --- FILE is temporary

test R comb: 1

unbiased THEISSIAN MODEL:

full analysis:

all active data points used

complex: 2 rates

using closure tolerance setting

= 1.00E-03

root mean squared error (m)

= 7.25E-03

transmissivity ( m\*\*2/day)

= 39.24

storativity (dimensionless)

= 2.55E-01

-----  
Press Enter to Continue.

**ENSAYO DE BOMBEO**  
**PUNTO N° 2410.6.003**

SONDEO 2410.6.0003  
TIEMPO NIVEL DINAMICO

RECUPERACION	0	5.560
	1	5.310
	3	5.050
	5	4.950
	7	4.915
	10	4.890
	15	4.865
	20	4.855
	25	4.845
	30	4.840
	40	4.830
	50	4.825
	60	4.815
	70	4.810
	80	4.810
	90	4.805

DESCENSO	0	4.805
	1	5.010
	3	5.245
	6	5.390
	7	5.415
	10	5.460
	15	5.490
	20	5.500
	25	5.505
	30	5.510
	40	5.520
	50	5.525
	60	5.530
	70	5.535
	80	5.535
	90	5.535

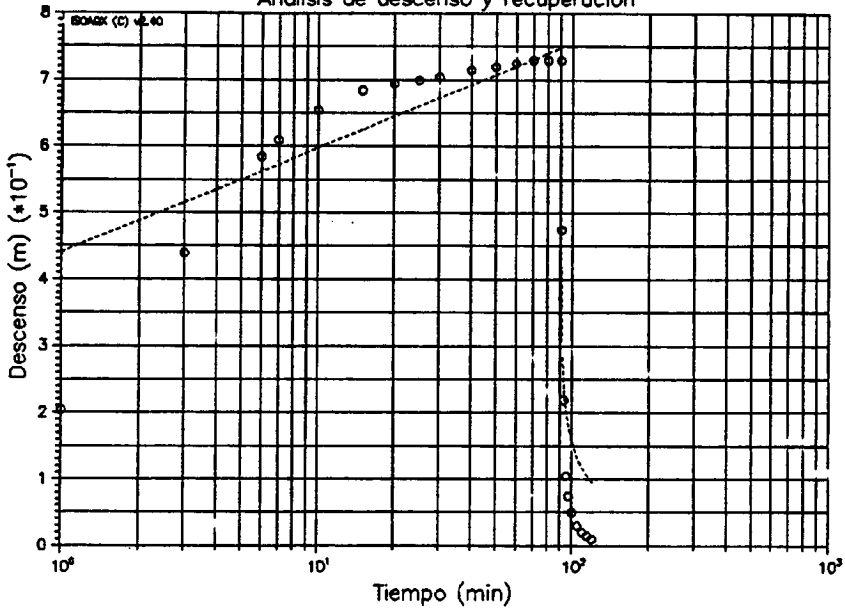
RECUPERACION	0	5.535
	1	5.280
	3	5.025
	5	4.910
	7	4.880
	10	4.855
	15	4.835
	20	4.825
	25	4.820
	30	4.815



Pozo 241060003

Pradejon

Análisis de descenso y recuperación



-----  
ISOAUX (C) v2.40 --- FILE is temporary

test R comb: 1

unbiased THEISSIAN MODEL:

full analysis:

all active data points used

complex: 2 rates

using closure tolerance setting

= 1.00E-03

root mean squared error (m)

= 8.44E-02

transmissivity ( m\*\*2/day)

