Lake Hendricks Water Quality
Study Area Report

Prepared by
South Dakota Department of Water and Natural Resources
Water Quality Management Section

July 1985

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CONTENTS

Lake Hendricks WQSA Summary

The Lake Hendricks Water Quality Study Area consists of about 31,430 acres in Brookings and Deuel Counties, South Dakota and Lincoln County, Minnesota. The watershed lies in the middle of the Prairie Coteau, a plateau-like highland at elevations of about 1,600 to 1,800 feet. Lake Hendricks was formed by glacial action during the Late Wisconsin glacial period some 13,000-15,000 years ago. The lake has a surface area of 1,634 acres, an average depth of 5 feet and a maximum depth of 10 feet. Lake Hendricks is classified under the South Dakota Water Quality Standards for the beneficial uses of warm water marginal fish life propagation, immersion recreation, limited contact recreation, stock watering and wildlife propagation.

Aquatic weeds are not abundant in Lake Hendricks but annual blooms of blue-green algae constitute visual evidence of eutrophication. Primary fish species managed for are walleye, northern pike, and panfish. Fish kills of varying severity have frequently been observed.

Approximately 74% of the Lake Hendricks watershed is cropland and 26% rangeland or pasture. About 2/3 of the drainage area was adequately treated in 1981 according to SCS estimates.

Lakeshore development includes about 40 lakeside residences, two parks, a number of farms, and the Town of Hendricks, Minnesota located near the northeastern shore. Lake Hendricks has extensive public use as a recreational area and there is considerable local interest in the lake as is evidenced by the existence ot the Lake Hendricks Improvement Association and strong local support for the Lake Hendricks WQSA project.

To determine water quality characteristics and identify water quality problems within the watershed, samples were taken at six sites. One site was located on Deer Creek, two were established on major intermittent tributaries, two were in-lake sites, and one was located near the Lac Qui Parle River, the lake outlet. Samples were collected after rainfall events and during snowmelt runoff.

In-lake sampling indicated Lake Hendricks to be hypereutrophic, as evidenced by high concentrations of total phosphorus and organic nitrogen. Annual mean concentrations of total phosphorus for in-lake sites ranged from 0.85 to .206 mg/l from 1980 to 1983. Corresponding values for organic nitrogen ranged from .76 to 1.42 mg/l.

The principal problem at Lake Hendricks appears to be extensive nutrient loading from the watershed via Deer Creek. Annual phosphorus and nitrogen loads entering the lake from the Deer Creek site during 1983 were 0.12 and 1.22 g/m^2/year, respectively. These values represent dangerous loading levels for Lake Hendricks (mean depth: 1.5 m).

Excessive fecal coliform levels were observed in-lake on only three sampling dates from 1980 to 1983. Generally, fecal coliforms are not a serious problem in Lake Hendricks. Mean fecal coliform counts for Deer Creek and the major intermittent tributaries were relatively low and ranged from 7 to 127/100 ml.

Watershed erosion, primarily from cropland, provided 2,978 tons and lakeshore erosion contributed 220 tons of sediment to Lake Hendricks. Total estimated sediment yield amounted to about 2.5 acre-feet per year or .03% of lake water capacity.

Non-point sources of pollution from the Deer Creek watershed, as indicated by relatively high nutrient loading and sediments to the lake are primarily from a lack of best management practices in the watershed. Approximately 33% of the watershed is in need of treatment to minimize erosion. Secondary sources of nutrients as well as primary sources of fecal coliforms to the lake are livestock operations without pollution controls and failing individual septic tanks systems.

Recommendations

Nutrient loading to Lake Hendricks from the Deer Creek drainage may be reduced by utilizing BMP's on the land including implementation of fertilizer management practices, and conservation tillage to reduce erosion. Proper grazing use and feedlot waste management systems will help in the reduction of nutrients, particularly phosphorus, and possible bacterial contamination to the lake. Malfunctioning septic tank systems around the lake periphery should be upgraded and technical assistance should be provided to control existing problems.

Following implementation of watershed treatment, a selective dredging program and/or chemical phosphorus flocculation to improve water quality and the overall recreational potential of the lake should be investigated.

I. Lake Hendricks Watershed Description

A. General Description

Lake Hendricks is a glacial lake located in the northeastern corner of Brookings County about 20 miles northeast of the City of Brookings. Approximately 1/3 of the lake, including the outlet, extends into Lincoln County, Minnesota. The Town of Hendricks, Minnesota, lies near the northeastern shoreline.

The lake is positioned in a relatively well dissected outwash channel tributary to the Lac Qui Parle River in extreme eastern Minnesota. Lake Hendricks is flushed adequately in normal years by surface waters discharged from a watershed of about 31,430 acres (Figure 1). Water is supplied to Lake Hendricks by Deer Creek and two other major intermittent tributaries that enter the lake at its north-central and southeast shore. The outflow empties into the Lac Qui Parle River.

The lake covers 1,634 acres and has a maximum depth of 10 feet and a mean depth of about 5 feet. The bottom consists of silt and muck in the lake basin with sand and gravel in the near shore areas.

About 5% of the shoreline area is covered by cattail and bullrush while submergent aquatic vegetation is limited to a few sheltered bays. Symptoms of eutrophication such as blooms of blue-green algae and reduced water clarity, are present annually. Carp. bullhead, and panfish represent common fish species.

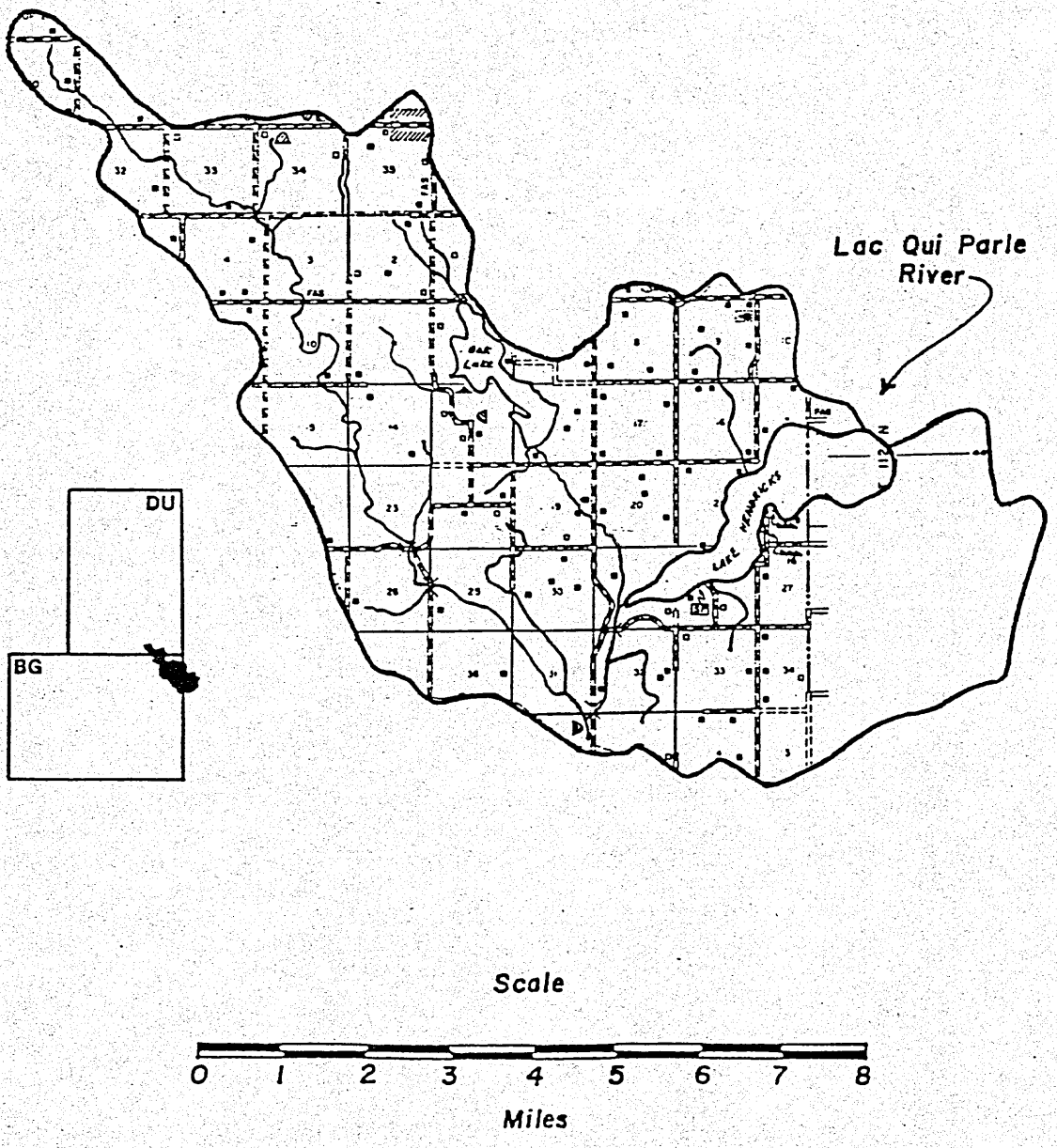

Figure 1. Lake Hendricks watershed.

B. Beneficial Uses and Impairments

Lake Hendricks is a popular recreation lake providing swimming, fishing, camping, waterskiing, and boating. It helps to serve the recreational needs of a population estimated at 159,831 within a 65-mile radius of the lake.

According to the South Dakota Board of Water and Natural Resources Regulations, Chapter 74:03:02, "Surface Water Quality Standards", Lake Hendricks is classified as having the beneficial use designations of warmwater marginal fish life propagation, immersion recreation, limited contact recreation, stock watering, and wildlife propagation. Deer Creek from Medary Creek to S30-T111N-R47W is classified for: warmwater marginal fish life propagation; limited contact recreation; wildlife propagation; stock watering; and irrigation. The water quality standards for these beneficial uses are presented in Table 1.

Lake Hendricks supports a warmwater sport fishery for walleye, northern pike, crappie, carp, and bullhead. The South Dakota Department of Game, Fish and Parks (GF&P) manages the lake for walleye, northern pike, and panfish. Due to the shallow depth and advanced eutrophy of Lake Hendricks, fish kills of varying severity may be expected to occur on a regular basis, as is indicated by the lake's beneficial use classification as a marginal fishery.

Other impairments to lake water quality include nutrient and sediment loading from the watershed. Excessive slopes in the watershed (mean 10.4%) impose a potentially hazardous sediment discharge. Additional

SURFACE WATER QUALITY STANDARDS

ARSD 74:03:02:30. Beneficial Uses of Public Waters Established

Parameters	1 Domestic water supply	2 Cold water permanent fish life propagation	3 Cold water marginal fish life propagation	4 Warm water permanent fish life propagation	5 Warm water semipermanent fish life propagation	6 Warm water marginal fish life propagation	7 Immersion recreation	8 Limited contact recreation	9 Wildlife propagation and stock watering	10 Irrigation waters (May 15 - Sept. 30)	11 Commerce and industry
Alkalinity, Total as $CaCO_3$ mg/l									750		
Arsenic mg/l	.05										
Barium mg/l	1.0										
Cadmium mg/l	.01										
Chloride mg/l	250	100									
Chlorine, Total Residual mg/l		.02	.02	.02	.02	.02					
Chromium mg/l	.05										
Coliform #/100 ml	5000										
Coliform Fecal #/100 ml							200	1000			
Conductivity Micromhos/cm @ 25° C									4000	2500	
Cyanide, Free mg/l		.005	.005	.005	.005	.005					
Cyanide, Total mg/l		.02	.02	.02	.02	.02					
Hydrogen Sulfide		.002	.002	.002	.002	.002					
Lead mg/l	.05										
Mercury mg/l	.002										
Nitrogen, Nitrates as N mg/l	10								50		
Nitrogen, Ammonia as N mg/l		.02	.02	.04	.04	.05					
Oxygen, Dissolved mg/l		6.0	5.0	5.0*	5.0	4.0	5.0	5.0			
Oxygen, Dissolved mg/l (spawning areas)		7.0		6.0*							
pH, Standard Units	6.5-9	6.6-8.6	6.5-8.5	6.5-9	6.3-9	6-9	6.5-8.3	6-9	6-9.5		6-9.5
Polychlorinated biphenyls		.000001	.000001	.000001	.000001	.000001					
Selenium mg/l	.01										
Sodium, absorption ratio										10	
Solids, suspended mg/l		30	90	90	90	150					
Solids, Total Dissolved mg/l	1000								2500		2000
Sulfate mg/l	500										
Temperature, Fahrenheit		65	75	80	90	90					
Silver mg/l	.05										
Fluoride mg/l	2.4										

* Greater than 6.0 in Big Stone and Traverse Lakes, May-April

sources of nutrients and sediments to the lake may be livestock wastes in runoff from nearby farms, seepage from failing individual septic tank systems around the lake periphery, and storm water runoff from the Town of Hendricks. Shoreline erosion was estimated to be minimal by field observers in 1979.

C. Land Use

The 1981 DWNR lakes classification survey estimated the Lake Hendricks watershed to comprise 31,430 acres or about 49 square miles. mostly in Brookings County. About 1/5 of the watershed extends across the state line into Lincoln County, Minnesota. Land use in the watershed is predominantly agricultural. Approximately 74% is cropland and 26% rangeland or pasture. SCS estimated about 2/3 of the watershed was adequately treated with erosion control practices including contour farming, terracing, grass seeding, and proper management of hayland and pasture.

Lakeshore development includes about 40 lakeside residences, two parks, a number of farms, and the Town of Hendricks, Minnesota, near the northeastern shore of the lake.

D. Climate, Geology, and Major Soils

Climate

The climate of east-central South Dakota is continental with cold, dry winters and relatively short springs marked by rapid weather changes. Over 40% of the annual precipitation falls during the three month period from April through June. Summer and autumn are characterized

as hot to mild with an abundance of sunshine. The average daily temperature is 43.5°F. Average annual precipitation and lake evaporation amount to 21 and 34 inches, respectively.

Geology

Glacial drift is the parent material of the soils in the Lake Hendricks watershed. The drift consists of till and outwash deposits laid down during the Late Wisconsin Age (Cary deposits). The former is comprised of a heterogeneous mixture of materials directly deposited by the glacier. The till in the northeastern corner of Brookings County has developed into a loam with a content of about 45% sand, 30% silt, and 25% clay. In this northeast area of Cary drift, the Singsaas soil series and its associates occur. The glacial outwash is a sorted deposit consisting of sand, gravel, and clay that was deposited by melt water streams issuing from the ice sheet.

Major Soils

According to soil surveys conducted by the SCS in the watershed, the following soil association are found in the drainage area (Soil Survey of Brookings County, South Dakota, 1955):

Kranzburg-Brookings-Vienna: Well drained and moderately well drained, nearly level to sloping, silty soils.

Forman-Buse: Well drained, undulating to hilly, loamy soils formed in loamy glacial till.

Singsaas-Oak Lake: Well drained and moderately well drained, nearly level to undulating silty and loamy soils.

Lamour: Poorly drained, nearly level, silty soils.

II. Lake Hendricks Water Quality Study Area Selection

Nominations for designation as a Water Quality Study Area (WQSA) within the First Planning and Development District were solicited by DWNR from the First District Commission. In January, 1980, nominations were open to all commissioners and the following lakes were prioritized: Lake Hendricks (Brookings County); Lake Norden (Hamlin County); and Lake Carthage (Miner County).

The criteria used for WQSA selection were the State Lakes Preservation Committee criteria, the South Dakota Lake Significance Ranking criteria, input from the First Planning and Development District Commission, the availability of land use, soils, and water quality data and identification of water problems. Strong public support was also a major consideration for WQSA selection.

The Lake Hendricks watershed received designation as the WQSA in the First Planning and Development District for 1980. Overwhelming public support for the project strongly influenced this designation.

III. Soil Erosion and Sediment Yield Summary

SCS conducted soil erosion and sediment yield studies of the immediate Lake Hendricks watershed (16,045 acres). The studies detailed the type and extent of erosion and sedimentation problems including contribution from

cropland, grassland, streambanks. gullies, and other sources. Detailed results of these studies are presented in Appendix A.

SCS estimated erosion in the Lake Hendricks watershed to be 42,764 tons per year with total sediment deposited in Lake Hendricks at 3,198 tons or 2.5 acre-feet per year. About 93% of the sediment volume was contributed by watershed erosion, primarily from cropland, and 7% was provided by lakeshore erosion.

SCS selected Best Management Practices (BMPs) for the watershed to reduce sediment yield and nutrients to Lake Hendricks. Examples of needed conservation practices are crop residue management, conservation tillage, proper grazing use of grassland, and pasture and hayland management. The SCS estimated that 10,700 acres or about 67% of the Lake Hendricks watershed was adequately treated in 1981.

IV. Water Quality Status for Lake Hendricks

Lake Hendricks is located in Brookings County, South Dakota, at a latitude of 44 Deg., 29 Min., 54 Sec. north and a longitude of 96 Deg., 27 Min., 12 Sec. north in Township 112N, Range 47W, and Sections 15, 21, 22, 27, 28, 29, and 33. Deer Creek is the major inflow and Lac Qui Parle River is the major outflow. The morphometry of Lake Hendricks is summarized below:

Area	1,600 A (647.5 ha)
Maximum Depth	10 ft. (3.0 m)
Mean Depth	5 ft. (1.5 m)
Volume	8,000 acre-feet ($9.869 \times 10^6 m^3$)
Watershed/Lake Surface Area Ratio	20

Origin of Lake Basin	Glacial
Thermal Stratification	No

Lake Hendricks has been assigned the following beneficial uses by the State of South Dakota:

° Warmwater marginal fish life propagation;

° Immersion recreation;

° Limited contact recreation; and

° Wildlife propagation and stock watering.

Six sampling sites were chosen for the water quality monitoring. Sites 1, 3, and 6 were in-lake sites and Site 6, although an in-lake site, was located near the Lac Qui Parle, the major outflow. Site 2 was located on Deer Creek, the major inflow. Sites 4 and 5 were established on tributaries which usually contained running water only during runoff (Figure 2). Legal descriptions of the sampling sites can be found in Figure 2 and Table IV-1.

Water samples were analyzed for the following parameters: dissolved oxygen, biochemical oxygen demand, fecal coliforms, pH, total alkalinity, total solids, total suspended solids, total dissolved solids, nitrite, nitrate, ammonia, total Kjeldahl nitrogen, total orthophosphate, and total phosphorus. Also, trophic state indices and total nitrogen:total phosphorus ratios were determined.

Tables IV-2 through IV-29 contain annual means, standard deviations, number of observations, ranges, and violations of established criteria for each

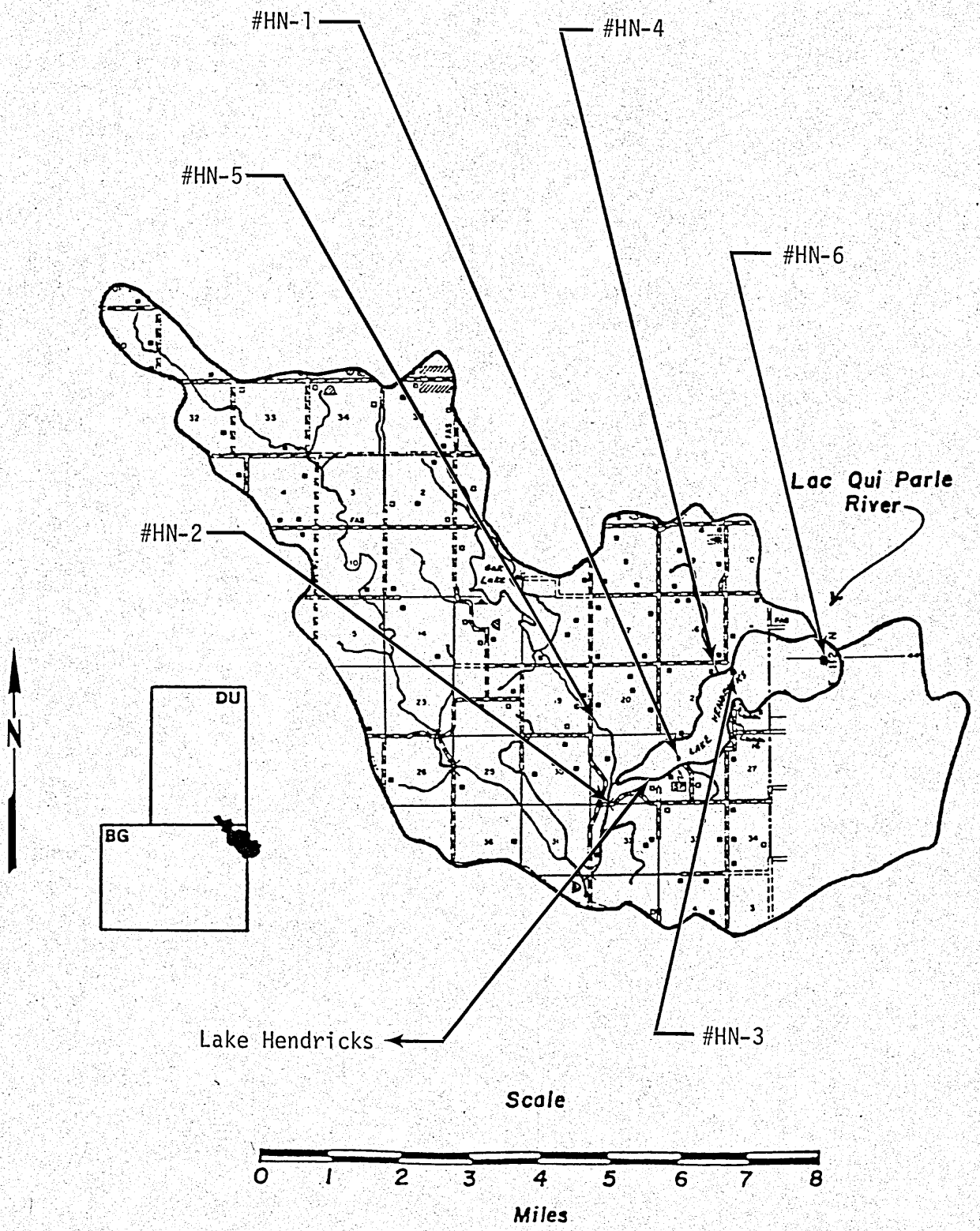

Figure 2. Sample sites for Lake Hendricks and its watershed.

46HN01 (HN-1)	Latitude 44 Deg., 28 Min., 50 Sec., longitude 96 Deg., 28 Min., 35 Sec., Township 112N, Range 47W, Section 28. NW 1/4, NE 1/4, SE 1/4, NW 1/4. This in-lake site is located near the Lake Hendricks state recreation area boat landing.
46HN02 (HN-2)	Latitude 44 Deg., 28 Min., 14 Sec., longitude 96 Deg., 30 Min., 01 Sec., Township 112N, Range 47W, Section 29. SE 1/4, SE 1/4, SW 1/4, SW 1/4. This site is located on Deer Creek adjacent to an east-west gravel road 2 miles north of Highway 30, north of the road.
46HN03 (HN-3)	Latitude 44 Deg., 29 Min., 52 Sec., longitude 96 Deg., 27 Min., 48 Sec., Township 112N, Range 47W, Section 22. SE 1/4, NE 1/4, NW 1/4, NW 1/4. This in-lake site is located off the Lake Hendricks north public access boat ramp.
46HN04 (HN-4)	Latitude 44 Deg., 29 Min., 58 Sec., longitude 96 Deg., 28 Min., 02 Sec., Township 112N, Range 47W, Section 21. NE 1/4, NW 1/4, NE 1/4, NE 1/4. This site is located on an unnamed tributary below a bridge on an east-west gravel road north of Lake Hendricks, south of the road.
46HN05 (HN-5)	Latitude 44 Deg., 29 Min., 11 Sec., longitude 96 Deg., 30 Min., 15 Sec., Township 112N, Range 47W, Section 20. NW 1/4, SW 1/4, SW 1/4, SW 1/4. This site is located near a culvert on a north-south road and 3 miles north of Highway 30, east of the road.
46HN06 (HN-6)	Latitude 44 Deg., 30 Min., 17 Sec., longitude 96 Deg., 26 Min., 06 Sec., Township 112N, Range 46W, Section 18. SE 1/4, NE 1/4, SE 1/4, SW 1/4. This in-lake site is located near the lake outlet, Lac Qui Parle River, at Hendricks, Minnesota.

Figure 2 (cont.). Sample sites for Lake Hendricks and its watershed.

parameter. Figures IV-1 through IV-104 are graphical presentations of the data. Tables and Figures are contained in Appendix B.

Dissolved Oxygen (DO)

In the State of South Dakota, surface waters must not exhibit dissolved oxygen concentrations below 4.0 mg/l for warm water marginal fish life propagation.

Water samples from Lake Hendricks and its inflows and outflows never contained DO concentrations below 4.0 mg/l (Tables IV-2, IV-3, IV-4, IV-5, IV-9, IV-12, IV-13, IV-16, IV-21, and IV-22). Mean values for all sites except Site 4 were always greater than 9.0 mg/l. A DO analysis was performed once on a Site 4 sample and a 5.6 mg/l DO was obtained. In general, Lake Hendricks and its associated streams are well oxygenated.

Seasonally, DO concentrations were usually highest during the winter and lowest during the summer.

Biochemical Oxygen Demand (BOD)

Mean BOD concentrations for Sites 2 and 5 were extremely low. Values over 5.0 mg/l were never obtained and it appears that the major inflow and outflow to Lake Hendricks do not contain high levels of organic pollution.

Fecal Coliforms

For Lake Hendricks, which is used for immersion recreation, fecal coliform counts must not exceed 200/100 ml as a geometric mean of not less than five samples collected during separate twenty-four hour periods for any 30 day period from May 1 to September 30. In addition, more than 20% of the

samples should not exceed counts of 200/100 ml for any 30 day period from May 1 to September 30 and fecal coliform counts must not exceed 400/100 ml in any one sample.

Five samples had fecal coliform counts greater than 400/100 ml and these occurred during the summer. Three of these violations were from in-lake sites, one from Deer Creek (Site 2), and one from Lac Qui Parle River (Site 6) (Tables IV-7, IV-11, IV-15, and IV-19). Mean fecal coliform counts for Sites 1, 2, 3, 4, 5, and 6 during the study period were relatively low; 114, 127, 75, 6.5, 74, and 16 per 100 ml (Tables IV-6, IV-10, IV-14, IV-16, IV-20, and IV-24). Two samples had fecal coliform counts greater than 200/100 ml; Site 1 on August 10, 1983, 280/100 ml; and Site 3 on September 9, 1982, 250/100 ml.

Excess fecal coliforms may pose a health hazard to the lake users. Since most of the violations occurred during the summer, the season of high use, it may be prudent to monitor Lake Hendricks and its inflows more intensively during the summer in order to locate any fecal coliform sources.

pH

A pH range of 6.5-8.3 units is the criterion selected by the State of South Dakota for surface waters used for immersion recreation.

About one-third of the water samples had values of pH greater than 8.3, but less than 9.0, and all sites except Site 4 had violations. However, all sampling sites had mean pH values within the South Dakota criteria (Tables IV-2 to IV-25). These values ranged from 6.7 to 8.2.

Total Alkalinity

The State of South Dakota had assigned a maximum value of 750 mg $CaCO_3$/l for surface waters used for wildlife propagation and stock watering.

Total alkalinity concentrations were never above 750 mg $CaCO_3$/l and were generally between 100-200 mg $CaCO_3$/l. Lake Hendricks is therefore a well buffered lake.

Total Solids, Dissolved Solids, and Suspended Solids

A maximum limit of 150 mg/l total suspended solids has been chosen for South Dakota waters which are used for warm water marginal fish life propagation. In addition, total dissolved solids must not exceed 2,500 mg/l. No standards have been set for total solids concentrations.

The dissolved solids concentrations never exceeded 2,500 mg/l (Tables IV-2 to IV-25). Mean total dissolved solids concentrations for Sites 1, 2, 3, 4, 5, and 6 were 612, 582, 631, 934, 623, and 554 mg/l, respectively. These concentrations are not considered excessive relative to the previously mentioned criterion.

Total suspended solids concentrations exceeded 150 mg/l twice (Table IV-11). Both violations occurred on Site 2, the Deer Creek inflow to Lake Hendricks. during April, 1982 and June, 1983.

The causes of these two violations are unknown although the April violation occurred on a rainy day. Stream bank erosion may have been relatively high on that day.

The mean total suspended solids concentration during the study period for Sites 1, 2, 3, 5, and 6 were 17.8, 76.0, 23.8, 3.5, and 14.2, respectively.

Nitrite

The State of South Dakota has not set water quality criteria for nitrites. Wetzel (1975), however, reported that natural waters usually have nitrites in concentrations from 0 to .01 mg/l. Annual mean nitrite-nitrogen concentrations of Lake Hendricks water and its tributaries were either below the .01 mg/l laboratory detection limit or just slightly above .01 mg/l (Tables IV-2 to IV-5, IV-8, IV-9, IV-12, IV-13, IV-16 to IV-18, and IV-22 to IV-23). These levels do not indicate abnormal conditions. In-lake Site 3 did have one extremely high nitrite-nitrogen concentration during September 9, 1983 (0.62 mg/l) and it is suspected that this value was due to laboratory error or contamination of the sample bottle.

Nitrate

The limit for nitrate concentrations in South Dakota surface waters used for wildlife propagation and stock watering is 50 mg/l. This limit was never exceeded (Tables IV-2 to IV-25). Nitrate-nitrogen concentrations ranged from below the 0.1 mg/l laboratory detection limit to 19.8 mg/l (found on September 9, 1982, Site 3) with most values around 0.1 to 0.5 mg/l.

Wetzel (1975) suggested that unpolluted waters generally have nitrate-nitrogen concentrations ranging from 0 to 10 mg/l and concentrations greater than 10 mg/l would indicate nitrate pollution. According to this criteria, Lake Hendricks and its associated streams are generally not nitrate polluted. Only once was 10 mg/l exceeded (Site 3,

September 9, 1982, 19.8 mg/l). Nitrite and ammonia concentrations were also high at this site although other parameters were not abnormally high or low. Laboratory error or contamination of the sample bottle is suspected but the presence of a localized temporary pollutant is also a possibility.

Ammonia as N

The South Dakota limit for ammonia nitrogen is based on the un-ionized fraction. Lake Hendricks is used for warm water marginal fish life propagation and therefore must not exhibit ammonia concentrations greater than .05 mg/l.

This limit was exceeded twice, once at Site 1 on September 7, 1983 (.051 mg/l) and once at Site 2 on May 12, 1983 (.454 mg/l). The causes of these violations are not known. Mean ammonia concentrations for Sites 1, 2, 3, 5, and 6 during the study period were .010, .034, .005, .001, and .012 mg/l, respectively.

Inorganic and Organic Nitrogen

Organic nitrogen concentrations were calculated by subtracting the ammonia concentrations from the total Kjeldahl nitrogen concentrations. Inorganic nitrogen concentrations are the sum of ammonia, nitrate, and nitrite nitrogen concentrations. In these calculations, any value which was reported as being below the detection limit was assumed to be the same concentration as the detection limit. The State of South Dakota does not have criteria for inorganic or organic nitrogen. Wetzel (1975) presented information relating these nitrogen fractions to trophic state and these relationships are used below.

The mean inorganic nitrogen concentrations during the study period for Sites 1, 2, 3, 4, 5, and 6 were .33, .48, .18, .21, .43, and .50 mg/l, respectively. Annual means are presented in Tables IV-26 to IV-29. These means indicate ultra-oligotrophic to meso-eutrophic conditions. Mean organic nitrogen concentrations during the study period for Sites 1, 2, 3, 4, 5, and 6 were 1.42, .76, 1.41, .82, 1.12, and 1.26 mg/l, respectively. These means indicate eutrophic or hypereutrophic conditions.

Sixty to eighty percent (60-80%) of the total nitrogen in the stream sites (2, 4, and 5) was in the form of organic nitrogen and 70-90% of the total nitrogen was organic nitrogen in the in-lake sites.

Total Orthophosphate

Total orthophosphate concentrations for 1983 ranged from .005 to .116 mg/l and the annual means for Sites 1, 2, 3, 5, and 6 were .050, .050, .054, .079, and .046, respectively. These concentrations are excessive and phosphorus control measures should be investigated. Usually, orthophosphate is recycled rapidly and orthophosphate concentrations are low (Wetzel, 1975).

Prior to 1983, the water samples were preserved with sulfuric acid and so the total orthophosphate concentrations presented also include some hydrolyzable forms of phosphorus. The total orthophosphate annual means prior to 1983 were understandably greater than those of 1983. The pre-1983 annual means ranged from .049 to .289 mg/l and most were greater than .1 mg/l.

Total Phosphorus

The State of South Dakota does not have a total phosphorus concentration limit for the beneficial uses assigned to Lake Hendricks. Reckhow, et.al. (1980), however, proposed a critical limit of .05 mg/l for indicating hypereutrophic conditions and this criterion is used below.

The annual means of total phosphorus concentration for in-lake Sites 1, 3, and 6 ranged from .085 to .206 mg/l and indicated a hypereutrophic lake (Tables IV-2 to IV-5, IV-12, IV-13, IV-21, and IV-22). The inflows, Sites 2, 4, and 5, also had annual means which indicated hypereutrophy; values ranged from .097 to .380 mg/l (Tables IV-8, IV-9, IV-16 to IV-18). These total phosphorus levels must be decreased if an increase in Lake Hendrick's water quality is desired.

Trophic State Index (TSI)

Total phosphorus concentration data were applied to Carlson's (1977) trophic state index. This index uses a scale from 0 to 100 to describe trophic state, and values greater than 50 imply eutrophy.

The TSI values for in-lake Sites 1, 3, and 6 ranged from 53.22 to 90.95. Mean TSI values for Sites 1, 3, and 6 during the study period were 74.60, 71.78, and 74.68, respectively. These data indicate that Lake Hendricks is eutrophic.

Limiting Nutrient

Nutrient limitation was determined with total nitrogen:total phosphorus ratios. In-lake Sites 1, 3, and 6 had mean ratios of 14.0, 19.7, and 16.4, respectively. These ratios vary from nitrogen limitation to co-limitation

to phosphorus limitation. These values are relatively high. Since about 80% of the ratios implied nitrogen limitation, median values are perhaps more informative. Median values for Sites 1, 3, and 6 were 11.1, 9.11, and 9.64, respectively, and these values indicate nitrogen limitation.

Nutrient Loading

Annual total phosphorus and total nitrogen areal loadings were calculated for Site 2, Deer Creek, and Site 6, an intermittent stream. Since flow data were only available for the 1983 spring runoff, annual loadings were based on these data. Thus, the annual loading values reported below are most likely a slight underestimation of annual areal nutrient loading.

Since the sampling was not temporally constant, nutrient loads were calculated by taking the load on a given date and assuming constancy between the given date and the mid-point to the next sampling date and the mid-point to the proceeding sampling date. The number of days between the mid-points was multiplied by the nutrient load found within the mid-points. These values were then summed to obtain total annual loading and divided by the lakes surface area to obtain areal loadings.

The annual total phosphorus and total nitrogen areal loads to Lake Hendricks from Site 2 were 0.12 and 1.22 $g/m^2/yr.$, respectively. Vollenweider (1968; cited in Wetzel, 1975; Table 12-10) presented provisional dangerous phosphorus and nitrogen loading levels for lakes of various mean depths. For a lake with a mean depth of 5 meters, phosphorus and nitrogen areal loadings greater than 0.13 and 2.0 $g/m^2/yr.$, respectively, are considered dangerous. According to these criteria, only the areal phosphorus loading from Site 2 was close to being considered

excessive. However, Lake Hendricks is not as deep as 5 meters (mean depth is 1.5 m) and the areal loadings may actually be excessive for a lake of this mean depth.

The nutrient loadings of Site 2 were much greater than those of Site 5. Total phosphorus and total nitrogen areal loadings for Site 5 were 0.01 and 0.06 $g/m^2/yr.$, respectively. These values are twelve and twenty times lower than those of Site 2. With these differences in mind, it seems reasonable to concentrate further sampling to Site 2 and only sample Site 5 occasionally.

Summary

Lake Hendricks is a shallow lake of glacial origin which is located in Brookings County, South Dakota. Deer Creek is the major inflow and the Lac Qui Parle River is the major outflow. The following beneficial uses have been assigned to the lake:

° Warmwater marginal fish life propagation;

° Immersion recreation;

° Limited contact recreation; and

° Wildlife propagation and stock watering.

The following conclusions are based on the results of monitoring Lake Hendricks and its associated streams from 1980 to 1983.

1. Lake Hendricks is generally well oxygenated.

2. Biochemical oxygen demand levels were low and reflected the high oxygen levels.

3. Fecal coliform levels were generally not excessive. However, 5 samples exceeded the South Dakota standards during the summer.

4. About one-third of the water samples had pH values greater than 8.3 but less than 9.0. However, the mean pH values of the sites were within the South Dakota criterion of 6.5-8.3.

5. Total alkalinity concentrations were generally between 100-200 mg $CaCO_3$/l and indicated a well buffered system.

6. Total dissolved solids concentrations never exceeded 2,500 mg/l. Mean values ranged from 554 to 934 mg/l and are not considered excessive.

7. Total suspended solids concentrations were generally well below the 90 mg/l standard. Site 2, the Deer Creek inflow exceeded 90 mg/l twice, once during runoff in 1982 and once during June of 1983. Total suspended solids do not appear to be a major problem.

8. Nitrite and nitrate-nitrogen concentrations were comparable to those found in unpolluted natural waters and are not considered excessive.

9. The South Dakota standard for un-ionized ammonia was exceeded twice during 1983. Mean ammonia concentrations ranged from .001 to .034 mg/l. These levels do not violate the standard (.05 mg/l) and are not considered excessive.

10. Mean concentrations of inorganic nitrogen indicated that Lake Hendricks is ultra-oligotrophic to meso-eutrophic whereas mean organic

nitrogen concentrations indicated eutrophy or hypereutrohy. Organic nitrogen is the dominant nitrogen fraction.

11. The total orthophosphate and total phosphorus concentrations were considered excessive. Mean total orthophosphate levels ranged from .046 to .079 mg/l. Total phosphorus concentrations ranged from .097 to .380 mg/l and indicated hypereutrophic conditions.

12. Carlson's (1977) total phosphorus trophic state index indicated a eutrophic system. The values ranged from 53.22 to 90.95 and mean values were around 74.

13. Based on total nitrogen:total phosphorus ratios, Lake Hendricks is nitrogen limited.

14. Phosphorus loading to Lake Hendricks was considered dangerous to the lake's water quality.

15. Site 5 did not contribute major amounts of nitrogen and phosphorus to Lake Hendricks.

16. Deer Creek, Site 2, contributed dangerous amounts of phosphorus to Lake Hendricks.

Recommendations

1. The hypereutrophic nature of Lake Hendricks indicates a need for lake restoration activities. Therefore, lake restoration activities should be considered.

2. Excessive phosphorus loading levels imply either point or non-point phosphorus sources within the watershed. These sources should be located and mitigative actions should be taken to reduce phosphorus loading. Although nitrogen is the limiting nutrient in this lake the paucity of viable strategies to reduce nitrogen inputs to the lake (except for point sources or fertilizer usage) precludes the use of techniques to directly control nitrogen sources. In addition, controlling nitrogen in a nitrogen limited lake may be risky because many noxious blue-green algae can fix atmospheric nitrogen and this will give them a competitive advantage over less noxious algae.

3. Frequent violations of parameter standards occurred during spring runoff. This implies some erosion is occurring and therefore areas of high erosion should be delineated and consideration should be given to methods which reduce erosion and control nutrients from non-point sources.

4. The possible sources of fecal coliforms should be noted, especially during the summer, and mitigative actions should be taken if these sources are identified.

V. Lake Hendricks Watershed Problems and Recommendations

A. Watershed Problems and Recommendations

1. Nutrient and Sediment Loading from Watershed Runoff

Problems:

Excessive nutrient loads from Deer Creek are probably a major contributing factor for the present hypereutrophic conditions in Lake Hendricks. The annual total phosphorus and total nitrogen areal loads to Lake Hendricks for 1983 were 0.12 g/m_2/year and 1.22 g/m^2/year, respectively. For a lake with a mean depth of 5 meters, phosphorus and nitrogen areal loadings greater than 0.13 g/m_2/year and 2.0 g/m^2/year, respectively, are considered dangerous (Vollenweider, 1968). However, Lake Hendricks' mean depth (1.5 m) is much less than that of the shallowest lake (5 m) considered by Vollenweider. Therefore, the areal loads recorded during this study are excessive for a lake of this mean depth.

Violations of several water quality standards, such as those for suspended solids, during spring runoff indicate that erosion is occurring in the watershed (Chapter IV). SCS estimated watershed erosion, primarily from cropland, provided 2,978 tons (2.3 acre-feet) of sediment to the lake. This represents about .03% of the lake volume. In general, sediment loading does not appear to be a serious lake-wide problem in Lake Hendricks. Fecal coliform levels were generally not excessive during the study period. Only three in-lake samples indicated violations of

fecal coliform standards from 1980 to 1983. Fecal coliforms do not appear to be a major problem in the lake (Chapter IV).

A door-to-door sanitary survey of 36 lakeside residences conducted by DWNR in 1979 did not indicate any obvious waste disposal system failures. Over 90% of the lakeside septic tank systems were situated more than 100 feet from the lakeshore in compliance with current regulations (ARSD 74:03:01:11). However, infrared photo imagery by EPA during 1980 identified 8 residences around the lake periphery with surface-failing on-site waste disposal systems.

Recommendations:

A sediment control structure (T112-R47-31) is presently in place to reduce sediment input from the northwestern tributary. Sediment input from the southeastern tributary, which drains ditched cropland in Minnesota, could be reduced by construction of a sediment basin at the influx (T112-R47-22).

Sediment and nutrient input into Lake Hendricks can be further reduced by utilizing BMPs on watershed land where erosion control practices need to be applied. Appropriate BMPs include conservation tillage and crop residue use. Proper grazing use should be practiced to prevent rangeland deterioration and streambank degradation. Vegetative sediment buffer strips should be established to protect overgrazed and eroding streambanks and thereby reduce the amount of sediment entering the tributaries.

Drainage patterns and nutrient contributions of existing livestock operations near the lakeshore and in the watershed should be established and monitored to determine their impact on Lake Hendricks water quality. Appropriate waste treatment systems could then be constructed, where needed, to reduce nutrient, sediment, and fecal coliform levels entering the lake. The contribution of the Town of Hendricks to sediment and nutrient loads should also be assessed.

The Lake Hendricks Improvement Association (LHIA) should initiate procedures necessary for correcting the presently identified septic tank surface failures around the lake. A sanitary district should be established which would serve as a sponsoring agency in efforts to secure funds for monitoring and upgrading malfunctioning systems and for the planning and construction of any needed facilities.

B. In-Lake Problems and Recommendations

1. Eutrophication

The major problem in Lake Hendricks is eutrophication as evidenced by high concentrations of phosphorus and nitrogen, annual blooms of blue-green algae, reduced depth, and decreased water clarity.

Annual mean concentrations of total phosphorus for in-lake sites ranged from .085 to .206 mg/l from 1980 to 1983. Corresponding values for organic nitrogen ranged from .76 to 1.42 mg/l. These

nutrient levels are indicative of advanced eutrophic or hypereutrophic conditions (Chapter IV).

Recommendations

The watershed treatments recommended in the previous section will help alleviate the nutrient problems in Lake Hendricks. Following watershed stabilization, in-lake treatments such as selective dredging and chemical phosphorus precipitation may be considered. Although the present estimated rate of sediment deposition is not an immediate threat to lake water storage capacity, due to the shallow average depth (5 feet) of Lake Hendricks dredging of identified areas of silt accumulation will: 1) prevent slough-like conditions from developing in some areas of the lake; 2) extend the useful life of the lake; and 3) remove nutrients bound to the sediments.

The second treatment involves the application of a chemical such as aluminum sulfate (alum) to the lake surface to tie up the soluble phosphorus which forms a precipitate, settles out, and creates a partial bottom seal. Treatment may have to be repeated every 1-3 years depending on lake conditions. Cost effectiveness of both in-lake treatments should be determined before any action is taken.

2. Shoreline erosion

SCS estimated that shoreline erosion contributes 220 tons or about 7.4% of the total sediment deposited in Lake Hendricks each

year. Lakeshore soils, when cultivated, are likely to be erodible with soil losses in excess of 5 tons/acre/year.

Recommendations

Seeding of grass is recommended for lakeshore areas that presently lack adequate vegetative cover. Stabilization of steeper shoreline areas normally involves shaping existing slough banks to a flatter, stable 3:1 slope by cut and/or fill, placing stone riprap on the new slope and establishing grass on the exposed areas above the riprap.

VI. Summary and Conclusions

Lake Hendricks is a shallow lake which occupies a moderately large contributing watershed (relative to the size of the lake) comprised mainly of cultivated land. As a result, the lake is subject to proportionately large annual sediment and nutrient loads. Restitution of incoming sediment and nutrients by means of watershed stabilization and sediment basins is not expected to appreciably decrease algal bloom production due to wind generated mixing of nutrients from the bottom sediments of the shallow lake. Unless funds are available to implement both watershed stabilization (sediment and nutrient reduction) and in-lake removal of sediments, substantial improvement in Lake Hendricks water quality cannot be reasonably expected.

VII. Literature Cited

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VIII. Appendices

Appendix A. SCS Soil Erosion and Sediment Yield Study

SECTION 208 - WATER QUALITY STUDY AREAS

SOIL EROSION AND SEDIMENT YIELD STUDY

IN

LAKE HENDRICKS WATERSHED

BROOKINGS COUNTY, SOUTH DAKOTA

AND

LINCOLN COUNTY, MINNESOTA

SOIL CONSERVATION SERVICE
U. S. DEPARTMENT OF AGRICULTURE
HURON, SOUTH DAKOTA

ASSISTED BY
SOUTH DAKOTA DEPARTMENT OF WATER AND NATURAL RESOURCES
PIERRE, SOUTH DAKOTA

September 1981

SOIL EROSION AND SEDIMENT YIELD

IN

LAKE HENDRICKS WATER QUALITY STUDY AREA

BROOKINGS COUNTY, SOUTH DAKOTA

AND

LINCOLN COUNTY, MINNESOTA

Introduction

Intense use of our natural resources over the years has caused a general deterioration of our environment. Some of our air, soil, and water resources have become polluted. Increased public awareness of this situation helped to bring about the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500). Section 208 of P.L. 92-500 addresses water pollution problems as it calls for management practices "...(to) be developed and implemented to assure adequate control of sources of pollutants in each state."

The South Dakota Department of Water and Natural Resources has responsibility for formulating a section 208 water quality management plan for South Dakota. Lake Hendricks Watershed was one of four selected for study in 1981 to facilitate formulation of the plan. (See Figure 1.)

It is generally thought that sediment and nutrients are the principal pollutants in South Dakota lakes and streams. 1/, 2/, 3/

This report outlines more detailed information on soil erosion, sediment sources and quantities, management practices to control sediment, and costs for those practices. This information was developed by the USDA Soil Conservation Service (SCS) for the South Dakota Department of Water and Natural Resources.

1/ Mathew, F.L., "Water Pollution in South Dakota, Part I: Natural Water Quality and Pollution Sources," 1970, South Dakota Water Resources Institute, South Dakota State University, Brookings, South Dakota, 34 pages.

2/ "Development Components of the South Dakota Water Plan, Volume II-B" 1977, Division of Resources Management, South Dakota Department of Water and Natural Resources, Pierre, South Dakota.

3/ "A plan for the Classification-Preservation-Restoration of Lakes in Northeastern South Dakota" 1977, State Lakes Preservation Committee, State of South Dakota and the Old West Regional Commission, Pierre, South Dakota.

Summary

Sediment was determined to be a major pollutant in the Lake Hendricks Water Quality Study Area (WQSA). The source of these sediments is from sheet and rill erosion from cropland, grassland, woodland, and from gully, streambank and lake bank erosion.

The volume of soil entering the lake annually is the gross erosion from all sources multiplied by estimated sediment delivery ratios developed by a watershed shape analysis. 1/ The Universal Soil Loss Equation 2/ 3/ was used to estimate the gross erosion from sheet and rill erosion. Gross erosion from gullies, streambanks and lake banks was estimated by direct volume calculation methods.

Soil and water conservation practices needed to control erosion are outlined in detail in the Technical Guide for South Dakota (available at all Soil Conservation Service offices). Those most appropriate for reducing sediment are identified in the Technical Guide as best management practices (BMP's). The kind and amount of these practices were estimated by the SCS district conservationists and the SCS state agronomist. Cost of the BMP's were abstracted from the SCS Cost-Return Handbook.

No quantification of reductions in sediment yield due to application of BMP's was attempted because the collection of the necessary data was overly time consuming. It was also felt that time spent in this endeavor would not be productive since the actual selection of practices applied ultimately rests with the farmer-operator.

The Universal Soil Loss Equation (USLE), 2/, 3/ was used to estimate sheet and rill erosion in the WQSA's. SCS personnel familiar with each WQSA provided the data needed for the USLE from their field experience, Section III of the South Dakota Technical Guide and detailed soils maps.

1/ "Sediment Yield versus Gross Erosion in Minnesota" by O.M. Finkelson, Geologist, SCS, St. Paul, Minnesota 1978.

2/ Wischmeier, W.H., and Smith, D.D., "Predicting Rainfall Erosion Losses, A Guide to Conservation Planning", Agricultural Handbook, No. 537, December 1978, Science & Education Administration.

3/ "Estimating Soil Loss Resulting from Water and Wind Erosion in South Dakota," June 1977, South Dakota Technical Guide III-1, USDA, SCS, Huron, South Dakota.

Definition and Outline of Study Methods

Erosion

Sheet erosion occurs as water flows overland and moves layers of soil particles loosened by raindrop impact. Rill erosion is movement of soil particles as overland flow concentrates into small channels, or rills, 2 to 12 inches deep. Soil particles are loosened in rills by shear force exerted on the bottom and banks of the rill by the channelized water. Bank sloughing, or miniature landslides, occur as the bottom and lower banks are eroded.

Data for the estimation of gross erosion was developed by the South Dakota State Planning Bureau and local SCS personnel. SCS provided soils maps, the Planning Bureau provided Landsat data maps. These two maps were consolidated by the Planning Bureau to obtain land uses by soils mapping units. Using this information as a base, local SCS personnel provided the needed factors to use in the Universal Soil Loss Equation. The actual soil loss calculations and summaries were made by computer furnished by the Planning Bureau.

Erosion from construction sites, roads and roadbanks was estimated using a direct volume method (multiplying the area of erosion by an estimated rate of erosion and the volume weight of the eroding soil). 1/ Sample areas were observed, calculations were made and expanded to the entire watershed.

Gully and streambank erosion is soil moved by water flowing in channels that are greater than 12 inches deep. The mechanisms of loosening and moving soil particles are the same as in rill erosion except for the larger scale. Lake shore erosion occurs as wave action loosens and moves soil particles. The direct volume method was used to estimate gully, streambank, and lake shore erosion. The effects of ice were also considered in the erosion rate. Sample areas were observed and aerial photographs were used to expand the sample data.

Sediment Yield

Sediment yield is the amount of soil removed from a drainage basin. 2/, 3/ It is measured (or estimated) at a point or at a stream channel cross section and only represents a fraction of the total soil eroded in the basin above that point.

1/ Method is outlined in the "Erosion and Sediment Inventory Handbook," USDA-SCS, Syracuse, New York (1972) and in "Guide to Sedimentation Investigations," Technical Guide 12, South Technical Service Center, USDA-SCS, Fort Worth, Texas (1976).

2/ "Sedimentation," 1975 National Engineering Handbook, Section 3, USDA, SCS, Washington, D.C.

3/ "Predicting Sediment Yields," in "Proceedings of the National Symposium on Soil Erosion and Sedimentation by Water," 1977, American Society of Agricultural Engineers, Publication 4-77, St. Joseph, Michigan.

In this study, gross erosion was estimated and them multiplied by an estimated sediment delivery ratio to obtain sediment yield delivered to Lake Hendricks. This ratio is expressed as a percent and represents the amount of soil removed from a watershed (sediment) divided by the amount of soil moved in the watershed (erosion). It is thus inversely proportional to the amount of deposition occurring between points of erosion and the point where sediment yield is measured.

Many factors affect sediment yield including watershed size, shape, hydrology, channel density, land use, vegetative cover, geology and topography, soil structure, texture, and permeability. The interaction between all of these factors was subjectively analyzed to select a delivery ratio for the drainage area. Higher ratios were used to estimate sediment yield from gully, streambank, and lakeshore erosion, since these areas are closer to the sediment damage area (Lake Hendricks).

Best Management Practices

The Environmental Protection Agency (EPA) has defined best management practices, as published in the Federal Register, as follows:

> "The term, best management practices (BMP), means a practice, or combination of practices, that is determined by a State (or designated areawide planning agency) after problem assessment, examination of alternative practices, and appropriate public participation to be the most effective, practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (40 CFR Part 130)."

Thus best management practices in section 208 water quality management plans are primarily those management practices that are believed to have a beneficial impact on water quality. 1/ Since sediment yield affects water quality adversely in these study areas, management practices that reduce sediment yield will be BMP's. Best management practices were selected from Section III of the South Dakota Technical Guide and costs were taken from the SCS Cost-Return Handbook.

Narrative Comments

The Soil Conservation Service completed a study of the Lake Hendricks Watershed. The purpose of this study was to identify the water erosion and sedimentation problems in Lake Hendricks and its drainage area. (See Watershed Map)

1/ "Environmental Impact of Land Use on Water Quality, Final Report on the Black Creek Project (Summary," 1977, U.S. Environmental Protection Agency 905/9-77-007-A, Great Lakes National Program Office, Chicago, Illinois.

Narrative Comments (cont.)

This study identifies the kind, amount and location of the major erosion problems. Sediment problems noted are entirely within Lake Hendricks.

Table 1 shows the present "Land Uses and Acres Needing Treatment" in the Lake Hendricks Watershed. Figures are given for the total watershed. The watershed contains 16,045 acres. Local SCS personnel estimate that 10,696 acres or about 2/3 of the watershed is now adequately treated. The remaining 5,345 acres needs treatment by some combination of Best Management Practices which will contribute to water quality improvement as well as erosion control on the land in the watershed area.

Table 2 - "Soil Erosion and Sediment Yield" shows the erosion estimates for the entire watershed. Estimates were made for sheet and rill erosion as well as erosion from other sources. The table also shows estimates of the amount of sediment by sources actually reaching Lake Hendricks annually. This is estimated to be 3,034 tons. It is estimated that this sediment will displace about 2.3 acre feet of water or about .028 percent of the total lake's capacity.

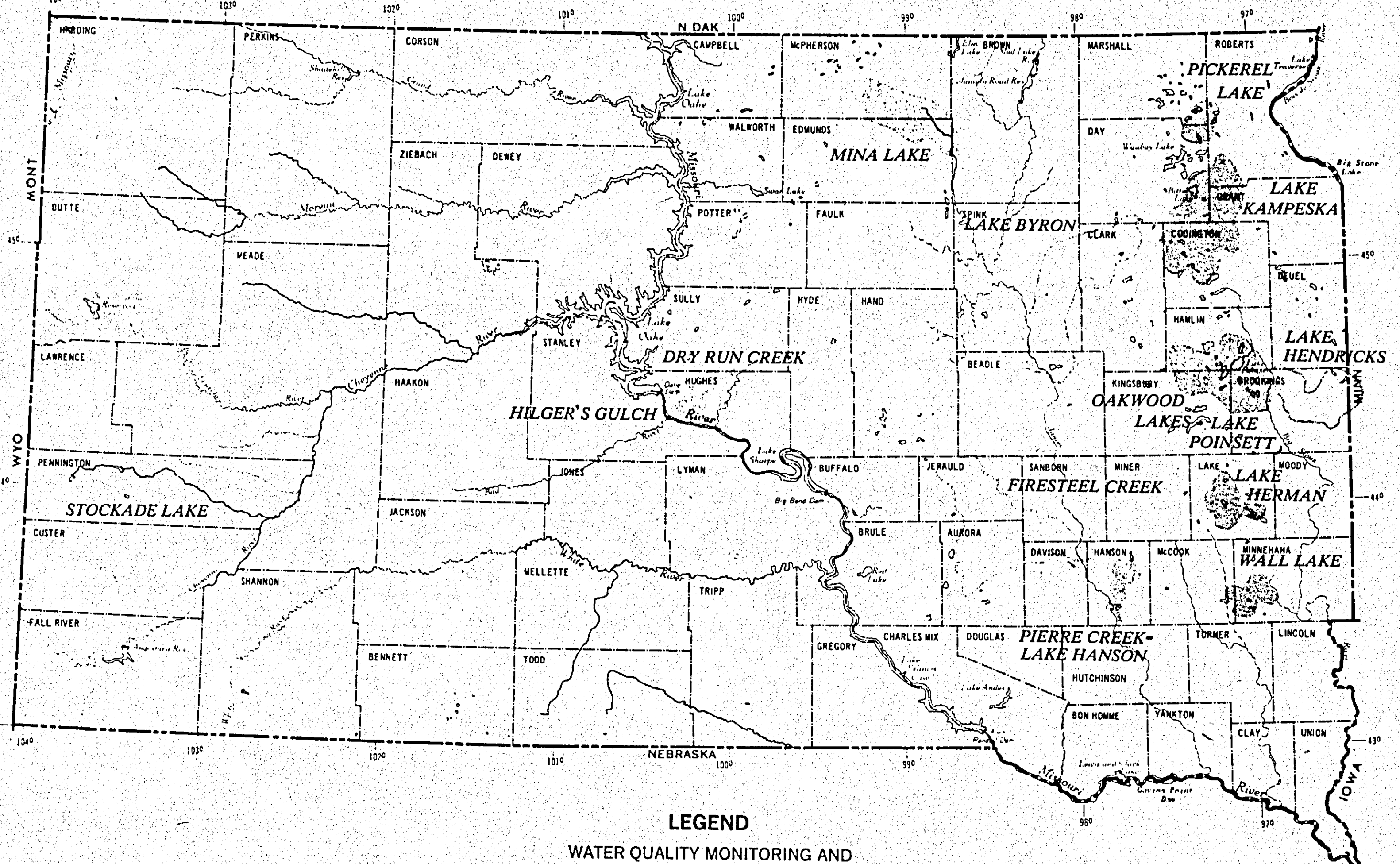
No figures were developed showing the extent of soil losses from erosion by wind. It was felt that an estimate of 1 to 1½ tons per acre per year could be used if this information is needed.

Table 3 - Best Management Practices (Conservation Practices and Measures) shows the major land treatment needed in this watershed area. The table also shows estimated amounts and probable costs to get the land in this watershed "adequately treated". It must be kept in mind, that these are "estimates" only, and that specific practices, and accurate amounts together with precise costs can only be obtained in a planning process with the owners and operators of each tract of land, based on their decisions on how each field is to be used and treated. This study does not show this sort of detailed information.

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

WATER QUALITY PROJECTS
SOUTH DAKOTA



LEGEND

WATER QUALITY MONITORING AND LAND TREATMENT UNDERWAY.

SEDIMENT DELIVERY AND LAND TREATMENT NEEDS TO BE STUDIED IN 1981

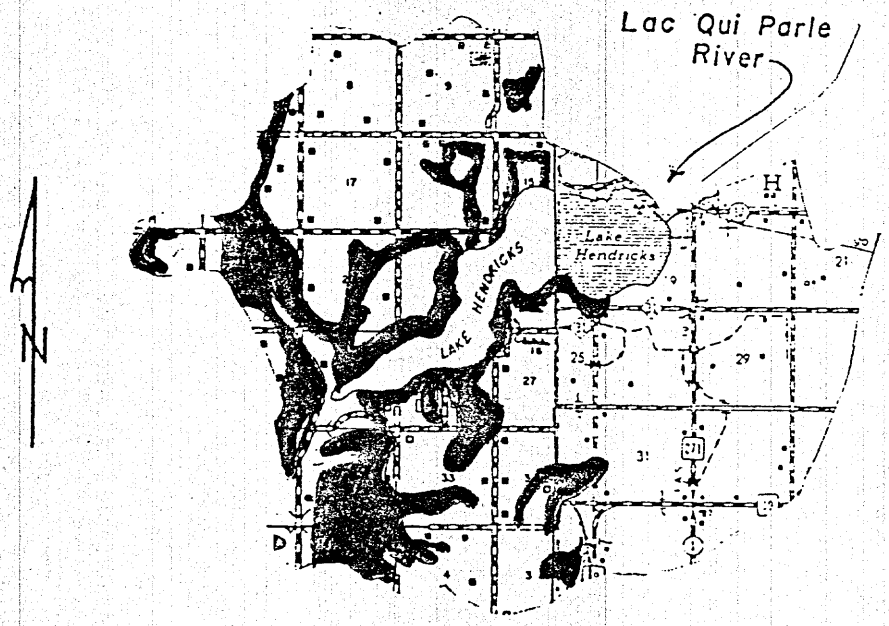
SCALE 0 10 20 30 40 50 60 70 80 MILES
0 20 40 60 80 100 120 KILOMETERS

SOURCE:
SCS DRAWING NO. 5,S-32,929,
SCS DRAWING NO. 5,0-36,220, AND
INFORMATION FROM SCS FIELD PERSONNEL
ALBERS EQUAL AREA PROJECTION
USDA—SCS—LINCOLN, NEBR. 1981

1-2-81
5,0-38,011

Lake Hendricks

16,045 acres



ESTIMATED SHEET AND RILL EROSION

WHERE CULTIVATED, SOIL LOSSES LIKELY TO BE >5 TONS/AC/YR

SOIL LOSSES GENERALLY <5 TONS/AC/YR

Detailed soil information can be obtained in the soil survey publication for Brookings County, South Dakota and Lincoln County, Minnesota.

TABLE 1

LAND USE AND ESTIMATED ACRES NEEDING TREATMENT
LAKE HENDRICKS WATERSHED

LAKE HENDRICKS WATERSHED	LAND USE (Acres) and TREATMENT (Acres and Percent)											
	CROPLAND		GRASSLAND		WOODLAND		FARMSTEAD AND URBAN		NONSEDIMENT CONTRIBUTING 1/		TOTAL	
	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%
Total watershed	10,594	100	3,016	100	105	100	736	100	1,594	100	16,045	100
Adequately treated	6,356	60	1,960	65	81	77	709	96	1,594	100	10,700	67
Needs treatment	4,238	40	1,056	35	24	23	27	4	0	0	5,345	33

1/ Generally, water and marsh areas.
Included Lake Hendricks surface area (1,457 acres).

TABLE 2

SOIL EROSION AND SEDIMENT YIELD
LAKE HENDRICKS WATERSHED AREA

LAKE HENDRICKS WATERSHED		Crop-land	Grass-land	Sub Total	Chan-nels	Lake Shore	Construc-tion[1]	Sub Total	Total	Acre[2] Feet Per Yr.	Per-cent[3]
Total Watershed	Erosion Ton/Year	40,202	2,342	42,544		220		220	42,764		
	Sediment Yield[4] Tons/Year	2,814	164	2,978		220		220	3,198	2.5	0.031

1/ Not estimated, but has high potential. Planned developments should include a sediment control plan for before, during, and after construction.

2/ Tons converted to acre feet. Sediment in lake volume computed at 60 pounds per cubic foot due to submerged sediment.

3/ Annual sediment yield expressed as a percent of total lake volume. Lake volume of Lake Hendricks is 8,160 acre feet.

4/ Sediment deposited in Lake Hendricks.

TABLE 3

BEST MANAGEMENT PRACTICES (Conservation Practices and Measures)[1/2/3/]

LAKE HENDRICKS WATERSHED AREA

CONSERVATION PRACTICES	Unit	Unit[4/] Cost (Dollars)	Total Watershed Amount Needed	Total Watershed Cost (Dollars)
Cropland - 10,594 acres				
Conservation Cropping System	acre	-	10,594	-
Conservation Tillage System	acre	5	10,594	52,970
Grass & Legumes in Rotation	acre	18	2,000	36,000
Grass Waterways	acre	500	20	10,000
Waste Utilization	acre	3	2,000	6,000
Minimize Fall Tillage	acre	-	700	-
Pasture & Hayland Planting	acre	20	500	10,000
Minimize Pesticide Use	acre	-	1,000	-
Contour Stripcropping	acre	6	100	600
Terraces	mile	2,112	3	6,336
Grassland - 4,238 acres				
Proper Grazing Use	acre	-	4,238	-
Pasture and Hayland Planting	acre	20	500	10,000
Deferred Grazing	acre	-	1,000	-
Planned Grazing Systems	acre	-	3,000	-
Livestock Water Stations	acre	1,000	5	5,000
Critical Area Planting	acre	1,000	5	5,000
Pasture & Hayland Management	acre	-	4,238	-
Waste Management Systems	no.	20,000	-	-
Wildlife Upland Habitat Mgmt.	acre	5	80	400
Wildlife Wetland Habitat Mtnce.	acre	4	30	120
Farmsteads, Urban & Other - 1,213 acres				
Sediment Control Measures[5/]	acre	2,000	30	60,000
TOTALS - Total Acres - 16,045		-		202,426 or 12.62 per acre

1/ Needed to get (Land Adequately Treated).
2/ Refer to Soil Conservation Service Technical Guide for South Dakota 1981.
3/ On site investigation and planning are necessary to determine kinds, locations, sizes, extent & costs of practices (BMP's).
4/ Refer to Soil Conservation Service Cost-Return Handbook for South Dakota 1981.
5/ Examples of measures are: cover and green manure crop, filter strips, lined and grassed waterways, diversions, mulching, sediment basins, streambank protection, and critical area planting.

