I.2222.5

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ANEXO B. GRAFICOS DE PRUEBAS DE BOMBEO REALIZADAS EN POZOS, CON SUS CALCULOS DE TRANSMISIVIDAD

INGEOMINAS

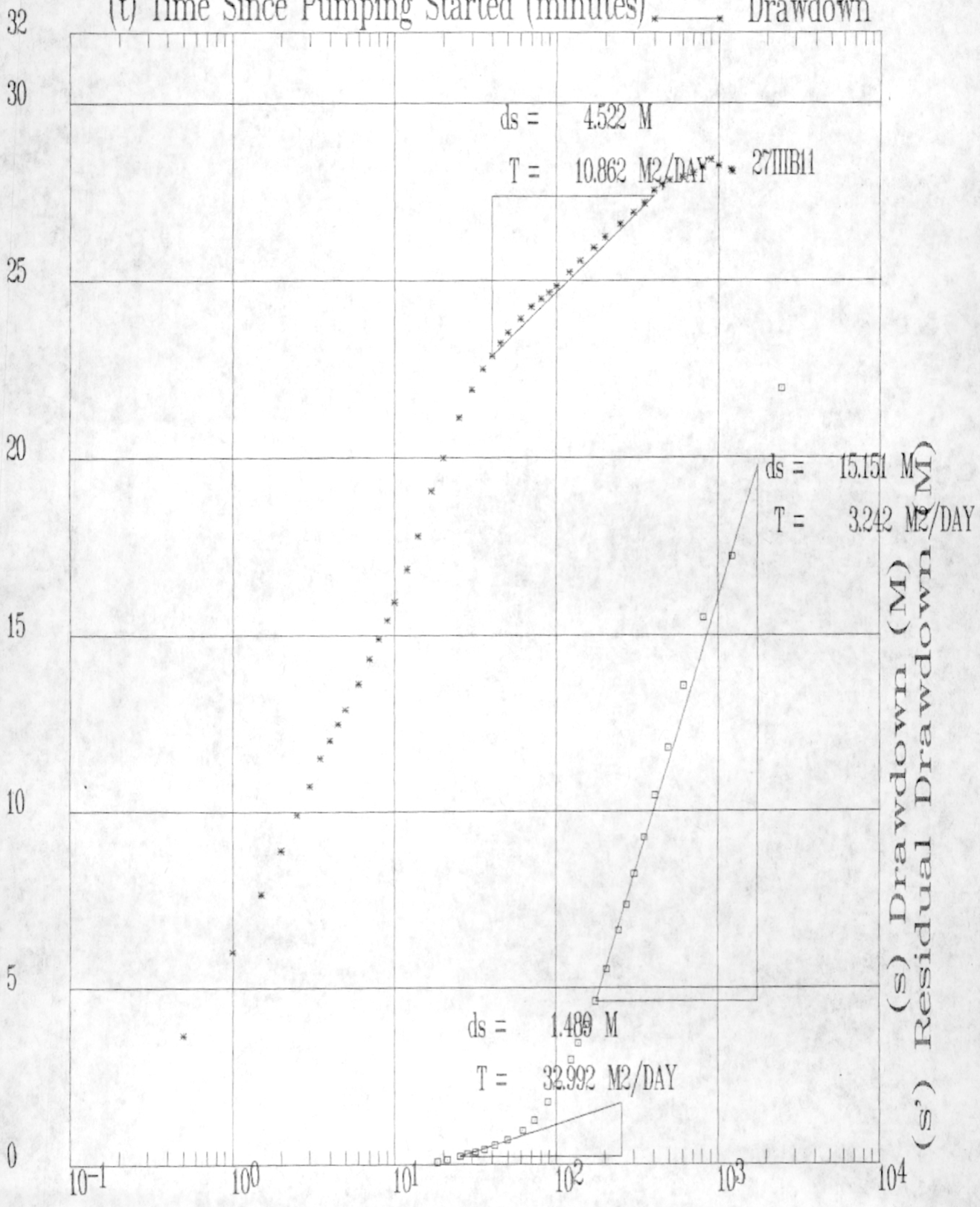
PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown



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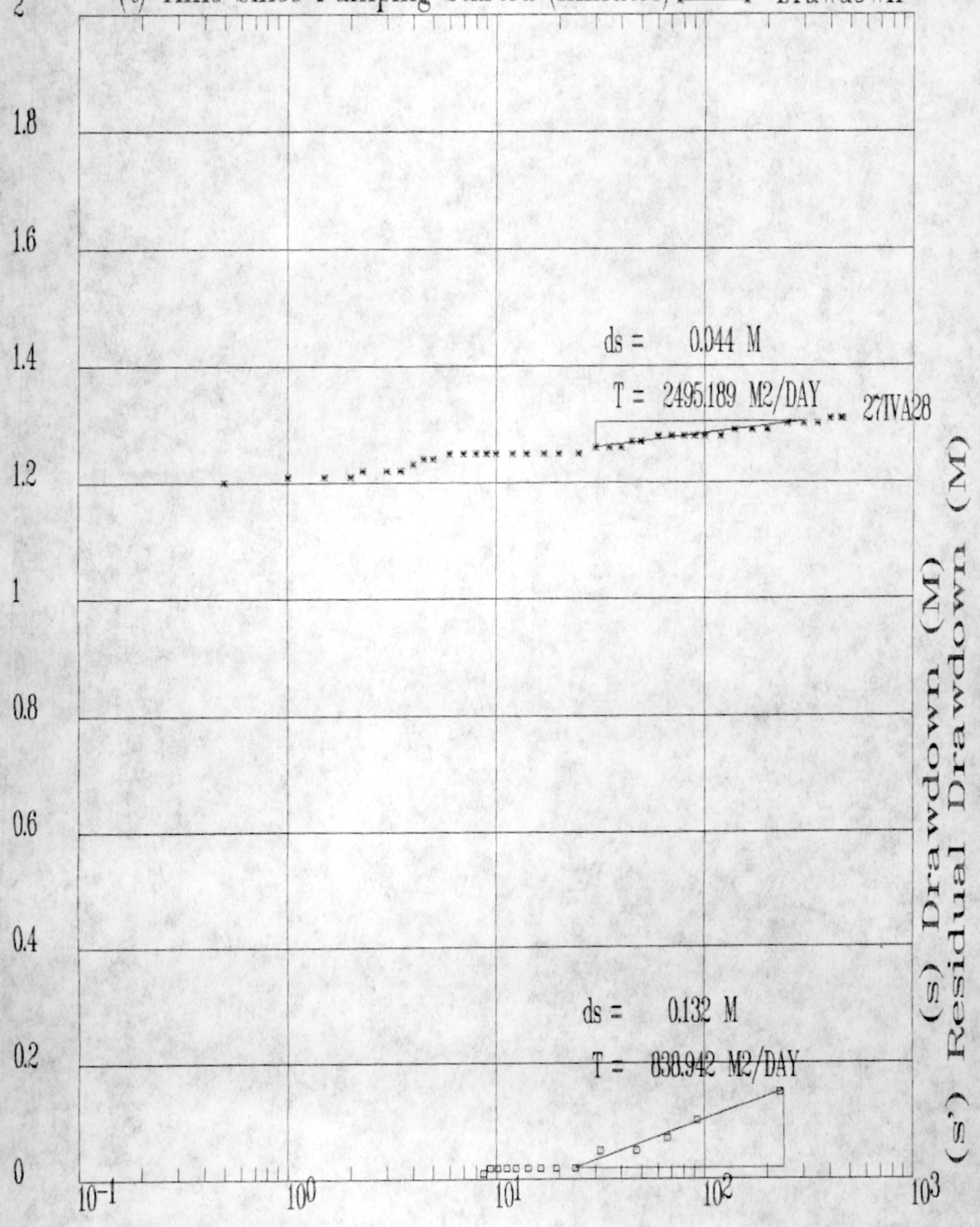
PUMPING TEST ANALYSIS Drawdown and Recovery

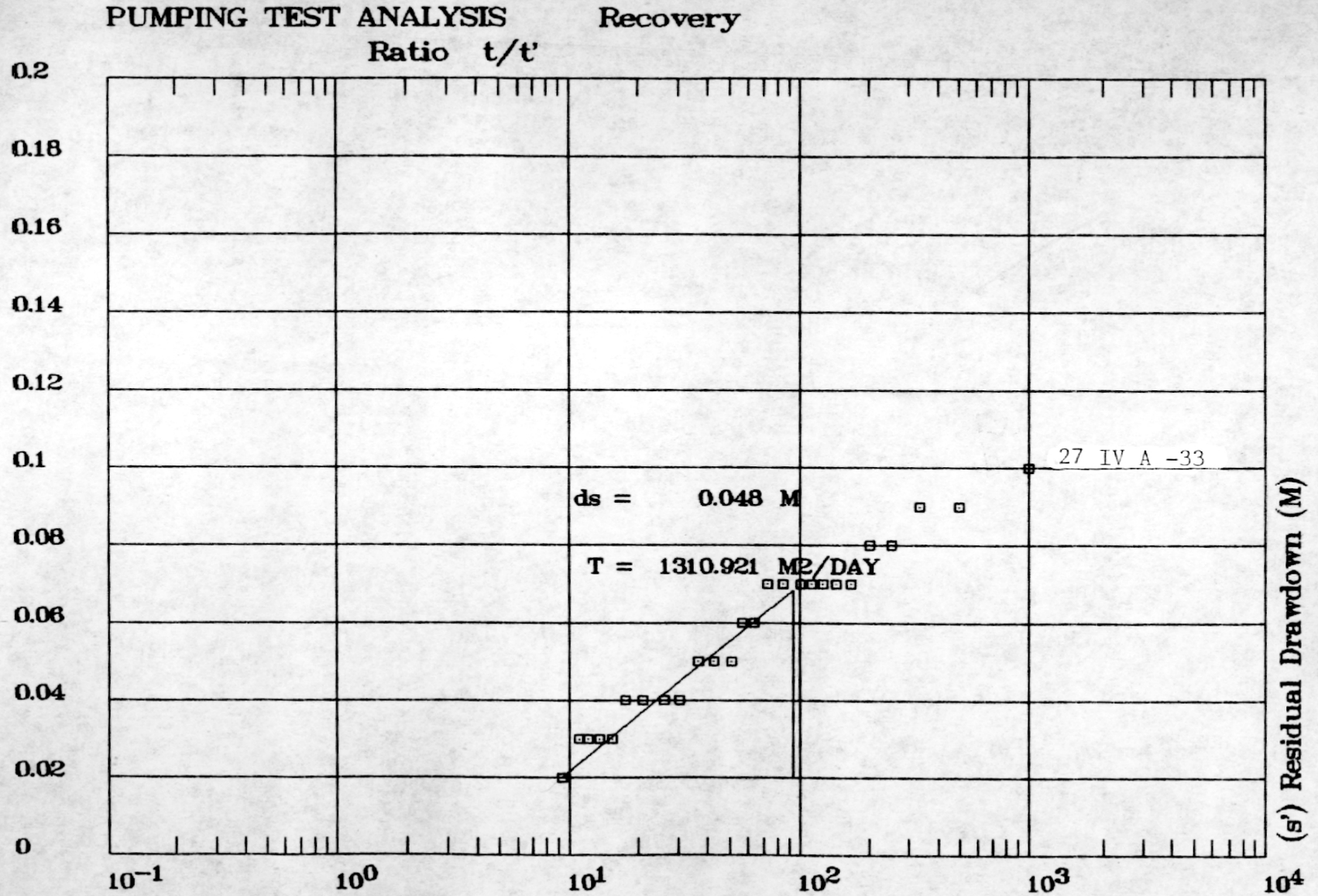
Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown





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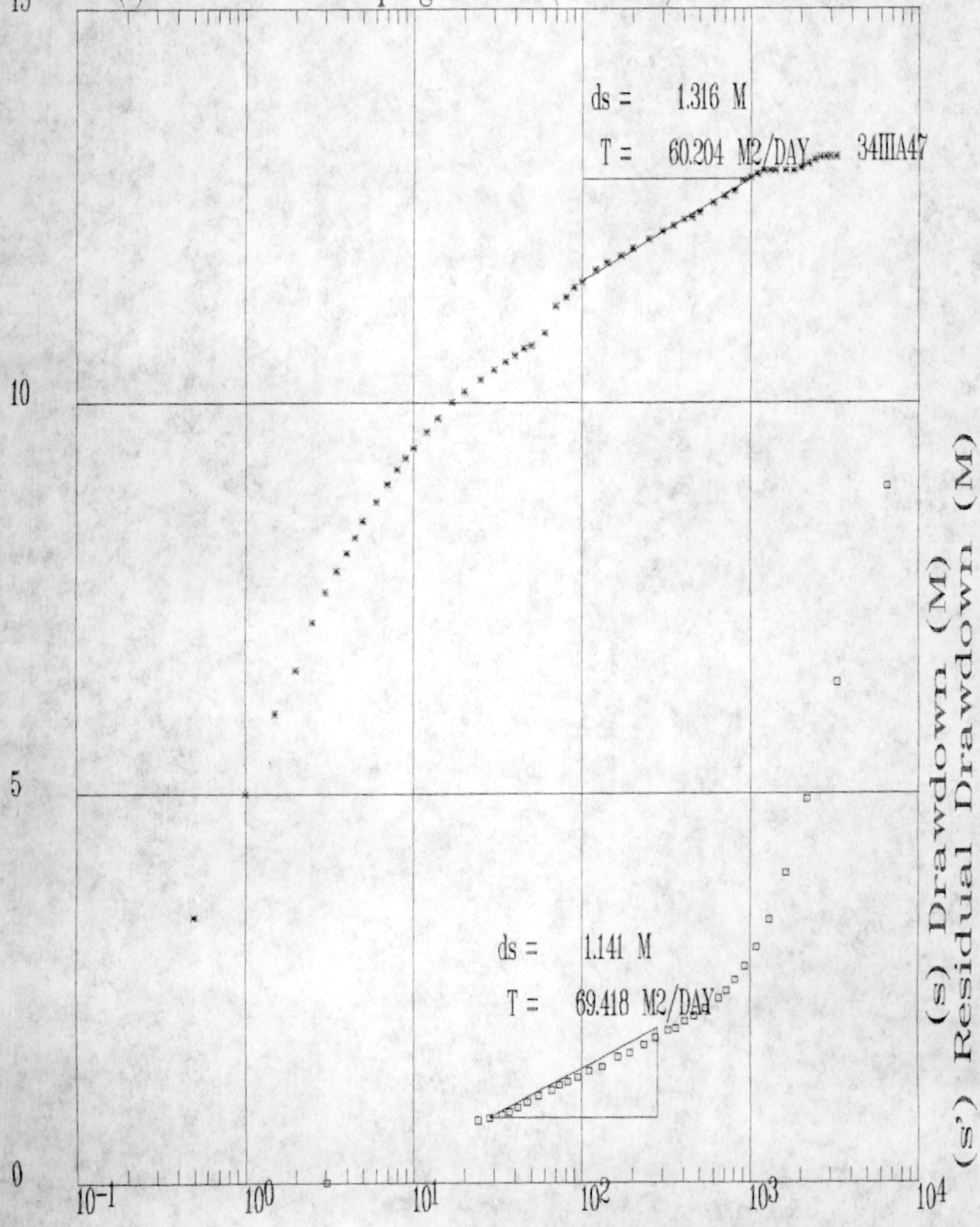
PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown

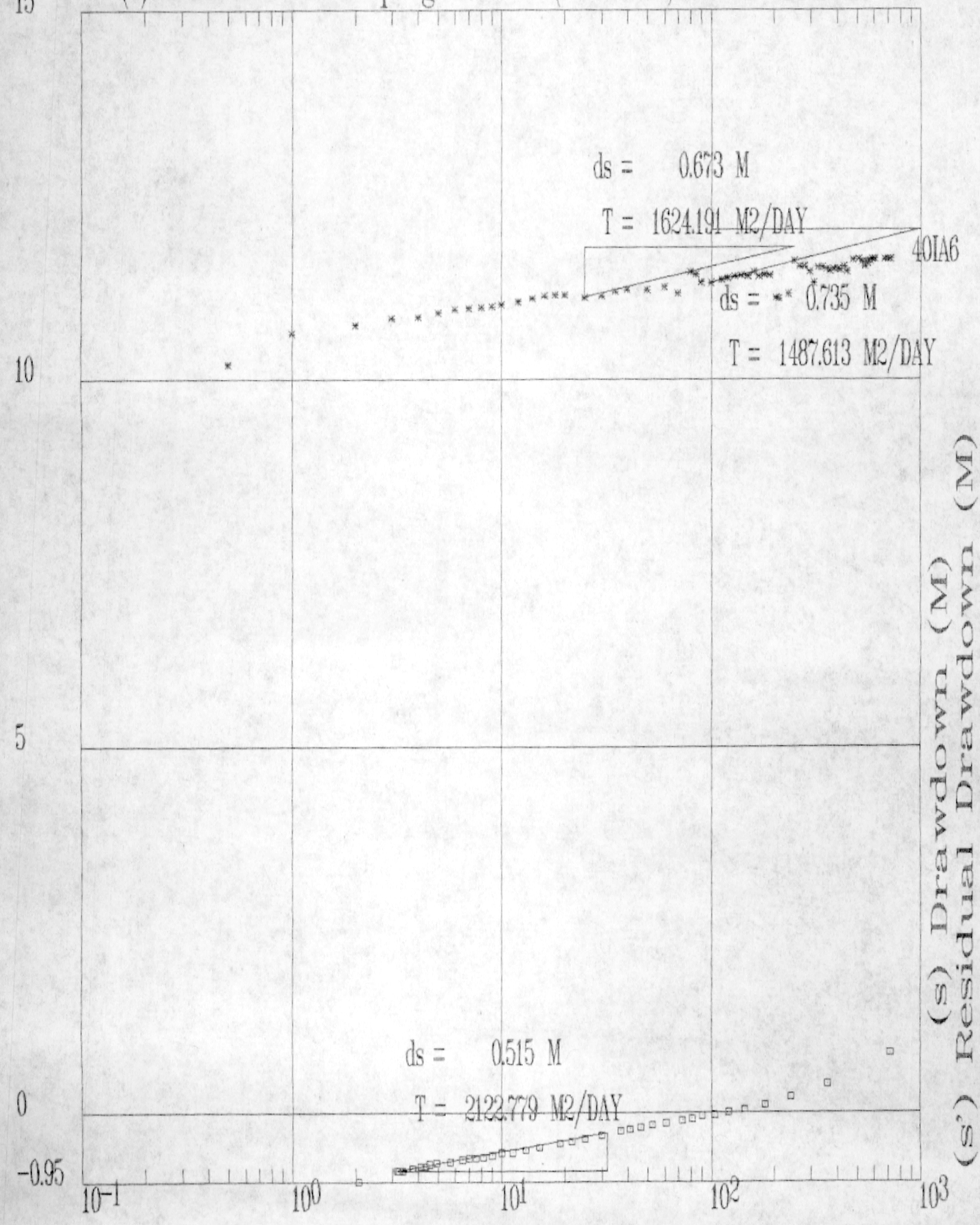


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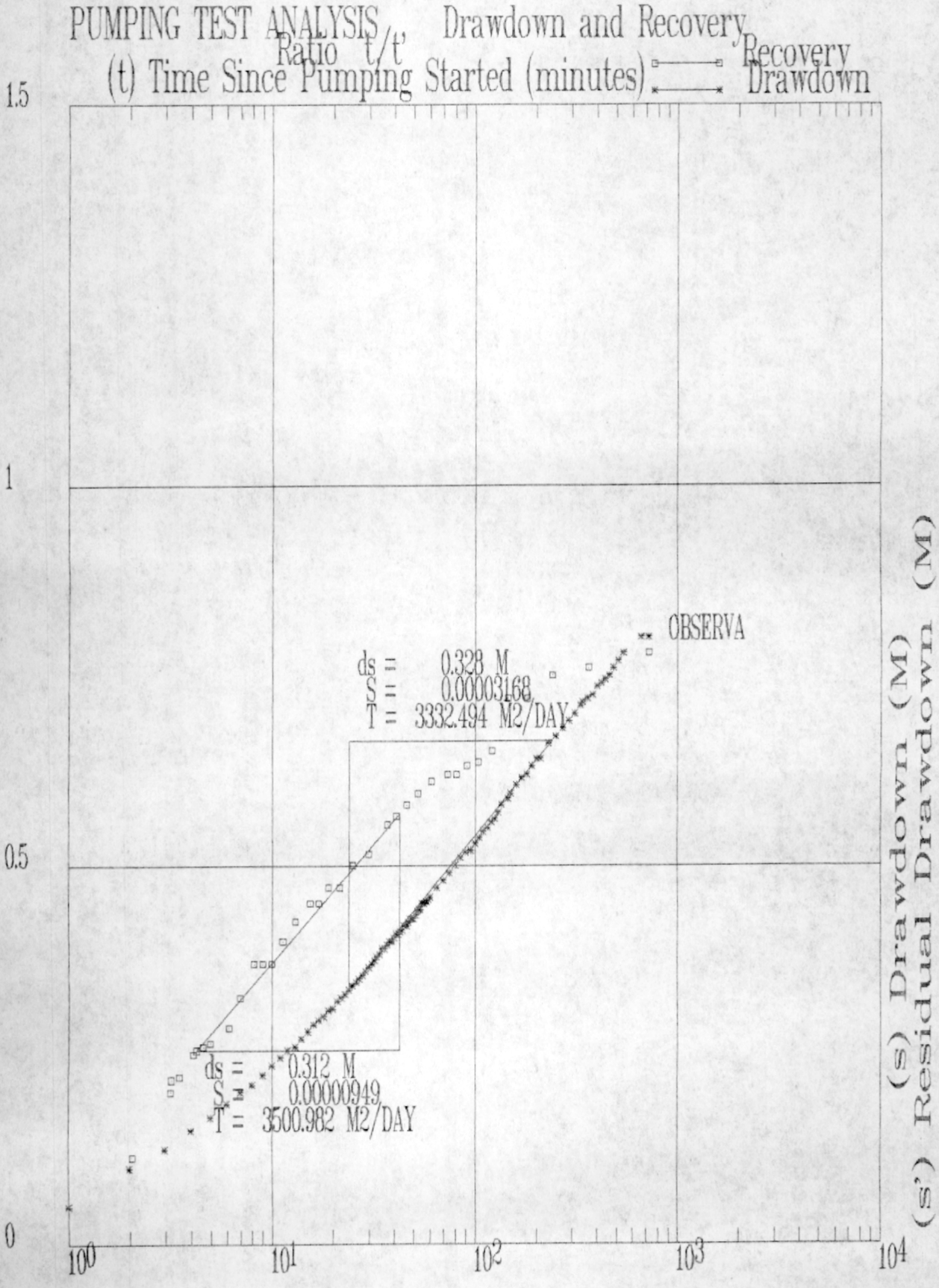
PUMPING TEST ANALYSIS Drawdown and Recovery