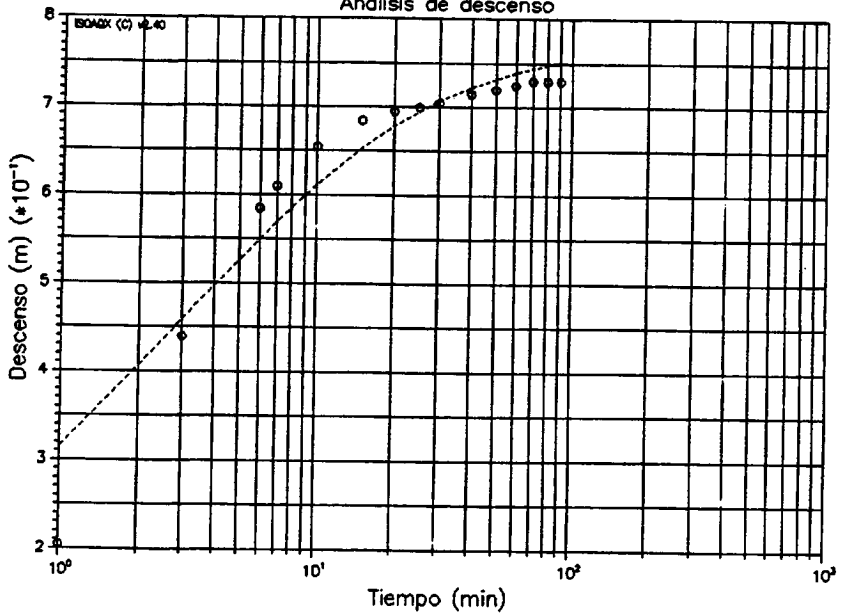
= 803.04

storativity (dimensionless)

= 1.54E-03

-----  
Press Enter to Continue.

Pozo 241060003  
 Pradejon  
 Analisis de descenso

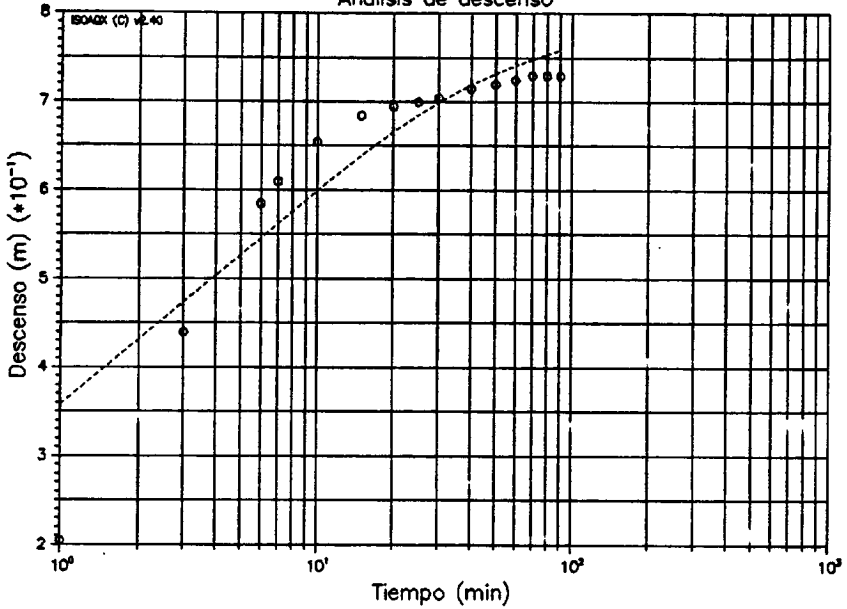


```

-----
                ISOAQX (C) v2.40 --- FILE is temporary
test R comb:  2
unbiased THEISSIAN MODEL:
full analysis:      all active data points used
distance to C-H-B image well (m)      =      20.00
using closure tolerance setting        =      1.00E-03
root mean squared error (m)           =      3.64E-02
transmissivity ( m**2/day)             =      404.96
storativity (dimensionless)            =      4.99E-02
-----
  
```

Press Enter to Continue.

Pozo 241060003  
Pradejon  
Análisis de descenso



-----

ISOAQX (C) v2.40 --- FILE is temporary

test R comb: 2

unbiased THEISSIAN MODEL:

