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A REPORT ON THE GROUNDWATER LEVELS IN PARTS OF BERNARD LODGE AND CAYMANAS AREAS AND ADJOINING COASTAL AREA ST. CATHERINE PLAINS

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INTRODUCTION

The Crop Diversification and Irrigation Project (CDI) started functioning officially from October 1985, to reinforce the institutional capacity of Agro-21 Corporation Limited to promote and develop private commercial agricultural investment in Jamaica. One of the activities of the CDI project was to rehabilitate and construct irrigation infrastructure such as wells, canals, pumping stations, fencing and storage facilities. On the reorganization of the activities of the Agro-21 Corporation Limited, with effect from April 1, 1989, the CDI project was merged with the National Irrigation Commission. The area of activity is a part of the St. Catherine Plains mostly on the western outskirts of Kingston where it is divided into five (5) sub-areas which are designated as Project - A, Project - B, Project - C (Horticulture), Project-C (small farmers' area) and Project-E. Other areas of small farmer activity include Hill-Run, and Bushy Park. The Hydrogeologist working with the project executed the programme of rehabilitating the old wells and constructing the new ones and also carried out other hydrogeological activities all of which are indicated below:

a) Three old wells in Project-A were rehabilitated in late 1985.

b) Fourteen (14) wells were constructed in Projects - A, B, C (Horticulture) and E during the period September, 1985 to February, 1988.

c) Six (6) old wells in Project-E and two (2) old wells in Project-C (small farmers' area) were tested for their yield and quality of water during the period April, 1987 to February, 1988.

d) Four (4) observation wells were constructed in coastal area to the east, south-east and south of the project areas and one in the Hill-Run area to monitor the quality of groundwater.

e) Two (2) exploratory wells were drilled in the Hill-Run area tapping the limestone aquifer.

f) Water levels and quality of groundwater in the general area were monitored.

As specified in the project document, environmental monitoring of the project activities will be the responsibility of the Underground Water Authority which will include monitoring of:

a) Water quality with respect to both salinity and contamination by pesticides and other pollutants.

b) Groundwater extraction.

Monitoring of groundwater levels is necessary to relate any changes in the quality of groundwater with extraction. Monitoring of water levels and the quality of groundwater and preparation of respective project reports were done in collaboration with Underground Water Authority.

Major hydrological work carried out has been described in the following reports:

1. Ramanamurty, D.V. December, 1988. A report on the groundwater resources of horticulture Project-C, Caymanas area, St. Catherine Plains. Land Utilization Department, Agro-21 Corporation Limited, Kingston.

Contains reports on the construction, development and testing of two wells viz. Watson Grove #3 and Riversdale #1 and the recommended rates of extraction of groundwater from these wells. Describes the chemical characteristics of water required for use in horticulture and the suitability of groundwater in the area for this purpose.

2. Ramanamurty, D.V., and B. Fernandez. March, 1989. A report on the salinity of and groundwater in the alluvial aquifer in parts of Bernard Lodge and Caymanas Areas and the adjoining coastal area, St. Catherine Plains. Land Utilization Department, Agro-21 Corporation Limited, Kingston.

Contains chemical analyses data of groundwater from 38 wells in the area; historical data from 1963 to 1982 and recent data from 1985 to 1988; shows areas of groundwater contamination with sea water and other pollutants.

3. Ramanamurty, D.V. May, 1989. A report on the groundwater resources of Project-A, Bernard Lodge area, St. Catherine Plains. National Irrigation Commission, Kingston.

Contains reports on testing of one old well, Half Way Tree #6, reconstruction, development and testing of three old wells, Half Way Tree #4, #5 and Cookson #3 and construction, development and testing of five new wells, Half Way Tree #2, Cookson #4, Newlands #2, #2A and #3, recommended rates of groundwater extraction from the wells, chemical characteristics of water required for irrigation and the suitability of groundwater for this purpose.

4. Ramanamurty, D.V. July, 1989. A report on the groundwater resources of Project-B, Caymanas area, St. Catherine Plains. National Irrigation Commission, Kingston.

Contains reports on the construction development and testing of wells, Cowpark-A, North Syndicate #2, South Syndicate #2, Naggo Head and Guinep Pen and testing of old well, Cedar Grove #2, recommended rates of groundwater extraction from the wells, chemical characteristics of water for irrigation and suitability of groundwater in the area for this purpose.

5. Ramanamurty, D.V. July, 1989. A report on the groundwater resources of Project-E, Bernard Lodge area, St. Catherine Plains. National Irrigation Commission, Kingston.

Contains reports on the construction, development and testing of three new wells Goshen #3A, Clifton #B, and Clifton #5 and testing of 6 old wells, Limetree #1, Government Park, Clifton #3 Congrieve Park #4, Salt Pond #7, and Reidspen #1, recommended rates of groundwater extraction from the wells, chemical characteristics of water required for irrigation and suitability of groundwater in the area for this purpose.

6. Ramanamurty, D.V. July, 1989. A report on the groundwater resources of Project-C (small farmers area), Caymanas area, St. Catherine Plains. National Irrigation Commission, Kingston.

Contains reports on testing of two old wells, Phoenix Park #1 and #3 and drilling of five coreholes, Lawrencefield, Riversdale #2 and #3 Cowpark B and C.

7. Ramanamurty, D.V., K. Mulchansingh and B. Fernandez. July, 1989. A report on the ground water levels in parts of Bernard Lodge and Caymanas areas and adjoining coastal area, St. Catherine Plains. National Irrigation Commission, Kingston.

Contains water level data and hydrographs for 27 wells and descriptions on the fluctuations in water levels.

8. Ramanamurty, D.V., and B. Fernandez. July, 1989. A note on the salinity of and groundwater from Riversdale #1 well, Caymanas area, St. Catherine Plains. National Irrigation Commission, Kingston.

Contains chemical analyses results of water samples collected from Riversdale #1 well from August, 1986 to March 1989 and description on the changes in the quality of groundwater with pumping time. Attempts to explain the unusually high concentrations of sodium and chloride in water just at the beginning of pumping.

9. Ramanamurty D.V.and B. Fernandez. July, 1989. A note on the water levels and quality of groundwater from the observation well at Hill-Run, St. Catherine Plains. National Irrigation Commission, Kingston.

Contains water level data, hydrographs and chemical analyses results of water samples from the Hill-run observation well.

Reports on the construction of five (5) observation wells along the coast and in the Hill-Run area, and on the drilling of two (2) exploratory wells tapping the limestone Aquifer in the Hill-Run area and on the organic contamination of groundwater in parts of Bernard Lodge area have been issued by the Underground Water Authority under the titles listed below:

1. Fernandez, B. January, 1988. The drilling of monitoring wells, South St. Catherine. Underground Water Authority, Kingston.

The Crop Diversification Project on the South St. Catherine alluvial plains, required high quality groundwater, necessitating the replacement of older sand pumping wells. The quality of groundwater must remain high and the monitoring well network is one early warning system put in place to detect any changes in groundwater quality. The five monitoring wells are aligned in a crescent between the well field and the sea. Multi-level (piezometers) and single level completion using 3" O pvc have been constructed.

2. Fernandez, B. July, 1988. Well completion report, Hill-Run Drive #1, exploratory Well, South St. Catherine. Underground Water Authority, Kingston.

Contains drilling, and testing information. The hole was drilled down to 200 ft. Groundwater from the well was highly saline in the deep zone and moderately saline in the top zone. The well was abandoned.

3. Fernandez, B. August 1988. Well completion report, Pepper Pot Drive exploratory well #2, Hill Run area, St. Catherine. Underground Water Authority, Kingston.

Contains drilling and testing information. The hole was drilled down to 90 ft. Testing could not be completed due to caving of the hole and it was abandoned.

4. Fernandez, B. and D.V. Ramanamurty. July 1989. Groundwater monitoring for organic contamination. Bernard Lodge, St. Catherine Plains. Underground Water Authority, Kingston.

Six water samples one each from six wells in and around the project areas were analysed. Concentration of organophosphorous pesticides in the groundwater were below the detectable limit. Concentration of organochlorine pesticides were also less than the detectable limit except in one sample.

Facilities extended by Agro-21 Corporation Limited, Underground Water Authority and National Irrigation Commission Limited, in furtherance of the work and in the preparation of the reports are gratefully acknowledged.

A REPORT ON THE GROUNDWATER LEVELS IN PARTS OF BERNARD LODGE AND CAYMANAS AREAS AND ADJOINING COASTAL AREA ST. CATHERINE PLAINS

CONTENTS

		Page
1.	Introduction	1 - 3
2.	Description of Water Level Changes	
	2.1 Project-A	3 - 10
	2.2 Project-B	10 - 11
	2.3 Project-C	11 - 12
	2.4 Project-E	13 - 15
	2.5 Observation Wells	16

Appendices

I Water Level Data from Wells

II Well Hydrographs

III Daily Water Level Data from Select Wells

Maps

Water level contour maps for the months of June 1986, May/June, 1987, November 1987, March 1988, May 1988, September 1988, October 1988 and April 1989.

A REPORT ON THE GROUNDWATER LEVELS IN PARTS OF BERNARD LODGE AND CAYMANAS AREAS AND ADJOINING COASTAL AREA, ST. CATHERINE PLAINS

1. INTRODUCTION

A list of twenty-seven (27) wells in the areas under consideration and their status is given below:

In the Project Areas

Project A

1.	Half-Way-Tree #2	As a replacement for the old well this tube well was constructed in December 1985, at about a hundred feet away from the old well.
2.	Half-Way-Tree #4	This is an old well. It was pumping sand. It was reconstructed in October 1985, by installing a 14" diameter well assembly consisting of the required lengths of plain pipe and well screens in the existing 20 inch diameter well and filling the annular space with proper size gravel.
3.	Half-Way-Tree #5	This is also an old well reconstructed in September 1985 like the one above.
4.	Half-Way-Tree #6	This is an old well used in the same condition.
5.	Cookson #3	This is an old well partly constructed in November 1985.
6.	Cookson #4	A new well constructed in December 1985.
7.	Newlands #2A	A new well constructed in April 1987.
8.	Newlands #3	A new well constructed in December 1985.

(All these wells have been in regular use from the time the project started in September 1985).

Project B

9.	Naggo Head	A new well constructed in August 1986.
10.	North Syndicate #2	This is a replacement well constructed in November 1986, at about 2000 ft. to the south east of the old well.
11.	South Syndicate #2	A replacement well for the old one, constructed in September 1986, at about 1000 ft. to the west north west of the old well.
12.	Guinep Pen	A new well constructed in September 1986.
13.	Cow Park A	A new well constructed in August 1986.

Project E

14.	Government Park]	All these are old wells and in use since their construction
15.	Congrieve Park #4]	
16.	Salt Pond #7]	
17.	Reids Pen #1]	
18.	Goshen #3A	A new well constructed in March 1987.

Wells Outside the Project Areas

19.	Cumberland Pen]	These are old wells and have been in use since their construction
20.	Portmore #2 (NWC)]	
21.	Watson Grove #3	A new well constructed in April 1986 at about 100 ft. to the east of the old well.
22.	Riversdale #1	A new well constructed in August 1986.

Observation Wells

23.	Waterford	Constructed in July 1987.
24.	Cumberland Pen	Constructed in June 1987. It has two piezometers one 30 ft. deep and the other 102 ft. deep.

25.	Naggo Head	Constructed in August 1987.
26.	Reids Pen	Constructed in July 1987.
27.	Newlands #2	A new well constructed in February 1986 but abandoned due to poor yield. Used as an observation well.

(These wells were constructed with 3" dia. PVC pipes)

Construction of new wells and reconstruction of old wells in Project-A were completed by the end of 1985 (except for Newlands #2A which was constructed in April 1987) and collection of water level data was started from January 1986. Construction of new wells in Project-B was completed by the end of 1986, in Project-C by the middle of 1986 and in Project-E by mid 1987. Old wells in Project-E were tested between March and September 1987. Collection of water level data from these wells started after their construction/ testing. The data was collected by the staff of Agro-21 Corporation Limited (National Irrigation Commission Limited, from April 1, 1989) and Underground Water Authority and given in Appendix-1 (upto June 17, 1989). Hydrographs were drawn separately for the pumping and non-pumping water levels and given in Appendix-2. Water level data for the Cumberland Pen (pumping well) is scanty and no hydrograph was drawn.

Wells in Project-A were in almost continuous use from January 1986 to March 1988 when pumping was discontinued. Wells in Project-B and the new well in Project-E (Goshen #3A) have not been put to use since their construction. The two wells in Project-C have been in regular use. The old wells in Project-E were also in regular use till September 1988. As almost all the wells in the area have not been in use since September 1988, daily water level data was collected from select wells and the report is given as Appendix-3.

2. DESCRIPTION OF WATER LEVEL CHANGES

2.1 PROJECT-A

Half Way Tree #2

Non-pumping Water Levels

The level in December 1985, when the well was constructed was 20.11 ft.

* All the water levels indicated are above sea level unless otherwise stated.

10

The well was in regular use from January 1986 to March 1988 and therefore data on the non-pumping water levels is somewhat scanty for this period. In 1986, minimum level recorded was 19.30 ft. in February 1986, which was 0.81 ft. lower than that in December 1985. The level then rose to 23.28 ft. by May 9. Heavy rains in early June sharply increased the water level to 28.12 ft. on June 10, which was 8.01 ft. higher than that in December 1985. The level fluctuated by about 2 ft. thereafter till October.

Data from 1987 is only for two months - April and November of which the level in April was higher, being 28.5 ft. In 1988 minimum water level for the year was 24.35 ft. on May 3. It rose to 27.65 ft. on June 2. Subsequently, there was a continuous decline till September 1, on which date the level was 26.03 ft. Heavy rains in mid-September increased the level sharply to 29.28 ft. by September 28. The level continued to rise to 30.33 ft. till October 21. Thereafter it slightly fluctuated and started to rise from December 9 to December 30 on which date it was 30.51 ft. being highest for the year. In 1989, the level frequently fluctuated from January to June by about 1.5 ft. Minimum level of 28.59 ft. was on April 4. The level on June 17 was 28.96 ft. and it was higher than the level in June 1986.

Pumping Levels

The recommended rate of abstraction from the well is 500 USgpm. The pumping water levels during 1986 for yields of 480-600 USgpm ranged from 10 ft. to 20 ft. below sea level. During 1987, the levels ranged from 2 ft. to 19 ft. b.s.l. for the same range of discharge and during 1988 the levels were about 6 ft. b.s.l. for a yield of 480 USgpm.

Half Way Tree #4

Non-pumping Levels

The non-pumping water in October 1985 when the well was reconstructed was 13.74 ft. In 1986 the minimum water level was 13.82 ft. on February 24, which was more or less the same as in October 1985. The level then continuously increased during the months of March to May and it was 15.94 ft. on May 21.

Heavy rains in early June increased the level to 18.86 ft. by June 10. The level continued to rise till June 27, when it was 19.69 ft. Thereafter, it gently declined till mid-September to 18.30. It sharply declined and rose in October and thereafter the level remained more or less the same till the end of the year. During 1987 the level declined, the level slightly rose from December 1986 to January 1988 and thereafter declined till March. The lowest level of 17.64 ft. for the year was recorded on March 9. The level thereafter rose till June and it was 19.69 ft. on June 27. Then it gradually declined to 18.30 ft. by October 6. November appears to be a month of recharge and the level rose in this month to 21.89 ft. which was the highest for the year.

During 1988 the level shows a gentle but continuous rise from February to early May followed by a continuous decline till early September. The level on September 1, was 18.61 ft. Due to heavy rains in mid-September it sharply rose to 17.70 on September 28 and 21.62 on October 14. The rise continued till early December followed by a slight decline till the end of the year. Highest level in the year was 22.01 ft. on November 30 and December 9.

Pumping Levels

Recommended rate of abstraction from the well is 250 USgpm. The well was in regular use till March 1988. The well was pumping upto a maximum of 360 USgpm. The level in 1986 for a discharge of 300 USgpm was about 9 ft. b.s.l. and in 1987 about 6 ft. b.s.l. indicating a rise in water level between 1986 and 1987. In 1988 the level for a yield of 240 USgpm was near about sea level.

Half Way Tree #5

Non-pumping Levels

The level in November 1985 when the well was reconstructed was 18.35 ft. In 1986 minimum level was 19.62 ft. in March. This level rose by about 5 ft. in May. Due to heavy rains in early June, this level rose further to 30.64 ft. by June 6. Then it sharply declined to 24.8 ft. by late July. The level again rose in August and September and declined from October to December.

In 1987 also minimum level was in March which was 24.78 ft. April and May appears to be periods of recharge and the level continuously rose from March to mid-May. Thereafter there were some fluctuation in level till late August followed by a continuous rise till early November. Highest level was 32.88 ft. on November 6. This was followed by a decline in 1988 also minimum level of 25.99 ft. was in March. It rose till early June and then continuously decline till early September. The level on September 3 was 26.7 ft. Heavy rains in mid-September increased the level sharply and it was 29.6 ft. by the end of September. The level continued to rise during the month of October and it was 32.3 ft. by late October. Thereafter it fluctuated by about a foot during November and early December and recorded a further rise till the end of December. Highest level in the year was 33 ft. on December 30. The level continuously declined during the months of January and early February 1989, and rose from early February to mid-March. Highest level in the year (till June) was 34.14 ft. on March 13. It sharply declined to the lowest level of the year - 28.69 ft. by April 4. Thereafter it increased by about 2 ft.

Pumping Levels

The recommended rate of abstraction from the well is 400 USgpm. The levels fluctuated widely for the same yield in different months of a year. They varied generally from about 9 ft. below sea level to about 4 ft. above sea level. The yields generally vary from 360 USgpm to 480 USgpm.

Halfway Tree #6

Non Pumping Levels

The level in November 1985, when the well was put to use after a long time was 18.45 ft. In 1986, minimum level was 15.78 ft. on February 24. It remained the same till early March and rose continuously and rapidly till early June. The level on June 10, was 25.75 ft. The level then declined till early September and was high again in the months of September, October and December. In 1987 the level declined from January to February.

Lowest level in the year was 20 ft. on February 17. It rose to 25.15 ft. by May 1, remained more or less the same during May fluctuated during the months of June to October by about a foot and sharply increased from late October to early November. Highest level in the year was 27.85 ft. on November 6. Thereafter it showed a declining trend which continued till early February 1988. Minimum level in the year was 22.2 ft. on April 7. It rose to 25.1 ft. by early May and then continuously declined to 23.2 ft. by early September. Heavy rains in mid-September increased the level to 27.8 ft. Thereafter the level slightly fluctuated but showed a rising trend and highest level of 28.24 ft. for the year was recorded on December 30. The level then declined till mid-February, showed fluctuations by about a foot during March and April, a sharp rise by about 6 ft. from mid-May to early June followed by a sharp decline.

Pumping Levels

The recommended rate of abstractions from the well is 250 USgpm. The pumping level varied from about 8 ft. below see level to about 12 ft. above sea level for yields varying 360 USgpm - 150 USgpm.

Cookson #4

Non-Pumping Levels

The non-pumping water level when the well was constructed in November 1985 was 11.36 ft. In 1986, the level showed fluctuations by about 1.5 ft. from late January to late May. The level then rose by about 6 ft. to 15.36 ft. on June 13, and then sharply declined to 11.06 ft. on June 20. The level rose again to 15.66 ft. by July 18, (highest for the year). Thereafter it continuously declined till early February 1987. Minimum level in the year 1987 was 10.81 ft. (February and March). Thereafter the level fluctuated showing an ascending trend till mid-November. Highest level in the year was 16.32 ft. on November 24. The rise in level was about 4.5 ft. between March and May. There was a continuous decline from early May to early September when the minimum level of 13.86 ft. for the year was recorded.

Heavy rains in mid-September increased the level to 18.44 ft. by September 29. Thereafter the level showed a declining trend except for a small rise in late November, which continued till June 1989, and the level on June 17 was 15.65 ft.

Pumping Levels

Recommended rate of abstraction from the well is 400 USgpm. Pumping levels were below sea level to the extent of 10 ft. to 12 ft. for a discharge of 420 USgpm to 480 USgpm.

Newlands #2A

Non-pumping Levels

The non-pumping level when the well was constructed in April 1987, was 15.5 ft. In 1987 there was a general decline in level from July to October and the level on October 14 was 14.89 ft. The level then rose till mid-November and it was 18.87 ft. on November 14 which was the highest for the year. A declining trend is seen thereafter which continued till early March 1989. There was a rise in level from early March to early May and a decline from early May to early August. The level increased by less than a foot from early August to early September. Due to heavy rains in mid-September it increased sharply from 13.7 to 18.7 ft. by September 28. Thereafter, the level declined continuously (except for a small fluctuation in late November) till June 17, 1989.

Pumping Levels

Recommended rate of abstraction from the well is 400 USgpm. The pumping levels varied from 2 ft. to 12 ft. below sea level for a discharge of 400 USgpm.

Newlands #3

Non-pumping Levels

The level when the well was constructed in November 1985 was 11.74 ft.

In 1986 there was a decline in the level from from January to early March. Minimum level was 11.49 ft. on March 3. The level then rose continuously till early June, remained so till late July and showed a declining trend till the year end. During 1987 the level showed very high fluctuations due probably to heavy pumping. The levels in the months of April, May, June and November were quite high. It was highest on November 18 being 19.59 ft. In 1988 the level declined from 19 ft. in early June to 15.12 ft. on September 1, which was the minimum for the year. It then rose sharply to 21.54 ft. by September 28 due to heavy rains in mid-September. Thereafter, the level fluctuated slightly with some conspicuous declines in early and late November. In 1989 the level continuously declined from January to June except for a slight rise in late April and early June.

Pumping Levels

Recommended rate of discharge from the well is 400 USgpm. The well was in regular use and pumping rates were generally around 360 USgpm to 480 USgpm. The pumping water levels were below sea level sometimes as much as 34 ft.

Newlands #2 (Observation Well)

This is an abandoned well and the date pertains only to non-pumping levels.

The non-pumping level was 11.8 ft. in April 1986 when the well was constructed. In 1986 the level was 11.55 ft. on May 21. It sharply rose to 15.68 ft. by June 10, due to heavy rains in early June. Another rise is seen in July ad the highest level for the year was 16.35 ft. on July 16. It then declined till end of the year. In 1987 the level increased from March to June and then slightly declined till late August. A steep rise from 15.6 ft. in late August to 19.3 ft. in early October is very conspicuous. In 1988 the level fluctuated much. Minimum level of 12.35 ft. was on March 8. It showed an ascending trend with high fluctuations and the highest level was 19.92 ft. on October 7. Thereafter it showed a declining trend till the end of the year except for one rise in late November. This decline continued till June 17, 1989, when the level was 16.40 ft.

Observations

The water levels in February-March 1986 were generally the lowest for the year. Heavy rains in early June built up the water levels in the area. An increase of 4 ft. to 6 ft. in the levels is observed. It is also seen that there was an increase in water levels during November-December 1987. Heavy rains in mid-September contributed for an increase in the water levels in the area. Thus there has been a build up of water levels in the area from February-March 1986 to June 1989, the increase varying from 5 ft. to 9 ft.

Between January and June 1989, three periods of recharge are seen - one in February-March, the second in April and the third one in May. These are clearly reflected in the hydrographs of Half Way Tree #2, Half Way Tree #5 and Half Way Tree #6.

2.2 PROJECT-B

The five wells in this project area were constructed during the period August-September, 1986. Non-pumping water level data from these wells is being collected from January 1987, as these wells have not been put to use since their construction. The non-pumping water levels of these wells at the time of their construction are shown below:

1. Guinep Pen
2. South Syndicate #2
3. North Syndicate #2
4. Naggo Head
5. Cow Park-A

In 1987 fluctuations in the water levels is somewhat less in Cow Park-A well when compared to the other four wells. May, June and July appear to be periods of recharge. There was a decline in the levels during August followed by a continuous rise like the end of the year.

In 1988 also fluctuations in the levels from February to early September was more pronounced in the other four wells than in Cow Park-A well. In general there is a decline in levels from February to early September with a period of recharge in June for Naggo Head, Guinep Pen and North Syndicate #2 wells, April for Cow Park-A well and May for South Syndicate #2 well.

Levels in all the five wells show a steep rise from early September to late September due to heavy rains in mid-September. This rise continued till early December and then a decline started. Another period of small recharge is seen in mid to late November 1988. The decline which started in December 1988 continued till June 17, 1989, indicating a dry period from January to June 1989. The water level in Cow Park-A well only showed a rise in early June followed by a decline.

Water levels on June 17, 1989, in all the five wells were higher by 0.5 to 1 ft. with respect to those in January 1987. The highest and lowest water levels recorded during 1987 and 1988 for the 5 wells are given below:

	1987		1988	
	Highest	Lowest	Highest	Lowest
Cow Park-A	16.67 (Dec)	13.62 (Aug)	17.62 (Oct)	14.22 (Sept)
North Syndicate #2	20.51 (Dec)	18.21 (Feb)	21.15 (Dec)	17.76 (Sept)
Naggo Head	14.92 (Nov)	12.75 (Apr)	15.80 (Dec)	13.02 (Sept)
South Syndicate #2	14.99 (Dec)	12.28 (Apr)	15.31 (Sept)	12.74 (Sept)
Guinep Pen	11.31 (Dec)	9.31 (Jan)	12.44 (Nov)	9.77 (Sept)

2.3 PROJECT-C

Watson Grove #3

The non-pumping water level in May 1986 when the well was constructed was 14.14 ft.

Non-pumping Water Levels

Highest level in 1986 was 17.90 ft. on June 11. Thereafter the level fluctuated between 13 ft. to 14 ft.

In 1987 the levels fluctuated generally between 11 ft. and 14 ft. High levels were recorded on May 18 (14.5 ft.) and December 4 (14.45 ft.)

In 1988 the levels till early August fluctuated between 11 ft. and 13 ft. Heavy rains in early September increased the levels to slightly more than 17 ft. In 1989, the levels fluctuated by about 2 ft. from 14 ft. to 16 ft. from January to early May. A clear recharge period is seen by mid-May when the level reached 20.2 ft. This was followed by a decline in June.

Pumping Water Levels

The recommended rate of abstraction from the well is 500 USgpm. The pumping water levels were around 12 ft. below sea level for the rates of discharge of 600 USgpm. In 1988 November and December the levels were around 2 ft. above sea level for discharges of about 500 USgpm. Some of the levels in 1987 and most in 1988 were high because the rate of pumping was low being about 50 USgpm.

Riversdale #1

The non-pumping water level was 14.12 ft. in August 1986 when the well was constructed.

Non-pumping Water Levels

In 1987 the minimum level was 11.05 ft. in March and the maximum was 17.55 ft. in November.

In 1988 minimum level was 11.55 ft. on September 5. There was a sharp rise in the level to 19.25 ft. by late September (21, 30) due to heavy rains in mid-September. The level however declined to 17.69 ft. by October 28 and this decline continued till May 1, 1989 (with some minor fluctuation in between) when the level was 14.86 ft. A slight rise in the level is seen in late May followed by a decline in June.

Pumping Water Levels

The recommended rate of abstraction from the well is 350 USgpm. The levels were generally 3 to 4 ft. below sea level for discharges of 330-380 USgpm in 1987 and 6 to 8 ft. below sea level in 1988 and 1989. However the level was 12 ft. below sea level in June 1989 for a discharge of 330 USgpm because the period January to June was a dry period but for a period of small recharge in mid-May.

19

2.4 PROJECT-E

There was a general decline in water levels from February to August 1988. Lowest levels for the year are seen in August. The levels show an increase from early August to early September. This increase was low by a foot, and in the case of Congrieve Park-4 and Goshen #3 wells. It was high in the case of Government Park (6 ft.) and Salt Pond #7 (2.5 ft.) wells. Heavy rains in mid-September increased the water levels in all the wells.

In the case of Government Park well highest level was reached by by early October (34.96) followed by a decline till early November and then a continuous rise till end of December, highest level recorded being 36.29 ft. on December 31.

In the case of Congrieve Park #4 well, highest level was reached in early October (26.51 ft.). Thereafter the level fluctuated by about a foot with a declining trend from late November to the end of December. In the case of Goshen #3A well highest level was reached on September 30 (29.20 ft.). Thereafter it declined by about a foot till mid-November, then rose by about 0.5 ft. till the end of the month and then declined again till the end of the year.

In the case of Salt Pond #7 well, highest level was reached in early October (28.95 ft.). The level then declined by about 2.5 ft. till mid-November, rose by about 2 ft. by late November and then declined till the end of the year.

Water level in Reids Pen #1 also showed a rise from early September to late September. Thereafter it showed a decline. Only Government Park well showed a considerable rise in level from early October to late December 1988.

During 1989, water level in Government Park well showed a continuous decline from January to June except for a small rise during May. Water level in Congrieve Park #4 well showed fluctuations to the extent of 1.5 ft. between January and June with two clear recharge periods between (1) late January and early February and (2) early May and late May. Water level in Goshen #3A well also showed a trend similar to that of Congrieve Park #4. Water level in Salt Pond #7 well showed high fluctuations to the extent of about 2 ft. from January to late April and a sharp rise from late April to late May to the extent of about 3 ft.

2.5 OBSERVATION WELLS

Naggo Head

In 1987, for the 3 months - October, November and December lowest water level was 1.66 ft. on October 1, and highest was 3.0 ft. on November 6. In 1988, lowest level was 1.80 ft. on March 24. Due to heavy rains in mid-September the level of 2.04 ft. on September 2 rose to 3.30 ft. on September 28. However the level started declining immediately and the decline continued till November 14 on which date the level was 2.90 ft. A second rise in the water level is conspicuous in the late November. The level was 3.45 ft. on November 21 and a decline started afterwards. In 1989 there were some fluctuations in the level in January-February and a continuous decline from late February to early May. Lowest level recorded was 2.24 ft. on May 1. The level rose to 2.60 ft. on May 16 and declined afterwards.

Waterford

In 1987, minimum water level was 0.28 ft. on October 1 and maximum was more then 2.0 ft. (overflowing the pipe). In 1988 the level of 1.8 ft. in January gradually declined to 1.2 ft. in May. The levels rose in June and July (5th) to 1.88 ft. and 1.79 ft. respectively. There was a decline from July 5 to September 2 on which date the level was 0.52 ft., the minimum for the year. Heavy rains in mid-September increased the level to more than 2 ft. resulting in overflowing condition. The levels then fluctuated in the months of October and November and showed a declining trend in December. Two recharge period towards the end of October and end of November are seen. In 1989 the level continuously declined from January to April, the minimum level being 0.06 ft. on April 6. The level then rose to the peak of 1.04 ft. on May 16, which was followed by a decline in June.

Cumberland Pen

Deep Observation Well

In 1987, the lowest level was 3.66 ft. on October 1 and highest was 5.45 ft. on November 6. In 1988 lowest level was 3.90 ft. on March 3. Heavy rains in mid-September sharply increased the level from 4.29 ft. on September 2 to 5.91 ft. on September 28.

Subsequently the level continuously declined to 5.28 ft. by November 14. Again there was sharp rise to 5.66 ft. by November 21 (indicating another period of recharge) followed by a decline in the month of December. This decline continued till May 1 (except for a slight rise at the end of February) when the water level was 4.28 ft. There was a slight rise in May followed by a decline in June.

Shallow Observation Well

The water level trend is similar to that of the deep observation well except for the following prominent durations:

Period		Trend in Deep well	Trend in Shallow well
1987 -	Nov. 6 to Dec. 4	Declining 0.17'	Declining 0.13'
1988 -	Feb. 23 to Mar. 3	Declining 1.21'	Declining 0.02
	Mar. 3 to Mar. 24	Rising .54	Declining 0.58
	July 5 to July 21	Rising 0.06	Declining 0.28
	Aug. 19 to Sept. 2	Rising 0.07	Rising 0.34
	Nov. 21 to Nov. 30	Declining 0.08	Rising 0.02
1989 -	Feb. 14 to Feb. 28	Rising 0.05	Declining 0.04

Reids Pen

In 1988 minimum water level was 0.27 ft. on July 1. Water level in June was high being 2.48 ft. on the 8th. The level continuously rose from July 1 to September 5 to 1.20 ft. Heavy rains in mid-September caused a rise in water level and by September 29 it was 2.90 ft. Then it declined in late October and early November, rose in late November and declined by the end of November. The water level fluctuated very much.

Observations

In 1988, three periods of recharge in June-July, in mid-September and in mid-late November are seen. The water levels generally fluctuated widely. Any recharge appears to dissipate rapidly. The shallow and deep aquifers behave sometimes differently. In 1989 a recharge period is seen in May.

A REPORT ON THE GROUNDWATER LEVELS
IN PARTS OF BERNARD LODGE AND CAYMANAS AREAS
AND ADJOINING COASTAL AREA
ST. CATHERINE PLAINS

APPENDIX-1

WATER LEVEL DATA FROM WELLS

(1 - 51 Pages)

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALFWAY TREE #2 ELEVATION OF R.P. 4303 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
22/1/86	64.0	-20.97	500	18/8/86	17 00	26 03	—
28/1/86	22 0	21.03	—	17/9/86	16 95	26.08	—
3/2/86	21 33	21 70	—	1/10/86	16.15	26.88	—
10/2/86	56.75	-13 72	425	1/11/86	38.75	4.28	300
18/2/86	23 68	19 35	—	3/11/86	31 57	11.46	240
19/2/86	52.50	-9 47	400	4/11/86	45 10	-2.07	375
24/2/86	21 75	21.28	—	4/12/86	54.25	-11.22	475
28/2/86	67.08	-24.05	575	11/12/86	63 30	-20.27	575
3/3/86	58 00	-14.97	425	30/12/86	51 72	-8.69	430
11/3/86	65 65	-22.62	550	8/1/87	55.37	-12.34	480
21/3/86	51.45	-8.42	375	16/1/87	69.50	-26.47	625
1/4/86	55.50	-12.47	450	2/2/87	63.25	-20.22	550
9/5/86	19.75	23.28	—	5/3/87	55 15	-12.12	425
21/5/86	57.55	-14.52	475	9/3/87	61 45	-18.42	500
10/6/86	14.91	28.12	—	13/3/87	62 65	-19 62	500
20/6/86	52 25	-9 22	475	19/3/87	25.90	17 30	150
27/6/86	61 25	-18.22	500	8/4/87	46.75	-3 72	400
16/7/86	63.75	-20.72	550	29/4/87	14.48	28.55	—
1/8/86	17.50	25.53	—	1/5/87	42.09	0.94	400

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALF-WAY TREE #2 ELEVATION OF R.P. 43.03 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
18/5/87	28.92	14.11	200	7/4/88	32.92	10.11	200
1/6/87	37.62	5.41	325	3/5/88	18.50	24.53	—
10/6/87	16.00	27.03	—	2/6/88	15.38	27.65	—
15/7/87	46.66	-3.63	4.25	1/7/88	16.60	26.43	
7/7/87	16.30	26.73	—	10/8/88	16.80	26.23	
12/8/87	45.45	-2.42	400	1/9/88	17.00	26.03	
27/8/87	40.00	3.03	375	28/9/88	13.75	29.28	
7/9/87	45.18	-2.15	350	7/10/88	13.26	29.77	
1/10/87	42.90	0.13	375	14/10/88	13.00	30.03	
14/10/87	40.00	3.03	325	21/10/88	12.70	30.33	
6/11/87	35.33	7.7	300	28/10/88	12.96	30.07	
18/11/87	15.17	27.86	—	4/11/88	12.98	30.05	
21/11/87	42.80	0.23	375	14/11/88	12.86	30.17	
27/11/87	48.00	-4.97	425	21/11/88	12.93	30.10	
4/12/87	44.64	-1.61	400	30/11/88	12.94	30.09	
21/1/88	48.33	-5.30	430	9/12/88	12.99	30.04	
8/2/88	47.65	-4.62	400	19/12/88	12.74	30.29	
2/3/88	17.19	25.84	—	30/12/88	12.52	30.51	
8/3/88	49.30	-6.27	400	10/1/89	13.94	29.09	

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: HALFWAY TREE #2 ELEVATION OF R.P. 43.03

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
1/1/89	13.15	29.88					
1/2/89	13.45	29.58					
13/2/89	13.84	29.19					
8/2/89	13.55	29.48					
13/3/89	13.24	29.79					
8/3/89	13.47	29.56					
4/4/89	14.44	28.59					
17/4/89	13.73	29.30					
1/5/89	14.19	28.84					
16/5/89	14.38	28.65					
1/6/89	13.35	29.68					
17/6/89	14.07	28.96					

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALF WAY TREE #4 ELEVATION OF R.P. 37.94 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (IGPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (IGPM)
	ft.	ft.			ft.	ft.	
22/1/86	45 20	-7.26	150	1/9/86	18.60	19.34	—
3/2/86	23 17	14.77	—	17/9/86	18.63	19 31	—
10/2/86	46.20	-8 26	225	6/10/86	19 64	18.30	—
19/2/86	23 80	14.14	—	1/11/86	18.64	19 30	—
24/2/86	24.12	13 32	—	4/11/86	47 20	-9 26	250
28/2/86	48 00	-10 06	275	8/11/86	51 15	-13.51	275
3/3/86	55 00	-17.06	275	3/12/86	43.15	-5.21	210
11/3/86	22.72	15.22	—	11/12/86	18.65	19 29	—
21/3/86	22.80	15.14	—	30/12/86	18.95	18 99	—
3/4/86	22.64	15 30	—	8/1/87	18.58	19 36	—
17/4/86	22 12	15 22	—	16/1/87	47.16	-9.22	300
9/5/86	22 18	15 76	—	2/2/87	20.00	17.94	—
21/5/86	22 00	15 94	—	6/2/87	62 87	-24 93	—
10/6/86	19 08	18.86	—	5/3/87	48.86	-10.92	275
13/6/86	18.70	19 24	—	9/3/87	20.30	17.64	—
20/6/86	18.45	19.49	—	21/3/87	18.65	19.24	—
27/6/86	18.25	19 69	—	3/4/87	18.35	19 59	—
16/7/86	18.35	19.59	—	29/4/87	17.39	20.55	—
18/8/86	18.45	19 49	—	1/5/87	17.33	20.61	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALF-WAY TREE #4 ELEVATION OF R.P. 37.94 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

Date	Water Level below R.P. ft.	Elevation of Water Level ft.	Well Discharge (1GPM)	Date	Water Level below R.P. ft.	Elevation of Water Level ft.	Well Discharge (1GPM)
1/5/87	39.25	-1.31	200	7/4/88	37.85	0.09	200
8/5/87	17.08	20.86	—	3/5/88	17.80	20.14	—
1/6/87	17.03	20.91	—	2/6/88	18.35	19.59	—
0/6/87	17.95	19.99	—	1/7/88	18.63	19.31	—
5/7/87	43.00	-5.06	250	10/8/88	19.15	18.79	—
2/8/87	44.25	-6.31	250	1/9/88	19.33	18.61	—
27/8/87	18.05	19.89	—	28/9/88	17.70	20.24	—
7/9/87	44.10	-6.16	250	14/10/88	16.32	21.62	—
1/10/87	18.33	19.61	—	21/10/88	16.15	21.79	—
14/10/87	18.00	19.94	—	28/10/88	16.15	21.79	—
23/10/87	18.55	19.39	—	21/11/88	15.98	21.96	—
6/11/87	16.46	21.48	—	30/11/88	15.93	22.01	—
18/11/87	17.05	20.89	—	9/12/88	15.93	22.01	
24/11/87	16.05	21.89	—	19/12/88	15.95	21.99	
4/12/87	37.55	0.39	2.00	30/12/88	15.99	21.95	
21/1/88	51.65	-13.71	300				
8/2/88	18.55	19.39	—				
2/3/88	18.40	19.54	—				
8/3/88	41.40	-3.46	225				

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALFWAY TREE #5 ELEVATION OF R.P. 4318 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (IGPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (IGPM)
	ft.	ft.			ft.	ft.	
9/11/85	24.83	18.35	—	17/4/86	40.56	2.62	275
15/11/85	40.30	2.88	360	9/5/86	18.50	24.68	—
16/11/85	27.30	15.88	—	21/5/86	52.00	-8.82	400
18/11/85	40.70	2.48	360	5/6/86	12.54	30.64	—
22/11/85	26.30	16.88	150	10/6/86	14.64	29.14	—
25/11/85	35.80	7.38	320	13/6/86	14.75	28.43	—
27/11/85	36.30	6.88	330	20/6/86	52.50	-9.32	400
22/1/86	>60.00	<-16.82	425	27/6/86	44.00	-0.82	400
3/2/86	21.96	21.22	—	16/7/86	44.00	-0.82	400
7/2/86	43.42	-0.24	350	25/7/86	18.30	24.88	—
10/2/86	22.58	20.60	—	1/8/86	17.60	25.58	—
18/2/86	42.70	0.48	360	15/8/86	17.40	25.78	—
18/2/86	41.00	2.18	400	1/9/86	16.45	26.73	—
19/2/86	45.62	-2.44	400	17/9/86	15.85	27.33	—
28/2/86	45.62	-2.44		1/10/86	15.75	27.43	—
24/2/86	22.50	20.38	—	1/11/86	38.70	4.48	300
3/3/86	23.00	20.18	—	5/11/86	43.20	-0.02	350
10/3/86	23.56	19.62	—	6/11/86	38.25	4.93	300
21/3/86	49.00	-5.82	400	2/12/86	44.50	-1.32	440
1/4/86	49.00	-5.82	400	11/12/86	11.00	26.13	—

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALF WAY TREE #5 ELEVATION OF R.P. 43 1841

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
30/12/86	28.64	14.34	300	1/10/87	16.28	26.90	
5/1/87	50.84	-7.36	430	14/10/87	15.48	27.10	
6/1/87	17.75	25.43		23/10/87	15.40	27.78	
2/2/87	45.00	-1.82	450	6/11/87	16.30	32.88	
1/3/87	52.00	-8.82	400	18/11/87	12.51	36.67	
9/3/87	18.40	24.78		24/11/87	48.30	-5.12	375
13/3/87	17.44	25.74		27/11/87	53.50	-10.32	400
2/3/87	50.85	-7.67	412	4/12/87	35.20	7.98	290
5/4/87	17.18	26.00		21/1/88	43.50	-0.32	300
27/4/87	15.62	27.56		5/2/88	39.34	3.84	300
1/5/87	39.93	3.25	325	2/3/88	17.19	25.99	
18/6/87	15.26	27.92		5/3/88	42.20	6.98	300
1/7/87	15.34	27.84		7/4/88	40.20	2.98	275
10/7/87	16.50	26.68		3/5/88	15.65	27.53	
15/7/87	11.30	26.88		2/6/88	15.33	27.55	
20/7/87	18.00	25.18		1/7/88	16.46	26.72	
12/8/87	17.18	26.00		10/8/88	16.55	26.63	
27/8/87	17.60	25.58		1/9/88	11.43	26.15	
7/9/87	54.40	-11.22	375	26/9/88	12.60	24.58	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALF WAY TREE #5 ELEVATION OF R.P. 43.18ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
7/10/88	12.42	30.76	—	17/4/89	13.65	29.53	
14/10/88	11.80	31.38		1/5/89	14.18	29.00	
21/10/88	10.87	32.31		16/5/89	13.22	29.96	
23/10/88	11.67	31.44		1/6/89	11.38	31.80	
4/11/88	12.08	31.10		17/6/89	13.70	29.48	
14/11/88	11.23	31.95					
21/11/88	11.70	31.48					
30/11/88	11.16	32.02					
9/12/88	11.71	31.47					
19/12/88	11.00	32.18					
30/12/88	10.13	33.05					
10/1/89	11.66	31.52					
20/1/89	12.25	30.93					
1/2/89	12.85	30.33					
13/2/89	13.70	29.48					
28/2/89	10.17	33.01					
13/3/89	9.04	34.14					
28/3/89	13.67	29.51					
4/4/89	14.49	28.69					

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALFWAY TREE #6 ELEVATION OF R.P. 37.50 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
9/11/85	19.05	18.45	--	5/6/86	12.02	25.48	—
11/11/85	19.20	18.30	-	10/6/86	11.75	25.75	--
20/11/85	18.60	18.90	—	13/6/86	11.75	25.75	—
2/12/85	19.82	17.68	—	20/6/86	25.87	5.63	220
2/1/86	31.15	6.35	200	2[illegible]/7/86	[illegible].00	4.50	250
23/1/86	18.95	18.55	--	16/7/86	34.30	3.20	225
28/1/86	28.56	8.94	80	25/7/86	40.10	-2.60	275
3/2/86	33.50	4.00	150	1/8/86	40.00	-2.50	250
10/2/86	34.83	2.67	225	13/8/86	1[illegible].70	23.60	--
18/2/86	40.90	-3.40	240	1/9/86	1[illegible].05	30.45	—
[illegible]	[illegible]	1.08	[illegible]0	17/9/86	13.25	24.25	--
[illegible]	21.72	15.78	—	1/10/86	12.95	24.55	—
[illegible]	21.00	-3.50	300	1/11/86	15.50	22.00	40
10/[illegible]/86	21.70	15.80	—	6/11/86	20.05	17.45	150
21/3/86	46.00	-8.50	275	9/11/86	25.50	12.00	225
1/4/86	19.80	17.70	—	4/12/86	13.20	24.30	—
17/4/86	25.00	12.50	120	11/12/86	13.45	24.07	—
9/5/86	16.75	20.75	—	30/12/86	13.80	23.70	—
21/5/86	26.42	11.08	100	5/1/87	14.08	23.42	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALF-WAY TREE #1. ELEVATION OF R.P. 37.50 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (IGPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (IGPM)
	ft.	ft.			ft.	ft.	
6/1/87	14 16	23 34		6/11/87	9 65	27 85	
2/2/87	15 00	22 56		18/11/87	9 85	27.65	
7/2/87	15 50	20.00		27/11/87	25 10	12 40	200
13/8/87	35 60	1 90	300	4/12/87	11.20	26.30	
9/3/87	41.60	-4.10	250-275	21/1/88	11 65	25 85	
3/3/87	15 22	22 28		5/2/88	15 15	22.35	
8/4/87	14.00	23 50		2/3/88	14.79	22.71	
29/4/87	12 35	25 15		5/3/88	33 35	4.15	250
1/5/87	12 35	25 15		1/4/88	15 30	22.20	
18/5/87	12 40	25.10		3/5/88	12.46	25 04	
1/6/87	12 35	25.15		2/6/88	12 35	24.65	
10/6/87	13.25	24.25		1/7/88	13.61	23 89	
15/7/87	12 88	24 62		10/8/88	14.17	23.33	
30/7/87	14.00	23.50		1/9/88	14.25	23 25	
12/8/87	13 55	23 95		28/9/88	9 70	27 80	
27/8/87	13 95	23 55		1/10/88	9 86	27.64	
1/10/87	13 84	23.66		14/10/88	9.76	27 74	
14/10/87	12 88	24.62		21/10/88	9.50	28 00	
25/10/87	13.75	23.75		28/10/88	9 50	28 00	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALF WAY TREE #6 ELEVATION OF R.P. 31.50 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
4/11/88	9.61	27.89	-	17/6/89	10.26	27.24	
14/11/88	9.10	27.70					
21/11/88	9.50	25.00					
30/11/88	9.58	27.92					
9/12/88	9.50	28.00					
19/12/88	9.32	28.18					
30/12/88	9.26	28.24					
10/1/89	9.45	28.05					
20/1/89	9.82	27.68					
1/2/89	10.18	27.32					
13/2/89	10.55	26.95					
28/2/89	10.38	27.12					
13/3/89	9.75	27.75					
28/3/89	10.67	26.83					
4/4/89	11.12	26.38					
17/4/89	9.55	27.95					
1/5/89	11.08	26.42					
16/5/89	10.82	26.68					
1/6/89	4.86	32.64					

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: COOKSON #3 ELEVATION OF R.P. 41.64 ft

REF. POINT FOR MEASUREMENT PUMP PLATFORM

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (IGPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (IGPM)
	ft.	ft.			ft.	ft.	
22/1/86	23.55	18.09		16/7/86	34.30	7.34	225
28/1/86	36.20	5.44	200	1/8/86	16.80	24.84	
3/2/86	22.99	18.65		18/8/86	16.45	25.19	
7/2/86	22.52	19.12		1/9/86	16.88	24.76	
10/2/86	23.58	18.06		17/9/86	17.50	24.14	
10/2/86	33.00	8.64	200	1/10/86	17.21	24.43	
18/2/86	23.10	18.54		1/11/86	17.20	24.44	
19/2/86	23.00	18.64		8/11/86	17.42	24.22	
25/2/86	50.00	-8.36	300	9/11/86	38.00	3.64	425
3/3/86	41.75	-0.11	200	22/11/86	40.41	1.23	300
10/3/86	24.41	17.23		23/11/86	16.50	25.14	
1/4/86	34.00	7.64	200	3/12/86	36.50	5.14	300
17/4/86	31.40	10.24	120	11/12/86	18.20	23.44	
9/5/86	22.14	19.50		30/12/86	18.00	23.64	
21/5/86	33.16	8.48	200	8/1/87	33.58	8.06	300
5/6/86	18.12	23.52		16/1/87	18.75	22.89	
10/6/86	15.93	25.71		6/2/87	33.60	8.04	250
13/6/86	15.93	25.71		17/2/87	35.00	6.64	270
20/6/86	32.50	9.14		20/3/87	18.40	23.24	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: COOKSON #3 ELEVATION OF R.P. 41.64 ft

REF. POINT FOR MEASUREMENT PUMP PLATFORM

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
10/4/87	19.16	22.50		7/4/88	18.06	23.58	
29/4/87	17.95	23.69		3/5/88	16.15	25.49	
1/5/87	17.68	23.96		2/6/88	17.95	23.69	
18/5/87	17.35	24 29		1/7/88	17.90	23 74	
1/6/87	17.35	24.29		10/8/88	18.67	22.97	
20/7/87	18.08	23.56		1/9/88	18.85	22.79	
12/8/87	17.88	23.76					
27/8/87	18.24	23.40					
1/10/87	18 72	22.92					
14/10/87	18.32	23.32					
23/10/87	18 37	23.27					
6/11/87	14.80	26.84					
18/11/87	14.10	27.54					
24/11/87	13.32	28.32					
4/12/87	14.20	27.44					
21/1/88	29.40	12 24	275				
8/2/88	15.80	25.84					
2/3/88	16.60	25 04					
8/3/88	17.20	24.40					

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: COOKSON #4 ELEVATION OF R.P. 27.86 ft

REF. POINT FOR MEASUREMENT PUMP PLATFORM

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
22/1/86	16.42	11.44		1/8/86	12.45	15.41	
28/1/86	16.35	11.51		12/8/86	44.40	-12.54	300
3/2/86	16.58	11.28		18/8/86	12.90	14.96	
10/2/86	18.16	9.70		1/9/86	13.05	14.81	
19/2/86	17.50	10.36		17/9/86	13.20	14.66	
24/2/86	18.66	9.20		1/10/86	13.36	14.50	
3/3/86	18.00	9.86		4/11/86	13.78	14.08	
10/3/86	17.00	10.86		4/12/86	42.00	-14.14	375
21/3/86	17.32	10.54		11/12/86	45.00	-17.14	550
1/4/86	17.70	10.16		30/12/86	19.90	7.96	
17/4/86	18.00	9.86		8/1/87	14.41	13.45	
9/5/86	16.50	11.36		16/1/87	15.58	12.28	
21/5/86	18.60	9.26		2/2/87	17.05	10.81	
10/6/86	12.58	15.28		9/2/87	40.00	-12.14	320
13/6/86	12.50	15.36		9/3/87	17.05	10.81	
20/6/86	16.80	11.06		13/3/87	34.93	-7.07	300
27/6/86	14.15	13.71		21/3/87	14.27	13.59	
8/7/86	12.20	15.66		8/4/87	14.38	13.48	
25/7/86	12.45	15.41		29/4/87	12.92	14.94	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: COOKSON #4 ELEVATION OF R.P. 27.86 ft

REF. POINT FOR MEASUREMENT PUMP PLATFORM

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
1/5/87	13.00	14.86		7/4/88	34.65	-6.79	250
18/5/87	12.56	15.30		3/5/88	11.58	16.28	
1/6/87	12.78	15.08		2/6/88	12.57	15.29	
10/6/87	14.90	12.96		1/7/88	13.12	14.74	
15/7/87	13.30	14.56		10/8/88	13.80	14.06	
30/7/87	47.65	-19.79		1/9/88	14.00	13.86	
27/8/87	37.00	-9.14	250	28/9/88	9.42	18.44	
7/9/87	14.46	13.40		7/10/88	9.45	18.41	
1/10/87	13.68	14.18		14/10/88	9.68	18.18	
14/10/87	13.20	14.66		21/10/88	9.79	18.07	
23/10/87	13.78	14.08		28/10/88	9.90	17.96	
6/11/87	10.83	17.03		4/11/88	10.00	17.86	
18/11/87	10.56	17.30		14/11/88	10.20	17.66	
24/11/87	11.54	16.32		21/11/88	9.90	17.96	
4/12/87	11.91	15.95		30/11/88	9.89	17.97.	
21/1/88	34.60	-6.74	400	9/12/88	9.90	17.96	
8/2/88	35.00	-7.14		19/12/88	10.05	17.81	
2/3/88	12.28	15.58		30/12/88	10.23	17.63	
8/3/88	40.00	-12.14	350	10/1/89	10.42	17.44	

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: COOKSON #4 ELEVATION OF R.P. 27.86 ft.

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Dischar (1GPM)
	ft.	ft.			ft.	ft.	
0/1/89	10.57	17.29					
/2/89	10.66	17.20					
3/2/89	10.83	17.03					
8/2/89	10.98	16.88					
3/3/89	11.19	16.67					
28/3/89	11.34	16.52					
4/4/89	11.55	16.31					
7/4/89	11.57	16.27					
1/5/89	12.02	15.84					
6/5/89	11.97	15.89					
1/6/89	12.00	15.86					
17/6/89	12.21	15.65					

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: NEWLANDS #2 ELEVATION OF R.P. 29.05

REF. POINT FOR MEASUREMENT TOP OF THE STEEL CAP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
1/4/86	17.25	11.80		2/2/87	14.20	14.85	
17/4/86	17.50	11.55		23/2/87	14.38	14.67	
9/5/86	16.83	12.22		9/3/87	14.45	14.60	
21/5/86	17.50	11.55		10/4/87	13.78	15.27	
5/6/86	13.33	15.72		1/5/87	13.66	16.05	
10/6/86	13.17	15.88		18/5/87	12.77	16.28	
13/6/86	13.34	15.68		1/6/87	12.70	16.35	
20/6/86	13.45	15.60		15/7/87	12.85	16.20	
27/6/86	13.25	15.80		12/8/87	13.30	15.75	
16/7/86	12.70	16.35		21/8/87	13.40	15.65	
25/7/86	12.97	16.08		23/10/87			
1/8/86	13.10	15.95		6/11/87	9.86	19.25	
18/8/86	13.50	15.65		24/11/87	10.58	18.47	
11/9/86	13.55	15.50		4/12/87	10.62	18.43	
17/11/86	13.25	15.80		21/1/88			
1/10/86	13.50	15.45		2/3/88	13.50	15.55	
21/10/86	13.50	15.55		9/3/88	16.70	12.35	
4/12/86	13.60	15.45		24/3/88	13.40	15.65	
11/12/86	13.50	15.55		28/4/88 2/6/88	12.45 12.68	16.60 14.37	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: NEWLANDS #2 ELEVATION OF R.P. 29.05

REF. POINT FOR MEASUREMENT TOP OF STEEL CAP

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
2/6/88	12.17	16.88		20/1/89	11.01	18.04	
1/7/88	13.13	15.92		1/2/89	11.13	17.92	
22/7/88	12.86	16.19		13/2/89	11.25	17.80	
10/8/88	13.92	15.13		28/2/89	11.47	17.58	
19/8/88	13.42	15.63		13/3/89	11.57	17.48	
[illegible]	13.82	15.23		4/4/89	11.88	17.17	
23/9/88	10.00	19.05		17/4/89	12.10	16.95	
7/10/88	10.13	19.92		1/5/89	12.32	16.73	
14/10/88	10.26	18.85		16/5/89	12.42	16.63	
18/10/88	10.26	18.79		1/6/89	LOCKED		
21/10/88	10.28	18.77					
28/10/88	10.37	18.68		17/6/89	12.65	16.[illegible]0	
4/11/88	10.47	18.58					
21/11/88	10.52	18.53					
30/11/88	9.77	19.28					
9/12/88	10.50	18.55					
19/12/88	10.65	18.40					
30/12/88	10.74	18.31					
10/1/89	10.90	18.15					

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: NEWLANDS #2H ELEVATION OF R.P. 23 00 ft

REF. POINT FOR MEASUREMENT STEEL PLATE BELOW DISCHARGE HEAD

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
7/7/87	12 67	15 43		1/9/88	14.20	13.80	
6/7/87	12 36	15 64		25/9/88	9 30	18.70	
26/8/87	12 80	15 20		7/10/88	9.44	13.56	
1/10/87	12 57	15 43		14/10/88	9 54	13.46	
21/10/87	13.11	14.89		21/10/88	9.62	13.38	
23/10/87	13.17	15 83		28/10/88	9 62	[illegible]	
4/11/87	9 18	15 82		4/11/88	9 73	13 27	
18/11/87	9 12	15 21		11/11/88	9 10	13 10	
24/11/87	9 90	15 10		21/11/88	9.81	13 19	
4/12/87	16.16	17 96		20/11/88	10.43	17.52	
21/1/88	31 10	- 3.10	330	9/12/88	9.80	18.20	
8/2/88	41 00	- 13.00	330	19/12/88	9.92	18.08	
2/3/88	12 70	15 30		30/12/88	10.01	17.99	
8/3/88	35 00	- 10.00	330	10/1/89	10.14	17.86	
7/4/88	12 39	15 61		20/1/89	10.26	17.74	
3/5/88	11 38	16 62		4/4/89	11.22	16.78	
24/5/88	12 00	16.00		1/5/89	11.61	16.39	
17/7/88	12 35	15.65		16/5/89	11.71	16.29	
10/8/88	15.10	12 90		1/6/89	11.78	16.22	

ST. CATHERINE PLAINS

WATER LEVEL DATA

)CATION: NEWLANDS # 2A

ELEVATION OF R.P. 25.02 H

EF. POINT FOR MEASUREMENT STEEL PLATE BELOW DISCHARGE HEAD

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
7/6/89	11.89	16.11					

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: NEWLANDS #3 ELEVATION OF R.P. 32 24 ft

REF. POINT FOR MEASUREMENT [illegible]

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
22/1/86	17 70	14 54		18/7/86	13.40	18.84	
25/1/86	17 94	14.30		25/7/86	13 50	18.74	
26/1/86	60-62	-24.76 - -27 76	437	1/8/86	13 55	18.69	
29/1/86	55 - 57	-24 76 -22 76	470	18/8/86	13 55	18 39	
30/1/86	60.5	28 32	475	1/9/86	14.00	18 24	
3/2/86	18.12	13 32		17/9/86	14.02	18.22	
19/2/86	19.85	12.34		1/10/86	14.17	18.07	
24/2/86	66.66	-27.76	450	24/10/86	16 20	16 04	
3/3/86	20 15	11 49		1/11/86	15 72	16 52	
10/3/86	18.40	13 64		15/11/86	42.70	-10.46	300
21/3/86	18 40	13 64		4/12/86	63.70	-31.46	400
1/4/86	18.66	13.58		11/12/86	16.70	15 54	
17/4/86	50.70	-18.46	275	30/12/86	57.58	-25 34	
9/5/86	17.96	14.28		30/12/86	56.06	-23.82	260
21/5/86	66.40	-34.16	400	8/1/87	62 16	-29 92	
10/6/86	13.70	18.54		8/1/87	60 14	-28.40	575
13/6/86	13.40	18.84		16/1/87	16.66	15 58	
20/6/86	66.00	-33.76	400	27/1/87	21.50	16 14	
27/6/86	63.50	-31.26	400	2/2/87	18 30	13.94	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: NEWLANDS #3 ELEVATION OF R.P. 32.24 ft

REF. POINT FOR MEASUREMENT PUMP PLATFORM

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
6/2/87	39.89	-7.65	150	28/8/87	42.60	-10.36	250
17/2/87	80.03	-47.79	500	7/9/87	46.70	-14.46	300
17/2/87	30.83	1.41	320	1/10/87	14.52	17.72	
6/3/87	7.75	< -42.76	475-550	14/10/87	14.10	18.14	
1/3/87	25.50	6.74		6/11/87	47.25	-15.01	320
3/3/87	18.76	13.48		18/11/87	12.65	19.59	
14/3/87	53.00	-20.64	300	24/11/87	60.20	-27.96	425
21/3/87	51.40	-19.24	325	27/11/87	54.60	-21.76	375
6/4/87	58.50	-26.26	362	4/12/87	70.16	-37.56	500
29/4/87	13.10	18.54		21/1/88	56.50	-24.26	350
15/5/87	15.16	17.08		8/2/88	72.70	-34.46	500
18/5/87	13.40	18.84		2/3/88	13.58	18.66	
1/6/87	13.38	18.86		8/3/88	49.25	-17.01	300
10/6/87	14.95	17.29		7/4/88	43.55	-11.31	250
17/7/87	18.66	13.64		2/6/88	13.18	19.06	
18/7/87	14.48	17.76		1/7/88	14.30	17.94	
30/7/87	60.00	-27.76		10/8/88	14.26	17.98	
12/8/87	43.70	-11.40	250	11/9/88	15.12	17.12	
21/8/87	38.70	-6.46	250	28/9/88	16.76	21.54	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: NEWLANDS #3 ELEVATION OF R.P. 32.24 ?1

REF. POINT FOR MEASUREMENT [illegible]

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
7/10/88	10.74	21.50		17/4/89	11.95	20.29	
14/10/88	10.79	21.55		1/5/89	12.51	19.73	
21/10/88	10.88	21.36		16/5/89	12.58	19.66	
28/10/88	10.93	21.31		1/6/89	12.40	19.84	
4/11/88	11.70	20.54		17/6/89	12.63	19.61	
14/11/88	11.16	21.08					
21/11/88	10.97	21.27					
30/11/88	11.62	20.62					
9/12/88	11.01	21.23					
19/12/88	11.06	21.18					
30/12/88	10.87	21.37					
10/1/89	10.99	21.25					
20/1/89	11.15	21.09					
1/2/89	11.30	20.94					
13/2/89	11.48	20.76					
28/2/89	11.66	20.58					
13/3/89	11.80	20.44					
28/3/89	12.00	20.24					
4/4/89	12.13	20.11					

ST. CATHERINE PLAINS

WATER LEVEL DATA

)CATION: GUINEP PEN ELEVATION OF R.P. 27·97ft

'EF. POINT FOR MEASUREMENT PUMP PLATFORM

ıte	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discha: (1GPM
	ft.	ft.			ft.	ft.	
1/87	17 86	10·11		1/7/88	17·70	10·27	
1/87	18·66	9·31		9/8/88	19·00	9·97	
1/87	17·90	10·07		5/9/88	19·20	9·77	
12/87	17 90	10 07		21/9/88	16·20	11·77	
12/87	17 82	10·15		30/9/88	15·84	12·13	
3/87	18·05	9·92		7/10/88	15·67	12 30	
3/87	17·90	10·07		14/10/88	15·65	12·33	
0/4/87	18·14	9·83		21/10/88	15 64	12 33	
5/5/87	17·50	10·47		28/10/88	15·60	12·37	
3/5/87	18·00	9·97		4/11/88	15·57	12·40	
0/6/87	18·30	9·67		14/11/88	15·65	12·32	
7/87	18 00	9·97		21/11/88	15·53	12·44	
/11/87	16·66	11·31		30/11/88	15·56	12·41	
8/11/87	16·54	11 43		9/12/88	15·55	12·42	
/12/87	16·45	11·52		19/12/88	15·60	12·37	
2/12/88	16·63	11·34		30/12/88	15·65	12·32	
2/3/88	16·75	11·22		10/1/89	15·73	12·24	
/4/88	17·02	10·95		20/1/89	15·74	12·23	
8/6/88	16·69	11·28		2/2/89	15·87	12·10	

ST. CATHERINE PLAINS

WATER LEVEL DATA

)CATION: GUINEP PEN

ELEVATION OF R.P. 27.97 ft.

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Dischar (1GPM)
	ft.	ft.			ft.	ft.	
4 2/89	15.93	12.04					
1 3/89	16.07	11.90					
14 3/89	16.15	11.82					
4 4/89	16.42	11.55					
17/4/89	16.56	11.41					
1/5/89	16.72	11.25					
6/5/89	16.81	11.16					
1/6/89	16.82	11.16					
7/6/89	16.85	11.12					

ST. CATHERINE PLAINS

WATER LEVEL DATA

ICATION: SOUTH SYNDICATE ELEVATION OF R.P. 31·04 ft

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ıte	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discha (1GPM
	ft.	ft.			ft.	ft.	
/87	17·82	13·22		2/3/88	16·70	14·34	
5/1/87	17·92	13·12		7/4/88	17·47	13·57	
7/1/87	17·90	13·14		3/5/88	16·30	14·74	
/2/87	17·91	13·13		8/6/88	17·23	13·81	
7/2/87	18·02	13·02		1/7/88	17·80	13·24	
/3/87	18·10	12·94		9/8/88	18·06	12·98	
0/3/87	18·15	12·89		1/9/88	18·30	12·74	
0/4/87	18·76	12·28		21/9/88	16·20	14·84	
/5/87	18·00	13·04		30/9/88	15·73	15·31	
28/5/87	17·75	13·29		7/10/88	15·83	15·21	
0/6/87	17·70	13·34		14/10/88	15·70	15·34	
/7/87	17·62	13·42		21/10/88	15·97	15·07	
30/7/87	17·50	13·54		28/10/88	15·60	15·44	
6/8/87	18·40	12·64		4/11/88	15·60	15·44	
7/10/87	17·75	13·29		14/11/88	15·40	15·64	
6/11/87	16·37	14·67		21/11/88	15·54	15·50	
3/11/87	16·09	14·95		30/11/88	15·53	15·51	
4/12/87	16·05	14·99		9/12/88	15·53	15·51	
2/2/88	16·63	14·41		19/12/88	15·58	15·46	

ST. CATHERINE PLAINS

WATER LEVEL DATA

)CATION: SOUTH SYNDICATE

ELEVATION OF R.P. 31 04 ft.

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Dischar (1GPM)
	ft.	ft.			ft.	ft.	
0/12/88	15.59	15.45					
0/1/89	15.68	15.36					
0/1/89	15.77	15.27					
2/2/89	15.83	15.21					
4/2/89	15.91	15.13					
5/2/89	15.99	15.05					
7/3/89	16.09	14.95					
4/4/89	16.38	14.66					
7/4/89	16.48	14.56					
1/5/89	16.61	14.43					
6/5/89	16.67	14.37					
1/6/89	16.73	14.31					
17/6/89	16.85	14.19					

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: COWPARK ELEVATION OF R.P. 37.42 ft

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discha (1GPM
	ft.	ft.			ft.	ft.	
1/87	22.70	14.72		9/12/87	40.00	-2.58	500
6/1/87	22.75	14.67		12/2/88	21.25	16.17	
7/1/87	22.92	14.50		4/3/88	21.45	15.97	
/2/87	22.75	14.67		7/4/88	20.57	16.85	
7/2/87	22.75	14.67		9/5/88	20.00	15.42	
/3/87	22.75	14.67		8/6/88	21.83	15.59	
0/3/87	22.90	14.52		1/7/88	22.50	14.92	
0/4/87	22.46	14.96		16/8/88	23.00	14.42	
/5/87	22.10	15.32		5/9/88	23.20	14.22	
8/5/87	22.15	15.37		21/9/88	20.85	16.57	
0/6/87	21.80	15.62		30/9/88	20.40	17.02	
7/7/87	21.00	16.42		7/10/88	20.06	17.36	
30/7/87	22.25	15.17		14/10/88	20.02	17.40	
6/8/87	23.80	13.62		21/10/88	20.00	17.42	
4/10/87	22.35	15.07		28/10/88	19.80	17.62	
6/11/87	21.82	15.60		4/11/88	19.84	17.58	
3/11/87	20.92	16.50		14/11/88	19.80	17.62	
24/11/87	20.90	16.52		21/11/88	19.80	17.62	
1/12/87	20.75	16.67		30/11/88	19.87	17.55	

ST. CATHERINE PLAINS

WATER LEVEL DATA

)CATION: COWPARKA

ELEVATION OF R.P. 37.42

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Dischar (1GPM)
	ft.	ft.			ft.	ft.	
/12/88	19.83	17.59					
7/12/88	20.01	17.41					
0/12/88	19.98	17.44					
1/1/89	20.11	17.31					
0/1/89	20.05	17.37					
3/2/89	20.13	17.29					
4/2/89	20.21	17.21					
1/3/89	20.36	17.06					
4/3/89	20.49	16.93					
28/3/89	20.55	16.87					
4/4/89	20.63	16.79					
17/4/89	20.90	16.52					
1/5/89	21.05	16.37					
16/5/89	20.96	16.46					
1/6/89	19.92	17.50					
17/6/89	21.17	16.25					

ST. CATHERINE PLAINS

WATER LEVEL DATA

)CATION: NORTH SYNDICATE ELEVATION OF R.P. 38 21ft

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ıte	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discha (1GPM
	ft.	ft.			ft.	ft.	
./1/37	19·66	18·55		2/3/88	19·10	19·11	
·/1/87	19·82	18·39		7/4/88	19·62	18·59	
7/1/87	20·00	18·21		8/6/88	19·11	19·10	
·/2/87	20 00	19·21		1/7/88	19·70	18·51	
7/2/87	19·72	18·49		9/8/88	20·15	18·06	
·/3/87	19·66	18·55		5/9/88	20·45	17·76	
·/3/87	19·60	18·61		21/9/88	18·98	19·23	
·/4/87	19·58	18·63		30/9/88	18·42	19·79	
./5/87	19 60	18·61		7/10/88	17·87	20·34	
8/5/87	18·50	19·71		14/10/88	17·60	20·61	
0/6/87	18·70	19·51		21/10/88	17·48	20·73	
7/7/87	18·49	19·72		28/10/88	17·36	20·85	
·0/7/87	19·70	19·51		4/11/88	17·24	20 97	
26/8/87	19·80	18·41		14/11/88	17·45	20·76	
4/10/87	19·50	18·71		21/11/88	17·15	21·06	
6/11/87	18 88	19·33		30/11/88	17·09	21·12	
8/11/87	19·13	19 08		9/12/88	17·06	21·15	
4/12/87	17·70	20·51		19/12/88	17·10	21·11	
2/2/88	18·30	19·41		30/12/88	17·13	21·08	

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: NORTH SYNDICATE ELEVATION OF R.P. 38.21 ft.

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Dischar (1GPM)
	ft.	ft.			ft.	ft.	
0/1/89	17.15	21.06					
0/1/89	17.23	20.98					
2/2/89	17.26	20.95					
4/2/89	17.38	20.83					
1/3/89	17.65	20.56					
4/3/89	17.70	20.51					
4/4/89	17.89	20.32					
7/4/89	18.08	20.13					
1/5/89	18.11	20.10					
6/5/89	18.17	20.04					
1/6/89	18.17	20.04					
3/6/89	18.24	19.97					

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: NAGGO HEAD ELEVATION OF R.P. 31·95 ft

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discha: (1GPM
	ft.	ft.			ft.	ft.	
/1/87	18·65	13·30		8/6/88	17·58	14·37	
/1/87	19·00	12·95		1/7/88	18·40	13·55	
7/1/87	18·92	13·03		9/8/88	18·75	13·20	
/2/87	18·73	13·22		5/9/88	18·93	13·02	
7/2/87	18·78	13·17		21/9/88	17·05	14·90	
5/3/87	18·80	13·15		30/9/88	16·73	15·22	
0/3/87	18·00	13·95		7/10/88	16·58	15·37	
/4/87	19·20	12·75		14/10/88	16·54	15·41	
5/5/87	19·00	12·95		21/10/88	16·45	15·50	
8/5/87	18·75	13·20		28/10/88	16·36	15·59	
0/6/87	18·55	13·40		4/11/88	16·32	15·63	
7/7/87	18·30	13·65		14/11/88	16·28	15·67	
5/11/87	17·03	14·92		21/11/88	16·13	15·82	
18/11/87	17·03	14·97		30/11/88	16·18	15·77	
1/12/87	17·45	14·50		9/12/88	16·15	15·80	
2/2/88	17·34	14·61		19/12/88	16·15	15·80	
2/3/88	17·41	14·54		30/12/88	16·18	15·77	
/4/88	18·02	13·93		10/1/89	16·25	15·70	
5/5/88	17·75	14·20		20/1/89	16·36	15·59	

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: NAGGO HEAD

ELEVATION OF R.P. 31.95 ft.

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Dischar (1GPM)
	ft.	ft.			ft.	ft.	
-/2/89	16.38	15.57					
:/2/89	16.48	15.47					
/3/89	16.51	15.44					
4/3/89	16.68	15.27					
4/4/89	16.97	15.08					
17/4/89	17.02	14.93					
1/5/89	17.13	14.82					
6/5/89	17.13	14.82					
1/6/89	17.24	14.71					
7/6/89	17.91	14.04					

ST. CATHERINE PLAINS

WATER LEVEL DATA

CATION: WATSON GROVE #3 ELEVATION OF R.P. 41·80 ft

F. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discha: (1GPM
	ft.	ft.			ft.	ft.	
'6/86	27·66	14 14		16/9/87	30 83	10·97	PUMPING
/6/86	23 90	17·90		5/10/87	28·13	13·67	PUMPING
17/86	28·40	13·40		14/10/87	31·38	10·42	PUMPING
'/8/86	28·05	13·75		22/10/87	28·12	13·68	
/9/86	28·60	13 20		6/11/87	29 16	12·64	
19/86	28·30	13·50		18/11/87	29·52	12·28	PUMPING
'/10/86	28·40	13·40		4/12/87	27·35	14·45	PUMPING
11/86	27·97	13 83		9/12/87	27·45	14·35	PUMPING
/12/86	28·25	13 55		21/1/88	28·10	13 70	PUMPING
0/12/86	53·52	-11·72	500	9/2/88	27·90	13 90	PUMPING
/1/87	29·00	12·80		2/3/88	27·35	14·45	
6/1/87	53·81	-12 01	500	7/4/88	28·47	12·33	PUMPING
2/2/87	28·00	13·80		9/5/88	32·40	9 40	PUMPING
/3/87	28·05	13·75		2/6/88	32·20	9 60	PUMPING
3/4/87	54·00	-12·20	500	1/7/88	29·40	12·40	PUMPING
8/5/87	27·30	14·50		5/8/88	28·20	13 60	
0/7/87	37·80	4 00	PUMPING	9/8/88	37·60	4 20	PUMPING
/9/87	28·25	13·55	PUMPING	5/9/88	29·68	12·12	PUMPING
/9/87	30·83	10·97	PUMPING	21/9/88	25·20	16 60	

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: WATSON GROVE #3 ELEVATION OF R.P. 41·80 ft.

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Dischar (1GPM)
	ft.	ft.			ft.	ft.	
9/9/88	24·60	17·20		28/3/89	26·50	15·30	
/10/88	24·57	17·23		30/3/89	36·30	5·50	350
1/10/88	29·73	12·07	170	4/4/89	26·61	15·19	
1/10/88	24·92	16·88		17/4/89	26·99	14·81	
11/10/88	24·80	17·00		1/5/89	26·71	15·09	
3/10/88	24·91	16·89		16/5/89	21·60	20·20	
4/11/88	25·08	16·72		1/6/89	26·87	14·93	
14/11/88	30·80	11·00		17/6/89	54·15	-12·35	PUMPING
21/11/88	24·81	16·99		20/6/89	32·62	8·18	
23/11/88	39·30	2·50	400				
30/11/88	25·78	16·02					
3/12/88	38·94	2·56	390				
9/12/88	46·29	-4·48	540				
10/12/88	28·74	13·06	125				
10/1/89	26·10	15·70					
21/1/89	41·90	-0·1	420				
1/2/89	27·78	14·02					
13/2/89	39·55	2·25	375				
28/2/89	31·60	10·20	170				

ST. CATHERINE PLAINS

WATER LEVEL DATA

)CATION: RIVERSDALE #1 ELEVATION OF R.P. 37·45 ft

:F. POINT FOR MEASUREMENT PUMP PLATFORM

ıte	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discha (1GPM
	ft.	ft.			ft.	ft.	
/1/87	23·00	14·45		6/11/87	19·70	17·55	
/1/87	23·16	14·29		18/11/87	20·32	17·13	
7/1/87	23·38	14·07		24/11/87	20·60	16·85	
/12/87	24·38	13·07		4/12/87	20·83	16·57	
4/2/87	24 68	12·77		9/12/87	41·00	-3·55	275
5/3/87	26·34	11·11		21/1/88	23·55	13·90	
2/3/87	26·40	11 05		12/2/88	21·95	15·50	
2/4/87	23·72	13·73		4/3/88	22·43	15·02	
5/5/87	23·40	14·05		9/3/88	23 90	13·65	PUMPING
9/5/87	22·30	15·15		7/4/88	22·88	14·57	
0/6/87	22 70	14·75		9/5/88	23·35	14·10	
+/7/87	23·0	14·45		2/6/88	23 77	13 68	
0/7/87	23·05	14·40		1/7/88	41 00	-3·55	317
29/7/87	22 75	14·70		7/7/88	28·30	8·65	-
7/7/87	40·40	-2·75	275	5/8/88	22·80	14·65	
7/8/87	23·35	14·10		9/8/88	35·00	2 45	250
7/9/87	23·10	14·35		5/9/88	25·90	11·55	
6/9/87	23·10	14·35		21/9/88	18·20	19·25	
22/10/87	22·40	14·55		30/9/88	18·20	19·25	

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: RIVERSDALE #1 ELEVATION [illegible]

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Dischar (1GPM)
	ft.	ft.			ft.	ft.	
/10/88	18·63	18·82		28/3/89	22·59	14·86	
3/10/88	19·76	17·69		30/3/89	22·55	14·90	
/11/88	31·90	5·55	250	4/4/89	22·36	15·09	
4/11/88	20·28	17·17		17/4/89	22·48	14.97	
1/11/88	20·25	17·20	–	1/5/89	22·59	14·86	
23/11/88	20·32	17·13		16/5/89	22·03	15·42	
24/11/88	45·00	-7·55	300	1/6/89	39·05	-2·60	250
5/11/88	36·00	1·45	225	17/6/89	50 00	-12·55	270
30/11/88	20·32	17·13		20/6/89	23·47	13·98	
9/12/88	20·70	16·75					
9/12/88	21·21	16·24					
30/12/88	20·37	17·08					
10/1/89	21·28	16·17					
21/1/89	21·56	15·89					
2/2/89	21·44	16·01					
13/2/89	21·74	15·71					
23/2/89	21·99	15·46					
14/3/89	22·00	15·45					

ST. CATHERINE PLAINS

WATER LEVEL DATA

)CATION: GOVERNMENT PARK ELEVATION OF R.P. 49·14 ft.

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ıte	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discha: (1GPM
	ft.	ft.			ft.	ft.	
/8/87	20·65	28·49		9/12/88	13·70	35·44	
./10/87	27·50	21·64	PUMPING	19/12/88	13·20	35·94	
/12/88	19·17	29·97		30/12/88	12·85	36·29	
/3/88	19·17	29·97		10/1/89	12·48	36·66	
/4/88	21·38	27·76		20/1/89	12·50	36·64	
/5/88	23·30	25·84		1/2/89	12·85	36·29	
/6/88	33·00	16·14	830	18/2/89	13·18	35·96	
/7/88	31·80	17·34	PUMPING	28/2/89	13·72	35·42	
/8/88	24·50	24·64		13/3/89	14·00	35·14	
/9/88	18·70	30·44		28/3/89	14·33	34·81	
0/9/88	14·30	34·84		4/4/89	14·65	34·49	
/10/88	14·18	34·96		17/4/89	14·72	34·42	
4/10/88	14·30	34·84		1/5/89	14·64	34·50	
1/10/88	14·42	34·72		16/5/89	14·58	34·56	
8/10/88	14·75	34·39		1/6/89	14·75	34·39	
4/11/88	14·85	34·29		17/6/89	15·09	34·05	
/11/88	14·62	34·52					
/11/88	14·57	34·57					

ST. CATHERINE PLAINS

WATER LEVEL DATA

.OCATION: CONGRIEVE PARK #4 ELEVATION OF R.P. 32·00 ft.

REF. POINT FOR MEASUREMENT PUMP PLATFORM

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
2/8/87	12·00	20·00		21/11/88	5·47	26·53	
2/10/87	13·05	18·95		30/11/88	5·88	26·12	
5/11/87	7·66	24·34		9/12/88	6·24	25·76	
7/12/87	19·40	12·60	PUMPING	19/12/88	6·17	25·83	
1/2/88	9·67	22·33		30/12/88	6·50	25·50	
2/3/88	10·15	21·85		11/1/89	6·90	25·10	
7/4/88	34·50	-2·50	667	20/1/89	7·13	24·87	
9/5/88	32·25	-0·25	709	2/2/89	6·62	25·38	
2/6/88	29·80	2·20	417	13/2/89	6·87	25·13	
1/7/88	34·30	-2·30	550	28/2/89	7·05	24·95	
9/8/88	12·40	19·60		14/3/89	7·34	24·68	
5/9/88	11·46	20·54		28/3/89	7·70	24·30	
30/9/88	5·70	26·30		4/4/89	7·78	24·22	
7/10/88	5·49	26·51		17/4/89	7·80	24·20	
14/10/88	5·94	26·06		1/5/89	8·47	23·53	
21/10/88	6·11	25·89		16/5/89	7·15	24·85	
28/10/88	6·28	25·72		1/6/89	7·46	24·54	
4/11/88	5·70	26·30		17/6/89	8·08	23·92	
14/11/88	5·92	26·08					

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: GOSHEN # 3A

ELEVATION OF R.P. 37.00 ft.

REF. POINT FOR MEASUREMENT PUMP PLATFORM

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
/2/88	12.20	24.80		11/1/89	9.03	27.97	
7/4/88	12.91	24.09		20/1/89	9.14	27.86	
1/5/88	13.33	23.67		2/2/89	8.99	28.01	
2/6/88	13.60	23.40		13/2/89	9.03	27.97	
1/7/88	13.83	23.17		28/2/89	9.31	27.69	
7/8/88	15.06	21.94		14/3/89	9.57	27.43	
5/9/88	14.40	22.60		28/3/89	9.69	27.31	
0/9/88	7.80	29.20		4/4/89	9.81	27.19	
7/10/88	7.88	29.12		17/4/89	10.05	26.95	
14/10/88	8.16	28.84		1/5/89	10.37	26.66	
21/10/88	8.39	28.61		16/5/89	9.80	27.20	
28/10/88	8.50	28.50		1/6/89	9.67	27.33	
4/11/88	8.60	28.40		17/6/89	10.01	26.99	
14/11/88	8.90	28.10					
21/11/88	8.67	28.33					
30/11/88	8.34	28.66					
9/12/88	8.48	28.52					
19/12/88	8.64	28.36					
30/12/88	8.78	28.22					

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: SALT POND # 7 ELEVATION OF R.P. 30.00 ft.

REF. POINT FOR MEASUREMENT PUMP PLATFORM

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
/10/87	11.64	18.36		14/11/88	3.63	26.37	
13/10/87	8.70	21.30		21/11/88	1.65	28.35	
3/11/87	3.50	26.50		30/11/88	2.56	27.44	
24/11/87	17.75	12.25	465	9/12/88	3.18	26.82	
4/12/87	3.90	26.10		19/12/88	2.94	27.06	
1/2/88	21.10	8.90	465	30/12/88	3.11	26.89	
2/3/88	7.30	22.70		11/1/89	4.60	25.40	
7/4/88	8.35	21.65		21/1/89	4.65	25.95	
9/5/88	7.74	22.26		14/2/89	4.97	25.03	
8/6/88	8.00	22.00		28/2/89	3.66	26.34	
1/7/88	8.50	21.50		13/3/89	3.76	26.22	
5/8/88	8.58	21.42		6/4/89	3.27	26.73	
5/9/88	5.96	24.04		17/4/89	5.29	24.71	
9/9/88	1.80	28.20		1/5/89	4.24	25.76	
7/10/88	1.05	28.95		16/5/89	1.87	28.13	
14/10/88	3.00	27.00					
21/10/88	2.90	27.10					
28/10/88	3.33	26.67					
4/11/88	3.50	26.50					

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: REIDSPEN #1 ELEVATION OF R.P. 27.00 ft.

