OCCOQUAN WATERSHED MONITORING LABORATORY

FINAL REPORT - MWCOG NURP

Prepared for

Department of Environmental Programs
Metropolitan Washington Council of Government
1875 Eye Street, N.W.
Washington, D.C. 20006

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
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1. Introduction

In May, 1979, the Metropolitan Washington Council of Governments (MWCOG), the Northern Virginia Planning District Commission (NVPDC), and the Virginia Polytechnic Institute and State University (VA TECH) jointly prepared and submitted a grant application to the United States Environmental Protection Agency (EPA) for funding of a project under the auspices of the Nationwide Urban Runoff Program (NURP). A revised version of that grant application was approved by EPA with MWCOG acting as the lead agency.

In late 1979 negotiations between MWCOG and VA TECH were begun to develop a detailed plan of work for the field studies required as a part of the MWCOG NURP. Because of delays in the execution of a final contract document, MWCOG obtained EPA permission to extend authorization to VA TECH for the procurement and deployment of equipment prior to the completion of negotiations. Data collection actually began in June, 1980, and the contract between MWCOG and VA TECH was executed that same month.

The plan of work for the project was developed around the following general categories:

- o Critical Watershed Studies
- o BMP Effectiveness Studies
- o Atmospheric Source Studies
- o Priority Pollutant Studies
- o Special Studies

Of the above categories, studies in each were conducted by VA TECH, with the exception of the priority pollutant category for which VA TECH only retrieved samples.

In the course of the program, VA TECH instrumented two critical watershed monitoring stations, sixteen BMP monitoring stations, four atmospheric source stations, and received samples from an additional seven high volume atmospheric sampling stations. In all, hydrologic and chemical data from over 600 station-storms were collected at the critical watershed and BMP stations. The wetfall/dryfall and hi-volume stations produced an additional observations for the data base.

It is the purpose of this document to convey the final results of the field studies conducted by VA TECH as required by Tasks 3f, 3g, 4f, 5h, and 5i of the MWCOG-VA TECH Contract of 18 June, 1980.

2. SITE SELECTION

In order to avoid problems with monitoring program start-up, VA TECH staff began working with representatives of MWCOG, NVPDC, NAHB, and NVBA on the task of monitoring site review and selection in February, 1980. this date was substantially in advance of final work plan adoption and execution of a contract document between MWCOG and VA TECH, but, as stated earlier, was deemed by all parties to be necessary to avoid scheduling problems at a later date.

BMP Site Selection

Proposed BMP monitoring sites were reviewed by a five member committee composed of members from the organizations cited above. Following tentative approval of a site by the committee, VA TECH staff conducted an additional examination to determine the suitability from a monitoring standpoint.

The final project design included 12 monitoring sites, six of which were pond facilities (retention or detention) requiring inflow and outflow monitoring. Nine of these sites were included in the original study design, which was to be performed in two phases, involving a shifting of monitoring station locations after a pre-determined period of time. However, later considerations of late start-up and size of data base made the phased approach unfeasible, and it was decided to retain the BMP monitoring sites throughout the project. A summary of the pertinent data from all the selected BMP monitoring sites is shown in Table 2-1.

Because of the alterations to the original plan of work that took place over the course of the study, the following observations should be made with respect to Table 2-1.

- Site V.A. - Bulk Mail Center (51UR13, 51UR14) was deleted from the original sampling plan because of site monitoring problems and unacceptable hazards to personnel.

- o Site I.B. - Defief (51UR18) was added to the initial network of BMP monitoring stations to provide information on moderate density single family catchments drained by grassed swales (in a Maryland suburb).
- o Site III.B. - Lake Ridge (51UR07, 51UR08) was originally instrumented as a part of the EPA Chesapeake Bay Program. The site was continued under MWCOG NURP, but was not equipped with compatible instrumentation.
- o IV.A - Rockville City Center (51UR19) was added to the work plan because of the desire to include a porous asphalt parking surface in the project.
- o VI.B - Fair Oaks Mall (51UR20, 51UR21) was added to the project plan using external funds contributed by the mall developer.

Given the above observations, it may be determined that the final project design for BMP assessment was distributed as follows:

Retention Ponds - 3 sites

Detention Ponds - 2 sites

Grassed Swales - 3 sites

Infiltration Pits - 2 sites

Porous Paving 1 site

The MWCOG NURP station numbering scheme is presented in Table 2-2.

Critical Watershed Site Selection

At the direction of COG staff, VA TECH personnel arranged to meet with representatives of the USGS Towson District Office for the purpose of selecting suitable monitoring sites on Seneca and Piscataway Creeks. The sites requested by COG staff were located at existing USGS gaging stations as follow:

STATION	USGS STATION	MWCOG NURP STATION
Seneca Creek at Dawsonville, Md.	01645000	51UR01
Piscataway Creek at Piscataway, Md	01653600	51UR02

Atmospheric Sampling Site Selection

High Volume Sampling Stations. COG staff selected a network of eight high volume atmospheric particulate monitoring stations in the Washington, D.C. region. These stations were all operated by other agencies, and arrangements were made to provide filter mats and air flow data to meet the program analytical needs. The stations names and numbers are summarized in Table 2-2.

Wetfall/Dryfall Sampling Stations. Originally, three wetfall/dryfall monitoring stations had been envisioned for the project. These were to be placed near BMP sites for which atmospheric source data were required near other urban areas for which atmospheric source data would be useful. At the end of the EPA Chesapeake Bay Sub-Study performed by VA TECH, an additional wetfall/dryfall sampler became available, and permission was secured from the owner, the Virginia State Water Control Board, to use the equipment in the project. The final wetfall/dryfall sampling site locations are shown in Table 2-2. It should be noted that one site, Burke Village Center, was instrumented with two samplers in order to allow determination of the differences between general air mass sources and near-ground sources.

Table 2-1. - Continued

MONITORING SITE	BMP TYPE	STORAGE (cu.ft.)	OTHER	BMP INFLOW DATA	% BMP COVERAGE
		I. Large-Lot Single Family Residential			
A. Stratton Woods	Grassed Swale	----	Mean Swale 260 ft. Mean Swale Slope 1.8%	IC.	100%
B. Dufief	Grassed Swale	----	Mean Swale Length 445 ft. Mean Swale Slope 5.1%	IC.	100%
C. Westleigh Inflow: Outflow:	Wet Pond	389,000	Pond Surface Area 50,000 sq. ft.	Monitor	100%
		II. Medium Density Single Family Residental			
A. Fairidge	Grassed Swale	----	Mean Swale Length 423 ft. Mean Swale Slope 4.1%	IIB	89.4%
B. Burke Ponds Inflow: Outflow:	Wet Pond Wet Pond	353,000	Pond Surface Area 41,000 sq. ft.	Monitor	100%
		III. Townhouse/Garden Apartments			
A. Stedwick Inflow: Outflow:	Dry Pond	38,000 (NPS)	5.5' 36" Riser 1/2" Perforations	Monitor	100%
B. Lakeridge Inflow: Outflow:	Dry Pond	210,000 (10 yr. 2 hr.)	7.5' Riser	Monitor	100%
C. Dandridge	Infiltration Pits	4060 (Void Space)	Perforated 6" Tile Drains	III A, B	47.6%
		IV. Office			
A. Rockville City Center	Porous Pavement	27,400 (void space)	Perforated 6" Tile Drains	III A, B.	91.1%
		V. Industrial			
A. Bulk Mail Center Inflow: Outflow:	Dry Pond	68,000 (NPS)	1.5' 8' Diam. Riser 1" Perforations	Monitor	100%
		VI. Shopping Center			
A. Burke Village Shopping Center	Infiltration Pits	11,240 (void space)	-------	Wetfall	58.8%
B. Fair Oaks	Wet Pond	32,250	-------	-------	100%

SOURCE: NVPDC

Table 2-1. BMP Monitoring Sites for MWCOG NURP

MONITORING SITE	WATERSHED AREA (acres)	AVERAGE DENSITY (du/acre)	IMPERVIOUS GROUND COVER (%)	EFFECTIVE IMPERVIOUS GROUND COVER (%)	REPRESENTATIVE SLOPE (%)	WATERSHED AREA WITH SEPARATE STORM SEWERS (%)	WATERSHED AREA WITH CURB & GUTTER (%)
I. Large Lot Single Family Residential							
A. Stratton Woods	9.48	1.8	22.2	16.5	1.6	100	0
B. Dufief	11.84	2.2	18.5	11.1	8.5	100	0
C. Westleigh							
Inflow:	40.9	1.2	21.2	14.0	3.7	100	83.7
Outflow:	47.9		24.2	16.1			
II. Medium Density Single Family Residential							
A. Fairidge	18.8	2.8	34.1	21.0	4.3	100	0
B. Burke Pond							
Inflow:	18.3	3.0	32.7	25.1	4.5	100	100
Outflow:	27.1		33.5	24.5			
III. Townhouse/Garden Apartments							
A. Stedwick							
Inflow:	27.4	6.1	33.8	22.1	4.7	100	79.7
Outflow:	34.4		30.5	19.2			
B. Lakeridge							
Inflow:	68.3	9.0	32.6	27.2	7.9	100	68.3
Outflow:	88.4		30.7	24.7			
C. Dandridge	2.46	16.0	54.5	33.6	3.6	100	100
IV. Office							
A. Rockville Center	4.2	N/A	69.5	69.5	2.6	100	74.3
V. Industrial							
A. Bulk Mail Center Inflow:	19.0	N/A	83.0	83.0	*	100	*
Outflow:	20.1	N/A	78.5	78.5			
VI. Shopping Centers							
A. Burke Village Shopping Center	4.5	N/A	79.2	79.2	1.6	100	82.0
B. Fair Oaks	54.7	N/A	90.0	90.0	*	*	*

SOURCE: NVPDC

Table 2-2. MWCOG NURP STATION NUMBERS

RUNOFF SITES	STATION NO.
Seneca Creek	UR 1
Piscataway	UR 2
Burke Pond (in)	UR 3
Burke Pond (out)	UR 4
Dandridge	UR 5
Stratton Woods	UR 6
Lake Ridge	UR 7 (CB 7)
Lake Ridge	UR 8 (CB 8)
Fairidge	UR 9
Stedwick (in)	UR 10
Stedwick (out)	UR 11
Rockville Police HQ	UR 12
Bulk Mail (in)	UR 13
Bulk Mail (out)	UR 14
Westleigh (in)	UR 15
Westleigh (out)	UR 16
Burke Village Center	UR 17
Defief	UR 18
Rockville	UR 19
Fair Oaks (in)	UR 20
Fair Oaks (out)	UR 21

HI-VOL FILTER SITES	STATION NO.
Catholic University, D.C.	HV 1
Hadley Hospital, D.C.	HV 2
Hall, MD	HV 3
Rockville, MD	HV 4
Laurel, MD	HV 5
Arlington, VA	HV 6
Fort Belvoir (Fairfax)	HV 7
Massey (Fairfax)	HV 8

NURP WETFALL AND DRYFALL SITES

LOCATION	STATION NO.
Haines Point, D.C.	WF 1
	DF 1
Burke Village Center (on roof)	WF 2
	DF 2
Burke Village Center (on ground)	WF 3
	DF 3
Stedwick	WF 4
	DF 4

3. STATION DESIGN AND INSTALLATION

Monitoring Considerations

It has been shown that good monitoring program design is an essential component of the success of a project such as the MWCOG NURP. The regional nature of the program dictated that monitoring stations and equipment be located in the District of Columbia and in the Virginia and Maryland suburbs. In fact, if a polygon were constructed on a map with the outermost sampling stations located at its vertices, it would encompass in excess of 3,000 square miles. The far-flung nature of the monitoring program and the performance of that program by a single contractor dictated a heavy reliance on automation and unattended operation of the remote sampling network.

For purposes of site design and equipment selection, station functions were divided into the following categories:

- o Precipitation Measurement
- o Flow Measurement
- o Sample Retrieval
- o Data Recording

An additional constraint imposed was that all station functions, including battery power, be enclosed in a fiberglass housing measuring approximately 1.8 m x 1.6 m x 2.0 m high.

Precipitation Measurements

Tipping bucket rain gages having a measurement sensitivity of 0.01 inch were selected for use in the project. With the exception of one location in the Piscataway Creek drainage basin, all precipitation gages were located on the BMP monitoring sites discussed in Chapter 2. The Piscataway Creek gage was installed at the request of COG staff to provide rainfall data for use in the

Critical Watershed segment of the study.

The rain gages located at the BMP monitoring sites were selected for use with a data recording device querying the instrument on a fixed time increment. For this reason, a rainfall totalizing circuit was employed. At each tip of the rain gage bucket, the circuit was designed to increase the potential across a set of contacts by 5.0 mvdc. Therefore, at each query from the recording device, a voltage proportional to total precipitation would be sensed. From these data, total rainfall, incremental rainfall and intensities could be computed.

The rain gages rainfall totalizers were acquired based on specifications developed by VA TECH staff, and included in Appendix A. The successful bidders on the devices were WeatherMeasure (3-1) and Science Associates (3-2), providing a model P501-1 rain gage and a model 584 event accumulator, respectively. In the course of the study, the rain gage hardware generally performed well, but significant problems were experienced with the accumulator circuits. These, on many occasions, led to the loss of rainfall data.

Flow Measurements

The provision of accurate and precise flow data was deemed to be essential to the successful completion of the project. Flow measurement activities were generally divided into two categories:

Perennial streams in natural channels	-	Critical Watershed Studies
Intermittent flows in manmade conduits or channels	-	BMP Studies

The need for obtaining data of suitable accuracy and precision in each of the above situations required different approaches to the measurement of flow.

Critical Watersheds. As noted in Chapter 2, the critical watershed monitoring stations on Seneca and Piscataway Creeks were established at existing gaging stations operated by the U.S. Geological Survey. The Seneca Creek gage is one of the oldest in Maryland, having records continuously since 1930. The Piscataway gage has not been in operation so long, but the records are considered good. Because of the prior effort by USGS in establishing the gaging stations mentioned, it was not necessary to create new rating curves at the sites. These stage-discharge relationships had already been computed and their accuracy determined. Although reliable stage-discharge relationships were available at the two sites, direct access to USGS recorders and records was not. USGS policy did not permit non-agency personnel to manipulate the equipment at either location. Arrangements were made, however, to allow the installation of VA TECH equipment in the gage house at the Seneca Creek site (51UR01). Because initial project plans had included the assumption that USGS recording equipment would be available, it was necessary to acquire an additional stage recorder. A Stevens Type A-35 (3-3) recorder was procured by VA TECH and used for the duration of the study at no cost to the project. This device was installed in the same stilling well as the USGS instrument and operated in parallel with it. The device described operates by means of a float suspended on a metal tape which drives a gear wheel connected to the pen on a strip chart recorder. A rating table was supplied by USGS for the stage to discharge conversion (3-4).

At the Piscataway Creek site (51UR02), it was not possible to place equipment in the gage house operated by USGS. For this reason, permission was obtained to expend funds for the purchase of an additional fiberglass shelter as well as the flowmeter required to instrument the station. Instead of the conventional float-recorder arrangement, however, site conditions made it necessary to utilize a different type of device. The flowmeter selected was of the type installed at all the BMP monitoring sites. The instrument was a secondary device of the bubbler type. It was equipped with an air compressor and storage tank to provide a source of the operating gas. The air reservoir was connected to a fixed orifice in the USGS stilling well and to an electronic pressure transducer in the flowmeter. The latter was able to sense the static head on the orifice, and thereby able to output a stage height signal on a continuous basis. The instrument used was also equipped with an erasable, programmable, read-only memory (EPROM) which allowed the internal computation of discharge using a stored rating curve. The rating curve was that supplied by USGS (3-5) and offset by 2.42' to account for the orifice location in the stilling well. The flowmeter was also equipped with aregulated motor strip chart which had a multiple overrange feature to permit the recording of very high flows. The device was purchased based on specifications developed by VA TECH staff, and included in Appendix A. The instrument used was an ISCO model 1870 flowmeter (3-6).

BMP Sites. As noted earlier, flow measurements at the BMP sites generally involved discharges from round pipes or some regularly configured man-made channel. No situations were encountered where pressurized flow occurred regularly, although some flow records were lost as a result of infrequent episodes of such conditions.

In contrast to the perennial streams at the critical watershed sites, no rating relationships were available for the sixteen other sites monitored in the BMP evaluation phase of the study. As a result, some primary flow measurement device was installed at each of the locations monitored. In situations where round pipe flow measurements were required, Palmer-Bowlus flumes were used exclusively (3-7). A schematic of the design variation selected is shown in Figure 3-1. All Flumes were fabricated by a specialty sheet metal jobber from galvanized metal. To prevent sample contamination, all flumes were coated with

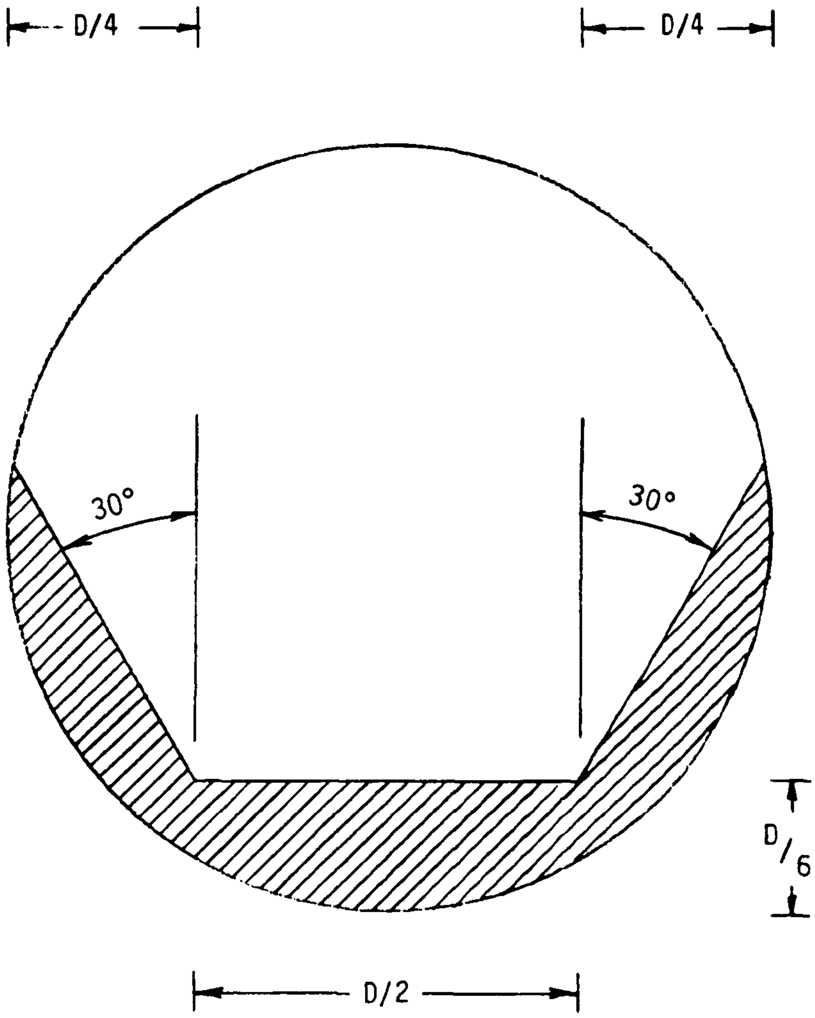


FIGURE 3-1. CROSS SECTIONAL SCHEMATIC OF PALMER-BOWLUS FLUME USED IN MWCOG NURP PROJECT

epoxy paint. For most of the applications encountered, standard rating curves were available for the flumes fabricated. In one instance, however, a flume size was required for which no rating relationship was readily available. In that instance, a rating table was constructed from a graphical solution based on energy relationships in the upstream pipe and the flume throat (3-8). The Arredi diagram and resulting rating curve for the 33-inch flume are shown in Figures 3-2(a) and 3-2(b), respectively.

The remaining BMP flow measurements were made using Type H flumes. These devices are not true flumes, but may be considered a cross between a flume and a weir. They were originally developed by the Agricultural Research Service to measure irrigation return flows in open channels, but have proven to be well-suited for a variety of other applications (3-9). Rating tables for a variety of sizes, having maximum flows from 0.34 to 85 cfs, are available.

Table 3-1 summarizes the primary devices for each station included in the program.

The secondary devices employed at each of the BMP monitoring stations were of the same type selected for the Piscataway Creek station. In each case, the rating curve for the primary device used was stored on an EPROM chip located in the flowmeter. This made it possible to perform the conversion from stage to flow in the field, and thus made automatic composite sample collection possible. It should be noted also that each of the flowmeters was equipped with an analog signal output in addition to a strip chart recorder. This configuration made possible recording of flow data by a data logging system. In general, the bubbler type flowmeters functioned well, but they were found to be subject to erratic behavior under cold weather conditions. Icing was found to produce spurious stage readings, and caused the flowmeter to assume that actual stage increases had occurred, signaling an increase in flow, and, therefore, the need

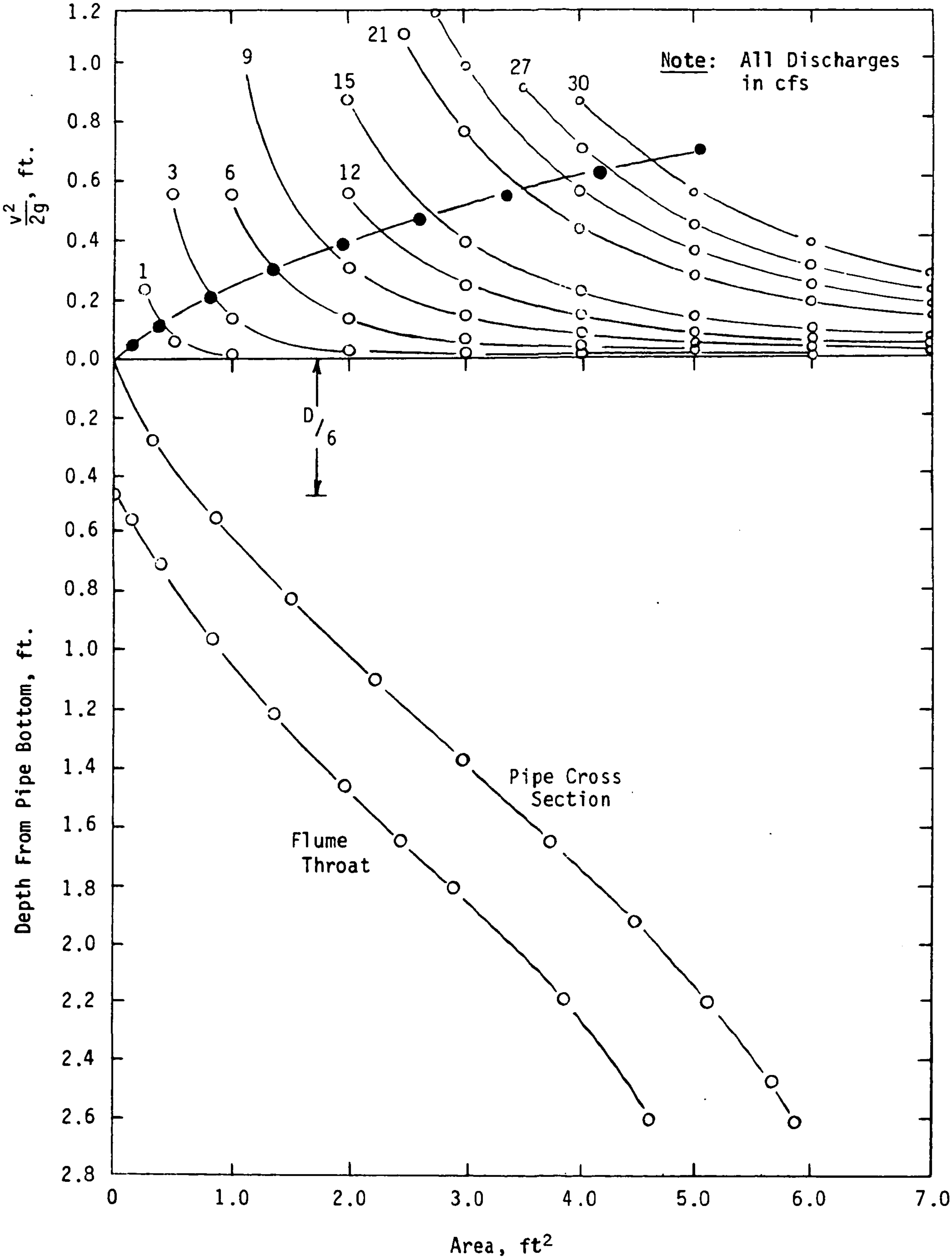


FIGURE 3-2(a). ARREDI DIAGRAM FOR 33" PALMER-BOWLUS FLUME

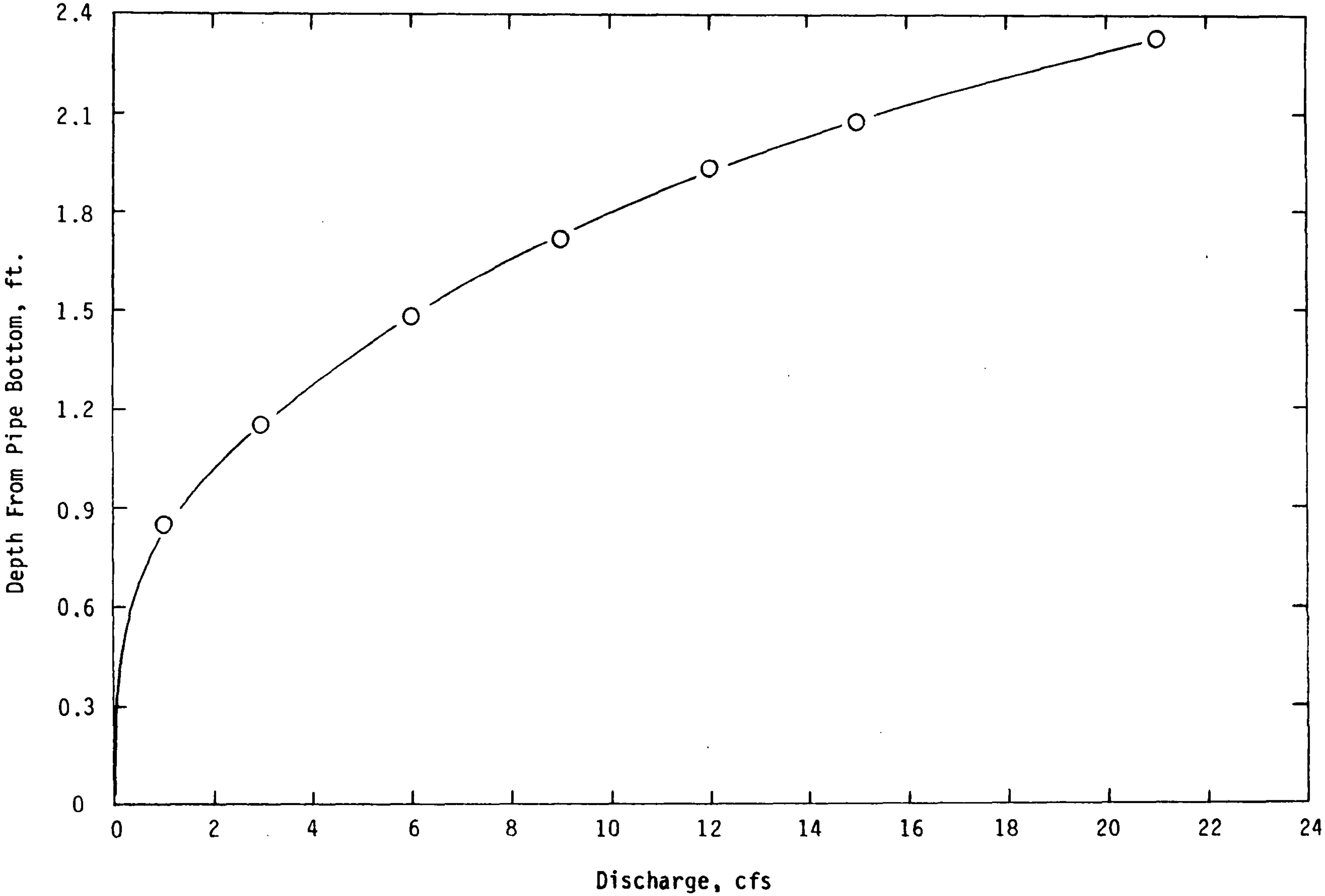


FIGURE 3-2(b). RATING CURVE FOR 33" PALMER-BOWLUS FLUME

TABLE 3-1. NURP MONITORING SITES

STATION NO.	STATION NAME	BMP TYPE	PRIMARY DEVICE
51UR01	Seneca Creek	N/A	Existing Rating
51UR02	Piscataway Creek	N/A	Existing Rating
51UR03	Burke Pond	Wet Pond Inflow	33" Palmer-Bowlus Flume*
51UR04	Burke Pond	Wet Pond OUtflow	36" Palmer-Bowlus Flume*
51UR05	Dandridge	Gravel Pits	15" Palmer-Bowlus Flume*
51UR06	Stratton Woods	Grassed Swales	27" Palmer-Bowlus Flume*
51UR07	Thousand Oaks	Dry Pond Inflow	3.0' Type H Flume
51UR08	Thousand Oaks	Dry Pond Outflow	2.5' Type H Flume
51UR09	Fairidge	Grassed Swales	30" Palmer-Bowlus Flume*
51UR10	Stedwick	Dry Pond Inflow	2.5' Type H Flume
51UR11	Stedwick	Dry Pond Outflow	2.5' Type H Flume
51UR15	Westleigh	Wet Pond Inflow	42" Palmer-Bowlus Flume*
51UR16	Westleigh	Wet Pond Outflow	2.5' Type H Flume
51UR17	Burke Village Ctr.	Gravel Trenches	27" Palmer-Bowlus Flume*
51UR18	Dufief	Grassed Swales	2.5' Type H Flume
51UR19	Rockville	Porous Paving	0.75' Type H Flume
51UR20	Fair Oaks	Wet Pond Inflow	60" Palmer-Bowlus Flume*
51UR21	Fair Oaks	Wet Pond Outflow	2.5' Type H Flume

*All Palmer-Bowlus Flumes fabricated for direct round pipe inservtion, 30° side slopes, and D/6 floor height.

to trigger the associated sampler. An example of this is shown on the strip chart in Figure 3-3. The data shown are from Christmas Eve, 1981, at 51UR10. The rapid rise and steady stage height is indicative of ice. The vertical lines on the trace are event marks from attempted sampler activations.

Sample Retrieval

The same sampling device was employed at both critical watershed and BMP monitoring sites. The sampler was selected based on the need to have a device capable of maintaining intake velocities in excess of 3 feet per second, storing either discrete samples or field-constructed composites, and being activated either by an external signal or an internal timer. In addition, the device was required to operate on 12 vdc electrical supply. Specifications developed for the samplers used are reproduced in Appendix A. The device selected was the Manning S-4040 Automatic Sampler, equipped with discrete and composite sample collection bases (3-10). These devices were of the vacuum type, equipped with a metering chamber and repeat sample features in order to provide the capability of collecting equal volumes upon each sample activation. this feature is essential if field composites are to be collected. At all stations, sampler intakes were place so as to collect from well-mixed locations.

Critical Watershed. Although the same sampling device was employed at all stations, there were two methods of activation. The first of these was employed at only one station - the Seneca Creek Critical Watershed Site (51UR01). Because of the decision to use a conventional Stevens A35 recorder, no sample activation signal was available to allow the construction of field composites. the sample activation procedure adopted was described by Grizzard, et al (3-11). The system was a simple one, relying only on magnetic reed switch closures to activate the sampler. The recorder-float wheel which was equipped with magnets

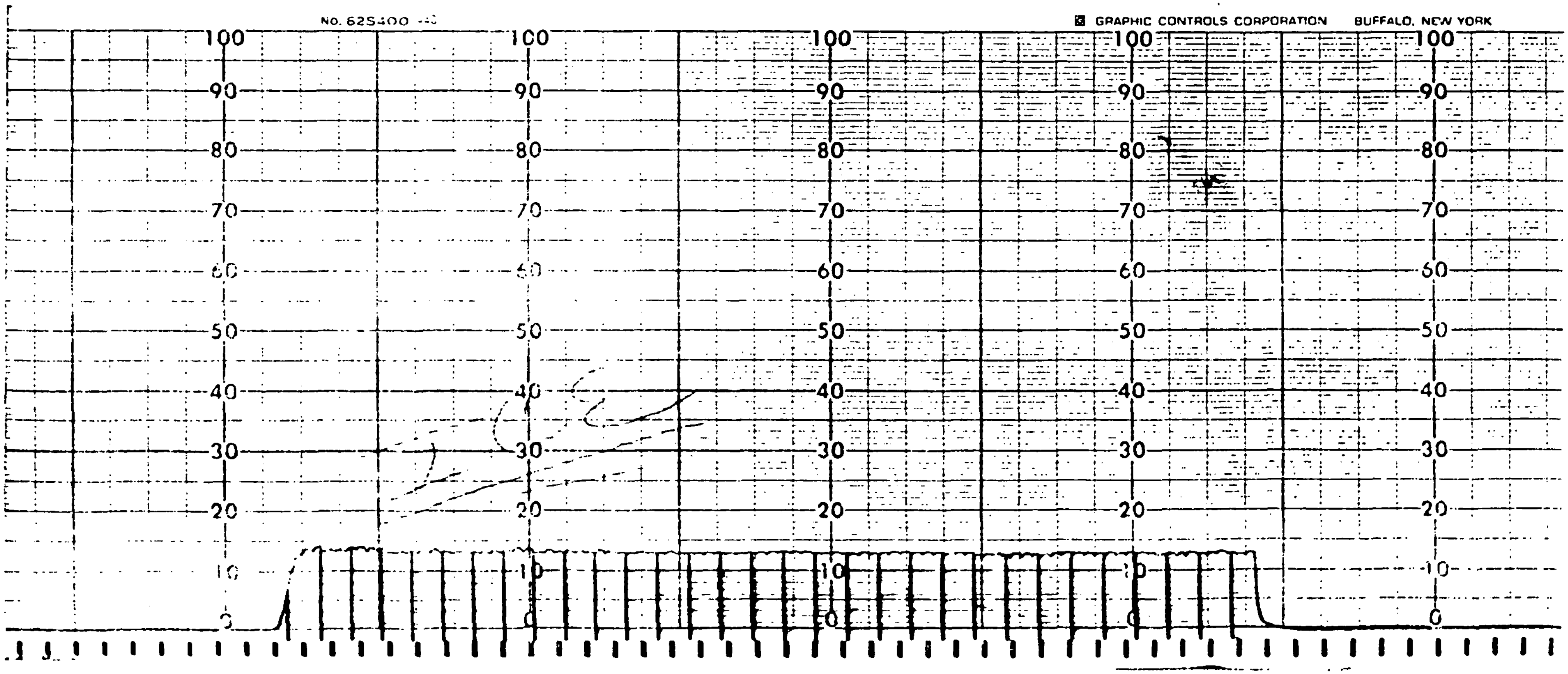


Figure 3-3. Effects of Icing on Flowmeter Performance

spaced equidistant on its circumference. As the wheel was turned by rising and falling stage the magnets passed by a reed switch placed at the recorder base, causing it to close. Upon activation, the reed switch provided a contact closure to the station sampler, activating it. An event marker was installed in parallel with the sampler and left a mark on the recorder trace at each activation. Because the activating magnets were placed equidistant on the float wheel, the sample activations occurred at equal increments of rising or falling stage. This approach to sampler activation has the virtue of being mechanically and electrically simple, but it also has some drawbacks. First, only discrete samples may be collected, and, therefore, only a limited number of activations may take place because of the availability of only 24 bottles in the sampler base. Second, because of the reliance on stage change to activate the sampler, it follows that sustained periods of high flow may not allow continued sampler activation unless the selected stage increment is very small. If that increment is too small, an excessive number of samples will be taken - exhausting the storage capacity of the device. The solution to the problem is to select a compromise stage increment for sampler activation - one small enough to give adequate storm resolution, but large enough to avoid exhausting the sampler storage capacity.

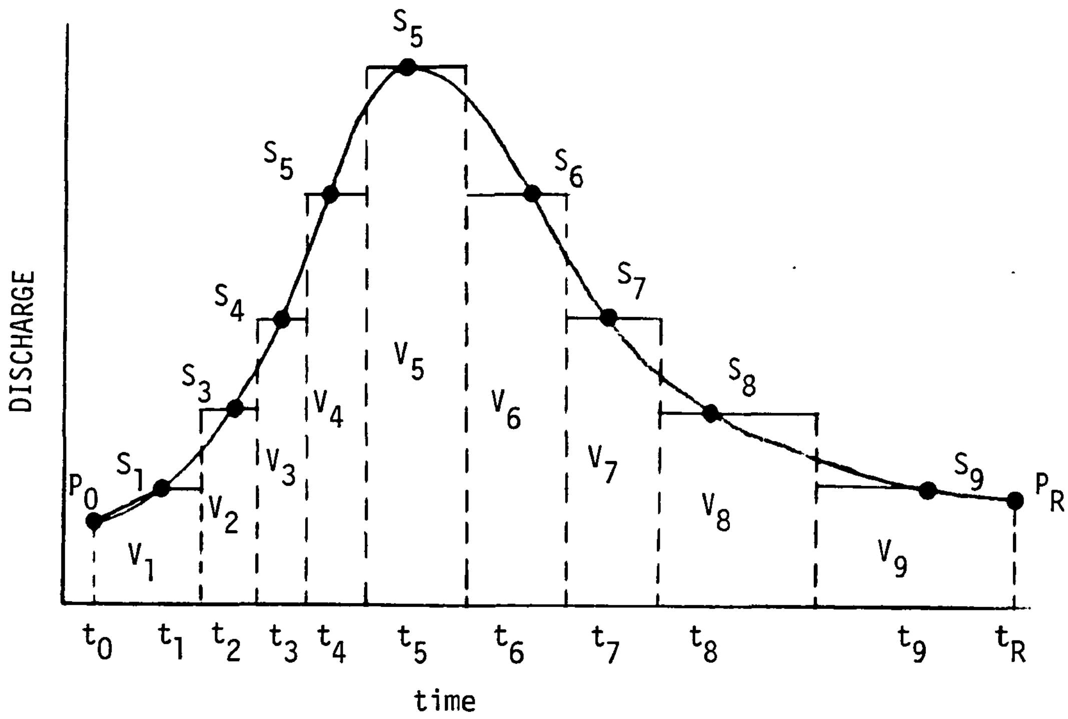
In order to keep the laboratory workload at a manageable level, it was decided to conduct most analyses on flow-weighted composite samples. For the stage-activated station, the composite was constructed manually using event mark time and flow date. The procedure is illustrated in Figure 3-4. This computation is, of course, easily adapted to a programmable calculator or microcomputer.

BMP Stations. The second critical watershed station (51UR02) and all the NURP-funded BMP stations were configured to allow collection of a flow-weighted composite in the field. This was made possible by a feature of the flowmetering equipment used for these stations. The flowmeters were all equipped with an internal total flow accumulator which tracked total volume and also output a signal at pre-selected volume increments. That signal was used to place an event mark on the sampler trace (see Figure 3-4) and to activate the sampler. Because the signals occurred at equal volumes of total flow, and the samplers collected equal volume aliquots, it was possible to composite these directly in the field using a single large vessel in the sampler base. Because there was no longer any limitation on sample numbers, the activation interval could be set to a much smaller value, assuring more samples over the course of a runoff event. The technique is illustrated schematically in Figure 3-5. It should be noted that analysis of the composite sample produced by either method would produce a value of the event mean concentration (EMC).

Data Recording

Critical Watersheds. At the critical watershed stations, budget limitations prohibited the use of data recording devices other than the flowmeter and rainfall strip charts discussed earlier.

BMP Stations. The BMP stations were, in all instances, established on very small catchments with rather short times of concentration, creating a need for good time base resolution between rainfall and runoff recording. In addition, the inflow/outflow monitoring stations (wet/dry ponds) would present a need to reconcile the hydrologic data from two flowmeters - particularly with respect to timing. For these reasons, it was decided to make use of data logging devices at each of the BMP monitoring stations. The specifications for the devices were developed by VA TECH staff, and are included in Appendix A. The successful bidder on the data loggers was A-D Data Systems, providing the ML-10A portable



NOTES:
1. P_0 and P_R are the begin and end times for the event - no samples are taken.
2. S_i are the sample points.
3. V_i are incremental areas under the hydrograph.

The volume req'd for any sub-aliquot of the composite is expressed by:

$$V_i = \frac{V_i}{V_T} \times C \quad \text{where,} \quad V_T = \sum_{i=1}^{n-1} V_i$$

V_i = aliquot volume for each sample, S_i

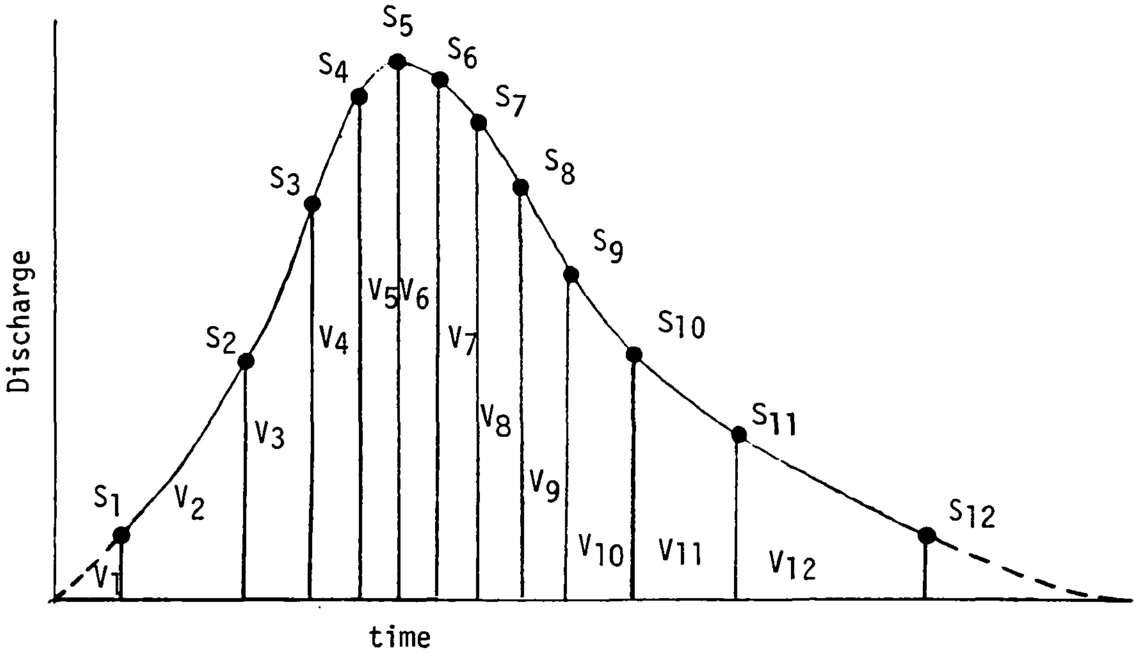
C = desired final composite volume

$$V_1 = \left(\frac{q_0+q_1}{2}\right)\left(t_1-t_0\right) + q_1\left(\frac{t_2-t_1}{2}\right)$$

$$V_{n-1} = \left(\frac{q_{n-1}+q_n}{2}\right)\left(t_n-t_{n-1}\right) + q_{n-1}\left(\frac{t_{n-1}-T_{n-2}}{2}\right)$$

$$V_i = \left(q_i\right)\left(\frac{t_i-t_{i-1}}{2} + \frac{t_{i+1}-ti}{2}\right) \quad \text{for } i = 2 \text{ to } n-2$$

FIG. 3-4. COMPUTATION OF COMPOSITE ALIQUOT VOLUMES



NOTES:

1. With the exception of V_1, all V_i are equal.
2. If V_i is very small, the error induced by unequal volume represented by sample 1 and unsampled volume past sample 12, will also be small.
3. If V_i is small, a better representation of flow near peak is also obtained.

FIG. 3-5. SCHEMATIC OF SAMPLING TECHNIC FOR AUTOMATED COLLECTION OF FLOW-WEIGHTED COMPOSITES data logger (3-12). The principle advantages derived from using a central data logger at each station may be summarized as follow:

- o Recording all data on a system with quartz crystal timing accuracy reduced the problems of reconciling inflow/outflow event timing between stations.
- o Recording all data (rainfall, runoff, event marks, date-time) on a single logging system at each station eliminated rainfall/runoff timing problems that had been encountered previously.
- o Providing the ability to record field data in a directly machine-readable format eliminated the human errors invariably associated with reducing data from strip charts.

Station Installation

Housings. As noted previously, the equipment at 51UR01 was placed in the same building as the USGS stage recorder. All other equipment (excepting rain gage receivers) was mounted in molded fiberglas enclosures manufactured by Western Power Products (3-13) according to specificatons in Appendix A.

Interfacing. Because each of the types of instrumentation used in the study was obtained from a different manufacturer, a substantial task existed to interface them all into an adequately-functioning station. The electronic interfaces and connections were, in general, designed and fabricated by VA TECH staff. A schematic diagram of the instrument arrangements for the BMP monitoring stations is shown in Figure 3-6.

Activation and Shut-Down. The station dates for first and last grab and runoff

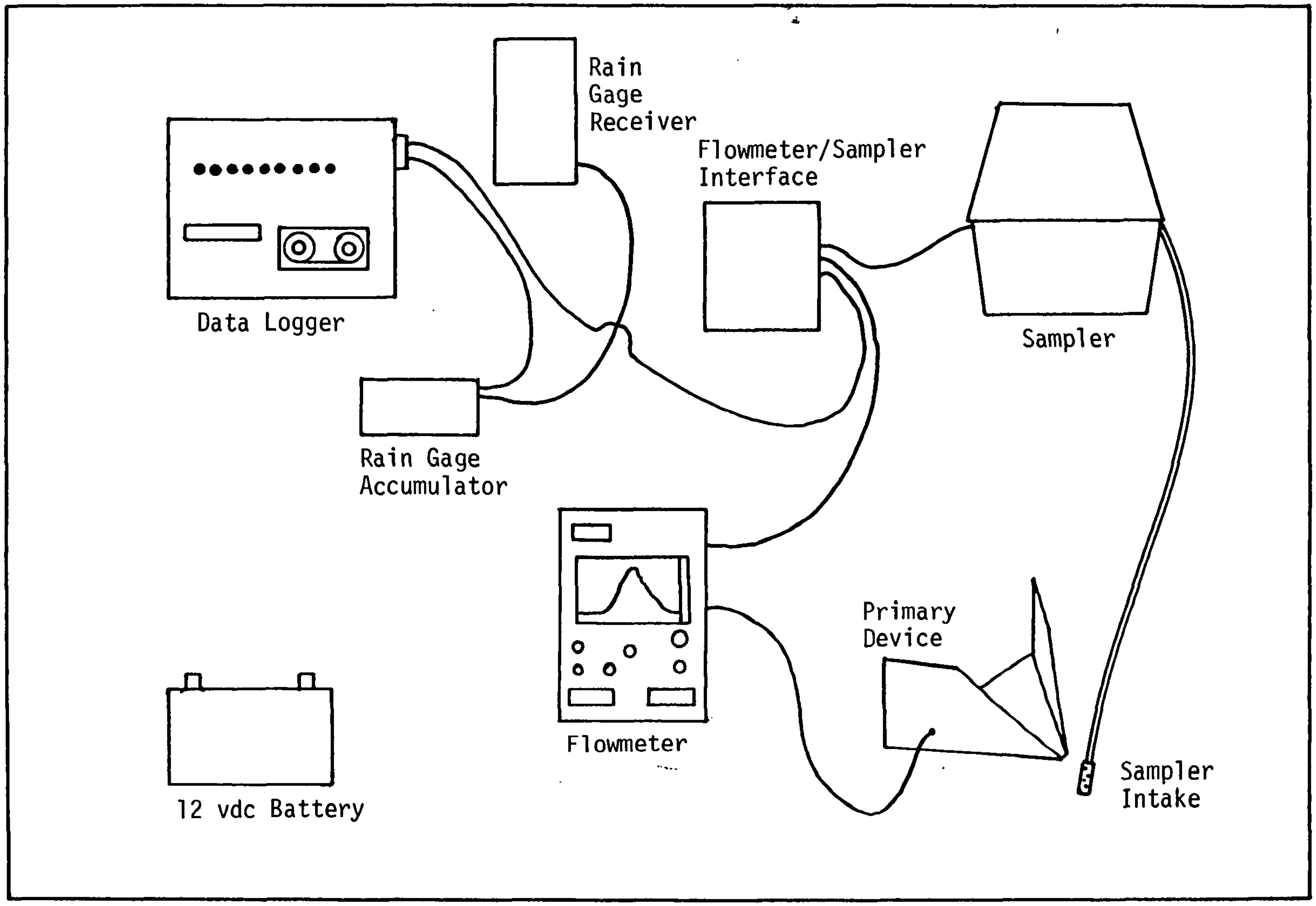


FIG. 3-6. MONITORING STATION SCHEMATIC

sampling are shown in Table 3-2.

Wetfall/Dryfall Sampling

Specifications for wetfall/dryfall samplers were developed by VA TECH staff, and are included in Appendix A. The successful bidder on the devices, Aerochem Metrics provided the model 301 wetfall/dryfall sampler used (3-14). The device, which incorporated a precipitation sensor, allowed for automatic collection and segregation of wetfall and dryfall in acid washed polypropylene buckets. During periods of dry weather, the dryfall bucket was exposed to the atmosphere while a "roof" covered the wetfall bucket. A few raindrops at the start of a storm event caused the movable roof to cover the dryfall bucket and thus expose the wetfall bucket. At the cessation of a rain event, the roof moved back over the wetfall bucket, thus again exposing the dryfall bucket. By making use of the surface area of the bucket, computations of dryfall loads in mass/area/time of operation could be made after analysis of bucket contents. Direct analysis of precipitation samples made possible the determination of loads from that source.

Significant delays were experienced in delivery of the wetfall/dryfall samplers. The monitoring period for the three NURP samplers and for the one loaned from the Virginia State Water Control Board is shown in Table 3-3.

Table 3-2. Inclusive Station Sampling Dates

STATION NO.	STATION NAME	FIRST GRAB SAMPLE	FIRST RUNOFF SAMPLE	LAST GRAB SAMPLE	LAST RUNOFF SAMPLE
51UR01	Seneca Creek	8/25/80	8/11/80	12/07/81	11/30/81
51UR02	Piscataway Creek	8/25/80	11/24/80	11/30/81	10/26/81
51UR03	Burke Pond (inlet)	N/A	10/18/80	N/A	12/1/81
51UR04	Burke Point (outlet)	N/A	11/24/80	N/A	10/26/81
51UR05	Dandridge	N/A	9/17/80	N/A	12/15/81
51UR06	Stratton Woods	N/A	10/25/80	N/A	10/26/81
51UR07	Lake Ridge (inlet)	8/25/80	8/3/80	7/27/81	8/3/81
51UR08	Lake Ridge (outlet)	8/25/80	8/2/80	7/27/81	8/3/81
51UR09	Fairidge	N/A	10/2/80	N/A	12/1/81
51UR10	Stedwick (inlet)	N/A	10/18/80	N/A	12/23/81
51UR11	Stedwick (outlet)	N/A	10/3/80	N/A	12/23/81
51UR13	Bulk Mail Center (inlet)	8/25/80	N/A	9/8/80	N/A
51UR14	Bulk Mail Center (outlet)	9/15/80	N/A	9/15/80	N/A
51UR15	Westleigh (inlet)	N/A	10/25/80	N/A	12/1/81
51UR16	Westleigh (outlet)	9/15/80	8/15/80	12/7/81	12/1/81
51UR17	Burket Town Center	N/A	9/10/80	N/A	12/4/81
51UR18	Dufief	N/A	2/8/81	N/A	10/26/81
51UR19	Rockville Gr.	N/A	2/20/81	N/A	11/6/81
51UR20	Fair Oaks (inlet)	N/A	9/15/81	N/A	1/4/82
51UR21	Fair Oaks (outlet)	9/21/81	10/26/81	12/7/81	10/26/81

Table 3-3. Wetfall/Dryfall Sampling Periods

Station Name	Station No.	Monitoring Period	Number of Wetfall Samples	Number of Dryfall Samples
Haines Point (D.C.)	51WF01 51DF01	12/20/80-1/2/82	39	52
Burke Village Centre Roof (VA)	51WF02 51DF02	2/10/81-12/30/81	39	49
Burke Village Centre Ground (VA)	51WF03 51DF03	3/22/81-12/23/81	30	38
Stedwick (Md.)	51WF04 51DF04	6/11/81-12/16/81	17	29

References

3-1 WeatherMeasure Division, Systron Donner, Box 41257, Sacremento, CA 95841.

3-2 Science Associates, Inc., 230 Nassau St., Box 230, Princeton, NJ 08540.

3-3 Leupold and Stevens, Inc., Box 688, Beaverton, OR 97005.

3-4 USGS, Towson District Office, Rating Curve for Station 01645000.

3-5 USGS, Towson Disrict Office, Rating Curve for Station 01653602.

3-6 Instrumentation Specialities Company (ISCO), Box 5347, Lincoln, NE 68505.

3-7 Palmer, H.K. and F.D. Bowlus, "Adaptation of Venturi Flumes to Flow Measurements in Conduits," Trans. A.S.C.E., 101, pp 1195-1216, (1936).

3-8 Wastewater Engineering: Collection and Pumping of Wastewater, Metcalf and Eddy, Inc., McGraw-Hill Book Co., New York, NY, 1981.

3-9 Field Manual for Research in Agricultural Hydrology, Agriculture Handbook No. 224, ARS, Soil and Water Conservation Research Division, USDA, Washington, D.C. 1962.

3-10 Manning Environmental Corp., 120 DuBois Street, Santa Cruz, CA 95061.

3-11 Grizzard, T.J., C.W. Randall, and R.C. Hoehn, "Data Collection for Water Quality Modeling in the Occoquan Watershed, EPA 600/9-76-016, pp 819-823, 1976.

3-12 A.D. Data Systems, Inc. 200 Commerce St., Rochester, N.Y. 14623.

3-13 Western Power Products, Inc., 900 Portway Ave., Hood River, OR 97031.

3-14 Aerochem Metrics, 6832 SW 81 Street, Miami, FL 33143.

4. FIELD METHODS

Site Visitation

VA TECH staff performed site maintenance visits on a minimum weekly frequency. The same site visitation schedule was also adhered to for wetfall/dryfall sampling stations.

At each station visit, staff carried out routine maintenance activities including the following:

- o battery changes
- o equipment performance checks
- o equipment changes, as required
- o minor instrumentation repairs, as required
- o major and minor site maintenance and repair, as required

All technical staff members involved in field operations received instruction in sufficient detail to enable them to diagnose, and in many cases repair, malfunctioning equipment in the field. In cases where this has proven impractical, staff noted symptoms on site visitation logs, and returned malfunctioning equipment to the laboratory for repair in-house or for forwarding to the manufacturer. On a number of occasions since the beginning of the project, site damage occurred either as a result of natural forces or vandalism. In no case did either situation result in the loss of equipment or instrumentation. All incidents of vandalism were easily corrected. For the most part, they consisted of the disconnection of flowmeter bubbler tubes or the destruction of flume approach boxes.

It should be noted that, because of the hydraulic stresses placed upon the primary devices at each station, a great deal of regular maintenance work was required just to maintain the integrity of sample intakes, primary devices, secondary device sensing hoses, and rain gage connections.

Maintenance activities at each site were recorded on forms provided for that purpose. These site visitation forms also contained pertinent station operating data, and have been retained as a permanent part of the project record. A sample is reproduced as Figure 4-1.

Rating Verification

A major concern in the successful management of a runoff quality and quantity data collection program is the measurement of discharge. This presents a task far more difficult than is generally supposed by those unfamiliar with the hydraulics of open channels. In order to minimize the errors in mass loadings due to poor quality flow measurements, VA TECH staff instrumented most MWCOG NURP stations with primary devices. The only two exceptions were the two critical watershed stations in Maryland, but these sites both had previously-prepared rating curves.

The two types of primary devices employed in the field study were the Type H flume and the Palmer-Bowlus flume. Even though these devices are quite reliable, experience has shown that an independent verification of the stage-discharge relationship is desirable. For this reason, VA TECH staff conducted such a program of verification with tracer dilution studies performed using lithium chloride.

Because lithium is rare as a dissolved species in most aquatic systems, it often makes an excellent choice for chemical gaging systems. this is due to the fact that elimination of a need for background correction eliminates one entire set of sampling equipment from the system.

Figure 4-2 is a schematic of the tracer injection dilution system used, and also shows the nomenclature for the calculations necessary to compute flow. Constructing a mass balance around the upstream manhole, it may be seen that equation 1 results:

OWML SITE VISIT LOGBOOK - NURP

1. Date: 10/15/81 2. Site: UR 7 3. Time: 1005

4. Personnel: RP GG

5. Equipment Changes (Note Serial # When Changes Are Made)
- ☑ NONE
- ☐ OTHER, if so, what?

6. Equipment Maintenance: sampler tested / dessicant changed on FM + DL / LICL pump checked + pumping at rate 61 ml/3 min.
- ☐ NONE
- ☑ BATTERY CHANGED
- ☑ CHART CHANGED
- ☑ CASSETTE TAPE CHANGED
- ☑ OTHER

7. Sample Collection
- ☑ NONE
- ☐ STORM SAMPLES
- ☐ GRAB SAMPLES

TOTAL PRECIPITATION N/A

8. Equipment Settings After Site Visit (Circle One)

CHART SPEED	1/8 1/4 1/2 1 (2) 4
RECORDER FULL SCALE SPAN	NORMAL (1st EXPANDED) 2nd EXPANDED
LEVEL UNITS	(FEET) METERS
MODE (Primary Device) AND TYPE	LEVEL (1) 2 3 4 — 30PB
SAMPLE INITIATION SIGNAL	10 (100) 1000
SCALING CONSTANT	2.8812
TOTAL FLOW	0 x 10 TO 0

9. Sampler Setting After Site Visit
- ☑ FLOW
  - ☐ Mult. Bottle (1) 2 3 4 5
  - ☑ Mult. Sample 6 7 8 9 10
- ☐ TIME

Min.	Hrs.
3.7	1
7.5	2
15	4
30	6
	12
	24

Approximate Sample Size in ml 500

Inches Hg vacuum

Bottle Type
- ☑ 500 ml
- ☐ 1 liter bottle
- ☐ composite bottle

10. DATA LOGGER

Power
- ☑ ON
- ☐ OFF
- ☐ Not In Use

	DATA SKIP	
Digital	☐ Yes	☑ No
Clock	☐ Yes	☑ No

Timeset
- ☐ Reset Time?
- ☑ Run

88:10:11

Channel In Use
- Temp. 0 1 2 3 4 5 6 7 8 9
- Skip 0 1 2 3 4 5 6 7 8 9
- Volts (0 1 2) 3 4 5 6 7 8 9

SCAN INTERVAL
- Sec. 10 30
- Min. 1 5 (10) 30

Scan
- ☐ Manual
- ☑ Internal
- ☐ External

Tape
- ☐ OFF
- ☑ Record

RG Reading 23 + 1.460

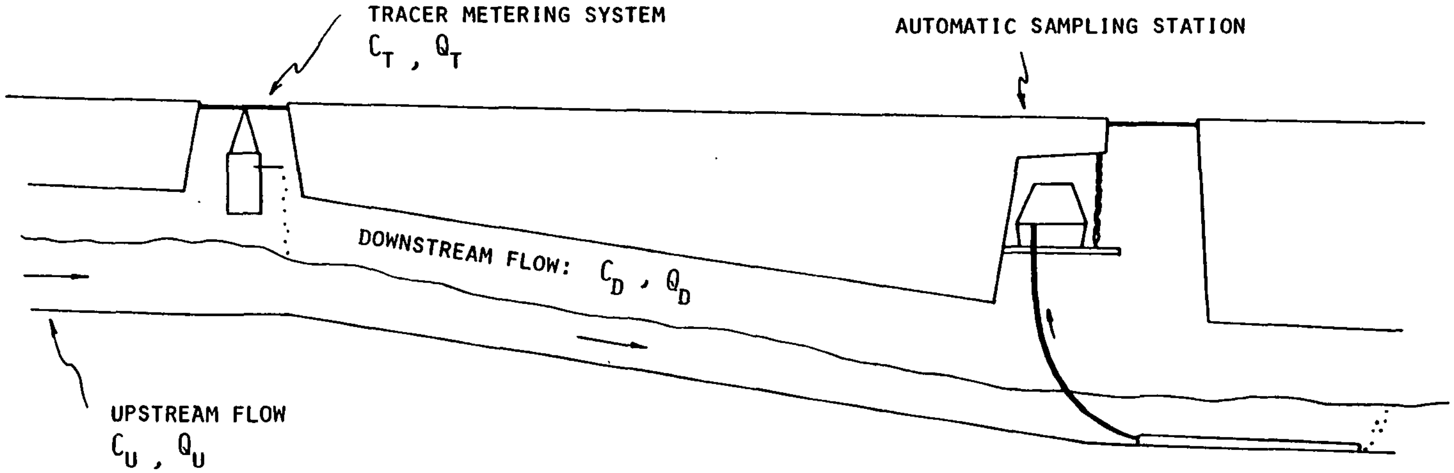
RG Interface Reset ☐ Yes ☑ No

11. Weather: ☐ Clear ☑ Partly Cloudy ☐ Overcast ☐ Rain ☐ Snow

12. Final Check
- ☑ Instrument Doors Shut
- ☑ Sample Electronically Advanced
- ☑ Sampler Pressure Sensor in Place
- ☑ Air Line Connected
- ☑ Air Line Not Pinched
- ☑ Battery Plugs Connected

13. Site Activity:

FIGURE 4-1. EXAMPLE OF NURP SITE VISITATION SHEET



MASS BALANCE:

$$C_D = \frac{Q_U C_U + Q_T C_T}{Q_U + Q_T}$$

NOTE: IF $C_U = 0$ AND $Q_U >> Q_T$, THEN:

$$Q_D = \frac{Q_T C_T}{C_D}$$

FIGURE 4-2. SCHEMATIC DIAGRAM OF TRACER DILUTION SYSTEM

$$\frac{Q_U C_C + Q_T C_T}{Q_u + Q_T} = C_D \qquad (1)$$

where, Q_U = Flow upstream

C_U = Trace Concentration upstream

Q_T = Tracer input flow

C_T = Tracer input concentration

Q_D = Flow downstream

C_D = Tracer concentration downstream

Equation 1 may be simplified in the following manner:

(1) Note that the value of $C_U = 0$ (If Proper Tracer is Used)

(2) Note that $Q_D + Q_{U+}Q_T$ and $Q_T << Q_U$

Rewriting Equation 1 yields:

$$Q_D = \frac{Q_T C^T}{C_D} \qquad (2)$$

In this manner, discrete flow measurements may be made at the time of each sample collection. Using the concomitant stage measurements made by the downstream flowmetering system, a rating curve of stage vs. actual discharge may be constructed.

Lithium chloride is soluble at a concentration of over $6x10^5$ mg/l at 20C. Lithium represents 16.37 percent of the compound by weight, therefore a solution approaching saturation would contain over 98 grams of the metal per liter. In addition, lithium may be detected at the sub-part per million level (100 ppb) by either emission or atomic absorption spectroscopy. Therefore, using a saturated solution, and assuming dilution to the detection limit would allow the measurement of a sewer flow almost a million times larger than the tracer flow. At a tracer flow of 100 mL/min., for instance, this would correspond to about 60 cfs.

A portable metering system was constructed for field use from the following components:

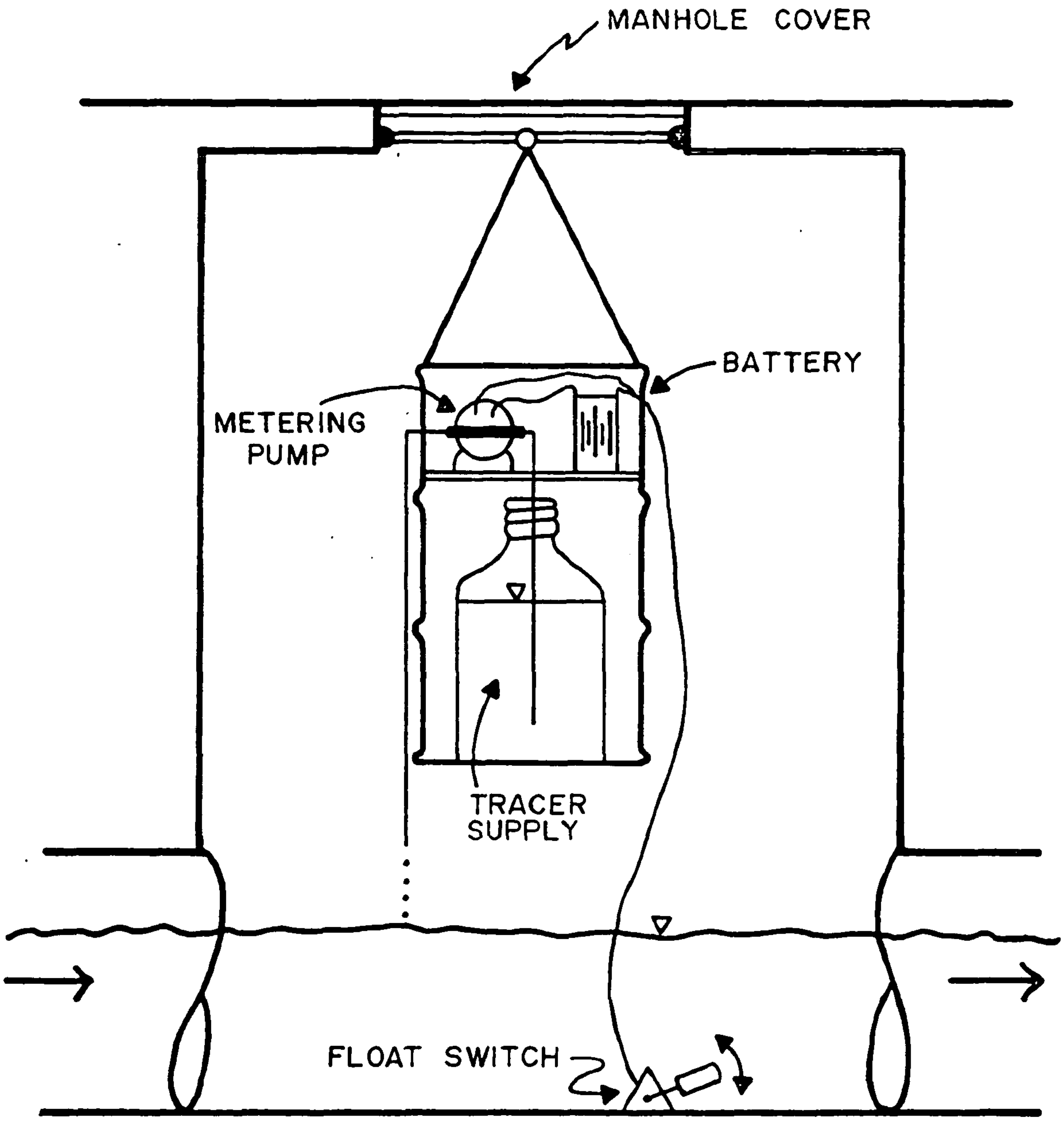
- o Low current drain (<100 ma), low volume, high accuracy positive displacement metering pump, operating on 12 vdc
- o 12 vdc motorcycle battery
- o Float switch
- o Plastic tracer reservoir
- o Container for entire system

A 5 gallon carboy containing the tracer solution was inserted in a metal drum, a false floor placed above it to carry the metering pump and battery, and the whole suspended in a storm sewer manhole with an expandable "chinning bar." A float switch was placed in series with the metering pump so that the onset of flow in the conduit started the system. Prior to leaving the system unattended, a calibration of the pumping rate in place was carried out with a graduated cylinder and stop watch. A schematic of the injection system is also shown in Figure 4-3.

Figure 4-4 shows the results of a number of tracer analyses at station UR15. This site was of particular concern to VA TECH staff because of the rather steep slope of the approach to the flume. To assure the maintenance of a sub-critical flow regime upstream of the flume, an artificial barrier was placed in the flow just upstream of the measuring section. As may be seen from the results in the figure, the agreement between the theoretical and observed flows is quite good, indicating that no adjustments were required to the flow data base.

Rating verifications of this type were carried out wherever concern existed over the accuracy of the primary device alone. Examples of conditions that prompted a verification study included:

- o Suspicion of deformed primary devices.



SCHEMATIC OF CHEMICAL GAGING
FEED APPARATUS

FIGURE 4-3.

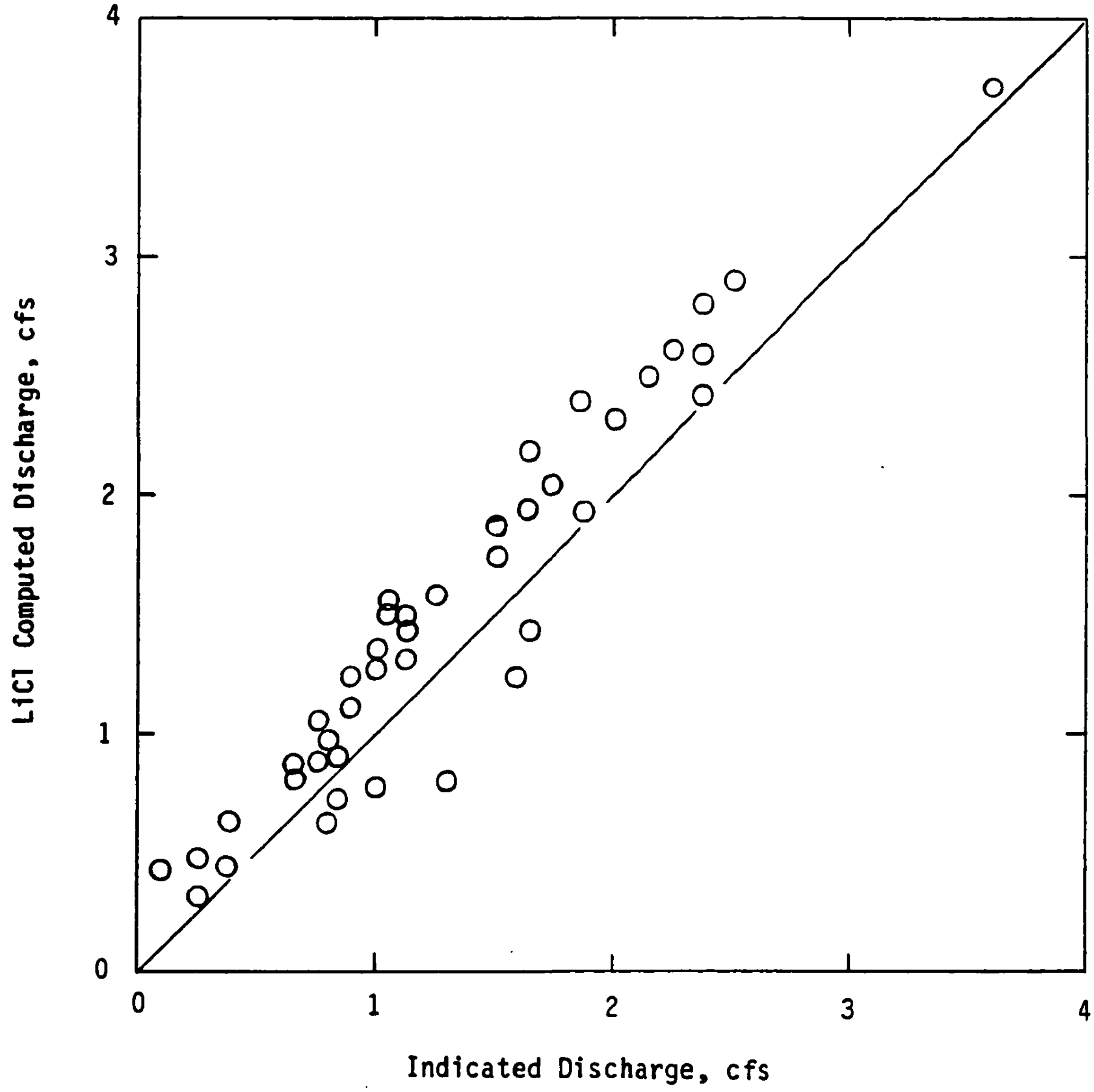


FIGURE 4-4. RESULTS OF RATING VERIFICATION STUDY FOR 42-INCH PALMER-BOWLUS FLUME AT UR15.

- o Suspicion of super critical flow upstream of primary devices

Sample Collection

Stormwater samples from the critical watershed and BMP stations were collected immediately following the cessation of runoff. At times, in order to prevent samples from standing in the field for extended time periods, portions of storm runoff composite samples were collected and returned to the laboratory prior to event completion. Samples were always transported in insulated containers and refrigerated immediately upon return to the laboratory. In general, samples remained in the stations no more than twelve hours following the collection of the first aliquot of a composite.

Wetfall and dryfall samples were generally retrieved following the completion of a runoff event. However, if an additional precipitation event began prior to sample retrieval, the bucket was generally allowed to remain in place. Begin and end times were recorded to coincide with sample bucket deployment and retrieval, not actual times open to the atmosphere.

5. LABORATORY METHODS

Sample Handling

Upon receipt in the laboratory, all samples were logged in and placed in the custody of the laboratory supervisor. While in storage, prior to preparation for analysis, all samples were held at 4 c in dedicated refrigerator compartments. No preservation other than refrigeration was used, with the exception of samples prepared for metals analysis. These were prepared and acidified to pH 4 prior to storage.

EPA (5-1) and APHA (5-2) guidelines were used in developing laboratory procedures for handling samples prior to analysis. Sample container preparation was given high priority in the protocol designed to protect sample integrity. Sample bottles were cleaned by the following procedure between uses in the field:

1. Phosphorus-free detergent wash
2. Chromic acid wash for contaminants as needed
3. 1 + 1 HCl wash for adsorbed inorganic removal
4. 3 deionized water rinses
5. Air dry

Analytical Program

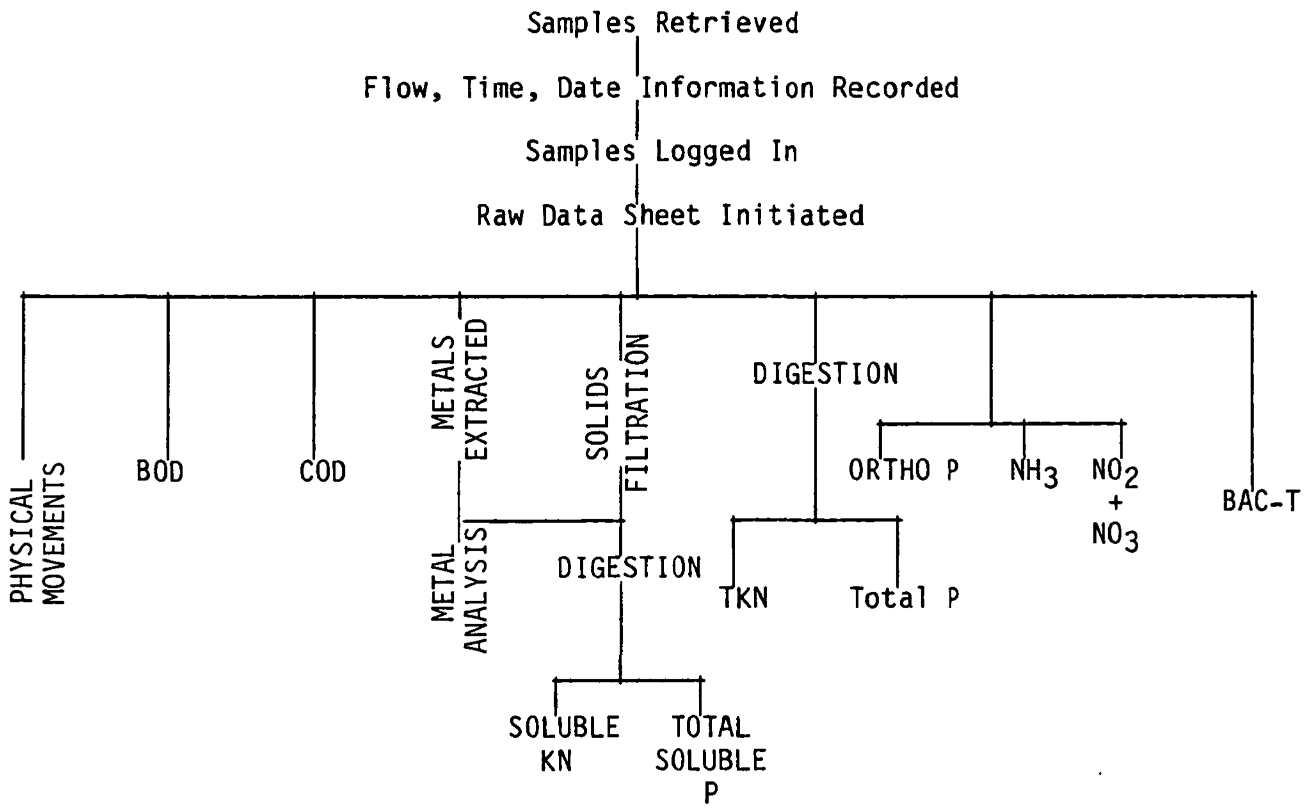
The analytical program for the MWCOG NURP was jointly developed by MWCOG and VA TECH. Table 5-1 summarizes the constituents measured for the five classes of sample retrieved: baseflow, runoff, wetfall, dryfall, and High Volume particulate. Figure 5-1 shows a sample flow diagram from time of laboratory receipt through completion of analysis.

Table 5-1. Basic Analytical Program for MWCOG NURP

	Baseflow	Runoff	Wetfall	Dryfall	Hi - Vol
Plant Nutrients					
a) Wet	X	X	X	X	X
b) Digested	X	X	X	X	X
C) Chlorophyll a					
Solids					
a) TSS	X	X			
b) VSS					
c) TDS					
d) TS				X	
Organics					
a) BOD_5 and/or 20	Monthly	Monthly	Monthly		
b) COD	X	X	X	X	
c) TOC					
Heavy Metals					
a) Cadmium	E & S	E & S	E & S	E	E
b) Chromium	↓	↓	↓	↓	↓
c) Copper	↓	↓	↓	↓	↓
d) Iron	↓	↓	↓	↓	↓
e) Lead	↓	↓	↓	↓	↓
f) Manganese	↓	↓	↓	↓	↓
g) Nickel	↓	↓	↓	↓	↓
h) Zinc	↓	↓	↓	↓	↓
Bacteriological					
a) Total Coliforms	Monthly	Monthly			
b) Fecal Coliforms	↓	↓			
c) Fecal Streptococci	↓	↓			
Physical					
a) Alkalinity		Monthly	Monthly		
b) Dissolved Oxygen	X				
c) pH	X	X	X		
d) Secchi Disk					
e) Specific Conductance	X	X	X		
f) State	X				
g) Temperature	X	X	X		

NOTE: E-Extractable S-Soluble

Fig. 5-1. MWCOG NURP ANALYTICAL FLOW SHEET



Analytical Methods

The analytical procedure utilized in the study are summarized and referenced in Table 5-2. Methods were selected from accepted procedures in the classical and automated analysis literature. Some procedures were modifications of original methods developed by VA TECH and utilized routinely in the laboratory. The decision to make extensive use of automated analysis was brought about by the workload already experienced by OWML and the increase anticipated as a result of the NURP effort.

Quality Assurance

Analytical quality assurance was recognized to be an integral part of the MWCOG NURP. The performance of all analytical tasks for the project was undertaken with the same in-house quality assurance program operated by the VA TECH Occoquan Watershed Monitoring Laboratory (OWML). A copy of the quality assurance plan was transmitted to COG Staff on 25 September, 1980, and is also included as Appendix B.

TABLE 5-2

ANALYTICAL PROCEDURE REFERENCE
MWCOG NURP

ANALYSIS	COMMENTS	REFERENCE
BOD_5 BOD_{20}	Determined using the static bottle method. BOD_{20} was inhibited.	5-2
COD	Determined by the normal range method or by the automated procedure.	5-1, 5-2, 5-3
TSS	Determined according to the references, with the following exception: A 70mm glass fiber filter was utilized to allow a larger volume of filtrate to pass before clossing. This filtrate was used in the determination of soluble nutrients and metals as detailed below.	5-1, 5-2
ORTHO PHOSPHORUS	Determined by the single reagent automated method.	5-2
TOTAL PHOSPHORUS	Determined upon digests done according to (5-4) and analyzed according to the low-level automated method (5-2).	5-3, 5-4
TOTAL SOLUBLE PHOSPHORUS	Identical to the above except that the sample was an aliquot of filtrate from the Total Suspended Solids analysis.	5-3, 5-4
AMMONIA	Determined by automated method.	5-3
TOTAL KJELDAHL NITROGEN	Determined upon digests done according to (5-4) and analyzed according to the automated method.	5-3, 5-4
SOLUBLE KJELDAHL NITROGEN	Identical to above except that the sample was an aliquot of the filtrate from the Total Suspended Solids analysis.	5-3, 5-4
NITRITE AND NITRATE	Determined by the automated reduction method. Data reported as the sum of $NO_2 + NO_3$ as N.	5-3
FECAL COLIFORM	Done according to the multiple tube fermentation technic in (5-2).	5-2
EXTRACTABLE METALS	Determined by Atomic Absorption Spectroscopy on acid extracts.	5-1
SOLUBLE METALS	Identical to above except that the sample was an aliquot of filtrate from the Total Suspended Solids analysis.	5-1

References

5-1. Methods of Chemical Analysis for Water and Wastes. U.S.E.P.A., Washington, D.C. (1979).

5-2. Standard Methods for the Examination of Water and Wastes. APHA, 15th Edition (1980).

5-3. AutoAnalyzer II Industrial Methods Manual. Technicon Corporation, Tarreytown, N.Y.

5-4. Personal Communication: "Total Phosphorus and TKN (micro semi-automated method)", Mark Carter, EPA, Chicago, Illinois (1975).

6. Data Management

Data management activities undertaken as a part of the project included coding, computer storage and transfer of data to project participants.

Data Base Manager

The Statistical Analysis System (SAS) was chosen as the computer-based data management and analysis system for the project (6-1). VA TECH experience with SAS over a period of some years has led staff to conclude that it is one of the most flexible and easily-used data management systems available. SAS data sets containing project numeric data were stored on disk packs and backed up on tapes at the computing facility utilized.

Computing Facilities

All SAS operations, and, therefore, data storage and manipulation were carried out on the IBM 370/158E located in the Virginia Tech Computing Center in Blacksburg. Access to the system from the Manassas laboratory was by remote ASCII compatible terminals.

Variable Codes

The list of variable code names was developed as an expansion of the SAS variable names already used by VA TECH-OWML. SAS variable names have a limit of eight characters, and, as a result, abbreviations have been adopted for most of the variables stored on the NURP data set. For the most part, the variable names are self-explanatory and/or have become familiar with continued use. However, to serve in a reference capacity, a list of NURP variables, their SAS names, and units of expression is included as Appendix C.

Data Storage

General. Upon the completion of sample log-in procedures, a data coding sheet was initiated for each sample to be analyzed. The data collected from field observations were initially coded into selected fields and the sheet then filed to await completion of analytical tasks. Upon completion of the analytical work, the remaining data were coded on the sheet, which was then passed on for initial entry into a SAS input file. Data from the stations monitored remained in such temporary storage until checks for accuracy of keying and transcription could be made. Following such checks, the data were periodically updated into hard disk storage on OS data sets. Following storage, data retrieval checks were again made to assure the accuracy of the update. The procedure described herein adequately describes the storage procedure for all data except the precipitation and instantaneous flow data for those stations equipped with data loggers.

Cassette Tape Data Storage. The NURP stations established to measure BMP effectiveness were all equipped with portable data loggers as discussed in Chapter 3. These devices were configured to provide 10-minute data for flow and precipitation at all stations. In addition, the loggers were set up to scan the flow channel and leave an event mark in another channel at each sample activation. The machine-readable tapes from the data loggers were retrieved at the end of each runoff event and returned to the laboratory for direct transmission to the host computer using a Techtran Model 816 data cassette reader (6-1) and the RDTAPE Utility provided by the Virginia Tech Computing Center (6-2). It may easily be seen that this device provided a great savings in staff time and potential coding error elimination. The precipitation and flow data were maintained in separate hydrologic data files.

Data Transfer

Because NVPDC has also made use of the mainframe computing facilities in Blacksburg, most data transfers to that agency have been performed on the system. Transfers to COG were by means of generation of an update tape and mailing it from Blacksburg, to Washington.

Data transfers to EPA were required to be in a machine-readable STORET format. It was recognized that the SAS formats used for the project were not compatible with STORET.

At the request of MWCOG staff, NVPDC modified and supplied VA TECH with a version of a State Water Control Board computer program designed to translate information in SAS data sets to a format compatible with the requirements of the EPA STORET system. Initial testing of the program showed it to be incapable of translating boundary times on composite samples, and to be equally deficient in its inability to load over 30 variables per observation.

Because of the noted deficiencies, VA TECH staff undertook the construction of a new translation program to transmit data in the ?04 storage procedure required in the NURP Data Management Procedures Manual. The program was tested and used in all data tape transfers. The program itself was provided to EPA to serve as a guide for other involved in similar transfers. The program statements are reproduced in Appendix C.

Data Base Abstract

It is interesting to note the size of the data base created by the MWCOG NURP. In the course of the study, the following have been compiled:

	Number of Observations
Hydrologic Data	77,077
Runoff Quality Data	1,238
Soil Solution Data	323
Wetfall Quality Data	126
Dryfall Quality Data	169
High Volume Sampler Data	53

The above summary, of course, does not show the extensive list of variables included in each observation.

References

6-1 Statistical Analysis System, SAS Institute, Inc., Box 8000, Cary, NC 27511.

6-2 Techtran Industries, Inc., 200 Commerce Drive, Rochester, NY 14623.

6-3 Virginia Tech Computing Center, Blacksburg, VA 24061.

7. CRITICAL WATERSHED STUDIES

Introduction

Monitoring data were collected at two critical watershed stations established on Seneca Creek near Darnestown (UR01) and on Piscataway Creek at Piscataway (UR02). The sites, their instrumentation, and operation have been described elsewhere in this report.

Base Flow

Regular base flow sampling took place throughout the course of the study in order to provide non-storm characterizations of water quality in the two streams. Table 3-2 shows the inclusive base flow sampling dates for the two streams.

Seneca Creek. A seasonal summary of base flow water quality data is given in Table 7-1. As may be seen, 48 samples were collected and analyzed in a monitoring period that encompassed the summer and fall seasons of 1980 and 1981, and the winter and spring seasons of 1981. Examination of the data in Table 7-1 leads to the conclusion that base flow water quality in the stream is generally quite good in all seasons. Total suspended solids were always below 10 mg/L, and average oxygen demand as measured by COD was always less than 15 and less than 10 mg/L for most seasons.

Average seasonal total phosphorus concentrations never rose above 0.1 mg/L. The soluble and ortho forms were generally less than 0.08 and 0.06, respectively. Unoxidized nitrogen was never higher than 0.6 mg/L as N. A substantial concentration of nitrate was maintained in the stream throughout the year, ranging from 3.36 to 4.07 mg/L as N. The very high inorganic nitrogen to total soluble phosphorus ratio would assure that from a macro-nutrient standpoint, the

Table 7-1. Base Flow Data Summary for Seneca Creek (1980-1981)

-----Constituent----	Season: Winter	Spring	Summer	Fall
Number of Samples	7	9	14	18
TSS, mg/L	4.7	9.8	8.9	2.5
COD, mg/L	4.7	13.9	8.1	6.2
Ortho-P, mg/L	0.02	0.02	0.06	0.06
Total Soluble P, mg/L	0.05	0.05	0.07	0.08
Total P, mg/L	0.06	0.07	0.10	0.09
NH_3-N, mg/L	0.06	0.11	0.06	0.04
TKN, mg/L	0.45	0.59	0.51	0.42
(NO_2+NO_3)-N, mg/L	3.49	2.77	3.46	3.64
Total N, mg/L	3.99	3.36	3.96	4.07
D.O., mg/L	13.6	9.3	8.4	10.7
pH	6.2	6.04	7.1	6.8

stream would be phosphorus limited.

Piscataway Creek. A seasonal summary of base flow water quality data is given in Table 7-2. The sample summary shows that 41 base flow samples were collected in the course of the study. The seasonal distribution was as noted above for Station UR01. The summer data show generally the greatest departure from the other seasonal averages. Summer average COD's at the monitoring station exceeded 20 mg/L while the dissolved oxygen was only 6.8 mg/L on average. Total phosphorus averaged over 0.16 mg/L with ortho-P averaging 0.08 mg/L. Much lower concentrations of nitrogen forms were observed than at the UR01 station. From the relative abundance of phosphorus compared to nitrogen it appears that from a macro nutrient standpoint, the stream would generally be nitrogen limited. The extreme low summer flows, which averaged 2.8 cfs on the dates sampled, reduced the dilution available and contributed to the higher concentrations observed.

Storm Runoff

Figures 7-1 through 7-12 show the distribution of storm runoff loading data for the critical watershed stations. All loads are expressed in units of pounds/acre/inch of runoff. This, it should be noted, is only a convenient normalization of event mean concentration. The data have been plotted in the familiar box-and-whisker format to allow comparisons between UR01 and UR02.

Total Suspended Solids. The distribution of total suspended solids storm loadings are shown in Figure 7-1. As may be seen, the median value for UR01 is lower than that for UR02, but the interquartile range is greater. Both distributions are positively skewed, which is to be expected with hydrologic and/or water quality data sets.

Chemical Oxygen Demand. The COD data loading distribution is shown in Figure

Table 7-2. Base Flow Data Summary for Piscataway Creek (1980-1981)

-----Constituent----	---------Season---------			
	Winter	Spring	Summer	Fall
Number of Samples	7	8	10	16
TSS, mg/L	2.5	5.7	7.9	3.7
COD, mg/L	8.4	16.7	21.3	12.7
Ortho-P, mg/L	0.01	0.04	0.08	0.04
Total Soluble P, mg/L	0.03	0.06	0.10	0.06
Total P, mg/L	0.04	0.10	0.16	0.10
NH_3-N, mg/L	0.54	0.10	0.10	0.04
TKN, mg/L	0.78	0.61	0.66	0.44
(NO_2+NO_3)-N, mg/L	0.67	0.44	0.15	0.26
Total N, mg/L	1.49	1.05	0.80	0.71
D.O., mg/L	13.6	9.3	6.8	10.5
pH	5.8	6.2	6.7	6.5

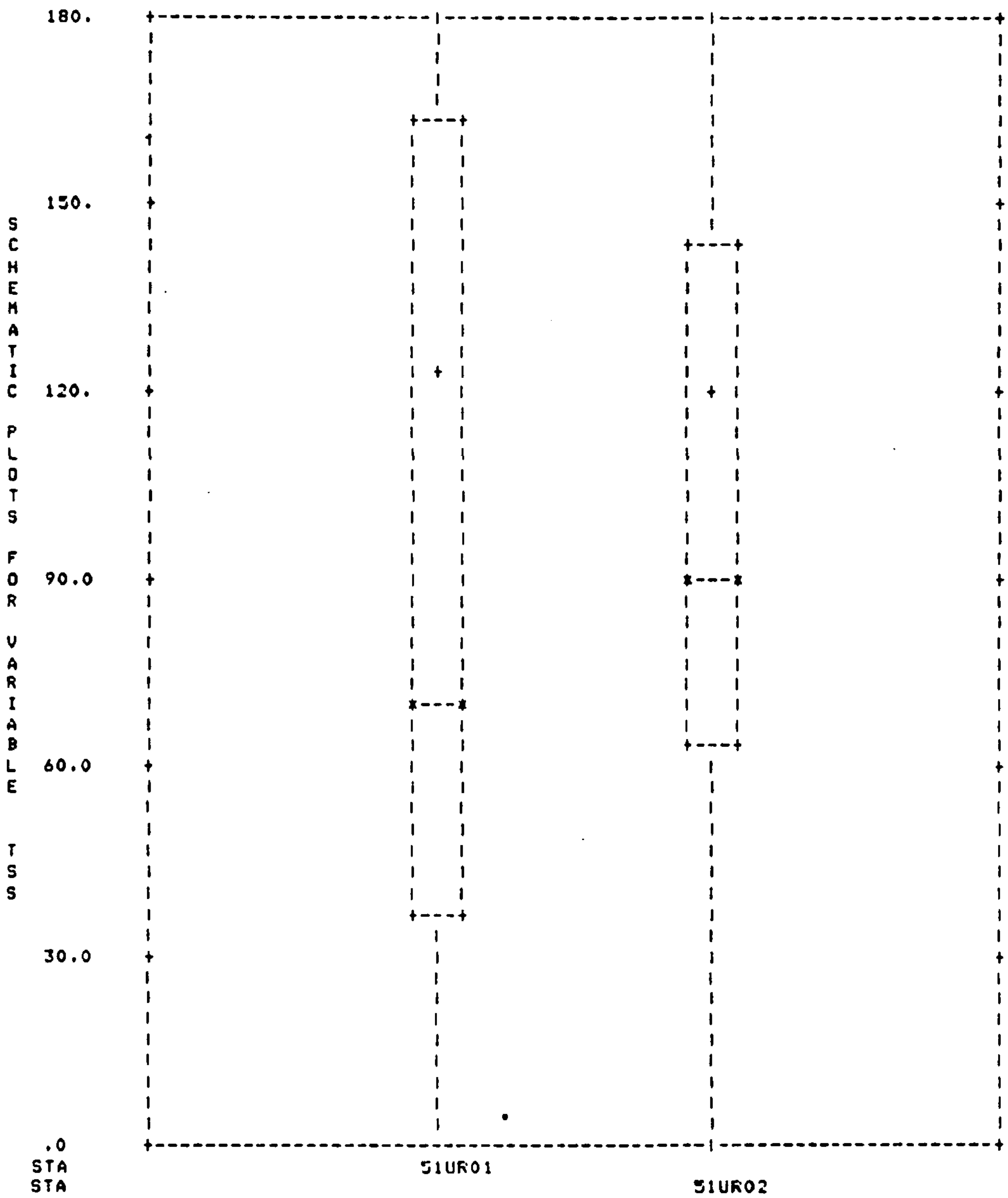


Figure 7-1. Distribution of Total Suspended Solids Loads at Critical Watershed Stations in lbs/acre/in runoff.

7-2. Again, the median loadings for UR02 were higher than those for UR01. The median loadings in the Figure correspond to event mean concentrations of 42.2 and 72.6 mg/L for UR01 and UR02, respectively.

Nitrogen. Distributions of loadings for various nitrogen forms are shown in Figures 7-3 through 7-7. Examination of Figures 7-3 and 7-5 shows that a relatively small fraction of the runoff TKN loadings at UR01 and UR02 were in the ammonia form. Figure 7-4 shows the soluble kjeldahl nitrogen loading distributions. If compared to the TKN data in Figure 7-5, it may be seen that approximately 40 percent and 25 percent of the loadings at UR01 and UR02 respectively, were in the soluble form. The runoff oxidized nitrogen loading distributions may be seen in Figure 7-6. The data from UR01 exhibited a dramatically higher median loading rate (0.53 lb./acre-in.) than those from UR02 (0.11 lb./acre-in.). This is consistent with the base flow concentration trends discussed in Tables 7-1 and 7-2. The total nitrogen loading distributions are shown in Figure 7-7. The median runoff loads for UR01 and UR02 were found to be 0.98 and 0.68 lb./acre-inch, respectively. These correspond to EMC's of 4.3 and 3.0 mg/L, respectively. A major difference between the two stations, however, is that 57 percent of the median loadings at UR01 were inorganic nitrogen, while only 21 percent were in that form at UR02. In evaluating nutrient availability, then, it is apparent that the differences between the runoff from UR01 and UR02 are greater than Figure 7-7 would indicate.

Phosphorus. The storm runoff loading distributions for phosphorus forms are shown in Figures 7-8, 7-9, and 7-10. As may be seen in Figure 7-8, the orthophosphorus loadings were uniformly low. Likewise, the total soluble phosphorus loadings in Figure 7-9 exhibited very low values and a narrow range. The total phosphorus loading distributions are shown in Figure 7-10. The median loading

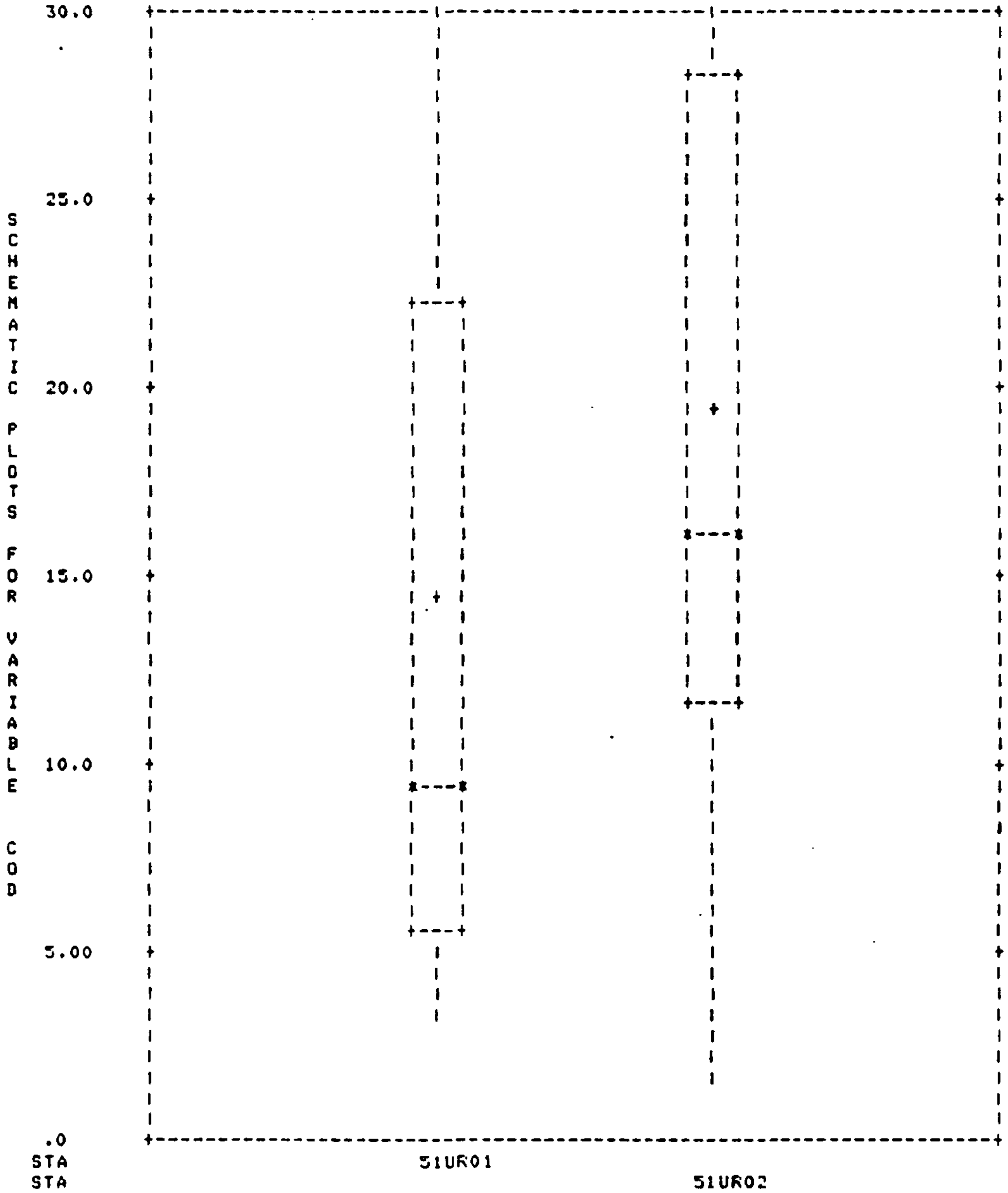


Figure 7-2. Distribution of COD Loadings for Critical Watersheds in lbs/acre/in runoff.

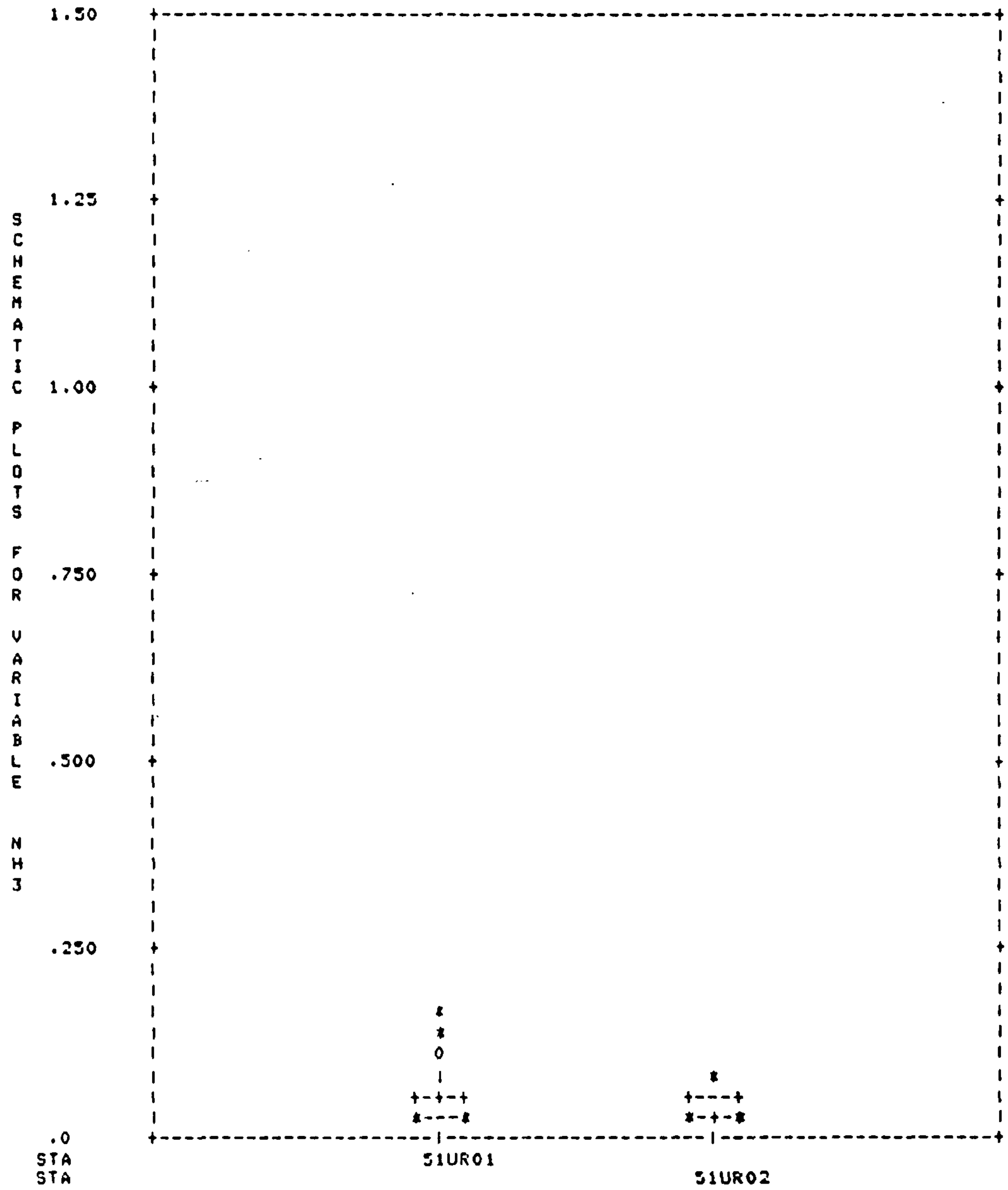


Figure 7-3. Distribution of Ammonia Loadings for Critical Watersheds in lbs/acre/in runoff.

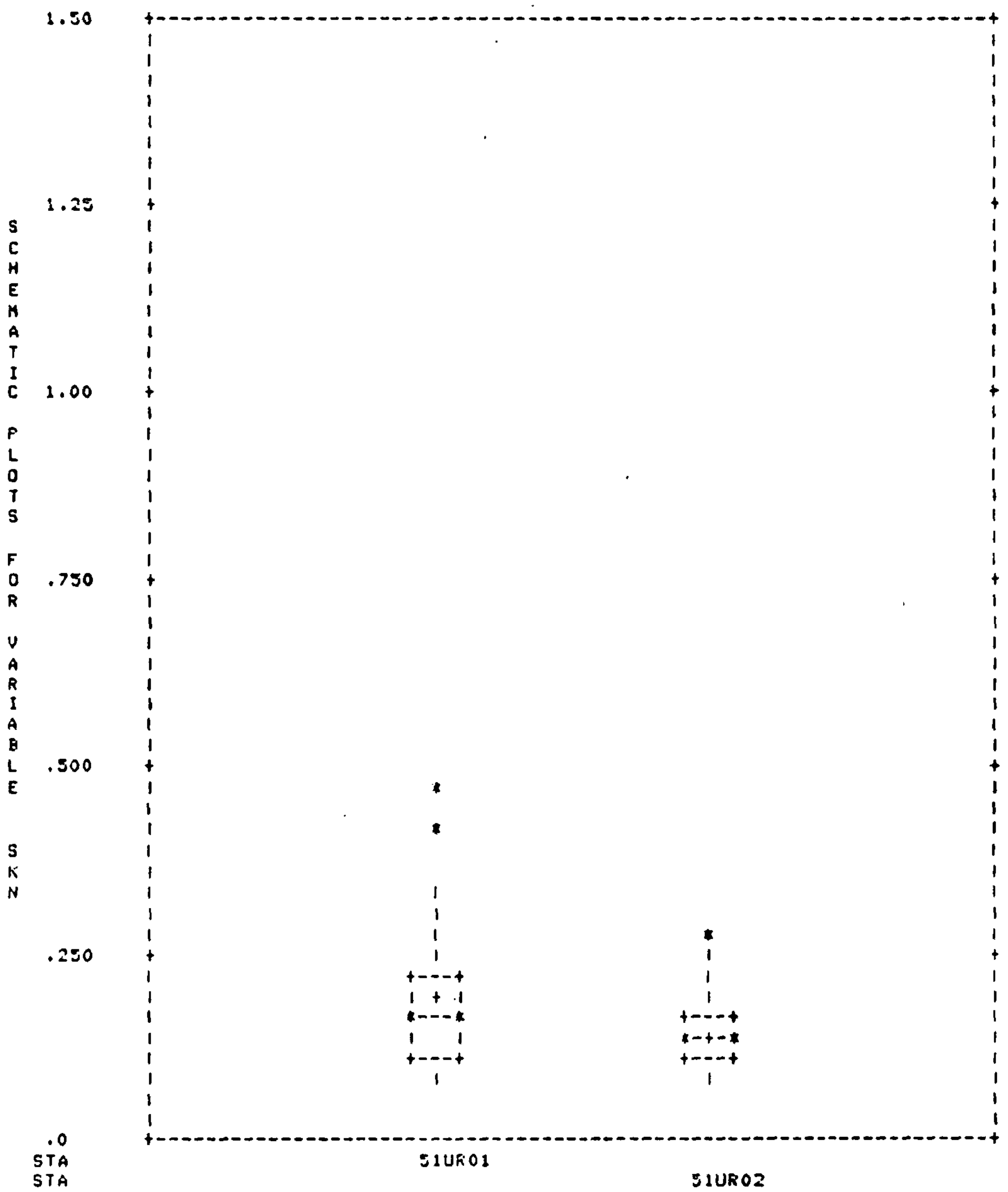


Figure 7-4. Distribution of Soluble Kjeldahl Nitrogen Loadings for Critical Watersheds in lbs/acre/in runoff.

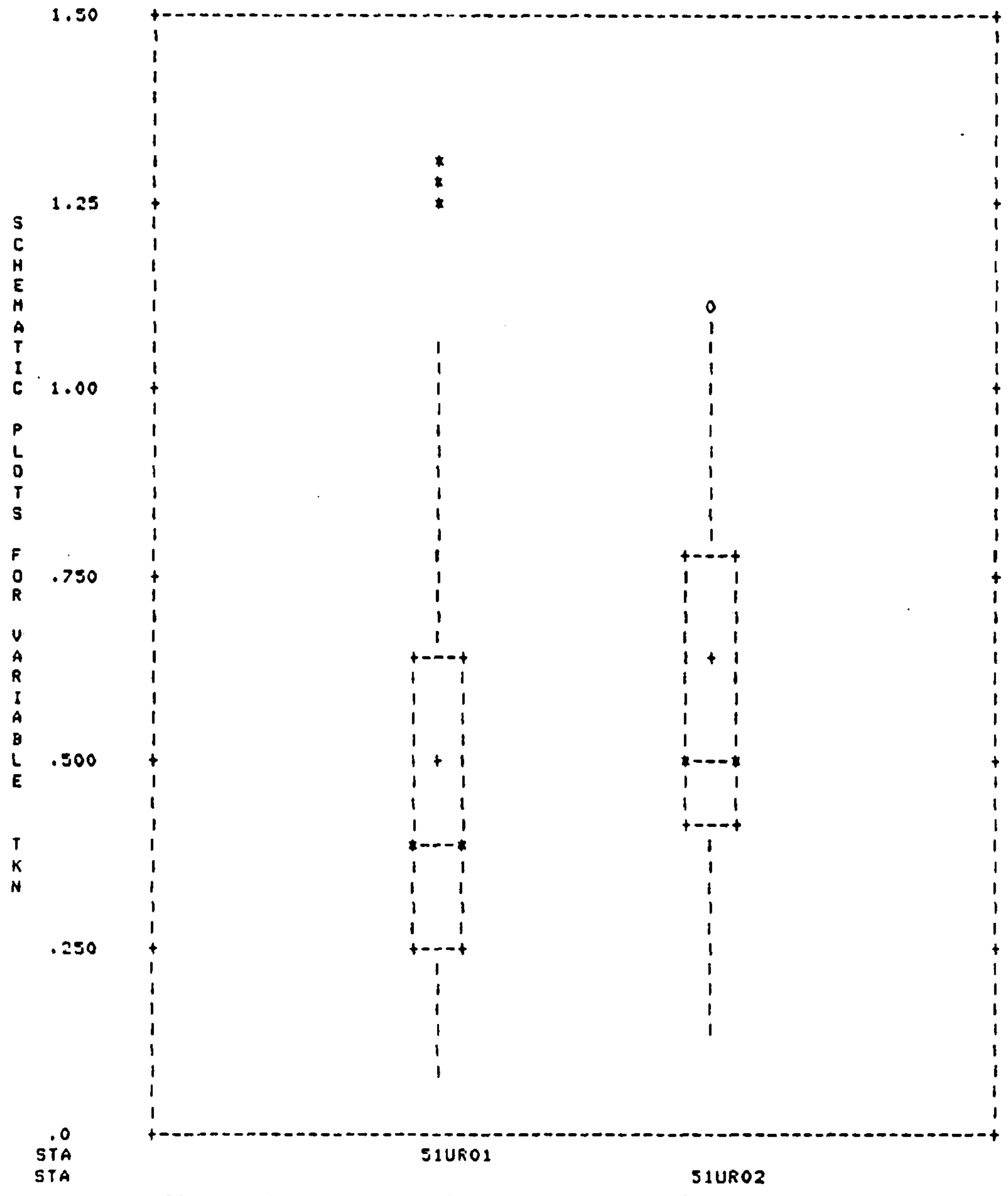


Figure 7-5. Distribution of Total Kjeldahl Nitrogen in lbs/acre/in runoff.

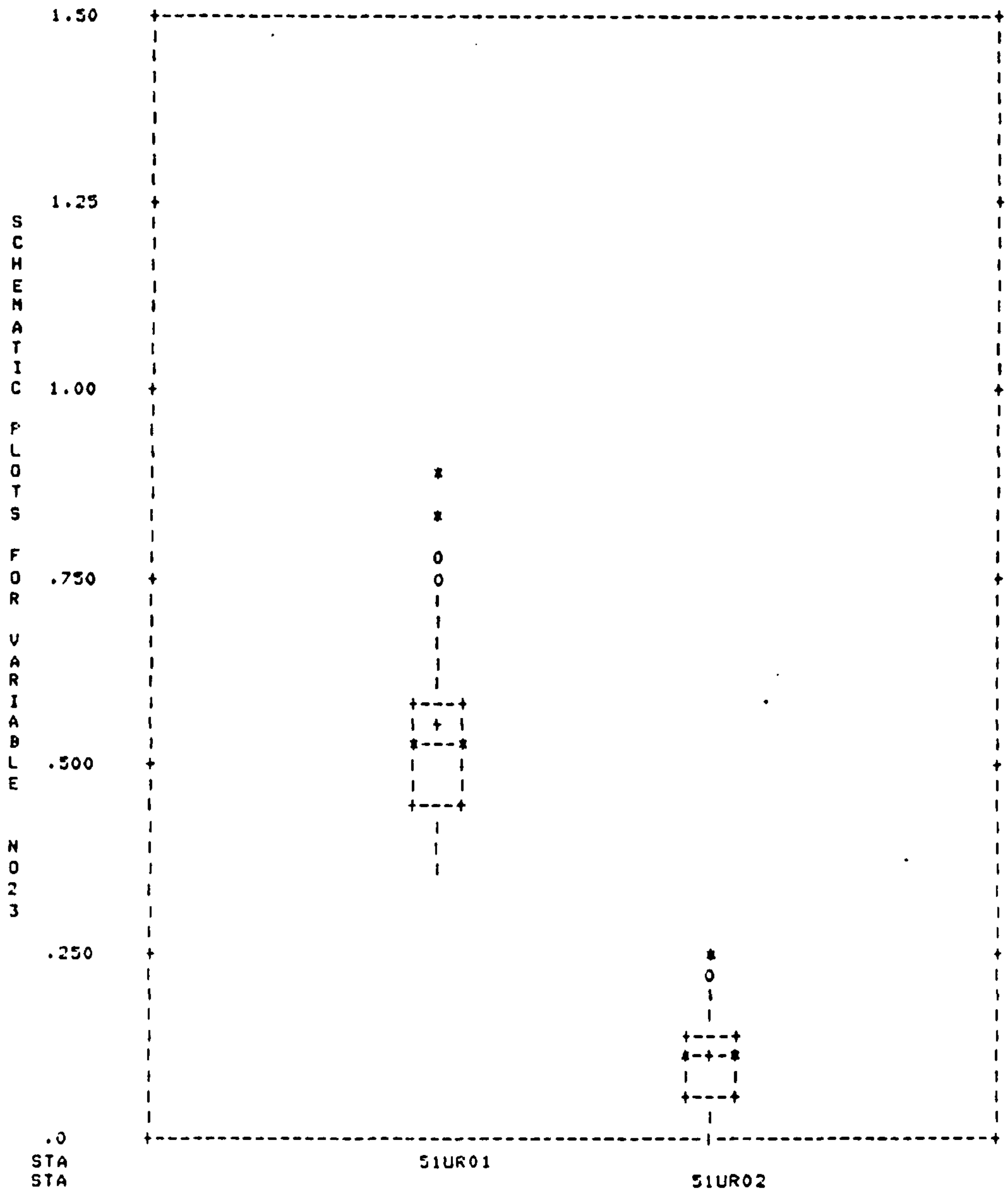


Figure 7-6. Distribution of Oxidized Nitrogen Loadings for Critical Watersheds in lb/acre/in runoff.

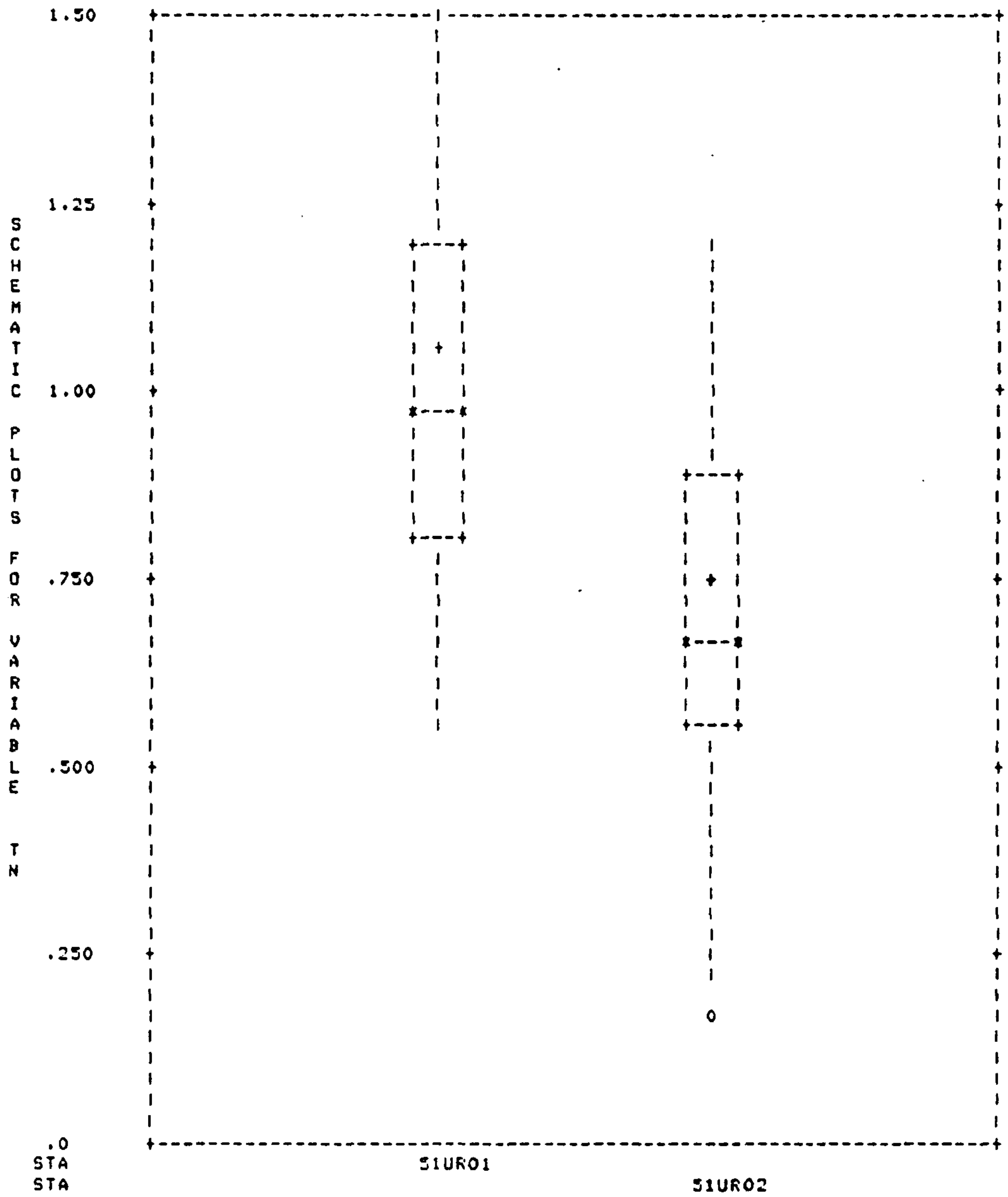


Figure 7-7. Distribution of Total Nitrogen Loadings for Critical Watersheds in lbs/acre/in runoff.

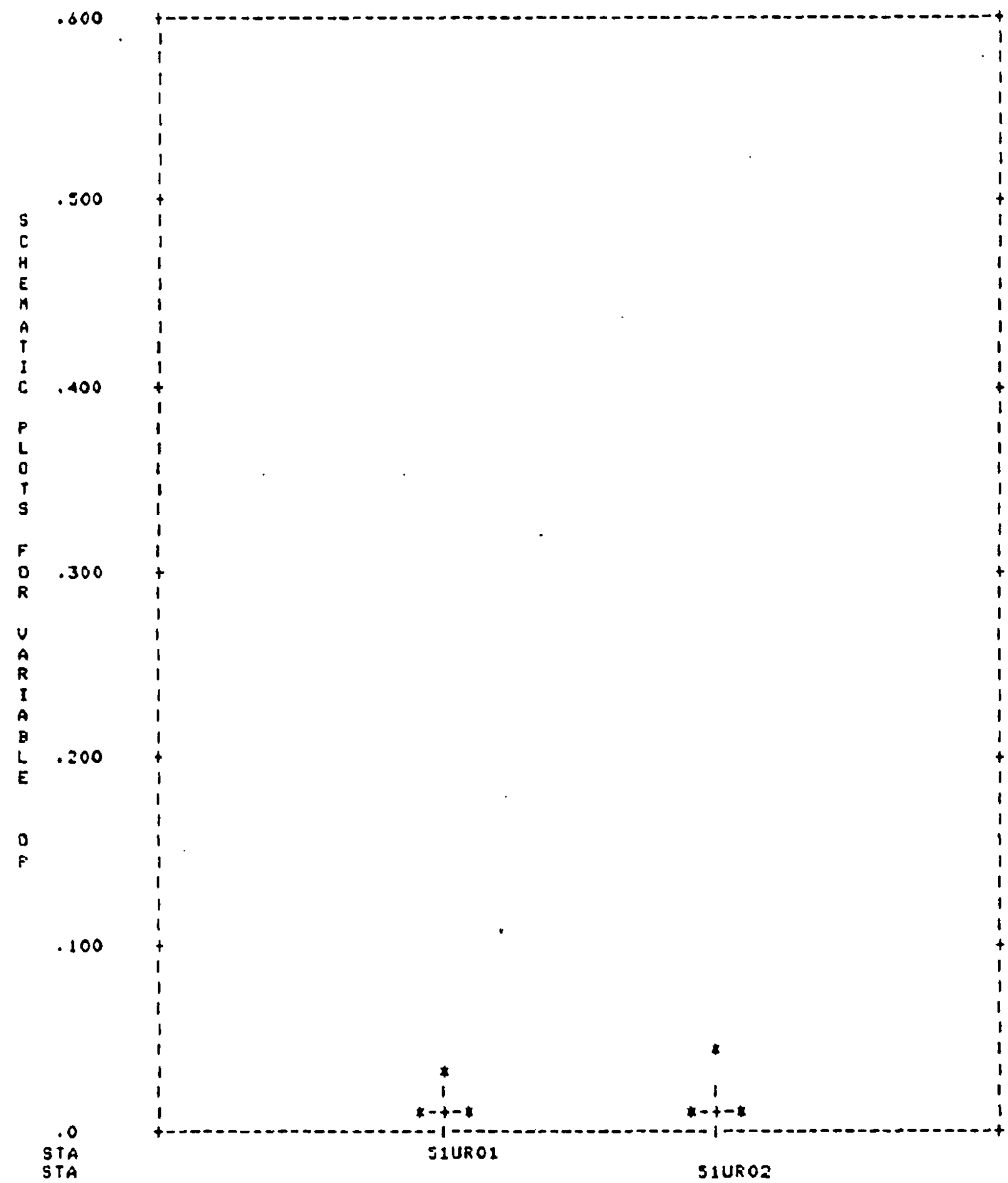


Figure 7-8. Distribution of Ortho-Phosphorus Loads for Critical Watersheds in lbs/acre/in runoff.

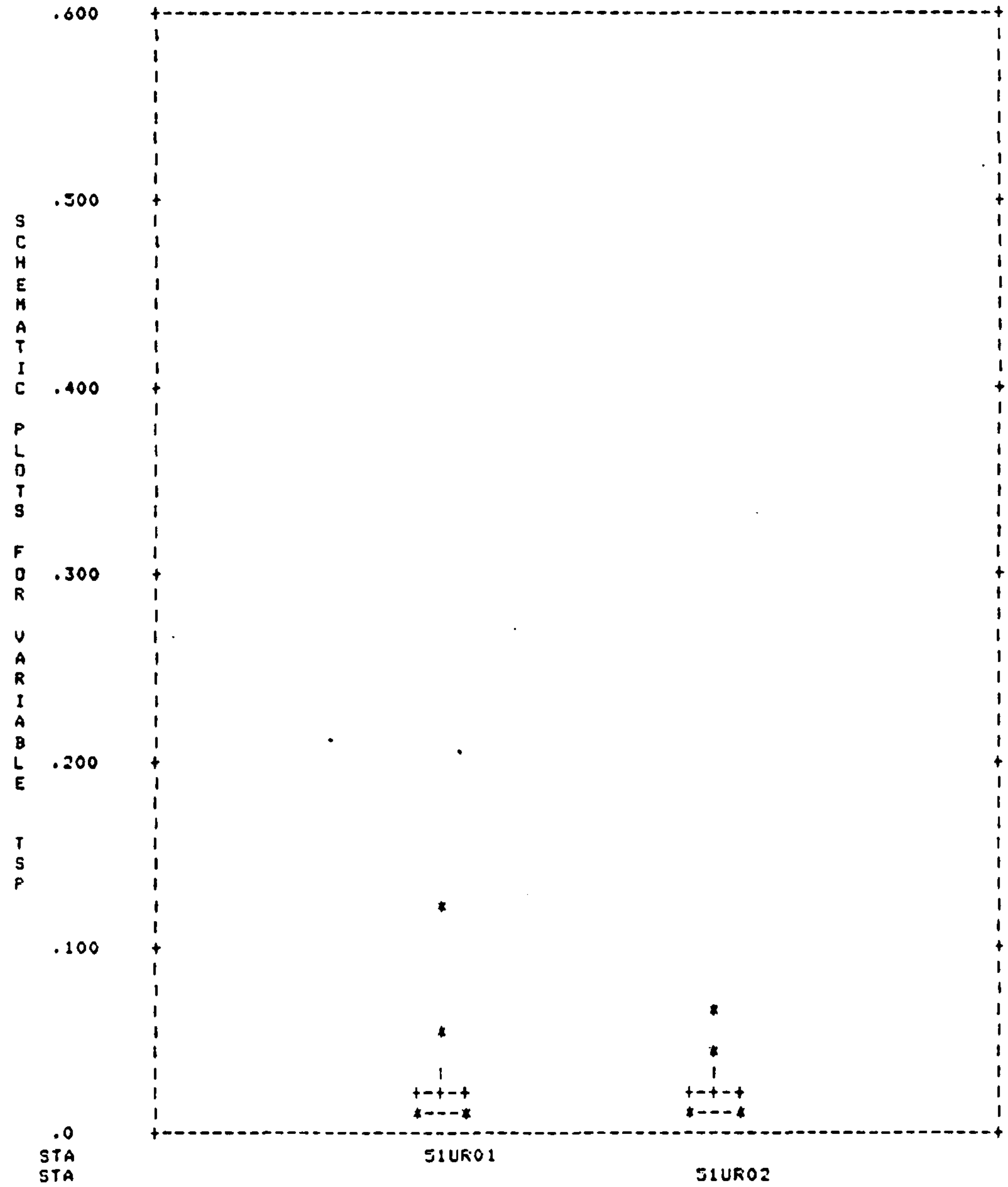


Figure 7-9. Distribution of Total Soluble Phosphorus Loadings for Critical Watersheds in lb/acre/in runoff.

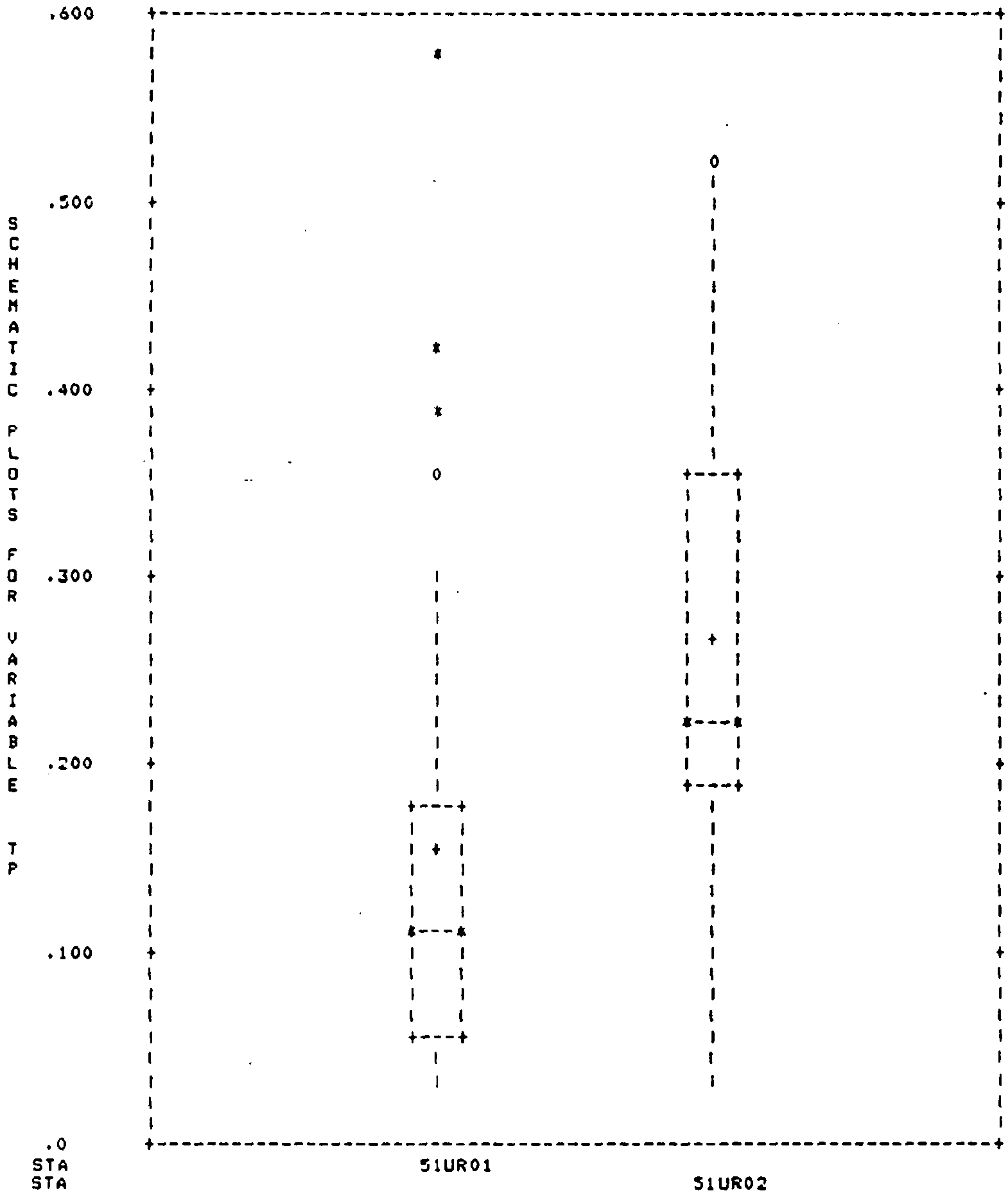


Figure 7-10. Distribution of Total Phosphorus Loadings for Critical Watersheds in lb/acre/in runoff.

values were 0.11 and 0.23 lb./acre-inch for UR01 and UR02, respectively. These data correspond to EMC's of 0.5 and 1.0 mg/L as P.

