

Appendix List

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APPENDIX I

Soil Descriptions

Sample #: 90-102-28/39-125-2

Quartz:	35%	53% V. fine to medium grain size
Feldspar:	45%	40% Coarse to V. coarse grain size
Mica:	15%	05% Silt grain size
Other:	5%	02% Clay grain size

Description:

- 6/3 Pale brown, 6/4 Light yellowish brown
- low plasticity
- subangular to subrounded
- very poorly sorted
- no reaction to HCl
- Mica is dominantly biotite

Sample #: 90-102-28/39-125-4

Quartz:	85%	65% V. fine to medium grain size
Feldspar:	5%	25% Coarse to V. coarse grain size
Mica:	10%	08% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 7/6 - 6/6 Reddish yellow
- low plasticity
- subrounded
- poorly sorted
- no reaction to HCl
- Mica is about equally muscovite and biotite
- Some coarse to V. coarse grains are partially consolidated weakly cemented

Sample #: 90-102-175/15'in-2

Quartz:	75%	63% V. fine to medium grain size
Feldspar:	10%	30% individual and partially consolidated (weakly cemented)
Mica:	5%	Coarse to V. coarse grain size
Woodchips:	10%	05% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 6/3 pale brown
- low plasticity
- subrounded
- poorly sorted
- no reaction to HCl
- Mica is mostly muscovite with some biotite
- Woodchips are undessicated

Sample #: 90-102-175/15'in-4

Quartz:	60%	75% V. fine to medium grain size
Feldspar:	32%	20% Coarse to V. coarse grain size
Woodchips:	8%	03% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 8/2 White, 7/2 Light gray, 8/3-7/3 Very pale brown
- low plasticity
- subrounded to subangular
- poorly sorted
- no reaction to HCl
- Woodchips are undessicated

Sample #: 90-102-39/28-20-2

Quartz:	55%	60% V. fine to medium grain size
Feldspar:	42%	15% Coarse to V. coarse grain size
Mica:	3%	15% Silt grain size
Other:	<1%	10% Clay grain size

Description: - 7/6, 7/8 Yellow
- moderate to high plasticity
- subangular to subrounded
- poorly sorted
- no reaction to HCl

Sample #: 90-102-39/28-20-4

Quartz:	50%	85% V. fine to medium grain size
Feldspar:	37%	10% Coarse to V. coarse grain size
Mica:	10%	03% Silt grain size
Other:	3%	02% Clay grain size

Description: - 7/6 Yellow
- low plasticity
- subangular to subrounded
- moderate to poorly sorted
- no reaction to HCl
- Mica is dominantly muscovite

Sample #: 90-102-39/28-20-6

Quartz:	45%	77% V. fine to medium grain size
Feldspar:	38%	20% Coarse to V. coarse grain size
Mica:	15%	02% Silt grain size
Other:	2%	01% Clay grain size

Description: - 7/6 Yellow
- low plasticity
- subangular
- moderate to poorly sorted
- no reaction to HCl
- Mica is dominantly muscovite

Sample #: 90-602-33/34-50-2

Quartz:	65%	45% V. fine to medium grain size
Feldspar:	35%	40% Coarse to V. coarse grain size
Other:	<1%	12% Silt grain size
		03% Clay grain size

Description: - 7/6 Yellow
- moderate plasticity
- subrounded to subangular
- very poorly sorted
- no reaction to HCl

Sample #: 90-602-33/34-50-4

Quartz:	70%	55% V. fine to medium grain size
Feldspar:	30%	25% Coarse to V. coarse grain size
Other:	<1%	15% Silt grain size 10% Clay grain size

Description: - 8/6 Reddish yellow
- moderately high plasticity
- subangular
- very poorly sorted
- no reaction to HCl

Sample #: 90-602-33/34-50-7

Quartz:	70%	70% V. fine to medium grain size
Feldspar:	30%	10% Coarse to V. coarse grain size
Other:	<1%	15% Silt grain size 05% Clay grain size

Description: - 8/2 White, 8/2 Pinkish white
- moderate to high plasticity
- subrounded
- poorly to moderately sorted
- no reaction to HCl

Sample #: 90-602-33/34-100-2

Quartz:	65%	65% V. fine to medium grain size
Feldspar:	35%	25% Coarse to V. coarse grain size
Other:	<1%	07% Silt grain size 03% Clay grain size

Description: - 7/3-7/6 Very pale brown
- low plasticity
- subangular to subrounded
- poorly sorted
- no reaction to HCl

Sample #: 90-602-33/34-100-2

Quartz:	70%	60% V. fine to medium grain size
Feldspar:	30%	20% Coarse to V. coarse grain size
Other:	<1%	12% Silt grain size 08% Clay grain size

Description: - 8/4-7/4 Pale yellow
- moderate to high plasticity
- subrounded
- poorly to moderately sorted
- slight reaction to HCl (?)

Sample #: 90-602-33/34-100-7

Quartz:	75%	85% V. fine to medium grain size
Feldspar:	23%	10% Coarse to V. coarse grain size
Mica:	2%	03% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 7/4-8/4 Very pale brown, 8/6 Yellow
- low plasticity
- subrounded
- moderately sorted
- no reaction to HCl
- Mica is primarily muscovite

Sample #: 90-602-33/34-150-2

Quartz:	65%	55% V. fine to medium grain size
Feldspar:	35%	20% Coarse to V. coarse grain size
Woodchips:	<1%	15% Silt grain size
Other:	<1%	10% Clay grain size

Description:

- 7/4 Very pale brown
- moderately high plasticity
- subrounded
- poorly sorted
- no reaction to HCl
- Woodchips are undessicated

Sample #: 90-602-33/34-150-4

Quartz:	70%	70% V. fine to medium grain size
Feldspar:	30%	10% Coarse to V. coarse grain size
Woodchips:	<1%	15% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 7/6-7/8 Reddish yellow
- moderately high plasticity
- subangular to subrounded
- moderately sorted
- no reaction to HCl
- Woodchips are undessicated

Sample #: 90-602-33/34-150-7

Quartz:	65%	70% V. fine to medium grain size
Feldspar:	35%	25% Coarse to V. coarse grain size
Other:	<1%	03% Silt grain size
		02% Clay grain size

Description:

- 7/6-7/8 Yellow
- very low plasticity
- subrounded
- poorly sorted
- no reaction to HCl
- minimal amounts of biotite

Sample #: 90-602-33/34-200-2

Quartz:	65%	65% V. fine to medium grain size
Feldspar:	35%	15% Coarse to V. coarse grain size
Other:	<1%	15% Silt grain size 05% Clay grain size

Description:

- 7/4 Very pale brown
- moderate to high plasticity
- subangular to subrounded
- poorly to moderately sorted
- slight reaction to HCl (?)

Sample #: 90-602-33/34-200-4

Quartz:	70%	65% V. fine to medium grain size
Feldspar:	30%	20% Coarse to V. coarse grain size
Woodchips:	<1%	10% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 8/2 White, 8/3 Very pale brown
- moderate plasticity
- subangular
- very poorly sorted
- no reaction to HCl
- Woodchips are undessicated

Sample #: 90-602-33/30.1-150-2

Quartz:	80%	45% V. fine to medium grain size
Feldspar:	20%	45% Coarse to V. coarse grain size
Other:	<1%	05% Silt grain size 05% Clay grain size

Description:

- 7/3-7/4 Very pale brown
- moderately low plasticity
- subangular
- moderate to poorly sorted
- no reaction to HCl

Sample #: 90-602-33/30.1-150-4

Quartz:	75%	55% V. fine to medium grain size
Feldspar:	23%	30% Coarse to V. coarse grain size
Woodchips:	2%	10% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 8/2 White, 8/3-8/4 Very pale brown
- moderate to low plasticity
- subangular to subrounded
- very poorly sorted
- no reaction to HCl

Sample #: 90-602-33/S-200-2

Quartz:	55%	45% V. fine to medium grain size
Feldspar:	42%	40% Coarse to V. coarse grain size
Mica:	3%	10% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 6/4 Light yellow brown, 7/4 Very pale brown
- moderate plasticity
- subangular
- very poorly sorted
- slight reaction to HCl
- Mica predominantly biotite

Sample #: 90-602-33/30.1-200-4

Quartz:	65%	70% V. fine to medium grain size
Feldspar:	35%	15% Coarse to V. coarse grain size
Other:	<1%	12% Silt grain size
		03% Clay grain size

Description:

- 7/6 Yellow
- moderate to high plasticity
- subangular
- moderate to poorly sorted
- no reaction to HCl

Sample #: 90-602-33/30.1-250-2

Quartz:	60%	52% V. fine to medium grain size
Feldspar:	40%	35% Coarse to V. coarse grain size
Other:	<1%	10% Silt grain size
		03% Clay grain size

Description:

- 7/6 Yellow
- moderate plasticity
- subangular to subrounded
- very poorly sorted
- no reaction to HCl

Sample #: 90-602-33/30.1-250-4

Quartz:	70%	50% V. fine to medium grain size
Feldspar:	30%	30% Coarse to V. coarse grain size
Other:	<1%	15% Silt grain size
		05% Clay grain size

Description:

- 8/4-7/4 Very pale brown
- moderate to high plasticity
- subangular to subrounded
- very poorly sorted
- no reaction to HCl

Sample #: 90-602-33/S-50-2

Quartz:	80%	50% V. fine to medium grain size
Feldspar:	20%	30% Coarse to V. coarse grain size
Other:	<1%	15% Silt grain size
		05% Clay grain size

Description:

- 7/4 Very pale brown
- moderate to high plasticity
- subangular to subrounded
- very poorly sorted
- no reaction to HCl

Sample #: 90-602-33/S-50-4

Quartz:	57%	55% V. fine to medium grain size
Feldspar:	43%	40% Coarse to V. coarse grain size
Other:	<1%	04% Silt grain size
		01% Clay grain size

Description:

- 7/8 Yellow
- moderate to low plasticity
- subangular
- very poorly sorted
- no reaction to HCl

Sample #: 90-602-33/S-100-2

Quartz:	75%	35% V. fine to medium grain size
Feldspar:	25%	33% Coarse to V. coarse grain size
Woodchips:	<1%	20% Silt grain size
Other:	<1%	12% Clay grain size

Description:

- 7/6 Yellow
- moderately high plasticity
- subrounded to subangular
- moderately poorly sorted
- no reaction to HCl
- Woodchips are undessicated

Sample #: 90-602-33/S-100-4

Quartz:	55%	65% V. fine to medium grain size
Feldspar:	45%	15% Coarse to V. coarse grain size
Other:	<1%	12% Silt grain size
		08% Clay grain size

Description:

- 7/8 Reddish yellow
- moderately high plasticity
- subangular to subrounded
- moderately poorly sorted
- no reaction to HCl

Sample #: 90-602-33/S-100-6

Quartz:	60%	45% V. fine to medium grain size
Feldspar:	40%	20% Coarse to V. coarse grain size
Other:	<1%	20% Silt grain size 15% Clay grain size

Description: - 8/4 Very pale brown
- moderately high plasticity
- subangular
- poorly sorted
- no reaction to HCl

Sample #: 90-602-33/S-150-2

Quartz:	75%	50% V. fine to medium grain size
Feldspar:	25%	30% Coarse to V. coarse grain size
Other:	<1%	15% Silt grain size 05% Clay grain size

Description: - 7/4 Very pale brown, 7/6 Yellow
- moderate plasticity
- subrounded
- poorly sorted
- no reaction to HCl

Sample #: 90-602-33/S-150-4

Quartz:	85%	45% V. fine to medium grain size
Feldspar:	15%	40% Coarse to V. coarse grain size
Other:	<1%	10% Silt grain size 05% Clay grain size

Description: - 7/8 Yellow
- low to moderate plasticity
- subrounded
- very poorly sorted
- no reaction to HCl

Sample #: 90-602-33/S-150-6

Quartz:	67%	75% V. fine to medium grain size
Feldspar:	33%	15% Coarse to V. coarse grain size
Other:	<1%	08% Silt grain size 02% Clay grain size

Description: - 8/2 White, 8/2 Pinkish white, 8/3 Very pale brown
- moderate plasticity
- subrounded
- poorly sorted
- no reaction to HCl

Sample #: 90-602-33/S-200-2

Quartz:	65%	80% V. fine to medium grain size
Feldspar:	35%	15% Coarse to V. coarse grain size
Other:	<1%	04% Silt grain size 01% Clay grain size

Description:

- 7/4 Very pale brown
- low plasticity
- subangular to subrounded
- poorly to moderately sorted
- no reaction to HCl
- some muscovite flakes

Sample #: 90-602-33/S-200-4

Quartz:	67%	75% V. fine to medium grain size
Feldspar:	33%	15% Coarse to V. coarse grain size
Other:	<1%	07% Silt grain size 03% Clay grain size

Description:

- 7/6 Yellow
- moderate plasticity
- subangular to subrounded
- moderately to poorly sorted
- no reaction to HCl

Sample #: 90-602-33/36-50-2

Quartz:	70%	65% V. fine to medium grain size
Feldspar:	30%	20% Coarse to V. coarse grain size
Other:	<1%	10% Silt grain size 05% Clay grain size

Description:

- 8/6-7/6 Yellow, 8/4 Very pale brown
- moderate plasticity
- subrounded
- poorly sorted
- no reaction to HCl

Sample #: 90-602-33/36-50-4

Quartz:	65%	65% V. fine to medium grain size
Feldspar:	35%	25% Coarse to V. coarse grain size
Other:	<1%	08% Silt grain size 02% Clay grain size

Description:

- 7/4-8/4 Very pale brown
- moderate to low plasticity
- subrounded
- poorly sorted
- no reaction to HCl

Sample #: 90-602-33/36-100-2

Quartz:	70%	65% V. fine to medium grain size
Feldspar:	30%	25% Coarse to V. coarse grain size
Other:	<1%	07% Silt grain size 03% Clay grain size

Description:

- 7/6 Yellow
- low plasticity
- subangular to subrounded
- poorly sorted
- no reaction to HCl

Sample #: 90-602-33/36-100-4

Quartz:	67%	50% V. fine to medium grain size
Feldspar:	33%	40% Coarse to V. coarse grain size
Other:	<1%	08% Silt grain size 02% Clay grain size

Description:

- 7/6 Yellow
- moderate to low plasticity
- subangular
- very poorly sorted
- no reaction to HCl

Sample #: 90-602-33/36-150-2

Quartz:	67%	60% V. fine to medium grain size
Feldspar:	33%	20% Coarse to V. coarse grain size
Other:	<1%	12% Silt grain size 08% Clay grain size

Description:

- 7/6 Yellow, 7/4 Very pale brown
- moderate to high plasticity
- subrounded to subangular
- poorly to very poorly sorted
- no reaction to HCl

Sample #: 90-602-33/36-150-4

Quartz:	60%	70% V. fine to medium grain size
Feldspar:	40%	20% Coarse to V. coarse grain size
Other:	<1%	08% Silt grain size 02% Clay grain size

Description:

- 7/6-7/8 Yellow
- moderate plasticity
- subangular to subrounded
- poorly sorted
- no reaction to HCl

Sample #: 90-602-30.1-(3.5'-5.0')

Quartz:	72%	60% V. fine to medium grain size
Feldspar:	25%	35% Coarse to V. coarse grain size
Mica:	3%	03% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 8/1 White
- very low plasticity
- subrounded
- moderate to poorly sorted
- no reaction to HCl
- Mica is biotite

Sample #: 90-602-30.1-(8.5'-10.0')

Quartz:	53%	75% V. fine to medium grain size
Feldspar:	35%	20% Coarse to V. coarse grain size
Mica:	12%	04% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 6/6 Brownish yellow, 7/4 Pale yellow
- low plasticity
- subangular to subrounded
- moderate to well sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-602-30.1-(13.5'-15.0')

Quartz:	65%	65% V. fine to medium grain size
Feldspar:	20%	30% Coarse to V. coarse grain size
Mica:	15%	04% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 6/6 Olive yellow
- low plasticity
- subangular
- moderate to well sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-602-30.1-(18.5'-20.0')

Quartz:	50%	55% V. fine to medium grain size
Feldspar:	40%	35% Coarse to V. coarse grain size
Mica:	10%	08% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 6/6 Brownish yellow, 6/6 Olive yellow
- moderate to low plasticity
- subangular to subrounded
- moderate sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-602-30.1-(23.5'-25.0')

Quartz:	70%	90% V. fine to medium grain size
Feldspar:	10%	05% Coarse to V. coarse grain size
Mica:	20%	04% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 7/3 Pale yellow
- very low plasticity
- subangular
- well sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-602-30.1-(28.5'-30.0')

Quartz:	65%	75% V. fine to medium grain size
Feldspar:	10%	15% Coarse to V. coarse grain size
Mica:	25%	09% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 6/4 Light yellowish brown, 6/6 Olive yellow
- low plasticity
- angular
- moderate to well sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-602-30.1-(33.5'-35.0')

Quartz:	60%	80% V. fine to medium grain size
Feldspar:	20%	15% Coarse to V. coarse grain size
Mica:	20%	04% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 6/4 Light yellowish brown, 6/6 Olive yellow
- very low plasticity
- subangular to subrounded
- moderate sorted
- no reaction to HCl
- Mica mostly biotite
- Quartz and feldspar pebbles

Sample #: 90-602-33-(3.5'-5.0')

Quartz:	85%	70% V. fine to medium grain size
Feldspar:	14%	15% Coarse to V. coarse grain size
Mica:	1%	10% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 8/2 White, 8/4 Pale yellow
- moderate plasticity
- angular to subangular
- moderate sorted
- no reaction to HCl
- Mica is biotite

Sample #: 90-602-33-(8.5'-10.0')

Quartz:	55%	65% V. fine to medium grain size
Feldspar:	43%	15% Coarse to V. coarse grain size
Mica:	2%	15% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 8/4 Very pale brown, 8/6 Yellow
- moderate to high plasticity
- angular to subangular
- moderate to poorly sorted
- Slight reaction to HCl (?)
- Mica is biotite

Sample #: 90-602-33-(13.5'-15.0')

Quartz:	30%	70% V. fine to medium grain size
Feldspar:	65%	20% Coarse to V. coarse grain size
Mica:	5%	07% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 6/6-6/8 Brownish yellow
- moderately low plasticity
- subangular to subrounded
- moderate to poorly sorted
- no reaction to HCl
- Mica mostly muscovite

Sample #: 90-602-33-(18.5'-20.0')

Quartz:	30%	70% V. fine to medium grain size
Feldspar:	55%	15% Coarse to V. coarse grain size
Mica:	15%	10% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 6/6-6/8 Brownish yellow
- moderate plasticity
- subrounded to subangular
- moderate to poorly sorted
- no reaction to HCl
- Mica is about equally biotite/muscovite

Sample #: 90-602-33-(23.5'-25.0')

Quartz:	49%	65% V. fine to medium grain size
Feldspar:	50%	25% Coarse to V. coarse grain size
Mica:	1%	05% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 6/8 Brownish yellow
- moderately low plasticity
- subrounded
- moderate to poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-602-33-(28.5'-30.0')

Quartz:	70%	70% V. fine to medium grain size
Feldspar:	26%	20% Coarse to V. coarse grain size
Mica:	4%	07% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 6/6 Brownish yellow
- low plasticity
- subangular to subrounded
- moderate to poorly sorted
- no reaction to HCl
- Mica is dominantly biotite

Sample #: 90-602-33-(33.5'-35.0')

Quartz:	48%	65% V. fine to medium grain size
Feldspar:	50%	25% Coarse to V. coarse grain size
Mica:	2%	08% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 6/8 Brownish yellow
- moderately low plasticity
- angular to subangular
- poorly sorted
- no reaction to HCl
- Mica mostly biotite
- Quartz and feldspar pebbles

Sample #: 90-602-35-(3.5'-5.0')

Quartz:	45%	75% V. fine to medium grain size
Feldspar:	40%	05% Coarse to V. coarse grain size
Mica:	15%	15% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 7/6 Yellow
- moderate to high plasticity
- subrounded to subangular
- moderate to well sorted
- no reaction to HCl
- Mica is about equally biotite/muscovite

Sample #: 90-602-35-(8.5'-10.0')

Quartz:	33%	33% V. fine to medium grain size
Feldspar:	65%	65% Coarse to V. coarse grain size
Mica:	2%	02% Silt grain size
Other:	<1%	00% Clay grain size

Description:

- 8/3 Very pale brown
- no plasticity
- subrounded
- extremely poorly sorted
- no reaction to HCl
- Mica mostly muscovite

Sample #: 90-602-35-(13.5'-15.0')

Quartz:	40%	45% V. fine to medium grain size
Feldspar:	27%	50% Coarse to V. coarse grain size
Mica:	33%	04% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 7/2 Light grey, 6/4 Light yellowish brown
- low plasticity
- subrounded
- moderately poorly sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-602-35-(18.5'-20.0')

Quartz:	60%	70% V. fine to medium grain size
Feldspar:	25%	25% Coarse to V. coarse grain size
Mica:	15%	03% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 7/2 Light grey, 7/3 Very pale brown
- moderately low plasticity
- subangular
- moderately poorly sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-602-35-(23.5'-25.0')

Quartz:	50%	77% V. fine to medium grain size
Feldspar:	40%	15% Coarse to V. coarse grain size
Mica:	10%	06% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 7/4 Very pale brown
- low plasticity
- subrounded
- moderately poorly sorted
- no reaction to HCl
- Mica mostly muscovite

Sample #: 90-602-35-(28.5'-30.0')

Quartz:	60%	80% V. fine to medium grain size
Feldspar:	25%	10% Coarse to V. coarse grain size
Mica:	15%	07% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 6/8 Brownish yellow
- moderately low plasticity
- subrounded to rounded
- moderately well sorted
- no reaction to HCl
- Mica mostly muscovite

Sample #: 90-602-35-(33.5'-35.0')

Quartz:	60%	90% V. fine to medium grain size
Feldspar:	35%	03% Coarse to V. coarse grain size
Mica:	5%	04% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 6/8 Brownish yellow
- moderately low plasticity
- subrounded to subangular
- well sorted
- no reaction to HCl
- Mica predominantly muscovite

Sample #: 90-602-36-(3.5'-5.0')

Quartz:	85%	35% V. fine to medium grain size
Feldspar:	15%	60% Coarse to V. coarse grain size
Other:	<1%	04% Silt grain size
		01% Clay grain size

Description:

- 8/1 White
- low plasticity
- rounded
- poorly sorted
- no reaction to HCl

Sample #: 90-602-36-(8.5'-10.0')

Quartz:	68%	80% V. fine to medium grain size
Feldspar:	30%	10% Coarse to V. coarse grain size
Mica:	2%	05% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 6/8 Brownish yellow
- moderate to low plasticity
- subrounded
- moderately poorly sorted
- no reaction to HCl
- Mica is muscovite

Sample #: 90-602-36-(13.5'-15.0')

Quartz:	50%	35% V. fine to medium grain size
Feldspar:	49%	50% Coarse to V. coarse grain size
Mica:	1%	10% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 6/6 Brownish yellow
- moderately high plasticity
- subangular to subrounded
- moderately poorly sorted
- no reaction to HCl
- Mica is muscovite

Sample #: 90-602-36-(18.5'-20.0')

Quartz:	60%	70% V. fine to medium grain size
Feldspar:	25%	25% Coarse to V. coarse grain size
Mica:	15%	04% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 7/6 Yellow, 6/6 Brownish yellow
- low plasticity
- subangular to subrounded
- moderately poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-602-36-(23.5'-25.0')

Quartz:	65%	58% V. fine to medium grain size
Feldspar:	30%	40% Coarse to V. coarse grain size
Mica:	5%	02% Silt grain size
Other:	<1%	

Description:

- 7/6-8/6 Yellow
- very low plasticity
- subrounded
- poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-602-36-(28.5'-30.0')

Quartz:	70%	80% V. fine to medium grain size
Feldspar:	22%	10% Coarse to V. coarse grain size
Mica:	8%	08% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 7/4 Very pale brown
- low plasticity
- subangular to angular
- moderately sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-602-36-(32.5'-32.6')

Quartz:	85%	52% V. fine to medium grain size
Feldspar:	14%	40% Coarse to V. coarse grain size
Mica:	1%	06% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 8/3 Very pale brown
- low plasticity
- subangular to angular
- very poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-102-28B-(3.5'-5.0')

Quartz:	65%	80% V. fine to medium grain size
Feldspar:	25%	15% Coarse to V. coarse grain size
Mica:	10%	04% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 8/2 Pinkish white
- low plasticity
- subangular to subrounded
- moderately poorly sorted
- no reaction to HCl
- Mica predominantly biotite with chunks of granitic bedrock

Sample #: 90-102-28B-(8.5'-10.0')

Quartz:	65%	73% V. fine to medium grain size
Feldspar:	20%	20% Coarse to V. coarse grain size
Mica:	15%	05% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- N8/White, N7/Grey
- low plasticity
- subangular to subrounded
- poorly sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-102-28B-(13.5'-15.0')

Quartz:	45%	22% V. fine to medium grain size
Feldspar:	47%	75% Coarse to V. coarse grain size
Mica:	8%	02% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 8/6 Reddish yellow
- very low plasticity
- subangular
- moderate to poorly sorted
- no reaction to HCl
- Mica dominantly muscovite

Sample #: 90-102-28B-(18.5'-20.0')

Quartz:	80%	22% V. fine to medium grain size
Feldspar:	13%	75% Coarse to V. coarse grain size
Mica:	7%	02% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 8/1 White, 7/1 Light grey
- very low plasticity
- subangular
- moderately sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-102-28B-(23.5'-25.0')

Quartz:	61%	65% V. fine to medium grain size
Feldspar:	35%	25% Coarse to V. coarse grain size
Mica:	4%	07% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 8/1 White
- low plasticity
- subangular to subrounded
- moderately poorly sorted
- no reaction to HCl
- Mica equally biotite/muscovite

Sample #: 90-102-28B-(28.5'-30.0')

Quartz:	80%	70% V. fine to medium grain size
Feldspar:	15%	20% Coarse to V. coarse grain size
Mica:	5%	08% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 8/1 White
- low plasticity
- subangular
- moderately poorly sorted
- no reaction to HCl
- Mica equally biotite/muscovite

Sample #: 90-102-28B-(33.5'-35.0')

Quartz:	70%	20% V. fine to medium grain size
Feldspar:	22%	75% Coarse to V. coarse grain size
Mica:	8%	03% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 7/2 Pinkish grey
- very low plasticity
- subangular
- moderately poorly sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-102-28B-(38.5'-40.0')

Quartz:	65%	58% V. fine to medium grain size
Feldspar:	27%	35% Coarse to V. coarse grain size
Mica:	8%	05% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 8/1 White
- low plasticity
- subangular to angular
- very poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-102-28B-(43.5'-45.0')

Quartz:	80%	85% V. fine to medium grain size
Feldspar:	17%	10% Coarse to V. coarse grain size
Mica:	3%	04% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 8/1 White, 8/2 Pinkish white
- low plasticity
- subangular to angular
- moderately well sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-102-28B-(48.5'-50.0')

Quartz:	66%	55% V. fine to medium grain size
Feldspar:	26%	35% Coarse to V. coarse grain size
Mica:	8%	06% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 8/1 White, 7/1 Light grey
- low plasticity
- angular to subangular
- very poorly sorted
- no reaction to HCl
- Mica predominantly biotite

Sample #: 90-102-28B-(53.5'-53.6')

Quartz:	60%	79% V. fine to medium grain size
Feldspar:	30%	10% Coarse to V. coarse grain size
Mica:	10%	06% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 8/1 White
- moderately low plasticity
- subangular to angular
- moderately poorly sorted
- no reaction to HCl
- Mica predominantly biotite

Sample #: 90-102-39-(3.5'-5.0')

Quartz:	45%	65% V. fine to medium grain size
Feldspar:	50%	15% Coarse to V. coarse grain size
Mica:	5%	10% Silt grain size
Other:	<1%	10% Clay grain size

Description:

- 8/6 Reddish yellow
- moderately high plasticity
- subangular to angular
- moderately well sorted
- no reaction to HCl
- Mica predominantly muscovite

Sample #: 90-102-39-(8.5'-10.0')

Quartz:	75%	72% V. fine to medium grain size
Feldspar:	15%	20% Coarse to V. coarse grain size
Mica:	10%	06% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 8/2 Pinkish white, 7/2 Pinkish grey
- low plasticity
- subangular to subrounded
- moderately sorted
- no reaction to HCl
- Mica equally biotite/muscovite

Sample #: 90-102-39-(13.5'-15.0')

Quartz:	55%	78% V. fine to medium grain size
Feldspar:	35%	12% Coarse to V. coarse grain size
Mica:	10%	06% Silt grain size
Other:	<1%	04% Clay grain size

Description:

- 7/2 Pinkish grey
- moderately low plasticity
- subangular
- moderately sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-102-39-(18.5'-20.0')

Quartz:	70%	56% V. fine to medium grain size
Feldspar:	27%	30% Coarse to V. coarse grain size
Mica:	3%	03% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 8/4 Pink
- very low plasticity
- subangular
- moderately sorted
- no reaction to HCl
- Mica is biotite

Sample #: 90-102-39-(23.5'-25.0')

Quartz:	60%	90% V. fine to medium grain size
Feldspar:	30%	06% Coarse to V. coarse grain size
Mica:	10%	02% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 8/2 Pinkish white, 7/2 Pinkish grey
- low plasticity
- subangular
- well sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-102-39-(28.5'-30.0')

Quartz:	55%	50% V. fine to medium grain size
Feldspar:	40%	45% Coarse to V. coarse grain size
Mica:	5%	05% Silt grain size
Other:	<1%	

Description:

- 7/2 Pinkish grey
- no plasticity
- subrounded
- very poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-102-39-(33.5'-35.0')

Quartz:	65%	55% V. fine to medium grain size
Feldspar:	25%	35% Coarse to V. coarse grain size
Mica:	10%	07% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 7/2 Pinkish grey
- moderately low plasticity
- subrounded to subangular
- very poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-102-39-(38.5'-40.0')

Quartz:	65%	73% V. fine to medium grain size
Feldspar:	30%	20% Coarse to V. coarse grain size
Mica:	5%	05% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 8/2 Pinkish white, 8/4 Pink
- very low plasticity
- angular to subangular
- poorly sorted
- no reaction to HCl
- Mica equally biotite/muscovite

Sample #: 90-R1-(3.5'-5.0')

Quartz:	70%	40% V. fine to medium grain size
Feldspar:	20%	55% Coarse to V. coarse grain size
Mica:	10%	04% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 8/3 Pink
- very low plasticity
- angular
- very poorly sorted
- no reaction to HCl
- Mica predominantly biotite with chunks of granitic bedrock

Sample #: 90-R1-(8.5'-10.0')

Quartz:	55%	30% V. fine to medium grain size
Feldspar:	38%	60% Coarse to V. coarse grain size
Mica:	8%	09% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 7/2 Pinkish grey, 7/3 Pink
- very low plasticity
- angular to subangular
- very poorly sorted
- no reaction to HCl
- Mica dominantly biotite with chunks of granitic bedrock

Sample #: 90-R2-(3.5'-5.0')

Quartz:	35%	75% V. fine to medium grain size
Feldspar:	50%	15% Coarse to V. coarse grain size
Mica:	15%	06% Silt grain size
Other:	<1%	04% Clay grain size

Description:

- 8/2 Pinkish white
- moderately low plasticity
- subangular to subrounded
- moderately well sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-R2-(8.5'-10.0')

Quartz:	47%	60% V. fine to medium grain size
Feldspar:	45%	25% Coarse to V. coarse grain size
Mica:	8%	10% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 7/8 Reddish yellow
- moderate to low plasticity
- subangular
- moderately poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-R2-(13.5'-15.0')

Quartz:	50%	50% V. fine to medium grain size
Feldspar:	35%	40% Coarse to V. coarse grain size
Mica:	15%	08% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 8/4 Pale yellow
- moderately low plasticity
- subangular to angular
- very poorly sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-R2-(18.5'-20.0')

Quartz:	60%	68% V. fine to medium grain size
Feldspar:	42%	20% Coarse to V. coarse grain size
Mica:	8%	08% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 8/4 Pale yellow
- moderate to low plasticity
- subangular to subrounded
- moderately poorly sorted
- no reaction to HCl
- Mica predominantly biotite

Sample #: 90-R2-(23.5'-25.0')

Quartz:	65%	85% V. fine to medium grain size
Feldspar:	13%	08% Coarse to V. coarse grain size
Mica:	22%	05% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 7/6 Yellow
- moderately low plasticity
- subangular
- well sorted
- no reaction to HCl
- Mica dominantly biotite

Sample #: 90-R2-(28.5'-30.0')

Quartz:	77%	75% V. fine to medium grain size
Feldspar:	20%	15% Coarse to V. coarse grain size
Mica:	3%	06% Silt grain size
Other:	<1%	04% Clay grain size

Description:

- 7/8 Yellow
- moderate to low plasticity
- subrounded
- well sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-R3-(3.5'-5.0')

Quartz:	55%	70% V. fine to medium grain size
Feldspar:	40%	18% Coarse to V. coarse grain size
Mica:	5%	07% Silt grain size
Other:	<1%	05% Clay grain size

Description:

- 8/4 Very pale brown, 8/6 Yellow
- moderate to low plasticity
- subrounded to subangular
- poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-R3-(8.5'-10.0')

Quartz:	57%	80% V. fine to medium grain size
Feldspar:	40%	13% Coarse to V. coarse grain size
Mica:	3%	06% Silt grain size
Other:	<1%	01% Clay grain size

Description:

- 8/3 Pink, 8/6 Reddish yellow
- very low plasticity
- subangular
- moderate to well sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-R3-(13.5'-15.0')

Quartz:	70%	50% V. fine to medium grain size
Feldspar:	20%	40% Coarse to V. coarse grain size
Mica:	10%	07% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 7/8 Reddish yellow
- low plasticity
- subangular
- poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-R3-(18.5'-20.0')

Quartz:	70%	20% V. fine to medium grain size
Feldspar:	18%	70% Coarse to V. coarse grain size
Mica:	12%	08% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 8/2 Pinkish white
- low plasticity
- subangular
- moderate to poorly sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-R3-(23.5'-25.0')

Quartz:	25%	75% V. fine to medium grain size
Feldspar:	70%	02% Coarse to V. coarse grain size
Mica:	5%	25% Silt grain size
Other:	<1%	08% Clay grain size

Description:

- 4/6 Strong brown
- moderate to high plasticity
- subangular
- well sorted
- no reaction to HCl
- Mica mostly biotite

Sample #: 90-R4-(3.5'-5.0')

Quartz:	40%	78% V. fine to medium grain size
Feldspar:	45%	15% Coarse to V. coarse grain size
Mica:	15%	05% Silt grain size
Other:	<1%	02% Clay grain size

Description:

- 7/3 Very pale brown
- low plasticity
- subangular
- moderately sorted
- no reaction to HCl
- Mica mostly muscovite

Sample #: 90-R4-(8.5'-10.0')

Quartz:	75%	90% V. fine to medium grain size
Feldspar:	17%	01% Coarse to V. coarse grain size
Mica:	8%	06% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 6/4 Light yellowish brown
- moderately low plasticity
- subrounded
- extremely well sorted
- no reaction to HCl
- Mica equally biotite/muscovite

Sample #: 90-R4-(13.5'-15.0')

Quartz:	60%	85% V. fine to medium grain size
Feldspar:	20%	04% Coarse to V. coarse grain size
Mica:	20%	07% Silt grain size
Other:	<1%	04% Clay grain size

Description:

- 6/4 Light yellowish brown
- moderately low plasticity
- subrounded
- well sorted
- no reaction to HCl
- Mica predominantly biotite

Sample #: 90-R4-(18.5'-20.0')

Quartz:	60%	75% V. fine to medium grain size
Feldspar:	32%	10% Coarse to V. coarse grain size
Mica:	8%	12% Silt grain size
Other:	<1%	03% Clay grain size

Description:

- 7/6 Yellow
- moderately low plasticity
- subrounded to subangular
- moderately well sorted
- no reaction to HCl
- Mica predominantly biotite

APPENDIX II

Drillers' Logs

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Knightsdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)
2. OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590
Raleigh NC 27602
 (Street or Route No.) City or Town State Zip Code
3. DATE DRILLED 8/15/90 USE OF WELL Monitoring
4. TOTAL DEPTH 35.0 CUTTINGS COLLECTED Yes No
5. DOES WELL REPLACE EXISTING WELL? Yes No
6. STATIC WATER LEVEL: 14.0 FT. above TOP OF CASING,
 below TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST None
 WATER ZONES (depth): 12.0
9. CHLORINATION: Type N/A Amount N/A

County: Wake

Depth	DRILLING LOG
From To	Formation Description
0.0 - 0.6	Topsoil
0.6 - 6.5	Gray Yellow Fine Sandy Silty Clay
6.5 - 12.0	Gray Yellow Slightly Fine Sandy Clayed Silt
12.0 - 35.0	Gray Yellow Fine to Medium Silty Sand
35.0	Boring Terminated

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>31.0</u> Ft.	<u>2"</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>27.0</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>27.0</u> To <u>29.0</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>31.0</u> To <u>33.0</u> Ft.	<u>2"</u>	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____
From _____ To _____ Ft.	_____	_____	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>29.0</u> To <u>35.0</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to #30

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads or other map reference points)

SEE ATTACHED MAP
 FIELD 602
 WELL# 30A

FOR OFFICE USE ONLY	
Quad. No. _____	Serial No. _____
Lat. _____	Long. _____
Minor Basin _____	Pc _____
Basin Code _____	
Header Ent. _____	GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Knightdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)

County: Wake

2. OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590
Raleigh (Street or Route No.) NC 27602
 City or Town State Zip Code

Depth		DRILLING LOG
From	To	Formation Description
0.0	0.5	Topsoil
0.5	6.0	Yellow Gray Fine Sandy Si Clay
6.0	12.0	Orange Gray Slightly Sand Clayey Silt
12.0	27.0	Orange Fine to Medium Sand Silt
27.0		Boring Terminated

3. DATE DRILLED 8/13/90 USE OF WELL Monitoring

4. TOTAL DEPTH 27.0 CUTTINGS COLLECTED Yes No

5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: _____ FT. above TOP OF CASING.
 below TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.

YIELD (gpm): N/A METHOD OF TEST None

8. WATER ZONES (depth): _____

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>22.0</u> Ft.	<u>3"</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>18.0</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>18.0</u> To <u>20.0</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>22.0</u> To <u>27.0</u> Ft.	<u>3"</u>	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____
From _____ To _____ Ft.	_____	_____	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>20.0</u> To <u>27.0</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to Well #33

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Road or other map reference points)

SEE ATTACHED MAP
 FIELD 602
 WELL# 32

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Knightsdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)

County: Wake

2. OWNER City of Raleigh (Neuse Wastewater Plant)

ADDRESS P.O. Box 590
Raleigh (Street or Route No.) NC 27602
 City or Town State Zip Code

Depth		DRILLING LOG
From	To	Formation Description
0.0	0.5	Topsoil
0.5	6.0	Yellow Gray Fine Sandy
		Silty Clay
6.0	12.0	Orange Gray Slightly Sandy
		Clayey Silt
12.0	35.0	Orange Fine to Medium
		Sand - Silt
35.0		Boring Terminated

3. DATE DRILLED 8/13/90 USE OF WELL Monitoring

4. TOTAL DEPTH 35.0 CUTTINGS COLLECTED Yes No

5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: _____ FT. above TOP OF CASING.
 below TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.

7. FLD (gpm): N/A METHOD OF TEST None

8. WATER ZONES (depth): _____

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>33.0</u> Ft.	<u>2"</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED MAP
 FIELD 602
 WELL# 33

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>29.0</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>29.0</u> To <u>31.0</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>33.0</u> To <u>35.0</u> Ft.	<u>2</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>31.0</u> To <u>35.0</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to 32

FOR OFFICE USE ONLY	
Quad. No. _____	Serial No. _____
Lat. _____	Long. _____ Pc _____
Minor Basin _____	
Basin Code _____	
Header Ent. _____	GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Knightdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)

County: Wake

2. OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590

Depth	DRILLING LOG
From To	Formation Description
0.0 - 0.6	Topsoil
0.6 - 6.0	Gray Yellow Orange
6.0 - 12.0	Slightly Sandy Silty Clay
	Gray Yellow Fine to Medium
	Sandy Silty Clay
12.0 - 25.0	Yellow Gray Fine to Medium
	Silty Sand
25.0	Boring Terminated

Raleigh NC 27602
 (Street or Route No.)
 City or Town State Zip Code

3. DATE DRILLED 8/14/90 USE OF WELL Monitoring

4. TOTAL DEPTH 25.0 CUTTINGS COLLECTED Yes No

5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: 18.5 FT. above TOP OF CASING.
 below
 TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.

YLD (gpm): N/A METHOD OF TEST None

8. WATER ZONES (depth): 16.5

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>17.0</u> Ft.	<u>3</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>13.0</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>13.0</u> To <u>15.0</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>17.0</u> To <u>22.0</u> Ft.	<u>3</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>15.0</u> To <u>25.0</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to #35

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED MAP
 FIELD 602
 WELL# 34

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Knightsdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)
2. OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590
Raleigh NC 27602
 (Street or Route No.)
 City or Town State Zip Code
3. DATE DRILLED 8/14/90 USE OF WELL Monitoring
4. TOTAL DEPTH 35.0 CUTTINGS COLLECTED Yes No
5. DOES WELL REPLACE EXISTING WELL? Yes No
6. STATIC WATER LEVEL: 18.5 FT. above TOP OF CASING,
 below TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
 FLD (gpm): N/A METHOD OF TEST None
8. WATER ZONES (depth): 16.5
9. CHLORINATION: Type N/A Amount N/A

Depth		DRILLING LOG
From	To	Formation Description
0.0	0.6	Topsoil
0.6	6.0	Gray Yellow Orange
6.0	12.0	Slightly Sandy Silty Clay
12.0	27.0	Gray Yellow Fine to Medium Sandy Silty Clay
27.0	35.0	Yellow Gray Fine to Medium Silty Sand
35.0		Orange Fine Sand Silt
		Boring Terminated

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads or other map reference points)

SEE ATTACHED MAP
 FIELD 602
 WELL# 35

10. CASING:
- | Depth | Diameter | Wall Thickness or Weight/Ft. | Material |
|-------------------------------------|-----------|------------------------------|--------------|
| From <u>+2.0</u> To <u>3.0</u> Ft. | <u>4"</u> | <u>.125"</u> | <u>Steel</u> |
| From <u>+2.0</u> To <u>33.0</u> Ft. | <u>2"</u> | <u>Sch40</u> | <u>PVC</u> |
| From _____ To _____ Ft. | _____ | _____ | _____ |
11. GROUT:
- | Depth | Material | Method |
|-------------------------------------|------------------|----------------|
| From <u>0.0</u> To <u>29.0</u> Ft. | <u>Cement</u> | <u>Tremie</u> |
| From <u>29.0</u> To <u>31.0</u> Ft. | <u>Bentonite</u> | <u>Pellets</u> |
12. SCREEN:
- | Depth | Diameter | Slot Size | Material |
|-------------------------------------|--------------|-----------------|------------|
| From <u>33.0</u> To <u>35.0</u> Ft. | <u>2</u> in. | <u>.010</u> in. | <u>PVC</u> |
| From _____ To _____ Ft. | _____ in. | _____ in. | _____ |
| From _____ To _____ Ft. | _____ in. | _____ in. | _____ |
13. GRAVEL PACK:
- | Depth | Size | Material |
|-------------------------------------|-------------|-------------|
| From <u>31.0</u> To <u>35.0</u> Ft. | <u>Fine</u> | <u>Sand</u> |
| From _____ To _____ Ft. | _____ | _____ |
14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to #34

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Knightdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)

County: Wake

2. OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590

Depth		DRILLING LOG
From	To	Formation Description
0.0-0.6		Topsoil
0.6-6.0		Tan fine to medium silty
		Sand
6.0-12.0		Orange gray fine sandv silty clay
12.0-21.0		Red orange silty fine sa
21.0-23.5		Red orange silty sand wi weathered rock lenses
23.5		Boring terminated

(Street or Route No.)
Raleigh NC 27602
 City or Town State Zip Code

3. DATE DRILLED 8-16-90 USE OF WELL Monitoring

4. TOTAL DEPTH 23.5 CUTTINGS COLLECTED Yes No

5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: 15.6 FT. above TOP OF CASING,
 below
 TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): N/A METHOD OF TEST None

8. WATER ZONES (depth): 13.6

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>18.5</u> Ft.	<u>3"</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

If additional space is needed use back of form.

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>14.5</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>14.5</u> To <u>16.5</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>18.5</u> To <u>23.5</u> Ft.	<u>3</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>16.5</u> To <u>23.5</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to #37

LOCATION SKETCH

(Show direction and distance from at least two State Roads or other map reference points)

SEE ATTACHED MAP
 Field 602
 WELL# 36

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc. _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Knightsdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)

County: Wake

2. OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590
Raleigh NC 27602
 (Street or Route No.)
 City or Town State Zip Code

Depth	DRILLING LOG
From To	Formation Description
0.0 - 0.6'	Topsoil
0.6' - 6.0'	Tan fine to Medium Silty
6.0 - 12.0'	Orange Gray Fine Sandy
	Silty Clay
12.0 - 21.0'	Red Orange Silty
	Fine Sand
21.0 - 31.0	Red Orange Silty Sand wit
	Weathered Rock Lenses
31.0 - 32.6	Red-Gray Weathered Rock
32.6	Auger Refused

3. DATE DRILLED 8/16/90 USE OF WELL Monitoring

4. TOTAL DEPTH 32.6 CUTTINGS COLLECTED Yes No

5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: 15.6 FT. above TOP OF CASING.
 below TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): N/A METHOD OF TEST None
 WATER ZONES (depth): 13.6

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>30.5</u> Ft.	<u>2"</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Road or other map reference points)

SEE ATTACHED MAP
 FIELD 602
 WELL# 37

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>26.5</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>26.5</u> To <u>28.5</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>30.5</u> To <u>32.5</u> Ft.	<u>2</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>28.5</u> To <u>32.6</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to Well #36

MW - Moore Farm Area Field 602

WELL CONSTRUCTION RECORD

FOR OFFICE USE ONLY	
Quad. No. _____	Serial No. _____
Lat. _____	Long. _____ Pc _____
Minor Basin _____	
Basin Code _____	
Header Ent. _____	GW-1 Ent. _____

DRILLING CONTRACTOR Law Engineering
 DRILLER REGISTRATION NUMBER 332

STATE WELL CONSTRUCTION
 PERMIT NUMBER: 91-0834-WM-0444

WELL LOCATION: (Show sketch of the location below)

Nearest Town: Raleigh, North Carolina
8500 Battle Bridge Road/Neuse Waste Treatment Plant
 (Road, Community, or Subdivision and Lot No.)

County: Wake

OWNER City of Raleigh/Neuse Waste Treatment Plant
 ADDRESS P. O. Box 590
Raleigh (Street or Route No.) NC 27602-0590
 City or Town State Zip Code

Depth		DRILLING LOG Formation Description
From	To	
0	10'	Tan Sandy Silt
10'	30'	Tan Sandy Silt

DATE DRILLED 04/15/92 USE OF WELL Monitoring
 TOTAL DEPTH 30.0' CUTTINGS COLLECTED Yes No
 DOES WELL REPLACE EXISTING WELL? Yes No
 STATIC WATER LEVEL: _____ FT. above TOP OF CASING,
 below TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE.
 YIELD (gpm): _____ METHOD OF TEST _____
 WATER ZONES (depth): 20' - 30'

CHLORINATION: Type _____ Amount _____

0. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>± 2.5</u> To <u>20'</u>	Fl. <u>2"</u>	<u>sch40</u>	<u>PVC</u>
From _____ To _____	Fl. _____	_____	_____
From _____ To _____	Fl. _____	_____	_____

1. GROUT:

Depth	Material	Method
From <u>0</u> To <u>17'</u>	Fl. <u>Portland I</u>	<u>tremie</u>
From <u>17'</u> To <u>18'</u>	Fl. <u>Bentonite Pellets</u>	_____

2. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>20'</u> To <u>30'</u>	Fl. <u>2.0 in.</u>	<u>.010 in.</u>	<u>PVC</u>
From _____ To _____	Fl. _____	in. _____	_____
From _____ To _____	Fl. _____	in. _____	_____

3. GRAVEL PACK:

Depth	Size	Material
From <u>18'</u> To <u>30'</u>	Fl. <u>Medium</u>	<u>torpedo</u>
From _____ To _____	Fl. _____	_____

14. REMARKS: Well installed using 8" diameter hollow stem augers.

If additional space is needed use back of form.
LOCATION SKETCH
 (Show direction and distance from at least two State Roads, or other map reference points)

Map Attached
 Well 641

MW642

WELL CONSTRUCTION RECORD

FIELD LOG

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

DRILLING CONTRACTOR Law Engineering
 DRILLER REGISTRATION NUMBER 332

STATE WELL CONSTRUCTION
 PERMIT NUMBER: 91-0834-WM-0444

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Raleigh, North Carolina
8500 Battle Bridge Rd./Neuse Waste Treatment Plant
 (Road, Community, or Subdivision and Lot No.)
2. OWNER City of Raleigh/Neuse Waste Treatment Plant
 ADDRESS P.O. Box 590
Raleigh NC 27602-0590
 (Street or Route No.)
 City or Town State Zip Code
3. DATE DRILLED 04/20/93 USE OF WELL Monitoring
4. TOTAL DEPTH 14' CUTTINGS COLLECTED Yes No
5. DOES WELL REPLACE EXISTING WELL? Yes No
6. STATIC WATER LEVEL: 9.2 FT. above TOP OF CASING.
3 FT. below TOP OF CASING IS _____ FT. ABOVE LAND SURFACE.
7. LD (gpm): _____ METHOD OF TEST _____
8. WATER ZONES (depth): 12' - 14'

County: Wake

Depth		DRILLING LOG Formation Description
From	To	

9. CHLORINATION: Type _____ Amount _____
10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+3</u> To <u>12'</u> Ft.	<u>2"</u>	<u>sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____
From _____ To _____ Ft.	_____	_____	_____

If additional space is needed use back of form.

LOCATION SKETCH
 (Show direction and distance from at least two State Road or other map reference points)

11. GROUT:

Depth	Material	Method
From <u>0</u> To <u>8</u> Ft.	<u>Portland 1</u>	<u>tremie</u>
From <u>8</u> To <u>10</u> Ft.	<u>Benonite</u>	<u>Pellerts</u>

MAP ATTACHED

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>12</u> To <u>14</u> Ft.	<u>2</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>10'</u> To <u>14'</u> Ft.	<u>Medium</u>	<u>Torpedo</u>
From _____ To _____ Ft.	_____	_____

14 REMARKS: Well installed using 8" diameter hollow stem augers

City of Raleigh
NRWWTP Monitoring Well
Installation Report

DATE Feb. 12, 1991 ASSIGNED WELL NO. P14
PERSONNEL Jones, Haven, Chappell LOCATION: NW of Wells 36 & 37
Field 602, edge of stream
TOTAL DEPTH AUGERED: 52"
SCREEN LENGTH: 1 ft casing 2½ ft SCREEN DIA.: 2"; 0.010 slots
CASING DIAMETER: 2"; Sched. 40 PVC
NUMBER OF CASING LENGTHS INSTALLED: 2 ft 2
5 ft _____
10 ft _____
CASING LENGTH ABOVE GROUND LEVEL (STICKUP) 13"

RECAPITULATION SKETCH OF WELL CASING AND SCREEN INSTALLATION

Diagram: Casing Log (Show sand pack and bentonite seal)

For Lithology
See P-12

TOTAL LENGTH BELOW SURFACE: SCREEN 35" + CASING 17 = 52"
Total length below ground + Stickup 13" = Total Casing 65"
SAND PACK: FROM 52 TO 28
BENTONITE SEAL FROM 28 TO 16" TYPE: Pellets
BACKFILL FROM 16" TO Surface

Description of backfill: Natural sand and bentonite powder

OTHER COMMENTS

- Plug tip to 1st slot scr = 8"
- Plug tip to top slot scr = 21"
- Plug tip to scr jt = 35"

City of Raleigh
NRWWTP Monitoring Well
Installation Report

DATE Feb 12, 1991 ASSIGNED WELL NO. P-13
PERSONNEL Jones, Haven, Chappell LOCATION: NW of Wells 36 & 37
Field 602; edge of stream
TOTAL DEPTH AUGERED: 97"
SCREEN LENGTH: 1 ft 2½' csg SCREEN DIA.: 2"; .010 slots
CASING DIAMETER: 2" Sched. 40 PVC

NUMBER OF CASING LENGTHS INSTALLED: 2 ft 2
5 ft 1
10 ft

CASING LENGTH ABOVE GROUND LEVEL (STICKUP) 12"

RECAPITULATION SKETCH OF WELL CASING AND SCREEN INSTALLATION

Diagram: Casing Log (Show sand pack and bentonite seal)

TOTAL LENGTH BELOW SURFACE: SCREEN 35" + CASING 5' = 8 ft

Total length below ground + stickup 35½" = Total Casing 131½"

SAND PACK: FROM 96" TO 46" Nat. cavings, filter cloth on scr.

BENTONITE SEAL FROM 46" TO 34" TYPE: Pellets
BACKFILL FROM 34" TO surface

Description of backfill: Natural material & bentonite powder

OTHER COMMENTS

Plug tip to 1st slot = 8"
Plug tip to last slot = 22"
Plug tip to top scr jt = 35"

Drilled 45" with large auger
cased, and cont to 97"
with 2" aug.

City of Raleigh
NRWWTP Monitoring Well
Installation Report

DATE Feb. 12, 1991 ASSIGNED WELL NO. P11
PERSONNEL Welby, Haven, Jones LOCATION: Buffer at Field 602, 10'
Chappell from stream & SE of Wells 36 & 37
TOTAL DEPTH AUGERED: 69"

SCREEN LENGTH: 1 ft on 2½ csg SCREEN DIA.: 2"; .010 slots

CASING DIAMETER: 2"; sched. 40 PVC.

NUMBER OF CASING LENGTHS INSTALLED: 2 ft 2
~~5 ft~~ Screen = 35"
10 ft _____

CASING LENGTH ABOVE GROUND LEVEL (STICKUP) _____

RECAPITULATION SKETCH OF WELL CASING AND SCREEN INSTALLATION

Diagram: Casing Log (Show sand pack and bentonite seal)

See P10 log for lithology.

TOTAL LENGTH BELOW SURFACE: SCREEN 35" - CASING 24' = 4' 11" (5ft)

Total length below ground + Stickup 34" = Total Casing 7' 11"

SAND PACK: FROM _____ TO Filter Cloth

BENTONITE SEAL FROM 33" TO 24" TYPE: Pellets

BACKFILL FROM 24" TO Surface

Description of backfill: Natural material mixed with bentonite powder

OTHER COMMENTS

Plug tip to 1st screen cut = 8"
Plug tip to top screen cut = 21"
Plug tip to top screen joint = 35"

City of Raleigh
NRWWTP Monitoring Well
Installation Report

DATE 2/12/91 _____ ASSIGNED WELL NO. P 10 _____

PERSONNEL Welby, Jones, Haven, Chappell LOCATION: Buffer at Field 602, 10' from stream and SE of Wells 36 & 37.

TOTAL DEPTH AUGERED: 8 1/2 ft _____

SCREEN LENGTH: 1 ft: on 2 1/2' casing SCREEN DIA.: 2"; .010 slots

CASING DIAMETER: 2" sched 40 PVC _____

NUMBER OF CASING LENGTHS INSTALLED: 2 ft 2 1/2 with screen - 1

5 ft 1 _____

10 ft _____

CASING LENGTH ABOVE GROUND LEVEL (STICKUP) 15" _____

RECAPITULATION SKETCH OF WELL CASING AND SCREEN INSTALLATION

Diagram: Casing Log (Show sand pack and bentonite seal)

TOTAL LENGTH BELOW SURFACE: SCREEN 35" + CASING 3' 10" = 6' 9"

Total length below ground + Stickup 15" = Total Casing 8 ft

SAND PACK: FROM 6' TO 5'

BENTONITE SEAL FROM 5' TO 4' TYPE: Bentonite pellets
BACKFILL FROM 4' TO surface

Description of backfill: Coarse silty sand mixed with bentonite powder

OTHER COMMENTS

Plug tip to 1st screen cut = 8"

Caving

Plug tip to Top screen cut = 21"

Plug tip to Top screen jt = 35"

City of Raleigh
NRWWTP Monitoring Well
Installation Report

DATE 2/18/91

ASSIGNED WELL NO. P 8

PERSONNEL Welby, Jones, Haven

LOCATION: About 20 yds NW of Monitoring
Wells 30 & 30.1, in buffer
zone.

TOTAL DEPTH AUGERED: 4 1/2'

SCREEN LENGTH: 1' on 2 1/2' csg SCREEN DIA.: 2"; .010 slots

CASING DIAMETER: 2" schedule 40 PVC

NUMBER OF CASING LENGTHS INSTALLED: 2 ft Scr, Jt = 35" plug tip to top joint
1 2 ft. Jt
1 - 1 ft

CASING LENGTH ABOVE GROUND LEVEL (STICKUP)

RECAPITULATION SKETCH OF WELL CASING AND SCREEN INSTALLATION

Diagram: Casing Log (Show sand pack and bentonite seal)

For Lithology see P-7 log.

TOTAL LENGTH BELOW SURFACE: SCREEN 35" + CASING 14" = 49"

Total length below ground + Stickup 16" = Total Casing 5'5"

SAND PACK: FROM - TO - Filter Cloth

BENTONITE SEAL FROM 3'8" TO 32" below M.P. TYPE: Pellets
BACKFILL FROM 3 ft TO surface

Description of backfill: Natural material mixed with bentonite powder

OTHER COMMENTS

Plug tip to 1st slot = 7 1/2"

Plug tip to top slot = 21"

Plug tip to screen jt. = 35"

City of Raleigh
NRWWTP Monitoring Well
Installation Report

DATE Feb. 8, 1991 ASSIGNED WELL NO. P7
PERSONNEL Welby, Haven, Jones LOCATION: About 20 yds NW of Monitoring Wells 30 & 30.1, in buffer zone.
TOTAL DEPTH AUGERED: _____
SCREEN LENGTH: 1' on 2½' casing SCREEN DIA.: 2" ; 0.010 slots
CASING DIAMETER: 2" sched. 40 PVC
NUMBER OF CASING LENGTHS INSTALLED: 2 ft 1 Screen Joint = 35" plug point to top of joint
5 ft 1
10 ft _____

CASING LENGTH ABOVE GROUND LEVEL (STICKUP) _____
RECAPITULATION SKETCH OF WELL CASING AND SCREEN INSTALLATION

Diagram: Casing Log (Show sand pack and bentonite seal)

TOTAL LENGTH BELOW SURFACE: SCREEN 35" + CASING _____ = _____
Total length below ground + Stickup 8" = Total Casing 7' 11"
SAND PACK: FROM _____ TO _____ Filter Cloth
BENTONITE SEAL FROM 4' 11" TO 4' 11" TYPE: Bentonite Pellets
BACKFILL FROM 3' 3" TO Surface

Description of backfill: Natural material mixed with bentonite powder

OTHER COMMENTS
Plug tip to 1st slot = 7½"
Plug tip to top slot = 21"
Plug tip to top screen casing = 35"

City of Raleigh
NRWWTP Monitoring Well
Installation Report

DATE Feb. 8, 1991

ASSIGNED WELL NO. P5

PERSONNEL Welby, Haven, Jones

LOCATION: Vegetative buffer at base of
Field 602; 20 yds. NW of Stream Sampling
Sta. PSTM, 50 yds upstm from wells 30 &
30.1

TOTAL DEPTH AUGERED: _____

SCREEN LENGTH: 1' on 2½ csg SCREEN DIA.: 2"

Plug tip to top slots = 2½"

CASING DIAMETER: _____

NUMBER OF CASING LENGTHS INSTALLED: 2 ft 1 2½' with 1' of slots

5 ft 1

10 ft _____

CASING LENGTH ABOVE GROUND LEVEL (STICKUP) _____

RECAPITULATION SKETCH OF WELL CASING AND SCREEN INSTALLATION

Diagram: Casing Log (Show sand pack and bentonite seal)

See P4 for lithology

TOTAL LENGTH BELOW SURFACE: SCREEN _____ + CASING _____ = _____

Total length below ground + Stickup _____ = Total Casing _____

SAND PACK: FROM _____ TO _____

BENTONITE SEAL FROM _____ TO _____ TYPE: _____

BACKFILL FROM _____ TO _____

Description of backfill:

OTHER COMMENTS

Plug tip to 1st slot = 8"

City of Raleigh
NRWWTP Monitoring Well
Installation Report

DATE Feb 8, 1991 ASSIGNED WELL NO. P4

PERSONNEL Welby, Jones, Haven LOCATION: Vegetative buffer at base of
Field 602, 20 yds NW of
stream sampling station PSTM

TOTAL DEPTH AUGERED: 77½"

SCREEN LENGTH: 1'+Plug=18" SCREEN DIA.: 2" PVC
to top screen

CASING DIAMETER: -----

NUMBER OF CASING LENGTHS INSTALLED: 2 ft -----

5 ft 1

10 ft -----

CASING LENGTH ABOVE GROUND LEVEL (STICKUP) -----

RECAPITULATION SKETCH OF WELL CASING AND SCREEN INSTALLATION

Diagram: Casing Log (Show sand pack and bentonite seal)

TOTAL LENGTH BELOW SURFACE: SCREEN 35" + CASING 4 ft = 83"

Total length below ground + Stickup 28½ = Total Casing 111½ in

SAND PACK: FROM 65 TO 59 Bel. MP

BENTONITE SEAL FROM 59 TO 44 Bel. MP + TYPE: Bentonite Pellet
BACKFILL FROM 44 TO Surface

Description of backfill: Natural material & bentonite powder

Tip plug to top screen = 18"

Tip plug to top cut = 17 3/4

OTHER COMMENTS

City of Raleigh
NRWWTP Monitoring Well
Installation Report

DATE 2/2/91

ASSIGNED WELL NO. P 2

PERSONNEL Welby, Chappell

LOCATION: Field 602 in vegetative buffer
along stream about midway along
base of Field 602 at stream
sampling station NSTM

TOTAL DEPTH AUGERED: _____

SCREEN LENGTH: 1' + plug = 17 3/4" SCREEN DIA.: 2"; slots = 0.10 in

CASING DIAMETER: 2" schedule 40 PVC

NUMBER OF CASING LENGTHS INSTALLED: 2 ft _____

5 ft 1

10 ft _____

CASING LENGTH ABOVE GROUND LEVEL (STICKUP) 16"

RECAPITULATION SKETCH OF WELL CASING AND SCREEN INSTALLATION

Diagram: Casing Log (Show sand pack and bentonite seal)

See PI Log for lithology.

TOTAL LENGTH BELOW SURFACE: SCREEN 17 3/4" + CASING 3' 8" = 5' 1 3/4"

Total length below ground + Stickup 16" = Total Casing 6' 5 3/4"

SAND PACK: FROM 5' 9" TO 4' 10 1/2" below M.Pt.

BENTONITE SEAL FROM 4' 10 1/2" TO 4' 2 3/4" TYPE: Bentonite Pellets
BACKFILL FROM 4' 2 3/4" TO Surface

Description of backfill:
Natural

OTHER COMMENTS

Tip plug to first slot = 8"

Tip plug to last slot = 17 1/2"

Tip plug to screen joint = 17 3/4"

Ground surface approximately
4 feet above stream bottom.

City of Raleigh
NRWWTP Monitoring Well
Installation Report

DATE 2/2/91 ASSIGNED WELL NO. PI

PERSONNEL Welby, Chappell LOCATION: Field 602 in vegative buffer

TOTAL DEPTH AUGERED: 7' 2" along stream; about midway
Stream Sampling Station NSTM.

SCREEN LENGTH: 1' + plug=18' SCREEN DIA.: 2"
Slots = 0.010 in

CASING DIAMETER: 2" schedule 40 PVC

NUMBER OF CASING LENGTHS INSTALLED: 2 ft 1
5 ft 1
10 ft _____

CASING LENGTH ABOVE GROUND LEVEL (STICKUP) 2 ft

RECAPITULATION SKETCH OF WELL CASING AND SCREEN INSTALLATION

Diagram: Casing Log (Show sand pack and bentonite seal)

TOTAL LENGTH BELOW SURFACE: SCREEN+Plug 18" CASING 5' 4 1/2" 6' 10 1/2"

Total length below ground + Stickup 6' 10 1/2" Total Casing 8' 10 1/2"

SAND PACK: FROM 7' 7 1/2" TO 6' 11"

BENTONITE SEAL FROM 6' 11" TO 6' 1 1/2" TYPE: Pellets
BACKFILL FROM 6' 1 1/2" TO Surface

Description of backfill:

Natural Material

OTHER COMMENTS

Base plug to first slot = 8"

Last Slot = 17 1/4" above plug tip

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Knightdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)
2. OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590
Raleigh NC 27602
 (Street or Route No.)
 City or Town State Zip Code
3. DATE DRILLED 8/23/90 USE OF WELL Monitoring
4. TOTAL DEPTH 23.5 CUTTINGS COLLECTED Yes No
5. DOES WELL REPLACE EXISTING WELL? Yes No
6. STATIC WATER LEVEL: 21.2 FT. above TOP OF CASING.
 below TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST None
8. WATER ZONES (depth): 19.2
9. CHLORINATION: Type N/A Amount N/A

County: Wake

Depth	DRILLING LOG
From To	Formation Description
0.0 - 0.6	Tan Gray Sandy Silt (topsoil)
0.6 - 6.5	Gray Yellow Orange Sandy
6.5 - 12.0	Silty Clay
12.0 - 17.0	Gray Yellow Fine to Medium Silty Sand
17.0 - 22.0	Gray Fine to Medium Silty Sand
22.0 - 23.5	Orange with Gray Silty Sand with weathered rock lenses
23.5	Gray weathered rock
	Boring Terminated

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED MAP
 FIELD 102
 WELL# 40

10. CASING:
- | Depth | Diameter | Wall Thickness or Weight/Ft. | Material |
|-------------------------------------|-----------|------------------------------|--------------|
| From <u>+2.0</u> To <u>3.0</u> Ft. | <u>4"</u> | <u>.125"</u> | <u>Steel</u> |
| From <u>+2.0</u> To <u>18.0</u> Ft. | <u>2"</u> | <u>Sch40</u> | <u>PVC</u> |
| From _____ To _____ Ft. | _____ | _____ | _____ |
11. GROUT:
- | Depth | Material | Method |
|-------------------------------------|------------------|----------------|
| From <u>0.0</u> To <u>14.0</u> Ft. | <u>Cement</u> | <u>Tremie</u> |
| From <u>14.0</u> To <u>16.0</u> Ft. | <u>Bentonite</u> | <u>Pellets</u> |
12. SCREEN:
- | Depth | Diameter | Slot Size | Material |
|-------------------------------------|--------------|-----------------|------------|
| From <u>18.0</u> To <u>23.0</u> Ft. | <u>2</u> in. | <u>.010</u> in. | <u>PVC</u> |
| From _____ To _____ Ft. | _____ in. | _____ in. | _____ |
| From _____ To _____ Ft. | _____ in. | _____ in. | _____ |
13. GRAVEL PACK:
- | Depth | Size | Material |
|-------------------------------------|-------------|-------------|
| From <u>16.0</u> To <u>23.5</u> Ft. | <u>Fine</u> | <u>Sand</u> |
| From _____ To _____ Ft. | _____ | _____ |

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to #38 & 39

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Walter O. Brantley

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Knightdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)

County: Wake

2. OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590

Raleigh (Street or Route No.)
NC 27602
 City or Town State Zip Code

Depth	DRILLING LOG
From 0.0 To 0.6	Tan Gray Sandy Silt (Topsoil)
0.6 - 6.5	Gray-Yellow-Orange Sandy Silty Clay
6.5 - 12.0	Gray Yellow Fine to Medium Silty Sand
12.0 - 17.0	Gray Fine to Medium Silty S
17.0 - 22.0	Orange with Gray Silty Sand with weathered rocklenses
22.0 - 40.5	Gray weathered rock
40.5	Auger Refusal

3. DATE DRILLED 8/25/90 USE OF WELL Monitoring

4. TOTAL DEPTH 40.5 CUTTINGS COLLECTED Yes No

5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: 21.2 FT. above below TOP OF CASING.
 TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): N/A METHOD OF TEST None

8. WATER ZONES (depth): 19.2

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>38.5</u> Ft.	<u>2"</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED MAP
 FIELD 102
 WELL# 39

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>34.5</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>34.5</u> To <u>36.5</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>38.5</u> To <u>40.5</u> Ft.	<u>2</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>36.5</u> To <u>40.5</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to #38 & 40

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Knightdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)

County: Wake

2. OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590

Depth	DRILLING LOG
From To	Formation Description
0.0 - 0.6	Tan-Gray Sandy Silt (Topsoil)
0.6 - 6.5	Gray-Yellow-Orange Sandy Silty Clay
6.5 - 12.0	Gray Yellow Fine to Medium Silty Sand
12.0 - 17.0	Gray Fine to Medium Silty Sand
17.0 - 22.0	Orange with Gray Silty Sand with Weathered Rock Lenses
22.0 - 30.5	Gray Weathered Rock
30.5	Boring Terminated

Raleigh (Street or Route No.) NC 27602
 City or Town State Zip Code

3. DATE DRILLED 8/25/90 USE OF WELL Monitoring

4. TOTAL DEPTH 30.5 CUTTINGS COLLECTED Yes No

5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: 21.2 FT. above TOP OF CASING.
 below TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.

7 LD (gpm): N/A METHOD OF TEST None

8. WATER ZONES (depth): 19.2

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>25.5</u> Ft.	<u>3"</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED MAP
 FIELD 102
 WELL# 38

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>21.5</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>21.5</u> To <u>23.5</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>25.5</u> To <u>30.5</u> Ft.	<u>3</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>23.5</u> To <u>30.5</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to #39 & 40

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Knightsdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)

County: Wake

2. OWNER City of Raleigh (Neuse Wastewater Plant)

ADDRESS P.O. Box 590
Raleigh NC 27602
 (Street or Route No.)
 City or Town State Zip Code

Depth		DRILLING LOG
From	To	Formation Description
0.0	0.3	Topsoil
0.3	2.5	Brown Gray Fine Silty Sand
2.5	12.0	Gray Weathered Rock
12.0	16.5	Red Orange Fine to Medium Silty Sand
16.5	22.5	Gray Weathered Rock
22.5	31.0	Gray-Yellow Fine to Medium Silty Sand
31.0	40.0	Gray-Yellow Weathered Rock (Hard Drilling)
40.0		Boring Terminated

3. DATE DRILLED 8/24/90 USE OF WELL Monitoring

4. TOTAL DEPTH 40.0 CUTTINGS COLLECTED Yes No

5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: 32.5 FT. above TOP OF CASING, below TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.

7. FLD (gpm): N/A METHOD OF TEST None

8. WATER ZONES (depth): 30.5

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>38.0</u> Ft.	<u>2"</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads or other map reference points)

SEE ATTACHED MAP
 FIELD 102
 WELL# 28C

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>34.0</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>34.0</u> To <u>36.0</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>38.0</u> To <u>40.0</u> Ft.	<u>2</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>36.0</u> To <u>40.0</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to 28A & B

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Knightsdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)

2. OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590
Raleigh NC 27602
 (Street or Route No.)
 City or Town State Zip Code

3. DATE DRILLED 8/21/90 USE OF WELL Monitoring

4. TOTAL DEPTH 53.6 CUTTINGS COLLECTED Yes No

5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: 32.5 FT. above TOP OF CASING,
 TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE. below

7. YIELD (gpm): N/A METHOD OF TEST None
 ATER ZONES (depth): 30.5

Depth		DRILLING LOG
From	To	Formation Description
0.0	0.3	Topsoil
0.3	2.5	Brn, Gray Fine Silty San
2.5	12.0	Gray Weathered Rock
12.0	16.5	Red Orange Fine to Mediu
		Silty Sand
16.5	22.5	Gray Weatherd Rock
22.5	31.0	Gray-Yellow Weathered
		Silty Sand
31.0	53.6	Gray-Yellow Weathered
		Rock (Hard Drilling)
53.6		Boring terminated

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>51.6</u> Ft.	<u>2"</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>47.5</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>47.5</u> To <u>49.5</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>51.6</u> To <u>53.6</u> Ft.	<u>2"</u>	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____
From _____ To _____ Ft.	_____	_____	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>49.5</u> To <u>53.6</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to #28A & C

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED MAP
 FIELD 102
 WELL# 28B

FOR OFFICE USE ONLY			
Quad. No.	_____	Serial No.	_____
Lat.	_____	Long.	_____ Pc _____
Minor Basin	_____		
Basin Code	_____		
Header Ent.	_____	GW-1 Ent.	_____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Westinghouse Environmental & Geotechnical Services, Inc.
 DRILLER REGISTRATION NUMBER 412 STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0776-WM-0299

- WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Knightdale, North Carolina
8500 Battle Bridge Road
 (Road, Community, or Subdivision and Lot No.)
- OWNER City of Raleigh (Neuse Wastewater Plant)
 ADDRESS P.O. Box 590
Raleigh (Street or Route No.) NC 27602
 City or Town State Zip Code
- DATE DRILLED 8/21/90 USE OF WELL Monitoring
- TOTAL DEPTH 35.0 CUTTINGS COLLECTED Yes No
- DOES WELL REPLACE EXISTING WELL? Yes No
- STATIC WATER LEVEL: 32.5 FT. above TOP OF CASING.
 below TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
- YIELD (gpm): N/A METHOD OF TEST None
- TEST ZONES (depth): 30.0

Depth	DRILLING LOG
From To	Formation Description
0.0 - 0.3	Topsoil
0.3 - 2.5	Brown Gray Fine Silty Sand
2.5 - 12.0	Gray Weathered Rock
12.0 - 16.5	Red Orange Fine to Medium Silty Sand
16.5 - 22.5	Gray Weathered Rock
22.5 - 31.0	Gray Yellow Fine to Medium Silty Sand
31.0 - 35.0	Gray Yellow Weathered Rock
	(Hard Drilling)
35.0	Boring terminated

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+2.0</u> To <u>3.0</u> Ft.	<u>4"</u>	<u>.125"</u>	<u>Steel</u>
From <u>+2.0</u> To <u>28.5</u> Ft.	<u>2"</u>	<u>Sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____

11. GROUT:

Depth	Material	Method
From <u>0.0</u> To <u>24.5</u> Ft.	<u>Cement</u>	<u>Tremie</u>
From <u>24.5</u> To <u>26.5</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>28.5</u> To <u>33.5</u> Ft.	<u>2</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>26.5</u> To <u>35.0</u> Ft.	<u>Fine</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed thru hollow stem augers. Well installed adjacent to 28B & C

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED MAP
 FIELD 102
 WELL# 28 A

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Walter J. Burkitt 9/7/90

MW 52

WELL CONSTRUCTION RECORD

FIELD 102

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

DRILLING CONTRACTOR Law Engineering
 DRILLER REGISTRATION NUMBER 332

STATE WELL CONSTRUCTION
 PERMIT NUMBER: 91-0834-WM-0444

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Raleigh, North Carolina
8500 Battle Bridge Rd./Neuse Waste Treatment Plant
 (Road, Community, or Subdivision and Lot No.)

County: Wake

2. OWNER City of Raleigh/Neuse Waste Treatment Plant
 ADDRESS P.O. Box 590
 (Street or Route No.)
Raleigh NC 27602-0590
 City or Town State Zip Code

Depth _____
 From _____ To _____
 DRILLING LOG
 Formation Description

3. DATE DRILLED 04/19/93 USE OF WELL Monitoring

4. TOTAL DEPTH 34' CUTTINGS COLLECTED Yes No

5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: 16.7 FT. above TOP OF CASING,
 below
 TOP OF CASING IS 3 FT. ABOVE LAND SURFACE.

7. D (gpm): _____ METHOD OF TEST _____

8. WATER ZONES (depth): 32- - 34'

9. CHLORINATION: Type _____ Amount _____

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+3</u> To <u>32</u> Ft.	<u>2"</u>	<u>sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____
From _____ To _____ Ft.	_____	_____	_____

If additional space is needed use back of form.
LOCATION SKETCH
 (Show direction and distance from at least two State Roads or other map reference points)

11. GROUT:

Depth	Material	Method
From <u>0</u> To <u>28</u> Ft.	<u>Portland 1</u>	<u>tremie</u>
From <u>28</u> To <u>30</u> Ft.	<u>Bentonite Pellets</u>	

MAP ATTACHED

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>32</u> To <u>34</u> Ft.	<u>2</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>30</u> To <u>34</u> Ft.	<u>Medium</u>	<u>Torpedo</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed using 8" diameter hollow stem augers

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Floyd Cox

MW 51

WELL CONSTRUCTION RECORD

Feb 102

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

DRILLING CONTRACTOR Law Engineering
 DRILLER REGISTRATION NUMBER 332

STATE WELL CONSTRUCTION
 PERMIT NUMBER: 91-0834-WM-0444

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Raleigh, North Carolina
8500 Battle Bridge Rd./Neuse Waste Treatment Plant
 (Road, Community, or Subdivision and Lot No.)
2. OWNER City of Raleigh/Neuse Waste Treatment Plant
 ADDRESS P.O. Box 590
Raleigh NC 27602-0590
 (Street or Route No.)
 City or Town State Zip Code
3. DATE DRILLED 04/19/93 USE OF WELL Monitoring
4. TOTAL DEPTH 29' CUTTINGS COLLECTED Yes No
5. DOES WELL REPLACE EXISTING WELL? Yes No
6. STATIC WATER LEVEL: 16.7 FT. above TOP OF CASING.
 below
 TOP OF CASING IS 3 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): _____ METHOD OF TEST _____
8. ZONED ZONES (depth): 24' - 29'

County: Wake

Depth		DRILLING LOG Formation Description
From	To	

9. CHLORINATION: Type _____ Amount _____
10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>+3</u> To <u>24</u> Ft.	<u>2"</u>	<u>sch40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____
From _____ To _____ Ft.	_____	_____	_____

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Road or other map reference points)

11. GROUT:

Depth	Material	Method
From <u>0</u> To <u>20</u> Ft.	<u>Portland 1</u>	<u>tremie</u>
From <u>20</u> To <u>22</u> Ft.	<u>Bentonite</u>	<u>Pellets</u>

MAP ATTACHED

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>24</u> To <u>29</u> Ft.	<u>2</u> in.	<u>.010</u> in.	<u>PVC</u>
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

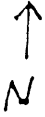
Depth	Size	Material
From <u>22</u> To <u>29</u> Ft.	<u>Medium</u>	<u>Torpedo</u>
From _____ To _____ Ft.	_____	_____

14. REMARKS: Well installed using 8" diameter hollow stem augers

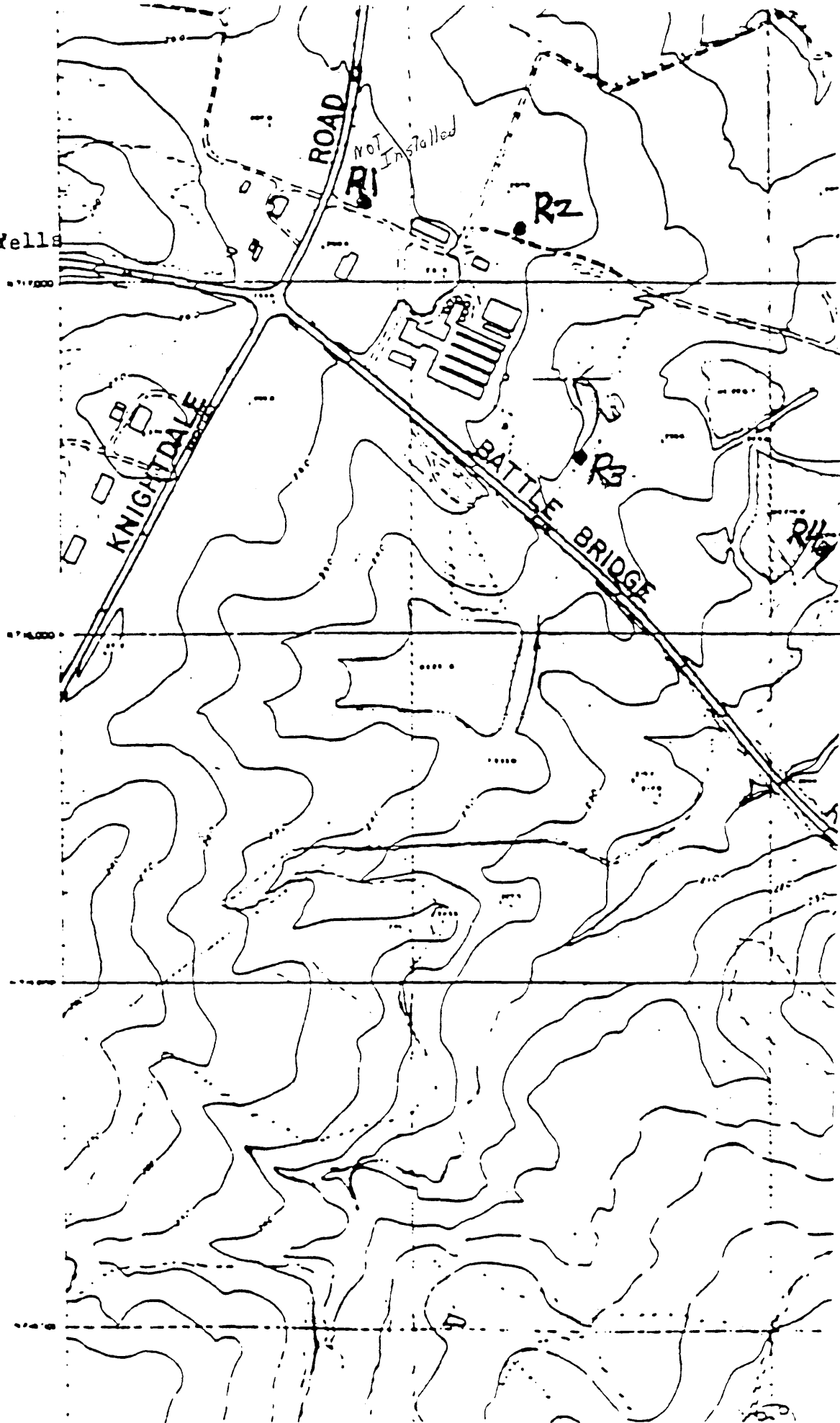
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[Signature]
 SIGNATURE OF CONTRACTOR OR AGENT

5-13-93
 DATE



Proposed Monitoring Wells
SITE 3
Randleigh Farm



FOR OFFICE USE ONLY

Quad No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Law Engineering
 DRILLER REGISTRATION NUMBER 332

STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0834-WM-0354

WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Clayton, North Carolina

WELL No. R-2
 County: Wake

(Road, Community, or Subdivision and Lot No.)
 OWNER City of Raleigh
 ADDRESS 222 West Hargett St.
Raleigh N.C. 27602
(Street or Route No.)
 City or Town State Zip Code

Depth		DRILLING LOG
From	To	Formation Description
0	6.0'	Redish Brn Clay Silt
6.0	22.0'	Wh Tan silty med sa
22.0	30'	Wh Tan silty Med-Coa: Sq.

DATE DRILLED 9-20-90 USE OF WELL monitoring
 TOTAL DEPTH 29.5' CUTTINGS COLLECTED Yes No
 DOES WELL REPLACE EXISTING WELL? Yes No

STATIC WATER LEVEL: 22.5 FT. above TOP OF CASING.
 below
 TOP OF CASING IS 30" FT. ABOVE LAND SURFACE.

YIELD (gpm): _____ METHOD OF TEST _____
 WATER ZONES (depth): 22.5' /

CHLORINATION: Type _____ Amount _____

1. CASING:

From	To	Depth	Diameter or Weight/Ft.	Wall Thickness	Material
0	24.5	Fl.	3" ID	40 sch	PVC

1. GROUT:

From	To	Depth	Material	Method
0	21.5	Fl.	type I Portland	trémie
21.5	22.5	Fl.	Bentonite Pellets	

2. SCREEN:

From	To	Depth	Diameter	Slot Size	Material
24.5	29.5	Fl.	3" ID	.010 in.	PVC

3. GRAVEL PACK:

From	To	Depth	Size	Material
22.5	29.5	Fl.	20dedo	silica

4. REMARKS: Well installed through 6.25 inch X 10.25 inch Hollow Stem Augers

If additional space is needed use back of form.
LOCATION SKETCH
 (Show direction and distance from at least two State Roads, or other map reference points)

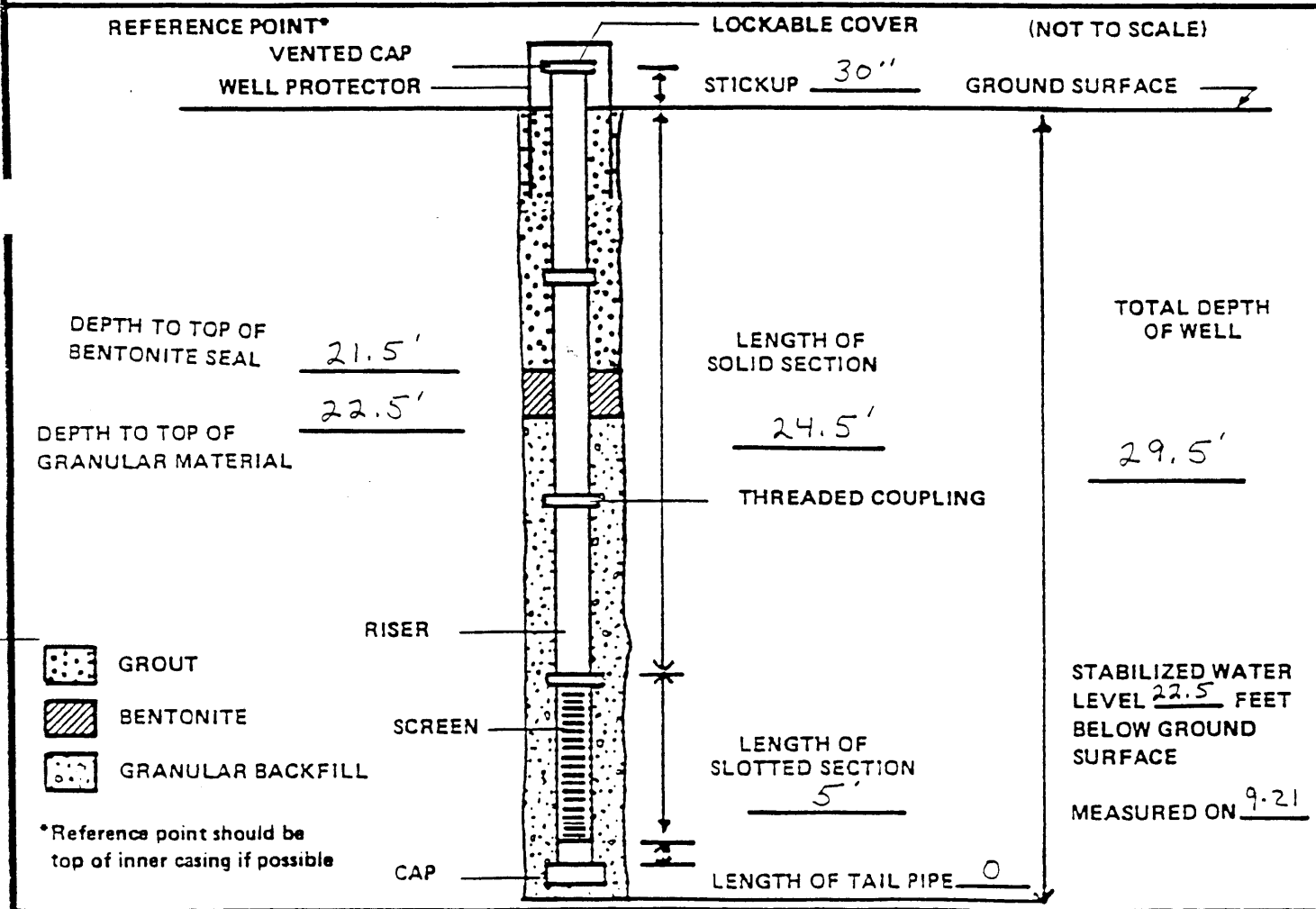
attached location maps


I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS. AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Flood Coy 9-24-90
 SIGNATURE OF CONTRACTOR OR AGENT DATE

TYPE II MONITORING WELL INSTALLATION RECORD

JOB NAME Randleigh Farm JOB NUMBER J. 5987
 WELL NUMBER R-2 INSTALLATION DATE 9-20-90
 LOCATION Raleigh N.C.
 GROUND SURFACE ELEVATION _____ REFERENCE POINT ELEVATION _____
 GRANULAR BACKFILL MATERIAL Torpedo Sand SLOT SIZE .010"
 SCREEN MATERIAL PVC SCREEN DIAMETER 2" 4⁹/₁₆"
 RISER MATERIAL PVC RISER DIAMETER 2" 2¹¹/₁₆"
 DRILLING TECHNIQUE HSA DRILLING CONTRACTOR Law Eng.
 BOREHOLE DIAMETER 10" LAW ENGINEERING FIELD REPRESENTATIVE Todd J.
 LOCK BRAND Master SIZE/MODEL No 3
 KEY CODE/COMBINATION 0536



 LAW ENGINEERING TESTING COMPANY

TYPE II MONITORING WELL
 INSTALLATION RECORD

FIGURE 2

PROJECT: Randleigh Farm PROJECT NO. J-5987 BORING: R-2

DATE: 9-20-90 DRILLER: T. Johnson CREW: S. Hancock / G. Fisher SURFACE ELEV. _____

DEPTH		SOIL STRATA SOIL DESCRIPTION AND REMARKS	TIME	TYPE	NO	DEPTH			REC		
FROM	TO					FROM	TO	FIRST 6"		2ND 6"	3RD 6"
		TOP SOIL:		SS							
0	6.0	brn si sa (top soil?)			1	3.5	5.0	4	5	5	15"
6.0	8.5	reddish brn clay si			2	8.5	10.0	4	4	4	18"
8.5	12.0	whit tan si sa coarse-med sa			3	13.5	15.0	7	8	9	18"
12.0		whit tan sa si med sa			4	18.5	20.0	7	8	7	18"
		w/ 3" brn coarse sa & rock frag. seam @ 14.5'			5	23.5	25.0	10	7	14	18"
22.0		whit tan si med-coarse sa w/ brn si seams w/mica (wet)			6	28.5	30.0	8	5/4"		18"
<u>B.T. @ 30.0'</u>											
set well @ 29.5'											
sand to 22.5'											
bentonite pellet seal to 21.5'											
grout to surface											
install protective cover w/ lock											
3" x 5.0' .010 slot screen											
CME - SS											

METHOD OF DRILLING (Check One)

a. AUGER ASA SIZE 6 1/4" I.D.

b. WASH _____ WATER _____ MUD _____

NG SIZE 10 1/4" BIT USED CME - Inner Bit System

CASING: SIZE _____ LENGTH _____

UNDISTURBED SAMPLES: NO. _____ SIZE _____

BAG SAMPLES: NO. _____

WATER LOSSES: % _____ DEPTH _____

SPECIAL TESTS (Hrs & Explain) _____

WEATHER 75° cloudy

NON-DRILLING TIME (Hrs.) Steam Clean 1.5 HR

BORING LAYOUT _____ MOVING 15 min

HAULING WATER .5 HR STANDBY _____

WATER LEVELS @ 23.0' DATE 9-20 TIME 70E

LEVELS @ 22.5' DATE 9-21 TIME 8am

CAVE-IN-DEPTH: @ _____ DATE _____ TIME _____

REMARKS: (All remarks should be explained on the back of white copy)

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Law Engineering
 DRILLER REGISTRATION NUMBER 332

STATE WELL CONSTRUCTION
 PERMIT NUMBER: 91-0834-WM-0354

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Clayton, North Carolina

WELL No. R-3
 County: Wake

(Road, Community, or Subdivision and Lot No.)
 2. OWNER City of Raleigh
 ADDRESS 222 West Hargett St.
Raleigh N.C. 27602
(Street or Route No.)
 City or Town State Zip Code

Depth		DRILLING LOG
From	To	Formation Description
0	-4.0'	Brn Silty Sa
4.0	-24.0'	Wh Tan si Med-Coars Sand
24.0'	-33.0	Tan Brn silt (wet)

3. DATE DRILLED 9-20-90 USE OF WELL Monitoring
 4. TOTAL DEPTH 32.0' CUTTINGS COLLECTED Yes No
 5. DOES WELL REPLACE EXISTING WELL? Yes No
 6. STATIC WATER LEVEL: 22.0 FT. above TOP OF CASING.
 TOP OF CASING IS 24" FT. below ABOVE LAND SURFACE.