EF. POINT FOR MEASUREMENT PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
10/87	9.04	17.96		16/5/89	0.52	26.48	
/10/87	6.46	20.54					
/11/87	1.65	25.35					
7/11/87	3.84	23.16					
1/2/88	30.70	-3.70	400				
2/3/88	5.18	21.82					
7/4/88	30.10	-3.10	PUMPING				
1/5/88	6.50	20.50					
3/6/88	6.89	20.11					
1/7/88	33.55	-6.55	PUMPING				
5/8/88	30.60	-3.60	PUMPING				
1/9/88	5.25	21.75					
0/9/88	OVER FLOWING	THE CASING					
7/10/88	0.10	26.90					
14/10/88	1.00	26.00					
21/10/88	1.30	25.70					
28/10/88	1.20	25.80					
4/11/88	1.45	25.55					
1/5/89	2.25	24.75					

ST. CATHERINE PLAINS

WATER LEVEL DATA

.OCATION: WATERFORD

ELEVATION OF R.P. 2.00 ft.

.EF. POINT FOR MEASUREMENT TOP OF PVC PIPE

.ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
)/9/87	0.00	2.00		14/10/88	0.42	1.58	
/10/87	1.72	0.28		18/10/88	0.45	1.55	
3/10/87	0.34	1.66		21/10/88	0.62	1.38	
)/11/87	OVER FLOWING THE PIPE			28/10/88	0.29	1.71	
8/11/87	TOP OF THE PIPE			4/11/88	0.76	1.24	
4/12/87	0.13	1.87		15/11/88	0.91	1.09	
21/1/88	0.20	1.80		21/11/88	0.67	1.33	
23/2/88	0.40	1.60		30/11/88	0.68	1.32	
3/3/88	0.45	1.55		9/12/88	0.70	1.30	
24/3/88	0.70	1.30		19/12/88	0.88	1.12	
3/5/88	0.80	1.20		30/12/88	1.01	0.99	
8/6/88	0.12	1.88		11/1/89	1.15	0.85	
5/7/88	0.21	1.79		1/2/89	1.17	0.83	
21/7/88	1.20	0.80		13/2/89	1.27	0.73	
5/8/88	1.14	0.86		3/3/89	1.31	0.69	
19/8/88	1.35	0.65		13/3/89	1.52	0.48	
2/9/88	1.48	0.52		28/3/89	1.71	0.29	
28/9/88	OVERFLOWING THE PIPE BY 0.23ft ABOVE THE CONCRETE			6/4/89	1.94	0.06	
7/10/88	0.48	1.52		18/4/89	1.86	0.14	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: WATERFORD ELEVATION OF R.P. 2.00 ft.

REF. POINT FOR MEASUREMENT TOP OF PVC. PIPE

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
16/5/89	0.96	1.04					
1/6/89	1.62	0.38					
17/6/89	1.96	0.04					

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: NAGGO HEAD OBS. ELEVATION OF R.P. 7ft.

EF. POINT FOR MEASUREMENT TOP OF PVC PIPE

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
'10/87	5·34	1·66		21/10/88	3·97	3·03	
5/11/87	4·00	3·00		28/10/88	3·97	3·03	
/12/87	4·20	2·80		4/11/88	4·06	2·94	
1/1/88	4·32	2·68		14/11/88	4·10	2·90	
1/2/88	4·90	2·10		21/11/88	3·55	3·45	
23/2/88	4·96	2·04		30/11/88	3·75	3·25	
3/3/88	4·60	2·40		9/12/88	3·78	3·22	
24/3/88	5·20	1·80		19/12/88	3·82	3·18	
28/4/88	5·06	1·94		30/12/88	4·04	2·96	
8/6/88	4·64	2·36		10/1/89	4·11	2·89	
5/7/88	4·64	2·36		20/1/89	4·24	2·76	
21/7/88	4·74	2·26		1/2/89	4·05	2·95	
5/8/88	4·84	2·16		13/2/89	4·18	2·82	
9/8/88	4·84	2·16		28/2/89	4·16	2·84	
2/9/88	4·96	2·04		13/3/89	4·29	2·71	
8/9/88	3·70	3·30		28/3/89	4·53	2·17	
7/10/88	3·82	3·18		4/4/89	4·56	2·44	
14/10/88	3·96	3·04		17/4/89	4·63	2·37	
8/10/88	3·93	3·07		1/5/89	4·76	2·24	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: NAGGO HEAD OBS. ELEVATION OF R.P. 7 ft

REF. POINT FOR MEASUREMENT TOP OF PIPE

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
16/5/89	4 40	2 60					
1/6/89	4·55	2·45					
17/6/89	4·69	2·31					

ST. CATHERINE PLAINS

WATER LEVEL DATA

.OCATION: CUMBERLAND PEN ELEVATION OF R.P. 15 ft.

EF. POINT FOR MEASUREMENT TOP OF PVC PIPE (DEEP PIEZOMETER)

DEEP PIEZOMETER				SHALLOW PIEZOMETER			
ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
/10/87	11.34	3.66		1/10/87	11.79	3.21	
3/10/87	10.79	4.21		23/10/87	11.20	3.80	
5/11/87	9.55	5.45		6/11/87	9.75	5.25	
+/12/87	9.72	5.28		4/12/87	9.62	5.38	
21/1/88	9.69	5.31		21/1/88	9.59	5.41	
11/2/88	10.24	4.76		11/2/88	10.19	4.81	
23/2/88	9.89	5.11		23/2/88	9.81	5.19	
3/3/88	11.10	3.90		3/3/88	9.33	5.17	
24/3/88	10.56	4.44		24/3/88	10.41	4.59	
3/5/88	10.50	4.50		3/5/88	10.26	4.74	
8/6/88	10.39	4.61		8/6/88	10.03	4.97	
5/7/88	10.64	4.36		5/7/88	10.12	4.88	
21/7/88	10.58	4.42		21/7/88	10.40	4.60	
5/8/88	10.71	4.29		5/8/88	10.52	4.48	
19/8/88	10.78	4.22		19/8/88	10.57	4.43	
2/9/88	10.71	4.29		2/9/88	10.23	4.77	
28/9/88	9.09	5.91		28/9/88	8.34	6.66	
7/10/88	9.29	5.71		7/10/88	8.55	6.45	
14/10/88	9.42	5.58		14/10/88	8.73	6.27	

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: CUMBERLAND PEN ELEVATION OF R.P. 15 ft.

EF. POINT FOR MEASUREMENT TOP OF PVC PIPE (DEEP PIEZOMETER)

DEEP PIEZOMETER				SHALLOW PIEZOMETER			
ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Dischar (1GPM)
	ft.	ft.			ft.	ft.	
3/10/88	9.50	5.50		18/10/88	8.80	6.20	
1/10/88	9.50	5.50		21/10/88	8.84	6.16	
3/10/88	9.52	5.48		28/10/88	8.93	6.07	
/11/88	9.60	5.40		4/11/88	9.05	5.95	
1/11/88	9.72	5.28		14/11/88	9.19	5.81	
1/11/88	9.34	5.66		21/11/88	8.84	6.16	
0/11/88	9.42	5.58		30/11/88	8.82	6.18	
1/12/88	9.42	5.58		9/12/88	8.91	6.09	
9/12/88	9.64	5.36		19/12/88	9.01	5.99	
0/12/88	9.78	5.22		30/12/88	9.28	5.72	
1/1/89	9.86	5.14		11/1/89	9.44	5.56	
2/2/89	9.88	5.12		2/2/89	9.61	5.39	
4/2/89	10.09	4.91		14/2/89	9.68	5.32	
28/2/89	10.04	4.96		28/2/89	9.72	5.28	
4/3/89	10.22	4.78		14/3/89	9.81	5.19	
6/4/89	10.52	4.48		6/4/89	10.12	4.88	
18/4/89	10.63	4.37		18/4/89	10.63	4.37	
1/5/89	10.72	4.28		1/5/89	10.44	4.56	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: CUMBERLAND PEN ELEVATION OF R.P. 15 ft

REF. POINT FOR MEASUREMENT TOP OF PVC (DEEP PIEZOMETER)

DEEP PIEZOMETER				SMALLOW PIEZOMETER			
Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
6/5/89	10.46	4.54		6/5/89	10.26	4.74	
1/6/89	10.65	4.35		1/6/89	10.40	4.60	
17/6/89	10.85	4.15		17/6/89	10.61	4.39	

ST. CATHERINE PLAINS

WATER LEVEL DATA

.OCATION: REIDSPEN

ELEVATION OF R.P. 11 ft.

EF. POINT FOR MEASUREMENT TOP OF PVC PIPE

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
3/10/87	10.73	0.27					
1/1/88	9.64	1.36					
3/2/88	10.26	0.74					
4/3/88	10.43	0.57					
/6/88	8.52	2.48					
17/88	10.73	0.27					
1/7/88	10.08	0.92					
5/8/88	10.03	0.97					
9/8/88	9.96	1.04					
5/9/88	9.80	1.20					
9/9/88	8.10	2.90					
28/10/88	9.00	2.00					
4/11/88	9.11	1.89					
21/11/88	8.20	2.80					
30/11/88	8.37	2.37					

ST. CATHERINE PLAINS

WATER LEVEL DATA

)CATION: PORTMORE # 2 ELEVATION OF R.P. 18·93 ft

:F. POINT FOR MEASUREMENT BASE OF PUMP PLATFORM

ıte	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
/2/87	23·50	-4·57	PUMPING	26/10/88	26·70	-7·77	PUMPING
'3/87	23·50	-4·57	PUMPING	23/11/88	27·70	-8·77	PUMPING
8/87	12·30	6·63	—	14/12/88	24·10	-5·17	PUMPING
'9/87	12·46	6·47	—	17/3/89	24·00	-5·07	PUMPING
/10/87	11·80	7·13	—	13/4/89	26·00	-7·07	PUMPING
/11/87	10·25	8·68	—				
'12/87	10·30	8·63	—				
1/1/88	10·15	8·78	—				
)/2/88	10·37	8·56	—				
)/3/88	10·75	8·18	—				
3/4/88	11·10	7·83	—				
2/5/88	11·50	7·43	—				
0/6/88	12·01	6·92	—				
7/7/88	11·00	7·93	—				
5/8/88	18·20	0·73	PUMPING				
9/8/88	25·14	-6·21	PUMPING				
2/9/88	25·43	-6·50	PUMPING				
29/9/88	11·25	7·68	—				
21/10/88	12·10	6·83	—				

A REPORT ON THE GROUNDWATER LEVELS IN PARTS OF BERNARD LODGE AND CAYMANAS AREAS AND ADJOINING COASTAL AREA ST. CATHERINE PLAINS

APPENDIX-II

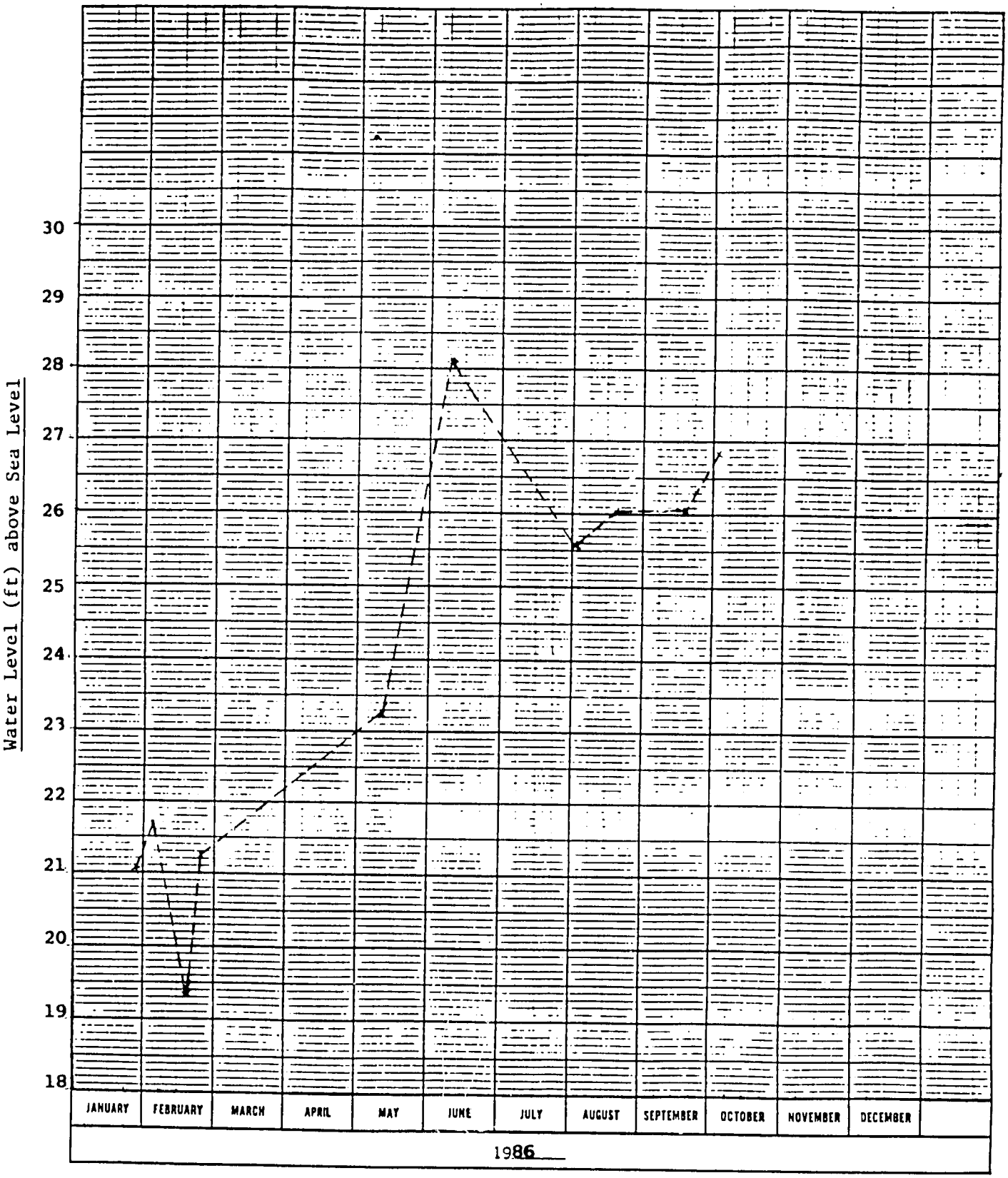
WELL HYDROGRAPHS

(1 - 107 Pages)

St. Catherine Plains
Well Hydrograph

Location: **HALF WAY TREE #2**

Elevation of M.P- **43.03ft.**

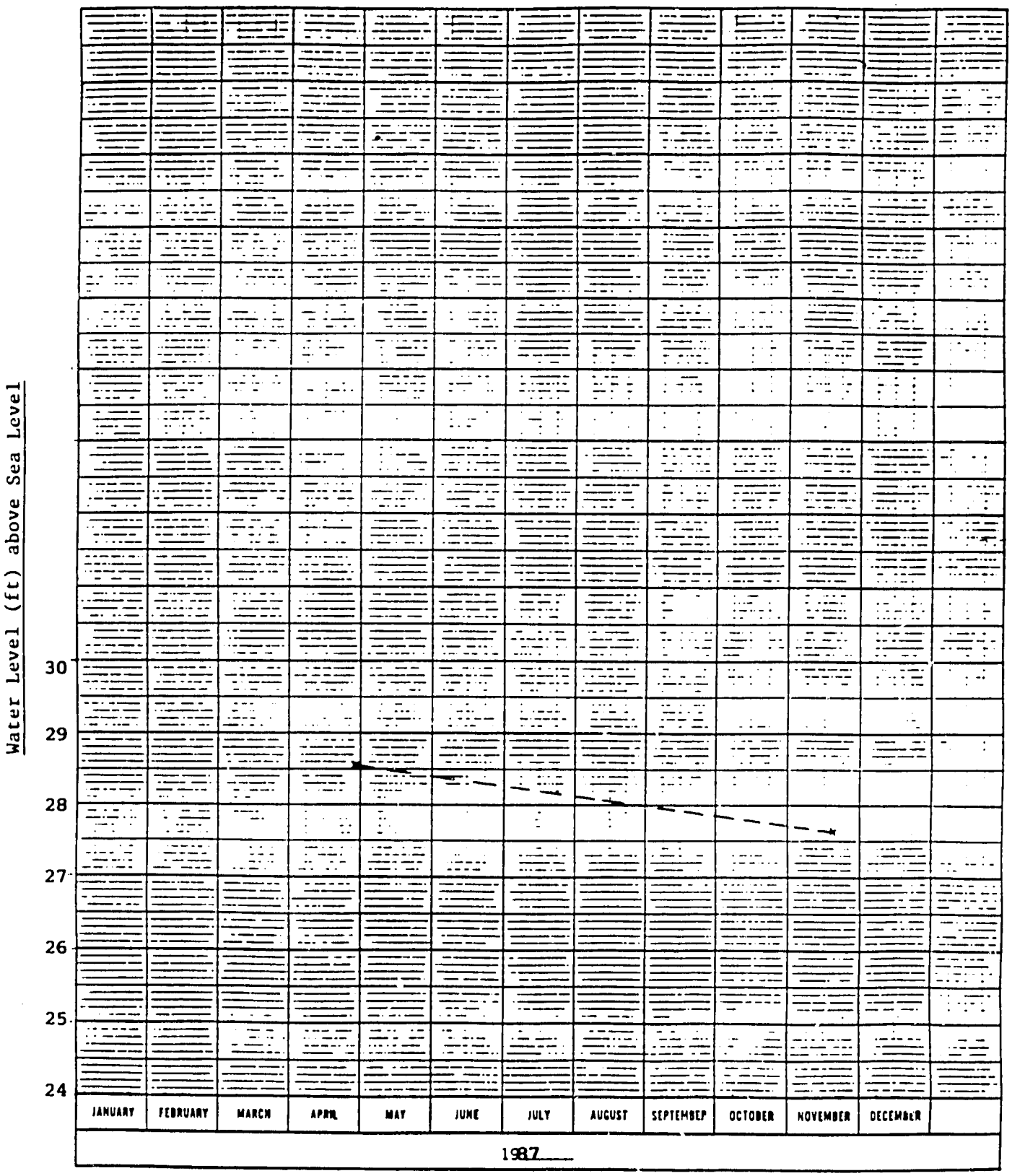


NOW PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #2

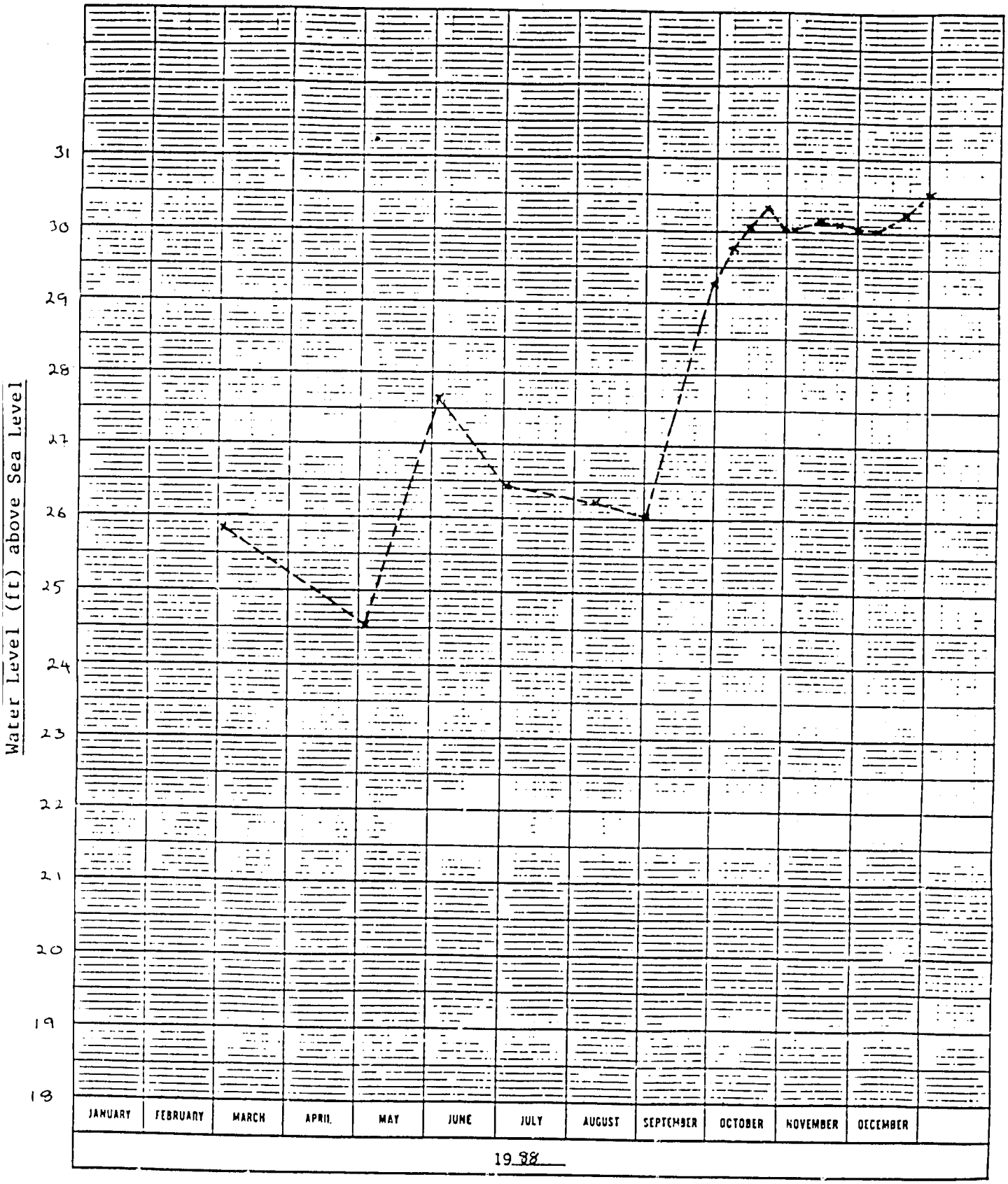
Elevation of M.P- 43.03 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

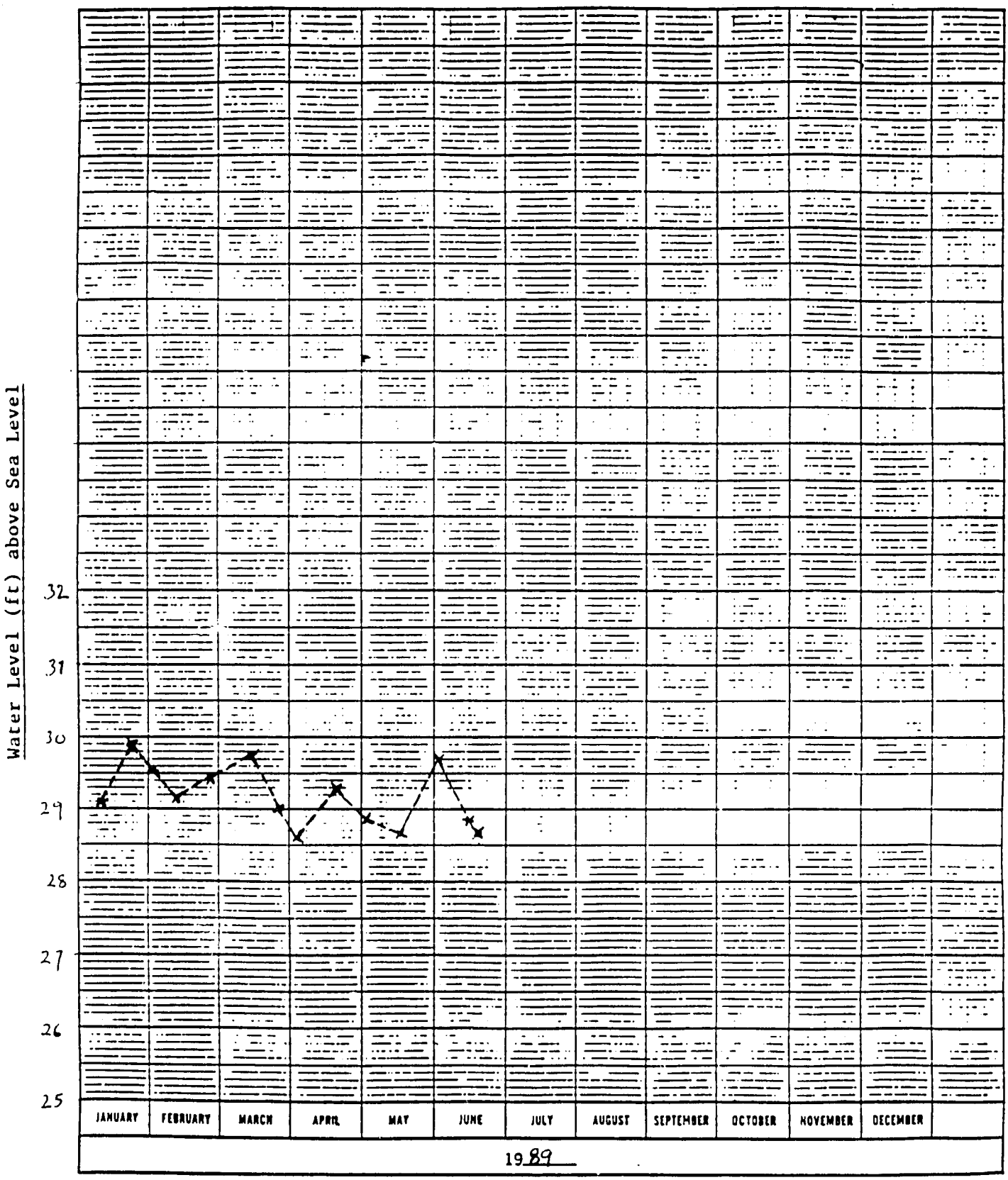
Location: HALFWAY TREE #2 Elevation of M.P- 43.03 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: HALFWAY TREE #2 Elevation of M.P- 43.03 ft.

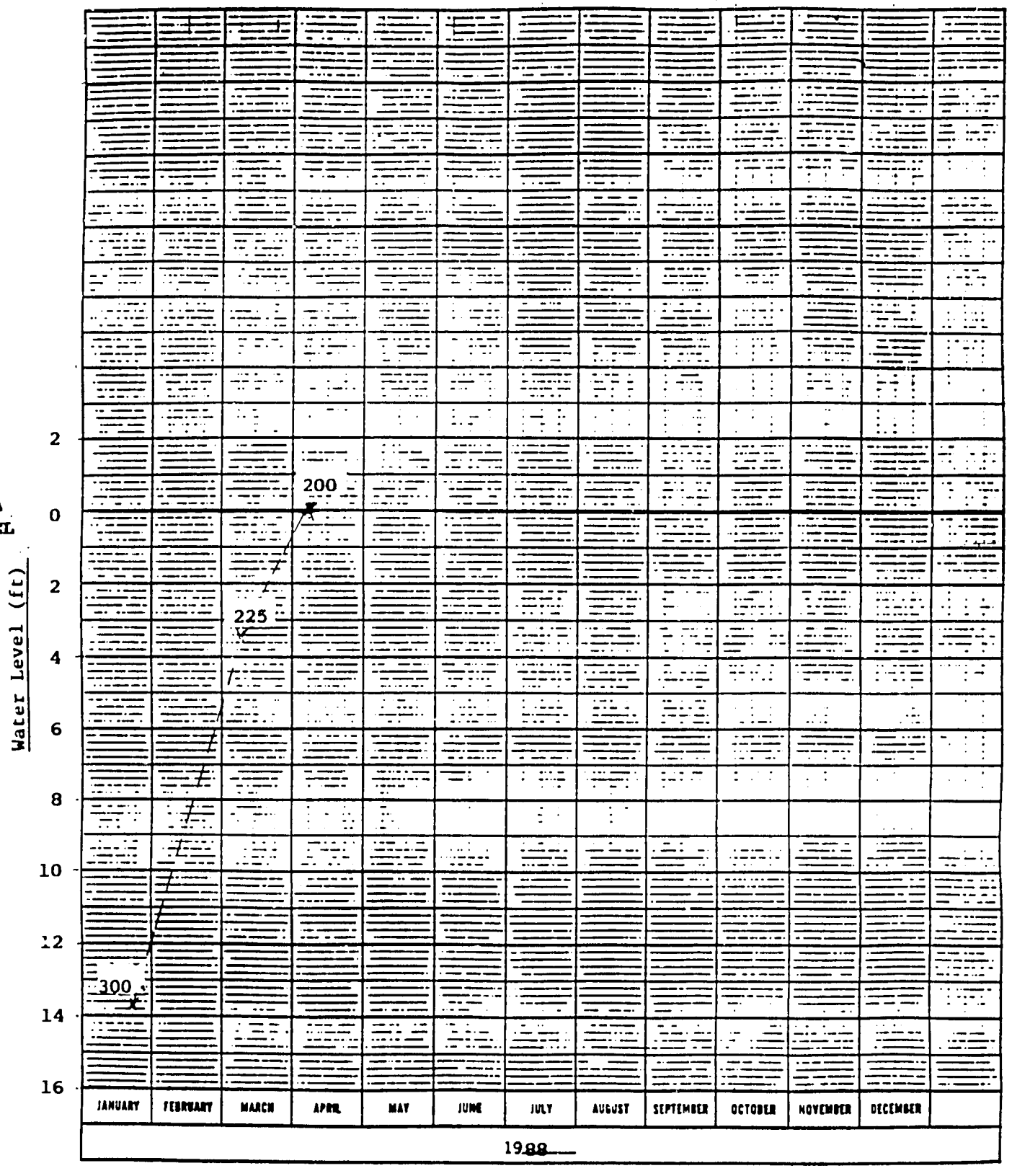


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #4

Elevation of M.P- 37.94ft.



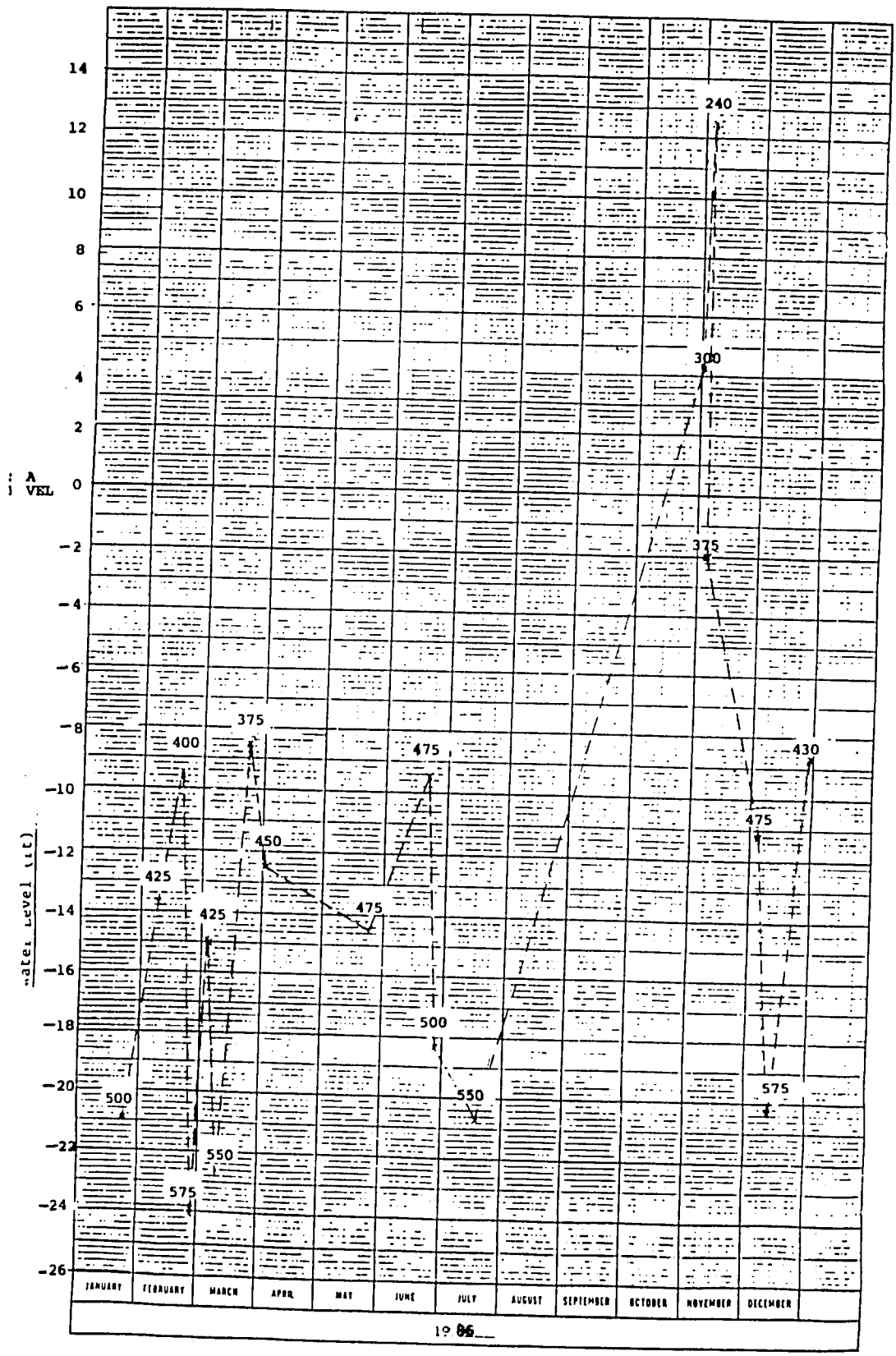
PUMPING WATER LEVEL

300 - WELL DISCHARGE (IGPM)

3.

St. Catherine Plains
Well Hydrograph

Location: HALF-WAY-TREE #2 Elevation of M.P- 43.03 ft.

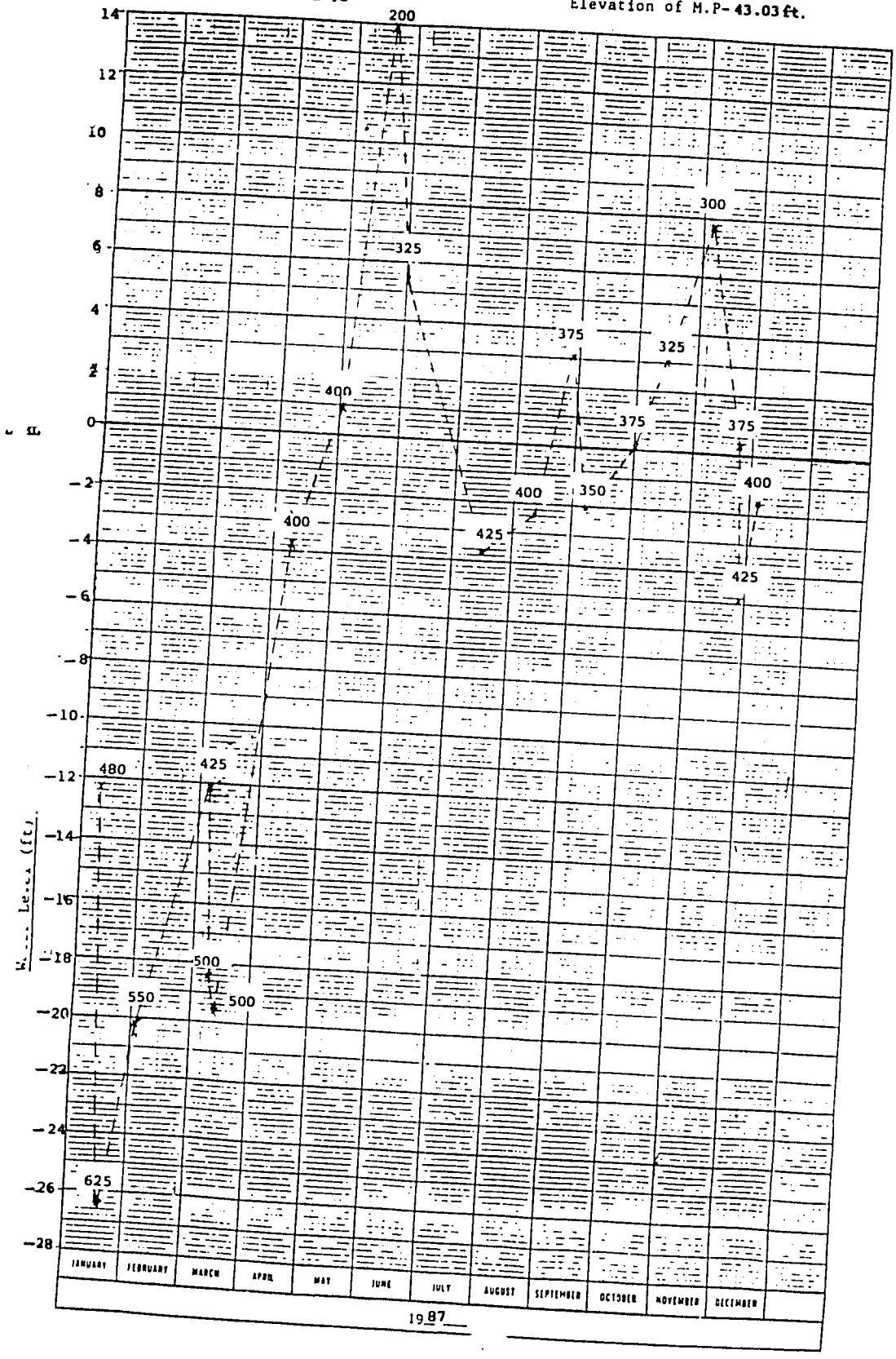


PUMPING WATER LEVELS 450 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: HALF-WAY-TREE #2

Elevation of M.P- 43.03 ft.



PUMPING WATER LEVEL

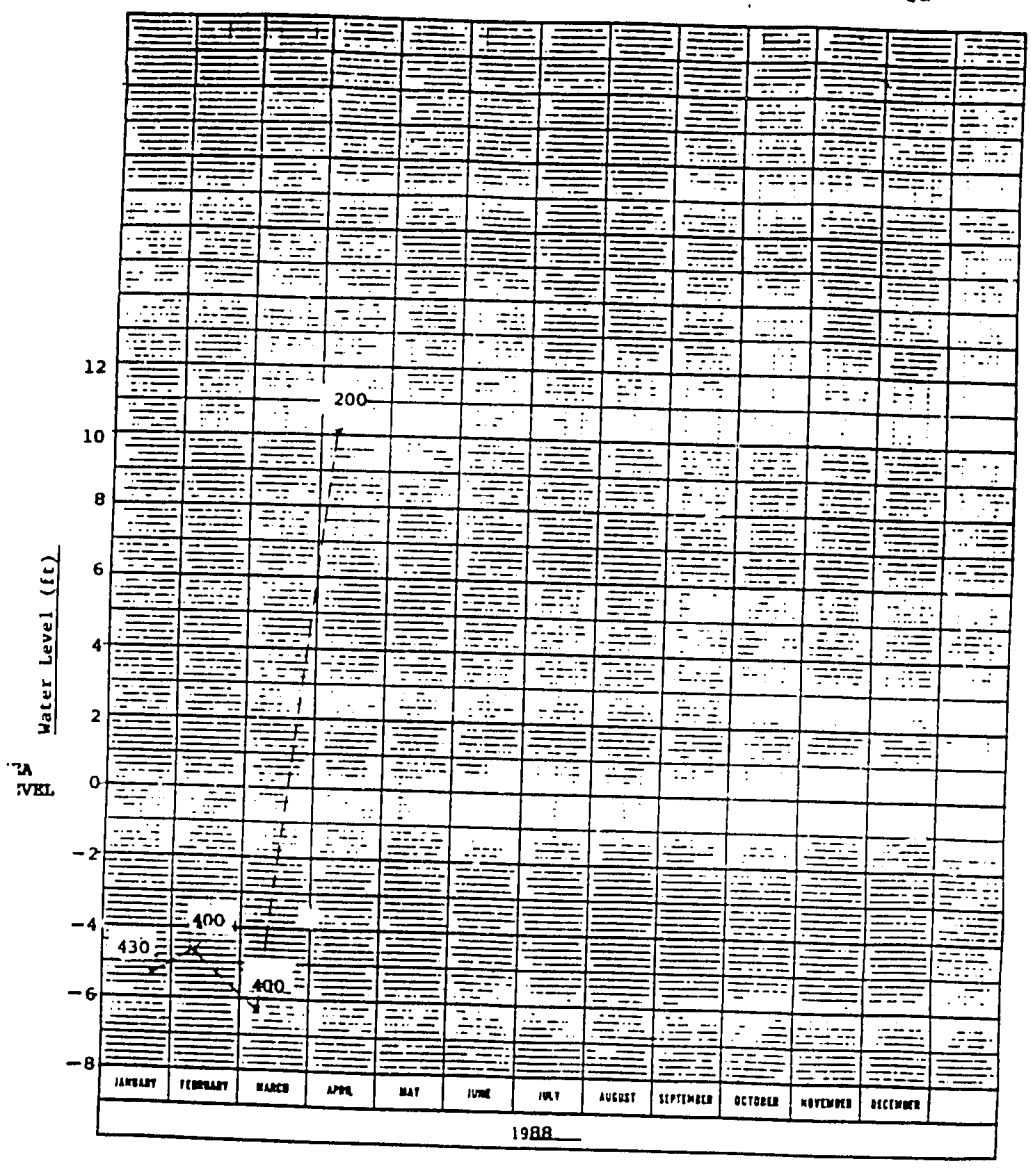
300 - WELL DISCHARGE (IGPM)

82

St. Catherine Plains
Well Hydrograph

Location: HALF-WAY-TREE #2

Elevation of M.P- 43.03ft.



PUMPING WATER LEVEL

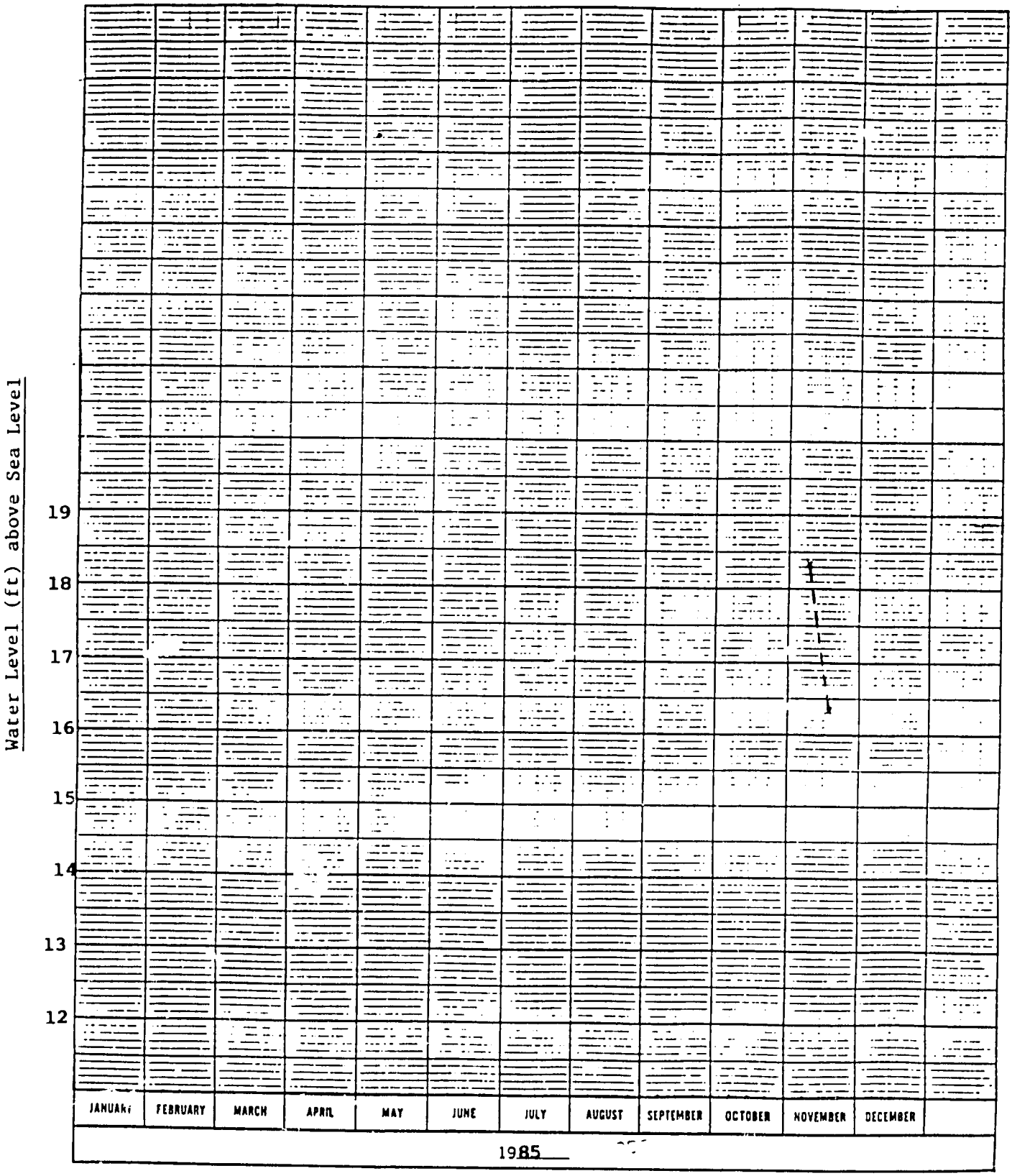
400 - WELL DISCHARGE (IGPM)

83

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #5

Elevation of M.P- 43.18 ft.

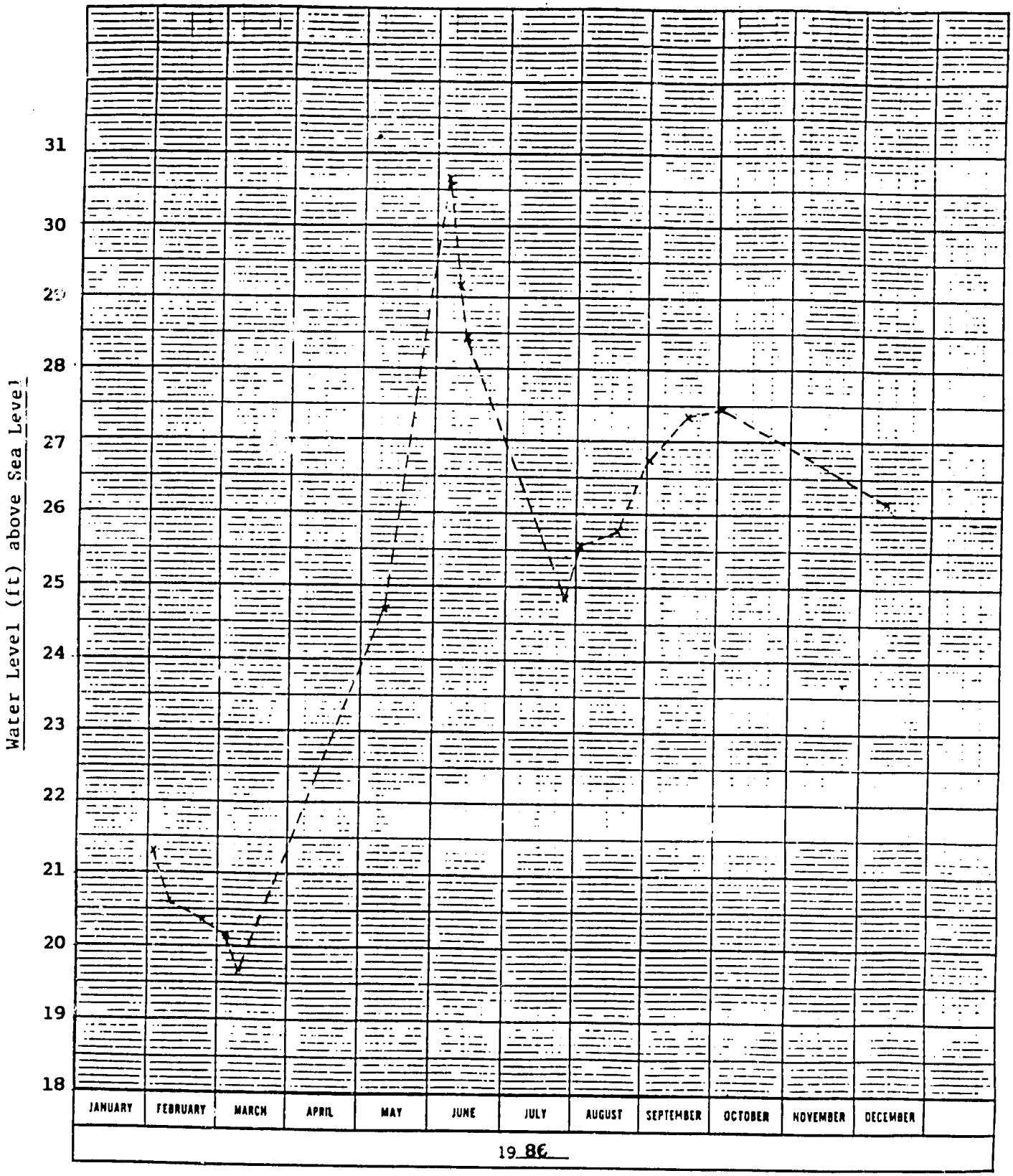


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: **HALF WAY TREE #5**

Elevation of M.P- **43.18 ft.**

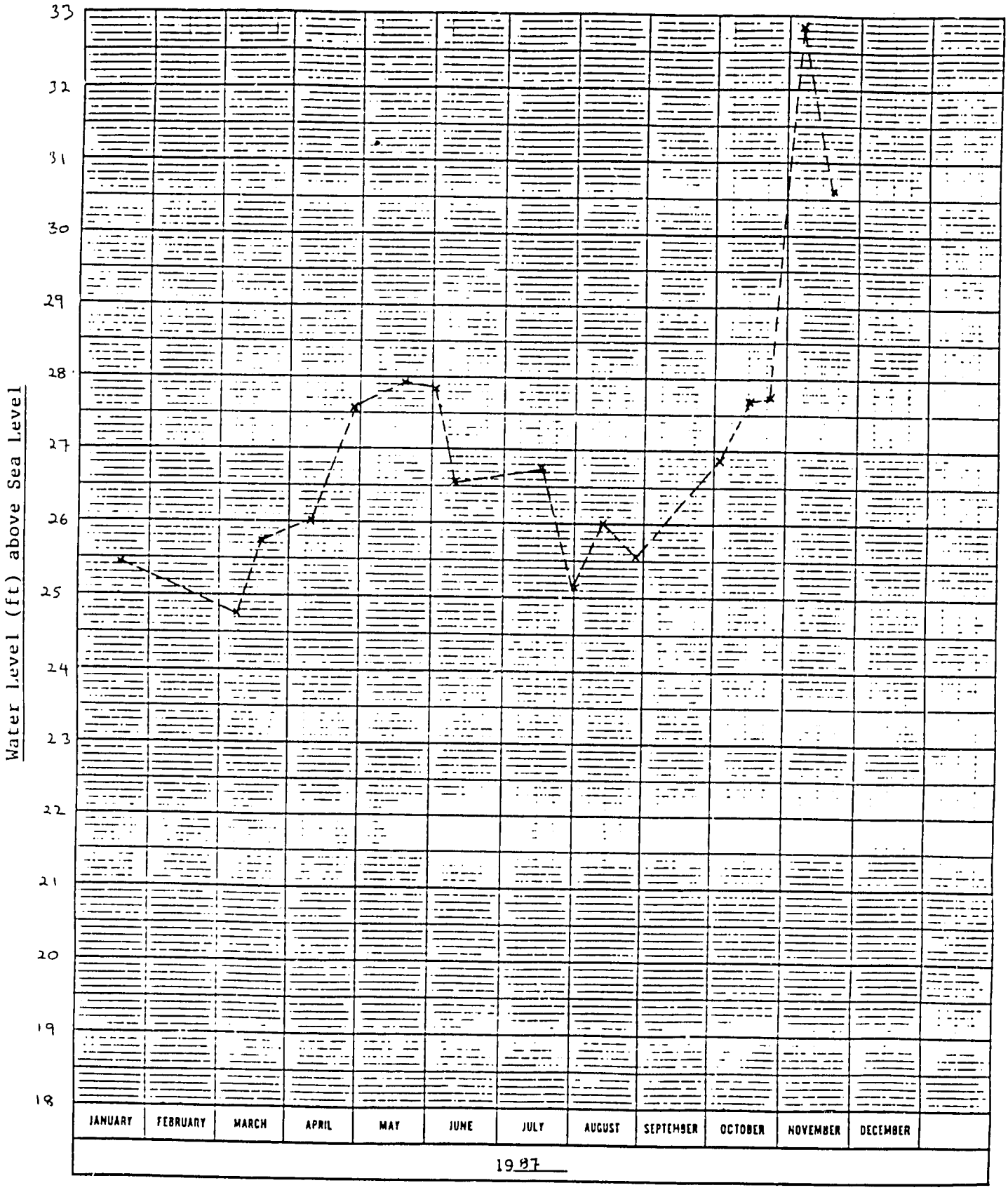


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: HALFWAY TREE #5

Elevation of M.P- 43.18 ft.

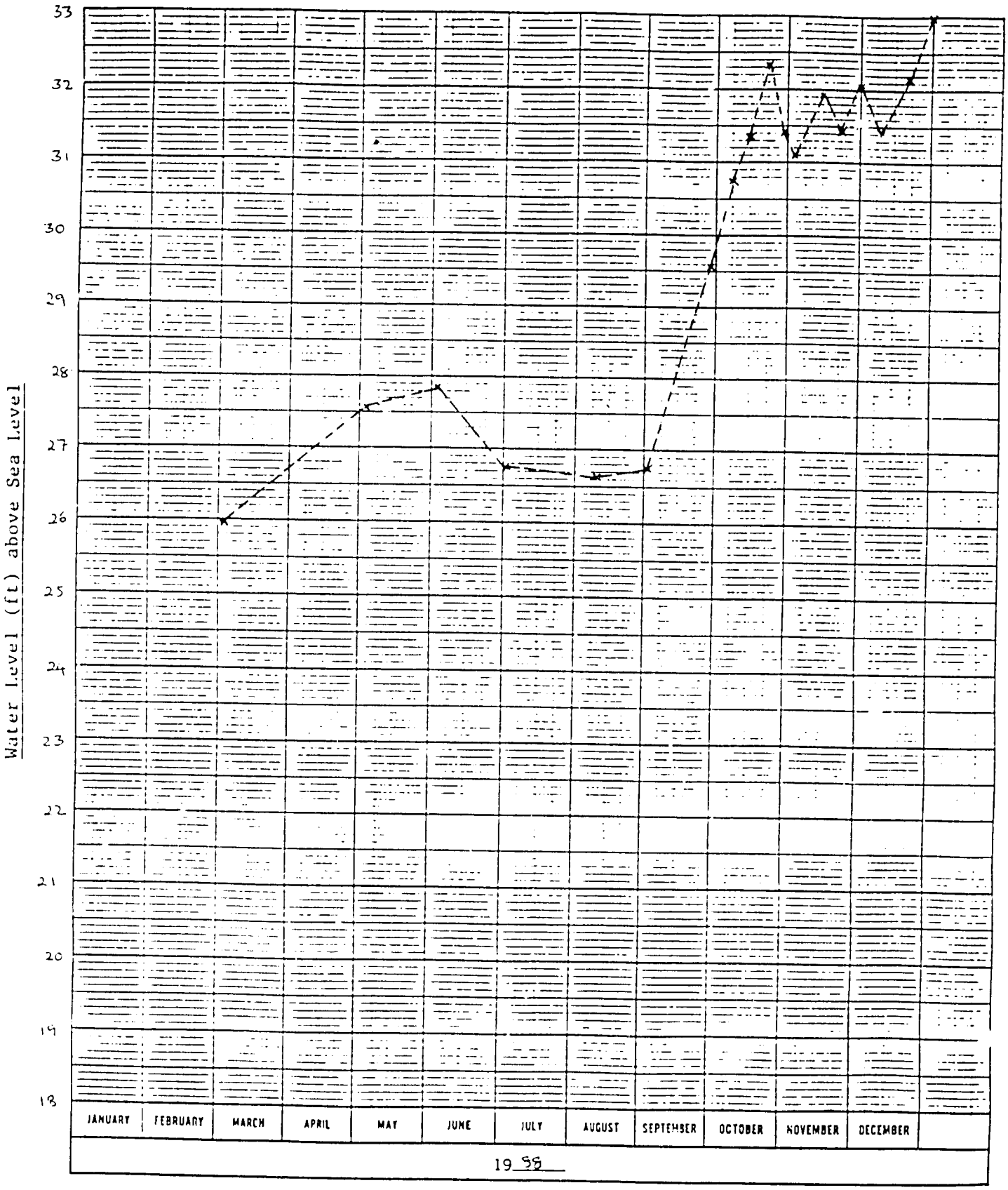


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: HALFWAY TREE # 5

Elevation of M.P- 43.18 ft.

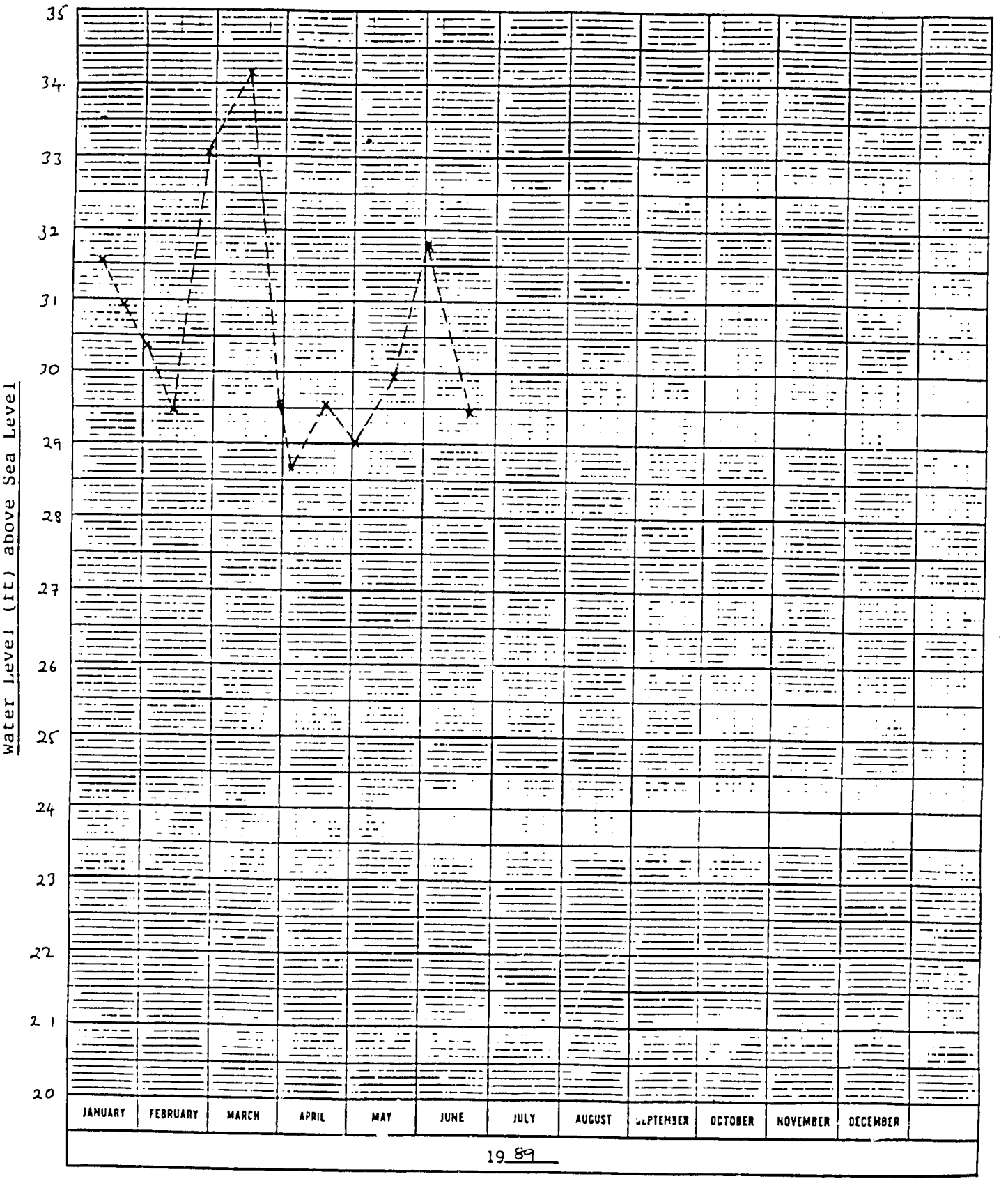


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: HALFWAY TREE #5

Elevation of M.P- 43.18 ft.

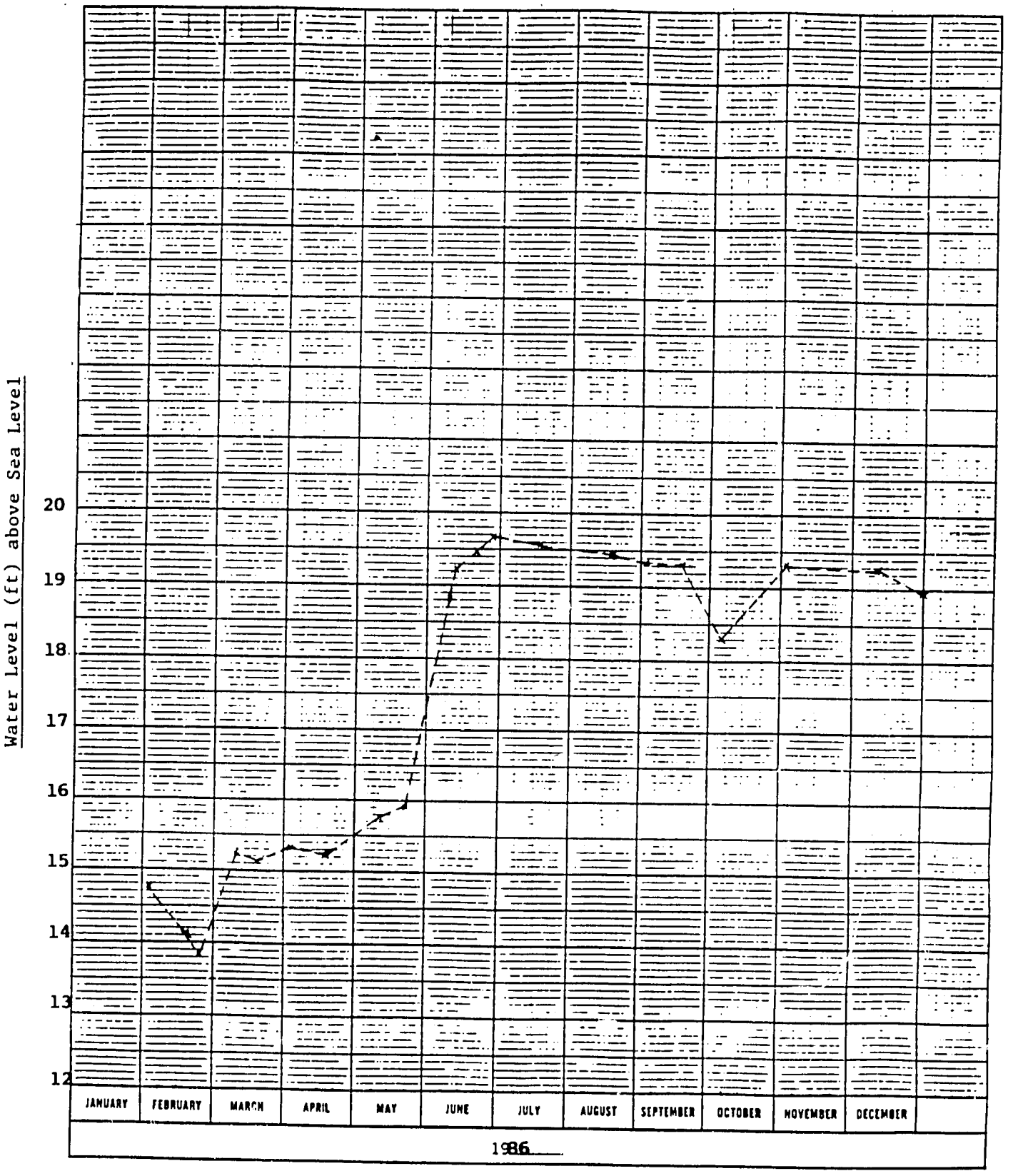


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #4

Elevation of M.P- 37.94 ft.

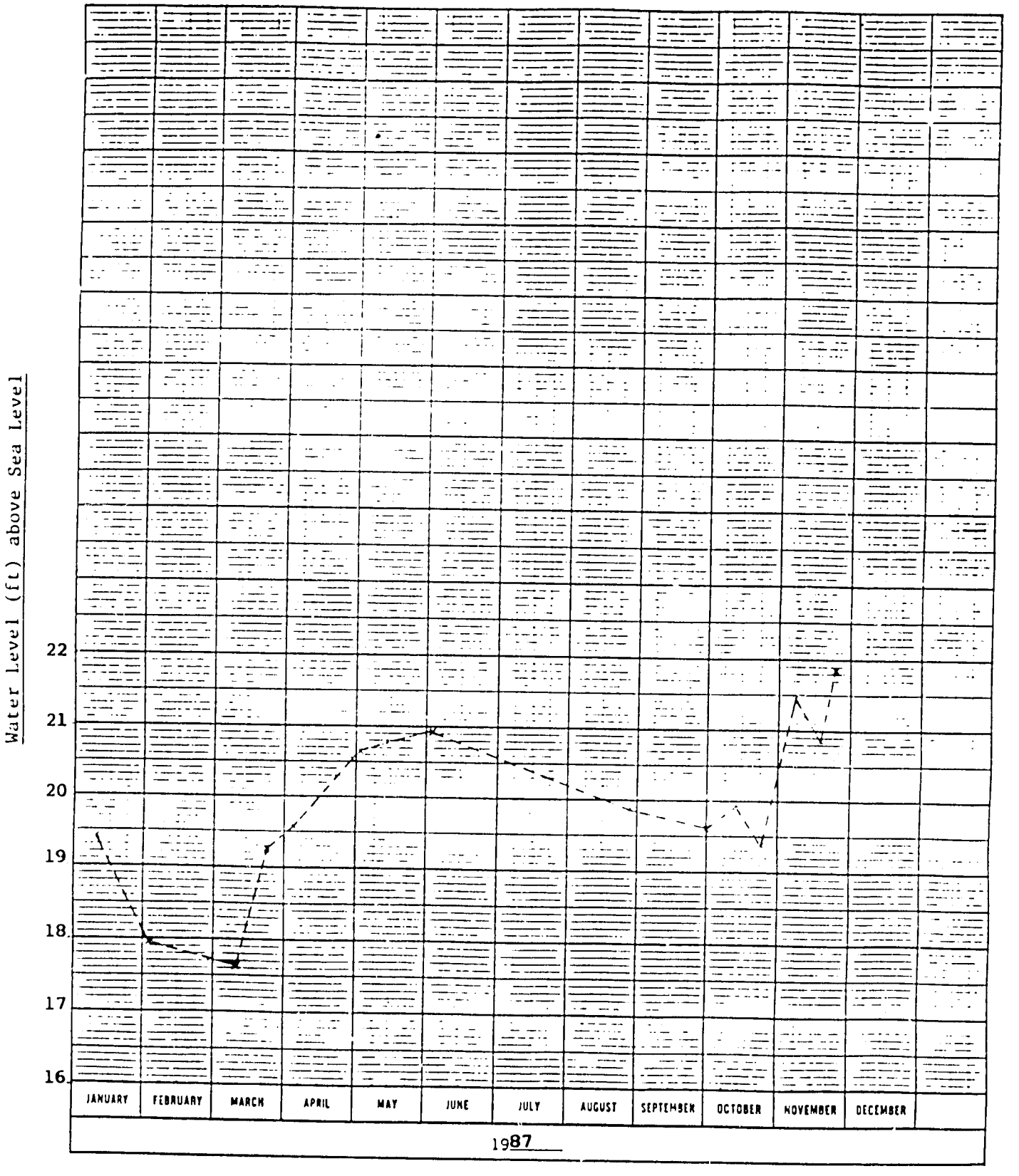


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: **HALF WAY TREE #4**

Elevation of M.P- **37.94 ft.**

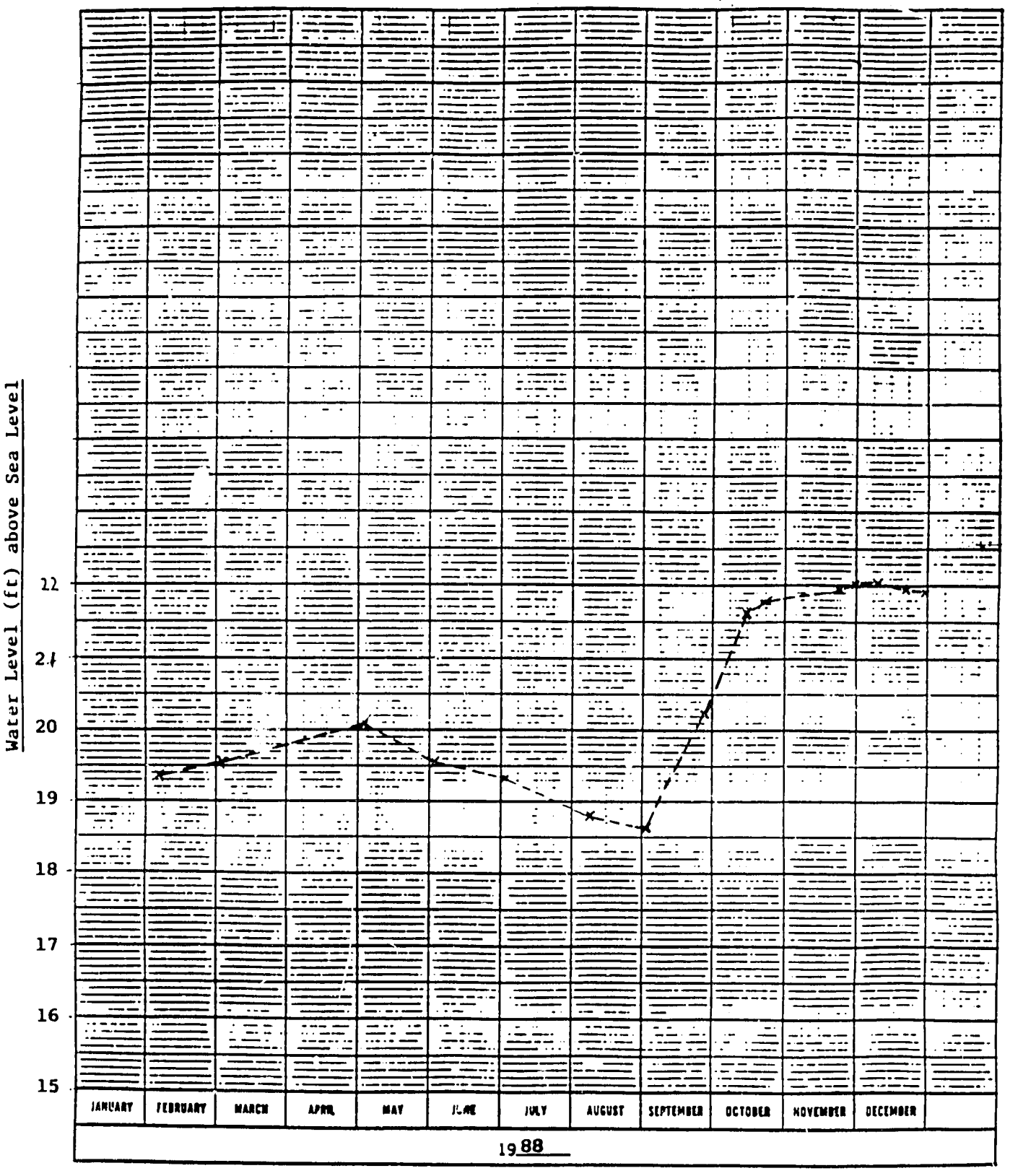


NOW PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #4

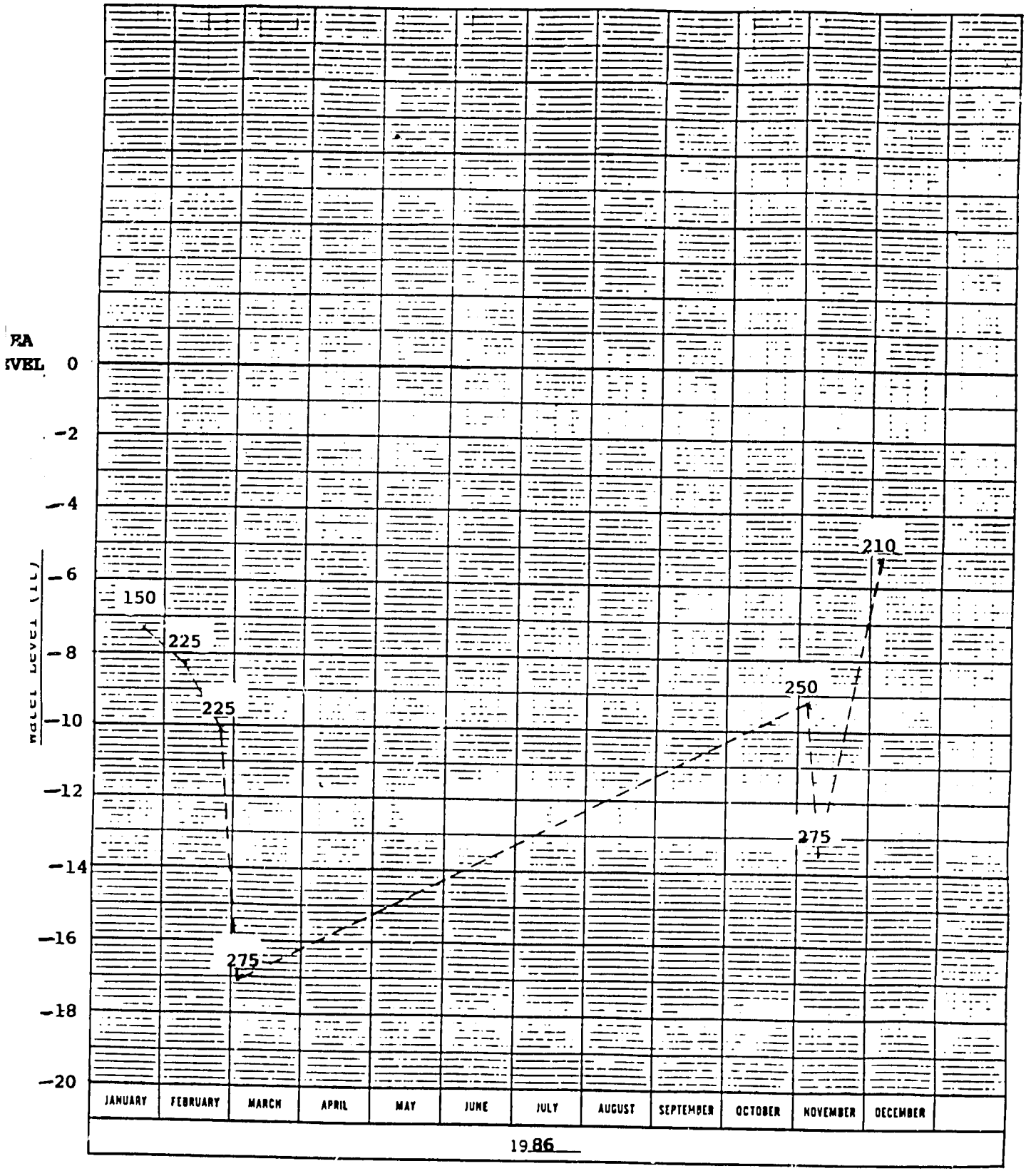
Elevation of M.P- 39.94 ft.



NOW PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: **HALF-WAY-TREE #4** Elevation of M.P- **37.94ft.**



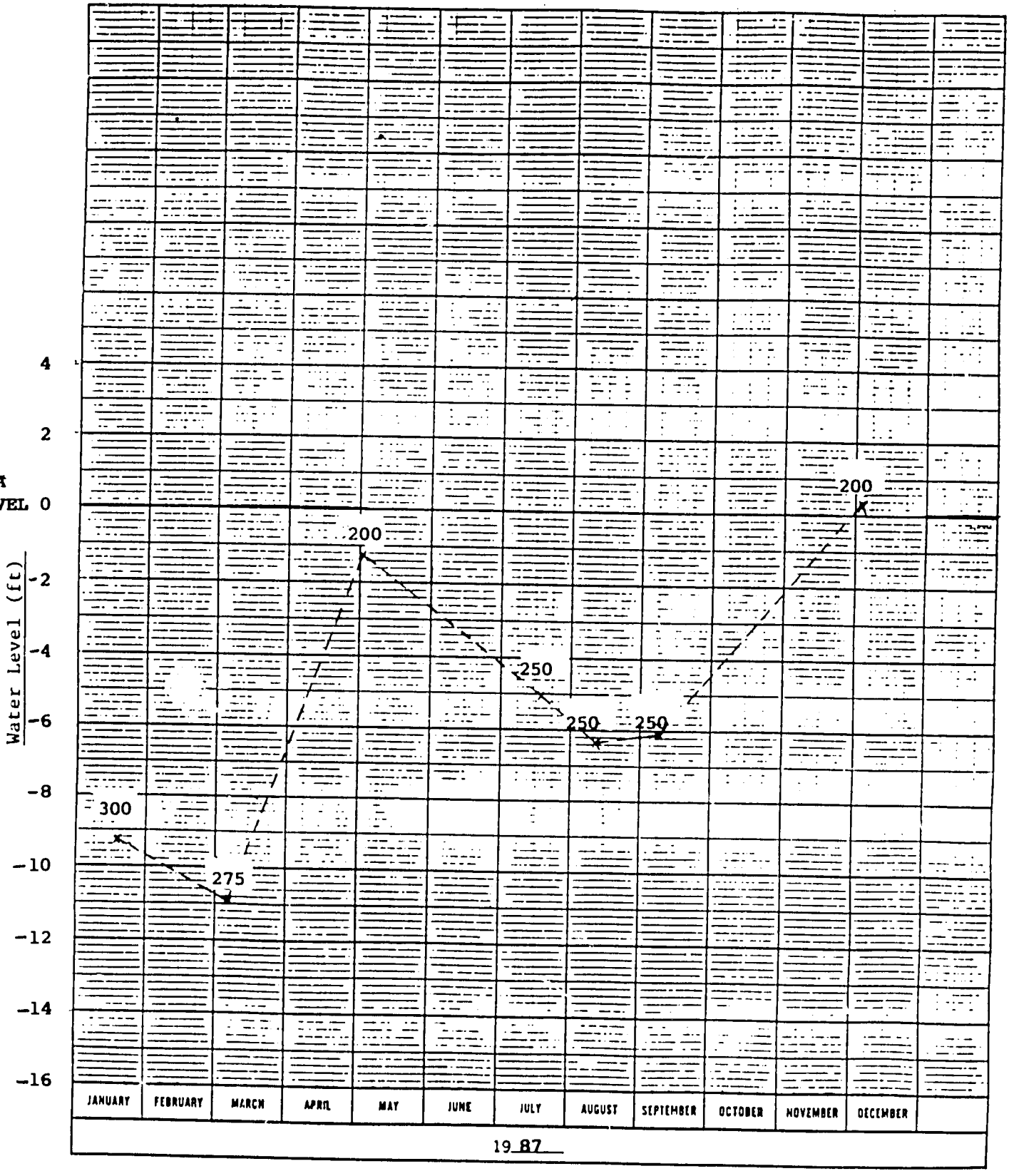
PUMPING WATER LEVEL

275 - **WELL DISCHARGE (IGPM)**

St. Catherine Plains
Well Hydrograph

Location: HALF-WAY-TREE #4

Elevation of M.P- 43.03 ft



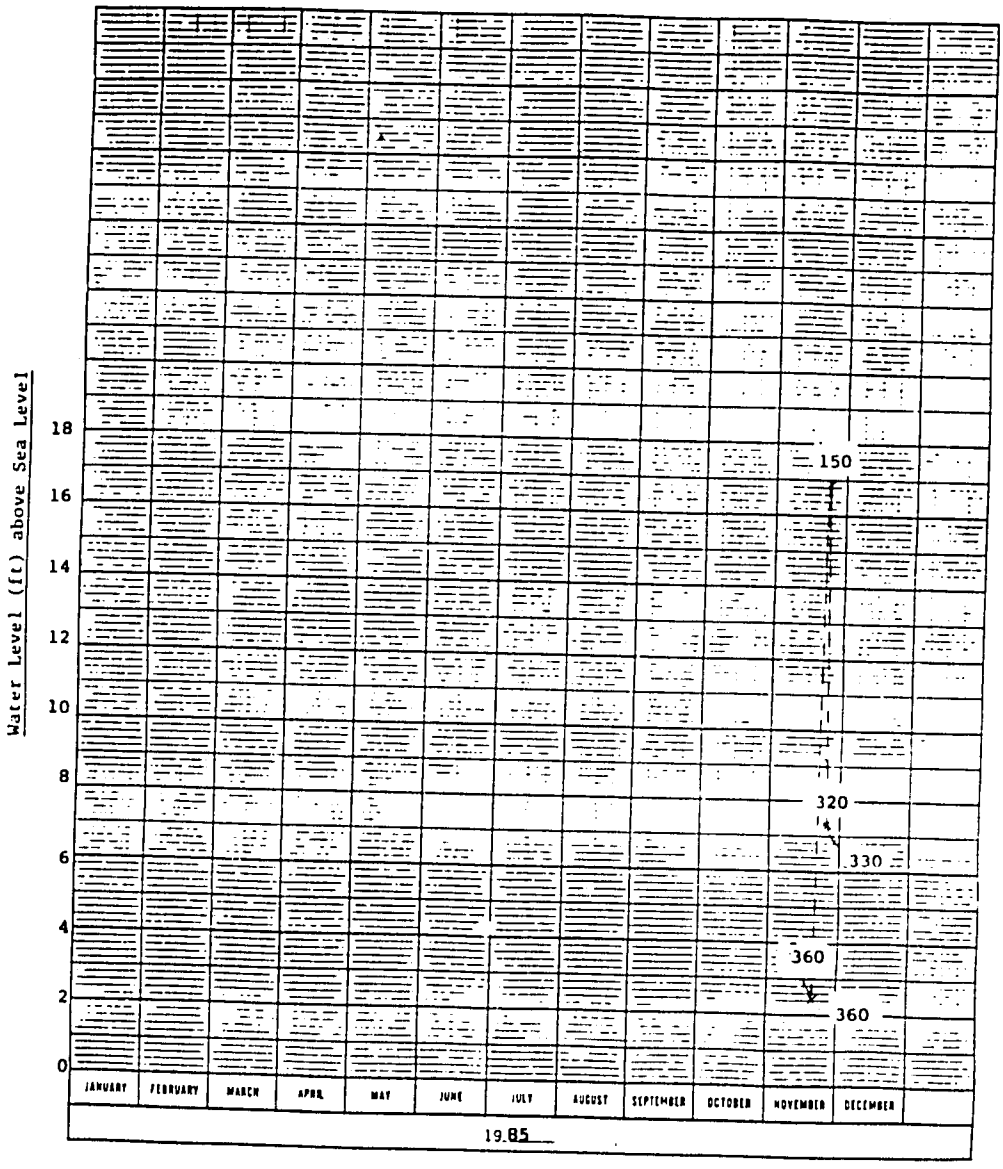
PUMPING WATER LEVEL

250 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #5

Elevation of M.P-43.18 ft.



