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SUPPLY SYSTEM NUCLEAR PLANT NO. 2

ANNUAL ENVIRONMENTAL OPERATING REPORT

1987

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

APRIL 1988

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INTRODUCTION

The WNP-2 Environmental Protection Plan (Appendix B to Operating License No. NPF-21) addresses the protection of nonradiological environmental values during plant operation. Section 3.0 of the EPP requires that changes in plant design and operation be assessed for environmental impacts against the impacts which were projected by the NRC at the time the plant was licensed. Changes which involve an unreviewed environmental question (defined in the EPP) must be approved by the NRC. Section 4.0 requires the reporting of events which may result in significant environmental impacts and also requires a soil and vegetation monitoring program to evaluate cooling tower drift impacts. Section 5.0 addresses administrative matters and requires an annual report on several EPP conditions including the monitoring program. This Annual Environmental Operating Report is submitted per Section 5.4.1 of the EPP.

UNREVIEWED ENVIRONMENTAL QUESTIONS

A proposed change, test, or experiment is deemed to involve an unreviewed environmental question if it concerns: (1) a matter which may result in significant increase in any adverse environmental impact previously evaluated in the environmental licensing documentation; or (2) a significant change in effluents or power level; or (3) a matter not previously evaluated in the environmental documentation which may have a significant adverse environmental impact (EPP Section 3.1). No design or operational changes, tests, or experiments in 1987 involved an unreviewed environmental question.

COOLING TOWER DRIFT STUDIES

Section 4.2.1 of the EPP requires a monitoring program to assess the effects of cooling tower drift. As in previous years, soil and vegetation samples were collected in May at four grassland (G01-G04) and five shrub (S01-S05) sites (see Figure 1) and analyzed for relevant chemistry parameters. Analytical methods were described in the Environmental Operating Report for 1985. The results for 1987 and comparisons with previous years are summarized below.

Soil Chemistry Results

The results of the 1987 soil chemical analyses are presented in Table 1 and are shown graphically in Figures 2 through 18.

Soils at all sample sites range from sandy to sandy loam and contain a low percentage of clay. Soil pH values were generally lower than measurements in previous years (Figure 2). Soil conductivity was higher at all stations over 1986 and was the highest ever measured at Station S03 and S05 (Figure 3).

As in 1986 soil sulfate concentrations at all sites were low (Figure 4). Calcium (Figure 5) was within the range of measurements for previous years except at Station G01 which was lower than ever recorded. Magnesium (Figure 6) was within the range of previous measurements and showed little station-to-station variability. Sodium (Figure 7) and potassium (Figure 8) measurements were generally higher than in 1986 but still lower than the preoperational period. Except for Station S05, measurements of bicarbonate (Figure 9) were within the range of previous measurements. Soil fluoride and chloride (Figures 10 and 11) were generally higher in 1987 than in 1986. The highest chloride concentrations since commencement of the monitoring program were recorded at Stations G03, G04, and S04.

Relative to the 1986 data, soil copper (Figure 12) was higher at four stations (G03, S01, S03, and S05) and lower at the other five. The highest copper measured by the program was at Station S01. Lead (Figure 13) was higher at all stations in 1987. Soil cadmium, chromium, nickel, and zinc (Figures 14-17) were within the range of concentrations previously recorded. Soil mercury (Figure 18) was lower than ever recorded at several stations.

Vegetation Chemistry Results

The results of the 1987 vegetation chemical analyses are presented in Table 2. Copper, sulfate, and chloride concentrations in Poa sandbergii and Bromus tectorum are shown in Figures 19 through 24.

With a few exceptions, vegetation copper concentrations were similar to measurements for previous years. Poa sandbergii copper concentrations were elevated slightly at Station G01 and lower than previous years at Stations G02, S01, S02, and S03. Extractable sulfate concentrations in all species were within the ranges of measurements for previous years. Extractable chloride concentrations, with a few exceptions, were also within the range of concentrations measured in previous years. Chloride in Poa sandbergii (Figure 23) was the highest ever recorded at Stations G03, S04, and S05. In Bromus tectorum (Figure 24) chloride was the highest ever measured at Station G03 but was within the range of previous measurements for this species at all other stations.

Soil and Vegetation Study Summary

Although some stations show departure from means of historical data for some chemical constituents, no trends or adverse impacts are apparent.

NONROUTINE REPORTS

During 1987 there were no nonroutine reports required by Section 5.4.2 of the EPP nor were there any EPP noncompliances.

NPDES PERMIT-RELATED REPORTS

Monthly discharge monitoring reports are submitted to the Energy Facility Site Evaluation Council (EFSEC). A summary of the reported data is shown in Table 3. There were no instances of noncompliance in 1987.

TABLE 1

SOIL CHEMISTRY AT NINE SAMPLE LOCATIONS, MAY 1987

	G01	G02	G03	G04	S01	S02	S03	S04	S05
pH (1:2 soil-water)	6.84	6.81	6.86	6.61	6.55	6.91	6.69	6.41	6.80
Conductivity (1:2 soil-water microsiemens/cm	52.3	42.2	50.6	24.8	46.0	36.5	42.2	29.6	55.5
Sulfate ug/gm	2.82	3.72	0.64	1.28	2.64	0.90	2.18	2.18	3.34
Chloride ug/gm	13.60	11.68	13.28	16.64	7.92	7.04	6.64	14.64	9.52
Copper ug/gm	13.24	12.70	11.58	10.41	17.34	13.67	14.98	13.11	11.97
Lead ug/gm	7.39	7.45	4.23	3.89	4.79	3.54	5.20	4.31	5.35
Cadmium ug/gm	0.08	0.08	0.05	0.13	0.05	0.04	0.07	0.05	0.08
Chromium ug/gm	9.36	8.00	6.39	5.07	6.17	6.87	6.55	7.46	8.37
Nickel ug/gm	17.22	14.22	11.63	11.42	16.56	12.45	13.44	13.73	11.63
Zinc ug/gm	50.25	50.55	43.39	43.07	51.04	31.44	60.57	44.42	47.02
Sodium %	0.092	0.096	0.068	0.054	0.065	0.046	0.084	0.061	0.080
Potassium %	0.269	0.216	0.152	0.134	0.172	0.096	0.169	0.173	0.164
Calcium %	0.08	0.40	0.34	0.35	0.35	0.42	0.41	0.33	0.43
Mercury ug/gm	0.003	0.001	0.001	0.006	0.004	0.001	0.002	0.004	0.002
Fluoride ug/gm	281.0	194.0	218.0	189.0	216.0	219.0	278.0	199.0	245.0
Bicarbonate (meq/HCO3/gm)	0.0019	0.0018	0.0015	0.0010	0.0015	0.0019	0.0018	0.0010	0.0025
Magnesium %	0.48	0.45	0.37	0.35	0.41	0.33	0.41	0.40	0.39

TABLE 2

VEGETATION CHEMISTRY AT NINE SAMPLE LOCATIONS, MAY. 1987

	Site	POSA*	BRTE*	SIAL*	PHLO*	PUTR*	ARTR*
Copper (ug/gm)	G01	5.40	6.85	4.90	4.75	--	--
	G02	2.55	4.70	6.10	2.80	--	--
	G03	4.65	6.60	3.45	--	6.40	--
	G04	3.60	5.20	4.50	5.05	--	--
	S01	2.10	5.35	6.05	3.95	--	--
	S02	1.75	4.0	--	3.60	4.00	--
	S03	2.45	4.75	--	3.95	--	10.00
	S04	2.80	5.10	5.15	6.20	--	--
	S05	3.85	6.30	--	--	5.35	9.20
Extractable Sulfate (%)	G01	0.023	0.028	0.162	0.025	--	--
	G02	0.026	0.023	0.148	0.026	--	--
	G03	0.023	0.093	0.532	--	0.021	--
	G04	0.023	0.023	0.231	0.023	--	--
	S01	0.023	0.026	0.198	0.023	--	--
	S02	0.024	0.022	--	0.025	0.013	--
	S03	0.021	0.023	--	0.023	--	0.025
	S04	0.027	0.025	0.267	0.023	--	--
	S05	0.028	0.023	--	--	0.015	0.023
Extractable Chloride (%)	G01	0.27	0.23	0.28	0.09	--	--
	G02	0.15	0.18	0.41	0.07	--	--
	G03	0.35	0.39	0.56	--	0.09	--
	G04	0.17	0.07	0.38	0.10	--	--
	S01	0.14	0.15	0.67	0.09	--	--
	S02	0.11	0.11	--	0.08	0.04	--
	S03	0.17	0.10	--	0.06	--	0.61
	S04	0.26	0.13	1.13	0.08	--	--
	S05	0.27	0.15	--	--	0.07	0.48

*POSA = Poa sandbergii
BRTE = Bromus tectorum
SIAL = Sisymbrium altissium
PHLO = Phlox longifolia
PUTR = Purshia tridentata
ARTR = Artemisia tridentata

TABLE 3

SUMMARY OF DISCHARGE MONITORING REPORTS, 1987

Month	Low Volume Waste						Cooling Tower Blowdown		
	TSS (lbs/d) Ave	TSS (lbs/d) Max	O/G (lbs/d) Ave	O/G (lbs/d) Max	Vol (10^3 gal/d) Ave	Vol (10^3 gal/d) Max	TRC (mg/l) Max	Vol (10^6 gal/d) Ave	Vol (10^6 gal/d) Max
Jan	1.2	8.8	0.1	0.3	12.4	31.2	< 0.1	0.9	1.5
Feb	0.3	0.7	0.1	0.7	12.4	20.9	< 0.1	0.6	1.5
Mar	2.1	15.4	0.1	0.1	15.4	26.8	< 0.1	0.8	1.4
Apr	0.6	3.1	0.2	0.6	10.6	17.1	< 0.1	1.6	5.8
May	4.3	20.6	0.3	1.6	10.7	15.4	–	0.0	0.0
Jun	4.2	18.5	0.1	0.1	11.5	17.5	< 0.1	1.7	3.2
Jul	1.3	5.8	0.1	0.1	12.8	28.5	< 0.1	1.1	4.0
Aug	0.6	1.9	0.5	5.1	15.3	29.6	< 0.1	2.1	7.6
Sep	4.4	28.6	0.1	0.2	13.7	28.2	< 0.1	1.4	5.9
Oct	2.4	26.4	0.1	0.1	11.6	14.5	< 0.1	1.4	2.3
Nov	0.6	1.6	0.1	0.5	13.2	28.8	< 0.1	1.4	2.1
Dec	0.4	0.9	0.1	0.2	11.3	20.4	< 0.1	1.1	2.2
Permit Limt	5	34	2.5	7	20	40	0.1	4.6	9.4