7. YIELD (gpm): _____ METHOD OF TEST _____
 8. WATER ZONES (depth): 22.0' /

9. CHLORINATION: Type _____ Amount _____

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From 0 To 27.0 Ft.	3"	40 sch	PVC
From _____ To _____ Ft.	_____	_____	_____
From _____ To _____ Ft.	_____	_____	_____

11. GROUT:

Depth	Material	Method
From 0 To 23.0 Ft.	type I Portland	ternie
From 23.0' To 24.0 Ft.	Bentonite Pellets	

12. SCREEN:

Depth	Diameter	Slot Size	Material
From 27.0 To 32.0 Ft.	3" in.	.010 in.	PVC
From _____ To _____ Ft.	_____ in.	_____ in.	_____
From _____ To _____ Ft.	_____ in.	_____ in.	_____

13. GRAVEL PACK:

Depth	Size	Material
From 24.0 To 32.0 Ft.	Tordedo	Silica
From _____ To _____ Ft.	_____	_____

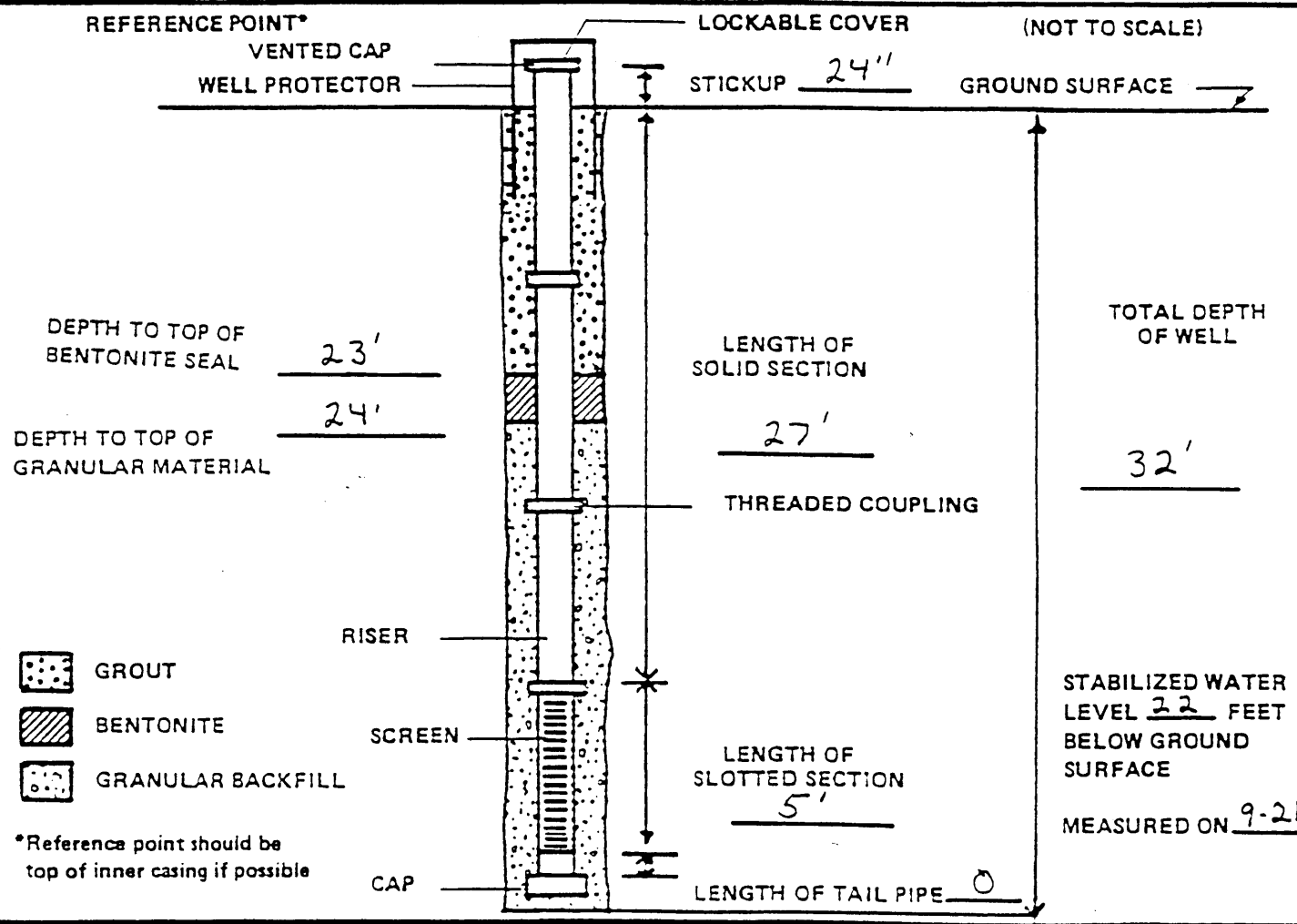
14. REMARKS: Well installed through 6.25 inch X 10.25 inch Hollow Stem Augers

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Floyd Cox
 SIGNATURE OF CONTRACTOR OR AGENT
9-24-90
 DATE

TYPE II MONITORING WELL INSTALLATION RECORD

JOB NAME Randleigh Farm JOB NUMBER J.5987
 WELL NUMBER R-3 INSTALLATION DATE 9-20-90
 LOCATION Raleigh N.C.
 GROUND SURFACE ELEVATION _____ REFERENCE POINT ELEVATION _____
 GRANULAR BACKFILL MATERIAL Torpedo Sand SLOT SIZE .010"
 SCREEN MATERIAL PVC SCREEN DIAMETER 2"
 RISER MATERIAL PVC RISER DIAMETER 2"
 DRILLING TECHNIQUE HSA DRILLING CONTRACTOR Law Eng.
 BOREHOLE DIAMETER 10" LAW ENGINEERING FIELD REPRESENTATIVE Todd J.
 LOCK BRAND Master SIZE/MODEL No 3
 KEY CODE/COMBINATION 0536



LAW ENGINEERING TESTING COMPANY

TYPE II MONITORING WELL INSTALLATION RECORD

FIGURE 2

PROJECT: Randleigh Farm

PROJECT NO. J-5987

BORING: R-3

DATE: 9-20-90

DRILLER: T. Johnson

CREW: S. Hancock / G. Fischer

SURFACE ELEV. _____

DEPTH		SOIL STRATA		TIME	TYPE	NO	DEPTH		FIRST 6"	2ND 6"	3RD 6"	REC
FROM	TO	SOIL DESCRIPTION AND REMARKS					FROM	TO				
		TOP SOIL:			SS							
0	4.0	brn si s2				1	3.5	5.0	4	5	6	18"
4.0	24.0	wht tan si med-coarse s2				2	8.5	10.0	4	6	7	18"
24.0		tan & brn si (wet)				3	13.5	15.0	6	7	6	18"
		Drilled through layers of extremely hard material from 24.0 to 32.0'				4	18.5	20.0	6	7	9	18"
						5	23.5	25.0	4	12	16	18"
		B.T. @ 33.0'				6	28.5	30.0				0"
		set well @ 32.0'										
		sand to 24.0'										
		bentonite pellet seal to 23.0'										
		grout to surface										
		install protective cover w/ lock										
		3" x 5.0' .010 slot screen										
		CME-55										

METHOD OF DRILLING (Check One)

a. AUGER HSA SIZE Ø 6 1/4" I.D.

b. WASH _____ WATER _____ MUD _____

ROD SIZE 10 1/2" BIT USED CME - inner bit system

PIPE: SIZE _____ LENGTH _____

UNDISTURBED SAMPLES: NO. _____ SIZE _____

BAG SAMPLES: NO. _____

WATER LOSSES, % _____ DEPTH _____

SPECIAL TESTS (Hrs. & Explain) _____

WEATHER 80° cloudy

NON-DRILLING TIME (Hrs) _____

BORING LAYOUT _____ MOVING 1.5 hr

HAULING WATER _____ STANDBY _____

WATER @ 25.5 DATE 9-20 TIME 7:00

LEVELS @ 22.0 DATE 9-21 TIME 8:30

CAVE-IN-DEPTH: @ _____ DATE _____ TIME _____

REMARKS: (All remarks should be explained on the back of white copy)

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
 Lat. _____ Long. _____ Pc _____
 Minor Basin _____
 Basin Code _____
 Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Law Engineering
 DRILLER REGISTRATION NUMBER 332

STATE WELL CONSTRUCTION PERMIT NUMBER: 91-0834-WM-0354

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Clayton, North Carolina

WELL No. R-4
 County: Wake

(Road, Community, or Subdivision and Lot No.)
 2. OWNER City of Raleigh
 ADDRESS 222 West Hargett St.
Raleigh N.C. 27602
(Street or Route No.)
City or Town State Zip Code

Depth		DRILLING LOG
From	To	Formation Description
0	3.5'	Tan Sa Si
3.5'	4.5'	Wh Gray Sa si
4.5'	7.0'	Tan Sa Si
7.0'	14.5'	gray-brn si Fi sa
14.5'	19.0'	Wh Tan si Med-coarse sand

3. DATE DRILLED 9-20-90 USE OF WELL Monitoring
 4. TOTAL DEPTH 15.0' CUTTINGS COLLECTED Yes No
 5. DOES WELL REPLACE EXISTING WELL? Yes No

6. STATIC WATER LEVEL: 8.0 FT. above below TOP OF CASING.
 TOP OF CASING IS 24" FT. ABOVE LAND SURFACE.

7. YIELD (gpm): _____ METHOD OF TEST _____
 8. WATER ZONES (depth): 8.0'

9. CHLORINATION: Type _____ Amount _____

10. CASING:

Depth	Diameter	Wall Thickness or Weight/Ft.	Material
From <u>0'</u> To <u>10'</u>	<u>3"</u>	<u>40 sch</u>	<u>PVC</u>
From _____ To _____	_____	_____	_____
From _____ To _____	_____	_____	_____

If additional space is needed use back of form.
LOCATION SKETCH
 (Show direction and distance from at least two State Road or other map reference points)

11. GROUT:

Depth	Material	Method
From <u>0</u> To <u>5'</u>	<u>type I Portland cement</u>	
From <u>5'</u> To <u>6'</u>	<u>Bentonite Pellets</u>	

Attached location maps.

12. SCREEN:

Depth	Diameter	Slot Size	Material
From <u>10'</u> To <u>15'</u>	<u>3"</u>	<u>.010 in.</u>	<u>PVC</u>
From _____ To _____	_____	_____	_____
From _____ To _____	_____	_____	_____

13. GRAVEL PACK:

Depth	Size	Material
From <u>6'</u> To <u>15'</u>	<u>20dedo</u>	<u>Silica</u>
From _____ To _____	_____	_____

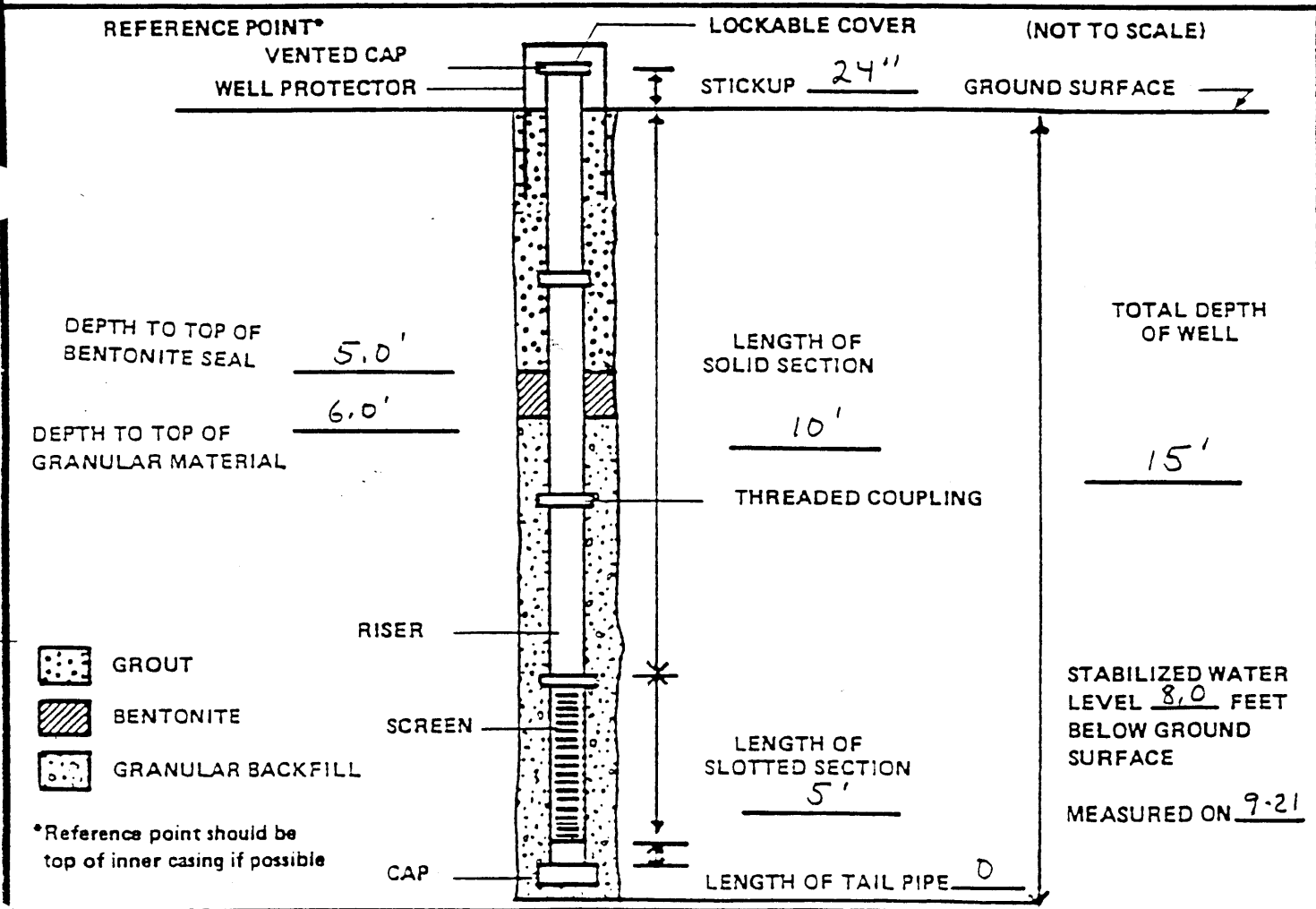
14. MARKS: Well installed through 6.25 inch X 10.25 inch Hollow Item Augers

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Floyd C Cox SIGNATURE OF CONTRACTOR OR AGENT
 DATE 9-24-90

TYPE II MONITORING WELL INSTALLATION RECORD

JOB NAME Randleigh Farm JOB NUMBER J.5987
 WELL NUMBER R-4 INSTALLATION DATE 9-20-90
 LOCATION Raleigh N.C.
 GROUND SURFACE ELEVATION _____ REFERENCE POINT ELEVATION _____
 GRANULAR BACKFILL MATERIAL Torpedo Sand SLOT SIZE .010"
 SCREEN MATERIAL PVC SCREEN DIAMETER 2"
 RISER MATERIAL PVC RISER DIAMETER 2"
 DRILLING TECHNIQUE HSA DRILLING CONTRACTOR Law Eng.
 BOREHOLE DIAMETER 10" LAW ENGINEERING FIELD REPRESENTATIVE Todo J.
 LOCK BRAND Master SIZE/MODEL No 3
 KEY CODE/COMBINATION 0536



 LAW ENGINEERING TESTING COMPANY

TYPE II MONITORING WELL INSTALLATION RECORD

FIGURE 2

PROJECT: Randleigh Farm PROJECT NO: J-5987 BORING: R-4
 DATE: 9-20-90 DRILLER: T. Johnson CREW: S. Hancock SURFACE ELEV. _____

DEPTH		SOIL STRATA	TIME	TYPE	NO	DEPTH		FIRST 6"	2ND 6"	3RD 6"	REC
FROM	TO	SOIL DESCRIPTION AND REMARKS				FROM	TO				
		TOP SOIL:			<u>55</u>						
<u>0</u>	<u>6"</u>	<u>brn fi sa si</u>			<u>1</u>	<u>3.5</u>	<u>5.0</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>18"</u>
<u>6"</u>	<u>3.5</u>	<u>tan sa si</u>			<u>2</u>	<u>8.5</u>	<u>10.0</u>	<u>3</u>	<u>2</u>	<u>3</u>	<u>18"</u>
<u>3.5</u>	<u>4.5</u>	<u>wht-gray si coarse → med sa</u>			<u>3</u>	<u>13.5</u>	<u>15.0</u>	<u>3</u>	<u>3</u>	<u>4</u>	<u>18"</u>
<u>4.5</u>	<u>7.0</u>	<u>tan sa si</u>			<u>4</u>	<u>18.5</u>	<u>20.0</u>	<u>9</u>	<u>10</u>	<u>9</u>	<u>18"</u>
<u>7.0</u>	<u>14.5</u>	<u>gray - brn si fi sa w/mica</u>			<u>5</u>	<u>23.5</u>	<u>25.0</u>				
<u>14.5</u>	<u>19.0</u>	<u>gray - brn si fi - med sa w/mica</u>									
<u>19.0</u>		<u>wht tan si med-coarse sa w/mica</u>									
<u>B.T. @ 22.0'</u>											
set well @ 15.0' sand to 6.0' bentonite pellet seal to 5.0 grout to surface install protective cover w/ lock											
<u>3" x 5.0' .010 slot screen</u>											
<u>CME-55</u>											

METHOD OF DRILLING (Check One)

a. AUGER HSA SIZE 6 1/4" I.D.
 b. WASH _____ WATER _____ MUD _____ BORING LAYOUT _____ MOVING .5 hr
 RING SIZE 10 1/8" BIT USED CME - Inner Bit System HAULING WATER _____ STANDBY _____
 RING: SIZE _____ LENGTH _____
 UNDISTURBED SAMPLES: NO. _____ SIZE _____
 BAG SAMPLES: NO. _____
 WATER LOSSES, % _____ DEPTH _____
 SPECIAL TESTS (Hrs. & Explain) _____

WEATHER 85° hazy
 NON-DRILLING TIME (Hrs.) _____
 WATER @ 8.0 DATE 9-20 TIME 705
 LEVELS @ 8.0 DATE 9-21 TIME 82
 CAVE-IN-DEPTH: @ _____ DATE _____ TIME _____

REMARKS: (All remarks should be explained on the back of white copy)

FOR OFFICE USE ONLY	
QUAD. NO. _____	SERIAL NO. _____
Lat. _____	Long. _____ RO _____
Minor Basin _____	
Basin Code _____	
Header Ent. _____ GW-1 Ent. _____	

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: Law Engineering, Inc. STATE WELL CONSTRUCTION
 DRILLER REGISTRATION NUMBER: 332 PERMIT NUMBER: 91-0834-WM-0444

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Clavton County: Wake
Field 61 Mial Plantation Road Well #163
 (Road, Community, or Subdivision and Lot No.)

2. OWNER City of Raleigh Wastewater Treatment Plant
 ADDRESS 8500 Battlebridge Road
 (Street or Route No.)
Raleigh, North Carolina 27610
 City or Town State Zip Code

3. DATE DRILLED 11/07/94 USE OF WELL GW Quality Monitoring

4. TOTAL DEPTH 23.9'

5. CUTTINGS COLLECTED YES NO

6. DOES WELL REPLACE EXISTING WELL? YES NO

7. STATIC WATER LEVEL Below Top of Casing: 23.2 FT.
 (Use "+" if Above Top of Casing)

TOP OF CASING IS 2.6' FT. Above Land Surface*
 Casing Terminated at/or below land surface is illegal unless a variance is issued
 in accordance with 15A NCAC 2C .0118

9. YIELD (gpm): _____ METHOD OF TEST _____

10. WATER ZONES (depth): _____

11. CHLORINATION: Type _____ Amount _____

12. CASING: Wall Thickness (see attached)

Depth	Diameter	or Weight/Ft.	Material
From <u>± 2.6</u> To <u>21.1</u> Ft.	<u>2"</u>	<u>SCH 40</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____
From _____ To _____ Ft.	_____	_____	_____

13. GROUT:

Depth	Material	Method
From <u>0</u> To <u>17.1</u> Ft.	<u>Bentonite/Cement</u>	_____
From <u>17.1</u> To <u>19.1</u> Ft.	<u>Bentonite Clay</u>	_____

14. SCREEN

Depth	Diameter	Slot Size	Material
From <u>21.1</u> To <u>22.9</u> Ft.	<u>2"</u>	<u>0.010</u>	<u>PVC</u>
From _____ To _____ Ft.	_____	_____	_____
From _____ To _____ Ft.	_____	_____	_____

15. SAND/GRAVEL PACK:

Depth	Size	Material
From <u>19.1</u> To <u>23.9</u> Ft.	<u>Torpedo</u>	<u>Sand</u>
From _____ To _____ Ft.	_____	_____

16. REMARKS: "Depths" are relative to ground surface established at 2.5' below top of casing.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

[Signature] DATE 11/18/94
 SIGNATURE OF CONTRACTOR OR AGENT
Submit original to Department of Environmental and Natural Resources

DEPTH		DRILLING LOG
From	To	Formation Description
1.0'	5.0'	Reddish brown silty/clay
5.0'	10.0'	Reddish brown silty sand/clay
10.0'	15.0'	Light brown silty sand
15.0'	20.0'	Light brown fine to medium sand
20.0'	23.9'	Light brown silty sand/with traces of mica

If additional space is needed use back of form

LOCATION SKETCH
 (Show direction and distance from at least two State Roads, or other map reference points)

FOR OFFICE USE ONLY	
QUAD. NO. _____	SERIAL NO. _____
Lat. _____	Long. _____ RO _____
Minor Basin _____	
Basin Code _____	
Header Ent. _____	GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR: Law Engineering, Inc. STATE WELL CONSTRUCTION
 DRILLER REGISTRATION NUMBER: 332 PERMIT NUMBER: 91-0834-WM-0444

1. WELL LOCATION: (Show sketch of the location below)
 Nearest Town: Clavton County: Wake
Field 602 Baucom Road Well#632
 (Road, Community, or Subdivision and Lot No.)

2. OWNER City of Raleigh Wastewater Treatment Plant
 ADDRESS 8500 Bartlebridge Road
 (Street or Route No.)
Raleigh, North Carolina 27610
 City or Town State Zip Code

3. DATE DRILLED 11/07/94 USE OF WELL GW Quality Monitoring

4. TOTAL DEPTH 15.9'

5. CUTTINGS COLLECTED YES NO

6. DOES WELL REPLACE EXISTING WELL? YES NO

7. STATIC WATER LEVEL Below Top of Casing: 14.0 FT.
 (Use "+" if Above Top of Casing)

8. DEPTH OF CASING IS 1.9' FT. Above Land Surface*
 *Casing Terminated at/or below land surface is illegal unless a variance is issued
 in accordance with 15A NCAC 2C .0118

9. YIELD (gpm): _____ METHOD OF TEST _____

10. WATER ZONES (depth): _____

11. CHLORINATION: Type _____ Amount _____

12. CASING: Wall Thickness (see attached)
 Depth Diameter or Weight/Ft. Material
 From + 1.9 To 12.6 Ft. 2" SCH 40 PVC
 From _____ To _____ Ft. _____
 From _____ To _____ Ft. _____

13. GROUT: Material Method
 Depth
 From 0 To 8.6 Ft. Bentonite/Cement
 From 8.6 To 10.6 Ft. Bentonite Clay

14. SCREEN: Material
 Depth Diameter Slot Size
 From 12.6 To 14.9 Ft. 2" 0.010 PVC
 From _____ To _____ Ft. _____
 From _____ To _____ Ft. _____

15. SAND/GRAVEL PACK: Material
 Depth Size
 From 10.6 To 15.9 Ft. 20/40 Sand
 From _____ To _____ Ft. _____

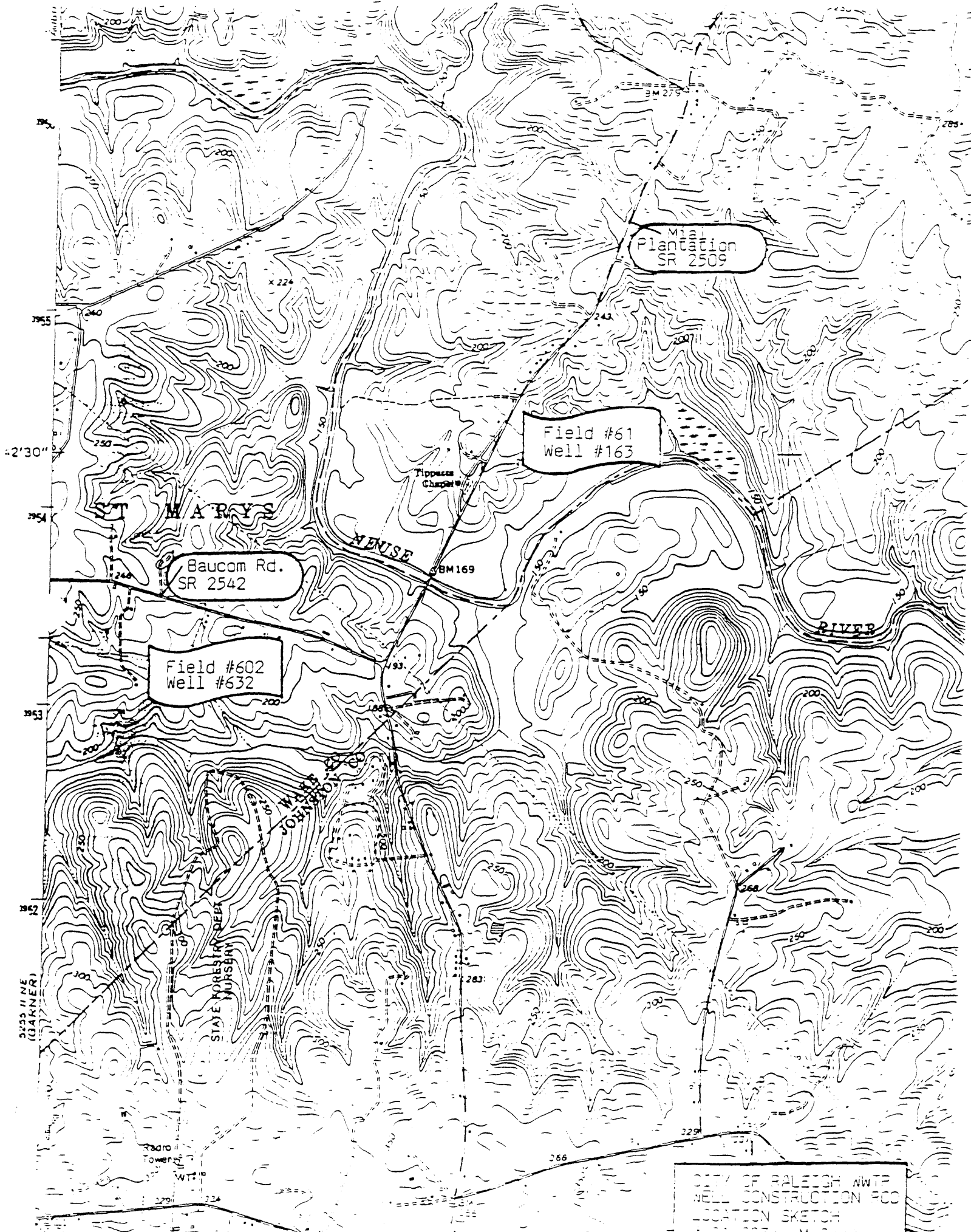
16. REMARKS: "Depths" are relative to ground surface established at 1.9' below top of casing.
 I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C WELL
 CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Law Engineering, Inc. 11/18/94
 SIGNATURE OF CONTRACTOR OR AGENT DATE

DEPTH		DRILLING LOG
From	To	Formation Description
1.0'	4.0'	Reddish brown siltv/ sandv clay
4.0'	13.5'	Light brown siltv/sandv clay
13.5'	15.0'	Light brown siltv sand clay with traces of mica

If additional space is needed use back of form

LOCATION SKETCH
 (Show direction and distance from at least two State
 Roads, or other map reference points)