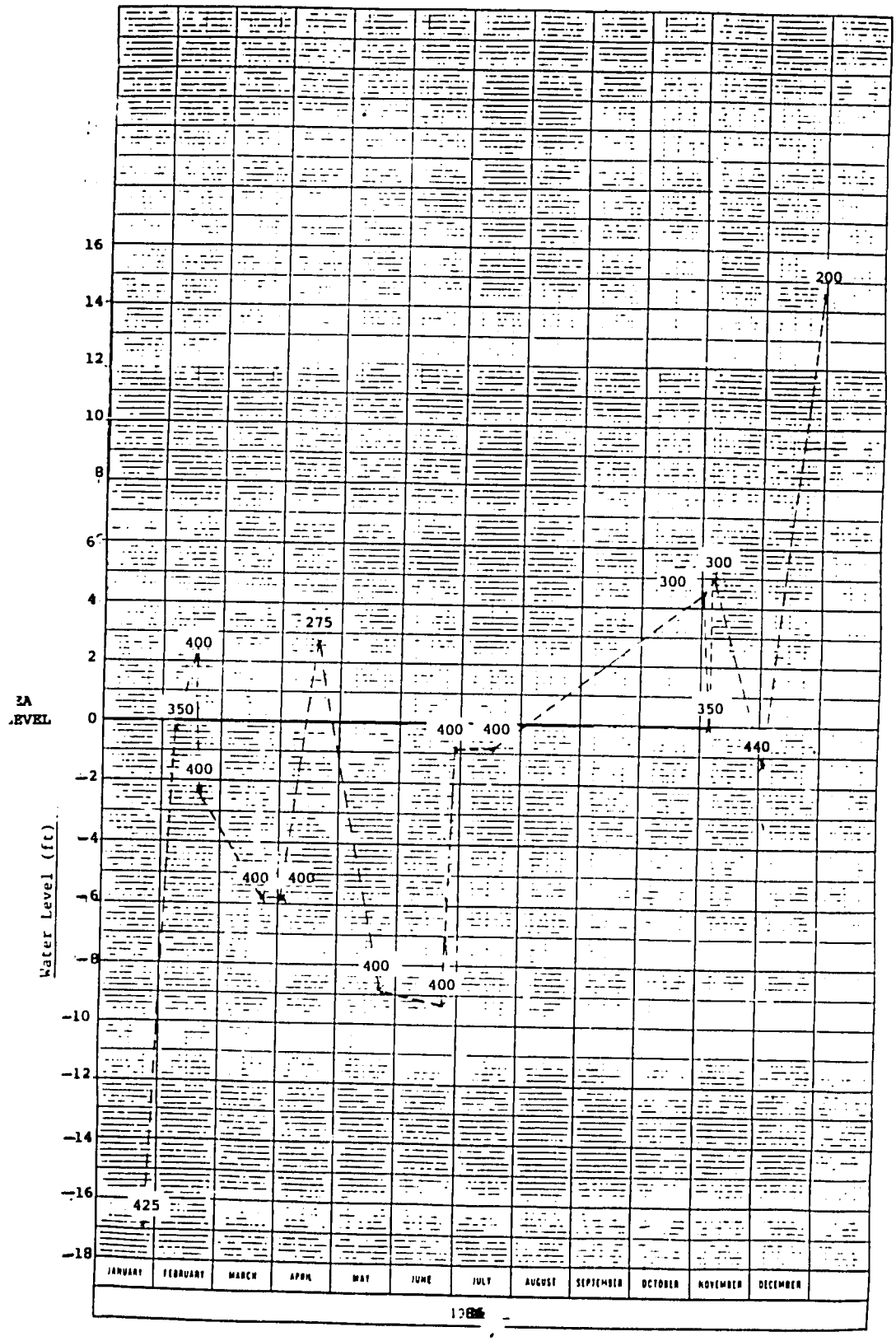
PUMPING WATER LEVEL

320 - WELL DISCHARGE (IGPM)

20.

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #5 Elevation of M.P- 43.18 ft.



PUMPING WATER LEVEL

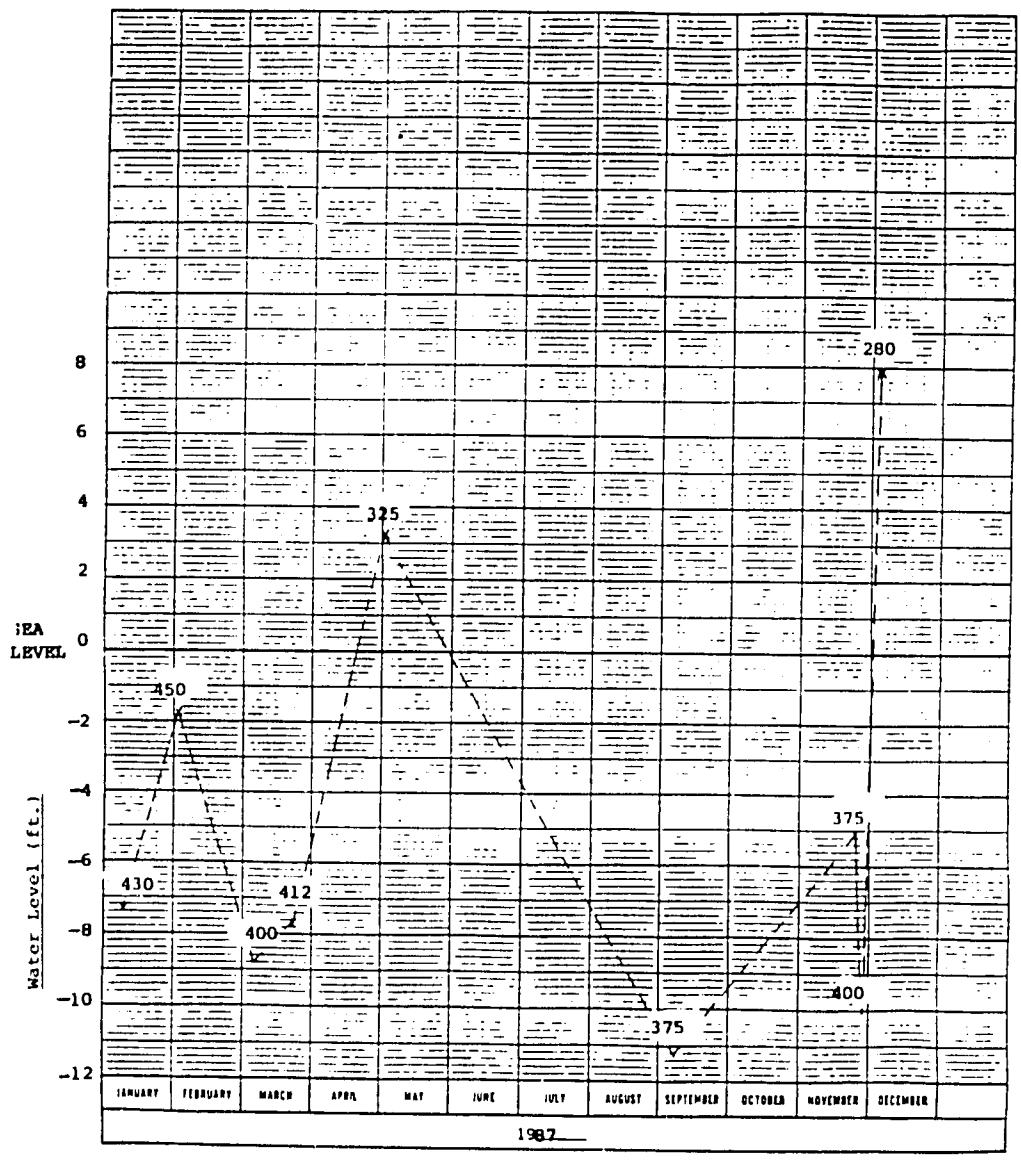
400 - WELL DISCHARGE (IGPM)

95

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #5

Elevation of M.P- 43.18 ft.



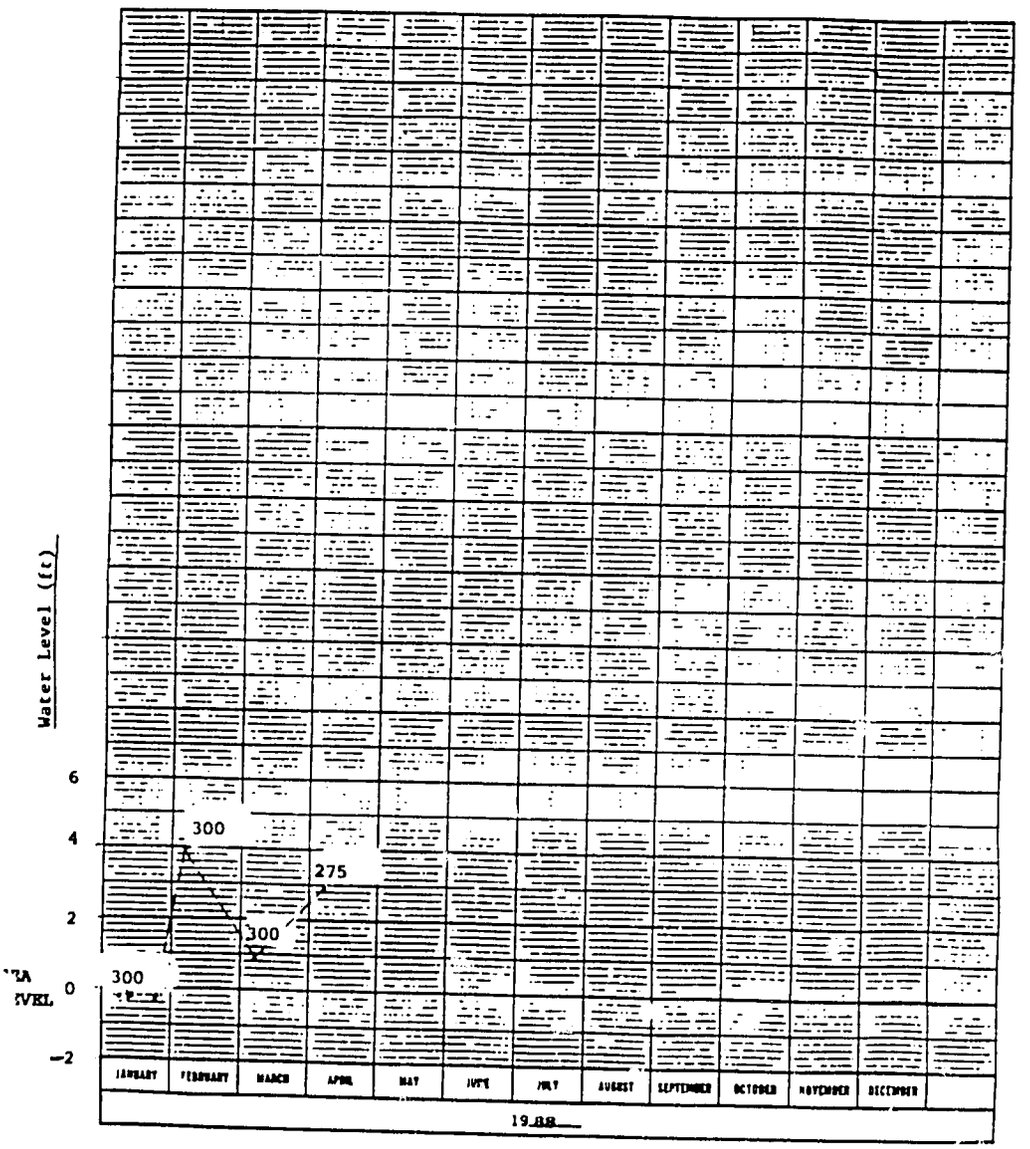
PUMPING WATER LEVEL

400 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE

Elevation of M.P- 43.18 ft.



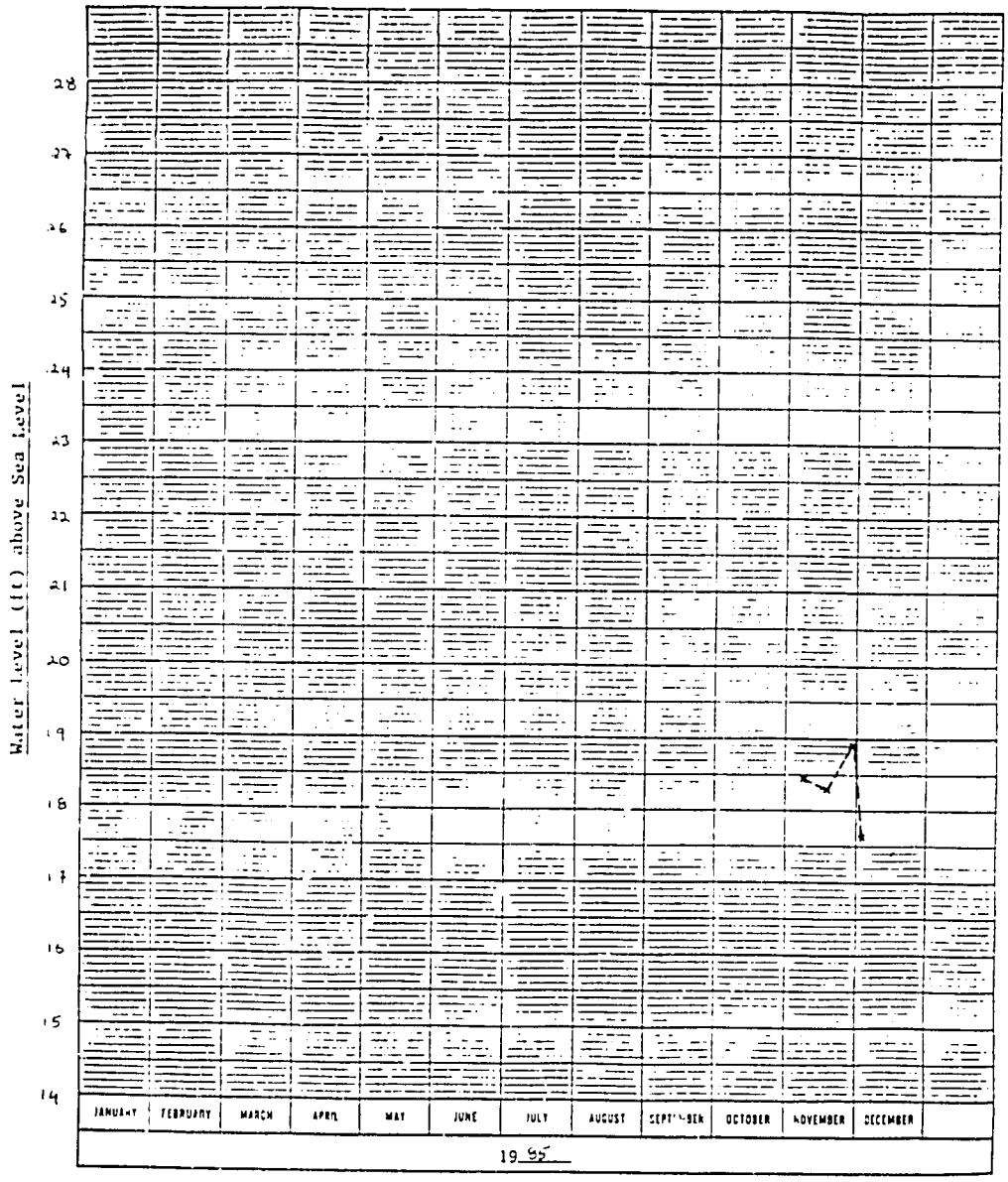
PUMPING WATER LEVEL

300 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: HALFWAY TREE #6

Elevation of M.P- 37.50 ft.

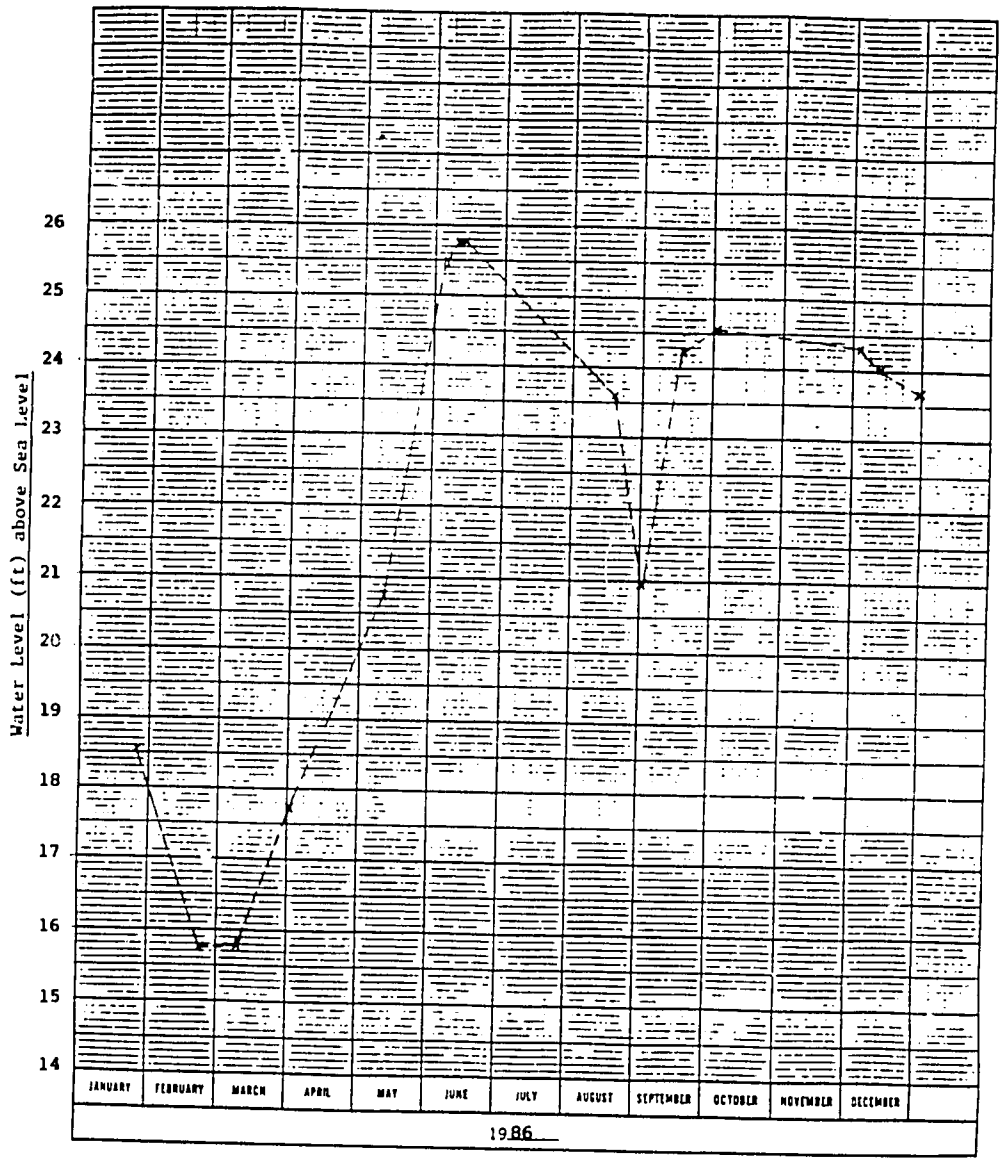


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #6

Elevation of M.P- 37.50 ft.

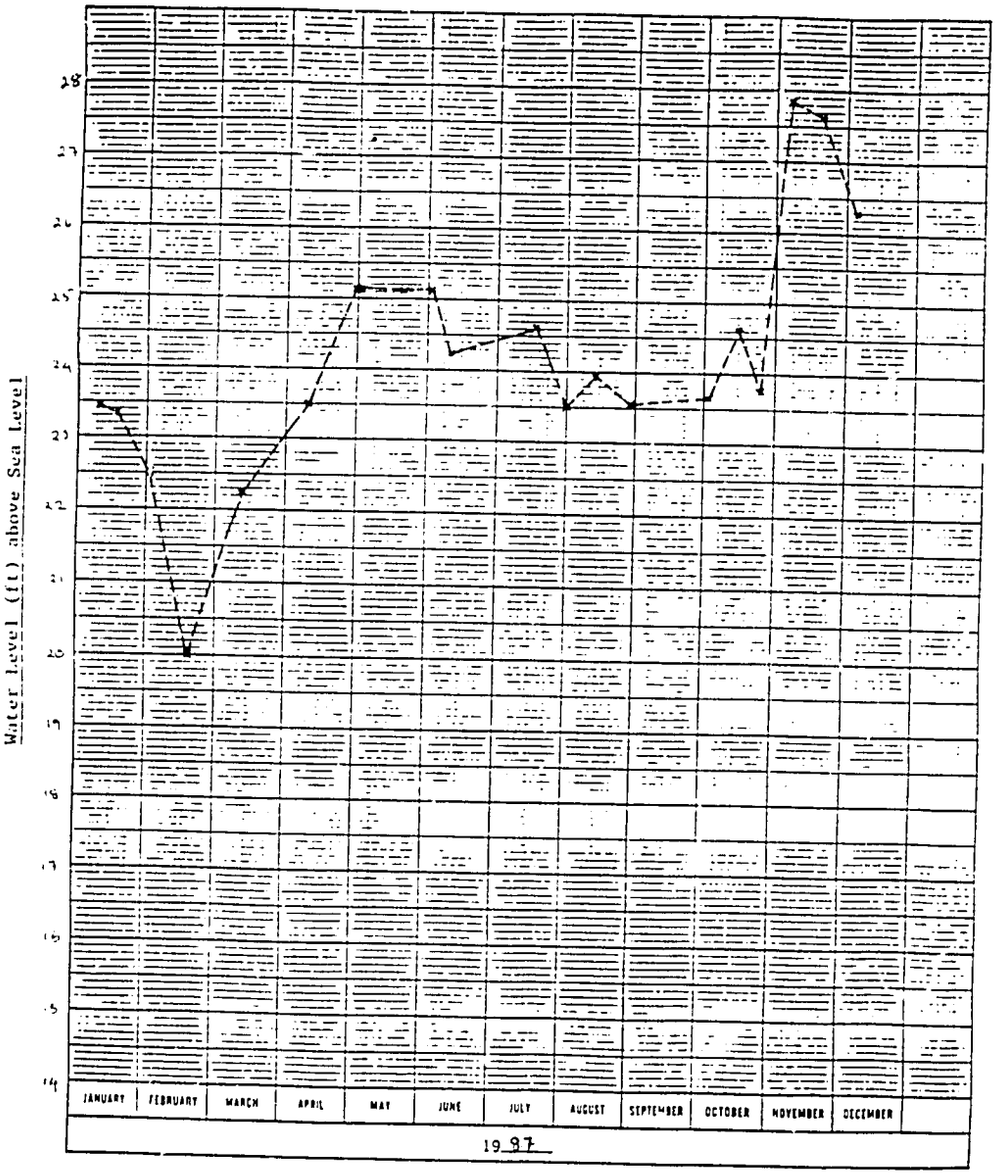


BOW PUMPING WATER LEVEL

99'

St. Catherine Plains
Well Hydrograph

Location: HALFWAY TREE #6 Elevation of M.P- 39.50 ft.

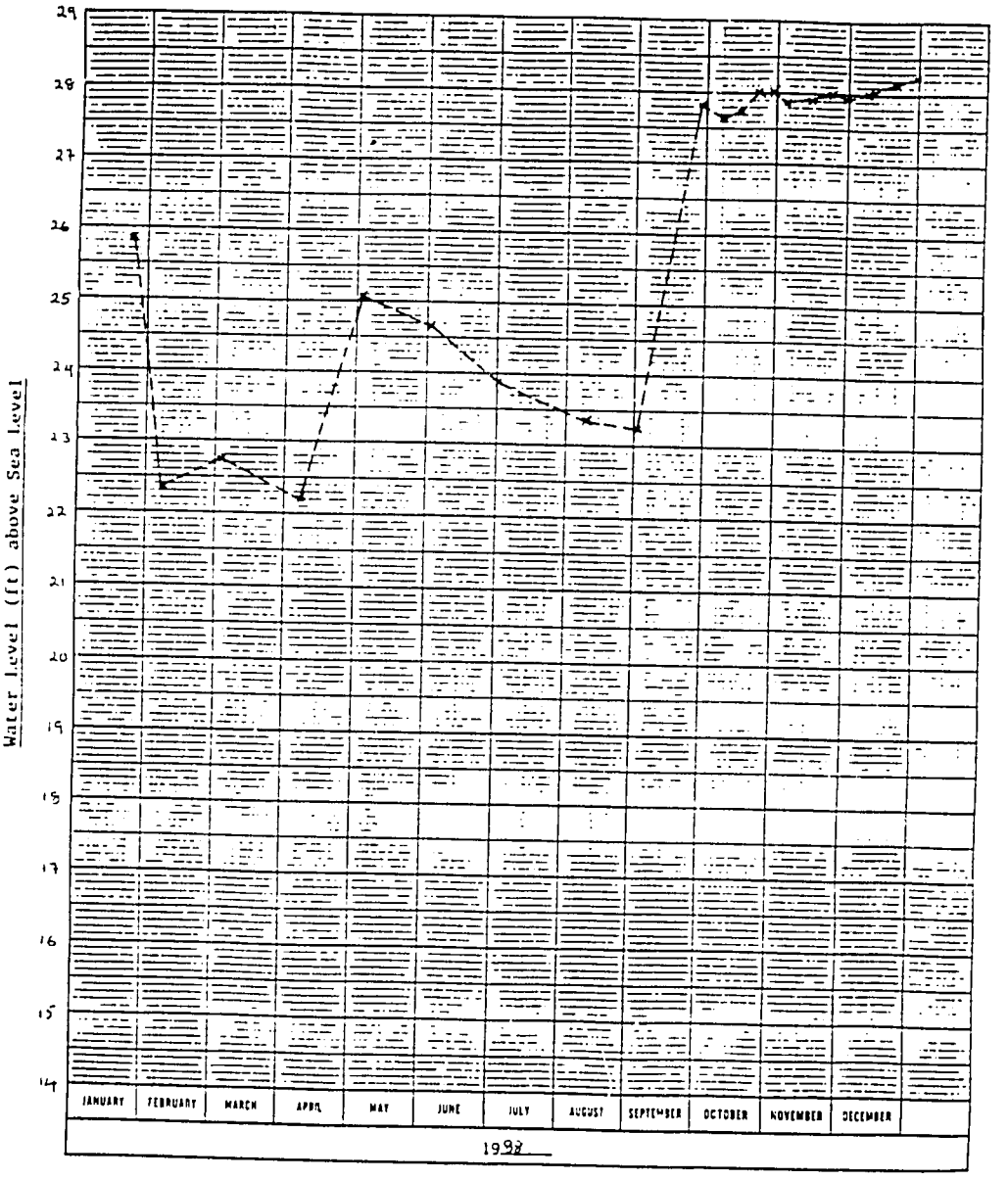


NON PUMPING WATER LEVEL

100

St. Catherine Plains
Well Hydrograph

Location: HALFWAY TREE #6 Elevation of M.P- 37 50 ft.



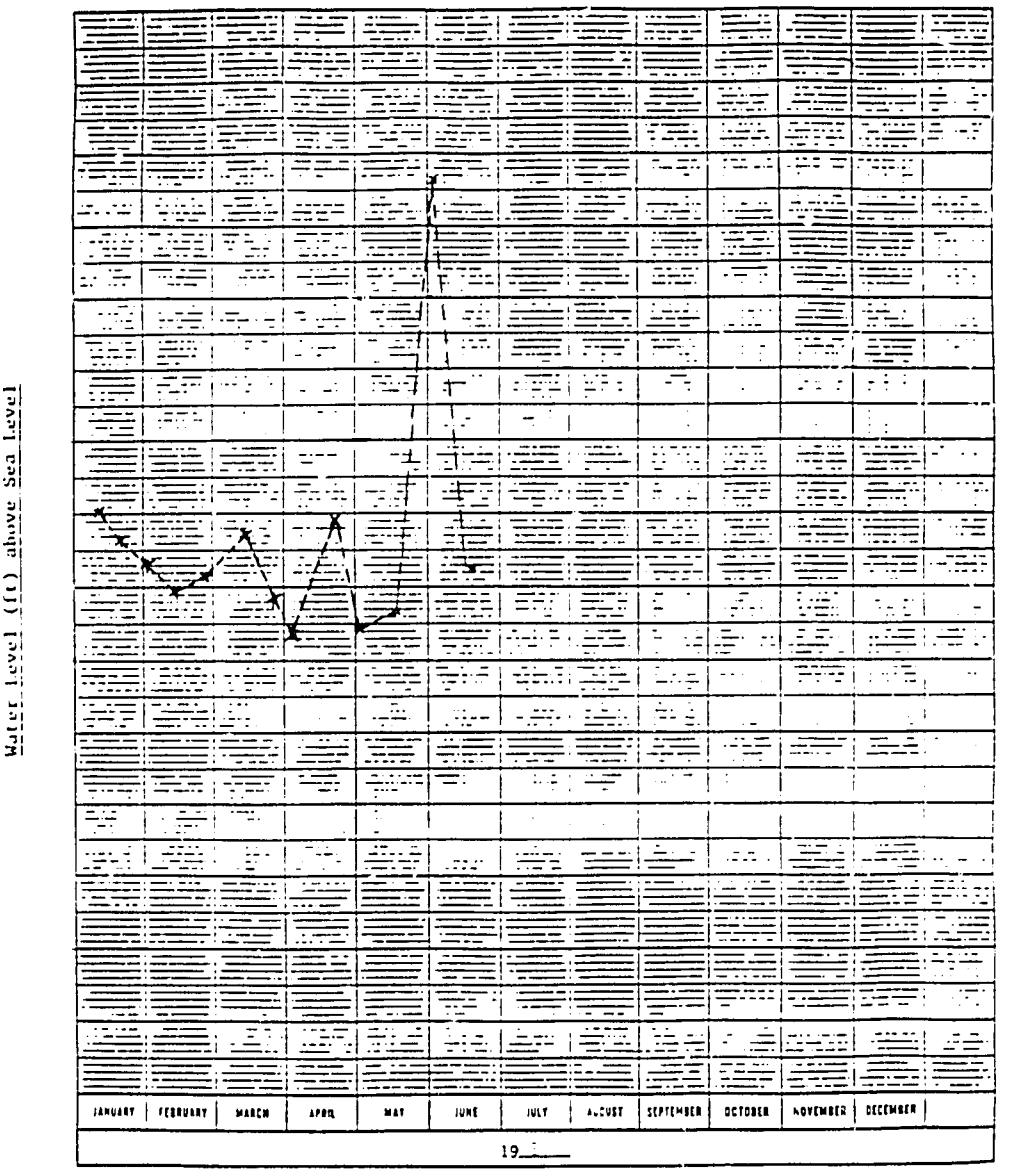
NON PUMPING WATER LEVEL

101

St. Catherine Plains
Well Hydrograph

Location:

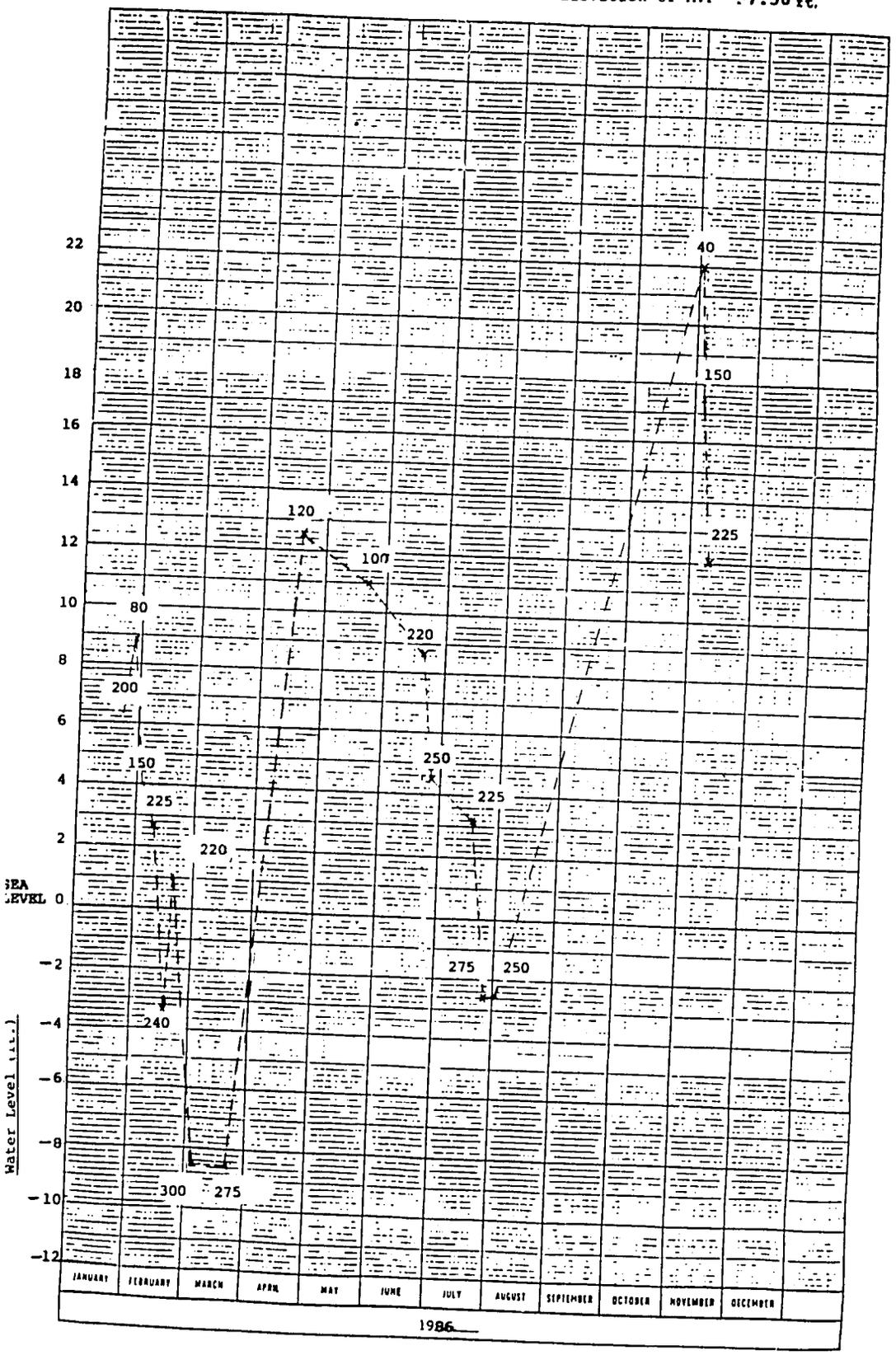
Elevation of M.P- ft.



St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #6

Elevation of M.P- 77.50 ft.



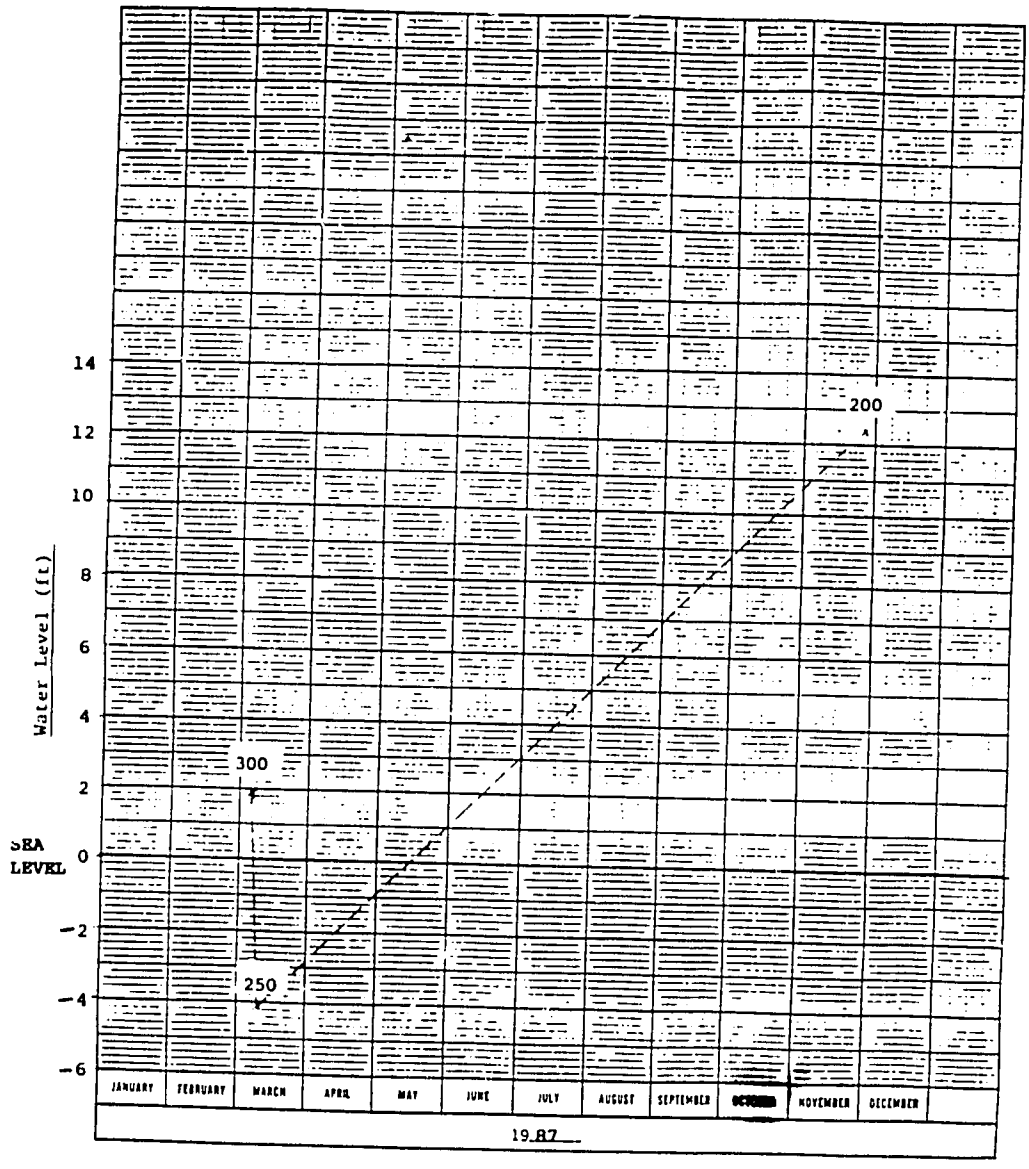
PUMPING WATER LEVEL

250 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: HALF-WAY-TREE #6

Elevation of M.P- 37.50 ft.



PUMPING WATER LEVEL

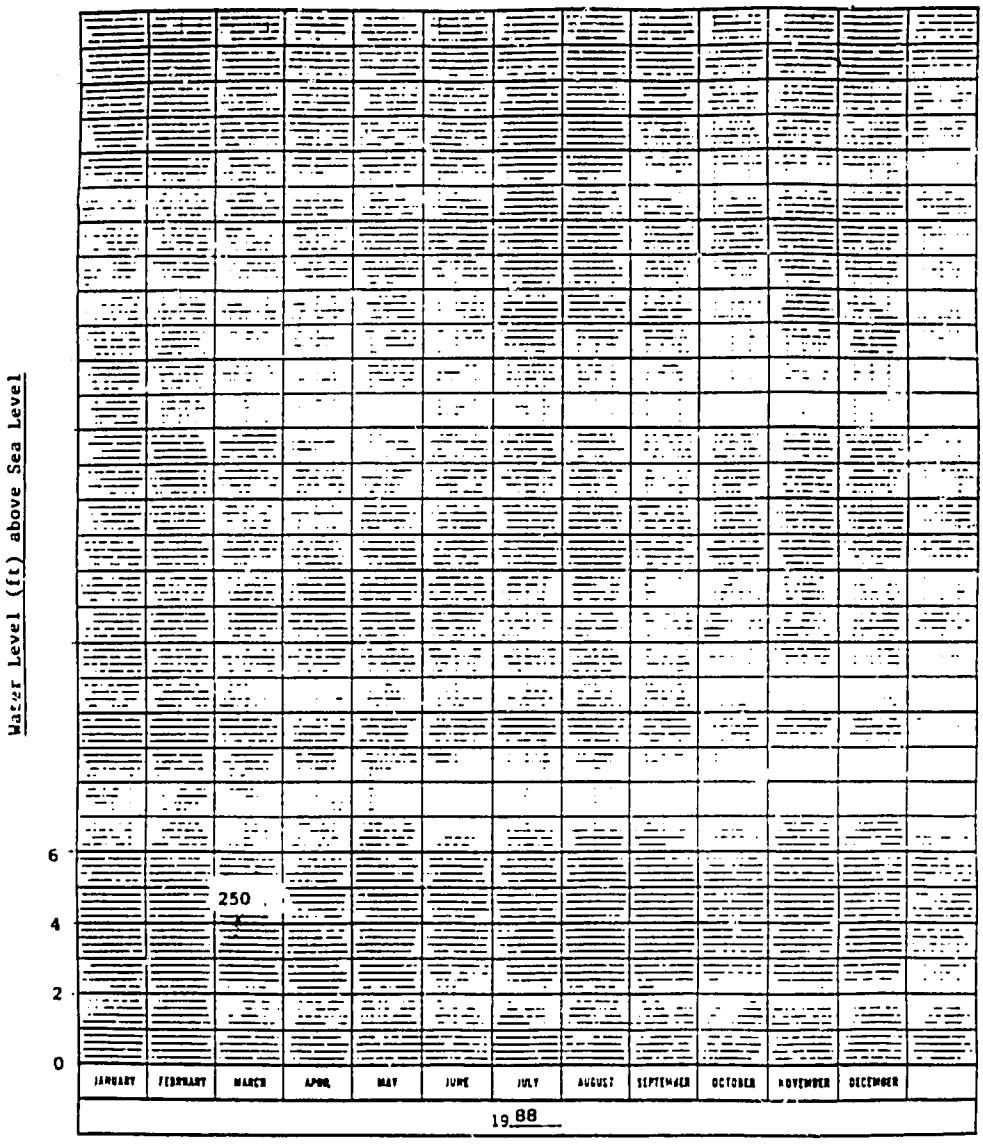
300 - WELL DISCHARGE (IGPM)

104

St. Catherine Plains
Well Hydrograph

Location: HALF WAY TREE #6

Elevation of M.P- 37.50 ft.



PUMPING WATER LEVEL

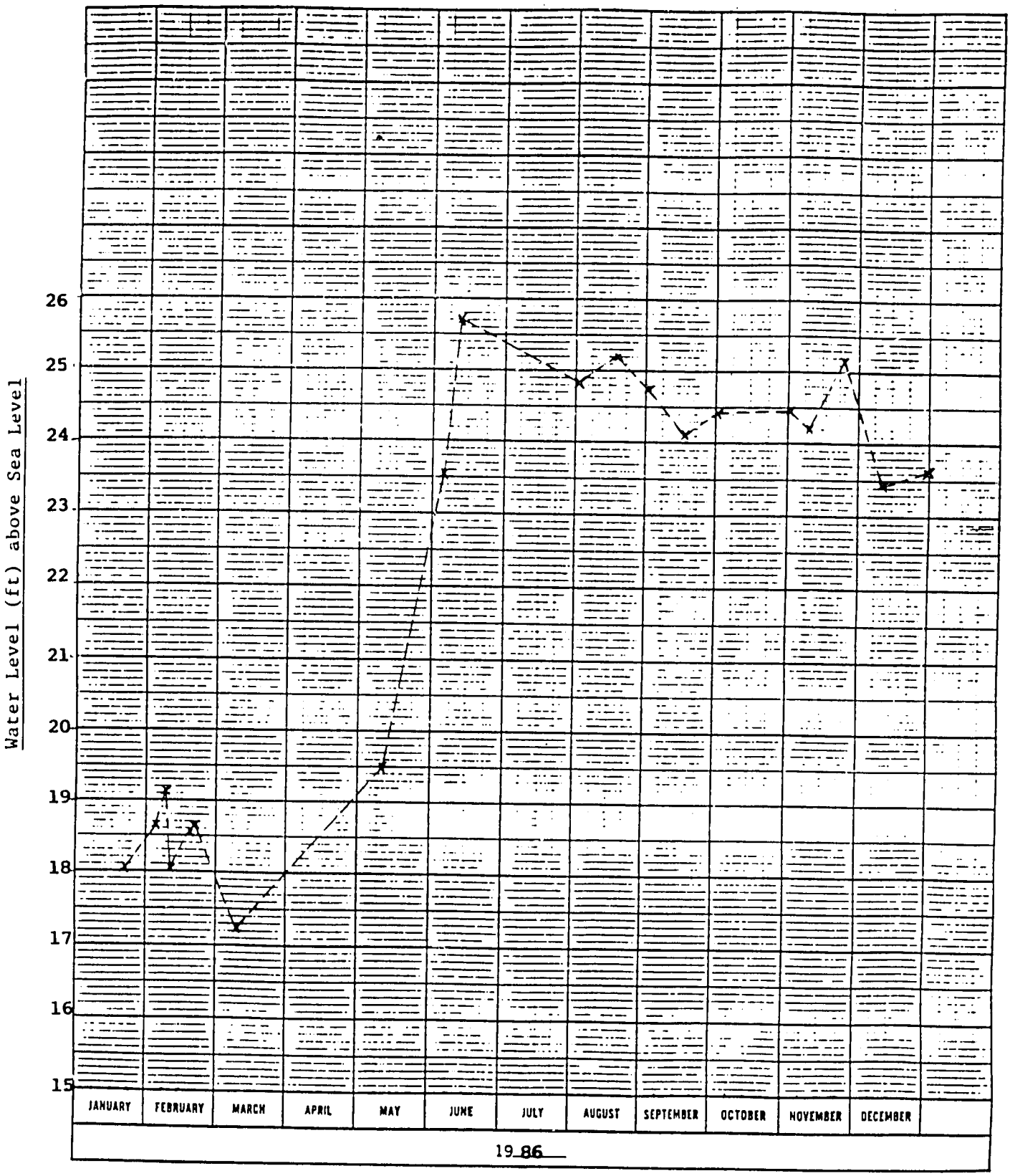
250 - WELL DISCHARGE (IGPM)

105

St. Catherine Plains
Well Hydrograph

Location: COOKSON #3

Elevation of M.P- 41.64 ft.

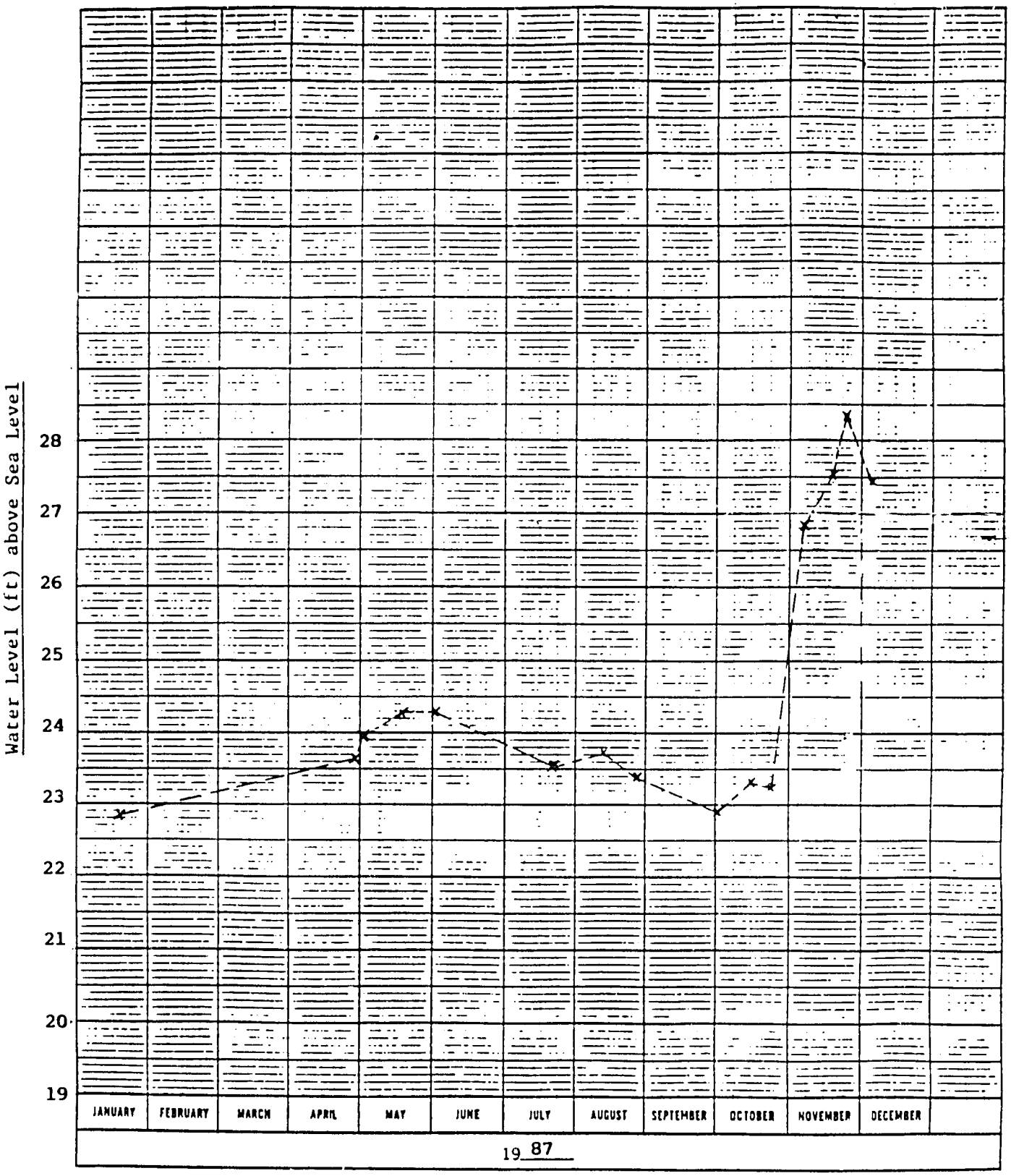


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: COOKSON #3

Elevation of M.P- 41.64 ft.

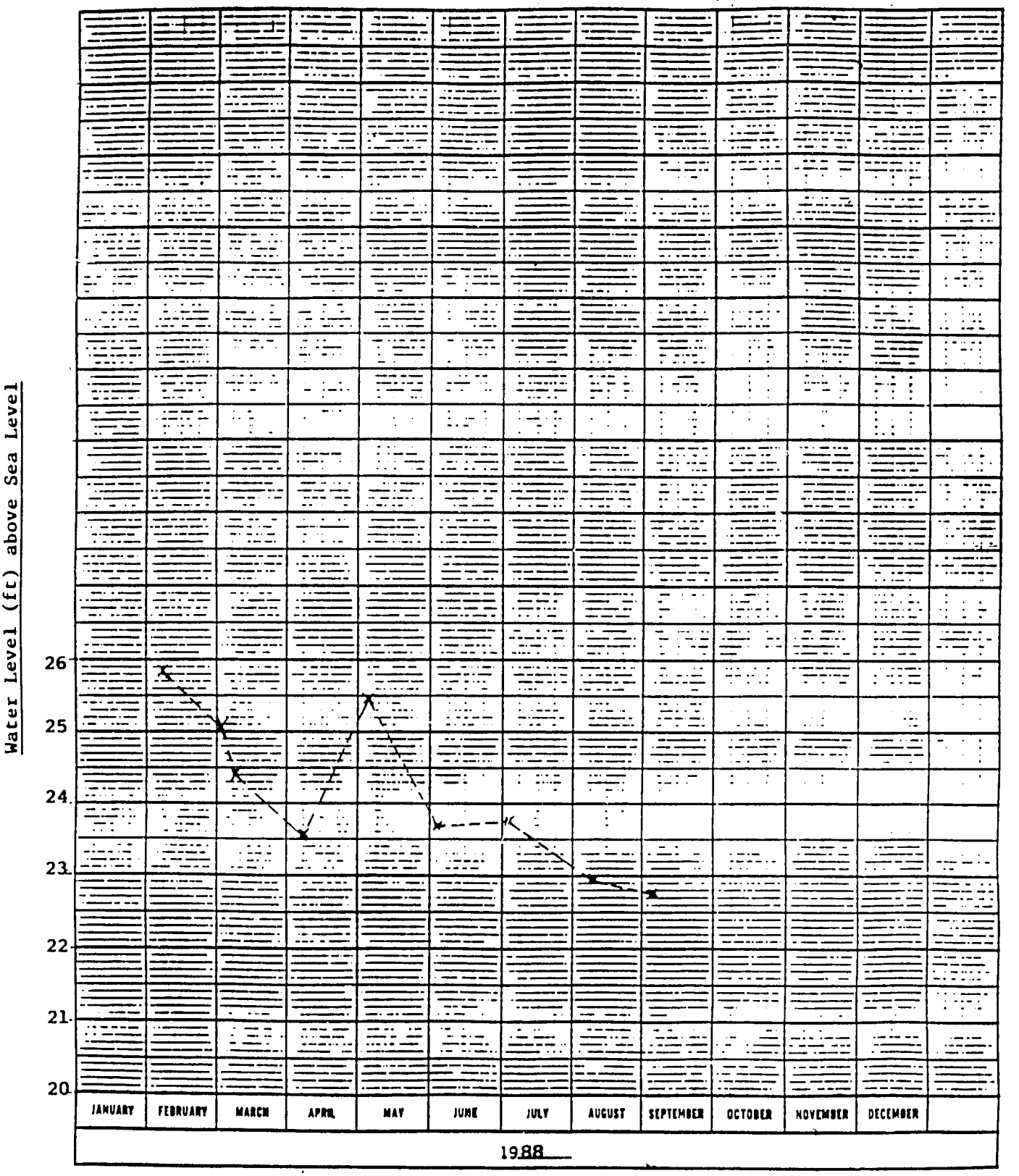


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: COOKSON #3

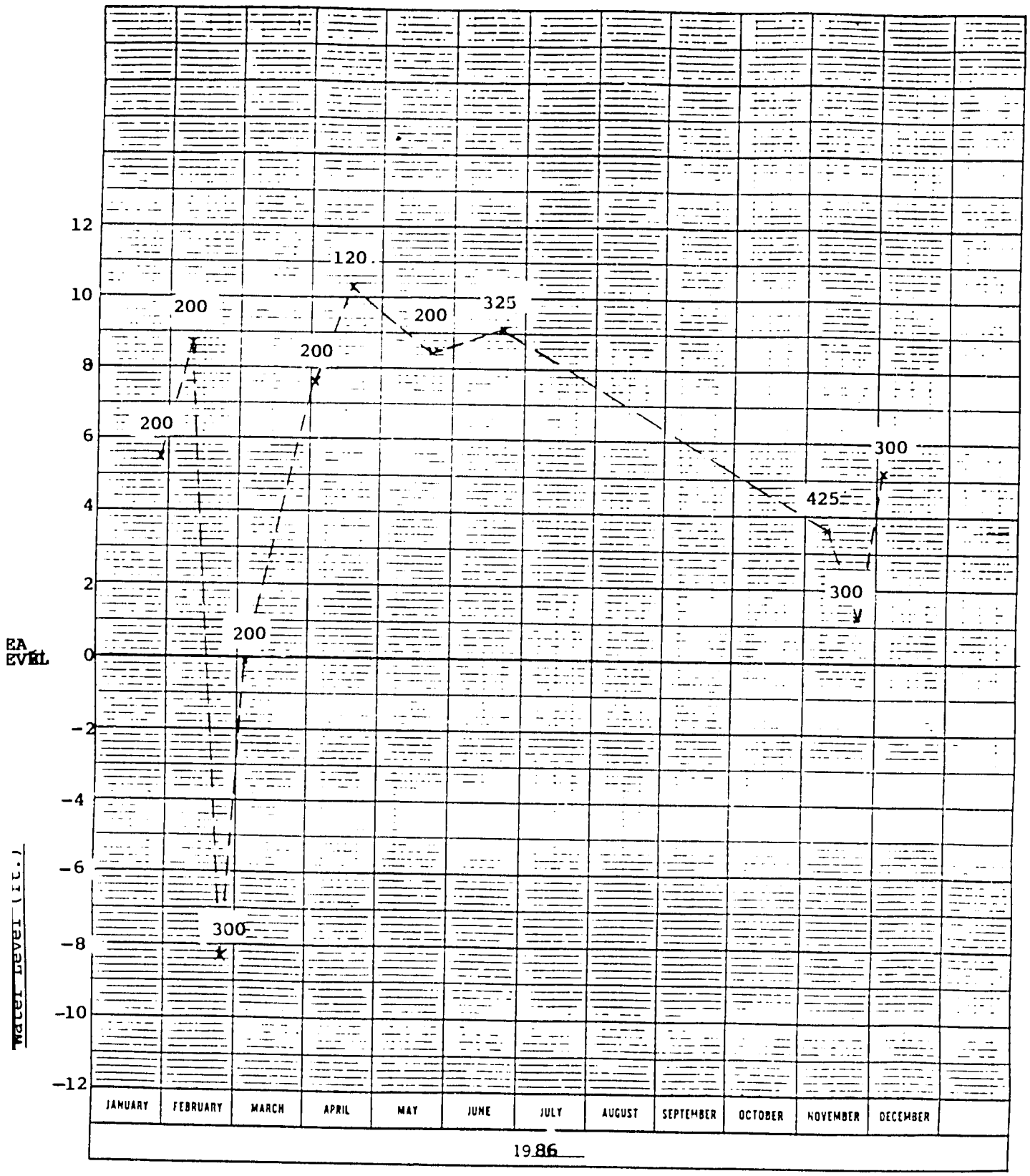
Elevation of M.P- 41.64 ft.



NOW PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: COOKSON #3 Elevation of M.P- 41.46 ft.



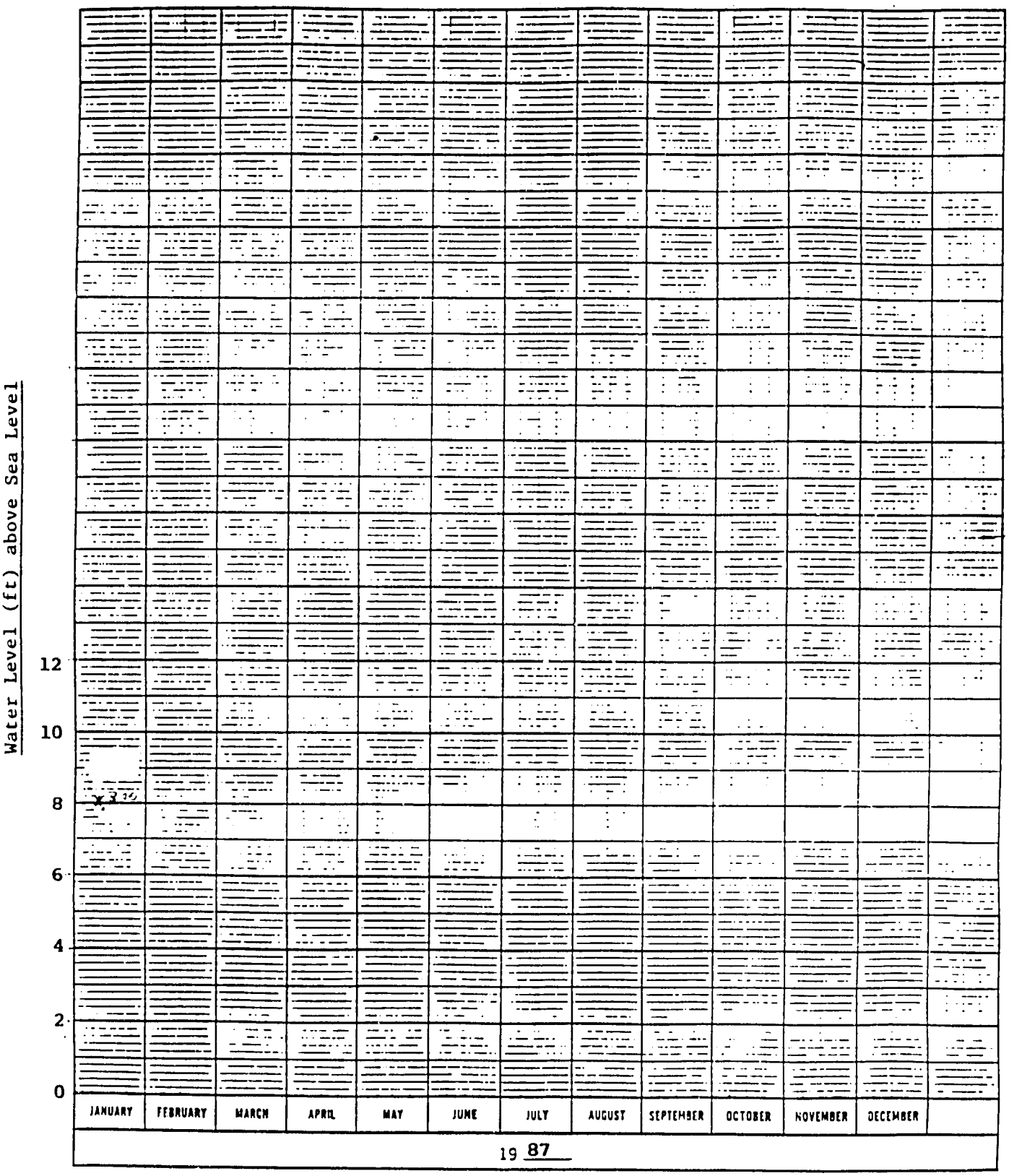
PUMPING WATER LEVEL

300 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: COOKSON #3

Elevation of M.P- 41.64 ft.

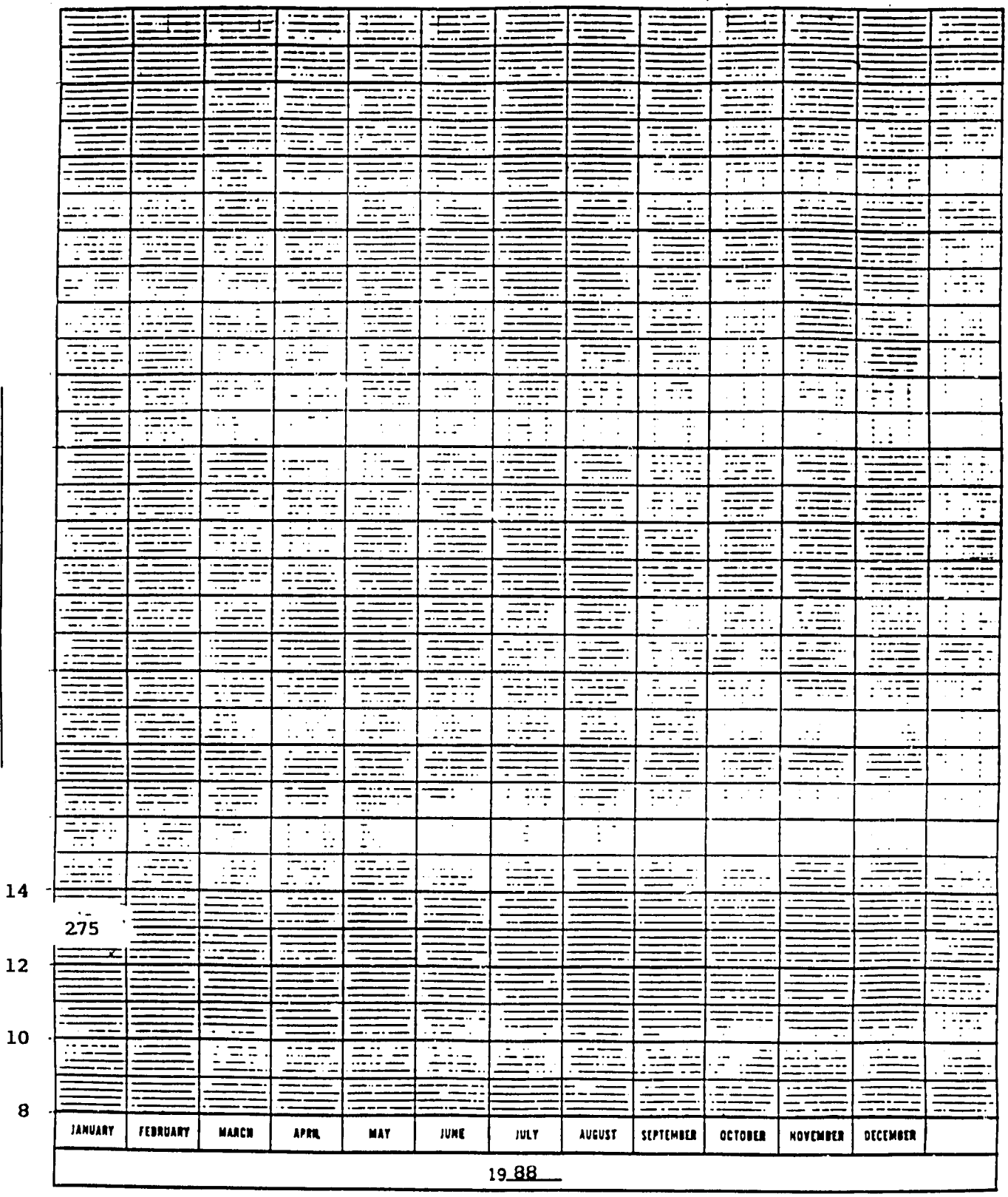


PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: COOKSON #3

Elevation of M.P- 41.64 ft.



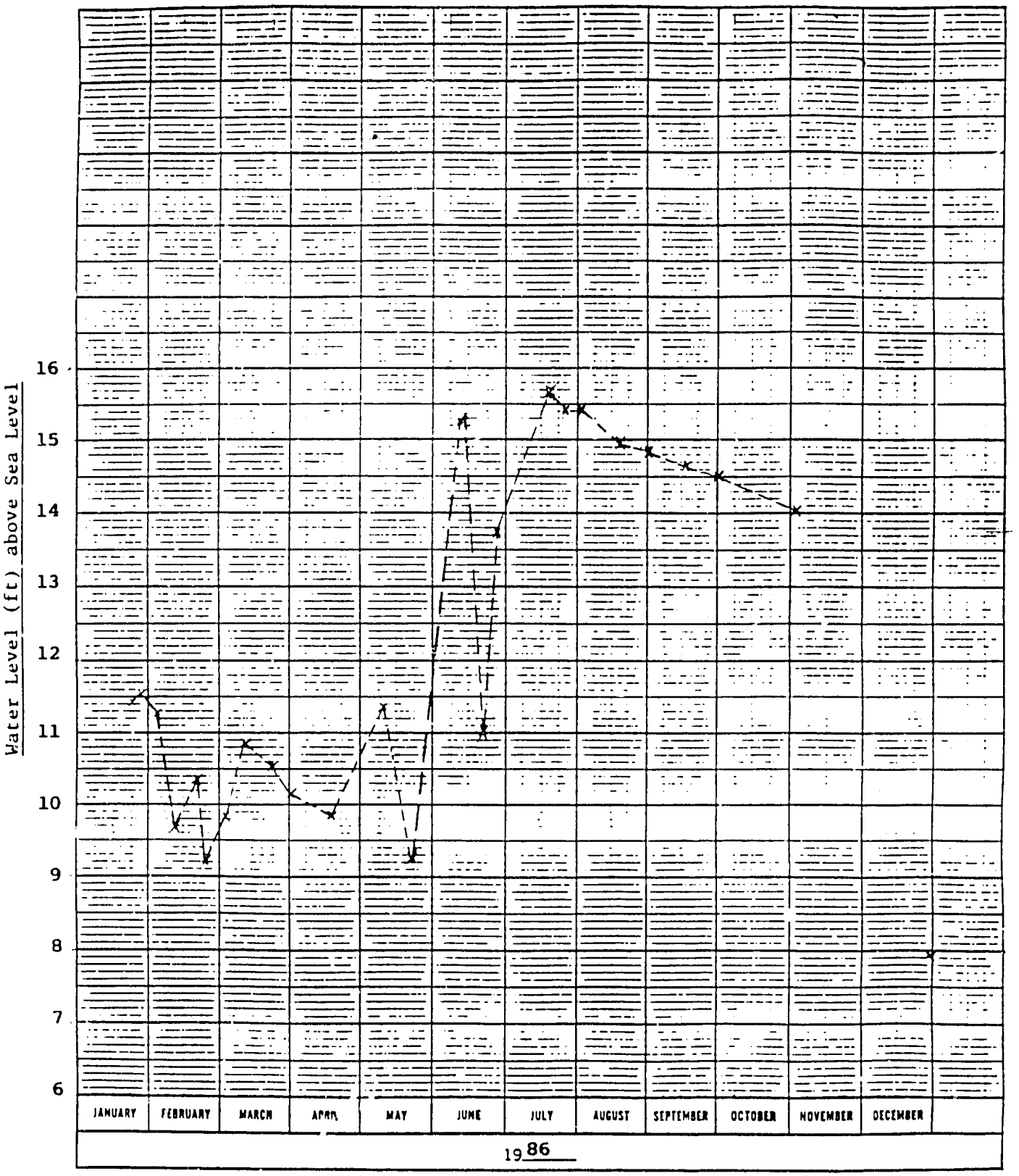
PUMPING WATER LEVEL

275 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: COOKTOWN #4

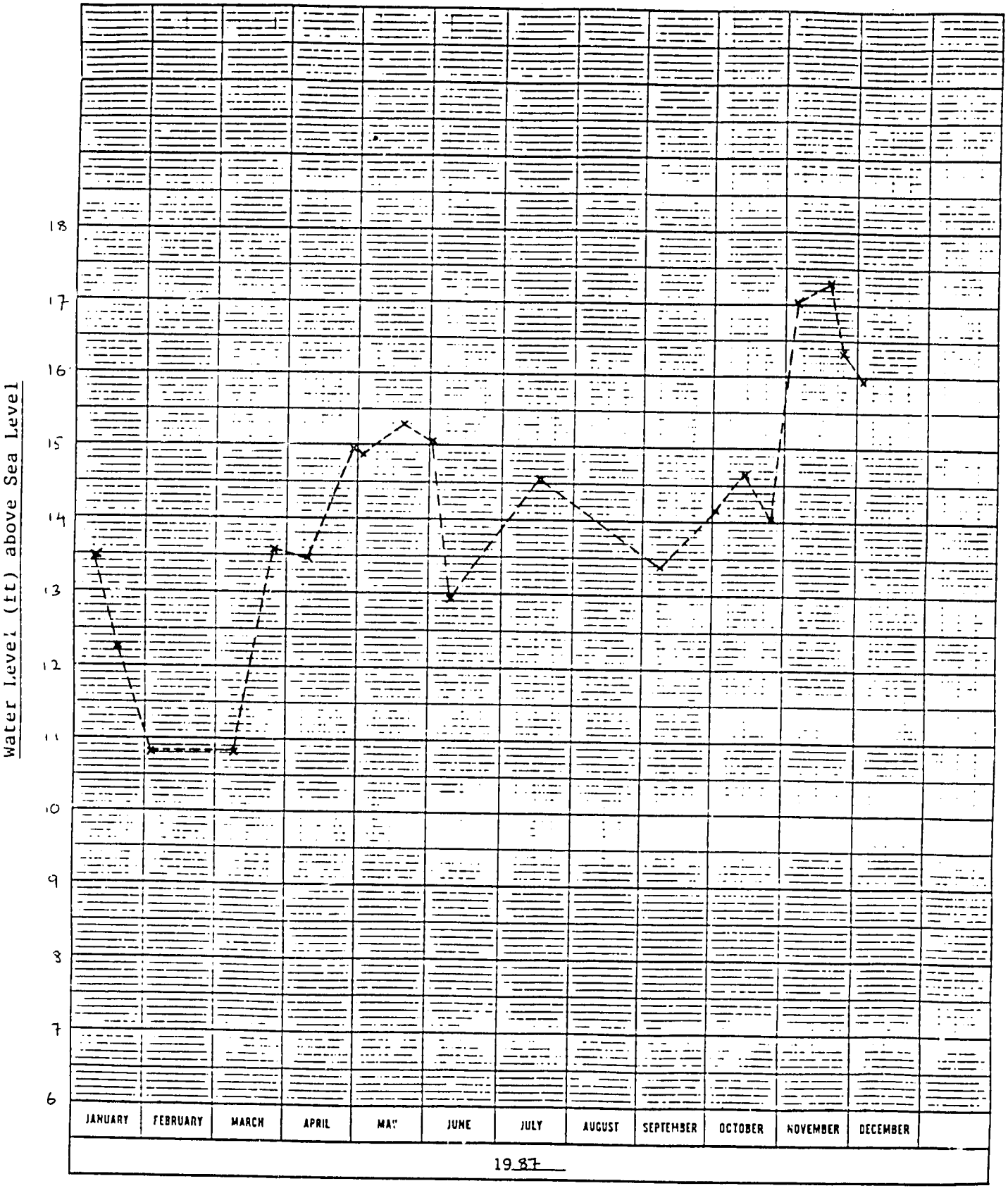
Elevation of M.P- 27.80 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

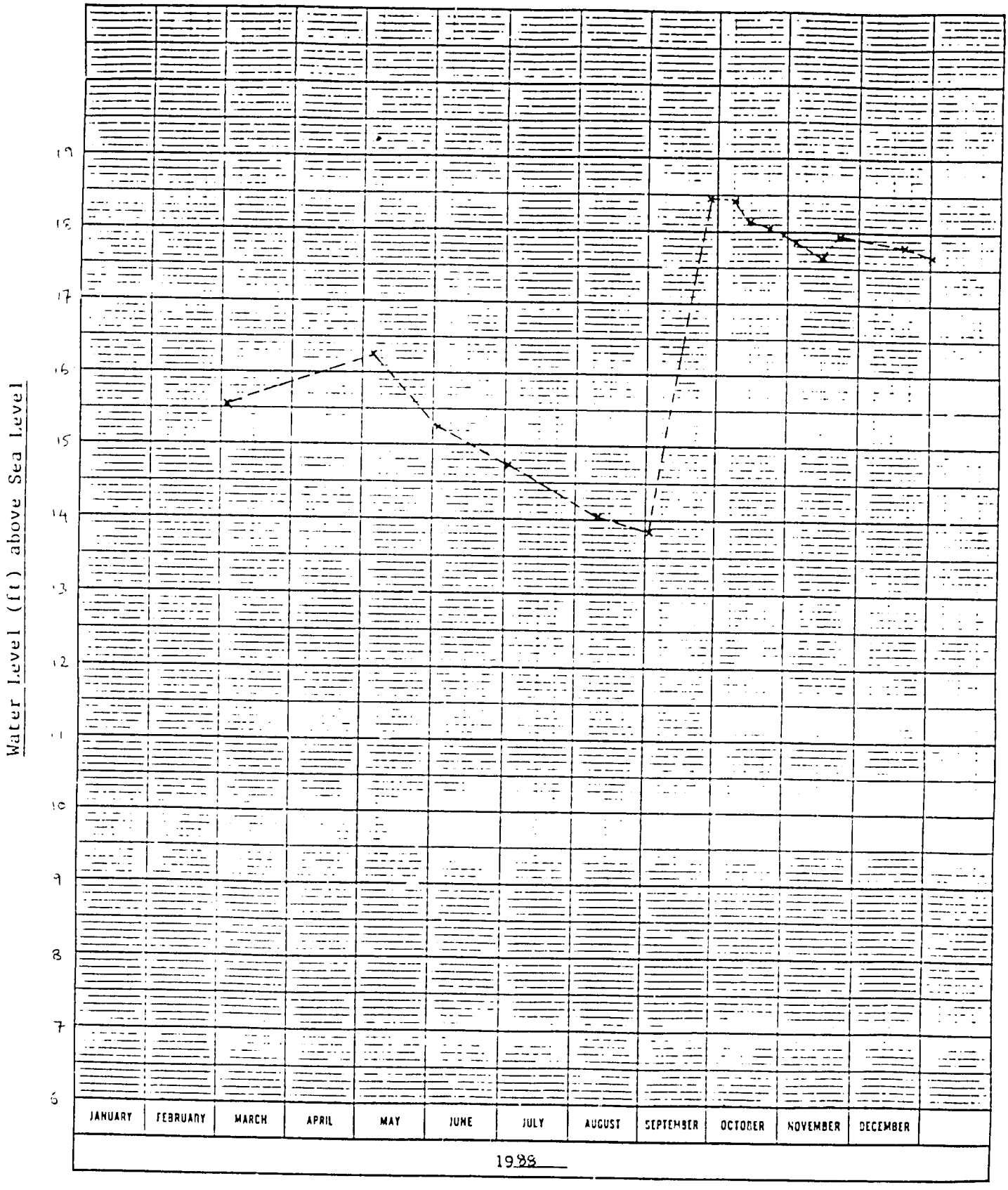
Location: COOKSON #4 Elevation of M.P- 27.86 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: COCKSON #4 Elevation of M.P- 2786 ft.

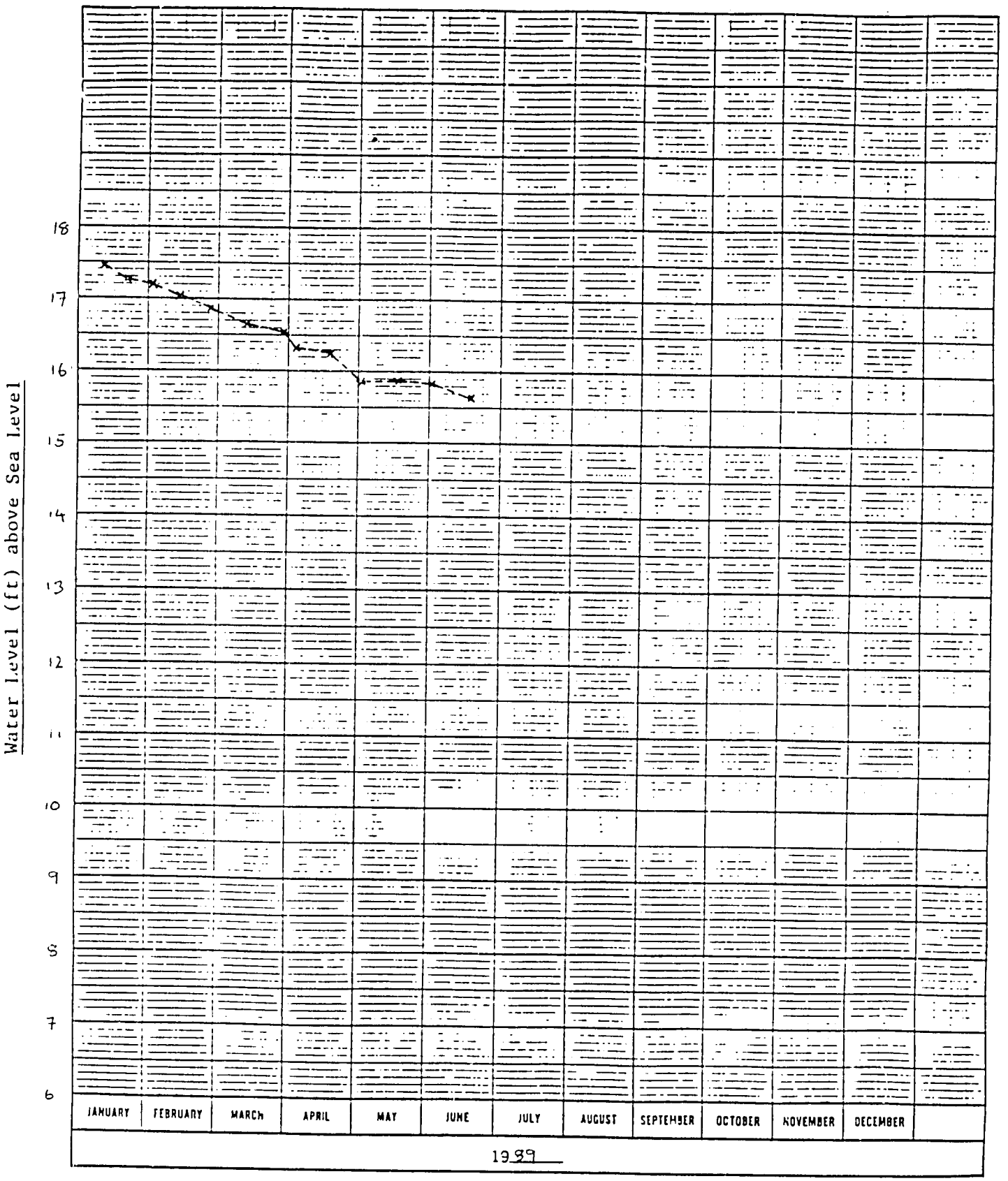


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: COOKSON #4

Elevation of M.P- 27.86 ft.

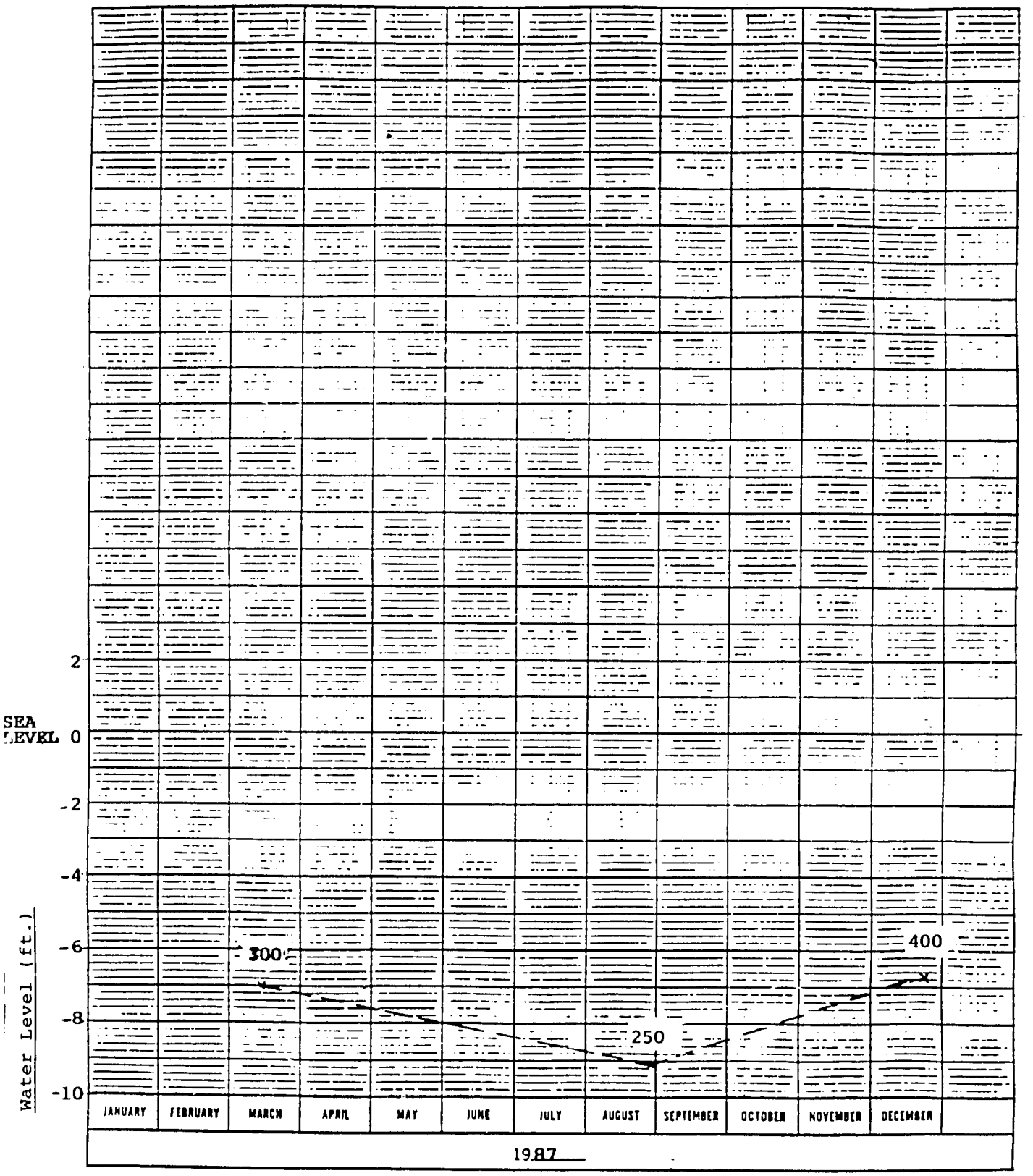


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: COOKSON #4

Elevation of M.P- 27.86 ft.



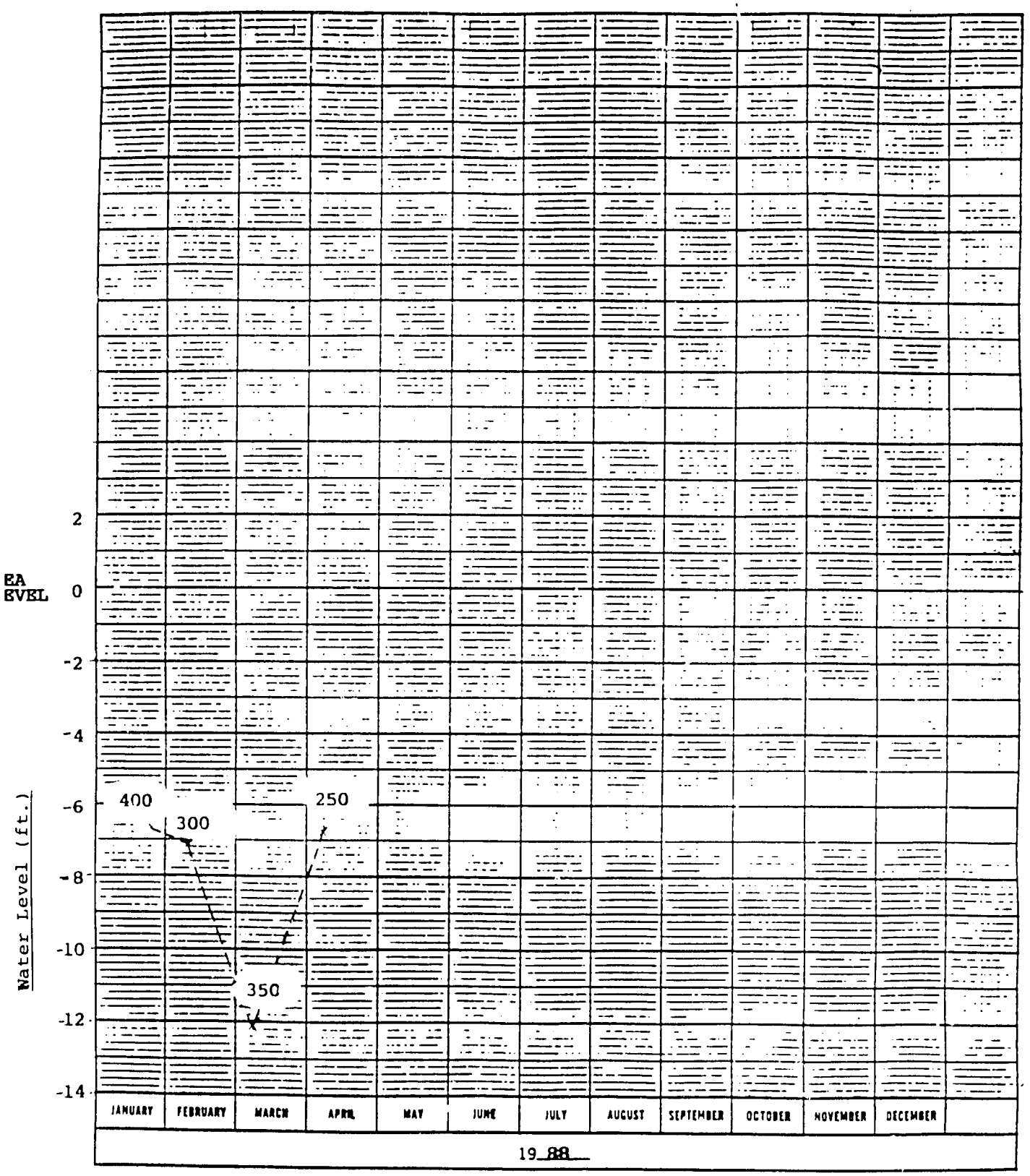
PUMPING WATER LEVEL

400 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: COOKSON #4

Elevation of M.P- 27.86 ft.