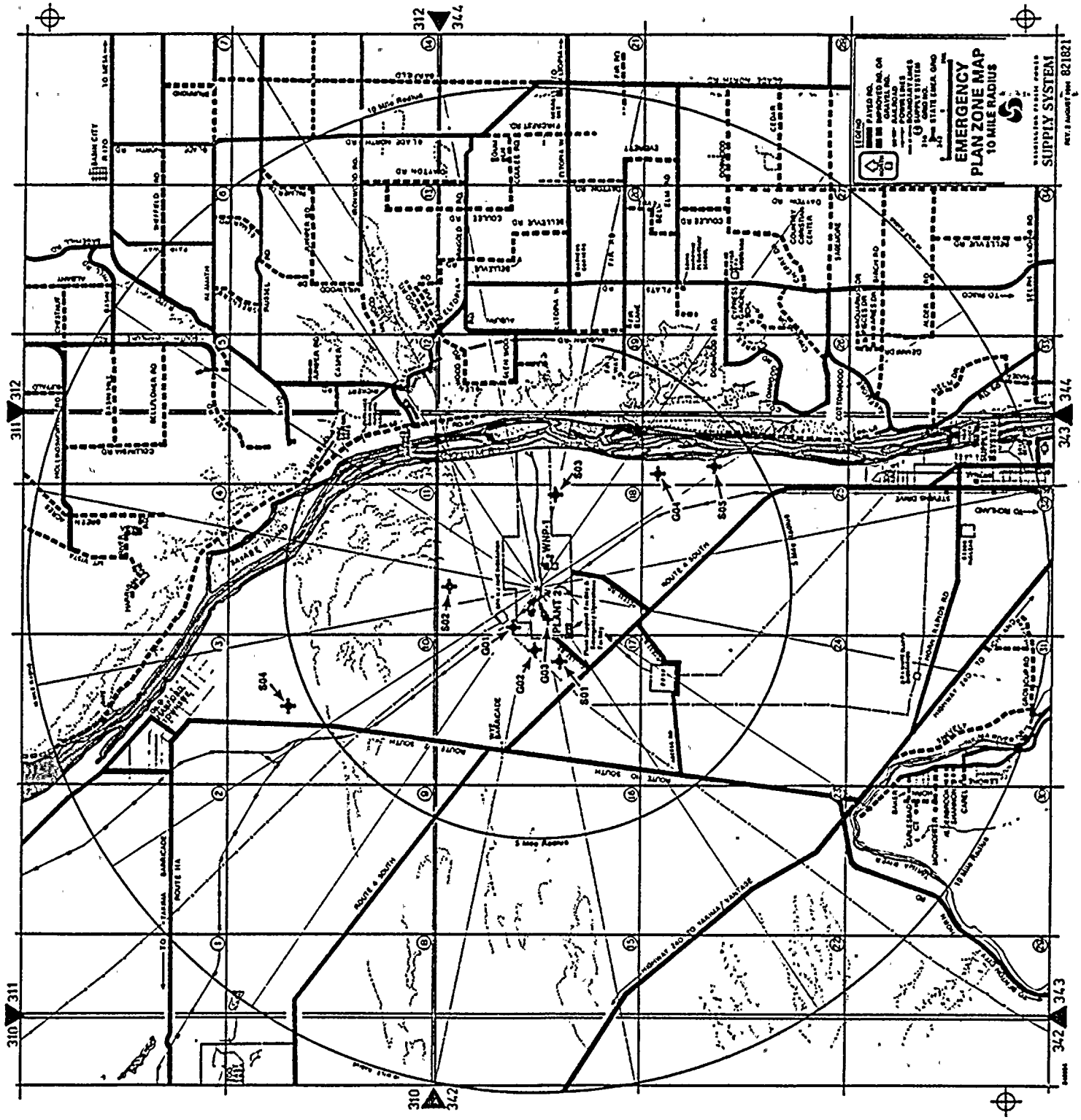


FIGURE 1. SOIL & VEGETATION CHEMISTRY SAMPLE LOCATIONS

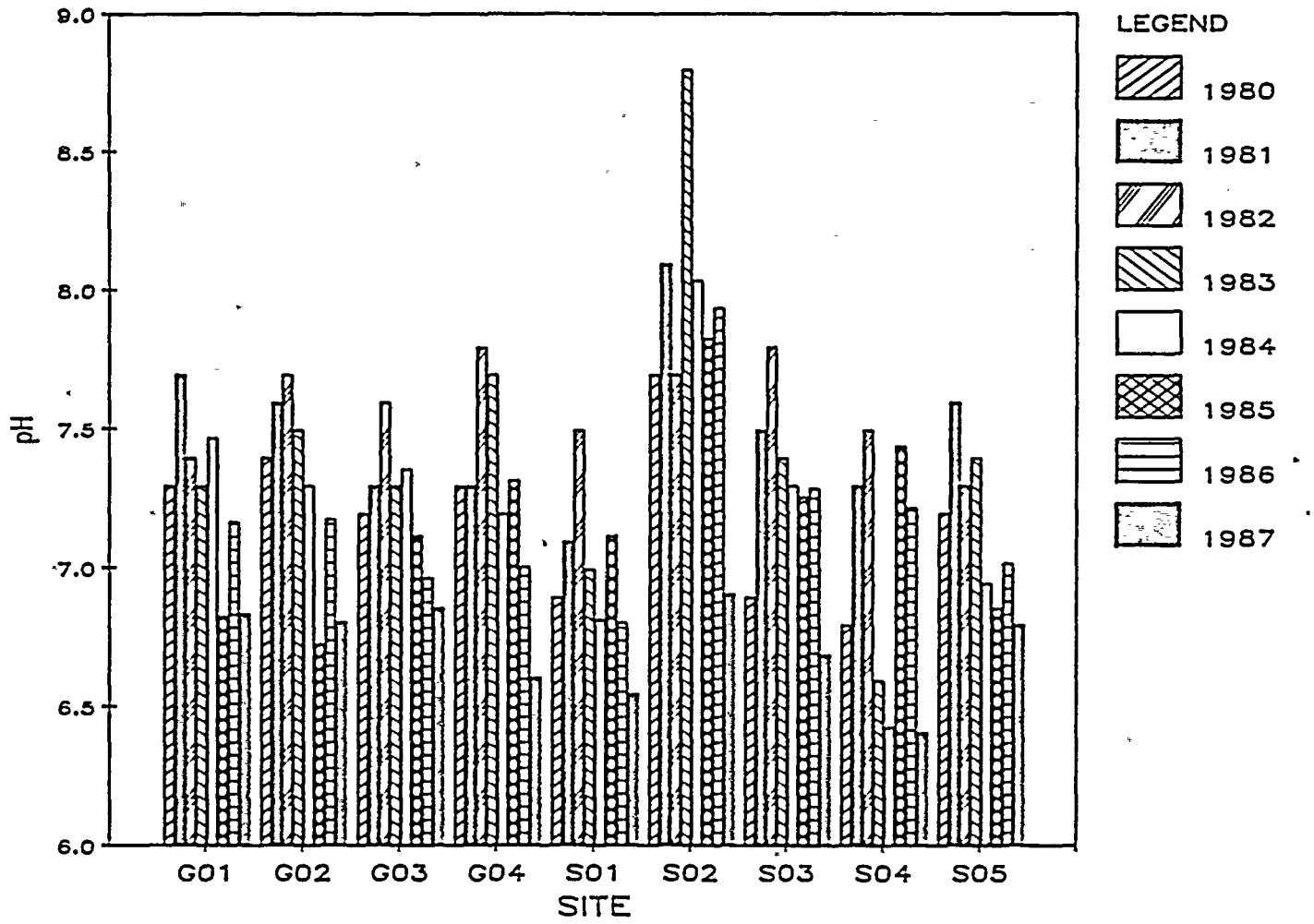


FIGURE 2. SOIL pH, 1980-1987

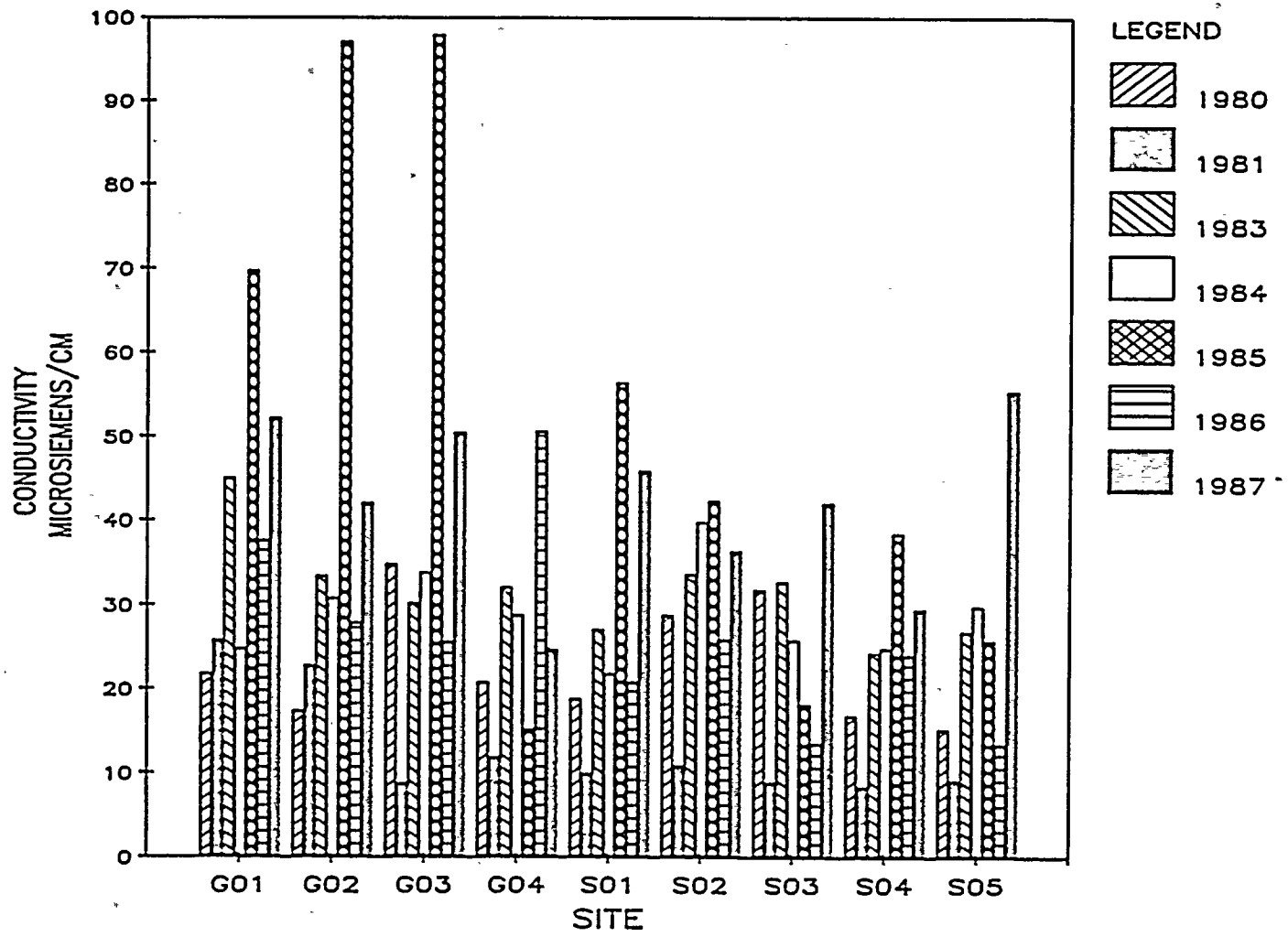


FIGURE 3. SOIL CONDUCTIVITY, 1980, 1981, and 1983-1987

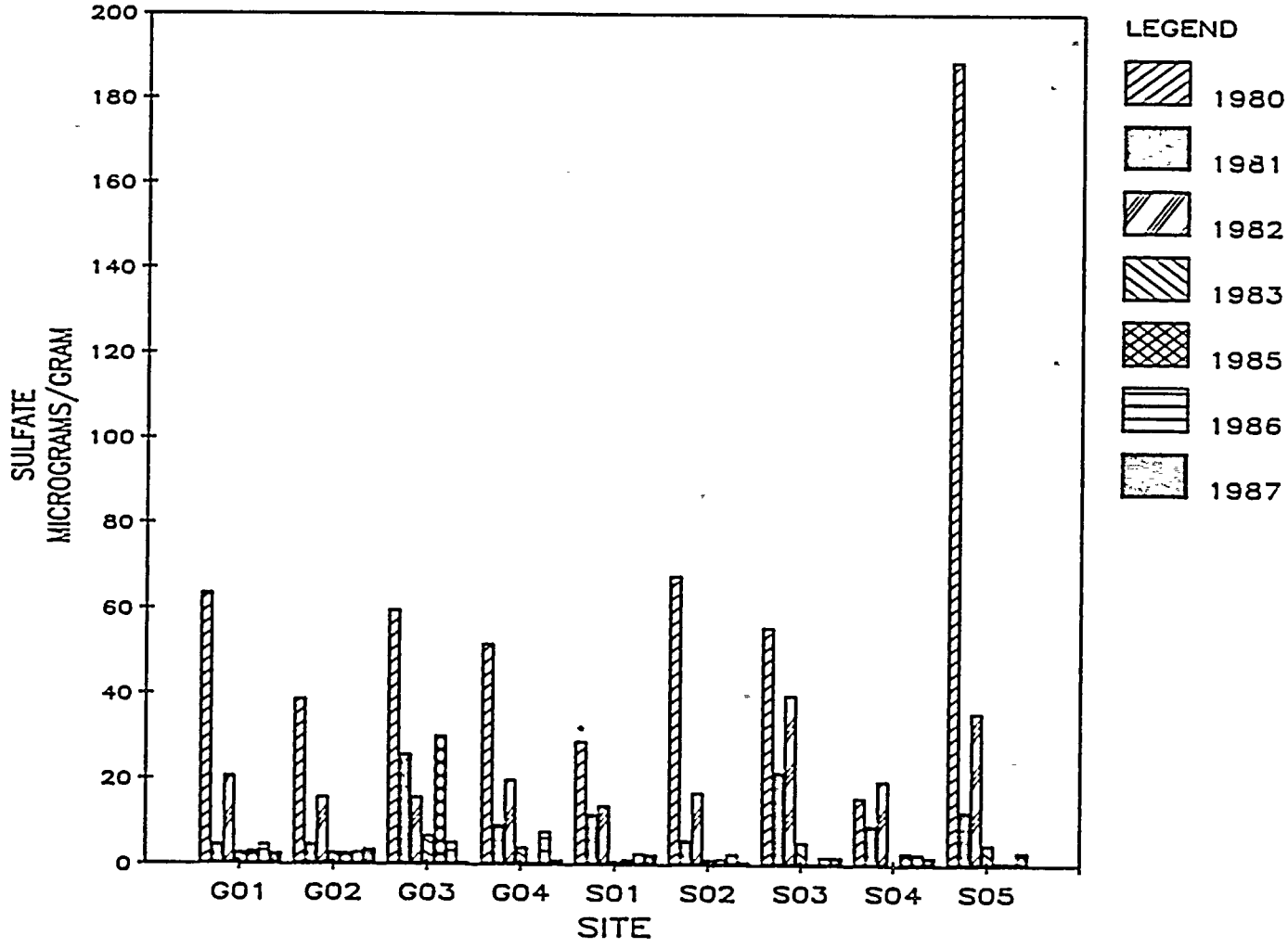


FIGURE 4. SOIL SULFATE, 1980-1987

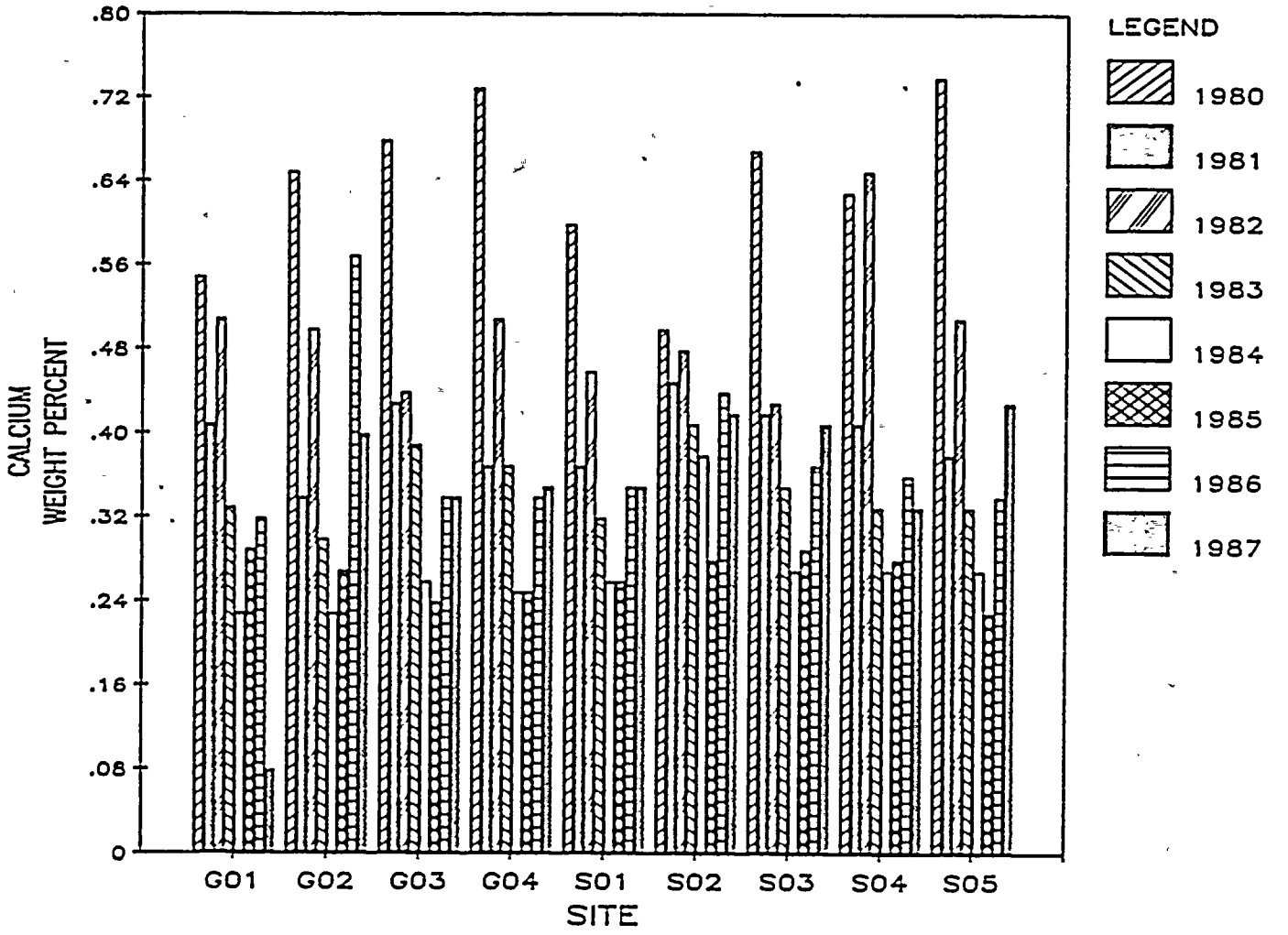