MIA
Plantation
SR 2509

Field #61
Well #163

Baucom Rd.
SR 2542

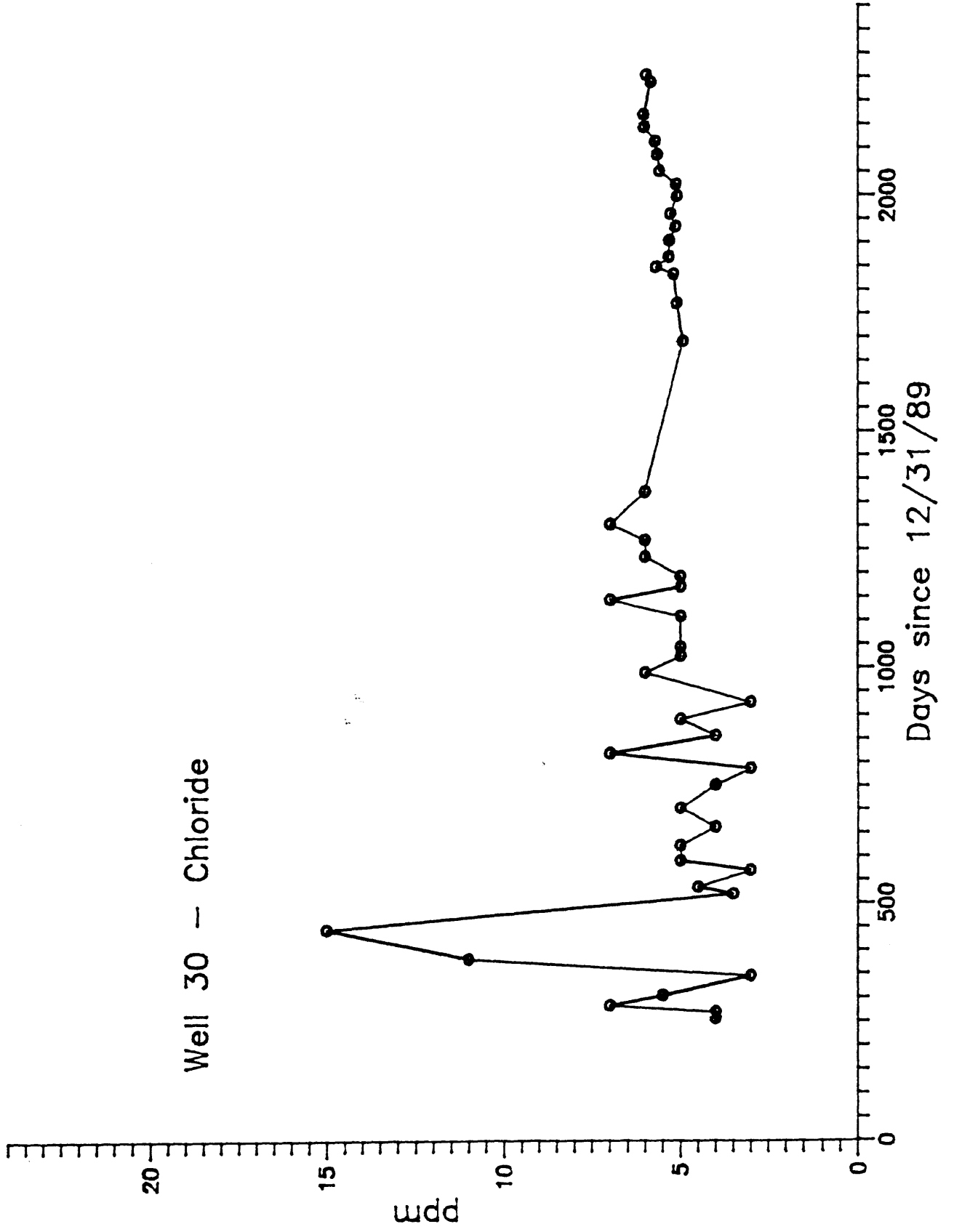
Field #602
Well #632

CITY OF RALEIGH WWT
WELL CONSTRUCTION PCD
LOCATION SKETCH
81-0854-WM-0000

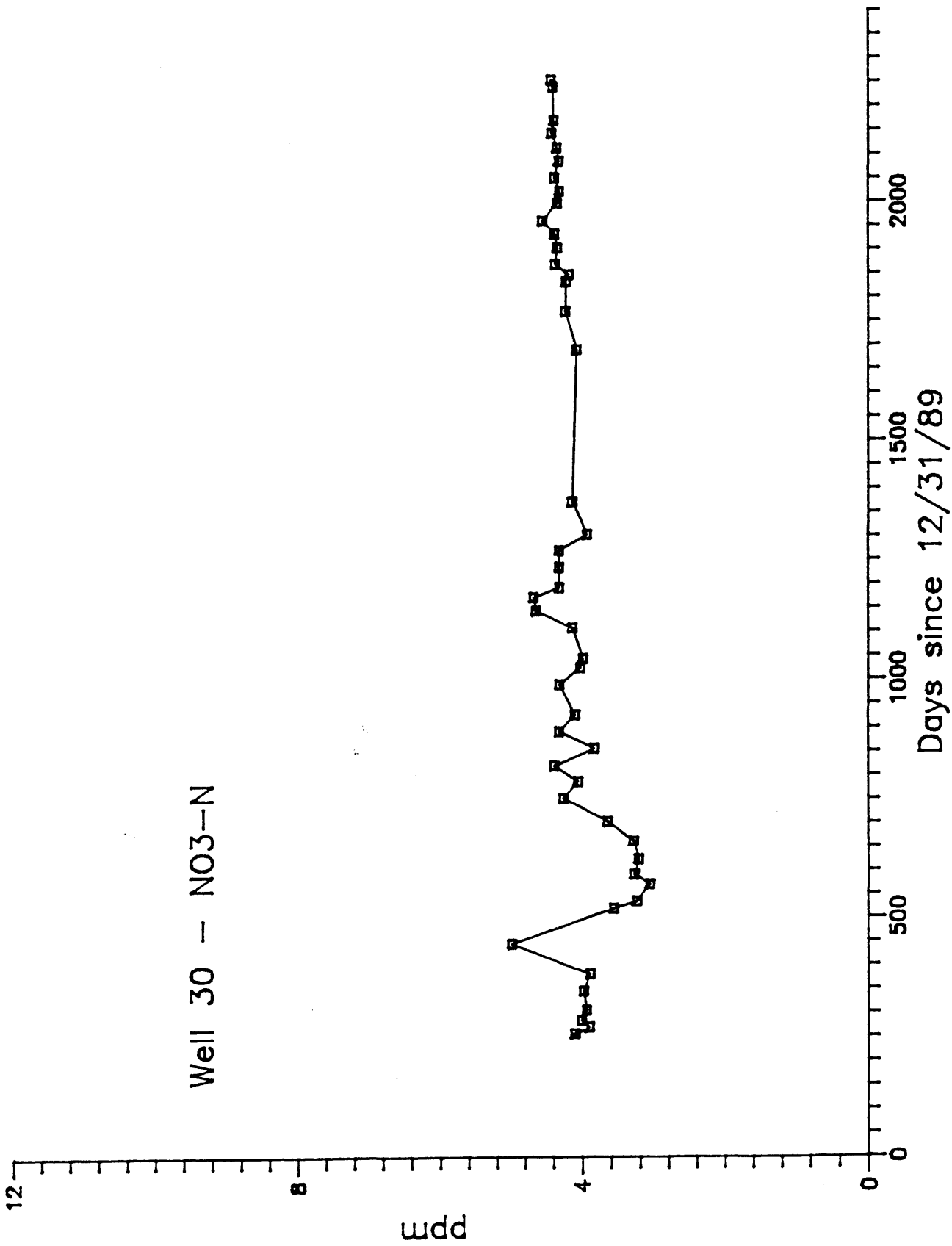
APPENDIX III

NO₃-N and Chloride Curves

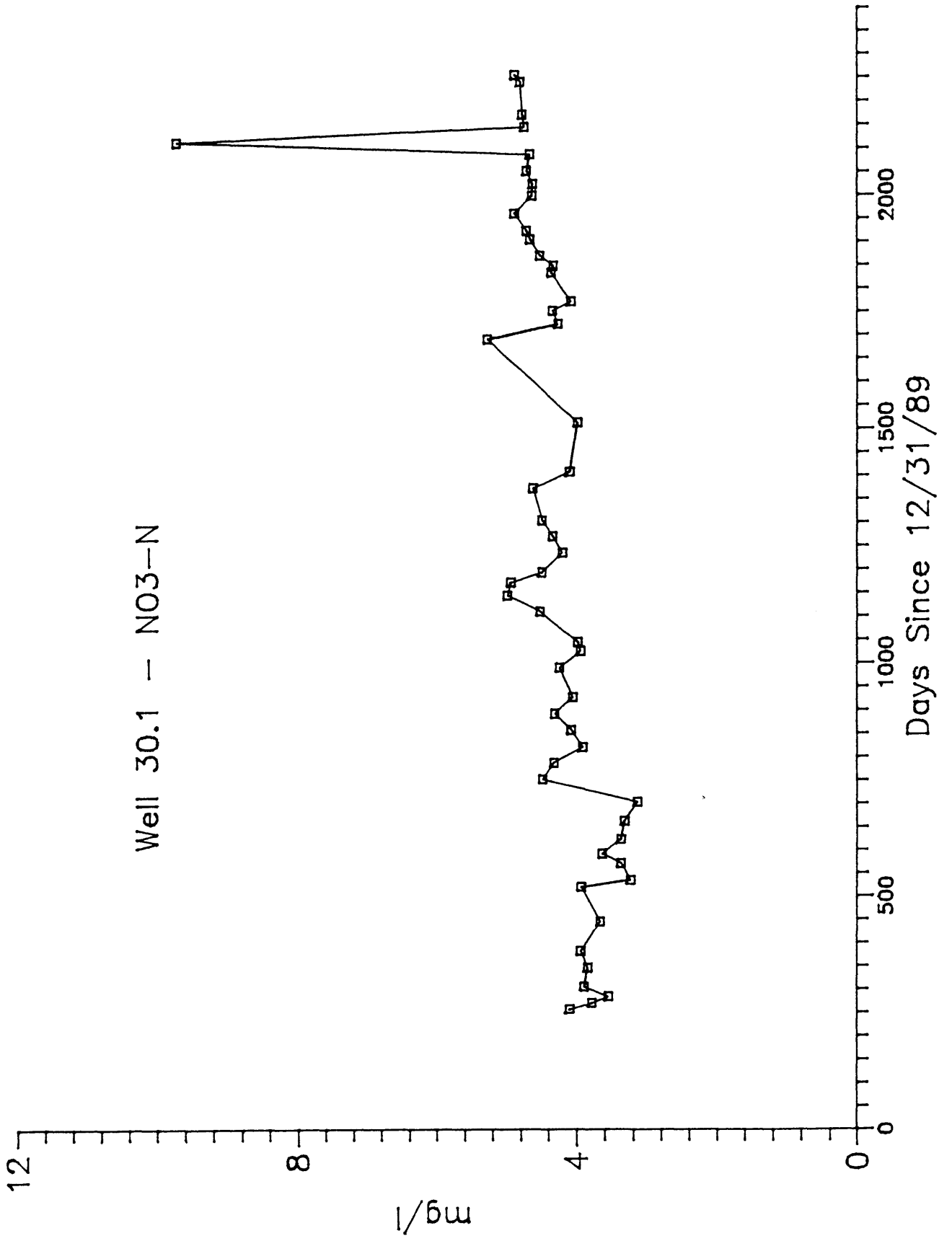
Well 30 - Chloride



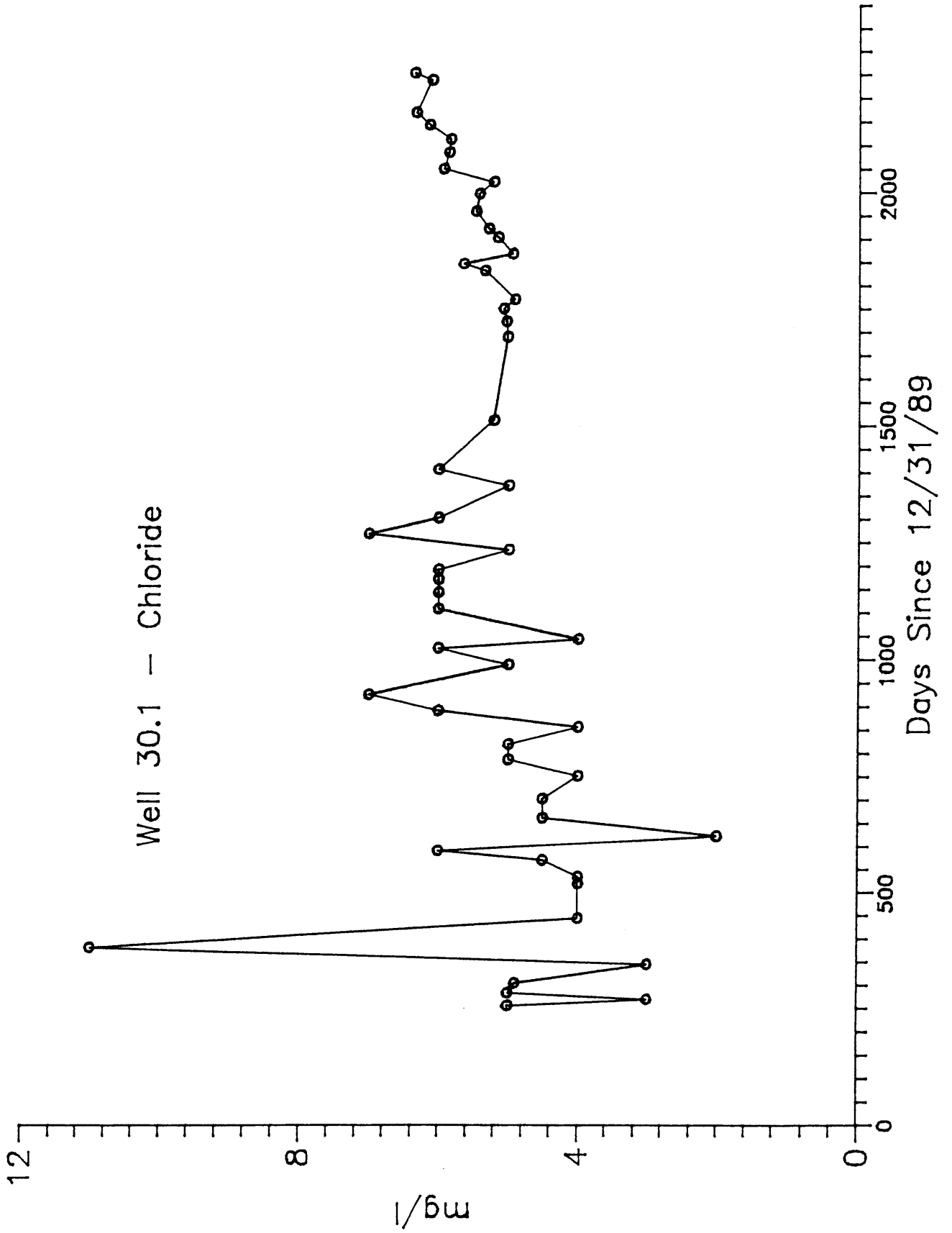
Well 30 - NO3-N



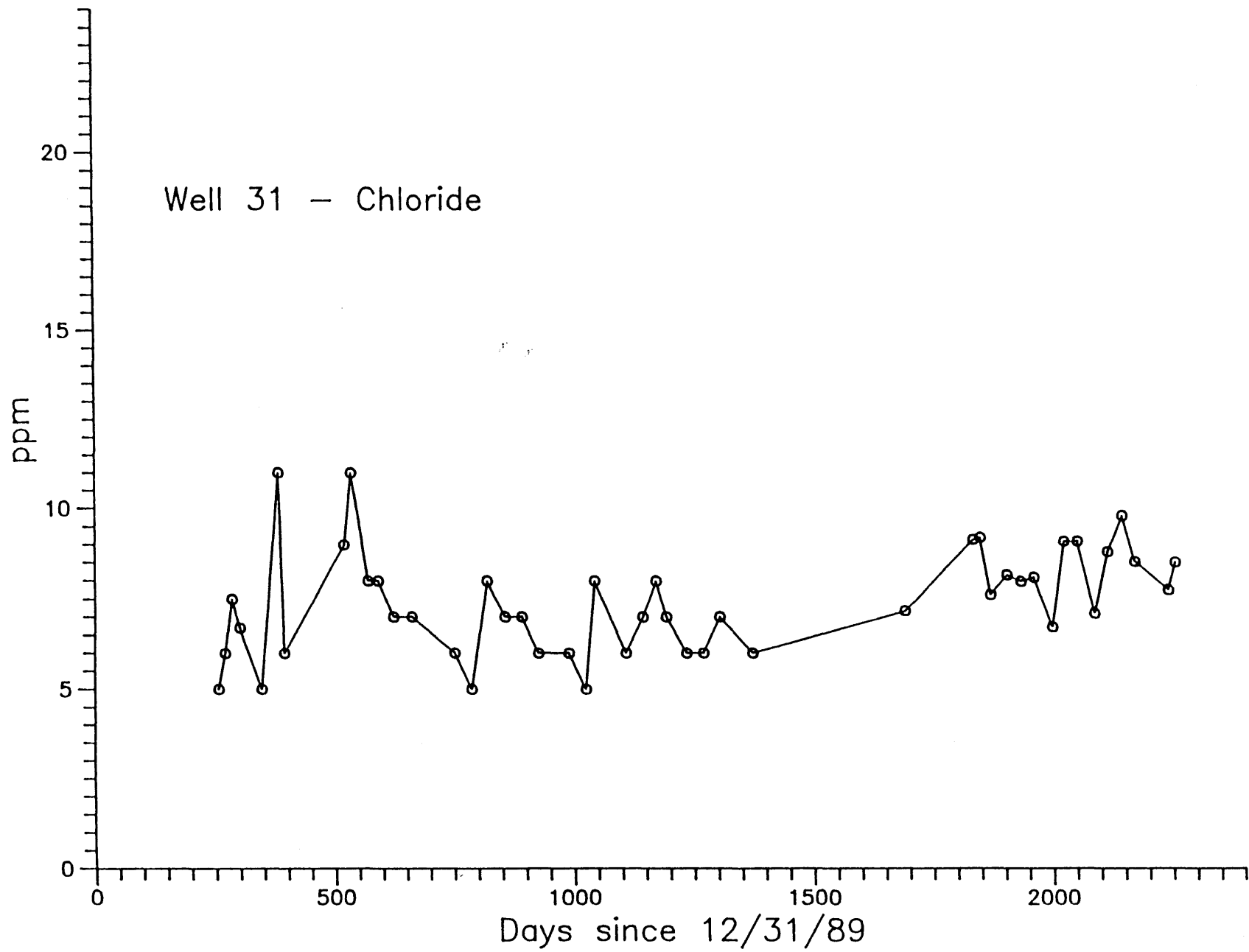
Well 30.1 - N03-N



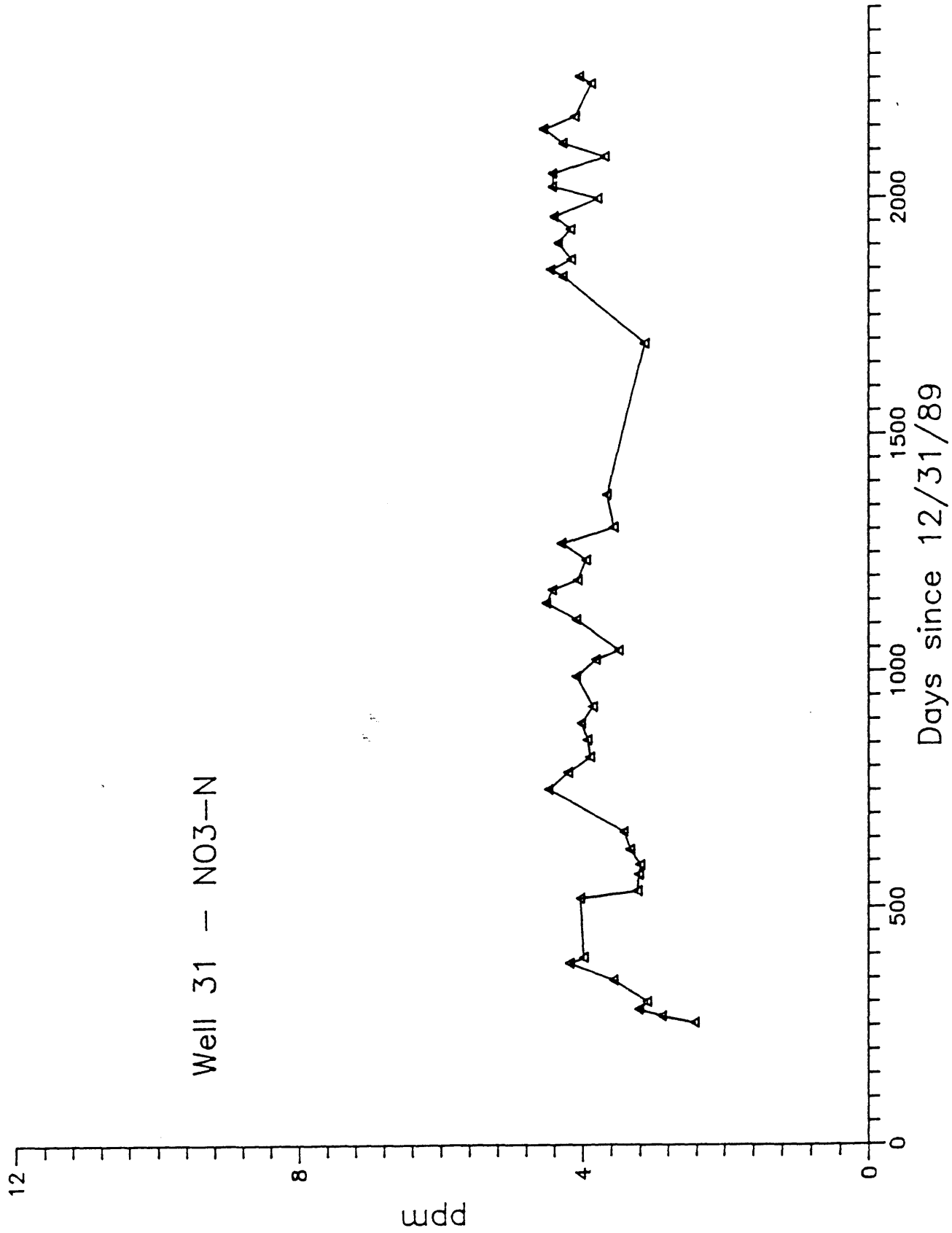
Well 30.1 - Chloride

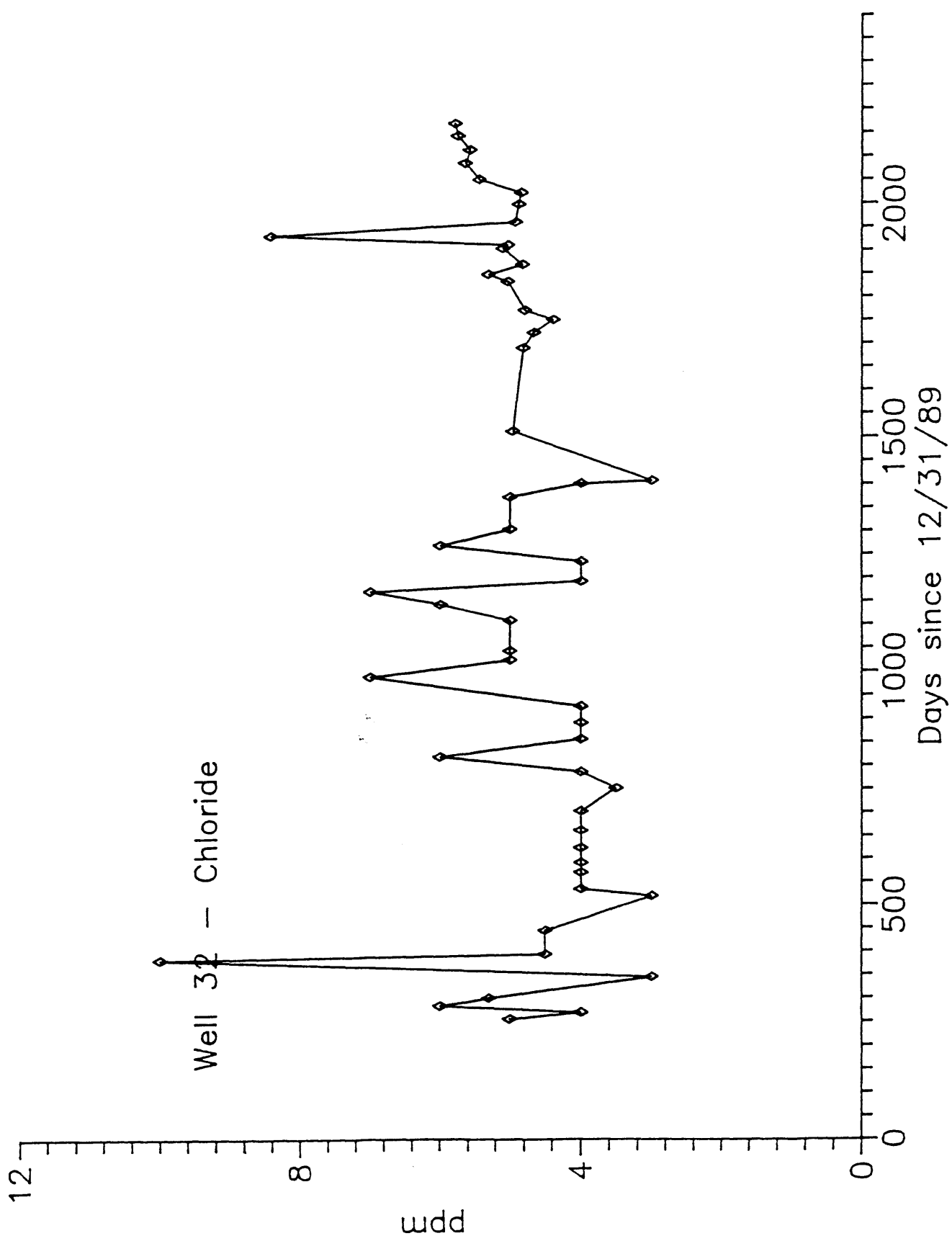


Well 31 - Chloride

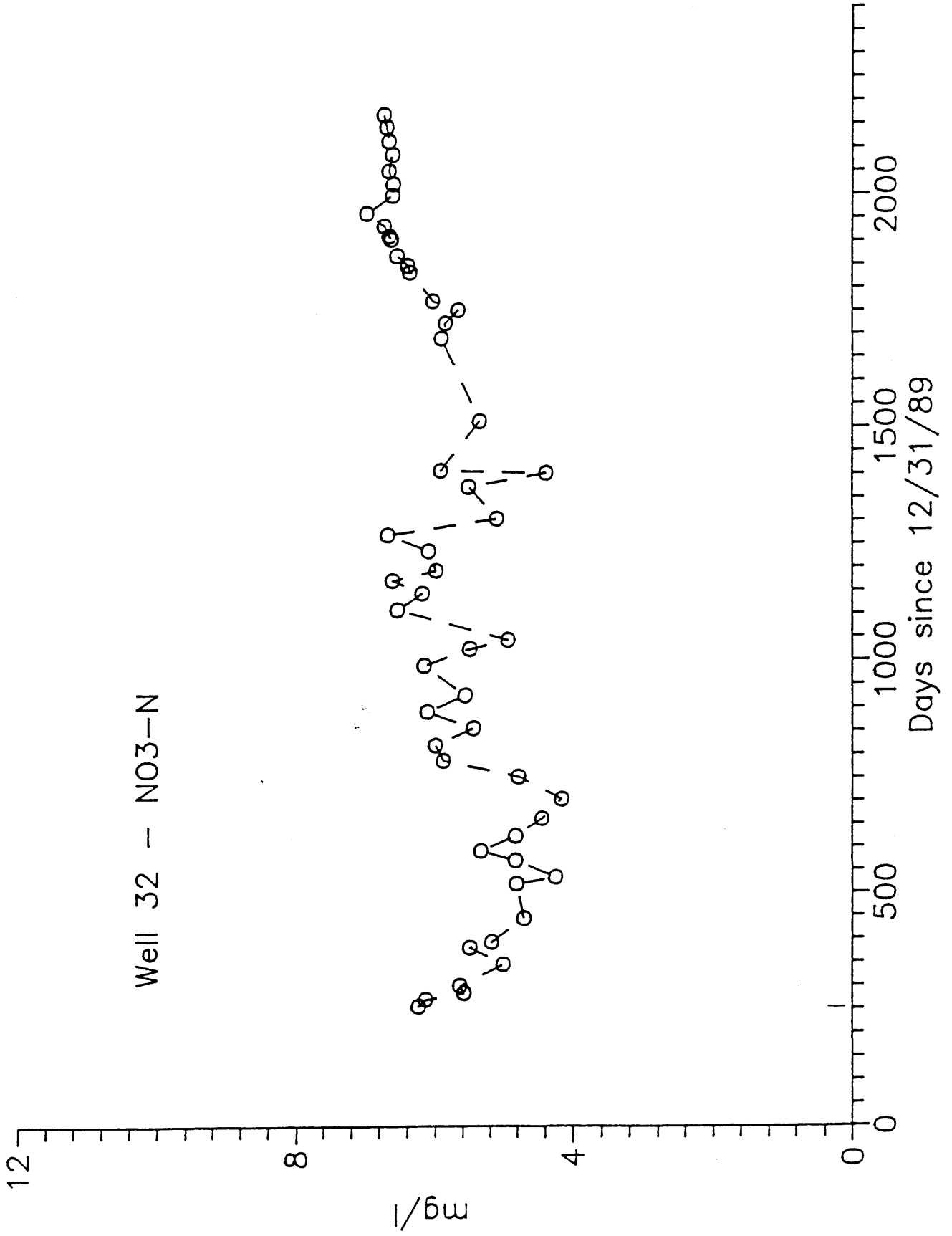


Well 31 - NO3--N

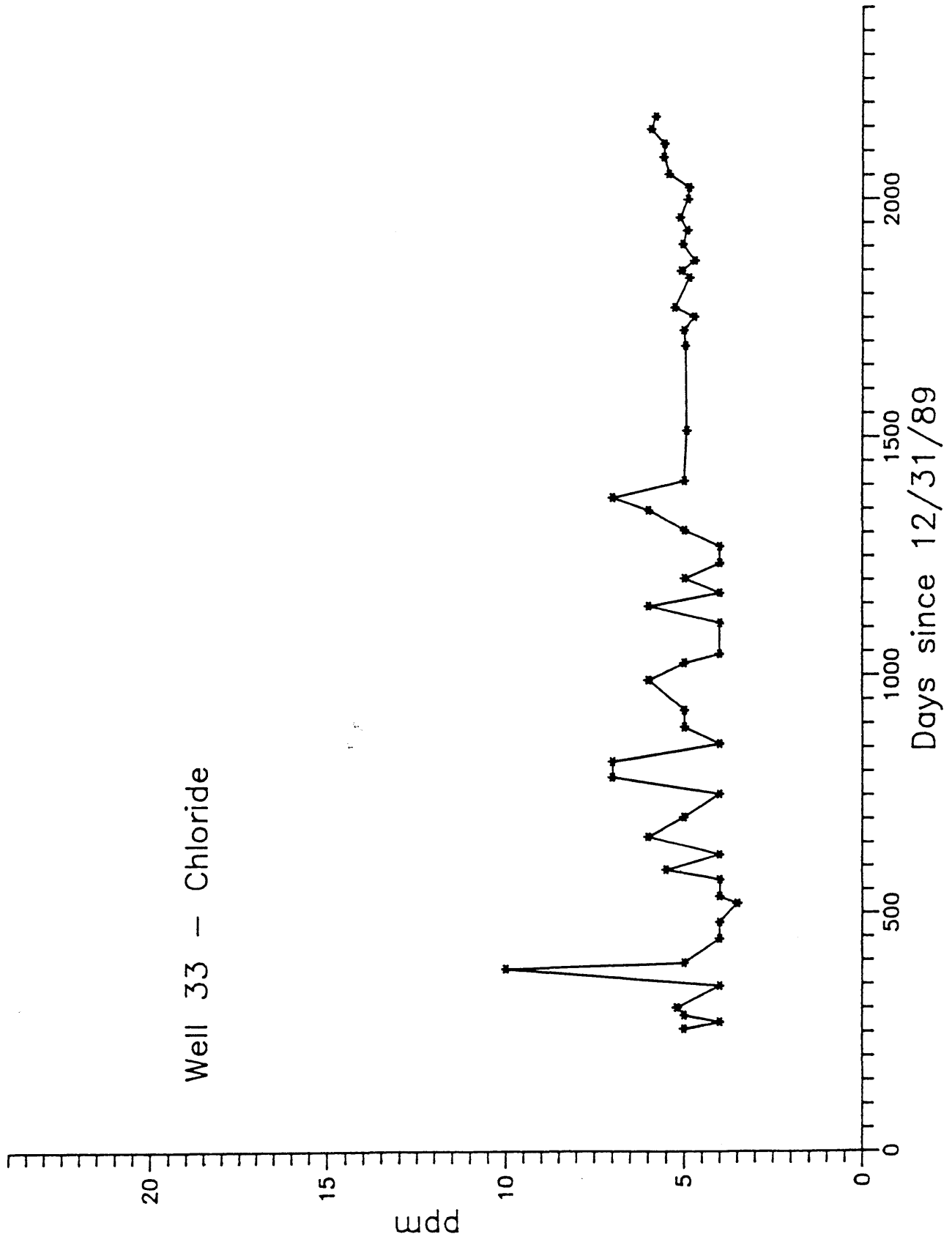




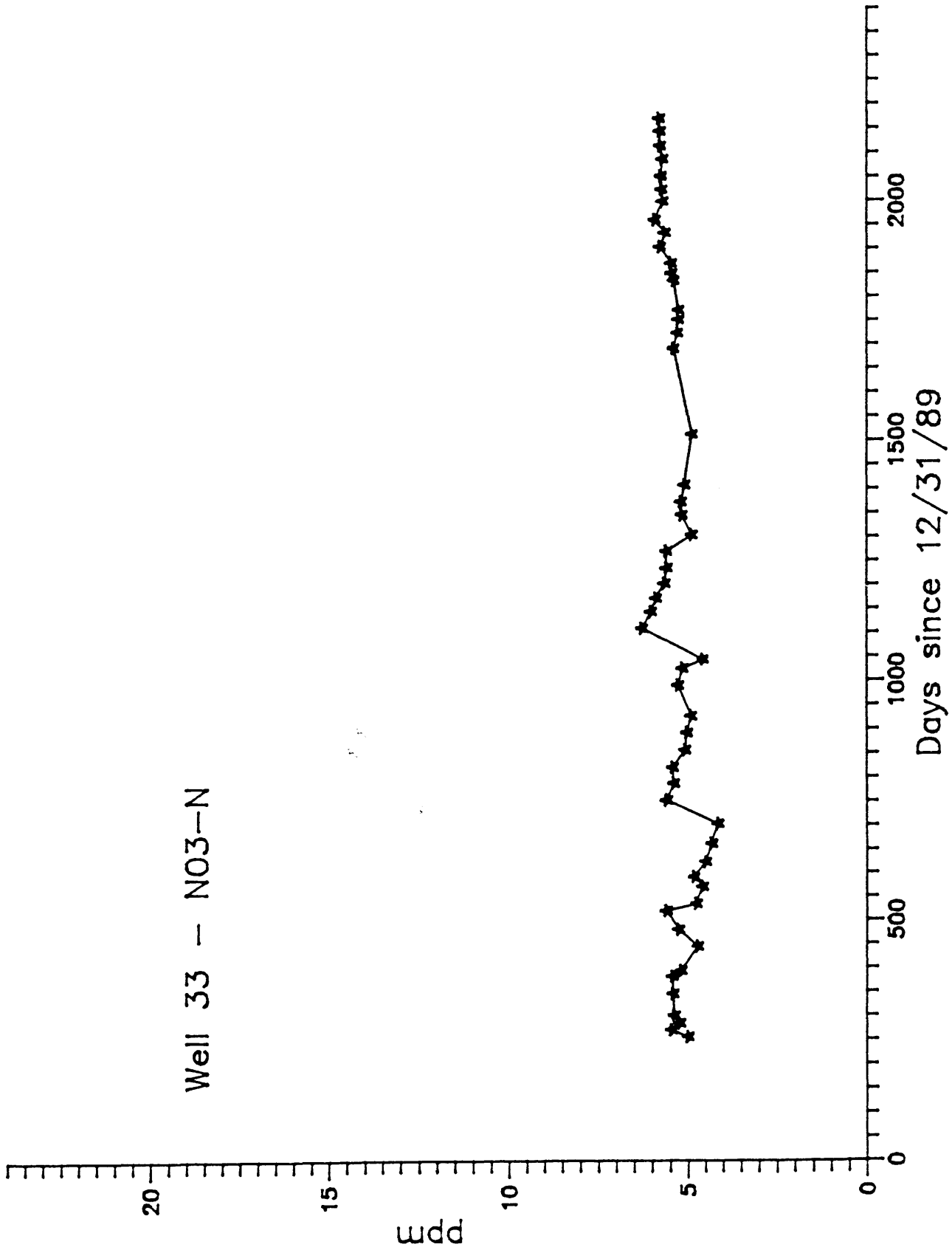
Well 32 - NO3-N



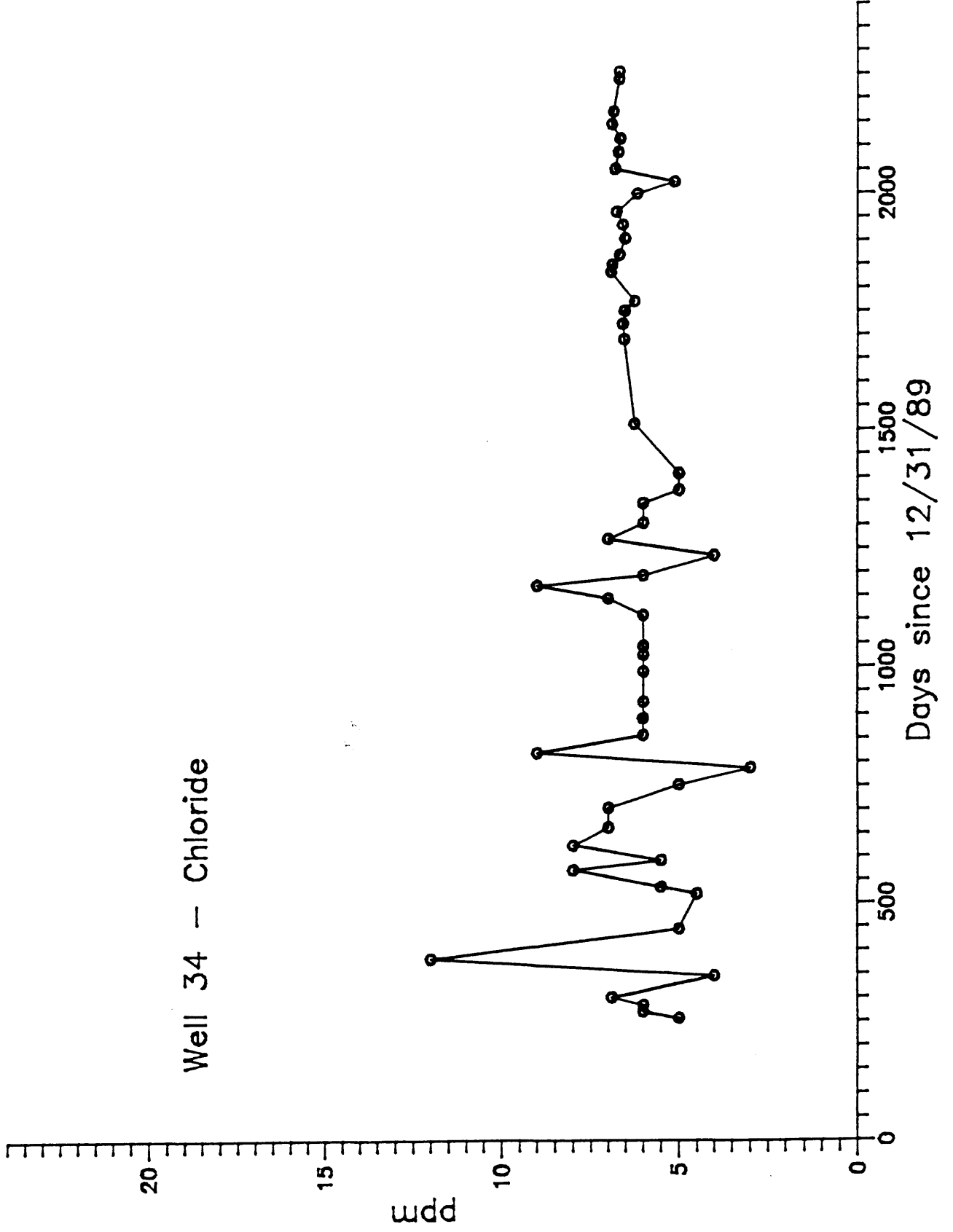
Well 33 - Chloride



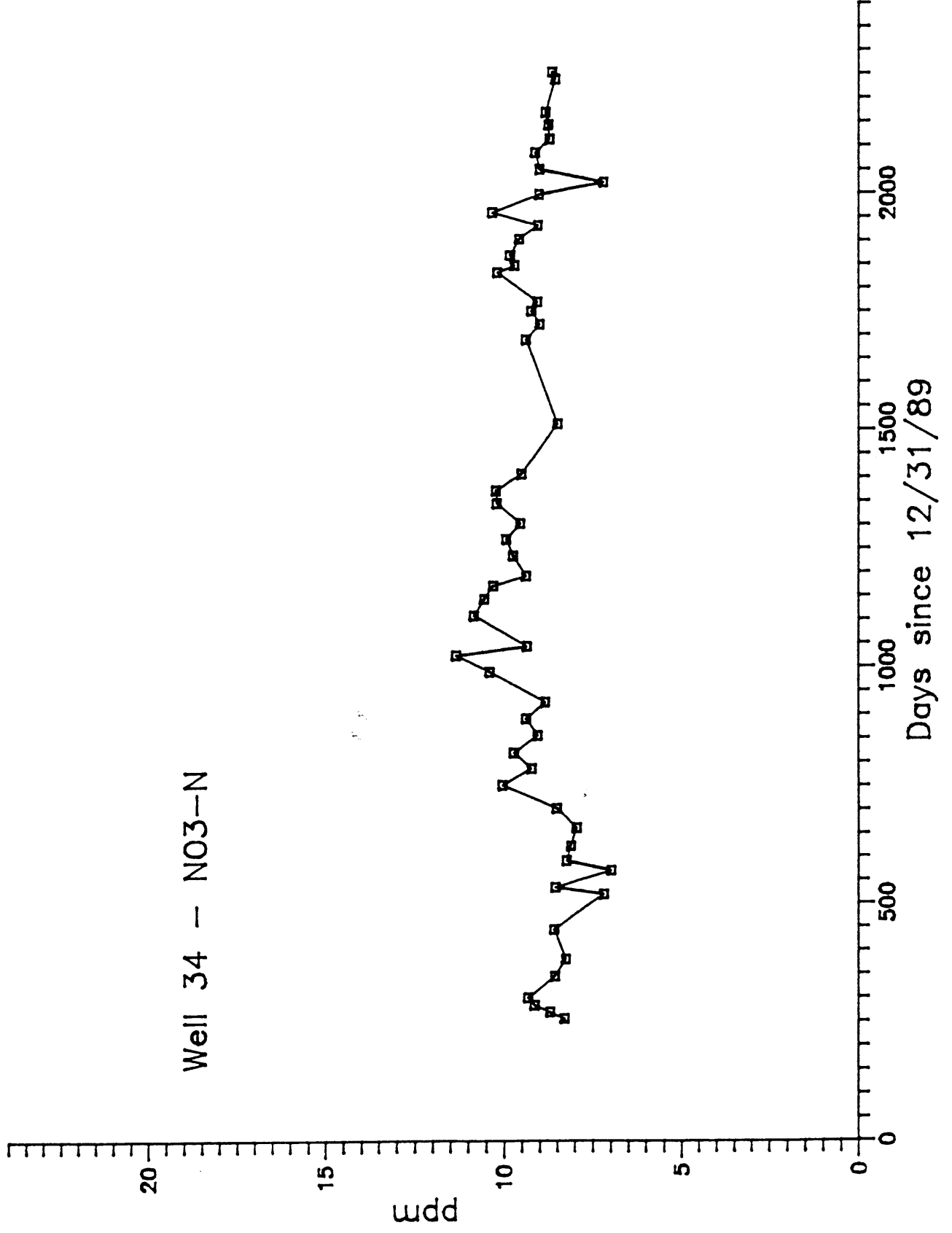
Well 33 - NO3-N



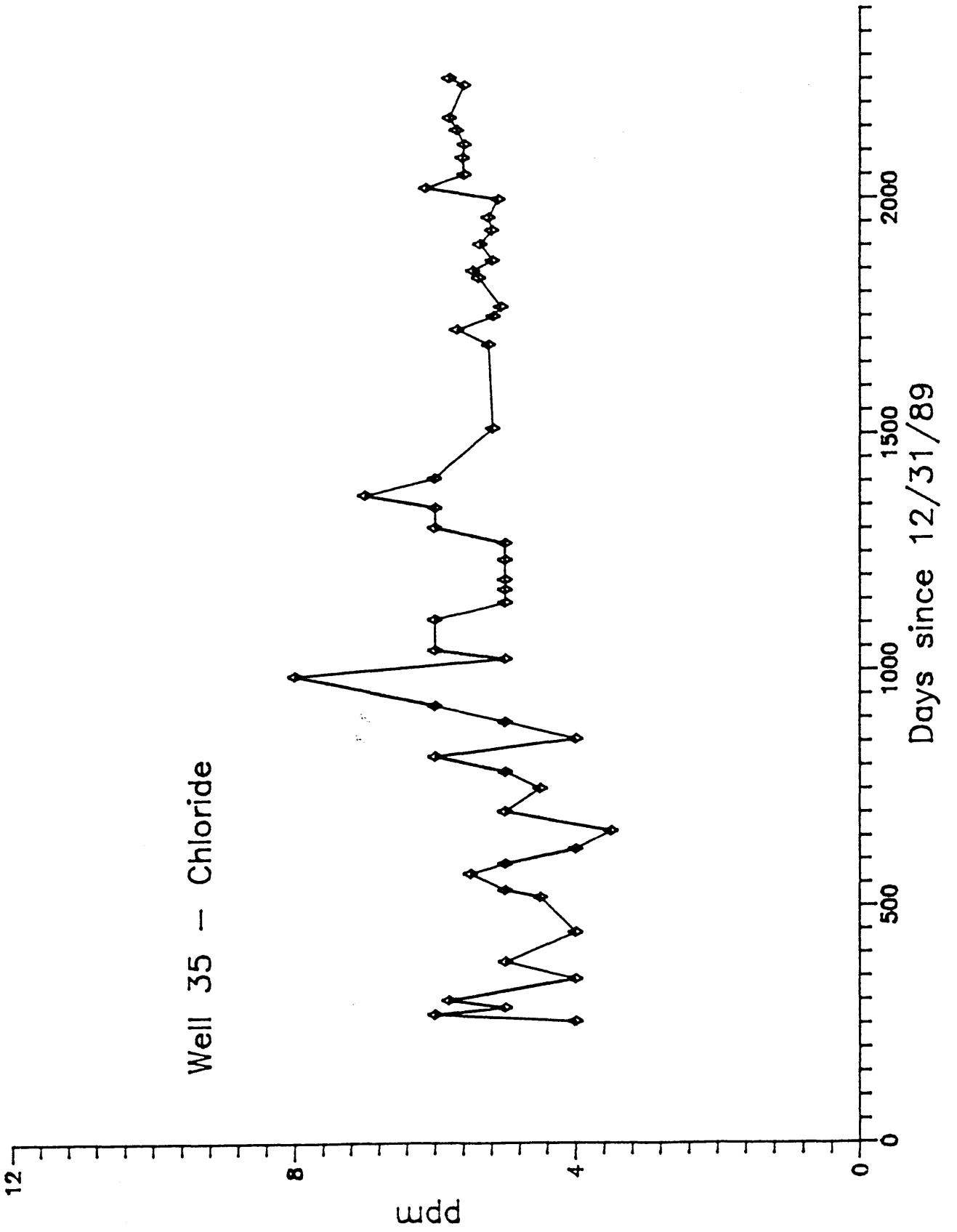
Well 34 - Chloride

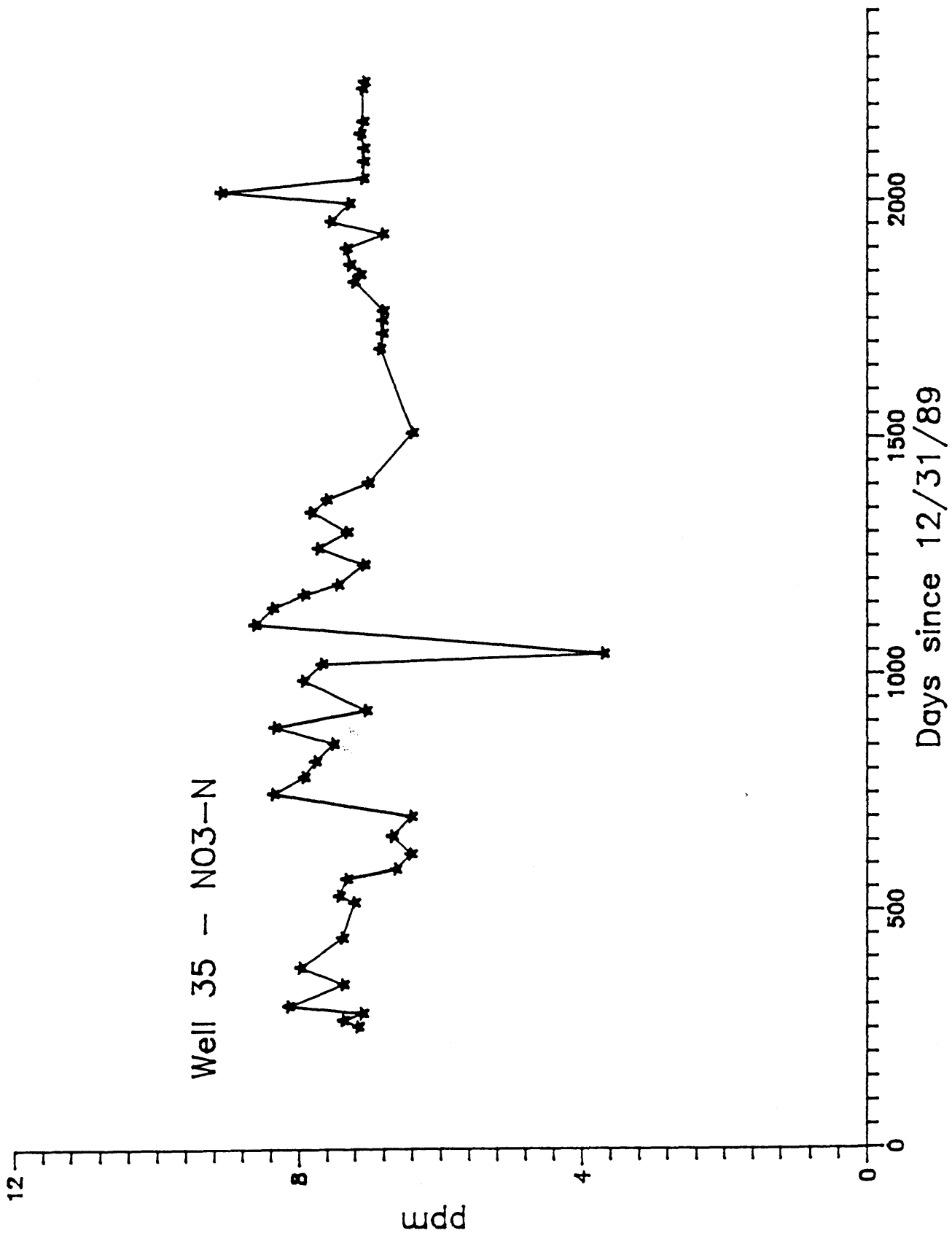


Well 34 - NO3-N

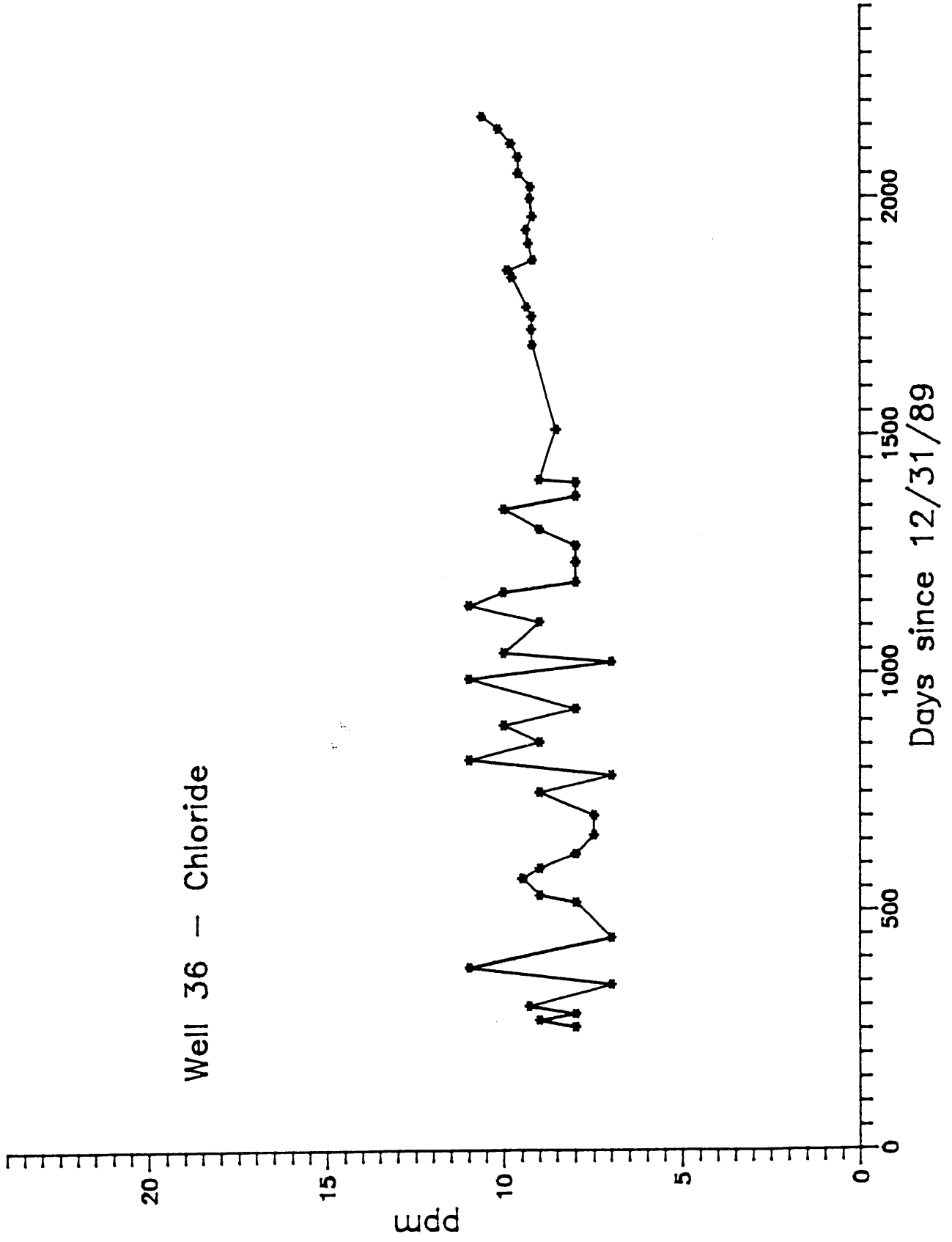


Well 35 - Chloride

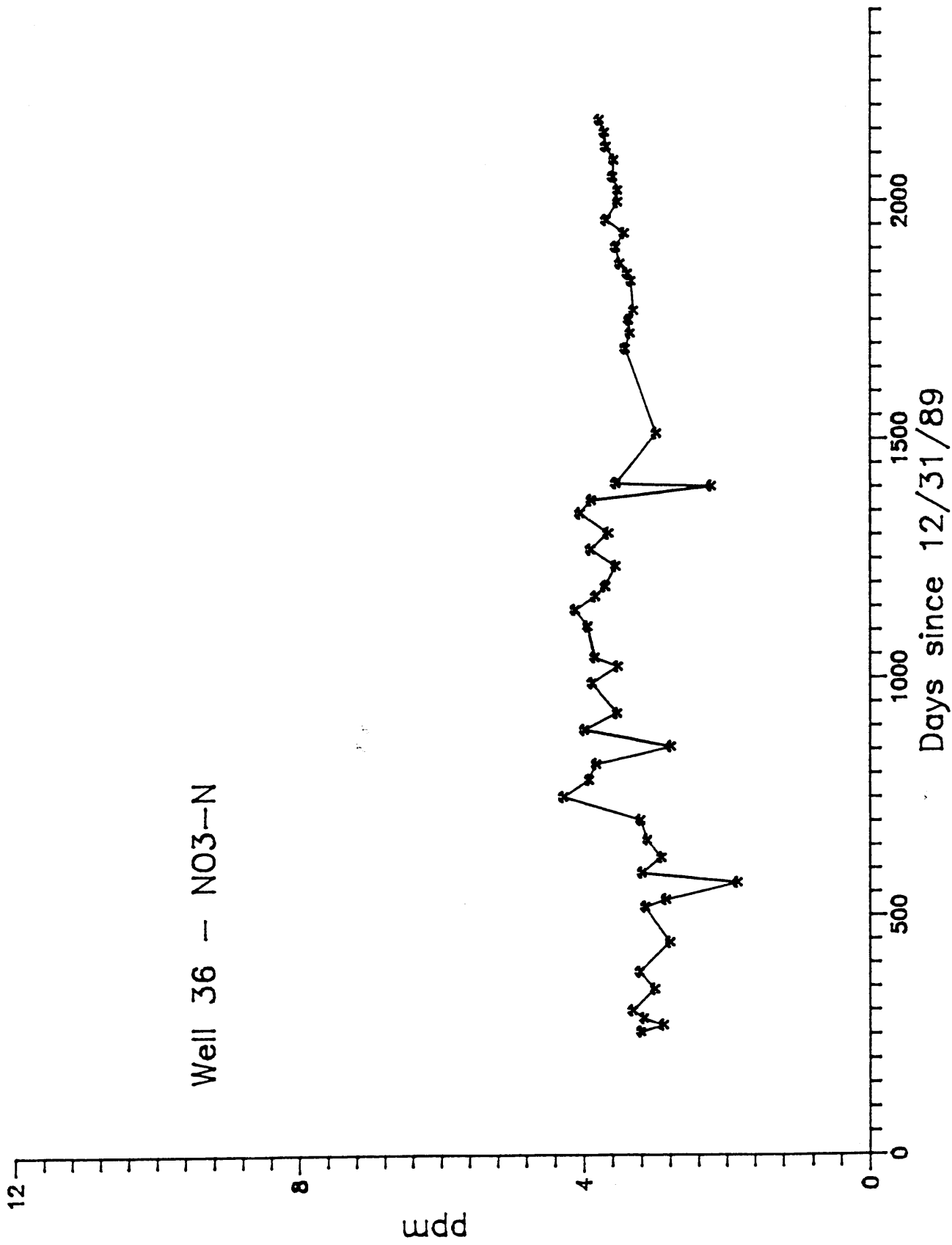


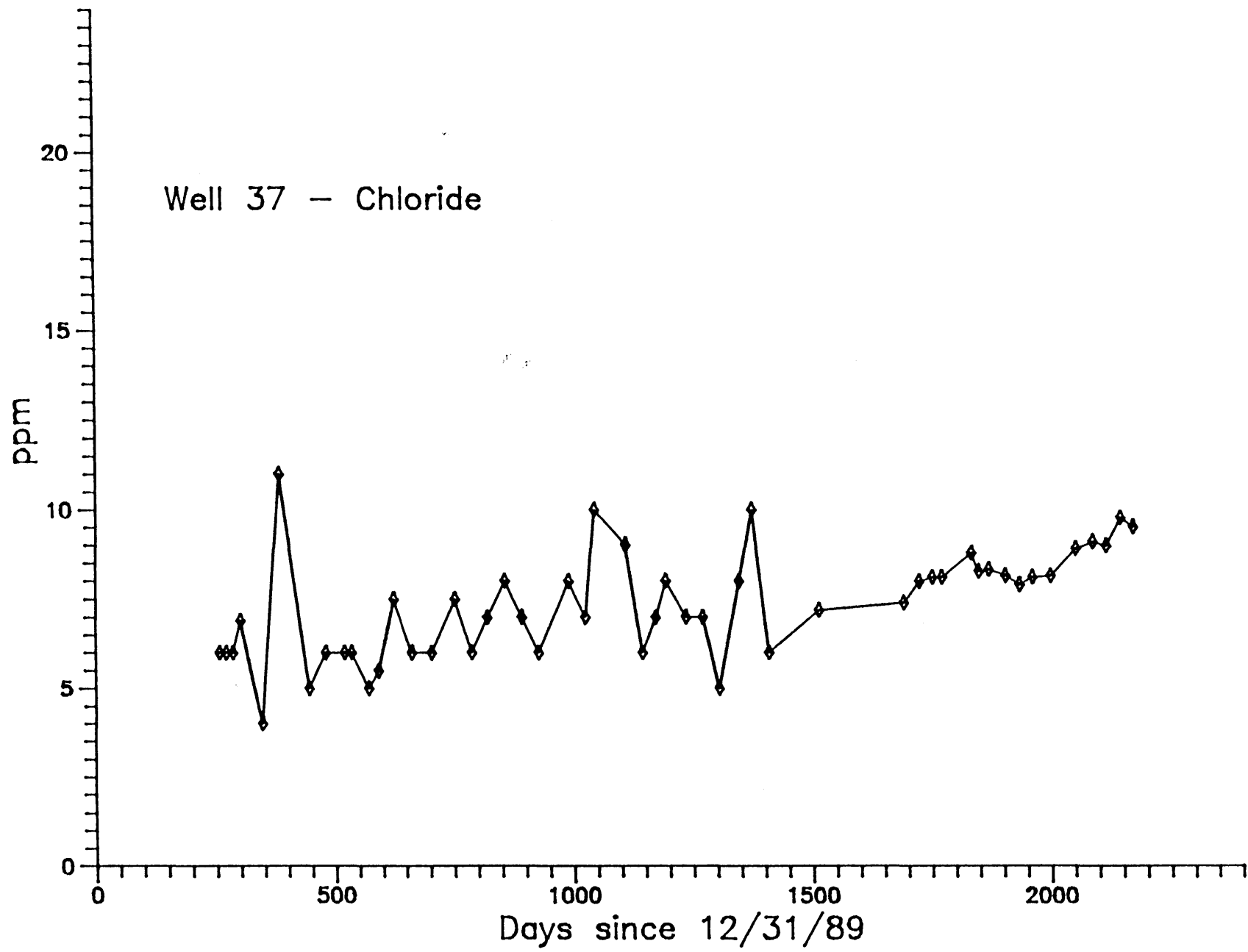


Well 36 - Chloride

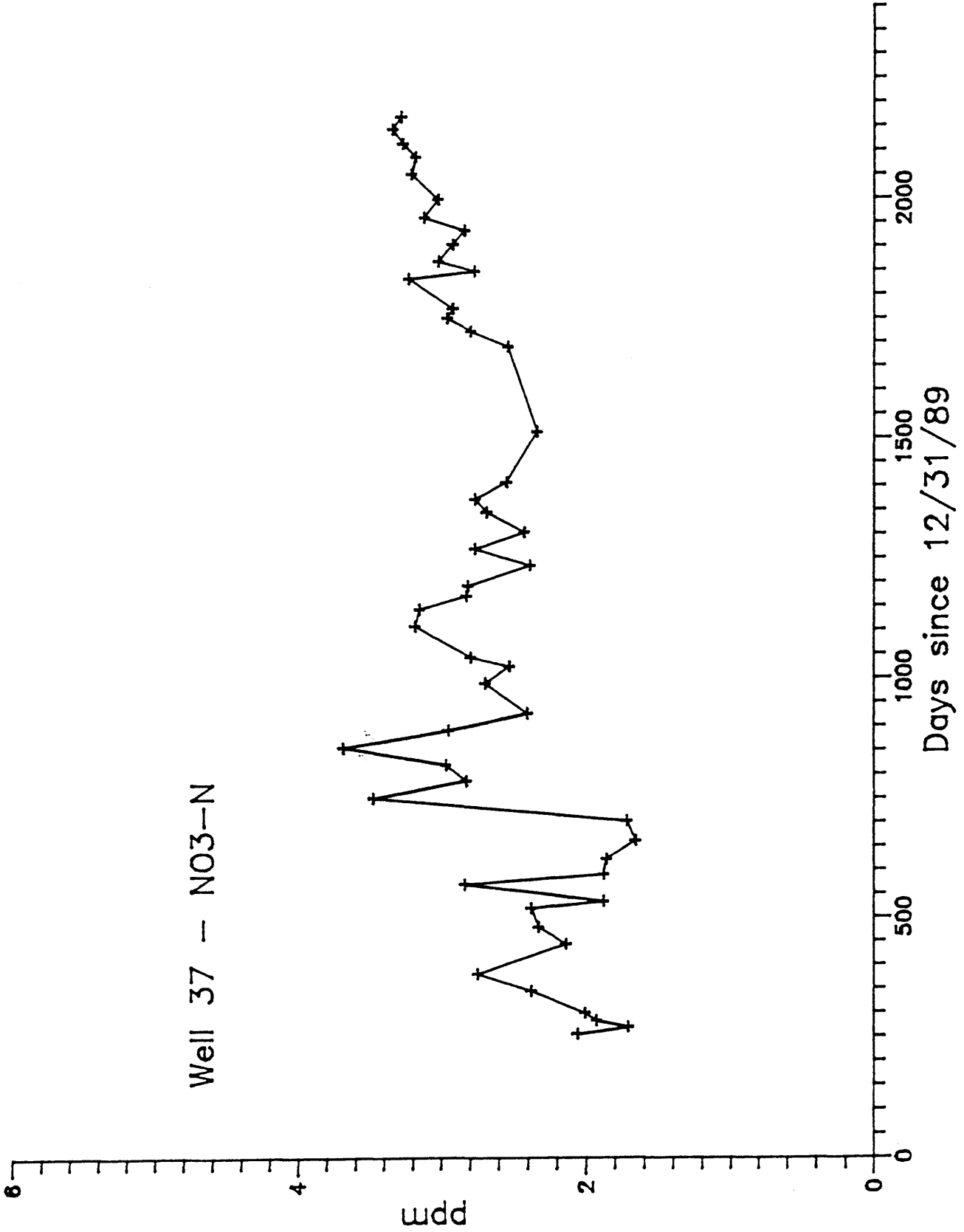


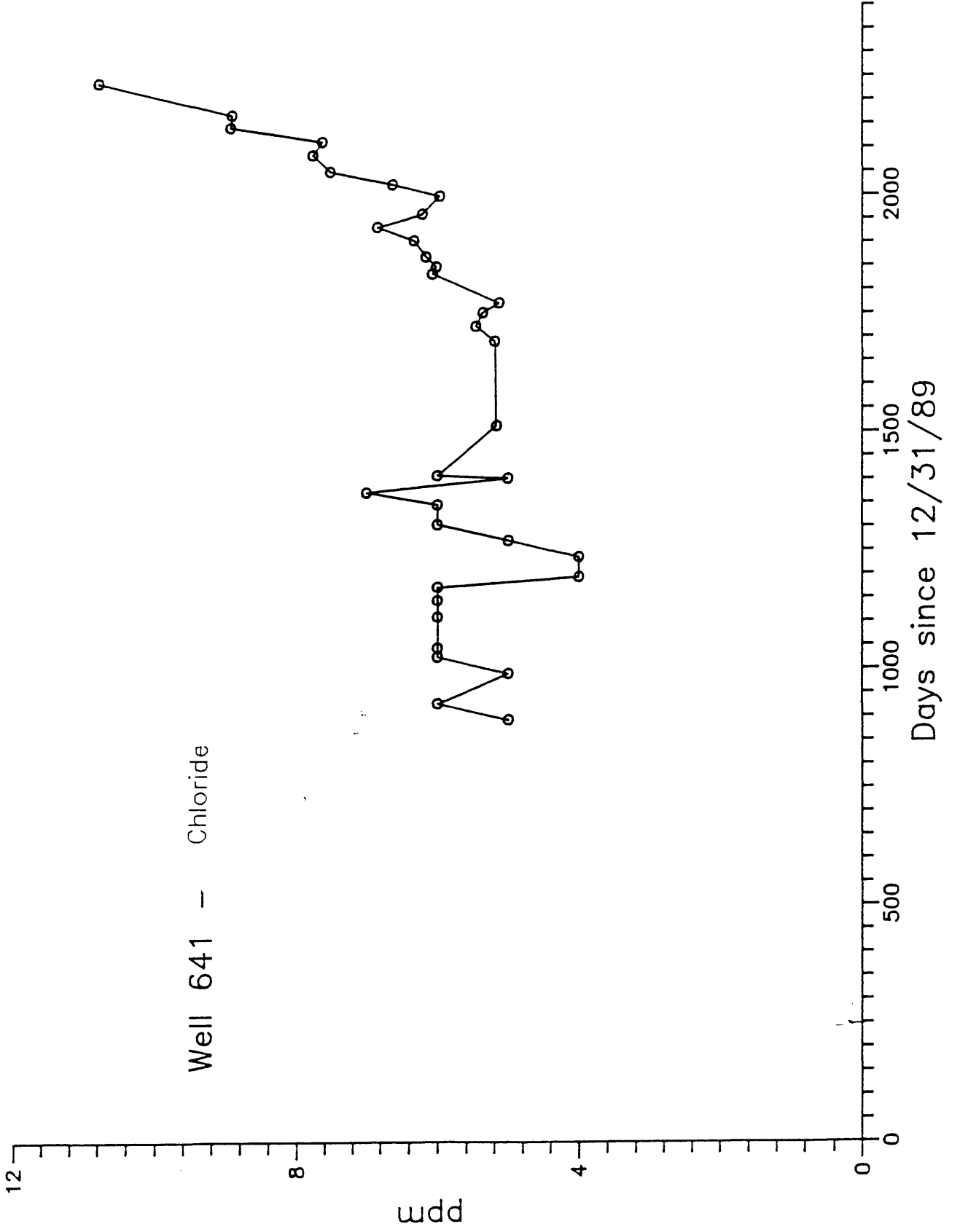
Well 36 - NO3-N



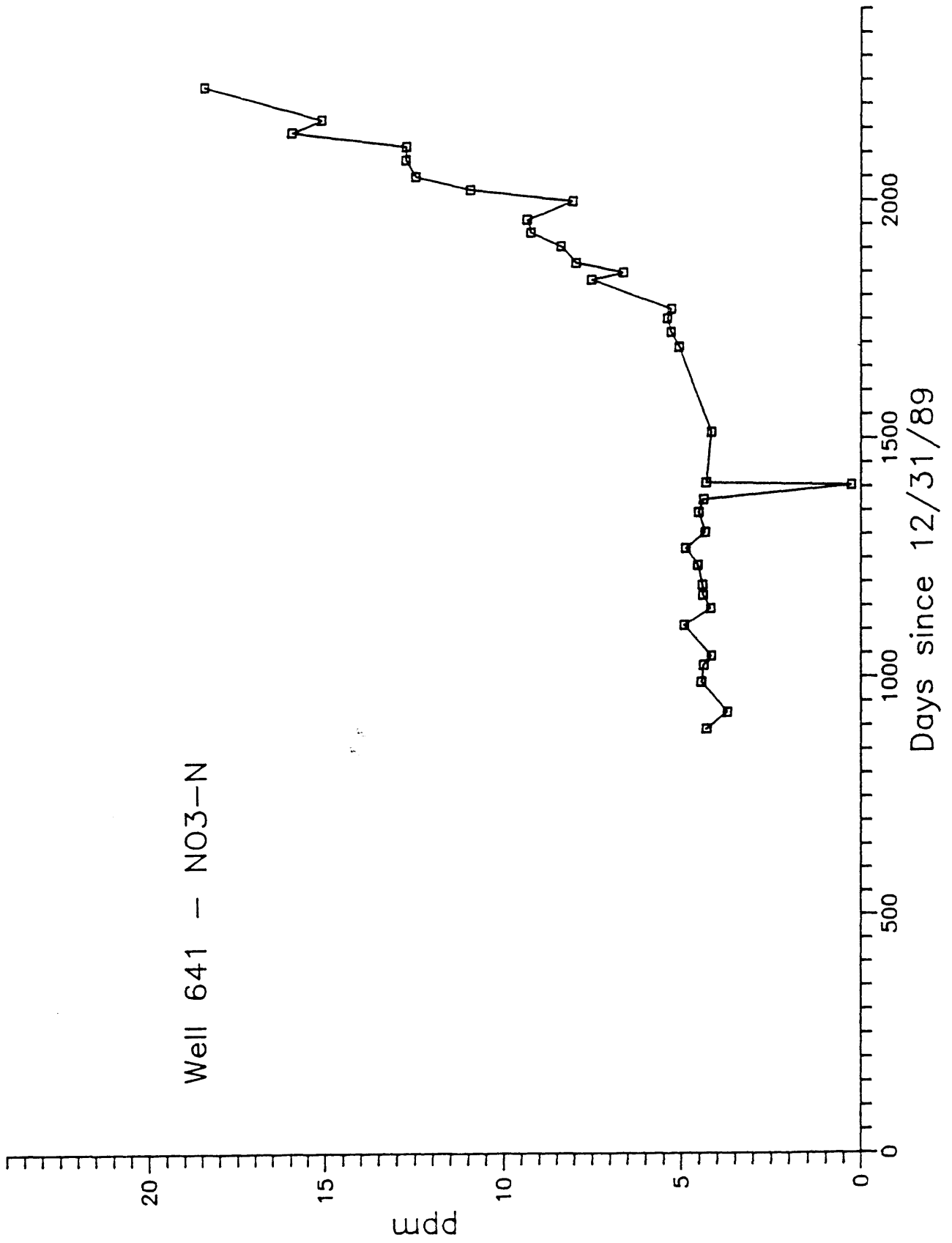


Well 37 - NO3-N

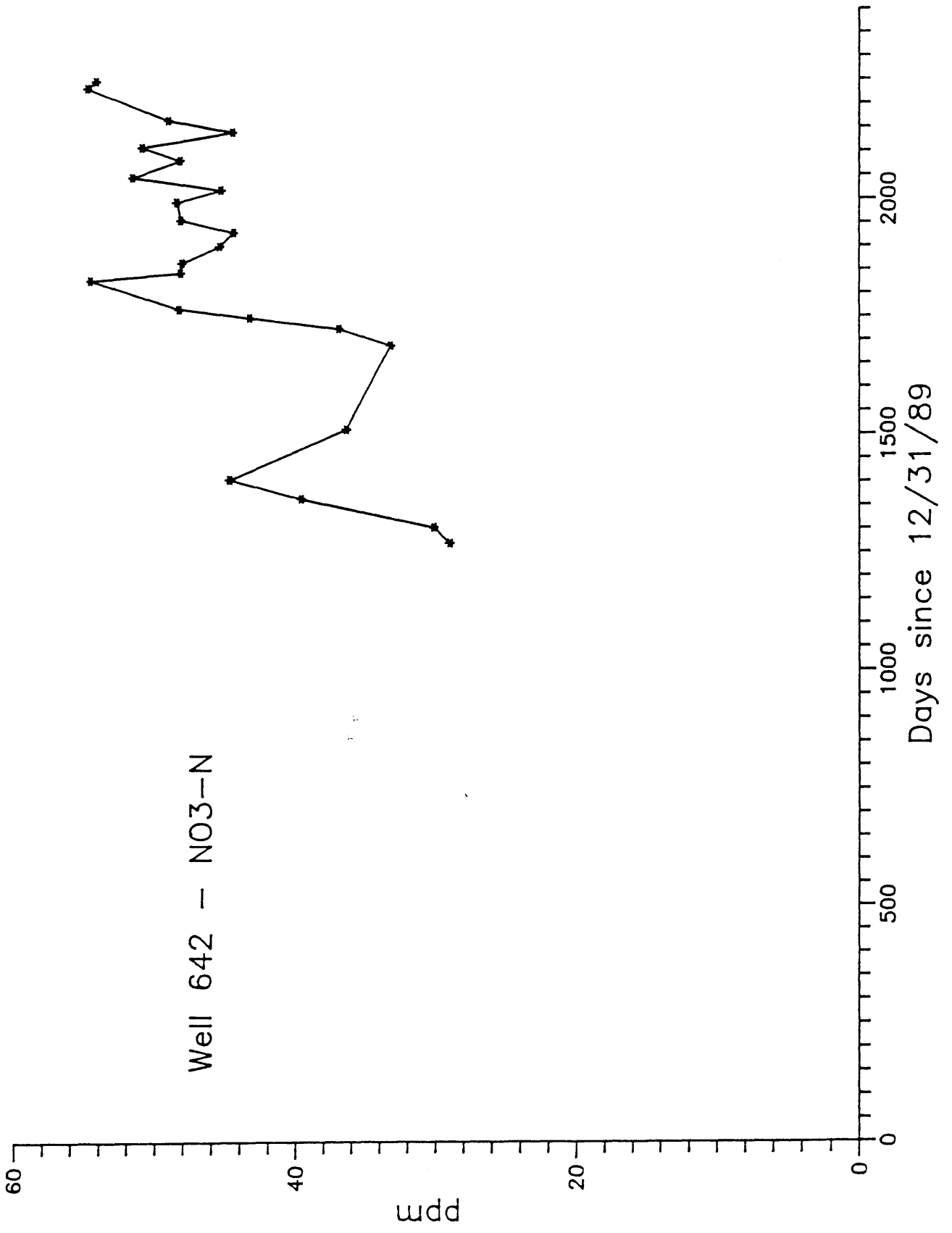




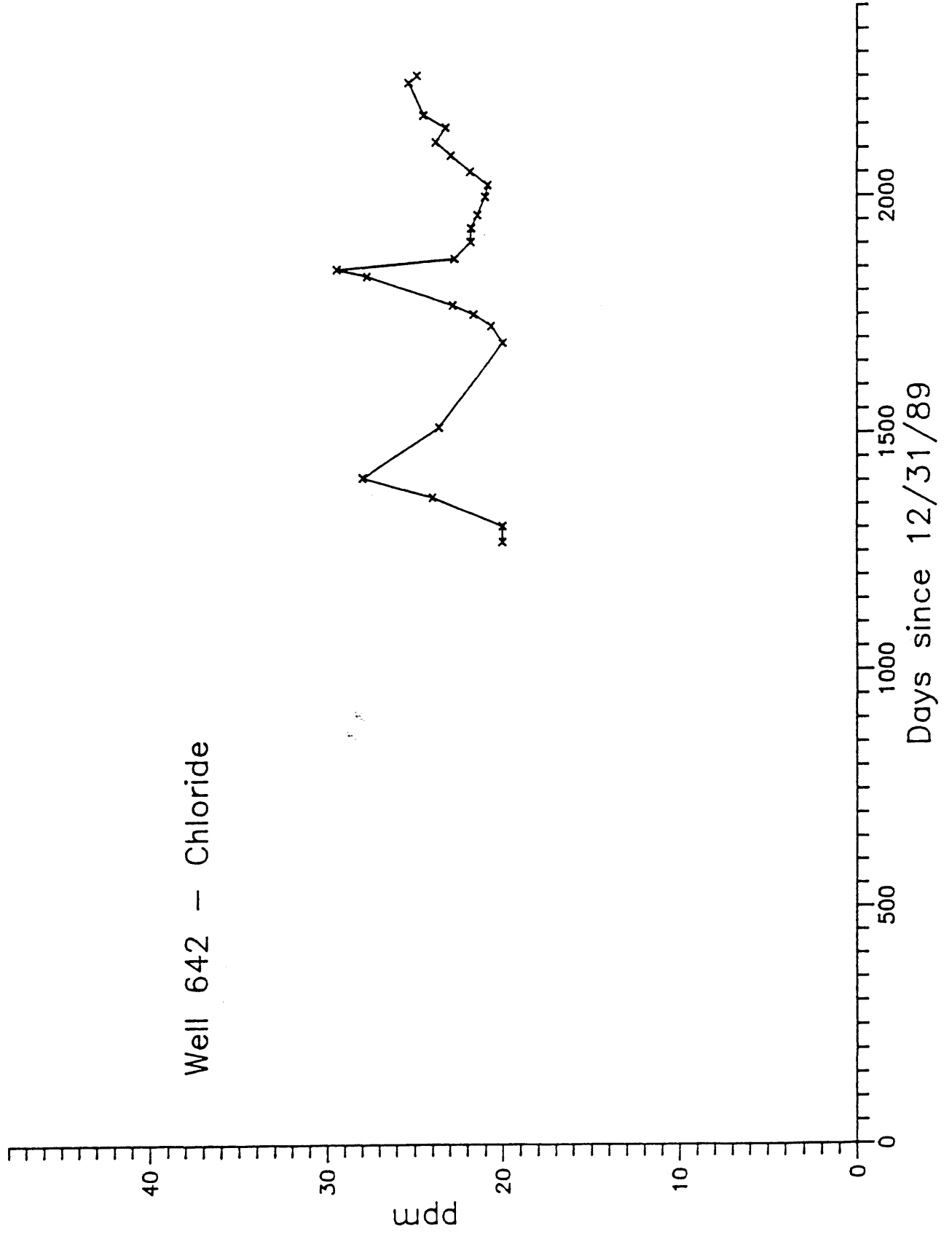
Well 641 - NO3-N



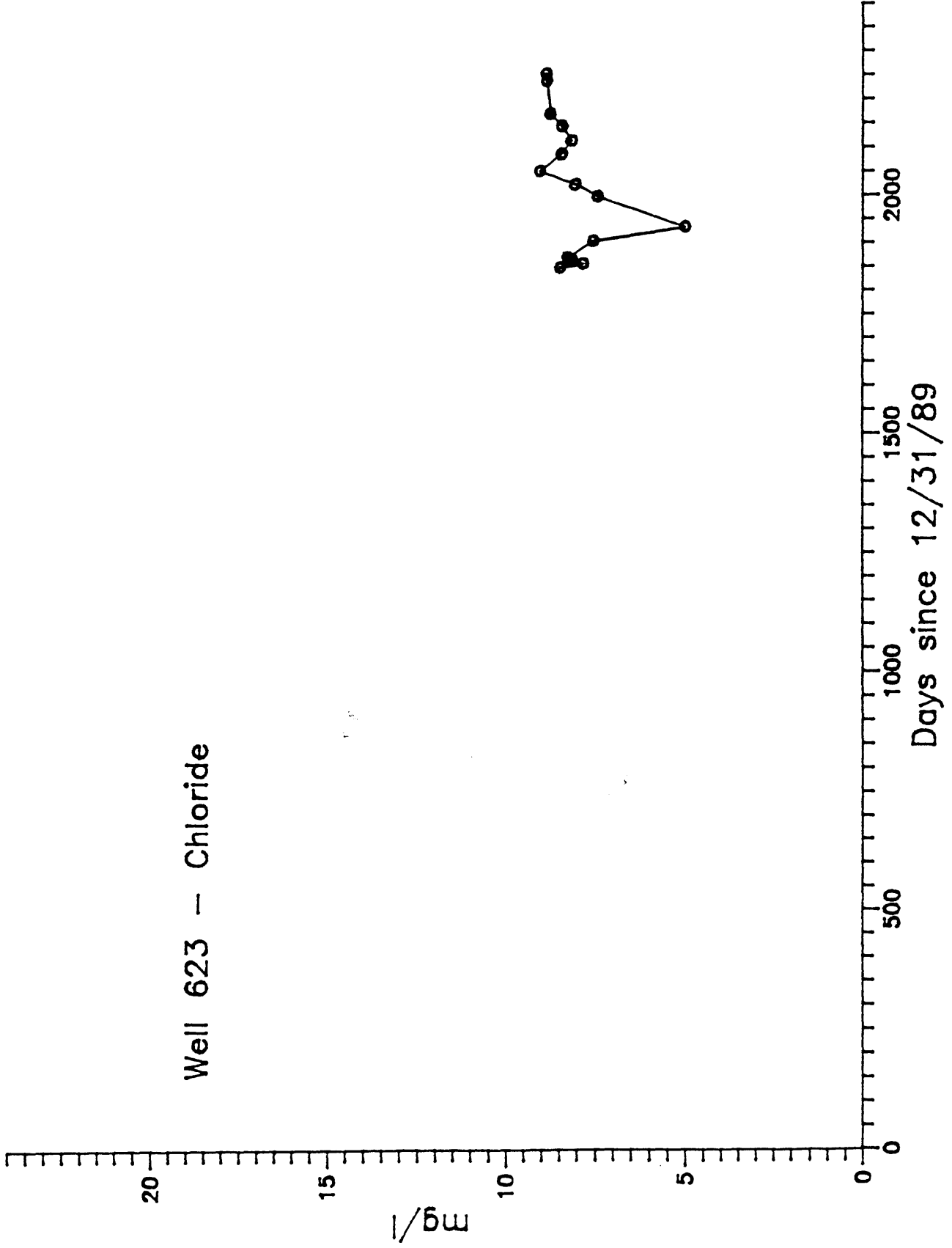
Well 642 - NO3-N



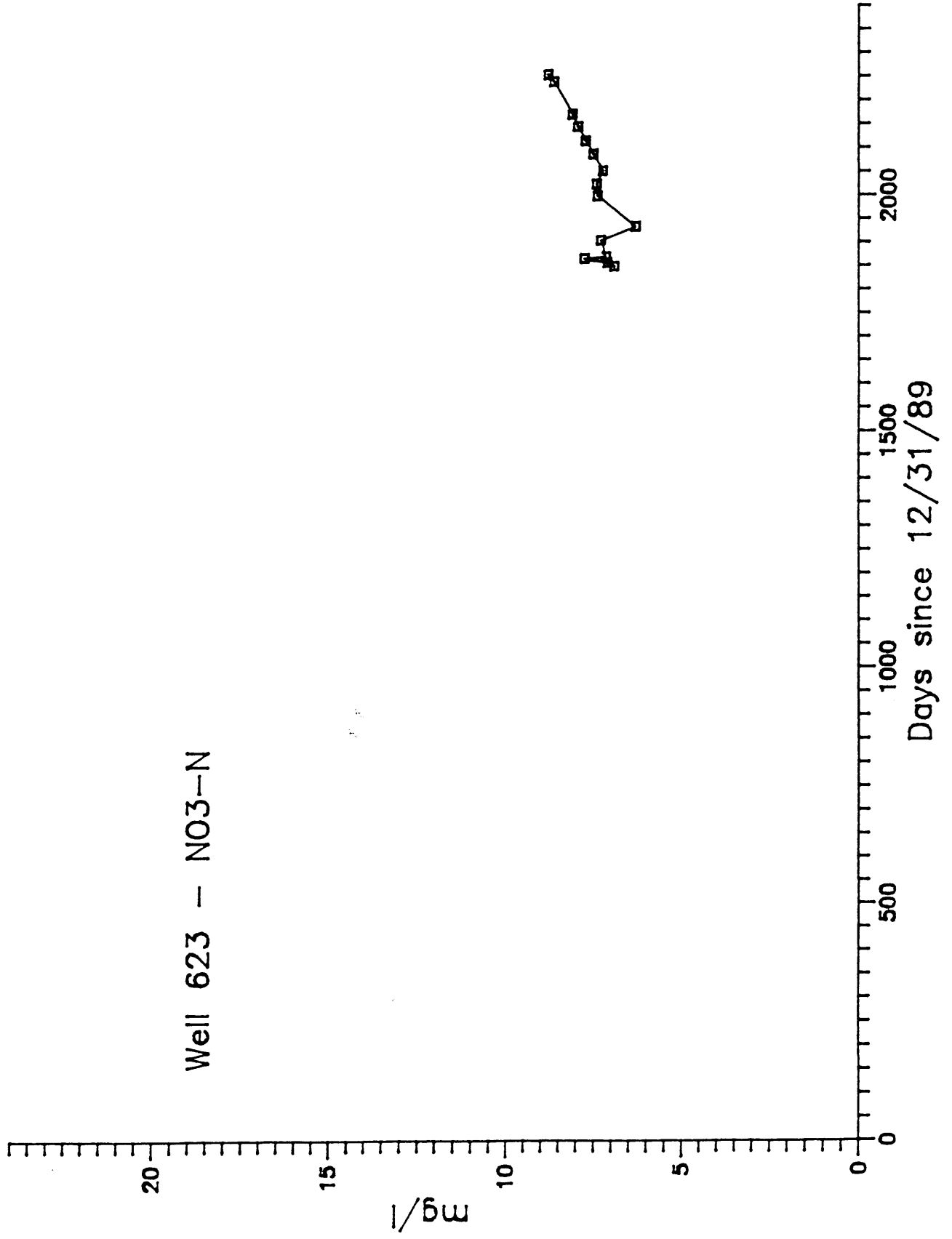
Well 642 - Chloride



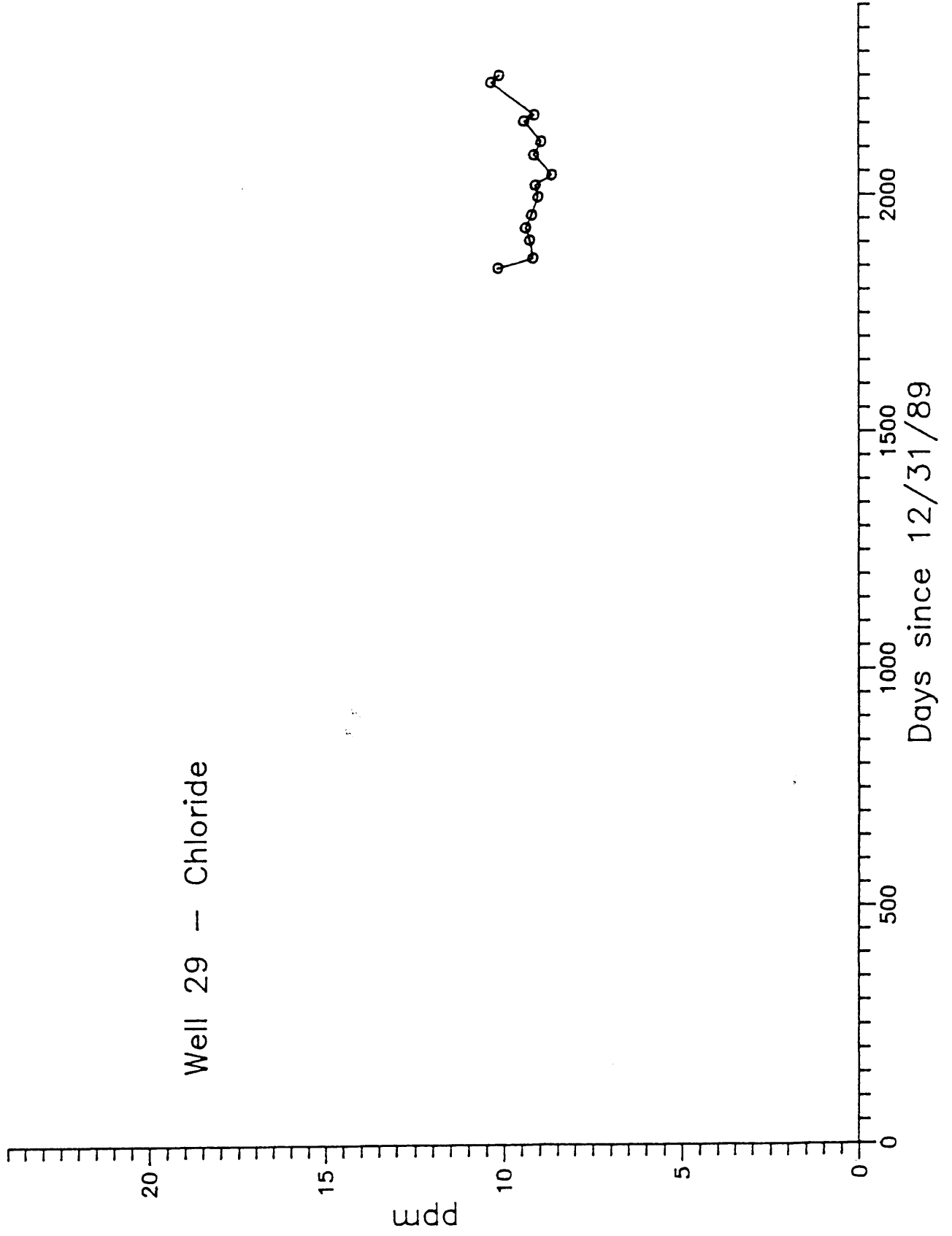
Well 623 - Chloride



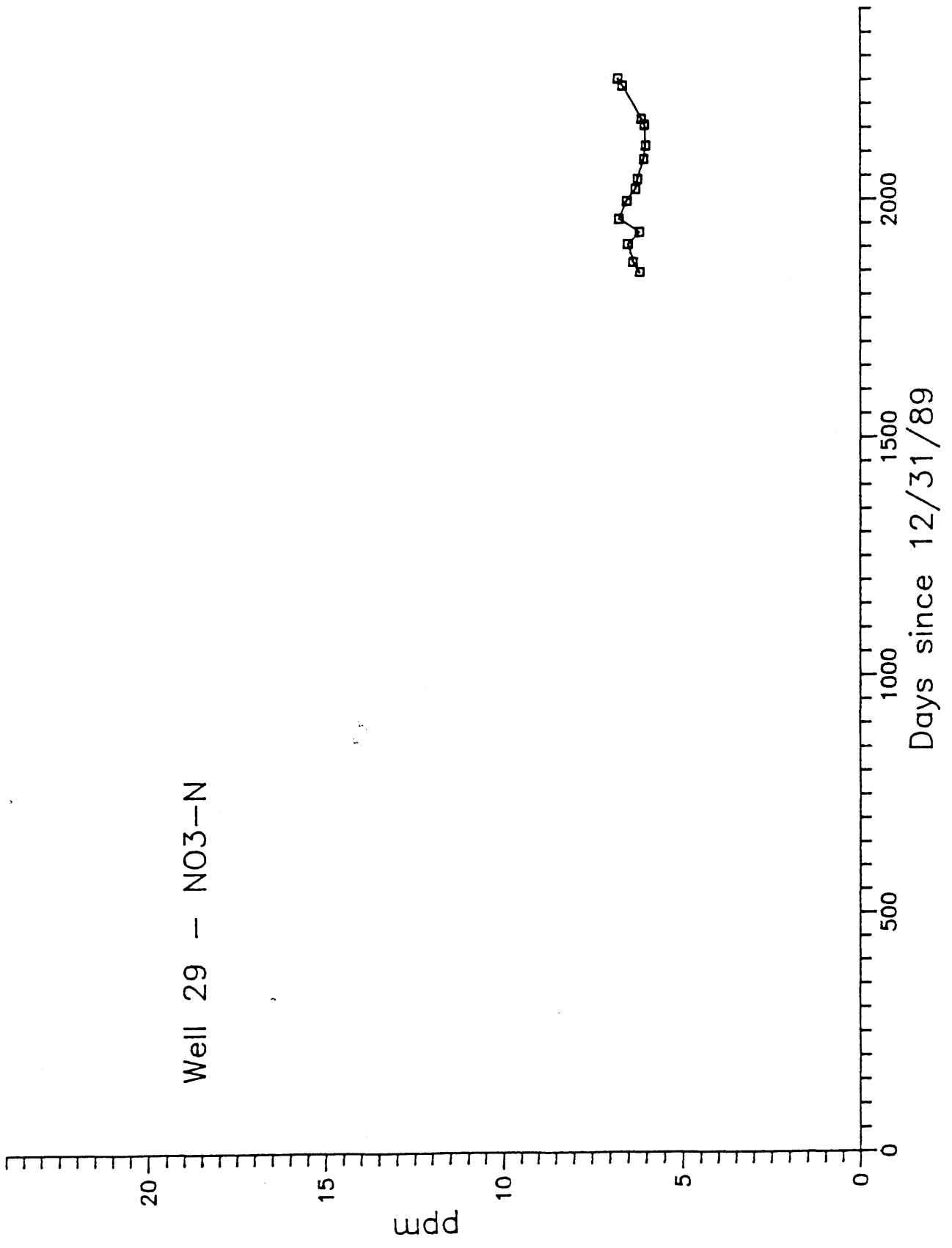
Well 623 - NO3-N



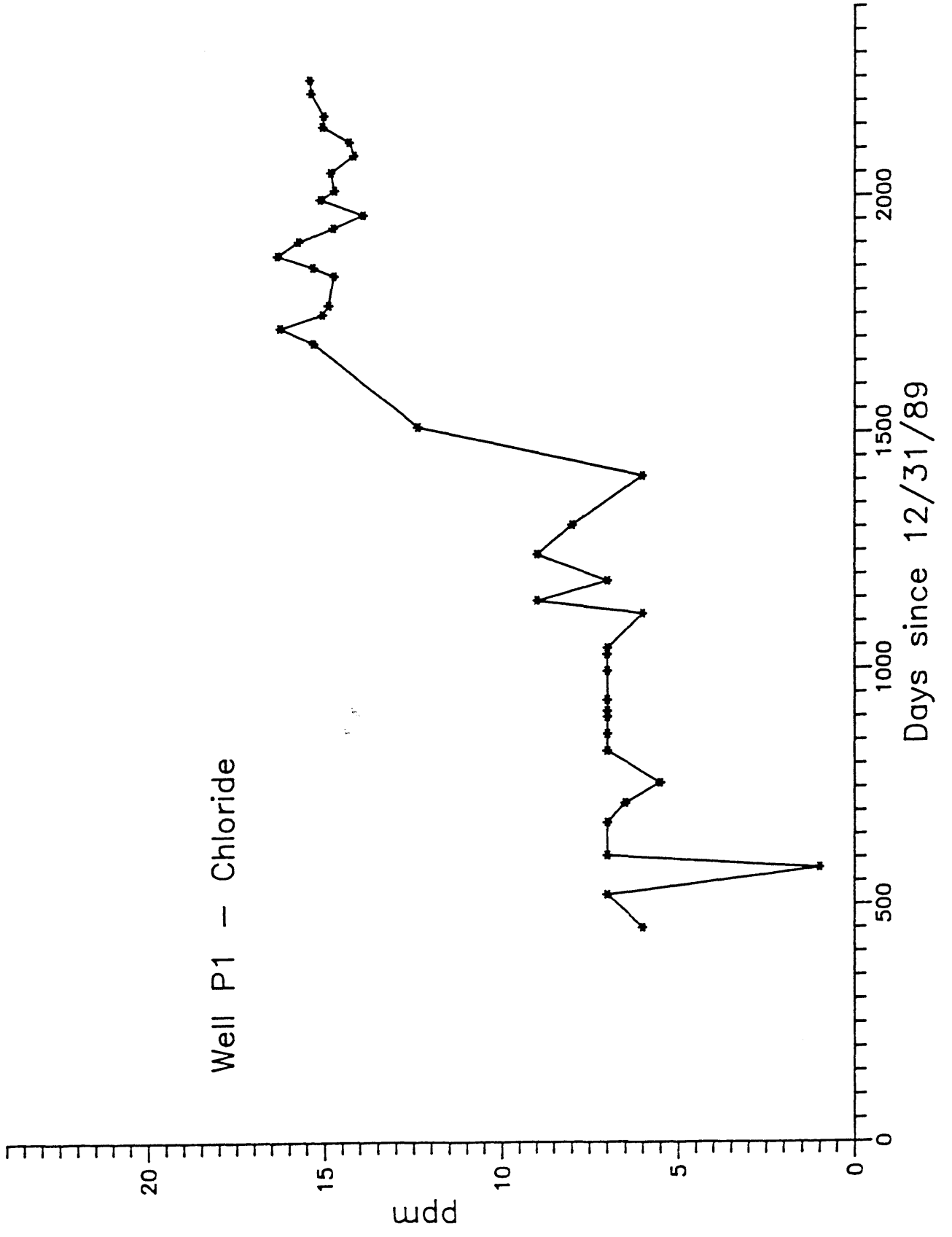
Well 29 -- Chloride



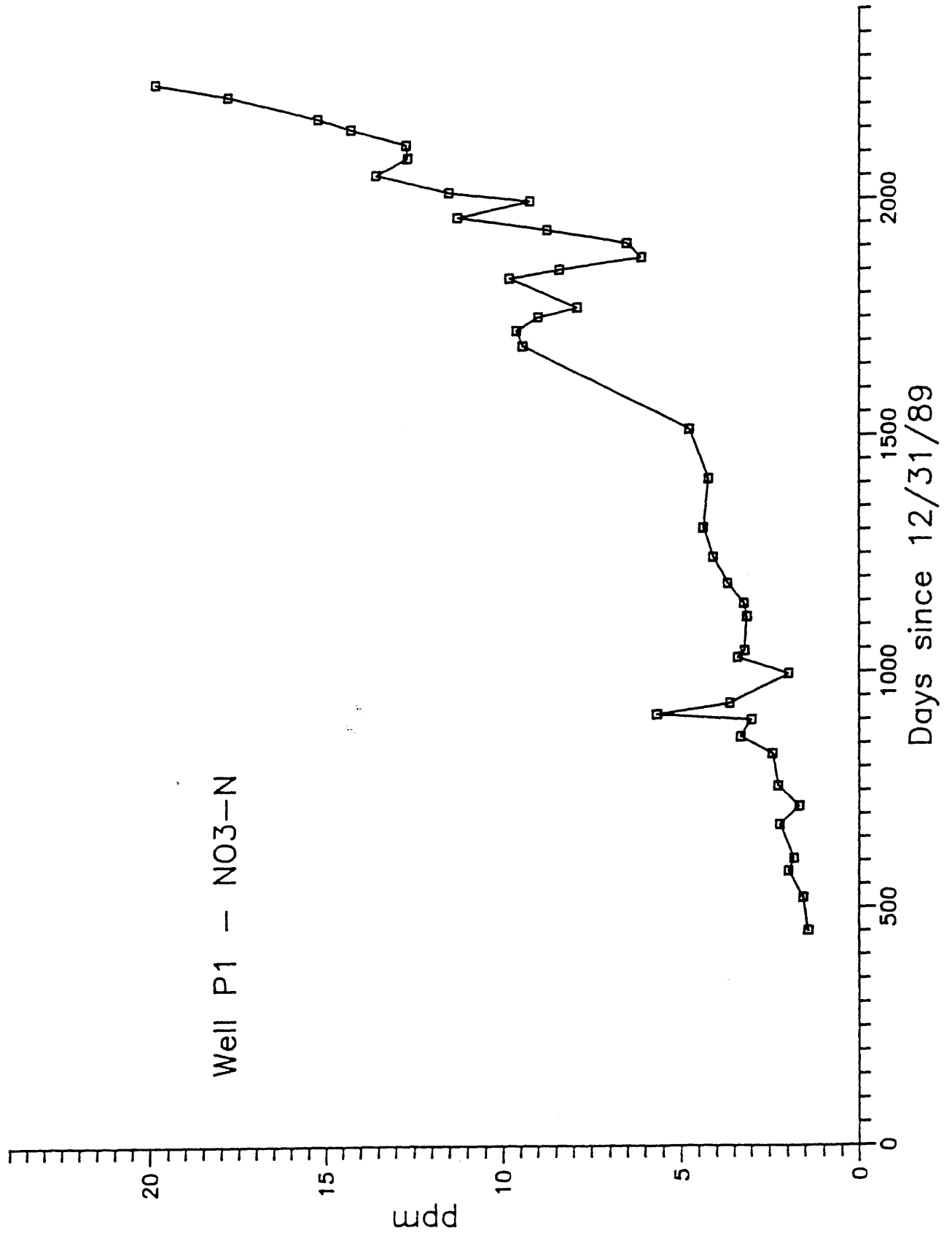
Well 29 - NO3-N

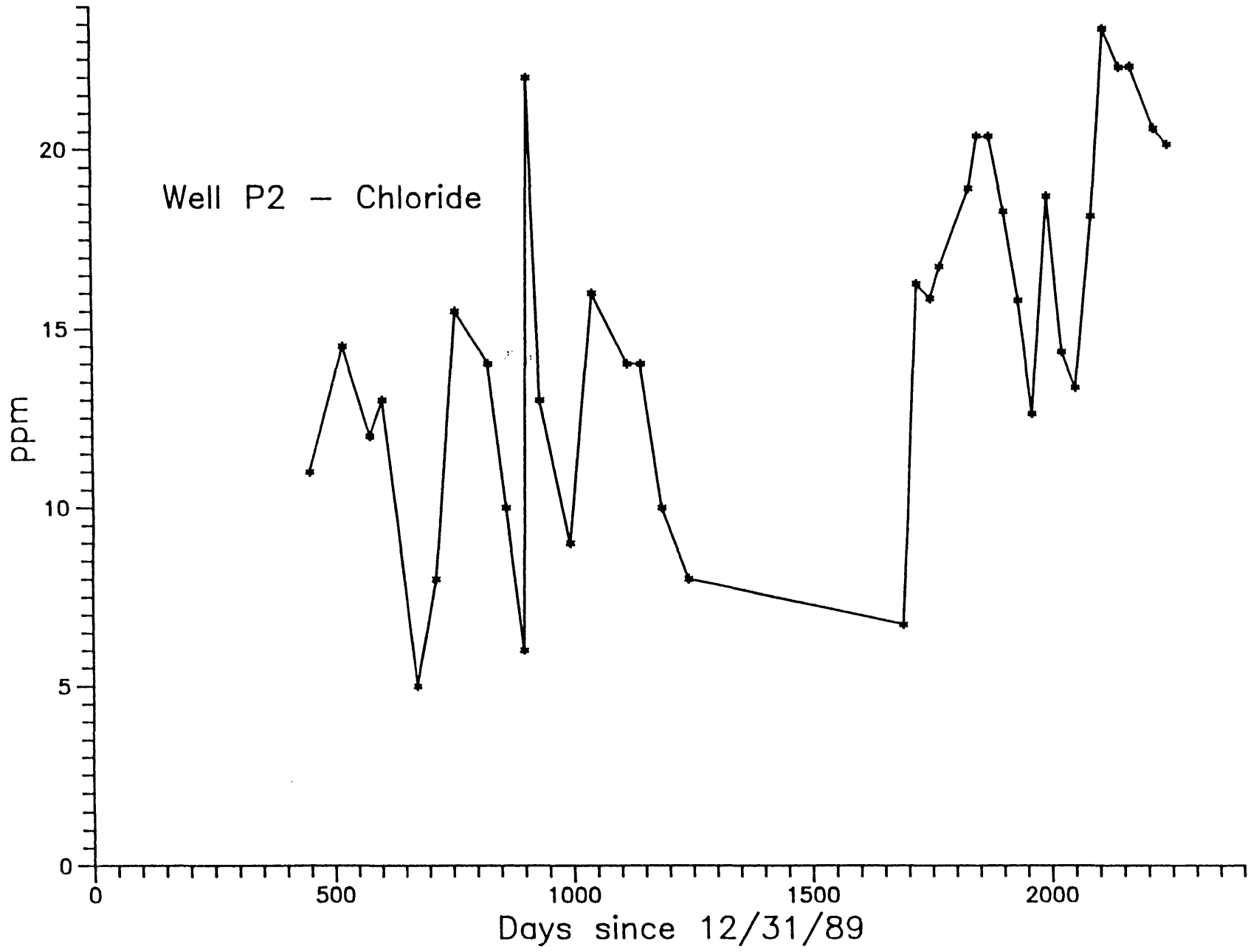


Well P1 - Chloride

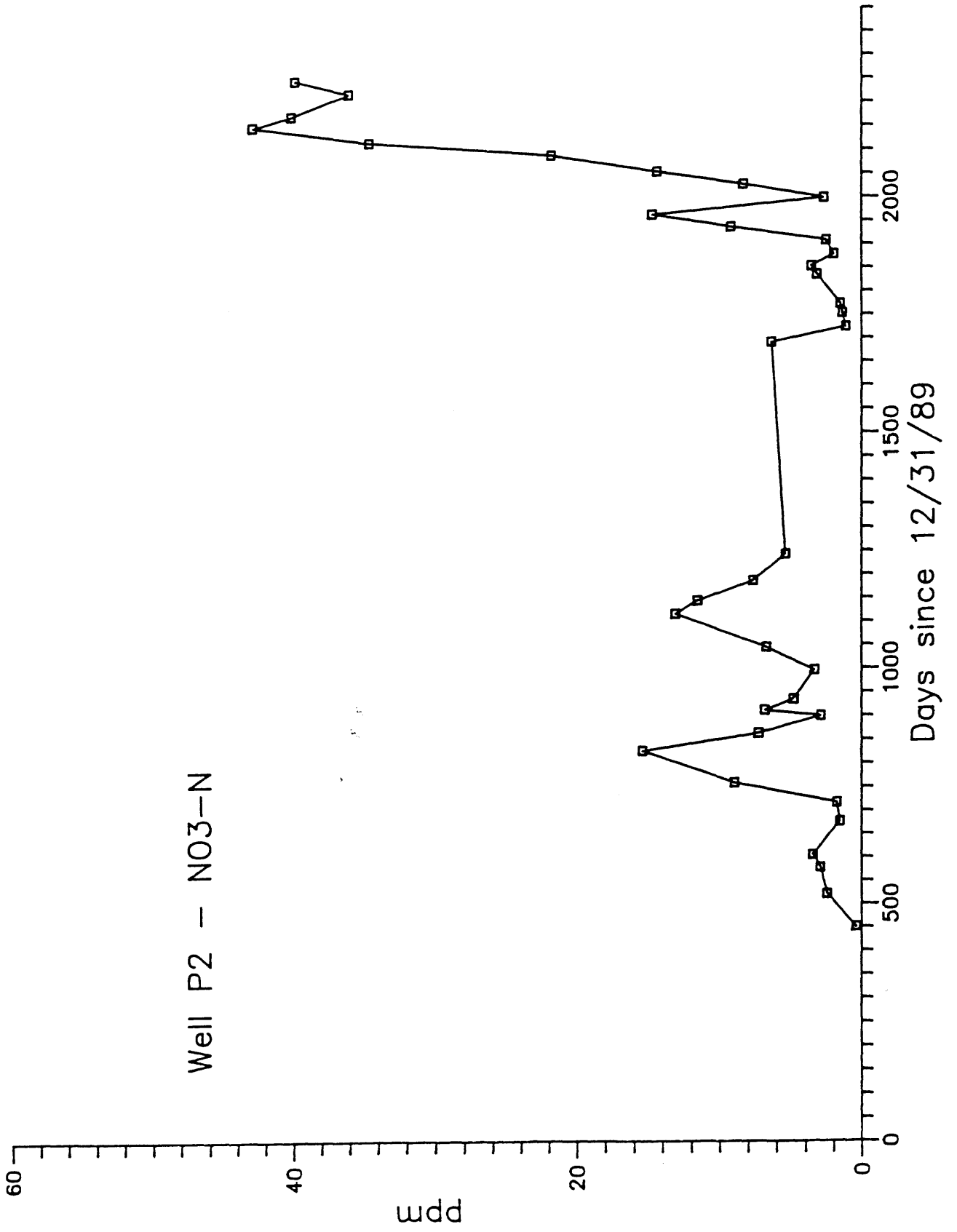


Well P1 - NO3-N

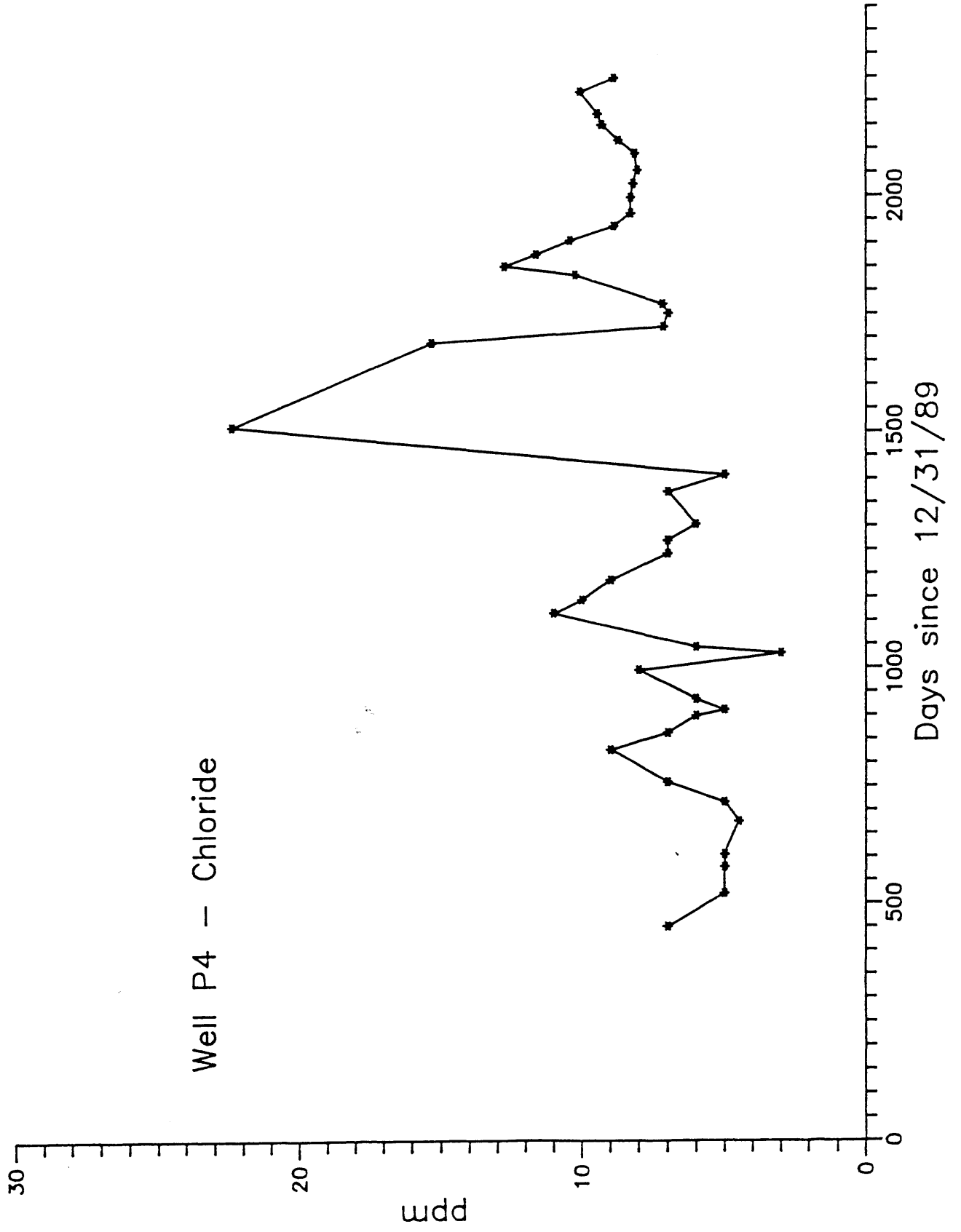




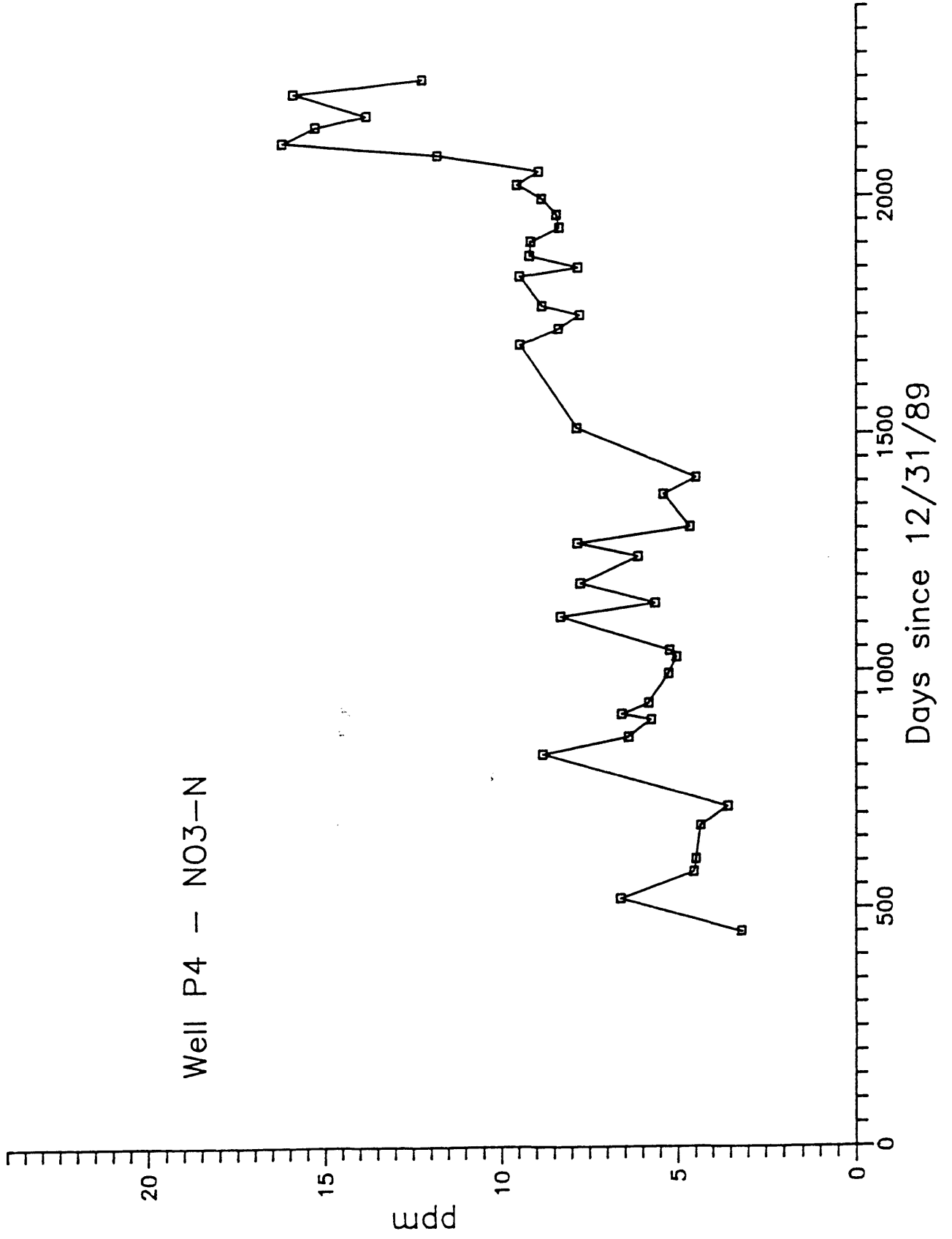
Well P2 - NO3-N