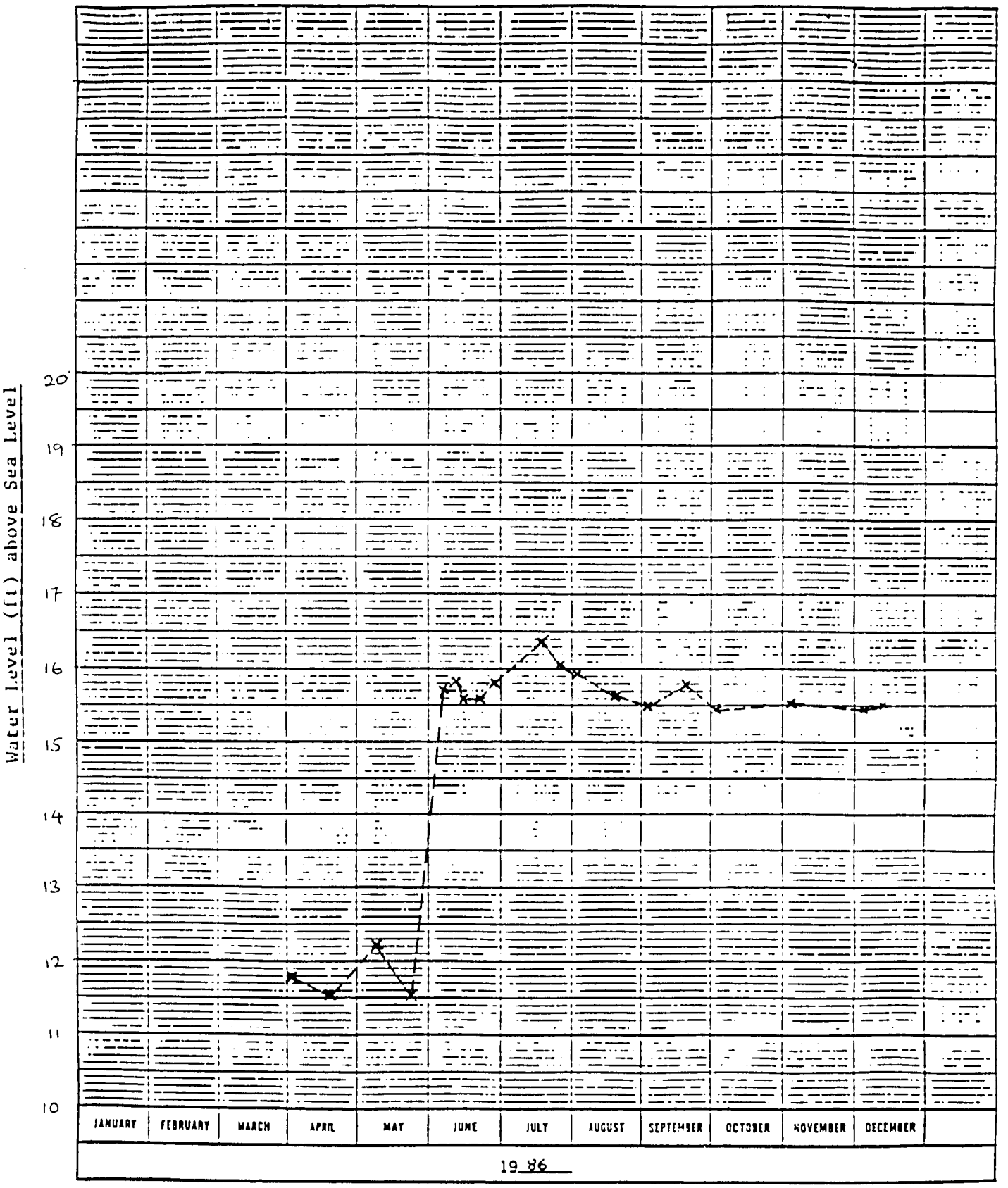
PUMPING WATER LEVEL

300 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS # 2

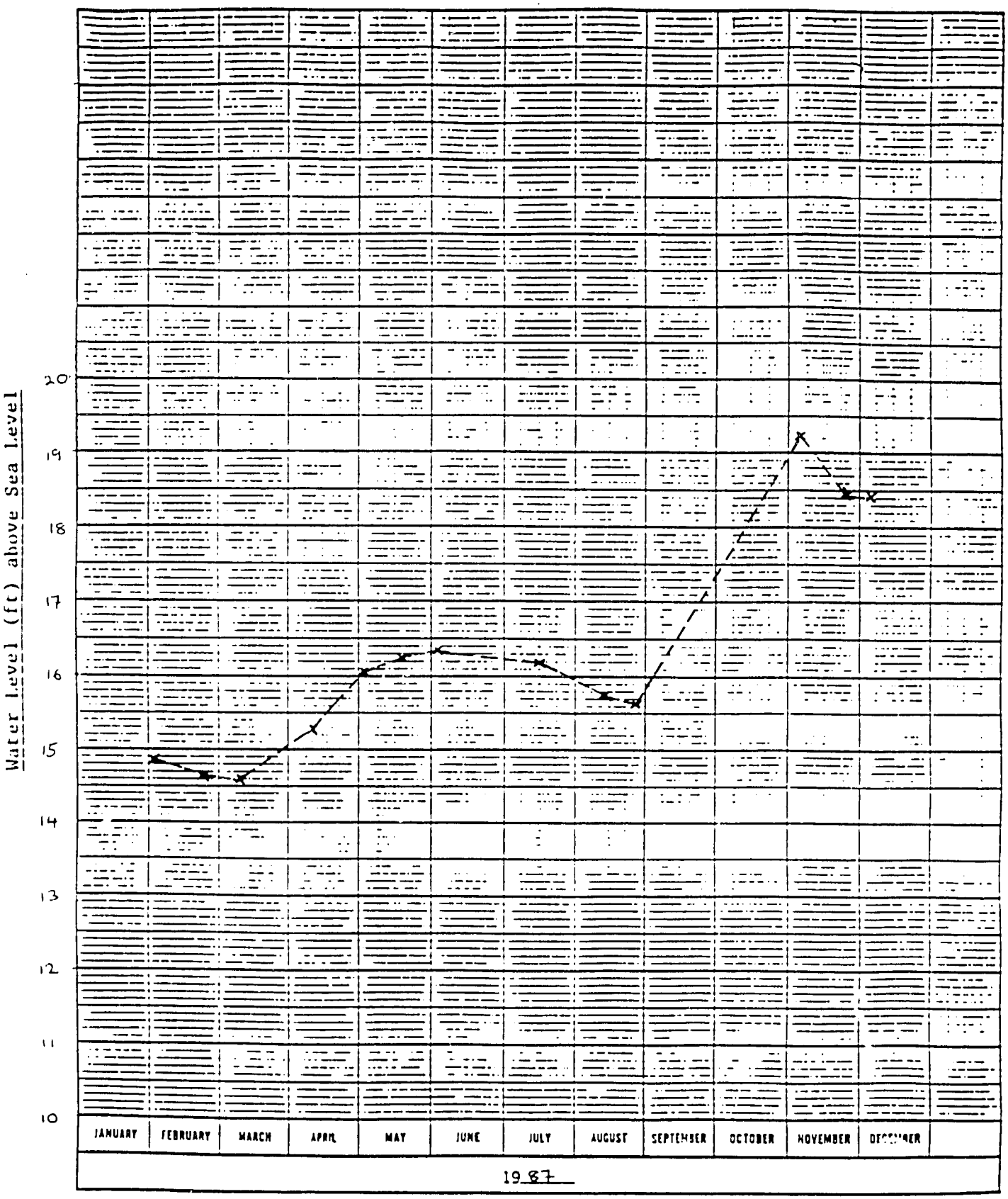
Elevation of M.P- 29·05 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS #2 **Elevation of M.P-** 29.05 **ft.**

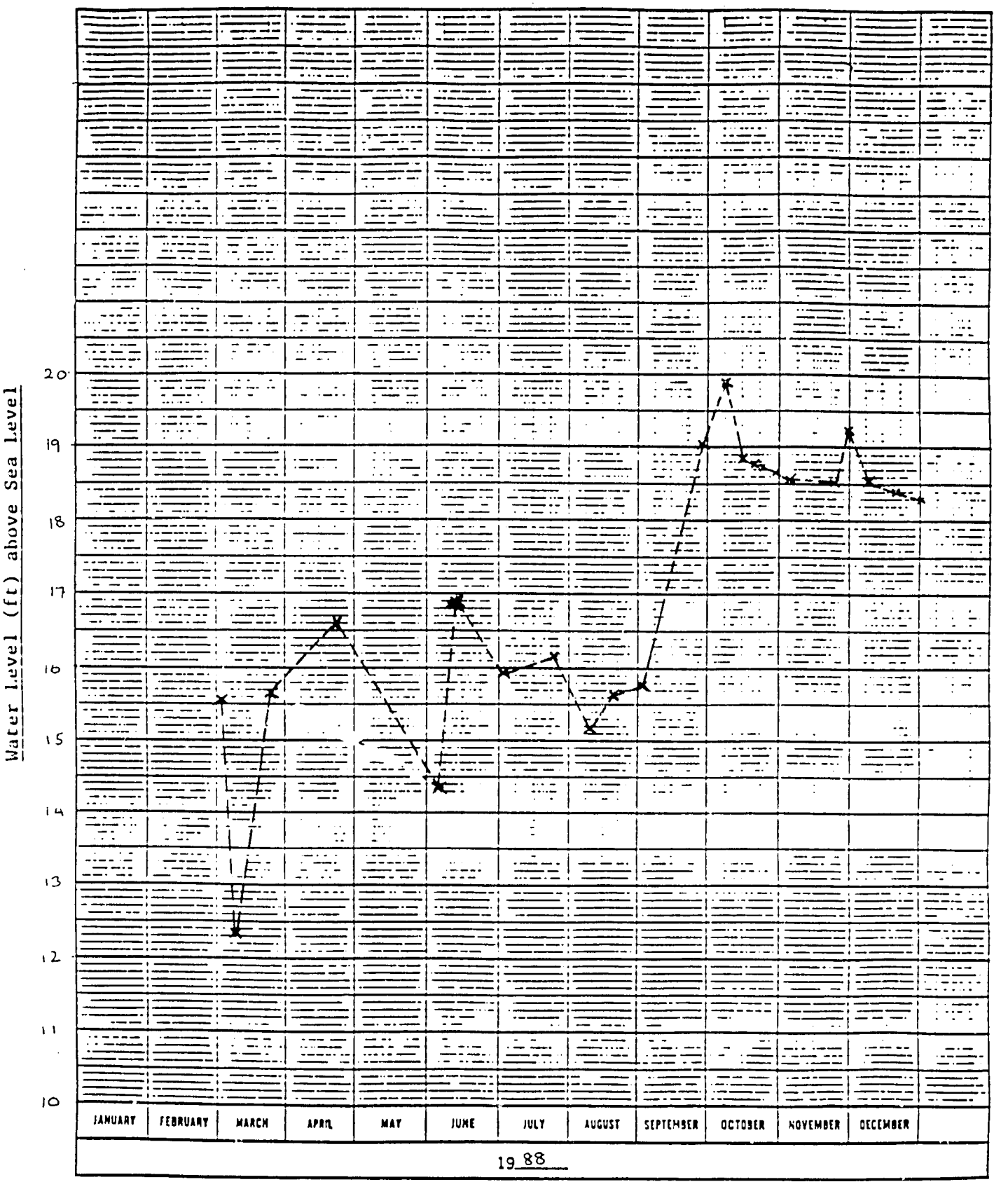


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS # 2

Elevation of M.P- 29.05 ft.



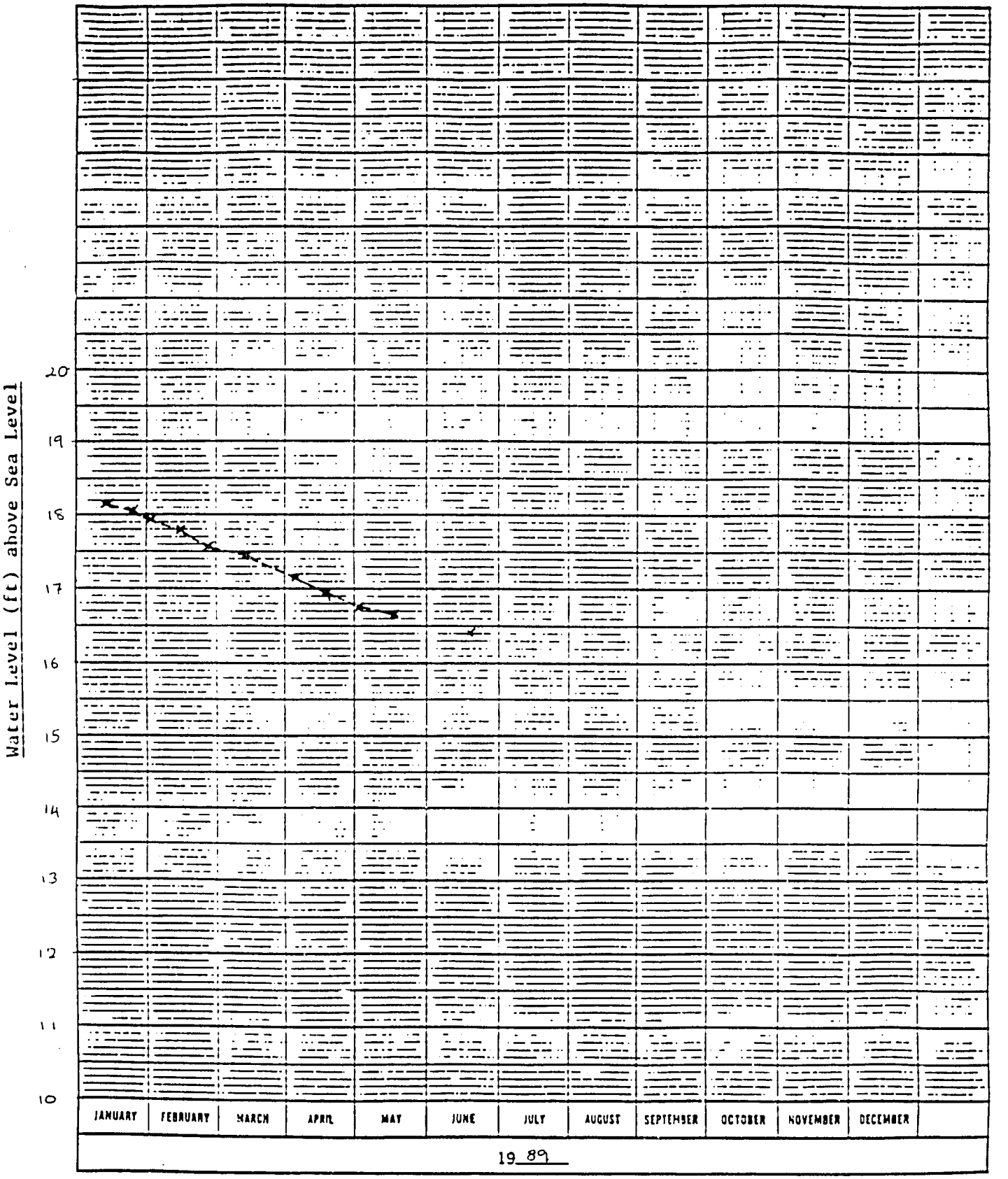
NON PUMPING WATER LEVEL

St. Catherine Plains

Well Hydrograph

Location: NEWLANDS #2

Elevation of M.P- 29.05 ft.

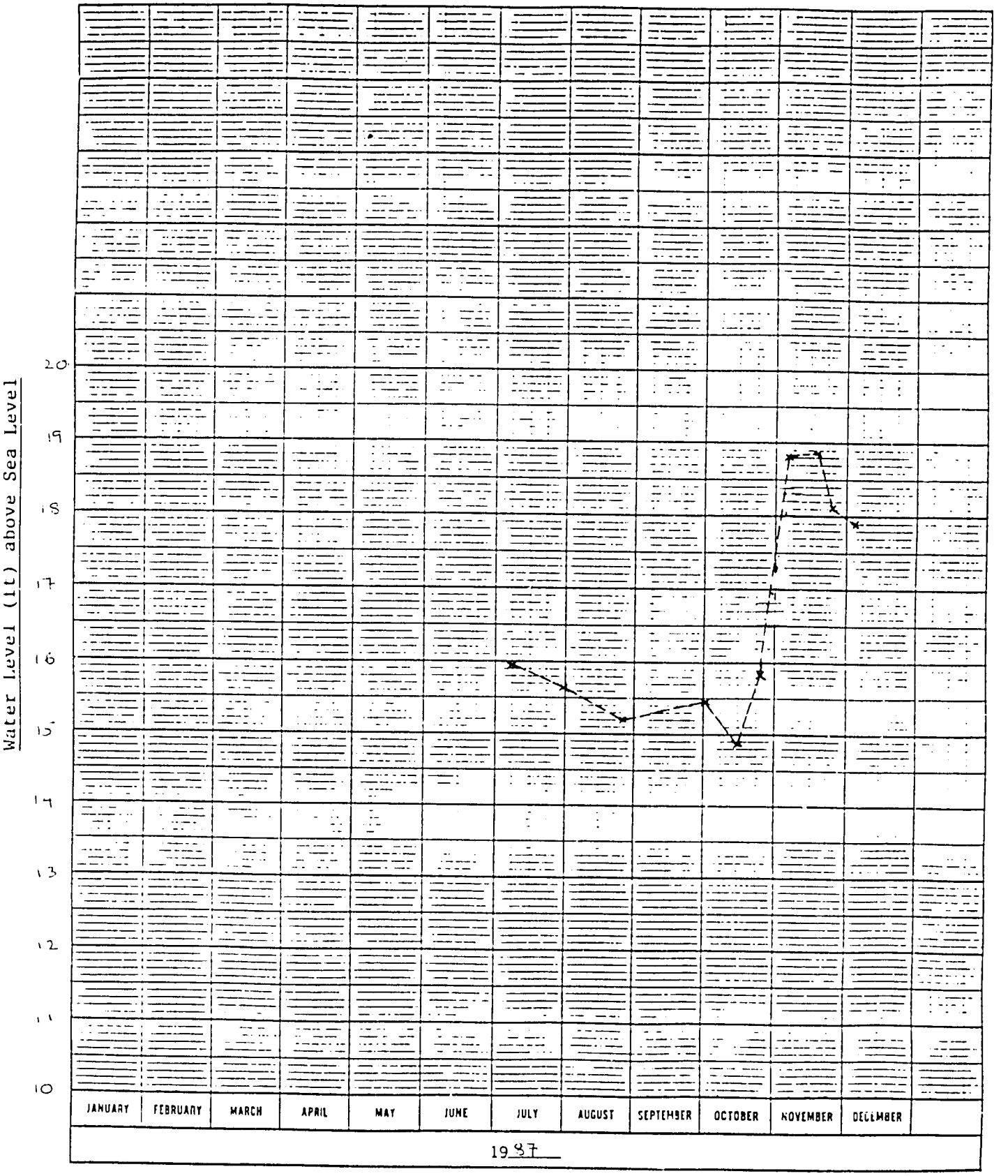


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS # 2A

Elevation of M.P- 280 ft.

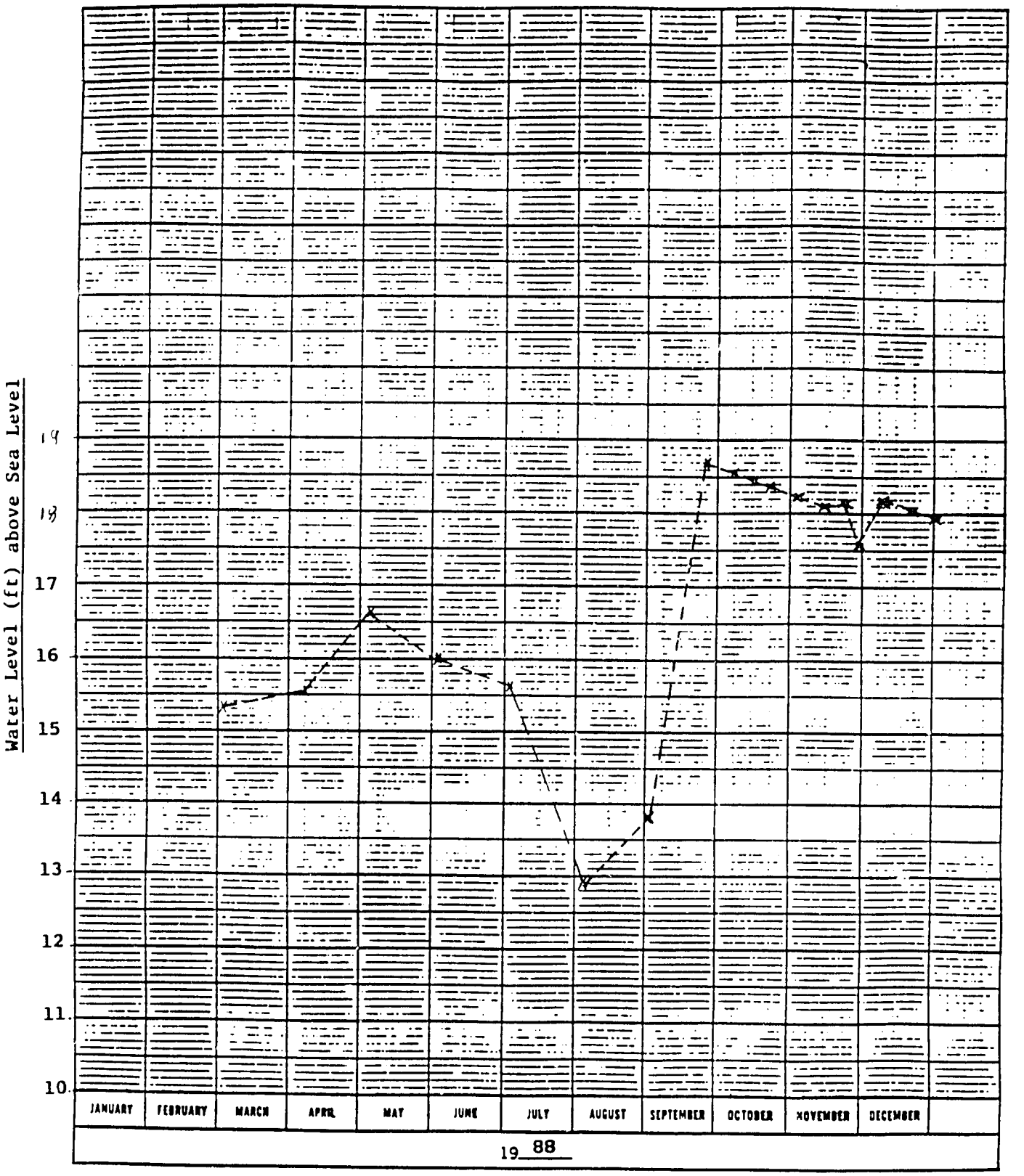


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS #2A

Elevation of M.P.- 28.00 ft.

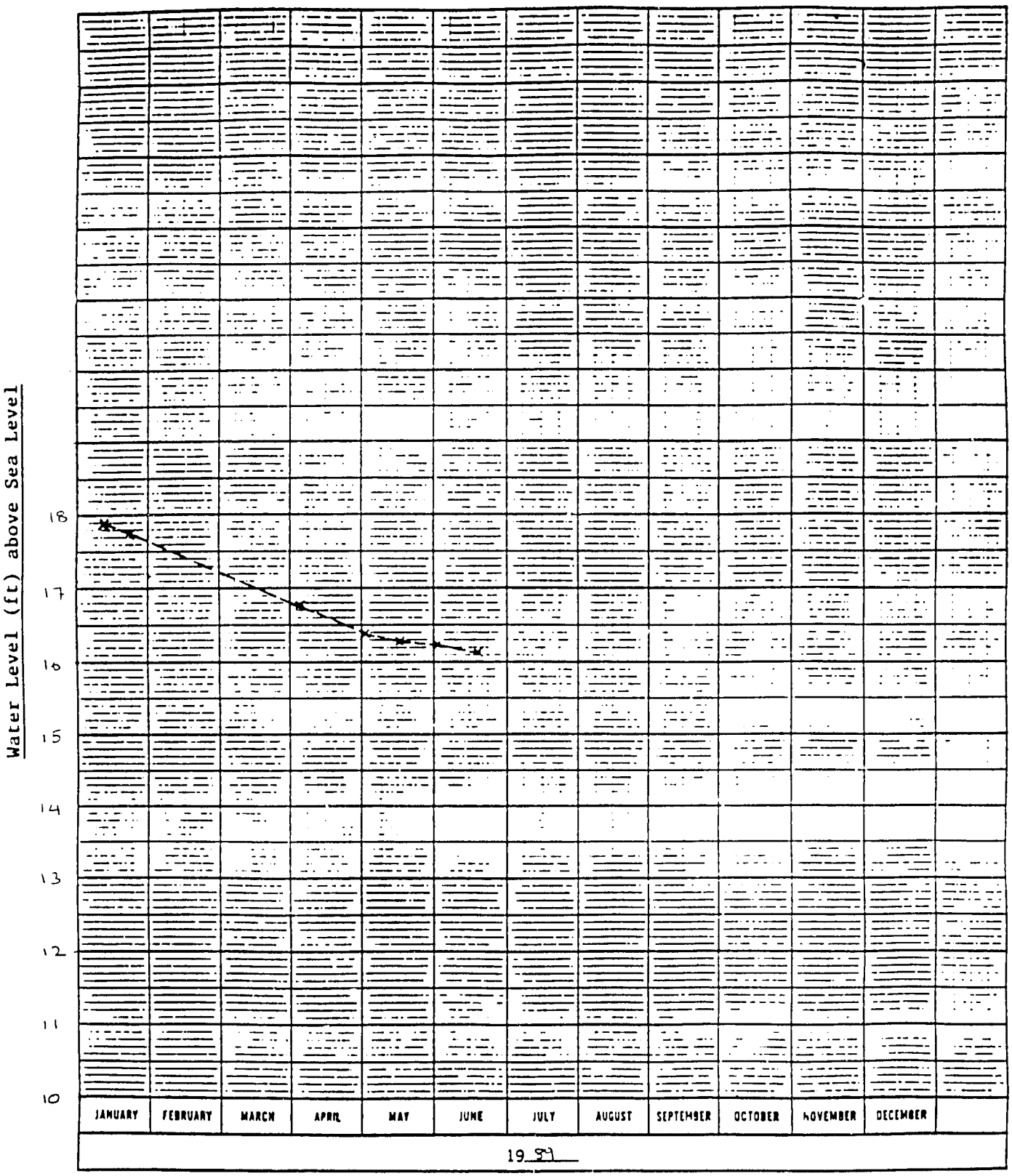


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS # 2A

Elevation of M.P- 2800 ft.

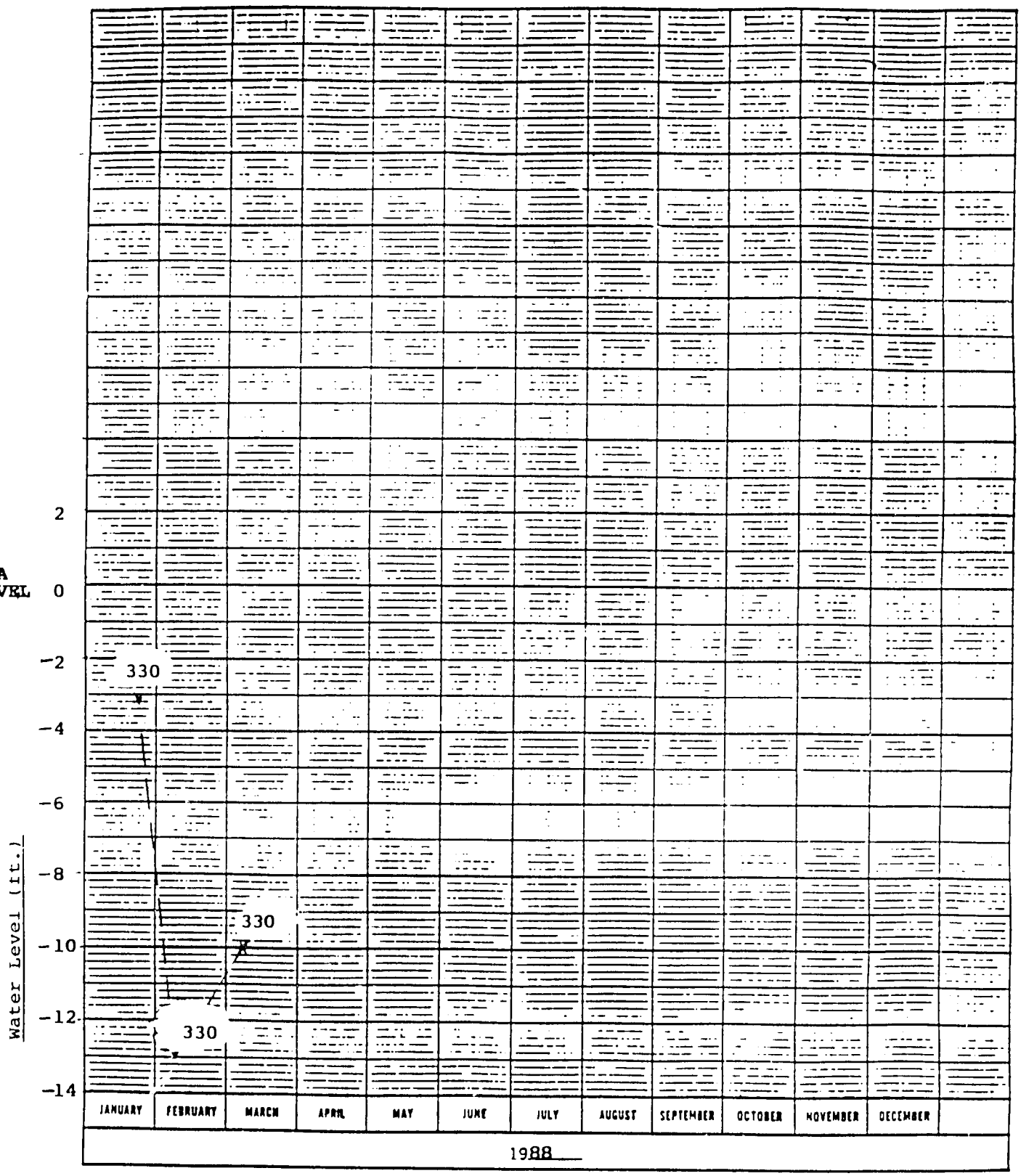


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS #2A

Elevation of M.P- 28.00 ft.



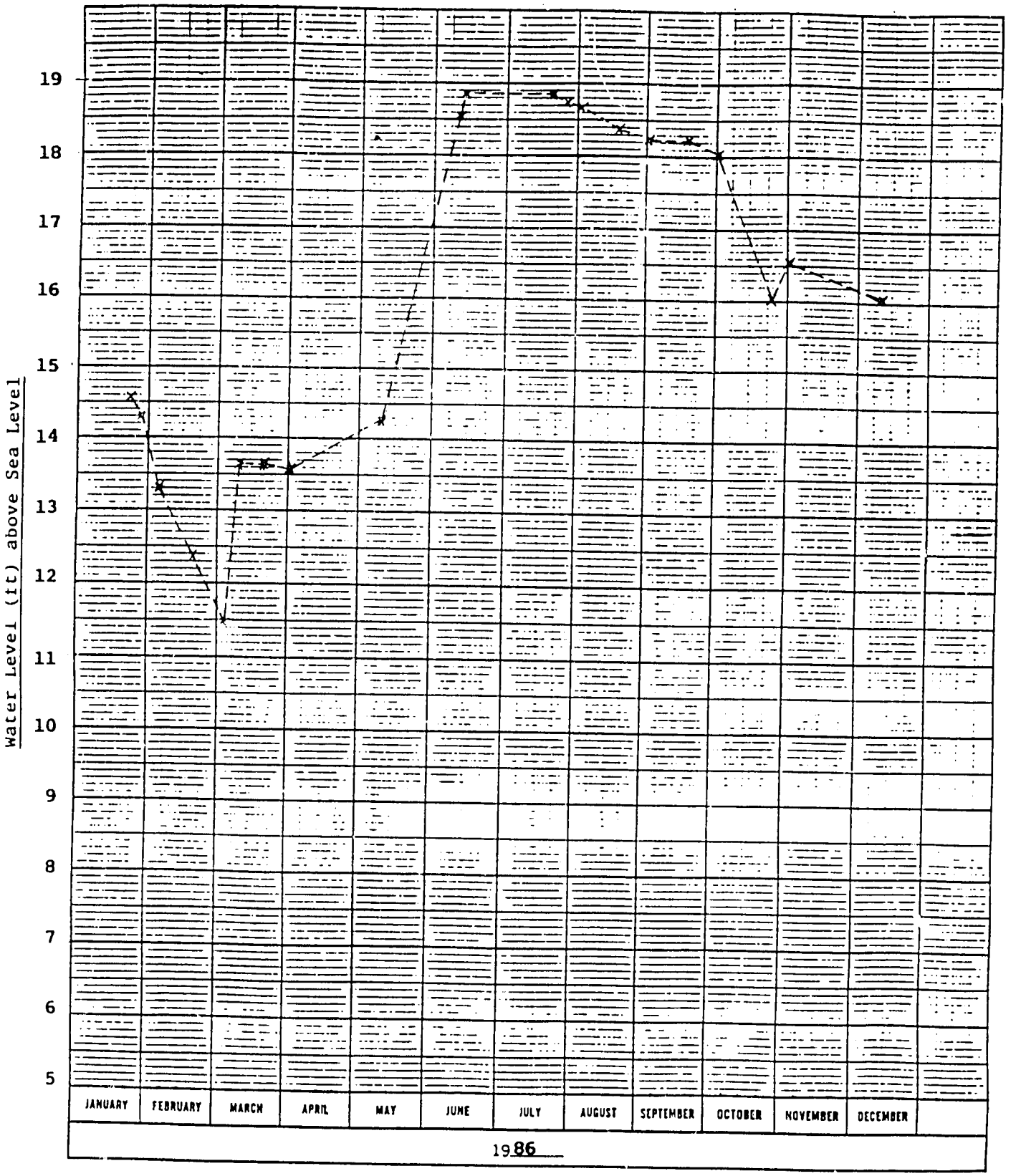
PUMPING WATER LEVEL

330 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS #3

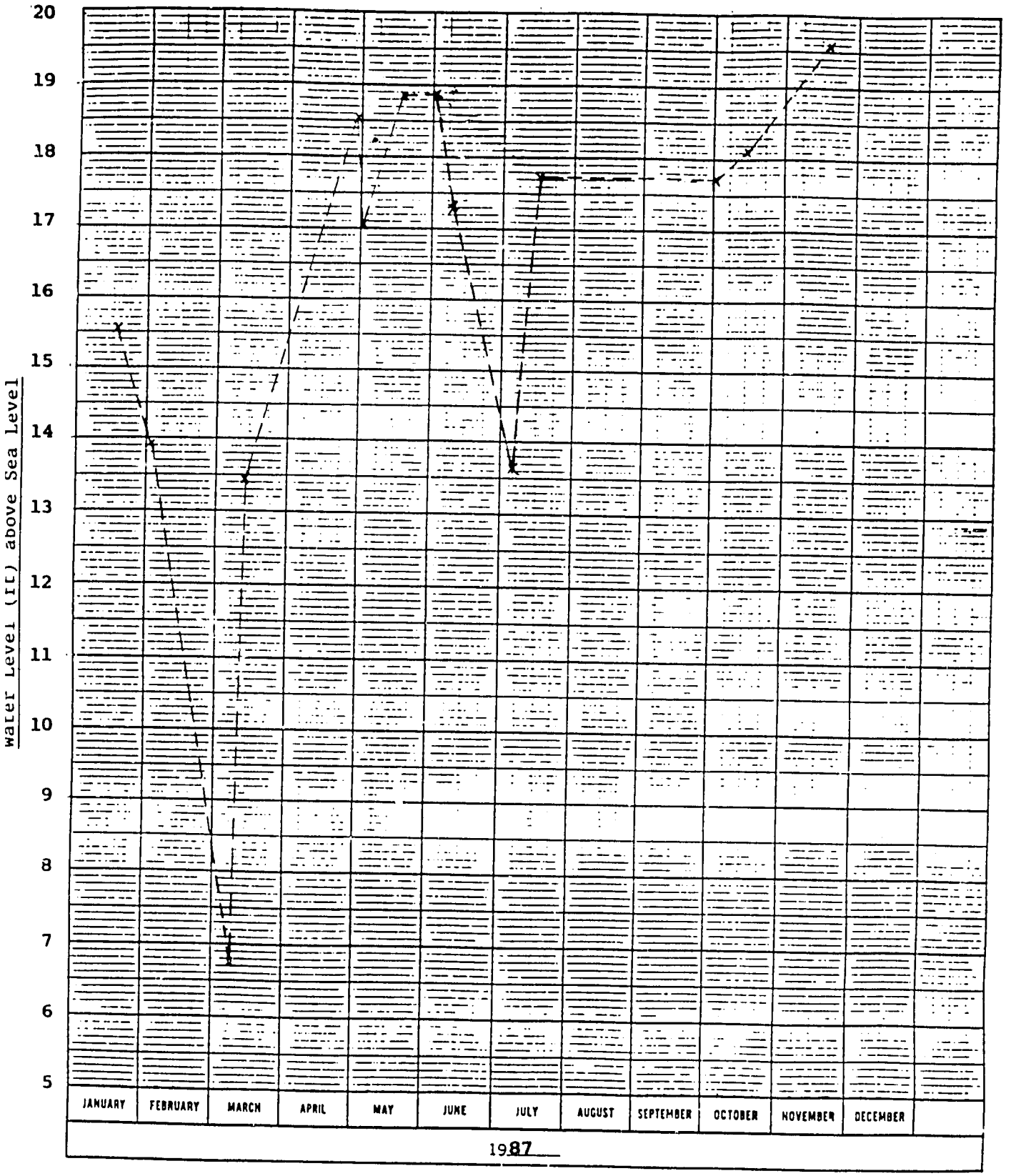
Elevation of M.P- 32.24 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS #3 Elevation of M.P- 32.34 ft.

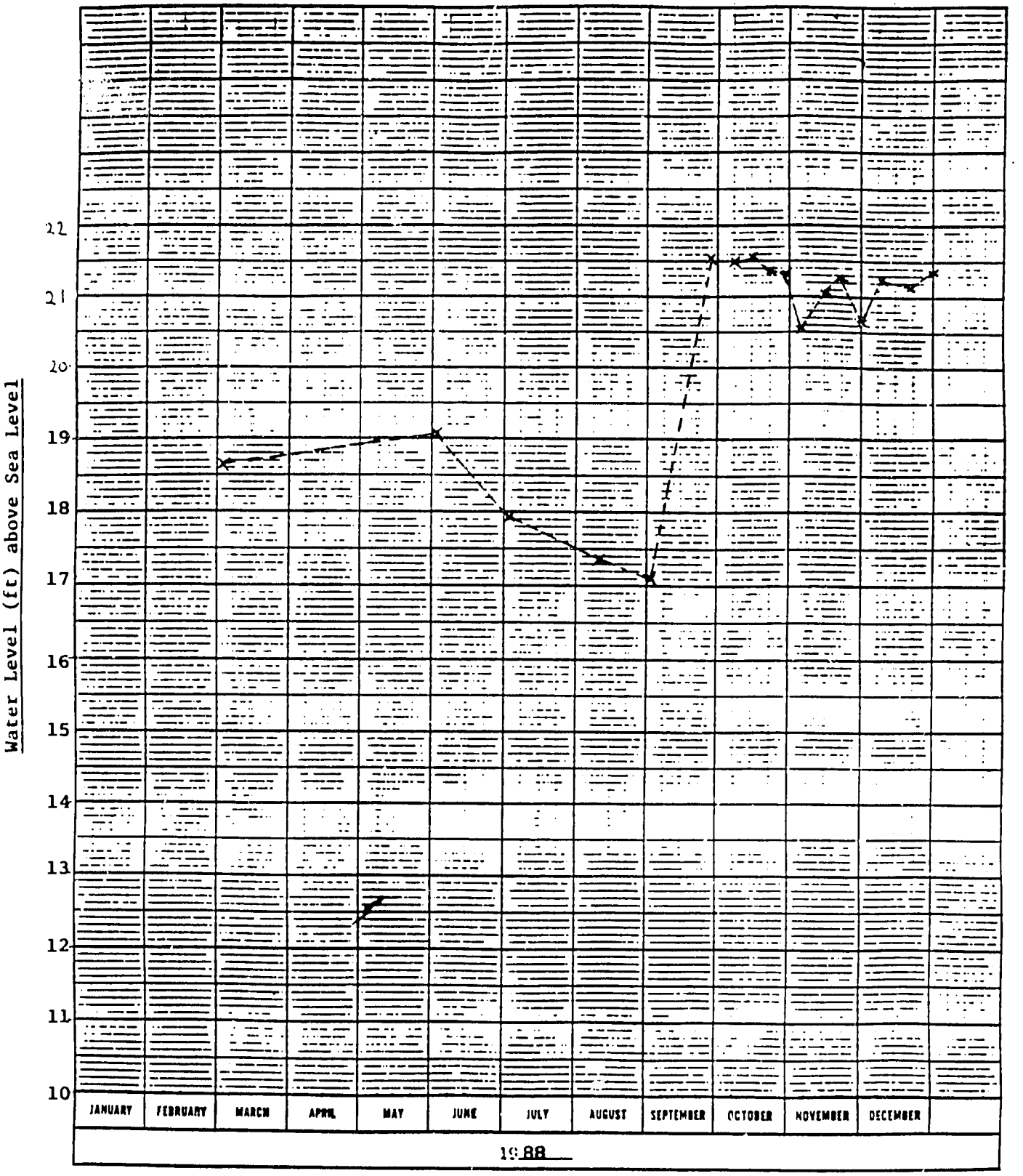


NOW PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: **NEWLANDS #3**

Elevation of M.P- 32.24 ft.

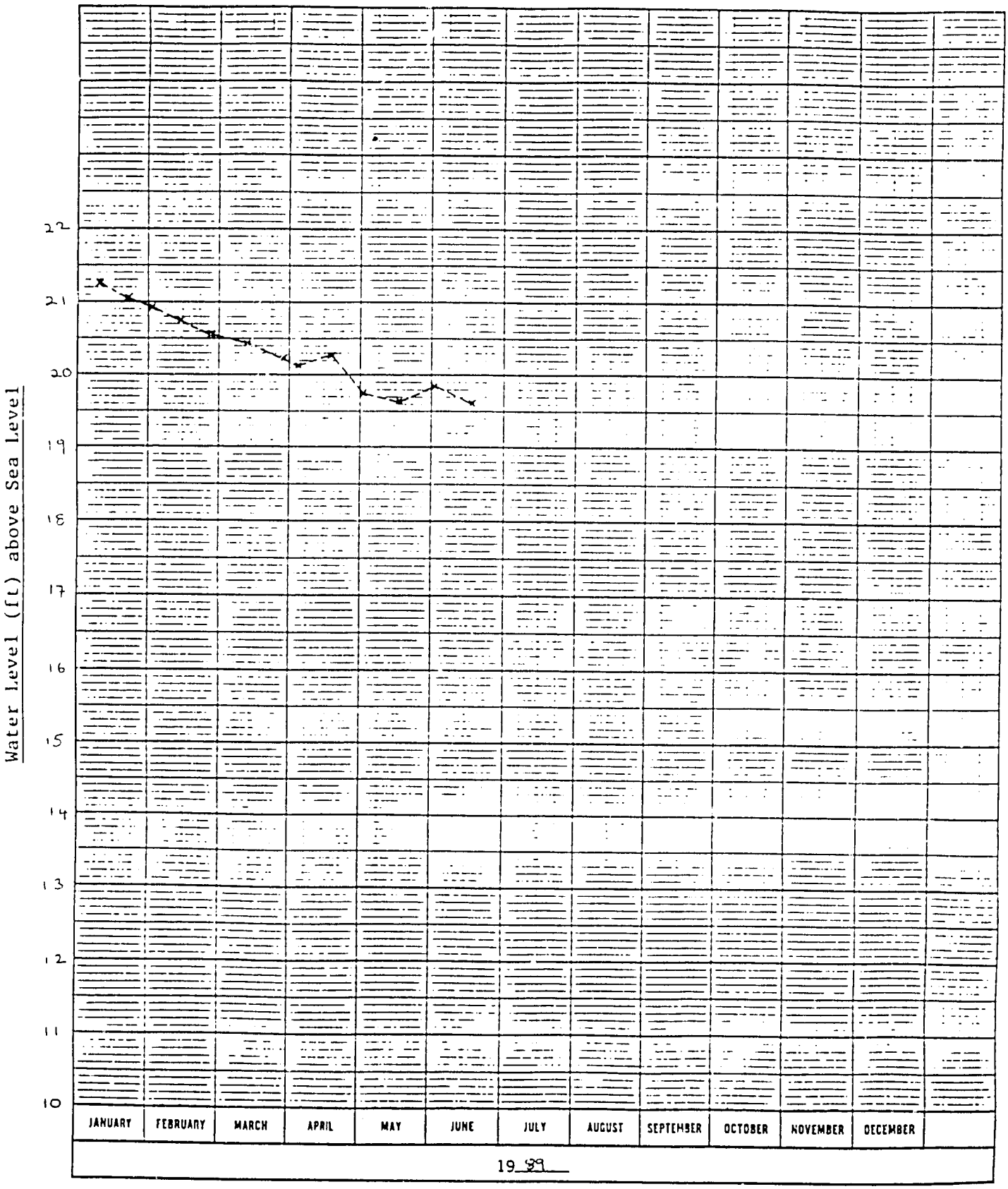


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS # 3

Elevation of M.P- 3224 ft.

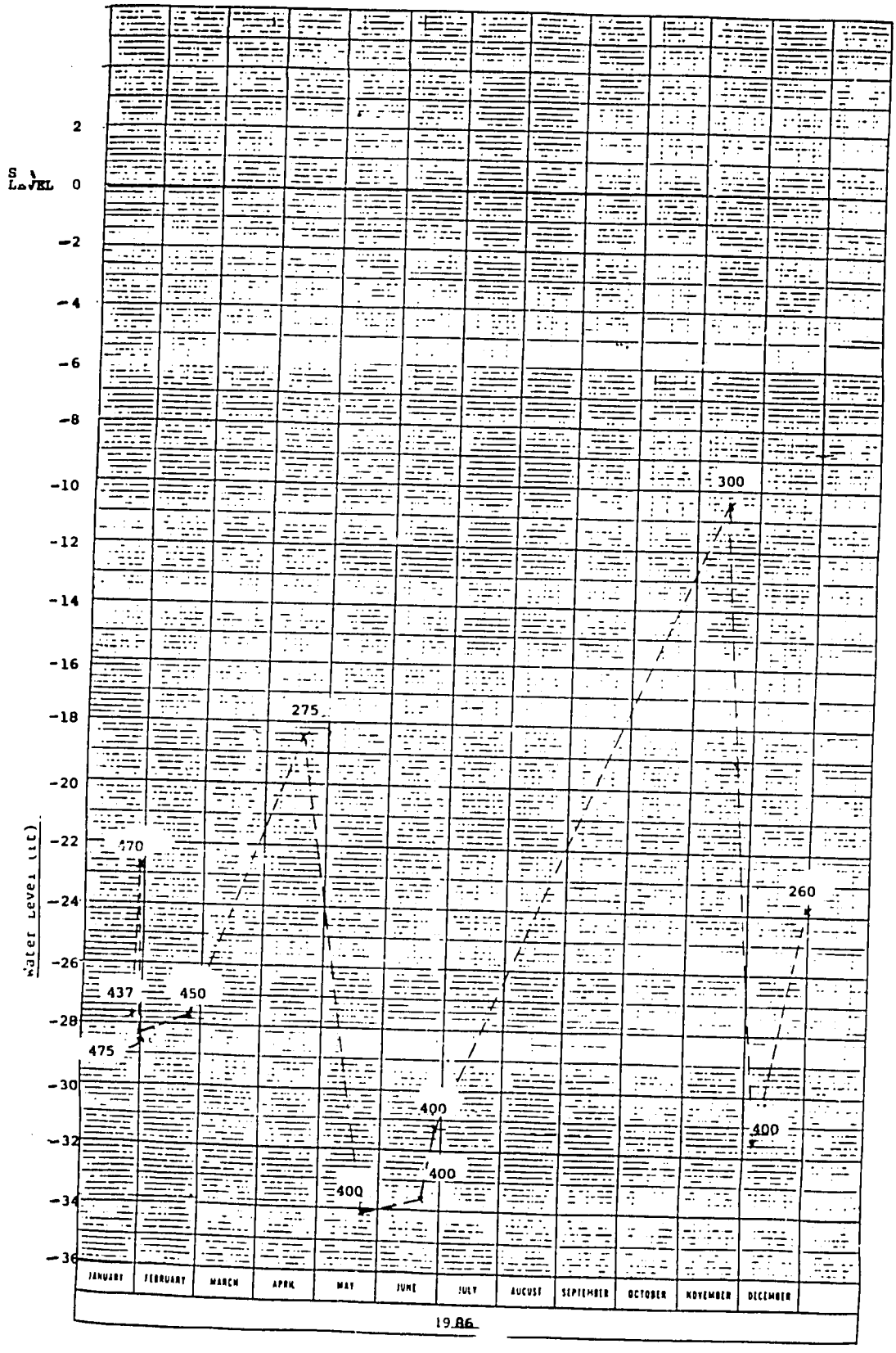


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS #3

Elevation of M.P- 32.24 ft.



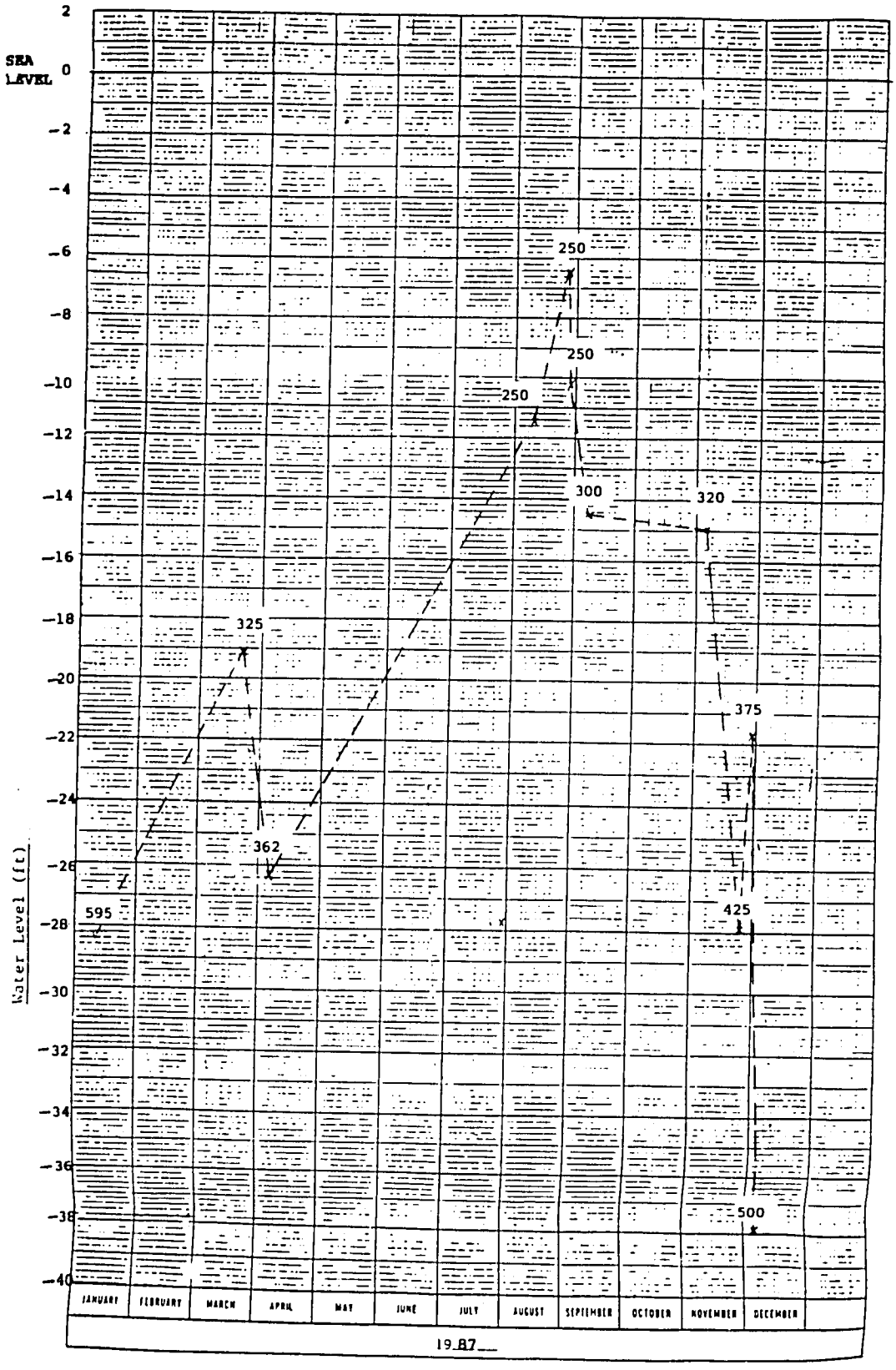
PUMPING WATER LEVEL

400 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: NEWLANDS #3

Elevation of M.P- 32.24 ft.



PUMPING WATER LEVEL

300 - WELL DISCHARGE (IGPM)

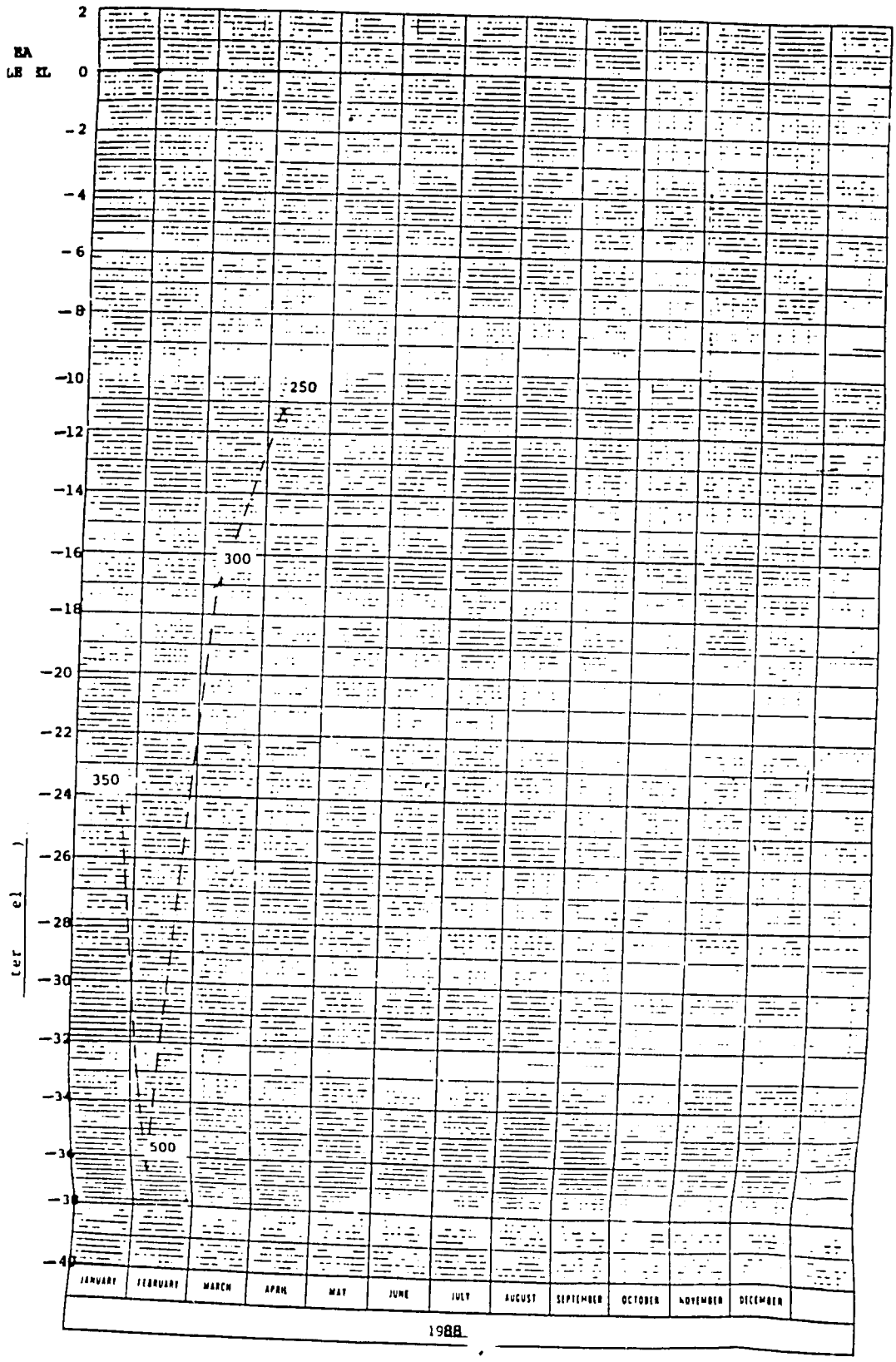
(5)

St. Catherines Plain

Well Hydrograph

Location: NEWLANDS #3

Elevation of M.P- 32.24 ft.



PUMPING WATER LEVEL

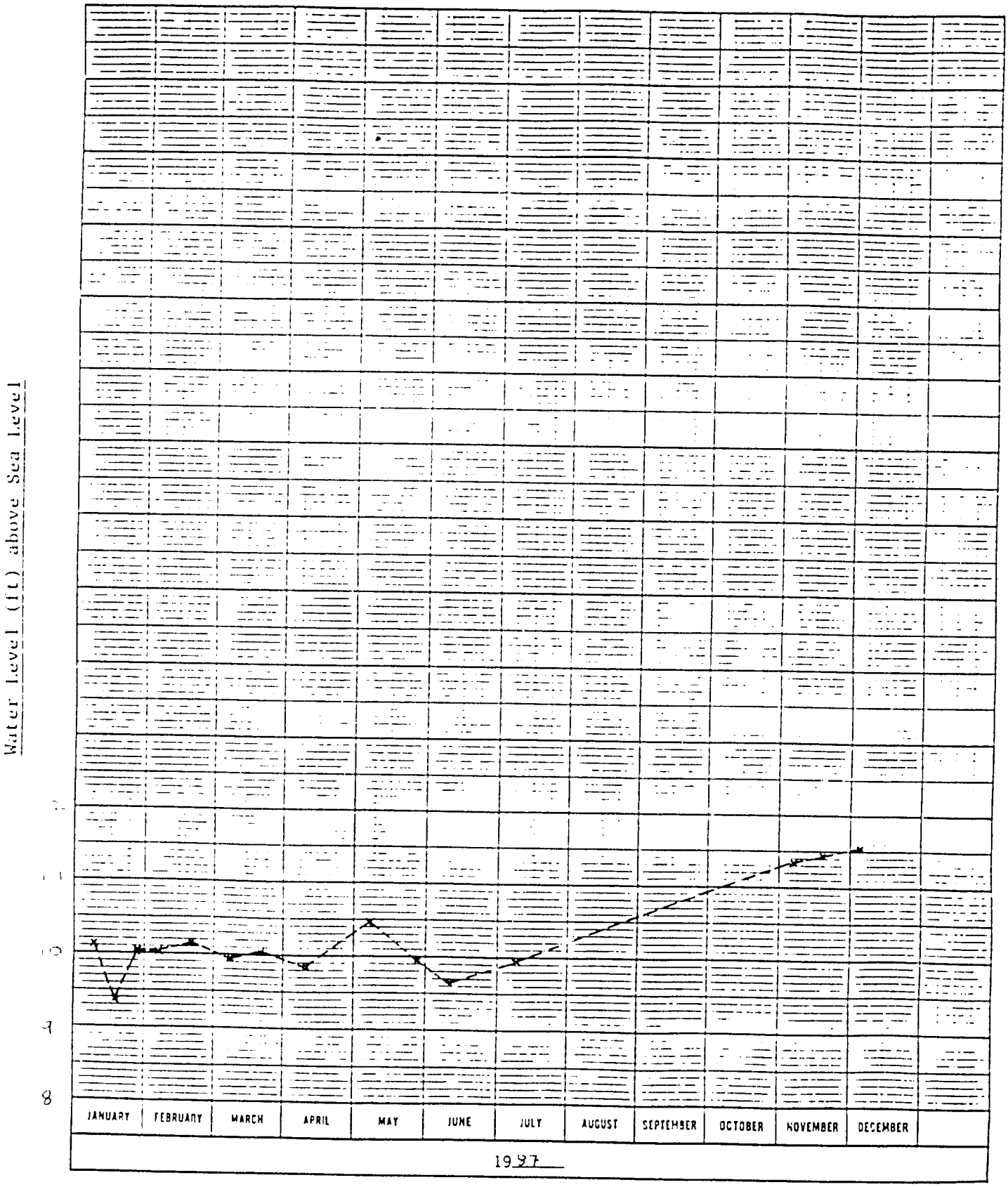
500 - WELL DISCHARGE (IGPM)

138

St. Catherine Plains
Well Hydrograph

Location: GUINEP PEN

Elevation of M.P- 27.97 ft.

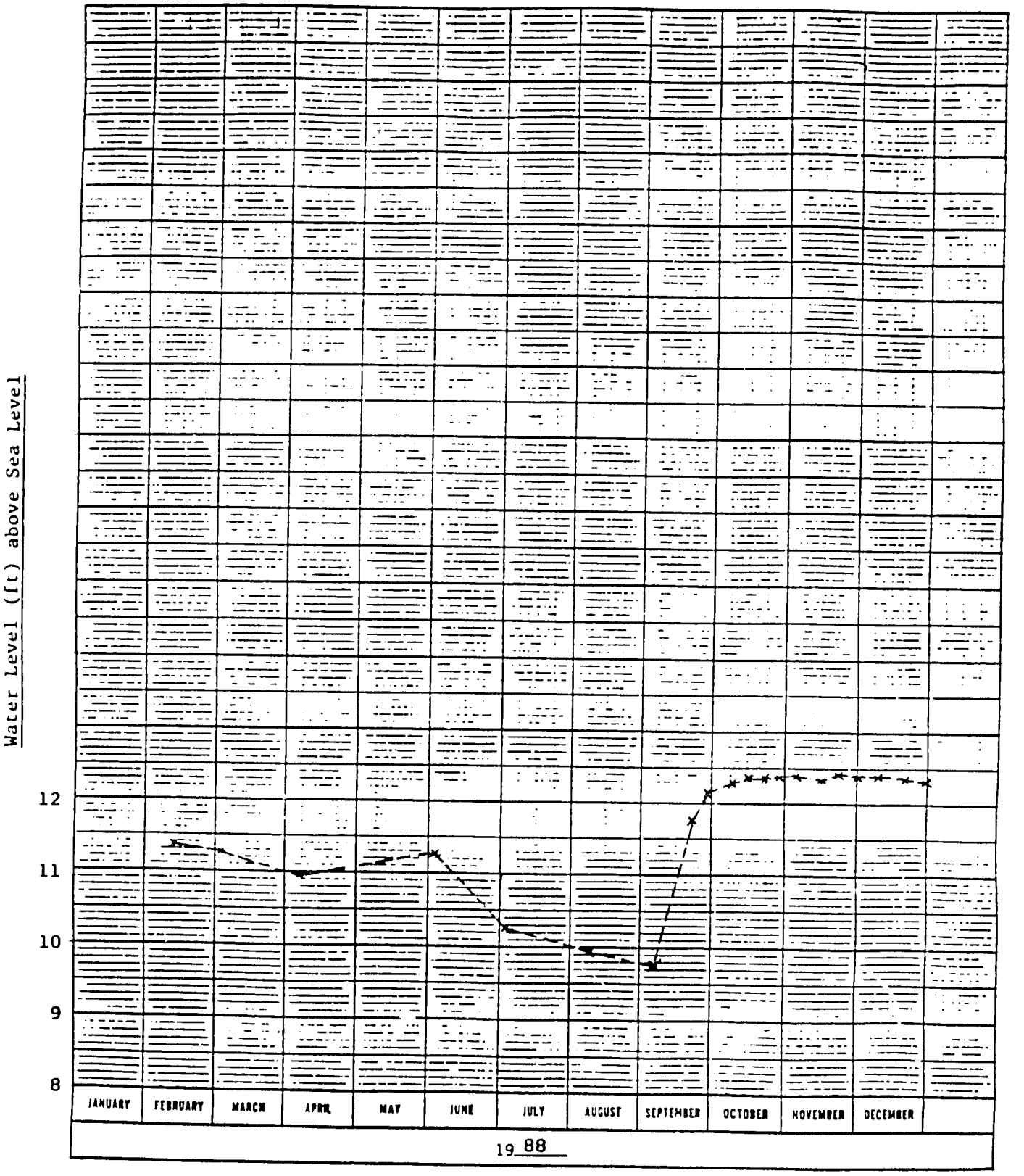


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: GUINEP PEN

Elevation of M.P- 27.97 ft.

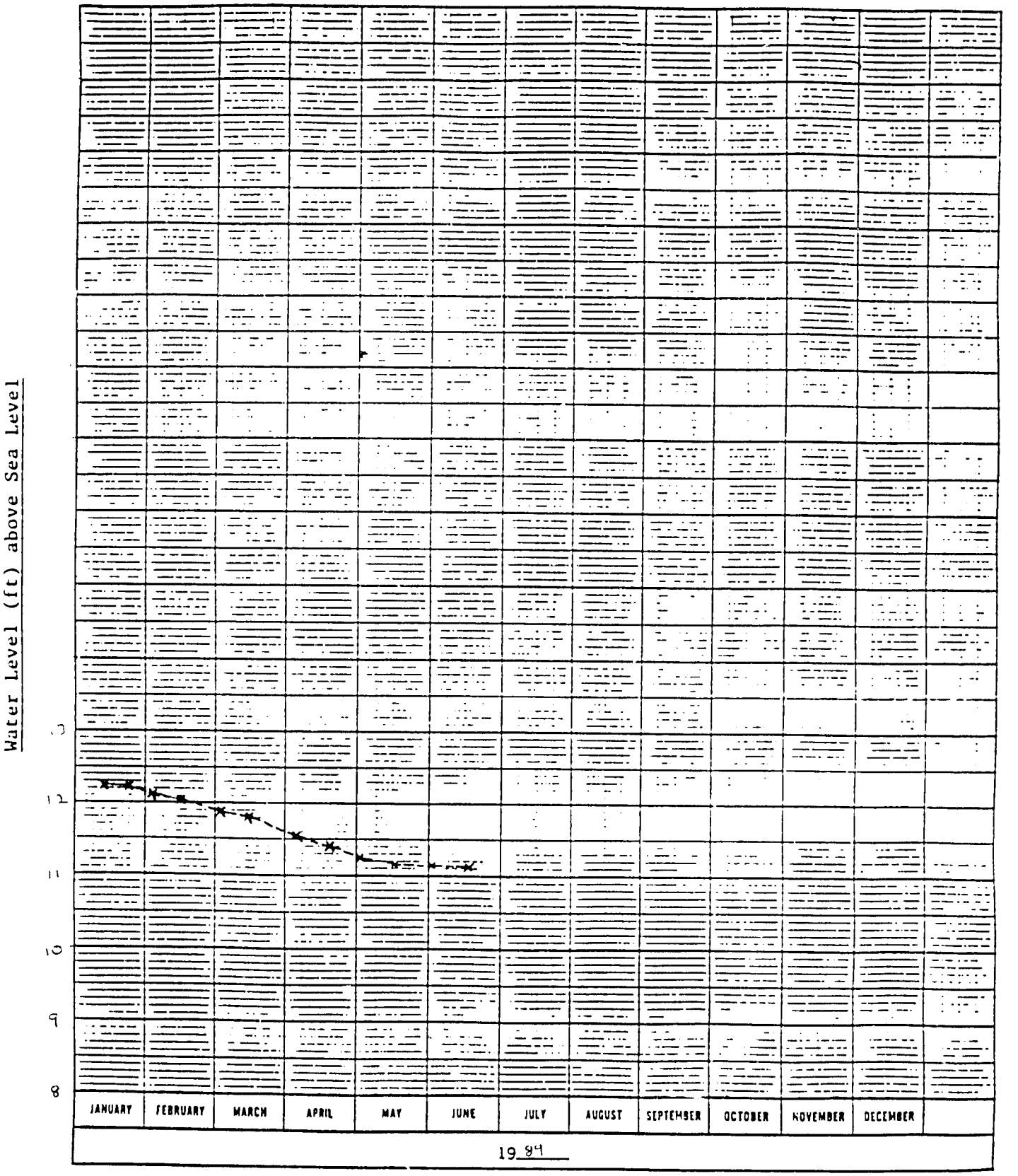


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: GUINEP PEN

Elevation of M.P- 27.97 ft.

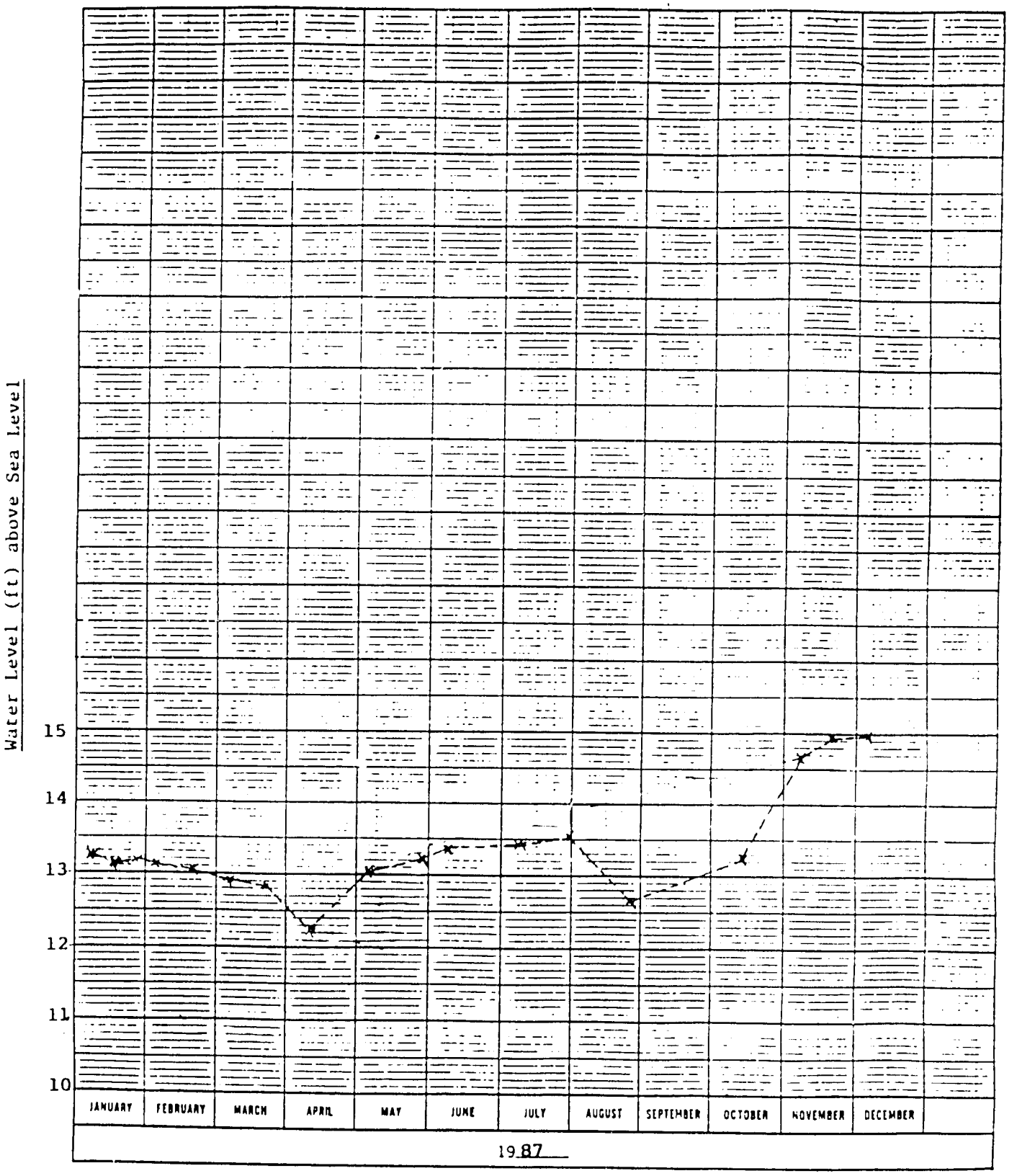


NON PUMPING WATER LEVEL-

St. Catherine Plains
Well Hydrograph

Location: **SOUTH SYNDICATE**

Elevation of M.P- **31.04 ft.**

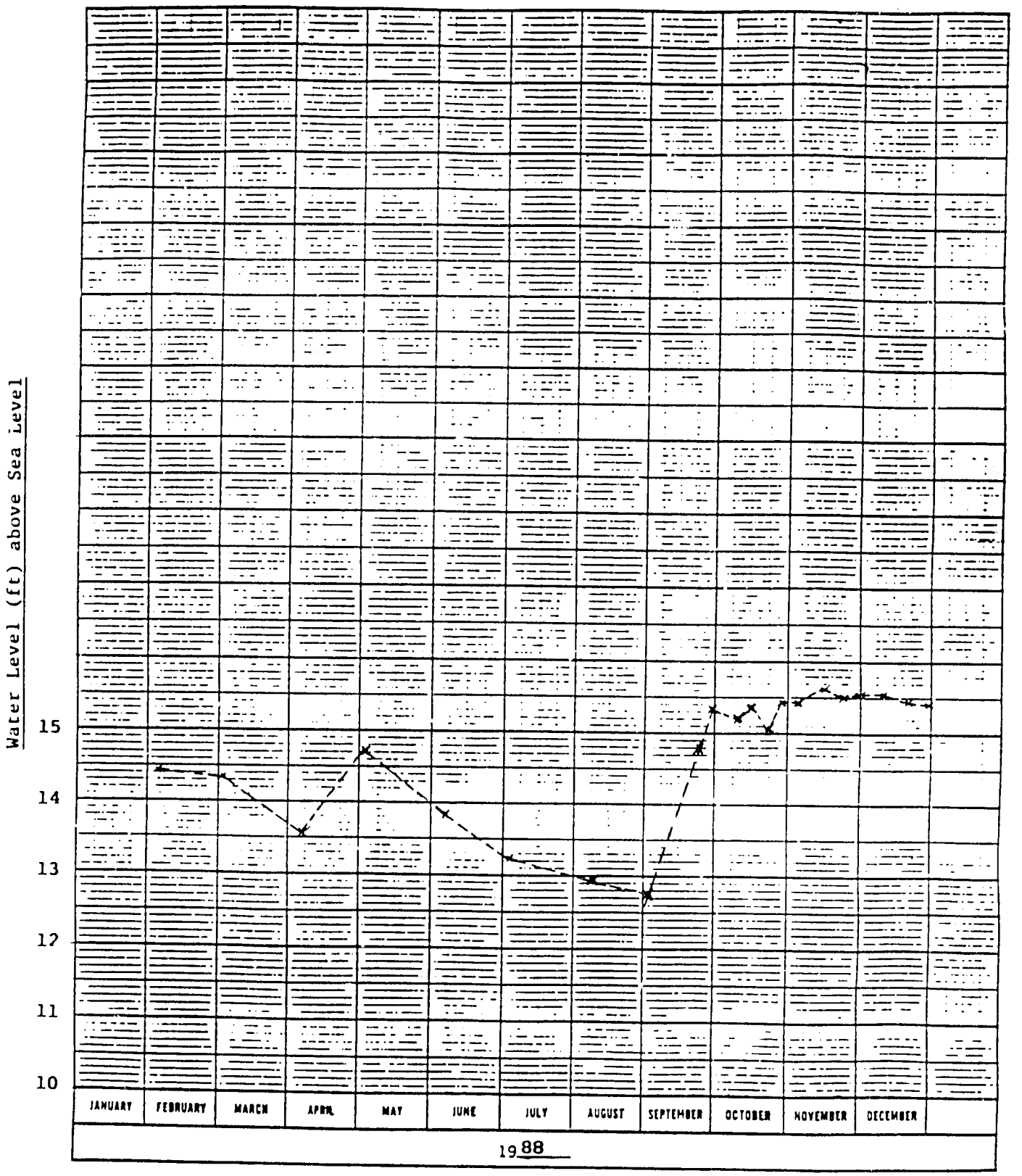


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: SOUTH SYNDICATE

Elevation of M.P- 31.04 ft.

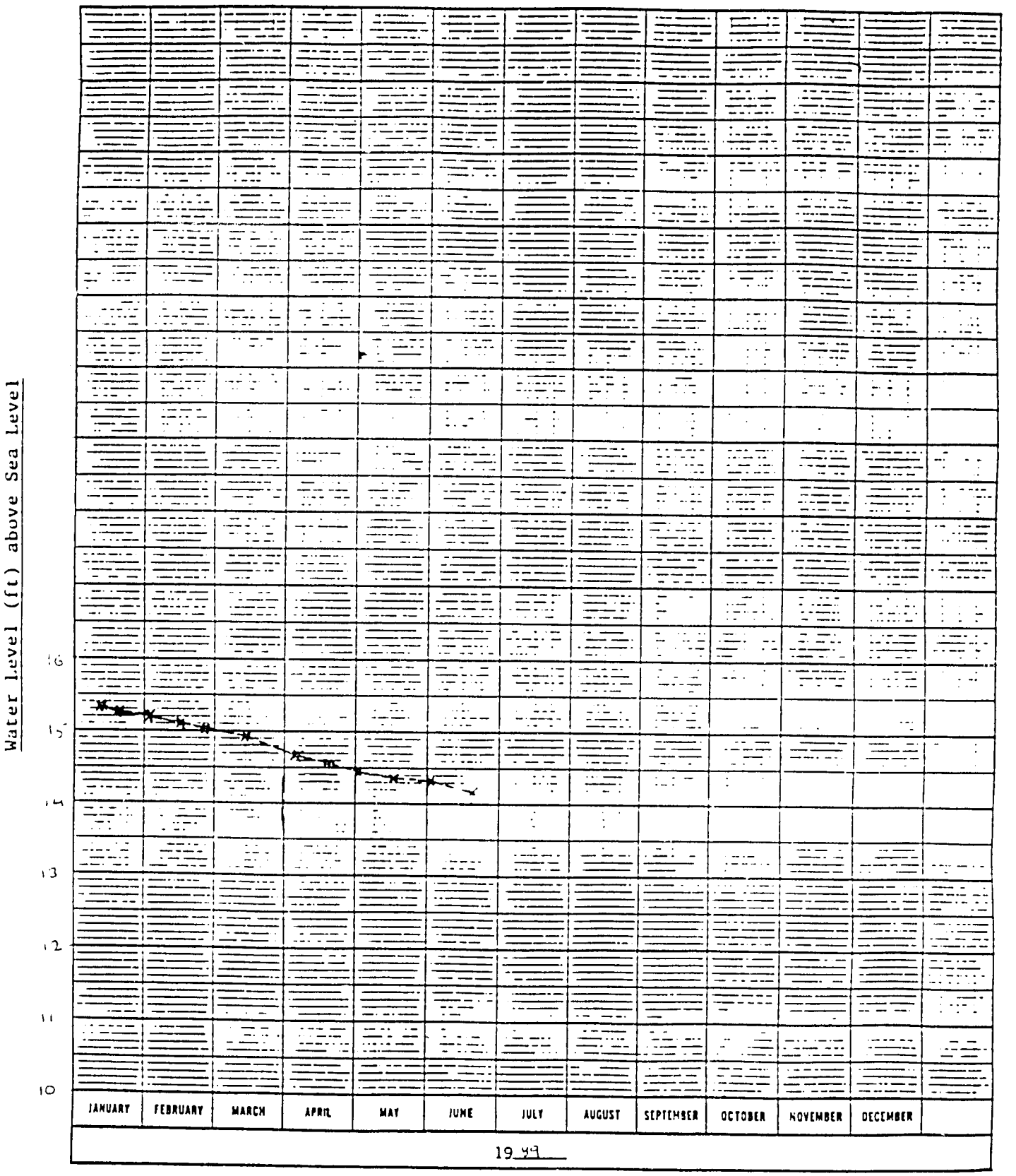


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: SOUTH SYNDICATE

Elevation of M.P- 31.04 ft.

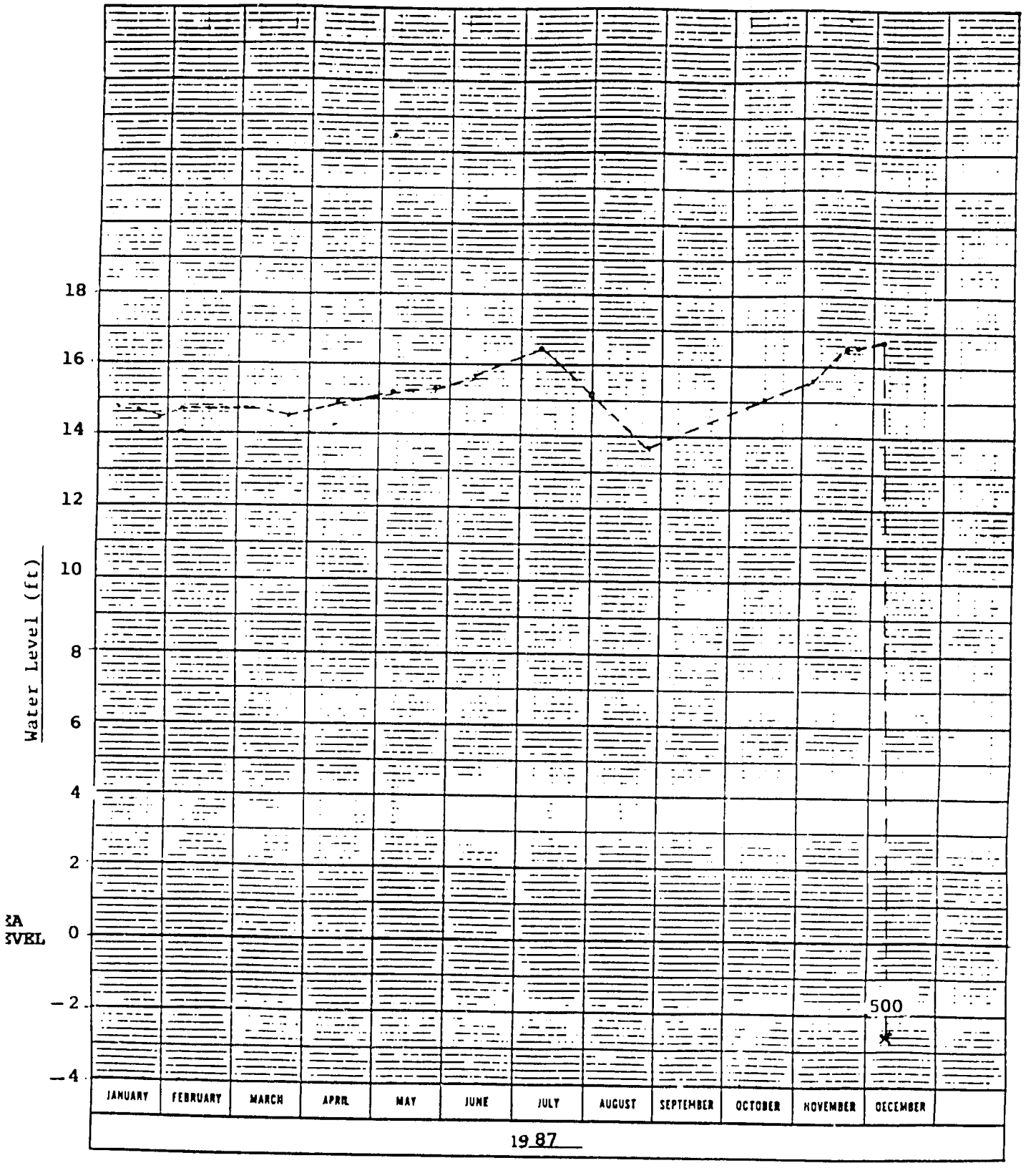


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: COMPARK

Elevation of M.P- 37.42 ft.