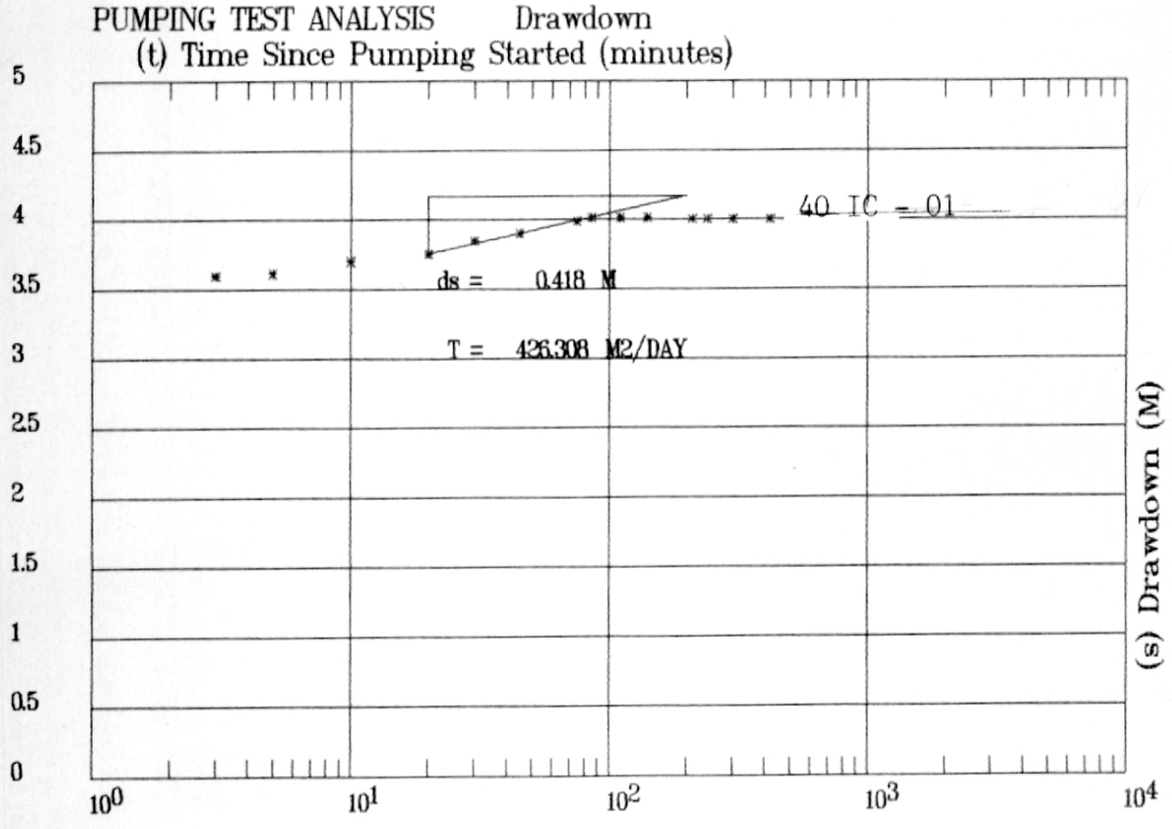
Ratio t/t' Recovery

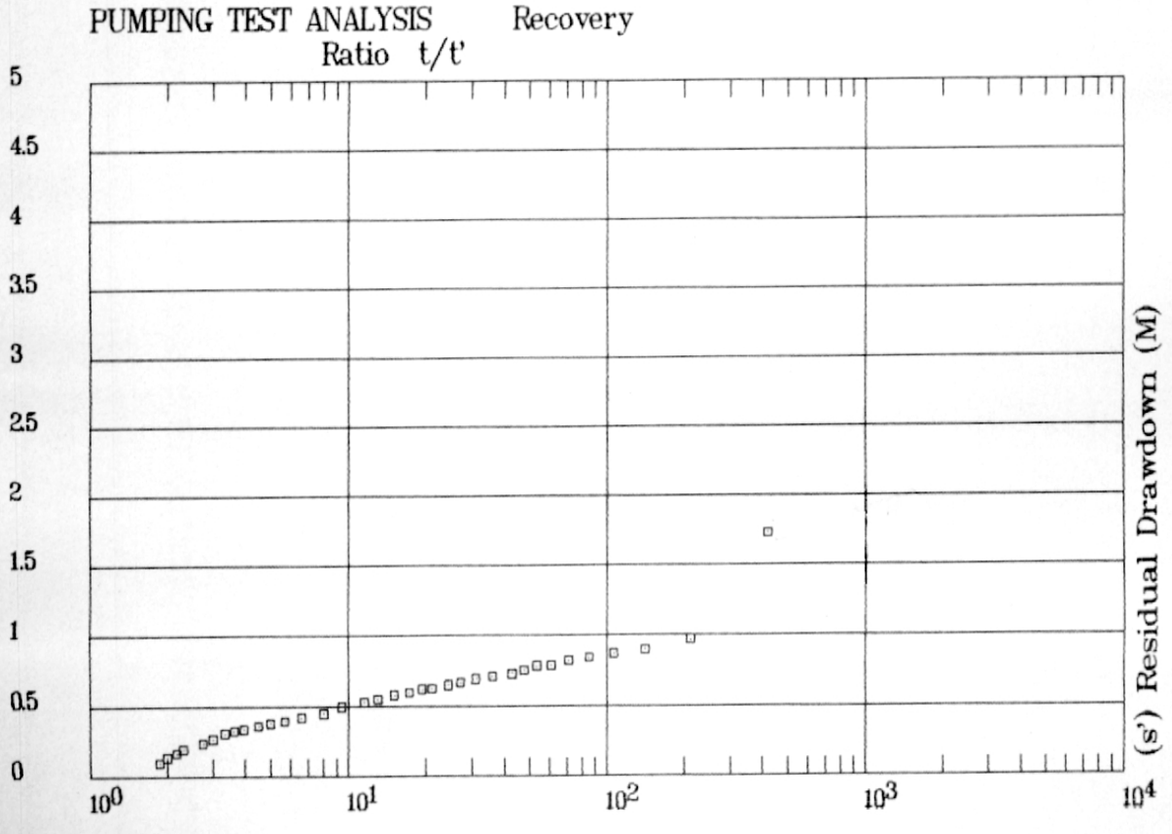
(t) Time Since Pumping Started (minutes) Drawdown



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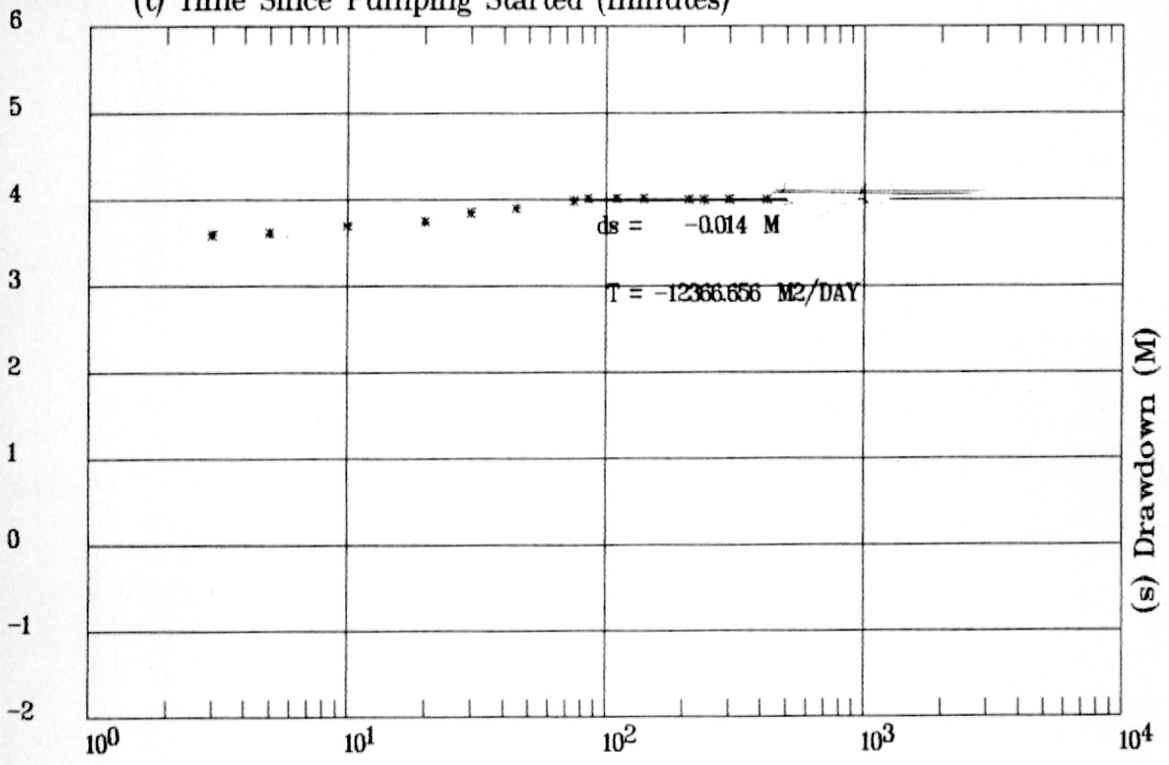



PUMPING TEST ANALYSIS Drawdown
(t) Time Since Pumping Started (minutes)
40 IC - 01
ds = 0.418 M
T = 426.308 M2/DAY
(s) Drawdown (M)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
10^0
10^1
10^2
10^3
10^4


PUMPING TEST ANALYSIS Recovery
Ratio t/t'
(s') Residual Drawdown (M)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
10^0
10^1
10^2
10^3
10^4

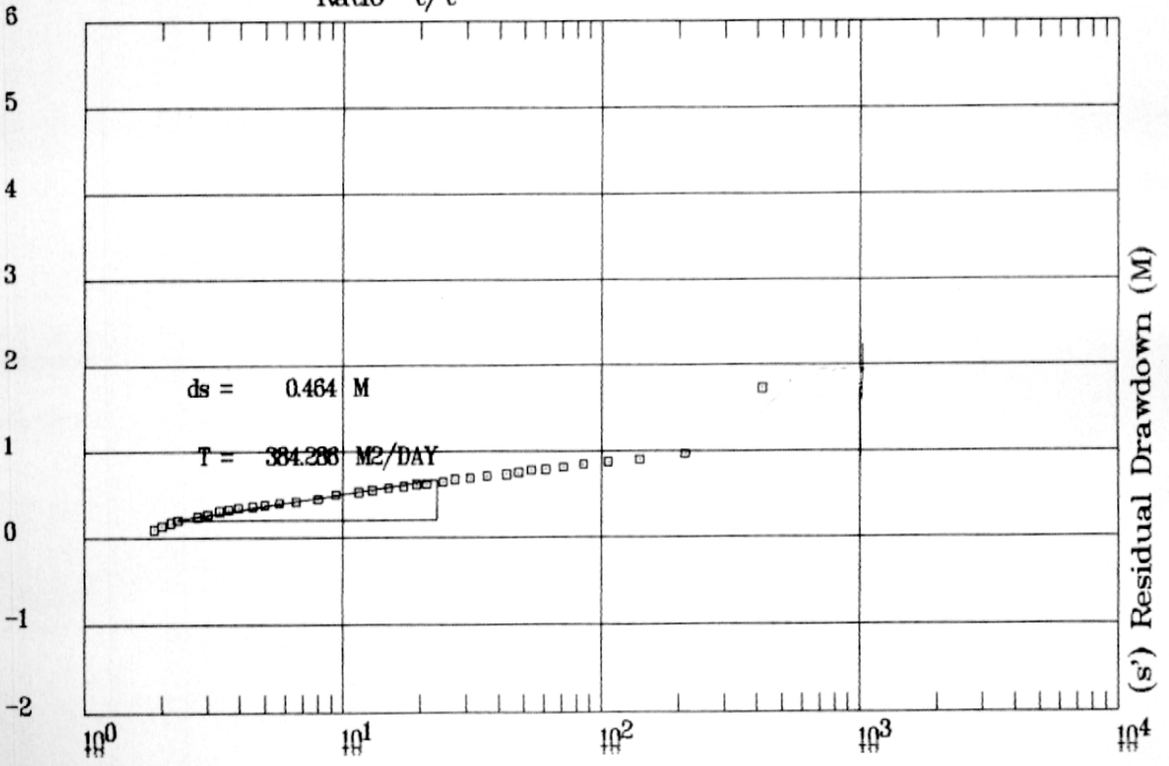
PUMPING TEST ANALYSIS Drawdown

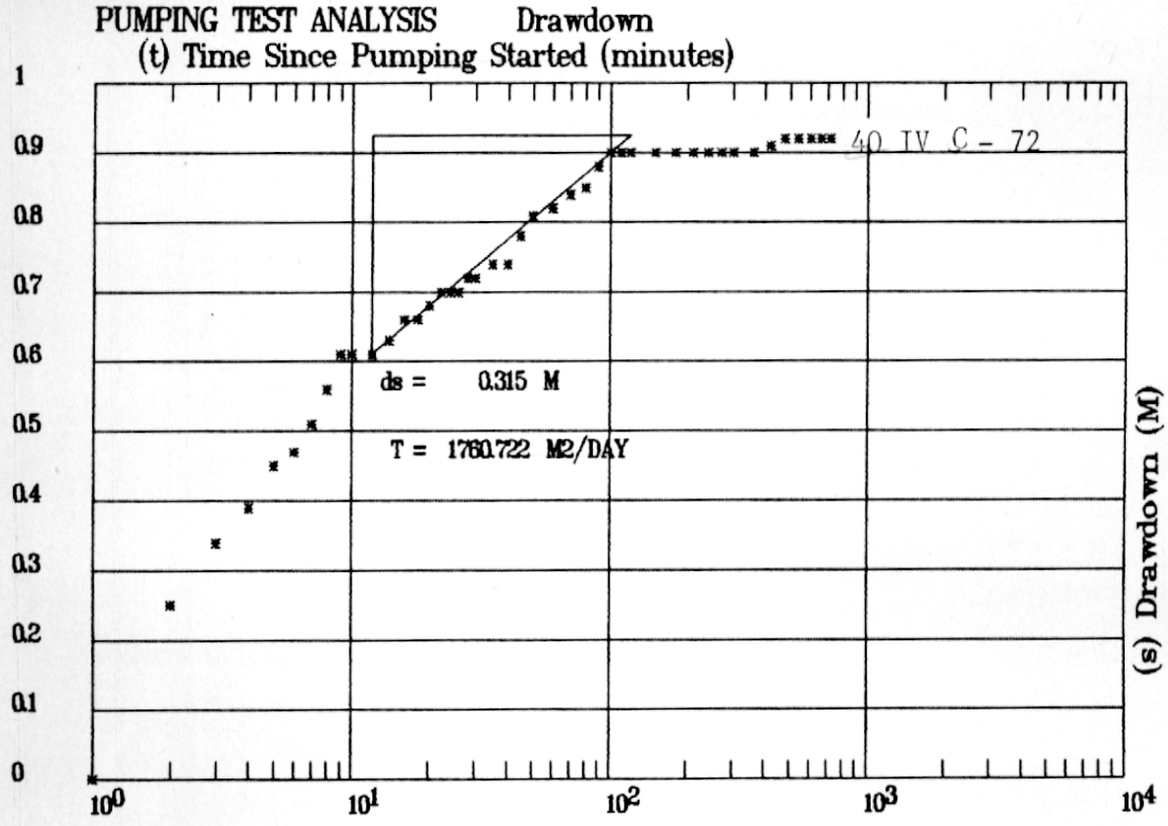
(t) Time Since Pumping Started (minutes)

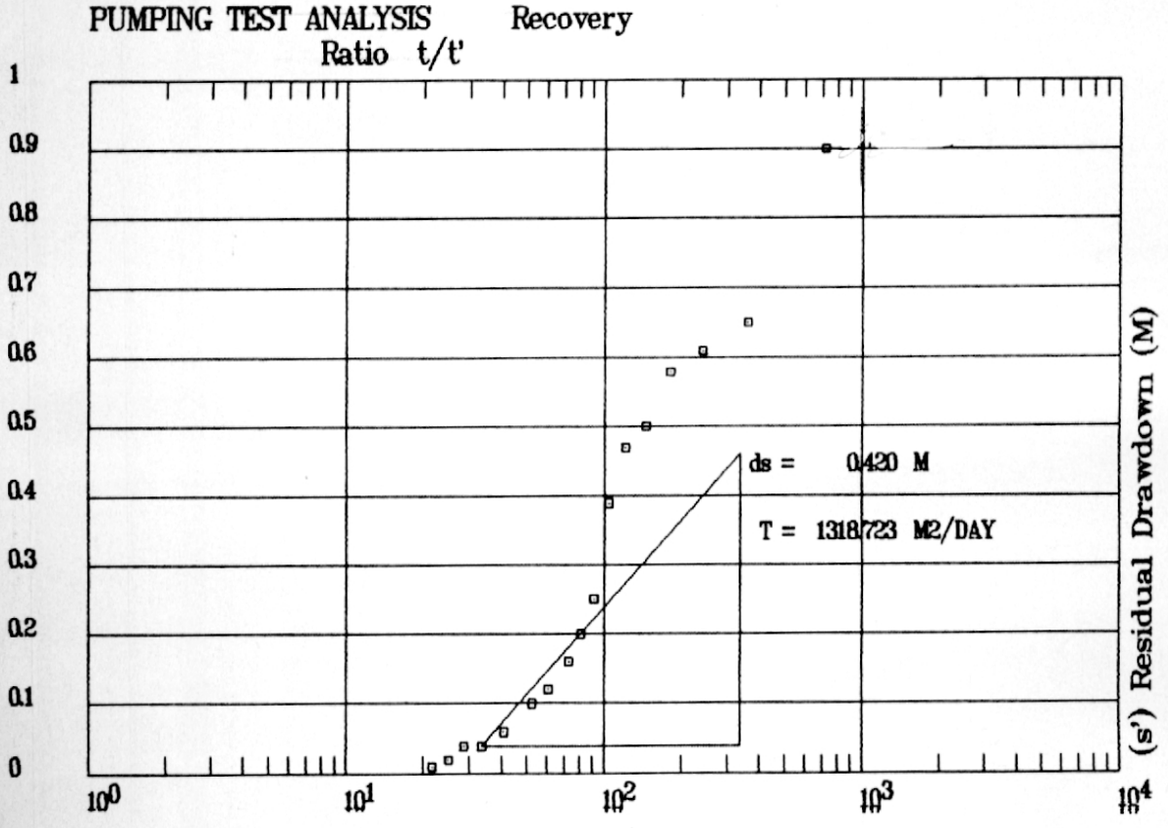


PUMPING TEST ANALYSIS Recovery

Ratio t/t'




PUMPING TEST ANALYSIS Drawdown
(t) Time Since Pumping Started (minutes)
40 IV C - 72
ds = 0.315 M
T = 1780.722 M2/DAY
(s) Drawdown (M)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
10^0
10^1
10^2
10^3
10^4

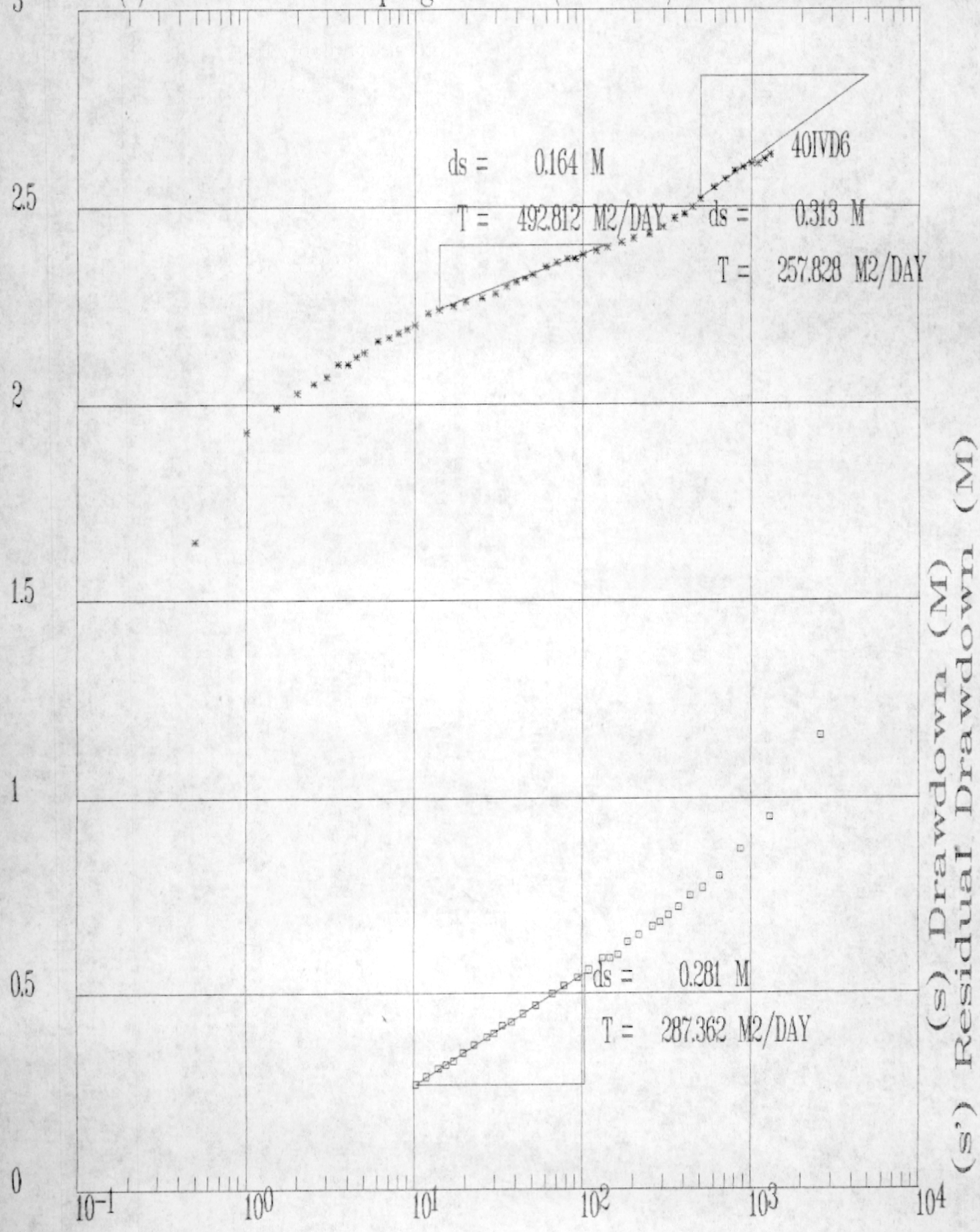

PUMPING TEST ANALYSIS Recovery
Ratio t/t'
ds = 0.420 M
T = 1318.723 M2/DAY
(s') Residual Drawdown (M)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
10^0
10^1
10^2
10^3
10^4

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PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t' Recovery

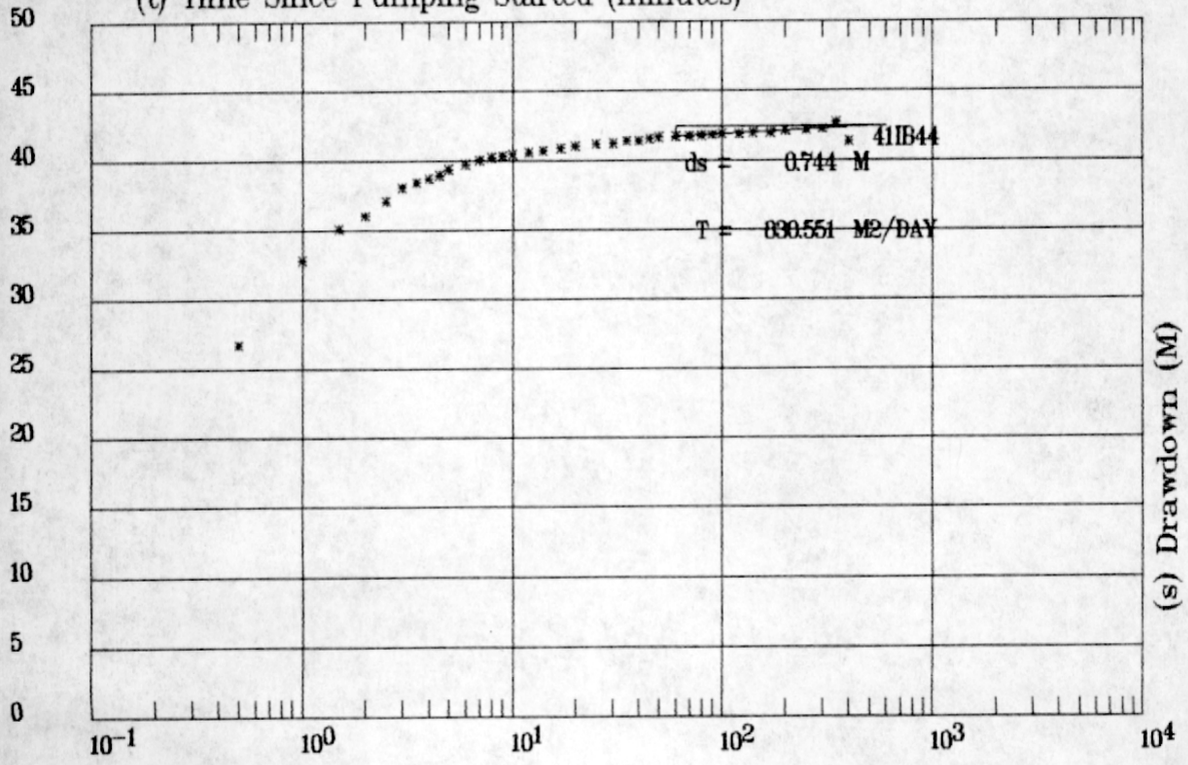
(t) Time Since Pumping Started (minutes) Drawdown