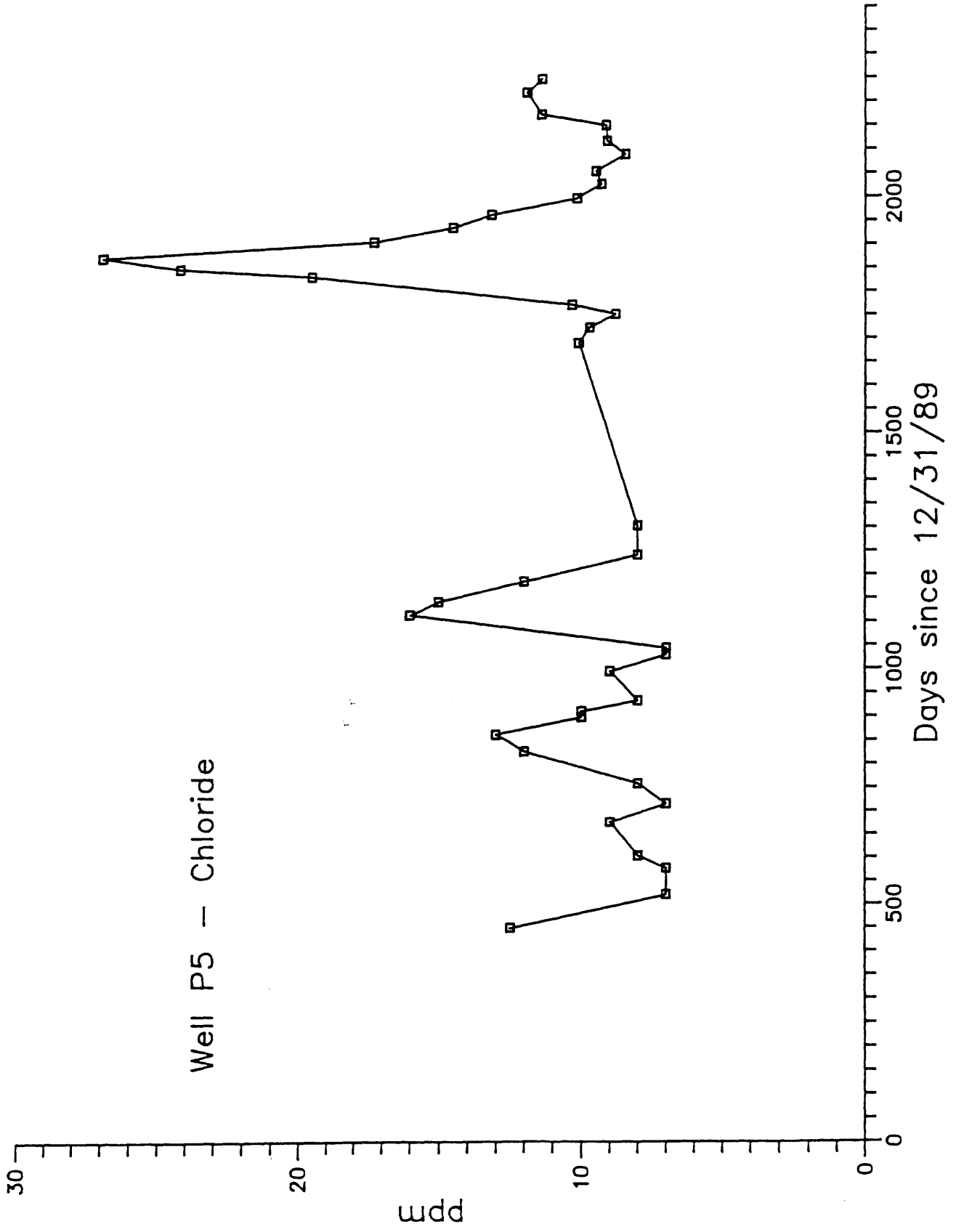
Well P4 - Chloride



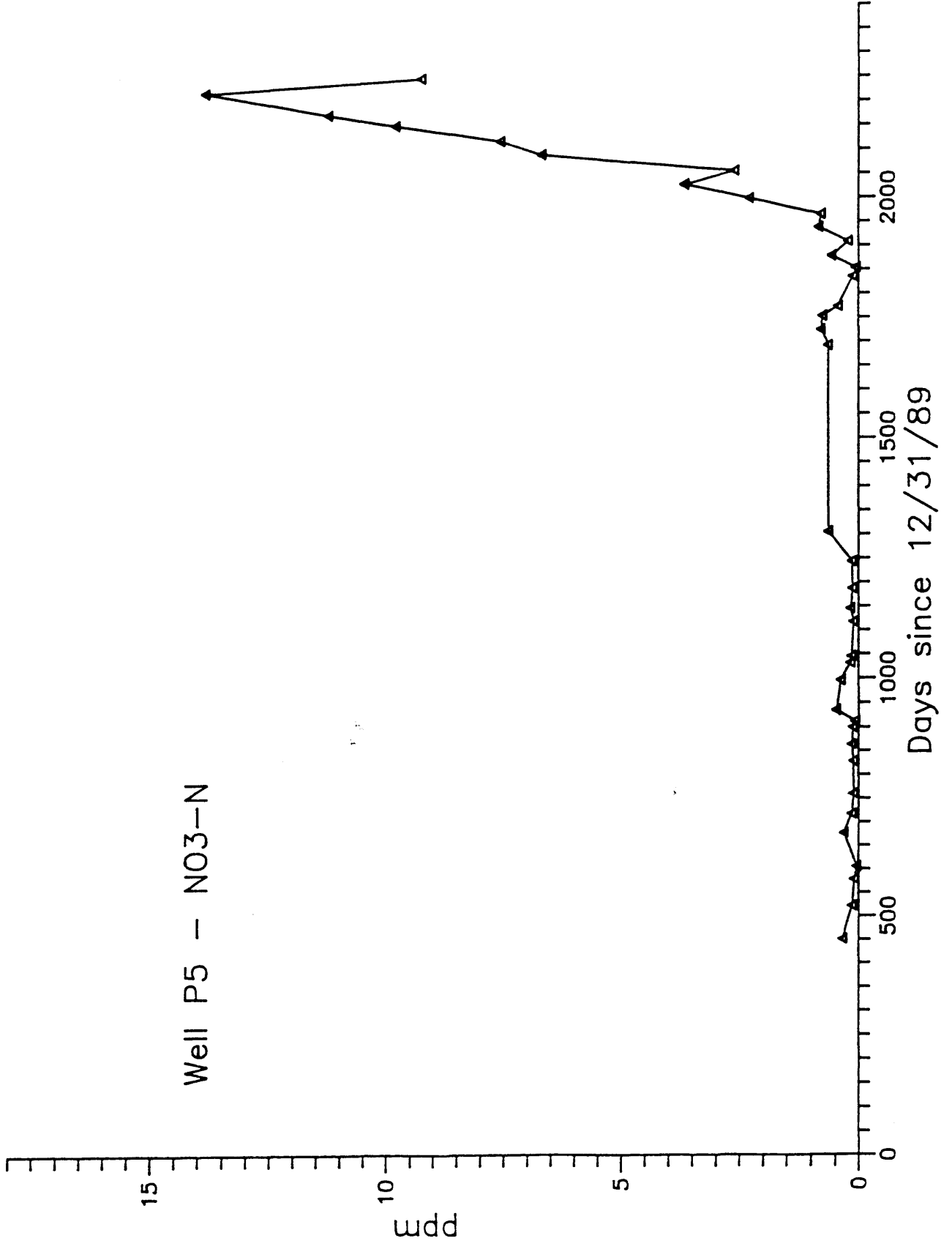
Well P4 - NO3-N



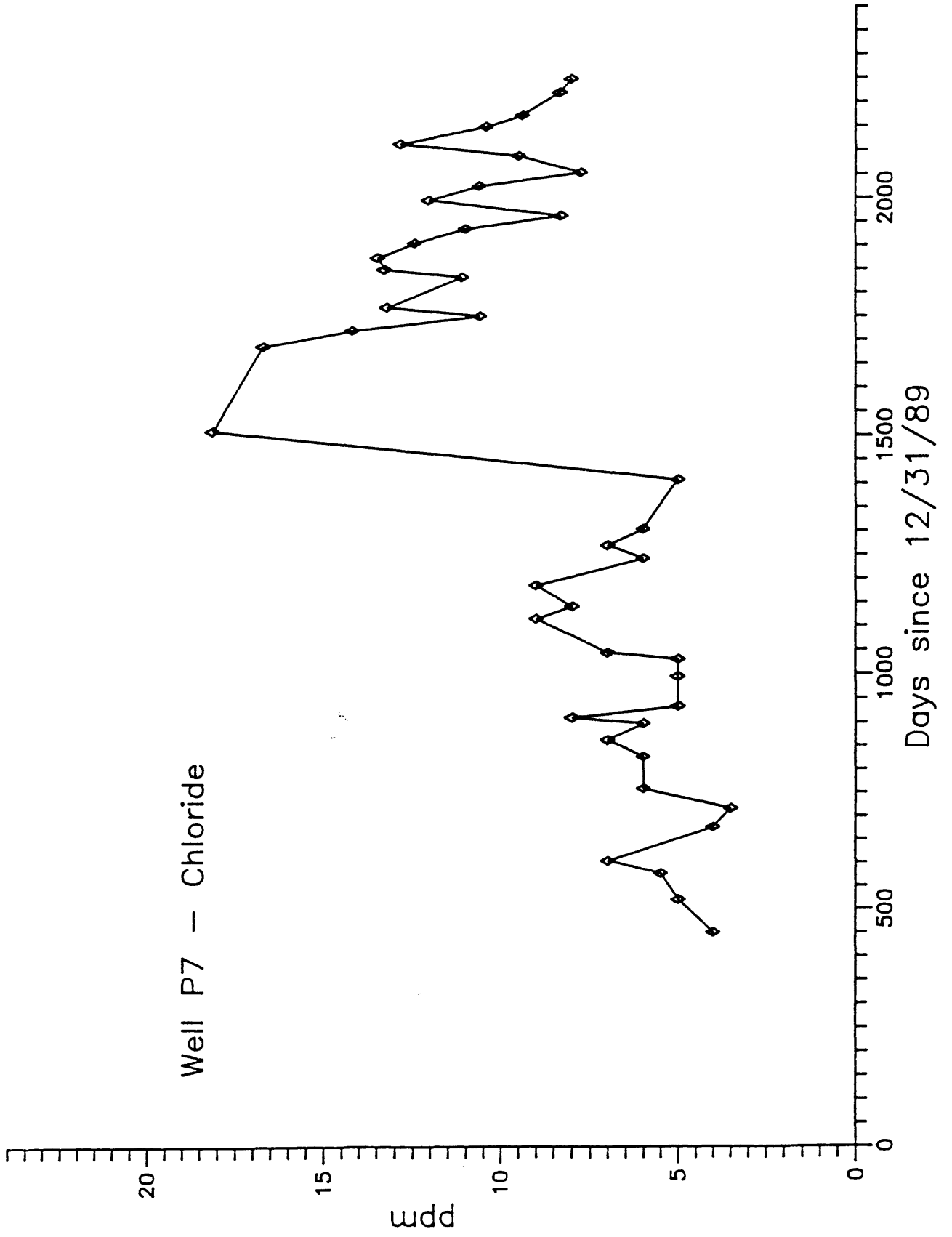
Well P5 -- Chloride



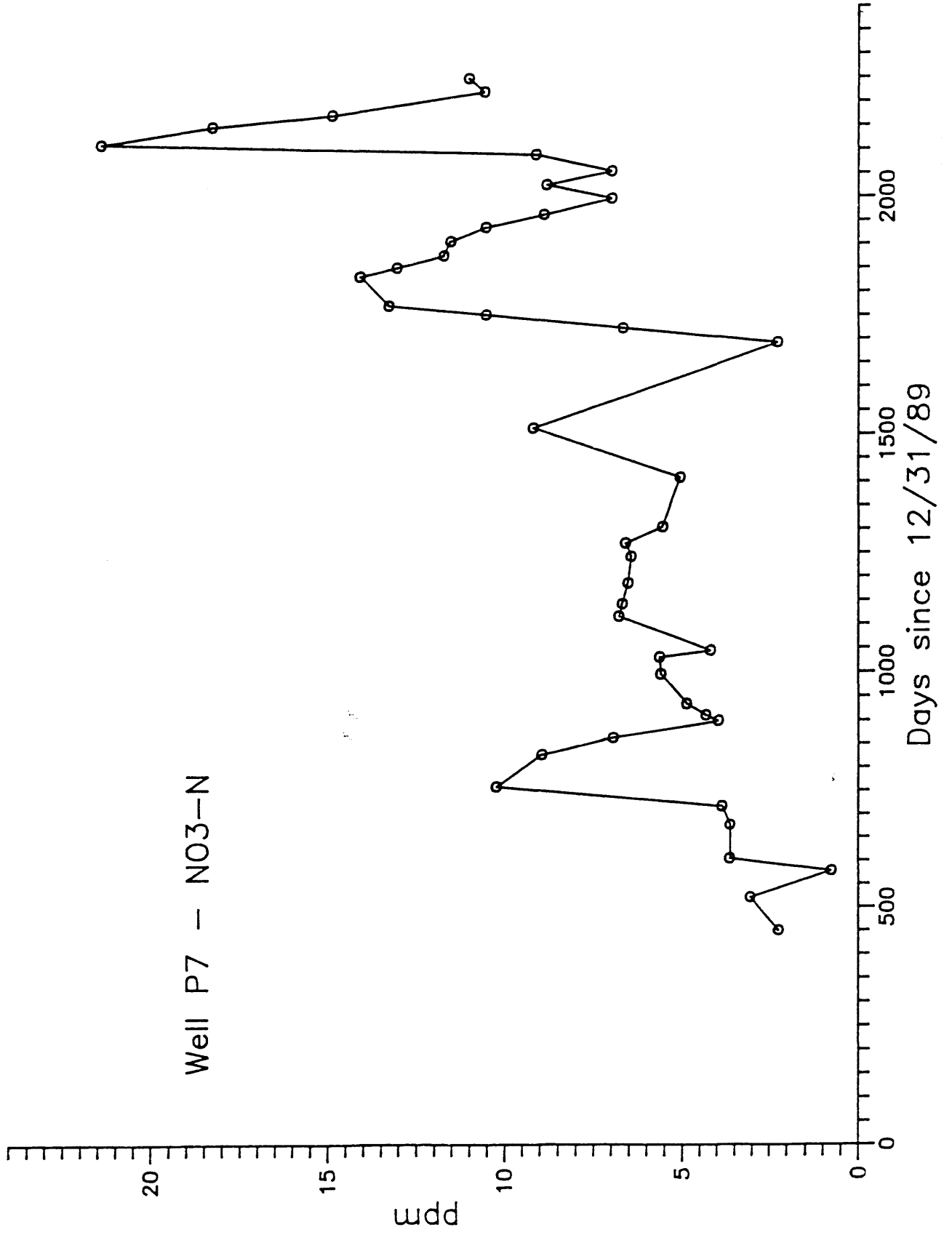
Well P5 - NO3-N



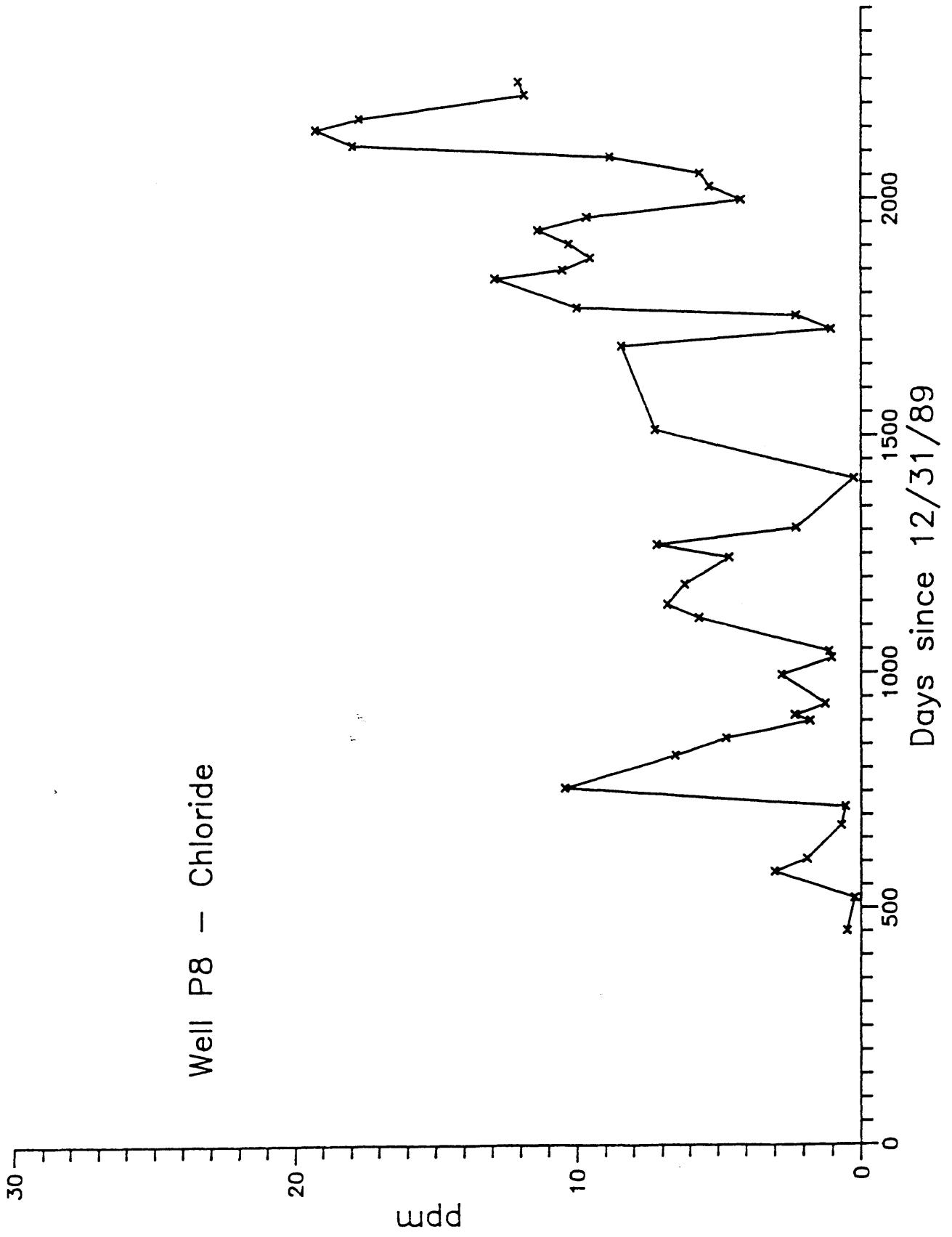
Well P7 - Chloride



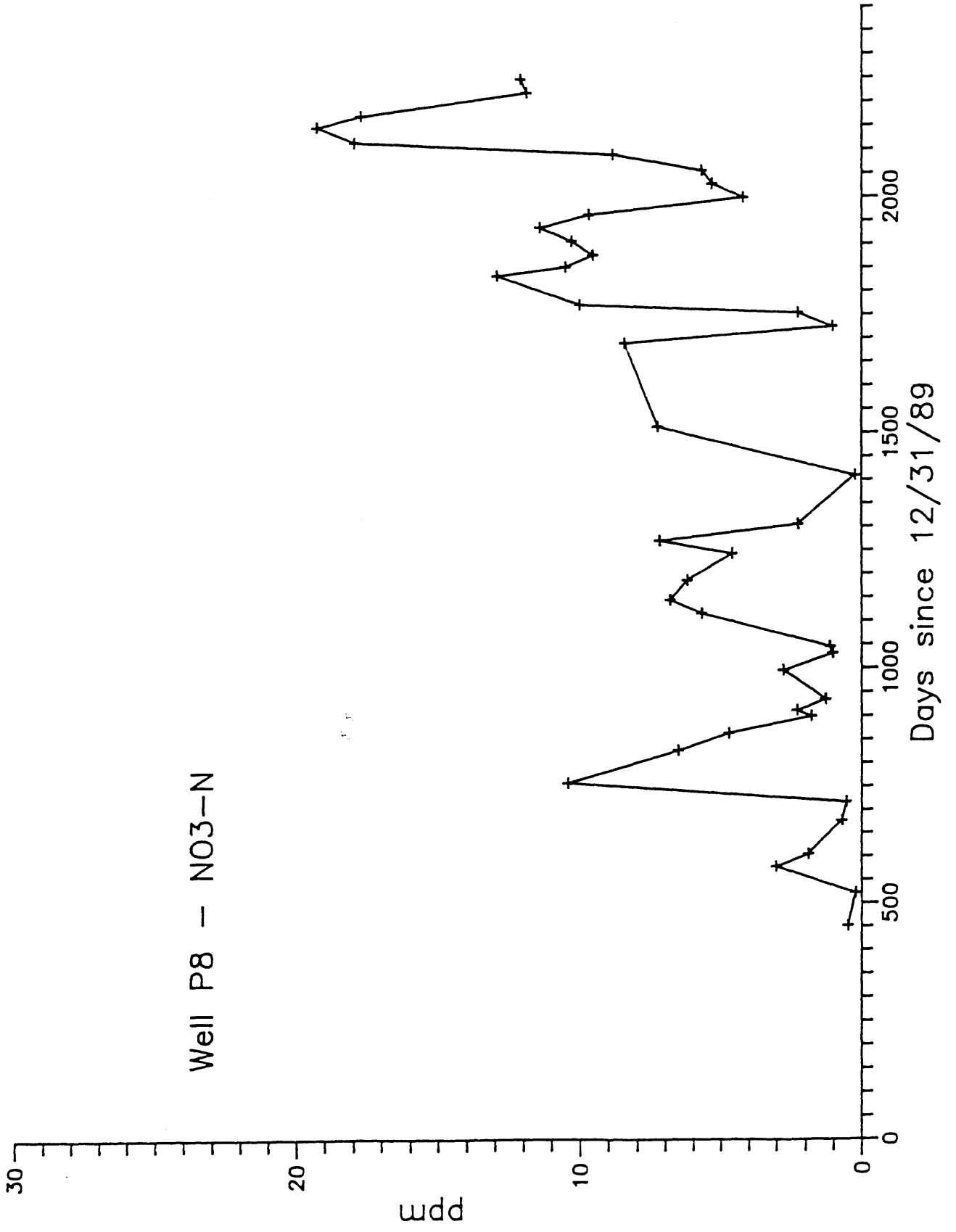
Well P7 - NO3-N



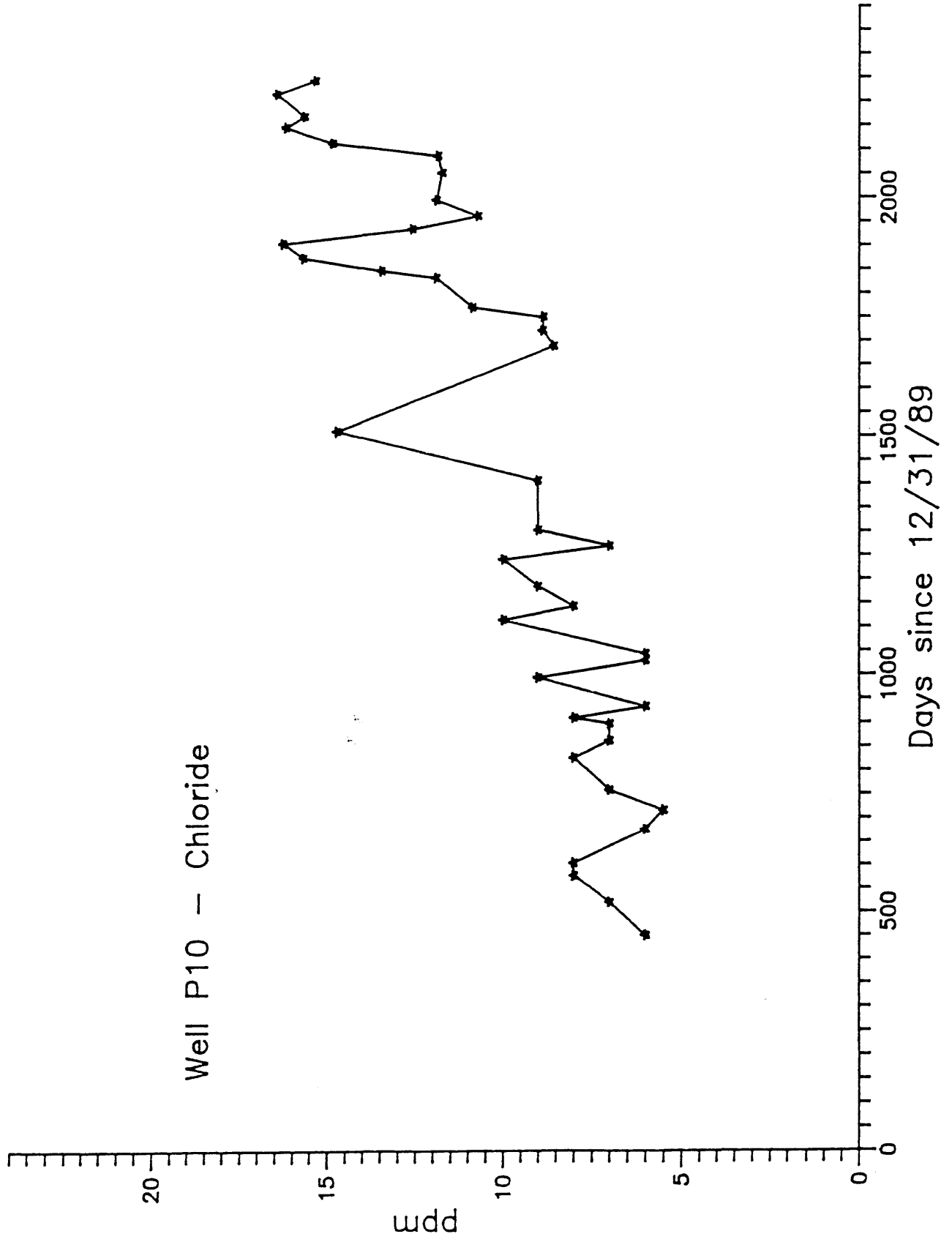
Well P8 - Chloride

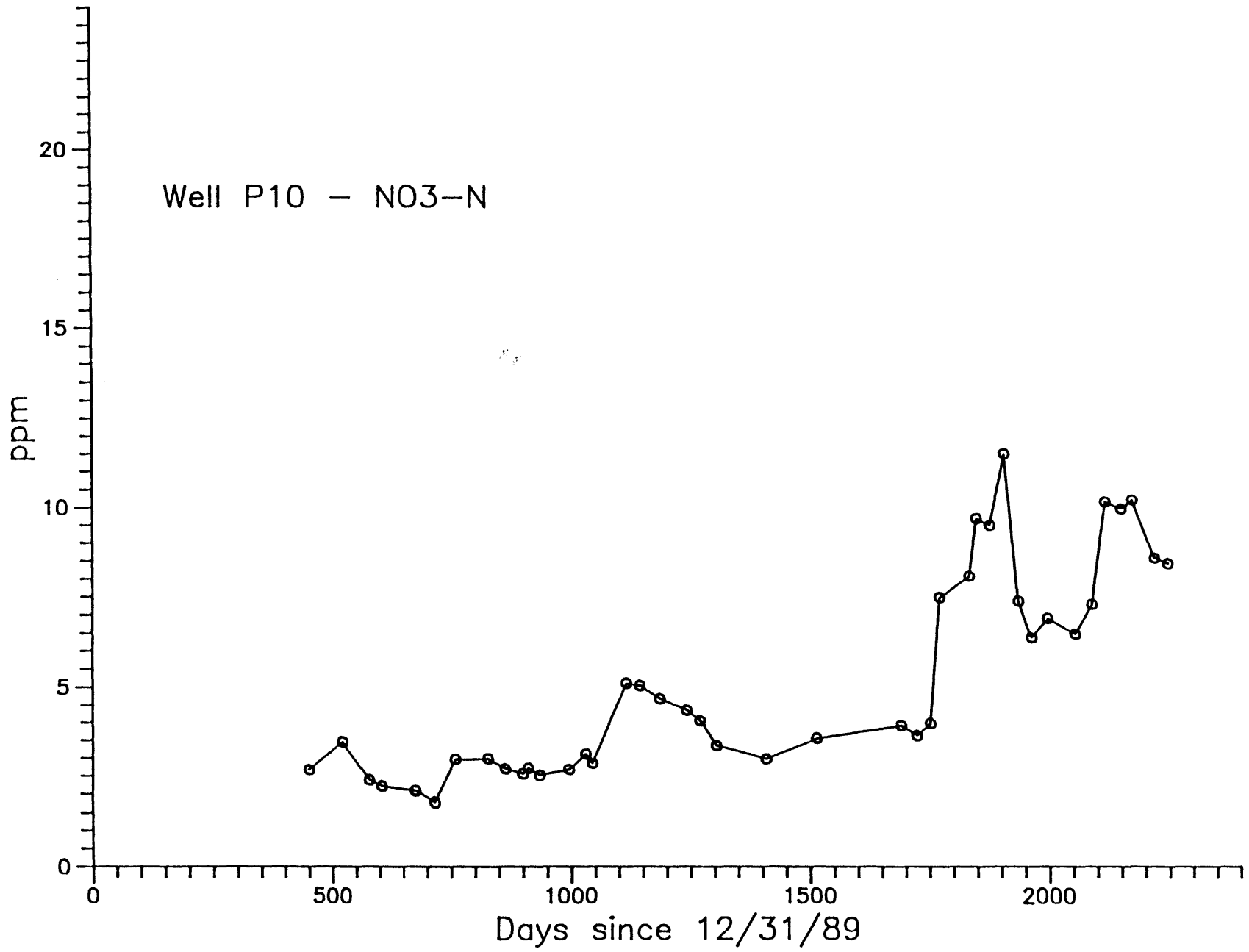


Well P8 - NO3-N

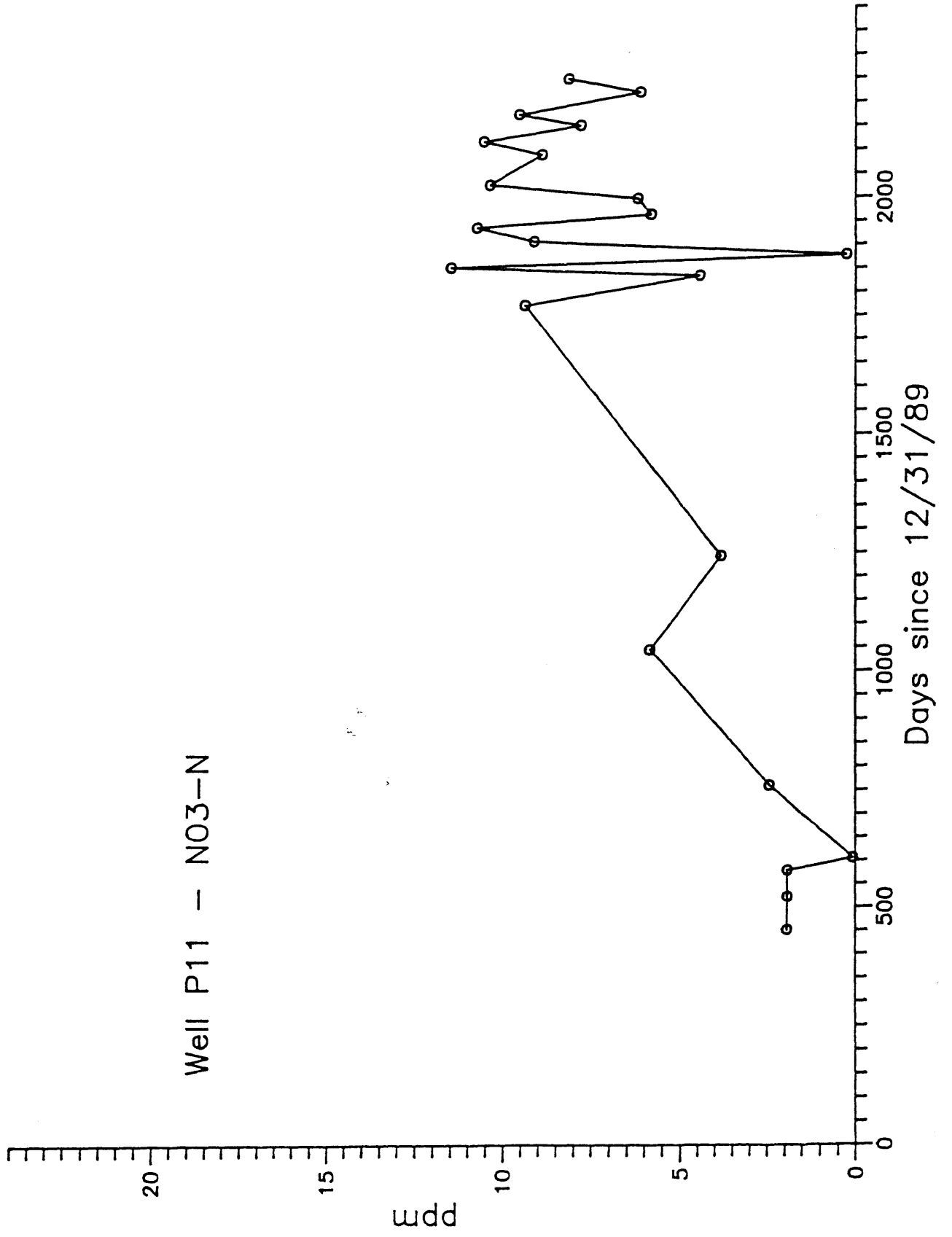


Well P10 -- Chloride

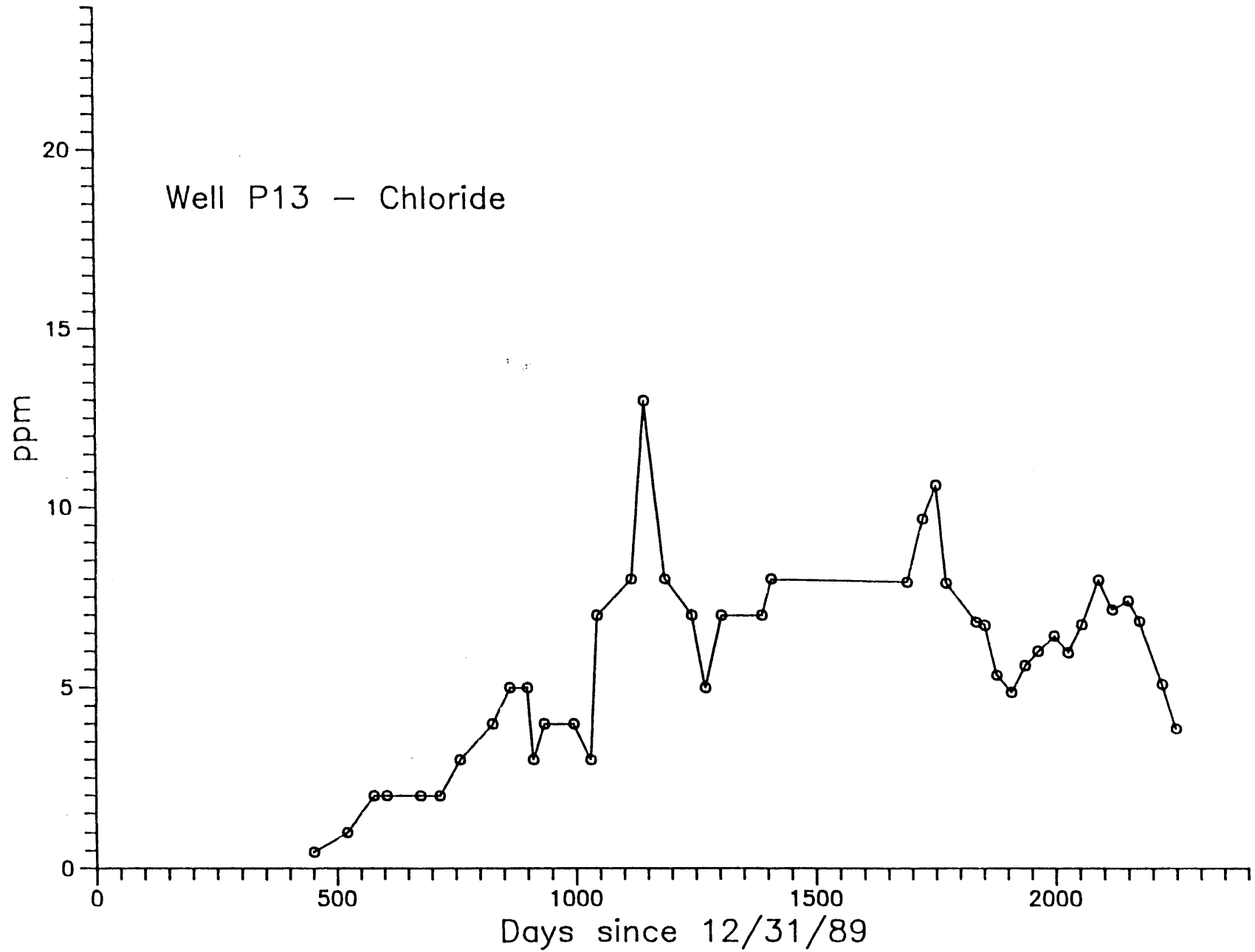


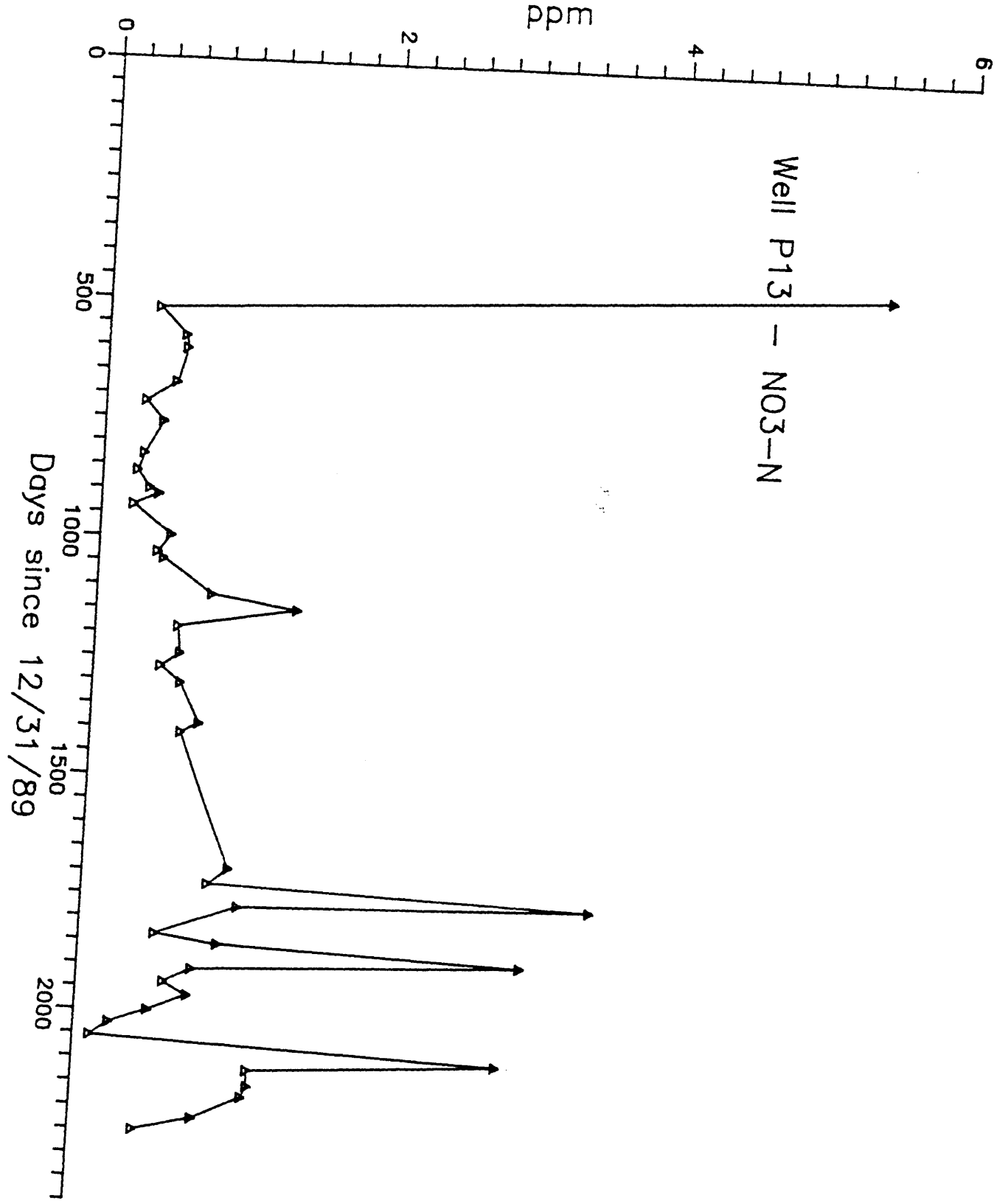


Well P11 - N03-N

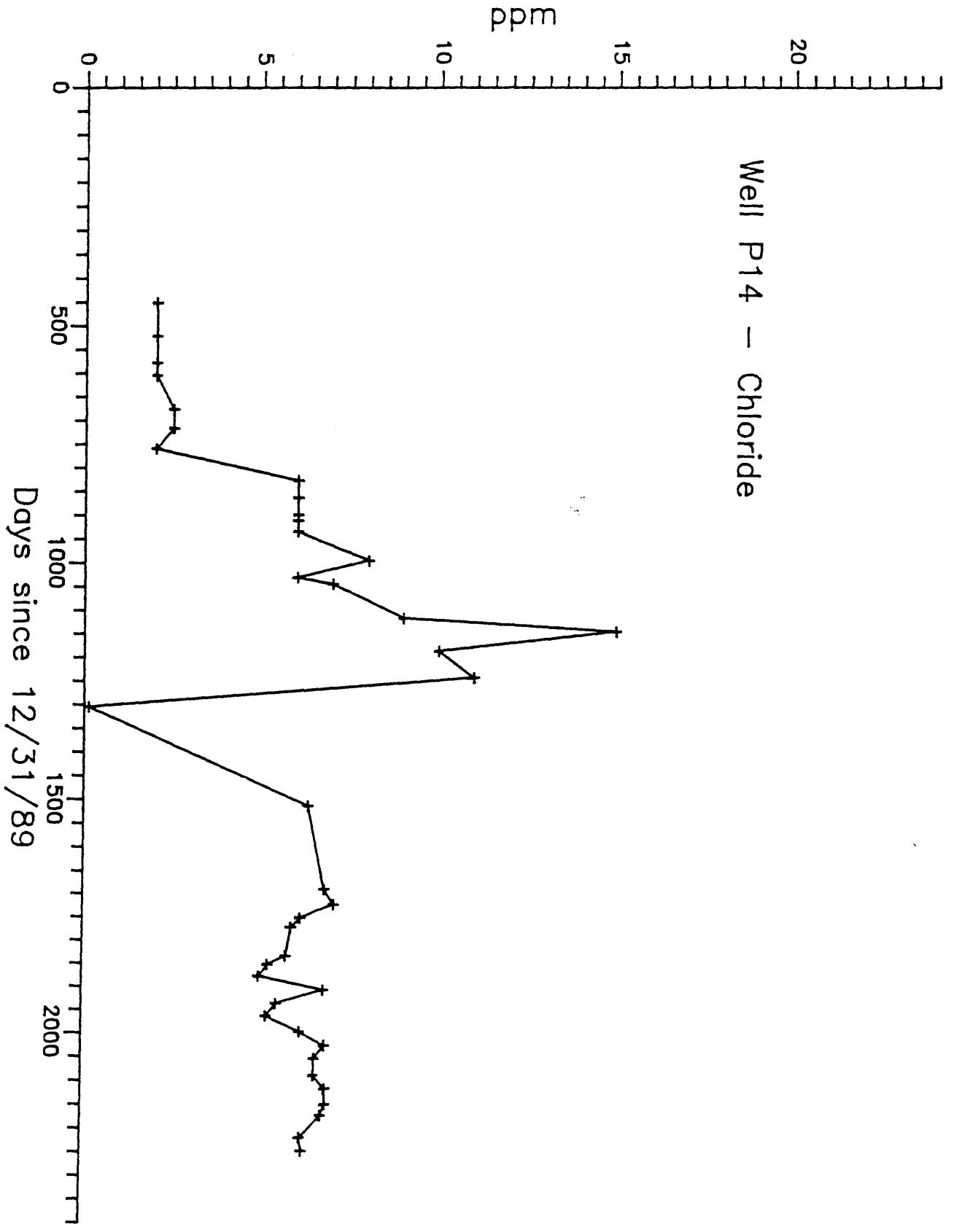


Well P13 - Chloride

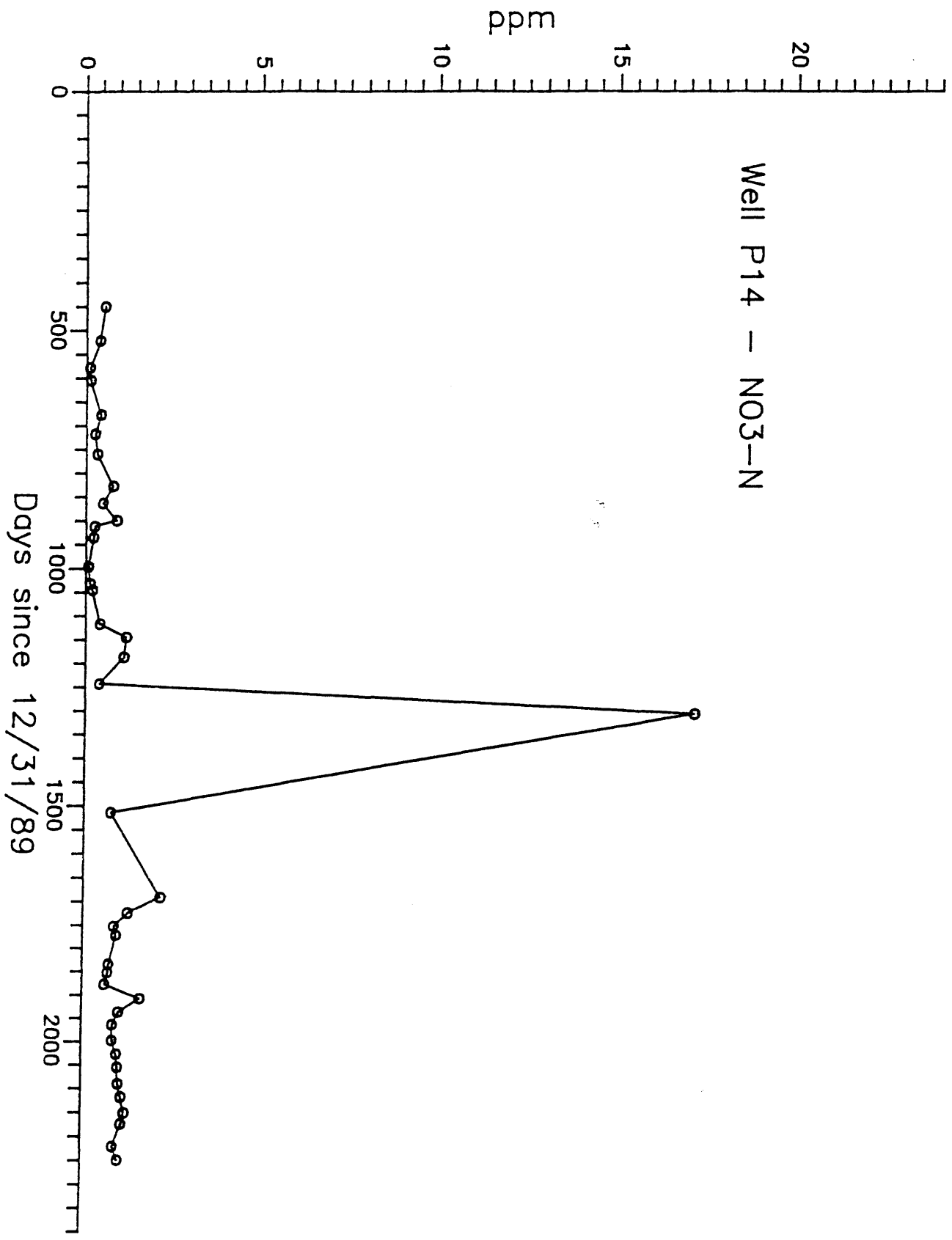


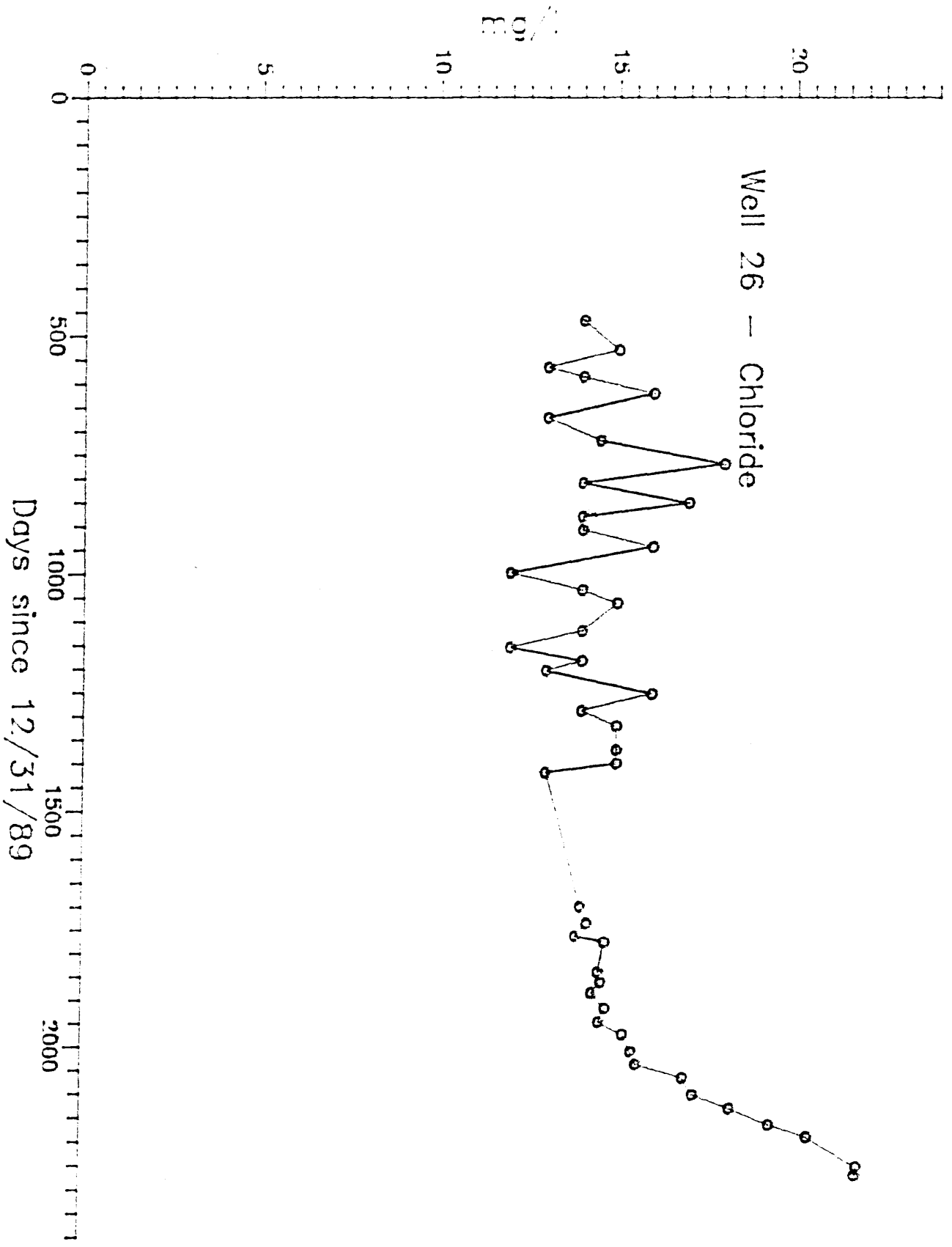


Well P14 - Chloride

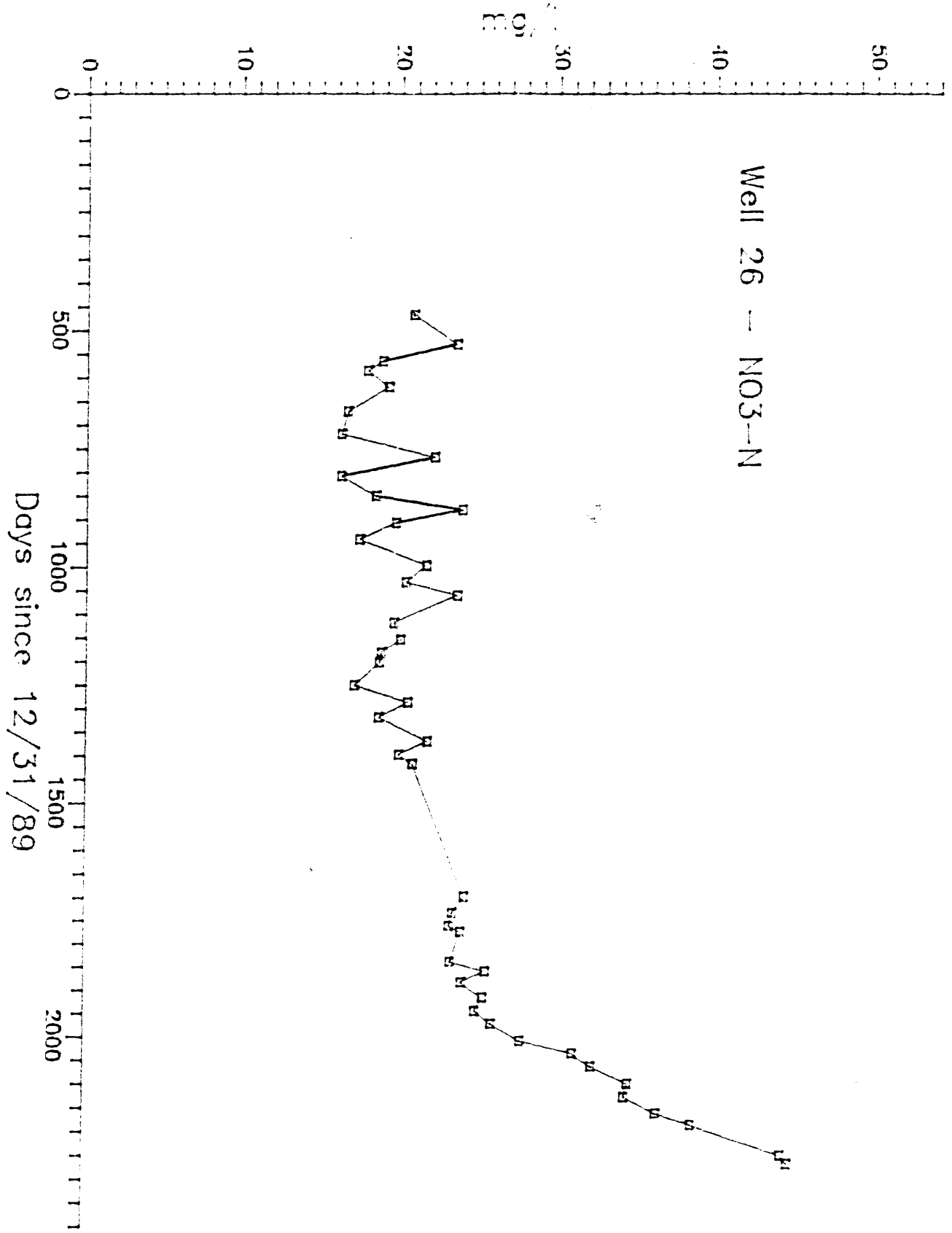


Well P14 - NO3-N

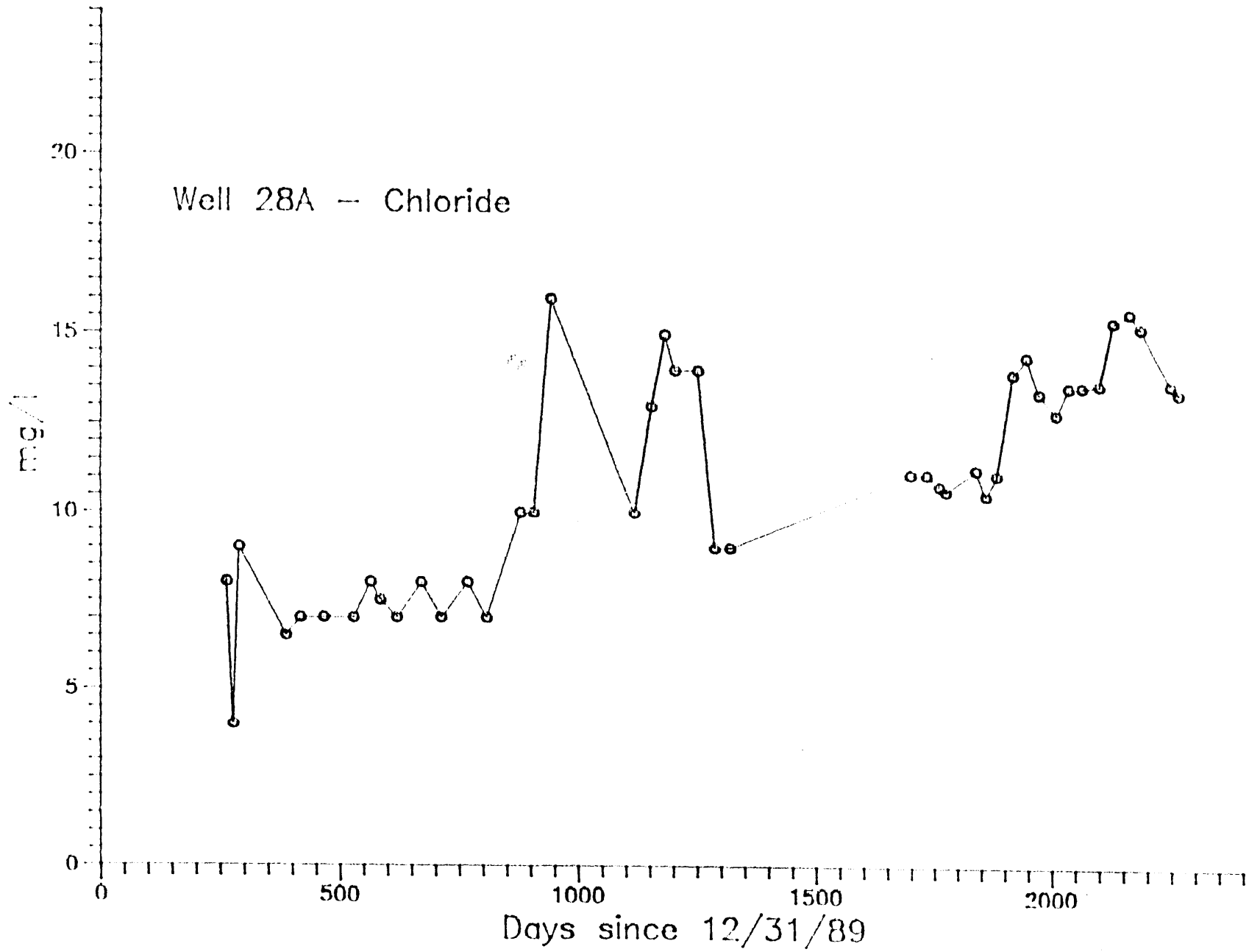




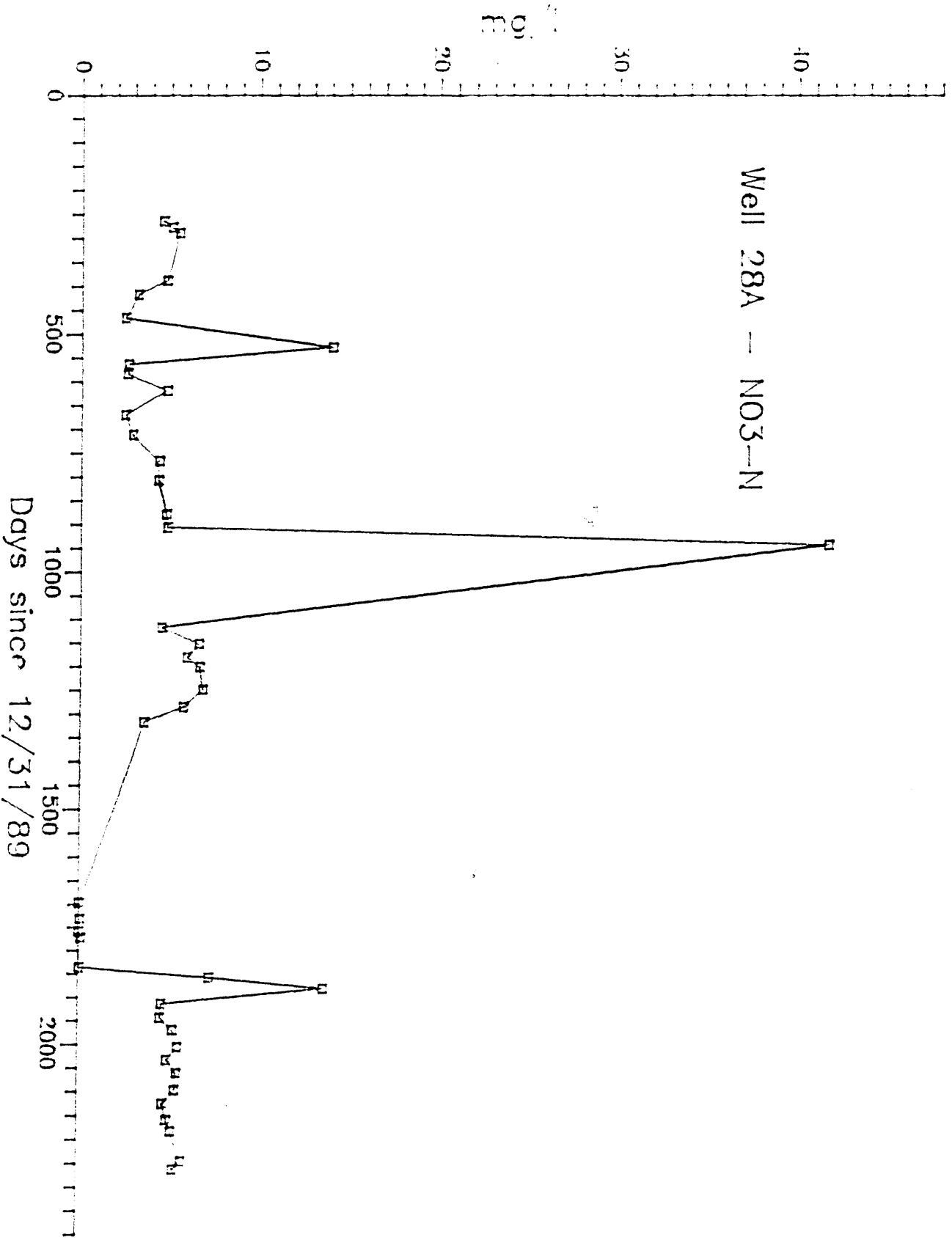
Well 26 -- NO3-N



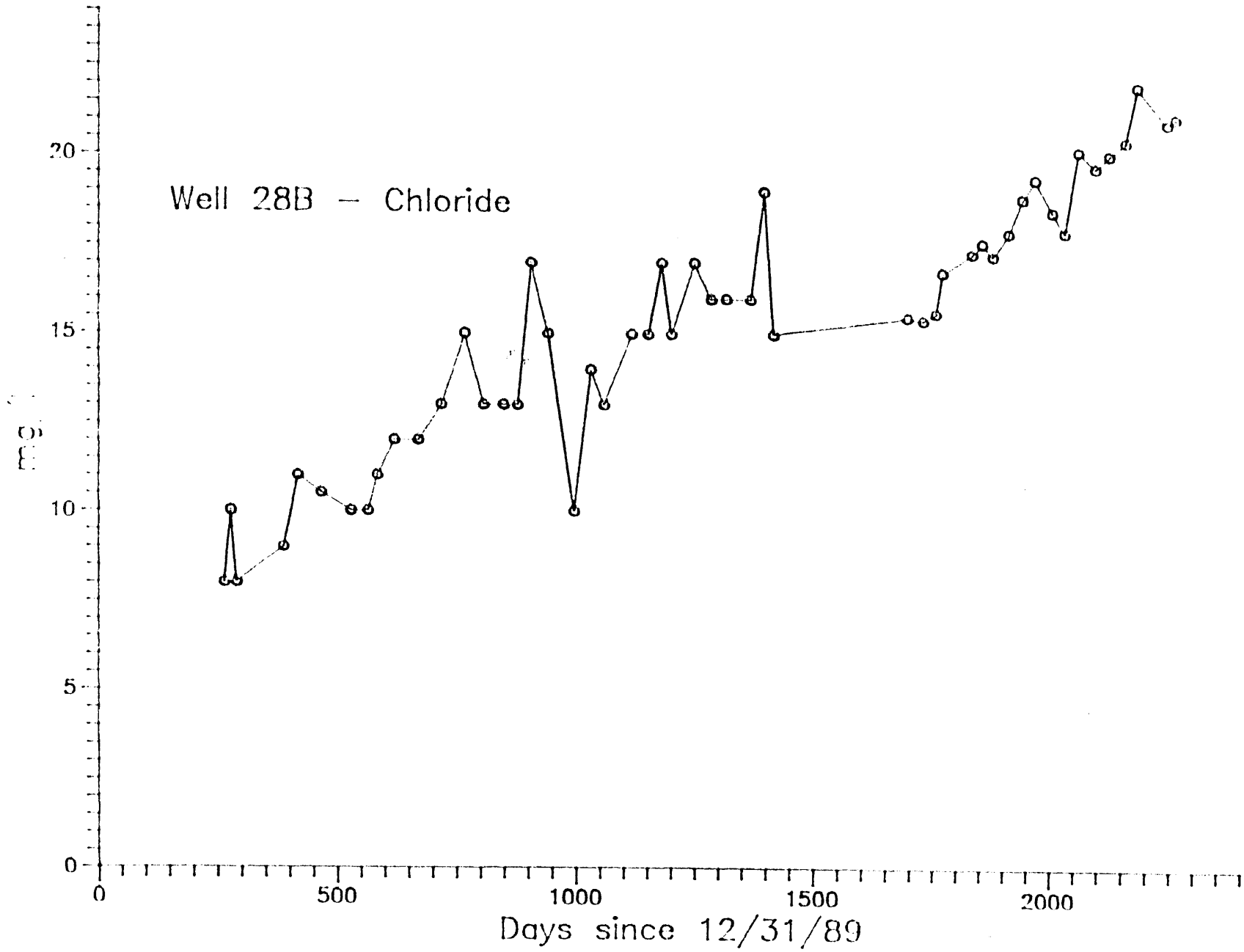
Well 28A - Chloride



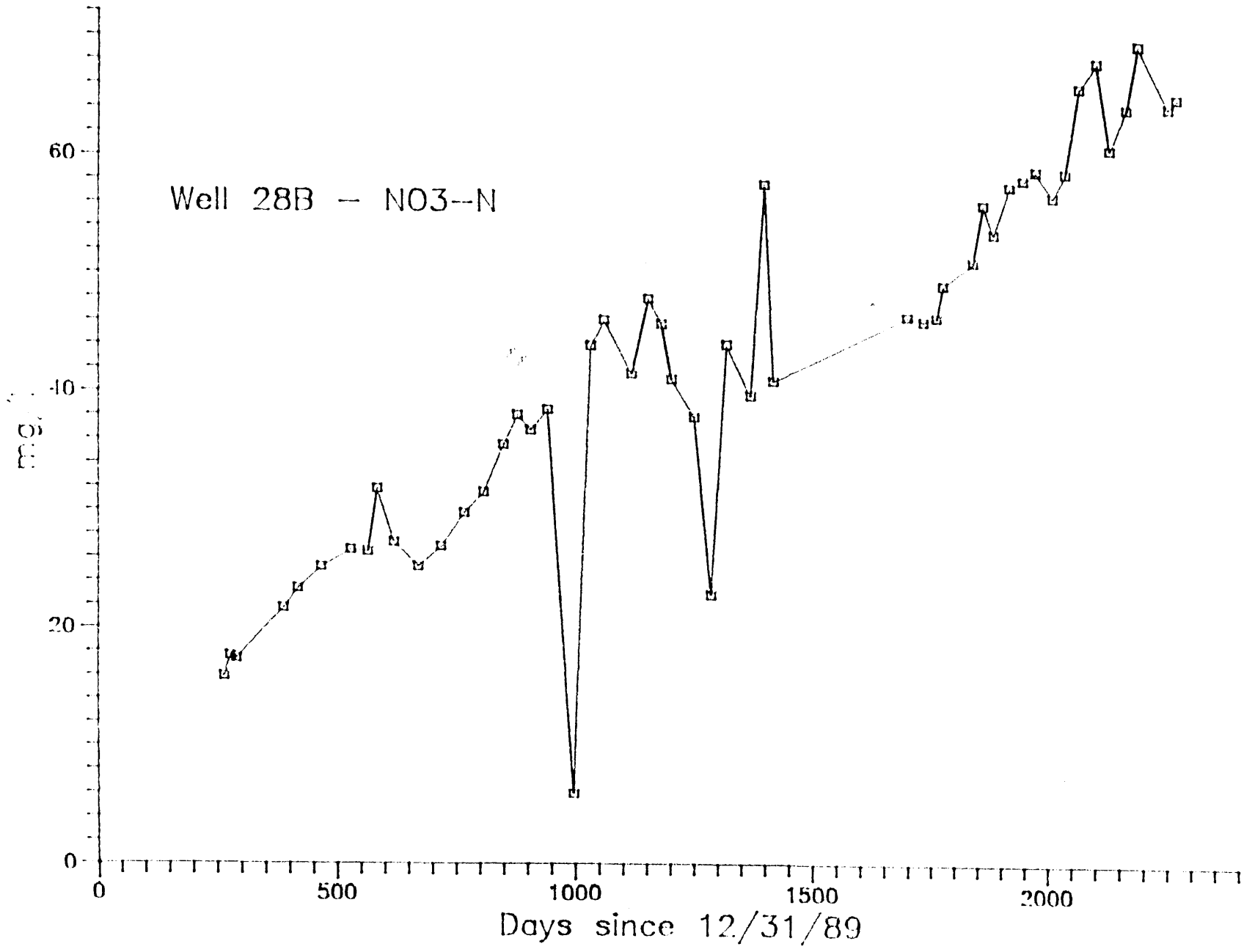
Well 28A -- NO3-N



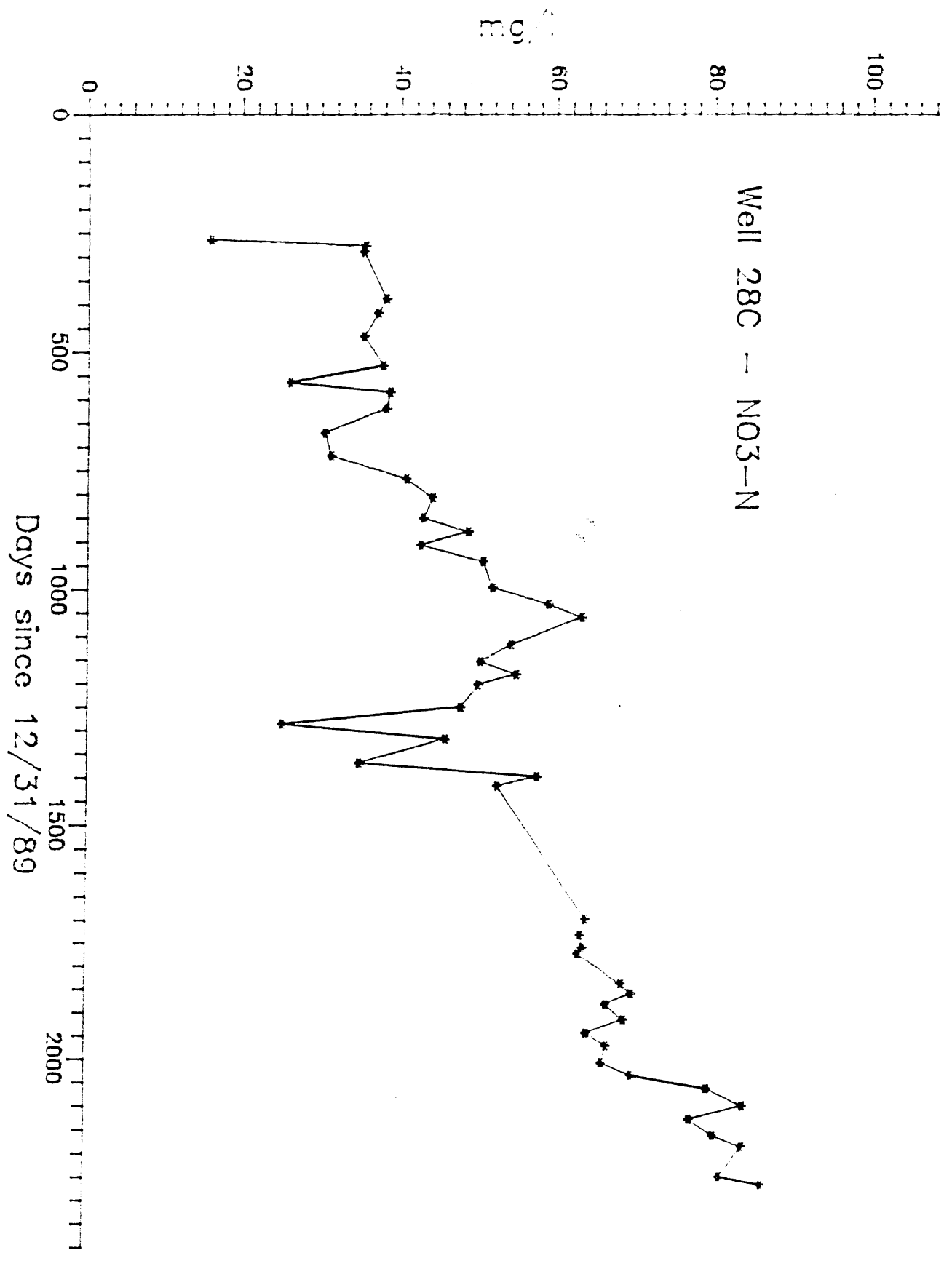
Well 28B - Chloride



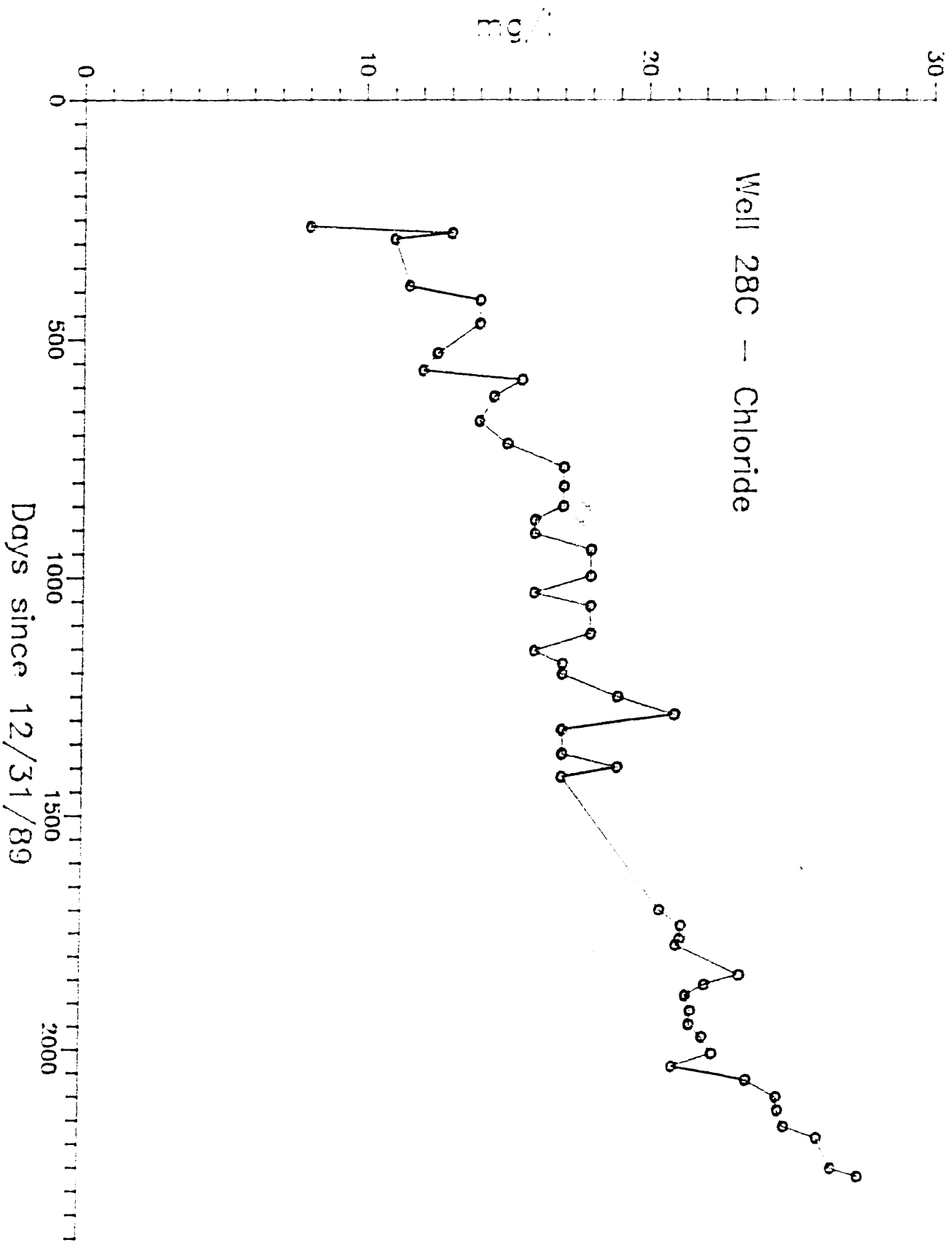
Well 28B - NO3-N



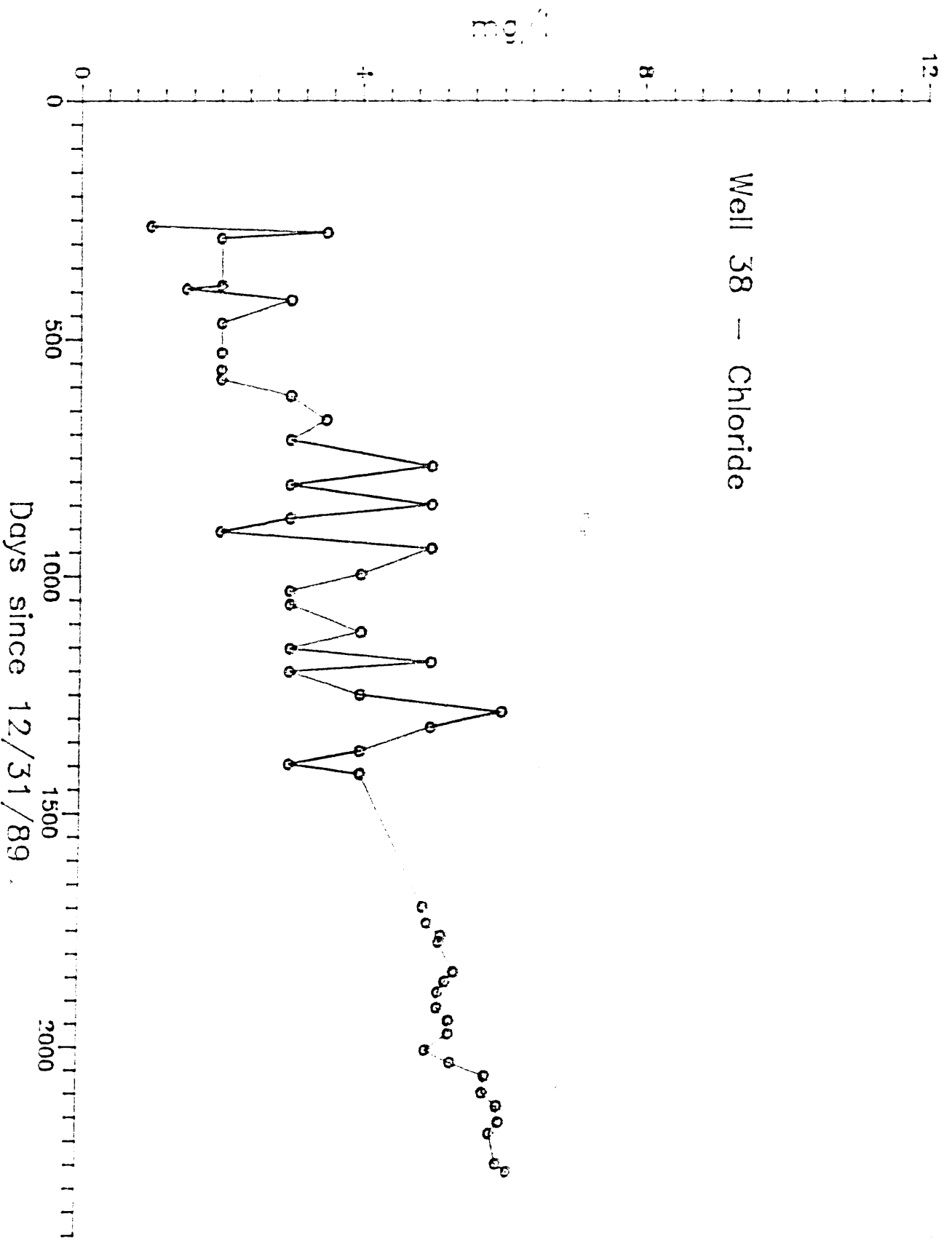
Well 28C -- NO3-N



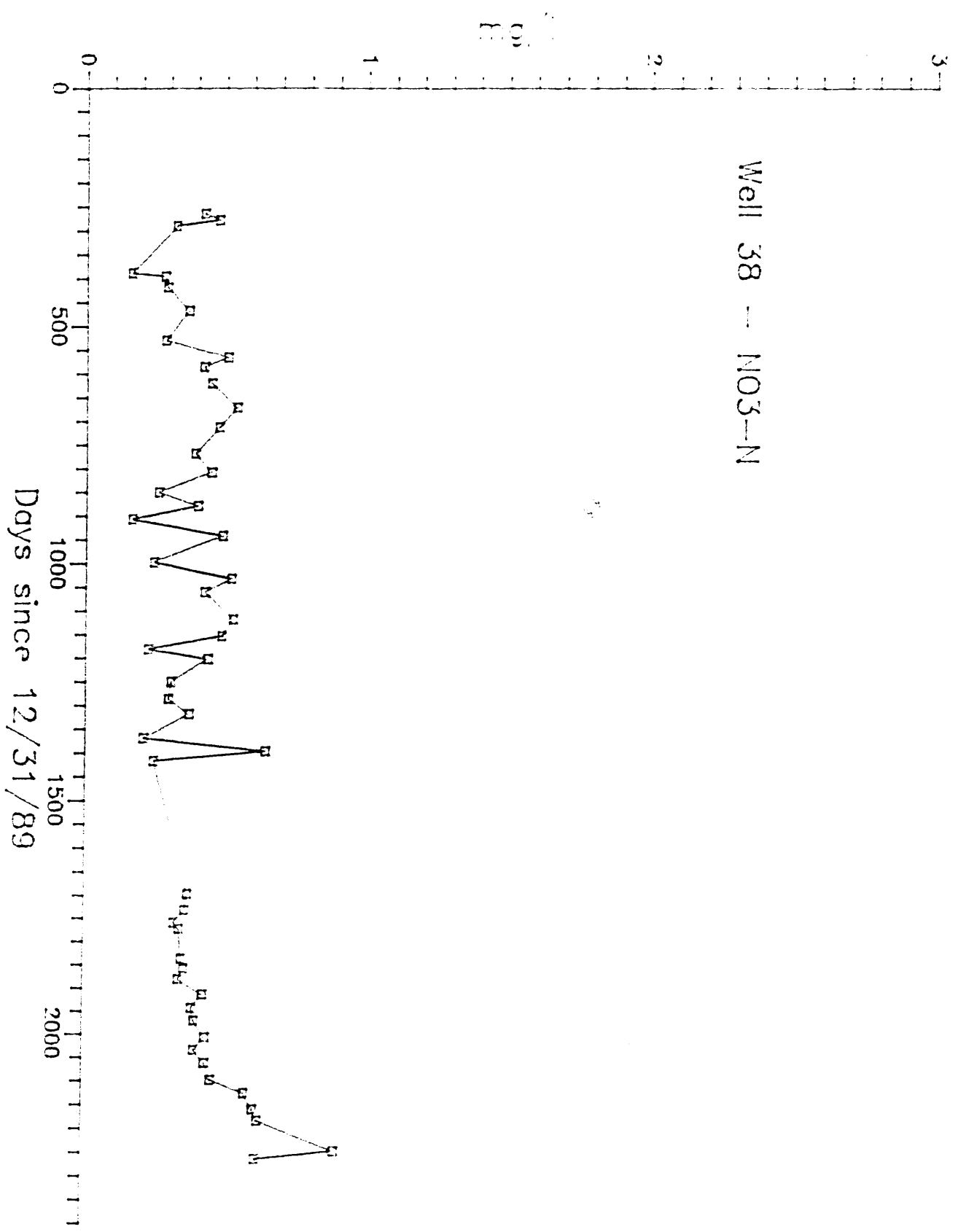
Well 28C -- Chloride



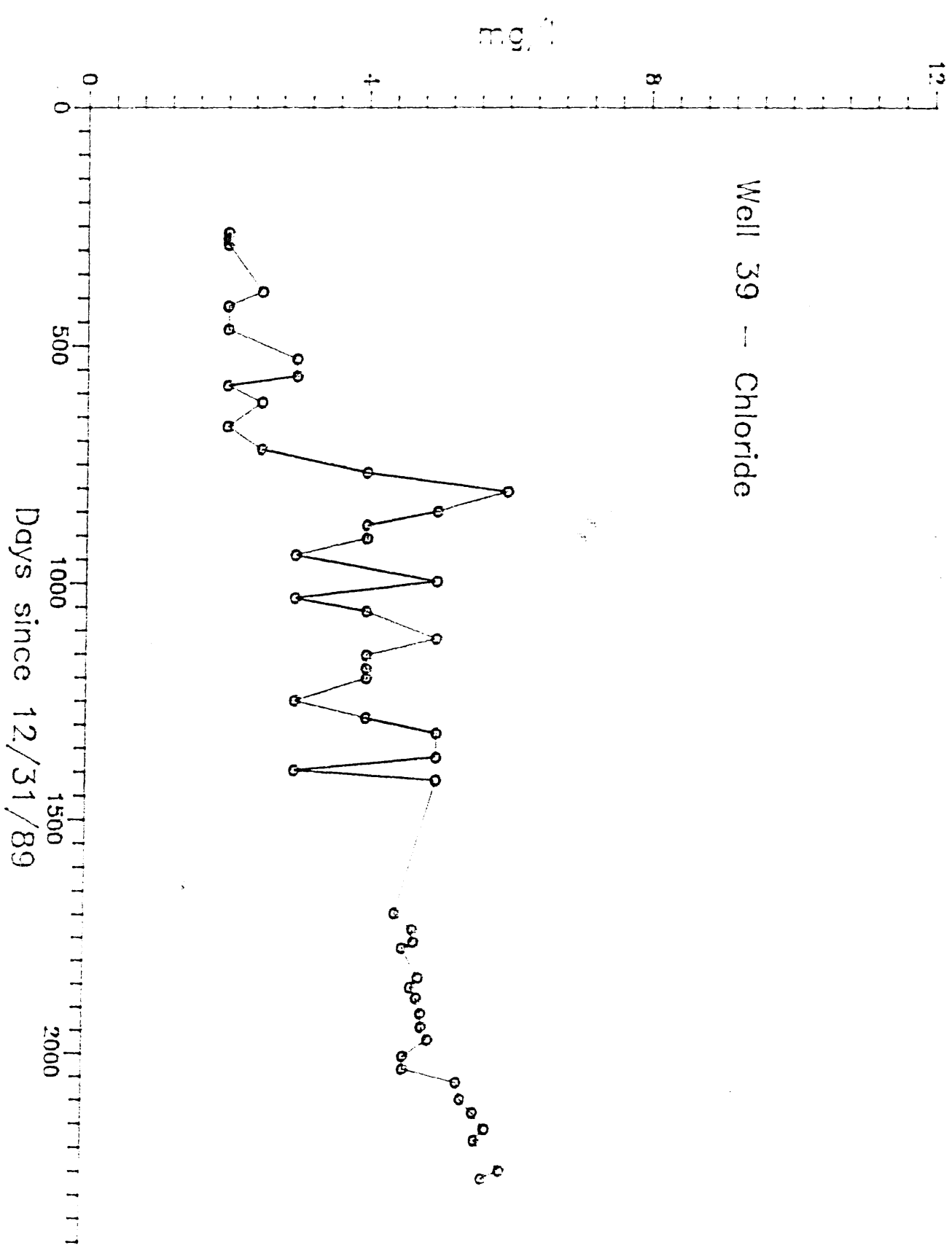
Well 38 -- Chloride



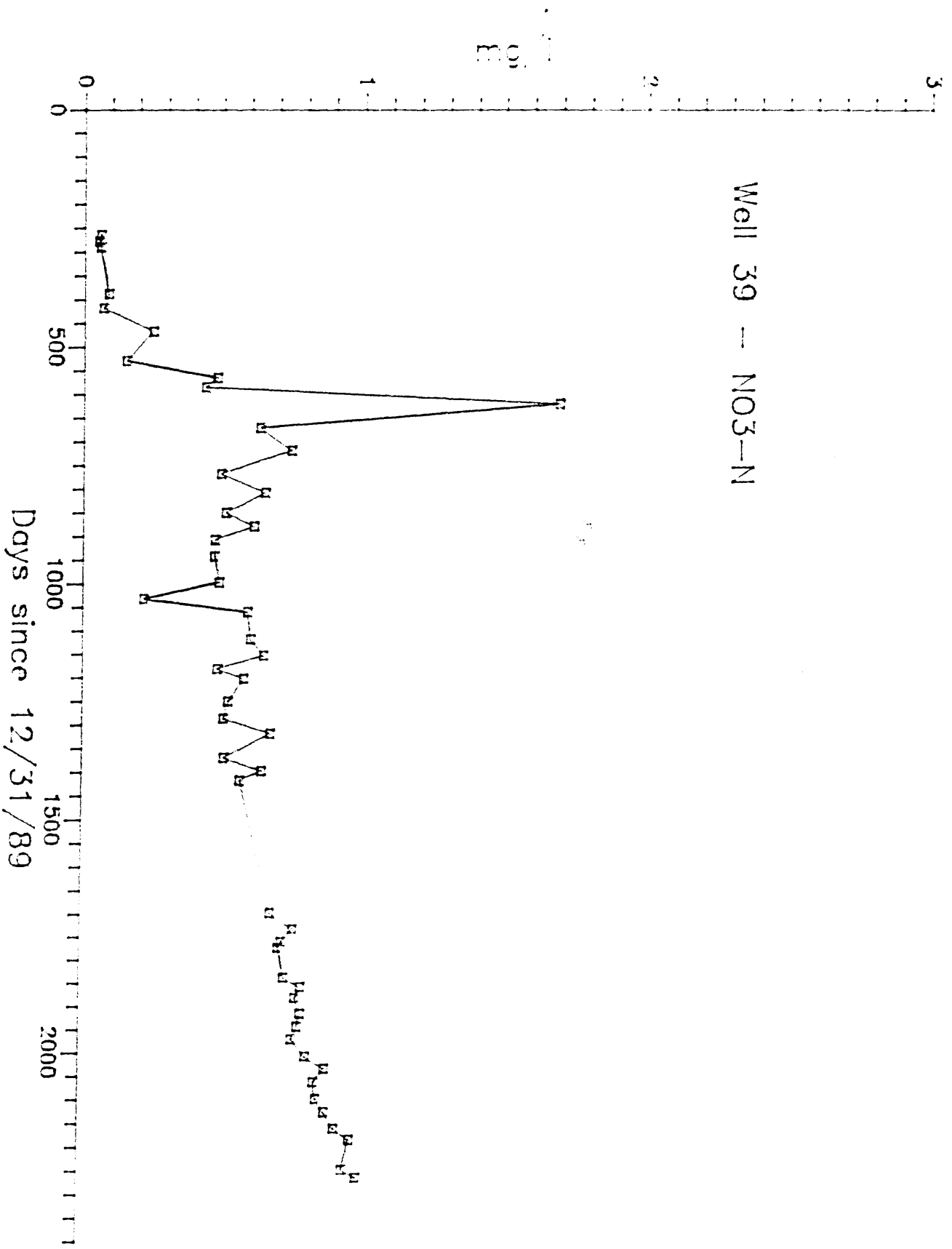
Well 38 -- NO3-N



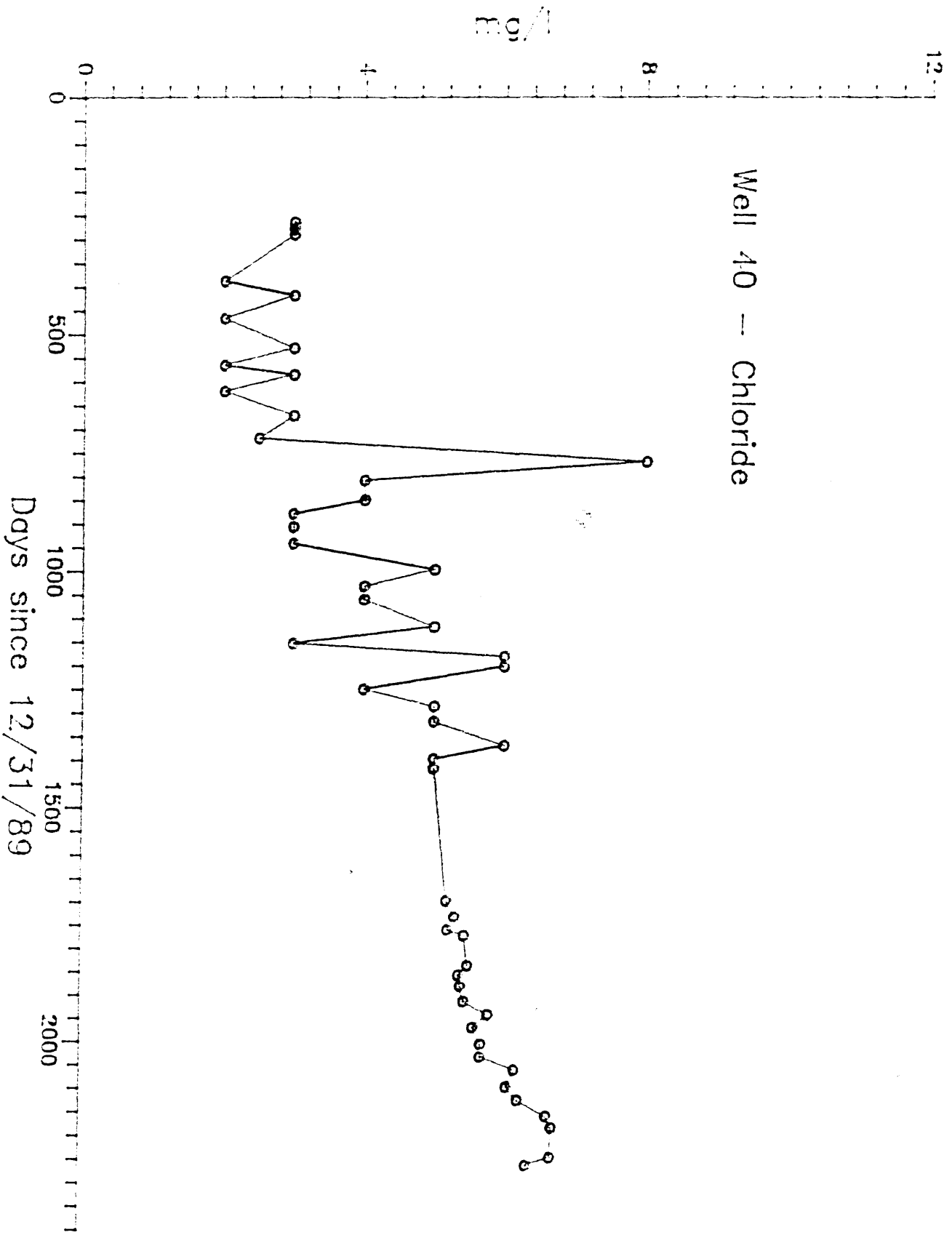
Well 39 --- Chloride

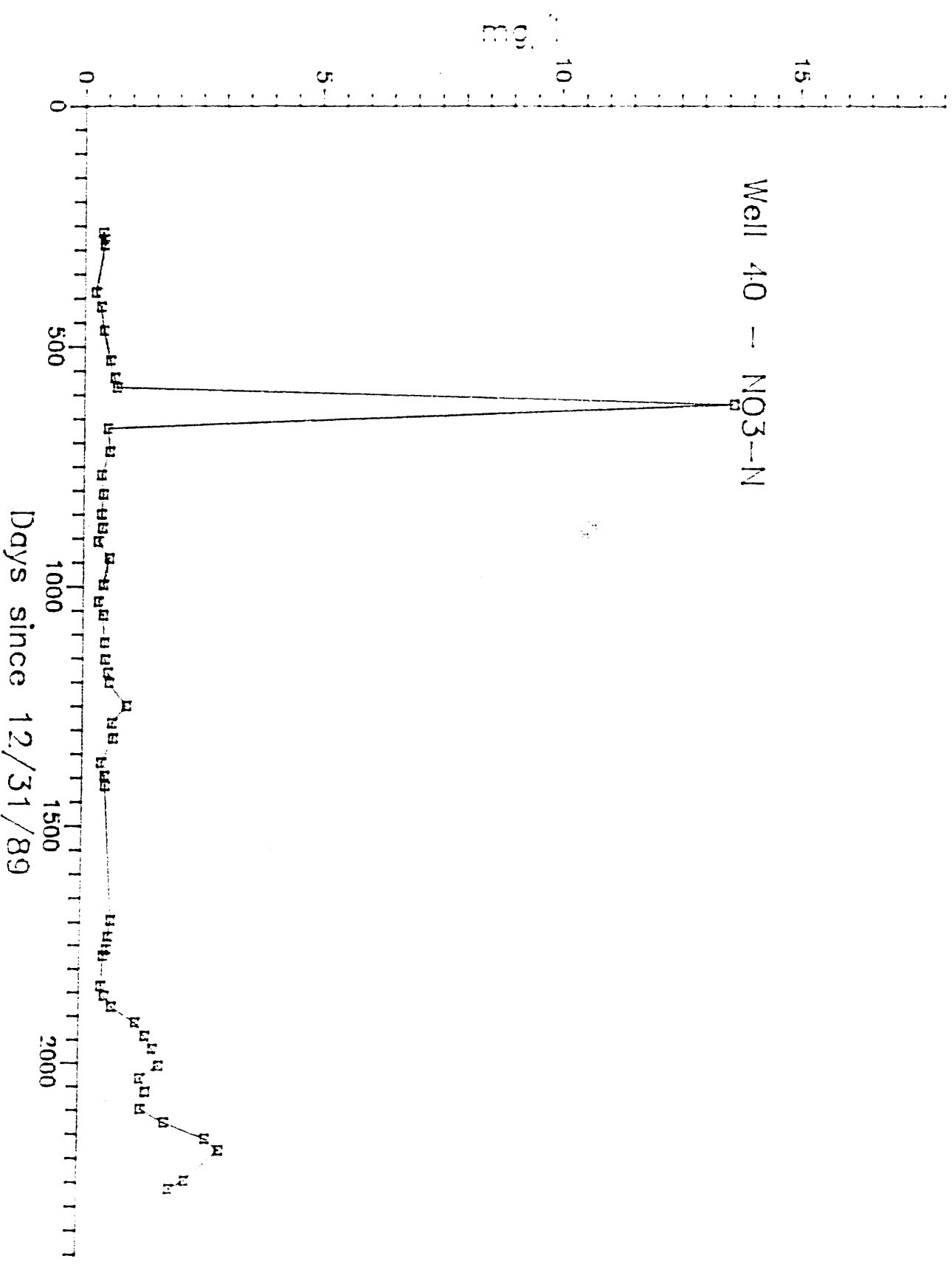


Well 39 -- NO3-N

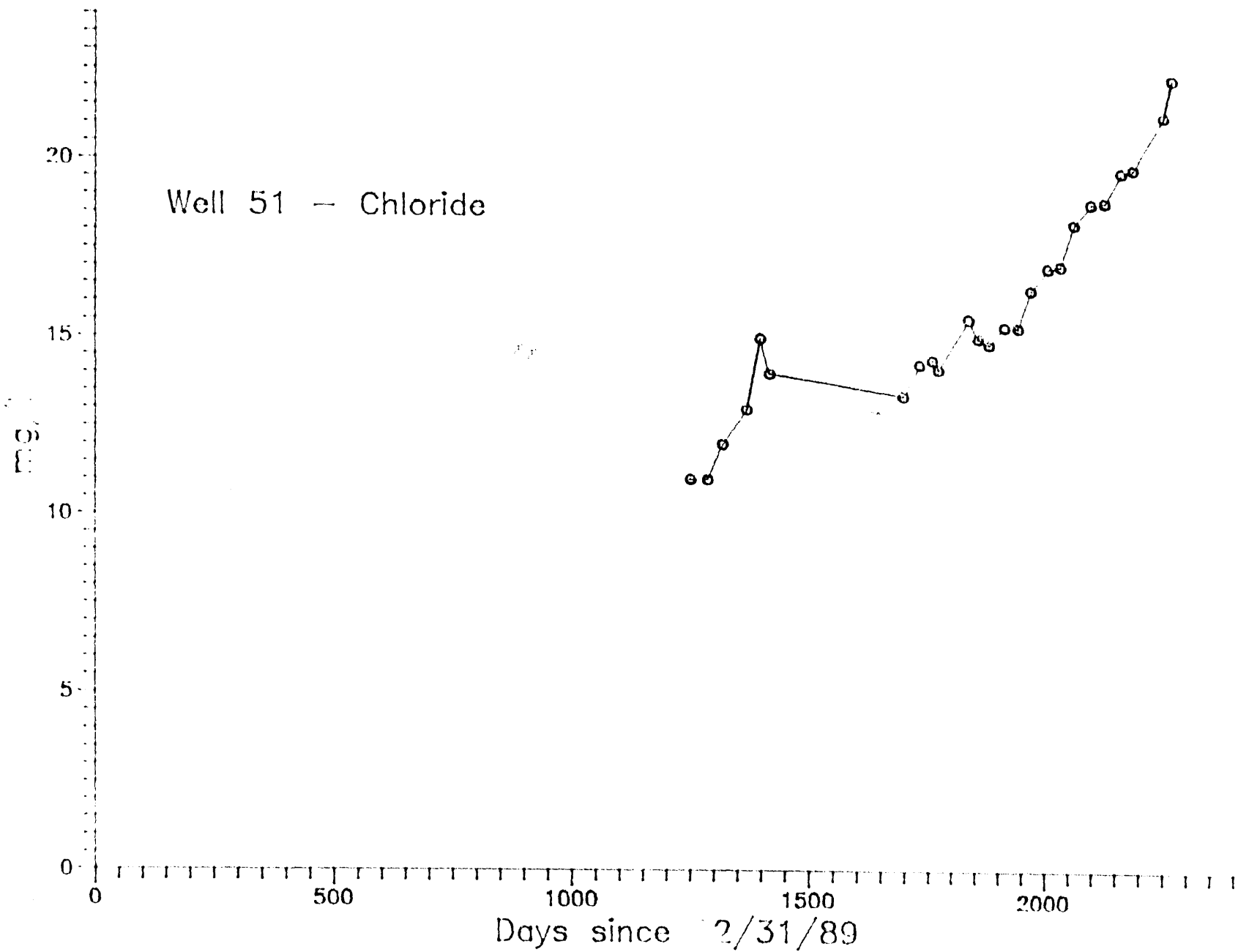


Well 40 -- Chloride

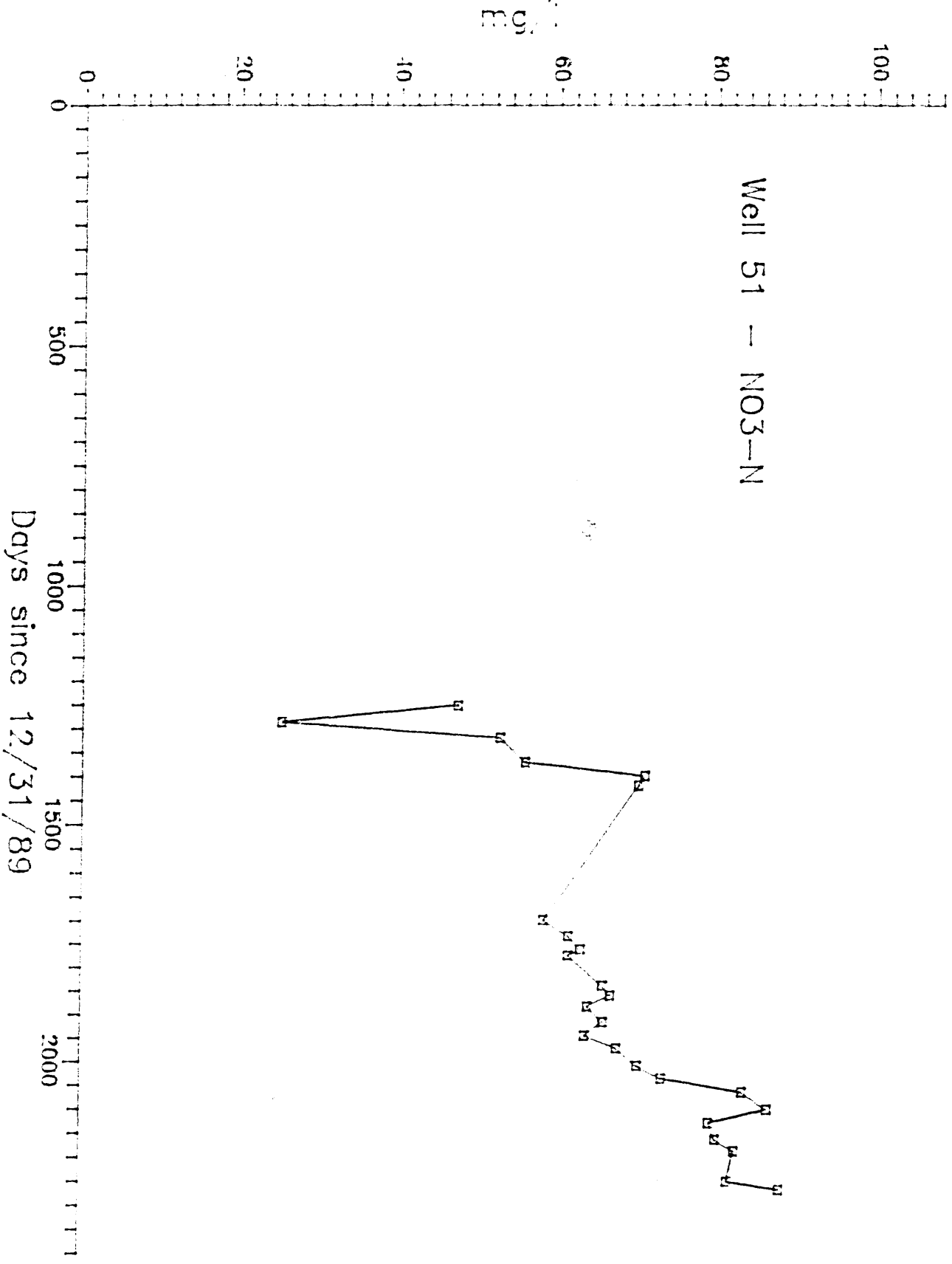




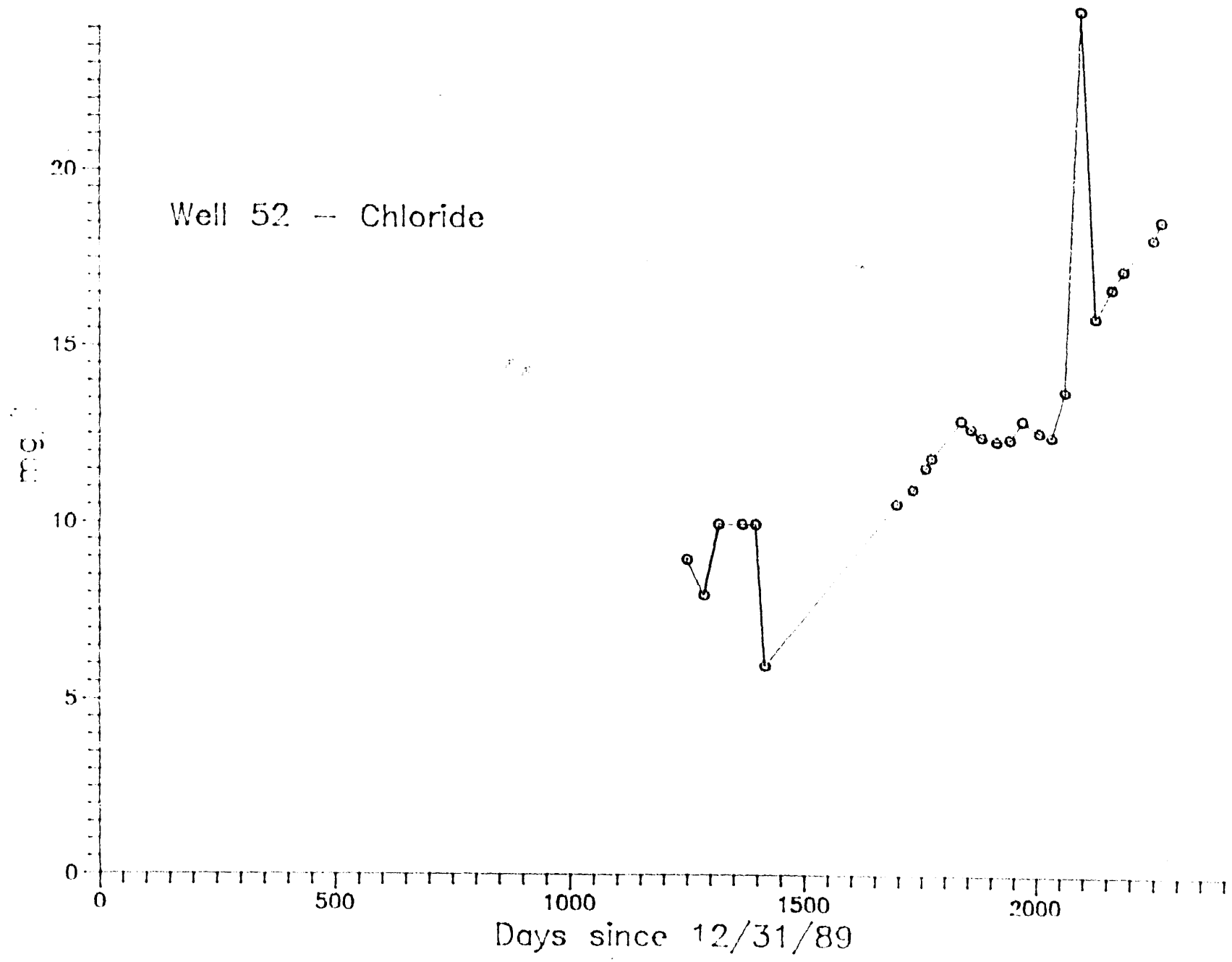
Well 51 - Chloride



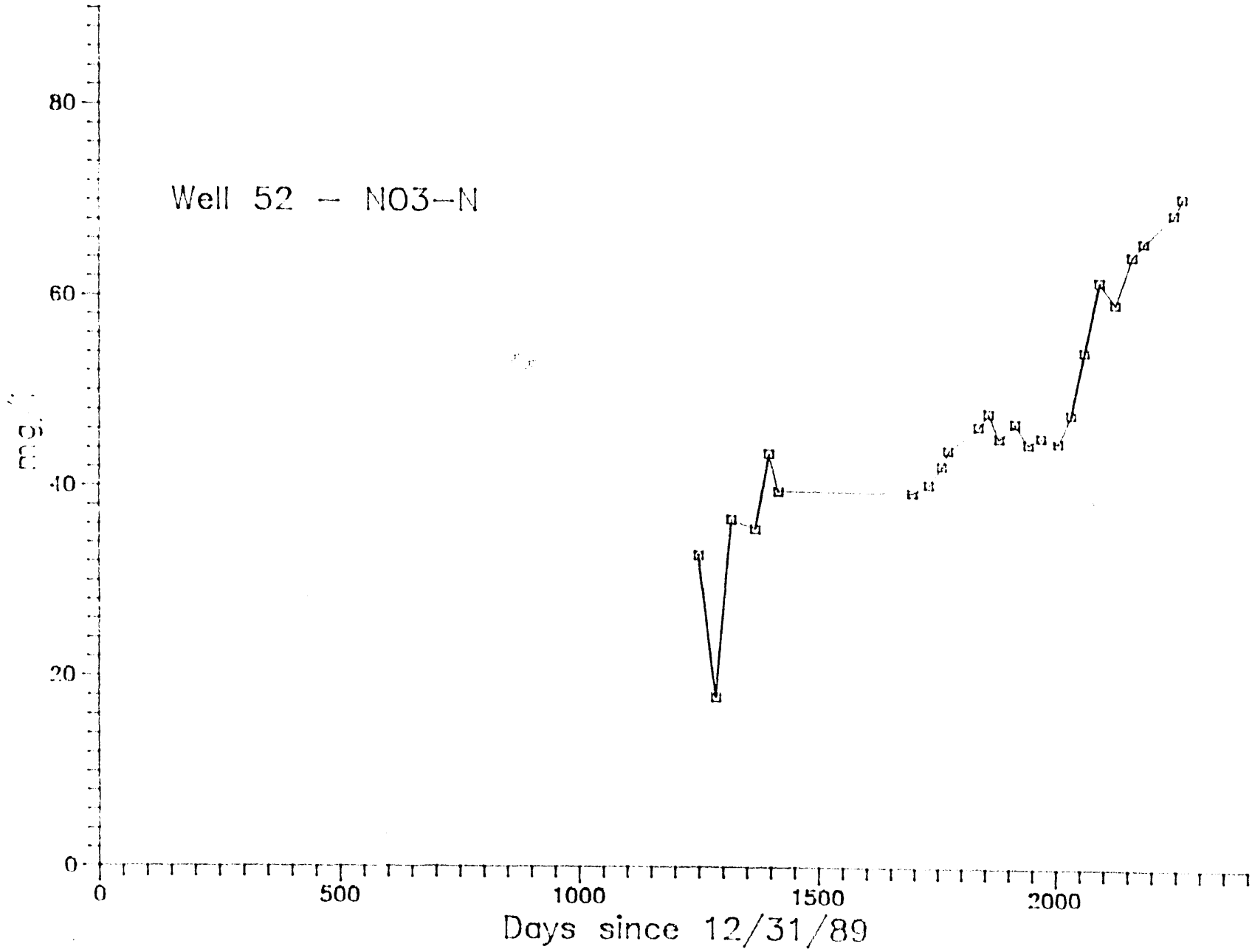
Well 51 - NO3-N

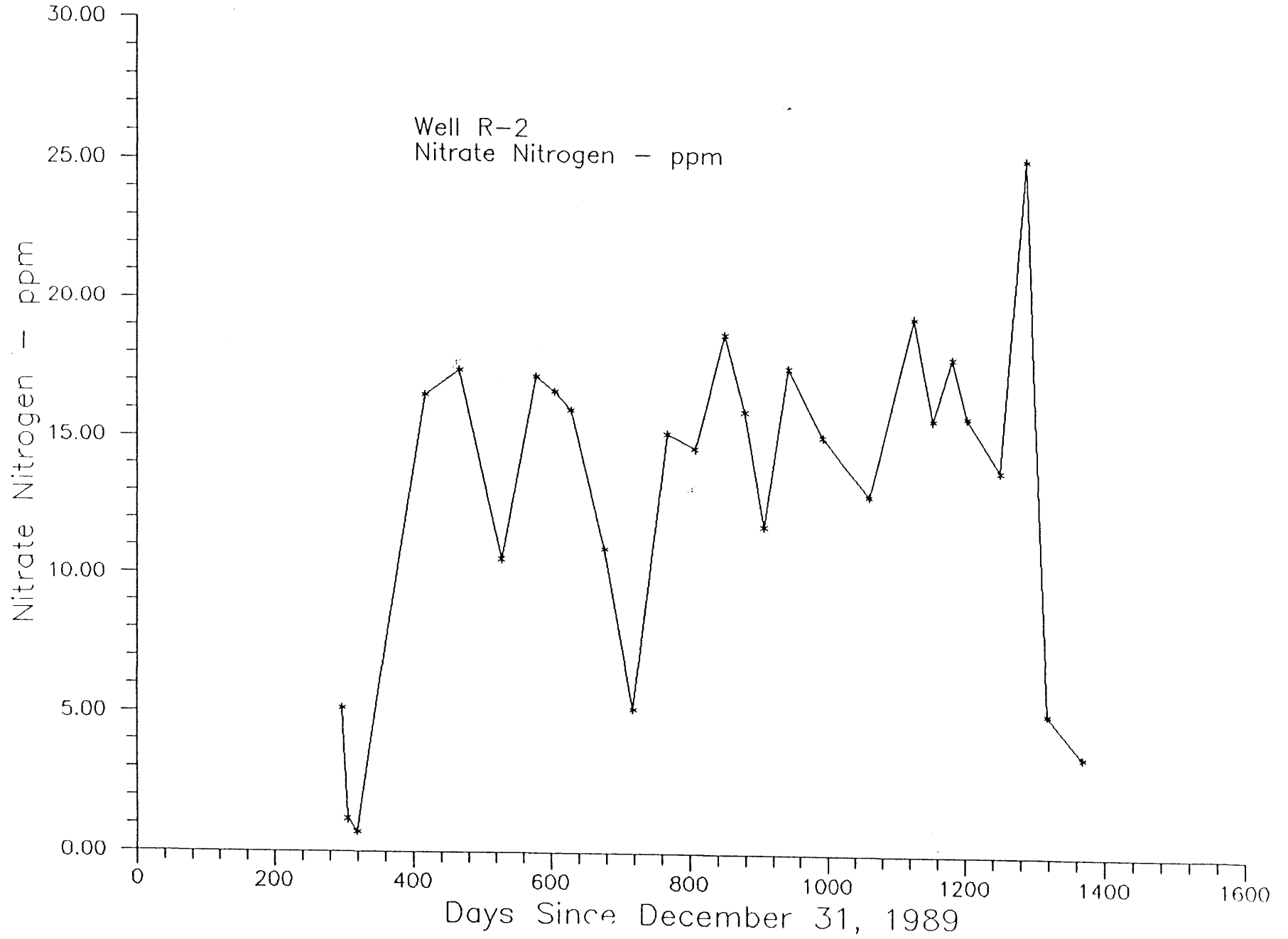


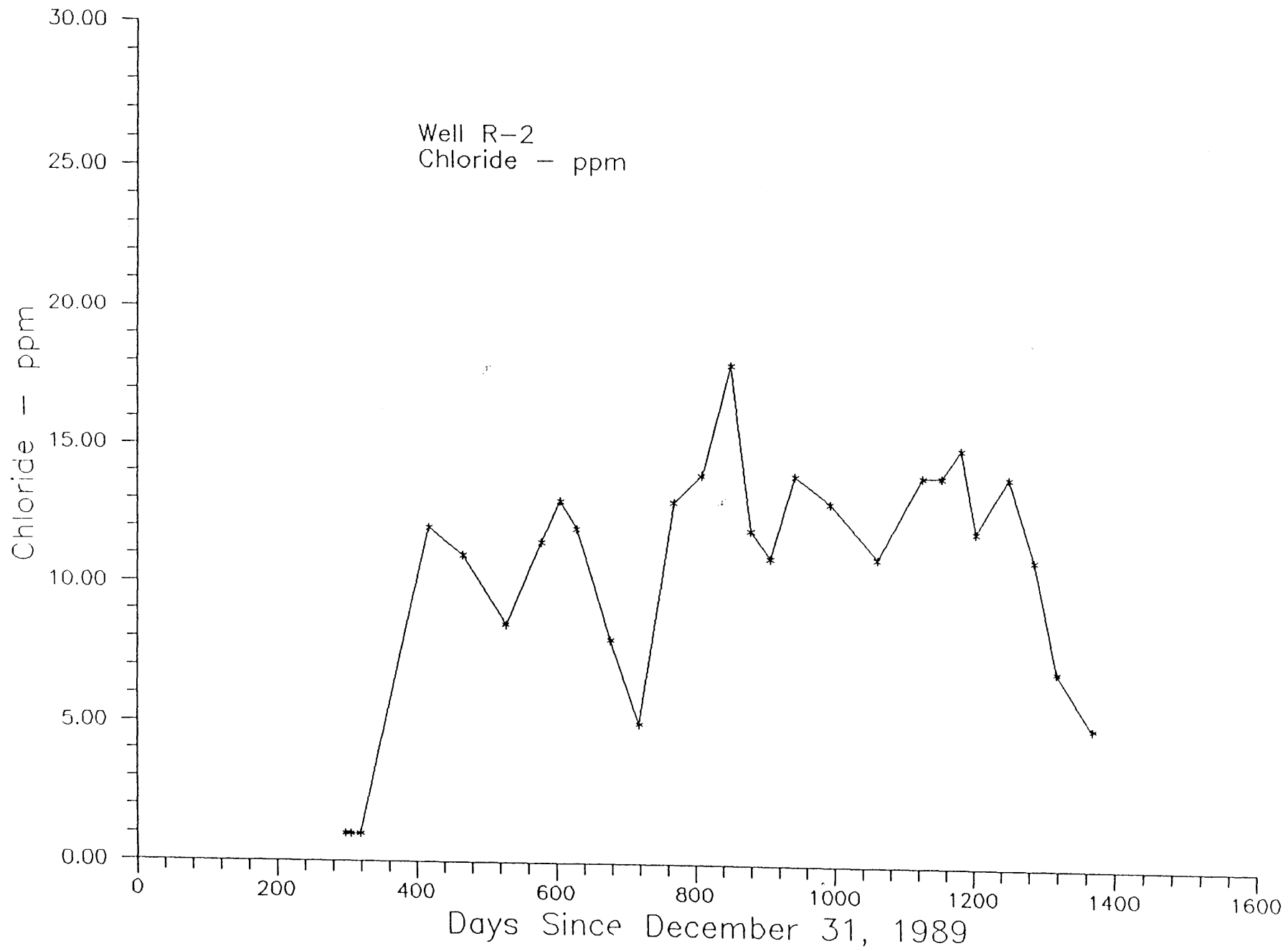
Well 52 -- Chloride

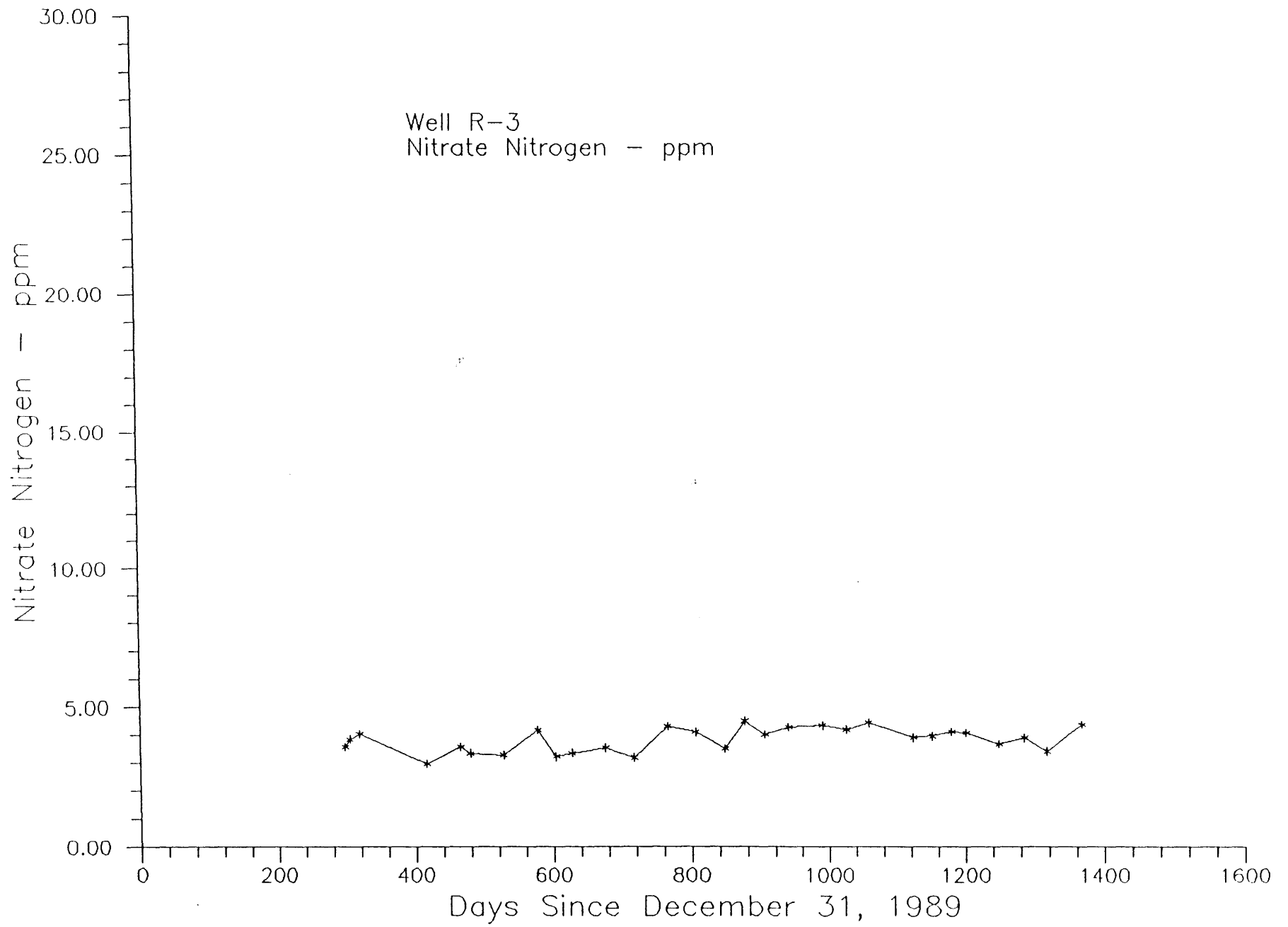


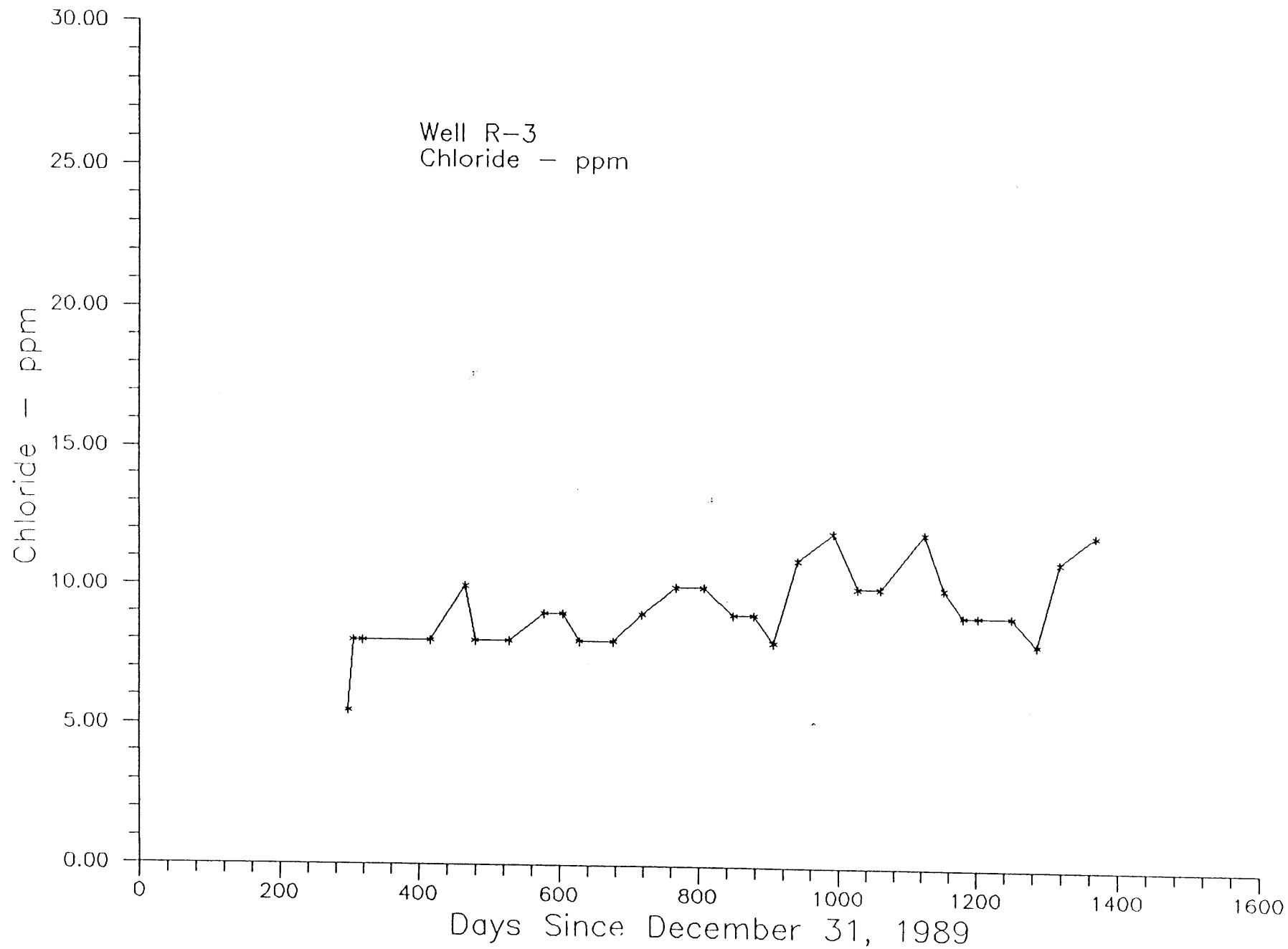
Well 52 - NO3-N