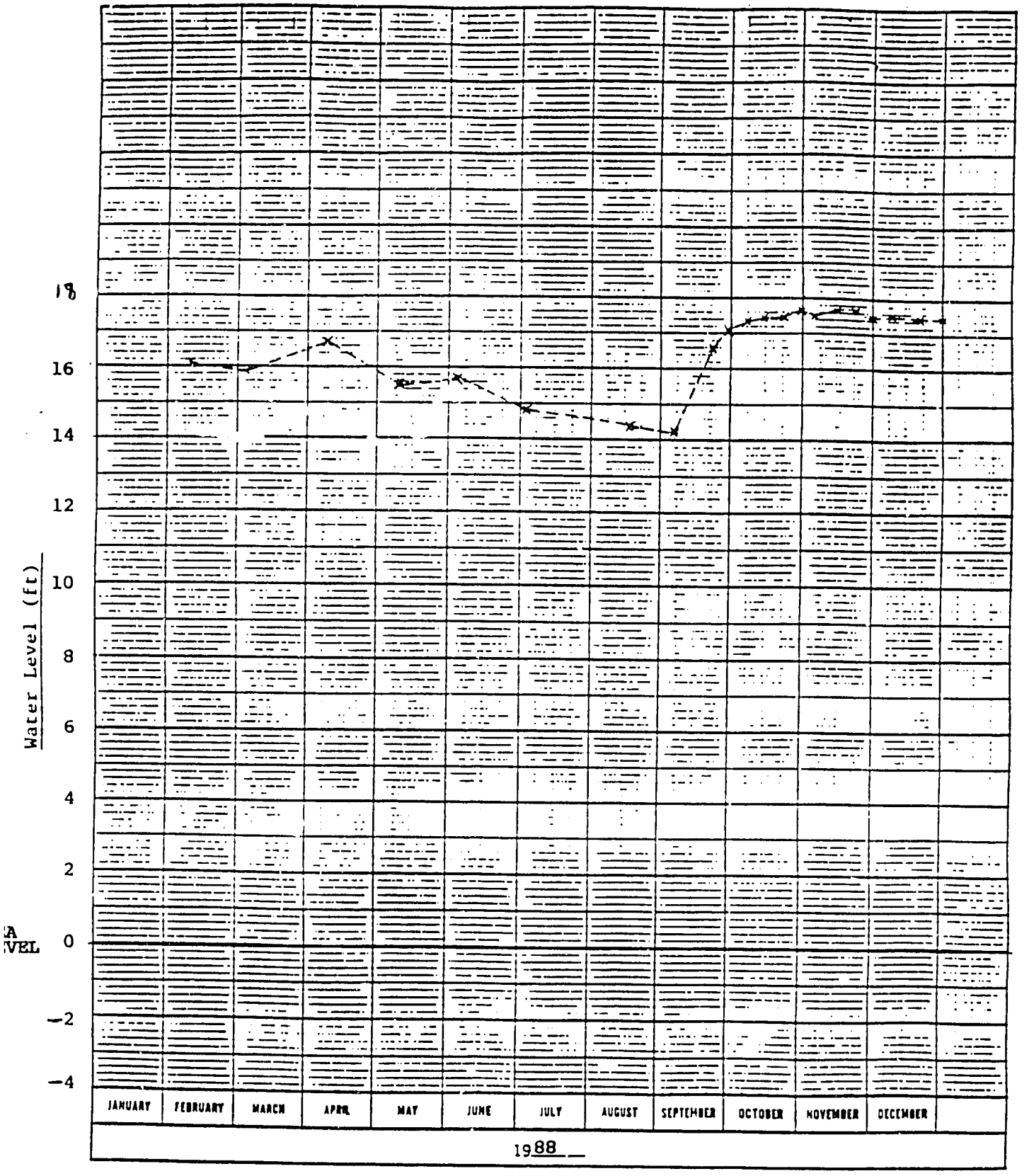


o - NON-PUMPING WATER LEVEL
x - PUMPING WATER LEVEL
500 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: COWPARK

Elevation of M.P- 37.42 ft.

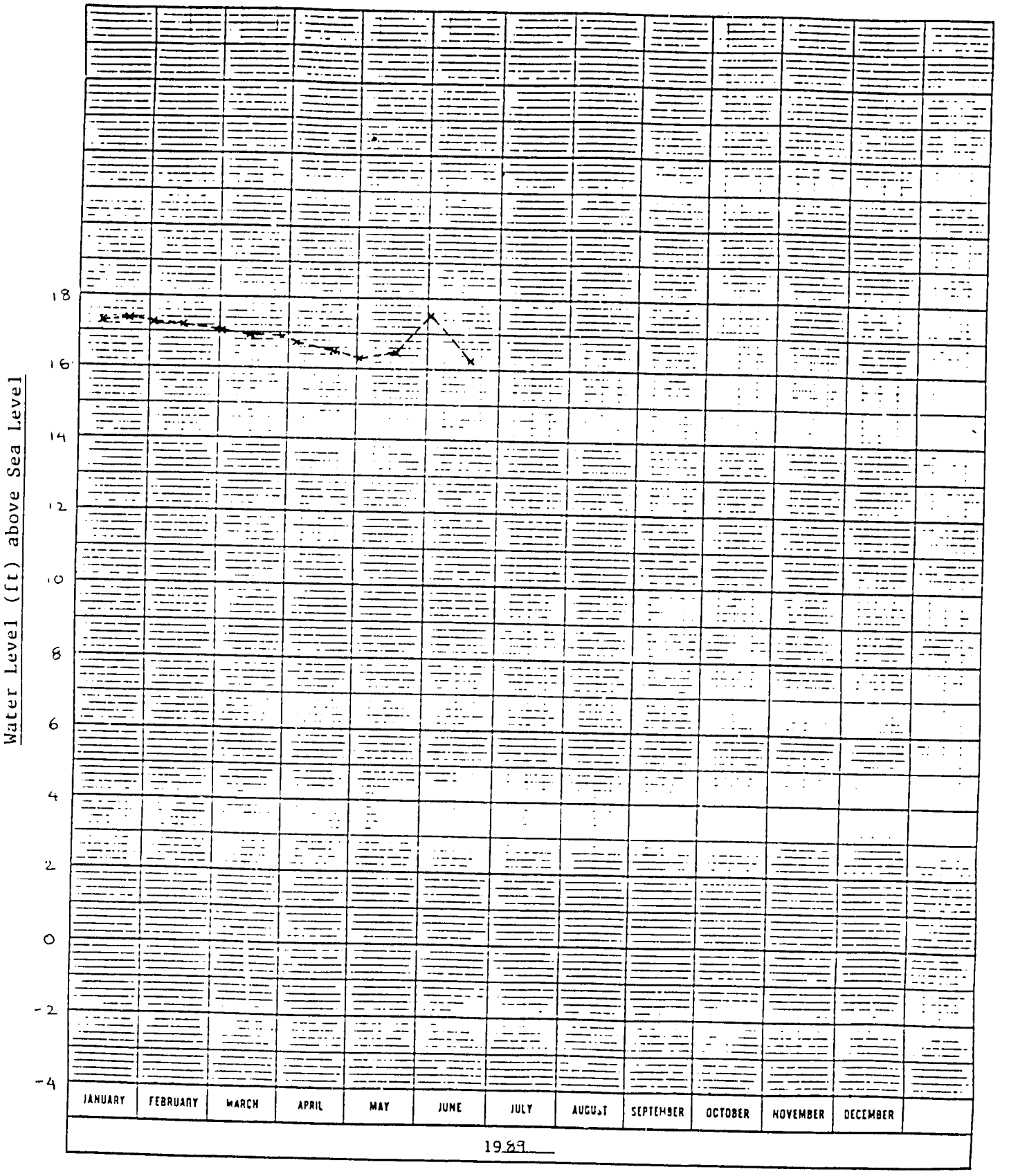


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: COWPARKA

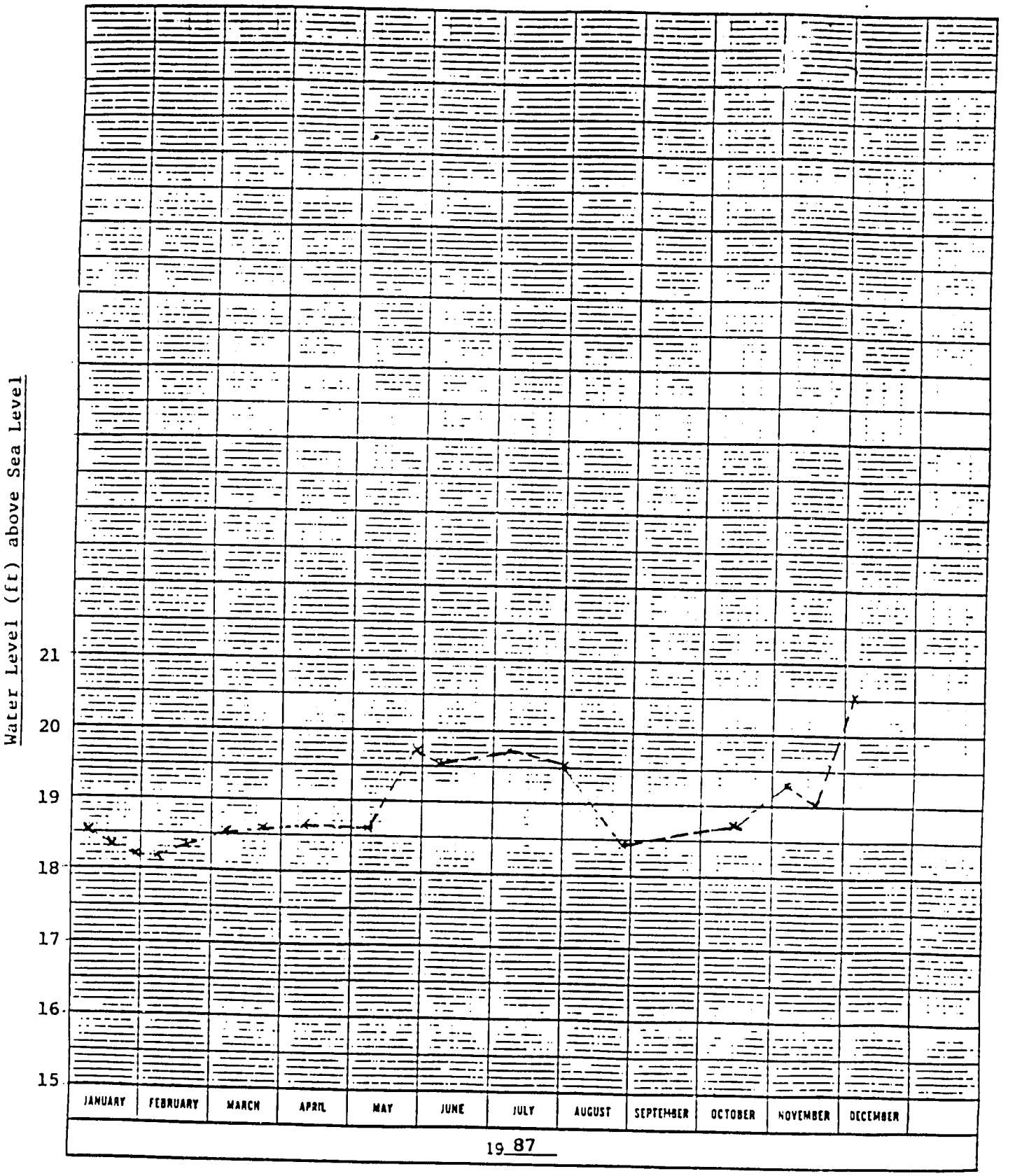
Elevation of M.P- 37.42 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: **NORTH SYNDICATE** Elevation of M.P- 38.21 ft.

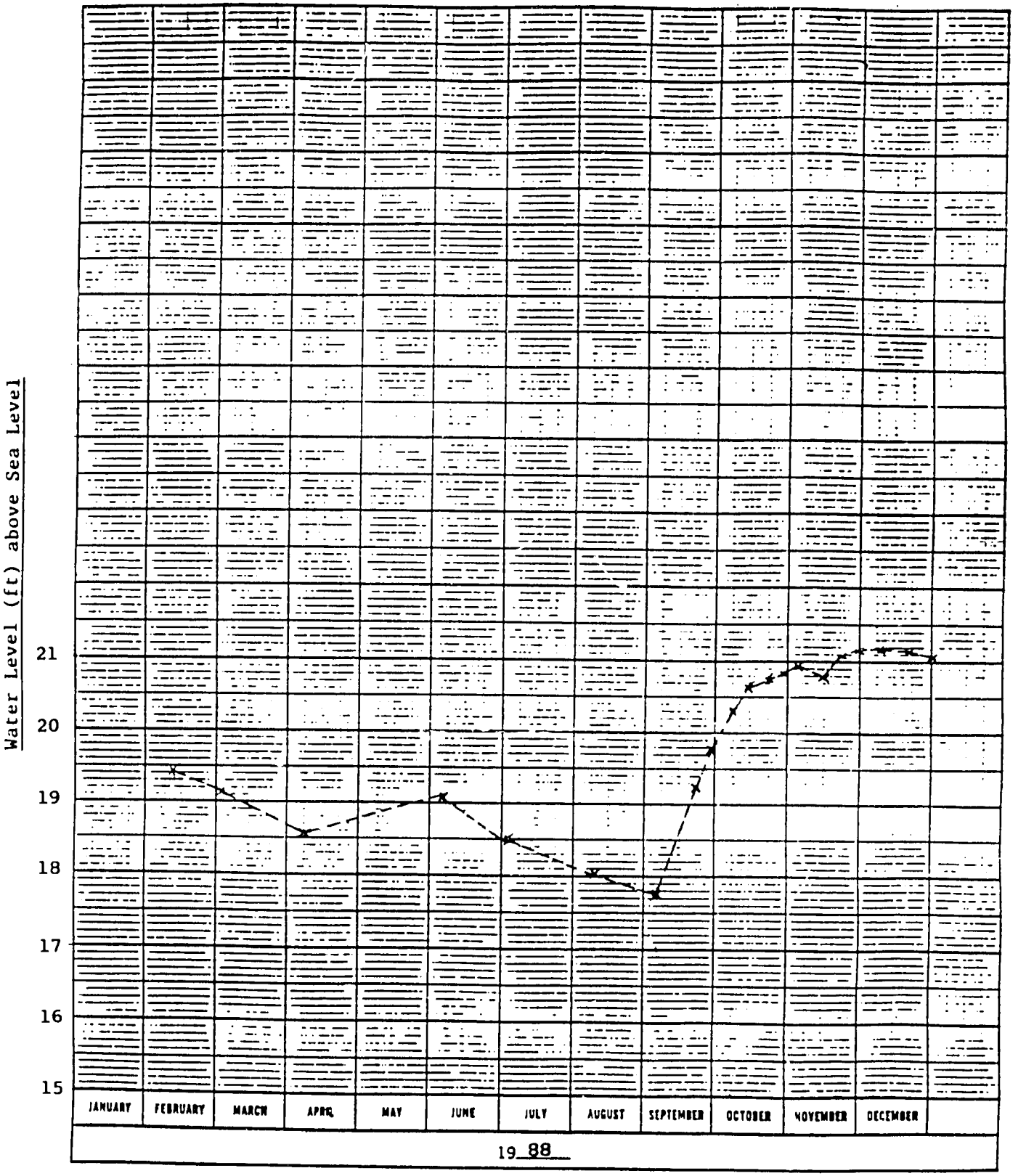


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NORTH SYNDICATE

Elevation of M.P- 38.21 ft.

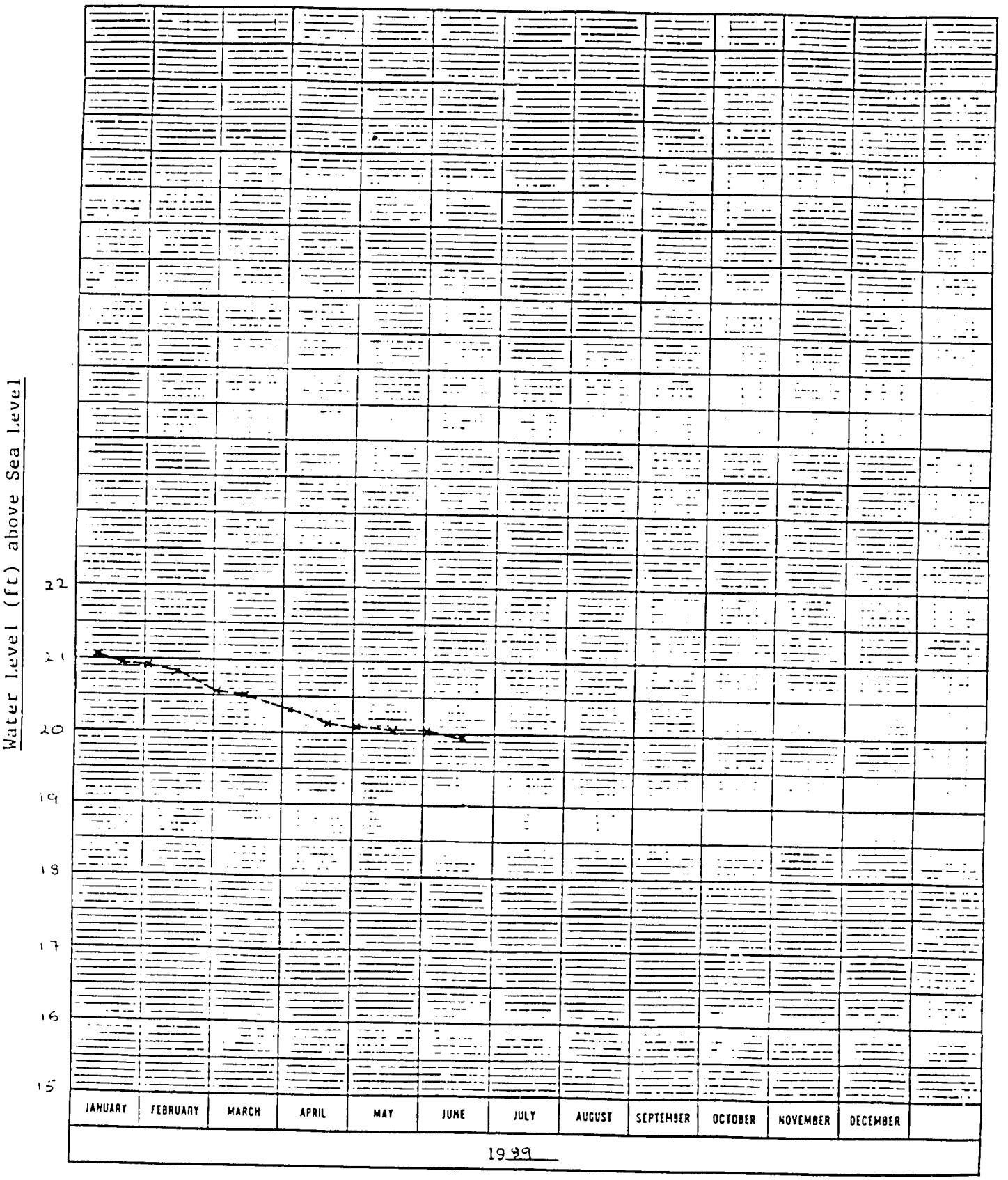


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NORTH SYNDICATE

Elevation of M.P- 38·21 ft.

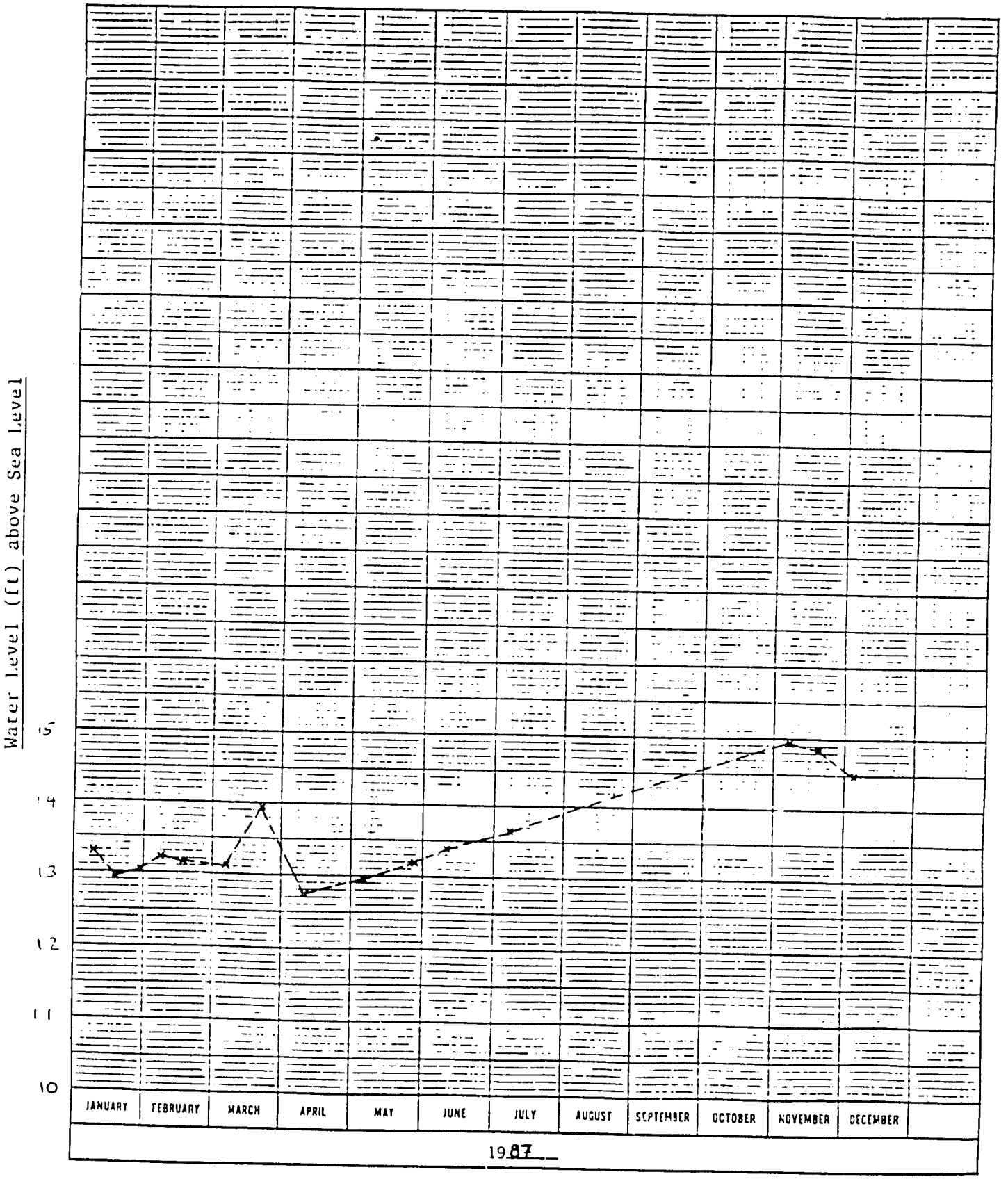


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NAGGO HEAD

Elevation of M.P- 31.95 ft.

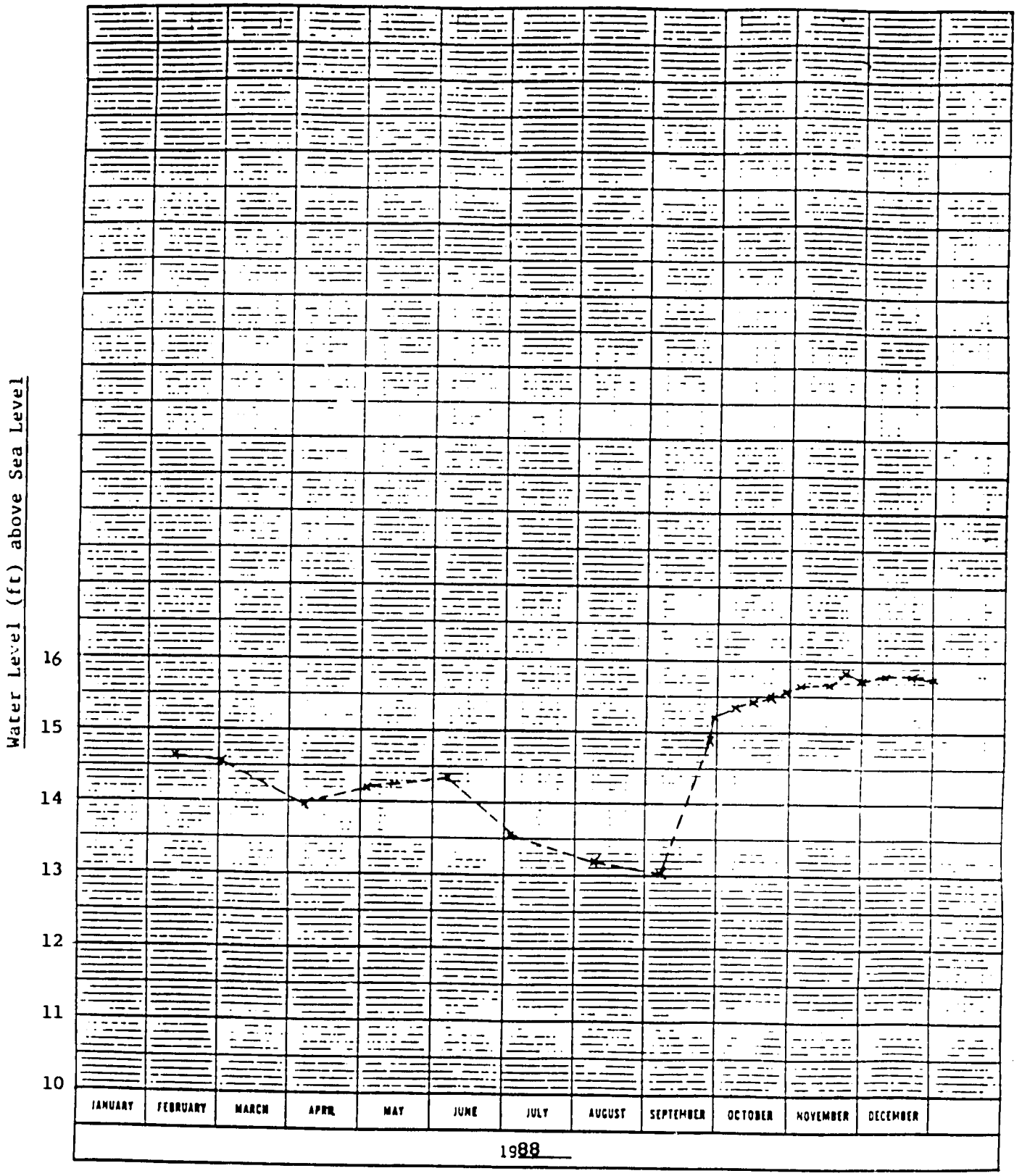


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: HAGGO HEAD

Elevation of M.P- 31.95ft.

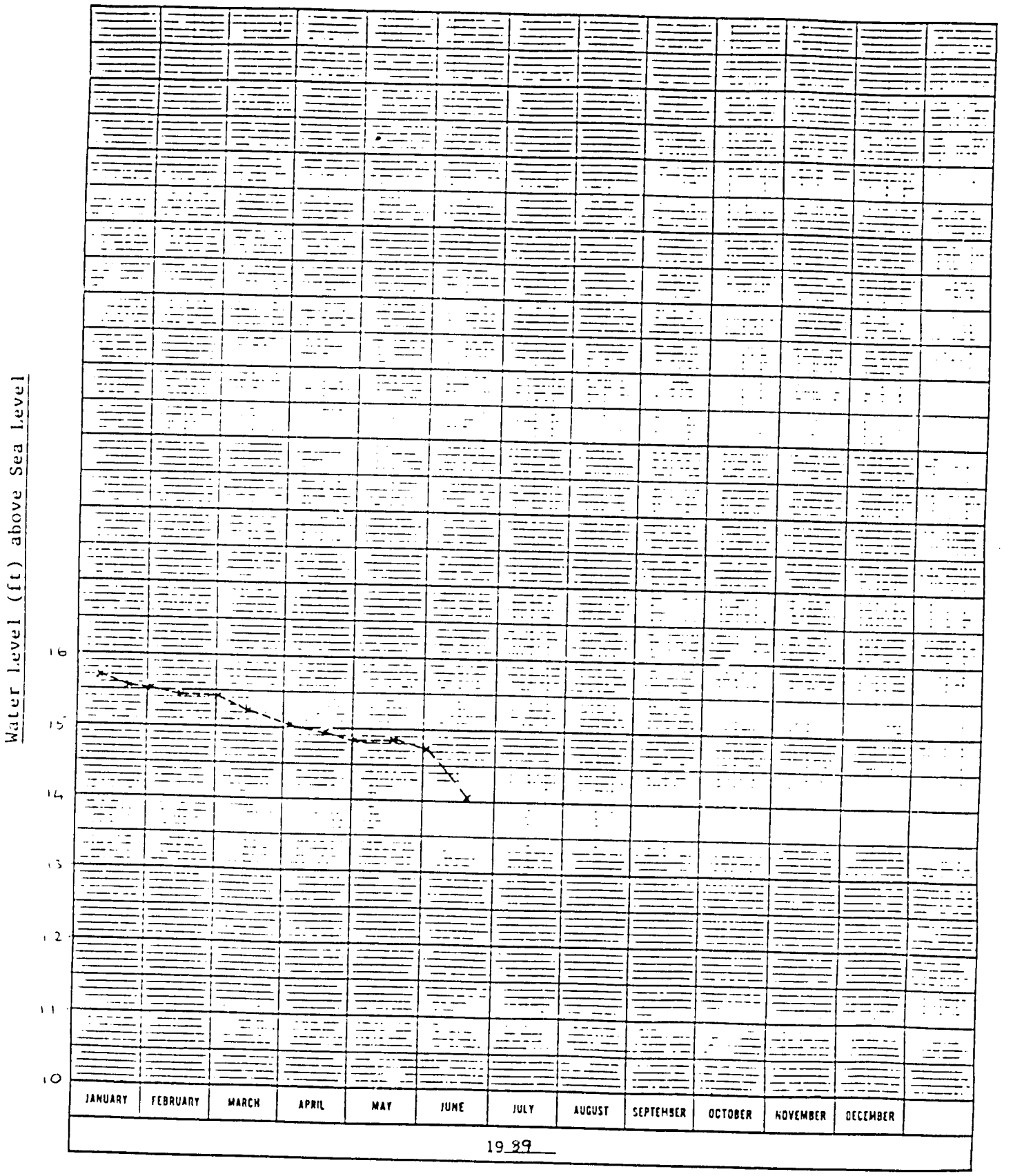


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: NAGGO HEAD

Elevation of M.P- 31.95 ft.

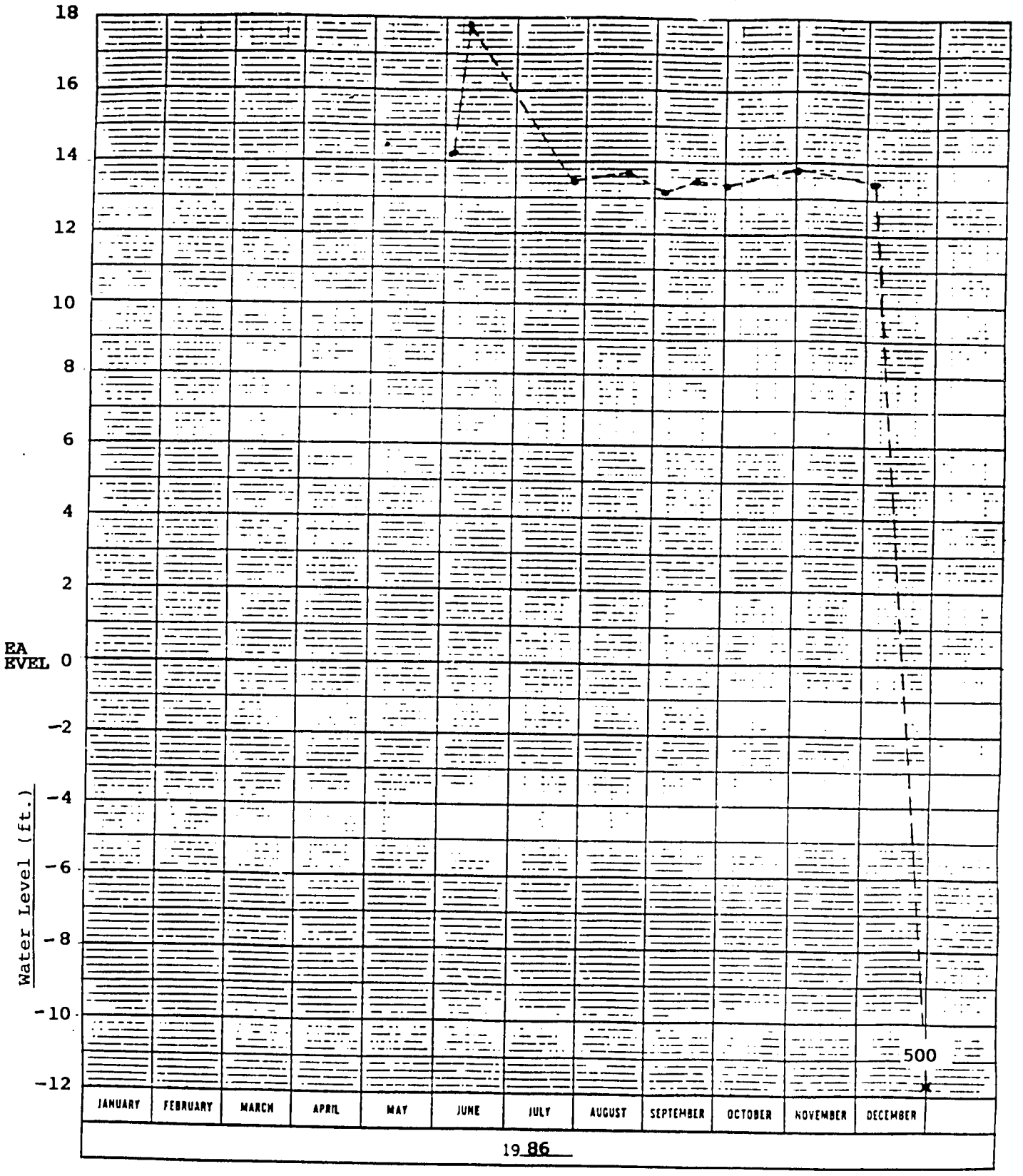


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: WATSON GROVE #3

Elevation of M.P- 41.80 ft.

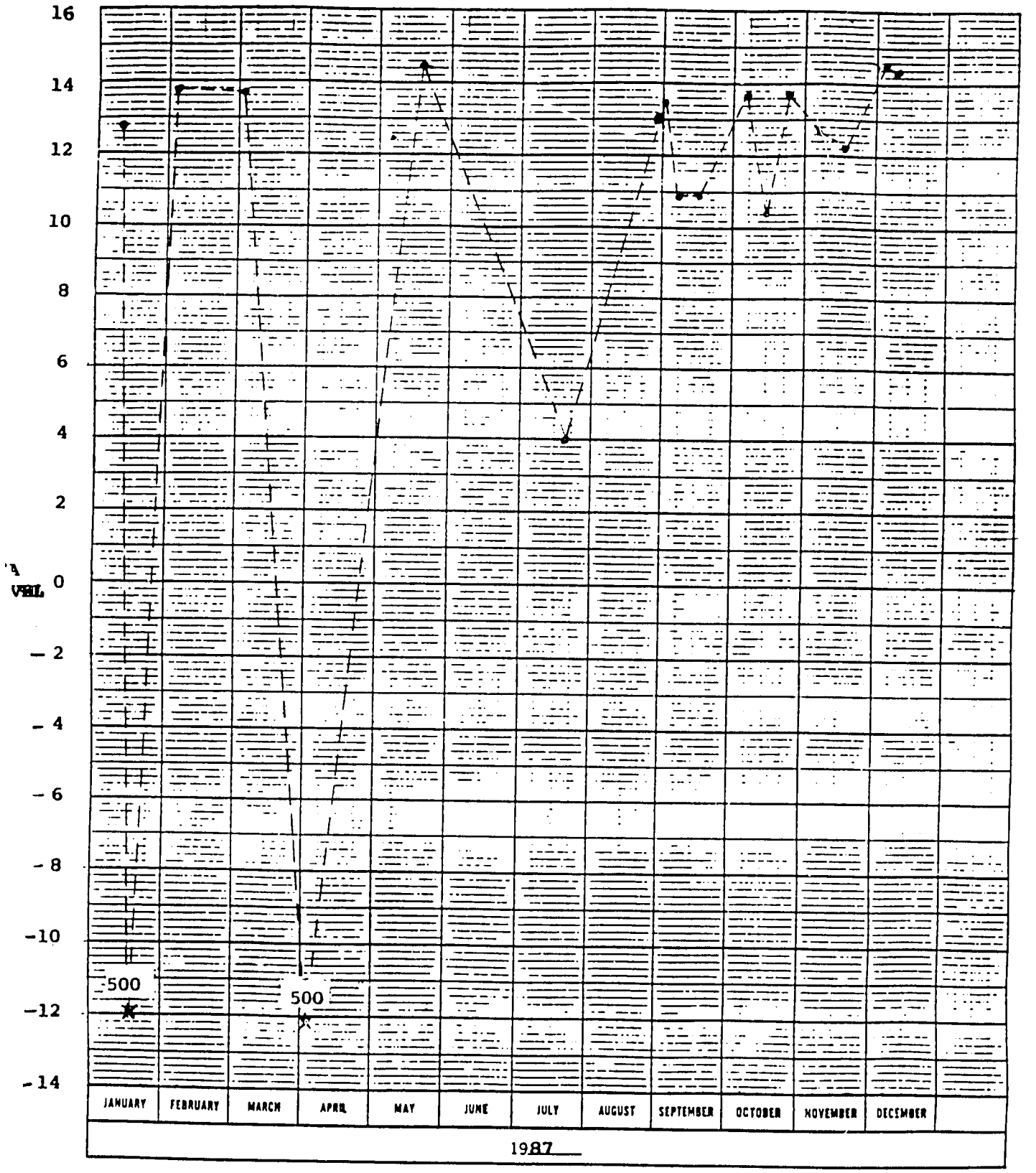


● - NON-PUMPING WATER LEVEL
x - PUMPING WATER LEVEL
500 - WELL DISCHARGE

St. Catherine Plains
Well Hydrograph

Location: WATSON GROVE #3

Elevation of M.P- 41.80 ft.

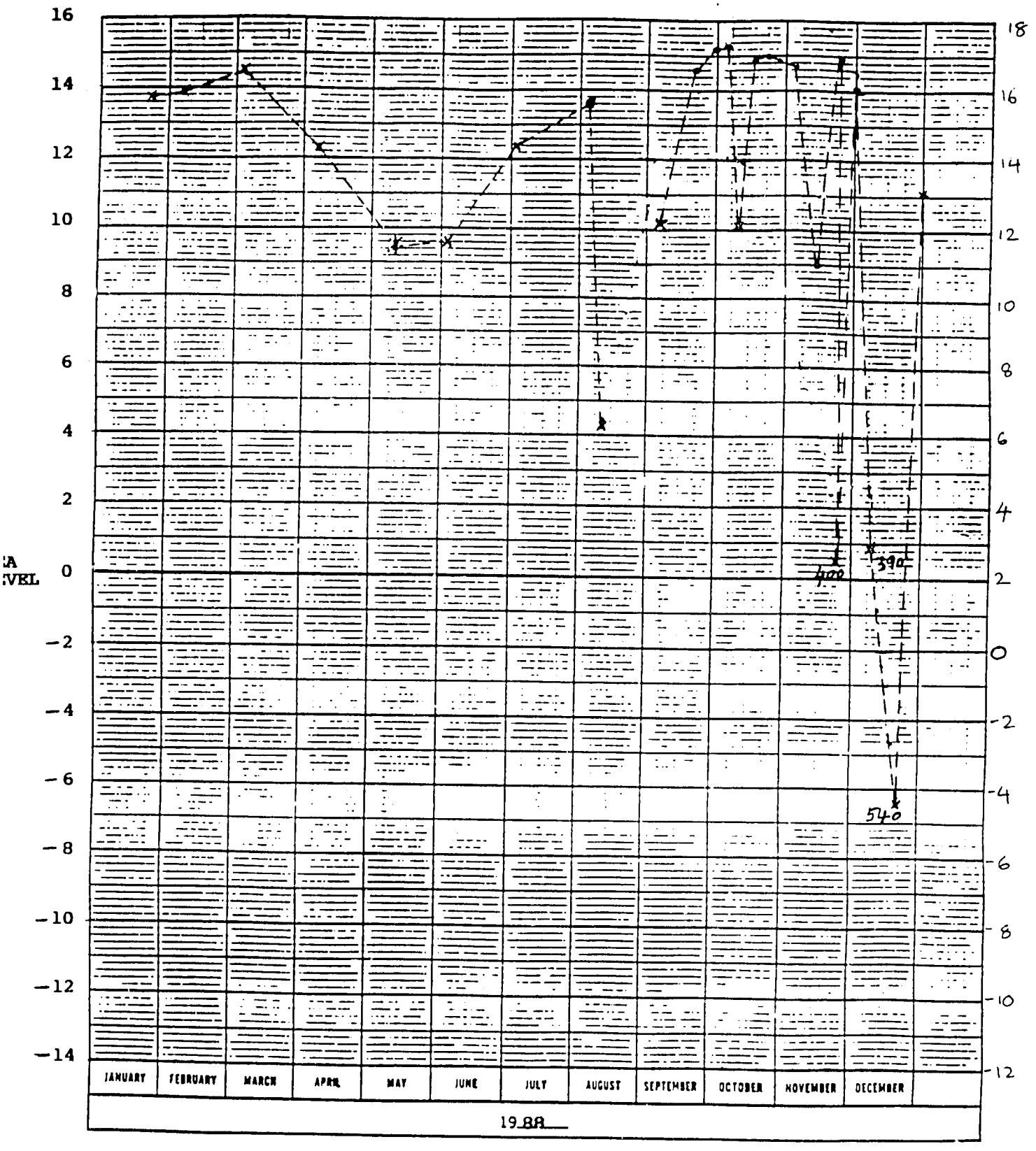


● - NON-PUMPING WATER LEVEL
x - PUMPING WATER LEVEL
500 - WELL DISCHARGE (IGPM)

St. Catherine Plains
Well Hydrograph

Location: WATSON GROVE #3

Elevation of M.P- 41.80 ft.



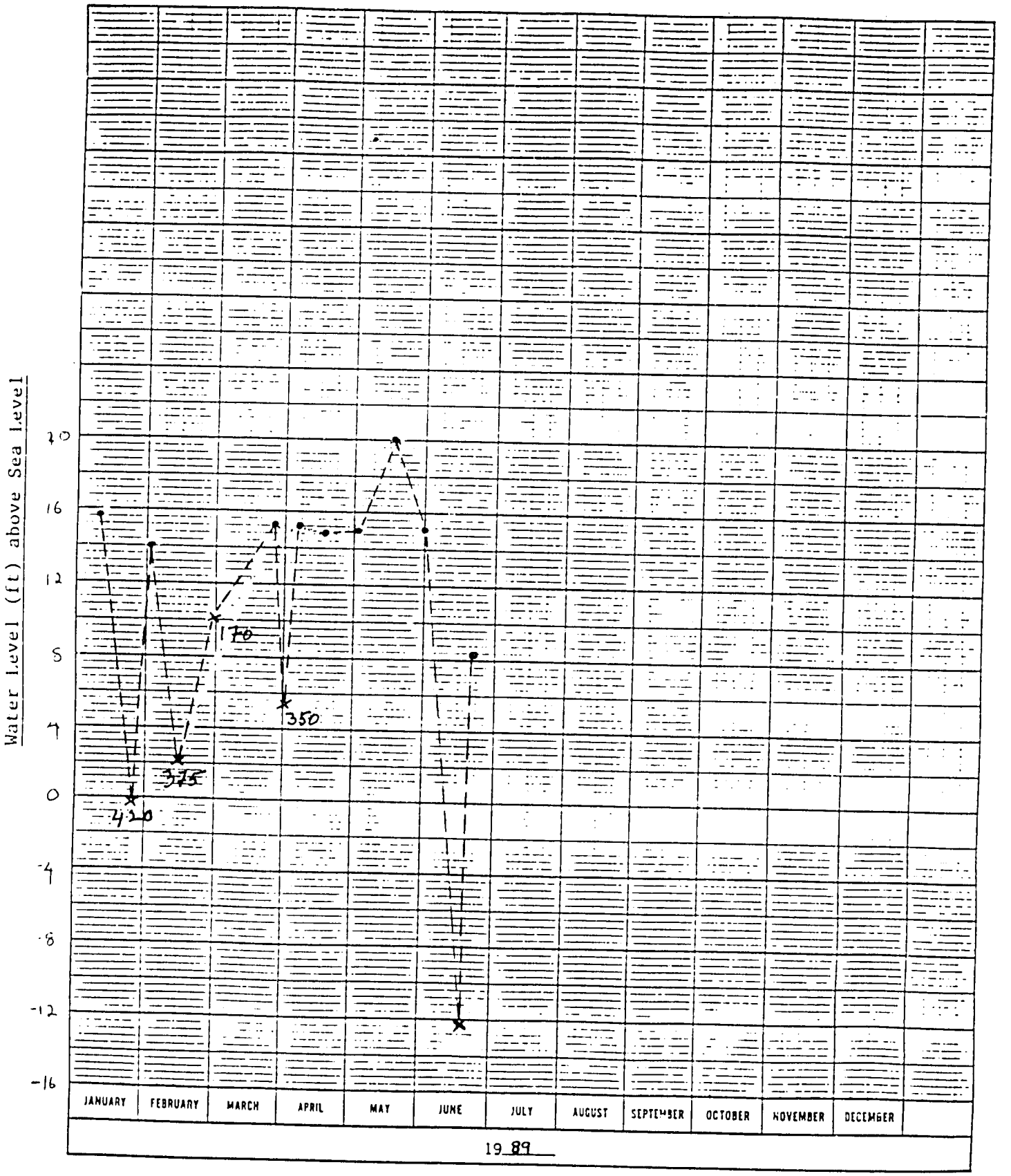
Sept - December

● - NON PUMPING WATER LEVEL
x - PUMPING WATER LEVEL

10

St. Catherine Plains
Well Hydrograph

Location: WATSON GROVE #3 Elevation of M.P- 41.80 ft.



WATER LEVEL

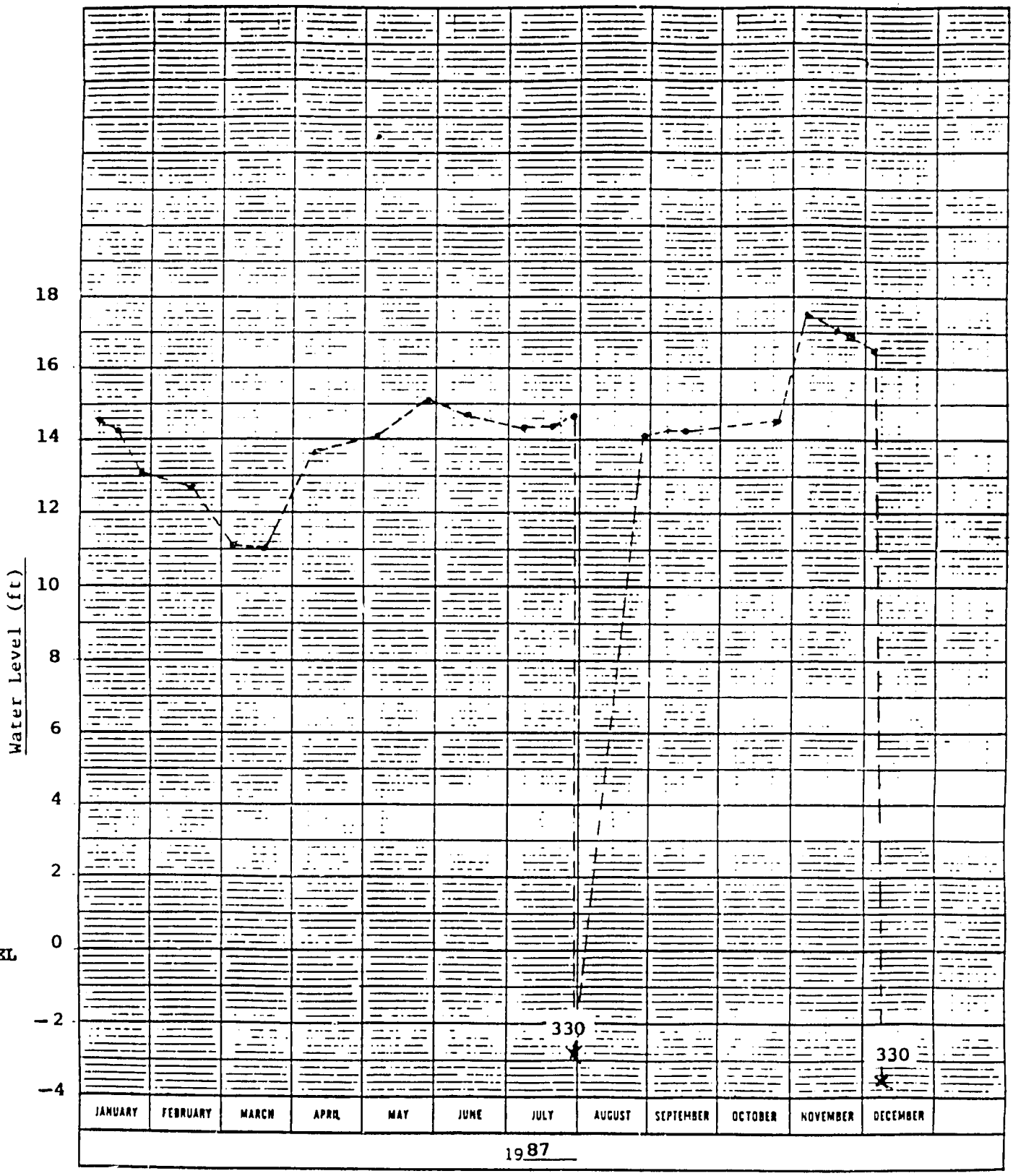
● - NON PUMPING WATER LEVEL

× - PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: **RIVERSDALE #1**

Elevation of M.P- 37.45 ft.

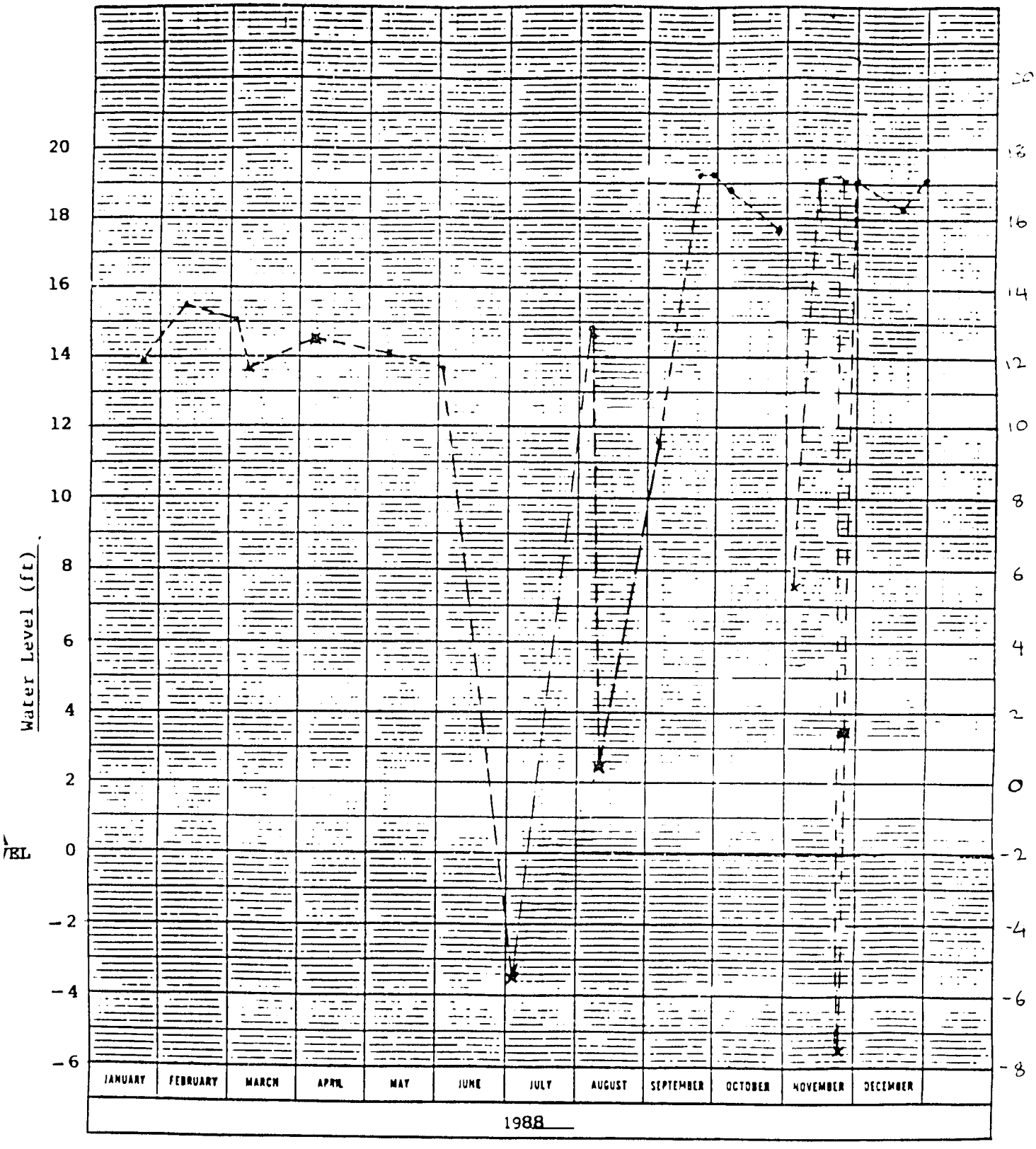


● - NON-PUMPING WATER LEVEL
x - PUMPING WATER LEVEL
500 - WELL DISCHARGE

St. Catherine Plains
Well Hydrograph

Location: **RIVERSDALE #1**

Elevation of M.P- 37.45 ft.



● - NON PUMPING WATER LEVEL

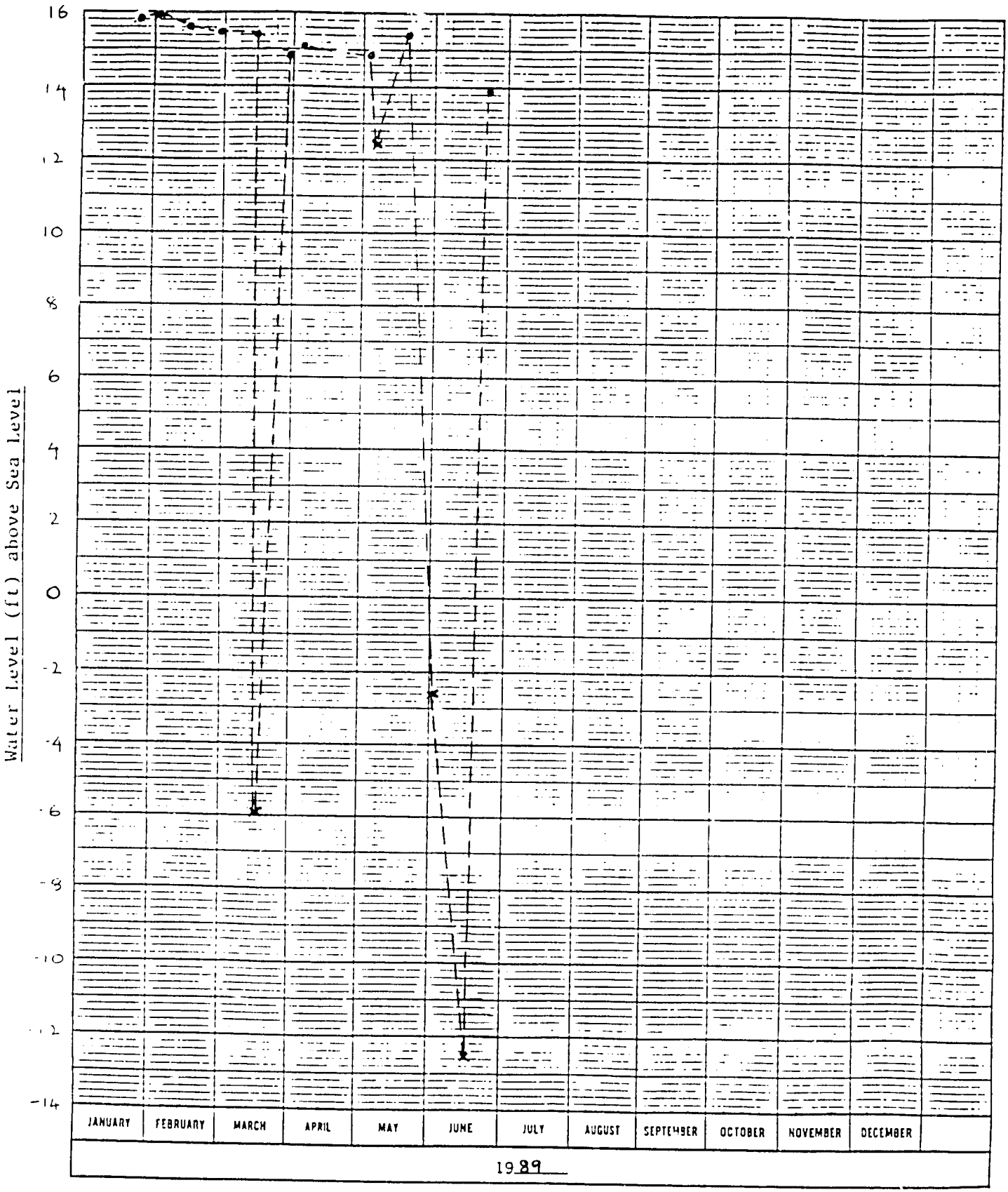
x - PUMPING WATER LEVEL

November & December

St. Catherine Plains
Well Hydrograph

Location: RIVERSDALE #1

Elevation of M.P- 37.45 ft.



WATER LEVEL

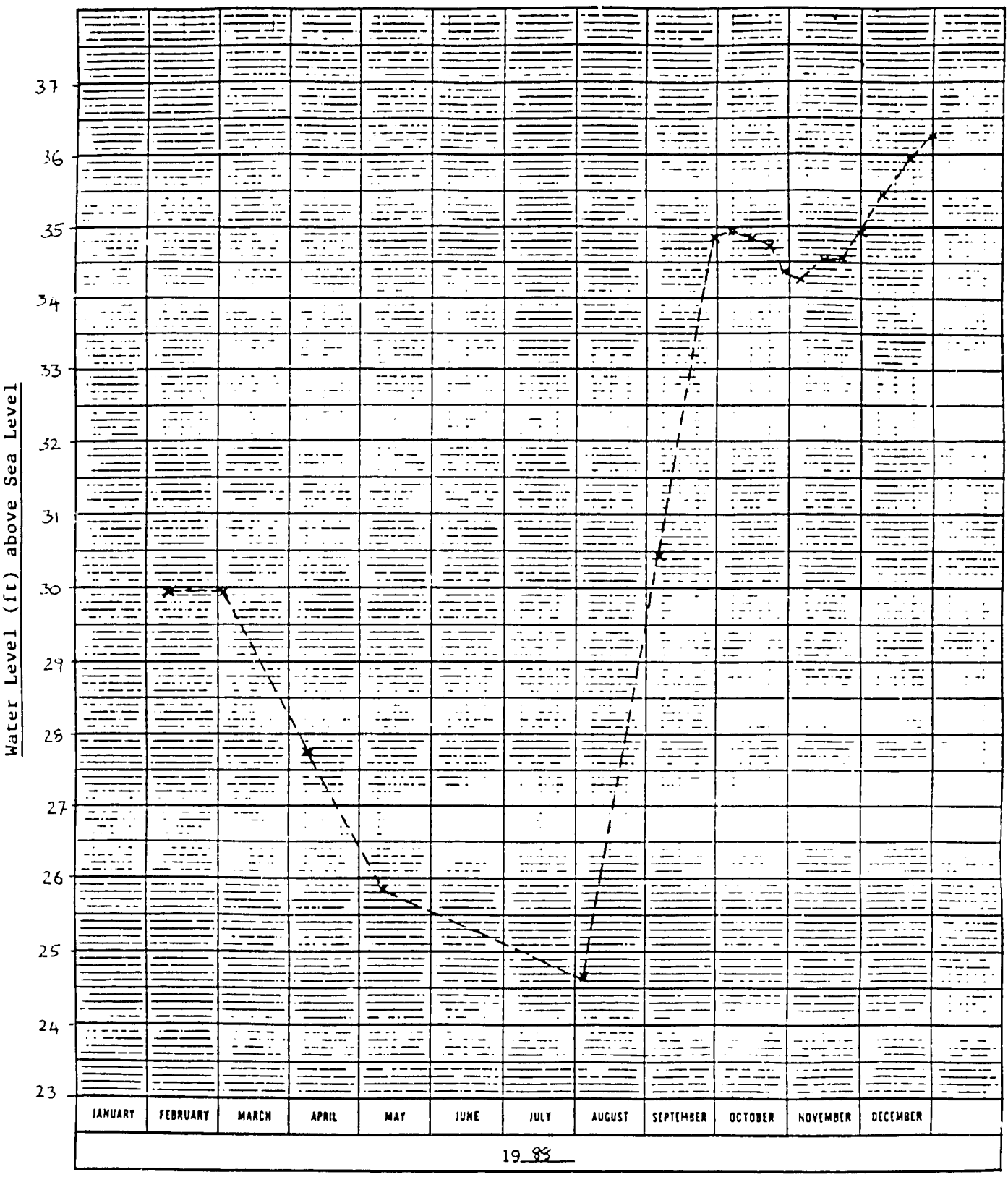
● - NON PUMPING WATER LEVEL

✕ - PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: GOVERNMENT PARK

Elevation of M.P- 49.14 ft.

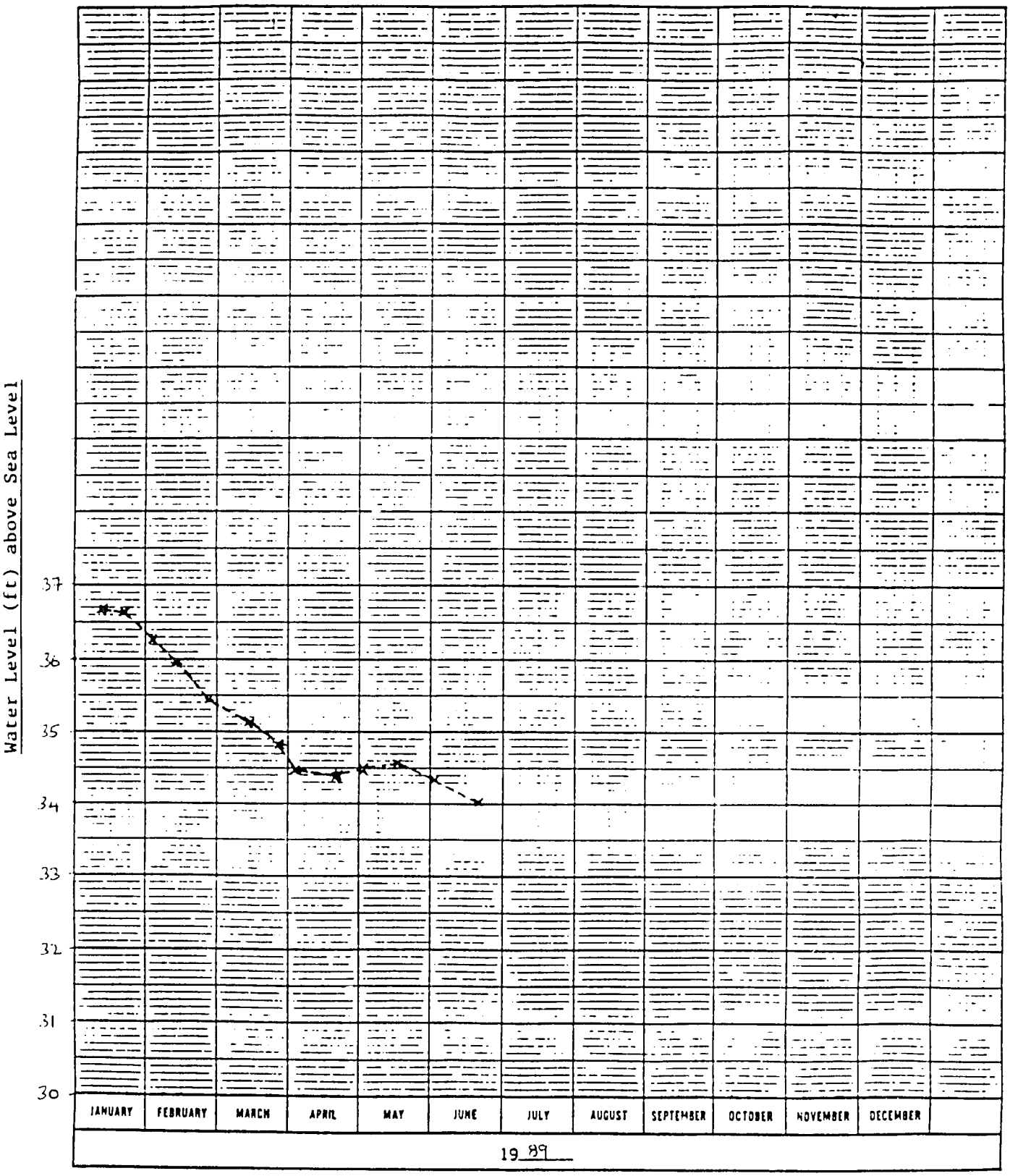


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: GOVERMENT PARK

Elevation of M.P- 49.14 ft.

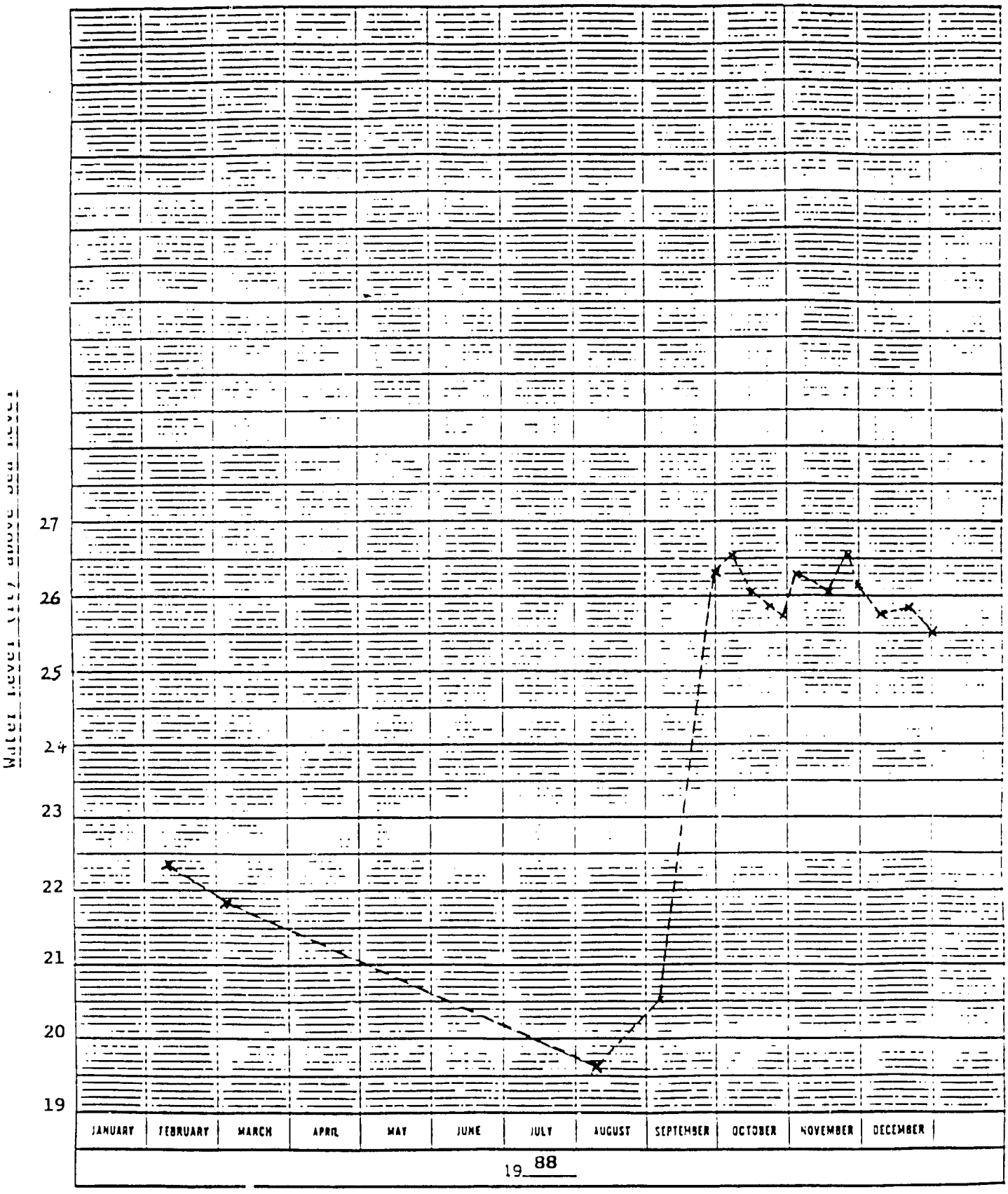


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: **CONGRIEVE PARK #4**

Elevation of M.P- 32~~ft~~.

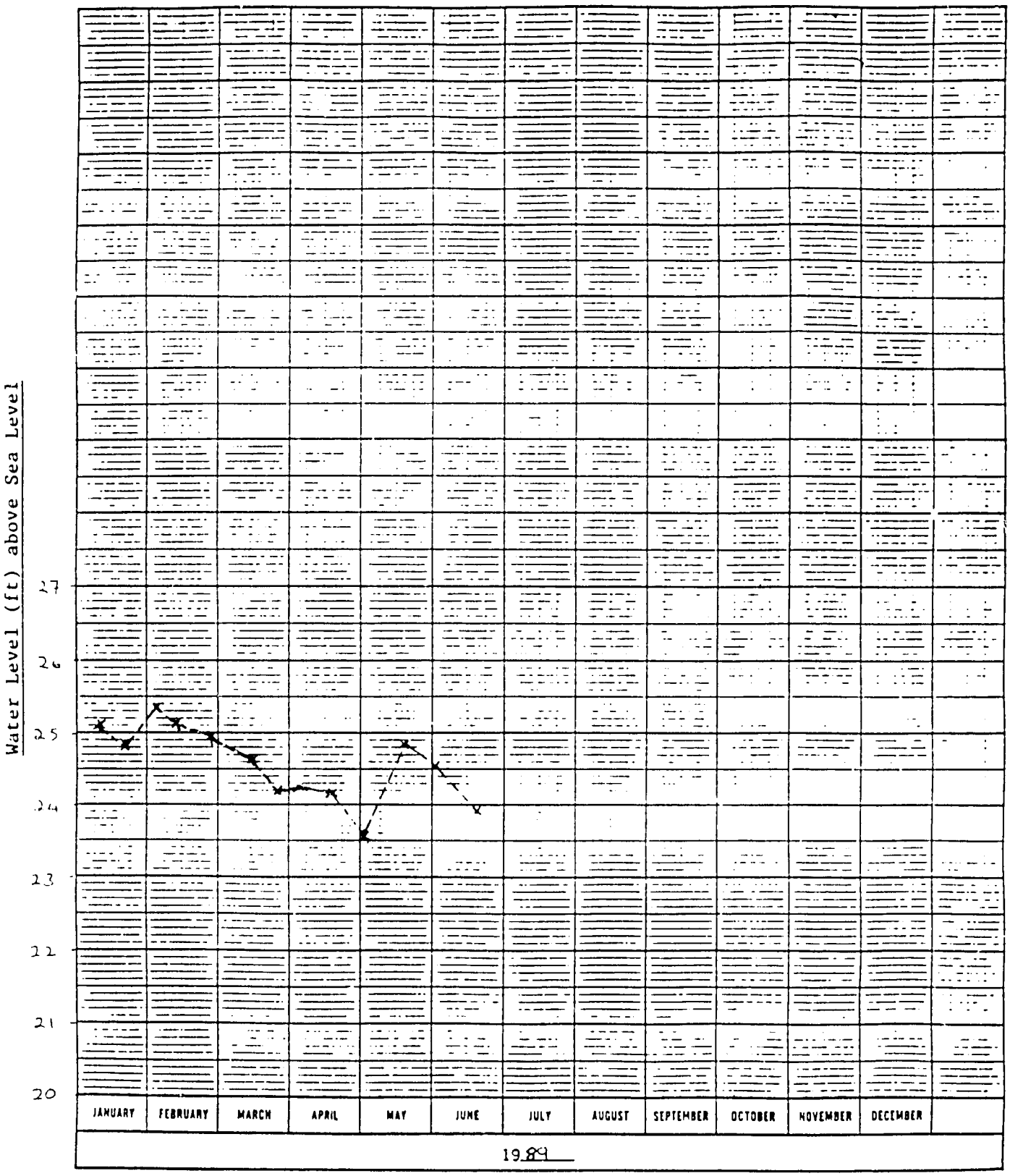


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: CONGRIEVE PARK # 4

Elevation of M.P- 320 ft.

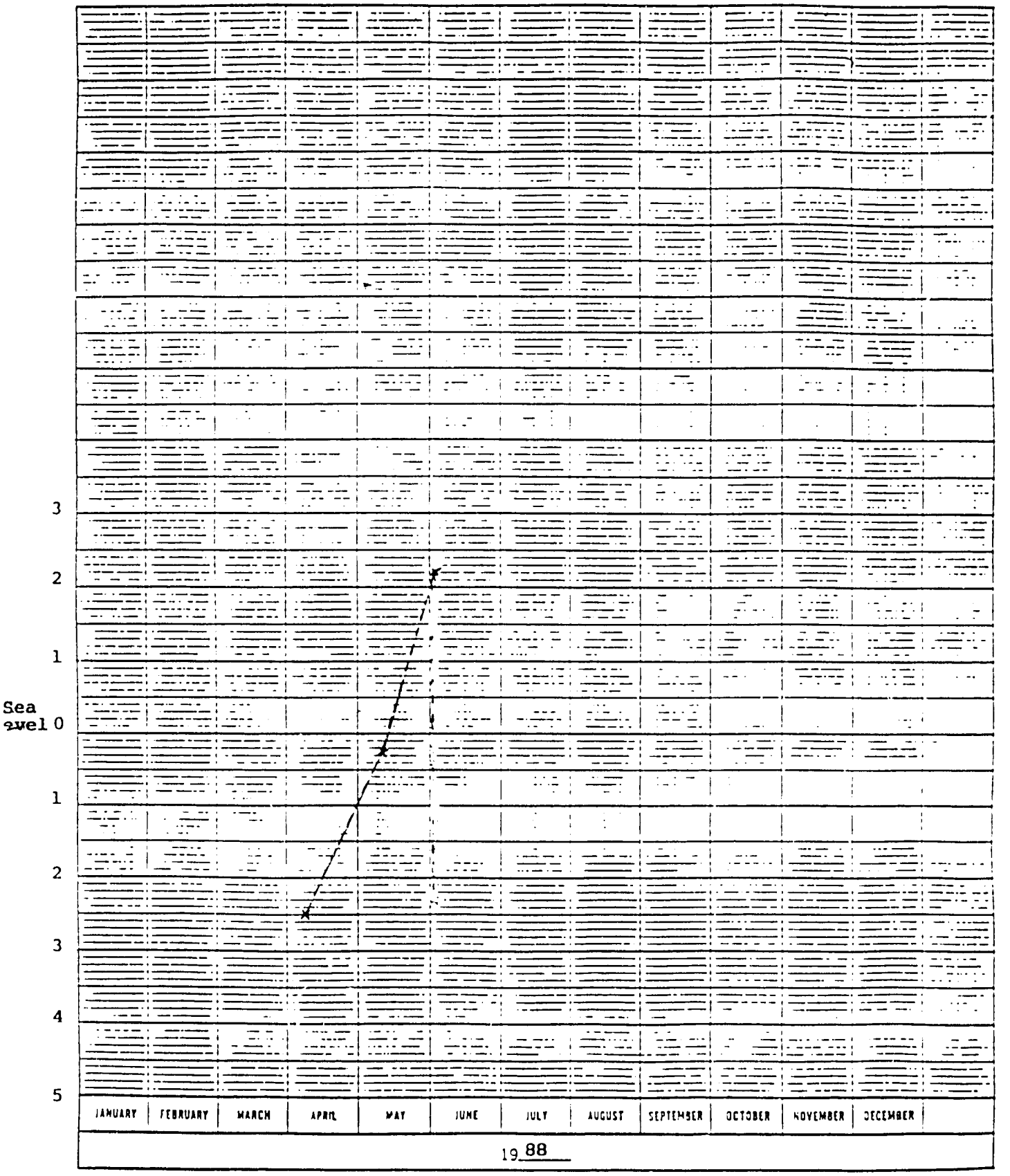


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: **CONGRIEVE PARK #4**

Elevation of M.P- 32 ft.

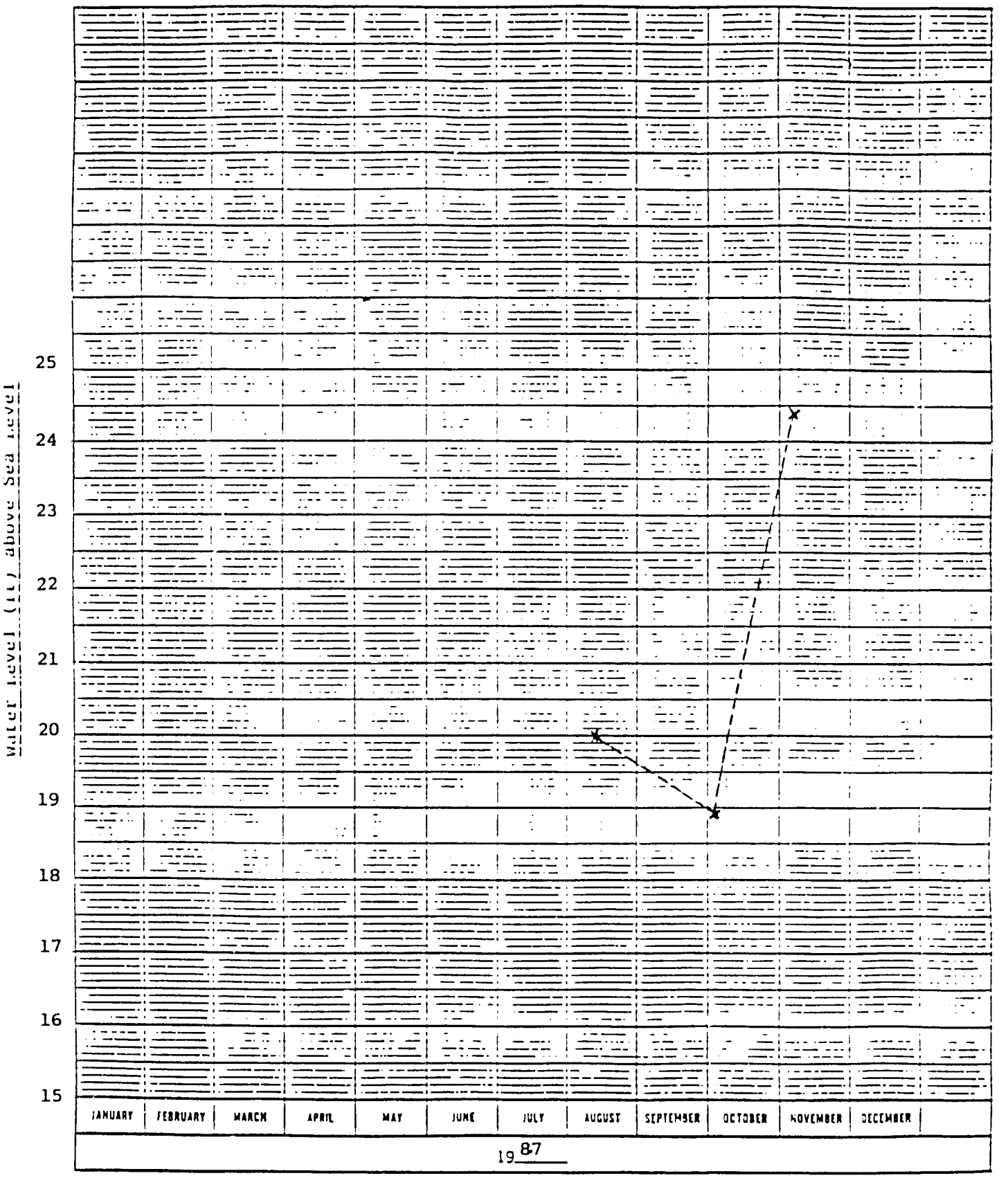


PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: CONGRIEVE PARK #4

Elevation of M.P- 32 ft.