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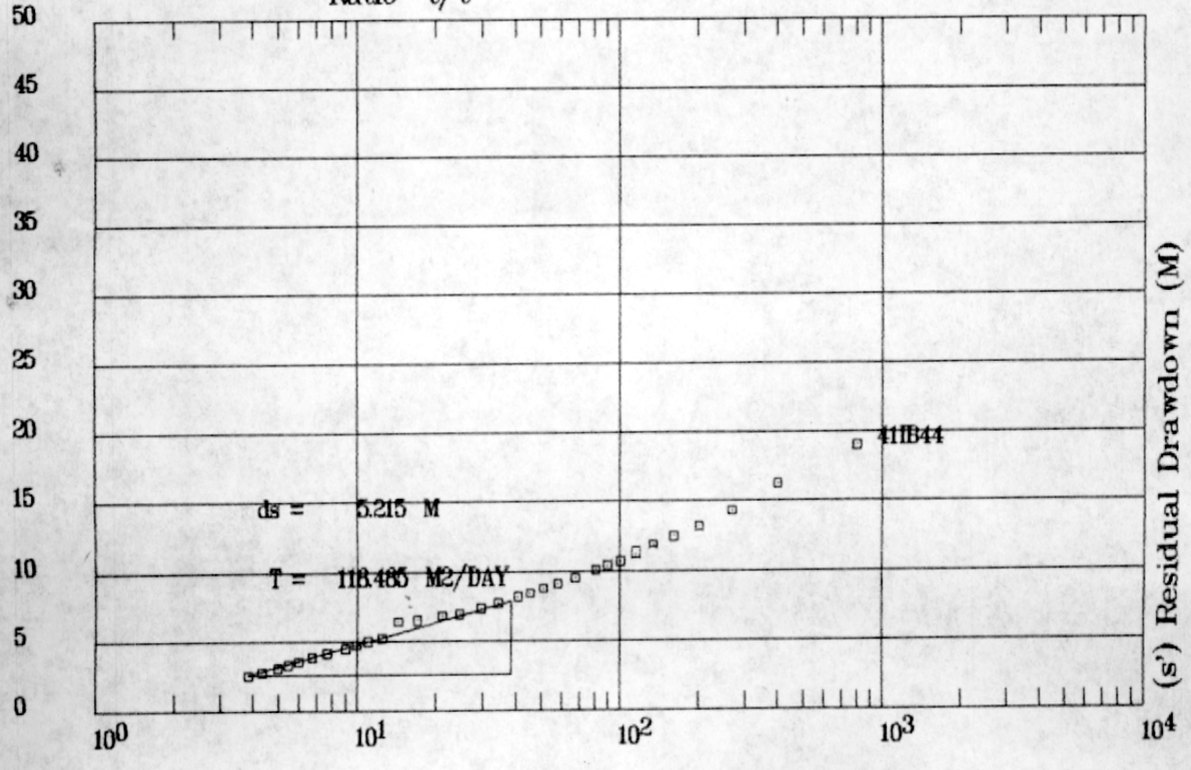
PUMPING TEST ANALYSIS Drawdown

(t) Time Since Pumping Started (minutes)



PUMPING TEST ANALYSIS Recovery

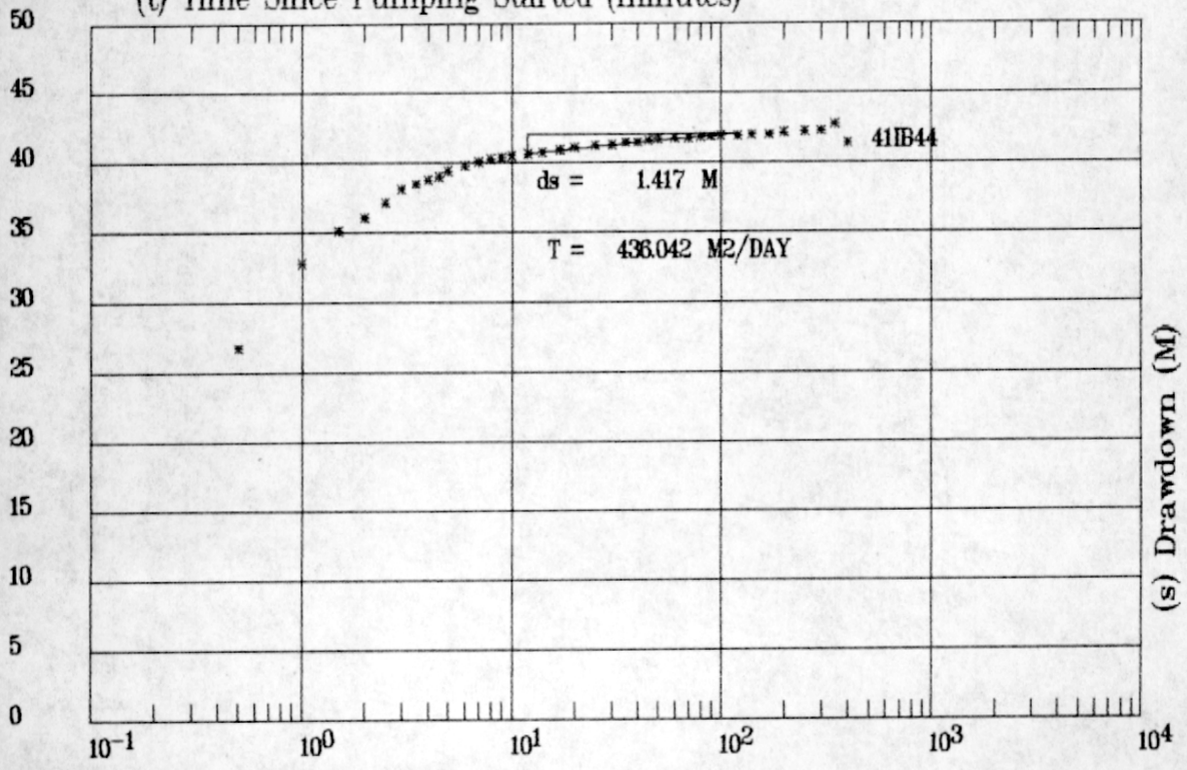
Ratio t/t'



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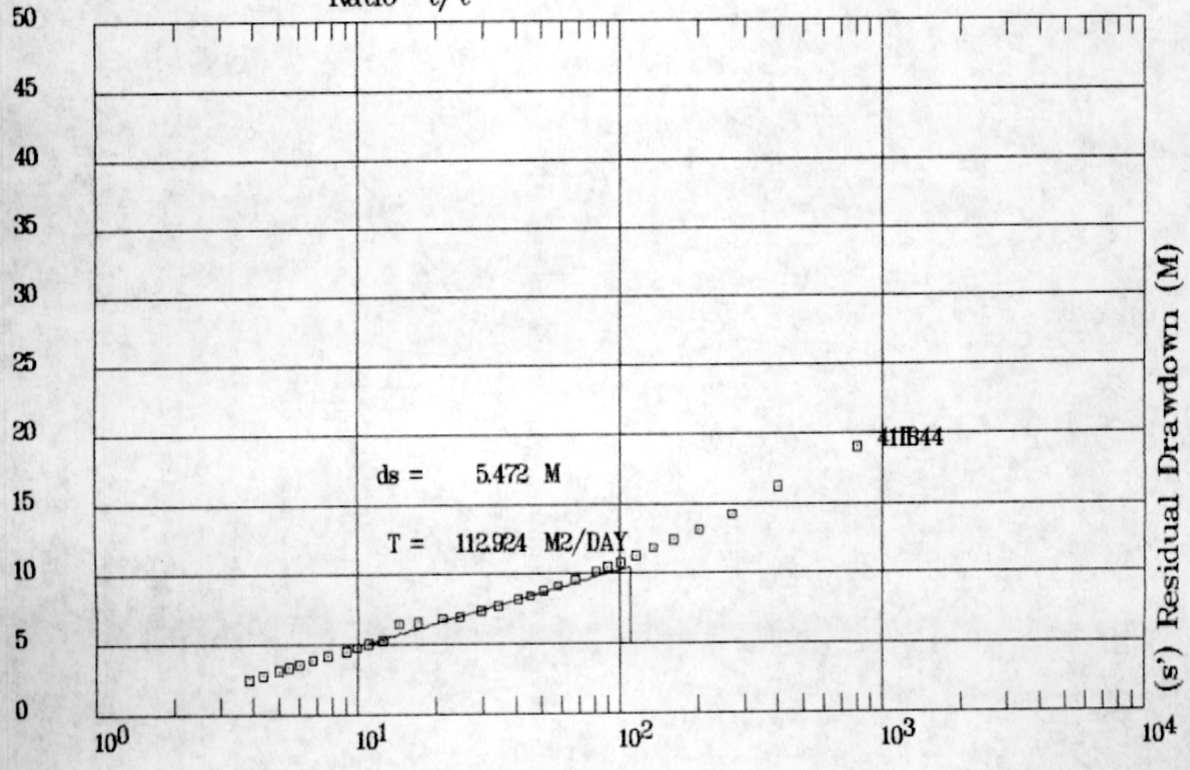
PUMPING TEST ANALYSIS Drawdown

(t) Time Since Pumping Started (minutes)

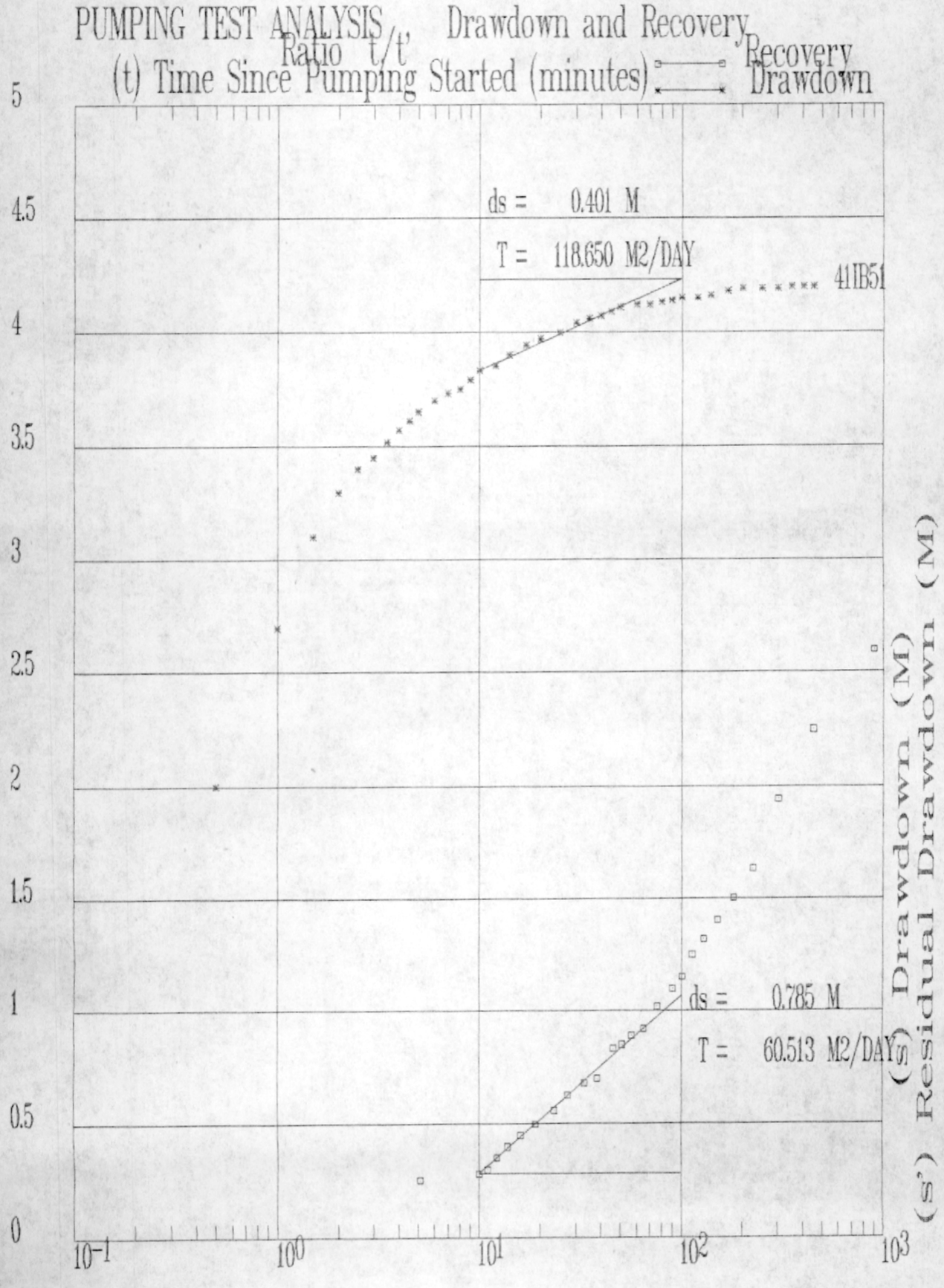


PUMPING TEST ANALYSIS Recovery

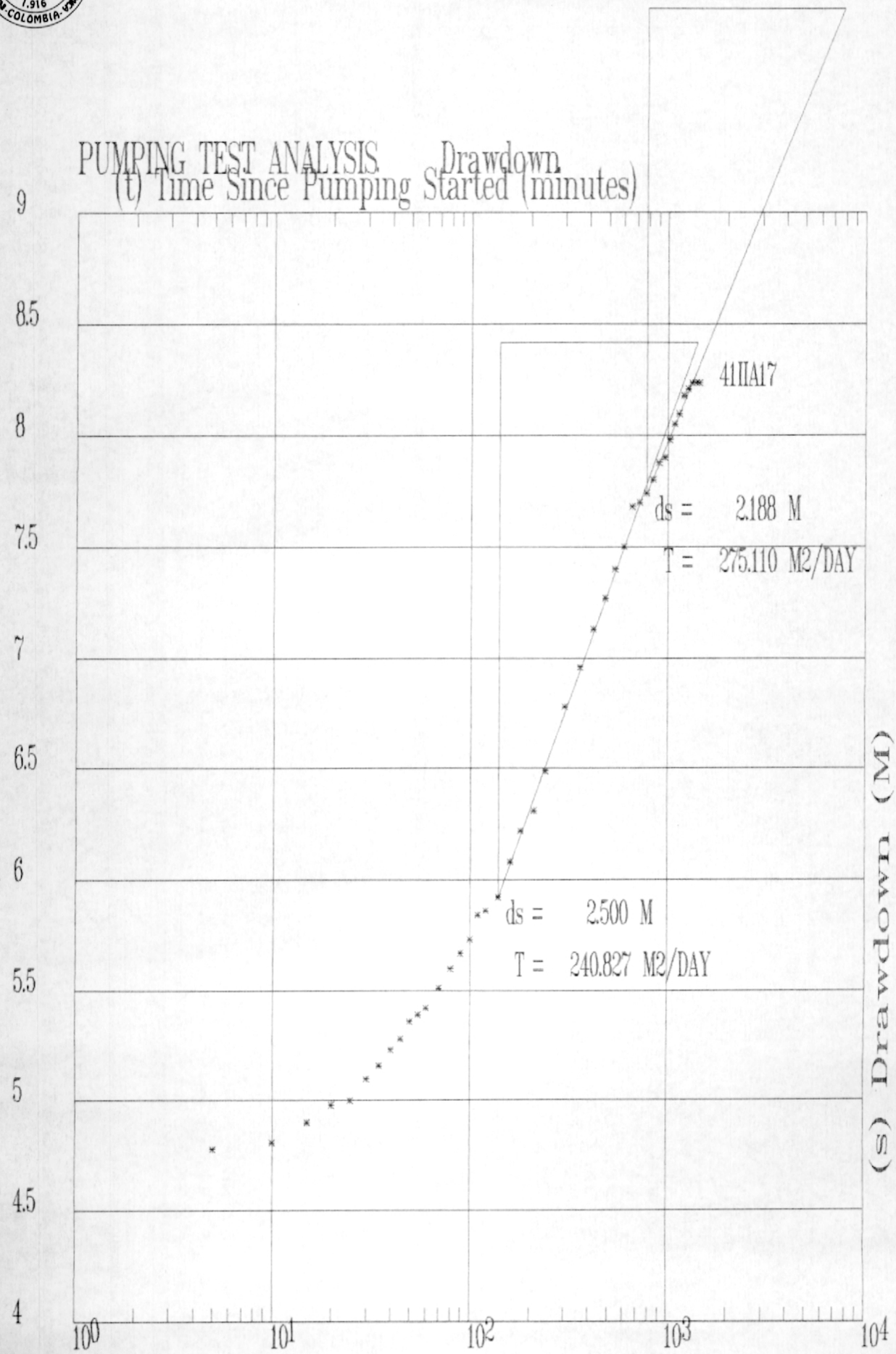
Ratio t/t'



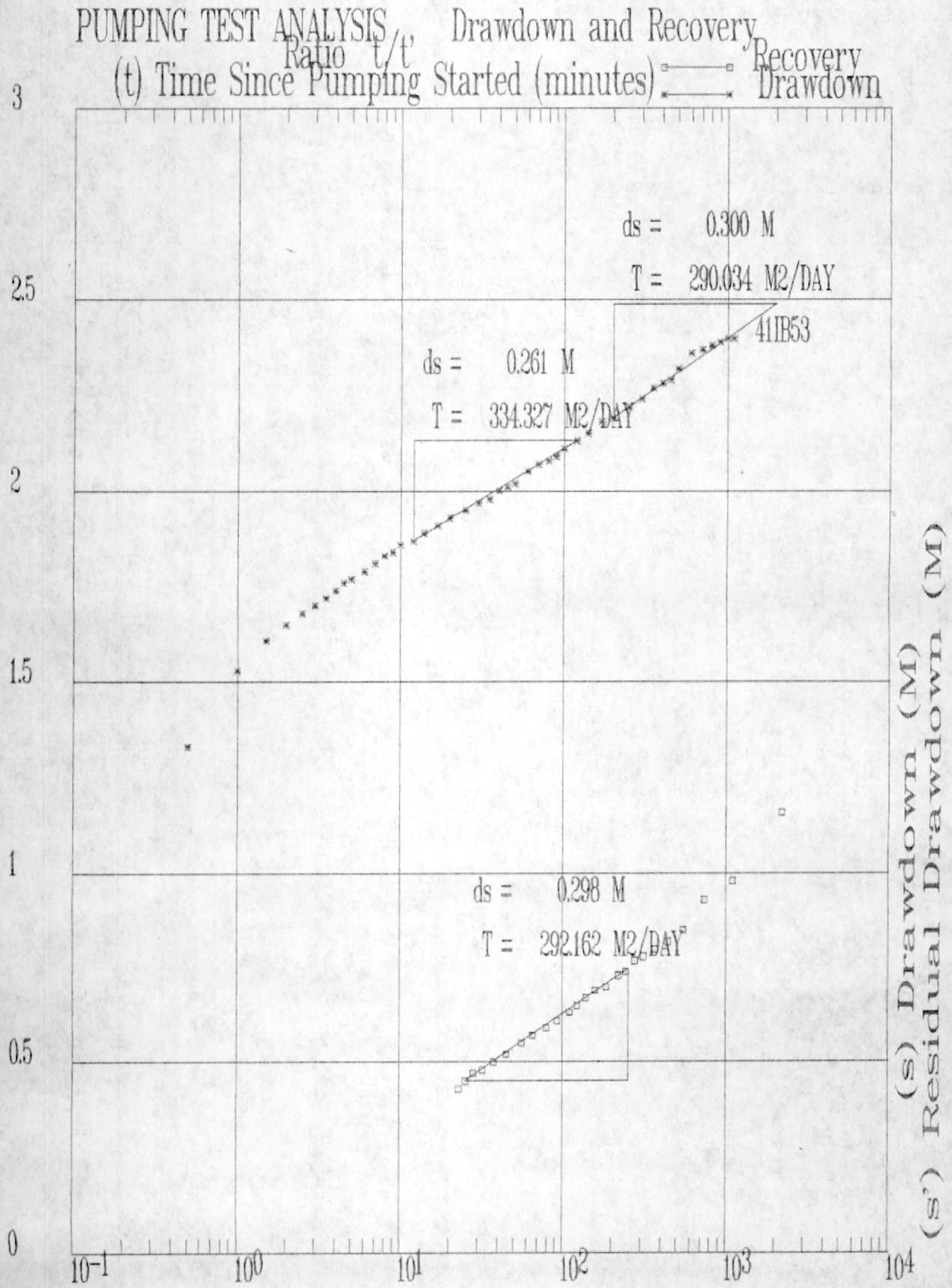
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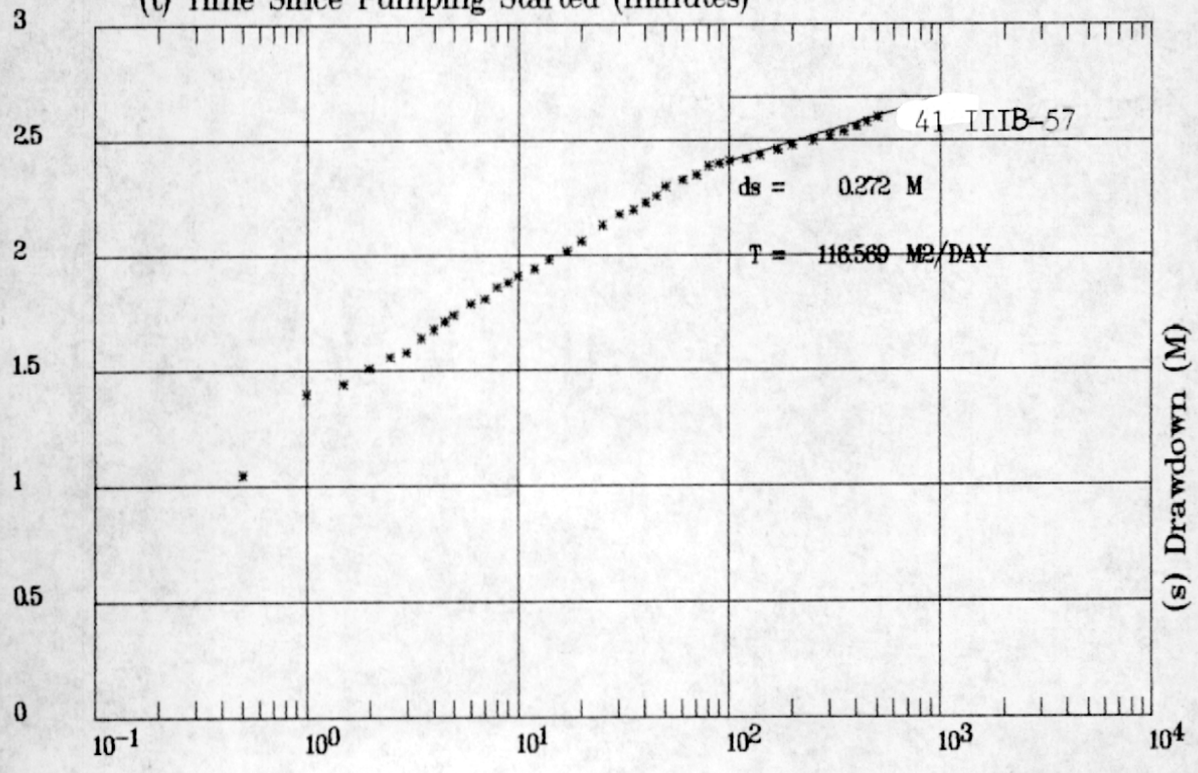
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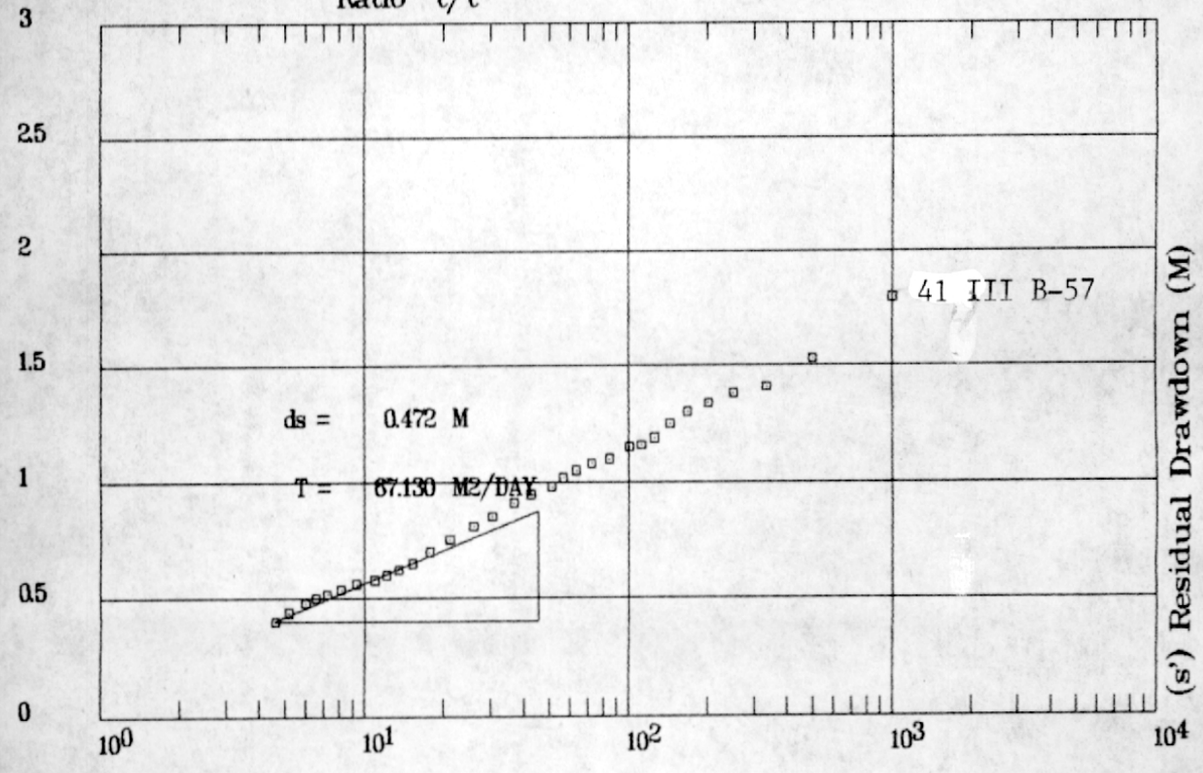
PUMPING TEST ANALYSIS Drawdown