Appendix B. Water Quality Summary Tables and Figures

Site Number	Site Description
46HN01 (HN-1)	Latitude 44 Deg., 28 Min., 50 Sec., longitude 96 Deg., 28 Min., 35 Sec., Township 112N, Range 47W, Section 28. NW 1/4, NE 1/4, SE 1/4, NW 1/4. This in-lake site is located near the Lake Hendricks state recreation area boat landing.
46HN02 (HN-2)	Latitude 44 Deg., 28 Min., 14 Sec., longitude 96 Deg., 30 Min., 01 Sec., Township 112N, Range 47W, Section 29. SE 1/4, SE 1/4, SW 1/4, SW 1/4. This site is located on Deer Creek adjacent to an east-west gravel road 2 miles north of Highway 30, north of the road.
46HN03 (HN-3)	Latitude 44 Deg., 29 Min., 52 Sec., longitude 96 Deg., 27 Min., 48 Sec., Township 112N, Range 47W, Section 22. SE 1/4, NE 1/4, NW 1/4, NW 1/4. This in-lake site is located off the Lake Hendricks north public access boat ramp.
46HN04 (HN-4)	Latitude 44 Deg., 29 Min., 58 Sec., longitude 96 Deg., 28 Min., 02 Sec., Township 112N, Range 47W, Section 21. NE 1/4, NW 1/4, NE 1/4, NE 1/4. This site is located on an unnamed tributary below a bridge on an east-west gravel road north of Lake Hendricks, south of the road.
46HN05 (HN-5)	Latitude 44 Deg., 29 Min., 11 Sec., longitude 96 Deg., 30 Min., 15 Sec., Township 112N, Range 47W, Section 20. NW 1/4, SW 1/4, SW 1/4, SW 1/4. This site is located near a culvert on a north-south road and 3 miles north of Highway 30, east of the road.
46HN06 (HN-6)	Latitude 44 Deg., 30 Min., 17 Sec., longitude 96 Deg., 26 Min., 06 Sec., Township 112N, Range 46W, Section 18. SE 1/4, NE 1/4, SE 1/4, SW 1/4. This in-lake site is located near the lake outlet, Lac Qui Parle River, at Hendricks, Minnesota.

Table IV-1. Sample sites for Lake Hendricks and its watershed.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663825-0693843

/TYPA/AMBNT/LAKE

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00011	WATER	TEMP	FAHN		4	58.0000	228.667	15.1217	72.0000	38.0000	80/08/19	80/10/29
00020	AIR	TEMP	CENT		4	15.1375	89.8838	9.48071	26.1000	6.67000	80/08/19	80/10/29
00021	AIR	TEMP	FAHN		4	59.2500	291.583	17.0758	79.0000	44.0000	80/08/19	80/10/29
00061	STREAM	FLOW,	INST-CFS		1	.000000	.		.000000	.000000	80/10/16	80/10/16
00300	DO		MG/L		4	9.52500	5.56925	2.35993	12.0000	6.80000	80/08/19	80/10/29
00400	PH		SU		4	7.85000	.096695	.310958	8.20000	7.50000	80/08/19	80/10/29
00500	RESIDUE	TOTAL	MG/L		5	626.400	1436.50	37.9012	667.000	583.000	80/08/19	80/12/16
00530	RESIDUE	TOT NFLT	MG/L		5	12.6000	142.800	11.9499	30.0000	2.00000	80/08/19	80/12/16
00610	NH3+NH4-	N TOTAL	MG/L		5	.344000	.148280	.385071	.850000	.060000	80/08/19	80/12/16
00613	NO2-N	DISS	MG/L		1	.030000			.030000	.030000	80/09/25	80/09/25
				K	4	.010000	-.776E-10	.000000	.010000	.010000	80/08/19	80/12/16
				TOT	5	.014000	.000080	.008944	.030000	.010000	80/08/19	80/12/16
00620	NO3-N	TOTAL	MG/L		3	.566667	.043333	.208166	.800000	.400000	80/09/25	80/12/16
				K	2	.100000	-.372E-08	.000000	.100000	.100000	80/08/19	80/09/10
				TOT	5	.380000	.087000	.294957	.800000	.100000	80/08/19	80/12/16
00625	TOT KJEL	N	MG/L		5	3.03800	8.97997	2.99666	8.38000	1.37000	80/08/19	80/12/16
31616	FEC COLI	MFM-FCBR	/100ML		2	14.5000	144.500	12.0208	23.0000	6.00000	80/08/19	80/09/10
				K	3	5.33333	16.3333	4.04145	10.0000	3.00000	80/09/25	80/12/16
				TOT	5	9.00000	69.5000	8.33667	23.0000	3.00000	80/08/19	80/12/16
70300	RESIDUE	DISS-180	C MG/L		5	613.400	1948.00	44.1361	659.000	562.000	80/08/19	80/12/16
70505	T PO4	P-COL	MG/L		5	.201600	.000326	.018066	.231000	.188000	80/08/19	80/12/16
70507	PHOS-T	ORTHO	MG/L P		4	.134750	.006498	.080612	.197000	.024000	80/08/19	80/10/29
				K	1	.005000			.005000	.005000	80/12/16	80/12/16
				TOT	5	.108800	.008241	.090778	.197000	.005000	80/08/19	80/12/16

Table IV-2.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663825-0693843

/TYPA/AMBNT/LAKE

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00011	WATER	TEMP	FAHN		3	47.6667	184.336	13.5770	56.0000	32.0000	81/03/11	81/05/13
00021	AIR	TEMP	FAHN		3	56.6667	65.3359	8.08306	66.0000	52.0000	81/03/11	81/05/13
00300	DO		MG/L		3	12.5000	8.11023	2.84785	15.0000	9.40000	81/03/11	81/05/13
00500	RESIDUE	TOTAL	MG/L		5	452.000	102180	319.656	719.000	45.0000	81/01/22	81/05/13
00515	RESIDUE	DISS-105	C MG/L		2	384.000	72200.0	268.701	574.000	194.000	81/02/25	81/05/04
00530	RESIDUE	TOT NFLT	MG/L		5	31.4000	833.301	28.8669	79.0000	6.00000	81/01/22	81/05/13
00610	NH3+NH4-	N TOTAL	MG/L		5	.092000	.003770	.061400	.200000	.050000	81/01/22	81/05/13
00613	NO2-N	DISS	MG/L		1	.020000			.020000	.020000	81/01/22	81/01/22
				K	4	.010000	-.776E-10	.000000	.010000	.010000	81/02/25	81/05/13
00620	NO3-N	TOTAL	MG/L	TOT	5	.012000	.000020	.004472	.020000	.010000	81/01/22	81/05/13
					1	.300000			.300000	.300000	81/01/22	81/01/22
				K	4	.100000	-.248E-08	.000000	.100000	.100000	81/02/25	81/05/04
00621	NO3 MUD	DRY WGT	MG/KG-N	TOT	5	.140000	.008000	.089443	.300000	.100000	81/01/22	81/05/04
00625	TOT KJEL	N	MG/L	K	2	.100000	-.372E-08	.000000	.100000	.100000	81/05/04	81/05/13
31616	FEC COLI	MFM-FCBR	/100ML		5	1.50000	.548152	.740373	2.27000	.540000	81/01/22	81/05/13
					1	3.00000			3.00000	3.00000	81/05/04	81/05/04
				K	4	3.00000	.000000	.000000	3.00000	3.00000	81/01/22	81/05/13
70300	RESIDUE	DISS-180	C MG/L	TOT	5	3.00000	.000000	.000000	3.00000	3.00000	81/01/22	81/05/13
70505	T PO4	P-COL	MG/L		6	470.333	81172.3	284.908	713.000	34.0000	81/01/22	81/05/13
70507	PHOS-T	ORTHO	MG/L P		5	.117200	.003540	.059499	.203000	.058000	81/01/22	81/05/13
					5	.211400	.085412	.292253	.720000	.014000	81/01/22	81/05/13

Table IV-3.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663825-0693843

/TYPA/AMBNT/LAKE

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT		6	12.7833	117.109	10.8217	25.6000	.000000	82/06/07	82/12/15
00011	WATER	TEMP	FAHN		7	57.4286	356.956	18.8933	78.0000	32.0000	82/06/07	82/12/15
00020	AIR	TEMP	CENT		6	10.5033	185.821	13.6316	24.4000	-.700E+01	82/06/07	82/12/15
00021	AIR	TEMP	FAHN		7	53.2857	547.907	23.4074	76.0000	19.0000	82/06/07	82/12/15
00300	DO		MG/L		7	12.0429	5.31632	2.30572	16.0000	9.10000	82/06/07	82/12/15
00400	PH		SU		7	8.18571	.161499	.401869	8.60000	7.50000	82/06/07	82/12/15
00403	LAB	PH	SU		6	8.26833	.064160	.253298	8.71000	8.00000	82/06/07	82/12/15
00500	RESIDUE	TOTAL	MG/L		7	741.857	974.833	31.2223	787.000	706.000	82/06/07	82/12/15
00530	RESIDUE	TOT NFLT	MG/L		7	16.1428	232.810	15.2581	45.0000	1.00000	82/06/07	82/12/15
00610	NH3+NH4-	N TOTAL	MG/L		7	.055714	.001029	.032071	.110000	.020000	82/06/07	82/12/15
00613	NO2-N	DISS	MG/L		1	.020000			.020000	.020000	82/09/09	82/09/09
				K	6	.011667	.000017	.004083	.020000	.010000	82/06/07	82/12/15
00620	NO3-N	TOTAL	MG/L	TOT	7	.012857	.000024	.004880	.020000	.010000	82/06/07	82/12/15
					5	.160000	.003000	.054772	.200000	.100000	82/06/07	82/12/15
				K	2	.100000	-.372E-08	.000000	.100000	.100000	82/07/15	82/08/12
00625	TOT KJEL	N	MG/L	TOT	7	.142857	.002857	.053452	.200000	.100000	82/06/07	82/12/15
00940	CHLORIDE	TOTAL	MG/L		7	.981428	.218414	.467348	1.44000	.170000	82/06/07	82/12/15
00945	SULFATE	SO4-TOT	MG/L		7	12.7000	8.39018	2.89658	17.0000	8.40000	82/06/07	82/12/15
31616	FEC COLI	MFM-FCBR	/100ML		7	306.571	952.729	30.8663	364.000	274.000	82/06/07	82/12/15
					6	193.833	100872	317.604	830.000	10.0000	82/06/07	82/11/08
				K	1	3.00000			3.00000	3.00000	82/12/15	82/12/15
70300	RESIDUE	DISS-180 C	MG/L	TOT	7	166.571	89262.6	298.769	830.000	3.00000	82/06/07	82/12/15
70505	T PO4	P-COL	MG/L		7	706.000	1308.67	36.1755	783.000	676.000	82/06/07	82/12/15
70506	SOL PO4-	T P-COL	MG/L		5	.157000	.020057	.141623	.410000	.081000	82/06/07	82/12/15
70507	PHOS-T	ORTHO	MG/L P		2	.142000	.000578	.024042	.159000	.125000	82/09/09	82/11/08
					7	.091428	.001701	.041239	.158000	.052000	82/06/07	82/12/15

Table IV-4.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663825-0693843

/TYPA/AMBNT/LAKE

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT		6	19.8333	26.1632	5.11499	25.6000	13.9000	83/05/12	83/10/11
00011	WATER	TEMP	FAHN		6	66.6667	115.871	10.7643	78.0000	51.0000	83/05/12	83/10/11
00020	AIR	TEMP	CENT		6	20.1833	47.7142	6.90755	29.4000	10.0000	83/05/12	83/10/11
00021	AIR	TEMP	FAHN		6	68.3333	155.471	12.4688	85.0000	50.0000	83/05/12	83/10/11
00061	STREAM	FLOW,	INST-CFS		5	.000000	.000000	.000000	.000000	.000000	83/01/12	83/04/20
00095	CNDUCTVY	AT 25C	MICROMHO		6	791.666	796.800	28.2276	837.000	753.000	83/05/12	83/10/11
00300	DO		MG/L		6	9.61666	1.16577	1.07971	11.1000	8.20000	83/05/12	83/10/11
00400	PH		SU		5	8.48000	.112061	.334754	9.00000	8.20000	83/05/12	83/09/07
00403	LAB	PH	SU		6	8.55166	.055225	.234999	8.92000	8.28000	83/05/12	83/10/11
00410	T ALK	CACO3	MG/L		6	128.467	3775.24	61.4430	171.000	6.80000	83/05/12	83/10/11
00415	PHEN-PH-	LFIN ALK	MG/L		4	47.7500	5112.49	71.5017	155.000	11.4000	83/05/12	83/10/11
00500	RESIDUE	TOTAL	MG/L		6	654.000	4139.20	64.3366	729.000	565.000	83/05/12	83/10/11
00530	RESIDUE	TOT NFLT	MG/L		5	15.0000	104.000	10.1980	26.0000	1.00000	83/05/12	83/10/11
				K	1	1.00000			1.00000	1.00000	83/06/15	83/06/15
				TOT	6	12.6667	115.867	10.7641	26.0000	1.00000	83/05/12	83/10/11
00610	NH3+NH4-	N TOTAL	MG/L		5	.102000	.012220	.110544	.280000	.020000	83/06/15	83/10/11
				K	1	.020000			.020000	.020000	83/05/12	83/05/12
				TOT	6	.088333	.010897	.104387	.280000	.020000	83/05/12	83/10/11
00613	NO2-N	DISS	MG/L	K	6	.010000	-.931E-10	.000000	.010000	.010000	83/05/12	83/10/11
00620	NO3-N	TOTAL	MG/L	K	6	.100000	-.223E-08	.000000	.100000	.100000	83/05/12	83/10/11
00625	TOT KJEL	N	MG/L		6	1.19167	.372818	.610589	2.37000	.600000	83/05/12	83/10/11
00665	PHOS-TOT		MG/L P		1	.230000			.230000	.230000	83/08/10	83/08/10
00940	CHLORIDE	TOTAL	MG/L		6	14.8500	.463135	.680540	15.7000	14.2000	83/05/12	83/10/11
00945	SULFATE	SO4-TOT	MG/L		6	261.833	73.8250	8.59215	270.000	248.000	83/05/12	83/10/11
31616	FEC COLI	MFM-FCBR	/100ML		6	233.333	151507	389.239	1000.00	10.0000	83/05/12	83/10/11
70300	RESIDUE	DISS-180	C MG/L		6	641.333	3440.40	58.6549	703.000	564.000	83/05/12	83/10/11
70505	T PO4	P-COL	MG/L		5	.136800	.009557	.097758	.295000	.030000	83/05/12	83/10/11
70507	PHOS-T	ORTHO	MG/L P		6	.050000	.000948	.030796	.094000	.010000	83/05/12	83/10/11

Table IV-5.

STORET RETRIEVAL DATE 84/07/25 - STAND - VERSION OF APR. 1983

STN 1.SUMMARY.1

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

/TYPA/AMBNT/LAKE

SUMMARY OF VIOLATIONS ON SAMPLES COLLECTED FROM 80/08/19 TO 83/10/11

	00400 PH SU	31616 FEC COLI MFM-FCBR /100ML	70300 RESIDUE DISS-180 C MG/L	00530 RESIDUE TOT NFLT MG/L	00610 NH3+NH4- N TOTAL MG/L	00619 UN-IONZD NH3-NH3 MG/L	00620 NO3-N TOTAL MG/L	00011 WATER TEMP FAHN	00415 PHEN-PH- LFIN ALK MG/L	00300 DO MG/L
NO OF VALUES	16	23	24	23	23	16	23	20	6	20
MEAN	8.194	114.2	612.	17.8	0.135	0.0096	0.18	58.85	85.5	10.880
MEDIAN	8.200	10.0	666.	12.0	0.070	0.0044	0.10	61.50	83.8	10.850
NO OF VIOLS	6	3	0	0	0	1	0	0	0	0
PERCENT VIOL	38.	13.	0.	0.	0.	6.	0.	0.	0.	0.
MINIMUM VIOL	8.400	280.0	0.	0.0	0.0	0.0511	0.0	0.0	0.0	0.0
MEAN VIOL	8.600	703.3	0.	0.0	0.0	0.0511	0.0	0.0	0.0	0.0
MAXIMUM VIOL	9.000	1000.0	0.	0.0	0.0	0.0511	0.0	0.0	0.0	0.0
MIN CRITERIA	6.500	*********	*********	*********	*********	*********	*********	*********	*********	4.000
MAX CRITERIA	8.300	200.0	2500.	150.0	*********	0.0500	50.00	90.00	750.0	*********

Table IV-6.

STORET RETRIEVAL DATE 84/07/25 - STAND - VERSION OF APR. 1983 STN 1 PAGE 1.1
VIOLATIONS ONLY

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

/TYPA/AMBNT/LAKE

DATE	TIME	00400 PH SU	31616 FEC COLI MFM-FCBR /100ML	70300 RESIDUE DISS-180 C MG/L	00530 RESIDUE TOT NFLT MG/L	00610 NH3+NH4- N TOTAL MG/L	00619 UN-IONZD NH3-NH3 MG/L	00620 NO3-N TOTAL MG/L	00011 WATER TEMP FAHN	00415 PHEN-PH- LFIN ALK MG/L	00300 DO MG/L
82/06/07	1500	8.500*									
82/07/15	1040	8.600*	830.0*								
82/08/12	1035	8.500*									
83/05/12	1115	8.400*									
83/06/15	1105		1000.0*								
83/08/10	1020	8.600*	280.0*								
83/09/07	1115	9.000*					0.0511*				

Table IV-7.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663826-0693844

/TYPA/AMBNT/STREAM/RUNOFF

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT		6	5.00833	70.7984	8.41418	21.7000	-.110E+01	82/03/17	82/07/15
00011	WATER	TEMP	FAHN		7	40.5714	191.954	13.8548	71.0000	30.0000	82/03/17	82/07/15
00020	AIR	TEMP	CENT		7	7.37285	83.3311	9.12859	24.4000	-.443E+01	82/03/17	82/07/15
00021	AIR	TEMP	FAHN		7	45.2857	270.907	16.4593	76.0000	24.0000	82/03/17	82/07/15
00061	STREAM	FLOW,	INST-CFS		2	12.0000	288.000	16.9706	24.0000	.000000	82/04/14	82/06/07
00400	PH		SU		5	6.68000	.197082	.443940	7.40000	6.20000	82/03/17	82/07/15
00500	RESIDUE	TOTAL	MG/L		7	671.571	586780	766.015	2375.00	120.000	82/03/17	82/07/15
00530	RESIDUE	TOT NFLT	MG/L		5	144.200	93144.1	305.195	690.000	2.00000	82/04/01	82/07/15
				K	2	1.00000	.000000	.000000	1.00000	1.00000	82/03/17	82/04/14
				TOT	7	103.286	66978.5	258.802	690.000	1.00000	82/03/17	82/07/15
00610	NH3+NH4-	N TOTAL	MG/L		7	.147143	.024857	.157661	.440000	.020000	82/03/17	82/07/15
00613	NO2-N	DISS	MG/L	K	7	.010000	.776E-10	.000009	.010000	.010000	82/03/17	82/07/15
00620	NO3-N	TOTAL	MG/L		4	.375000	.049167	.221736	.600000	.100000	82/03/17	82/04/21
				K	3	.100000	-.186E-08	.000000	.100000	.100000	82/04/14	82/07/15
				TOT	7	.257143	.046191	.214920	.600000	.100000	82/03/17	82/07/15
00625	TOT KJEL	N	MG/L		7	1.09571	.415129	.644305	2.48000	.540000	82/03/17	82/07/15
00940	CHLORIDE	TOTAL	MG/L		1	6.40000			6.40000	6.40000	82/07/15	82/07/15
00945	SULFATE	SO4-TOT	MG/L		1	222.000			222.000	222.000	82/07/15	82/07/15
31616	FEC COLI	MFM-FCBR	/100ML		1	3.00000			3.00000	3.00000	82/04/14	82/04/14
				K	5	7.20000	14.7001	3.83407	10.0000	3.00000	82/03/17	82/04/28
				TOT	6	6.50000	14.7000	3.83406	10.0000	3.00000	82/03/17	82/04/28
70300	RESIDUE	DISS-180	C MG/L		7	658.143	592522	769.755	2370.00	119.000	82/03/17	82/07/15
70505	T PO4	P-COL	MG/L		6	.241833	.011224	.105941	.386000	.068000	82/03/17	82/07/15
70507	PHOS-T	ORTHO	MG/L P		6	.188666	.011052	.105130	.372000	.055000	82/03/17	82/07/15

Table IV-8.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN02
44.28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663826-0693844

/TYPA/AMBNT/STREAM/RUNOFF

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT		11	7.98727	39.9677	6.32200	15.6000	-.110E+01	83/03/04	83/06/15
00011	WATER	TEMP	FAHN		11	46.3636	129.056	11.3603	60.0000	30.0000	83/03/04	83/06/15
00020	AIR	TEMP	CENT		11	8.58363	54.6833	7.39482	17.2000	-.166E+01	83/03/04	83/06/15
00021	AIR	TEMP	FAHN		11	47.4545	177.274	13.3144	63.0000	29.0000	83/03/04	83/06/15
00061	STREAM	FLOW,	INST-CFS		2	3.30000	14.5800	3.81838	6.00000	.600000	83/03/30	83/04/27
00095	CNDUCTVY	AT 25C	MICROMHO		3	777.000	543.000	23.3024	803.000	758.000	83/04/20	83/06/15
00300	DO		MG/L		1	9.30000			9.30000	9.30000	83/05/12	83/05/12
00310	BOD	5 DAY	MG/L		2	3.50000	4.50000	2.12132	5.00000	2.00000	83/03/15	83/05/12
00400	PH		SU		9	8.22222	.324493	.569643	8.90000	7.20000	83/03/15	83/06/15
00403	LAB	PH	SU		9	8.03555	.090973	.301617	8.46000	7.62000	83/03/04	83/06/15
00410	T ALK	CACO3	MG/L		2	186.500	2812.50	53.0330	224.000	149.000	83/05/12	83/06/15
00415	PHEN-PH-	LFIN ALK	MG/L		1	302.000			302.000	302.000	83/04/20	83/04/20
00500	RESIDUE	TOTAL	MG/L		10	547.500	9798.33	98.9865	646.000	323.000	83/03/04	83/05/12
00530	RESIDUE	TOT NFLT	MG/L		11	58.6363	23691.1	153.919	520.000	1.00000	83/03/04	83/06/15
00610	NH3+NH4-	N TOTAL	MG/L		9	1.06111	8.86686	2.97773	9.00000	.030000	83/03/04	83/06/15
				K	2	.020000	-.232E-09	.000000	.020000	.020000	83/03/24	83/03/30
				TOT	11	.871818	7.27085	2.69645	9.00000	.020000	83/03/04	83/06/15
00613	NO2-N	DISS	MG/L	K	11	.010909	.000009	.003015	.020000	.010000	83/03/04	83/06/15
00620	NO3-N	TOTAL	MG/L		4	.800000	.080000	.282844	1.00000	.400000	83/03/04	83/04/07
				K	7	.100000	.000000	.000000	.100000	.100000	83/03/24	83/06/15
				TOT	11	.354545	.148727	.385652	1.00000	.100000	83/03/04	83/06/15
00625	TOT KJEL	N	MG/L		11	.662727	.071322	.267061	1.25000	.390000	83/03/04	83/06/15
00916	CALCIUM	CA-TOT	MG/L		1	2.00000			2.00000	2.00000	83/06/15	83/06/15
00940	CHLORIDE	TOTAL	MG/L		8	11.8250	3.14505	1.77343	15.0000	9.40000	83/03/04	83/05/12
00945	SULFATE	SO4-TOT	MG/L		8	180.000	3164.29	56.2520	262.000	84.0000	83/03/04	83/05/12
31616	FEC COLI	MFM-FCBR	/100ML		1	1900.00			1900.00	1900.00	83/06/15	83/06/15
				K	9	10.0000	.000000	.000000	10.0000	10.0000	83/03/10	83/05/12
				TOT	10	199.000	357210	597.670	1900.00	10.0000	83/03/10	83/06/15
70300	RESIDUE	DISS-180	C MG/L		11	533.818	8678.30	93.1574	636.000	307.000	83/03/04	83/06/15
70505	T PO4	P-COL	MG/L		11	.097182	.002656	.051534	.193000	.041000	83/03/04	83/06/15
70507	PHOS-T	ORTHO	MG/L P		11	.050091	.001940	.044051	.131000	.005000	83/03/04	83/06/15

Table IV-9.

STORET RETRIEVAL DATE 84/07/25 - STAND - VERSION OF APR. 1983 STN 2.SUMMARY.1

46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

/TYPA/AMBNT/STREAM/RUNOFF

SUMMARY OF VIOLATIONS ON SAMPLES COLLECTED FROM 82/03/17 TO 83/06/15

	00400 PH SU	31616 FEC COLI MFM-FCBR /100ML	70300 RESIDUE DISS-180 C MG/L	00530 RESIDUE TOT NFLT MG/L	00610 NH3+NH4- N TOTAL MG/L	00619 UN-IONZD NH3-NH3 MG/L	00620 NO3-N TOTAL MG/L	00011 WATER TEMP FAHN	00415 PHEN-PH- LFIN ALK MG/L	00300 DO MG/L
NO OF VALUES	14	16	18	18	18	14	18	18	3	1
MEAN	7.671	126.8	582.	76.0	0.590	0.0339	0.32	44.11	225.0	9.300
MEDIAN	7.700	10.0	521.	5.0	0.040	0.0008	0.10	40.00	224.0	9.300
NO OF VIOLS	6	1	0	2	0	1	0	0	0	0
PERCENT VIOL	43.	6.	0.	11.	0.	7.	0.	0.	0.	0.
MINIMUM VIOL	6.200	1900.0	0.	520.0	0.0	0.4539	0.0	0.0	0.0	0.0
MEAN VIOL	8.233	1900.0	0.	605.0	0.0	0.4539	0.0	0.0	0.0	0.0
MAXIMUM VIOL	8.900	1900.0	0.	690.0	0.0	0.4539	0.0	0.0	0.0	0.0
MIN CRITERIA	6.500	********	********	********	********	********	********	********	********	4.000
MAX CRITERIA	8.300	200.0	2500.	150.0	********	0.0500	50.00	90.00	750.0	********

Table IV-10.

STORET RETRIEVAL DATE 84/07/25 - STAND - VERSION OF APR. 1983 STN 2 PAGE 1.1
VIOLATIONS ONLY

46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

/TYPA/AMBNT/STREAM/RUNOFF

DATE	TIME	00400 PH SU	31616 FEC COLI MFM-FCBR /100ML	70300 RESIDUE DISS-180 C MG/L	00530 RESIDUE TOT NFLT MG/L	00610 NH3+NH4- N TOTAL MG/L	00619 UN-IONZD NH3-NH3 MG/L	00620 NO3-N TOTAL MG/L	00011 WATER TEMP FAHN	00415 PHEN-PH- LFIN ALK MG/L	00300 DO MG/L
82/03/17	1100	6.200*									
82/04/07	1145				690.0*						
83/03/24	1530	8.700*									
83/03/30	1515	8.500*									
83/04/07	1200	8.600*									
83/04/20	1400	8.500*									
83/04/27	0315	8.900*									
83/05/12	1030						0.4539*				
83/06/15	1050		1900.0*		520.0*						

Table IV-11.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663827-0693845

/TYPA/AMBNT/LAKE

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT		6	12.2167	103.509	10.1739	23.9000	.000000	82/06/07	82/12/15
00011	WATER	TEMP	FAHN		7	56.1428	311.812	17.6582	75.0000	32.0000	82/06/07	82/12/15
00020	AIR	TEMP	CENT		7	11.3514	153.202	12.3775	22.8000	-.721E+01	82/06/07	82/12/15
00021	AIR	TEMP	FAHN		7	52.5714	501.622	22.3969	73.0000	19.0000	82/06/07	82/12/15
00300	DO		MG/L		7	10.5857	7.29154	2.70029	14.2000	7.30000	82/06/07	82/12/15
00400	PH		SU		7	8.10000	.113363	.336694	8.50000	7.50000	82/06/07	82/12/15
00403	LAB	PH	SU		6	8.18166	.077783	.278896	8.51000	7.79000	82/06/07	82/12/15
00500	RESIDUE	TOTAL	MG/L		6	721.333	6891.00	83.0121	786.000	568.000	82/06/07	82/12/15
00530	RESIDUE	TOT NFLT	MG/L		6	39.6667	1197.87	34.6102	98.0000	10.0000	82/06/07	82/11/08
00610	NH3+NH4-	N TOTAL	MG/L		4	.075000	.001167	.034157	.120000	.040000	82/06/07	82/12/15
				K	2	.020000	-.232E-09	.000000	.020000	.020000	82/10/19	82/11/08
00613	NO2-N	DISS	MG/L	TOT	6	.056667	.001507	.038816	.120000	.020000	82/06/07	82/12/15
					1	.620000			.620000	.620000	82/09/09	82/09/09
				K	6	.010000	-.931E-10	.000000	.010000	.010000	82/06/07	82/12/15
00618	NO3-N	DISS	MG/L	TOT	7	.097143	.053157	.230558	.620000	.010000	82/06/07	82/12/15
00620	NO3-N	TOTAL	MG/L		1	.080000			.080000	.080000	82/07/15	82/07/15
					3	6.73333	128.053	11.3160	19.8000	.200000	82/09/09	82/12/15
				K	4	.100000	-.248E-08	.000000	.100000	.100000	82/06/07	82/10/19
00625	TOT KJEL	N	MG/L	TOT	7	2.94285	55.2560	7.43344	19.8000	.100000	82/06/07	82/12/15
00940	CHLORIDE	TOTAL	MG/L		7	.962857	.457790	.676602	2.13000	.160000	82/06/07	82/12/15
00945	SULFATE	SO4-TOT	MG/L		7	12.7571	6.80627	2.60888	16.4000	8.80000	82/06/07	82/12/15
31616	FEC COLI	MFM-FCBR	/100ML		7	277.714	6757.02	82.2011	358.000	102.000	82/06/07	82/12/15
					6	187.667	46493.1	215.623	580.000	3.00000	82/06/07	82/11/08
				K	1	3.00000			3.00000	3.00000	82/12/15	82/12/15
70300	RESIDUE	DISS-180	C MG/L	TOT	7	161.286	43615.9	208.844	580.000	3.00000	82/06/07	82/12/15
70505	T PO4	P-COL	MG/L		7	662.714	4285.50	65.4637	775.000	557.000	82/06/07	82/12/15
70506	SOL PO4-	T P-COL	MG/L		5	.105800	.000457	.021370	.129000	.071000	82/06/07	82/12/15
70507	PHOS-T	ORTHO	MG/L P		2	.159000	.000000	.000000	.159000	.159000	82/09/09	82/11/08
					7	.095000	.001073	.032752	.151000	.052000	82/06/07	82/12/15

Table IV-12.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663827-0693845

/TYPA/AMBNT/LAKE

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT		9	11.8644	112.900	10.6255	25.6000	.000000	83/01/20	83/10/11
00011	WATER	TEMP	FAHN		9	53.3333	365.252	19.1116	78.0000	32.0000	83/01/20	83/10/11
00020	AIR	TEMP	CENT		9	11.9155	145.142	12.0475	28.3000	-.332E+01	83/01/20	83/10/11
00021	AIR	TEMP	FAHN		9	53.4444	470.280	21.6859	83.0000	26.0000	83/01/20	83/10/11
00095	CNDUCTVY	AT 25C	MICROMHO		7	690.714	67971.1	260.713	837.000	104.000	83/03/15	83/10/11
00300	DO		MG/L		9	11.4111	7.78619	2.79038	15.5000	8.70000	83/01/20	83/10/11
00400	PH		SU		8	8.23750	.105573	.324921	8.80000	7.80000	83/01/20	83/09/07
00403	LAB	PH	SU		9	8.17888	.285706	.534514	8.97000	7.42000	83/01/20	83/10/11
00410	T ALK	CACO3	MG/L		5	148.400	401.312	20.0328	170.000	119.000	83/06/15	83/10/11
00415	PHEN-PH-	LFIN ALK	MG/L		5	40.4800	3505.71	59.2090	146.000	9.60000	83/03/15	83/10/11
00500	RESIDUE	TOTAL	MG/L		9	618.666	50392.0	224.482	852.000	71.0000	83/01/20	83/10/11
00530	RESIDUE	TOT NFLT	MG/L		8	14.7500	109.643	10.4710	33.0000	2.00000	83/01/20	83/10/11
00610	NH3+NH4-	N TOTAL	MG/L	K	1	1.00000			1.00000	1.00000	83/03/15	83/03/15
				TOT	9	13.2222	116.944	10.8141	33.0000	1.00000	83/01/20	83/10/11
00613	NO2-N	DISS	MG/L		8	.058750	.000698	.026424	.100000	.020000	83/01/20	83/10/11
00620	NO3-N	TOTAL	MG/L	K	1	.020000			.020000	.020000	83/02/15	83/02/15
				TOT	9	.054444	.000778	.027889	.100000	.020000	83/01/20	83/10/11
00625	TOT KJEL	N	MG/L	K	9	.010000	.582E-10	.000008	.010000	.010000	83/01/20	83/10/11
00940	CHLORIDE	TOTAL	MG/L		1	.100000			.100000	.100000	83/06/15	83/06/15
00945	SULFATE	SO4-TOT	MG/L	K	8	.100000	.000000	.000000	.100000	.100000	83/01/20	83/10/11
31616	FEC COLI	MFM-FCBR	/100ML	TOT	9	.100000	.000000	.000000	.100000	.100000	83/01/20	83/10/11
					9	.967777	.317019	.563045	2.22000	.120000	83/01/20	83/10/11
70300	RESIDUE	DISS-180 C	MG/L		9	13.3333	23.3150	4.82856	17.3000	1.30000	83/01/20	83/10/11
70505	T PO4	P-COL	MG/L		9	261.111	11302.6	106.314	400.000	22.0000	83/01/20	83/10/11
70507	PHOS-T	ORTHO	MG/L P		3	10.0000	.000000	.000000	10.0000	10.0000	83/06/15	83/10/11
				K	6	7.66667	13.0667	3.61479	10.0000	3.00000	83/01/20	83/09/07
				TOT	9	8.44444	9.52780	3.08671	10.0000	3.00000	83/01/20	83/10/11
					9	605.444	49507.2	222.502	850.000	70.0000	83/01/20	83/10/11
					9	.111444	.002039	.045150	.166000	.041000	83/01/20	83/10/11
					9	.054111	.000840	.028980	.107000	.010000	83/01/20	83/10/11

Table IV-13.

STORET RETRIEVAL DATE 84/07/25 - STAND - VERSION OF APR. 1983

STN 3.SUMMARY.1

46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

/TYPA/AMBNT/LAKE

SUMMARY OF VIOLATIONS ON SAMPLES COLLECTED FROM 82/06/07 TO 83/10/11

	00400 PH SU	31616 FEC COLI MFM-FCBR /100ML	70300 RESIDUE DISS-180 C MG/L	00530 RESIDUE TOT NFLT MG/L	00610 NH3+NH4- N TOTAL MG/L	00619 UN-IONZD NH3-NH3 MG/L	00620 NO3-N TOTAL MG/L	00011 WATER TEMP FAHN	00415 PHEN-PH- LFIN ALK MG/L	00300 DO MG/L
NO OF VALUES	15	16	16	15	15	14	16	16	7	16
MEAN	8.173	75.3	631.	23.8	0.055	0.0047	1.34	54.56	73.9	11.050
MEDIAN	8.200	10.0	659.	17.0	0.050	0.0027	0.10	57.50	22.8	10.350
NO OF VIOLS	5	2	0	0	0	0	0	0	0	0
PERCENT VIOL	33.	13.	0.	0.	0.	0.	0.	0.	0.	0.
MINIMUM VIOL	8.400	250.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAN VIOL	8.520	415.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAXIMUM VIOL	8.800	580.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MIN CRITERIA	6.500	*********	*********	*********	*********	*********	*********	*********	*********	4.000
MAX CRITERIA	8.300	200.0	2500.	150.0	*********	0.0500	50.00	90.00	750.0	*********

Table IV-14.

STORET RETRIEVAL DATE 84/07/25 - STAND - VERSION OF APR. 1983 STN 3 PAGE 1.1
VIOLATIONS ONLY

46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

/TYPA/AMBNT/LAKE

DATE	TIME	00400 PH SU	31616 FEC COLI MFM-FCBR /100ML	70300 RESIDUE DISS-180 C MG/L	00530 RESIDUE TOT NFLT MG/L	00610 NH_3+NH_4- N TOTAL MG/L	00619 UN-IONZD NH3-NH3 MG/L	00620 NO_3-N TOTAL MG/L	00011 WATER TEMP FAHN	00415 PHEN-PH- LFIN ALK MG/L	00300 DO MG/L
82/06/07	1545	8.500*									
82/08/12	1015	8.400*	580.0*								
82/09/09	1000		250.0*								
83/03/15	0930	8.400*									
83/08/10	1000	8.500*									
83/09/07	1030	8.800*									

Table IV-15.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663828-0693846

/TYPA/AMBNT/STREAM/RUNOFF

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT		2	10.8350	167.994	12.9613	20.0000	1.67000	82/03/17	82/06/04
00011	WATER	TEMP	FAHN		4	43.7500	264.250	16.2558	68.0000	34.0000	82/03/17	82/06/04
00020	AIR	TEMP	CENT		4	8.12750	87.2125	9.33876	22.0000	1.67000	82/03/17	82/06/04
00021	AIR	TEMP	FAHN		4	46.6500	282.224	16.7995	71.6000	35.0000	82/03/17	82/06/04
00061	STREAM	FLOW,	INST-CFS		4	.000000	.000000	.000000	.000000	.000000	82/03/17	82/04/28
00300	DO		MG/L		1	5.60000			5.60000	5.60000	82/06/04	82/06/04
00400	PH		SU		2	7.05000	.405014	.636407	7.50000	6.60000	82/03/17	82/06/04
00500	RESIDUE	TOTAL	MG/L		4	818.500	1135872	1065.77	2406.00	195.000	82/03/17	82/06/04
00530	RESIDUE	TOT NFLT	MG/L		2	50.0000	4232.00	65.0538	96.0000	4.00000	82/04/21	82/06/04
				K	2	1.00000	.000000	.000000	1.00000	1.00000	82/03/17	82/04/01
				TOT	4	25.5000	2211.00	47.0213	96.0000	1.00000	82/03/17	82/06/04
00610	NH3+NH4-	N TOTAL	MG/L		4	.130000	.014200	.119164	.280000	.020000	82/03/17	82/06/04
00613	NO2-N	DISS	MG/L	K	4	.010000	-.776E-10	.000000	.010000	.010000	82/03/17	82/06/04
00620	NO3-N	TOTAL	MG/L		2	.150000	.005000	.070711	.200000	.100000	82/03/17	82/06/04
				K	1	.100000			.100000	.100000	82/04/21	82/04/21
				TOT	3	.133333	.003333	.057735	.200000	.100000	82/03/17	82/06/04
00621	NO3 MUD	DRY WGT	MG/KG-N	K	1	.100000			.100000	.100000	82/04/01	82/04/01
00625	TOT KJEL	N	MG/L		4	.780000	.095267	.308653	1.00000	.330000	82/03/17	82/06/04
31616	FEC COLI	MFM-FCBR	/100ML	K	2	6.50000	24.5000	4.94975	10.0000	3.00000	82/03/17	82/04/21
31673	FECSTREP	MFKFAGAR	/100ML		1	10.0000			10.0000	10.0000	82/04/01	82/04/01
70300	RESIDUE	DISS-180	C MG/L		3	933.666	1617033	1271.63	2402.00	194.000	82/03/17	82/04/21
70505	T PO4	P-COL	MG/L		2	.471000	.143648	.379009	.739000	.203000	82/03/17	82/06/04
70506	SOL PO4-	T P-COL	MG/L		2	.142500	.010224	.101116	.214000	.071000	82/04/01	82/04/21
70507	PHOS-T	ORTHO	MG/L P		4	.281750	.078681	.280501	.693000	.061000	82/03/17	82/06/04

Table IV-16.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663829-0693847

/TYPA/AMBNT/STREAM/RUNOFF

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT		1	3.33000			3.33000	3.33000	82/03/04	82/03/04
00011	WATER	TEMP	FAHN		1	38.0000			38.0000	38.0000	82/03/04	82/03/04
00020	AIR	TEMP	CENT		1	7.22000			7.22000	7.22000	82/03/04	82/03/04
00021	AIR	TEMP	FAHN		1	45.0000			45.0000	45.0000	82/03/04	82/03/04
00061	STREAM	FLOW,	INST-CFS		1	.000000			.000000	.000000	82/06/07	82/06/07
00403	LAB	PH	SU		1	7.57000			7.57000	7.57000	82/03/04	82/03/04
00500	RESIDUE	TOTAL	MG/L		1	417.000			417.000	417.000	82/03/04	82/03/04
00530	RESIDUE	TOT NFLT	MG/L		1	8.00000			8.00000	8.00000	82/03/04	82/03/04
00610	NH3+NH4-	N TOTAL	MG/L		1	.290000			.290000	.290000	82/03/04	82/03/04
00613	NO2-N	DISS	MG/L	K	1	.010000			.010000	.010000	82/03/04	82/03/04
00620	NO3-N	TOTAL	MG/L		1	.500000			.500000	.500000	82/03/04	82/03/04
00625	TOT KJEL	N	MG/L		1	3.34000			3.34000	3.34000	82/03/04	82/03/04
00940	CHLORIDE	TOTAL	MG/L		1	9.00000			9.00000	9.00000	82/03/04	82/03/04
00945	SULFATE	SO4-TOT	MG/L		1	74.0000			74.0000	74.0000	82/03/04	82/03/04
70300	RESIDUE	DISS-180	C MG/L		1	409.000			409.000	409.000	82/03/04	82/03/04
70505	T PO4	P-COL	MG/L		1	.380000			.380000	.380000	82/03/04	82/03/04
70507	PHOS-T	ORTHO	MG/L P		1	.289000			.289000	.289000	82/03/04	82/03/04

Table IV-17.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663829-0693847

/TYPA/AMBNT/STREAM/RUNOFF

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT		7	7.53285	41.1208	6.41255	13.3000	.000000	83/03/15	83/06/15
00011	WATER	TEMP	FAHN		7	45.5714	133.621	11.5595	56.0000	32.0000	83/03/15	83/06/15
00020	AIR	TEMP	CENT		7	7.47285	46.8087	6.84169	15.6000	-.110E+01	83/03/15	83/06/15
00021	AIR	TEMP	FAHN		7	45.4286	150.955	12.2864	60.0000	30.0000	83/03/15	83/06/15
00061	STREAM	FLOW,	INST-CFS		1	4.00000			4.00000	4.00000	83/03/24	83/03/24
00095	CNDUCTVY	AT 25C	MICROMHO		1	1058.00			1058.00	1058.00	83/06/15	83/06/15
00310	BOD	5 DAY	MG/L		2	3.50000	4.50000	2.12132	5.00000	2.00000	83/03/15	83/05/12
00400	PH		SU		7	7.85714	.262858	.512697	8.50000	7.30000	83/03/15	83/06/15
00403	LAB	PH	SU		5	7.89600	.097351	.312011	8.31000	7.61000	83/03/24	83/06/15
00410	T ALK	CACO3	MG/L		1	317.000			317.000	317.000	83/06/15	83/06/15
00500	RESIDUE	TOTAL	MG/L		7	656.714	35918.5	189.522	877.000	329.000	83/03/15	83/06/15
00530	RESIDUE	TOT NFLT	MG/L		6	3.16667	5.36668	2.31661	6.00000	1.00000	83/03/15	83/06/15
				K	1	1.00000			1.00000	1.00000	83/05/12	83/05/12
				TOT	7	2.85714	5.14287	2.26779	6.00000	1.00000	83/03/15	83/06/15
00610	NH3+NH4-	N TOTAL	MG/L		7	.044286	.000095	.009759	.060000	.030000	83/03/15	83/06/15
00613	NO2-N	DISS	MG/L		1	.020000			.020000	.020000	83/03/15	83/03/15
				K	6	.010000	-.931E-10	.000000	.010000	.010000	83/03/24	83/06/15
				TOT	7	.011429	.000014	.003780	.020000	.010000	83/03/15	83/06/15
00620	NO3-N	TOTAL	MG/L		4	.550000	.136667	.369685	.900000	.100000	83/03/15	83/04/07
				K	3	.100000	-.186E-08	.000000	.100000	.100000	83/03/24	83/06/15
				TOT	7	.357143	.126191	.355233	.900000	.100000	83/03/15	83/06/15
00625	TOT KJEL	N	MG/L		7	.734285	.051495	.226926	1.18000	.550000	83/03/15	83/06/15
00940	CHLORIDE	TOTAL	MG/L		4	10.0250	4.60921	2.14691	12.7000	7.80000	83/03/24	83/04/07
00945	SULFATE	SO4-TOT	MG/L		4	179.750	4864.25	69.7442	243.000	92.0000	83/03/24	83/04/07
31616	FEC COLI	MFM-FCBR	/100ML		1	460.000			460.000	460.000	83/06/15	83/06/15
				K	6	10.0000	.000000	.000000	10.0000	10.0000	83/03/15	83/05/12
				TOT	7	74.2857	28928.6	170.084	460.000	10.0000	83/03/15	83/06/15
70300	RESIDUE	DISS-180	C MG/L		7	653.000	35791.3	189.186	874.000	323.000	83/03/15	83/06/15
70505	T PO4	P-COL	MG/L		7	.125714	.002415	.049138	.197000	.075000	83/03/15	83/06/15
70507	PHOS-T	ORTHO	MG/L P		7	.079000	.002078	.045581	.166000	.032000	83/03/15	83/06/15

Table IV-18.

STORET RETRIEVAL DATE 84/07/25 - STAND - VERSION OF APR. 1983 STN 5.SUMMARY.1

46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

/TYPA/AMBNT/STREAM/RUNOFF

SUMMARY OF VIOLATIONS ON SAMPLES COLLECTED FROM 82/03/04 TO 83/06/15

	00400 PH SU	31616 FEC COLI MFM-FCBR /100ML	70300 RESIDUE DISS-180 C MG/L	00530 RESIDUE TOT NFLT MG/L	00610 NH3+NH4- N TOTAL MG/L	00619 UN-IONZD NH3-NH3 MG/L	00620 NO3-N TOTAL MG/L	00011 WATER TEMP FAHN	00415 PHEN-PH- LFIN ALK MG/L	00300 DO MG/L
NO OF VALUES	7	7	8	8	8	7	8	8	1	0
MEAN	7.857	74.3	623.	3.5	0.0750	0.0010	0.37	44.63	317.0	0.0
MEDIAN	7.900	10.0	593.	2.5	0.0450	0.0004	0.25	45.00	317.0	*********
NO OF VIOLS	2	1	0	0	0	0	0	0	0	0
PERCENT VIOL	29.	14.	0.	0.	0.	0.	0.	0.	0.	0.
MINIMUM VIOL	8.500	460.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAN VIOL	8.500	460.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAXIMUM VIOL	8.500	460.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MIN CRITERIA	6.500	*********	*********	*********	*********	*********	*********	*********	*********	4.000
MAX CRITERIA	8.300	200.0	2500.	150.0	*********	0.0500	50.00	90.00	750.0	*********

Table IV-19.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663830-0693848

/TYPA/AMBNT/STREAM/RUNOFF

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00011	WATER	TEMP	FAHN		6	51.6667	220.270	14.8415	70.0000	33.0000	80/08/19	80/11/25
00021	AIR	TEMP	FAHN		6	54.3333	333.870	18.2721	79.0000	26.0000	80/08/19	80/11/25
00300	DO		MG/L		6	10.2500	5.65513	2.37805	13.3000	6.70000	80/08/19	80/11/25
00400	PH		SU		6	7.88333	.465771	.682474	8.50000	6.60000	80/08/19	80/11/25
00500	RESIDUE	TOTAL	MG/L		6	632.500	1348.00	36.7151	679.000	604.000	80/08/19	80/12/16
00530	RESIDUE	TOT NFLT	MG/L		7	12.7143	78.2382	8.84523	25.0000	5.00000	80/08/19	80/12/16
00610	NH3+NH4-	N TOTAL	MG/L		7	.248571	.077981	.279251	.750000	.040000	80/08/19	80/12/16
00613	NO2-N	DISS	MG/L		2	.045000	.002450	.049497	.080000	.010000	80/09/25	80/11/25
				K	5	.010000	-.582E-10	.000000	.010000	.010000	80/08/19	80/12/16
00620	NO3-N	TOTAL	MG/L	TOT	7	.020000	.000700	.026457	.080000	.010000	80/08/19	80/12/16
					5	.680000	.077000	.277489	1.10000	.400000	80/09/25	80/12/16
				K	2	.100000	-.372E-08	.000000	.100000	.100000	80/08/19	80/09/10
00621	NO3 MUD	DRY WGT	MG/KG-N	TOT	7	.514285	.131428	.362531	1.10000	.100000	80/08/19	80/12/16
					4	.725000	.089166	.298607	1.10000	.400000	80/09/25	80/11/25
				K	1	.100000			.100000	.100000	80/09/10	80/09/10
00625	TOT KJEL	N	MG/L	TOT	5	.600000	.145000	.380789	1.10000	.100000	80/09/10	80/11/25
31616	FEC COLI	MFM-FCBR	/100ML		7	1.40714	.073959	.271954	1.93000	1.09000	80/08/19	80/12/16
					3	24.3333	56.3337	7.50558	33.0000	20.0000	80/09/10	80/10/16
				K	4	2.50000	1.00000	1.00000	3.00000	1.00000	80/08/19	80/12/16
70300	RESIDUE	DISS-180 C	MG/L	TOT	7	11.8571	155.476	12.4690	33.0000	1.00000	80/08/19	80/12/16
70505	T PO4	P-COL	MG/L		6	621.833	1313.60	36.2436	673.000	583.000	80/08/19	80/12/16
70507	PHOS-T	ORTHO	MG/L P		7	.206000	.000366	.019134	.231000	.173000	80/08/19	80/12/16
					7	.166857	.001986	.044567	.228000	.091000	80/08/19	80/12/16

Table IV-21.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663830-0693848

/TYPA/AMBNT/STREAM/RUNOFF

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00011	WATER	TEMP	FAHN		4	43.5000	176.333	13.2791	55.0000	32.0000	81/02/25	81/05/13
00020	AIR	TEMP	CENT		4	10.8300	46.4675	6.81671	18.9000	2.22000	81/02/25	81/05/13
00021	AIR	TEMP	FAHN		4	51.5000	150.333	12.2610	66.0000	36.0000	81/02/25	81/05/13
00300	DO		MG/L		4	14.6500	9.07015	3.01167	18.1000	10.8000	81/02/25	81/05/13
00500	RESIDUE	TOTAL	MG/L		5	446.600	96125.4	310.041	743.000	104.000	81/01/22	81/05/13
00530	RESIDUE	TOT NFLT	MG/L		4	16.0000	200.667	14.1657	37.0000	6.00000	81/02/25	81/05/13
				K	1	1.00000			1.00000	1.00000	81/01/22	81/01/22
				TOT	5	13.0000	195.500	13.9821	37.0000	1.00000	81/01/22	81/05/13
00610	NH3+NH4-	N TOTAL	MG/L		5	.074000	.001430	.037815	.140000	.050000	81/01/22	81/05/13
00613	NO2-N	DISS	MG/L	K	5	.010000	-.582E-10	.000000	.010000	.010000	81/01/22	81/05/13
00620	NO3-N	TOTAL	MG/L		1	.040000			.040000	.040000	81/01/22	81/01/22
				K	4	.100000	-.248E-08	.000000	.100000	.100000	81/02/25	81/05/13
				TOT	5	.088000	.000720	.026833	.100000	.040000	81/01/22	81/05/13
00625	TOT KJEL	N	MG/L		5	1.60600	2.32008	1.52318	4.30000	.640000	81/01/22	81/05/13
31616	FEC COLI	MFM-FCBR	/100ML		1	3.00000			3.00000	3.00000	81/05/04	81/05/04
				K	4	3.00000	.000000	.000000	3.00000	3.00000	81/01/22	81/05/13
				TOT	5	3.00000	.000000	.000000	3.00000	3.00000	81/01/22	81/05/13
70300	RESIDUE	DISS-180	C MG/L		5	453.800	87107.3	295.140	743.000	94.0000	81/01/22	81/05/13
70505	T PO4	P-COL	MG/L		5	.084800	.001678	.040960	.142000	.044000	81/01/22	81/05/13
70507	PHOS-T	ORTHO	MG/L P		3	.078000	.001939	.044034	.123000	.035000	81/01/22	81/03/11
				K	2	.005000	.000000	.000000	.005000	.005000	81/05/04	81/05/13
				TOT	5	.048800	.002568	.050677	.123000	.005000	81/01/22	81/05/13

Table IV-22.

STORET RETRIEVAL DATE 84/07/26 - INVENT - VERSION OF SEP. 1981

46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 CLASS 00 CSN-RSP 0663830-0693848

/TYPA/AMBNT/STREAM/RUNOFF

PARAMETER				RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT		2	20.8000	25.9207	5.09123	24.4000	17.2000	83/06/15	83/07/13
00011	WATER	TEMP	FAHN		2	69.5000	84.5000	9.19239	76.0000	63.0000	83/06/15	83/07/13
00020	AIR	TEMP	CENT		2	21.9500	55.1250	7.42462	27.2000	16.7000	83/06/15	83/07/13
00021	AIR	TEMP	FAHN		2	71.5000	180.500	13.4350	81.0000	62.0000	83/06/15	83/07/13
00095	CNDUCTVY	AT 25C	MICROMHO		2	810.500	265.000	16.2788	822.000	799.000	83/06/15	83/07/13
00400	PH		SU		2	8.14999	.005188	.072028	8.20000	8.10000	83/06/15	83/07/13
00403	LAB	PH	SU		2	8.24999	.002029	.045049	8.28000	8.22000	83/06/15	83/07/13
00410	T ALK	CACO3	MG/L		2	159.500	4.50000	2.12132	161.000	158.000	83/06/15	83/07/13
00500	RESIDUE	TOTAL	MG/L		1	657.000			657.000	657.000	83/06/15	83/06/15
00530	RESIDUE	TOT NFLT	MG/L		1	31.0000			31.0000	31.0000	83/07/13	83/07/13
00610	NH3+NH4-	N TOTAL	MG/L		2	.065000	.000450	.021213	.080000	.050000	83/06/15	83/07/13
00613	NO2-N	DISS	MG/L	K	1	.010000			.010000	.010000	83/06/15	83/06/15
00620	NO3-N	TOTAL	MG/L	K	1	.100000			.100000	.100000	83/06/15	83/06/15
00625	TOT KJEL	N	MG/L		2	.945000	.031250	.176777	1.07000	.820000	83/06/15	83/07/13
00916	CALCIUM	CA-TOT	MG/L		1	110.000			110.000	110.000	83/07/13	83/07/13
00927	MGNSIUM	MG,TOT	MG/L		1	38.2000			38.2000	38.2000	83/07/13	83/07/13
00929	SODIUM	NA,TOT	MG/L		1	8.50000			8.50000	8.50000	83/07/13	83/07/13
31616	FEC COLI	MFM-FCBR	/100ML		2	65.0000	1250.00	35.3553	90.0000	40.0000	83/06/15	83/07/13
70300	RESIDUE	DISS-180	C MG/L		1	646.000			646.000	646.000	83/06/15	83/06/15
70505	T PO4	P-COL	MG/L		2	.113500	.000264	.016263	.125000	.102000	83/06/15	83/07/13
70507	PHOS-T	ORTHO	MG/L P		2	.046000	.000072	.008486	.052000	.040000	83/06/15	83/07/13

Table IV-23.

STORET RETRIEVAL DATE 84/07/25 - STAND - VERSION OF APR. 1983 STN 6.SUMMARY.1

46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

/TYPA/AMBNT/STREAM/RUNOFF

SUMMARY OF VIOLATIONS ON SAMPLES COLLECTED FROM 80/08/19 TO 83/07/13

	00400 PH SU	31616 FEC COLI MFM-FCBR /100ML	70300 RESIDUE DISS-180 C MG/L	00530 RESIDUE TOT NFLT MG/L	00610 NH3+NH4-N TOTAL MG/L	00619 UN-IONZD NH3-NH3 MG/L	00620 NO3-N TOTAL MG/L	00011 WATER TEMP FAHN	00415 PHEN-PH-LFIN ALK MG/L	00300 DO MG/L
NO OF VALUES	8	14	12	13	14	8	13	12	2	10
MEAN	7.950	16.3	554.	14.2	0.1600	0.0115	0.32	51.92	159.5	12.010
MEDIAN	8.100	3.0	609.	10.0	0.0750	0.0046	0.10	55.00	159.5	11.450
NO OF VIOLS	1	0	0	0	0	0	0	0	0	0
PERCENT VIOL	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MINIMUM VIOL	8.500	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAN VIOL	8.500	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAXIMUM VIOL	8.500	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MIN CRITERIA	6.500	********	********	********	********	********	********	********	********	4.000
MAX CRITERIA	8.300	200.0	2500.	150.0	********	0.0500	50.00	90.00	750.0	********

Table IV-24.

STORET RETRIEVAL DATE 84/07/25 - STAND - VERSION OF APR. 1983 STN 6 PAGE 1.1
VIOLATIONS ONLY

46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27061 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

/TYPA/AMBNT/STREAM/RUNOFF

DATE	TIME	00400 PH SU	31616 FEC COLI MFM-FCBR /100ML	70300 RESIDUE DISS-180 C MG/L	00530 RESIDUE TOT NFLT MG/L	00610 NH3+NH4- N TOTAL MG/L	00619 UN-IONZD NH3-NH3 MG/L	00620 NO3-N TOTAL MG/L	00011 WATER TEMP FAHN	00415 PHEN-PH- LFIN ALK MG/L	00300 DO MG/L
80/08/19	1330	8.500*									

Table IV-25.

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
STATION=21SDLAKE 46HN01					
ORGN	5	2.694	3.158	0.890	8.310
INORGN	5	0.738	0.365	0.180	1.100
STATION=21SDLAKE 46HN06					
ORGN	7	1.159	0.447	0.450	1.860
INORGN	7	0.783	0.323	0.180	1.150

1980

Table IV-26.

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
STATION=21SDLAKE 46HN01					
ORGN	5	1.408	0.739	0.470	2.220
INORGN	3	0.290	0.121	0.160	0.400
STATION=21SDLAKE 46HN06					
ORGN	5	1.532	1.531	0.590	4.240
INORGN	5	0.172	0.051	0.110	0.250

Table IV-27.

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
STATION=21SDLAKE 46HN01					
ORGN	7	0.926	0.484	0.100	1.360
INORGN	7	0.211	0.067	0.140	0.330
STATION=21SDLAKE 46HN02					
ORGN	7	0.949	0.695	0.460	2.460
INORGN	7	0.414	0.209	0.130	0.630
STATION=21SDLAKE 46HN03					
ORGN	6	0.833	0.718	0.080	2.110
INORGN	6	3.585	8.306	0.130	20.540
STATION=21SDLAKE 46HN04					
ORGN	4	0.650	0.423	0.050	0.980
INORGN	3	0.310	0.070	0.260	0.390
STATION=21SDLAKE 46HN05					
ORGN	1	3.050	.	3.050	3.050
INORGN	1	0.800	.	0.800	0.800

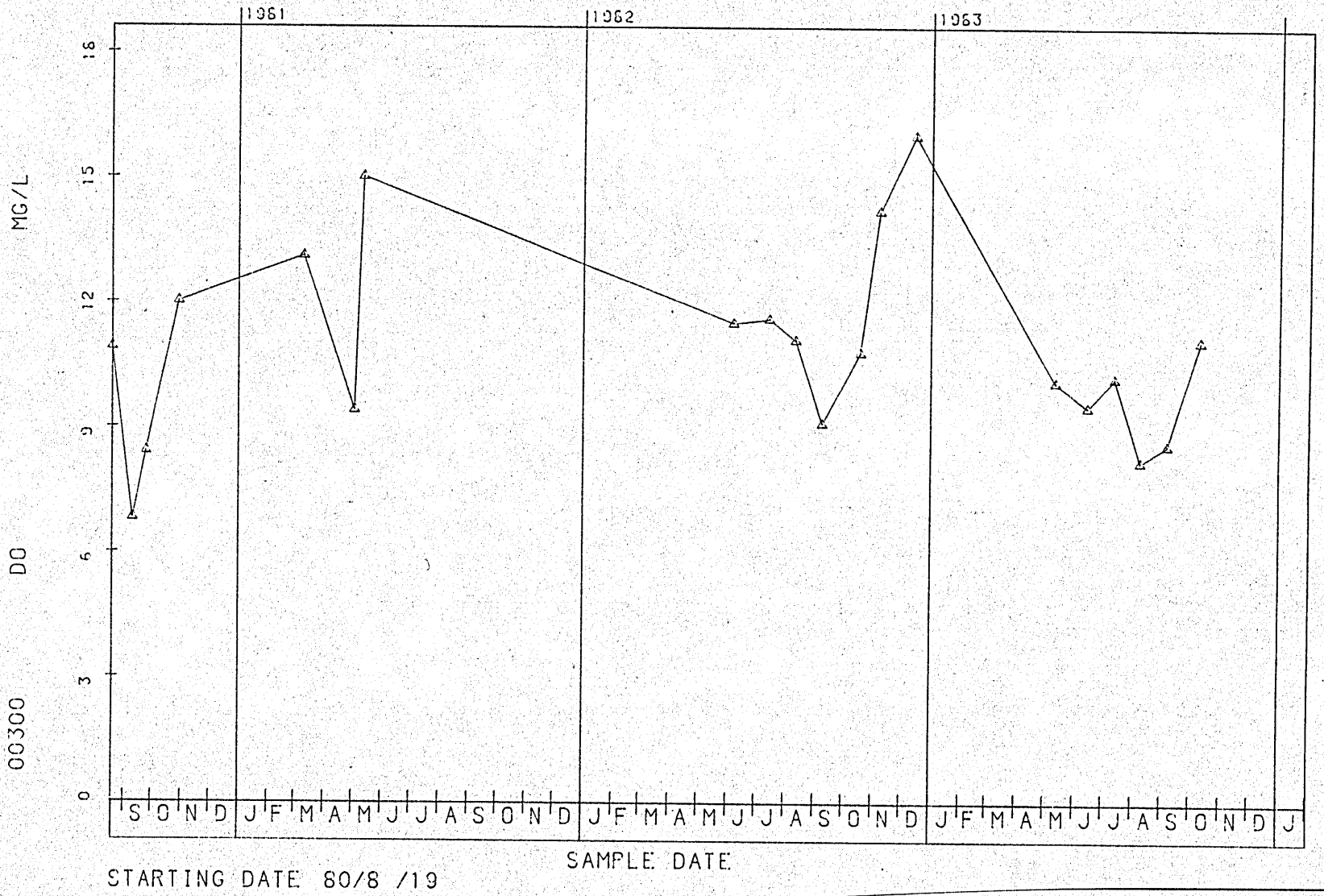
1982

Table IV-28.

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
STATION=21SDLAKE 46HN01					
ORGN	6	1.103	0.516	0.560	2.090
INORGN	6	0.198	0.104	0.130	0.390
STATION=21SDLAKE 46HN02					
ORGN	11	-0.209	2.504	-7.750	0.800
INORGN	11	1.237	2.642	0.130	9.110
STATION=21SDLAKE 46HN03					
ORGN	9	0.913	0.558	0.040	2.120
INORGN	9	0.164	0.028	0.130	0.210
STATION=21SDLAKE 46HN05					
ORGN	7	0.690	0.221	0.510	1.130
INORGN	7	0.413	0.357	0.150	0.970
STATION=21SDLAKE 46HN06					
ORGN	2	0.880	0.198	0.740	1.020
INORGN	1	0.160	.	0.160	0.160

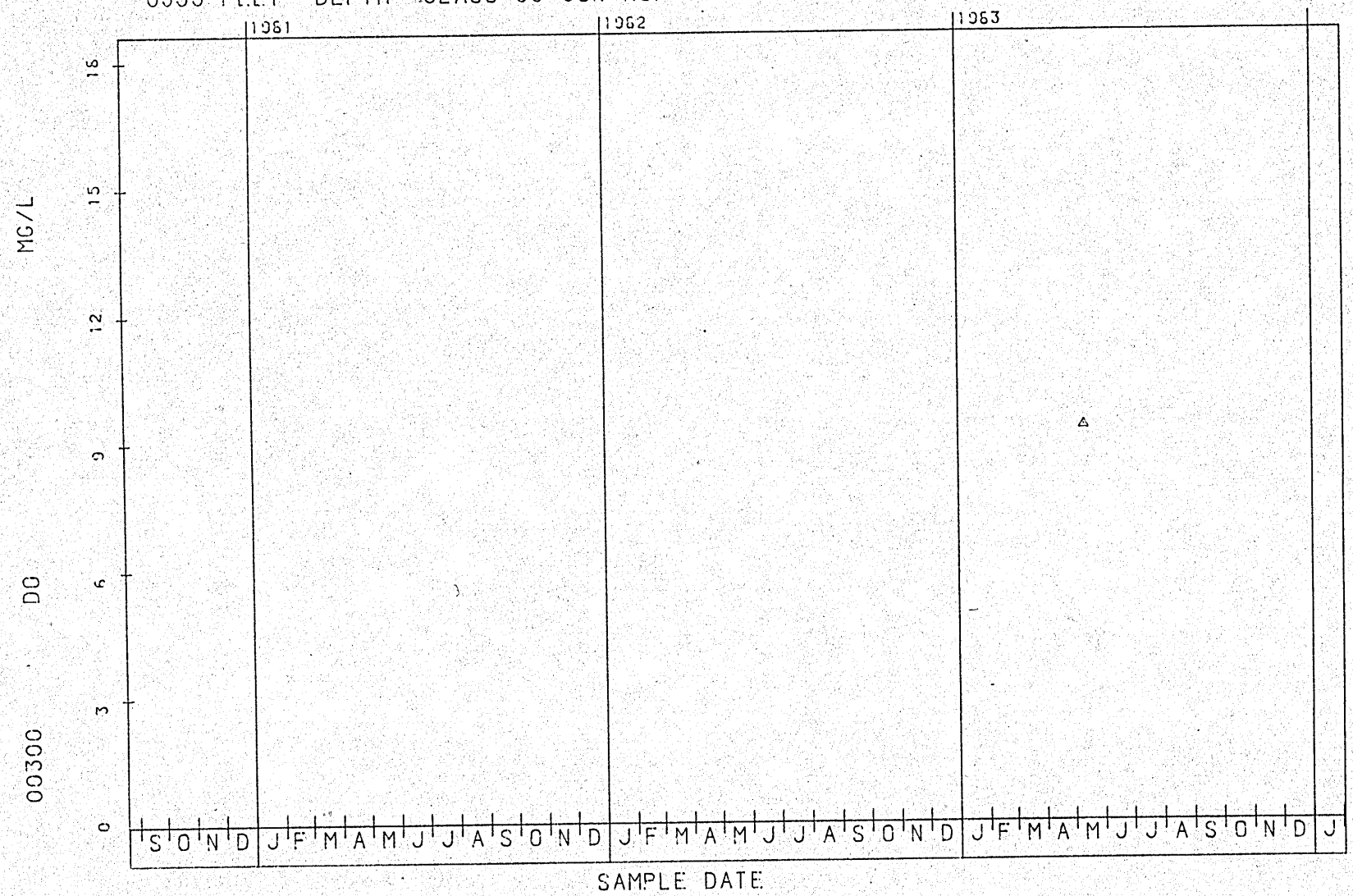
Table IV-29.