Metals. Loading distributions for exractable zinc (conventional AA) and total lead (graphite furnace AA) are shown in Figures 7-11 and 7-12, respectively. The median values for stormwater-borne zinc loadings were 1.03 and 1.63 lb./acre-in., for UR01 and UR02, respectively.

For the greater part of the study, lead concentrations, and therefore, loadings were below the detection limit of the analytical technique employed. a limited number of storms, however, were analyzed for lead using the capabilities of graphite furnace atomic absorption spectroscopy. The distributions of these low level lead loadings are shown in Figure 7-12. The median values of the loadings shown correspond to median values of EMC's of approximately 20 μg/L.

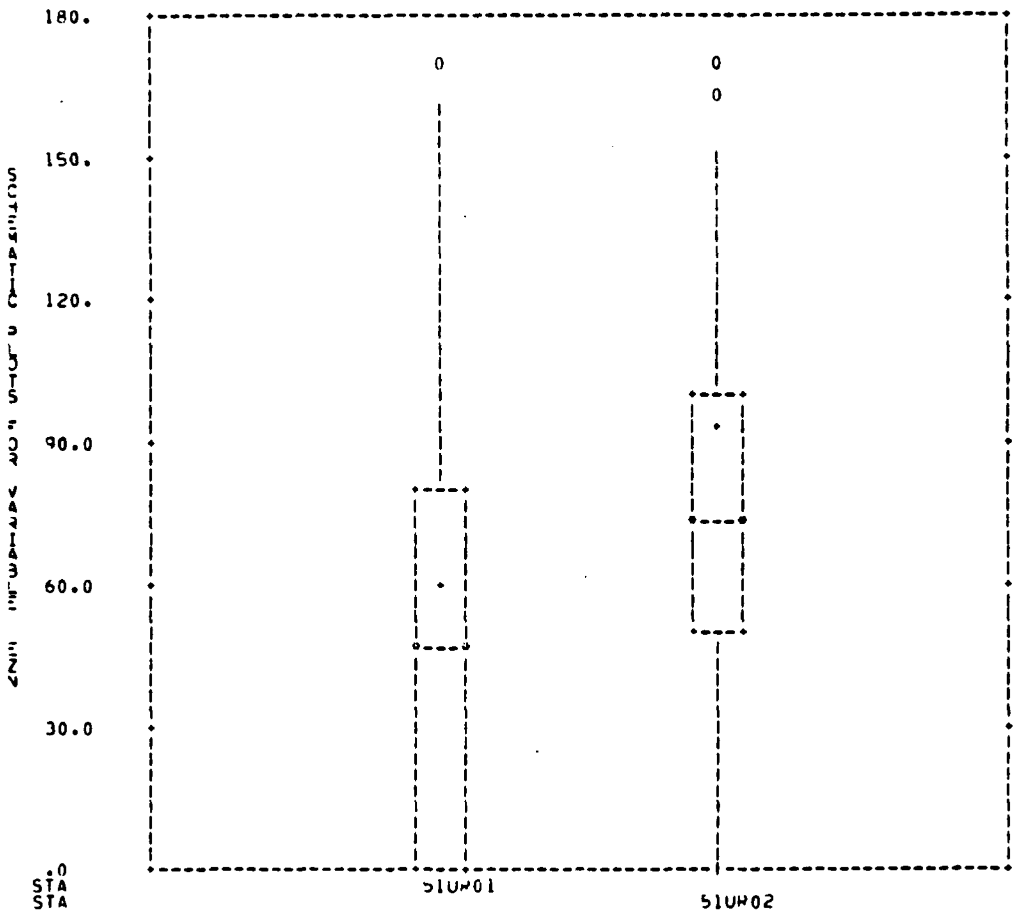


Figure 7-11. Distribution of Extractable Zinc Loadings for Critical Watersheds in lb/acre/in runoff.

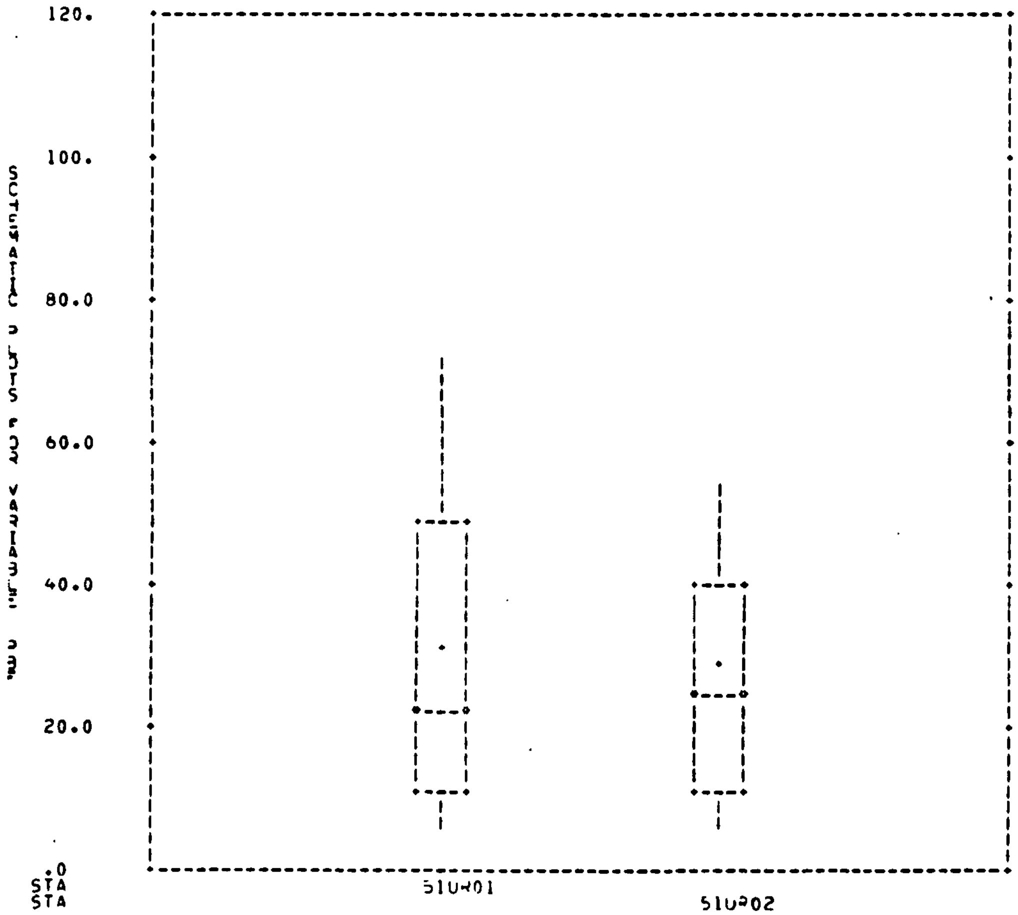


Figure 7-12. Distribution of Extractable Lead Loadings for Critical Watersheds in lb/acre/in runoff.

8. BMP MONITORING

Introduction

As discussed in Chapters 2 and 3, a total of sixteen automatic monitoring sites were instrumented for BMP effectiveness studies. Descriptions of the sites, the BMP types, station numbering, and flow measurement devices were presented in Tables 2-1, 2-2, and 3-1. It is the purpose of this section to present in more detail the results of the BMP monitoring-specifically to do so in a graphical format that allows rapid visual comparison of pollutant export data between monitoring stations. To this end, the data presentation will be undertaken using box-and-whisker diagrams as described previously in Chapter 6, and used in Chapter 7. The raw data from the BMP monitoring are contained in Appendix E.

BMP Pairings

When the BMP evaluation is directed towards an inflow/outflow practice such as a pond, it is a simple matter to make calculations of efficiencies of pollutant by observing inflow and outflow loads and adjusting for the additional direct drainage area between the inlet point and the point of outflow. The procedure is less clear for practices such as infiltration pits, grass swales, and the like. The reason for this is that there is generally no clearly defined control available for such on-site practices. In the case of a pond, which is an off-site practice, the basin serves as its own control. Table 2-1 contains some suggestions regarding the control to be used for non-pond type BMP's.

Retention and Detention Ponds

As may be seen in Table 2-1, six pond monitoring sites were included in the study plan. Because of physical problems encountered in the study, two of the pond sites were dropped from the monitoring network. The deleted ponds and the reasons for their elimination were:

Pond	Station(s)	Reason for Abandonment
Bulk Mail	UR13, UR14	Backwater submergence of pond inflow point.
Fair Oaks	UR20, UR21	Leaking outlet riser in wet pond.

At the former site, no instrumentation was ever placed, and therefore, the data base contains no observations for the site. At the latter site (Fair Oaks) equipment was placed and in operation before the leaking riser was discovered. A limited number of outflow storm events is available, but they are insufficient for use in pond efficiency estimates. The upstream monitoring station (UR20), however, has been included in the non-pond BMP data base because it is representative of a shopping mall catchment with high frequency vacuum cleaning of the parking lot. One of the remaining pond pairs was not originally instrumented for the MWCOG NURP, but was actually a holdover from the USEPA Chesapeake Bay Program. The site (UR07, UR08) was instrumented with flow measurement equipment not used in the MWCOG NURP, and, as a result, different data recording and sample compositing techniques were used (8-1).

Data Analysis. When conducting BMP studies, the best result is a data base consisting only of synoptic storm events monitored on ponds at inflow and outflow points draining 100 percent of the tributary area. This situation, however, is the exception rather than the rule. In the first instance, ponds draining equal areas at the inflow and outflow points are a rarity. Usually, direct drainage to the pond supplements the flow entering the principal inlet, or there is more than one principal inlet. However, it is generally possible to locate facilities, for monitoring purposes, that have a principle inflow point. For efficiency calculations, adjustments may be made to account for the differing drainage areas. For this study, the percentage of total pond drainage represented by the monitored inflow ranged from 67.5 to 85.4 percent.

The potential problems in data base analysis posed by attempting to rely only on synoptic data at inflow and outflow points are more complicated. In general, monitoring programs relying on automatically functioning stations will produce a number of non-paired storm events in the course of a project. It is the opinion of the writer that excluding such storms from the analytical data base seriously weakens the BMP efficiency analysis for the following reasons:

- Long-term monitoring of unpaired storm events has been a generally accepted procedure for comparing pollutant export from catchments of different land uses.

- The pond may be viewed as an off-site treatment that alters the export characteristics only at the point of outflow. A comparison of the pollutant loading populations from the inflow and outflow stations, then, is more easily justified than the paired catchment approach because the data originate in runoff from the same basin.

- The approach allows, in general, the use of a much larger data base. The statistical analysis power, if any, lost from using other than paired storms is more than compensated for by generally providing a longer term description of BMP behavior.

- If the precipitation and/or runoff population distributions for the inflow/outflow stations can be shown to be similar, it may be reasoned that the resulting pollutant export characteristics are likewise comparable. This is stated in full knowledge that all storms of similar volume do not produce identical pollutant loads. It is reasonable to conclude, however, that if a sufficiently large number of storms are monitored, the full range of pollutant load variations will be represented in the data set for all storms.

- It is also reasonable to conclude that, due to the skewed nature of the loading distributions, comparisons of the median values of the inflow and outflow loading distributions will provide an adequate estimate of pond removal efficiencies.

Efficiency estimates may be made by comparing the inflow and outflow population medians of loading data developed in the following ways:

- From event mean concentrations (EMC's) multiplied by total flow between first and last sample points, and normalized by dividing by depth of precipitation.
- From EMC's multiplied by total flow between first and last sample points and normalized by dividing by depth of runoff over the basin.
- From EMC's multiplied by total flow between beginning and end of hydrograph, and normalized by dividing by depth of precipitation.
- From EMC's multiplied by total flow between beginning and end of hydrograph, and normalized by dividing by depth of runoff over the basin.

For the purposes of this report, the second approach was selected for inflow/outflow comparisons, as well as for comparisons of loads between BMP's and their control sites. The data are present in Appendix E to allow the other estimates to be made.

Runoff. Figure 8-1 shows the distribution of runoff at the inflow and outflow stations for all ponds monitored. The data set was purged of anamolies in hydrologic data before the figure was produced. Such anamolies consisted of storms with irreconcilable precipitaton-runoff relationships. The same storms were also excluded from subsequent BMP efficiency analyses. A listing of the suspect events is in Appendix E. Observation of the paired box and whisker diagrams shows that, indeed, the runoff populations were very similar, lending strong support to the conclusion that the use of the entire runoff data base was warranted.

Suspended Solids-Retention Ponds. Figure 8-2 shows the distribution of suspended solids loadings. The retention ponds showed mixed performance: Burke Pond effected no reductions, while Westleigh effected substantial load reduc-

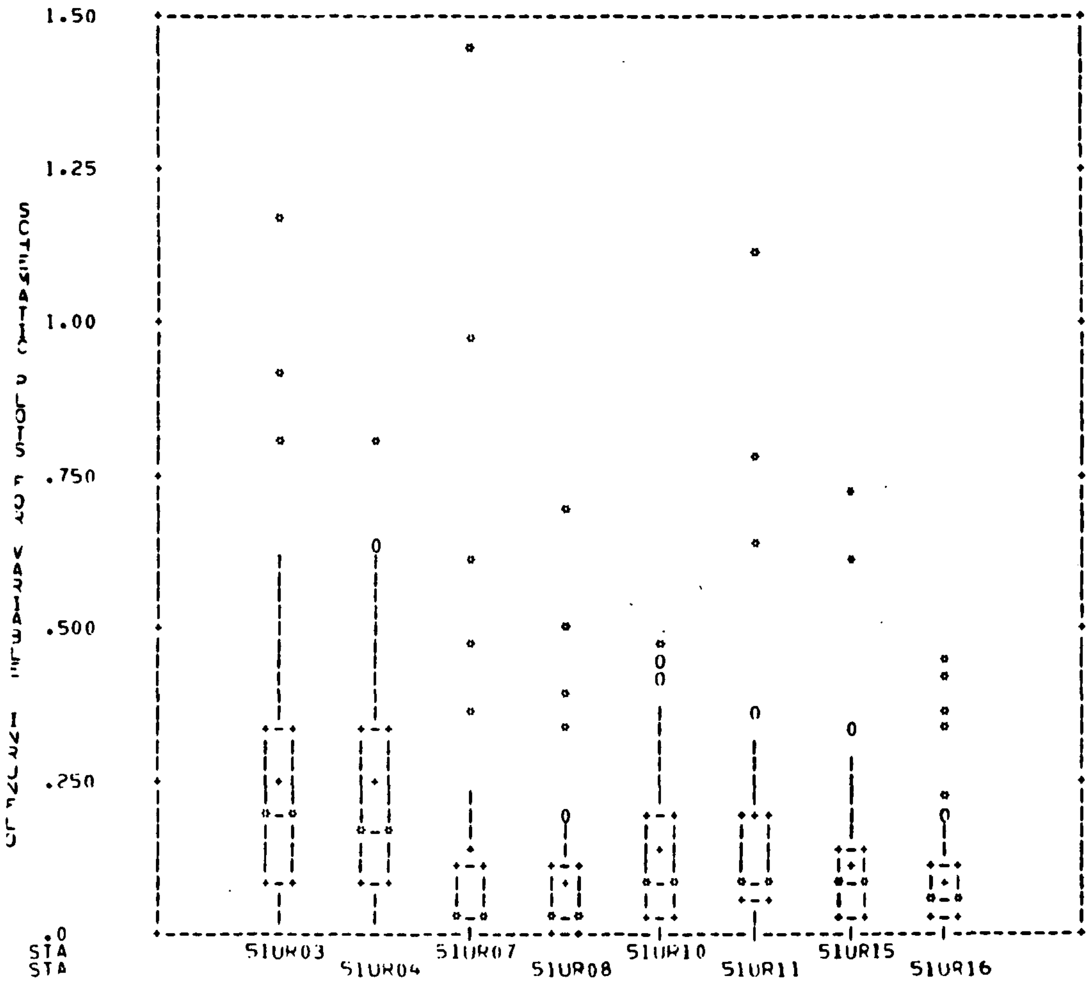


Figure 8-1. Distribution of Runoff Depth (in inches) for Storms Monitored at Pond BMP sites.

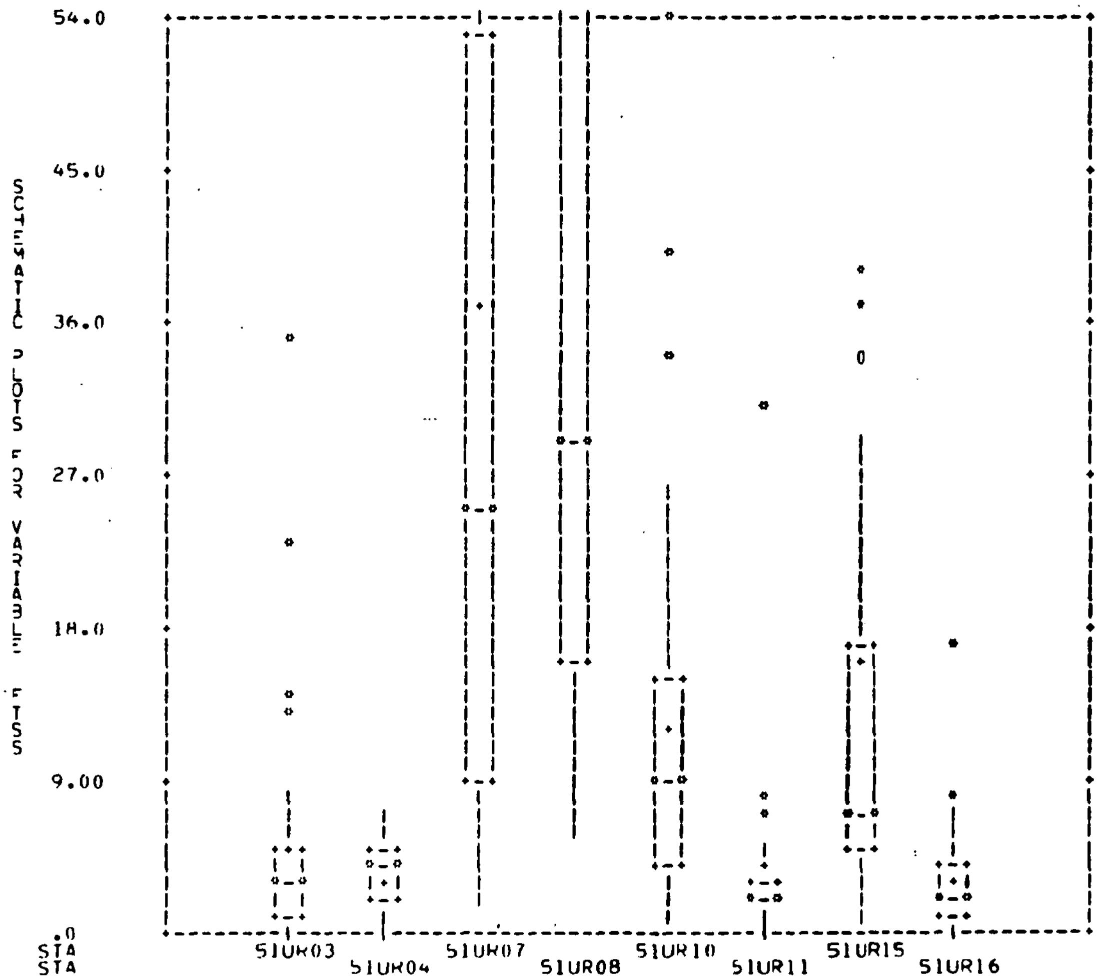


Figure 8-2. Distribution of TSS Loadings in lb/acre-in of runoff at Pond BMP's.

tions, as well as a compression of the interquartile range of the data. A possible explanation of the apparent poor performance of the Burke Pond is that the influent median TSS concentrations were very low initially-less than 15 mg/L. Removal percentages based in median loading rates are summarized for all ponds in Table 8-1.

Suspended Solids-Detention Ponds. As with the wet ponds, the detention ponds exhibited mixed performance with respect to solids removal. Negative removals and relatively high positive removals were observed at Lake Ridge and Stedwick, respectively, as shown in Figure 8-2. The removals are summarized in Table 8-1.

COD-Retention Ponds. At the median population values, both ponds exhibited positive removals. These are shown in Figure 8-3, and summarized in Table 8-1. Burke Pond produced a 21.4 percent removal, while Westleigh pond produced 23.2 percent, but also a substantial interquartile range compression.

COD-Detention Ponds. Both detention ponds exhibited positive COD removals. Stedwick Pond, in addition, effected a substantial range reduction.

Nitrogen-Retention Ponds. Figures 8-4 through 8-8 show the loading distributions of nitrogen forms at retention and detention pond inflow-outflows. All the nitrogen loading data are plotted on a common scale so that visual comparisons may be made between forms. Both the retention ponds exhibited positive removals of all nitrogen forms except for TKN at the Westleigh Pond. Using the discrete forms of nitrogen as indicators of removal in wet ponds is probably a poor practice, however, because their long detention times allow sufficient time for chemical transformations to take place. For instance, referring to Table 8-1, it may be seen that the two retention ponds exhibited removal efficiencies of 76.1 and 44.8 percent. It is not likely that these resulted from any direct

Table 8-1. Estimated Removals of Stormwater Pollutants by Detention and Retention Ponds

POND NAME	TYPE	TSS	COD	NH_3-N	SKN	TKN	Ox-N	TN	OP	TSP	TP	Zn	Pb
Burke	Retention	-33.3	21.4	26.7	12.5	10.9	76.1	32.1	76.7	48.6	39.2	83.7	37.8
Lake Ridge	Detention	-16.1	18.0	0.0	0.0	13.3	10.8	15.0	0.0	0.0	8.2	11.3	14.4
Stedwick	Detention	79.1	38.3	0.0	17.0	15.4	0.6	12.7	0.0	20.0	14.3	46.0	64.4
Westleigh	Retention	71.2	23.2	31.8	7.4	0.0	44.8	37.0	90+	63.0	42.7	44.2	81.8

NOTE: Removal percentages are calculated using median loading values from populations based on:

$$\text{Load, \#/acre-inch} = \frac{(EMC)(FLO)(\Delta t)}{pA} \times 6.24\times10^{-5}$$

where,

EMC = Event mean concentration, mg/L
FLO = Event mean flow, cfs
Δt = Event duration (sample to sample), sec.
p = precipitation, inches
A = basin area, ft^3

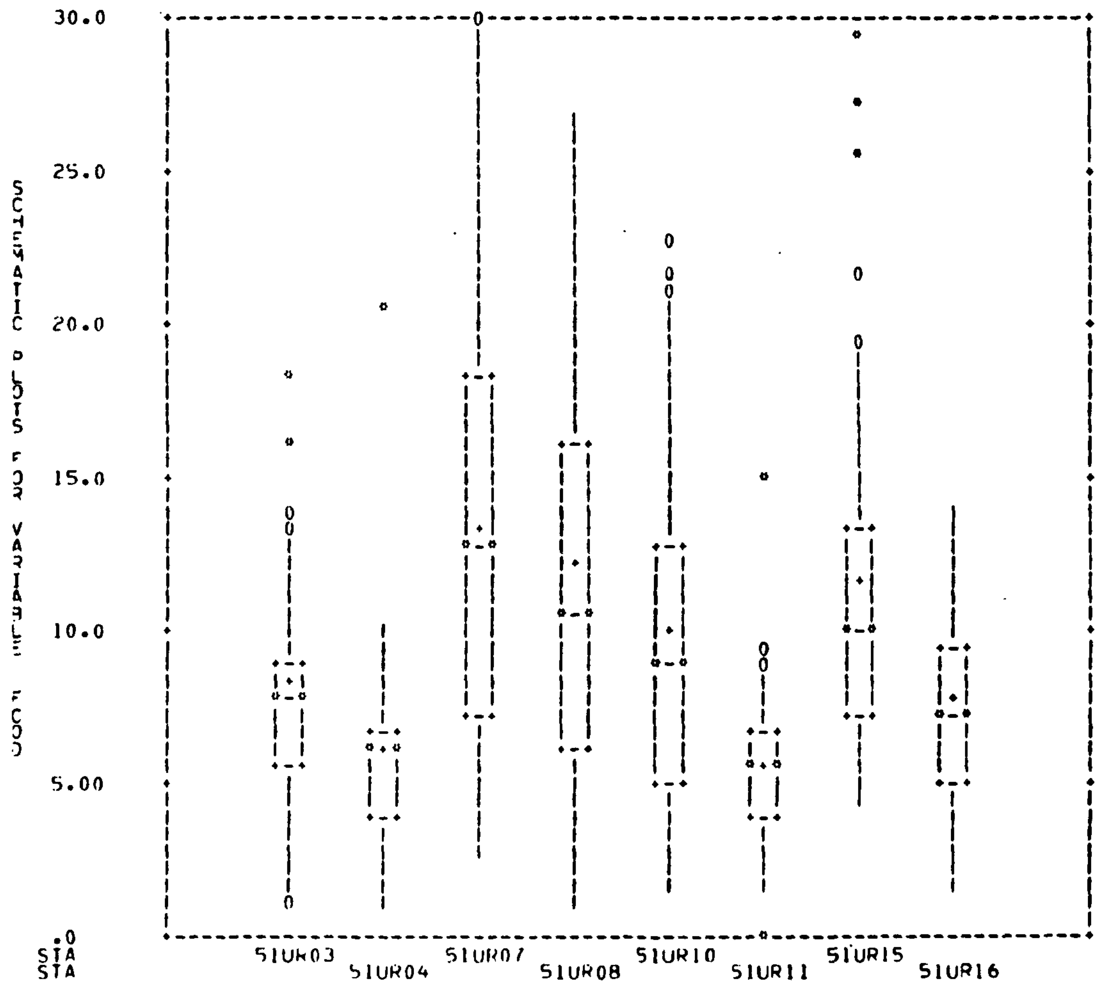


Figure 8-3. Distributions of COD Loadings in lb/acre-inch of runoff at Pond BMP's.

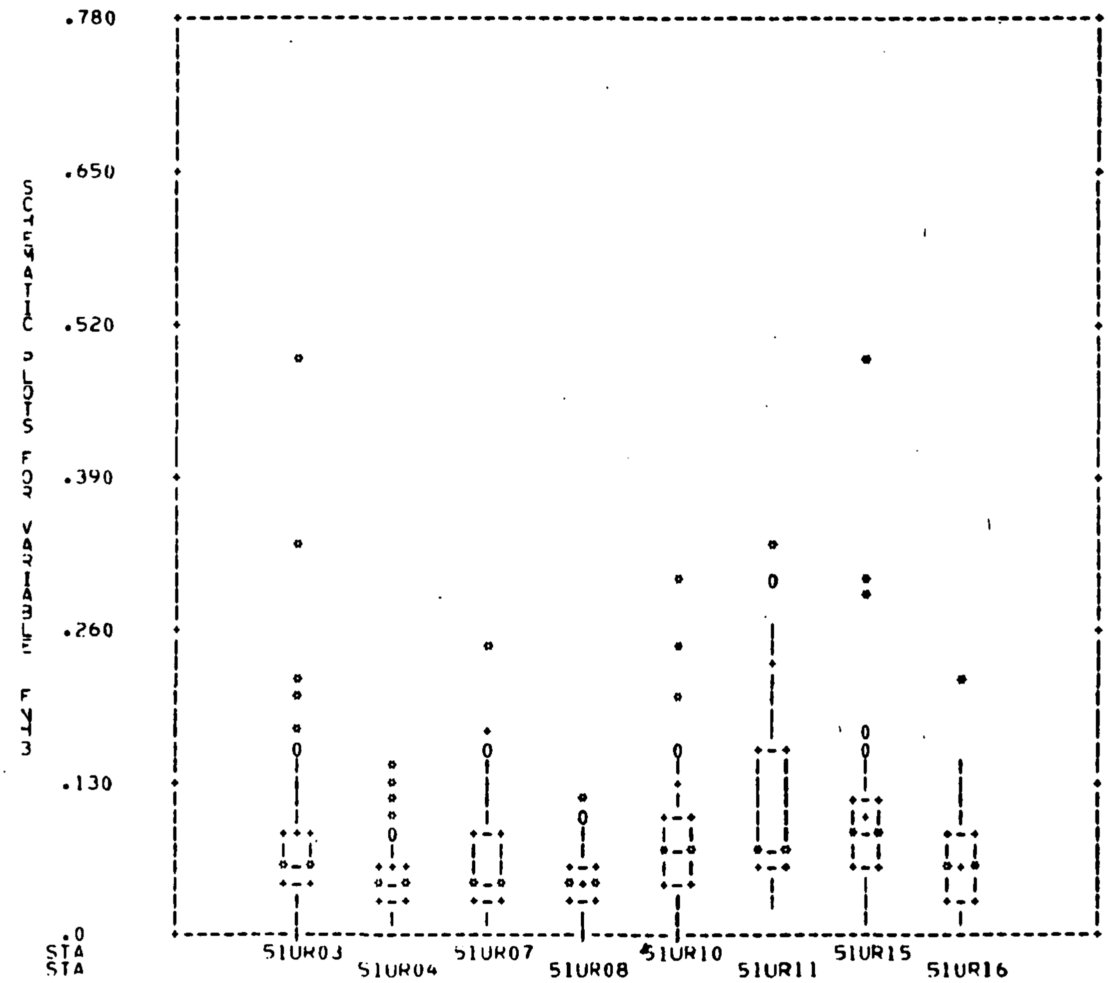


Figure 8-4. Distributions of Ammonia Nitrogen Loadings in lb/acre-inch of runoff at Pond BMP's.

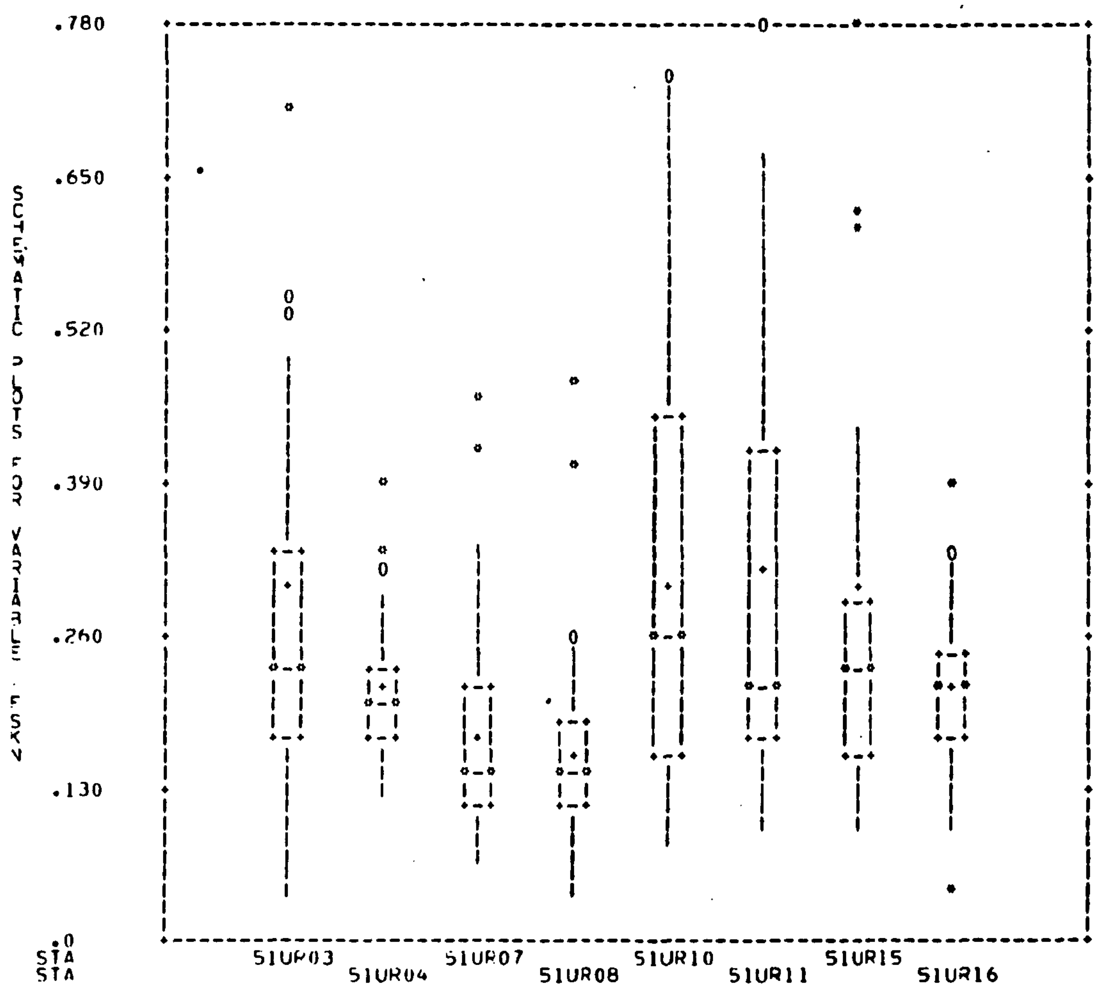


Figure 8-5. Distributions of Soluble Kjeldahl Nitrogen in lb/acre-inch of runoff at Pond BMP's.

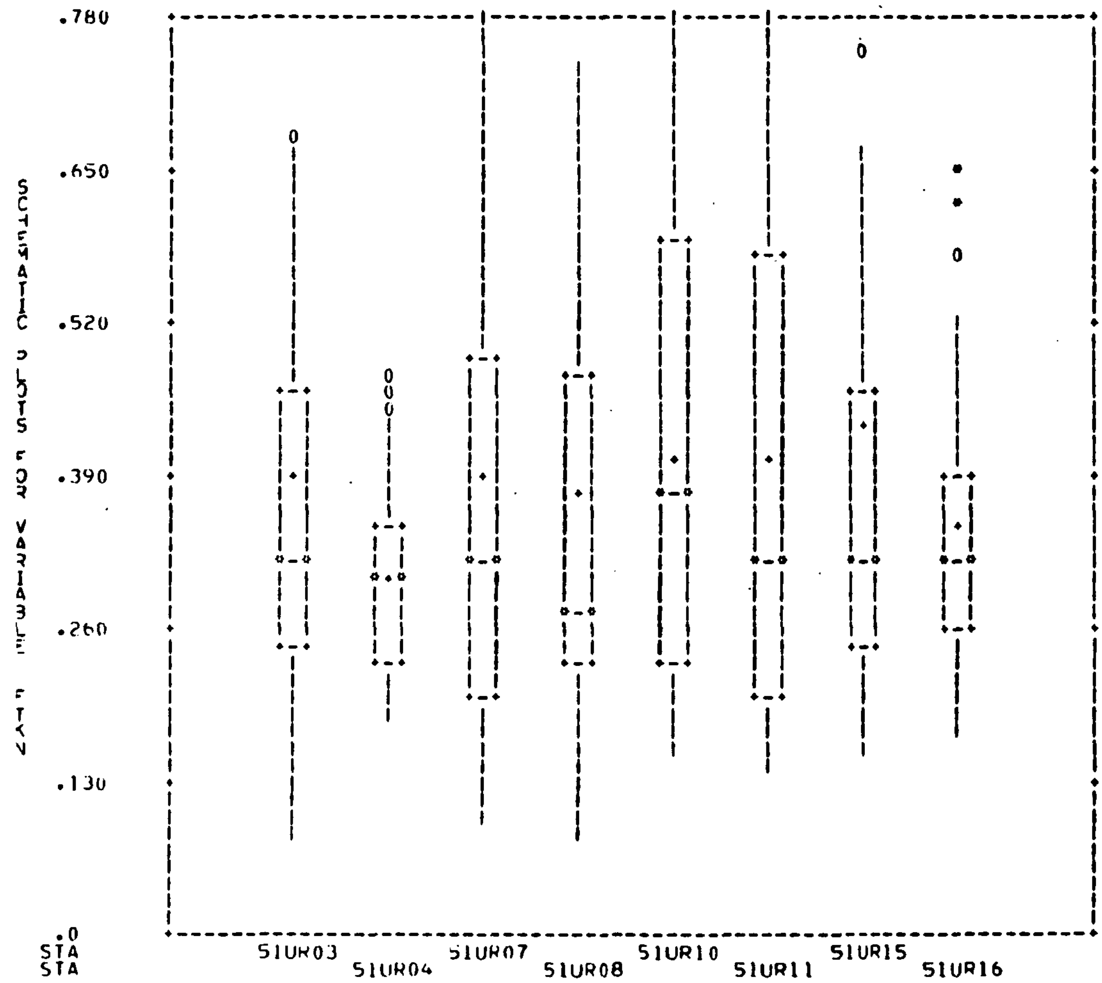


Figure 8-6. Distribution of Total Kjeldahl Nitrogen Loadings in lb/acre-inch of runoff at Pond BMP's.

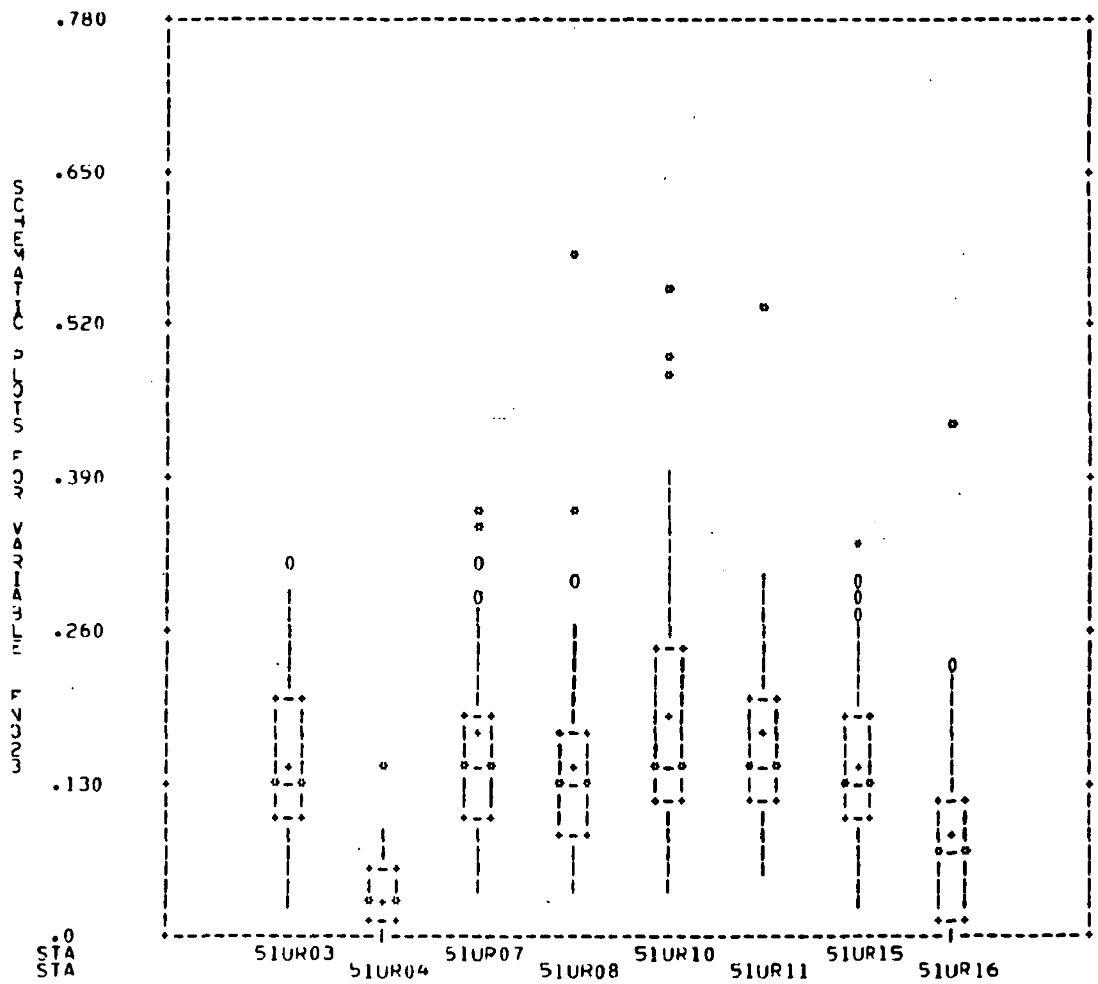


Figure 8-7. Distributions of Oxidized Nitrogen Loadings in lb/acre-inch of runoff at Pond BMP's.

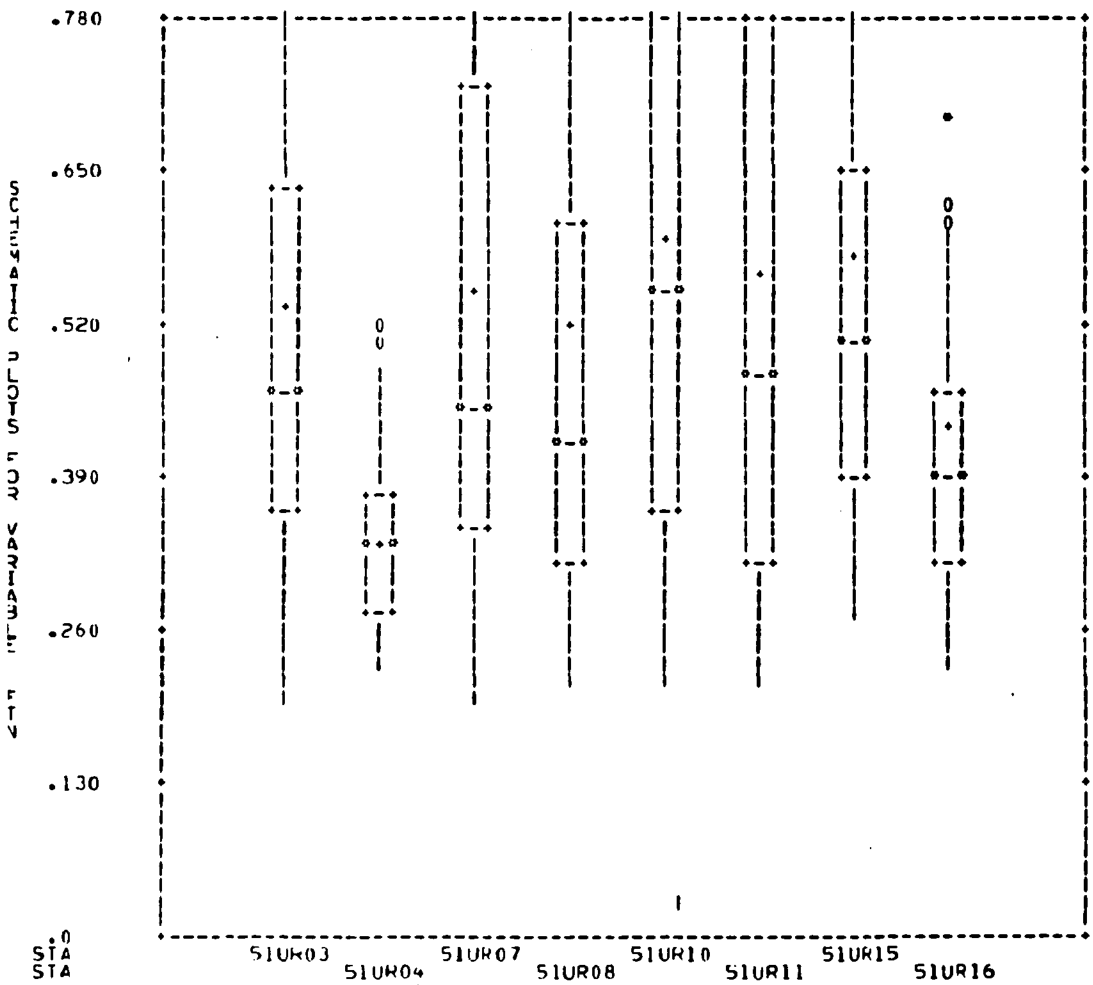


Figure 8-8. Distributions of Total Nitrogen Loadings in lb/acre-inch of runoff at Pond BMP's.

removal of nitrite or nitrate, but rather from their conversion to other forms. It is most likely that the mechanism in the case of oxidized forms is biological uptake and incorporation into biomass. Bacterial biomass may then be removed by sedimentation processes. Some direct reduction of nitrate loads probably occurs as a result of rooted aquatic plant uptake. The examination of TKN removals in the wet ponds is of limited use for the same reasons. While ammonium ion may directly adsorb to negatively charged sediment surfaces, it is also likely that another component of its removal, as well as that for SKN and TKN is oxidation to nitrate and subsequent removal of that anion as discussed above. The net result is that, in very long detention time facilities, the only fair estimate of nitrogen removal is the Total N value (TKN+NO_2-N+NO_3-N).

Nitrogen-Detention Ponds. The detention ponds, because they fill and return to a dry condition for each event, have much shorter residence times. As a result, fewer chemical/biological transformations of nitrogen would be expected to occur. This is generally confirmed in the removal data seen in Figure 8-4 through 8-8 and in Table 8-1. For Lake Ridge and Stedwick ponds, the nitrogen forms generally thought of as soluble (NH_4-N, SKN, OX-N) displayed generally low removals. The two exceptions to this were SKN (17% at Lake Ridge) and OX-N (10.8% at Stedwick). The removals of those forms associated with suspended solids were generally more consistent, and as they constituted the greater fraction of the total nitrogen load that consistency was transmitted to the total.

Phosphorus-Retention Ponds. Loading distributions for all phosphorus forms are shown for all pond types in Figures 8-9, 8-10, and 8-11. The median value loading reductions are summarized in Table 8-1. Many of the same arguments made for the soluble/insoluble forms of nitrogen, and to their incorporation into biomass (bacteria, algae, rooted aquatics, etc.) may be applied to phosphorus.

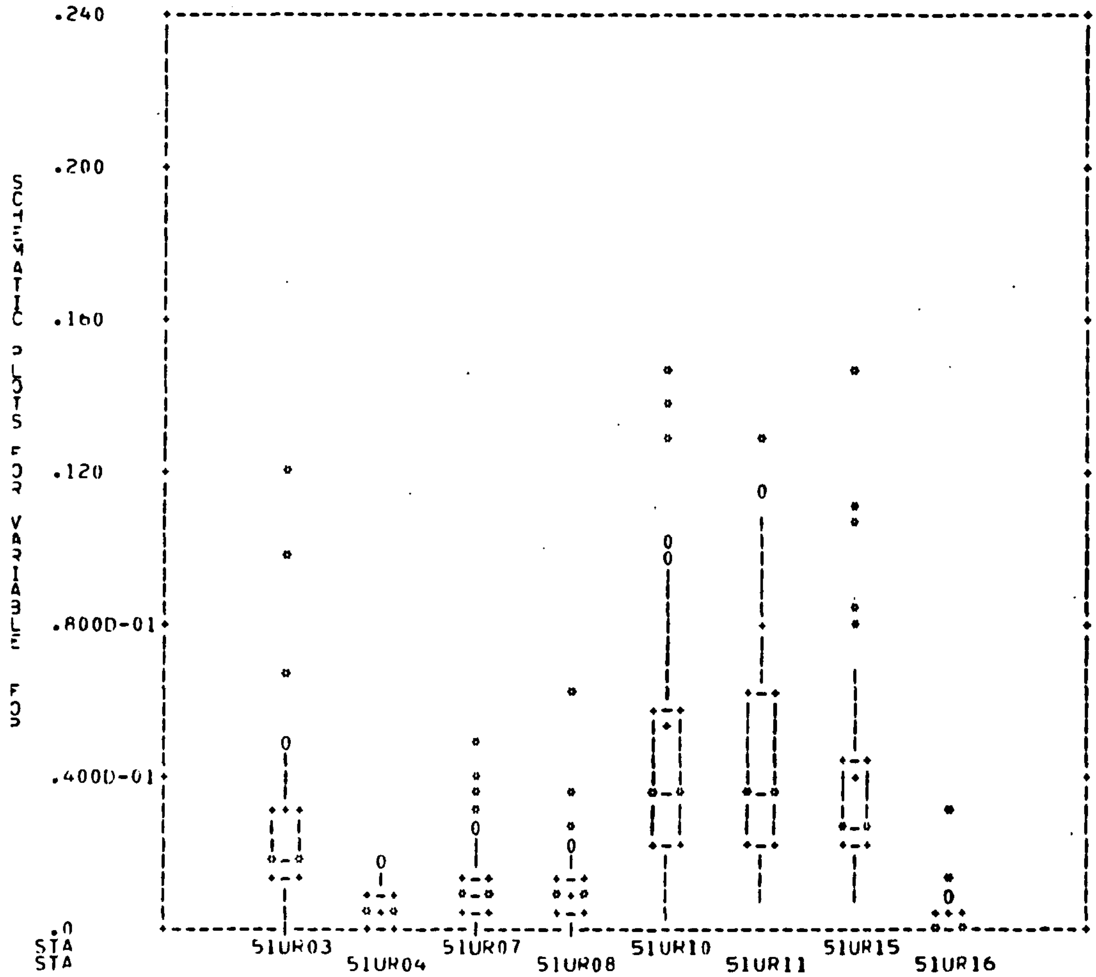


Figure 8-9. Distributions of Ortho-Phosphorus Loadings in lb/acre-inch of runoff at Pond BMP's.

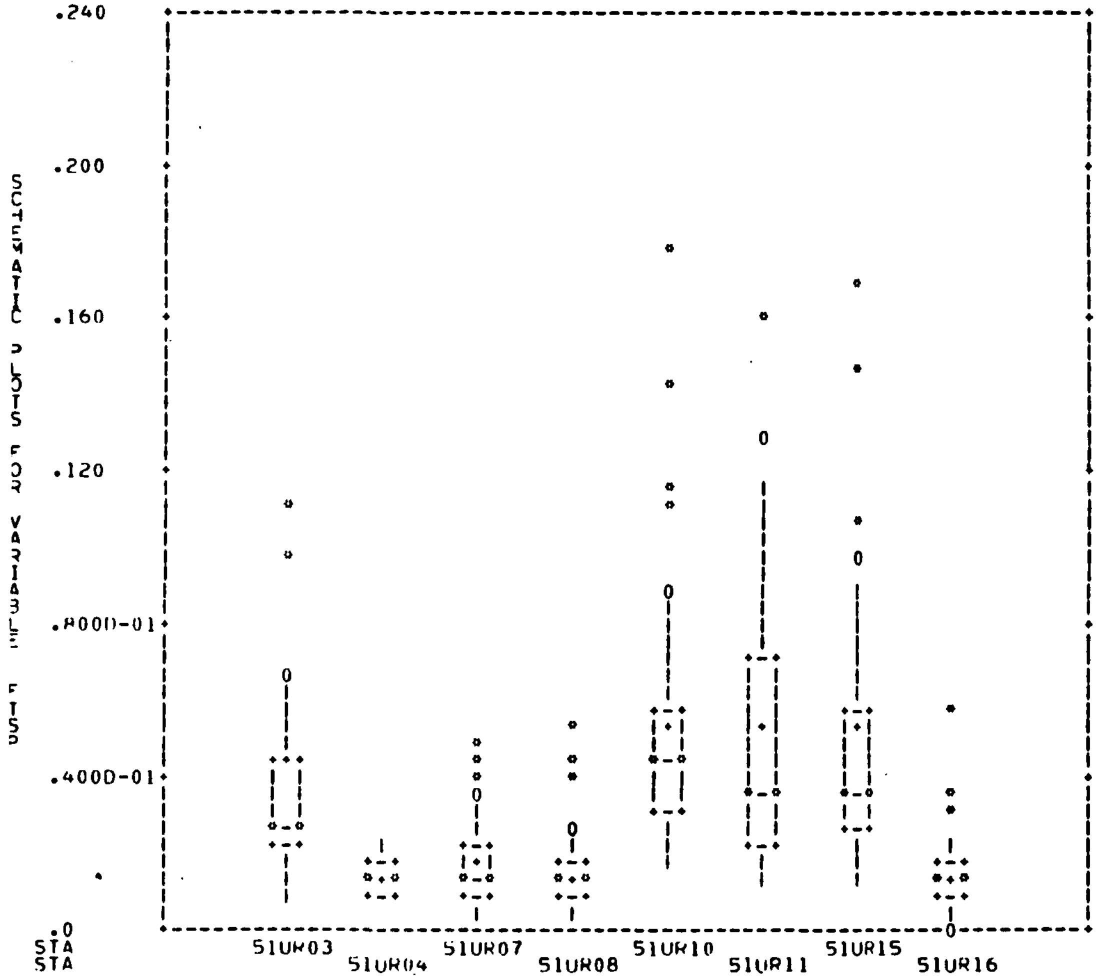


Figure 8-10. Distributions of Total Soluble Phosphorus Loadings in lb/acre-inch of runoff at Pond BMP's.

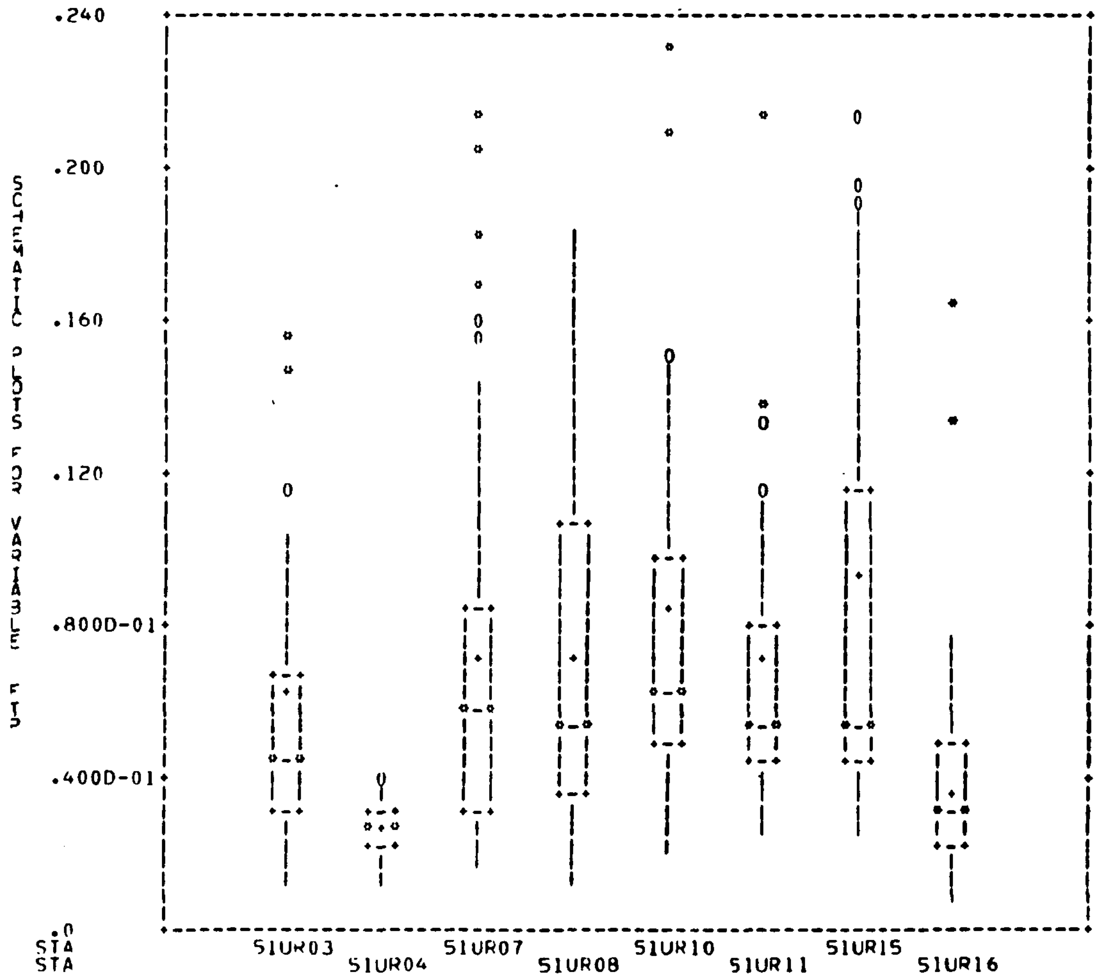


Figure 8-11. Distributions of Total Phosphorus Loadings in lb/acre-inch of runoff at Pond BMP's.

The figures and Table 8-1 show substantial compression of the interquartile ranges and reduction of the median loading values for all three phosphorus forms at both retention ponds. In fact, although the total phosphorus removals ranged between 39.2 and 42.7 percent, the removals of the soluble forms (the most biologically available) ranged from 48.6 to 63.0 percent.

Phosphorus-Detention Ponds. Examination of the loading distributions and median value load reductions for detention ponds in Figures 8-9 through 8-11 and Table 8-1 show that the performance with respect to phosphorus was generally quite poor. The data show essentially no change in the population interquartile ranges or in the median loading values for ortho phosphorus. In fact, for total soluble phosphorus, the interquartile range for Stedwick actually increased through the pond. This poor performance is no doubt due to the short detention times and lack of opportunity for the soluble forms to attach to the suspended load. The removal of total phosphorus, although positive, was quite disappointing, ranging from 8.2 to 14.3 percent.

Metals-Retention Ponds. Figures 8-12 and 8-13 show the distributions of inflow and outflow loading data for zinc and lead at all pond BMP sites. The estimated removals based on changes in median loading values are shown in Table 8-1. The data shown for lead in Figure 8-13 and Table 8-1 are based on a much smaller population than the zinc data. This is because the majority of exractable lead analyses performed by conventional aspiration atomic absorption spectroscopy (AAS) fell at or below the detection limit of the instrument. Limited analyses were performed on storm samples from the later months of the study using the lower detection limits provided by graphite furnace AAS. The number of observations comprising the low level data set was substantially smaller.

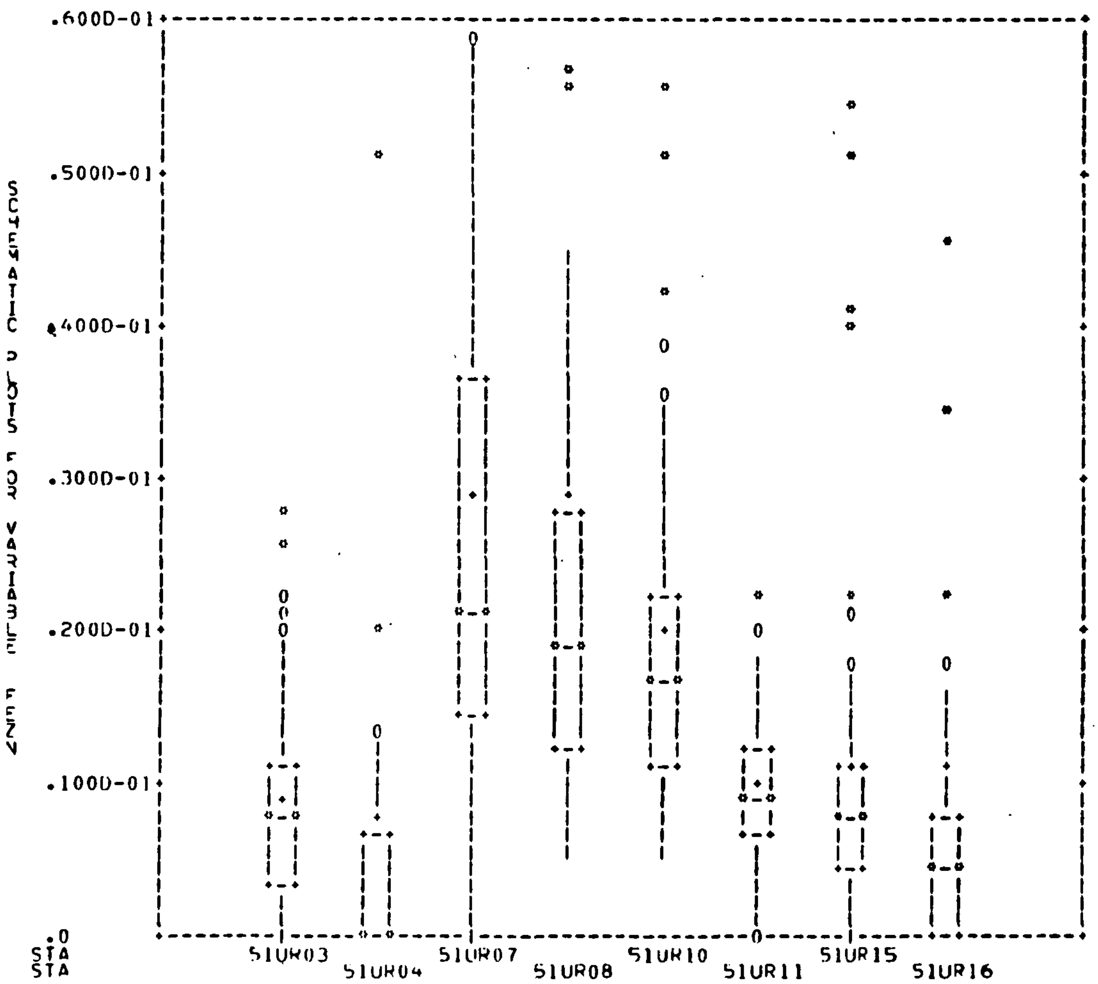


Figure 8-12. Distribution of Extractable Zinc Loadings in lb/acre-inch of runoff at Pond BMP's.

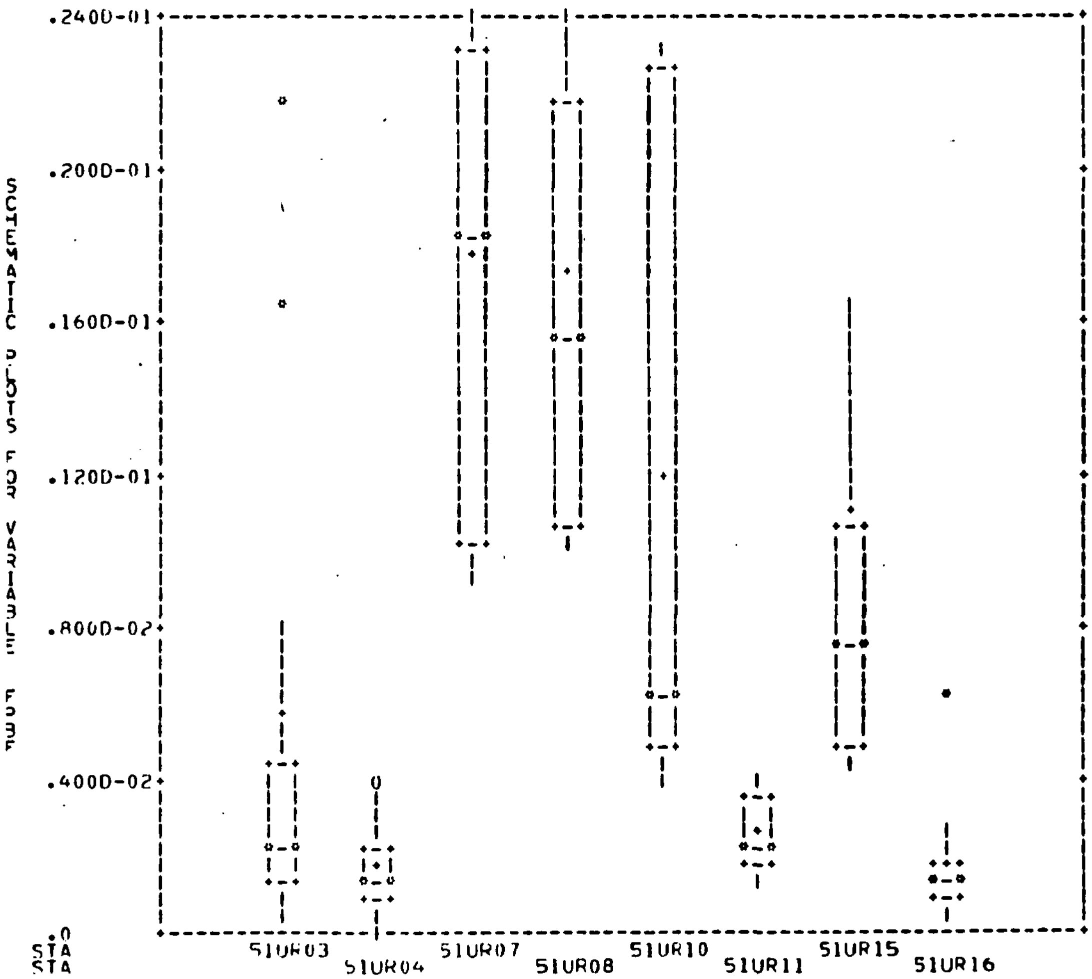


Figure 8-13. Distribution of Extractable Lead (furnace AA) Loadings in lb/acre-inch of runoff at Pond BMP's.

Substantial reductions in zinc loadings were observed at both the wet pond sites, ranging from 44.2 percent (Westleigh) and 83.7 percent (Burke). Using the limited low level data base for lead loadings, the removals varied from 81.8 to 37.8 percent for the same two stations. This has limited water quality significance, however, because the lead concentration ranges for the samples used were all below 30 μg/L.

Metals-Detention Ponds. The loading distributions for zinc and lead at the two detention pond sites are shown in Figures 8-11 and 8-12. The median loading reductions are summarized in Table 8-1. While the highest loading rate distributions for zinc and lead were observed at the Lake Ridge inflow site, the removal percentages were also the lowest observed. The zinc and lead reductions attained at the Stedwick site were much higher, and, in fact, were comparable to those from the wet pond sites.

Non-Pond BMP's

As may be seen in Table 2-1, six non-pond BMP's were included in the study plan. These consisted of 2 infiltration pits, 3 grassed swales, and one porous paving application. All the non-pond BMP's, therefore, fell into the volume control category-indicating that, at least in part, the functional mechanism of pollutant removal was assumed to be reduction of flow volume. This reasoning, of course, derives from the design features of such practices that allow some portion of the runoff flow to be directed into the soil profile.

Data Analysis. As stated earlier in the section on pond data analysis, flow volumes in ponds may be assumed to balance between inflow and outflow over the long term. For that reason, an analysis of pond efficiencies based on long-term observations of pollutant exports at the inflow and outflow points seemed appropriate.

The situation is less clear for volume control BMP's. The study design called for the use of the uncontrolled station at a pond BMP pair as the control for the volume control BMP monitored at a similar land use. In the project planning stages this seemed to be a logical method for maximizing the efficiency of limited resources available for site instrumentation and monitoring. The realities of the study, however, have made it apparent that selection of control catchments based only upon similarities of development density and imperviousness makes such comparisons difficult. Differences in soils, slopes, and traffic patterns may have contributed materially to the problems experienced in establishing adequate control watersheds for the volume control BMP's. In retrospect, it now seems clear that site selection for such a study should focus (with limited monitoring resources available) not only on the location of control watersheds having very similar physical attributes to the BMP watershed, but also on the proximity of the control and BMP-applied catchments. For studies of relatively short duration, a dataset of sufficient size may not be created to allow comparisons of pollutant export under similar hydrometeorologic conditions.

As stated earlier, volume control BMP's function, at least in part, by directing a portion of the runoff flow into the soil profile. For this reason, effectiveness comparisons made on the lb/acre/inch of runoff basis used in the pond evaluations are not suitable. A more logical choice would be comparisons based on pollutant export generated as a result of the initial driving force: rainfall. An efficiency analysis was attempted using the loading populations developed from lb/acre/inch of precipitation and control/BMP catchments as follow:

BMP TYPE	SITE	CONTROL SITE
Infiltration Pit	Dandridge (UR05)	Stedwick Inflow (UR10)
	Burke Village Center (UR17)	Fair Oaks Inflow (UR20)
Swale Drain	Stratton Woods (UR06)	Westleigh Inflow (UR15)
	Fairidge (UR09)	Burke Inflow (UR03
	Dufief (UR18)	Westleigh Inflow (UR15)
Porous Paving	Rockville City (UR19)	Fair Oaks Inflow (UR20)

Paired as shown above, the BMP and control site comparisons suffer from the following deficiencies:

- o The Dandridge site was not entirely representative of outflow from an infiltration pit as 52 percent of the site drainage reached the monitoring point unobstructed. In addition, the site is extremely remote from its control basin, the inflow to Stedwick pond. There were, as well, substantial differences in site imperviousness and development density.

- o The infiltration pit site at Burke Village Center might have successfully used the wetfall and dryfall loads reaching the surface as estimators of the uncontrolled loading. However, it is suspected that the ground-level dryfall collector on a principally parking catchment does not do an adequate job of collecting direct deposits from motor vehicle undercarriages. Using the Fair Oaks Pond inflow point as a control has some deficiencies of its own: the control site already had its own BMP practice (vacuum sweeping) and the storm event data base was quite small (10 events).

- o The Stratton Woods and Westleigh inflow catchments appeared to have sufficient physical similarity to permit comparisons, but the wide separation of the sites and the very different rainfall distributions have made this doubtful. Careful editing of the datasets to include storms of more similarity might remedy this.

- o The Fairidge and Burke Pond inflow sites also displayed substantial physical similarity, but the wide separation of the catchments and differences in rainfall populations contributed to the limited suitability of the pair.

- o The Dufief and Westleigh inflow sites were located in the same area. The development densities were high at the Dufief site, but the net impervious percentages were similar. This pair probably had the best opportunity to serve in the control-BMP function. However, due to the late date in the program at which the Dufief site was established, and the very low runoff volumes produced, only eight runoff events were available for analysis. The Westleigh data set was much larger, and therefore, more representative of catchment export behavior.

- The Rockville City-Fair Oaks inflow pair suffer from the same problems as noted earlier with the Burke Village Center-Fair Oaks inflow. In addition, the sites were widely separated.

Having summarized the apparent weaknesses of the selected pairs, the limited effectiveness data may be viewed in proper context.

Precipitation. As stated earlier, because of the unknown quantity of runoff directed into the soil profile with volume control BMP's, comparisons with the control catchments would be best performed using unit area pollutant export per unit rainfall. Figure 8-14 presents the rainfall data distributions for the volume control BMP sites and their selected control basins. As may be seen, the median rainfall values were similar for the following pairs:

UR05 - UR10
UR17 - UR20
UR19 - UR20

Of the above pairs, it should be remembered that the Dandridge site received 52 percent of its drainage directly-not through the infiltration pit. An additional limitation of the pairings above is the relatively small size (10 events) of the Fair Oaks inflow (UR20) data set.

It is likely that editing of the data sets of the other proposed pairs would produce similar "driving force" populations that would make the resulting pollutant export comparisons more meaningful.

Suspended Solids. Figure 8-15 shows the suspended solids loading distributions for the volume control BMP sites. While strictly not a volume control site, UR20 has been included because it is a vacuum swept catchment and also its

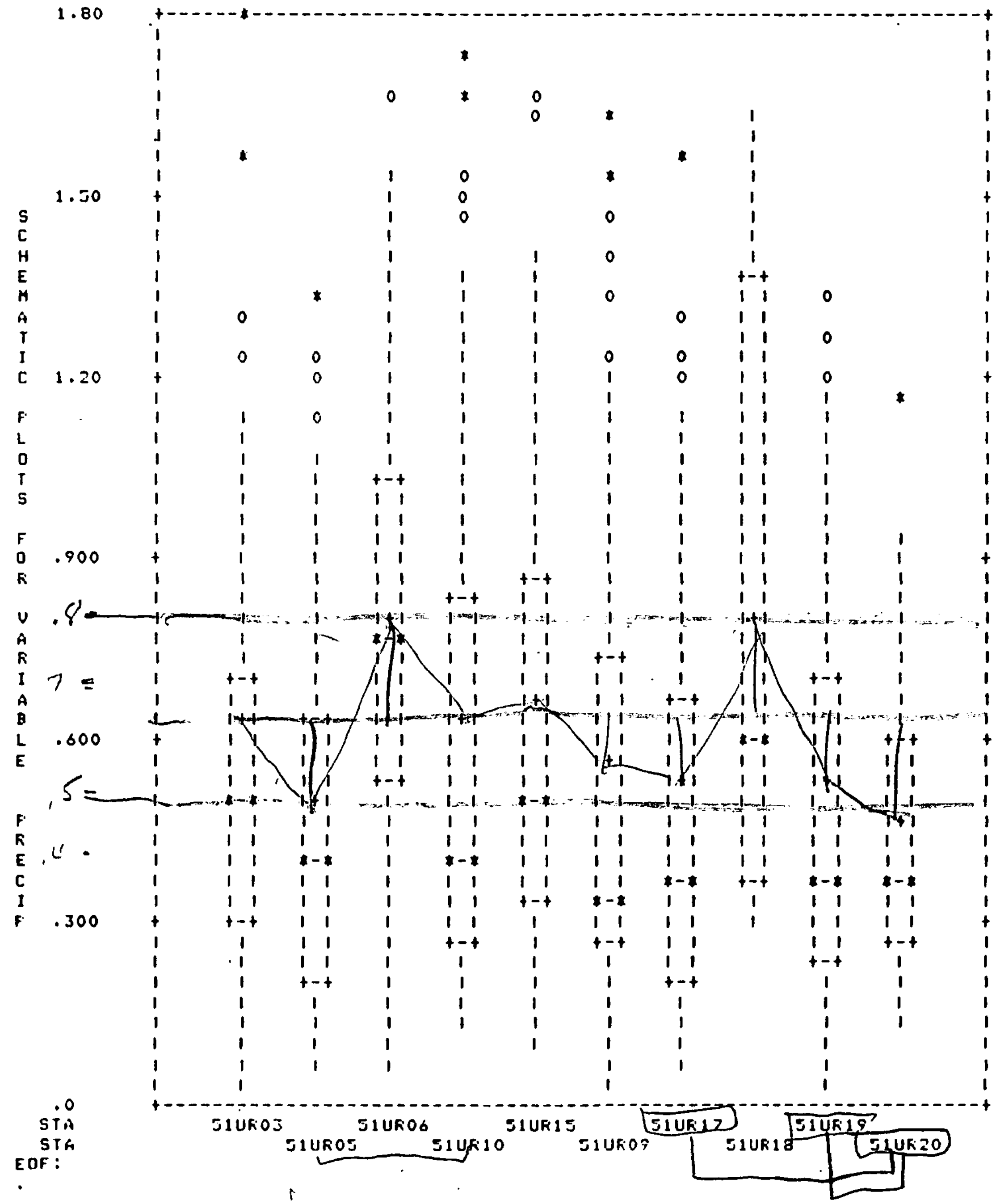


Figure 8-14. Distributions of Rainfall Data at Volume Control and Control BMP Sites.

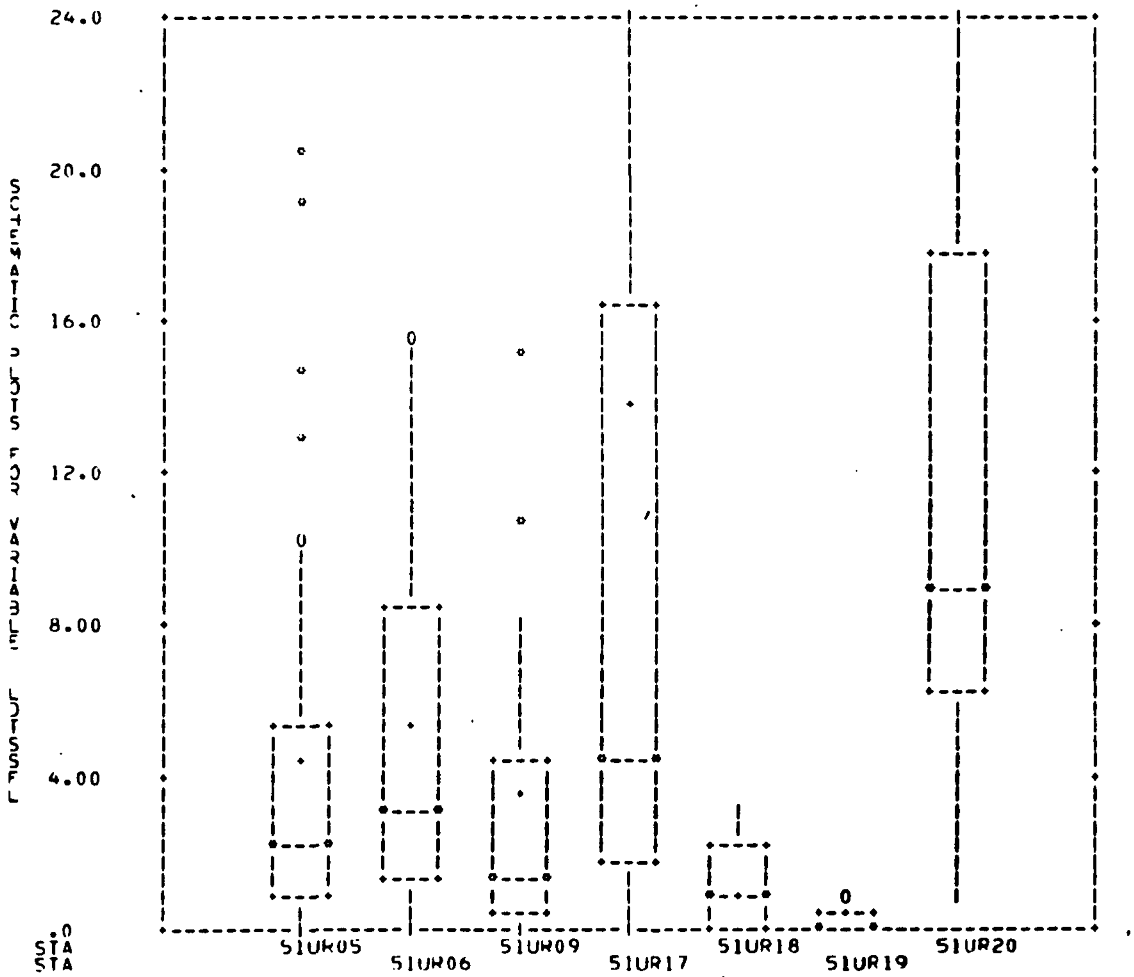


Figure 8-15. Distribution of TSS Loadings in lb/acre-in of precipitation at Volume Control BMP's.

loading data have been used for the control for sites UR17 and UR19. The estimated efficiency data for the volume controls for TSS are given in Figure 8-2. These were developed using the available loading distributions from the BMP sites and their selected control sites (loads expressed as lb/acre/in-Precip). As may be seen, the results are not encouraging for any of the swale drain sites, with efficiencies ranging from -17.8 to -224 percent. It is possible, however, that these poor estimated performances are artifacts of the site and rainfall distribution differences. Similarly poor results were obtained from the Dandridge infiltration pit, and probably for the same reasons. The Burke Center infiltration pit, however, appeared to perform quite well when compared to the Fair Oaks inflow, producing a TSS removal estimate of 36.9%. Likewise, the Rockville Center porous paving site was estimated to achieve a TSS reduction of 82.5 percent.

Chemical Oxygen Demand. The COD loading distribution data are shown in Figure 8-16. It is interesting to note that two of the residential swale sites, UR06 and UR09, exhibited very similar median loading rates, while the third site, UR18 was substantially lower. it is also interesting to note that the lowest loading distribution of all was derived from the Rockville Center porous paving site. Reference to Table 8-2 again shows the disappointing volume control performance, with two exceptions: Burke Village Center (UR17) and Rockville Center (UR19), which produced median COD loading reductions of 36.9 and 82.5 percent, respectively.

Nitrogen. The loading distributions of ammonia, soluble Kjeldahl nitrogen, total Kjeldahl nitrogen, oxidized nitrogen, and total nitrogen are shown in Figures 8-17 through 8-21, respectively. As may be seen from comparing the values from common scales on the ordinates, TKN was generally the dominant form at all sites. Nitrate loadings at the UR06 and UR18 swale drainage sites were

Table 8-2. Estimated Removals of Stormwater Pollutants at Non-Pond BMP Sites

SITE NAME	BMP TYPE	CONTROL STATION	PERCENT REMOVALS					
			TSS	COD	TN	TP	ZN	Pb
Dandridge (UR05)	Infiltration Pit	UR10	-66.7	-144	-200	-267	-160	-234
Stratton Woods (UR06)	Swale Drain	UR15	-133	-224	-187	-220	-581	-543
Fairidge (UR09)	Swale Drain	UR03	-50.0	-48.1	-18.2	-9.1	-140	-328
Burke Ctr. (UR17)	Infiltration Pit	UR20	50.0	36.9	-9.8	-8.0	48.2+	-
Dufief (UR18)	Swale Drain	UR15	31.0	-17.8	36.5	-23.3	-173	33.3
Rockville (UR19)	Porous Paving	UR20	96.0	82.5	59.9	88.1	99+	-

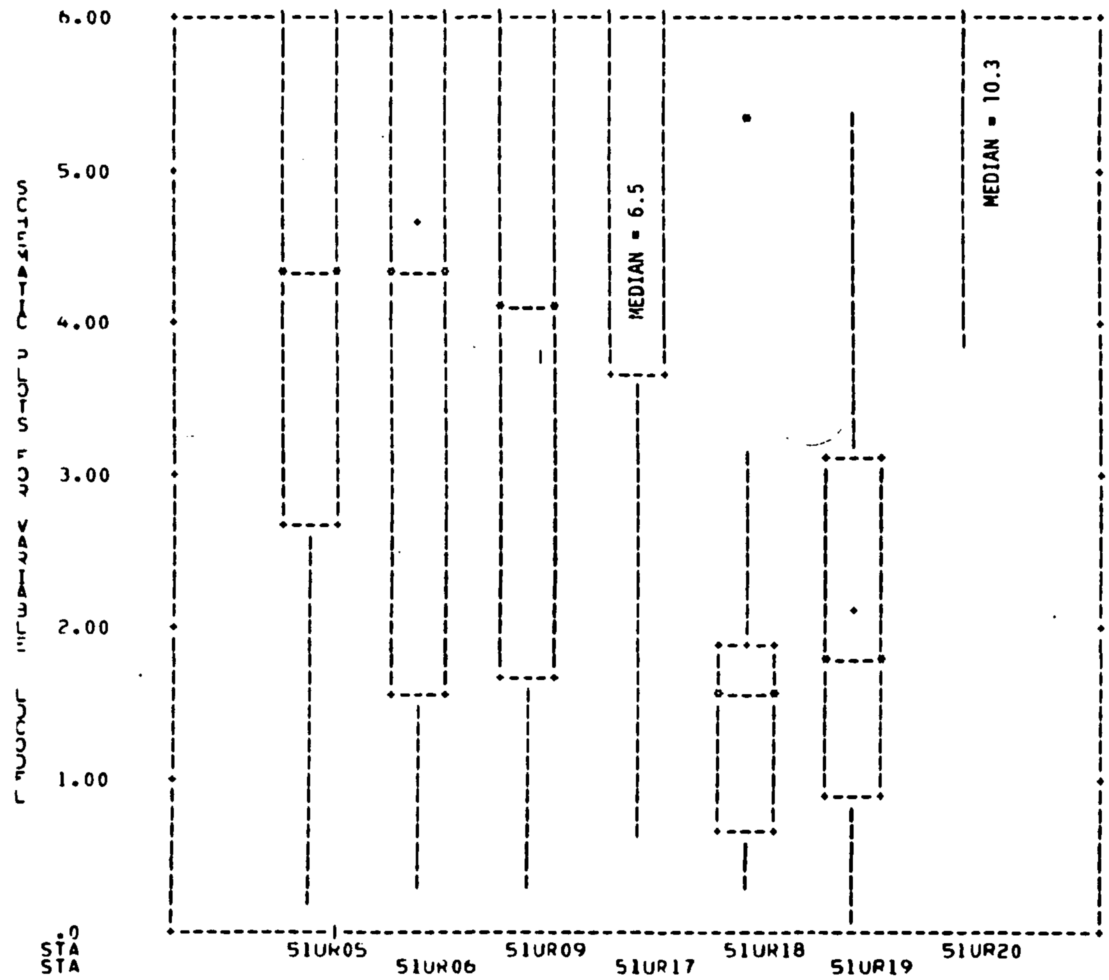


Figure 8-16. Distribution of COD Loadings in lb/acre-in of precipitation at Volume Control BMP's.

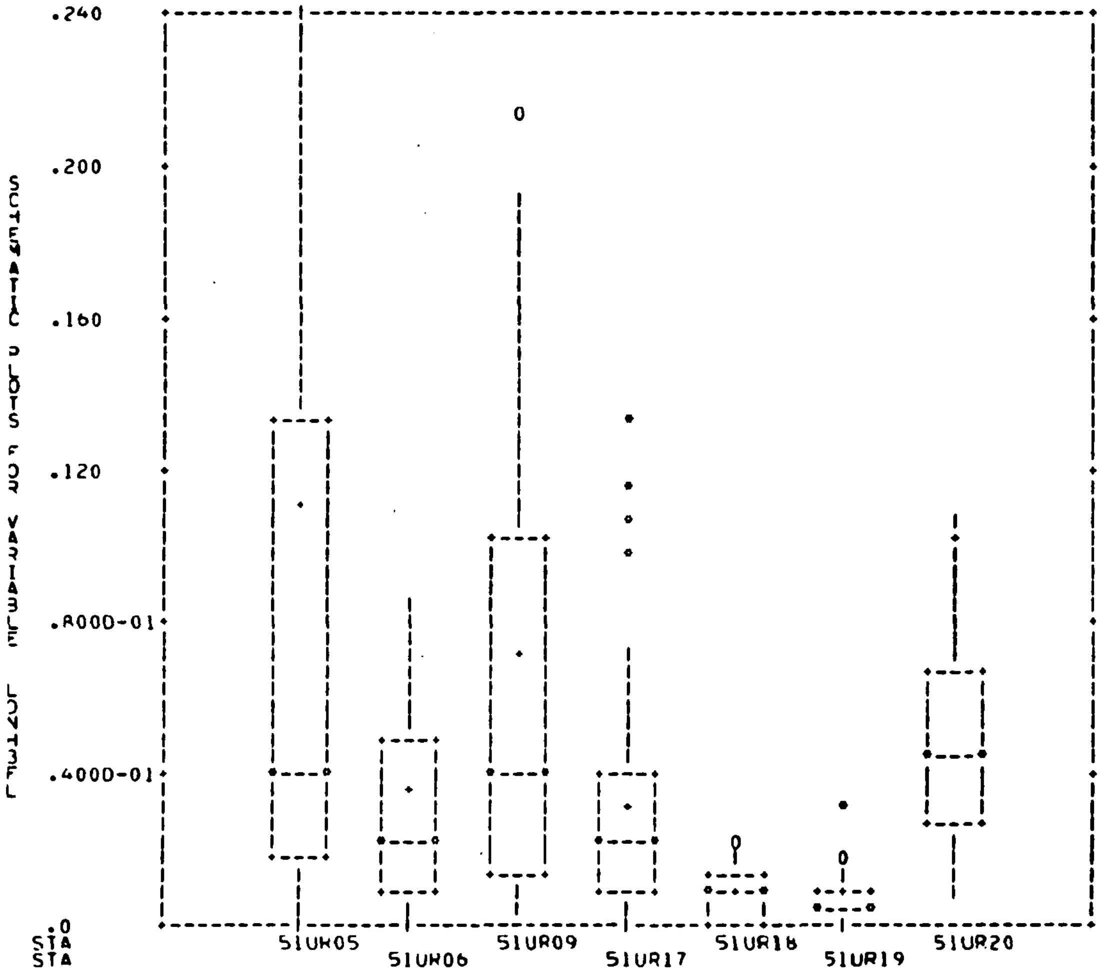


Figure 8-17. Distribution of Ammonia Nitrogen Loadings in lb/acre-inch of precipitation at Volume Control BMP's.

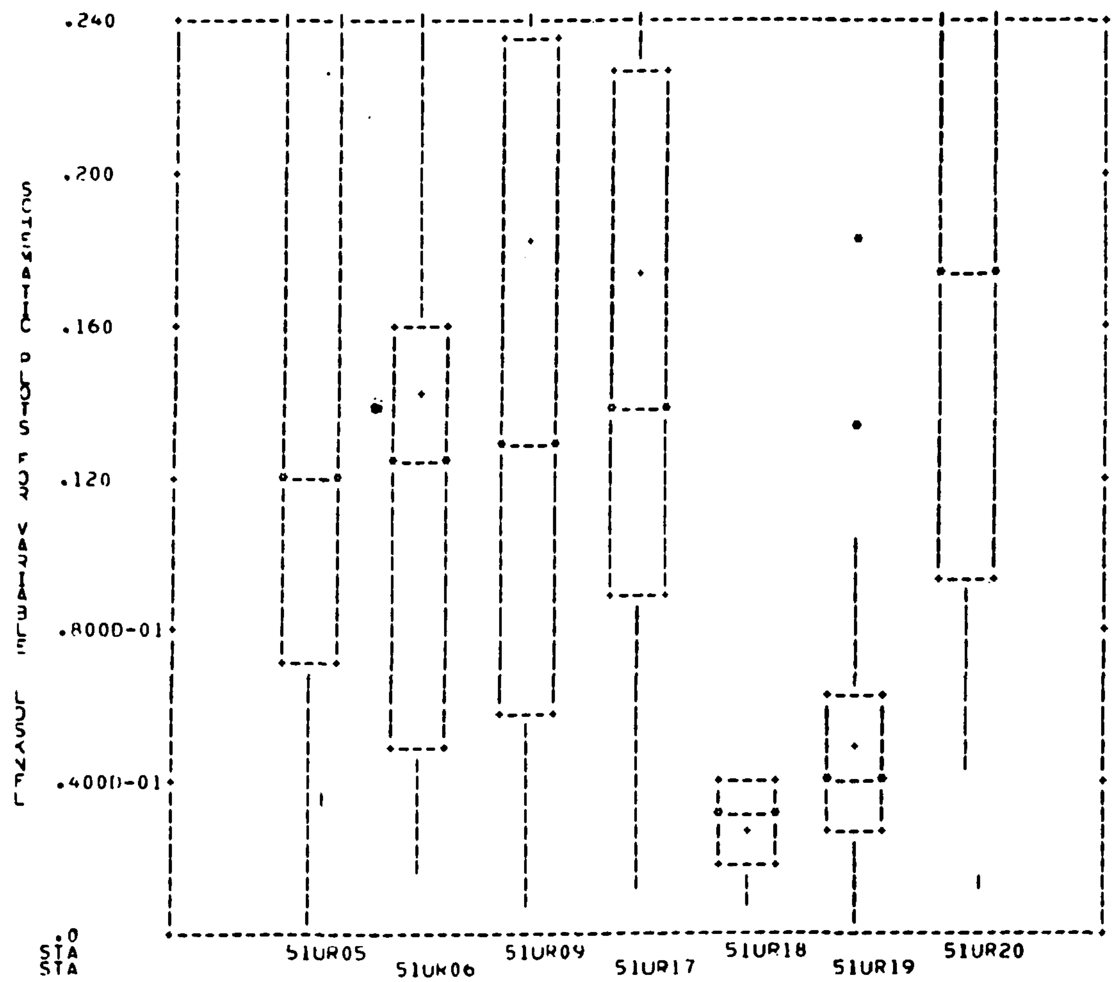


Figure 8-18. Distribution of SKN Loadings in lb/acre-inch of precipitation at Volume Control BMP's.

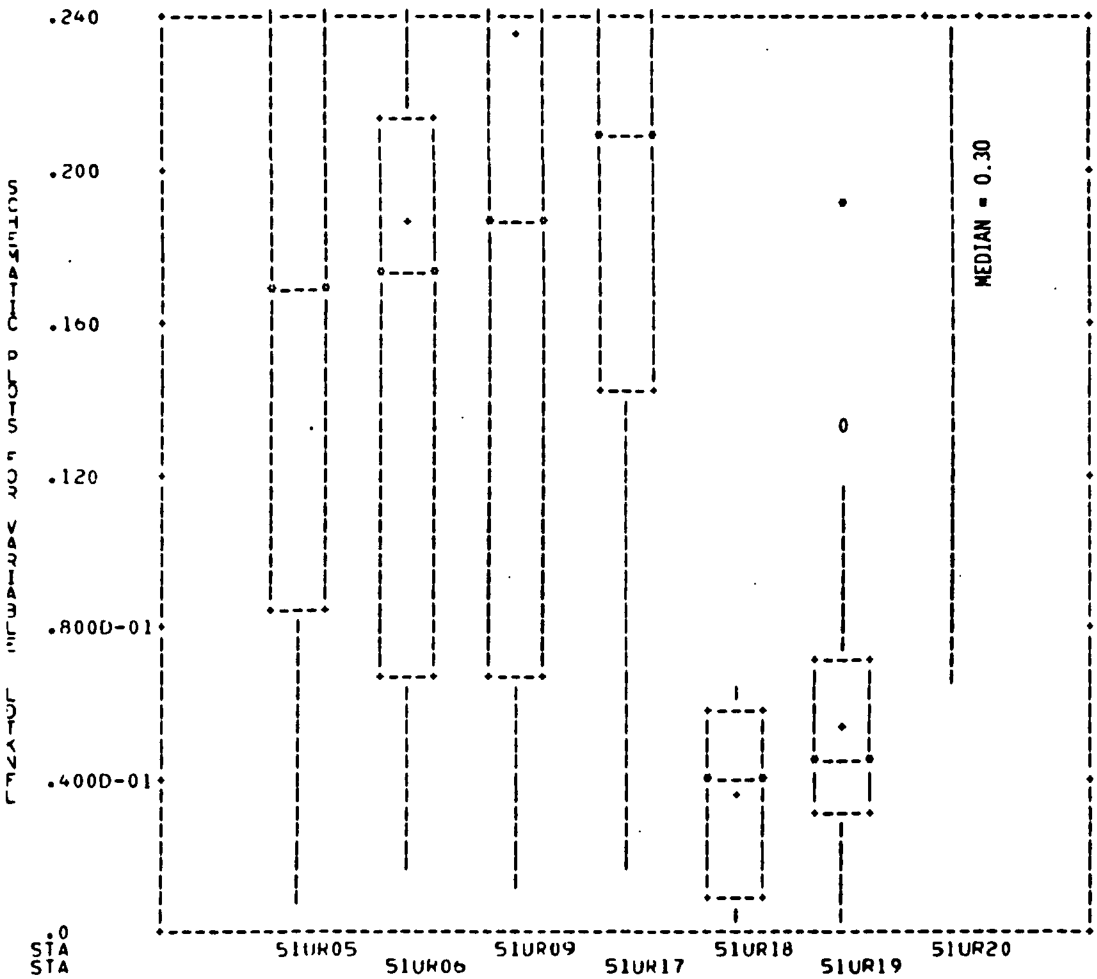


Figure 8-19. TKN Loadings in lb/acre-inch of precipitation at Volume Control BMP's.

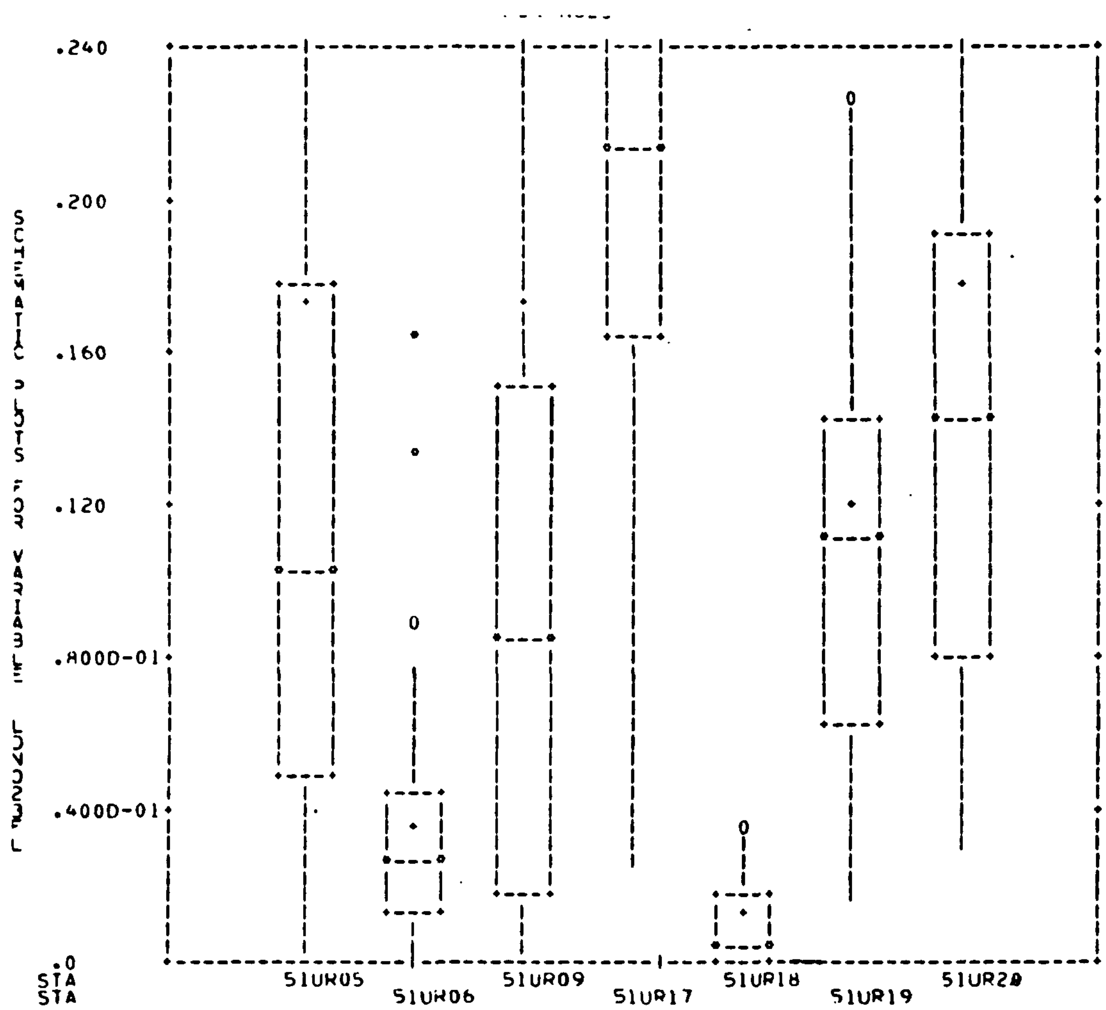


Figure 8-20. Distribution of Oxidized Nitrogen Loadings in lb/acre-inch of precipitation at Volume Control BMP's.

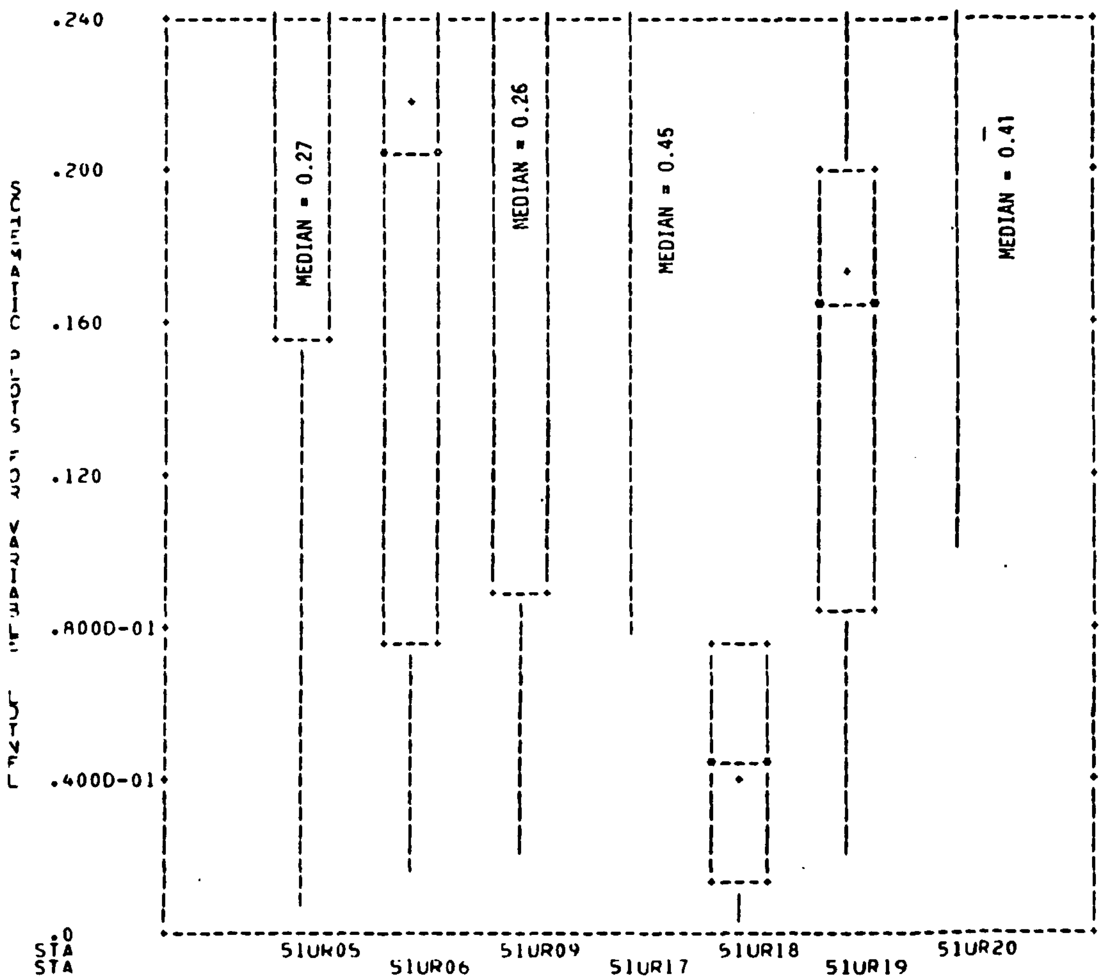


Figure 8-21. Distribution of Total N Loadings in lb/acre-inch of precipitation at Volume Control BMP's.

similar, but were both substantially different from those at UR09. Estimated removal percentages for total nitrogen are given in Table 8-2. Of the swale drainage sites, only Dufief exhibited a positive removal (36.5 percent). The only other site of any type exhibiting a positive removal was UR19 (Rockville Center), which was estimated to remove 59.9 percent of the total nitrogen.

Phosphorus. The loading distributions for phosphorus forms are shown in Figures 8-22 through 8-24. As may be seen, the lowest loadings for any of the sites monitored were produced by the Rockville Center porous paving catchment. At the other sites, the figures show substantial fractions of the total phosphorus loadings to be either in the ortho or soluble form. Reference to Table 8-2 shows that of all the sites monitored, only the Rockville Center porous paving BMP exhibited a positive estimated phosphorus removal (88.1 percent). It should be noted again at this point, however, that the negative values at other sites may, to some extent, be artifacts of the comparison data sets chosen.

Metals. The loading distributions for flame AAS zinc and furnace AAS lead are shown in Figures 8-25 and 8-26. The estimated removals of the two metals at the volume control sites are shown in Figure 8-2. No estimates are given for lead for those sites utilizing UR20 as a control, because of the paucity of loading data available at that site. For zinc, all sites except Rockville Center produced negative estimated efficiencies.

Only the Dufief site produced a positive efficiency estimate for lead removal. The data from all other sites produced strongly negative efficiency estimates. It should be again suggested that a further examination of the loading data be undertaken using similar rainfall data sets for the treatment and control sites.

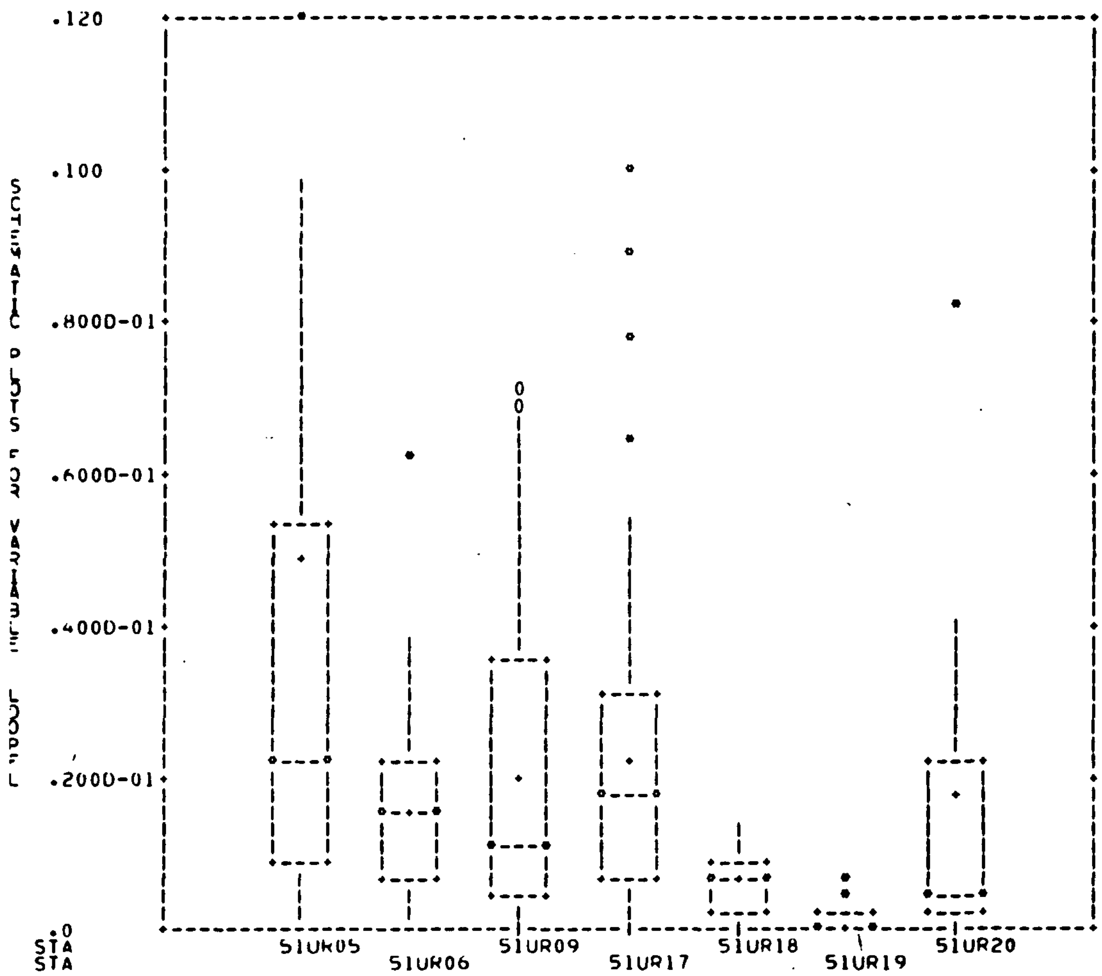


Figure 8-22. Distributions of Ortho-Phosphorus Loadings in lb/acre-inch of precipitation at Volume Control BMP's.

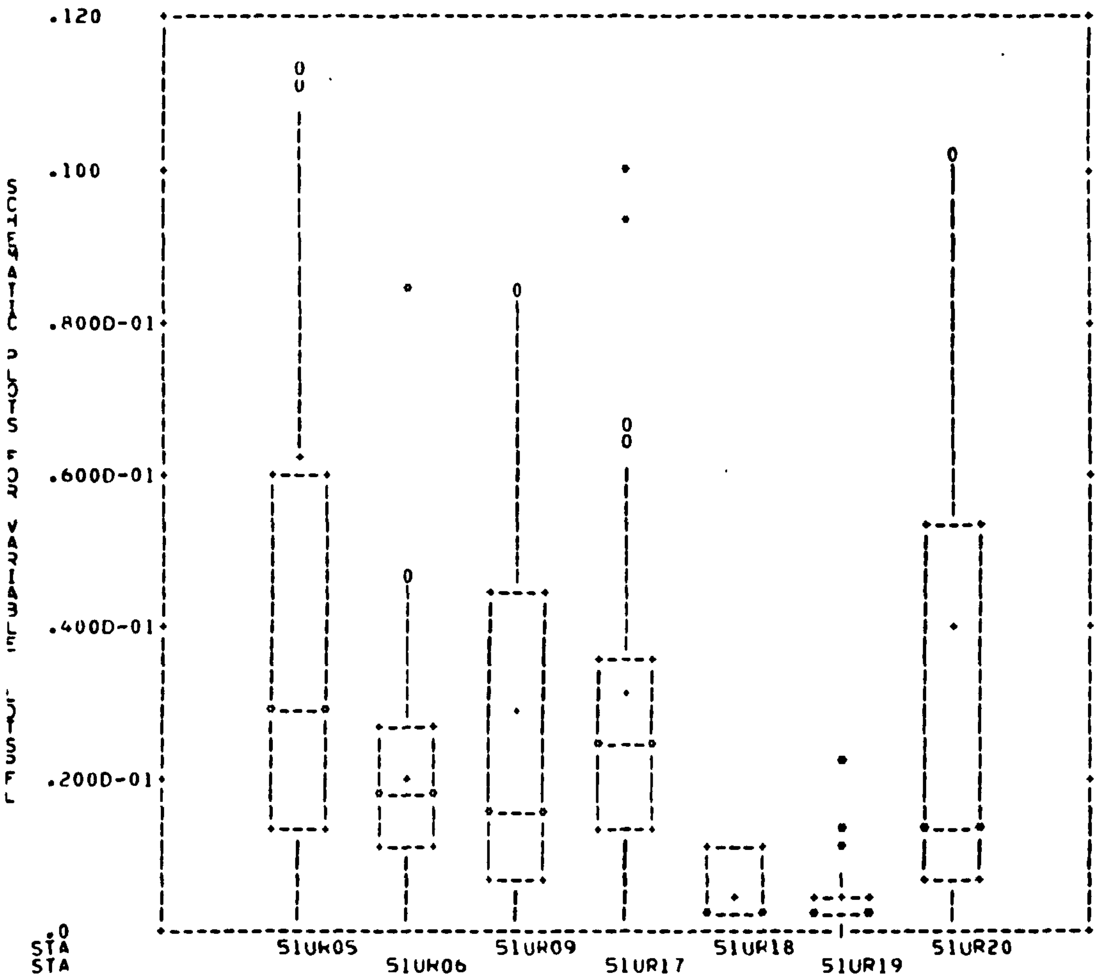


Figure 8-23. Distribution of Total Soluble Phosphorus Loadings in lb/acre-inch of precipitation at Volume Control BMP's.

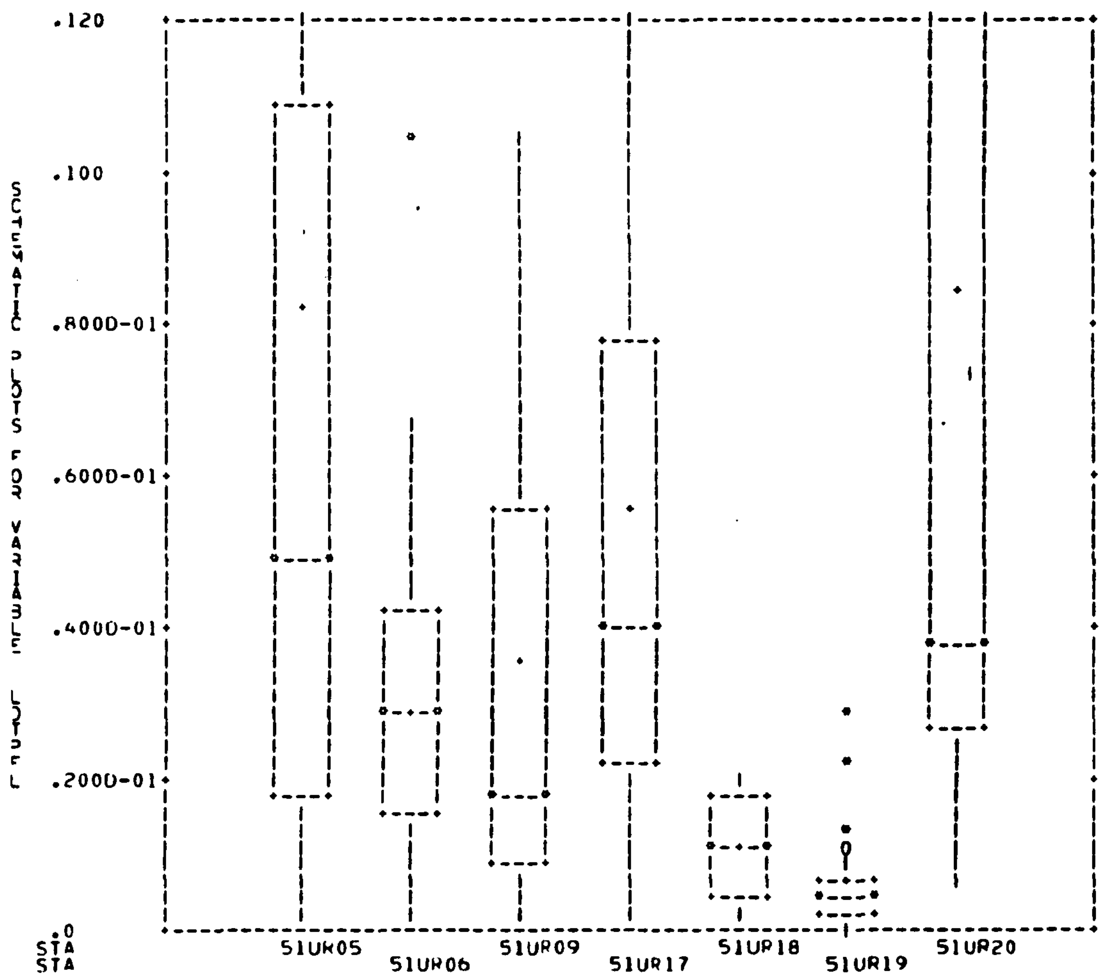


Figure 8-24. Distribution of Total Phosphorus Loadings in lb/acre-inch of precipitation at Volume Control BMP's.

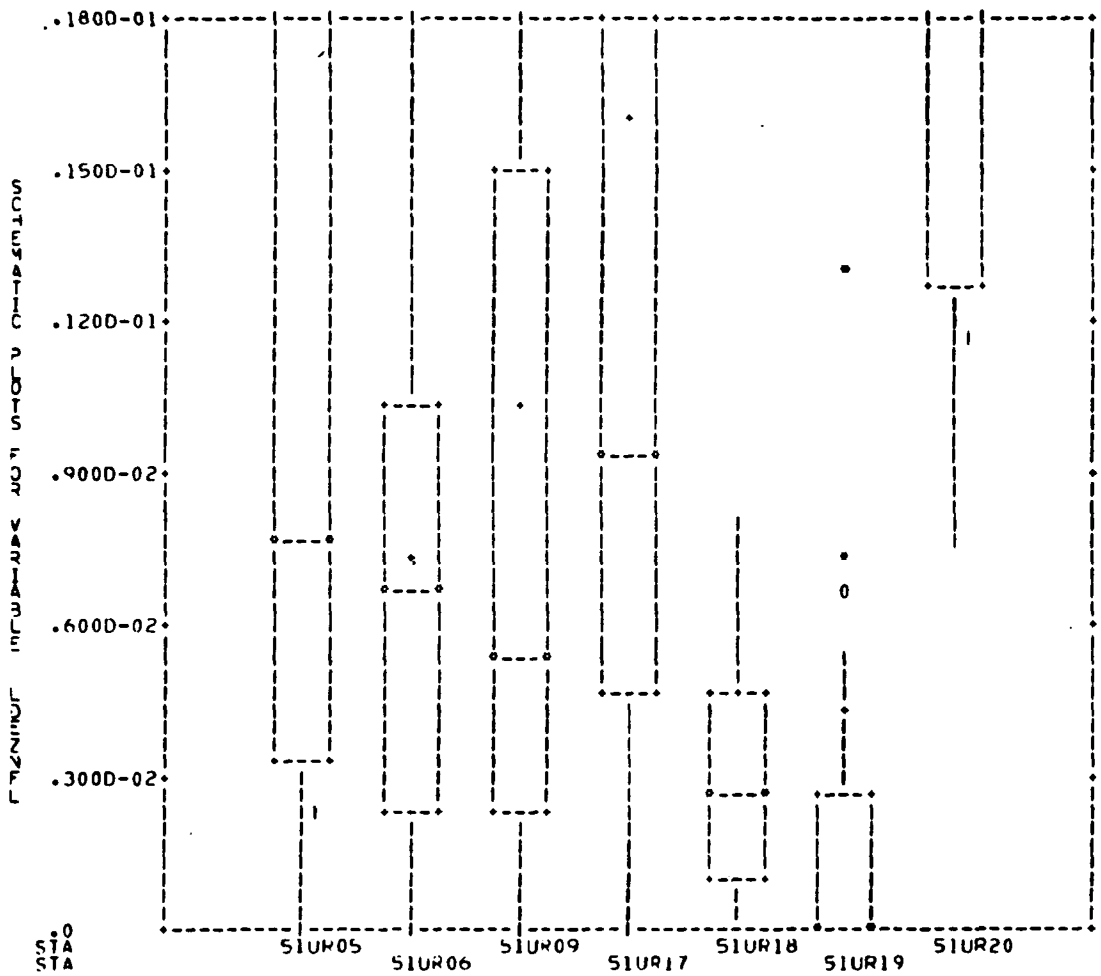


Figure 8-25. Distribution of Extractable Zinc Loadings in lb/acre-inch of precipitation at Volume Control BMP's.

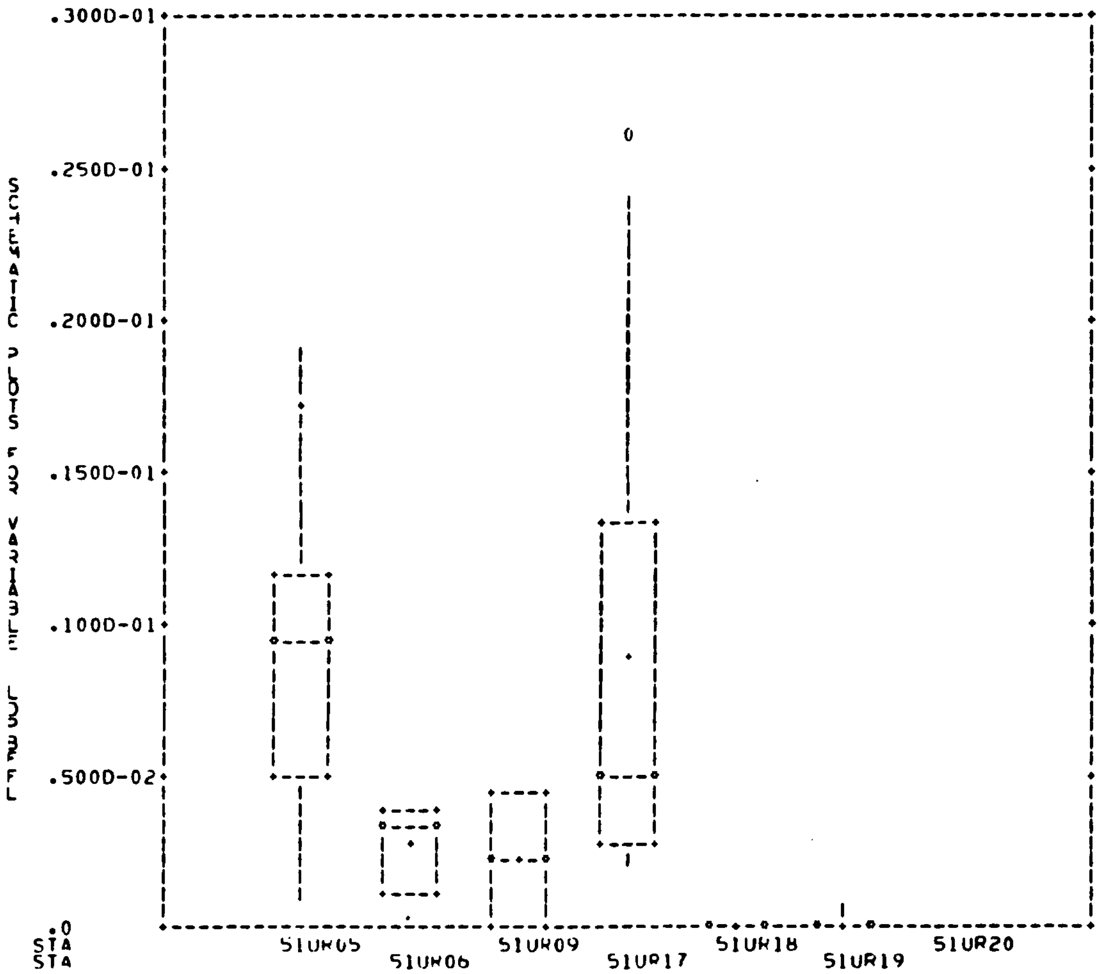


Figure 8-26. Distribution of Furnace AAS Lead Loadings in lb/acre-inch precipitation at Volume Control BMP's.

References

8-1 "Evaluation of Management Tools in the Occoquan Watershed," VA TECH Department of Civil Engineering, Manassas, VA 22110.

9. ATMOSPHERIC SOURCES

Introduction

The atmospheric source monitoring program consisted of three elements: suspended particulate sampling and analysis, dryfall sampling and analysis, and wetfall sampling and analysis. The locations of the total suspended particulate sampling stations were fixed by an existing network. Eight stations were distributed between Virginia, the District of Columbia and Maryland. The station names and numbers were presented previously in Table 2-2. The dryfall and wetfall sampling sites were located together in all cases because of the design of the equipment employed. The wetfall/dryfall sampling sites were installed and operated by VA TECH staff. The total suspended particulate samples were obtained by MWCOG staff and delivered to VA TECH.

The wetfall/dryfall and total suspended particulate data base is contained in Appendix F. The locations and inclusive sampling dates for the atmospheric source stations are shown in Table 9-1.

Total Suspended Particulate Monitoring

Samples were obtained from MWCOG staff, and consisted of 20x25 cm glass fiber filter mats from high volume air samplers located at the locations in Virginia, Maryland and the District of Columbia as shown in Table 9-1. The air flow data for each sampler were transmitted with the filter mat, making it possible to compute a 24-hour average air mass concentration in $\mu g/m^3$. The results of the filter mat analyses are shown in box plots in Figures 9-1 through 9-8 for total suspended particulates, nutrients, and heavy metals.

Particulates. No immediately apparent trends in atmospheric particulate load are apparent from Figure 9-1. With the exception of Station HV03 (Hall,

Table 9-1. Atmospheric Source Monitoring

STATION TYPE	STATION NAME	STATION NO.	MONITORING PERIOD	NO. SAMPLES
Total Suspended Particulate	Catholic University, DC	HV01	5-16-80 through 12-18-81	20
	Hadley Hospital, DC	HV02	5-16-80 through 12-18-81	18
	Hall, MD	HV03	5-16-80 through 10-13-81	17
	Rockville, MD	HV04	5-16-80 through 5-16-81	9
	Laurel, MD	HV05	5-16-80 through 10-13-81	17
	Arlington, VA	HV06	5-16-80 through 01-17-82	21
	Fort Belvoir, VA	HV07	5-16-80 through 01-14-82	22
	Massey Bldg., VA	HV08	5-16-80 through 01-14-82	22
Wetfall/Dryfall	Haines Point, DC	WF01 DF01	12-20-80 through 01-02-82	39 52
	Burke Village Center (Roof) (VA)	WF02 DF02	02-10-81 through 12-30-81	39 49
	Burke Village Center (Ground) (VA)	WF03 DF03	03-22-81 through 12-23-81	30 38
	Stedwick, MD	WF04 DF04	06-11-81 through 12-16-81	17 29

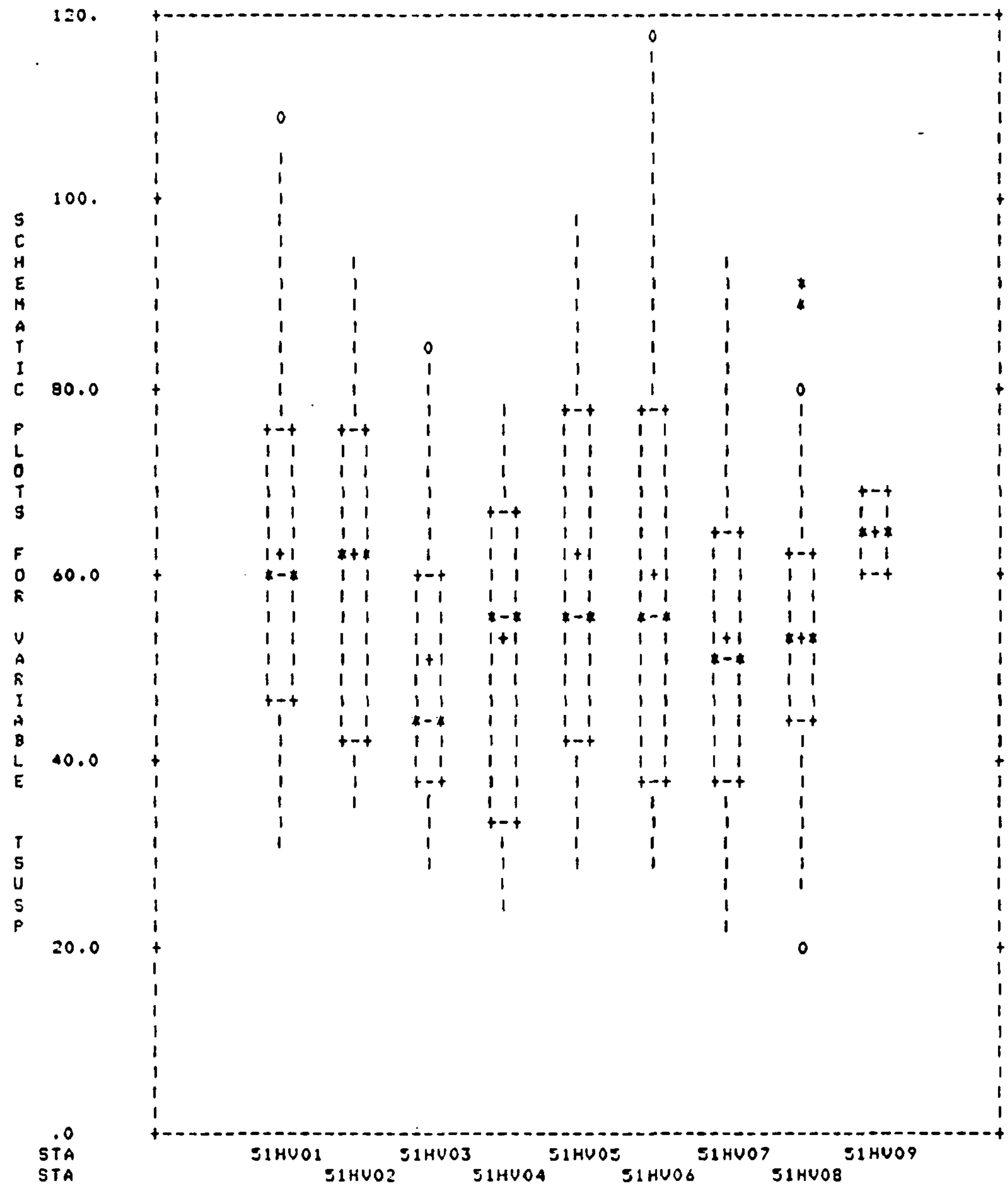


Figure 9-1. Distribution of Total Suspended Particulates in Ambient Air Mass as µg/m^3.

Maryland), the median values of total suspended particulates for the entire network vary only about ∓10 percent, indicating remarkable air mass uniformity with respect to particulate burden.

Phosphorus. The data shown in Figures 9-2 and 9-3 illustrate that, for the stations where ortho and total phosphorus analyses were performed, most of the phosphorus was found to be in the non-ortho form. In general, the orthophosphorus forms comprised only about 25 percent of the total. In looking at inter-jurisdictional variations, it may be seen that the DC stations exhibited the highest median concentrations, followed by Virginia, and Maryland. The lowest median total P concentration was observed at the Rockville, Maryland site, with a value of 0.02 $\mu g/m^3$. The highest median concentration, 0.045 $\mu g/m^3$, was observed at the Hadley Hospital site in DC (HV02).

Nitrogen. TKN and oxidized nitrogen forms from Hi-Vol mat analyses are shown in Figures 9-4 and 9-5, respectively. An interesting trend may be observed by observing the nitrogen data on a jurisdictional basis. The highest oxidized nitrogen concentrations (NO_2+NO_3) were observed at the Maryland sites. Conversely, the lowest TKN values were observed at the same sites. The opposite trends were observed at the Virginia and DC sites. No reason for this observation is immediately apparent, but the consistency in the data is undeniable.

Metals. Trace metals associated total suspended particulates are shown in box and whisker plots in Figures 9-6, 9-7, and 9-8.

The lead data are shown in Figure 9-6. There are no apparent trends by jurisdiction, but it does appear that the most suburban of the stations, HV03, HV07, and HV08 (Hall, MD; Ft. Belvoir, VA; and Massey Building, VA) exhibited the lowest air mass concentrations.