(t) Time Since Pumping Started (minutes)



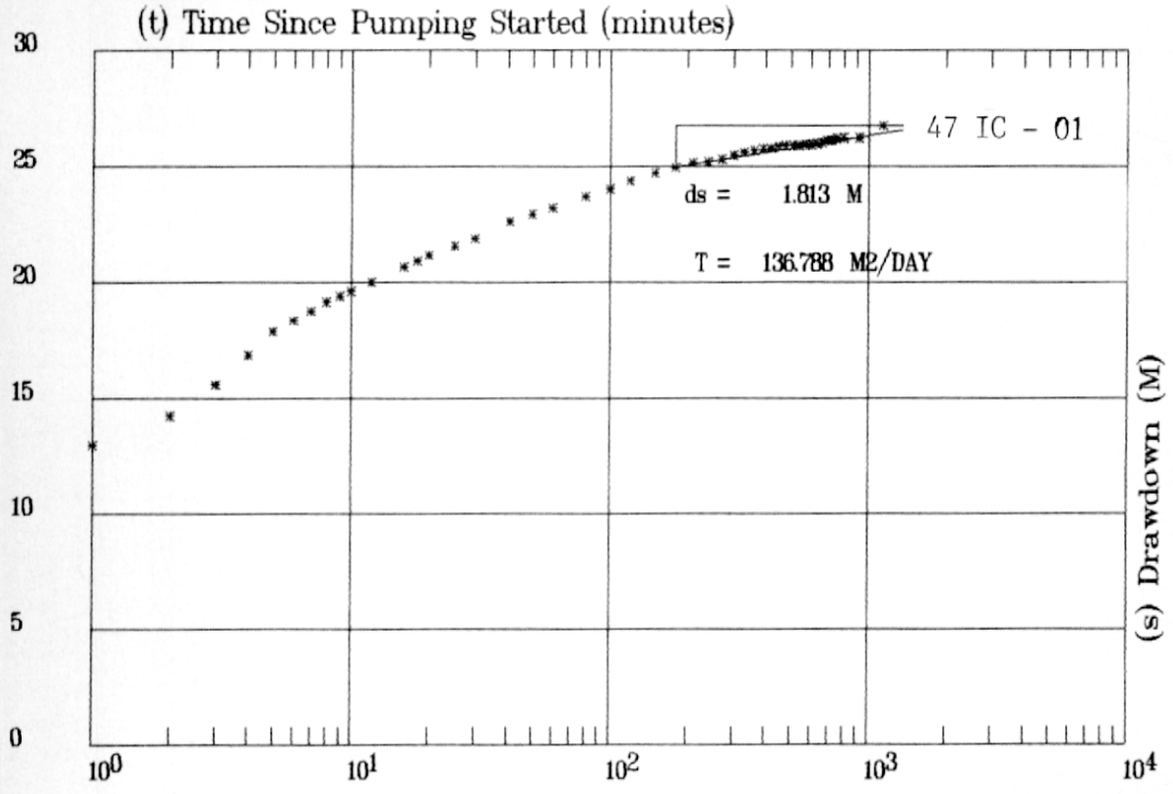
PUMPING TEST ANALYSIS Recovery

Ratio t/t'



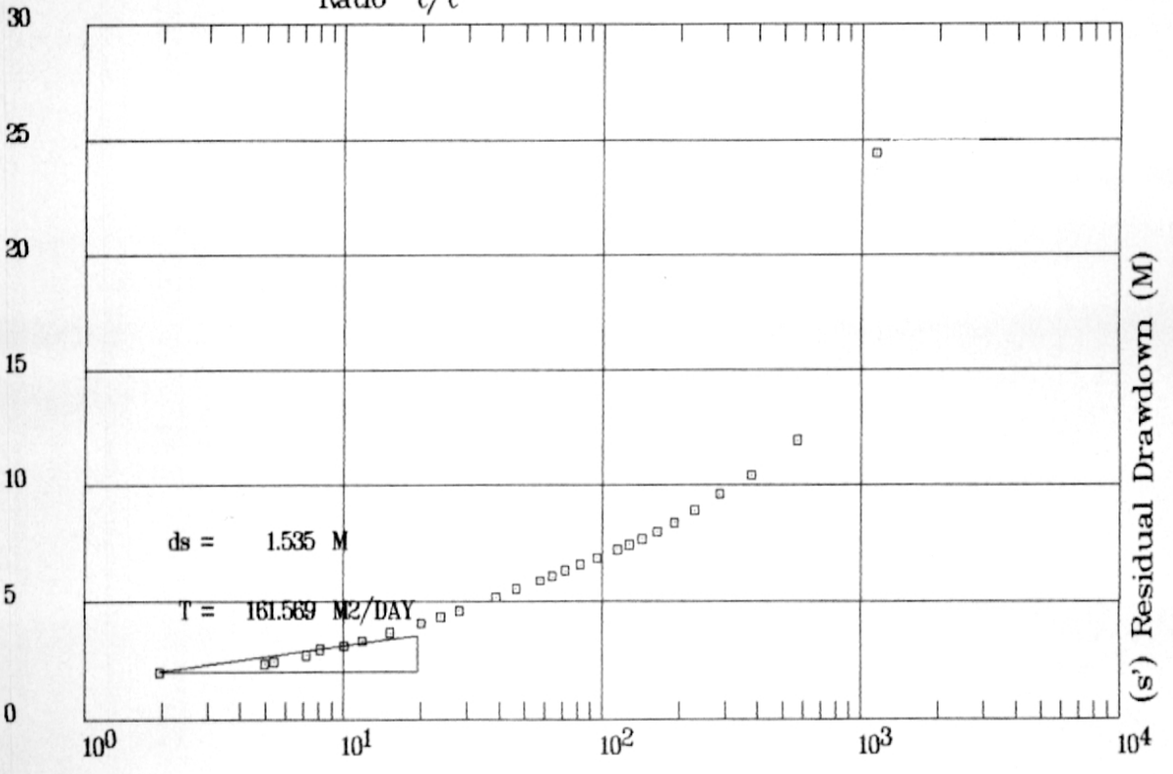
PUMPING TEST ANALYSIS Drawdown

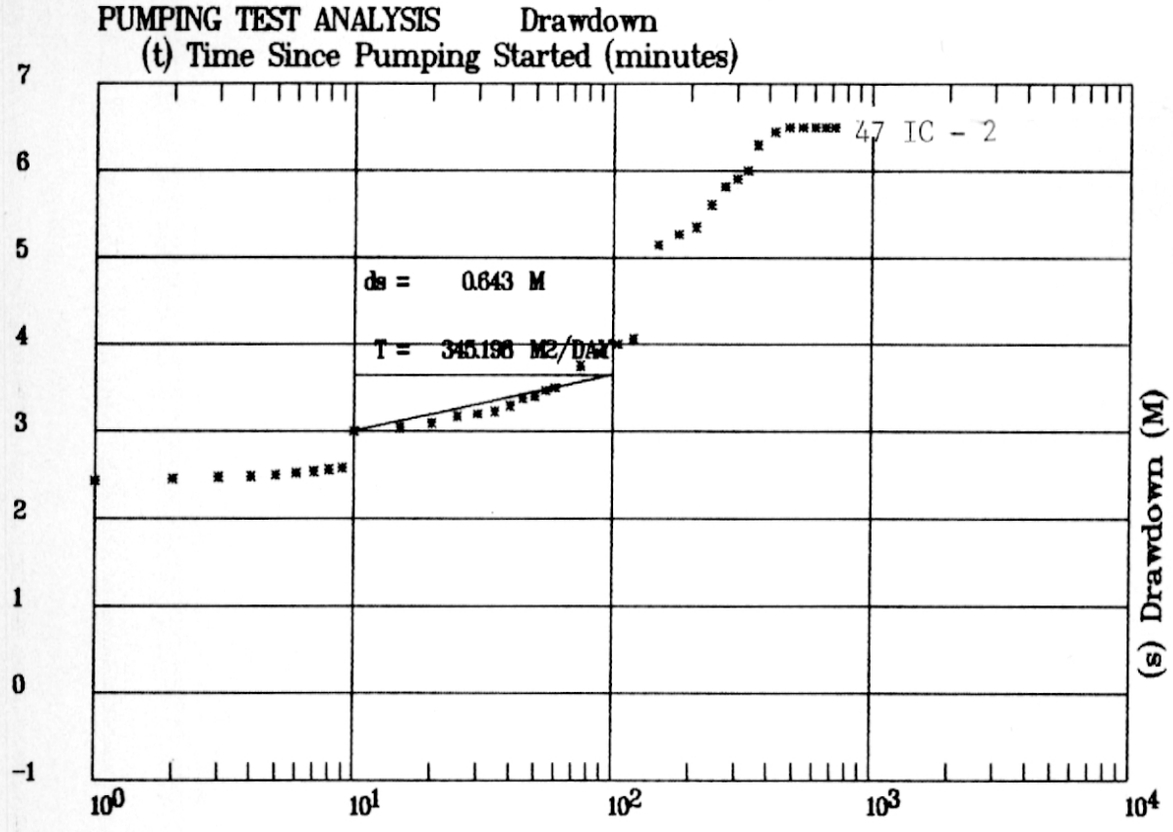
(t) Time Since Pumping Started (minutes)

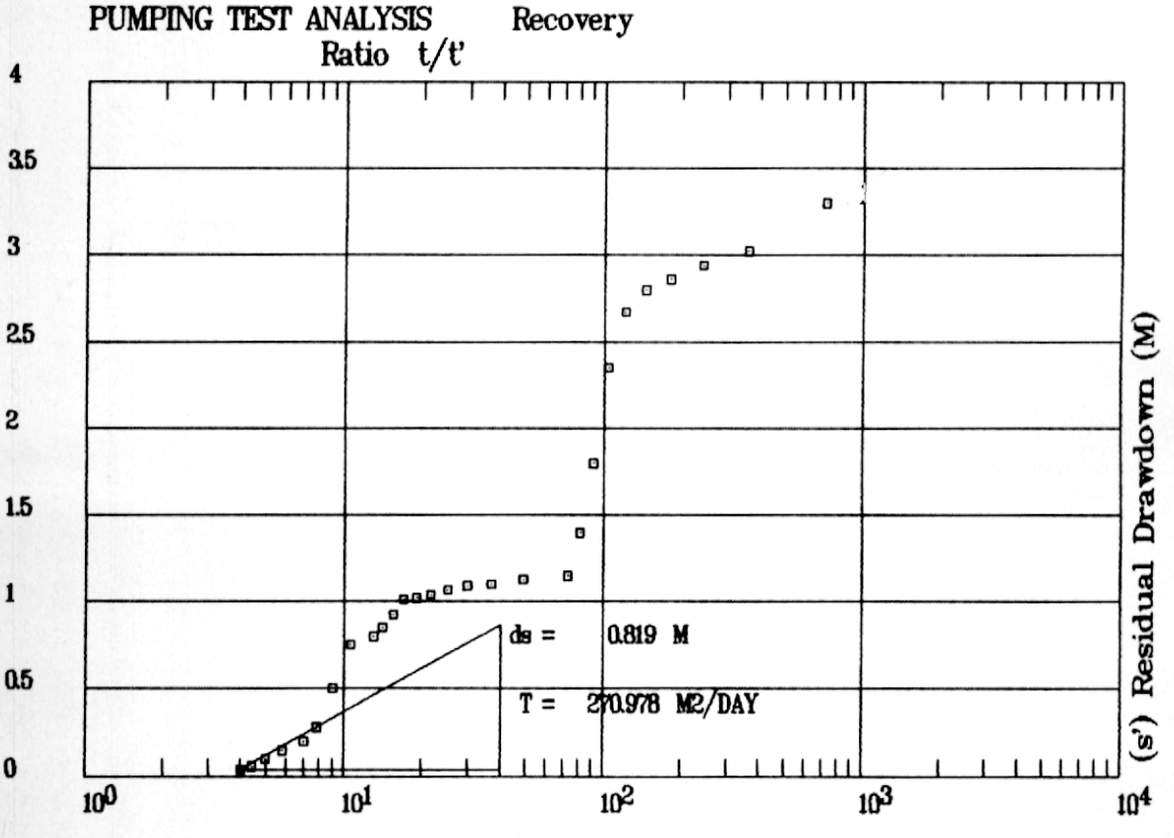


PUMPING TEST ANALYSIS Recovery

Ratio t/t'




PUMPING TEST ANALYSIS Drawdown
(t) Time Since Pumping Started (minutes)
47 IC - 2
ds = 0.643 M
T = 345.196 M2/DAY
(s) Drawdown (M)
7
6
5
4
3
2
1
0
-1
10^0
10^1
10^2
10^3
10^4


PUMPING TEST ANALYSIS Recovery
Ratio t/t'
ds = 0.819 M
T = 270.978 M2/DAY
(s') Residual Drawdown (M)
4
3.5
3
2.5
2
1.5
1
0.5
0
10^0
10^1
10^2
10^3
10^4

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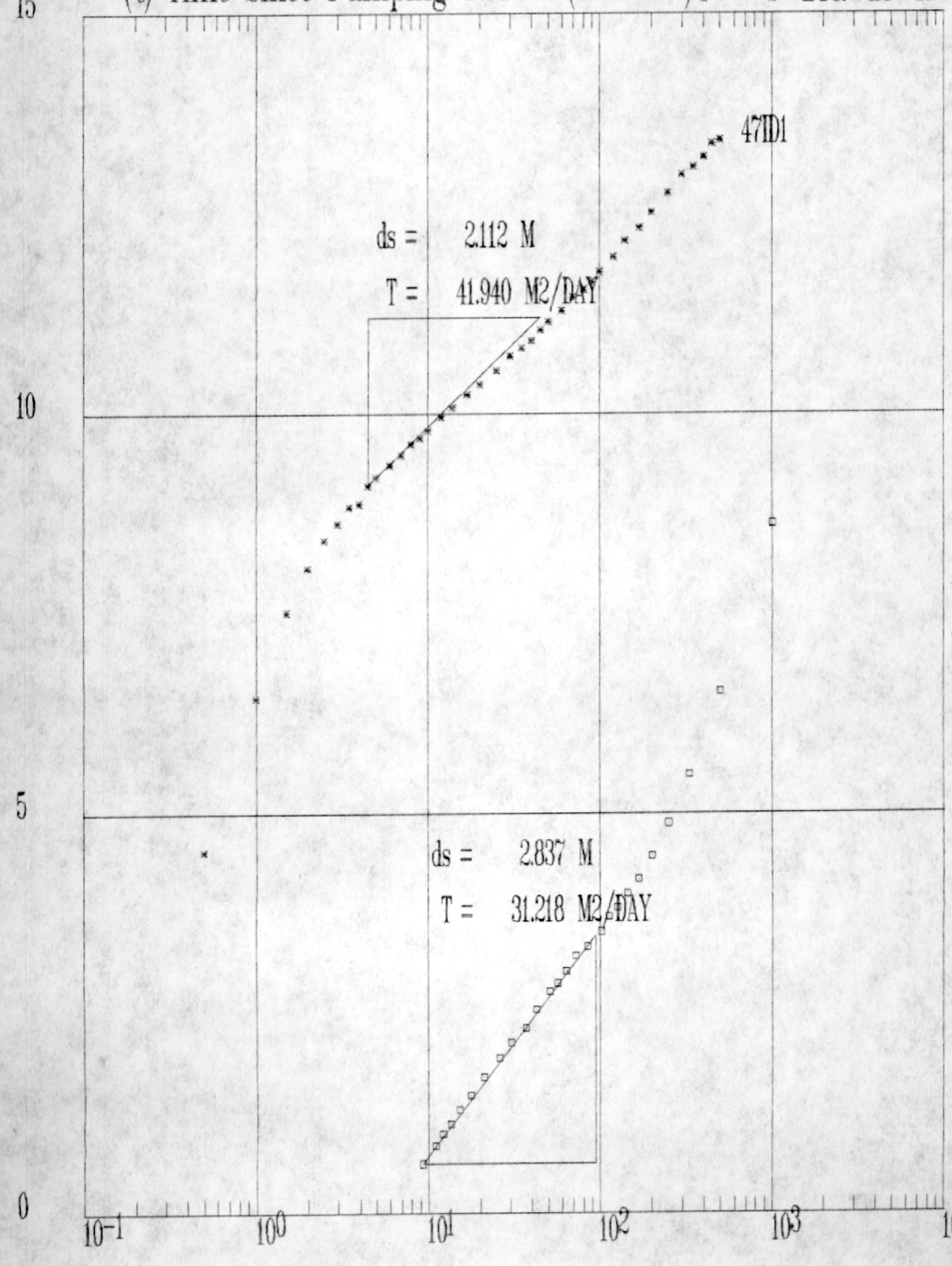
PUMPING TEST ANALYSIS, Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

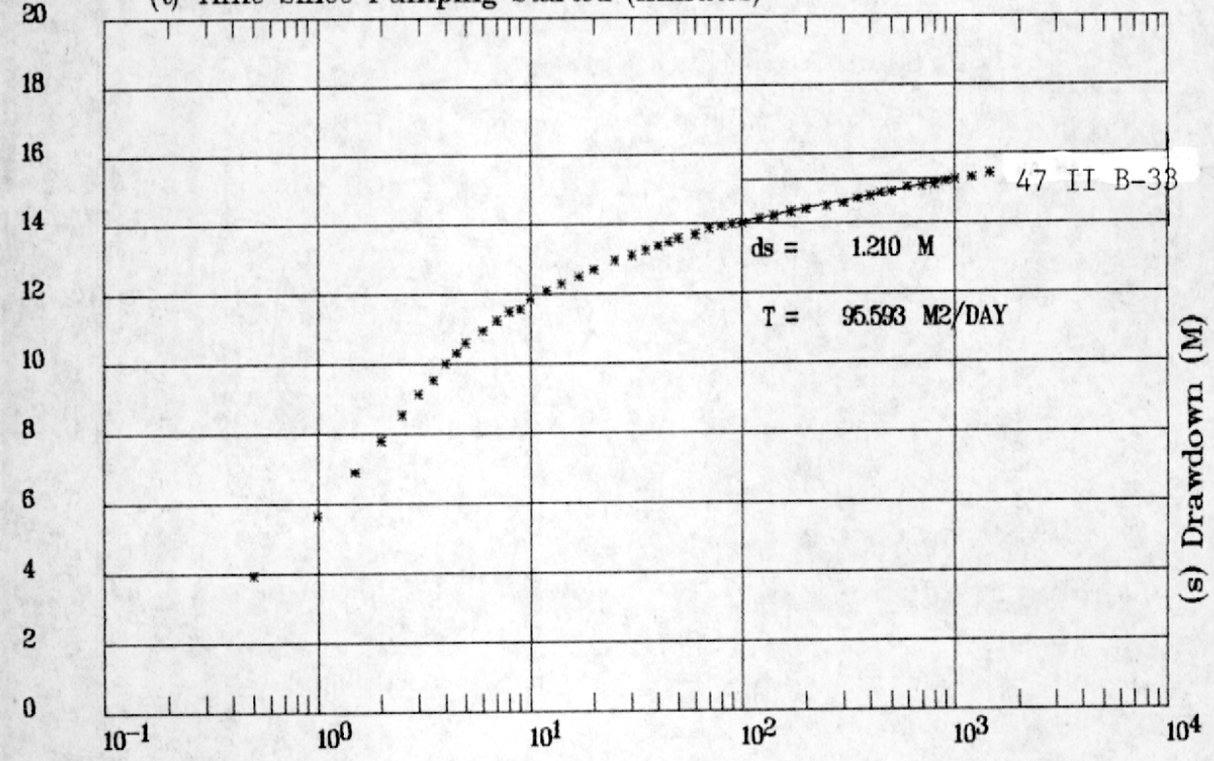
Drawdown



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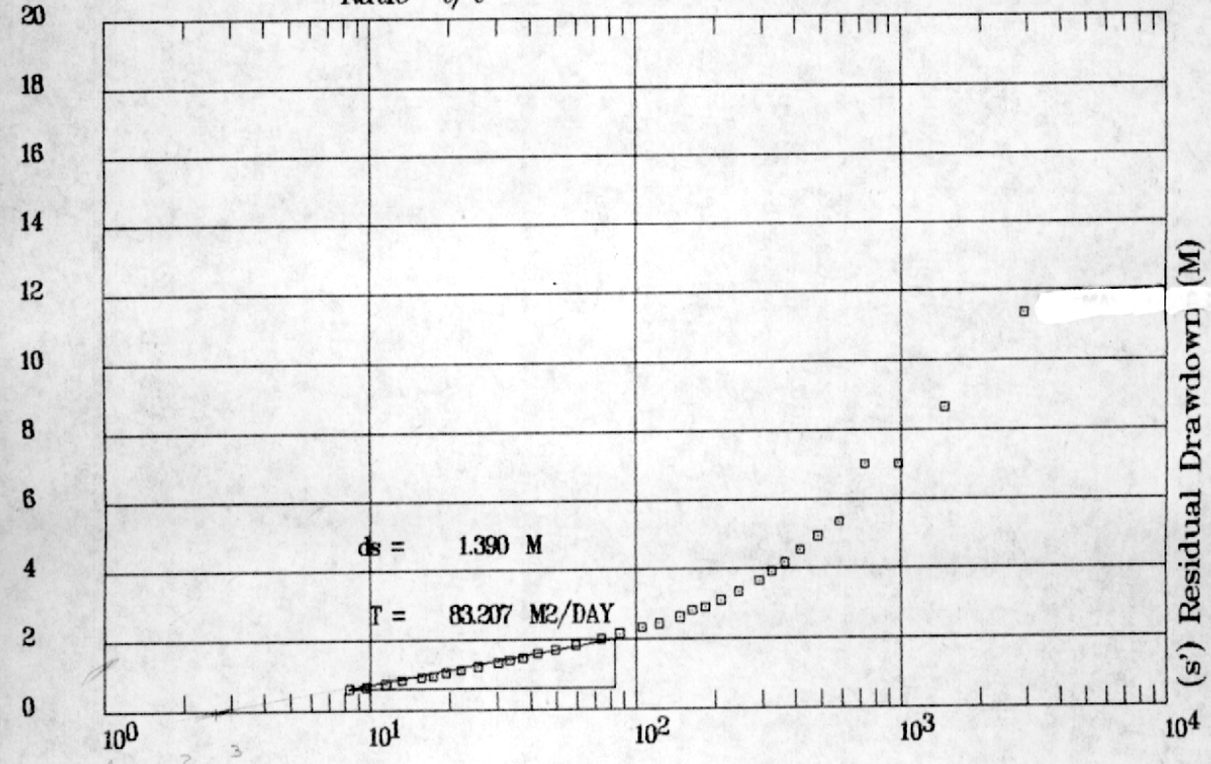
PUMPING TEST ANALYSIS Drawdown

(t) Time Since Pumping Started (minutes)



PUMPING TEST ANALYSIS Recovery

Ratio t/t'



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PUMPING TEST ANALYSIS, Drawdown and Recovery