Figure IV-1.


46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843
1961
1962
1963
MG/L
DO
00300
0
3
6
9
12
15
18
S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J
SAMPLE DATE
STARTING DATE 80/8 /19

46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

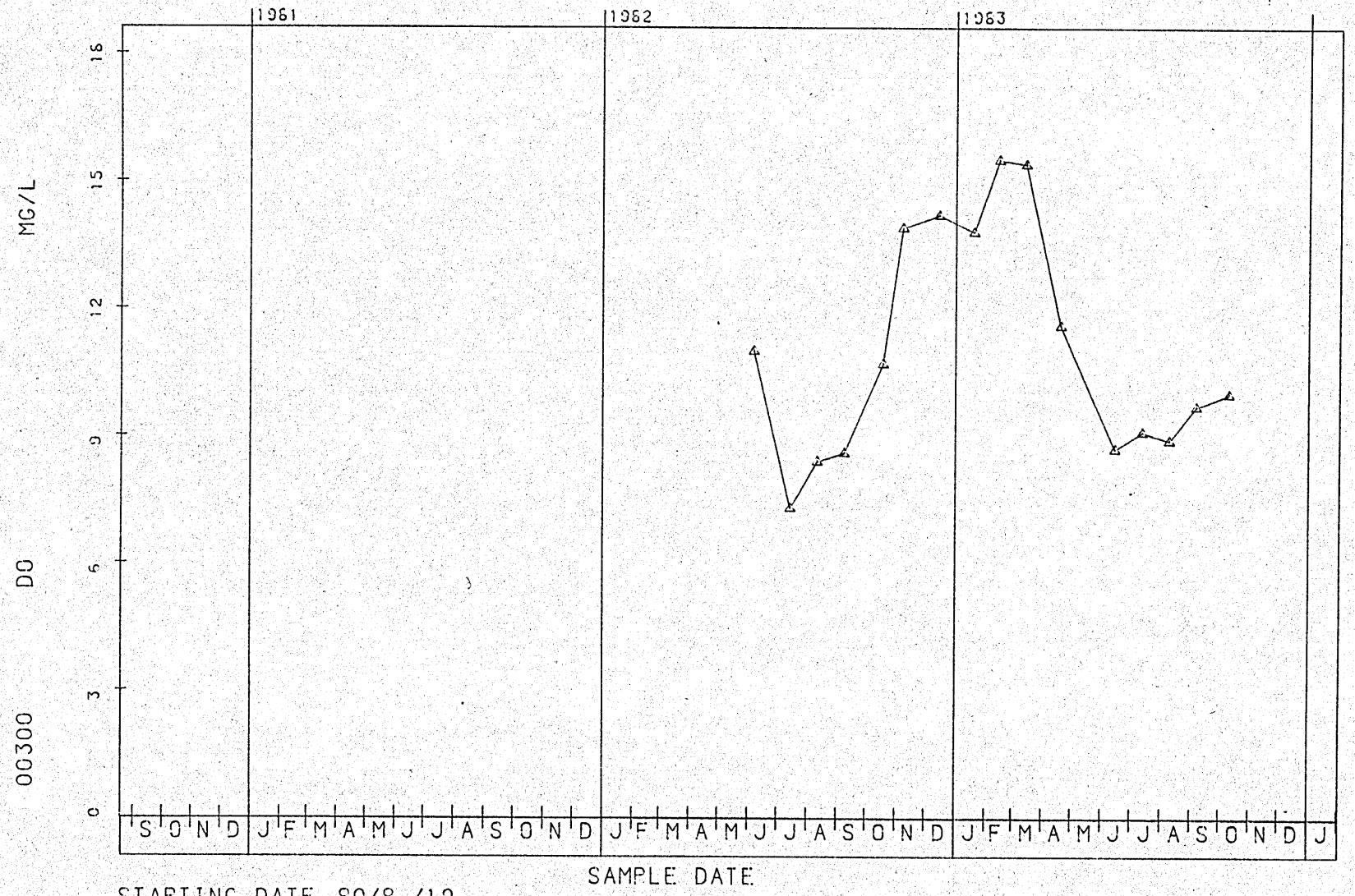
Figure IV-2.



STARTING DATE 80/8 /19

46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

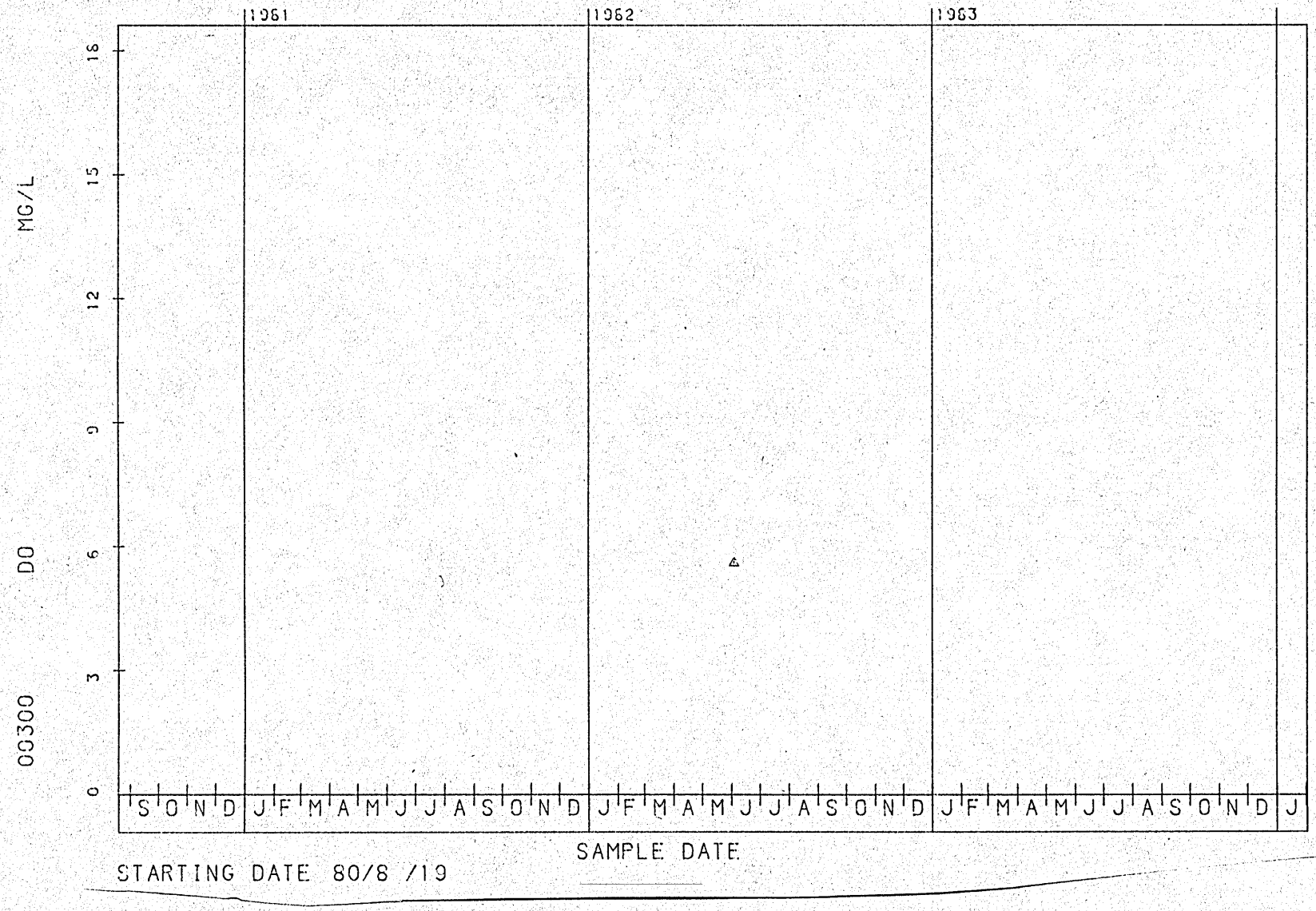
Figure IV-3.



STARTING DATE 80/8 /19

46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

Figure IV-4.



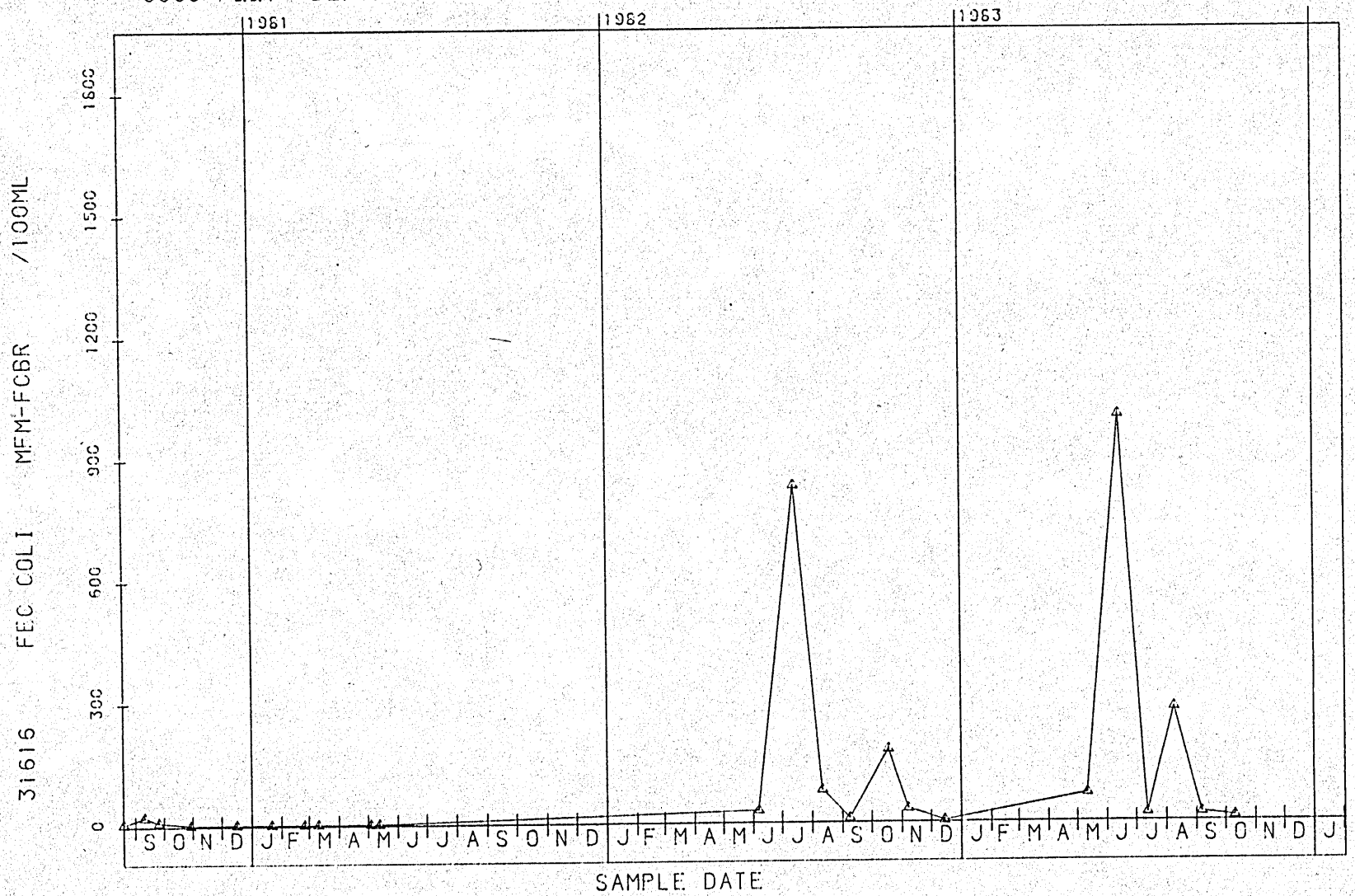
46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

Figure IV-5.

STARTING DATE 80/8 /19

Figure IV-6.

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843



STARTING DATE 80/8 /19

46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

Figure IV-7.

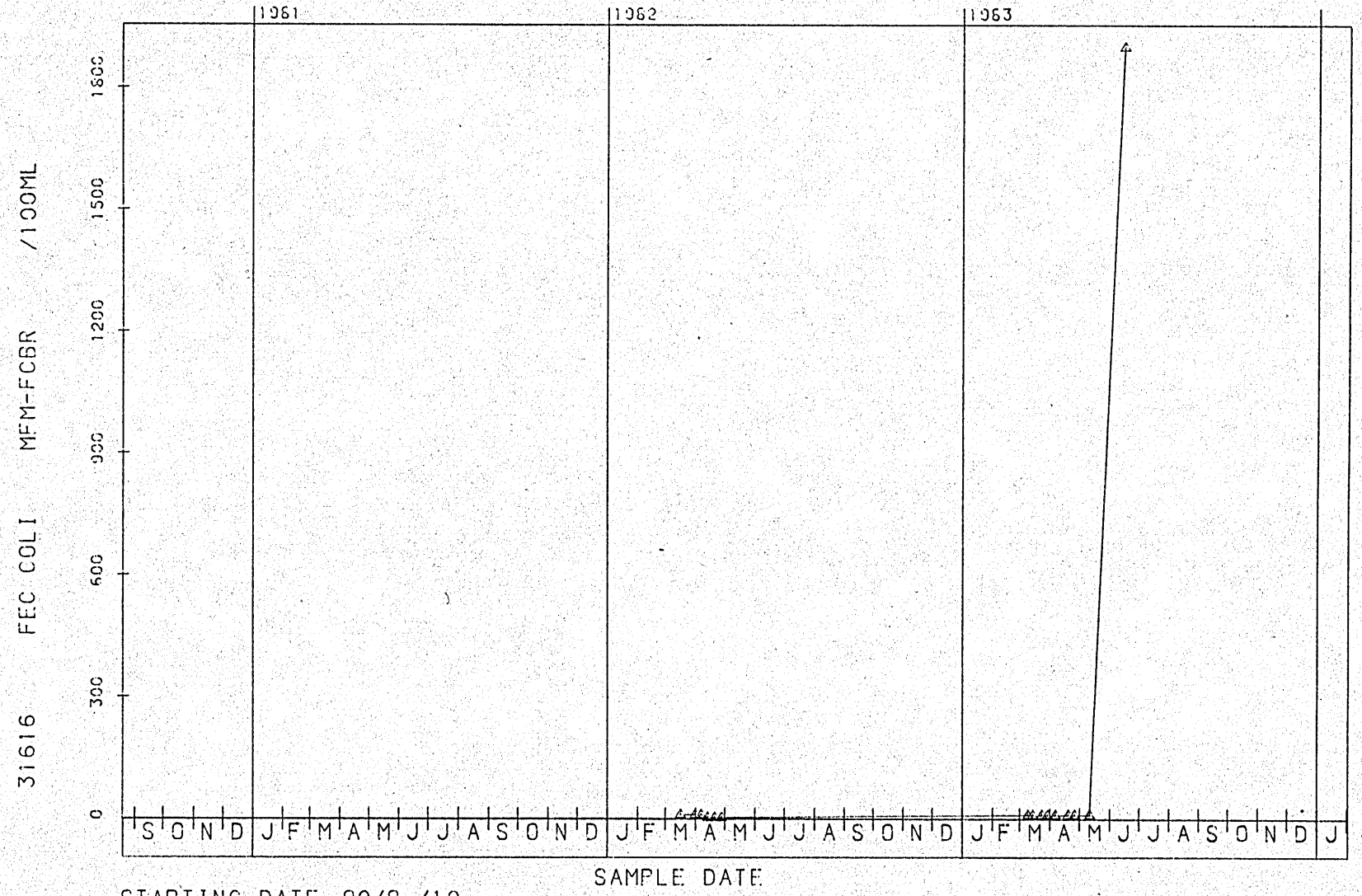
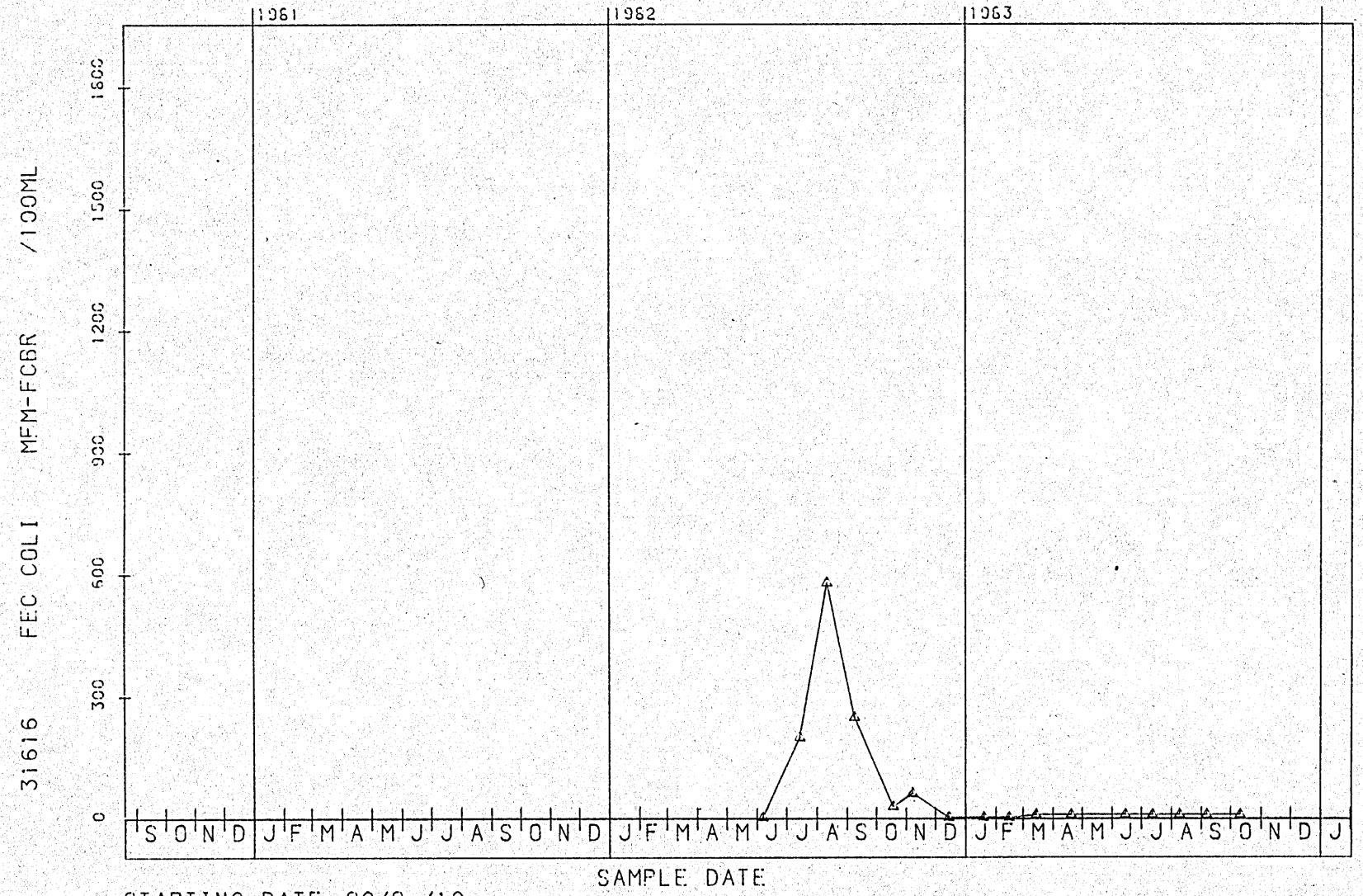


Figure IV-8.

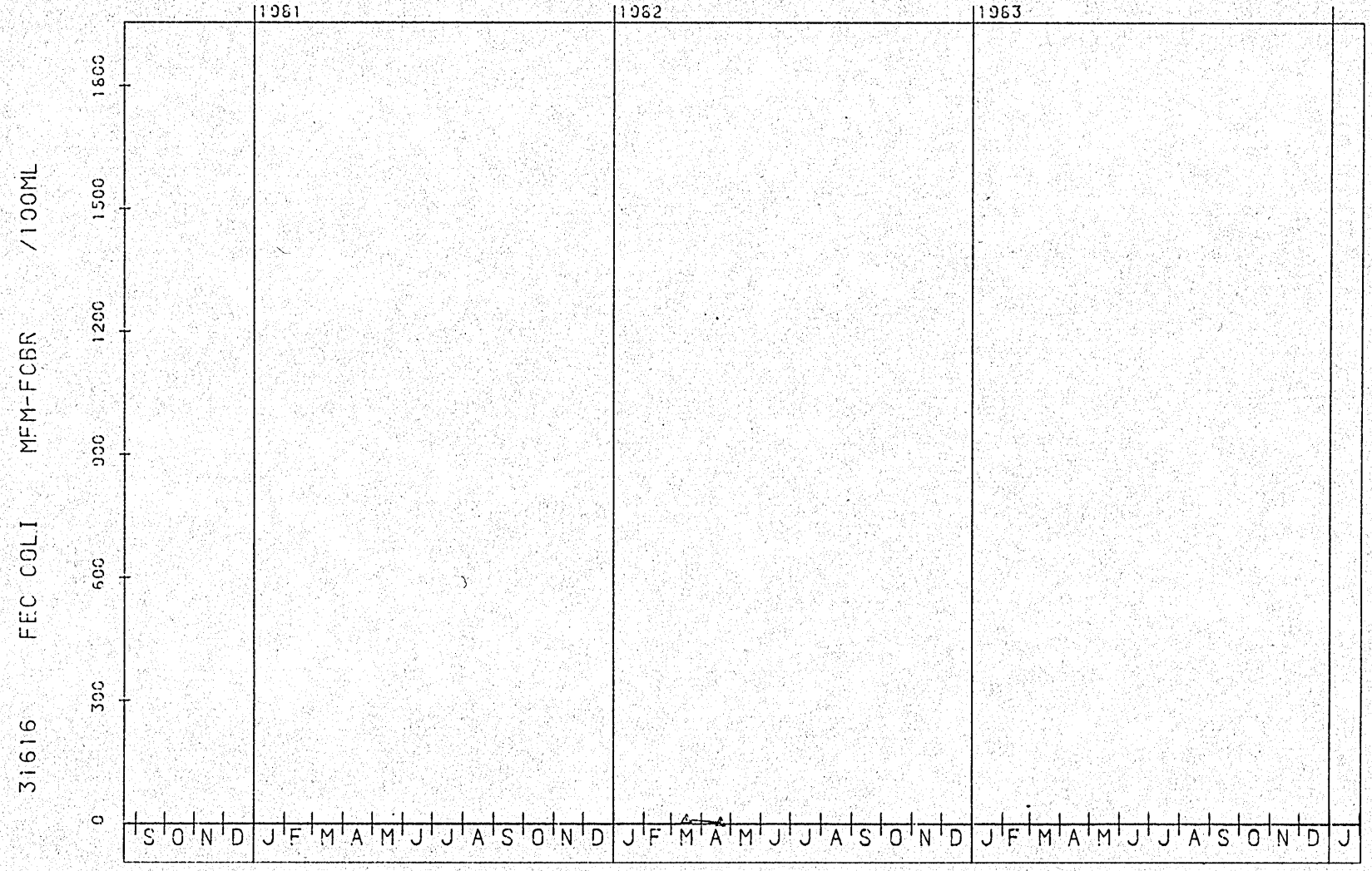
46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845



STARTING DATE 80/8 /19

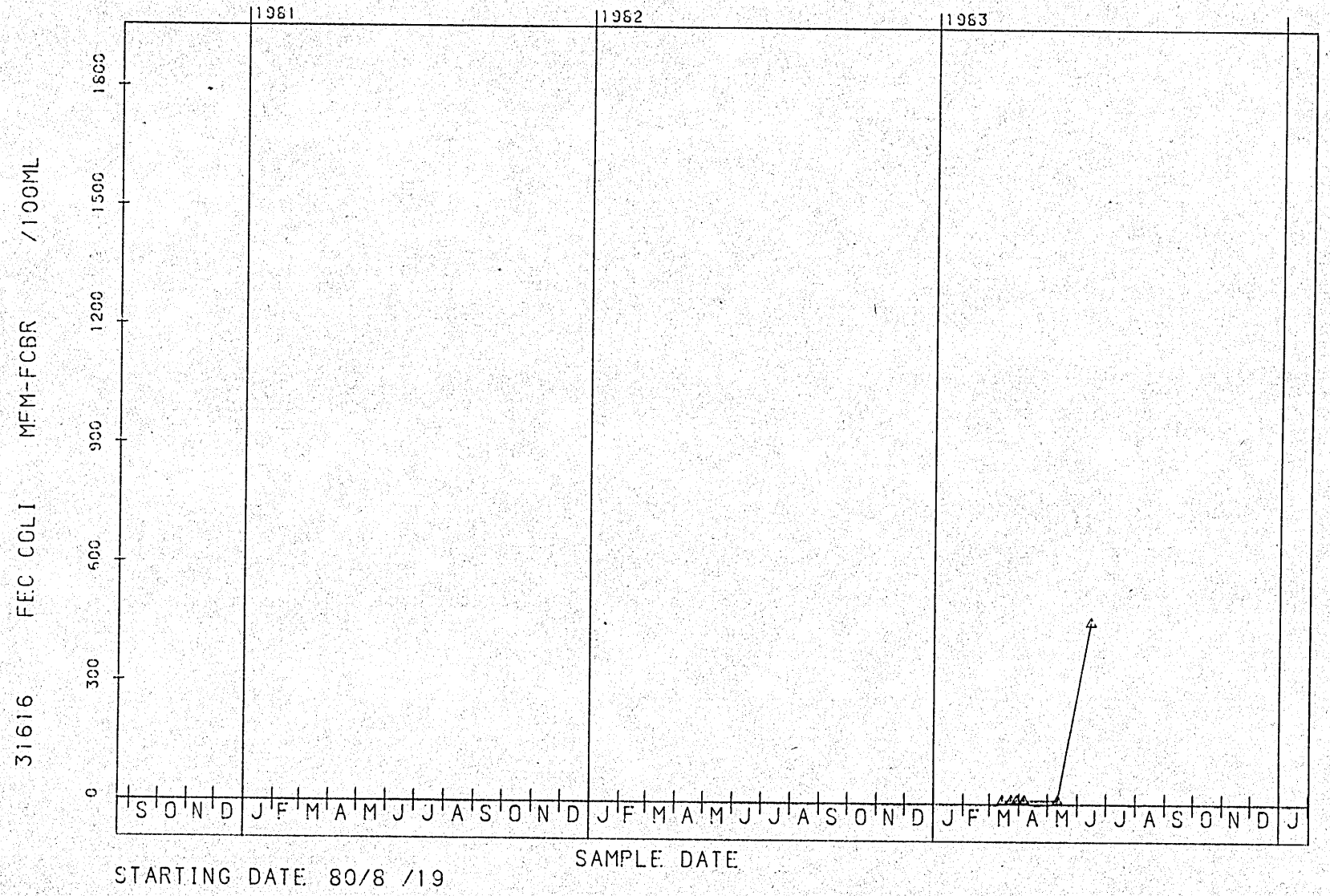
46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

Figure IV-9.



46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

Figure IV-10.



46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

Figure IV-11.

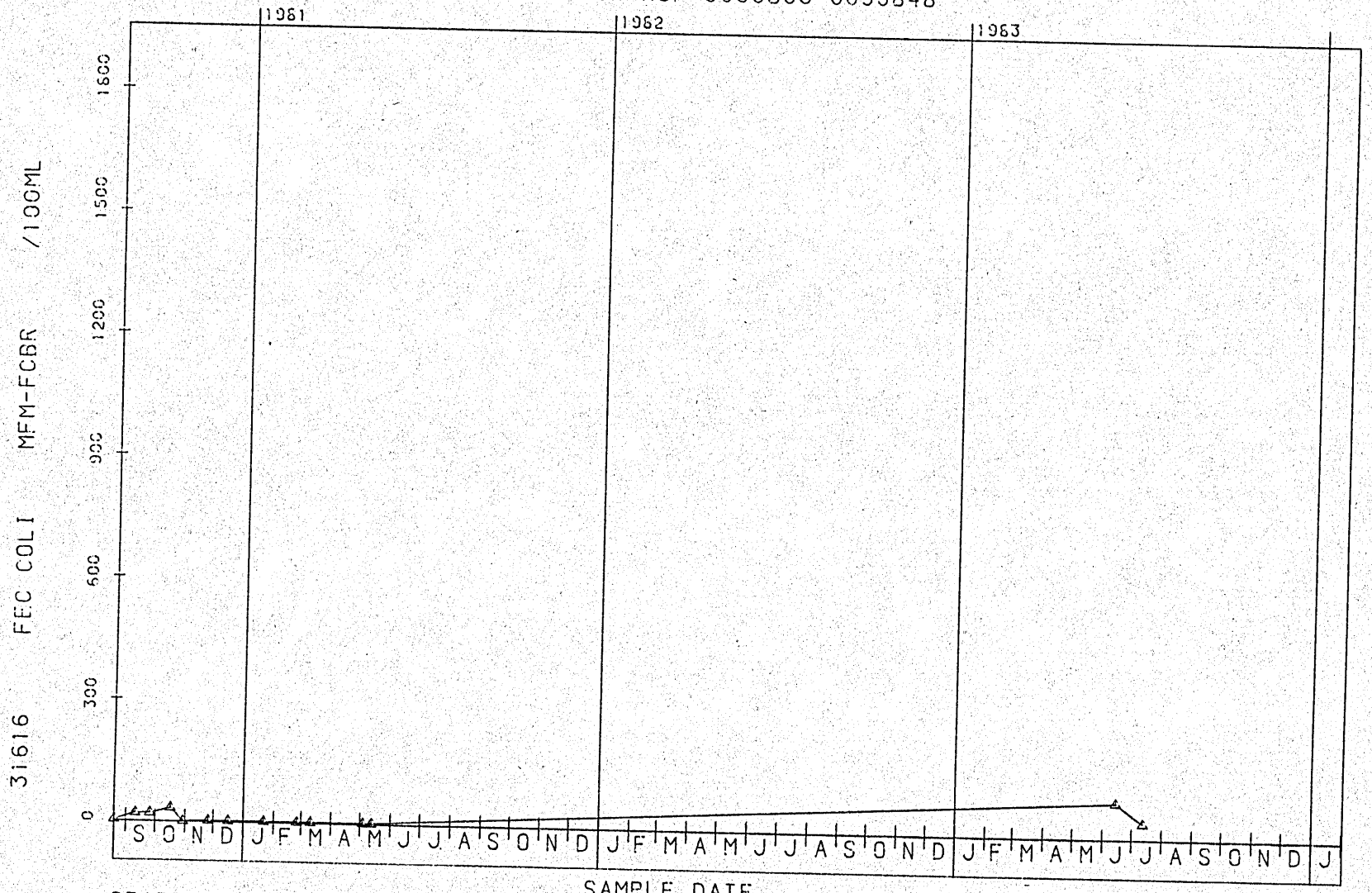
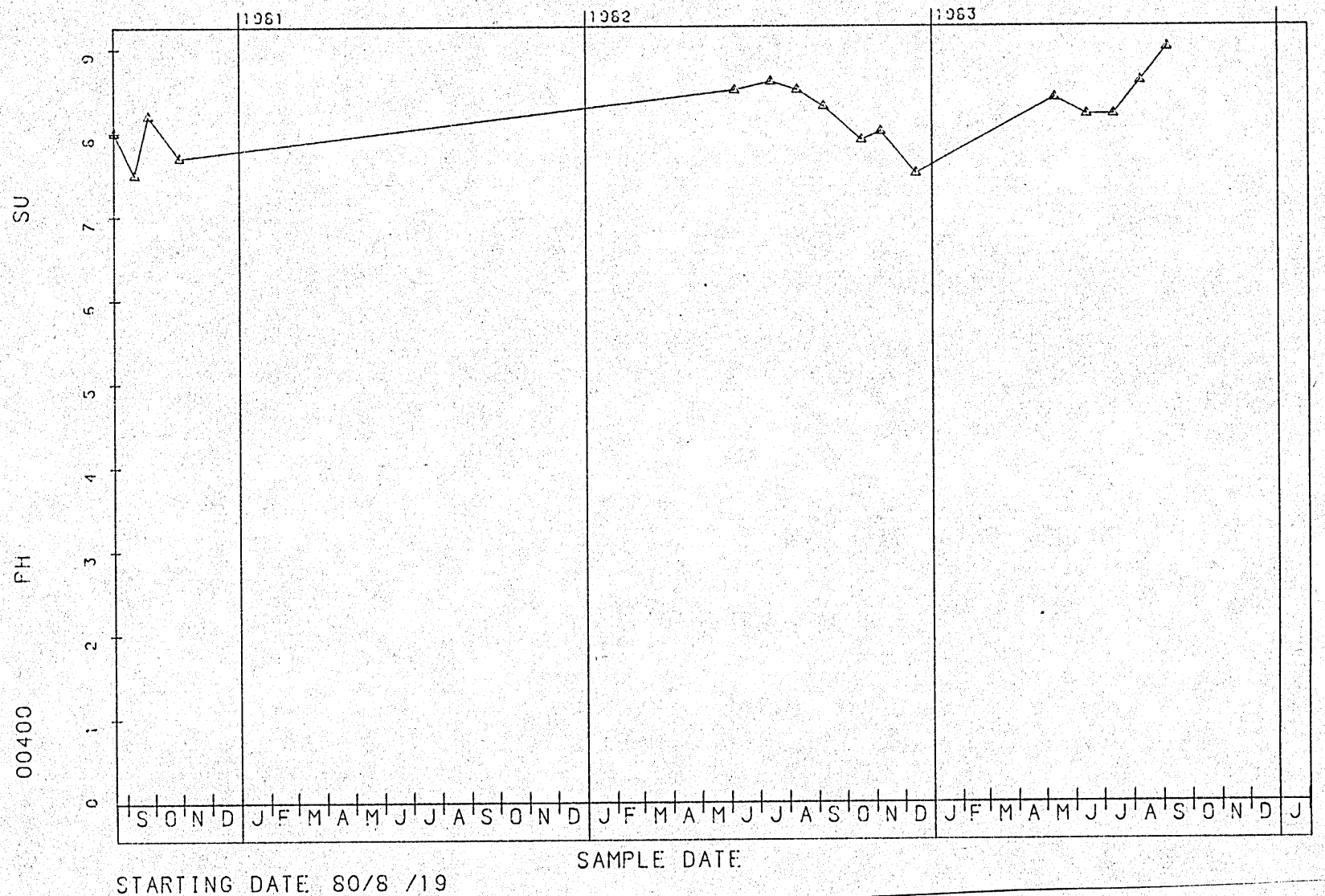
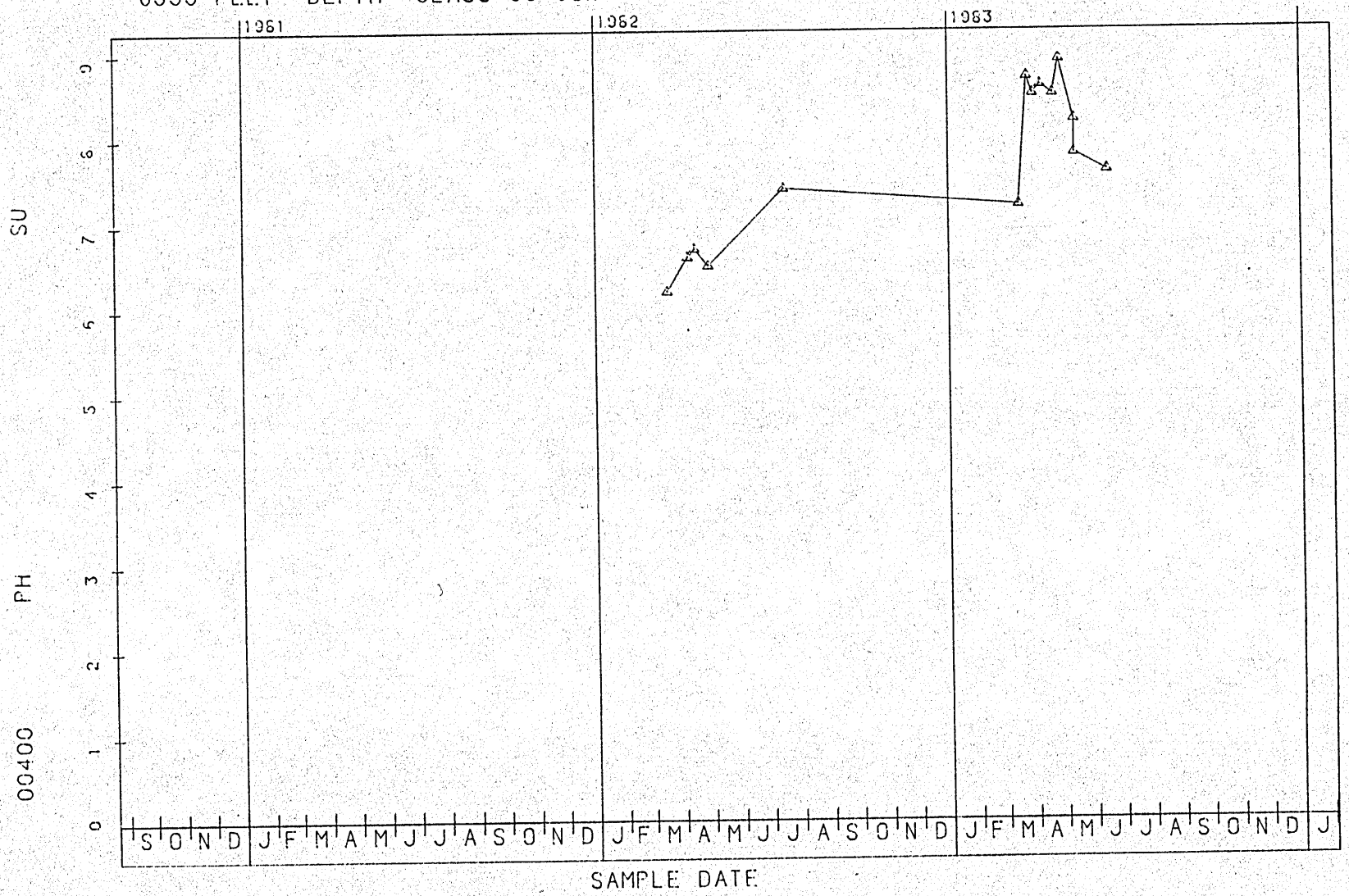


Figure IV-12.


46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843
1981
1982
1983
SU
PH
00400
0 1 2 3 4 5 6 7 8 9
S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J
SAMPLE DATE
STARTING DATE 80/8 /19

46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

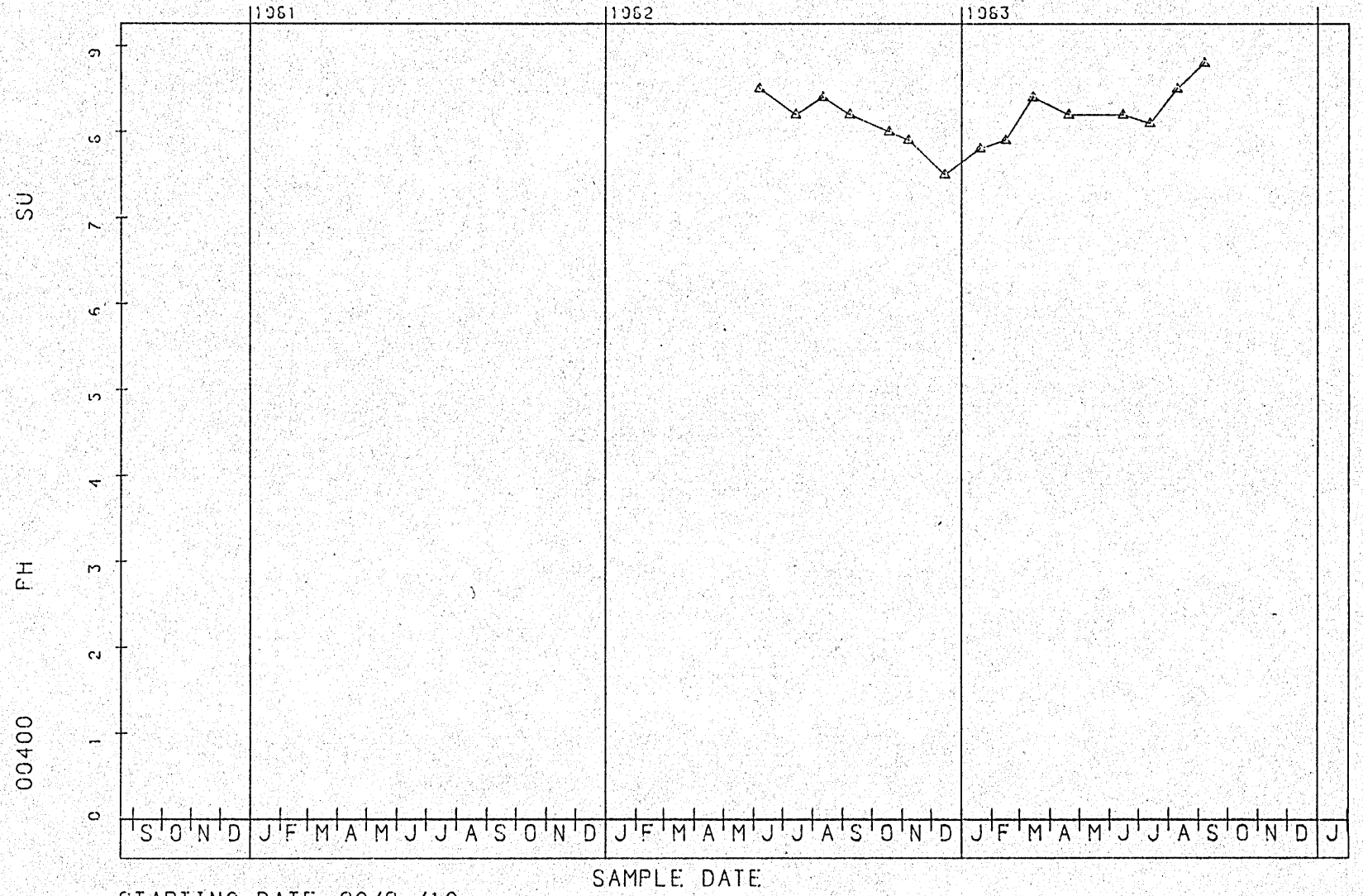
Figure IV-13.



STARTING DATE 80/8 /19

46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

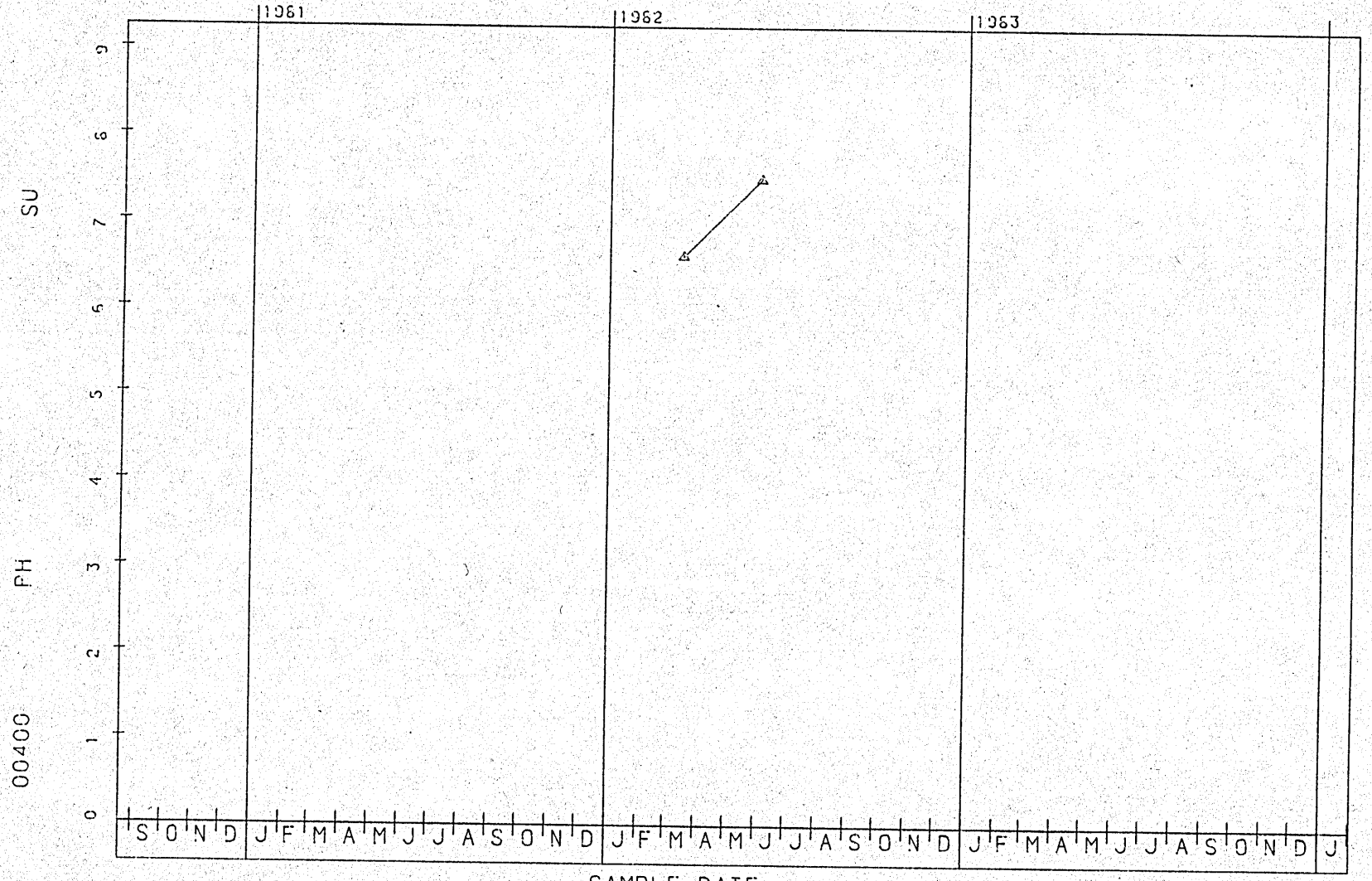
Figure IV-14.



STARTING DATE 80/8 /19

Figure IV-15.

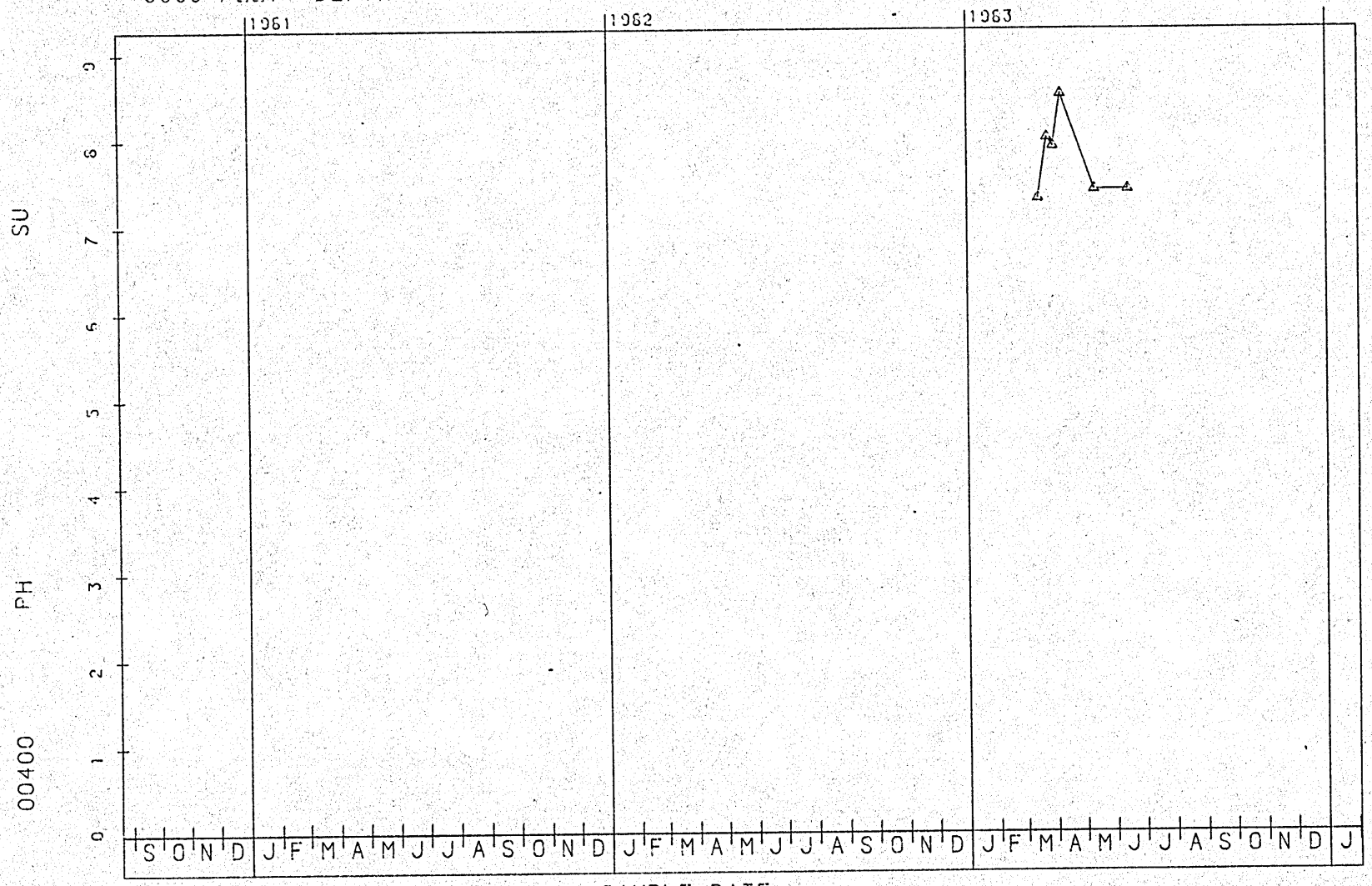
46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846



STARTING DATE 80/8 /19

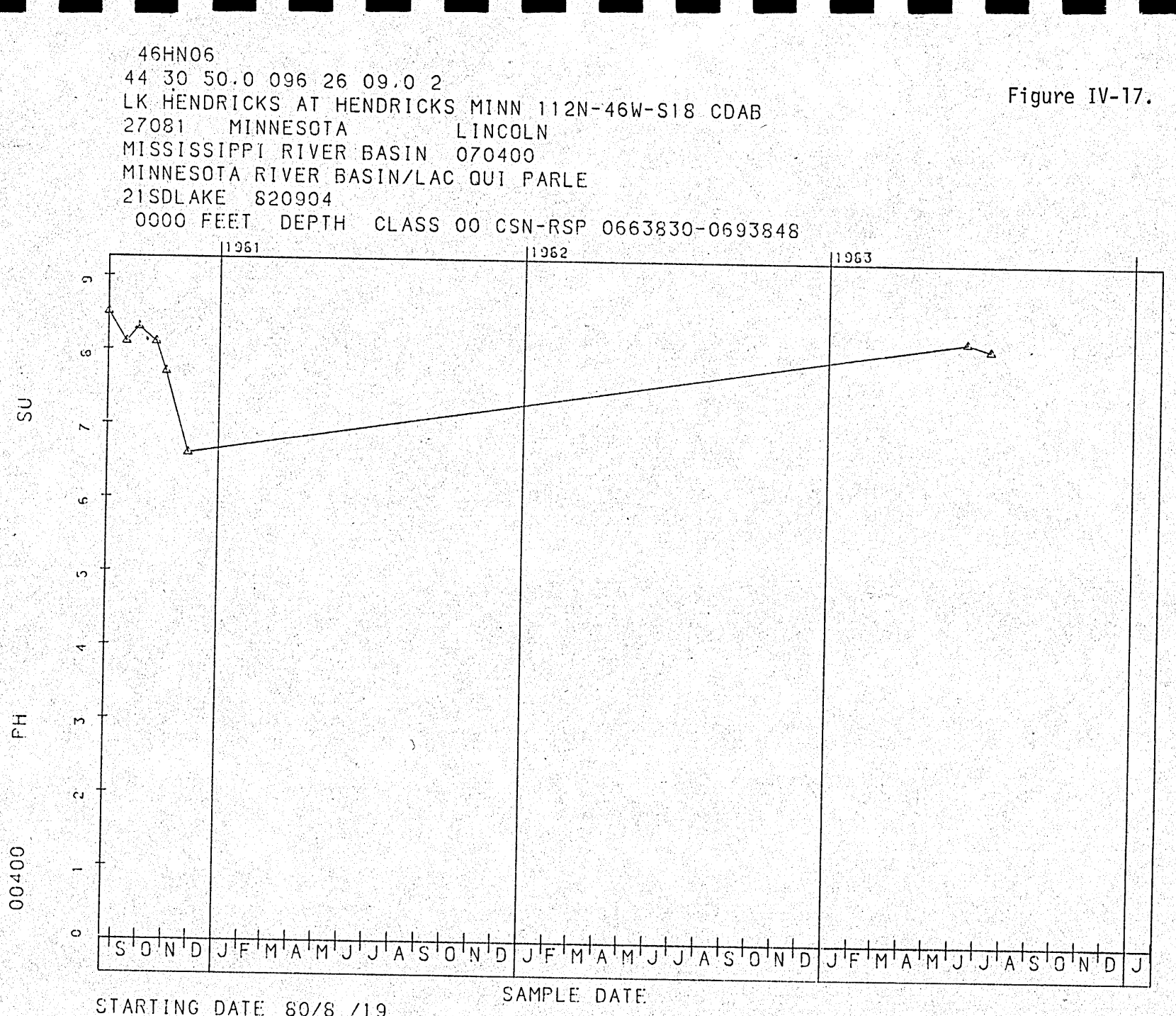
46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

Figure IV-16.



STARTING DATE 80/8 /19

Figure IV-17.


46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848
1961
1962
1963
00400 PH SU
0 1 2 3 4 5 6 7 8 9
S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J
SAMPLE DATE
STARTING DATE 80/8 /19

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

Figure IV-18.

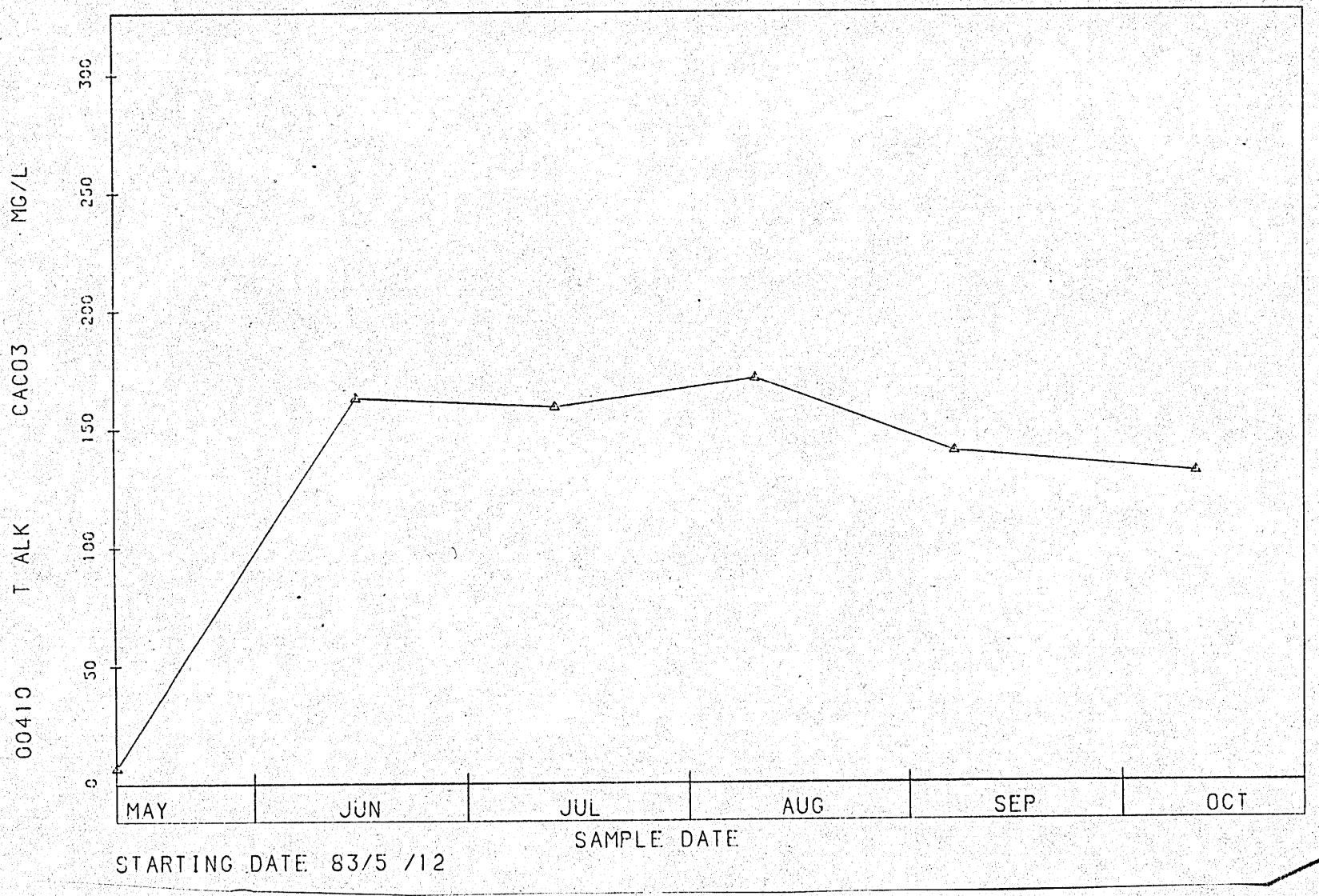
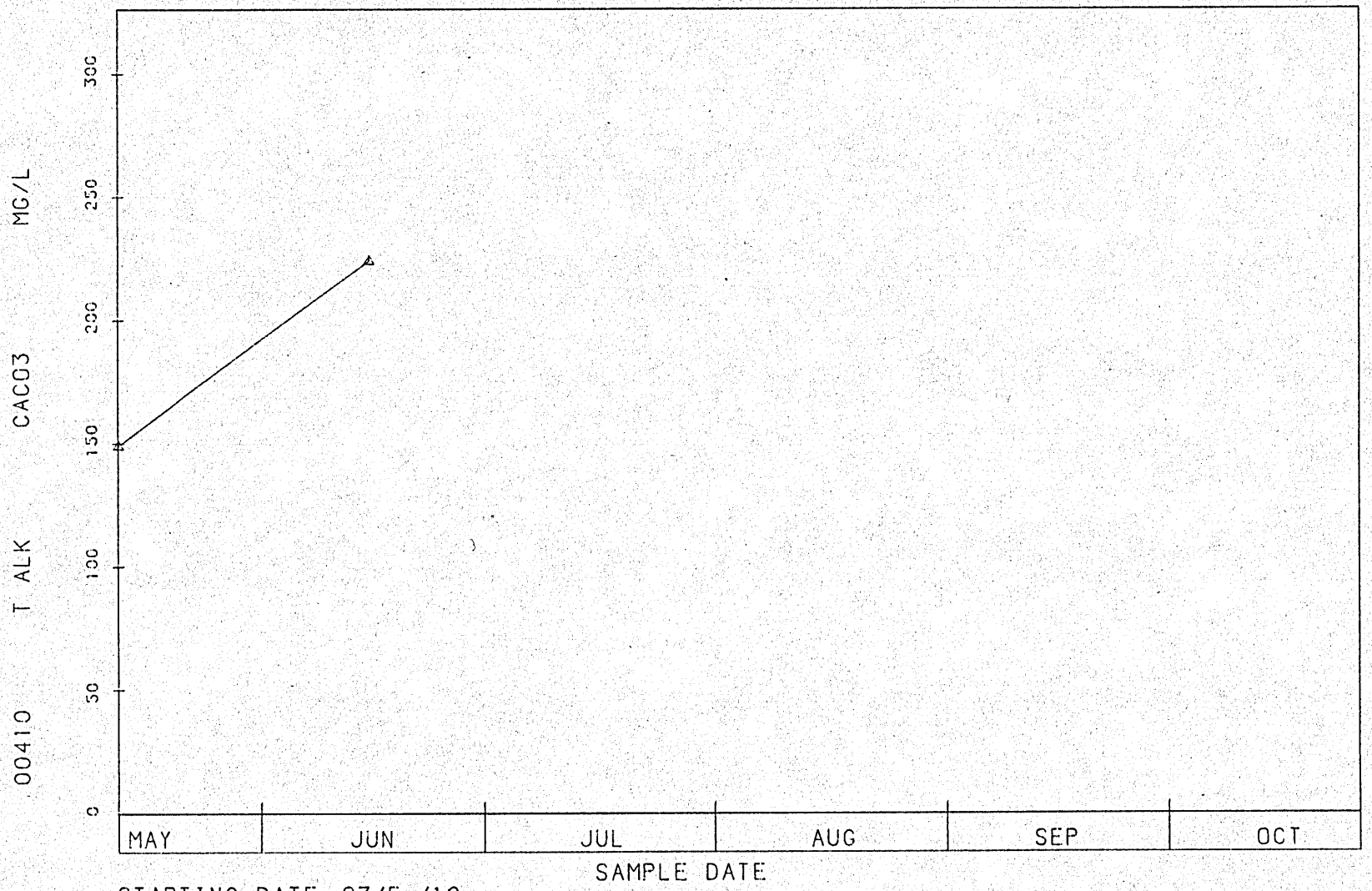


Figure IV-19.