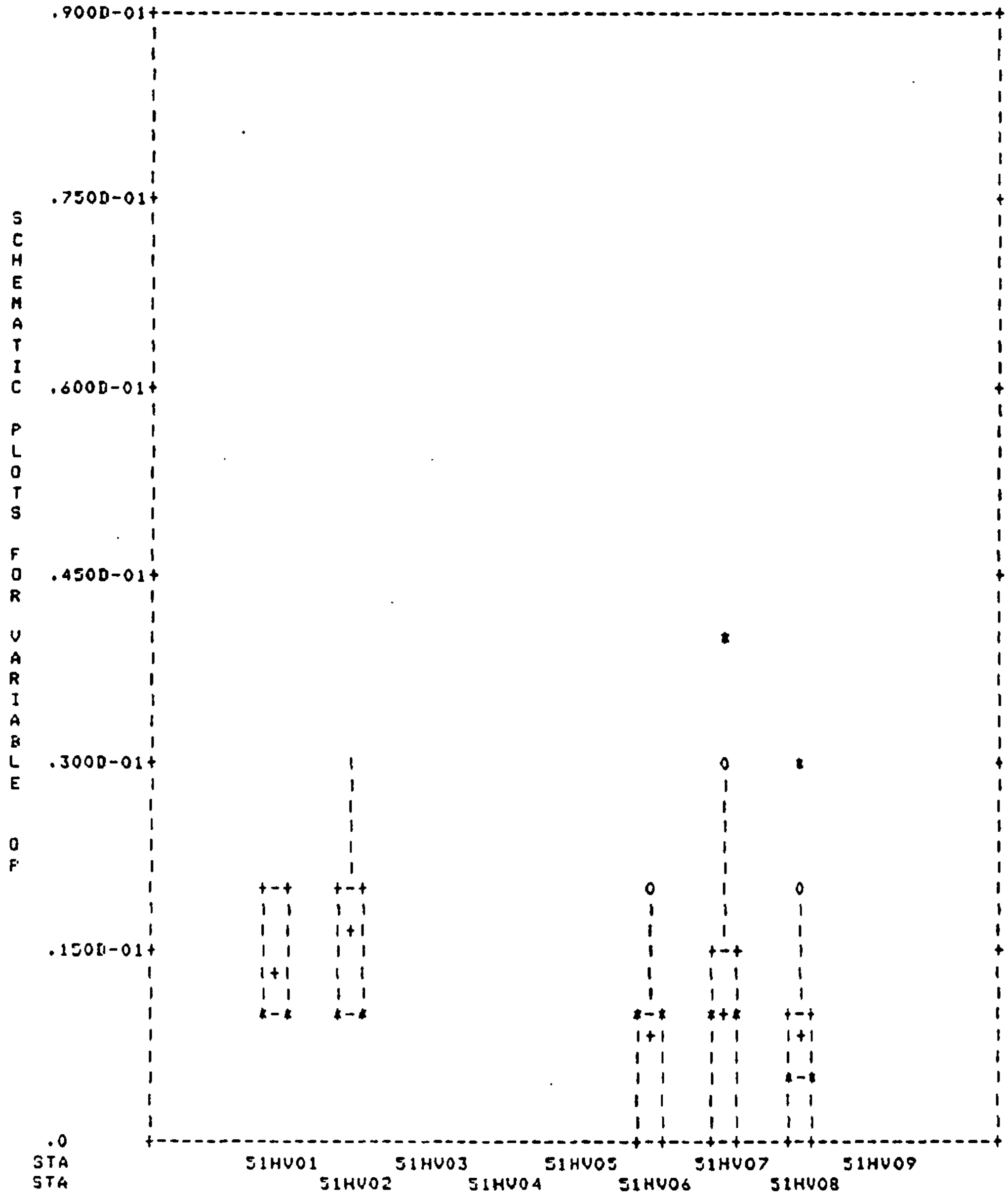


Figure 9-3. Distribution of Ortho Phosphorus in Ambient Air Mass as $\mu g/m^3$.

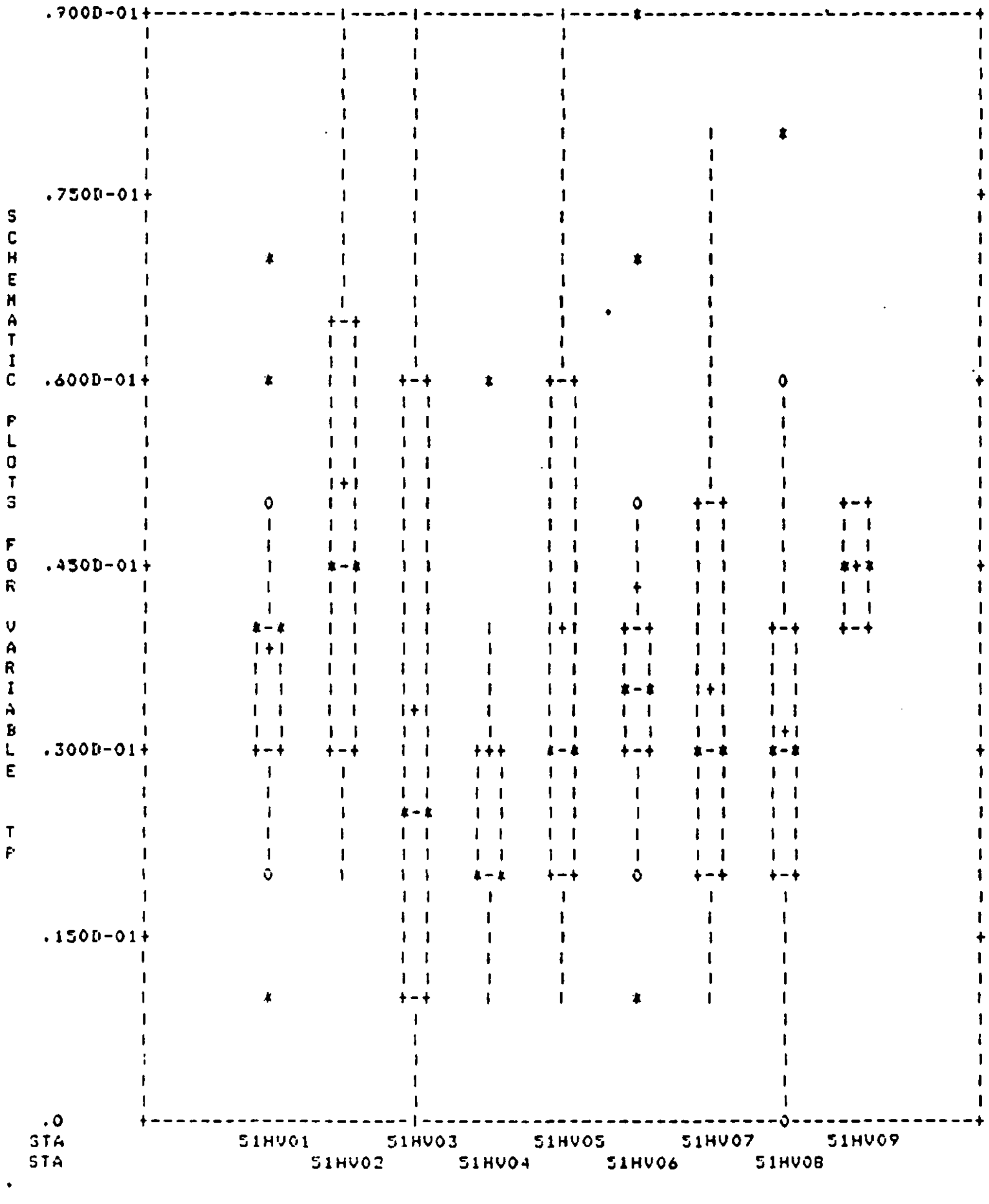


Figure 9-2. Distribution of Ortho Phosphorus in Ambient Air Mas as µg/m³.

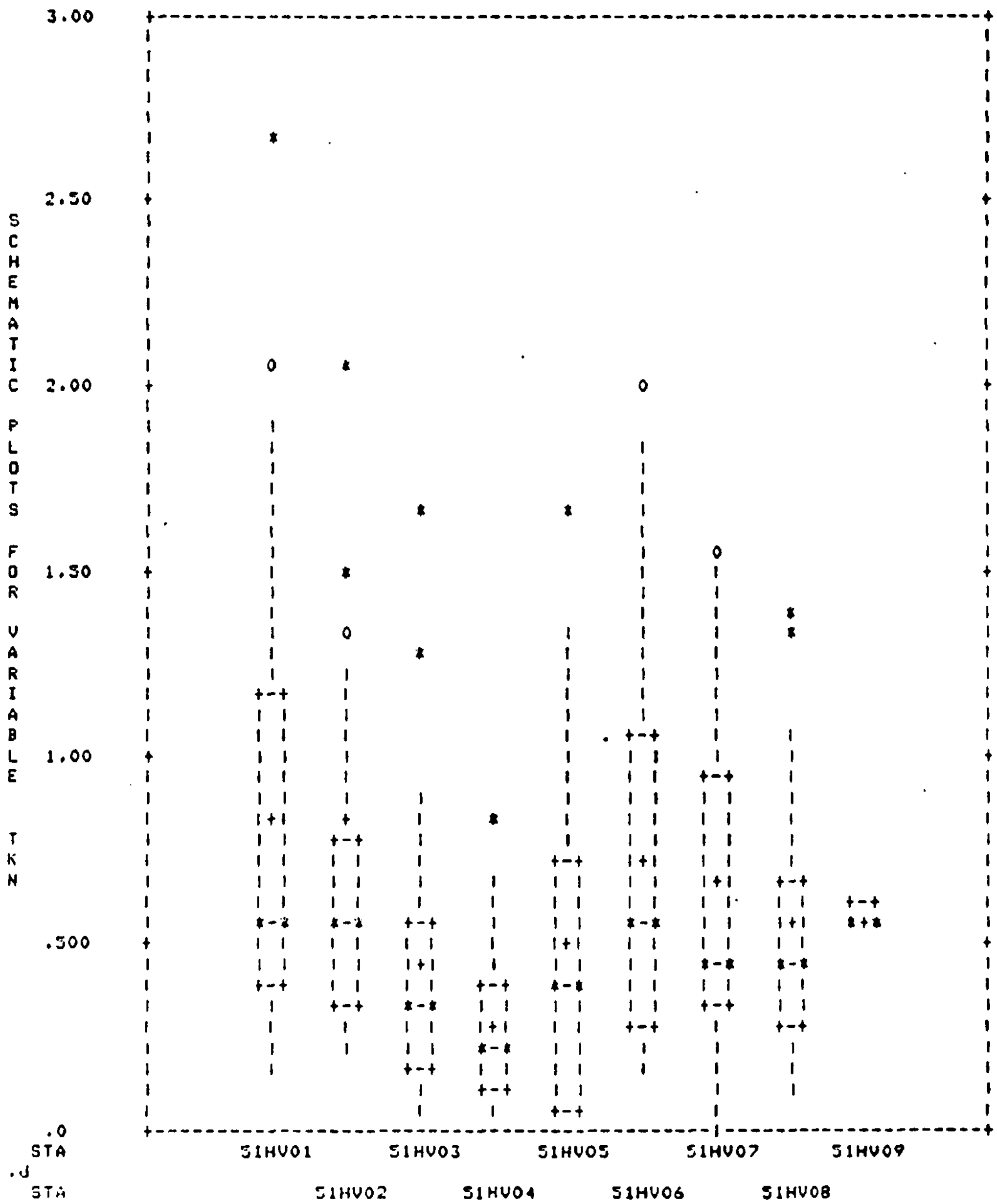


Figure 9-4. Distribution of Total Kjeldahl Nitrogen in Ambient Air Mass as μg/m^3.

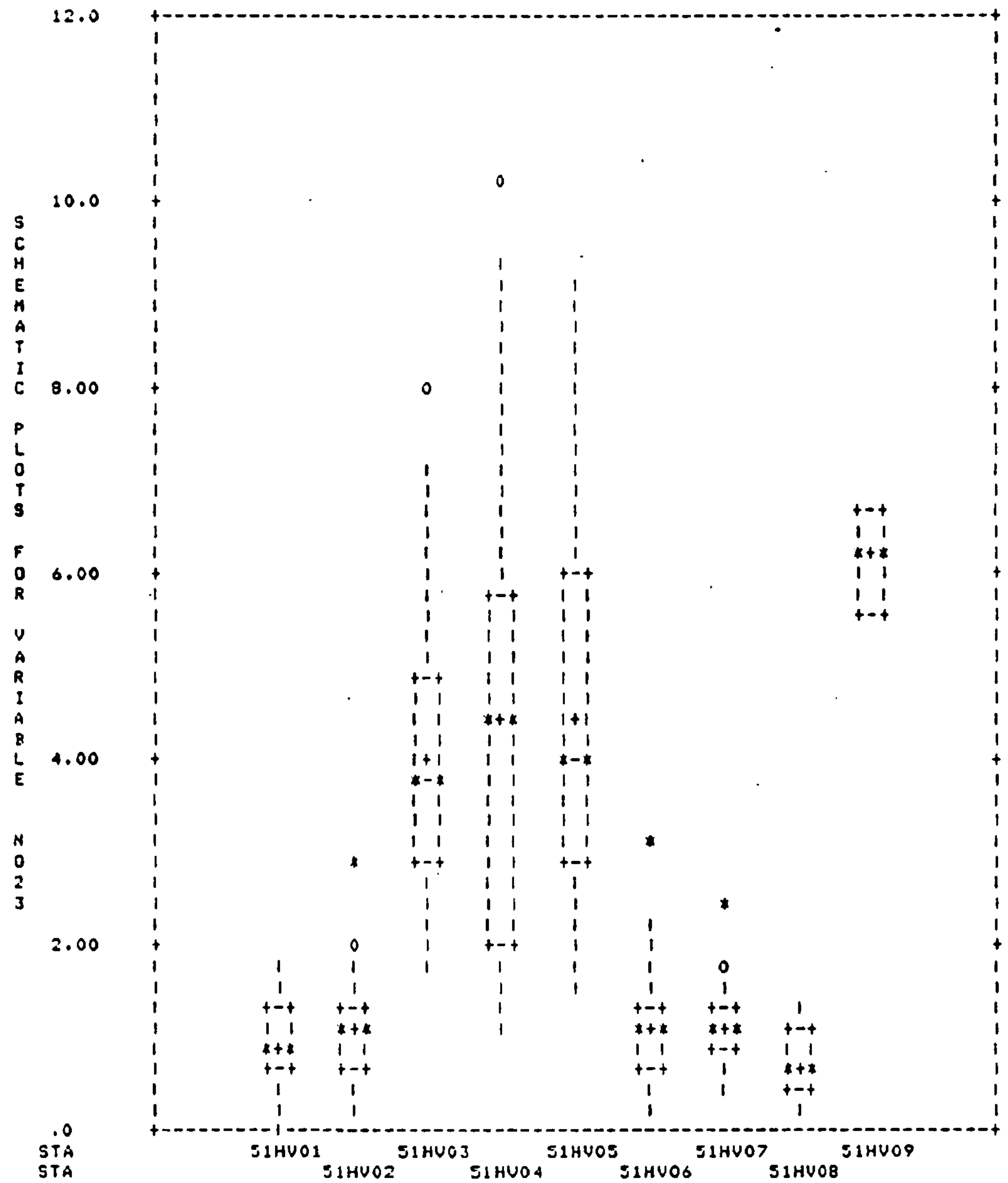


Figure 9-5. Distribution of Oxodized Nitrogen in Ambient Air Mas as μg/m^3.

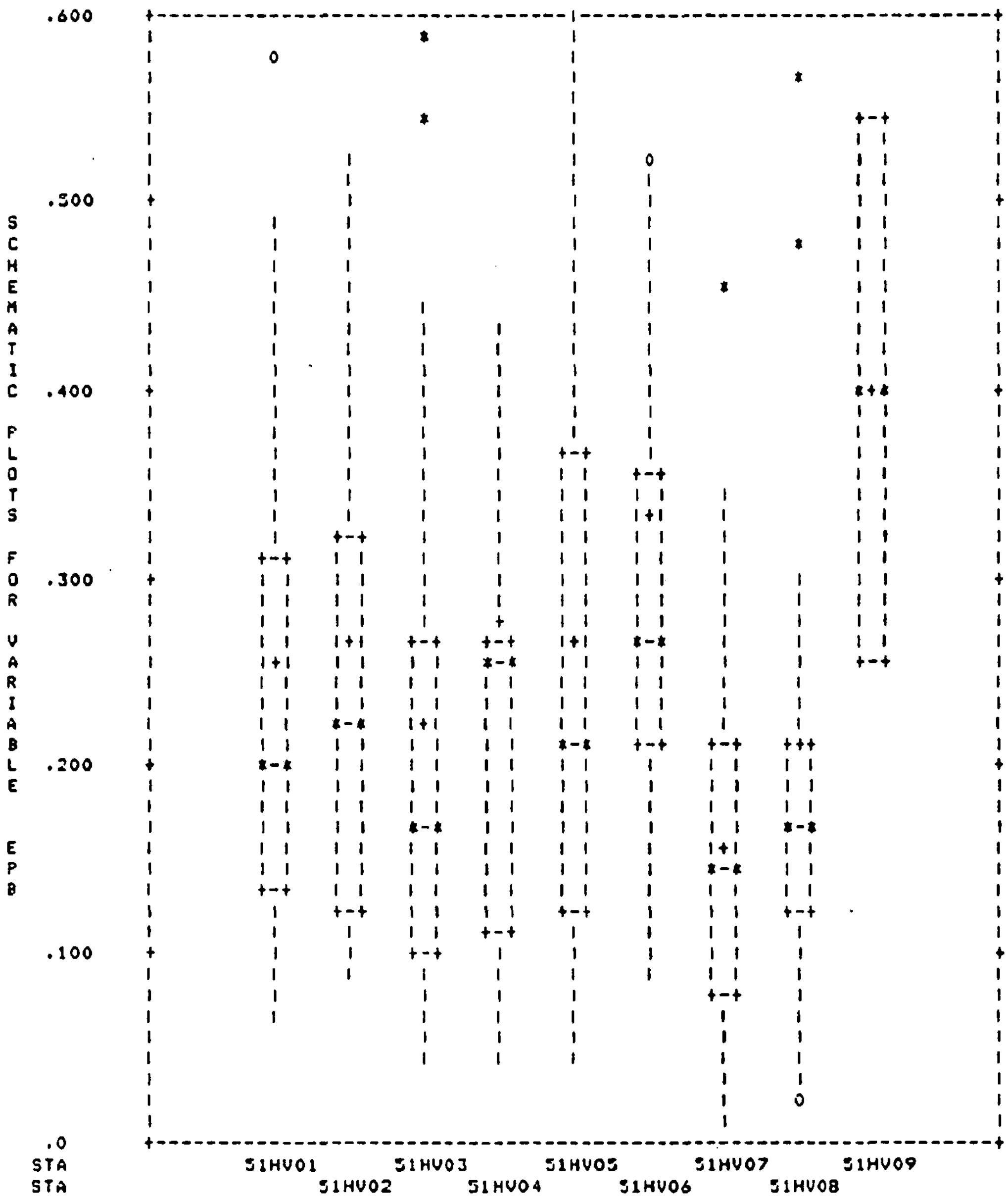


Figure 9-6. Distribution of Extractable Lead in Ambient Air Mass as $\mu g/m^3$.

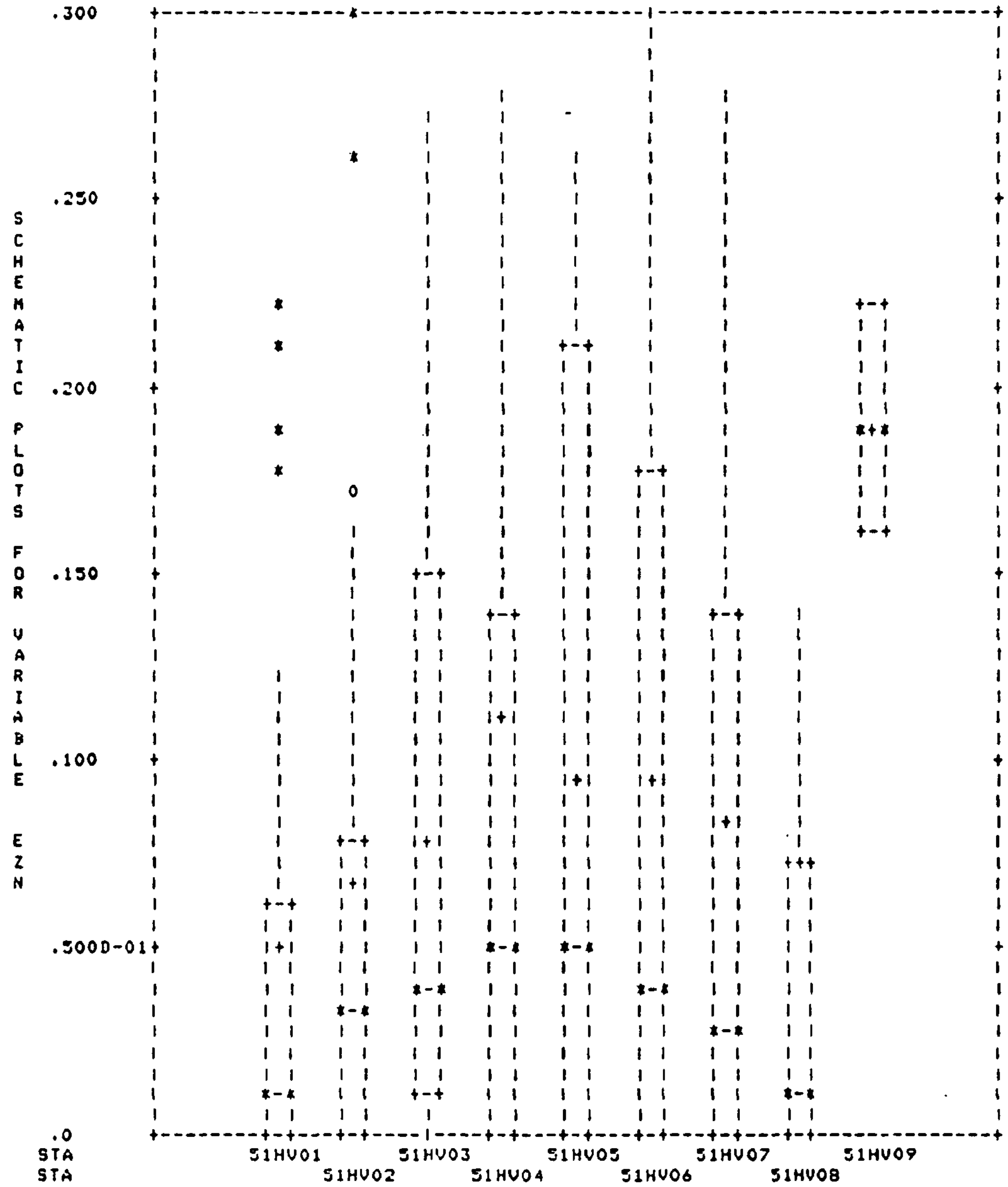


Figure 9-7. Distribution of Extractable Zinc in Ambient Air Mass as μg/m³.

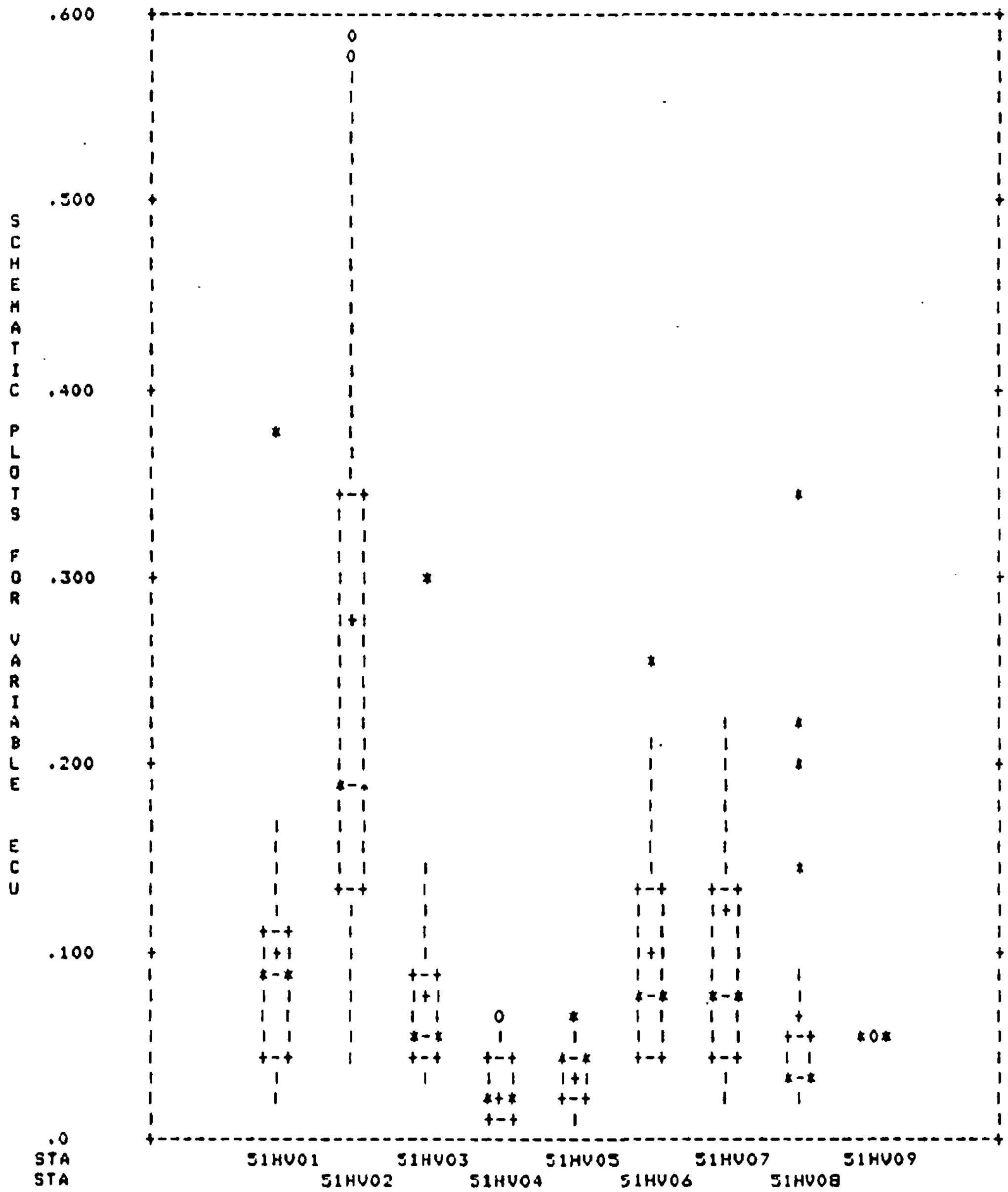


Figure 9-8. Distribution of Extractable Copper in Ambient Air Mass as µg/m³.

The zinc data, shown in Figure 9-7, show an interesting jurisdictional trend. The highest concentrations were observed at the Maryland stations, while the DC and Virginia stations were generally lower.

Copper concentration distributions in the air mass particulates are shown in Figure 9-8. The highest median concentration (1.9 $\mu g/m^3$) was observed at the Hadley Hospital site (HV02). Median concentrations at other sites in the network ranged from 0.22 to 0.89 $\mu g/m^3$.

Dryfall

Dryfall data were collected at the four locations cited in Table 9-1. Two of the sites, DF02 and DF03 were located in the same catchment, but at different elevations above the ground surface. This was done because of concerns that the data collected at the ground surface would be biased by multiple sampling of dryfall resuspended by vehicular movement and/or wind action. It was reasoned that a collector placed at roof level would be less influenced by such resuspension than one at the ground surface. The problem with this approach is that it runs the risk of discounting all dryfall originating at or near the ground surface. The evaluation of data from the paired collectors must, therefore, be somewhat subjective, but still should provide valuable insights into the accumulation of dryfall pollutants.

Accumulation rates were computed as follows:

$$R_a = \frac{M}{A\Delta t}$$

where,

R_a = accumulation rate, M/L^2-t
M = mass in collector, M
A = collector area, L^2
Δt = exposure time, t

Because of the inability to measure the period of time the dryfall collector was closed (e.g. during rain events) the accumulation rates have been calculated assuming exposure during the entire time period. This is not thought to introduce a great deal of bias into the results because of the relative lengths of the dry and wet periods in a given time interval. More simply, it may be seen that most of a given period of time consists of dry conditions with relatively short periods of intervening wetfall.

Figure 9-9 through 9-17 show the distributions of pollutant accumulation rates for the course of the field monitoring period in 1980 and 1981.

Solids. As shown in Figure 9-9, dryfall solids accumulations were highest at the Haines Point station in the District of Columbia (DF01), with a median value of approximately 78 $mg/m^2/day$. At the Burke Village Center stations (DF02, DF03) it may be seen that the ground level collector produced a median solids accumulation rate some 42 percent higher than the roof top collector. The accumulation rates at the Stedwick site (DF04) were very similar to the rooftop values at Burke Village Center.

Chemical Oxygen Demand. The COD data showed distribution trends very similar to those for total solids. Figure 9-10 shows box plots of the accumulation rates at the four stations.

Nitrogen. Distributions of ammonia, TKN, and oxidized nitrogen accumulation rates are shown in Figures 9-11, 9-12, and 9-13, respectively. Examination of the figures shows little difference between sites for ammonia accumulation. For TKN, the highest accumulation rates were observed at the Haines Point Station (DF01), and were probably associated with the elevated solids accumulations at that site. The lowest rates were at the Stedwick Site (DF04). The rooftop site at Burke Village Center (DF02) exhibited slightly lower accumulations than the

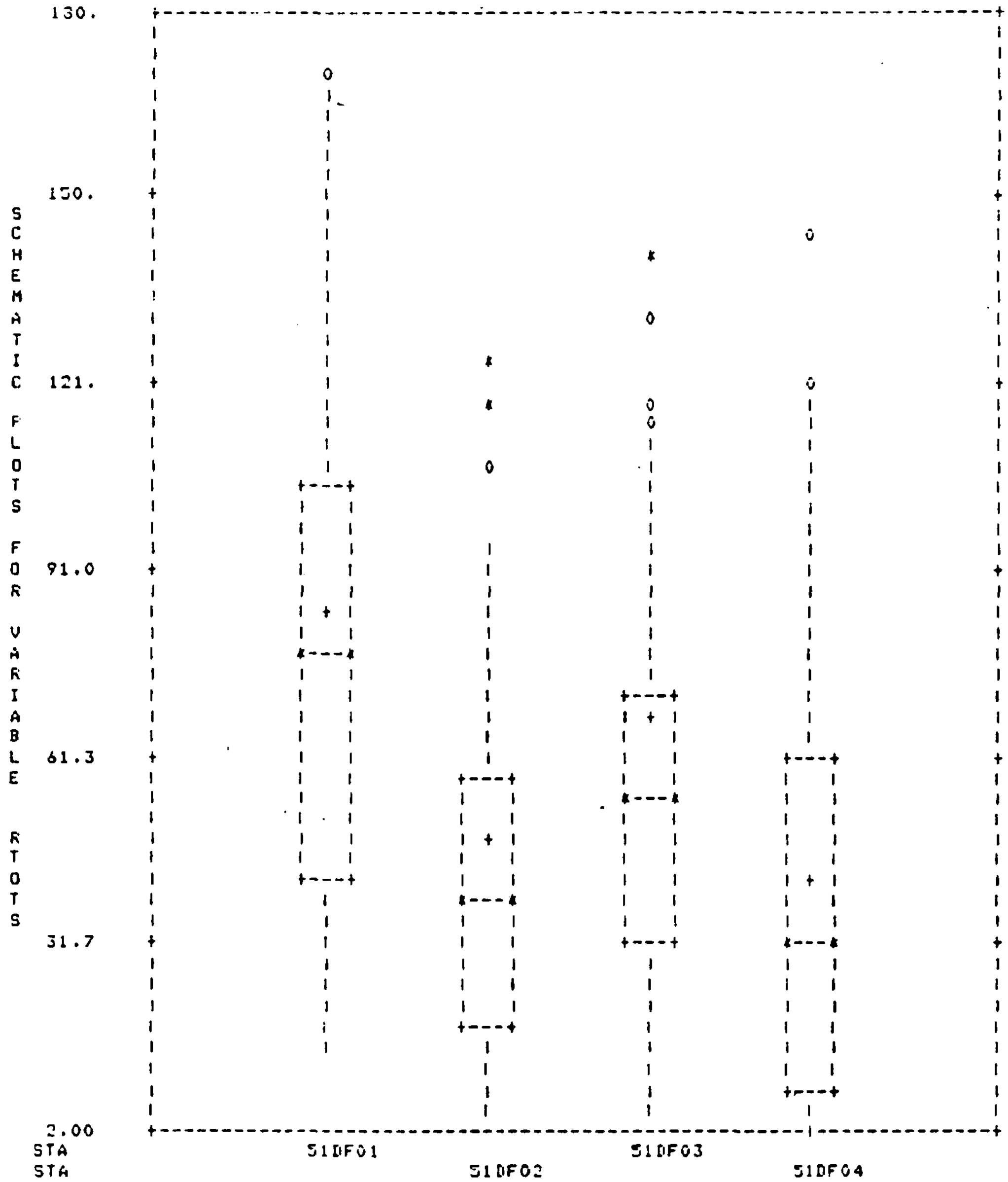


Figure 9-9. Dryfall Total Solids Distributions in mg/m2-day.

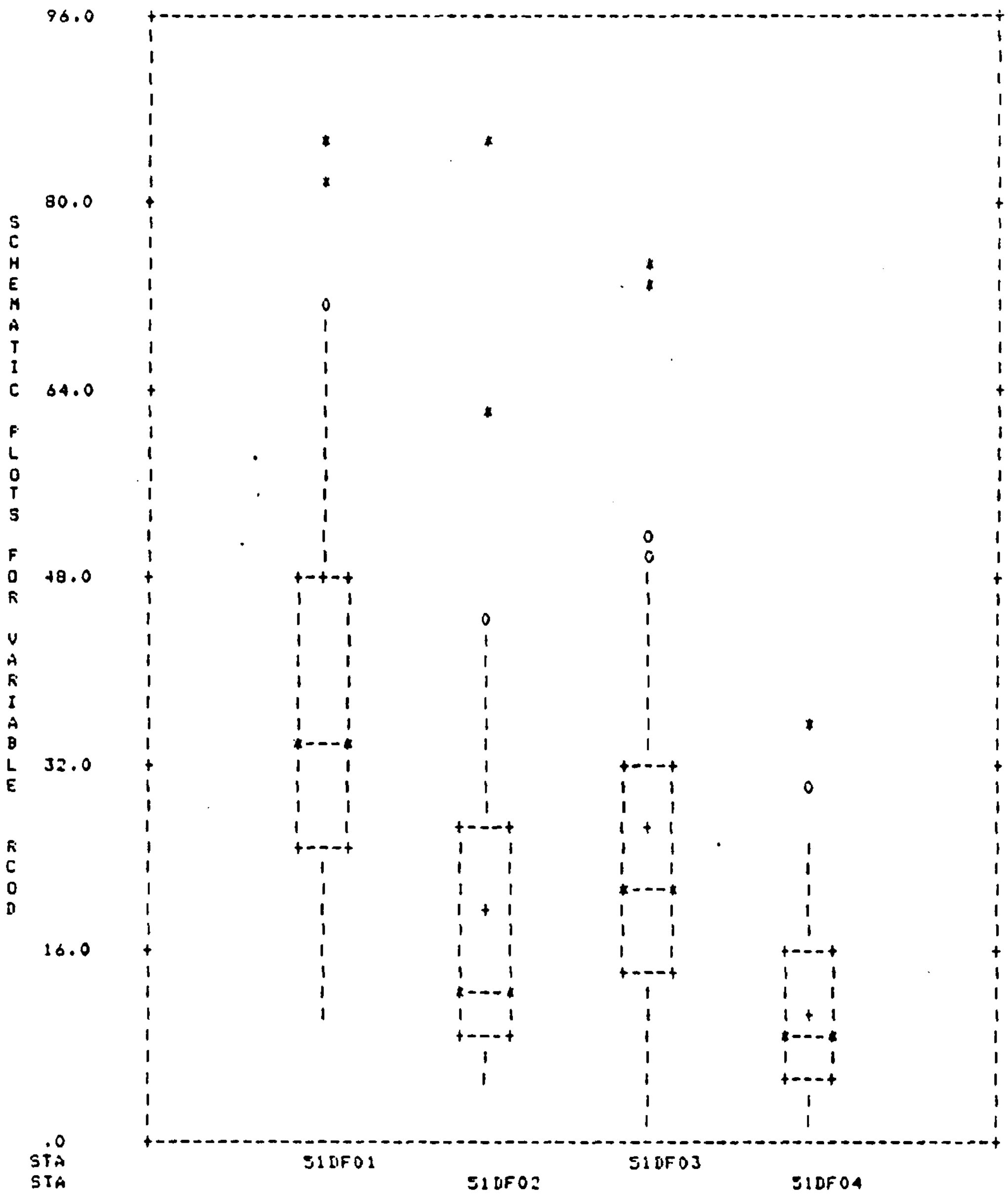


Figure 9-10. Dryfall Chemical Oxygen Demand Distributions in mg/m^2-day.

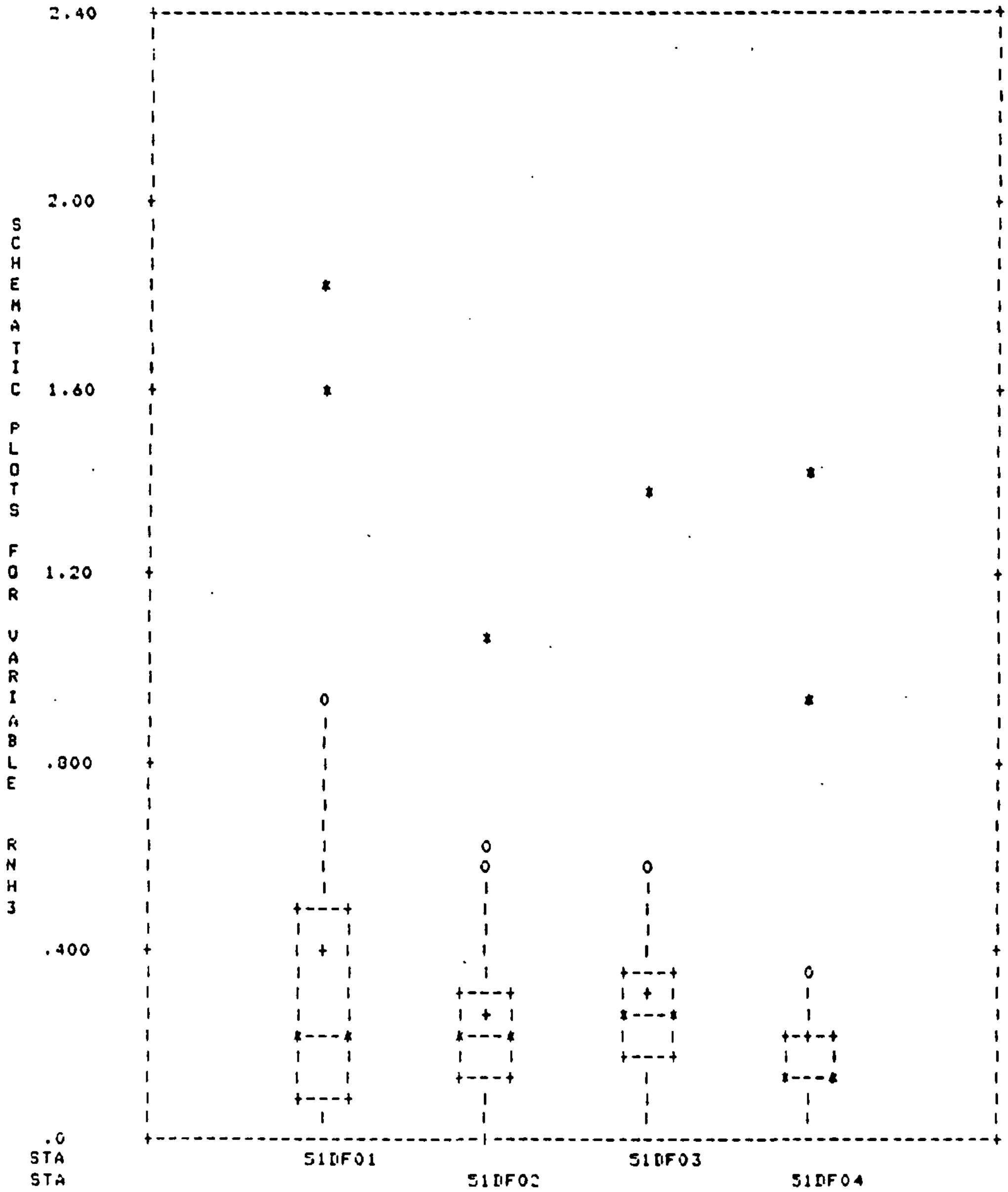


Figure 9-11. Dryfall Ammonia Nitrogen Distributions in mg/m^2-day.

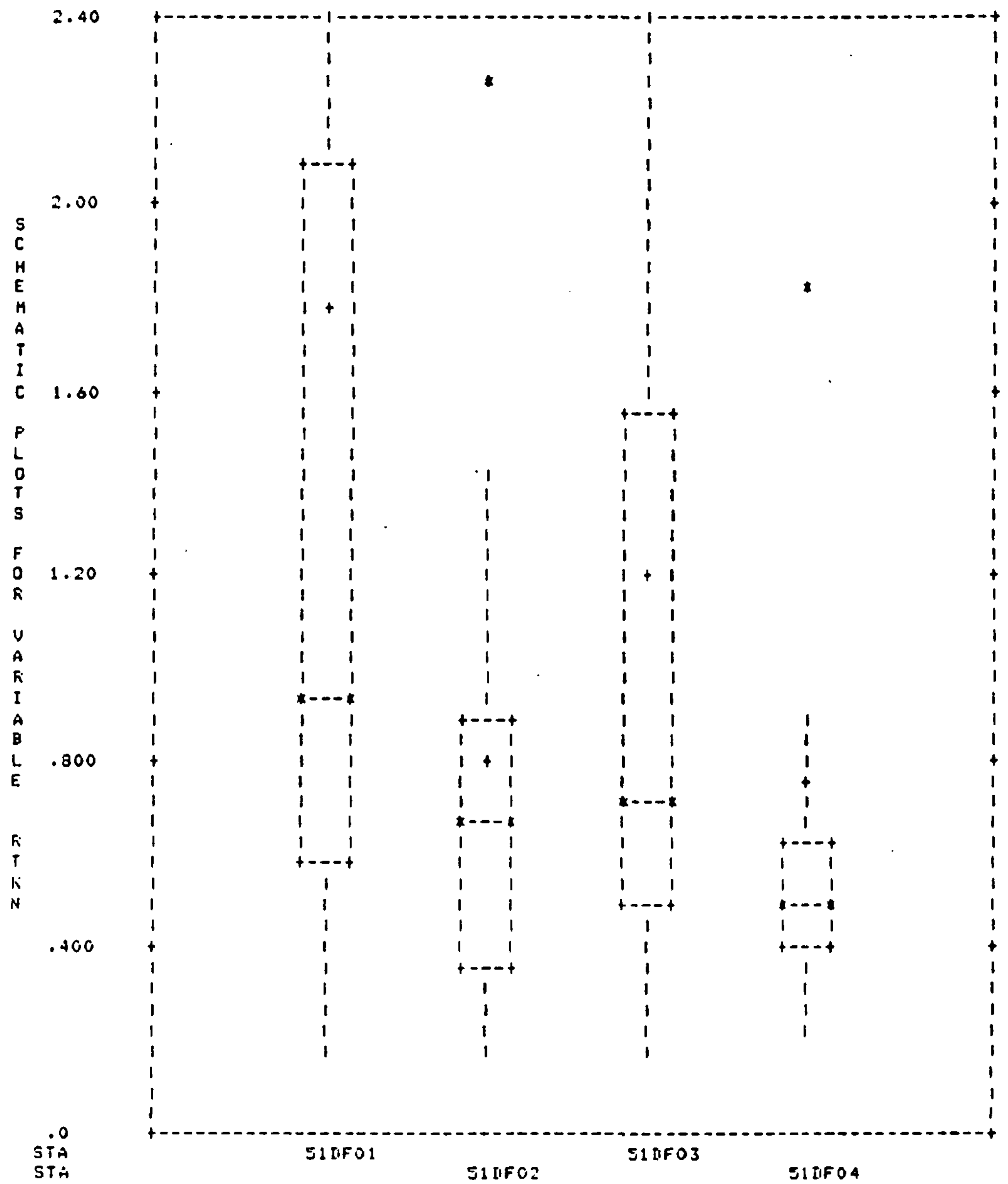


Figure 9-12. Dryfall Total Kjeldahl Nitrogen Distributions in mg/m^2-day.

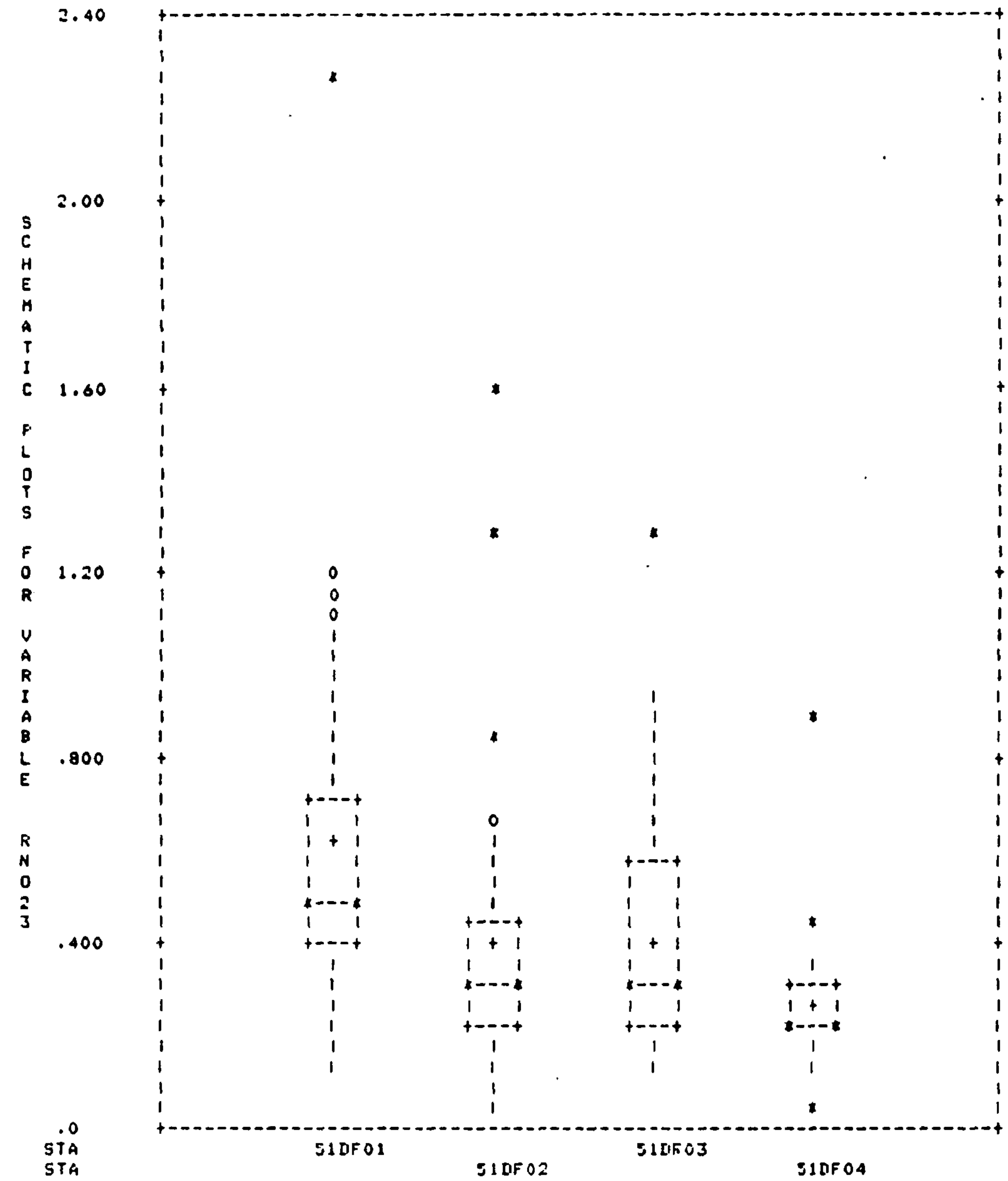


Figure 9-13. Dryfall Oxidized Nitrogen Distributions in mg/m^2-day.

ground level site (DF03). This pattern is very similar to that exhibited by the solids data in Figure 9-9. Oxidized forms of nitrogen exhibited a different pattern, as shown in Figure 9-13. The Haines Point Site (DF01) showed the highest rates, but there was very little difference between the roof and ground level collectors at Burke Village Center. This is probably because the nitrate and nitrite anions do not associate with dustfall solids to the degree of ammonia and TKN.

Phosphorus. Distributions of ortho and total phosphorus accumulation rates are shown in Figures 9-14 and 9-15, respectively. For ortho phosphiate phosphorus, little difference was observed between the median values at all four stations, but a much wider range was observed in the data at Haines Point (DF01). The total phosphorus data, by contrast, exhibit the same pattern as the dustfall solids. The non-ortho forms of phosphorus associate closely with the solids in the dustfall, and, therefore, this pattern is to be expected.

Metals. The lead and zinc accumulation data are shown in Figures 9-16 and 9-17. As may be seen in Figure 9-16, no boxes were produced for the accumulation of lead. This is because of the preponderance of values at or below the detection limit. As a result, only the mean values were available for comparisons between sites. The highest mean accumulation rate was observed at the Haines Point Site (DF01). Little difference was observed between the three remaining sites. Figure 9-17 shows the distribution of accumulation rates for zinc at the dryfall sampling stations. A change of the trends observed for most other parameters occurred in that the highest median zinc accumulation rate was observed at the Burke Village Center ground level collector (DF03). The median rate at that site was over 1.8 times higher than that at the associated roof top sampler. This is probably due to the fact that the dryfall zinc originates from automo-

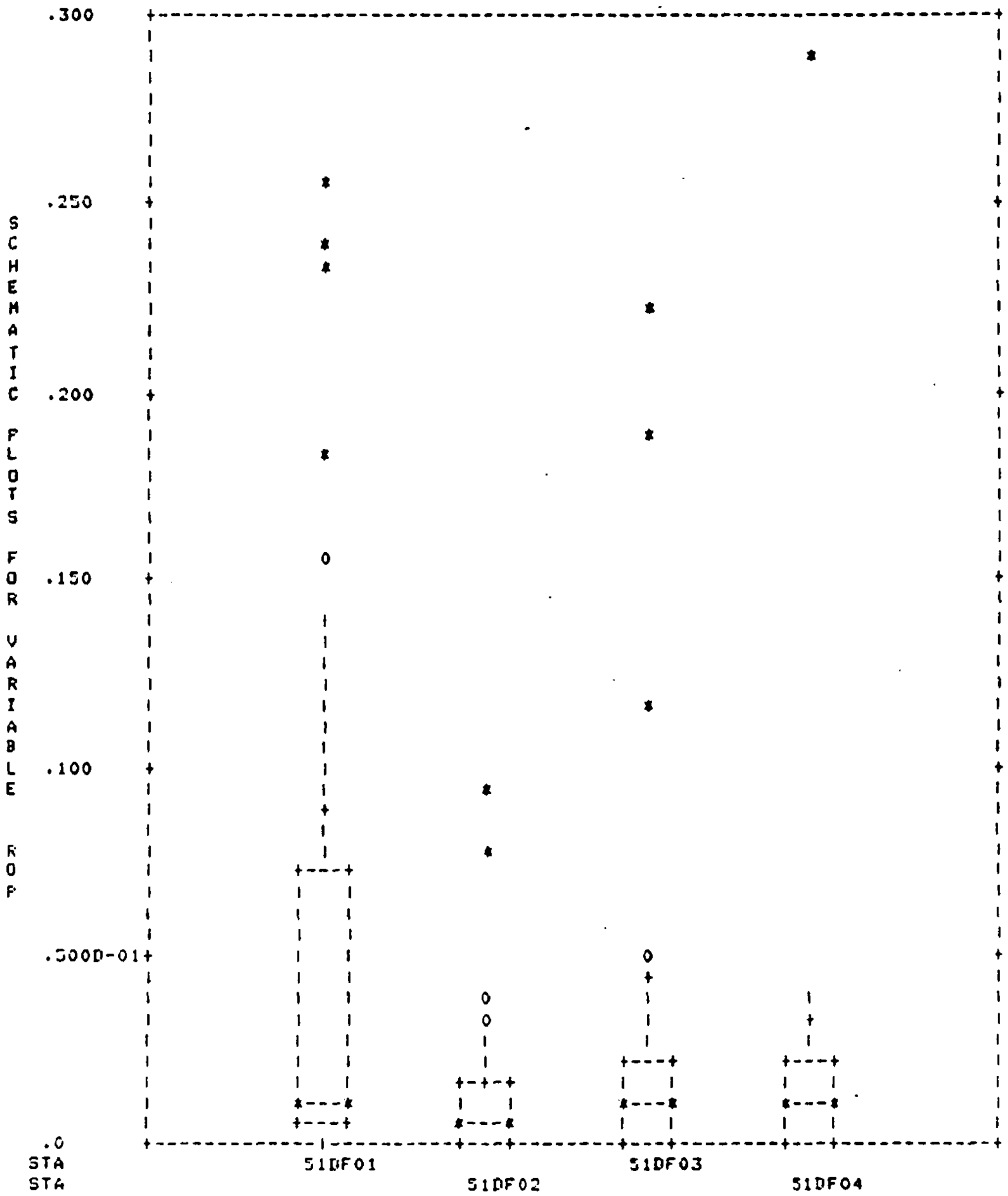


Figure 9-14. Dryfall Ortho-Phosphorus Distributions in mg/m^2-day.

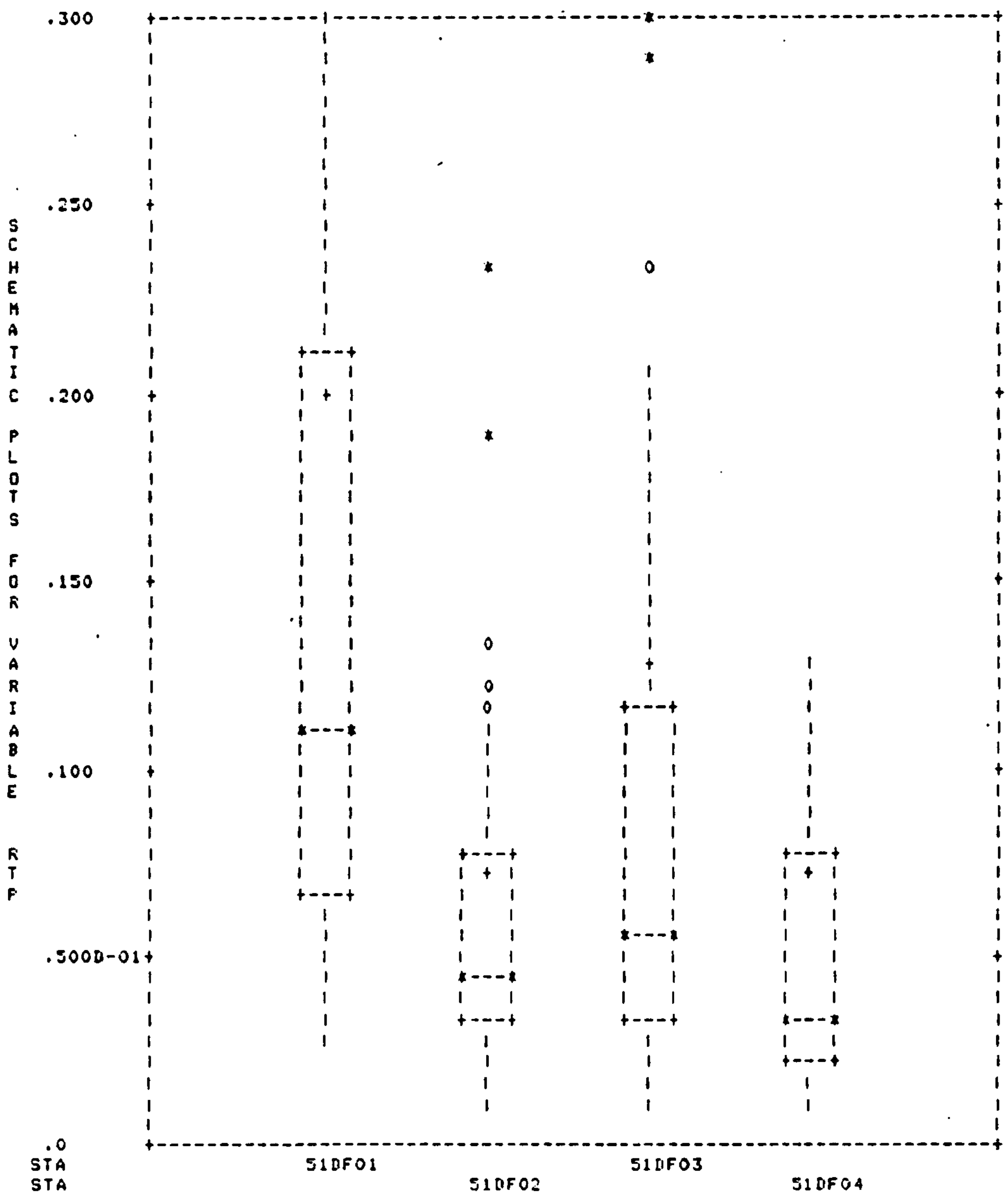


Figure 9-15. Dryfall Total Phosphorus Distributions in mg/m^2-day.

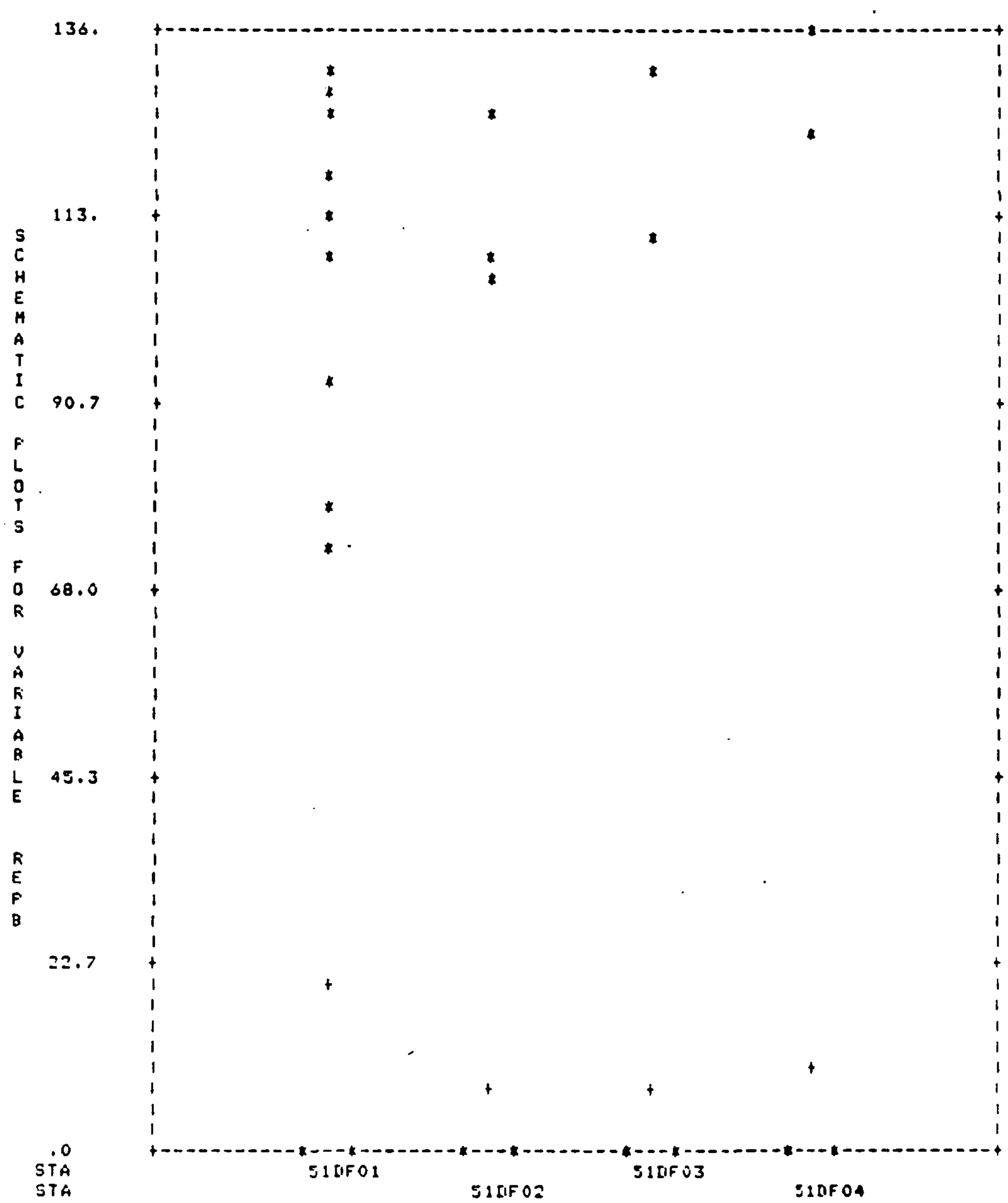


Figure 9-16. Dryfall Extractable Lead Distributions in $\mu g/m^2$-day.

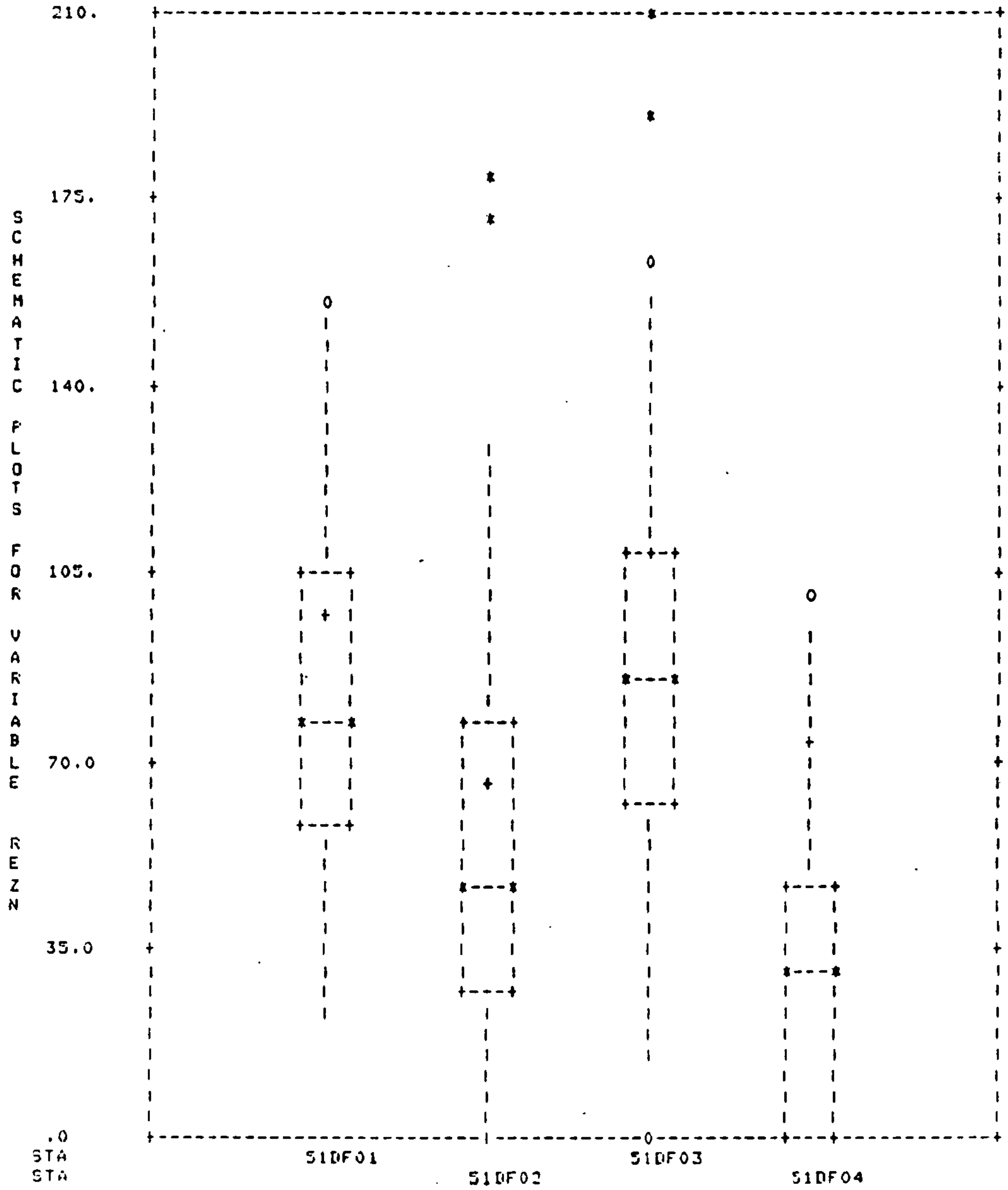


Figure 9-17. Dryfall Extractable Zinc in µg/m²-day.

bile and truck tire wear, and, therefore, is principally present in the near-surface collector. That the Haines Point (DF01) and Stedwick (DF04) sites displayed lower accumulation rates can be explained by their relative isolation from paired areas as compared to the Burke Village Center ground level site (DF03). As noted before, the zinc accumulations are generally the result of tire abrasion, and probably do not migrate far (vertically or horizontally) from the point of detachment.

Wetfall

Wetfall data were collected at the same four stations discussed previously in the dryfall section and described in Table 9-1. The roof and ground-level stations at Burke Village Center were operated as for dryfall, but because of the lack of near-ground sources of wetfall, it was not anticipated that vertical variations in quality would be observed.

COD. The distribution of COD concentrations in wetfall at the four monitoring sites is shown in Figure 9-18. As postulated above, there was little observed difference in the distribution of data between stations WF02 and WF03, confirming the homogeneity of the precipitation falling at each site, with respect to oxidizable organics. With the exception of the Haines Point site (WF01), all the median wetfall COD data fell at or below 10 mg/L. the median value at the Haines Point site was about 15 mg/L. The extremes in the distributions were considerably above these values, but, in general, it can be concluded that oxygen-demanding substances are not a problem in wetfall.

Nitrogen. Substantial concentrations of nitrogen were observed in wetfall at all four monitoring stations, as shown in Figures 9-19 through 9-22. Median ammonia concentrations were in the vicinity of 0.25 mg/L as N. In general, ammonia represented about 50 percent of the TKN concentration. The total

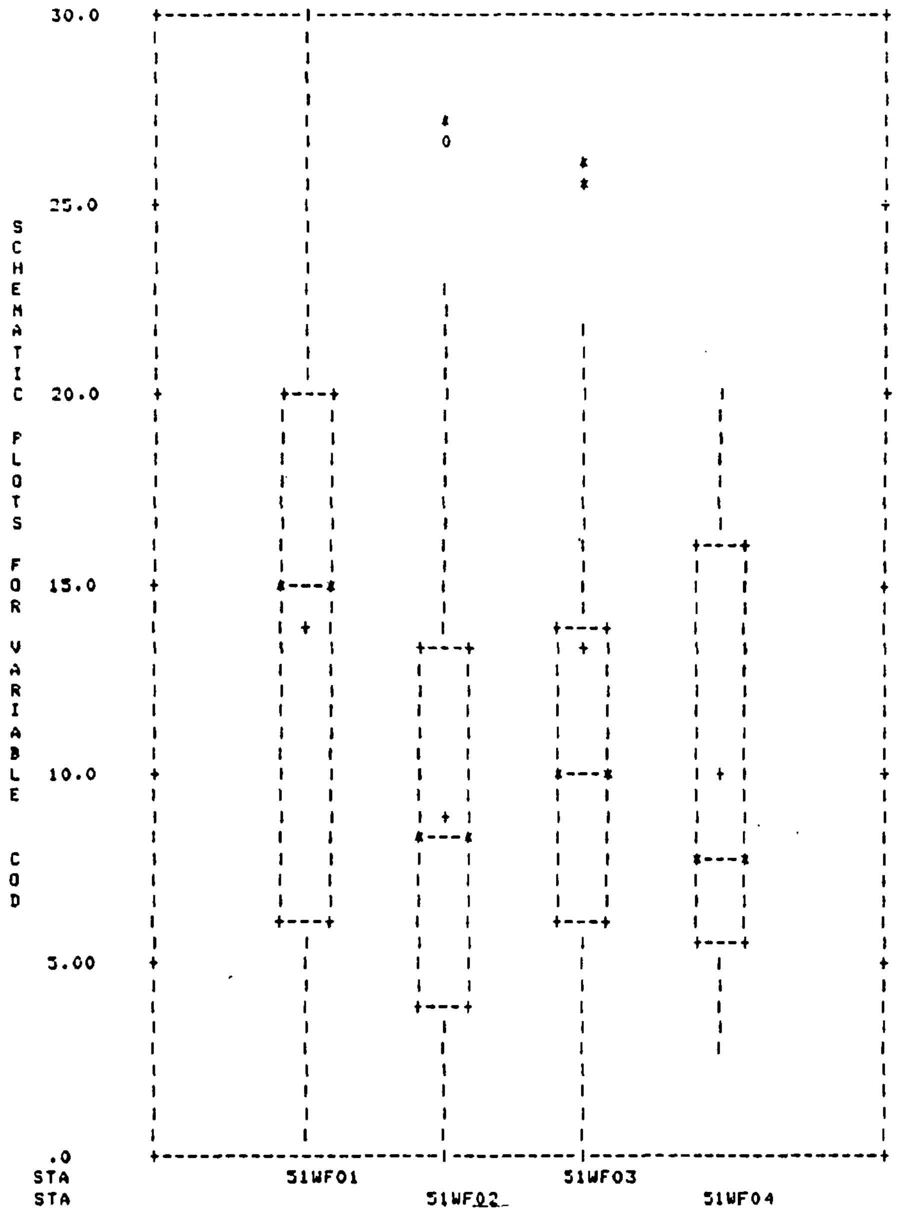


Figure 9-18. Wetfall COD Distributions as mg/L.

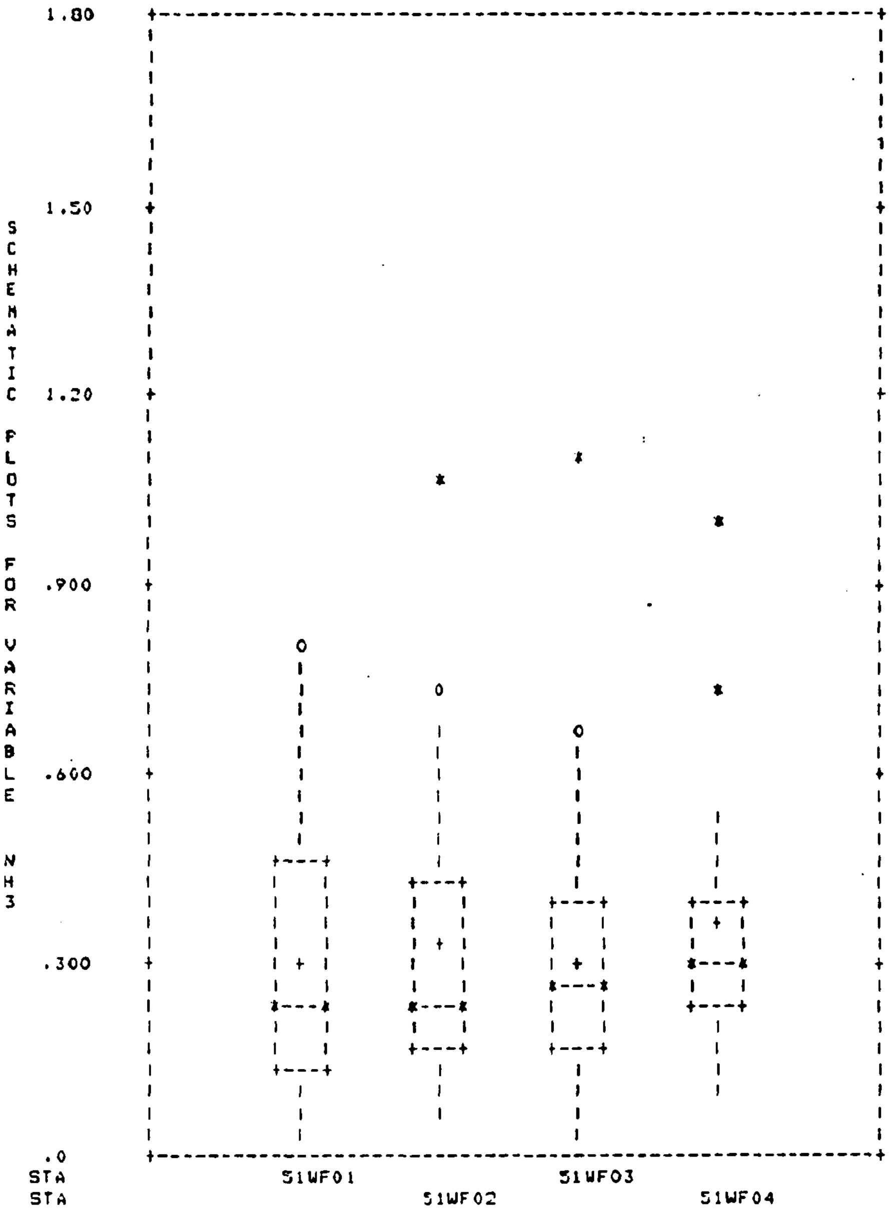


Figure 9-19. Wetfall Ammonia Nitrogen Distributions as mg/L.

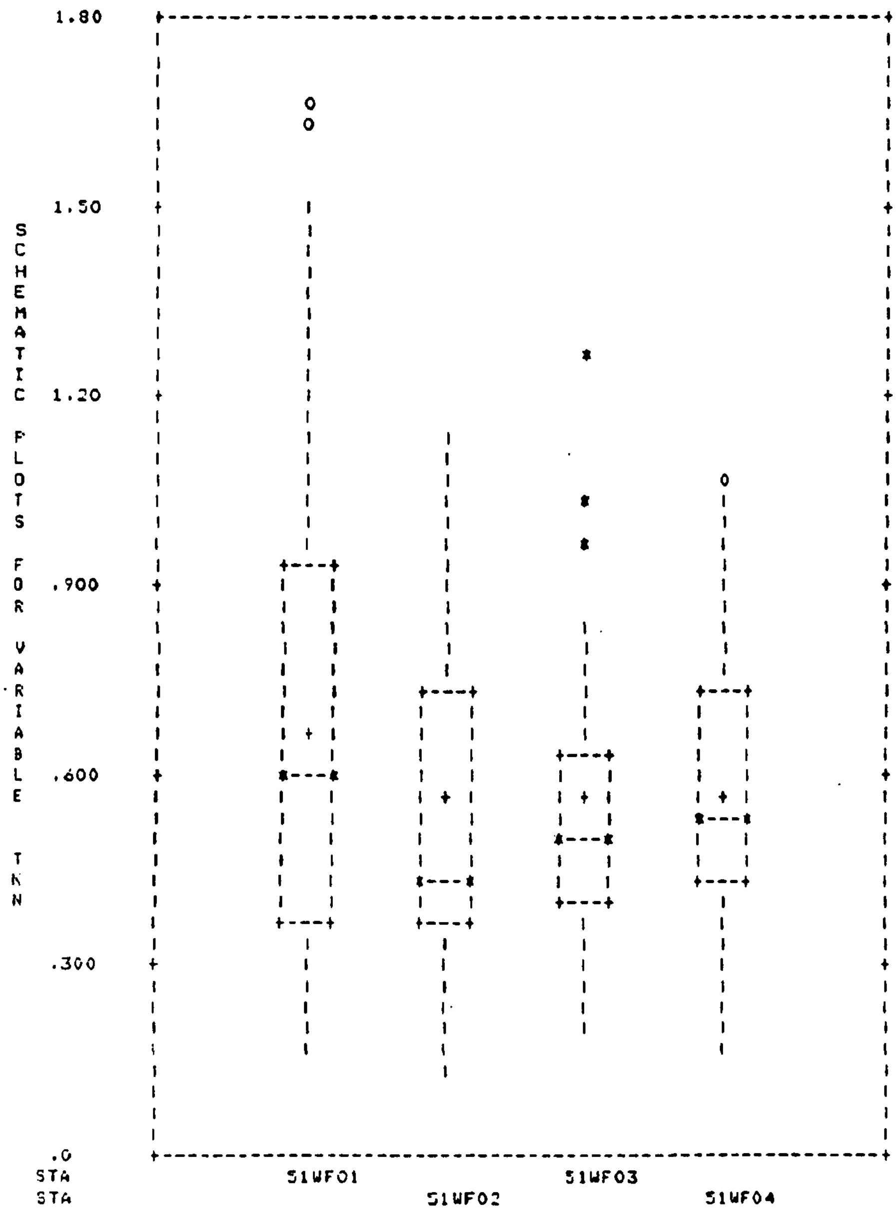


Figure 9-20. Wetfall TKN distributions as mg/L.

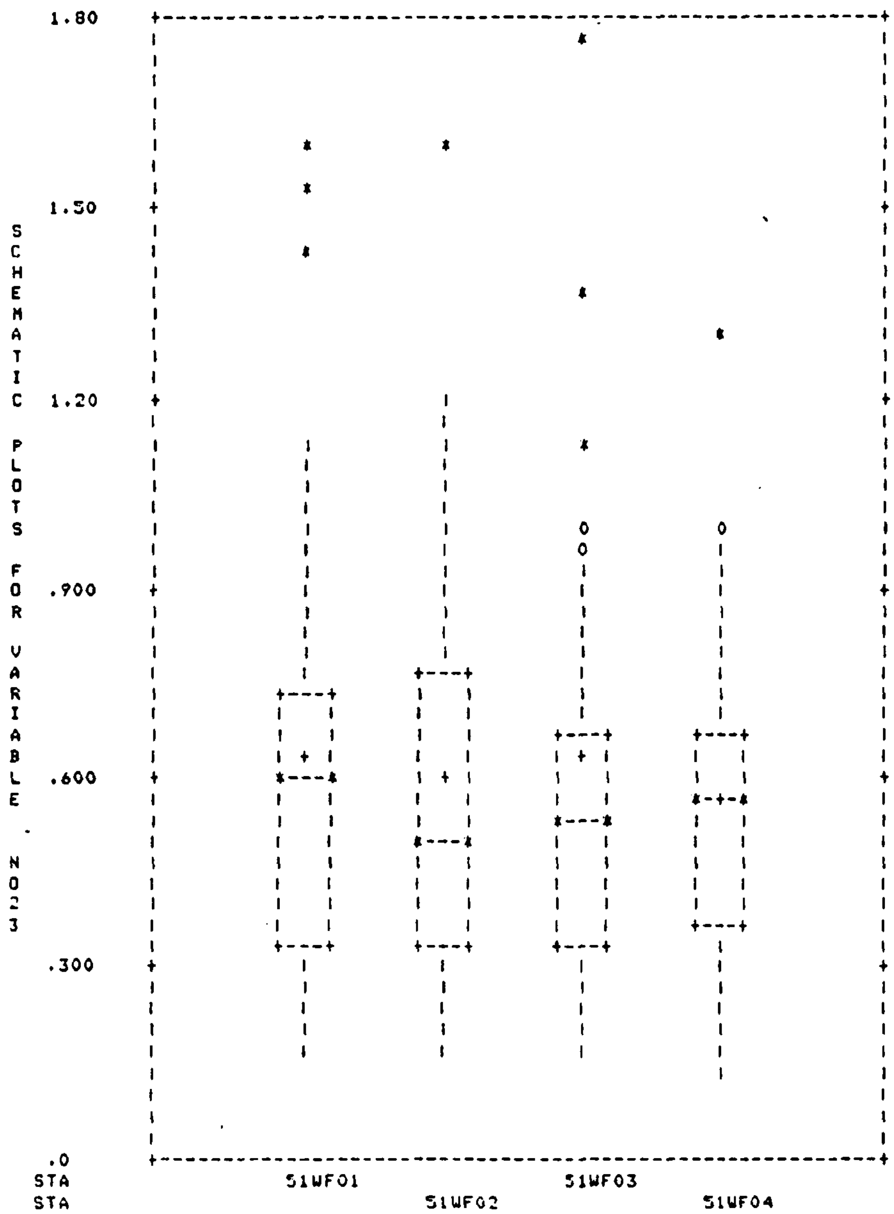


Figure 9-21. Wetfall Oxidized Nitrogen. Distributions as mg/L.

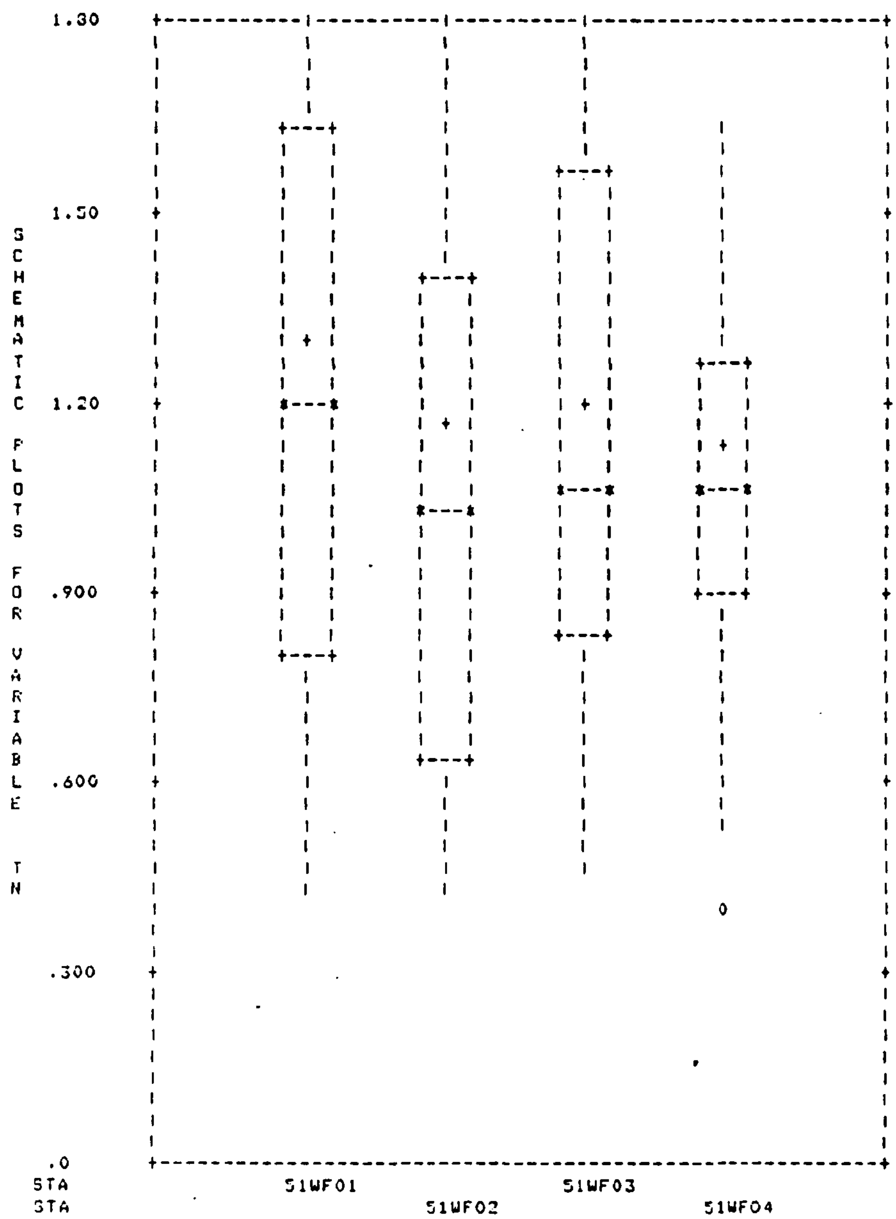


Figure 9-22. Wetfall Total N Distributions as mg/L.

nitrogen concentration was divided almost equally between TKN and oxidized forms. Approximately three quarters of the wetfall nitrogen concentration could then be taken to be inorganic. This has some interesting implications with respect to nitrogen availability in runoff waters from the affected catchments. It is, in fact, probable that substantial portions of the runoff nitrogen budget for the watersheds investigated originated in wetfall. Although nitrogen management does not appear to be generally required for receiving water protection in the metropolitan Washington area, in areas where it is important, such wetfall inputs would be significant. Of most interest would be the high concentrations of oxidized nitrogen forms, which could be expected to remain in the soluble phase in resulting runoff waters, and also to be generally the most algal-available.

Phosphorus. The distributions of wetfall concentrations of ortho-P and total P are shown in Figures 9-23 and 9-24, respectively. The plots show very low median concentrations of ortho-phosphate phosphorus, with only the Stedwick Station (WF04) median rising above zero (0.045 mg/L) at the resolution of the plots. The total phosphorus concentration medians were in the range of 0.015 to 0.03 mg/L as P. From the standpoint of serving as a significant source of algal-available phosphorus leaving the catchments as runoff, it would appear that precipitation plays a minor role. As far as inter-station trends are concerned, the highest concentrations were observed at the Haines Point Site (WF01) and the lowest at the Stedwick Site (WF04). The intermediate concentrations were observed at the Burke Village Center sites (WF02, WF03), where essentially no difference was detected between the rooftop and ground level population medians.

Metals. Figures 9-25 through 9-27 show wetfall concentration distributions for

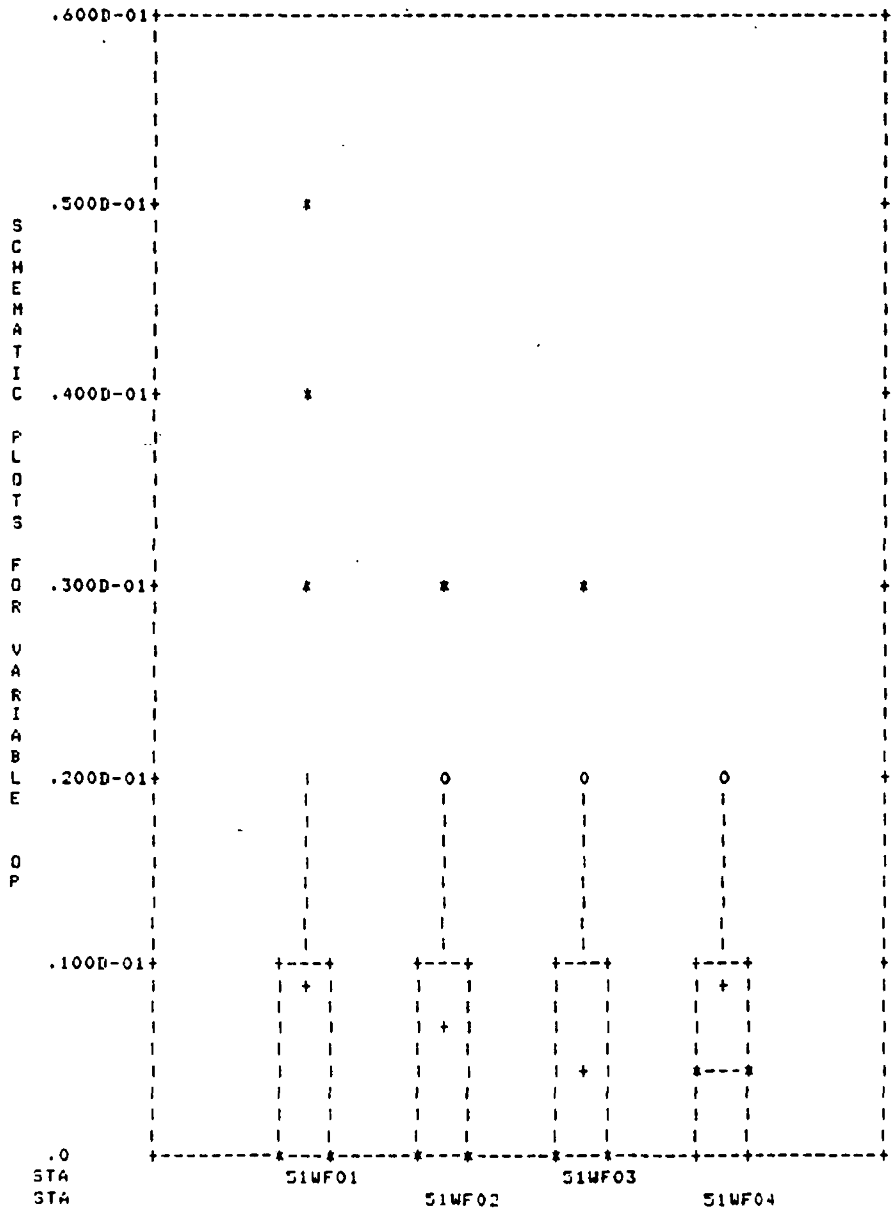


Figure 9-23. Wetfall Ortho-Phosphate.
Phosphorus Distributions as mg/L.

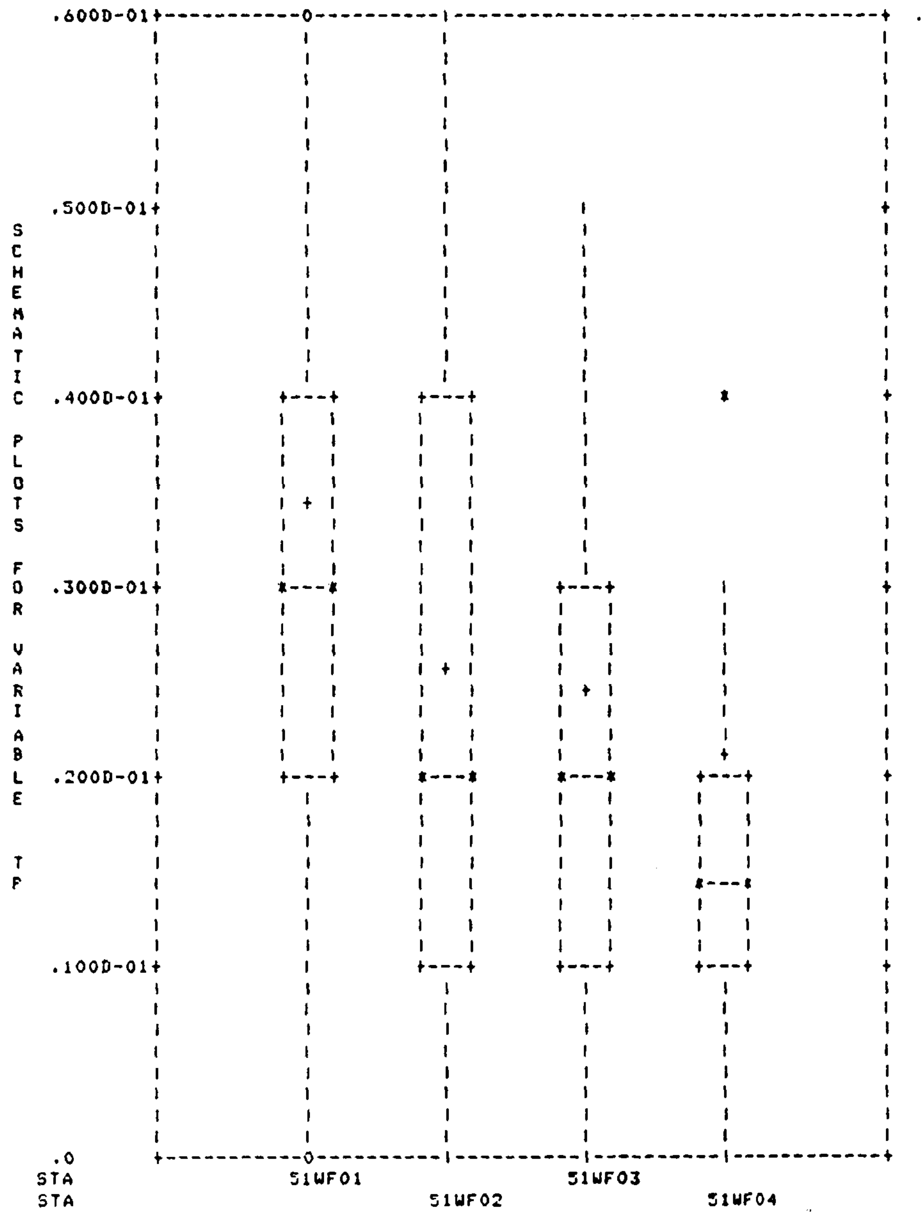


Figure 9-24. Wetfall Distributions of Total Phosphorus as mg/L.

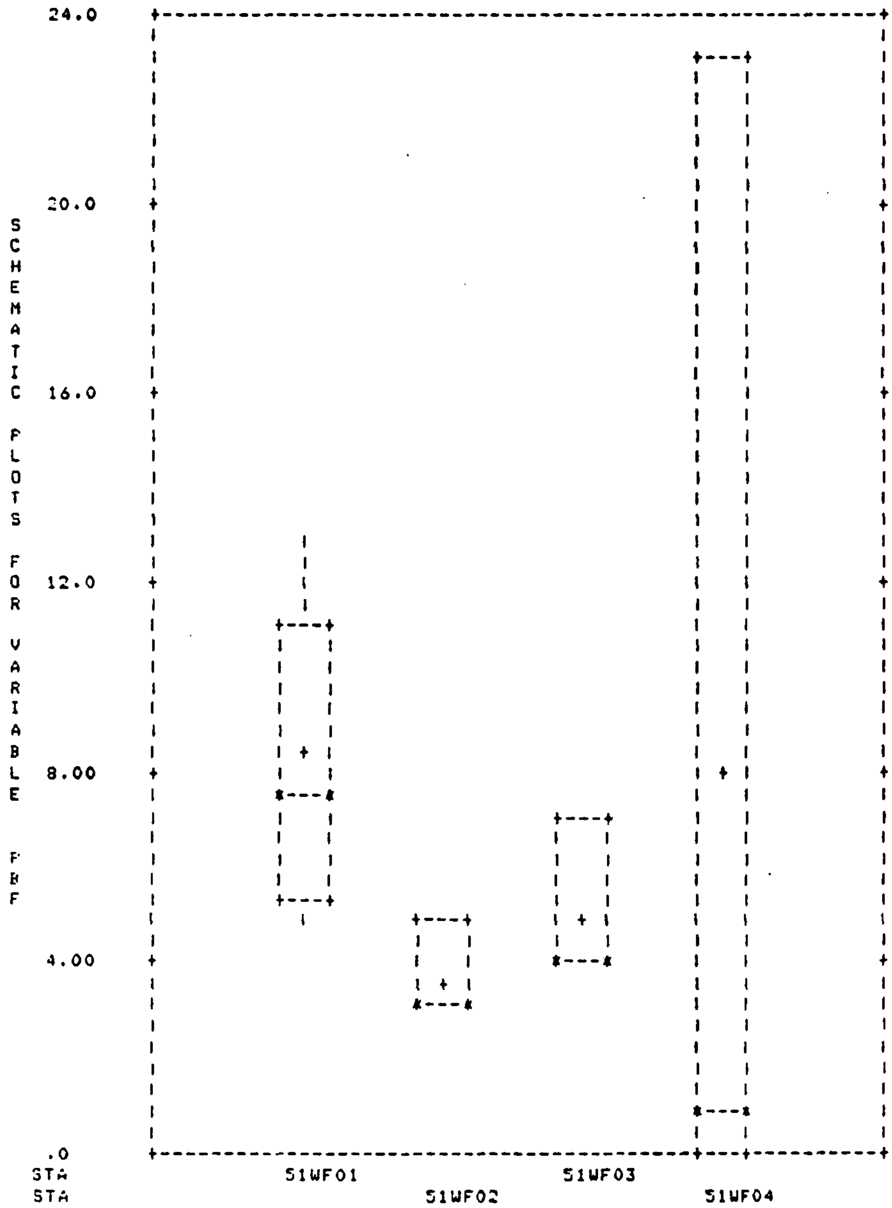


Figure 9-26. Wetfall Distributions of Lead (µg/L) Using Graphite Furnace AA Spectroscopy.

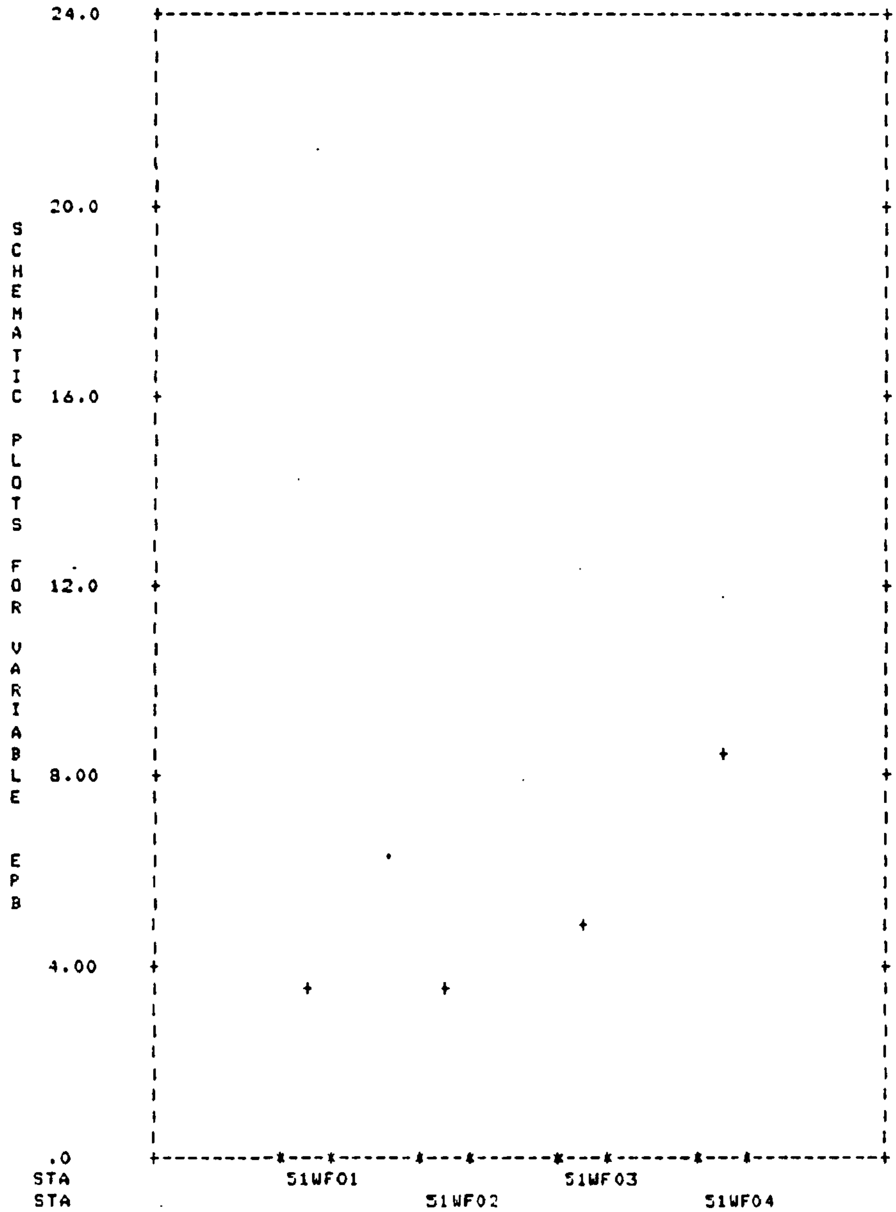


Figure 9-25. Wetfall Distributions of Lead (as µg/L) by Direct Aspiration AA Spectroscopy.

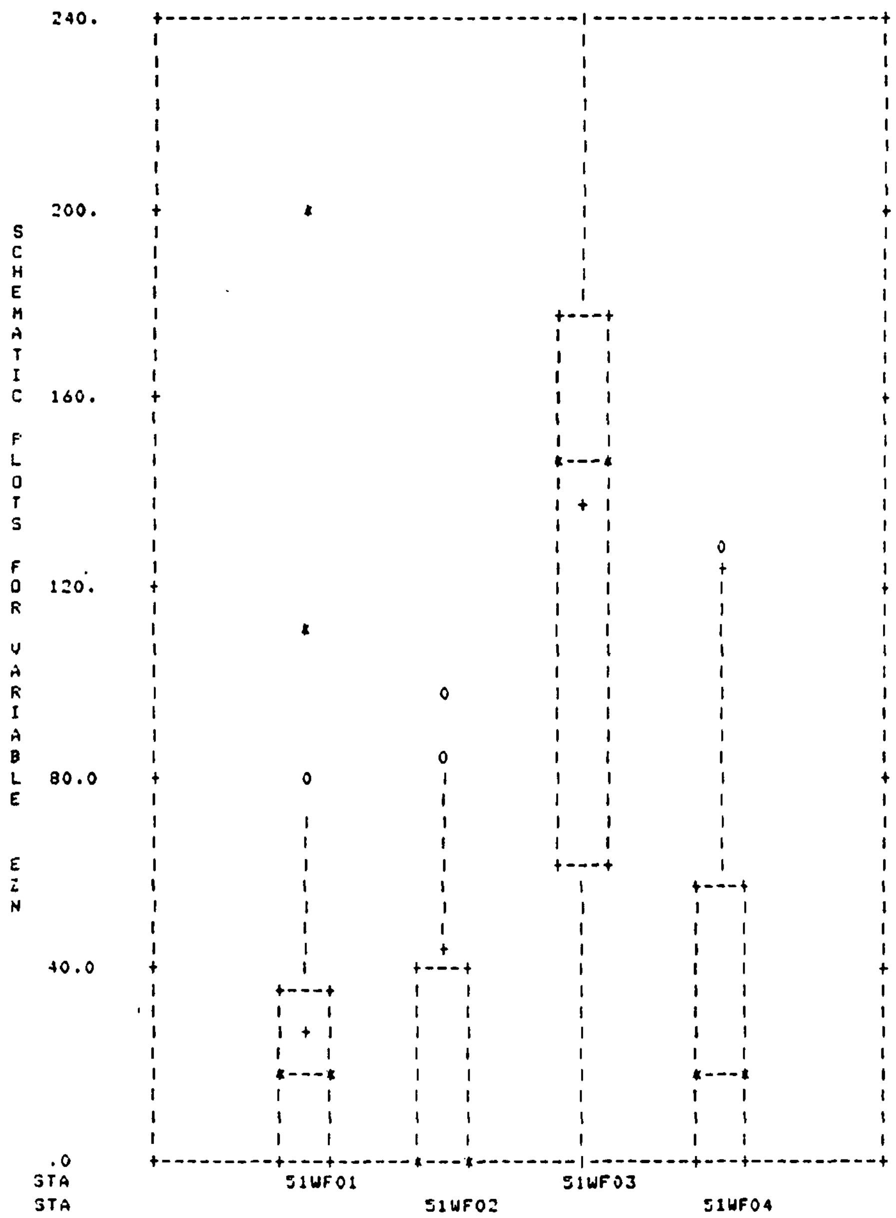


Figure 9-27. Wetfall Distributions (as µg/L) of Zinc.

lead (direct aspiration AA), lead (graphite furnace AA), and zinc, respectively.

As may be seen from the examination of Figure 9-25, the many lead values at or below the detection limit of the instrument precluded the construction of box plots, as the median values were all at zero at the detection limit of the instrument. Means, however, ranged from 4 to 8 μg/L. Using the much lower detection limit capabilities of the graphite furnace procedure, a limited number of wetfall samples were analyzed for lead. These data distributions may be seen in Figure 9-26. The highest median value recorded in this limited population was 7.6 μg/L at the Haines Point Site (WF01). The other sites displayed very low values, which were, in fact, sufficiently low to postulate that wetfall-borne lead does not constitute a significant fraction of the total finding its way into catchment drainage.

The distributions of zinc at each site are shown in Figure 9-27. As in the case of the lead data, the zinc concentrations in wetfall were observed to be quite low, with one dramatic exception. A large difference between the data distributions for the roof-mounted (WF02) and ground-level (WF-03) collectors at the Burke Village Center site may be observed. Site inspection lead to the hypothesis that this difference was probably due to the spatter of low-pH rain waters on the galvanized coated fence surrounding the collector.

Hydrogen Ion Activity. Upon the return of the wetfall collector vessels to the laboratory, pH measurements were routinely made on the bulk samples. The data distributions that resulted are shown in Figure 9-28. The most immediately striking feature of the Figure is the general uniformity of the distributions. All exhibited median pH values very close to 4.0. At sea level, carbon dioxide equilibria would make a pH of about 5.5 possible in distilled water. It follows, then, that any values below that figure must necessarily be due to the

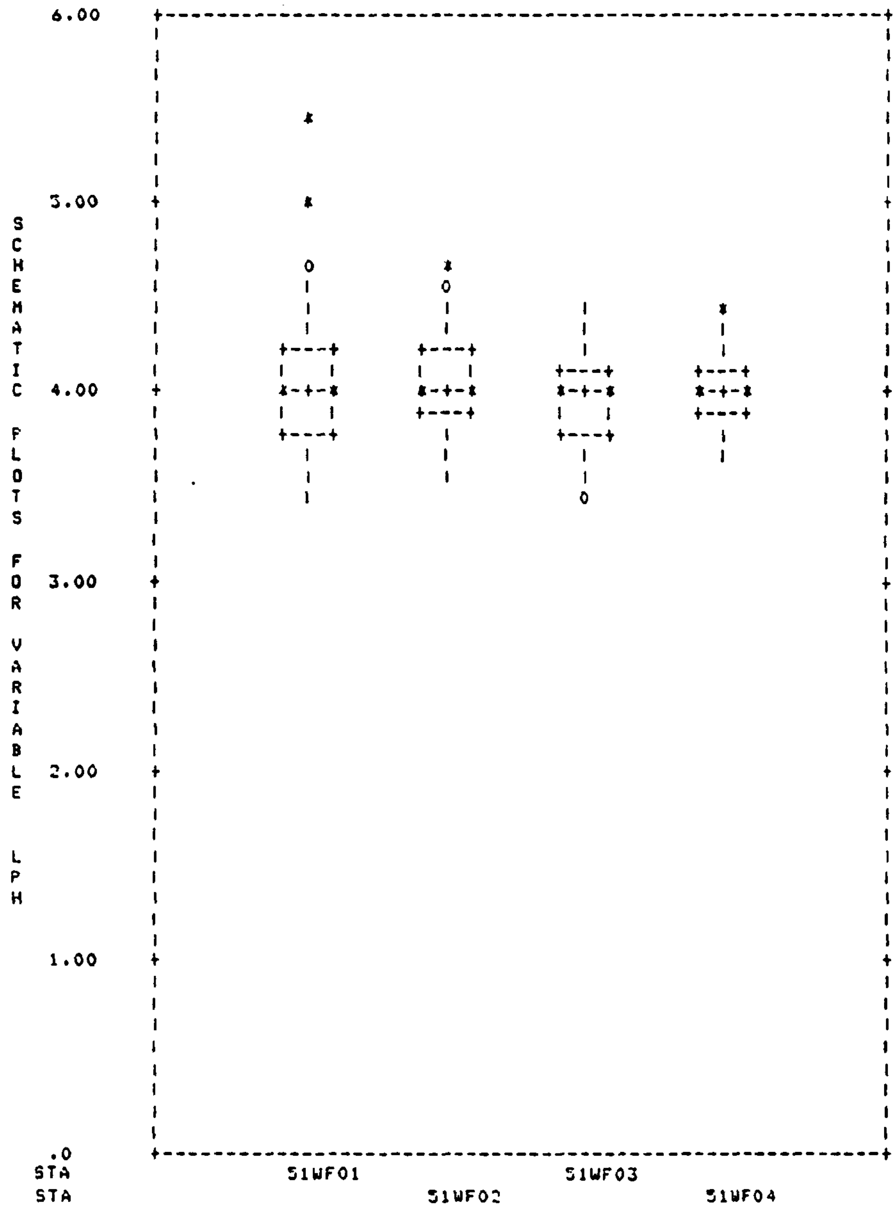


Figure 9-28. Wetfall pH Distributions, Standard Units.

presence of an acid other than the equilibrium concentration of carbonic acid. It should be noted that the depression of pH from 5.5 to 4.0 involves more than a ten-fold increase in hydrogen ion concentration. A stoichiometric analysis of the nitrate data shows the range of concentrations present in the wetfall to be sufficient to account for the pH values observed if it were all associated with nitric acid (See Figure 9-21). It is likely, however, that mineral acidity from other sources is also present. There are no additional anion analyses to support this supposition, but the acid rain data reported in the literature for the east coast report generally high concentrations of sulfate.

The low rainfall pH measurements have many implications, not all of which are related to water quality. A major water quality concern, however, is the mobilization of cations in catchment soils and paving materials that would, under more neutral conditions, be fixed.

10. TRACE METALS IN SOILS OF BMP SITES

Study Sites

Six study sites were located in a four-county area surrounding Washington, D.C. (Figure 10-1). The sub-study described herein utilized three Best Management Practice (BMP) sites (UR09, UR06, and UR10-UR11) that were being monitored in the MWCOG NURP. Another study sites, UR13-UR14, was to have been included in the NURP monitoring network, however installation of adequate instrumentation was not possible. The two additional study sites, KMart and Rt. 234 were included in the present study because they were representative of land uses that receive large loadings of trace metals, they had been in use a relatively long period of time, and they could be sampled without expensive equipment. Other NURP sites did not have one or more of these characteristics.

The study sites were evenly divided between grassed swale drains and detention basins. Fairidge (UR09), Stratton Woods (UR06), and Rt. 234 were the swale drain sites. Stedwick (UR10-UR11) Bulk Mail (UR13-UR14), and KMart were the detention basin sites.

The soils and geology of the study sites were typical of many Piedmont and Coastal Plains locations in the Washington, D.C. area. Five of the sites were located in the Piedmont Geologic Province; the Triassic Basin, drainageway, and upland landscapes positions were represented. Only the Bulk Mail site was located on a Coastal Plain land surface. Table 10-1 provides a summary of the soils present at the time of construction at each site. However, it is important to remember that construction activities have drastically altered the soil profiles. In ssome situations, the solum may have been almost completely removed leaving only the substratum.

Different phases of the present research utilized various combinations of

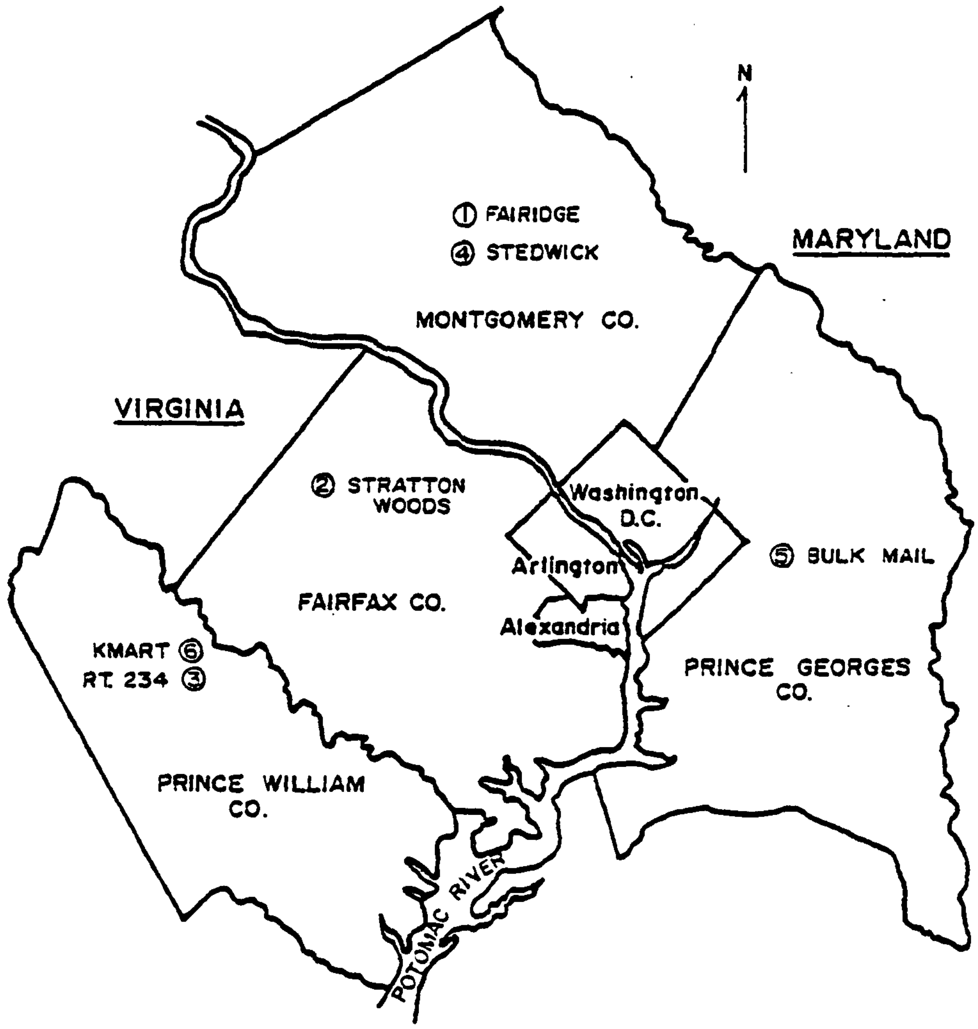


Fig. 10-1 Location of study sites in the Washington, D.C. area.

Table 10-1. **Summary of study site soils.**

Site	Nature of Area Summarized	Primary Soil Series Present	Soil Family*
Fairidge	entire development	Glenelg**	Fine-loamy, mixed, mesic Typic Hapludults
		Manor	same as above
Stratton Woods	entire development	Iredell**	Fine, montmorillonitic, thermic Typic Hapludalfs
		Penn#	Fine-loamy, mixed, mesic Ultic Hapludalfs
		Elbert	same as above
Rt. 234	highway vicinity	Penn 5	same as above
		Elbert	" " "
		Croton	Fine-silty, mixed, mesic Typic Fragiagualfs
		Readington	Fine-loamy, mixed, mesic Typic Fragiudalfs
		Birdsboro	Fine-loamy, mixed, mesic Typic Hapludults
Stedwick	detention basin	Manor**	Course-loamy, micaceous, thermic Typic Dystrochrepts
Bulk Mail	detention basin	Collington+	Fine-loamy, mixed, mesic++ Typic Hapludults
KMart	detention basin	Elbert#	Fine, montmorillonitic, mesic Typic Ochraguaffs

*from reference (99) unless otherwise noted.
**reference (18).
+reference (33).
++reference (120).
#reference (79).

soil samples from the site sites (Table 10-2). An initial investigation of site characteristics and metal accumulation and variability in surface soils was conducted at each site. Based on site characteristics, land use, background data, and trace metal accumulation, four sites were selected for further study, Bulk Mail, Stedwick, Fairidge, and Stratton Woods. As can be seen, the NURP sites were favored. For these sites, depth samples were taken to assess downward migration of metals in the soil profiles, and the amounts of leachable (soluble plus exchangeable) trace metals in the surface soils were determined. The Bulk Mail and Fairidge surface soil samples were selected for use in adsorption isotherm experiments.

Fairidge. The Fairidge site is a subdevelopment in the Montgomery Village planned community near Gaithersburg, Maryland. Table 10-3 summarizes some of the important characteristics of Fairidge and other swale drain sites. The streets of this residential area do not have curbs or gutters. Instead, runoff from the edge of the street flows into grassed swales, which are a continuous part of residential lawns. The swales are 10 to 20 m long, with the center of the swale approximately 3m from the edge of the street. The swales are usually separated by driveways to homes. Galvanized steel culverts allow runoff in one swale drain to flow under driveways to the next lower swale. Storm sewer inlets are located in periodic swales to prevent excessive waterflow and subsequent erosion in the swales.

The Fairidge subdevelopment was built on soils of the Glenelg Series (10-1). These soils are characterized by loam to silt loam texture surface soils, with subsoil textures ranging from silt loam to silty clay loam. The total solum depth is from 45 to 76 cm. The substratum is derived from micacious loamy saprolite; depth to hard rock is 1 to 3 m or more (10-2).

Table 10-2. Summary of sites from which soil samples were used during various research phases.

	RESEARCH PHASE				
Site	metal accumul. & variability in surface soils	downward metal movement	leachability of surface soil metals	BMP sorptive capacity effects	soil property/ metal sorption correlation
Stedwick (basin)	X	X	X		
Bulk Mail (basin)	X	X	X	X	X
KMart (basin)	X				
Fairidge (swale)	X	X	X	X	X
Stratton Woods (swale)	X	X	X		
Rt. 234 (swale)	X				

Table 10-3. Age and land use characteristics of urban stormwater swale drains examined during study.

SITE	COMPLETION YEARS(S)	TRAFFIC FLOW	WATERSHED LAND USE
Fairidge	1972 - 1976*	100** vehicle trips/day /ha	Medium density single family[+] dwellings. 1.2 - 2.0 dwelling units per ha
Stratton Woods	1976 - 1978*	46** vehicle trips/day /ha	Large lot single family[+] dwellings. 1.2 dwelling units per hectare
Rt. 234	1971[++]	29,000* vehicles/12 hrs.	Four lane, divided highway in commercial area

*based on conversations with residents.
**national average for given land use, reference (177).
+reference (18).
++reference (197).
#1980 av. traffic count, reference (197).

Stratton Woods. This large lot single family subdevelopment near Reston, Virginia has a design similar to the Fairidge site. One major difference is the presence of a 2 to 3 m graveled shoulder between the road and the swale drain. As a result, the center of the swale is 3 to 4 m from the edge of the road. The swales vary in length from 10 to 30 m. Zinc culverts allow runoff to pass beneath driveways from one swale to the next. Periodic storm sewer inlets remove excessive runoff from the swales.

Soil from several series were present when the Stratton Woods project was initiated (10-1). All have fine textured soils and allow only slow downward percolation of water through soil profiles. The Elbert Series has silt loam or silty clay loam surface soils with clay subsoils; solum depth is 76 to 127 cm. With a total depth to hard rock of 0.9 to 2.4 m, the Elbert substratum is composed of weathered materials derived from basic rocks such as basalt. Penn soils have silt loam surface soils with B horizons of silt loam to clayey silt loam. Total solum dpeth is usually less than 86 cm and total depth to bedrock is usually less than 1 m. Substratum was derived from shale, sandstone, and siltstone. The Iredell series typically has silt loam to clay loam surface soils and plastic clay subsoils; total solum depth is 511 to 91 cm. Extending to a depth of no more than 1.8 m, the substratum derived is from diabase, basalt, and other basic rocks (10-2).

Route 234. The U. S. Route 234 study site is a 1600 m long section of median for a four-land highway through an intensively developed commercial area of Prince William County, Virginia. With many shopping centers, stores, and fast food resturants, this segment of highway is a classic example of American strip development. The site was selected because of its very large traffic volumes and the relatively long period of time that the swales have been receiving runoff.

The highway median has two sets of swale drains, one on the inside of the southbound lane and one on the inside of the northbound lane. The middle of the swales are 4 to 5 m from the edge of the highway. As with the other swale drain sites, stormsewer inlets are located at periodic intervals to remove excessive runoff and reduce erosion. The drains are only partly effective; a significant percentage of the grassed swales have been gullied due to erosion.

Some of the most abundant soils that occur along this segment of Rt. 234 are classified in the Penn, Elbert, and Croton Series (10-3). The Penn and Elbert Series have already been discussed. The Croton Series soils are derived from Triassic aged shale or siltstone. Surface and subsoil textures range from silt loam to clay loam; solum depth is 51 to 102 cm and the total depth to bedrock is less than 1.5 m (10-2). Other soils common to the area include the fine textured soils of the Readington and Birbsboro Series (10-3).

Stedwick. Located in Montgomery Village, not far from the Fairidge site, the Stedwick subdevelopment detention basin had a 13.9 ha watershed with a mixture of townhouse, school, street, and powerline right-of-way land uses (Table 10-4). The basin was created by construction of a dam in a natural drainage. Surrounded by a chain-link fence, the dry pond has a main concrete channel to prevent erosion. In 1980, the outlet of the basin was changed from a narrow pipe through the base of the dam to a perforated riser pipe that allowed longer detention times of runoff and a greater opportunity for infiltration of water into the soil. The basin was built in a landscape position occupied by soil of the Manor Series (10-1). Characteristics of this series have already been discussed.

Bulk Mail. The study sites was one of several detention basins that control runoff from the U. S. Postal Service Bulk Mail Center near Capitol Heights, Maryland. The watershed of the study basin was dominated by parking lots and roads of the complex (Table 10-4). These impervious surfaces are very heavily traveled by large tractor trailors. The dry pond was formed by construction of a dam in a natural drainage. In addition, excavation of the site created a flat-bottomed, steep-sided structure. The original outlet, a narrow pipe through the dam, was replaced by a riser in 1980 to increase the detention time of the stormwater runoff in the basin. Fenced in by chain-link fence, the detention basin is overgrown with either vegetation species typical of the pioneer stages of old field successsion or emergent vegetation species. Even during extended period of dry weather, the marshy areas tend to still have some standing water.

The original soil at the site was a member of the Collington Series (10-4). This series has surface soils that tend to have silt loam to sandy loam textures with sandy clay loam, loam, or clay loam subsoils (10-5). The solum is less than 81 cm thick, and the parent material consists of very deep marine sediments containing moderate amounts of glauconite.

For most of the study sites the surface soils surrounding the BMP structures seemed to be very similar to those in the structure, but the surface soils around the Bulk Mail site were significantly different than the basin soils. The soils outside the basin were a combination of natural soils profiles on two sides of the dry pond and soil disturbed by construction on the other two sides surrounded by the basin. The original A horizon of the the soil in the basin had been completely removed. A new organic matter-rich surface soil was forming in the marsh areas of the basin. The mineral soil closest to the surface was a heavy clay loam from the original argillic horizon of the original soil profile. Below the clayey layer was a region of sandy sediments with a much lower clay content.

KMart. Located near the intersection of Interstate 66 and U. S. Route 234, west of Manassas, Virginia the detention basin receives runoff primarily from the parking lot of a KMart shoping center (Table 10-4). Built in 1974, the small dry pond was constructed by excavating a pit-like structure in a relatively flat area of fill-dirt. The basin is approximately three meters deep, in some places down to bedrock. As a result there is little opportunity for infiltration and movement downward of water through soil or regolith. However, when ponding of water occurs in the basin, some water may move laterally through the soil of the steep side slopes of the structure. The outlet is a horizontal pipe at the bottom of the basin. Prior to construction, the soil of the site was mapped as a member of the Elbert Series (10-3). The basin floor is swampy with some emergent vegetation as well as various terrestrial shrub, grass, and tree species.

Sampling And Sample Selection

Surface Soils. The same basic technique was used to collect all of the surface soil samples. A 2.54 cm diameter soil tube was utilized to remove five to ten cores from the top 5 cm of mineral soils at each sampling area. The cores were composited and stored in 500 ml polyethylene bags.

Before the actual soil sampling could be conducted, a sampling design had to be established for each study site. Every site had enough unique characteristics to make a uniform sampling layout impossible. As a result, each site had a sampling layout that was at least a little different than every other site. The surface sampling was conducted during the months of October and November, 1980.

Grassed Swale. The first procedure used to establish a sampling layout was to map the area, as shown for the Fairidge site in Figure 10-2. Once mapped, 20 of

Table 10-4. Age and land use characteristics of urban stormwater detention basins examined during study.

SITE	COMPLETION YEAR	WATERSHED AREA	WATERSHED LAND USE
Stedwick (194)*	1973**	13.9 ha	Townhouse 9.0 ha (65%) Jr. High School 0.8 ha (6%) Powerline right of way 2.8 ha (20%) Paved road 1.3 ha (9%)
Bulk Mail (195)	1973	9.1 ha	Parking lot and roads 3.2 ha (36%) Building roof 1.8 ha (20%) Grassed area 2.2 ha (24%) Wooded area 1.8 ha (20%)
KMart (196)	1974	4.6 ha	Parking lot 4.2 ha (81%) Grassed area 0.4 ha (9%)

*Number in parentheses refers to source of information for each site.
**Reference (197).

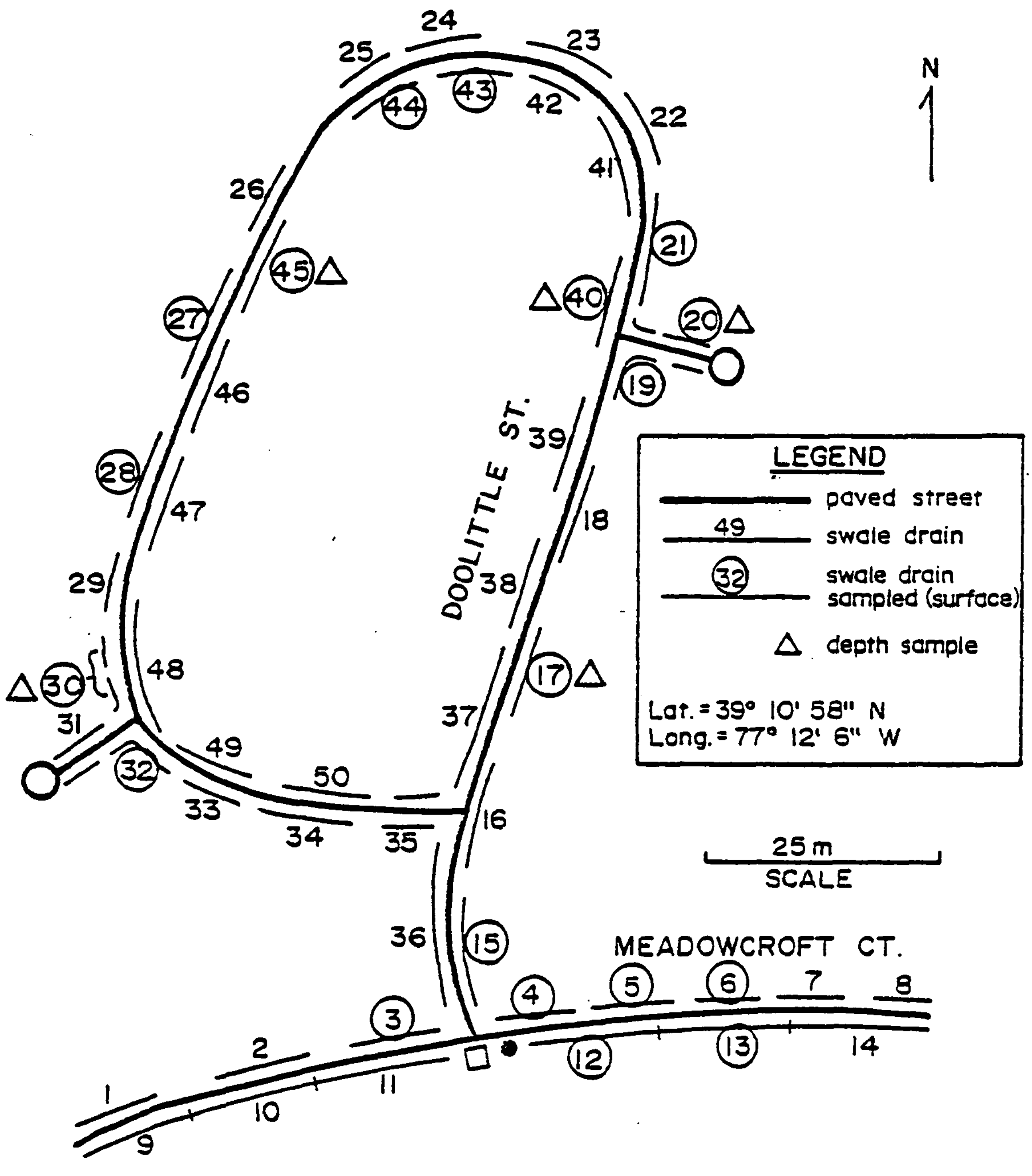


Figure 10-2. Sampling layout for Fairidge subdivision grassed swale site.

the total 50 swales at the Fairidge site were randomly selected to be sampled.

The expected pattern of trace metal, especially Pb and Zn, distribution in soil was a decrease in concentration as the distance away from the road increased. If trace metals had accumulated significantly in the soil of the swales, then the normal pattern of metal distribution should have been altered. If the concentration of metals in the swale soils was greater than or equal to the metal concentration of soils closer to the street, then a strong case could be made for accumulation of trace metals in swale soils due to stormwater BMP usage.

Therefore, three sampling zones parallel to the street were established at the swales that had been selected to be sampled (Figure 10-3). One zone was located between the edge of the street and the swale (street zone), approximately 0.5 to 2 m from the edge of the street. Another sampling zone was a straight line down the center of the swale (swale zone), approximately 3 m from the edge of the street. Finally, a sampling zone was located on the far side of the swale from the street (yard zone), 4 to 5 m from the edge of the street. In each zone, a minimum of ten cores were collected along the length of the zone (the length of the swale) and composited (Figure 10-4).

The sampling logic and implementation for the Stratton Woods site was very similar to that of Fairidge. The site was mapped and 20 swales randomly selected (Figure 10-5). Three sampling zones were established at each swale. However, there was a 2 to 3 m graveled shoulder at the site that forced the sampling zones to be located further from the edge of the paved surface than the Fairidge site. The road zone was 2 to 3 m from the paved surface, the swale zone 3 to 4 m, and the yard zone 4 to 5 m.