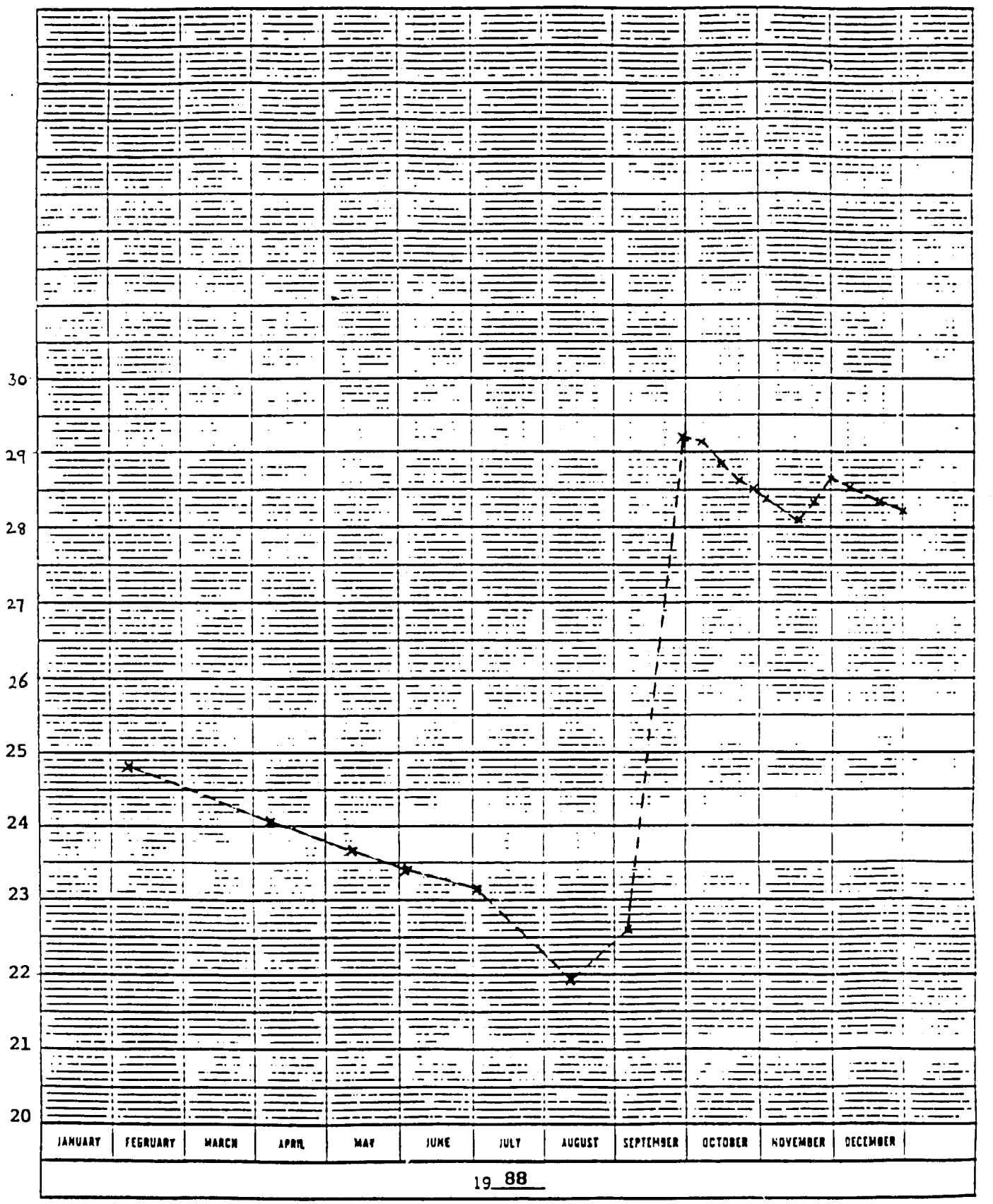


NON-PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: GOSHEN #3A

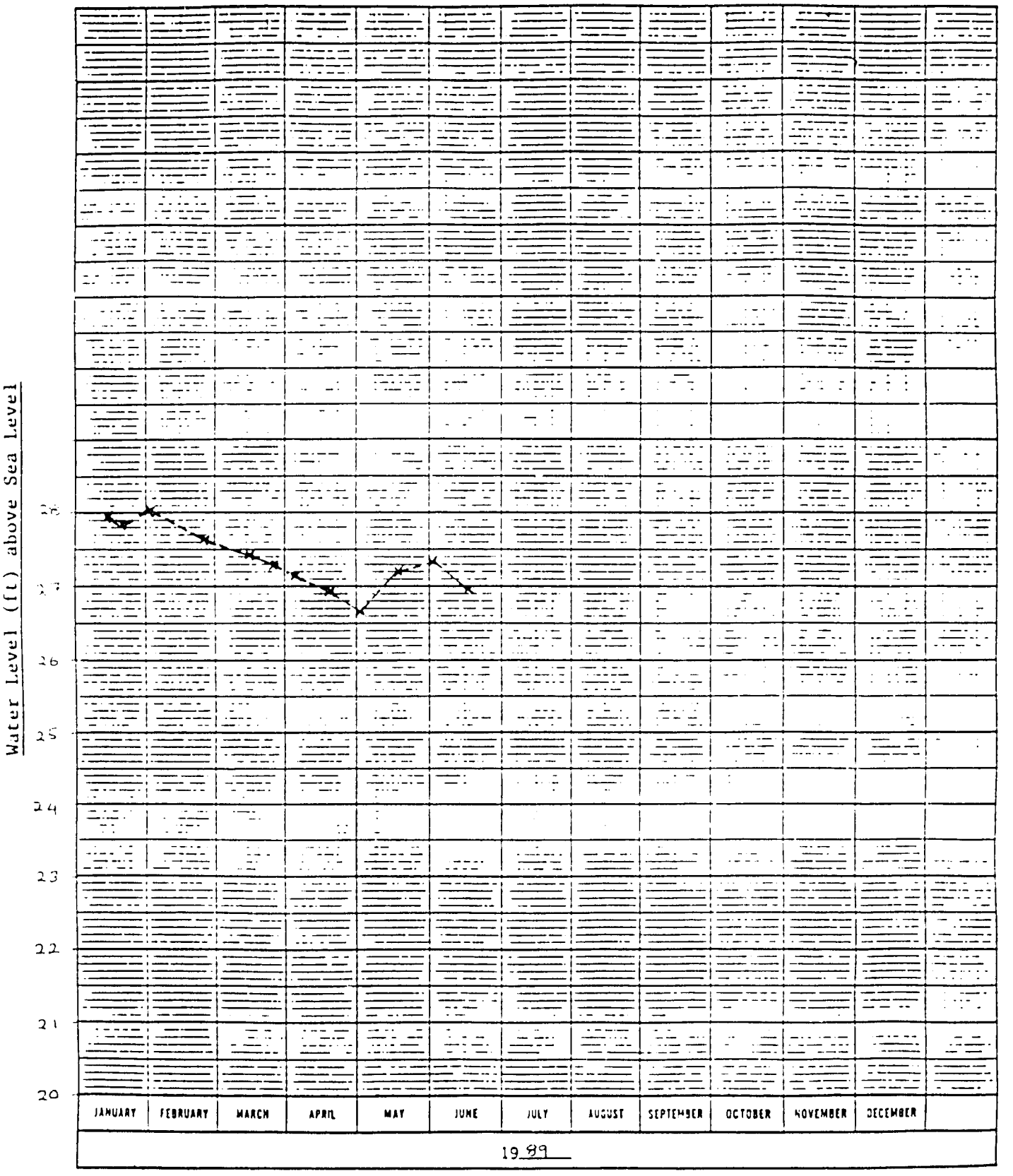
Elevation of M.P- 37.00 ft.



St. Catherine Plains
Well Hydrograph

Location: GOSHEN 3A

Elevation of M.P- 37.0 ft.

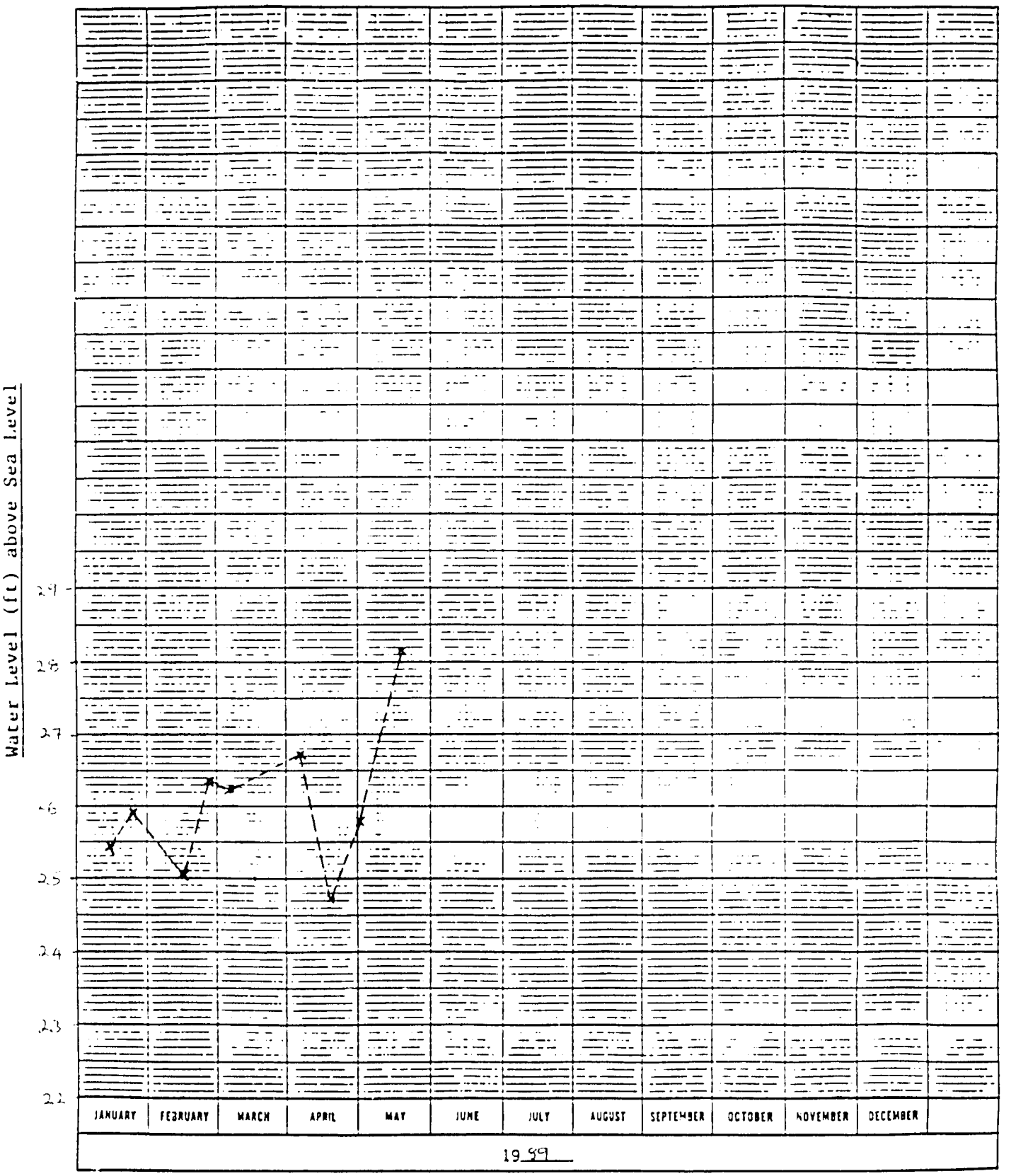


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: SALT POND #7

Elevation of M.P- 30·0 ft.

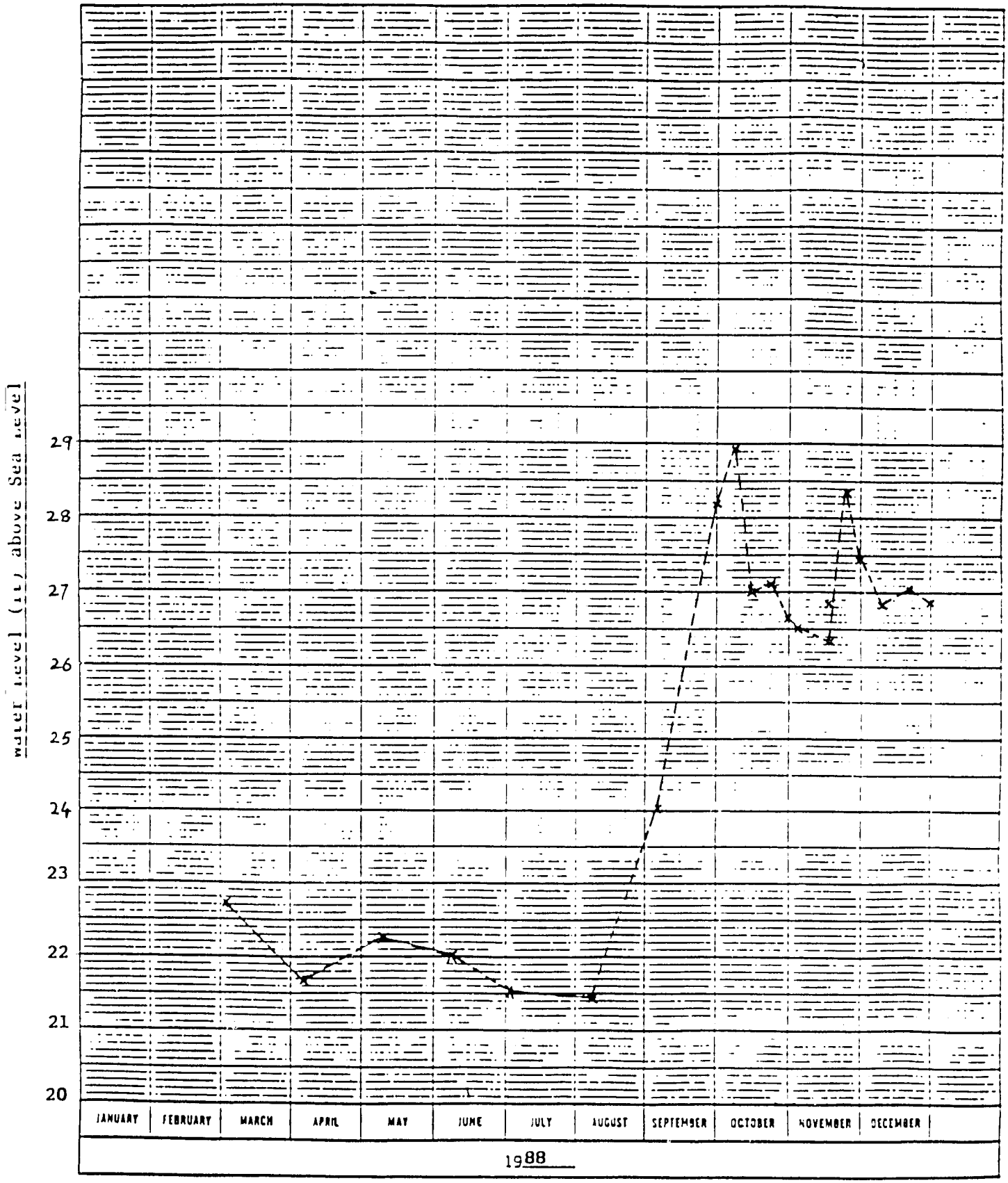


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: SALT POND #7

Elevation of M.P- 30·00 ft.

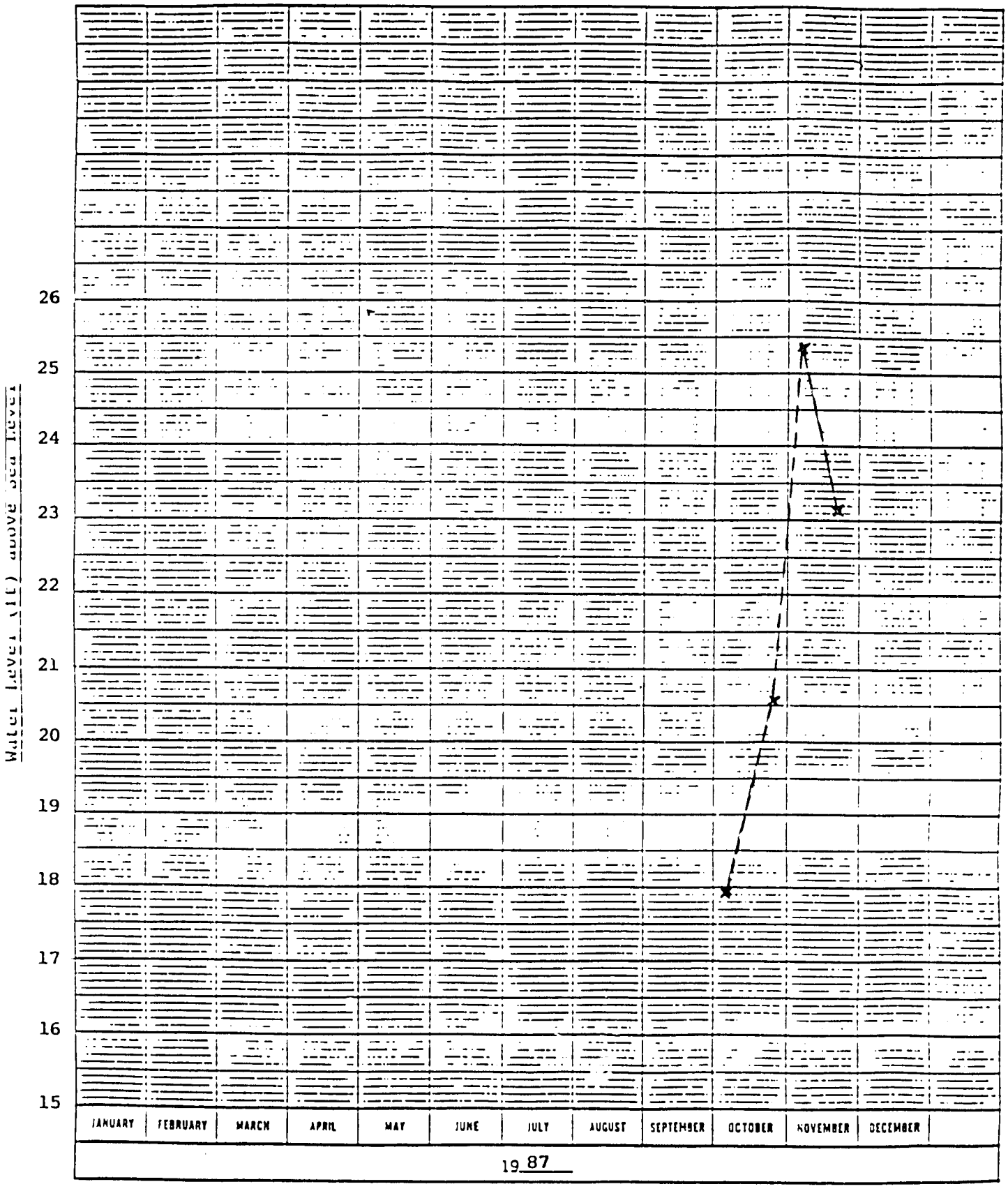


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: **REIDS PEN #1**

Elevation of M.P- 27.00 ft.

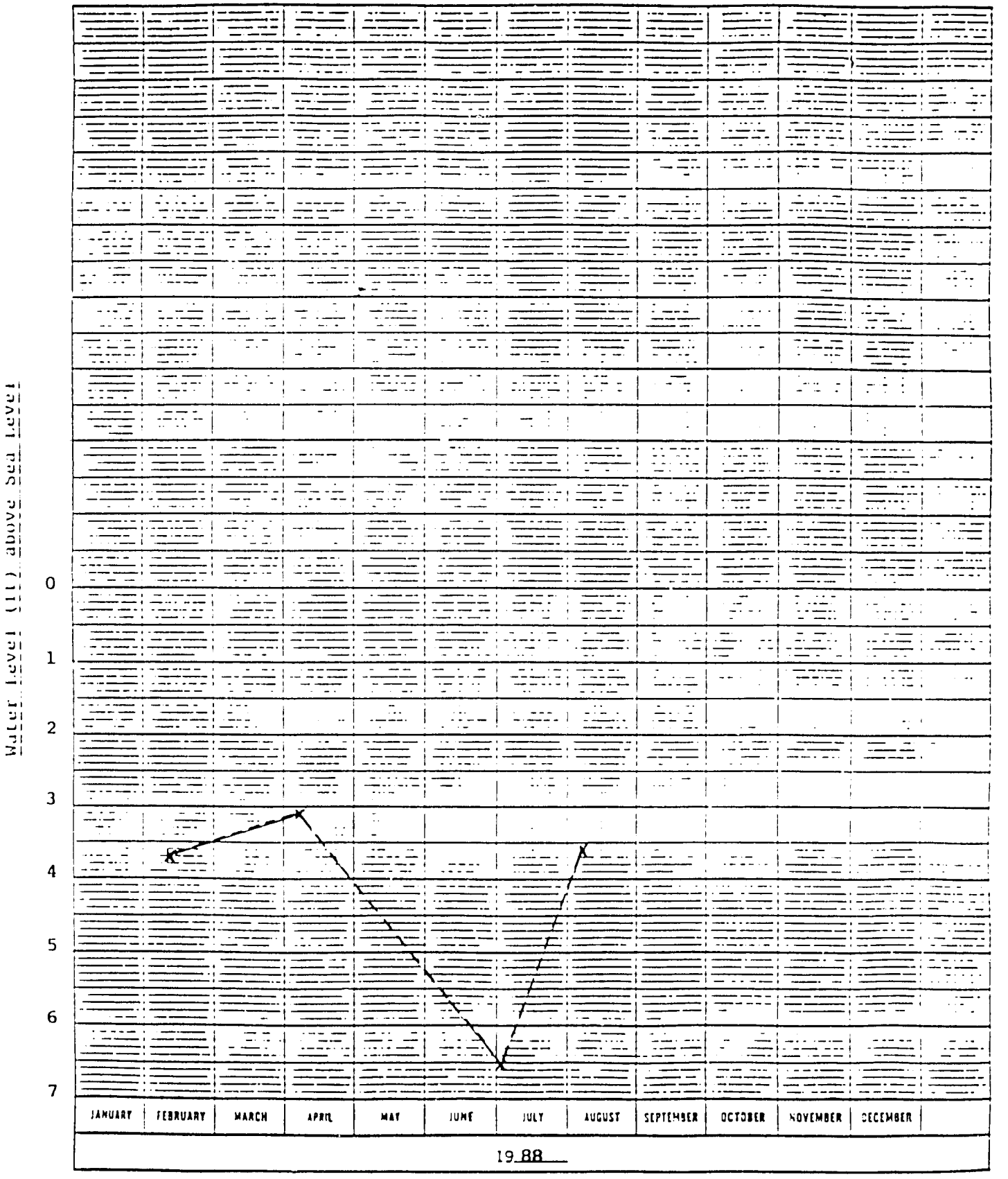


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: REIDS PEN #1

Elevation of M.P- 27·00 ft.

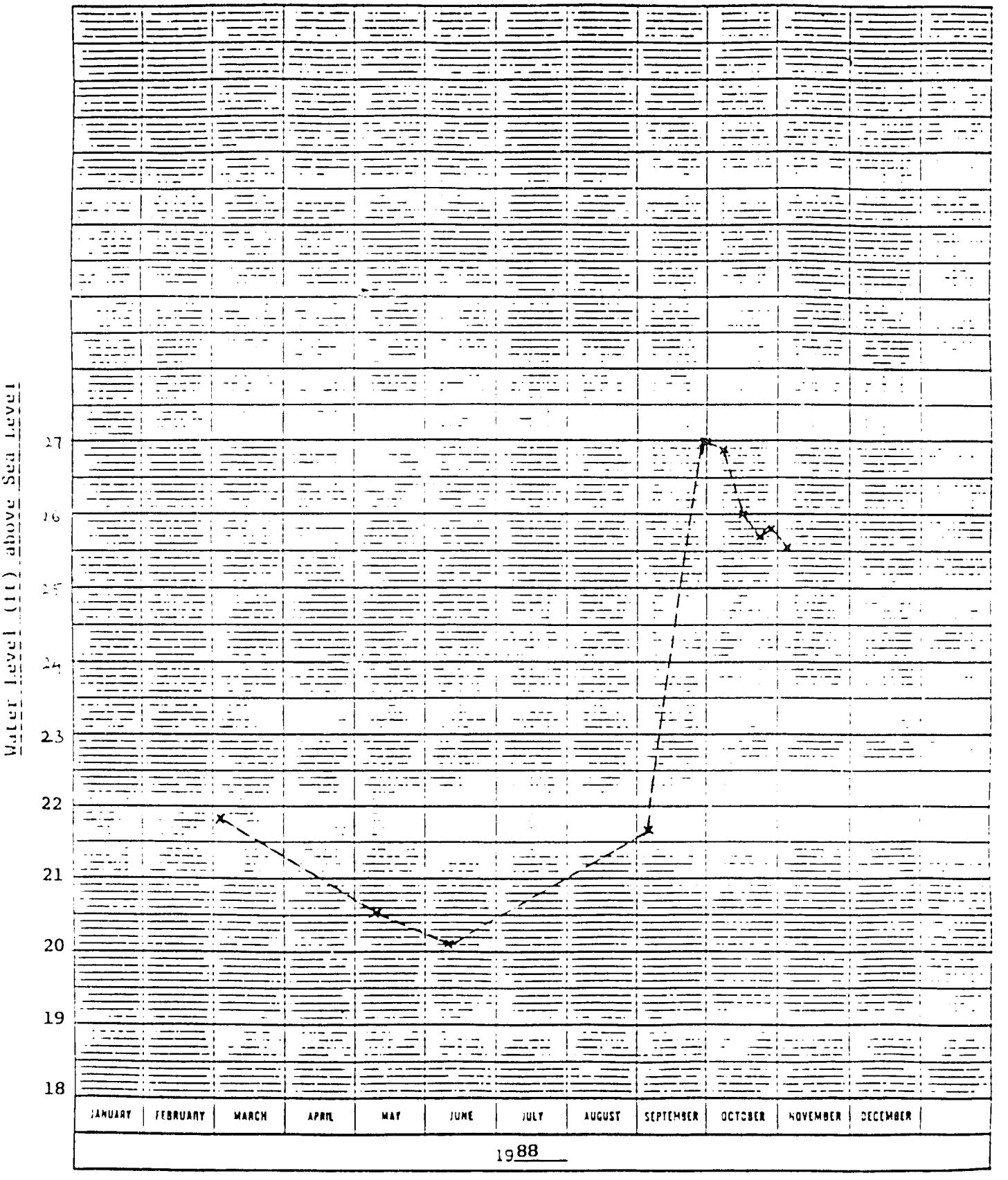


PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: **REIDS PEN #1**

Elevation of M.P- 27·00 ft.

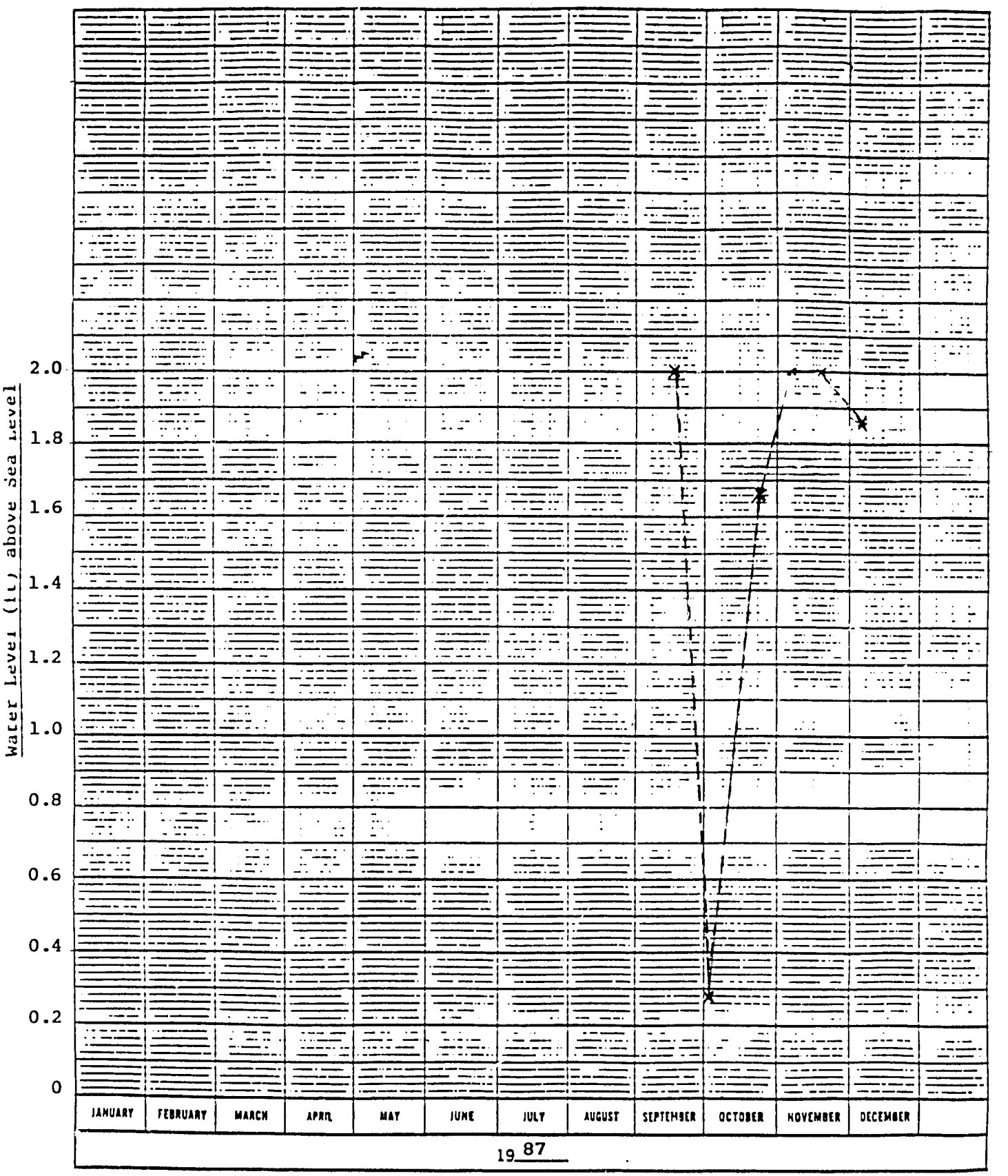


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: WATERFORD

Elevation of M.P- 2.00 ft.

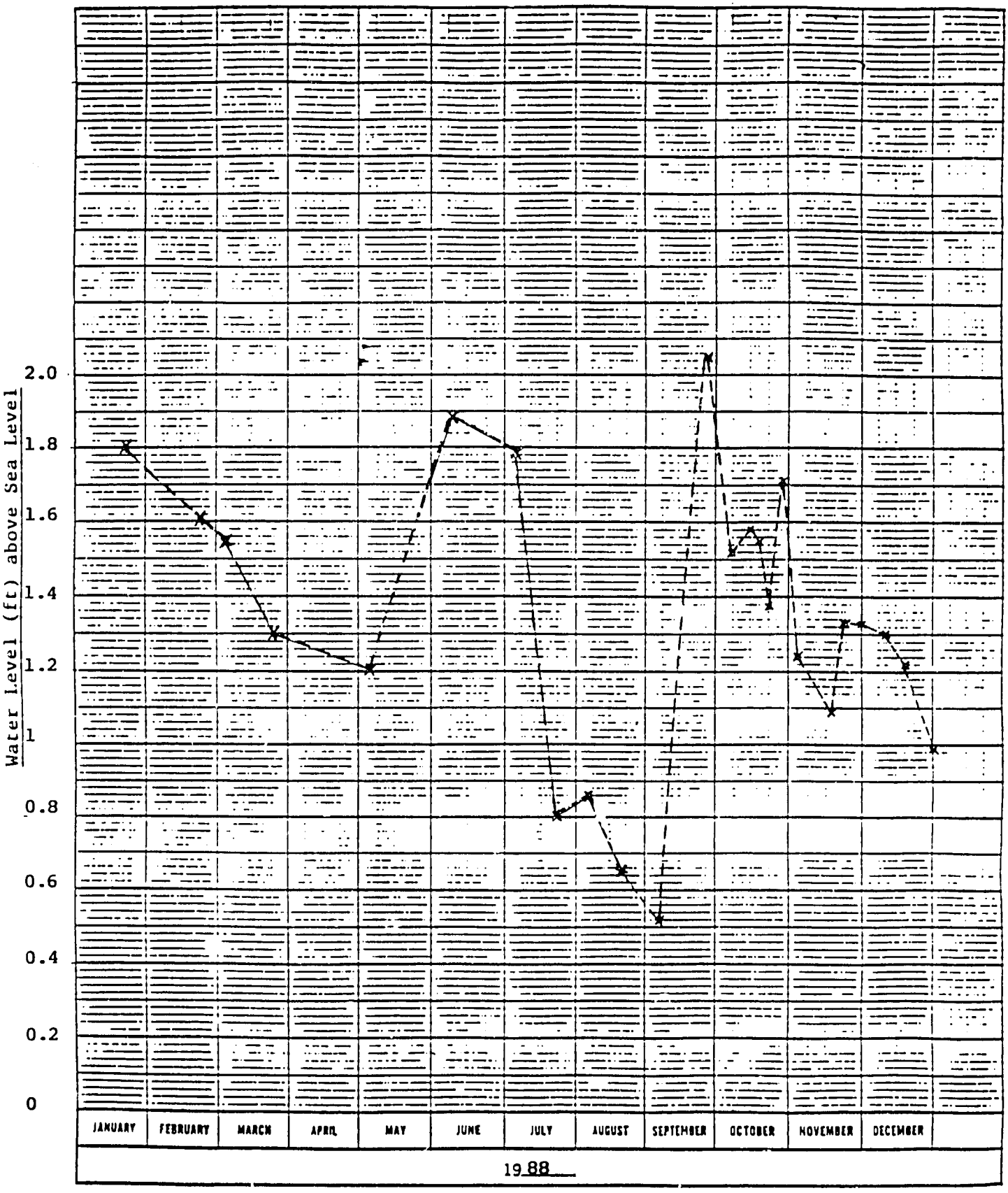


168

St. Catherine Plains
Well Hydrograph

Location: WATERFORD

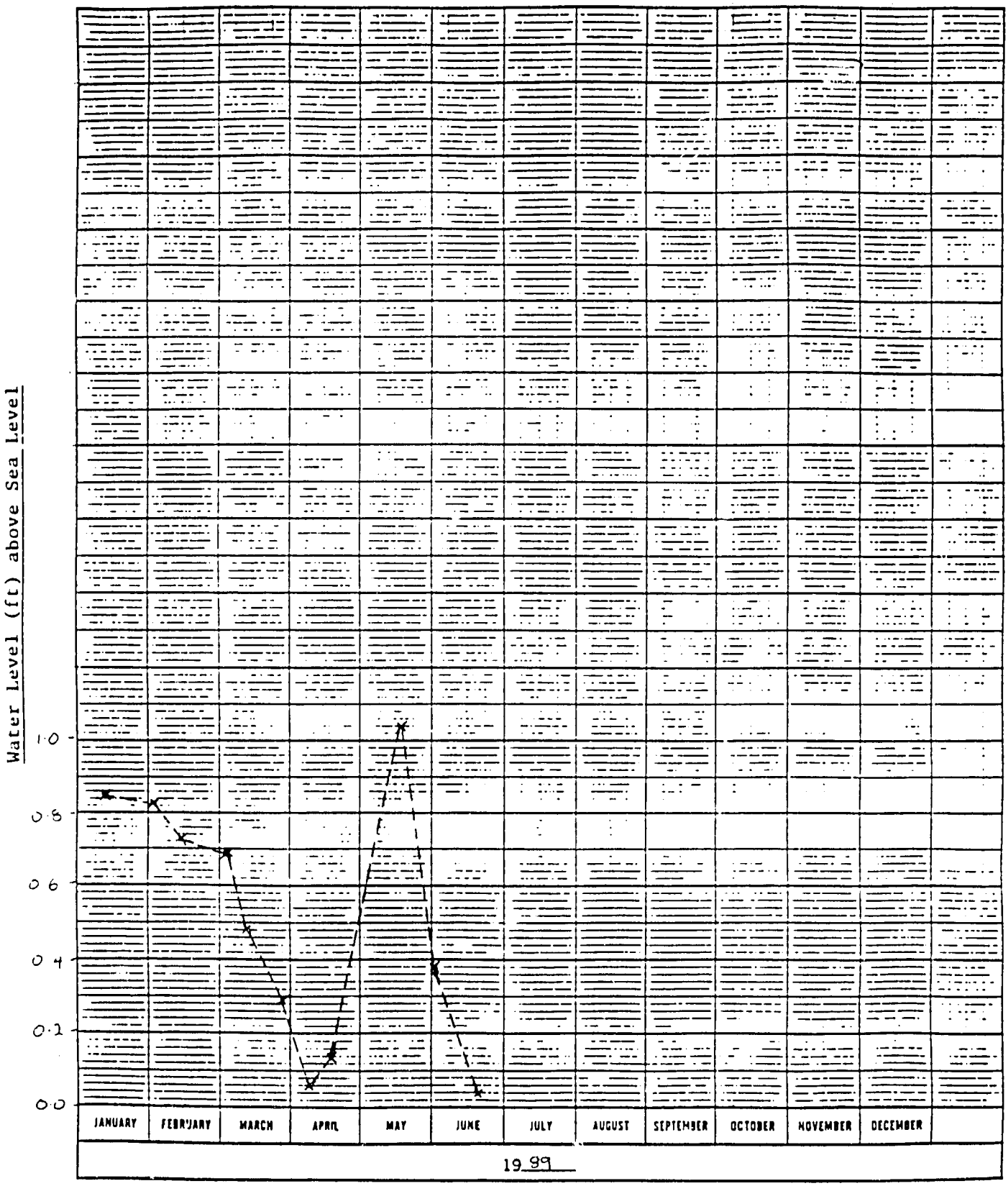
Elevation of M.P- 2·00 ft



St. Catherine Plains
Well Hydrograph

Location: WATERFORD

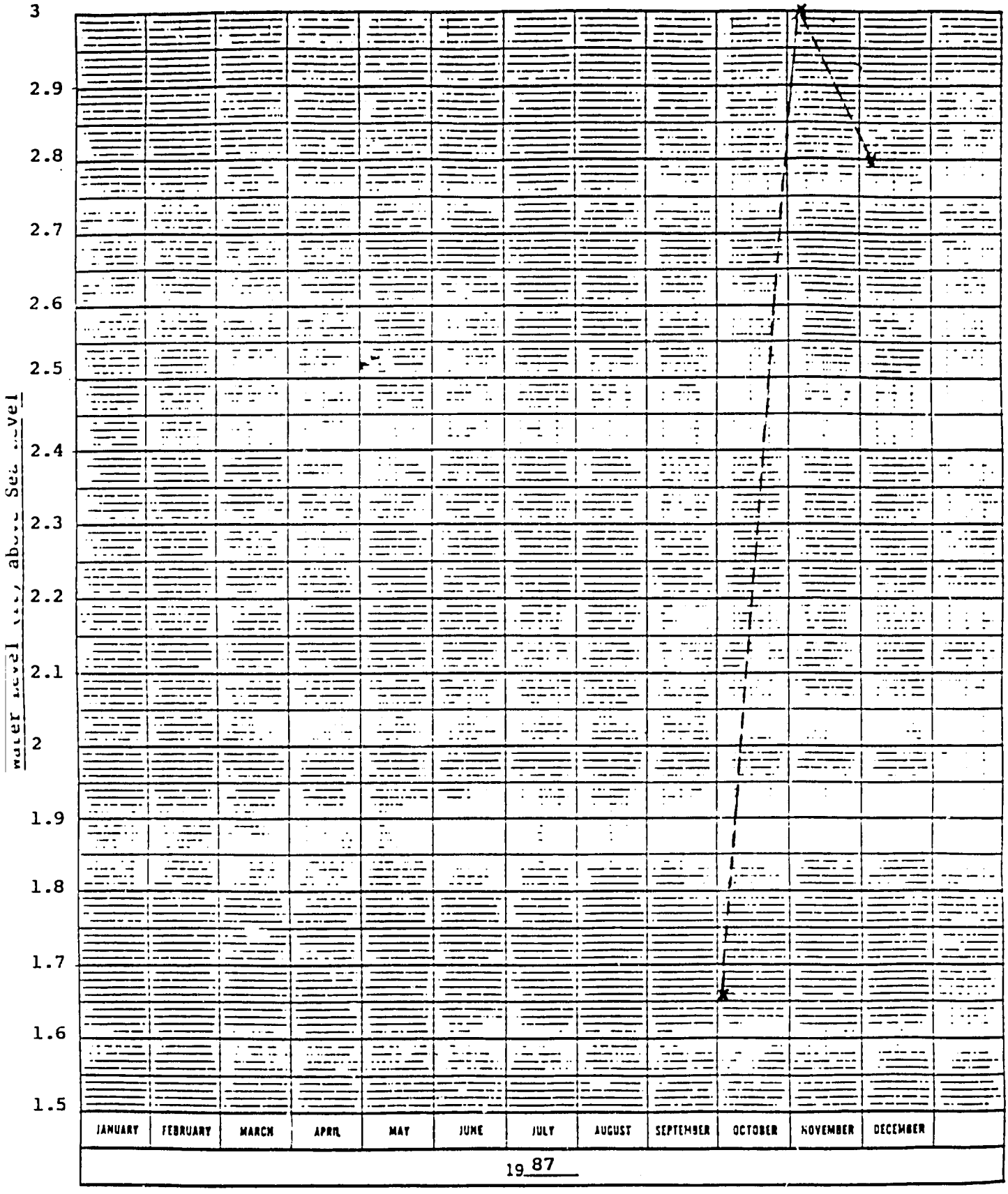
Elevation of M.P- 2·00 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

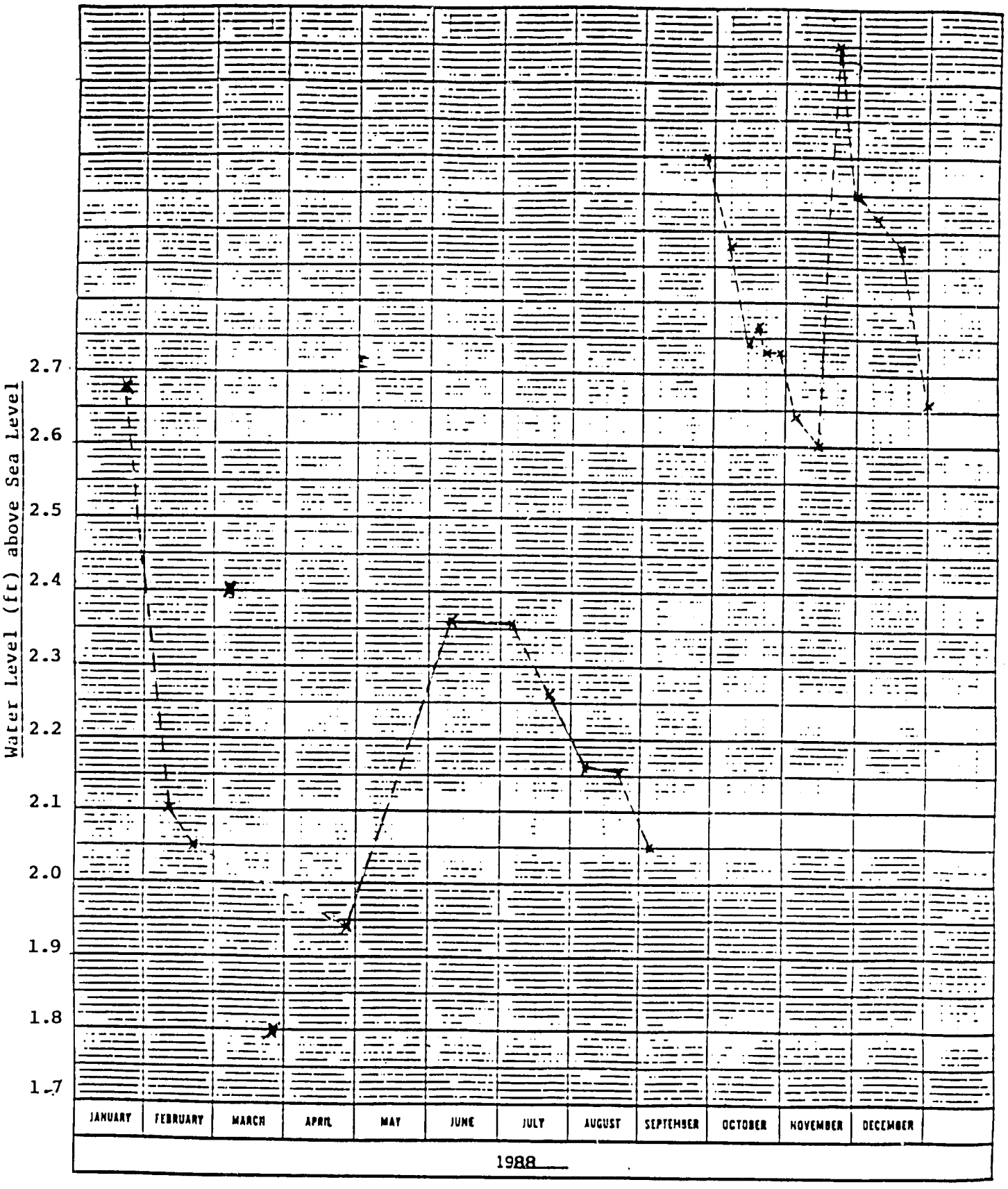
Location: NAGGO HEAD (OBSERVATION WELL) Elevation of M.P- 7.00 ft.



St. Catherine Islands

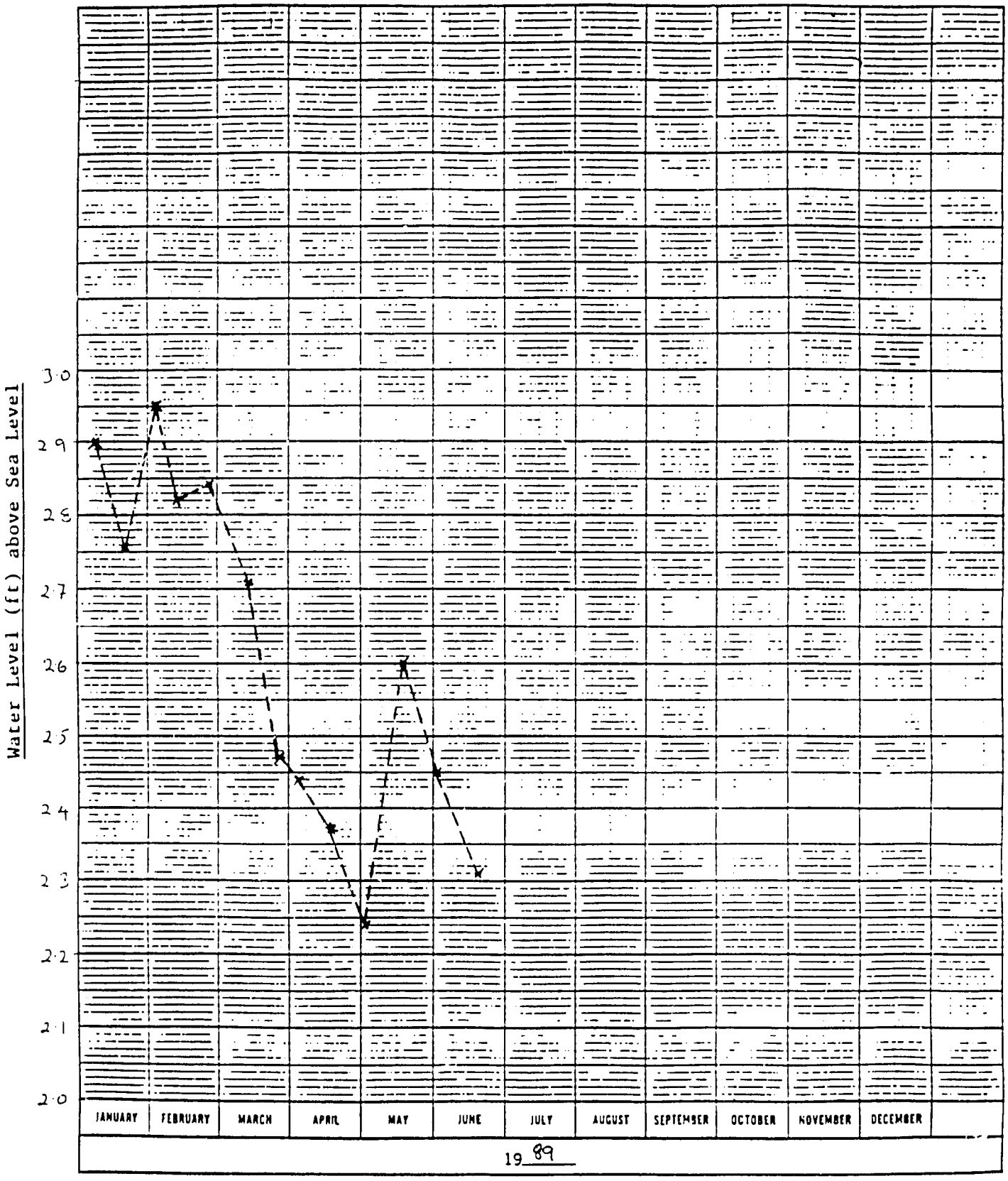
Well Hydrograph

Location: NAGGO HEAD (OBSERVATION WELL) Elevation of M.P- 7.00 ft.



St. Catherine Plains
Well Hydrograph

Location: NAGGO HEAD (OBSERVATION WELL) Elevation of M.P- 7.0 ft.

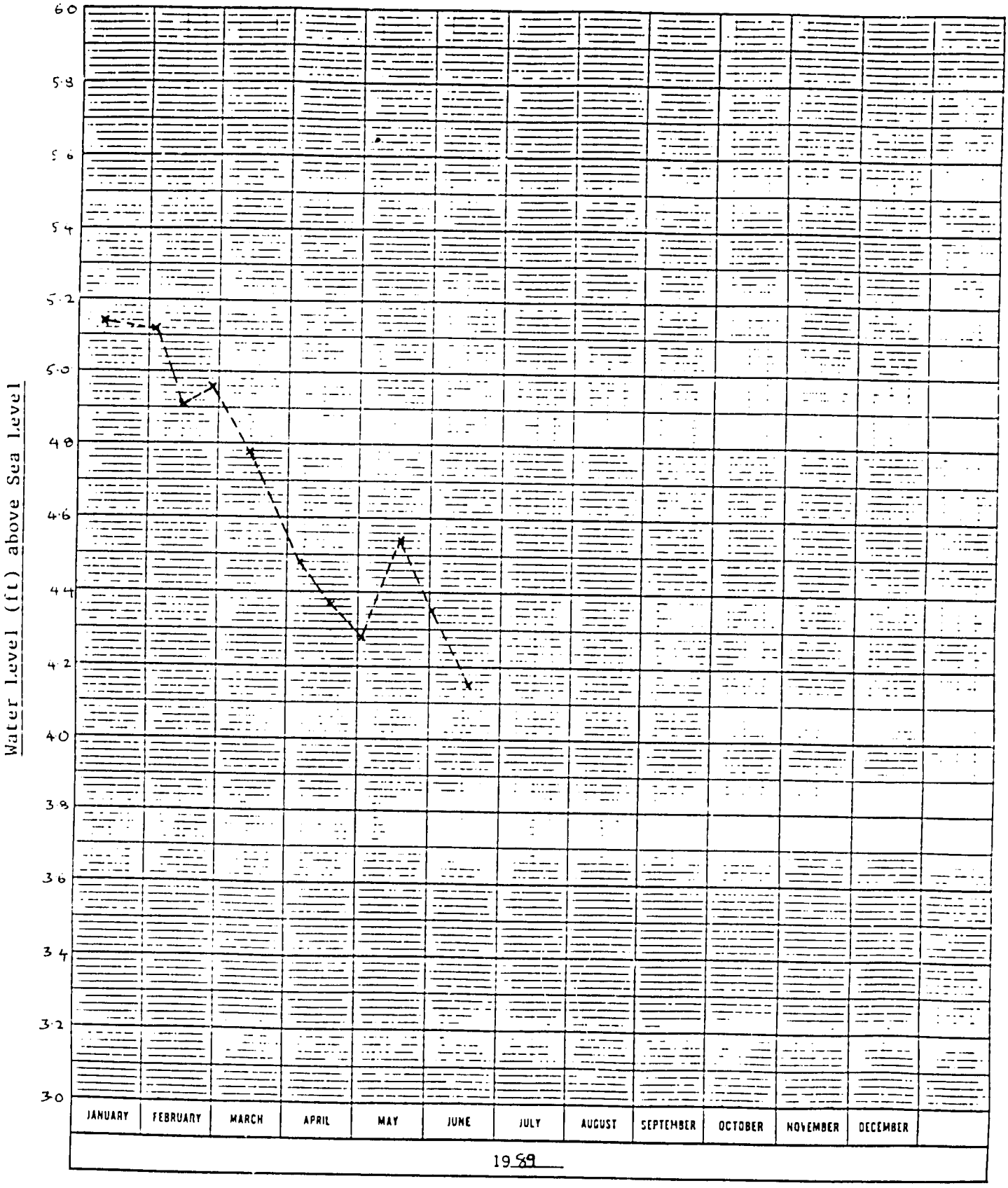


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: CUMBERLAND PEN (DEEP)

Elevation of M.P- 15.00 ft.

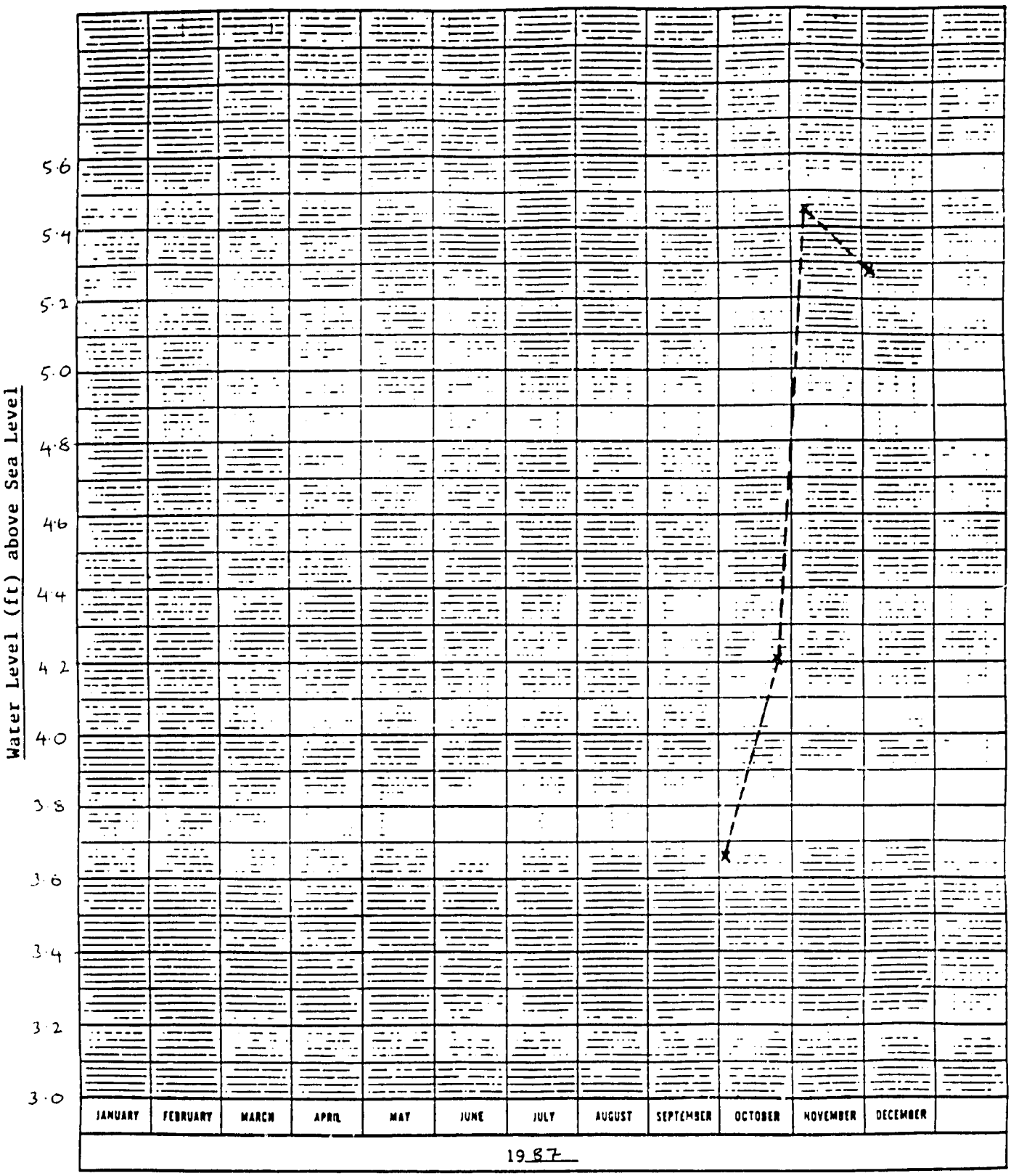


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: CUMBERLAND PEN OBS (DEEP)

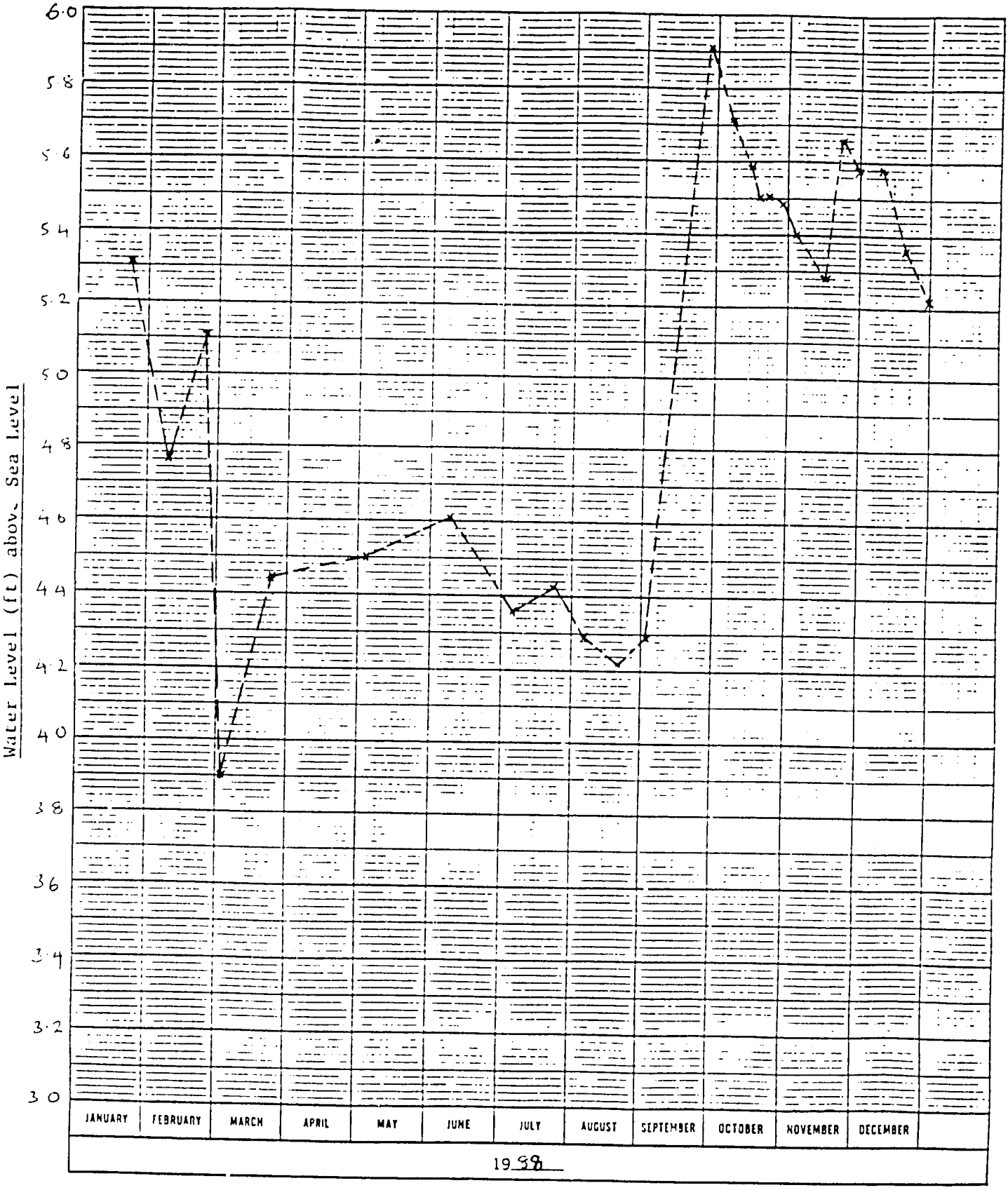
Elevation of M.P- 15.00 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

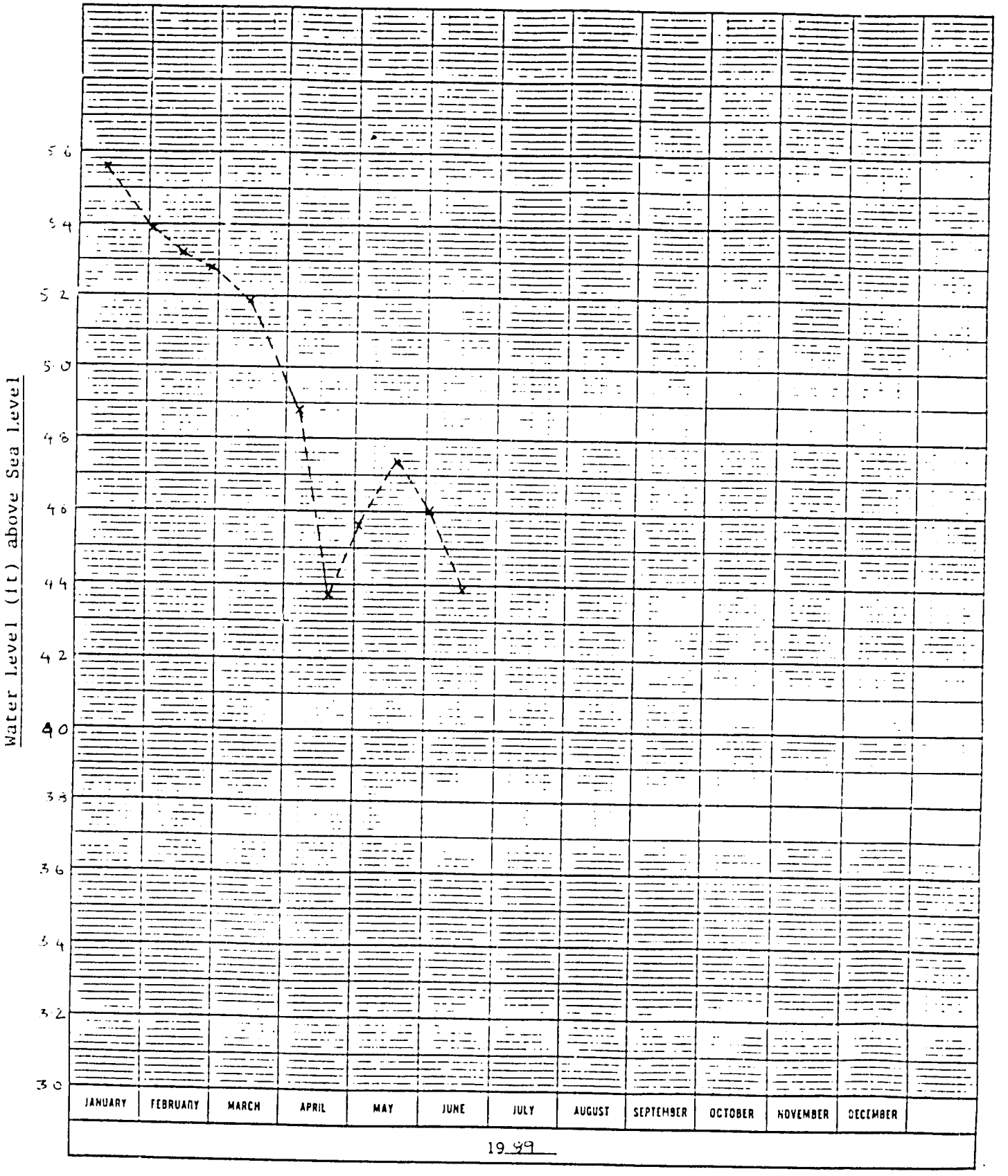
Location: CUMBERLAND PEN OBS (DEEP) Elevation of M.P- 15.00 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

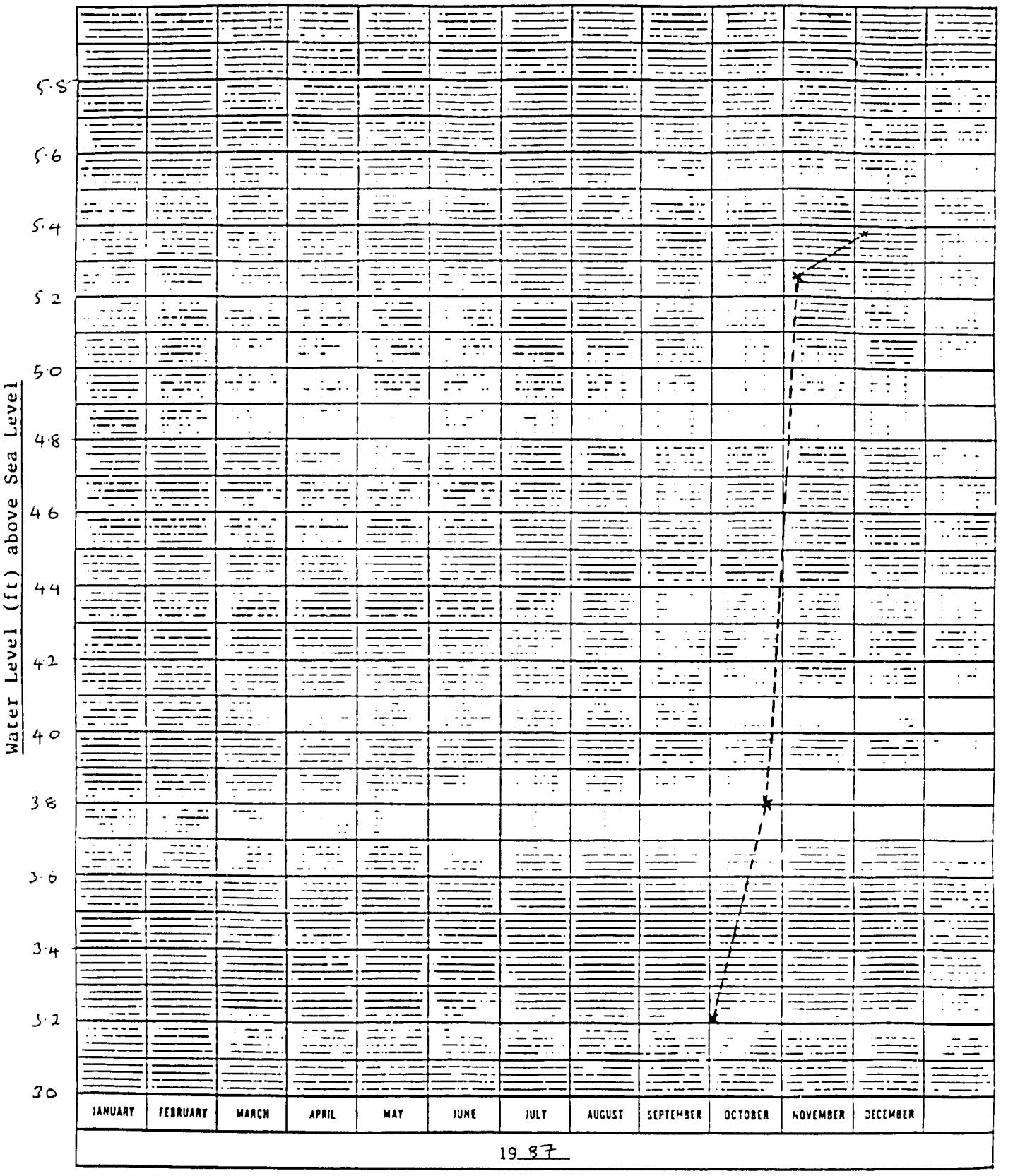
Location: CUMBERLAND FEN (SHALLOW) Elevation of M.P- 15·00 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: CUMBERLAND PEN ODS (SHALLOW) Elevation of M.P- 15.00 ft.

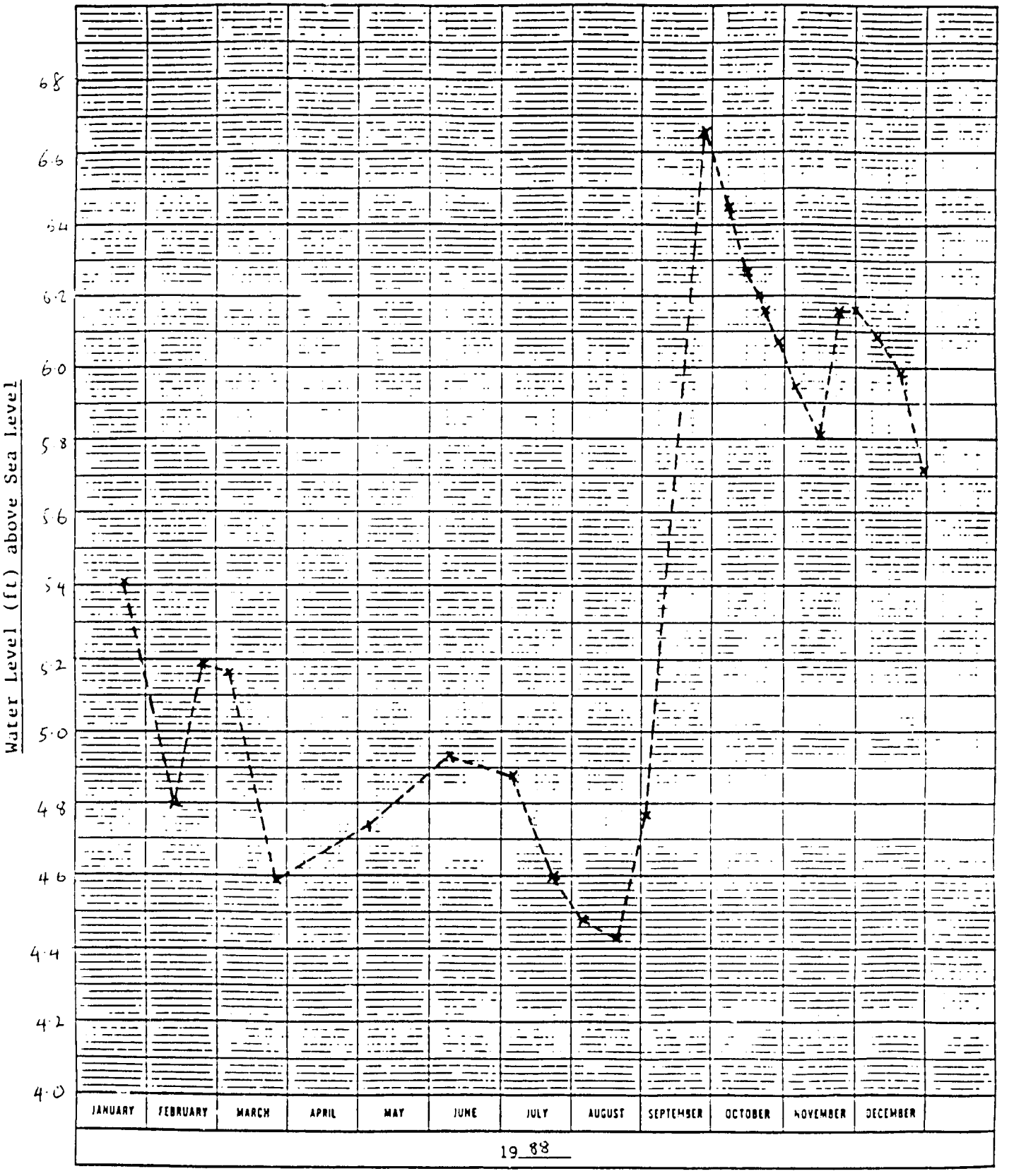


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: CUMBERLAND PEN OBS (SHALLOW)

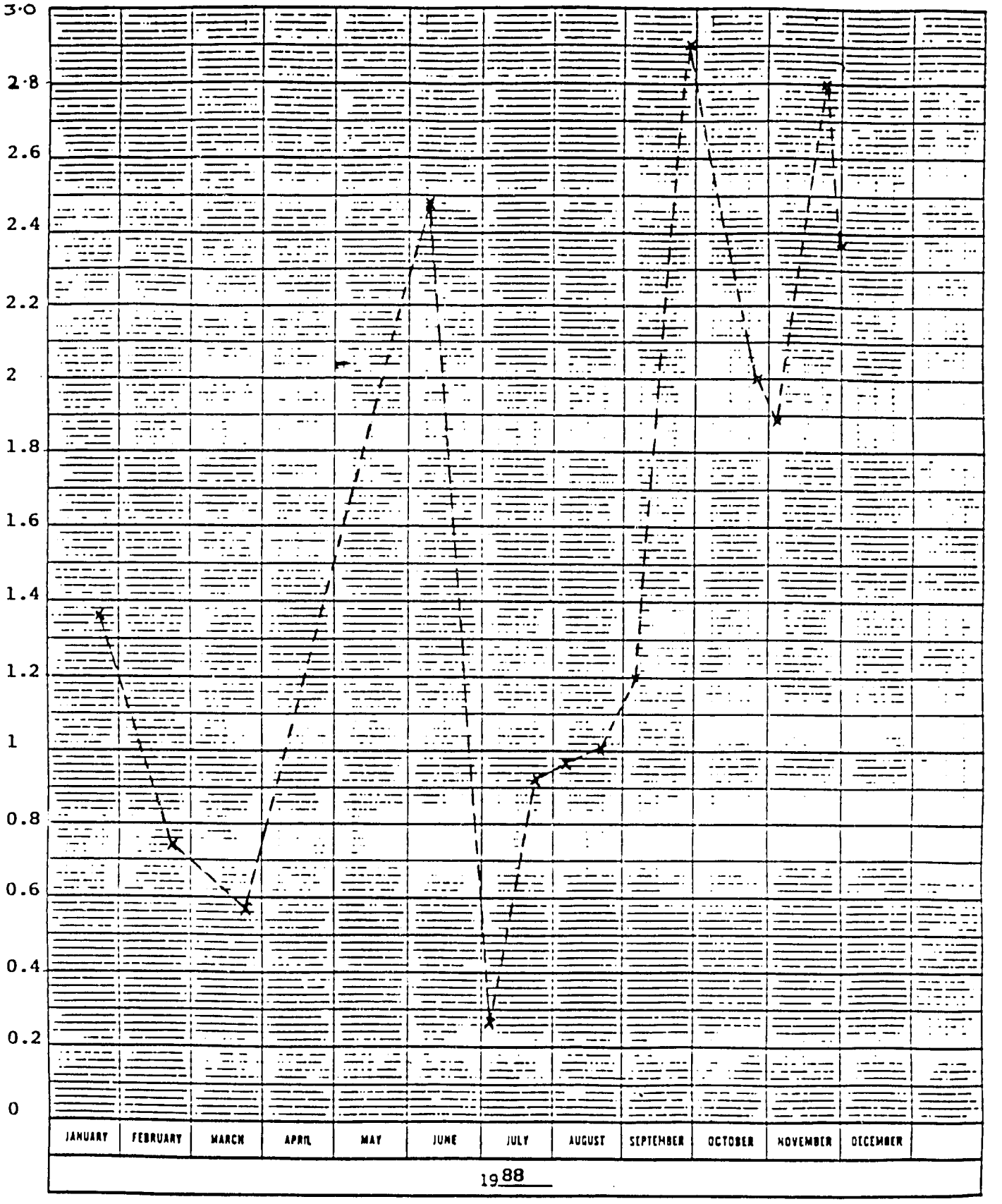
Elevation of M.P- 15.05 ft.



NON PUMPING WATER LEVEL

St. Catherine Plains 105.
Well Hydrograph

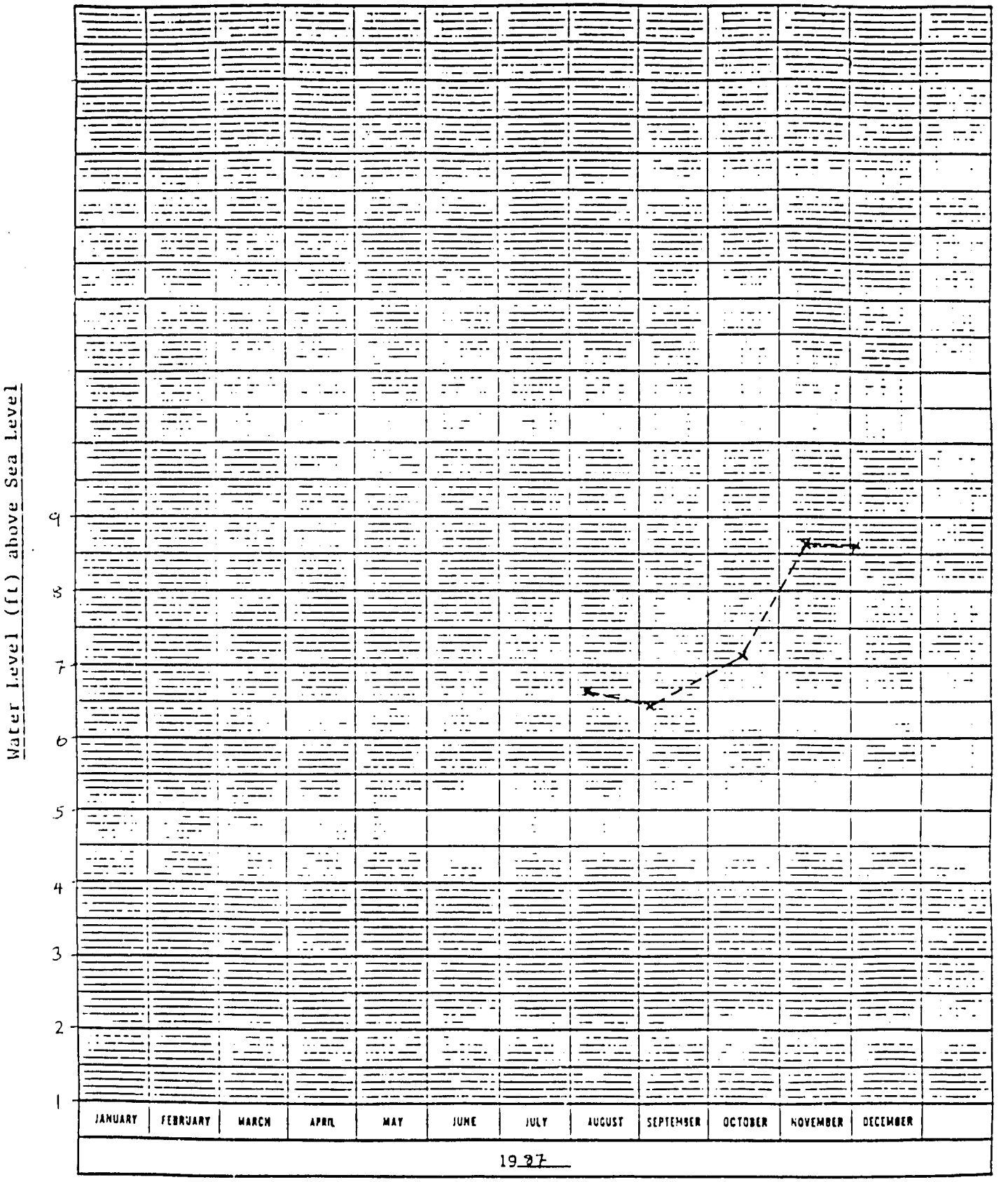
Location: REIDS PEN (OBSERVATION WELL) Elevation of M.P- 11-00 ft.



St. Catherine Plains 156.
Well Hydrograph

Location: PORTMORE #2

Elevation of M.P- 18·93 ft.

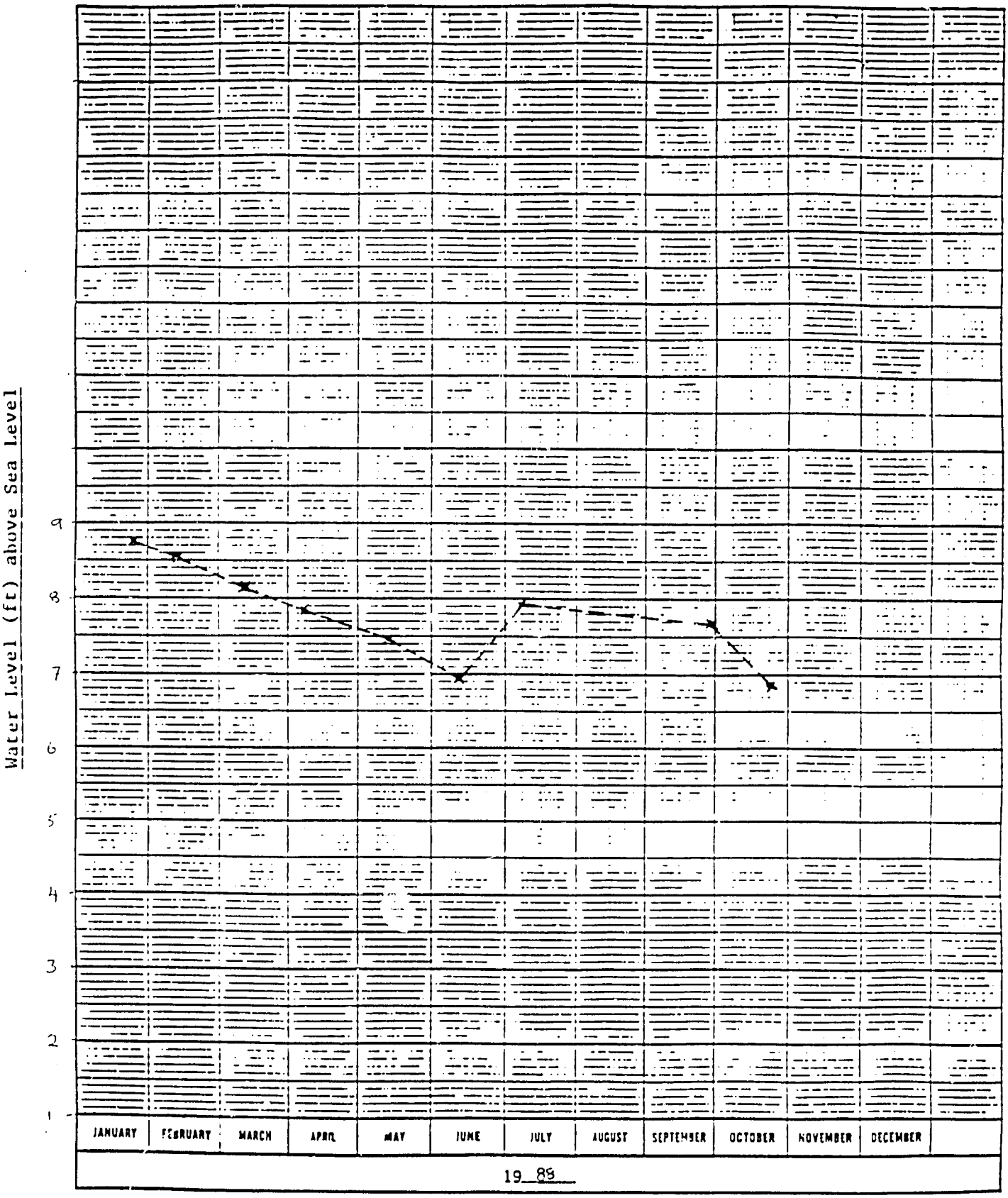


NON PUMPING WATER LEVEL

St. Catherine Plains
Well Hydrograph

Location: [illegible]

Elevation of M.P- ft.



A REPORT ON THE GROUNDWATER LEVELS
IN PARTS OF BERNARD LODGE AND CAYMANAS AREAS
AND ADJOINING COASTAL AREA
ST. CATHERINE PLAINS

APPENDIX-III

DAILY WATER LEVEL DATA AND
HYDROGRAPHS FOR SELECT WELLS

(1 - 45 Pages)

DAILY WATER LEVEL DATA AND HYDROGRAPHS FOR SELECT WELLS

Daily measurements were made on eight wells which formed a section across the area between December 19, 1988 and May 22, 1989. These wells are Government Park, Clifton #3, Half Way Tree #6, Half Way Tree #5, Half Way Tree #2, Cookson #4, Newlands #3 and Naggo Head observation well. Hydrographs for the wells for this period are enclosed.

The lowest water level observed in these wells within the time period stated was on May 8, 1989. The highest water level was observed on different dates for the different wells. Between December 23-26, 1988, the highest levels were recorded in Half Way Tree #6 and Naggo Head observation well. Between December 21-27 the highest levels were recorded in Cookson #4 and Half Way Tree #2 and 5. Government Park and Clifton #3 wells showed their highest levels on January 10 and February 14 respectively. Graphs were drawn showing the maximum and minimum water levels for the months of December 1988 and from January to May 1989. Half Way Tree #5 shows the maximum fluctuation between December 1988 to March 1989. April is the month in which fluctuations are minimum for all wells. Half Way Tree #5 and #6 show high fluctuations.