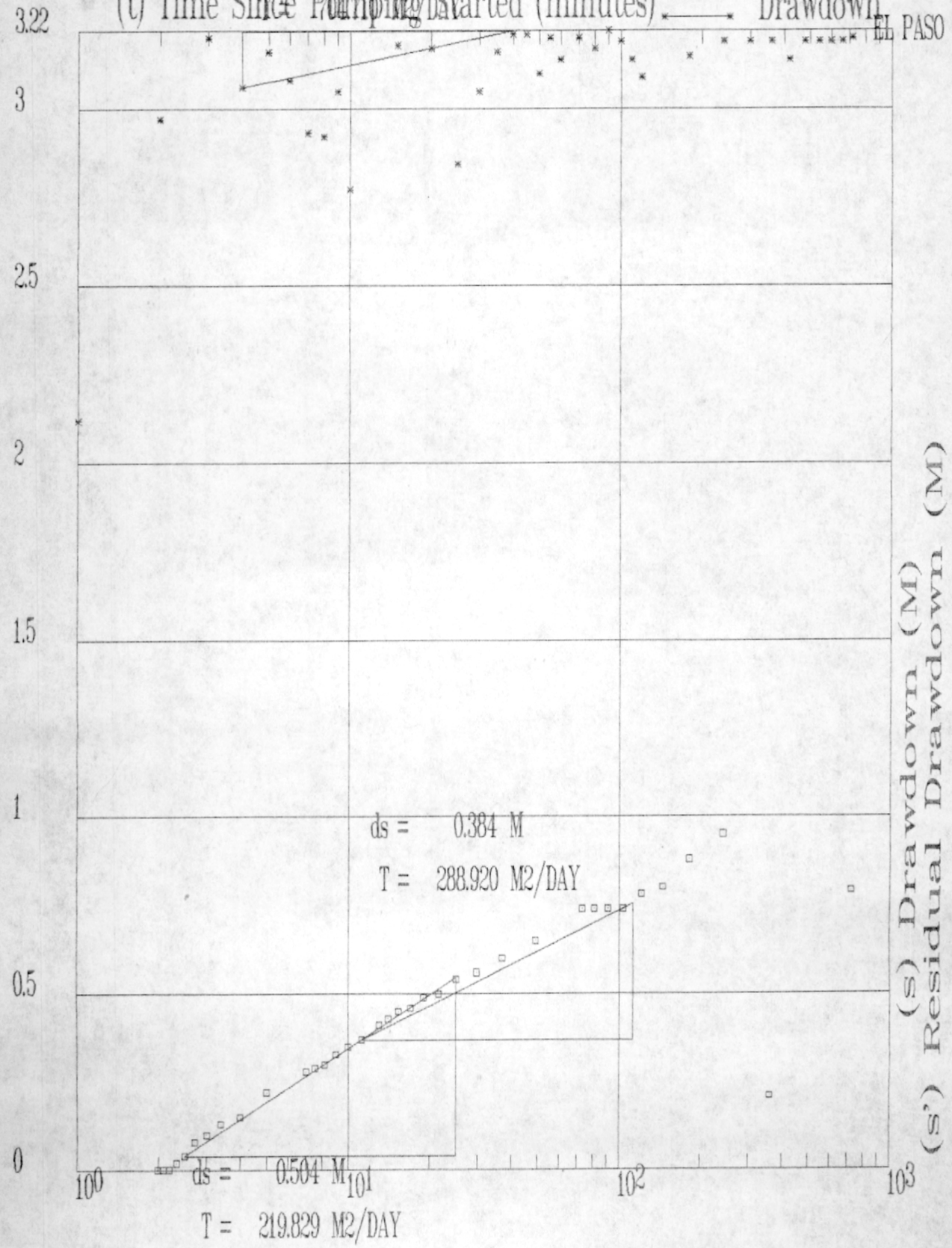
Ratio t/t'

(t) Time Since Pumping Started (minutes)

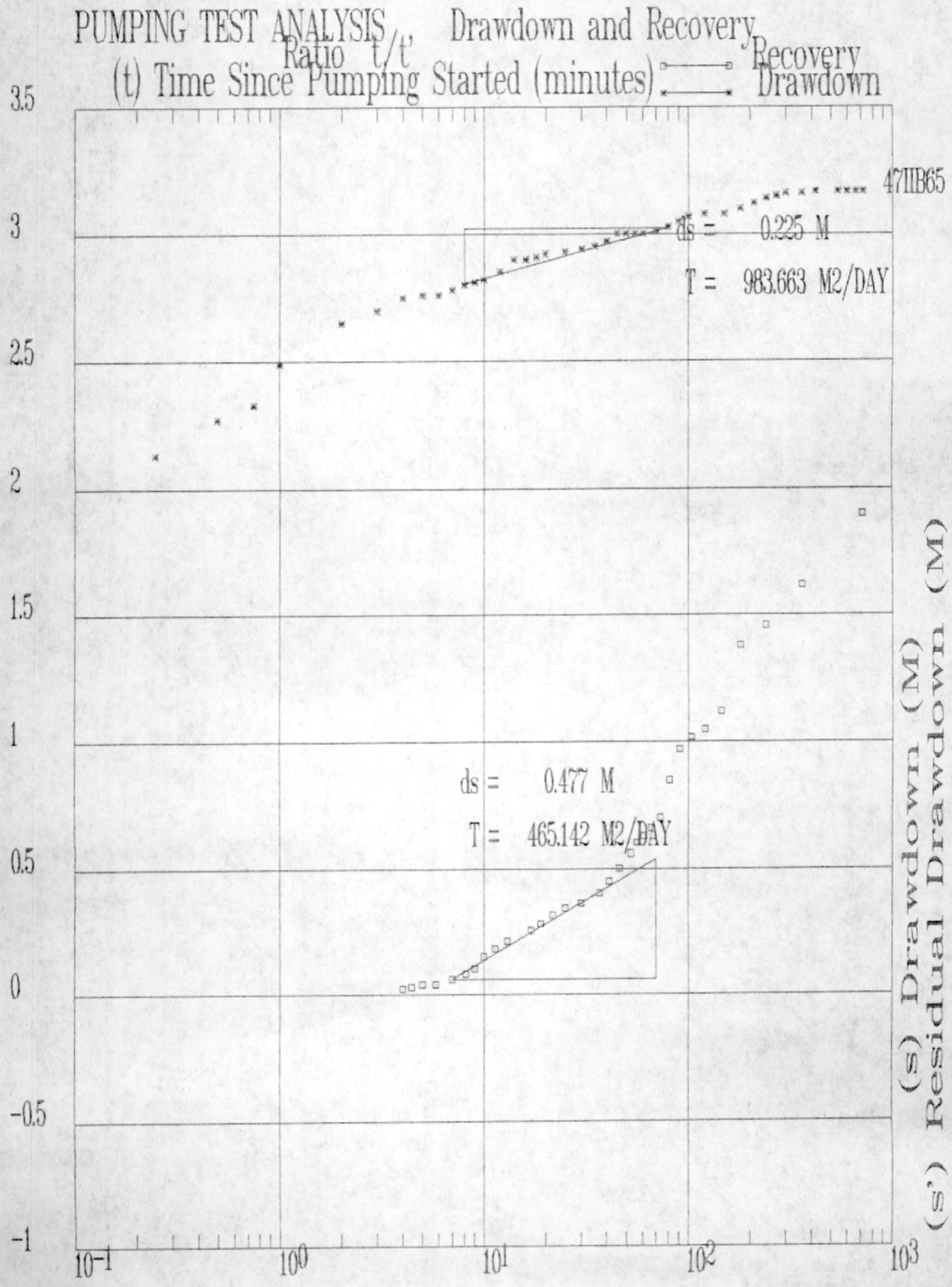
Recovery

Drawdown

EL PASO



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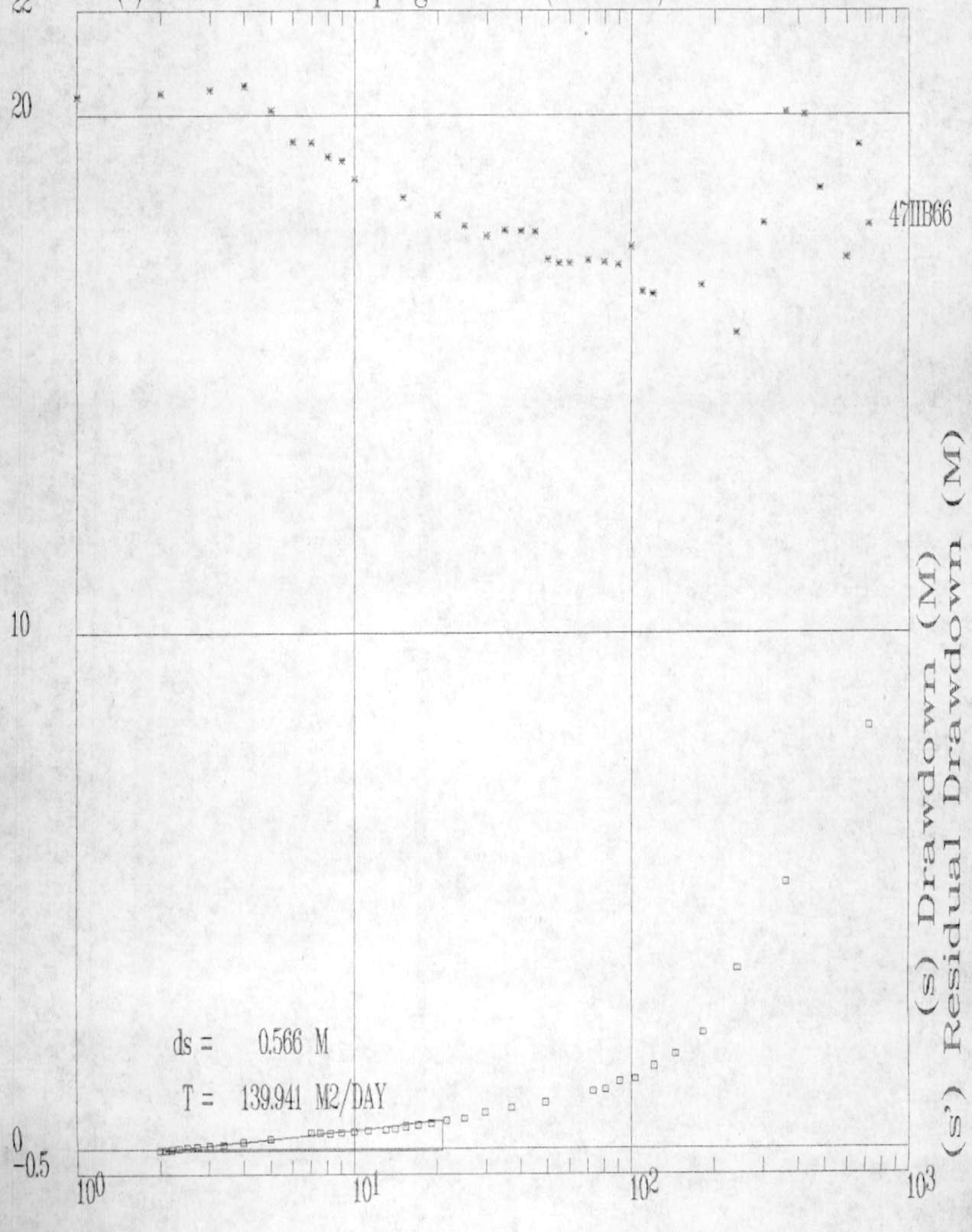


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PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t' Recovery

(t) Time Since Pumping Started (minutes) Drawdown



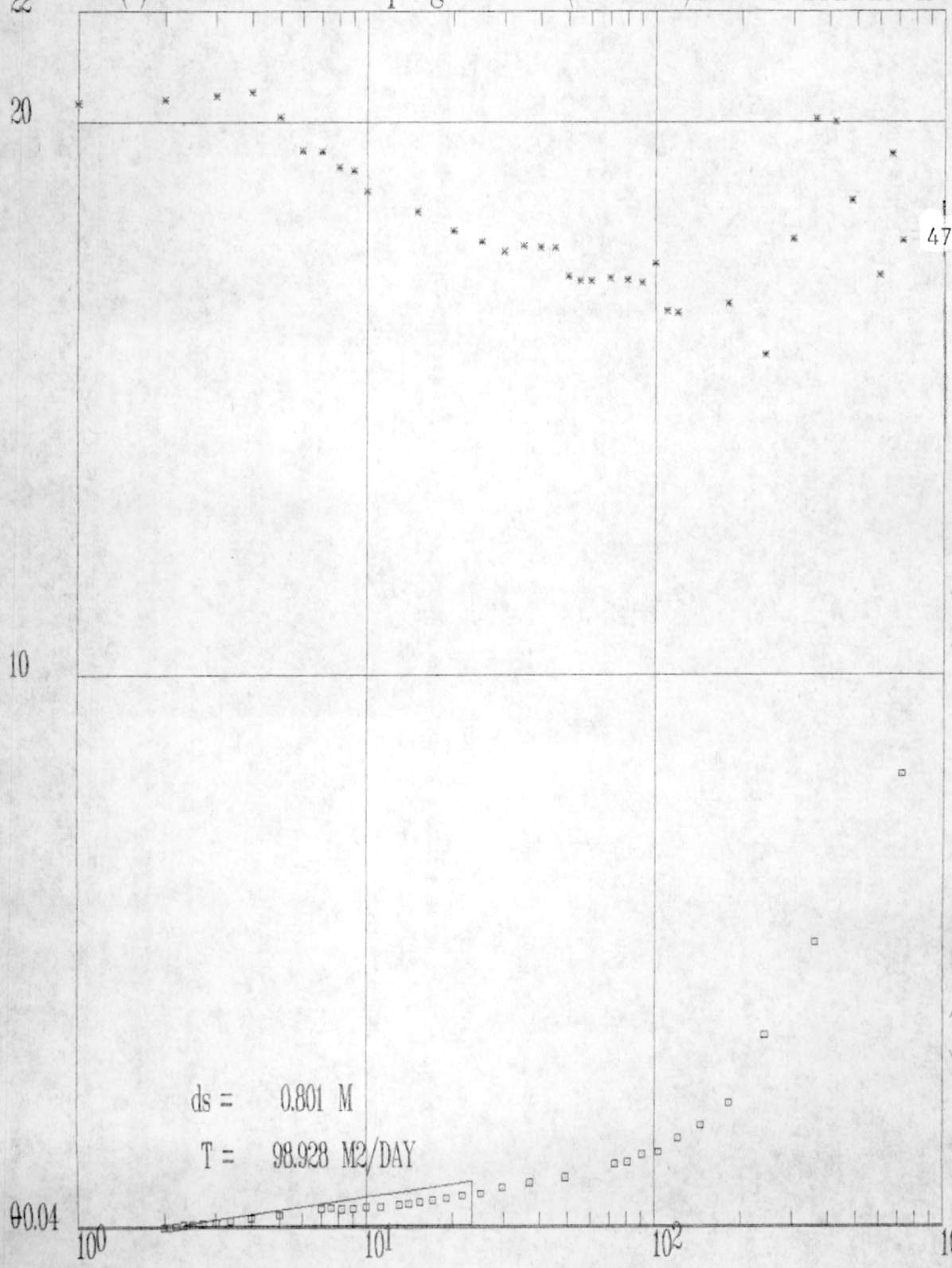
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Ratio t/t' Recovery

(t) Time Since Pumping Started (minutes) Drawdown

47 II B - 66



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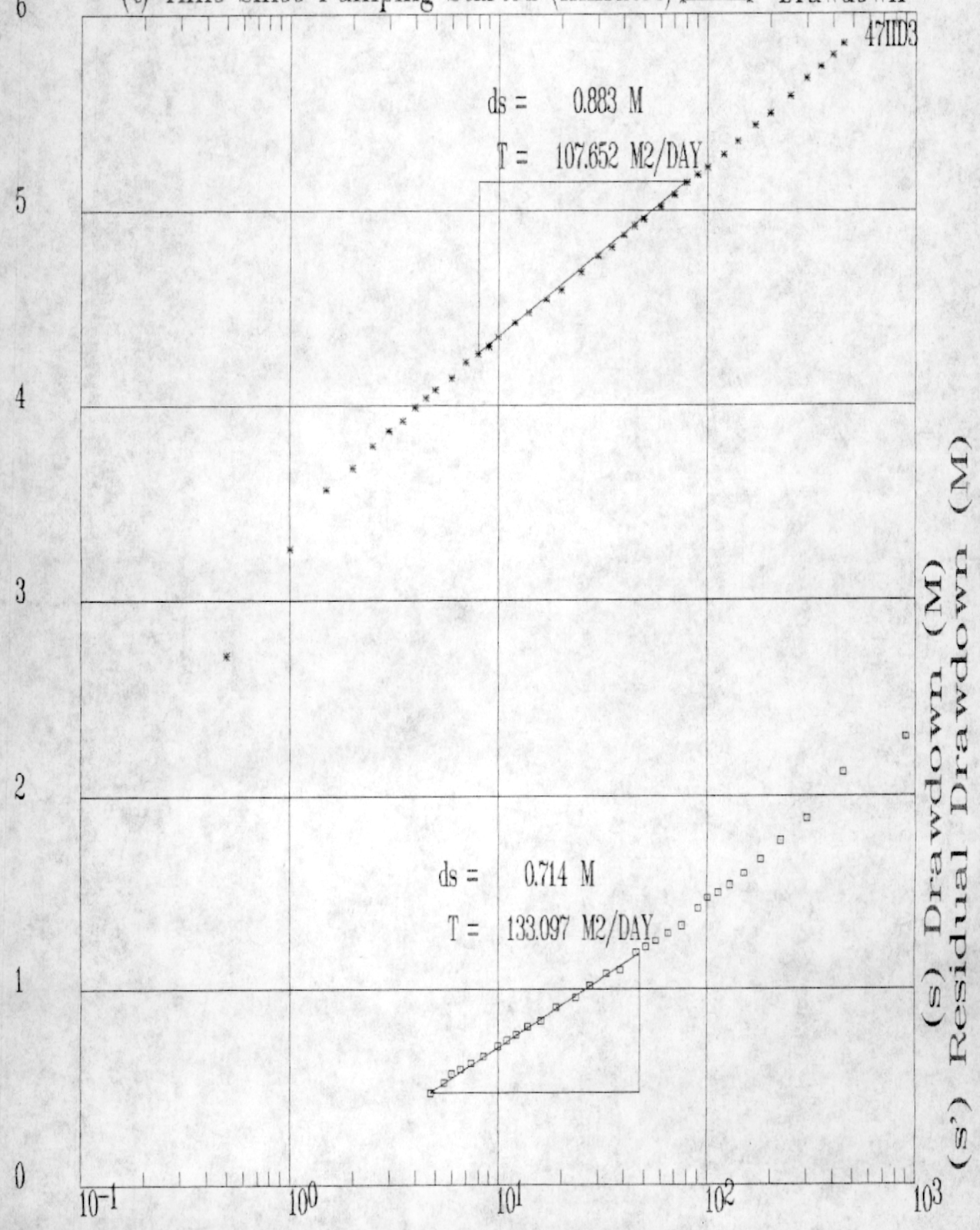
PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

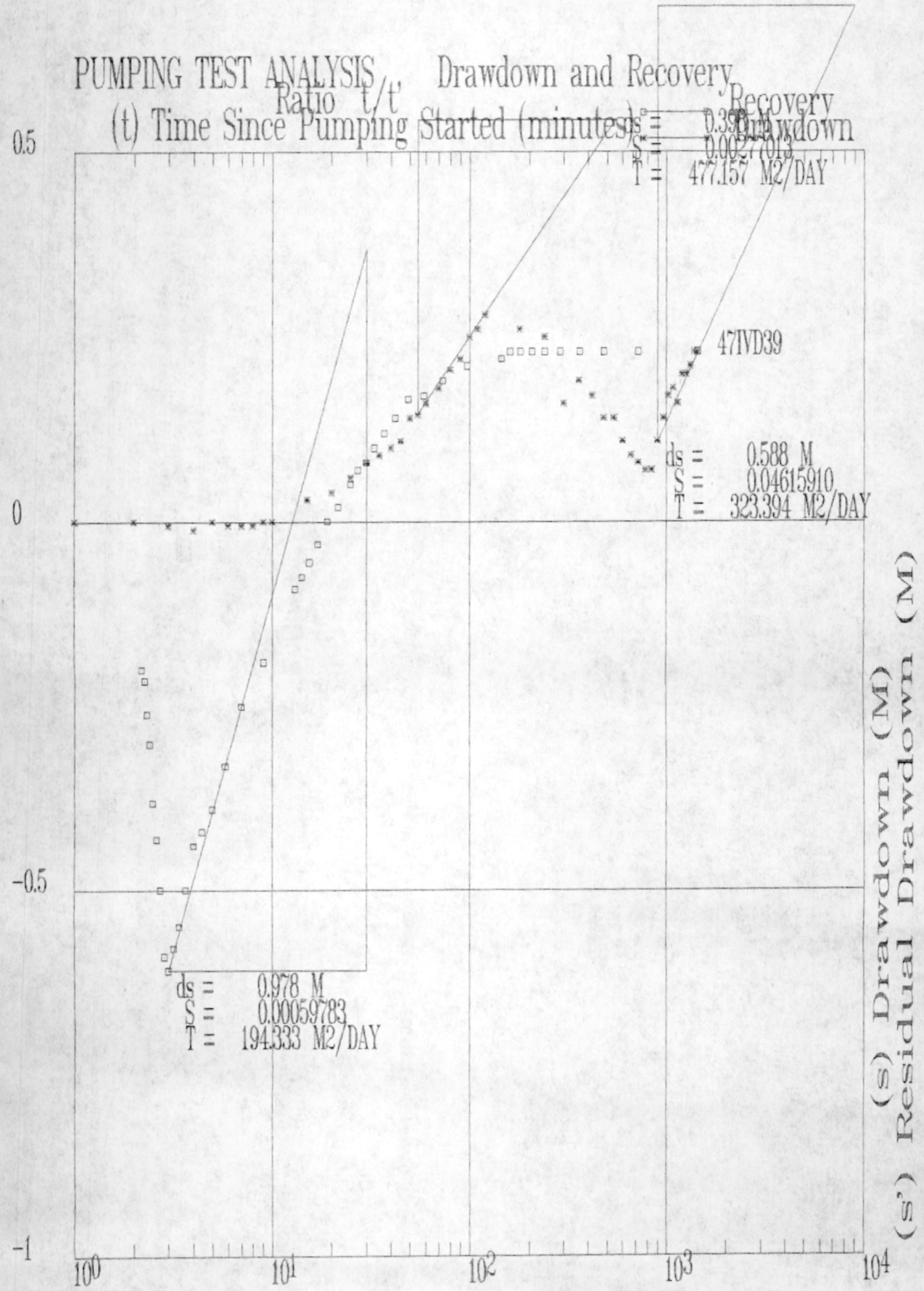
(t) Time Since Pumping Started (minutes)

Recovery

Drawdown



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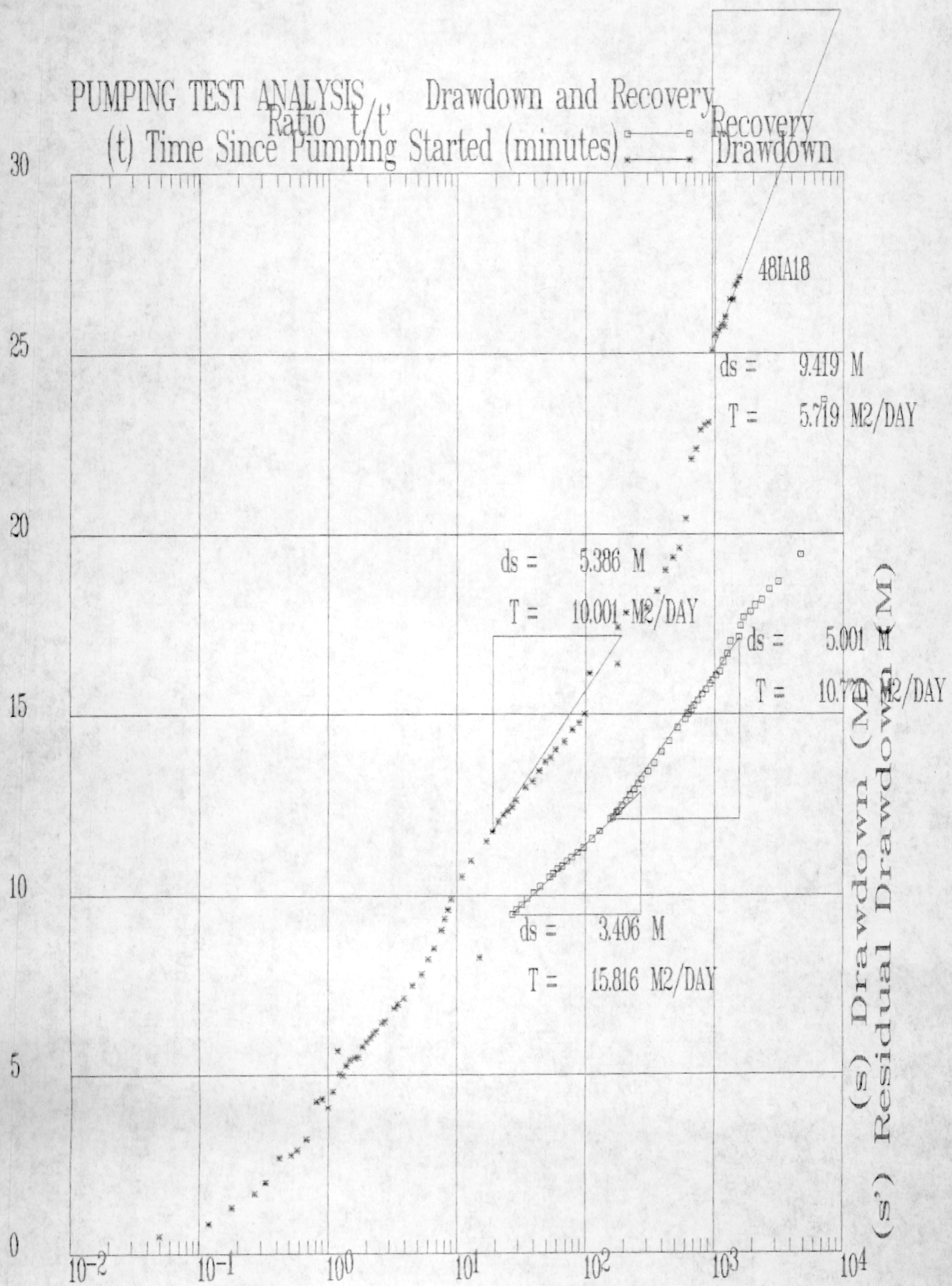
PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