The findings from the sampling procedures described above indicated an accumulation of Zn in the swales of the Fairidge and Stratton Woods sites. To

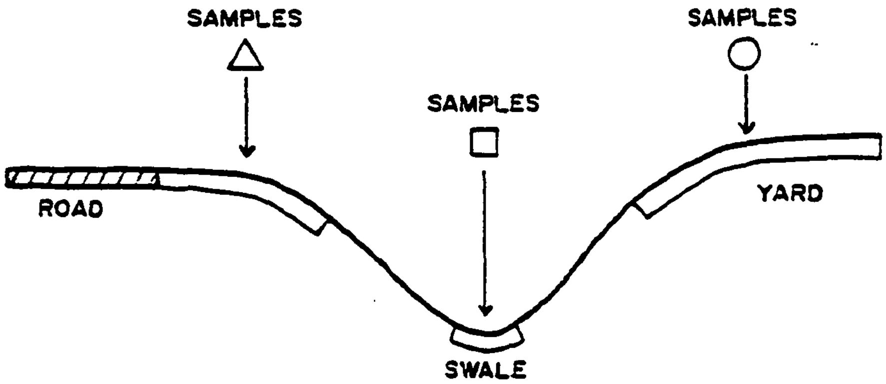


Figure 10-3. Cross-section of residential swale study sites (not drawn to scale).

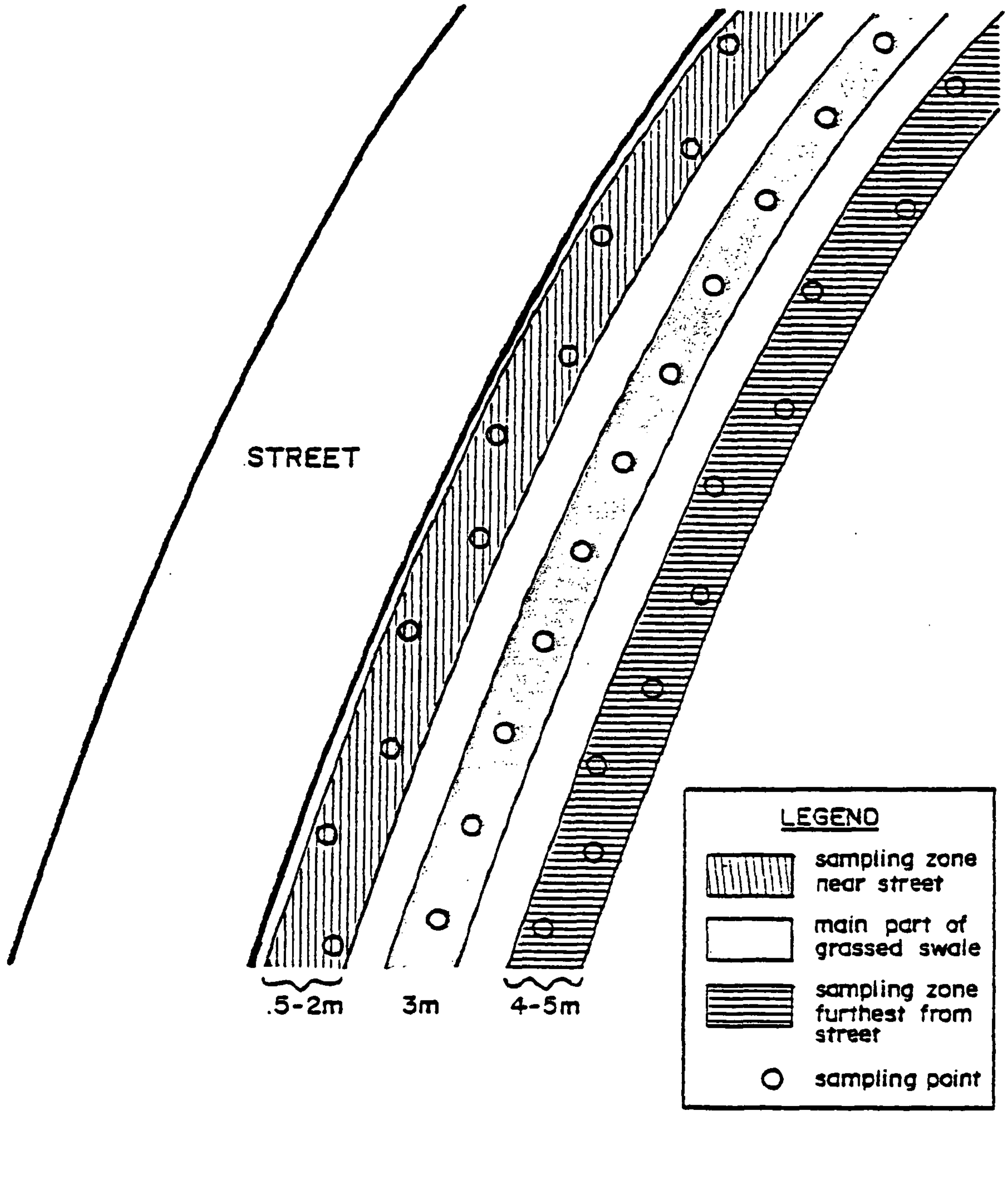


Figure 10-4. Overhead view of sampling scheme for an individual swale at the Fairidge site.

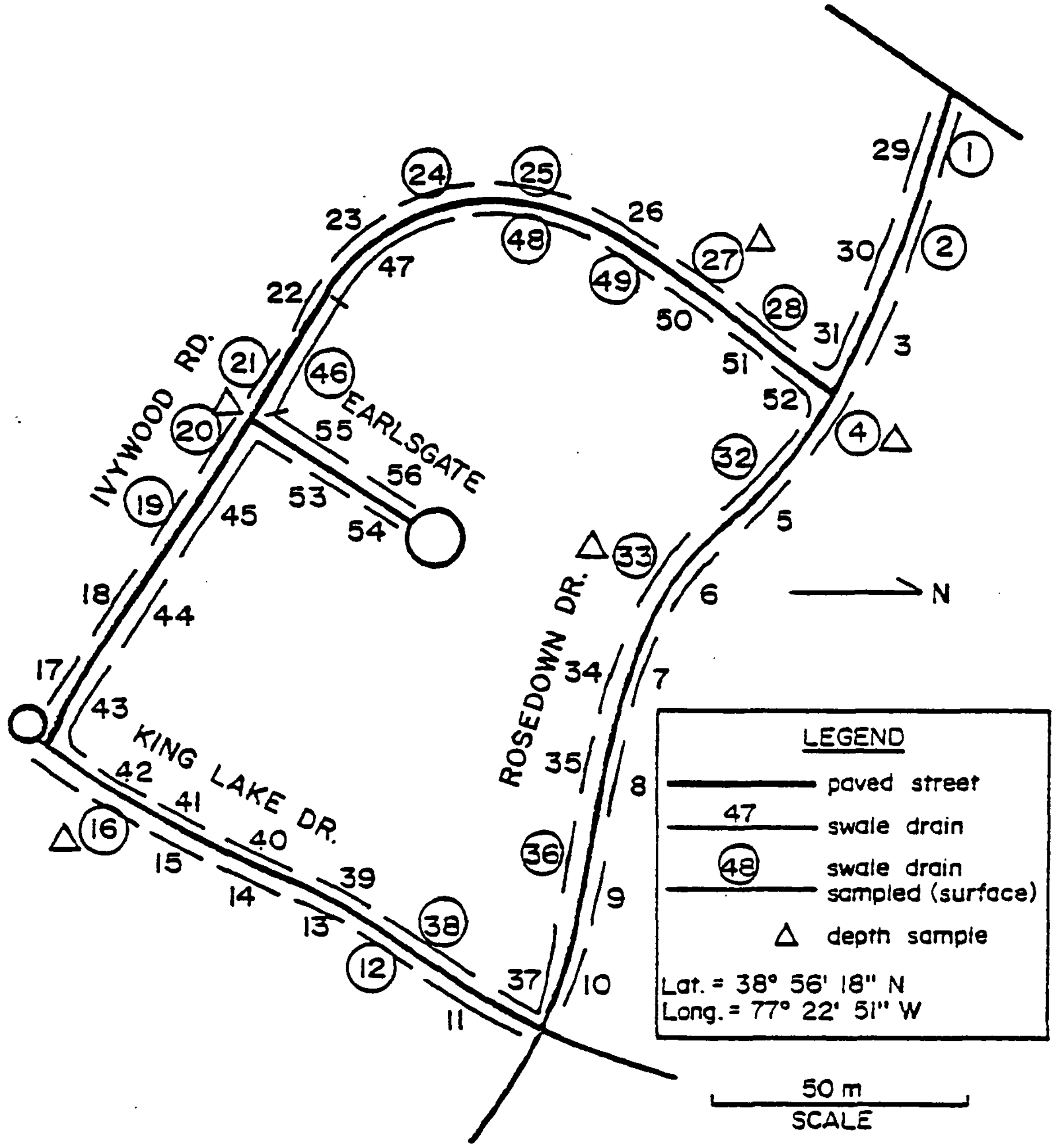


Figure 10-5. Sampling layout for Stratton Woods subdivision grassed swale site.

determine if the elevated zinc levels in the swale soils could be attributed to urban runoff or to the zinc coating of the culverts connecting the swales, an additional set of surface soils samples were collected at the Fairidge and Stratton Woods sites. For each site, four swales were selected with soils that had significantly greater Zn concentration than the surrounding soil. For these swales, at distances of 1, 5, 9, and 13 m downstream from the culverts, 5 to 6 soil cores were collected within a 30 cm diameter circlue in the center of the swale and composited. If galvanized culverts were the source of zinc in the swale soils, then the soil-zinc concentrations should decrease with distance away from the culverts.

For the Route 234 study site, the 1600 m median strip was divided into 15 equal segments (Figure 10-6). Within each segment, a 60 m long section of swale was located that had not been recently disturbed by the construction of exits or turn-arounds. Also, lengths of swale that were seriously eroded were avoided.

For each of the 15 segments, the swale on one side of the median was sampled, but not both sides. The number of swales sampled on the north side of the median was approximately equal to the number of swales on the south side.

Much like the other two swale study sites, three sampling zones were established (Figure 10-7). The road zone was 1 to 4 m from the edge of the highway; the swale zone was in the center of the swale 4 to 5 m from the edge of the highway; and the median zone was 5 to 8 m from the highway. In each zone, ten soils cores were collected and composited.

Detention Basins. The main concept behind the detention basin sampling designs was to compare soils around the basin that had not been exposed to urban runoff (control soils), with those soils in the detention basins that had been used to control urban runoff (basin soils). To minimize differences in parent material and soil properties between the control soils and basin soils, the control

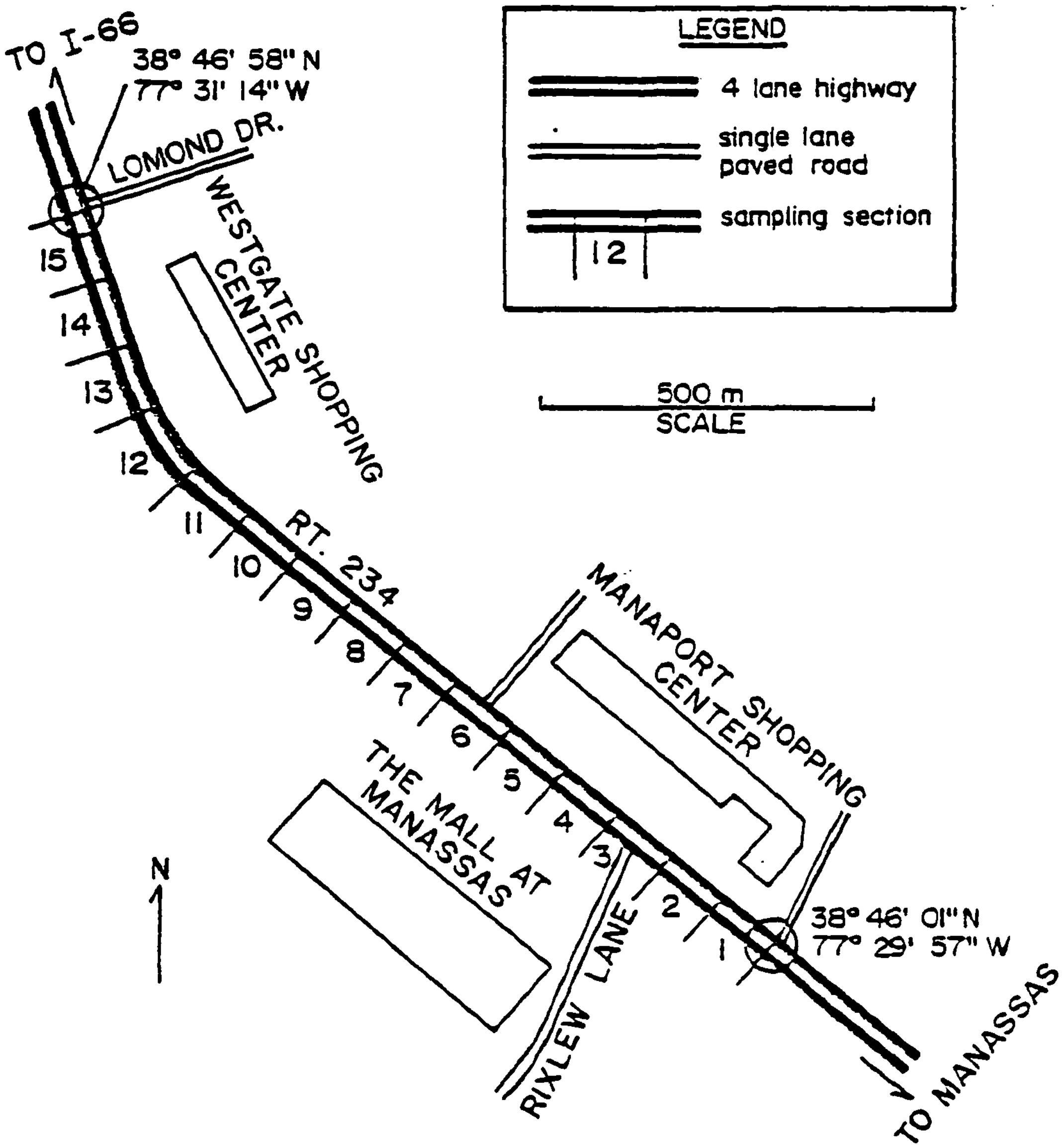


Figure 10-6. Sampling layout for Route 234 grassed swale site.

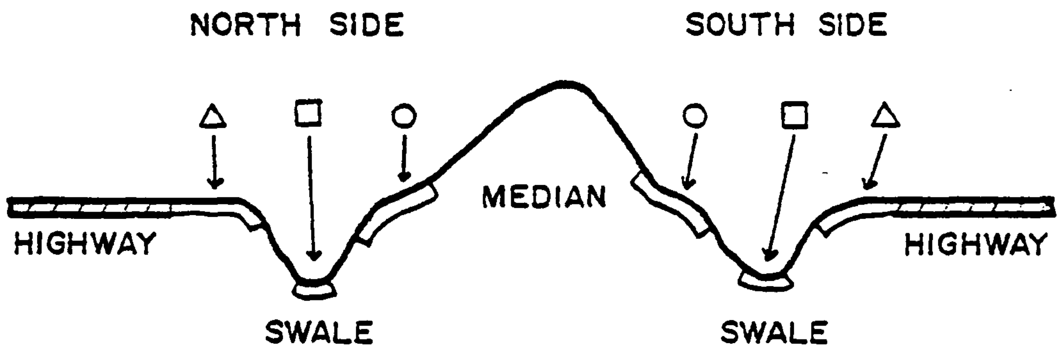


Figure 10-7. Cross-section of Route 234 grassed swale site (not drawn to scale).

sample areas were located as close as possible to the basin, without being influenced by urban runoff.

At the Stedwick site, the fence surrounding the basin and the channel in the basin were the reference points for the sampling layout (Figure 10-8). For the control samples, 9 m by 10 to 35 m blocks were established outside the fence and above the level of the riser pipe. Within each block, ten cores were collected at random and composited (Figure 10-9). The basin samples were collected at sample points. Ten cores were collected within a 2 m diameter circle and composited. The sample points were spaced every 5.5 m along the channel and a 1, 5, and 9 m spacings on either side of the channel.

The control samples for the Bulk Mail site were collected in a similar manner to the Stedwick site. Soils cores were gathered and composited within 6 m by 12 m blocks that were outside the fence and above the level of the dam (Figure 10-10). Within the basin, sample points were located every 6 m on four north-south transects that were 12 m apart. At each sample point five to ten cores were taken and composited. Some of the basin samples were very difficult to collect due to very wet, marshy conditions.

The sampling design for the KMart site was unique among the detention basin sites. For the control samples, rather than sampling within blocks, sample points were used a 5 m spacings around the outside of the basin (Figure 10-11). Since some movement of runoff through the sideslope of the basin was expected, sample points were located every 5 m around the basin on the sideslopes within 1 m of the basin floor. The basin floor sample points had 5 m by 3 m spacings.

Depth Sampling. Unless otherwise noted, a 7.6 cm bucket auger was used to collect soil samples at the following depth intervals, 0 to 5 cm, 5 to 15 cm, 15 to 30 cm, and 30 to 60 cm. The soil from each depth interval was removed from the auger and stored in polyethylene bags. The depth sampling was conducted

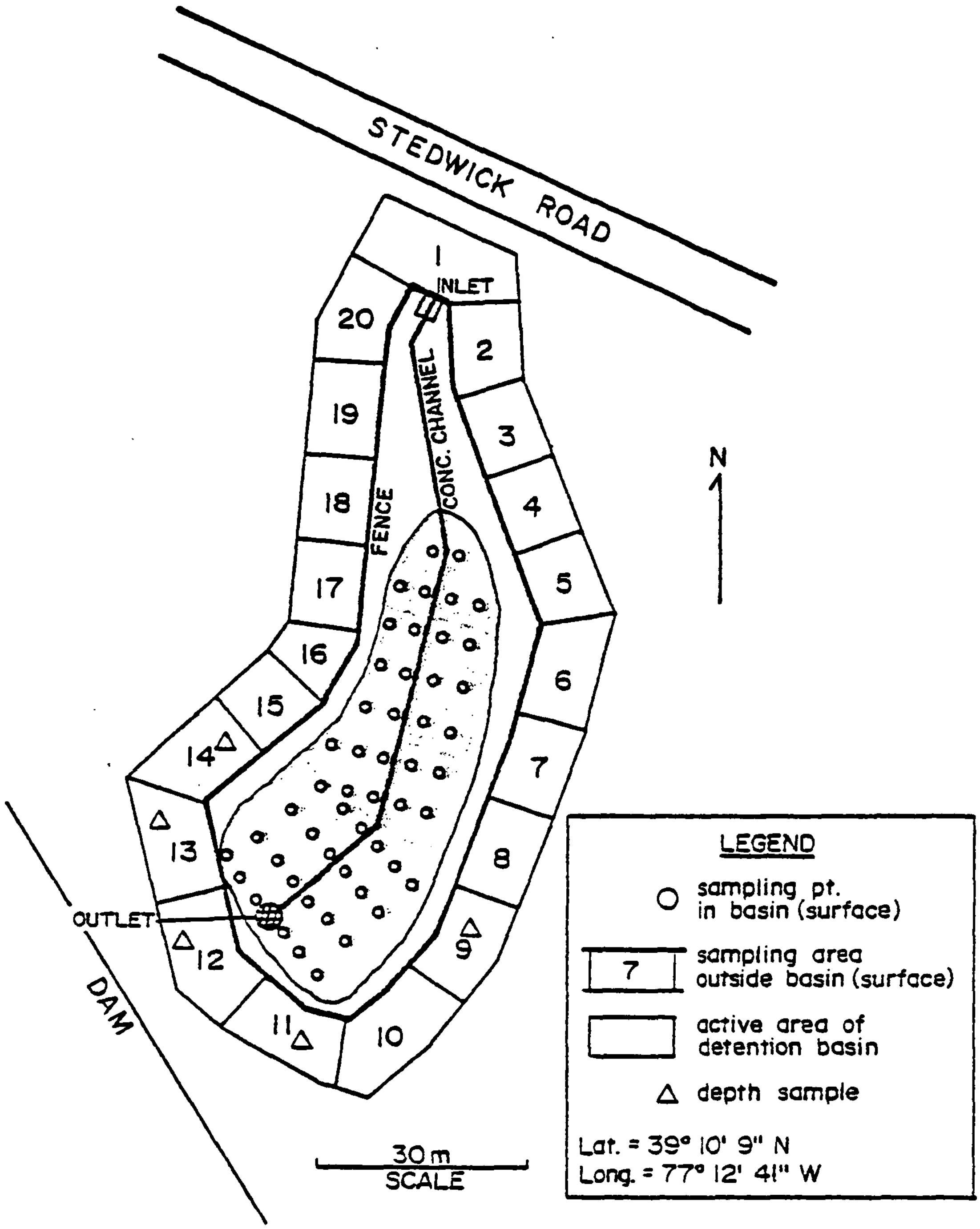


Figure 10-8. Sampling layout for Stedwick detention basin site (see also Figure 15a).

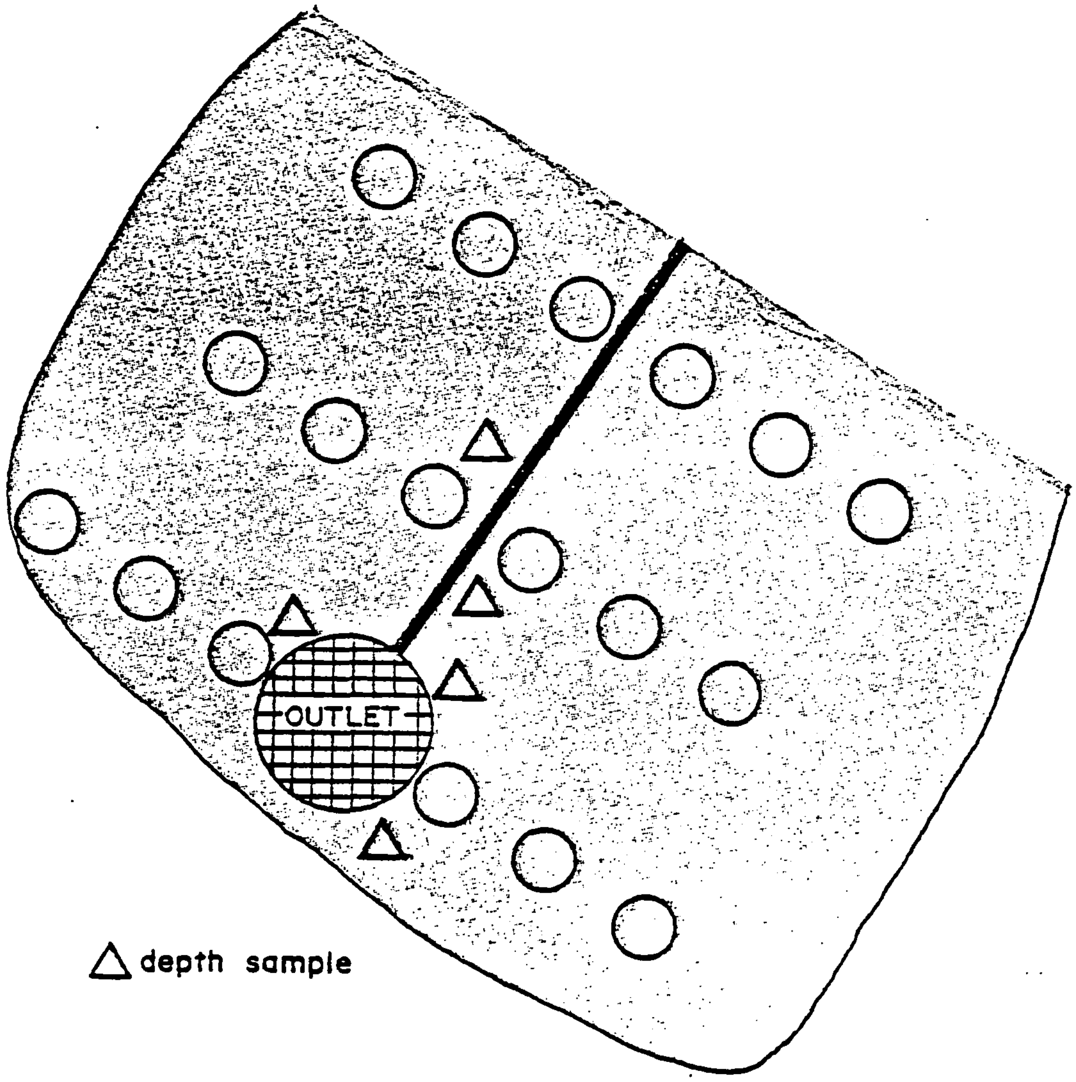


Figure 10-9. Enlargement of the lower portion of the Stedwick detention basin to show location of depth samples.

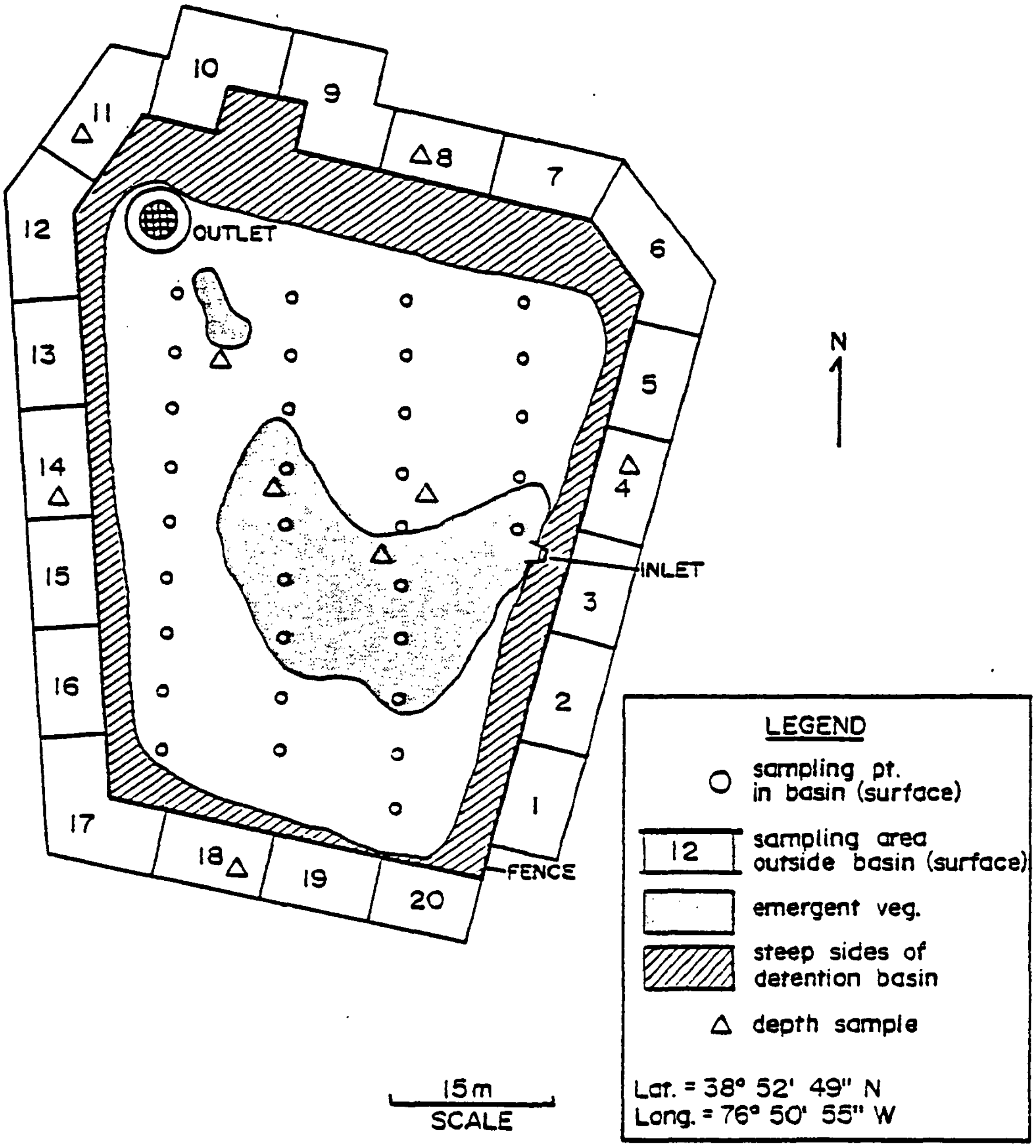


Figure 10-10. Sampling layout for Bulk Mail detention basin site.

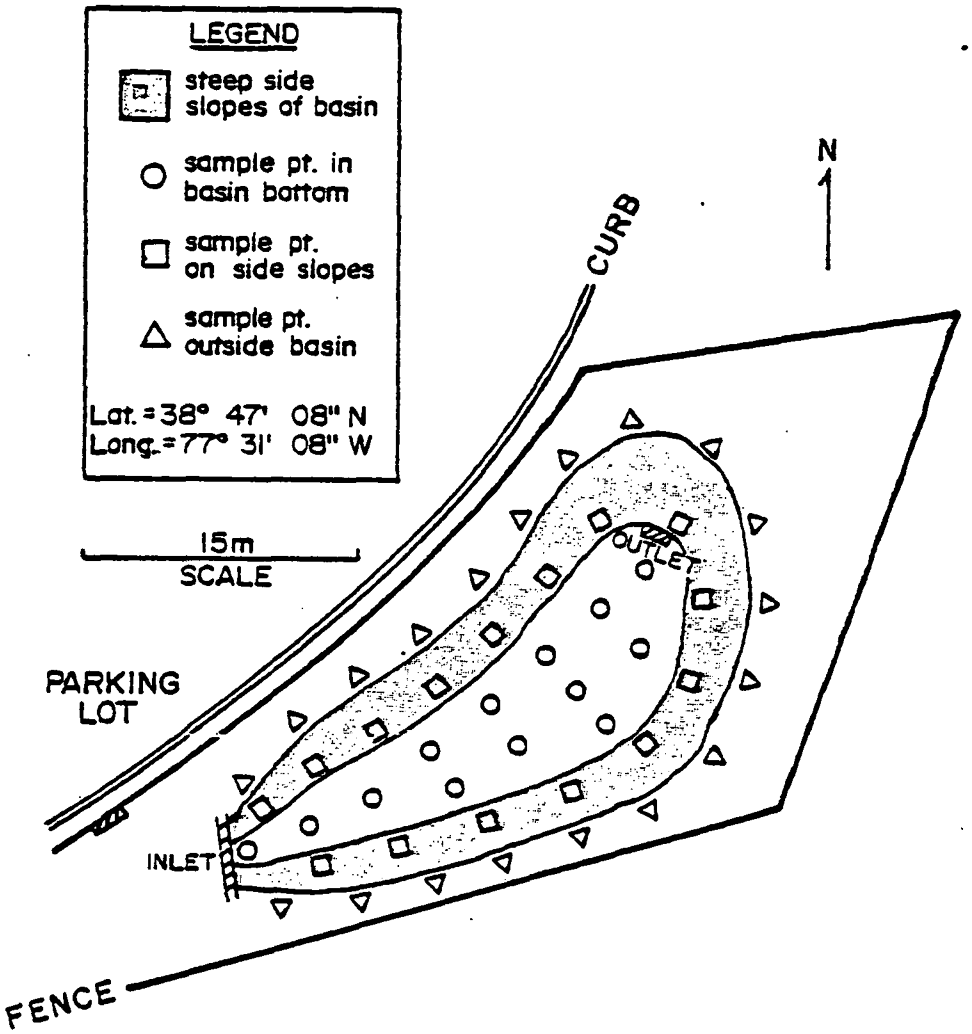


Figure 10-11. Sampling layout for KMart detention basin site.

during the months of March, April, and May, 1981.

As previously mentioned, depth samples were taken at the Bulk Mail, Stedwick, Fairidge, and Stratton Woods sites. At each site, the results of the surface sampling experiment were used to identify either typical control sampling locations or BMP locations that had elevated trace metal concentrations.

Five swales were selected for sampling at each of the swale drain sites. At a random point along the length of the swale a series of three depth samples were taken. For the Fairidge swales, the samples were located at 1, 3, and 5 m from the edge of the street, the 3 m sample was in the center of the swale. The Stratton Woods samples were taken at 3 to 3.5 m, 4 to 5 m, and 7 to 8 m from the road; the 4 to 5 m sample was in the center of the swale.

Because the samples were collected in residential lawns, special precautions had to be taken to not disturb the site. For each sample taken, the grass sod was removed with a tilling spade. The sample was taken with a bucket auger and the hole filled in with soils that had been transported from off the site. Finally, the sod was replaced and tamped in place.

At each detention basin site, five depth samples were taken in the area surrounding the basins. At the Stedwick site, the in-basin depth samples were routinely collected in areas shown to have elevated soil trace metal concentrations. However, the procedure to sample the in-basin soils at the Bulk Mail site was more difficult. The use of a bucket auger was impossible due to contamination of the soil samples as they were being pulled up through the muck of the waterlogged soils of the basin. Naturally, these were the locations with the greatest trace metal concentrations. As a result, at four points, a 120 cm length of 5.1 cm inside diameter polyvinyl chloride (PVC) pipe was driven in the soil to a depth of 60 cm with a block of wood and a sledge hammer. The open end of the pipe was then sealed with a rubber stopper, and the soil was dug away from the pipe with a shovel. After approximately two thirds of the buried pipe had been exposed, the pipe could be pulled out of the soil with the soil core intact in the PVC pipe. Finally, the pipes were frozen and then cut off at the appropriate lengths with a band saw.

Laboratory Methods

Total Enriched Trace Metals. The concentrations of Pb, Zn, Cu, and Cd were determined in all of the surface soil samples and depth samples with a modification of a technique described by Agemian and Chau (10-6). The metals determined by direct aspiration using a Model 703, Perkin-Elmer (Norwalk, Conn.) Atomic Absorption Spectrophotometer. Quality control measures included a series of blanks, replications, and spikes.

Soil Property Determinations. The Virginia Tech Department of Agronomy Soil Testing and Plant Analysis Laboratory performed routine soil chemistry analyses for all of the depth samples (10-7). The properties measured included pH, organic matter, phosphorus, calcium, magnesium, and potassium. The organic matter method used a sodium dichromate-sulfuric acid digestion followed by a colorimetric measurement. pH was determined by a potentiometric measurement of one to one soil-water suspention. Soil P, Ca, Mg, and K were exracted with a dilute double acid solution, 0.05 N HCl in 0.025 N H_2SO_4. P was determined by an ammonium molybdate colormetric method; K was determined by emission spectroscopy, while Ca and Mg were determined by atomic absorption.

The cation exchange capacity was determined with a method that was a slight modification of a technique commonly used in the Virginia Tech Department of Agronomy (10-8).

Free oxides of Fe, Al, and Mn were measured by a procedure refined by Miller (10-9).

Results-Surface Soils

The purpose of the surface soil investigation was to detrmine if trace metals had accumulated in the surface soils of urban runoff control structures. To this end, the surface soil trace metal concentrations from the various sampling zones of the study sites were compared to identify any metal accumulations.

If trace metal accumulations could be documented in surface soils of BMP structures, this would serve as presumptive evidence that there is significant interaction between the soil surface and the trace metals transported by stormwater runoff. In addition, trace metal accumulations would imply that partial treatement of stormwater runoff can be accomplished by overland flow and/or soil percolation. To obtain as much separation of the probable treatment mechanisms as possible, the results for the swale drain sites are presented separately from the results of the detention basin sites.

Grassed Swales. The trace metal distributions of the grassed swale sites, as determined by this investigation are presented in Figures 10-13 through 10-24. Figure 10-12 explains the symbols and terms used in these figures. A common factor among these graphs is the variation of trace metal concentrations from swale to swale. In fact, the same swale may not have had large concentrations of all of the study metals. Topography, traffic patterns, and length of swale are but a few of the possible explanations of this phenonmenon. This variation, however, is not especially important. The important comparison is of the metal concentrations for the three sampling zones at each swale (i.e., the road zone, the swale zone, and the yard zone).

Examination of the figures reveals that there were dramatic accumulations of Zn in the surface soils of the swales at both the Fairidge and Stedwick study

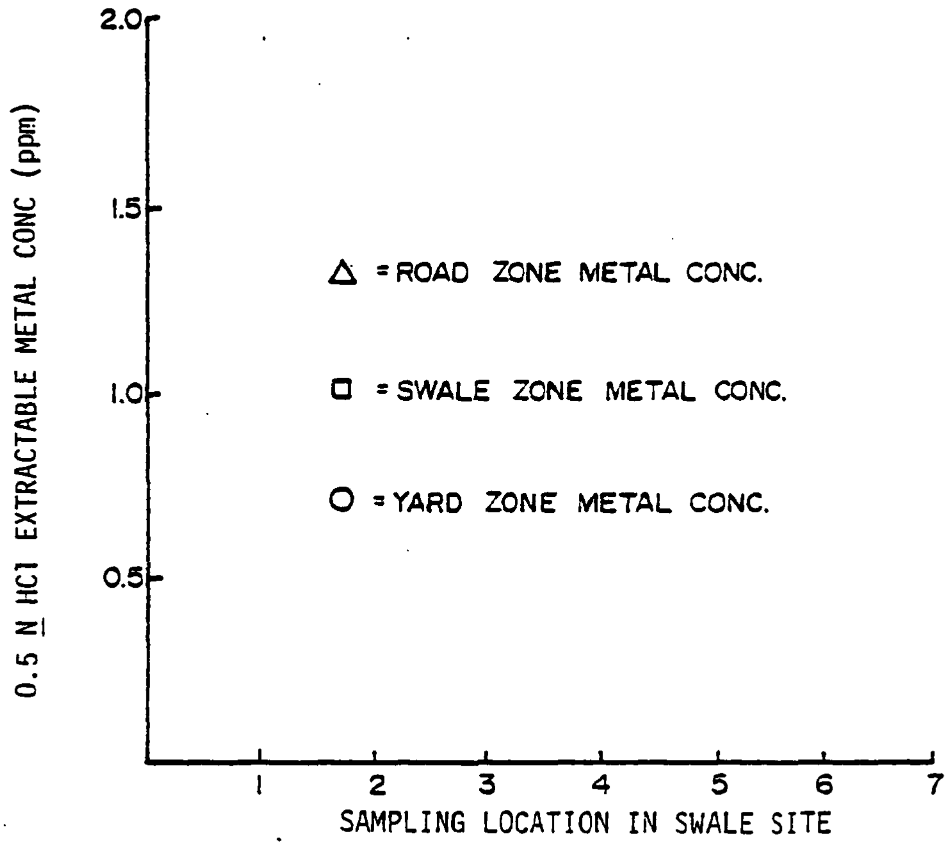


Figure 10-12. Symbol definition of scatter diagrams of surface soil trace metal concentrations of swale sites; Figures 10-13 through 10-24.

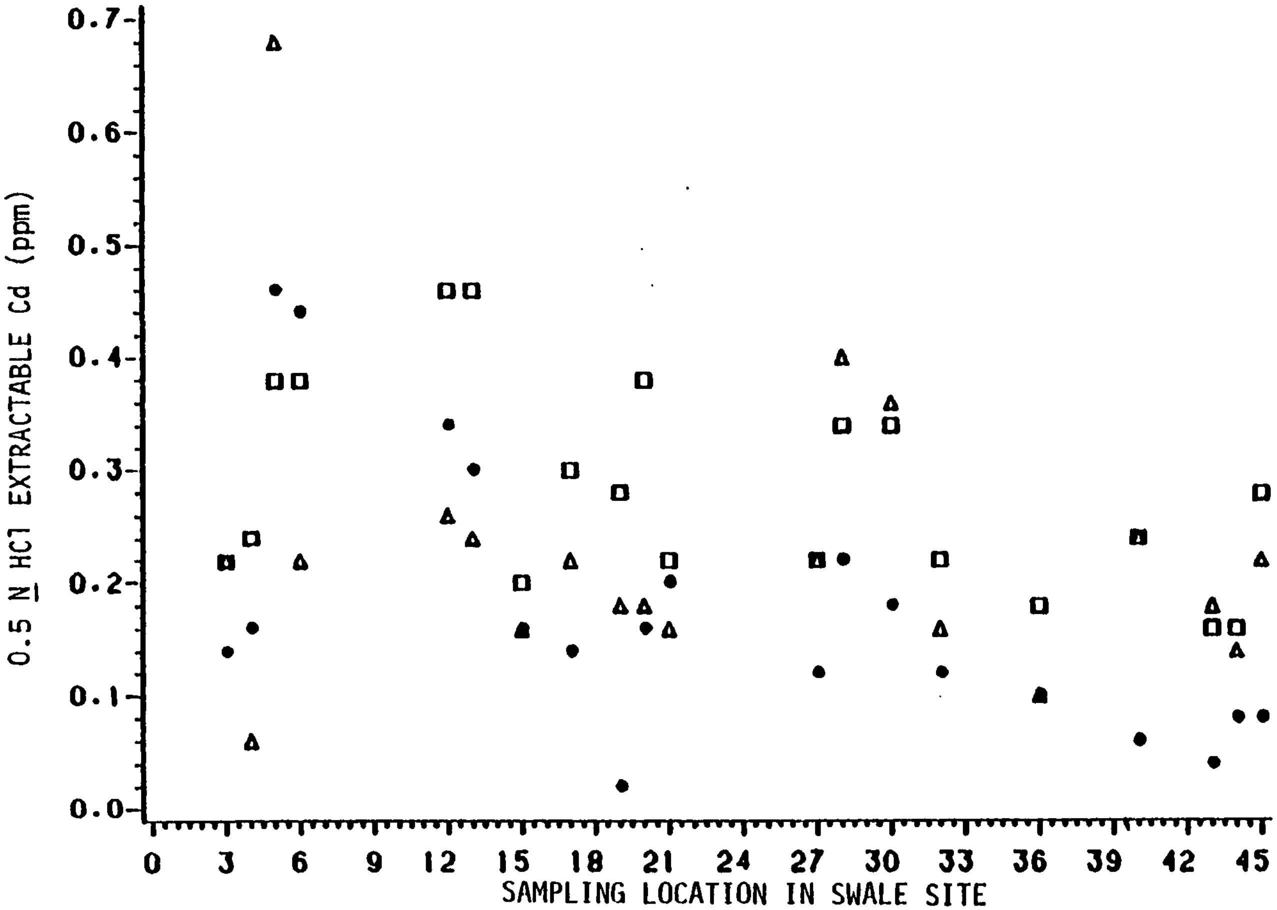


Figure 10-13. Comparison of surface soil 0.5 N HCl extractable Cd concentrations of three sample zones, Fairidge swale site (See also Figure 9).

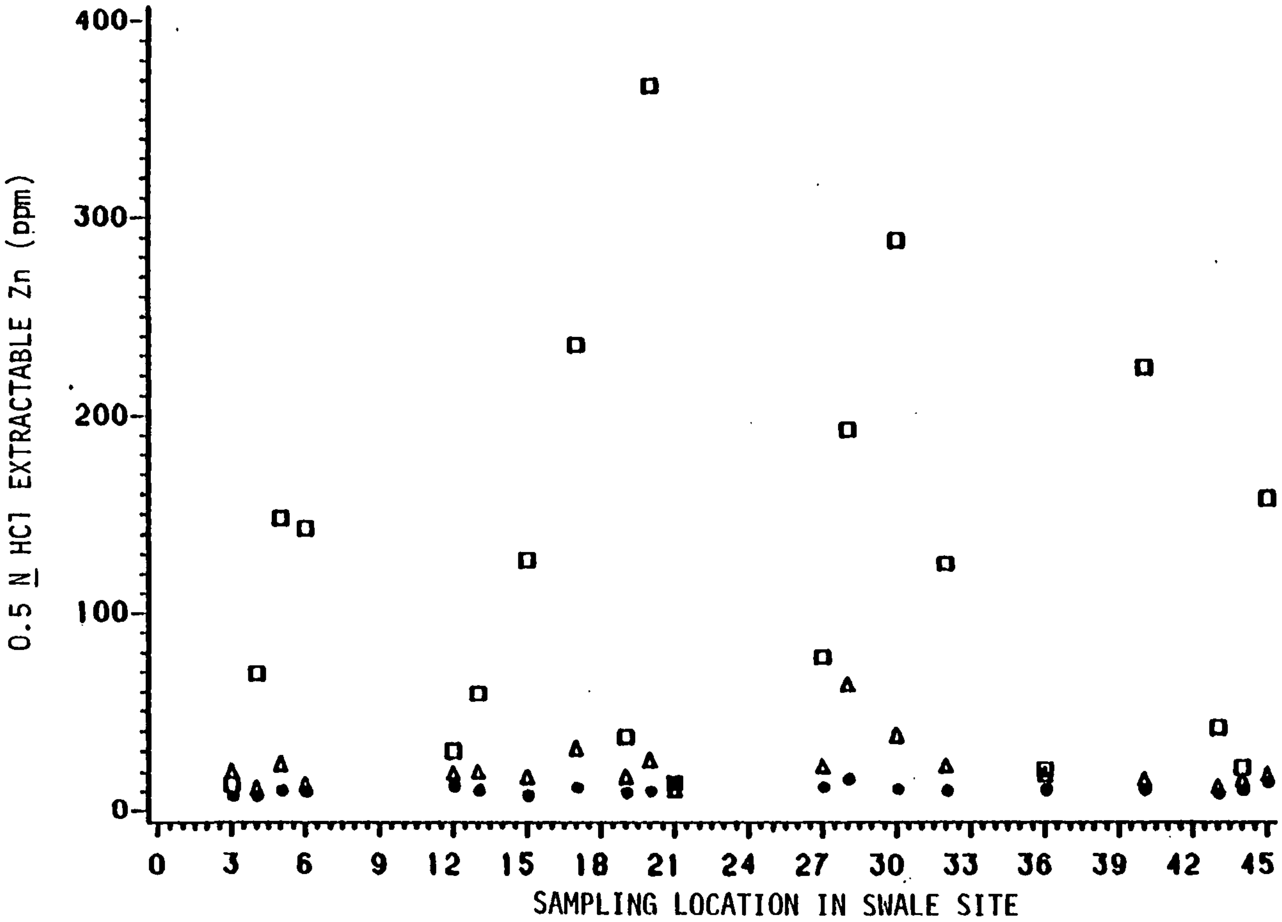


Figure 10-14. Comparison of surface soil 0.5 N HCl extractable Zn concentrations of three sample zones, Fairidge swale site (See also Figure 9).

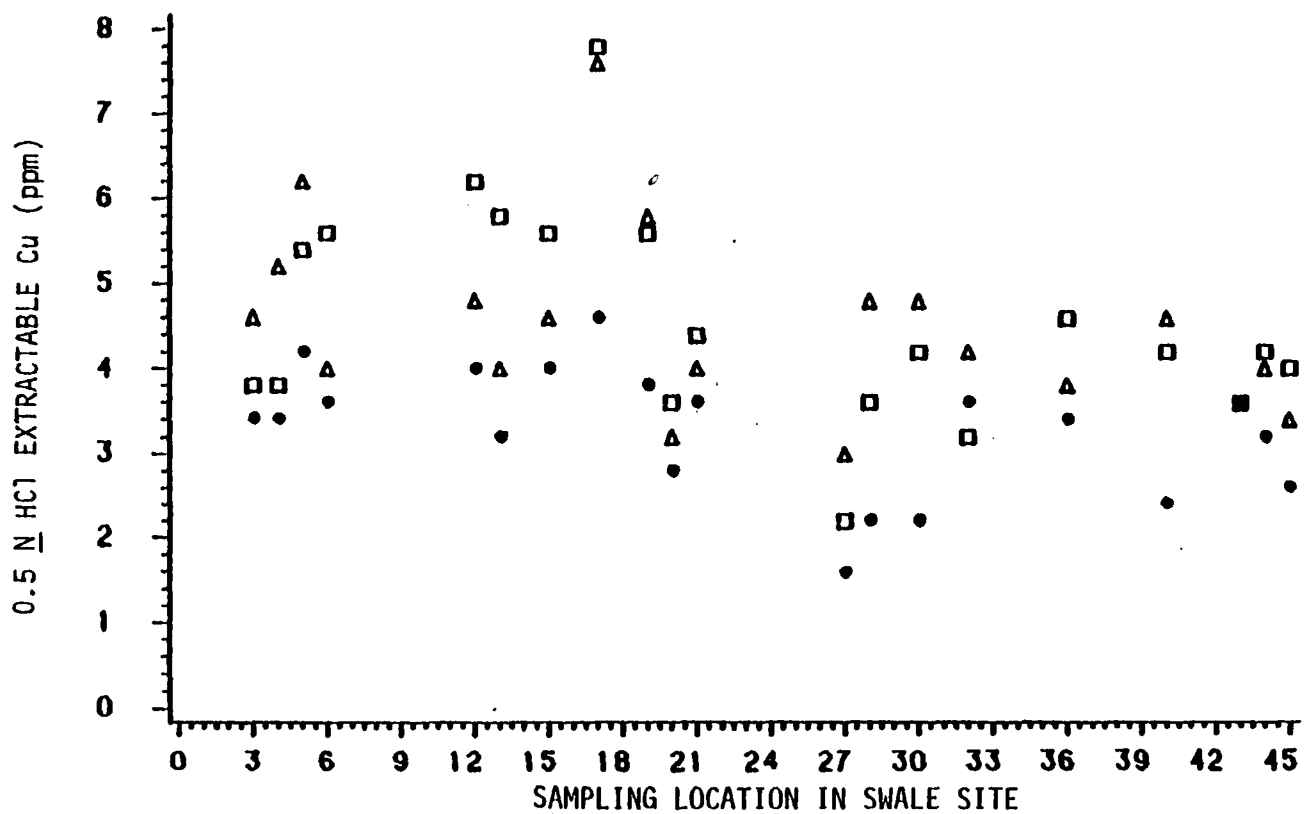


Figure 10-15. Comparison of surface soil 0.5 N HCl extractable Cu concentrations of three sample zones, Fairidge swale site (See also Figure 9).

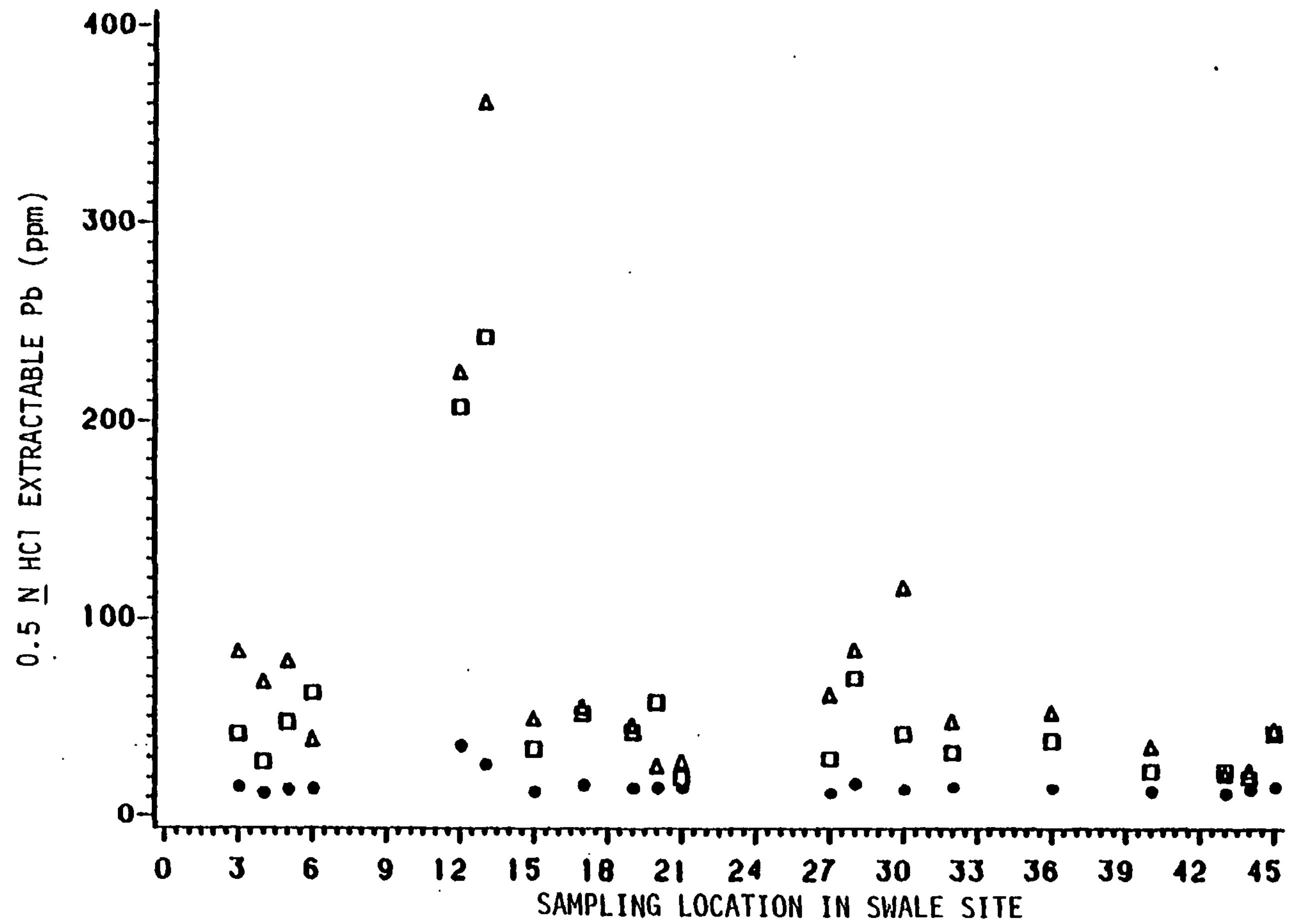


Figure 10-16. Comparison of surface soil 0.5 N HCl extractable Pb concentrations of three sample zones, Fairidge swale site (See also Figure 9).

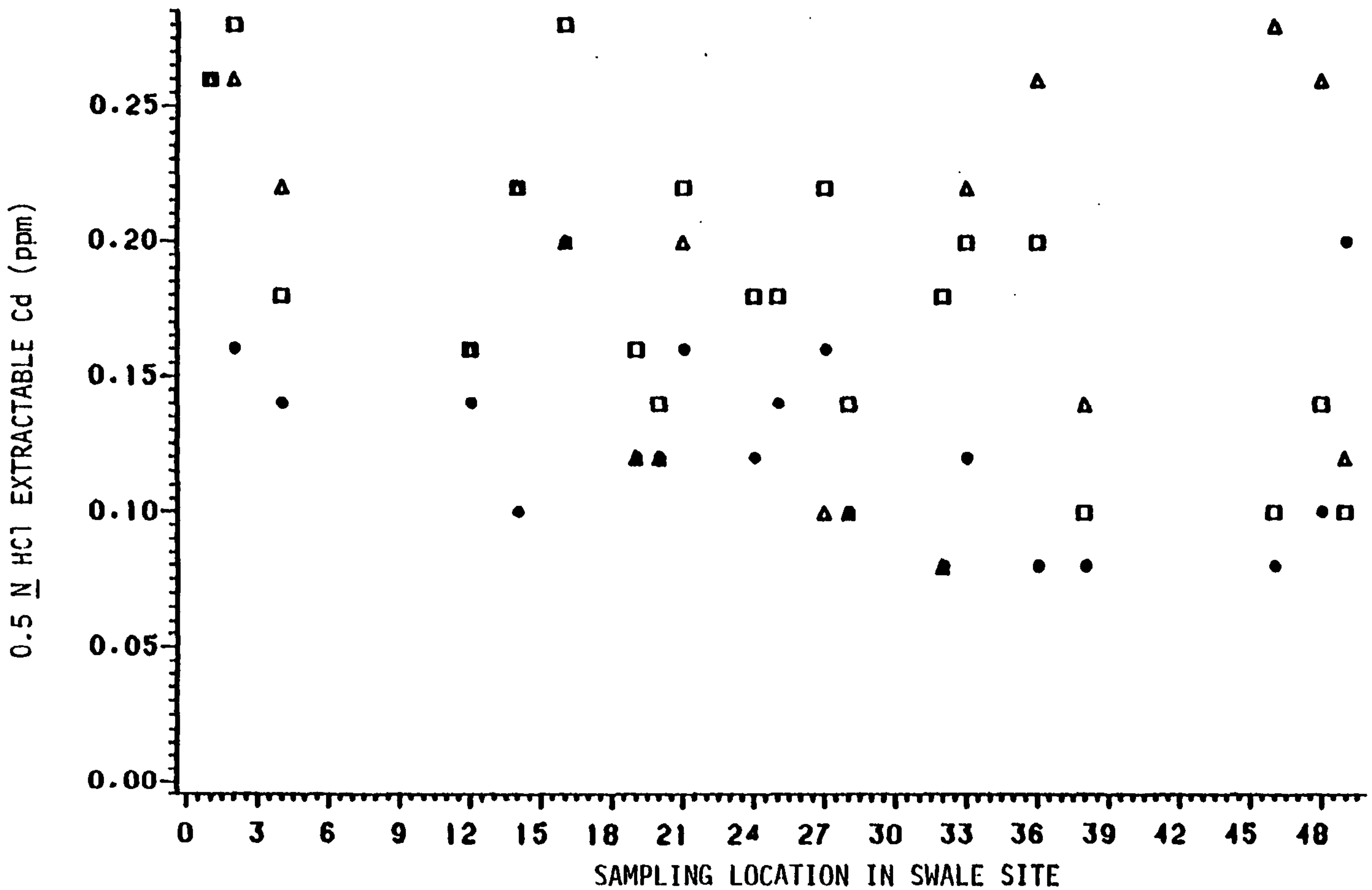


Figure 10-17. Comparison of surface soil 0.5 N HCl extractable Cd concentrations of three sample zones, Stratton Woods swale site (See also Figure 12).

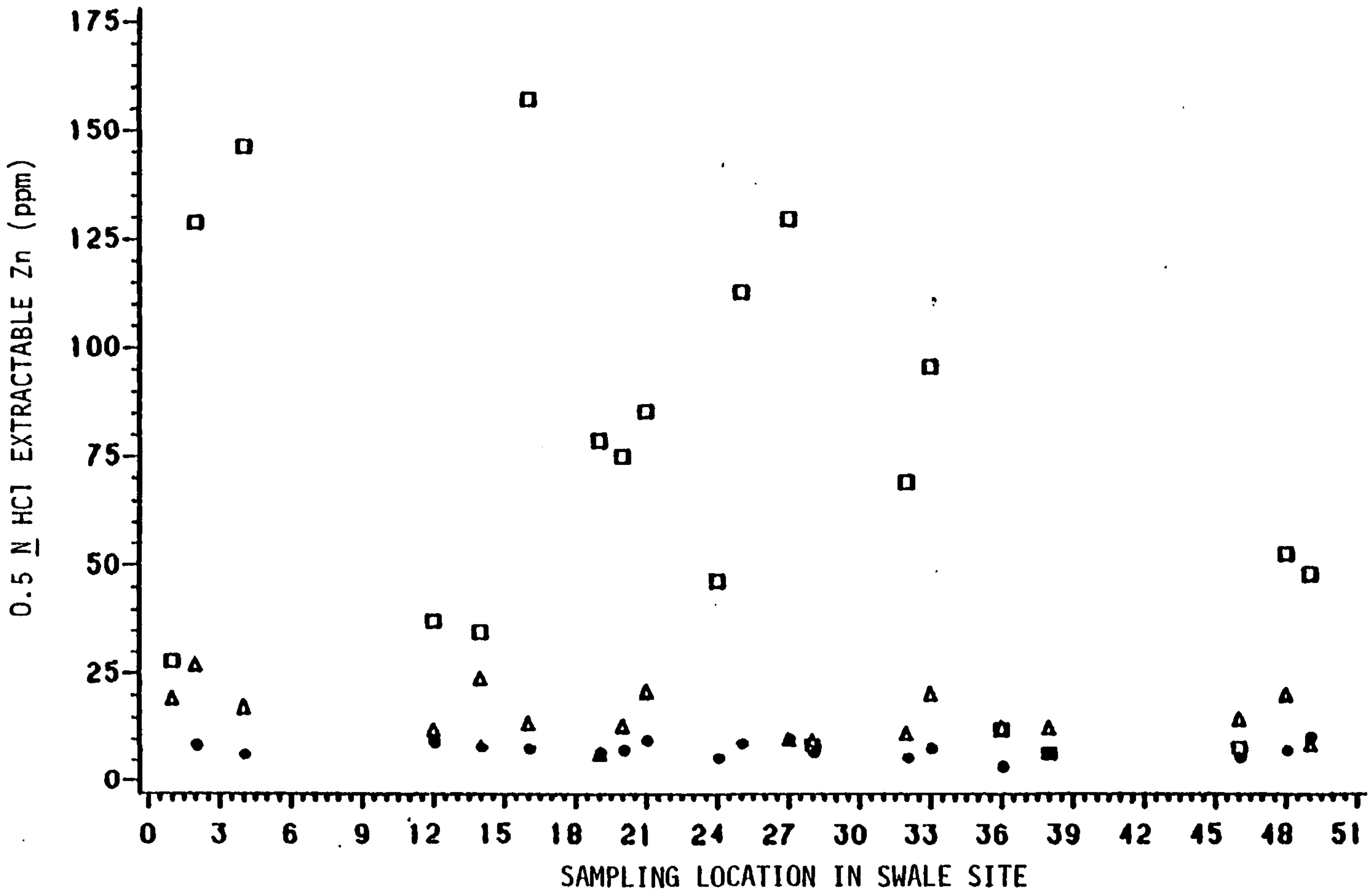


Figure 10-18. Comparison of surface soil 0.5 N HCl extractable Zn concentrations of three sample zones, Stratton Woods swale site (See also Figure 12).

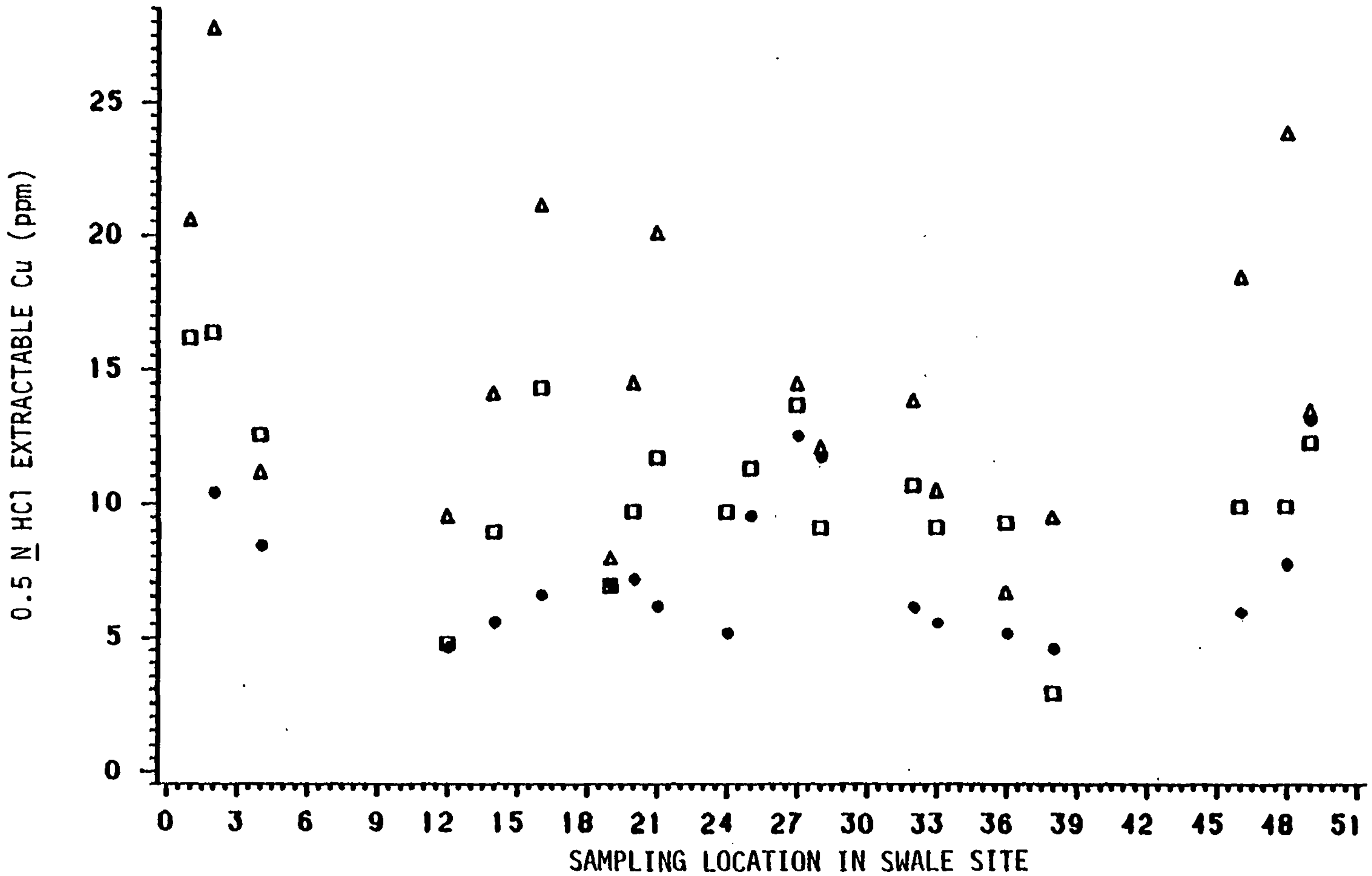


Figure 10-19. Comparison of surface soil 0.5 N HCl extractable Cu concentrations of three sample zones, Stratton Woods swale site (See also Figure 12).

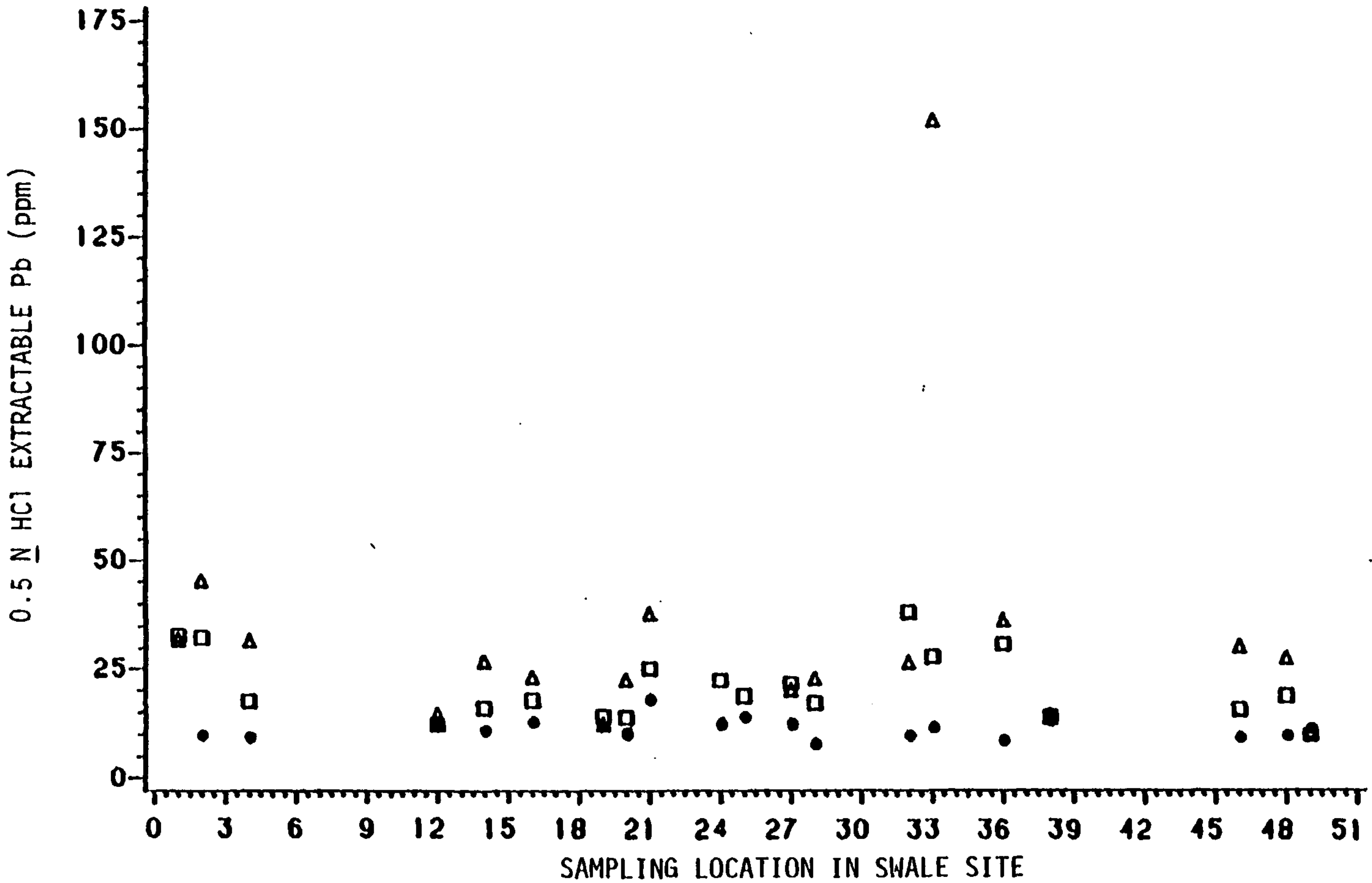


Figure 10-20. Comparison of surface soil 0.5 N HCl extractable Pb concentrations of three sample zones, Stratton Woods swale site (See also Figure 12).

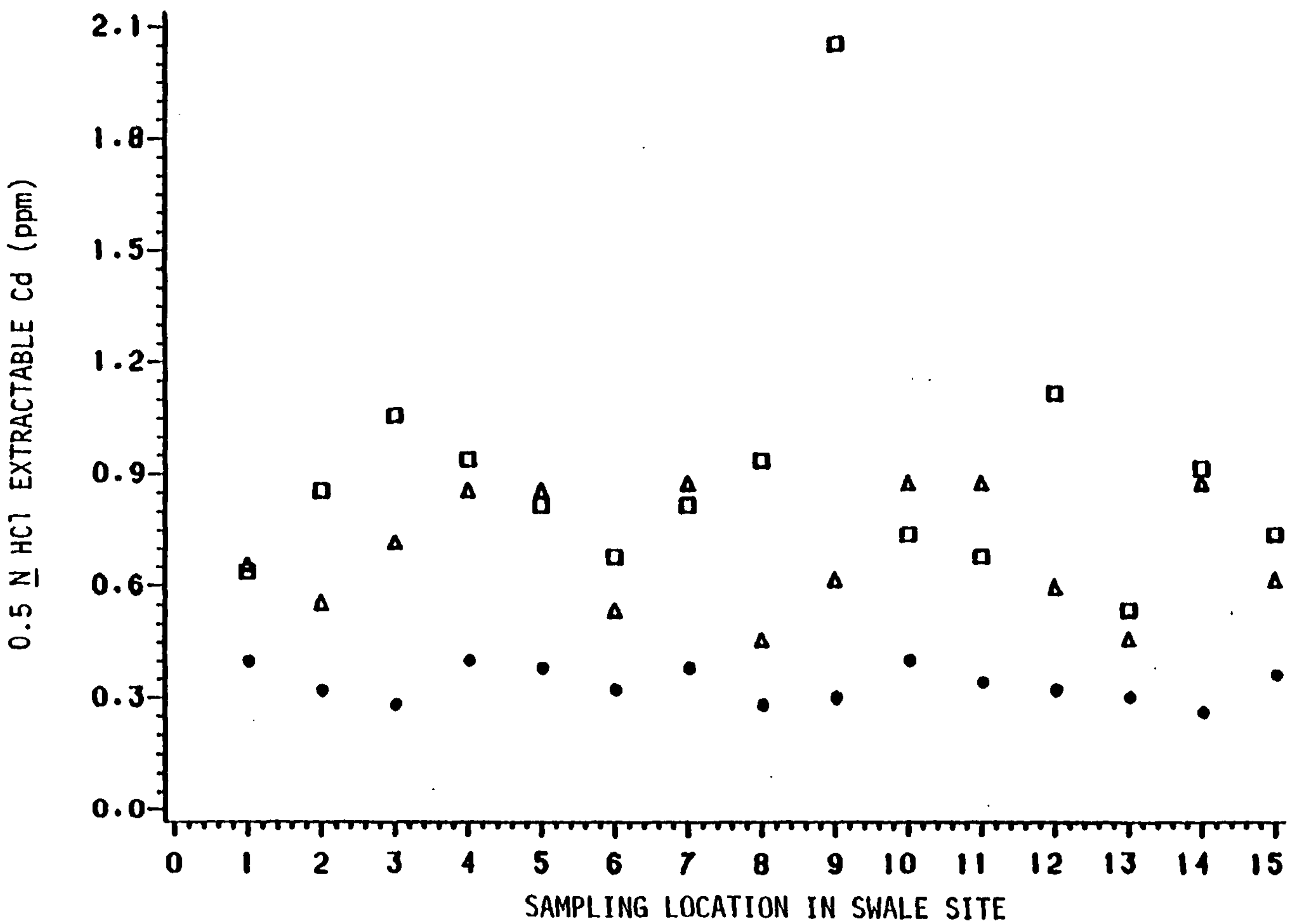


Figure 10-21. Comparison of surface soil 0.5 N HCl extractable Cd concentrations of three sample zones, Route 234 swale site (See also Figure 13).

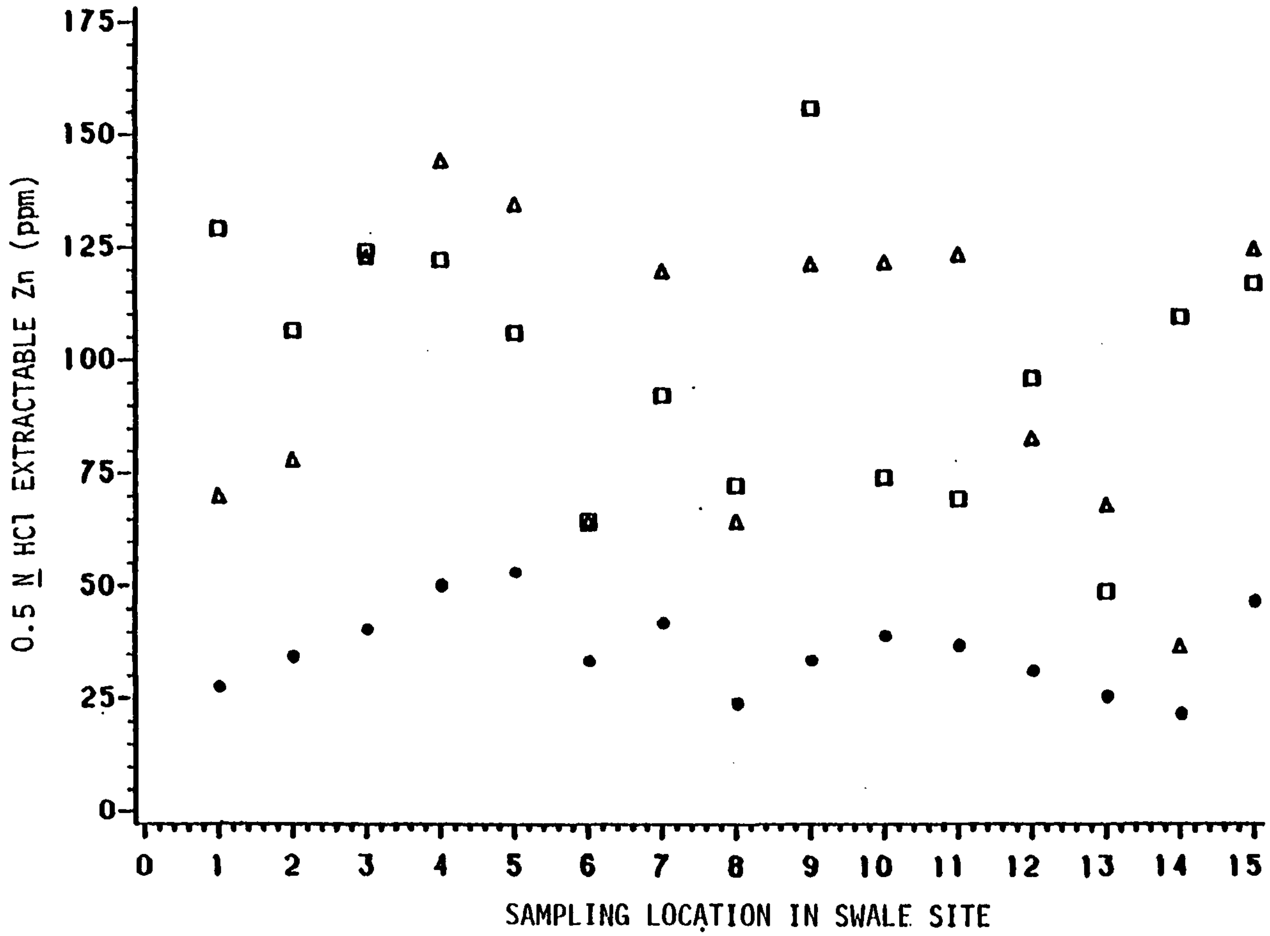


Figure 10-22. Comparison of surface soil 0.5 N HCl extractable Zn concentrations of three sample zones, Route 234 swale site (See also Figure 13).

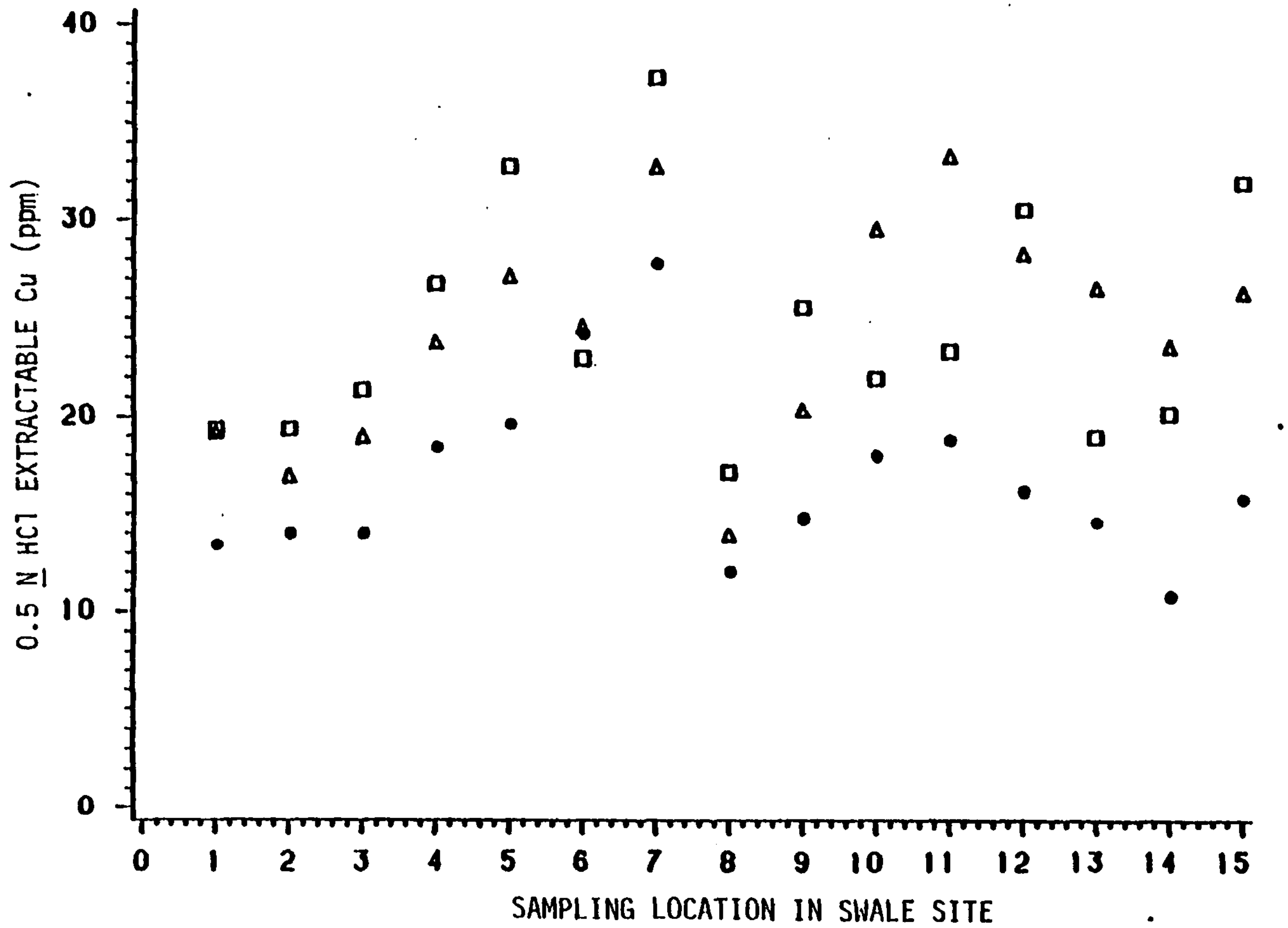


Figure 10-23. Comparison of surface soil 0.5 N HCl extractable Cu concentrations of three sample zones, Route 234 swale site (See also Figure 13).

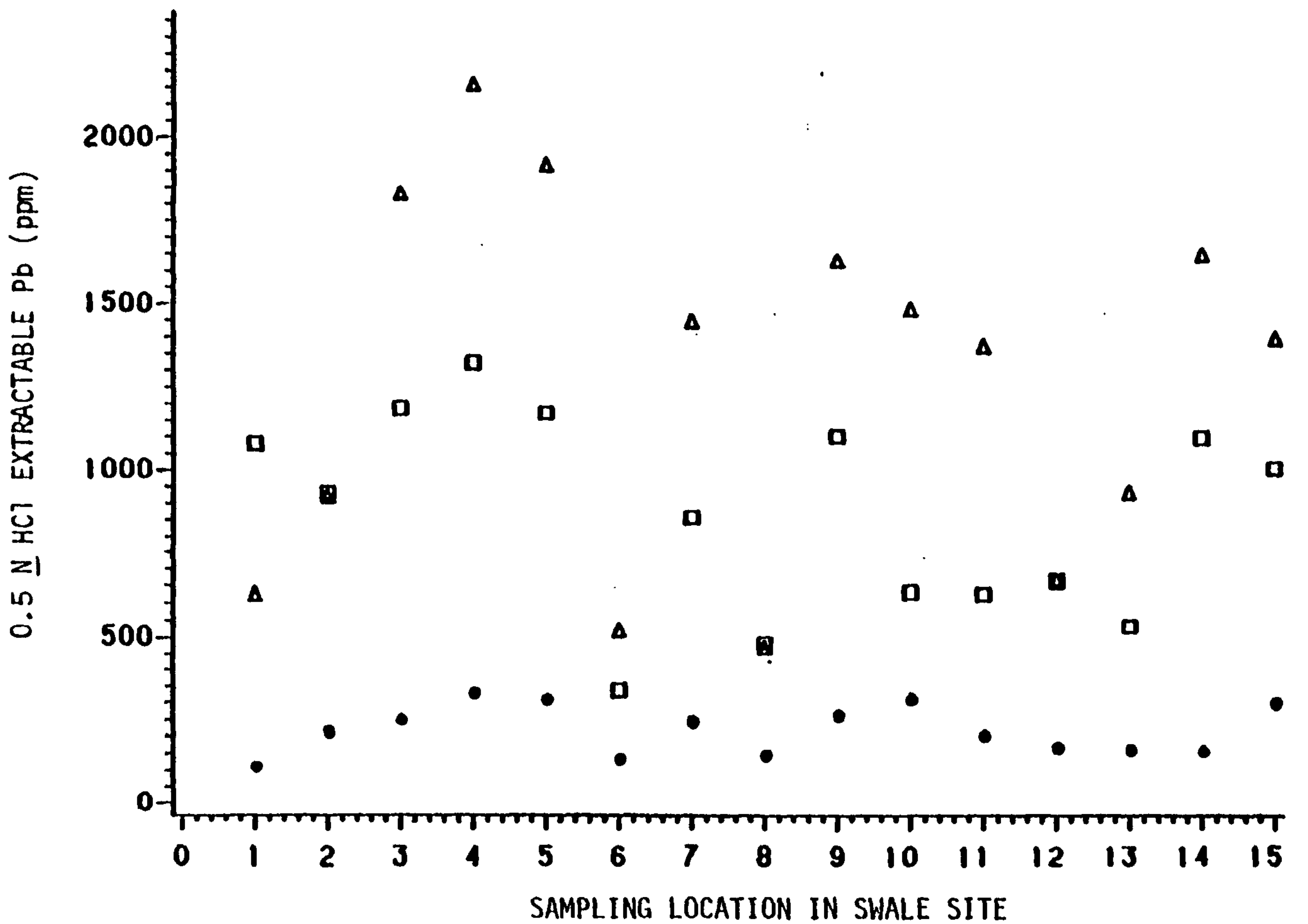


Figure 10-24. Comparison of surface soil 0.5 N HCl extractable Pb concentrations of three sample zones, Route 234 swale site (See also Figure 13).

sites (Figures 10-14 and 10-18). Beyond this observation, no other clear trends are visually apparent. The statistical analyses, however, allowed a closer examination of the data.

For all of the study trace metals, the results of the Friedman Rank Sums Tests provide very strong evidence that there were differences among the sampling zones at each of the study sites (Table 10-5). To evaluate if the trace metals had accumulated in the swale zone soils, control-treatment comparisons, based on Firedman Rank Sums were employed. The road zone was used as the control, with which the swale zone and yard zone metal concentrations were compared. If the swale zone metal concentrations were greater than the road zone metal concentrations, then a case would be made for enrichment in the swale zone soil. Control-treatment comparisons, rather than all treatment comparisons, were used because smaller differences can be more readily detected due to fewer total comparisons. A summary of the comparisons is given in Table 10-6.

It was found that both Cd and Zn concentrations were greater in the swale zone than in the road zone at the Fairidge Subdivision site. For the Stratton Woods site, only Zn was found to be significantly greater in the swale zone soil. The comparisons indicate that for the Rt. 234 site, Cd, Zn, and Cu were not very likely to have different concentrations in the swale zone soil than in the road zone. The comparison results also strongly indicated that the road zone Pb concentrations were greater than the swale zone concentrations. In addition, for all metals, at each of the sites, the test results strongly showed that the road zone soil trace metal concentrations were greater than the yard zone trace metal concentrations.

Patterns at Swale Sites. The total enriched Cd levels were much lower than any

Table 10-5. Results of Friedman Rank Sums analyses of differences among trace metal concentrations of surface soil from three sample zones at grassed swale study sites.

Site/Trace Metal	Friedman Rank Sums Statistic	Level of* Significance
Fairidge Subdivision Swale Site, n = 20		
Cd	16.0	< 0.001
Zn	32.4	< .001
Cu	25.6	< .001
Pb	34.9	< .001
Stratton Woods Subdivision Swale Site, n = 17		
Cd	13.7	.0015
Zn	22.8	< .001
Cu	24.4	< .001
Pb	23.4	< .001
Rt. 234, n = 15		
Cd	23.3	< .001
Zn	22.5	< .001
Cu	20.1	< .001
Pb	24.1	< .001

*Chi square distribution large sample approximation.

Alternate Hypothesis (Ha): metal concentrations of sampling zones, yard, swale, and road, are not equal.

Table 10-6. Comparison of trace metal concentrations in surface soil from swale zone and yard zone to concentration in road zone of the swale study sites; based on Friedman Rank Sums.

Site/Trace Metal	swale: direction of* difference	swale: P**	yard: direction of difference	yard: P
Fairidge Subdivision Swale Site				
Cu	+	.0371	-	.0072
Zn	+	.0042	-	.0002
Cu	0		-	< .00001
Pb	-	.00198	-	< .00001
Stratton Woods Subdivision Swale Site				
Cd	+	.3410	-	.0052
Zn	+	.0446	-	.0026
Cu	-	.0002	-	< .00001
Pb	-	.0058	-	< .00001
Rt 234 Swale Site				
Cd	+	.2872	-	< .00001
Zn	+	.5922	-	< .00001
Cu	+	.3570	-	.00001
Pb	-	.0327	-	< .00001

* + = metal conc. swale zone > metal conc. road zone
0 = equal rank sums
- = metal conc. swale zone < metal conc. road zone.

**level of significance.

other of the study metals. The Stratton Woods site had the lowest Cd concentrations and the Rt. 234 site had the highest (Figures 10-13, 10-17, and 10-21). With the exception of one observation, all data points were less than 1.2 ppm. The enrichment of Cd in the swales of the Fairidge site is evident in Figure 10-13. The difference between the 0.5 N HCl extractable Cd of the swale zone soil, and soil of the surrounding zones was no more than approximately 0.2 ppm.

Whereas the swale zone soil of the Fairidge site had slightly elevated Cd levels, the Zn concentrations of both residential sites were much greater in the swales than surrounding areas (Figures 10-14 and 10-18). Differences between swale and adjoining zones were as much as several hundred ppm. The Zn enrichment in the Fairidge swales was greater than that of Stratton Woods swales. The maximum concentration observed at the Fairidge site was more than 350 ppm; the maximum Zn concentration for Stratton Woods was less than half of the Fairidge observed maximum. The soil Zn concentrations in the sampling zones of the Rt. 234 site were in the same range as those of the Stratton Woods site (Figures 10-18 and 10-22).

At each of the study sites, Cu was the third most abundant of the study metals. The Cu concentrations were smallest at the Fairidge site, and greatest at the Rt. 234 (Figures 10-15 and 10-23). The typical roadside pattern of decreased trace metal concentrations with increased distance from the road was evident at the Stratton Woods site (Figure 10-19).

The same pattern of decreased concentrations with distance form the road was observed for Pb at each of the study sites (Figures 10-16, 10-20, and 10-24). However, the Rt. 234 site had the largest Pb concentrations and the strongest pattern (Figure 10-24). The Pb levels at the Fairidge site were generally greater than the Stratton Woods site (Figures 10-16 and 10-20). At both of these residential sites, the differences between the Pb concentrations of the swale soil and road soil were relatively small; sometimes the swale soil had equal or greater concentrations of Pb.

The dramatic accumulation of Zn in the swale soils of the Fairidge and Stratton Woods site is unusual in light of the Zn pattern at the Rt. 234 site. This highway had been in use a longer time than either of the residential areas and it had much higher traffic volumes than the residential areas. However, the Rt. 234 Zn levels were no greater than those of the Stratton Woods site. Also, there was no significant accumulation of Zn in the highway median swales. Another factor, in addition to urban runoff, seemed to be involved in the Zn enrichment of the resident swale soils.

To put the accumulation of Zn and Cd in swale soils in perspective, the median concentration increase and associated load are presented in Table 10-7. The increase was calculated as the difference between the metal concentration of a swale soil and the concentration of its associated yard soil. The assumption that 100 percent of the metal remains in the surface five cm of soils will be substantiated later in this chapter. Both the total Zn increase and the rate of Zn increase were greater at the Fairidge site than the Bulk Main site. The Cd concentration increase and load were very modest at the Fairidge site.

Impacts of Galvanized Culverts. To determine if the Zn enrichment of residential swale soils was due to the presence of galvanized culverts, the additional surface sampling, described in the previous chapter, was conducted. Figures 10-25 through 10-28 show the distribution of trace metal concentration with distance dowslope of culverts. Zinc had the most dramatic concentration decrease with distance from the culverts.

For the Fairidge site, the results of the Page Ordered Alternative Tests

Table 10-7. Accumulation and loads of trace metals found to have significant enrichment in swale surface soils.

Site/Metal	Median concentration increase (ppm)	Median Conc.* increase per year (ppm/yr)	Median** load (kg/ha)	Median** load rate (kg/ha/yr)
Fairidge Subdivision Swale Site				
Cd	0.11	0.02	0.08	0.01
Zn	129.0	21.5	96.4	16.1
Stratton Woods Subdivision Swale Site				
Zn	64.4	16.1	48.1	12.0

*assumes uniform accumulation over time.
**assumes 100% of metals applied to soil retained in upper 5 cm.

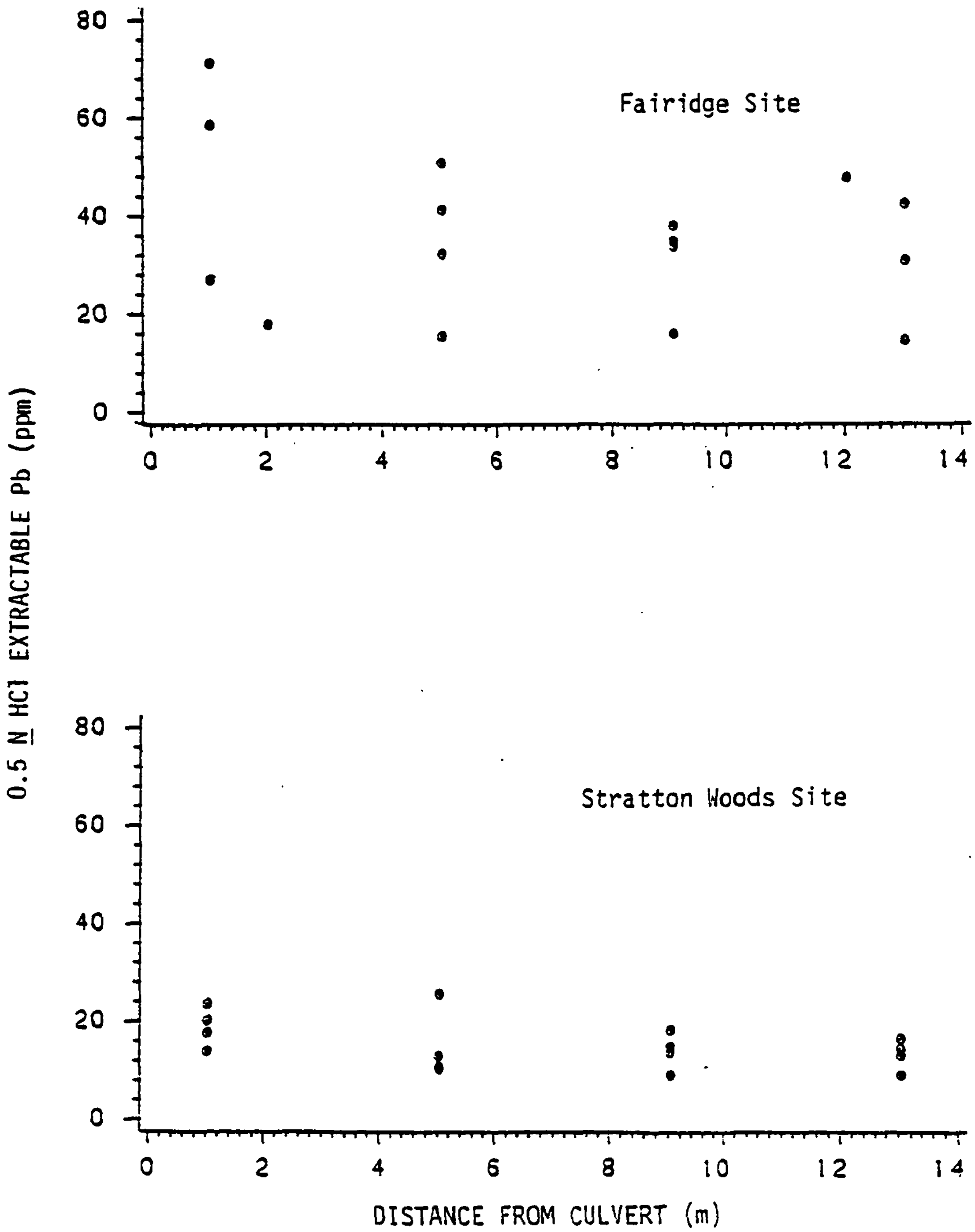


Figure 10-25. Variation of 0.5 N HCl extractable Pb of swale surface soils with distance downslope of culverts at the Fairidge and Stratton Woods sites.

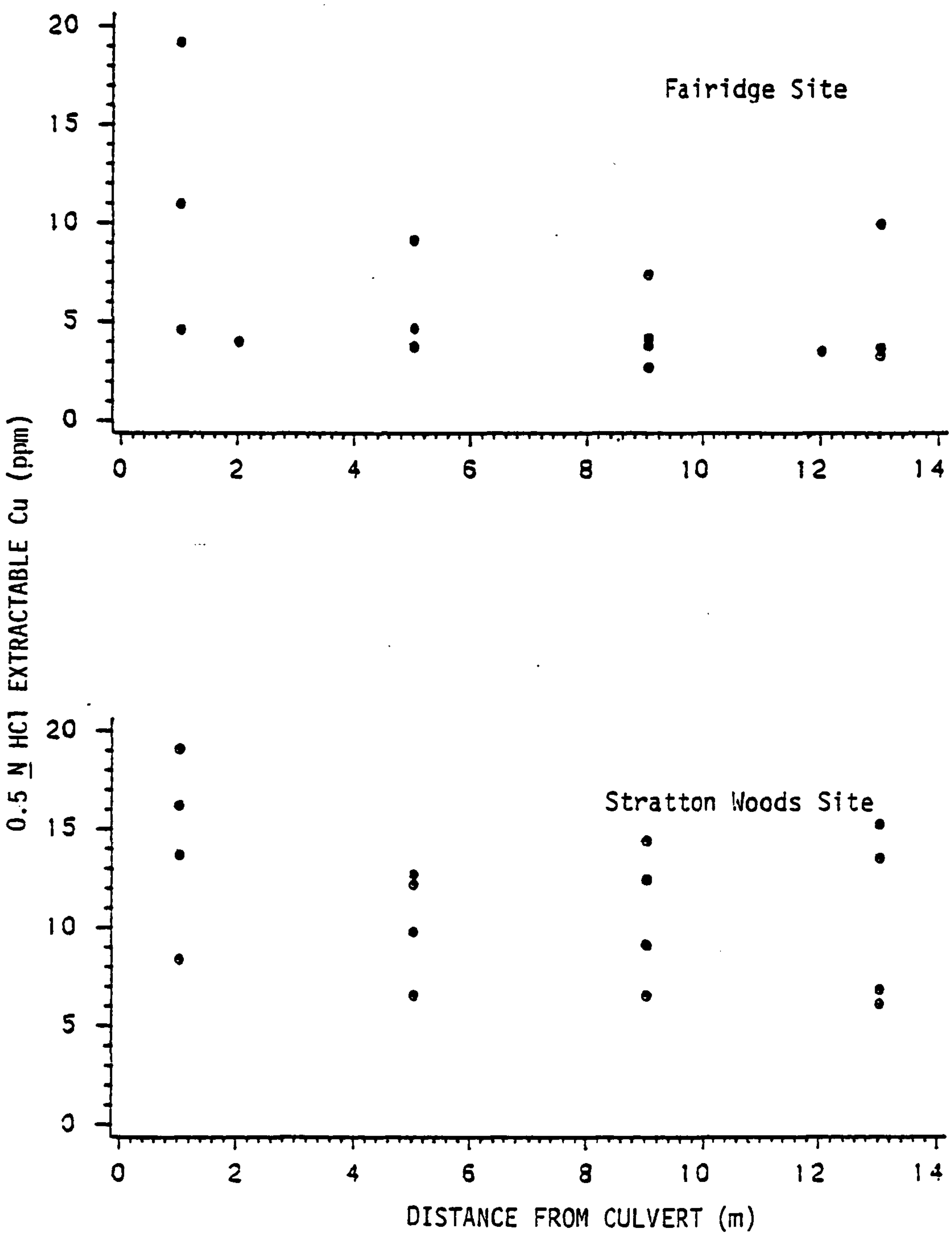


Figure 10-26. Variation of 0.5 N HCl extractable Cu of swale surface soils with distance downslope of culverts at the Fairidge and Stratton Woods sites.

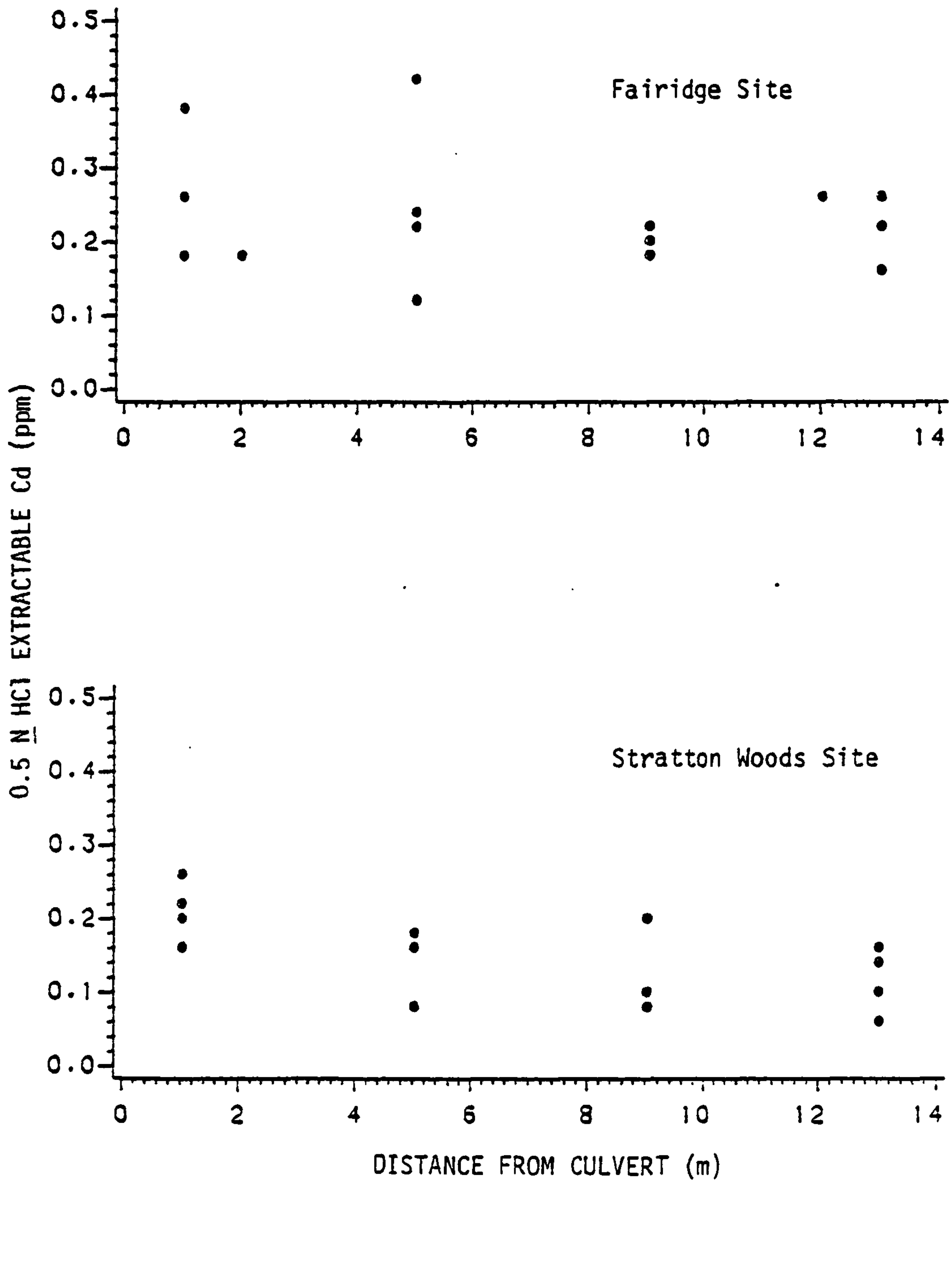


Figure 10-27: Variation of 0.5 N HCl extractable Cd of swale surface soils with distance downslope of culverts at the Fairidge and Stratton Woods sites.

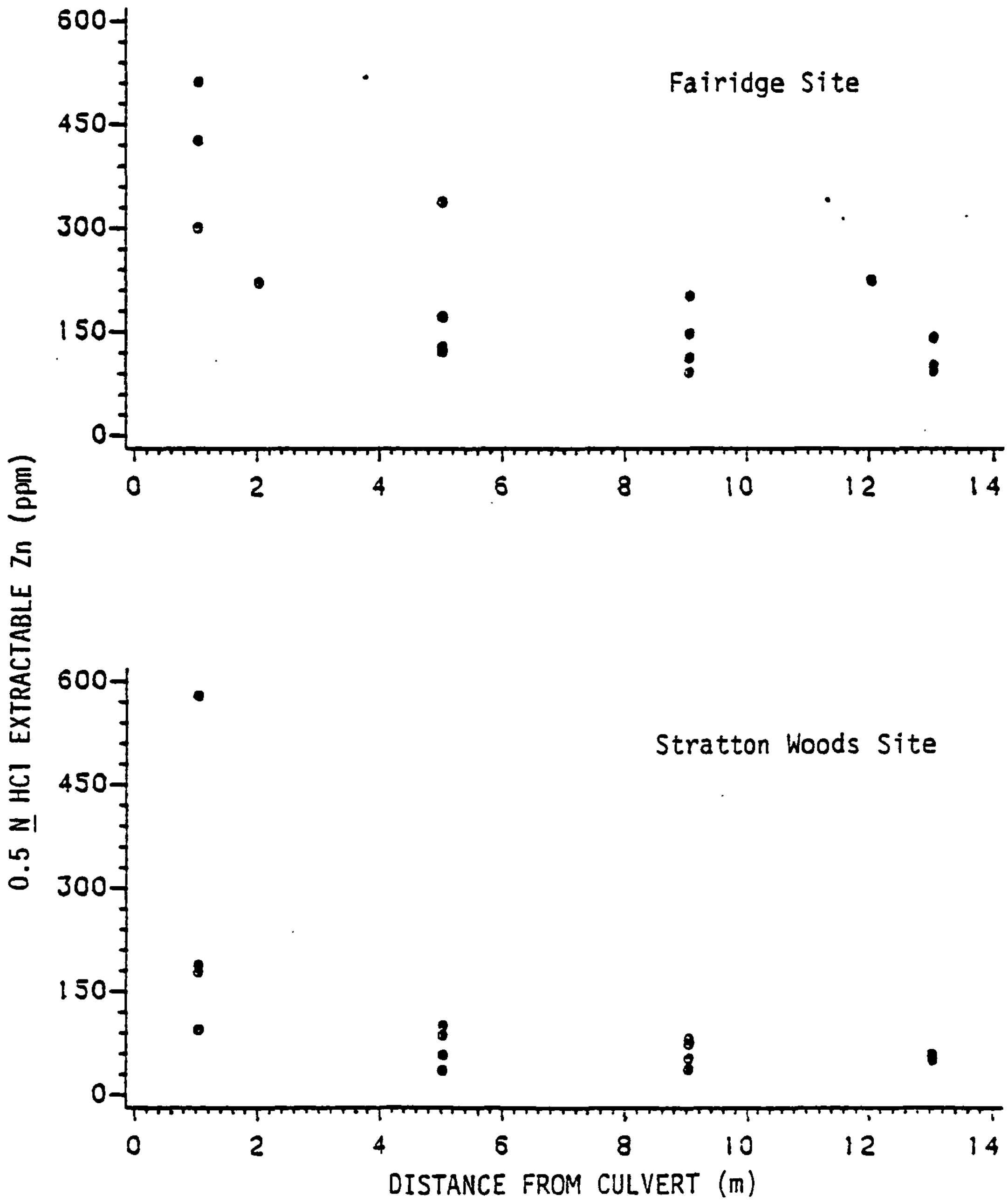


Figure 10-28. Variation of 0.5 N HCl extractable Zn of swale surface soils with distance downslope of culverts at the Fairidge and Stratton Woods sites.

strongly show a decrease of Zn and Cu concentrations with distance from culverts (Table 10-8). The test results, with less confidence, also reveal a decrease of Pb concentrations with distance downslope from culverts. Cadmium, Zn, and Pb all had significant concentration decreases with distance from culverts at the Stratton Woods site; the P value (level of significance, probability of Type I error) of Zn was especially small.

The changes in trace metal concentrations with distance from the culverts, were estimated by the slopes of Theil regression equations (Table 10-9). The large slopes of the Zn equations reflected the sharp drop of Zn concentrations with distance from the culverts. Copper and Cd had significant slopes. However, the slopes of the lines were small for both elements. The P values of the Pb slopes were much greater than any of the other metals found to have concentration decreases downslope of culverts. Also, the slopes of the Pb models were small and of questionable significance.

Detention Basins. The trace metals distributions and spatial patterns for the detention basin sites are presented in Figures 10-30 through 10-53. The even number figures in this section are box plots that compare the trace metal concentrations of basin site sampling zones (i.e., basin zone, control zone outside the basin, and for the KMart site, sideslope zone). Figure 10-29 provides an explanation of the box plots used in this section. The even numbered figures are isoconcentration maps that illustrate the spatial pattern of trace metal distribution at the swale sites. For the isoconcentration maps, it is important to note that the contour intervals are not uniform. Instead of including contour lines that could not be substantiated by the data to make uniform contour intervals, only those lines that could be established directly from the trace metal data points were included.

Figures 10-30, 10-32, 10-34, and 10-36 illustrate the range of metal con-

Table 10-8. Page Ordered Alternative Test (based on Friedman Rank Sums) of surface soil trace metal concentration differences due to distance from galvanized culverts at the Fairidge and Stratton Woods sites.

Site/Trace Metal	Page Statistic (large sample approx.)	Level of* Significance
Fairidge Subdivision Swale Site		
Cd	.35	.363
Zn	2.77	.003
Cu	2.08	.019
Pb	1.39	.082
Stratton Woods Subdivision Swale Site		
Cd	1.82	.034
Zn	2.77	.003
Cu	0.52	.302
Pb	1.99	.023

*Test statistic and level of significance based on normal theory approximations.

Ha: metal concentrations decrease with distance from culvert.

Table 10-9. Theil linear regression models relating surface soil trace metal concentration and distance downslope from galvanized culverts at the Fairidge and Stratton Woods sites.

Site/Metal	Model	Significance* Level	95% Confidence Interval for Slope
Fairidge Subdivision Swale Site			
Zn	$\hat{y}$ = 314.31 - 16.38x	.003	(-32.87, -3.78)
Cu	$\hat{y}$ = 6.36 - 0.12x	.026	(- 0.68, 0.01)
Pb	$\hat{y}$ = 42.76 - 0.99x	.199	(- 3.67, 1.35)
Stratton Woods Subdivision Swale Site			
Cd	$\hat{y}$ = 0.2024 - .0074x	.039	(- 0.1500, 0.0000)
Zn	$\hat{y}$ = 128.54 - 6.11x	.003	(-14.68, -1.52)
Pb	$\hat{y}$ = 17.82 - 0.39x	.133	(- 1.08, 0.22)

*Ha: slope less than zero.

NOTE: $\hat{y}$ for each metal = 0.5 N HCl extractable metal (ppm).
x = distance down slope from culvert (m).

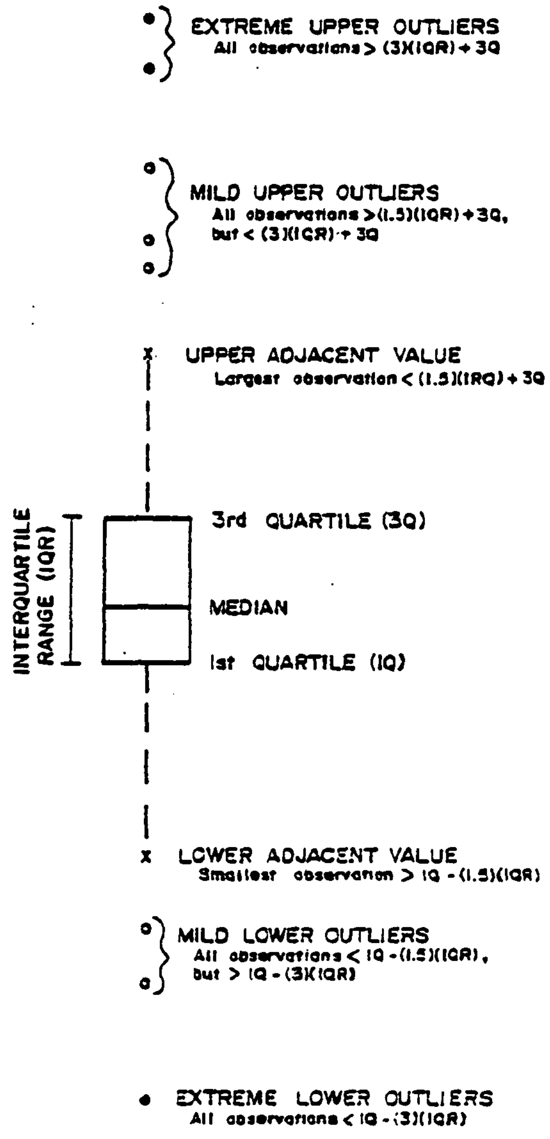


Figure 10-29. Component description of box plots of surface soil trace metal concentrations of detention basin sites; even numbered figures, 36 through 59 (reference 86).

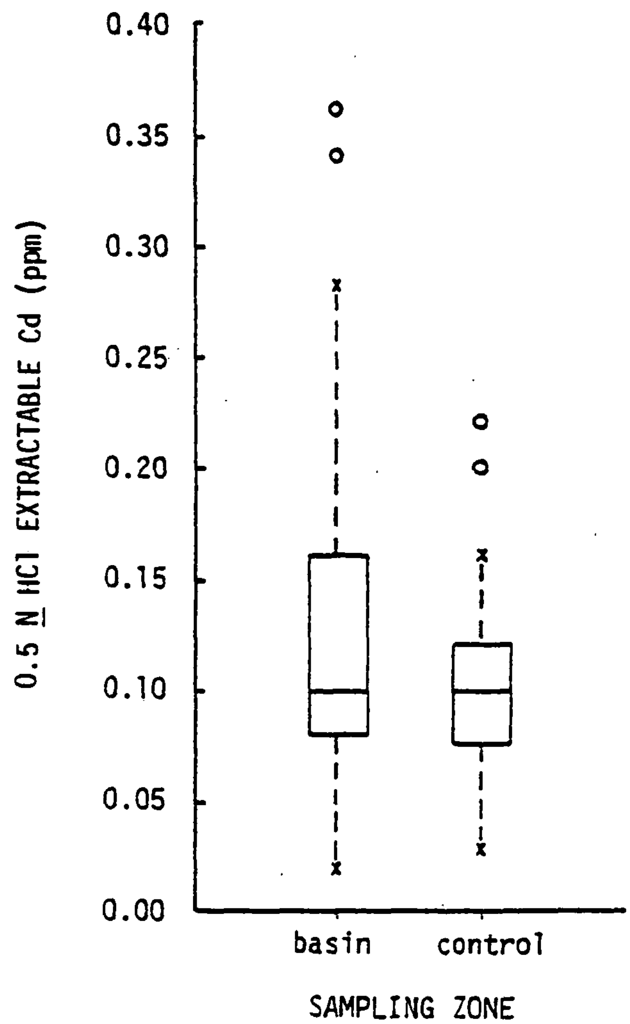


Figure 10-30. Comparison of 0.5 N HCl extractable Cd of basin and control surface soils, Stedwick detention basin site (See also Figure 15).

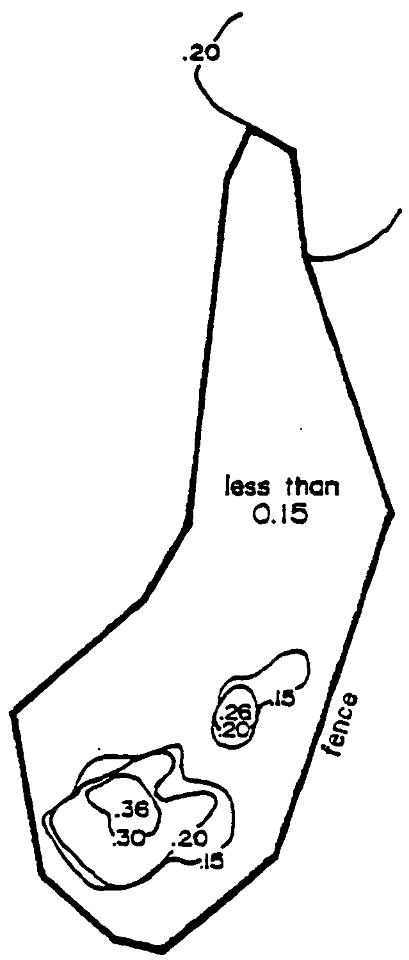


Figure 10-31. Surface soil 0.5 N HCl extractable Cd isoconcentration map (ppm), Stedwick detention basin site (See also Figure 15).

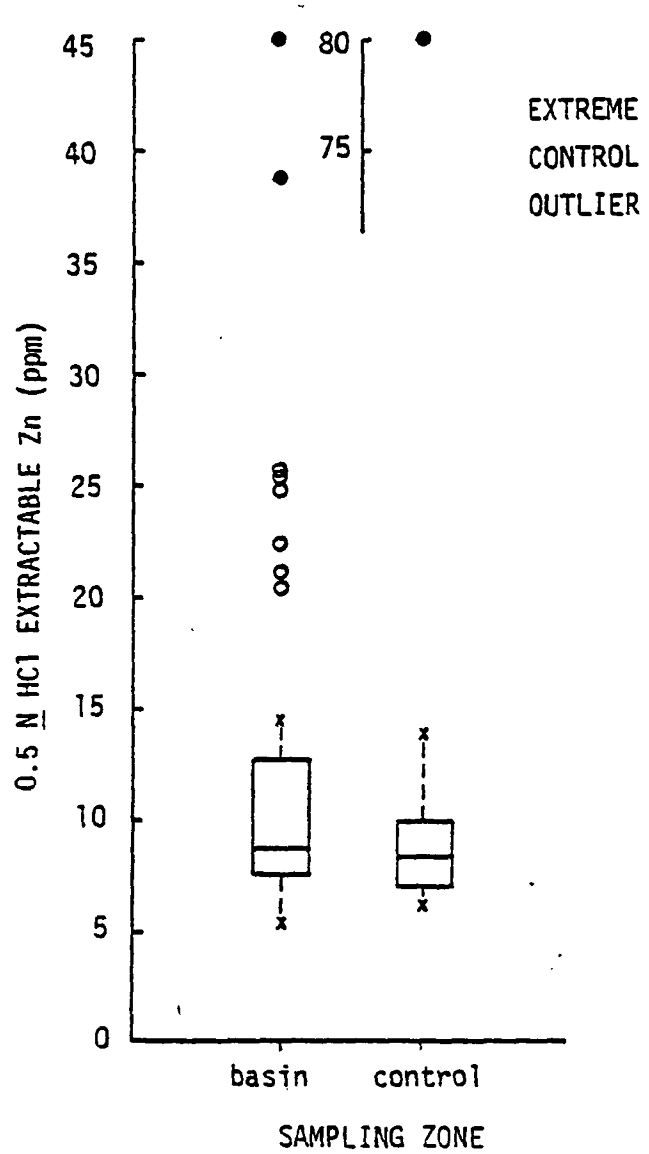


Figure 10-32. Comparison of 0.5 N HCl extractable Zn of basin and control surface soils, Stedwick detention basin site (See also Figure 15).

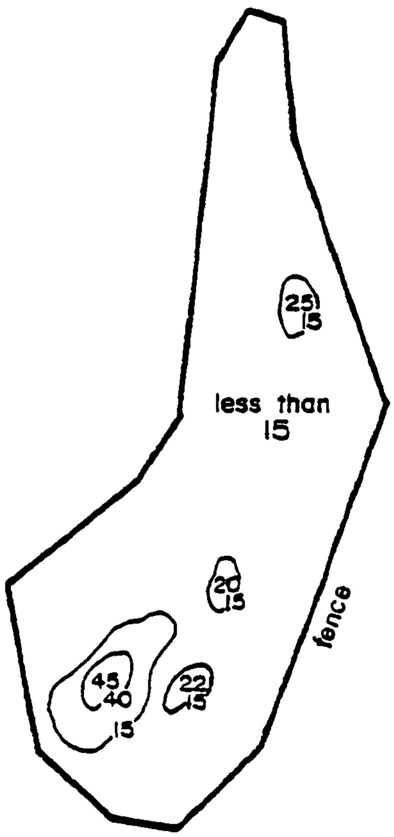


Figure 10-33. Surface soil 0.5 N HCl extractable Zn isoconcentration map (ppm), Stedwick detention basin site (See also Figure 15).

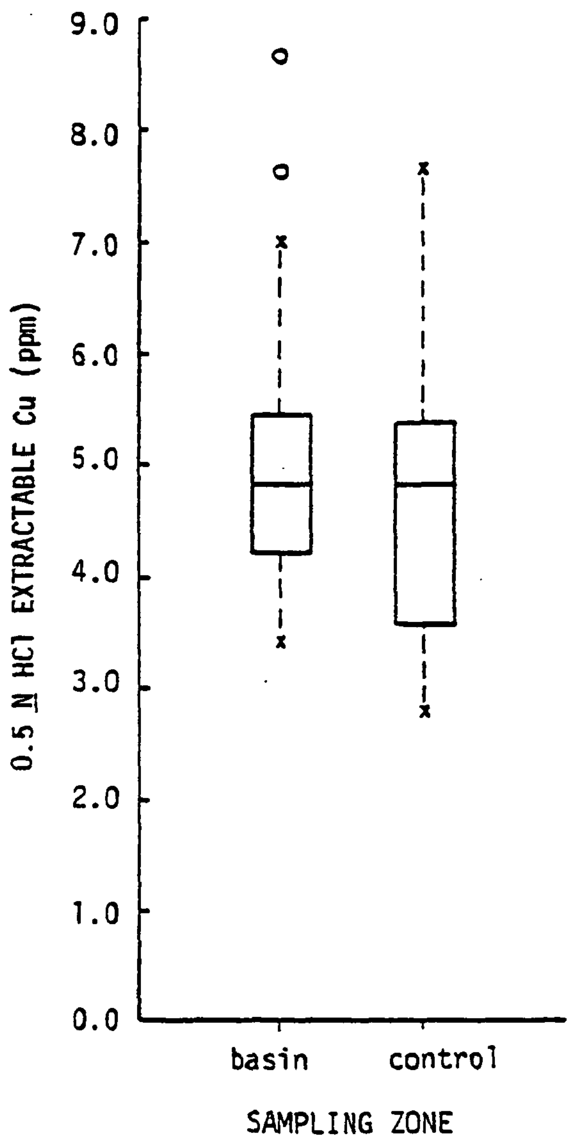


Figure 10-34. Comparison of 0.5 N HCl extractable Cu of basin and control surface soils, Stedwick detention basin site (See also Figure 15).

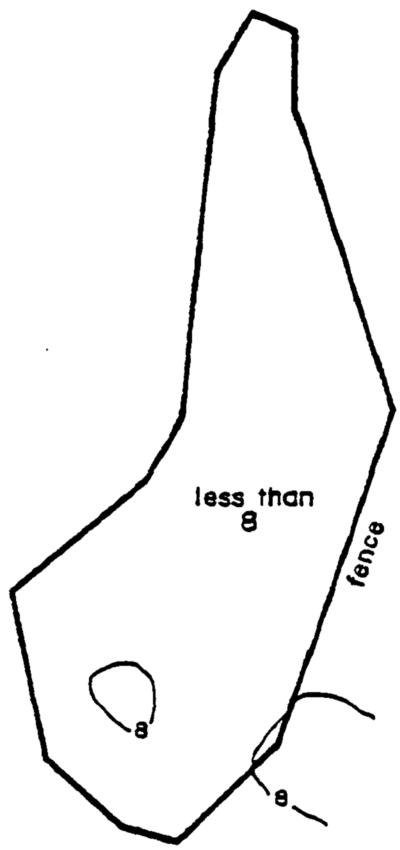


Figure 10-35. Surface soil 0.5 N HCl extractable Cu isoconcentration map (ppm), Stedwick detention basin site (See also Figure 15).

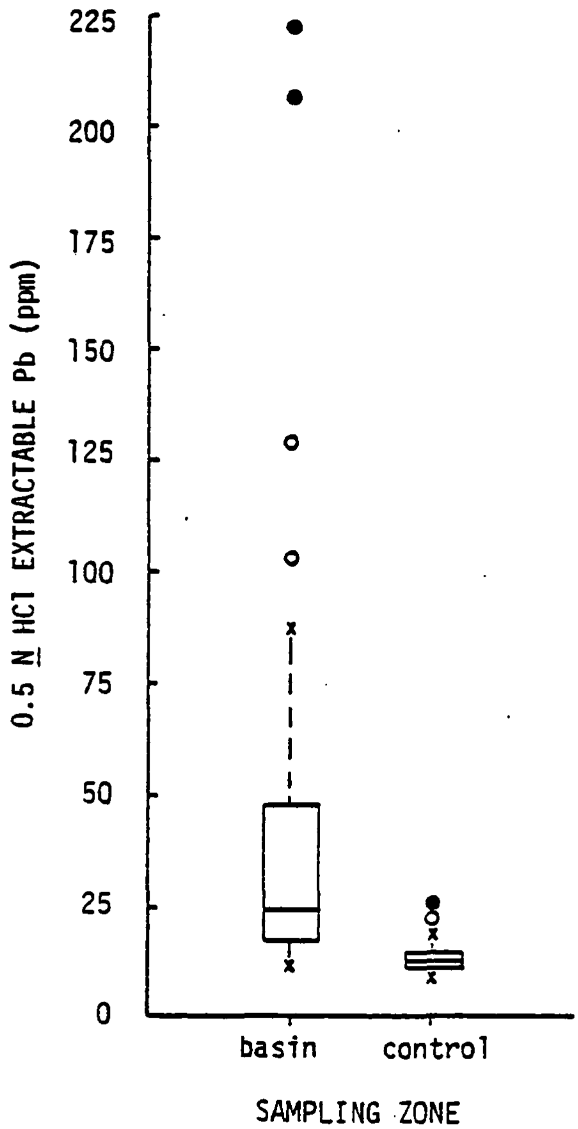


Figure 10-36. Comparison of 0.5 N HCl extractable Pb of basin and control surface soils, Stedwick detention basin site (See also Figure 15).

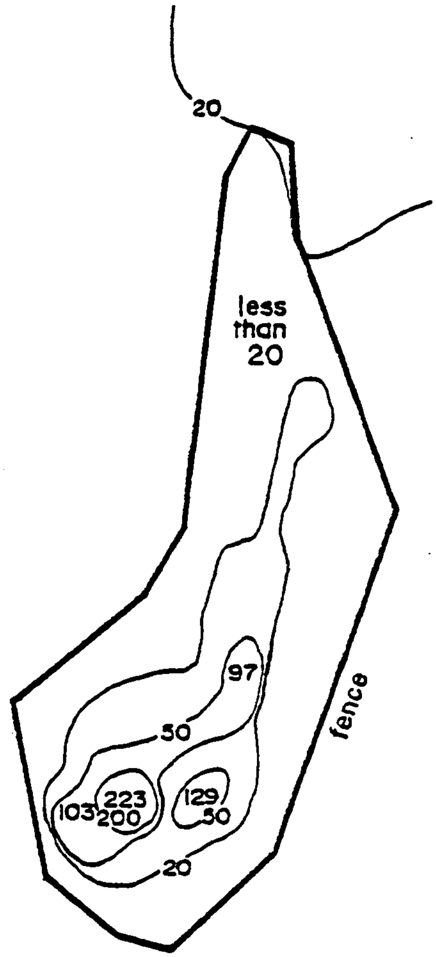


Figure 10-37. Surface soil 0.5 N HCl extractable Pb isoconcentration map (ppm), Stedwick detention basin site (See also Figure 15).

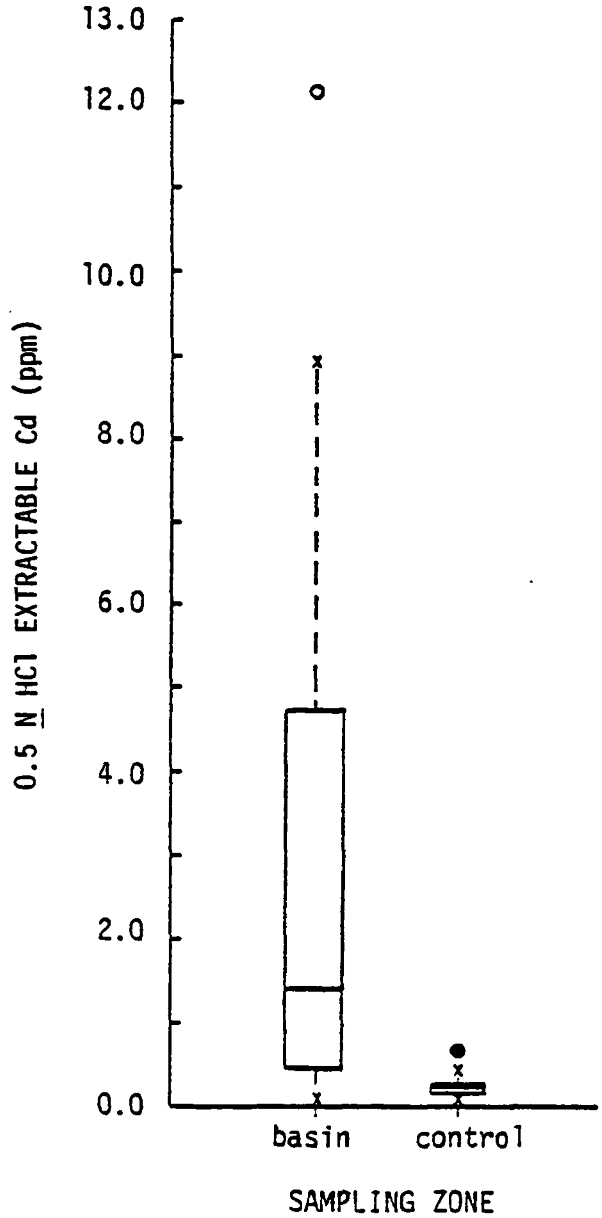


Figure 10-38. Comparison of 0.5 N HCl extractable Cd of basin and control surface soils, Bulk Mail detention basin site (See also Figure 16).