FIGURE 5. SOIL CALCIUM (Wt %), 1980-1987

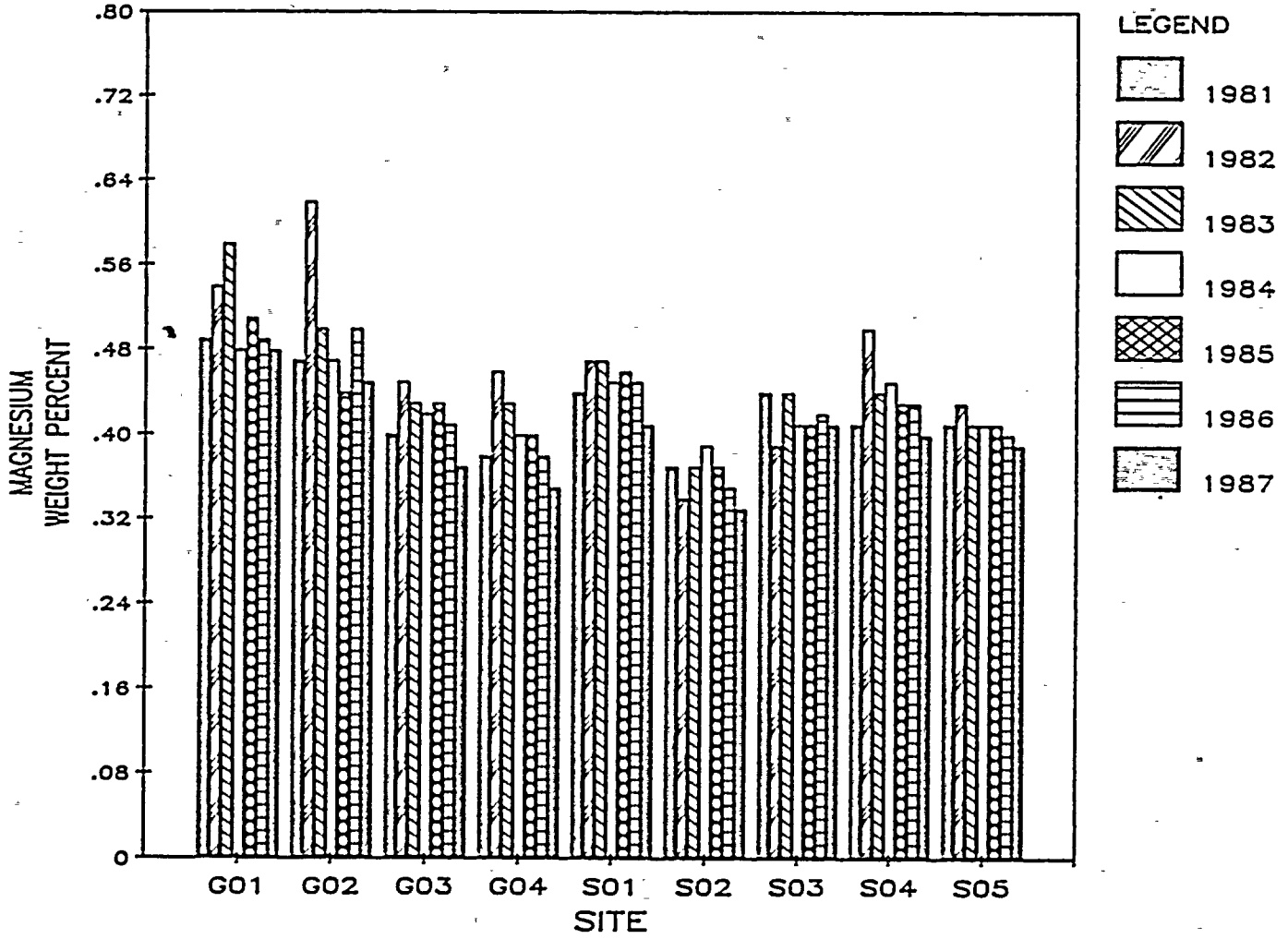


FIGURE 6. SOIL MAGNESIUM (Wt %), 1980-1987

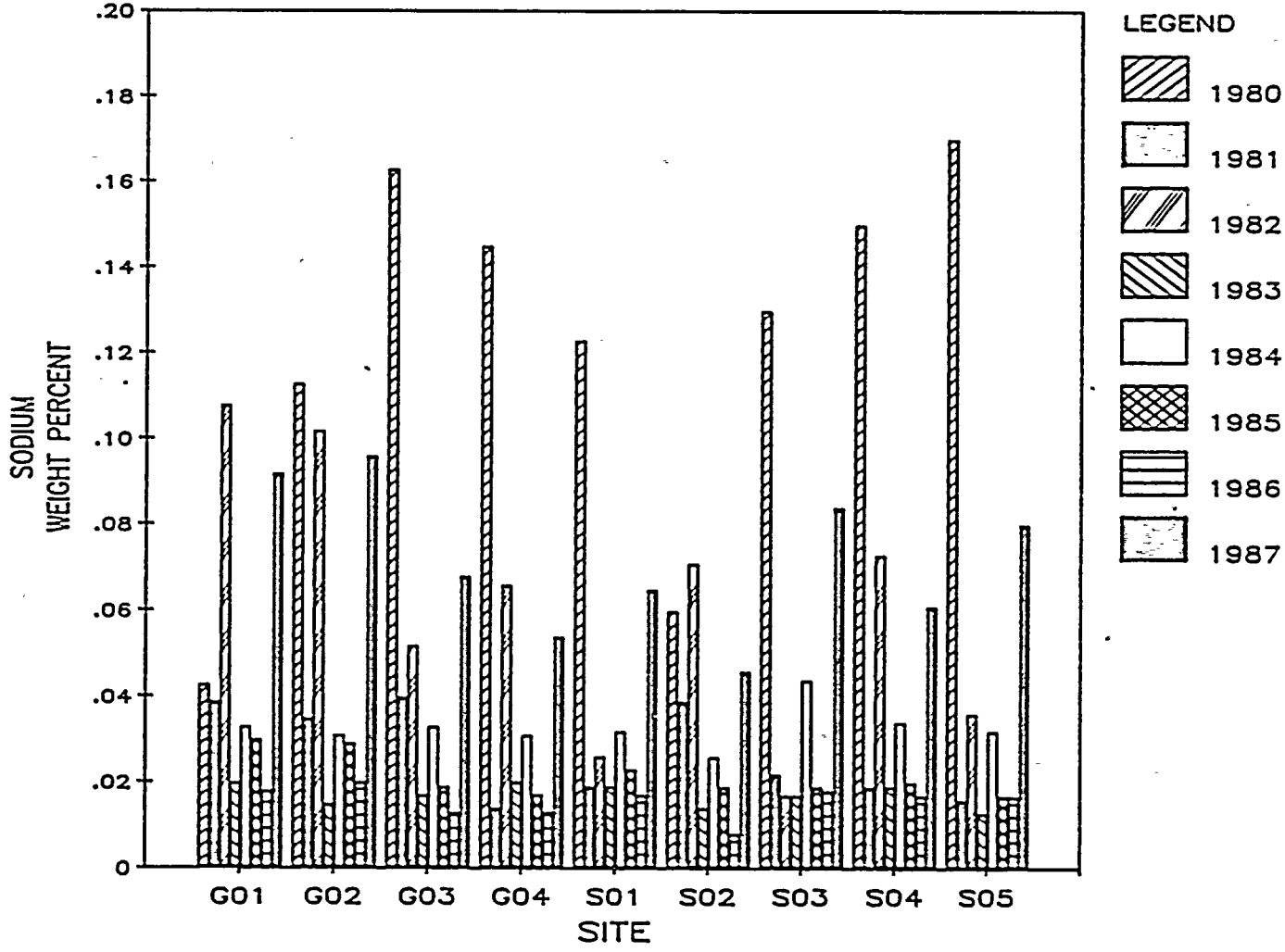


FIGURE 7. SOIL SODIUM (Wt %), 1980-1987

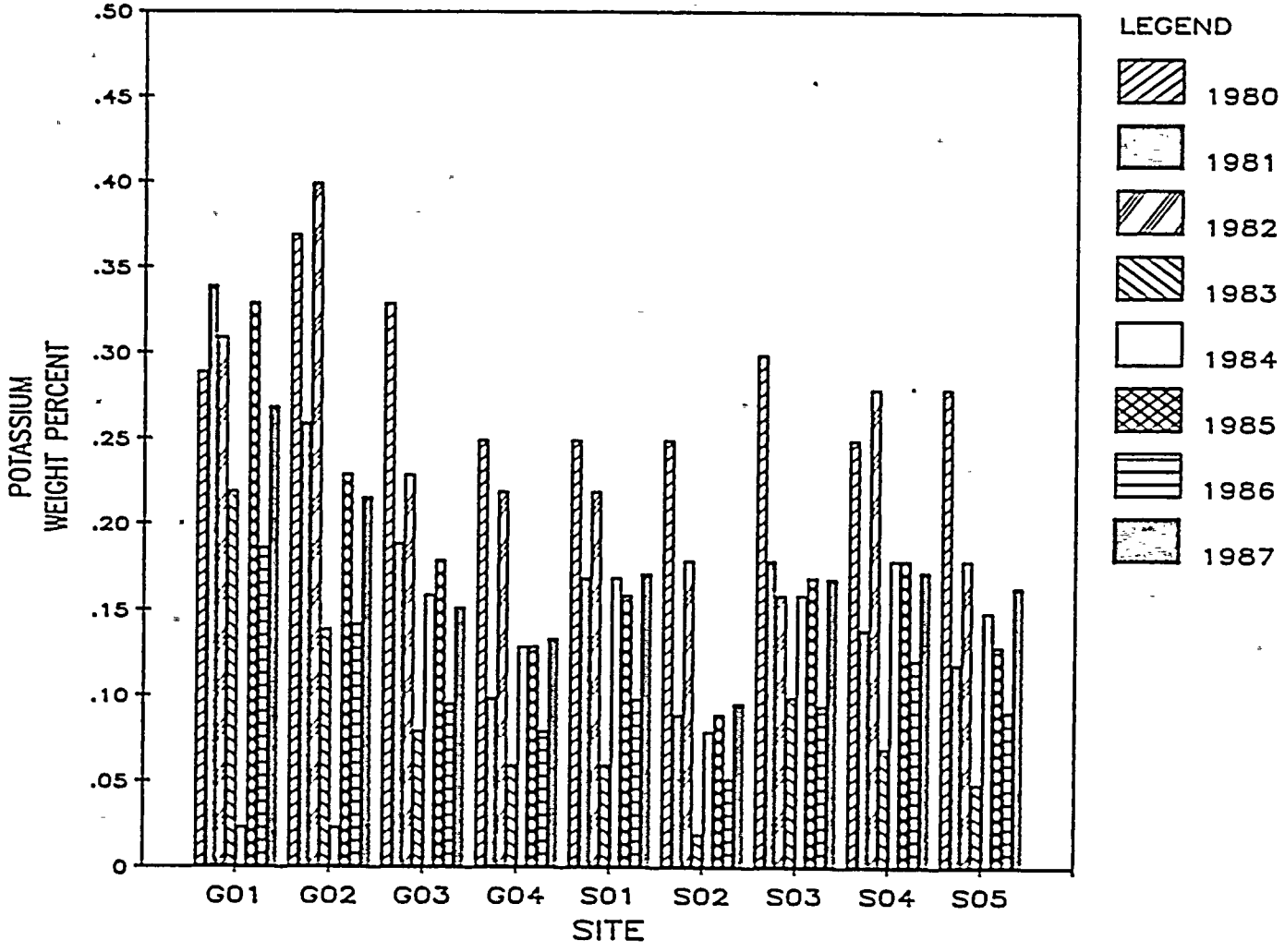


FIGURE 8. SOIL POTASSIUM (Wt %), 1980-1987

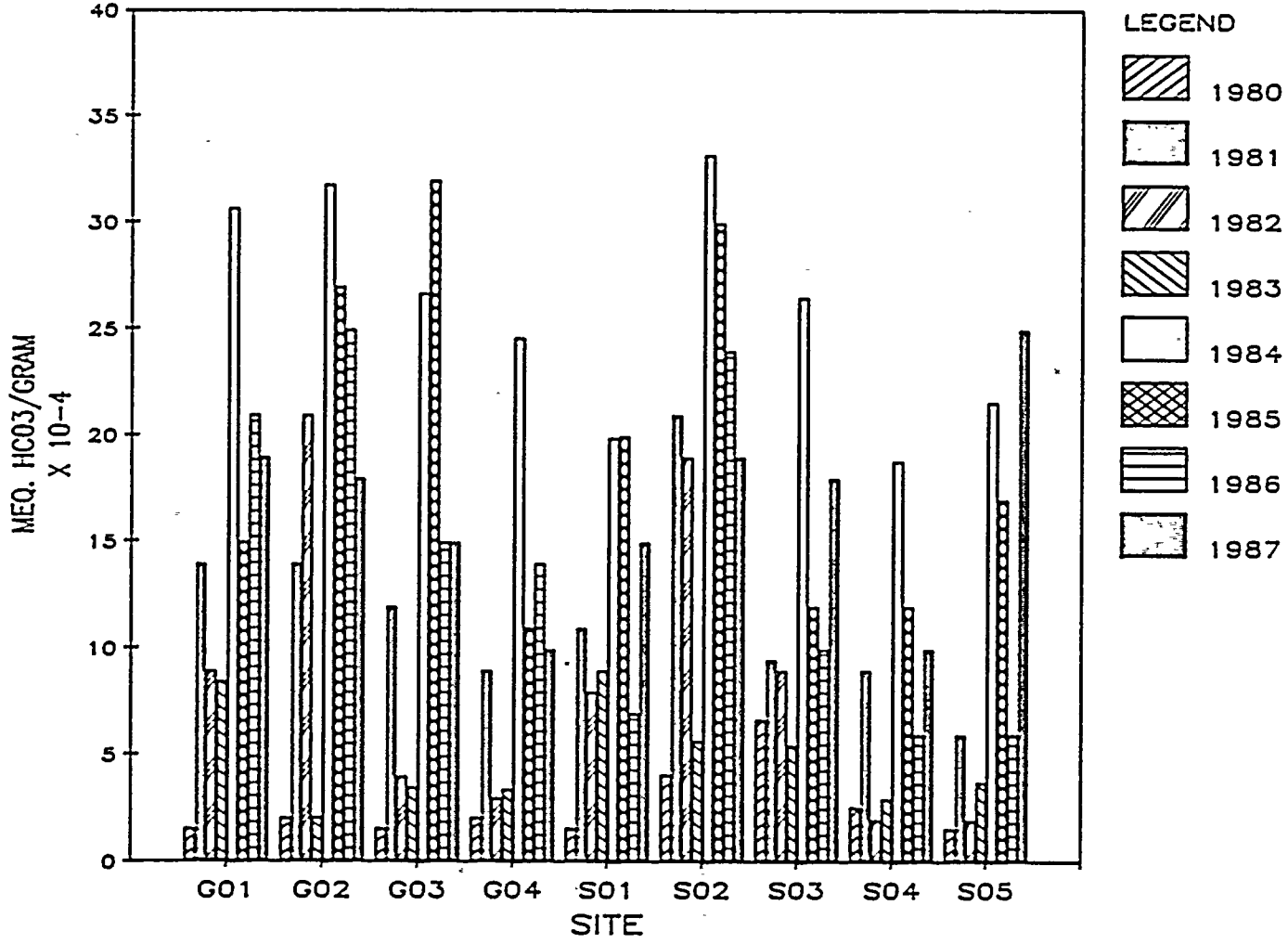


FIGURE 9. SOIL BICARBONATE, 1980-1987