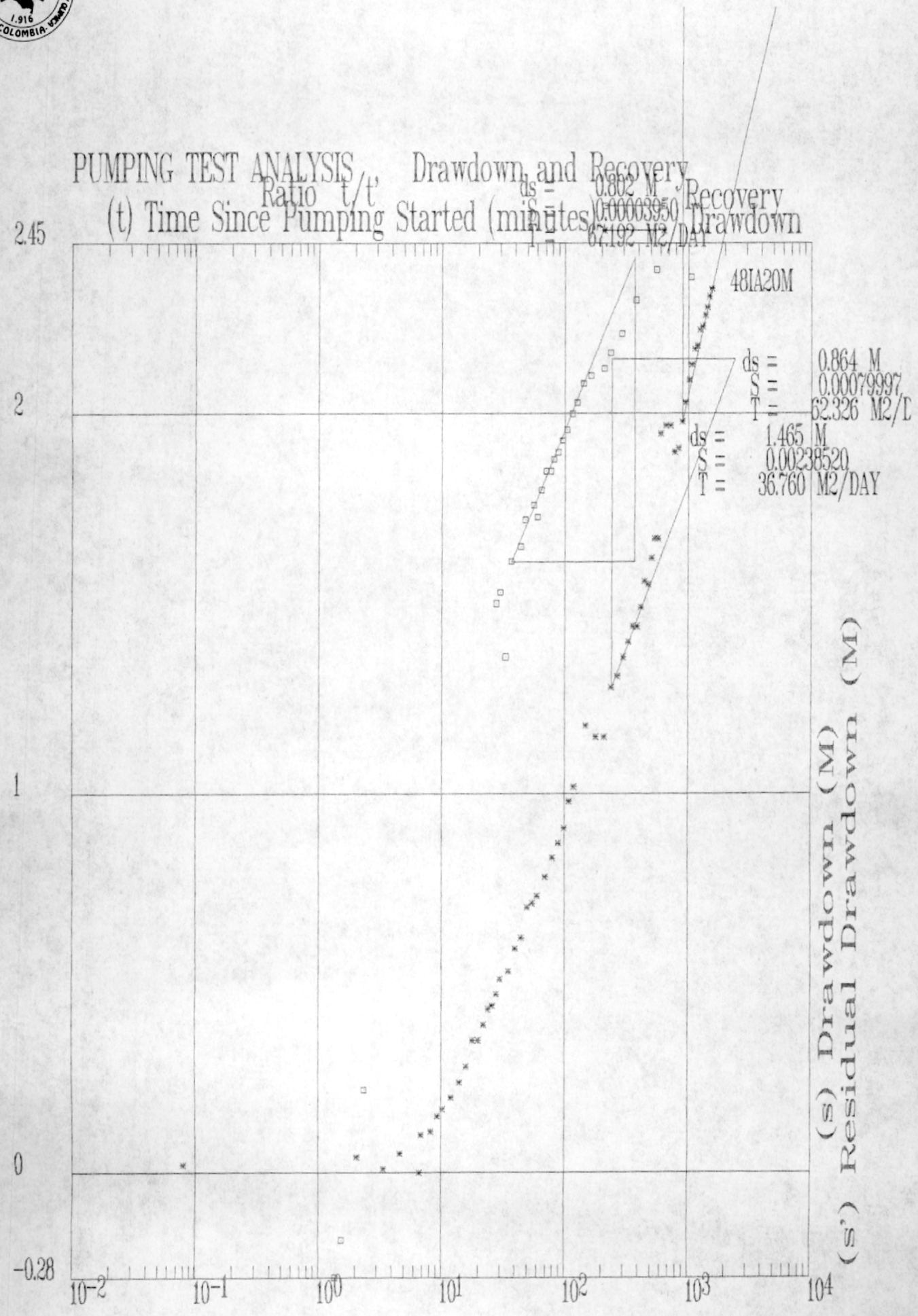
(t) Time Since Pumping Started (minutes)

Recovery

Drawdown



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PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t' Recovery

(t) Time Since Pumping Started (minutes) Drawdown

48IA20B

ds = 3.205 M
S = 0.00000063
T = 16.808 M2/DAY

ds = 10.636 M
S = 0.00055155
T = 5.065 M2/DAY

(s) Drawdown (M)
(s') Residual Drawdown (M)

15
10
5
0
-2

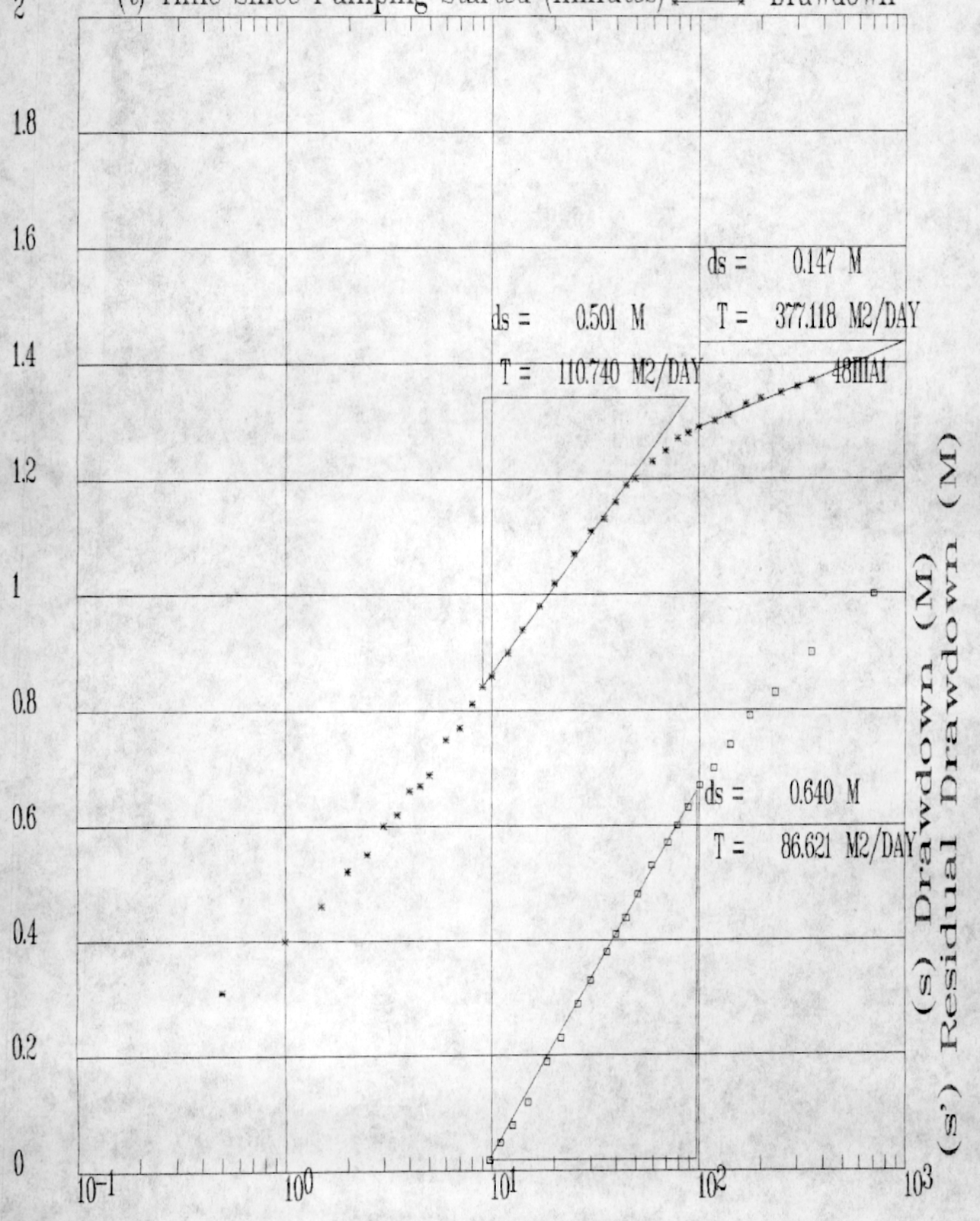
10^{-1} 10^{0} 10^{1} 10^{2} 10^{3} 10^{4}

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PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t' Recovery

(t) Time Since Pumping Started (minutes) Drawdown



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PUMPING TEST ANALYSIS Drawdown and Recovery

(t) Time Since Pumping Started (minutes) Ratio t/t' Recovery

48IIIC12

ds = 0.700 M

ds = 1.186 M T = 76.964 M2/DAY

T = 45.429 M2/DAY

(s) Drawdown (M) (s') Residual Drawdown (M)

5 4.5 4 3.5 3 2.5 2 1.5 1 0.5 0

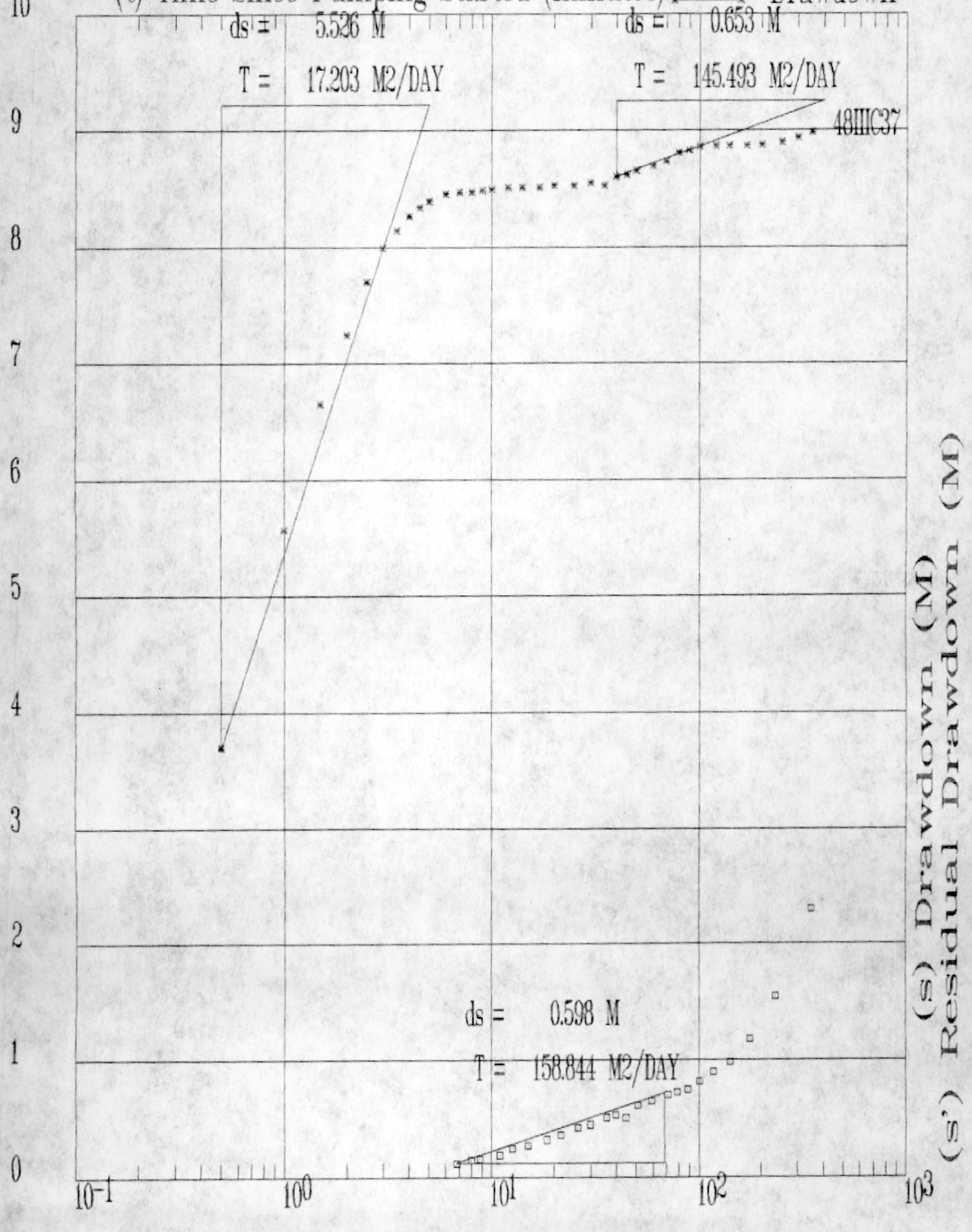
10^0 10^1 10^2 10^3

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PUMPING TEST ANALYSIS

Ratio t/t' Drawdown and Recovery

(t) Time Since Pumping Started (minutes) Recovery / Drawdown



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1.916
COLOMBIA

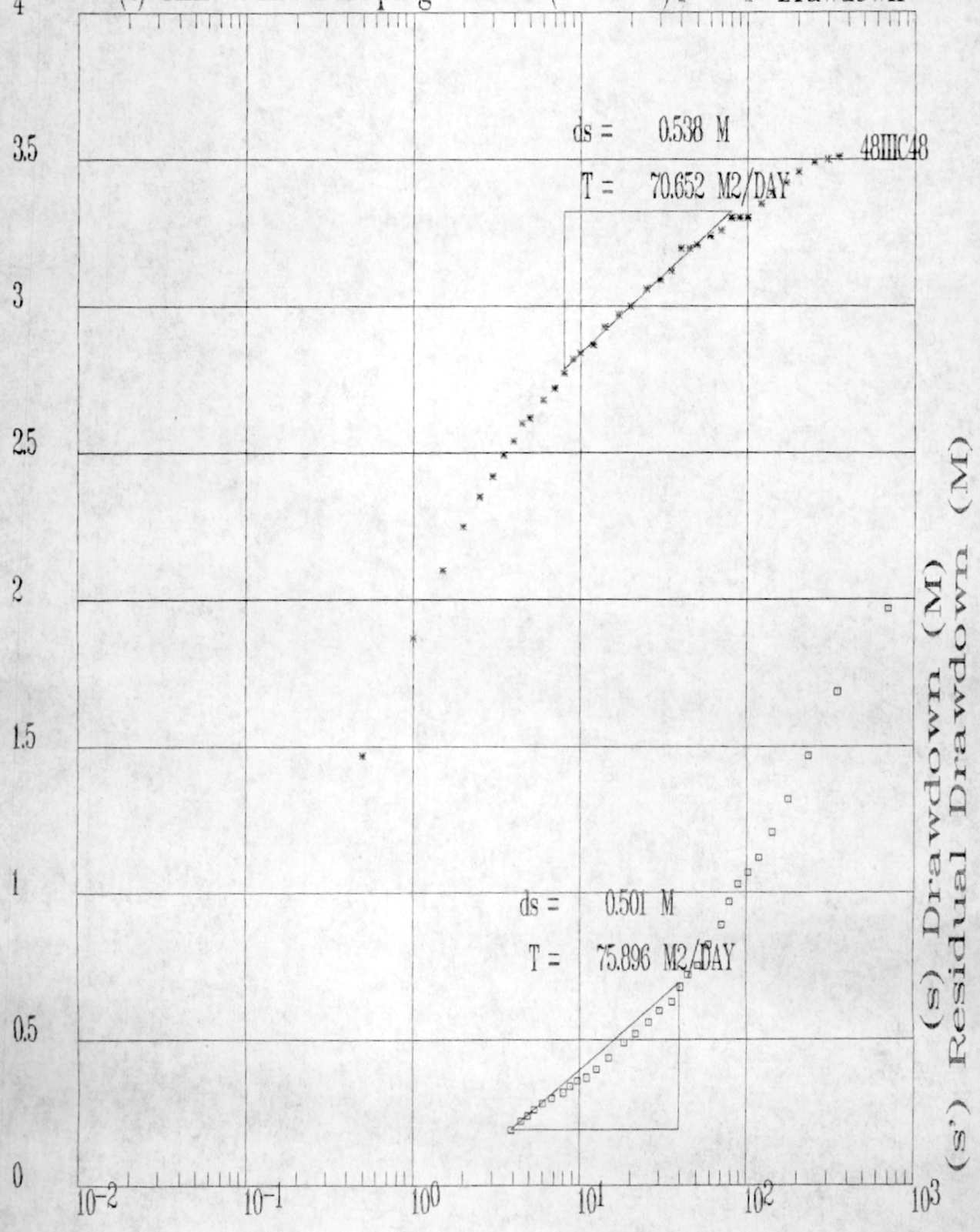
PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown



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PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown

55IIB7

ds = 0.421 M

T = 112.966 M2/DAY

ds = 0.610 M

T = 77.870 M2/DAY

(s) Drawdown (M)

(s') Residual Drawdown (M)

4
3.5
3
2.5
2
1.5
1
0.5
0

10^{-1} 10^{0} 10^{1} 10^{2} 10^{3}

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ds = 1.139 M

T = 97.405 M2/DAY

PUMPING TEST ANALYSIS Drawdown

(t) Time Since Pumping Started (minutes)

55IIC34

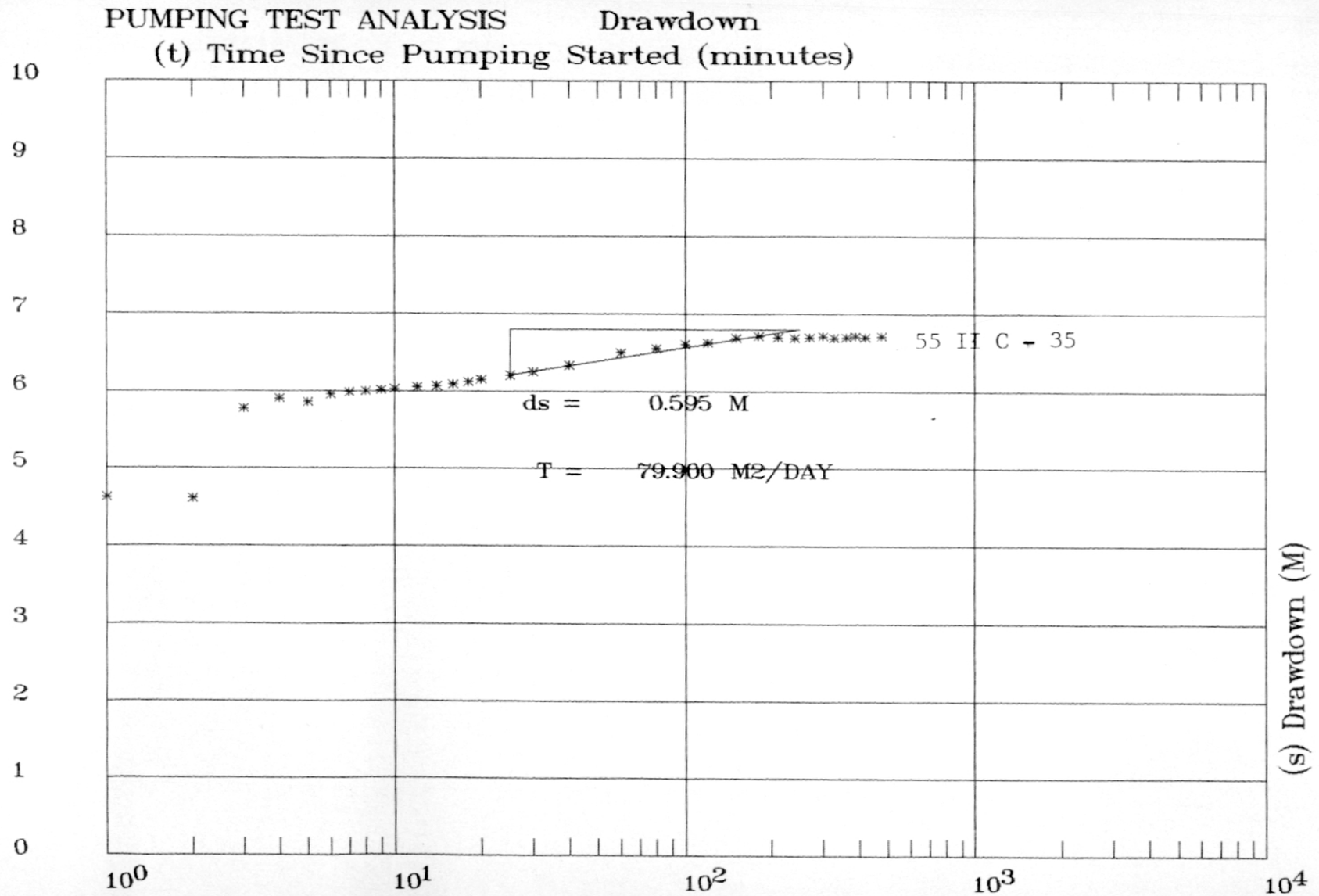
ds = 0.350 M

T = 316.465 M2/DAY

(s) Drawdown (M)

3
2.5
2
1.5
1
0.5
0

10^0 10^1 10^2 10^3 10^4 10^5


PUMPING TEST ANALYSIS Drawdown
(t) Time Since Pumping Started (minutes)
10
9
8
7
6
5
4
3
2
1
0
55 II C - 35
ds = 0.595 M
T = 79.900 M2/DAY
10^0
10^1
10^2
10^3
10^4
(s) Drawdown (M)

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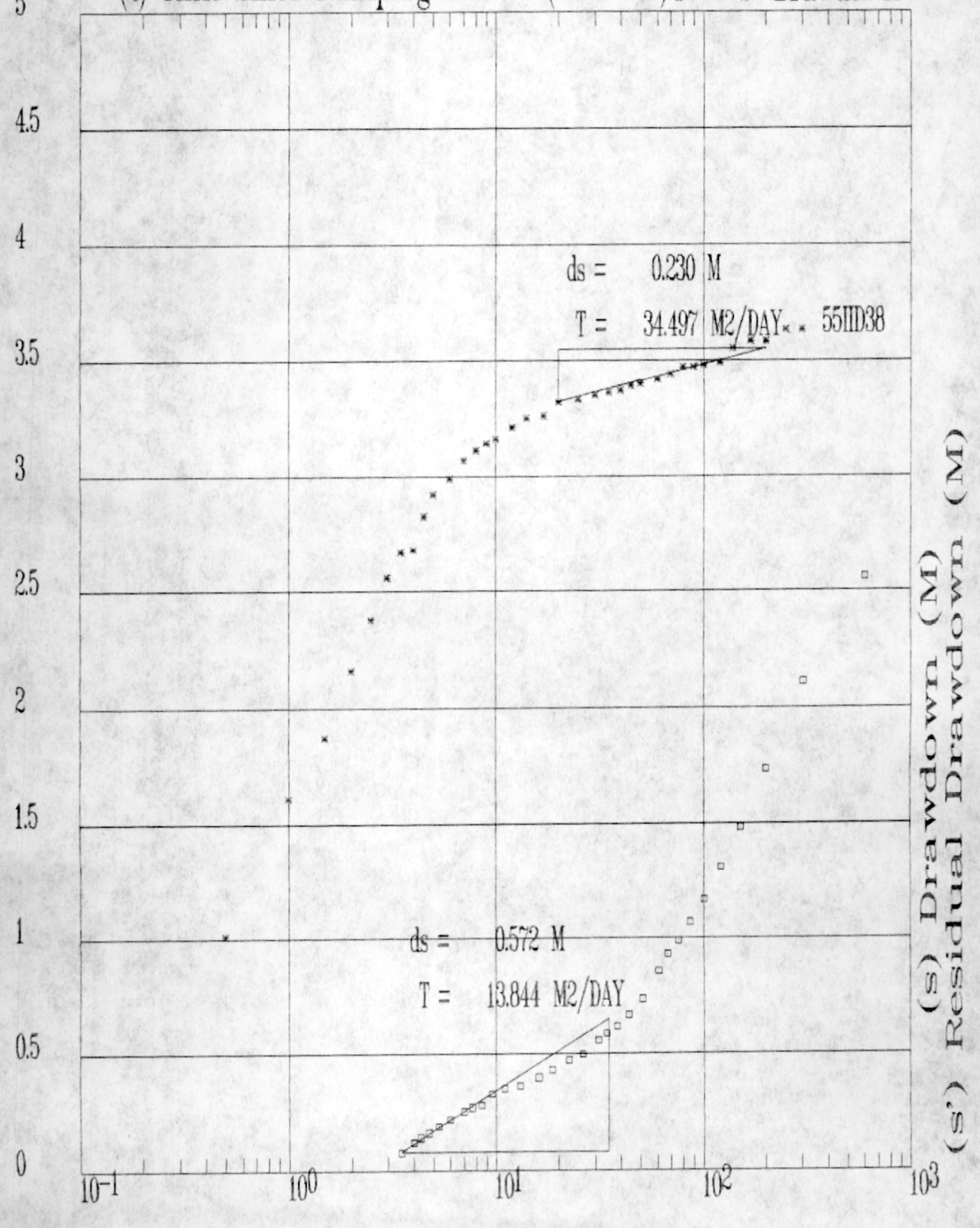
PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown