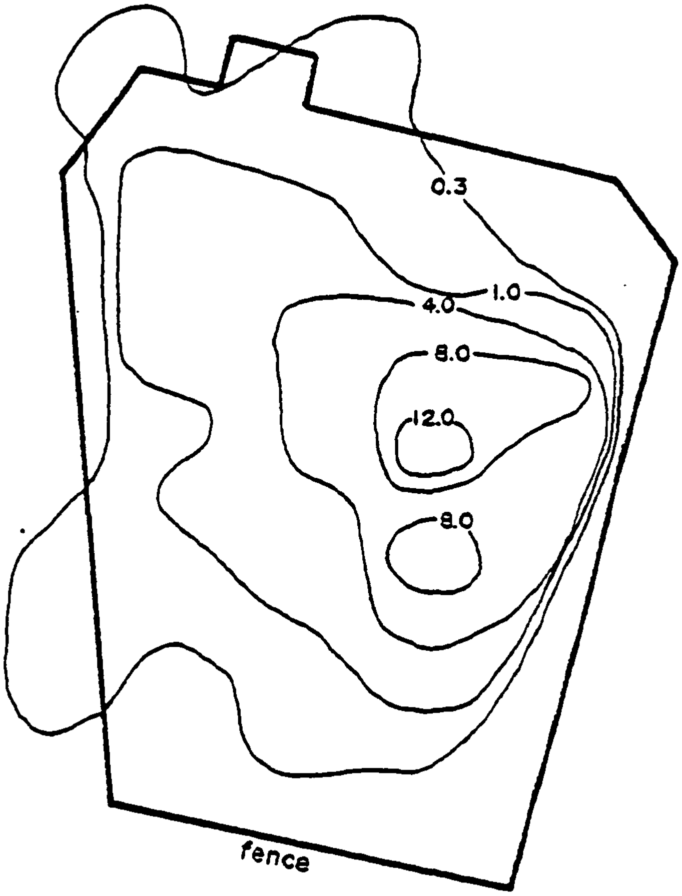


Figure 10-39. Surface soil 0.5 N HCl extractable Cd isoconcentration map (ppm), Bulk Mail detention basin site (See also Figure 16).

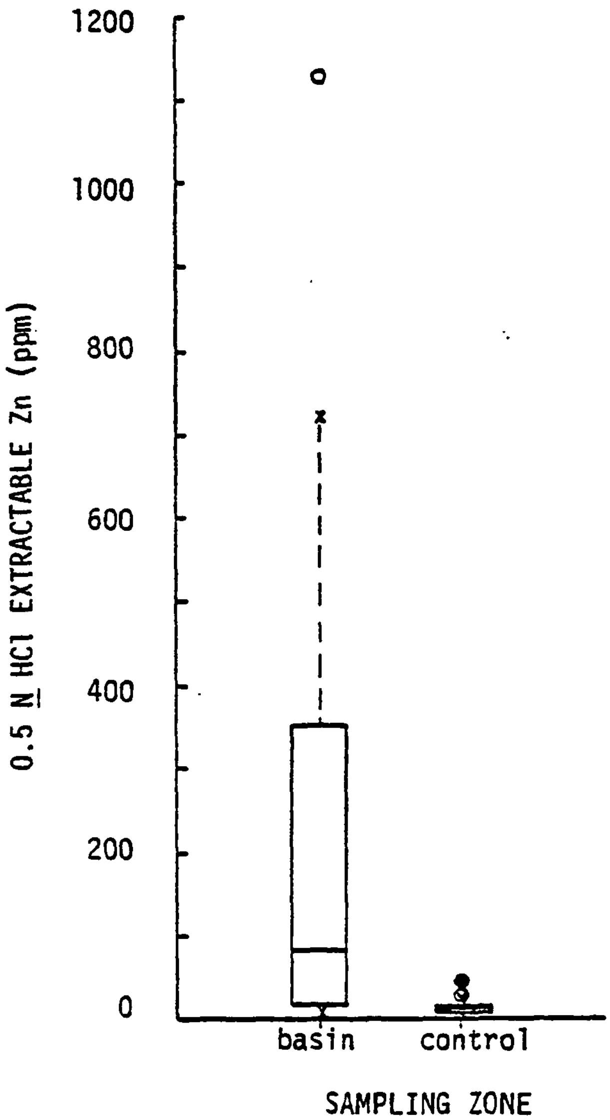


Figure 10-40. Comparison of 0.5 N HCl extractable Zn of basin and control surface soils, Bulk Mail detention basin site (See also Figure 16).

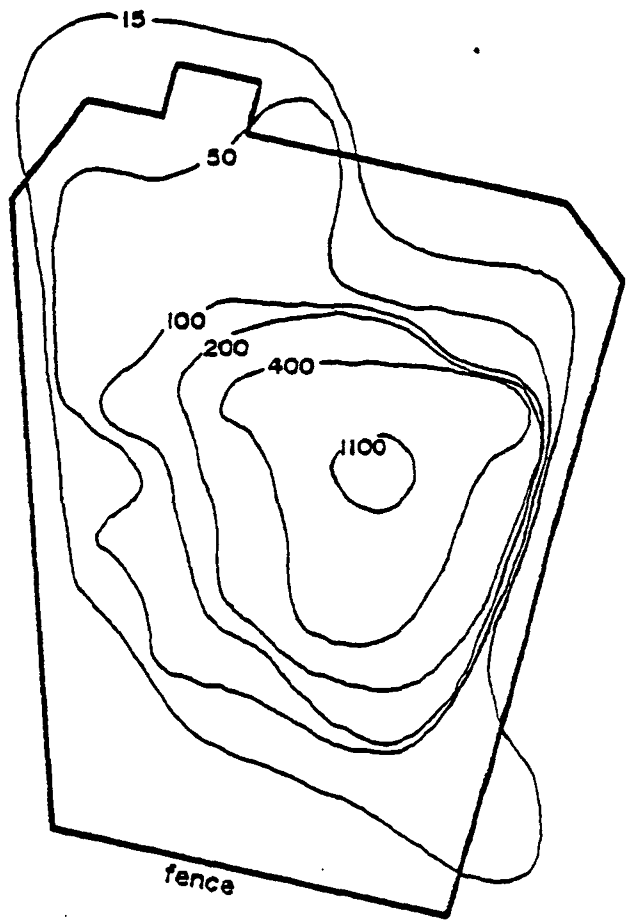


Figure 10-41. Surface soil 0.5 N HCl extractable Zn isoconcentration map (ppm), Bulk Mail detention basin site (See also Figure 16).

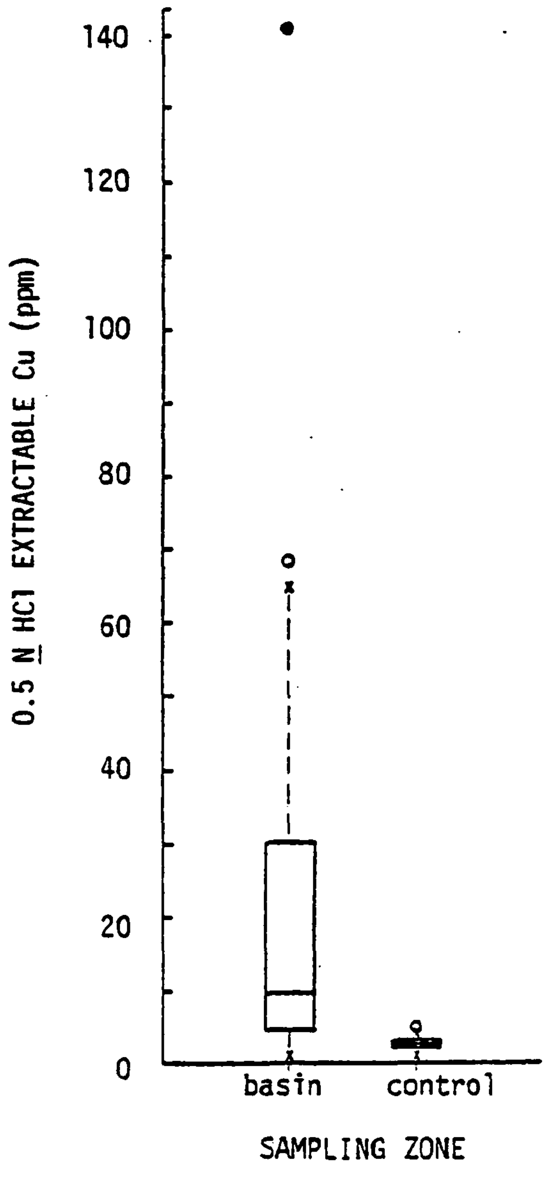


Figure 10-42. Comparison of 0.5 N HCl extractable Cu of basin and control surface soils, Bulk Mail detention basin site (See also Figure 16).

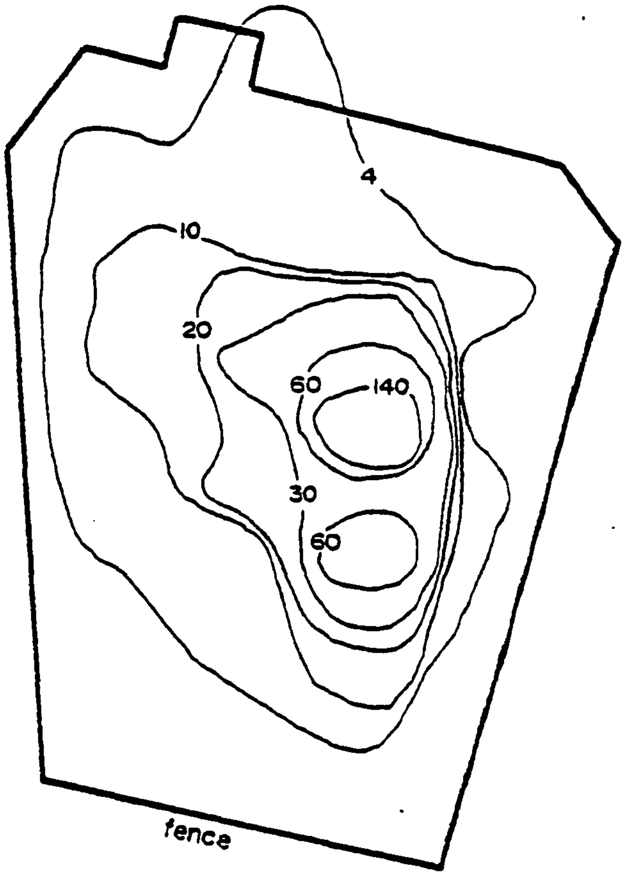


Figure 10-43. Surface soil 0.5 N HCl extractable Cu isoconcentration map (ppm), Bulk Mail Detention basin site (See also Figure 16).

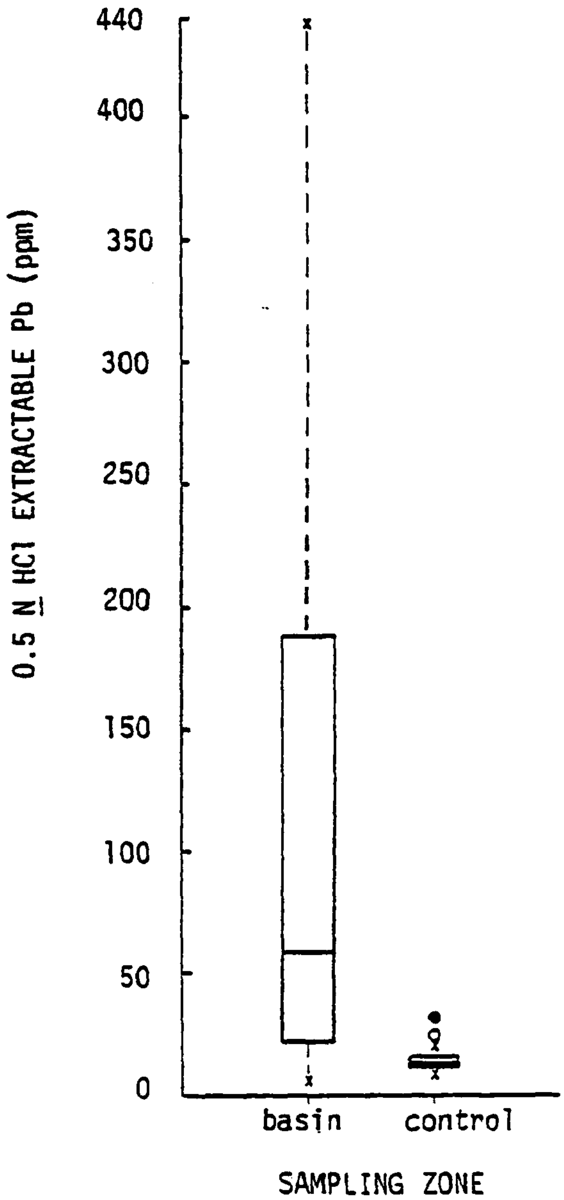


Figure 10-44. Comparison of 0.5 N HCl extractable Pb of basin and control surface soils, Bulk Mail detention basin site (See also Figure 16).

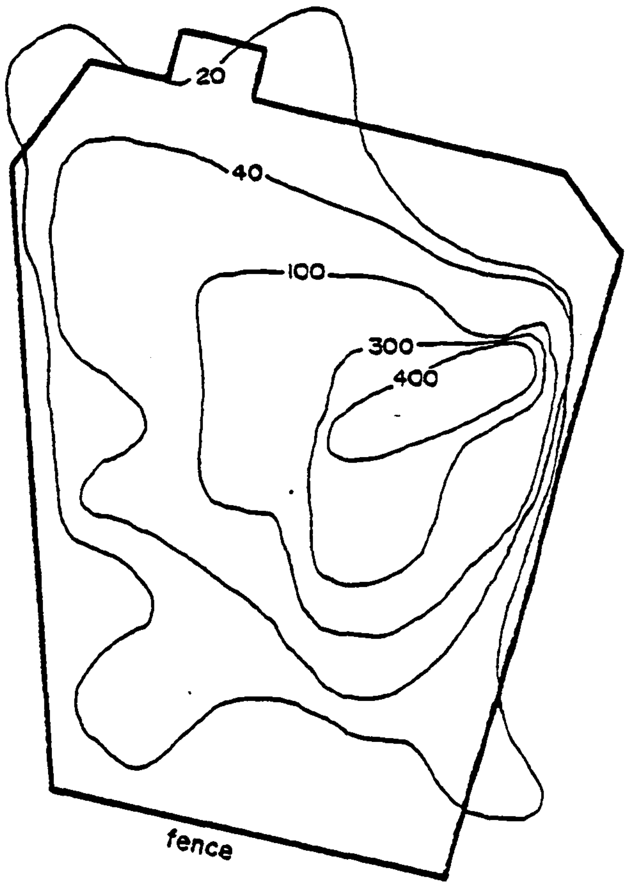


Figure. 10-45. Surface soil 0.5 N HCl extractable Pb isoconcentration map (ppm), Bulk Mail detention basin (See also Figure 16).

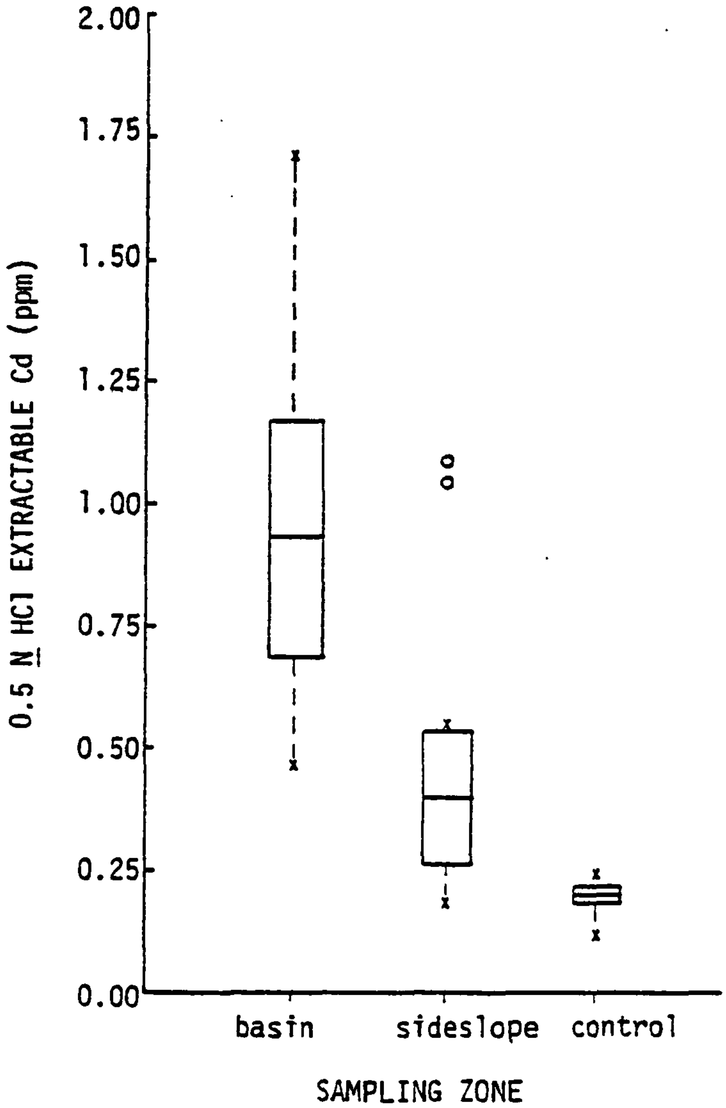


Figure 10-46. Comparison of 0.5 N HCl extractable Cd of basin, sideslope, and control surface soils, KMart detention basin site (See also Figure 17).

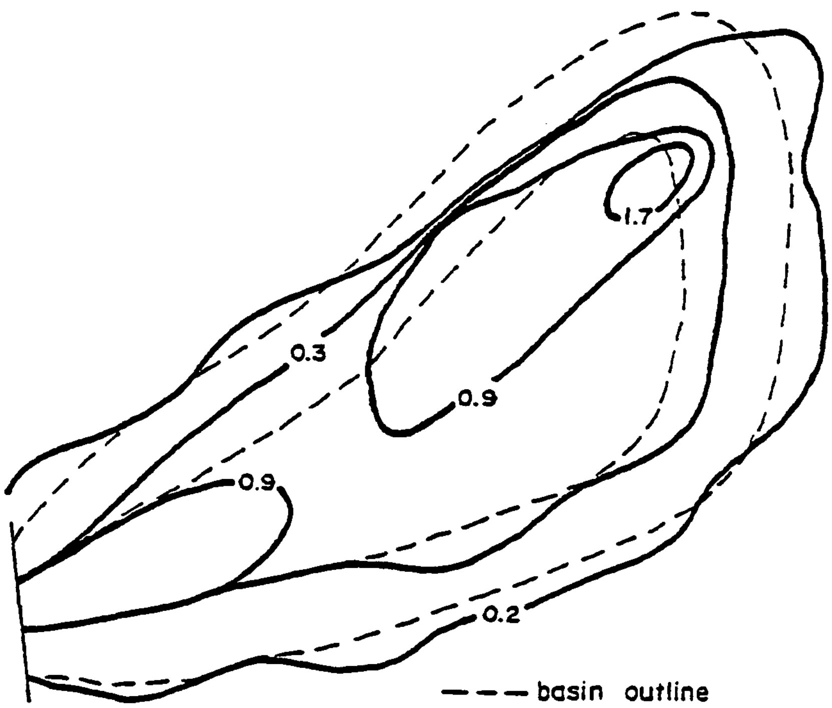


Figure 10-47. Surface soil 0.5 N HCl extractable Cd isoconcentration map (ppm), KMart detention basin site (See also Figure 17).

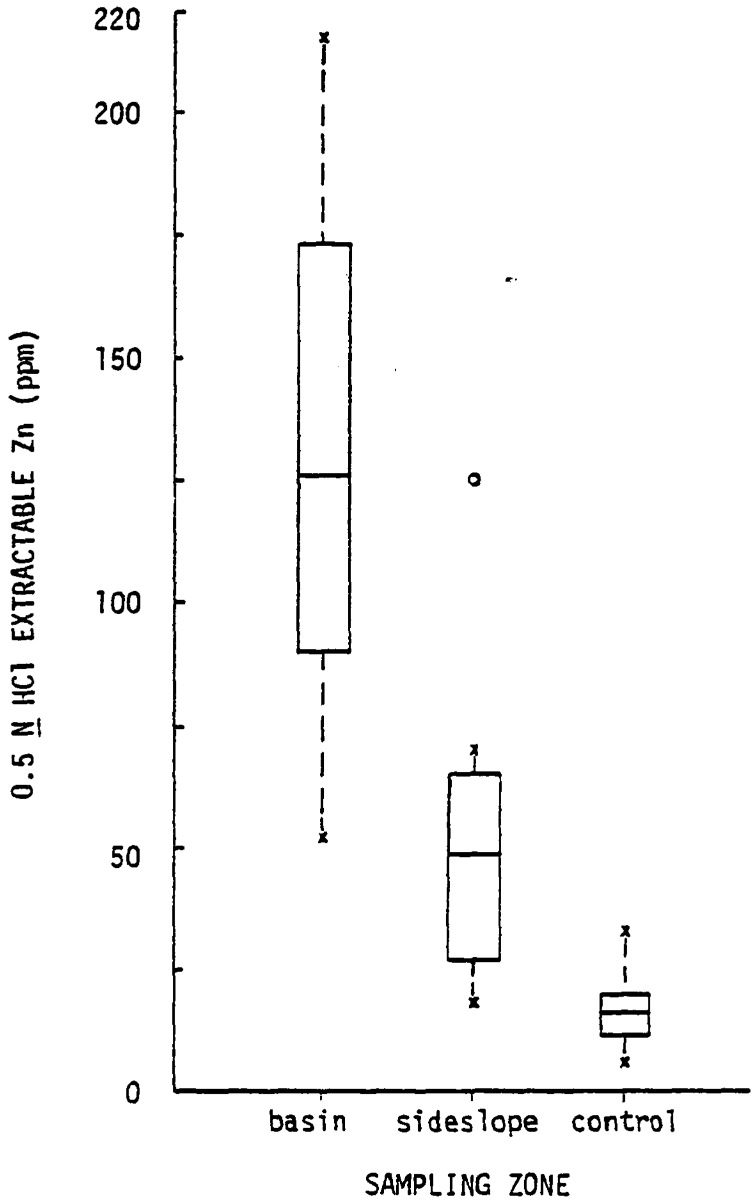


Figure 10-48. Comparison of 0.5 N HCl extractable Zn of basin, sideslope, and control surface soils, KMart detention basin site (See also Figure 17).

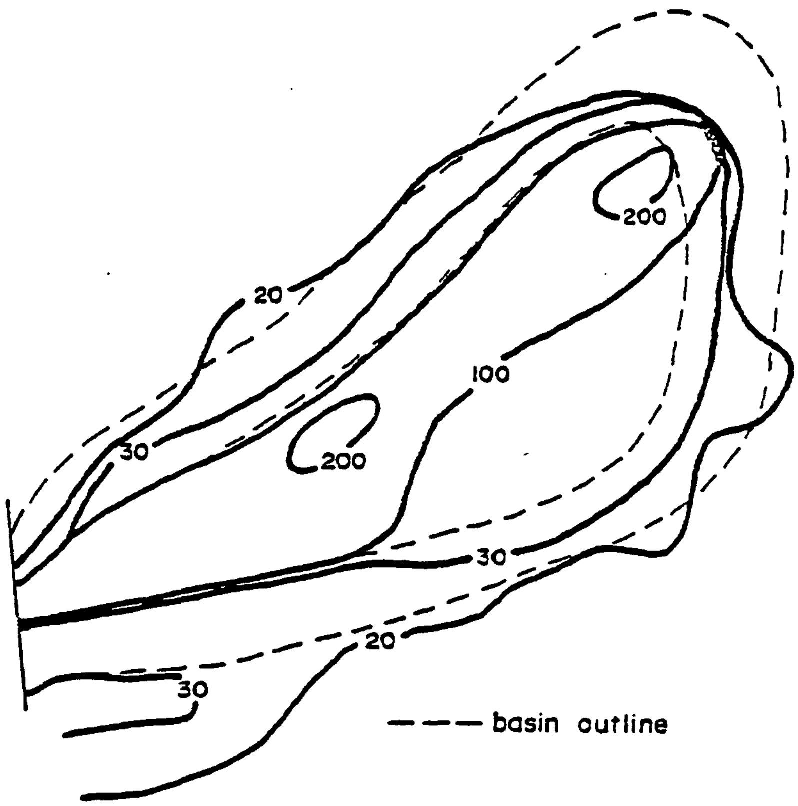


Figure 10-49. Surface soil 0.5 N HCl extractable Zn isoconcentration map (ppm), KMart detention basin site (See also Figure 17).

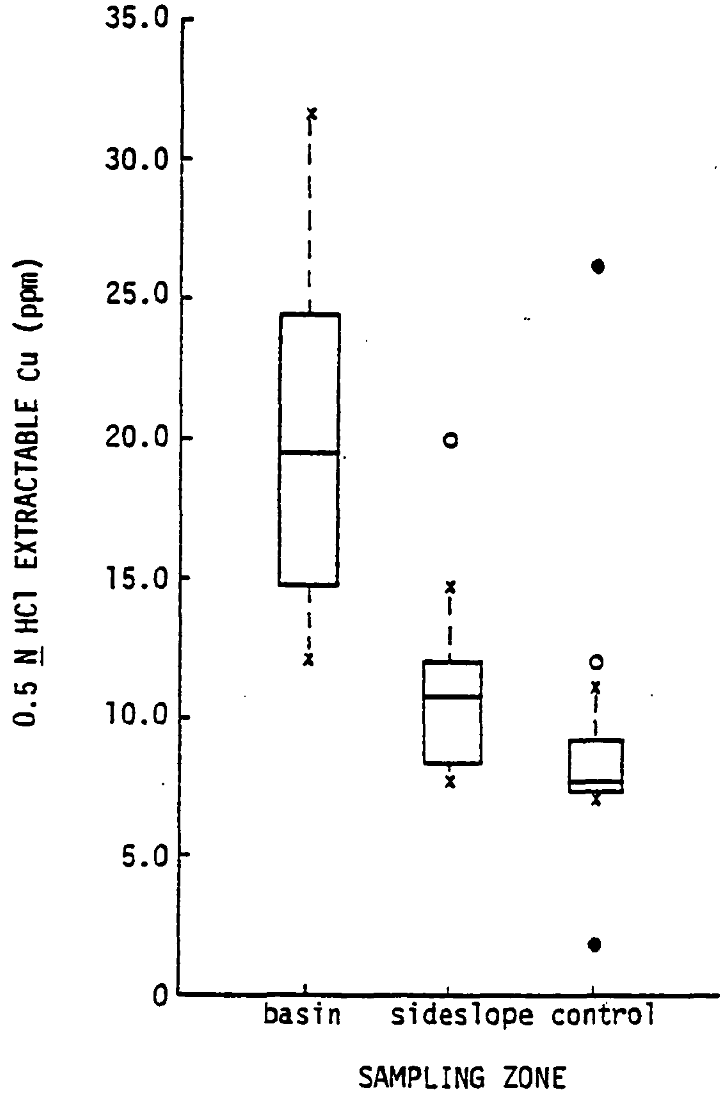


Figure 10-50. Comparison of 0.5 N HCl extractable Cu of basin, sideslope, and control surface soils, KMart detention basin site (See also Figure 17).

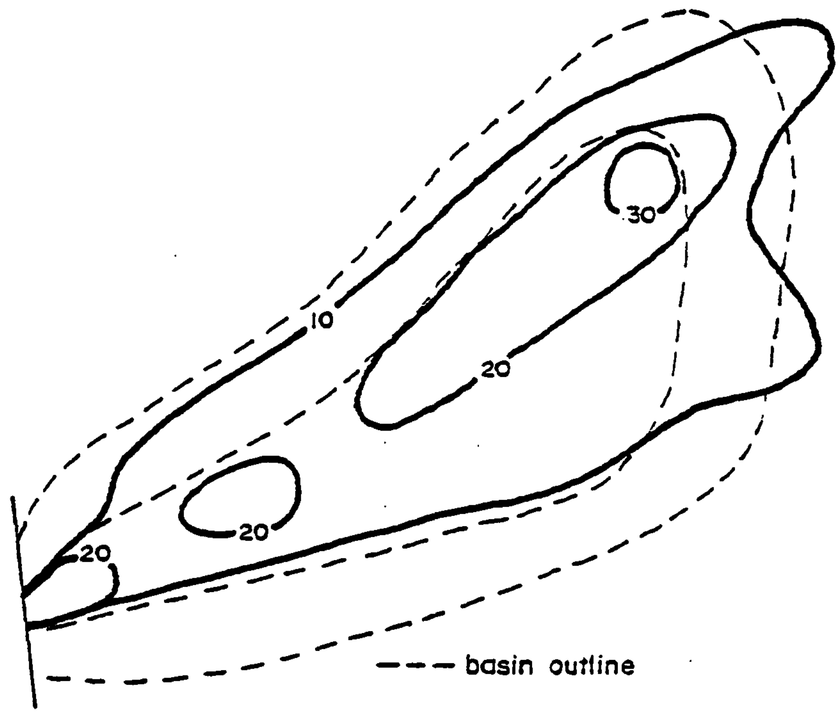


Figure 10-51. Surface soil 0.5 N HCl extractable Cu isoconcentration map (ppm), KMart detention basin site (See also Figure 17).

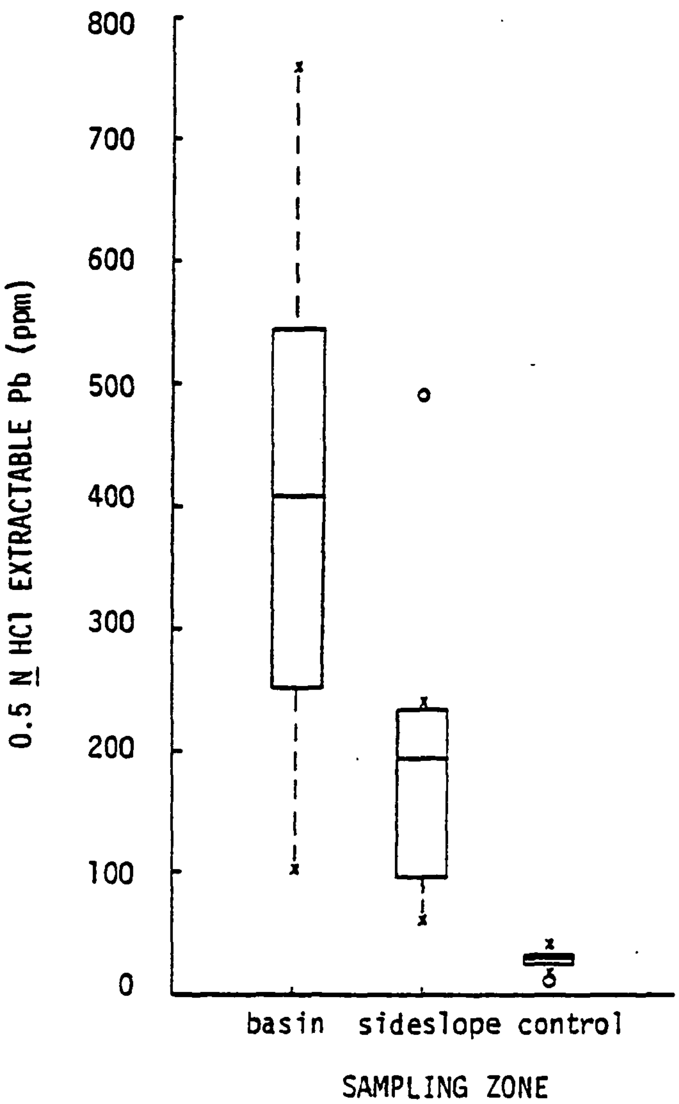


Figure 10-52. Comparison of 0.5 N HCl extractable Pb of basin, sideslope, and control surface soils, KMart detention basin side (See also Figure 17).

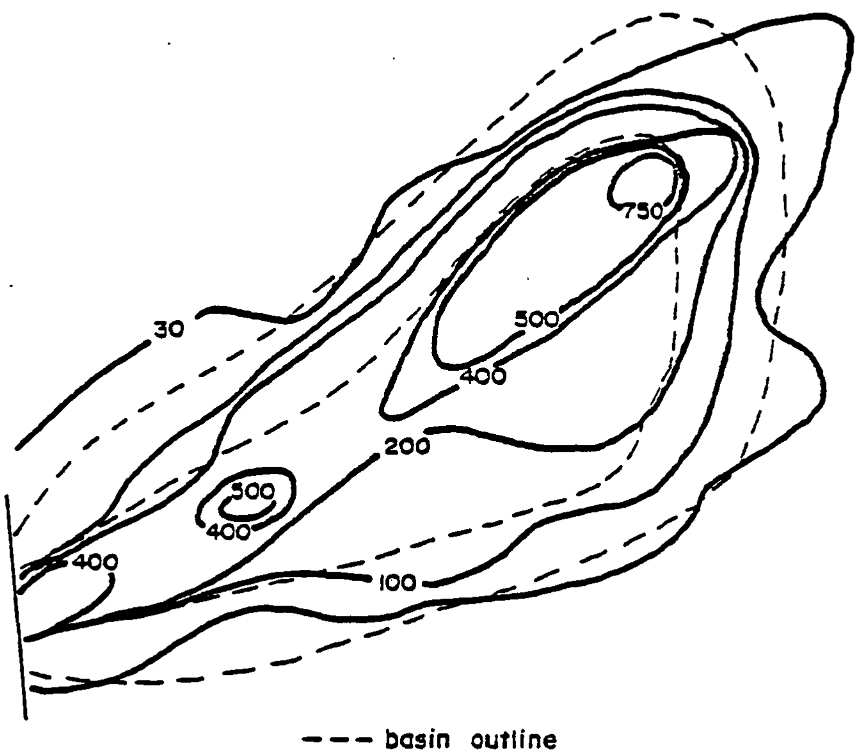


Figure 10-53. Surface soil 0.5 N HCl extractable Pb isoconcentration map (ppm), KMart detention basin site (See also Figure 17).

centrations for basin and control soils at the Stedwick site. Clearly, Pb, followed by Zn, had the greatest concentrations in the basin soil. Most of the Zn concentrations of the control soils were fairly uniform. One very large exception was an extreme upper outlier that was greater than all other control or basin samples. No explanation is offered; although it is relevent to note that the nonparametric statistics methods used to analyze the data are less sensitive to outliers than normal theory statistics.

The spatial distribution of the study metals can be seen in a series of isoconcentration maps of the Stedwick site (Figures 10-31, 10-33, 10-35, and 10-37). The concentration of Cu is basically uniform throughout the basin and control areas (Figure 10-35). All of the other study metals were found to have elevated concentrations around the basin outlet and in zones or pockets near the concrete channel. The pattern is most pronounced for lead. The slightly elevated Pb levels in the control area, near the head of basin were probably due to the proximity of Stedwick Road.

The trace metal accumulation in the basin soil of the Bulk Mail site was a sharp contrast to the Stedwick site. For the Stedwick site, Pb was the only study metal with distinct concentration differences between the basin and control soils. At the Bulk Mail Study site, all of the study metals were much greater in the basin soil than the control soil.

The greatest Cd concentrations observed during the study were at the Bulk Mail site (Figure 10-38). The control soil Cd concentrations were well below one ppm; but the basin concentrations reached a maximum of greater than twelve ppm, with many observations in the one to four ppm range. The greatest Cd concentrations were found relatively near the basin inlet, in a zone north of the emergent vegetation and west of the inlet (Figure 10-39). The area of emergent vegetation had fairly large Cd concentrations, but not the maximum observations.

A very similar pattern of trace metal distribution was recorded for the other study metals (Figures 10-41, 10-43, and 10-45).

Like Cd, the greatest concentration of Zn observed during the study was in the Bulk Mail detention basin. Figure 10-40 illustrates the difference between the basin and control soils. The soil Zn concentrations near the outlet of the structure were greater than the Zn concentration of most of the control samples (Figure 10-35). On the other hand, the outlet region was not a zone of great enrichment. Many other areas in the basin had greater Zn concentrations than the outlet region.

The maximum soil Cu concentrations were also recorded at the Bulk Mail Site (Figure 10-42). The difference between the control and basin soils was apparent. Although the spatial distribution patter of Cu in the basin was similar to the other study metals, the zone of emergent vegetation seemed to have a larger proprotion of the large Cu observations (Figure 10-43).

The Pb concentrations of the basin surface soil at the Bulk Mail site were not as great as the Pb concentrations of the surface soils at the Rt. 234 or the KMart study sites. However, the difference between the control and basin soils was striking (Figure 10-44). Similar to other metals, the smallest Pb concentrations were at the south end of the basin (Figure 10-45).

Figure 10-11 presents the sampling layout of the KMart site. Although not to the extent of the basin soil of the Bulk Mail site, the basin soil and sideslope soil of the KMart site had been enriched with Cd (Figure 10-46). Main areas of enrichment were near the mouth of the basin and in a elongated zone near the outlet (Figure-47). All of the other study metals had similar distribution patterns.

Zinc was the second most abundant study metal at the KMart site (Figure 10-48). Zones of maximum accumulation were in isolated depressed areas near the outlet and in midddle portion of the basin (Figure 10-49).

The small difference in Cu content between the sideslope and control soils can be observed in Figure 10-50. This difference was much smaller than that of the other metals for these two sampling zones. Figure 10-51 shows the spatial distribution of Cu at the KMart site.

Of the three detention basins, the greatest accumulation of Pb was noted in the basin soils of the KMart site (Figure 10-52). Only the Rt. 234 swale site had Pb concentrations higher than the KMart site. In spite of the large difference in concentration between Pb and the other study metals, the spatial distribution pattern of Pb was very similar to the other metals (Figure 10-53).

The results of the statistical analyses for the detention basin surface soil investigation are presented in Tables 10-10 through 10-12. The basis for the comparisons made with the statistical tests was that the trace metal concentrations of the soil outside of the basins (i.e. control zone) were the background levels. Any trace metal concentrations observed in the basin soils that were significantly greater than the background levels could be considered due to contributions from stormwater runoff.

In general, the results of the statistical tests confirmed the trends that were evident from the box plots and isoconcentration maps. Results of the Wilcoxon Rank Sums Tests for the Stedwick site revealed that when the basin samples were compared as a whole to the control samples, only Pb was distinctly greater in the basin soil (Table 10-10). A difference in Zn concentrations between the control and basin soils was likely, but with a much lower level of significance. For the Bulk Mail site, highly significant differences were detected with the Wilcoxon Ranked Sums Test between the control and basin soils for all of the study metals.

The results of the Kruskal-Wallis Tests for differences of metal con-

Table 10-10. Results of Wilcoxon Rank Sum analyses of differences between trace metal concentrations of basin and control surface soils of the Stedwick and the Bulk Mail sites.

Site/Trace Metal	Wilcoxon Rank Sum Test Statistic	Level of * Significance
Stedwick Detention Basin Site		
Cd	-0.68	.2483
Zn	-1.30	.0968
Cu	-0.76	.2236
Pb	-4.99	< .0002
Bulk Mail Detention Basin Site		
Cd	-4.59	< .0002
Zn	-4.75	< .0002
Cu	-4.74	< .0002
Pb	-5.04	< .0002

*Test statistic and level of significance based on normal distribution approximations.

Ha: trace metal concentration of control soil less than trace metal of basin soil.

Table 10-11. Results of Kruskal-Wallis analyses of differences among soil trace metal concentrations of sampling zones of the KMart detention basin site.

Metal	Kruskal-Wallis Statistic	Level of* Significance
Cd	31.8	< .001
Zn	32.5	< .001
Cu	25.3	< .001
Pb	34.6	< .001

*Chi square distribution lrage sample approximation (2 d.f.).

Ha: soil trace metal concentrations of the 3 zones, basin, side slope, and control, are not equal.

NOTE: Sample sizes for the various sampling zones:
n (basin) = 12
n (side slope) = 13
n (control) = 19.

Table 10-12. Multiple comparisons, based on Kruskal-Wallis Rank Sums, of surface soil trace metal concentrations from three sampling zones of the KMart detention basin site.

Significance Level/Metal	Sampling Zones
S.L. = 0.15	
Cd	$\underline{A}$ $\underline{B}$ $\underline{C}$*
Zn	$\underline{A}$ $\underline{B}$ $\underline{C}$
Cu	$\underline{A}$ $\underline{B\quad C}$
S.L. = 0.05	
Cd	$\underline{A}$ $\underline{B\quad C}$
Zn	$\underline{A}$ $\underline{B}$ $\underline{C}$
Cu	$\underline{A\quad B}$ $\underline{C}$
Pb	$\underline{A}$ $\underline{B\quad C}$

*Sites scored by the <u>same</u> line not significantly different at stated significance level.

NOTE: A = control zone
B = sideslope zone
C = basin zone

where differences occurred, A < B, A < C, or B < C.

centrations among the three sampling zones at the KMart site indicated that there were very significant differences as show in Table 10-11. All treatment multiple comparisons were used to establish the order of the differences (Table 10-12). For each metal, with the exception of Cu, the sideslope metal concentrations were greater than the control metal concentrations at a significance level of 0.05. For all of the study metals, the basin soil metal concentrations were found to be greater than the control soil metal concentrations at the 0.05 significance level.

Table 10-13 summarizes the accumulation and loads of trace metals at the detention basin sites. The KMart site had the greatest concentration, accumulation and load of Pb. The Bulk Mail detention basin had the largest concentrations, accumulations, and loads of Cd, Zn, and Cu. The Stedwick basin had mild enrichment of Zn, and Cd in basin soils and only Pb accumulated to notable levels.

Results - Depth Investigations

The purpose of the depth investigation was to determine if trace metals had leached downward in the soil profiles of areas that had large surface soil concentrations of trace metals due to contributions from stormwater runoff. To accomplish this, soil trace metal concentrations in the depth intervals from the basin or swale sampling zone were compared to the trace metal concentations of the appropriate control zone at the same depth intervals. The locations of the sampling points have been previously shown graphically in an earlier section.

The downward movement of trace metals has at least two potential implications for soils that are used to control urban runoff. First, the downward movement can be an index of the rate at which the trace metal sorptive capaci-

Table 10-13. **Accumulation and loads of trace metals found to have significant enrichment in detention basin surface soils.**

Site/Metal	mean conc. increase (ppm)	mean conc. * increase per year (ppm/yr)	mean** load (kg/ha)	mean** load rate (kg/ha/yr)
Stedwick Detention Basin Site				
Zn	3.8	0.5	2.8	0.4
Pb	29.3	4.2	21.9	3.1
Bulk Mail Detention Basin Site				
Cd	2.79	0.40	2.08	0.30
Zn	224.1	32.0	167.4	23.9
Cu	19.0	2.7	14.2	2.0
Pb	112.3	16.0	83.9	12.0
KMart Detention Basin Site				
Cd	0.75	0.12	0.56	0.09
Zn	114.1	19.0	86.2	14.2
Cu	12.4	2.1	9.3	1.5
Pb	368.4	61.4	275.2	45.9

*assumes uniform accumulation over time.
**assumes 100% of metals applied to soil retained in upper 5 cm.

ties of the soils are being exhausted. The observation of the distribution of trace metals with depth may provide an estimate of the life expectancy of a BMP structure. Second, excessive downward leaching of trace metals could potentially contaminate ground water supplies. The observation of the vertical distribution of trace metals can help to assess potential hazards to ground water. To allow the maximum separation of trends and mechanisms, the results of the swale drain sites and detention basin sites are presented separately.

Grassed Swales. The results of the swale site depth study are presented in Figures 10-55 through 10-62. Figure 10-54 provides a partial guide to the depth plots. A few additional points, however, must be clarified. For the swale sites, a sample point for a given depth interval from the swale zone is related to a specific point in the same depth interval for the road zone and yard zone. At each of the five swales sampled at a study site, a soil core was taken from the road zone, swale zone, and yard zone. Therefore, the results of a swale zone sample must be compared to the results from the sample taken from the adjacent road or yard zone. Unfortunately, due to a large number of data points, and a very wide range of trace metal concentrations, unique symbols for each swale could not be used. At the lower depths the different symbols would have been crammed together and meaningless. The plus symbol was selected to allow maximum differentiation of points with close spacings.

Due to the complex nature of the depth graphs for the swale sites, the assessment of clear trends from the graphs by themselves is difficult. For this reason the graphical presentations and statistical analyses shall be described simultaneously.

The results of Friedman Rank Sums Tests and comparisons are presented in Tables 10-14 through 10-17. For the comparisons, the depth samples collected in

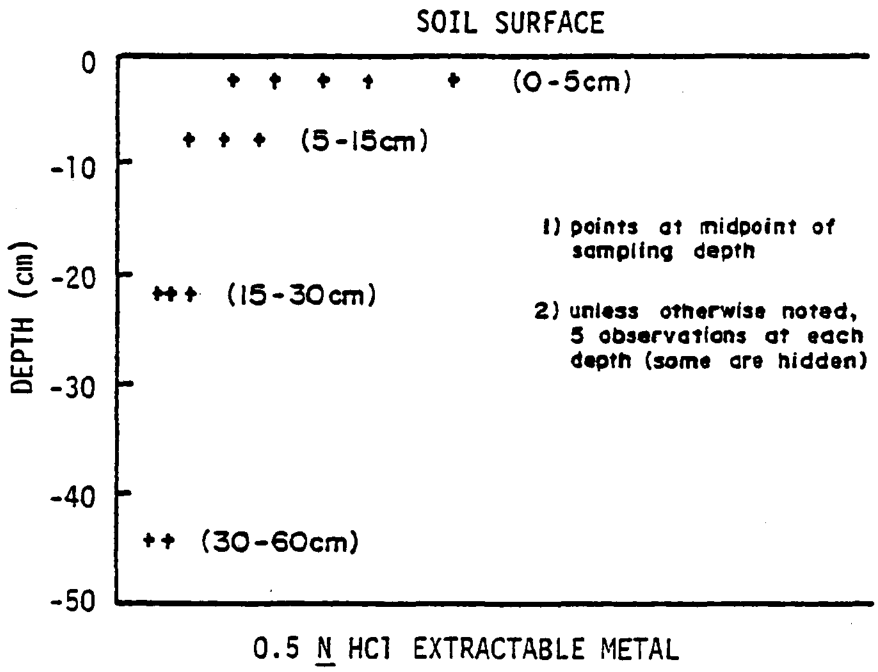


Figure 10-54. Description of depth plots of soil trace metal concentrations; Figures 61 through 76.

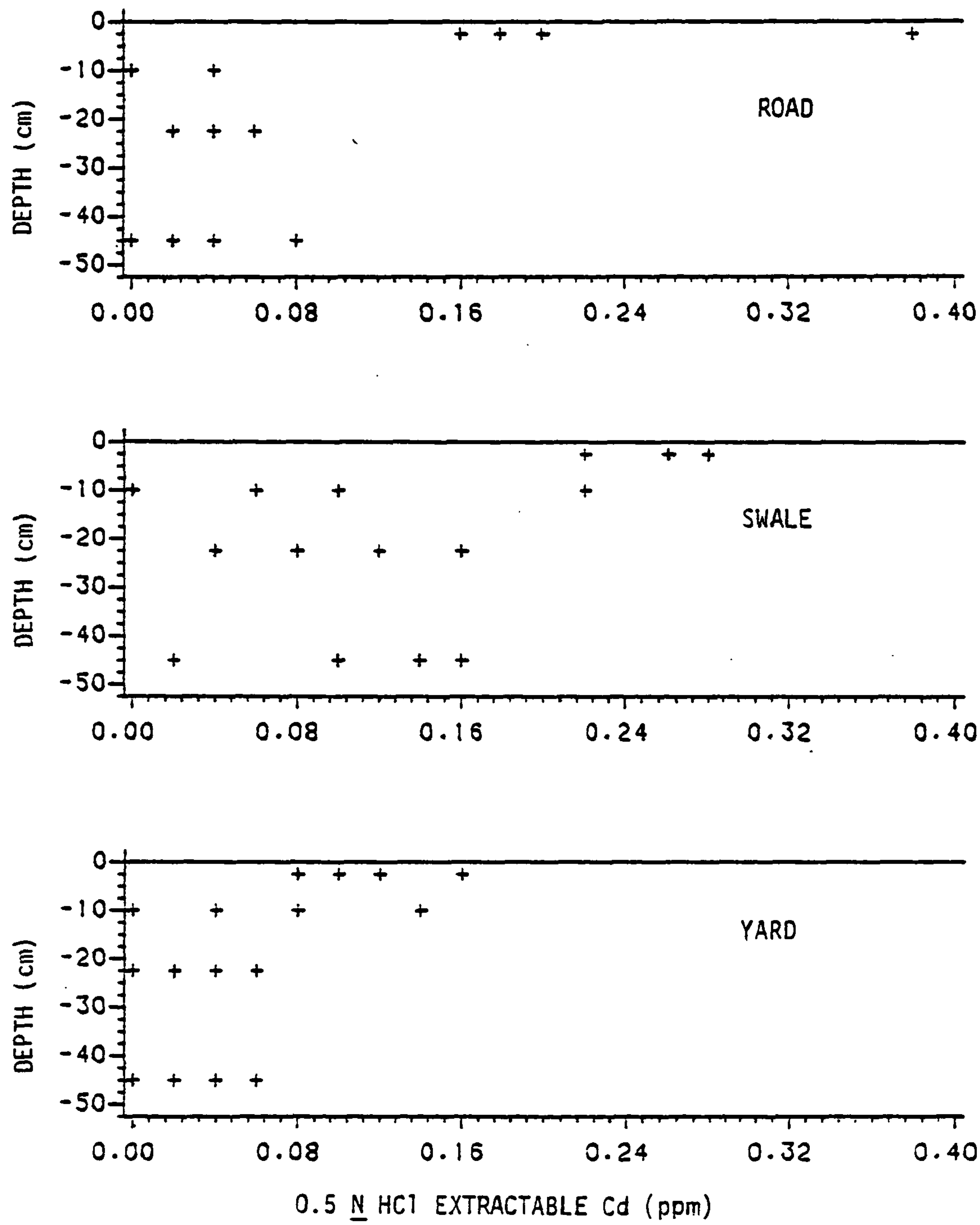


Figure 10-55. Distribution of 0.5 N extractable soil Cd with depth for three sampling zones, Fairidge swale site.

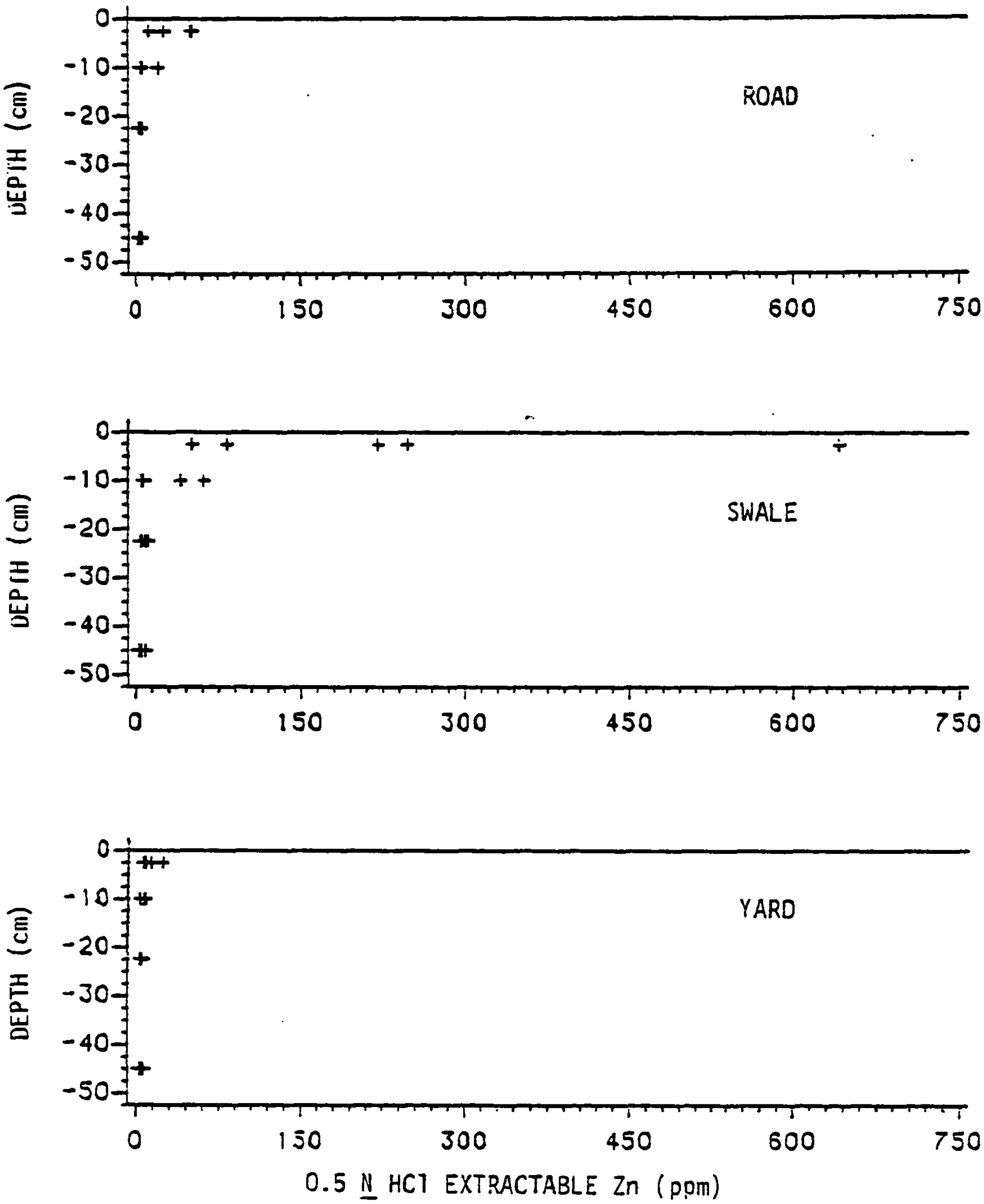


Figure 10-56. Distribution of 0.5 N HCl extractable soil Zn with depth for three sampling zones, Fairidge swale site.

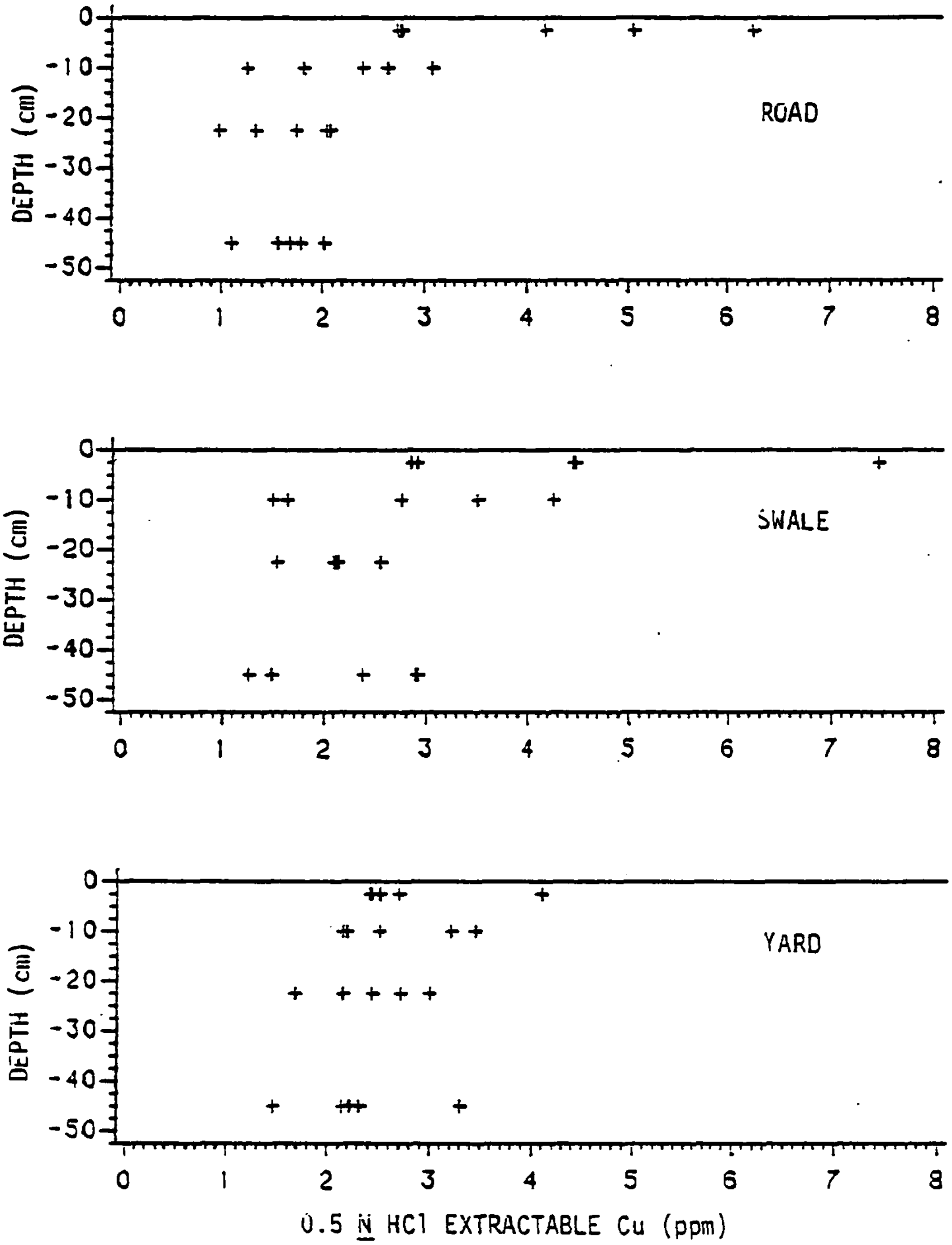


Figure 10-57. Distribution of 0.5 N HCl extractable soil Cu with depth for three sampling zones, Fairidge swale site.

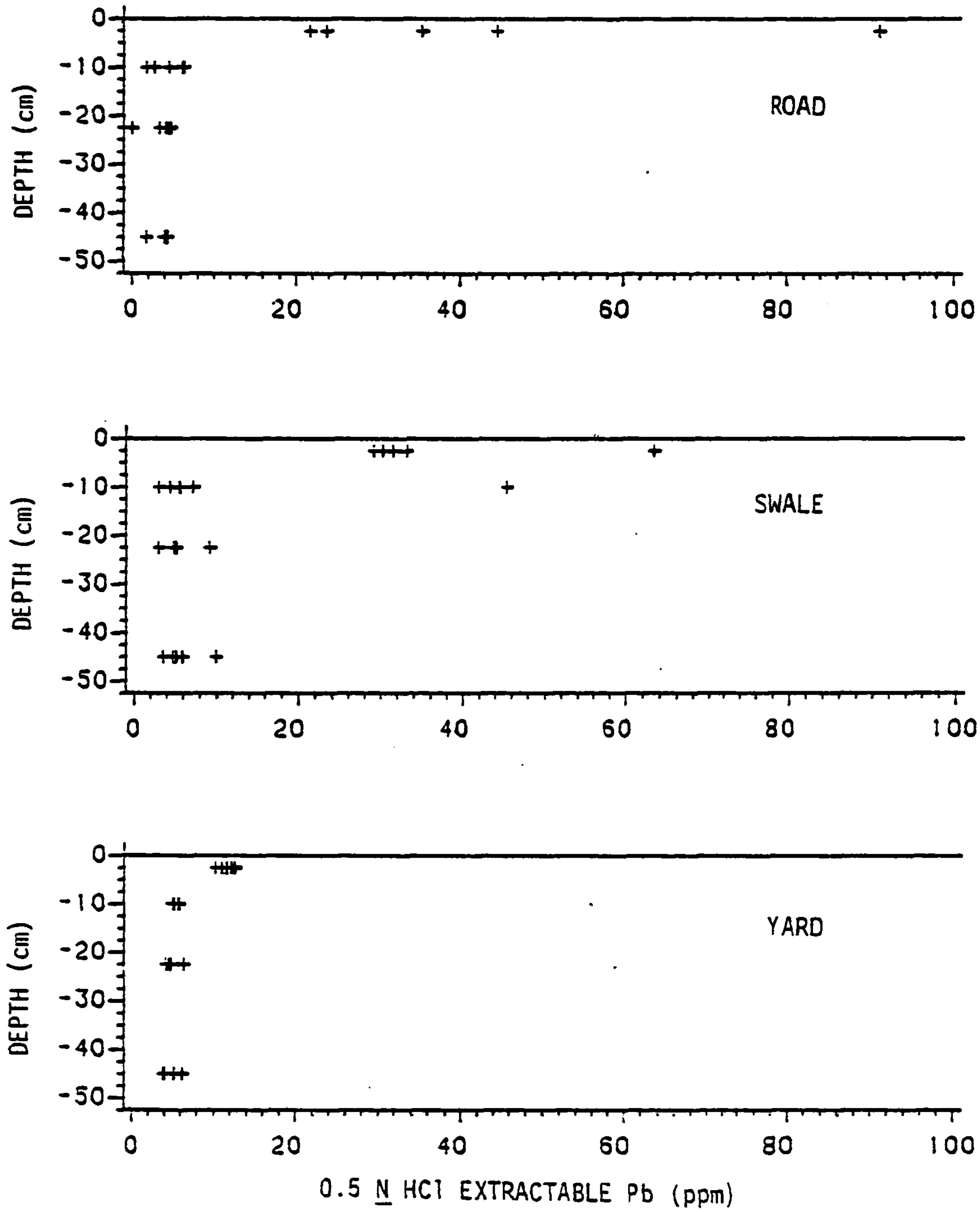


Figure 10-58. Distribution of 0.5 N HCl extractable soil Pb with depth for three sampling zones, Fairidge swale site.

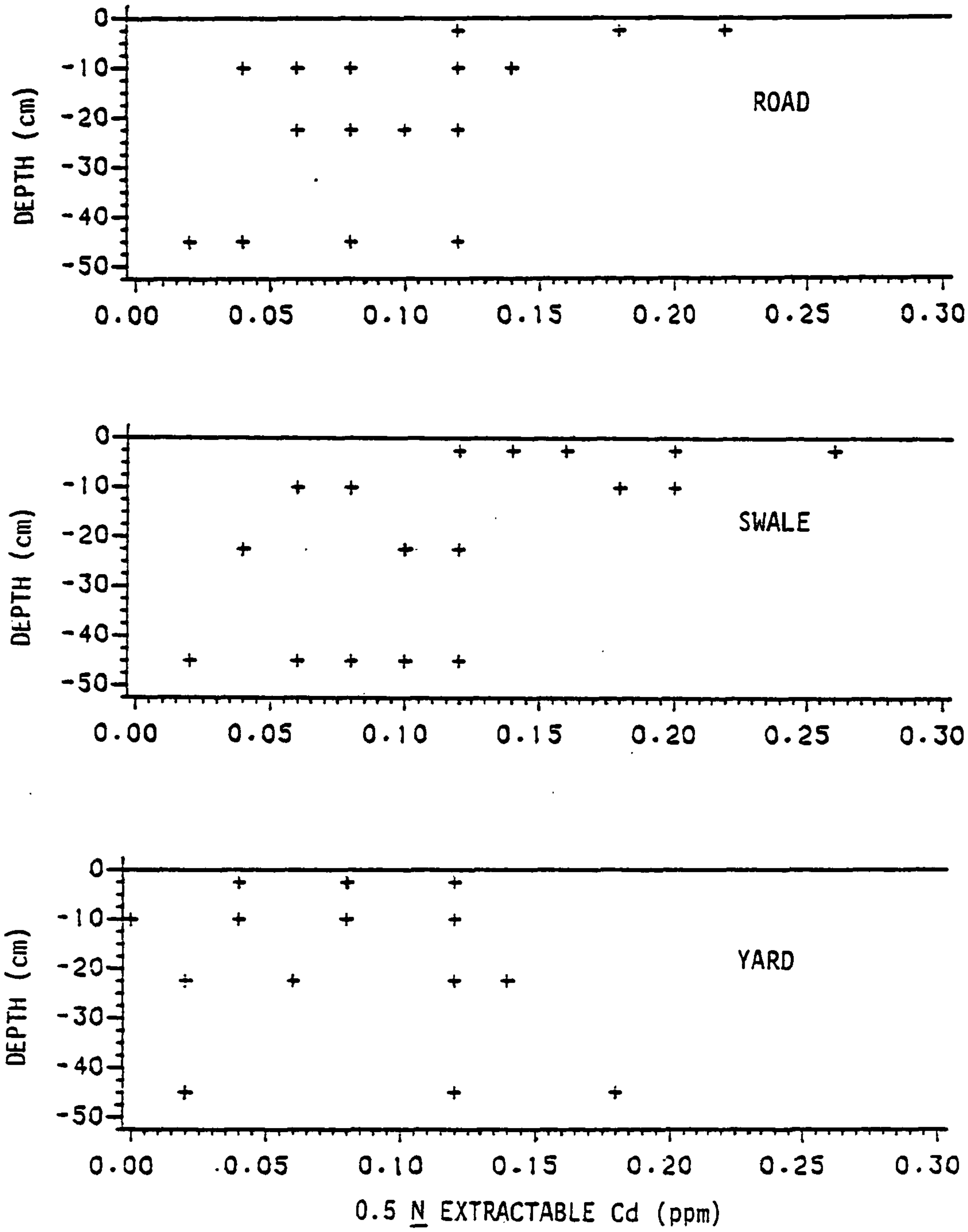


Figure 10-59. Distribution of 0.5 N HCl extractable soil Cd with depth for three sampling zones, Stratton Woods swale site.

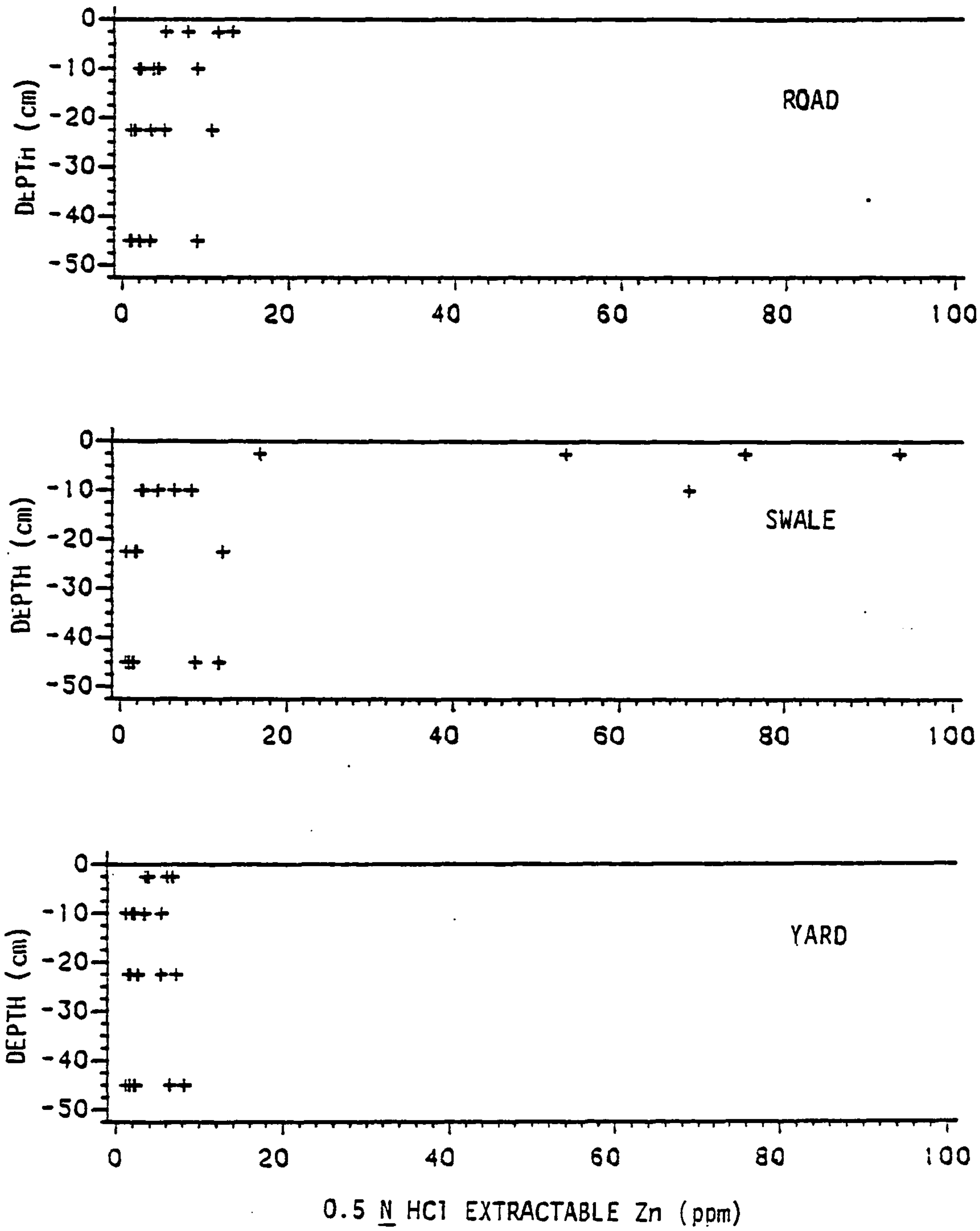


Figure 10-60. Distribution of 0.5 N HCl extractable soil Zn with depth for three sampling zones, Stratton Woods swale site.

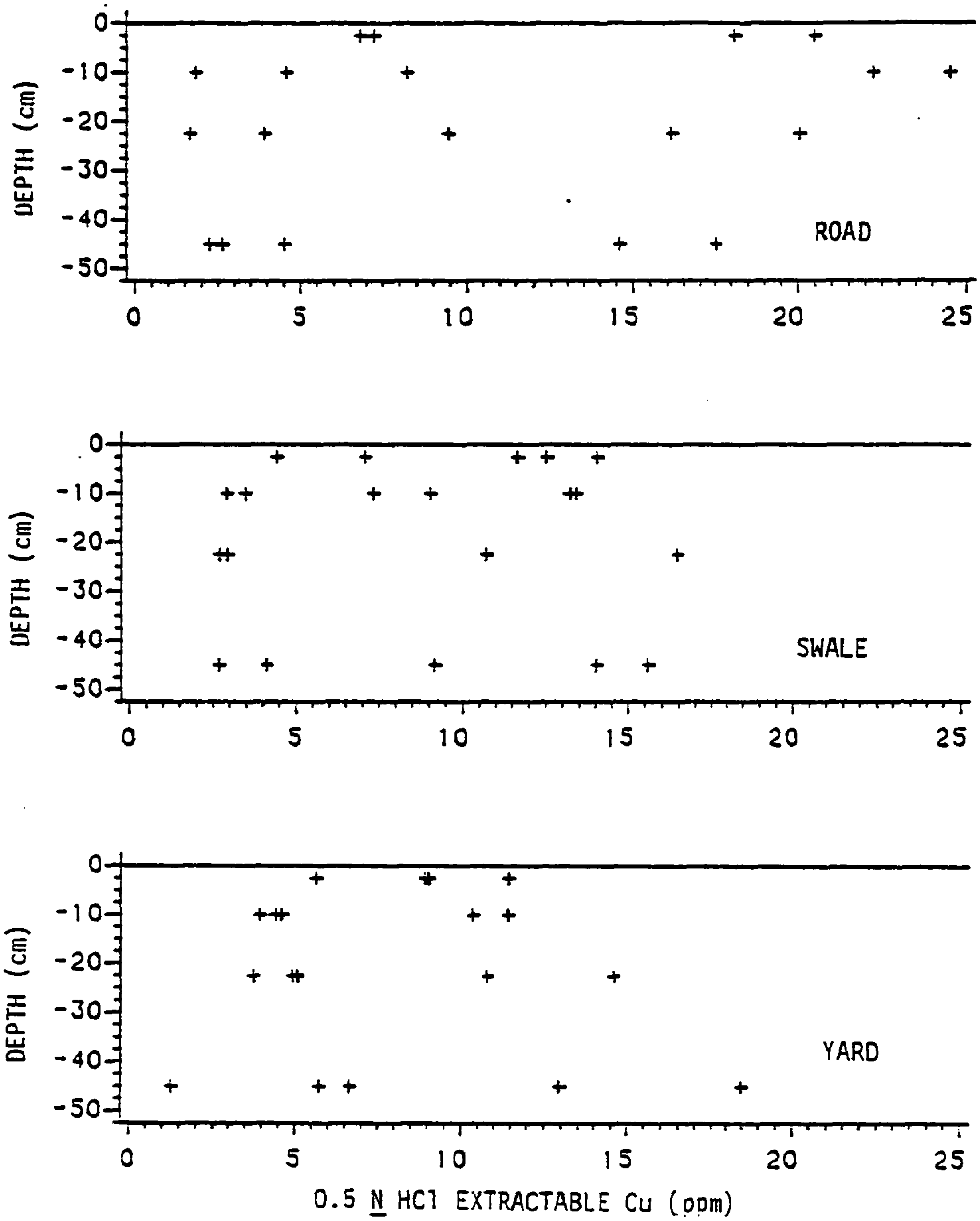


Figure 10-61. Distribution of 0.5 N HCl extractable soil Cu with depth for three sampling zones, Stratton Woods swale site.

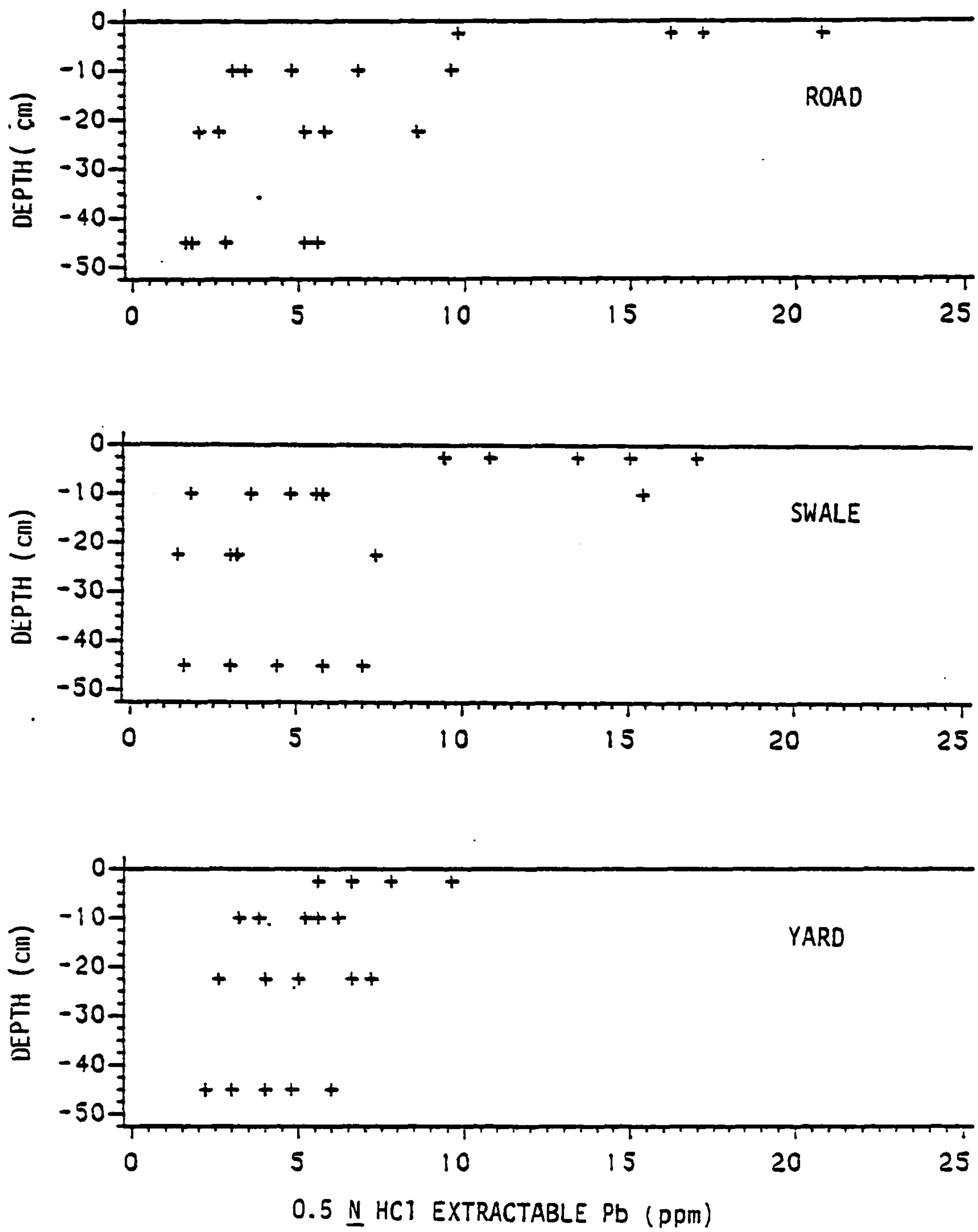


Figure 10-62. Distribution of 0.5 N HCl extractable soil Pb with depth for two sampling zones, Stratton Woods swale site.

Table 10-14. Results of Friedman Rank Sums analyses of differences among soil trace metal concentrations for three sampling zones at various depths; Fairidge Swale Site.

Depth (cm)/Metal	Friedman Rank Sums Statistic	Level of* Significance
0 - 5		
Cd	8.4	.008
Zn	8.4	.008
Cu	8.4	.008
Pb	7.6	.024
5 - 15		
Cd	3.1	.298
Zn	2.8	.367
Cu	0.4	.954
Pb	1.2	.691
15 - 30		
Cd	5.2	.093
Zn	3.6	.182
Cu	10.0	.001
Pb	5.2	.093
30 - 60		
Cd	4.1	.158
Zn	1.2	.691
Cu	5.2	.093
Pb	2.8	.367

*Ha: soil metal concentrations for sampling zones, yard swale, and road, are not equal.

NOTE: For all depth intervals and metals, n = 5.

Table 10-15. At various depths, comparisons of soil trace metal concentrations of swale zones and road zone to yard zones of the Fairidge swale site; based on Friedman Rank Sums.

Depth/Metal (cm)	road: difference of* direction	road: P**	yard: direction of difference	yard: P
0 - 5				
Cd	-	.3336	-	.0028
Zn	-	.0697	-	.0028
Cu	-	.3336	-	.0028
Pb	-	.6024	-	.0131
15 - 30				
Cd	-	.1052	-	.0517
Zn	-	.0697	-	.3336
Cu	-	.1406	+	.1406
Pb	+	.0337	-	.4815
30 - 60				
Cd	-	.0697	-	.1844
Cu	-	.1406	+	.4815

* + = metal conc. road zone > metal conc. swale zone
0 = equal rank sums
\- = metal conc. road zone < metal conc. swale zone.

**level of significance.

NOTE: Comparisons made for metals that had significant differences for a given depth as determined by Friedman Rank Sums Test.

Table 10-16. Results of Friedman Rank Sums analyses of difference among soil trace metal concentrations for three sampling zones at various depths; Stratton Woods swale site.

Depth (cm)/metal	Friedman Rank Sum Statistic	Level of* Significance
0 - 5		
Cd	7.6	.024
Zn	8.0	.016
Cu	2.0	.470
Pb	8.0	.016
5 - 15		
Cd	4.3	.137
Zn	4.8	.124
Cu	1.2	.691
Pb	0.0	1.000
15 - 30		
Cd	0.9	.822
Zn	1.2	.691
Cu	0.4	.954
Pb	1.2	.691
30 - 60		
Cd	0.1	.988
Zn	0.4	.954
Cu	0.4	.954
Pb	1.6	.522

*Ha: soil metal concentrations for sampling zones, yard, swale, and road, are not equal.

NOTE: For all depth intervals and metals, n = 5.

Table 10-17. At various depths, comparisons of soil trace metal concentrations of road zone and yard zone to swale zone of the Stratton Woods swale site; based on Friedman Rank Sums.

Depth/Metal (cm)	road: direction of* difference	road: P**	yard: direction of difference	yard: P
0 - 5				
Cd	-	.3336	-	.0234
Zn	-	.2281	-	.0131
Cu	+	.4815	-	.4815
Pb	+	.2281	-	.2281
5 - 15				
Cd	-	.1844	-	.0697
Zn	-	.0697	-	.0697

* + = metal conc. road zone > metal conc. swale zone
0 = equal rank sums
\- = metal conc. road zone < metal conc. swale zone.

**level of significance.

NOTE: Comparisons made for metals that had significant differences for a given depth as determined by Friedman Rank Sums Test.

the swale sampling zone were used as the control. If larger concentrations of trace metals can be established in the various depth intervals of the swale zone samples than the same depth intervals of the road zone and the yard zone samples, this is strong evidence to indicate that detectable leaching of trace metals has occurred in the swale zone soils. Since the sample sizes were much smaller for the depth investigation that the surface soil investigation, greater differences among the sampling zones were required to show significant trends. That is not to say that the Friedman test was not valuable. Actually, the determination of important trends would have been almost impossible without it.

With regard to the Fairidge site, significant differences were detected among the sampling zones for all of the study metals in the 0-5 cm depth interval (Table 10-14, Figures 10-55 through 10-58). In contrast, none of the study metals had significantly different concentrations among the sample zones at the 5-15 cm interval. At the deeper intervals, only Cd and Cu had test results that showed differences among sampling zones at the 15-30 cm and 30-60 cm depths. The P value for Cu at the 15-30 cm level was especially small, allowing a great deal of confidence in the conclusion of differences among the sampling zones.

Treatment-control comparisons (with the swale zone as the control) results provided evidence of enriched Zn in swale zone samples for the surface layer, a finding compatible with the finds of the surface soil investigation (Table 10-15). At none of the other depth intervals did the test results support Zn enrichment of swale zone soil. At the 15-30 cm depth interval, the Zn concentrations of swale zone samples were significantly greater than the road samples; but the swale zone Zn levels were less than yard zone Zn levels. By the 15-30 cm depth, Zn levels had decreased from the several hundred ppm concentrations observed in the surface soils to less than 10 ppm (Figure 10-56).

The phenomenon of decreasing metal concentration with depth was not unique to Zn, all of the study metals exhibited this pattern for all of the sampling zones. Pb especially seemed to be concentrated only in the surface layer (Figure 10-58).

Copper was unique among the study metals at Fairidge site in that the Cu concentration of the yard zone at the 15-30 depth intervals seemed greater than the Cu concentrations of the swale zone (Table 10-15, Figure 10-57.) At the 30-60 cm depth interval, there was no significant difference between the soil Cu concentration of the swale and yard zones, and the swale zone Cu appeared greater than the road zone Cu (P = .1406).

Of all the study metals, Cd seemed to have the greatest amount of downward mobility in the swale zone soil. With a fair amount of confidence, the conclusion that Cd concentrations were greater in swale zone soil than either road zone soil or yard zone soil for the 15-30 and 30-60 cm depth intervals could be made (Table 10-15). Even though there were significant differences at these depths, the Cd concentrations in the swale zone soil were still quite small (Figure 10-55).

The Stratton Woods site had uniform trace metal distributions below the surface 5 cm (Table 10-16, Figures 10-59 through 10-62). The only notable differences among the sampling zones occurred at the 5-15 cm interval for Zn and Cd, and the P values of these two were marginal (Table 10-16). Control Treatment comparisons for this interval revealed that both Zn and Cd concentrations were significantly greater in swale zone than either th yard zone or the road zone (Table 10-17). But, the magnitude of the differences of Zn and Cd concentrations at the 5-15 cm level were generally quite small, a few ppm for Zn and less than 0.1 ppm for Cd.

For the 0-5 cm depth interval, the Friedman Rank Sums results indicated highly significant differences among the sampling zones for Cd, Zn, and Pb

(Table 10-16). On the other hand, the comparisons failed to show differences between study metal concentrations of the road and swale zone soils. Significant differences were found between the swale zone and yard zone for the metals Cd and Zn (Table 10-17).

Detention Basins. The trace metal depth data are presented in Figures 10-63 through 10-70. Because the control zone samples and basin zone samples were collected independently at the detention basin sites, all of the samples from a given depth interval from the basin sampling zone can be compared directly to all of the samples from the same depth interval from the control sampling zone.

The results of the Wilcoxon Rank Sum Tests of differences between soil trace metal concentrations of the basin and control sampling zones are presented in Tables 10-18 and 10-20. Estimates of the magnitute of the significant differences between the trace metal concentrations of basin sampling zone and the control sampling zone are presented in Tables 10-19 and 10-21.

The Stedwick detention basin soil had trace metal contamination limited almost exclusively to the surface five cm (Table 10-18). In general, the control soil had remarkably uniform concentration distributions in the soil profile for all of the study metals (Figures 10-63 through 10-66). Interestingly, the Cu concentration of the lower three depth intervals seemed greater in the control soil than basin soil; a difference in parent material is implied (Figure 10-65). For each study metal, with the possible exception of Cu, a distinct accumulation was noted in the basin surface soil layer (Table 10-18, Figures 10-63 through 10-66). For the basin soil, background metal concentrations were usually approached by the 5-15 cm depth interval. Lead and Zn were the only study metals significantly greater in the basin soil than the control soil at the 5-15 cm depth interval (Table 10-18). Even these metals had very small concentration differences (Table 10-19).

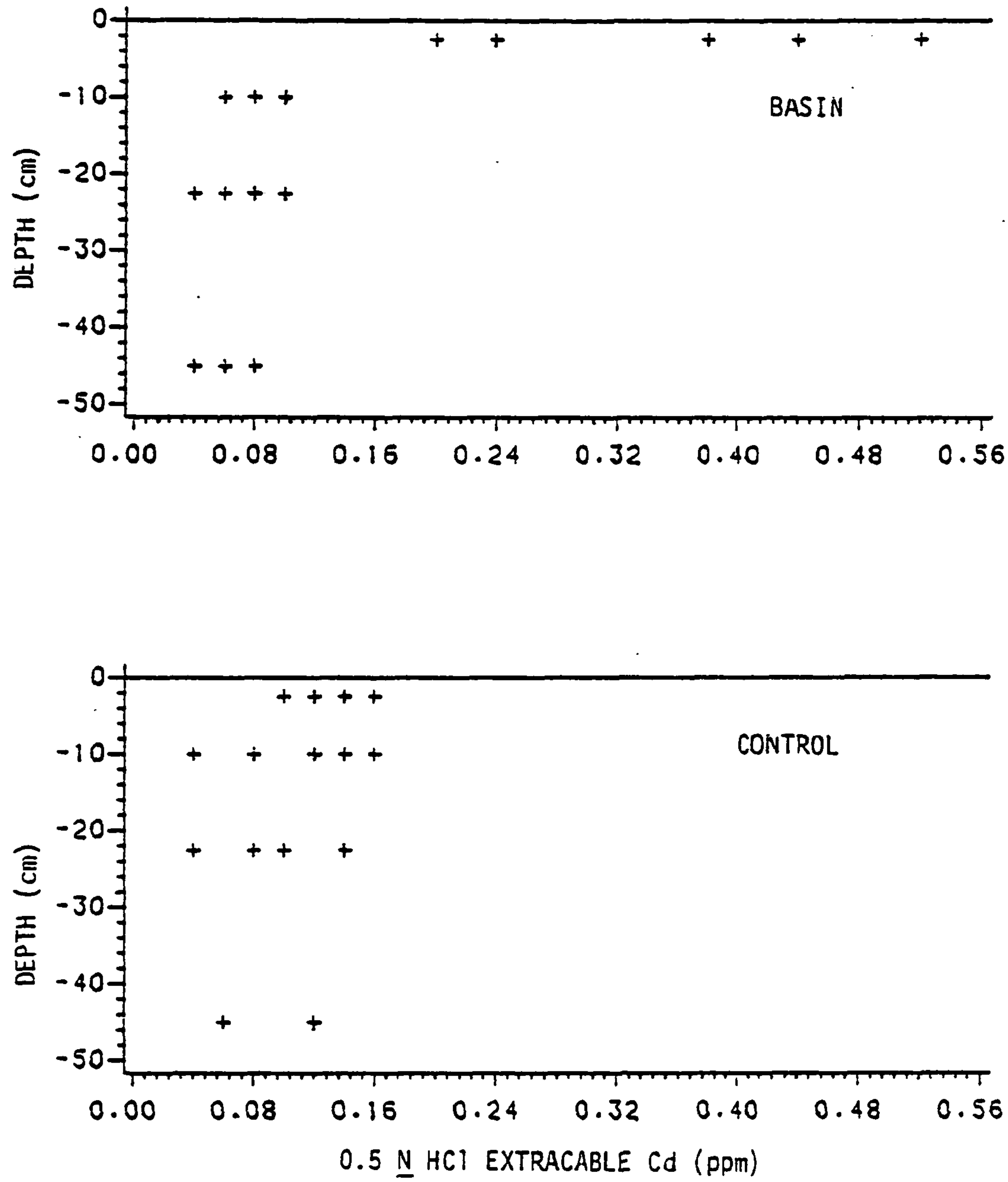


Figure 10-63. Distribution of 0.5 N HCl extractable soil Cd with depth for two sampling zones, Stedwick detention basin site.

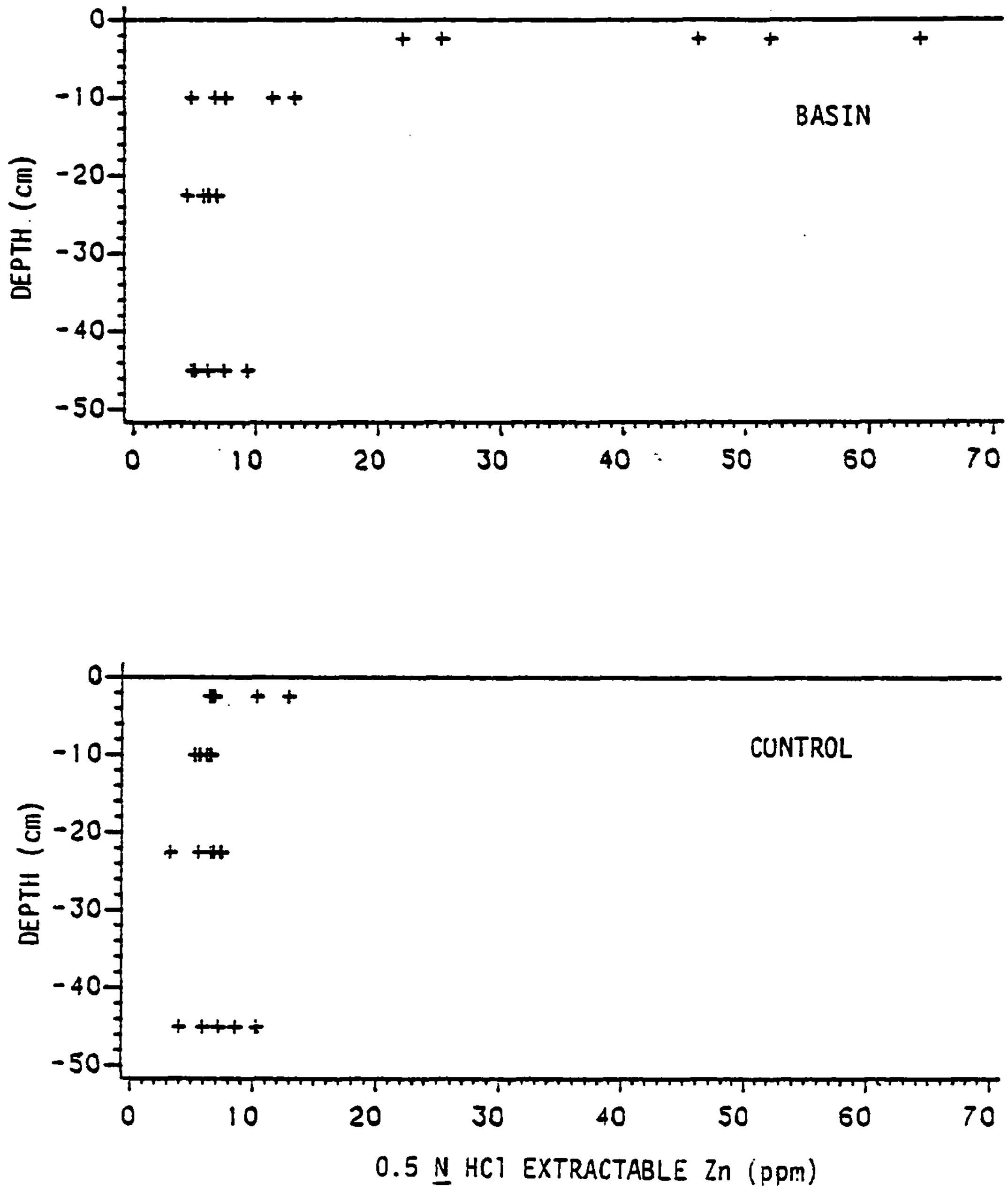


Figure 10-64. Distribution of 0.5 N HCl extractable soil Zn with depth for two sampling zones, Stedwick detention basin site.

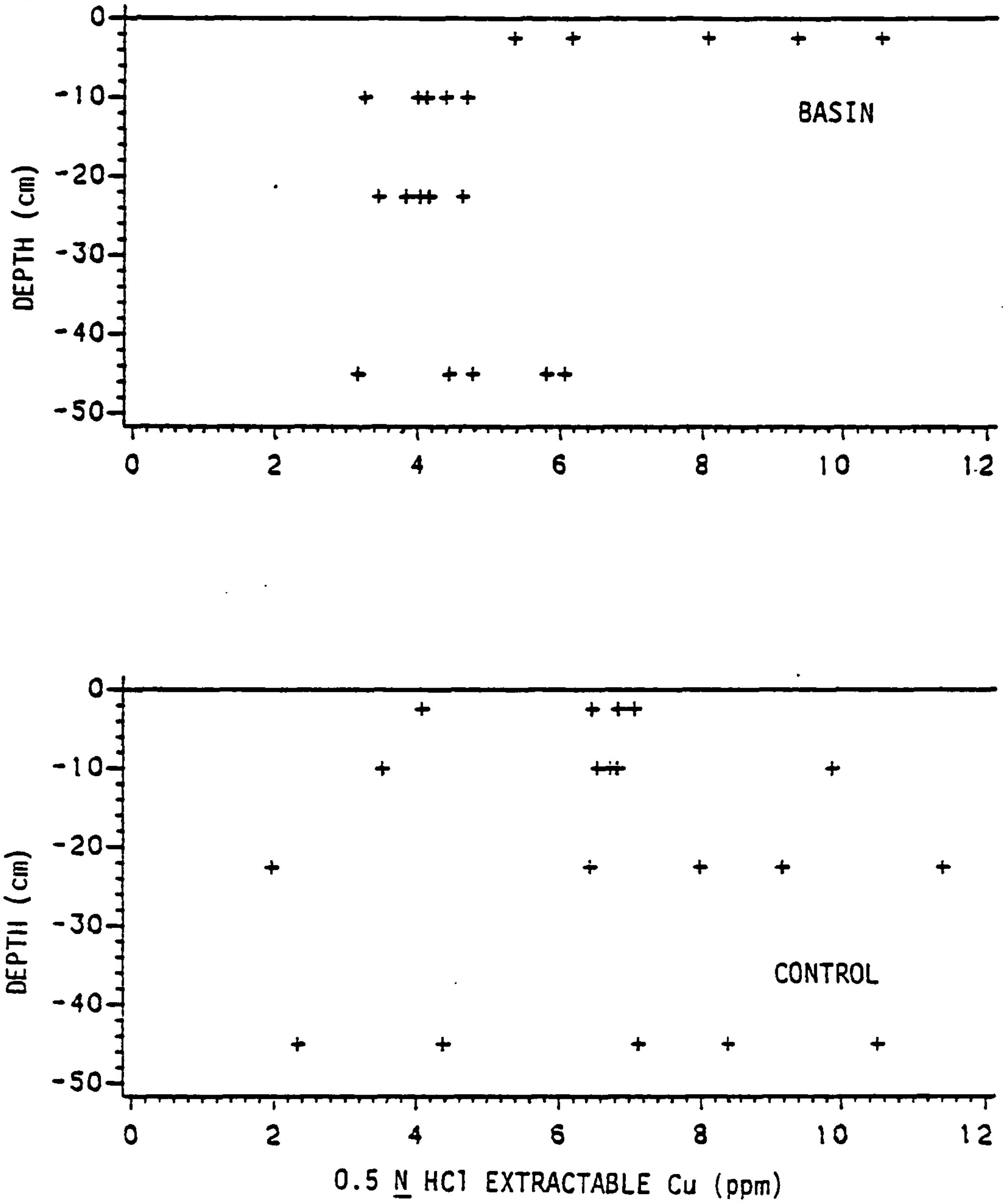


Figure 10-65. Distribution of 0.5 N HCl extractable soil Cu with depth for two sampling zones, Stedwick detention basin site.

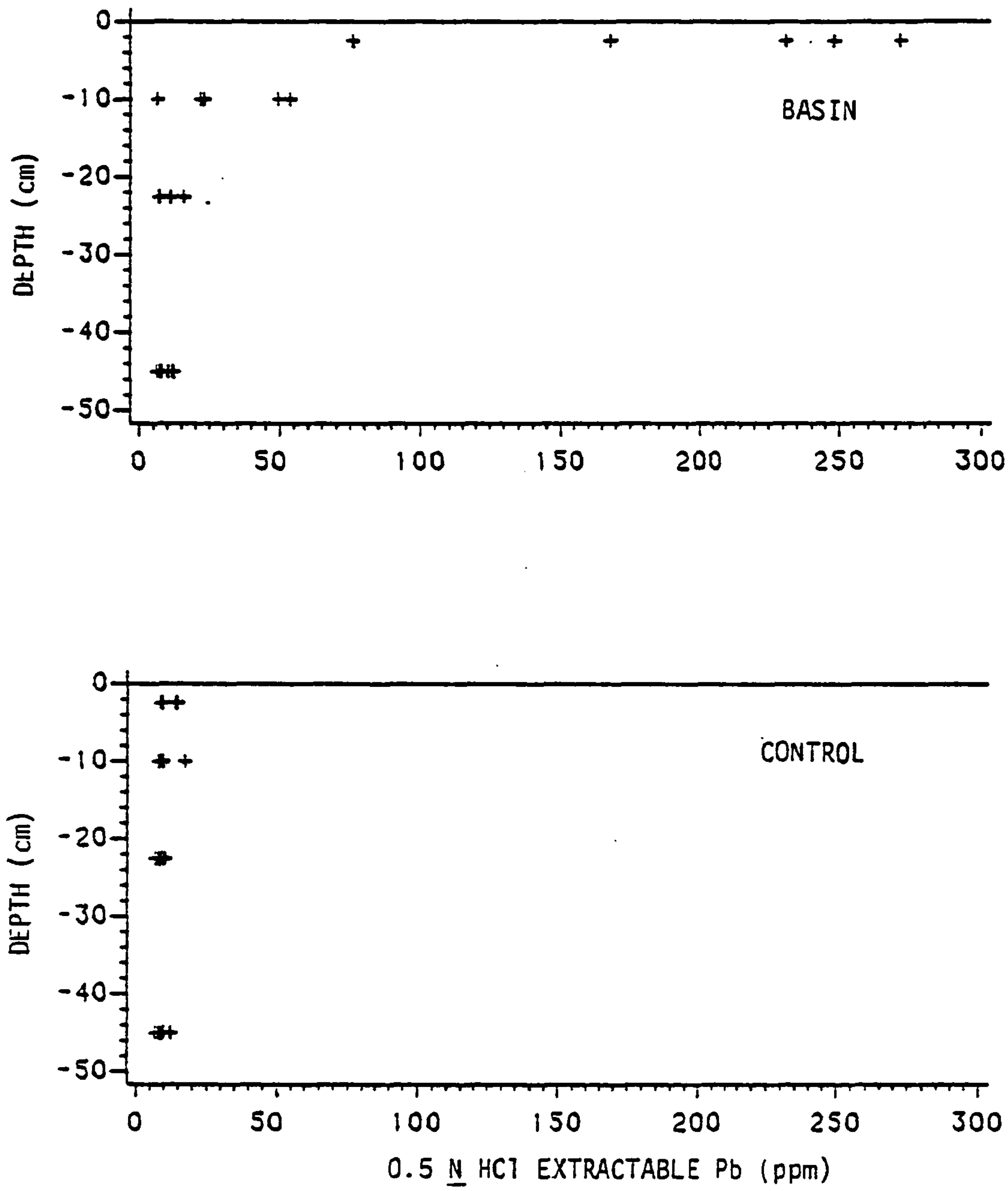


Figure 10-66. Distribution of 0.5 N HCl extractable soil Pb with depth for two sampling zones, Stedwick detention basin site.

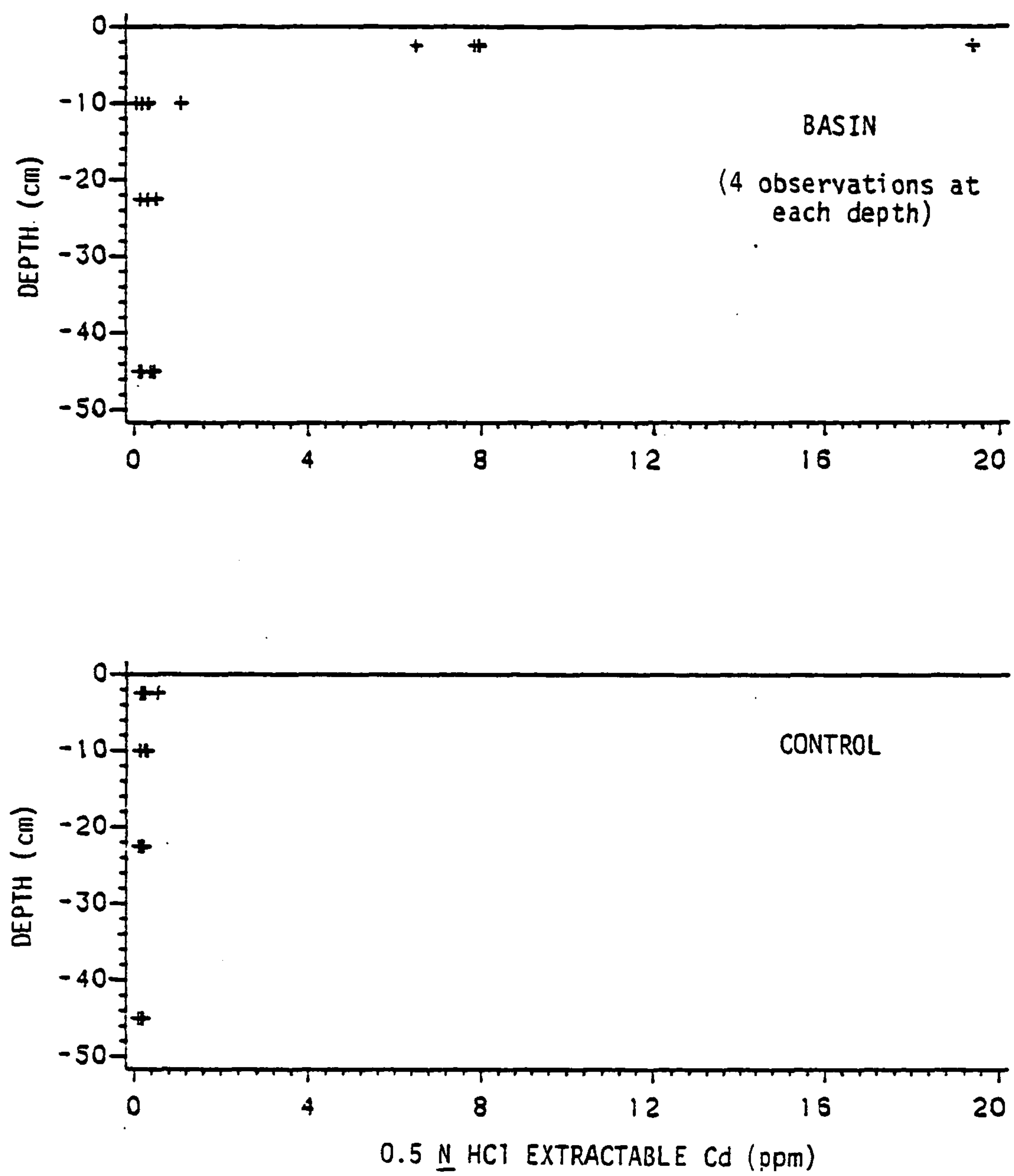


Figure 10-67. Distribution of 0.5 N HCl extractable soil Cd with depth for two sampling zones, Bulk Mail detention basin site.

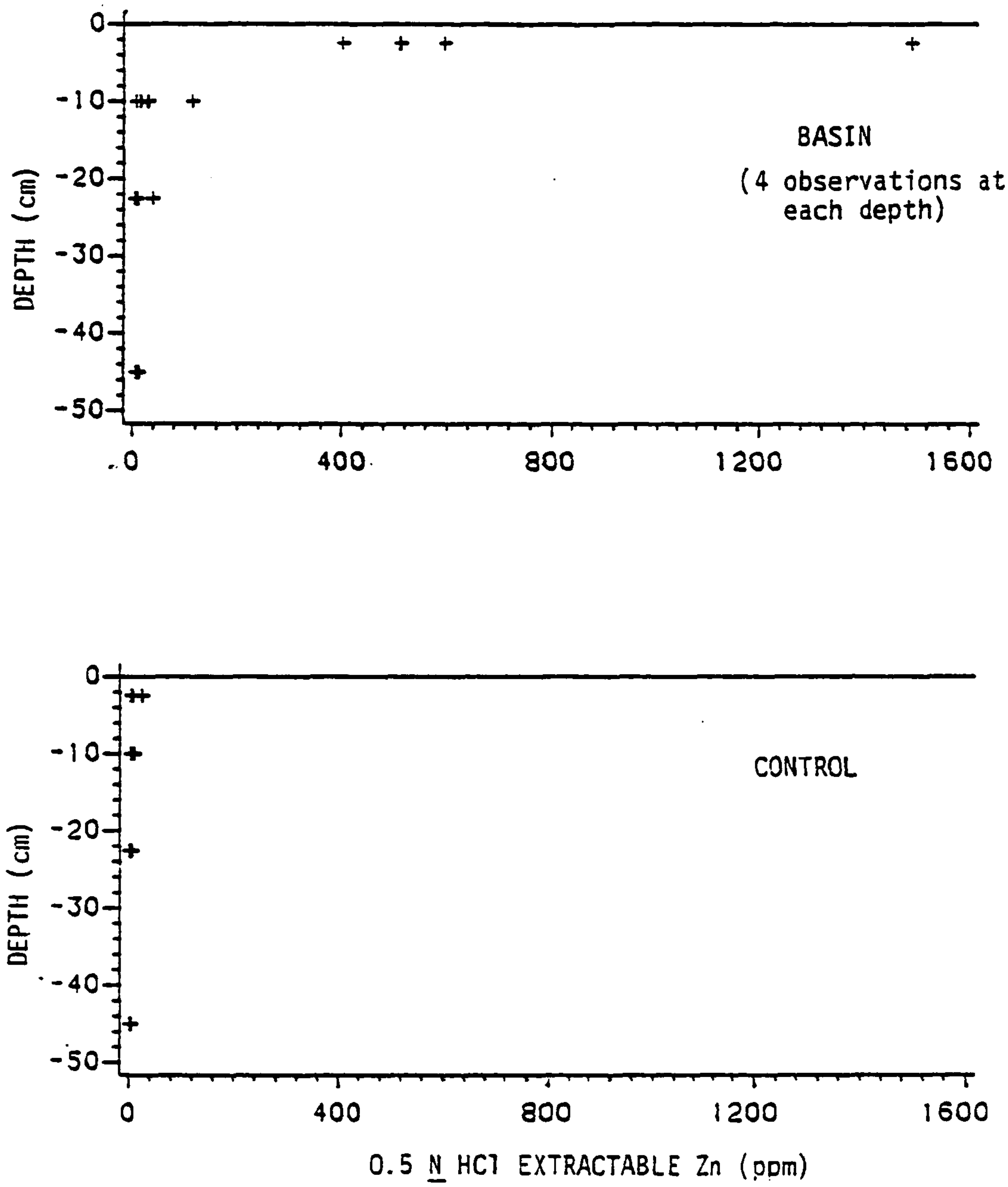


Figure 10-68. Distribution of 0.5 N HCl extractable soil Zn with depth for two sampling zones, Bulk Mail detention basin site.

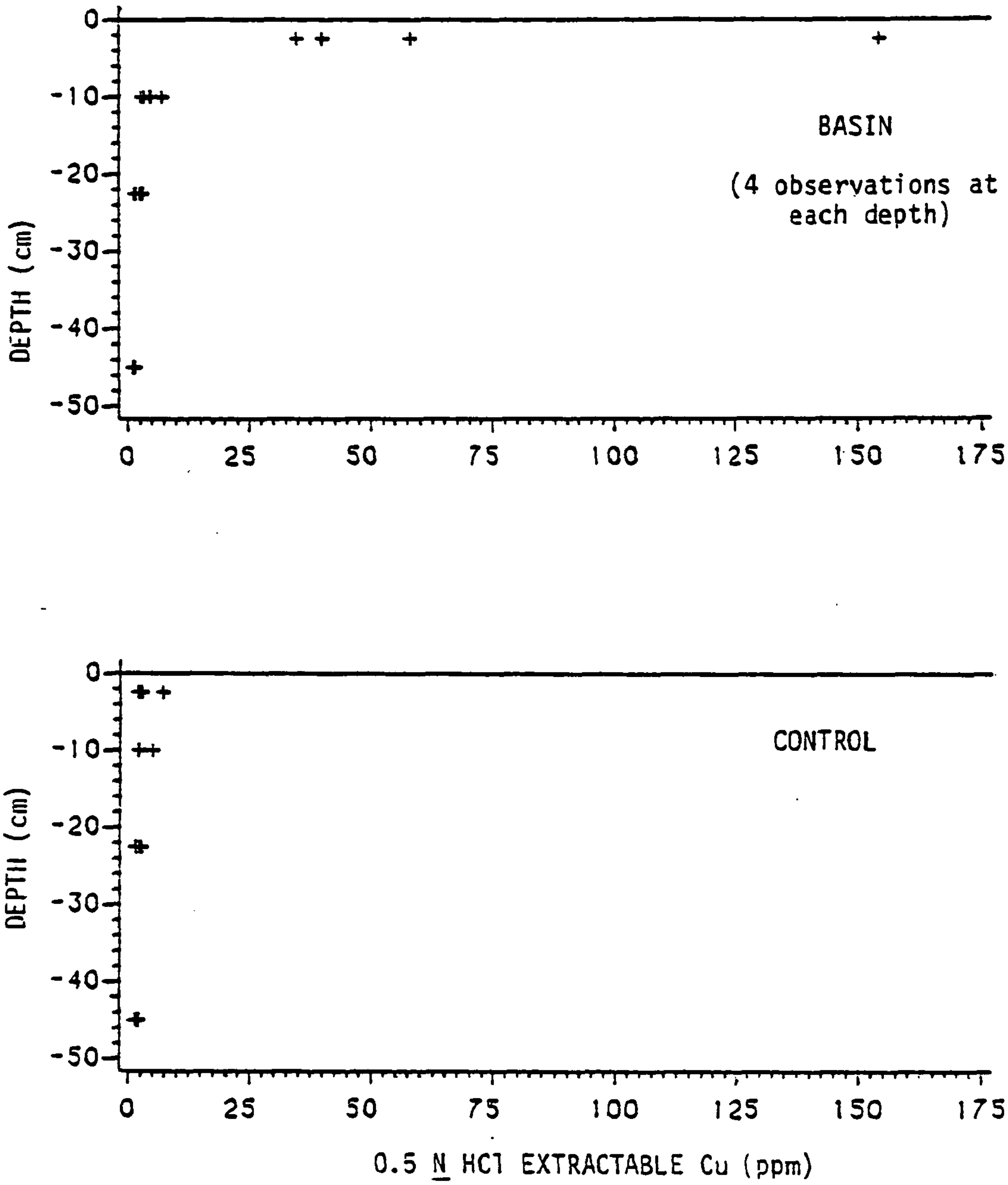


Figure 10-69. Distribution of 0.5 N HCl extractable soil Cu with depth for two sampling zones, Bulk Mail detention basin site.

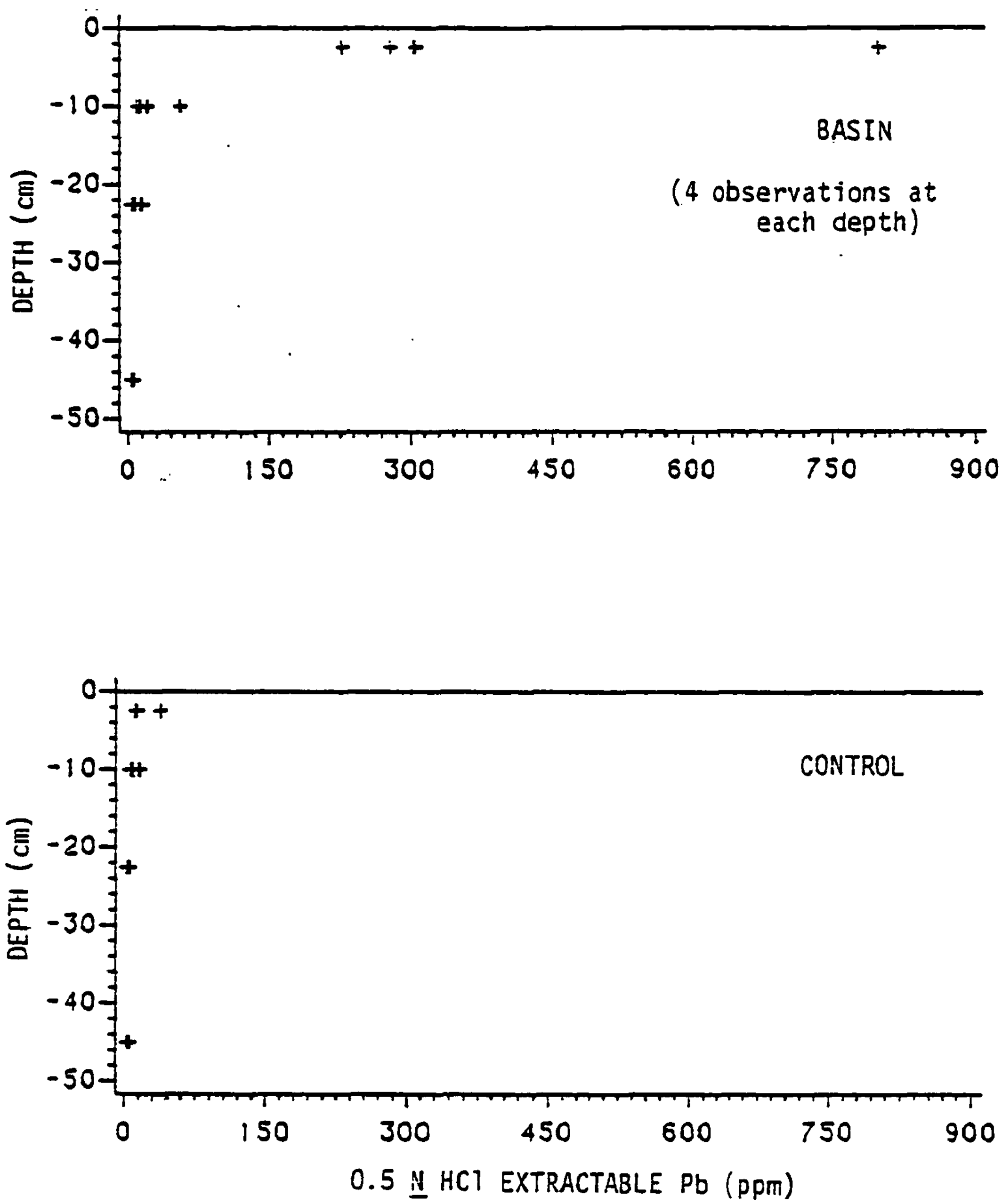


Figure 10-70. Distribution of 0.5 N HCl extractable soil Pb with depth for two sampling zones, Bulk Mail detention basin site.

Table 10-18. Results of Wilcoxon Rank Sum Tests of differences between soil trace metal concentrations of basin and control sampling zones at various depths; Stedwick detention basin site.

Depth/Metal (cm)	Wilcoxon Rank* Sum Statistic	Level of** Significance
0 - 5		
Cd	40.0	.004
Zn	40.0	.004
Cu	32.0	.210
Pb	40.0	.004
5 - 15		
Cd	23.5	> .500
Zn	35.0	.075
Cu	19.0	> .500
Pb	35.0	.075
15 - 30		
Cd	22.0	> .500
Zn	25.5	> .500
Cu	20.0	> .500
Pb	31.0	.274
30 - 60		
Cd	20.0	> .500
Zn	26.0	> .500
Cu	24.0	> .500
Pb	26.0	> .500

*Rank sum for basin sample.

**Ha: Soil trace metal concentration from basin greater than control area.

NOTE: For basin and control depth samples, n = 5.

Table 10-19. Estimates of trace metal concentration differences between basin and control soils at various depths; Stedwick detention basin site.*

Depth/Metal (cm)	Estimate of Med. Diff. (ppm)	95% Confidence Interval (ppm)
0 - 5		
Cd	0.24	0.38, 0.08
Zn	39.1	53.9 , 14.9
Cu	1.6	4.1, - 1.1
Pb	217.2	257.6, 66.8
5 - 15		
Zn	1.9	6.9, 0.5
Pb	14.2	44.0, - 2.4

*Based on Wilcoxon Rank Sum Test.

As shown by the results of the surface soil investigation, the Bulk Mail site had the greatest accumulation of Cu, Cd, and Zn of any study site. The results of the depth study substantiated this conclusion (Figures 10-67 through 10-70). In fact, one observation was recorded in the 0-5 cm interval for each of the study metals that was much greater than any value observed during the surface study. This is not surprising since the depth samples were basically point samples, while the surface samples were composites from a larger area. The probability of an extreme observation is much greater for the point samples.

Even though the concentrations of trace metals in the surface soil layer were very large, the movement of the metals down through the soil profile was minimal. Significant differences between the Cd concentrations of the control and basin soils were not detected below the 0-5 cm soil layer (Table 10-20, Figure 10-67). Wilcoxon Rank Sum Tests showed, with decreasing confidence as depth increased, that the Cu concentrations of the basin soil were greater than the Cu and Pb concentrations of the control soil. At the 30-60 cm depth interval, the null hypothesis of equal Cu or Pb concentrations could not be rejected (Table 10-20). Except for the 15-30 cm interval, test results indicated very confidently that Zn concentrations were greater in the basin soil than control soil (Table 10-20). However, all of the intervals below the surface layer that had enrichment of any of the study metals, the differences were very small compared to the large metal concentrations of the 0-5 cm interval (Table 10-21). For example, the estimated median difference between the Zn concentrations of the basin and control soils from the 5-15 cm interval was only 2.7 percent of the estimated median difference for the surface layer (Table 10-21). The Zn differences at the lower depths represented even small percentages of the surface layer Zn accumulation.

Table 10-20. Results of Wilcoxon Rank Sum Tests of differences between soil trace metal concentrations of basin and control sampling zones at various depths; Bulk Mail detention basin site.

Depth/Metal (cm)	Wilcoxon Rank* Sum Statistic	Level of ** Significance
0 - 5		
Cd	30.0	.008
Zn	30.0	.008
Cu	30.0	.008
Pb	30.0	.008
5 - 15		
Cd	23.0	.278
Zn	29.0	.016
Cu	27.0	.056
Pb	28.0	.032
15 - 30		
Cd	22.0	.365
Zn	24.0	.206
Cu	24.0	.206
Pb	25.0	.143
30 - 60		
Cd	23.5	.242
Zn	30.0	.008
Cu	13.0	> .548
Pb	23.5	.242

*Rank sum for basin sample.

**Ha: Soil trace metal concentration from basin greater than control area.

NOTE: For basin samples, n = 4; control samples, n = 5.

Table 10-21. Estimates of trace metal concentration differences between basin and control soils at various depths; Bulk Mail detention basin site.*

Depth/Metal (cm)	Estimate of Median Diff. (ppm)	95% Confidence Interval (ppm)
0 - 5		
Cd	7.71	19.24, 6.28
Zn	539.7	1484.9 , 395.2
Cu	44.7	152.0 , 32.2
Pb	268.3	786.8 , 215.8
5 - 15		
Zn	14.7	110.6 , 2.5
Cu	1.4	5.2 , - 1.6
Pb	6.9	48.4 , - 2.4
15 - 30		
Zn	3.6	36.5 , - 1.3
Cu	0.4	1.5 , - 1.1
Pb	1.8	11.8 , - 1.6
30 - 60		
Zn	5.0	10.6 , - 0.9

*Based on Wilcoxon Rank Sum Test.

Discussion - Surface Soils

Grassed Swales. The statistical analyses revealed cases of clearcut enrichment in grassed swales for two trace metals, Zn and Cd (Table 10-6). The enrichment occurred at the two swale study sites probably the least likely to have especially high concentrations of trace metals in urban runoff, the Fairidge and Stratton Woods sites. These residential areas had not been in existence very long, they had low intensity urban land uses and they had small traffic volumes (Table 10-2). Yet, very large accumulations of Zn were observed in the swales of both sites and significant accumulation of Cd in the Fairidge swales (Figures 10-13, 10-14 and 10-18). In the same areas, Cu and Pb had typical roadside patterns of decreasing metal concentrations with increasing distance from the road, and in general the concentrations were not exceptionally large (Figures 10-15, 10-16, 10-19 and 10-20).

The residential trends were especially surprising in light of the Rt. 234 swale results. The highway median swales had been in operation several years longer, and were exposed to much greater traffic volumes than the residential sites, but none of the study metals had accumulated in the median swales to concentrations significantly greter than the road zone concentrations (Table 10-2 and 10-6). Actually, the Cd, Cu and Zn concentrations in the Rt. 234 swales seemed to be much the same in the road zone (Table 10-6). Perhaps stormwater runoff had increased the concentrations of these three metals in the swales to equal those near the road. If so, the pattern of decreasing metal concentrations in the soil with increasing distance from the road had been broken. However, if accumulation of metals had occurred, it was small compared to the Zn accumulation in the swales of the residential sites. Another interesting observation was that the soil Zn concentrations at the Rt. 234 site had approximately the same range as the Stratton Woods soil Zn concentrations, whereas the soil Pb concentrations were one or two orders of magnitude greater at the Rt. 234 site

(Figures 10-18, 10-20, 10-22, and 10-24).

If automobile and roadway pollutants were the primary source of trace metals at all three sites, the results were illogical. Logic seemed to demand that additional sources of Zn were present at the residential swale sites. The results of the additional surface soil sampling in the residential swales provided strong evidence that the galvanized steel culverts under each driveway were the latent sources. At the swales sampled, the Zn concentrations decreased with increased distance downslope of the culverts (Figure 10-28). The Theil regression equation slope estimates of approximately 16 ppm per m for the Fairidge site and approximately 6 ppm per m for the Stratton Woods site demonstrated the sharp change with distance (Table 10-8). By contrast, galvanized material was not used at the Rt. 234 site, but rather concrete pipe or ditches transported runoff between swales.

The results established with reasonable certainty that Zn enrichment of the residential swale soil was the result of Zn leaching from the galvanized coatings of the culverts as runoff passed through the pipes. Likewise, the metal was then transferred to the soil while the runoff passed over the soil surface or as the water infiltrated into the soil profile. The occurrence of acid rainfall (and therefore acid runoff) in the eastern United States has been well-documented, and rainfall precipitation pH measurements by the Occoquan Watershed Monitoring Laboraory in the Northern Virginia area are frequently as low as 3.5. The acid precipitation has probably reduced pH levels of runoff waters and contributed significantly to the leaching process by increasing the solubility of Zn.

The accumulation of Zn in the swales at the Fairidge site were much greater than at the Stratton Woods site (Figures 10-14 and 10-18). An obvious factor in the difference in the Zn concentrations was the age difference between the two developments (Table 10-2). When time is considered as a factor, however, the Fairidge site still had a greater rate of Zn concentration increase (Table 10-9). Two factors that might explain the differential Zn accumulation rates are watershed slope and swale length. As observed in the field, the roads and watershed in general has a significantly greater slope at the Fairidge site. Therefore, a greater percentage of precipitation was probably delivered to the swales and culverts as runoff at the Fairidge site. The swales are generally longer at Stratton Woods than Fairidge and thus, there are fewer culverts per unit length of swale to contribute Zn.

Cadmium, Cu, and Pb concentrations in the soils also showed signs of being related to galvanized culverts (Table 10-7 and 10-8). Cadmium and Pb had small but significant equation slopes for the Theil regression model of concentration decrease with distance from culverts for the Fairidge site; Cu had a small but significant slope for the Stratton Woods site. The culverts were probably contributing minor amounts of trace metals, possibly impurities in the galvanized coatings, other than zinc. The variation in which metals had significant decreases with distance from culverts for a given site may have been a function of the manufacturer. That is, different manufacturers would likely use different zinc ore and impurities in the areas would probably vary from source to source.

Detention Basins. Clearcut differences among the land use characteristics of the detention basin watershed were reflected in the accumulation patterns of trace metals in the basin surface soils. The Stedwick watershed was comprised of primarily clustered residential developments, roads, and open space (Table 10-3). Lead and zinc accumulated moderately in the basin surface soil of this site (Figures 10-30 through 10-37). With a watershed dominated by roads and a parking lot that was heavily used by large trucks, the Bulk Mail site had the greatest accumulations of Cu, Cd, and Zn of any study site and zinc was found in the greatest concentrations of any of the study metals (Table 10-3, Figurs 10-38 through 10-43). The KMart basin watershed was mainly the KMart shopping center parking lot (Table 10-3). In the surface soils of this basin, the largest Pb concentration of any detention basin site was found while zinc was the second most abundant metal measured at the site (Figures 10-48, 10-49, 10-52 and 10-53).

Although the trace metal concentrations were much larger at the KMart site, the general patterns of trace metal accumulation of the KMart and Stedwick basin were similar. In each case, Pb was the major metal, with an important Zn component. Cadmium, while present in low concentrations, had increased significantly relative to background levels. Copper either did not show signs of accumulation or had only small increases compared to background levels.

The common factor for the two sites was the automobile. For the Washington, D.C. area, Helsel et al. (10-10) noted that Pb and Zn were the main trace metal contaminants in urban runoff and that Pb and Zn concentrations in stormwater runoff were positively correlated with the traffic volumes and the percent impervious cover of monitored catchments. Even though the Stedwick site was a year older than the KMart site, the higher metal concentrations observed at the KMart site were hardly surprising because it had a much greater traffic volume and greater impervious surface area than the Stedwick site. The similar ordering of trace metal concentrations at the two sites is evidence that the trace metal sources at the two sites were the same, i.e., automobiles. Rubber worn from tires was probably a major source of both Zn and Pb, while motor oil added additional Zn, and gasoline combustion products contributed the largest portion of the Pb (10-11).

The trace metal accumulation pattern for the Bulk Mail basin was unlike the other two study basins. Zinc was the dominant trace metal, rather than Pb, and Cd and Cu were observed to have much larger concentrations than at any other site examined during the study.

The trace metal sources at the Bulk Mail basin must have been at least partially, different in nature, from those at the other two detention basin sites. During the field sampling, a distinct petroleum product odor was present in the basin. In places, the iridescent color patterns of some floating petroleum product were visible on the standing water in the basin's marshy areas. In addition to the normal automobile products more typical of roads and commercial parking lots, the Bulk Mail basin was probably receiving large loads of petroleum material from crankcase oil drippings, oil spills, and fuel oil spills. Crankcase oil has an especially large Zn content and could easily be responsible for the elevated Zn concentrations in the basin surface soil (10-11). Lead may have come from the normal sources of gasoline exhaust products and rubber. Identification of potential Cd and Cu sources is more difficult. Antifreeze is one of the automobile-related substances that has a very important Cu component (10-11). The information available concerning Cd is too incomplete to allow speculation.

Basin topography was an important factor with regard to the spatial variability of trace metals. At the Stedwick site, the accumulation patterns were clear, the greatest metal concentrations occurred where the water backed up most frequently, that is, near the basin outlet and in depressions and overlfow areas along the concrete channel (Figures 10-31, 10-33 and 10-37). For most of the life of both the Stedwick and Bulk Mail detention basins, the primary function of the structures was runoff quantity control, rather than control of water quality. The fairly recent change of the outlet structures to allow longer detention times at the sites probably has altered the trace metal patterns and increased the rate of trace metal enrichment in the basin. At the KMart site, trace metal concentrations were greatest near the inlet, near the outlet of the structure, and in depressions in the middle of the basin. Also, the steep side slopes showed signs of trace metal enrichment from the impoundment of runoff from large precipitation events (Figures 10-47, 10-49, 10-51, and 10-53). At the Bulk Mail site, the outlet of the basin was not a zone of accumulation but, instead, the area of large trace metal concentrations were in the midpart of the basin. Runoff did not seem to have backed up frequently at the basin outlet, but had dissipated primarily in the interior of the basin.

Results - Depth Investigations

The results of the depth studies demonstrated that accumulation of the study trace metals was limited primarily to the surface soil sampling zone for all BMP sites. Any additional accumulation was almost always limited to the 5-15 cm depth sampling interval. Researchers working with the application of metals in the form of sewage sludge have reached similar conclusions (10-12, 10-13, 10-14). Also, the results are compatible with the research findings of Nightingale (10-15). He found that large concentrations of Zn, Pb, and Cu were limited to the surface 5 cm of soil in California stormwater detention basins and that background levels were reached by the 15-30 cm soil depth interval.

The one instance of trace metal movement below the 15 cm interval at the swale drain sites was for Cd at the Fairidge site (Table 10-15, Figure 10-55). The downward movement of Cd is not surprising. Of the study trace metals, Cd and Zn are normally the most mobile in soil environments. Since the mobility of Zn and Cd are roughly equivalent, it was surprising to see the movement of Cd without strong evidence of Zn leaching. Especially since the surface concentrations for Zn were greater than those of Cd. However, the Cd concentration increases were small.