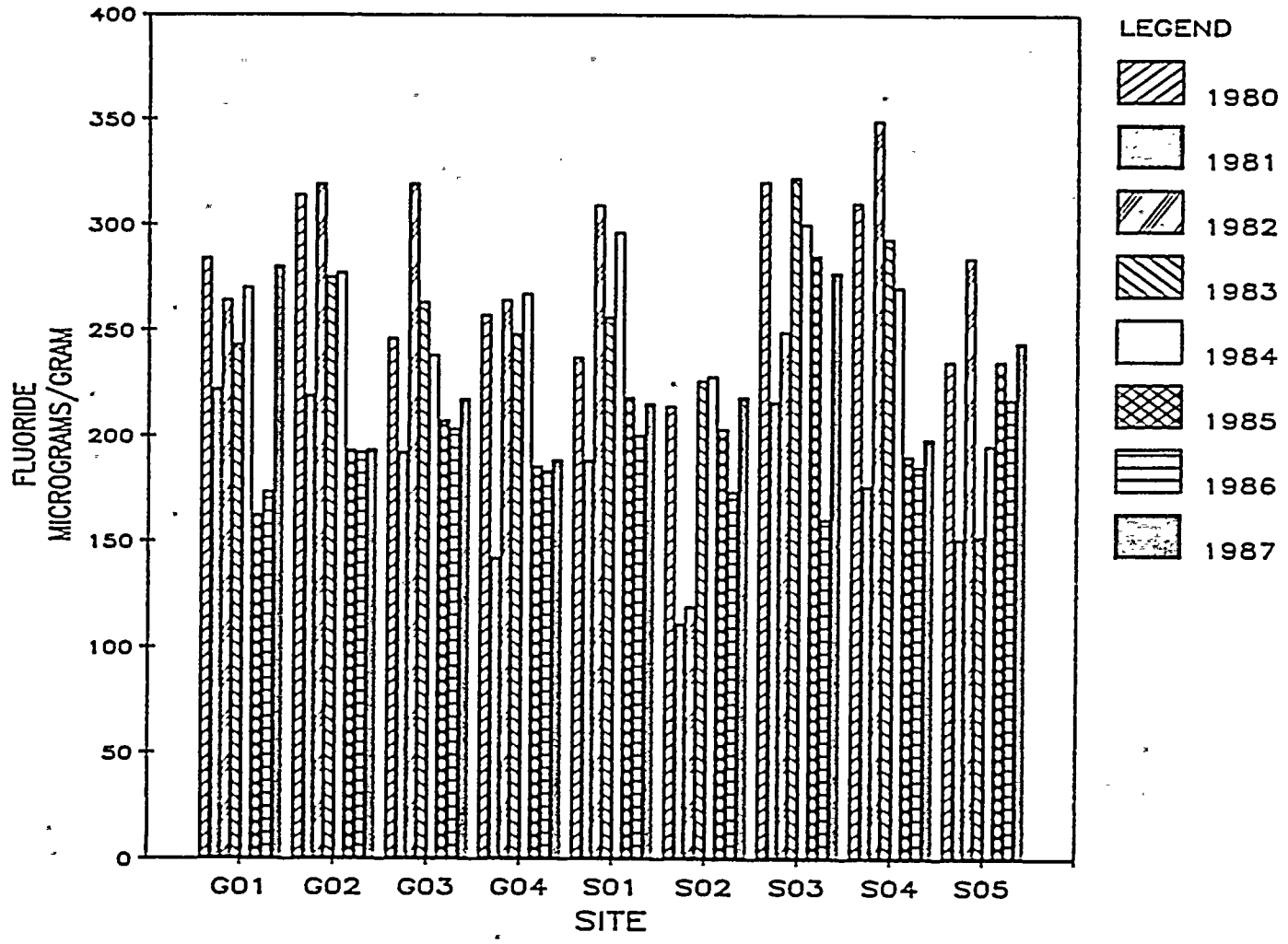


FIGURE 10. SOIL FLUORIDE, 1980-1987

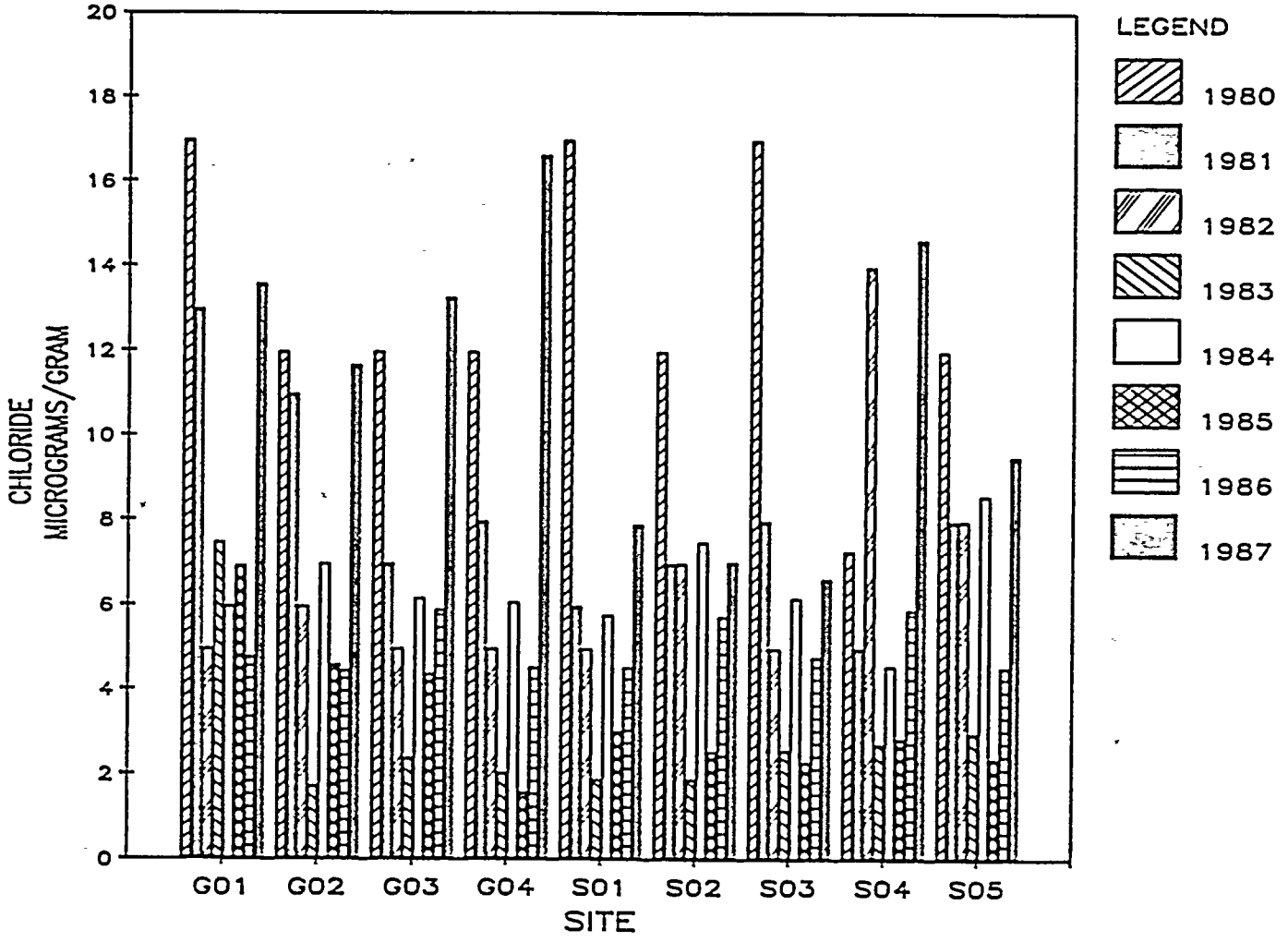


FIGURE 11. SOIL CHLORIDE, 1980-1987

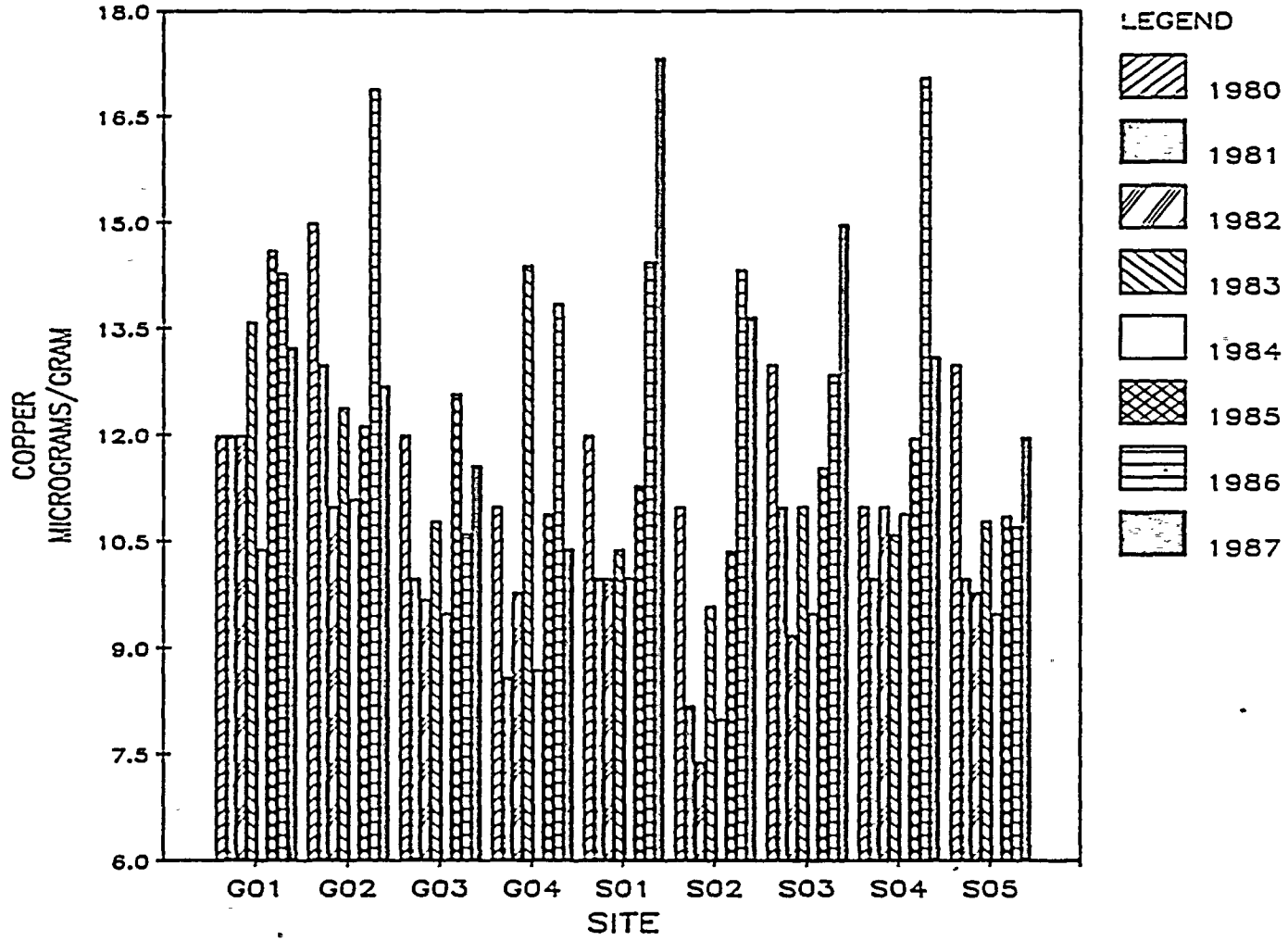


FIGURE 12. SOIL COPPER, 1980-1987

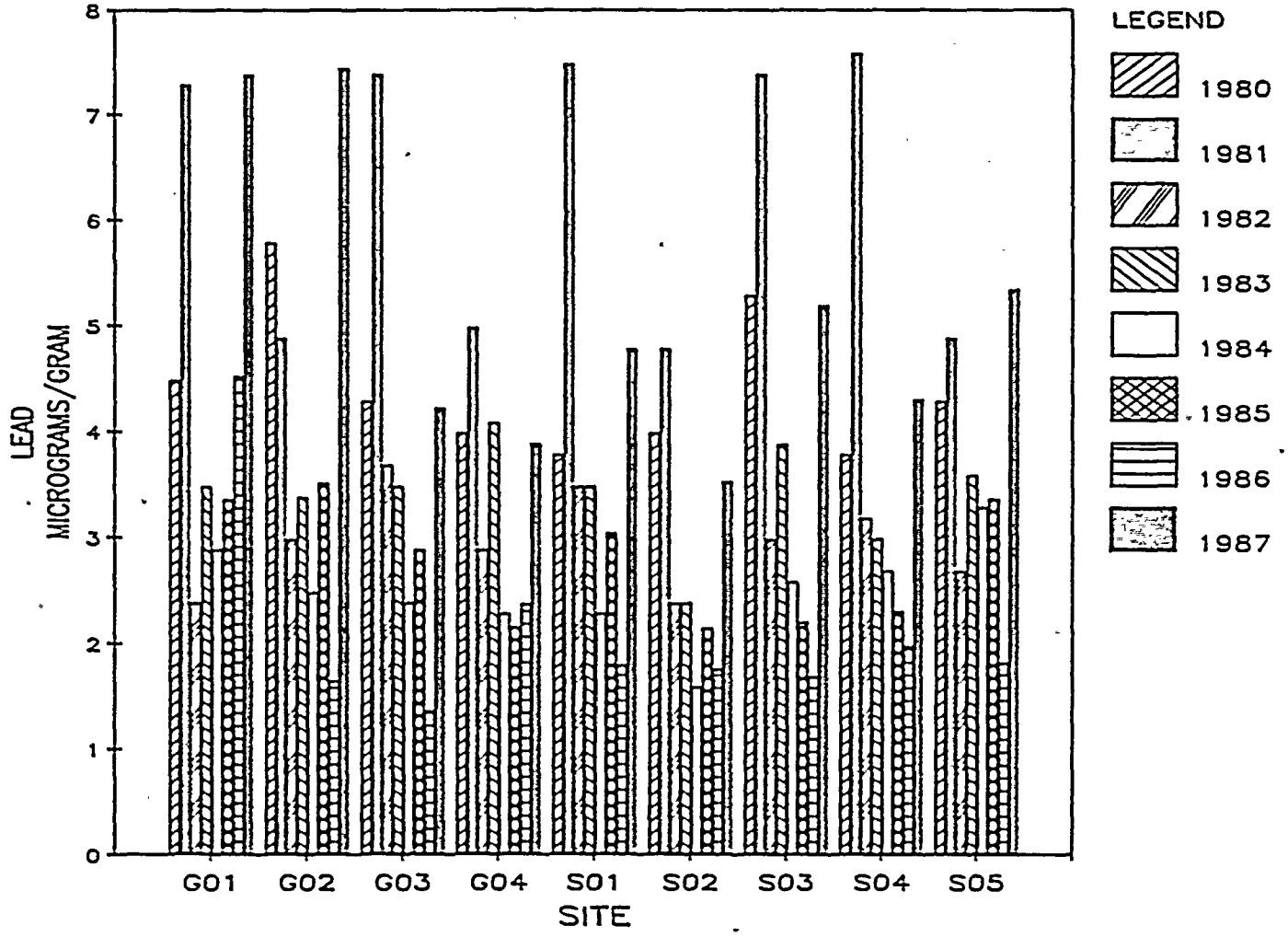


FIGURE 13. SOIL LEAD, 1980-1987

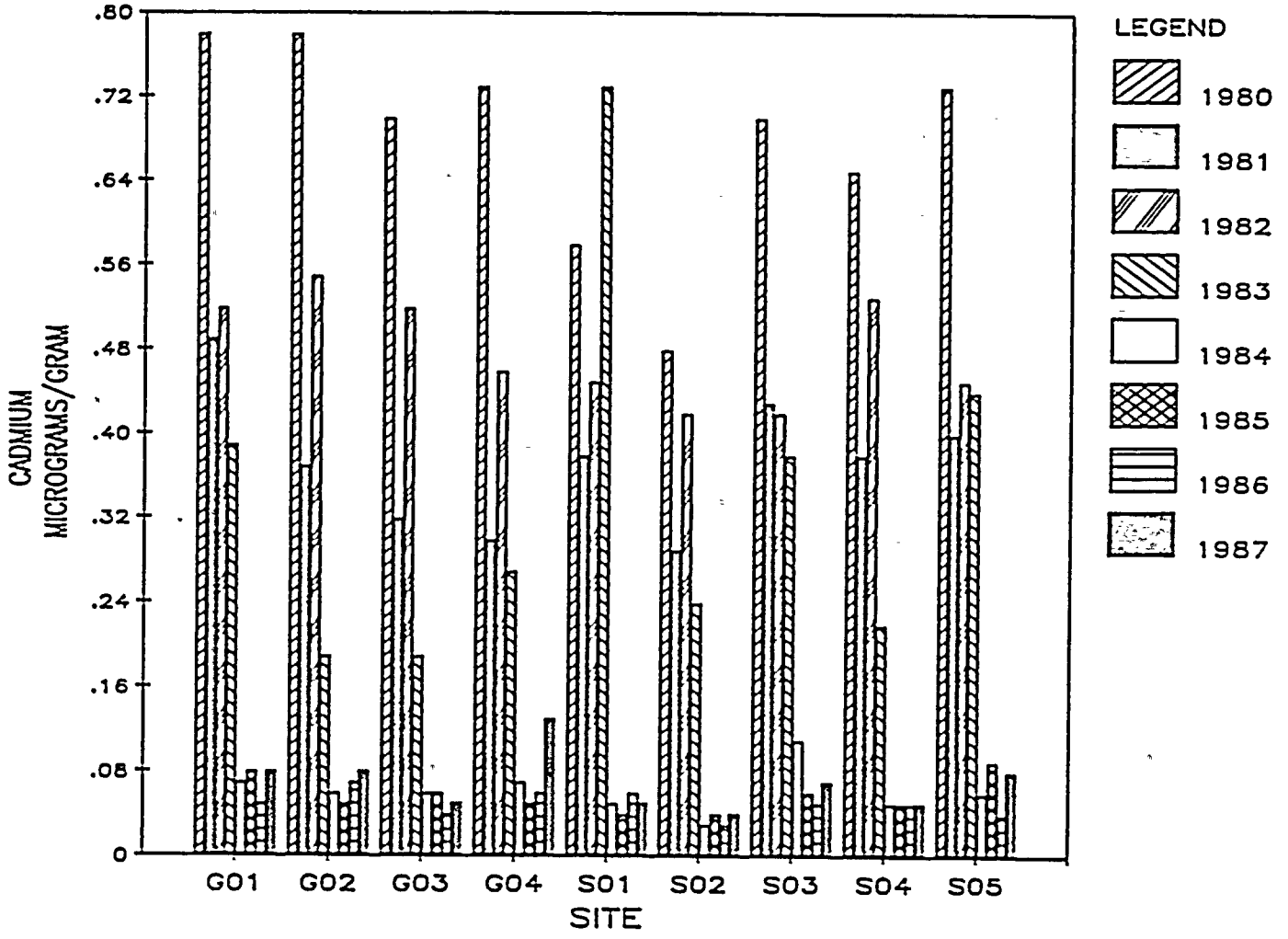