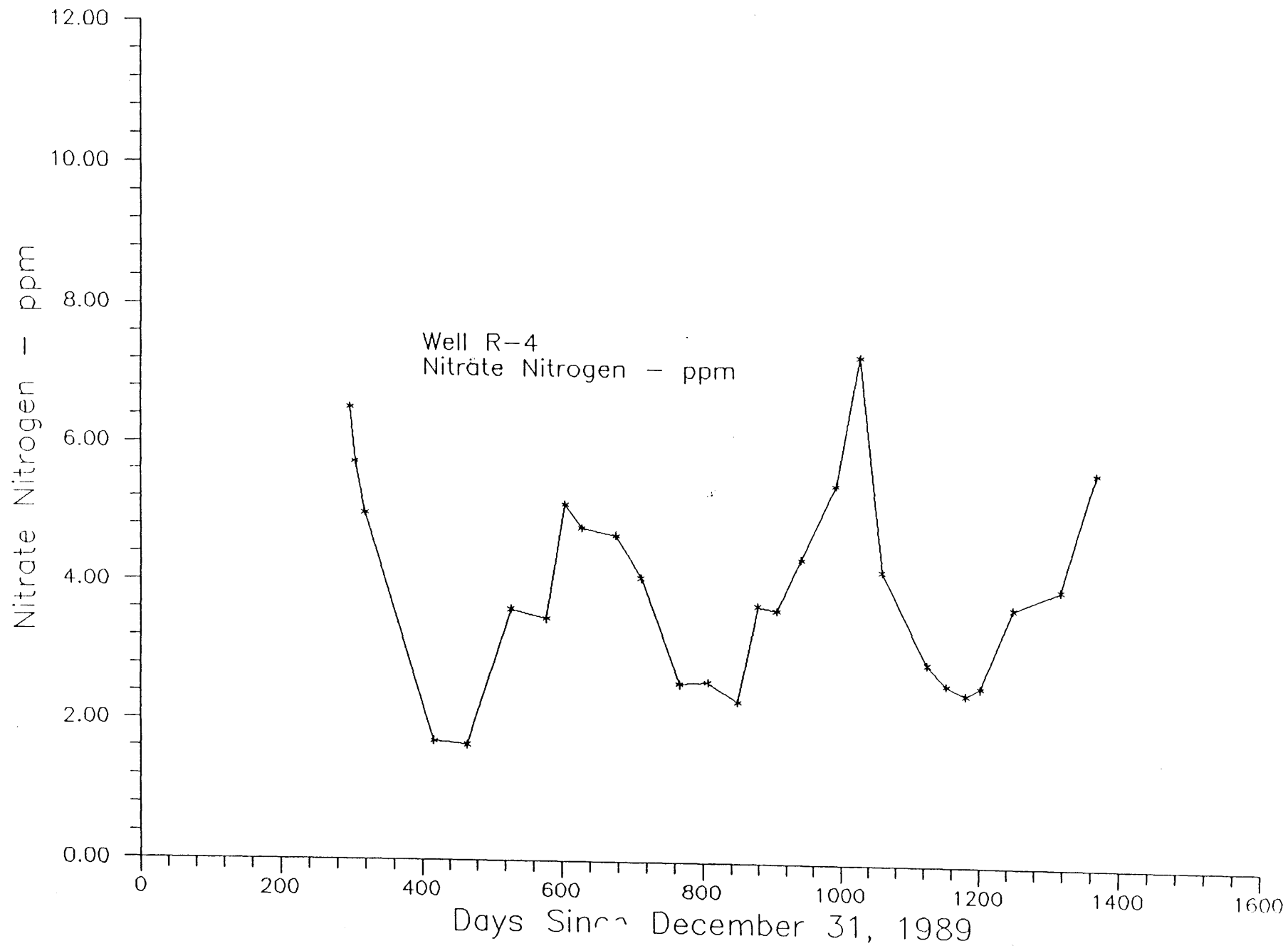


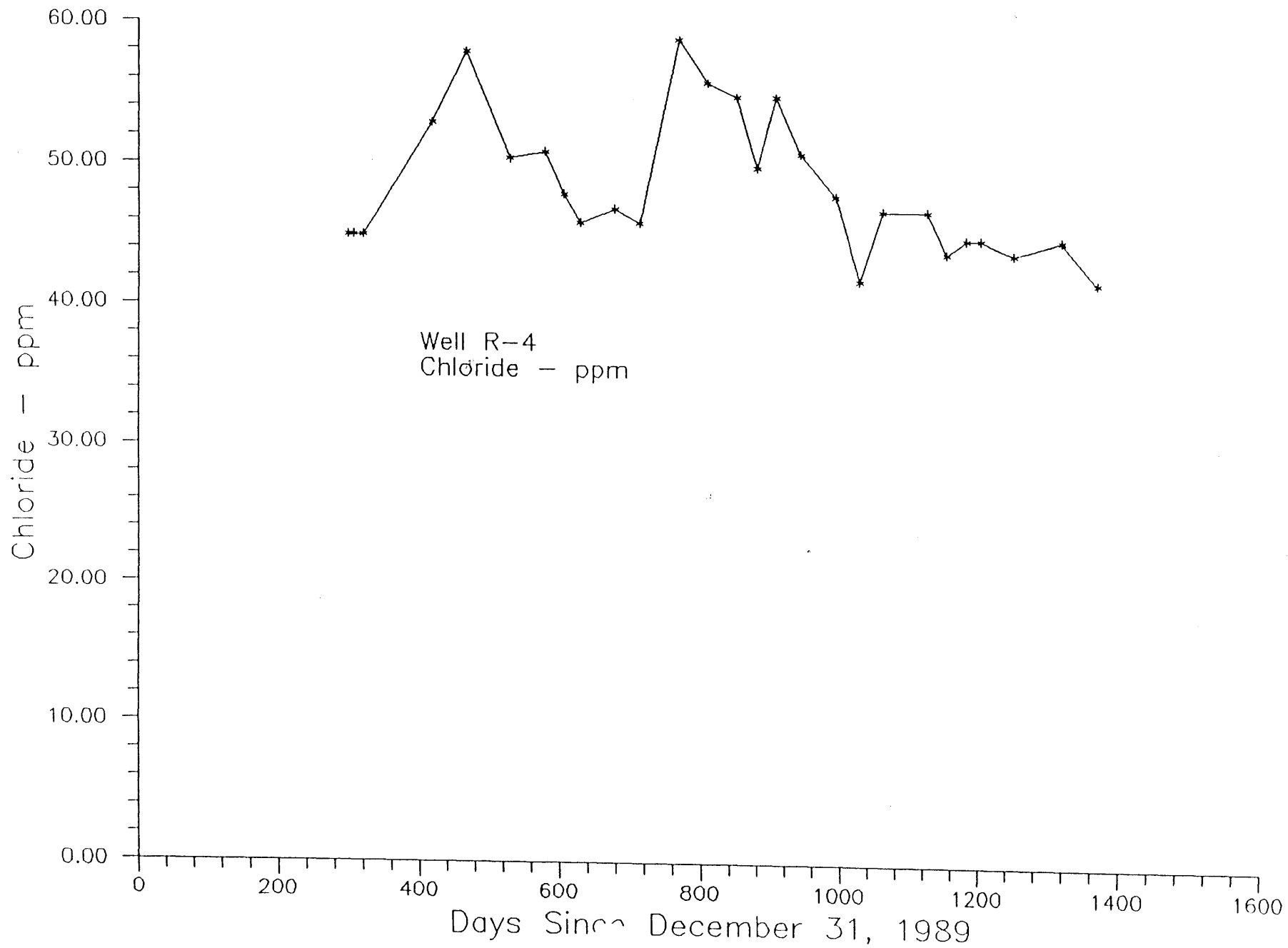


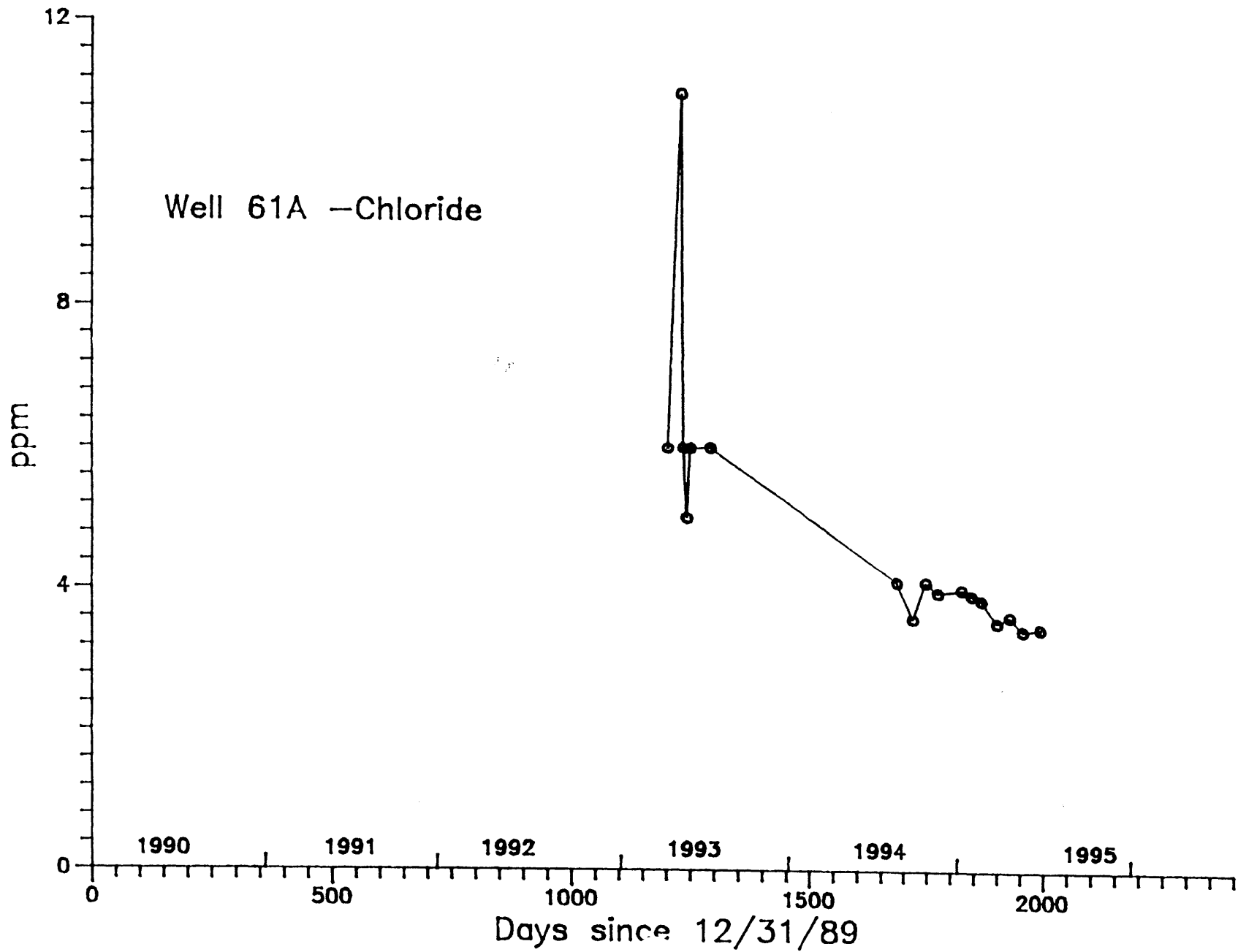


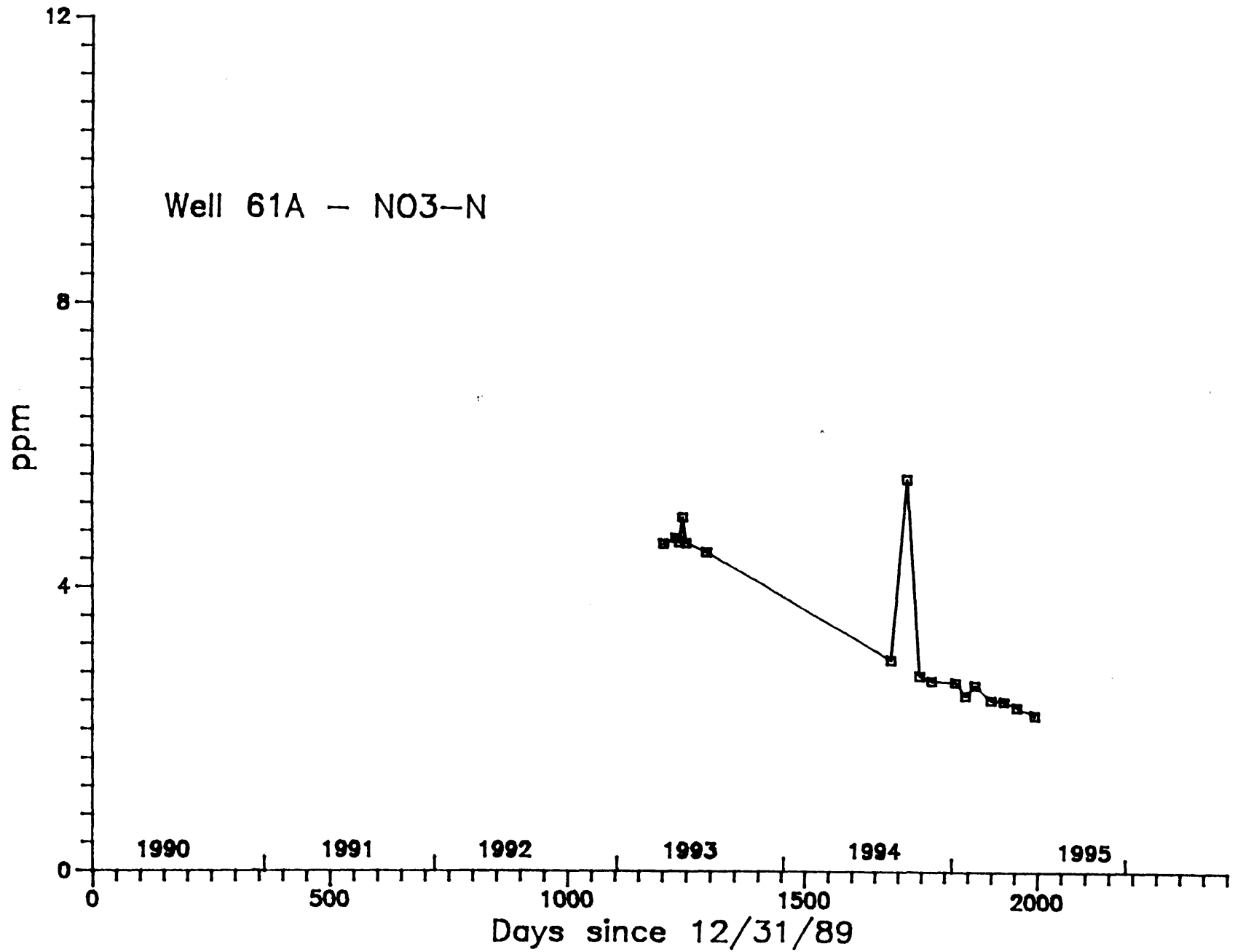


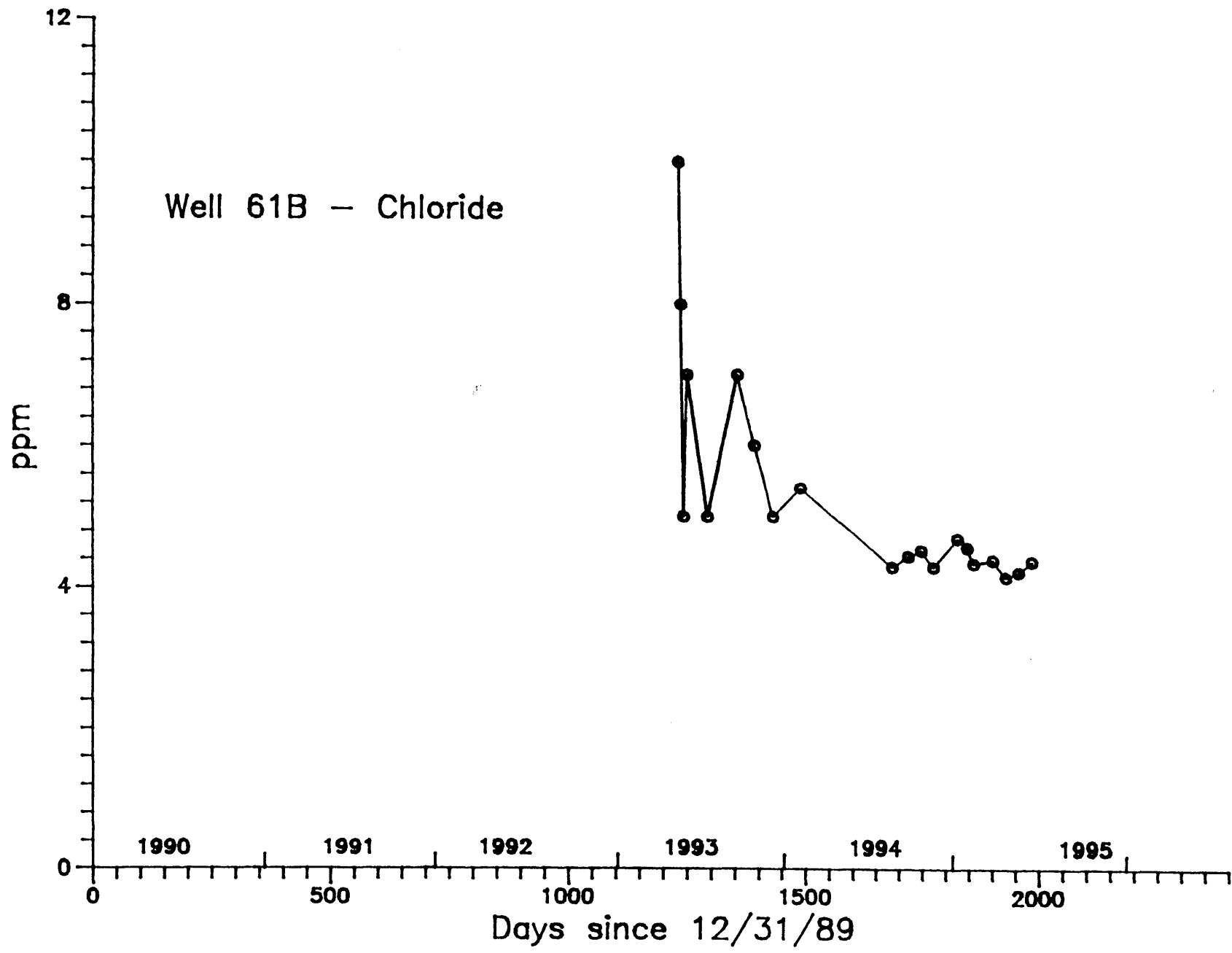


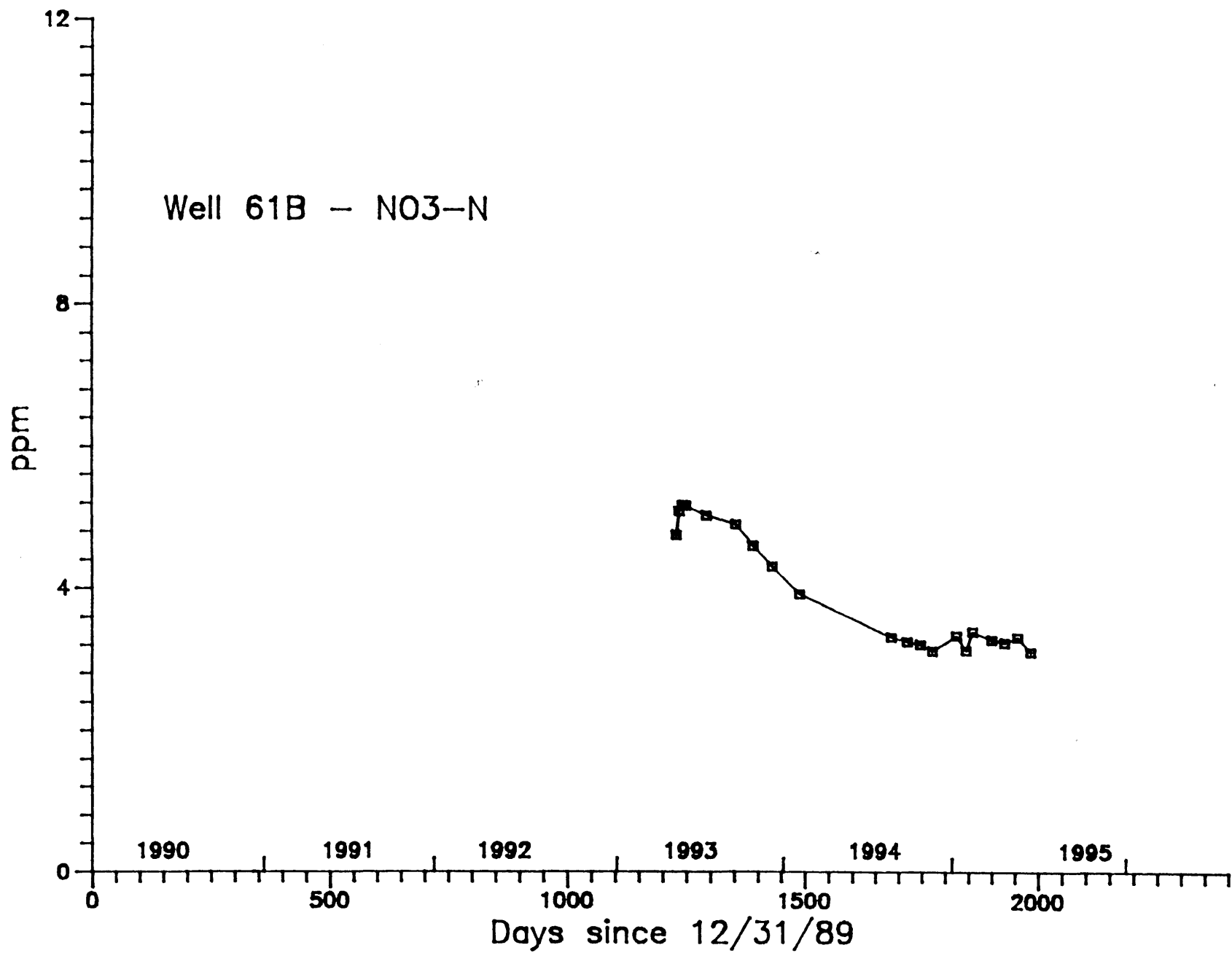


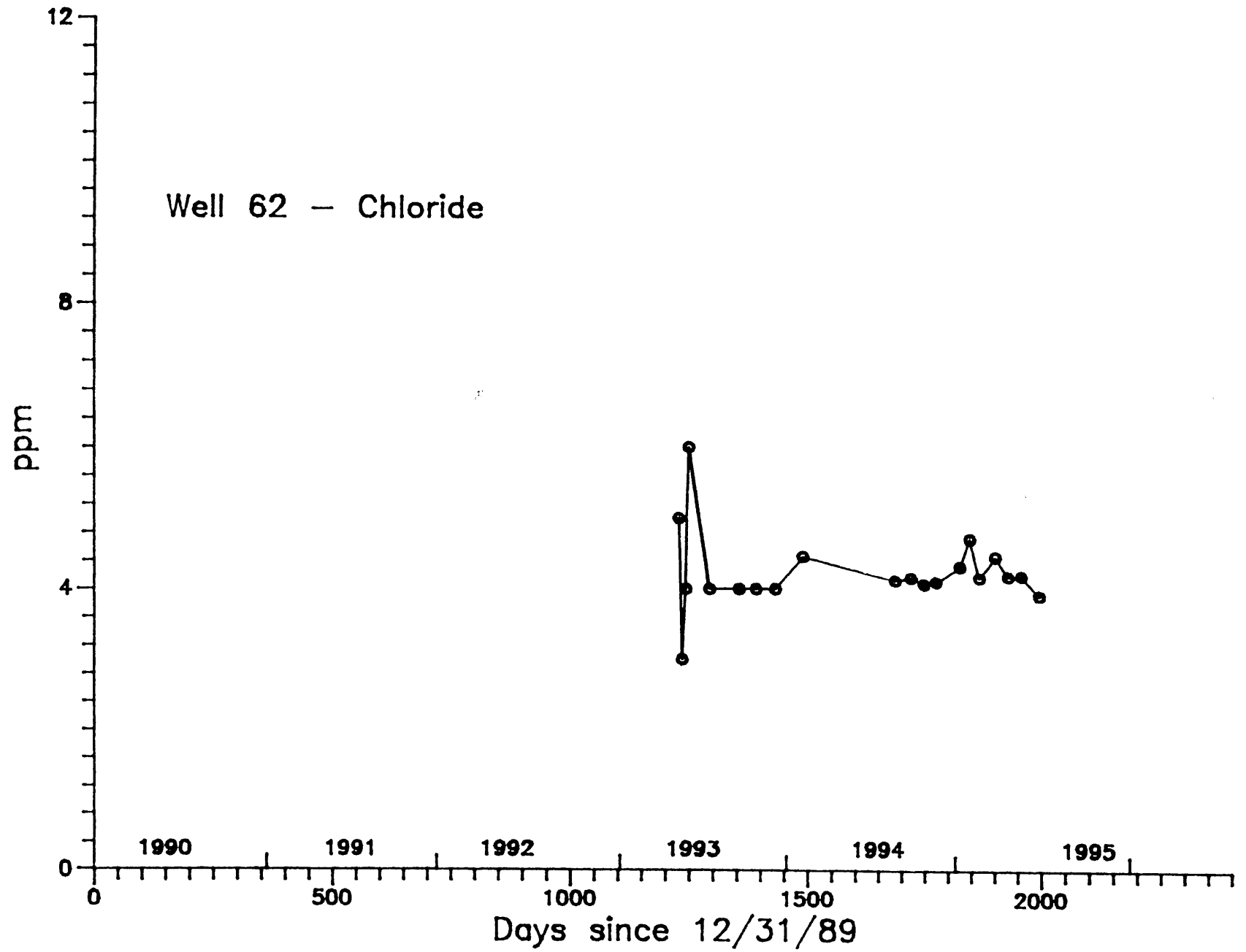


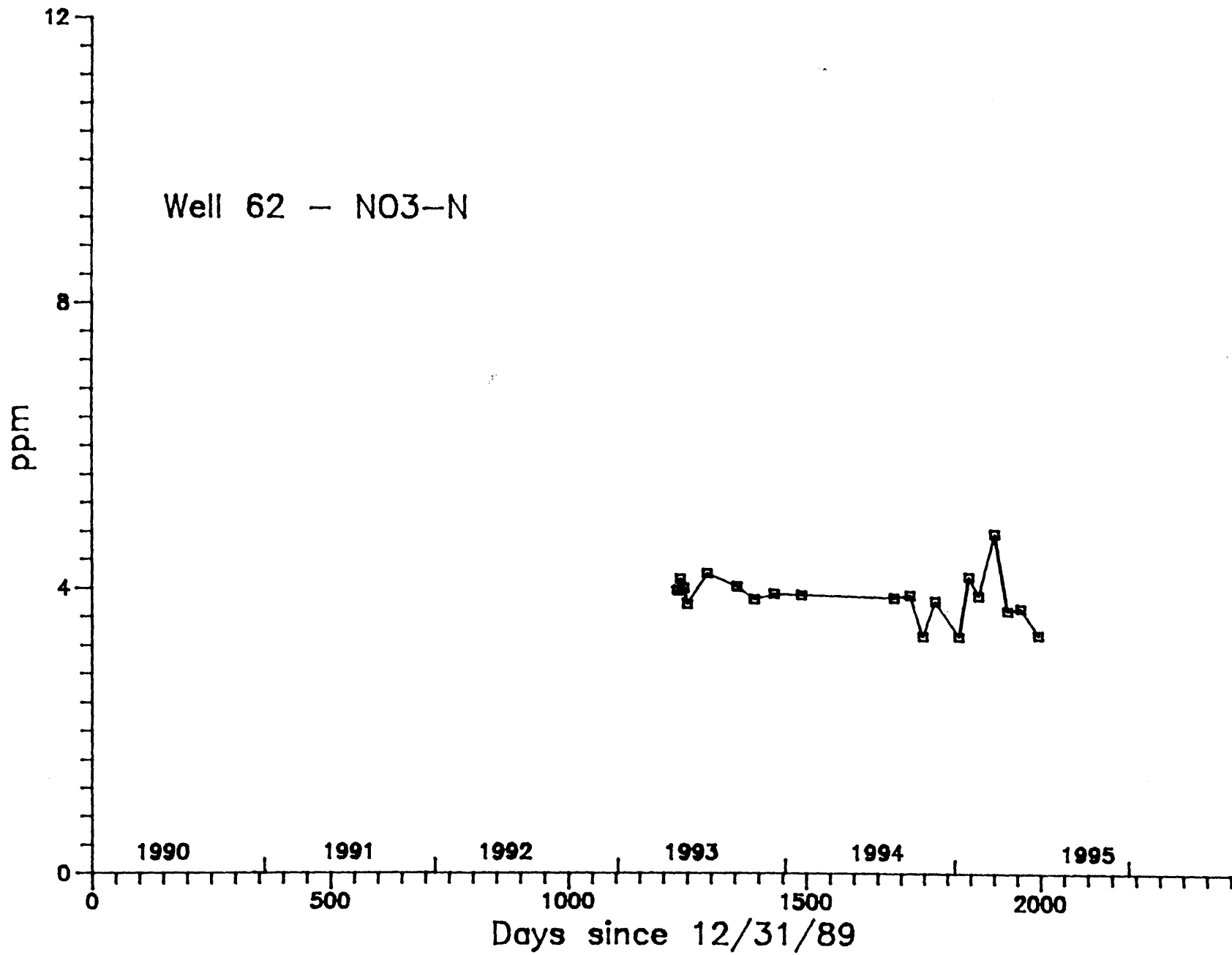


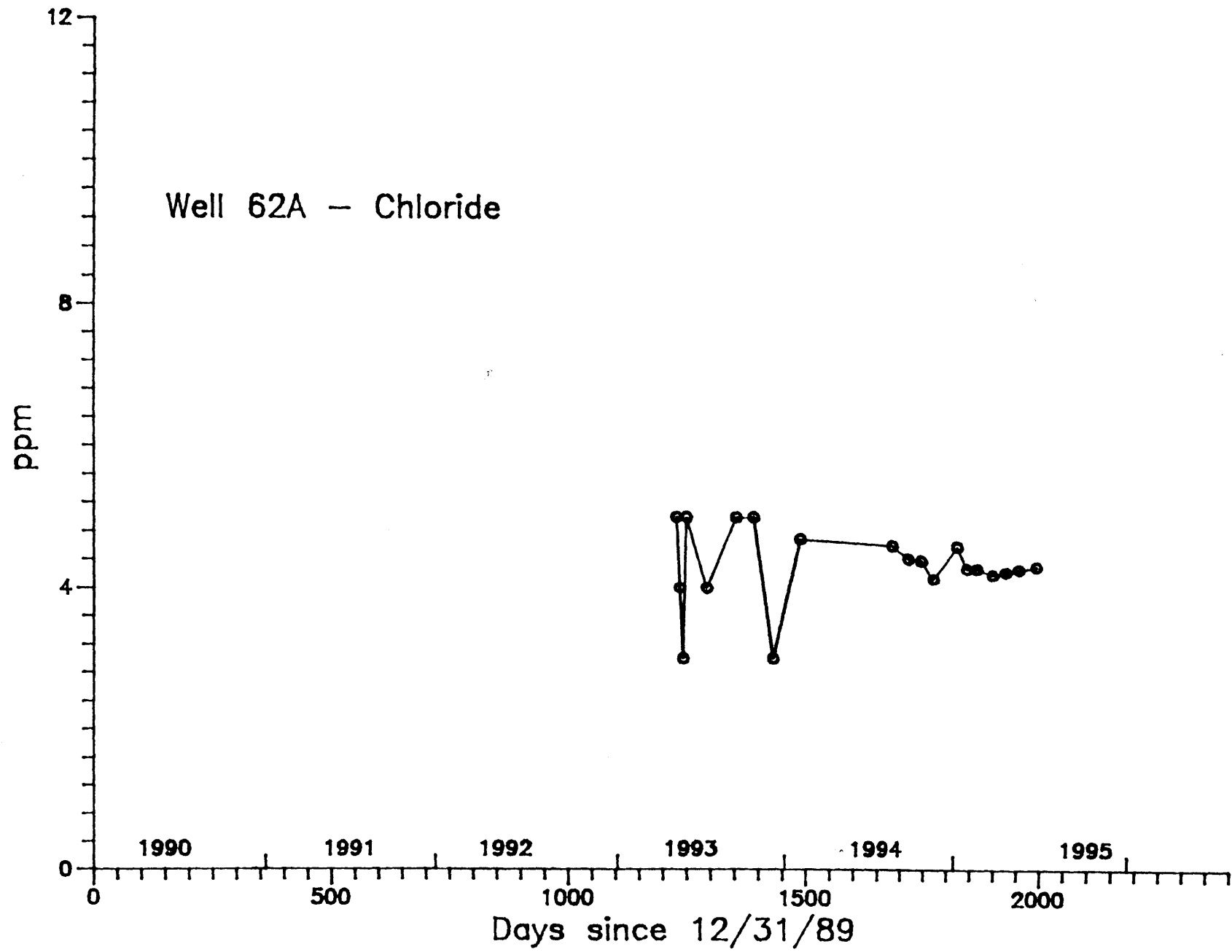


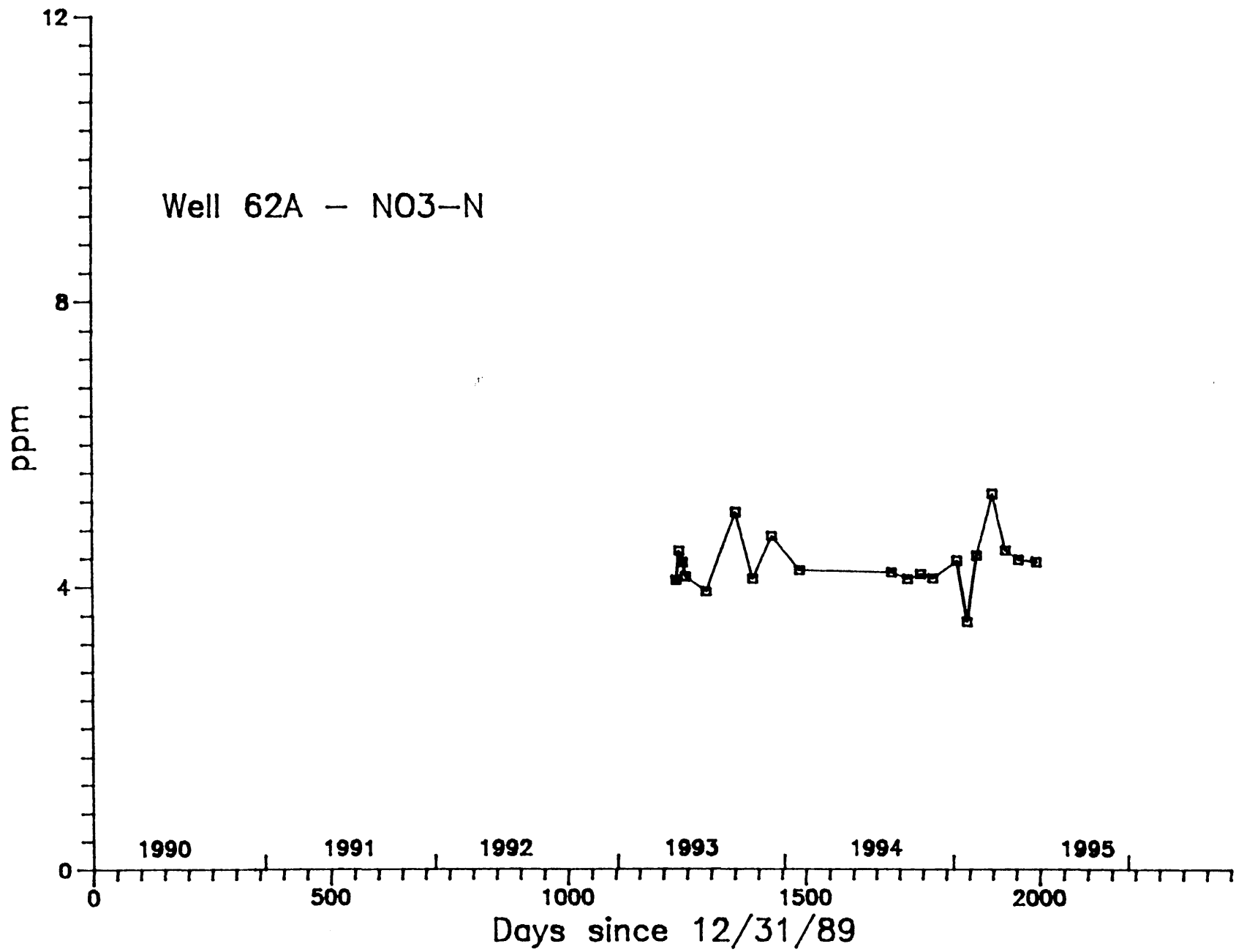




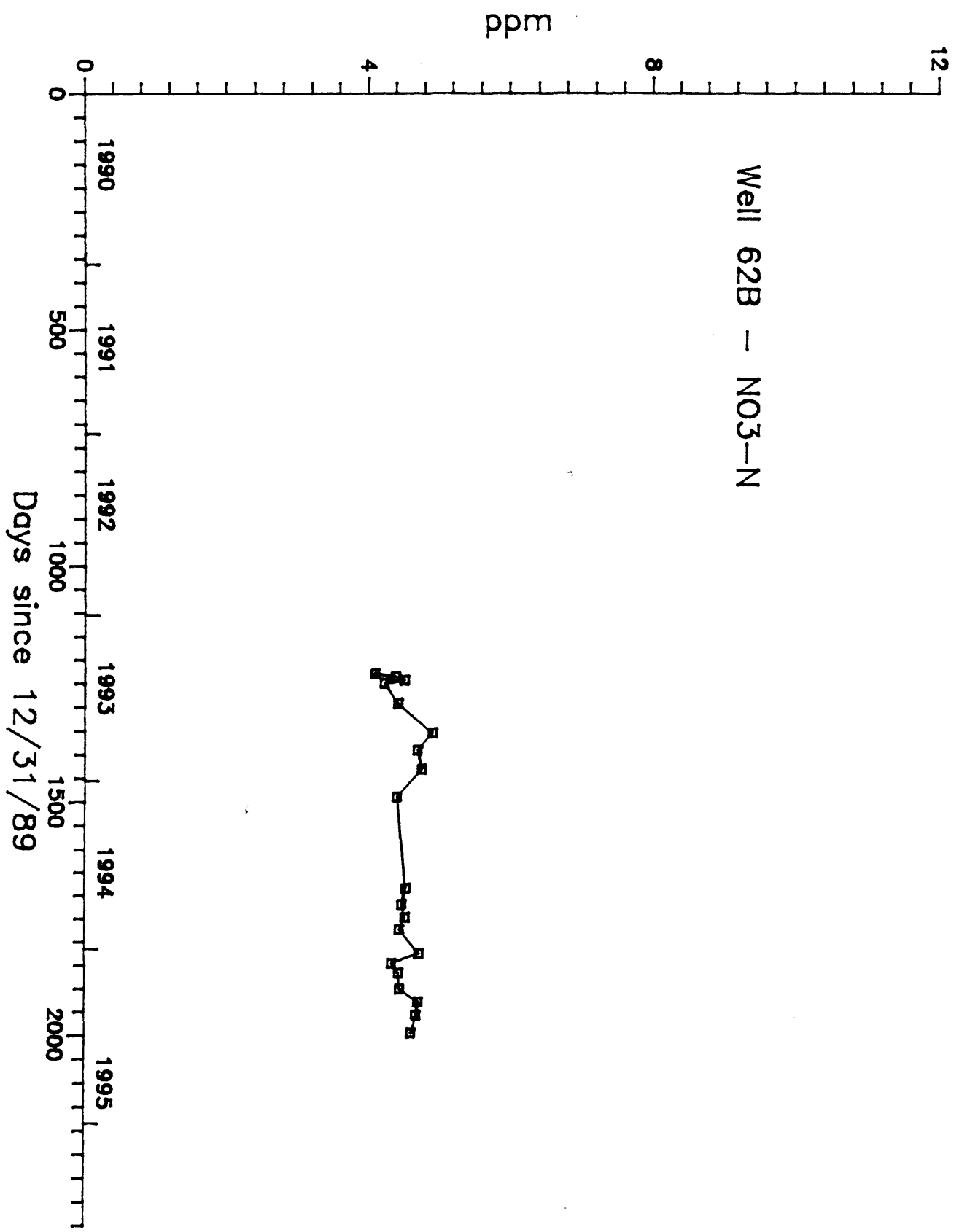


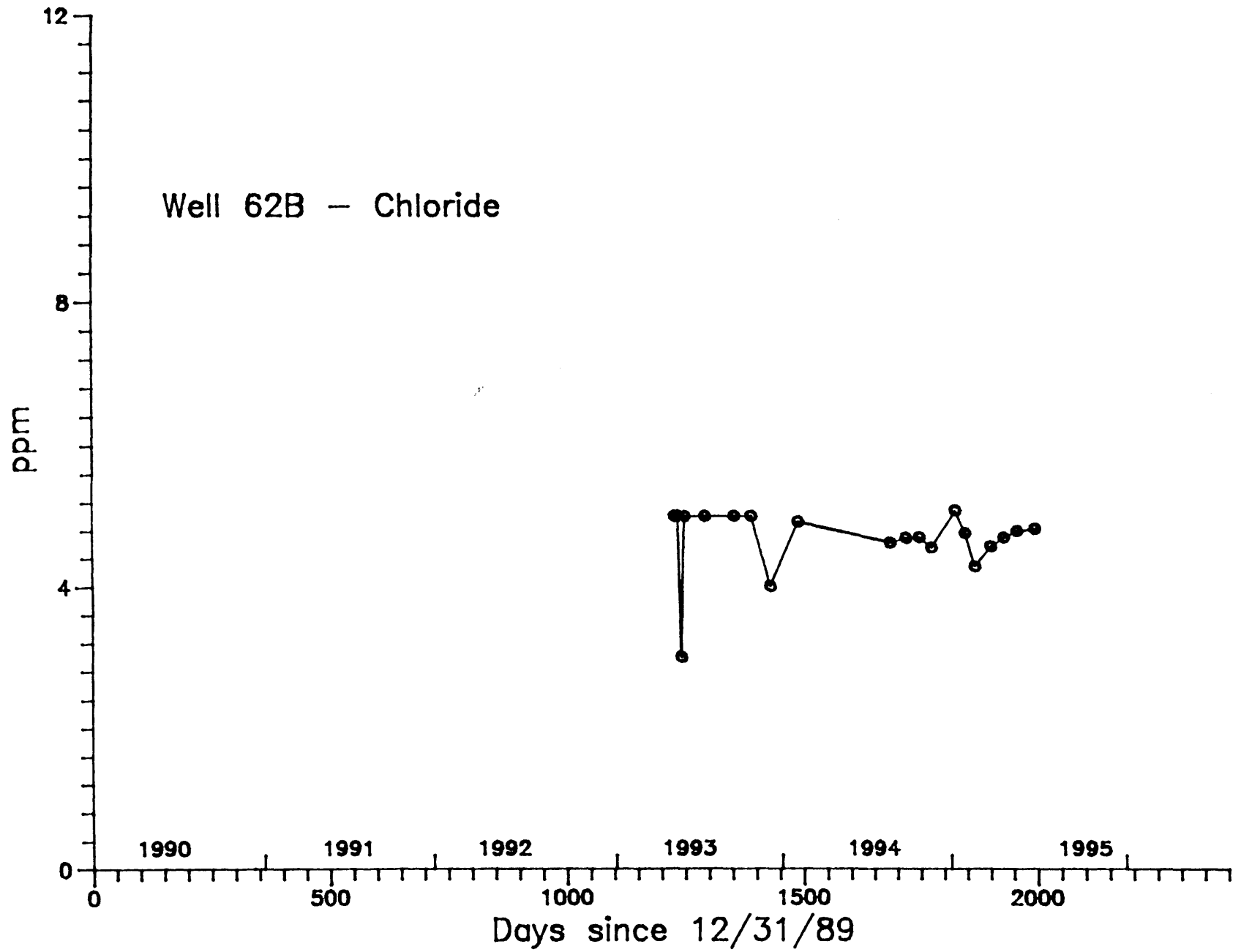


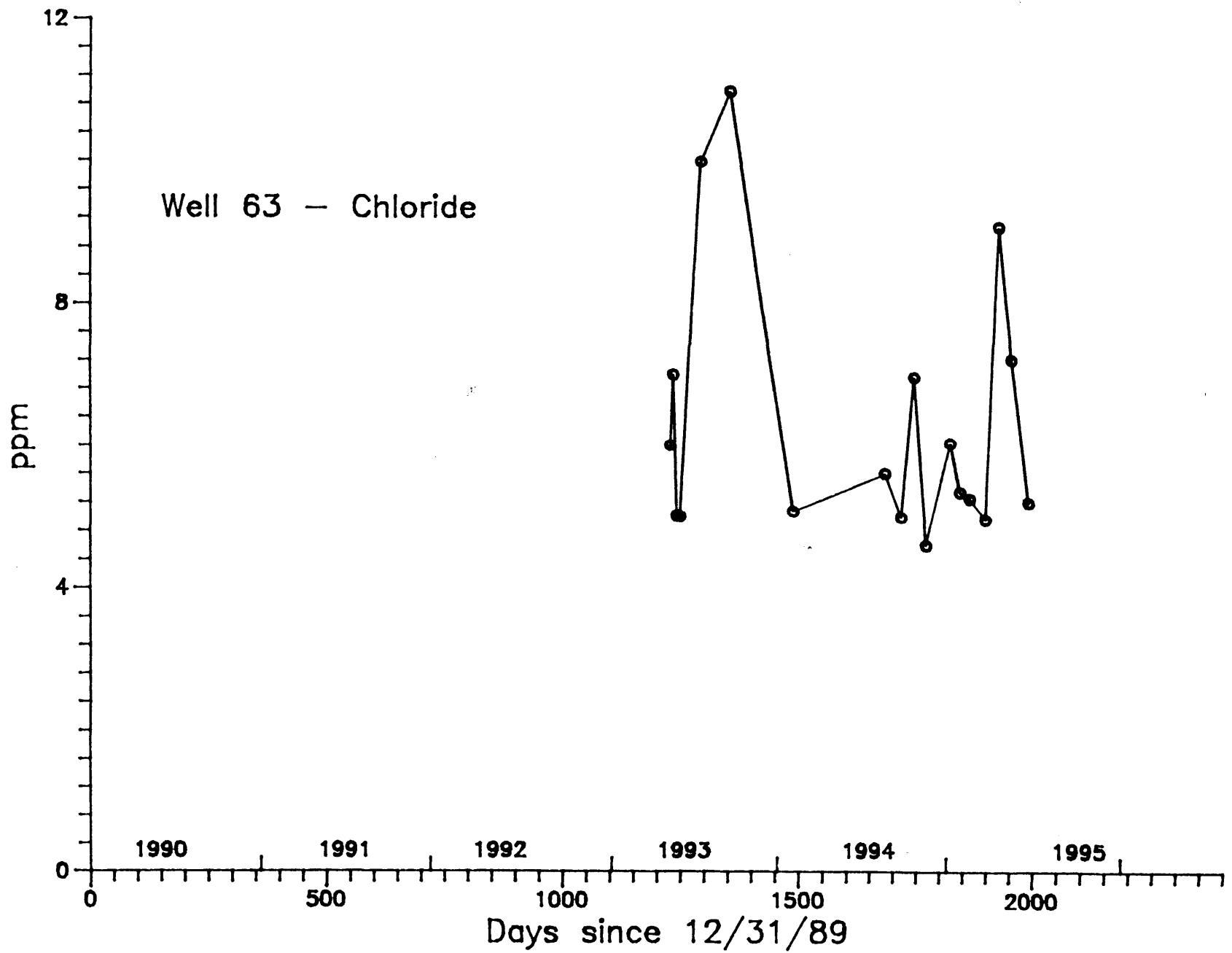


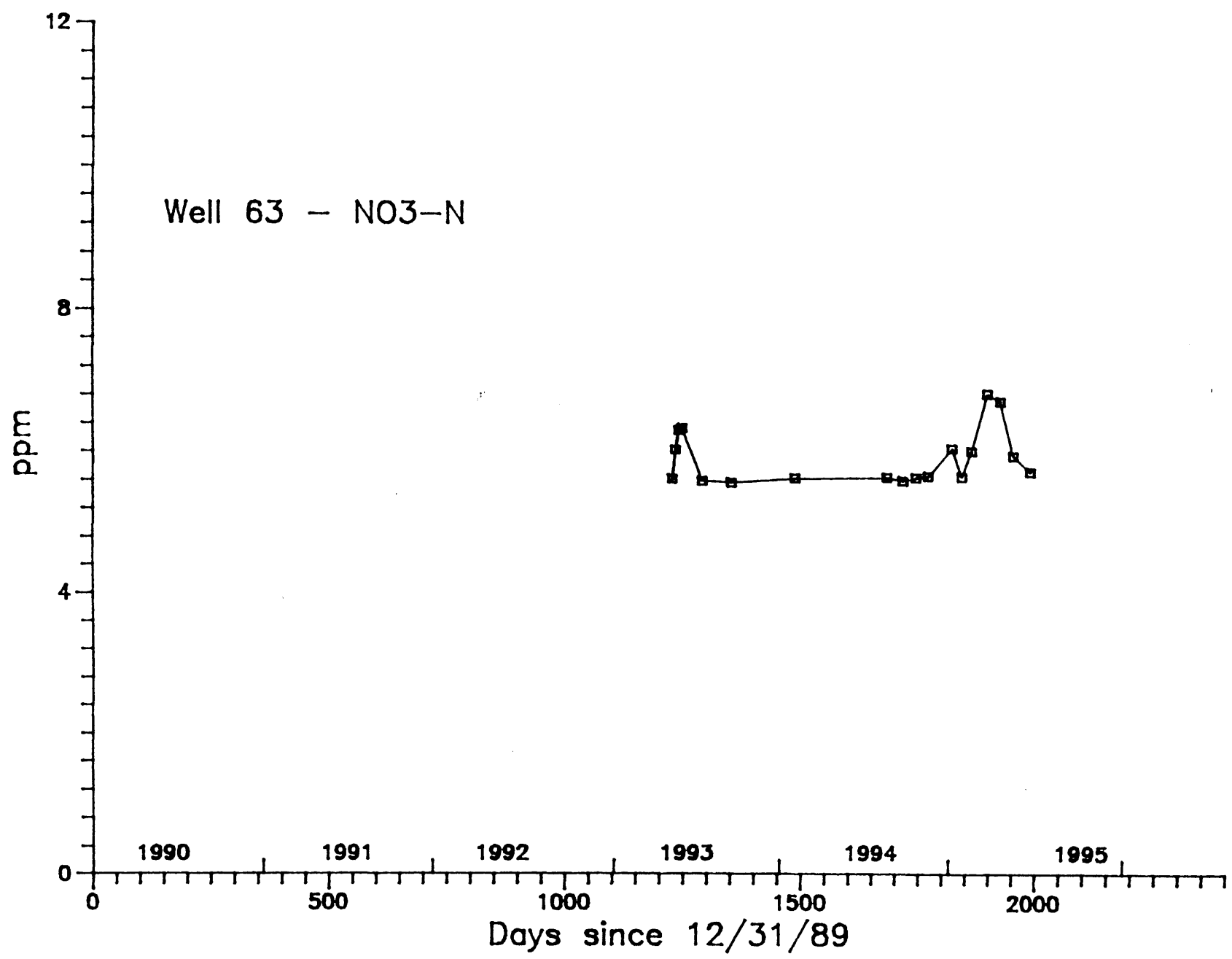


Well 62B -- NO3-N

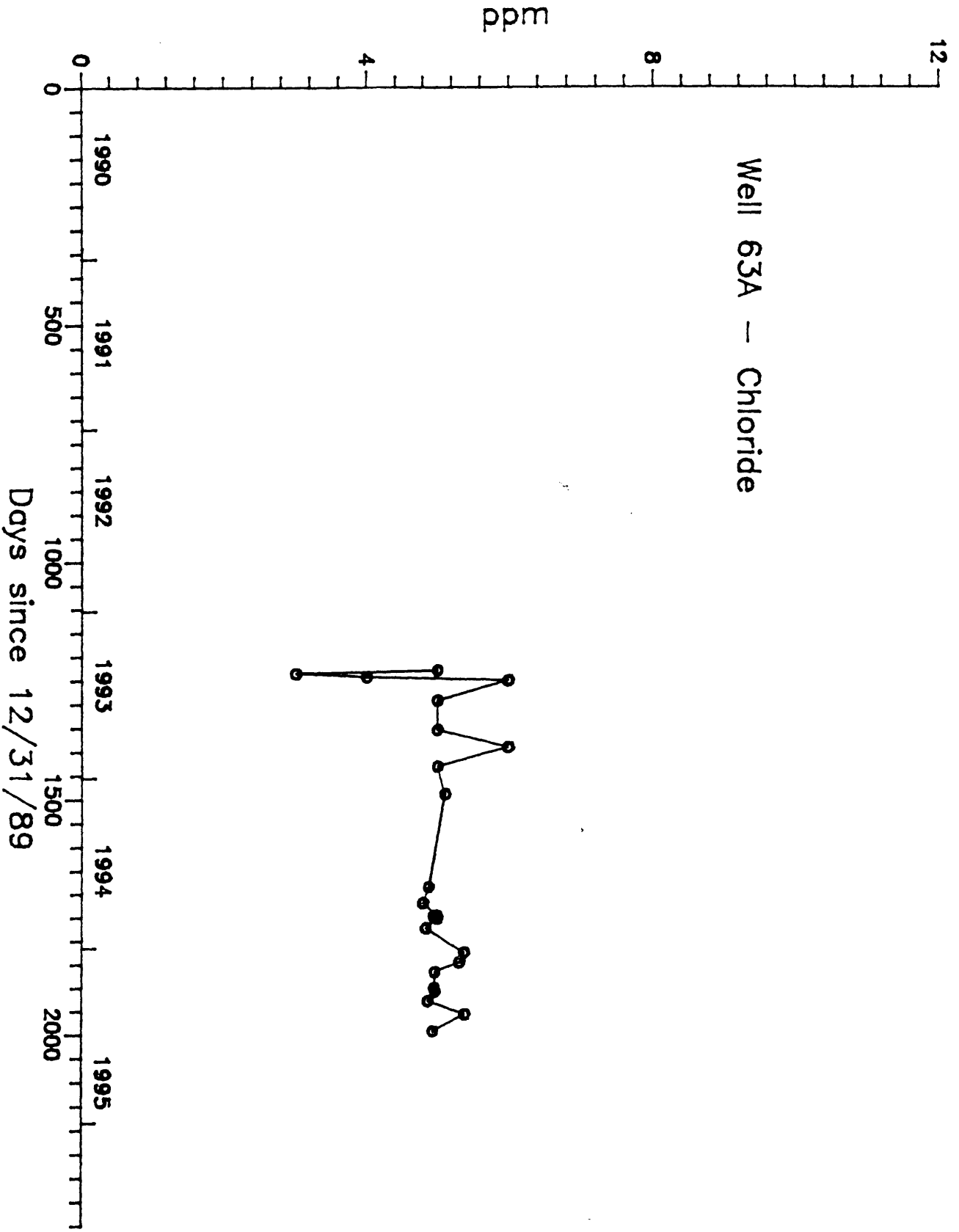


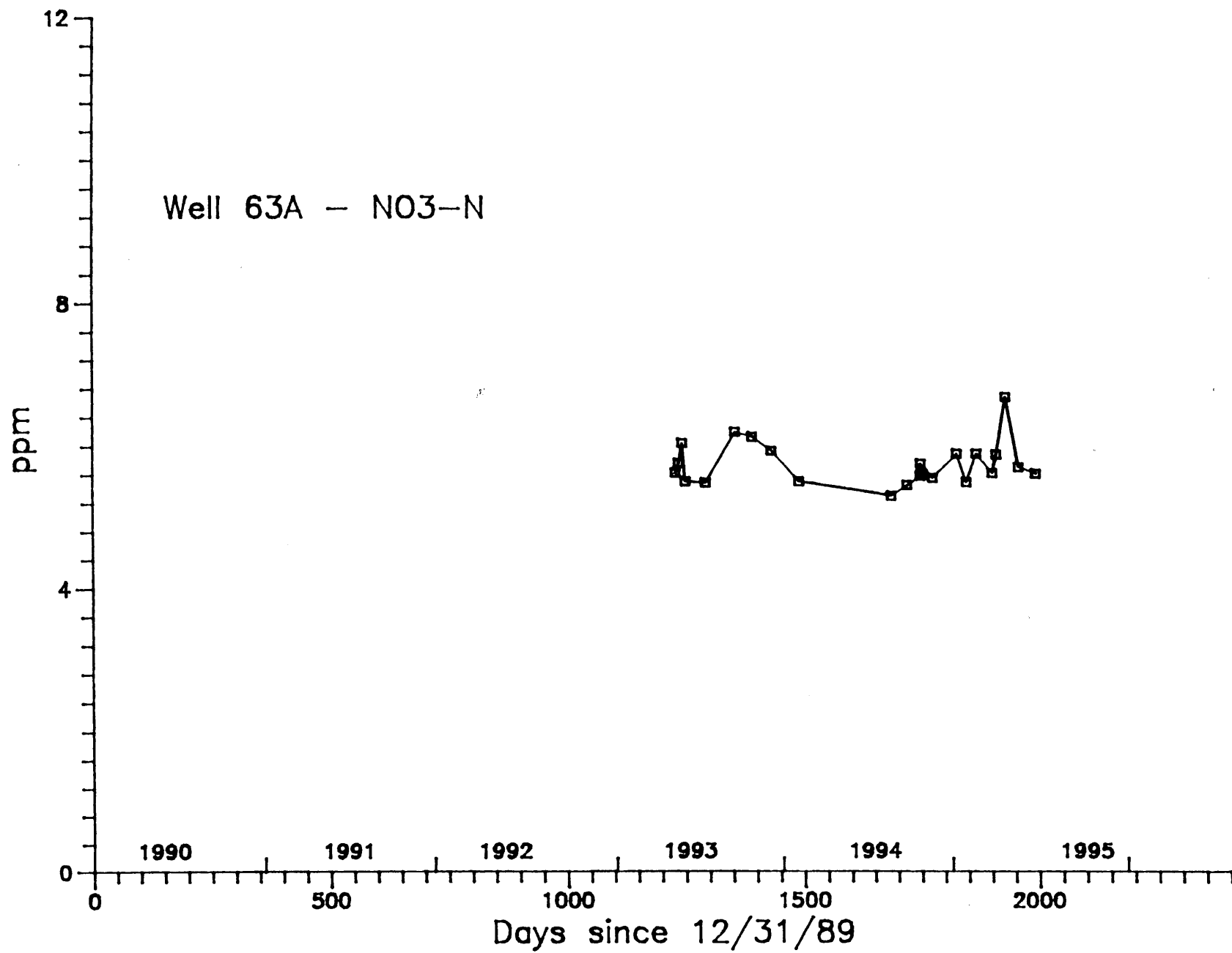


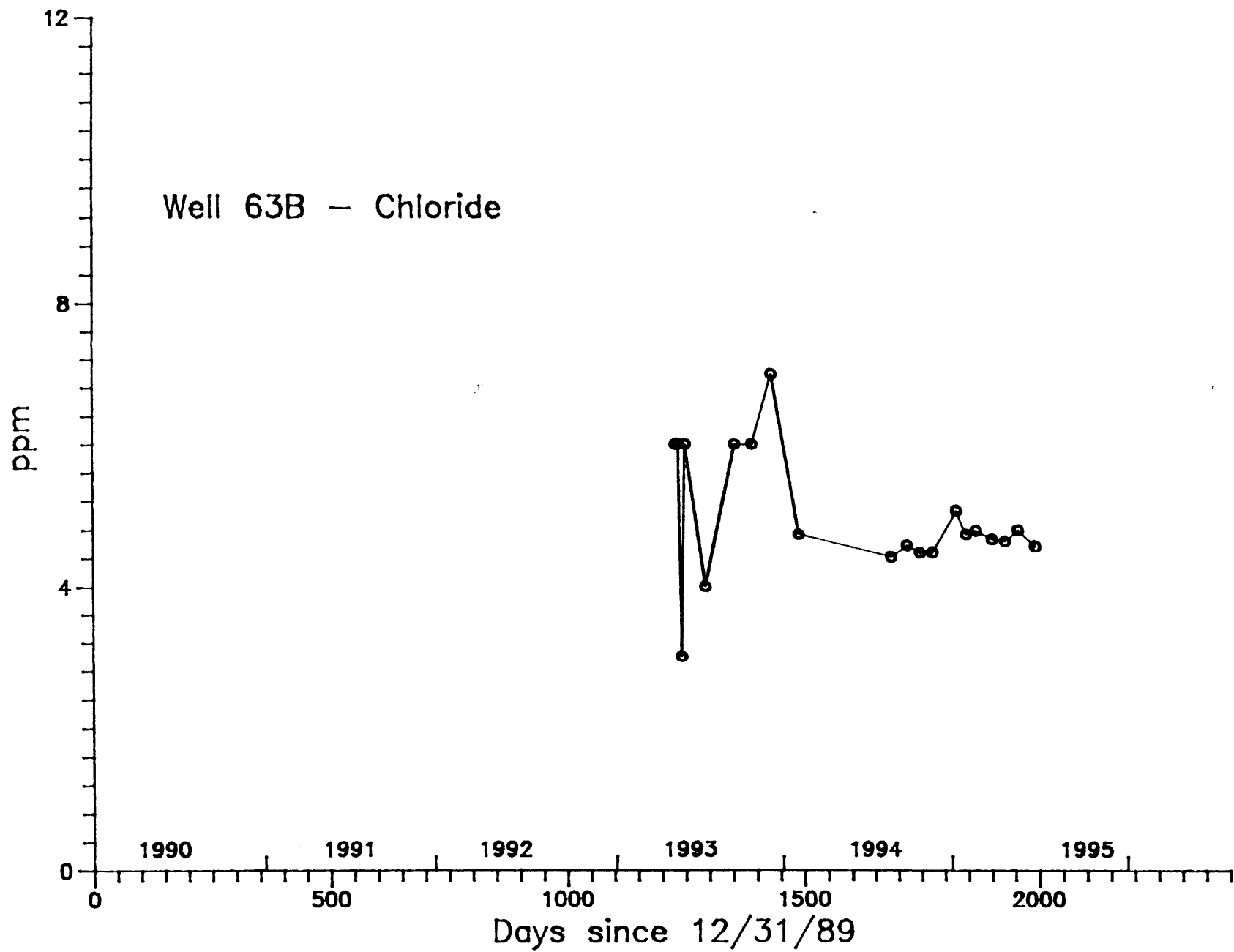


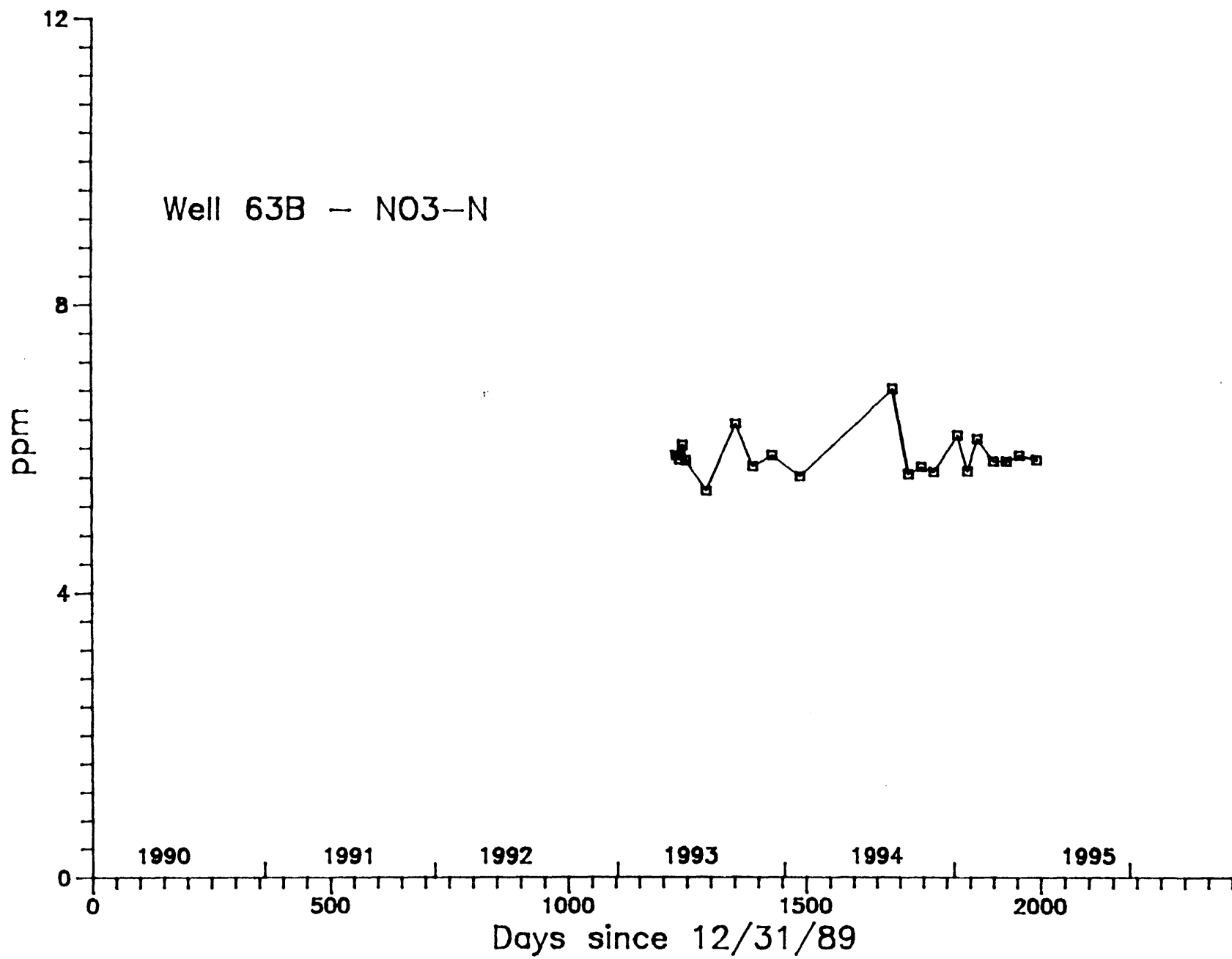


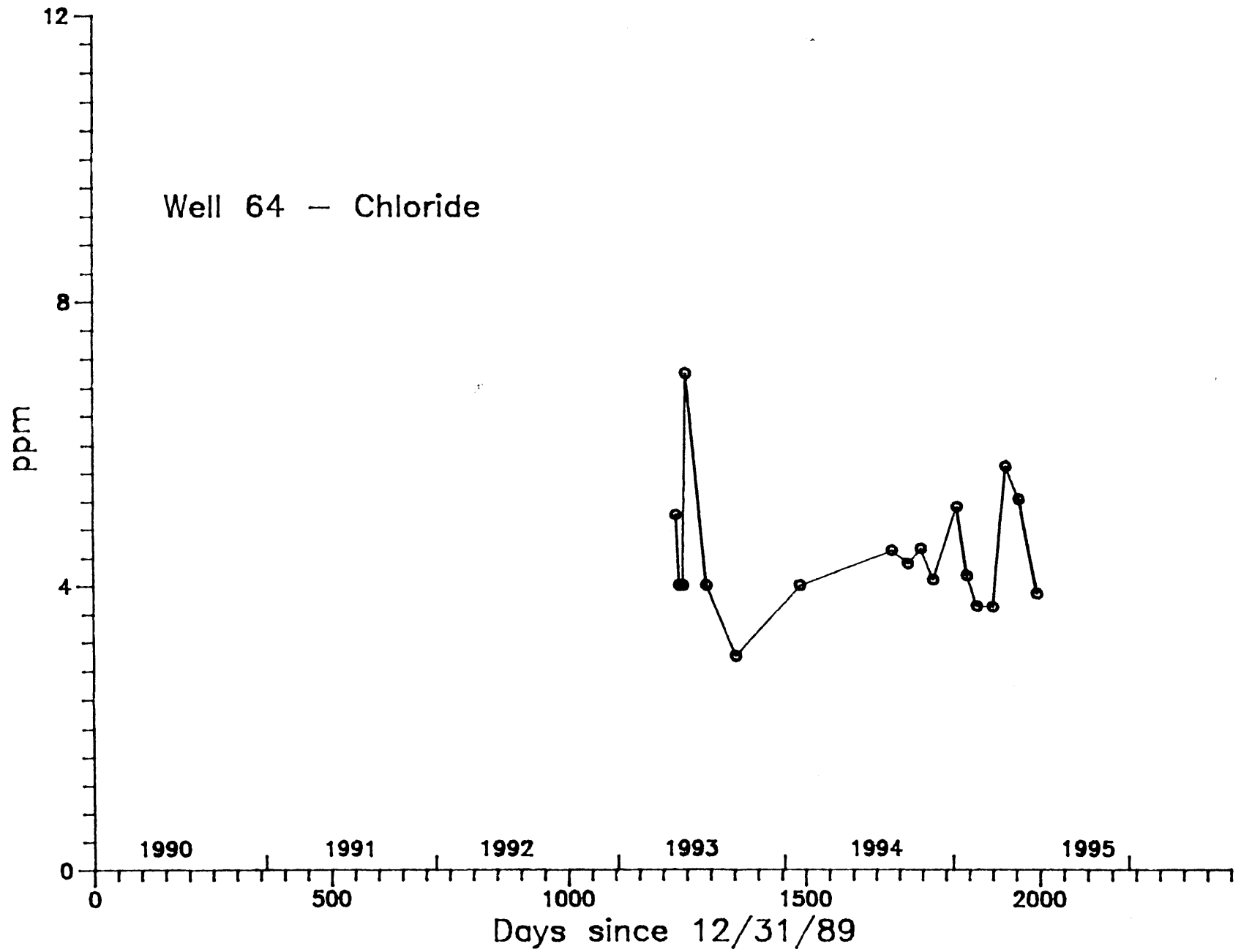
Well 63A — Chloride



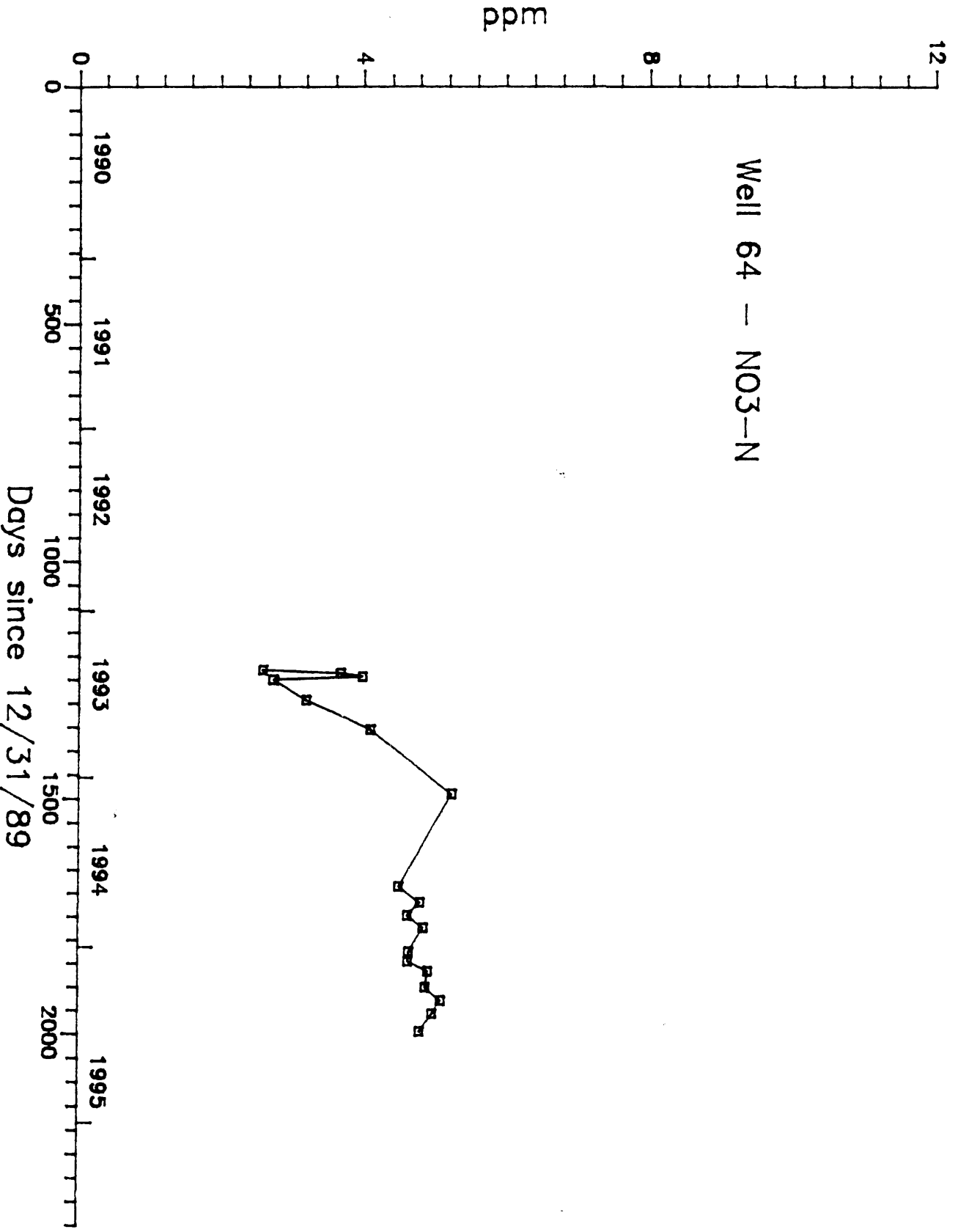




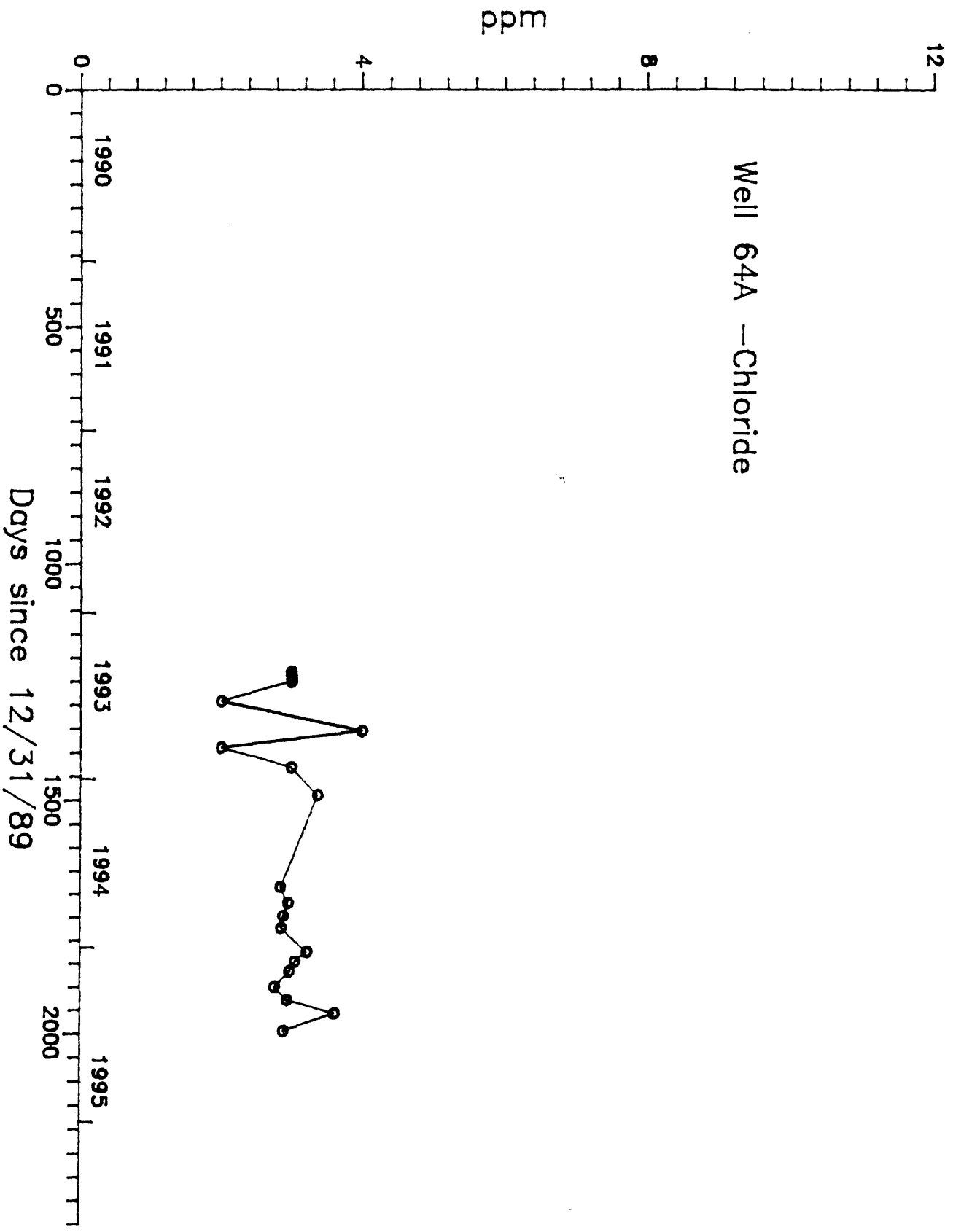


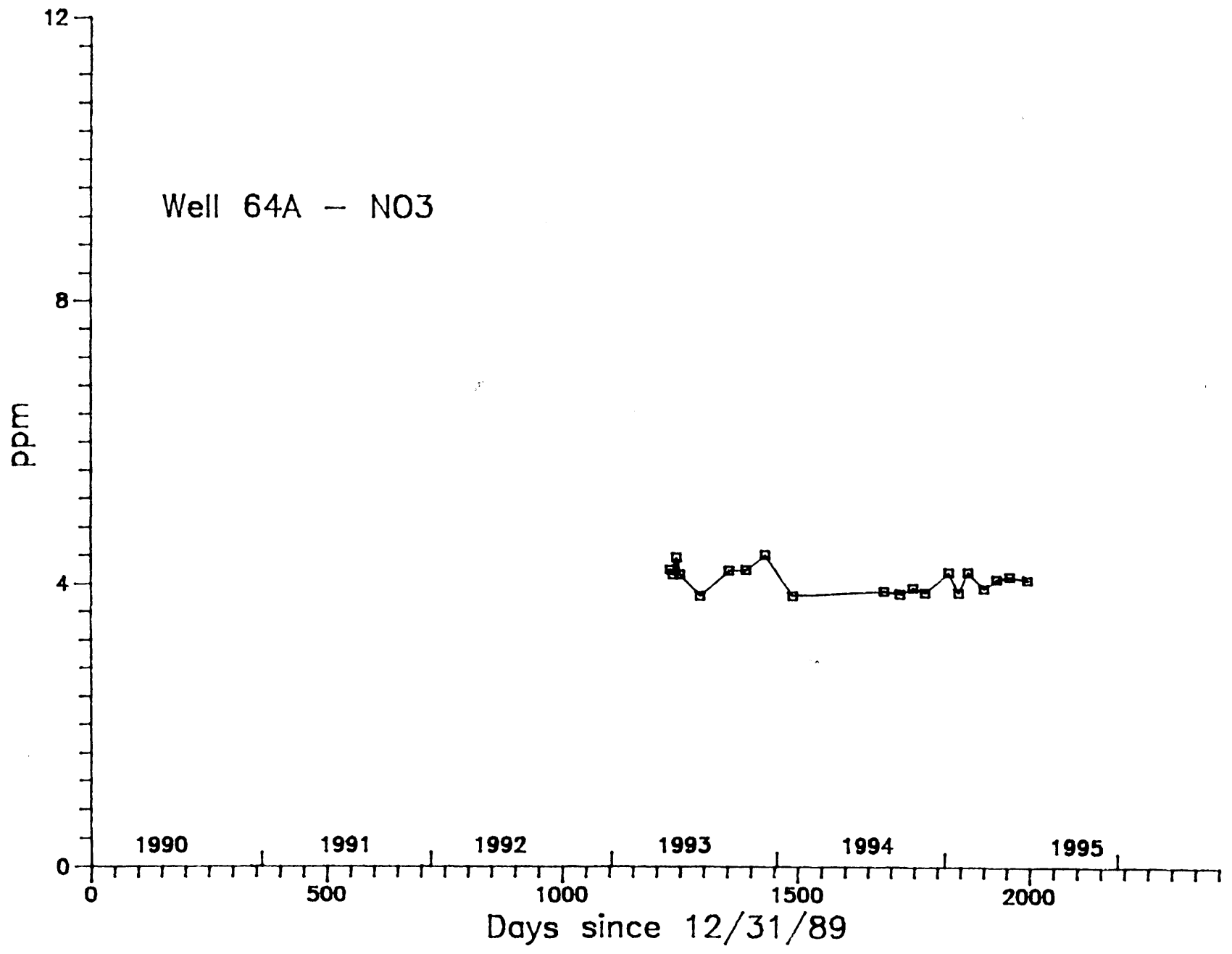


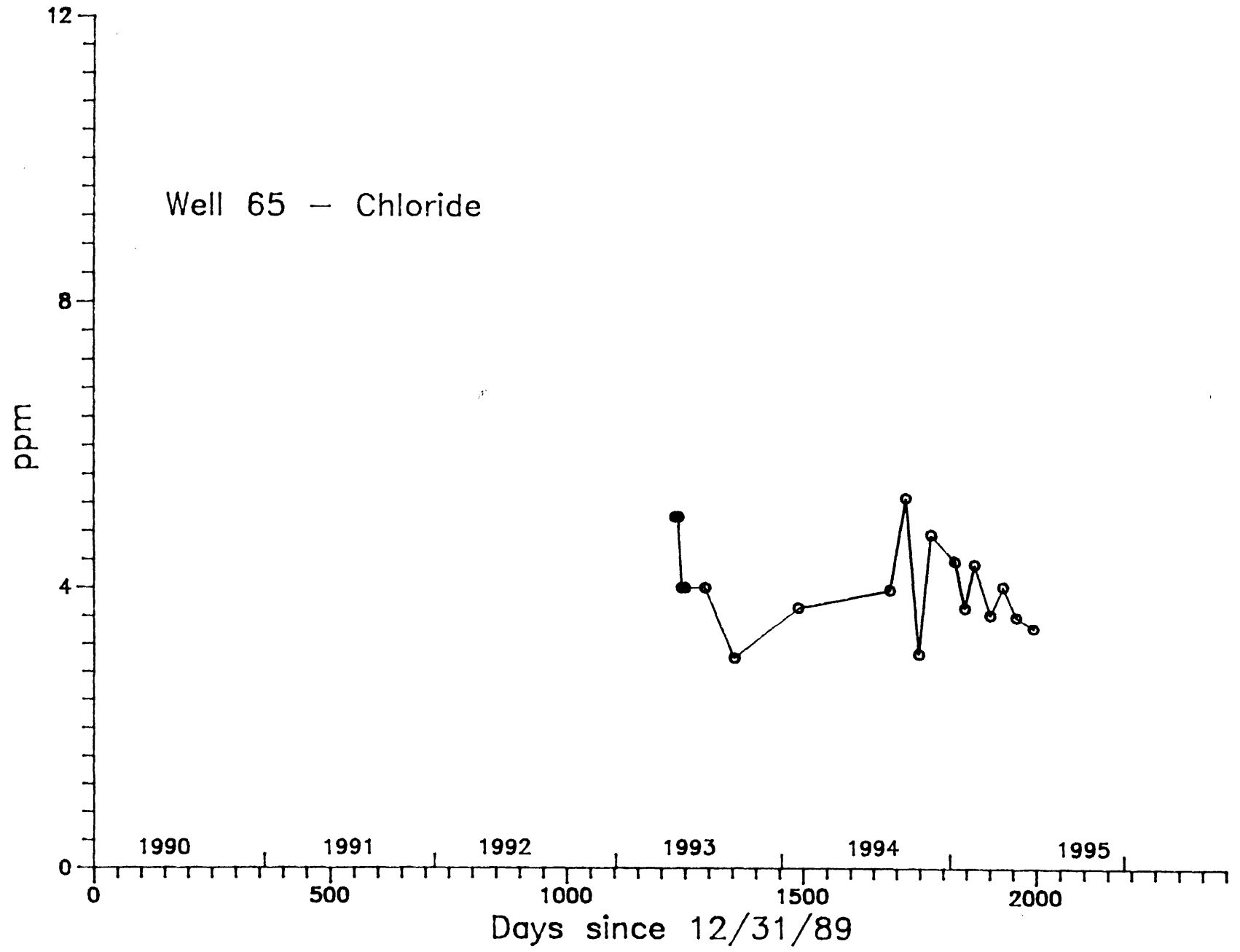
Well 64 - NO3-N

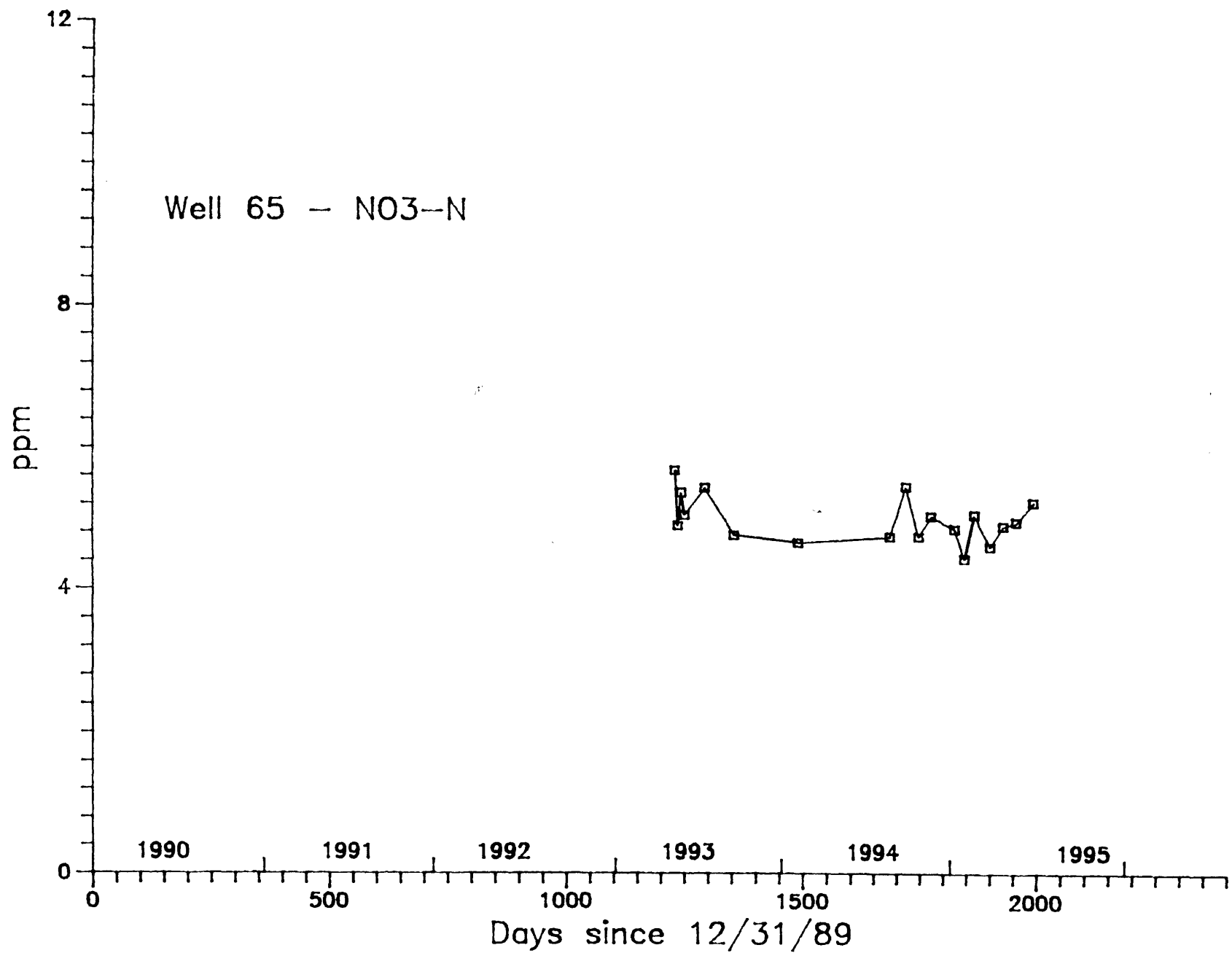


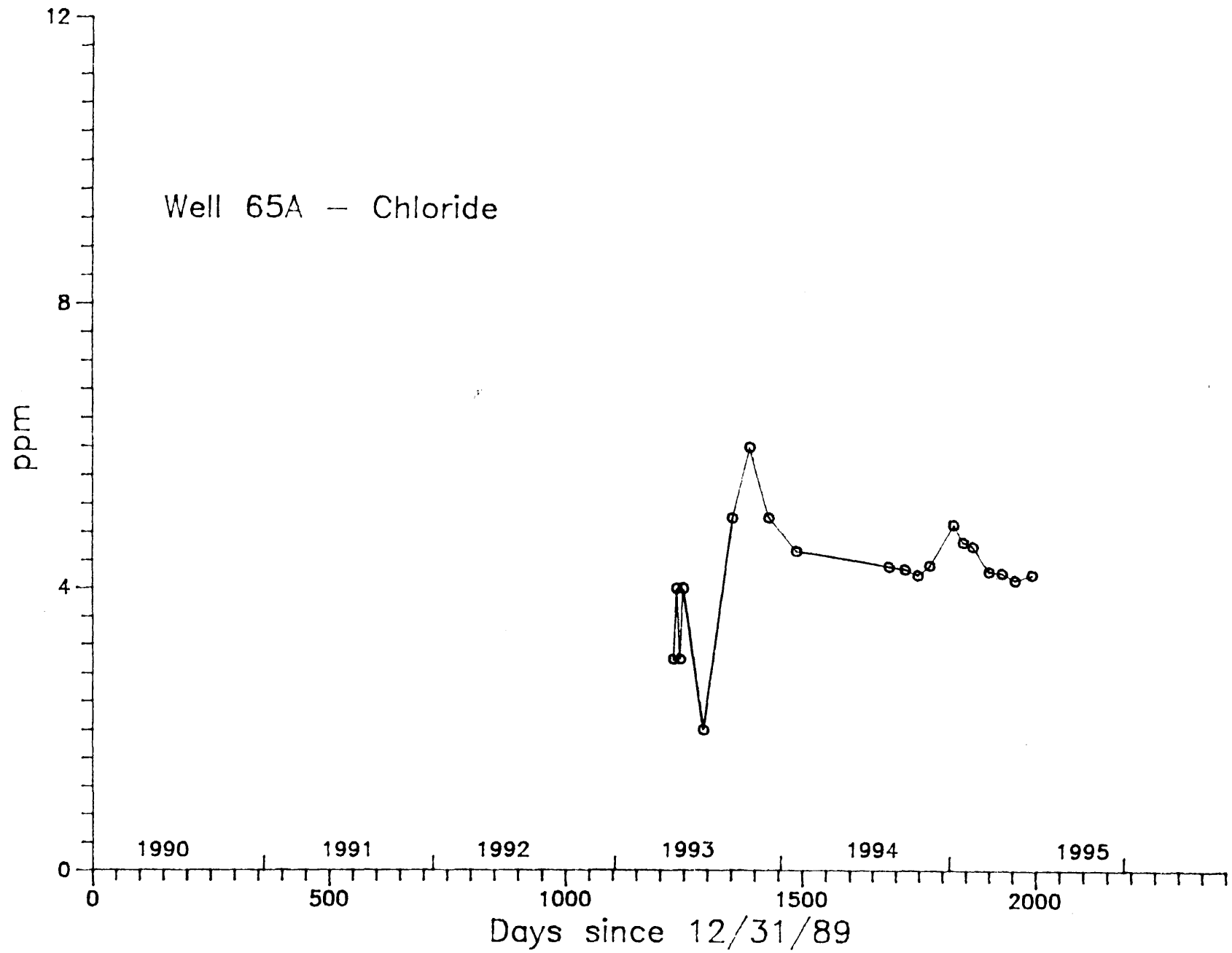
Well 64A - Chloride

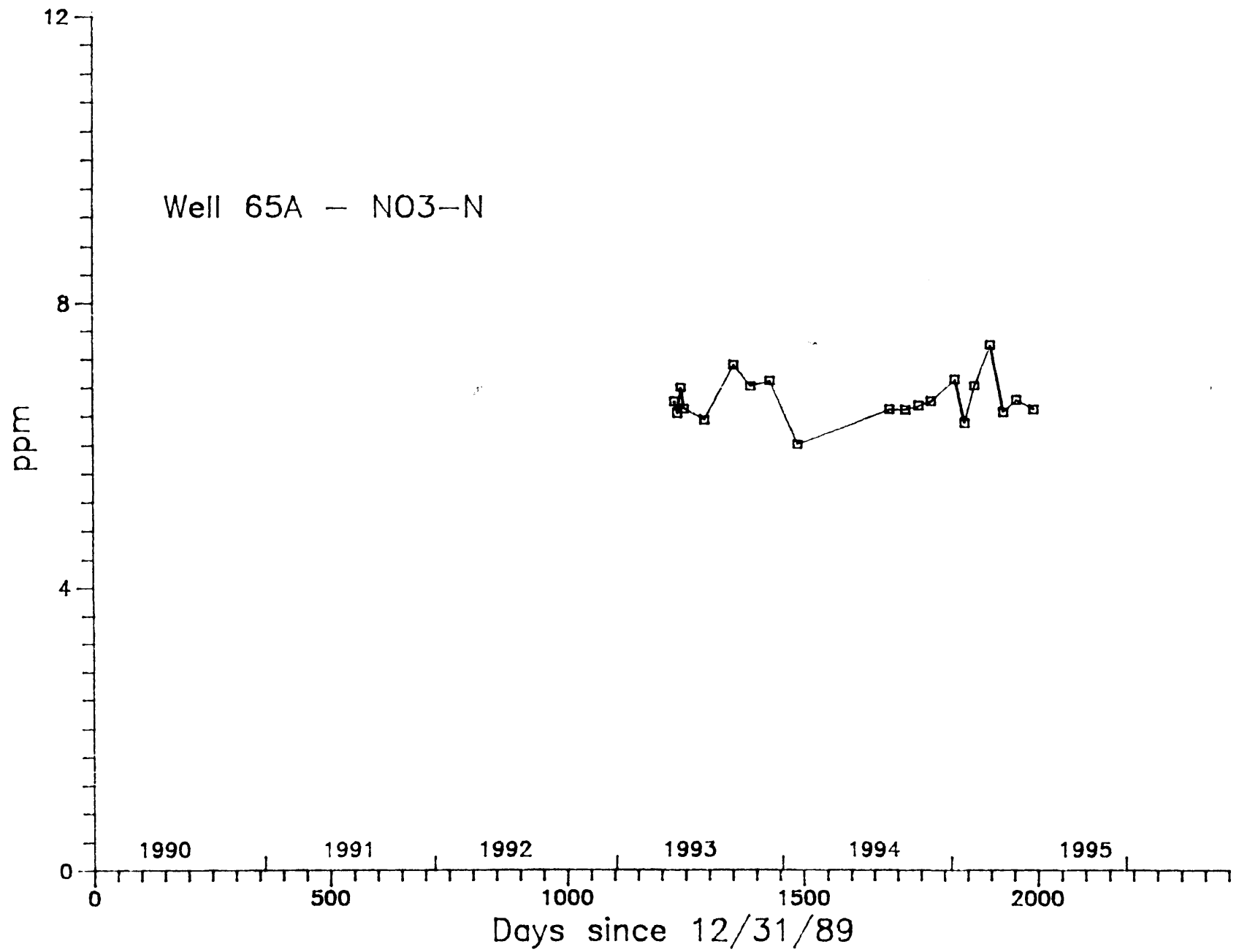


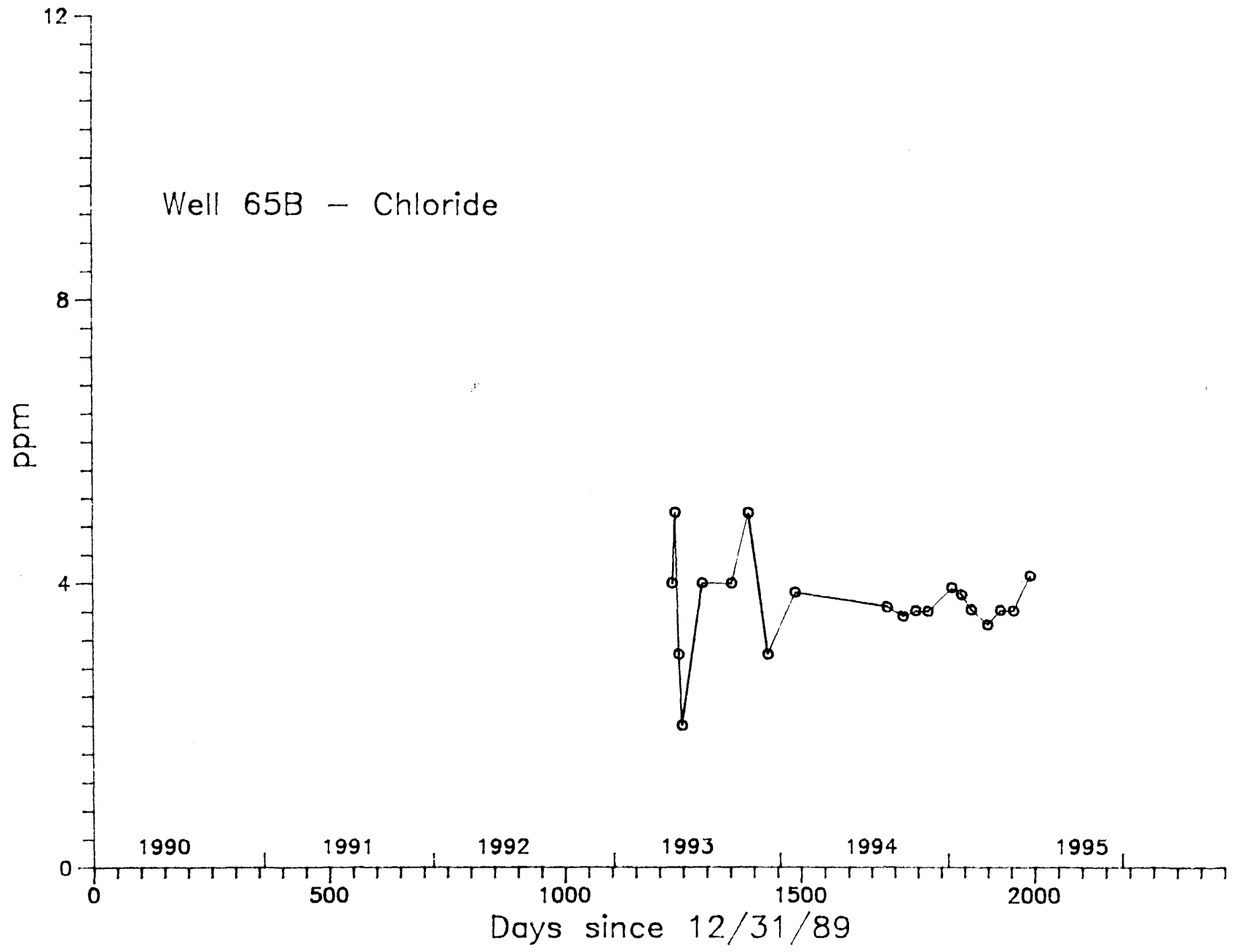


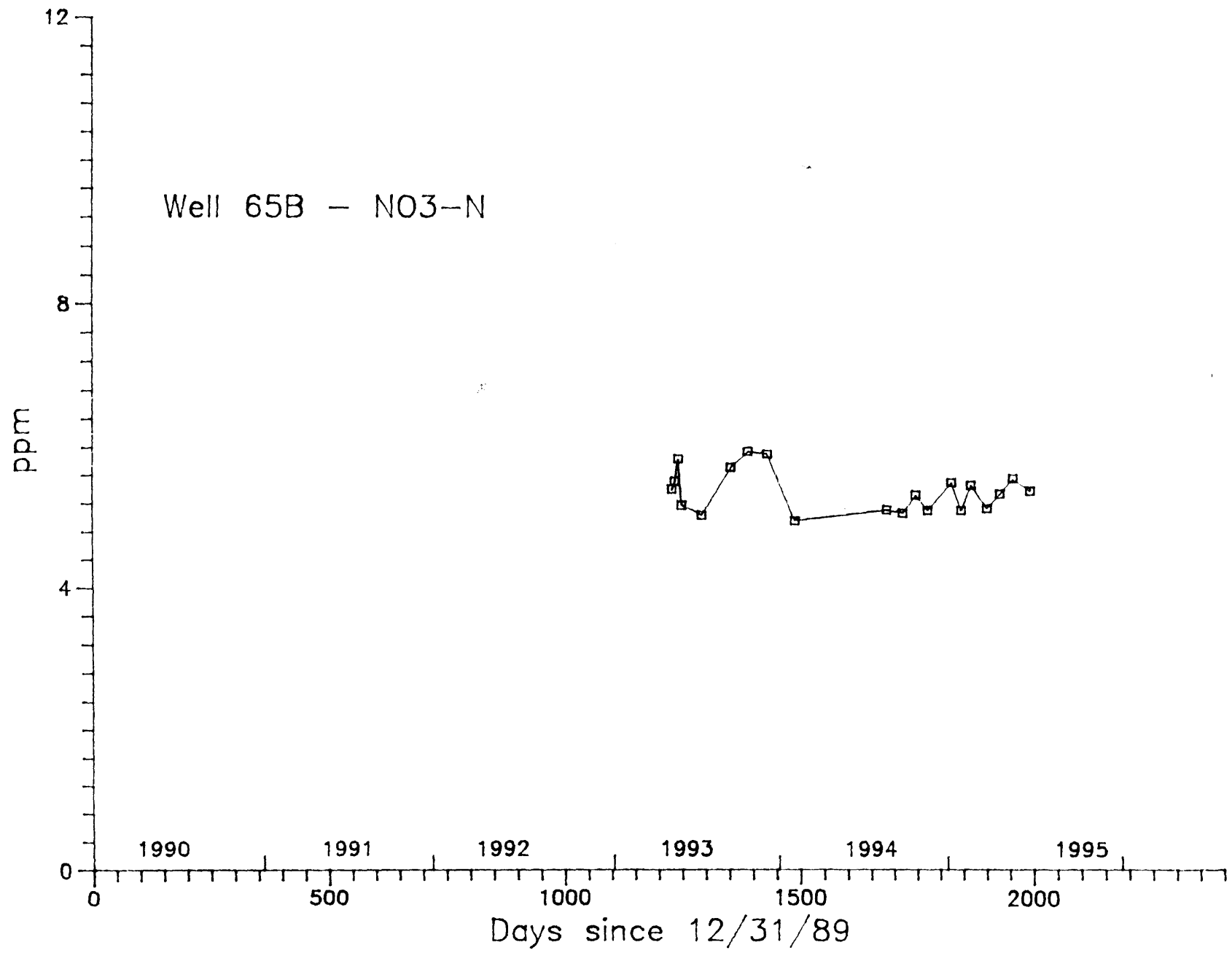










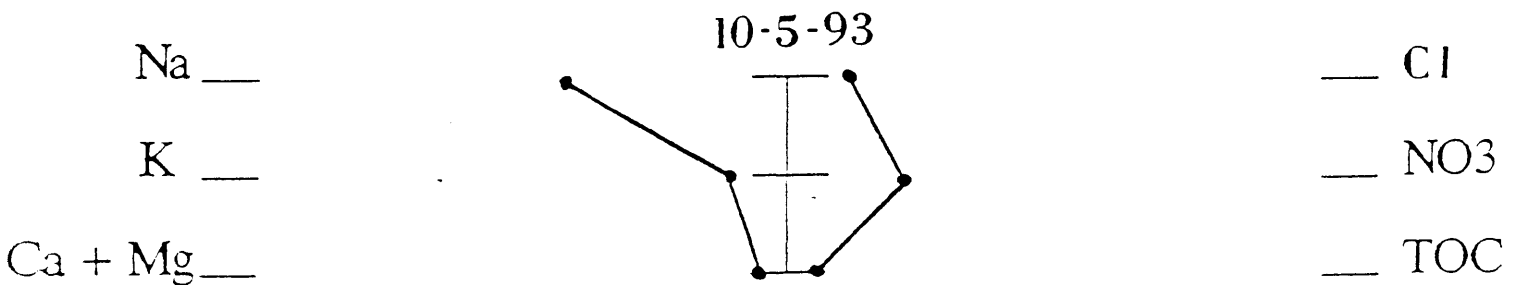
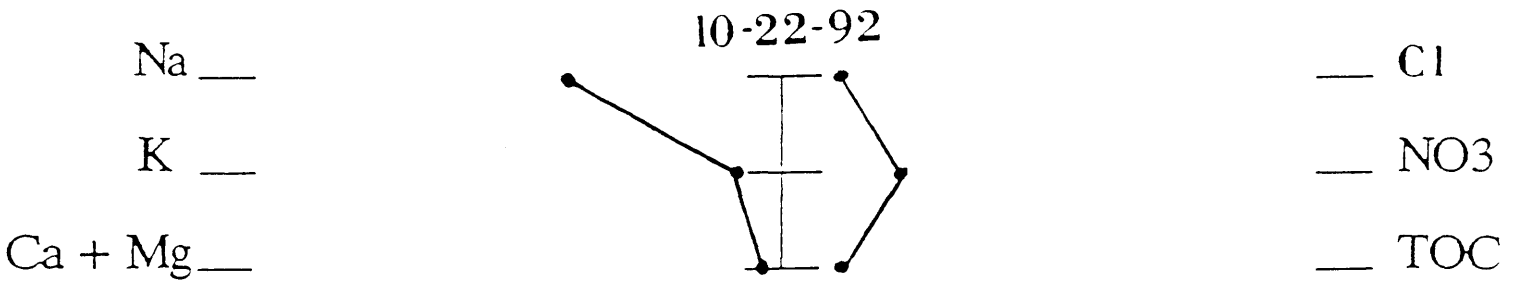
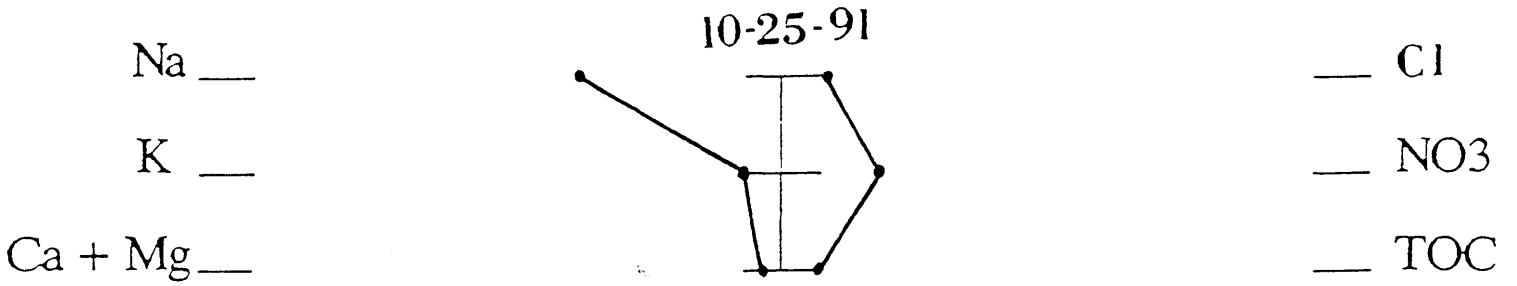
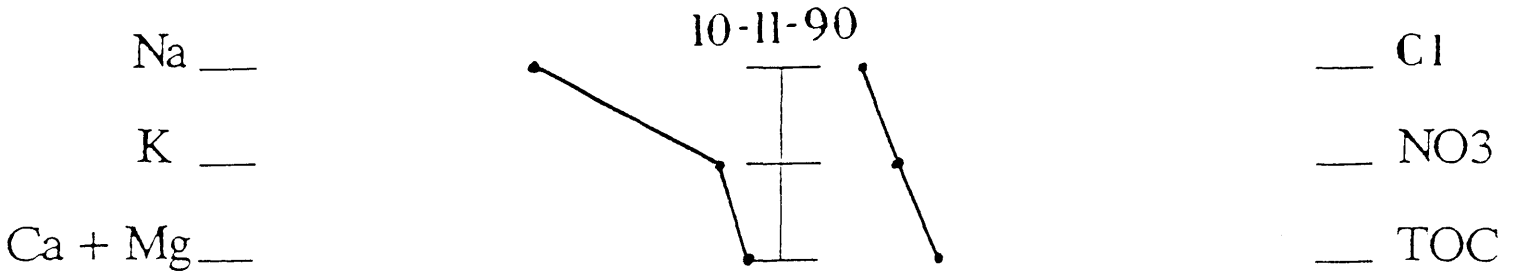
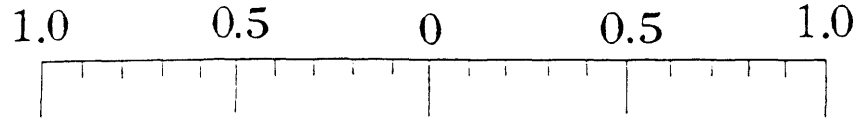


APPENDIX IV

Stiff Diagrams

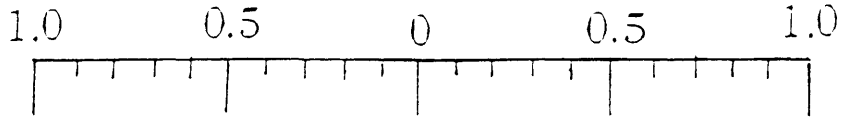
WELL 30

EPM



WELL 30

EPM



Na ___
K ___
Ca + Mg ___

11/8/94
___ Cl
___ NO3
___ TOC

Na ___
K ___
Ca + Mg ___

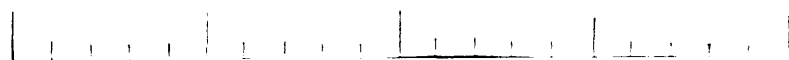
12/12/95
___ Cl
___ NO3
___ TOC

Na ___
K ___
Ca + Mg ___

___ Cl
___ NO3
___ TOC

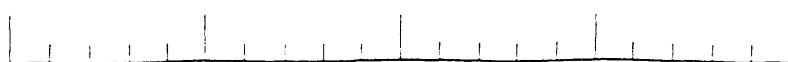
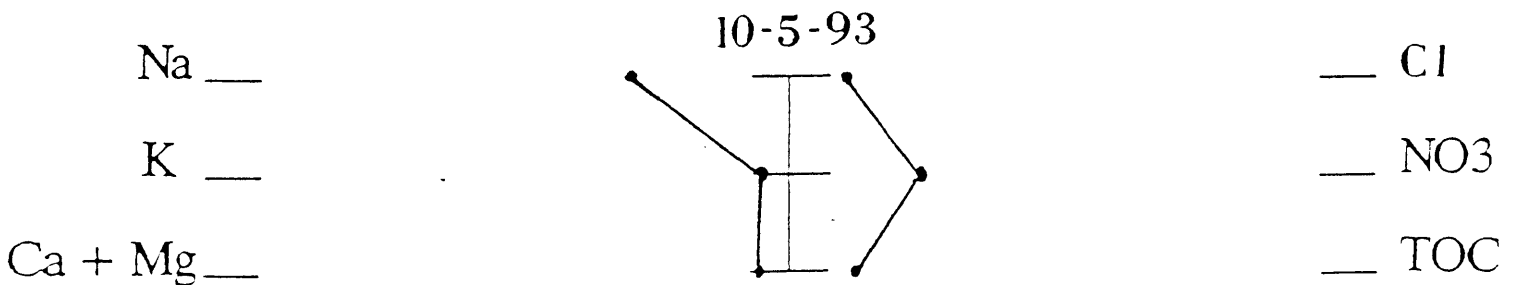
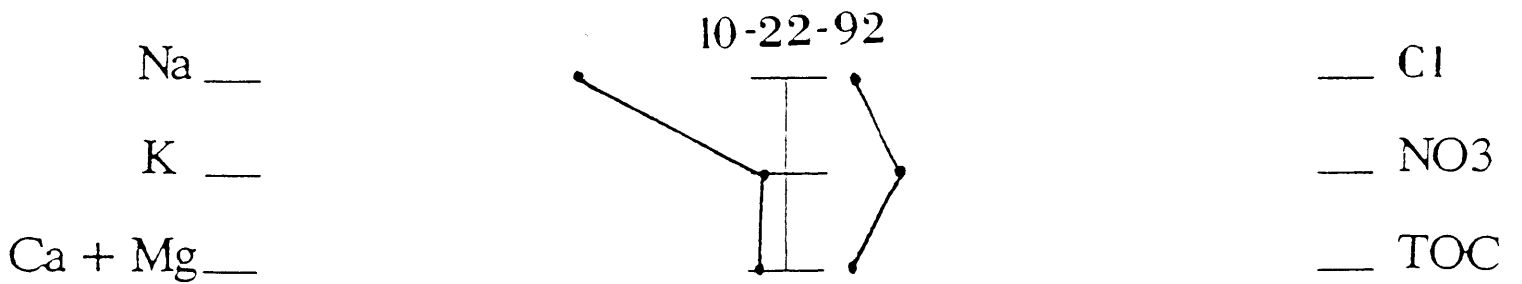
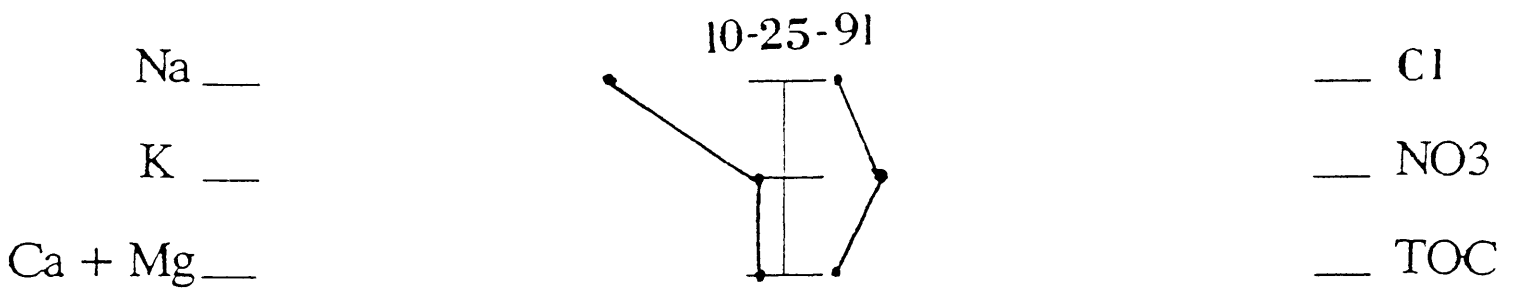
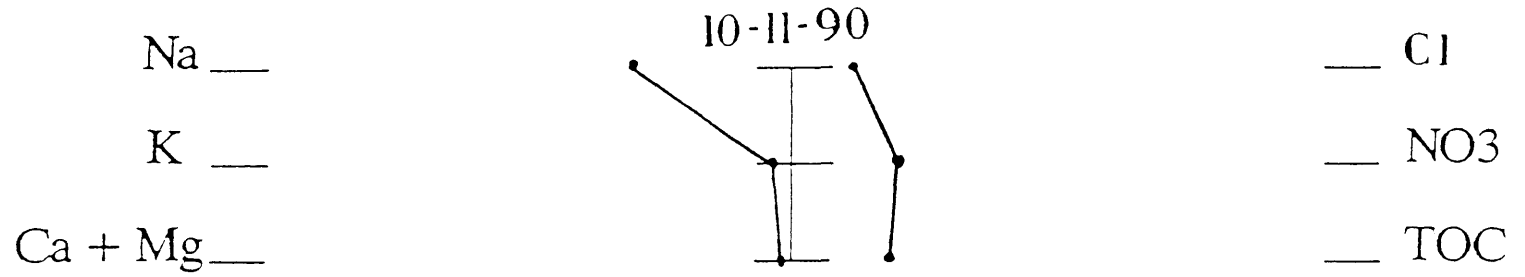
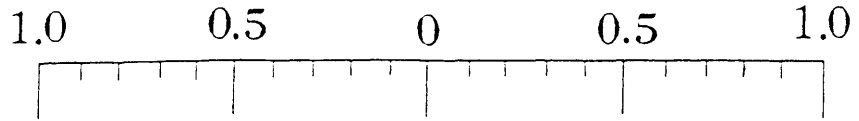
Na ___
K ___
Ca + Mg ___