The conditions at the Bulk Mail site seemly should have been very conducive to the downward migration of trace metals. Based on the surface soil study, if any of the study sites were going to have leaching problems, Bulk Mail should have been the one. The concentrations of Cd, Cu and especially Zn were very high in the surface soil and a large part of the basin was submerged for long periods of time, a situation conducive to the production of organic compounds that can form soluble complexes with trace metals. Organic pollutants, in the form of petroleum products were also present and could have potentially increased the metal solubility as well. Further, the soil profile was very sandy 25 cm below the soil surface or deeper.

In spite of all the conditions, serious leaching was not a problem. There was no significant statistical evidence of the downward movement of Cd, while Cu and Pb concentration differences were small or did not exist below 15 cm. Zinc, had hugh surface concentrations but, by the 30-60 cm sampling interval the concentrations were no more than 10 or 11 ppm greater in the basin soil than in the control soil (Table 10-21).

Several mechanisms were in operation that prevented the large-scale downward movement of trace metals. First, the organic load of the urban runoff was probably not great enough to create the anaerobic conditions necessary for accelerated biochemical production in the basin soils, even with long periods of submersion. Also, the high clay content surface soil layer prevented rapid infiltration to the sandy soil beneath. In fact, marsh areas were typically underlain by a very clayey layer and below the clay was a region of unsaturated sandy sediments with lower clay contents. The slow downward movement of water combined with large CEC values, organic matter, and the clay content of the surface soils probably prevented the leaching of trace metals.

If during the construction of the basin the soil had been excavated deep enough to expose the underlying sandy sediments, the rate of downward movement of trace metals in the soil profile probably would have been much greater. The soil infiltration rate would have been greatly increased, thereby eliminating the marshy areas and decreasing the quanitity of runoff leaving the basin. If the sandy sediments were at the surface, the basin could handle larger volumes of runoff and eliminate most surface runoff, but there would be a much greater likelihood of the trace metals exhausting the soils sorption capacity and contaminating the ground water.

Summary

The results of this phase of the study seemed to indicate that the use of grassed swale drains and detention basins to control urban stormwater runoff has few harmful effects to soil with respect to the trace metals Cd, Cu, Zn and Pb. The field investigations revealed little evidence to show that these metals accumulated in swale drains due to contributions from urban runoff. The metals, especially Pb and Zn, were found to accumulate in the surface soils of the basins, but if any downward movement of these metals occurred, it was very small. This finding is not surprising in view of the fact that the exchangeable fractions of these metals for soils and incoming stormwater solids were small.

The conclusion that the accumulations of trace metals in the detention basin soils were not harmful is certainly a relative judgement. For the BMP sites, several factors must be considered. As mentioned above, for the time and conditions of the current study, leaching to ground water did not appear to be a problem. Also, the land used for the study BMP's, and most other stormwater control structures, were not in prime agricultural areas, but in urban environments. Food is not produced from these areas, so there is little food chain hazard associated with the trace metal accumulations. The primary concern with regard to the trace metal accumulations may be the additional increase of trace metals in the urban environment as a whole. Daily trace metal insult to humans may have chronic effects that have yet to be defined. This potential problem is not restricted to storm water detention basins, but encompasses the entire urban area.

The findings of this research project relate to specific areas in the Washington, D.C. region. The soils of the study sites were generally fine textured and appeared to have relatively low infiltration rates. The removal of trace metals from urban runoff at these sites was primarily a surface phenomenon. In swale drains, particulate metals may have been removed as the runoff flowed across the sideslopes of the swales. In addition, a large part of the total stormwater flow probably moved the downslope swale drains rather than infiltrating into the soil profile. At the detention basins, stormwater was generally impounded for short periods of time, but most of the water gradually escaped through the basin outlet instead of infiltrating into the soil profile. The primary removal mechanism for metals at the basin site was probably settling. Other BMP structures with different soils may have very different trace metal vertical and horizontal distribution patterns. For example, coarse textured soils would allow the majority of the runoff in BMP structures to move downward in the soil profile, rather than moving across the soil surface.

References

10-1 Bragan, R. J., "Memorandum to Working Group for Selection of National Urban Runoff BMP Monitoring Sites," Council of Governments, Washington, D.C. (1980).

10-2 Lietzke, D. A., Guide to Soil Taxonomy and Key to Virginia Soils, Piedmont Division, Virginia Tech Extension Division Publication MA-218, Blacksburg, 95 p. (1978).

10-3 Kaster, D. L. and Porter, H. D., Soils of Prince William County (associated maps), Prince William County Virginia, Virginia Tech Agronomy Department, and U.S.D.A. Soil Conservation Service, Blacksburg (undated).

10-4 National Cooperative Soil Survey, "Collingtin Series," Official Soil Series Descriptions, Washington, D.C. (1977).

10-5 DeBuchenanne, G. (Council of Governments, Washington, D.C.) Personal Communication (1981).

10-6 Agemian, H., and Chau, A. S. Y., "Evaluation of Extraction Techniques for the Determination of Metals in Aquatic Sediments." The Analyst, 101, 761-767 (1976).

10-7 Donohue, S. J., and Gettier, S. W., Laboratory Procedures, Soil Testing and Plant Analysis Laboratory, Agronomy Department, Virginia Tech, Blacksburg, Virginia (1980).

10-8 Alley, M. A., "Cation Exchange Capacity Determination," Class Handout, Agronomy 4060, Virginia Tech, Blacksburg (1979).

10-9 Young, R. H. F., "Urban Stormwater Runoff in Hawaii," Proc. Int. Symp. Urban Storm Water Mgmt., Univ. of Kentucky, Lexington (1978).

10-10 Helsel, D. R., Kim, J. I., Grizzard, T. J., Randall, C. W., and Hoehn, R. C., "Land Use Influences on Metals in Storm Drainage," Jour. Water Poll. Cont. Fed., 51, 709-717 (1979).

10-11 Shaheen, D. G., Contributions of Urban Roadway Usage to Water Pollution, EPA 600/2-75-004, Washington, D.C. (1975).

10-12 Sidle, R. C., Hook, J. E., and Kardos, L. T., "Accumulation of Heavy Metals in Soils from Extended Wastewater Irrigation," Jour. Water Poll. Cont. Fed., 49, 311-318 (1977).

10-13 Sidle, R. C., Hook, J. E., and Kardos, L. T., "Accumulation of Heavy Metals in Soils from Extended Wastewater Irrigation," Jour. Water Poll. Cont. Fed., 49, 311-318 (1977).

10-14 Sommers, L. E., Nelson, D. W., and Silviera, D. J. "Transformations of Carbon, Nitrogen, and Metals in Soils Treated with Waste Materials," Jour. Env. Qual., 8, 287-293 (1979).

10-15 Nightingale, H. I., "Lead, Zinc, and Copper in Soils of Urban Storm-Runoff Retention Basins," Amer. Water Works Assoc. Jour., 67, 443-446 (1975).

11. Sedimentation and Particle Size Association Studies

Introduction

It was the objective of this sub-study to examine the degree of pollutant removal attainable by gravity sedimentation of stormwater derived from highly impervious areas. A laboratory-scale settling column was used to simulate a full-scale basin. Stormwater samples were collected from three commercial (shopping center) catchments and used in a series of studies to determine pollutant removals of a variety of constituents of water quality significance as well as of various particle sizes in suspension.

Methods

The commercial sites selected for study were all located near the Occoquan Watershed Monitoring Laboratory. This was a requirement in selecting the sites because of the need to minimize travel time for sample collection. Because of the large volumes of sample required for settling column analyses, it was not practical to retrieve them with the automated equipment utilized in the BMP evaluations, nor was it possible to collect flow-weighted composites. In summary, then, the sites selected for this sub-study were not all NURP BMP sites, and the samples retrieved were manually-collected grabs.

Sampling Sites. The three commercial areas chosen for sampling locations were Fair Oaks Mall in Fairfax, Virginia, and Manassas Mall and Manassas Shopping Center in Manassas, Virginia. These sites were selected because of their large impermeable surface areas. They were also typical of locations in urban regions where detention/retention basins are used to control runoff.

Fair Oaks Mall is a relatively new covered shopping mall. Samples were collected from a 60 inch culvert that drains directly into a retention pond currently in use. The pond discharges into Difficult Run, which flows into the Potomac River.

At the Manassas Mall site, samples were taken from a 42 inch storm sewer that receives drainage from a covered shopping mall. The storm sewer system discharges to a tributary of Bull Run, which flows into the Occoquan Reservoir.

The final site involved sample collection from a 42 inch culvert under Portner Avenue in Manassas. This culvert collects runoff from the Manassas Shopping Center, which is of the strip commercial type, and discharges into a concrete channel. The channel eventually flows into Bull Run, which discharges into the Occoquan Reservoir.

Parking and road areas at Manassas Mall and Fair Oaks Mall are cleaned daily. Manassas Shopping Center is cleaned five days a week. Cleaning practices at all three sites involve vacuum trucks and sweeping by hand. Table 11-1 lists the sampling sites, their characteristics, and the dates on which samples were collected.

Sample Collection. Stormwater was collected by retrieving grab samples from the storm drainage systems during a runoff event. Five 5½-gallon Polyethylene carboys were used for collection. The samples were then transported to the Occoquan Watershed Monitoring Laboratory in Manassas, Virginia.

At the laboratory, 4 liters (1.06 gallons) from each of the five carboys were placed in a sixth carboy to obtain composite samples. Because of the variations in pollutant concentrations with time and flow, this was done to minimize any differences in pollutant concentrations between the carboys. Composited samples were then placed in four Plexiglass columns. The columns were five feet deep, six inches in diameters, and had quarter inch thick walls. Each column contained approximately 20 liters (5.28 gallons) of sample. Three

Table 11-1. Sampling Sites and Sampling Dates

Site	Drainage Area Acres	Collection Site	[a]Cleaning Frequency	Sampling Date	Experiment No.
Fair Oaks Mall	54.66	60in. Culvert	Daily	6/20/81	3
				7/4/81	1
				10/23/81	4
Manassass Mall	23.0	42in. Culvert	Daily	7/5/81	2
				7/26/81	5
				8/11/81	6
Manassas Shopping Center	30.0	42in. Culvert	5 days/wk.	9/15/81	7

[a]Vacuum trucks plus sweeping by hand.

ports on each column were used to withdraw sample at one foot intervals, and at designated times. A schematic of the column design is shown in Figure 11-1.

The first storm sampled, which was on June 20 from Fair Oaks Mall, was used as a preliminary sample. This was treated differently from all others in that only one column was used and only solids, nutrients, and heavy metals determinations were made. Sampling depths were at one, two, and three feet. Sampling times were zero, two, six, and twenty-four hours. The preliminary sample was taken to prepare for subsequent analytical procedures and sampling techniques.

After filling the columns, samples were withdrawn at intervals of either one, two, and three feet consecutive depths or one, two and four feet. The sampling began immediately following sample addition and after two, six, twelve, twenty-four, and forty-eight hours. Samples were collected at the one foot depth at time zero from each column to determine if any major variations existed in pollutant concentrations between the columns. This comparison was performed for five storms.

Sample Analysis. Each sample was analyzed for total suspended solids, volatile suspended solids, particle size distribution, lead, zinc, copper, nckel, chromium, cadmium, nitrate and nitrite, total and soluble Kjeldahl nitrogen, ammonia, total and soluble phosphorus, and ortho-phosphate. Total and fecal coliform bacteria and 5-day biochemical oxygen demand were also examined, but with less frequency, at zero, two, and twenty-four hours. Chemical oxygen demand time intervals were at zero, two, twenty-four, forty-eight hours. Total and soluble organic carbon determinations were made at zero, two, twelve, twenty-four, and forty-eight hours. All water quality parameters were determined by the methods of analysis described previously in Chapter 5. All particle size

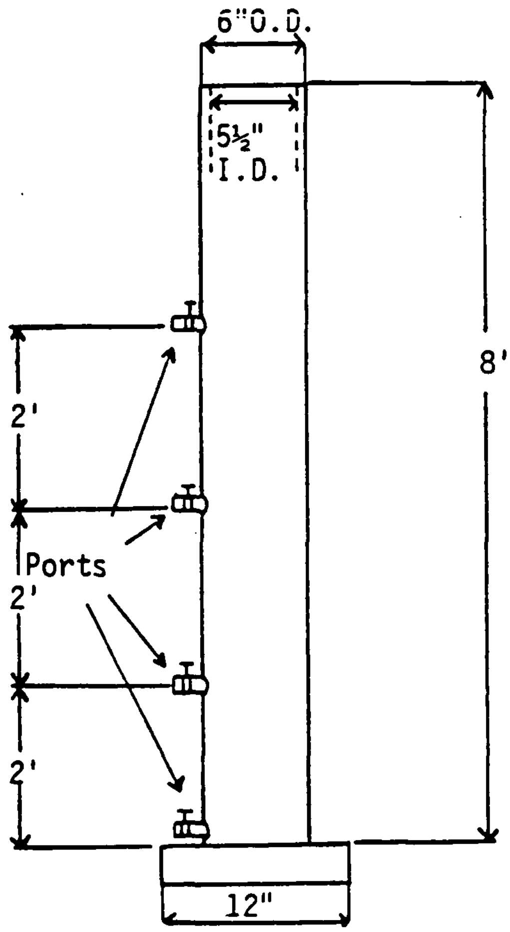


FIG. 11-1. LABORATORY SETTLING COLUMN (41)

distribution determinations were made using a HIAC Particle Size Analyzer Model PC-320 (11-2).

Results

The pollutant concentrations in the seven samples varied widely. For example, the initial TSS concentrations ranged from 15 to 721 mg/L, and the initial COD concentration range was even greater, from 6.8 to 908 mg/L. By contrast, the nickel, chromium and cadmium concentrations were always less than the 20 μg/L detection limit of the instrument used. In addition, only one sample had a copper concentration greater than the 20 μg/L detection limit, and it decreased below the limit after only two hours of settling. The initial concentrations of the more significant parameters are tabulated in Table 11-2.

Solids. The storms sampled were numbered according to the initial TSS concentration because most of the pollutants removed by sedimentation will be related to the particulate matter in some way. These numbers are cross-referenced with the sampling sites and dates in Table 11-1. A summary of TSS removal by sedimentation for all of the experiments is given in Table 11-3. The concentrations observed at three difference depths were averaged for each sampling time to obtain the data in this table. The results show that TSS removal was 80% or greater for all tests. They also show that after 6 hours of settling the highest TSS concentration observed was 40 mg/L, with an average of 25 mg/L, even though there was a very large variation in the initial concentrations. After 24 hours, all TSS concentrations were less than 20 mg/L, which would be equal in quality to the flows discharged by well-operated secondary sewage treatment plants.

Graphical analyses for the performance of the columns in removing selected

TABLE 11-2. Initial Pollutant Concentrations in Urban Runoff Samples

EXPERIMENT NO.	Pollutant Concentrations, mg/L										
	TSS	COD	TOC	BOD_5	TN	NH_3-N	(NO_2+NO_3+N)	TP	TSP	Pb	Zn
1	15	6.8	22	--	2.32	0.20	0.06	0.83	0.72	ND	ND
2	35	82	--	--	4.57	0.07	2.26	0.19	0.06	ND	.368
3	38	--	--	--	5.47	1.92	2.14	0.14	0.06	ND	.302
4	100	87	23	30	3.11	0.38	0.76	0.45	0.24	.27	.112
5	155	50	9	--	2.03	0.07	0.77	0.25	0.10	.44	.160
6	215	138	17	35	3.00	0.28	0.74	0.48	0.21	.37	.172
7	721	908	322	210	4.44	0.19	0.04	0.82	0.30	.913	.692

No detectable (ND) concentration of nickel, chromium and cadmium, and only one (No. 7) had detectable copper (75 g/l). No. 4 and No. 5 had 24 million and 240,000 total coliforms per 100 ml., respectively.

TABLE 11-3. Settleability of Suspended Solids in Urban Runoff

Experiment No.	Total Suspended Solids Concentration, mg/L						Maximum % Removal
		Sedimentation Time, hours					
	Initial	2	6	12	24	48	
1	15	14	14	13	11	2	87
2	35	20	18.5	18	14.5	7	80
3	38	24	16	--	6	-	84
4	100	45	34	30	19	7	93
5	155	21	17	12	9	7	95
6	215	67	40	26	17	9	96
7	721	103	34	30	18	18	98

constituents were conducted using methods common to the study of flocculant suspensions (11-1).

The settling of the suspended solids with water column depth and time was analyzed using isoconcentration lines. Flocculant particles will describe a curved isoconcentration line whereas discrete particles will produce a straight isoconcentration line. The resulting curves, shown in Figures 11-2 through 11-8, indicate that the TSS in urban runoff behave like a mixture of discrete and flocculant solids, with the discrete particles settling out rapidly while the flocculant solids sometimes did not settle well until the second day. The degree of flocculation that occurred did not seem to correlate with initial TSS concentrations. Nonetheless, the time required to achieve a specific % removal did correlate well with the initial TSS concentration, as the data in Figure 11-9 show. The results indicate that urban runoff TSS can be adequately analyzed using flocculant settling techniques. It was also generally observed that removal percentages other than 00% were closely related to initial TSS concentration. Figure 11-10 shows a summary of the data at the six hour mark for all seven experiments. This increase in removal with increasing initial TSS concentrations is consistent with flocculant settling phenomena.

The volatile fraction (% VSS) of the TSS varied from 23 to 60% initially. During settling the inorganic fraction usually settled faster than the volatile (organic) fraction resulting in an increasing % VSS in the solids still suspended in the water column. These increases ranged from 9 to 36.5%, but with no correlation with initial TSS. During two of the experiments, Numbers 2 and 4, the VSS settled faster than the inorganic suspended solids and this was particularly pronounced for Experiment No. 4.

<u>Organic Matter</u>. The removal of COD and TOC that occurred is summarized in Table

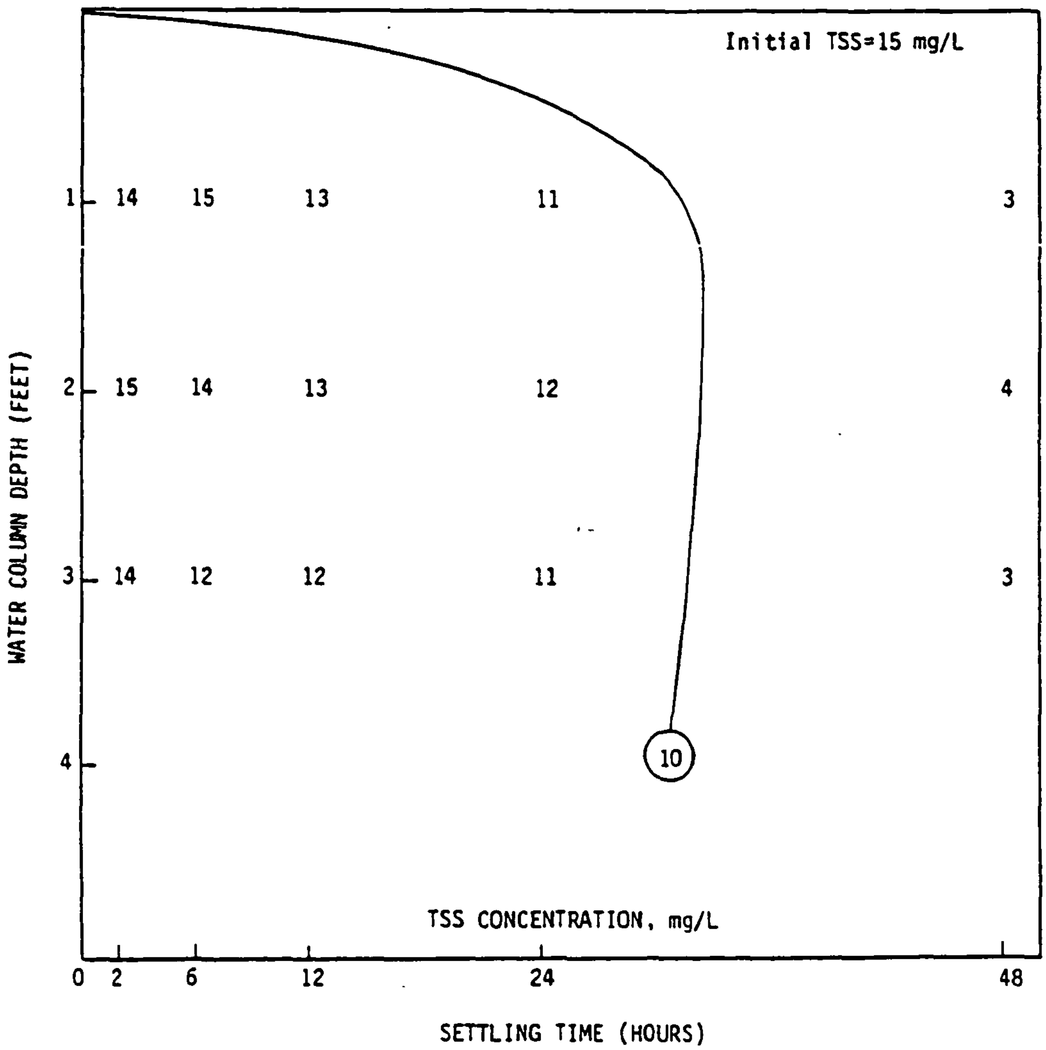


FIG. 11-2. CHANGES IN SUSPENDED SOLIDS CONCENTRATIONS WITH SETTLING TIME FOR EXPERIMENT 1.

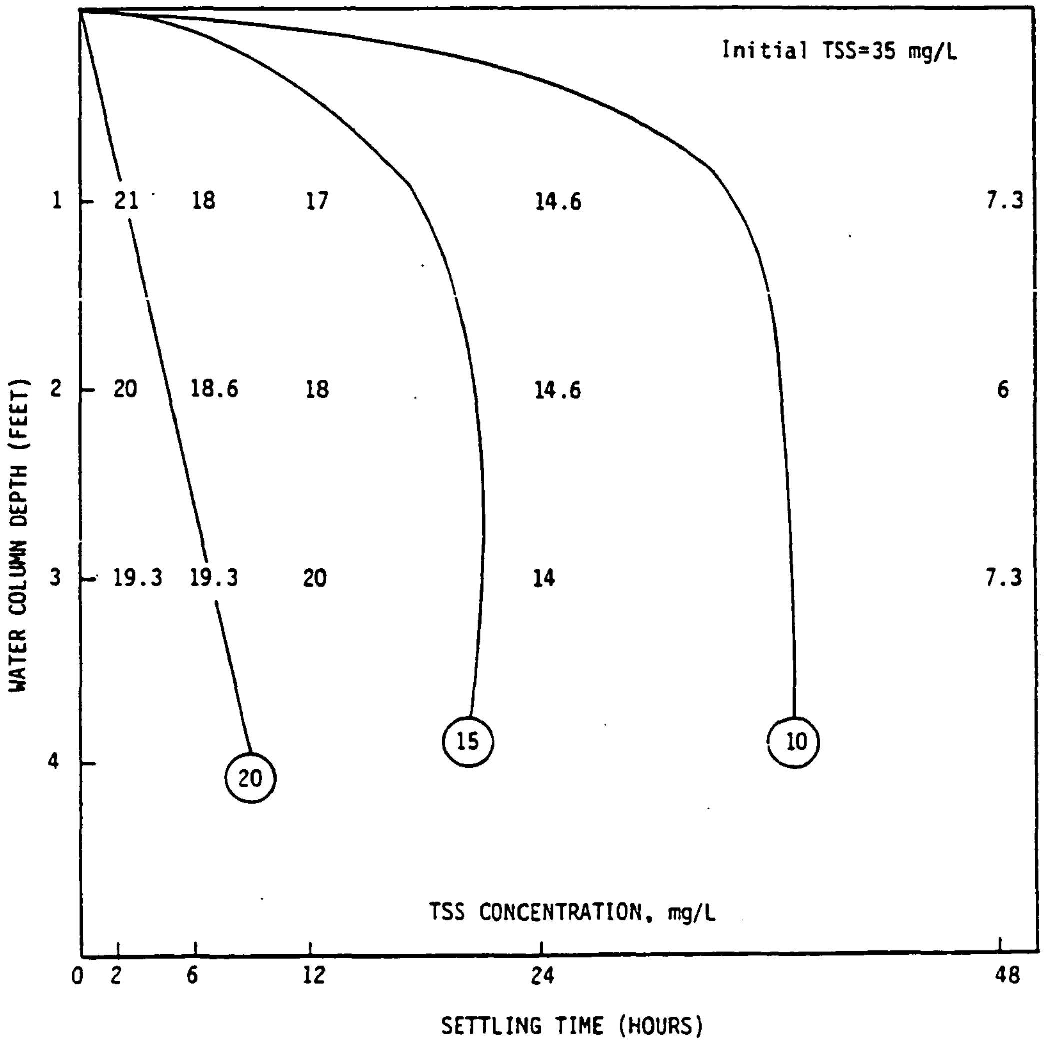


FIG. 11-3. CHANGES IN SUSPENDED SOLIDS CONCENTRATIONS WITH SETTLING TIME FOR EXPERIMENT 2.

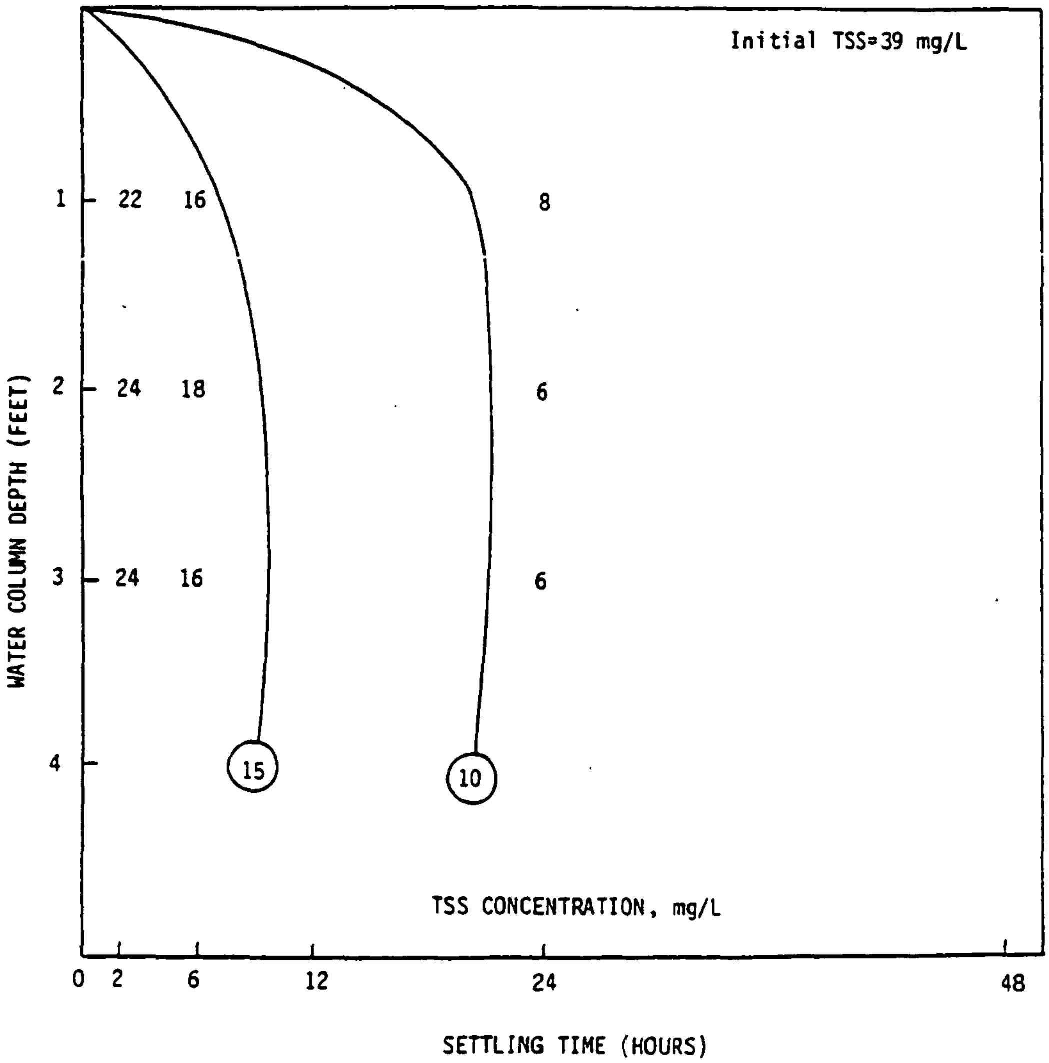


FIG. 11-4. CHANGES IN SUSPENDED SOLIDS CONCENTRATION WITH SETTLING TIME FOR EXPERIMENT 3.

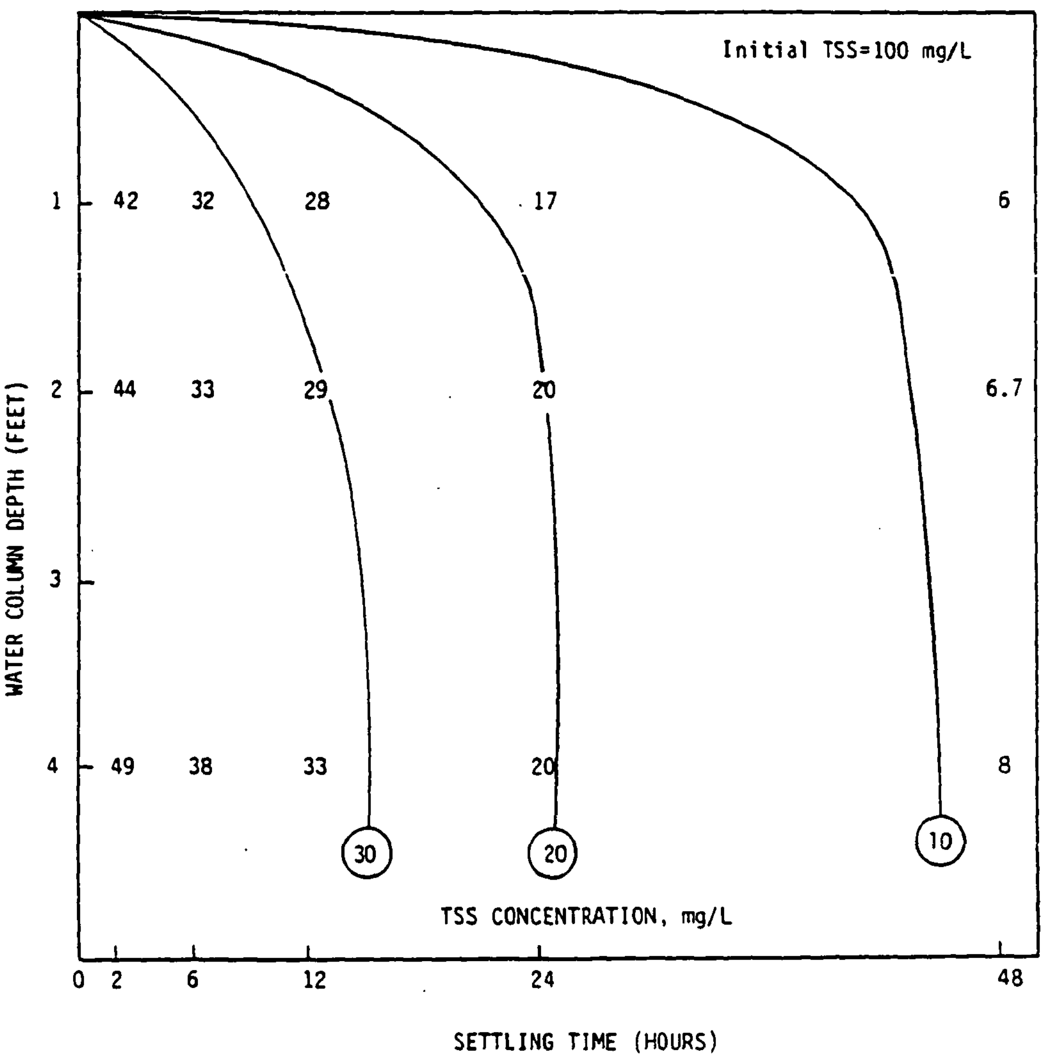


FIG. 11-5. CHANGES IN SUSPENDED SOLIDS CONCENTRATIONS WITH SETTLING TIME FOR EXPERIMENT 4.

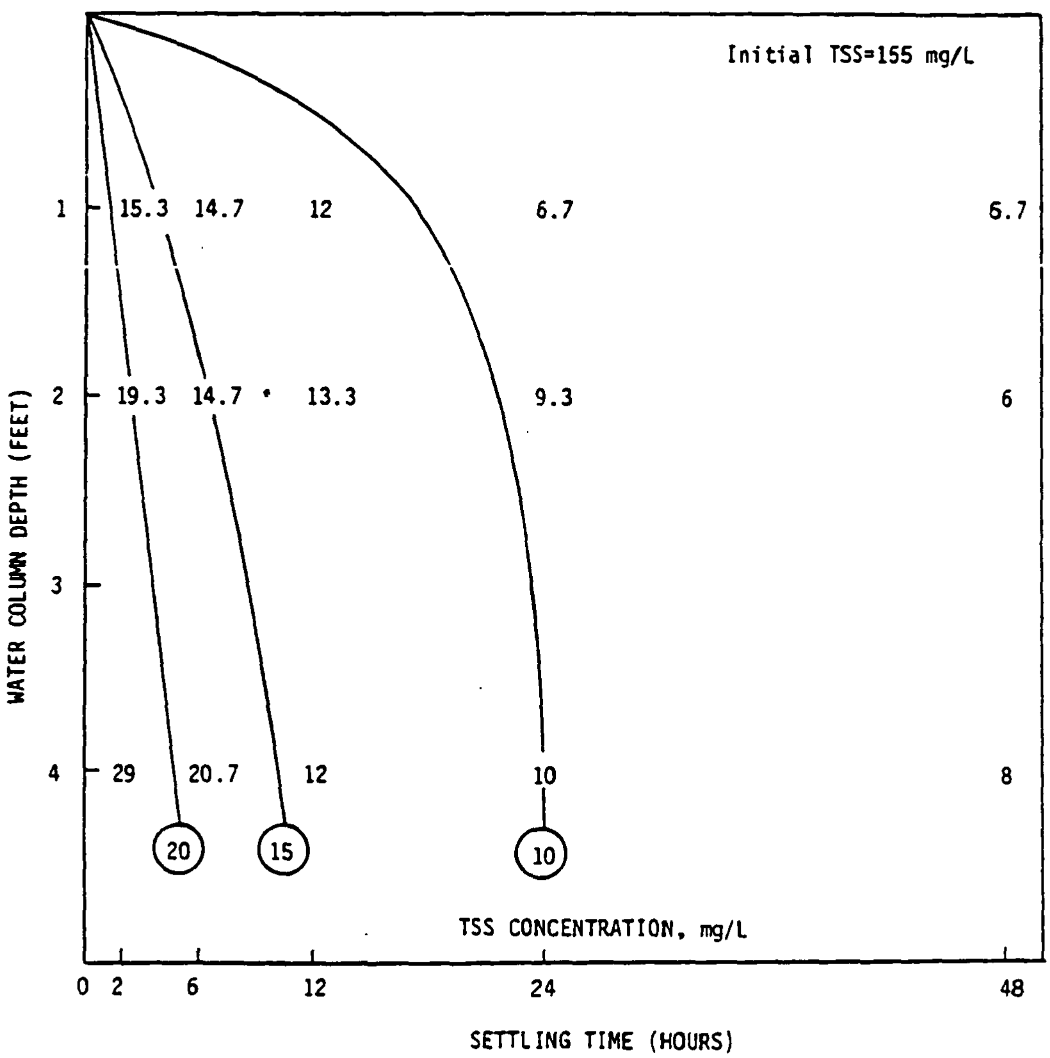


FIG. 11-6. CHANGES IN SUSPENDED SOLIDS CONCENTRATIONS WITH SETTLING TIME FOR EXPERIMENT 5.

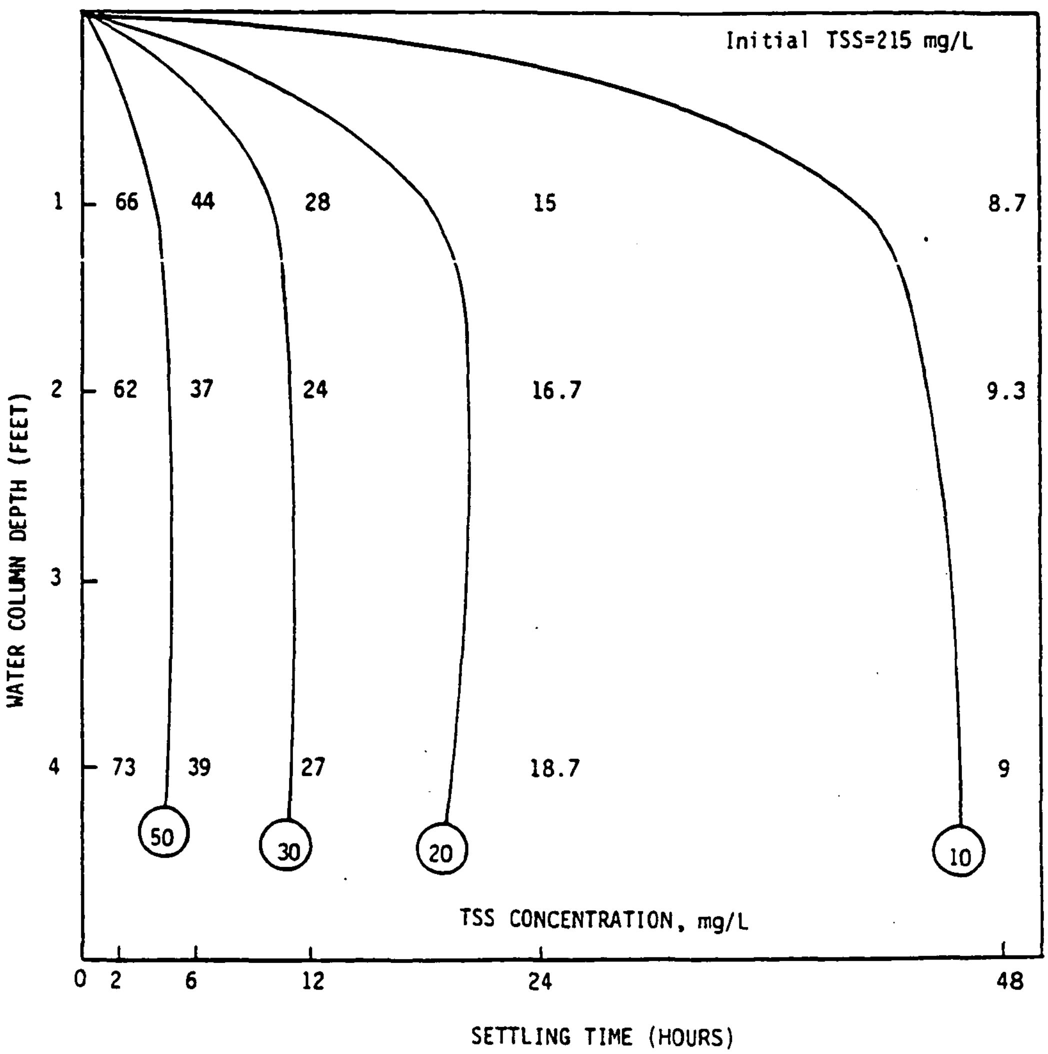


FIG. 11-7. CHANGES IN SUSPENDED SOLIDS CONCENTRATIONS WITH SETTLING TIME FOR EXPERIMENT 6.

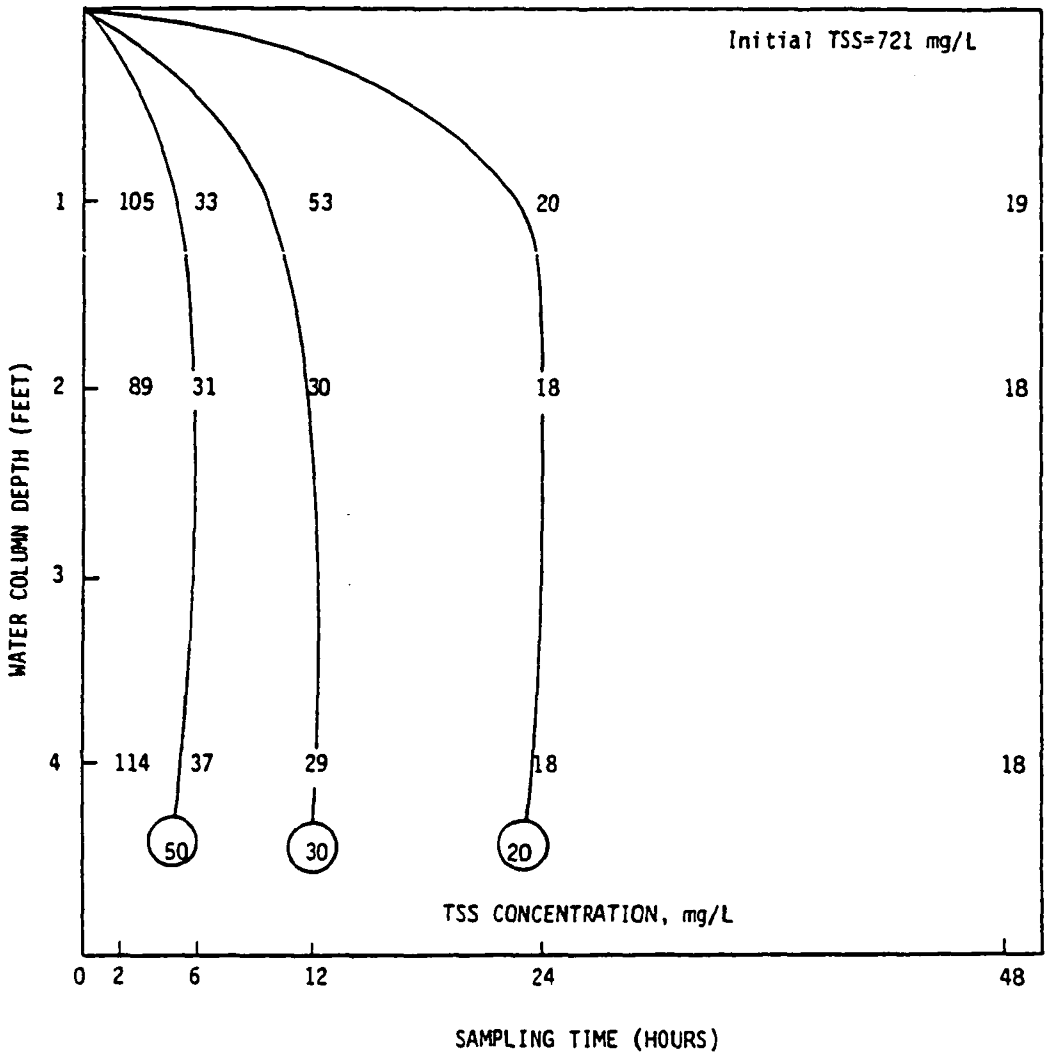


FIG. 11-8. CHANGES IN SUSPENDED SOLIDS CONCENTRATIONS WITH SETTLING TIME FOR EXPERIMENT 8.

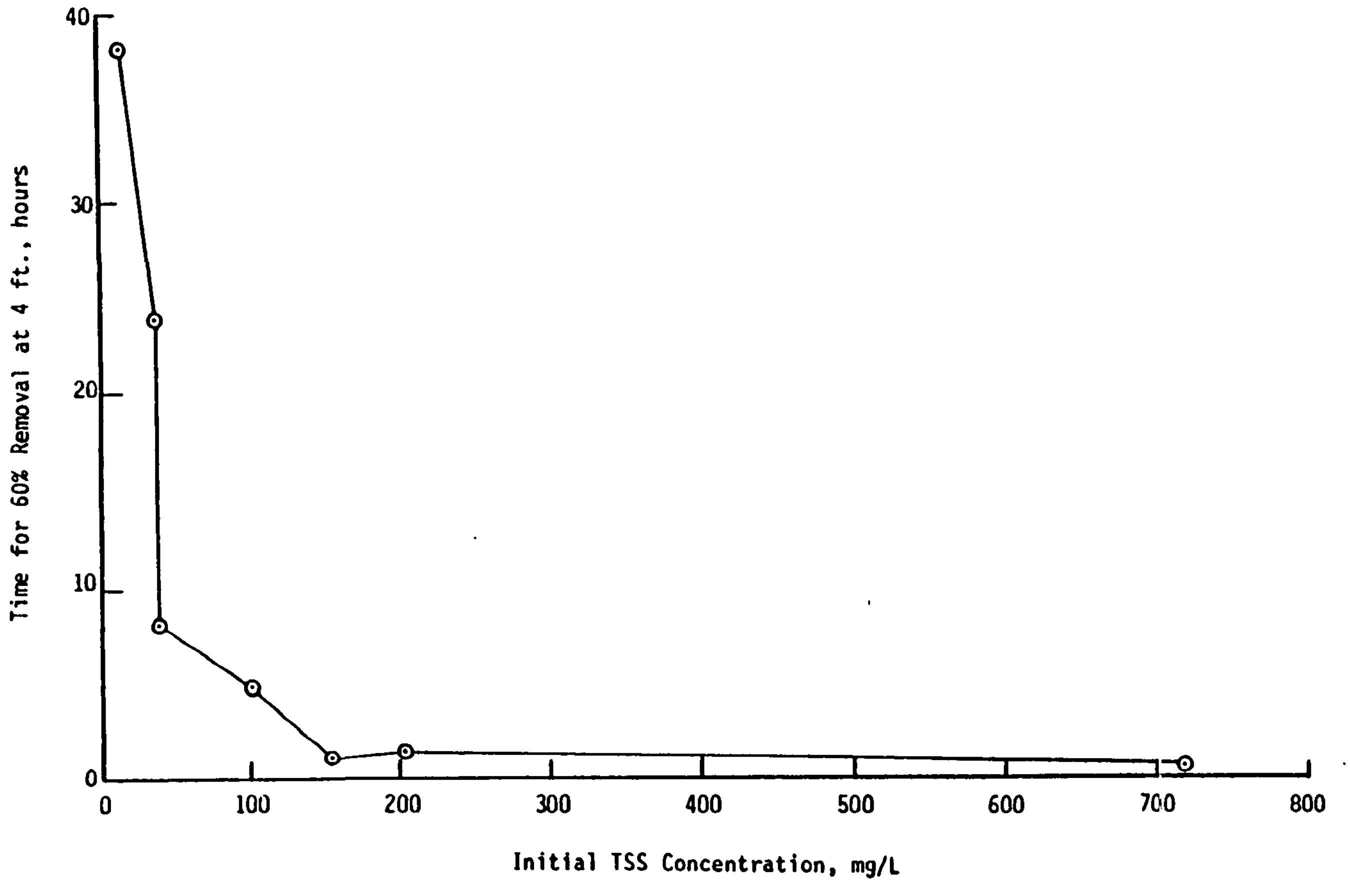


FIG. 11-9. THE EFFECT OF INITIAL TSS CONCENTRATIONS ON REMOVAL RATES

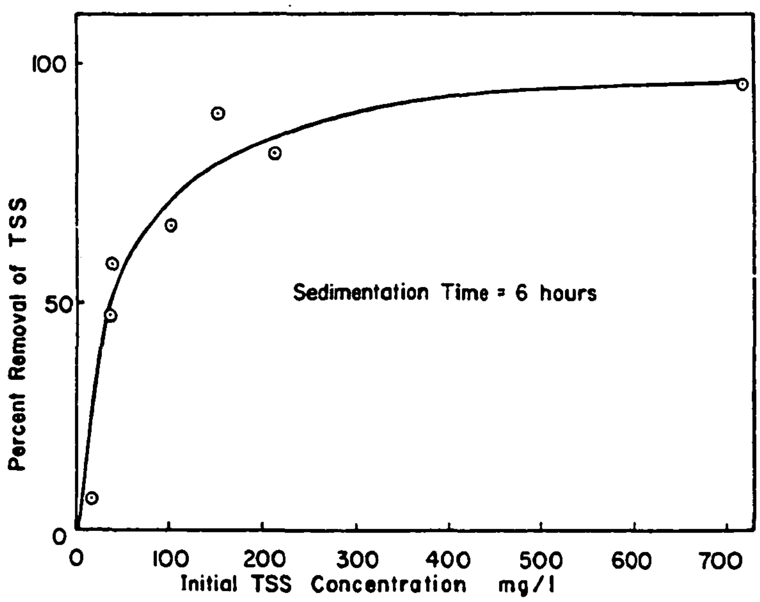


FIG. 11-10. THE EFFECT OF PARTICLE CONCENTRATION ON TSS REMOVAL FROM URBAN RUNOFF BY SEDIMENTATION

11-4.

COD removal was low for the samples with low TSS concentrations, but was 47% or greater, with an average removal of 57%, for the four experiments when the initial TSS was 200 mg/L or greater. TOC % removals were less but generally followed this trend except during Experiment No. 6. This test had a very high COD removal but a low TOC removal. It is possible the initial TOC concentration of this sample was inaccurately measured.

The BOD_5 removal was measured after 2 and 24 hours of settling for Experiment No. 4, 6 and 7. The initial concentrations were 30, 35 and 210 mg/L, respectively. The % removals after 2 hours of settling were 57, 23, and 56%, respectively, whereas the removals were 60, 63 and 60% after 24 hours of sedimentation.

The removal of organic matter could be characterized fairly consistently by % removals during these experiments but the concentrations remaining in the water column were quite variable, as were the initial concentrations.

Phosphorus. Table 11-5 summarizes the total phosphorus removal data. The maximum % removals varied from 42 to 85% with an average of 56%. The 24 hour sample for Experiment No. 6 was apparently mis-analyzed. If it is ignored, the results show that removals were nearly complete after 24 hours of settling, and that the additional removals after 12 hours were relatively small in terms of concentration reductions. As with the organic matter, the final concentrations were very variable, ranging from 0.07 to 0.47 mg/L.

Nitrogen. As shown by Table 11-6, total nitrogen removals during the experiments ranged from 9 to 77% with an average of 32.5%. Removals were substantially higher for the samples with initial TSS concentrations of 100 mg/L or greater, ranging from 29 to 77% with an average of 47%. The final con-

Table 11-4. Settleability of Organic Matter in Urban Runoff

Settling Time, hrs.	EXPERIMENT NUMBER: COD Concentration, mg/L						TOC Concentration, mg/L				
	1	2	4	5	6	7	1	4	5	6	7
Initial	6.8	82	87	50	138	908	22	23.1	9	17	322
2	6.7	72	77	23	77	713	20.6	15	6.6	18	311
12	--	--	--	--	--	--	--	14.8	6.6	16	207
24	4.9	69	66	23	46	455	19.6	14.1	6.2	12	209
48	--	47	46	20	47	425	--	12.4	4.6	13	203
Max. % Removal	28	18	47	60	67	53	11	46	49	29	37

Table 11-5. Settleability of Total Phosphorus in Urban Runoff

Experiment No.	Total Phosphorus Concentration, mg/L						Maximum % Removal
		Sedimentation Time, hours					
	Initial	2	6	12	24	48	
1	0.83	0.79	0.83	0.74	0.54	0.47	43
2	0.19	0.16	0.13	0.13	0.11	0.09	53
3	0.14	0.12	0.10	--	0.08	--	43
4	0.45	0.33	0.30	0.33	0.28	0.26	42
5	0.25	0.12	0.11	0.12	0.12	0.14	56
6	0.48	0.32	0.26	0.10	0.24	0.07	85
7	0.82	0.61	0.40	0.30	0.24	0.28	71

Table 11-6. Settleability of Total Nitrogen in Urban Runoff

Experiment No.	Total Nitrogen Concentration, mg/L						Maximum % Removal
		Sedimentation Time, hours					
	Initial	2	6	12	24	48	
1	2.32	2.27	2.27	2.20	2.12	2.62	9
2	4.57	4.36	4.32	4.13	3.97	3.64	20
3	5.47	5.46	5.27	--	4.84	--	12
4	3.11	2.25	2.20	2.34	2.37	2.28	29
5	2.03	1.32	1.31	1.35	1.48	1.29	36
6	3.00	2.17	1.90	2.01	1.70	1.64	45
7	4.44	1.72	1.25	1.23	1.03	1.19	77

centrations achieved did appear to be strongly related to the initial TSS concentration because the % removed increased as the initial TSS concentration increased. The final nitrogen concentrations were also influenced by the initial nitrogen concentrations. Surprisingly, the two highest initial total nitrogen concentrations observed were in the two samples that had very low TSS concentrations. Removals from those two samples occurred at approximately the same rate.

The % removals of TKN were very similar to those of total nitrogen. Nitrate removals were generally poor as would be expected because they are highly soluble and have very little affinity for sorbing on paritculate surfaces. The average reduction of nitrate concentrations in the experiments was less than 10% although Experiment No. 6 achieved a removal of 27%. Ammonia removals were very small in terms of concentration and frequently increased during the settling test. The largest concentration decrease was 0.12 mg/L whereas the largest increase was 0.19 mg/L.

Metals. The removal of zinc was monitored during six of the experiments. The results are given in Table 11-7. As shown, the % removals ranged from 12 to 73% with an average of 44%. Average removal for samples with an initial TSS concentration of 100 mg/L or greater was 57.5% with three of the four removals in excess of 50%. The two samples with the lowest initial TSS concentrations had high concentrations of zinc and poor removals were obtained. In fact, the final concentrations in those two samples were the highest observed.

It was possible to monitor lead removal in only four of the experiments, but the removals obtained were very good. They ranged from 78 to 94% with an average of 86% . Nevertheless, a residual concentration of 100 μg/L was observed after 48 hours of settling the sample with the highest concentration.

Table 11-7. Settleability of Total Zinc in Urban Runoff

Experiment No.	Total Zinc Concentration µg/L						Maximum % Removal
		Sedimentation Time, hours					
	Initial	2	6	12	24	48	
2	368	353	350	350	350	325	12
3	302	260	317	--	242	--	20
4	112	80	80	68	58	55	51
5	160	53	45	45	43	43	73
6	172	155	115	113	135	130	34
7	692	275	193	195	195	200	72

The results are shown in Table 11-8.

Coliforms. The coliform concentrations were so high that the dilutions selected did not yield any usable removal information except for tests No. 4 and 5. In Experiment No. 4, the total coliforms were reduced from 24 million per 100 ml in 24 hours. A similar reduction was obtained for fecal coliforms with a 24 hour concentration of 13,000 per 100 ml measured. In Experiment No. 5, the total coliforms were reduced from 460,000 to 199,000 per 100 ml in 24 hours, but no reduction in fecal coliforms was observed.

Particle Size. The particle size distribution of all seven of the samples was measured and the percent of the particles in each size range is given in Table 11-9. The results show that an average of 80% of the total particles were less than 25 μg in diameter and 57% had diameters less than 15 μm in diameter. It is of interest to note that 92% of the particles in the most concentrated sample collected (Experiment No. 7) had diameters less than 25 μg, the highest percentage observed.

Estimates were also made of the fraction of total suspended matter surface area that was present in specific particle size ranges. This was done by making the assumption of spherical shape for all particles, and arriving at a representative diameter for each size range based upon the geometric mean:

$$\text{Diameter for range} = \sqrt{(\text{largest diameter} \times \text{smallest diameter})}$$

The total surface area in each range was then determined by multiplying the number of particle counts by the area of a spherical particle having the geometric mean diameter. Table 11-10 shows the distribution of surface area amongst the various particle size ranges for the raw samples. It is interesting to note that 10^9 square microns is 1,000 square meters, indicating quite a large surface area ranges for samples having less than 1 gram per liter of suspended

Table 11-8. Settleability of Total Lead in Urban Runoff

Experiment No.	Total Lead Concentration, μg/L						Maximum % Removal
		Sedimentation Time, hours					
	Initial	2	6	12	24	48	
4	127	88	62	67	40	28	78
5	144	25	24	21	15.5	9	94
6	370	122	116	85	70	59	84
7	913	260	130	120	100	100	89

Table 11-9. Particle Size Distribution of Urban Runoff Suspended Solids

Experiment No.	Particle Diameter, μm						
	15	15-25	25-35	35-45	45-55	55-65	65
1	64	21	7	3	2	1	2
2	48	20	11	6	4	5	6
3	54	23	10	5	3	2	3
4	52	23	11	6	3	2	3
5	54	25	12	4	2	1	2
6	63	22	9	4	1	1	1
7	65	27	4	2	1	1	1
Average	57	23	9	4.3	2.3	1.7	2.3

Table 11-10. Total Initial Surface Area of Suspended Particles and the Percent of the Total in Each Size Range

Experiment No.	Initial TSS (mg/L)	Initial Total Surface Area (microns) μ^2/L	Initial Percent of Total Surface Area in Each Particle Size Range (microns)										
			5-15	15-25	25-35	35-45	45-55	55-65	65-75	75-85	85-95	95-105	105-115
1	15	2.6×10^{7}	12	19	16	13	10	8	6	5	5	4	3
2	35	2.3×10^{8}	1	7	10	9	9	18	8	10	8	9	9
3	38	2.5×10^{7}	7	14	14	13	11	10	7	9	6	5	4
4	100	5.9×10^{8}	6	14	16	16	13	10	7	7	4	4	2
5	155	3.0×10^{8}	9	20	22	12	12	8	5	4	3	3	2
6	215	8.3×10^{8}	13	22	20	15	9	7	4	3	2	2	1
7	721	2.2×10^{9}	18	37	14	13	6	4	2	2	1	2	1

matter. Note that the majority of surface area was found in particles of the 15 to 35 micron size range with the exception of the Experiment 2 sample in which the most surface ara was associated with particles in the 55 to 65 size range. This distribution remained approximately the same throughout the settling period. Using the Statistical Analysis System (SAS), Pearson product moment correlation coefficients were computed between incremental reductions in surface area and incremental reductions in other sample pollutants (11-3). The data from the seven available samples were grouped according to initial TSS as follows:

Low - Experiment 1, 2, 3

Moderate - Experiments 4, 5, 6

High - Experiment 7

Correlation coefficients were computed for 8 constituents, and are listed in Table 11-11. As may be seen, in general, the poorest correlations existed between surface area and pollutant removal for the low TSS group. Notable exceptions in this group were suspended zinc, total phosphorus, and suspended phosphorus.

With the exception of total and suspended zinc, the correlations for the moderate size storms were all quite high. For the single large storm, the incremental removal correlations were quite high for all constituents. Given the implied relationship between reductions in surface area and reductions in pollutant concentrations, it was decided to extend the analysis to incremental reductions in surface area in each particle size range. This was done to determine if there were specific associations between selected pollutants and given particle size ranges.

The analysis was undertaken using the stepwise regression capability of SAS (11-3). Incremental reductions in surface area in each particle size range were established as the independent variables. The stepwise regression procedure was

TABLE 11-11. RELATIONSHIP BETWEEN THE PERCENT REDUCTION OF TOTAL SURFACE AREA AND WATER QUALITY PARAMETERS

Parameter	TSS GROUPING	Correlation Coefficient	n
Total Phosphorus	low	0.68	38
	moderate	0.77	45
	high	0.95	16
Suspended Phosphorus	low	0.64	38
	moderate	0.84	45
	high	0.95	16
Total Kjeldahl Nitrogen	low	0.18	38
	moderate	0.76	45
	high	0.98	16
Suspended Kjeldahl Nitrogen	low	0.12	38
	moderate	0.80	45
	high	0.98	16
Total Lead	low	-	-
	moderate	0.81	44
	high	0.98	15
Suspended Lead	low	-	-
	moderate	0.86	44
	high	0.94	15
Total Zinc	low	0.48	24
	moderate	0.32	44
	high	0.98	15
Suspended Zinc	low	0.97	24
	moderate	0.46	44
	high	0.97	15

then allowed to select the best one, two, or three independent variable model to describe reductions in pollutant concentrations. The sample data were also segregated into low, moderate, and high TSS groupings prior to conducting the stepwise analysis. The procedure was conducted in such a way as to identify the highest correlation coefficients for multi-variate regressions having no more than three independent variables. What this means is that the regression procedure identified the reductions is TSS in the particle size ranges that were most responsible for the observed reductions in pollutant concentrations.

The results of the stepwise regression procedure are summarized in Table 11-12. One of the most striking things about the data in the Table is the consistency of the results with respect to particle size for the high TSS storm (initial TSS=721 mg/L). For each parameter investigated, correlation coefficients in excess of 0.87 were observed. Only in one instance (suspended organic carbon), was a three independent variable model required, and even then the size ranges selected were all less than 45 microns. In fact, the data in Table 11-12 clearly show that, at least in the high TSS storm, the pollutant associations are very strongly skewed towards the small particles. In fact, in all cases except the one cited initially the association was best described by a single 10 micron range, all of which were less than or equal to 45 μ.

For the low and moderate TSS storms, somewhat poorer correlations were obtained. Specifically, in the low TSS storms, no strong relationships were observed for TKN, total zinc, suspended zinc, total phosphorus, and organic nitrogen. For the moderate TSS storms, poor correlations resulted only for suspended organic carbon, and total and suspended zinc. In all cases, poor correlations were produced for oxidized nitrogen forms (nitrite and nitrate) as these anions do not associate well with the generally negatively-charged suspended matter surfaces.

Table 11-12. Relationship Between Reductions in Pollutant Concentration and Surface Area Reductions in Various Particle-Size Ranges

PARAMETER	TSS GROUPING	MULTIPLE CORRELATION COEFFICIENT	PARTICLE SIZE RANGE (microns)
Suspended Lead	Low	-	-
	Moderate	0.86	65-75, 25-35,35-45
	High	0.87	15-25
Suspended Kjeldahl Nitrogen	Low	0.86	105-115
	Moderate	0.79	105-115
	High	0.99	35-45
Suspended Organic Carbon	Low	-	-
	Moderate	0.33	25-35
	High	0.98	15-25, 35-45, 5-16
Total Lead	Low	-	-
	Moderate	0.88	75-85, 35-45, 55-65
	High	0.99	35-45
Total Kjeldahl Nitrogen	Low	0.06	55-65
	Moderate	0.78	105-115, 15-35, 35-45
	High	0.99	35-45
Total Zinc	Low	0.37	45-55, 15-25
	Moderate	0.35	105-115, 95-105, 75-85
	High	0.99	35-45
Suspended Zinc	Low	0.36	105-115, 5-15
	Moderate	0.30	105-115
	High	0.96	15-25
Total Phosphorus	Low	0.52	25-35, 55-65, 65-75
	Moderate	0.69	25-35, 35-45, 95-105
	High	0.97	25-35
Total Nitrogen	Low	-	-
	Moderate	0.73	105-115, 15-25, 35-45
	High	0.99	35-45
Nitrites and Nitrates	Low	0.25	5-15
	Moderate	0.07	5-15
	High	-	-
Organic Nitrogen	Low	0.11	55-65
	Moderate	0.88	105-115, 25-35, 35-45
	High	0.99	35-45

NOTE: Particle size ranges are shown in order of importance when more than one range is listed for a coefficient.

Using the information provided by the regression analysis, a design particle-size range can be chosen to be used in developing criteria for the most efficient removal of pollutants. For example, the reduction of TKN in the sample with an initial TSS concentration of 721 mg/L would depend on the reduction of particles in the 35 to 45 micron size range. The design criterion for reducing TKN concentrations, therefore, would focus on the removal of particles 35 microns or less. Using Stokes' Law, a settling velocity for a particle with a 35 micron diameter can be determined and then converted to an overflow rate. Those particles with settling velocities equal to or greater than the overflow rate settling velocity will be removed. Particles with settling velocities less than the overflow rate will be removed in direct proportion of their settling velocity to overflow rate settling velocity ratio.

Carrying the example further, a particle 35 microns in diameter would have an overflow rate settling velocity of 143 gpd/ft^2 according to Stokes' Law by assuming a water temperature of 20°C (μ = 1.0007; ρ = 0.998) and a specific gravity of 1.10. This particular specific gravity was chosen to represent a small diameter particle. In Figure 11-11, a wide range of specific gravity values were plotted against the corresponding overlfow rates from Stokes' Law using a particle diameter of 50 microns. Large specific gravity values would represent heavy particles such as sands, and the lower end of the scale would represent smaller particles such as silts. Therefore, a low specific gravity was chosen for the 35 micron particle used. An overflow rate settling velocity of 143 gpd/ft^2 would correspond to a column depth and time interval of four-feet and 5.6 hours. These data could then be used with settling column data for the stormwater in question to arrive at adequate detention times for the removals required.

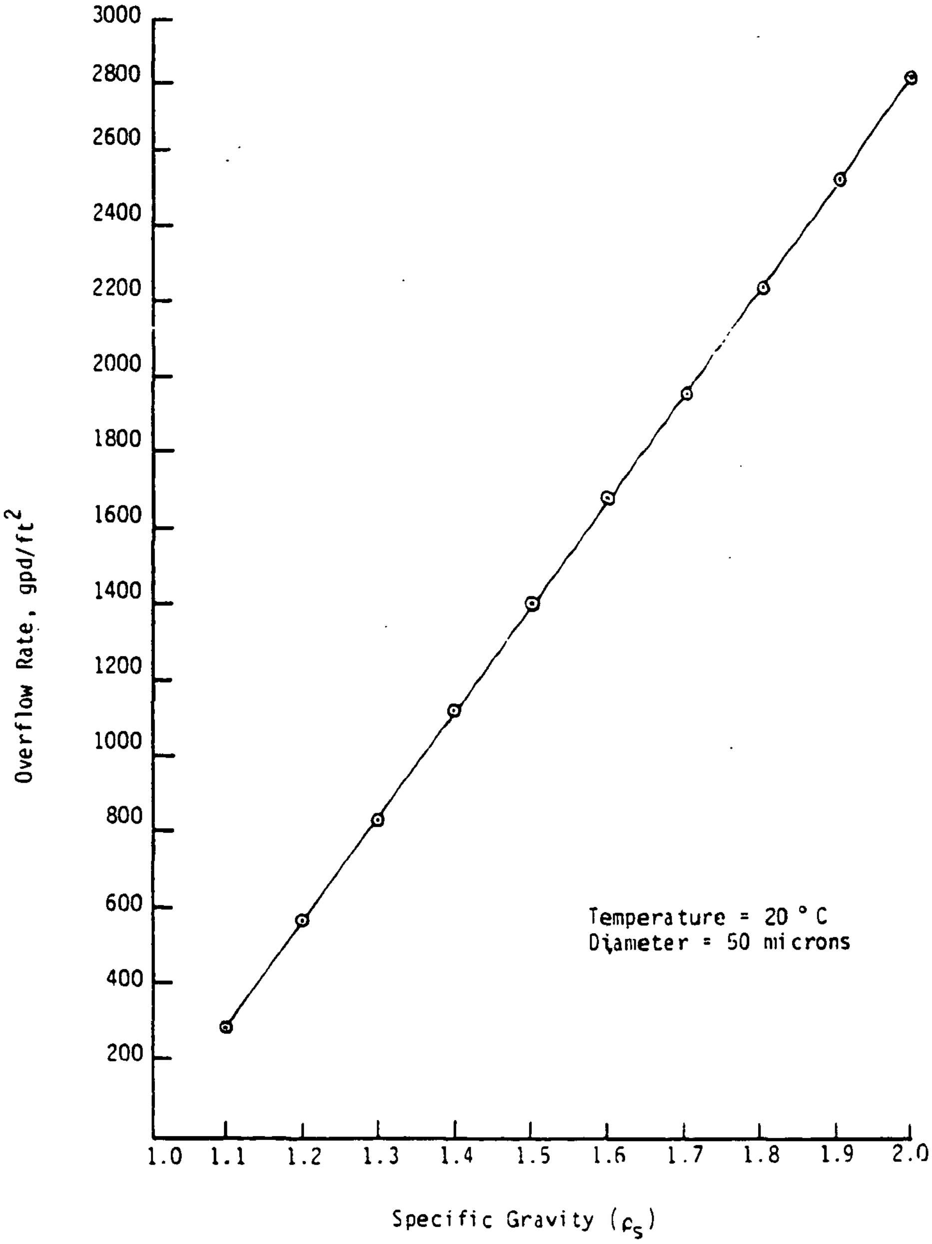


FIG. 11-11. VARIOUS SPECIFIC GRAVITY VALUES AND THE CORRESPONDING OVERFLOW RATE

References

11-1. Eckenfelder, W. W. and Ford, D. L., Water Pollution Control, Jenkins Book Publishing Company, Austin and New York, pp. 59-63 (1970).

11-2. Knocke, W. R., Personal Communication, Department of Civil Engineering, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, 1981.

11-3. SAS Institute Incorporated, "SAS User's Guide 1979 Edition." Raleigh, North Carolina (1979).

12. Bioavailability of Nutrients

General

It was the purpose of this sub-study to develop data for the examination of nutrient availability in stormwater runoff from the urban catchments studied. In addition, it was desired to examine the effects on nutrient availability of some of the inflow-outflow BMP structures monitored.

This was established as a sub-study goal because of the relative abundance of information on nutrient transport in urban stormwaters, and the paucity of information on the availability of those nutrients to biological systems. Such information is critical, because it is, after all, the nutrient availability that classifies nitrogen or phosphorus as pollutants, not their respective concentrations.

Methods

Samples were obtained from splits of the flow-weighted composites collected at the BMP monitoring stations described in Chapters 3 and 4. Selection of storms for assay was based, in part, on having sufficient composite volume to conduct the full range of NURP analyses <u>and</u> to perform the assay. Because of the limited scope of this sub-study, no attempt was made to assay the availability of sediment-bound nutrient forms. The sample aliquots selected for the algal assays, therefore, passed through an acid-washed glass fiber filter. A portion was reserved for the algal assays, and an aliquot set aside for nutrient analyses as described in Chapter 5.

Algal growth potentials were measured on collected stormwater samples using a modification of the Algal Assay Bottle Test recommended by the USEPA National Eutrophication Research Program (12-1). The green alga *Selenastrum capricor-*

nutum was selected as the test species because of its unicellular nature, inability to fix nitrogen, and ease of culture. In addition, the nutritional requirements and growth dynamics of the organism are well-documented in the literature (12-2).

Test containers used were 125 milliliter (ml), acid-washed Erlenmeyer flasks, and were stoppered with sterile cotton plugs to permit gas exchange and minimize the possibility of contamination. The recommended 40 ml. of sample was used to insure an adequate surface to volume ratio (12-1). Stock cultures of *Selenastrum capricornutum* were maintained in synthetic medium, and the suspensions were transferred on a weekly basis. Because it was desirable to process as many storms as possible, it was necessary to shorten the length of the assay. This was accomplished by increasing the inoculum concentration from 1,000 cells/ml to approximately 1.0 mg/l dry weight. this permitted the test cultures to reach their maximum growth in 4 to 7 days.

The asssay scheme consisted of two undiluted replicate flasks serving as controls, a 1.0 mg/l NO_3-N addition and a 0.5 mg/l PO_4-P addition. While this phosphorus addition is quite large, it was necessary because of the high phosphorus concentrations found in the runoff samples. It was felt that if small additions were made, growth-limitation by phosphorus would be masked in certain cases by normal variations in flask concentration.

Samples were incubated under 400 foot-candles of continuous fluorescent light as a temperature of 24 ∓ 0.5° C. Test flasks were swirled daily to insure maximum availability of carbon dioxide for growth.

Measurement of biomass was conducted by using a Photovolt photofluorimeter Model 520 modified for use in measuring fluorescence of chlorophyll *a*.

Conversion of relative photometric units to biomass was achieved by use of a

Table 12-1. Algal Assays for MWCOG NURP

STATION No.	STATION NAME	LAND USE	BMP TYPE	YEAR	STORM NO.
51UR03	Burke Pond-In	Single Family Res.	Wet Pond Inflow	1981	242.0 258.0
51UR04	Burke Pond-Out	Single Family Res.	Wet Pond Outflow	1981	242.0 258.0
51UR06	Stratton Woods	Single Family Res.	Grassed Swales	1981	258.0
51UR09	Fairidge	Single Family Res.	Grassed Swales	1981	335.0
51UR10	Stedwick-In	Townhouse/Apts.	Dry Pond Inflow	1981	258.0 299.0
51UR11	Stedwick-Out	Townhouse/Apts.	Dry Pond Outflow	1981	258.0 299.0 335.0
51UR15	Westleigh-In	Single Family Res.	Wet Pond Inflow	1981	242.0 298.0
51UR16	Westleigh-Out	Single Family Res.	Wet Pond Outflow	1981	242.0 298.0
51UR17	Burke Village Ctr.	Shopping Center	Infiltration Pits	1981	242.0 299.0 335.0
51UR18	Dafief	Single Family Res.	Grassed Swales	1981	299.1
51UR19	Rockville Ctr.	Office Building	Pourous Paving	1981	296.0
51UR21	Fair Oaks-Out	Shopping Center	Wet Pond Outflow	1981	299.0

Table 12-2. Algal Assay Results - MWCOG NURP

BMP TYPE	STATION No.	IN OR OUT	--------Yield mg/l Dry Weight ------- ACTUAL	THEORETICAL-N	THEORETICAL-P	LIMITING NUTRIENT
Wet Ponds	UR03/04	In	27.9	29.6	51.6	N
		Out	1.1	5.3	4.3	P
		In	49.3	43.3	98.9	N
		Out	7.4	9.1	12.9	N&P
	UR/5/16	In	16.1	16.3	60.2	N
		Out	1.2	10.3	4.3	P
		In	16.2	22.0	81.7	N
		Out	21.4	11.8	25.8	N&P
Dry Pond	UR/0/11	In	26.5	23.9	94.6	N
		Out	24.2	25.5	103	N
		In	8.1	8.7	55.9	N
		Out	7.0	8.0	60.2	N
Infiltration Pit	UR17		27.4	23.6	47.3	N
			12.3	14.4	51.5	N
			63.6	60.0	60.2	N&P
Grassed Swale	UR06		82.7	82.5	331	N
	UR09		44.5	46.4	81.7	N
	UR18		20.7	25.5	154.8	N
Pourous Paving	UR19		0.2	33.4	0.0	P

spike exceeded the control flasks by 20% or more, the growth-limiting nutrient prediction was considered to be confirmed.

Results

A total of thirty algal assays were conducted in the course of the sub-study. Of that number, nine were discarded because the standing crop did not approach within 20 percent of the theoretical yield based on the limiting nutrient computation. The successful assays are summarized by station and storm number in Table 12-1.

Table 12-2 also summarizes the assay results, including maximum standing crop attained and an assessment of limiting nutrient. Miller, et al. (12-3), proposed the following productivity classes for the maximum yield of *Selenastrum capricornutum*:

Low = 0.00 to 0.10 mg/l dry weight

Moderate = 0.11 to 0.80 mg/l dry weight

Moderately high = 0.81 to 6.00 mg/l dry weight

High = greater than 6.10 mg/l dry weight

Using the above as a guide, it may be seen that all the pond inflows and the outflows from all other BMP sites except the porous paving site fell into the high productivity classification. In fact, of the sites mentioned as being in the high productivity class, the lowest exceeded the threshold by a factor of 1.3 and the highest by 13.5. It is clear from these results that the nutrient burden of the urban stormwaters studied (even when only the soluble forms remain) is sufficient to stimulate the growth of large quantities of algal mass. This observation is fully consistent with the conclusions of Grizzard, *et al.* (12-4) from an earlier study in the region.

Wet Ponds. While the wet pond inflows exhibited consistently high productivity for the storms sampled (27.4 mg/L dry weight, mean), the outflows showed an average reduction of almost 70 percent. Also, in two cases, the level of productivity was reduced from high to moderately high. In addition, in each case, the nutrient limitation shifted between the inflow and outflow samples. In all four inflow samples, nitrogen was found to be the limiting nutrient. In two of the outflow samples nutrient limitation shifted to phosphorus, and in the remaining two, to a combination of phosphorus and nitrogen. What this implies is a shift in the algal-available phosphorus to nitrogen ratio. If this ratio is greater than 0.088 then nitrogen limitation may be expected, and phosphorus limitation if the reverse is true. The phenomenon witnessed in the wet ponds indicates a more efficient removal mechanism at work with respect to algal-available phosphorus. This is a positive indication, because of the general existence of phosphorus limited conditions in most receiving waters. For that reason, the shift to a phosphorus-limited condition is desirable. The removals of N and P shown in the BMP performance data also generally parallel the algal growth studies.

Dry Pond. The two assays conducted at the Stedwick site were not very encouraging. The two storms sampled encompassed a wide range of algal growth potential, exhibiting inflow standing crops of 26.5 and 8.1 mg/L dry weight. Over this wide range of inflow stimulation potential, however, the reduction efficiencies were only 8.1 and 13.6 percent, respectively. This poor performance with respect to removal of algal-available nutrients is mirrored in the BMP efficiency data.

Infiltration Pit. Although no control data are available for the infiltration standard curve produced from the stock suspensions, using concentrations increased by centrifugation and decreased by serial dilution. The standard curve was checked periodically for the duration of the study and was found to be an accurate estimate of biomass.

Samples were removed and assayed on a daily basis until maximum standing crop was attained, and sample aliquots used for analysis were returned to the test flasks. the sample cuvette was rinsed three times with double-distilled water after each sample, and was acid-washed before the initial reading each day. In between samples, the meter was zeroed using double-distilled water as a reference solution. At the conclusion of the assay, three drops of 1% phenolphthalein solution were added to the test flasks to judge whether or not carbon dioxide was in limiting supply.

According to results by Shiroyama, et. al. (12-2), the maximum growth response of *Selenastrum capricornutum* can be predicted from nitrogen and phosphorus data in the absence of other growth-limiting nutrients and toxicity. their research shows that waters containing or exceeding 0.010 mg/l orthophosphorus can be expected to produce 0.43 mg *Selenastrum capricornutum* dry weight per 0.001 mg P/l. For nitrogen, each 0.001 mg/l of total soluble inorganic nitrogen will yield 0.038 mg dry weight of the alga per liter. the authors state that actual yields falling within ∓ 20% of the predicted yields are considered statistically significant.

For the purposes of this sub-study, the predicted maximum yield was calculated from the orthophosphorus and total soluble inorganic nitrogen data, and the lower figure was considered to be the maximum theoretical yield. Either nitrogen or phosphorus was then predicted to be the growth-limiting nutrient based on the lowest figure for the maximum yield. If the respective nutrient pit BMP, it is apparent that the algal growth potential of the outflows was quite high for the storms sampled. It is also clear that, from a concentration standpoint, the nutrient supplies were typical for the site. This finding would cast some doubt on the efficacy of infiltration pits to effectively function as stormwater quality BMP's beyond their ability to redirect portions of the flow into the groundwater.

Grassed Swales. As a group, the grassed swales produced the single highest AGP of any sample in the sub-study. Even discounting that observation, the remaining yields were all in the high productivity class. As in the section above, this must cast some doubt on the practice as an effective BMP outside of its ability to reduce erosion and offsite flow volumes. Uptake of algal-available nutrients by the grassed waterways appeared to be slight.

Porous Paving. It is unfortunate that more assays were not available for the porous paving site, because the one that was performed produced the single lowest yield of the entire sub-study - well into the moderate productivity range. Examination of the BMP data set for the site, however, showed the concentration of phosphorus (the limiting nutrient) for the assay performed to be typical for the period of record. this is an encouraging result, and projects many questions about nutrient removal mechanisms at work on the site.

References

12-1. U. S. Environmental Protection Agency, Algal Assay Procedure: Bottle Test, USEPA, Corvallis, Oregon, (1971).

12-2. T. Shiroyama, W. E. Miller, and J. C. Greene, Proceedings: Biostimulation and Nutrient Assessment Workshop, EPA 660/3-75-034, (1975).

12.3. W. E. Miller, T. E. Maloney, and J. C. Greene, Water Research, 8, 667-679, (1974).

12-4 T. J. Grizzard, et al., Progress in Water Technology, 12, 883-896, (1980).

APPENDIX A

FIELD EQUIPMENT SPECIFICATIONS

FOR

MWCOG   NURP

NURP FLOWMETER SPECIFICATION

1. The device shall be a portable, pressure transducer type flowmeter, operating on 12 vdc, and being capable of obtaining its pressurized gas supply from either an internal pump or an external pressure-regulated source. Any required peripheral devices shall be powered from the flowmeter itself.

2. The device shall be enclosed in a weatherproof case, and all electronic components shall be sealed and equipped with renewable dessicant cartridges.

3. The device shall be capable of measuring liquid level over a range of 0 to 3 feet, with independently selectable ranges of 1 foot, 2 feet, and 3 feet. Alternatively, the device shall be equipped, if required by the purchaser, to operate in ranges of 0-2, 0-4, 0-6 feet. Electronic calibration of the unit shall be accomplished by front panel adjustment.

4. The device shall be equipped with a modular, replaceable read-only memory (ROM) that allows an internal storage of stage-discharge relationships for four flow control sections. The primary device types required shall be as follows: (1) 90° V-notch weir, (2) Palmer-Bowlus flumes, (3) Parshall Flumes, and (4) Type-H flumes. The four specific device combinations and sizes for each ROM shall be detailed by the purchaser.

5. The device shall be equipped with an integral strip chart recorder providing a continuous record of either stage, or instantaneous flow as determined from the integral ROM. The recorder shall have a minimum chart width of 4 inches, and a minimum of three selectable speeds ranging from one to four inches per hour. Chart paper with a minimum length of 65 feet shall be available for the recorder. The recorder shall have a reroll feature to take up chart paper as it is used. The recorder trace shall be provided to continue recording should the measured instantaneous flow exceed the full-scale value. In addition to the chart data output, the flowmeter shall provide a digital front panel LED readout of flow rate or stage.

6. The device shall provide a calibration control to allow the data output to be read in any volumetric flow unit. A periodic 12 vdc pulse shall be provided at three switch selectable increments of flow to activate an associated water sampler. In addition, upon sampler activation the device shall place an event mark on the permanent strip chart trace. The supplier shall provide a separate quote for any peripherals that may be needed to meet this requirement with sampling devices manufactured by others.

7. The device shall be equipped with auxiliary data output capability as follows:
   (a) A 4-20 ma signal proportional to instantaneous flow rate.
   (b) A 12 vdc pulse in conjunction with the flowmeter sampler initiation signal.
   (c) A 12 vdc pulse output at each tenth increment of total flow.

   The external connections for data output shall be of the weatherproof "Cannon" type. The supplier shall provide schematics identifying the pins for each data acquisition point. Any peripherals needed to supply this capability shall obtain power from the flowmeter.

8. The supplier shall provide a one year parts and labor warranty on the flowmeter as specified herein.

9. The supplier shall provide 2 days of on-site factory maintenance and repair training to an individual designated by the purchaser. Transportation and lodging costs for this item shall be borne by the supplier.

NURP AUTOMATIC SAMPLER SPECIFICATION

1. The unit shall be a portable, automatic water sampler powered by 12 vdc.

2. The unit shall be weatherproofed to withstand constant exposure to precipitation and a high humidity environment. In addition, the control circuitry shall be waterproofed to the extent necessary to allow accidental submersion without damage. A replaceable dessicant cartridge shall be provided to minimize exposure of internal components to moisture.

3. The unit shall be sufficiently small to pass through a 30 inch manhole opening and retrieved from same without tilting.

4. The unit must provide interior space for addition of ice to afford sample cooling.

5. The unit shall be capable of retrieving a 500 ml sample against a suction lift of 20 feet with a hose length and I.D. of 25 feet and 3/8 inch, respectively. The minimum sample transport velocity shall be 3 feet per second against a suction head of 15 feet.

6. The unit shall be equipped with a distribution system capable of discretely depositing a minimum of 24 samples in bottles contained in a removable base.

7. The unit shall be equipped with a set of 24 polypropylene sample bottles of 1.0 liter capacity each, contained in an integral base. The unit shall also be equipped with a 15 liter composite bottle contained in an integral base interchangeable with the 24-bottle base. Two spare sets each of discrete and composite bottles shall be provided.

8. The unit shall have the capability of collecting up to four (4) samples of equal volume per bottle and of distributing a simgle sample among as many as four (4) bottles.

9. The unit shall have the capability of being activated by an external contact closure or by an internal timing mechnaism. The time activation shall have as a minimum the following activation intervals: 15 min., 30 min., 1 hr., 2 hr., 4 hr., 16 hr., 24 hr.

10. Upon activation, the unit shall provide an air purge of the sample intake line both before and after the sample cycle.

11. The sample path following entry into the unit shall at all times have a sufficient negative slope to prevent suspended material from depositing on surfaces in contact with the liquid being sampled.

12. The supplier shall make arrangements to provide loaner units to purchaser on two days notice to replace any failed unit for the duration of the warranty period.

13. The supplier shall provide for one employee of the purchaser two (2) days of service and maintenance training for the equipment at the factory site. Expenses for the training (transportation, food, and lodging) shall be borne by the supplier.

14. Upon selection of the successful bidder, all units included in this order shall be delivered within 45 days of the order date.

NURP DATALOGGER SPECIFICATION FOR ACQUISITION OF HYDROLOGIC DATA

1. The device shall be a portable datalogger operating on 12 vdr. provided by an internal, rechargeable gel-cell battery. The device shall be enclosed in a weather-proof case and provided with sealed connectors for all inputs and outputs.

2. The device shall be equipped with a digital cassette recorder designed for use with a Phillips type 300 foot certified data cassette.

3. A minimum of eight independent channels must be provided for recording data from external sources. The input signals may be 4-20 ma, 0-12 volt, 0-12 volt pulses, or contact closures. At the time of purchase, the user will specify the exact combinations of input signals to be provided. For bid purposes, these may be shown as options where a price differential is involved.

4. The device shall contain an internal digital clock recording days, hours and minutes. The device, upon initiation of a data scan, must record time data along with channel values to the digital cassette.

5. The device must have a switch-selectable scan rate of 1, 5, 10, 30, in 60 minutes. In addition, the device must initiate a scan of all channels upon the input of a contact closure or a 12 v. pulse (at the purchaser's option) from another channel.

6. The supplier shall provide interface cables for associated instruments. Details for the interfaces will be provided by the purchaser.

7. The supplier shall provide an operator's manual, maintenance manual, and four certified digital cassettes for each device.

8. The supplier shall provide on-site orientation for purchaser's staff in device use maintenance, and routine troubleshooting. The supplier shall warrant equipment performance for one calendar year from installation date.

NURP RAIN GAGE SPECIFICATION

1. The supplier shall furnish a tipping bucket rain gage having a sensitivity of 0.01 inches of rainfall. The receiver shall maintain accuracy of 95% or better at rainfall intensities of up to 6 inches per hour. The rain gage shall provide a momentary contact closure from a mercury switch to two output terminals.

2. The receiver shall be equipped with brackets to enable it to be firmly secured to a mounting surface.

NURP EVENT ACCUMULATOR SPECIFICATION

1. The supplier shall furnish an event accululator powered by 12 VDC, for use with a tipping bucket rain gage.

2. The device shall produce an output voltage proportional to the number of contact closures occurring accross its input terminals. The full scale output voltage range shall be 0 to 5 VDC. The device shall accumulate 1,000 contact closures, at 0.005 VDC per closure, prior to resetting the output voltage to zero.

3. The device will be supplied with a manual reset to zero capability, and shall be designed in such a way as to facilitate field calibration.

NURP SPECIFICATION FOR WET/DRY SAMPLER

1. The supplier shall provide an automatic wetfall/dryfall sampler operating on 12 VDC.

2. The equipment shall have separate collectors for dryfall and wetfall sample deposition. Samples shall contact no metallic surfaces in either collector.

3. The sampler shall have equal cross sectional areas exposed to the atmosphere for both wet and dry collectors. Upon sensing the onset of precipitation the device shall close the dryfall collector to the atmosphere and expose the wetfall side. Upon sensing the end of precipitation, the device shall reverse the sequence.

4. The supplier shall provide one spare set of replaceable containers, one each for both wetfall and dryfall collection.

NURP SPECIFICATION FOR FIBERGLASS ENCLOSURES

1. Molded, one piece construction of reinforced polyester, ready for installation.

2. Minimum inside dimensions 36 inches length, 34 inches width and 50 inches height; comparable to Western Power Products Model 42-2.

3. Lift-off door engaged with lip type fastener.

4. Two louvres, each approximately 4 inches square.

APPENDIX B

QUALITY ASSURANCE PROGRAM

FOR THE

OCCOQUAN WATERSHED MONITORING LABORATORY

VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY

9408 PRINCE WILLIAM ST.
MANASSAS, VA 22110

INTRODUCTION

The data produced in any analytical laboratory are not an end in themselves, but will presumably be interpreted to provide a basis for management decisions and further action. It is therefore imperative that such data be reliable. Reliability, in turn, can be adequately established only through an organized, routine program of quality assurance.

In the evaluation of any scientific data, both accuracy and precision are of concern. The former represents how well the measured data agree with the true (but usually unknown) value, while the latter indicates the reproducibility of the measurement. These characteristics are dependent upon variables introduced during the course of analysis which are related to the sampling procedure, the analytical methodology employed, the instrumentation used, and the analyst himself.

The errors which are present in any datum may be conceptually classified as random or systematic in nature. Random errors are those which are equally likely to affect the datum in a positive or negative manner, thus giving no inherent bias to the result. This type of error may be described by a normal statistical distribution. Another type of error, however, may be regarded as systematic in nature. Such an error may result in a consistently high or low result, such that it is not due to chance alone. It may be due to technician error, equipment malfunction or a number of other causes. While random errors will be present in any analysis, systematic errors can be identified and eliminated. One of the goals of a quality assurance program is to eliminate such systematic error from reported data.

A program of quality assurance (QA) is carried out by the Occoquan Watershed Monitoring Laboratory (OWML) to insure the reliability of the data produced in the course of all its investigations. The program, of course, concerns itself with analytical procedures but also with the maintenance and calibration of field equipment, sample identification, data logging and other activities which impinge upon the production of a representative, reliable data base. The following pages are intended to document the individual aspects of the QA program, and to indicate how the reported laboratory results may be used with confidence.

Field Operations

Quality Assurance in the field is often neglected, yet it is obvious that a valid analytical result can only be had if a representative sample is taken, and if reliable field data are available. The primary field equipment employed consist of flow control sections, flowmeters and automatic samplers.

All monitoring sites utilized are serviced regularly, at which time several check procedures are carried out. The batteries which provide power to the monitoring equipment are replaced with freshly charged ones. The automatic samplers are checked to a ssure a full complement of bottles is ready to receive samples, and for proper operation of the sampler. Specific check procedures are incorporated into a written log by field personnel on site visits.

The flowmeters are checked to assure correct zero (both mechanical and electronic) in the field. The recording mechanism is tested for correct tension, pen span and speed, and labeled accordingly. The chart paper supply is also checked, and replaced as needed. Data loggers, if present, are checked out and cassette tape supply examined.

The flow control sections utilized have been constructed to exact dimensions, and carefully installed in a manner to provide an upstream control sectioin. Particular attention was paid to leveling the apparatus. Although self cleaning to a large extent, the flumes are mopped out and the stilling well flushed during site visits by field personnel. Each flume is checked on a bimonthly basis to assure the proper orientation is maintained.

Immediately following storm events, samples are retrieved from the various monitoring sites. All sample containers are labeled in the field and returned to the laboratory and logged in. Transport time is minimized. At the same time the samples are transported, the record charts and tapes (if any) from the corresponding flowmeter are returned.

Occasionally, spiked samples and preservative blanks are prepared in the field and returned to the laboratory for analysis. These provide an indication of any problems with field sampling procedures.

A record is kept in the laboratory on each major piece of field equipment, so that any continuing problems or malfunctions can be easily discerned. These records include any repairs or modifications made to the equipment.

Sample Identification and Handling

Samples are taken automatically during the course of a storm and are retrieved by field personnel. At the time of retrieval the sample bottles are labeled with identifying information, such as station, time and the sample sequence number. The samples are then brought back to the laboratory and logged into the laboratory record by the field technician. At the same time, the flowmeter record is examined and the sampling points identified so that a stage may be recorded along with each sample. At this point, the samples may be composited according to flow, or analyzed independently as sequential samples. All samples are refrigerated until the analyses are carried out. Samples are often composited automatically in the field when the appropriate equipment is present in the station. The flow data checks carried out are very similar to the above.

The laboratory record is routinely checked by the laboratory supervisor to determine if all the required analytical work has been completed. If the work has been completed satisfactorily, he initials the record book and has the samples discarded.

Data Processing

As samples are analyzed for the parameters of interest, the results and corresponding calculations are entered into analytical bench notebooks, dated and initialed by the analyst. All data are screened for gross errors and compatibility at this time, and analyses are rerun if necessary.

The automated analyzer used by the OWML is interfaced with a microcomputer so that the raw data are stored on a diskette as they are generated. This system allows the technician to assign identifying descriptive data to each sample so that a complete record is generated upon analysis. This process minimizes data handling and reduces transcribing error in the analytical process. It also eliminates the possibility of the analyst intentionally biasing the data, because once recorded on diskette, the information cannot be changed. The editing of data can be accomplished, but is outside the responsibilities and capabilities of the bench technicians employed.

Data are recorded on individual computerized files according to sampling site. Retrievals are obtained on a regular basis and proofread to guard against keypunching errors and to assure data integrity. Computer storage is done in a manner to allow later minipulation and statistical analysis. Both a backup computer file and hard-copy permanent record are maintained of all data generated.

Control of Analytical Performance

The theory of control charts was developed over a half-century ago by Walter Shewhart to evaluate the quality of products from manufacturing processes. (Grant, 1974; U.S. EPA, 1972). Simply put, a chart can be constructed on the basis of statistical calculations such that an indication is given as to whether the errors observed are random or systematic in nature, as well as their relative magnitude. An unexpectedly high random error or a systematic error would be reason to suspect something to be wrong with the process. At this point the process is said to be "out-of-control" and is stopped until the problem is resolved. A process which is seen to be within the limits expected due to natural, random error is termed "in control." Such charting techniques can be used in analytical laboratories to insure that both the precision and accuracy of the various analyses are acceptable, or "in control."

<u>Precision</u>

The precision of a particular analytical method must be determined by the analysis of replicate samples. The intial precision criterion for a particular analytical procedure should be developed from replicate results accumulated during the routine analysis program. One reference (EPA, 1972) suggests a minimum of 15 replicate sets be used for this purpose.

After a minimum number of replicate samples has been analyzed, the range of each set of results may be calculated. For a replicate set of two samples.

$$R = [X_1 - X_2] \qquad (1)$$

where R = The absolute difference in results between the replicate set " ".

The mean range $(\overline{R})$ may then be calculated by summing the individual ranges and dividing by the number of replicate sets:

$$\overline{R} = \frac{\Sigma R}{n} \qquad (2)$$

where n = no. of replicate sets

The Upper Control Limit on the range (UCL_R) can then be calculated according to the formula:

$$UCL_R = D_4\overline{R} \qquad (3)$$

The factor D_4 is dependent upon the size of the replicate group (Table 1). For duplicate samples D_4 is 3.27 when three standard deviations are used to fix the UCL_R.

By plotting the individual ranges from a replicate measurement on a chart on which the UCL_R has been drawn, it can be determined whether or not a given procedure is statistically in or out of control. A range above the UCL is considered an indication of an out-of-control procedure. In such an instance the observed error is greater than what would be expected from random sources alone, and the analyses would be stopped until the problem was resolved. Questionable data would be discarded, and the analyses rerun if possible.

Note that for the particular instance of laboratory precision a lower control limit is not required because there are no adverse economic or scientific consequences of improved precision. Therefore only the Upper Control Limit need be of concern here.

Sometimes an Upper Warning Limit on the range (UWL_R) is calculated in additional to the UCL. The UWL_R provides another reference point for process control. If the range of a replicate set is found to be greater than the UWL it is commonly taken to signify a potential problem developing. The process is not stoped, but is watched more closely. An Upper Warning Limit for the range (UWL_R) can be calculated according to the formula:

$$UWL_R = \quad (2D_4+1) \qquad (4)$$

A typical graph resulting from this procedure is shown in Figure 1.

<u>Accuracy</u>

The evaluation of analytical accuracy is usually accomplished through the use of "known" samples, or standards. In the analysis of environmental samples this task is often accomplished by recovery of the analyte from a spiked sample, i.e., a sample to which a known amount of the analyte has been added. Shewhart control charts can then be used in conjunction with these procedures to assure that laboratory accuracy continue under control.

Use of Analytical Control Charts

Control charts are constructed in accordance with the procedures outlined above, thus providing a continuing check on the precision and accuracy of the analyses. A separate chart for both precision and accuracy is required for each analytical procedure.

The data required for the construction and subsequent use of the control charts requires the analysis of both replicate and spiked samples. Although the use of field spikes is often desirable, the compositing of samples in the laboratory makes this an awkward and burdensome chore. Therefore, spiked samples are routinely prepared in the laboratory and only occasional field spikes are carried out as a check on collection and sampling procedures. For automated analyses, using a standard tray with a capacity of 40 samples, two sets of duplicate samples and two spiked samples are analyzed. these are interspersed in the analytical sequence so as to produce an early indication of poor performance. These samples alone represent 15% of the samples analyzed.

The initial collection of quality assurance data provides a basis for calculating the applicable limits needed to construct a control chart for each analytical parameter of interest. The results are recorded as obtained in a permanently bound laboratory notebook reserved for QA samples. When control limits are periodically calculated a control chart is constructed in the same notebook. The QA results are plotted on the control chart at the same time they are entered into the notebook. At that time it is also noted whether the process is in control or not. In the later instance the analytical process is halted until the problem is resolved, and appropriate remarks are entered in the QA notebook. A particular procedure is deemed out-of-control if:

1. A control limit is exceeded on either precision or accuracy control charts.

2. A sequence of seven values fall on same side of the mean value line on an accuracy control plot.

Warning Limits on the control charts are used to identify the development of potential problems in an analytical procedure. An analysis is more closely observed under either of the following conditions:

1. A warning limit is exceeded on either precision or accuracy control charts.

2. A sequence of sevel values fall on the same side of the mean value line on an accuracy control chart.

Performance Checks

During the course of analysis, a number of blank samples and standards are routinely run to verify the operating standard curve and check instrument operation. Approximately nine of these analyses are run in the course of an automated analysis with a standard 40 compartment tray. These are in addition to the replicate and spiked samples required for control chart purposes.

In addition to the use of quality control charts and standards, several other means are used to insure confidence in the laboratory data produced. For example, the Occoquan Watershed Monitoring Laboratory participates in a round-robin testing program administered by the U.S. Geological Survey on a quarterly basis. A performance evaluation is also submitted to the U.S. Environmental Protection Agency on an annual basis, and EPA check samples are run when it is considered prudent. These activities allow comparisons with the performance of other laboratories and the identification of any deficiencies.

A minimum of 15 spiked samples is run during normal laboratory operations to establish the mean recovery of the analytical procedures. The percent recovery for any analytical method may be calculated using the formula:

$$P = \frac{100(O-B)}{T} \qquad (5)$$

where P = percent recovery

O = observed value in spiked sample

B = background value (from unspiked sample)

T = added value (spike)

The mean percent recovery ($\overline{P}$) and standard deviation (Sp) can be calculated using the following equations (EPA, 1978b.):

$$\overline{P} = \frac{\sum_{=1}^{n} P}{n} \qquad (6)$$

$$Sp = \sqrt{\frac{1}{n-1}\left[\sum_{=1}^{n} P^2 - \frac{(\sum_{=1}^{n} P)^2}{n}\right]} \qquad (7)$$

where n = no. of results.

The control and warning limits are then calculated as follows:

$$UCL = \overline{P} + 3\ Sp \qquad (8)$$

$$UWL = \overline{P} + 2\ Sp \qquad (9)$$

$$LWL = \overline{P} - 2\ Sp \qquad (10)$$

$$LCL = \overline{P} - 3\ Sp \qquad (11)$$

These values may be used to construct a control chart such as that shown in Figure 2.

Other checks on laboratory performance are provided by splitting samples between other laboratories. Continual comparisons are made between OWML results and those reported by the Upper Occoquan Sewage Authority on effluent streams.

For some parameters, split samples are analyzed by OWML, the Fairfax County Water Authority and the Civil Engineering Department at Virginia Tech.

Administration

The Quality Assurance Program for the OWML is under the direct supervision of a QA coordinator. The QA coordinator is a research associate of the laboratory who possesses a graduate degree and laboratory experience. This position reports directly to the Laboratory Director.

Specific duties of the QA Coordinator include:

1. Administration of the QA plan.
2. Measurement of the precision and accuracy of analytical procedures.
3. Maintenance of a permanent record of quality control charts.
4. Identification of training needs and methodology gaps.
5. Coordination of the laboratory quality control activities with other agencies.

As problems in procedures or analytical accuracy and precision are encountered, the QA coordinator consults with the laboratory supervisor to identify the source of the problem.

The resolution of QA problems will be made by the coordinator in concert with the laboratory supervisor. A report of all such activities is made on a routine basis to the laboratory director.

References

1. U. S. Environmental Protection Agency, 1972. Handbook for Analytical Quality Control in Water and Wastewater Laboratories. Cincinnati, Ohio. 102 pp.

2. U. S. Environmental Protection Agency, 1978a. Minimal Requirements for a Water Quality Assurance Program. Cincinnati, Ohio. 32 pp.

3. U. S. Environmental Protection Agency, 1978b. Quality Assurance Program for the Analysis of Chemical Constituents in Environmental Samples. Cincinnati, Ohio. 22 pp.

4. Hazardous Materials Control Research Institute, et. al. 1978. Quality Assurance of Environmental measurements. Information Transfer, Inc. Silver Spring, MD. 225 pp.

5. Grant, Eugene L., 1964. Statistical Quality Control, 3rd Edition. McGraw Hill Book Co., New York. 610 pp.

6. U. S. Environmental Protection Agency. Data Collection Quality Assurance for the Nationwide Urban Runoff Program. Washington, D.C. 49 pp.

APPENDIX C-1

VARIABLE CODE NAMES

FOR

MWCOG NURP

VARIABLE CODE NAMES
NATIONWIDE URBAN RUNOFF PROJECT
RUNOFF MONITORING STATIONS

CODE	PARAMETER
STA	Station Identification Number (51URXX)
STRMNO	Storm Number (Day of Year)
TYPE	Type of Sample 1.0 Base Flow Sample 2.0 Storm Runoff Samples 3.0 Grab Samples
TI1	Date and Time Sample Taken (DDMMMYY:HH:MM)
TI2	Date and Time of Final Sample Collected (composited storm samples only) (DDMMMYY:HH:MM)
HYD	Portion of Hydrograph during which storm sample taken 1 Beginning 2 End 3 Peak 4 Dip 5 Rising 6 Falling
STG	Stage (feet)
FLO	Flow (cfs)
SAMNO	Number of Samples (for sequential samples includes order taken)
CMT	Comments (storm runoff only) 1.0 Complete Storm 2.0 Equipment Malfunctions 2.1 Flow Recrorder 2.2 Sampler 2.3 External Sampling Line 2.4 Vandalasm 2.5 Power Failure 3.0 Flow Not Storm Generated 3.1 Snow Melt 3.2 Impoundment Release 4.0 Sample Lost 5.0 Frozen Line or Equipment 6.0 Insufficient Stage Increase to Trigger Sampling
LpH	pH - laboratory (standard units)
LCOND	Conductivity - laboratory (μmhos)
LTALK	Total Alkalinity - laboratory (mg/l)
TCALK	Carbonate Alkalinity - laboratory (mg/l)
LTEMP	Temperature - laboratory (°C)
COD	Chemical Oxygen Demand (mg/l)

$DBOD_5$	Descriptive Biochemical Oxygen Demand- Five Day
BOD_5	Biochemical Oxygen Demand - Five Day (mg/l)
$DBOD_{20}$	Descriptive Biochemical Oxygen Demand - Twenty Day
BOD_{20}	Biochemical Oxygen Demand - Twenty Day (mg/l)
TSS	Total Suspended Solids (mg/l)
TOTS	Total Solids (mg/l)
DTCOLI	Descriptive Total Coliform
TCOLI	Total Coliform (MPN)
DFCOLI	Descriptive Fecal Coliform
FCOLI	Fecal Coliform (MPN)
DFSTREP	Descriptive Fecal Streptococci
FSTREP	Fecal Streptococci (MPN)
TKN	Total Kjeldahl Nitrogen (mg/l)
SKN	Soluble Kjeldahl Nitrogen (mg/l)
NH3	Soluble Ammonia (mg/l as N)
NO23	Soluble Nitrate plus Nitrite (mg/l as N)
TP	Total Phosphorus (mg/l as P)
TSP	Total Soluble Phosphorus (mg/l as P)
OP	Soluble Ortho-phosphorus (mg/l as P)
EPB	Extractable Lead (μg/l)
SPB	Soluble Lead (μg/l)
EZN	Extractable Zinc (μg/l)
SZN	Soluble Zinc (μg/l)
ECU	Extractable copper (μg/l)
SCU	Soluble Copper (μg/l)
EMN	Extractable Manganese (μg/l)
SMN	Soluble Manganese (μg/l)
EFE	Extractable Iron (μg/l)
SFE	Soluble Iron (μg/l)
ECR	Extractable Chromium (μg/l)
SCR	Soluble Chromium (μg/l)
ECD	Extractable Cadnium (μg/l)
SCD	Soluble Cadnium (μg/l)
ENI	Extractable Nickel (μg/l)
SNI	Soluble Nickel (μg/l)
pH	pH - field (standard units)
DO	Dissolved Oxygen (mg/l)

TEMP	Temperature - field (°C)
COND	Conductivity - field (μmhos)
PRECIP	Precipitation (inches)

Description for BOD_5 BOD_{20} TCOLI FCOLI FSTREP:

G Greater Than
L Less Than
E Equal To

VARIABLE CODE NAMES

NATIONWIDE URBAN RUNOFF PROJECT

WETFALL

CODE	PARAMETER
STA	Station Identification Number (51WFXX)
TI1	Beginning Date and Time (DDMMMYY:HH:MM)
TI2	Date and Time of Final Sample Collected (DDMMMYY:HH:MM)
PRECIP	Precipitation (inches)
PRP DUR	Precipitation Duration (minutes)
LpH	pH - Laboratory (standard units)
LCOND	Conductivity - laboratory (μmhos)
LTEMP	Temperature - laboratory (°C)
LTALK	Total Alkalinity - laboratory (mg/l)
LCALK	Carbonate Alkalinity - laboratory (mg/l)
$DBOD_5$	Descriptive Biochemical Oxygen Demand - Five Day
BOD_5	Biochemical Oxygen Demand - Five Day (mg/l)
$DBOD_{20}$	Descriptive Biochemical Oxygen Demand - Twenty Day
BOD_{20}	Biochemical Oxygen Demand - Twenty Day (mg/l)
COD	Chemical Oxygen Demand (mg/l)
TKN	Total Kjeldahl Nitrogen (mg/l)
SKN	Soluble Kjeldahl Nitrogen (mg/l)
NH3	Soluble Ammonia (mg/l as N)
NO23	Soluble Nitrate Plus Nitrite (mg/l as N)
TP	Total Phosphorus (mg/l as P)
TSP	Total Soluble Phosphorus (mg/l as P)
OP	Soluble Ortho-phosphorus (mg/l as P)
TOTS	Total Solids (mg/l)

Description for BOD_5 BOD_{20}:

G Greater Than
L Less Than
E Equal To

VARIABLE CODE NAMES

NATIONWIDE URBAN RUNOFF PROJECT

DRYFALL

CODE	PARAMETER
STA	Station Identification Number (51DFXX)
TI1	Date and Time Sample Taken (DDMMMYY:HH:MM)
TI2	Date and Time of Final Sample Taken
TOTS	Total Solids (mg/m^2)
COD	Chemical Oxygen Demand (mg/m^2)
NH_3	Soluble Ammonia (mg/m^2 as N)
TKN	Total Kjeldahl Nitrogen (mg/m^2)
SKN	Solubel Kjeldahl Nitrogen (mg/m^2)
NO_{23}	Soluble Nitrate Plus Nitrite (mg/m^2 as N)
OP	Soluble Ortho-Phosphorus (mg/m^2 as P)
TSP	Total Soluble Phosphorus (mg/m^2 as P)
TP	Total Phosphorus (mg/m^2 as P)

VARIABLE CODE NAMES

NATIONWIDE URBAN RUNOFF PROJECT

LYSIMETERS

CODE	PARAMETER
STA	Station Identification Number (51LYXX)
STRMNO	Storm Number (Day of Year)
TI1	Date and Time Sample Collected (DDMMMYY:HH:MM)
LpH	pH - laboratory (standard units)
LCOND	Conductivity - laboratory (µmhos)
LTEMP	Temperature - laboratory (°C)
TKN	Total Kjeldahl Nitrogen (mg/l)
SKN	Soluble Kjeldahl Nitrogen (mg/l)
NH_3	Soluble Ammonia (mg/l as N)
NO_{23}	Soluble Nitrate plus Nitrite (mg/l as N)
TP	Total Phosphorus (mg/l as P)
TSP	Total Soluble Phosphorus (mg/l as P)
OP	Soluble Ortho-Phorphorus (mg/l as P)
COD	Chemical Oxygen Demand (mg/l)
TOC	Total Organic Carbon (mg/l)
SOC	Soluble Organic Carbon (mg/l)
TSS	Total Suspended Solids (mg/l)
DTCOLI	Descriptive Total Coliform
TCOLI	Total Coliform (MPN)
DFCOLI	Descriptive Fecal Coliform
FCOLI	Fecal Coliform (MPN)
DFSTREP	Descriptive Fecal Streptococci
FSTREP	Fecal Streptococci (MPN)

Description for TCOLI FCOLI FSTREP

G Greater Than

L Less Than

E Equal To

VARIABLE CODE NAMES
NATIONWIDE URBAN RUNOFF PROJECT
HI-VOL FILTERS

CODE	PARAMETER
STA	Station Identification Number (51HVXX)
DATE	Date Sample Taken (YYMMDD)
TKN	Total Kjeldahl Nitrogen ($\mu g/m^3$)
SKN	Soluble Kjeldahl Nitrogen ($\mu g/m^3$)
NH_3	Soluble Ammonia ($\mu g/m^3$ as N)
TP	Total Phosphorus ($\mu g/m^3$ as P)
TSP	Total Soluble Phosphorus ($\mu g/m^3$ as P)
OP	Soluble Ortho-Phosphorus ($\mu g/m^3$ as P)
NO_{23}	Soluble Nitrate Plus Nitrite ($\mu g/m^3$ as N)
TSUSP	Total Suspended Particulate ($\mu g/m^3$)

VARIABLE CODE NAMES

NATIONWIDE URBAN RUNOFF PROJECT

DRYFALL

CODE	PARAMETER
STA	Station Identification Number (51DFXX)
TI1	Date and Time Sample Taken (DDMMMYY:HH:MM)
TI2	Date and Time of Final Sample Taken
TOTS	Total Solids (mg/m^2)
COD	Chemical Oxygen Demand (mg/m^2)
NH_3	Soluble Ammonia (mg/m^2 as N)
TKN	Total Kjeldahl Nitrogen (mg/m^2)
SKN	Solubel Kjeldahl Nitrogen (mg/m^2)
NO_{23}	Soluble Nitrate Plus Nitrite (mg/m^2 as N)
OP	Soluble Ortho-Phosphorus (mg/m^2 as P)
TSP	Total Soluble Phosphorus (mg/m^2 as P)
TP	Total Phosphorus (mg/m^2 as P)

APPENDIX C-2

SAS TO STORET TRANSLATION

PROGRAM

```
R;

t nancy cntl

//OWMLKGS JOB       ,SAUNDERS,REGION=600K,TIME=10
/*LONGKEY
/*ROUTE PRINT VM2.OCCOQUAN
/*PRIORITY IDLE
/*JOBPARM LINES=100
//STEP1 EXEC SAS
//MYSAS DD DSN=A51340.NURP2.DBASE.ONLINE,DISP=(OLD,KEEP)
//SYSIN DD *
DATA TEMP1;
SET MYSAS.UR03 MYSAS.UR01 MYSAS.UR02 MYSAS.UR04 MYSAS.UR05 MYSAS.UR06
MYSAS.UR07 MYSAS.UR08 MYSAS.UR09 MYSAS.UR10 MYSAS.UR11
MYSAS.UR13 MYSAS.UR14 MYSAS.UR15 MYSAS.UR16 MYSAS.UR17;
IF TI2 NE . THEN CVT='B';
IF TI2 NE . THEN ST='T';
V='GN';
IF EPB <100 AND EPB NE . THEN DO; EPBR='K';EPB=100;END;
IF SPB <100 AND SPB NE . THEN DO;SPBR='K'; SPB=100;END;
IF EZN <20 AND EZN NE . THEN DO;EZNR='K'; EZN=20;END;
IF SZN <20 AND SZN NE . THEN DO;SZNR='K'; SZN=20;END;
IF ECU <20 AND ECU NE . THEN DO;ECUR='K'; ECU=20;END;
IF SCU <20 AND SCU NE . THEN DO;SCUR='K'; SCU=20;END;
IF EMN <20 AND EMN NE . THEN DO;EMNR='K'; EMN=20;END;
IF SMN <20 AND SMN NE . THEN DO;SMNR='K'; SMN=20;END;
IF EFE <100 AND EFE NE . THEN DO;EFER='K'; EFE=100;END;
IF SFE <100 AND SFE NE . THEN DO;SFER='K'; SFE=100;END;
IF ECR <20 AND ECR NE . THEN DO;ECRR='K'; ECR=20;END;
IF SCR <20 AND SCR NE . THEN DO;SCRR='K'; SCR=20;END;
IF ECD <20 AND ECD NE . THEN DO;ECDR='K'; ECD=20;END;
IF SCD <20 AND SCD NE . THEN DO;SCDR='K'; SCD=20;END;
IF ENI <20 AND ENI NE . THEN DO;ENIR='K'; ENI=20;END;
IF SNI <20 AND SNI NE . THEN DO;SNIR='K'; SNI=20;END;
DATA TEMP1A;
SET MYSAS.HYD03 MYSAS.HYD04 MYSAS.HYD05 MYSAS.HYD06 MYSAS.HYD09
MYSAS.HYD11 MYSAS.HYD15 MYSAS.HYD16 MYSAS.HYD17
MYSAS.HYD10 MYSAS.HYD18 MYSAS.HYD19;
TI1=TIME1;
IF TIME2 NE . THEN DELETE;
IF SAMPLE='Y' THEN SAMPLE='1';
DATA TEMP1B;
SET TEMP1 TEMP1A;
DATA TEMP1C;
SET MYSAS.LY01 MYSAS.LY02 MYSAS.LY03 MYSAS.LY04
MYSAS.LY05 MYSAS.LY06 MYSAS.LY07 MYSAS.LY08
MYSAS.LY09 MYSAS.LY10;
EPB=TPB;
EZN=TZN;
ECU=TCU;
EMN=TMN;
EFE=TFE;
ECR=TCR;
ECD=TCD;
ENI=TNI;
```

```
IF EPB <100 AND EPB NE . THEN DO;EPBR='K'; EPB=100;END;
IF SPB <100 AND SPB NE . THEN DO;SPBR='K'; SPB=100;END;
IF EZN <20 AND EZN NE . THEN DO;EZNR='K'; EZN=20;END;
IF SZN <20 AND SZN NE . THEN DO;SZNR='K'; SZN=20;END;
IF ECU <20 AND ECU NE . THEN DO;ECUR='K'; ECU=20;END;
IF SCU <20 AND SCU NE . THEN DO;SCUR='K'; SCU=20;END;
IF EMN <20 AND EMN NE . THEN DO;EMNR='K'; EMN=20;END;
IF SMN <20 AND SMN NE . THEN DO;SMNR='K'; SMN=20;END;
IF EFE <100 AND EFE NE . THEN DO;EFER='K'; EFE=100;END;
IF SFE <100 AND SFE NE . THEN DO;SFER='K'; SFE=100;END;
IF ECR <20 AND ECR NE . THEN DO;ECRR='K'; ECR=20;END;
IF SCR <20 AND SCR NE . THEN DO;SCRR='K'; SCR=20;END;
IF ECD <20 AND ECD NE . THEN DO;ECDR='K'; ECD=20;END;
IF SCD <20 AND SCD NE . THEN DO;SCDR='K'; SCD=20;END;
IF ENI <20 AND ENI NE . THEN DO;ENIR='K'; ENI=20;END;
IF SNI <20 AND SNI NE . THEN DO;SNIR='K'; SNI=20;END;
DATA TEMP1D;
SET TEMP1B TEMP1C;
DATA TEMP1E;
SET MYSAS.DF01;
IF TOTS=. THEN DELETE;
CVT='B';
ST='T';
V='C';
TI3=(TI2-TI1)/86400;
IF EPB <100 AND EPB NE . THEN DO; EPB=100 ; EPBR='K';END;
IF SPB <100 AND SPB NE . THEN DO; SPB=100 ; SPBR='K';END;
IF EZN <20 AND EZN NE . THEN DO; EZN=20 ; EZNR='K';END;
IF SZN <20 AND SZN NE . THEN DO; SZN=20 ; SZNR='K';END;
IF ECU <20 AND ECU NE . THEN DO; ECU=20 ; ECUR='K';END;
IF SCU <20 AND SCU NE . THEN DO; SCU=20 ; SCUR='K';END;
IF EMN <20 AND EMN NE . THEN DO; EMN=20 ; EMNR='K';END;
IF SMN <20 AND SMN NE . THEN DO; SMN=20 ; SMNR='K';END;
IF EFE <100 AND EFE NE . THEN DO; EFE=100 ; EFER='K';END;
IF SFE <100 AND SFE NE . THEN DO; SFE=100 ; SFER='K';END;
IF ECR <20 AND ECR NE . THEN DO; ECR=20 ; ECRR='K';END;
IF SCR <20 AND SCR NE . THEN DO; SCR=20 ; SCRR='K';END;
IF ECD <20 AND ECD NE . THEN DO; ECD=20 ; ECDR='K';END;
IF SCD <20 AND SCD NE . THEN DO; SCD=20 ; SCDR='K';END;
IF ENI <20 AND ENI NE . THEN DO; ENI=20 ; ENIR='K';END;
IF SNI <20 AND SNI NE . THEN DO; SNI=20 ; SNIR='K';END;
DEPB=ROUND((EPB*.001)/(TOTS*.000001),1);
DEZN=ROUND((EZN*.001)/(TOTS*.000001),1);
DECU=ROUND((ECU*.001)/(TOTS*.000001),1);
DEMN=ROUND((EMN*.001)/(TOTS*.000001),1);
DEFE=ROUND((EFE*.001)/(TOTS*.000001),1);
DECR=ROUND((ECR*.001)/(TOTS*.000001),1);
DECD=ROUND((ECD*.001)/(TOTS*.000001),1);
DENI=ROUND((ENI*.001)/(TOTS*.000001),1);
DCOD=ROUND(COD/(TOTS*.000001),.1);
DTOTS=ROUND((TOTS*.001)/TI3,.1);
```

```
ENH3=ROUND(NH3/(TOTS*.000001),.01);
ETKN=ROUND(TKN/(TOTS*.000001),.01);
ESKN=ROUND(SKN/(TOTS*.000001),.01);
ENO23=ROUND(NO23/(TOTS*.000001),.01);
EOP=ROUND(OP/(TOTS*.000001),.01);
ETSP=ROUND(TSP/(TOTS*.000001),.01);
ETP=ROUND(TP/(TOTS*.000001),.01);
DROP TOTS COD NH3 TKN SKN NO23 OP TSP TP
EZN ECU EMN EFE ECR ECD ENI EPB;
DATA TEMP1F;
SET TEMP1D TEMP1E;
IF TI1 GE 662774400 THEN DELETE;
DATE=DATEPART(TI1);
H=HOUR(TI1);
MM=MINUTE(TI1);
DATE2=DATEPART(TI2);
H2=HOUR(TI2);
MM2=MINUTE(TI2);
IF DBOD5='L' THEN DBOD5='K';
IF DBOD5='G' THEN DBOD5='L';
IF DBOD5='GE' THEN DBOD5='L';
IF DTCOLI='L' THEN DTCOLI='K';
IF DTCOLI='G' THEN DTCOLI='L';
IF DTCOLI='GE' THEN DTCOLI='L';
IF DFCOLI='L' THEN DFCOLI='K';
IF DFCOLI='G' THEN DFCOLI='L';
IF DFCOLI='GE' THEN DFCOLI='L';
IF DFSTREP='L' THEN DFSTREP='K';
IF DFSTREP='G' THEN DFSTREP='L';
IF DFSTREP='GE' THEN DFSTREP='L';
IF DBOD20='L' THEN DBOD20='K';
IF DBOD20='G' THEN DBOD20='L';
IF DBOD20='GE' THEN DBOD20='L';
CODE='DC1';
DATA TEMP2;
FILE PRINT;
PUT @ 1 '?START';
PUT @ 1 '?04';
PUT @ 1 'AC,A=22DCCITY,UK=SHOWERS,USER=OCCOQUAN MONITORING LAB 703-361-56
LOOP: SET TEMP1F;
D='SC,'||CODE||STA||',';
C=COMPRESS(D);
PUT C @;
NEXTCOL=LENGTH(C)+1;
PUT @ NEXTCOL DATE YYMMDD6. @;
NEXTCOL=NEXTCOL+6;
PUT @ NEXTCOL H Z2. @;
NEXTCOL=NEXTCOL+2;
PUT @ NEXTCOL MM Z2. @;
NEXTCOL=NEXTCOL+2;
```

```
IF CFS NE . THEN DO;
A='P61,'||CFS||',';
LINK COM;
END;
IF STRMNO NE . THEN DO;
A='P134,'||STRMNO||',';
LINK COM;
END;
IF RAIN NE . THEN DO;
A='P193,'||RAIN||',';
LINK COM;
END;
IF SAMPLE ='1' THEN DO;
A='P29,'||SAMPLE||',';
LINK COM;
END;
IF LTALK NE . THEN DO;
A='P410,'||LTALK||',';
LINK COM;
END;
IF LCALK NE . THEN DO;
A='P430,'||LCALK||',';
LINK COM;
END;
IF LPH NE . THEN DO;
A='P403,'||LPH||',';
LINK COM;
END;
IF LCOND NE . THEN DO;
A='P95,'||LCOND||',';
LINK COM;
END;
IF PRECIP NE . THEN DO;
A='P82381,'||PRECIP||',';
LINK COM;
END;
IF BOD5 NE . THEN DO;
A='P310,'||BOD5||DBOD5||',';
LINK COM;
END;
IF TSS NE . THEN DO;
A='P530,'||TSS||',';
LINK COM;
END;
IF TOTS NE . THEN DO;
A='P500,'||TOTS||',';
LINK COM;
END;
IF DTOTS NE . THEN DO;
A='P82375,'||DTOTS||',';
LINK COM;
END;
```

```
E=',';
F=COMPRESS(E);
PUT F @;
NEXTCOL=NEXTCOL+LENGTH(F);
IF TI2=. THEN GO TO JUMP;
PUT @ NEXTCOL DATE2 YYMMDD6. @;
NEXTCOL=NEXTCOL+6;
PUT @ NEXTCOL H2 Z2. @;
NEXTCOL=NEXTCOL+2;
PUT @ NEXTCOL MM2 Z2. @;
NEXTCOL=NEXTCOL+2;
E=',';
F=COMPRESS(E);
PUT F @;
NEXTCOL=NEXTCOL+LENGTH(F);
PUT @ NEXTCOL CVT @;
NEXTCOL=NEXTCOL+1;
PUT @ NEXTCOL ',' @;
NEXTCOL=NEXTCOL+1;
PUT @ NEXTCOL ST @;
NEXTCOL=NEXTCOL+1;
PUT @ NEXTCOL ',' @;
NEXTCOL=NEXTCOL+1;
IF TI2 NE . AND STA NE '51DF01' THEN GO TO SAMAR;
PUT @ NEXTCOL V @;
NEXTCOL=NEXTCOL+1;
PUT @ NEXTCOL ',' @;
NEXTCOL=NEXTCOL+1;
GO TO JUMP;
SAMAR: PUT @ NEXTCOL V @;
NEXTCOL=NEXTCOL+2;
PUT @ NEXTCOL SAMNO Z2. @;
NEXTCOL=NEXTCOL+2 ;
PUT @ NEXTCOL ',' @;
NEXTCOL=NEXTCOL+1;
JUMP: IF FCOLI NE . THEN DO;
A='P31615,'||FCOLI||DFCOLI||',';
LINK COM;
END;
IF STG NE . THEN DO;
A='P65,'||STG||',';
LINK COM;
END;
IF HSTG NE . THEN DO;
A='P65,'||HSTG||',';
LINK COM;
END;
IF FLO NE . THEN DO;
A='P61,'||FLO||',';
LINK COM;
END;
```

```
IF BOD20 NE . THEN DO;
A='P324,'||BOD20||DBOD20||',';
LINK COM;
END;
IF COD NE . THEN DO;
A='P80116,'||COD||',';
LINK COM;
END;
IF DCOD NE . THEN DO;
A='P339,'||DCOD||',';
LINK COM;
END;
IF TCOLI NE . THEN DO;
A='P31505,'||TCOLI||DTCOLI||',';
LINK COM;
END;
IF FSTREP NE . THEN DO;
A='P31677,'||FSTREP||DFSTREP||',';
LINK COM;
END;
IF TKN NE . THEN DO;
A='P625,'||TKN||',';
LINK COM;
END;
IF ETKN NE . THEN DO;
A='P627,'||ETKN||',';
LINK COM;
END;
IF SKN NE . THEN DO;
A='P623,'||SKN||',';
LINK COM;
END;
IF ESKN NE . THEN DO;
A='P82539,'||ESKN||',';
LINK COM;
END;
IF NH3 NE . THEN DO;
A='P608,'||NH3||',';
LINK COM;
END;
IF ENH3 NE . THEN DO;
A='P611,'||ENH3||',';
LINK COM;
END;
IF NO23 NE . THEN DO;
A='P631,'||NO23||',';
LINK COM;
END;
IF ENO23 NE . THEN DO;
A='P633,'||ENO23||',';
LINK COM;
END;
IF TP NE . THEN DO;
A='P665,'||TP||',';
LINK COM;
END;
IF ETP NE . THEN DO;
A='P668,'||ETP||',';
LINK COM;
END;
IF TSP NE . THEN DO;
A='P666,'||TSP||',';
LINK COM;
END;
IF ETSP NE . THEN DO;
A='P70509,'||ETSP||',';
LINK COM;
END;
IF OP NE . THEN DO;
A='P671,'||OP||',';
LINK COM;
END;
IF EOP NE . THEN DO;
A='P79511,'||EOP||',';
LINK COM;
END;
IF PH NE . THEN DO;
A='P400,'||PH||',';
LINK COM;
END;
IF DO NE . THEN DO;
A='P299,'||DO||',';
LINK COM;
END;
IF TEMP NE . THEN DO;
A='P10,'||TEMP||',';
LINK COM;
END;
IF COND NE . THEN DO;
A='P94,'||COND||',';
LINK COM;
END;
IF EPB NE . THEN DO;
A='P1051,'||EPB||EPBR||',';
LINK COM;
END;
IF DEPB NE . THEN DO;
A='P1052,'||DEPB||EPBR||',';
LINK COM;
END;
IF SPB NE . THEN DO;
A='P1049,'||SPB||SPBR||',';
LINK COM;
END;
```

```
IF EZN NE . THEN DO;
A='P1092,'||EZN||EZNR||',';
LINK COM;
END;
IF DEZN NE . THEN DO;
A='P1093,'||DEZN||EZNR||',';
LINK COM;
END;
IF SZN NE . THEN DO;
A='P1090,'||SZN||SZNR||',';
LINK COM;
END;
IF ECU NE . THEN DO;
A='P1042,'||ECU||ECUR||',';
LINK COM;
END;
IF DECU NE . THEN DO;
A='P1043,'||DECU||ECUR||',';
LINK COM;
END;
IF SCU NE . THEN DO;
A='P1040,'||SCU||SCUR||',';
LINK COM;
END;
IF EMN NE . THEN DO;
A='P1055,'||EMN||EMNR||',';
LINK COM;
END;
IF DEMN NE . THEN DO;
A='P1053,'||DEMN||EMNR||',';
LINK COM;
END;
IF DEFE NE . THEN DO;
A='P1170,'||DEFE||EFER||',';
LINK COM;
END;
IF SMN NE . THEN DO;
A='P1056,'||SMN||SMNR||',';
LINK COM;
END;
IF EFE NE . THEN DO;
A='P1045,'||EFE||EFER||',';
LINK COM;
END;
IF SFE NE . THEN DO;
A='P1046,'||SFE||SFER||',';
LINK COM;
END;
IF ECR NE . THEN DO;
A='P1034,'||ECR||ECRR||',';
LINK COM;
END;
IF DECR NE . THEN DO;
A='P1029,'||DECR||ECRR||',';
LINK COM;
END;
IF SCR NE . THEN DO;
A='P1030,'||SCR||SCRR||',';
LINK COM;
END;
IF ECD NE . THEN DO;
A='P1027,'||ECD||ECDR||',';
LINK COM;
END;
IF DECD NE . THEN DO;
A='P1028,'||DECD||ECDR||',';
LINK COM;
END;
IF SCD NE . THEN DO;
A='P1025,'||SCD||SCDR||',';
LINK COM;
END;
IF ENI NE . THEN DO;
A='P1067,'||ENI||ENIR||',';
LINK COM;
END;
IF DENI NE . THEN DO;
A='P1068,'||DENI||ENIR||',';
LINK COM;
END;
IF SNI NE . THEN DO;
A='P1065,'||SNI||SNIR||',';
LINK COM;
END;
PUT;
GO TO LOOP;
COM:B=COMPRESS(A);
PUT @ NEXTCOL B @;
LEN=LENGTH (B);
NEXTCOL=NEXTCOL+LEN;
IF NEXTCOL >60 THEN DO;
PUT;
NEXTCOL=1;
END;
RETURN;
/*
//

R;
```

APPENDIX D

RAW DATA LISTINGS

CRITICAL WATERSHED STUDIES

STATION RUNOFF DATA

STA=S1UR01

OBS	STRMNO	TYPE	TT1	TT2	FLO	SAMNO	CMT	PRECIP
1	224	.	.	.	.	.	.	.
2	224	2	11AUG80:07:30	12AUG80:11:55	141.0	4	1	.
3	226	2	15AUG80:23:30	16AUG80:11:00	125.0	3	1	.
4	.	1	08SEP80:11:00	.	43.2	1	.	.
5	.	1	15SEP80:14:09	.	35.6	1	.	.
6	.	1	22SEP80:11:00	.	40.0	1	.	.
7	.	1	29SEP80:10:15	.	41.6	1	.	.
8	.	1	06OCT80:11:00	.	166.0	1	.	.
9	.	1	20OCT80:14:45	.	31.8	1	.	.
10	299	2	25OCT80:08:00	26OCT80:13:05	351.0	10	1	.
11	.	1	27OCT80:11:55	.	51.6	1	.	.
12	.	1	03NOV80:11:50	.	35.6	1	.	.
13	.	1	10NOV80:12:00	.	41.6	1	.	.
14	.	1	17NOV80:10:09	.	34.2	1	.	.
15	322	2	17NOV80:10:10	19NOV80:12:10	132.0	5	1	.
16	329	2	24NOV80:10:00	25NOV80:11:00	340.0	4	1	.
17	.	1	01DEC80:11:20	.	61.0	1	.	.
18	.	1	08DEC80:13:05	.	43.2	1	.	.
19	.	1	15DEC80:13:35	.	37.1	1	.	.
20	.	1	22DEC80:10:30	.	36.0	1	.	.
21	.	1	05JAN81:14:10	.	43.2	1	.	.
22	.	1	12JAN81:11:45	.	38.5	1	.	.
23	.	1	26JAN81:10:21	.	35.6	1	.	.
24	33	2	02FEB81:05:00	03FEB81:03:00	550.0	11	1	.
25	.	1	09FEB81:10:05	.	64.8	1	.	.
26	42	2	11FEB81:10:30	11FEB81:23:00	939.0	7	1	.
27	54	2	23FEB81:10:55	25FEB81:02:00	481.0	11	1	.
28	.	1	09MAR81:11:00	.	43.2	1	.	.
29	.	1	16MAR81:10:35	.	70.9	1	.	.
30	.	1	23MAR81:10:00	.	46.4	1	.	.
31	.	1	06APR81:11:05	.	95.8	1	.	.
32	102	2	12APR81:23:00	13APR81:21:00	191.0	4	1	.
33	104	2	14APR81:09:00	15APR81:05:00	222.0	5	1	.
34	.	1	20APR81:11:30	.	81.6	1	.	.
35	.	1	27APR81:10:05	.	61.0	1	.	.
36	121	2	01MAY81:11:50	04MAY81:10:25	181.0	12	1	.
37	.	1	04MAY81:10:32	.	111.0	1	.	.
38	135	2	15MAY81:12:00	17MAY81:14:15	115.0	7	1	.
39	.	1	18MAY81:10:15	.	61.0	1	.	.
40	149	2	29MAY81:22:30	30MAY81:10:55	120.0	3	1	.
41	.	1	01JUN81:10:30	.	57.1	1	.	.
42	154	2	03JUN81:12:25	04JUN81:17:30	234.0	12	1	.
43	155	2	04JUN81:22:45	05JUN81:09:15	310.0	9	1	.
44	157	2	06JUN81:06:00	07JUN81:08:45	134.0	3	1	.
45	.	1	08JUN81:11:10	.	83.9	1	.	.
46	164	2	14JUN81:05:00	14JUN81:14:15	147.0	9	1	.
47	.	1	22JUN81:10:55	.	68.8	1	.	.
48	.	1	29JUN81:10:15	.	48.1	1	.	.
49	165	2	04JUL81:09:00	05JUL81:12:10	341.0	6	1	.
50	.	1	13JUL81:10:35	.	41.6	1	.	.
51	.	1	20JUL81:11:15	.	32.9	1	.	.
52	.	1	27JUL81:10:20	.	38.5	1	.	.
53	209	2	28JUL81:19:00	30JUL81:10:00	215.0	12	1	.
54	.	1	03AUG81:12:00	.	35.6	1	.	.