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PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown

ds = 1.243 M

T = 10.449 M2/DAY

55HD72

ds = 1.341 M

T = 9.688 M2/DAY

(s) Drawdown (M)

(s') Residual Drawdown (M)

9
8
7
6
5
4
3
2
1
0

10^{-2} 10^{-1} 10^{0} 10^{1} 10^{2} 10^{3}

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ds = 0.576 M
S = 0.0000042
T = 22.562 M2/DAY

PUMPING TEST ANALYSIS - Drawdown and Recovery

Ratio t/t' (t) Time Since Pumping Started (minutes)

Recovery
Drawdown

55IID73

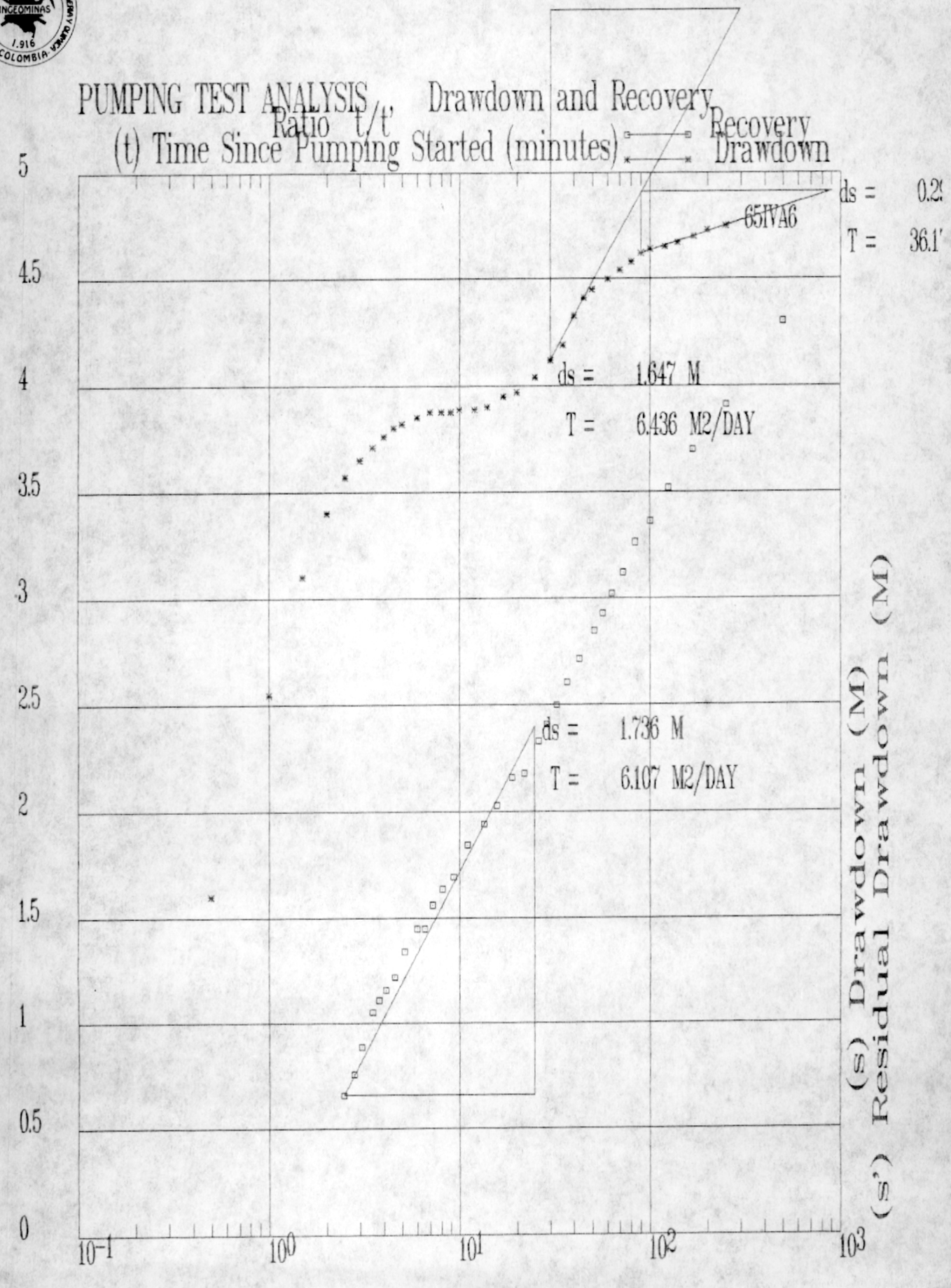
ds = 0.587 M
S = 0.00001107
T = 22.138 M2/DAY

(s) Drawdown (M)
(s') Residual Drawdown (M)

1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0

10^{-1} 10^{0} 10^{1} 10^{2} 10^{3} 10^{4}

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PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown

65IVA14

ds = 1.(

T = 60.

ds = 1.802 M

T = 35.177 M2/DAY

ds = 1.594 M

T = 39.769 M2/DAY

(s) Drawdown (M)

(s') Residual Drawdown (M)

10 9 8 7 6 5 4 3 2 1 0

10^{-1} 10^{0} 10^{1} 10^{2} 10^{3}

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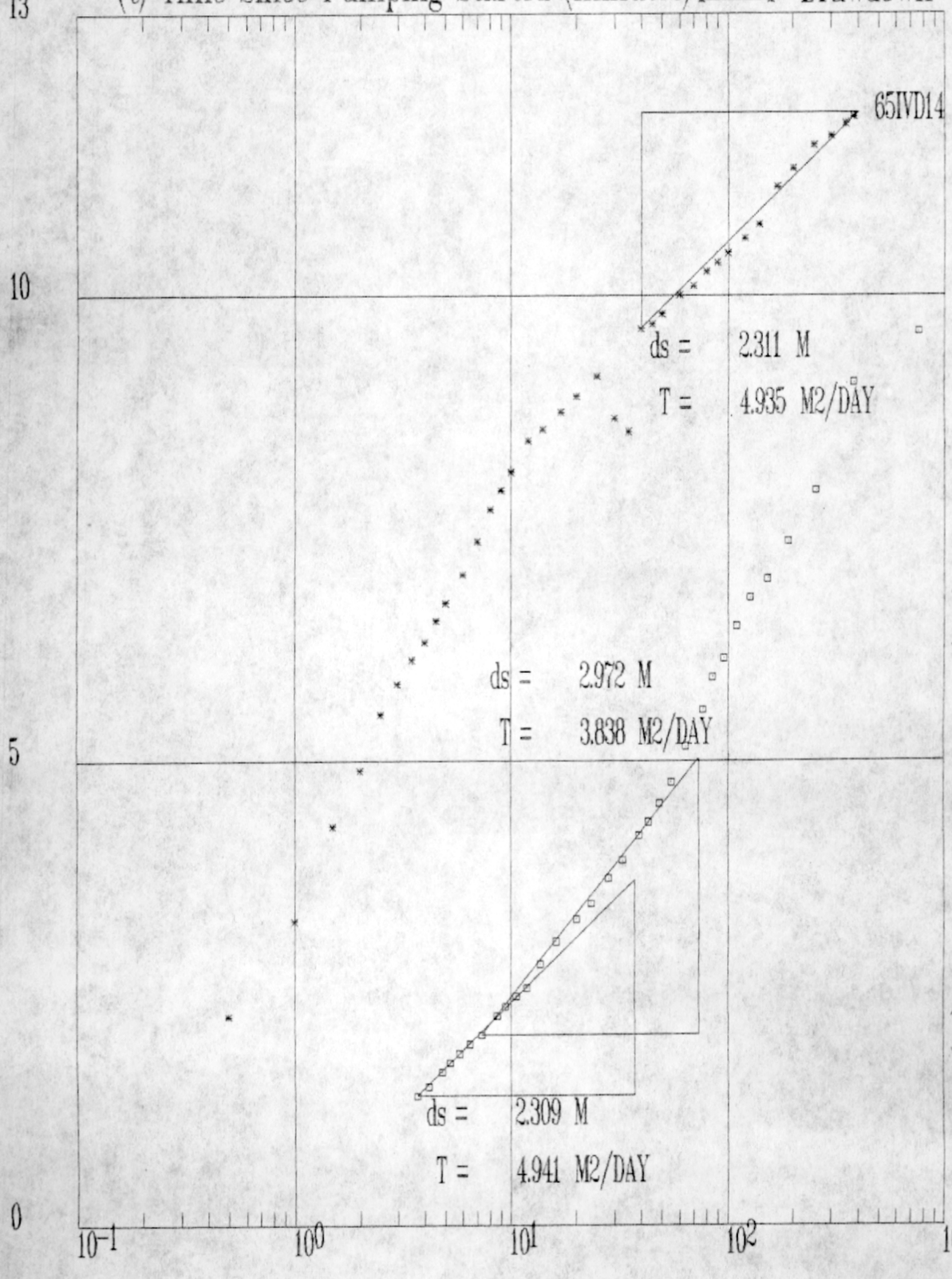
PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

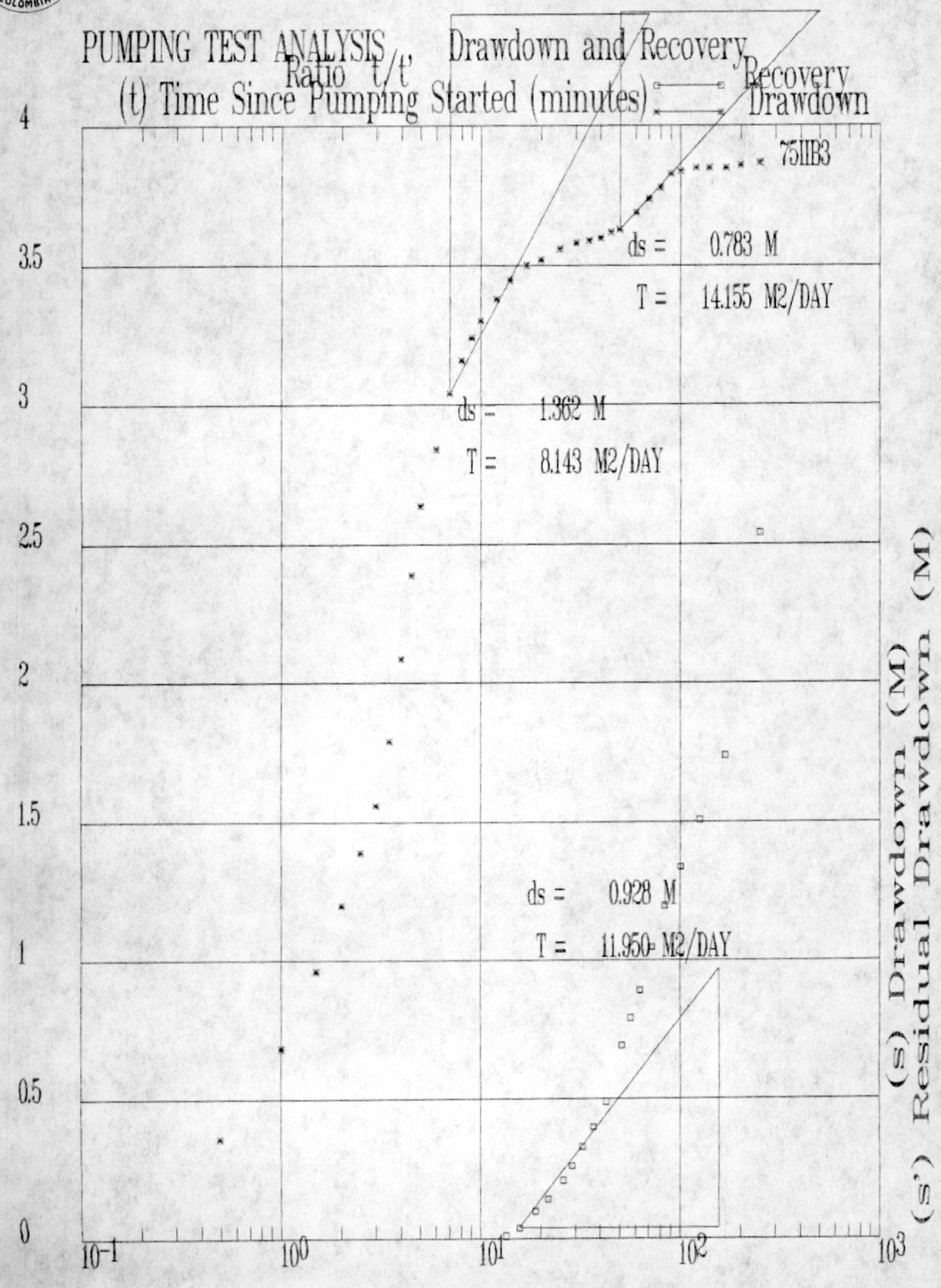
(t) Time Since Pumping Started (minutes)

Recovery

Drawdown



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PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown

75HB10

ds = 0.133 M

T = 178.253 M2/DAY

ds = 0.383 M

T = 61.856 M2/DAY

1.85

1.51

1.01

0.51

0.01

10^{-1} 10^{0} 10^{1} 10^{2} 10^{3}

(s) Drawdown (M)
(s') Residual Drawdown (M)

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PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown

75IIC2

ds = 2.073 M

T = 64.959 M2/DAY

ds = 2.194 M

T = 61.391 M2/DAY

(s) Drawdown (M)

(s') Residual Drawdown (M)

14

10

5

0

10^{-1} 10^{0} 10^{1} 10^{2} 10^{3}

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PUMPING TEST ANALYSIS

Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown

75IVA7

ds = 3.920 M

T = 12.124 M2/DAY

ds = 3.437 M

T = 13.828 M2/DAY

ds = 2.164 M

T = 21.965 M2/DAY

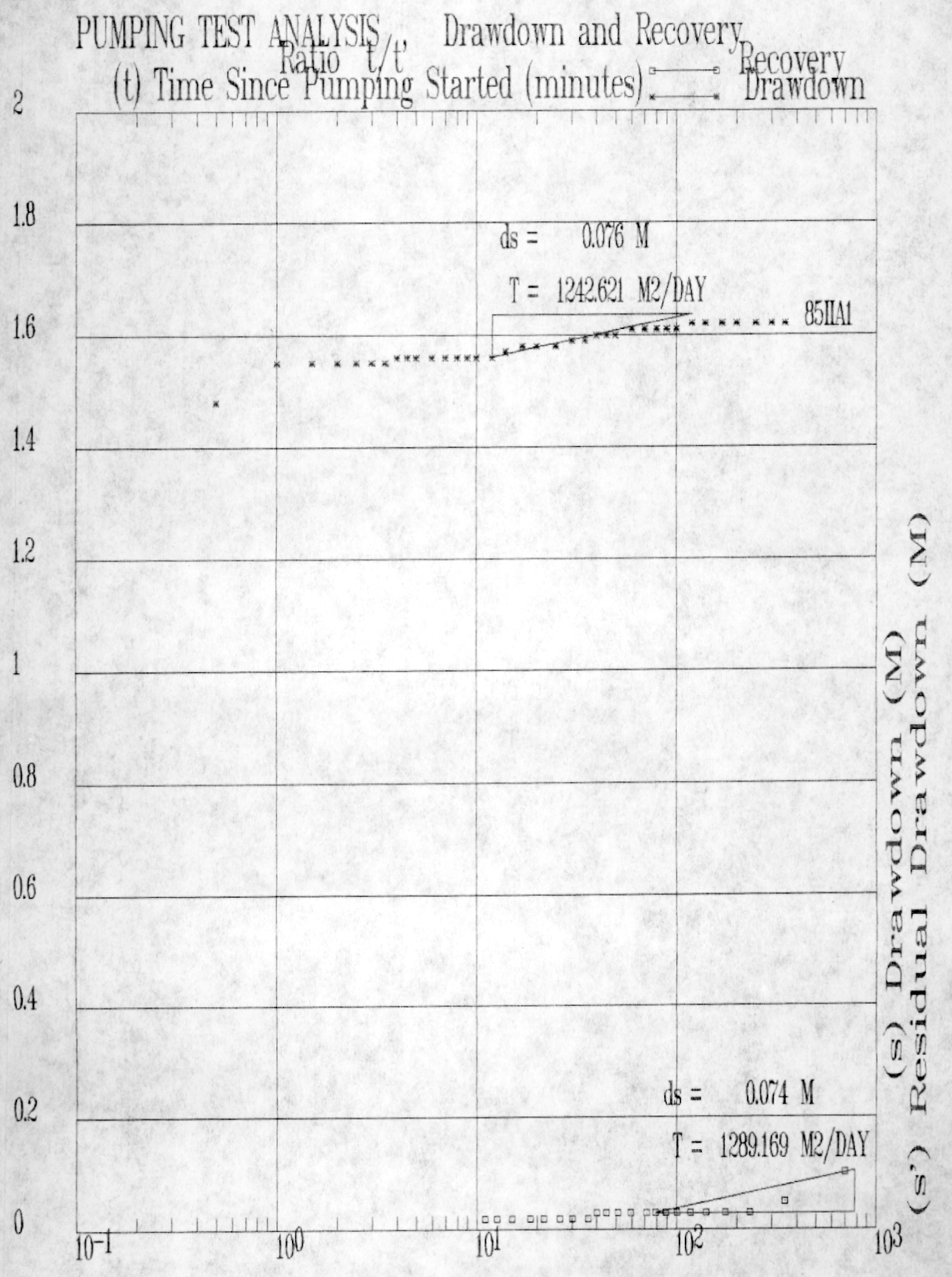
(s) Drawdown (M)

(s') Residual Drawdown (M)

19
15
10
5
0

10^{-1} 10^{0} 10^{1} 10^{2} 10^{3}

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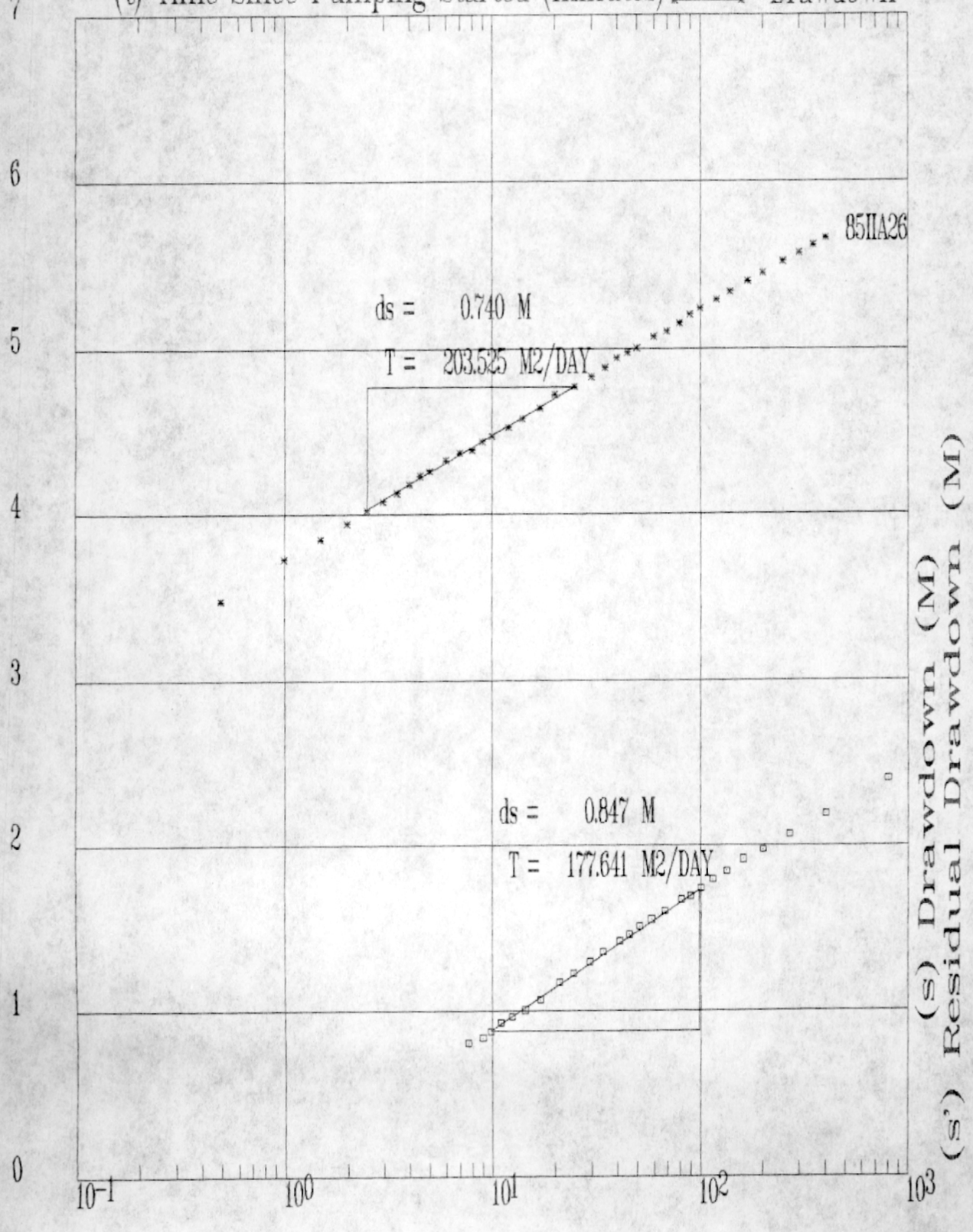


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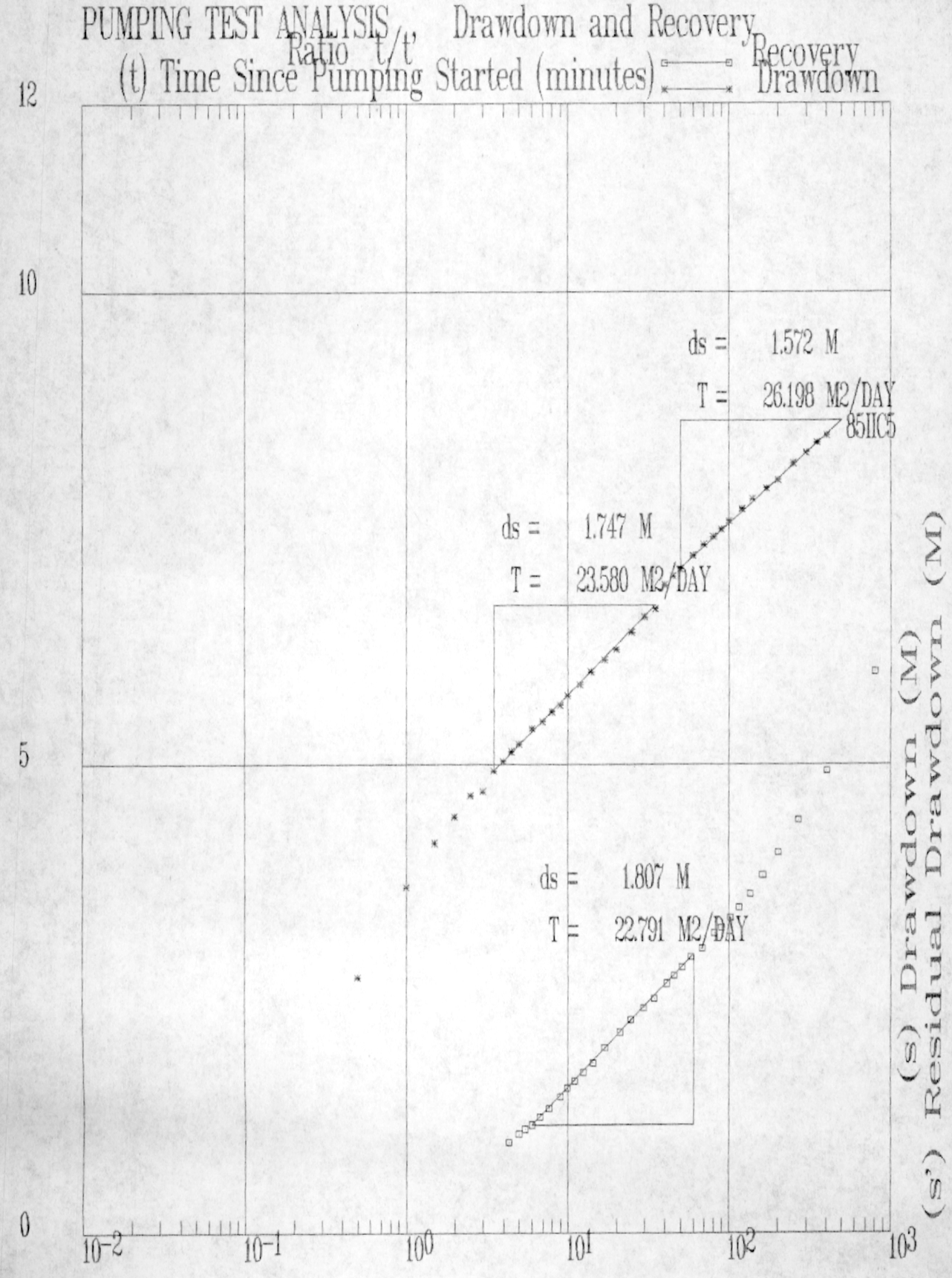
PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t' — Recovery