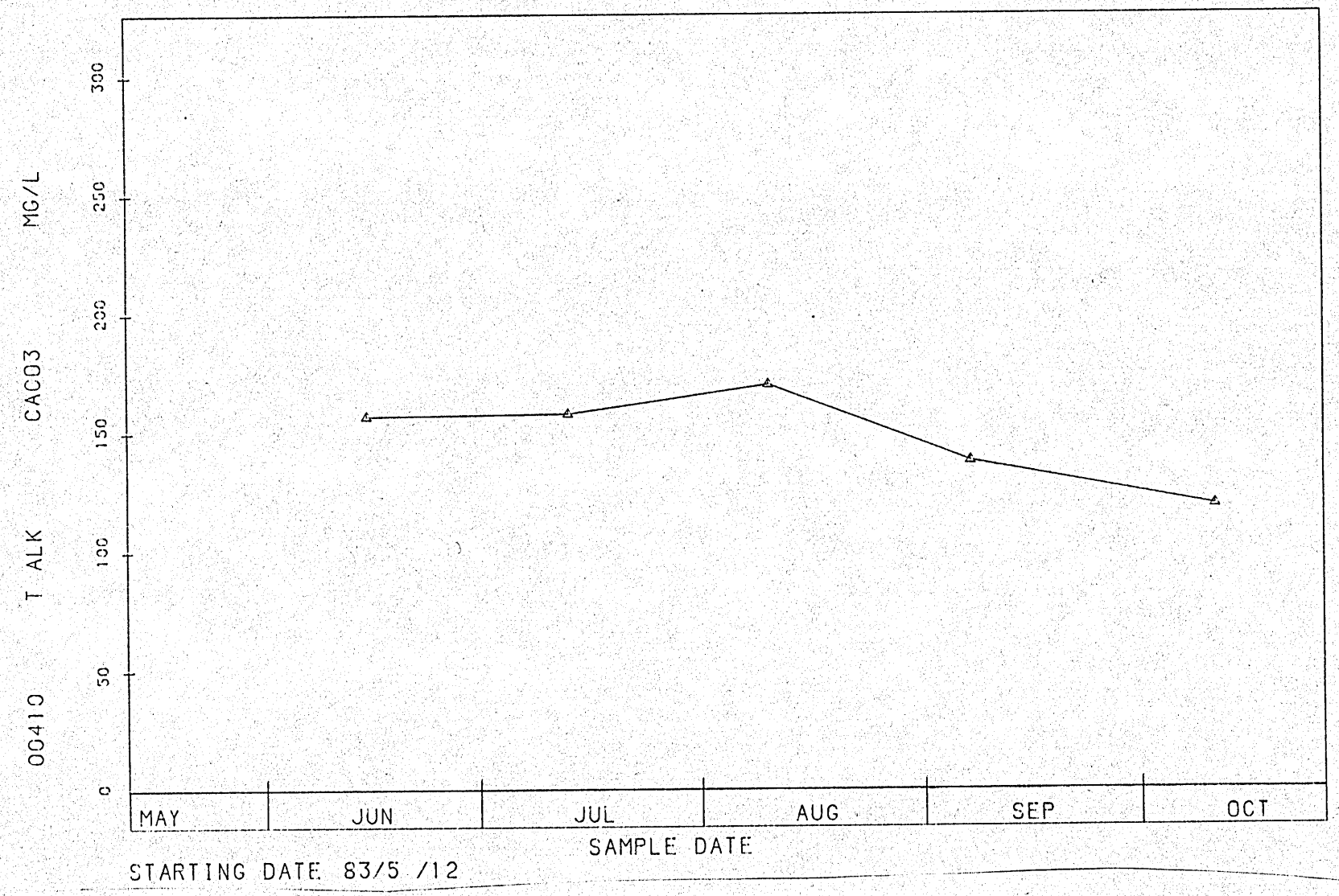
46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844



STARTING DATE 83/5 /12

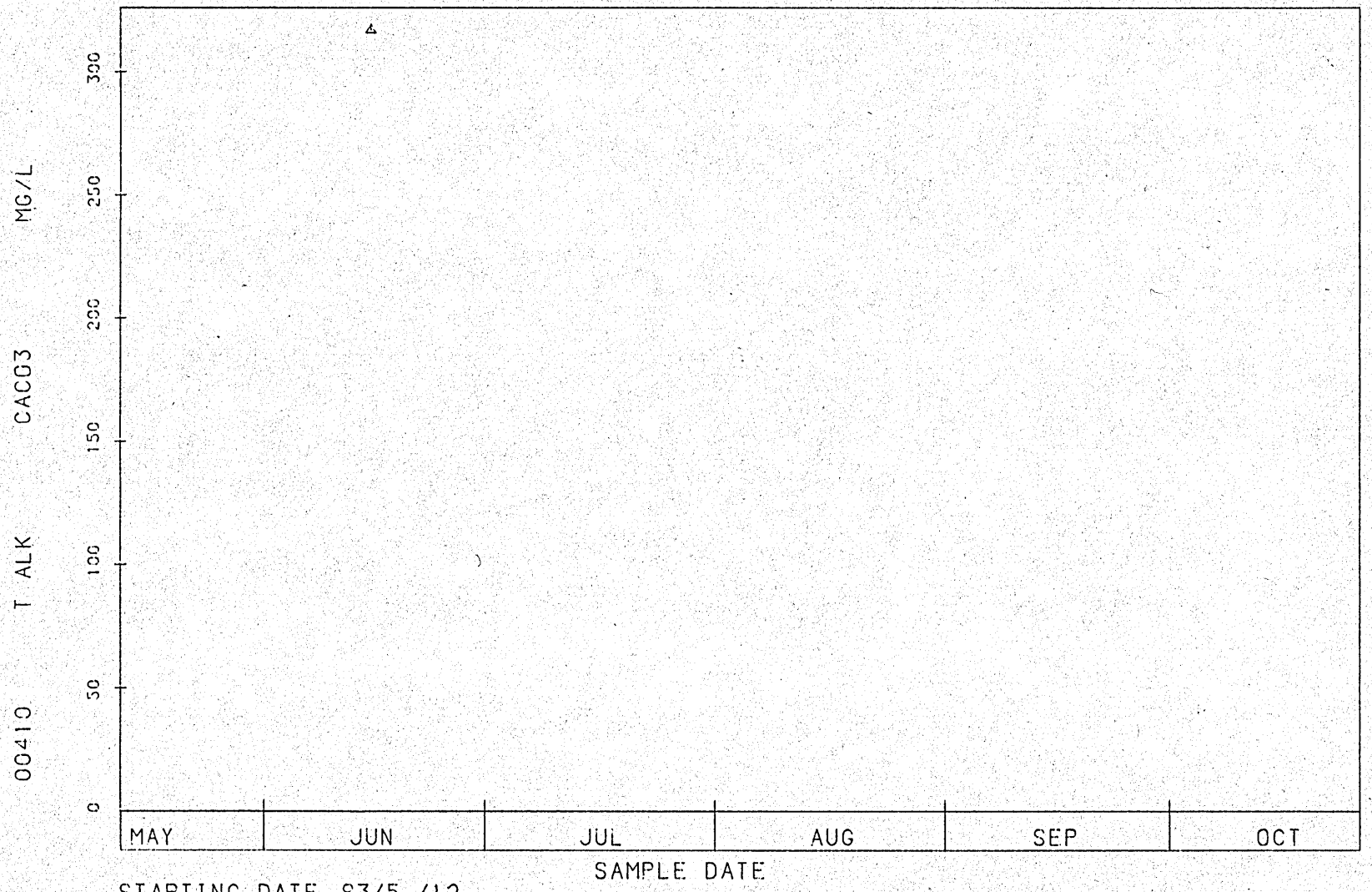
STORET
46HNO3
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

Figure IV-20.



STORET
46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

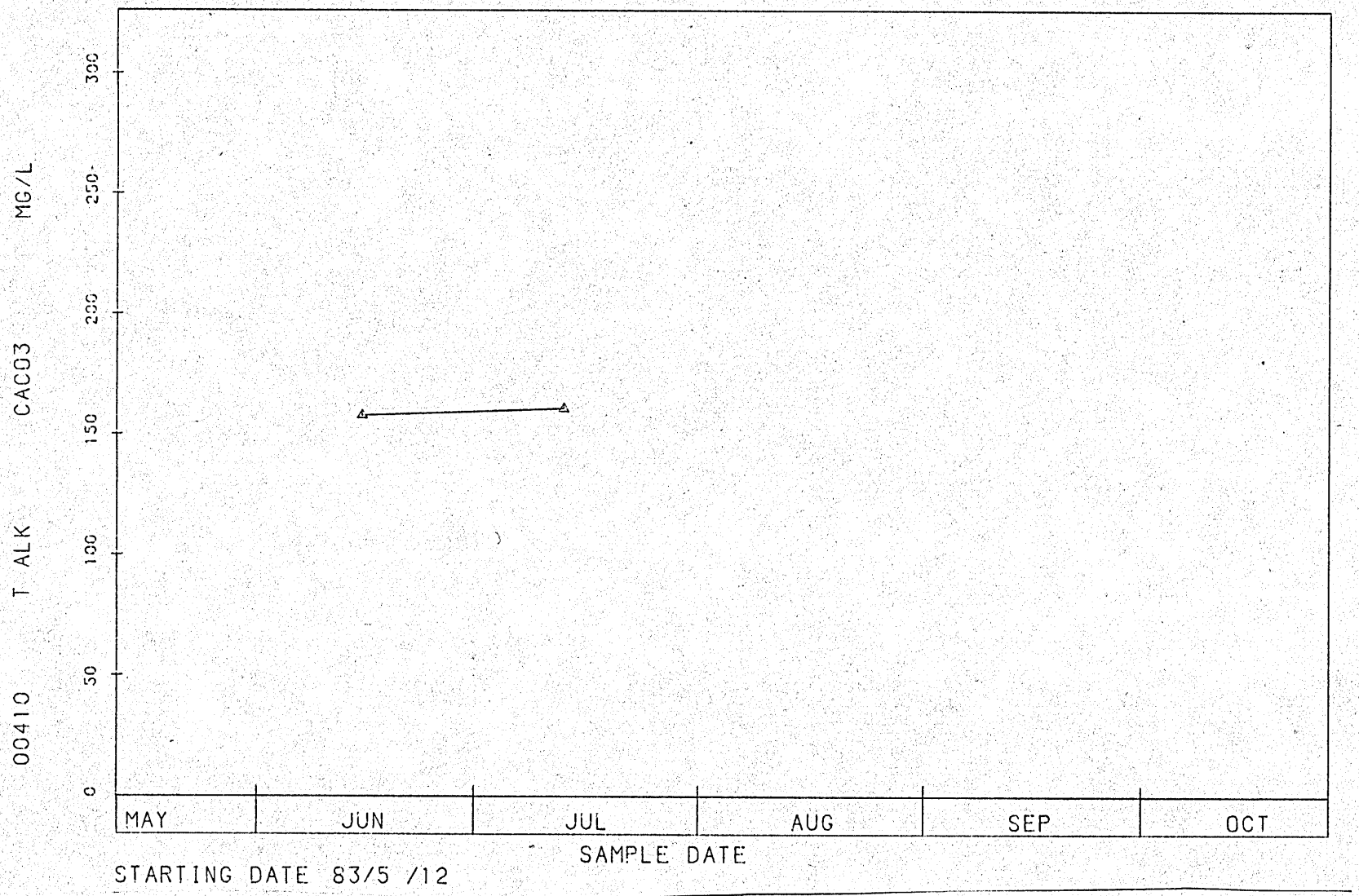
Figure IV-21.



STARTING DATE 83/5 /12

STORET
46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

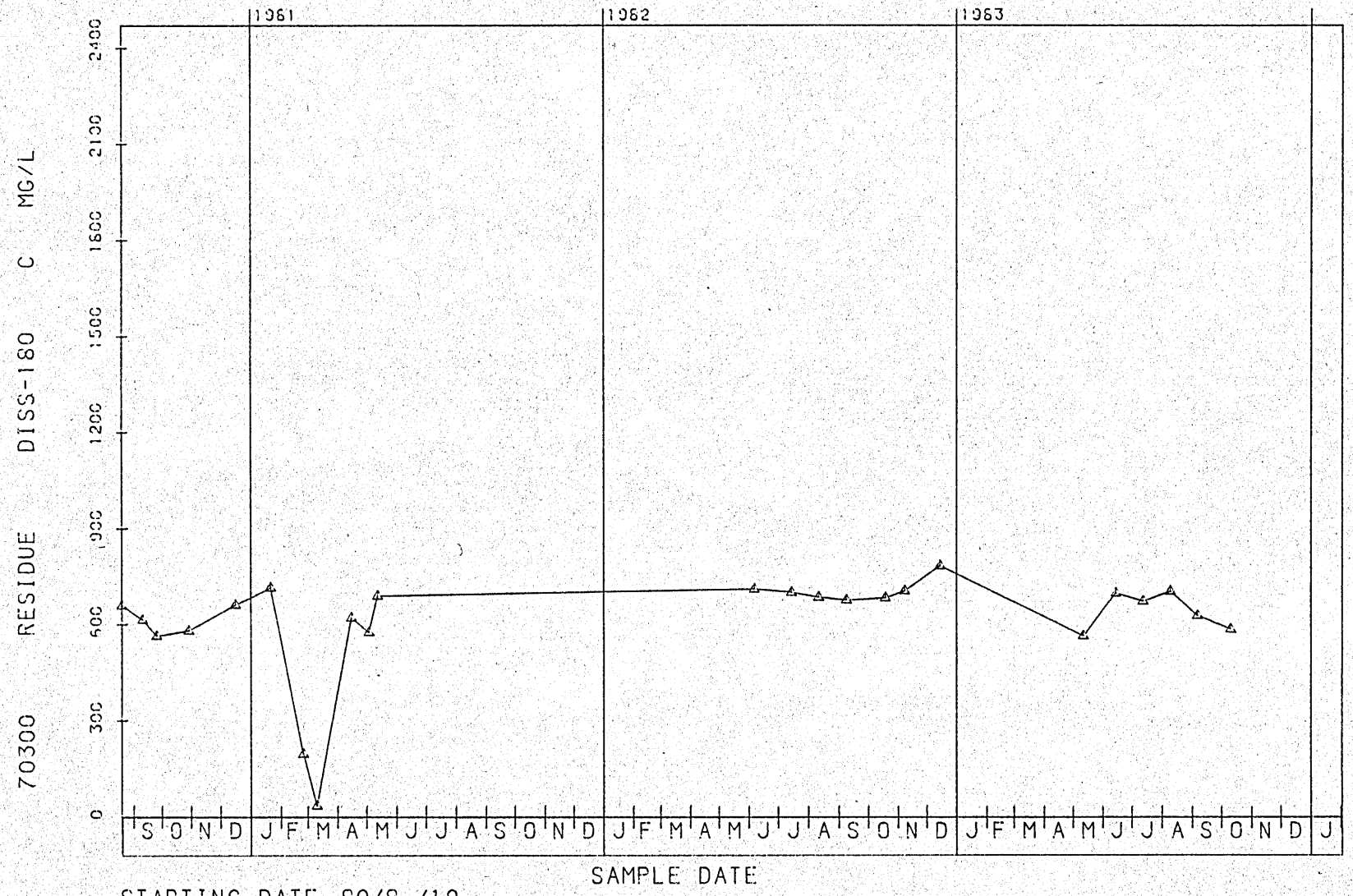
Figure IV-22.



STARTING DATE 83/5 /12

STORET
46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

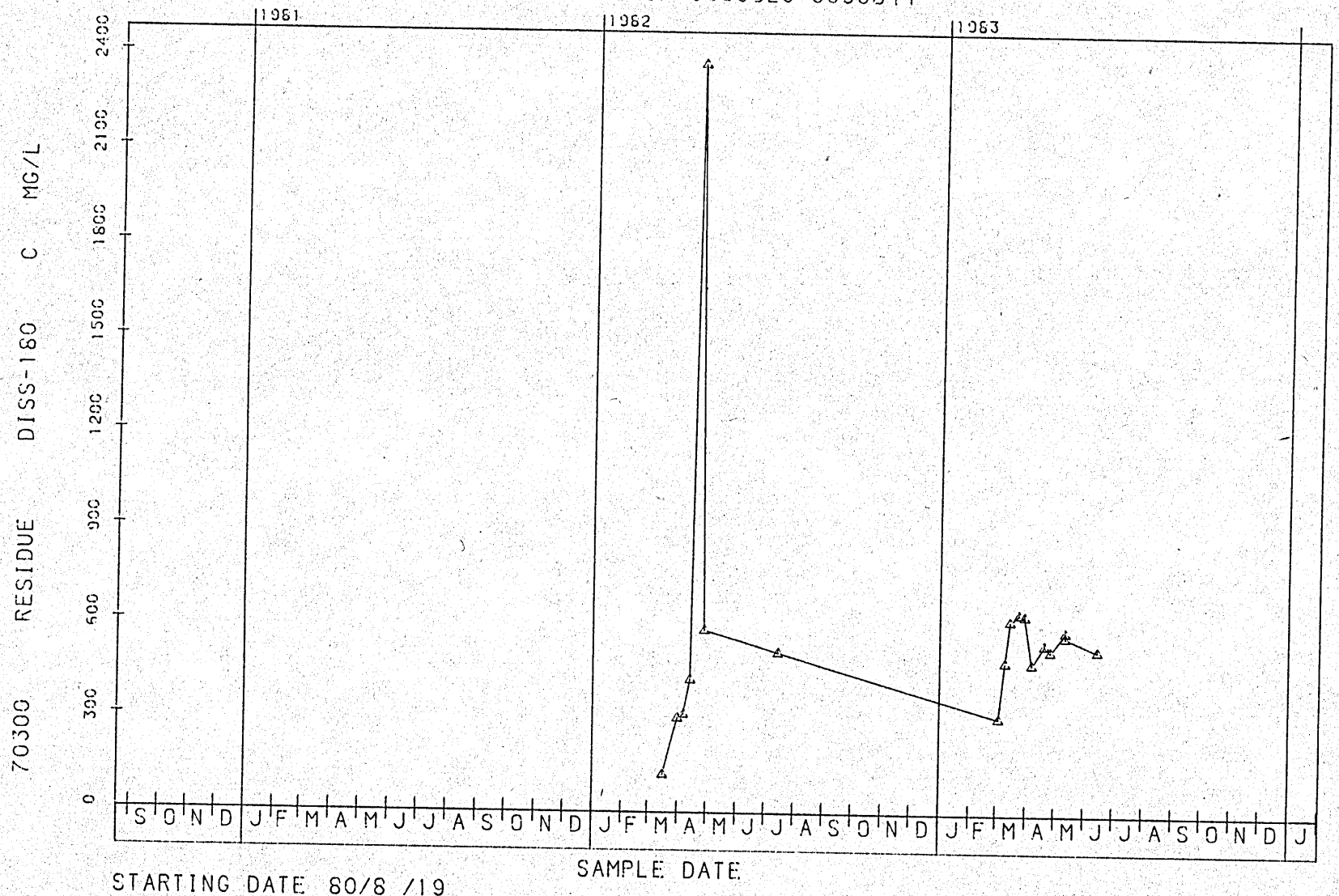
Figure IV-23.



STARTING DATE 80/8 /19

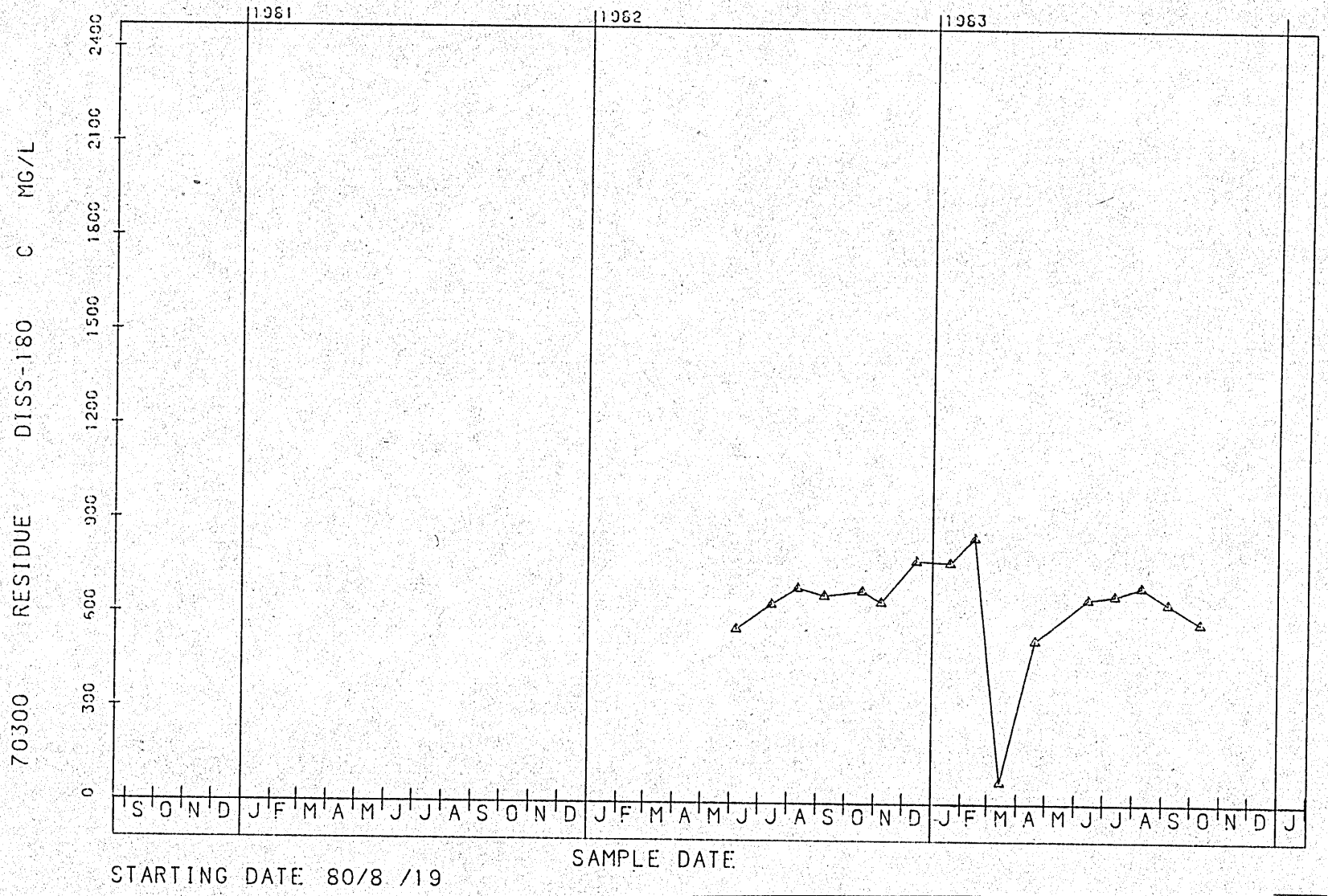
STORET
46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

Figure IV-24.



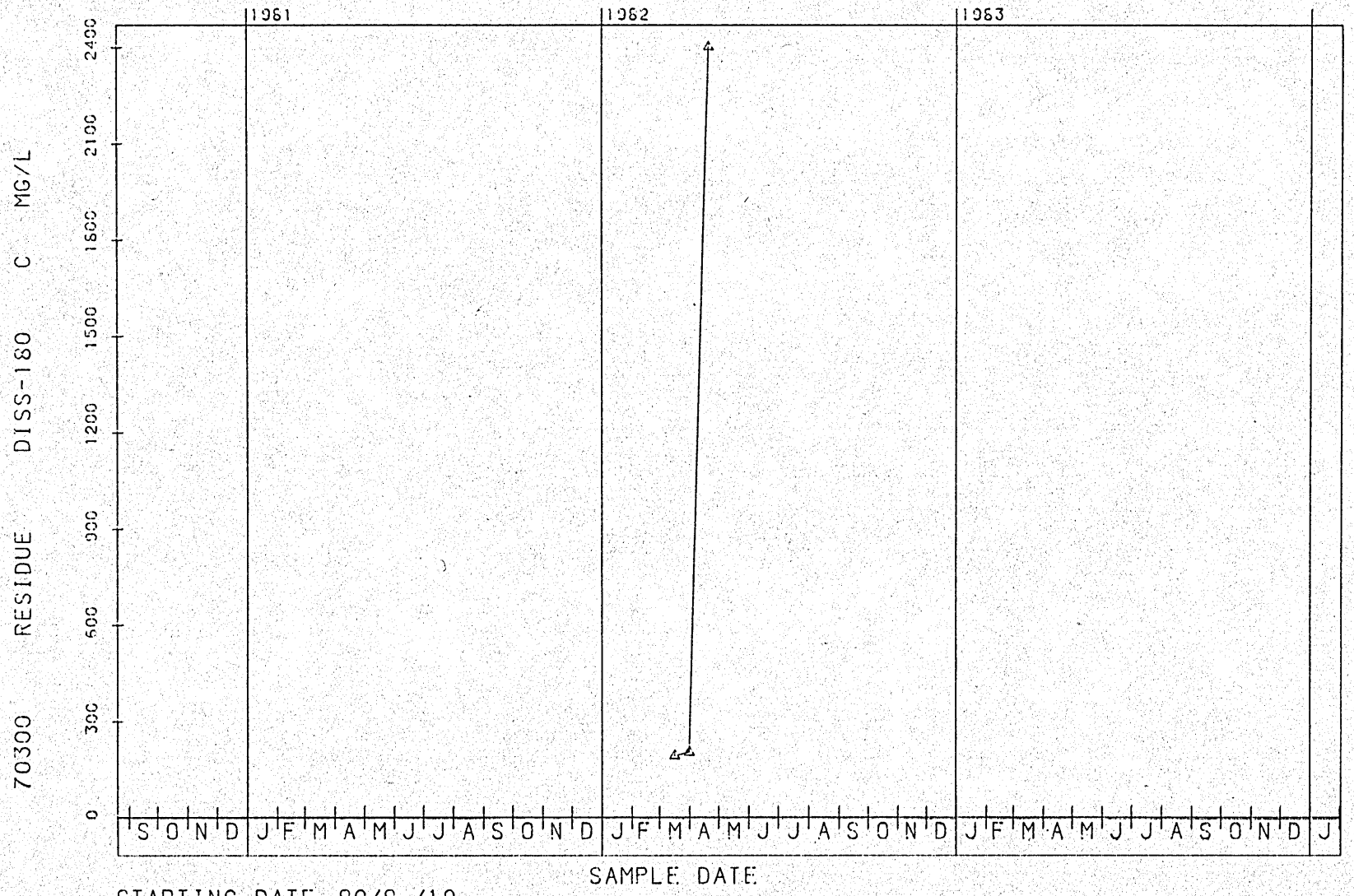
STORET
46HNO3
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

Figure IV-25.



STORET
46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

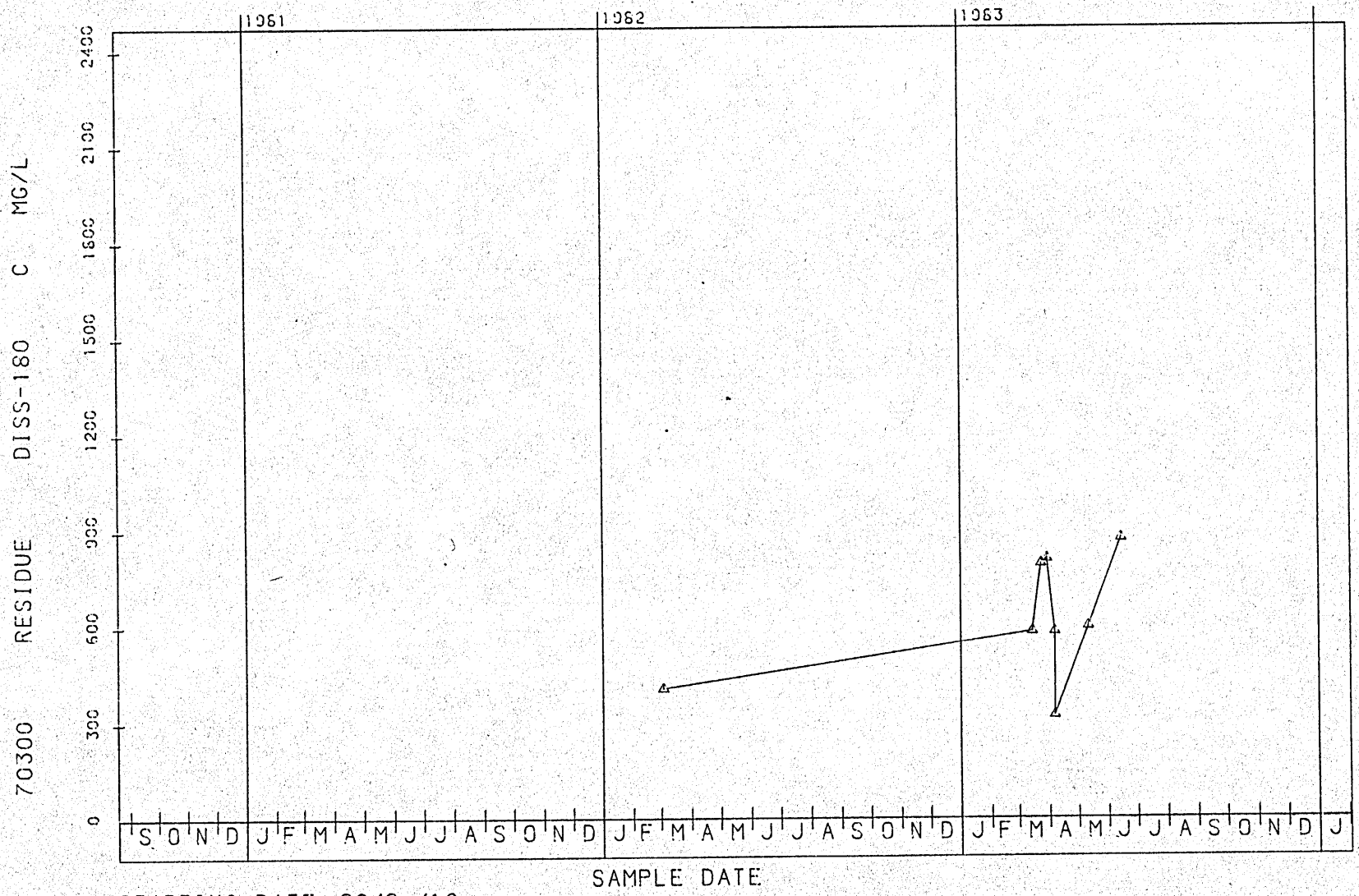
Figure IV-26.



STARTING DATE 80/8 /19

Figure IV-27.

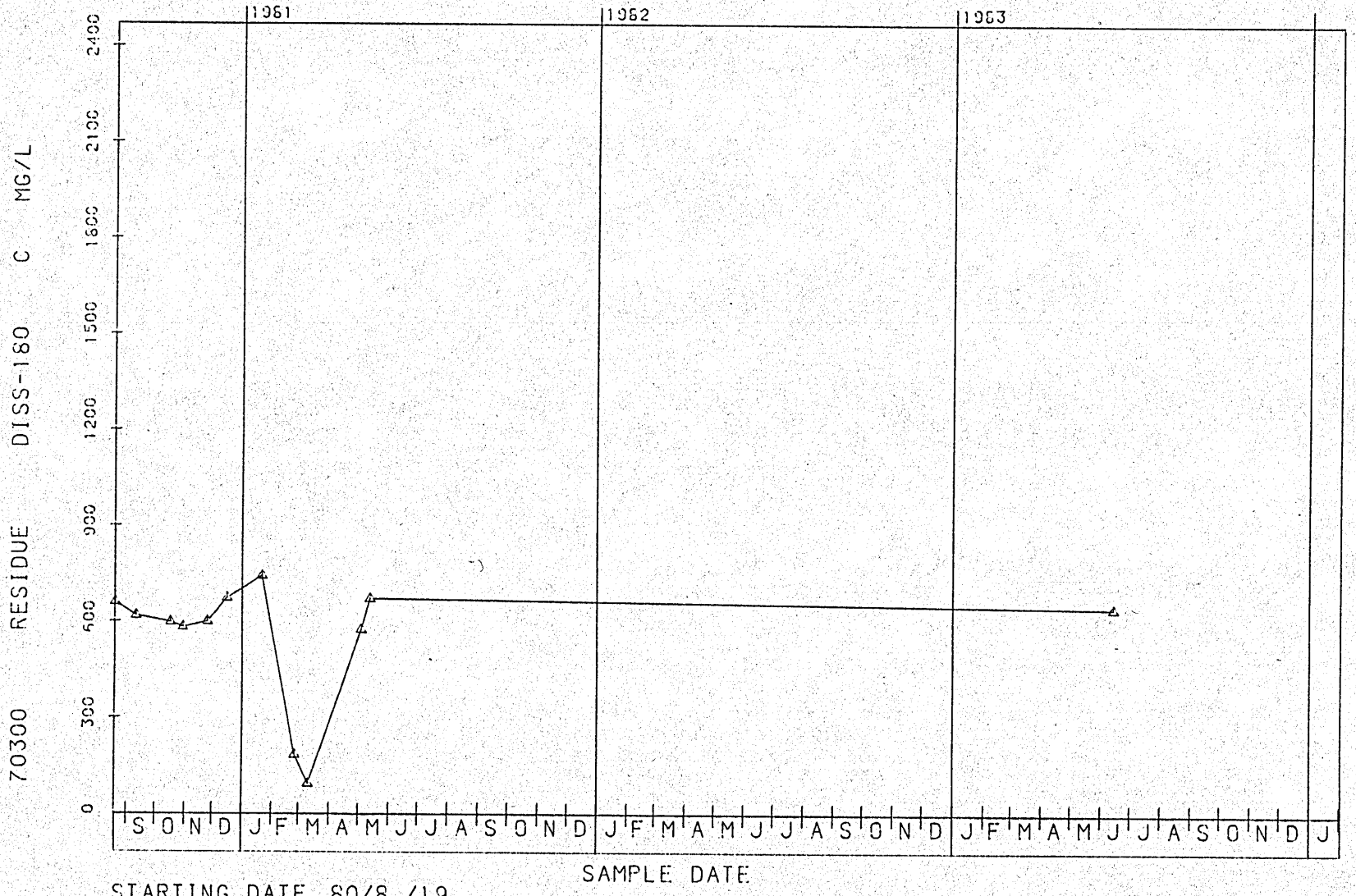
STORET
46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847



STARTING DATE 80/8 /19

STORET
46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

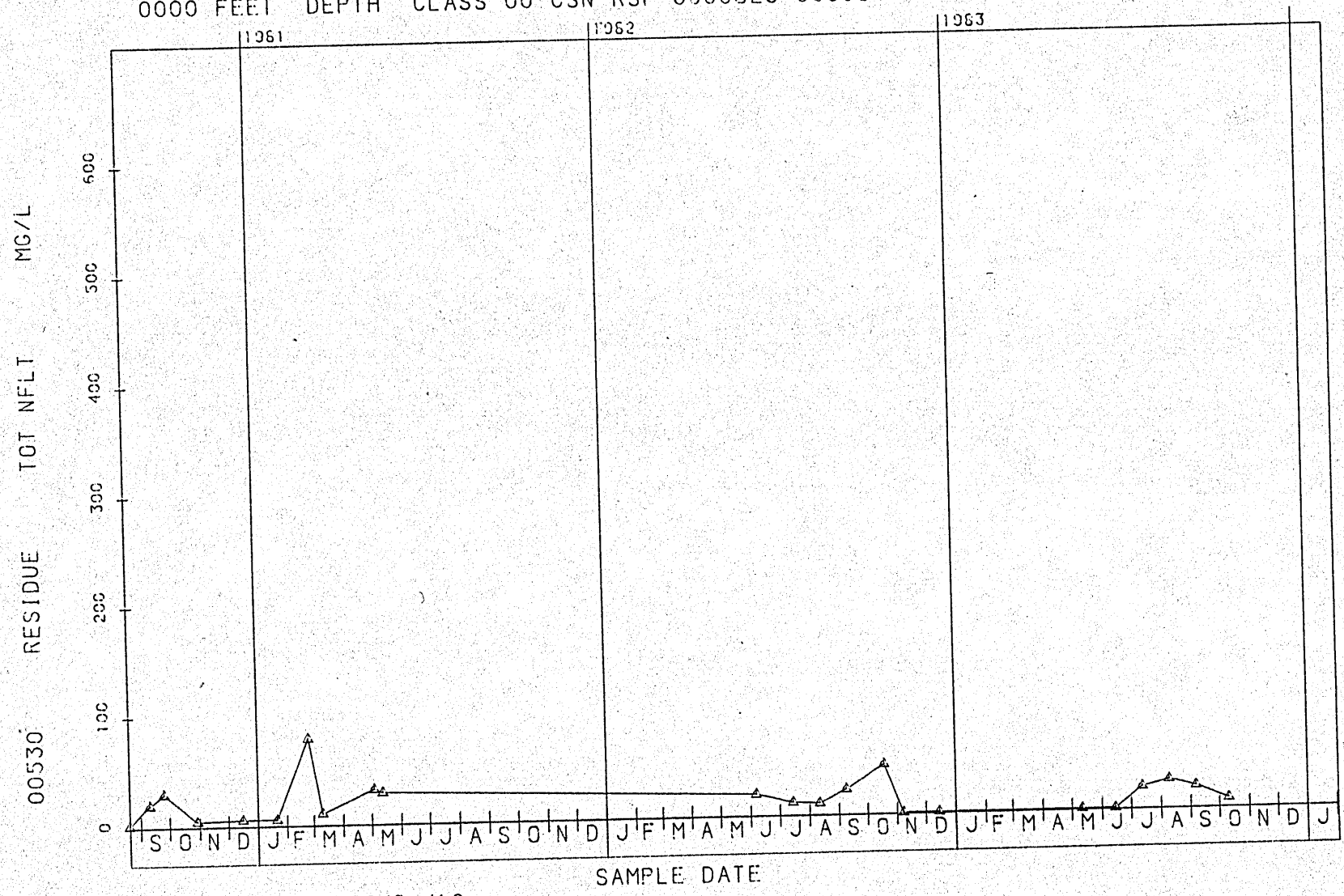
Figure IV-28.



STARTING DATE 80/8 /19

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

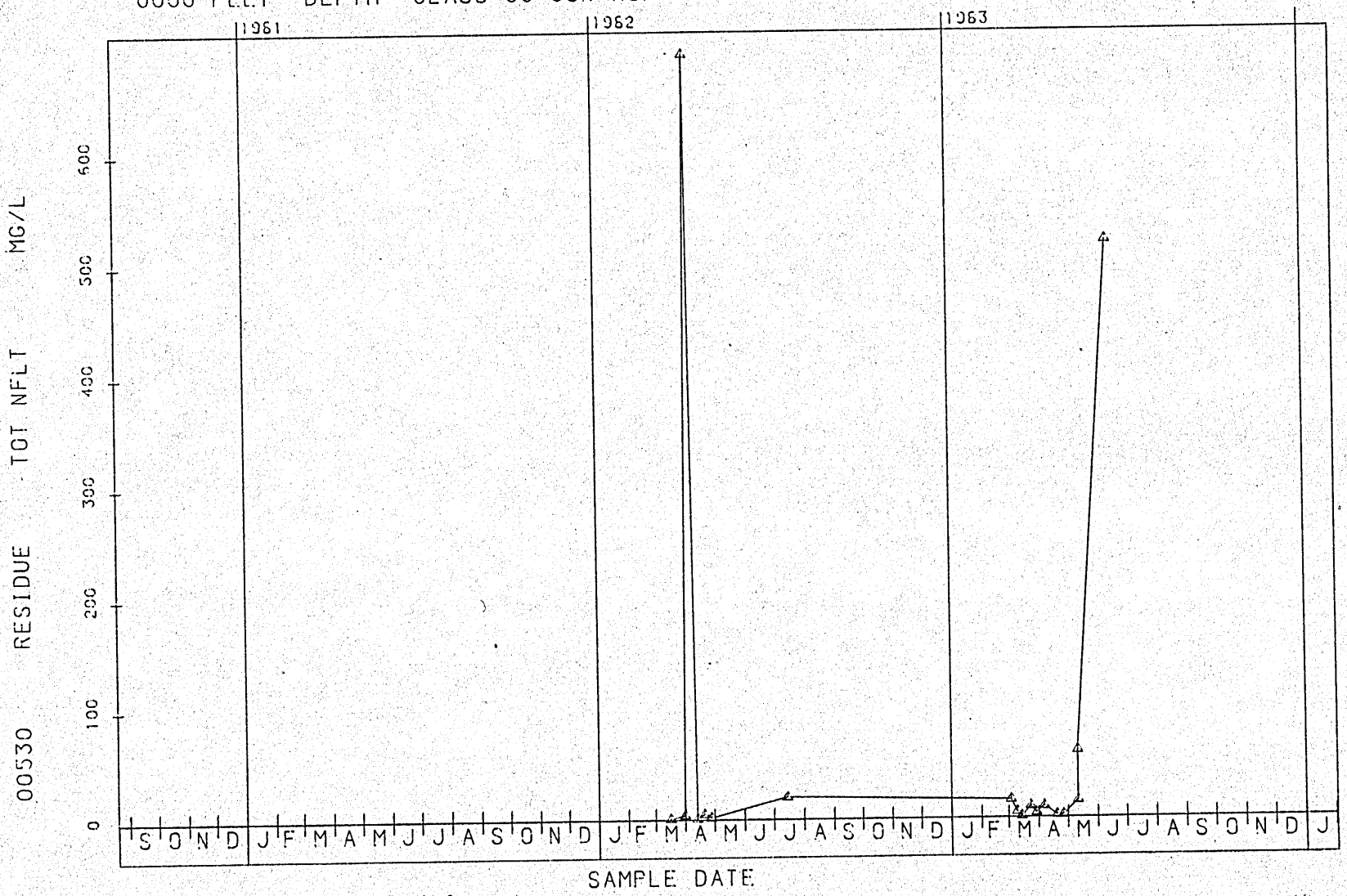
Figure IV-29.



STARTING DATE 80/8 /19

46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

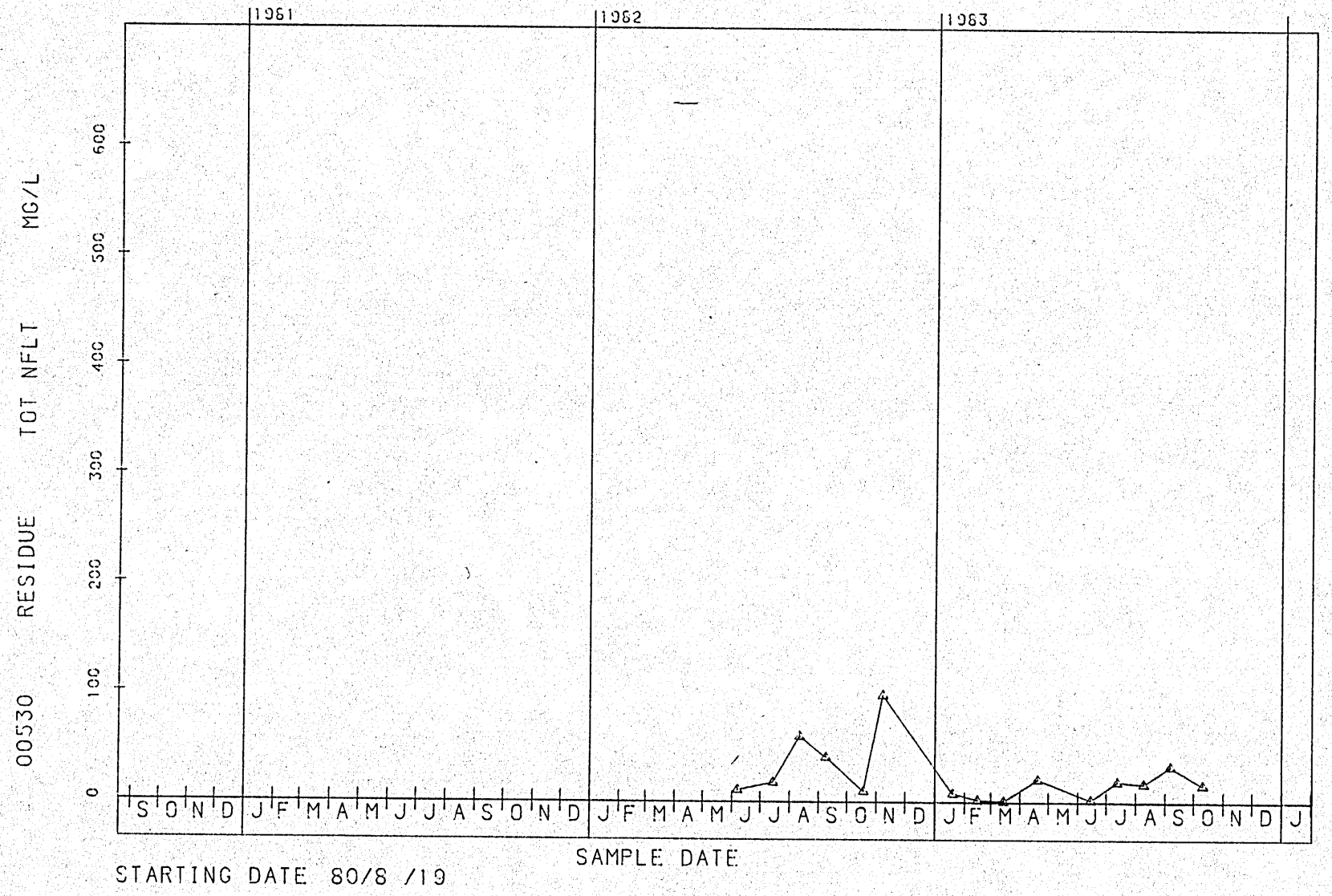
Figure IV-30.



STARTING DATE 80/8 /19

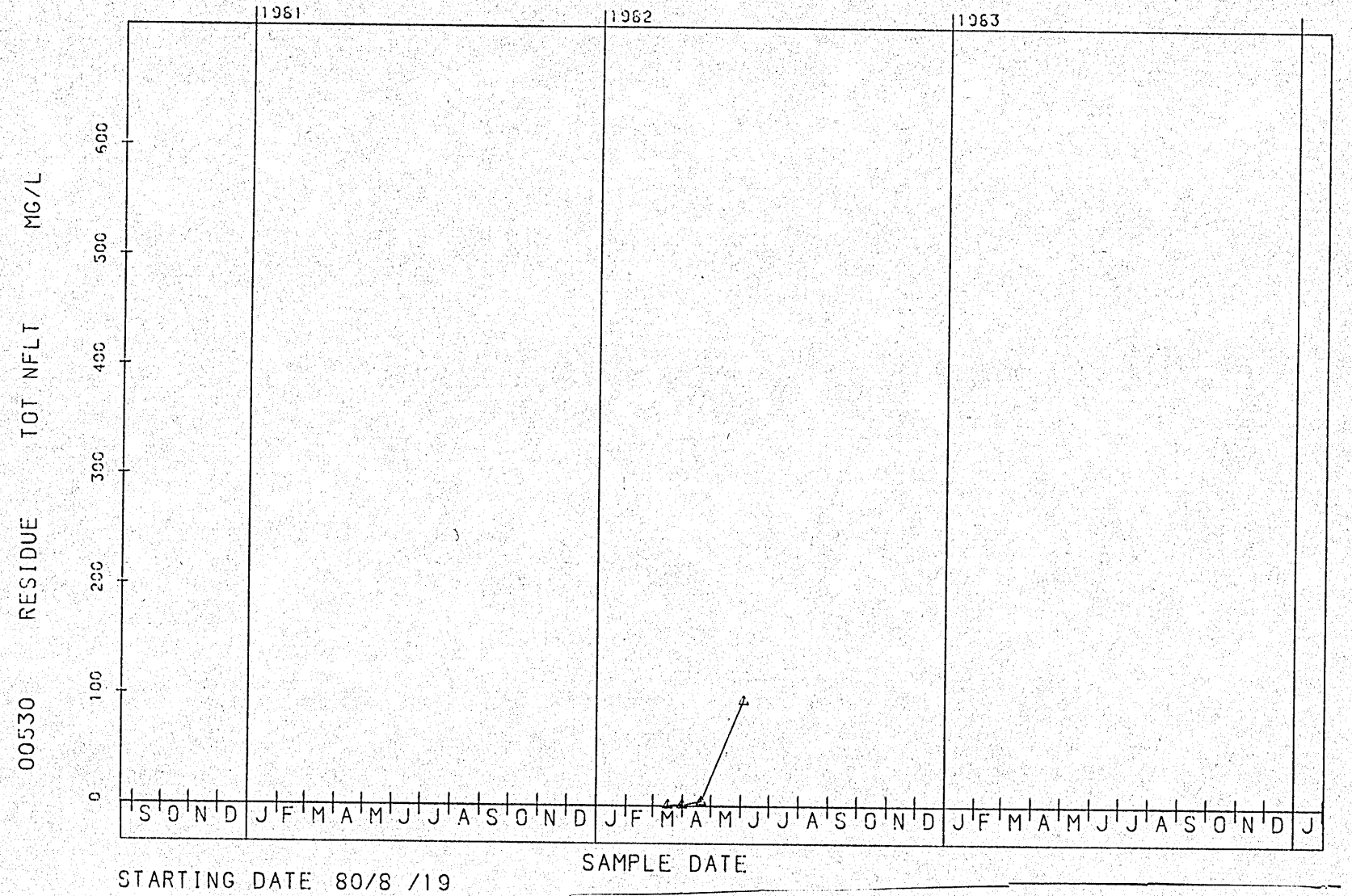
46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

Figure IV-31.



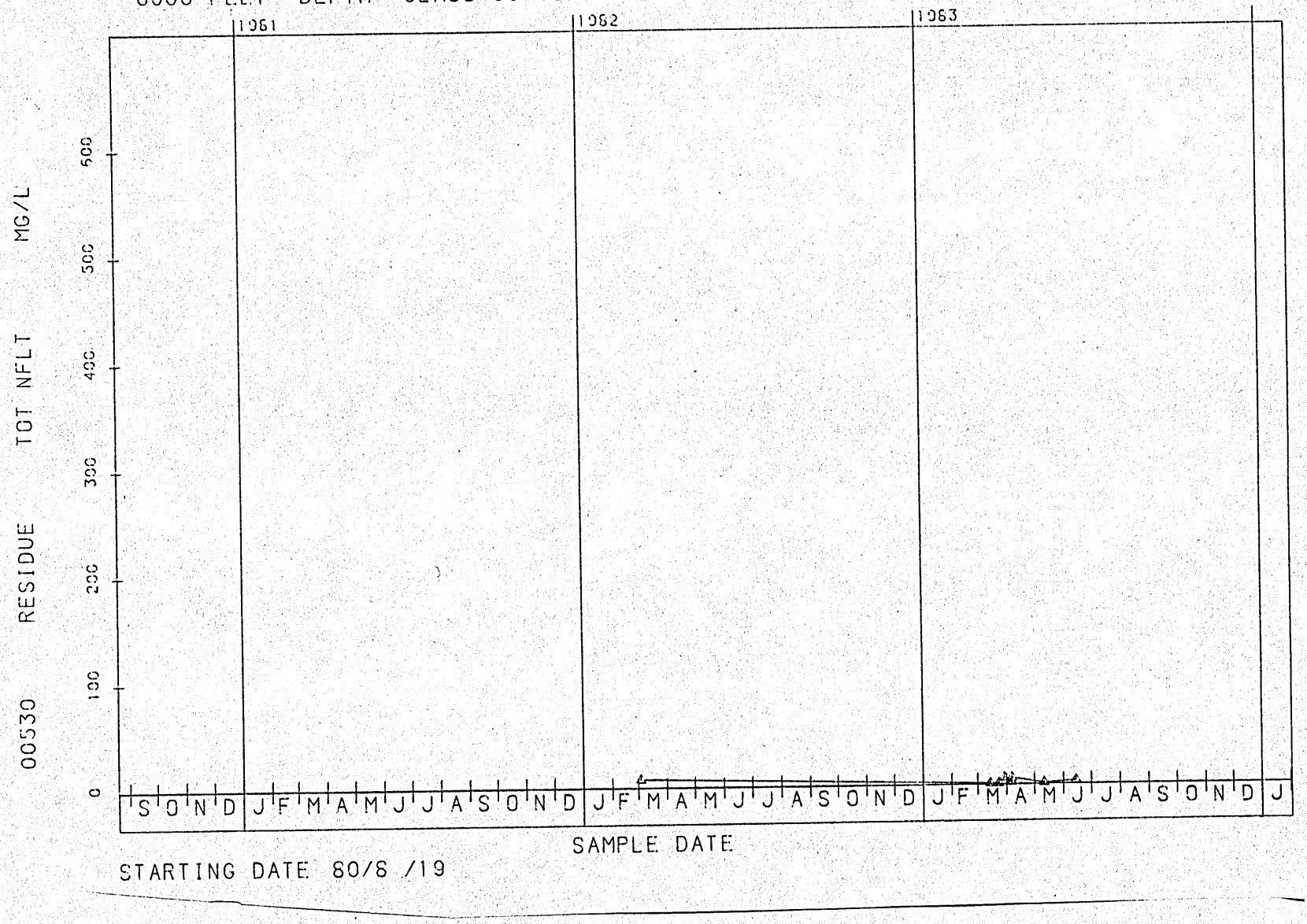
STORET
46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

Figure IV-32.



STORET
46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

Figure IV-33.



STARTING DATE 80/8 /19

STORET
46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

Figure IV-34.

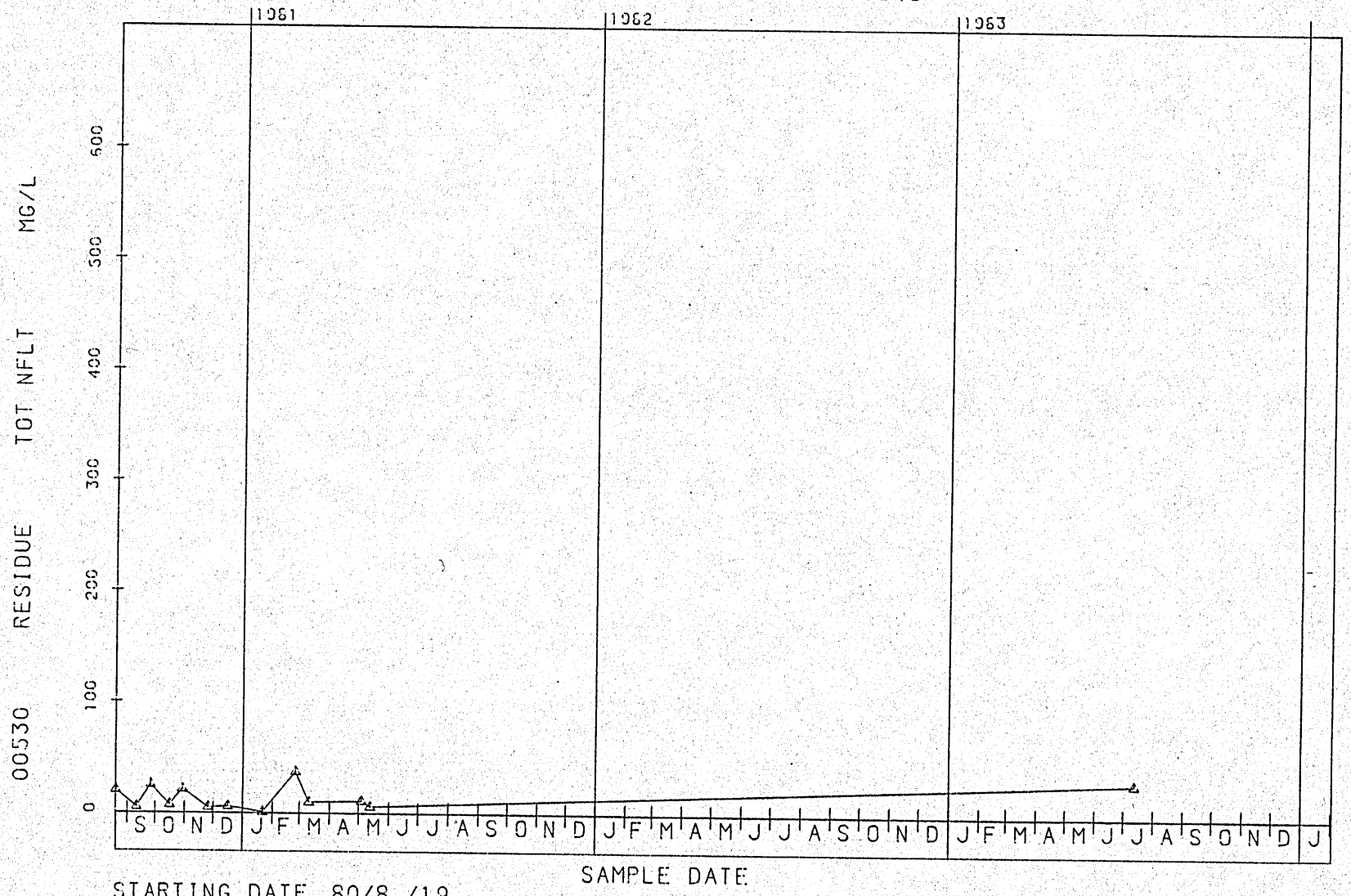
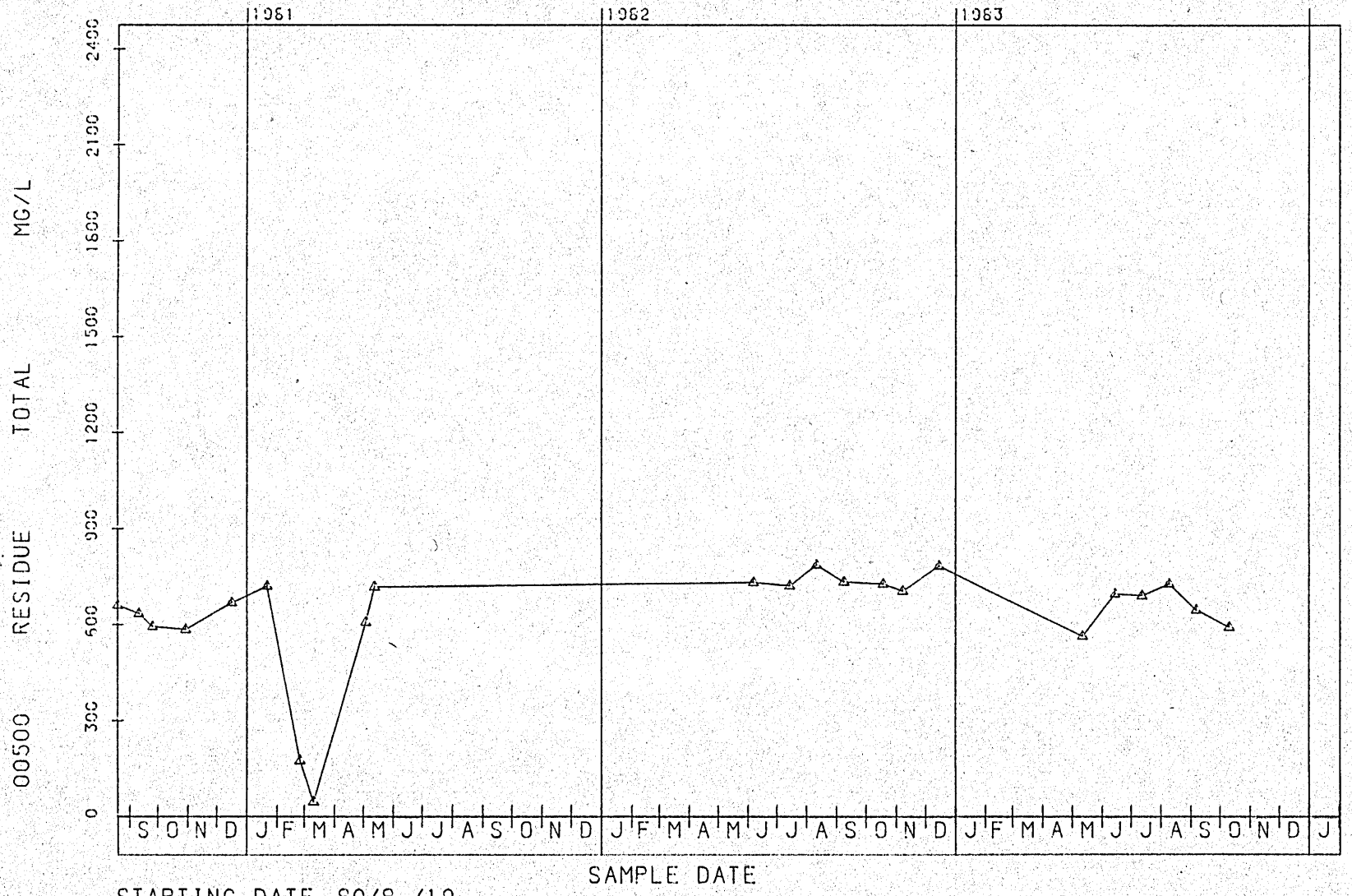


Figure IV-35.

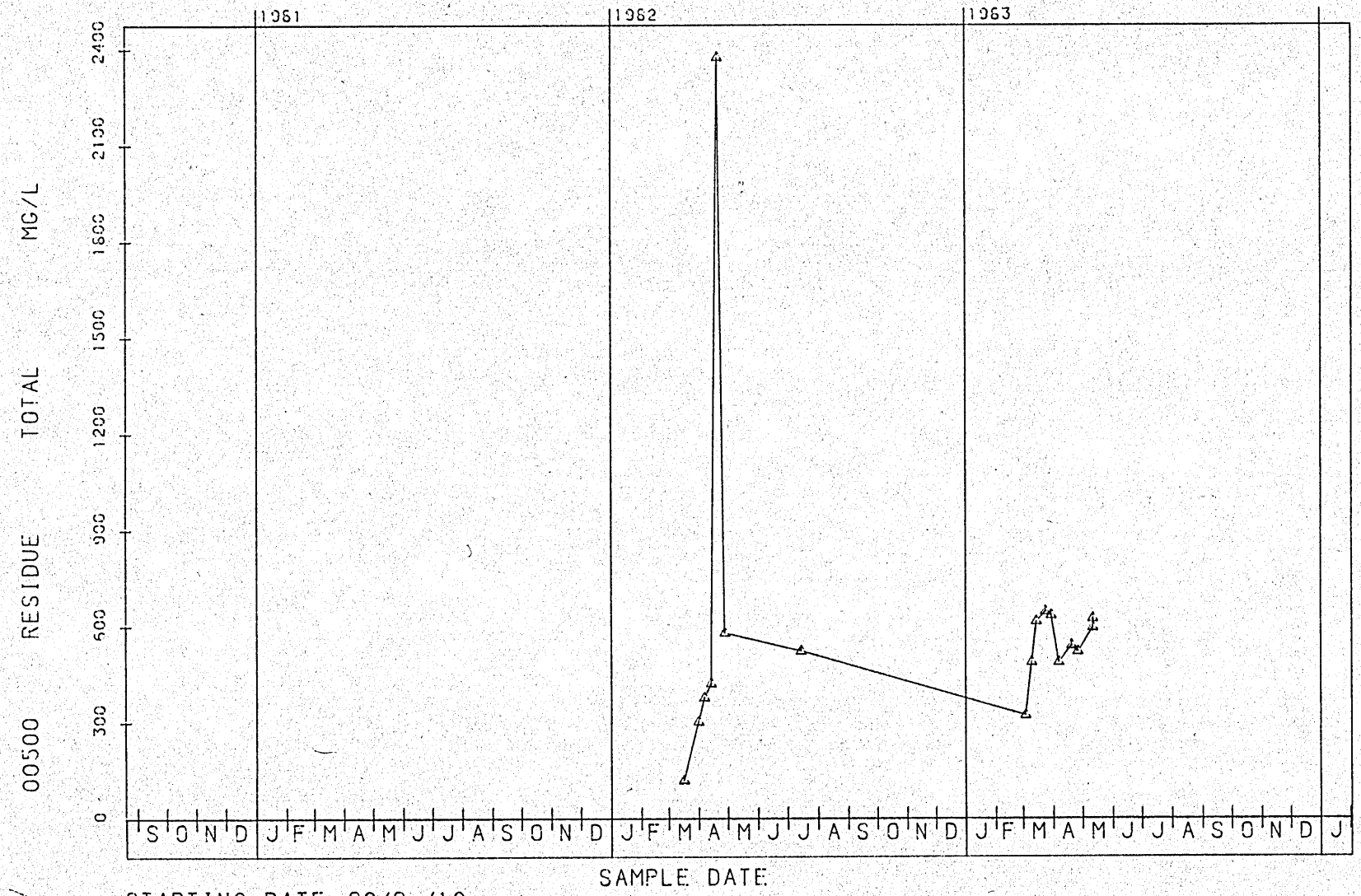
STORET
46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843



STARTING DATE 80/8 /19

STORET
46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

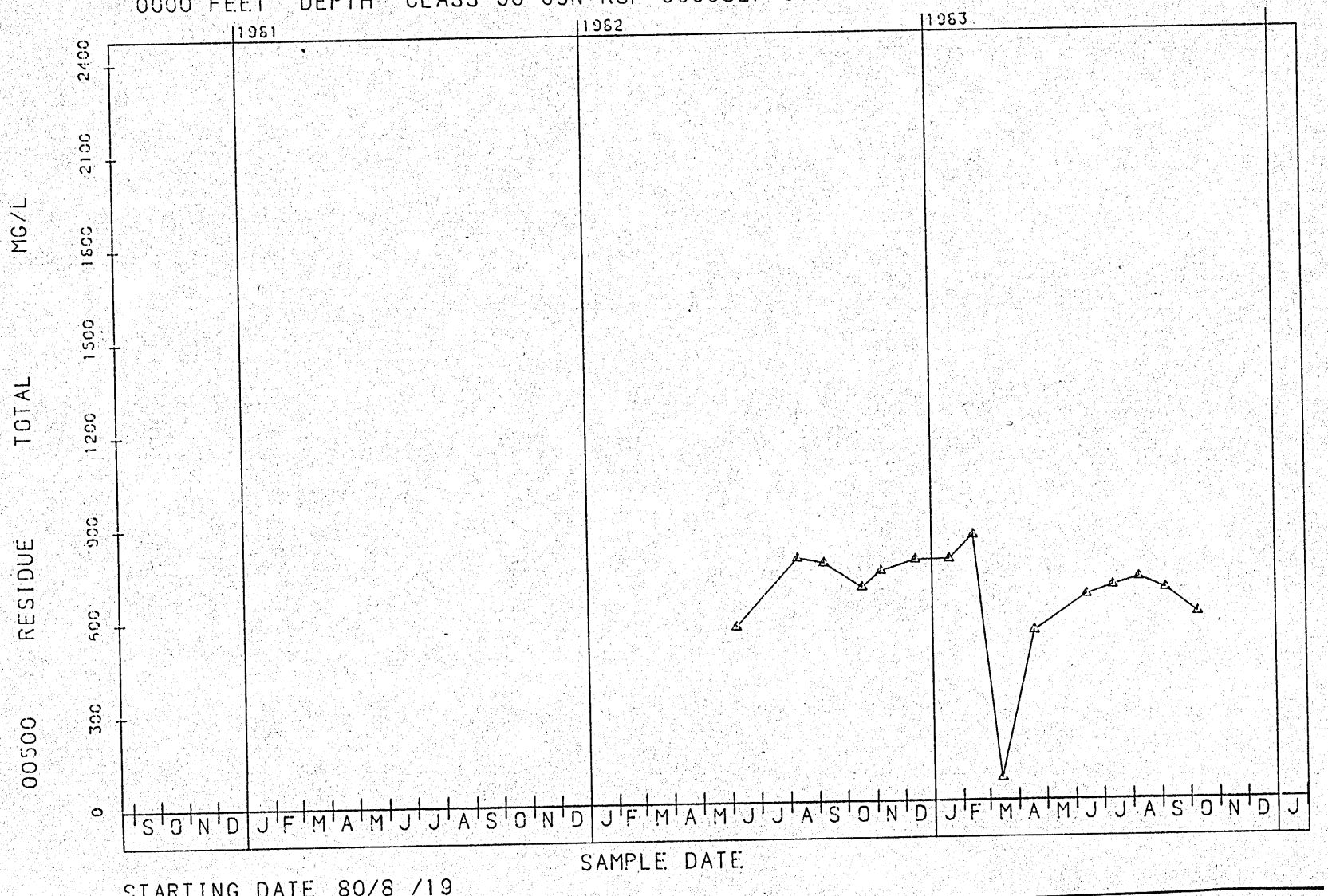
Figure IV-36.