STATION RUNOFF DATA

STA=51UR01

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
55	.	1	10AUG81:13:05	.	38.50	1	.	.
56	224	2	11AUG81:23:50	12AUG81:03:25	139.00	3	1	.
57	224	2	12AUG81:11:00	13AUG81:12:05	165.00	9	1	.
58	228	2	16AUG81:00:10	17AUG81:12:05	97.00	8	1	.
59	.	1	17AUG81:12:05	.	44.80	1	.	.
60	.	1	24AUG81:12:00	.	29.00	1	.	.
61	242	2	30AUG81:07:00	01SEP81:21:00	89.00	11	1	.
62	.	1	14SEP81:11:05	.	25.80	1	.	.
63	258	2	15SEP81:16:30	18SEP81:11:10	84.00	10	1	.
64	.	1	21SEP81:11:55	.	34.20	1	.	.
65	.	1	28SEP81:11:45	.	23.80	1	.	.
66	274	2	01OCT81:18:00	03OCT81:11:31	37.80	4	1	.
67	.	1	05OCT81:11:04	.	24.80	1	.	.
68	.	1	12OCT81:11:35	.	27.90	1	.	.
69	296	2	23OCT81:16:50	25OCT81:12:05	50.50	5	1	.
70	298	2	26OCT81:11:05	28OCT81:17:00	106.10	11	1	.
71	.	1	02NOV81:10:55	.	31.60	1	.	.
72	.	1	09NOV81:10:50	.	37.10	1	.	.
73	.	1	16NOV81:11:00	.	37.10	1	.	.
74	.	1	23NOV81:10:20	.	32.90	1	.	.
75	.	1	30NOV81:10:45	.	35.60	1	.	.
76	334	2	30NOV81:21:00	04DEC81:04:40	54.83	4	1	.
77	.	1	07DEC81:11:17	.	37.10	1	.	.

STA=51UR02

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
78	.	1	06OCT80:14:00	.	0.605	1	.	.
79	.	1	20OCT80:11:30	.	33.400	1	.	.
80	.	1	27OCT80:09:45	.	14.100	1	.	.
81	.	1	03NOV80:09:45	.	1.760	1	.	.
82	.	1	10NOV80:13:25	.	9.590	1	.	.
83	.	1	17NOV80:12:40	.	2.750	1	.	.
84	329.00	2	24NOV80:17:26	25NOV80:12:28	48.000	4	1.0	.
85	.	1	08DEC80:09:30	.	5.500	1	.	.
86	.	1	15DEC80:11:55	.	6.000	1	.	.
87	.	1	22DEC80:13:10	.	3.040	1	.	.
88	.	1	05JAN81:11:00	.	4.250	1	.	.
89	.	1	12JAN81:09:35	.	2.270	1	.	.
90	.	1	26JAN81:13:10	.	6.180	1	.	.
91	.	1	09FEB81:12:40	.	16.100	1	.	.
92	51.00	2	20FEB81:18:47	22FEB81:08:09	31.690	5	2.1	.
93	53.00	2	22FEB81:21:05	25FEB81:03:29	77.160	15	1.0	.
94	64.00	2	05MAR81:12:03	06MAR81:07:38	14.460	4	1.0	0.15
95	.	1	09MAR81:13:33	.	12.500	1	.	.
96	.	1	16MAR81:13:10	.	9.480	1	.	.
97	75.00	2	16MAR81:17:00	17MAR81:03:37	14.800	3	1.0	0.13
98	.	1	23MAR81:13:05	.	8.370	1	.	.
99	91.00	2	01APR81:21:30	02APR81:13:05	16.300	2	1.0	0.19
100	96.00	2	06APR81:02:15	06APR81:08:44	34.000	2	8.0	0.26
101	.	1	06APR81:14:30	.	21.500	1	.	.
102	99.00	2	09APR81:13:35	10APR81:13:55	34.600	16	1.0	.

STATION RUNOFF DATA

-- STA=51UR02 --

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
103	100.00	2	10APR81:15:00	13APR81:13:33	38.200	45	1.0	0.05
104	.	1	20APR81:13:40	.	9.590	1	.	.
105	114.00	2	24APR81:00:40	25APR81:10:21	65.400	49	1.0	0.78
106	.	1	27APR81:13:21	.	10.300	1	.	.
107	119.00	2	29APR81:09:40	30APR81:01:58	9.850	10	1.0	0.02
108	.	1	04MAY81:13:32	.	10.300	1	.	.
109	131.00	2	11MAY81:00:26	12MAY81:23:16	45.390	76	1.0	1.20
110	135.00	2	15MAY81:13:47	17MAY81:11:25	65.000	107	4.0	0.74
111	.	1	18MAY81:12:50	.	10.300	1	.	.
112	139.01	2	19MAY81:07:12	19MAY81:20:59	25.500	14	2.1	0.31
113	139.03	2	20MAY81:14:22	22MAY81:12:26	16.900	29	2.1	0.31
114	148.00	2	28MAY81:18:31	31MAY81:11:03	22.540	56	1.0	1.02
115	151.00	2	31MAY81:14:24	01JUN81:10:05	5.820	7	1.0	0.13
116	152.00	2	01JUN81:14:09	05JUN81:13:01	56.250	112	1.0	.
117	.	1	08JUN81:13:45	.	6.000	1	.	.
118	161.00	2	10JUN81:05:44	11JUN81:07:51	36.130	15	1.0	0.55
119	164.01	2	13JUN81:20:59	14JUN81:13:15	757.000	224	1.0	4.16
120	164.02	2	14JUN81:13:36	16JUN81:09:54	46.630	18	1.0	.
121	172.00	2	20JUN81:17:57	20JUN81:21:28	2.880	9	4.0	.
122	.	1	29JUN81:12:42	.	2.750	1	.	.
123	183.00	2	02JUL81:09:56	03JUL81:08:49	8.910	11	1.0	.
124	185.00	2	04JUL81:10:28	06JUL81:13:25	15.400	30	1.0	.
125	.	1	13JUL81:12:40	.	0.429	1	.	.
126	194.00	2	13JUL81:14:40	14JUL81:09:26	11.400	9	1.0	0.27
127	.	1	20JUL81:13:30	.	0.578	1	.	.
128	206.00	2	25JUL81:17:16	26JUL81:19:23	9.650	11	1.0	1.54
129	.	1	27JUL81:13:15	.	1.020	1	.	.
130	209.00	2	28JUL81:15:20	30JUL81:05:16	22.700	25	1.0	0.14
131	.	1	03AUG81:14:20	.	3.510	1	.	.
132	.	1	10AUG81:14:25	.	3.680	1	.	.
133	.	1	17AUG81:14:25	.	3.850	1	.	.
134	243.00	2	31AUG81:15:44	01SEP81:07:17	19.600	9	1.0	0.45
135	258.00	2	16SEP81:12:19	17SEP81:07:59	22.900	18	2.2	1.26
136	260.00	2	17SEP81:12:35	20SEP81:16:12	12.700	39	1.0	0.59
137	.	1	21SEP81:14:05	.	4.460	1	.	.
138	.	1	28SEP81:13:45	.	4.680	1	.	.
139	.	1	05OCT81:13:10	.	2.000	1	.	.
140	.	1	12OCT81:13:45	.	0.662	1	.	.
141	299.00	2	26OCT81:11:59	29OCT81:10:13	49.100	129	2.2	0.45
142	.	1	02NOV81:14:00	.	37.800	1	.	.
143	.	1	09NOV81:13:25	.	4.250	1	.	.
144	.	1	16NOV81:13:20	.	2.330	1	.	.
145	.	1	23NOV81:12:50	.	3.040	1	.	.
146	.	1	30NOV81:13:18	.	3.040	1	.	.
147	336.00	2	02DEC81:01:23	03DEC81:10:30	9.060	12	1.0	0.44

STATION NUTRIENT DATA

STA=51UR01

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
1	224	.	.	.	.	.	.	.	.	.	.
2	224	2	11AUG80:07:30	141.0	1.26	0.40	0.06	2.17	0.32	0.06	0.02
3	228	2	15AUG80:23:30	125.0	0.76	0.40	0.06	2.31	0.15	0.04	0.00
4	.	1	08SEP80:11:00	43.2	0.50	0.50	0.05	3.27	0.10	0.10	0.07
5	.	1	15SEP80:14:09	35.6	0.35	0.27	0.08	3.37	0.14	0.10	0.09
6	.	1	22SEP80:11:00	40.0	0.35	0.35	0.16	2.93	0.10	0.09	0.07
7	.	1	29SEP80:10:15	41.6	0.32	0.30	0.06	3.61	0.14	0.13	0.12
8	.	1	06OCT80:11:00	166.0	0.26	0.26	0.04	3.93	0.11	0.11	0.10
9	.	1	20OCT80:14:45	31.8	0.59	0.45	0.04	3.91	0.20	0.18	0.14
10	299	2	25OCT80:08:00	351.0	2.18	0.62	0.08	1.76	0.81	0.11	0.06
11	.	1	27OCT80:11:55	51.6	0.68	0.52	0.07	2.58	0.13	0.08	0.06
12	.	1	03NOV80:11:50	35.6	0.33	0.31	0.04	3.76	0.13	0.13	0.11
13	.	1	10NOV80:12:00	41.6	0.39	0.35	0.01	3.59	0.14	0.12	0.09
14	.	1	17NOV80:10:09	34.2	0.30	0.27	0.02	3.72	0.09	0.07	0.05
15	322	2	17NOV80:10:10	132.0	0.88	0.48	0.16	2.52	0.18	0.07	0.06
16	329	2	24NOV80:10:00	340.0	2.06	1.09	0.18	2.42	0.47	0.14	0.09
17	.	1	01DEC80:11:20	61.0	0.29	0.29	0.09	2.78	0.03	0.03	0.03
18	.	1	08DEC80:13:05	43.2	0.37	0.37	0.05	3.20	0.06	0.06	0.06
19	.	1	15DEC80:13:35	37.1	0.25	0.25	0.00	3.75	0.06	0.05	0.04
20	.	1	22DEC80:10:30	36.0	0.28	0.28	0.06	4.00	0.05	0.03	0.03
21	.	1	05JAN81:14:10	43.2	0.27	0.22	0.03	2.95	0.04	0.03	0.01
22	.	1	12JAN81:11:45	38.5	0.38	0.38	0.01	4.60	0.08	0.07	0.04
23	.	1	26JAN81:10:21	35.6	0.53	0.50	0.04	3.77	0.10	0.08	0.05
24	33	2	02FEB81:05:00	550.0	5.65	2.11	0.68	2.45	1.30	0.53	0.14
25	.	1	09FEB81:10:05	64.8	0.67	0.57	0.11	3.30	0.05	0.03	0.03
26	42	2	11FEB81:10:30	939.0	5.73	1.83	0.46	2.50	1.88	0.10	0.08
27	54	2	23FEB81:10:55	481.0	5.50	1.36	0.57	2.27	1.71	0.15	0.06
28	.	1	09MAR81:11:00	43.2	0.58	0.58	0.07	3.22	.	.	0.01
29	.	1	16MAR81:10:35	70.9	0.27	0.27	0.10	3.41	0.04	0.03	0.01
30	.	1	23MAR81:10:00	46.4	.	.	0.05	3.18	.	.	0.02
31	.	1	06APR81:11:05	95.6	0.65	0.60	0.06	1.72	0.05	0.04	0.01
32	102	2	12APR81:23:00	191.0	1.78	1.30	0.15	1.86	0.20	0.11	0.02
33	104	2	14APR81:09:00	222.0	4.20	0.44	0.14	2.31	1.56	0.05	0.05
34	.	1	20APR81:11:30	81.6	0.55	0.51	0.05	2.49	0.05	0.05	0.01
35	.	1	27APR81:10:05	61.0	0.34	0.34	0.09	2.73	0.05	0.05	0.02
36	121	2	01MAY81:11:50	181.0	1.87	0.72	0.16	1.95	0.40	0.08	0.04
37	.	1	04MAY81:10:32	111.0	0.68	0.40	0.17	2.14	0.07	0.05	0.02
38	135	2	15MAY81:12:00	115.0	1.44	0.69	0.29	1.98	0.39	0.06	0.06
39	.	1	18MAY81:10:15	61.0	0.63	0.63	0.12	2.54	0.05	0.03	0.02
40	149	2	29MAY81:22:30	120.0	1.67	0.56	0.26	1.87	0.56	0.08	0.06
41	.	1	01JUN81:10:30	57.1	0.70	0.36	0.15	2.86	0.11	0.08	0.04
42	154	2	03JUN81:12:25	234.0	1.56	0.84	0.20	2.60	0.60	0.08	.
43	155	2	04JUN81:22:45	310.0	2.92	0.35	0.14	3.18	1.08	0.10	0.06
44	157	2	06JUN81:06:00	134.0	3.02	0.50	0.10	2.38	1.00	0.04	0.02
45	.	1	08JUN81:11:10	83.9	0.52	0.44	0.09	3.23	0.09	0.06	0.03
46	164	2	14JUN81:05:00	147.0	0.94	0.88	0.10	2.69	0.23	0.06	0.05
47	.	1	22JUN81:10:55	68.8	0.69	0.67	0.19	3.46	0.08	0.04	0.03
48	.	1	29JUN81:10:15	48.1	0.56	0.34	0.07	3.76	0.05	0.04	0.02
49	185	2	04JUL81:09:00	341.0	.	1.31	0.21	2.06	.	0.12	0.09
50	.	1	13JUL81:10:35	41.6	0.54	0.43	0.07	3.57	0.06	0.04	0.02
51	.	1	20JUL81:11:15	32.9	0.45	0.45	0.04	3.91	0.05	0.04	0.03
52	.	1	27JUL81:10:20	38.5	0.67	0.54	0.06	3.05	0.07	0.05	0.04
53	209	2	28JUL81:19:00	215.0	4.53	0.77	0.27	1.95	2.53	0.06	0.06
54	.	1	03AUG81:12:00	35.6	0.41	0.31	0.06	3.34	0.09	0.06	0.05

STATION NUTRIENT DATA

STA=51UR01

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
55	.	1	10AUG81:13:05	38.50	0.48	0.33	0.10	2.98	0.11	0.06	0.05
56	224	2	11AUG81:23:50	134.00	1.00	0.58	0.06	2.29	0.21	0.04	0.02
57	224	2	12AUG81:11:00	165.00	1.84	0.78	0.24	3.34	0.52	0.05	0.05
58	226	2	15AUG81:00:10	97.00	1.71	0.71	0.07	2.02	0.50	0.07	0.05
59	.	1	17AUG81:12:05	44.80	0.73	0.58	0.04	3.11	0.14	0.05	0.05
60	.	1	26AUG81:12:00	29.00	0.46	0.35	0.01	3.88	0.10	0.09	0.07
61	242	2	30AUG81:07:00	89.00	1.45	0.57	0.20	2.39	0.43	0.07	0.03
62	.	1	14SEP81:11:05	25.80	0.49	0.47	0.03	4.61	0.09	0.08	0.06
63	258	2	15SEP81:16:30	84.00	.	0.82	0.17	2.31	0.32	0.08	0.02
64	.	1	21SEP81:11:55	34.20	0.66	0.60	0.06	3.31	0.09	0.07	0.06
65	.	1	28SEP81:11:45	23.80	0.71	0.64	0.07	4.08	0.10	0.08	0.06
66	274	2	01OCT81:16:00	37.80	0.57	0.46	0.03	3.74	0.13	0.06	0.04
67	.	1	05OCT81:11:04	24.80	0.38	0.32	0.01	2.11	0.08	0.07	0.06
68	.	1	12OCT81:11:35	27.90	0.64	0.64	0.03	4.54	0.08	0.07	0.04
69	296	2	23OCT81:16:50	50.50	1.57	0.89	0.17	2.78	0.24	0.07	0.04
70	298	2	26OCT81:11:05	106.10	2.74	1.17	0.33	1.64	0.68	0.12	0.09
71	.	1	02NOV81:10:55	31.60	0.48	0.48	0.04	3.24	0.08	0.07	0.04
72	.	1	09NOV81:10:50	37.10	0.48	0.48	0.05	3.46	0.06	0.05	0.04
73	.	1	16NOV81:11:00	37.10	0.51	0.51	0.04	4.26	0.06	0.05	0.02
74	.	1	23NOV81:10:20	32.90	0.31	0.31	0.02	4.02	0.07	0.07	0.05
75	.	1	30NOV81:10:45	35.60	0.58	0.55	0.08	4.83	0.08	0.07	0.07
76	334	2	30NOV81:21:00	54.83	0.97	0.97	0.14	3.94	0.45	0.26	0.05
77	.	1	07DEC81:11:17	37.10	0.53	0.53	0.10	3.89	0.07	0.06	0.06

STA=51UR02

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
78	.	1	06OCT80:14:00	0.605	0.33	0.33	.	.	0.10	0.08	.
79	.	1	20OCT80:11:30	33.400	0.73	0.57	0.05	0.92	0.14	0.05	0.04
80	.	1	27OCT80:09:45	14.100	0.50	0.50	0.10	0.93	0.08	0.05	0.05
81	.	1	03NOV80:09:45	1.760	0.38	0.31	0.02	0.28	0.07	0.06	0.04
82	.	1	10NOV80:13:25	9.590	0.42	0.37	0.00	0.16	0.13	0.07	0.03
83	.	1	17NOV80:12:40	2.750	0.25	0.21	0.02	0.04	0.07	0.05	0.03
84	329.00	2	24NOV80:17:25	48.000	2.06	0.53	0.08	0.58	0.71	0.06	0.02
85	.	1	08DEC80:09:30	5.500	0.28	0.28	0.03	0.43	0.05	0.04	0.03
86	.	1	15DEC80:11:55	6.000	0.19	0.19	0.02	0.35	0.05	0.03	0.01
87	.	1	22DEC80:13:10	3.040	0.22	0.22	0.08	0.48	0.09	0.04	0.03
88	.	1	05JAN81:11:00	4.250	0.45	0.43	0.17	0.16	0.03	0.02	0.00
89	.	1	12JAN81:09:35	2.270	1.19	1.06	0.33	0.82	0.04	0.03	0.01
90	.	1	26JAN81:13:10	6.180	.	.	2.39	0.64	0.05	0.05	0.01
91	.	1	09FEB81:12:40	16.100	1.27	1.13	0.65	0.94	0.02	.	0.01
92	51.00	2	20FEB81:18:47	31.690	1.61	0.76	0.42	1.04	0.90	0.04	0.02
93	53.00	2	22FEB81:21:05	77.160	2.22	0.73	.	1.08	0.63	0.04	0.03
94	64.00	2	05MAR81:12:03	14.460	2.03	0.62	0.27	0.98	0.72	0.04	0.02
95	.	1	09MAR81:13:33	12.500	0.62	0.62	0.11	0.98	0.02	0.01	0.01
96	.	1	16MAR81:13:10	9.480	0.38	0.27	0.12	0.64	0.05	0.04	0.02
97	75.00	2	16MAR81:17:00	14.800	0.72	0.33	0.12	0.74	0.26	0.04	0.02
98	.	1	23MAR81:13:05	8.370	.	.	0.05	0.52	.	.	0.02
99	91.00	2	01APR81:21:30	16.300	7.10	0.42	0.15	0.46	.	0.04	0.02
100	95.00	2	06APR81:07:15	34.000	7.10	0.76	0.19	0.49	.	0.07	0.04
101	.	1	06APR81:14:30	21.500	1.08	0.91	0.20	1.05	0.09	0.05	0.03
102	99.00	2	09APR81:13:35	34.600	0.72	0.45	0.12	0.49	0.36	0.06	0.02

STATION NUTRIENT DATA

STA=51UR01

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
55	.	1	10AUG81:13:05	38.50	0.48	0.33	0.10	2.98	0.11	0.06	0.05
56	224	2	11AUG81:23:50	139.00	1.00	0.58	0.06	2.29	0.21	0.04	0.02
57	224	2	12AUG81:11:00	165.00	1.84	0.78	0.24	3.34	0.52	0.05	0.05
58	226	2	15AUG81:00:10	97.00	1.71	0.71	0.07	2.02	0.50	0.07	0.05
59	.	1	17AUG81:12:05	44.80	0.73	0.58	0.04	3.11	0.14	0.05	0.05
60	.	1	24AUG81:12:00	29.00	0.46	0.35	0.01	3.88	0.10	0.09	0.07
61	242	2	30AUG81:07:00	89.00	1.45	0.57	0.20	2.39	0.43	0.07	0.03
62	.	1	14SEP81:11:05	25.80	0.49	0.47	0.03	4.61	0.09	0.08	0.06
63	256	2	15SEP81:16:30	84.00	.	0.82	0.17	2.31	0.32	0.08	0.02
64	.	1	21SEP81:11:55	34.20	0.66	0.60	0.06	3.31	0.09	0.07	0.06
65	.	1	24SEP81:11:45	23.80	0.71	0.64	0.07	4.08	0.10	0.08	0.06
66	274	2	01OCT81:16:00	37.80	0.57	0.46	0.03	3.74	0.13	0.06	0.04
67	.	1	05OCT81:11:04	24.80	0.38	0.32	0.01	2.11	0.08	0.07	0.06
68	.	1	12OCT81:11:35	27.90	0.64	0.64	0.03	4.54	0.08	0.07	0.04
69	296	2	23OCT81:16:50	50.50	1.57	0.89	0.17	2.78	0.24	0.07	0.04
70	298	2	26OCT81:11:05	106.10	2.74	1.17	0.33	1.64	0.68	0.12	0.09
71	.	1	02NOV81:10:55	31.60	0.48	0.48	0.04	3.24	0.08	0.07	0.04
72	.	1	09NOV81:10:50	37.10	0.48	0.48	0.05	3.46	0.06	0.05	0.04
73	.	1	16NOV81:11:00	37.10	0.51	0.51	0.04	4.26	0.06	0.05	0.02
74	.	1	23NOV81:10:20	32.90	0.31	0.31	0.02	4.02	0.07	0.07	0.05
75	.	1	30NOV81:10:45	35.60	0.58	0.55	0.08	4.83	0.08	0.07	0.07
76	334	2	30NOV81:21:00	54.83	0.97	0.97	0.14	3.94	0.45	0.26	0.05
77	.	1	07DEC81:11:17	37.10	0.53	0.53	0.10	3.89	0.07	0.06	0.06

STA=51UR02

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
78	.	1	06OCT80:14:00	0.605	0.33	0.33	.	.	0.10	0.08	.
79	.	1	20OCT80:11:30	33.400	0.73	0.57	0.05	0.92	0.14	0.05	0.04
80	.	1	27OCT80:09:45	14.100	0.50	0.50	0.10	0.93	0.08	0.05	0.05
81	.	1	03NOV80:09:45	1.760	0.38	0.31	0.02	0.28	0.07	0.06	0.04
82	.	1	10NOV80:13:25	9.590	0.42	0.37	0.00	0.16	0.13	0.07	0.03
83	.	1	17NOV80:12:40	2.750	0.25	0.21	0.02	0.04	0.07	0.05	0.03
84	329.00	2	24NOV80:17:26	48.000	2.06	0.53	0.08	0.58	0.71	0.06	0.02
85	.	1	08DEC80:09:30	5.500	0.28	0.28	0.03	0.43	0.05	0.04	0.03
86	.	1	15DEC80:11:55	6.000	0.19	0.19	0.02	0.35	0.05	0.03	0.01
87	.	1	22DEC80:13:10	3.040	0.22	0.22	0.08	0.48	0.09	0.04	0.03
88	.	1	05JAN81:11:00	4.250	0.45	0.43	0.17	0.16	0.03	0.02	0.00
89	.	1	12JAN81:09:35	2.270	1.19	1.06	0.33	0.82	0.04	0.03	0.01
90	.	1	26JAN81:13:10	6.180	.	.	2.39	0.64	0.05	0.05	0.01
91	.	1	09FEB81:12:40	16.100	1.27	1.13	0.65	0.94	0.02	.	0.01
92	51.00	2	20FEB81:18:47	31.690	1.61	0.76	0.42	1.04	0.90	0.04	0.02
93	53.00	2	22FEB81:21:05	77.160	2.22	0.73	.	1.08	0.63	0.04	0.03
94	64.00	2	05MAR81:12:03	14.460	2.03	0.62	0.27	0.98	0.72	0.04	0.02
95	.	1	09MAR81:13:33	12.500	0.62	0.62	0.11	0.98	0.02	0.01	0.01
96	.	1	16MAR81:13:10	9.480	0.36	0.27	0.12	0.64	0.05	0.04	0.02
97	75.00	2	16MAR81:17:00	14.600	0.72	0.33	0.12	0.74	0.26	0.04	0.02
98	.	1	23MAR81:13:05	8.370	.	.	0.05	0.52	.	.	0.02
99	91.00	2	01APR81:21:30	16.300	7.10	0.42	0.15	0.46	.	0.04	0.02
100	95.00	2	06APR81:02:15	34.000	7.10	0.76	0.19	0.49	.	0.07	0.04
101	.	1	06APR81:14:30	21.500	1.08	0.91	0.20	1.05	0.09	0.05	0.03
102	99.00	2	09APR81:13:35	34.600	0.72	0.45	0.12	0.49	0.36	0.06	0.02

STATION NUTRIENT DATA

STA=51UR02

OBS	STRMNO	TYPE	TI	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
103	109.00	2	10APR81:15:00	38.200	1.90	0.47	0.13	0.48	0.86	0.04	0.02
104	.	1	20APR81:13:40	9.590	0.39	0.28	0.05	0.35	0.03	0.03	0.03
105	114.00	2	24APR81:00:40	65.400	3.47	0.59	0.21	0.57	1.47	0.04	0.04
106	.	1	27APR81:13:21	10.300	0.21	0.21	0.07	0.13	0.06	0.05	0.04
107	119.00	2	29APR81:09:40	9.850	2.26	0.74	0.26	0.20	0.93	0.05	0.02
108	.	1	04MAY81:13:32	10.300	0.44	0.27	0.07	0.29	0.07	0.06	0.02
109	131.00	2	11MAY81:00:26	45.390	3.40	0.97	0.18	0.49	1.62	0.09	0.05
110	135.00	2	15MAY81:13:47	65.000	2.02	0.47	0.09	0.74	1.07	0.08	0.06
111	.	1	18MAY81:12:50	10.300	0.62	0.61	0.10	0.62	0.10	0.06	0.04
112	139.01	2	19MAY81:07:12	25.500	1.99	0.65	0.22	0.46	0.87	0.06	0.03
113	139.03	2	20MAY81:14:22	16.900	2.26	0.46	0.10	0.72	0.89	0.05	0.04
114	148.00	2	28MAY81:18:31	22.540	3.87	0.45	0.09	0.52	1.32	0.04	0.04
115	151.00	2	31MAY81:14:24	5.820	3.11	0.38	0.10	0.53	1.68	0.08	0.03
116	152.00	2	01JUN81:14:09	56.250	1.87	0.34	0.08	0.57	1.71	0.21	0.05
117	.	1	08JUN81:13:45	6.000	0.81	0.42	0.09	0.48	0.13	0.07	0.06
118	161.00	2	10JUN81:05:44	36.130	4.07	0.34	0.06	0.21	1.92	0.05	0.05
119	164.01	2	13JUN81:20:59	757.000	2.70	0.58	0.31	0.71	1.48	0.21	0.18
120	164.02	2	14JUN81:13:36	46.630	2.74	0.92	0.39	0.47	1.25	0.16	0.07
121	172.00	2	20JUN81:17:57	2.880	1.39	0.76	0.13	0.19	0.48	0.10	0.06
122	.	1	29JUN81:12:42	2.750	0.47	0.47	0.11	0.26	0.16	0.08	0.08
123	183.00	2	02JUL81:09:56	8.910	2.14	0.97	0.21	0.19	0.87	0.17	0.09
124	185.00	2	04JUL81:10:28	15.400	1.79	0.89	0.08	0.27	0.83	0.13	0.06
125	.	1	13JUL81:12:40	0.429	0.75	0.60	0.13	0.13	0.20	0.13	0.09
126	194.00	2	13JUL81:14:40	11.400	3.71	0.62	0.16	0.18	2.33	0.07	0.07
127	.	1	20JUL81:13:30	0.578	0.91	0.72	0.08	0.13	0.19	0.12	0.10
128	205.00	2	25JUL81:17:16	9.650	8.35	0.31	0.24	0.21	1.18	0.29	0.07
129	.	1	27JUL81:13:15	1.020	0.62	0.54	0.04	0.20	0.14	0.09	0.06
130	209.00	2	28JUL81:15:20	22.700	2.21	0.34	0.12	0.38	1.31	.	0.07
131	.	1	03AUG81:14:20	3.510	0.48	0.39	0.12	0.07	0.21	0.12	0.10
132	.	1	10AUG81:14:25	3.680	0.35	0.33	0.10	0.10	0.18	0.15	0.12
133	.	1	17AUG81:14:25	3.850	0.64	0.64	0.08	0.18	0.13	0.08	0.07
134	243.00	2	31AUG81:15:44	19.600	4.95	1.27	0.19	0.19	3.14	0.11	0.05
135	255.00	2	16SEP81:12:19	22.900	2.58	0.67	0.17	0.48	1.57	0.12	0.08
136	260.00	2	17SEP81:12:35	12.700	2.75	0.57	0.13	0.44	1.60	0.10	0.06
137	.	1	21SEP81:14:05	4.460	0.38	0.38	0.06	0.43	0.10	0.09	0.07
138	.	1	28SEP81:13:45	4.680	0.65	0.55	0.09	0.05	0.18	0.10	0.08
139	.	1	05OCT81:13:10	2.000	0.56	0.36	0.05	0.02	0.16	0.08	0.05
140	.	1	12OCT81:13:45	0.662	0.64	0.55	0.03	0.02	0.13	0.08	0.06
141	299.00	2	26OCT81:11:59	49.100	2.44	0.84	0.13	0.24	0.97	0.11	0.06
142	.	1	02NOV81:14:00	37.800	0.52	0.48	0.06	0.02	0.14	0.11	0.07
143	.	1	09NOV81:13:25	4.250	0.85	0.82	0.11	0.01	0.11	0.07	0.04
144	.	1	16NOV81:13:20	2.330	0.43	0.43	0.02	0.02	0.12	0.09	0.05
145	.	1	23NOV81:12:50	3.040	0.31	0.31	0.02	0.02	0.07	0.07	0.05
146	.	1	30NOV81:13:18	3.040	0.55	0.42	0.02	0.01	0.09	0.06	0.01
147	336.00	2	02DEC81:01:23	9.060	0.63	0.55	0.08	0.06	0.17	0.07	0.03

STATION CHEMICAL DATA

STA=51UR01

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
1	224	.	.	.	.	.	.	.	.	.	.	.
2	224	2	11AUG80:07:30	141.0	6.7	100	.	.	.	.	.	.
3	228	2	15AUG80:23:30	125.0	7.3	155	.	.	.	.	.	.
4	.	1	06SEP80:11:00	43.2	.	.	.	.	7.5	7.30	21.0	215
5	.	1	15SEP80:14:09	35.6	.	.	.	.	7.1	9.10	20.5	230
6	.	1	22SEP80:11:00	40.0	.	.	.	.	8.4	6.20	21.0	240
7	.	1	29SEP80:10:15	41.6	.	.	55.5	0	7.8	9.10	15.0	300
8	.	1	06OCT80:11:00	166.0	.	.	.	.	6.1	6.60	14.0	155
9	.	1	20OCT80:14:45	31.8	.	.	.	.	6.7	10.00	14.0	295
10	299	2	25OCT80:08:00	351.0	6.2	160	46.5	0	.	.	.	.
11	.	1	27OCT80:11:55	51.6	.	.	31.5	0	5.2	10.60	9.0	205
12	.	1	03NOV80:11:50	35.6	.	.	42.5	0	5.9	11.00	7.0	245
13	.	1	10NOV80:12:00	41.6	.	.	.	.	6.3	11.00	11.0	150
14	.	1	17NOV80:10:09	34.2	.	.	.	.	6.8	11.60	4.0	230
15	322	2	17NOV80:10:10	132.0	7.1	205	.	.	.	.	.	.
16	329	2	24NOV80:10:00	340.0	6.3	200	.	.	.	.	.	.
17	.	1	01DEC80:11:20	61.0	.	.	11.0	0	6.8	12.20	8.5	205
18	.	1	08DEC80:13:05	43.2	.	.	.	.	6.4	10.60	11.0	165
19	.	1	15DEC80:13:35	37.1	.	.	.	.	5.3	12.00	4.0	185
20	.	1	22DEC80:10:30	36.0	.	.	.	.	5.4	14.00	1.0	170
21	.	1	05JAN81:14:10	43.2	.	.	27.5	0	4.9	13.80	3.0	145
22	.	1	12JAN81:11:45	38.5	.	.	.	.	5.5	14.00	0.0	215
23	.	1	26JAN81:10:21	35.6	.	.	.	.	8.6	13.00	3.0	170
24	33	2	02FEB81:05:00	550.0	5.3	195	.	.	.	.	.	.
25	.	1	09FEB81:10:05	64.8	.	.	.	.	4.7	13.40	0.0	170
26	42	2	11FEB81:10:30	939.0	6.7	190	40.0	0	.	.	.	.
27	54	2	23FEB81:10:55	481.0	6.6	185	.	.	.	.	.	.
28	.	1	09MAR81:11:00	43.2	.	.	22.0	0	6.9	12.20	5.0	145
29	.	1	16MAR81:10:35	70.9	.	.	.	.	5.8	11.00	6.0	155
30	.	1	23MAR81:10:00	46.4	.	.	.	.	6.9	17.80	5.5	145
31	.	1	06APR81:11:05	95.8	.	.	.	.	6.1	11.20	10.0	140
32	102	2	12APR81:23:00	191.0	6.3	160	.	.	.	.	.	.
33	104	2	14APR81:09:00	222.0	5.7	180	.	.	.	.	.	.
34	.	1	20APR81:11:30	81.6	.	.	28.5	0	6.1	10.50	13.0	145
35	.	1	27APR81:10:05	61.0	.	.	.	.	5.9	10.60	15.0	150
36	121	2	01MAY81:11:50	181.0	6.6	200	.	.	.	.	.	.
37	.	1	04MAY81:10:32	111.0	.	.	.	.	6.3	9.80	12.0	150
38	135	2	15MAY81:12:00	115.0	6.5	170	.	.	.	.	.	.
39	.	1	18MAY81:10:15	61.0	.	.	.	.	6.3	8.90	13.0	155
40	149	2	29MAY81:22:30	120.0	6.8	170	.	.	.	.	.	.
41	.	1	01JUN81:10:30	57.1	.	.	.	.	6.0	8.00	21.0	150
42	154	2	03JUN81:12:25	234.0	6.8	150	.	.	.	.	.	.
43	155	2	04JUN81:22:45	310.0	6.8	150	.	.	.	.	.	.
44	157	2	06JUN81:06:00	134.0	6.9	270	.	.	.	.	.	.
45	.	1	08JUN81:11:10	83.9	.	.	.	.	5.9	7.30	18.0	140
46	164	2	14JUN81:05:00	147.0	5.9	185	.	.	.	.	.	.
47	.	1	22JUN81:10:55	68.8	.	.	.	.	6.0	7.90	23.0	175
48	.	1	29JUN81:10:15	46.1	.	.	.	.	5.8	9.40	18.0	210
49	185	2	04JUL81:09:00	341.0	5.8	155	.	.	.	.	.	.
50	.	1	13JUL81:10:35	41.6	.	.	.	.	6.6	8.15	23.0	200
51	.	1	20JUL81:11:15	32.9	.	.	.	.	6.0	7.50	23.0	230
52	.	1	27JUL81:10:20	38.5	.	.	.	.	5.7	8.10	22.0	200
53	209	2	28JUL81:19:00	215.0	7.1	245	.	.	.	.	.	.
54	.	1	03AUG81:12:00	35.6	.	.	.	.	6.5	8.10	20.0	210

STATION CHEMICAL DATA

STA=51UR01

OBS	STRMNU	TYPE	TI1	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
55	.	1	10AUG81:13:05	38.50	.	.	.	.	7.5	8.1	25.0	200
56	224	2	11AUG81:23:50	139.00	6.9	335	.	.	.	.	.	.
57	224	2	12AUG81:11:00	165.00	6.5	255	.	.	.	.	.	.
58	226	2	16AUG81:00:10	97.00	6.6	290	.	.	.	.	.	.
59	.	1	17AUG81:12:05	44.80	.	.	.	.	7.4	7.5	21.0	205
60	.	1	24AUG81:12:00	29.00	.	.	.	.	7.4	10.6	18.5	275
61	242	2	30AUG81:07:00	89.00	7.3	220	.	.	.	.	.	.
62	.	1	14SEP81:11:05	25.80	.	.	.	.	7.0	9.9	20.5	310
63	258	2	15SEP81:16:30	84.00	6.8	235	.	.	.	.	.	.
64	.	1	21SEP81:11:55	34.20	.	.	.	.	7.8	9.0	16.0	245
65	.	1	28SEP81:11:45	23.80	.	.	.	.	6.9	8.3	16.0	255
66	274	2	01OCT81:18:00	37.80	7.2	265	40.5	0	.	.	.	.
67	.	1	05OCT81:11:04	24.80	.	.	.	.	7.8	10.1	14.0	255
68	.	1	12OCT81:11:35	27.90	.	.	.	.	7.3	6.9	11.0	260
69	296	2	23OCT81:16:50	50.50	.	.	.	.	.	.	.	.
70	298	2	26OCT81:11:05	106.10	.	.	.	.	.	.	.	.
71	.	1	02NOV81:10:55	31.60	.	.	.	.	7.6	9.1	15.0	210
72	.	1	09NOV81:10:50	37.10	.	.	.	.	7.5	13.3	11.0	205
73	.	1	16NOV81:11:00	37.10	.	.	37.0	0	8.0	11.4	9.0	210
74	.	1	23NOV81:10:20	32.90	.	.	.	.	7.8	9.9	3.0	205
75	.	1	30NOV81:10:45	35.60	.	.	.	.	7.6	11.8	6.0	190
76	334	2	30NOV81:21:00	54.83	7.2	200	35.0	0	.	.	.	.
77	.	1	07DEC81:11:17	37.10	.	.	30.0	0	7.5	10.4	4.0	185

STA=51UR02

OBS	STRMNU	TYPE	TI1	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
78	.	1	06OCT80:14:00	0.605	.	.	.	.	6.8	9.7	16.0	280
79	.	1	20OCT80:11:30	33.400	.	.	.	.	6.5	8.7	14.5	145
80	.	1	27OCT80:09:45	14.100	.	.	6.0	0	6.4	10.6	9.0	145
81	.	1	03NOV80:09:45	1.760	.	.	14.5	0	6.0	10.2	6.0	140
82	.	1	10NOV80:13:25	9.590	.	.	.	.	5.8	10.2	10.0	140
83	.	1	17NOV80:12:40	2.750	.	.	.	.	5.5	11.6	5.0	130
84	329.00	2	24NOV80:17:26	48.000	6.8	160	.	.	.	.	.	.
85	.	1	08DEC80:09:30	5.500	.	.	.	.	6.2	10.4	9.0	145
86	.	1	15DEC80:11:55	6.000	.	.	.	.	6.6	11.4	4.0	160
87	.	1	22DEC80:13:10	3.040	.	.	.	.	6.3	14.4	1.0	145
88	.	1	05JAN81:11:00	4.250	.	.	13.0	0	5.4	14.2	2.0	175
89	.	1	12JAN81:09:35	2.270	.	.	.	.	5.6	12.8	1.0	180
90	.	1	26JAN81:13:10	6.180	.	.	.	.	5.7	12.8	4.0	165
91	.	1	09FEB81:12:40	16.100	.	.	.	.	5.0	14.2	1.0	160
92	51.00	2	20FEB81:18:47	31.690	6.7	225	.	.	.	.	.	.
93	53.00	2	22FEB81:21:05	77.160	6.4	205	.	.	.	.	.	.
94	64.00	2	05MAR81:12:03	14.460	5.6	175	.	.	.	.	.	.
95	.	1	09MAR81:13:33	12.500	.	.	11.5	0	6.1	12.0	6.0	155
96	.	1	16MAR81:13:10	9.480	.	.	.	.	5.9	12.2	7.0	145
97	75.00	2	16MAR81:17:00	14.800	6.3	165	.	.	.	.	.	.
98	.	1	23MAR81:13:05	8.370	.	.	.	.	6.8	16.8	7.0	140
99	91.00	2	01APR81:21:30	16.300	6.8	125	.	.	.	.	.	.
100	96.00	2	06APR81:02:15	34.000	6.7	175	.	.	.	.	.	.
101	.	1	06APR81:14:30	21.500	.	.	.	.	6.3	10.4	11.0	150
102	99.00	2	09APR81:13:35	34.600	6.1	165	13.0	0	.	.	.	.

STATION CHEMICAL DATA

STA=51UR02

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
103	100.00	2	10APR81:15:00	38.200	7.1	160	.	.	.	.	.	.
104	.	1	20APR81:13:40	9.590	.	.	12.0	0	6.7	11.0	14	155
105	114.00	2	24APR81:00:40	65.400	6.3	175	.	.	.	.	.	.
106	.	1	27APR81:13:21	10.300	.	.	.	.	5.5	11.0	16	135
107	119.00	2	29APR81:09:40	9.850	5.9	155	.	.	.	.	.	.
108	.	1	04MAY81:13:32	10.300	.	.	.	.	6.5	9.0	15	125
109	131.00	2	11MAY81:00:26	45.390	6.8	135	.	.	.	.	.	.
110	135.00	2	15MAY81:13:47	65.000	6.6	120	.	.	.	.	.	.
111	.	1	18MAY81:12:50	10.300	.	.	.	.	6.3	8.9	13	120
112	139.01	2	19MAY81:07:12	25.500	6.6	140	.	.	.	.	.	.
113	139.03	2	20MAY81:14:22	16.900	6.7	140	.	.	.	.	.	.
114	148.00	2	28MAY81:18:31	22.540	6.8	120	.	.	.	.	.	.
115	151.00	2	31MAY81:14:24	5.820	7.1	130	.	.	.	.	.	.
116	152.00	2	01JUN81:14:09	56.250	7.2	110	.	.	.	.	.	.
117	.	1	08JUN81:13:45	6.000	.	.	.	.	6.1	7.5	27	85
118	161.00	2	10JUN81:05:44	36.130	7.2	120	.	.	.	.	.	.
119	164.01	2	13JUN81:20:59	757.000	7.2	85	.	.	.	.	.	.
120	164.02	2	14JUN81:13:36	46.630	7.1	100	.	.	.	.	.	.
121	172.00	2	20JUN81:17:57	2.880	6.5	140	.	.	.	.	.	.
122	.	1	29JUN81:12:42	2.750	.	.	.	.	6.0	8.8	19	135
123	183.00	2	02JUL81:09:56	8.910	6.0	155	.	.	.	.	.	.
124	185.00	2	04JUL81:10:28	15.400	6.1	120	18.5	0	.	.	.	.
125	.	1	13JUL81:12:40	0.429	.	.	.	.	6.7	5.3	25	140
126	194.00	2	13JUL81:14:40	11.400	6.8	130	.	.	.	.	.	.
127	.	1	20JUL81:13:30	0.578	.	.	.	.	6.0	6.4	28	115
128	206.00	2	25JUL81:17:16	9.650	7.0	250	.	.	.	.	.	.
129	.	1	27JUL81:13:15	1.020	.	.	.	.	6.2	8.4	24	110
130	209.00	2	28JUL81:15:20	22.700	6.7	205	.	.	.	.	.	.
131	.	1	03AUG81:14:20	3.510	.	.	.	.	6.7	5.1	23	125
132	.	1	10AUG81:14:25	3.680	.	.	.	.	6.9	7.3	25	120
133	.	1	17AUG81:14:25	3.850	.	.	.	.	6.9	7.2	23	105
134	243.00	2	31AUG81:15:44	19.600	6.7	120	.	.	.	.	.	.
135	258.00	2	16SEP81:12:19	22.900	6.7	120	.	.	.	.	.	.
136	260.00	2	17SEP81:12:35	12.700	7.5	105	.	.	.	.	.	.
137	.	1	21SEP81:14:05	4.460	.	.	.	.	7.5	8.7	17	130
138	.	1	28SEP81:13:45	4.680	.	.	.	.	6.7	6.4	18	140
139	.	1	05OCT81:13:10	2.000	.	.	.	.	7.5	10.2	14	130
140	.	1	12OCT81:13:45	0.662	.	.	.	.	6.7	7.8	11	125
141	299.00	2	26OCT81:11:59	49.100	7.2	155	.	.	.	.	.	.
142	.	1	02NOV81:14:00	37.800	.	.	.	.	7.0	8.6	17	130
143	.	1	09NOV81:13:25	4.250	.	.	.	.	6.9	12.2	13	130
144	.	1	16NOV81:13:20	2.330	.	.	20.0	0	7.3	10.4	11	140
145	.	1	23NOV81:12:50	3.040	.	.	.	.	7.3	9.4	4	125
146	.	1	30NOV81:13:18	3.040	.	.	.	.	6.9	11.2	7	120
147	336.00	2	02DEC81:01:23	9.060	7.2	140	16.5	0	.	.	.	.

STATION SOLIDS AND ORGANICS DATA

STA=51UR01

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
1	224	.	.	.	.	.		.		.
2	224	2	11AUG80:07:30	141.0	19.2	130.0		.		.
3	224	2	15AUG80:23:30	125.0	14.0	194.0		.		.
4	.	1	08SEP80:11:00	43.2	8.2	3.0		.		.
5	.	1	15SEP80:14:09	35.6	8.0	30.0		.		.
6	.	1	22SEP80:11:00	40.0	6.6	5.0		.		.
7	.	1	29SEP80:10:15	41.6	4.0	2.0		1.8		.
8	.	1	06OCT80:11:00	166.0	3.6	1.5		.		.
9	.	1	20OCT80:14:45	31.8	8.5	1.5		.		.
10	299	2	25OCT80:08:00	351.0	58.0	643.0		.		.
11	.	1	27OCT80:11:55	51.6	10.5	11.5		2.6		3.5
12	.	1	03NOV80:11:50	35.6	6.0	1.5	L	1.0		.
13	.	1	10NOV80:12:00	41.6	10.0	2.0		.		.
14	.	1	17NOV80:10:09	34.2	7.5	3.0		.		.
15	322	2	17NOV80:10:10	132.0	24.0	.		.		.
16	329	2	24NOV80:10:00	340.0	20.0	203.0		.		.
17	.	1	01DEC80:11:20	61.0	5.9	3.0	L	1.0		2.1
18	.	1	08DEC80:13:05	43.2	5.9	3.0		.		.
19	.	1	15DEC80:13:35	37.1	2.3	0.0		.		.
20	.	1	22DEC80:10:30	36.0	4.8	8.0		.		.
21	.	1	05JAN81:14:10	43.2	3.6	3.0		1.4		2.0
22	.	1	12JAN81:11:45	38.5	2.2	1.0		.		.
23	.	1	26JAN81:10:21	35.6	3.8	4.0		.		.
24	33	2	02FEB81:05:00	550.0	137.0	1570.0		.		.
25	.	1	09FEB81:10:05	64.8	9.9	20.4		4.2		6.3
26	42	2	11FEB81:10:30	939.0	160.0	.		6.2	G	13.0
27	54	2	23FEB81:10:55	481.0	140.0	1649.0		.		.
28	.	1	09MAR81:11:00	43.2	.	2.5		3.0		3.7
29	.	1	16MAR81:10:35	70.9	4.6	1.0		.		.
30	.	1	23MAR81:10:00	46.4	4.2	1.0		.		.
31	.	1	06APR81:11:05	95.8	11.5	1.0		.		.
32	102	2	12APR81:23:00	191.0	170.0	1735.0		.		.
33	104	2	14APR81:09:00	222.0	111.0	982.0		.		.
34	.	1	20APR81:11:30	81.6	7.9	5.0		1.7		5.0
35	.	1	27APR81:10:05	61.0	12.7	4.0		.		.
36	121	2	01MAY81:11:50	181.0	24.0	277.0		.		.
37	.	1	04MAY81:10:32	111.0	12.2	6.0		.		.
38	135	2	15MAY81:12:00	115.0	33.9	254.0		.		.
39	.	1	18MAY81:10:15	61.0	9.6	16.0		.		.
40	149	2	29MAY81:22:30	120.0	36.0	396.0		.		.
41	.	1	01JUN81:10:30	57.1	8.8	15.0		.		.
42	154	2	03JUN81:12:25	234.0	73.4	172.0		.		.
43	155	2	04JUN81:22:45	310.0	84.0	932.0		.		.
44	157	2	06JUN81:06:00	134.0	168.0	20.0		.		.
45	.	1	08JUN81:11:10	83.9	4.6	16.0		.		.
46	164	2	14JUN81:05:00	147.0	13.9	139.0		.		.
47	.	1	22JUN81:10:55	68.8	50.1	19.0		.		.
48	.	1	29JUN81:10:15	48.1	7.8	6.0		.		.
49	185	2	04JUL81:09:00	341.0	76.6	685.0		.		.
50	.	1	13JUL81:10:35	41.6	12.6	5.0	L	1.0		1.9
51	.	1	20JUL81:11:15	32.9	10.4	4.0		.		.
52	.	1	27JUL81:10:20	38.5	6.1	5.0		.		.
53	209	2	28JUL81:19:00	215.0	122.0	2090.0		.		.
54	.	1	03AUG81:12:00	35.6	6.2	8.0		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR01

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
55	.	1	10AUG81:13:05	38.50	.	22.0		.		.
56	224	2	11AUG81:23:50	139.00	19.8	118.0		.		.
57	224	2	12AUG81:11:00	165.00	32.0	425.0		.		.
58	228	2	16AUG81:00:10	97.00	28.3	352.0		.		.
59	.	1	17AUG81:12:05	44.80	14.4	31.0		.		.
60	.	1	24AUG81:12:00	29.00	9.6	2.0		.		.
61	242	2	30AUG81:07:00	89.00	.	341.0		.		.
62	.	1	14SEP81:11:05	25.80	6.3	1.0		.		.
63	258	2	15SEP81:16:30	84.00	25.8	162.0		.		.
64	.	1	21SEP81:11:55	34.20	6.1	3.0		.		.
65	.	1	28SEP81:11:45	23.80	7.6	2.0		.		.
66	274	2	01OCT81:18:00	37.80	46.6	79.0		.		.
67	.	1	05OCT81:11:04	24.80	8.1	0.5		.		.
68	.	1	12OCT81:11:35	27.90	4.8	1.5		.		.
69	296	2	23OCT81:16:50	50.50	25.9	107.0		.		.
70	298	2	26OCT81:11:05	106.10	46.8	149.0		.		.
71	.	1	02NOV81:10:55	31.60	7.8	1.0		.		.
72	.	1	09NOV81:10:50	37.10	7.4	1.0		.		.
73	.	1	16NOV81:11:00	37.10	4.6	2.0		1.3		2.3
74	.	1	23NOV81:10:20	32.90	3.4	2.5		.		.
75	.	1	30NOV81:10:45	35.60	6.2	0.5		.		.
76	334	2	30NOV81:21:00	54.83	34.3	200.0		.		.
77	.	1	07DEC81:11:17	37.10	3.4	0.5		.		.

STA=51UR02

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
78	.	1	06OCT80:14:00	0.605	.	2.5		.		.
79	.	1	20OCT80:11:30	33.400	16.3	15.5		.		.
80	.	1	27OCT80:09:45	14.100	14.5	6.0		3.0		3.3
81	.	1	03NOV80:09:45	1.760	14.0	1.0	L	1.0		.
82	.	1	10NOV80:13:25	9.590	18.0	5.0		.		.
83	.	1	17NOV80:12:40	2.750	12.8	0.5		.		.
84	329.00	2	24NOV80:17:26	48.000	36.0	251.0		.		.
85	.	1	08DEC80:09:30	5.500	9.9	2.0		.		.
86	.	1	15DEC80:11:55	6.000	8.6	1.5		.		.
87	.	1	22DEC80:13:10	3.040	8.4	0.0		.		.
88	.	1	05JAN81:11:00	4.250	10.4	5.0		2.2		2.9
89	.	1	12JAN81:09:35	2.270	4.6	1.0		.		.
90	.	1	26JAN81:13:10	6.180	12.4	1.0		.		.
91	.	1	09FEB81:12:40	16.100	11.7	6.4		4.0		6.0
92	51.00	2	20FEB81:18:47	31.690	70.0	350.0		.		.
93	53.00	2	22FEB81:21:05	77.160	78.0	521.0		.		.
94	64.00	2	05MAR81:12:03	14.460	.	365.0		.		.
95	.	1	09MAR81:13:33	12.500	6.2	2.0		4.8		5.5
96	.	1	16MAR81:13:10	9.480	8.6	2.0		.		.
97	75.00	2	16MAR81:17:00	14.800	21.6	125.0		.		.
98	.	1	23MAR81:13:05	8.370	5.0	0.0		.		.
99	91.00	2	01APR81:21:30	16.300	146.0	942.0		.		.
100	96.00	2	06APR81:02:15	34.000	308.0	2032.0		.		.
101	.	1	06APR81:14:30	21.500	26.2	8.0		.		.
102	99.00	2	09APR81:13:35	34.600	38.0	144.0		2.1		4.1

STATION SOLIDS AND ORGANICS DATA

STA=51UR02

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
103	100.00	2	10APR81:15:00	38.200	.	323.0		.		.
104	.	1	20APR81:13:40	9.590	13.7	3.0		1.9		3.4
105	114.00	2	24APR81:00:40	65.400	125.0	193.0		.		.
106	.	1	27APR81:13:21	10.300	14.2	3.5		.		.
107	119.00	2	29APR81:09:40	9.850	72.0	399.0		.		.
108	.	1	04MAY81:13:32	10.300	13.7	4.0		.		.
109	131.00	2	11MAY81:00:26	45.390	30.0	838.0		.		.
110	135.00	2	15MAY81:13:47	65.000	15.8	454.0		.		.
111	.	1	18MAY81:12:50	10.300	15.8	13.0		.		.
112	139.01	2	19MAY81:07:12	25.500	67.3	129.0		.		.
113	139.03	2	20MAY81:14:22	16.900	90.9	440.0		.		.
114	148.00	2	28MAY81:18:31	22.540	124.0	531.0		.		.
115	151.00	2	31MAY81:14:24	5.820	132.0	691.0		.		.
116	152.00	2	01JUN81:14:09	56.250	84.0	450.0		.		.
117	.	1	08JUN81:13:45	6.000	12.7	3.0		.		.
118	161.00	2	10JUN81:05:44	36.130	172.0	1008.0		.		.
119	164.01	2	13JUN81:20:59	757.000	68.0	630.0		.		.
120	164.02	2	14JUN81:13:36	46.630	72.0	502.0		.		.
121	172.00	2	20JUN81:17:57	2.880	56.0	153.0		.		.
122	.	1	29JUN81:12:42	2.750	23.4	2.0		.		.
123	183.00	2	02JUL81:09:56	8.910	50.5	286.0		.		.
124	185.00	2	04JUL81:10:28	15.400	60.9	204.0		3.2		5.2
125	.	1	13JUL81:12:40	0.429	28.2	7.0		4.4		.
126	194.00	2	13JUL81:14:40	11.400	137.0	1248.0		.		.
127	.	1	20JUL81:13:30	0.578	20.1	9.0		.		.
128	206.00	2	25JUL81:17:16	9.650	136.0	988.0		.		.
129	.	1	27JUL81:13:15	1.020	24.9	2.0		.		.
130	209.00	2	28JUL81:15:20	22.700	72.5	335.0		.		.
131	.	1	03AUG81:14:20	3.510	18.1	8.0		.		.
132	.	1	10AUG81:14:25	3.680	.	1.0		.		.
133	.	1	17AUG81:14:25	3.850	22.2	6.0		.		.
134	243.00	2	31AUG81:15:44	19.600	150.0	1310.0		.		.
135	258.00	2	16SEP81:12:19	22.900	63.9	496.0		.		.
136	260.00	2	17SEP81:12:35	12.700	81.6	292.0		.		.
137	.	1	21SEP81:14:05	4.460	16.0	0.5		.		.
138	.	1	28SEP81:13:45	4.680	18.4	9.5		.		.
139	.	1	05OCT81:13:10	2.000	17.9	1.5		.		.
140	.	1	12OCT81:13:45	0.662	13.3	5.0		.		.
141	299.00	2	26OCT81:11:59	49.100	74.9	331.0		.		.
142	.	1	02NOV81:14:00	37.800	14.5	2.5		.		.
143	.	1	09NOV81:13:25	4.250	15.6	8.5		.		.
144	.	1	16NOV81:13:20	2.330	14.5	3.0		1.4		1.9
145	.	1	23NOV81:12:50	3.040	10.5	0.5		.		.
146	.	1	30NOV81:13:18	3.040	8.7	2.5		.		.
147	336.00	2	02DEC81:01:23	9.060	7.6	7.5		.		.

STA=51UR01

OBS	STRMNO	TYPE	TTT	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
1	224	.	.	.	.	.	.	.	.	.	8.0	19
2	224	2	11AUG80:07:30	141.0	0	0	350	10	0	0	.	.
3	223	2	15AUG80:23:30	125.0	0	0	.	10	.	0	.	.
4	.	1	08SEP80:11:00	43.2	0	0	0	0	0	0	.	.
5	.	1	15SEP80:14:09	35.6	0	0	0	0	0	0	.	.
6	.	1	22SEP80:11:00	40.0	0	0	25	0	0	0	.	.
7	.	1	29SEP80:10:15	41.6	0	0	0	0	0	0	.	.
8	.	1	06OCT80:11:00	166.0	0	0	0	0	0	0	.	.
9	.	1	20OCT80:14:45	31.8	0	0	0	0	0	0	.	.
10	299	2	25OCT80:08:00	351.0	0	.	0	.	0	.	.	.
11	.	1	27OCT80:11:55	51.6	0	0	0	0	0	0	.	.
12	.	1	03NOV80:11:50	35.6	0	0	0	0	0	0	.	.
13	.	1	10NOV80:12:00	41.6	0	0	0	.	0	0	.	.
14	.	1	17NOV80:10:09	34.2	.	.	.	.	.	.	.	.
15	322	2	17NOV80:10:10	132.0	0	0	0	0	0	0	.	.
16	329	2	24NOV80:10:00	340.0	0	0	50	15	0	0	.	.
17	.	1	01DEC80:11:20	61.0	0	0	0	.	0	0	.	.
18	.	1	08DEC80:13:05	43.2	0	0	0	0	0	0	.	.
19	.	1	15DEC80:13:35	37.1	0	0	0	0	0	0	.	.
20	.	1	22DEC80:10:30	36.0	0	0	0	0	0	0	.	.
21	.	1	05JAN81:14:10	43.2	0	0	20	20	0	0	.	.
22	.	1	12JAN81:11:45	38.5	0	0	105	0	0	0	.	.
23	.	1	26JAN81:10:21	35.6	0	0	0	0	0	0	.	.
24	33	2	02FEB81:05:00	550.0	0	0	170	0	65	0	.	.
25	.	1	09FEB81:10:05	64.8	0	0	0	0	0	0	.	.
26	42	2	11FEB81:10:30	939.0	0	0	115	50	40	0	.	.
27	54	2	23FEB81:10:55	461.0	0	0	60	.	0	.	.	.
28	.	1	09MAR81:11:00	43.2	.	0	.	20	.	0	.	.
29	.	1	16MAR81:10:35	70.9	0	0	40	0	0	0	.	.
30	.	1	23MAR81:10:00	46.4	0	0	0	0	0	0	.	.
31	.	1	06APR81:11:05	95.8	0	0	0	0	0	0	.	.
32	102	2	12APR81:23:00	191.0	0	0	80	0	0	0	.	.
33	104	2	14APR81:09:00	222.0	0	0	60	30	30	25	.	.
34	.	1	20APR81:11:30	81.6	0	0	0	0	0	0	.	.
35	.	1	27APR81:10:05	61.0	0	.	0	0	0	0	.	.
36	121	2	01MAY81:11:50	181.0	0	0	25	0	0	0	.	.
37	.	1	04MAY81:10:32	111.0	0	0	0	.	0	0	.	.
38	135	2	15MAY81:12:00	115.0	110	0	45	0	0	0	.	.
39	.	1	18MAY81:10:15	61.0	0	0	0	0	0	0	.	.
40	147	2	29MAY81:22:30	120.0	0	0	80	0	0	0	.	.
41	.	1	01JUN81:10:30	57.1	0	0	0	.	0	0	.	.
42	154	2	03JUN81:12:25	234.0	0	0	75	35	30	30	.	.
43	155	2	04JUN81:22:45	310.0	0	0	40	40	20	0	.	.
44	157	2	06JUN81:06:00	134.0	0	0	35	.	75	25	14.5	.
45	.	1	08JUN81:11:10	83.9	0	0	35	0	0	0	.	.
46	164	2	14JUN81:05:00	147.0	0	0	0	0	0	0	6.4	.
47	.	1	22JUN81:10:55	68.8	0	.	60	30	0	0	.	.
48	.	1	29JUN81:10:15	48.1	0	.	0	0	0	0	.	.
49	185	2	04JUL81:09:00	341.0	0	.	120	0	20	0	28.0	.
50	.	1	13JUL81:10:35	41.6	0	.	0	0	0	0	.	.
51	.	1	20JUL81:11:15	32.9	0	.	0	0	0	0	.	.
52	.	1	27JUL81:10:20	38.5	0	.	0	0	0	0	.	.
53	209	2	28JUL81:19:00	215.0	0	.	85	65	25	0	72.0	.
54	.	1	03AUG81:12:00	35.6	0	0	0	0	0	0	.	.

STA=51UR01

OBS	STORMID	TYPE	TII	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
55	.	1	16AUG81:13:05	38.50	0	.	0	.	0	.	.	.
56	224	2	11AUG81:23:50	139.00	0	0	0	0	0	0	.	.
57	224	2	12AUG81:11:00	165.00	0	0	0	0	25	0	24	59
58	228	2	16AUG81:00:10	97.00	0	0	30	0	25	0	22	60
59	.	1	17AUG81:12:05	44.80	0	0	0	0	0	0	.	.
60	.	1	24AUG81:12:00	29.00	0	0	0	.	0	0	.	.
61	242	2	30AUG81:07:00	89.00	0	0	0	0	0	0	12	48
62	.	1	14SEP81:11:05	25.80	.	0	.	0	.	0	.	.
63	256	2	15SEP81:16:30	84.00	.	.	.	.	.	.	.	.
64	.	1	21SEP81:11:55	34.20	0	0	0	0	0	0	.	.
65	.	1	26SEP81:11:45	23.80	0	0	0	0	.	0	.	.
66	274	2	01OCT81:12:00	37.80	0	0	0	0	0	0	7	26
67	.	1	05OCT81:11:04	24.80	0	0	45	0	.	0	.	.
68	.	1	12OCT81:11:35	27.90	0	0	0	0	.	.	.	.
69	236	2	23OCT81:16:50	50.50	100	0	0	0	0	0	4	13
70	298	2	26OCT81:11:05	106.10	0	0	60	0	20	0	7	66
71	.	1	02NOV81:10:55	31.60	0	0	0	0	.	.	.	.
72	.	1	09NOV81:10:50	37.10	0	0	0	0	.	.	.	.
73	.	1	16NOV81:11:00	37.10	0	0	0	0	.	.	.	.
74	.	1	23NOV81:10:20	32.90	0	0	0	0	.	.	.	.
75	.	1	30NOV81:10:45	35.60	0	0	0	0	.	.	.	.
76	334	2	30NOV81:21:00	54.83	0	0	50	35	.	.	5	78
77	.	1	07DEC81:11:17	37.10	.	0	.	0	.	.	.	.

STA=51UR02

OBS	STORMID	TYPE	TII	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
78	.	1	06OCT80:14:00	0.605	0	0	20	20	0	0	.	.
79	.	1	20OCT80:11:30	33.400	0	0	55	15	0	0	.	.
80	.	1	27OCT80:09:45	14.100	0	0	0	0	0	0	.	.
81	.	1	03NOV80:09:45	1.760	0	0	0	0	0	0	.	.
82	.	1	10NOV80:13:25	9.590	0	0	0	0	0	0	.	.
83	.	1	17NOV80:12:40	2.750	0	0	0	0	0	0	.	.
84	329.00	2	24NOV80:17:26	48.000	0	0	35	15	0	0	.	.
85	.	1	08DEC80:09:30	5.500	0	0	25	20	0	0	.	.
86	.	1	15DEC80:11:55	6.000	0	0	0	0	25	0	.	.
87	.	1	22DEC80:13:10	3.040	0	0	0	0	0	0	.	.
88	.	1	05JAN81:11:00	4.250	0	0	95	0	0	0	.	.
89	.	1	12JAN81:09:35	2.270	0	0	65	0	0	0	.	.
90	.	1	26JAN81:13:10	6.180	0	0	0	0	0	0	.	.
91	.	1	09FEB81:12:40	16.190	0	0	0	.	0	0	.	.
92	51.00	2	20FEB81:18:47	31.690	0	0	70	30	0	0	.	.
93	53.00	2	22FEB81:21:05	77.160	0	0	70	25	0	0	.	.
94	64.00	2	05MAR81:12:03	14.450	0	0	60	0	0	0	.	.
95	.	1	09MAR81:13:33	12.500	.	0	.	0	.	0	.	.
96	.	1	16MAR81:13:10	9.480	0	0	40	25	25	0	.	.
97	75.00	2	19MAR81:17:00	14.600	0	0	35	20	0	0	.	.
98	.	1	23MAR81:13:05	8.370	0	0	0	0	0	0	.	.
99	91.00	2	01APR81:21:30	16.300	0	0	280	25	410	25	.	.
100	95.00	2	06APR81:02:15	34.000	0	0	210	55	0	0	.	.
101	.	1	06APR81:14:30	21.500	0	0	25	0	0	0	.	.
102	99.00	2	09APR81:13:35	34.600	0	0	0	.	20	.	.	.

-- STA=51UR02 --

OBS	STRMOD	TYPE	TI	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
103	100.00	2	18APR81:15:00	36.200	0	0	50	0	0	0	.	.
104	.	1	20APR81:13:40	9.590	0	0	25	0	0	0	.	.
105	114.00	2	24APR81:00:40	65.400	0	0	150	40	0	0	.	.
106	.	1	27APR81:13:21	10.300	0	0	0	0	0	0	.	.
107	119.00	2	29APR81:00:40	9.850	0	0	100	40	0	0	.	.
108	.	1	04MAY81:13:32	10.300	0	0	0	0	0	0	.	.
109	131.00	2	11MAY81:00:26	45.390	0	0	290	75	25	0	.	.
110	135.00	2	15MAY81:13:47	65.000	0	0	90	45	20	0	.	.
111	.	1	18MAY81:12:50	10.300	0	0	0	0	0	0	.	.
112	139.01	2	19MAY81:07:12	25.500	0	0	165	35	0	0	.	.
113	139.03	2	20MAY81:14:22	16.900	0	0	85	25	0	0	.	.
114	146.00	2	28MAY81:15:31	22.540	0	0	170	20	0	0	.	.
115	151.00	2	31MAY81:14:24	5.820	0	0	60	35	0	0	.	.
116	152.00	2	01JUN81:14:09	56.250	0	0	40	30	0	0	.	.
117	.	1	08JUN81:13:45	6.000	0	0	80	30	0	0	.	.
118	161.00	2	10JUN81:05:44	36.130	0	0	90	55	0	.	40.4	.
119	164.01	2	13JUN81:20:59	757.000	0	0	100	60	20	0	53.1	.
120	164.02	2	14JUN81:13:36	46.630	0	0	85	85	0	0	23.8	.
121	172.00	2	20JUN81:17:57	2.680	0	0	65	0	0	0	11.4	.
122	.	1	29JUN81:12:42	2.750	0	.	0	0	0	0	.	.
123	183.00	2	02JUL81:09:56	8.910	0	0	50	20	0	0	.	.
124	185.00	2	04JUL81:10:28	15.400	0	.	25	0	0	0	6.0	.
125	.	1	13JUL81:12:40	0.429	0	.	0	0	0	0	.	.
126	194.00	2	13JUL81:14:40	11.490	0	.	110	20	20	0	37.0	.
127	.	1	20JUL81:13:30	0.578	0	.	0	0	0	0	.	.
128	200.00	2	25JUL81:17:16	9.650	0	.	75	.	0	.	23.0	.
129	.	1	27JUL81:13:15	1.020	0	.	0	0	0	0	.	.
130	204.00	2	28JUL81:15:20	22.700	0	.	60	.	0	.	30.0	95
131	.	1	03AUG81:14:20	3.510	0	0	0	.	0	0	.	.
132	.	1	10AUG81:14:25	3.680	0	.	0	.	0	.	.	.
133	.	1	17AUG81:14:25	3.850	0	0	0	0	0	0	.	.
134	243.00	2	31AUG81:15:44	19.600	0	0	150	0	0	0	.	.
135	250.00	2	16SEP81:12:19	22.900	0	0	70	0	0	0	21.0	85
136	260.00	2	17SEP81:12:35	12.700	0	0	80	0	0	0	22.0	91
137	.	1	21SEP81:14:05	4.460	0	0	0	0	20	0	.	.
138	.	1	28SEP81:13:45	4.680	0	0	35	0	.	0	.	.
139	.	1	05OCT81:13:10	2.000	.	0	.	0	.	0	.	.
140	.	1	12OCT81:13:45	0.662	0	0	0	0	.	.	.	.
141	299.00	2	26OCT81:11:59	49.100	0	0	30	0	0	0	18.0	63
142	.	1	02NOV81:14:00	37.800	0	0	0	0	.	.	.	.
143	.	1	09NOV81:13:25	4.250	0	0	30	30	.	.	.	.
144	.	1	16NOV81:13:20	2.330	0	0	50	0	.	.	.	.
145	.	1	23NOV81:12:50	3.040	0	0	0	0	.	.	.	.
146	.	1	30NOV81:13:12	3.040	0	0	0	0	.	.	.	.
147	330.00	2	02DEC81:01:23	9.060	0	0	0	0	.	.	1.0	14

STA=S1UR01

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
1	224	.	.	.	.	.	.	.	.	.	.	.	.	0
2	224	2	11AUG80:07:30	141.0	400	0	5950	270	.	25	0	75	0	.
3	223	2	15AUG80:23:30	125.0	.	0	.	135	.	0	0	.	0	.
4	.	1	06SEP80:11:00	43.2	.	0	.	0	.	0	.	.	0	.
5	.	1	15SEP80:14:09	35.6	.	55	.	240	.	0	.	.	0	.
6	.	1	22SEP80:11:00	40.0	.	0	.	130	.	0	.	.	0	.
7	.	1	29SEP80:10:15	41.6	0	0	500	180	0	0	0	0	0	.
8	.	1	05OCT80:11:00	166.0	.	35	.	0	.	0	.	.	0	.
9	.	1	20OCT80:14:45	31.8	.	35	.	175	.	0	.	.	0	.
10	294	2	25OCT80:08:00	351.0	625	.	13225	.	.	.	0	75	.	.
11	.	1	27OCT80:11:55	51.6	90	0	840	525	0	0	0	0	0	.
12	.	1	03NOV80:11:50	35.6	30	0	260	180	0	0	0	65	0	.
13	.	1	10NOV80:12:00	41.6	.	50	.	180	.	0	.	.	0	.
14	.	1	17NOV80:10:09	34.2	.	.	.	.	.	.	.	.	.	.
15	322	2	17NOV80:10:10	132.0	195	55	1175	175	.	0	0	30	0	.
16	329	2	24NOV80:10:00	340.0	405	50	3200	325	.	0	0	0	0	.
17	.	1	01DEC80:11:20	61.0	140	140	535	360	0	0	0	0	0	.
18	.	1	08DEC80:13:05	43.2	.	.	.	0	.	.	.	.	.	.
19	.	1	15DEC80:13:35	37.1	.	.	.	115	.	.	.	.	.	.
20	.	1	22DEC80:10:30	35.0	.	.	.	205	.	.	.	.	.	.
21	.	1	05JAN81:14:10	43.2	70	50	190	150	0	0	0	30	0	.
22	.	1	12JAN81:11:45	38.5	.	.	.	.	.	.	.	.	.	.
23	.	1	26JAN81:10:21	35.6	.	.	.	.	.	.	.	.	.	.
24	33	2	02FEB81:05:00	550.0	.	160	.	375	.	0	.	.	0	.
25	.	1	09FEB81:10:05	64.8	70	0	245	130	0	0	0	0	.	.
26	42	2	11FEB81:10:30	939.0	1630	165	.	28	30	30	0	0	0	.
27	54	2	23FEB81:10:55	481.0	.	0	.	310	.	0	.	.	0	.
28	.	1	09MAR81:11:00	43.2	.	.	.	.	.	.	.	.	.	.
29	.	1	16MAR81:10:35	70.9	.	.	.	.	.	.	.	.	.	.
30	.	1	23MAR81:10:00	46.4	.	.	.	.	.	.	.	.	.	.
31	.	1	06APR81:11:05	95.8	.	.	.	.	.	.	.	.	.	.
32	162	2	12APR81:23:00	191.0	.	0	.	120	.	0	.	.	0	.
33	164	2	14APR81:09:00	222.0	.	.	.	.	.	.	.	.	.	.
34	.	1	20APR81:11:30	81.6	70	0	210	160	0	0	0	0	0	.
35	.	1	27APR81:10:05	61.0	.	.	.	.	.	.	.	.	.	.
36	121	2	01MAY81:11:50	181.0	.	.	.	.	.	.	.	.	.	.
37	.	1	04MAY81:10:32	111.0	.	.	.	.	.	.	.	.	.	.
38	135	2	15MAY81:12:00	115.0	.	.	.	.	.	.	.	.	.	.
39	.	1	18MAY81:10:15	61.0	.	.	.	.	.	.	.	.	.	.
40	149	2	29MAY81:22:30	120.0	.	.	.	.	.	.	.	.	.	.
41	.	1	01JUN81:10:30	57.1	.	.	.	.	.	.	.	.	.	.
42	154	2	03JUN81:12:25	234.0	.	.	.	.	.	.	.	.	.	.
43	155	2	04JUN81:22:45	310.0	.	.	.	.	.	.	.	.	.	.
44	157	2	05JUN81:06:00	134.0	.	.	.	.	.	.	.	.	.	.
45	.	1	08JUN81:11:10	83.9	.	.	.	.	.	.	.	.	.	.
46	164	2	14JUN81:05:00	147.0	.	.	.	.	.	.	.	.	.	.
47	.	1	22JUN81:10:55	68.8	.	.	.	.	.	.	.	.	.	.
48	.	1	29JUN81:10:15	48.1	55	.	230	.	0	.	0	0	.	.
49	185	2	04JUL81:09:00	341.0	.	.	.	.	.	.	.	.	.	.
50	.	1	13JUL81:10:35	41.6	.	.	.	.	.	.	.	.	.	.
51	.	1	20JUL81:11:15	32.9	.	.	.	.	.	.	.	.	.	.
52	.	1	27JUL81:10:20	38.5	60	.	185	.	0	.	0	0	.	.
53	209	2	28JUL81:19:00	215.0	.	.	.	.	.	.	.	.	.	.
54	.	1	03AUG81:12:00	35.6	.	.	.	.	.	.	.	.	.	.

STA=51UR01

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
55	.	1	10AUG81:13:05	38.50	.	.	.	.	.	.	.	.	.	.
56	224	2	11AUG81:23:50	139.00	0	0	160	105	0	0	0	0	0	.
57	224	2	12AUG81:11:00	165.00	.	.	.	.	.	.	.	.	.	5
58	226	2	16AUG81:00:10	97.00	.	.	.	.	.	.	.	.	.	0
59	.	1	17AUG81:12:05	44.80	105	0	680	265	0	0	0	0	0	.
60	.	1	24AUG81:12:00	29.00	.	.	.	.	.	.	.	.	.	.
61	242	2	30AUG81:07:00	89.00	.	.	.	.	.	.	.	.	.	0
62	.	1	14SEP81:11:05	25.80	.	.	.	.	.	.	.	.	.	.
63	258	2	15SEP81:16:30	84.00	.	.	.	.	.	.	.	.	.	.
64	.	1	21SEP81:11:55	34.20	40	.	235	.	0	.	0	0	.	.
65	.	1	28SEP81:11:45	23.80	.	.	.	.	.	.	.	.	.	.
66	274	2	01OCT81:16:00	37.80	.	.	.	.	.	.	.	.	.	0
67	.	1	05OCT81:11:04	24.80	.	.	.	.	0	.	0	.	.	.
68	.	1	12OCT81:11:35	27.90	.	.	.	.	.	.	.	.	.	.
69	295	2	23OCT81:15:50	50.50	.	.	.	.	.	.	.	.	.	0
70	298	2	26OCT81:11:05	106.10	.	0	.	200	.	25	.	.	0	0
71	.	1	02NOV81:10:55	31.60	.	.	.	.	0	0	0	.	.	.
72	.	1	09NOV81:10:50	37.10	.	.	.	.	0	.	0	.	.	.
73	.	1	16NOV81:11:00	37.10	.	.	.	.	.	.	.	.	.	.
74	.	1	23NOV81:10:20	32.90	.	.	.	.	.	.	.	.	.	.
75	.	1	30NOV81:10:45	35.60	.	.	.	.	.	.	.	.	.	.
76	334	2	30NOV81:21:00	54.83	.	.	.	.	.	.	.	.	.	0
77	.	1	07DEC81:11:17	37.10	.	.	.	.	.	0	.	.	.	.

STA=51UR02

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
78	.	1	06OCT80:14:00	0.605	.	50	.	510	.	0	.	.	0	.
79	.	1	20OCT80:11:30	33.400	.	40	.	510	.	0	.	.	0	.
80	.	1	27OCT80:09:45	14.100	90	0	940	605	0	0	0	0	0	.
81	.	1	03NOV80:09:45	1.760	105	30	690	690	0	0	0	50	0	.
82	.	1	10NOV80:13:25	9.590	.	0	.	400	.	0	.	.	0	.
83	.	1	17NOV80:12:40	2.750	.	45	.	450	.	0	.	.	0	.
84	329.00	2	24NOV80:17:26	48.000	260	0	2180	195	.	0	0	0	0	.
85	.	1	05DEC80:09:30	5.500	.	.	.	300	.	.	.	.	.	.
86	.	1	15DEC80:11:55	6.000	.	.	.	255	.	.	.	.	.	.
87	.	1	22DEC80:13:10	3.040	.	.	.	350	.	.	.	.	.	.
88	.	1	05JAN81:11:00	4.250	105	105	370	160	0	0	0	45	0	.
89	.	1	12JAN81:09:35	2.270	.	.	.	.	.	.	.	.	.	.
90	.	1	26JAN81:13:10	6.180	.	.	.	.	.	.	.	.	.	.
91	.	1	09FEB81:12:40	16.100	150	125	325	235	0	0	0	0	0	.
92	51.00	2	20FEB81:18:47	31.690	.	0	.	130	.	0	.	.	0	.
93	53.00	2	22FEB81:21:05	77.160	.	0	.	250	.	0	.	.	0	.
94	64.00	2	05MAR81:12:03	14.460	.	0	.	0	.	0	.	.	0	.
95	.	1	09MAR81:13:33	12.500	.	.	.	.	.	.	.	.	.	.
96	.	1	16MAR81:13:10	9.480	.	.	.	.	.	.	.	.	.	.
97	75.00	2	16MAR81:17:00	14.800	.	0	.	110	.	0	.	.	0	.
98	.	1	23MAR81:13:05	8.370	.	.	.	.	.	.	.	.	.	.
99	91.00	2	01APR81:21:30	16.300	.	0	.	125	.	0	.	.	0	.
100	96.00	2	06APR81:02:15	34.000	.	0	.	110	.	0	.	.	0	.
101	.	1	06APR81:14:30	21.500	.	.	.	.	.	.	.	.	.	.
102	99.00	2	09APR81:13:35	34.000	.	0	.	155	.	0	.	.	30	.

STA=51UR02

OBS	STR400	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
103	100.00	2	10APR81:15:00	38.200	.	.	.	.	.	.	.	.	.	.
104	.	1	20APR81:13:40	9.590	130	0	640	385	0	0	0	0	0	.
105	114.00	2	24APR81:00:40	65.400	.	.	.	.	.	.	.	.	.	.
106	.	1	27APR81:13:21	10.300	.	.	.	.	.	.	.	.	.	.
107	119.00	2	29APR81:09:40	9.850	.	.	.	.	.	.	.	.	.	.
108	.	1	04MAY81:13:32	10.300	.	.	.	.	.	.	.	.	.	.
109	131.00	2	11MAY81:00:26	45.390	.	.	.	.	.	.	.	.	.	.
110	135.00	2	15MAY81:13:47	65.000	.	.	.	.	.	.	.	.	.	.
111	.	1	16MAY81:12:50	10.300	.	.	.	.	.	.	.	.	.	.
112	139.01	2	19MAY81:07:12	25.500	.	.	.	.	.	.	.	.	.	.
113	139.03	2	20MAY81:14:22	16.900	.	.	.	.	.	.	.	.	.	.
114	148.00	2	28MAY81:16:31	22.540	.	.	.	.	.	.	.	.	.	.
115	151.00	2	31MAY81:14:24	5.620	.	.	.	.	.	.	.	.	.	.
116	152.00	2	01JUN81:14:09	56.250	.	.	.	.	.	.	.	.	.	.
117	.	1	08JUN81:13:45	6.000	.	.	.	.	.	.	.	.	.	.
118	161.00	2	10JUN81:05:44	36.130	.	.	.	.	.	.	.	.	.	.
119	164.01	2	13JUN81:20:59	157.000	.	.	.	.	.	.	.	.	.	.
120	164.02	2	14JUN81:13:36	46.630	.	.	.	.	.	.	.	.	.	.
121	172.00	2	20JUN81:17:57	2.680	.	.	.	.	.	.	.	.	.	.
122	.	1	24JUN81:12:42	2.750	40	.	870	.	0	.	0	0	.	.
123	183.00	2	02JUL81:09:56	8.910	.	0	.	.	.	0	.	.	.	.
124	185.00	2	04JUL81:10:28	15.400	.	.	.	.	.	.	.	.	.	.
125	.	1	13JUL81:12:40	0.429	.	.	.	.	.	.	.	.	.	.
126	194.00	2	13JUL81:14:40	11.400	.	.	.	.	.	.	.	.	.	.
127	.	1	20JUL81:13:30	0.578	.	.	.	.	.	.	.	.	.	.
128	206.00	2	25JUL81:17:16	9.650	.	.	.	.	.	.	.	.	.	.
129	.	1	27JUL81:13:15	1.020	40	.	670	.	0	.	0	0	.	.
130	209.00	2	28JUL81:15:20	22.700	.	.	.	.	.	.	.	0	.	5
131	.	1	03AUG81:14:20	3.510	.	.	.	.	.	.	.	.	.	.
132	.	1	10AUG81:14:25	3.680	.	.	.	.	.	.	.	.	.	.
133	.	1	17AUG81:14:25	3.850	35	0	840	790	0	0	0	0	0	.
134	243.00	2	31AUG81:15:44	19.600	.	.	.	.	.	.	.	.	.	.
135	256.00	2	16SEP81:12:19	22.900	820	0	6700	355	0	0	0	40	0	0
136	260.00	2	17SEP81:12:35	12.700	.	.	.	.	.	.	.	.	.	5
137	.	1	21SEP81:14:05	4.460	30	.	750	.	0	.	0	120	.	.
138	.	1	28SEP81:13:45	4.680	.	.	.	.	.	.	.	.	.	.
139	.	1	05OCT81:13:10	2.000	.	0	.	500	.	0	.	.	0	.
140	.	1	12OCT81:13:45	0.662	.	.	.	.	0	0	0	.	.	.
141	299.00	2	26OCT81:11:59	49.100	600	0	7170	395	0	0	0	0	0	0
142	.	1	02NOV81:14:00	37.800	.	.	.	.	0	0	0	.	.	.
143	.	1	09NOV81:13:25	4.250	.	.	.	.	.	.	.	.	.	.
144	.	1	16NOV81:13:20	2.330	.	.	.	.	.	.	.	.	.	.
145	.	1	23NOV81:12:50	3.040	.	.	.	.	.	.	.	.	.	.
146	.	1	30NOV81:13:18	3.040	.	.	.	.	.	.	.	.	.	.
147	336.00	2	02DEC81:01:23	9.060	.	.	.	.	0	.	0	.	.	0

APPENDIX E

RAW DATA LISTINGS

BMP SITES

STATION RUNOFF DATA

STA=51UR03

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
148	292.00	2	18OCT80:09:18	.	0.12000	1.50	1	.
149	292.00	2	18OCT80:10:14	.	0.12000	2.50	1	.
150	292.00	2	18OCT80:11:19	.	0.09000	3.50	1	.
151	292.00	2	18OCT80:12:27	.	0.06000	4.50	1	.
152	292.00	2	18OCT80:14:12	.	0.03000	5.50	1	.
153	292.10	2	18OCT80:16:46	.	0.58000	1.24	4	.
154	292.10	2	18OCT80:16:58	.	0.42000	2.24	4	.
155	292.10	2	18OCT80:17:18	.	0.12000	3.24	4	.
156	292.10	2	18OCT80:17:53	.	0.12000	4.24	4	.
157	292.10	2	18OCT80:18:26	.	0.33000	5.24	4	.
158	292.10	2	18OCT80:18:34	.	1.11000	6.24	4	.
159	292.10	2	18OCT80:18:39	.	0.89000	7.24	4	.
160	292.10	2	18OCT80:18:44	.	0.89000	8.24	4	.
161	292.10	2	18OCT80:18:50	.	0.67000	9.24	4	.
162	292.10	2	18OCT80:18:57	.	0.42000	10.24	4	.
163	292.10	2	18OCT80:19:07	.	0.42000	11.24	4	.
164	292.10	2	18OCT80:19:15	.	0.42000	12.24	4	.
165	292.10	2	18OCT80:19:24	.	0.42000	13.24	4	.
166	292.10	2	18OCT80:19:33	.	0.42000	14.24	4	.
167	292.10	2	18OCT80:19:44	.	0.33000	15.24	4	.
168	292.10	2	18OCT80:19:56	.	0.33000	16.24	4	.
169	292.10	2	18OCT80:20:11	.	0.21000	17.24	4	.
170	292.10	2	18OCT80:20:29	.	0.21000	18.24	4	.
171	292.10	2	18OCT80:20:48	.	0.67000	19.24	4	.
172	292.10	2	18OCT80:20:52	.	1.11000	20.24	4	.
173	292.10	2	18OCT80:20:57	.	1.23000	21.24	4	.
174	292.10	2	18OCT80:21:02	.	0.89000	22.24	4	.
175	292.10	2	18OCT80:21:08	.	0.67000	23.24	4	.
176	292.10	2	18OCT80:21:16	.	0.42000	24.24	4	.
177	309.00	2	04NOV80:08:22	04NOV80:13:44	0.19000	17.00	1	.
178	314.00	2	09NOV80:15:44	09NOV80:16:50	0.58000	3.00	1	.
179	329.00	2	24NOV80:05:27	25NOV80:11:52	0.36000	38.00	1	0.63
180	332.00	2	27NOV80:16:56	29NOV80:12:29	0.12000	21.00	1	0.31
181	344.00	2	09DEC80:12:55	09DEC80:15:52	0.29000	4.00	1	0.20
182	358.00	2	23DEC80:08:19	24DEC80:08:30	0.15000	12.00	1	0.13
183	51.00	2	20FEB81:00:14	20FEB81:00:41	0.61000	2.00	1	0.33
184	51.10	2	20FEB81:13:15	21FEB81:08:19	0.15000	8.00	1	0.06
185	52.00	2	21FEB81:15:32	22FEB81:12:17	0.16064	12.00	1	0.15
186	53.00	2	22FEB81:17:11	25FEB81:09:09	0.33264	77.00	1	1.30
187	63.00	2	04MAR81:19:57	05MAR81:09:28	0.47000	25.00	2	0.45
188	75.00	2	16MAR81:12:11	18MAR81:04:04	0.05000	21.00	1	0.14
189	89.01	2	30MAR81:07:36	.	0.18000	1.10	1	.
190	89.01	2	30MAR81:08:04	.	0.18000	2.10	1	.
191	89.01	2	30MAR81:08:28	.	0.27000	3.10	1	.
192	89.01	2	30MAR81:08:45	.	0.33000	4.10	1	.
193	89.01	2	30MAR81:09:00	.	0.39000	5.10	1	.
194	89.01	2	30MAR81:09:13	.	0.42000	6.10	1	.
195	89.01	2	30MAR81:09:24	.	0.45000	7.10	1	.
196	89.01	2	30MAR81:09:36	.	0.36000	8.10	1	.
197	89.01	2	30MAR81:09:53	.	0.24000	9.10	1	.
198	89.01	2	30MAR81:10:19	.	0.15000	10.10	1	.
199	89.03	2	30MAR81:13:20	31MAR81:08:34	0.47000	29.00	1	0.98
200	90.00	2	31MAR81:10:44	02APR81:19:54	0.12682	26.00	1	0.14
201	95.00	2	05APR81:17:30	05APR81:21:07	0.60000	8.00	1	0.43

STATION RUNOFF DATA

STA=51UR03

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
202	99.0	2	09APR81:10:56	09APR81:13:49	0.53000	6	1.0	0.25
203	102.0	2	12APR81:18:53	14APR81:12:31	0.27689	42	1.0	0.71
204	104.0	2	14APR81:16:23	15APR81:10:41	0.15000	9	1.0	0.09
205	107.0	2	17APR81:06:24	18APR81:09:58	0.13301	14	1.0	0.18
206	113.0	2	23APR81:19:08	24APR81:09:07	0.22646	11	1.0	0.29
207	130.0	2	10MAY81:14:23	13MAY81:06:33	0.29437	68	1.0	1.09
208	133.0	2	19MAY81:13:38	20MAY81:10:54	0.26000	22	4.0	0.47
209	148.0	2	28MAY81:01:07	29MAY81:09:08	0.24000	26	1.0	0.37
210	149.0	2	29MAY81:18:33	30MAY81:08:42	0.10000	5	1.0	0.03
211	150.0	2	30MAY81:23:40	31MAY81:07:00	0.09000	3	1.0	0.01
212	152.0	2	01JUN81:13:15	03JUN81:05:57	0.22000	28	1.0	0.79
213	154.0	2	03JUN81:19:25	04JUN81:08:20	0.09000	4	1.0	0.04
214	155.0	2	04JUN81:20:56	05JUN81:07:40	0.06000	3	1.0	.
215	157.1	2	06JUN81:21:10	07JUN81:10:40	0.09465	5	1.0	0.02
216	159.0	2	08JUN81:21:20	09JUN81:11:05	0.12000	6	1.0	.
217	161.0	2	10JUN81:01:08	11JUN81:10:44	0.25876	31	1.0	0.66
218	164.0	2	13JUN81:17:18	15JUN81:09:43	0.14000	26	1.0	0.56
219	170.0	2	19JUN81:23:34	20JUN81:00:24	1.32000	4	1.0	.
220	176.0	2	25JUN81:20:12	26JUN81:10:12	0.58929	28	1.0	0.65
221	184.0	2	03JUL81:05:11	03JUL81:07:32	0.20000	2	1.0	0.14
222	185.0	2	04JUL81:06:09	04JUL81:10:55	5.60000	59	1.0	2.65
223	201.0	2	20JUL81:19:41	21JUL81:12:58	0.14143	9	1.0	0.50
224	202.0	2	21JUL81:15:32	22JUL81:09:26	0.15363	9	1.0	0.18
225	205.0	2	24JUL81:14:24	26JUL81:08:37	0.26000	39	1.0	1.31
226	207.0	2	26JUL81:19:54	27JUL81:07:12	0.18191	7	1.0	0.13
227	209.0	2	28JUL81:00:16	29JUL81:08:31	0.18000	17	1.0	0.60
228	215.0	2	03AUG81:16:26	04AUG81:08:46	0.10000	8	2.1	0.34
229	218.0	2	06AUG81:10:32	07AUG81:08:20	0.16000	12	1.0	0.10
230	219.0	2	07AUG81:18:23	08AUG81:13:27	0.08596	6	1.0	0.05
231	223.0	2	11AUG81:20:04	13AUG81:10:26	0.19403	27	1.0	1.09
232	227.0	2	15AUG81:20:44	16AUG81:23:43	0.26000	19	1.0	0.50
233	242.0	2	30AUG81:08:48	31AUG81:08:15	0.48000	33	1.0	1.25
234	243.0	2	31AUG81:10:20	01SEP81:06:17	0.33417	24	1.0	.
235	251.0	2	08SEP81:13:08	08SEP81:13:22	1.40000	2	1.0	0.28
236	258.0	2	15SEP81:17:41	16SEP81:08:38	0.92000	40	1.0	1.81
237	260.0	2	17SEP81:20:42	18SEP81:03:41	0.34000	7	1.0	0.30
238	265.0	2	22SEP81:19:15	23SEP81:03:55	0.18000	6	1.0	0.36
239	270.0	2	27SEP81:19:20	28SEP81:07:55	0.24000	9	1.0	0.28
240	274.0	2	01OCT81:21:49	02OCT81:08:24	0.36000	13	1.0	0.50
241	291.0	2	18OCT81:17:57	18OCT81:19:15	0.44000	2	1.0	0.15
242	296.0	2	23OCT81:13:10	24OCT81:07:04	0.24000	15	1.0	0.56
243	297.0	2	24OCT81:21:52	26OCT81:07:19	0.15000	13	1.0	0.29
244	299.0	2	25OCT81:12:04	27OCT81:01:25	0.54000	24	1.0	1.58
245	300.0	2	27OCT81:08:24	28OCT81:06:34	0.33000	25	1.0	.
246	335.0	2	01DEC81:11:40	02DEC81:00:25	0.20000	7	1.0	0.58

STATION RUNOFF DATA

STA=51UR04

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
247	329	2	24NOV80:14:54	25NOV80:08:55	0.68004	4	2	0.63
248	332	2	27NOV80:22:48	28NOV80:08:42	0.54714	2	1	0.31
249	33	2	02FEB81:10:36	02FEB81:20:06	0.18000	5	1	0.80
250	42	2	11FEB81:04:56	12FEB81:01:57	0.76000	53	1	1.07
251	50	2	19FEB81:15:29	22FEB81:12:06	0.15000	23	1	0.57
252	53	2	22FEB81:18:45	24FEB81:09:03	0.45000	59	1	1.30
253	89	2	30MAR81:16:09	31MAR81:05:23	0.33795	16	1	0.98
254	90	2	31MAR81:13:51	02APR81:03:45	0.20009	27	1	0.14
255	95	2	05APR81:17:49	06APR81:05:21	0.21676	5	1	0.43
256	99	2	09APR81:13:25	10APR81:04:45	0.13000	5	2	0.25
257	102	2	12APR81:20:02	13APR81:09:13	0.59418	25	1	0.71
258	104	2	14APR81:15:46	15APR81:09:42	0.11000	6	1	0.09
259	107	2	17APR81:20:50	18APR81:08:20	0.05000	2	1	0.18
260	110	2	20APR81:07:56	20APR81:18:30	0.05002	3	1	0.05
261	121	2	01MAY81:13:25	02MAY81:15:36	0.58455	55	1	1.16
262	131	2	11MAY81:11:58	12MAY81:00:10	0.52000	23	1	1.09
263	135	2	15MAY81:14:22	16MAY81:00:30	0.49068	17	1	0.65
264	139	2	19MAY81:09:42	21MAY81:00:40	0.09000	10	1	0.47
265	153	2	02JUN81:05:58	03JUN81:07:55	0.11000	12	1	0.79
266	154	2	03JUN81:20:00	04JUN81:07:23	0.16000	5	1	0.04
267	161	2	10JUN81:05:38	10JUN81:10:40	0.29999	6	1	0.66
268	164	2	13JUN81:22:10	14JUN81:10:55	0.34000	17	1	0.56
269	171	2	20JUN81:15:50	20JUN81:21:04	0.48000	8	1	0.21
270	176	2	25JUN81:20:32	27JUN81:02:48	0.16000	19	1	0.65
271	185	2	04JUL81:08:10	05JUL81:01:10	1.30000	70	1	2.65
272	207	2	26JUL81:21:34	27JUL81:07:05	0.15000	5	1	0.13
273	208	2	27JUL81:12:32	29JUL81:09:50	0.09872	14	1	0.60
274	223	2	11AUG81:20:39	12AUG81:17:54	0.30000	19	1	1.09
275	227	2	15AUG81:20:55	16AUG81:06:23	0.35000	11	1	0.50
276	242	2	30AUG81:14:20	31AUG81:07:38	0.24000	12	1	1.25
277	243	2	31AUG81:09:32	01SEP81:01:06	0.60000	33	1	.
278	258	2	15SEP81:21:01	17SEP81:02:44	0.50000	51	1	1.81
279	260	2	17SEP81:21:10	18SEP81:08:23	0.17335	7	1	0.30
280	274	2	01OCT81:23:01	02OCT81:04:43	0.28000	6	1	0.50
281	299	2	26OCT81:12:52	28OCT81:09:11	0.35000	51	1	1.58

STA=51UR05

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
282	224.10	.	.	.	.	.	.	.
283	279.00	.	.	.	.	.	.	.
284	261.00	2	17SEP80:18:51	18SEP80:01:49	0.04	3.0	1.0	0.31
285	269.00	2	25SEP80:03:08	25SEP80:12:02	0.27	6.0	1.0	.
286	309.00	2	04NOV80:08:15	04NOV80:15:46	0.04	14.0	1.0	.
287	314.00	2	09NOV80:15:41	10NOV80:02:36	0.03	8.0	1.0	.
288	321.00	2	16NOV80:01:16	16NOV80:07:09	0.03	7.0	1.0	0.90
289	329.01	2	24NOV80:01:22	24NOV80:10:07	0.10	30.0	1.0	.
290	329.02	2	24NOV80:10:25	24NOV80:14:25	0.35	6.0	1.0	.
291	329.03	2	24NOV80:15:02	25NOV80:08:05	0.07	5.0	1.0	.
292	332.00	2	27NOV80:08:26	27NOV80:23:17	0.10	53.0	2.2	0.21
293	344.00	2	09DEC80:10:58	10DEC80:08:52	0.03	21.0	1.0	0.20
294	33.00	2	02FEB81:06:17	02FEB81:20:04	0.08	36.0	1.0	0.84

STATION RUNOFF DATA

STA=51UR05

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
295	39.0	2	08FEB81:10:36	09FEB81:12:12	0.03	27.0	1.0	0.31
296	41.0	2	10FEB81:23:08	11FEB81:19:50	0.09	45.0	1.0	0.85
297	50.0	2	19FEB81:16:00	20FEB81:10:57	0.07	25.0	1.0	0.49
298	63.0	2	04MAR81:19:29	06MAR81:09:54	0.09	69.0	1.0	0.59
299	75.0	2	16MAR81:05:14	17MAR81:03:07	0.07	51.0	1.0	0.28
300	89.0	2	30MAR81:07:25	31MAR81:03:55	0.05	38.0	1.0	0.38
301	91.0	2	01APR81:13:40	02APR81:07:09	0.06	36.0	1.0	0.38
302	95.0	2	05APR81:13:16	06APR81:06:30	0.06	33.0	1.0	0.40
303	99.0	2	09APR81:11:31	10APR81:01:57	0.07	24.0	1.0	0.34
304	101.0	2	11APR81:10:41	11APR81:11:40	0.09	4.0	1.0	0.08
305	102.0	2	12APR81:18:48	13APR81:10:21	0.08	31.0	1.0	0.68
306	103.0	2	13APR81:14:32	14APR81:11:56	0.05	8.0	1.0	.
307	107.0	2	17APR81:08:53	18APR81:03:40	0.05	30.0	1.0	0.12
308	118.0	2	28APR81:17:17	.	0.01	1.3	2.2	.
309	118.0	2	28APR81:18:12	.	0.41	2.3	2.2	.
310	118.0	2	28APR81:18:22	.	0.04	3.3	2.2	0.19
311	121.0	2	01MAY81:14:53	01MAY81:19:18	0.13	20.0	2.2	1.33
312	130.0	2	10MAY81:14:35	11MAY81:03:29	0.07	15.0	1.0	0.44
313	131.0	2	11MAY81:11:29	11MAY81:22:16	0.08	23.0	2.0	0.50
314	135.0	2	15MAY81:11:55	15MAY81:12:50	0.10	5.0	1.0	0.14
315	135.1	2	15MAY81:18:25	15MAY81:22:15	0.05	6.0	1.0	0.20
316	138.0	2	18MAY81:21:12	19MAY81:03:31	0.04	5.0	1.0	0.29
317	148.0	2	28MAY81:01:12	28MAY81:16:50	0.08	5.0	1.0	0.32
318	150.0	2	30MAY81:22:02	31MAY81:04:03	0.04	7.0	1.0	0.63
319	152.0	2	01JUN81:13:27	02JUN81:03:40	0.03	9.0	1.0	0.28
320	154.0	2	03JUN81:20:20	04JUN81:02:25	0.01	2.0	1.0	0.12
321	160.0	2	09JUN81:16:04	10JUN81:11:53	0.04	24.0	1.0	0.60
322	161.0	2	10JUN81:14:54	11JUN81:12:17	0.03	12.0	1.0	0.10
323	164.0	2	13JUN81:17:47	14JUN81:10:21	0.05	20.0	1.0	0.59
324	173.0	2	22JUN81:15:54	23JUN81:10:49	0.02	10.0	1.0	0.10
325	182.0	2	01JUL81:07:48	01JUL81:09:52	0.10	4.0	1.0	0.14
326	201.0	2	20JUL81:18:41	21JUL81:12:27	0.04	7.0	1.0	0.10
327	209.1	2	28JUL81:16:16	29JUL81:02:25	0.05	11.0	1.0	1.20
328	223.0	2	11AUG81:19:37	11AUG81:20:39	0.09	3.0	1.0	1.92
329	224.1	2	12AUG81:08:27	12AUG81:10:03	0.14	9.0	1.0	1.13
330	243.1	2	31AUG81:12:53	31AUG81:15:11	0.15	7.0	1.0	1.25
331	252.0	2	09SEP81:03:13	09SEP81:08:13	0.02	3.0	1.0	0.11
332	256.0	2	15SEP81:17:23	15SEP81:17:54	0.16	3.0	1.0	0.39
333	256.1	2	15SEP81:20:04	16SEP81:04:44	0.06	18.0	1.0	0.74
334	265.0	2	22SEP81:18:33	22SEP81:19:59	0.24	5.0	1.0	0.56
335	274.0	2	01OCT81:21:45	02OCT81:10:34	0.09	41.0	1.0	0.57
336	279.0	2	06OCT81:18:59	06OCT81:22:31	0.04	5.0	1.0	0.56
337	296.0	2	23OCT81:06:06	24OCT81:08:51	0.03	15.0	1.0	0.69
338	298.0	2	25OCT81:14:14	25OCT81:23:58	0.03	4.0	1.0	0.22
339	299.0	2	26OCT81:12:14	26OCT81:19:12	0.07	13.0	1.0	0.58
340	300.0	2	27OCT81:08:27	27OCT81:19:07	0.06	11.0	1.0	0.63
341	309.0	2	05NOV81:21:07	06NOV81:00:33	0.11	6.0	1.0	0.43
342	335.0	2	01DEC81:11:57	01DEC81:23:28	0.03	8.0	1.0	0.44
343	338.0	2	04DEC81:18:00	04DEC81:20:36	0.02	2.0	1.0	0.08
344	349.0	2	15DEC81:11:33	15DEC81:16:11	0.05	7.0	1.0	0.20

STATION RUNOFF DATA

STA=51UR06

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
345	299.00	2	25OCT80:05:39	25OCT80:14:05	0.33	10	1	.
346	322.00	2	17NOV80:15:59	18NOV80:00:48	0.29	9	1	1.00
347	329.00	2	24NOV80:10:22	24NOV80:19:16	0.58	18	1	1.30
348	332.00	2	27NOV80:21:04	28NOV80:01:42	0.09	2	1	0.30
349	33.01	2	02FEB81:06:27	02FEB81:11:33	0.50	79	1	0.85
350	33.02	2	02FEB81:12:13	.	0.10	1	1	0.82
351	39.00	2	08FEB81:13:43	08FEB81:19:00	0.14	2	1	0.26
352	42.00	2	11FEB81:04:24	11FEB81:19:24	0.29	14	1	0.90
353	50.00	2	19FEB81:23:04	20FEB81:03:11	0.31	4	1	0.73
354	51.00	2	20FEB81:23:55	21FEB81:05:54	0.12	3	1	0.07
355	53.10	2	22FEB81:23:38	23FEB81:17:49	0.26	15	1	0.54
356	64.00	2	05MAR81:04:17	06MAR81:03:39	0.07	4	1	0.44
357	99.00	2	09APR81:11:46	09APR81:13:48	0.14	2	1	0.44
358	102.00	2	12APR81:19:09	13APR81:05:03	0.12	5	1	0.77
359	121.00	2	01MAY81:10:07	02MAY81:00:09	0.51	24	1	1.85
360	131.00	2	11MAY81:03:05	11MAY81:13:58	0.26	6	1	0.84
361	139.00	2	19MAY81:05:03	20MAY81:03:02	0.16	4	1	0.36
362	148.00	2	28MAY81:07:26	28MAY81:20:22	0.06	2	1	0.78
363	149.00	2	29MAY81:20:02	30MAY81:08:14	0.18	8	1	0.58
364	150.00	2	30MAY81:21:48	31MAY81:11:11	0.23	9	1	0.56
365	152.00	2	01JUN81:14:45	02JUN81:11:13	0.18	12	1	0.64
366	161.00	2	10JUN81:06:32	10JUN81:07:55	0.17	2	1	0.42
367	164.00	2	13JUN81:19:46	14JUN81:05:05	0.24	8	1	0.98
368	171.00	2	20JUN81:14:35	20JUN81:23:37	0.60	13	1	1.03
369	172.00	2	21JUN81:20:12	22JUN81:02:50	0.28	4	1	0.56
370	185.00	2	04JUL81:07:08	04JUL81:11:16	1.13	15	1	1.28
371	209.00	2	28JUL81:11:45	28JUL81:19:52	1.08	6	1	1.05
372	223.00	2	11AUG81:19:51	12AUG81:09:08	1.01	5	1	0.98
373	227.00	2	15AUG81:20:33	15AUG81:21:21	1.93	4	1	0.67
374	242.00	2	30AUG81:10:55	31AUG81:08:26	0.28	9	1	1.35
375	258.00	2	15SEP81:16:54	16SEP81:03:50	0.19	5	1	1.05
376	296.00	2	23OCT81:16:23	23OCT81:22:30	0.06	2	1	0.66
377	299.00	2	26OCT81:12:42	28OCT81:02:27	0.23	11	1	1.67

STA=51UR07

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
378	204.0	2	22JUL80:19:26	22JUL80:21:07	5.2300	13.0	1.0	0.32
379	204.1	2	22JUL80:22:50	23JUL80:01:29	1.2700	5.0	1.0	0.11
380	211.0	2	29JUL80:02:06	29JUL80:02:57	0.4900	3.0	1.0	0.10
381	214.0	2	01AUG80:14:06	01AUG80:14:45	0.6000	5.0	1.0	0.67
382	216.0	2	03AUG80:16:06	03AUG80:16:35	0.8400	7.0	1.0	0.21
383	216.1	2	03AUG80:23:47	04AUG80:01:37	1.0700	10.0	1.0	0.66
384	231.0	2	18AUG80:05:52	18AUG80:09:25	1.0500	9.0	1.0	0.42
385	232.0	2	19AUG80:02:57	19AUG80:03:54	0.8000	5.0	1.0	0.17
386	.	1	08SEP80:15:00	.	0.0055	1.0	.	.
387	254.0	2	10SEP80:01:09	10SEP80:02:24	0.3400	15.0	1.0	0.11
388	.	1	15SEP80:10:35	.	0.0021	1.0	.	.
389	.	1	22SEP80:15:30	.	0.0021	1.0	.	.
390	269.0	2	25SEP80:03:55	.	0.0939	1.6	1.0	.
391	269.0	2	25SEP80:05:52	.	0.2340	2.6	1.0	.
392	269.0	2	25SEP80:07:44	.	0.2340	3.6	1.0	.

STATION RUNOFF DATA

STA=51UR07

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
393	269.0	2	25SEP80:08:06	.	0.1340	4.6	1.0	.
394	269.0	2	25SEP80:10:55	.	0.0407	5.6	1.0	.
395	269.0	2	25SEP80:12:43	.	0.0186	6.6	1.0	0.37
396	.	3	29SEP80:12:45	.	0.0686	1.0	.	.
397	276.0	2	02OCT80:21:50	03OCT80:04:02	0.1600	5.0	1.0	0.51
398	.	1	06OCT80:10:00	.	0.0021	1.0	.	.
399	.	1	20OCT80:09:25	.	0.0105	1.0	.	.
400	299.0	2	25OCT80:09:00	25OCT80:15:00	7.1100	12.0	1.0	2.25
401	.	1	27OCT80:10:20	.	0.0234	1.0	.	.
402	302.0	2	28OCT80:06:20	28OCT80:12:10	0.1100	6.0	1.0	0.04
403	.	1	03NOV80:06:30	.	0.0143	1.0	.	.
404	309.0	2	04NOV80:08:13	04NOV80:14:15	0.8200	11.0	2.5	0.28
405	.	1	10NOV80:14:45	.	0.0073	1.0	.	.
406	329.0	2	24NOV80:03:18	25NOV80:03:02	1.0200	12.0	1.0	0.78
407	332.0	2	27NOV80:15:56	28NOV80:08:50	0.4200	4.0	1.0	0.37
408	.	1	01DEC80:14:45	.	0.0105	1.0	.	.
409	.	1	08DEC80:08:30	.	0.0021	1.0	.	.
410	.	1	15DEC80:10:30	.	0.0073	1.0	.	.
411	.	1	22DEC80:14:25	.	0.0143	1.0	.	.
412	.	1	26JAN81:14:20	.	0.0021	1.0	.	.
413	.	1	09FEB81:13:50	.	0.0143	1.0	.	.
414	52.0	2	21FEB81:00:10	21FEB81:12:41	0.1800	5.0	1.0	0.09
415	53.0	2	22FEB81:12:08	24FEB81:12:36	0.6600	30.0	1.0	0.85
416	63.0	2	04MAR81:16:00	06MAR81:09:10	0.1300	5.0	2.2	0.37
417	.	1	09MAR81:14:15	.	0.0234	1.0	.	.
418	.	1	23MAR81:14:05	.	0.0186	1.0	.	.
419	89.0	2	30MAR81:07:54	31MAR81:11:50	0.2900	16.0	1.0	0.52
420	91.0	2	01APR81:13:19	01APR81:17:15	0.6000	8.0	2.4	0.21
421	.	1	06APR81:16:00	.	0.0186	1.0	.	.
422	99.0	2	09APR81:09:22	09APR81:15:32	0.4800	10.0	1.0	0.25
423	102.0	2	12APR81:17:40	13APR81:04:27	0.9100	15.0	1.0	0.56
424	104.0	2	14APR81:17:06	14APR81:18:56	0.5400	6.0	1.0	0.10
425	107.0	2	17APR81:09:12	17APR81:13:45	0.4100	5.0	1.0	0.17
426	.	1	20APR81:14:40	.	0.0050	1.0	.	.
427	.	1	27APR81:14:35	.	0.0186	1.0	.	.
428	120.0	2	30APR81:09:20	30APR81:12:00	0.2600	3.0	1.0	0.12
429	120.1	2	30APR81:23:03	01MAY81:00:56	0.4400	4.0	1.0	0.10
430	121.0	2	01MAY81:09:36	02MAY81:13:28	3.6000	33.0	2.1	0.72
431	.	1	04MAY81:14:30	.	0.0186	1.0	.	.
432	130.0	2	10MAY81:14:24	10MAY81:17:50	0.3600	6.0	1.0	0.12
433	130.1	2	10MAY81:20:15	10MAY81:21:53	1.2200	10.0	1.0	0.17
434	131.0	2	11MAY81:02:08	11MAY81:08:51	0.2500	4.0	1.0	0.07
435	131.1	2	11MAY81:11:02	11MAY81:16:16	1.8800	11.0	1.0	0.44
436	131.2	2	11MAY81:19:51	11MAY81:23:32	1.1400	8.0	1.0	0.21
437	132.0	2	12MAY81:00:47	12MAY81:17:46	0.5800	10.0	1.0	0.22
438	135.0	2	15MAY81:11:50	15MAY81:14:10	0.6400	6.0	1.0	0.18
439	.	1	18MAY81:13:45	.	0.0186	1.0	.	.
440	139.0	2	19MAY81:02:57	19MAY81:09:42	0.4200	4.0	1.0	0.41
441	139.1	2	19MAY81:13:15	20MAY81:10:14	0.4200	8.0	1.0	0.05
442	149.0	2	29MAY81:20:56	29MAY81:22:02	0.6800	5.0	1.0	0.08
443	152.0	2	01JUN81:12:20	01JUN81:22:00	0.1400	4.0	1.0	0.21
444	153.0	2	02JUN81:03:50	02JUN81:09:03	2.3200	14.0	1.0	0.50
445	.	1	06JUN81:15:05	.	0.0288	1.0	.	.
446	161.1	2	10JUN81:18:12	10JUN81:20:10	0.9200	8.0	1.0	0.17

STATION RUNOFF DATA

STA=51UR07

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
447	164.0	2	13JUN81:21:47	14JUN81:04:09	1.7100	14	1.0	0.45
448	171.0	2	20JUN81:15:53	20JUN81:18:20	0.6600	3	1.0	0.12
449	172.0	2	21JUN81:19:58	21JUN81:21:54	4.1600	14	1.0	0.38
450	.	1	22JUN81:14:22	.	0.0143	1	.	.
451	176.0	2	25JUN81:20:20	25JUN81:22:55	3.2300	12	1.0	0.51
452	.	1	29JUN81:14:15	.	0.0045	1	.	.
453	183.1	2	02JUL81:23:01	03JUL81:00:01	1.2700	4	1.0	0.22
454	185.0	2	04JUL81:05:47	04JUL81:15:15	7.0700	16	1.0	1.98
455	.	1	13JUL81:13:40	.	0.0143	1	.	.
456	.	1	20JUL81:14:35	.	0.0045	1	.	.
457	205.0	2	24JUL81:13:52	24JUL81:16:47	0.6500	7	1.0	0.21
458	206.0	2	25JUL81:07:24	25JUL81:07:54	3.8500	6	2.2	.
459	.	1	27JUL81:14:33	.	0.0686	1	.	.
460	215.0	2	03AUG81:14:49	04AUG81:13:15	0.1200	10	2.2	0.38

STA=51UR08

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
461	214.0	2	01AUG80:14:30	01AUG80:17:43	1.4400	7.0	1.0	0.67
462	229.0	2	16AUG80:02:49	16AUG80:09:45	0.0400	3.0	1.0	0.10
463	231.1	2	18AUG80:06:12	18AUG80:09:28	0.3500	5.0	1.0	0.42
464	232.0	2	19AUG80:07:31	19AUG80:11:43	0.2800	12.0	1.0	0.17
465	.	1	08SEP80:15:05	.	0.0061	1.0	.	.
466	269.0	2	25SEP80:05:32	.	0.0406	1.4	1.0	.
467	269.0	2	25SEP80:06:32	.	0.1176	2.4	1.0	.
468	269.0	2	25SEP80:10:05	.	0.0406	3.4	1.0	.
469	269.0	2	25SEP80:13:08	.	0.0121	4.4	1.0	0.37
470	.	1	29SEP80:13:00	.	0.0089	1.0	.	.
471	.	1	06OCT80:10:10	.	0.0009	1.0	.	.
472	285.0	2	11OCT80:15:39	11OCT80:17:10	2.3600	5.0	1.0	0.05
473	.	1	20OCT80:10:50	.	0.0018	1.0	.	.
474	299.0	2	25OCT80:08:15	25OCT80:15:15	6.2000	11.0	1.0	2.25
475	.	1	27OCT80:10:35	.	0.0089	1.0	.	.
476	.	1	03NOV80:08:30	.	0.0089	1.0	.	.
477	309.0	2	04NOV80:08:27	04NOV80:14:30	0.3400	6.0	1.0	0.28
478	.	1	10NOV80:14:50	.	0.0038	1.0	.	.
479	322.0	2	17NOV80:15:41	18NOV80:02:22	0.9200	8.0	1.0	1.05
480	332.0	2	27NOV80:16:20	28NOV80:05:05	0.4900	5.0	1.0	0.37
481	.	1	01DEC80:14:50	.	0.0158	1.0	.	.
482	337.0	2	02DEC80:19:44	.	0.1275	1.3	1.0	.
483	337.0	2	02DEC80:20:04	.	0.3280	2.3	1.0	.
484	337.0	2	02DEC80:21:12	.	0.1275	3.3	1.0	0.05
485	.	1	08DEC80:08:30	.	0.0089	1.0	.	.
486	344.0	2	09DEC80:10:05	09DEC80:15:55	0.3200	4.0	1.0	0.17
487	.	1	15DEC80:10:30	.	0.0018	1.0	.	.
488	.	1	22DEC80:13:50	.	0.0018	1.0	.	.
489	.	1	26JAN81:14:20	.	0.0018	1.0	.	.
490	39.0	2	08FEB81:10:21	08FEB81:16:19	0.3000	3.0	1.0	0.20
491	.	1	09FEB81:13:50	.	0.0121	1.0	.	.
492	50.0	2	19FEB81:23:00	20FEB81:06:00	0.9000	11.0	1.0	0.33
493	51.0	2	20FEB81:09:47	20FEB81:14:44	0.2500	4.0	1.0	0.04
494	52.0	2	21FEB81:00:30	21FEB81:12:09	0.3000	4.0	1.0	0.09

STATION RUNOFF DATA

STA=51UR08

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
495	53.1	2	23FEB81:09:10	24FEB81:11:41	1.3000	12	2.2	0.85
496	.	1	09MAR81:14:15	.	0.0350	1	.	.
497	.	1	23MAR81:14:05	.	0.0200	1	.	.
498	89.0	2	30MAR81:08:13	30MAR81:17:59	0.4900	12	1.0	0.52
499	91.0	2	01APR81:13:40	01APR81:16:17	0.4600	4	1.0	0.21
500	95.0	2	05APR81:13:29	06APR81:04:03	0.4800	9	1.0	0.38
501	.	1	06APR81:16:00	.	0.0200	1	.	.
502	99.0	2	09APR81:09:43	09APR81:17:05	0.5500	6	1.0	0.25
503	102.0	2	12APR81:18:13	13APR81:09:12	1.0000	12	1.0	0.56
504	104.0	2	14APR81:17:42	14APR81:22:55	0.2200	4	1.0	0.10
505	107.0	2	17APR81:10:07	17APR81:19:11	0.2100	4	1.0	0.17
506	.	1	20APR81:14:45	.	0.0200	1	.	.
507	113.0	2	23APR81:21:11	24APR81:07:33	1.1000	12	1.0	0.48
508	117.0	2	27APR81:03:32	27APR81:13:10	0.2700	3	1.0	0.08
509	.	1	27APR81:14:45	.	0.0250	1	.	.
510	120.0	2	30APR81:09:35	30APR81:13:30	0.2600	5	1.0	0.12
511	120.1	2	30APR81:23:47	01MAY81:01:41	0.3900	2	1.0	0.10
512	121.0	2	01MAY81:10:56	02MAY81:13:14	1.1600	7	1.0	0.72
513	.	1	04MAY81:14:33	.	0.0121	1	.	.
514	131.1	2	11MAY81:11:25	11MAY81:16:32	2.5400	5	1.0	0.44
515	135.0	2	15MAY81:12:05	16MAY81:09:31	0.2400	5	1.0	0.18
516	.	1	18MAY81:13:45	.	0.0121	1	.	.
517	149.0	2	29MAY81:21:22	30MAY81:00:54	0.5600	2	1.0	0.08
518	.	1	08JUN81:14:54	.	0.0200	1	.	.
519	161.1	2	10JUN81:18:19	10JUN81:20:48	1.0500	5	1.0	0.17
520	164.0	2	13JUN81:22:00	14JUN81:11:22	1.3900	9	1.0	0.45
521	171.0	2	20JUN81:15:23	20JUN81:17:43	0.4100	3	1.0	0.12
522	172.0	2	21JUN81:20:22	21JUN81:23:57	1.2200	8	1.0	0.38
523	.	1	22JUN81:14:20	.	0.0061	1	.	.
524	176.0	2	25JUN81:20:41	25JUN81:23:29	3.7100	11	1.0	0.51
525	.	1	29JUN81:14:25	.	0.0089	1	.	.
526	183.0	2	02JUL81:13:35	02JUL81:15:25	0.3000	4	1.0	0.07
527	184.0	2	03JUL81:04:50	03JUL81:06:11	0.5100	3	1.0	0.15
528	185.0	2	04JUL81:02:51	04JUL81:15:55	4.8200	9	1.0	1.98
529	.	1	13JUL81:13:50	.	0.0061	1	.	.
530	.	1	20JUL81:14:35	.	0.0038	1	.	.
531	205.0	2	24JUL81:14:24	24JUL81:16:56	0.5900	3	1.0	0.21
532	206.0	2	25JUL81:07:44	25JUL81:10:10	3.6700	4	2.1	1.43
533	.	1	27JUL81:14:41	.	0.0465	1	.	.
534	215.0	2	03AUG81:12:00	04AUG81:01:39	0.2600	9	1.0	0.38

STA=51UR09

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
535	276.00	2	02OCT80:16:46	03OCT80:12:44	0.22	11	1.0	0.91
536	299.00	2	25OCT80:03:40	25OCT80:19:46	0.82	29	2.0	.
537	309.00	2	04NOV80:14:29	04NOV80:22:09	0.11	3	2.0	.
538	314.00	2	09NOV80:00:27	10NOV80:08:59	0.19	6	1.0	.
539	322.00	2	17NOV80:16:03	18NOV80:07:42	0.70	32	1.0	1.25
540	329.01	2	24NOV80:07:06	24NOV80:14:21	1.20	32	1.0	1.32
541	329.03	2	24NOV80:18:34	25NOV80:08:41	0.11	3	1.0	.
542	332.00	2	27NOV80:14:12	29NOV80:14:04	0.06	10	1.0	0.30

STATION RUNOFF DATA

STA=51UR09

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
543	344.0	2	09DEC80:12:19	10DEC80:10:40	0.13	9	1.0	0.20
544	351.0	2	16DEC80:04:07	16DEC80:18:34	0.19	8	1.0	0.06
545	354.0	2	23DEC80:11:05	23DEC80:20:28	0.20	7	1.0	0.05
546	33.0	2	02FEB81:06:24	03FEB81:01:20	0.47	32	1.0	1.25
547	39.0	2	08FEB81:12:30	08FEB81:15:10	0.22	3	1.0	0.26
548	42.0	2	11FEB81:00:45	12FEB81:17:41	0.46	56	1.0	.
549	50.0	2	19FEB81:15:11	20FEB81:13:29	0.30	22	1.0	0.36
550	51.0	2	20FEB81:15:20	22FEB81:12:05	0.21	34	1.0	0.52
551	53.0	2	22FEB81:13:50	23FEB81:11:45	0.24	22	1.0	0.88
552	89.0	2	30MAR81:09:09	30MAR81:14:49	0.08	2	1.0	0.31
553	91.0	2	01APR81:15:12	01APR81:22:25	0.36	6	1.0	0.31
554	95.0	2	05APR81:16:56	05APR81:22:57	0.19	3	1.0	0.29
555	99.0	2	09APR81:10:48	09APR81:13:22	0.18	4	1.0	0.28
556	104.0	2	14APR81:05:22	14APR81:20:25	0.46	22	1.0	0.36
557	107.0	2	17APR81:11:15	17APR81:12:13	0.36	2	1.0	0.06
558	110.0	2	20APR81:01:55	20APR81:04:11	0.25	3	1.0	0.08
559	121.0	2	01MAY81:08:15	02MAY81:06:56	0.57	45	1.0	1.53
560	130.0	2	10MAY81:15:38	12MAY81:07:55	0.32	38	1.0	0.37
561	135.0	2	15MAY81:12:19	16MAY81:04:10	0.72	37	1.0	0.66
562	138.0	2	18MAY81:20:21	20MAY81:01:58	0.17	14	1.0	0.22
563	154.0	2	03JUN81:20:57	03JUN81:23:07	1.07	9	1.0	0.82
564	155.0	2	04JUN81:17:01	04JUN81:21:50	1.15	20	1.0	0.22
565	171.0	2	20JUN81:00:56	20JUN81:02:29	0.62	4	1.0	0.10
566	182.0	2	01JUL81:07:10	01JUL81:18:53	0.67	24	1.0	0.28
567	184.0	2	03JUL81:15:28	03JUL81:15:53	1.39	3	1.0	0.14
568	209.0	2	28JUL81:10:29	28JUL81:12:24	1.25	2	1.0	1.63
569	218.0	2	06AUG81:10:24	06AUG81:16:45	0.59	13	1.0	0.26
570	219.0	2	07AUG81:23:53	08AUG81:06:34	1.08	23	2.3	0.40
571	223.0	2	11AUG81:18:54	11AUG81:19:57	1.25	5	1.0	2.02
572	242.0	2	30AUG81:07:42	30AUG81:15:00	0.15	5	1.0	0.56
573	243.1	2	31AUG81:11:19	31AUG81:16:44	0.59	11	1.0	1.40
574	251.0	2	08SEP81:15:41	08SEP81:17:17	0.24	2	1.0	0.32
575	258.0	2	15SEP81:16:40	17SEP81:02:09	0.33	30	1.0	1.46
576	260.0	2	17SEP81:04:18	17SEP81:11:08	0.18	4	1.0	0.16
577	274.0	2	01OCT81:21:14	02OCT81:02:27	0.31	4	1.0	0.44
578	291.0	2	18OCT81:17:36	19OCT81:07:00	0.10	5	1.0	0.27
579	296.0	2	23OCT81:07:35	23OCT81:23:04	0.20	9	1.0	0.55
580	298.0	2	25OCT81:14:58	26OCT81:06:56	0.05	3	1.0	0.25
581	299.0	2	26OCT81:12:39	26OCT81:23:46	0.28	10	1.0	0.54
582	300.0	2	27OCT81:05:42	28OCT81:08:11	0.35	22	1.0	.
583	309.0	2	05NOV81:23:54	06NOV81:06:06	0.58	2	1.0	0.33
584	335.0	2	01DEC81:11:04	01DEC81:23:23	0.14	6	1.0	0.53

STATION RUNOFF DATA

STA=51UR10

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
585	292.1	2	18OCT80:15:25	18OCT80:17:29	0.34000	4	1	.
586	299.0	2	25OCT80:03:38	25OCT80:11:54	1.60000	39	1	2.34
587	299.1	2	25OCT80:14:03	25OCT80:14:12	1.54000	2	1	.
588	322.0	2	17NOV80:15:48	18NOV80:02:54	0.89000	31	1	1.25
589	329.0	2	24NOV80:10:05	24NOV80:20:19	1.24000	49	1	1.50
590	344.0	2	09DEC80:13:48	09DEC80:16:07	0.28777	2	1	0.20
591	33.0	2	02FEB81:06:25	02FEB81:11:50	0.49000	11	1	1.21
592	39.0	2	08FEB81:11:34	08FEB81:14:47	0.58000	7	1	0.30
593	50.0	2	19FEB81:23:18	20FEB81:09:24	0.55000	16	1	0.57
594	51.0	2	20FEB81:22:49	21FEB81:08:07	0.35000	12	1	0.36
595	53.0	2	22FEB81:22:48	23FEB81:17:52	0.43000	19	1	1.66
596	75.0	2	16MAR81:12:45	16MAR81:14:52	0.27559	2	1	0.28
597	91.0	2	01APR81:16:30	01APR81:17:27	1.06000	5	1	0.33
598	95.0	2	05APR81:16:39	05APR81:18:30	0.66000	4	1	0.28
599	99.0	2	09APR81:09:52	09APR81:12:17	0.48000	5	1	0.28
600	101.0	2	11APR81:10:18	13APR81:00:35	0.77000	17	1	0.91
601	104.0	2	14APR81:05:32	14APR81:08:09	1.02972	9	1	0.40
602	121.0	2	01MAY81:08:07	01MAY81:20:43	0.93000	38	1	1.53
603	130.0	2	10MAY81:21:38	11MAY81:03:00	0.25362	4	1	0.37
604	131.0	2	11MAY81:12:15	11MAY81:20:33	0.16399	5	1	0.31
605	138.0	2	18MAY81:20:32	19MAY81:04:25	0.08104	2	1	0.22
606	139.0	2	19MAY81:13:47	19MAY81:21:23	0.23000	6	1	0.27
607	147.0	2	27MAY81:14:53	28MAY81:11:03	0.36000	13	9	0.19
608	148.0	2	28MAY81:13:02	29MAY81:11:45	0.24000	19	1	0.27
609	149.0	2	29MAY81:14:26	30MAY81:08:38	0.30000	20	1	0.46
610	150.0	2	30MAY81:11:10	31MAY81:07:15	0.23000	12	1	0.17
611	152.0	2	01JUN81:13:59	02JUN81:10:23	0.29000	22	1	0.41
612	154.0	2	03JUN81:14:35	03JUN81:22:13	0.99000	15	9	0.81
613	155.0	2	04JUN81:17:06	05JUN81:06:45	0.39000	18	1	0.22
614	156.0	2	05JUN81:22:40	07JUN81:07:24	0.15699	18	1	.
615	160.0	2	09JUN81:11:24	10JUN81:14:31	0.21512	21	1	0.62
616	164.0	2	13JUN81:22:45	14JUN81:07:00	0.57000	14	9	0.50
617	183.0	2	02JUL81:13:10	02JUL81:13:16	8.88889	2	1	0.31
618	184.0	2	03JUL81:15:25	04JUL81:13:08	0.44768	36	1	1.46
619	205.0	2	24JUL81:14:30	25JUL81:03:48	0.06892	3	1	0.22
620	209.1	2	28JUL81:16:21	29JUL81:04:06	1.03000	20	1	1.72
621	219.0	2	08AUG81:05:35	08AUG81:06:03	0.71429	2	1	0.49
622	223.0	2	11AUG81:18:52	12AUG81:09:34	0.15306	8	1	1.48
623	227.0	2	15AUG81:20:25	15AUG81:20:35	3.66667	2	1	0.83
624	258.0	2	15SEP81:16:45	16SEP81:04:06	0.57000	15	1	1.46
625	259.0	2	17SEP81:04:11	17SEP81:04:29	1.20370	2	1	0.16
626	274.0	2	01OCT81:21:08	01OCT81:23:49	0.37267	4	1	0.44
627	296.0	2	23OCT81:08:04	23OCT81:17:57	0.16000	4	1	0.58
628	299.0	2	26OCT81:11:26	27OCT81:14:20	0.64000	21	1	2.34
629	335.0	2	01DEC81:09:26	01DEC81:22:10	0.16000	11	1	0.62
630	345.0	2	14DEC81:15:20	14DEC81:23:53	0.34000	11	1	1.00
631	357.0	2	23DEC81:05:01	23DEC81:08:54	0.18598	2	1	0.14

STATION RUNOFF DATA

---------- STA=51UR11 ----------

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
632	277.00	2	03OCT80:10:15	.	0.00100	1.4	1	.
633	277.00	2	03OCT80:11:13	.	0.00100	2.4	1	.
634	277.00	2	03OCT80:12:06	.	0.00100	3.4	1	.
635	277.00	2	03OCT80:13:03	.	0.00400	4.4	1	0.91
636	292.00	2	18OCT80:08:54	.	0.03000	1.1	1	.
637	292.00	2	18OCT80:09:06	.	0.06000	2.1	1	.
638	292.00	2	18OCT80:09:17	.	0.06000	3.1	1	.
639	292.00	2	18OCT80:09:28	.	0.06000	4.1	1	.
640	292.00	2	18OCT80:09:39	.	0.05000	5.1	1	.
641	292.00	2	18OCT80:09:51	.	0.05000	6.1	1	.
642	292.00	2	18OCT80:10:06	.	0.04000	7.1	1	.
643	292.00	2	18OCT80:10:23	.	0.03000	8.1	1	.
644	292.00	2	18OCT80:10:42	.	0.03000	9.1	1	.
645	292.00	2	18OCT80:11:10	.	0.00500	10.1	1	.
646	299.00	2	25OCT80:04:39	26OCT80:02:45	0.86000	67.0	1	.
647	309.00	2	04NOV80:08:46	04NOV80:13:36	0.16000	4.0	1	.
648	329.01	2	24NOV80:10:36	24NOV80:17:17	1.40000	34.0	1	1.50
649	329.02	2	24NOV80:22:05	.	0.52000	1.0	1	.
650	332.00	2	27NOV80:22:26	28NOV80:03:51	0.12000	2.0	1	0.30
651	344.00	2	09DEC80:14:10	09DEC80:17:51	0.11000	3.0	1	0.20
652	33.00	2	02FEB81:06:57	03FEB81:00:53	0.76000	48.0	1	1.21
653	99.00	2	09APR81:10:51	09APR81:16:34	0.53000	12.0	1	0.28
654	101.00	2	11APR81:10:57	13APR81:09:06	0.58000	65.0	1	0.91
655	130.00	2	10MAY81:21:52	11MAY81:08:16	0.44000	16.0	1	0.37
656	131.00	2	11MAY81:12:39	11MAY81:22:28	0.49000	18.0	1	0.31
657	138.00	2	18MAY81:21:18	19MAY81:09:06	0.10000	4.0	1	0.22
658	139.00	2	19MAY81:14:20	20MAY81:00:32	0.50000	18.0	1	0.27
659	148.00	2	28MAY81:06:26	28MAY81:11:44	0.32000	7.0	1	0.18
660	148.10	2	28MAY81:15:44	28MAY81:21:20	0.65000	13.0	1	0.27
661	149.00	2	29MAY81:14:36	30MAY81:00:16	0.71000	26.0	1	0.46
662	150.00	2	30MAY81:22:00	31MAY81:01:57	0.45000	7.0	1	0.17
663	152.00	2	01JUN81:15:50	02JUN81:09:15	0.72000	45.0	1	0.41
664	155.00	2	04JUN81:11:44	05JUN81:02:17	0.75000	33.0	2	0.22
665	157.00	2	06JUN81:01:33	06JUN81:05:28	0.65000	10.0	1	.
666	171.00	2	20JUN81:12:56	20JUN81:22:12	0.19784	7.0	1	0.20
667	172.00	2	21JUN81:20:50	22JUN81:00:04	0.26000	4.0	1	0.11
668	176.00	2	25JUN81:19:08	26JUN81:00:16	0.15152	3.0	1	0.10
669	183.00	2	02JUL81:15:29	03JUL81:11:51	0.08592	5.0	1	0.31
670	184.00	2	03JUL81:16:02	05JUL81:10:33	0.53000	56.0	1	1.46
671	209.10	2	28JUL81:15:35	29JUL81:16:07	1.56000	99.0	1	1.72
672	218.00	2	06AUG81:12:09	06AUG81:15:28	0.52764	6.0	1	0.26
673	219.00	2	07AUG81:23:47	08AUG81:15:09	0.41000	20.0	1	0.49
674	258.00	2	15SEP81:17:33	16SEP81:09:49	0.30000	15.0	1	1.46
675	274.00	2	01OCT81:23:03	02OCT81:01:02	0.26611	2.0	1	0.44
676	299.00	2	26OCT81:11:56	27OCT81:22:07	0.48000	29.0	1	1.54
677	335.00	2	01DEC81:11:46	02DEC81:01:33	0.12000	6.0	1	0.62
678	348.00	2	14DEC81:16:29	15DEC81:06:27	0.19000	9.0	1	1.00
679	357.00	2	23DEC81:04:07	23DEC81:09:46	0.19666	4.0	1	0.14

STATION RUNOFF DATA

-- STA=51UR15 --

OBS	STANO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
680	299.0	2	25OCT80:02:54	.	0.16	1.10	1.0	.
681	299.0	2	25OCT80:03:19	.	0.08	2.10	1.0	.
682	299.0	2	25OCT80:03:43	.	0.16	3.10	1.0	.
683	299.0	2	25OCT80:04:29	.	0.16	4.10	1.0	.
684	299.0	2	25OCT80:05:11	.	0.16	5.10	1.0	.
685	299.0	2	25OCT80:05:37	.	0.08	6.10	1.0	.
686	299.0	2	25OCT80:06:01	.	0.08	7.10	1.0	.
687	299.0	2	25OCT80:06:24	.	0.16	8.10	1.0	.
688	299.0	2	25OCT80:07:11	.	0.05	9.10	1.0	.
689	299.0	2	25OCT80:07:45	.	0.01	10.10	1.0	.
690	299.1	2	25OCT80:10:53	.	0.01	1.15	2.1	.
691	299.1	2	25OCT80:11:28	.	0.03	2.15	2.1	.
692	299.1	2	25OCT80:12:01	.	0.12	3.15	2.1	.
693	299.1	2	25OCT80:13:52	.	0.03	4.15	2.1	.
694	299.1	2	25OCT80:14:36	.	0.08	5.15	2.1	.
695	299.1	2	25OCT80:14:55	.	0.22	6.15	2.1	.
696	299.1	2	25OCT80:15:15	.	0.12	7.15	2.1	.
697	299.1	2	25OCT80:15:41	.	0.08	8.15	2.1	.
698	299.1	2	25OCT80:16:03	.	0.12	9.15	2.1	.
699	299.1	2	25OCT80:16:24	.	0.12	10.15	2.1	.
700	299.1	2	25OCT80:16:43	.	0.08	11.15	2.1	.
701	299.1	2	25OCT80:17:06	.	0.22	12.15	2.1	.
702	299.1	2	25OCT80:17:26	.	0.08	13.15	2.1	.
703	299.1	2	25OCT80:17:50	.	0.12	14.15	2.1	.
704	299.1	2	25OCT80:18:09	.	0.12	15.15	2.1	.
705	344.0	2	09DEC80:12:51	09DEC80:16:21	0.59	9.00	1.0	0.20
706	21.0	2	21JAN81:10:41	21JAN81:11:30	0.25	2.00	1.0	0.16
707	33.0	2	02FEB81:05:58	02FEB81:11:55	2.23	34.00	1.0	0.28
708	39.0	2	08FEB81:10:57	08FEB81:15:27	0.82	4.00	1.0	0.80
709	50.0	2	19FEB81:22:56	20FEB81:05:28	0.85	18.00	1.0	1.27
710	51.0	2	20FEB81:22:47	21FEB81:08:00	0.83	30.00	1.0	0.90
711	52.0	2	21FEB81:16:49	22FEB81:08:38	0.04	2.00	1.0	0.09
712	53.0	2	22FEB81:12:40	23FEB81:17:38	0.87	70.00	1.0	1.66
713	93.0	2	04MAR81:20:15	05MAR81:11:27	0.33	11.00	1.0	0.60
714	95.0	2	05APR81:17:00	.	0.33	1.30	1.0	.
715	95.0	2	05APR81:18:11	.	0.84	2.30	1.0	.
716	95.0	2	05APR81:18:49	.	0.33	3.30	1.0	0.28
717	99.0	2	09APR81:10:36	.	0.75	1.40	1.0	.
718	99.0	2	09APR81:11:07	.	1.00	2.40	1.0	.
719	99.0	2	09APR81:11:40	.	0.50	3.40	1.0	.
720	99.0	2	09APR81:12:11	.	0.21	4.40	1.0	0.30
721	101.0	2	11APR81:09:59	.	0.25	1.40	1.0	.
722	101.0	2	11APR81:10:20	.	0.79	2.40	1.0	.
723	101.0	2	11APR81:10:50	.	1.04	3.40	1.0	.
724	101.0	2	11APR81:11:27	.	0.25	4.40	1.0	.
725	102.0	2	12APR81:19:11	.	0.75	1.18	1.0	.
726	102.0	2	12APR81:19:32	.	1.80	2.18	1.0	.
727	102.0	2	12APR81:19:45	.	1.00	3.18	1.0	.
728	102.0	2	12APR81:20:17	.	0.21	4.18	1.0	.
729	102.0	2	12APR81:20:51	.	2.84	5.18	1.0	.
730	102.0	2	12APR81:20:54	.	4.68	6.18	1.0	.
731	102.0	2	12APR81:20:58	.	3.34	7.18	1.0	.
732	102.0	2	12APR81:21:07	.	1.25	8.18	1.0	.
733	102.0	2	12APR81:21:22	.	0.96	9.18	1.0	.