___ Cl
___ NO3
___ TOC



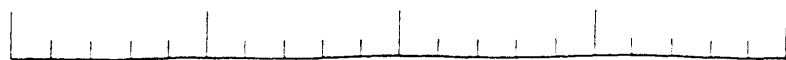
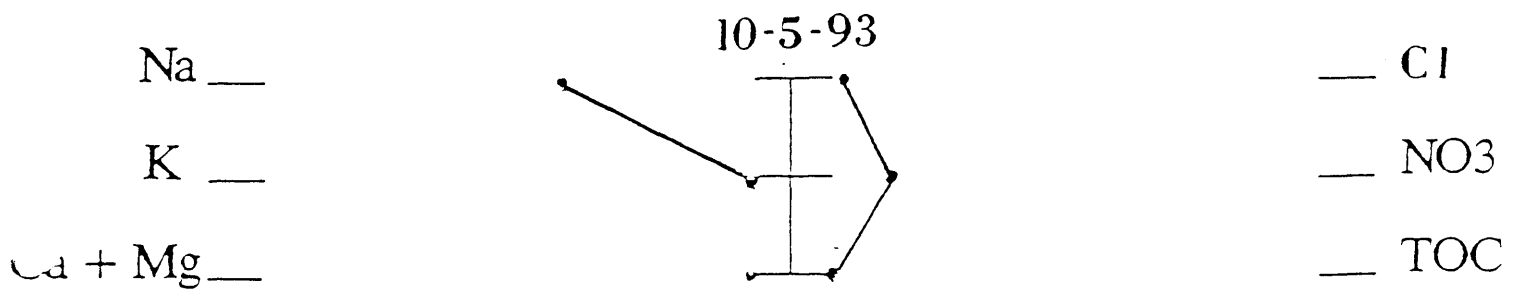
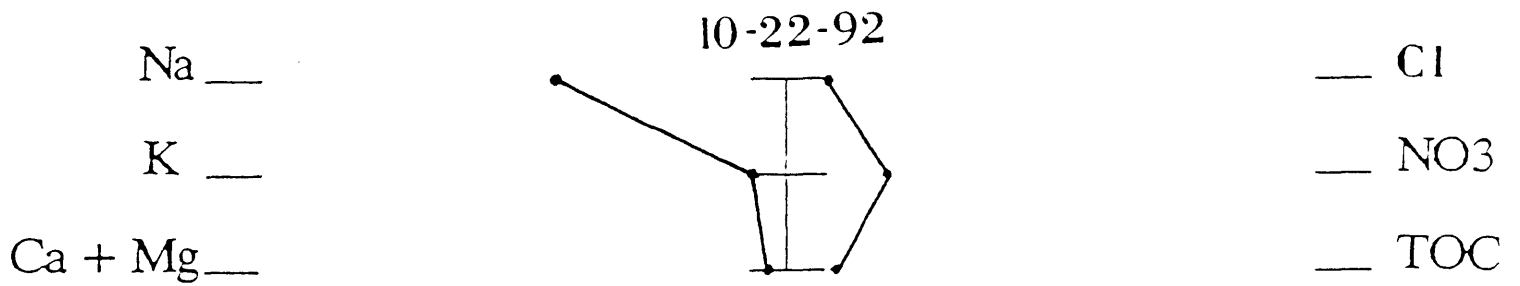
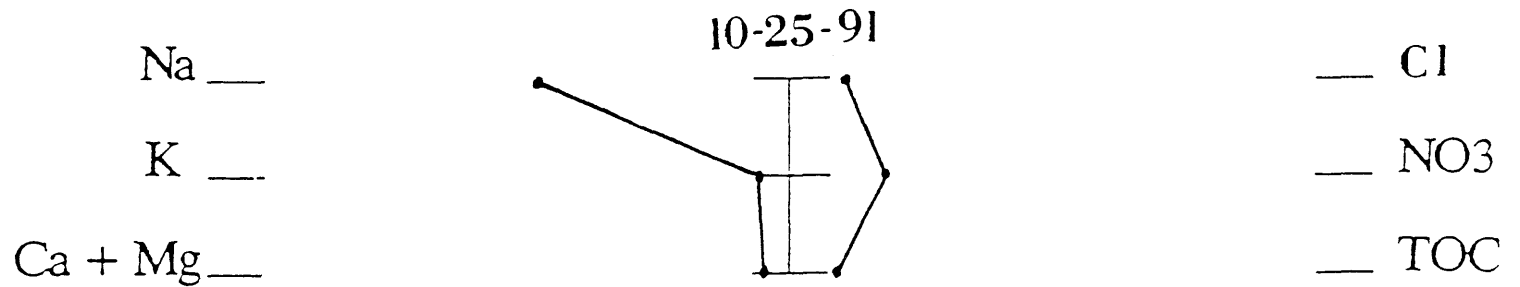
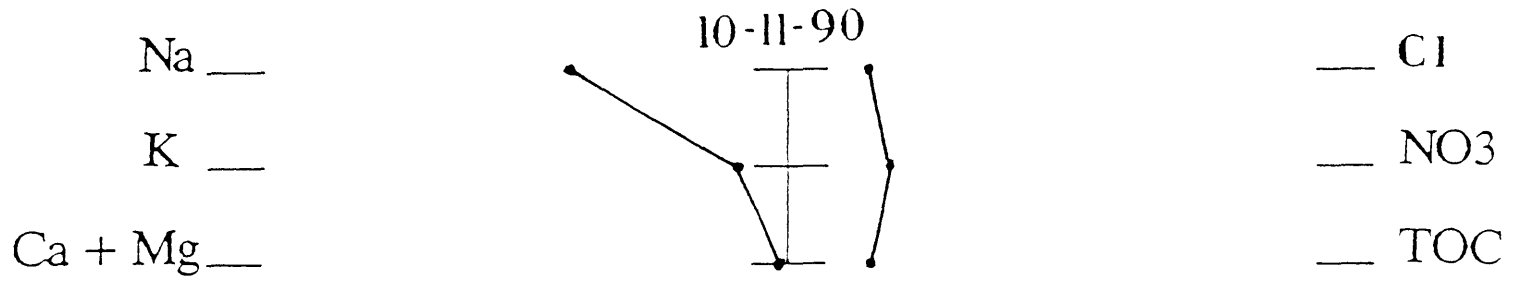
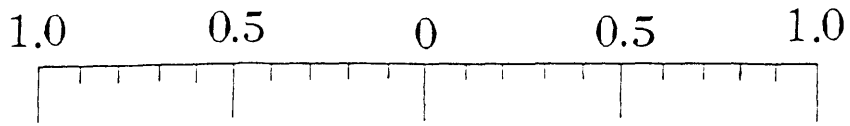
WELL 30.1

EPM



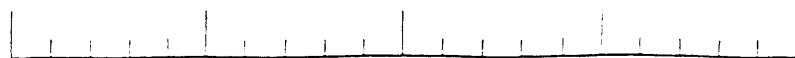
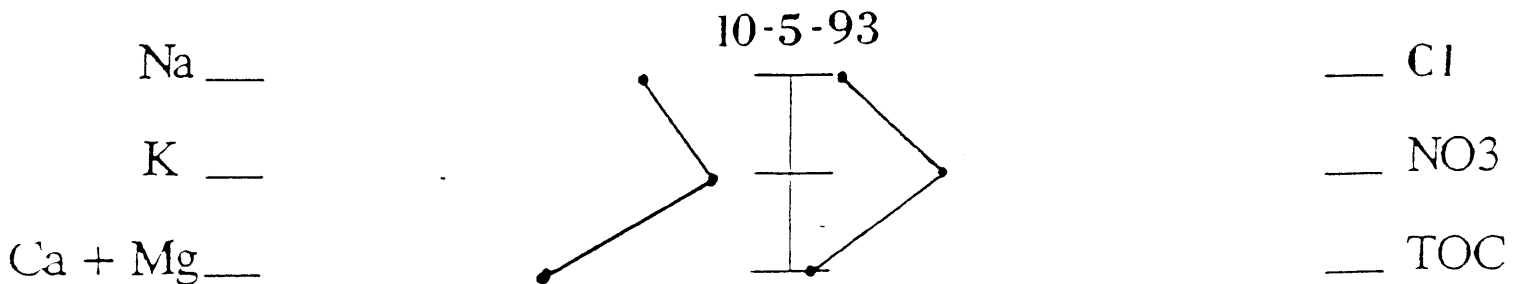
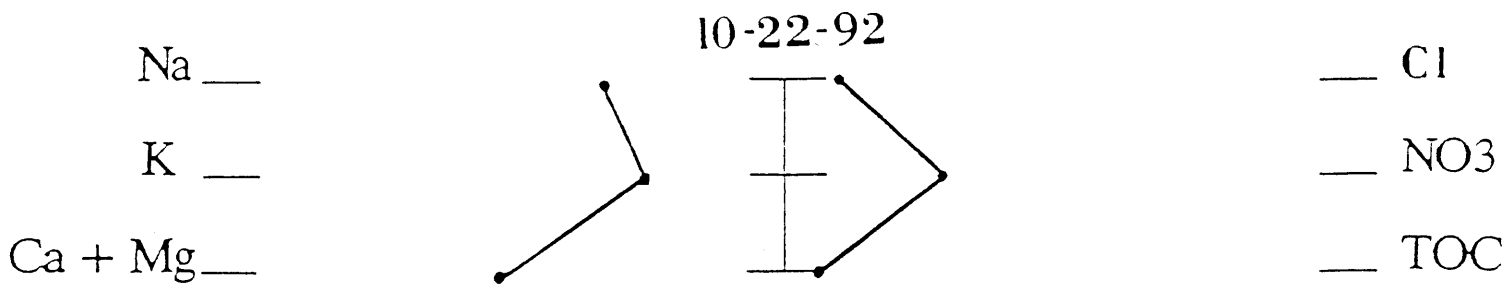
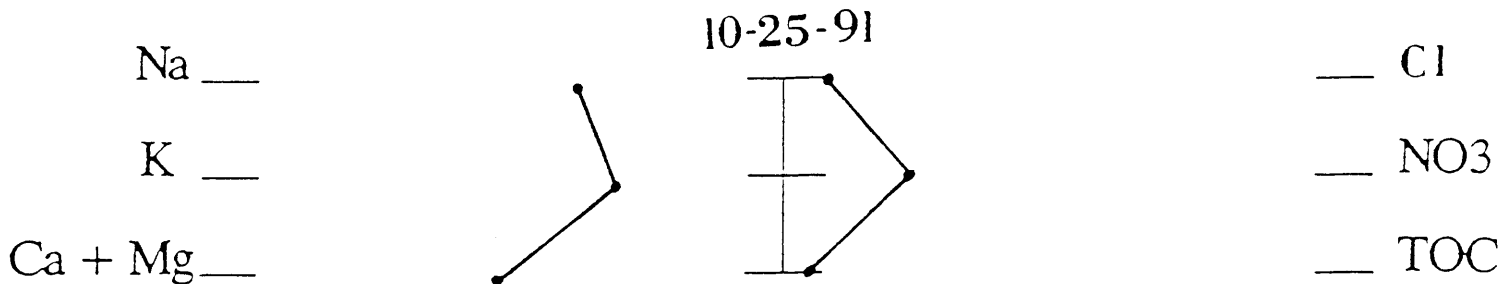
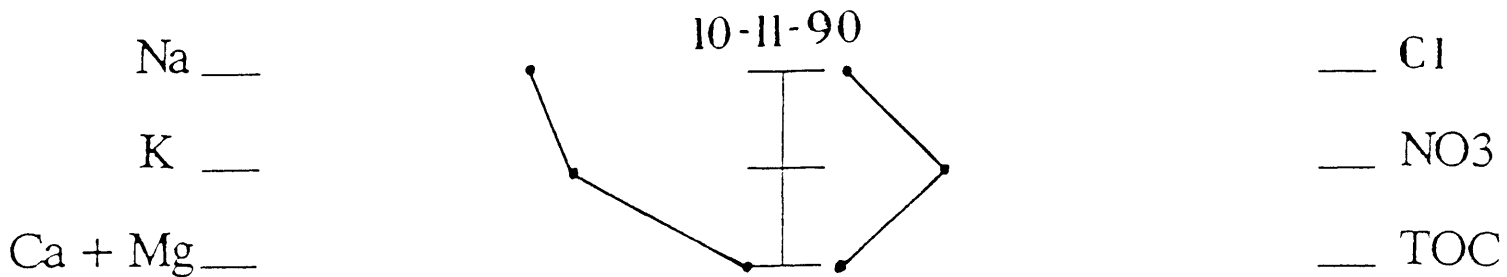
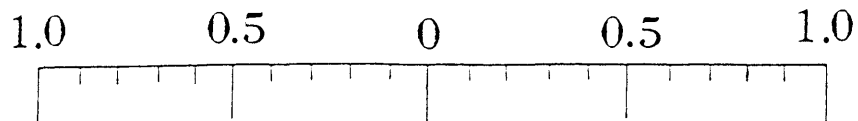
WELL 31

EPM



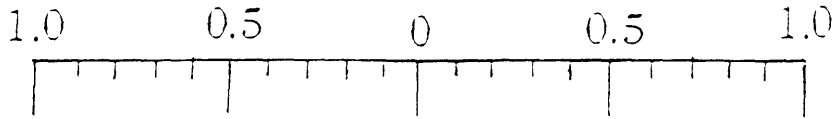
WELL 32

EPM

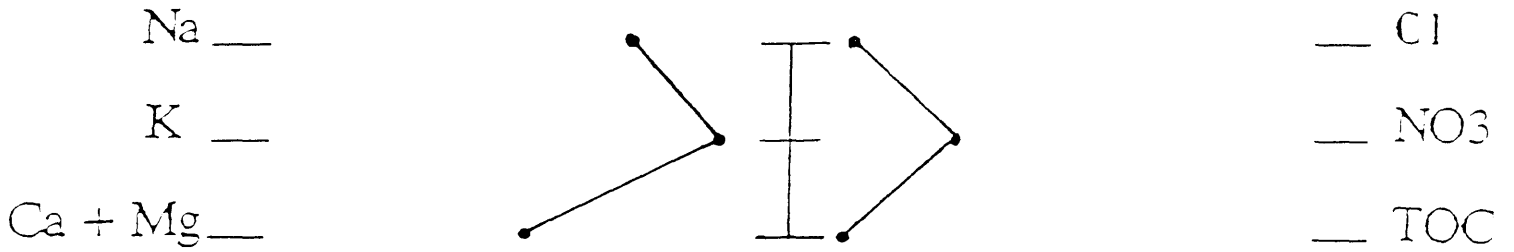


WELL 32

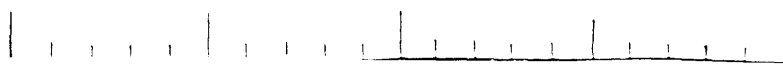
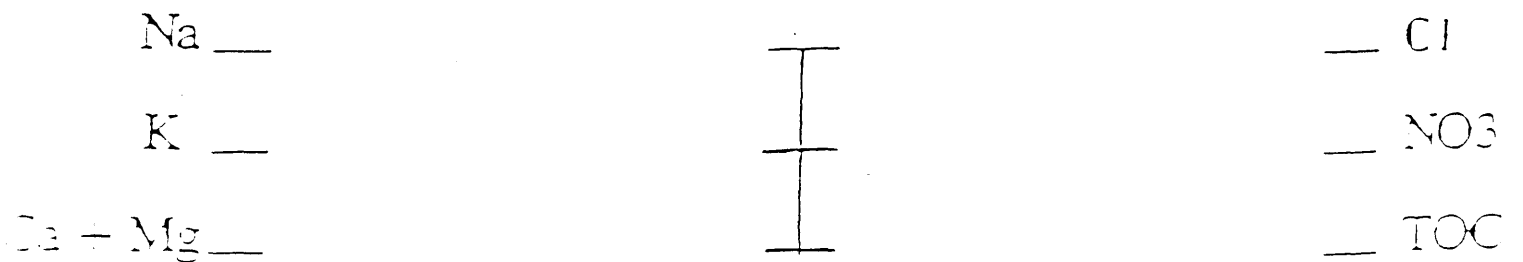
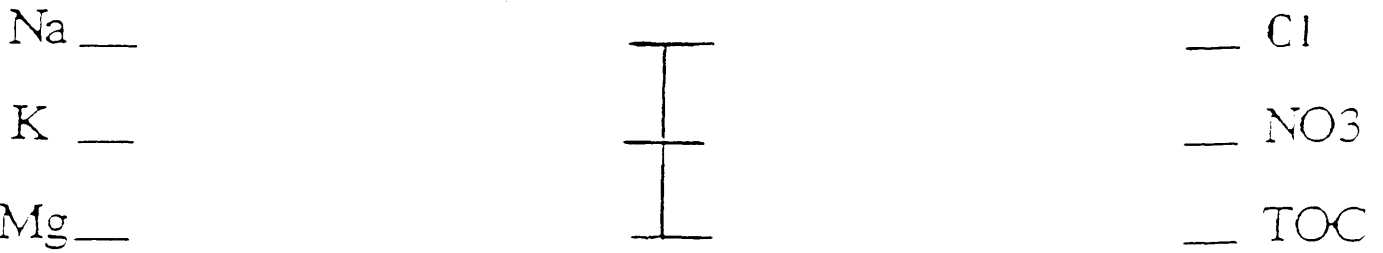
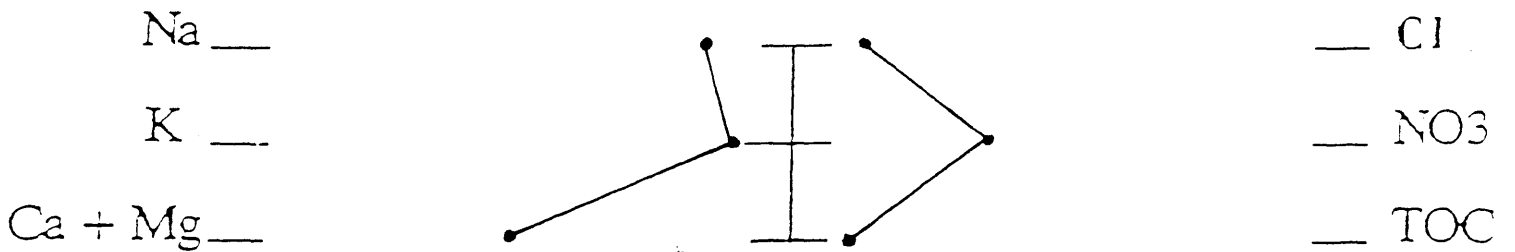
EPM



10/19/94

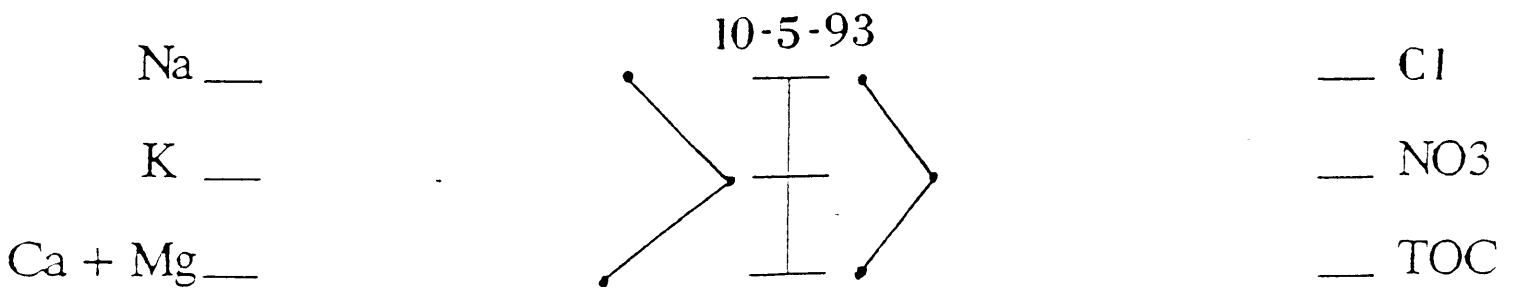
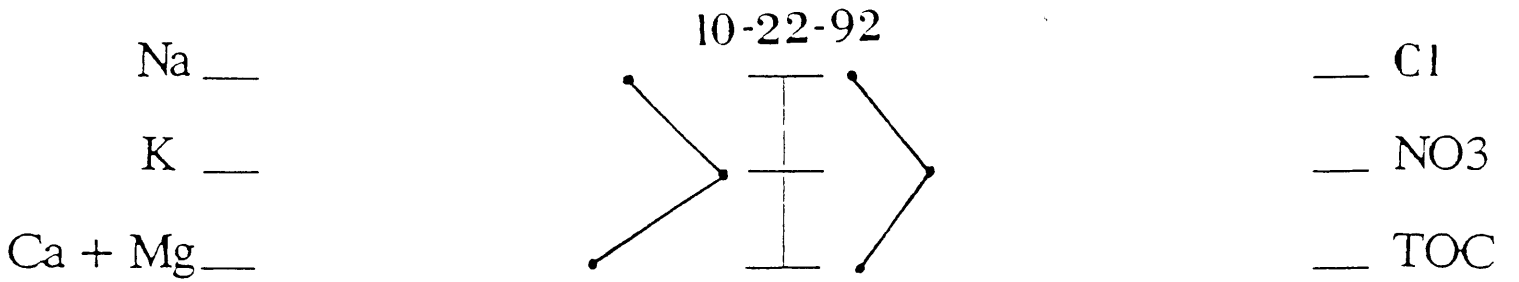
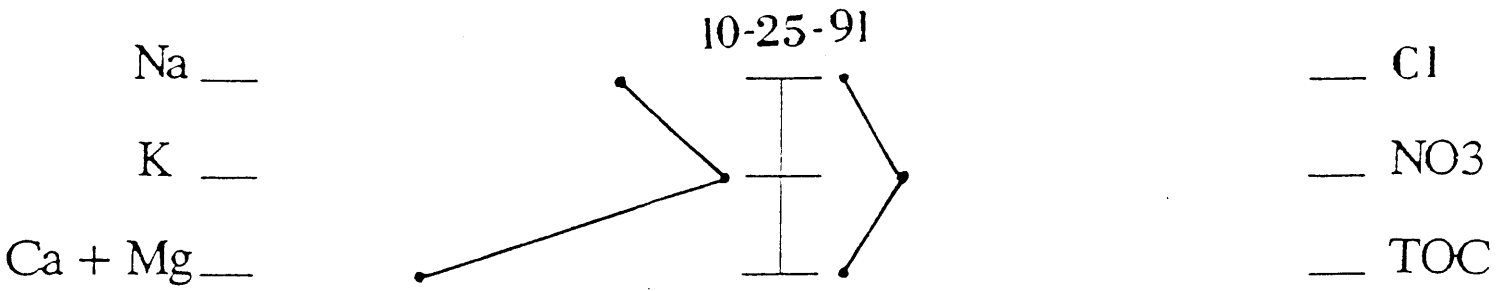
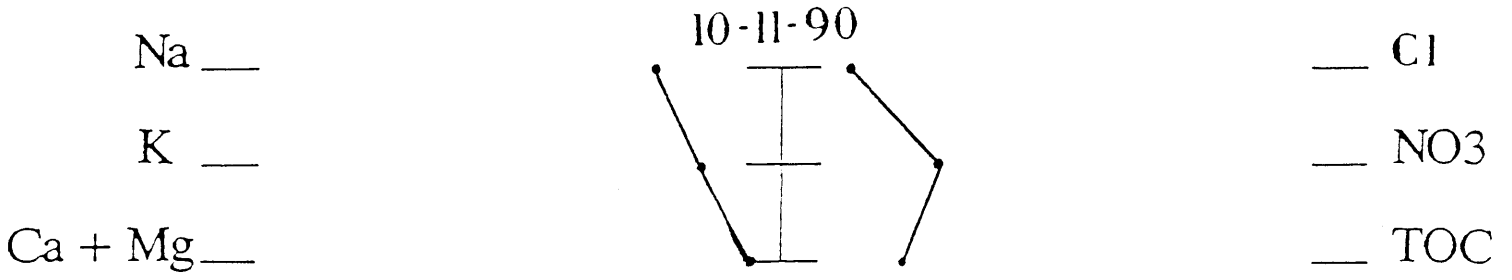
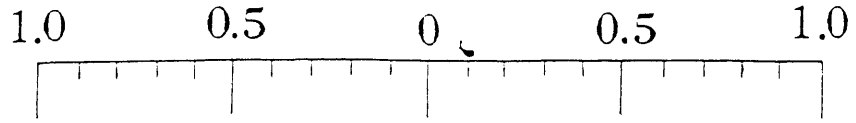


12/12/95



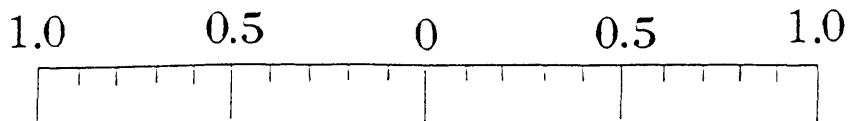
WELL 33

EPM

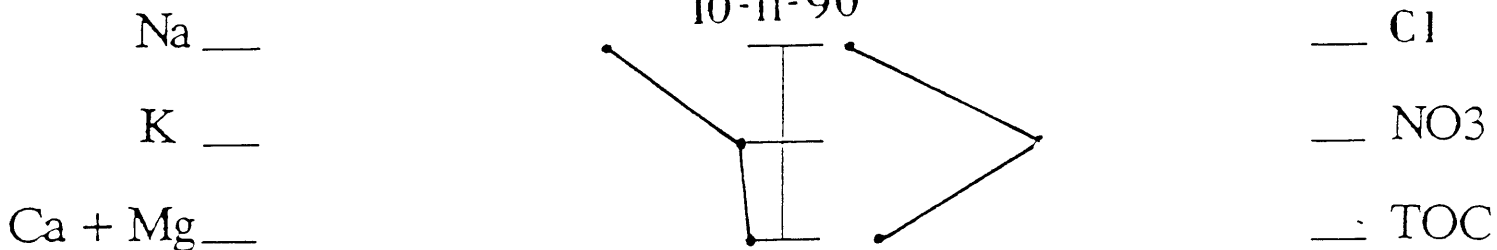


WELL 34

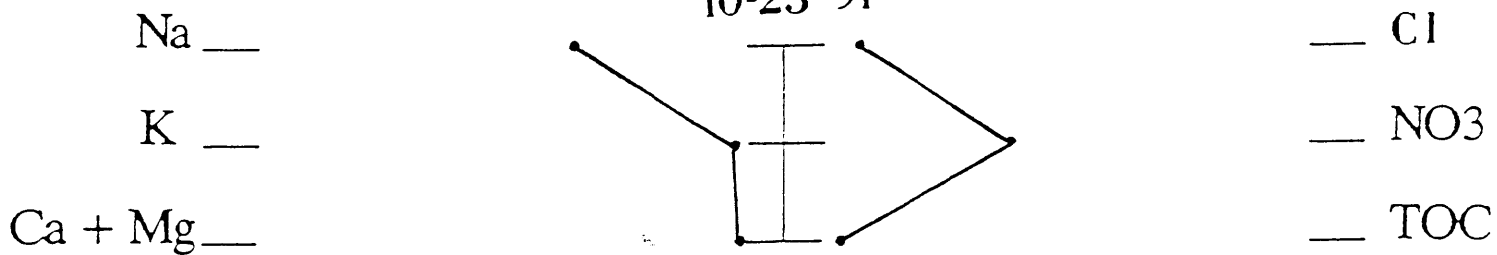
EPM



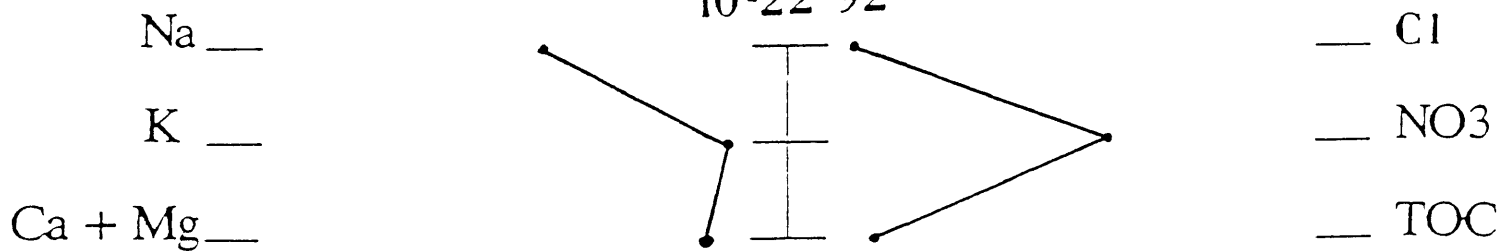
10-11-90



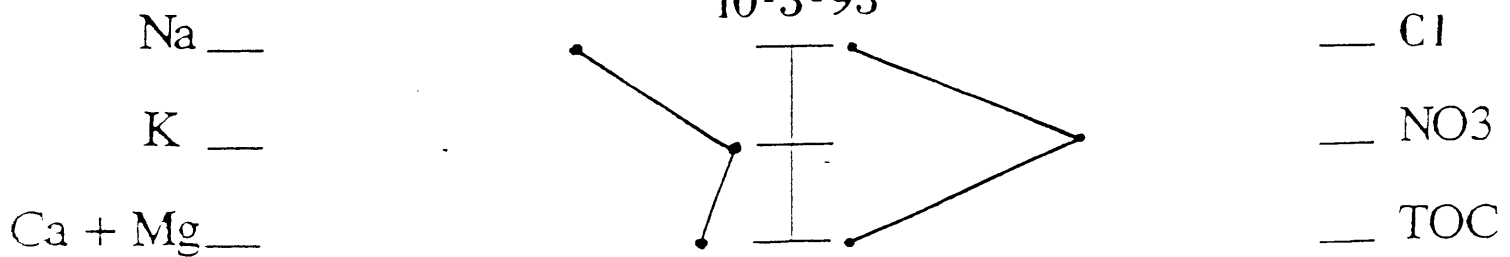
10-25-91



10-22-92

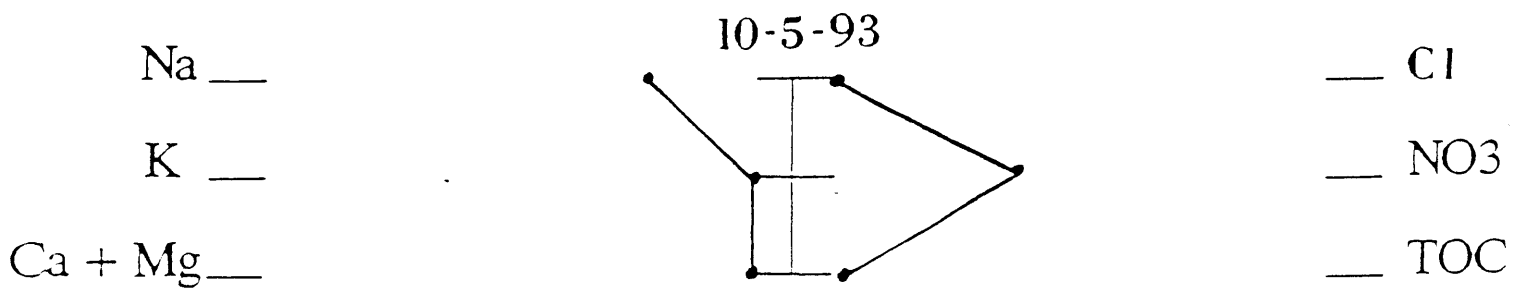
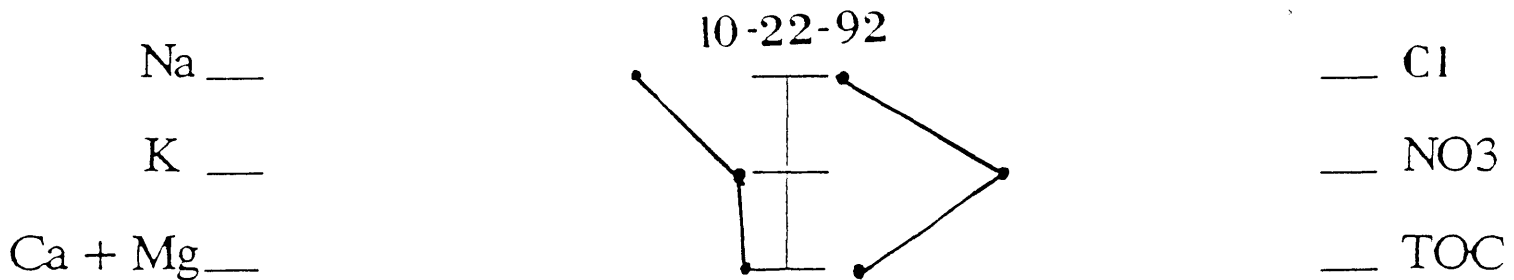
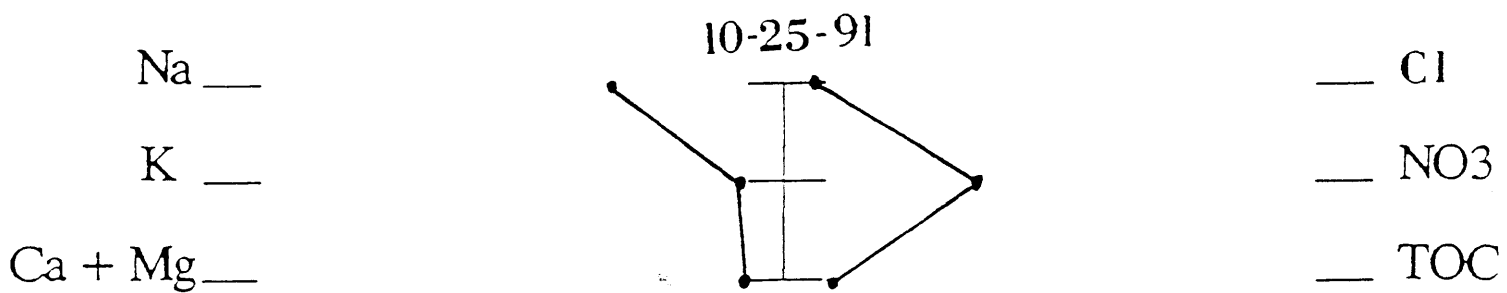
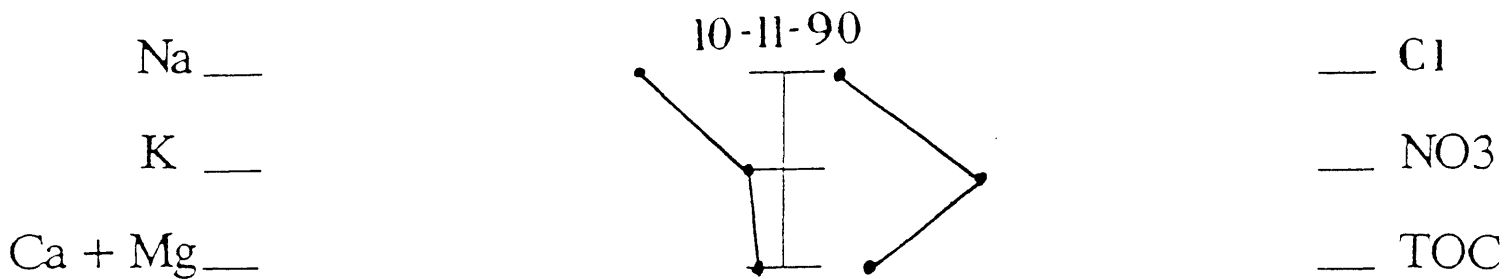
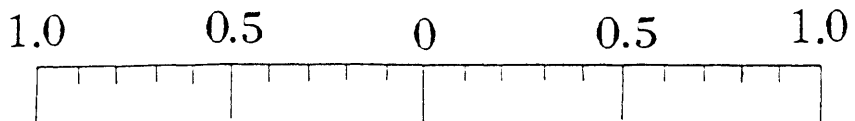


10-5-93



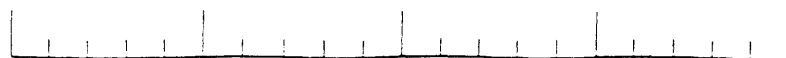
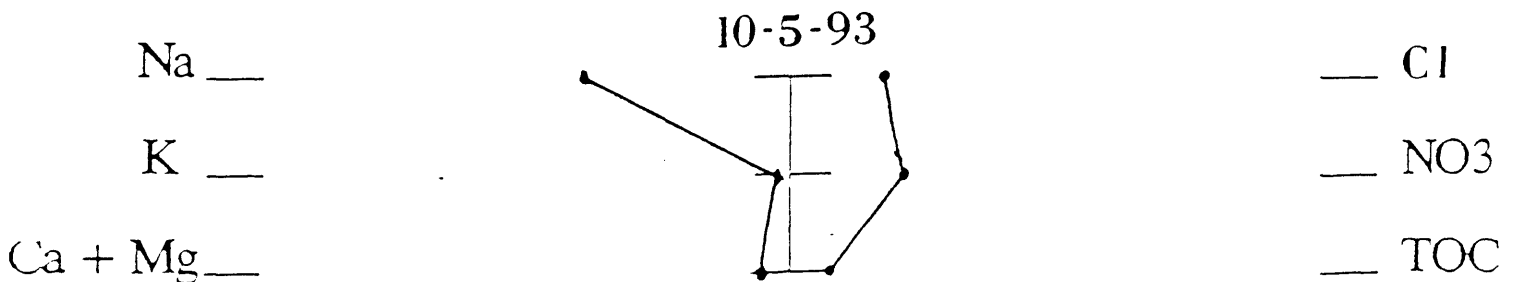
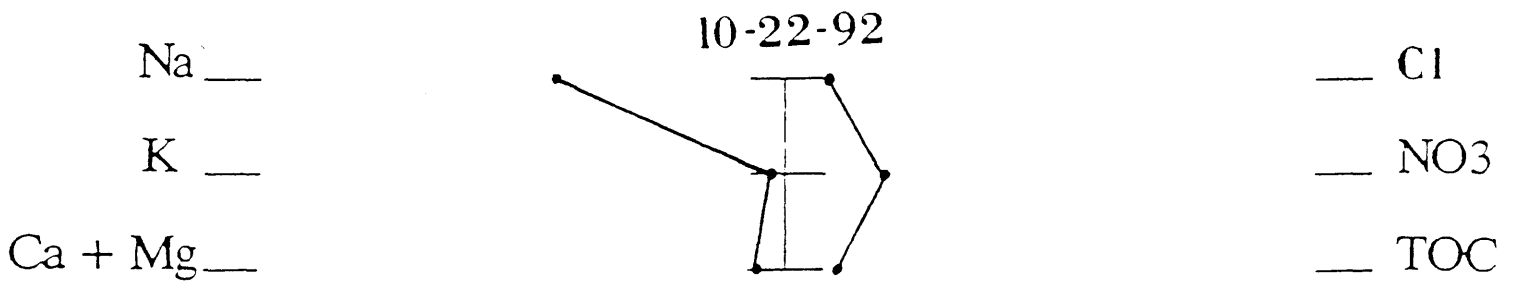
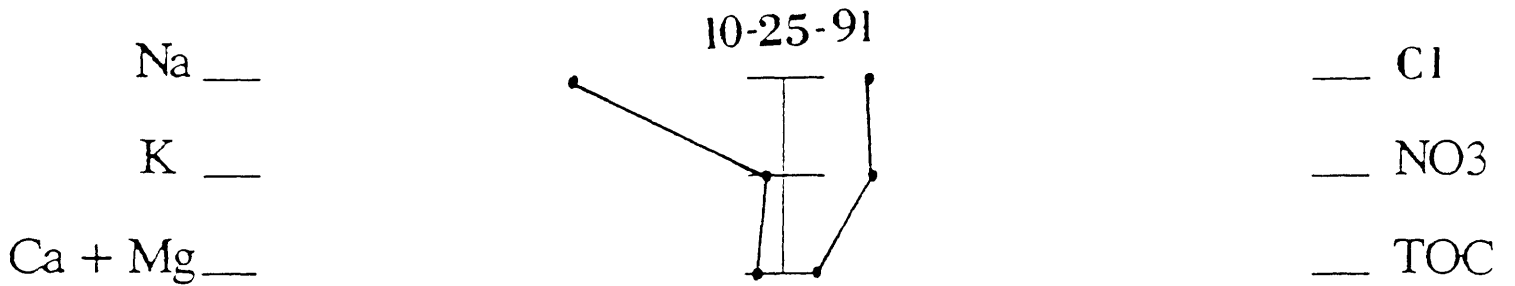
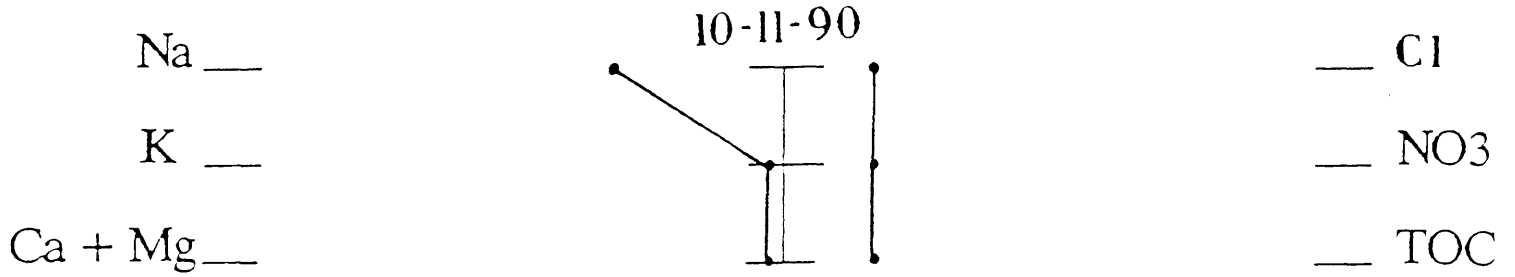
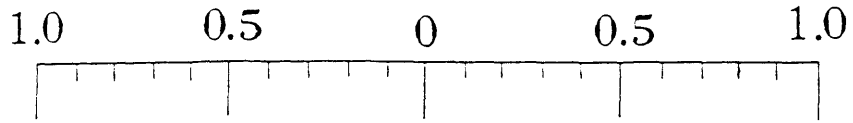
WELL 35

EPM



WELL 36

EPM



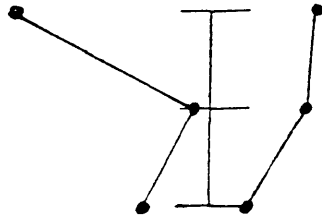
WELL 36

EPM



11/8/94

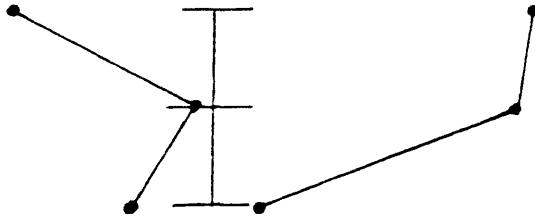
Na ___
K ___
Ca + Mg ___



___ Cl
___ NO3
___ TOC

12/12/95

Na ___
K ___
Ca + Mg ___



___ Cl
___ NO3
___ TOC

Na ___
K ___
Ca + Mg ___



___ Cl
___ NO3
___ TOC

Na ___
K ___
Ca + Mg ___

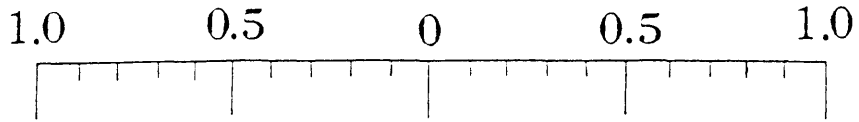


___ Cl
___ NO3
___ TOC

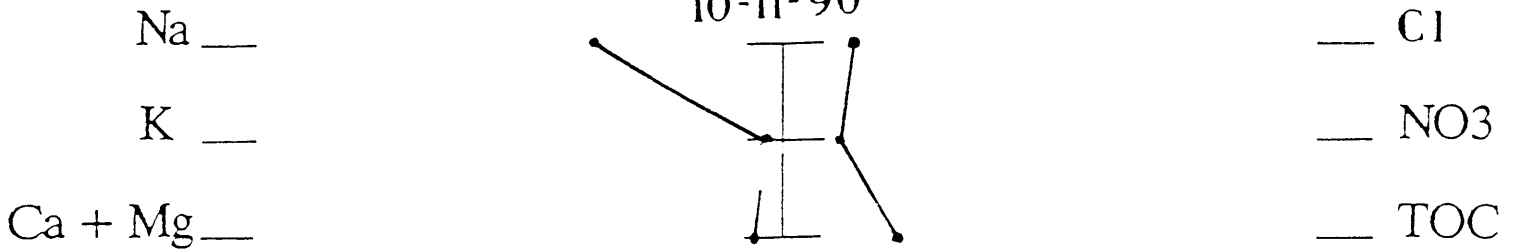


WELL 37

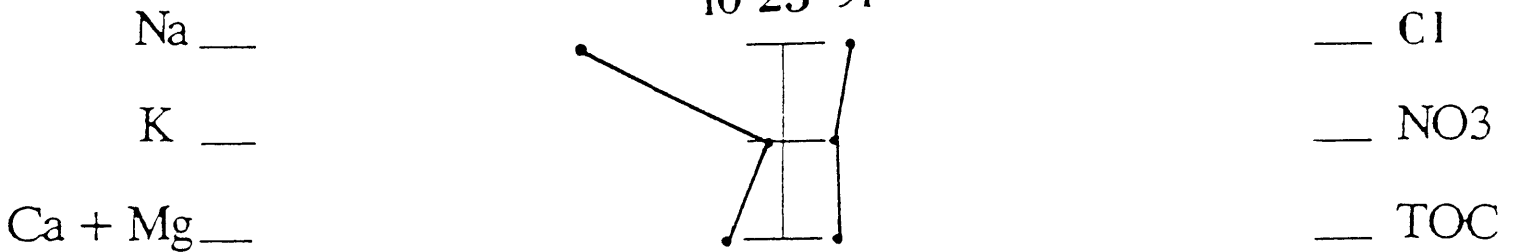
EPM



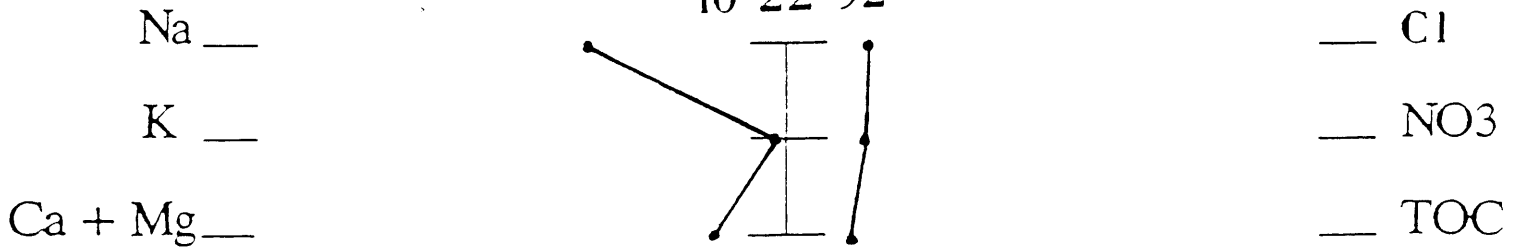
10-11-90



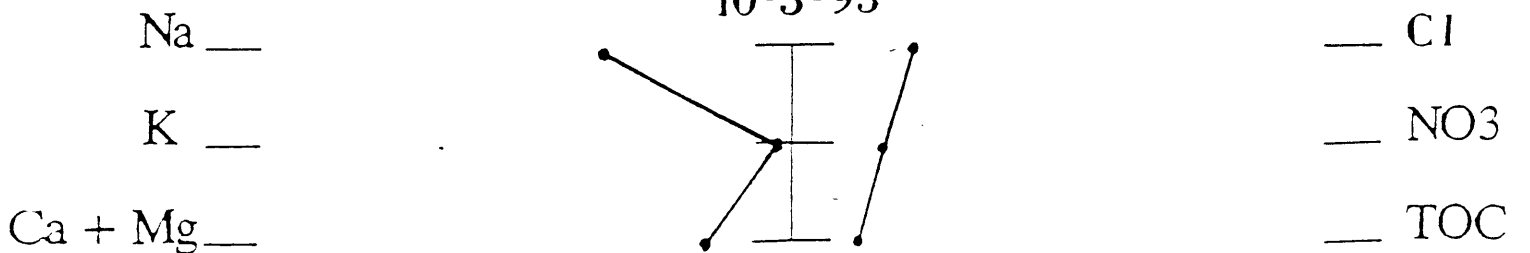
10-25-91



10-22-92

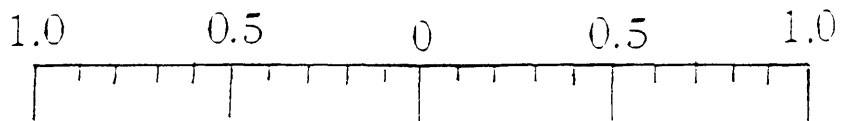


10-5-93



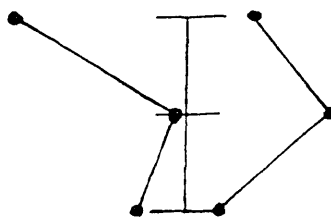
WELL 641

EPM



12/19/94

Na ___
K ___
Ca + Mg ___



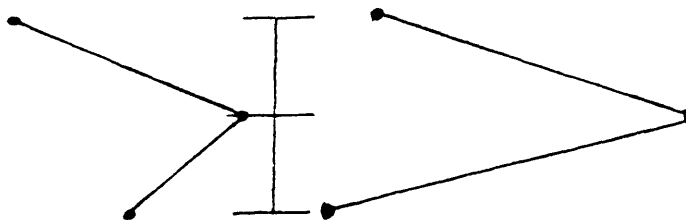
___ Cl

___ NO3

___ TOC

12/12/95

Na ___
K ___
Ca + Mg ___



___ Cl

___ NO3

___ TOC

Na ___
K ___
Ca + Mg ___



___ Cl

___ NO3

___ TOC

Na ___
K ___
Ca + Mg ___



___ Cl

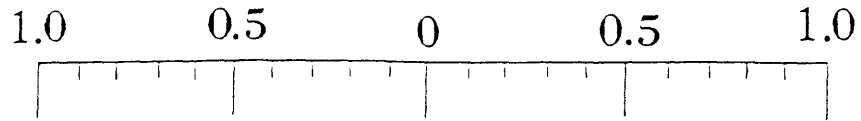
___ NO3

___ TOC

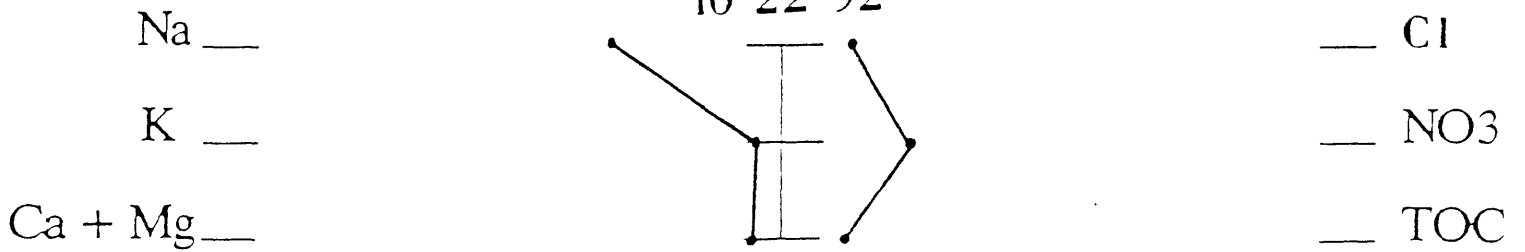


WELL 64I

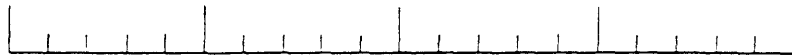
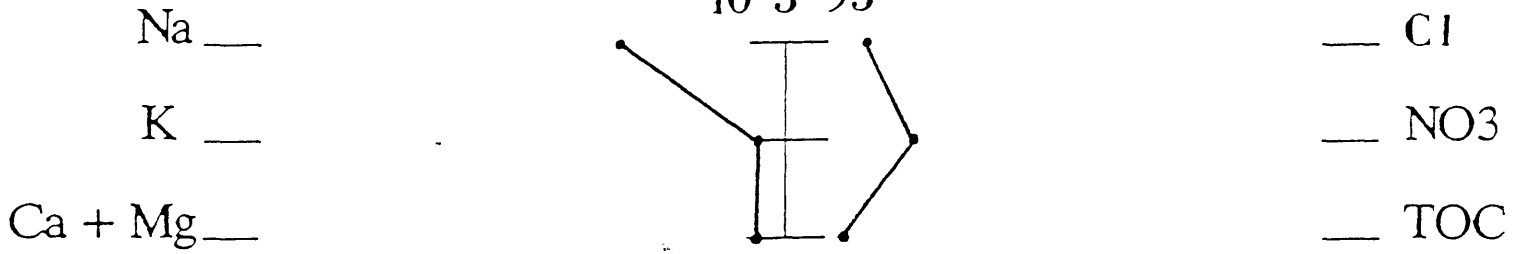
EPM



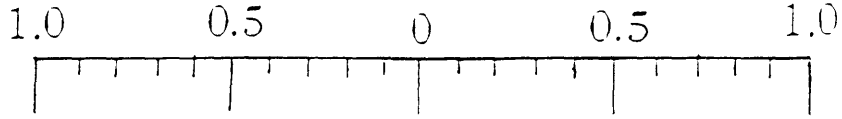
10-22-92



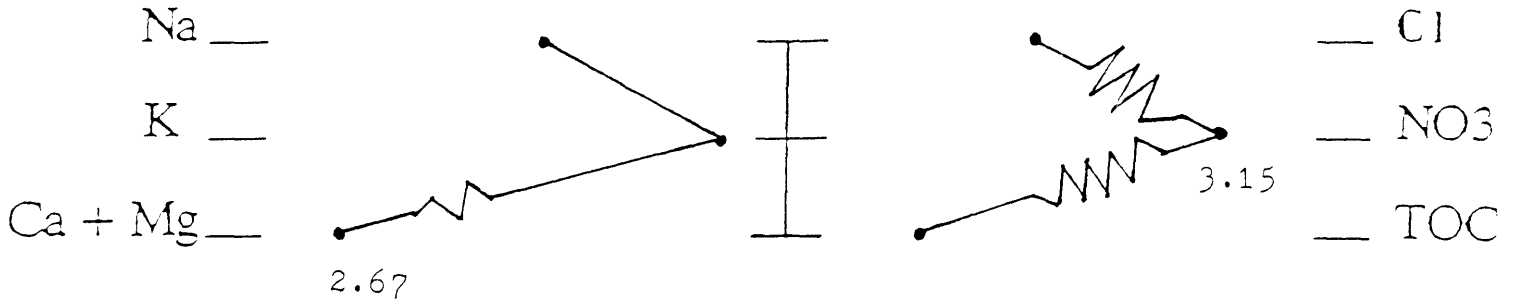
10-5-93



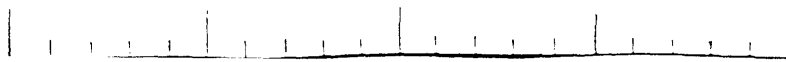
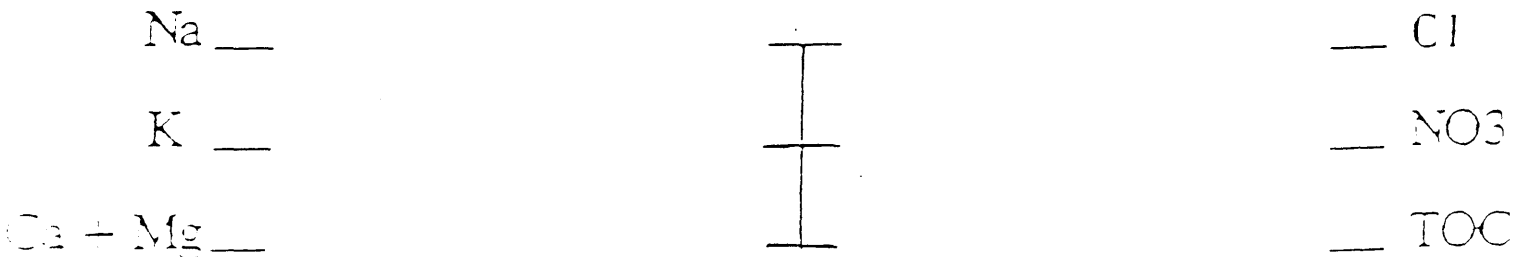
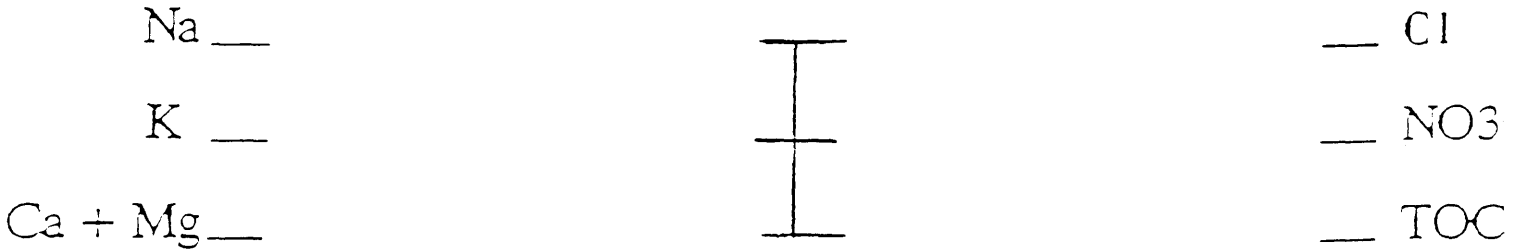
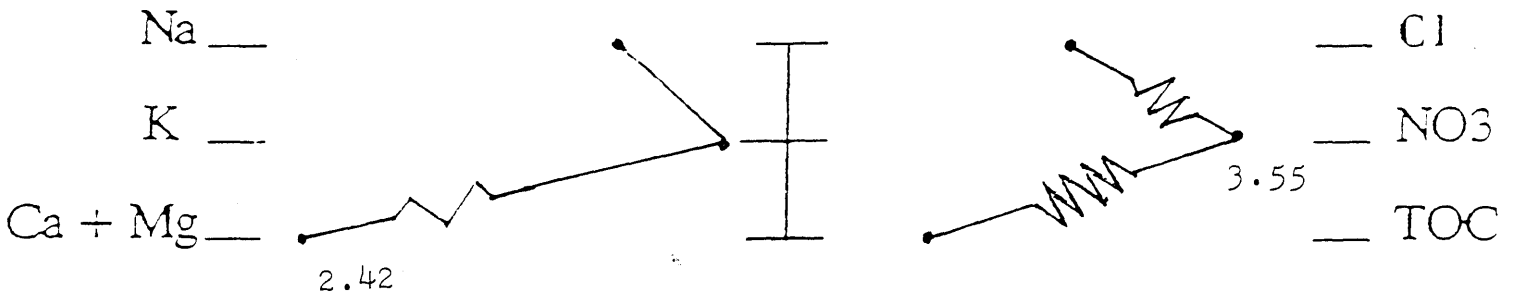
WELL 642
EPM



10/19/94

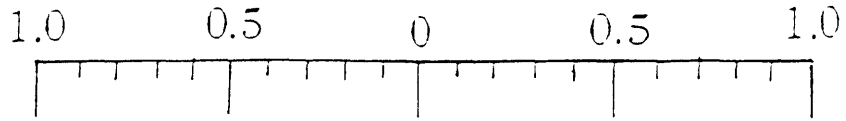


12/12/95



WELL 623

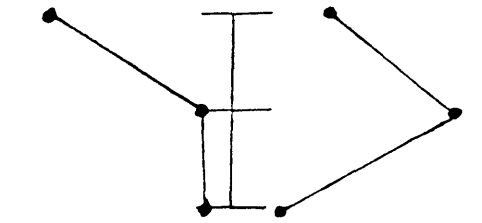
EPM



3/21/95

Na ___
K ___
Ca + Mg ___

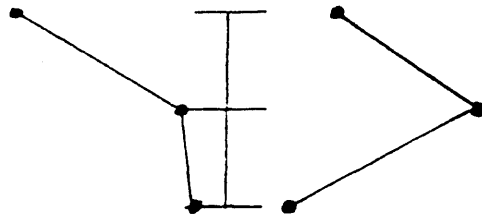
___ Cl
___ NO3
___ TOC



12/12/95

Na ___
K ___
Ca + Mg ___

___ Cl
___ NO3
___ TOC



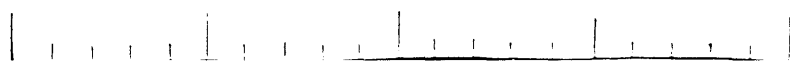
Na ___
K ___
Ca + Mg ___

___ Cl
___ NO3
___ TOC



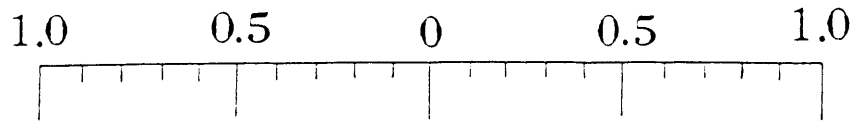
Na ___
K ___
Ca + Mg ___

___ Cl
___ NO3
___ TOC

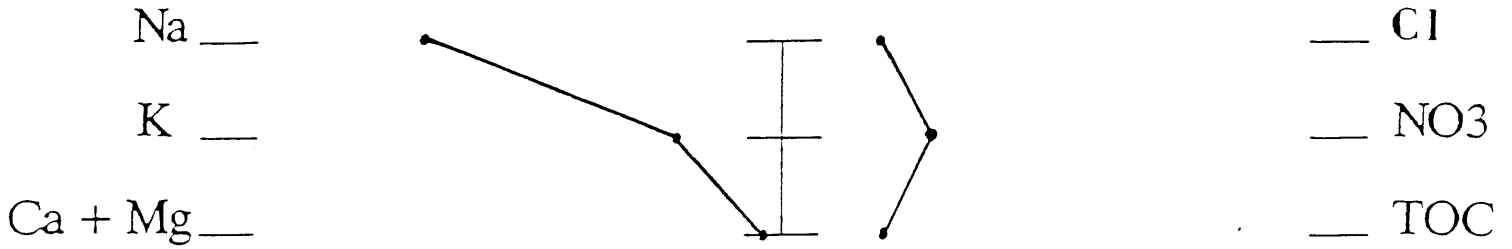


WELL 28A

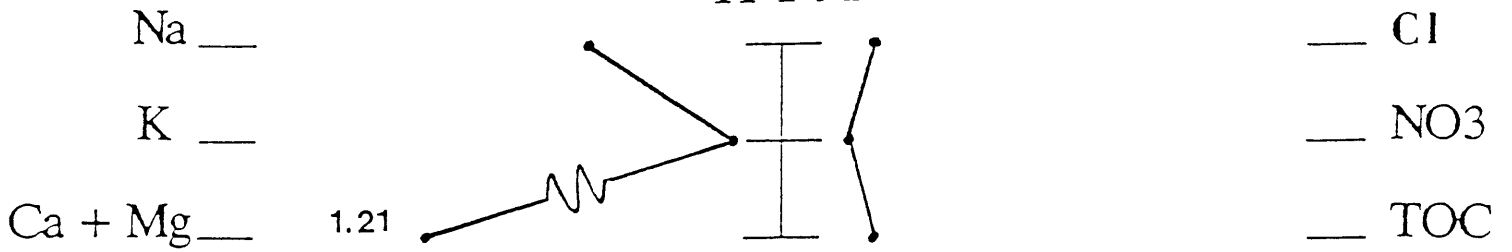
EPM



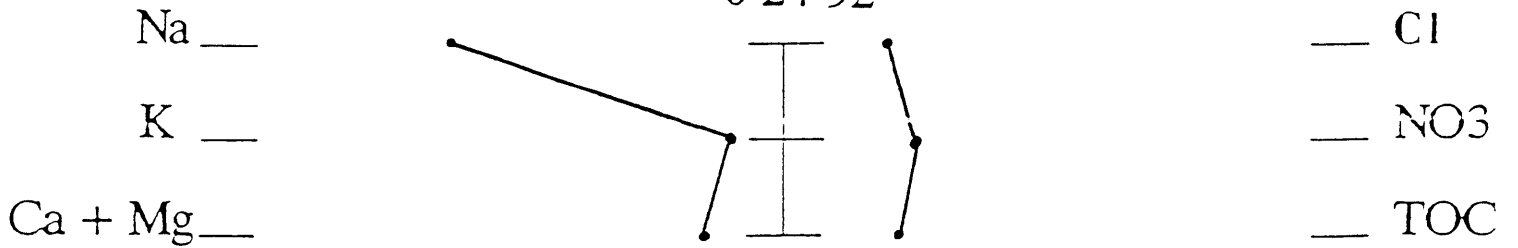
10-16-90



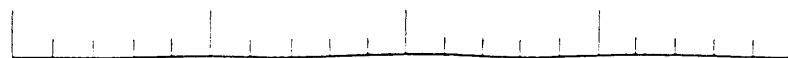
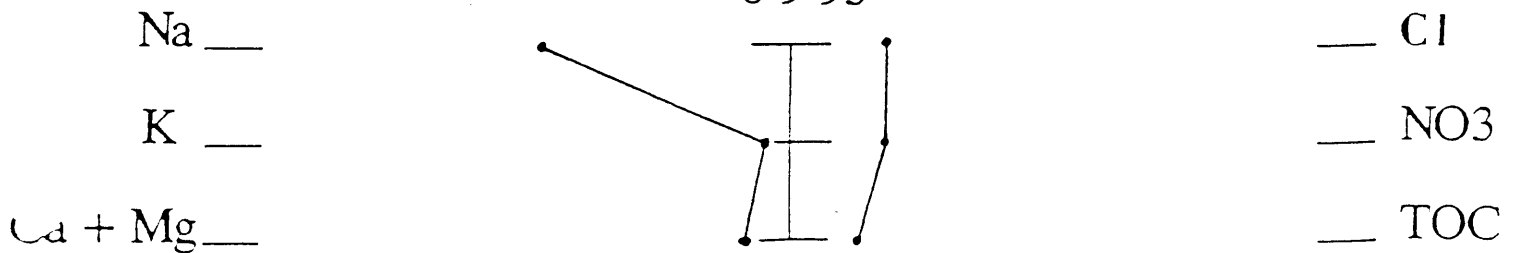
11-1-91



6-24-92

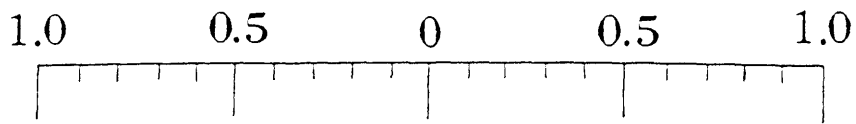


8-9-93

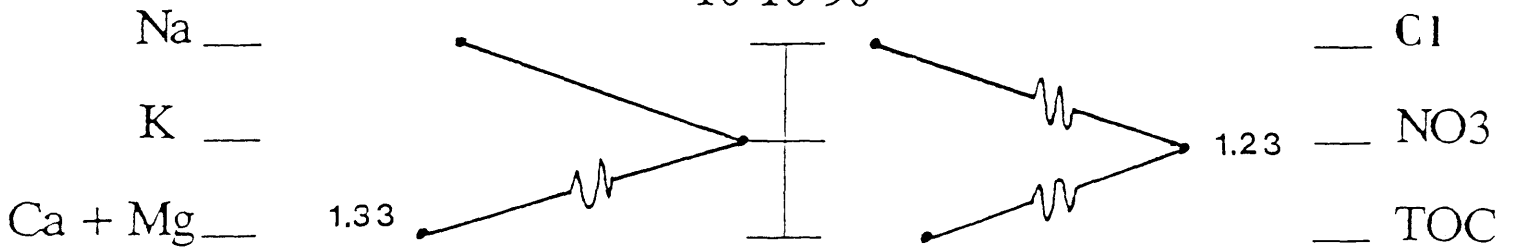


WELL 28B

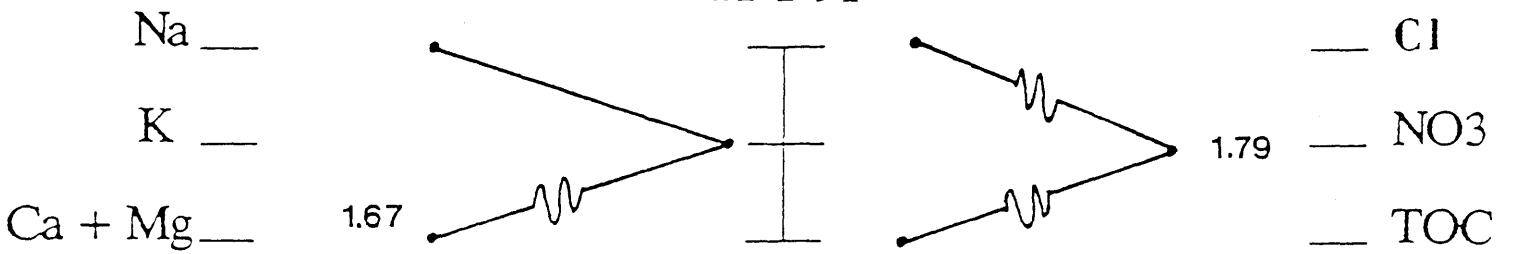
EPM



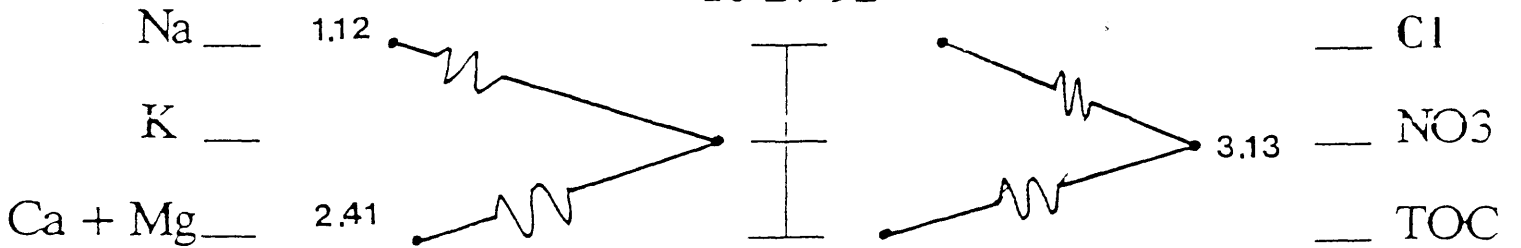
10-16-90



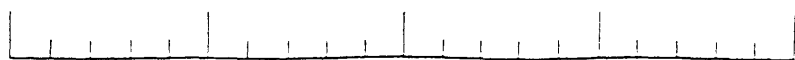
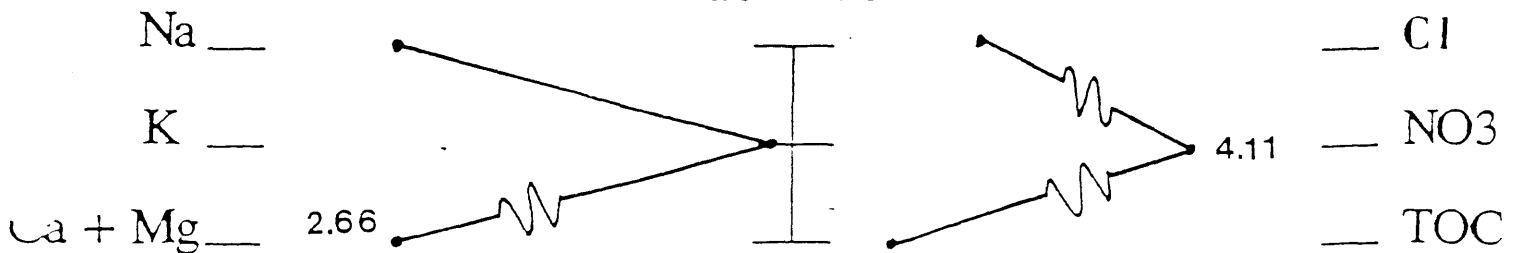
11-1-91



10-27-92

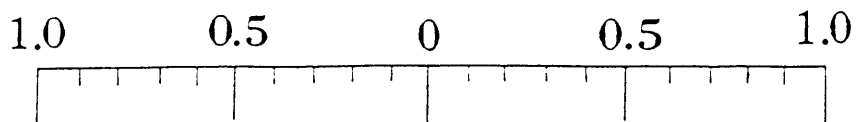


10-27-93

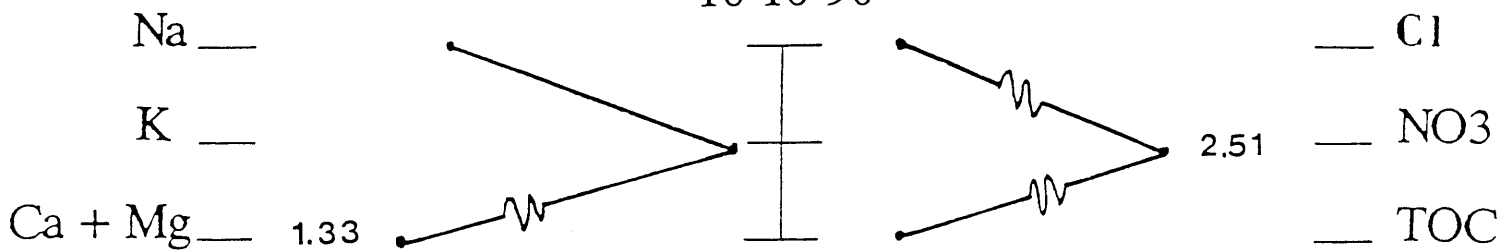


WELL 28C

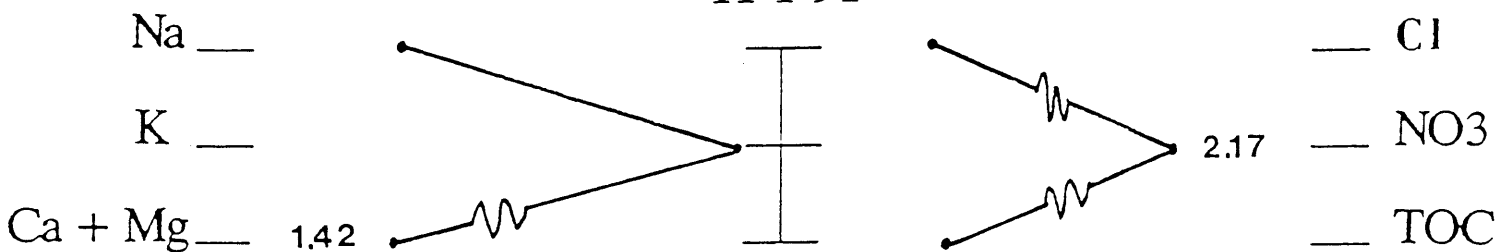
EPM



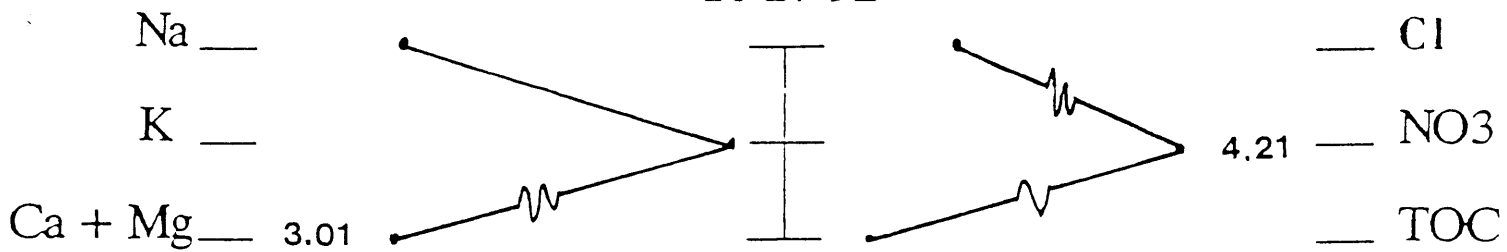
10-16-90



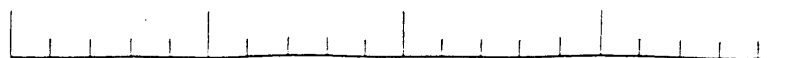
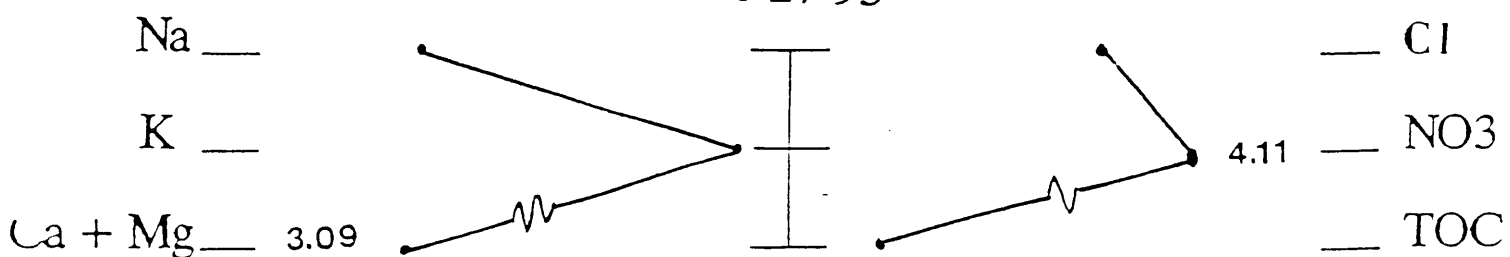
11-1-91



10-27-92

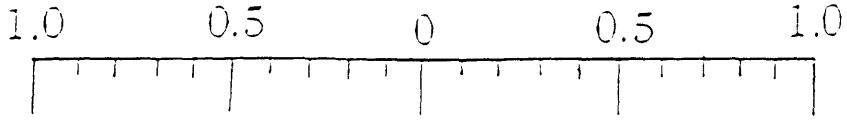


10-27-93



WELL 28C

EPM



10/25/94

Na 1.18

K

Ca + Mg 4.37

Cl

NO3

4.62

TOC

12/22/94

Na

K

Ca + Mg 4.81

Cl

NO3

6.12

TOC

Na

K

Ca + Mg

Cl

NO3

TOC

Na

K

Ca + Mg

Cl

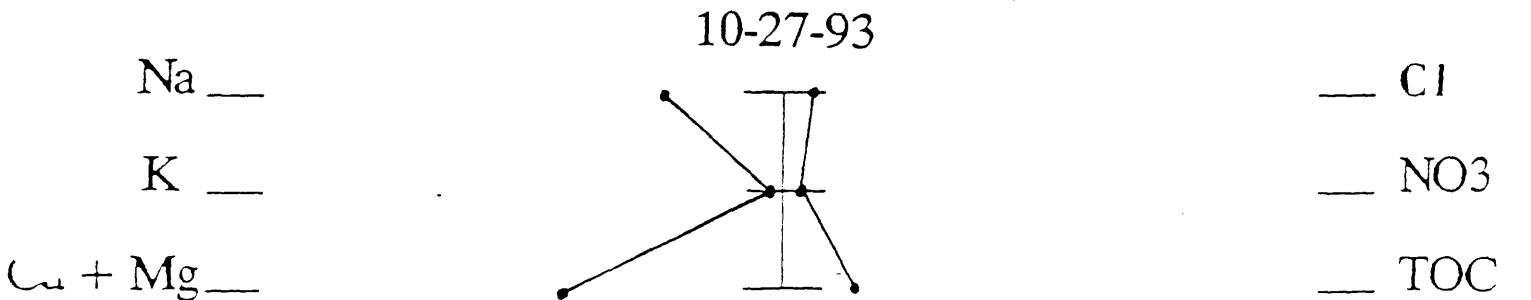
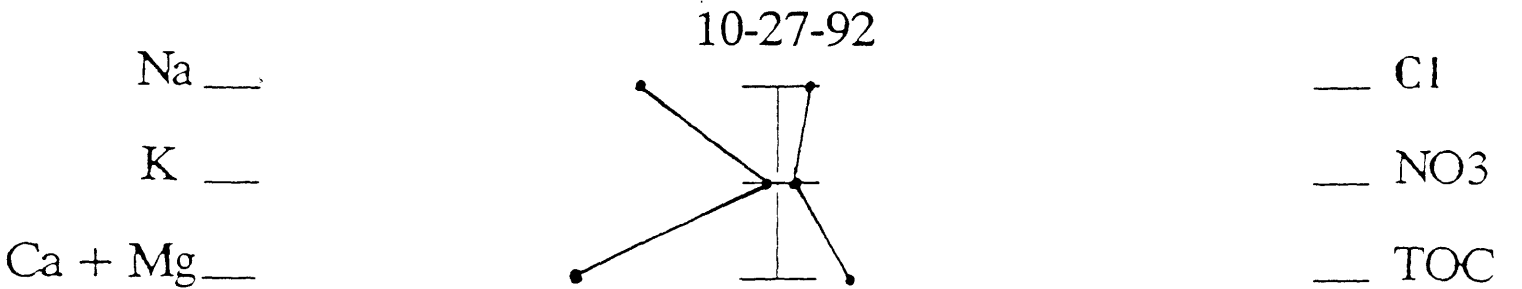
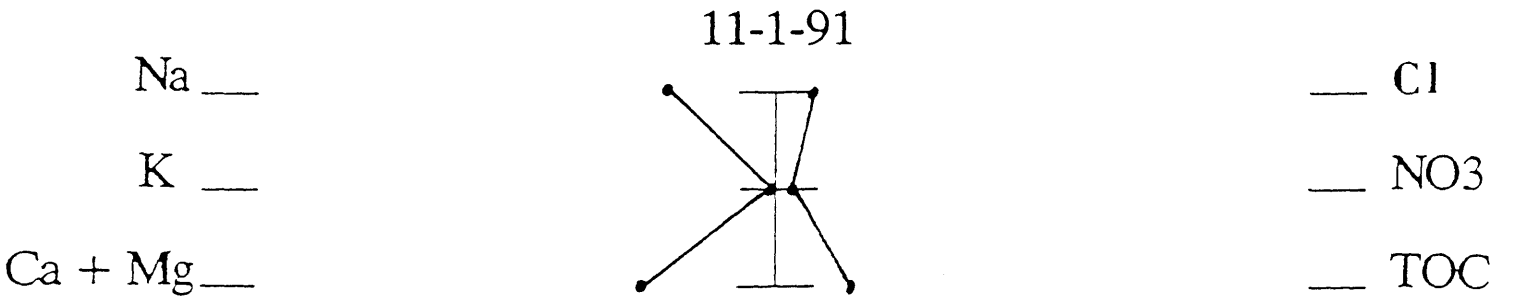
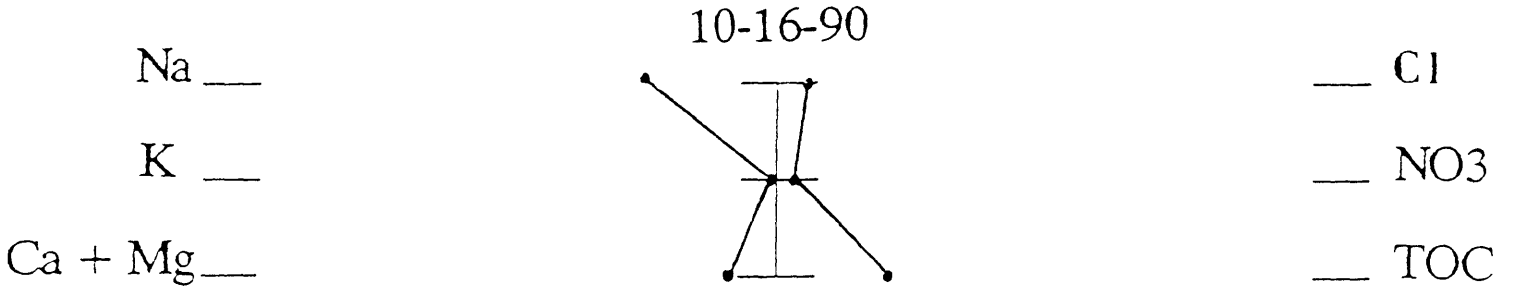
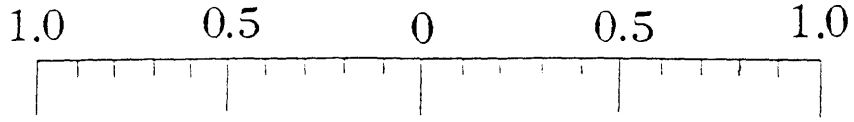
NO3

TOC



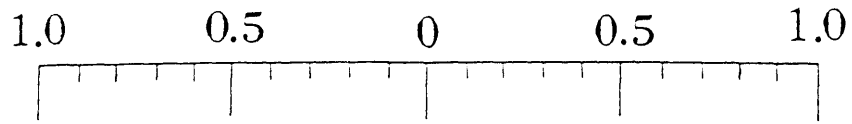
WELL 38

EPM

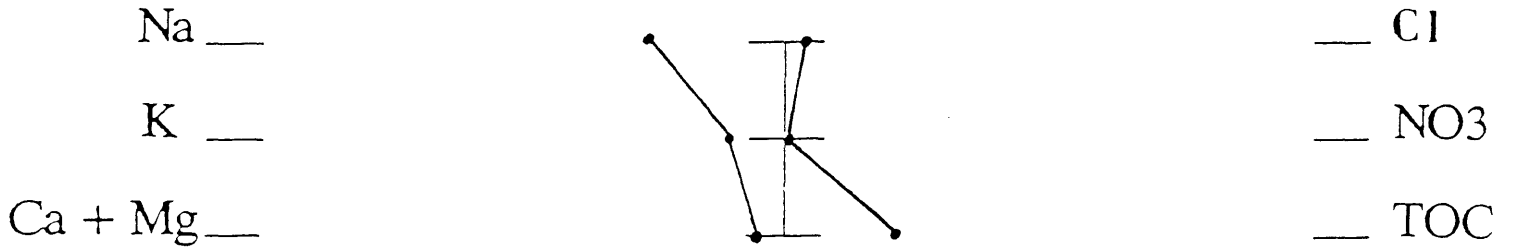


WELL 39

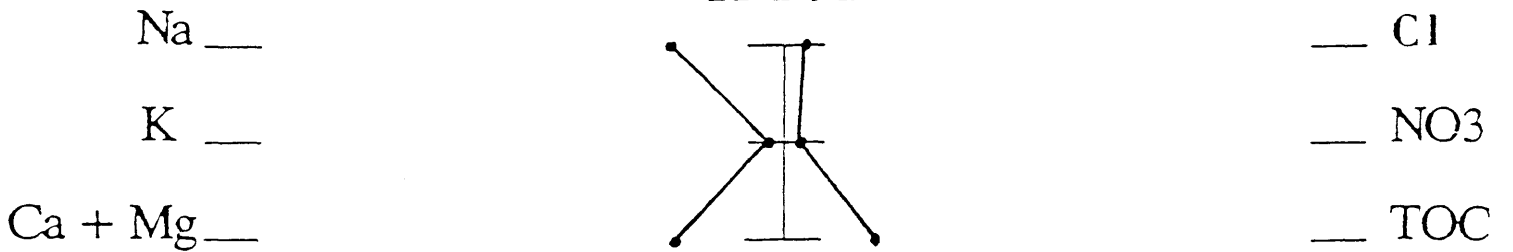
EPM



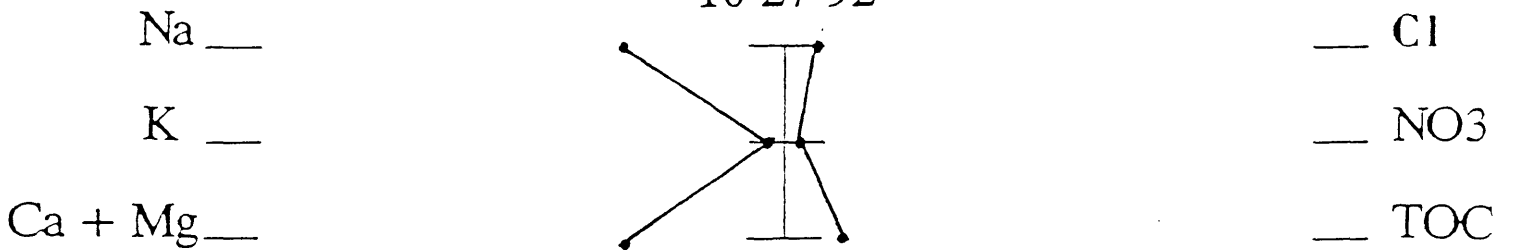
10-16-90



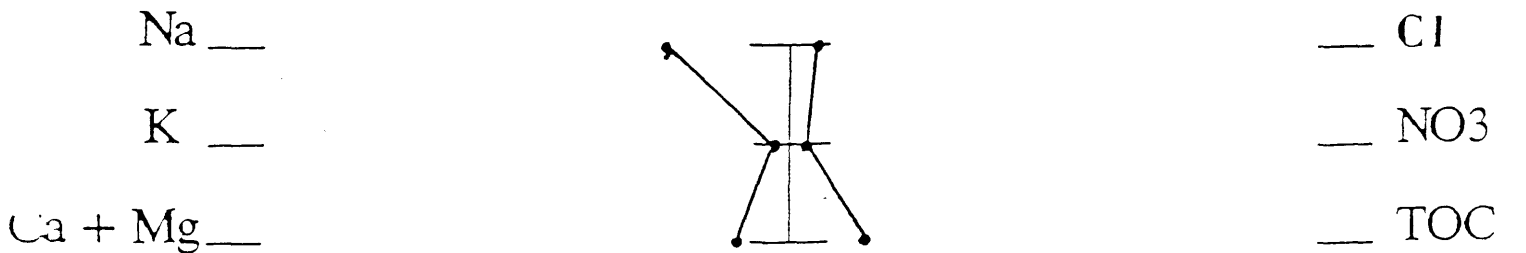
11-1-91



10-27-92

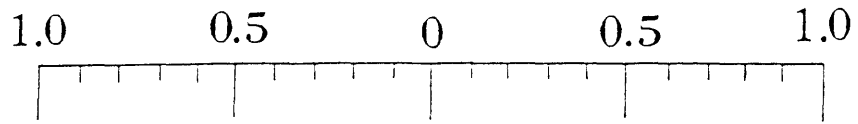


10-27-93

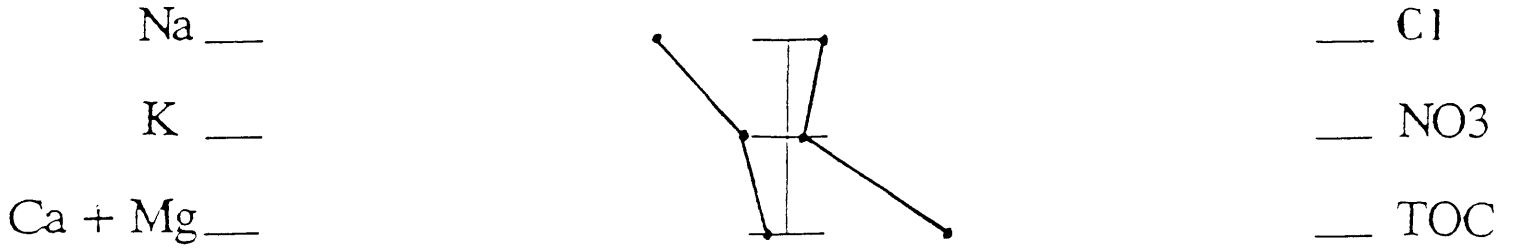


WELL 40

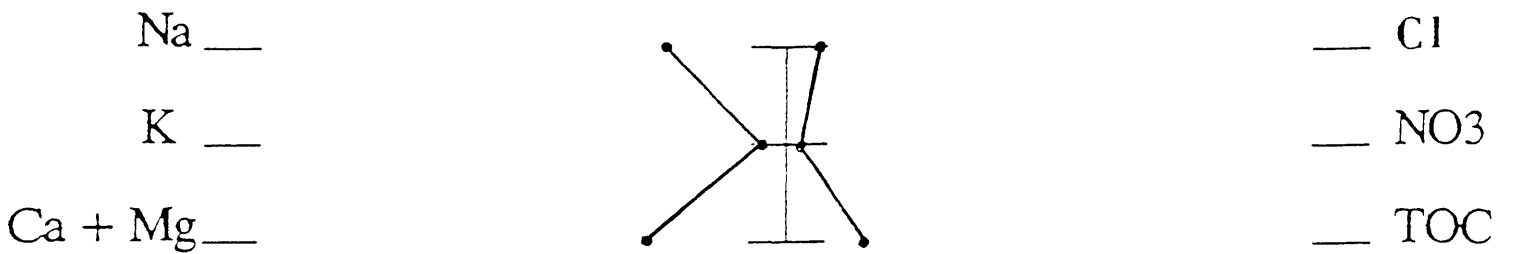
EPM



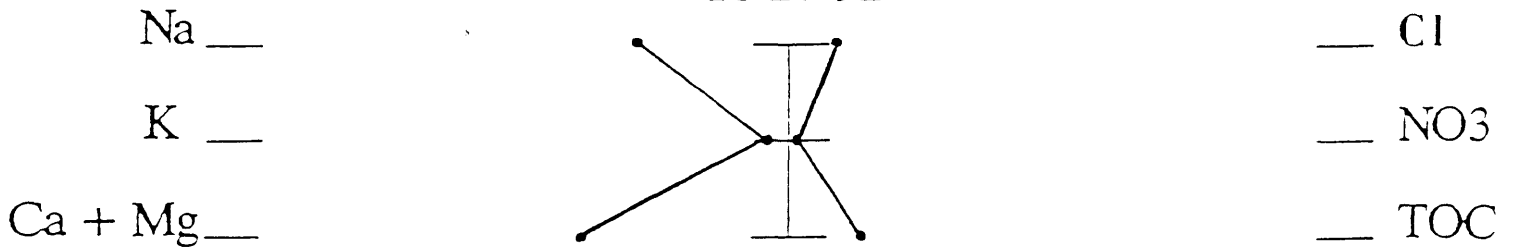
10-16-90



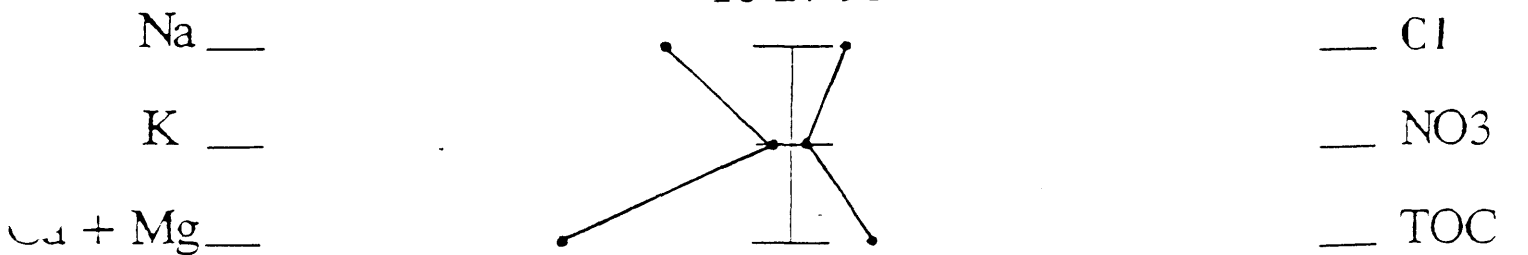
11-1-91



10-27-92

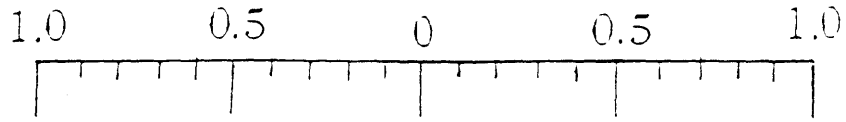


10-27-93



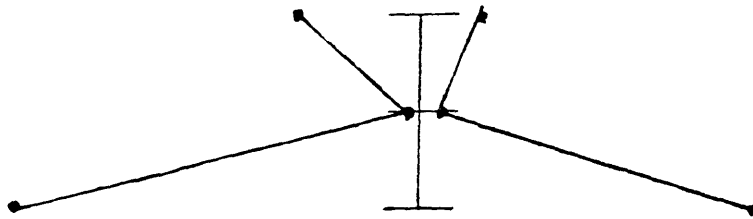
WELL 40

EPM



10/25/94

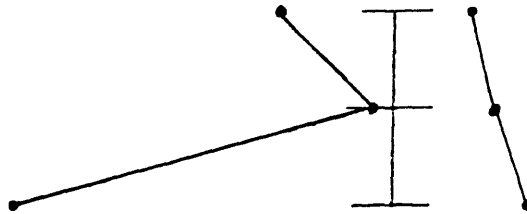
Na ___
K ___
Ca + Mg ___



___ Cl
___ NO3
___ TOC

12/22/95

Na ___
K ___
Ca + Mg ___



___ Cl
___ NO3
___ TOC

Na ___
K ___
Ca + Mg ___



___ Cl
___ NO3
___ TOC

Na ___
K ___
Ca + Mg ___

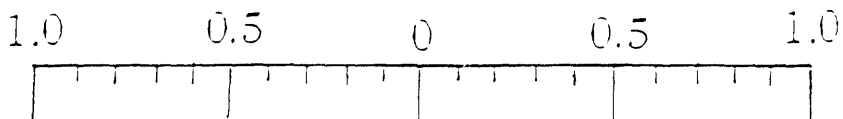


___ Cl
___ NO3
___ TOC

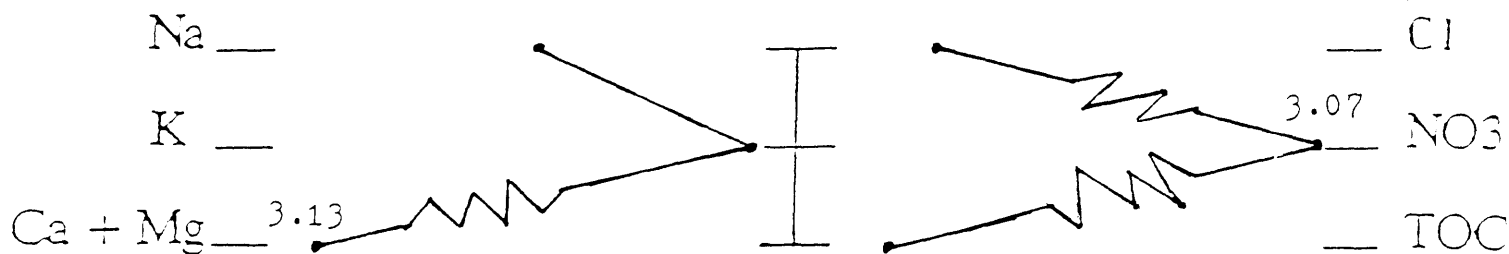


WELL 52

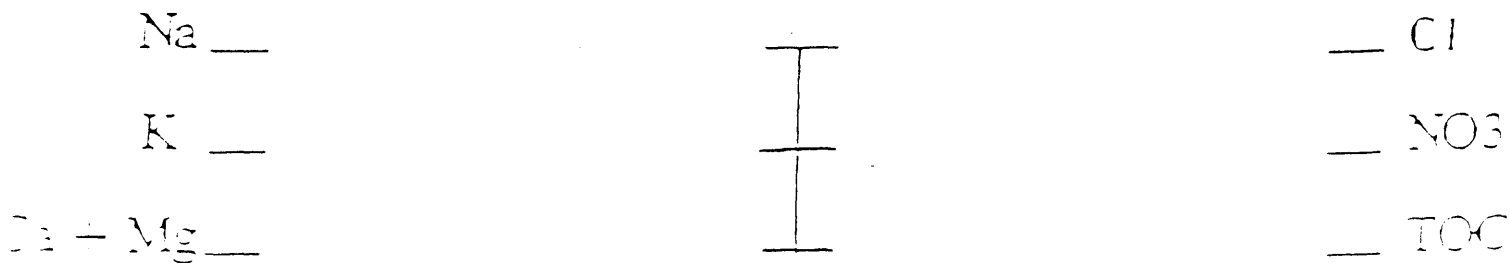
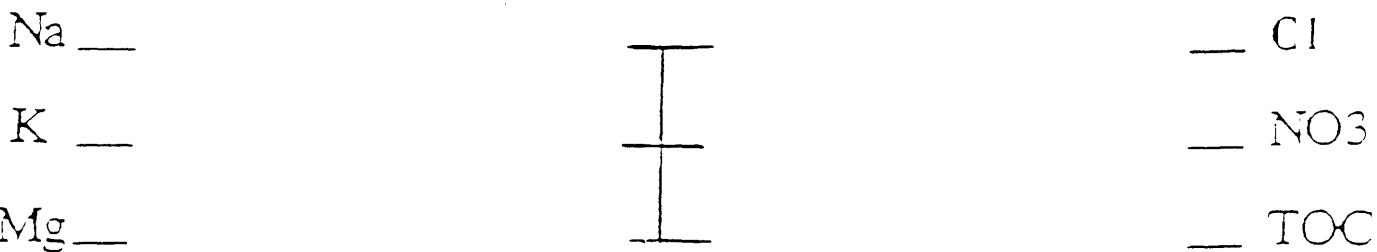
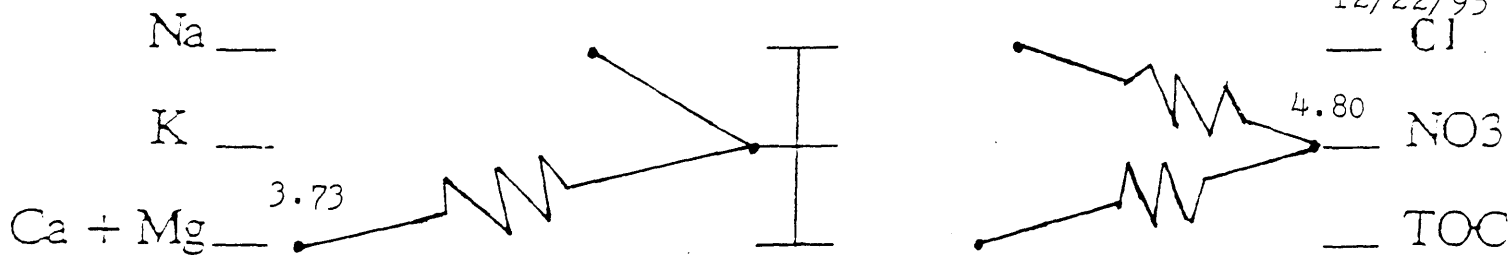
EPM