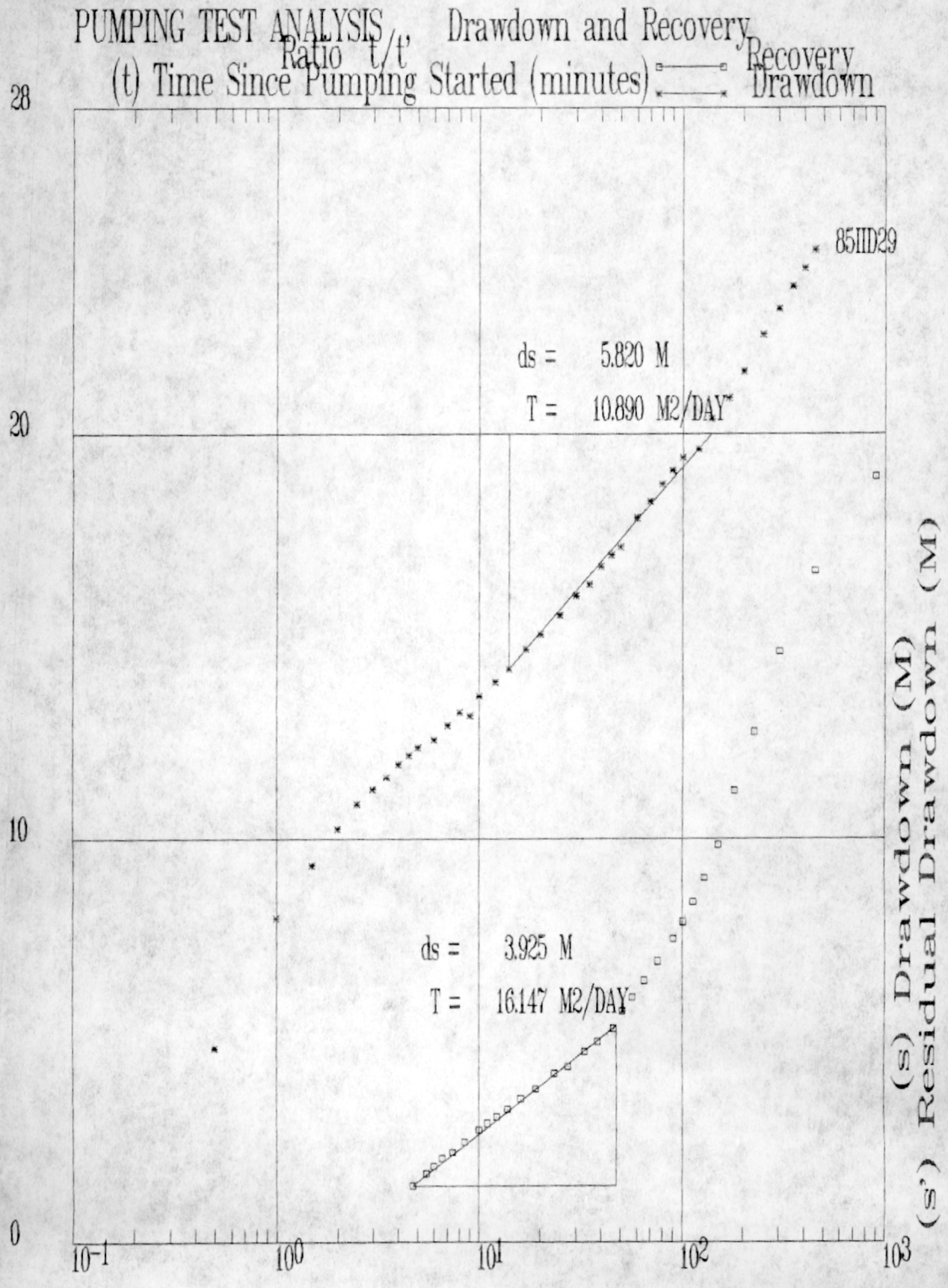
(t) Time Since Pumping Started (minutes) — Drawdown



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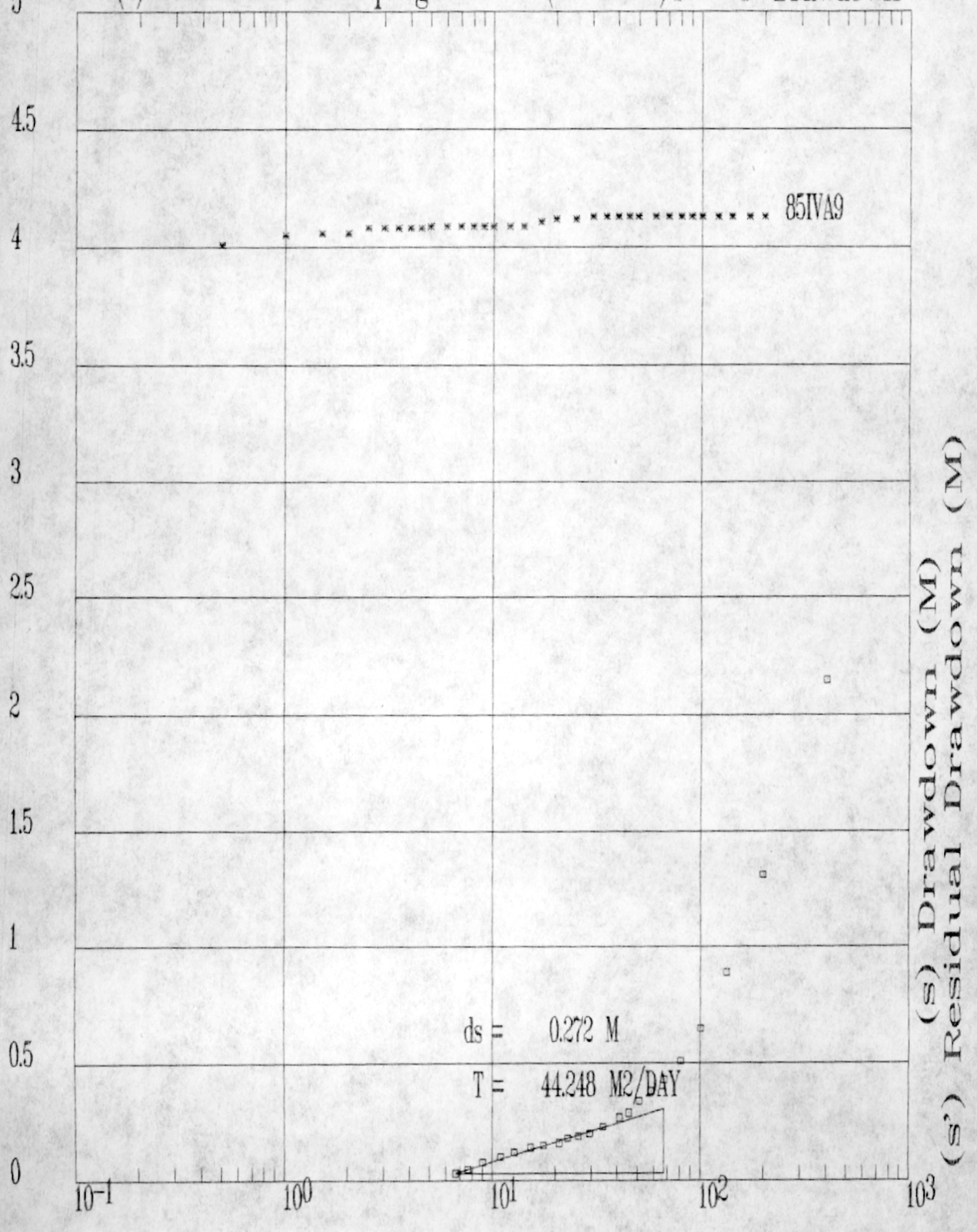
PUMPING TEST ANALYSIS Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown



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PUMPING TEST ANALYSIS

Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown

14

10

5

0

ds = 3.399 M

T = 23.307 M2/DAY

85IVD2

ds = 4.436 M

T = 17.859 M2/DAY

10^{-1} 10^{0} 10^{1} 10^{2} 10^{3}

(s) Drawdown (M)

(s') Residual Drawdown (M)

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PUMPING TEST ANALYSIS

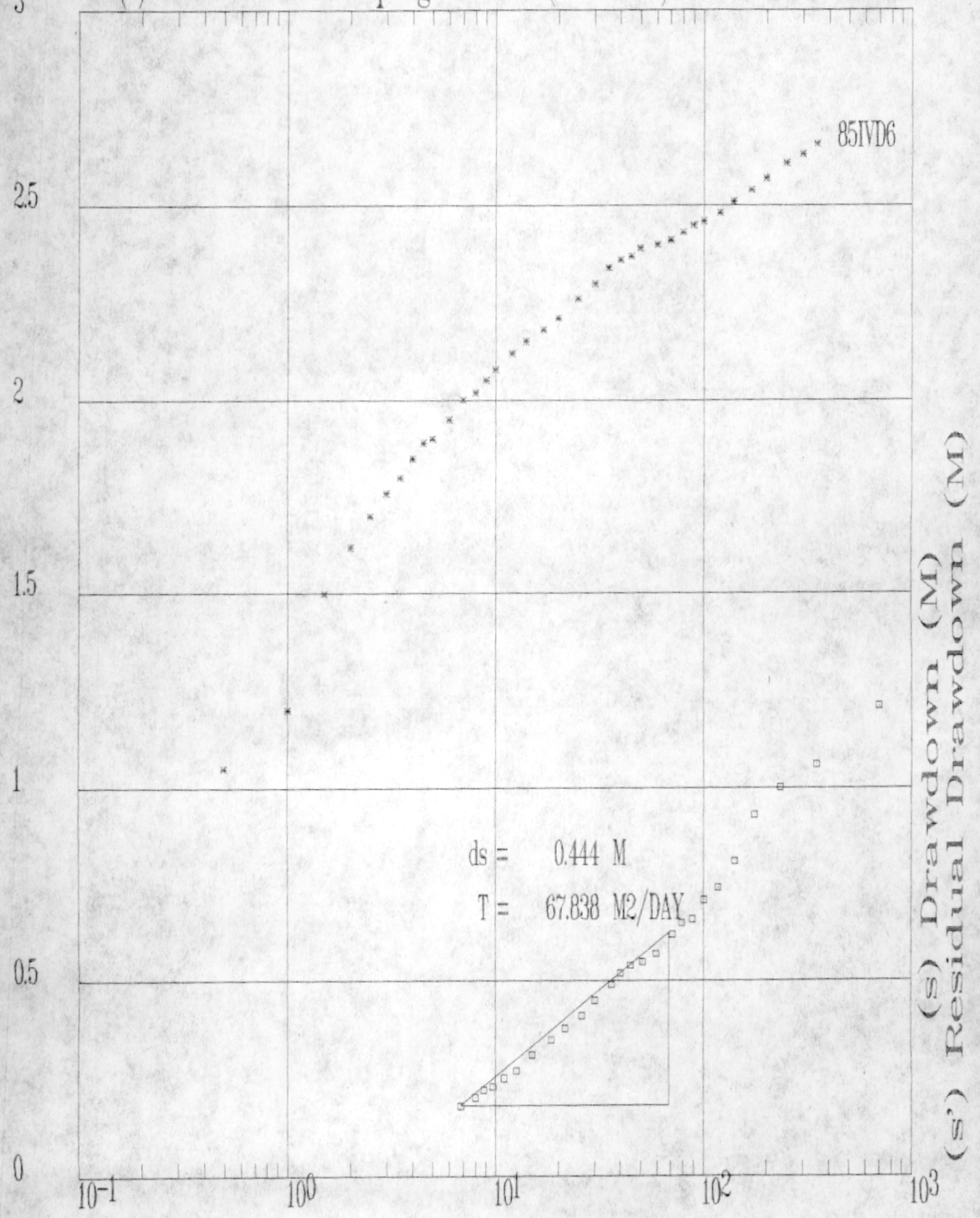
Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown



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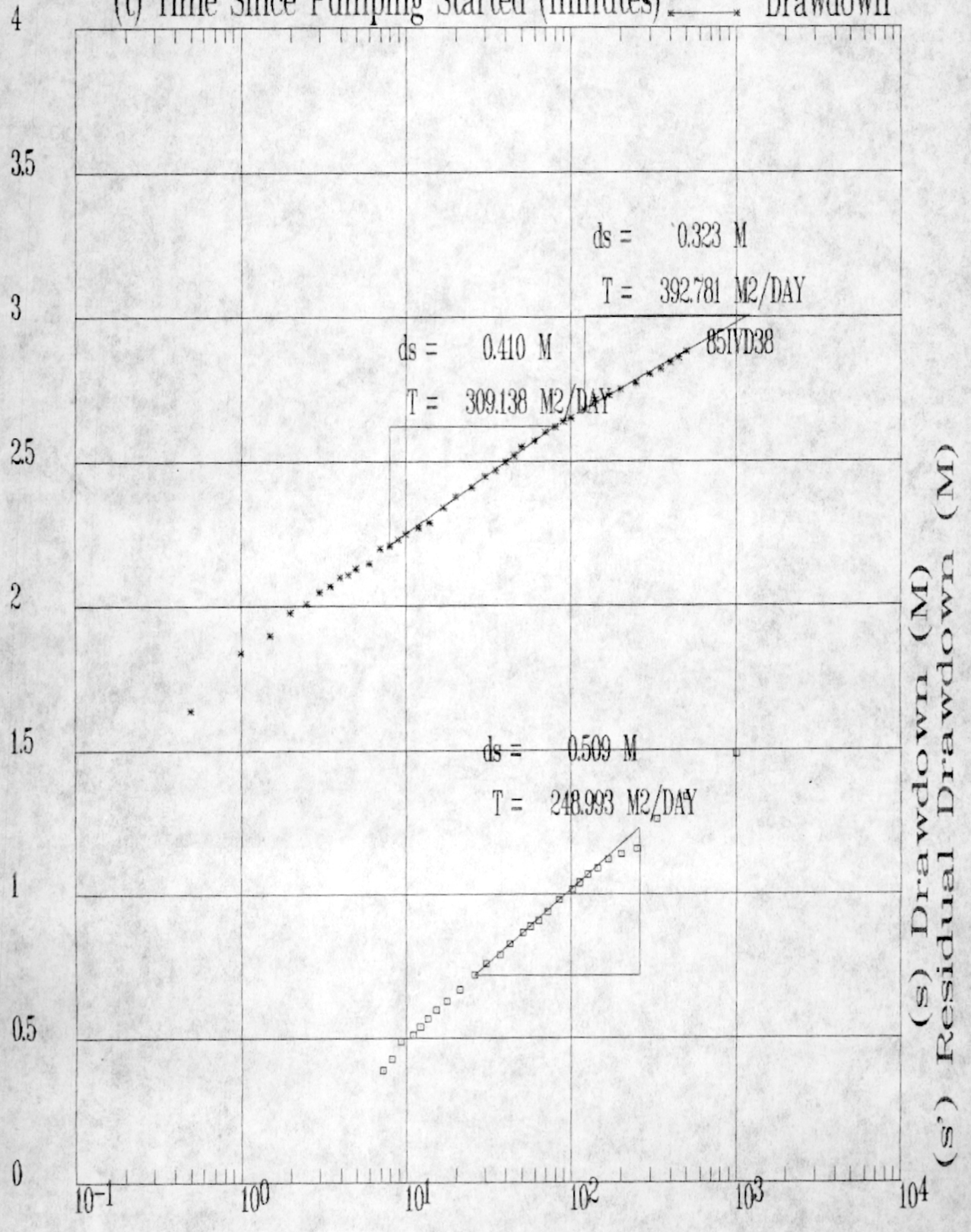
PUMPING TEST ANALYSIS

Ratio t/t' Drawdown and Recovery

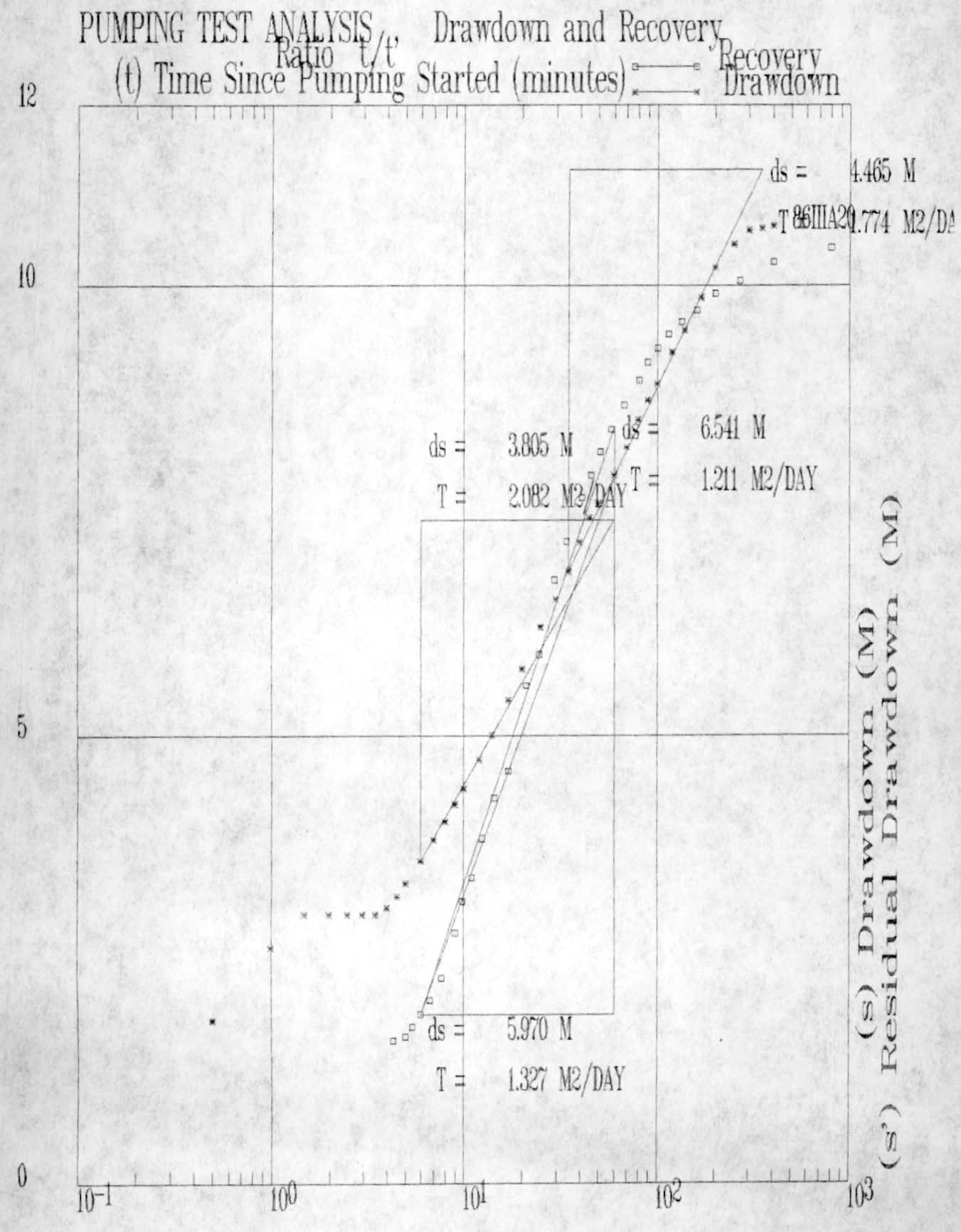
(t) Time Since Pumping Started (minutes)

Recovery

Drawdown



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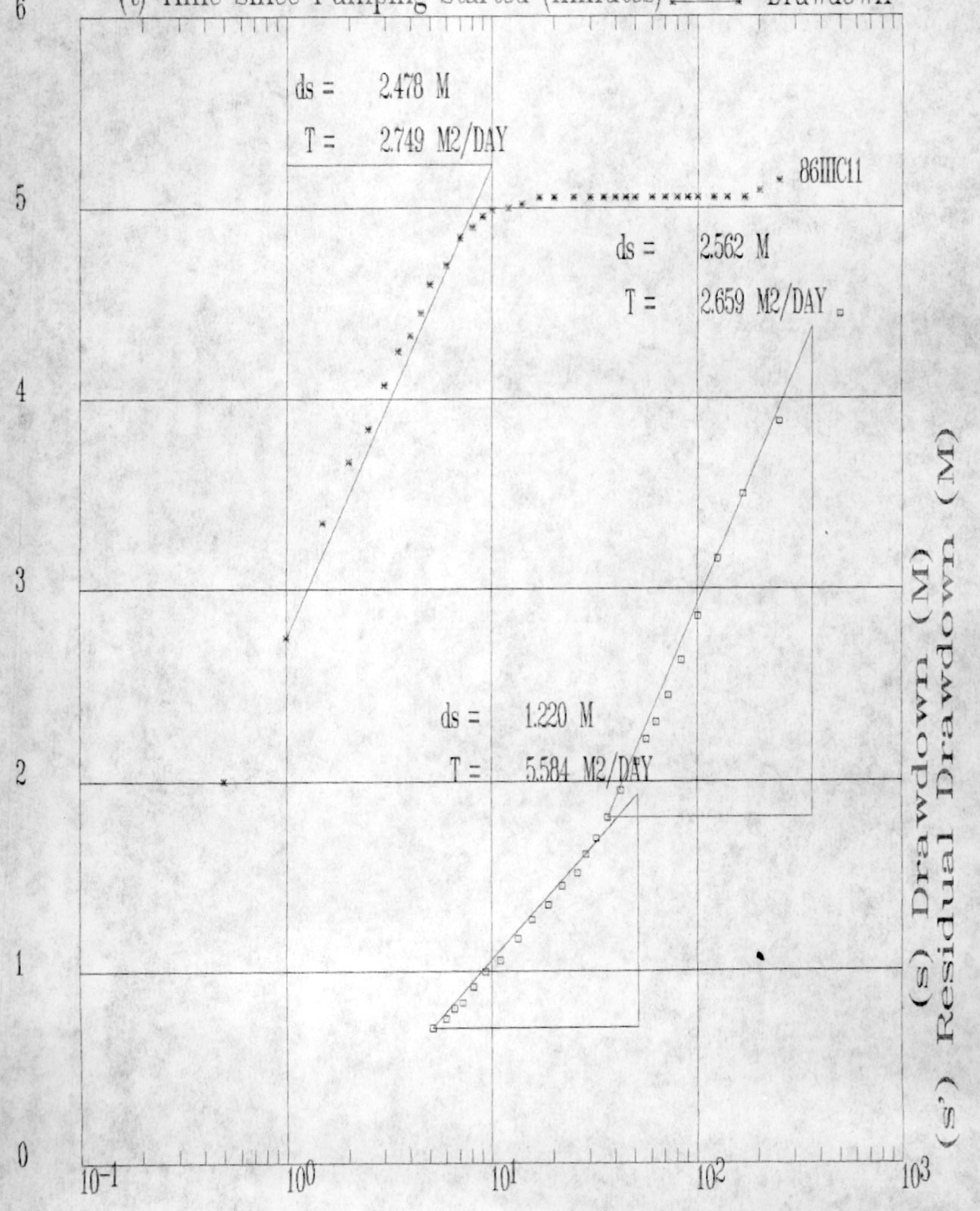
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Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown



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Drawdown and Recovery

Ratio t/t'

(t) Time Since Pumping Started (minutes)

Recovery

Drawdown