STARTING DATE 80/8 /19

STORET
46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

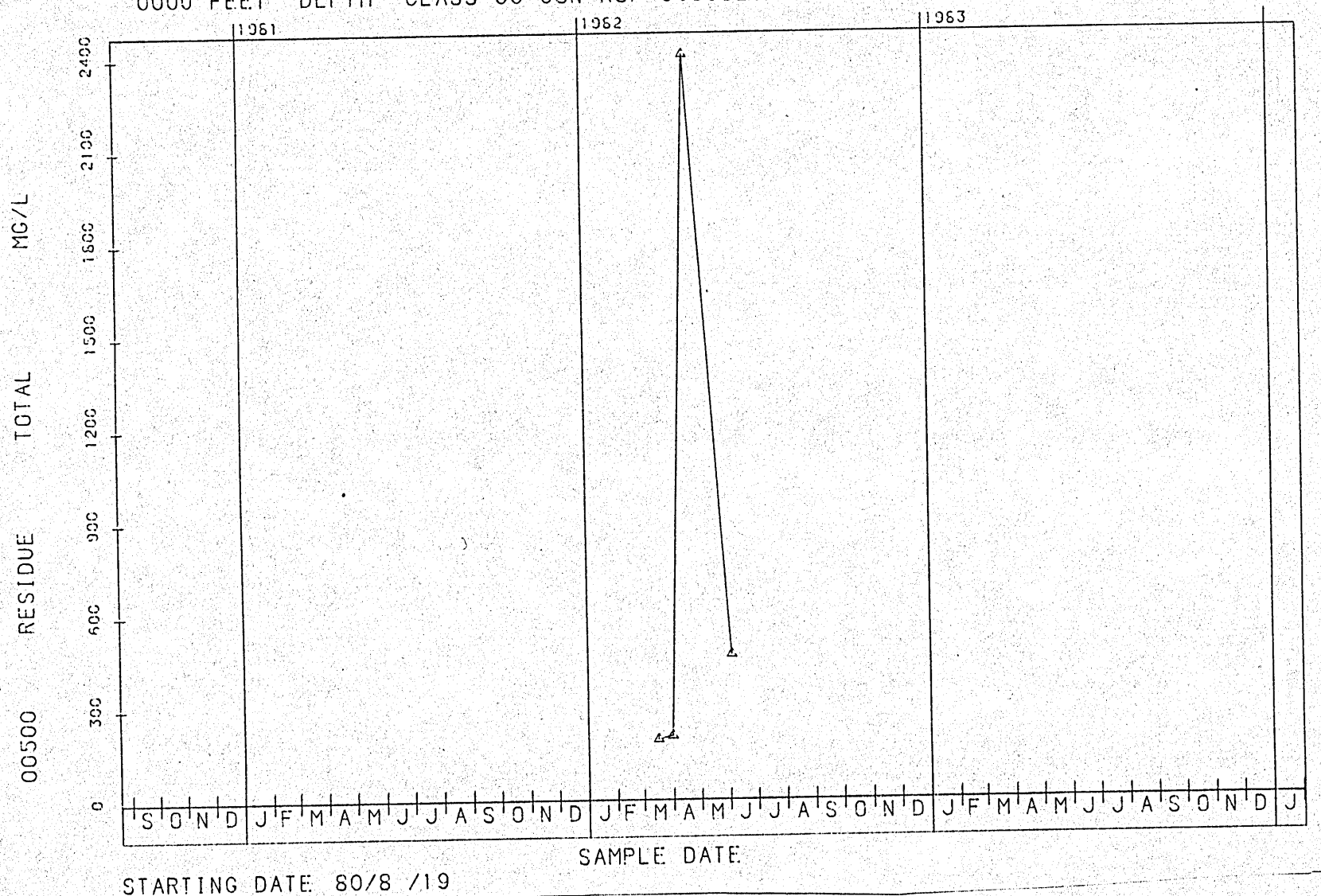
Figure IV-37.



STARTING DATE 80/8 /19

STORET
46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

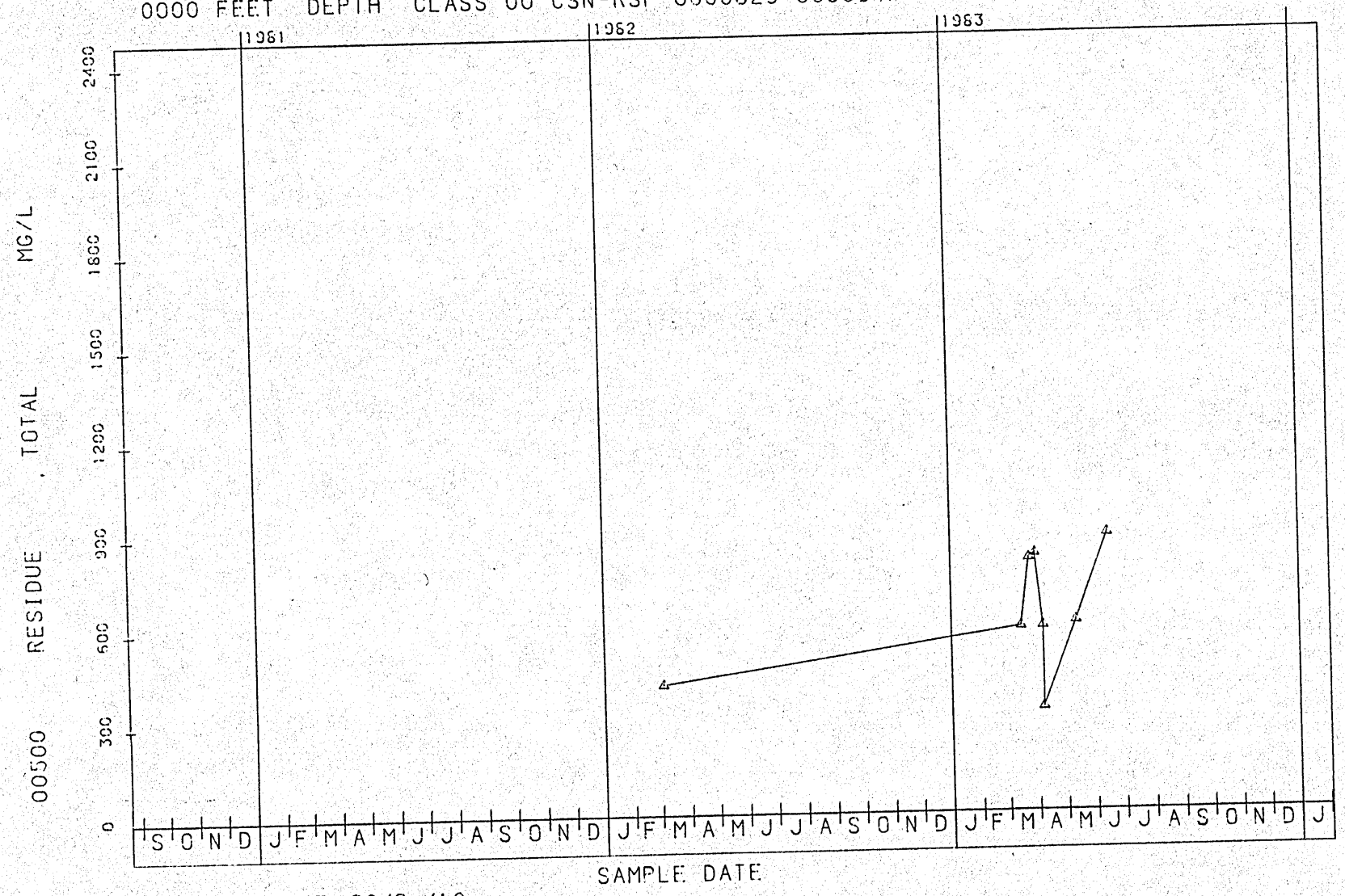
Figure IV-38.



STARTING DATE 80/8 /19

STORET
46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

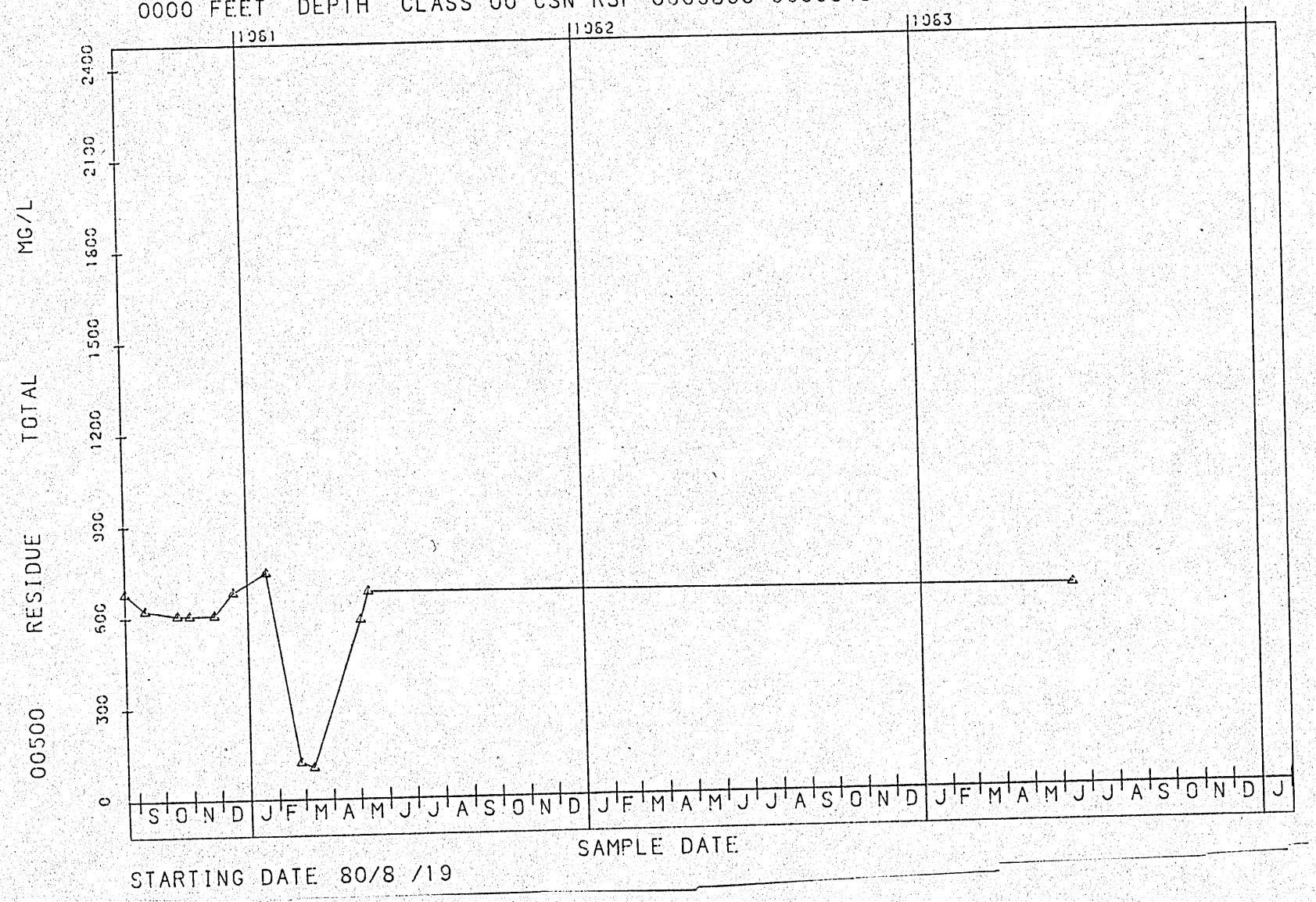
Figure IV-39.



STARTING DATE 80/8 /19

Figure IV-40.

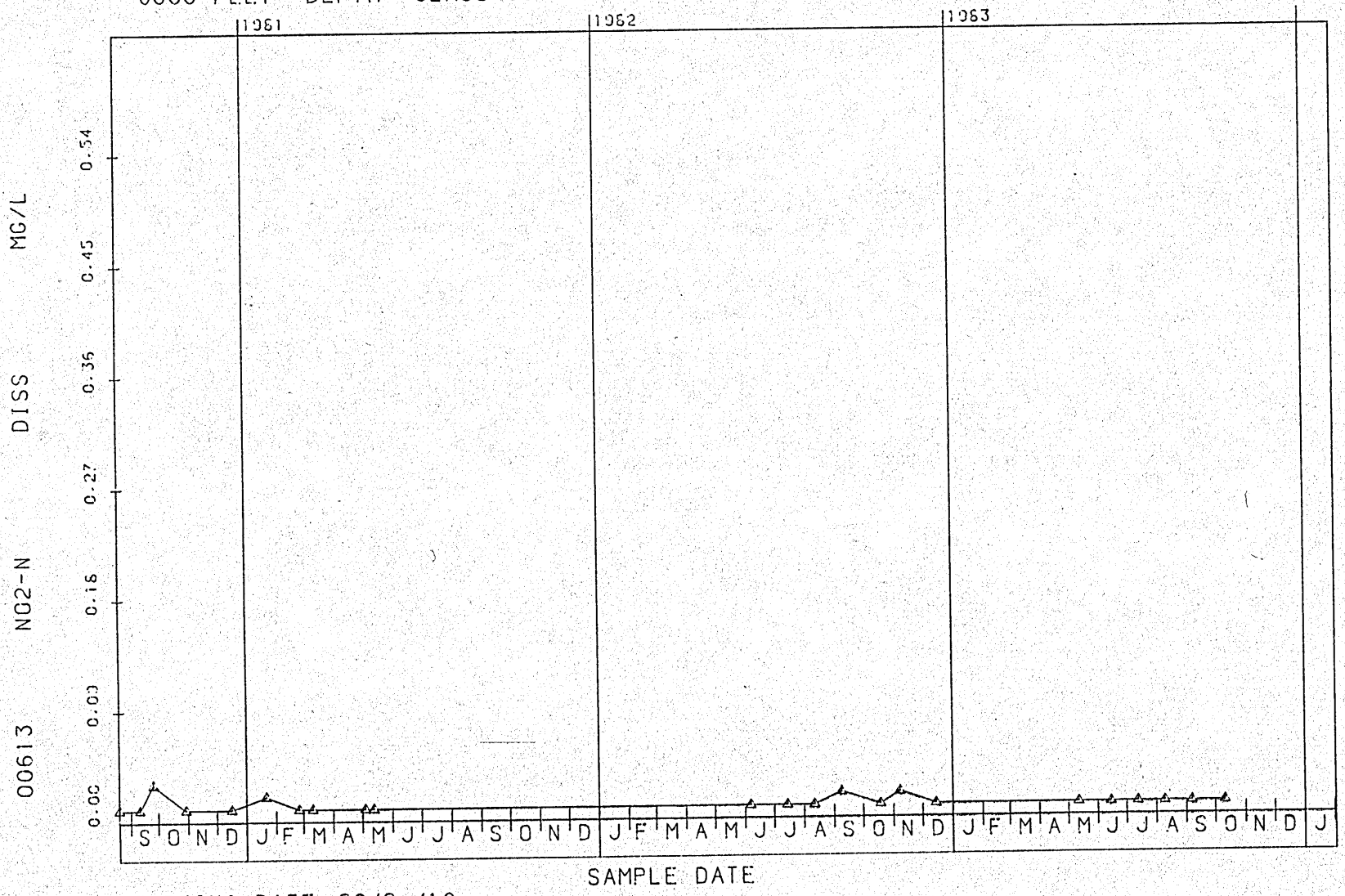
STORET
46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848



STARTING DATE 80/8 /19

STORET
46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

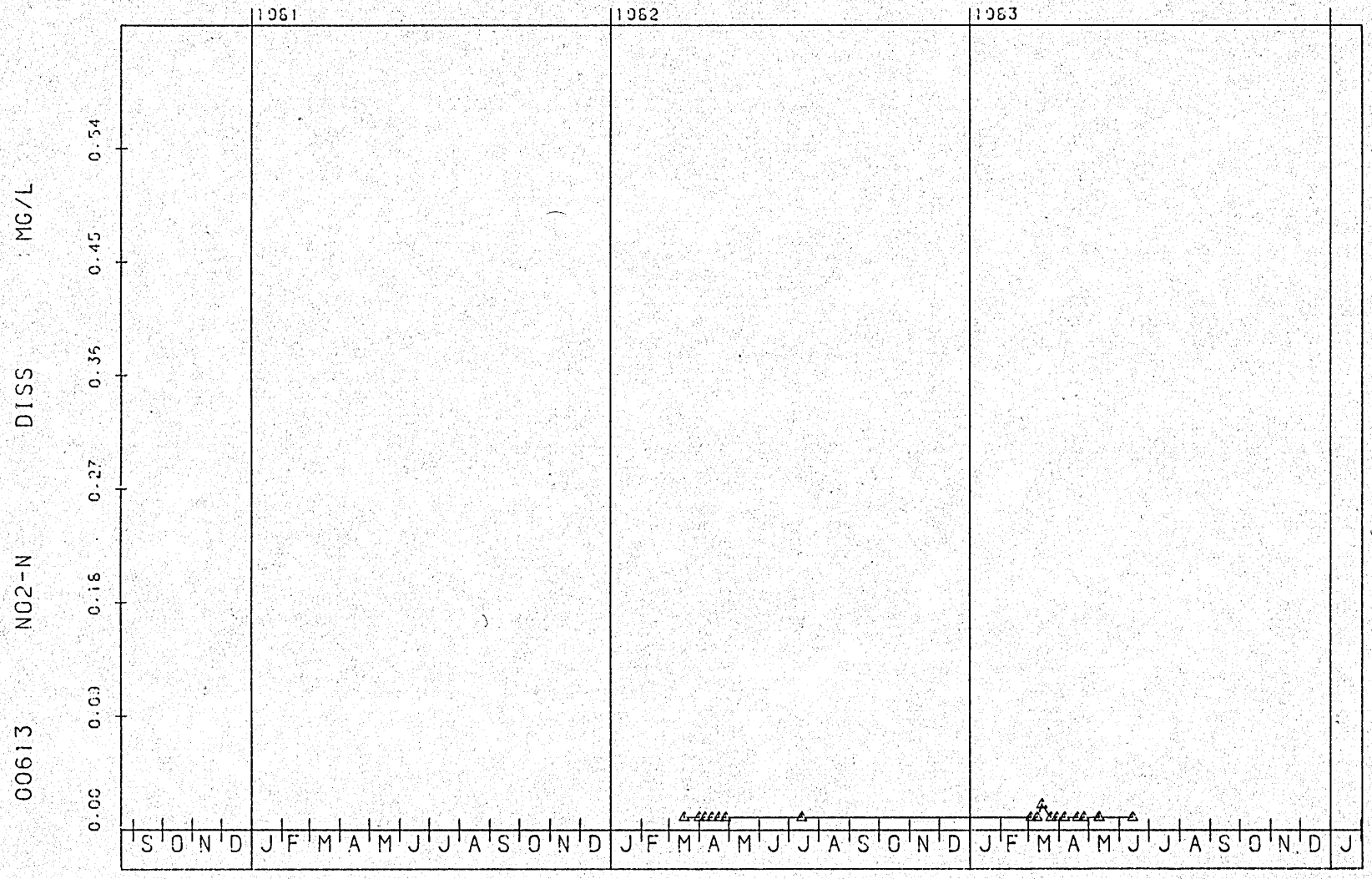
Figure IV-41.



STARTING DATE 80/8 /19

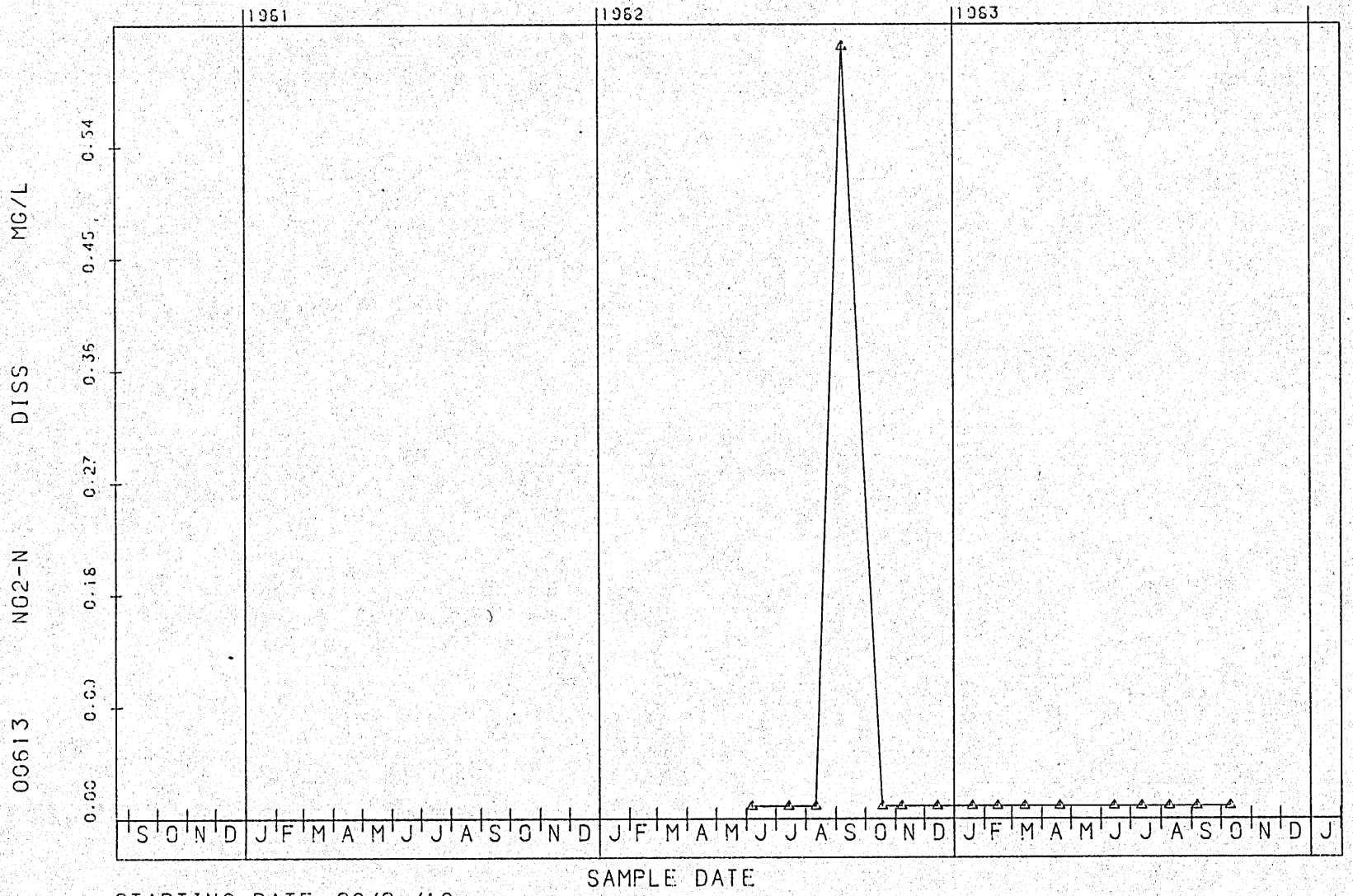
46HNO2
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE S20904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

Figure IV-42.



46HNO3
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDC 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

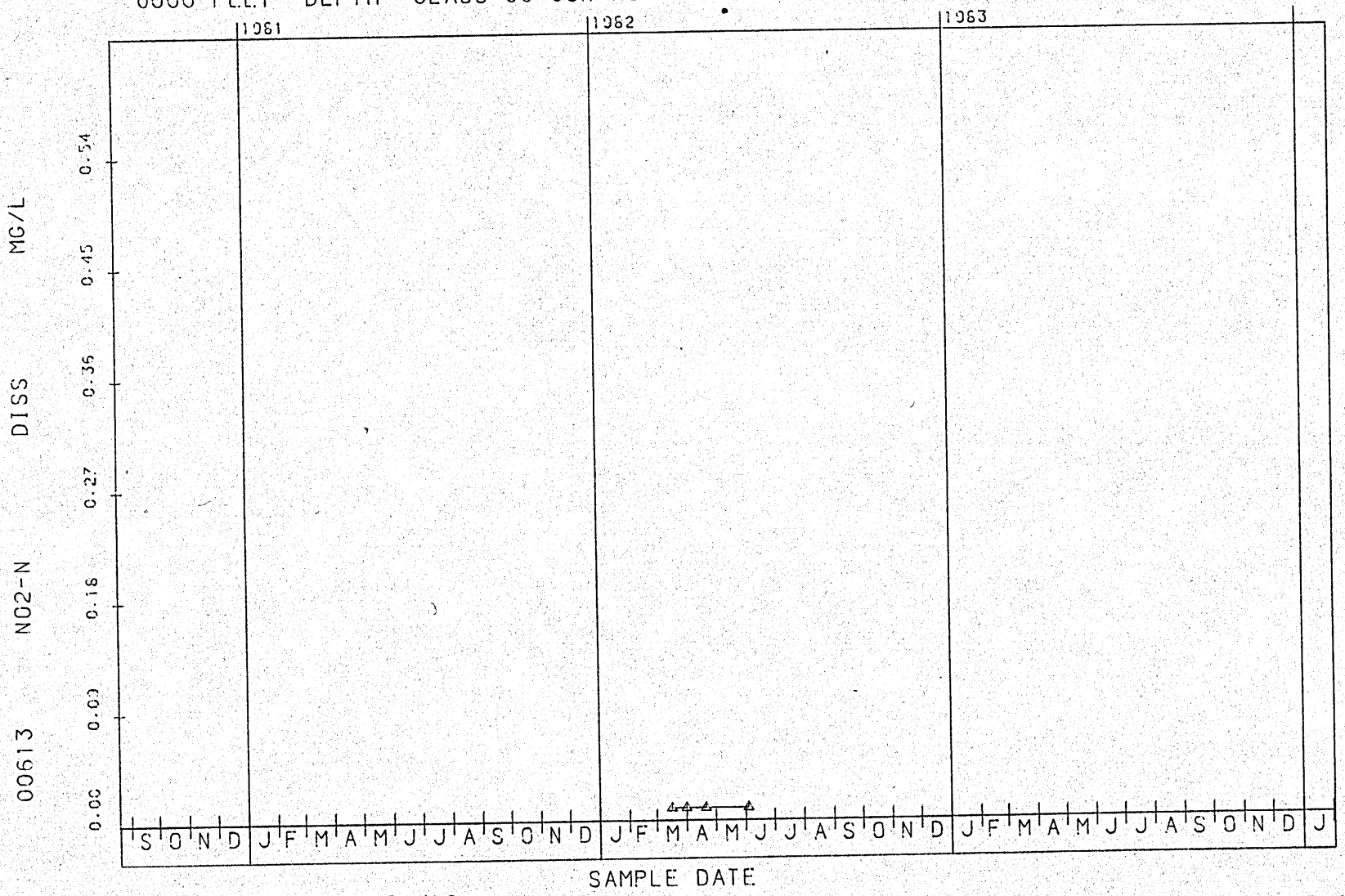
Figure IV-43.



STARTING DATE 80/8 /19

46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

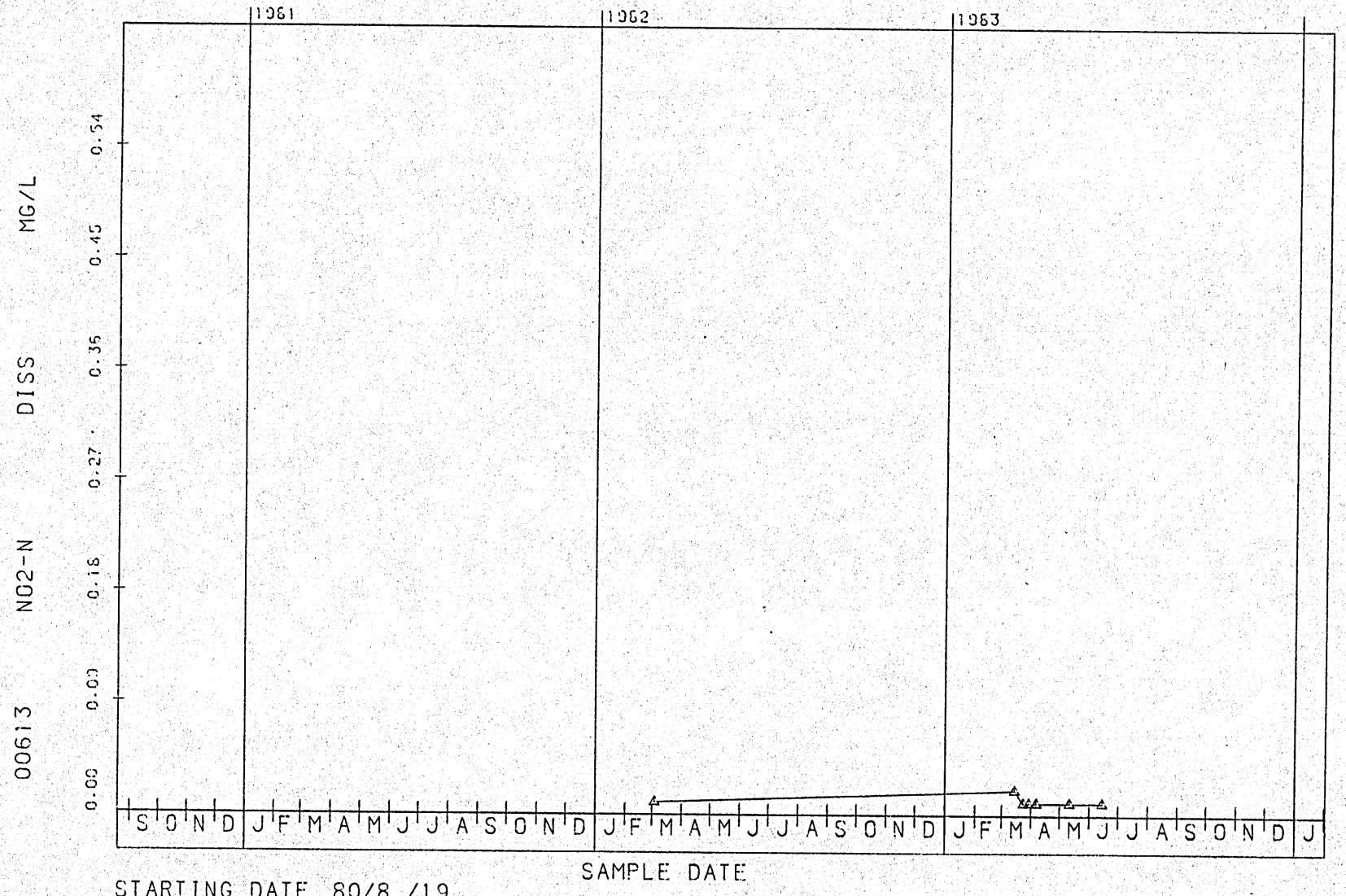
Figure IV-44.



STARTING DATE 80/8 /19

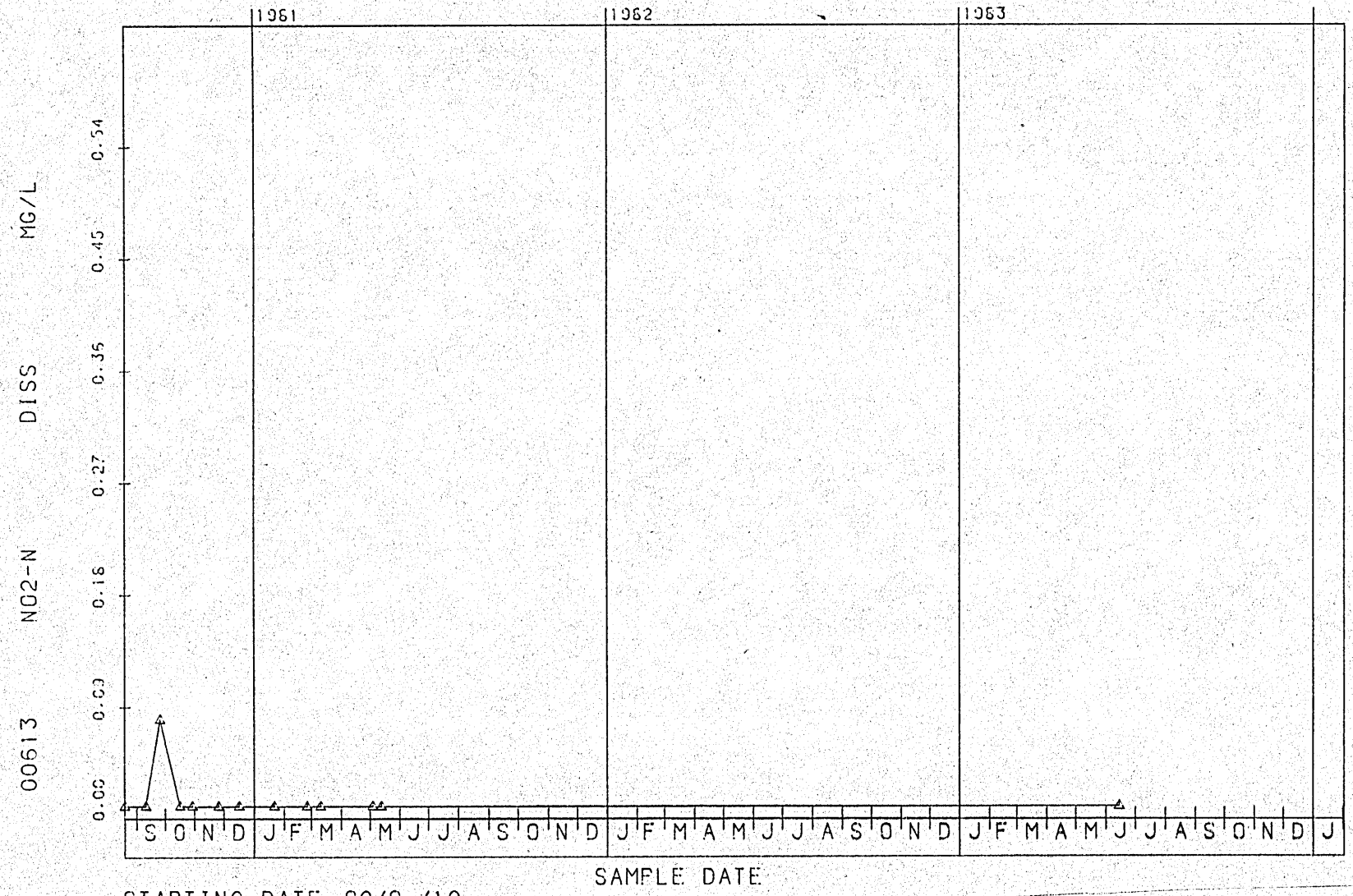
46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

Figure IV-45.



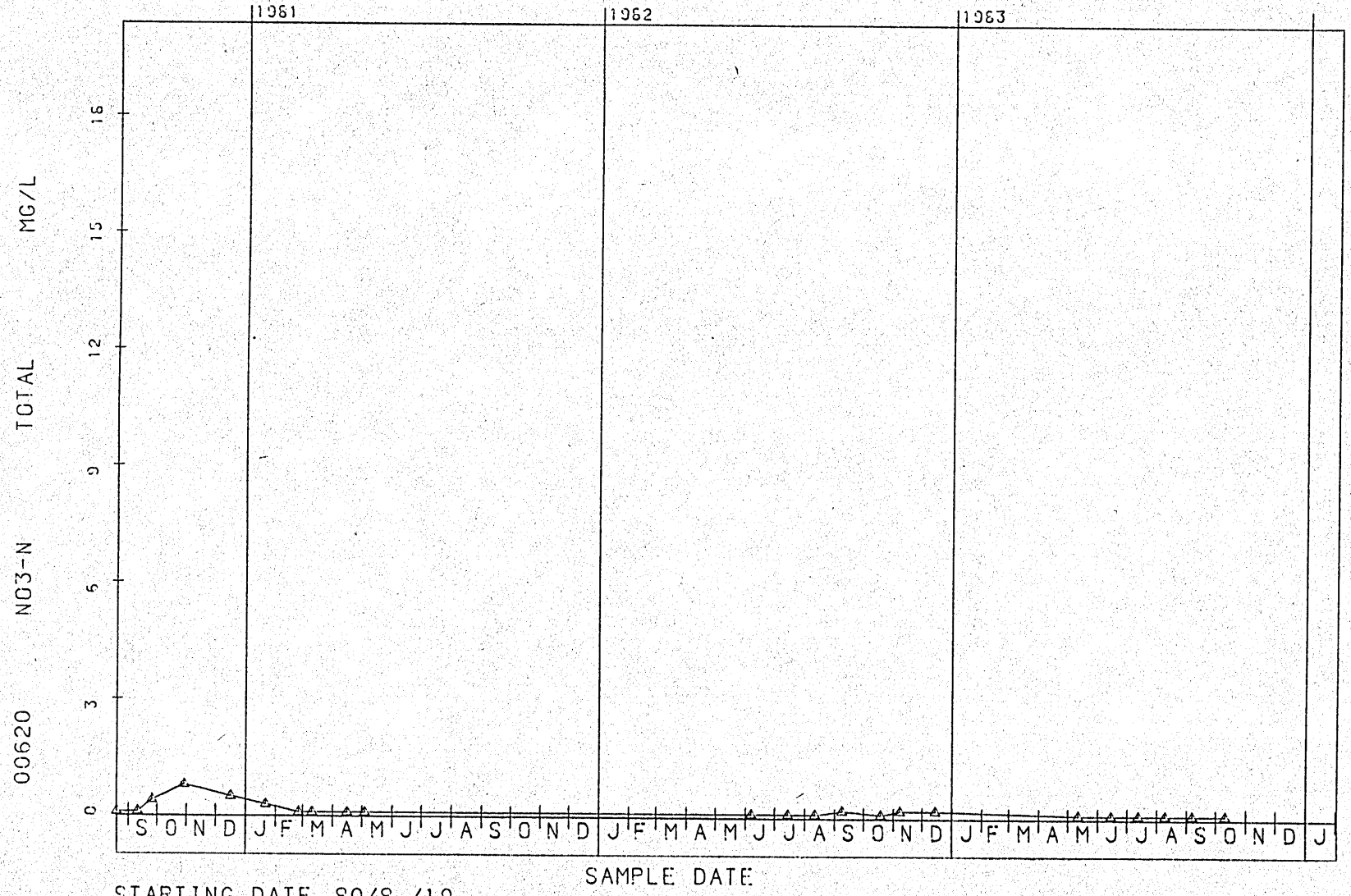
46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

Figure IV-46.



46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

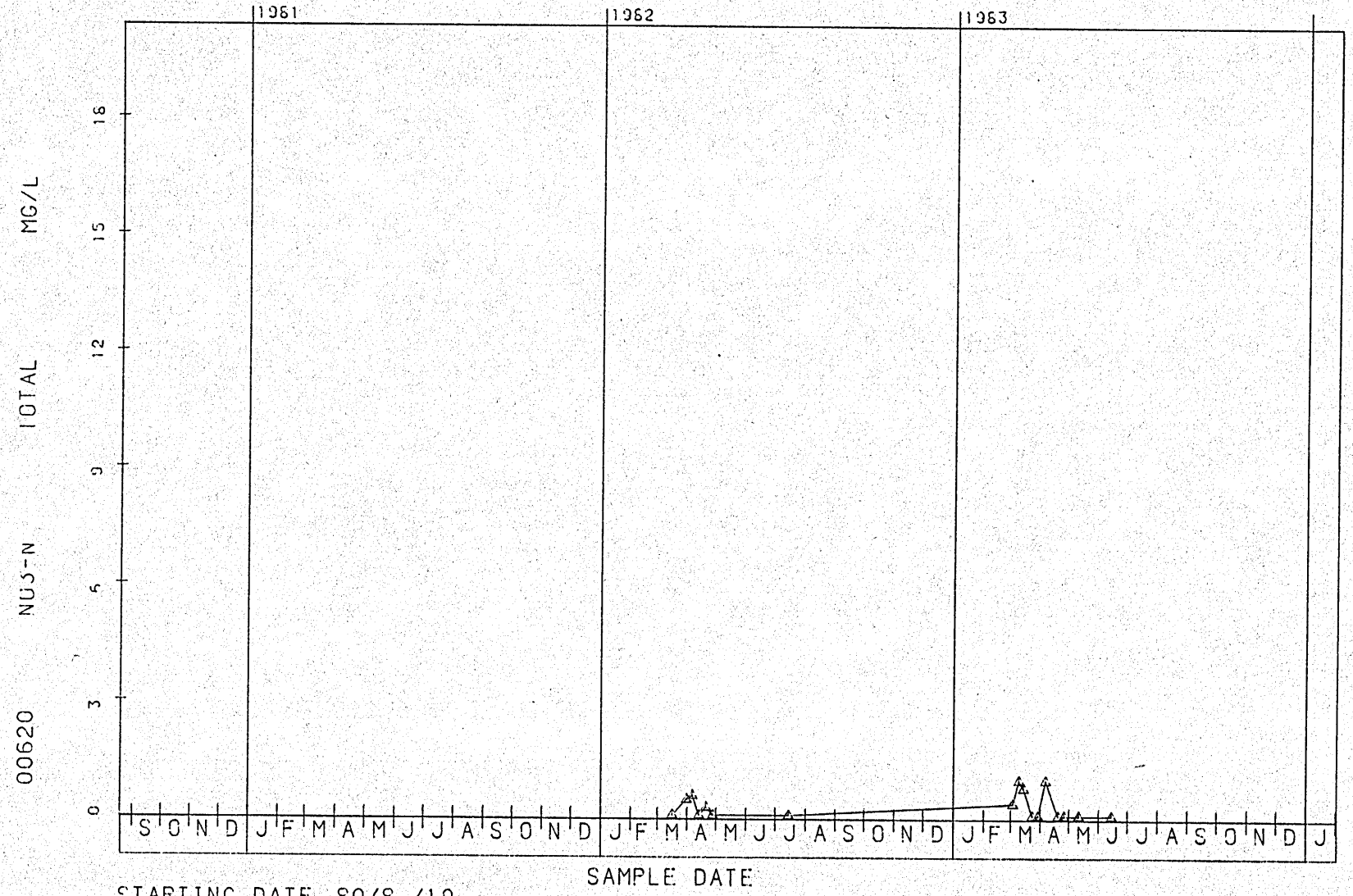
Figure IV-47.



STARTING DATE 80/8 /19

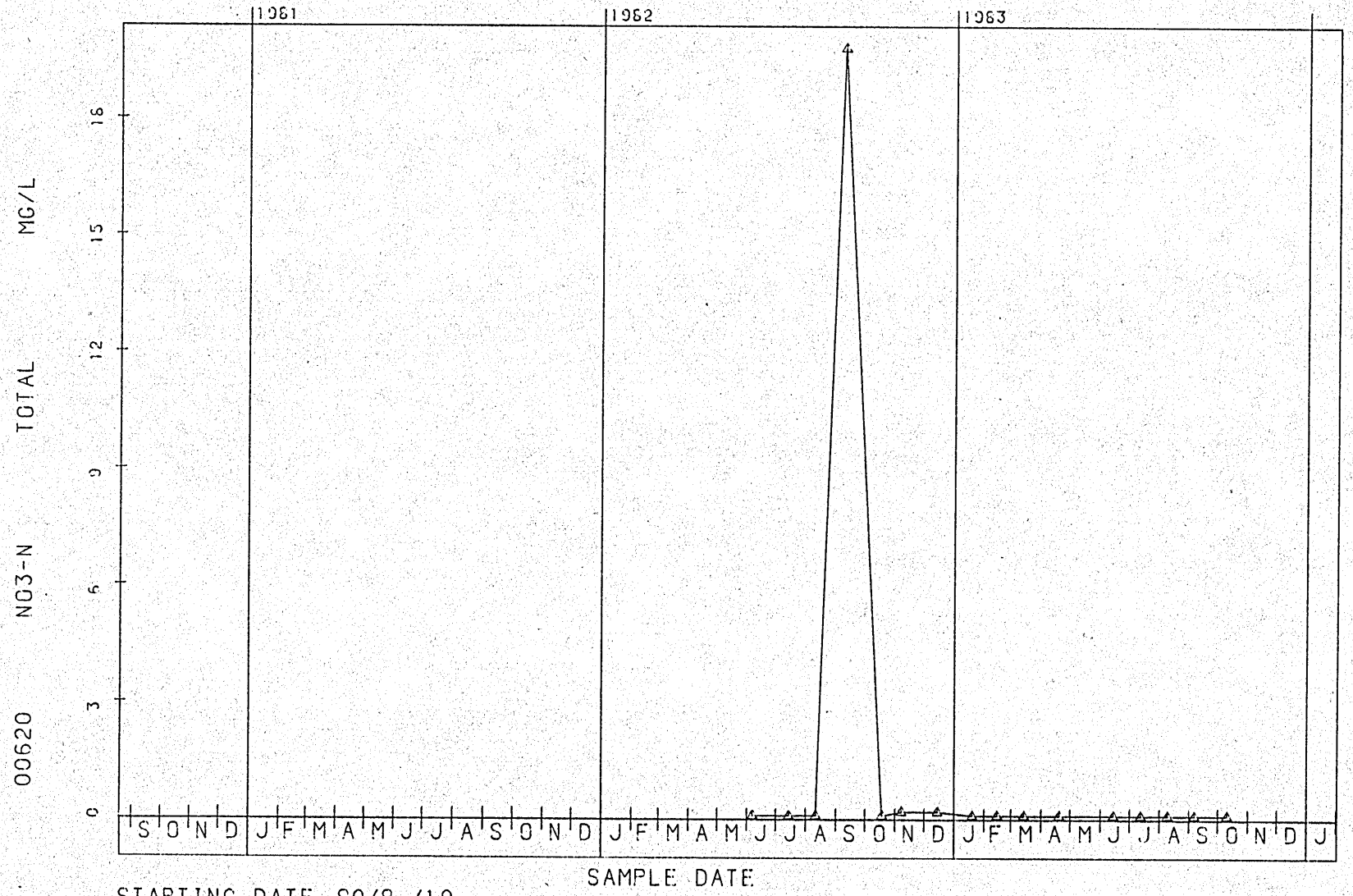
46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

Figure IV-48.



46HNO3
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

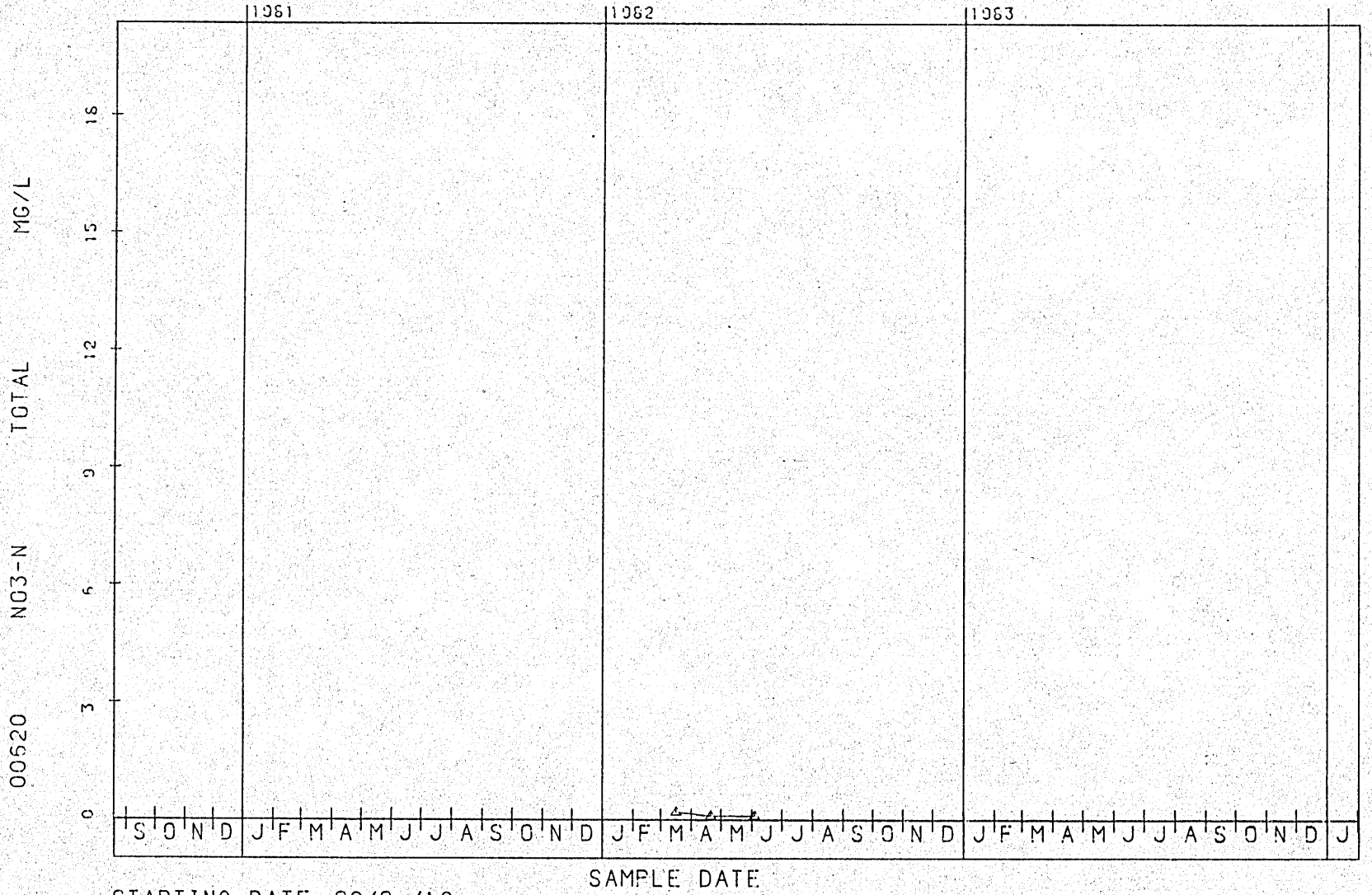
Figure IV-49.



STARTING DATE 80/8 /19

46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

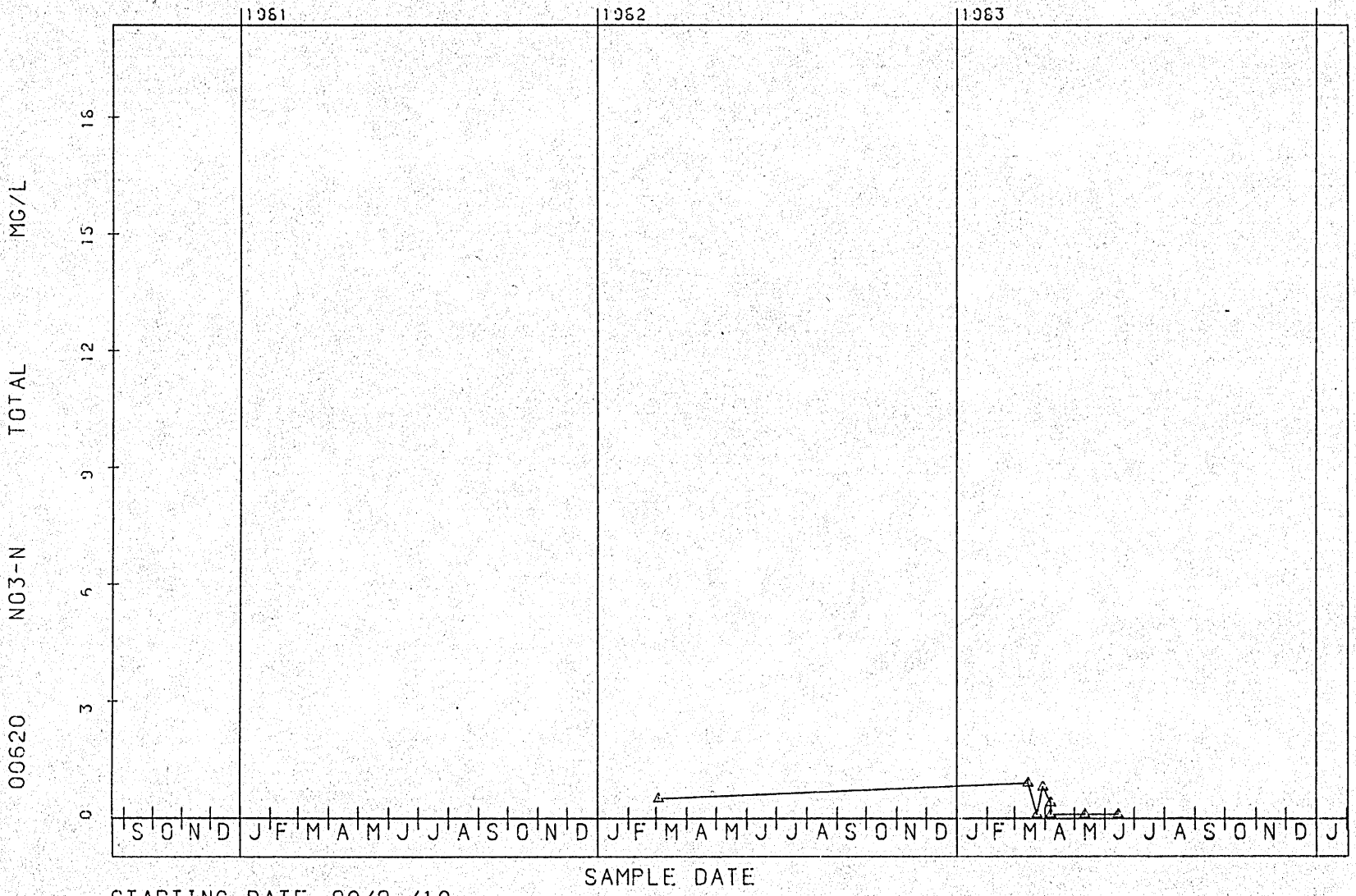
Figure IV-50.



STARTING DATE 80/8 /19

46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

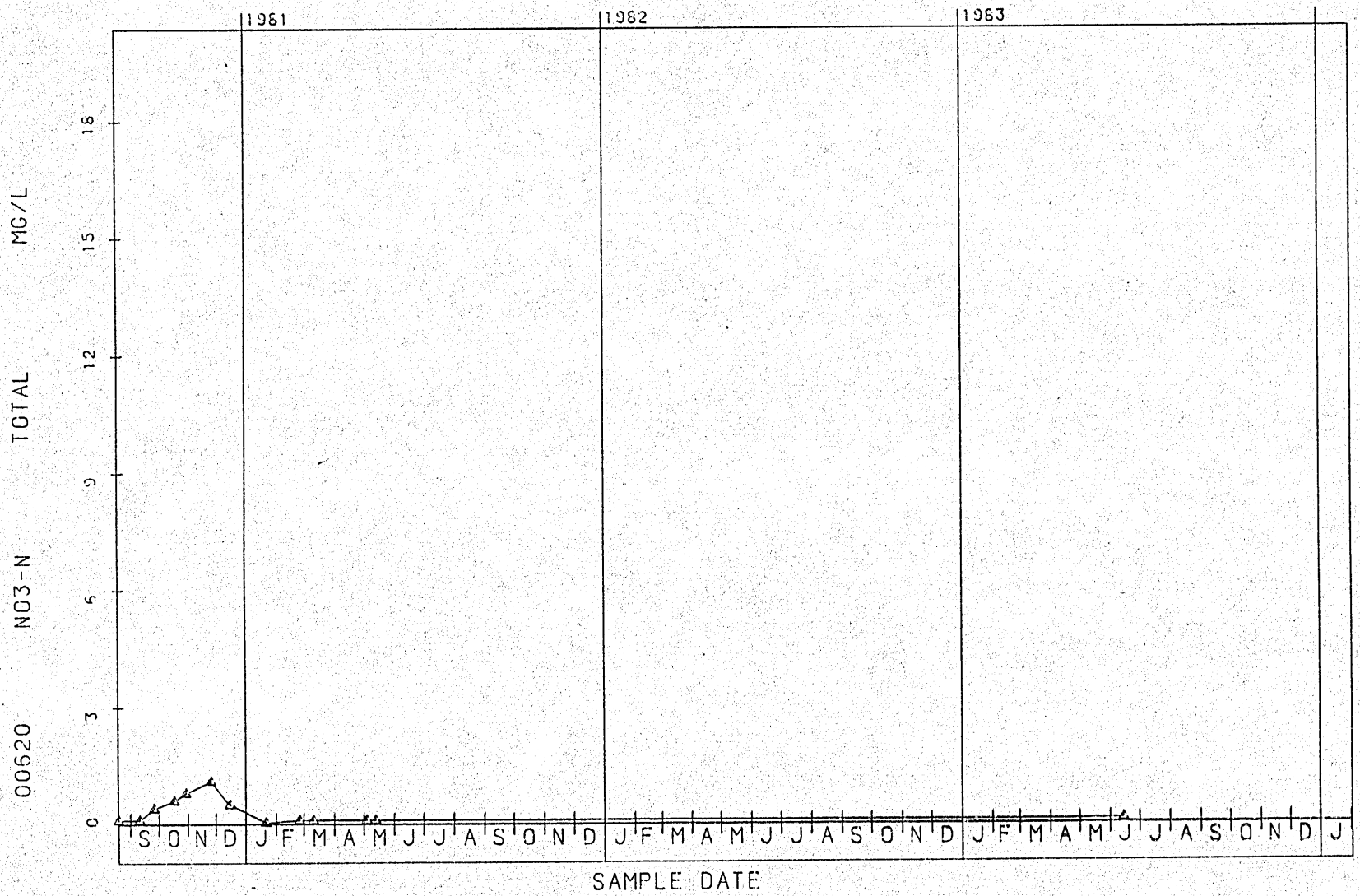
Figure IV-51.



STARTING DATE 80/8 /19

46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

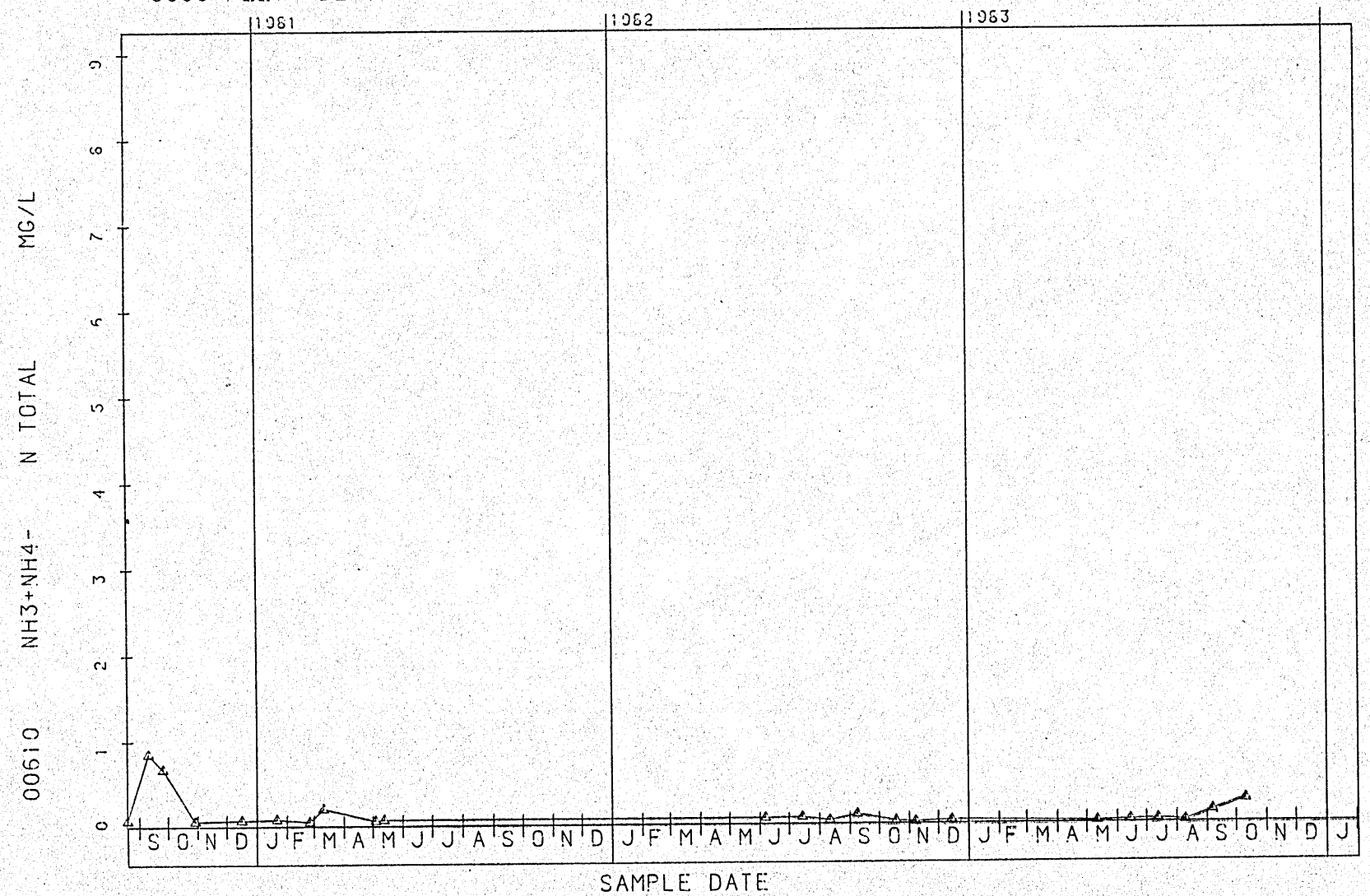
Figure IV-52.



STARTING DATE 80/8 /19

STORET
46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

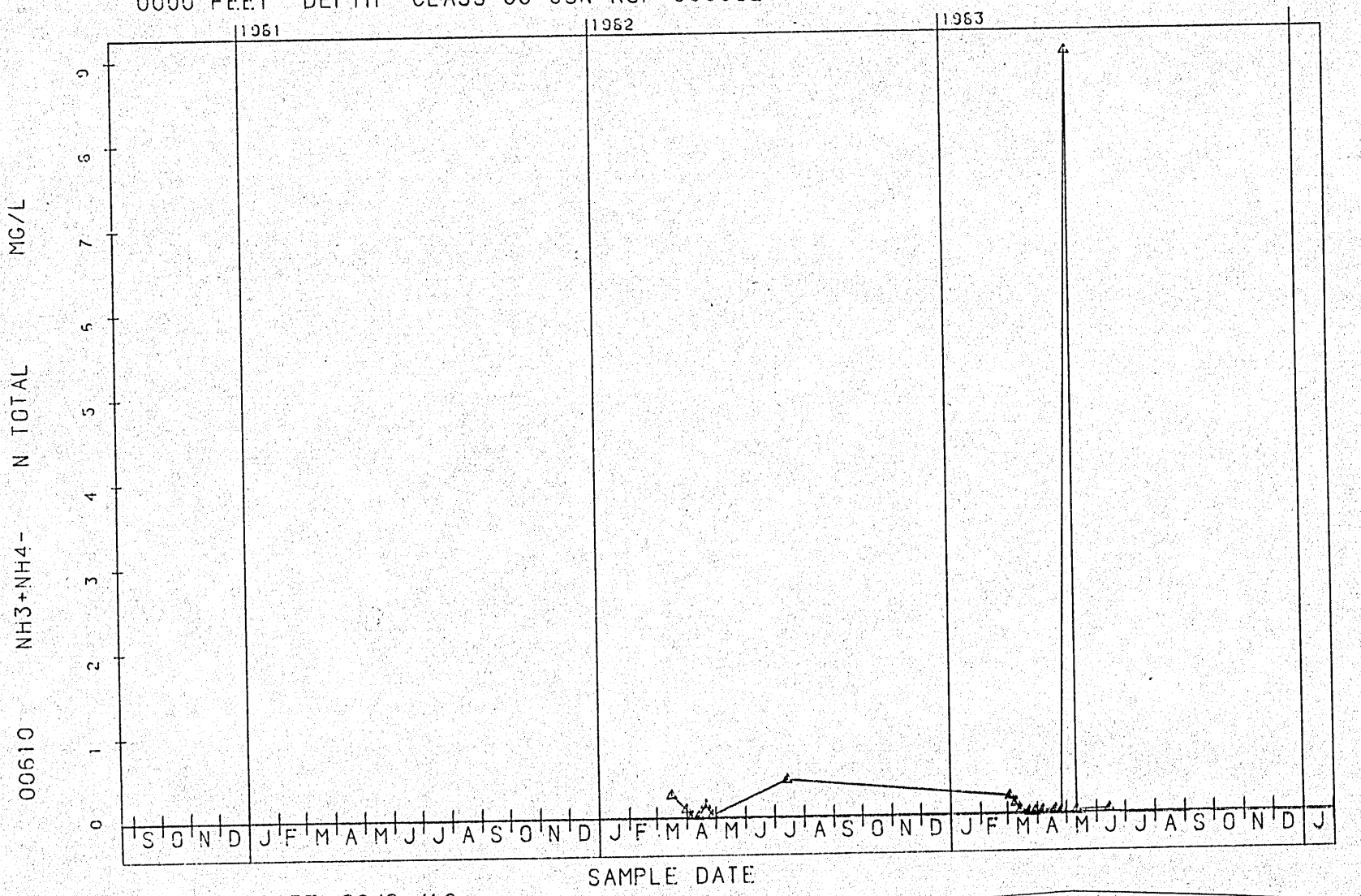
Figure IV-53.