10/25/94



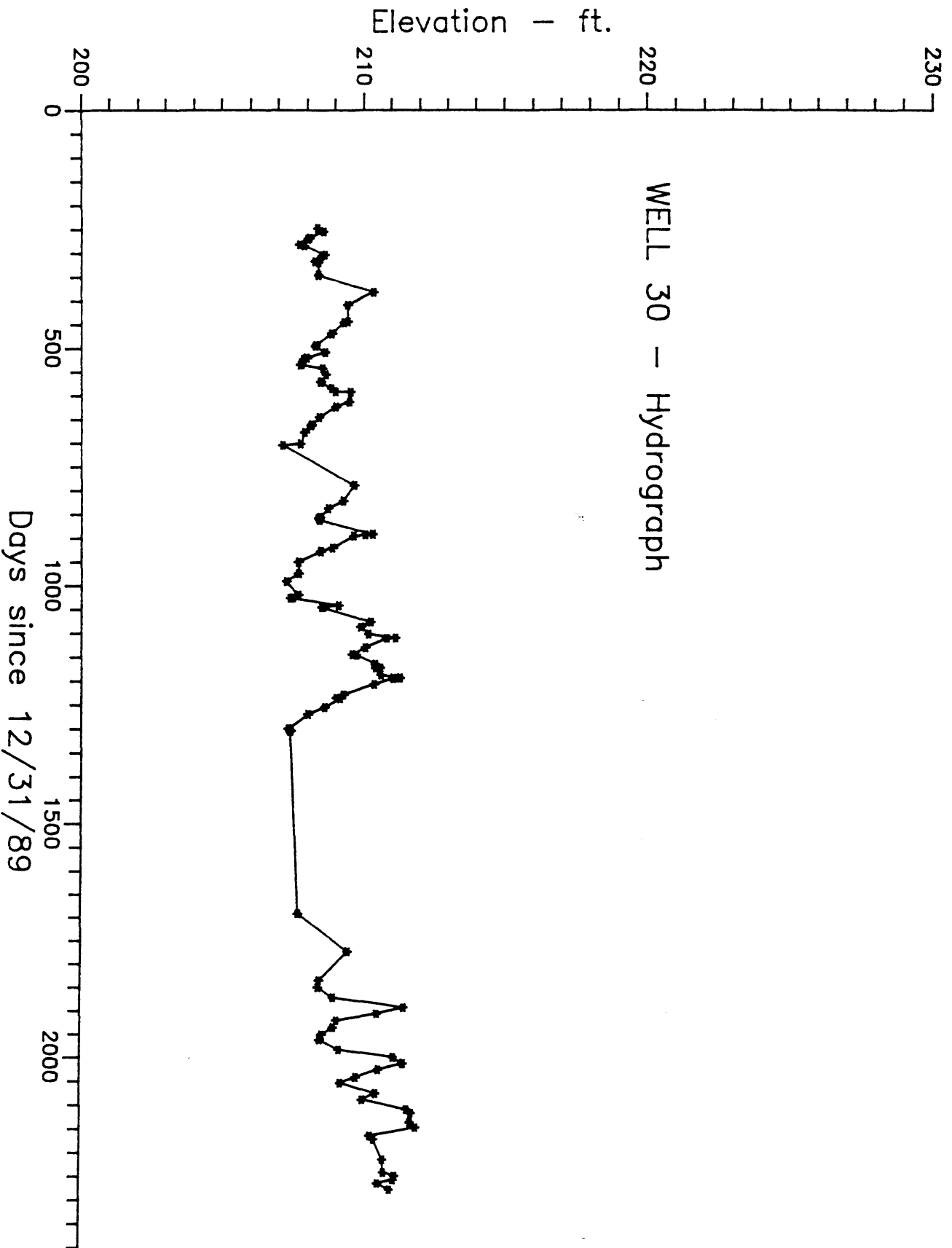
12/22/95



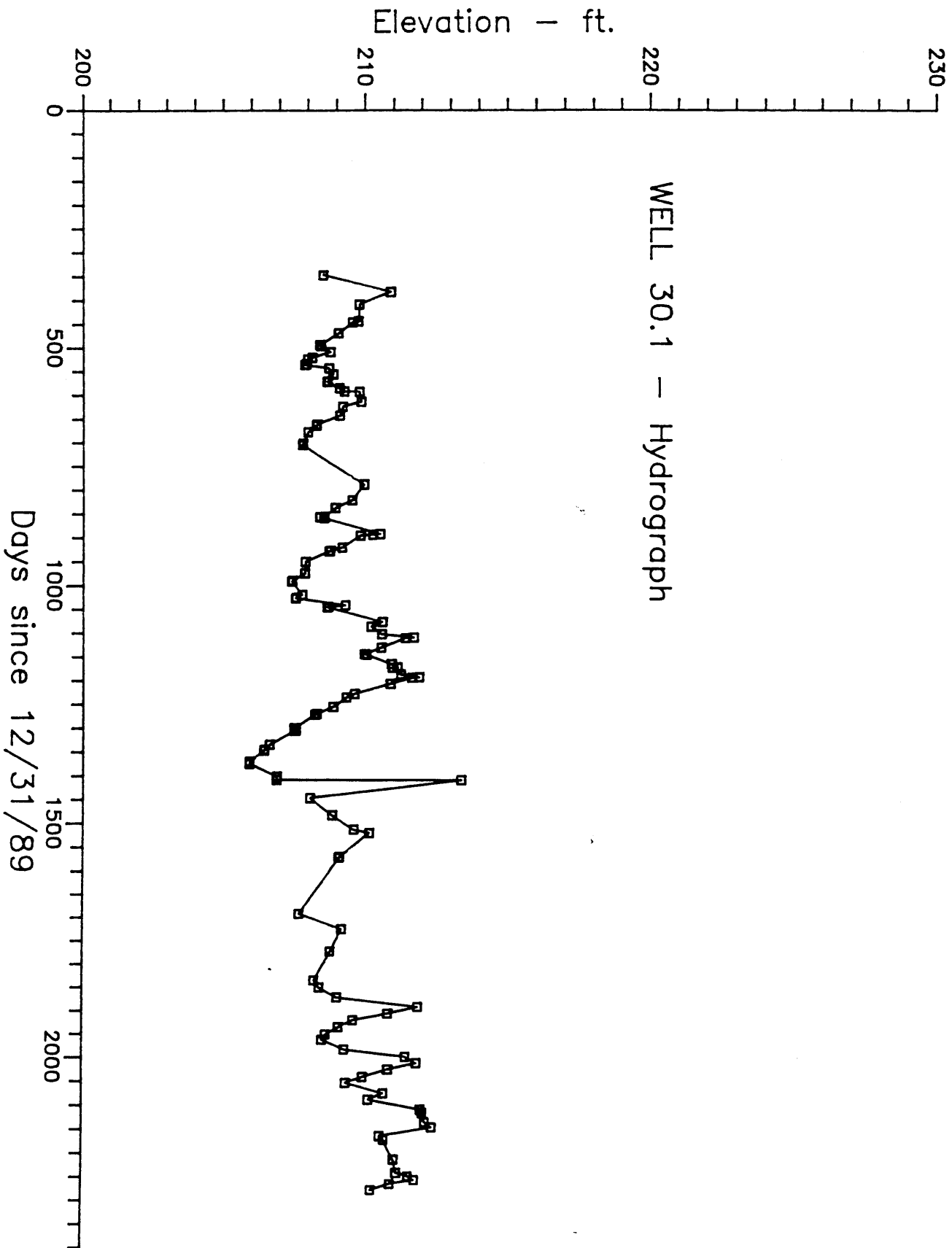
APPENDIX V

Well Hydrographs

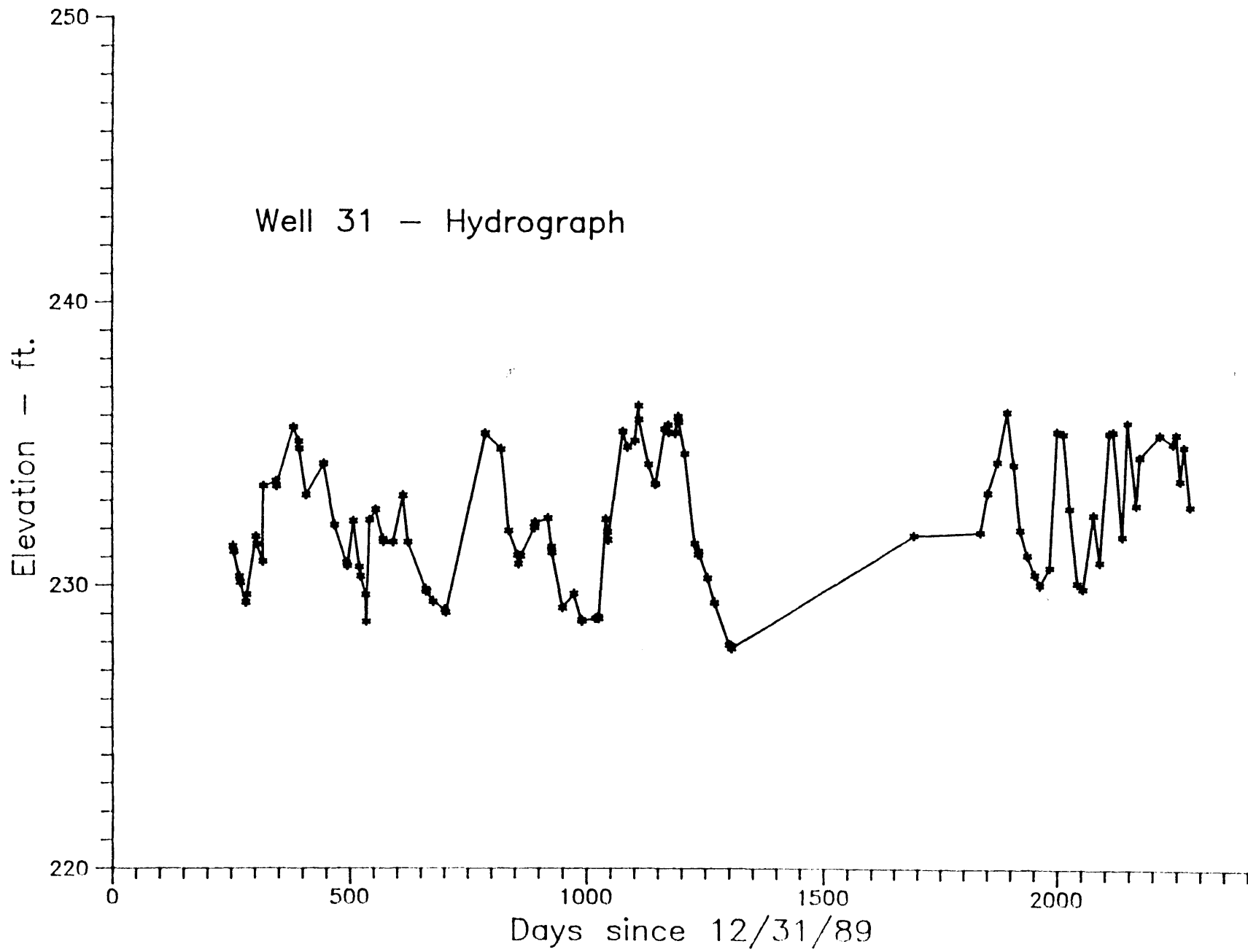
WELL 30 - Hydrograph



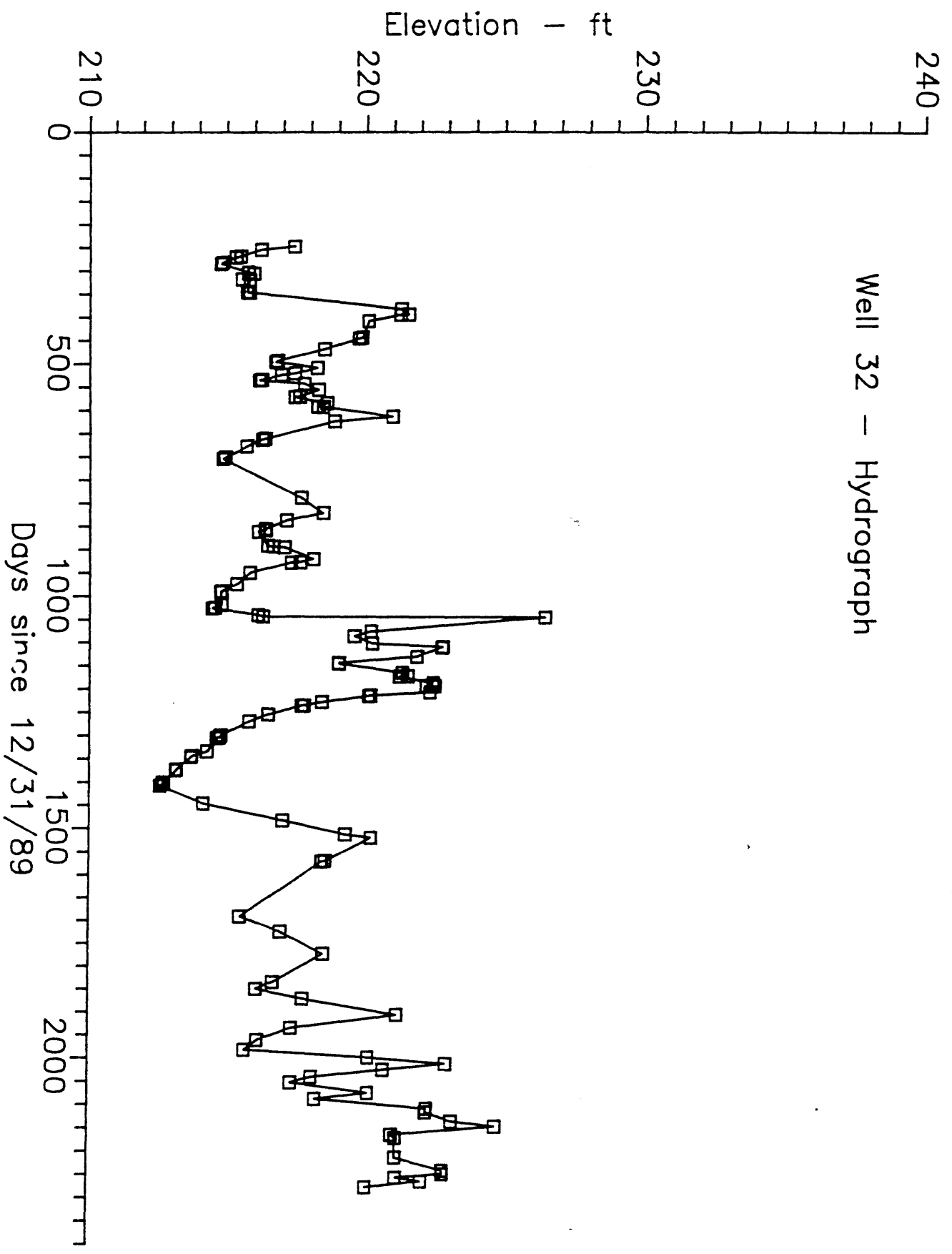
WELL 30.1 - Hydrograph



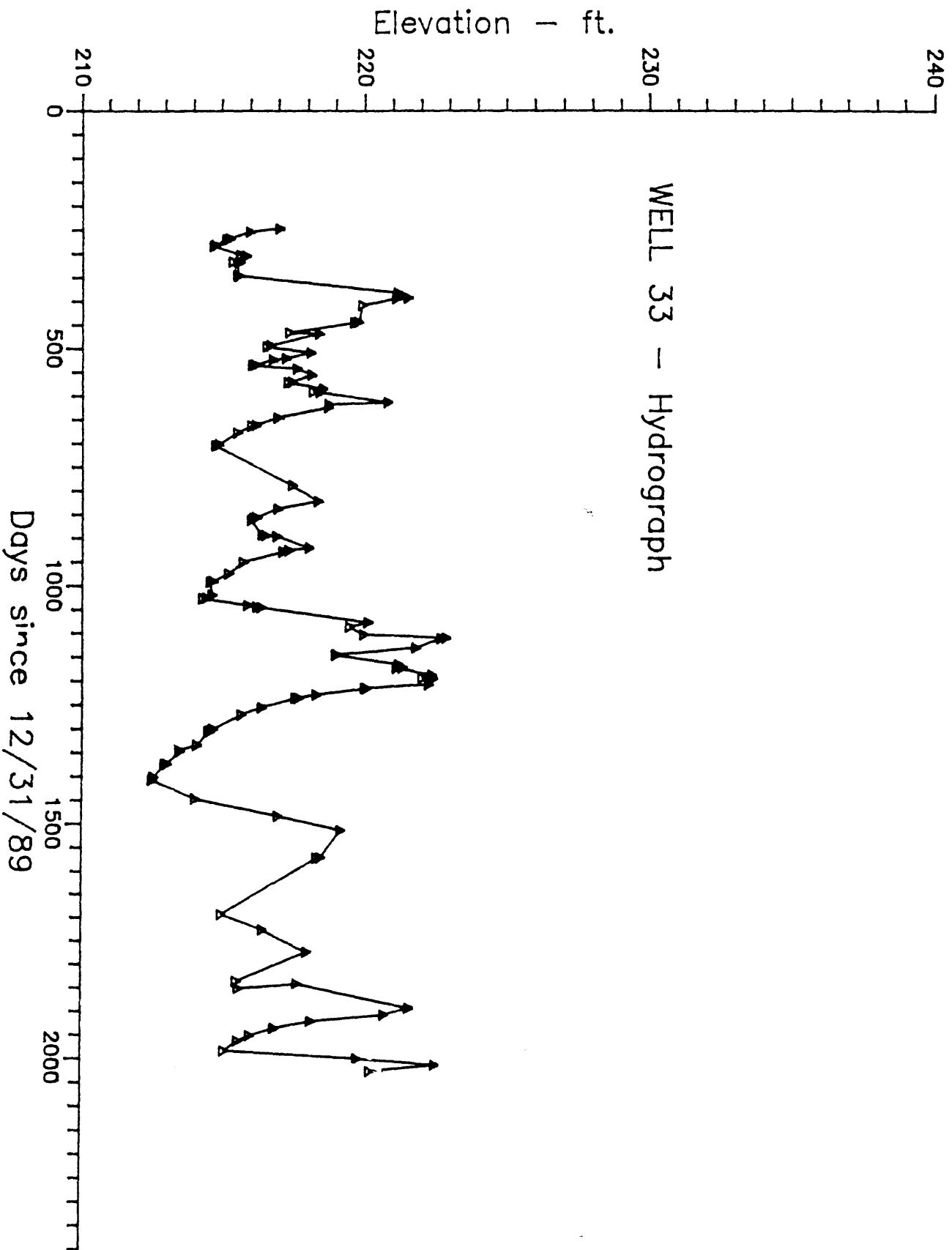
Well 31 - Hydrograph



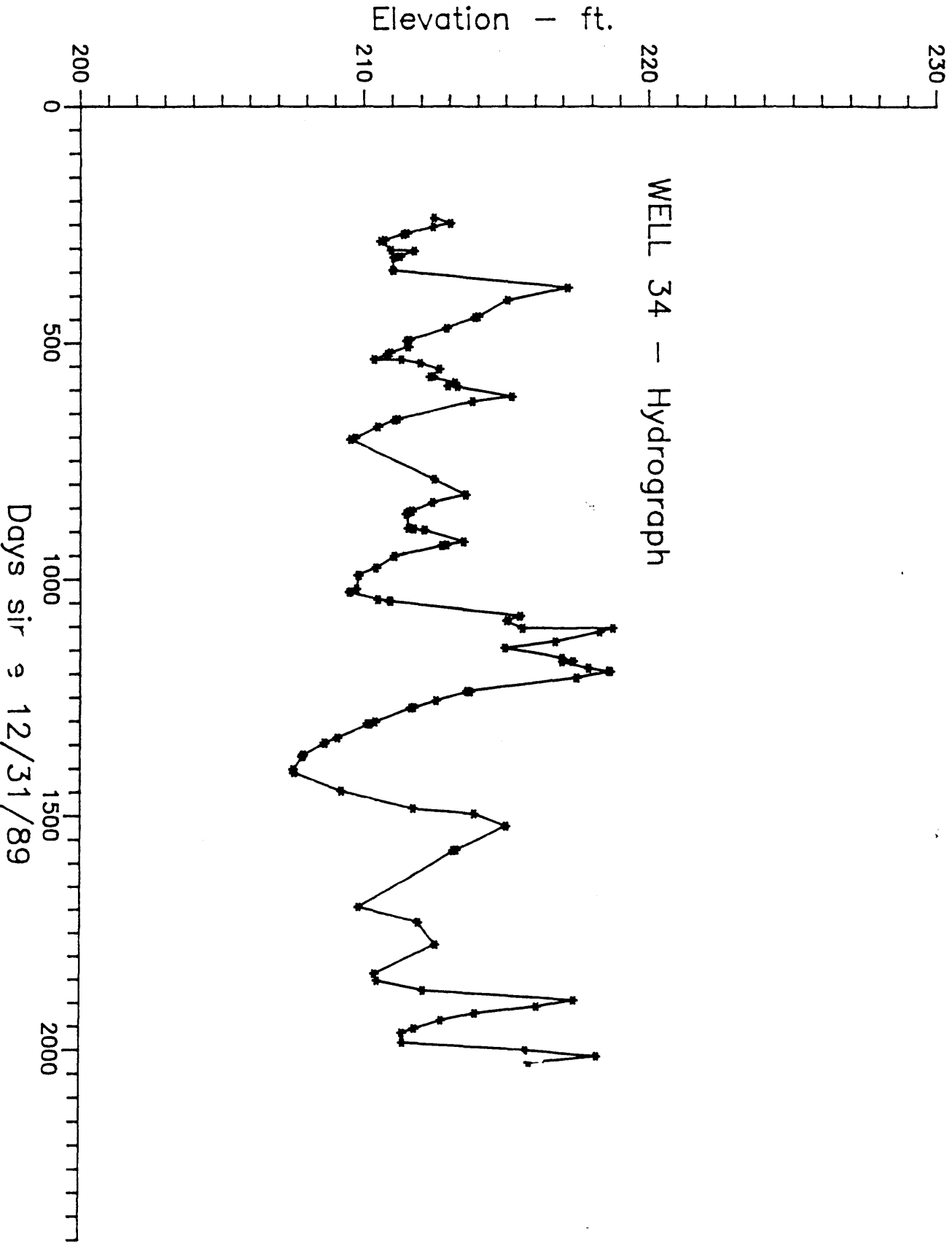
Well 32 - Hydrograph



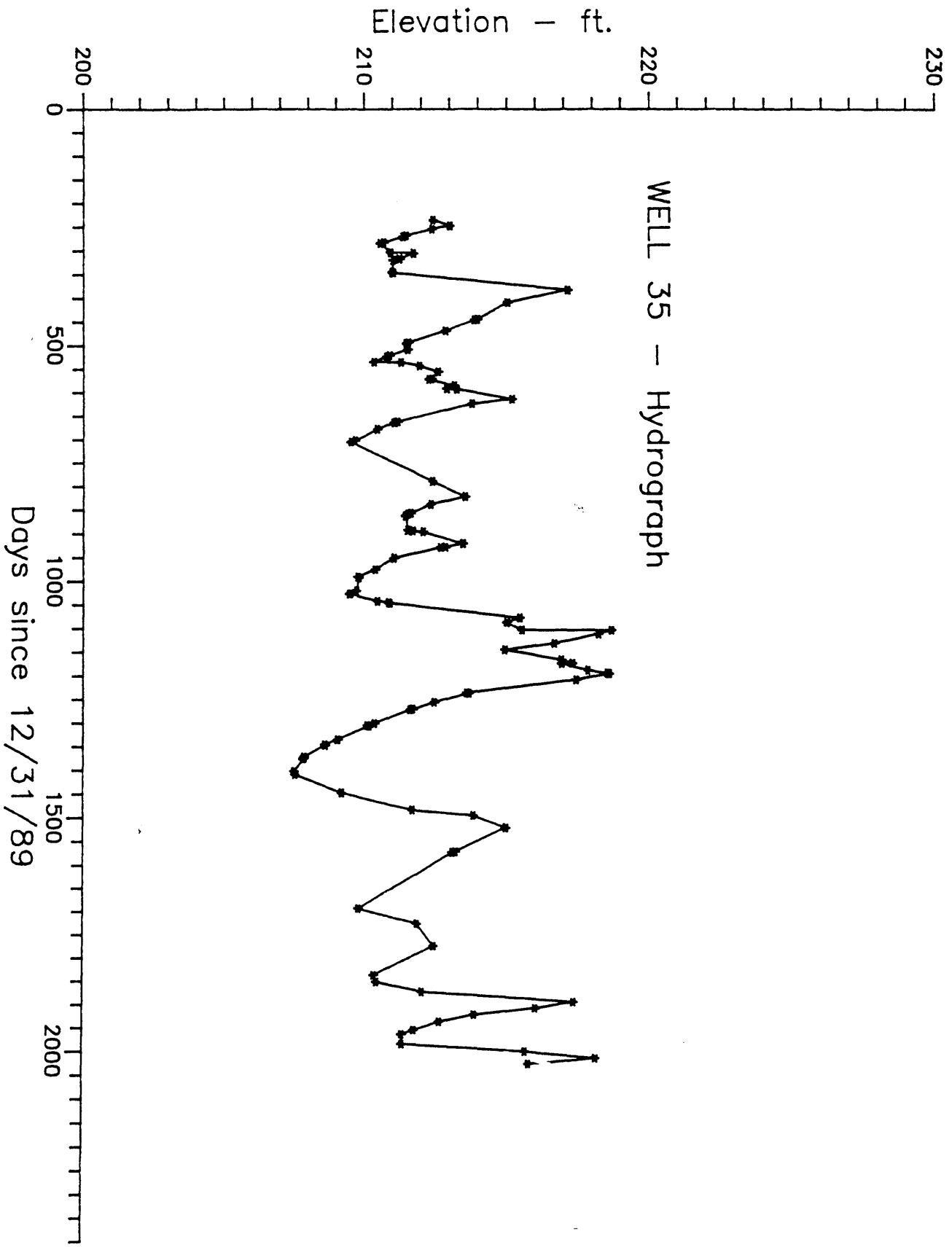
WELL 33 - Hydrograph

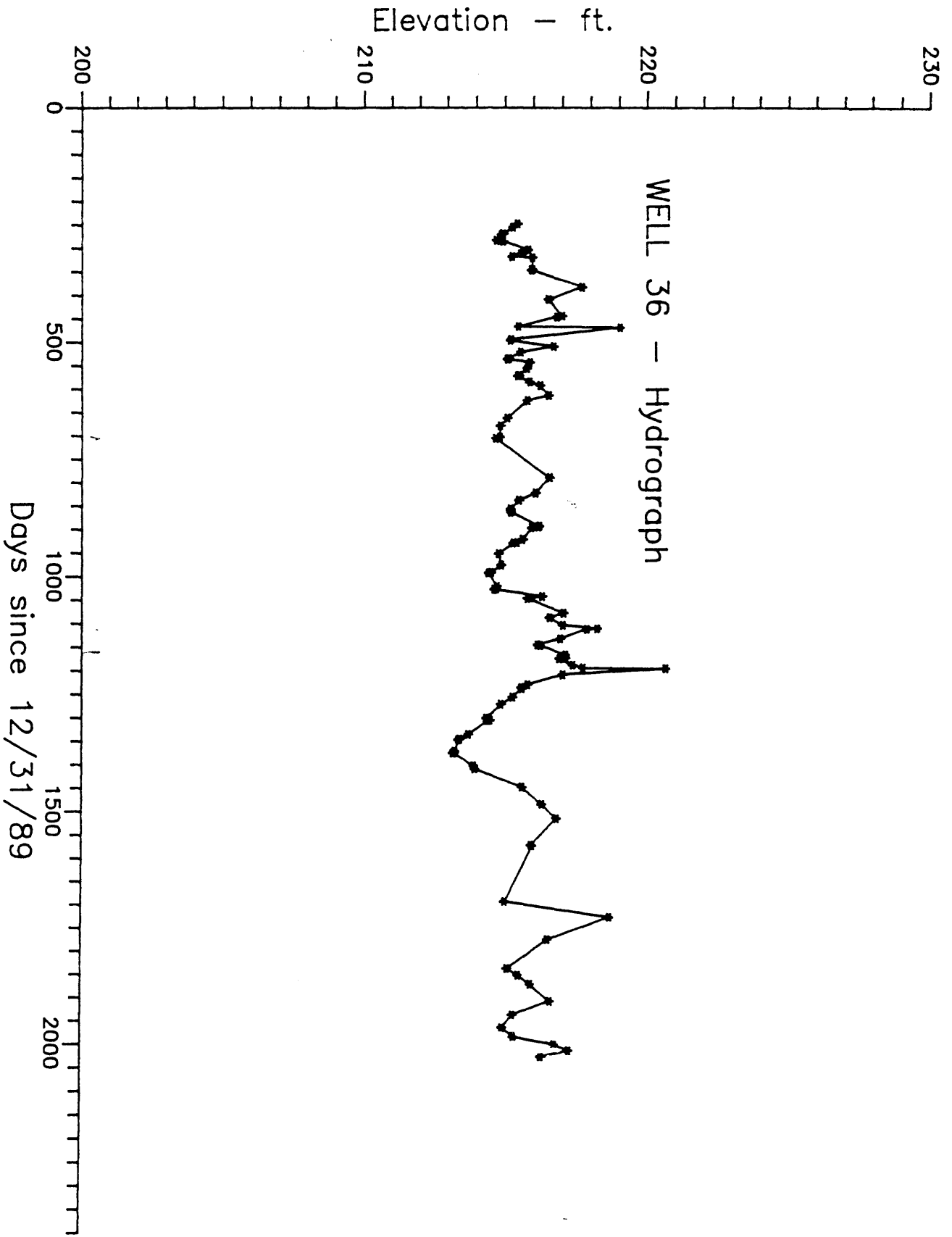


WELL 34 - Hydrograph

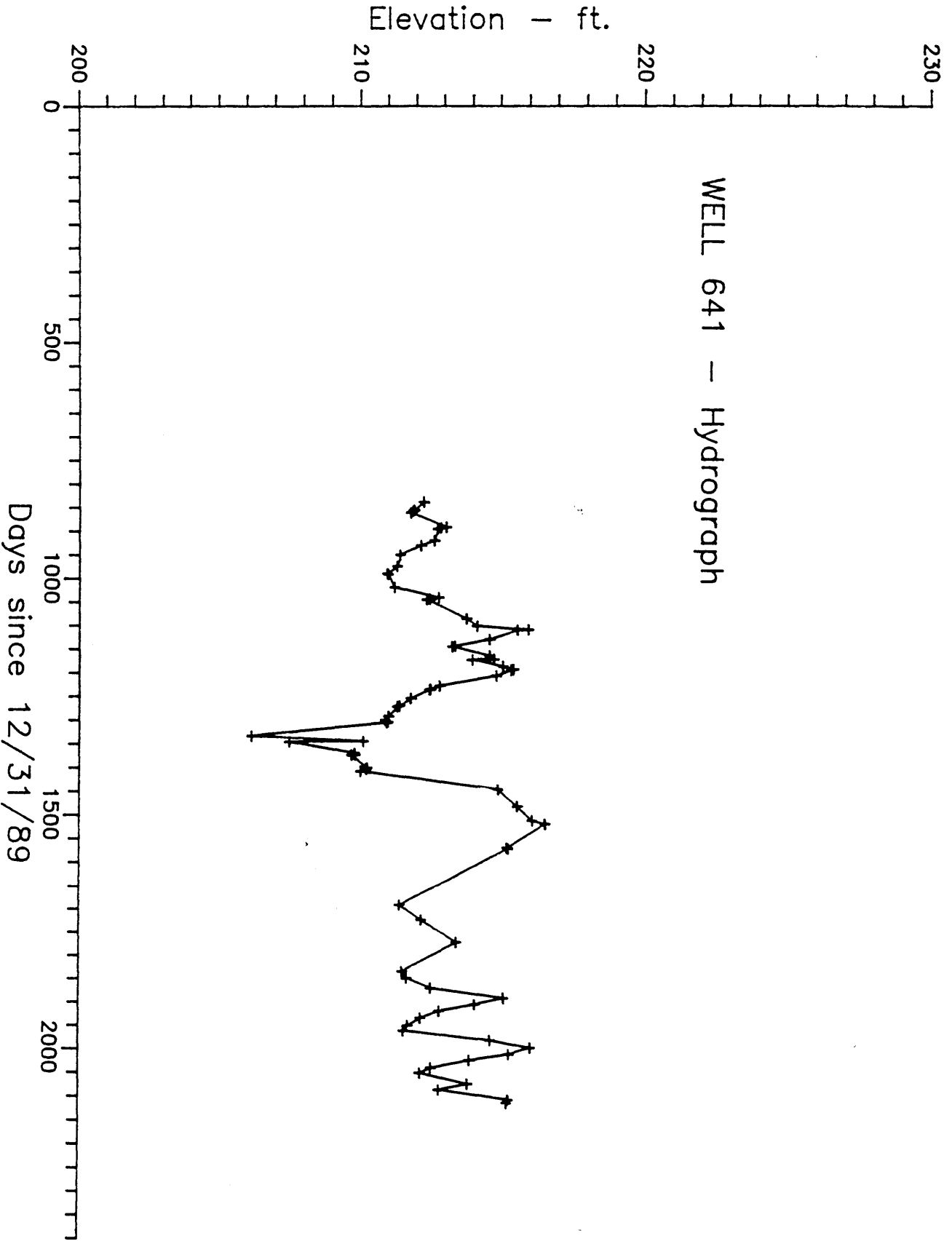


WELL 35 - Hydrograph

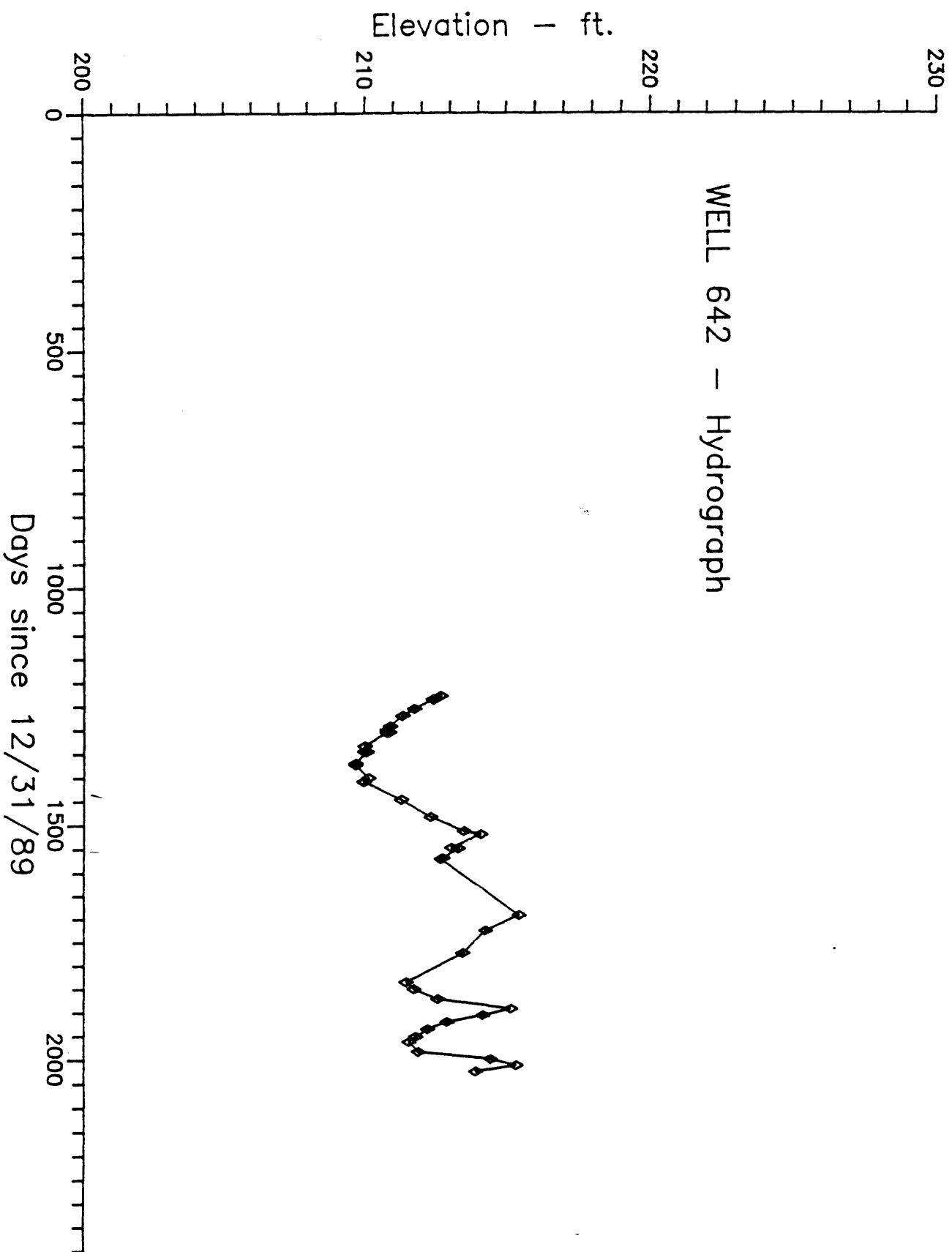




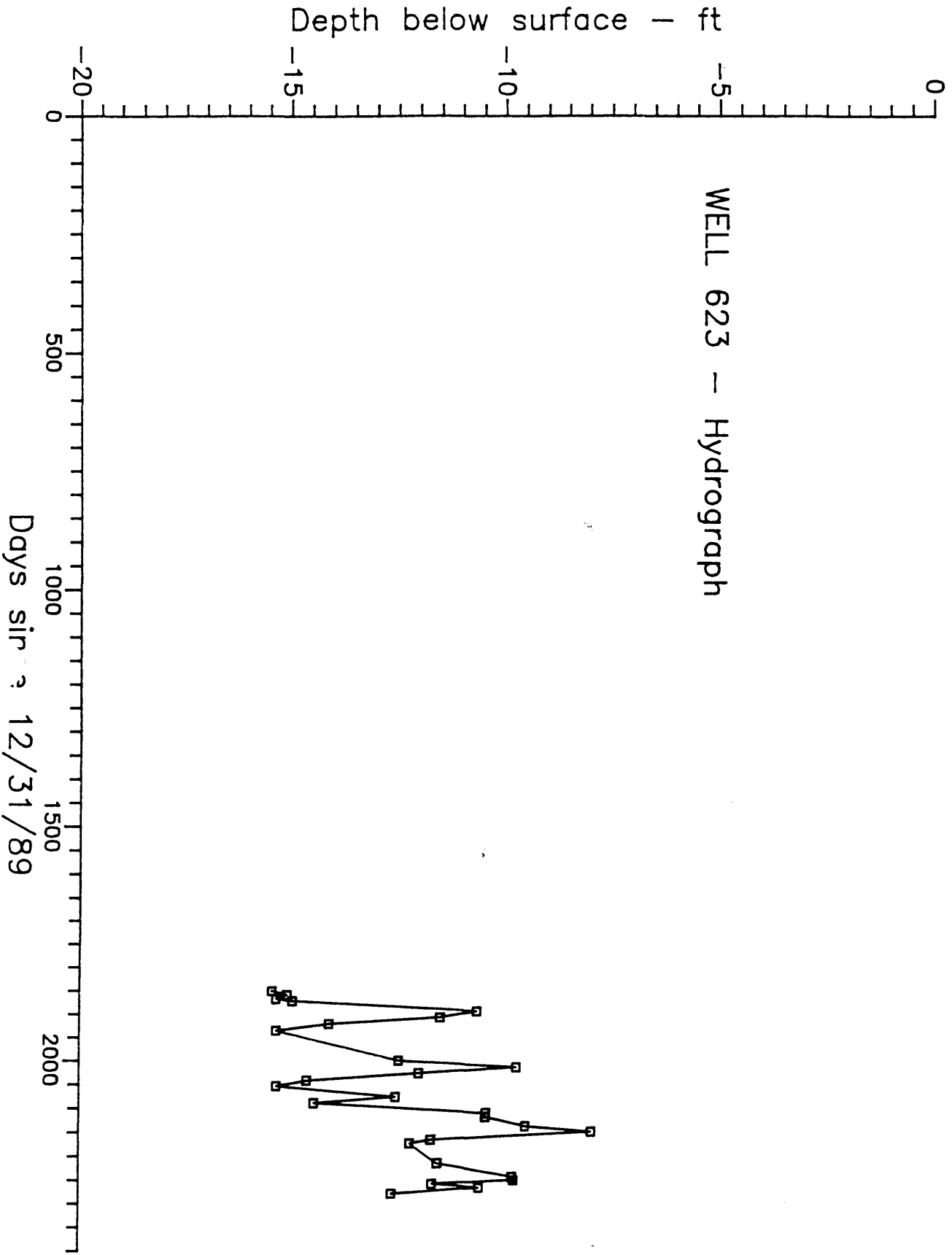
WELL 641 - Hydrograph



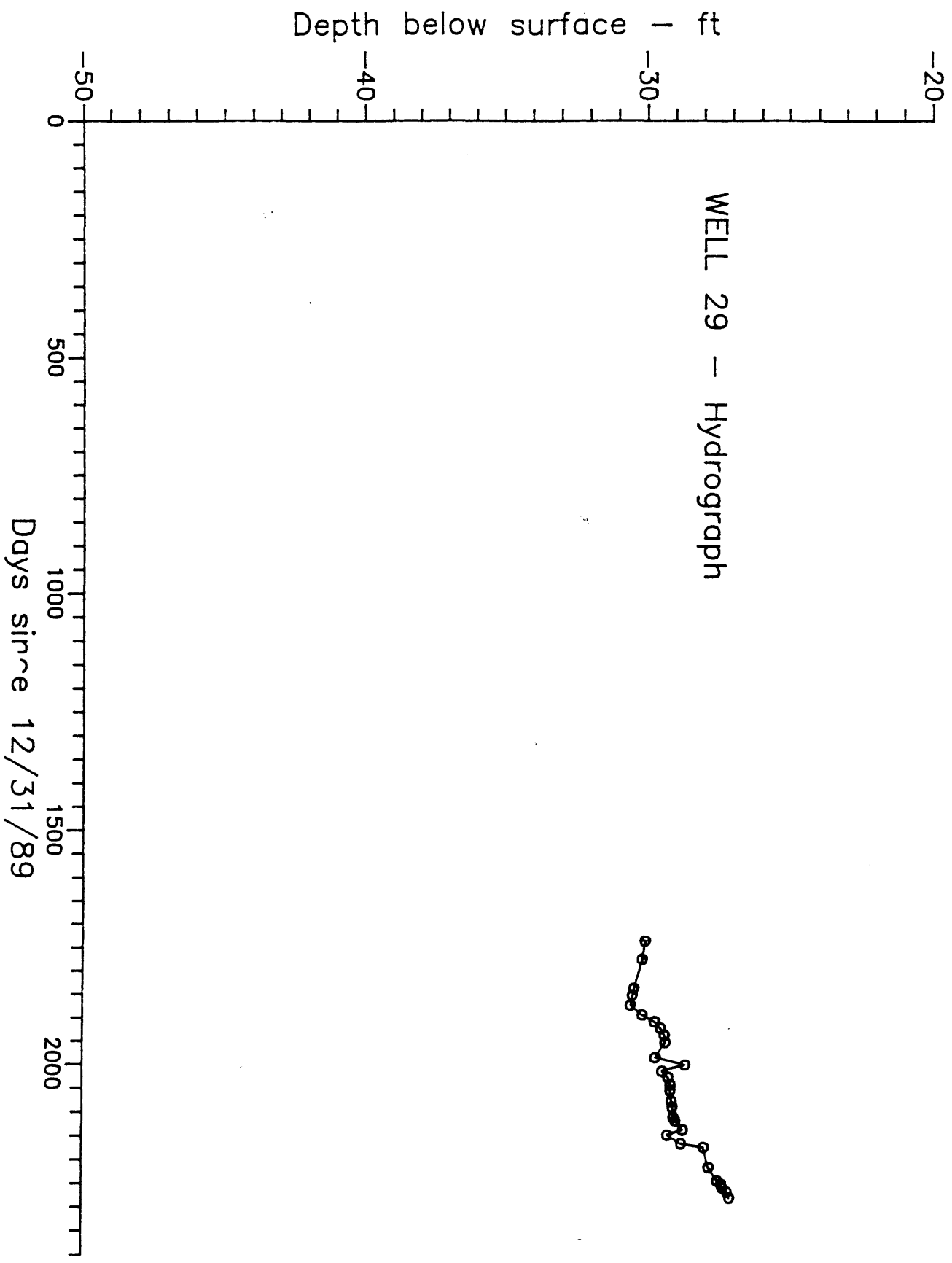
WELL 642 -- Hydrograph



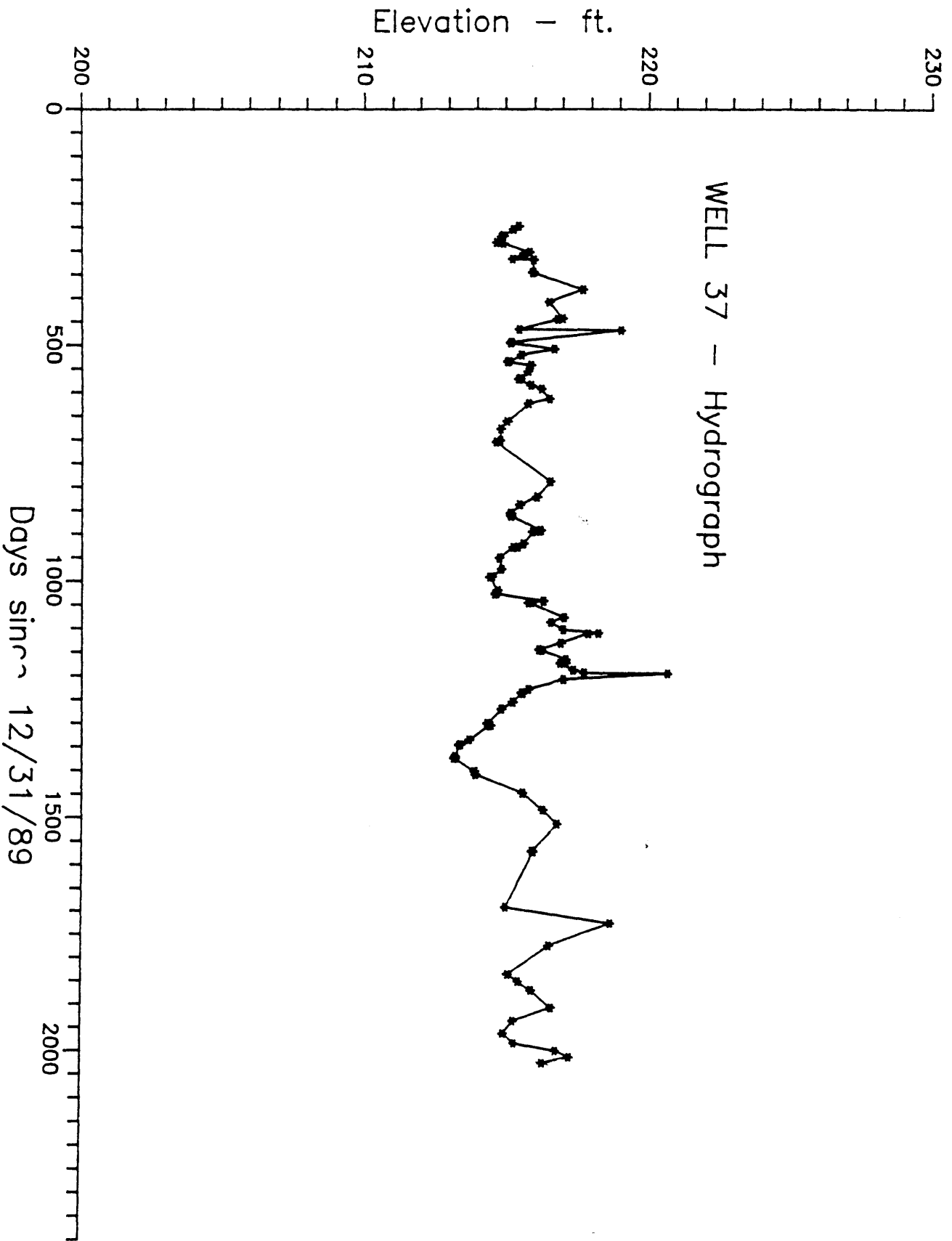
WELL 623 - Hydrograph



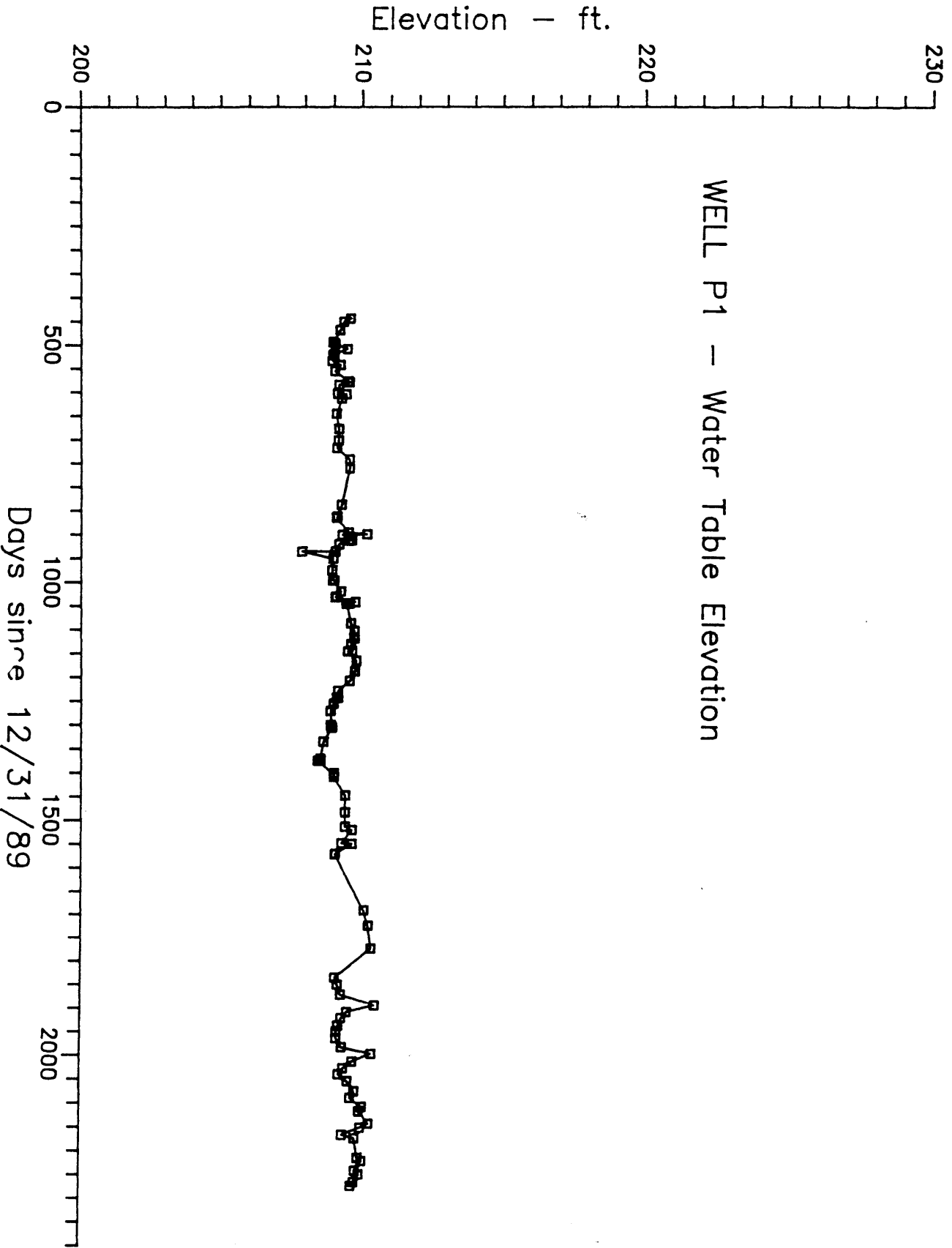
WELL 29 - Hydrograph



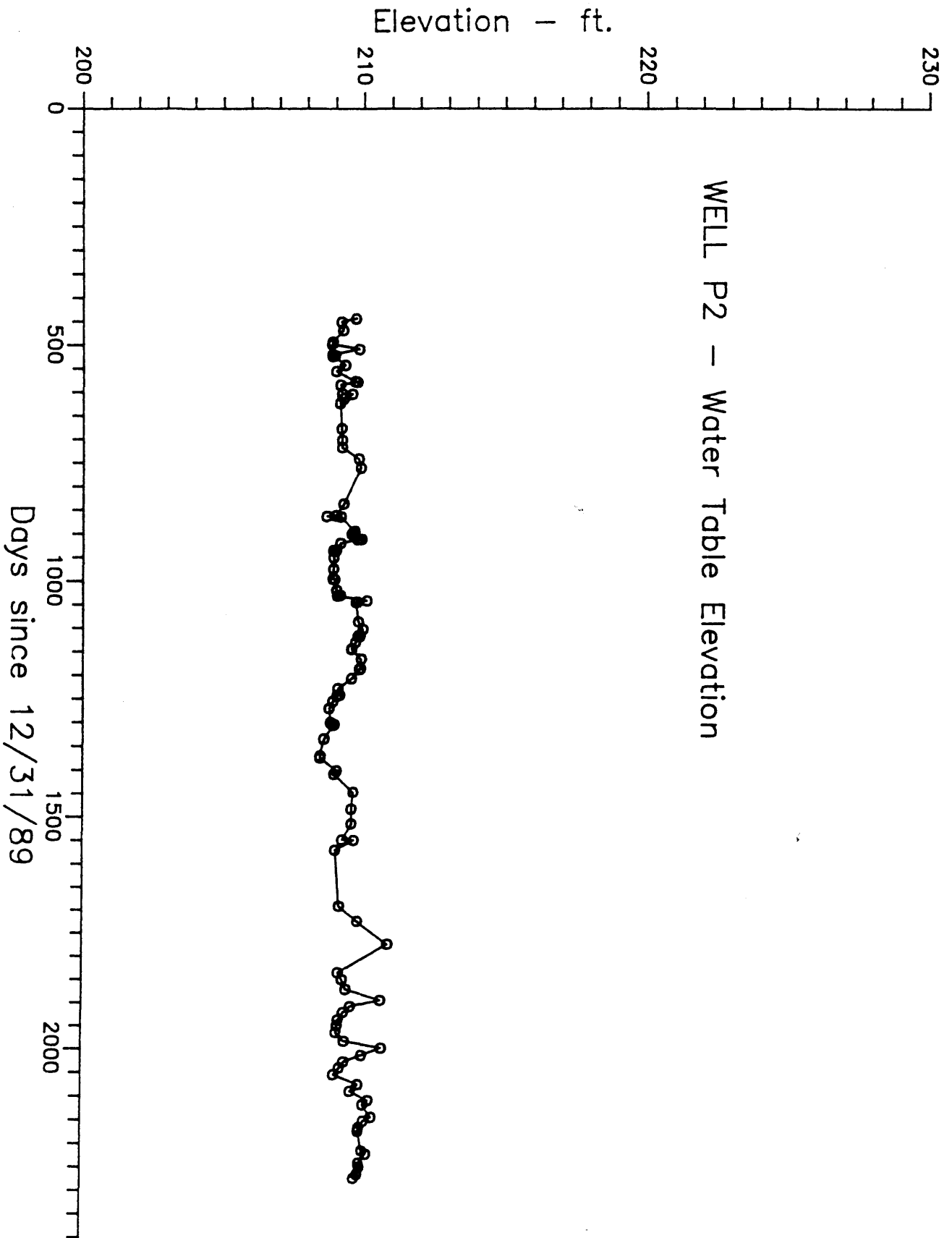
WELL 37 -- Hydrograph



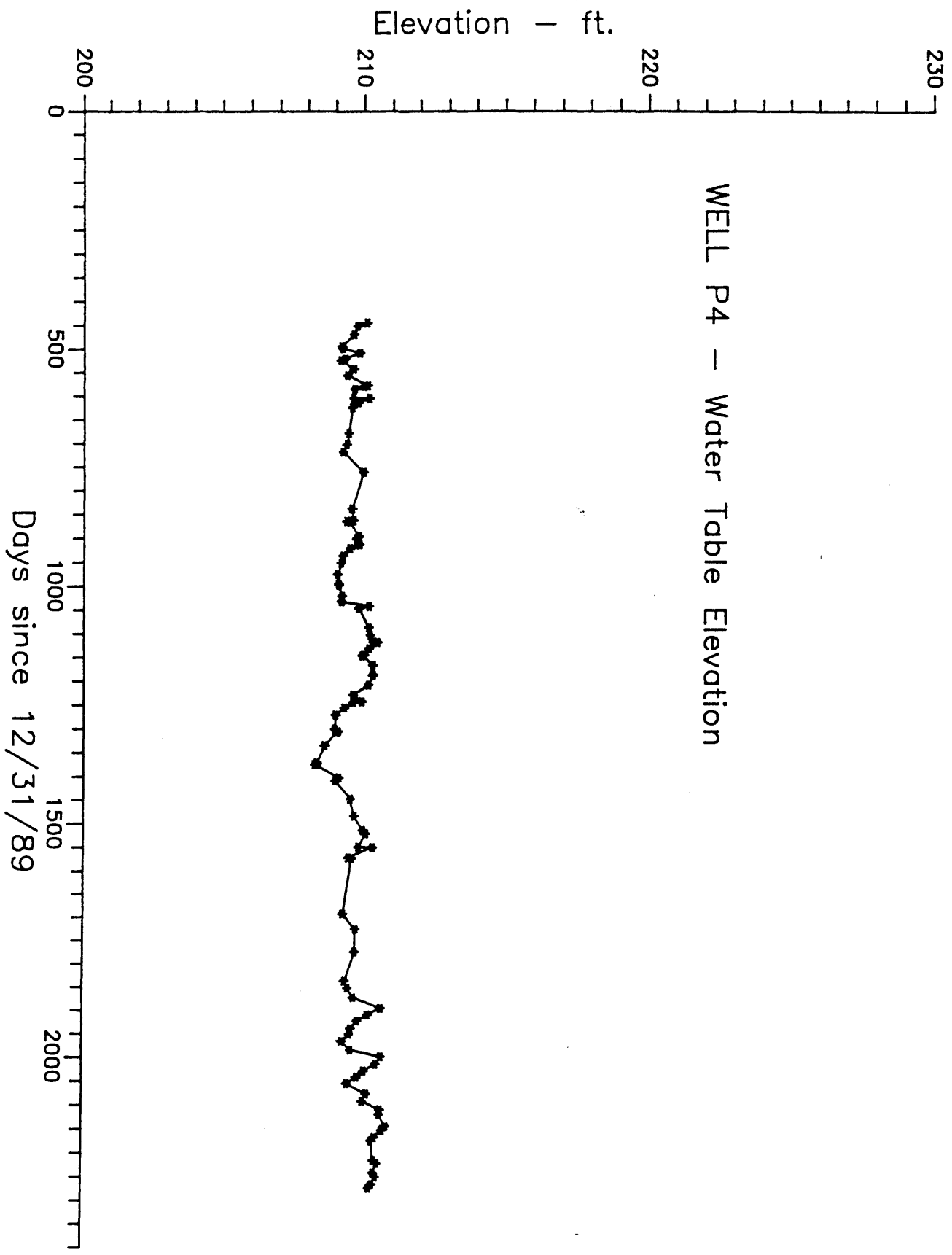
WELL P1 - Water Table Elevation



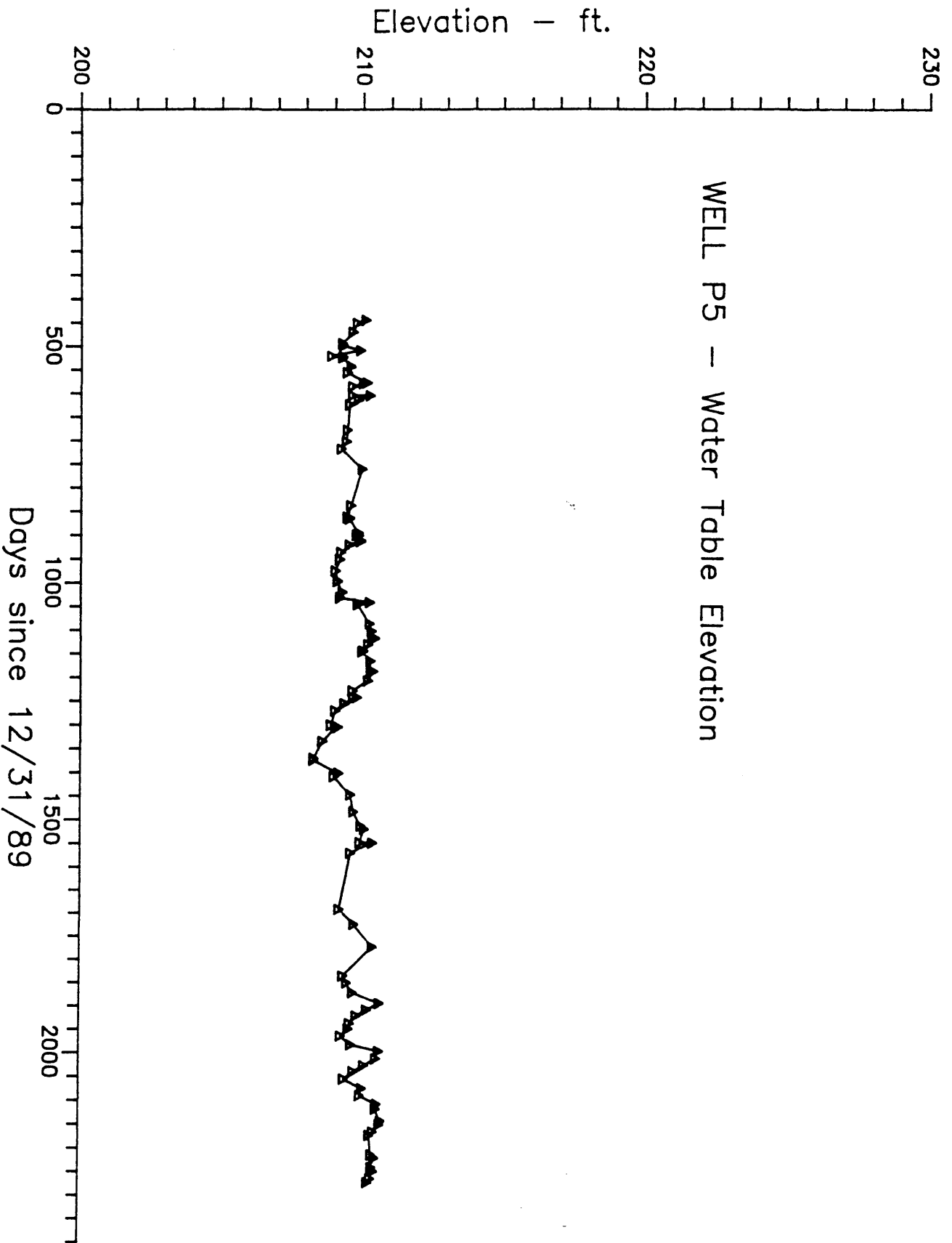
WELL P2 - Water Table Elevation



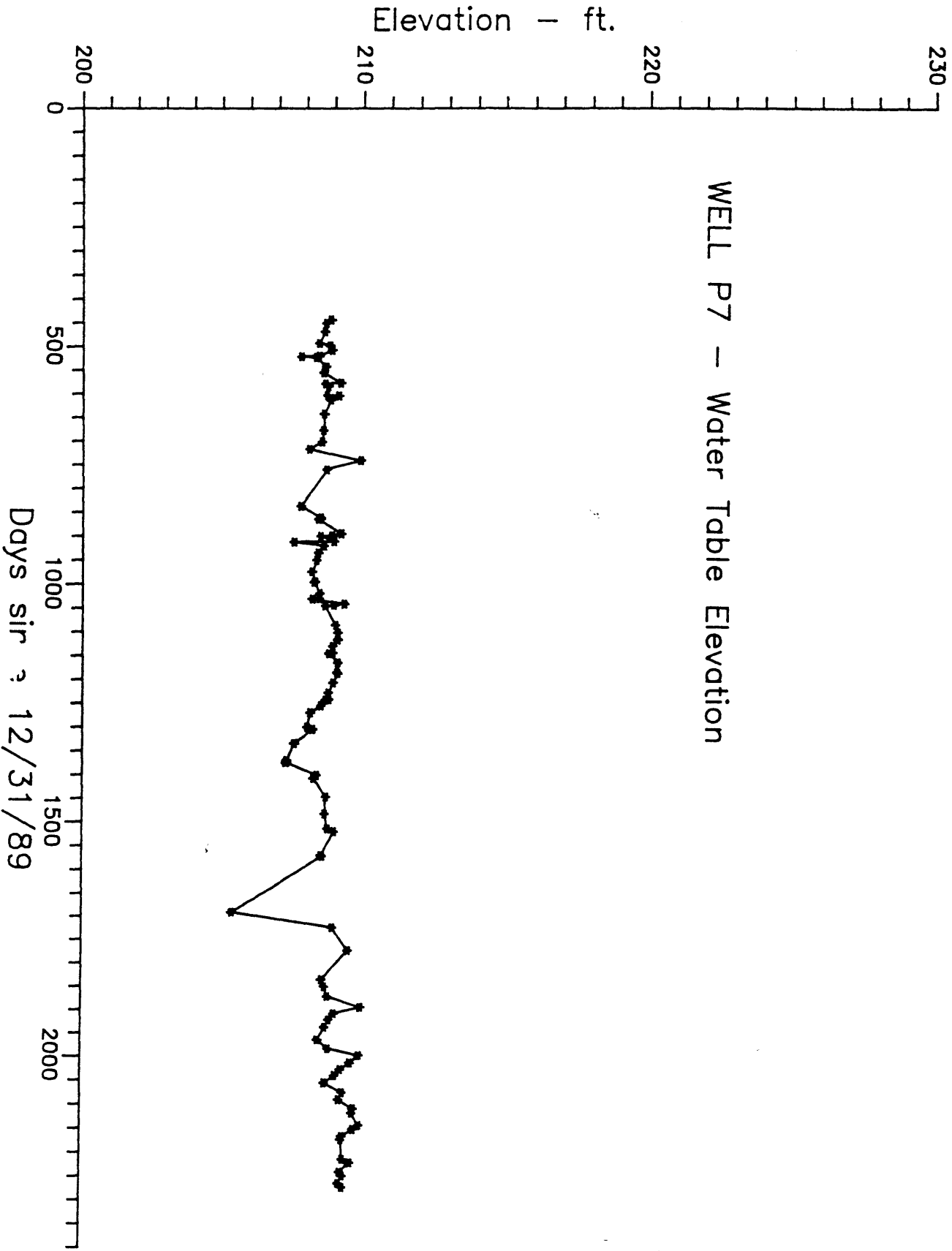
WELL P4 -- Water Table Elevation



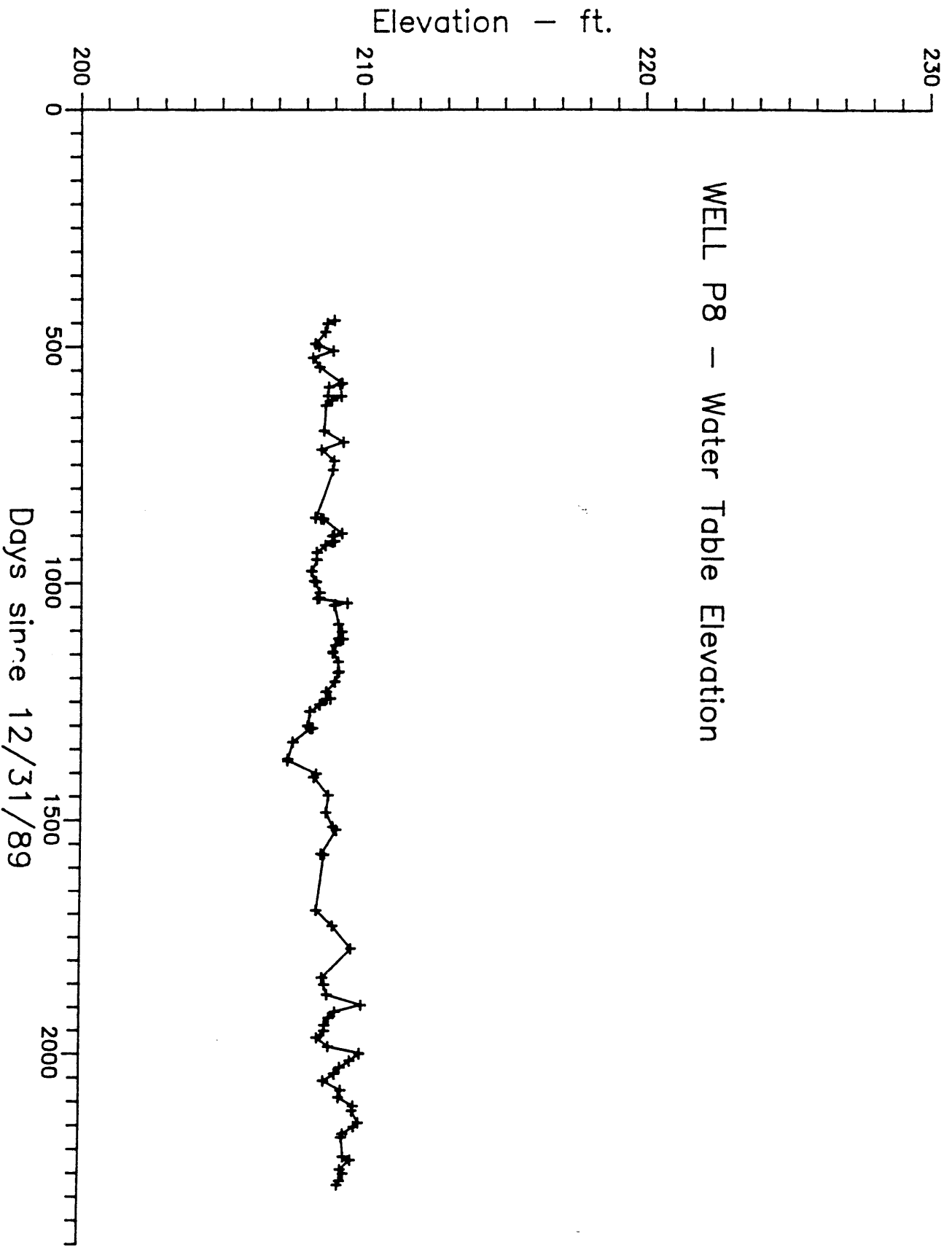
WELL P5 - Water Table Elevation

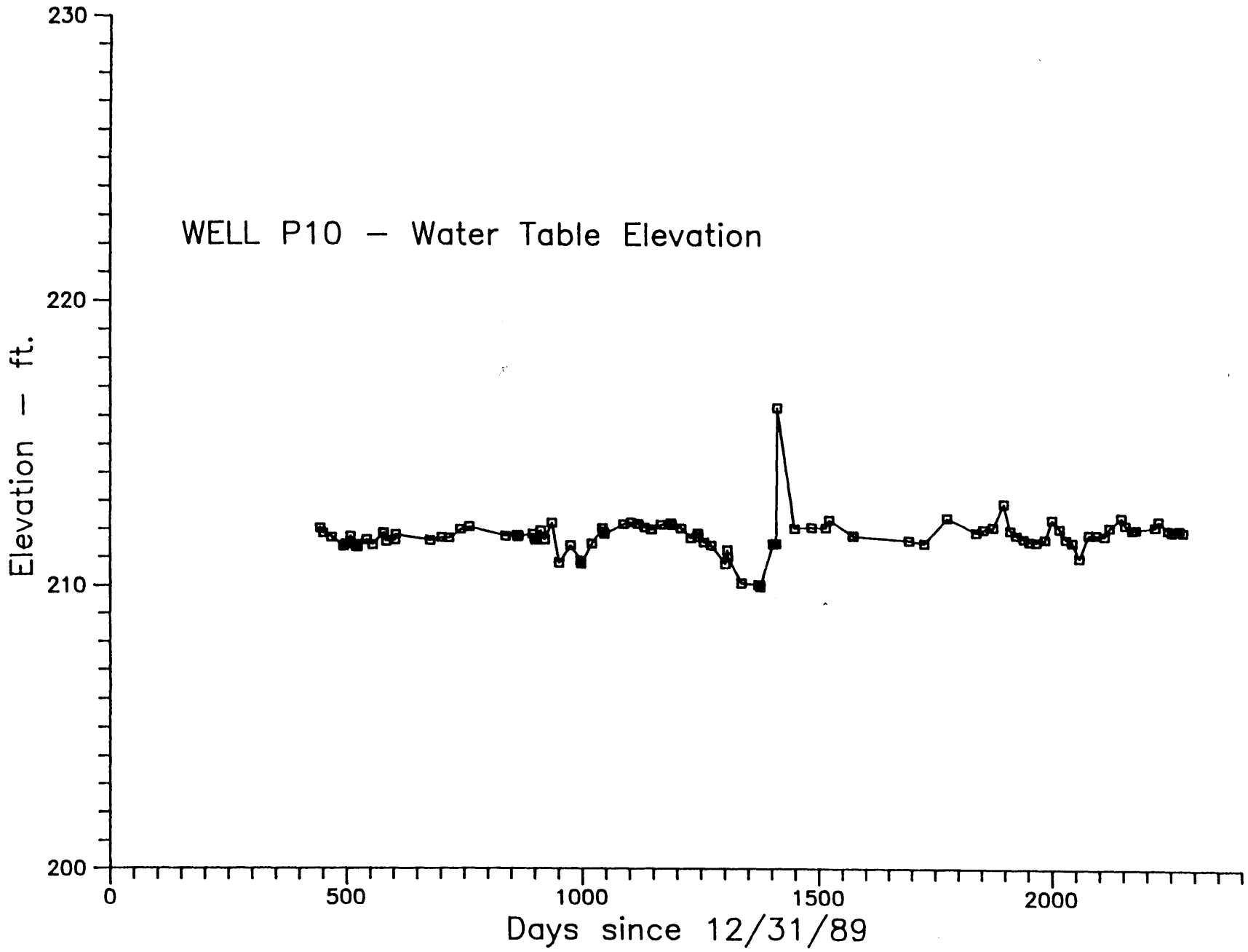


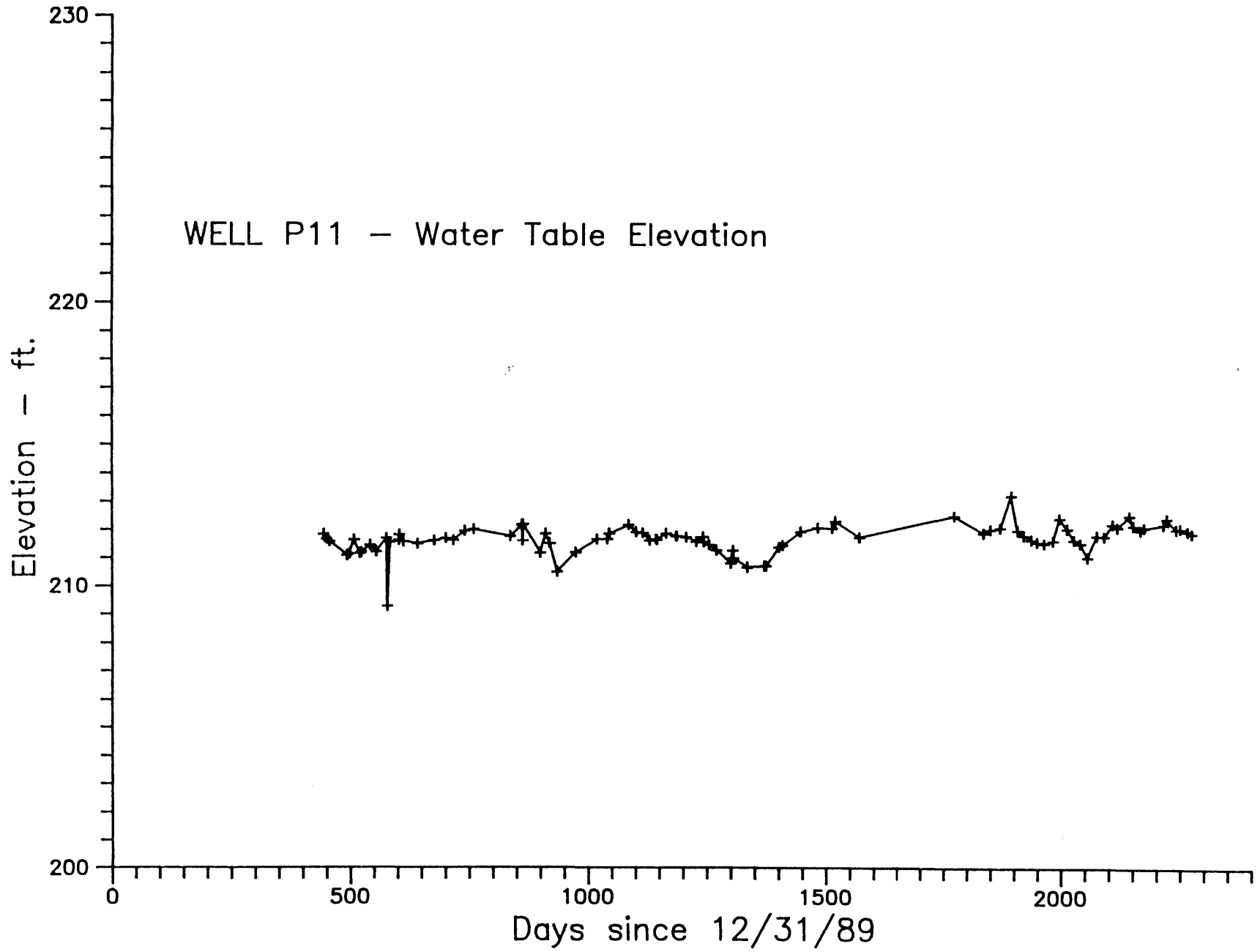
WELL P7 - Water Table Elevation

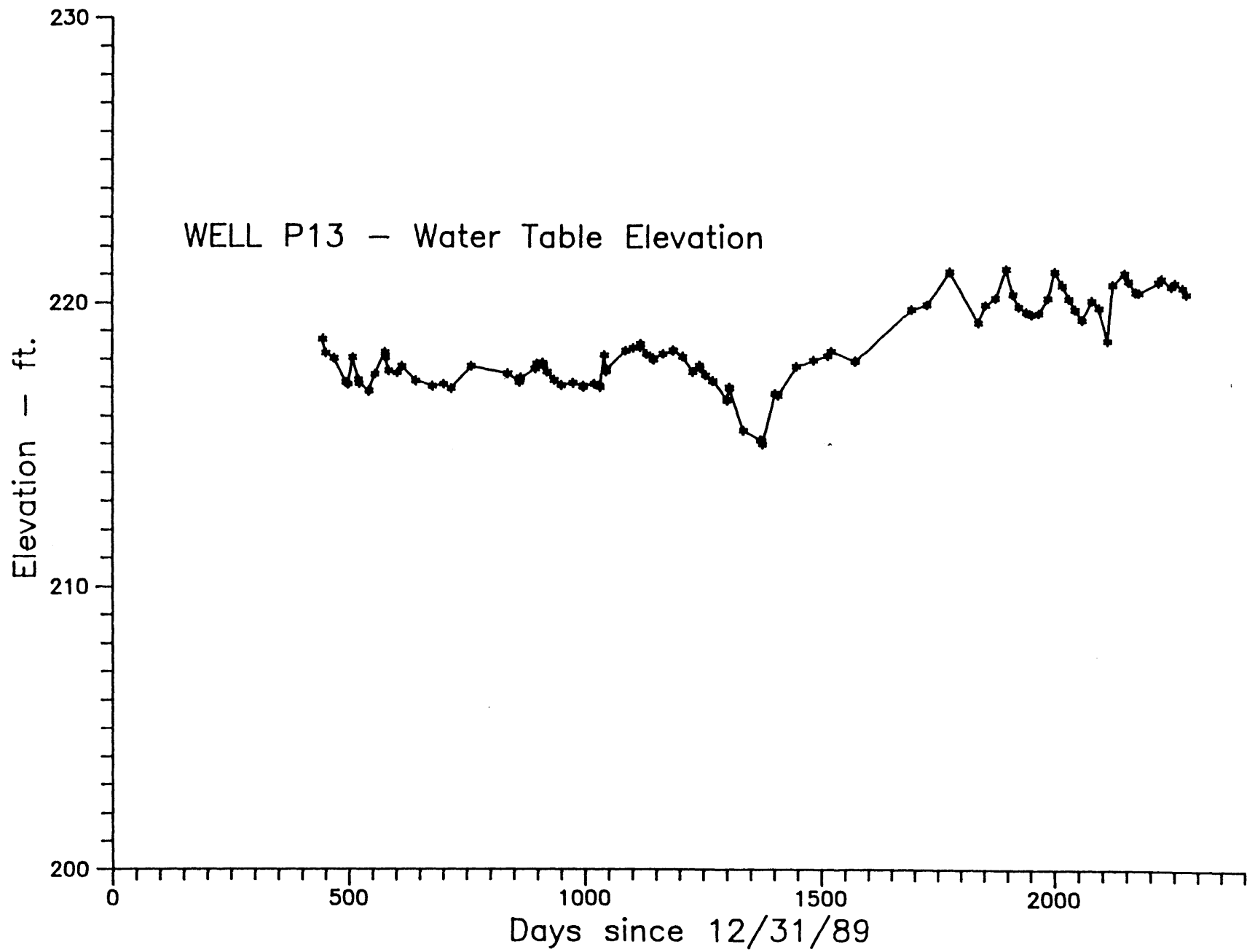


WELL P8 - Water Table Elevation

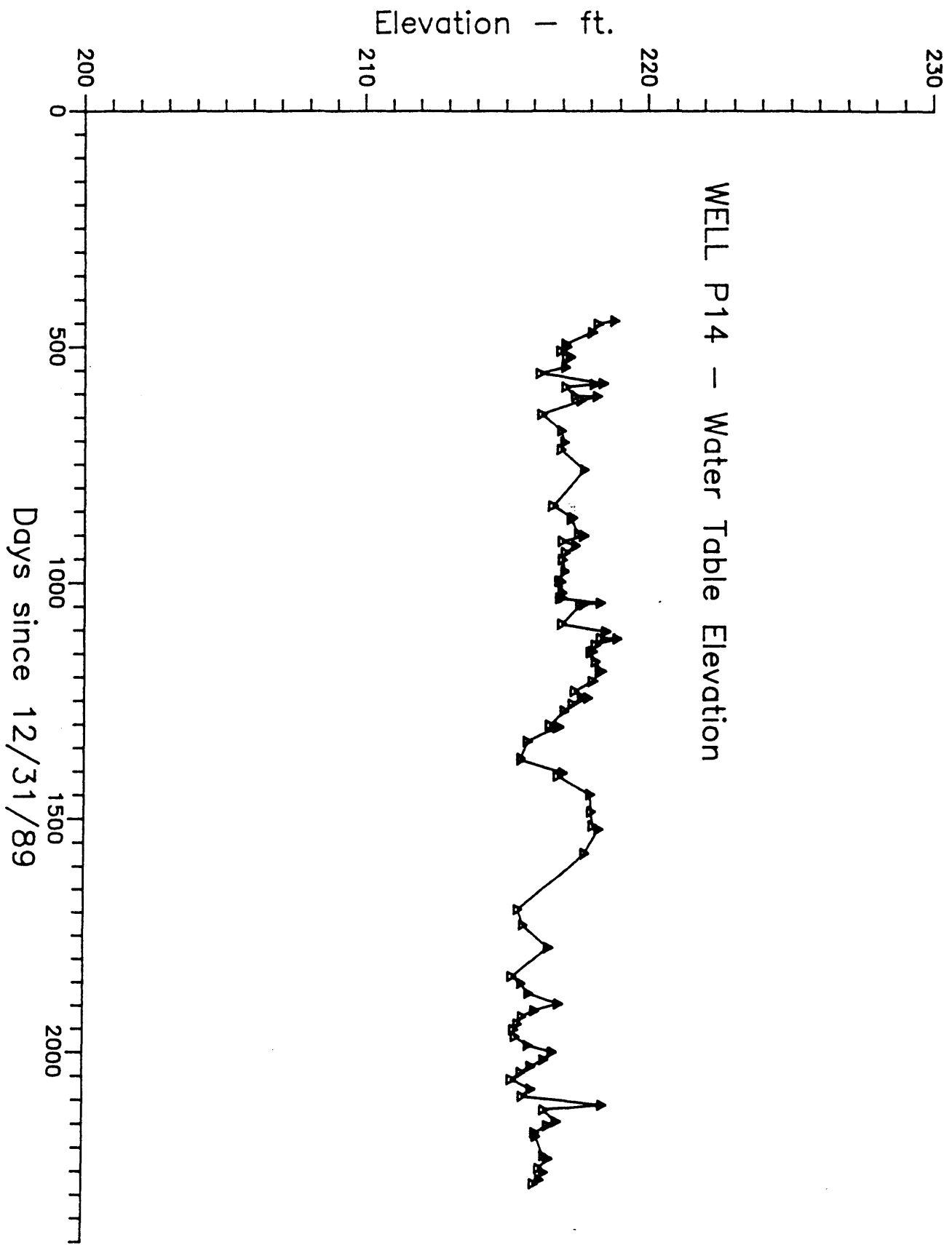


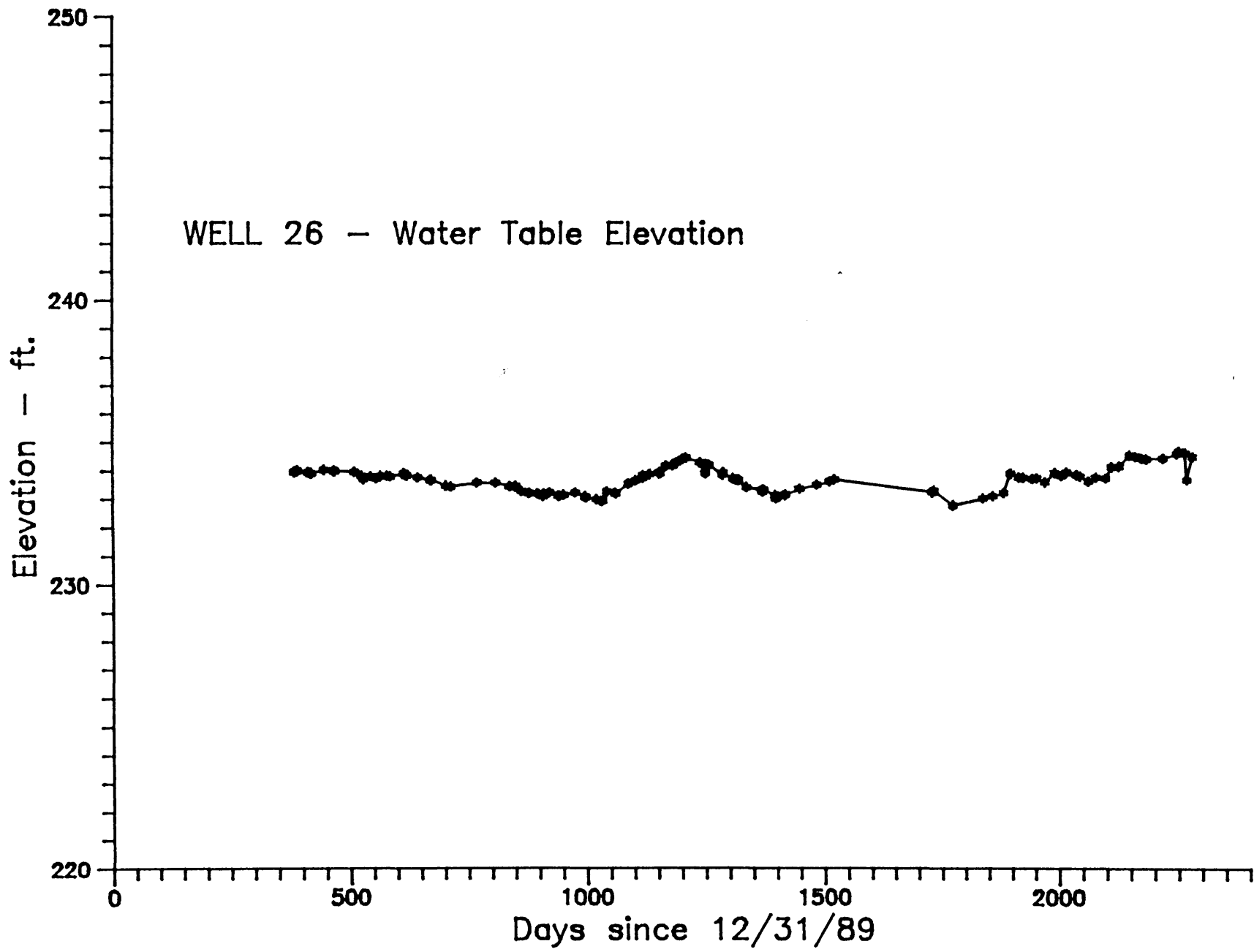




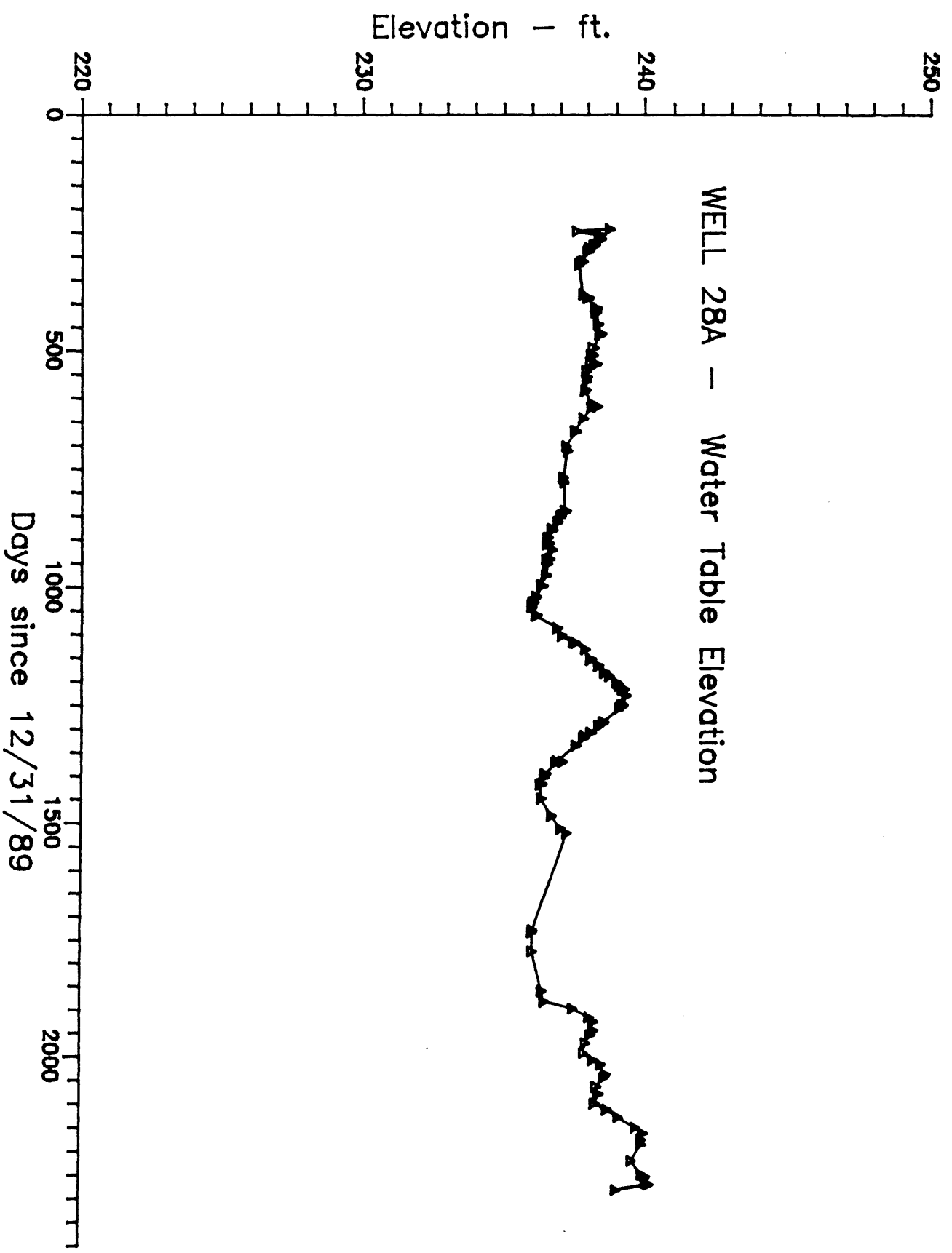