FIGURE 14. SOIL CADMIUM, 1980-1987

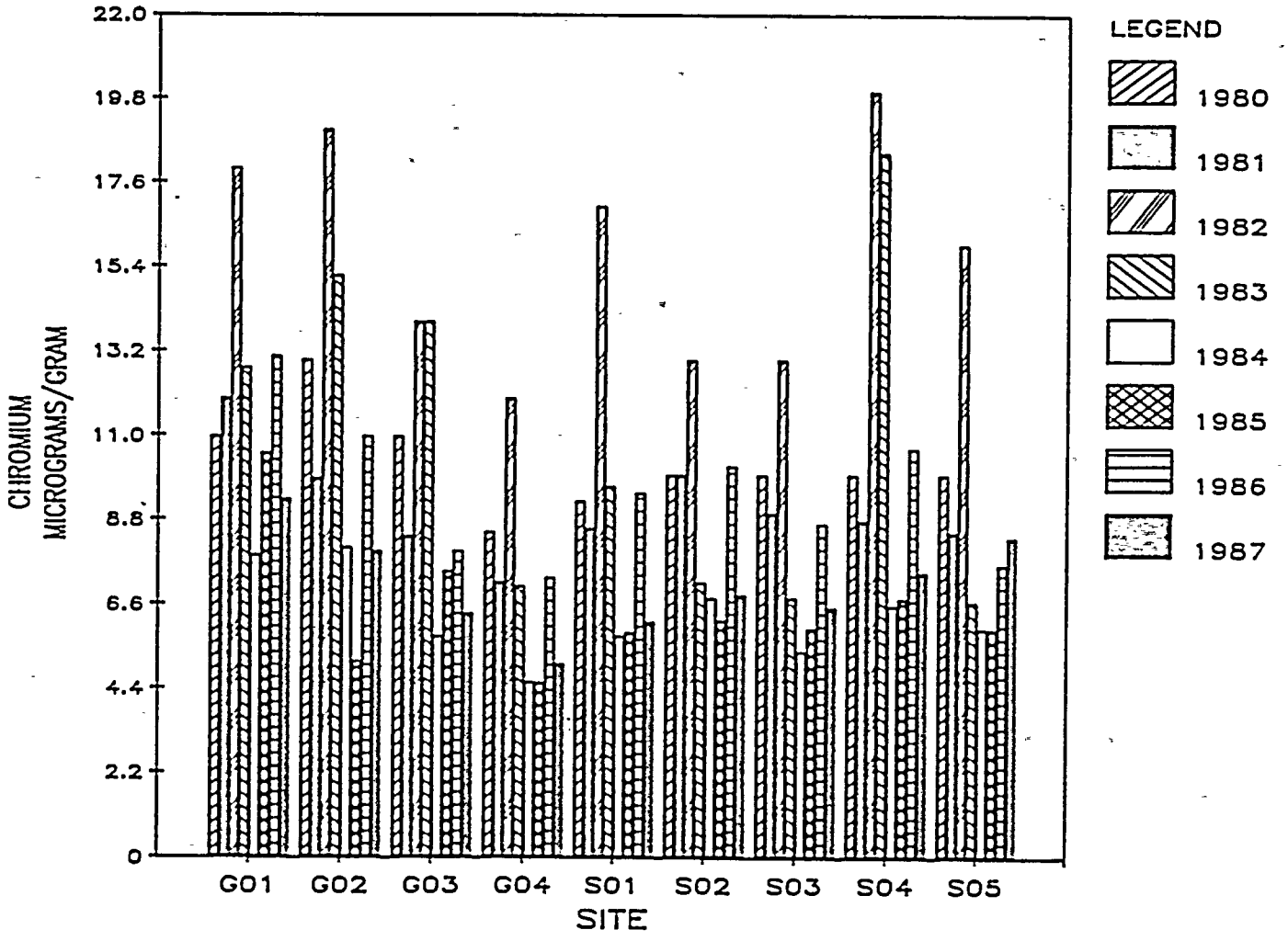


FIGURE 15. SOIL CHROMIUM, 1980-1987

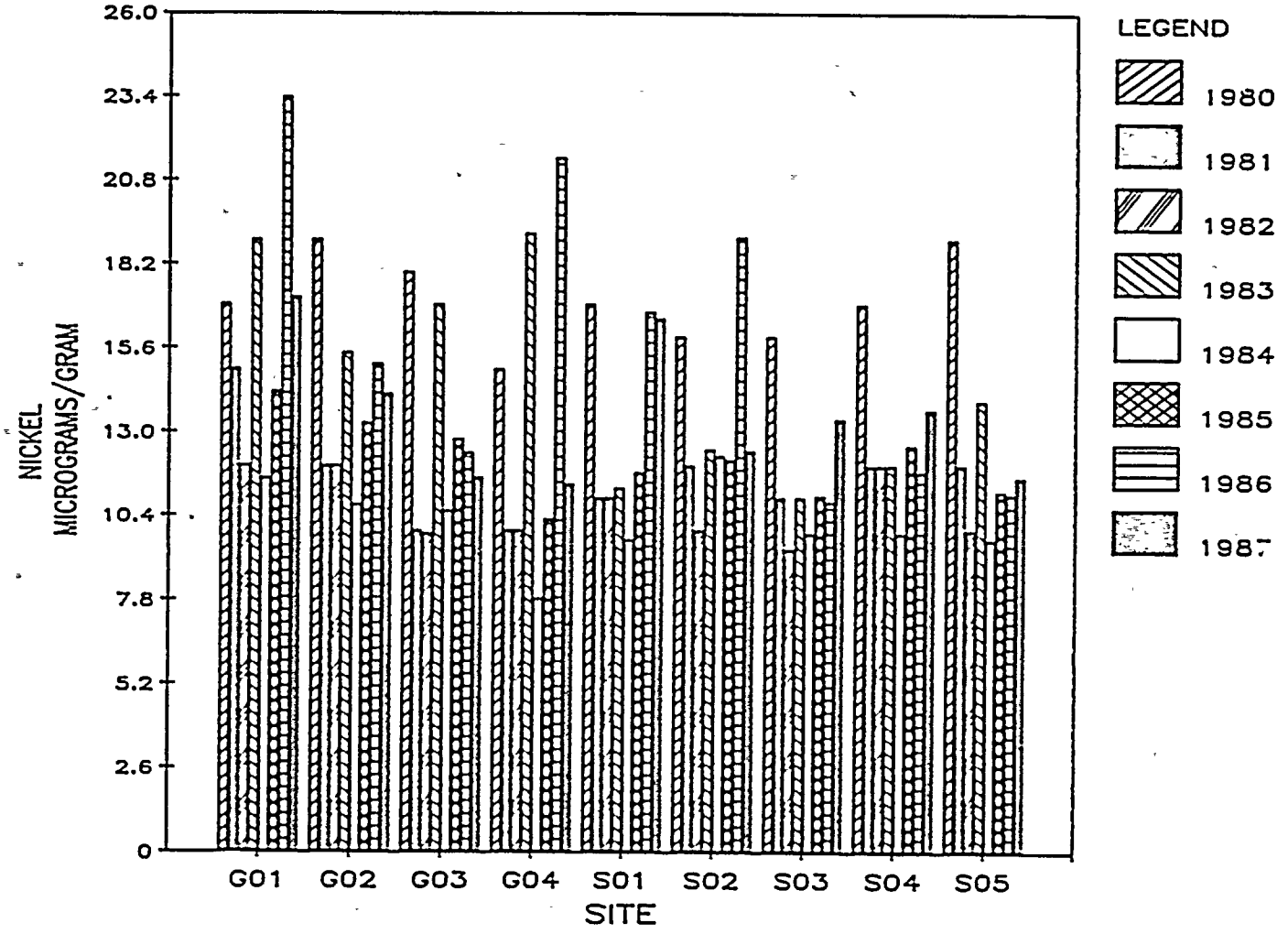


FIGURE 16. SOIL NICKEL, 1980-1987

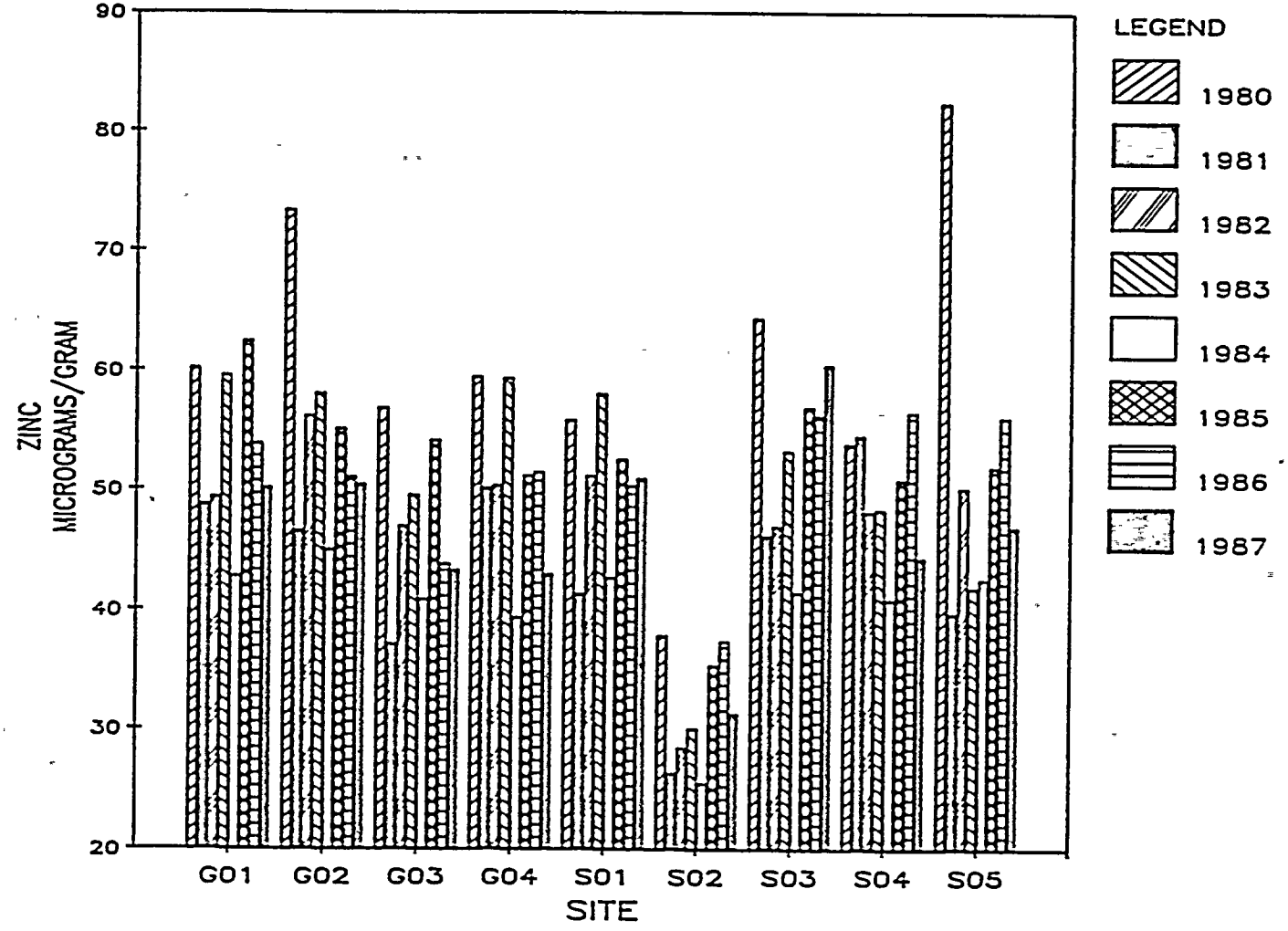


FIGURE 17. SOIL ZINC, 1980-1987

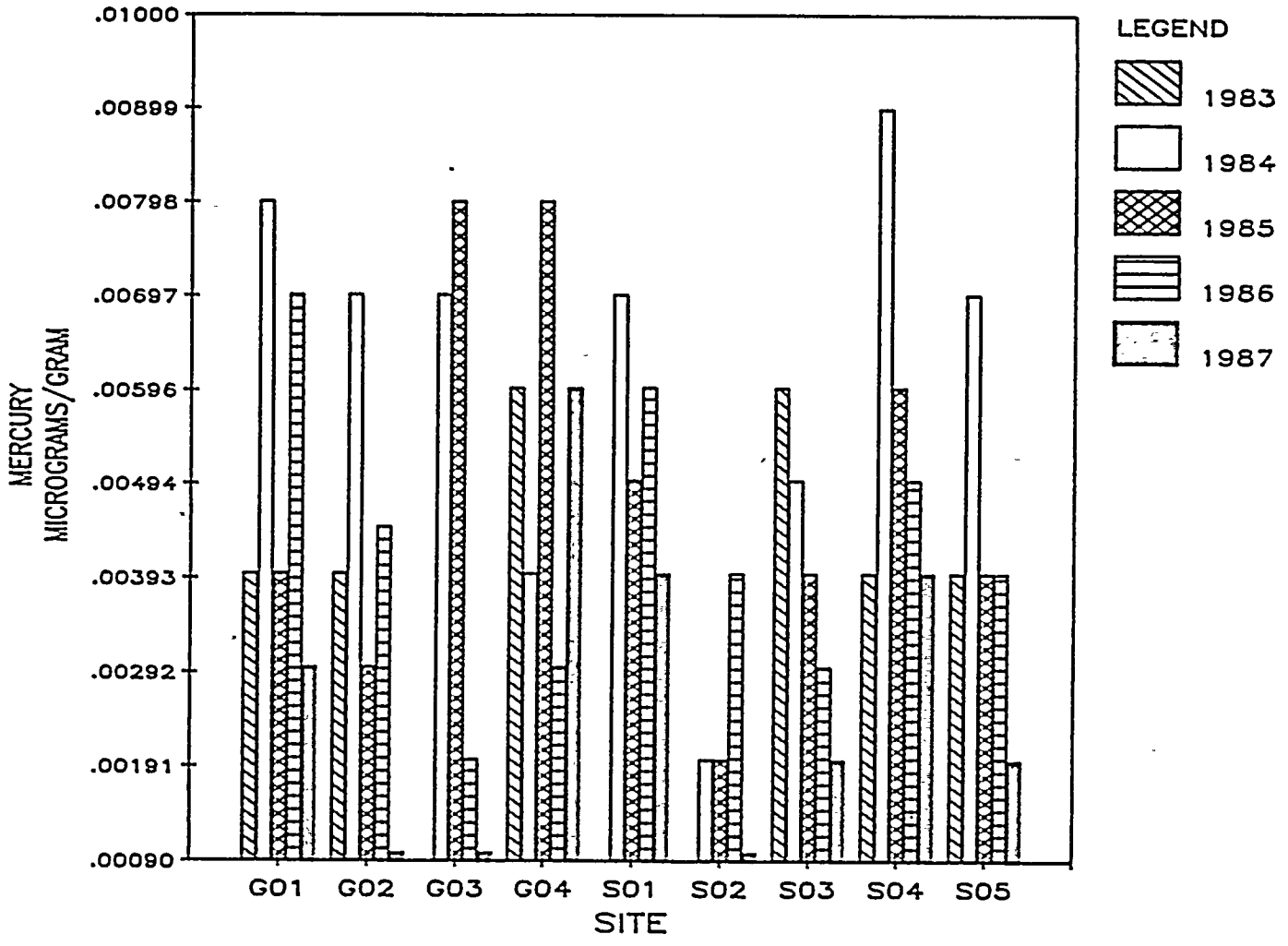


FIGURE 18. SOIL MERCURY, 1983-1987

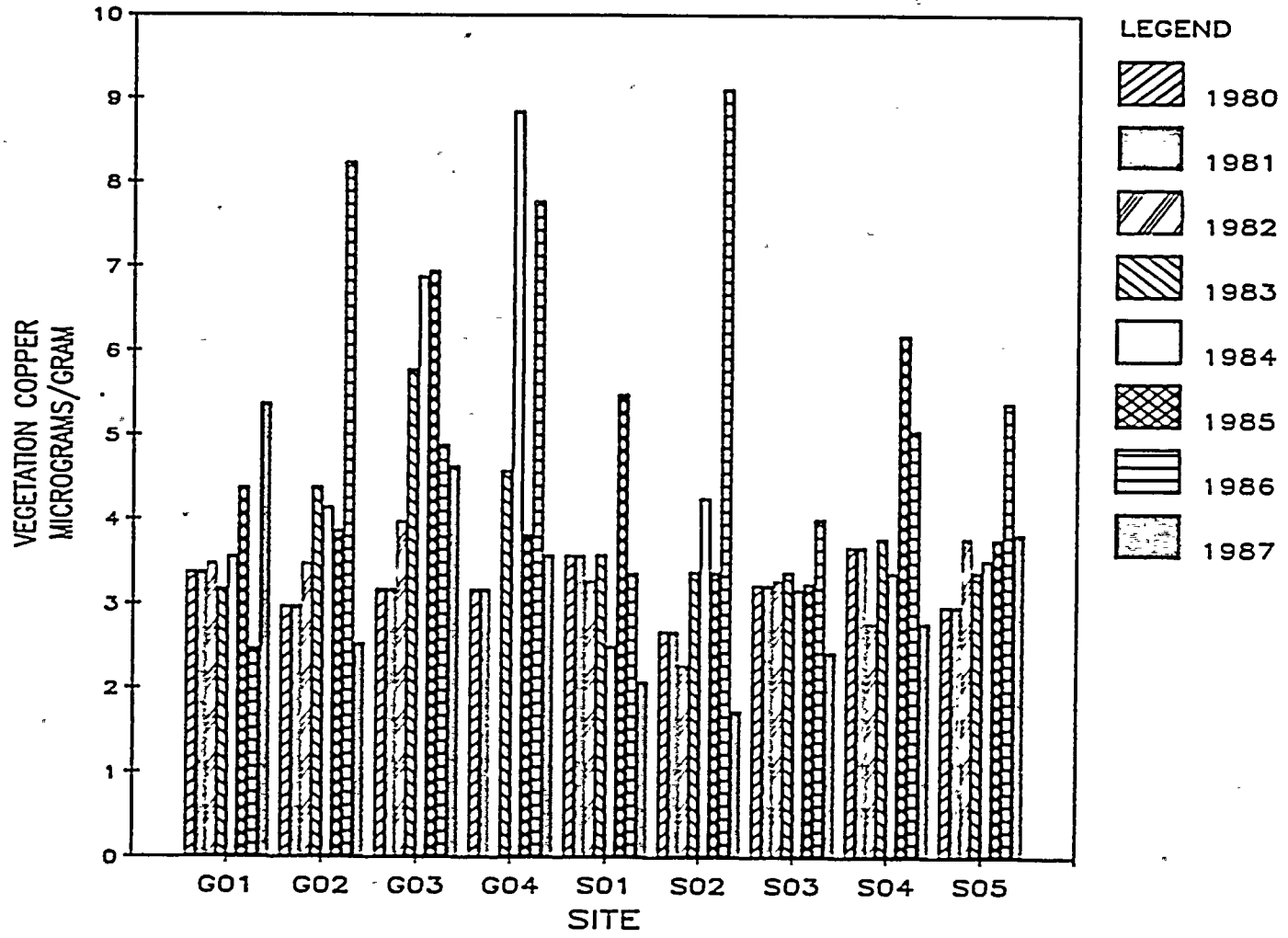