STARTING DATE 80/8 /19

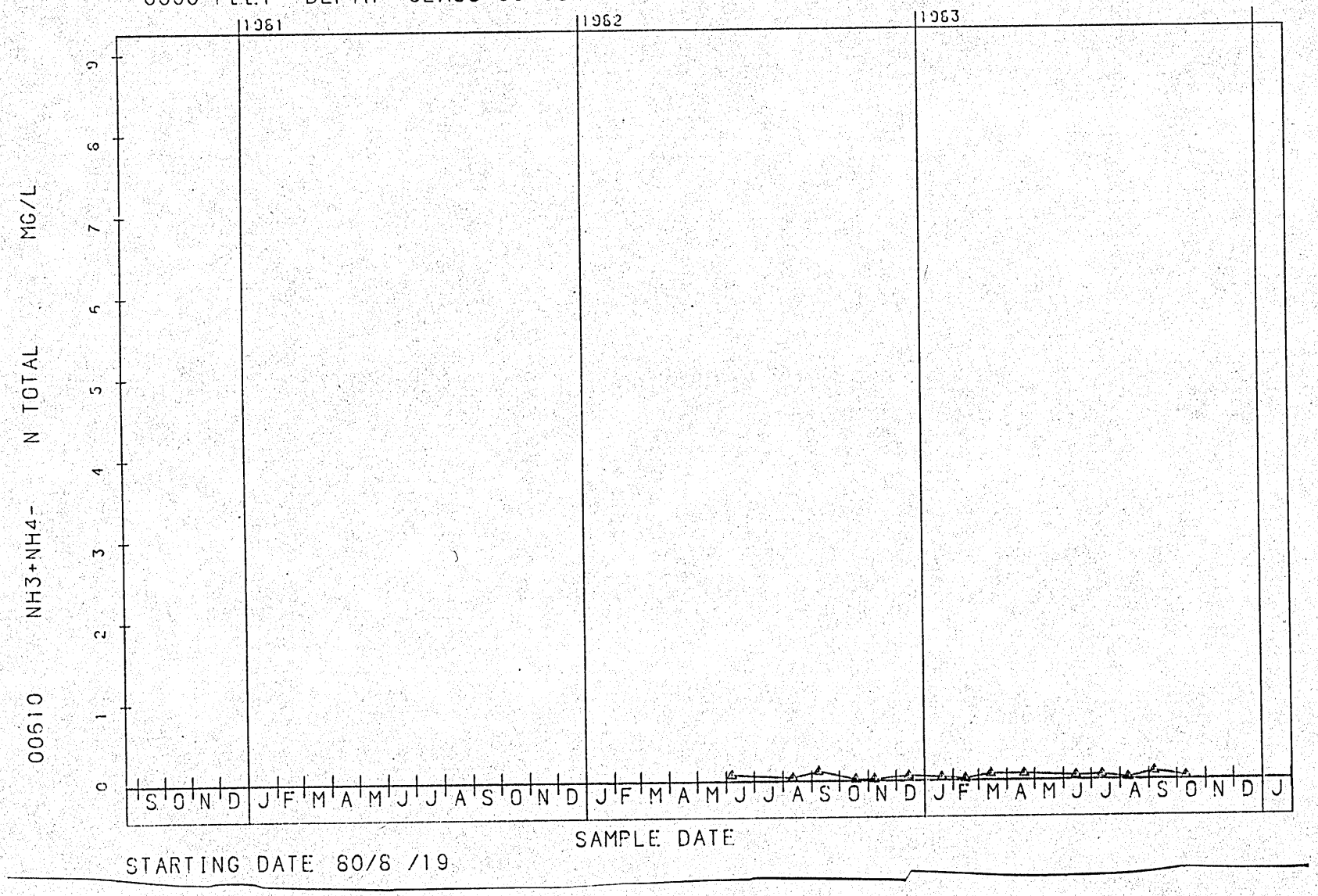
STORET
46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

Figure IV-54.



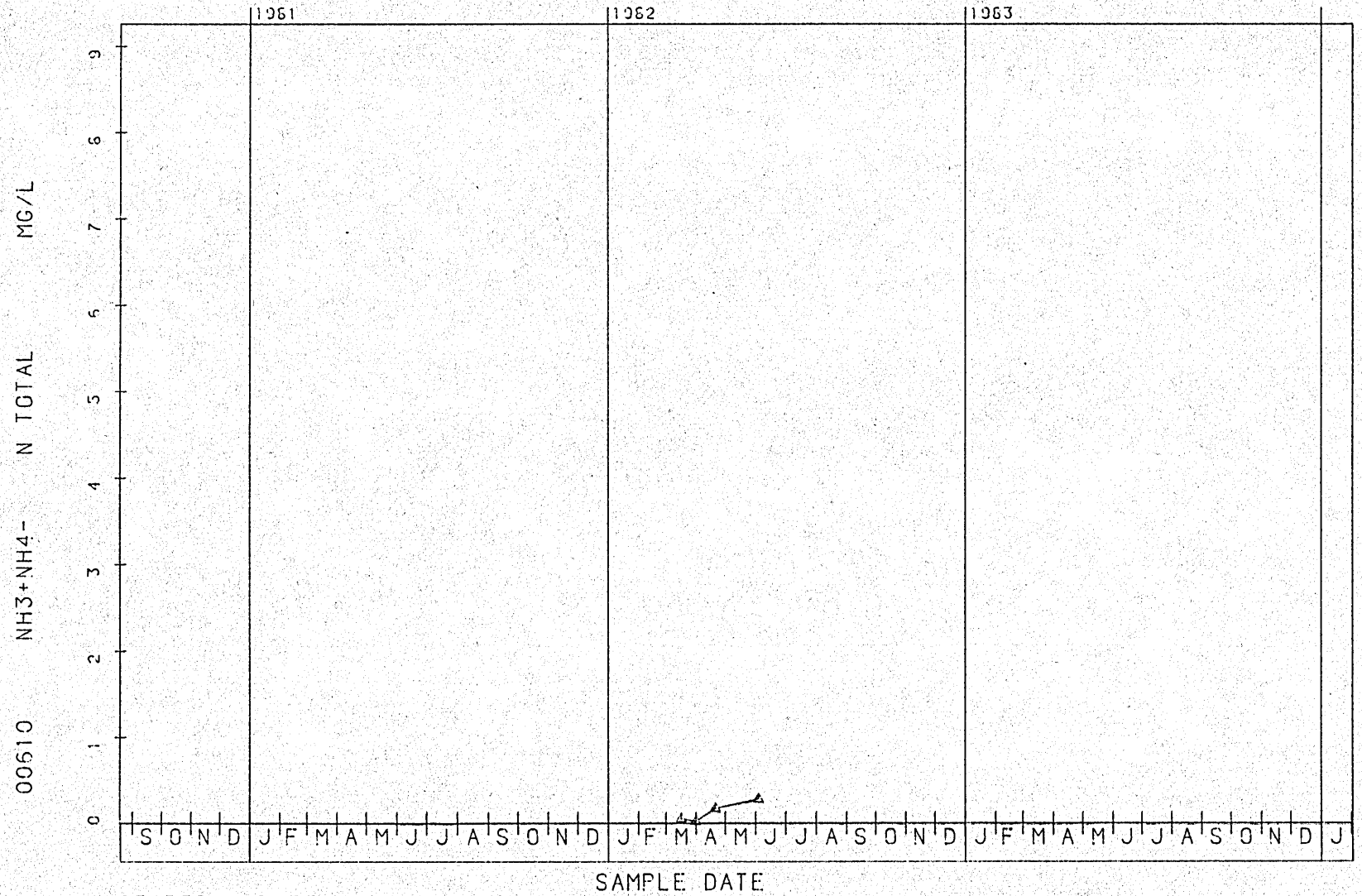
STORET
46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

Figure IV-55.



STORET
46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

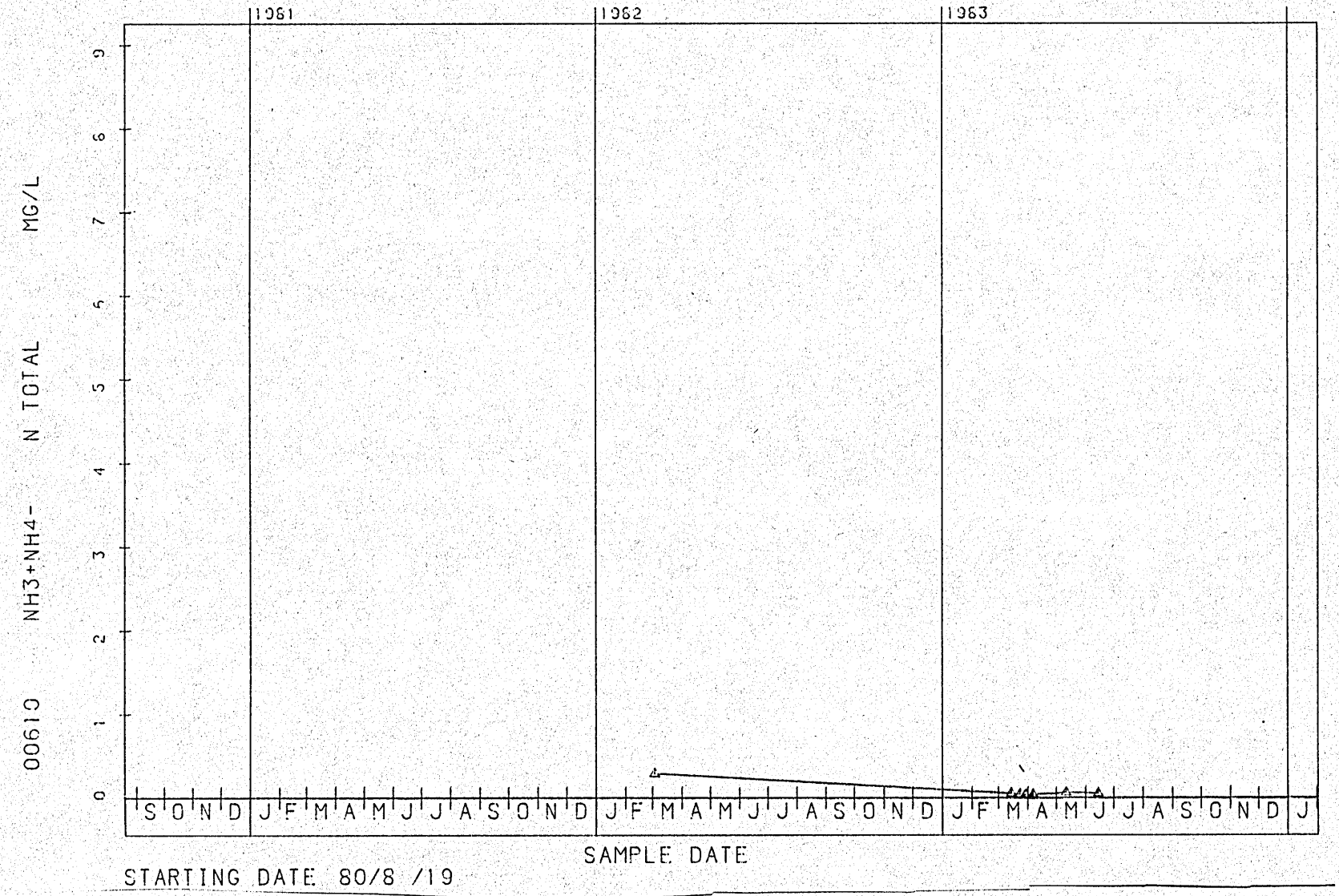
Figure IV-56.



STARTING DATE 80/8 /19

STORET
46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

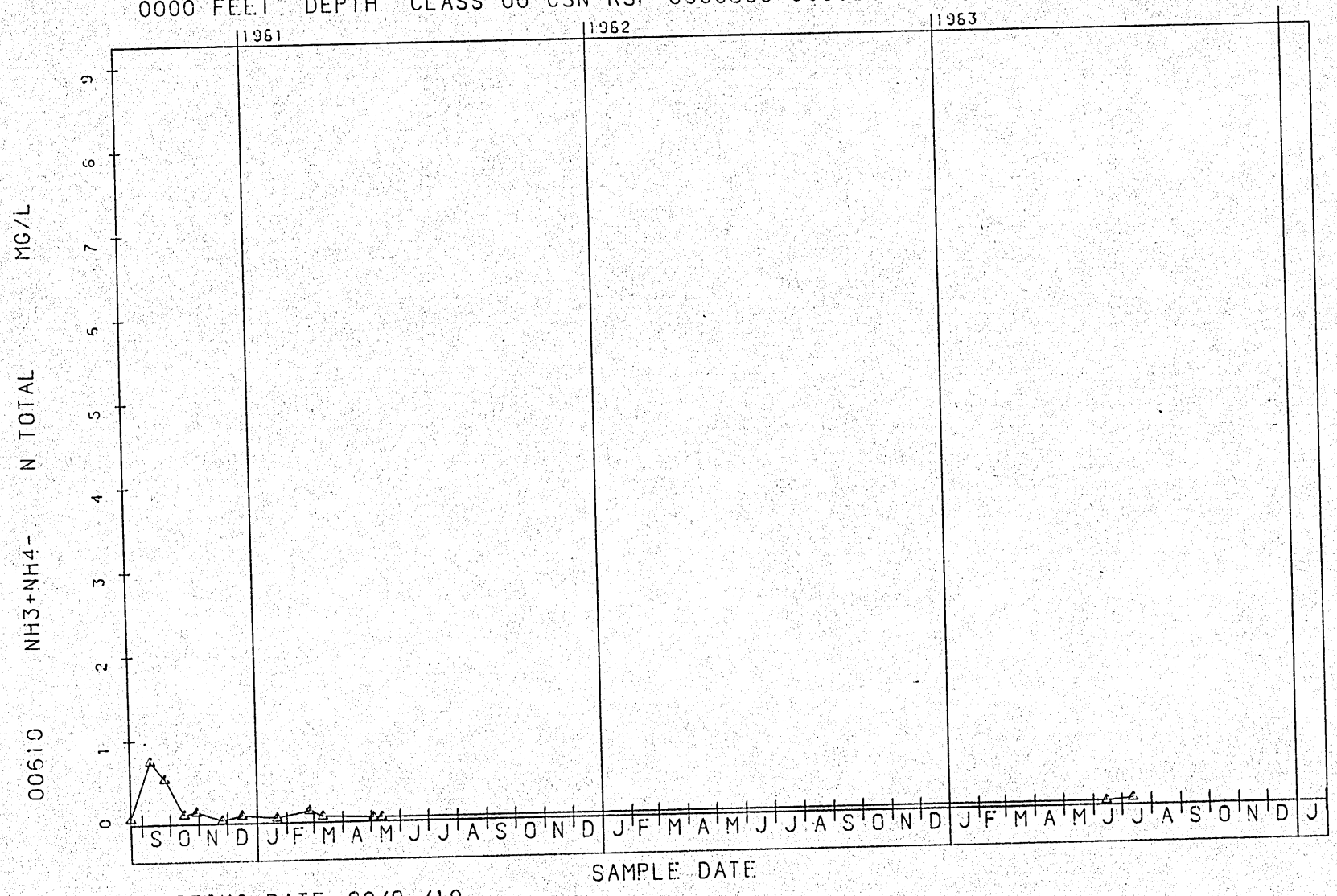
Figure IV-57.



STARTING DATE 80/8 /19

Figure IV-58.

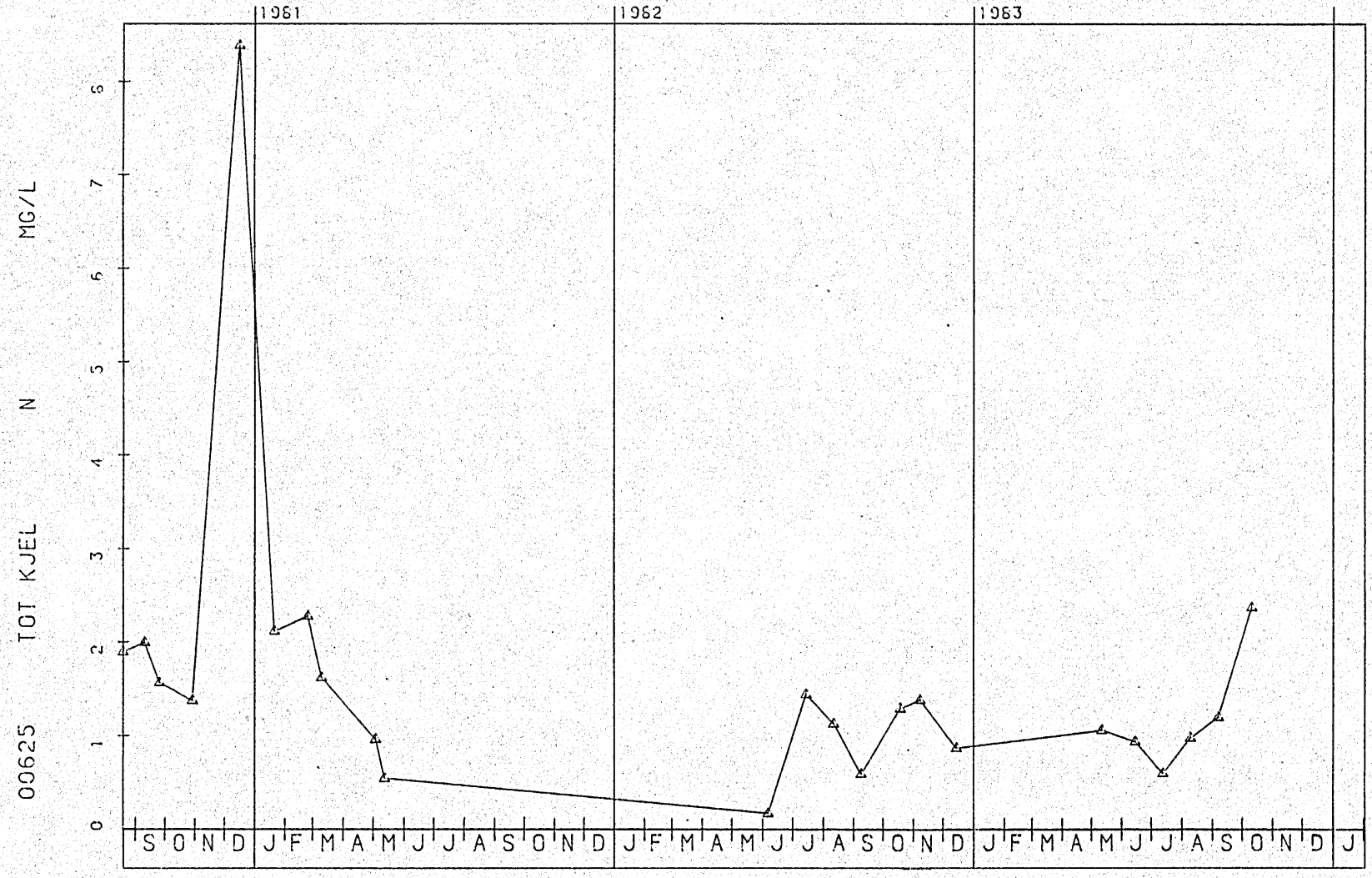
STORET
46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848



STARTING DATE 80/8 /19

STORET
46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

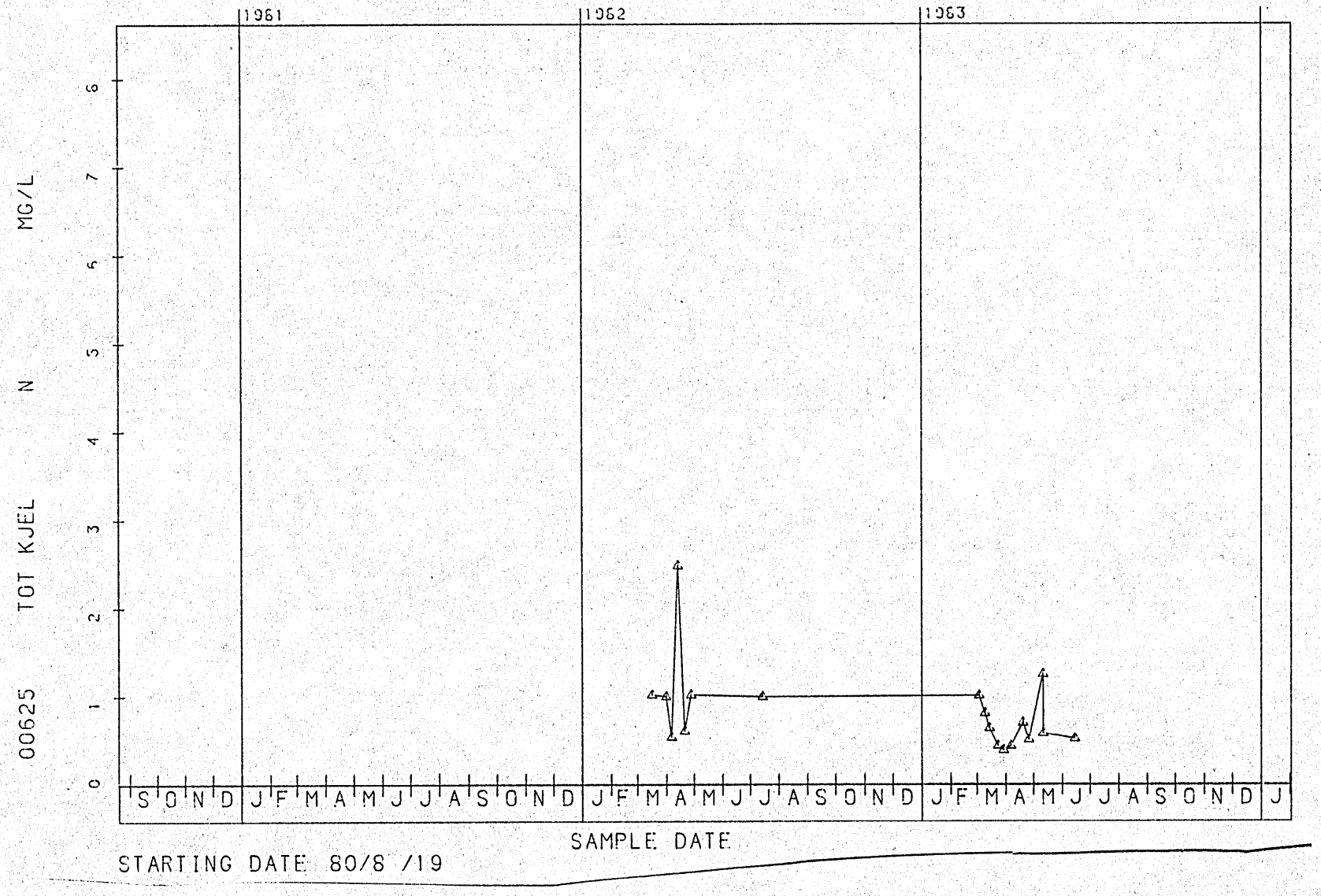
Figure IV-59.



STARTING DATE 80/8 /19

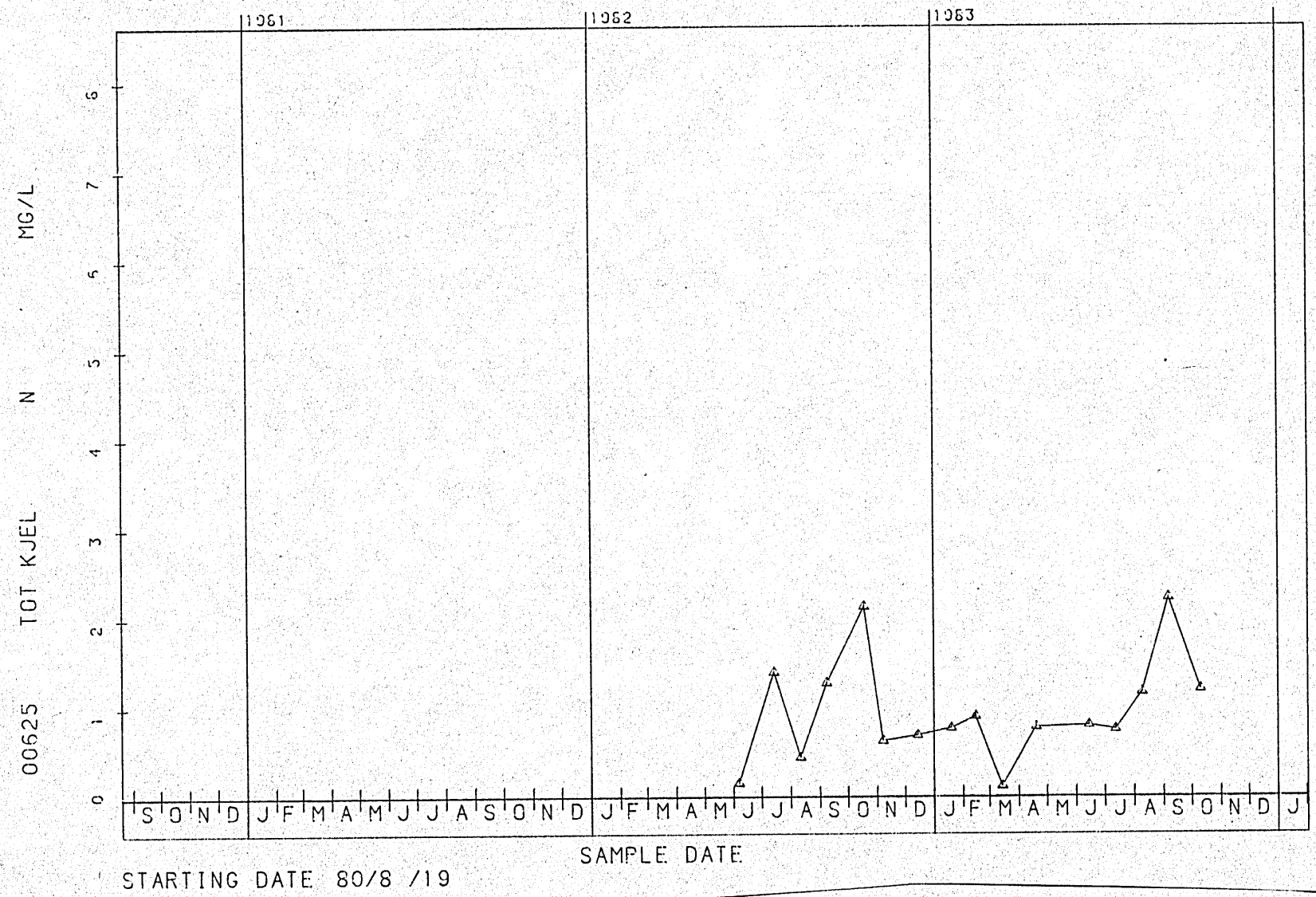
STORET
46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

Figure IV-60.



STORET
46HNO3
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820004
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

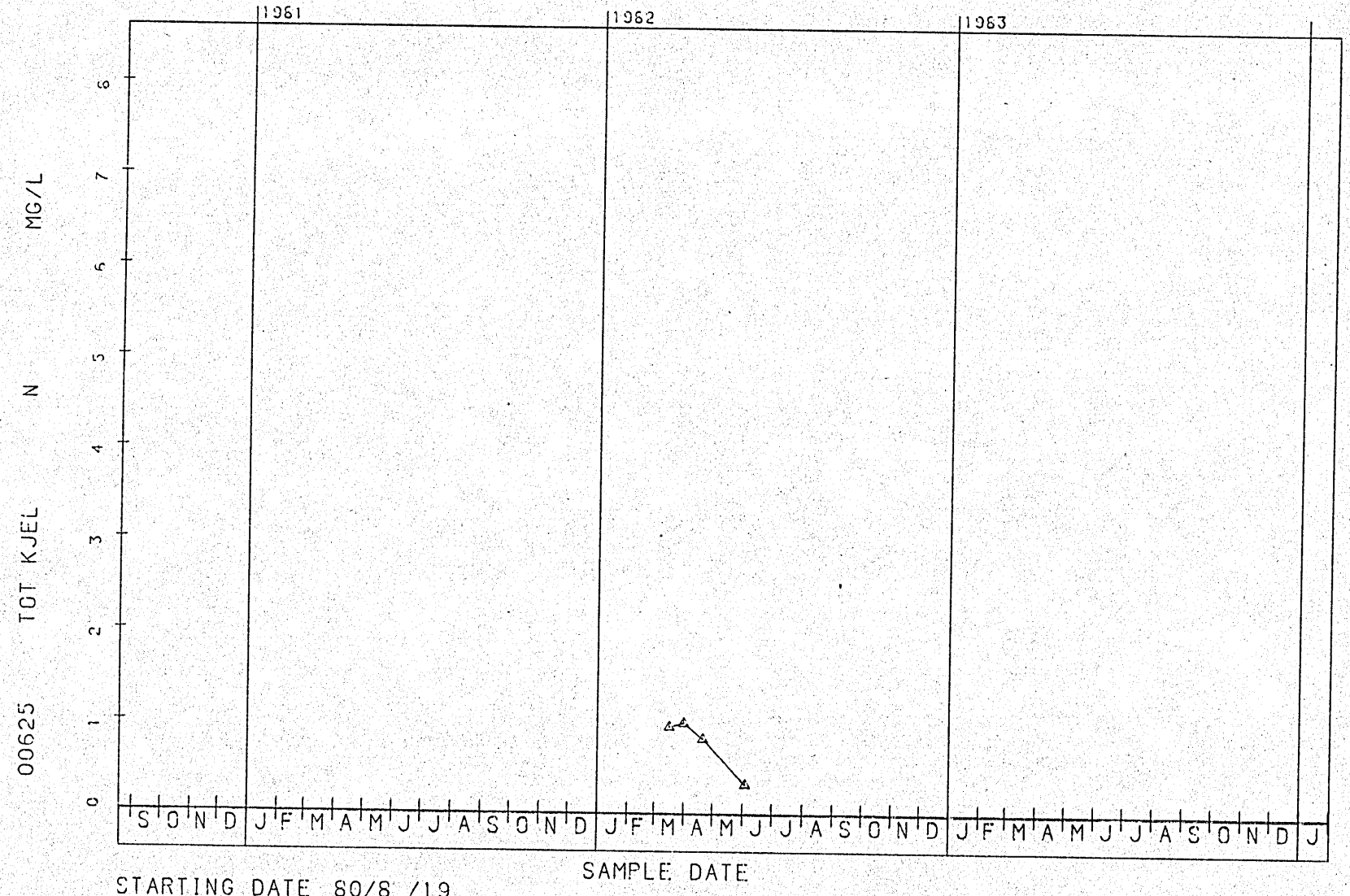
Figure IV-61.



STARTING DATE 80/8 /19

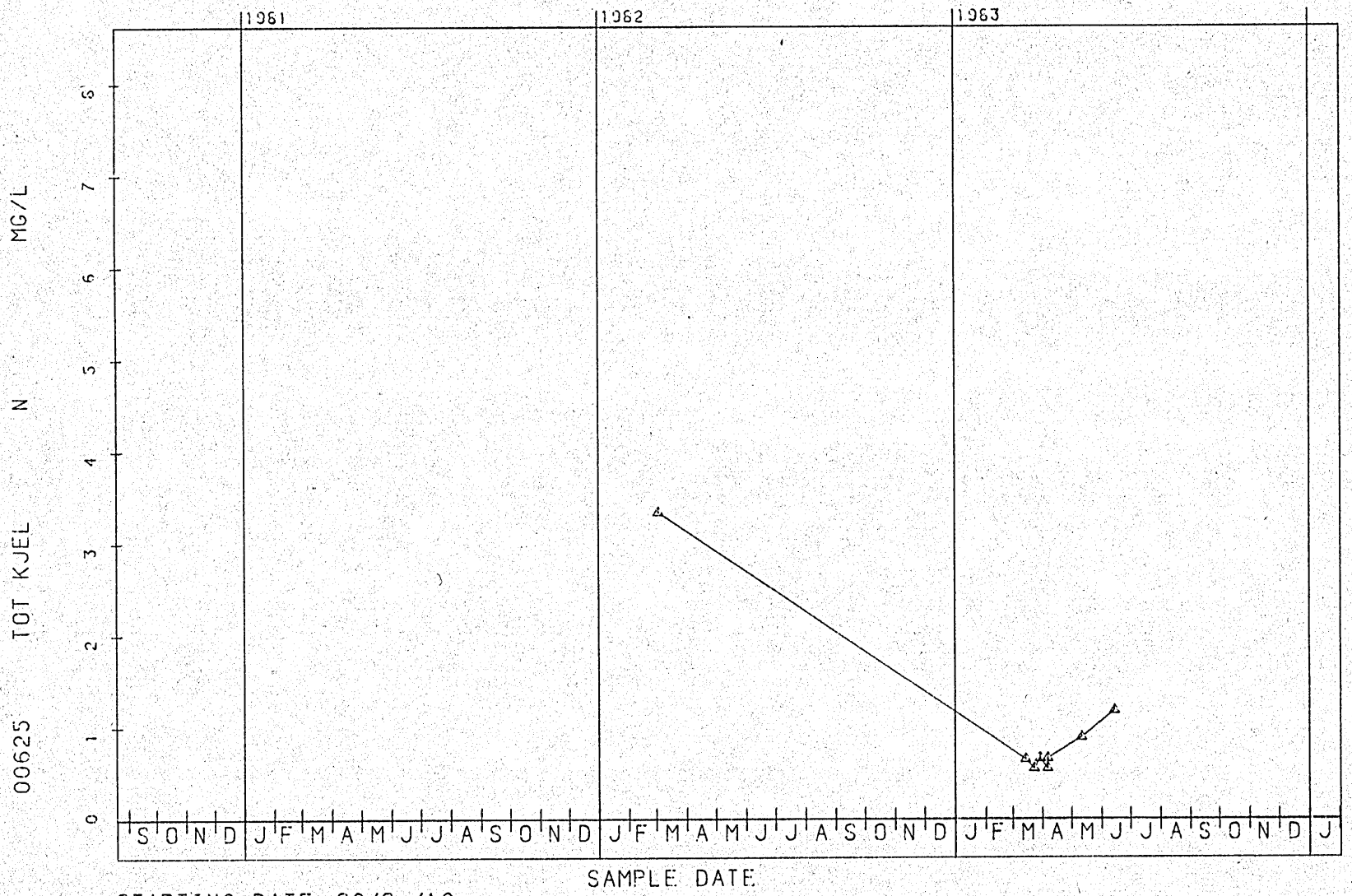
STORET
46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

Figure IV-62.



STORET
46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

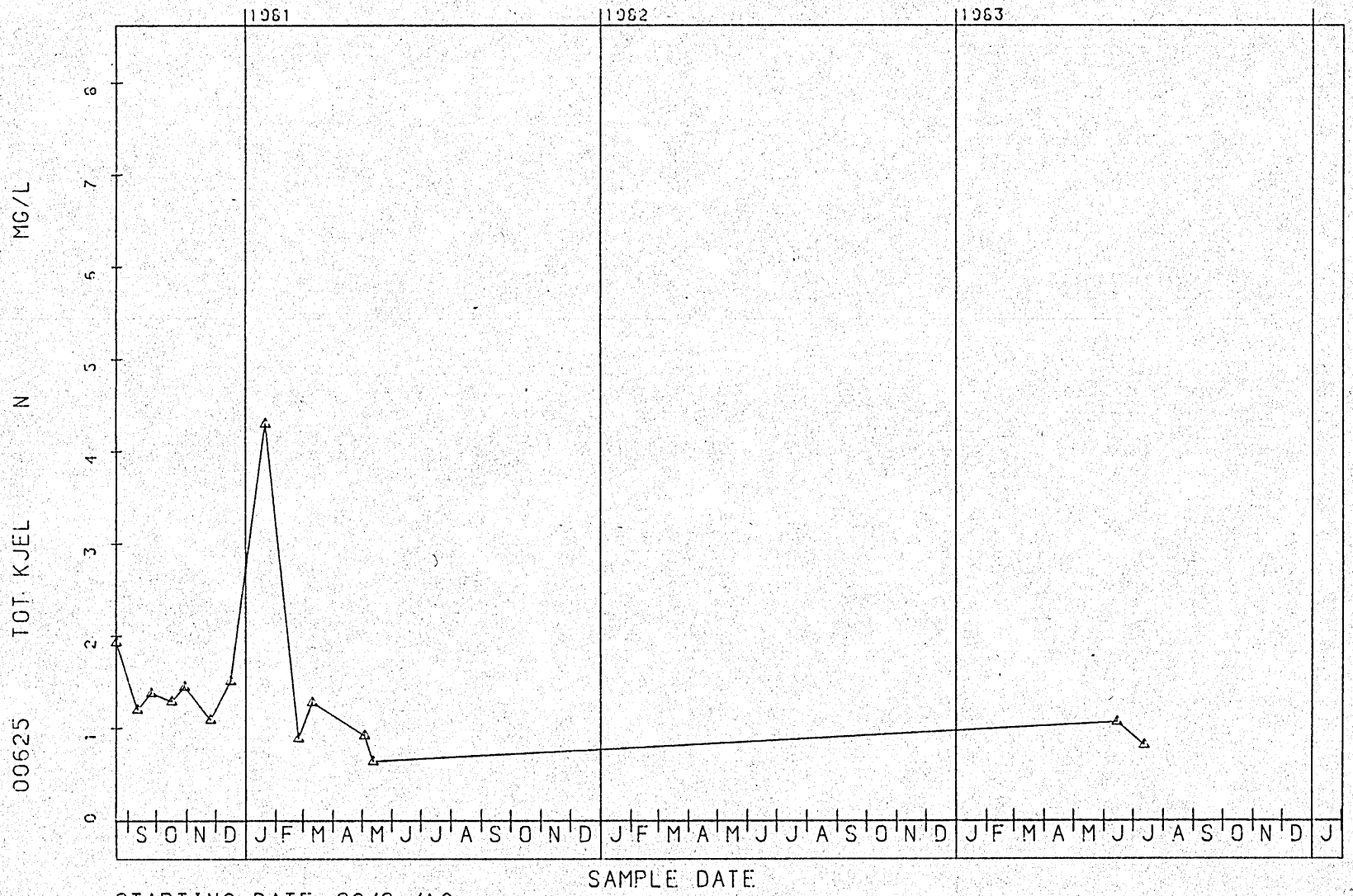
Figure IV-63.



STARTING DATE 80/8 /19

STORET
46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

Figure IV-64.



STARTING DATE 80/8 /19

Figure IV-65.

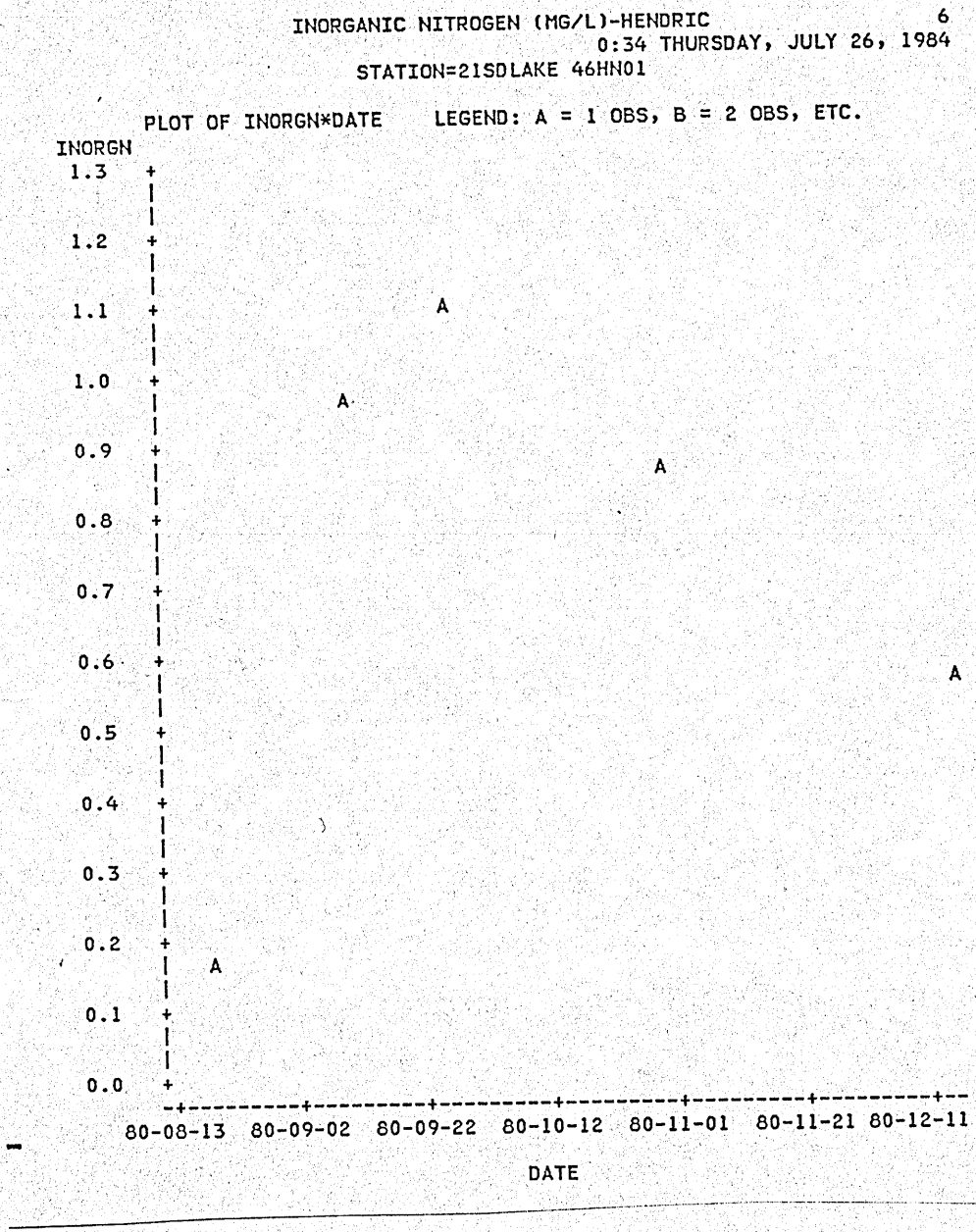

INORGANIC NITROGEN (MG/L)-HENDRIC 6
0:34 THURSDAY, JULY 26, 1984
STATION=21SDLAKE 46HN01
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
80-08-13 80-09-02 80-09-22 80-10-12 80-11-01 80-11-21 80-12-11
DATE

Figure IV-66.

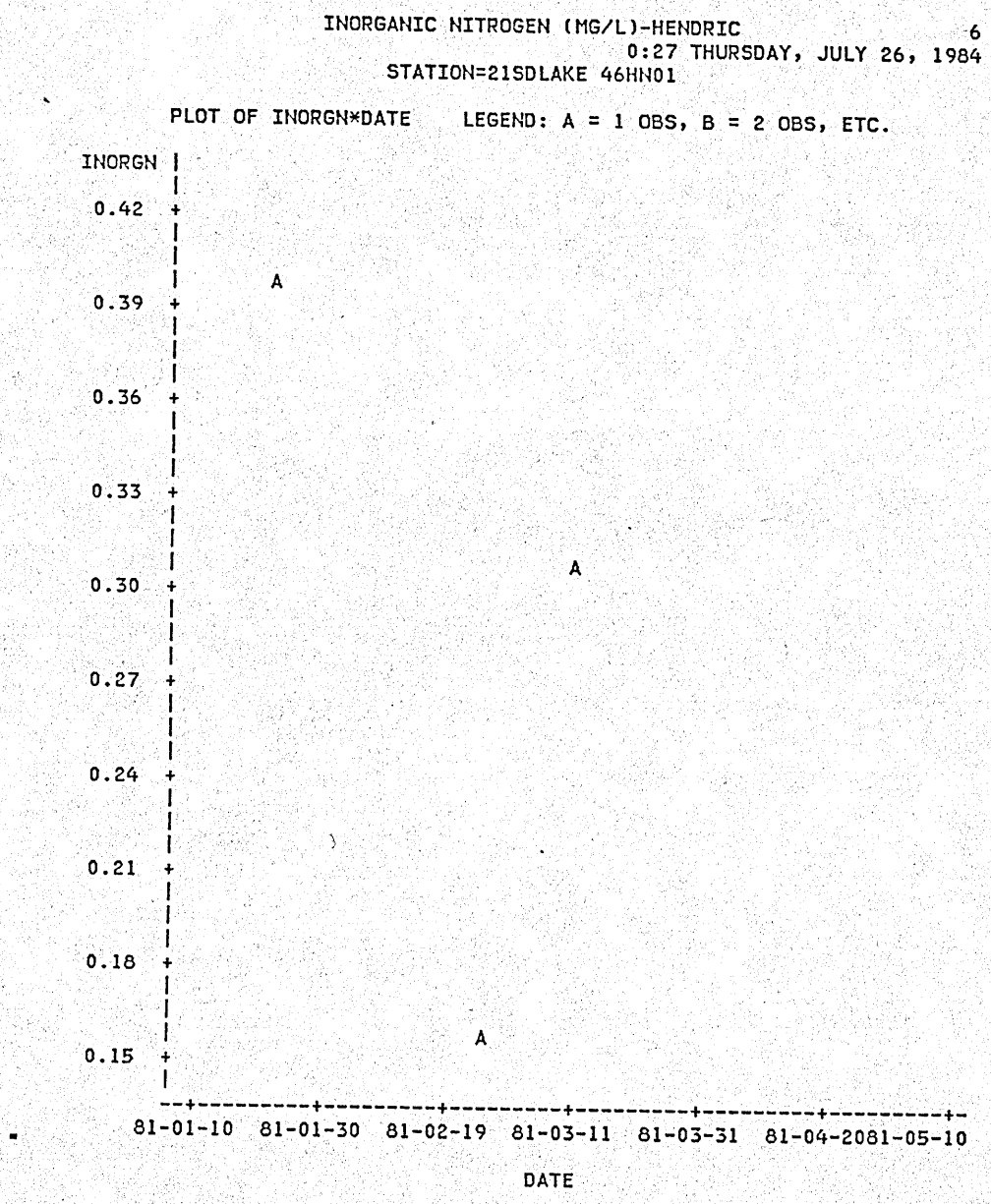

INORGANIC NITROGEN (MG/L)-HENDRIC
6
0:27 THURSDAY, JULY 26, 1984
STATION=21SDLAKE 46HN01
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
0.42
0.39
0.36
0.33
0.30
0.27
0.24
0.21
0.18
0.15
A
A
A
81-01-10 81-01-30 81-02-19 81-03-11 81-03-31 81-04-20 81-05-10
DATE

Figure IV-67.

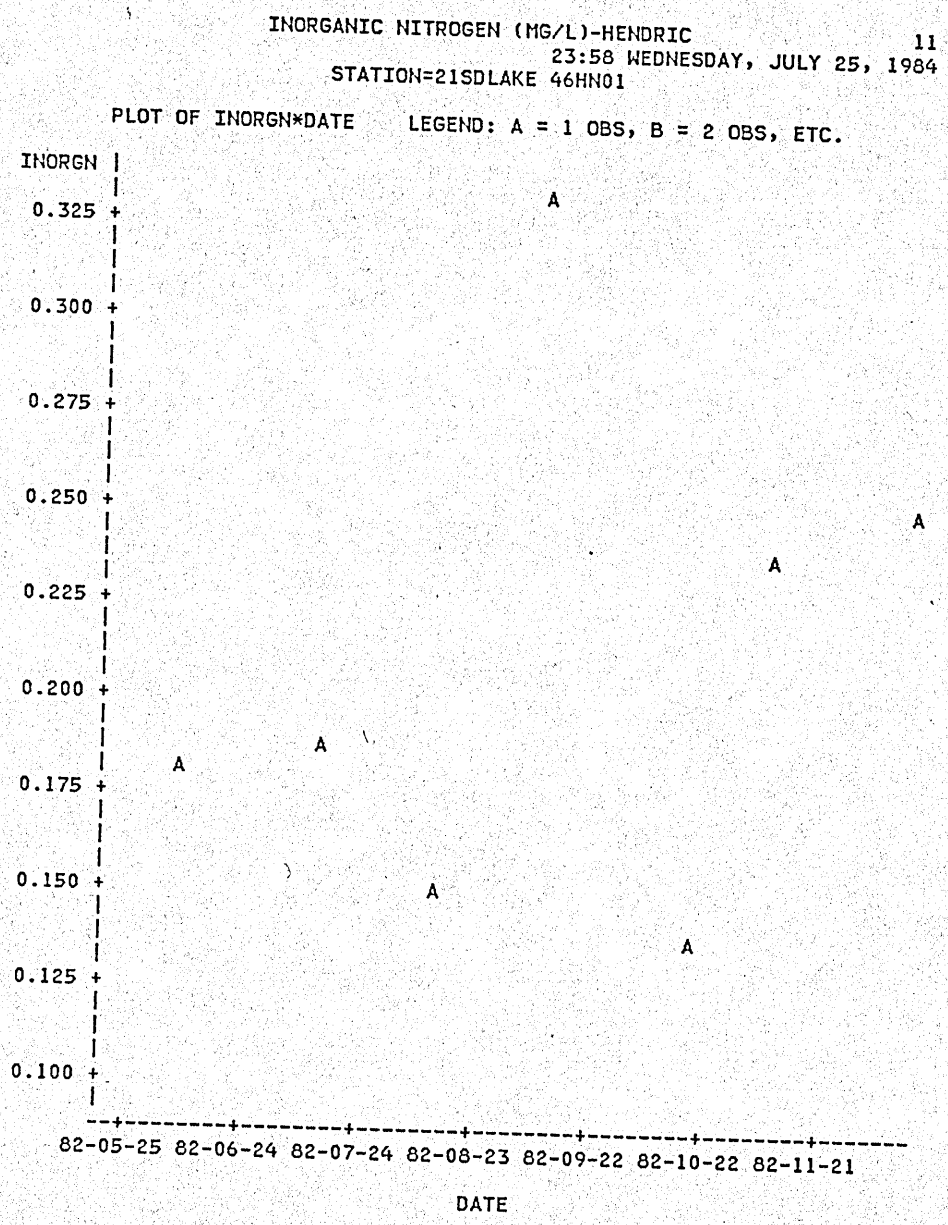

INORGANIC NITROGEN (MG/L)-HENDRIC
11
23:58 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN01
PLOT OF INORGN*DATE
LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
0.325
0.300
0.275
0.250
0.225
0.200
0.175
0.150
0.125
0.100
82-05-25 82-06-24 82-07-24 82-08-23 82-09-22 82-10-22 82-11-21
DATE

Figure IV-68.

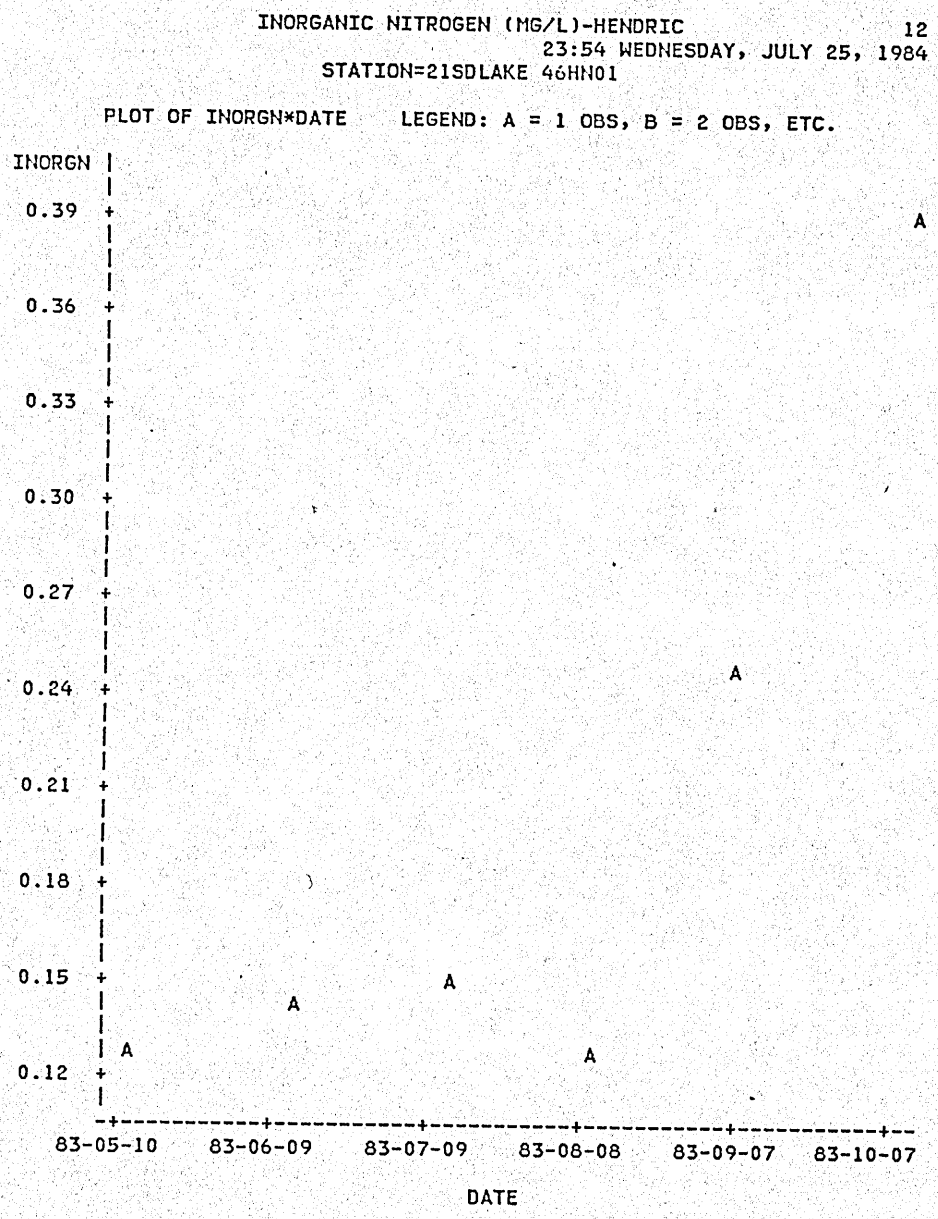

INORGANIC NITROGEN (MG/L)-HENDRIC 12
23:54 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN01
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
0.39
0.36
0.33
0.30
0.27
0.24
0.21
0.18
0.15
0.12
83-05-10
83-06-09
83-07-09
83-08-08
83-09-07
83-10-07
DATE

Figure IV-69.

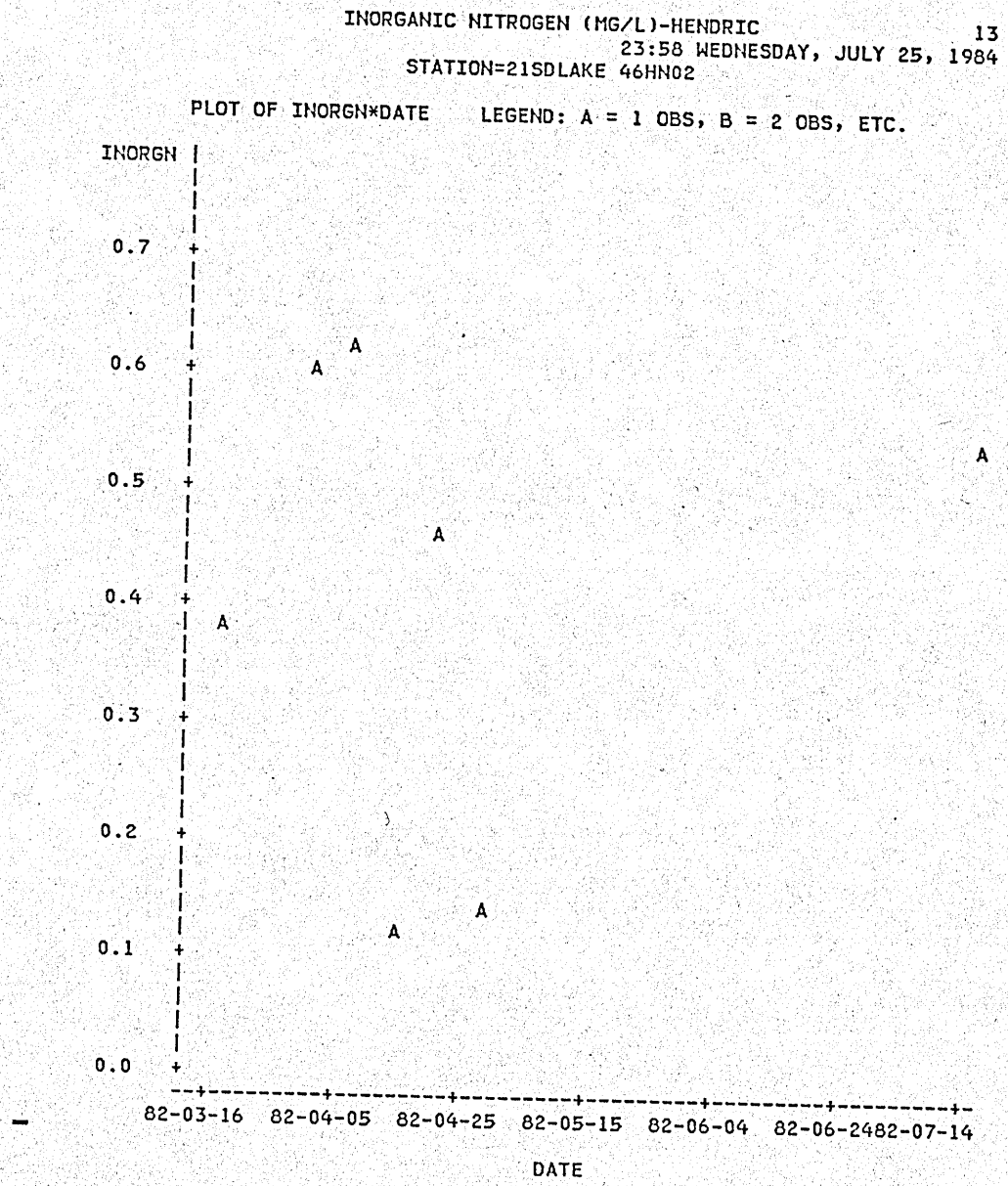

INORGANIC NITROGEN (MG/L)-HENDRIC 13
23:58 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN02
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
82-03-16
82-04-05
82-04-25
82-05-15
82-06-04
82-06-24
82-07-14
DATE

Figure IV-70.

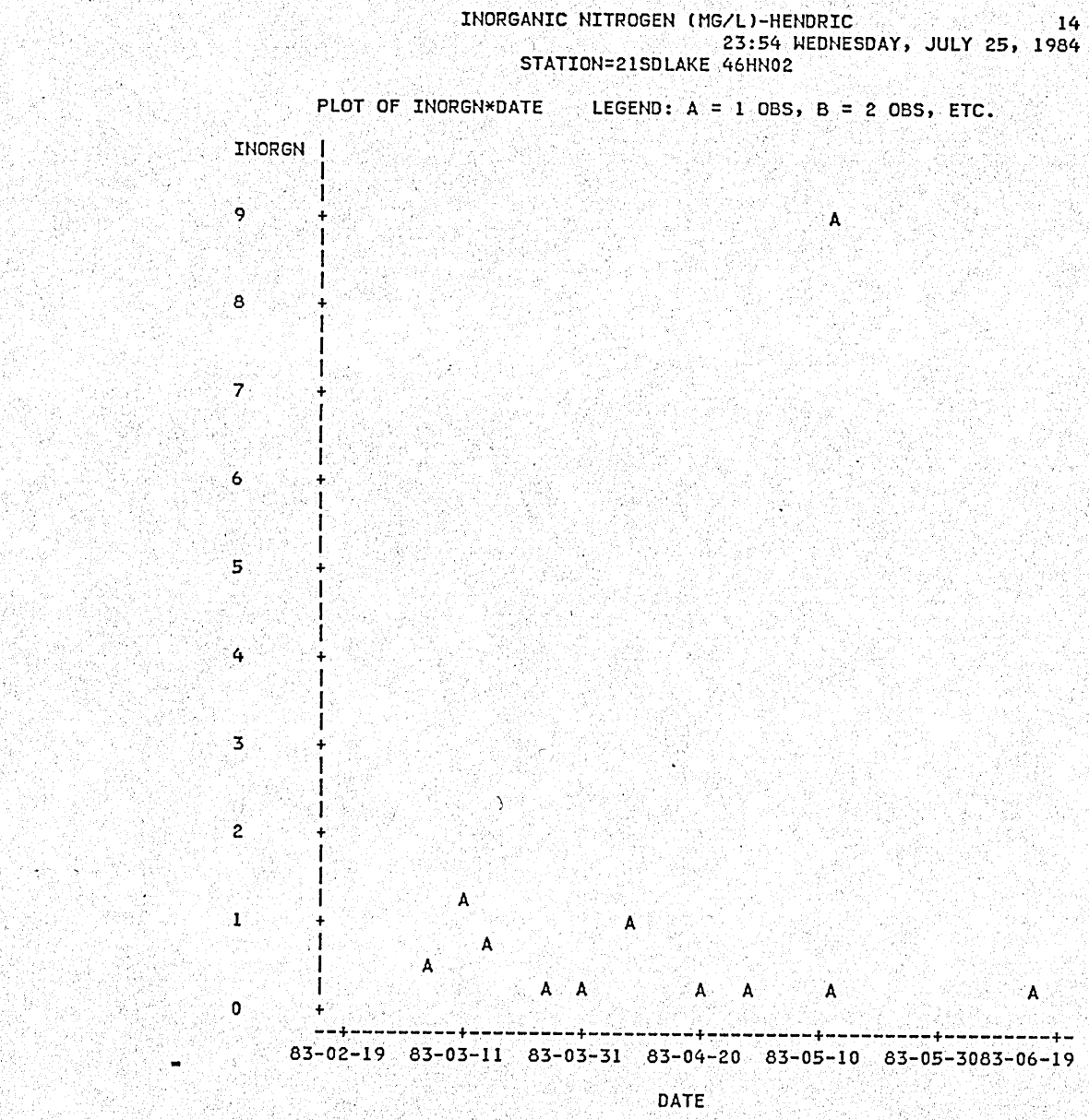

INORGANIC NITROGEN (MG/L)-HENDRIC 14
23:54 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN02
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
9
8
7
6
5
4
3
2
1
0
83-02-19 83-03-11 83-03-31 83-04-20 83-05-10 83-05-30 83-06-19
DATE

Figure IV-71.

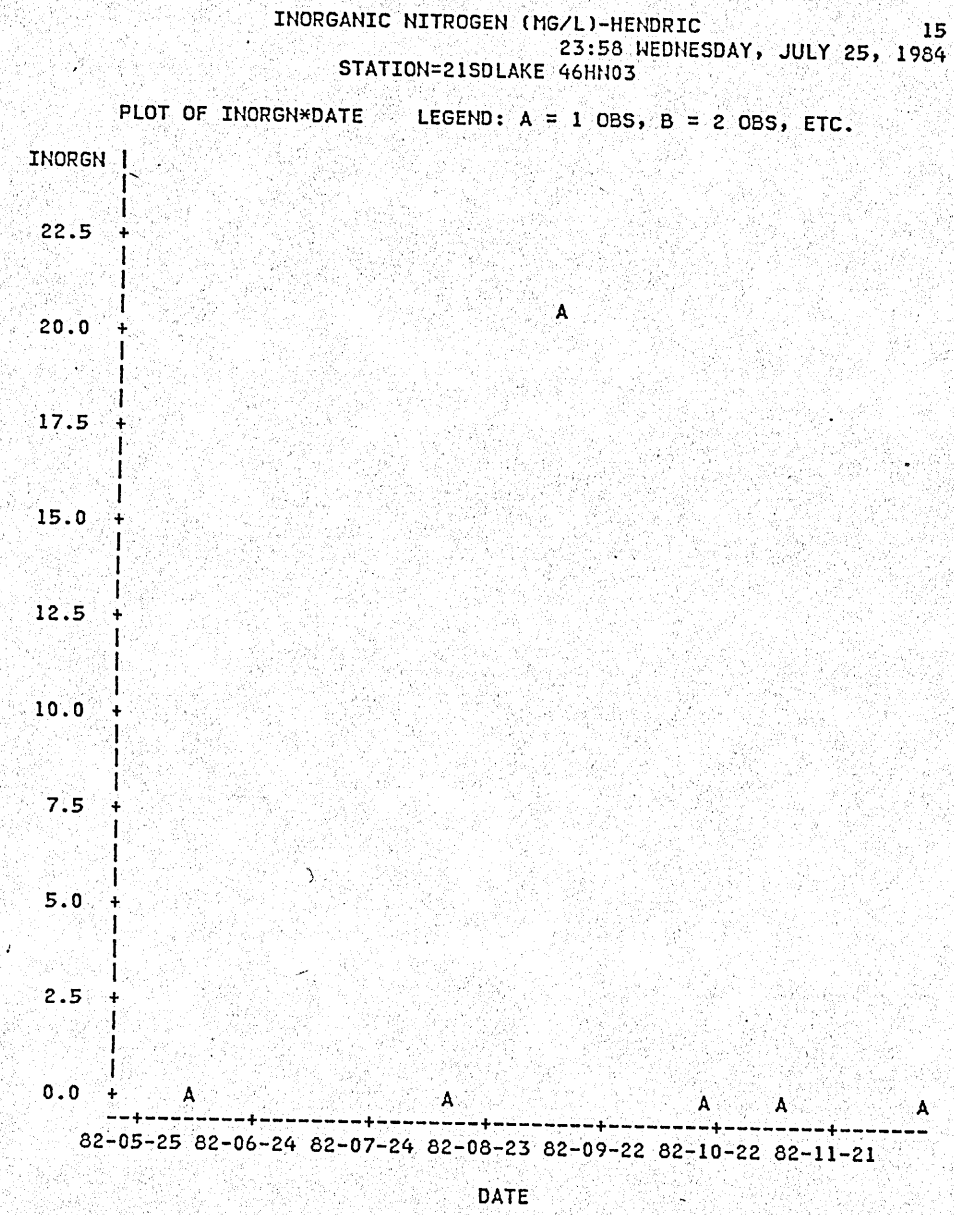

INORGANIC NITROGEN (MG/L)-HENDRIC 15
23:58 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN03
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
A
A
A
A
A
82-05-25 82-06-24 82-07-24 82-08-23 82-09-22 82-10-22 82-11-21
DATE
NOTE: 1 OBS HAD MISSING VALUES

Figure IV-72.