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: GOVERNMENT PARK ELEVATION OF R.P. 49.14 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
1/12/88	13.70	35.44		14/1/89	12.53	36.61	
1/12/88	13.20	35.94		15/1/89	12.65	36.49	
10/12/88	13.10	36.04		16/1/89	12.60	36.54	
1/12/88	13.10	36.04		17/1/89	12.60	36.54	
2/12/88	13.09	36.05		18/1/89	12.57	36.57	
3/12/88	13.07	36.07		19/1/89	12.57	36.57	
1/12/88	13.11	36.03		20/1/89	12.50	36.64	
5/12/88	13.00	36.14		21/1/89	12.53	36.61	
1/12/88	12.50	36.64		23/1/89	12.61	36.53	
/12/88	12.85	36.29		24/1/89	12.54	36.60	
3/1/89	12.76	36.38		25/1/89	12.55	36.59	
1/1/89	12.69	36.45		27/1/89	12.60	36.54	
5/1/89	12.64	36.50		28/1/89	12.60	36.54	
6/1/89	12.62	36.52		29/1/89	12.75	36.39	
1/1/89	12.54	36.60		30/1/89	12.74	36.40	
0/1/89	12.45	36.66		31/1/89	12.80	36.34	
/1/89	12.51	36.63		1/2/89	12.85	36.29	
2/1/89	12.52	36.62		3/2/89	12.90	36.24	
3/1/89	12.53	36.61		4/2/89	12.92	36.22	

18

ST. CATHERINE PLAINS

WATER LEVEL DATA

)CATION: GOVERNMENT PARK ELEVATION OF R.P. 49·14 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
/2/89	13·95	35·19		10/4/89	14·72	34·37	
7/2/89	12·93	36·16		13/4/89	14·66	34·48	
3/2/89	13·3	35·96		8/4/89	14·80	34·34	
4/2/89	13·22	35·92		16/5/89	14·58	34·56	
6/2/89	13·31	35·83		22/5/89	14·54	34·60	
3/2/89	13·72	35·42		1/6/89	14·75	34·39	
1/3/89	13·77	35·37					
7/3/89	13·84	35·30					
/3/89	13·78	35·35					
/3/89	13·86	35·28					
3/3/89	13·90	35·24					
/3/89	14·00	35·14					
4/3/89	14·00	35·14					
/3/89	14·02	35·12					
7/3/89	14·11	35·03					
0/3/89	14·09	35·05					
3/3/89	14·21	34·93					
8/3/89	14·33	34·81					
4/4/89	14·65	34·49					

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: CLIFTON #3 ELEVATION OF R.P. 50.00ft

'EF. POINT FOR MEASUREMENT STEEL PLATE AT BASE OF PUMP

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
5/1/89	19 93	30 07		14/2/89	19.60	30 40	
3/1/89	19.99	30 01		16/2/89	19 65	30 35	
19/1/89	19.99	30 01		20/2/89	19.75	30 25	
2/1/89	19 85	30 15		3/3/89	19.89	30.12	
1/1/89	19 87	30 13		6/3/89	20 07	29 93	
23/1/89	19 77	30.23		7/3/89	19.99	30.01	
4/1/89	19 73	30.27		10/3/89	20 07	29.93	
25/1/89	19 72	30 28		13/3/89	20.14	29.86	
7/1/89	19 68	30.32		14/3/89	20.02	29.98	
3/1/89	19 57	30 43		15/3/89	20 01	29.99	
9/1/89	19 65	30 35		20/3/89	20 07	29.93	
2/1/89	19 65	30 35		23/3/89	20 13	29.87	
1/1/89	19 67	30 33		4/4/89	20 26	29.74	
1/2/89	19.58	30.42		10/4/89	20 44	29.56	
/2/89	19.64	30 36		23/4/89	20 55	29.45	
4/2/89	19.67	30 33		8/5/89	20.77	29.23	
/2/89	19.67	30.33		16/5/89	20 73	29.27	
/2/89	19.63	30 .37		22/5/89	20.68	29.32	
13/2/89	19.52	30.43		1/6/89	20.60	29.40	

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: HALFWAY TREE #5 ELEVATION OF R.P. 43.18 ft.

EF. POINT FOR MEASUREMENT 0.70ft BELOW TIP OF PVC PIPE

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
1/12/88	11.71	31.47		14/1/89	12.41	30.77	
1/12/88	11.00	32.18		15/1/89	12.55	30.63	
0/12/88	9.60	33.58		16/1/89	11.65	31.53	
1/12/88	9.32	33.86		17/1/89	11.95	31.23	
2/12/88	10.27	32.91		18/1/89	11.96	31.22	
3/12/88	9.49	33.69		19/1/89	11.51	31.67	
4/12/88	10.02	33.16		20/1/89	12.25	30.93	
5/12/88	11.11	32.07		21/1/89	12.12	31.06	
1/12/88	11.23	32.95		23/1/89	12.21	30.97	
1/12/88	10.13	33.05		24/1/89	12.44	30.74	
1/1/89	11.74	31.44		25/1/89	12.57	30.59	
/1/89	11.60	31.58		26/1/89	12.57	30.61	
7/1/89	10.21	32.97		27/1/89	12.62	30.56	
1/1/89	10.20	32.98		28/1/89	12.77	30.41	
/1/89	11.55	31.63		29/1/89	12.83	30.35	
1/1/89	11.66	31.52		30/1/89	12.95	30.23	
/1/89	11.86	31.32		31/1/89	12.30	30.88	
2/1/89	12.06	31.12		1/2/89	12.85	30.33	
3/1/89	12.24	30.94		3/2/89	12.96	30.22	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALFWAY TREE #5 ELEVATION OF R.P. 43·18 ft

REF. POINT FOR MEASUREMENT 0·70 ft BELOW TIP OF PVC PIPE

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
4/2/89	13·06	30·12		23/2/89	12·90	30·28	
5/2/89	13·16	30·02		28/2/89	13·67	29·51	
7/2/89	12·95	30·23		4/4/89	14·13	29·05	
3/2/89	13·70	29·48		10/4/89	14·49	28·69	
4/2/89	13·88	29·30		23/4/89	14·23	28·96	
15/2/89	13·96	29·22		8/5/89	14·69	28·49	
20/2/89	14·18	29·00		16/5/89	13·22	29·96	
28/2/89	10·17	33·03		22/5/89	11·30	31·88	
1/3/89	9·57	33·61		1/6/89	11·38	31·80	
1/3/89	10·62	32·56					
6/3/89	11·70	31·48					
7/3/89	11·87	31·31					
9/3/89	10·86	32·32					
13/3/89	10·41	32·77					
14/3/89	9·04	34·14					
15/3/89	10·60	32·58					
16/3/89	13·37	29·81					
17/3/89	11·77	31·41					
20/3/89	12·44	30·74					

184

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: HALFWAY TREE #2 ELEVATION OF R.P. 43.03 ft

EF. POINT FOR MEASUREMENT 1.2 ft BELOW TIP OF PVC

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
1/12/88	12.99	30.04		14/1/89	12.90	30.14	
1/12/88	12.74	30.29		15/1/89	13.04	29.99	
20/12/88	12.58	30.45		16/1/89	13.03	30.00	
1/12/88	12.49	30.54		17/1/89	13.11	29.92	
2/12/88	12.58	30.45		18/1/89	13.09	29.94	
23/12/88	12.49	30.54		19/1/89	13.13	29.90	
4/12/88	12.51	30.52		20/1/89	13.15	29.88	
28/12/88	12.64	30.39		21/1/89	13.19	29.84	
9/12/88	12.64	30.39		23/1/89	13.20	29.83	
2/12/88	12.52	30.51		24/1/89	13.24	29.79	
3/1/89	12.75	30.28		25/1/89	13.27	29.76	
1/1/89	12.77	30.26		26/1/89	13.29	29.74	
5/1/89	12.62	30.41		27/1/89	13.34	29.69	
6/1/89	12.55	30.48		28/1/89	13.39	29.64	
7/1/89	12.81	30.22		29/1/89	13.38	29.65	
10/1/89	13.94	30.09		30/1/89	13.40	29.63	
1/1/89	12.93	30.10		31/1/89	13.45	29.58	
2/1/89	12.99	30.04		1/2/89	13.45	29.58	
3/1/89	12.95	30.08		3/2/89	13.47	29.56	

190

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: HALFWAY TREE #2 ELEVATION OF R.P. 43.03 ft

REF. POINT FOR MEASUREMENT 1.20 ft. BELOW TIP OF PVC PIPE

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
1/2/89	13.51	29.52		28/7/89	14.03	29.00	
6/2/89	13.58	29.45		4/4/89	14.44	28.59	
7/2/89	13.58	29.45		10/4/89	14.37	28.66	
13/2/89	13.84	29.19		22/4/89	14.14	28.89	
14/2/89	13.90	29.13		8/5/89	14.43	28.60	
15/2/89	13.97	29.06		16/5/89	14.38	28.65	
20/2/89	14.14	28.89		22/5/89	13.78	29.25	
28/2/89	13.55	29.48		1/6/89	13.35	29.68	
1/3/89	13.97	29.06					
3/3/89	13.96	29.07					
6/3/89	13.53	29.50					
1/3/89	13.72	29.31					
10/3/89	13.65	29.38					
3/3/89	13.96	29.67					
4/3/89	13.24	29.79					
15/3/89	13.33	29.70					
7/3/89	13.52	29.51					
20/3/89	13.70	29.33					
3/3/89	13.83	29.2					

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALFWAY TREE #6 ELEVATION OF R.P. 37.50 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP - 0.50 ft BELOW TIP OF PVC

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
9/12/88	9.50	28.00		14/1/89	9.66	27.84	
9/12/88	9.32	28.18		15/1/89	9.67	27.83	
20/12/88	9.19	28.31		16/1/89	9.65	27.85	
21/12/88	9.08	28.42		17/1/89	9.74	27.76	
22/12/88	9.08	28.42		18/1/89	9.75	27.75	
23/12/88	9.02	28.48		19/1/89	9.78	27.72	
24/12/88	9.02	28.48		20/1/89	9.82	27.68	
28/12/88	9.22	28.28		21/1/89	9.87	27.63	
29/12/88	9.25	28.25		22/1/89	9.87	27.63	
30/12/88	9.26	28.24		24/1/89	9.92	27.58	
3/1/89	9.41	28.09		25/1/89	9.95	27.55	
4/1/89	9.44	28.06		26/1/89	9.98	27.52	
5/1/89	9.33	28.12		27/1/89	10.01	27.49	
6/1/89	9.26	28.24		28/1/89	10.05	27.45	
9/1/89	9.37	28.13		29/1/89	10.10	27.40	
10/1/89	9.45	28.05		30/1/89	10.16	27.34	
11/1/89	9.42	28.08		31/1/89	10.11	27.39	
12/1/89	9.55	27.95		1/2/89	10.18	27.32	
13/1/89	9.63	27.87		3/2/89	10.33	27.17	

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: HALFWAY TREE #6 ELEVATION OF R.P. 37.50 ft

REF. POINT FOR MEASUREMENT TOP OF STEEL PLATE BELOW PUMP - 0.50ft BELOW TIP OF PVC

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
4/2/89	10.28	27.22		28/3/89	10.67	26.83	
6/2/89	10.33	27.17		4/4/89	11.12	26.38	
7/2/89	10.34	27.16		10/4/89	11.27	26.23	
13/2/89	10.55	26.95		23/4/89	10.81	26.69	
14/2/89	10.60	26.90		8/5/89	11.40	26.10	
16/2/89	10.64	26.86		16/5/89	10.32	26.68	
20/2/89	10.91	26.69		22/5/89	5.48	32.02	
28/2/89	10.38	27.12		1/6/89	4.86	32.64	
1/3/89	10.15	27.35					
3/3/89	10.07	27.43					
6/3/89	10.13	27.37					
9/3/89	10.27	27.23					
10/3/89	10.16	27.34					
13/3/89	9.88	27.62					
14/3/89	9.75	27.75					
15/3/89	9.78	27.72					
17/3/89	9.81	27.69					
20/3/89	10.06	27.44					
23/3/89	10.31	27.19					

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: NEWLANDS # 3 ELEVATION OF R.P. 32·24 ft.

REF. POINT FOR MEASUREMENT 0 1 ft BELOW PUMP PLATFORM

Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
1/12/88	11·01	21 23		14/1/89	11 05	21·19	
19/12/88	11·06	21·18		15/1/89	11·08	21·16	
20/12/88	11·12	21·12		16/1/89	11·10	21·14	
21/12/88	11·10	21·14		17/1/89	11·13	21·11	
22/12/88	11·14	21·10		18/1/89	11·14	21·10	
23/12/88	11·12	21·12		19/1/89	11·16	21·08	
24/12/88	11·14	21·10		20/1/89	11·15	21·09	
28/12/88	11·16	21 08		21/1/89	11·21	21·03	
29/12/88	10·59	21·65		23/1/89	11·18	21·06	
30/12/88	10·86	21·38		24/1/89	11·20	21·04	
31/1/89	10 91	21·33		25/1/89	11 21	21·03	
2/1/89	10·91	21·33		26/1/89	11 23	21·01	
5/1/89	10 93	21 31		27/1/89	11·24	21·00	
6/1/89	10 94	21·30		28/1/89	11·24	21·00	
9/1/89	10 95	21·26		29/1/89	11·24	21·00	
10/1/89	10 99	21·25		30/1/89	11·27	20 97	
11/1/89	11·01	21·23		31/1/89	11·28	20·96	
12/1/89	11·03	21·21		1/2/89	11·30	20·94	
13/1/89	11·05	21·19		3/2/89	11·32	20·92	

195

ST. CATHERINE PLAINS

WATER LEVEL DATA

LOCATION: NEWLANDS #3 ELEVATION OF R.P. 32.24 ft.

EF. POINT FOR MEASUREMENT 0.1ft BELOW PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
/2/89	11.37	20.87		28/3/89	12.00	20.24	
/2/89	11.40	20.84		4/4/89	12.13	20.11	
7/2/89	11.43	20.81		10/4/89	12.24	19.90	
3/2/89	11.48	20.76		22/4/89	12.42	19.82	
1/2/89	11.49	20.75		8/5/89	12.42	19.82	
6/2/89	11.52	20.72		16/5/89	12.58	19.66	
2/2/89	11.57	20.67		22/5/89	12.49	19.75	
8/2/89	11.66	20.58		6/6/89	12.40	19.84	
1/3/89	11.67	20.57					
/3/89	11.67	20.57					
6/3/89	11.72	20.51					
/3/89	11.76	20.49					
2/3/89	11.76	20.48					
3/3/89	11.80	20.44					
4/3/89	11.80	20.44					
5/3/89	11.81	20.43					
7/3/89	11.83	20.41					
2/3/89	11.86	20.38					
23/3/89	11.90	20.34					

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: COOKSON #4 ELEVATION OF R.P. 27·86 ft

EF. POINT FOR MEASUREMENT 0·1 ft. BELOW PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
/12/88	9·90	17·96		14/1/89	10·42	17·44	
/12/88	10·05	17·81		15/1/89	10·50	17·36	
0/12/88	10·09	17·78		16/1/89	10·51	17·35	
/12/88	10·09	17·77		17/1/89	10·54	17·32	
/12/88	10·12	17·74		18/1/89	10·57	17·29	
3/12/88	10·13	17·73		19/1/89	10·59	17·27	
1/12/88	10·15	17·71		20/1/89	10·57	17·29	
8/12/88	10·20	17·66		21/1/89	10·52	17·27	
/12/88	10·22	17·64		23/1/89	10·53	17·28	
/12/88	10·23	17·63		24/1/89	10·60	17·26	
3/1/89	10·39	17·47		25/1/89	10·60	17·26	
/1/89	10·31	17·55		26/1/89	10·60	17·26	
/1/89	10·33	17·53		27/1/89	10·62	17·24	
6/1/89	10·35	17·51		28/1/89	10·62	17·24	
/1/89	10·39	17·47		29/1/89	10·61	17·25	
0/1/89	10·42	17·44		30/1/89	10·64	17·22	
/1/89	10·42	17·44		31/1/89	10·65	17·21	
2/1/89	10·43	17·43		1/2/89	10·66	17·20	
3/1/89	10·40	17·46		3/2/89	10·69	17·19	

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: COOKSON #4 ELEVATION OF R.P. 27·86 ft.

F. POINT FOR MEASUREMENT 0·1ft BELOW PUMP PLATFORM

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
/2/89	10·73	17·13		28/3/89	11·34	16·52	
/2/89	10·75	17·11		4/4/89	11·55	16·31	
2/89	10·75	17·11		10/4/89	11·68	16·18	
/2/89	10·83	17·03		23/4/89	11·91	15·95	
/2/89	10·86	17·00		8/5/89	12·09	15·77	
/2/89	10·89	16·97		16/5/89	11·97	15·89	
/2/89	10·90	16·96		22/5/89	11·97	15·89	
/2/89	10·99	16·87		1/6/89	12·00	15·86	
/3/89	11·01	16·85					
/3/89	11·03	16·83					
/3/89	11·10	16·76					
/3/89	11·12	16·74					
/3/89	11·12	16·74					
/3/89	11·19	16·67					
/3/89	11·19	16·67					
/3/89	11·21	16·65					
/3/89	11·23	16·63					
0/3/89	11·25	16·61					
/3/89	11·32	16·54					

ST. CATHERINE PLAINS

WATER LEVEL DATA

OCATION: NAGGO HEAD OBS ELEVATION OF R.P. 7·00ft.

EF. POINT FOR MEASUREMENT PVC PIPE

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
1/12/88	3·78	3·22		14/1/89	4·19	2·81	
1/12/88	3·82	3·18		15/1/89	4·15	2·85	
1/12/88	3·86	3·14		16/1/89	4·17	2·83	
1/12/88	3·90	3·10		17/1/89	4·18	2·82	
2/12/88	3·98	3·02		18/1/89	4·11	2·89	
3/12/88	3·97	3·03		19/1/89	4·23	2·77	
1/12/88	3·97	3·03		20/1/89	4·24	2·76	
1/12/88	4·10	2·90		21/1/89	4·27	2·73	
1/12/88	4·03	2·97		23/1/89	4·06	2·94	
1/12/88	4·04	2·96		24/1/89	3·96	3·04	
1/1/89	4·06	2·94		25/1/89	3·96	3·04	
1/1/89	4·07	2·93		26/1/89	3·96	3·04	
1/1/89	4·10	2·90		27/1/89	4·00	3·00	
1/1/89	4·11	2·89		28/1/89	4·00	3·00	
1/1/89	4·12	2·88		29/1/89	4·00	3·00	
1/1/89	4·11	2·89		30/1/89	4·01	2·99	
1/1/89	4·12	2·88		31/1/89	—		
1/1/89	4·15	2·85		1/2/89	4·05	2·95	
1/1/89	4·15	2·85		3/2/89	4·10	2·90	

198

ST. CATHERINE PLAINS

WATER LEVEL DATA

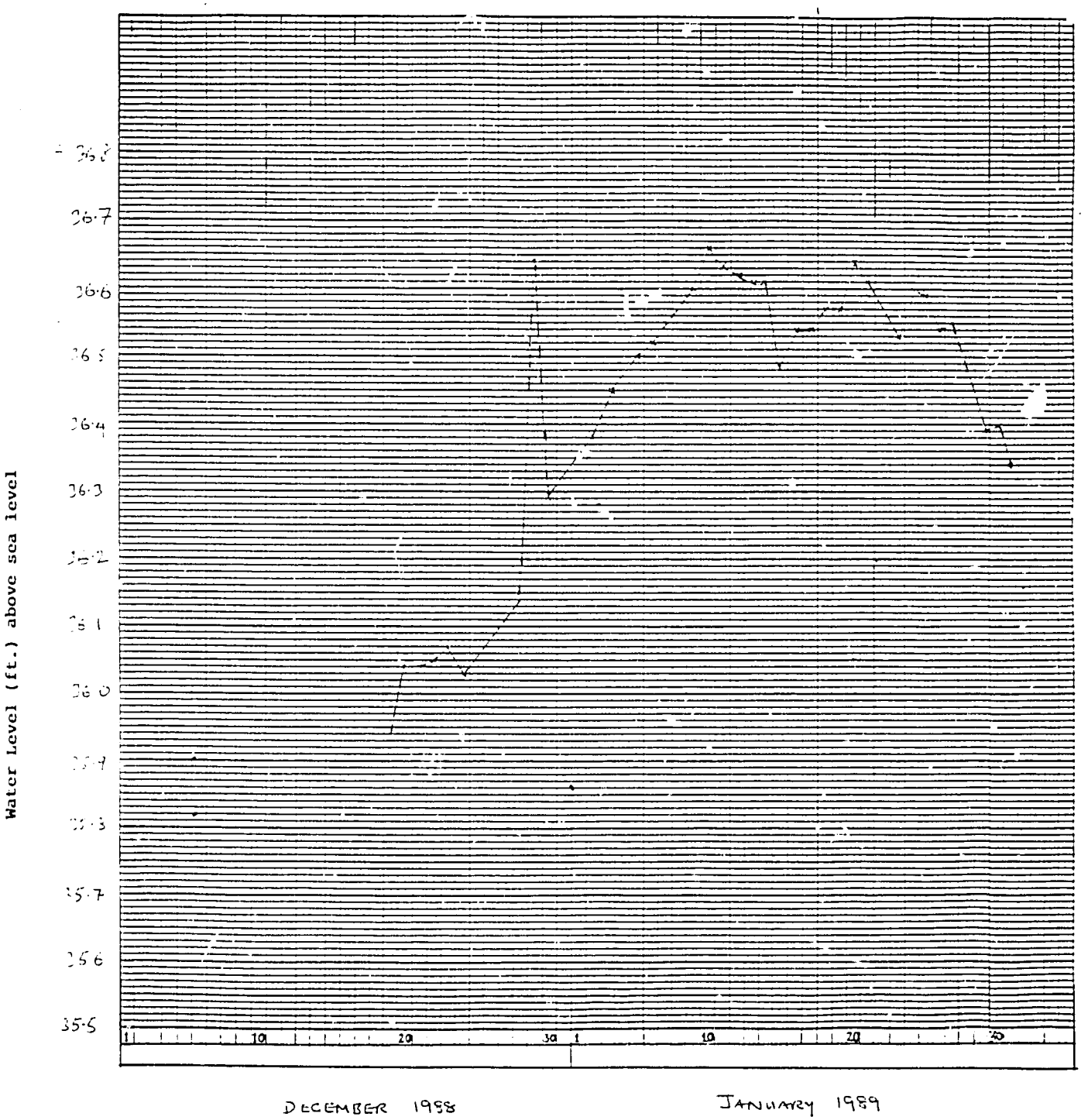
LOCATION: NAGGO HEAD OBS ELEVATION OF R.P. 7·00 ft.

EF. POINT FOR MEASUREMENT PVC. PIPE

ate	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)	Date	Water Level below R.P.	Elevation of Water Level	Well Discharge (1GPM)
	ft.	ft.			ft.	ft.	
4/2/89	4.10	2.90		4/4/89	4.56	2.44	
2/2/89	4.17	2.83		10/4/89	4.61	2.39	
7/2/89	4.14	2.86		23/4/89	4.51	2.49	
3/2/89	4.18	2.82		8/5/89	4.74	2.26	
4/2/89	4.21	2.79		16/5/89	4.40	2.60	
8/2/89	4.16	2.84		22/5/89	4.51	2.49	
1/3/89	4.18	2.82		1/6/89	4.55	2.45	
3/3/89	4.19	2.81					
6/3/89	4.26	2.74					
1/3/89	4.22	2.78					
0/3/89	4.22	2.78					
3/3/89	4.29	2.71					
4/3/89	4.29	2.71					
5/3/89	4.33	2.67					
6/3/89	4.53	2.47					
7/3/89	4.35	2.65					
0/3/89	4.35	2.65					
3/3/89	4.42	2.58					
6/3/89	4.53	2.47					

WELL HYDROGRAPH

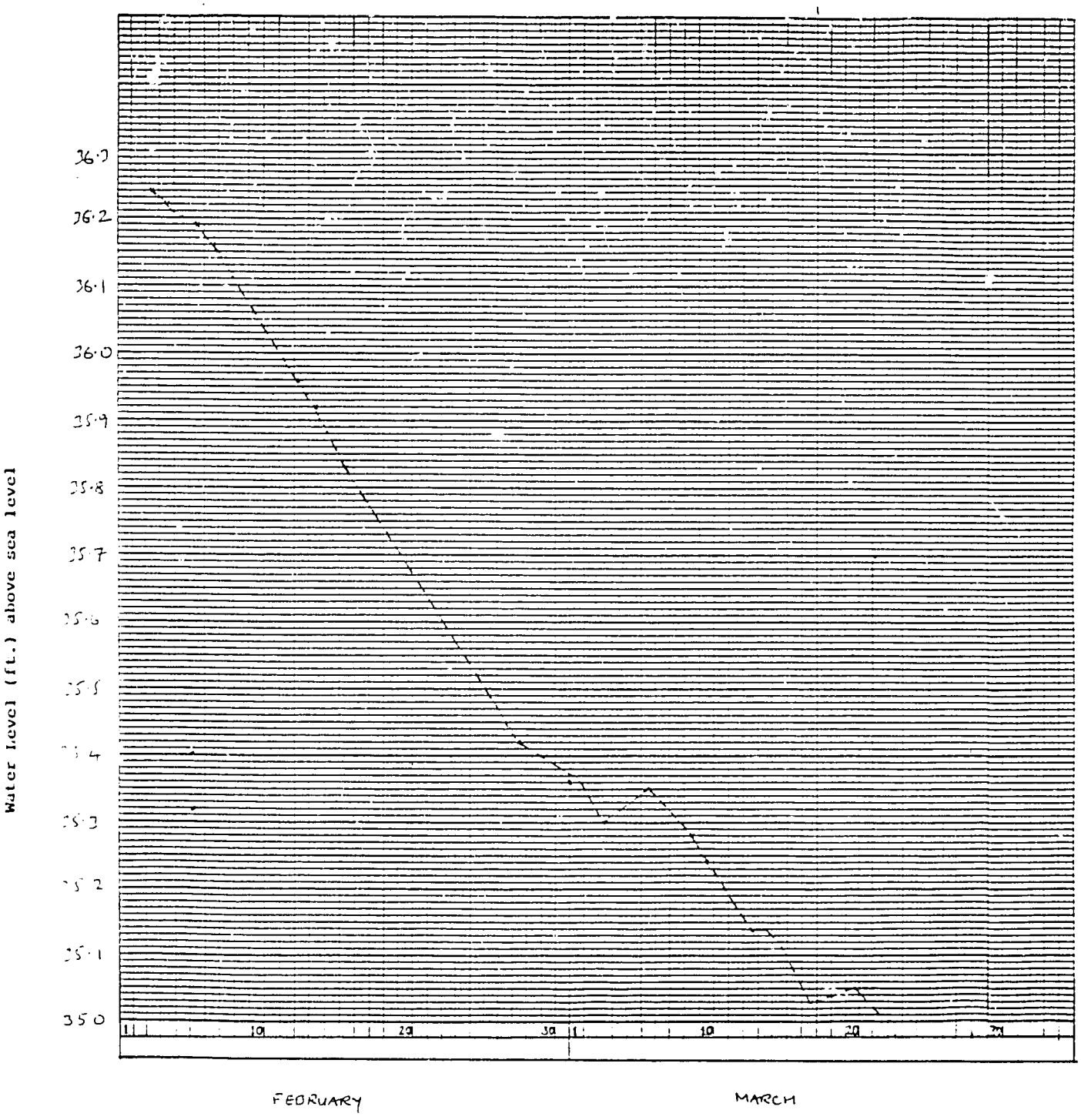
LOCATION: GOVERNMENT PARK **ELEVATION OF M.P.:** 49.14 ft



WELL HYDROGRAPH

LOCATION: GOVERNMENT PARK

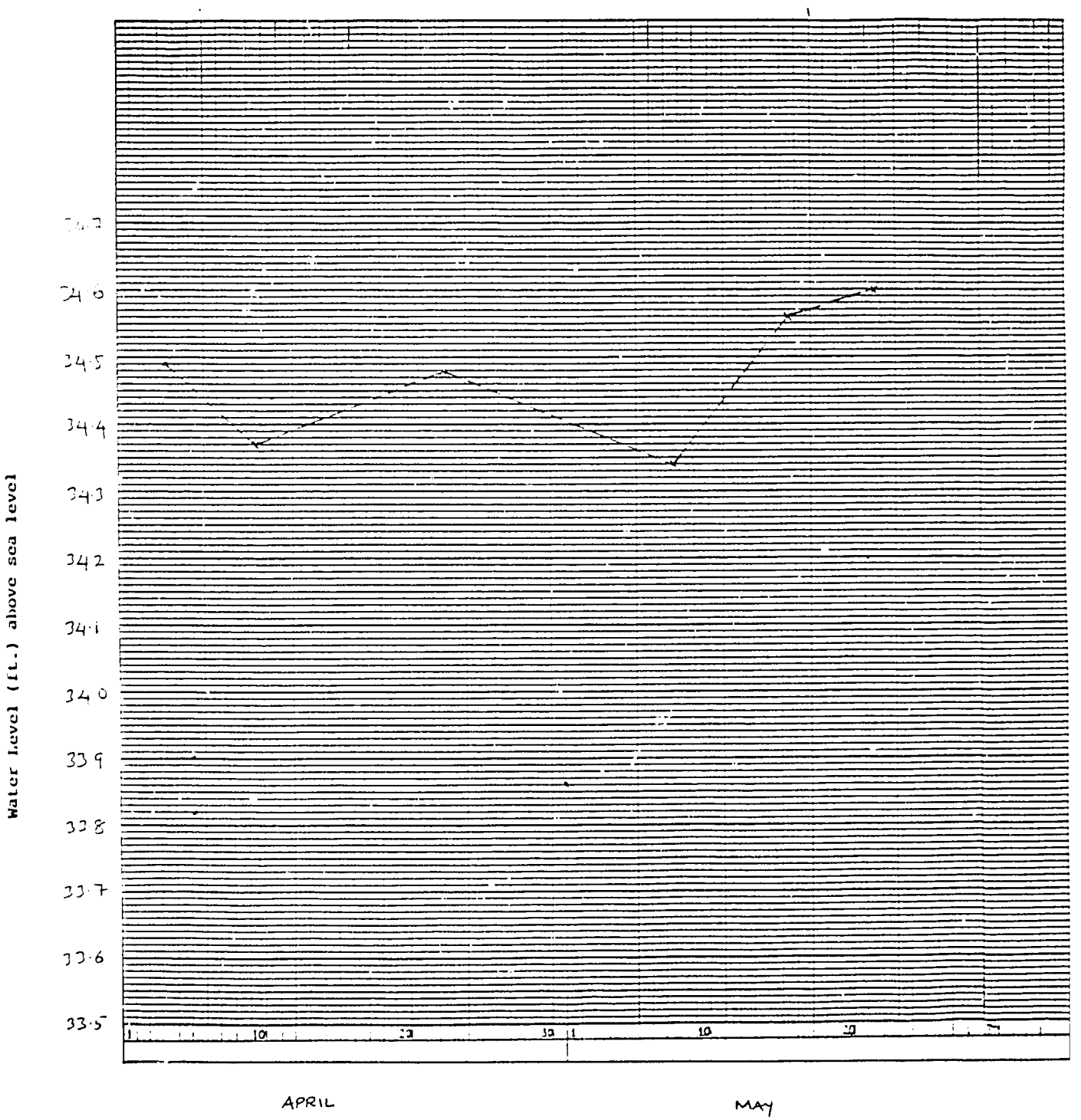
ELEVATION OF M.P.: 49.14 ft



WELL HYDROGRAPH

LOCATION: GOVERNMENT PARK

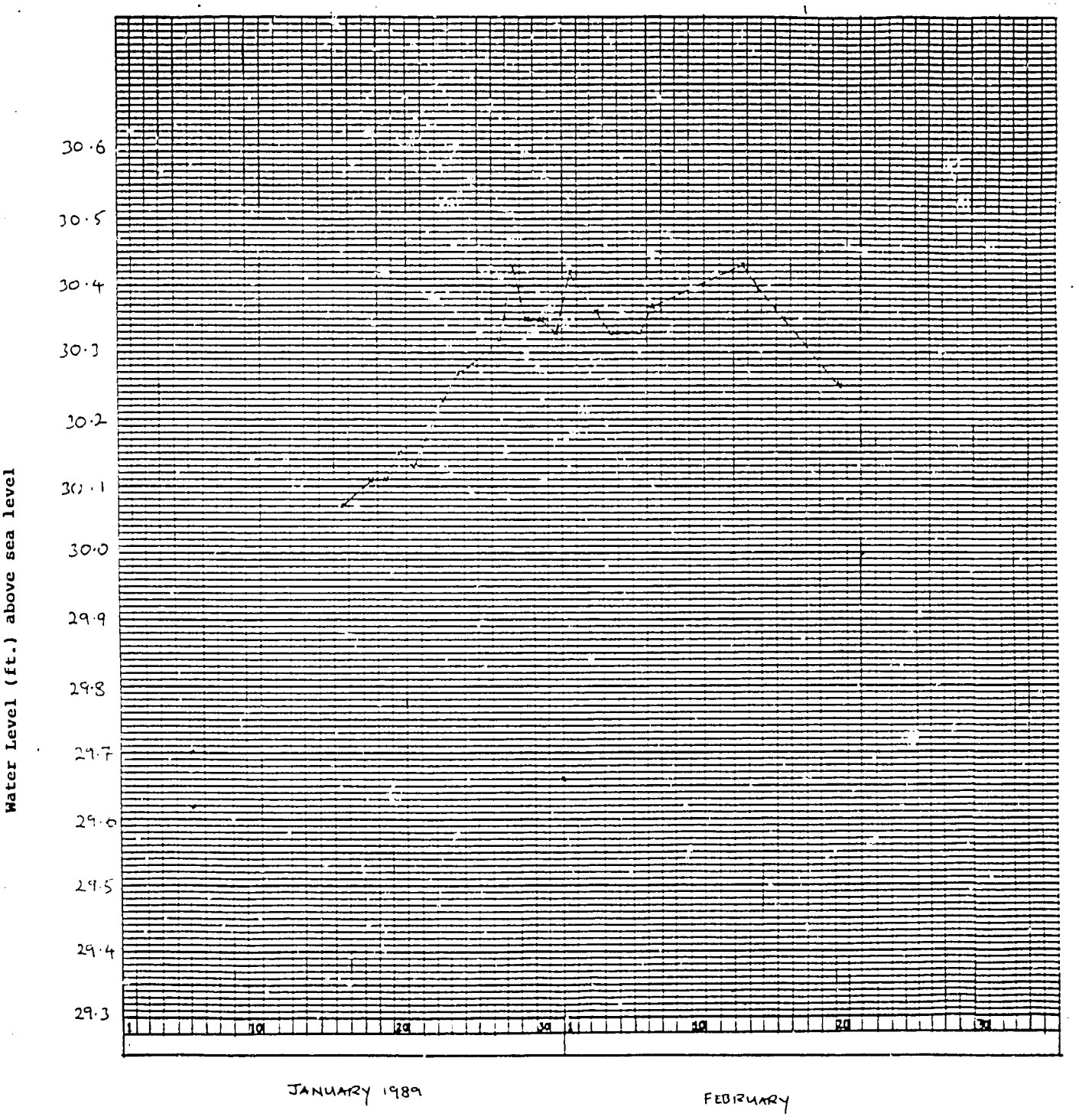
ELEVATION OF M.P.: 49·14 ft



WELL HYDROGRAPH

LOCATION: CLIFTON #3

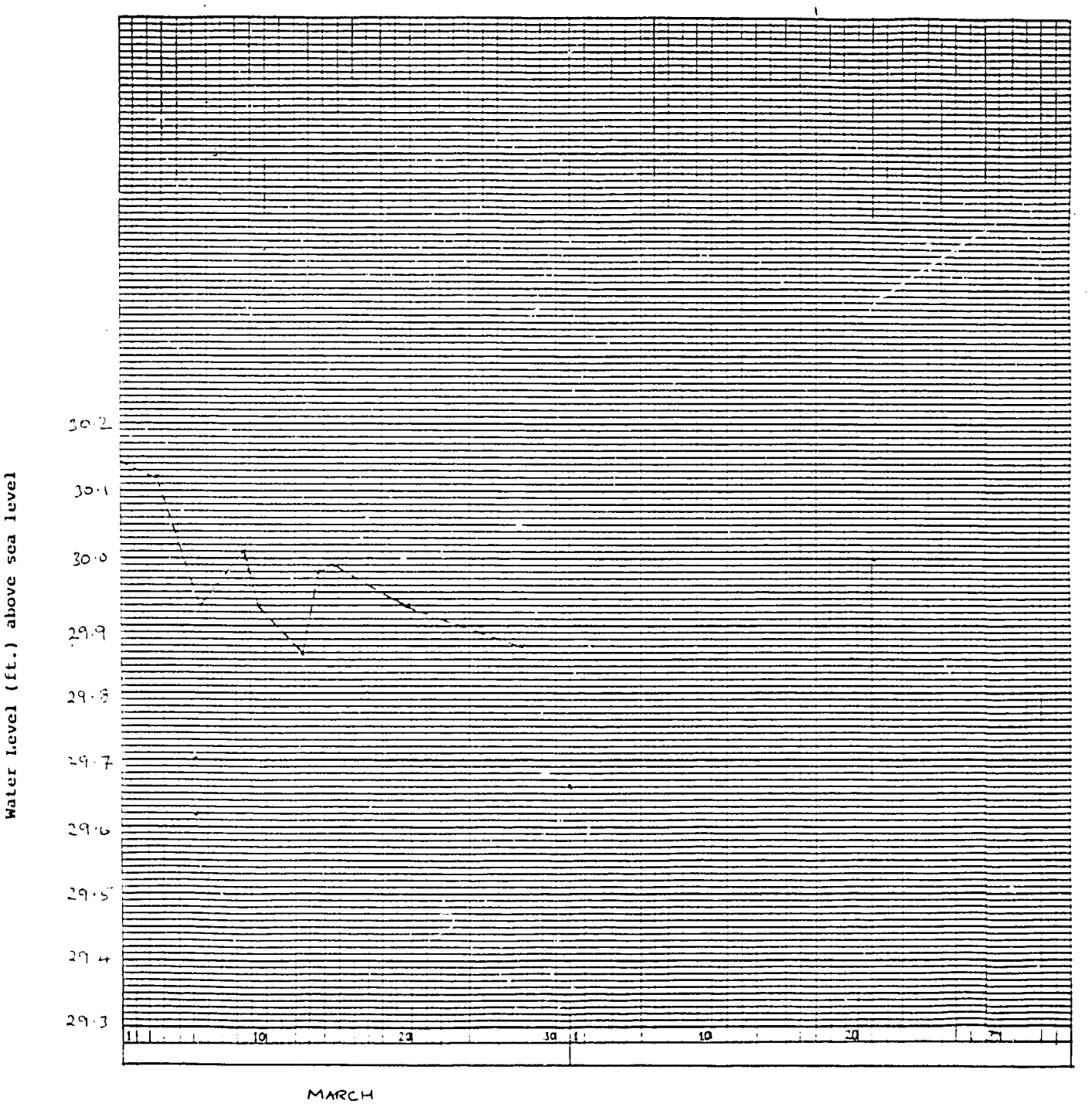
ELEVATION OF M.P.: 50.0 ft



WELL HYDROGRAPH

LOCATION: CLIFTON #3

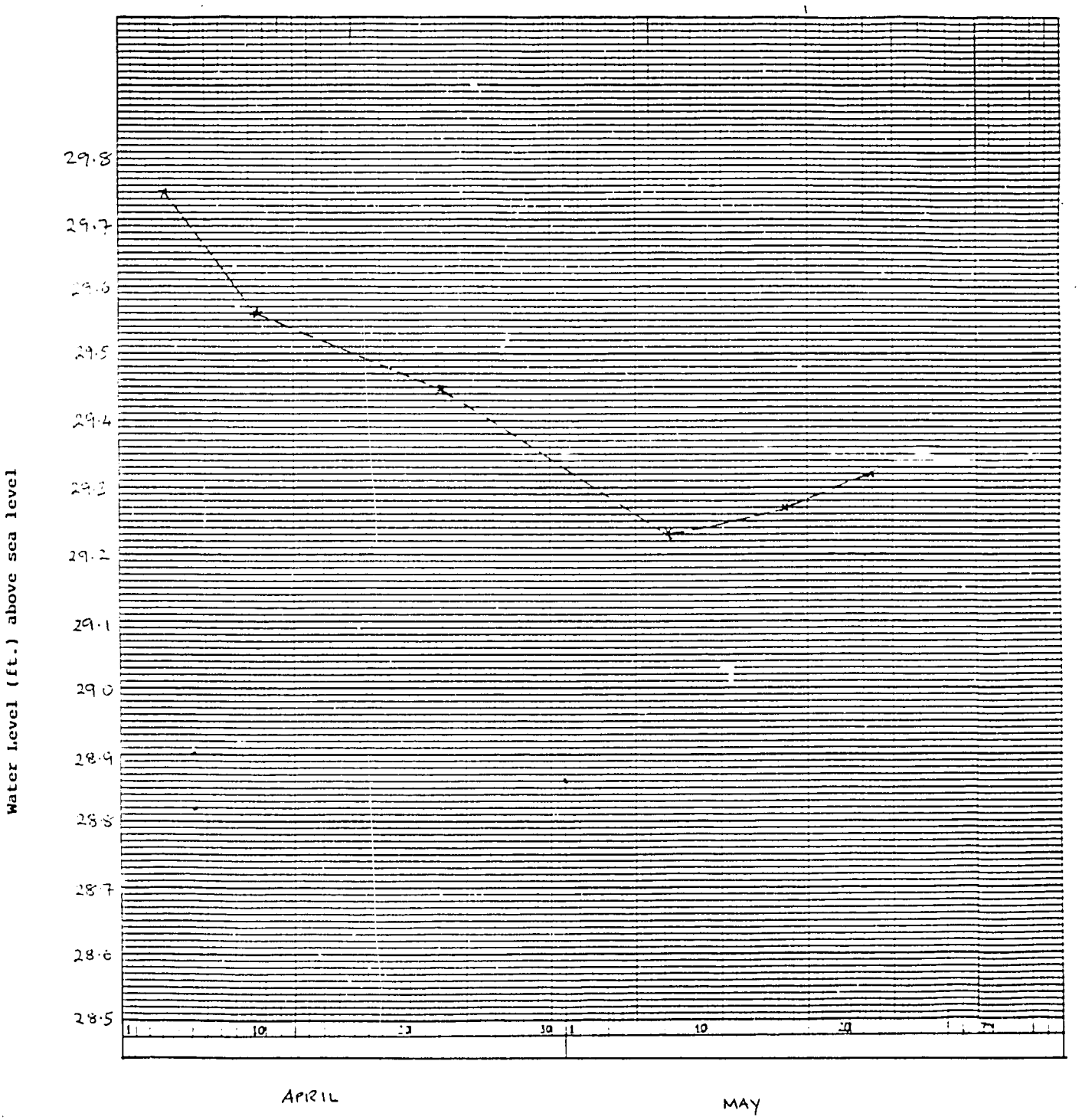
ELEVATION OF M.P.: 50.0 ft



WELL HYDROGRAPH

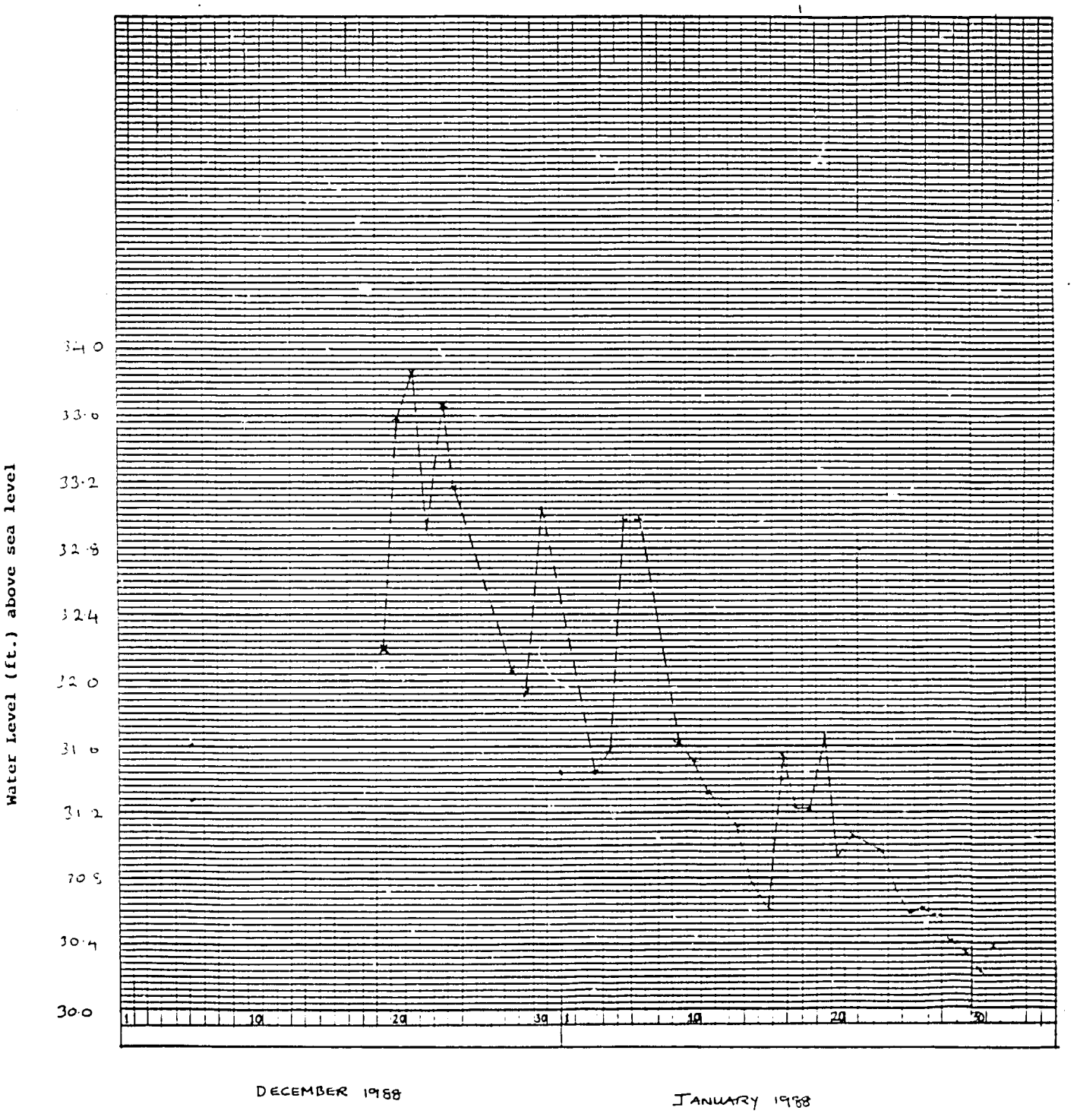
LOCATION: CLIFTON #3

ELEVATION OF M.P.: 50.0 ft.



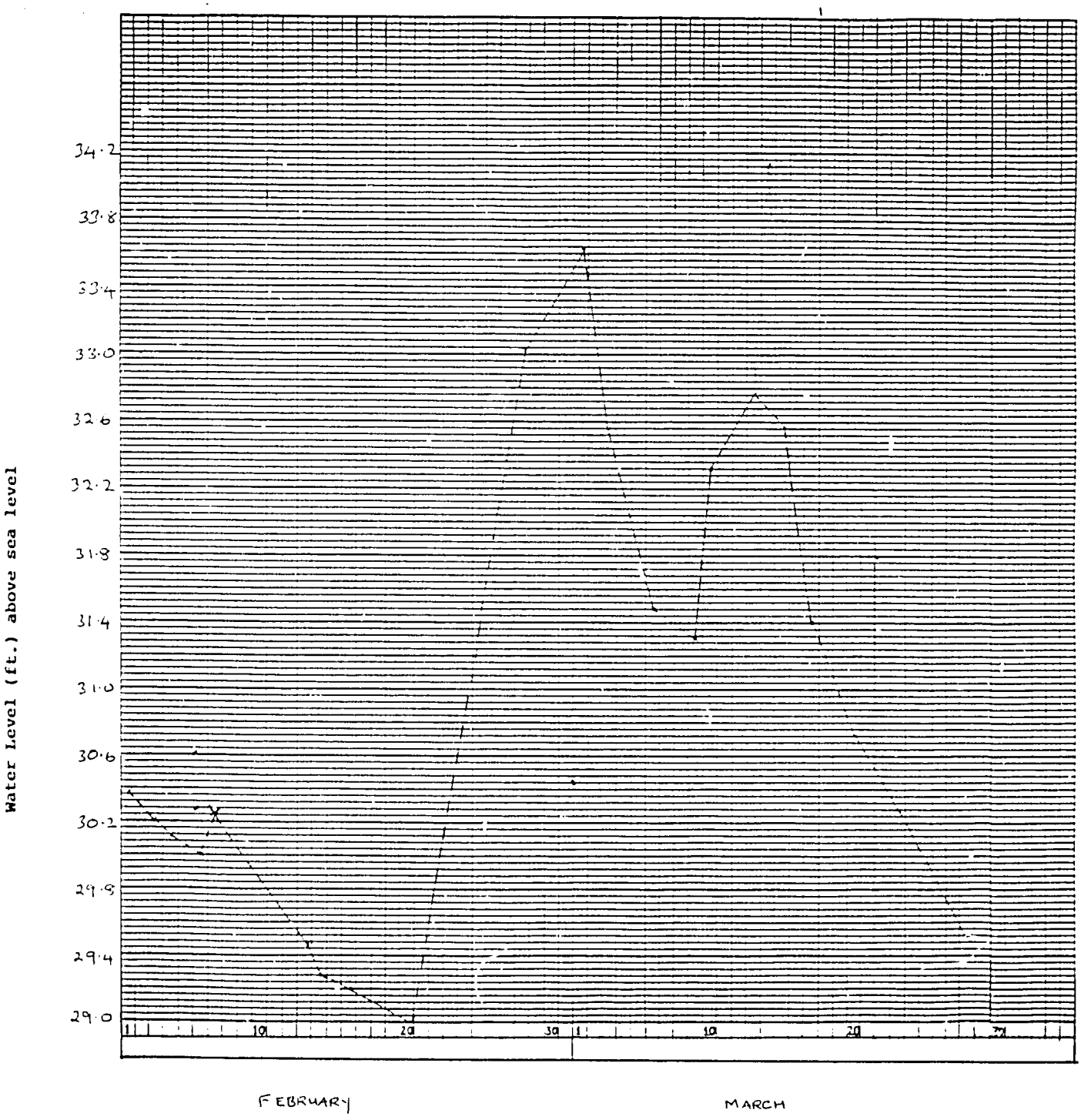
WELL HYDROGRAPH

LOCATION: HALFWAY TREE #5 **ELEVATION OF M.P.:** 43.18 ft.



WELL HYDROGRAPH

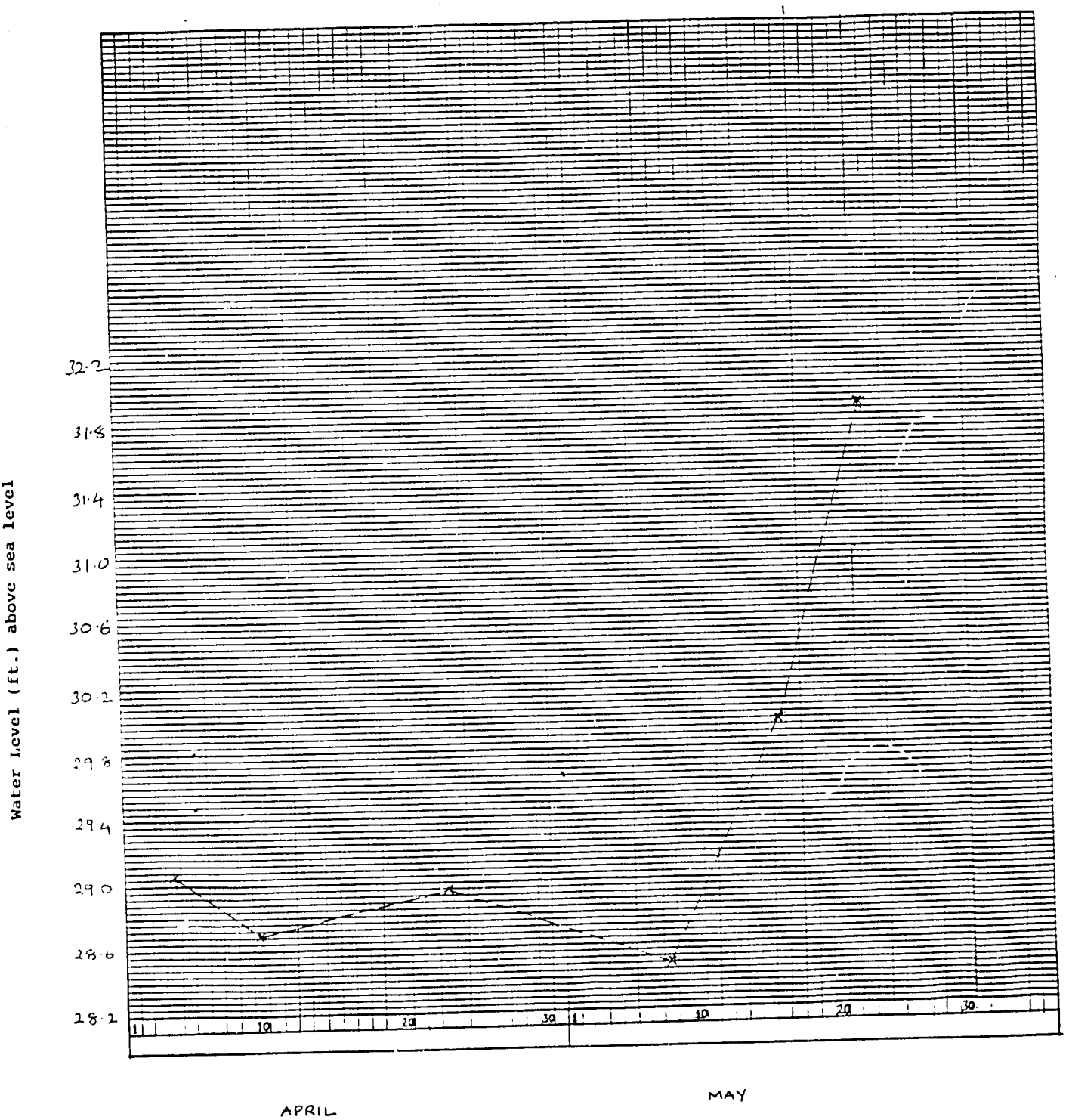
LOCATION: HALFWAY TREE#5 **ELEVATION OF M.P.:** 43·18 ft.



WELL HYDROGRAPH

LOCATION: HALFWAY TREE #5

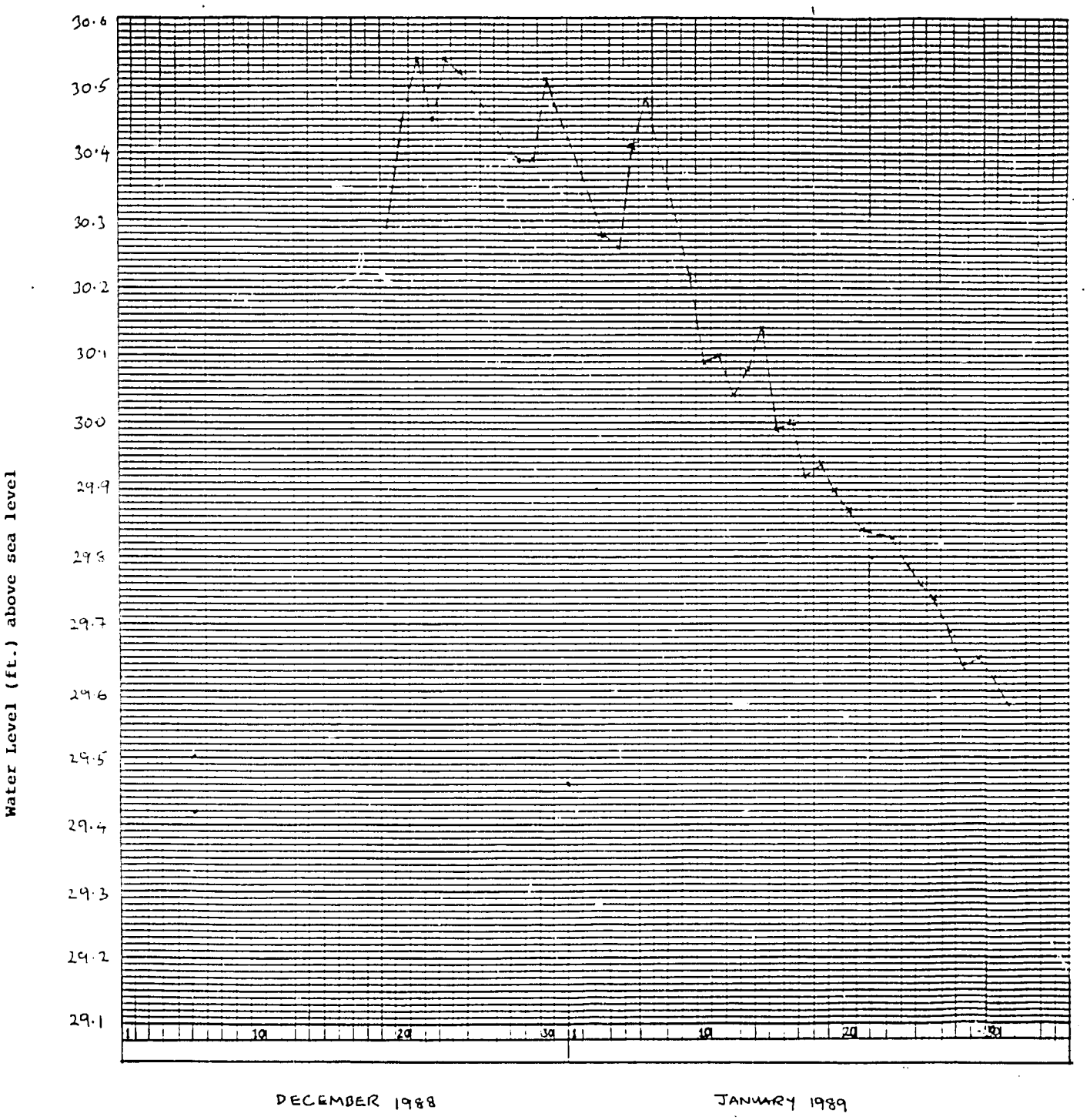
ELEVATION OF M.P.: 43.18 ft



WELL HYDROGRAPH

LOCATION: HALFWAY TREE #2

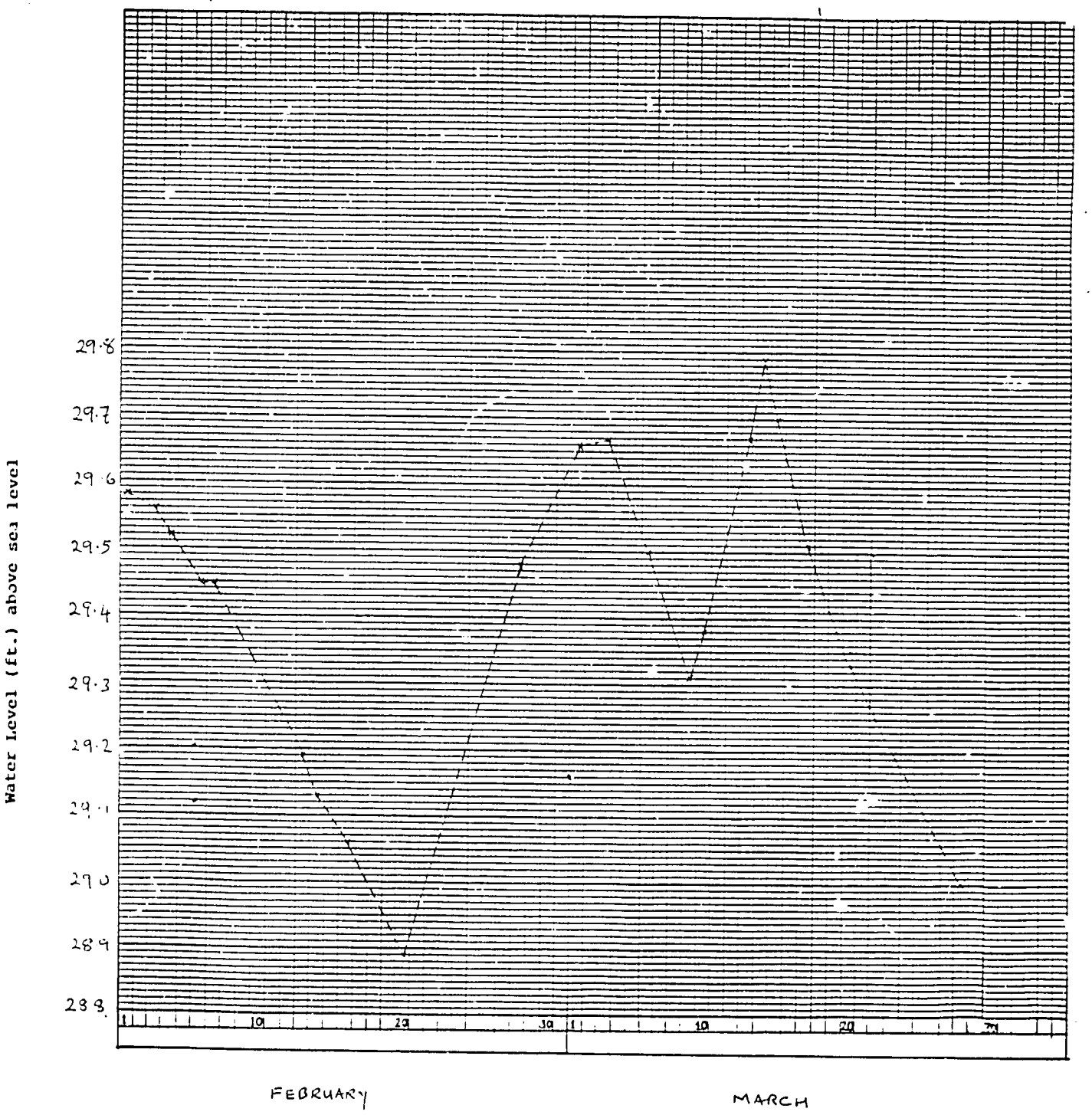
ELEVATION OF M.P.: 43·03 ft.



WELL HYDROGRAPH

LOCATION: HALFWAY TREE #2

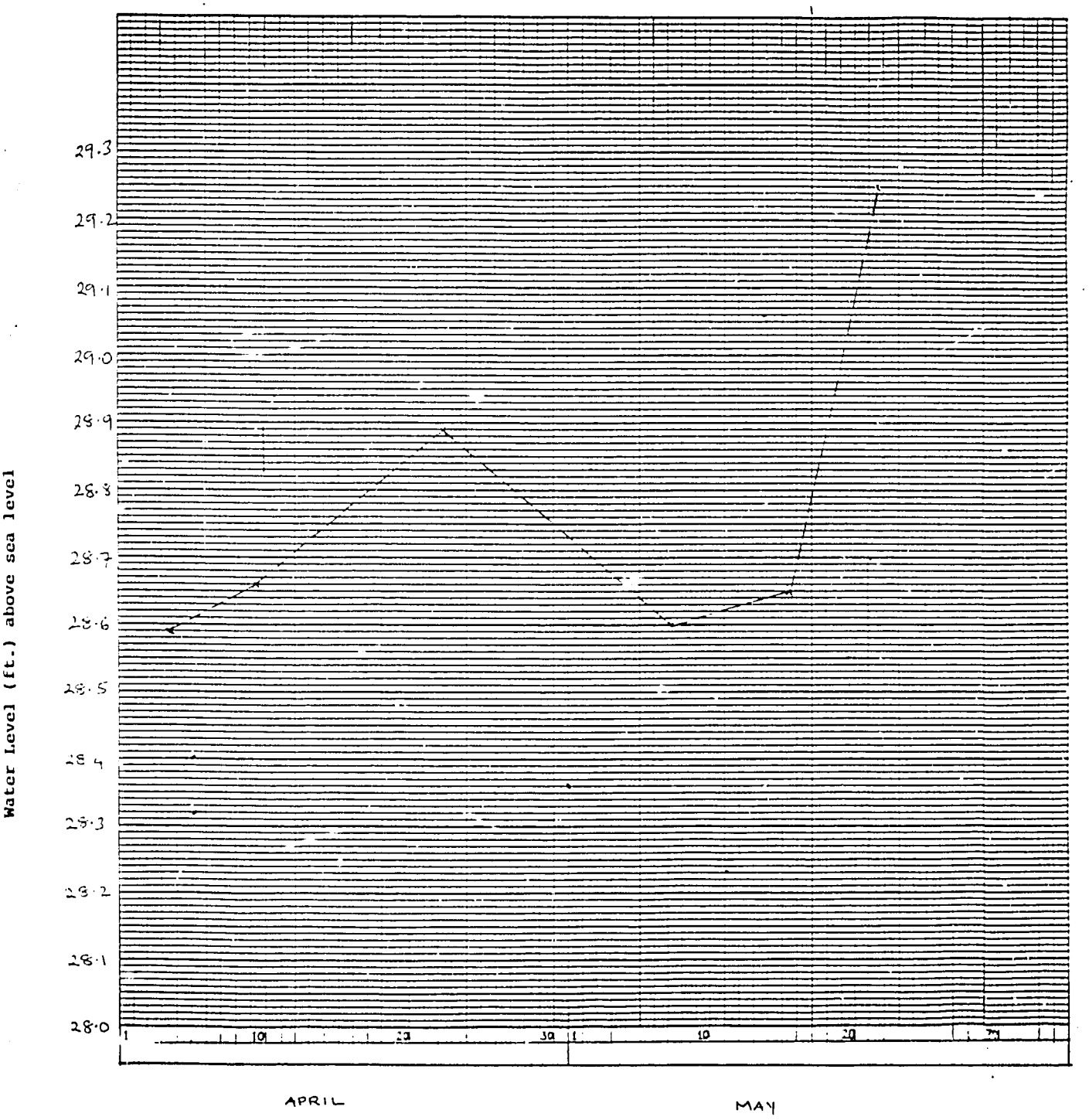
ELEVATION OF M.P.: 43.03 ft.



WELL HYDROGRAPH

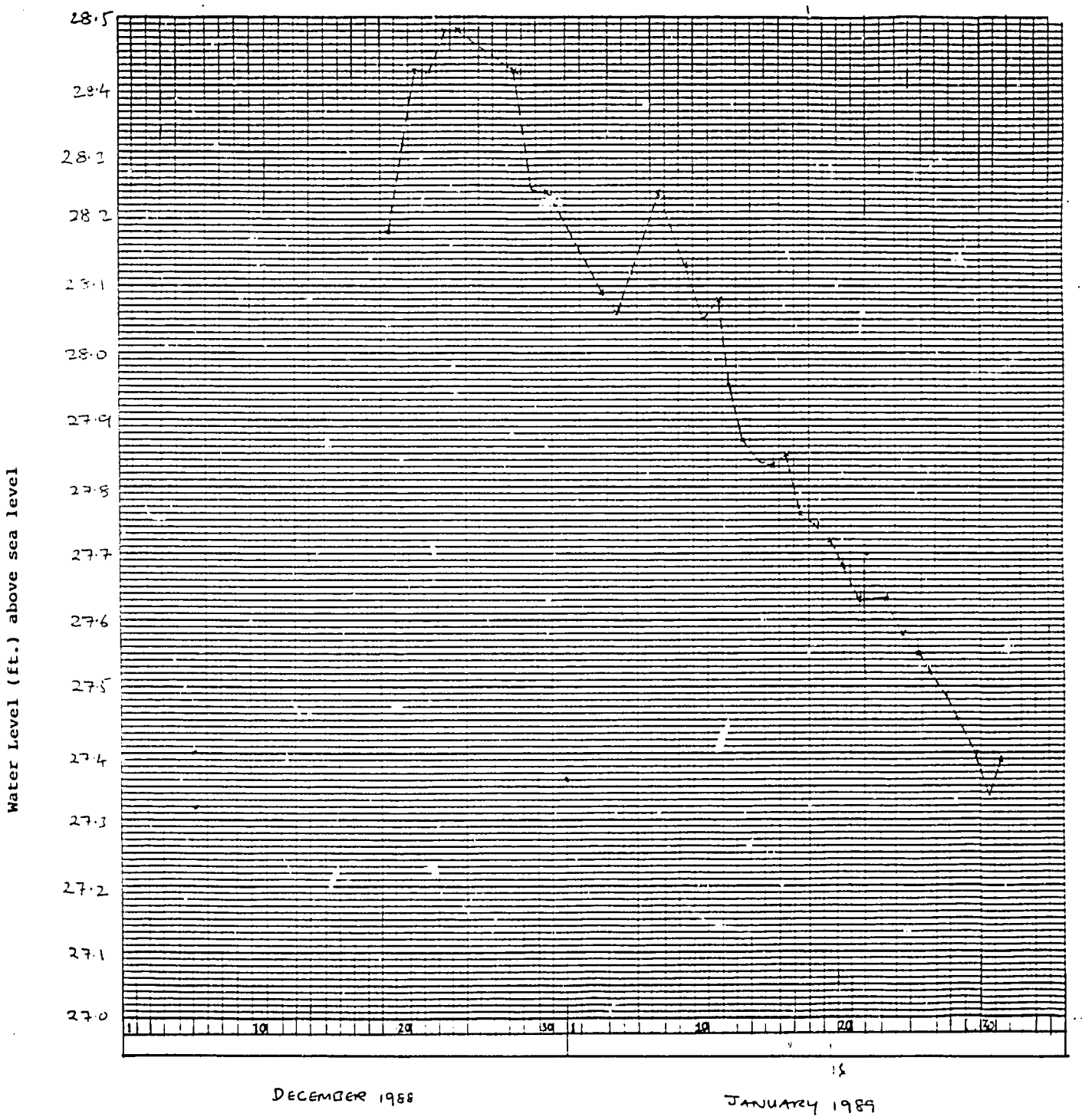
LOCATION: HALFWAY TREE #2

ELEVATION OF M.P.: 43.03 ft.



WELL HYDROGRAPH

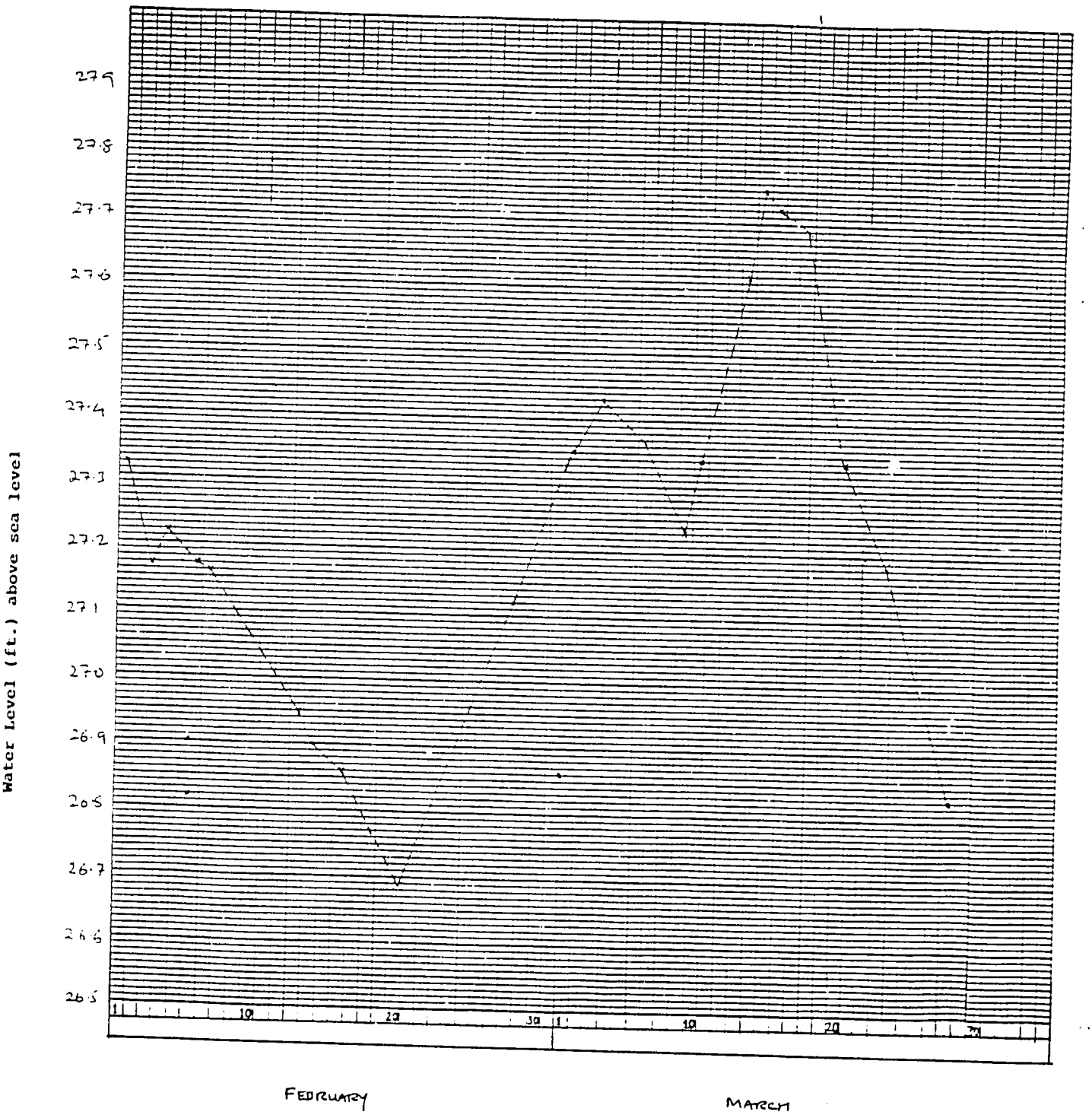
LOCATION: HALFWAY TREE #6 **ELEVATION OF M.P.:** 37.50 ft.



WELL HYDROGRAPH

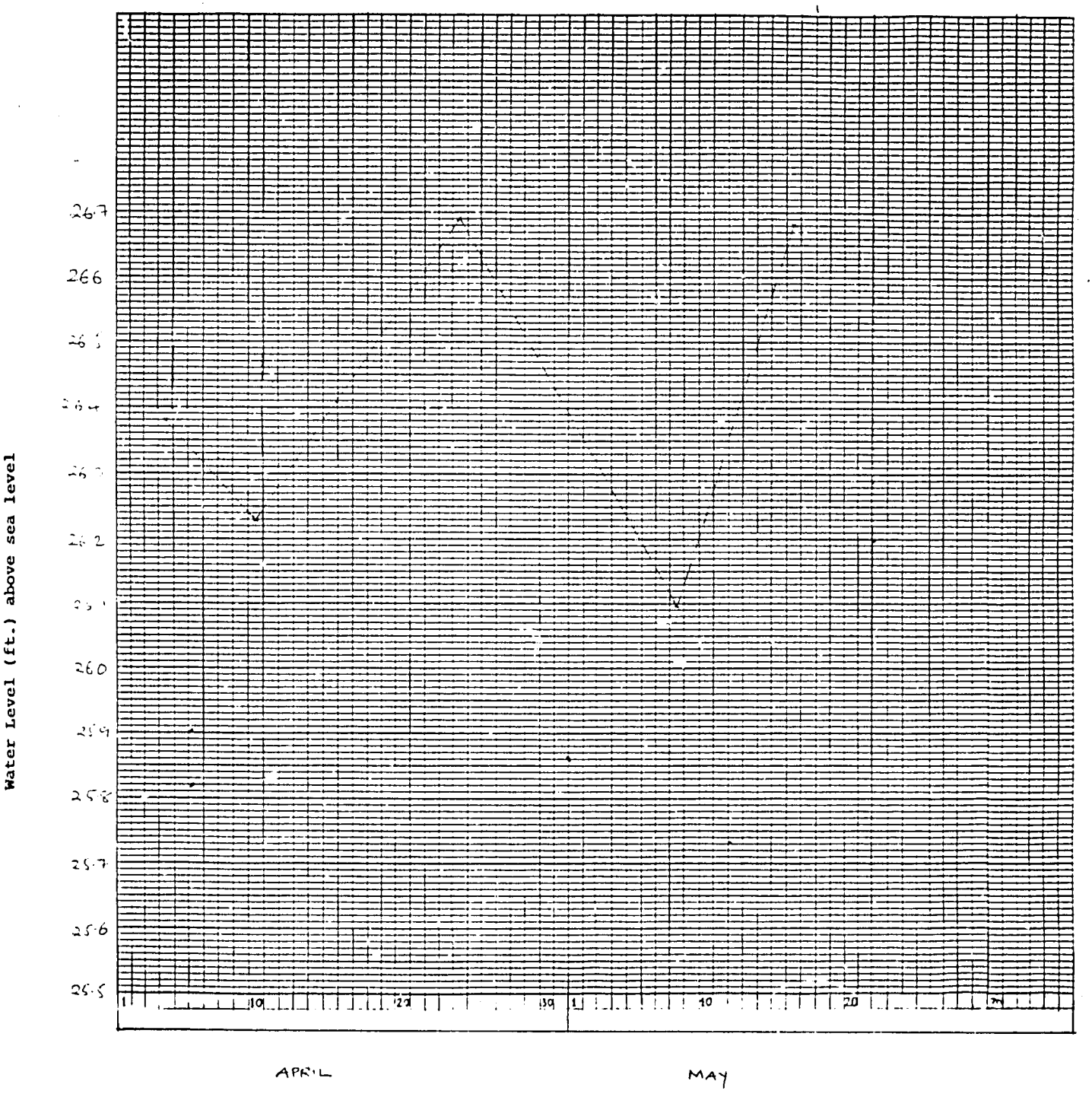
LOCATION: HALFWAY TREE #6

ELEVATION OF M.P.: 37.50 ft.



WELL HYDROGRAPH

LOCATION: HALFWAY TREE #6 **ELEVATION OF M.P.:** 37.50ft

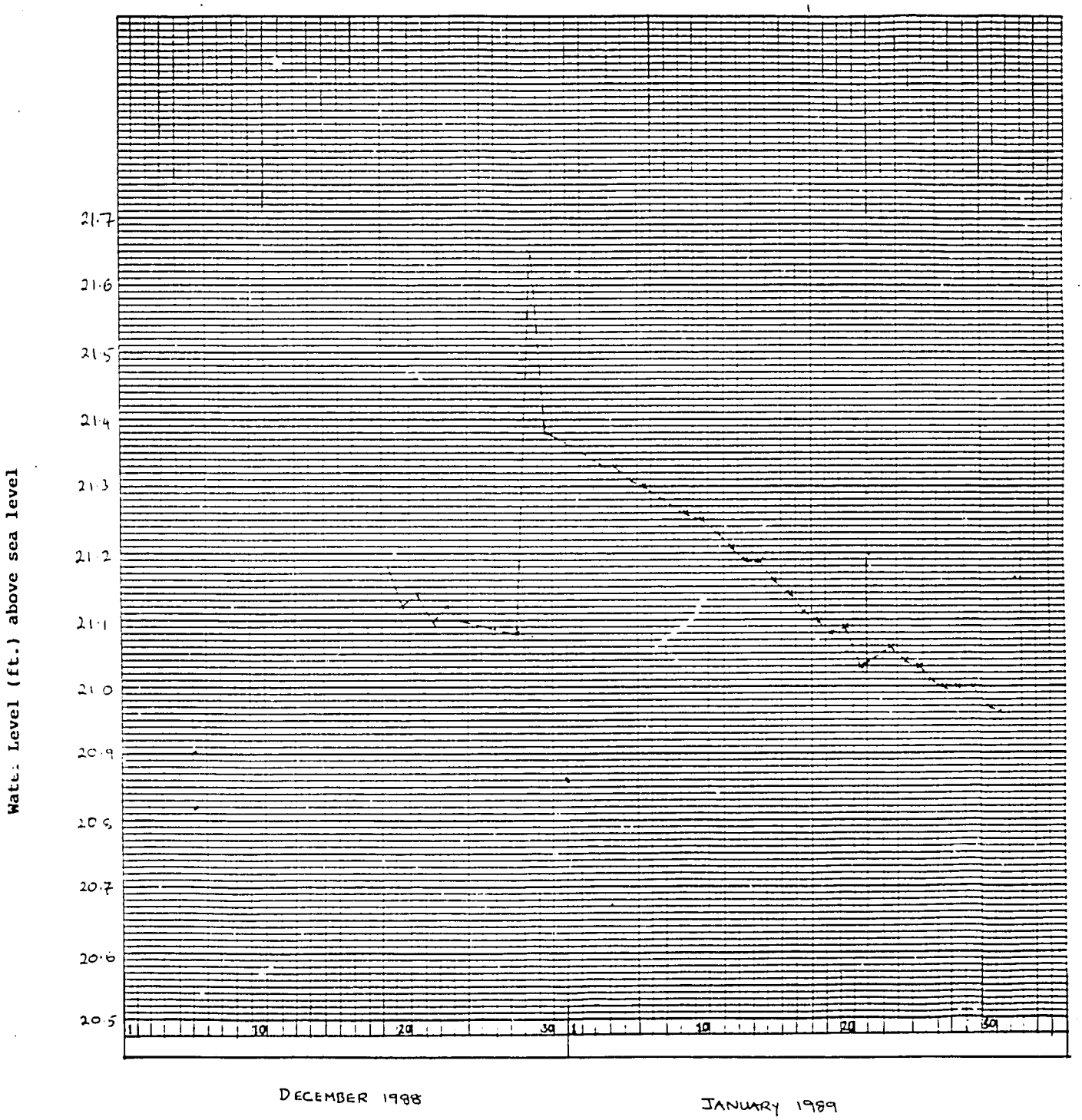


31.

WELL HYDROGRAPH

LOCATION: NEWLANDS #3

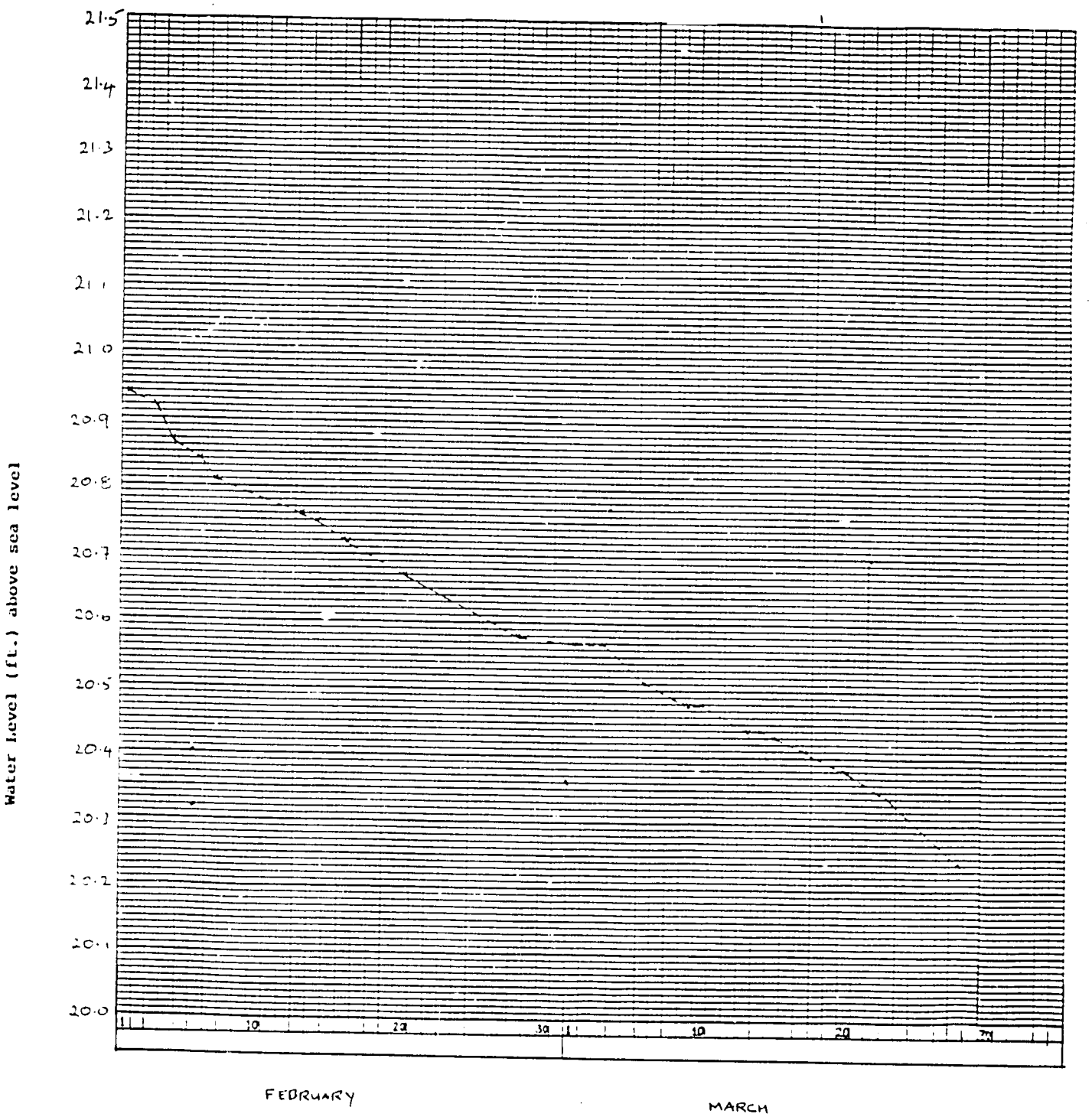
ELEVATION OF M.P.: 32.24 ft.