full analysis: all active data points used

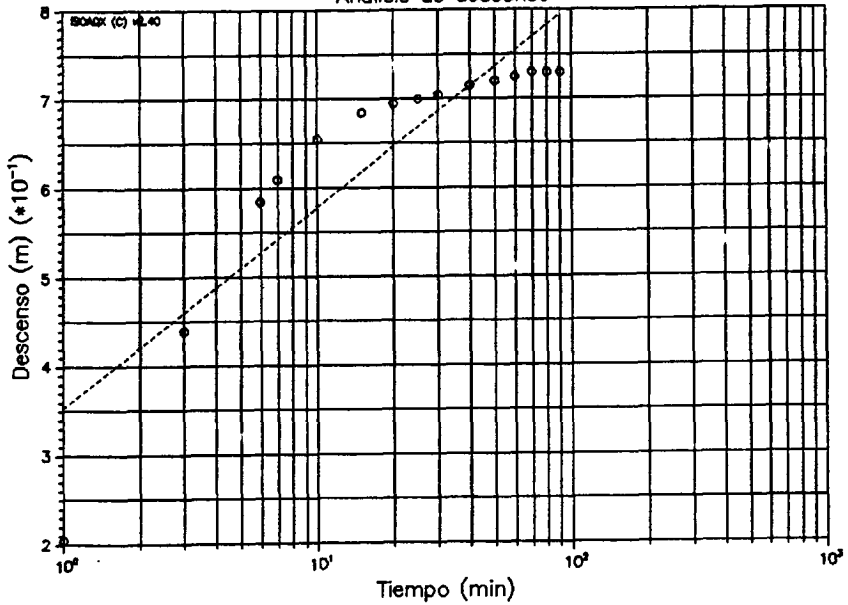
distance to C-H-B image well (m)	=	50.00
using closure tolerance setting	=	1.00E-03
root mean squared error (m)	=	4.96E-02
transmissivity ( m**2/day)	=	521.08
storativity (dimensionless)	=	2.10E-02

-----

Press Enter to Continue.

ANALISIS DE DESCENSOS CON POZO IMAGEN A 50 MTS.

Pozo 241060003  
 Pradejon  
 Analisis de descenso



-----

ISOAQX (C) v2.40 --- FILE is temporary

test R comb: 2

unbiased THEISSIAN MODEL:

full analysis: all active data points used

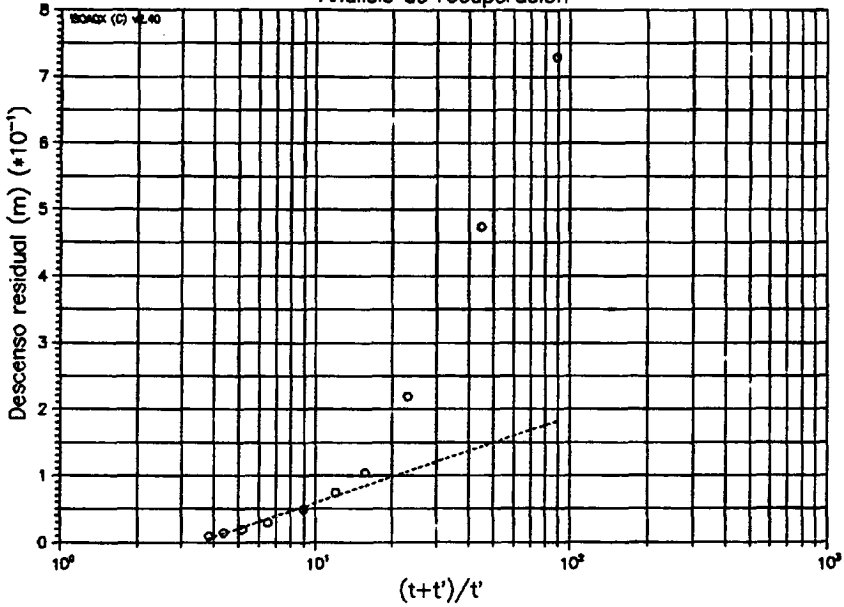
distance to C-H-B image well (m)	=	200.00
using closure tolerance setting	=	1.00E-03
root mean squared error (m)	=	5.98E-02
transmissivity ( m**2/day)	=	558.67
storativity (dimensionless)	=	1.86E-02

-----

Press Enter to Continue.

ANALISIS DE DESCENSOS CON POZO IMAGEN A 200 MTS.

Pozo 241060003  
 Pradejon  
 Analisis de recuperacion



ISOAQX (C) v2.40 --- FILE is temporary

test R comb: 3

SEMI-LOG RECOVERY ANALYSIS:

root mean squared error (m)	=	4.02E-03
pump on time "To" (min.)	=	1.000
pump off time "Te" (min.)	=	89.000
transmissivity ( m**2/day)	=	985.02

Press Enter to Continue.

ANALISIS DE LOS DATOS DE RECUPERACION