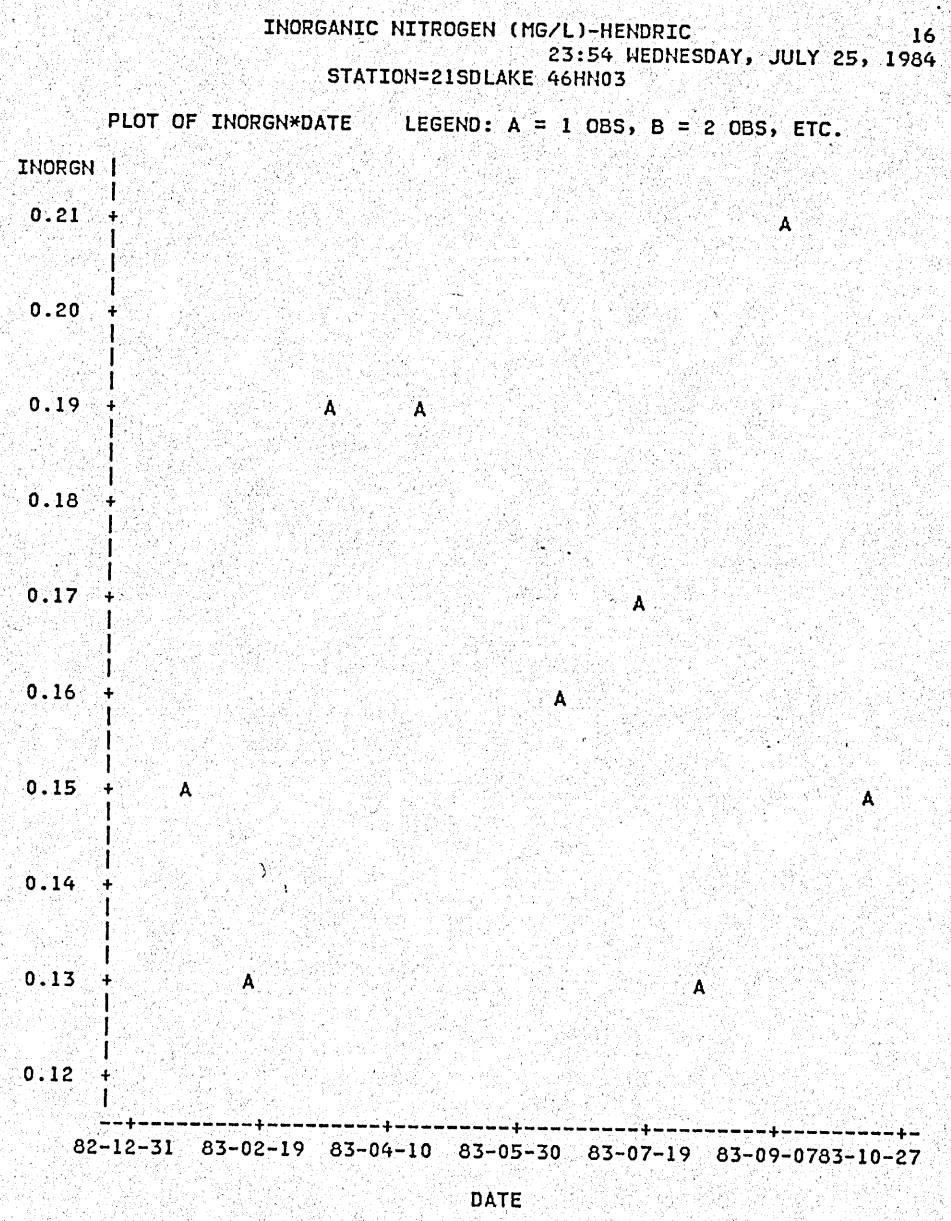

INORGANIC NITROGEN (MG/L)-HENDRIC 16
23:54 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN03
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
0.21
0.20
0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
82-12-31 83-02-19 83-04-10 83-05-30 83-07-19 83-09-07 83-10-27
DATE

Figure IV-73.

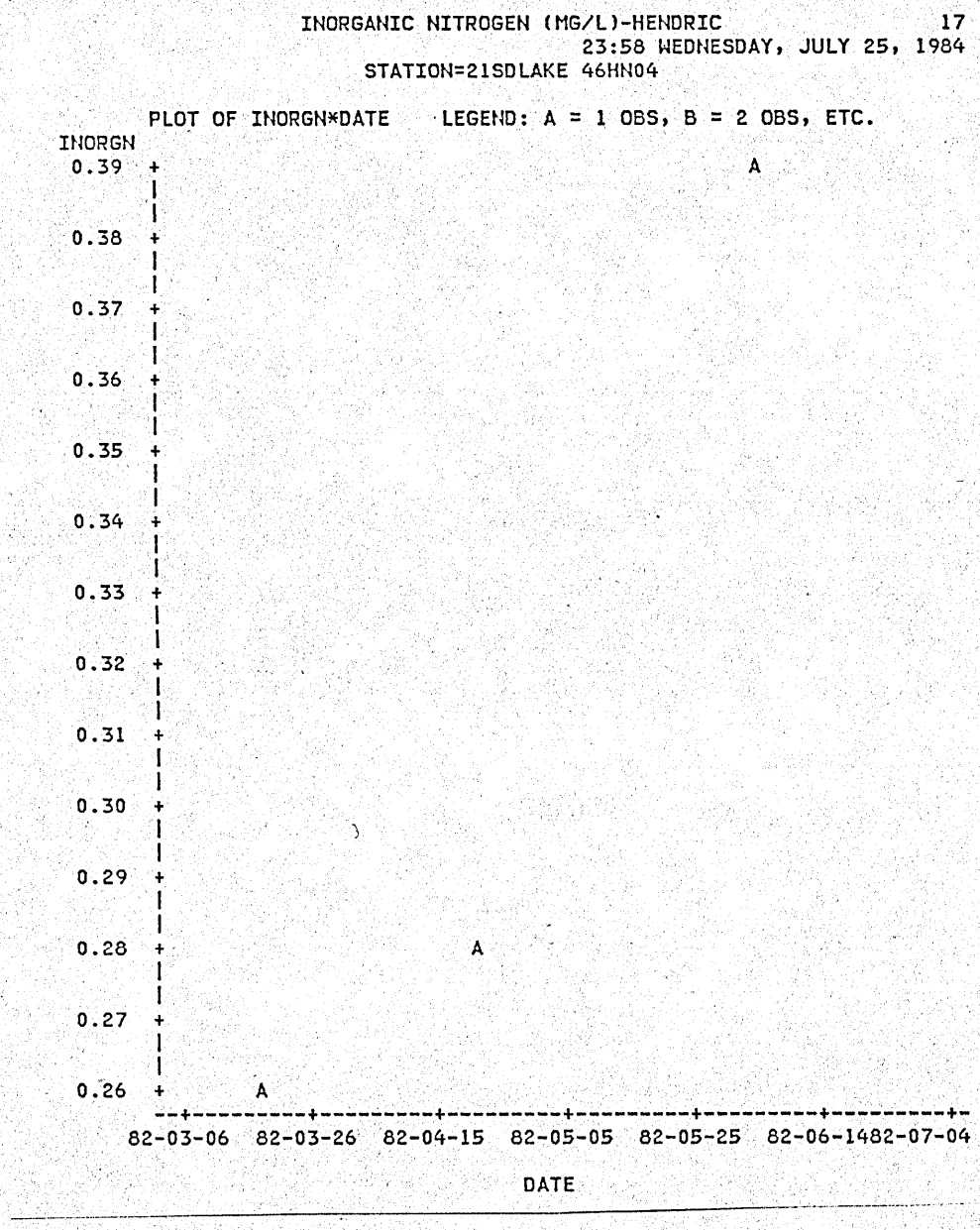

INORGANIC NITROGEN (MG/L)-HENDRIC 17
23:58 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN04
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
0.39
0.38
0.37
0.36
0.35
0.34
0.33
0.32
0.31
0.30
0.29
0.28
0.27
0.26
82-03-06
82-03-26
82-04-15
82-05-05
82-05-25
82-06-14
82-07-04
DATE

Figure IV-74.

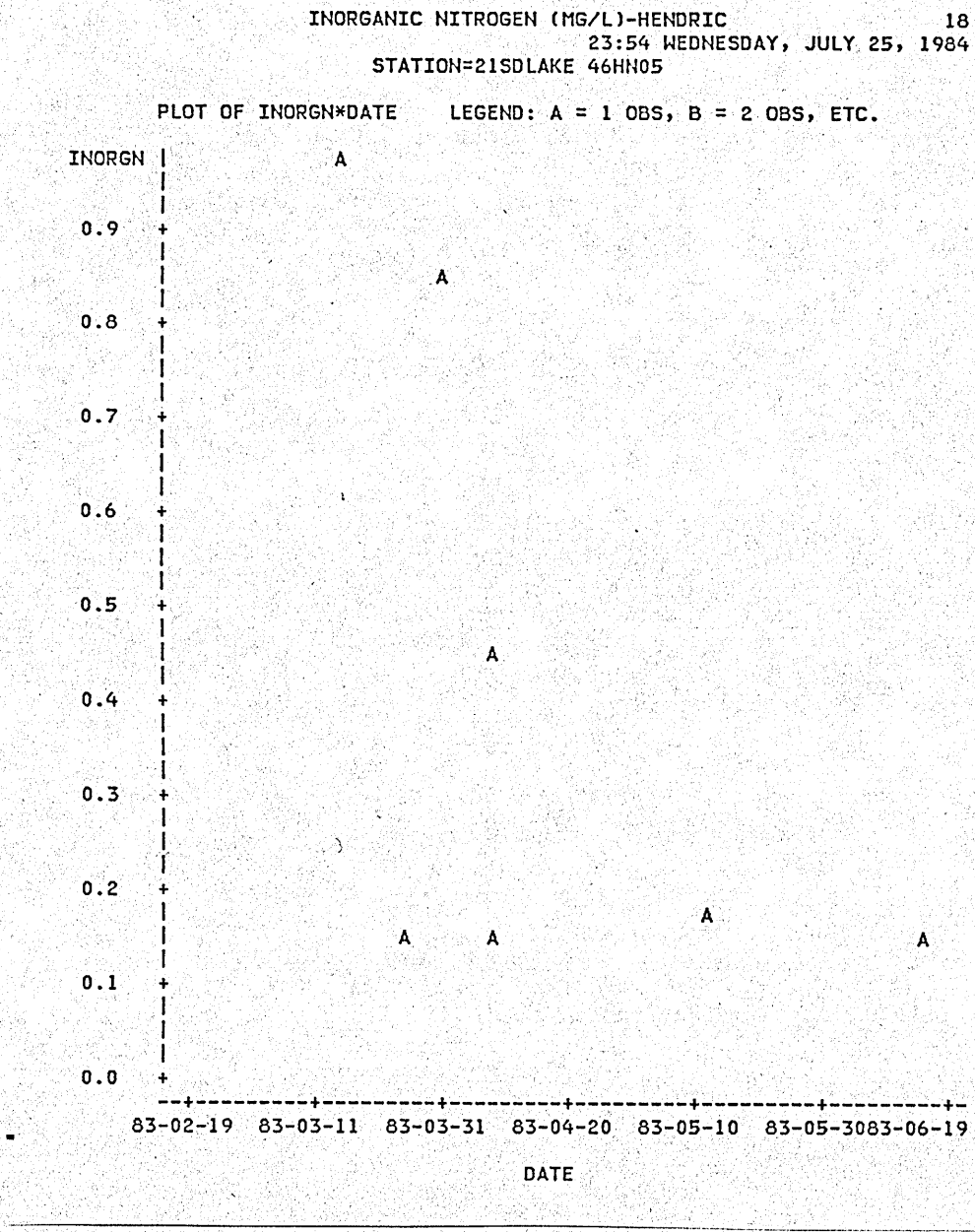

INORGANIC NITROGEN (MG/L)-HENDRIC 18
23:54 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN05
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
83-02-19 83-03-11 83-03-31 83-04-20 83-05-10 83-05-30 83-06-19
DATE

Figure IV-75.

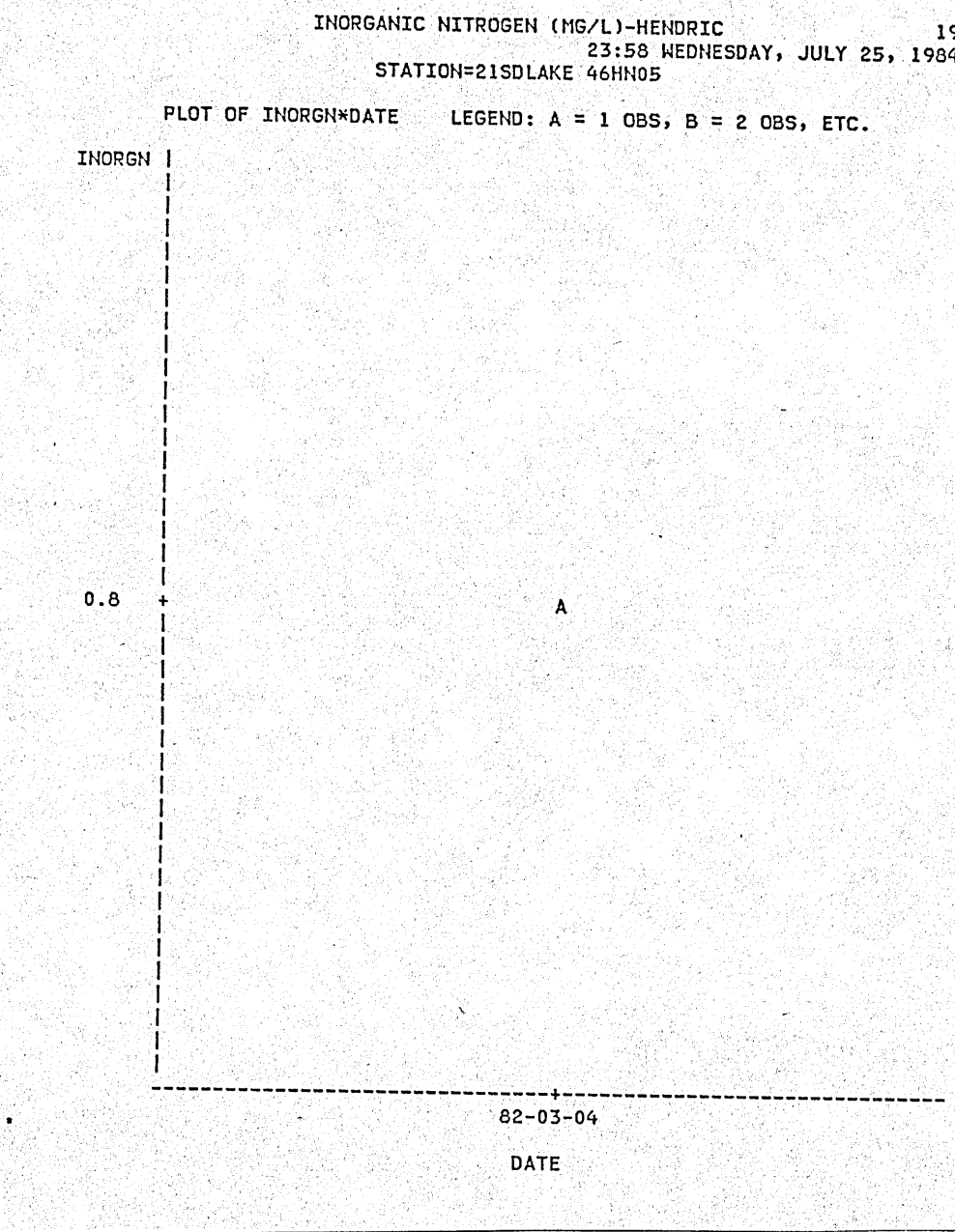

INORGANIC NITROGEN (MG/L)-HENDRIC 19
23:58 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN05
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
0.8
A
82-03-04
DATE

Figure IV-76.

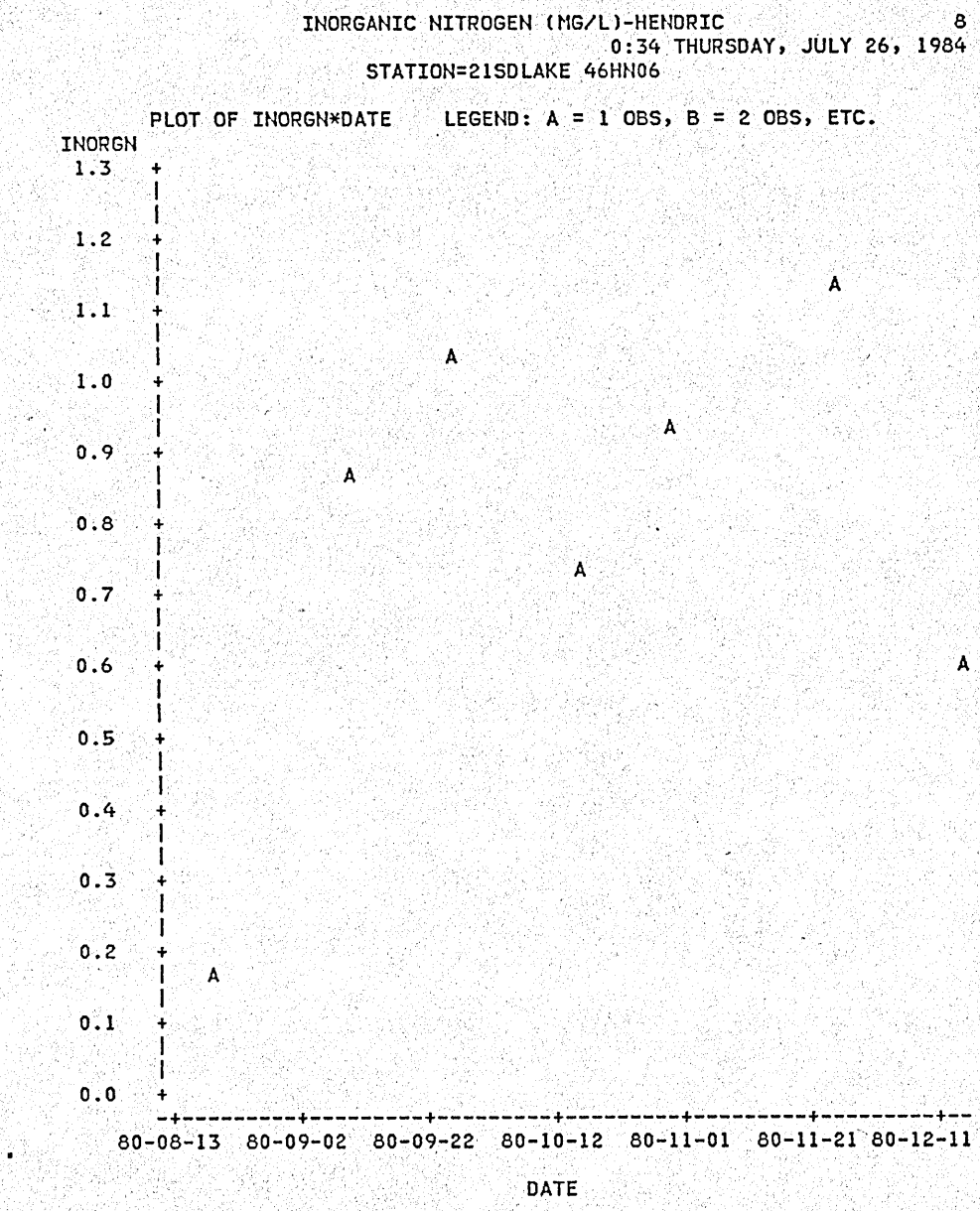

INORGANIC NITROGEN (MG/L)-HENDRIC 8
0:34 THURSDAY, JULY 26, 1984
STATION=21SDLAKE 46HN06
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
80-08-13 80-09-02 80-09-22 80-10-12 80-11-01 80-11-21 80-12-11
DATE

Figure IV-77.

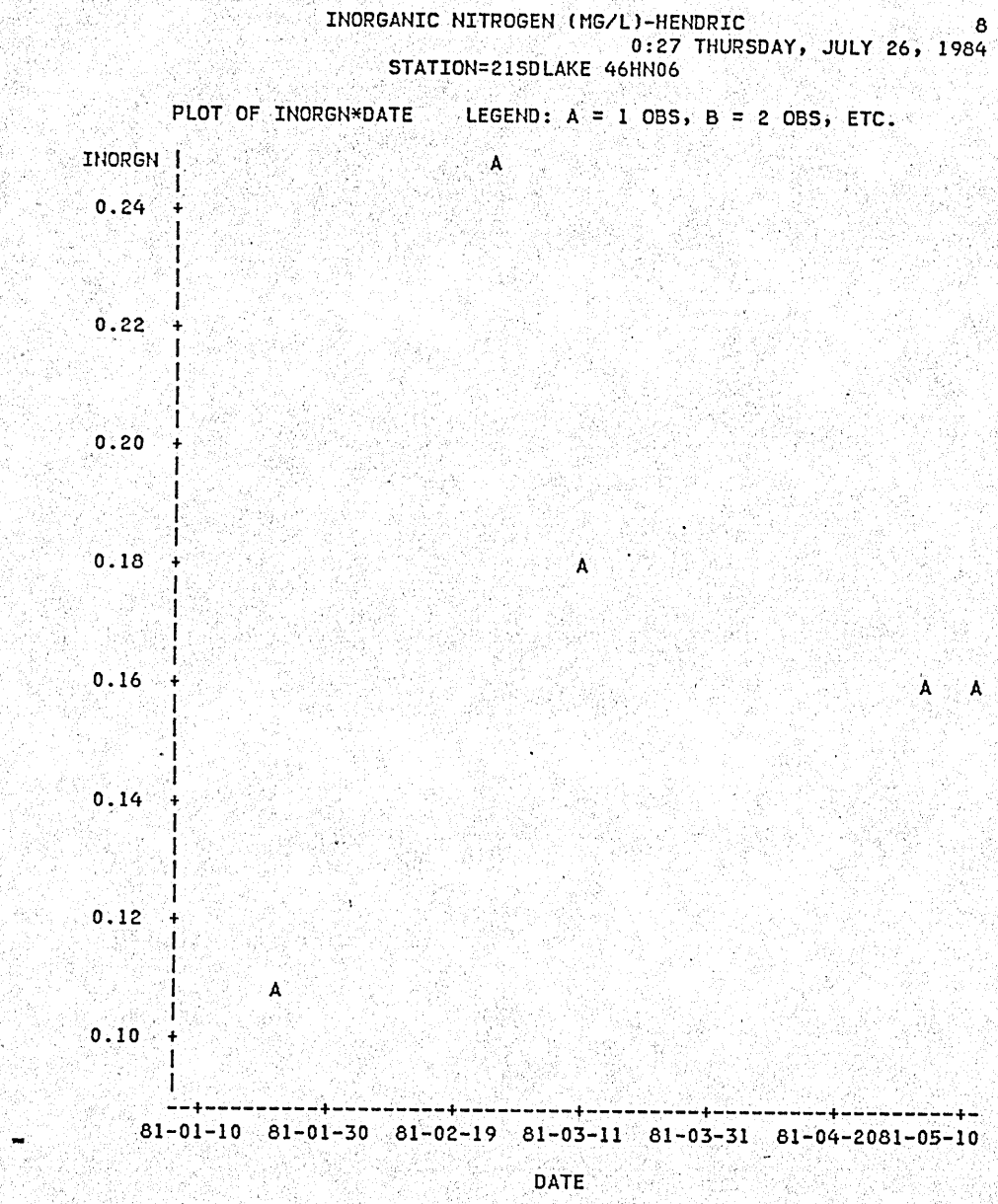

INORGANIC NITROGEN (MG/L)-HENDRIC 8
0:27 THURSDAY, JULY 26, 1984
STATION=21SDLAKE 46HN06
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.10
81-01-10 81-01-30 81-02-19 81-03-11 81-03-31 81-04-20 81-05-10
DATE

Figure IV-78.

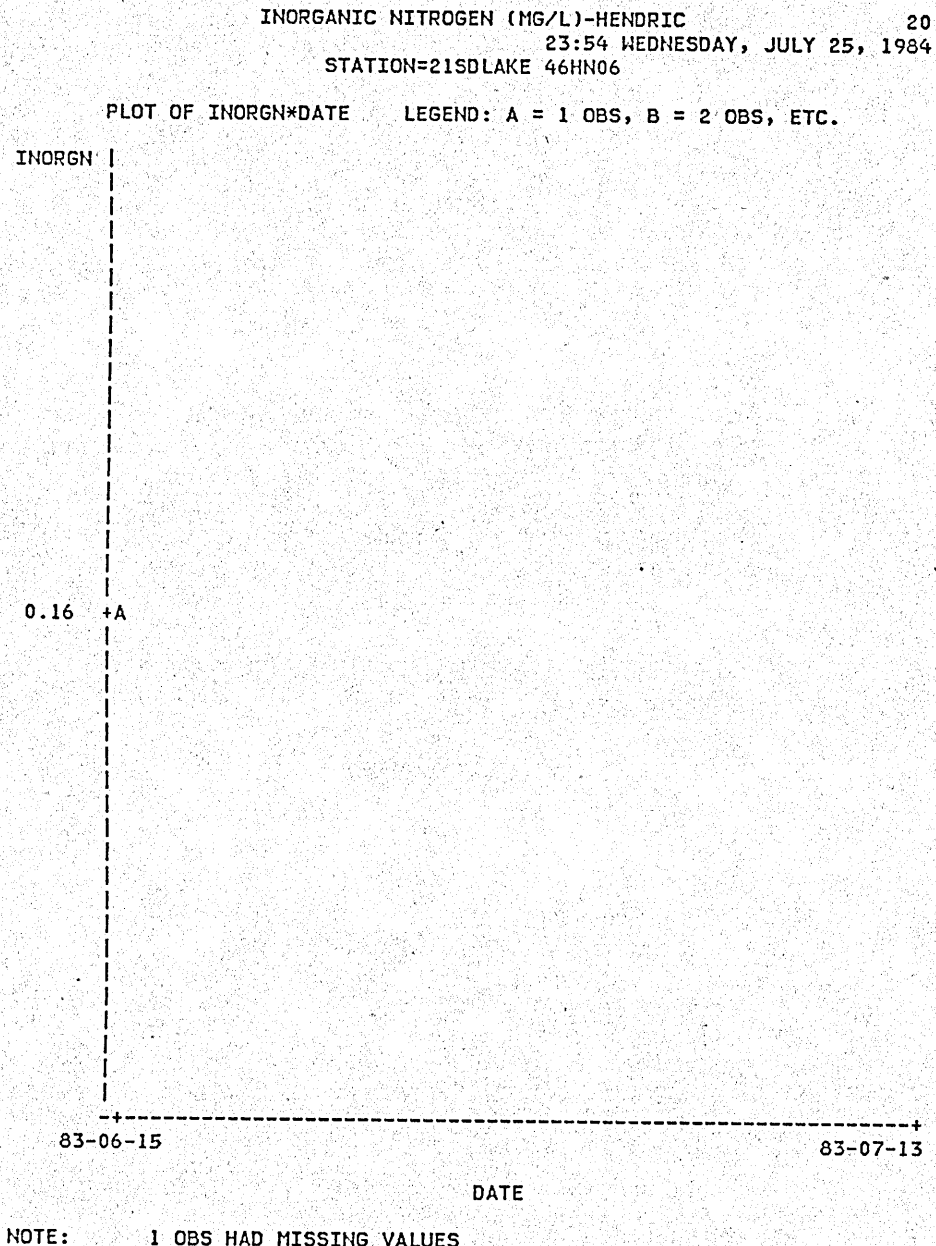

INORGANIC NITROGEN (MG/L)-HENDRIC 20
23:54 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN06
PLOT OF INORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
INORGN
0.16 +A
83-06-15
83-07-13
DATE
NOTE: 1 OBS HAD MISSING VALUES

Figure IV-79.

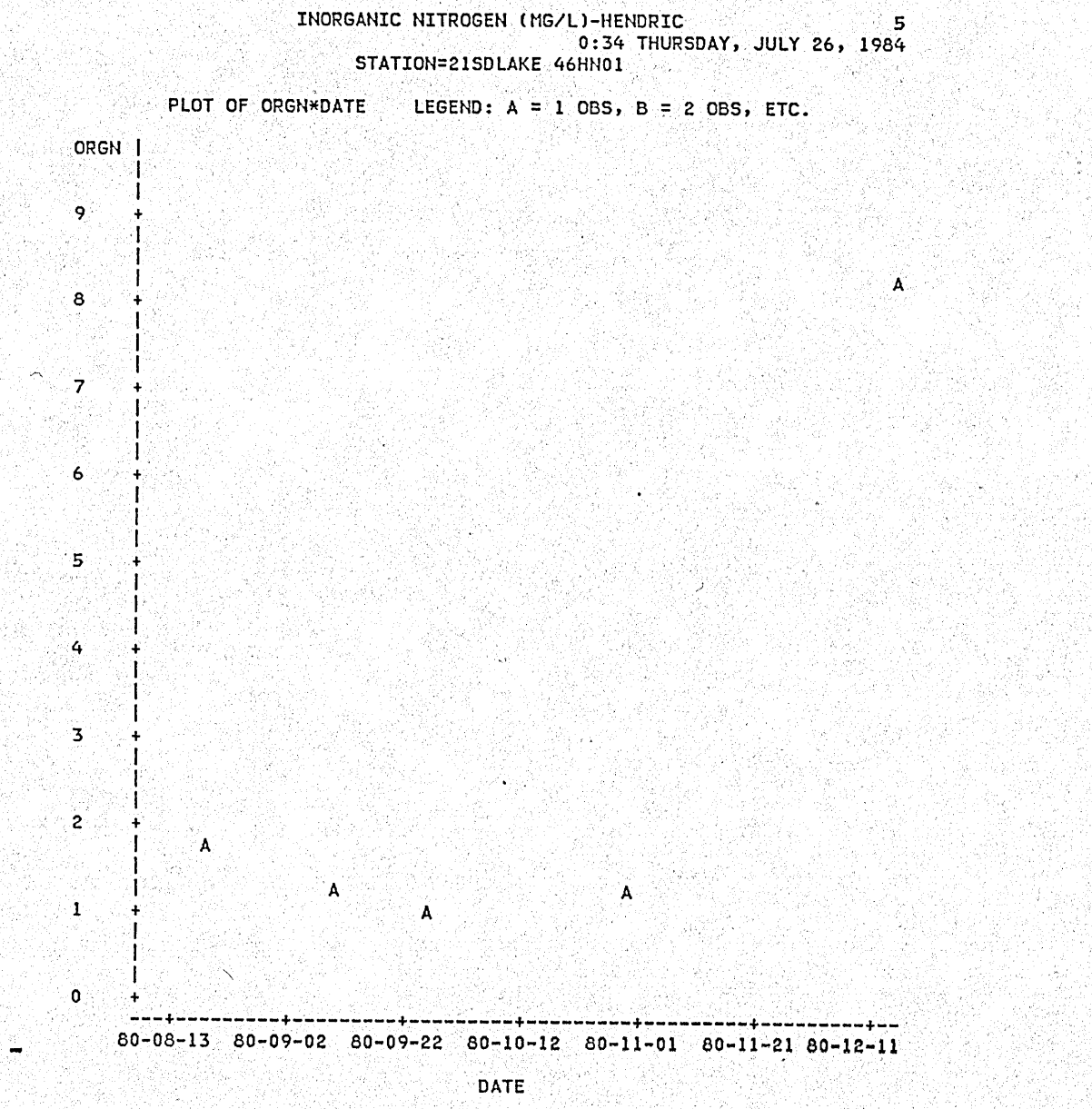

INORGANIC NITROGEN (MG/L)-HENDRIC 5
0:34 THURSDAY, JULY 26, 1984
STATION=21SDLAKE 46HN01
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
9
8
7
6
5
4
3
2
1
0
A
A
A
A
A
80-08-13 80-09-02 80-09-22 80-10-12 80-11-01 80-11-21 80-12-11
DATE

Figure IV-80.

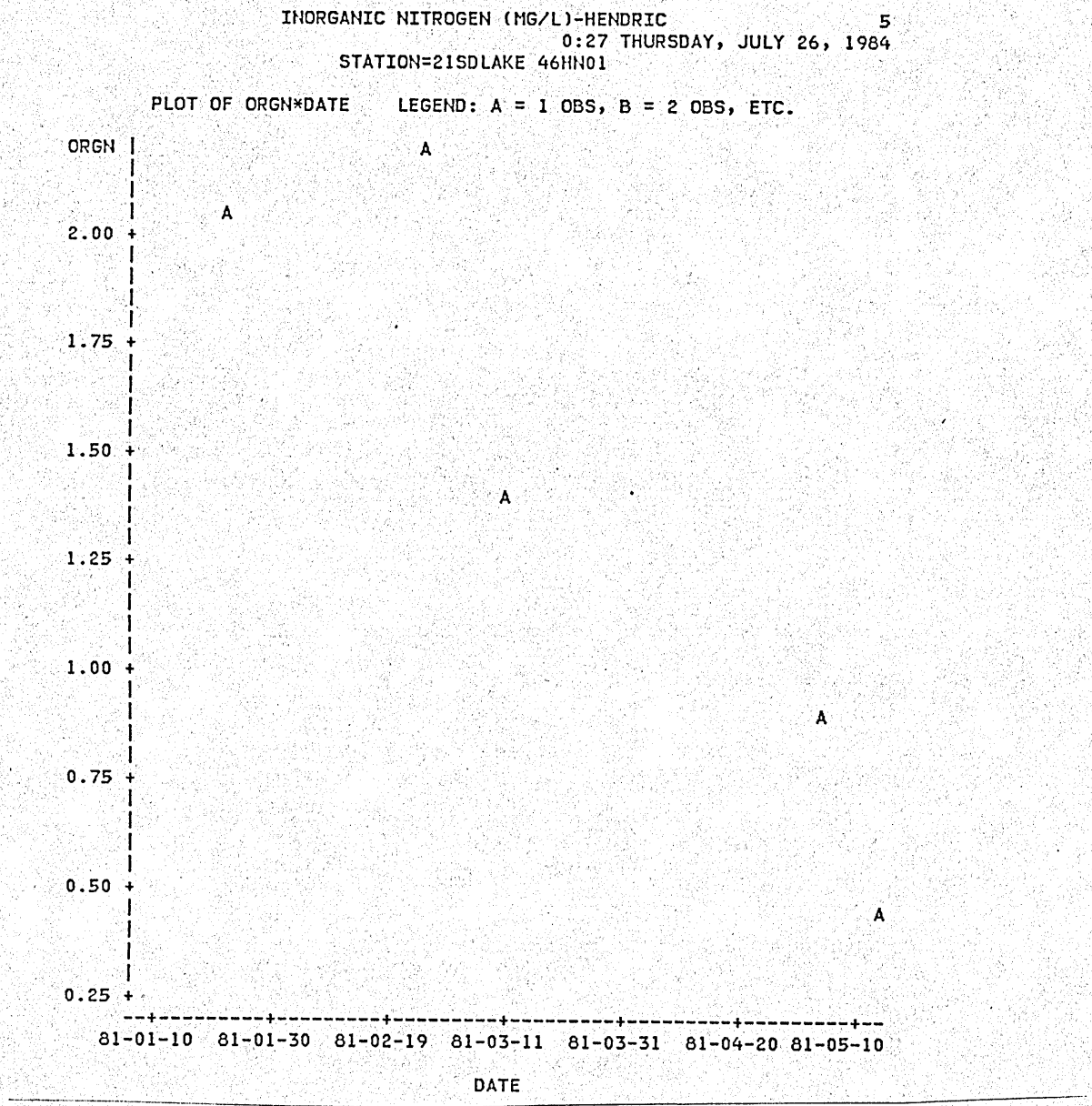

INORGANIC NITROGEN (MG/L)-HENDRIC 5
0:27 THURSDAY, JULY 26, 1984
STATION=21SDLAKE 46HN01
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
81-01-10
81-01-30
81-02-19
81-03-11
81-03-31
81-04-20
81-05-10
DATE

Figure IV-81.

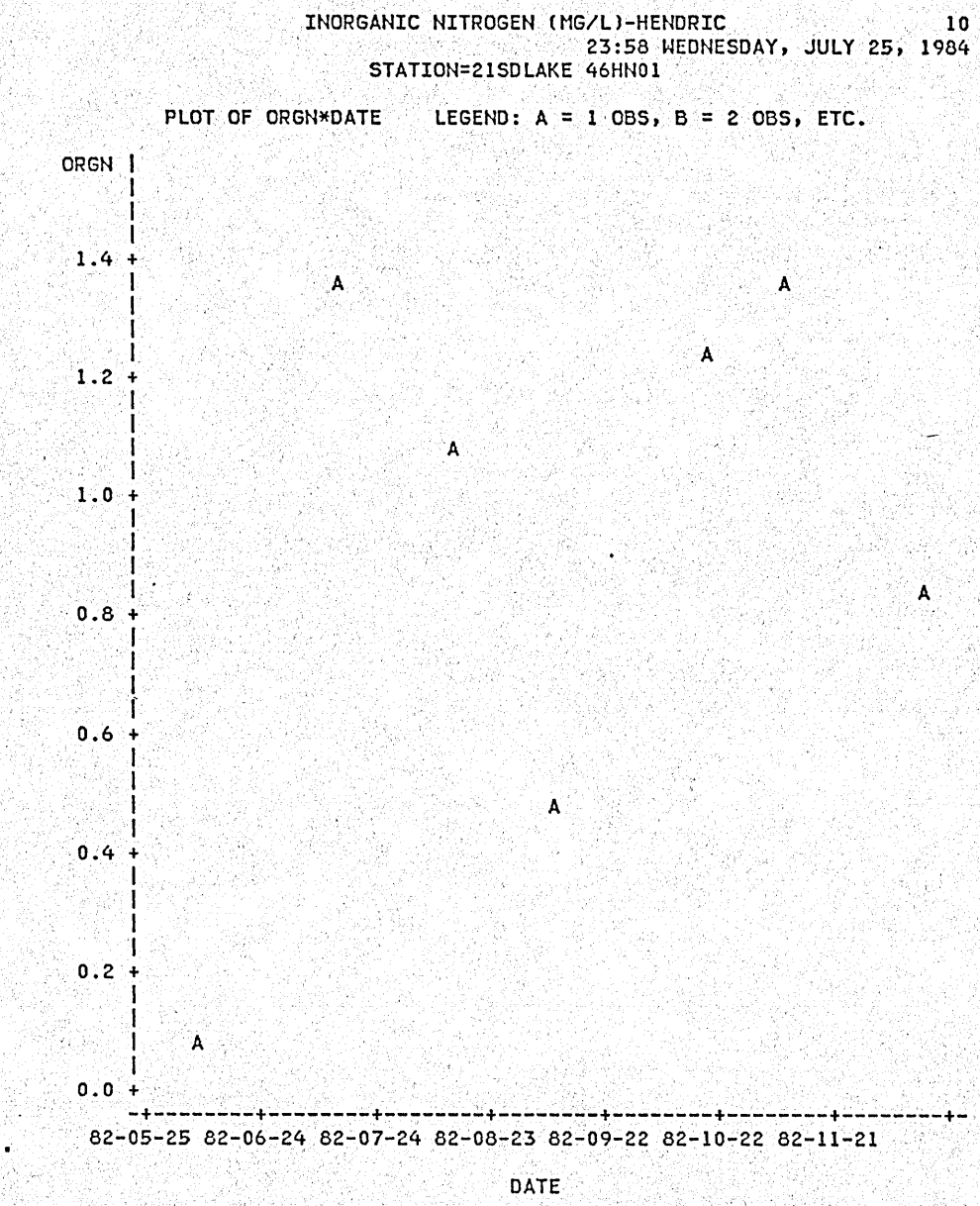

INORGANIC NITROGEN (MG/L)-HENDRIC 10
23:58 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN01
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
82-05-25 82-06-24 82-07-24 82-08-23 82-09-22 82-10-22 82-11-21
DATE

Figure IV-82.

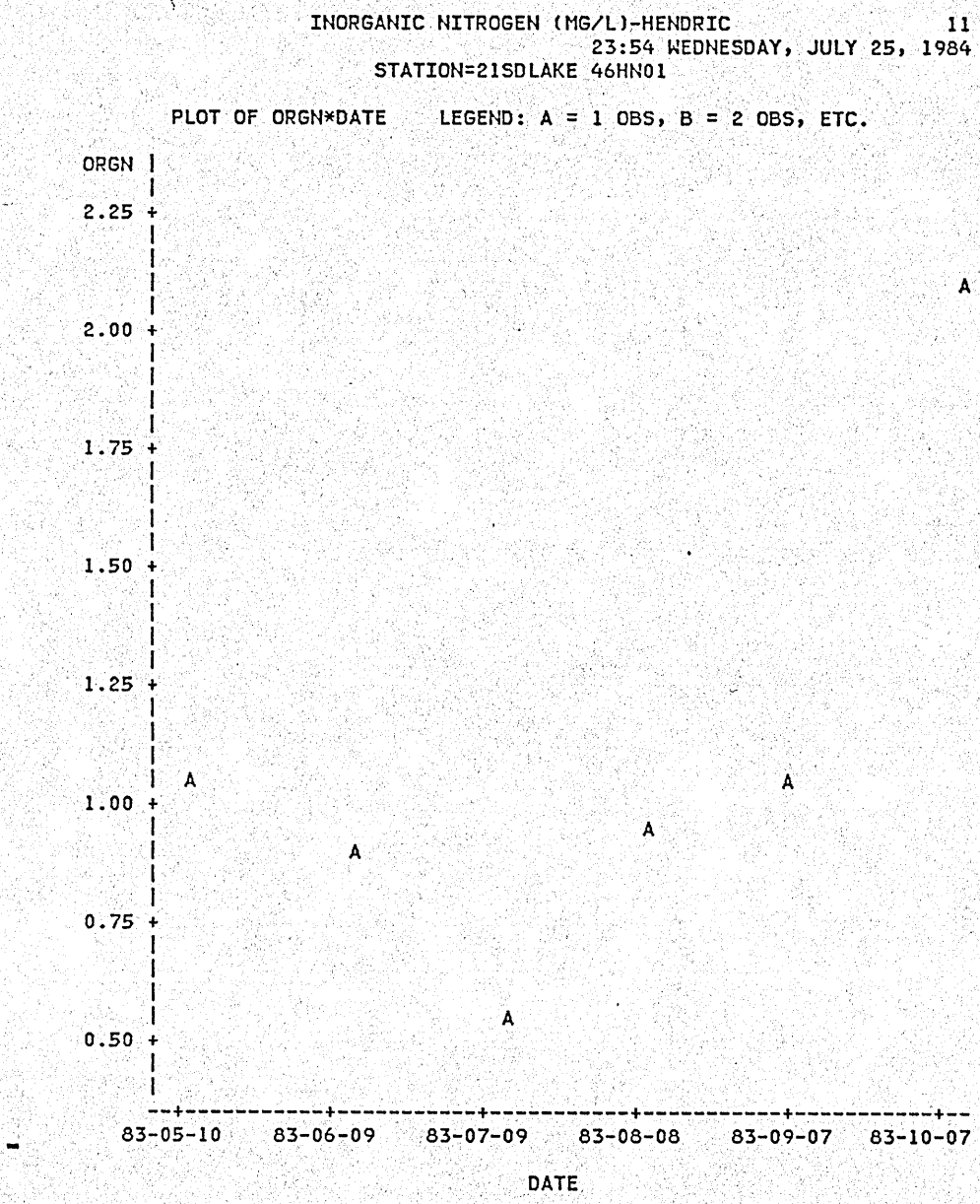

INORGANIC NITROGEN (MG/L)-HENDRIC 11
23:54 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN01
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
83-05-10
83-06-09
83-07-09
83-08-08
83-09-07
83-10-07
DATE

Figure IV-83.

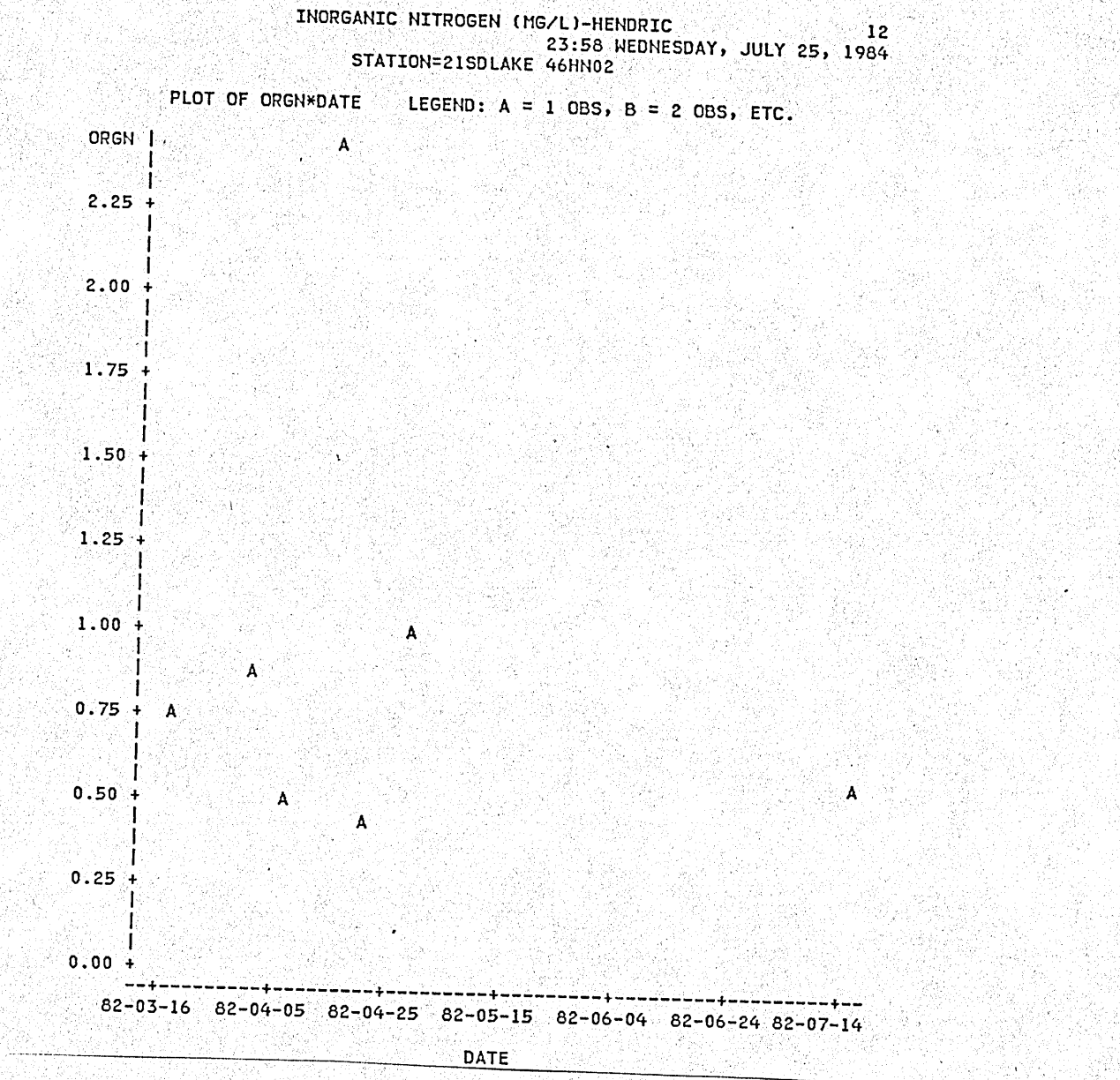

INORGANIC NITROGEN (MG/L)-HENDRIC
12
23:58 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN02
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
82-03-16
82-04-05
82-04-25
82-05-15
82-06-04
82-06-24
82-07-14
DATE

Figure IV-84.

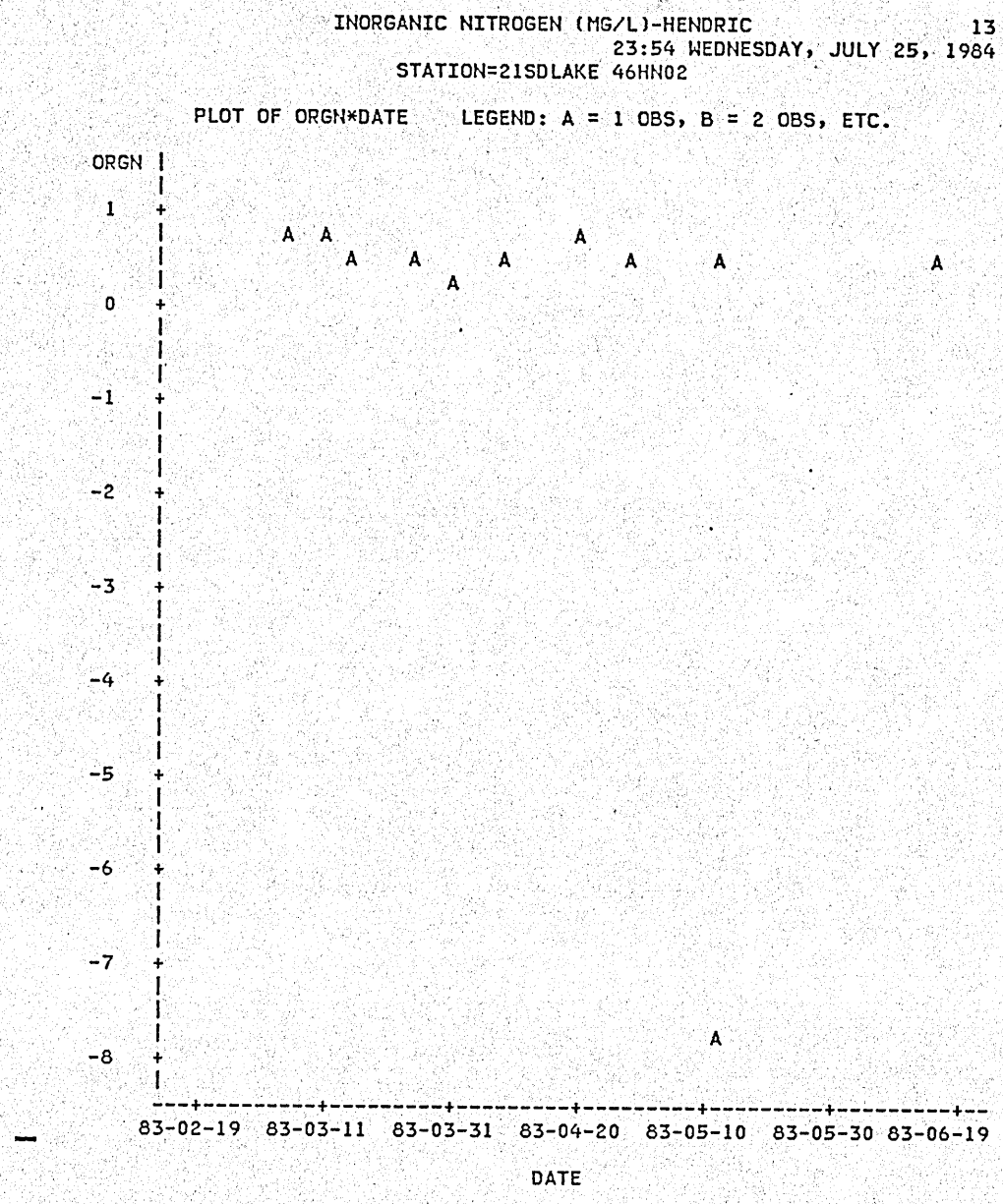

INORGANIC NITROGEN (MG/L)-HENDRIC 13
23:54 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN02
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
1
0
-1
-2
-3
-4
-5
-6
-7
-8
83-02-19 83-03-11 83-03-31 83-04-20 83-05-10 83-05-30 83-06-19
DATE

Figure IV-85.

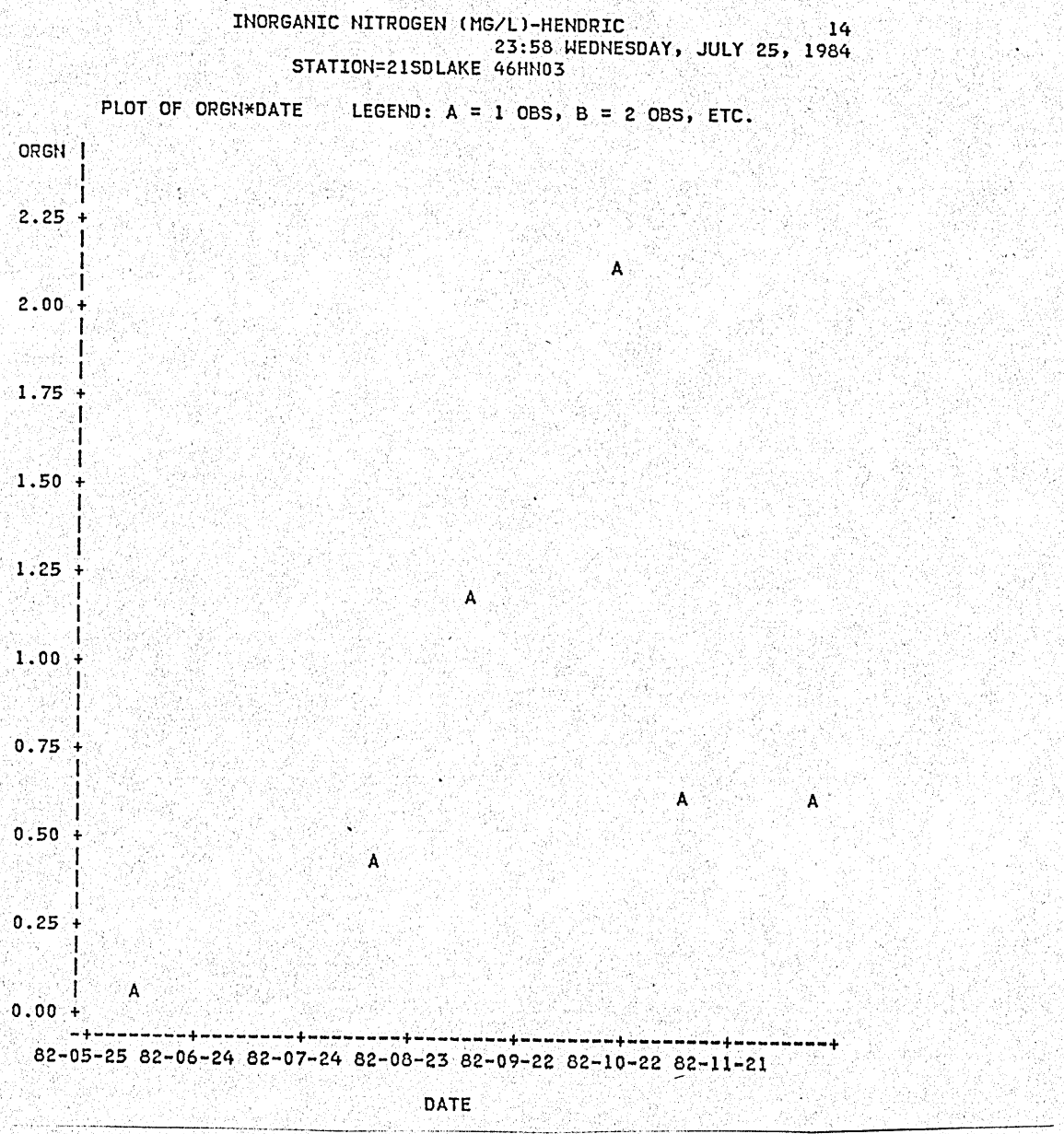

INORGANIC NITROGEN (MG/L)-HENDRIC 14
23:58 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN03
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
82-05-25 82-06-24 82-07-24 82-08-23 82-09-22 82-10-22 82-11-21
DATE

Figure IV-86.

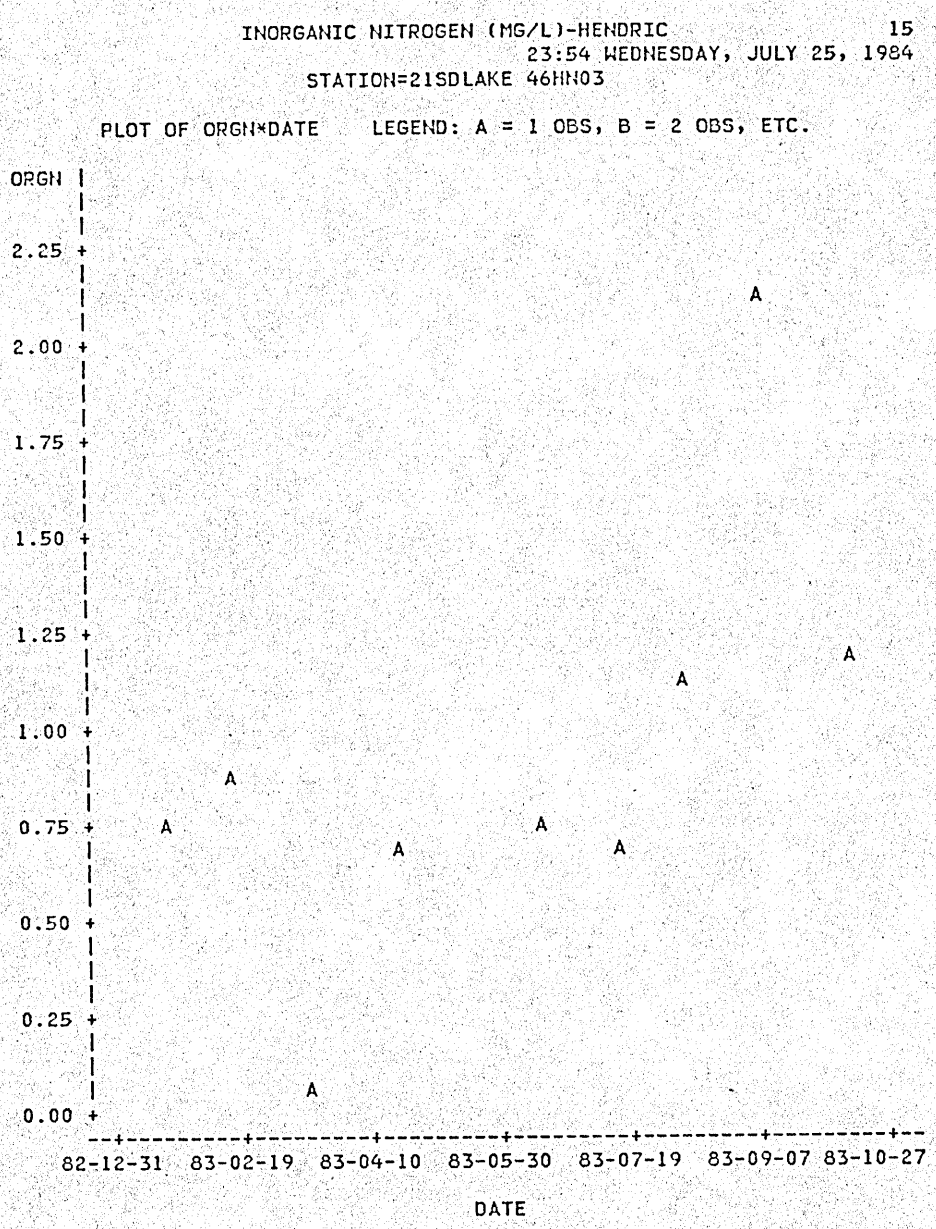

INORGANIC NITROGEN (MG/L)-HENDRIC 15
23:54 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN03
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
82-12-31 83-02-19 83-04-10 83-05-30 83-07-19 83-09-07 83-10-27
DATE

Figure IV-87.

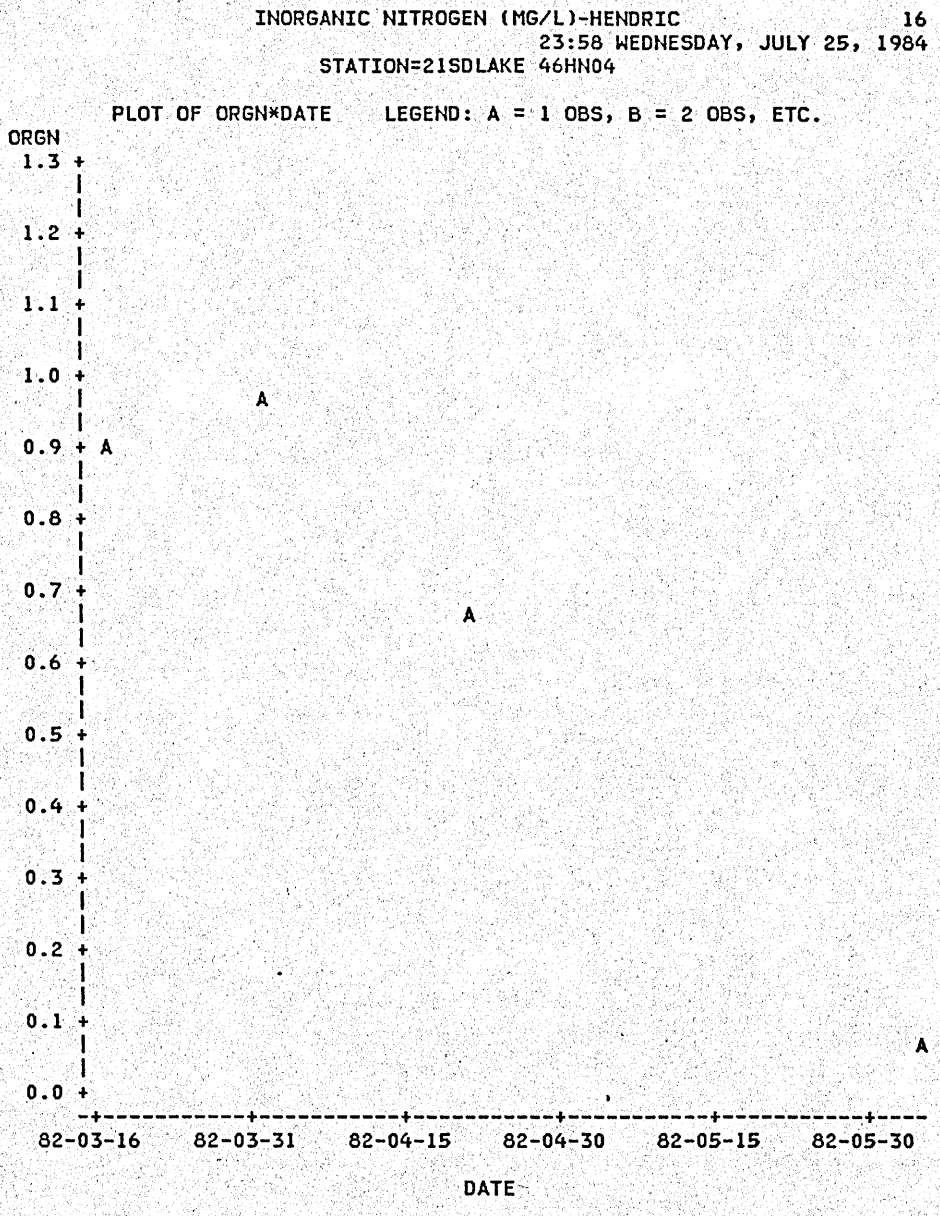

INORGANIC NITROGEN (MG/L)-HENDRIC 16
23:58 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN04
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
82-03-16
82-03-31
82-04-15
82-04-30
82-05-15
82-05-30
DATE

Figure IV-88.