FIGURE 19. COPPER IN POA SANDBERGII, 1980-1987

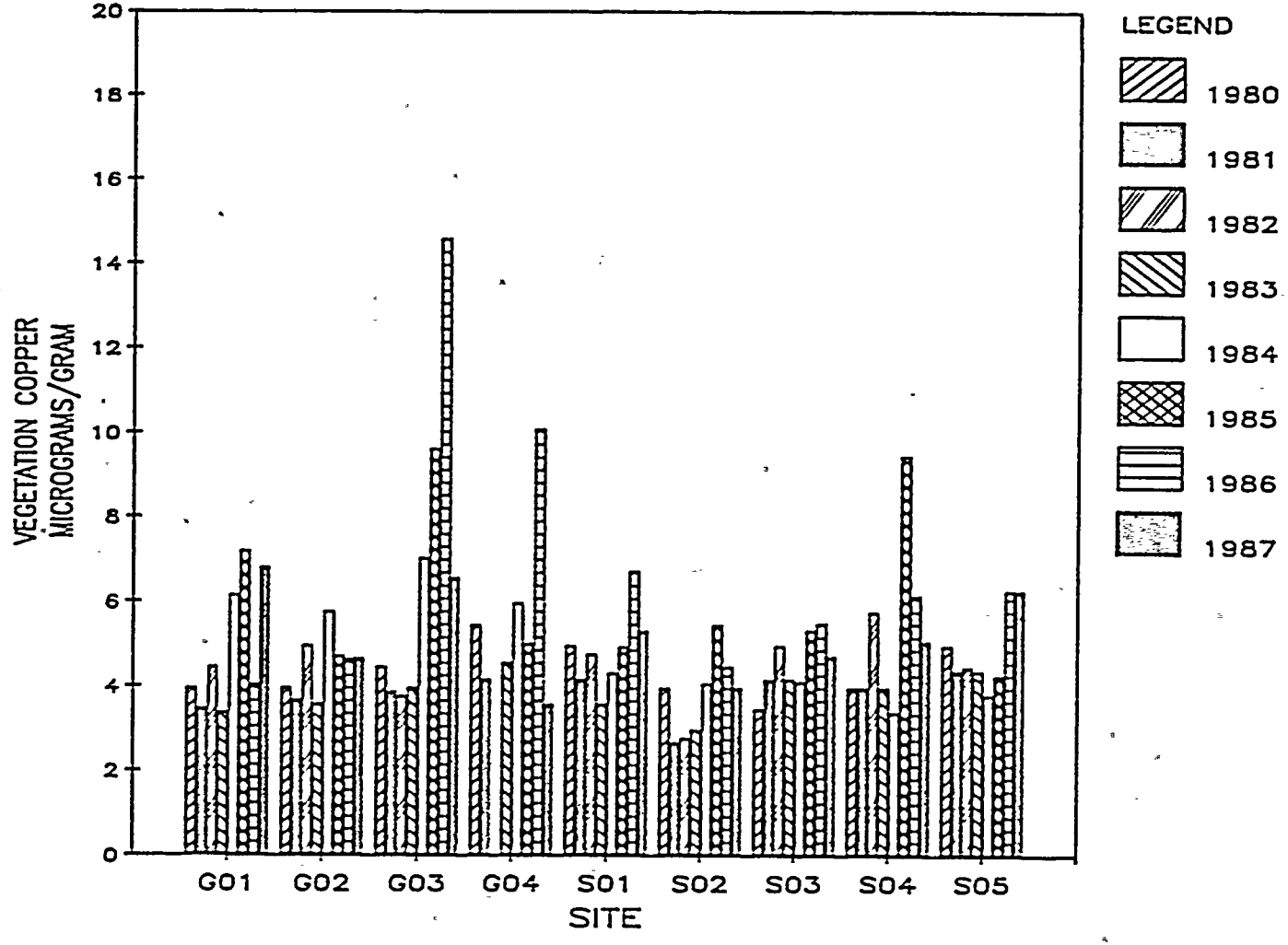


FIGURE 20. COPPER IN BROMUS TECTORUM, 1980-1987

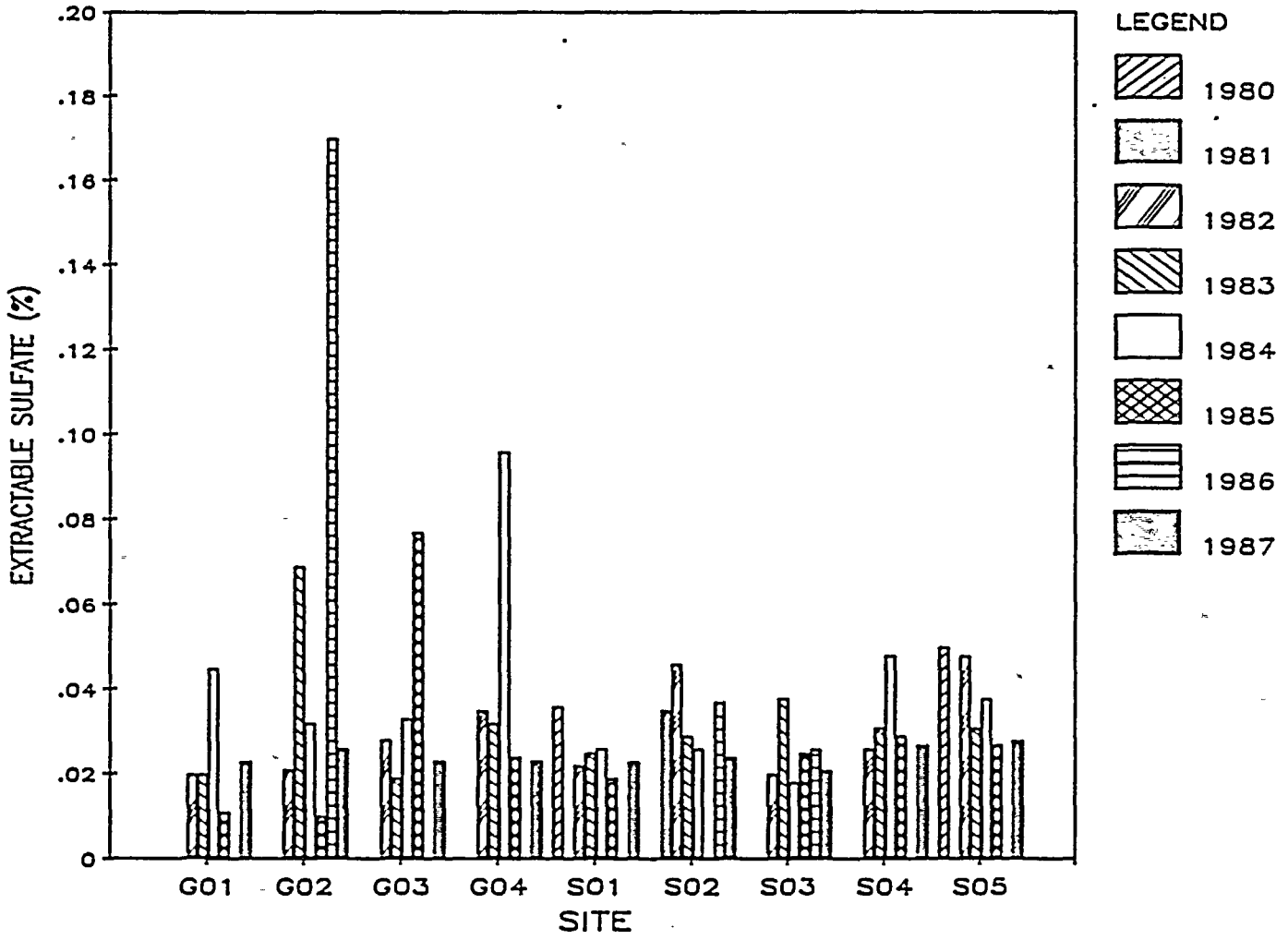


FIGURE 21. SULFATE IN POA SANDBERGII, 1980-1987

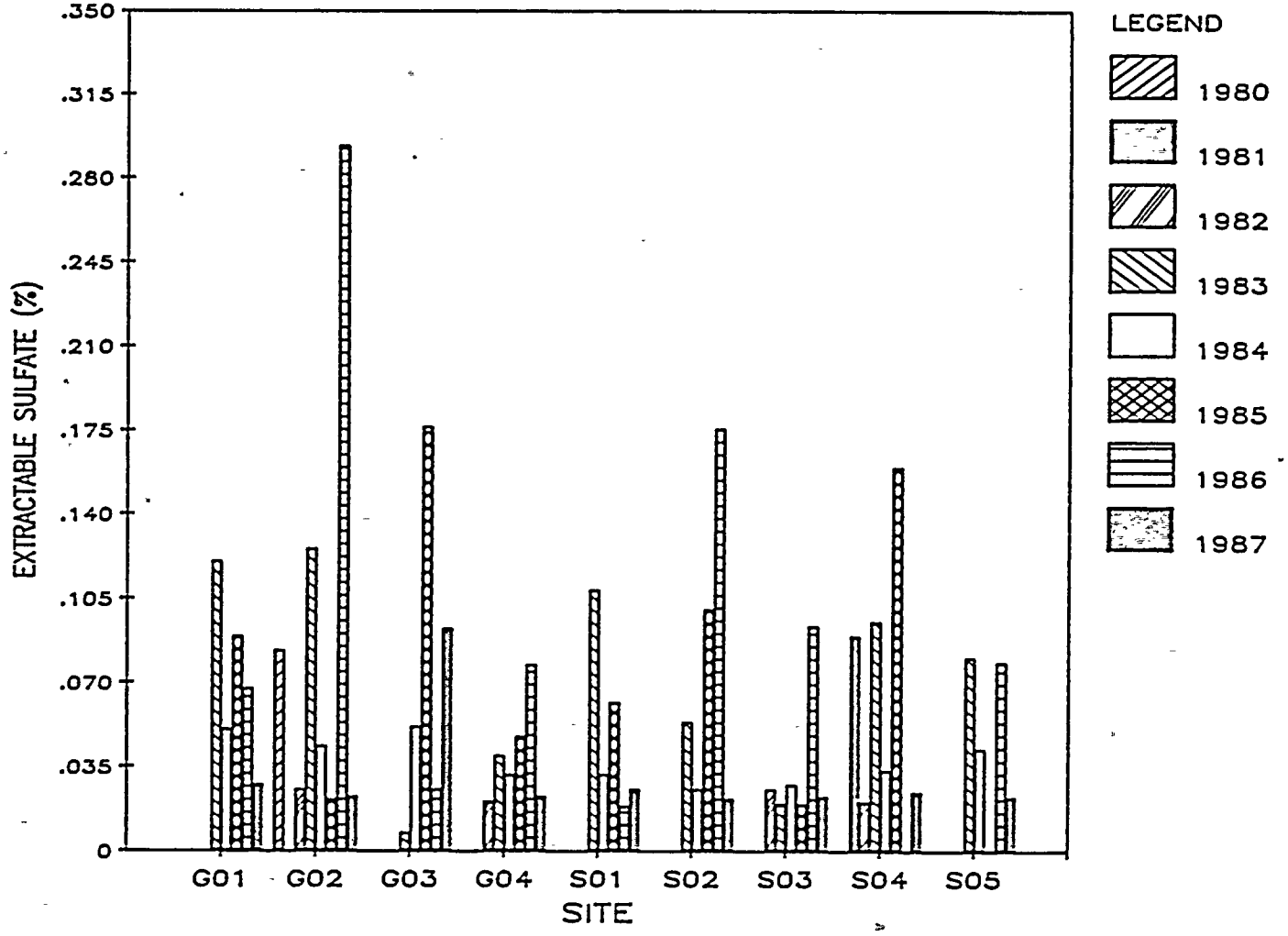
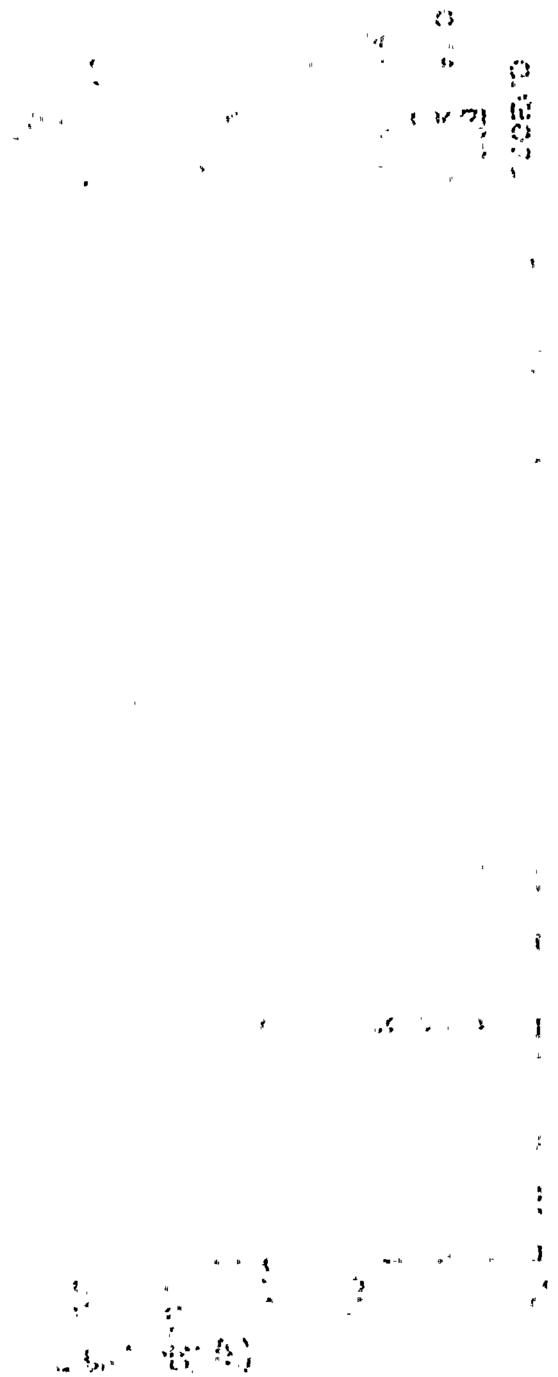


FIGURE 22. SULFATE IN BROMUS TECTORUM, 1980-1987



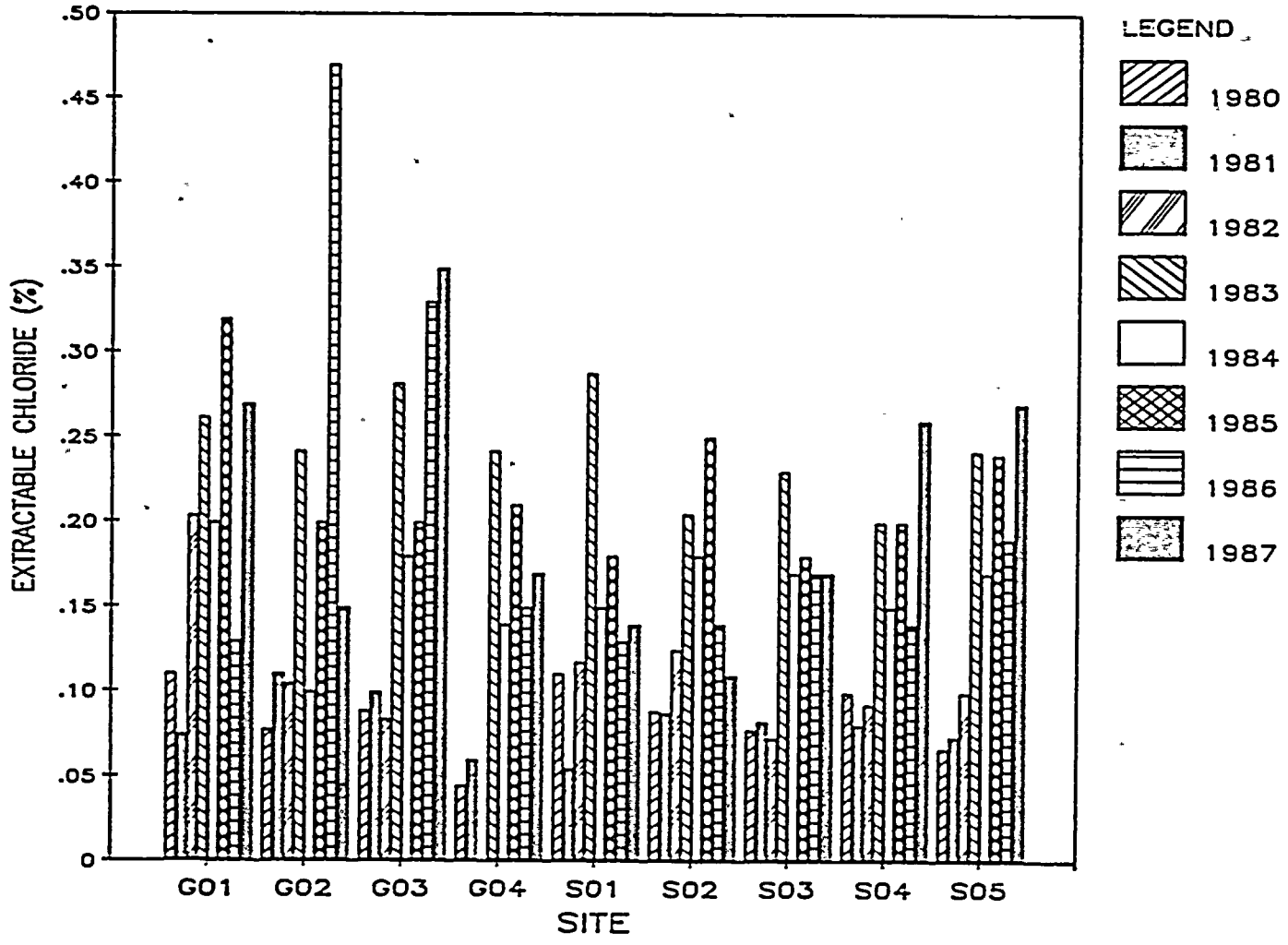


FIGURE 23. CHLORIDE IN POA SANDBERGII, 1980-1987

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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Docket No. 50-397

G02-88-097
April 28,1988

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U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Sirs:

Subject: NUCLEAR PLANT NO. 2
ANNUAL ENVIRONMENTAL OPERATING REPORT

Reference: Facility Operating License NPF-21
Appendix B - Environmental Protection Plan

Per Section 5.4.1 of the referenced EPP, please find attached the subject report for the 1987 calendar year.

Very truly yours,

G. C. Sorensen, Manager
Regulatory Programs

Attachment: as stated

cc: JB Martin/NRC RV
C Bosted/Resident Inspector/901A
WL Fitch/EFSEC

IE25
1/1