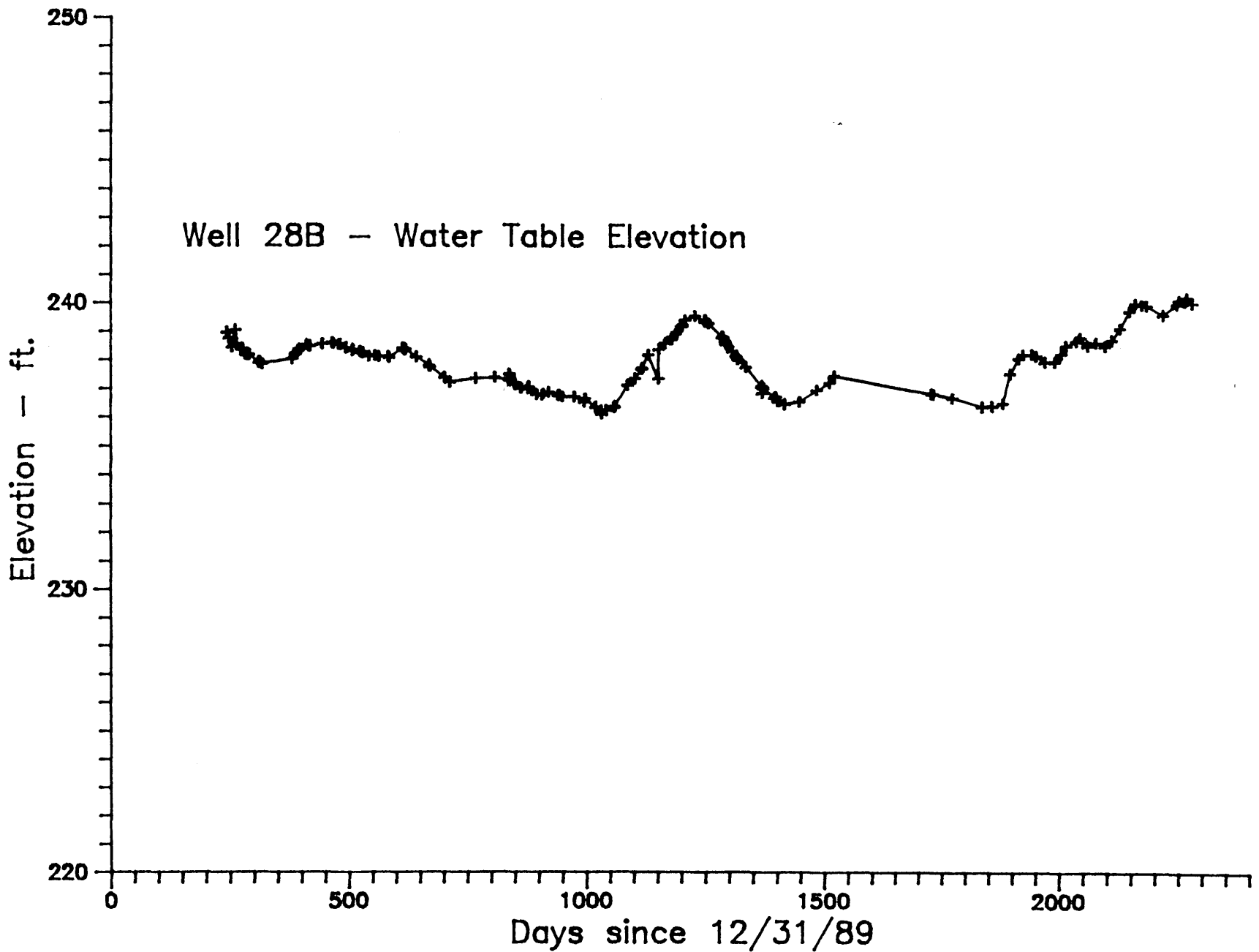
WELL P14 - Water Table Elevation

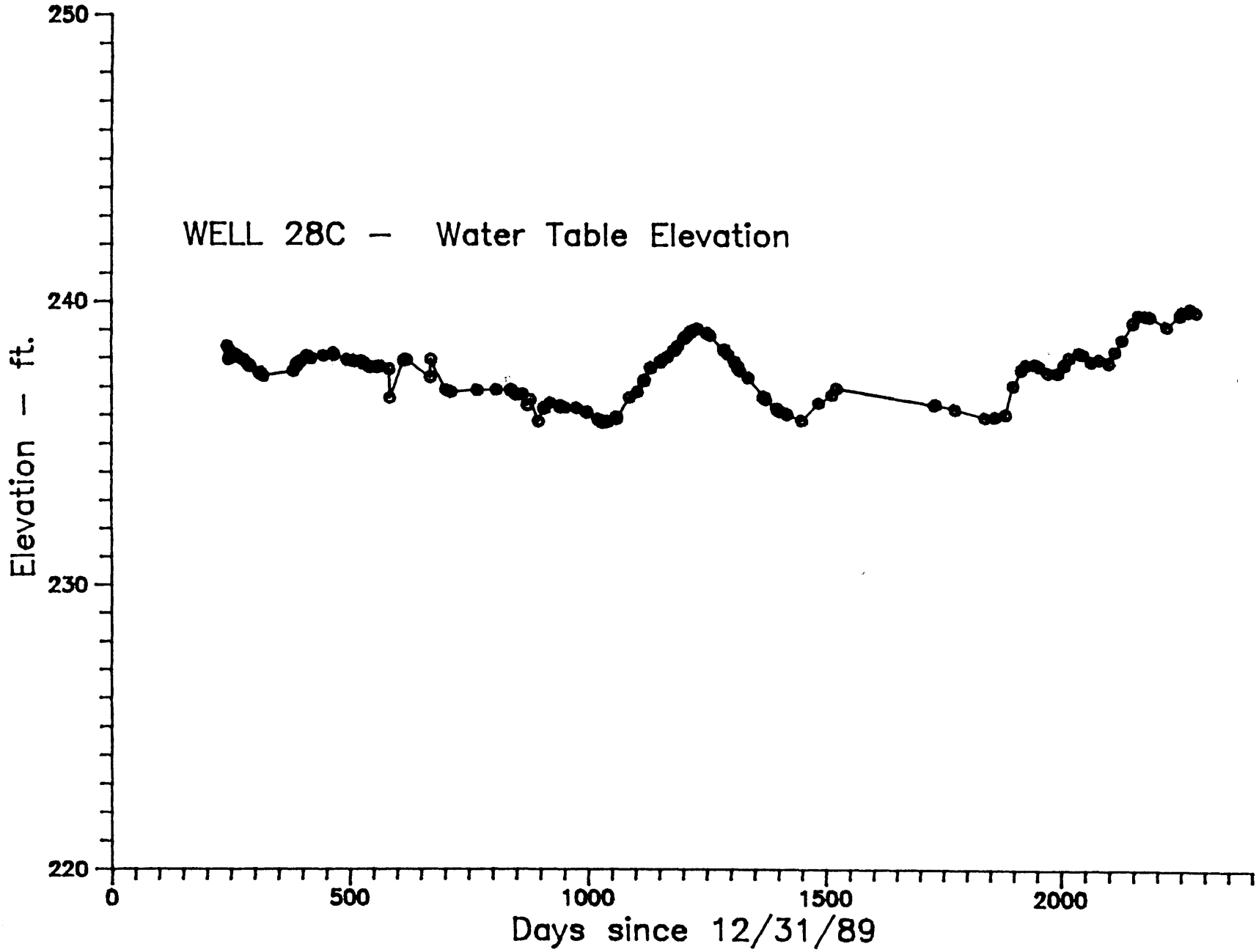


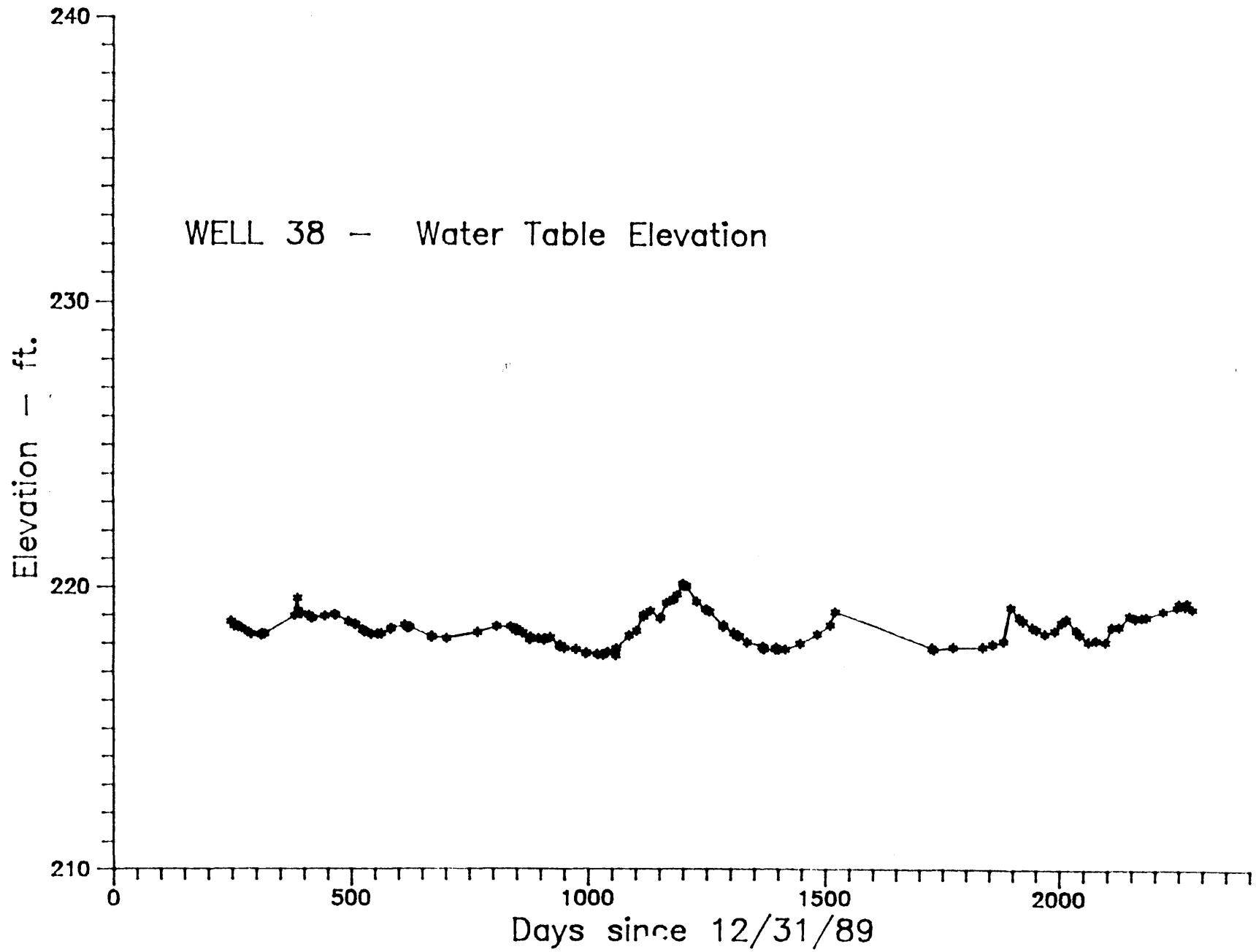


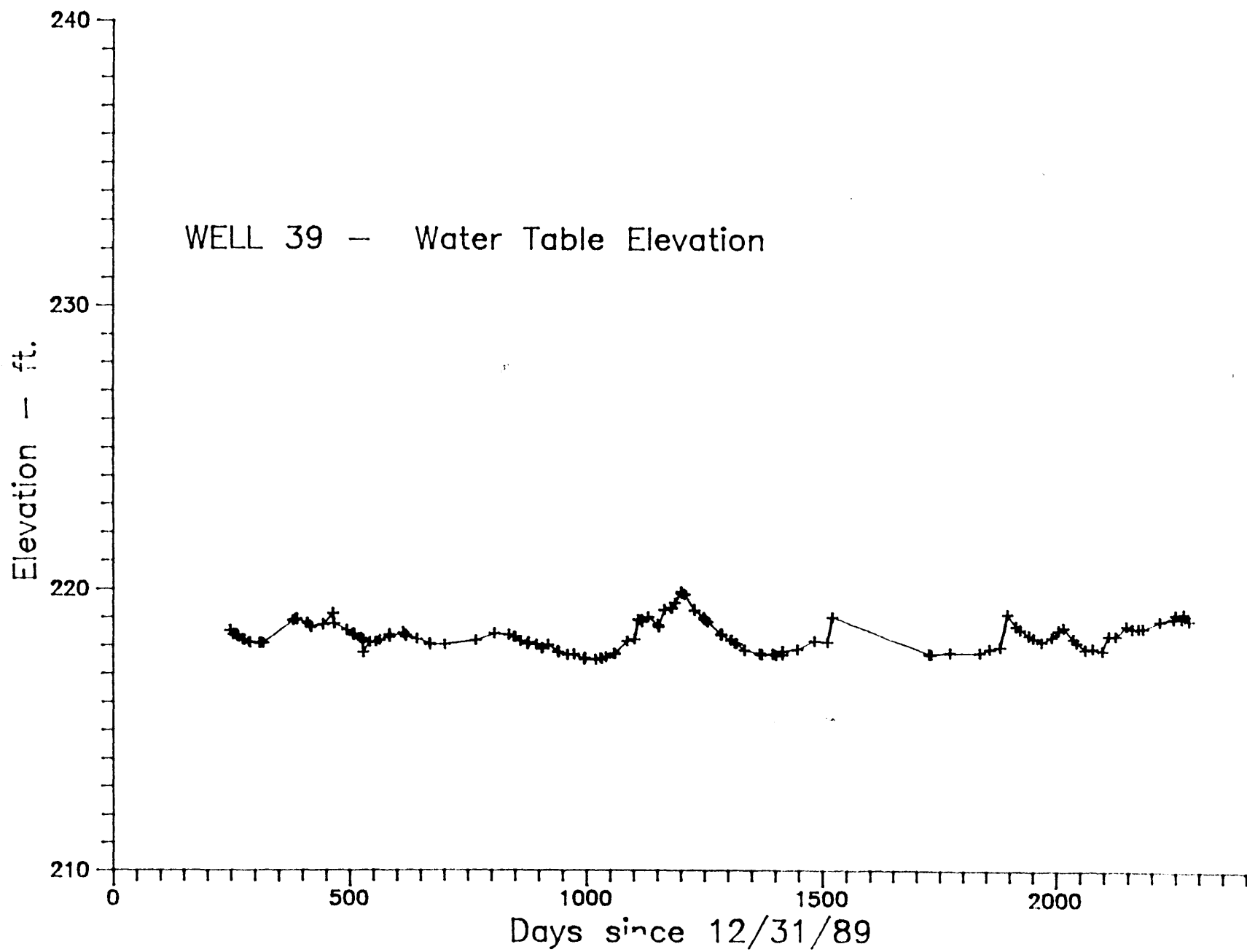
WELL 28A - Water Table Elevation

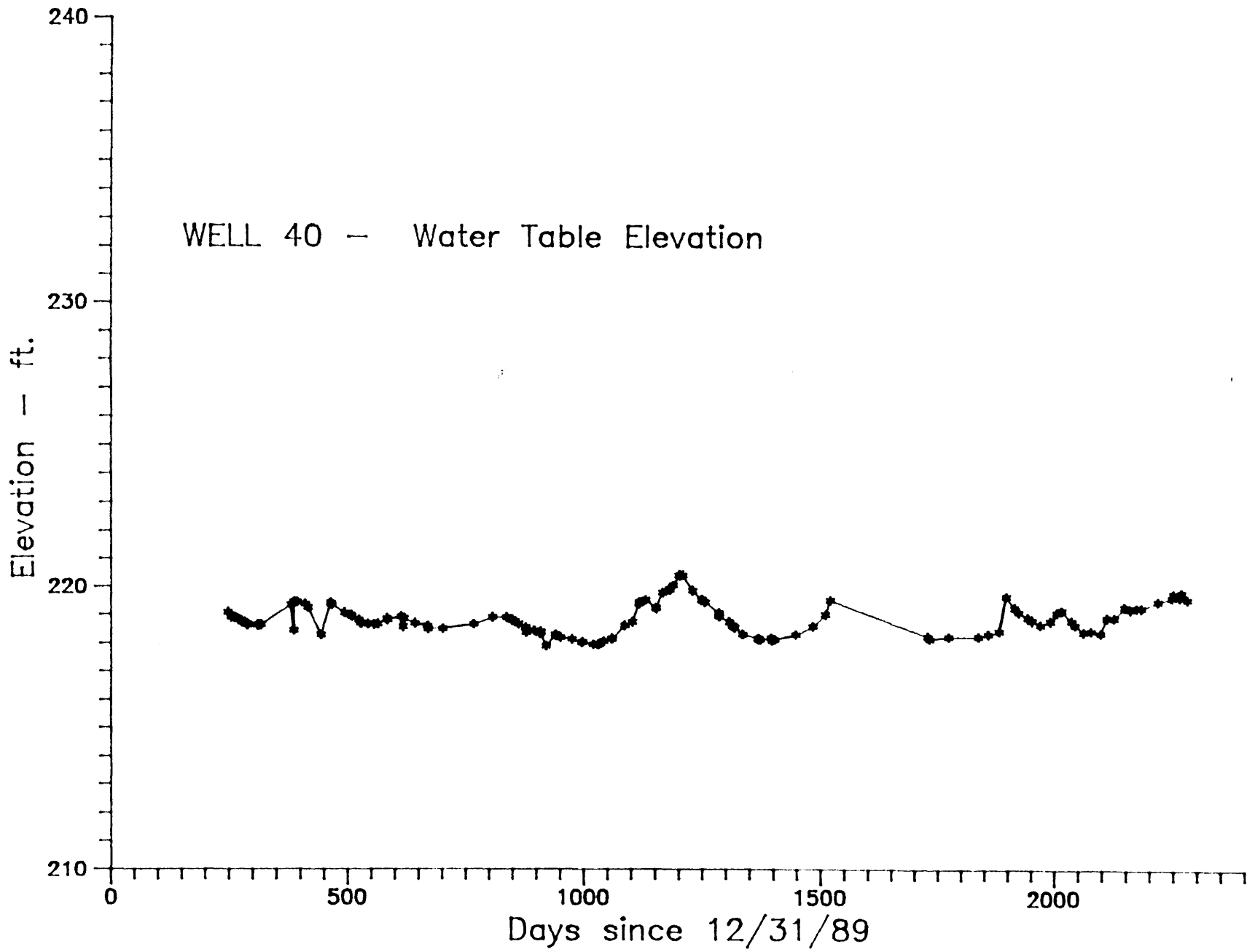




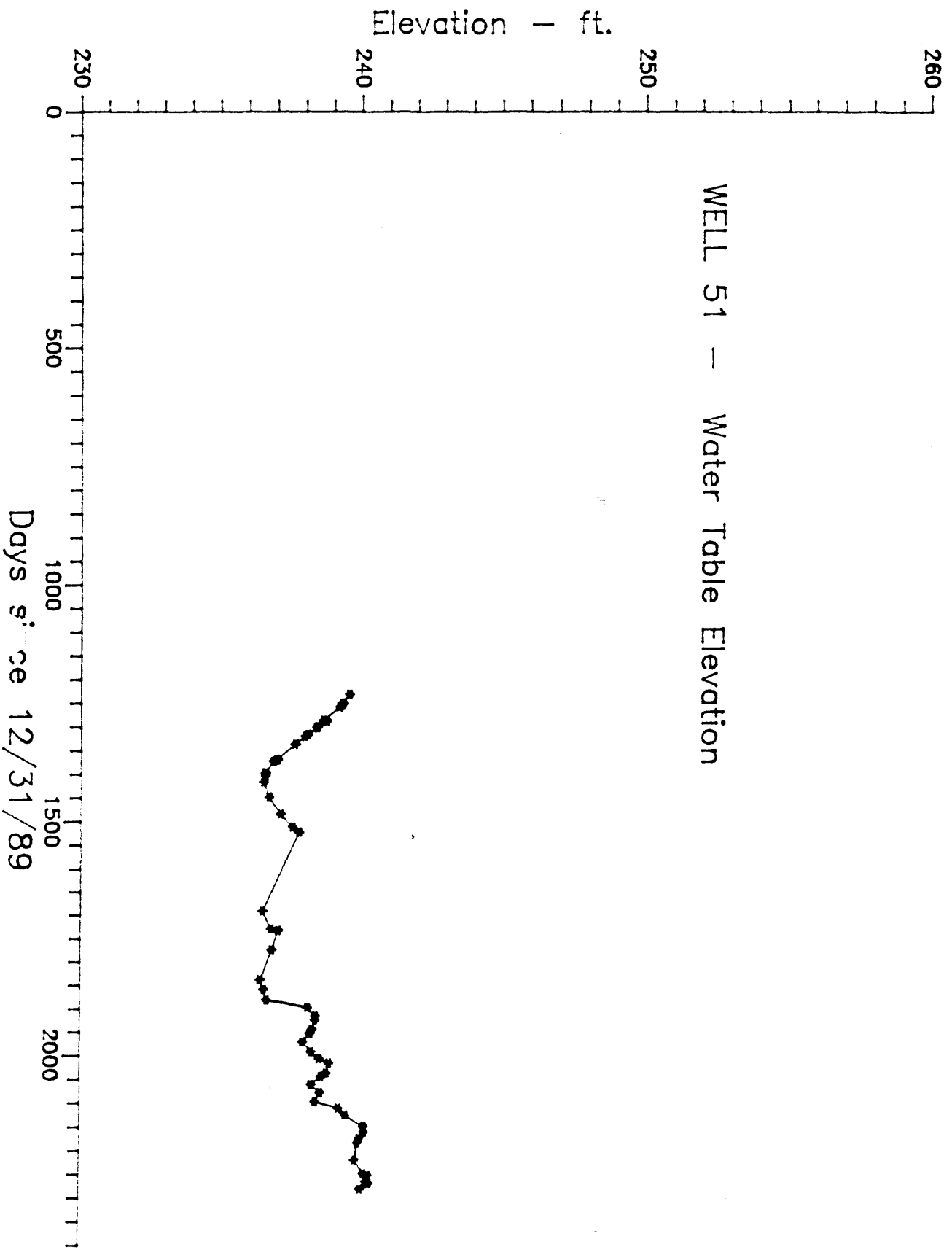


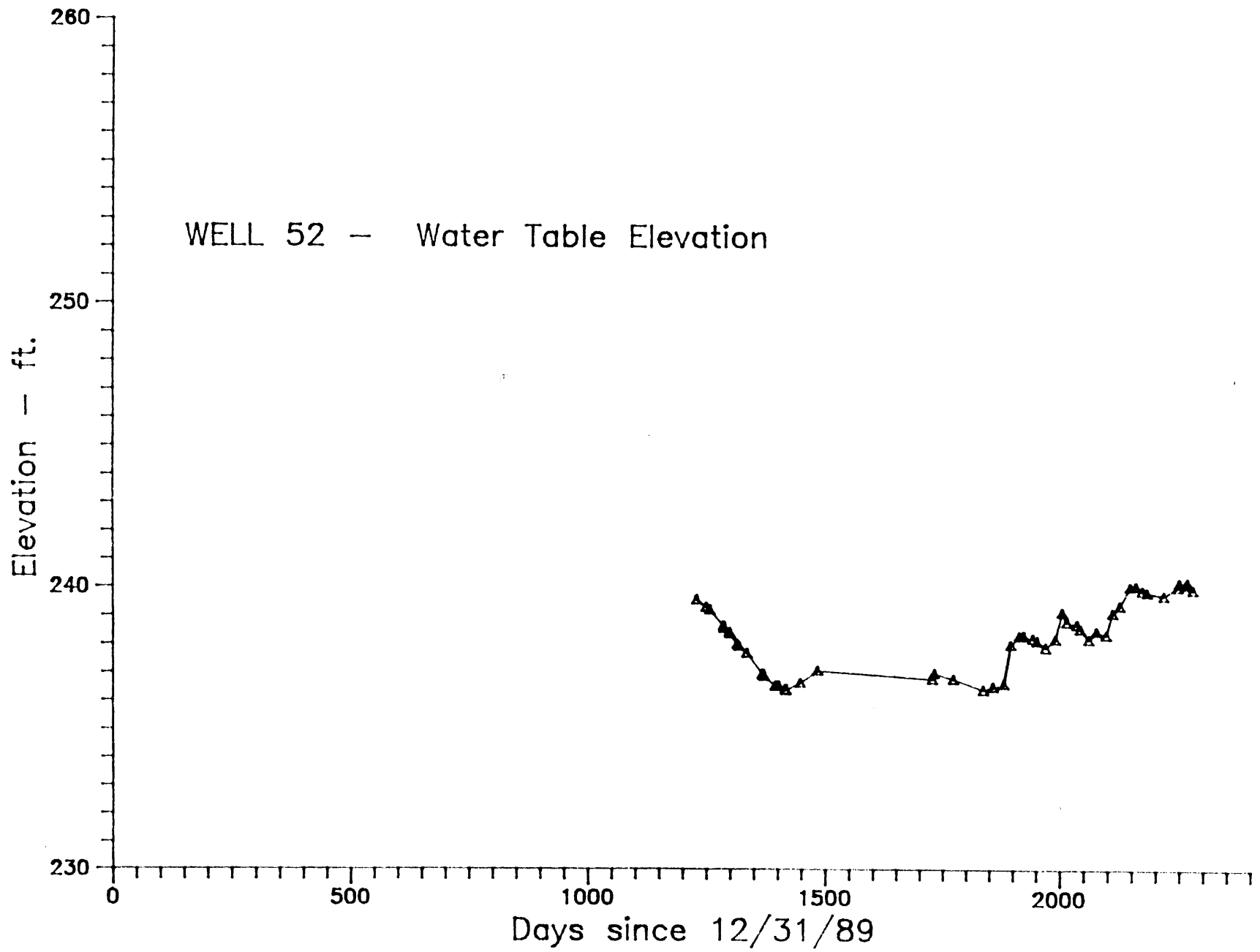


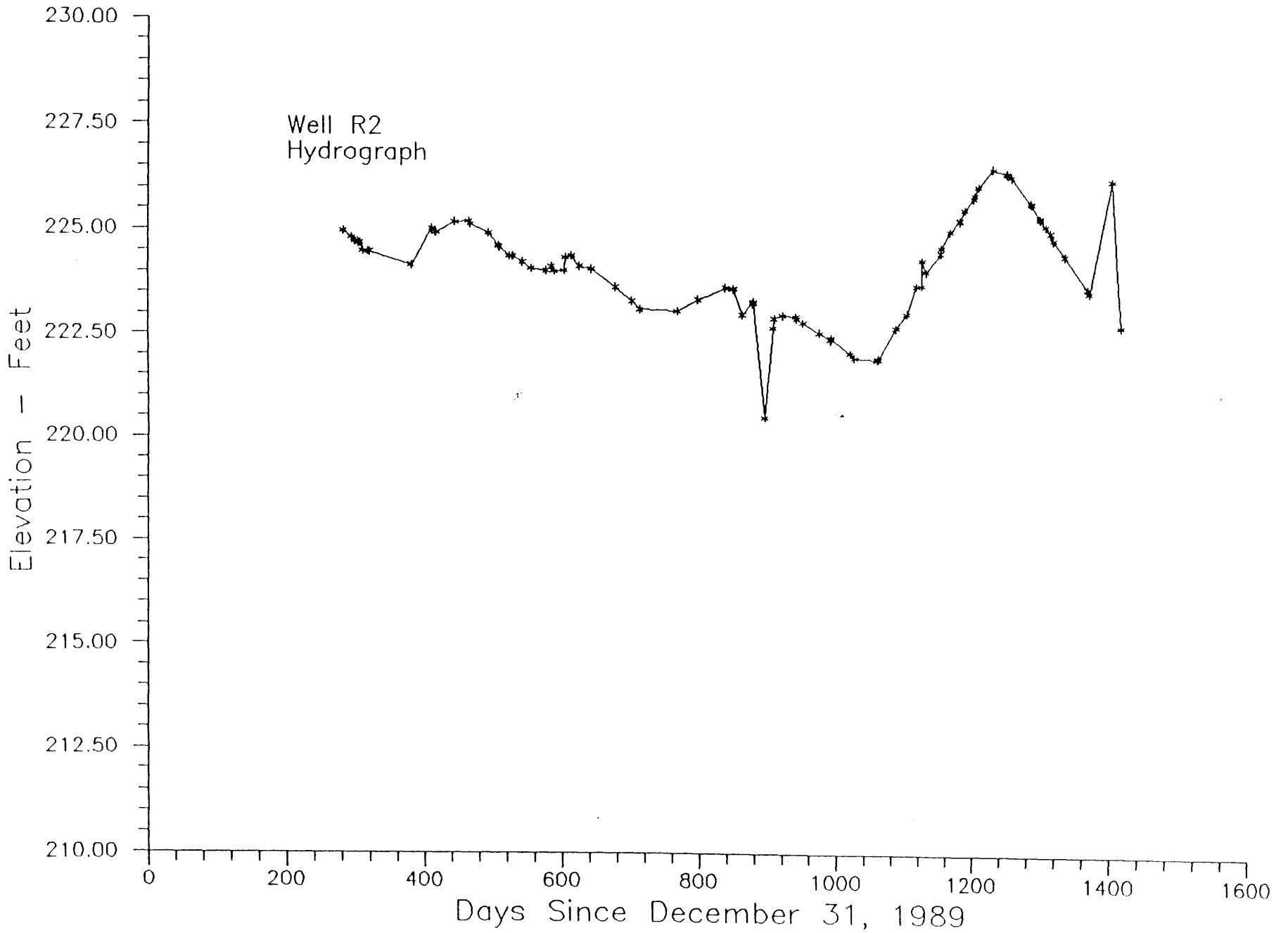


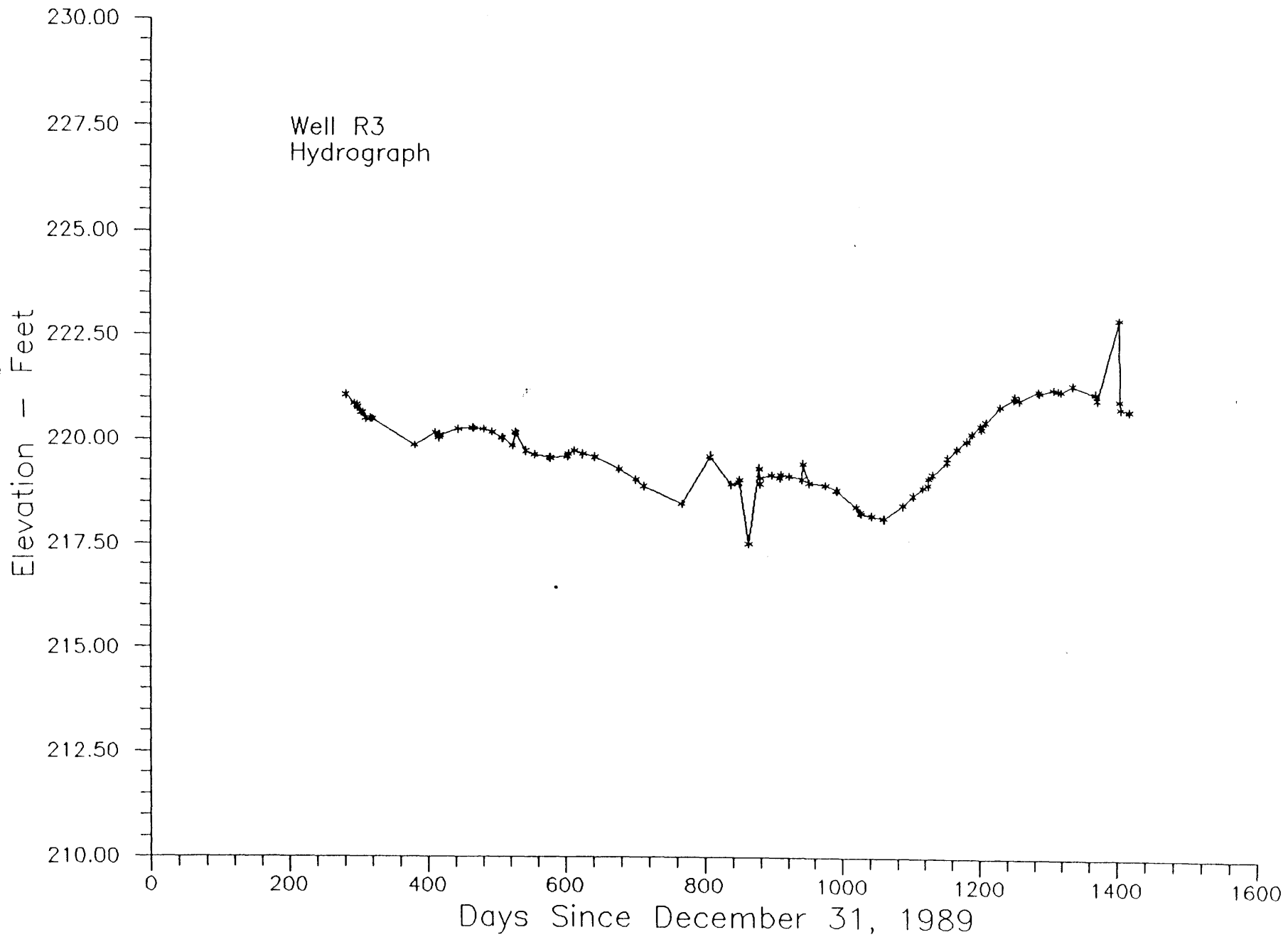


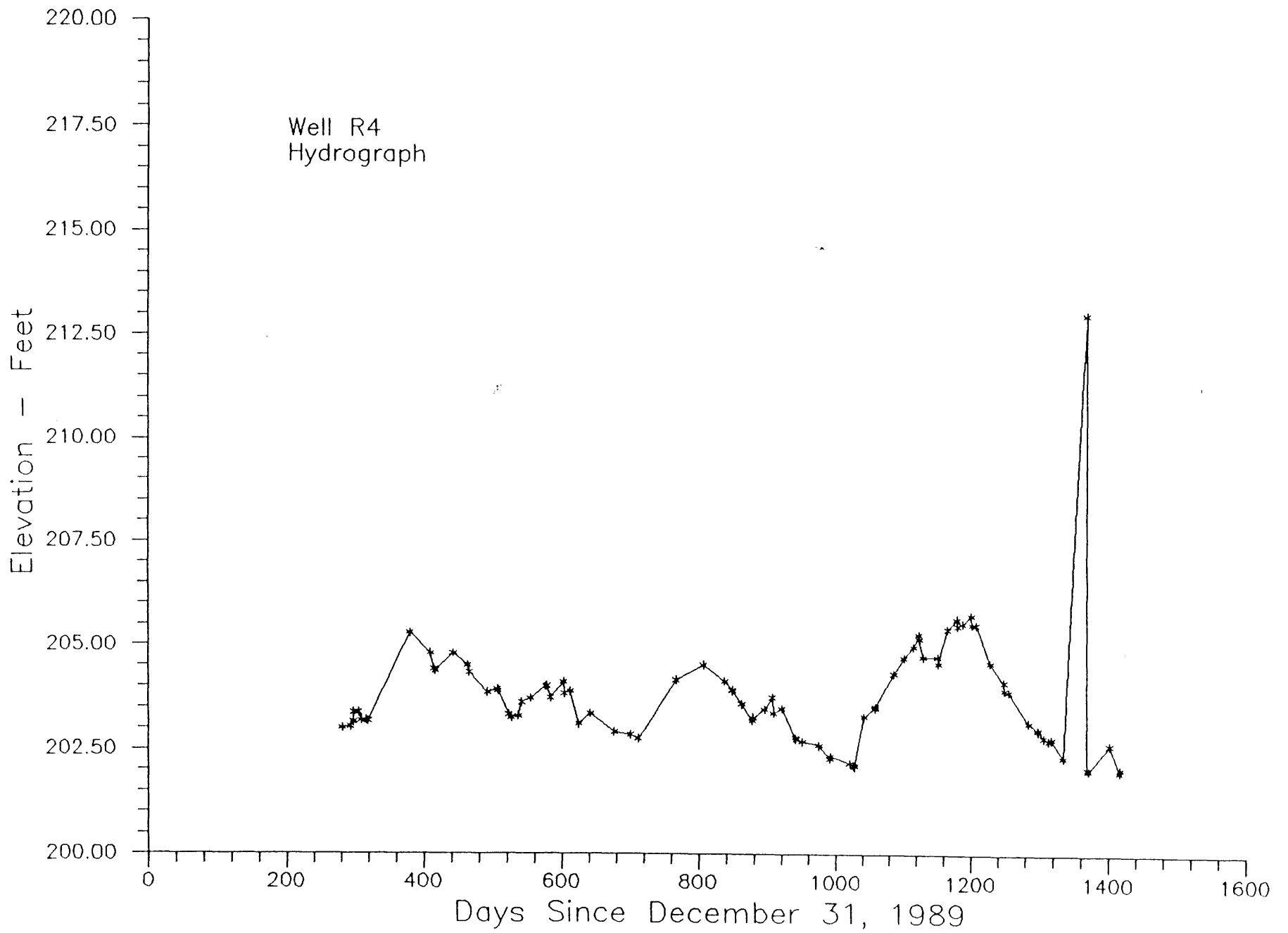
WELL 51 - Water Table Elevation



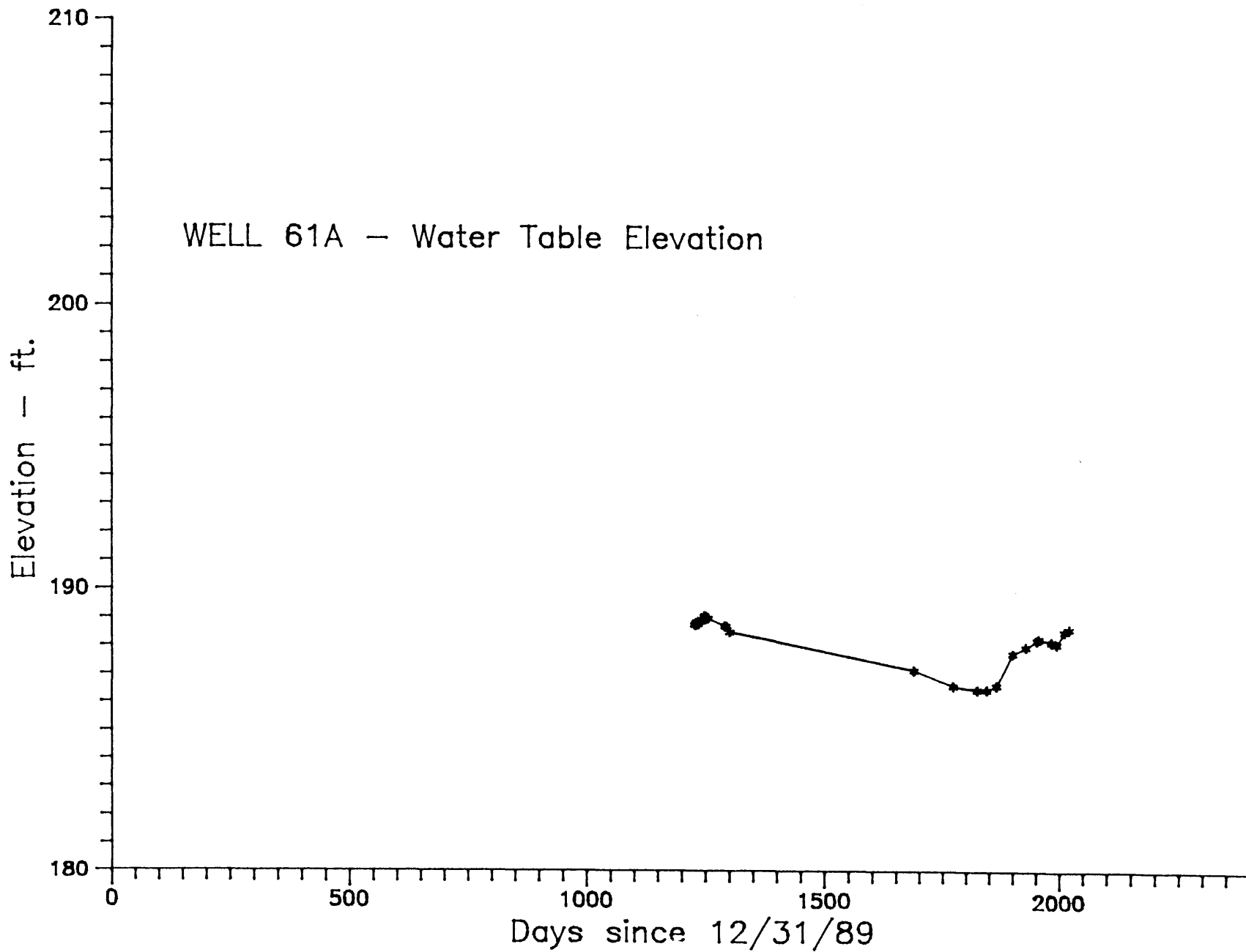




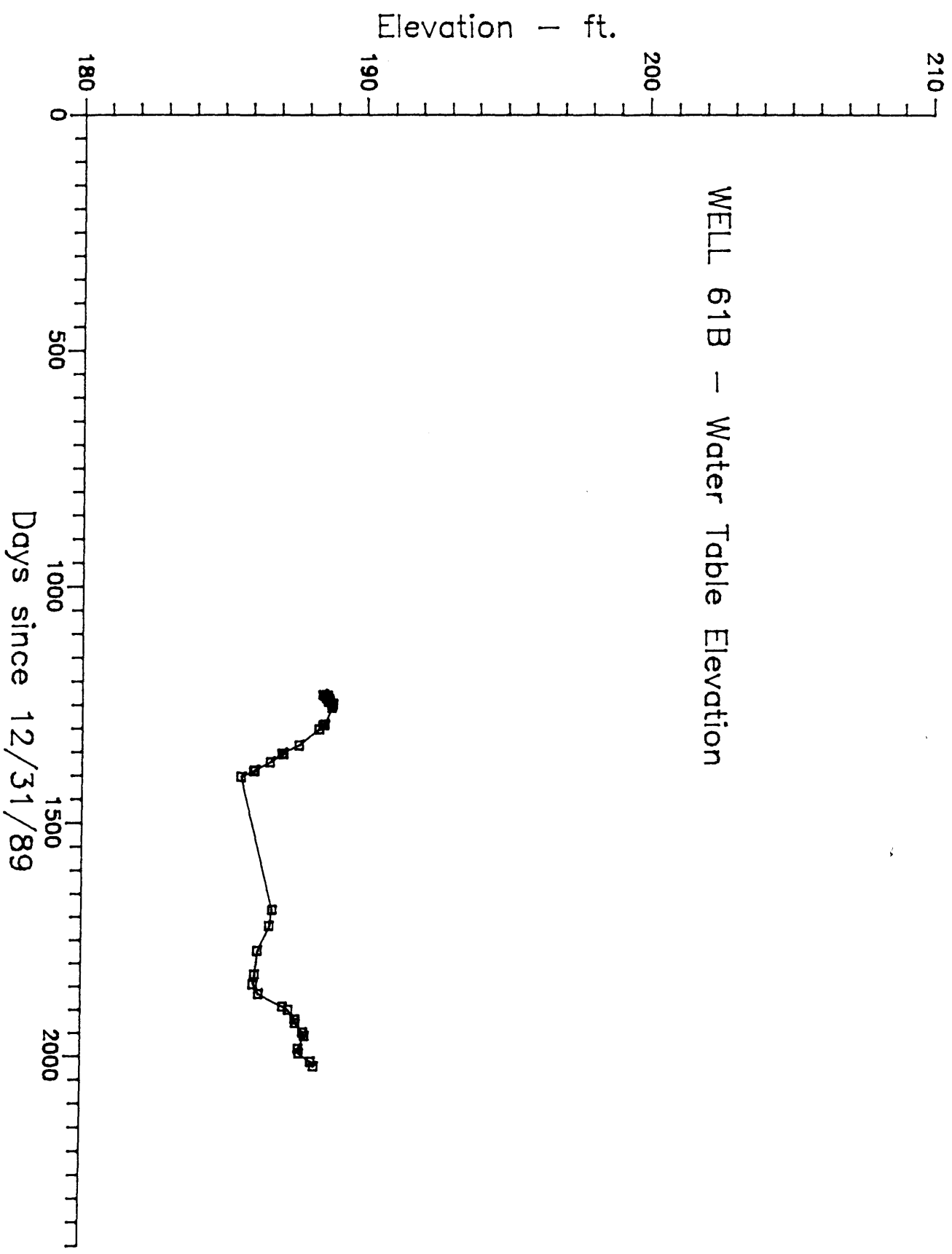


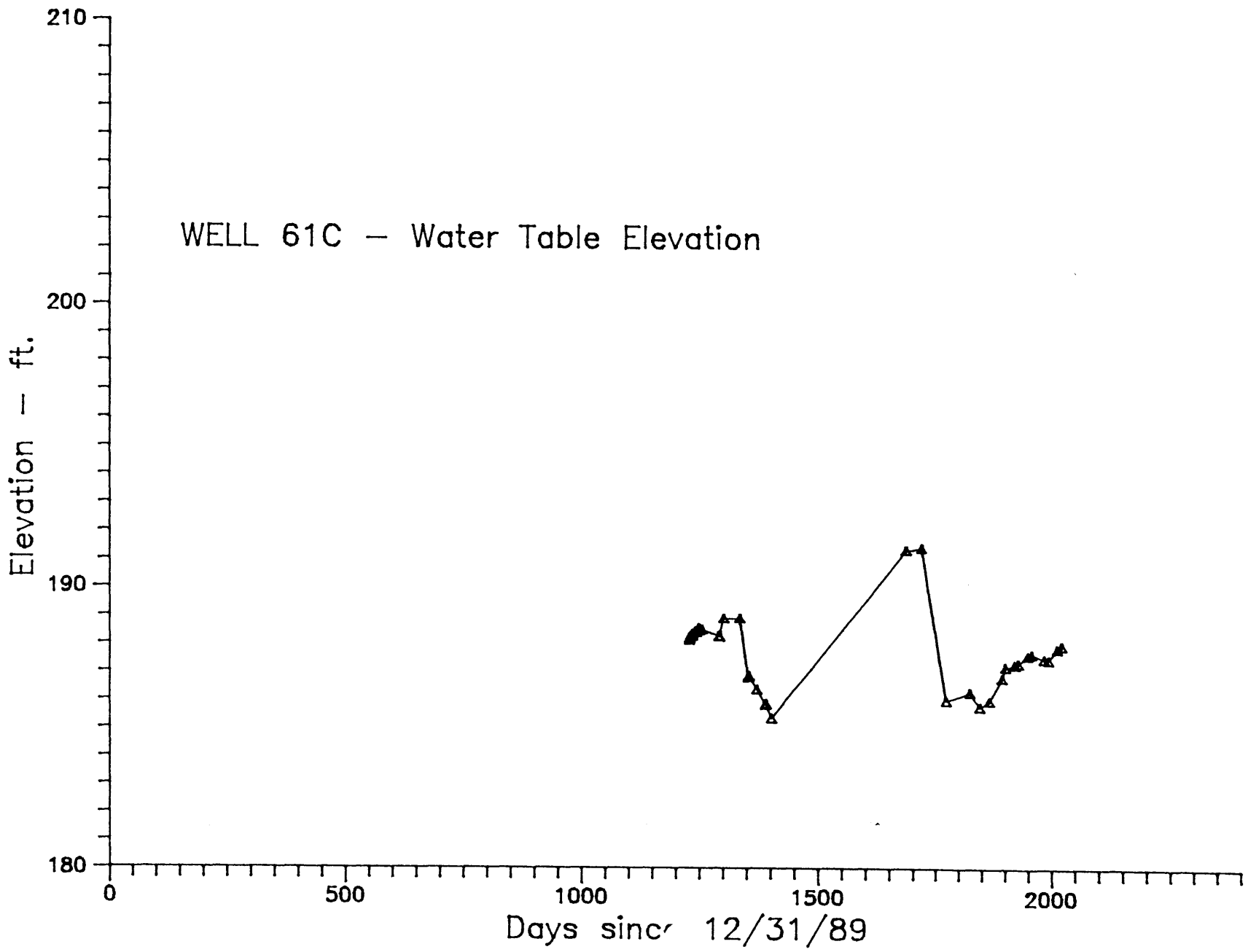


WELL 61A — Water Table Elevation

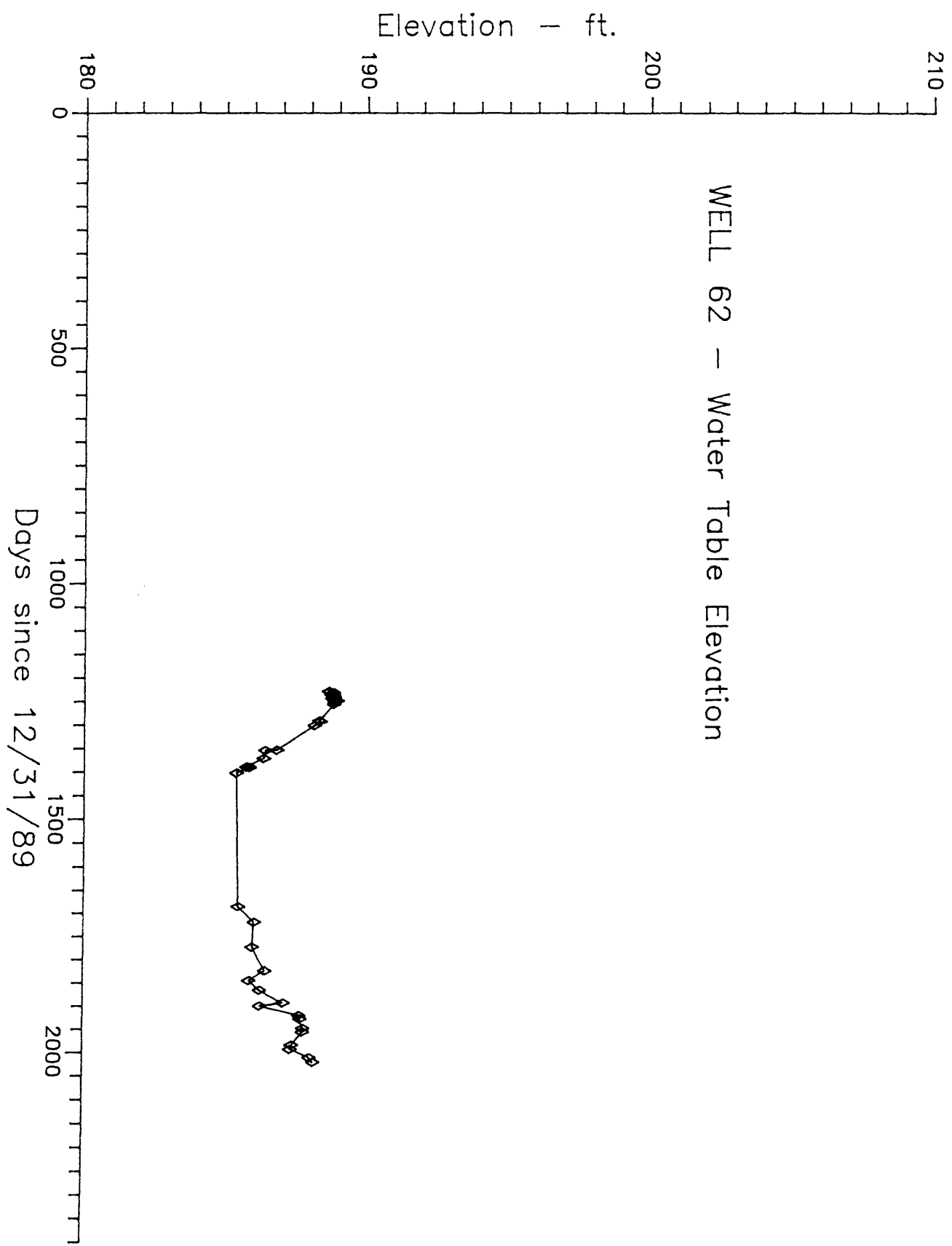


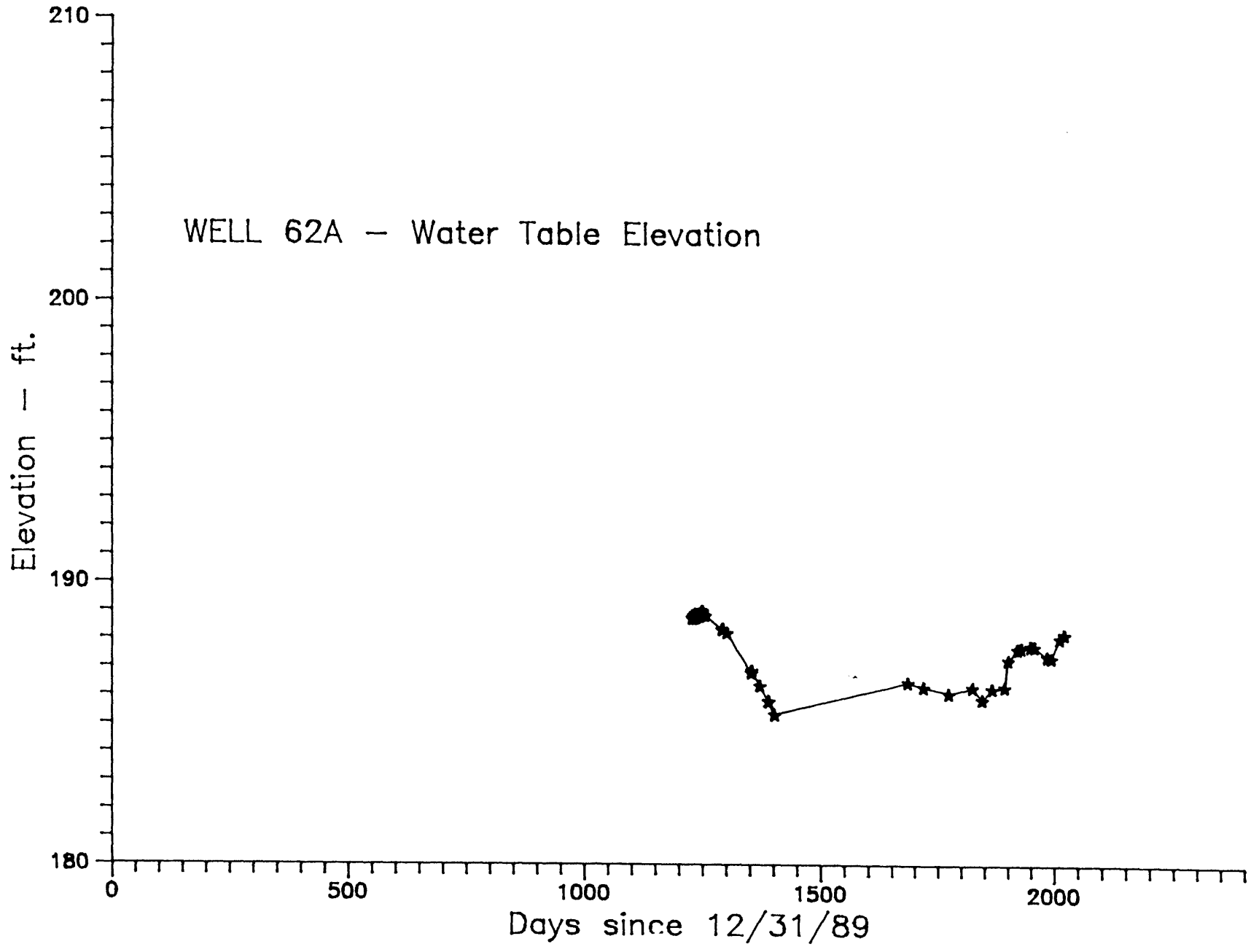
WELL 61B - Water Table Elevation



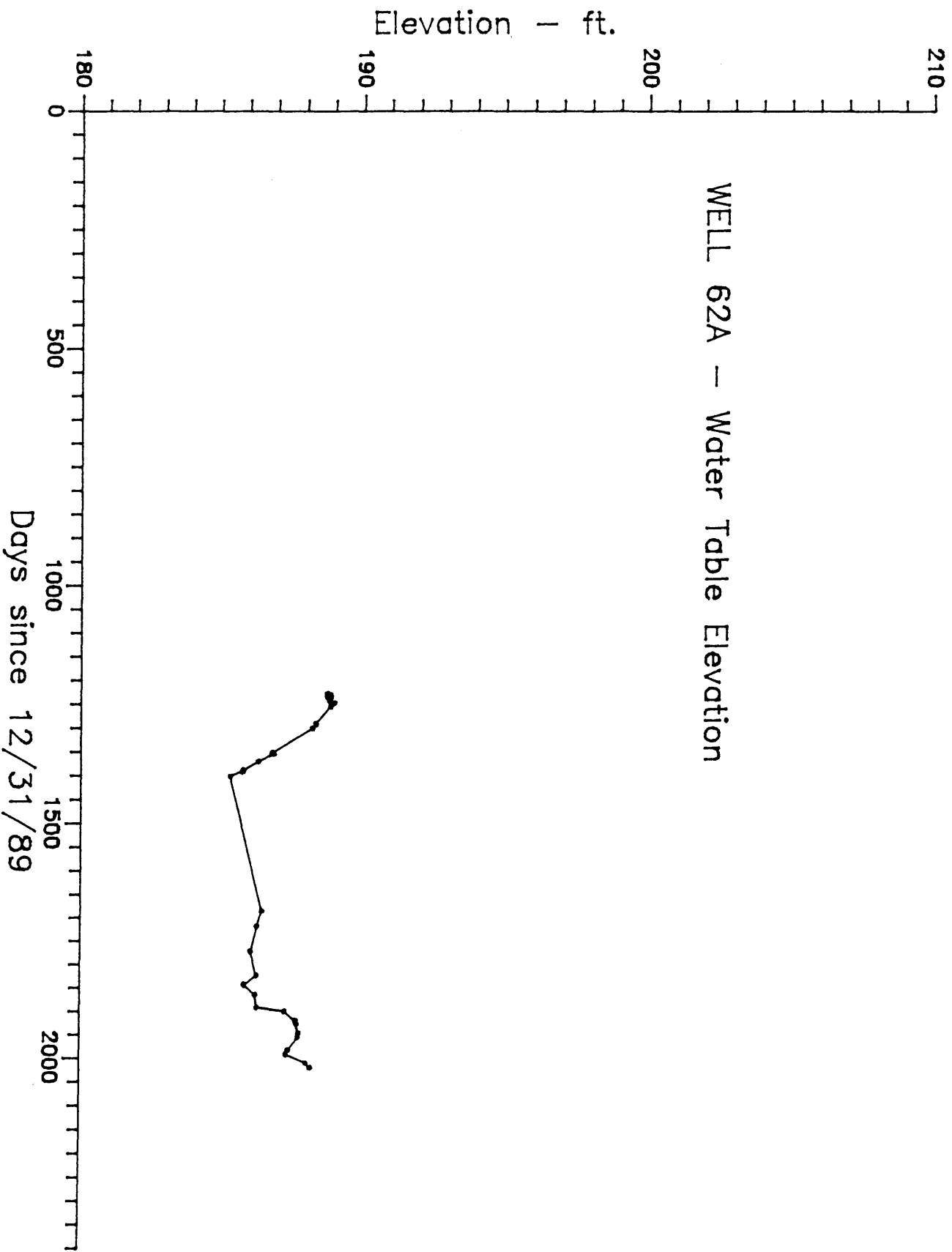


WELL 62 - Water Table Elevation

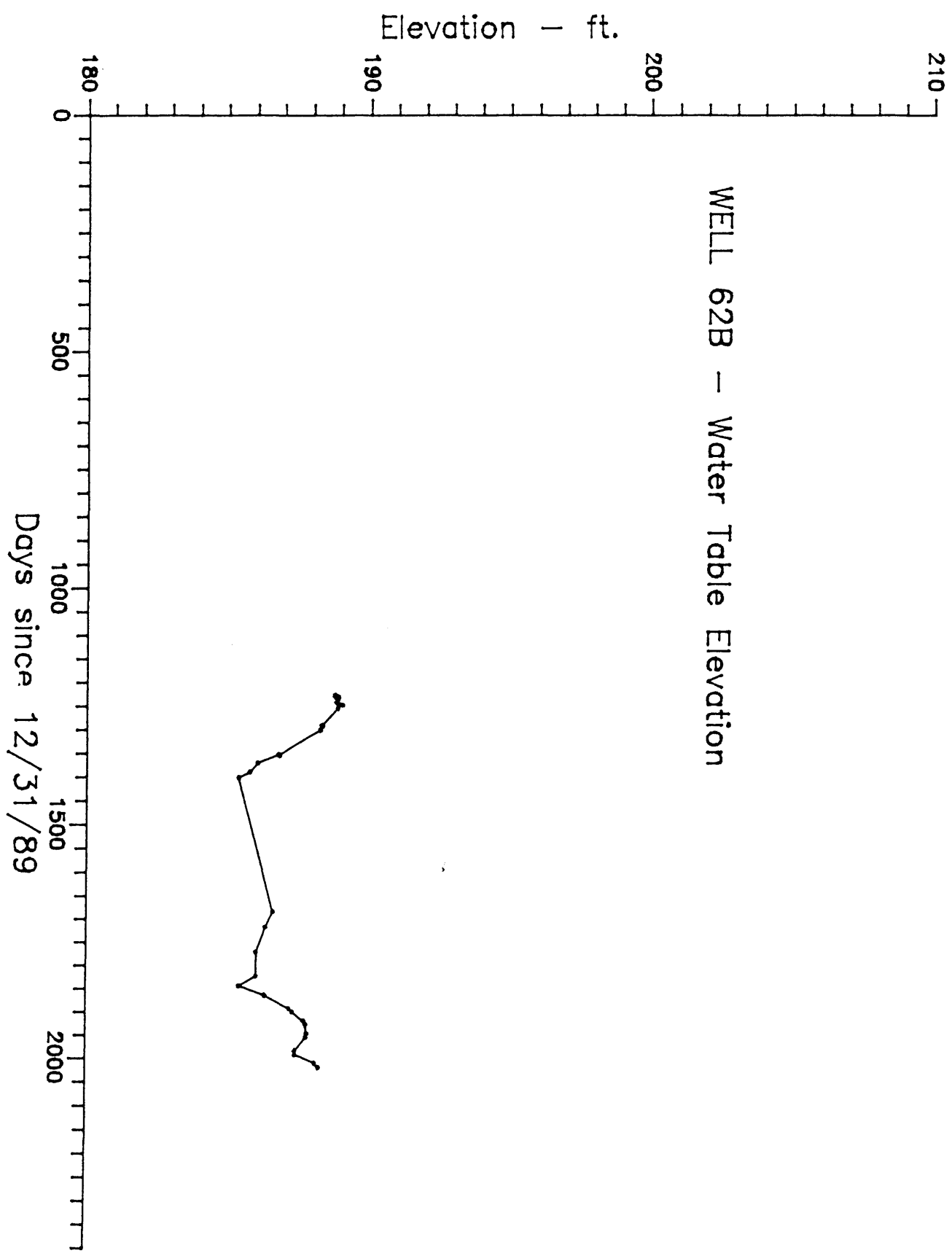




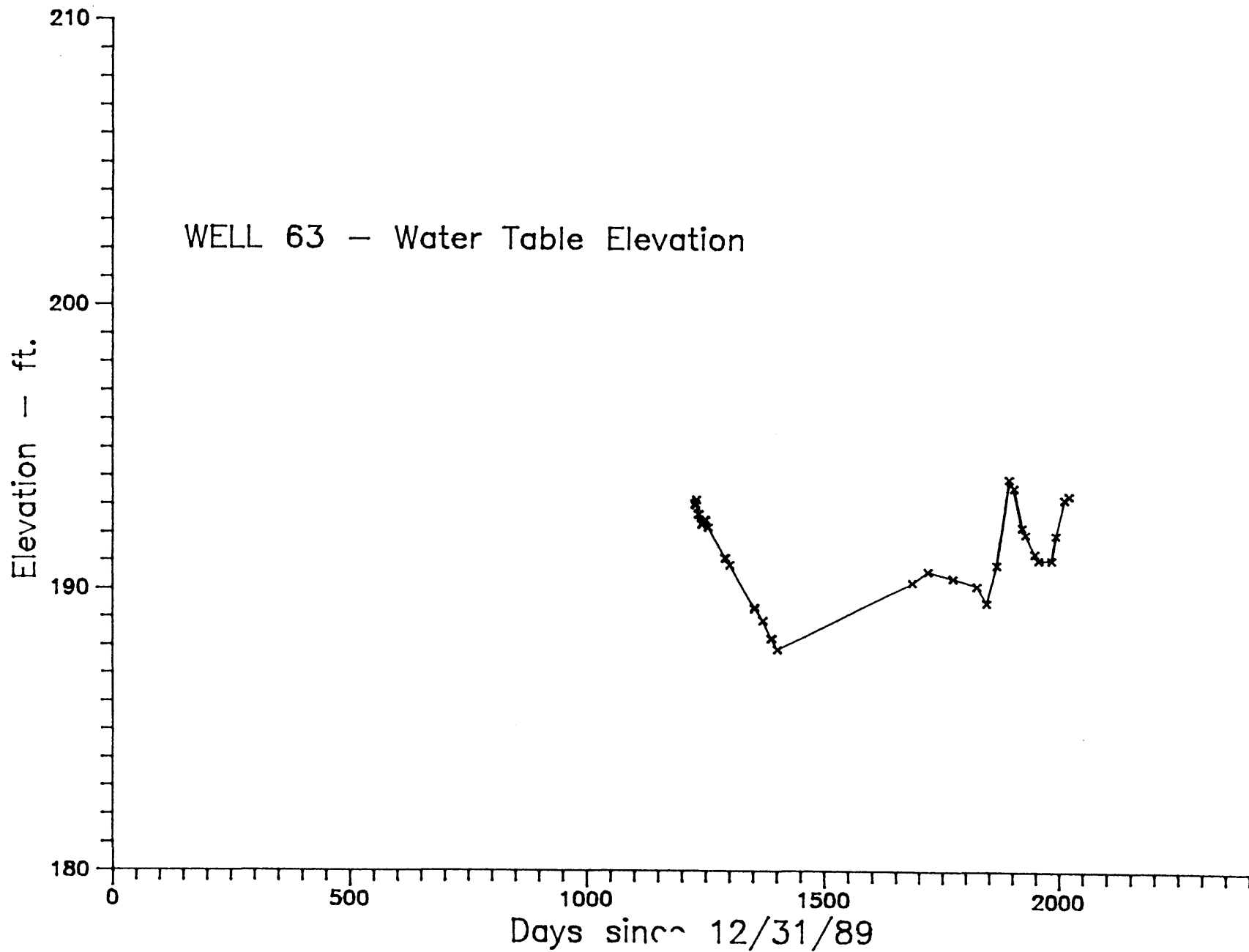
WELL 62A - Water Table Elevation



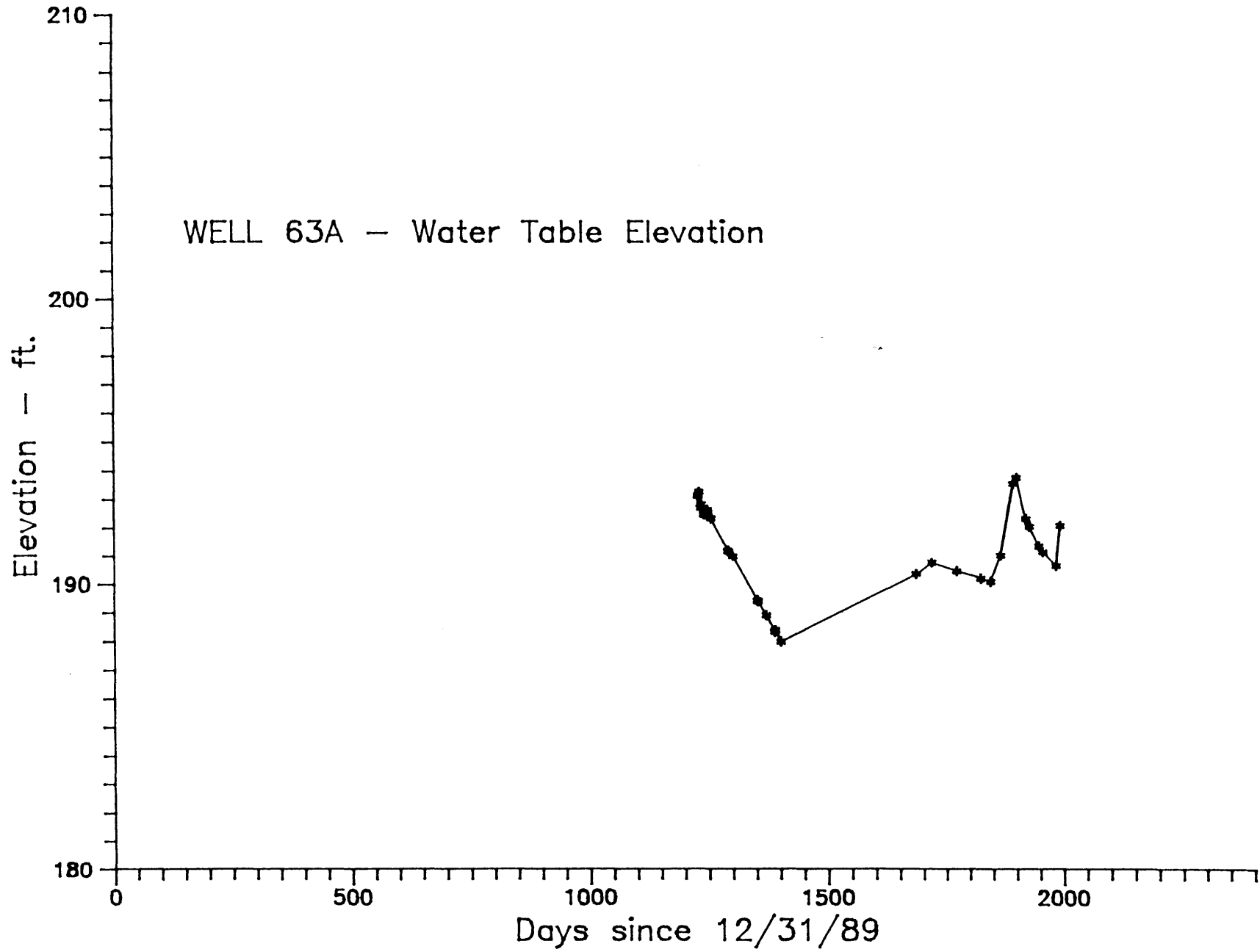
WELL 62B - Water Table Elevation



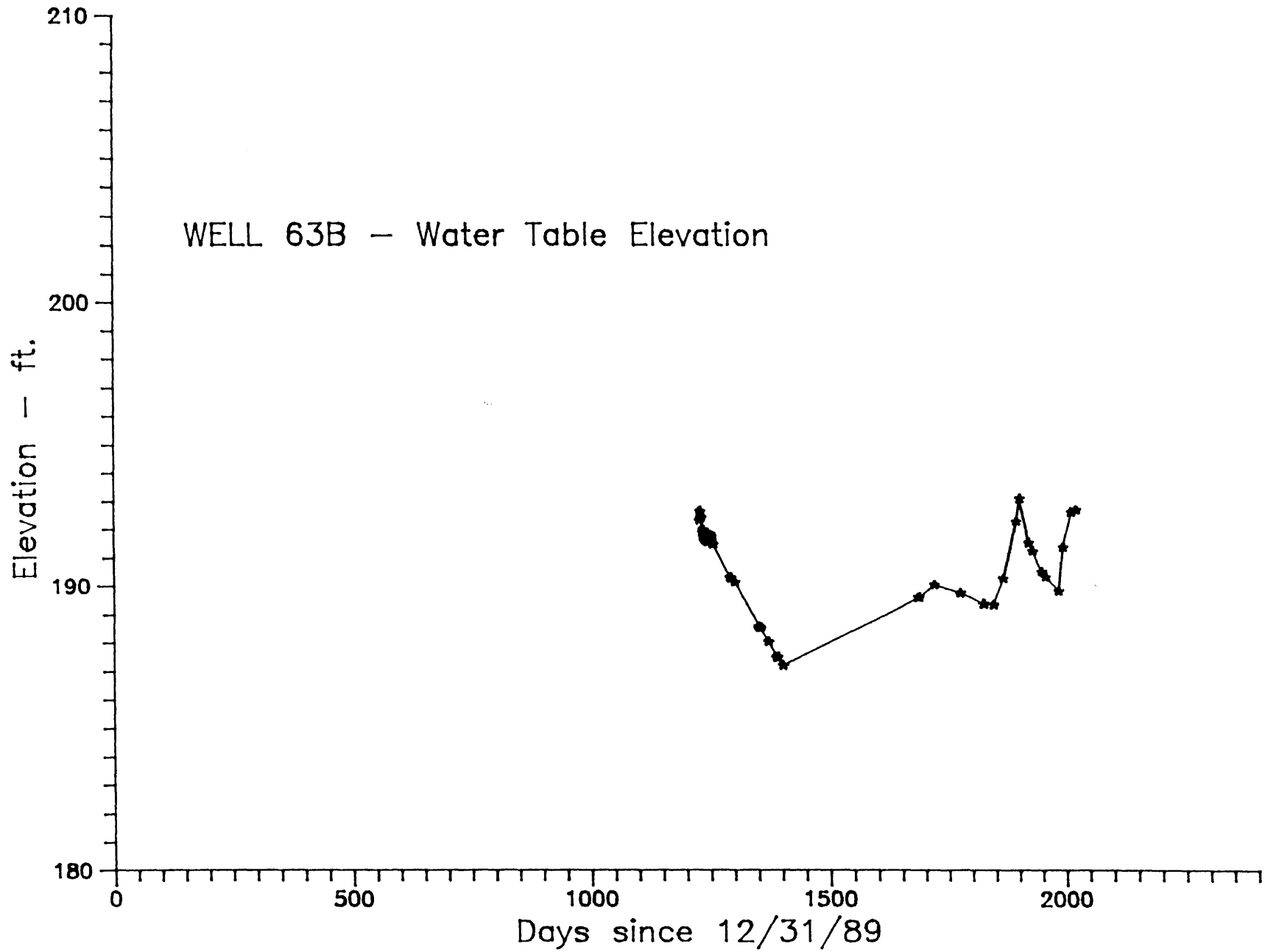
WELL 63 - Water Table Elevation



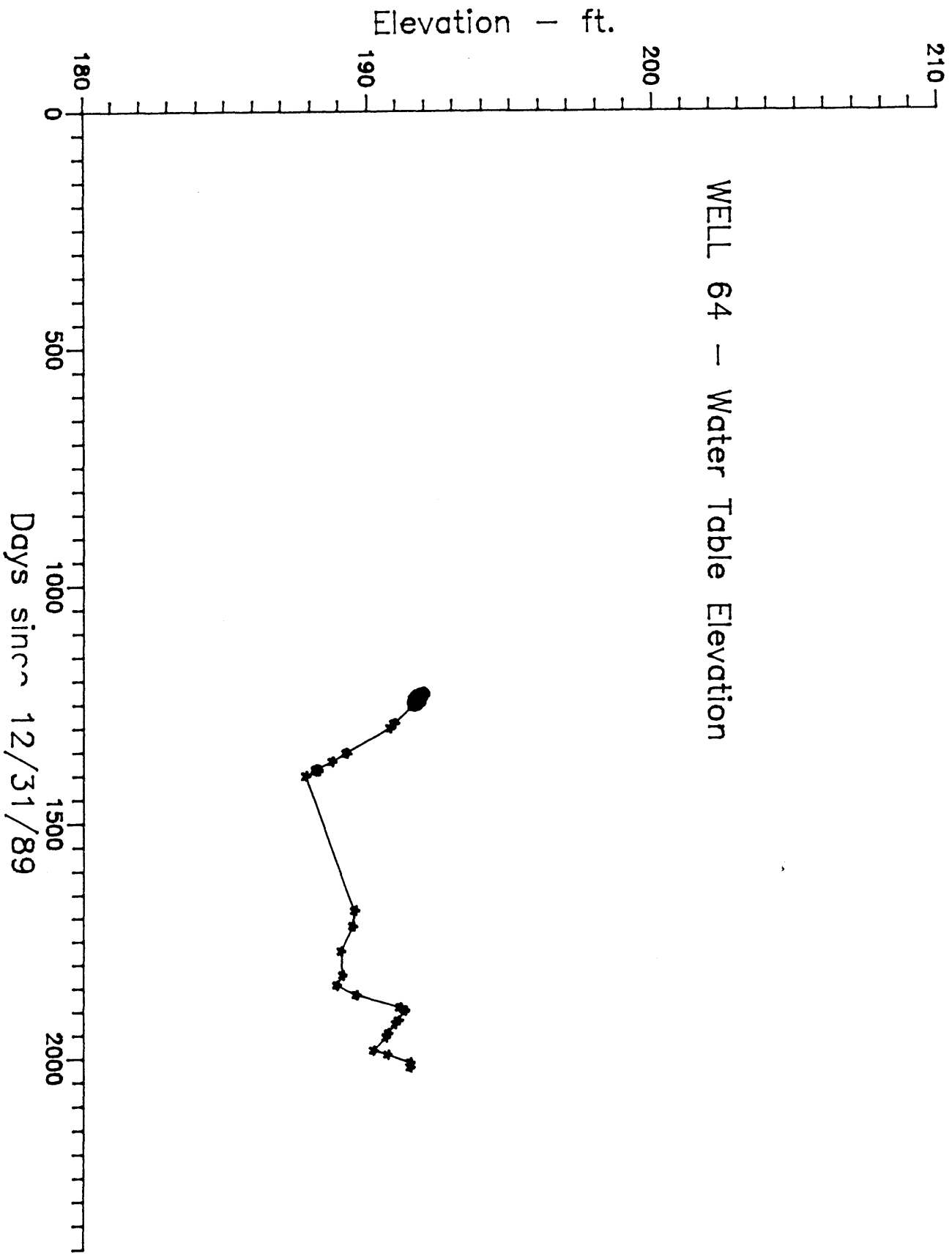
WELL 63A — Water Table Elevation



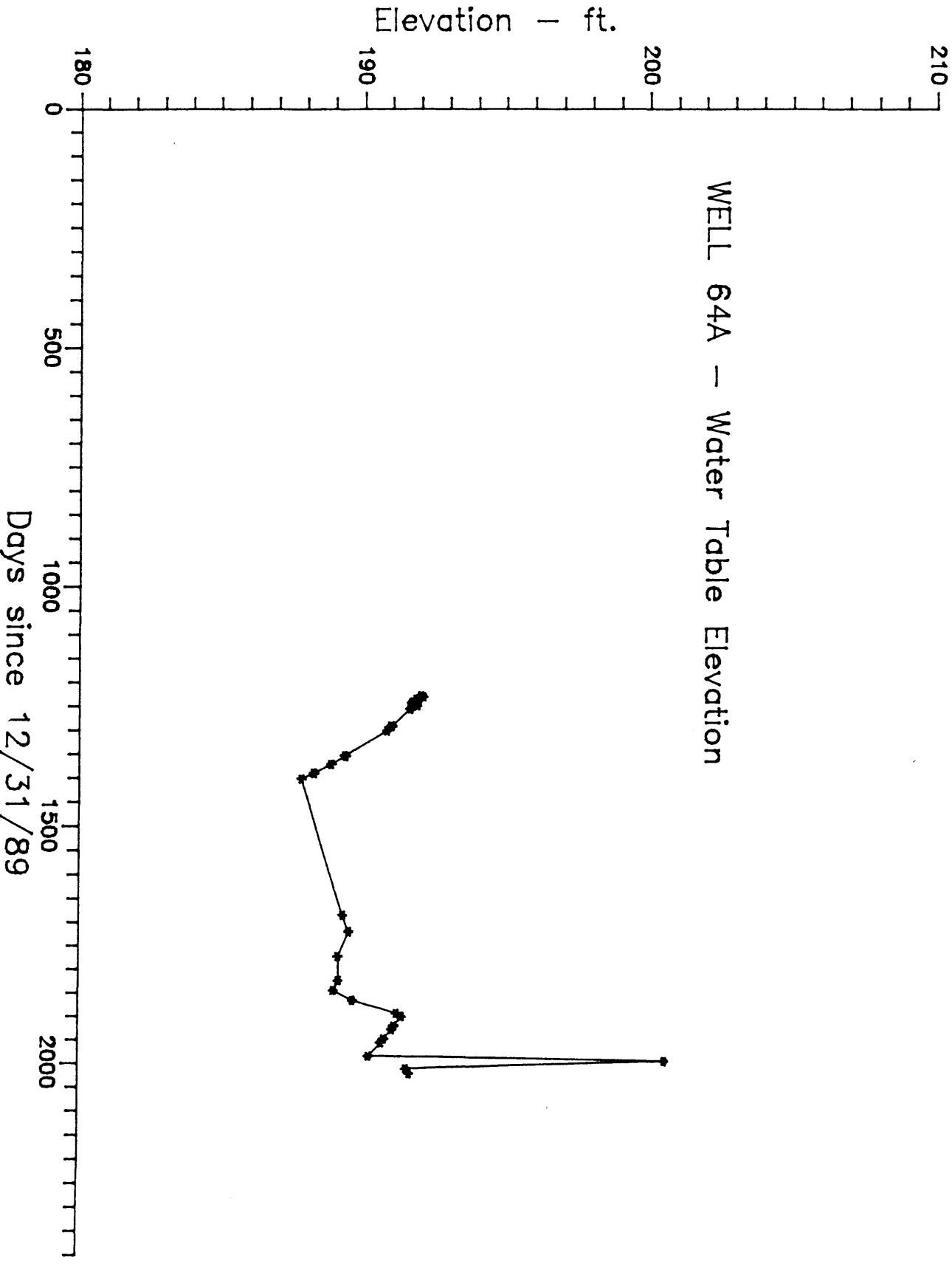
WELL 63B - Water Table Elevation



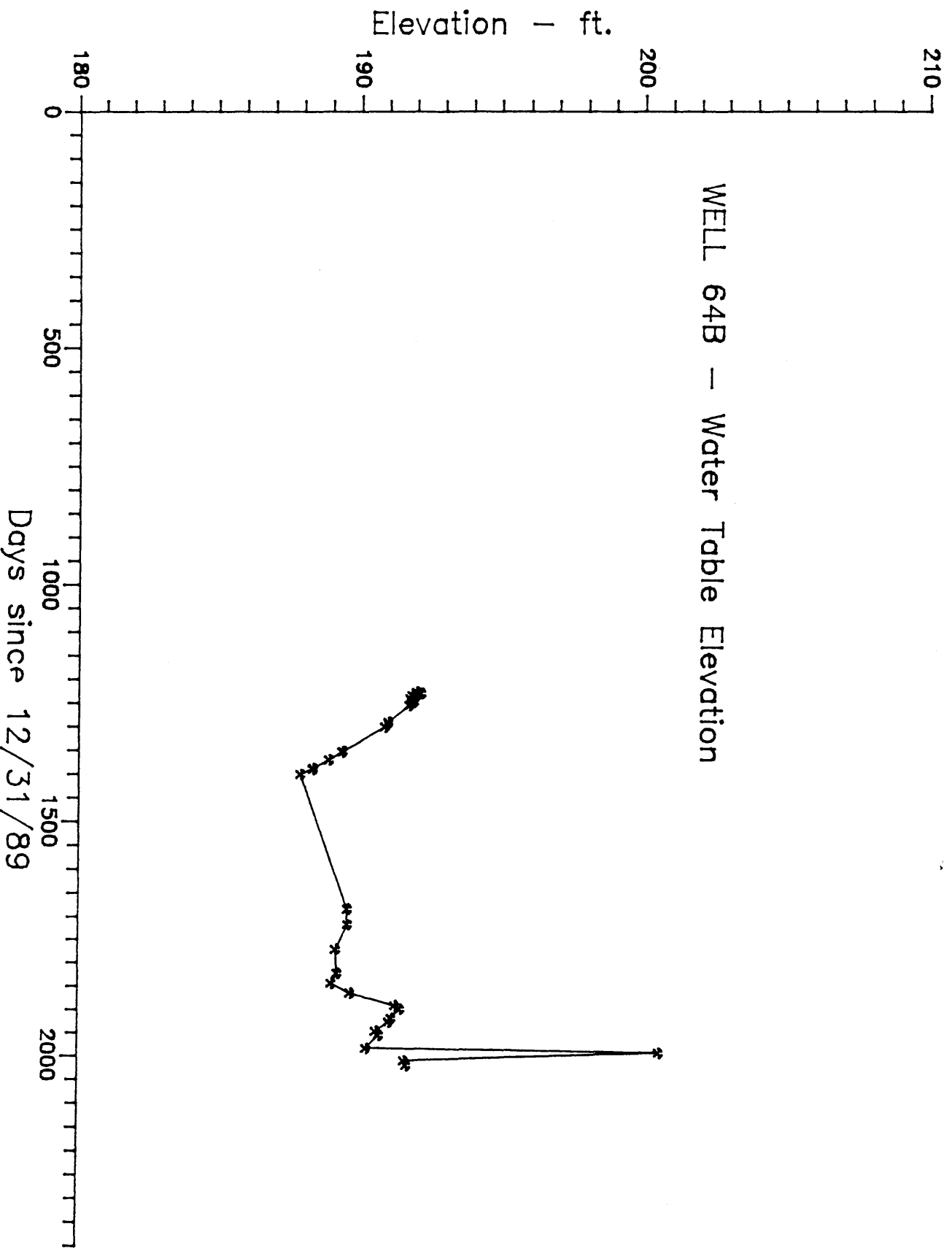
WELL 64 - Water Table Elevation

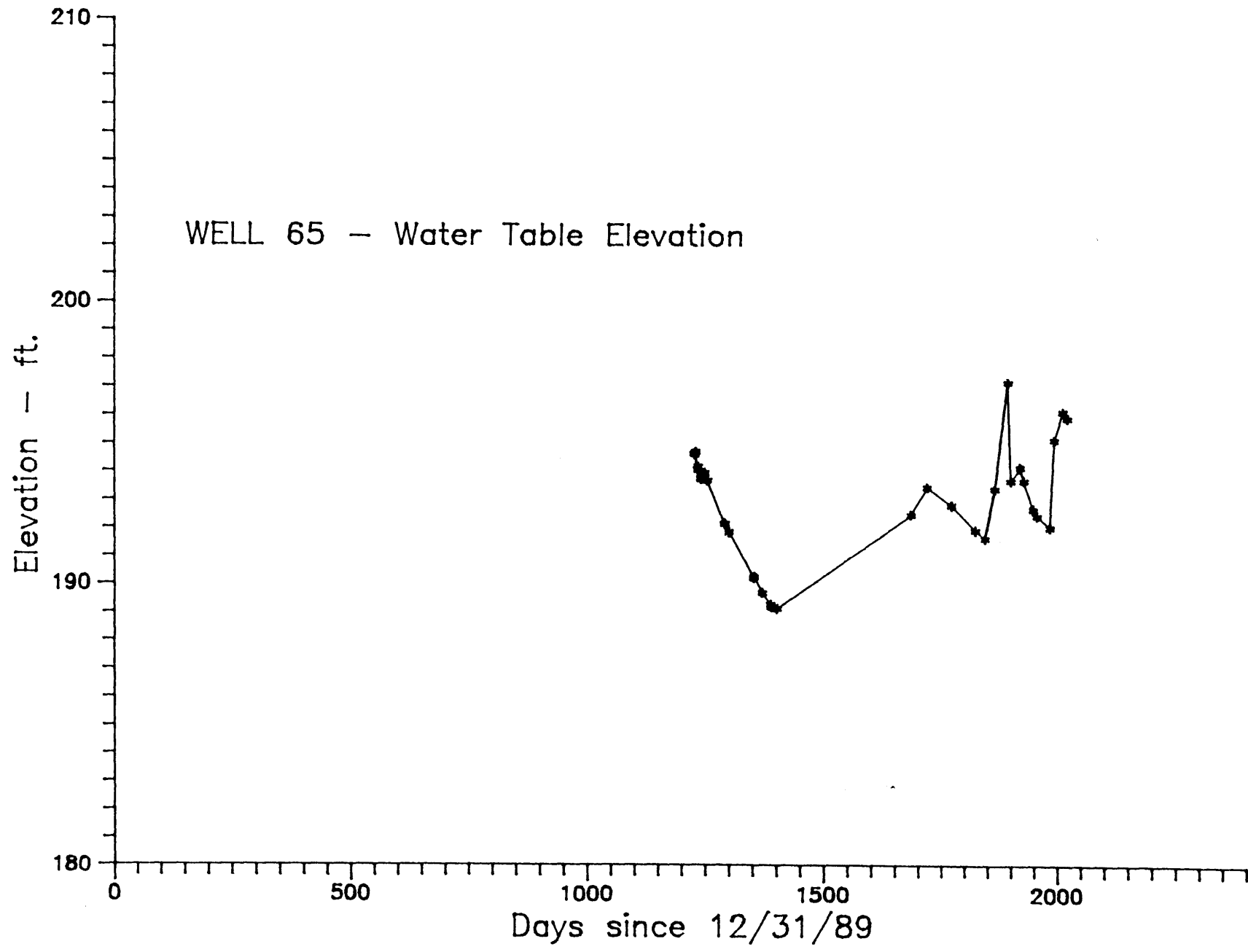


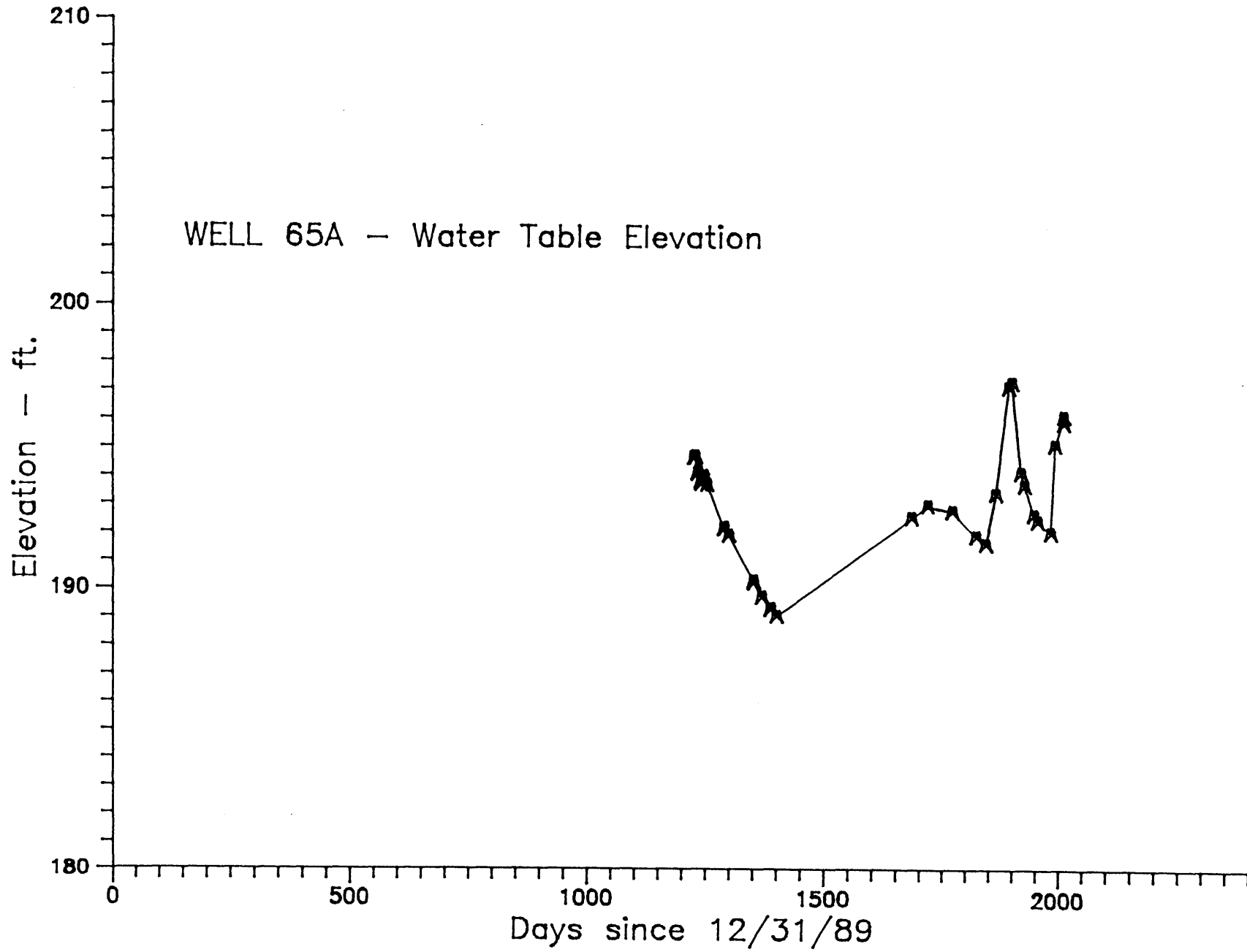
WELL 64A - Water Table Elevation



WELL 64B - Water Table Elevation







WELL 65B - Water Table Elevation