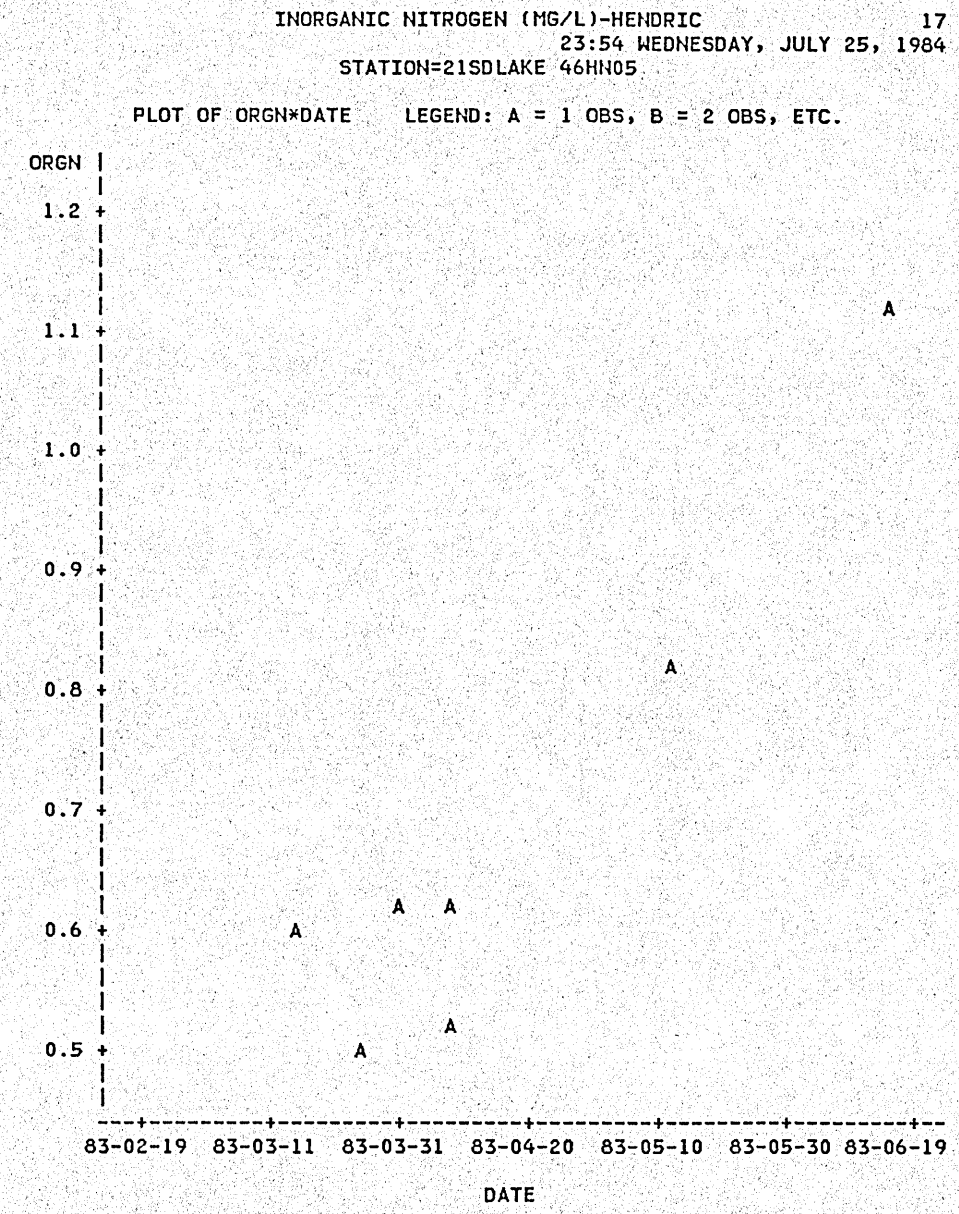

INORGANIC NITROGEN (MG/L)-HENDRIC 17
23:54 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN05
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
83-02-19
83-03-11
83-03-31
83-04-20
83-05-10
83-05-30
83-06-19
DATE

Figure IV-89.

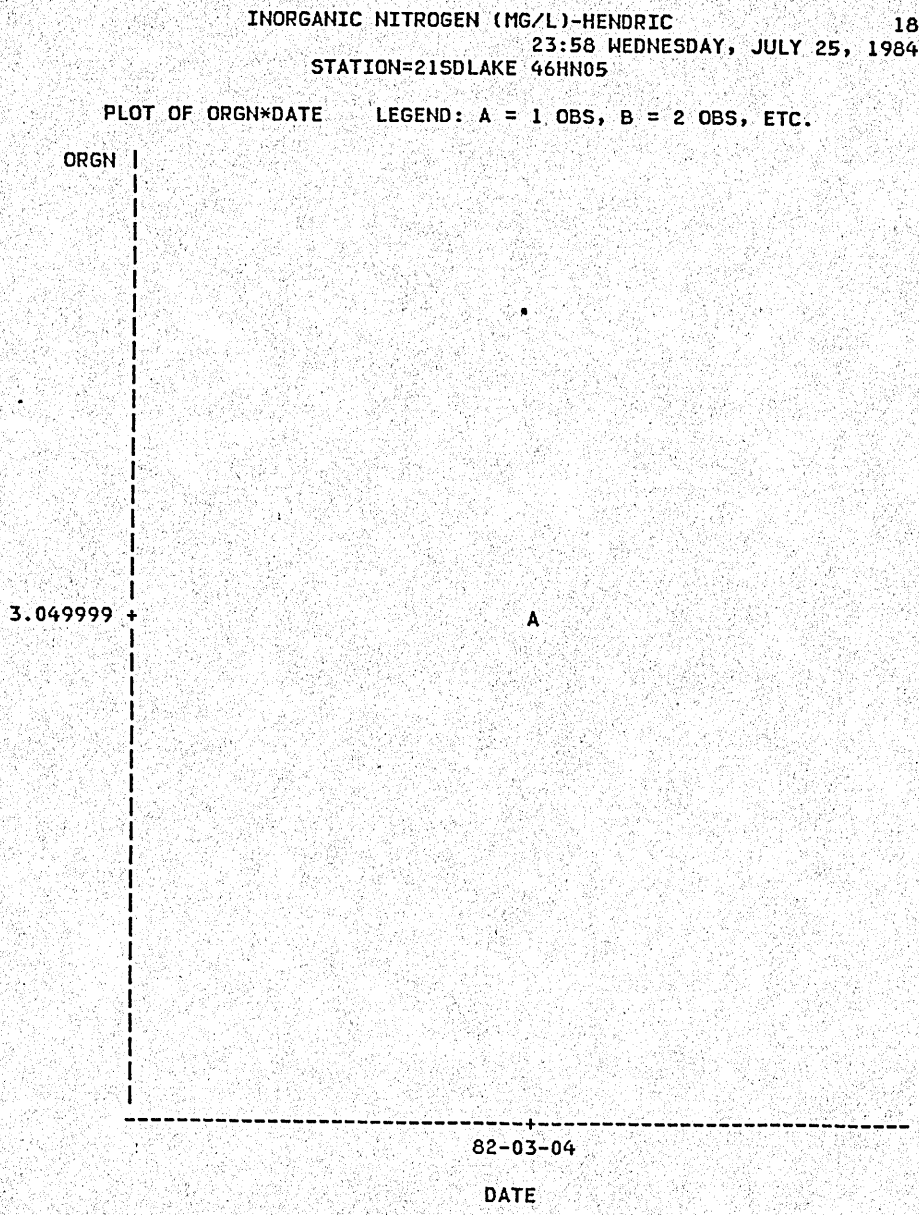

INORGANIC NITROGEN (MG/L)-HENDRIC 18
23:58 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN05
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
3.049999
A
82-03-04
DATE

Figure IV-90.

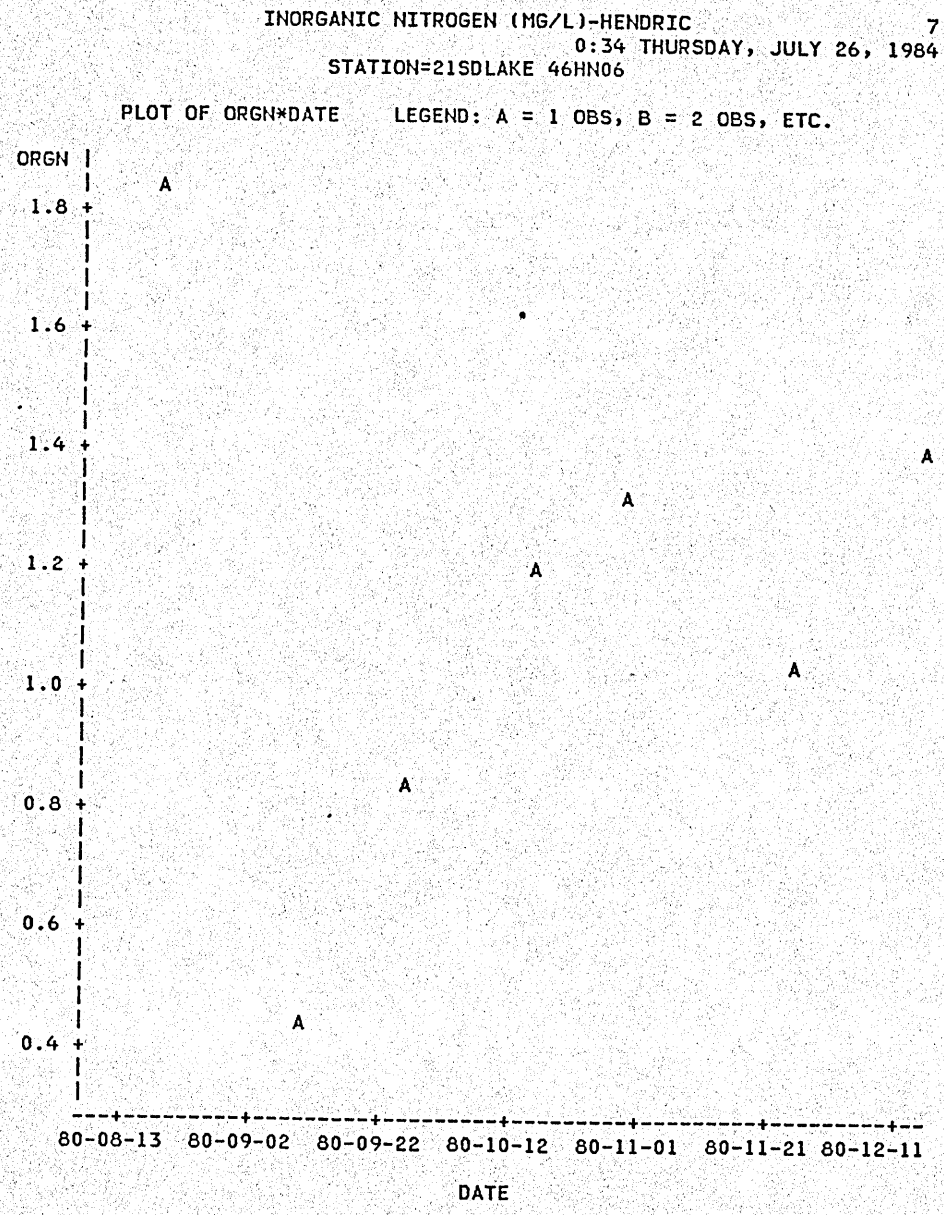

INORGANIC NITROGEN (MG/L)-HENDRIC 7
0:34 THURSDAY, JULY 26, 1984
STATION=21SDLAKE 46HN06
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
80-08-13 80-09-02 80-09-22 80-10-12 80-11-01 80-11-21 80-12-11
DATE

Figure IV-91.

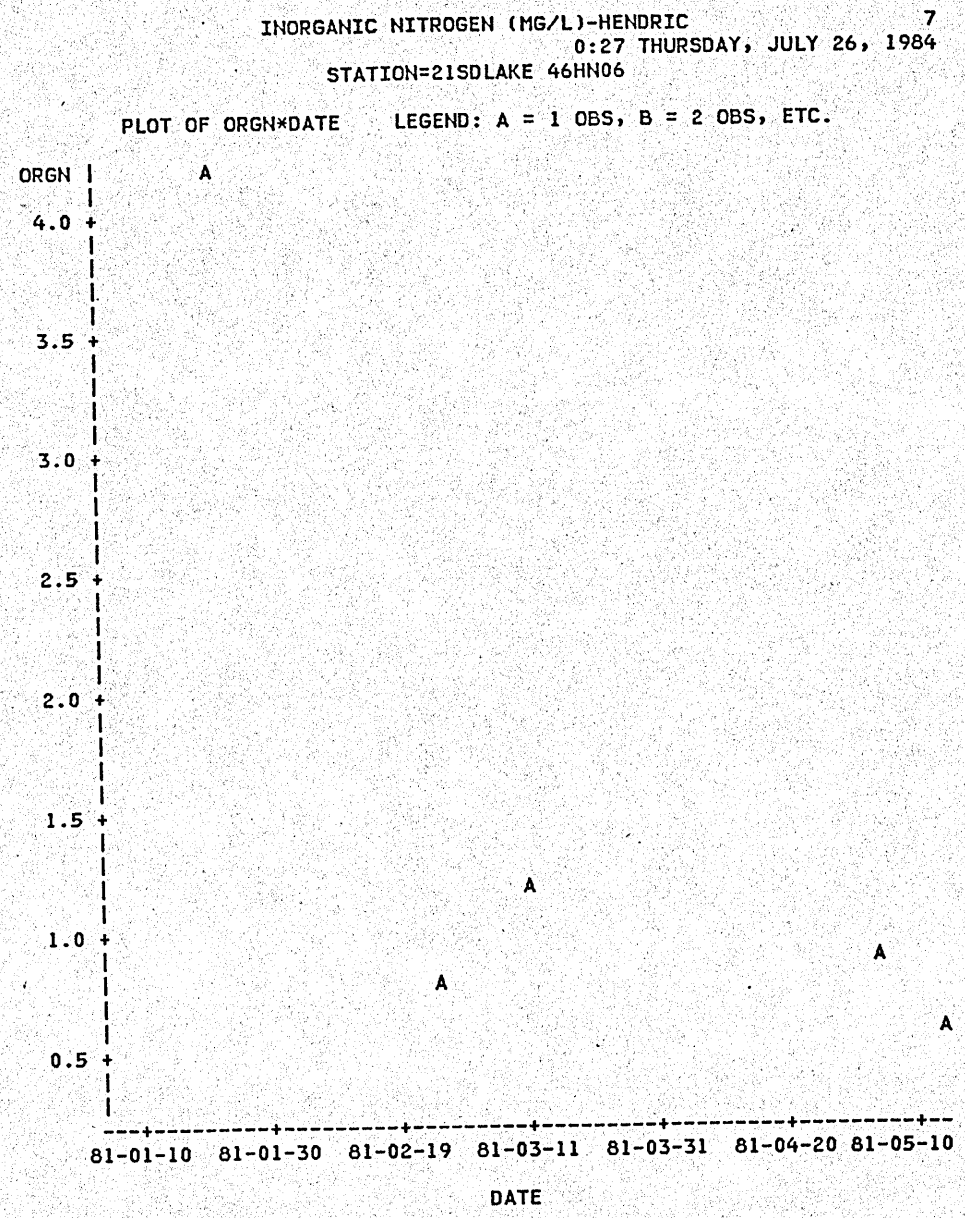
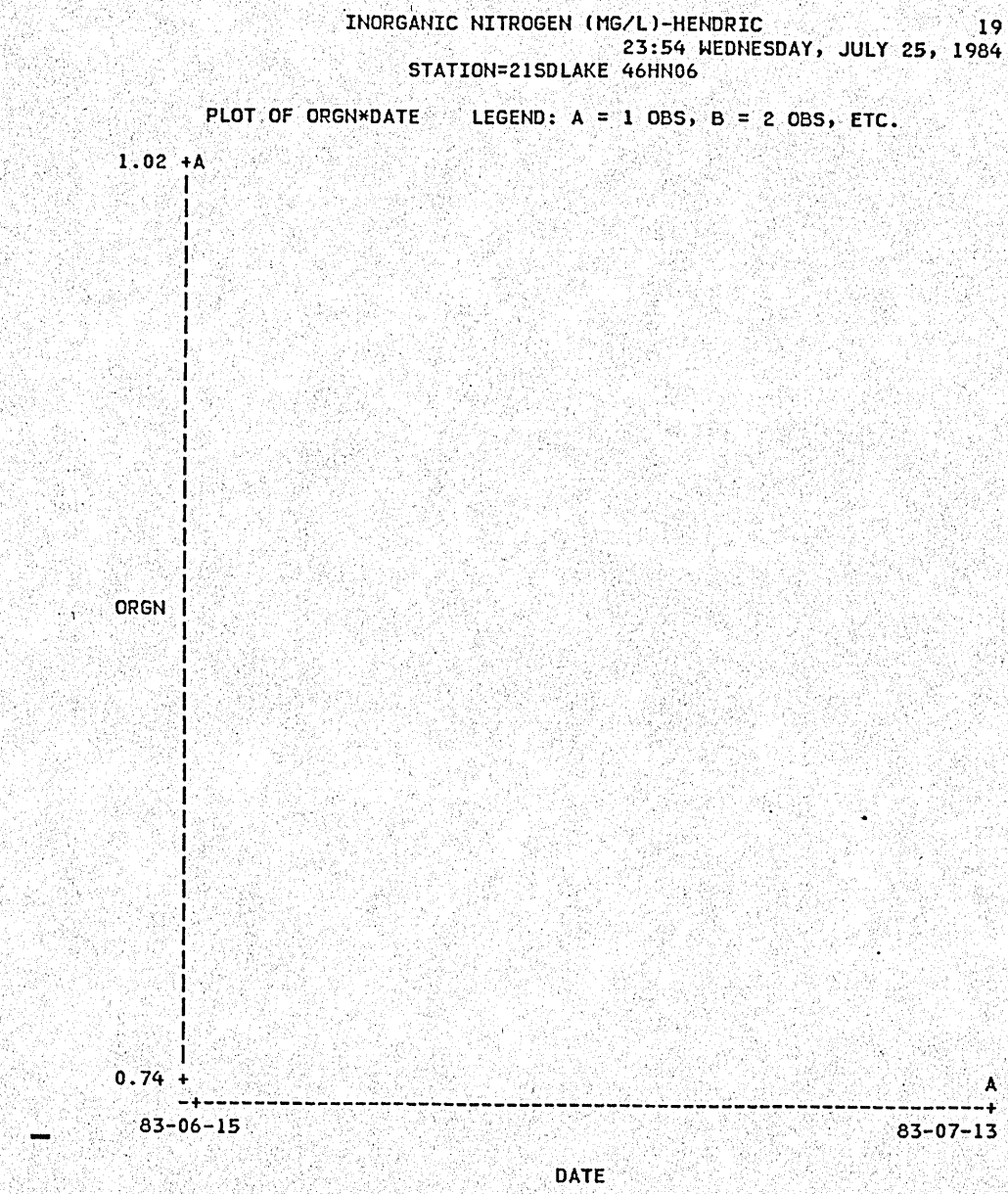
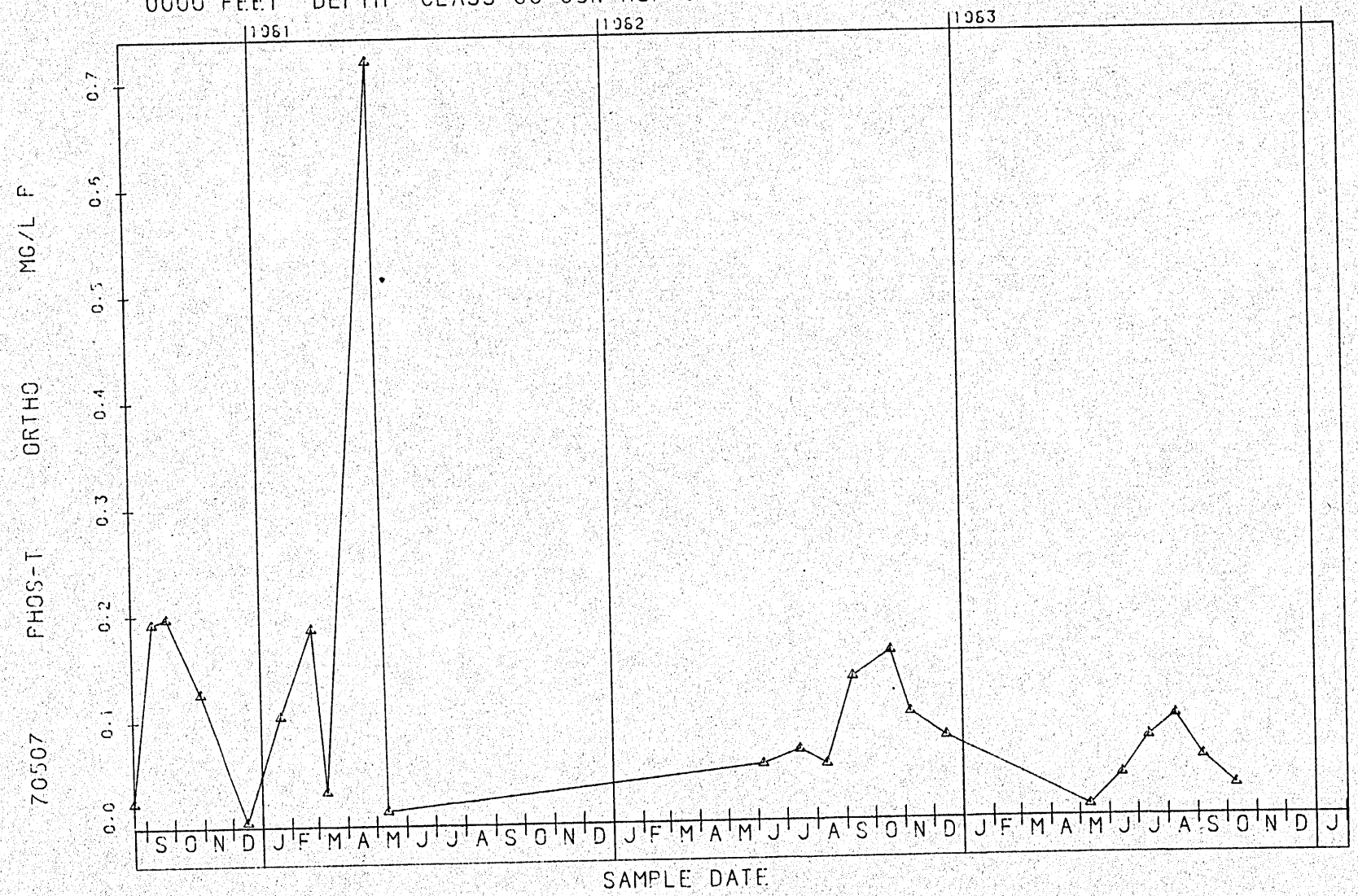

INORGANIC NITROGEN (MG/L)-HENDRIC 7
0:27 THURSDAY, JULY 26, 1984
STATION=21SDLAKE 46HN06
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
ORGN
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
A
81-01-10 81-01-30 81-02-19 81-03-11 81-03-31 81-04-20 81-05-10
DATE

Figure IV-92.


INORGANIC NITROGEN (MG/L)-HENDRIC 19
23:54 WEDNESDAY, JULY 25, 1984
STATION=21SDLAKE 46HN06
PLOT OF ORGN*DATE LEGEND: A = 1 OBS, B = 2 OBS, ETC.
1.02 +A
ORGN
0.74 +
A
83-06-15
83-07-13
DATE

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

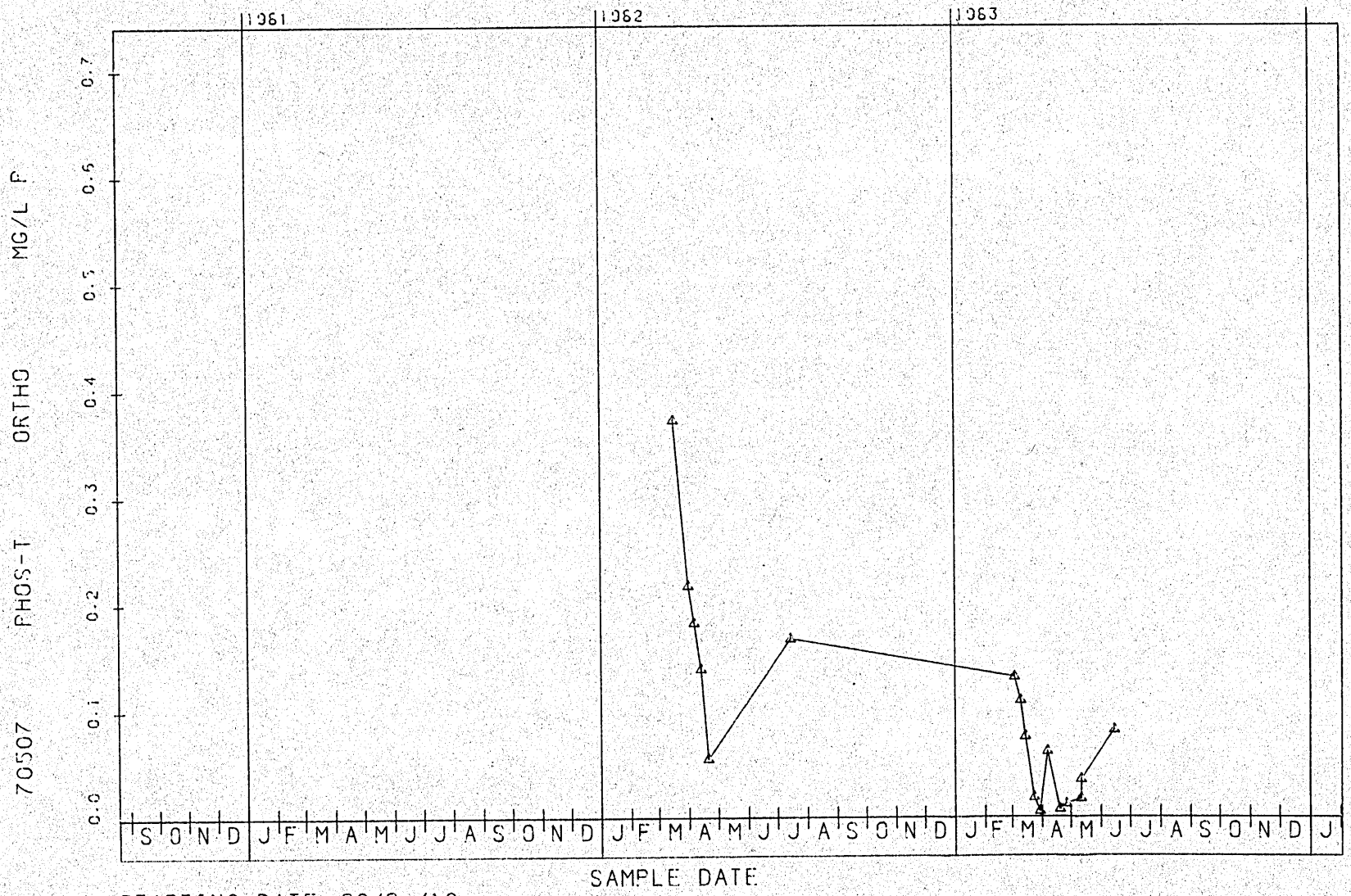
Figure IV-93.



STARTING DATE 80/8 /19

46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

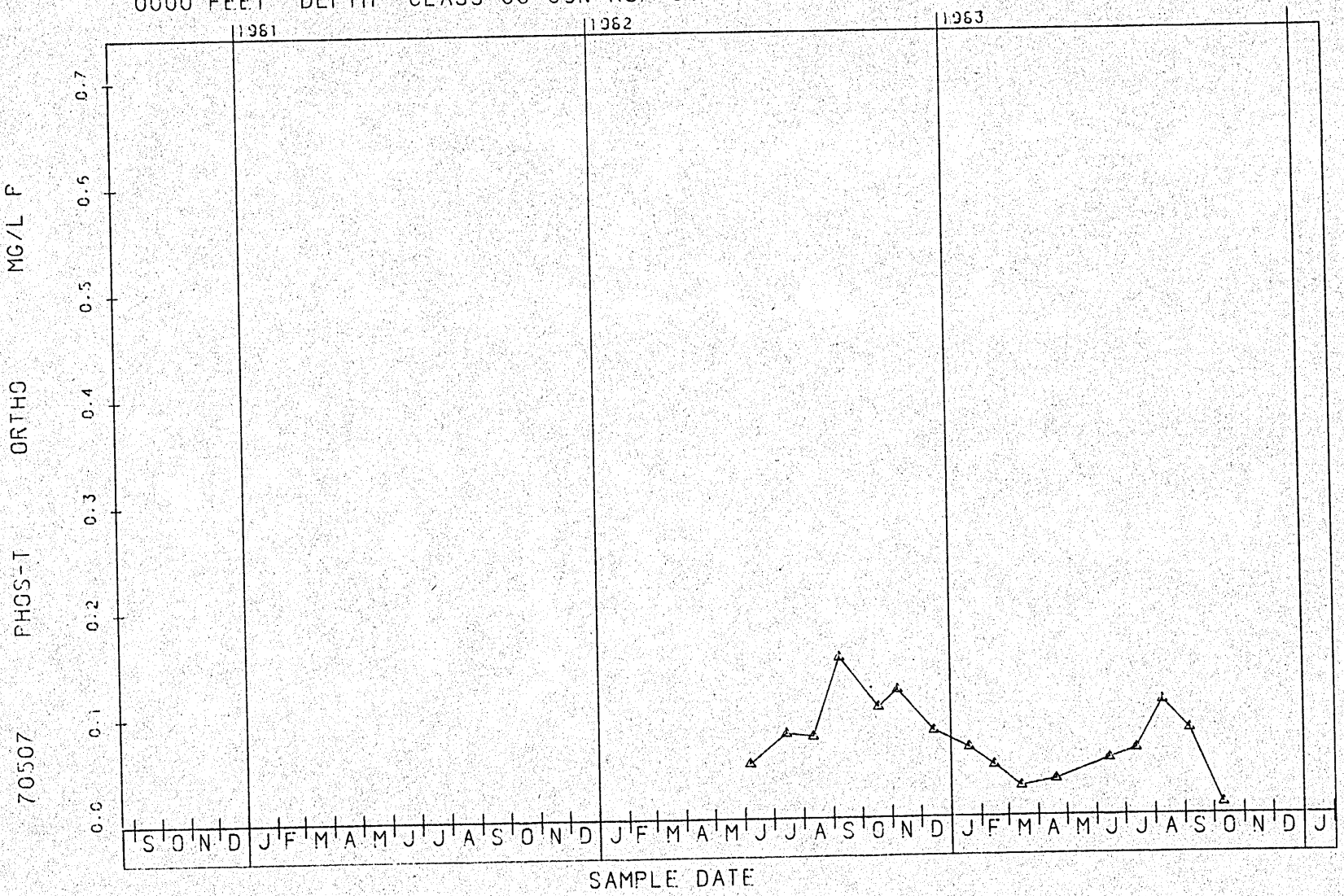
Figure IV-94.



STARTING DATE 80/8 /19

46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDC 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

Figure IV-95.

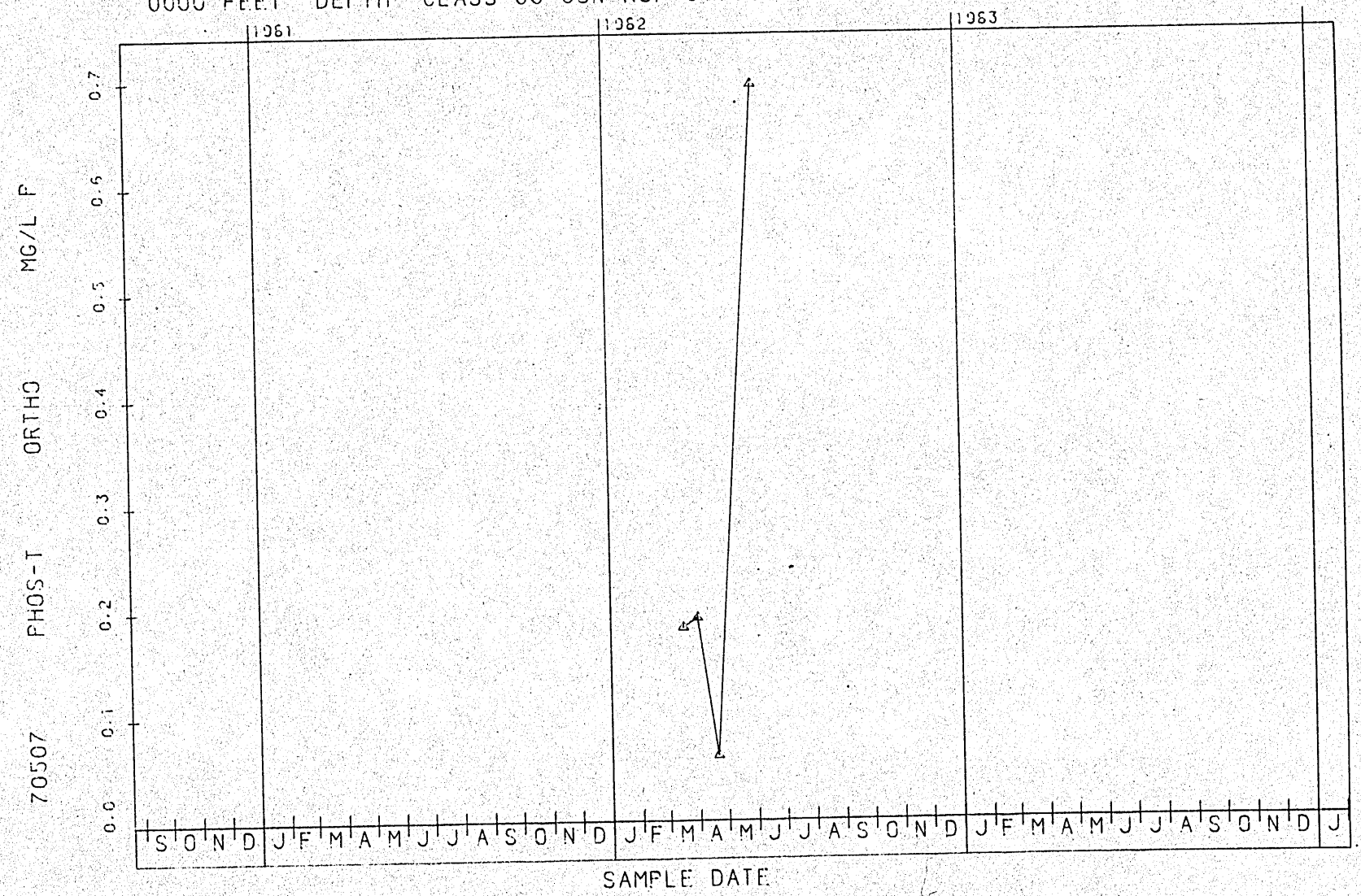


70507 PHOS-T ORTHO MG/L P

STARTING DATE 80/8 /19

46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

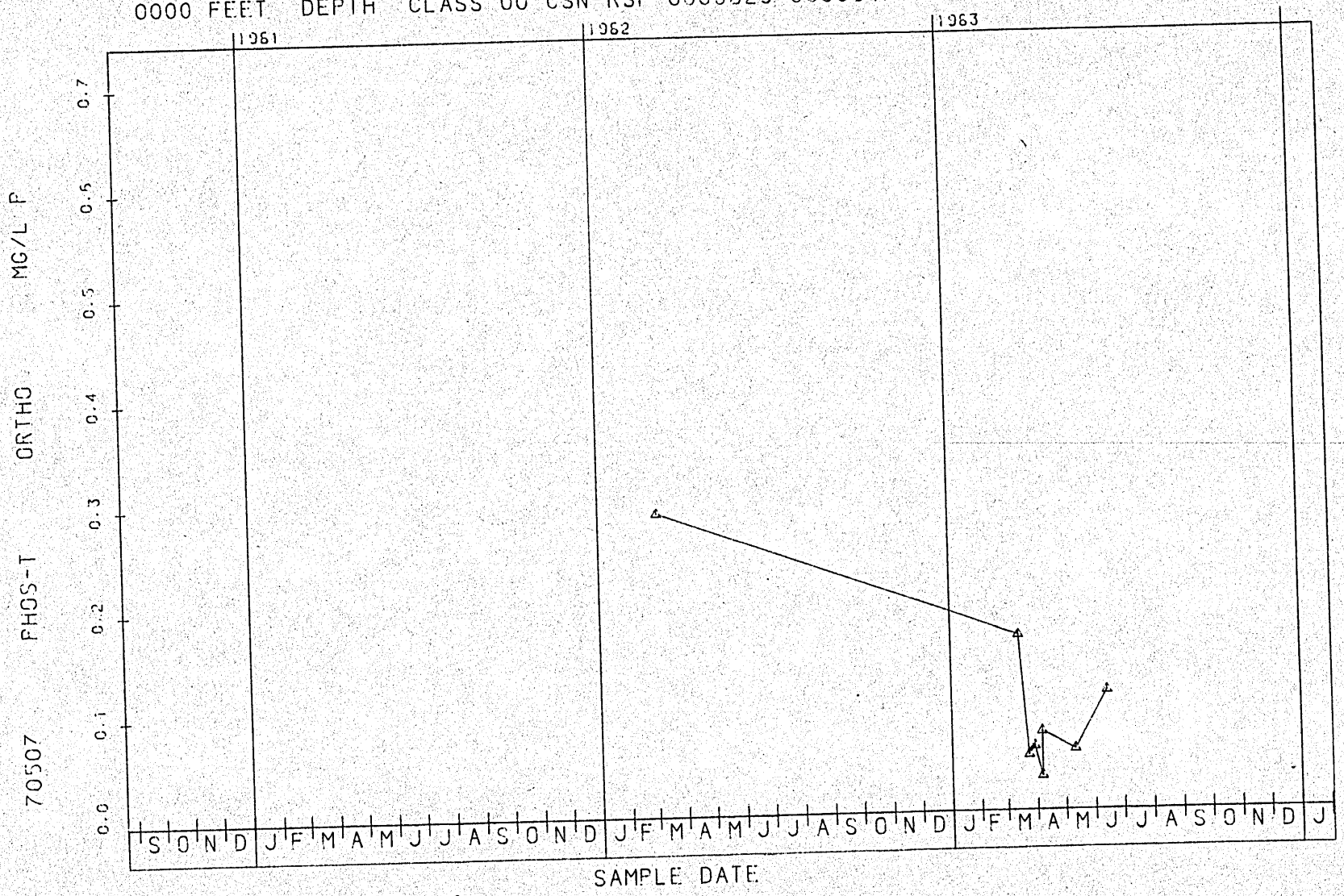
Figure IV-96.



STARTING DATE 80/8 /19

46HNO5
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847

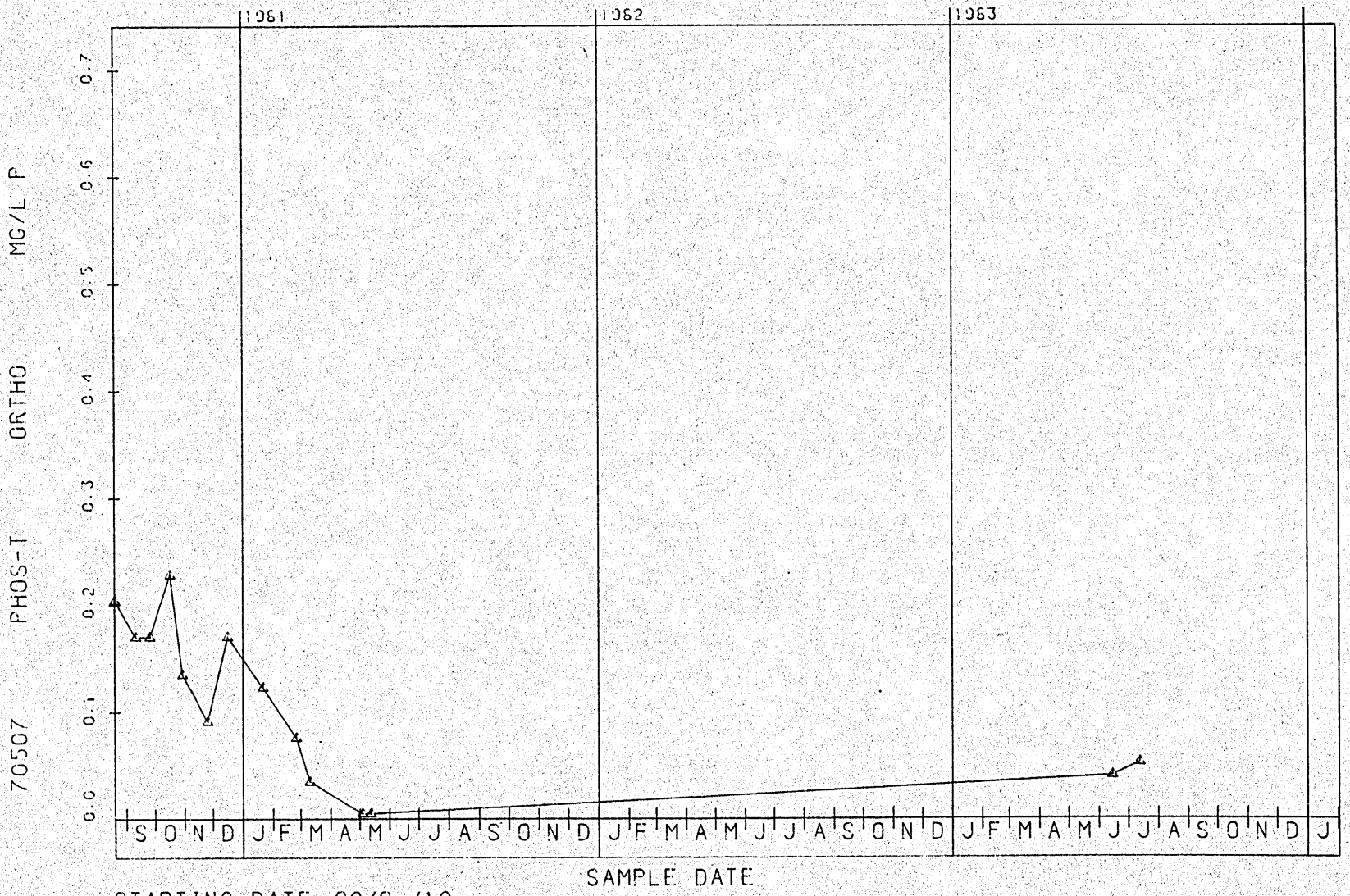
Figure IV-97.



STARTING DATE 80/8 /19

46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

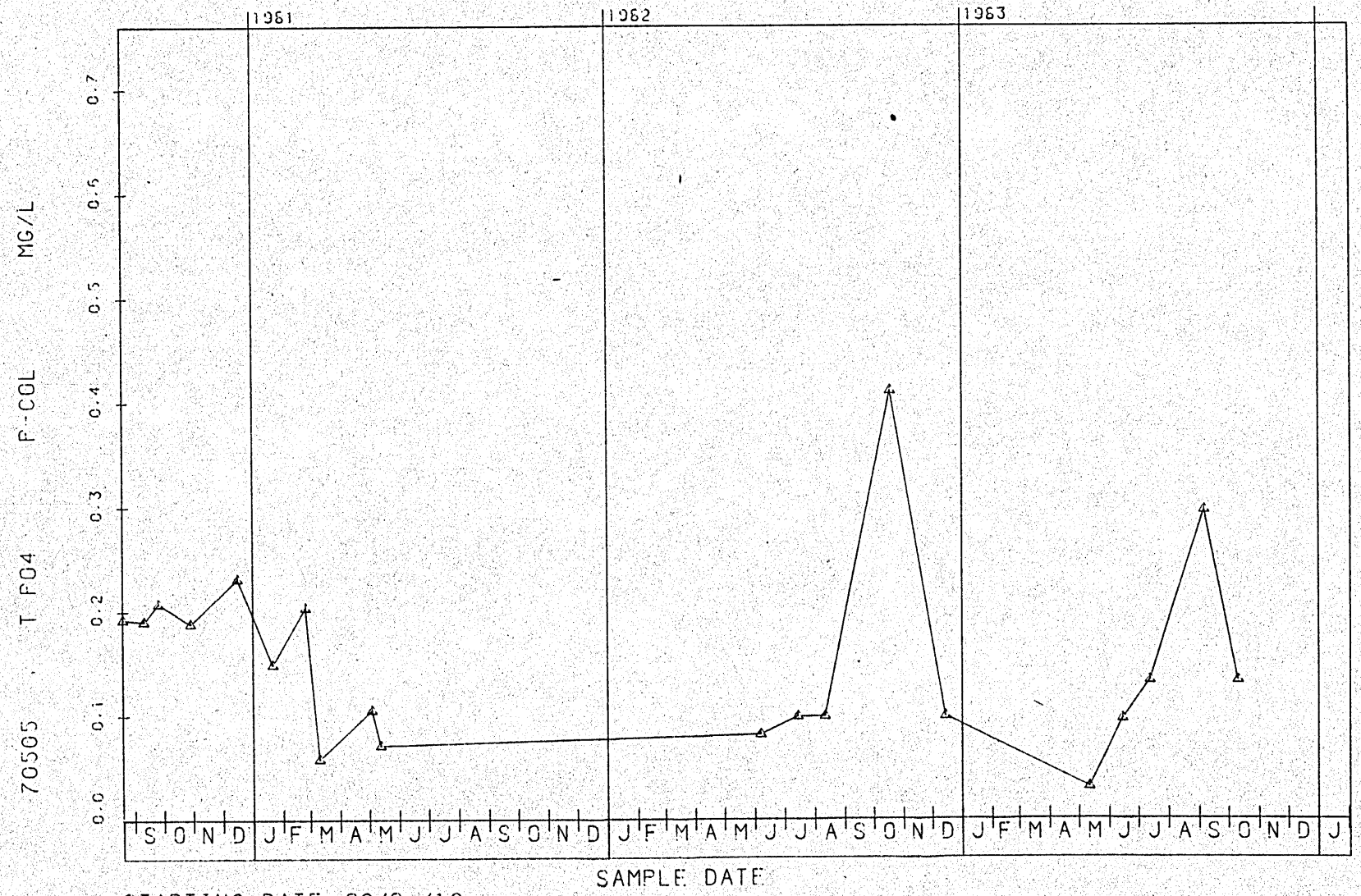
Figure IV-98.



STARTING DATE 80/8 /19

46HN01
44 28 50.0 096 28 35.0 2
LK HENDRICKS S PUBLIC BOAT LNDG 112W-47W-S28BDAB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663825-0693843

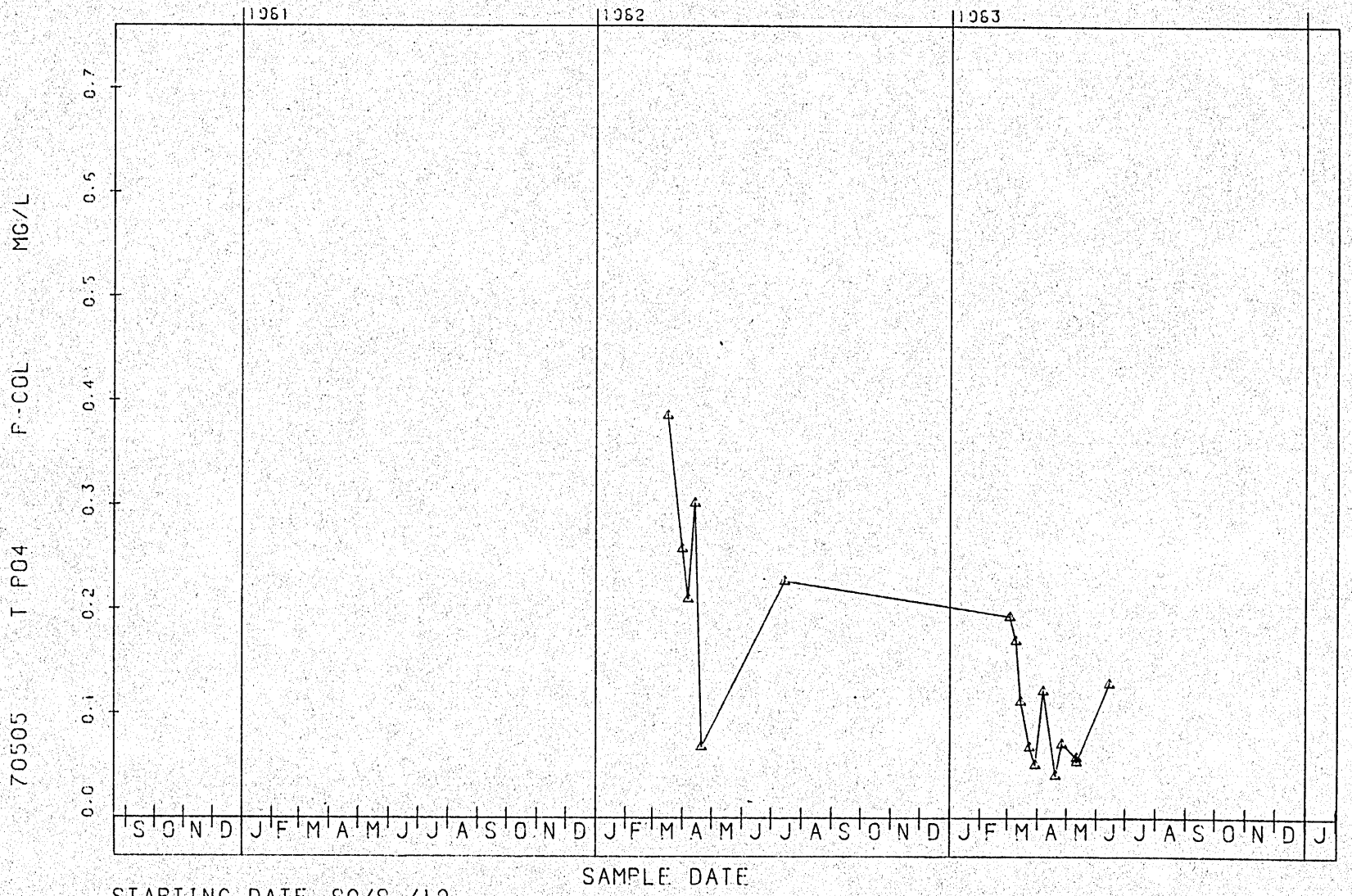
Figure IV-99.



STARTING DATE 80/8 /19

46HN02
44 28 14.0 096 30 01.0 2
DEER CR TRIB TO LK HENDRICKS 112N-47W-S29 CCDD
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663826-0693844

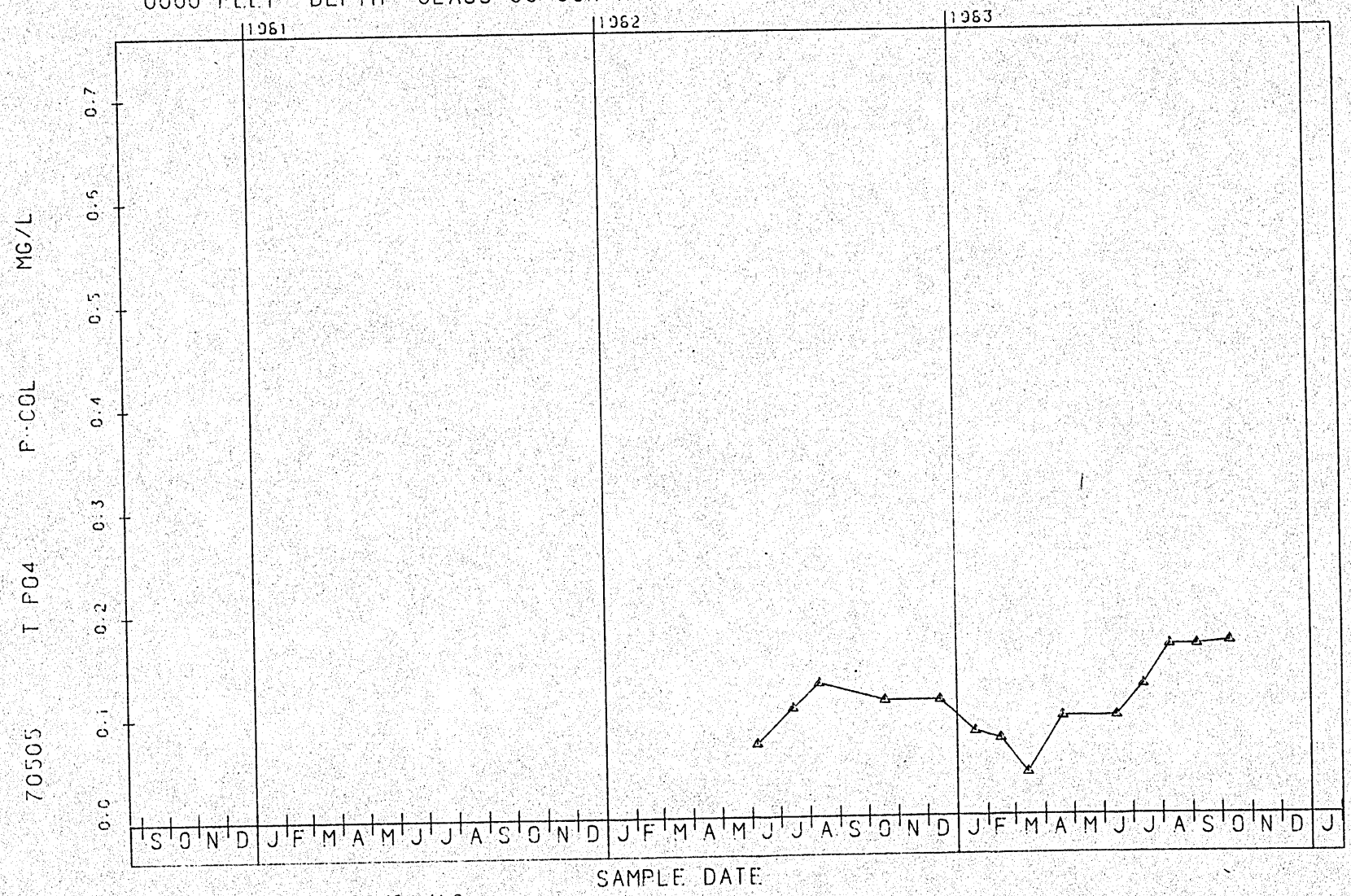
Figure IV-100.



STARTING DATE 80/8 /19

46HN03
44 29 52.0 096 27 48.0 2
LK HENDRICKS N SIDE BT LNDG 112N-47W-S22 BBCC
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663827-0693845

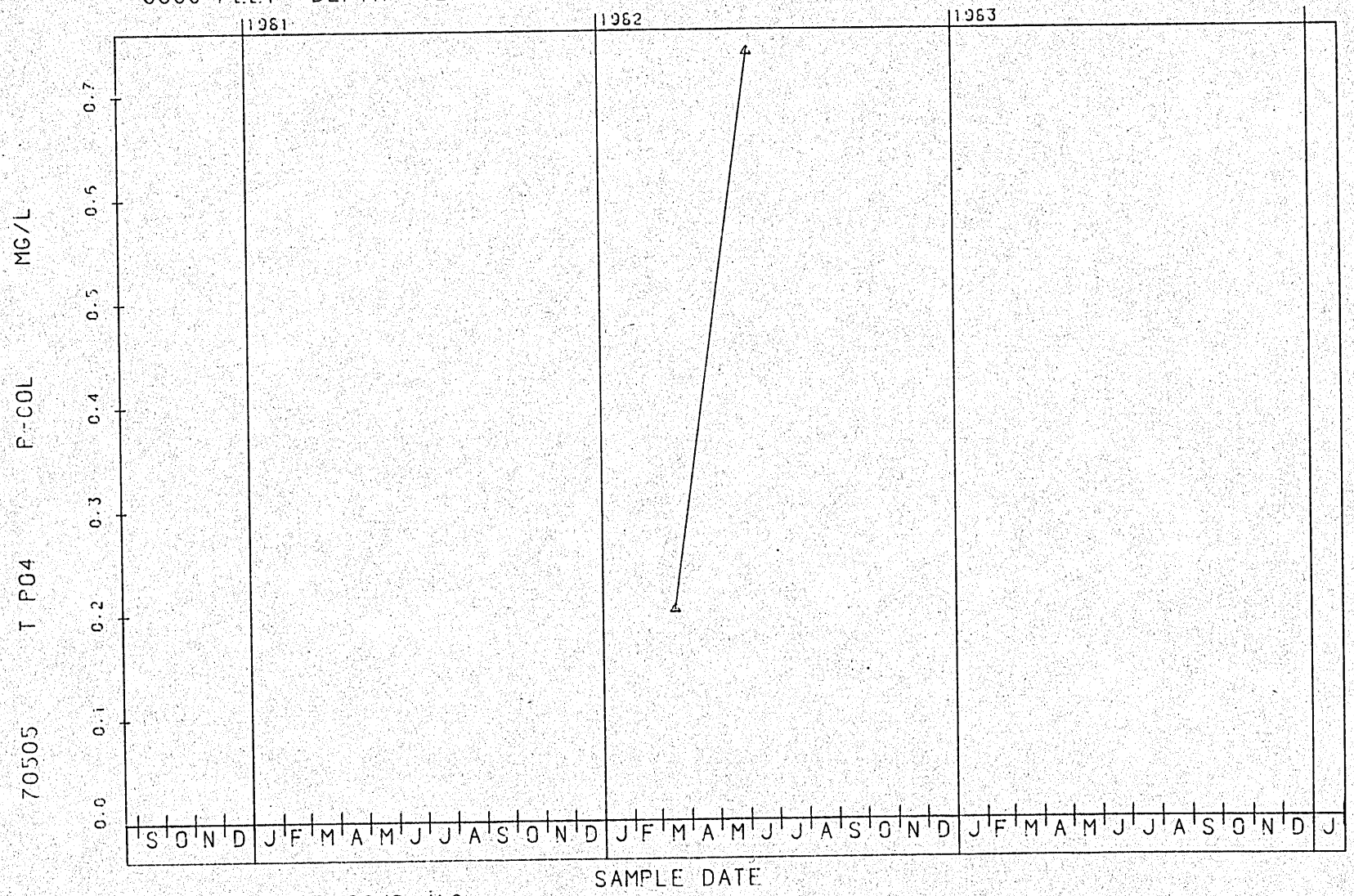
Figure IV-101.



STARTING DATE 80/8 /19

46HN04
44 29 58.0 096 28 02.0 2
N TRIB TO LK HENDRICKS 112N-R47W-S21 AABA
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663828-0693846

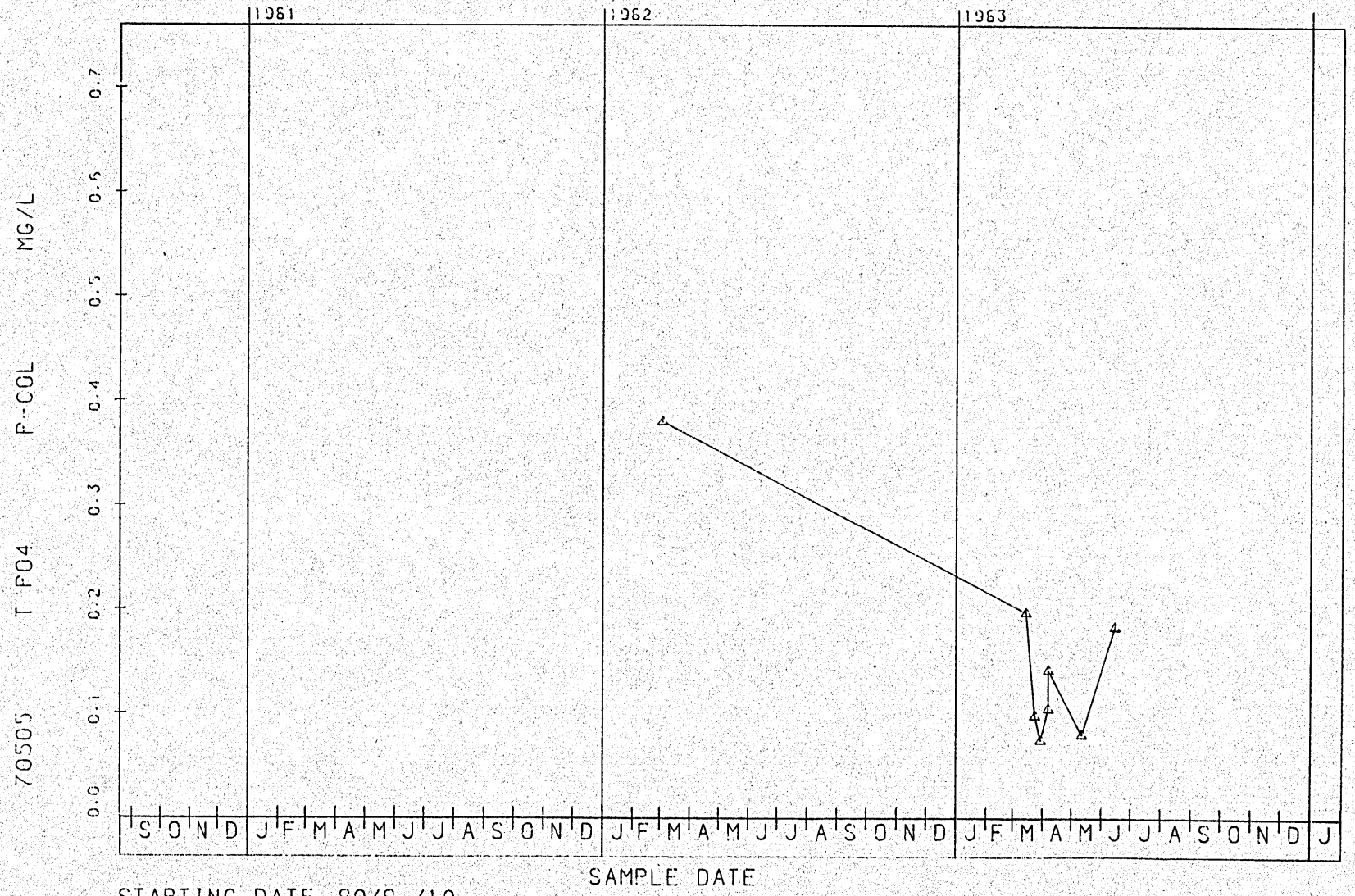
Figure IV-102.



STARTING DATE 80/8 /19

Figure IV-103.

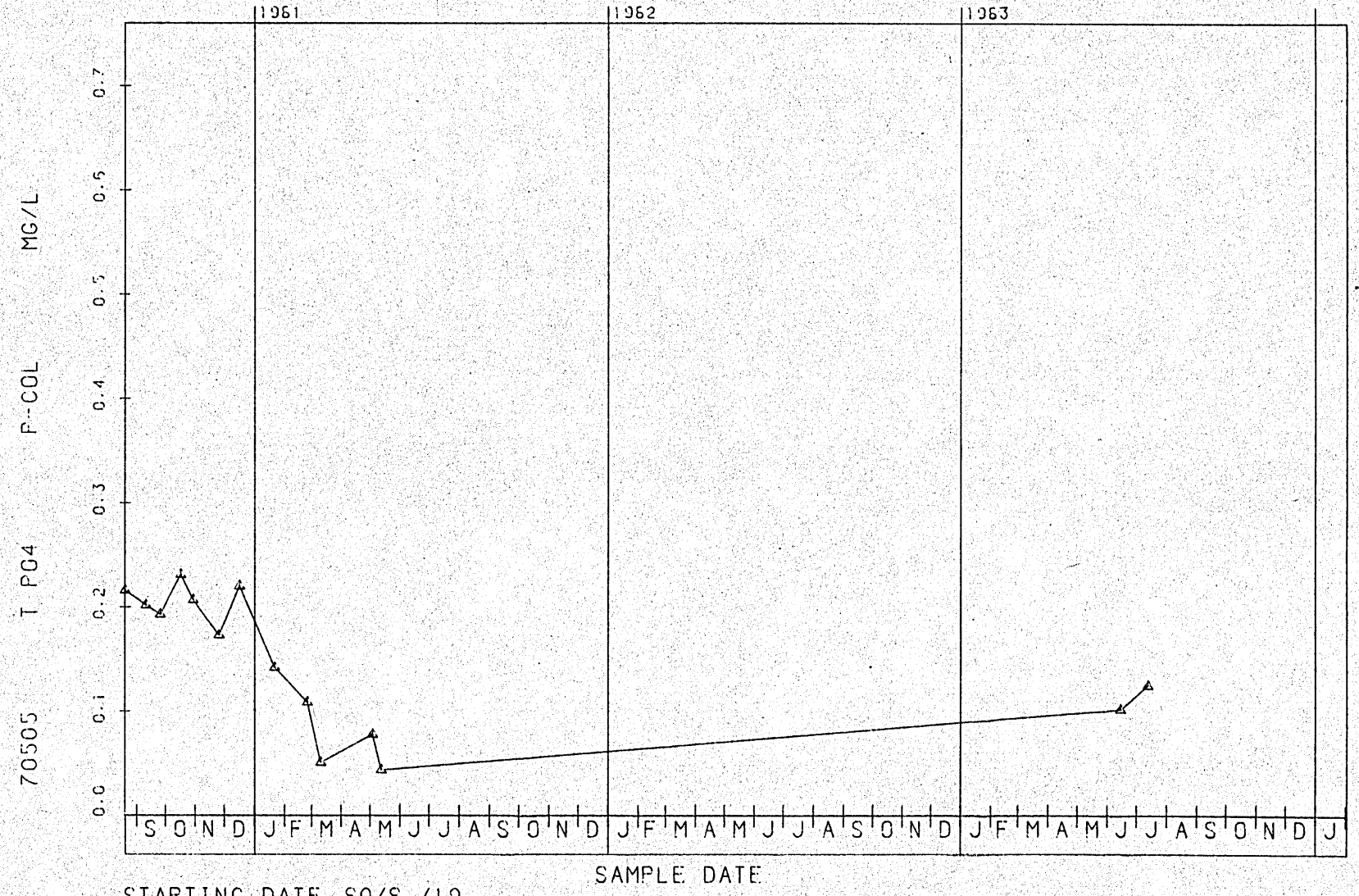
46HN05
44 29 11.0 096 30 15.0 2
NW TRIB TO LK HENDRICKS 112N-47W-S20 CCCB
46011 SOUTH DAKOTA BROOKINGS
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663829-0693847



STARTING DATE 80/8 /19

46HN06
44 30 50.0 096 26 09.0 2
LK HENDRICKS AT HENDRICKS MINN 112N-46W-S18 CDAB
27081 MINNESOTA LINCOLN
MISSISSIPPI RIVER BASIN 070400
MINNESOTA RIVER BASIN/LAC QUI PARLE
21SDLAKE 820904
0000 FEET DEPTH CLASS 00 CSN-RSP 0663830-0693848

Figure IV-104.



STARTING DATE 80/8 /19