WELL HYDROGRAPH

LOCATION: NEWLANDS #3

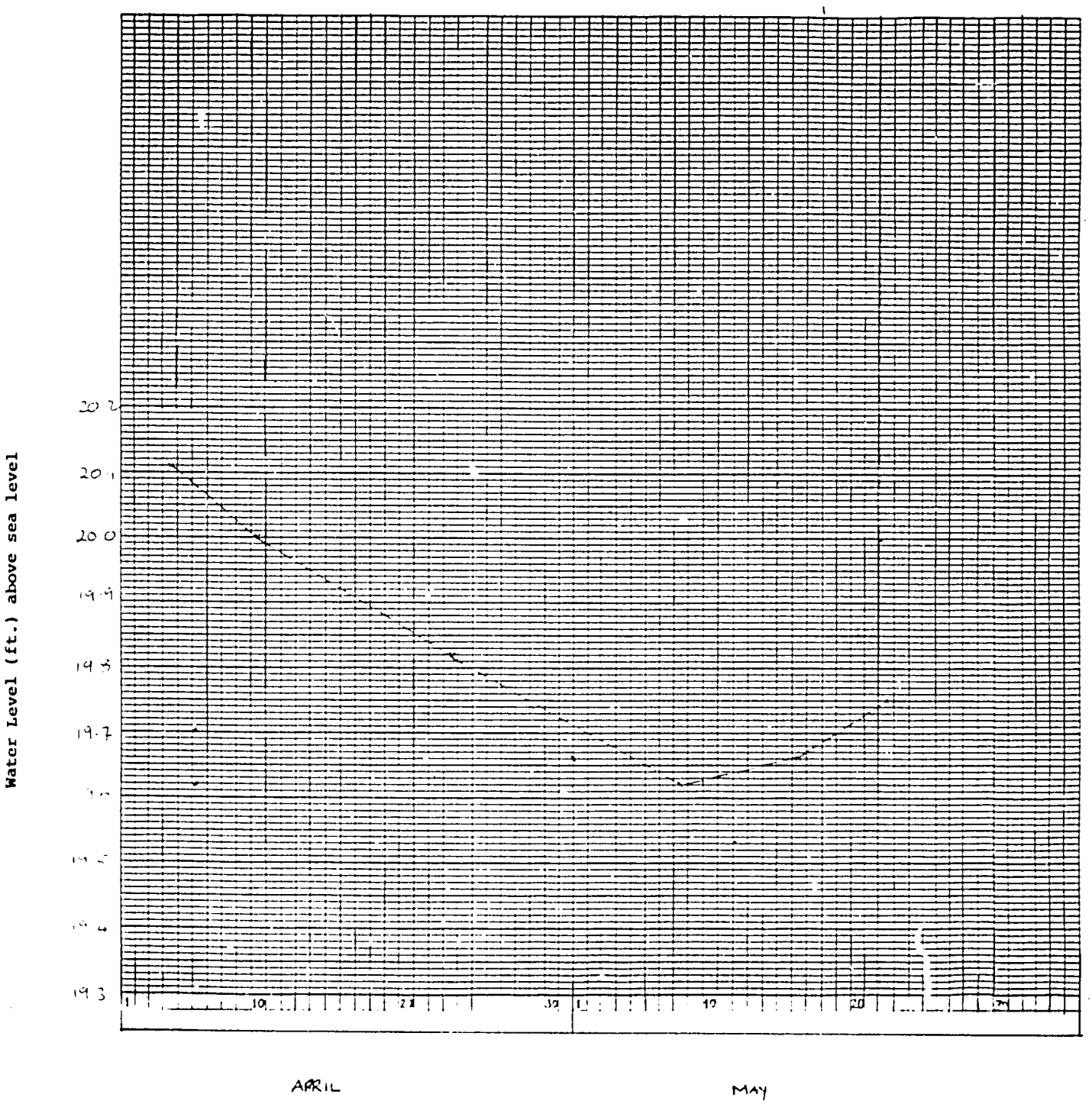
ELEVATION OF M.P.: 32.24 ft.



WELL HYDROGRAPH

LOCATION: NEWLANDS # 3

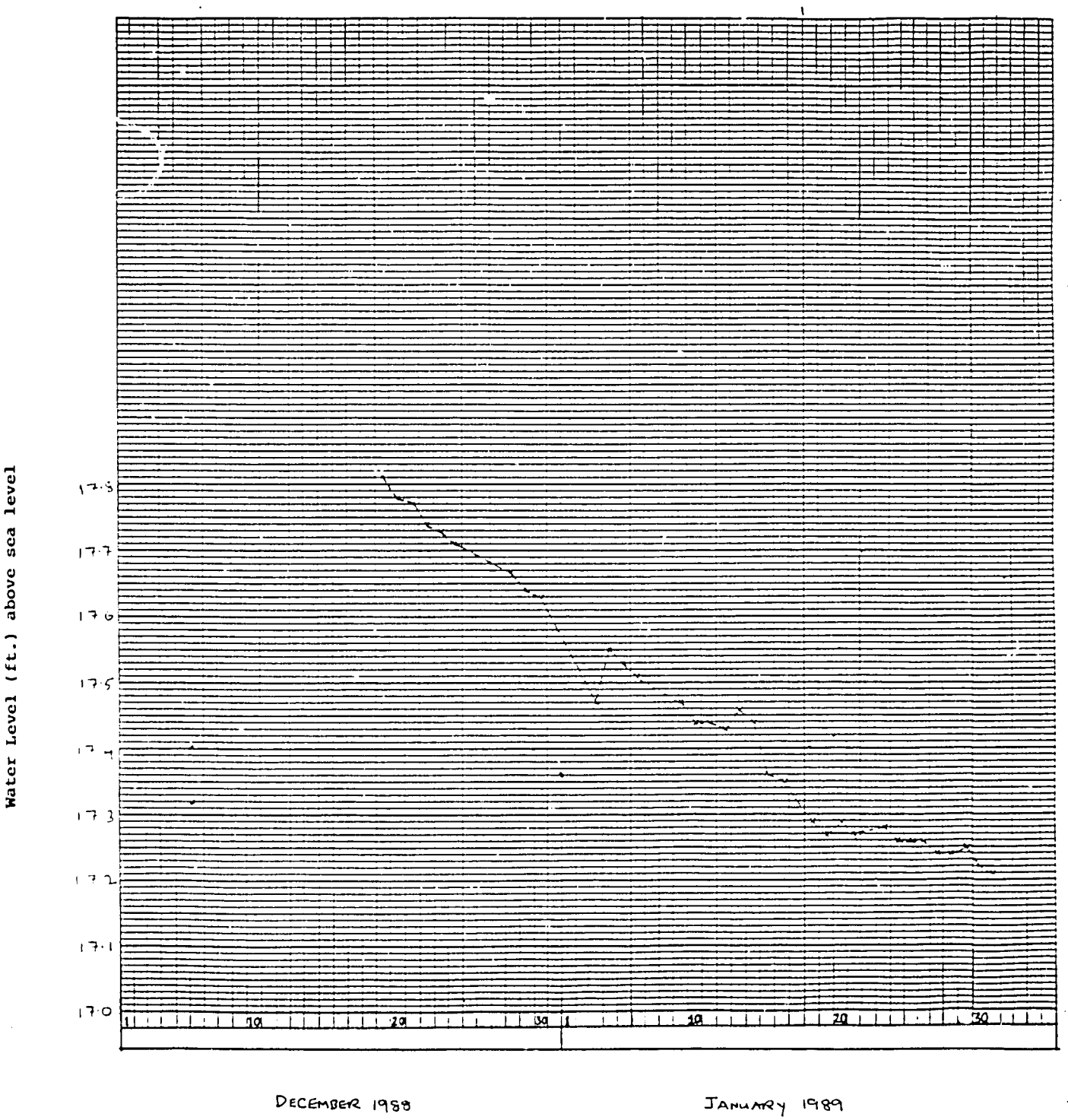
ELEVATION OF M.P.: 32·24 ft.



WELL HYDROGRAPH

LOCATION: COOKSON #4

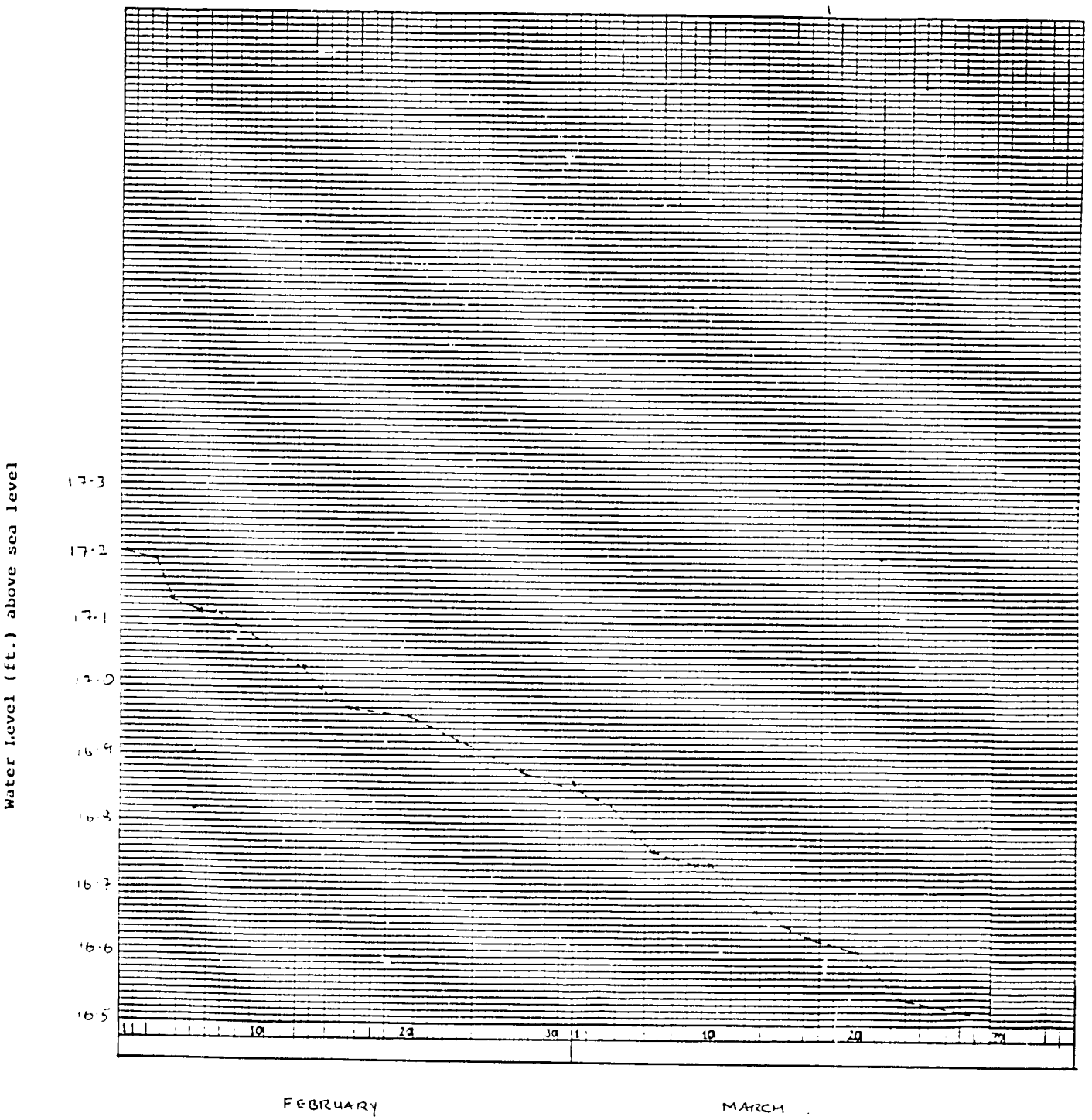
ELEVATION OF M.P.: 27.86 ft



WELL HYDROGRAPH

LOCATION: COOKSON H/T

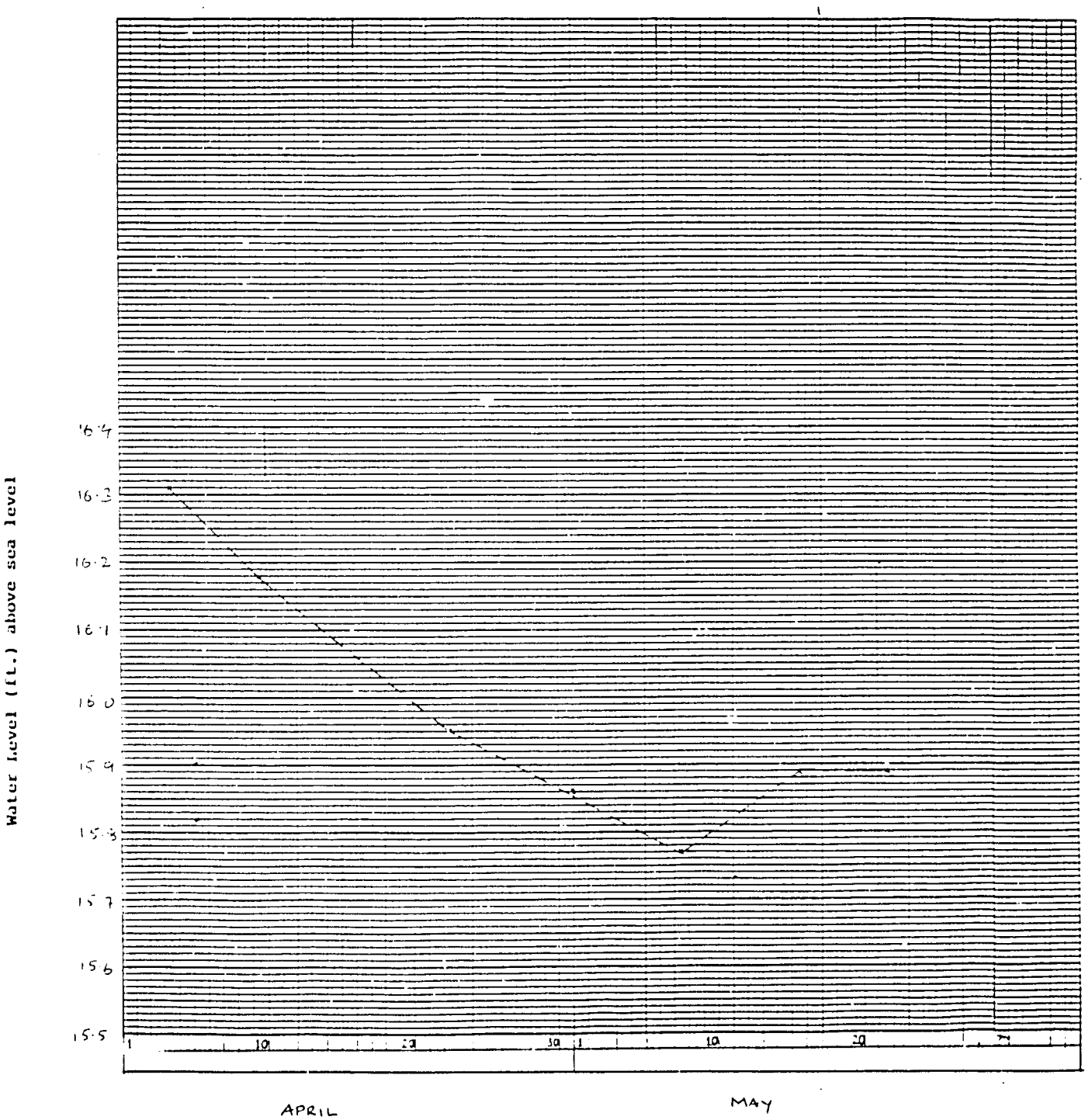
ELEVATION OF M.P.: 27·86 ft



WELL HYDROGI

LOCATION: COOKSON #4

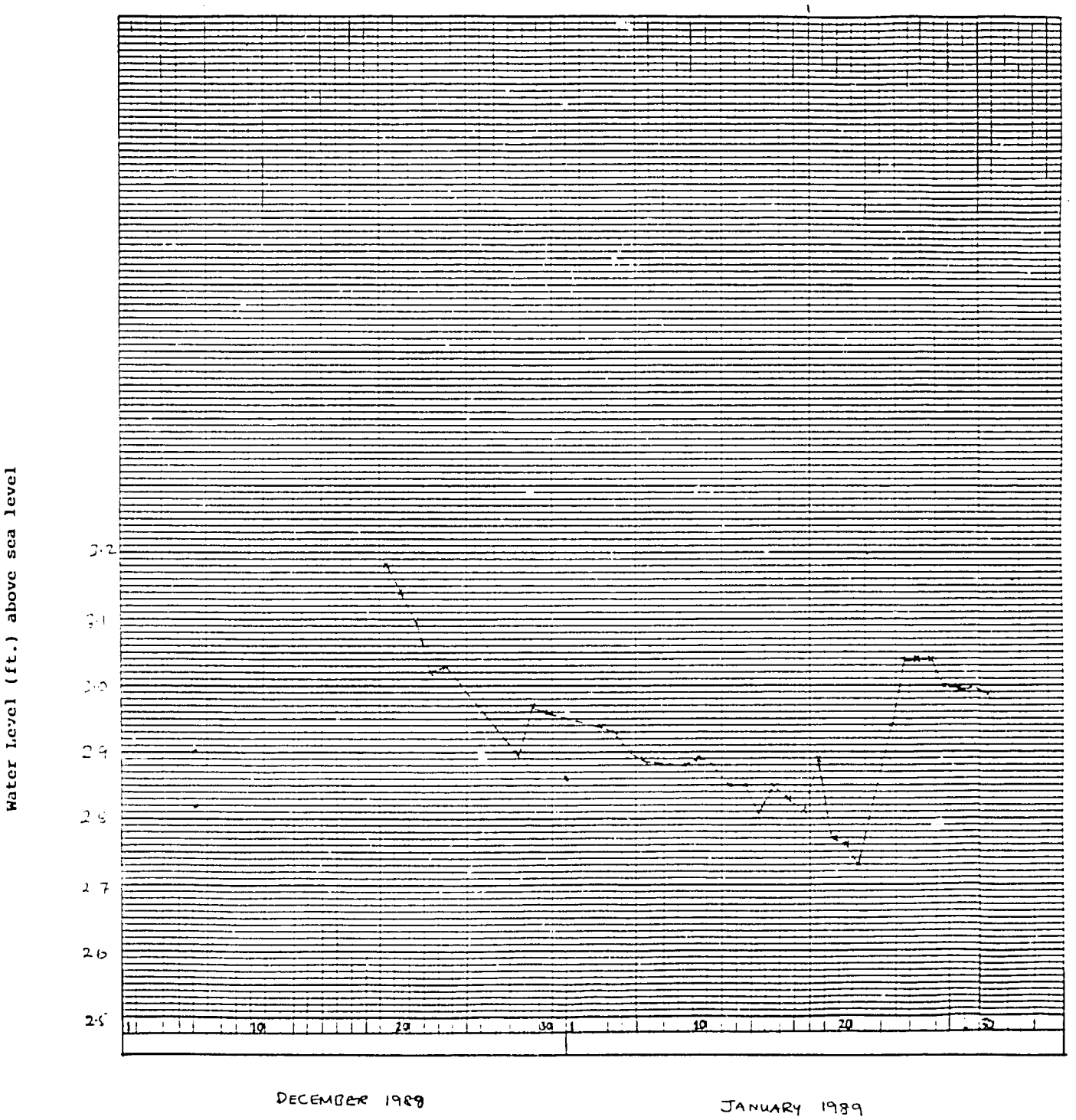
ELEVATION OF M.P.: 27.86 ft



WELL HYDROGRAPH

LOCATION: NAGGO HEAD OBS

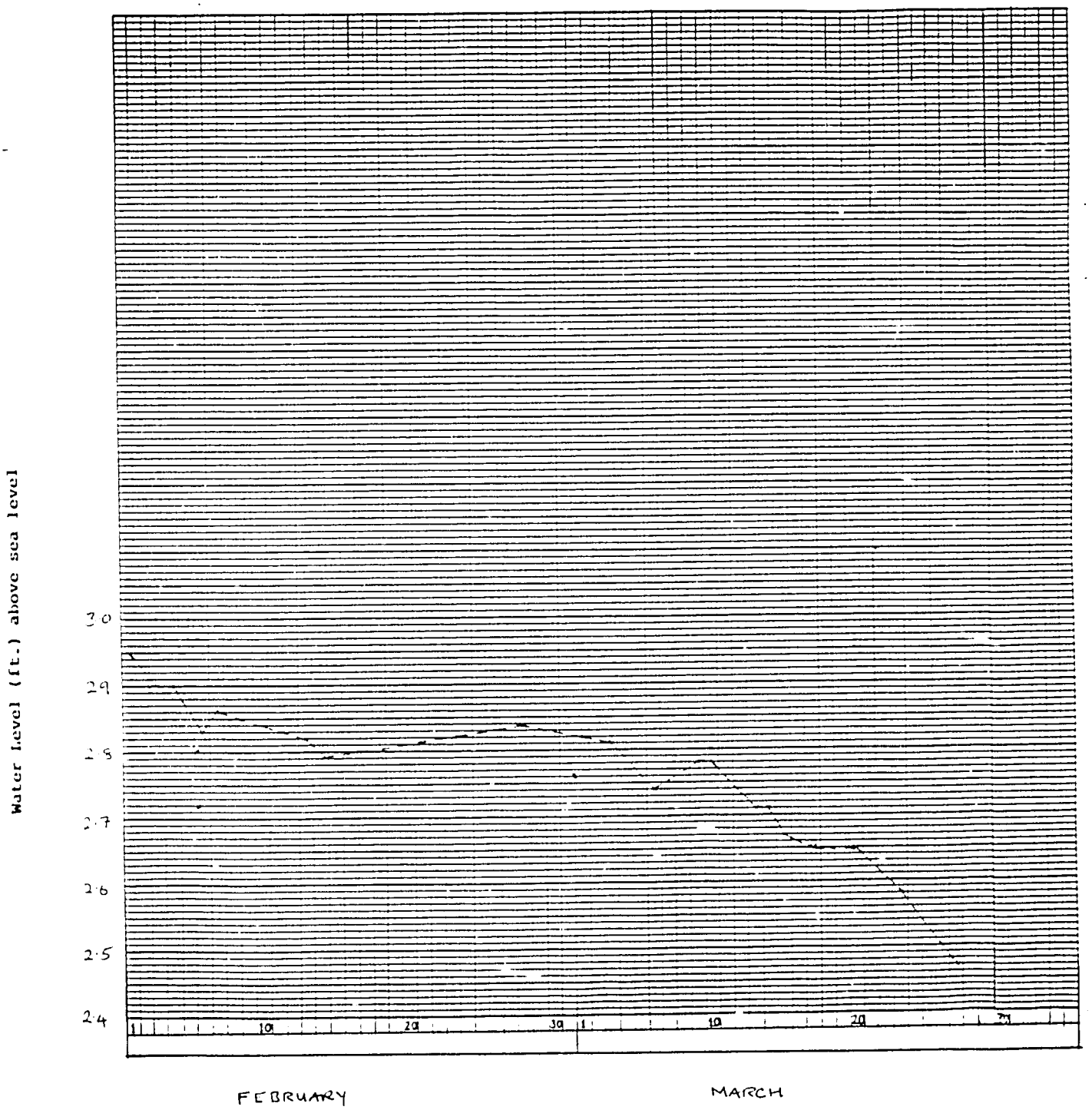
ELEVATION OF M.P.: 7·0 ft



WELL HYDROGRAPH

LOCATION: NAGGO HEAD OBS

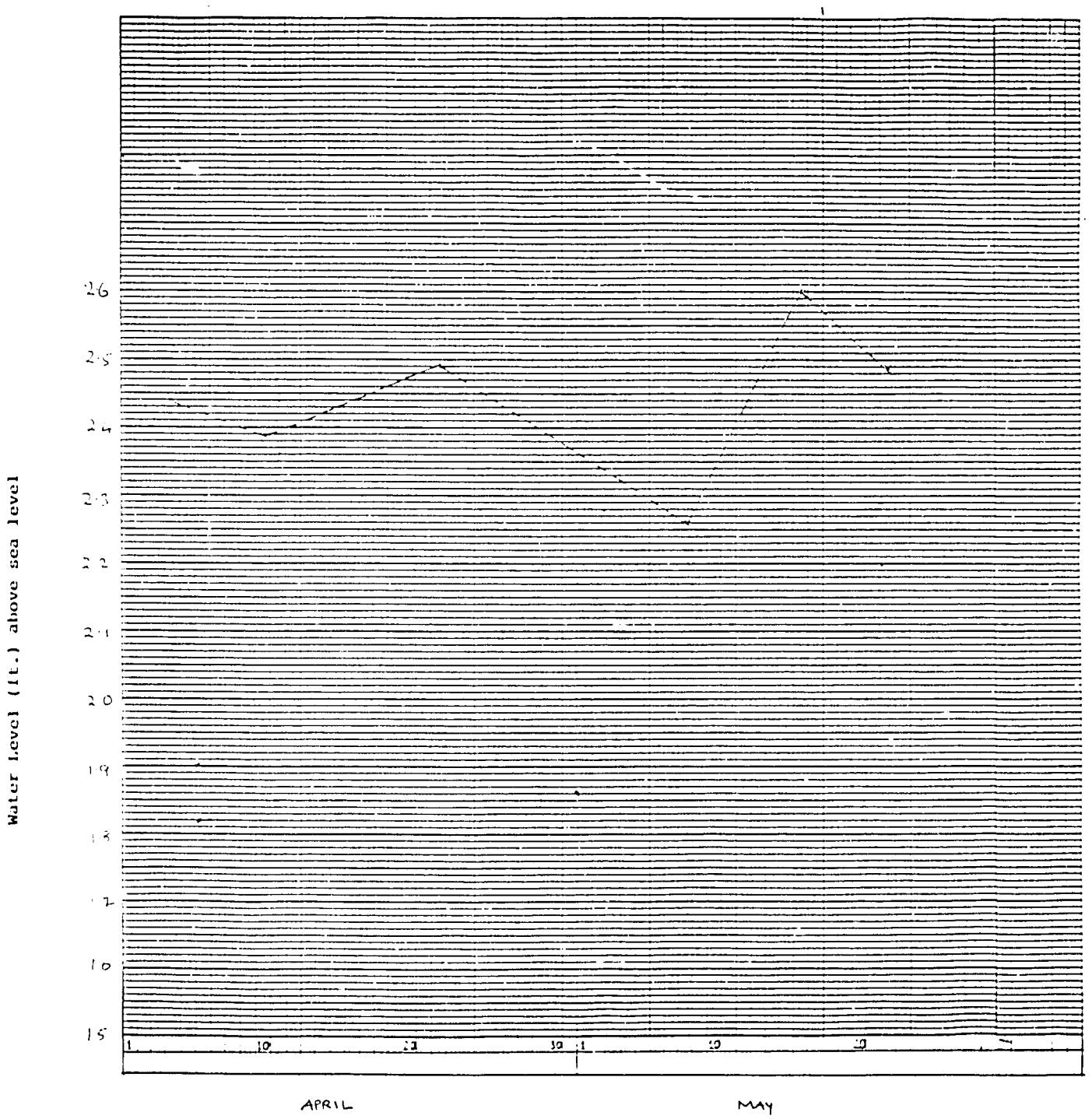
ELEVATION OF M.P.: 70 ft



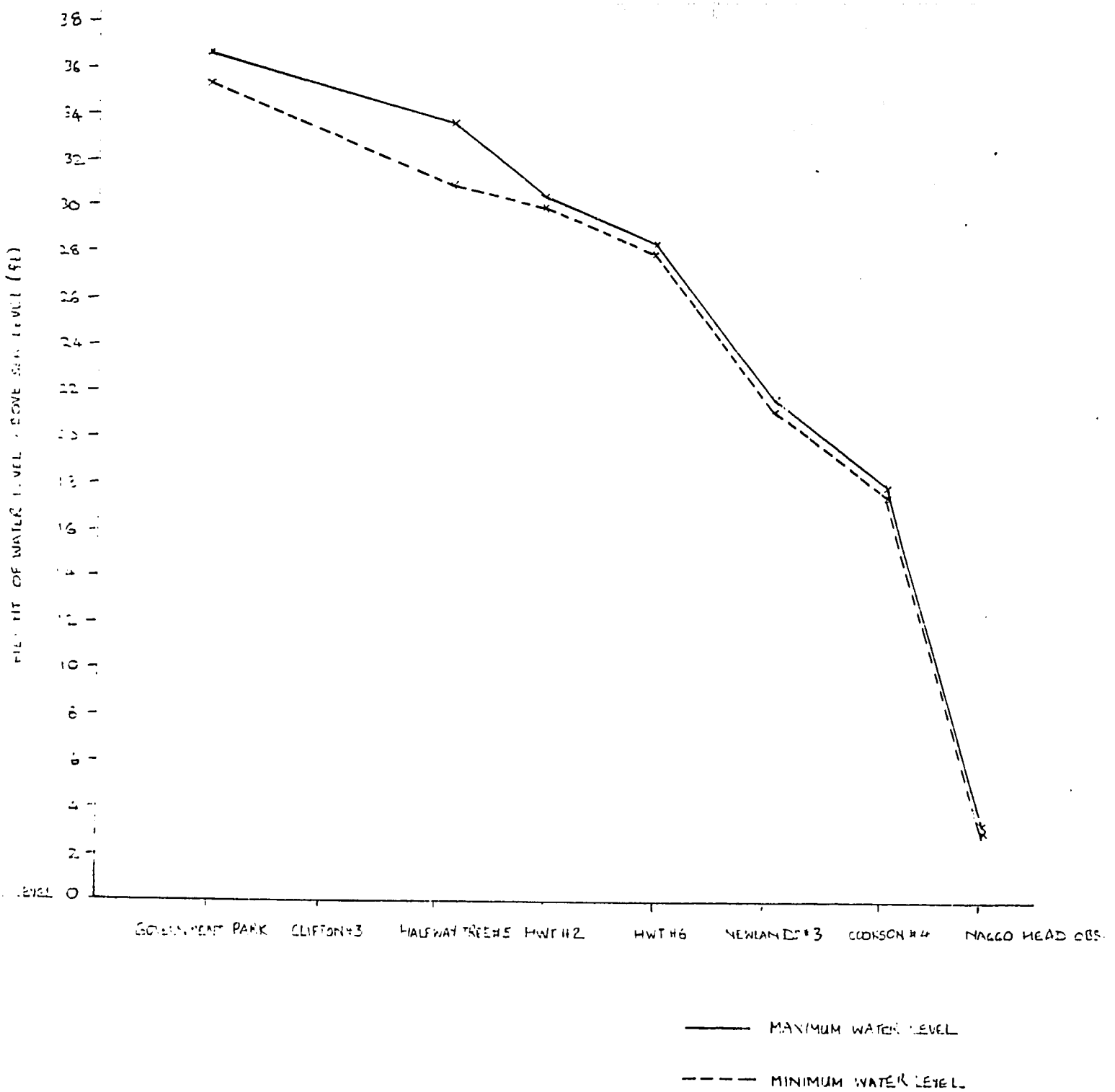
WELL HYDROGRAPH

LOCATION: NAGGO MEAD OBS.

ELEVATION OF M.P.: 7·00 ft

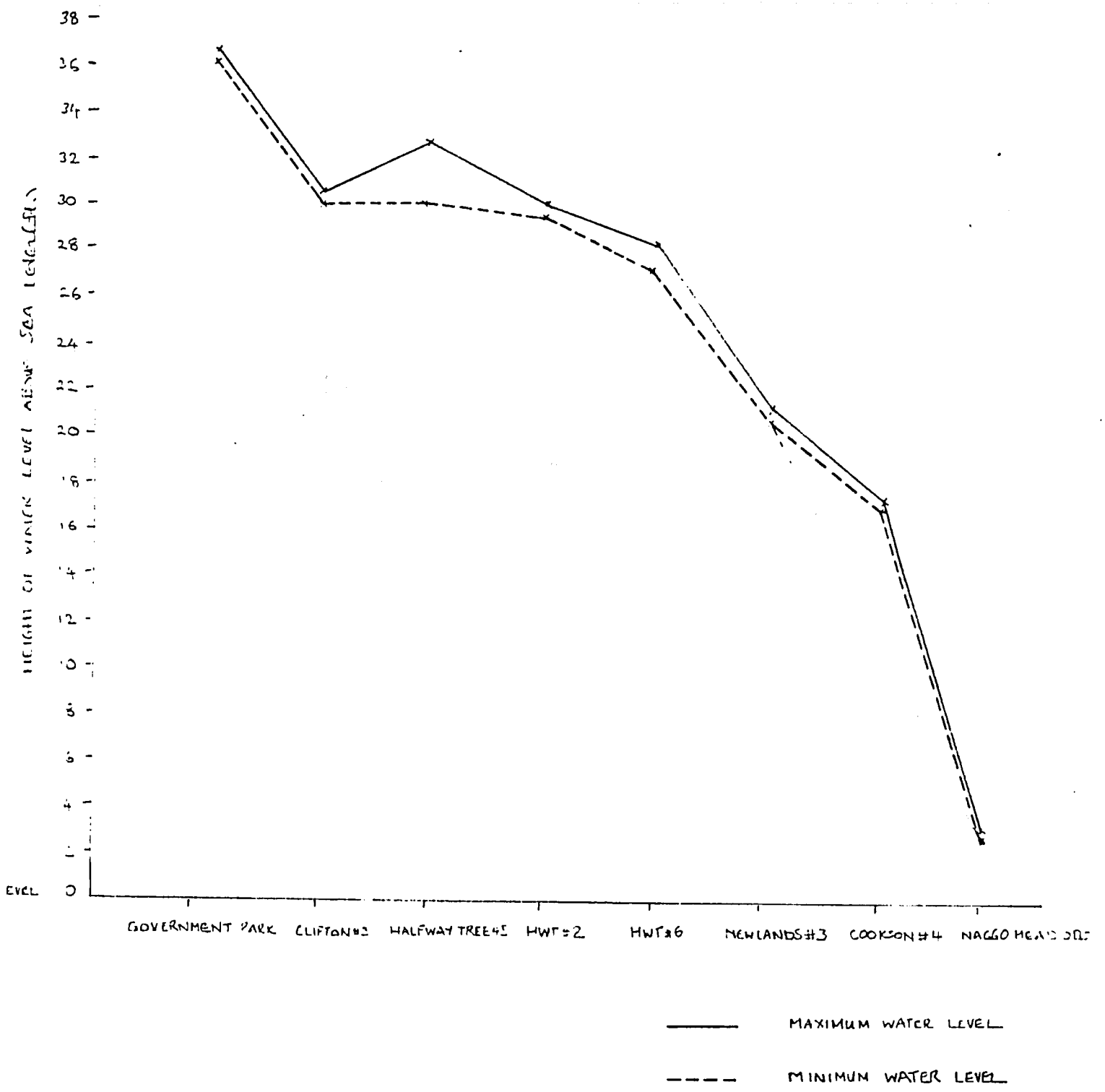


DECEMBER 1988



204

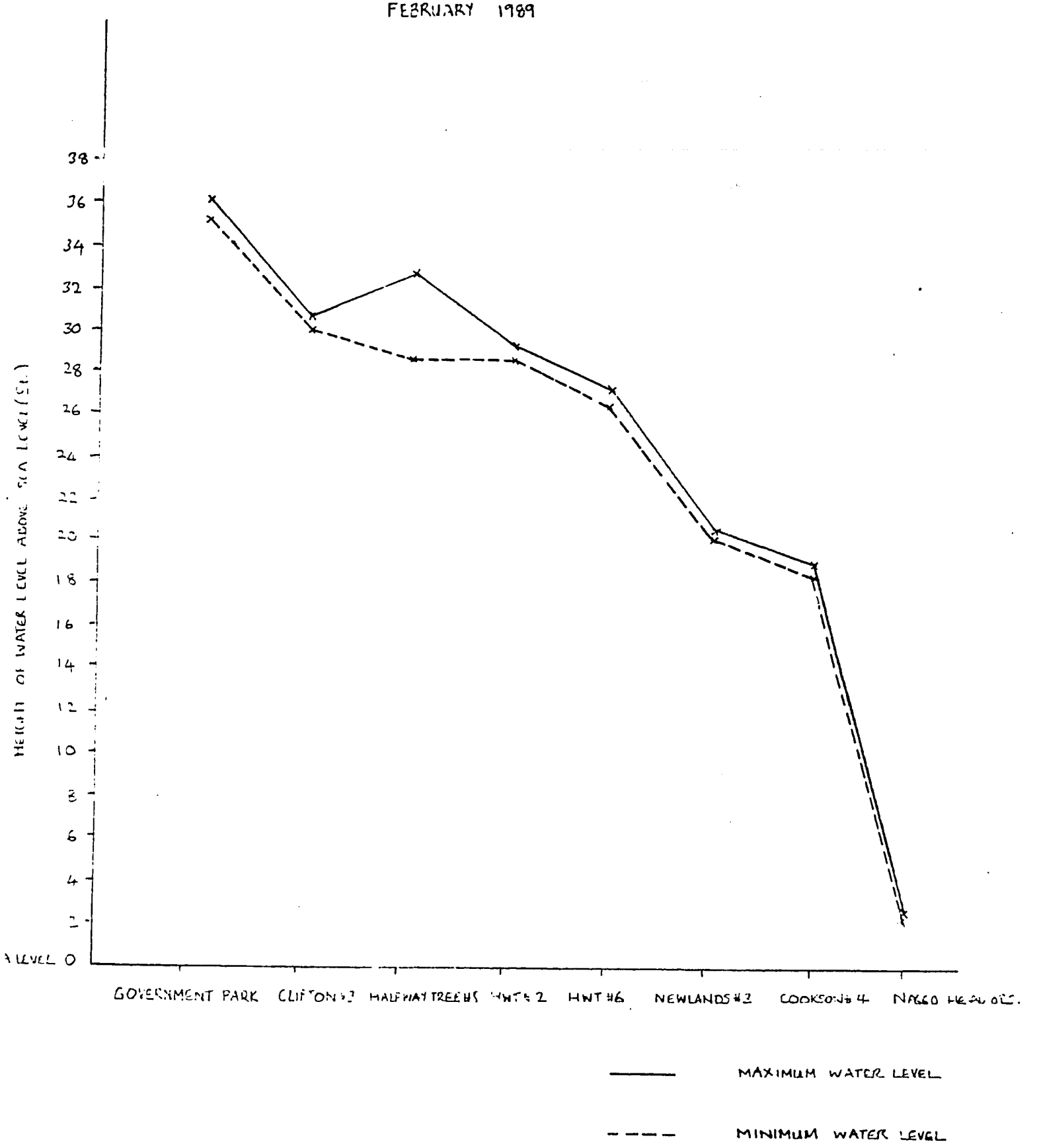
JANUARY 1989



MAXIMUM WATER LEVEL

MINIMUM WATER LEVEL

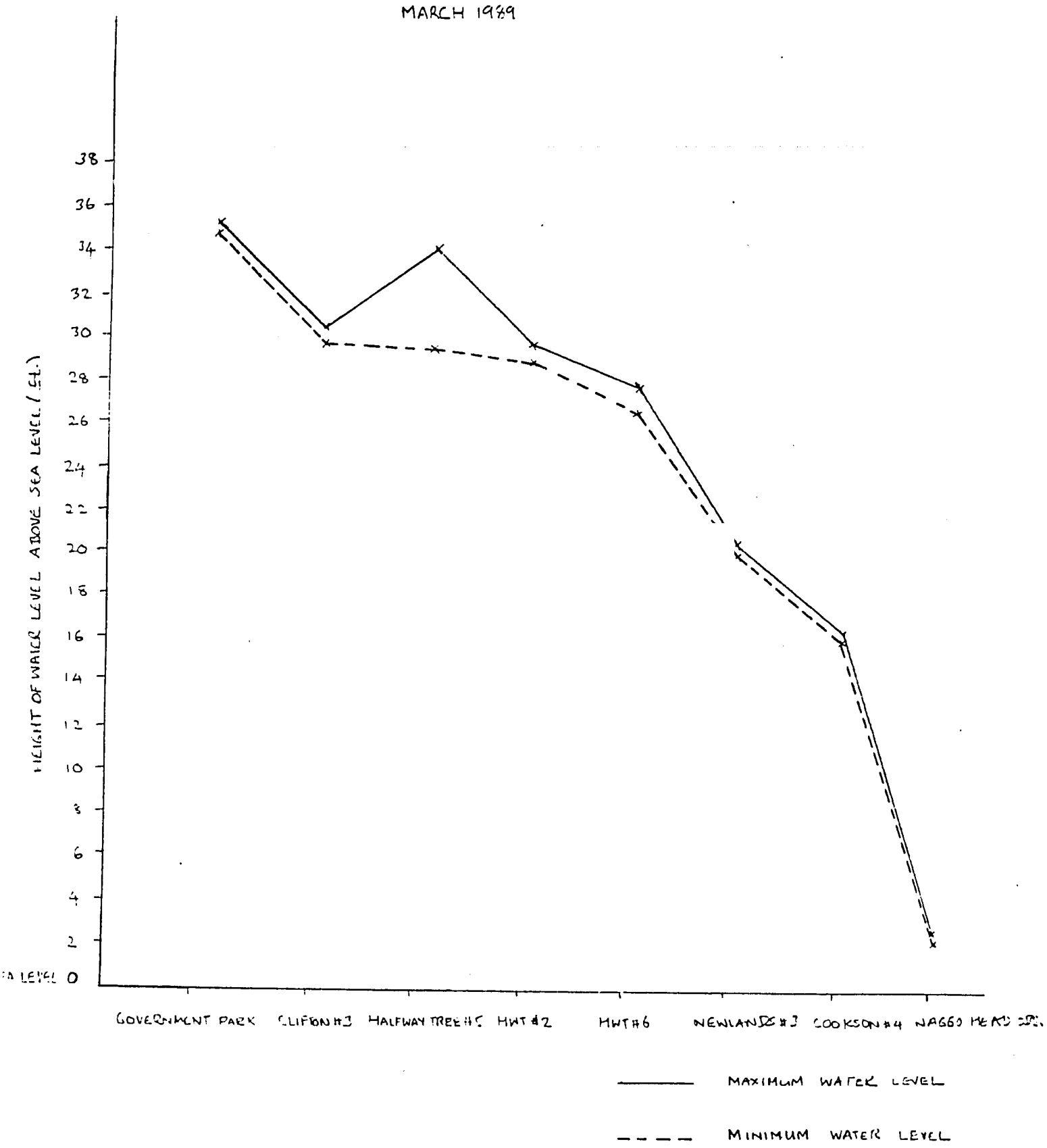
FEBRUARY 1989



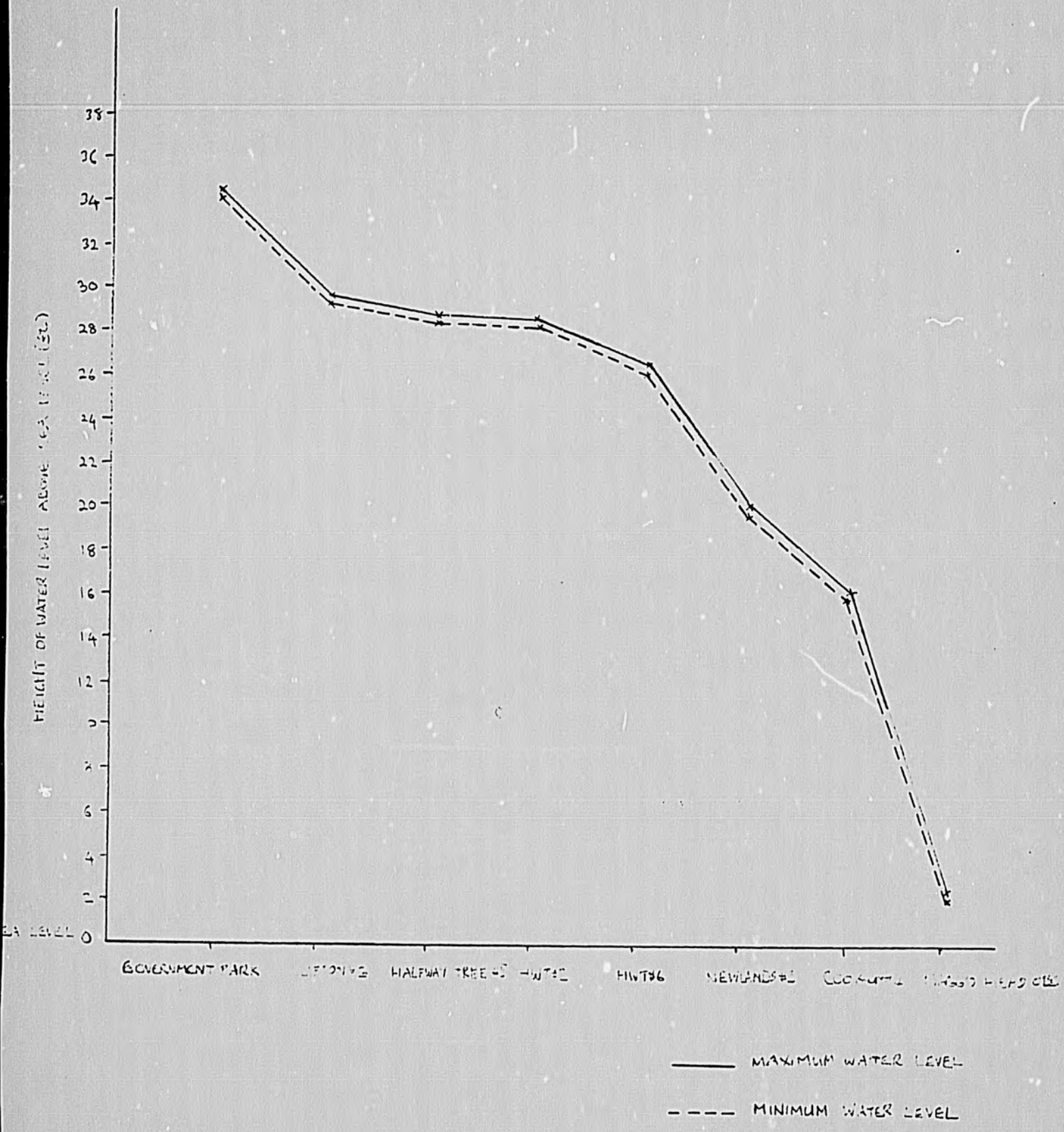
MAXIMUM WATER LEVEL

MINIMUM WATER LEVEL

MARCH 1989

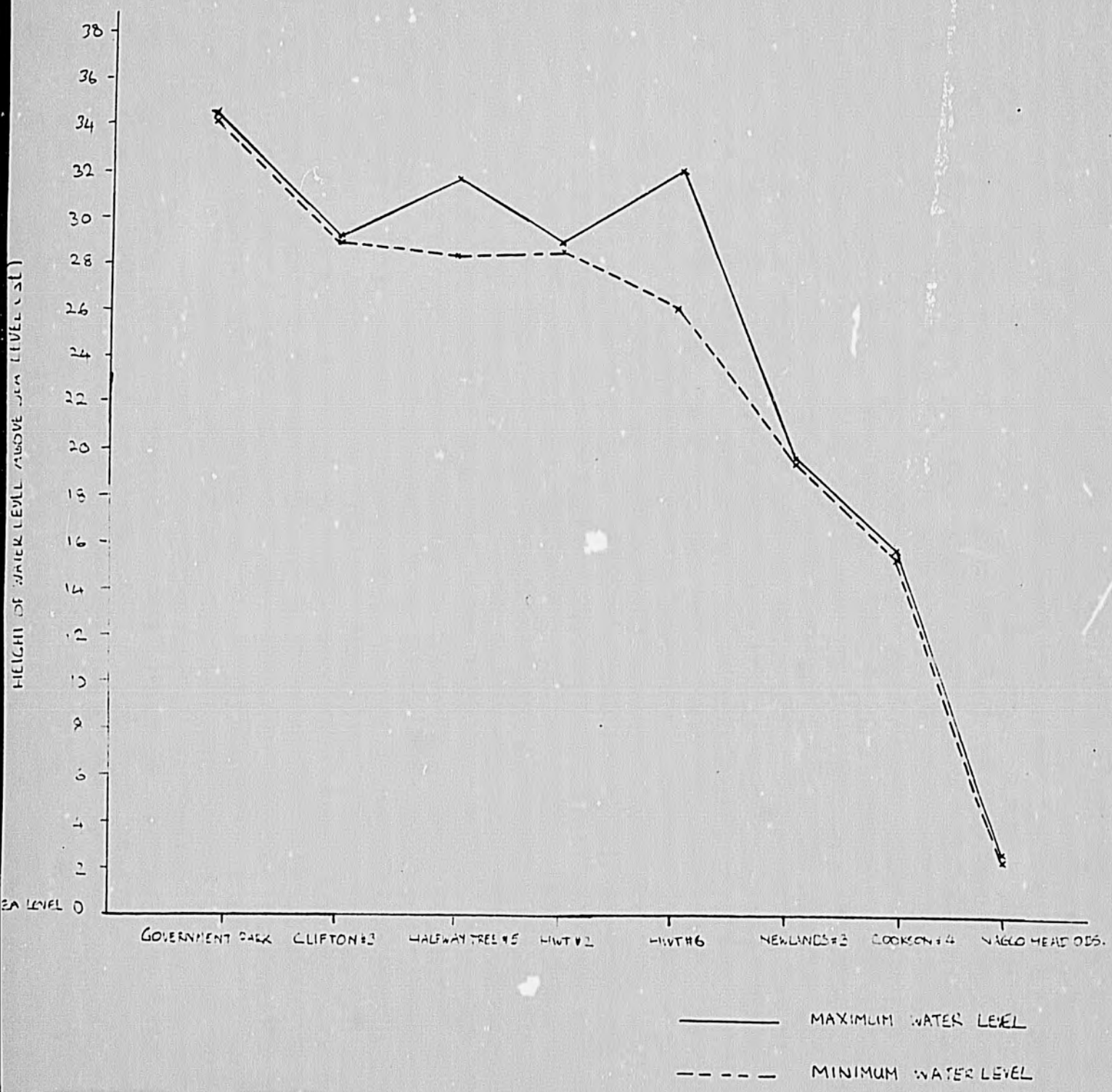

HEIGHT OF WATER LEVEL ABOVE SEA LEVEL (FT.)
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
GOVERNMENT PARK
CLIFTON #3
HALFWAY TREE #5
HWT #2
HWT #6
NEWLANDS #3
COOKSON #4
MAXIMUM WATER LEVEL
MINIMUM WATER LEVEL

APRIL 1989



228

MAY 1989


HEIGHT OF WATER LEVEL ABOVE SEA LEVEL (FT)
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
SEA LEVEL 0
GOVERNMENT PARK
CLIFTON #3
HALFWAY TREE #5
HWT #2
HWT #6
NEWLANDS #3
COOKSON #4
NAGLO HEAD OBS.
MAXIMUM WATER LEVEL
MINIMUM WATER LEVEL

229

A REPORT ON THE GROUNDWATER LEVELS
IN PARTS OF BERNARD LODGE AND CAYMANAS AREAS
AND ADJOINING COASTAL AREA
ST. CATHERINE PLAINS

MAPS

WATER LEVEL CONTOUR MAPS OF PARTS
OF BERNARD LODGE AND CAYMANAS AREAS
FOR MONTHS OF JUNE '86, MAY/JUNE '87, NOVEMBER '87,
MARCH '88, MAY '88, SEPTEMBER '88, OCTOBER '88 AND APRIL '89

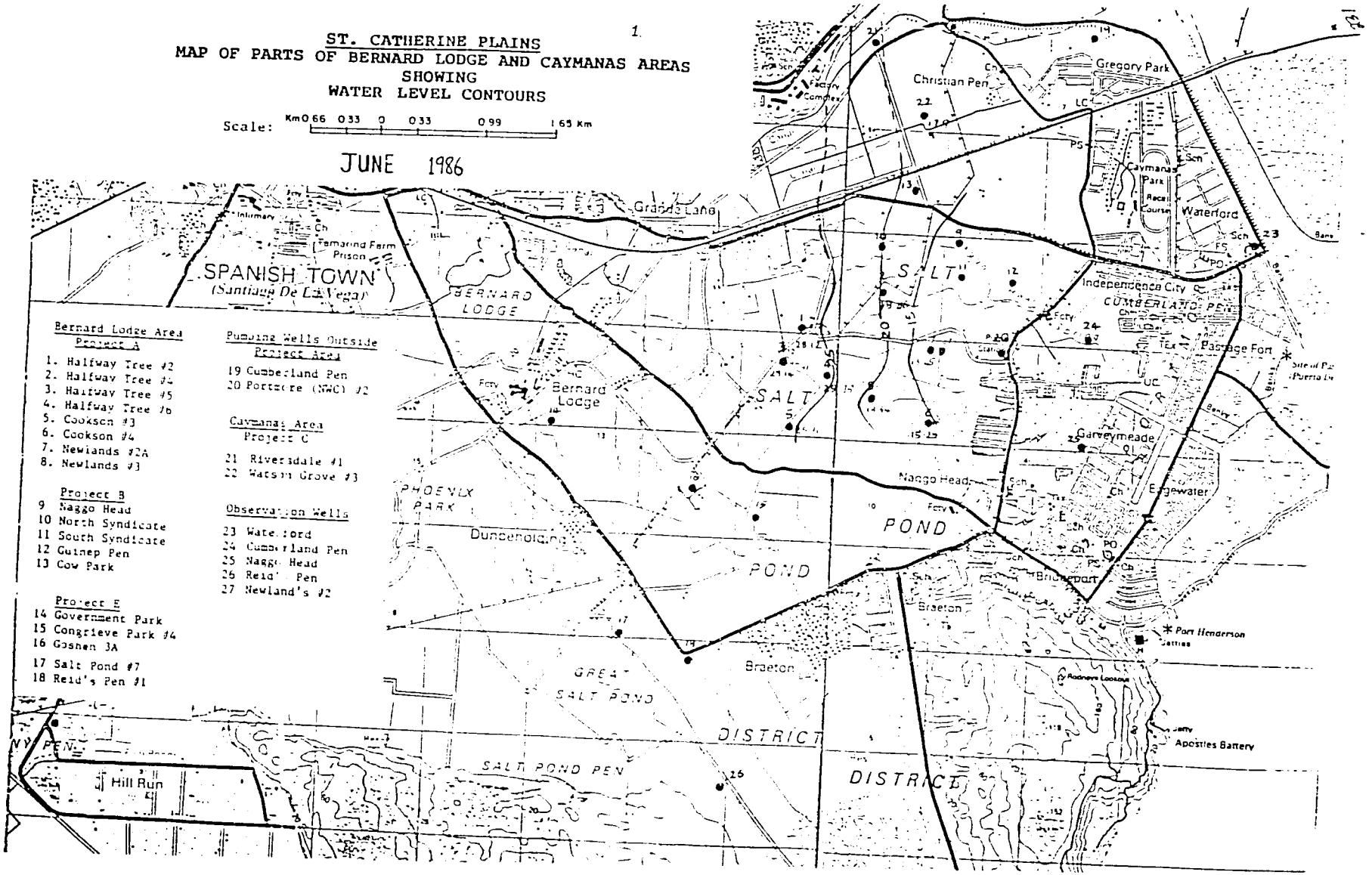
(1 - 9 Pages)

230

ST. CATHERINE PLAINS
MAP OF PARTS OF BERNARD LODGE AND CAYMANAS AREAS SHOWING WATER LEVEL CONTOURS

Scale: Km 0.66 0.33 0 0.33 0.99 1.65 Km

JUNE 1986



Bernard Lodge Area
Project A

1. Halfway Tree #2
2. Halfway Tree #4
3. Halfway Tree #5
4. Halfway Tree #6
5. Cookson #3
6. Cookson #4
7. Newlands #2A
8. Newlands #3

Project B

9 Naggo Head
10 North Syndicate
11 South Syndicate
12 Guinep Pen
13 Cow Park

Project E

14 Government Park
15 Congrieve Park #4
16 Goshen 3A
17 Salt Pond #7
18 Reid's Pen #1

Pumping Wells Outside Project Area

19 Cumberland Pen
20 Portmore (NWC) #2

Caymanas Area
Project C

21 Riversdale #1
22 Watson Grove #3

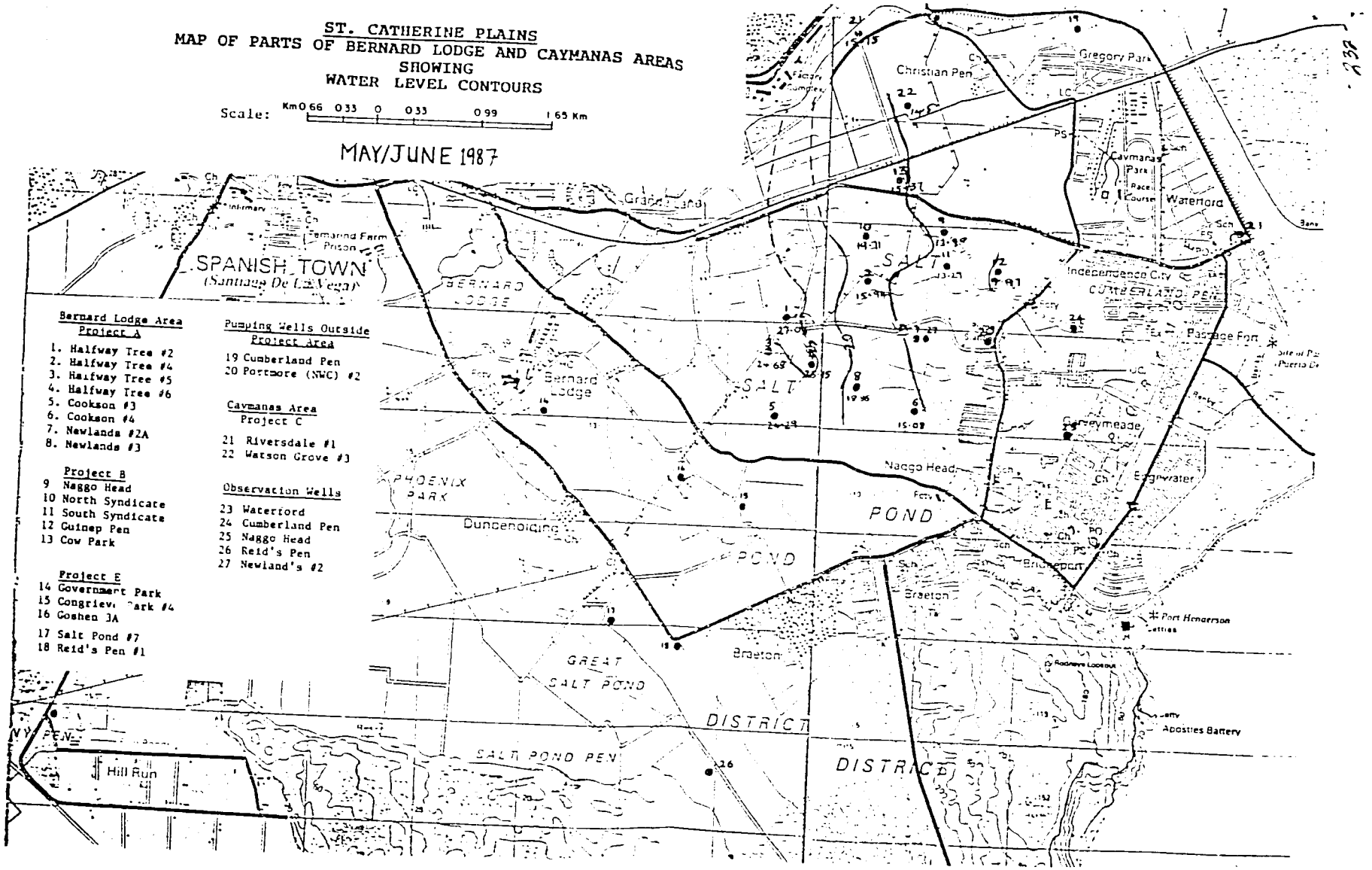
Observation Wells

23 Waterford
24 Cumberland Pen
25 Naggo Head
26 Reid's Pen
27 Newland's #2

ST. CATHERINE PLAINS
MAP OF PARTS OF BERNARD LODGE AND CAYMANAS AREAS SHOWING WATER LEVEL CONTOURS

Scale: Km 0.66 0.33 0 0.33 0.99 1.65 Km

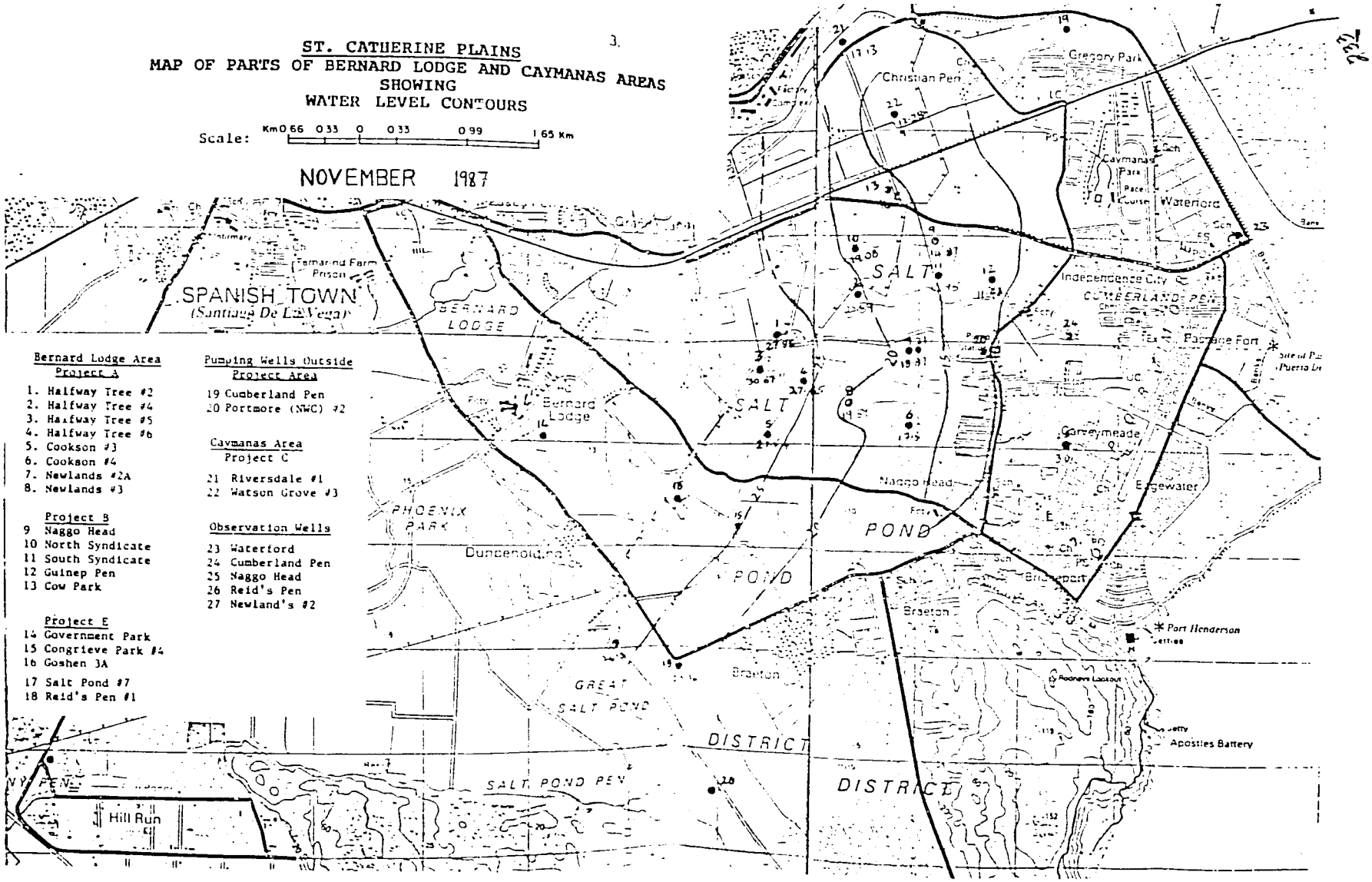
MAY/JUNE 1987



ST. CATHERINE PLAINS
MAP OF PARTS OF BERNARD LODGE AND CAYMANAS AREAS SHOWING WATER LEVEL CONTOURS

Scale: Km 0.66 0.33 0 0.33 0.99 1.65 Km

NOVEMBER 1987



Bernard Lodge Area
Project A

1. Halfway Tree #2
2. Halfway Tree #4
3. Halfway Tree #5
4. Halfway Tree #6
5. Cookson #3
6. Cookson #4
7. Newlands #2A
8. Newlands #3

Project B

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Project E

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15 Congrieve Park #4
16 Goshen 3A
17 Salt Pond #7
18 Reid's Pen #1

Pumping Wells Outside Project Area

19 Cumberland Pen
20 Portmore (NWC) #2

Caymanas Area
Project C

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22 Watson Grove #3

Observation Wells

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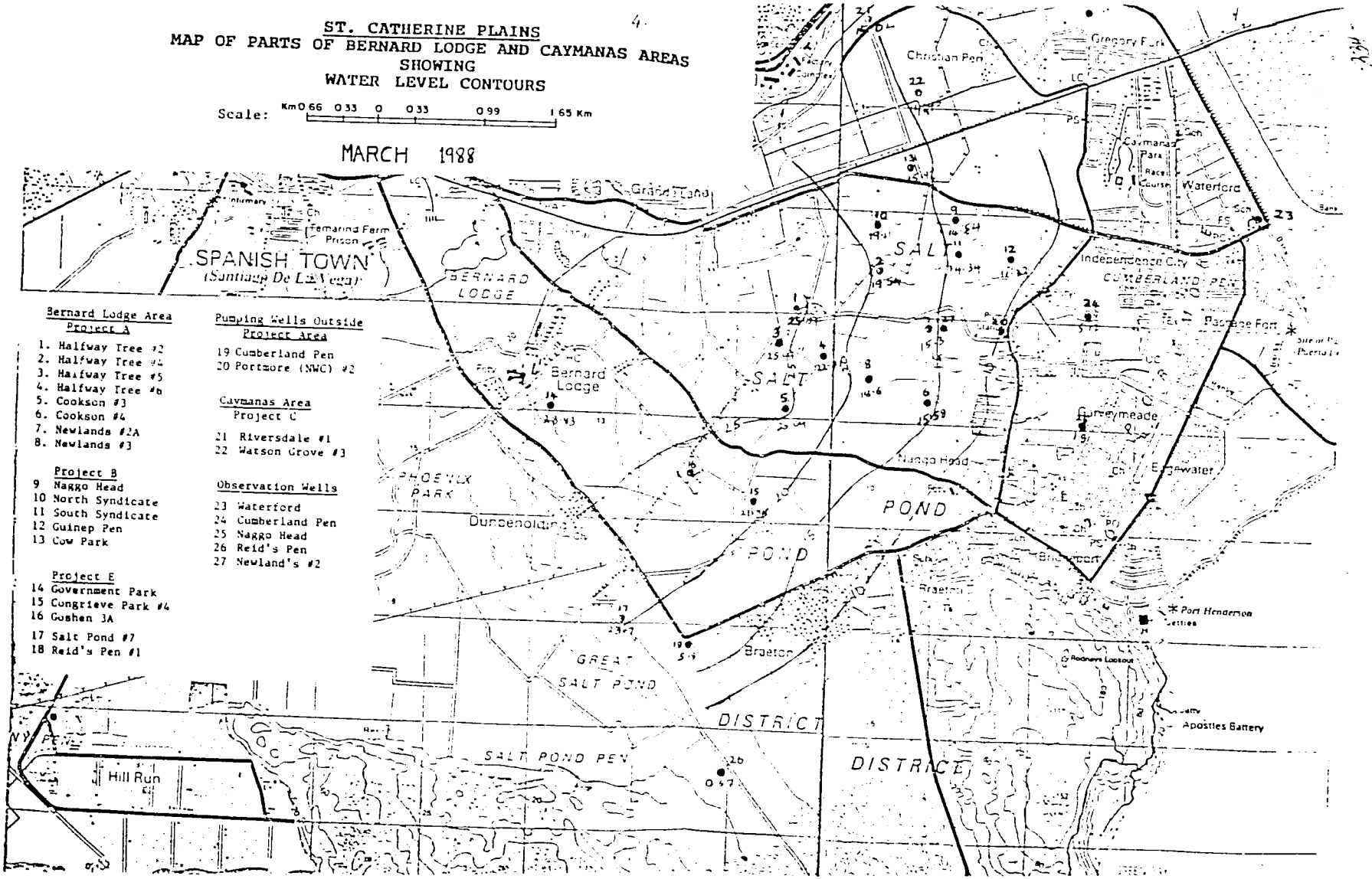
24 Cumberland Pen
25 Naggo Head
26 Reid's Pen
27 Newland's #2

ST. CATHERINE PLAINS
MAP OF PARTS OF BERNARD LODGE AND CAYMANAS AREAS SHOWING WATER LEVEL CONTOURS

Scale: Km 0.66 0.33 0 0.33 0.99 1.65 Km

MARCH 1988



Bernard Lodge Area
Project A

1. Halfway Tree #2
2. Halfway Tree #4
3. Halfway Tree #5
4. Halfway Tree #6
5. Cookson #3
6. Cookson #4
7. Newlands #2A
8. Newlands #3

Project B

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Project E

14 Government Park
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17 Salt Pond #7
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Caymanas Area
Project C

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Observation Wells

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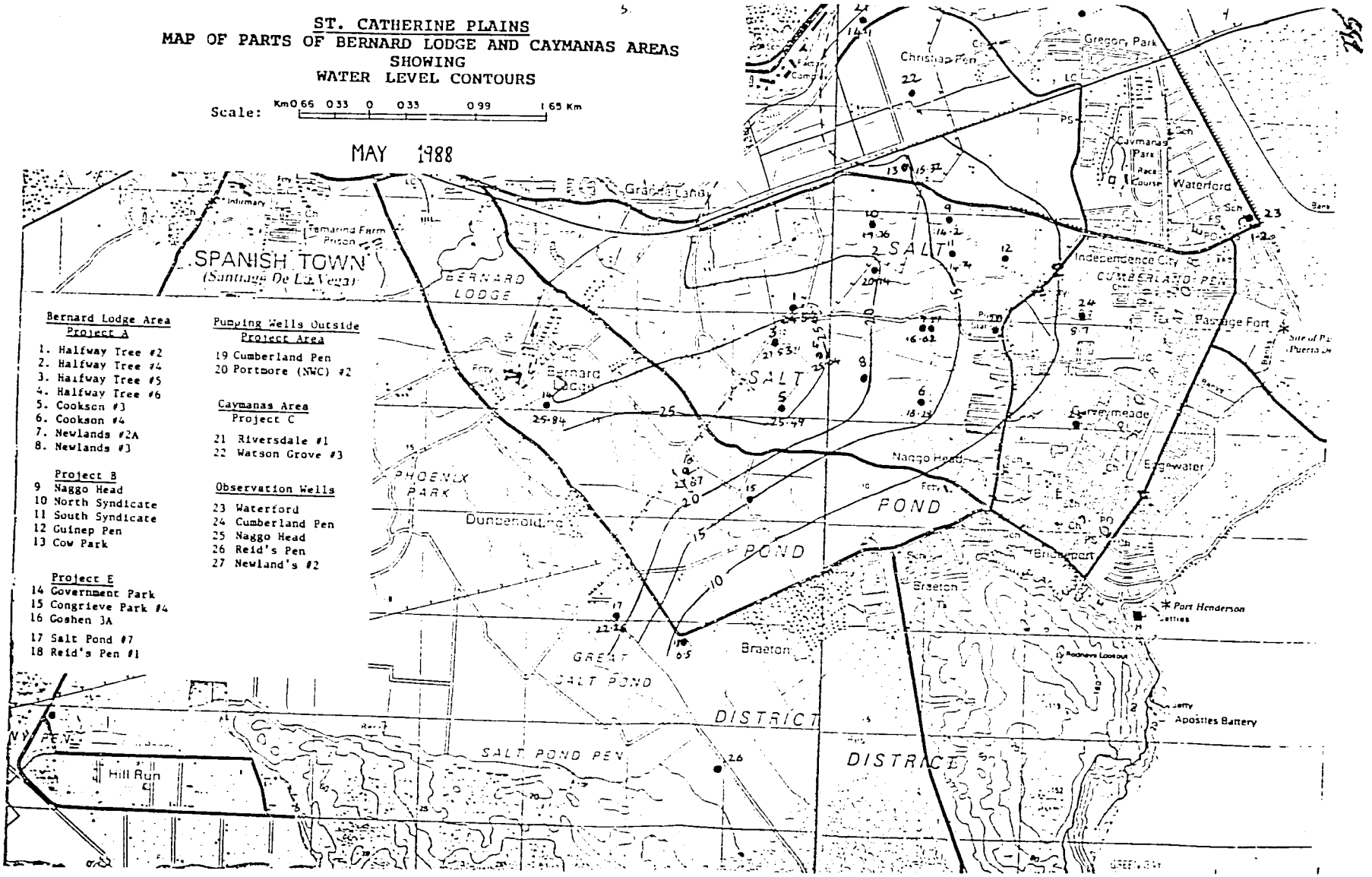
ST. CATHERINE PLAINS
MAP OF PARTS OF BERNARD LODGE AND CAYMANAS AREAS SHOWING WATER LEVEL CONTOURS

Scale: Km 0.66 0.33 0 0.33 0.99 1.65 Km

MAY 1988



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Pumping Wells Outside Project Area

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Project C

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Observation Wells

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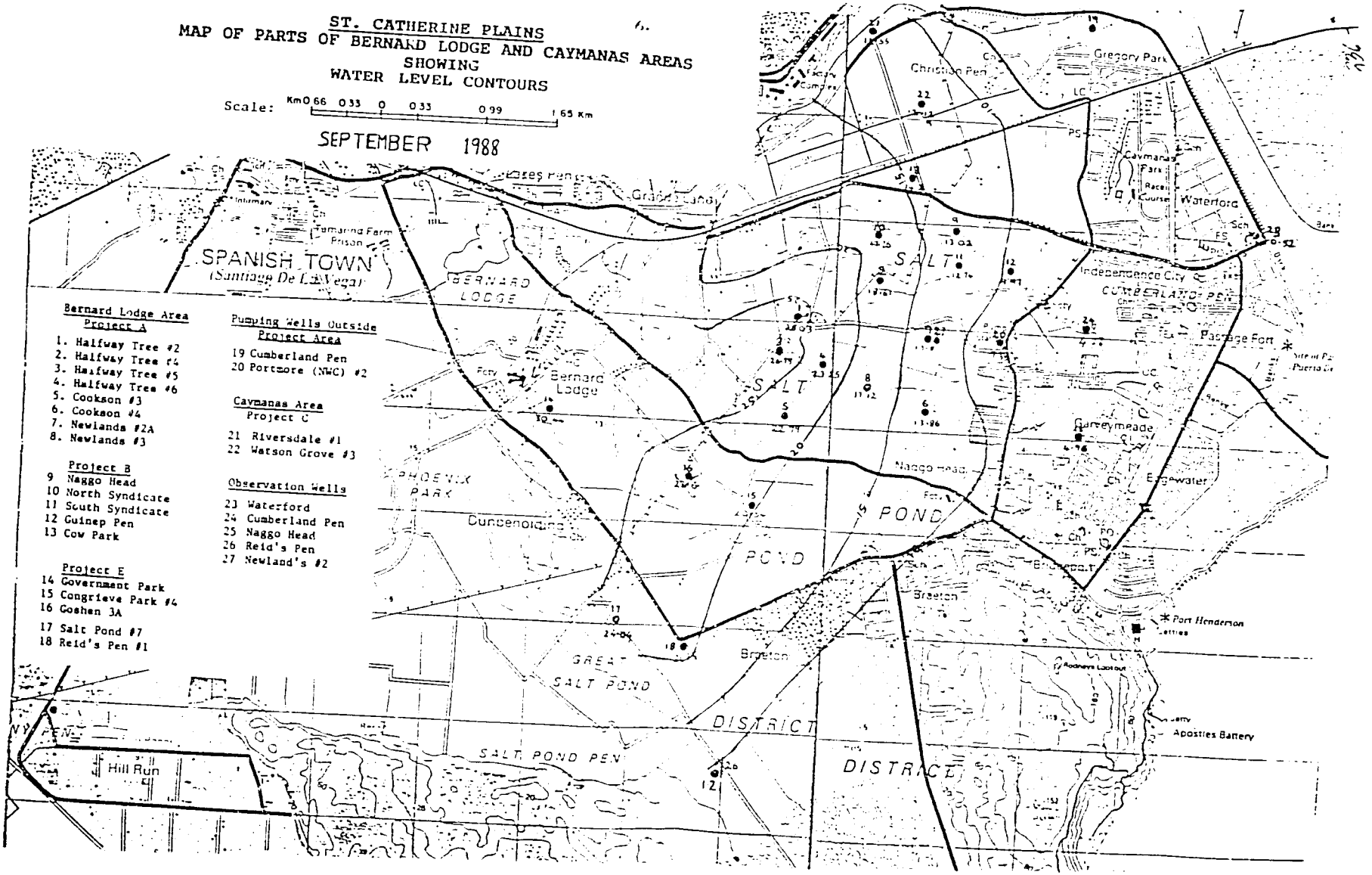
27 Newland's #2

ST. CATHERINE PLAINS

MAP OF PARTS OF BERNARD LODGE AND CAYMANAS AREAS SHOWING WATER LEVEL CONTOURS

Scale: Km 0.66 0.33 0 0.33 0.99 1.65 Km

SEPTEMBER 1988



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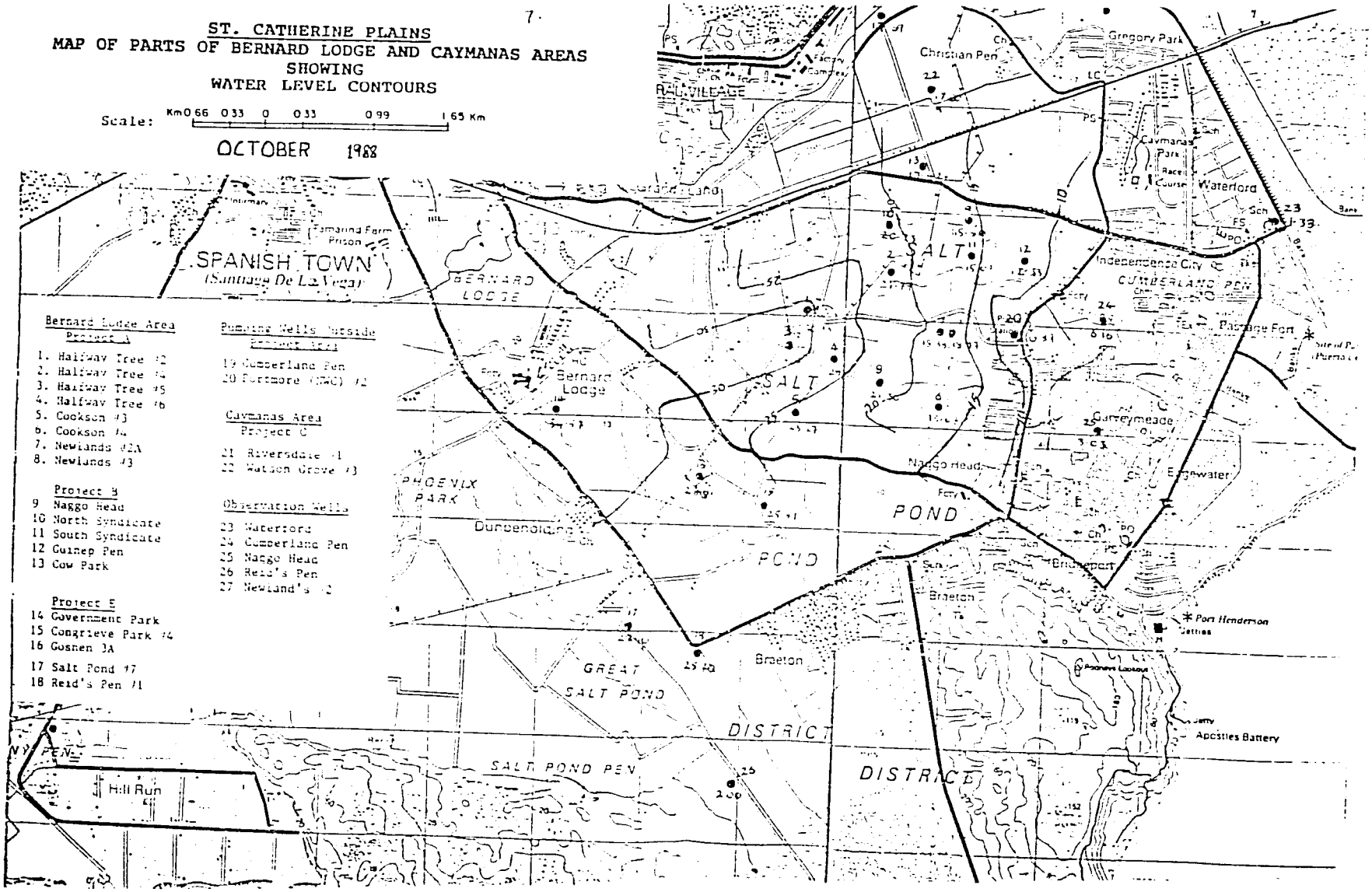
MAP OF PARTS OF BERNARD LODGE AND CAYMANAS AREAS SHOWING WATER LEVEL CONTOURS

Scale: Km 0.66 0.33 0 0.33 0.99 1.65 Km

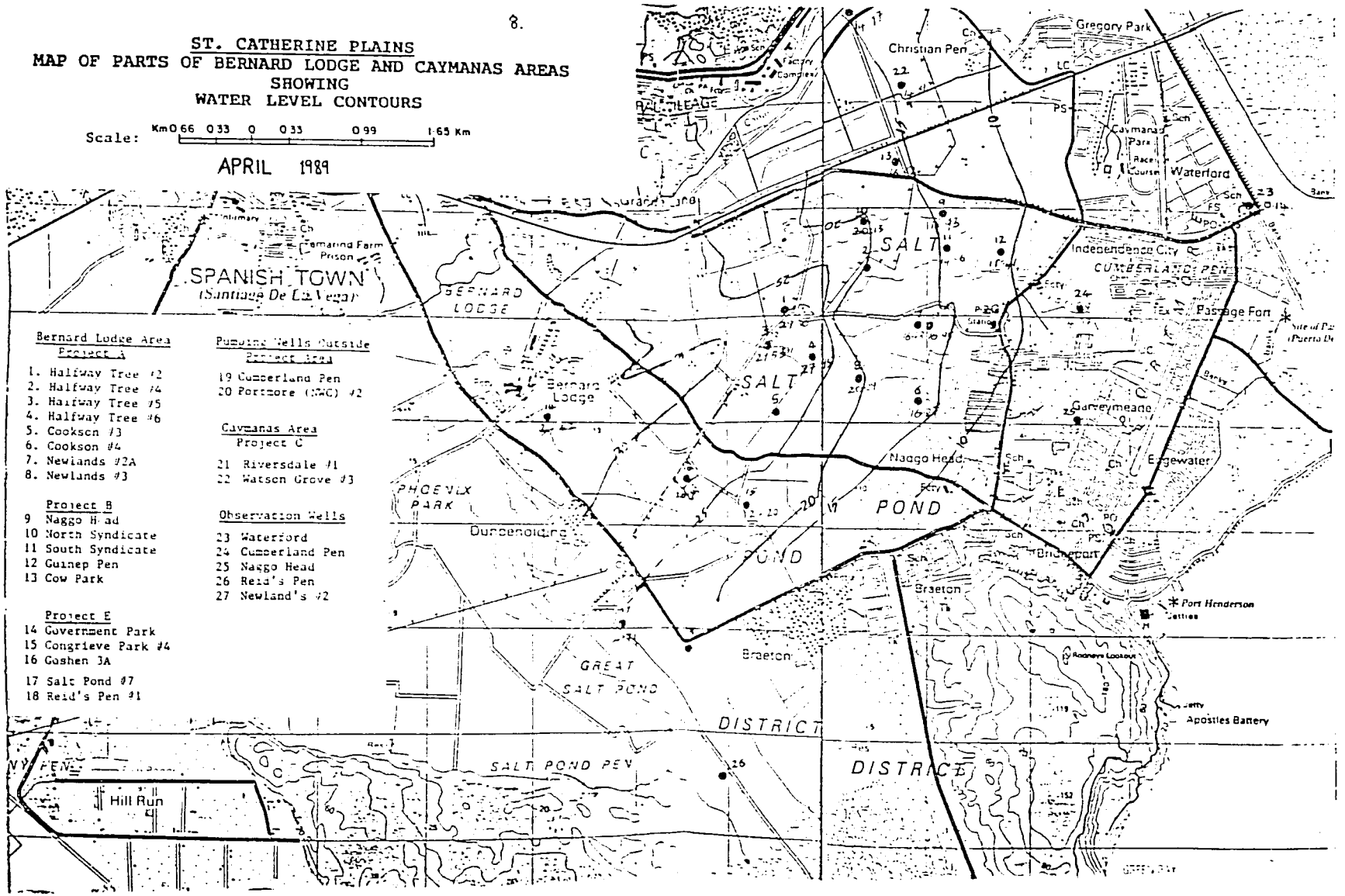
OCTOBER 1988



ST. CATHERINE PLAINS
MAP OF PARTS OF BERNARD LODGE AND CAYMANAS AREAS SHOWING WATER LEVEL CONTOURS

Scale: Km 0.66 0.33 0 0.33 0.99 1.65 Km

APRIL 1989



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Project A

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