STATION RUNOFF DATA

STA=51UR15

OBS	STRMNO	TYPE	T11	T12	FLO	SAMNO	CMT	PRECIP
734	102.0	2	12APR81:21:39	.	0.75000	10.18	1.0	.
735	102.0	2	12APR81:22:15	.	0.50000	11.18	1.0	.
736	102.0	2	12APR81:23:19	.	0.46000	12.18	1.0	.
737	102.0	2	12APR81:23:45	.	1.50000	13.18	1.0	.
738	102.0	2	13APR81:00:00	.	0.96000	14.18	1.0	.
739	102.0	2	13APR81:00:28	.	0.21000	15.18	1.0	.
740	102.0	2	13APR81:01:58	.	0.21000	16.18	1.0	.
741	102.0	2	13APR81:04:49	.	0.21000	17.18	1.0	.
742	102.0	2	13APR81:07:52	.	0.04000	18.18	1.0	.
743	103.0	2	13APR81:10:17	14APR81:08:10	0.28000	10.00	1.0	0.36
744	113.0	2	23APR81:20:59	.	1.04000	1.30	1.0	.
745	113.0	2	23APR81:21:06	.	1.84000	2.30	1.0	.
746	113.0	2	23APR81:21:25	.	0.79000	3.30	1.0	0.26
747	121.0	2	01MAY81:10:23	01MAY81:19:10	1.12000	29.00	1.0	1.64
748	130.0	2	10MAY81:21:25	11MAY81:02:28	0.91000	6.00	1.0	0.50
749	131.0	2	11MAY81:12:09	11MAY81:14:36	0.40000	4.00	1.0	0.42
750	135.0	2	15MAY81:12:10	15MAY81:18:26	0.19060	4.00	1.0	0.36
751	136.0	2	18MAY81:19:44	18MAY81:20:52	0.17000	2.00	1.0	0.28
752	139.0	2	19MAY81:14:22	19MAY81:15:25	0.29000	2.00	1.0	0.31
753	140.0	2	28MAY81:12:08	28MAY81:15:58	0.40580	6.00	1.0	0.42
754	152.0	2	01JUN81:17:13	02JUN81:07:07	0.76000	6.00	1.0	0.60
755	154.0	2	03JUN81:21:40	03JUN81:23:39	1.70000	11.00	1.0	0.60
756	157.0	2	06JUN81:00:20	06JUN81:01:48	1.42000	4.00	1.0	0.38
757	161.0	2	10JUN81:02:41	10JUN81:06:27	0.55000	6.00	1.0	0.52
758	164.0	2	13JUN81:22:42	14JUN81:01:18	1.54000	5.00	1.0	0.40
759	182.0	2	01JUL81:15:32	01JUL81:15:56	0.21000	3.00	1.0	0.22
760	182.1	2	01JUL81:21:10	01JUL81:22:25	0.06000	4.00	1.0	.
761	201.0	2	20JUL81:18:16	20JUL81:18:59	3.96000	10.00	1.0	0.94
762	204.0	2	28JUL81:11:53	28JUL81:12:45	0.67000	2.00	1.0	0.10
763	209.1	2	28JUL81:19:23	28JUL81:21:41	0.42000	4.00	1.0	0.69
764	216.0	2	06AUG81:10:16	06AUG81:15:48	0.39000	6.00	1.0	0.15
765	220.0	2	08AUG81:00:21	08AUG81:07:33	0.26000	4.00	1.0	0.46
766	223.0	2	11AUG81:18:54	12AUG81:12:35	0.76000	26.00	1.0	2.10
767	227.0	2	15AUG81:20:25	16AUG81:01:46	0.57000	4.00	1.0	0.39
768	242.0	2	30AUG81:07:23	30AUG81:11:40	0.78000	13.00	1.0	1.40
769	243.0	2	31AUG81:04:02	31AUG81:15:34	0.44000	11.00	1.0	1.30
770	251.0	2	08SEP81:13:40	08SEP81:17:06	0.36000	4.00	1.0	0.33
771	258.1	2	15SEP81:16:56	16SEP81:06:35	0.49000	17.00	1.0	1.23
772	274.0	2	01OCT81:21:10	02OCT81:11:05	0.29000	14.00	1.0	0.53
773	291.0	2	18OCT81:17:34	18OCT81:18:14	1.30000	3.00	1.0	0.19
774	296.0	2	23OCT81:07:58	24OCT81:04:06	0.32000	16.00	1.0	0.72
775	298.0	2	25OCT81:14:46	28OCT81:08:23	0.45000	46.00	1.0	.
776	309.0	2	05NOV81:23:05	06NOV81:01:53	0.29762	3.00	1.0	0.22
777	335.0	2	01DEC81:12:32	01DEC81:23:03	0.35000	9.00	2.2	0.87

STATION RUNOFF DATA

-- STA=51UR16 --

OBS	STRMNO	TYPE	T11	T12	FLO	SAMNO	CMT	PRECIP
778	228.0	2	15AUG80:18:30	15AUG80:21:57	1.850	23	1	.
779	.	1	15SEP80:13:48	.	0.005	1	.	.
780	.	1	22SEP80:10:05	.	0.005	1	.	.
781	.	1	29SEP80:09:50	.	0.005	1	.	.
782	.	1	06OCT80:13:30	.	0.005	1	.	.
783	.	1	20OCT80:14:15	.	0.005	1	.	.
784	.	1	27OCT80:11:10	.	0.005	1	.	.
785	.	1	03NOV80:11:06	.	0.010	1	.	.
786	.	1	10NOV80:10:20	.	0.010	1	.	.
787	.	1	17NOV80:09:45	.	0.010	1	.	.
788	322.0	2	17NOV80:16:37	18NOV80:07:00	0.630	34	1	1.05
789	329.0	2	24NOV80:06:47	25NOV80:00:25	1.220	87	1	1.25
790	.	1	01DEC80:09:30	.	0.010	1	.	.
791	.	1	08DEC80:13:30	.	0.010	1	.	.
792	.	1	15DEC80:14:00	.	0.010	1	.	.
793	.	1	22DEC80:09:45	.	0.005	1	.	.
794	.	1	12JAN81:13:00	.	0.005	1	.	.
795	.	1	26JAN81:10:40	.	0.005	1	.	.
796	.	1	09FEB81:10:25	.	0.005	1	.	.
797	51.0	2	20FEB81:01:19	20FEB81:06:51	0.490	13	1	1.27
798	51.1	2	20FEB81:23:38	21FEB81:07:18	0.490	15	1	0.90
799	54.0	2	23FEB81:00:08	23FEB81:23:36	0.720	61	1	1.66
800	63.0	2	04MAR81:11:17	04MAR81:23:47	0.100	6	1	0.60
801	.	1	09MAR81:11:20	.	0.010	1	.	.
802	.	1	16MAR81:10:00	.	0.020	1	.	.
803	75.0	2	16MAR81:13:09	16MAR81:20:31	0.130	5	1	0.21
804	.	1	23MAR81:09:30	.	0.010	1	.	.
805	89.0	2	30MAR81:09:03	30MAR81:23:18	0.100	5	1	0.33
806	91.0	2	01APR81:17:27	01APR81:22:33	0.270	5	1	0.04
807	.	1	06APR81:10:35	.	0.005	1	.	.
808	99.0	2	09APR81:10:59	09APR81:15:33	0.350	7	1	0.30
809	101.0	2	11APR81:10:35	13APR81:05:56	0.250	28	1	0.92
810	104.0	2	14APR81:03:17	14APR81:15:47	0.380	12	1	0.36
811	107.0	2	17APR81:11:31	18APR81:01:09	0.020	2	1	0.06
812	.	1	20APR81:10:50	.	0.010	1	.	.
813	113.0	2	23APR81:11:51	24APR81:04:10	0.290	7	1	0.26
814	.	1	27APR81:09:40	.	0.010	1	.	.
815	118.0	2	28APR81:17:31	28APR81:20:22	0.130	2	1	0.10
816	121.0	2	01MAY81:10:44	02MAY81:01:40	1.080	57	1	1.64
817	.	1	04MAY81:09:58	.	0.005	1	.	.
818	130.0	2	10MAY81:16:30	11MAY81:06:16	0.230	7	1	0.50
819	.	1	11MAY81:10:00	.	0.020	1	.	.
820	131.0	2	11MAY81:12:46	11MAY81:21:00	0.180	6	1	0.42
821	135.0	2	15MAY81:12:39	16MAY81:00:27	0.070	3	1	0.36
822	.	1	18MAY81:09:35	.	0.005	1	.	.
823	136.0	2	18MAY81:20:35	19MAY81:08:20	0.060	2	1	0.28
824	137.0	2	19MAY81:15:09	19MAY81:22:11	0.140	3	1	0.31
825	142.0	2	28MAY81:15:45	28MAY81:16:56	0.420	3	1	0.42
826	.	1	01JUN81:11:00	.	0.005	1	.	.
827	153.0	2	02JUN81:04:20	02JUN81:09:01	0.260	4	1	0.60
828	154.0	2	03JUN81:22:03	04JUN81:00:16	1.290	11	1	0.60
829	157.0	2	06JUN81:01:26	06JUN81:18:34	0.070	3	1	0.38
830	.	1	08JUN81:11:45	.	0.005	1	.	.
831	161.0	2	10JUN81:02:50	10JUN81:12:54	0.220	6	1	0.52

STATION RUNOFF DATA

STA=51UR16

OBS	STANNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
832	164	2	13JUN81:23:20	14JUN81:03:19	0.300	4	1	0.40
833	171	2	20JUN81:01:06	20JUN81:07:19	0.190	4	1	0.30
834	176	2	25JUN81:19:48	26JUN81:04:14	0.190	4	1	0.28
835	183	2	02JUL81:13:09	02JUL81:15:35	0.800	8	1	0.60
836	185	2	04JUL81:06:04	04JUL81:13:50	1.700	36	2	1.12
837	201	2	20JUL81:18:27	21JUL81:05:44	0.980	42	1	0.94
838	.	1	27JUL81:09:50	.	0.005	1	.	.
839	209	2	28JUL81:12:55	29JUL81:05:13	0.270	10	1	0.79
840	213	2	06AUG81:12:37	06AUG81:18:23	0.240	5	1	0.15
841	220	2	08AUG81:01:02	08AUG81:14:18	0.180	5	1	0.46
842	.	1	10AUG81:11:55	.	0.000	1	.	.
843	.	1	24AUG81:12:50	.	0.000	1	.	.
844	242	2	30AUG81:08:12	31AUG81:17:10	0.510	29	1	2.70
845	251	2	08SEP81:15:44	08SEP81:17:16	0.140	2	1	0.33
846	258	2	15SEP81:17:27	16SEP81:04:10	0.350	14	1	1.38
847	.	1	21SEP81:12:25	.	0.005	1	.	.
848	274	2	01OCT81:21:57	02OCT81:03:36	0.150	4	1	0.53
849	.	1	05OCT81:11:45	.	0.005	1	.	.
850	.	1	12OCT81:12:15	.	0.005	1	.	.
851	291	2	18OCT81:17:57	18OCT81:20:24	0.210	3	1	0.19
852	296	2	23OCT81:10:52	24OCT81:02:35	0.260	14	1	0.72
853	298	2	25OCT81:17:11	28OCT81:01:35	0.350	54	1	.
854	.	1	02NOV81:10:15	.	0.005	1	.	.
855	310	2	06NOV81:01:49	06NOV81:08:04	0.140	4	1	0.22
856	.	1	09NOV81:10:10	.	0.005	1	.	.
857	.	1	16NOV81:10:10	.	0.005	1	.	.
858	.	1	23NOV81:09:35	.	0.005	1	.	.
859	.	1	30NOV81:09:56	.	0.005	1	.	.
860	335	2	01DEC81:10:22	02DEC81:01:28	0.190	10	1	0.87
861	.	1	07DEC81:10:10	.	0.005	1	.	.

STA=51UR17

OBS	STANNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
862	262.0	2	18SEP80:03:00	.	0.11	1.3	4.0	.
863	262.0	2	18SEP80:06:25	.	0.07	2.3	4.0	.
864	262.0	2	18SEP80:10:30	.	0.04	3.3	4.0	0.23
865	265.0	2	21SEP80:19:53	.	0.03	1.2	1.0	.
866	265.0	2	21SEP80:21:04	.	0.03	2.2	1.0	.
867	292.0	2	18OCT80:20:10	.	0.24	1.5	1.0	.
868	292.0	2	18OCT80:22:02	.	0.17	2.5	1.0	.
869	292.0	2	19OCT80:01:34	.	0.05	3.5	1.0	.
870	292.0	2	19OCT80:06:05	.	0.02	4.5	1.0	.
871	292.0	2	19OCT80:12:37	.	0.00	5.5	1.0	.
872	332.0	2	27NOV80:16:34	27NOV80:22:23	0.15	5.0	1.0	0.31
873	344.0	2	09DEC80:12:34	09DEC80:22:28	0.07	33.0	1.0	0.20
874	354.0	2	23DEC80:09:40	23DEC80:16:48	0.17	6.0	1.0	0.13
875	21.0	2	21JAN81:04:33	21JAN81:06:57	0.02	2.0	1.0	0.08
876	33.0	2	02FEB81:06:46	02FEB81:17:11	1.21	171.0	1.0	0.93
877	37.0	2	08FEB81:10:59	08FEB81:21:36	0.15	23.0	1.0	0.28
878	42.0	2	11FEB81:04:52	12FEB81:03:32	0.18	78.0	1.0	1.09
879	50.0	2	19FEB81:22:37	20FEB81:10:20	0.08	21.0	1.0	0.38

STATION RUNOFF DATA

------------------------------ STA=51UR17 ------------------------------

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
880	53.0	2	23FEB81:11:45	23FEB81:20:53	0.25	39	2.2	1.10
881	75.0	2	16MAR81:13:25	16MAR81:17:05	0.08	3	1.0	0.19
882	89.0	2	30MAR81:07:43	31MAR81:03:59	0.17	24	1.0	0.96
883	95.0	2	05APR81:17:35	05APR81:21:04	0.36	9	1.0	0.42
884	99.0	2	09APR81:11:34	09APR81:14:22	0.24	5	1.0	0.32
885	102.0	2	12APR81:19:54	14APR81:07:38	0.11	21	1.0	0.71
886	104.0	2	14APR81:17:59	14APR81:23:48	0.08	2	1.0	0.09
887	107.0	2	17APR81:10:59	17APR81:15:04	0.07	3	1.0	0.18
888	113.0	2	23APR81:20:42	23APR81:23:19	0.32	5	1.0	0.29
889	120.0	2	30APR81:10:36	01MAY81:09:04	0.06	5	1.0	0.15
890	121.0	2	01MAY81:10:31	02MAY81:23:43	0.16	42	1.0	1.19
891	130.0	2	10MAY81:15:15	11MAY81:05:55	0.17	10	1.0	0.46
892	131.0	2	11MAY81:12:29	12MAY81:02:51	0.20	14	1.0	0.62
893	135.0	2	15MAY81:12:12	15MAY81:13:40	0.54	6	1.0	0.32
894	135.1	2	15MAY81:14:47	18MAY81:11:43	0.11	30	1.0	0.29
895	138.0	2	18MAY81:12:01	19MAY81:12:00	0.05	9	1.0	0.24
896	139.0	2	19MAY81:14:14	21MAY81:20:17	0.06	19	1.0	0.23
897	148.0	2	28MAY81:06:19	28MAY81:22:21	0.15	9	1.0	0.37
898	152.0	2	01JUN81:13:16	04JUN81:06:14	0.22	90	1.0	0.79
899	161.0	2	10JUN81:04:26	10JUN81:21:07	0.18	18	1.0	0.43
900	164.0	2	13JUN81:16:42	14JUN81:16:28	0.08	16	1.0	0.56
901	171.0	2	20JUN81:00:06	20JUN81:06:46	0.25	11	1.0	0.21
902	176.0	2	25JUN81:20:21	26JUN81:04:56	0.41	18	1.0	0.65
903	[illegible]	2	03JUL81:05:58	03JUL81:08:29	0.07	2	1.0	0.14
904	[illegible]	2	21JUL81:15:30	21JUL81:21:47	0.19	8	1.0	0.18
905	205.0	2	24JUL81:16:02	25JUL81:21:26	0.31	32	1.0	1.31
906	207.0	2	26JUL81:19:46	27JUL81:07:45	0.12	4	1.0	0.13
907	215.0	2	03AUG81:15:23	03AUG81:19:36	0.23	7	1.0	0.34
908	218.0	2	06AUG81:13:40	06AUG81:18:46	0.01	2	1.0	0.10
909	223.0	2	11AUG81:20:14	12AUG81:11:56	0.34	24	1.0	1.10
910	242.0	2	30AUG81:09:18	31AUG81:09:28	0.24	29	1.0	1.25
911	243.0	2	31AUG81:11:57	31AUG81:22:04	0.33	14	1.0	.
912	251.0	2	08SEP81:14:07	08SEP81:18:00	0.11	3	1.0	0.28
913	[illegible]	2	15SEP81:17:52	17SEP81:03:54	0.21	44	1.0	2.22
914	260.0	2	17SEP81:20:49	18SEP81:09:41	0.12	9	1.0	0.38
915	270.0	2	27SEP81:19:21	27SEP81:23:47	0.17	5	1.0	0.28
916	279.0	2	06OCT81:11:08	07OCT81:06:55	0.10	6	1.0	0.13
917	[illegible]	2	23OCT81:14:16	24OCT81:05:22	0.13	12	1.0	0.56
918	[illegible]	2	25OCT81:20:33	26OCT81:08:57	0.06	4	2.2	0.29
919	299.0	2	26OCT81:12:33	27OCT81:01:08	0.17	41	1.0	1.58
920	309.0	2	05NOV81:21:05	06NOV81:10:45	0.25	27	1.0	0.64
921	335.0	2	01DEC81:11:05	02DEC81:08:39	0.12	18	1.0	0.58
922	336.0	2	04DEC81:18:52	05DEC81:04:06	0.09	4	1.0	.

STATION RUNOFF DATA

STA=51UR18

OBS	STMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
923	39.0	2	08FEB81:13:55	08FEB81:14:42	0.07	3	1	0.80
924	54.0	2	23FEB81:09:27	23FEB81:14:25	0.48	3	1	0.41
925	121.0	2	01MAY81:16:04	01MAY81:17:17	0.41	3	1	1.64
926	139.0	2	19MAY81:15:55	19MAY81:20:10	0.06	2	1	0.31
927	154.0	2	03JUN81:23:49	04JUN81:03:55	0.20	25	1	0.60
928	157.0	2	06JUN81:01:11	07JUN81:05:29	0.02	7	1	0.38
929	258.0	2	15SEP81:17:25	16SEP81:06:26	0.05	21	1	1.38
930	299.1	2	26OCT81:21:10	27OCT81:22:21	0.07	26	1	.

STA=51UR19

OBS	STMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
931	51.0	2	20FEB81:00:07	20FEB81:12:04	0.084	36	1.0	0.55
932	51.1	2	20FEB81:15:07	21FEB81:13:14	0.032	21	1.0	0.38
933	53.0	2	22FEB81:16:40	24FEB81:12:43	0.051	80	1.0	0.93
934	63.0	2	04MAR81:23:00	06MAR81:14:53	0.032	46	1.0	.
935	75.0	2	16MAR81:14:16	17MAR81:17:25	0.017	17	1.0	0.20
936	89.0	2	30MAR81:09:59	31MAR81:04:22	0.024	19	1.0	0.26
937	95.0	2	05APR81:19:20	06APR81:03:33	0.034	13	1.0	0.22
938	99.0	2	09APR81:12:09	09APR81:23:11	0.042	18	1.0	0.30
939	101.0	2	11APR81:11:34	12APR81:12:00	0.024	23	1.0	0.70
940	103.0	2	13APR81:10:57	15APR81:04:08	0.014	17	1.0	0.22
941	113.0	2	23APR81:21:31	24APR81:07:22	0.052	16	1.0	0.32
942	121.0	2	01MAY81:11:06	02MAY81:08:10	0.117	92	1.0	1.20
943	130.0	2	10MAY81:17:25	13MAY81:06:53	0.027	63	1.0	0.42
944	135.0	2	15MAY81:13:07	16MAY81:04:59	0.045	27	1.0	0.42
945	138.0	2	18MAY81:21:48	20MAY81:06:18	0.032	38	1.0	0.79
946	145.0	2	28MAY81:09:25	30MAY81:05:21	0.010	18	1.0	0.71
947	150.0	2	30MAY81:23:15	31MAY81:21:49	0.017	17	1.0	0.21
948	164.0	2	13JUN81:19:02	15JUN81:04:15	0.051	65	1.0	0.84
949	171.0	2	20JUN81:06:33	21JUN81:04:44	0.012	9	1.0	0.30
950	176.0	2	25JUN81:07:53	26JUN81:07:33	0.029	23	1.0	0.27
951	183.0	2	02JUL81:14:40	03JUL81:16:22	0.018	20	2.0	0.38
952	202.0	2	21JUL81:00:53	22JUL81:03:37	0.005	4	1.0	0.65
953	205.0	2	24JUL81:20:45	27JUL81:08:23	0.007	13	1.0	0.18
954	209.0	2	28JUL81:10:22	30JUL81:07:37	0.054	74	1.0	0.65
955	218.0	2	06AUG81:13:02	07AUG81:09:00	0.031	22	1.0	0.10
956	220.0	2	08AUG81:06:22	08AUG81:13:59	0.020	7	1.0	0.34
957	223.0	2	11AUG81:19:27	12AUG81:12:40	0.282	159	2.3	1.95
958	227.0	2	15AUG81:21:34	16AUG81:15:06	0.022	15	1.0	0.19
959	242.0	2	30AUG81:09:20	02SEP81:15:48	0.041	99	1.0	1.32
960	256.0	2	15SEP81:17:34	16SEP81:10:03	0.115	71	2.5	1.26
961	265.0	2	22SEP81:18:59	23SEP81:05:16	0.002	2	1.0	0.12
962	291.0	2	18OCT81:20:11	19OCT81:03:45	0.009	3	1.0	0.04
963	295.0	2	23OCT81:10:52	25OCT81:09:55	0.033	57	1.0	0.69
964	298.0	2	25OCT81:16:56	28OCT81:05:52	0.069	151	1.0	1.05
965	310.0	2	06NOV81:00:34	06NOV81:23:53	0.016	14	1.0	0.22

STATION RUNOFF DATA

STA=51UR20

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
966	258	2	15SEP81:17:41	16SEP81:06:21	4.11	10	1	0.90
967	255	2	22SEP81:19:06	22SEP81:20:01	15.56	6	1	0.38
968	274	2	01OCT81:17:13	02OCT81:04:02	11.25	9	9	0.49
969	279	2	06OCT81:18:56	06OCT81:19:37	15.18	4	1	0.28
970	291	2	18OCT81:18:15	18OCT81:18:42	2.25	2	1	0.16
971	285	2	23OCT81:09:49	23OCT81:20:48	3.75	9	1	0.61
972	298	2	25OCT81:14:54	25OCT81:18:20	0.84	2	1	0.14
973	299	2	26OCT81:12:12	27OCT81:19:26	9.63	18	1	1.16
974	309	2	05NOV81:21:04	06NOV81:00:14	4.48	5	1	0.32
975	335	2	01DEC81:10:24	01DEC81:23:27	1.20	6	1	0.35
976	4	2	04JAN82:15:06	05JAN82:09:49	0.51	3	1	.

STA=51UR21

OBS	STRMNO	TYPE	TI1	TI2	FLO	SAMNO	CMT	PRECIP
977	.	1	21SEP81:09:20	.	0.035	1	.	.
978	.	1	28SEP81:08:36	.	0.029	1	.	.
979	.	1	05OCT81:08:55	.	0.028	1	.	.
980	.	1	12OCT81:09:15	.	0.014	1	.	.
981	299	2	26OCT81:16:33	28OCT81:04:47	0.420	46	1	1.16
982	.	1	02NOV81:08:55	.	0.019	1	.	.
983	.	1	09NOV81:08:35	.	0.035	1	.	.
984	.	1	16NOV81:08:35	.	0.023	1	.	.
985	.	1	23NOV81:08:30	.	0.023	1	.	.
986	.	1	30NOV81:08:45	.	0.014	1	.	.
987	.	1	07DEC81:08:55	.	0.011	1	.	.

STATION NUTRIENT DATA

STA=51UR03

OBS	STRMNO	TYPE	TIM	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
148	292.00	2	18OCT80:09:18	0.12000	.	.	2.88	8.44	0.65	0.36	0.23
149	292.00	2	18OCT80:10:14	0.12000	.	.	2.19	7.63	.	.	0.20
150	292.00	2	18OCT80:11:19	0.09000	.	.	2.11	7.43	0.73	0.61	0.18
151	292.00	2	18OCT80:12:27	0.05000	.	.	2.07	7.43	0.83	0.62	0.20
152	292.00	2	18OCT80:14:12	0.03000	.	.	1.99	7.43	0.41	0.34	0.18
153	292.10	2	18OCT80:16:48	0.58000	.	.	1.48	1.80	.	.	0.19
154	292.10	2	18OCT80:16:58	0.42000	.	.	1.46	1.35	.	.	0.16
155	292.10	2	18OCT80:17:18	0.12000	.	.	2.48	1.62	.	.	0.67
156	292.10	2	18OCT80:17:53	0.12000	.	.	1.36	1.62	.	.	0.34
157	292.10	2	18OCT80:18:26	0.33000	.	.	1.02	0.99	.	.	0.23
158	292.10	2	18OCT80:18:34	1.11000	2.58	1.30	0.42	0.45	0.59	0.18	0.18
159	292.10	2	18OCT80:18:39	0.89000	.	2.23	0.80	0.69	.	0.64	0.64
160	292.10	2	18OCT80:18:44	0.89000	2.14	1.61	0.58	0.59	0.65	0.50	0.41
161	292.10	2	18OCT80:18:50	0.67000	1.85	1.52	0.62	0.47	0.54	0.44	0.39
162	292.10	2	18OCT80:18:57	0.42000	1.65	1.44	0.58	0.41	0.48	0.46	0.36
163	292.10	2	18OCT80:19:07	0.42000	1.52	1.24	0.50	0.33	0.44	0.38	0.31
164	292.10	2	18OCT80:19:15	0.42000	1.30	1.22	0.48	0.33	0.39	0.36	0.31
165	292.10	2	18OCT80:19:24	0.42000	.	.	0.78	0.33	.	.	0.33
166	292.10	2	18OCT80:19:33	0.42000	1.65	1.33	0.52	0.33	0.45	0.38	0.32
167	292.10	2	18OCT80:19:44	0.33000	.	.	0.58	0.37	.	.	0.40
168	292.10	2	18OCT80:19:56	0.33000	.	.	0.76	0.41	.	.	0.40
169	292.10	2	18OCT80:20:11	0.21000	.	.	0.58	0.43	.	.	0.35
170	292.10	2	18OCT80:20:29	0.21000	.	.	0.62	0.43	.	.	0.36
171	292.10	2	18OCT80:20:48	0.67000	.	.	0.90	0.25	.	.	0.44
172	292.10	2	18OCT80:20:52	1.11000	.	.	0.26	0.21	.	.	0.12
173	292.10	2	18OCT80:20:57	1.23000	1.95	1.48	0.68	0.31	0.57	0.42	0.35
174	292.10	2	18OCT80:21:02	0.89000	1.67	1.37	0.44	0.33	0.52	0.44	0.35
175	292.10	2	18OCT80:21:08	0.67000	1.52	1.39	0.56	0.35	0.51	0.47	0.40
176	292.10	2	18OCT80:21:16	0.42000	1.72	1.67	0.76	0.36	0.63	0.63	0.50
177	309.00	2	04NOV80:08:22	0.19000	0.69	0.61	0.00	0.46	0.29	0.20	0.00
178	314.00	2	09NOV80:15:44	0.58000	2.99	2.34	0.11	1.43	0.26	0.08	0.05
179	323.00	2	24NOV80:05:27	0.36000	1.32	1.22	0.26	0.54	0.20	0.17	0.16
180	332.00	2	27NOV80:16:56	0.12000	0.83	0.83	0.08	0.84	0.10	0.10	0.07
181	344.00	2	09DEC80:12:55	0.29000	1.85	1.60	0.17	0.49	0.12	0.08	0.06
182	358.00	2	23DEC80:08:19	0.15000	1.79	1.68	0.23	2.77	0.17	0.14	0.12
183	51.00	2	20FEB81:00:14	0.61000	.	.	0.20	0.36	.	.	0.02
184	51.10	2	20FEB81:13:15	0.15000	0.70	0.49	0.12	0.72	0.06	0.02	0.02
185	52.00	2	21FEB81:15:32	0.16064	1.19	0.92	0.14	1.45	1.86	1.86	0.71
186	53.00	2	22FEB81:17:11	0.33264	1.76	1.34	0.24	0.54	0.11	0.08	0.06
187	63.00	2	04MAR81:19:57	0.47000	1.10	0.83	0.17	0.96	0.14	0.10	0.07
188	75.00	2	16MAR81:12:11	0.05000	1.25	0.67	0.40	1.04	0.65	0.50	0.44
189	89.01	2	30MAR81:07:36	0.18000	.	.	0.84	2.53	.	.	0.10
190	89.01	2	30MAR81:08:04	0.18000	.	.	0.76	1.50	.	.	0.66
191	89.01	2	30MAR81:08:28	0.27000	.	.	0.88	1.18	.	.	0.84
192	89.01	2	30MAR81:08:45	0.33000	.	.	0.32	0.95	.	.	0.04
193	89.01	2	30MAR81:09:00	0.39000	.	.	0.32	0.83	.	.	0.04
194	89.01	2	30MAR81:09:13	0.42000	.	.	0.30	0.59	.	.	0.06
195	89.01	2	30MAR81:09:24	0.45000	.	.	0.40	0.51	.	.	0.05
196	89.01	2	30MAR81:09:36	0.36000	.	.	0.32	0.53	.	.	0.05
197	89.01	2	30MAR81:09:53	0.24000	.	.	0.17	0.53	.	.	0.05
198	89.01	2	30MAR81:10:19	0.15000	.	.	0.23	0.79	.	.	0.08
199	89.13	2	30MAR81:13:20	0.47000	2.59	2.14	0.38	0.49	0.24	0.12	0.11
200	90.00	2	31MAR81:16:44	0.12682	2.05	1.58	0.13	1.64	0.12	0.05	0.05
201	95.00	2	05APR81:17:30	0.60000	2.57	2.14	0.42	0.49	0.22	0.11	0.10

STATION NUTRIENT DATA

STA=S10R03

OBS	[illegible]	TYPE	TIME	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
202	99.0	2	09APR81:10:56	0.53000	3.88	3.10	2.16	0.28	0.40	0.24	0.17
203	102.0	2	12APR81:11:53	0.27639	2.71	2.45	0.50	0.81	0.28	0.25	0.13
204	[illegible]	2	16APR81:16:23	0.15000	.	0.55	0.07	1.03	.	0.05	0.02
205	107.0	2	17APR81:06:24	0.13301	0.63	0.59	0.14	0.77	0.06	0.05	0.04
206	113.0	2	23APR81:[illegible]	0.22646	1.09	0.88	0.26	0.93	0.11	0.07	0.06
207	130.0	2	10MAY81:[illegible]	0.29437	1.57	1.48	0.22	0.42	0.12	0.10	0.05
208	[illegible]	2	19MAY81:13:3[illegible]	0.26000	1.06	0.79	0.13	0.38	0.10	0.06	0.04
209	148.0	2	28MAY81:01:07	0.24000	1.16	0.60	0.23	0.76	0.13	0.05	0.05
210	[illegible]	2	29MAY81:[illegible]	0.10000	0.46	0.44	0.02	0.45	0.05	0.04	0.03
211	159.0	2	30MAY81:23:00	0.09000	2.45	2.08	0.49	1.25	0.07	0.03	0.03
212	[illegible]	2	01JUN81:13:15	0.22000	0.66	0.61	0.18	0.41	0.11	0.04	0.04
213	156.0	2	03JUN81:19:25	0.09000	0.65	0.53	0.06	1.21	0.08	0.03	0.03
214	155.0	2	04JUN81:20:56	0.06000	3.69	3.48	0.79	1.38	0.12	0.10	0.09
215	157.1	2	06JUN81:21:10	0.09465	1.02	0.48	0.10	2.75	0.35	0.06	0.01
216	159.0	2	08JUN81:21:20	0.12000	1.44	1.44	0.68	1.04	0.69	.	0.53
217	[illegible]	2	10JUN81:01:08	0.25875	1.41	0.99	0.36	0.67	0.52	0.44	0.30
218	[illegible]	2	13JUN81:17:1[illegible]	0.14000	1.11	0.91	0.05	0.53	0.13	0.08	0.05
219	170.0	2	19JUN81:23:[illegible]	1.32000	4.35	2.07	1.44	0.70	0.38	0.18	.
220	[illegible]	2	25JUN81:20:12	0.55929	1.32	1.03	0.17	0.74	0.23	0.19	.
221	[illegible]	2	03JUL81:05:11	0.20000	1.05	0.98	0.29	0.73	0.13	0.10	0.07
222	[illegible]	2	04JUL81:05:09	5.60000	0.82	0.82	0.11	0.15	0.16	0.15	0.11
223	201.0	2	20JUL81:19:41	0.14143	2.40	1.47	0.30	1.02	0.35	0.14	0.14
224	202.0	2	21JUL81:15:32	0.15363	0.88	0.62	0.16	0.82	.	0.07	0.07
225	205.0	2	24JUL81:14:24	0.26000	0.87	0.71	0.16	0.37	0.14	0.11	0.09
226	207.0	2	26JUL81:19:54	0.18191	2.31	0.54	0.06	0.45	0.09	0.07	0.04
227	209.0	2	28JUL81:00:16	0.18000	0.41	0.21	0.14	0.51	0.32	0.29	0.05
228	215.0	2	03AUG81:16:26	0.10000	0.80	0.67	0.19	0.54	0.14	0.10	0.07
229	[illegible]	2	06AUG81:10:32	0.15000	0.66	0.51	0.10	0.85	0.09	0.05	0.03
230	219.0	2	07AUG81:18:23	0.08596	1.34	1.30	0.20	1.11	0.09	0.06	0.03
231	223.0	2	11AUG81:20:04	0.19403	1.35	0.78	0.14	0.67	0.28	0.19	0.14
232	227.0	2	15AUG81:20:44	0.26000	1.67	1.25	0.23	0.57	0.27	0.24	0.19
233	242.0	2	30AUG81:08:48	0.48000	0.73	0.58	0.30	0.51	0.20	0.15	0.08
234	243.0	2	31AUG81:10:20	0.33417	0.75	0.60	0.26	0.47	0.19	0.14	0.07
235	251.0	2	08SEP81:13:08	1.40000	2.28	0.97	0.52	0.58	0.29	0.10	.
236	253.0	2	15SEP81:17:41	0.92000	2.17	1.81	0.72	0.34	0.34	0.30	0.22
237	260.0	2	17SEP81:20:42	0.34000	1.84	1.63	0.49	1.00	0.15	0.12	0.07
238	[illegible]	2	22SEP81:19:15	0.18000	1.80	1.27	0.48	1.06	0.20	0.11	0.08
239	270.0	2	27SEP81:19:20	0.24000	1.43	0.99	0.15	0.98	0.16	0.10	0.06
240	274.0	2	01OCT81:21:49	0.36000	1.50	1.26	0.33	0.68	0.22	0.18	0.14
241	[illegible]	2	18OCT81:17:57	0.44000	6.10	5.67	0.95	1.39	0.35	0.25	0.16
242	[illegible]	2	23OCT81:13:10	0.24000	1.39	1.20	0.17	0.40	0.21	0.17	0.09
243	297.0	2	24OCT81:21:52	0.15000	1.36	1.06	0.21	0.52	2.34	2.14	1.51
244	299.0	2	26OCT81:12:04	0.54000	1.39	1.17	0.23	0.14	0.19	0.17	0.11
245	300.0	2	27OCT81:08:24	0.33000	1.34	1.25	0.25	0.22	0.15	0.12	0.08
246	335.0	2	01DEC81:11:40	0.20000	1.17	0.98	0.28	0.50	0.36	0.17	0.11

STATION NUTRIENT DATA

STA=51UR04

OBS	STRMNO	TYPE	TI	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
247	329	2	24NOV80:14:54	0.68004	1.51	0.98	0.16	0.14	0.13	0.04	0.02
248	332	2	27NOV80:22:48	0.54714	2.01	1.40	0.16	0.29	0.15	0.09	0.06
249	33	2	02FEB81:10:36	0.18000	.	1.02	0.22	0.23	.	0.04	0.02
250	42	2	11FEB81:04:56	0.76000	1.38	1.18	0.24	0.25	0.10	0.04	0.02
251	50	2	19FEB81:15:29	0.15000	0.92	0.76	0.16	0.24	0.06	0.03	0.01
252	53	2	22FEB81:18:45	0.45000	2.00	1.74	0.44	0.28	0.10	0.05	0.04
253	59	2	30MAR81:16:09	0.33795	1.27	0.85	0.15	0.16	0.13	0.07	0.04
254	60	2	31MAR81:13:51	0.20009	1.51	0.88	0.15	0.23	0.10	0.05	0.02
255	75	2	05APR81:17:49	0.21676	1.32	0.91	0.15	0.17	0.10	0.05	0.01
256	99	2	09APR81:13:25	0.13000	1.31	0.98	0.26	0.08	0.11	0.07	0.02
257	102	2	12APR81:20:02	0.59418	.	.	0.20	0.15	.	.	0.02
258	104	2	14APR81:15:46	0.11000	1.18	0.71	0.11	0.06	0.13	0.05	0.00
259	107	2	17APR81:20:50	0.05000	.	.	0.30	0.09	.	.	0.03
260	110	2	20APR81:07:56	0.05002	.	.	0.14	0.05	.	.	0.02
261	121	2	01MAY81:13:25	0.58455	1.34	1.13	0.35	0.25	0.13	0.09	0.07
262	131	2	11MAY81:11:58	0.52000	0.92	0.92	0.62	0.24	0.12	0.10	0.07
263	135	2	15MAY81:14:22	0.49068	0.99	0.72	0.60	0.26	0.11	0.07	0.05
264	139	2	19MAY81:09:42	0.09000	1.34	1.13	0.49	0.26	0.10	0.08	0.04
265	153	2	02JUN81:05:58	0.11000	1.49	0.98	0.39	0.17	0.10	0.05	0.03
266	154	2	03JUN81:20:00	0.16000	2.98	1.53	0.97	0.45	0.41	0.06	0.05
267	161	2	10JUN81:05:38	0.29999	2.11	1.48	054	0.10	0.18	0.07	0.04
268	164	2	13JUN81:22:16	0.34000	1.63	0.86	0.25	0.08	0.11	0.04	0.01
269	171	2	20JUN81:15:50	0.48000	1.34	1.08	0.18	0.11	0.08	0.05	0.01
270	177	2	25JUN81:20:32	0.16000	0.95	0.77	0.15	0.05	0.09	0.04	0.02
271	185	2	04JUL81:08:10	1.30000	1.05	0.99	0.14	0.13	0.13	0.09	0.04
272	207	2	26JUL81:21:34	0.15000	1.37	0.60	0.14	0.04	0.12	0.04	0.01
273	208	2	27JUL81:12:32	0.09872	0.96	0.73	0.18	0.06	0.07	0.03	0.01
274	223	2	11AUG81:20:39	0.30000	0.81	0.58	0.10	0.61	0.06	0.04	0.01
275	227	2	15AUG81:20:55	0.35000	1.67	0.81	0.13	0.04	0.06	0.04	0.02
276	242	2	30AUG81:14:20	0.24000	0.94	0.75	0.06	0.08	0.05	0.05	0.00
277	243	2	31AUG81:09:32	0.60000	1.10	0.92	0.10	0.04	0.08	0.04	0.00
278	250	2	15SEP81:21:01	0.50000	1.20	0.69	0.17	0.07	0.16	0.06	0.03
279	260	2	17SEP81:21:10	0.17335	1.12	0.82	0.17	0.12	0.11	0.06	0.03
280	274	2	01OCT81:23:01	0.28000	1.70	0.82	0.19	0.11	0.16	0.06	0.02
281	299	2	26OCT81:12:52	0.35000	1.43	1.00	0.17	0.03	0.12	0.06	0.01

STA=51UR05

OBS	STRMNO	TYPE	TI	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
282	224.10	.	.	.	.	.	.	.	.	.	.
283	279.00	.	.	.	.	.	.	.	.	.	.
284	251.00	2	17SEP80:18:51	0.04	1.68	0.92	0.26	0.61	0.34	0.16	0.09
285	269.00	2	25SEP80:03:05	0.27	1.12	0.56	0.34	0.88	0.27	0.21	0.20
286	304.00	2	04NOV80:05:15	0.04	3.16	3.05	2.12	0.89	1.38	1.26	1.20
287	314.00	2	09NOV80:15:41	0.03	1.89	1.36	0.53	1.69	0.36	0.20	0.14
288	321.00	2	16NOV80:01:16	0.03	2.23	2.21	1.09	3.75	0.24	0.19	0.14
289	324.01	2	24NOV80:01:22	0.10	0.88	0.86	0.36	1.04	0.32	0.30	0.30
290	327.02	2	24NOV80:10:25	0.35	1.19	1.15	0.50	0.72	1.52	1.50	1.26
291	329.03	2	24NOV80:15:02	0.07	1.25	1.17	0.70	0.88	.	.	1.86
292	332.00	2	27NOV80:08:25	0.10	0.77	0.75	0.20	0.98	0.39	0.39	0.37
293	344.00	2	09DEC80:10:58	0.03	0.86	0.30	0.04	0.42	0.23	0.11	0.10
294	33.00	2	02FEB81:06:17	0.08	3.48	2.29	1.24	0.98	1.46	1.12	1.00

STATION NUTRIENT DATA

STA=51UR05

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
295	39.0	2	08FEB81:10:36	0.03	3.81	3.65	1.12	0.76	1.12	.	0.86
296	41.0	2	10FEB81:23:06	0.09	3.02	2.61	1.30	0.78	1.10	0.99	0.86
297	50.0	2	19FEB81:16:00	0.07	4.36	3.62	1.53	0.98	0.57	0.45	0.39
298	63.0	2	04MAR81:19:29	0.09	2.01	1.93	0.59	1.12	0.38	0.33	0.27
299	75.0	2	16MAR81:05:14	0.07	1.44	0.57	0.36	1.49	0.22	0.05	.
300	89.0	2	30MAR81:07:25	0.05	1.19	0.64	0.22	0.86	0.34	0.24	0.16
301	91.0	2	01APR81:13:40	0.06	2.03	1.20	0.40	1.02	0.41	0.24	0.21
302	95.0	2	05APR81:13:15	0.06	1.07	0.63	0.17	0.55	0.22	0.15	0.12
303	99.0	2	09APR81:11:31	0.07	0.93	.	0.55	0.65	0.25	0.21	0.18
304	101.0	2	11APR81:10:41	0.09	1.49	1.09	0.35	1.28	0.15	0.10	0.05
305	102.0	2	12APR81:18:46	0.08	1.66	1.49	0.37	0.75	0.30	0.25	0.24
306	103.0	2	13APR81:14:32	0.05	1.21	0.88	0.37	1.20	0.17	0.09	0.07
307	107.0	2	17APR81:08:53	0.05	1.03	0.76	0.22	0.91	0.16	0.07	0.07
308	118.0	2	28APR81:17:17	0.01	.	.	1.82	1.30	.	.	0.18
309	118.0	2	28APR81:18:12	0.41	.	.	0.81	0.56	.	.	0.10
310	118.0	2	29APR81:18:22	0.04	.	.	1.19	1.14	.	.	0.28
311	121.0	2	01MAY81:14:53	0.13	1.75	1.47	0.56	0.47	0.53	0.50	0.41
312	130.0	2	10MAY81:14:35	0.07	1.39	0.90	0.40	0.40	0.18	0.11	0.08
313	131.0	2	11MAY81:11:29	0.08	1.56	1.07	0.38	0.38	0.35	0.27	0.22
314	135.0	2	15MAY81:11:55	0.10	2.52	1.17	0.30	0.94	0.28	0.07	0.07
315	135.1	2	15MAY81:16:25	0.05	1.67	0.88	0.48	0.82	0.26	0.11	0.09
316	138.0	2	18MAY81:21:12	0.04	0.71	0.36	0.22	0.37	0.14	0.08	0.05
317	143.0	2	28MAY81:01:12	0.08	2.15	1.05	0.60	0.88	0.45	0.28	0.23
318	150.0	2	30MAY81:22:02	0.04	1.88	1.28	0.39	0.70	0.57	0.43	0.38
319	152.0	2	01JUN81:13:27	0.03	1.12	0.81	0.22	0.74	0.22	0.17	0.14
320	154.0	2	03JUN81:20:20	0.01	1.26	0.69	0.19	1.55	0.20	0.13	0.11
321	160.0	2	09JUN81:16:04	0.04	1.40	1.07	0.25	0.93	0.26	0.20	0.16
322	161.0	2	10JUN81:14:54	0.03	3.31	2.75	1.68	0.95	0.39	0.30	.
323	164.0	2	13JUN81:17:47	0.05	1.09	0.61	0.22	0.94	0.36	0.23	0.09
324	173.0	2	22JUN81:15:54	0.02	3.12	1.47	0.59	0.76	0.53	0.33	.
325	182.0	2	01JUL81:07:48	0.10	3.24	1.58	0.72	0.77	0.58	0.18	0.17
326	201.0	2	20JUL81:18:41	0.04	4.18	3.64	1.40	1.72	1.01	0.99	0.58
327	209.1	2	28JUL81:16:16	0.05	1.41	1.19	0.32	0.89	0.62	0.59	0.49
328	223.0	2	11AUG81:19:37	0.09	1.66	1.33	0.45	0.73	0.57	0.54	0.47
329	224.1	2	12AUG81:08:27	0.14	0.96	0.87	0.23	0.97	0.43	0.38	0.38
330	243.1	2	31AUG81:12:53	0.15	1.37	1.14	0.38	0.71	0.41	0.39	0.36
331	252.0	2	09SEP81:03:13	0.02	1.26	1.12	0.51	0.63	0.20	0.17	0.12
332	258.0	2	15SEP81:17:23	0.16	2.08	1.50	0.70	0.62	0.60	0.52	0.44
333	258.1	2	15SEP81:20:04	0.06	2.08	1.40	0.40	0.47	0.28	0.26	0.21
334	265.0	2	22SEP81:18:33	0.24	2.55	1.91	0.73	0.74	0.85	0.66	0.50
335	274.0	2	01OCT81:21:45	0.09	2.14	1.51	0.46	1.01	0.29	0.25	0.22
336	279.0	2	06OCT81:18:59	0.04	1.45	1.32	0.23	0.60	0.31	0.27	0.22
337	296.0	2	23OCT81:06:06	0.03	1.76	1.48	0.44	0.73	0.67	0.57	0.50
338	298.0	2	25OCT81:14:14	0.03	1.00	0.89	0.10	0.89	0.25	0.23	0.15
339	299.0	2	26OCT81:12:14	0.07	3.61	2.68	1.71	0.49	1.06	0.87	0.81
340	300.0	2	27OCT81:08:27	0.06	1.61	1.10	0.40	0.55	0.93	0.83	0.79
341	309.0	2	05NOV81:21:07	0.11	2.03	1.66	0.38	0.76	0.61	0.46	0.43
342	335.0	2	01DEC81:11:57	0.03	1.19	1.19	0.70	0.76	0.41	0.41	0.37
343	338.0	2	04DEC81:16:00	0.02	1.27	1.21	0.70	2.18	0.26	0.26	0.21
344	349.0	2	15DEC81:11:33	0.05	1.65	1.55	0.69	1.11	1.30	0.62	.

STATION NUTRIENT DATA

STA=51UR06

OBS	STRMNO	TYPE	TIME	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
345	299.00	2	25OCT80:05:39	0.33	1.34	1.01	0.30	0.41	0.61	0.50	0.36
346	322.00	2	17NOV80:15:59	0.29	0.79	0.56	0.08	0.43	0.31	0.22	0.19
347	329.00	2	24NOV80:10:22	0.58	.	.	4.10	0.56	.	.	0.35
348	332.00	2	27NOV80:21:04	0.09	1.00	1.00	0.10	0.24	0.15	0.15	0.11
349	33.01	2	02FEB81:06:27	0.50	2.44	1.24	0.30	0.61	0.72	0.28	0.26
350	33.02	2	02FEB81:12:13	0.10	.	.	0.20	0.43	.	.	0.27
351	39.00	2	02FEB81:13:43	0.14	.	.	0.35	0.46	.	.	0.14
352	42.00	2	11FEB81:04:24	0.29	1.72	1.31	0.18	0.27	0.46	0.26	0.21
353	50.00	2	19FEB81:23:04	0.31	1.33	1.11	0.26	0.30	0.14	0.09	0.08
354	51.00	2	20FEB81:23:55	0.12	0.88	0.70	0.10	0.26	0.12	0.07	0.06
355	53.10	2	22FEB81:23:35	0.26	2.61	2.11	0.16	0.27	0.20	0.13	0.08
356	64.00	2	05MAR81:04:17	0.07	1.99	1.72	0.19	0.35	0.18	0.12	0.09
357	99.00	2	09APR81:11:46	0.14	1.19	1.17	0.19	0.03	0.19	0.13	0.08
358	102.00	2	12APR81:19:09	0.12	1.78	1.30	0.25	0.40	0.20	0.11	0.07
359	121.00	2	01MAY81:10:07	0.51	2.49	0.99	0.58	0.75	0.38	0.18	0.13
360	131.00	2	11MAY81:03:05	0.26	2.45	2.10	0.60	0.35	0.49	0.37	0.27
361	139.00	2	19MAY81:05:03	0.16	1.53	1.18	0.20	0.16	0.22	0.14	0.08
362	148.00	2	28MAY81:07:26	0.06	2.88	1.92	0.65	0.41	0.69	0.47	0.37
363	149.00	2	29MAY81:20:02	0.18	1.67	1.41	0.39	0.47	0.37	0.23	0.18
364	151.00	2	30MAY81:21:48	0.23	.	.	0.49	1.25	.	.	0.04
365	152.00	2	01JUN81:14:45	0.18	1.66	1.43	0.22	0.15	0.21	0.15	0.11
366	161.00	2	10JUN81:06:32	0.17	2.29	1.97	0.62	0.49	0.38	0.30	0.21
367	164.00	2	13JUN81:19:46	0.24	2.06	1.19	0.25	0.43	0.44	0.19	0.18
368	171.00	2	29JUN81:14:35	0.60	1.45	1.05	0.39	0.35	0.36	.	0.27
369	172.00	2	21JUN81:20:12	0.28	2.65	1.59	0.35	0.31	0.49	.	0.35
370	185.00	2	04JUL81:07:00	1.13	1.01	0.90	0.13	0.13	0.18	0.13	0.09
371	209.00	2	28JUL81:11:45	1.08	3.61	3.05	0.31	0.45	0.27	0.17	0.12
372	223.00	2	11AUG81:19:51	1.01	1.46	1.11	0.15	0.41	0.32	0.26	0.19
373	227.00	2	15AUG81:20:33	1.93	1.23	1.06	0.25	0.32	0.52	0.43	0.41
374	242.00	2	30AUG81:10:55	0.28	1.77	1.45	0.17	0.17	0.28	0.23	0.18
375	258.00	2	15SEP81:16:54	0.19	.	3.10	1.33	0.84	.	0.98	0.77
376	290.00	2	23OCT81:16:23	0.06	1.89	1.76	0.12	0.33	0.40	0.38	0.26
377	294.00	2	26OCT81:12:42	0.23	1.34	1.20	0.06	0.04	0.18	0.17	0.10

STA=51UR07

OBS	STRMNO	TYPE	TIME	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
378	204.0	2	22JUL80:19:26	5.2300	0.85	0.33	0.08	0.42	0.21	0.05	.
379	204.1	2	22JUL80:22:50	1.2700	0.89	0.41	0.14	0.50	0.26	0.07	.
380	211.0	2	29JUL80:02:06	0.4900	0.93	0.43	0.06	0.61	0.11	0.03	0.01
381	214.0	2	01AUG80:14:06	0.6000	2.04	1.25	0.26	1.43	0.24	0.05	0.03
382	216.0	2	03AUG80:16:06	0.8400	1.74	1.15	0.38	0.77	0.27	0.07	0.04
383	216.1	2	03AUG80:23:47	1.0700	1.60	0.67	0.18	0.77	0.22	0.04	0.01
384	231.0	2	18AUG80:05:52	1.0500	3.51	0.51	0.12	0.68	0.94	0.06	0.02
385	232.0	2	19AUG80:02:57	0.8000	1.46	0.32	0.05	0.58	0.14	0.05	0.01
386	.	1	08SEP80:15:00	0.0055	1.47	0.58	0.07	0.04	0.21	0.03	0.01
387	254.0	2	10SEP80:01:09	0.3400	2.72	1.10	0.21	1.41	0.50	0.05	0.02
388	.	1	15SEP80:10:35	0.0021	0.12	0.06	0.06	0.07	0.02	0.01	0.01
389	.	1	22SEP80:15:30	0.0021	0.25	0.25	0.14	0.03	0.03	0.03	0.01
390	269.0	2	25SEP80:03:55	0.0939	1.73	0.71	0.18	1.40	0.36	0.07	0.01
391	269.0	2	25SEP80:05:52	0.2340	3.10	0.70	0.16	0.91	0.72	0.12	0.04
392	269.0	2	25SEP80:07:44	0.2340	0.86	0.84	0.14	0.47	0.21	0.07	0.03

STATION NUTRIENT DATA

STA=51UR07

OBS	STRMNO	TYPE	TI	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
393	269.0	2	25SEP80:08:06	0.1340	0.66	0.54	0.20	0.51	0.09	0.06	0.02
394	270.0	2	25SEP80:10:55	0.0407	0.78	0.70	0.14	0.73	0.10	0.07	0.02
395	274.0	2	25SEP80:12:43	0.0165	0.33	0.33	0.06	0.47	0.07	0.05	0.01
396	.	1	29SEP80:12:45	0.0586	0.20	0.20	0.10	0.12	0.02	0.02	0.01
397	276.0	2	02OCT80:21:50	0.1600	.	.	26.82	4.06	.	.	3.18
398	.	1	06OCT80:10:00	0.0021	0.24	0.22	0.10	0.23	0.02	0.02	0.02
399	.	1	20OCT80:09:25	0.0105	0.23	0.23	0.06	0.08	0.01	0.00	0.00
400	299.0	2	25OCT80:09:00	7.1100	1.24	0.81	0.40	0.97	0.70	0.21	0.21
401	.	1	27OCT80:10:20	0.0234	0.27	0.25	0.07	0.25	0.01	0.01	0.01
402	302.0	2	28OCT80:08:20	0.1100	0.47	0.43	0.14	0.43	0.08	0.03	0.02
403	.	1	03NOV80:08:30	0.0143	0.19	0.17	0.07	0.05	0.02	0.00	0.00
404	309.0	2	04NOV80:06:13	0.6200	1.86	1.39	0.09	0.81	0.29	0.11	0.01
405	.	1	10NOV80:14:45	0.0073	0.18	0.18	0.01	0.12	0.04	0.03	0.00
406	324.0	2	24NOV80:03:18	1.0200	1.16	0.97	0.22	0.66	0.23	0.14	0.14
407	332.0	2	27NOV80:15:56	0.4200	0.86	0.64	0.04	0.84	0.12	0.05	0.04
408	.	1	01DEC80:14:45	0.0105	0.42	0.25	0.16	0.22	1.46	1.46	0.12
409	.	1	08DEC80:08:30	0.0021	0.12	0.12	0.08	0.02	0.01	0.01	0.01
410	.	1	15DEC80:10:30	0.0073	0.05	0.05	0.05	0.06	0.00	0.00	0.00
411	.	1	22DEC80:14:25	0.0143	0.36	0.18	0.08	0.06	0.10	0.02	0.00
412	.	1	26JAN81:14:20	0.0021	0.49	0.31	0.16	0.43	0.02	0.01	0.01
413	.	1	09FEB81:13:50	0.0143	0.35	0.35	0.09	0.31	.	.	0.01
414	52.0	2	21FEB81:00:10	0.1900	0.51	0.30	0.18	0.66	0.09	0.02	0.02
415	53.0	2	22FEB81:12:06	0.6600	1.34	0.49	0.44	0.60	0.37	.	0.11
416	63.0	2	04MAR81:16:00	0.1300	0.54	0.33	0.04	1.00	0.10	0.05	0.02
417	.	1	09MAR81:14:15	0.0234	0.33	0.33	0.09	0.16	.	.	0.00
418	.	1	23MAR81:14:05	0.0186	.	.	0.05	0.05	.	.	0.01
419	89.0	2	30MAR81:07:54	0.2900	2.82	0.76	0.49	0.34	0.81	0.17	0.17
420	91.0	2	01APR81:13:19	0.6000	2.40	1.42	1.07	0.79	0.43	0.18	.
421	.	1	06APR81:16:00	0.0186	0.48	0.48	0.08	0.13	0.04	0.03	0.02
422	99.0	2	09APR81:09:22	0.4800	0.90	0.73	0.17	0.46	0.12	0.04	0.03
423	102.0	2	12APR81:17:40	0.9100	1.73	0.67	0.41	0.78	0.23	0.05	0.05
424	104.0	2	14APR81:17:06	0.5400	8.97	0.62	0.11	0.55	0.90	0.04	0.00
425	107.0	2	17APR81:09:12	0.4100	0.55	0.53	0.12	0.46	0.11	0.03	0.03
426	.	1	20APR81:14:40	0.0050	0.31	.	0.07	0.08	0.03	0.03	0.01
427	.	1	27APR81:14:35	0.0186	0.37	0.33	0.09	0.05	0.02	0.02	0.02
428	120.0	2	30APR81:09:20	0.2600	2.33	1.05	0.32	0.85	0.29	0.04	0.01
429	120.1	2	30APR81:23:03	0.4400	0.86	0.49	0.12	0.89	0.11	0.05	0.02
430	121.0	2	01MAY81:09:36	3.6000	2.58	0.86	0.41	1.61	0.52	0.05	0.05
431	.	1	04MAY81:14:30	0.0186	0.24	0.24	0.07	0.01	0.02	0.02	0.00
432	130.0	2	10MAY81:14:24	0.3600	1.55	1.06	0.42	0.51	0.23	0.06	0.06
433	130.1	2	10MAY81:20:15	1.2200	1.64	0.59	0.18	0.23	0.35	0.05	0.03
434	131.0	2	11MAY81:02:08	0.2500	0.85	0.74	0.22	0.65	0.08	0.04	0.03
435	131.1	2	11MAY81:11:02	1.8800	1.19	0.76	0.20	0.35	0.21	0.10	0.09
436	131.2	2	11MAY81:19:51	1.1400	1.17	0.54	0.15	0.28	0.38	0.06	0.03
437	132.0	2	12MAY81:00:47	0.5800	1.06	0.89	0.24	0.67	0.14	0.07	0.06
438	135.0	2	15MAY81:11:50	0.6400	2.76	1.20	0.43	1.28	0.38	0.05	0.01
439	.	1	18MAY81:13:45	0.0186	0.30	0.30	0.08	0.07	0.02	0.02	0.01
440	137.0	2	19MAY81:02:57	0.4200	0.92	0.54	0.17	0.58	0.12	0.04	0.02
441	137.1	2	19MAY81:13:15	0.4200	0.82	0.62	0.11	0.44	0.14	0.10	0.06
442	140.0	2	29MAY81:20:56	0.6500	1.69	0.98	0.38	1.51	0.16	0.05	0.00
443	152.0	2	01JUN81:12:20	0.1400	0.99	0.42	0.08	0.43	0.18	0.03	0.01
444	153.0	2	02JUN81:03:50	2.3200	1.26	0.46	0.16	0.27	0.36	0.05	0.05
445	.	1	08JUN81:15:05	0.0268	0.48	0.48	0.09	1.45	0.04	0.03	0.00
446	151.1	2	10JUN81:18:12	0.9200	1.95	0.61	0.18	0.55	0.57	0.09	0.03

STATION NUTRIENT DATA

STA=51UR07

OBS	STORM	TYPE	TIT	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
447	154.0	2	13JUN81:21:47	1.7100	1.82	0.76	0.20	0.35	0.36	0.06	0.02
448	171.0	2	20JUN81:15:53	0.5600	3.07	2.03	0.68	0.62	0.34	0.02	0.01
449	172.0	2	21JUN81:14:55	4.1600	1.62	0.49	0.14	0.40	0.28	0.03	0.02
450	.	1	22JUN81:14:22	0.0143	0.41	0.41	0.07	0.28	0.02	0.02	0.01
451	176.0	2	25JUN81:20:20	3.2300	2.75	0.51	0.42	0.39	0.69	0.09	0.09
452	.	1	29JUN81:16:15	0.0045	0.51	0.36	0.11	0.87	0.04	0.02	0.01
453	183.1	2	02JUL81:23:01	1.2700	1.03	0.68	0.14	0.74	0.13	0.04	.
454	185.0	2	04JUL81:05:47	7.0700	1.03	0.56	0.25	0.19	0.23	0.11	0.11
455	.	1	13JUL81:13:40	0.0143	0.47	0.47	0.05	0.35	0.02	0.02	0.00
456	.	1	20JUL81:14:35	0.0045	0.72	0.58	0.06	1.33	0.12	0.01	0.00
457	205.0	2	24JUL81:13:52	0.5500	3.73	1.64	0.73	1.50	0.75	0.19	0.15
458	205.0	2	25JUL81:07:24	3.2500	1.21	0.51	0.15	0.29	0.27	0.06	0.04
459	.	1	27JUL81:11:33	0.0585	0.67	0.65	0.08	0.13	0.05	0.04	0.02
460	215.0	2	03AUG81:14:49	0.1200	2.90	1.02	0.28	1.03	0.70	0.15	0.12

STA=51UR08

OBS	STORM	TYPE	TIT	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
461	214.0	2	01AUG80:11:30	1.4400	1.09	0.63	0.12	0.88	0.15	0.03	.
462	229.0	2	15AUG80:02:49	0.0400	0.93	0.59	0.14	0.47	0.13	0.06	0.01
463	231.0	2	1[illegible]AUG80:06:12	0.3500	7.88	0.55	0.28	0.35	1.10	0.19	0.03
464	232.0	2	1[illegible]AUG80:07:31	0.2800	1.12	0.22	0.11	0.35	0.28	0.05	0.04
465	.	1	05SEP80:15:05	0.0061	1.74	1.55	1.05	0.12	0.05	0.02	0.00
466	269.0	2	25SEP80:05:32	0.0406	.	.	0.44	1.46	.	.	0.05
467	269.0	2	25SEP80:06:32	0.1176	.	.	0.38	1.88	.	.	0.06
468	269.0	2	25SEP80:10:05	0.0405	0.71	0.71	0.18	0.71	0.12	.	0.03
469	269.0	2	25SEP80:13:09	0.0121	.	.	0.12	0.71	.	.	0.01
470	.	1	29SEP80:13:00	0.0089	1.16	0.89	0.34	0.28	0.16	0.05	0.02
471	.	1	06OCT80:10:10	0.0009	.	.	0.12	0.11	0.04	0.04	0.01
472	285.0	2	11OCT80:15:39	2.3600	2.37	1.81	0.42	2.54	0.16	0.06	0.03
473	.	1	20OCT80:10:50	0.0018	0.27	0.25	0.05	0.05	0.04	0.01	0.01
474	299.0	2	25OCT80:05:15	6.2000	1.05	0.69	0.43	0.94	0.43	.	0.27
475	.	1	27OCT80:10:35	0.0089	0.31	0.29	0.07	0.07	0.03	0.02	0.02
476	.	1	03NOV80:06:30	0.0089	0.21	0.21	0.04	0.07	0.02	0.01	0.01
477	305.0	2	04NOV80:05:27	0.3400	1.10	0.70	0.00	0.69	0.24	0.07	0.02
478	.	1	10NOV80:14:50	0.0038	0.31	0.29	0.00	0.06	0.09	0.07	0.04
479	322.0	2	17NOV80:15:41	0.9200	.	.	0.23	0.50	.	.	0.15
480	332.0	2	27NOV80:16:20	0.4900	0.90	0.86	0.06	0.50	0.09	0.04	0.04
481	.	1	01DEC80:14:50	0.0158	0.15	0.15	0.05	0.08	0.01	0.01	0.01
482	337.0	2	02DEC80:19:44	0.1275	.	.	0.11	0.27	.	.	0.03
483	337.0	2	02DEC80:20:04	0.3280	.	.	0.15	1.17	.	.	0.03
484	337.0	2	02DEC80:21:12	0.1275	.	.	0.19	1.44	.	.	0.04
485	.	1	08DEC80:06:30	0.0089	0.07	0.07	0.05	0.06	0.01	0.01	0.01
486	344.0	2	09DEC80:10:05	0.3200	0.59	0.51	0.04	0.34	0.10	0.04	0.02
487	.	1	15DEC80:10:30	0.0018	0.11	0.11	0.02	0.08	0.01	0.01	0.01
488	.	1	22DEC80:13:50	0.0018	0.32	0.32	0.06	0.06	0.02	0.01	0.00
489	.	1	26JAN81:14:20	0.0016	0.56	0.49	0.20	0.17	0.03	0.01	0.01
490	39.0	2	05FEB81:10:21	0.3000	0.87	0.68	0.11	0.40	0.12	0.04	0.00
491	.	1	09FEB81:13:50	0.0121	0.45	0.45	0.09	0.45	.	.	0.02
492	50.0	2	19FEB81:23:00	0.9000	0.72	0.56	0.22	0.54	0.18	0.03	.
493	51.0	2	20FEB81:09:47	0.2500	0.41	0.41	0.14	0.76	0.05	0.02	0.02
494	52.0	2	21FEB81:00:30	0.3000	0.41	0.41	0.12	0.76	0.07	0.03	0.03

STATION NUTRIENT DATA

STA=51UR08

OBS	STRMNO	TYPE	TI1	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
495	53.1	2	23FEB81:09:10	1.3000	1.02	0.49	0.46	0.73	0.29	0.05	.
496	.	1	09MAR81:14:15	0.0350	0.39	0.35	0.07	0.12	.	.	0.00
497	.	1	23MAR81:14:05	0.0200	.	.	0.05	0.05	.	.	0.01
498	89.0	2	30MAR81:06:13	0.4900	2.11	0.93	0.52	0.57	0.70	0.08	.
499	91.0	2	01APR81:13:40	0.4600	1.31	0.42	0.13	0.47	0.31	0.05	0.05
500	95.0	2	05APR81:13:29	0.4800	1.51	0.47	0.15	0.35	0.36	0.05	0.05
501	.	1	06APR81:16:00	0.0200	0.50	0.50	0.09	0.11	0.03	0.03	0.01
502	99.0	2	09APR81:09:43	0.5500	0.99	0.52	0.11	0.37	0.15	0.04	0.01
503	102.0	2	12APR81:18:13	1.0000	1.73	0.67	0.34	0.65	0.23	0.05	0.05
504	104.0	2	14APR81:17:42	0.2200	1.09	0.48	0.07	0.29	0.19	0.03	0.02
505	107.0	2	17APR81:10:07	0.2100	0.53	0.38	0.12	0.44	0.07	0.04	0.02
506	.	1	20APR81:14:45	0.0200	0.53	0.38	0.05	0.08	0.05	0.03	0.01
507	113.0	2	23APR81:21:11	1.1000	2.91	0.93	.	.	0.60	0.05	.
508	117.0	2	27APR81:03:32	0.2700	.	.	0.17	.	.	.	0.01
509	.	1	27APR81:14:45	0.0250	0.47	0.35	0.07	0.07	0.04	0.02	0.02
510	120.0	2	30APR81:07:35	0.2600	1.22	0.72	0.18	1.01	0.13	0.05	0.02
511	120.1	2	30APR81:23:47	0.3900	1.36	0.49	0.24	1.60	0.24	0.05	0.02
512	121.0	2	01MAY81:10:56	1.1600	2.24	0.82	0.34	0.93	0.60	0.12	0.12
513	.	1	04MAY81:14:33	0.0121	0.55	0.47	0.15	0.00	0.04	0.02	0.00
514	131.1	2	11MAY81:11:25	2.5400	1.21	0.55	0.22	0.29	0.21	0.05	0.04
515	135.0	2	15MAY81:12:05	0.2400	1.50	0.82	0.25	0.68	0.18	0.02	0.02
516	.	1	18MAY81:13:45	0.0121	0.23	0.21	0.16	0.09	0.05	0.04	0.01
517	149.0	2	29MAY81:21:22	0.5600	0.75	0.60	0.20	0.18	0.10	0.05	0.01
518	.	1	08JUN81:14:54	0.0200	0.51	0.42	0.17	0.54	0.04	0.03	0.01
519	161.1	2	10JUN81:18:19	1.0500	2.69	0.67	0.10	0.41	0.62	0.04	0.03
520	164.0	2	13JUN81:22:00	1.3900	2.16	0.65	0.04	0.51	0.53	0.04	0.03
521	171.0	2	20JUN81:15:23	0.4100	1.81	1.04	0.35	0.89	0.20	0.07	0.01
522	172.0	2	21JUN81:20:22	1.2200	1.56	0.58	0.19	0.56	0.41	0.07	0.03
523	.	1	22JUN81:14:20	0.0061	0.91	0.91	0.41	0.15	0.05	0.05	0.01
524	176.0	2	25JUN81:20:41	3.7100	1.95	1.01	0.18	0.39	0.48	0.23	0.08
525	.	1	29JUN81:14:25	0.0089	0.56	0.51	0.33	0.11	0.04	0.03	0.01
526	183.0	2	02JUL81:13:35	0.3000	1.21	0.78	0.14	0.60	0.28	0.17	0.07
527	184.0	2	03JUL81:04:50	0.5100	1.16	0.54	0.06	0.62	0.18	0.07	0.01
528	185.0	2	04JUL81:02:51	4.8200	1.38	0.56	0.10	0.21	0.33	0.11	0.10
529	.	1	13JUL81:13:50	0.0061	0.69	0.69	0.27	0.03	0.05	0.03	0.01
530	.	1	20JUL81:14:35	0.0038	0.75	0.69	0.26	0.09	0.05	0.03	0.01
531	205.0	2	24JUL81:14:24	0.5900	4.32	2.08	0.36	1.31	0.60	0.04	0.02
532	206.0	2	25JUL81:07:44	3.6700	2.72	1.15	0.34	0.73	0.55	0.04	0.03
533	.	1	27JUL81:14:41	0.0465	0.50	0.50	0.07	0.48	0.05	0.05	0.02
534	215.0	2	03AUG81:12:00	0.2600	2.23	0.87	0.16	1.07	0.54	0.12	0.09

STA=51UR09

OBS	STRMNO	TYPE	TI1	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
535	276.00	2	02OCT80:16:46	0.22	.	.	5.25	2.81	.	.	0.99
536	299.00	2	25OCT80:03:40	0.82	3.16	2.85	1.34	1.01	1.35	1.35	1.19
537	309.00	2	04NOV80:14:29	0.11	1.31	1.31	0.43	0.81	0.35	0.35	0.26
538	314.00	2	09NOV80:00:27	0.19	2.53	1.87	0.09	1.81	0.42	0.29	0.18
539	322.00	2	17NOV80:16:03	0.70	2.78	2.55	0.55	0.68	0.56	0.53	0.40
540	329.01	2	24NOV80:07:06	1.20	9.70	0.63	0.16	0.30	0.44	0.22	0.21
541	329.03	2	24NOV80:18:34	0.11	5.74	5.74	3.24	1.49	0.43	0.42	0.31
542	332.00	2	27NOV80:14:12	0.06	1.85	1.78	0.32	0.92	0.14	0.13	0.08

STATION NUTRIENT DATA

STA=510R09

OBS	STRMNO	TYPE	TI	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
543	344.0	2	09DEC80:12:19	0.13	1.23	1.03	0.07	0.90	0.10	0.04	0.02
544	351.0	2	16DEC80:04:07	0.19	.	.	0.31	3.77	.	.	0.01
545	358.0	2	23DEC80:11:05	0.20	.	.	0.96	3.38	.	.	0.06
546	33.0	2	02FEB81:06:24	0.47	.	1.75	0.48	1.00	0.32	.	0.29
547	39.0	2	08FEB81:12:30	0.22	2.25	2.15	0.41	0.64	0.30	0.26	0.19
548	42.0	2	11FEB81:00:45	0.46	2.16	2.05	0.42	0.72	0.32	0.28	0.20
549	50.0	2	19FEB81:15:11	0.30	1.13	1.13	0.16	0.98	0.09	0.07	0.04
550	51.0	2	20FEB81:15:20	0.21	0.92	0.86	0.12	0.78	0.08	0.06	0.04
551	53.0	2	22FEB81:13:50	0.24	1.50	1.33	0.32	.	0.10	0.08	0.06
552	89.0	2	30MAR81:09:09	0.08	1.09	0.62	0.22	0.59	0.11	0.08	0.06
553	91.0	2	01APR81:15:12	0.36	3.21	2.41	1.46	0.61	0.63	0.47	0.43
554	95.0	2	05APR81:16:56	0.19	1.20	0.84	0.16	0.35	0.14	0.11	0.07
555	99.0	2	09APR81:10:48	0.18	1.15	0.94	0.32	0.45	0.14	0.11	0.09
556	104.0	2	14APR81:05:22	0.46	2.63	2.46	0.47	0.42	0.22	0.18	0.12
557	107.0	2	17APR81:11:15	0.36	1.49	1.11	0.39	1.61	0.17	0.10	0.08
558	110.0	2	20APR81:01:55	0.25	1.70	1.28	0.45	2.37	0.13	0.07	0.04
559	121.0	2	01MAY81:08:15	0.57	2.01	1.89	0.60	0.85	0.32	0.30	0.21
560	130.0	2	10MAY81:15:38	0.32	1.85	1.70	0.40	0.63	0.18	0.13	0.09
561	135.0	2	15MAY81:12:19	0.72	2.27	1.24	0.50	0.56	0.38	0.26	0.19
562	138.0	2	18MAY81:20:21	0.17	2.35	2.22	0.78	0.46	0.26	0.23	0.19
563	154.0	2	03JUN81:20:57	1.07	3.22	2.81	0.55	0.37	0.33	0.27	0.20
564	155.0	2	04JUN81:17:01	1.15	2.18	1.74	0.47	0.53	0.76	0.72	0.23
565	171.0	2	20JUN81:00:56	0.62	2.52	1.70	0.87	1.15	0.79	0.57	.
566	182.0	2	01JUL81:07:10	0.67	1.87	1.87	0.50	1.03	0.30	0.25	0.21
567	185.0	2	03JUL81:15:28	1.39	2.32	1.93	1.29	0.80	0.14	0.08	0.05
568	209.0	2	28JUL81:10:29	1.25	0.64	0.52	0.26	0.59	0.28	0.21	0.10
569	213.0	2	05AUG81:10:24	0.59	1.04	0.69	0.22	0.89	0.17	0.11	0.09
570	219.0	2	07AUG81:23:53	1.08	1.20	0.77	0.24	0.52	0.31	0.24	0.20
571	223.0	2	11AUG81:18:54	1.25	1.51	1.13	.	.	0.44	0.37	.
572	242.0	2	30AUG81:07:42	0.15	2.73	2.23	0.49	0.43	0.44	0.39	0.30
573	243.1	2	31AUG81:11:19	0.59	2.20	1.93	0.57	0.53	0.31	0.28	0.20
574	251.0	2	08SEP81:15:41	0.24	1.24	0.97	0.26	0.35	0.24	0.21	0.16
575	258.0	2	15SEP81:16:40	0.33	3.01	2.61	1.08	0.64	0.75	0.72	0.52
576	260.0	2	17SEP81:04:18	0.18	2.65	2.48	0.70	1.49	0.32	0.28	0.22
577	274.0	2	01OCT81:21:14	0.31	3.52	2.90	1.60	0.96	1.03	0.88	0.80
578	291.0	2	18OCT81:17:36	0.10	3.24	2.61	0.97	1.09	0.30	0.20	0.15
579	296.0	2	23OCT81:07:35	0.20	1.45	1.36	0.28	0.67	0.23	0.23	0.17
580	298.0	2	25OCT81:14:58	0.05	1.85	1.83	0.38	0.51	0.16	0.15	0.10
581	299.0	2	26OCT81:12:39	0.28	1.82	1.58	0.25	0.33	0.30	0.29	0.20
582	300.0	2	27OCT81:05:42	0.35	1.87	1.67	0.14	0.35	0.34	0.34	0.20
583	309.0	2	05NOV81:23:54	0.58	2.59	2.13	1.08	0.97	0.43	0.32	0.28
584	335.0	2	01DEC81:11:04	0.14	1.00	0.95	0.32	0.44	0.41	0.27	0.23

STATION NUTRIENT DATA

----- STA=S1UR10 -----

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
585	292.1	2	16OCT80:15:25	0.34000	1.82	1.21	0.32	2.20	0.33	0.18	0.13
586	299.0	2	25OCT80:03:38	1.60000	0.85	0.50	0.14	0.33	0.60	0.38	0.31
587	299.1	2	25OCT80:14:03	1.54000	0.71	0.50	0.04	0.41	0.31	0.24	0.19
588	322.0	2	17NOV80:15:48	0.89000	0.86	0.84	0.51	0.50	0.44	0.40	0.35
589	329.0	2	24NOV80:10:05	1.24000	0.78	0.55	0.32	0.32	0.44	0.33	0.33
590	344.0	2	09DEC80:13:48	0.26777	.	.	8.50	1.04	.	.	2.10
591	33.0	2	02FEB81:06:25	0.49000	4.06	3.35	1.87	0.78	1.55	1.07	0.99
592	39.0	2	08FEB81:11:34	0.56000	2.59	2.15	1.06	1.26	0.93	.	0.65
593	50.0	2	19FEB81:23:18	0.55000	.	3.28	0.88	0.50	0.65	0.51	0.46
594	51.0	2	20FEB81:22:49	0.35000	0.78	0.43	0.20	0.60	0.17	.	0.12
595	53.0	2	22FEB81:22:48	0.43000	1.00	0.77	0.16	0.64	0.17	0.13	0.11
596	75.0	2	16MAR81:12:45	0.27559	.	.	0.40	1.10	.	.	0.06
597	91.0	2	01APR81:16:30	1.06000	1.74	0.54	0.36	0.46	0.49	0.15	0.15
598	95.0	2	05APR81:16:39	0.66000	2.89	0.99	0.22	0.45	0.61	0.10	0.08
599	99.0	2	09APR81:09:52	0.48000	1.11	0.70	0.00	0.57	0.16	0.07	0.04
600	101.0	2	11APR81:10:18	0.77000	1.27	0.86	0.35	0.55	0.19	0.08	0.08
601	104.0	2	14APR81:05:32	1.02972	1.38	0.95	0.33	0.57	0.20	0.10	0.09
602	121.0	2	01MAY81:08:07	0.93000	1.55	0.97	0.41	0.90	0.22	0.14	0.11
603	130.0	2	10MAY81:21:38	0.25362	1.64	1.15	0.48	0.76	0.23	0.12	0.09
604	131.0	2	11MAY81:12:15	0.16399	.	.	0.24	0.39	.	.	0.07
605	133.0	2	18MAY81:20:32	0.08104	1.00	0.69	0.35	0.54	0.13	0.09	0.07
606	139.0	2	19MAY81:13:47	0.23000	0.86	0.37	0.17	0.34	0.15	0.11	0.06
607	147.0	2	27MAY81:14:53	0.36000	3.62	2.95	1.56	1.93	0.60	0.34	0.31
608	148.0	2	28MAY81:13:02	0.24000	2.88	2.53	0.26	1.38	0.37	.	0.17
609	149.0	2	29MAY81:14:26	0.30000	2.21	2.15	0.70	1.14	0.28	0.18	0.15
610	150.0	2	30MAY81:11:10	0.23000	3.27	3.21	1.26	1.04	0.24	0.19	.
611	152.0	2	01JUN81:13:59	0.29000	1.69	1.34	0.26	1.20	0.16	0.16	0.11
612	154.0	2	03JUN81:14:35	0.99000	2.11	1.30	0.39	0.72	0.36	0.18	0.18
613	155.0	2	04JUN81:17:06	0.39000	1.65	1.22	0.24	0.76	0.36	0.23	0.20
614	156.0	2	05JUN81:22:40	0.15699	3.01	2.76	0.24	1.22	0.24	0.20	0.17
615	160.0	2	09JUN81:11:24	0.21512	3.01	2.59	0.30	1.12	0.27	0.20	0.18
616	164.0	2	13JUN81:22:45	0.57000	2.69	2.27	0.29	0.93	0.35	0.23	0.20
617	183.0	2	02JUL81:13:10	8.88889	1.99	1.33	0.14	0.63	0.28	0.13	0.04
618	184.0	2	03JUL81:15:25	0.44768	0.72	0.70	0.04	0.21	0.23	0.17	0.02
619	205.0	2	24JUL81:14:30	0.06892	4.19	1.87	0.50	2.08	0.66	0.31	0.25
620	209.1	2	28JUL81:16:21	1.03000	3.09	2.01	0.26	0.53	0.57	0.26	.
621	219.0	2	08AUG81:05:35	0.71429	0.88	0.55	0.20	0.77	0.21	0.14	0.10
622	223.0	2	11AUG81:19:52	0.15306	2.36	1.97	0.18	1.01	0.37	0.27	0.24
623	227.0	2	15AUG81:20:25	3.66667	0.98	0.50	0.19	0.28	0.24	0.16	0.14
624	258.0	2	15SEP81:16:45	0.57000	1.33	0.80	0.27	0.32	0.33	0.26	0.22
625	260.0	2	17SEP81:04:11	1.20370	1.22	1.10	0.51	2.42	0.10	0.07	0.04
626	274.0	2	01OCT81:21:08	0.37267	3.52	1.91	0.43	1.19	1.03	0.78	0.60
627	296.0	2	23OCT81:08:04	0.16000	1.42	1.23	0.16	0.55	0.28	0.23	0.18
628	299.0	2	26OCT81:11:26	0.64000	0.96	0.87	0.06	0.10	0.20	0.17	0.10
629	335.0	2	01DEC81:09:28	0.16000	2.58	2.20	1.37	0.91	0.62	0.62	0.56
630	348.0	2	14DEC81:15:20	0.34000	1.00	0.91	0.41	0.40	0.28	0.25	0.25
631	357.0	2	23DEC81:05:01	0.18598	1.76	1.76	0.44	0.68	0.62	0.50	0.44

STATION NUTRIENT DATA

-- STA=51UR11 --

OBS	STR-NO	TYPE	TTT	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
632	277.00	2	03OCT80:10:15	0.00100	1.54	1.23	0.21	2.69	0.33	0.26	0.20
633	277.00	2	03OCT80:11:13	0.00100	2.14	1.79	0.57	2.63	0.43	0.36	0.28
634	277.00	2	03OCT80:12:06	0.00100	2.14	1.62	0.31	1.65	0.44	0.34	0.26
635	277.00	2	03OCT80:13:03	0.00400	2.10	1.46	0.33	1.25	0.48	0.32	0.25
636	292.00	2	18OCT80:08:54	0.03000	.	.	0.61	5.25	.	.	0.18
637	292.00	2	18OCT80:09:06	0.06000	.	.	0.61	4.24	.	.	0.21
638	292.00	2	18OCT80:09:17	0.06000	.	.	0.67	3.58	.	.	0.25
639	292.00	2	18OCT80:09:28	0.06000	.	.	0.67	3.66	.	.	0.24
640	292.00	2	18OCT80:09:39	0.05000	3.44	2.80	0.75	3.27	0.57	0.43	0.26
641	292.00	2	18OCT80:09:51	0.05000	3.12	2.30	0.59	3.25	0.54	0.41	0.27
642	292.00	2	18OCT80:10:06	0.04000	2.98	2.54	0.59	3.13	0.52	0.42	0.26
643	292.00	2	18OCT80:10:23	0.03000	2.78	2.34	0.57	3.13	0.52	0.41	0.26
644	292.00	2	18OCT80:10:42	0.03000	3.10	1.79	0.52	2.95	0.54	0.39	0.26
645	292.00	2	18OCT80:11:10	0.00500	1.29	0.95	0.36	1.45	0.35	0.24	0.16
646	299.00	2	25OCT80:04:39	0.86000	0.66	0.58	0.20	0.35	0.58	0.42	0.36
647	309.00	2	04NOV80:03:46	0.16000	.	.	34.21	0.97	.	.	12.05
648	329.01	2	24NOV80:10:36	1.40000	0.65	0.55	0.32	0.28	0.37	0.31	0.31
649	329.02	2	24NOV80:22:05	0.52000	0.71	0.67	0.32	0.30	0.43	0.37	0.37
650	332.00	2	27NOV80:22:26	0.12000	1.38	1.16	0.58	0.64	0.34	0.30	0.27
651	344.00	2	09DEC80:14:10	0.11000	.	.	14.10	0.69	.	.	3.70
652	33.00	2	02FEB81:06:57	0.76000	3.51	2.16	1.45	0.80	1.11	0.78	0.78
653	99.00	2	09APR81:10:51	0.53000	0.66	0.45	0.20	0.58	0.12	0.09	0.07
654	101.00	2	11APR81:10:57	0.58000	0.84	0.73	0.23	0.48	0.12	0.07	0.07
655	130.00	2	10MAY81:21:52	0.44000	1.17	0.82	0.46	0.63	0.21	0.14	0.11
656	131.00	2	11MAY81:12:39	0.49000	.	.	0.26	0.48	.	.	0.09
657	138.00	2	18MAY81:21:18	0.10000	0.79	0.60	0.31	0.68	0.23	0.08	0.08
658	139.00	2	19MAY81:14:20	0.50000	0.69	0.58	0.15	0.36	0.12	0.06	0.06
659	148.00	2	28MAY81:06:26	0.32000	1.40	0.93	0.25	0.90	0.27	.	0.18
660	148.10	2	28MAY81:15:44	0.65000	2.04	1.94	0.82	0.60	0.21	0.16	0.14
661	149.00	2	29MAY81:14:36	0.71000	1.96	1.79	1.46	0.84	0.14	0.10	.
662	150.00	2	30MAY81:22:00	0.45000	1.87	1.63	0.42	0.72	0.14	0.12	0.09
663	152.00	2	01JUN81:15:50	0.72000	1.52	0.79	0.16	1.14	0.22	0.10	0.10
664	155.00	2	04JUN81:11:44	0.75000	1.20	0.93	0.26	0.39	0.46	0.33	0.16
665	157.00	2	06JUN81:01:33	0.65000	0.99	0.75	0.24	0.60	0.29	0.20	0.10
666	171.00	2	20JUN81:12:56	0.19784	3.55	2.78	0.63	0.79	0.52	0.14	.
667	172.00	2	21JUN81:20:50	0.26000	3.10	2.81	0.51	1.15	0.23	0.12	.
668	176.00	2	25JUN81:19:08	0.15152	3.55	3.43	0.83	2.33	0.19	0.16	.
669	183.00	2	02JUL81:15:29	0.08592	3.59	3.59	1.09	1.11	0.52	0.46	0.26
670	184.00	2	03JUL81:16:02	0.53000	0.94	0.94	0.10	0.27	0.20	0.17	0.04
671	209.10	2	28JUL81:15:35	1.56000	1.37	1.06	0.29	0.57	0.59	0.48	0.42
672	218.00	2	06AUG81:12:09	0.52764	3.37	1.00	0.22	1.03	0.33	0.25	0.22
673	219.00	2	07AUG81:23:47	0.41000	1.35	1.20	0.22	0.77	0.21	0.16	0.13
674	258.00	2	15SEP81:17:33	0.30000	1.15	0.95	0.27	0.34	0.33	0.28	0.24
675	274.00	2	01OCT81:23:03	0.26611	3.03	1.74	0.69	0.96	0.94	0.71	0.57
676	299.00	2	26OCT81:11:56	0.48000	0.87	0.72	0.03	0.07	0.21	0.18	0.10
677	335.00	2	01DEC81:11:46	0.12000	2.10	1.93	1.33	0.83	0.61	0.57	0.51
678	348.00	2	14DEC81:16:29	0.19000	0.85	0.80	0.26	0.38	0.25	0.22	0.22
679	357.00	2	23DEC81:04:07	0.19666	1.57	1.42	0.32	0.50	0.35	0.33	0.28

STATION NUTRIENT DATA

STA=51UR15

OBS	STRMNO	TYPE	TIME	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
680	299.0	2	25OCT80:02:54	0.16	16.07	13.07	3.34	1.99	2.26	1.53	0.87
681	299.0	2	25OCT80:03:19	0.08	.	3.68	1.69	0.70	0.44	0.32	0.22
682	299.0	2	25OCT80:03:43	0.16	2.31	2.07	1.22	0.49	0.28	0.24	0.18
683	299.0	2	25OCT80:04:29	0.16	1.11	0.95	0.46	0.32	0.22	0.19	0.14
684	299.0	2	25OCT80:05:11	0.16	1.01	0.95	0.52	0.28	0.20	0.17	0.12
685	299.0	2	25OCT80:05:37	0.08	0.75	0.67	0.34	0.19	0.20	0.17	0.13
686	299.0	2	25OCT80:06:01	0.08	0.69	0.65	0.32	0.26	0.18	0.16	0.13
687	299.0	2	25OCT80:06:24	0.16	0.79	0.75	0.36	0.36	0.18	0.17	0.14
688	299.0	2	25OCT80:07:11	0.05	0.55	0.53	0.28	0.17	0.14	0.13	0.09
689	299.0	2	25OCT80:07:45	0.01	0.55	0.49	0.20	0.13	0.17	0.15	0.12
690	299.1	2	25OCT80:10:53	0.01	.	.	1.00	1.22	.	.	0.89
691	299.1	2	25OCT80:11:28	0.03	2.11	1.64	0.50	0.86	0.68	0.47	0.47
692	299.1	2	25OCT80:12:01	0.12	2.01	1.90	0.62	1.20	0.89	0.83	0.69
693	299.1	2	25OCT80:13:52	0.03	0.86	0.70	0.24	0.45	0.28	0.17	0.15
694	299.1	2	25OCT80:14:36	0.08	1.82	1.56	0.58	0.88	0.77	0.65	0.53
695	299.1	2	25OCT80:14:55	0.22	1.82	1.59	0.50	1.01	0.88	0.80	0.63
696	299.1	2	25OCT80:15:15	0.12	2.26	1.76	0.60	1.11	0.94	0.87	0.68
697	299.1	2	25OCT80:15:41	0.08	2.60	2.18	0.48	1.16	0.98	0.89	0.67
698	299.1	2	25OCT80:16:03	0.12	1.99	1.99	0.44	1.34	0.99	0.86	0.71
699	299.1	2	25OCT80:16:24	0.12	1.40	1.40	0.30	0.90	0.51	0.44	0.30
700	299.1	2	25OCT80:16:43	0.08	1.02	0.74	0.32	0.70	0.35	0.25	0.24
701	299.1	2	25OCT80:17:06	0.22	1.00	0.86	0.24	0.63	0.33	0.29	0.24
702	299.1	2	25OCT80:17:26	0.08	1.42	1.23	0.38	0.84	0.48	0.40	0.36
703	299.1	2	25OCT80:17:50	0.12	1.78	1.78	0.40	1.07	0.59	0.57	0.40
704	299.1	2	25OCT80:18:09	0.12	2.31	2.18	0.46	1.28	0.73	0.68	0.50
705	344.0	2	09DEC80:12:51	0.59	4.07	3.78	0.65	0.40	0.26	0.16	0.14
706	21.0	2	21JAN81:10:41	0.25	3.09	.	1.19	1.78	0.73	0.23	0.22
707	33.0	2	02FEB81:05:58	2.23	2.45	1.23	0.48	0.61	0.95	0.28	.
708	39.0	2	08FEB81:10:57	0.82	1.36	1.28	0.45	0.94	0.55	0.25	0.19
709	50.0	2	19FEB81:22:56	0.85	0.90	0.68	0.40	0.38	0.24	0.10	.
710	51.0	2	20FEB81:22:47	0.83	0.92	0.60	0.30	0.32	0.20	0.12	.
711	52.0	2	21FEB81:16:49	0.04	1.38	1.29	0.28	1.49	0.24	0.20	0.17
712	53.0	2	22FEB81:12:40	0.87	1.27	1.15	0.48	0.30	0.23	0.16	0.14
713	63.0	2	04MAR81:20:15	0.33	2.74	2.70	0.79	0.48	0.33	0.28	0.27
714	95.0	2	05APR81:17:00	0.33	1.67	0.83	0.32	0.35	0.35	0.13	0.11
715	95.0	2	05APR81:18:11	0.84	1.72	0.50	0.25	0.33	0.27	0.08	0.07
716	95.0	2	05APR81:16:49	0.33	1.03	1.03	0.36	0.37	0.20	0.15	0.11
717	99.0	2	09APR81:10:36	0.75	0.78	0.70	0.28	0.49	0.19	0.14	0.10
718	99.0	2	09APR81:11:07	1.00	0.42	0.30	0.18	0.31	0.14	0.08	0.07
719	99.0	2	09APR81:11:40	0.50	0.49	0.32	0.20	0.37	0.13	0.08	0.07
720	99.0	2	09APR81:12:11	0.21	0.47	0.19	0.19	0.39	0.13	0.06	0.06
721	101.0	2	11APR81:09:59	0.25	2.83	0.88	0.17	0.95	0.46	0.07	0.02
722	101.0	2	11APR81:10:20	0.79	1.83	0.50	0.11	0.29	0.29	0.06	0.03
723	101.0	2	11APR81:10:50	1.04	1.27	0.45	0.09	0.19	0.26	0.05	0.03
724	101.0	2	11APR81:11:27	0.25	1.03	0.69	0.17	0.35	0.15	0.10	0.06
725	102.0	2	12APR81:19:11	0.75	1.96	0.98	0.06	1.42	0.31	0.07	0.07
726	102.0	2	12APR81:19:32	1.80	1.00	0.71	0.12	0.86	0.16	0.06	0.02
727	102.0	2	12APR81:19:45	1.00	0.96	0.77	0.14	0.97	0.12	0.08	0.07
728	102.0	2	12APR81:20:17	0.21	1.49	1.19	0.12	1.42	0.19	0.14	0.14
729	102.0	2	12APR81:20:51	2.84	2.11	0.85	0.47	0.46	0.26	0.06	0.04
730	102.0	2	12APR81:20:54	4.68	2.19	0.58	0.29	0.42	0.82	0.05	0.03
731	102.0	2	12APR81:20:58	3.34	1.13	0.60	0.29	0.35	0.27	0.07	0.05
732	102.0	2	12APR81:21:07	1.25	1.28	1.05	0.39	0.33	0.22	0.12	0.11
733	102.0	2	12APR81:21:22	0.96	1.73	1.39	0.45	0.33	0.23	0.16	0.14

STATION NUTRIENT DATA

--- STA=51UR15 ---

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
734	102.0	2	12APR81:21:39	0.75000	1.53	1.17	0.39	0.29	0.30	0.15	0.13
735	102.0	2	12APR81:22:15	0.50000	.	.	0.47	0.35	.	.	0.13
736	102.0	2	12APR81:23:19	0.46000	1.32	0.88	0.31	0.54	0.19	0.10	0.10
737	102.0	2	12APR81:23:45	1.50000	0.88	0.70	0.25	0.42	0.12	0.09	0.06
738	102.0	2	13APR81:00:00	0.96000	0.94	0.77	0.25	0.33	0.12	0.10	0.06
739	102.0	2	13APR81:00:28	0.21000	.	1.49	0.41	0.33	.	0.21	0.14
740	102.0	2	13APR81:01:58	0.21000	3.06	2.39	0.45	0.37	0.44	0.30	0.21
741	102.0	2	13APR81:04:49	0.21000	3.06	2.66	0.53	0.44	0.40	0.31	0.22
742	102.0	2	13APR81:07:52	0.04000	.	2.43	0.31	0.52	.	0.24	0.17
743	103.0	2	13APR81:10:17	0.28000	1.43	1.18	0.23	0.63	0.24	0.10	0.06
744	113.0	2	23APR81:20:59	1.04000	3.04	0.70	0.34	0.38	0.60	0.10	0.07
745	113.0	2	23APR81:21:06	1.84000	1.68	0.26	0.26	0.22	0.33	0.07	0.04
746	113.0	2	23APR81:21:26	0.79000	0.84	0.47	0.22	0.26	0.17	0.08	0.06
747	121.0	2	01MAY81:10:23	1.12000	1.93	1.12	0.42	0.60	0.24	0.14	0.13
748	130.0	2	10MAY81:21:25	0.91000	1.78	0.75	0.42	0.26	0.51	0.09	0.03
749	131.0	2	11MAY81:12:09	0.40000	1.01	0.65	0.20	0.26	0.14	0.09	0.05
750	135.0	2	15MAY81:12:10	0.19060	1.55	0.45	.	0.74	0.37	0.15	0.11
751	138.0	2	18MAY81:19:44	0.17000	2.12	1.26	0.87	0.66	0.22	0.08	0.08
752	139.0	2	19MAY81:14:22	0.29000	1.45	1.24	0.41	0.28	0.19	0.14	0.13
753	144.0	2	28MAY81:12:08	0.40580	2.03	1.11	0.52	0.44	0.84	0.14	0.10
754	152.0	2	01JUN81:17:13	0.76000	0.77	0.66	0.26	0.61	0.12	0.06	0.05
755	154.0	2	03JUN81:21:40	1.70000	1.84	1.44	0.42	0.51	0.29	0.19	0.14
756	157.0	2	06JUN81:00:20	1.42000	1.35	0.79	0.40	0.75	0.20	0.11	0.09
757	161.0	2	10JUN81:02:41	0.55000	1.00	0.60	0.30	0.53	0.20	0.11	0.06
758	164.0	2	13JUN81:22:42	1.54000	1.18	0.76	0.17	0.71	0.18	0.12	0.10
759	182.0	2	01JUL81:15:32	0.21000	2.20	1.11	0.42	1.11	0.41	0.12	0.11
760	182.1	2	01JUL81:21:10	0.06000	1.15	0.88	0.23	0.69	0.19	0.13	0.10
761	201.0	2	20JUL81:18:15	3.98000	4.49	3.44	1.32	0.57	1.42	1.14	0.48
762	209.0	2	28JUL81:11:53	0.67000	2.07	0.66	0.22	0.81	1.10	0.23	0.14
763	209.1	2	28JUL81:19:23	0.42000	1.02	0.54	0.38	1.35	0.39	0.39	0.10
764	218.0	2	06AUG81:10:16	0.39000	1.01	0.84	0.30	0.91	0.17	0.13	0.10
765	220.0	2	08AUG81:00:21	0.26000	0.72	0.59	0.18	1.20	0.13	0.10	0.07
766	223.0	2	11AUG81:18:54	0.76000	1.62	1.04	0.18	0.81	0.54	0.48	0.36
767	227.0	2	15AUG81:20:25	0.57000	1.23	0.66	0.13	0.47	0.15	0.10	0.06
768	242.0	2	30AUG81:07:23	0.78000	1.11	0.95	0.06	0.13	0.20	0.18	0.09
769	243.0	2	31AUG81:04:02	0.44000	1.43	1.36	0.18	0.45	0.18	0.15	0.08
770	251.0	2	08SEP81:13:40	0.36000	1.75	0.74	0.23	0.77	0.18	0.16	0.10
771	258.1	2	15SEP81:16:58	0.49000	1.72	1.60	0.45	0.49	0.41	0.37	0.28
772	274.0	2	01OCT81:21:10	0.29000	3.29	2.74	0.73	1.27	0.55	0.44	0.38
773	291.0	2	18OCT81:17:34	1.30000	6.55	3.43	1.30	1.05	1.38	0.65	0.50
774	296.0	2	23OCT81:07:58	0.32000	1.09	0.77	0.65	0.59	0.20	0.16	.
775	298.0	2	25OCT81:14:46	0.45000	1.43	1.27	0.20	0.34	0.31	0.24	0.19
776	304.0	2	05NOV81:23:05	0.29762	6.08	5.48	2.17	1.15	0.87	0.74	0.65
777	335.0	2	01DEC81:12:32	0.35000	1.73	1.02	0.45	0.60	0.40	0.26	0.22

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STATION NUTRIENT DATA

STA=51UR16

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
778	228.0	2	15AUG80:18:30	1.850	0.90	0.76	0.20	0.14	0.07	0.04	0.01
779	.	1	15SEP80:13:48	0.005	0.79	0.21	0.08	0.03	0.07	0.04	0.01
780	.	1	22SEP80:10:05	0.005	1.70	1.18	0.18	0.07	0.13	0.06	0.01
781	.	1	29SEP80:09:50	0.005	0.88	0.71	0.10	0.10	0.08	0.04	0.01
782	.	1	06OCT80:13:30	0.005	0.78	0.66	0.18	0.65	0.06	0.04	0.02
783	.	1	20OCT80:14:15	0.005	0.79	0.65	0.11	0.26	0.03	0.01	0.01
784	.	1	27OCT80:11:10	0.005	0.91	0.82	0.19	0.40	0.05	0.03	0.01
785	.	1	03NOV80:11:06	0.010	0.63	0.47	0.04	0.40	0.04	0.03	0.00
786	.	1	10NOV80:10:20	0.010	0.71	0.56	0.05	0.28	0.05	0.04	0.00
787	.	1	17NOV80:09:45	0.010	0.64	0.52	0.06	0.39	0.04	0.03	0.00
788	322.0	2	17NOV80:16:37	0.630	0.90	0.73	0.16	0.40	0.09	0.05	0.02
789	329.0	2	24NOV80:06:47	1.220	1.27	1.07	0.26	0.52	0.21	0.16	0.14
790	.	1	01DEC80:09:30	0.010	0.80	0.74	0.09	0.69	0.10	0.06	0.03
791	.	1	08DEC80:13:30	0.010	1.45	0.82	0.11	0.82	0.10	0.05	0.02
792	.	1	15DEC80:14:00	0.010	1.40	0.81	0.16	0.86	0.08	0.03	0.01
793	.	1	22DEC80:09:45	0.005	1.56	0.85	0.14	1.09	0.06	0.03	0.00
794	.	1	12JAN81:13:00	0.005	1.62	1.41	0.29	1.43	0.07	0.03	0.01
795	.	1	26JAN81:10:40	0.005	1.66	1.51	0.64	1.21	0.08	0.05	0.00
796	.	1	09FEB81:10:25	0.005	1.66	1.04	0.15	0.94	0.14	.	0.04
797	51.0	2	20FEB81:01:19	0.490	1.66	0.96	0.96	0.62	0.16	0.05	0.03
798	51.1	2	20FEB81:23:38	0.490	1.55	0.96	0.50	0.58	0.15	0.05	0.03
799	54.0	2	23FEB81:00:08	0.720	1.43	1.11	0.48	0.48	0.15	0.07	0.03
800	63.0	2	04MAR81:11:17	0.100	1.99	1.64	0.51	0.66	0.16	0.10	0.06
801	.	1	09MAR81:11:20	0.010	1.26	.	0.59	0.82	0.07	.	0.05
802	.	1	16MAR81:10:00	0.020	0.70	0.70	0.65	0.88	0.10	0.08	0.03
803	75.0	2	16MAR81:13:09	0.130	1.70	1.15	0.64	0.96	0.12	0.04	0.03
804	.	1	23MAR81:09:30	0.010	.	.	0.73	1.06	.	.	0.05
805	89.0	2	30MAR81:09:03	0.100	1.76	1.48	0.63	1.01	0.10	0.06	0.02
806	91.0	2	01APR81:17:27	0.270	1.80	1.44	0.46	0.90	0.11	0.07	0.02
807	.	1	06APR81:10:35	0.005	1.43	1.36	0.18	0.73	0.11	0.07	0.02
808	99.0	2	09APR81:10:59	0.350	0.74	0.66	0.14	0.68	0.12	0.06	0.02
809	101.0	2	11APR81:10:35	0.250	2.57	0.82	0.23	0.48	0.23	0.04	0.01
810	104.0	2	14APR81:03:17	0.360	1.32	0.91	0.19	0.50	0.09	0.05	.
811	107.0	2	17APR81:11:31	0.020	.	.	0.39	0.44	.	.	0.03
812	.	1	20APR81:10:50	0.010	1.07	0.75	0.11	0.47	0.07	0.04	0.01
813	113.0	2	23APR81:11:51	0.290	1.15	0.86	0.20	0.48	0.08	0.05	0.02
814	.	1	27APR81:09:40	0.010	0.47	0.35	0.15	0.32	0.04	0.02	0.01
815	118.0	2	28APR81:17:31	0.130	1.01	0.78	0.22	0.46	0.07	0.04	0.00
816	121.0	2	01MAY81:10:44	1.080	1.32	1.02	0.31	0.37	0.16	0.07	0.03
817	.	1	04MAY81:09:58	0.005	1.05	1.05	0.45	0.29	0.08	0.06	0.01
818	130.0	2	10MAY81:16:30	0.230	1.57	1.39	0.56	0.99	0.09	0.05	0.02
819	.	1	11MAY81:10:00	0.020	1.32	1.02	0.45	0.20	0.16	0.07	0.01
820	131.0	2	11MAY81:12:46	0.180	0.91	0.78	0.46	0.23	0.07	0.05	0.01
821	135.0	2	15MAY81:12:39	0.070	.	.	0.12	0.41	0.03	0.02	0.02
822	.	1	18MAY81:09:35	0.005	.	.	0.18	0.33	0.10	0.05	0.01
823	138.0	2	18MAY81:20:36	0.060	1.32	0.96	0.29	0.30	0.13	0.04	0.00
824	139.0	2	19MAY81:15:09	0.140	1.59	1.12	0.41	0.30	0.12	0.04	0.00
825	148.0	2	28MAY81:15:45	0.420	1.63	0.76	0.14	0.18	0.15	0.04	0.00
826	.	1	01JUN81:11:00	0.005	0.99	0.77	0.13	0.21	0.14	0.05	0.01
827	153.0	2	02JUN81:04:20	0.260	1.10	0.93	0.26	0.21	0.06	0.01	0.01
828	154.0	2	03JUN81:22:03	1.290	0.91	0.64	0.26	0.33	0.09	0.04	0.00
829	157.0	2	06JUN81:01:26	0.070	1.20	0.91	0.38	0.21	0.10	0.06	0.01
830	.	1	08JUN81:11:45	0.005	1.09	0.74	0.09	0.07	0.07	0.04	0.01
831	161.0	2	10JUN81:02:50	0.220	1.59	1.01	0.17	0.04	0.13	0.06	0.01

STATION NUTRIENT DATA

STA=51UR16

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
832	164	2	13JUN81:23:20	0.300	1.39	0.90	0.19	0.04	0.21	0.08	0.01
833	171	2	20JUN81:01:06	0.190	1.59	1.25	0.43	0.11	0.19	0.04	0.01
834	176	2	25JUN81:19:48	0.190	2.55	0.90	0.09	0.03	0.23	0.06	0.02
835	183	2	02JUL81:13:09	0.800	1.17	0.70	0.29	0.05	0.27	0.14	0.04
836	185	2	04JUL81:08:04	1.700	1.13	0.66	0.31	0.07	0.26	0.13	0.05
837	201	2	20JUL81:18:27	0.980	2.72	1.39	0.08	0.04	0.58	0.16	0.01
838	.	1	27JUL81:09:50	0.005	2.82	0.96	0.08	0.04	0.32	0.06	0.01
839	209	2	28JUL81:12:55	0.270	1.20	0.20	0.06	0.03	0.72	0.26	0.01
840	218	2	06AUG81:12:37	0.240	2.86	1.35	0.60	1.94	0.30	0.07	0.02
841	220	2	06AUG81:01:02	0.180	.	0.75	0.10	0.73	.	0.05	0.01
842	.	1	10AUG81:11:55	0.000	1.31	0.58	0.09	0.02	0.14	0.05	0.00
843	.	1	24AUG81:12:50	0.000	1.46	0.89	0.08	0.04	0.10	0.05	0.01
844	242	2	30AUG81:08:12	0.510	1.73	1.01	0.12	0.02	0.12	0.06	0.00
845	251	2	08SEP81:15:44	0.140	2.02	1.71	0.13	0.02	0.22	0.07	0.01
846	258	2	15SEP81:17:27	0.350	1.73	0.61	0.09	0.01	0.26	0.05	0.02
847	.	1	21SEP81:12:25	0.005	1.57	0.71	0.14	0.05	0.11	0.05	0.01
848	274	2	01OCT81:21:57	0.150	1.82	0.84	0.13	0.02	0.09	0.05	0.01
849	.	1	05OCT81:11:45	0.005	1.32	0.52	0.09	0.02	0.11	0.03	0.01
850	.	1	12OCT81:12:15	0.005	1.78	0.90	0.09	0.02	0.10	0.02	0.00
851	291	2	18OCT81:17:57	0.210	1.88	1.09	0.20	0.04	0.13	0.05	0.01
852	296	2	23OCT81:10:52	0.260	1.65	1.04	0.18	0.06	0.19	0.04	0.01
853	298	2	25OCT81:17:11	0.350	1.43	0.98	0.12	0.20	0.15	0.06	0.01
854	.	1	02NOV81:10:15	0.005	0.90	0.82	0.16	0.27	0.05	0.04	0.01
855	310	2	06NOV81:01:49	0.140	1.43	1.18	0.30	0.32	0.07	0.06	0.01
856	.	1	09NOV81:10:10	0.005	0.91	0.89	0.17	0.55	0.04	0.03	0.01
857	.	1	16NOV81:10:10	0.005	0.99	0.86	0.20	0.70	0.05	0.04	0.01
858	.	1	23NOV81:09:35	0.005	0.56	0.56	0.10	0.82	0.02	0.02	0.01
859	.	1	30NOV81:09:58	0.005	0.73	0.73	0.08	0.97	0.03	0.02	.
860	335	2	01DEC81:10:22	0.190	0.89	0.83	0.10	0.92	0.10	0.08	0.03
861	.	1	07DEC81:10:10	0.005	0.61	0.61	0.10	.	0.04	0.04	0.02

STA=51UR17

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
862	262.0	2	18SEP80:03:00	0.11	.	.	.	.	.	.	.
863	262.0	2	18SEP80:06:25	0.07	.	.	0.14	2.14	.	.	0.03
864	262.0	2	18SEP80:10:30	0.04	.	.	0.06	3.45	.	.	0.02
865	265.0	2	21SEP80:19:53	0.03	.	.	0.07	2.95	.	.	0.09
866	265.0	2	21SEP80:21:04	0.03	.	.	0.03	3.70	.	.	0.03
867	292.0	2	18OCT80:20:10	0.24	1.01	0.81	0.04	1.89	0.33	0.27	0.17
868	292.0	2	18OCT80:22:02	0.17	0.89	0.48	0.02	1.64	0.23	0.11	0.06
869	292.0	2	19OCT80:01:34	0.05	0.93	0.79	0.06	1.28	0.63	0.54	0.40
870	292.0	2	19OCT80:06:05	0.02	0.58	0.54	0.00	1.64	0.20	0.14	0.09
871	292.0	2	19OCT80:12:37	0.00	.	.	0.10	1.87	.	.	0.03
872	332.0	2	27NOV80:16:34	0.15	1.12	0.90	0.06	1.36	0.31	0.18	0.16
873	344.0	2	09DEC80:12:34	0.07	1.12	0.70	0.00	1.14	0.11	0.02	0.00
874	358.0	2	23DEC80:09:40	0.17	0.80	0.70	0.07	2.77	0.05	0.02	0.00
875	21.0	2	21JAN81:04:33	0.02	1.14	.	0.04	3.86	0.11	0.08	0.05
876	33.0	2	02FEB81:06:46	1.21	1.19	.	0.16	1.10	0.14	.	0.13
877	39.0	2	08FEB81:10:59	0.15	0.72	0.72	0.11	1.61	0.14	0.13	0.04
878	42.0	2	11FEB81:04:52	0.18	1.31	0.51	0.19	0.70	0.41	.	0.18
879	50.0	2	19FEB81:22:37	0.08	0.83	0.39	0.12	.	0.18	0.08	0.08

STATION NUTRIENT DATA

STA=51UR17

OBS	STRDDU	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
880	53.0	2	23FEB81:11:45	0.25	.	.	.	.	.	.	.
881	75.0	2	16MAR81:13:25	0.08	.	.	0.18	2.90	.	.	0.05
882	89.0	2	30MAR81:07:43	0.17	1.03	0.46	0.40	0.92	0.22	0.07	0.07
883	95.0	2	05APR81:17:35	0.36	0.91	0.53	0.02	1.12	0.15	0.10	0.07
884	99.0	2	09APR81:11:34	0.24	0.47	0.40	0.10	1.64	0.22	0.19	0.16
885	102.0	2	12APR81:19:54	0.11	1.07	0.60	0.21	1.24	0.22	0.08	.
886	104.0	2	14APR81:17:59	0.08	0.92	0.71	0.05	2.66	0.09	0.06	0.01
887	107.0	2	17APR81:10:59	0.07	0.61	0.59	0.12	1.96	0.12	0.10	0.09
888	113.0	2	23APR81:20:42	0.32	0.99	0.74	0.16	1.96	0.12	0.08	0.05
889	120.0	2	30APR81:10:36	0.06	1.18	0.80	0.04	2.83	0.11	0.08	0.01
890	121.0	2	01MAY81:10:31	0.16	1.21	0.70	0.24	0.85	0.19	0.13	0.13
891	130.0	2	10MAY81:15:15	0.17	1.33	1.07	0.18	1.48	0.16	0.08	0.07
892	131.0	2	11MAY81:12:29	0.20	0.84	0.69	0.12	0.86	0.18	0.13	0.13
893	135.0	2	15MAY81:12:12	0.54	1.40	0.81	0.21	1.48	0.19	0.07	0.06
894	135.1	2	15MAY81:14:47	0.11	0.90	0.42	0.09	2.24	0.14	0.05	0.05
895	138.0	2	18MAY81:12:01	0.05	0.63	0.48	0.09	2.72	0.06	0.05	0.04
896	139.0	2	19MAY81:14:14	0.06	0.60	0.58	0.14	1.99	0.09	0.07	0.07
897	148.0	2	28MAY81:06:19	0.15	1.34	0.70	0.14	1.51	0.24	0.12	0.09
898	152.0	2	01JUN81:13:16	0.22	0.56	0.52	0.08	1.72	0.12	0.11	0.11
899	161.0	2	10JUN81:04:26	0.18	1.03	0.65	0.07	1.04	0.43	0.27	0.14
900	164.0	2	13JUN81:16:42	0.08	1.05	0.61	0.03	1.24	0.28	0.18	0.08
901	171.0	2	20JUN81:00:06	0.25	2.81	0.96	0.34	1.43	0.61	0.16	.
902	176.0	2	25JUN81:20:21	0.41	1.38	0.69	0.12	1.01	0.35	0.12	0.10
903	184.0	2	03JUL81:05:58	0.07	1.40	1.35	0.29	2.24	0.31	0.27	0.25
904	202.0	2	21JUL81:15:30	0.19	1.31	0.78	0.08	0.75	0.24	0.14	0.11
905	205.0	2	24JUL81:16:02	0.31	1.34	0.58	0.12	0.49	0.24	0.19	0.15
906	207.0	2	26JUL81:19:46	0.12	0.86	0.62	0.08	1.33	0.34	0.24	0.14
907	215.0	2	03AUG81:15:23	0.23	1.20	.	0.24	1.48	0.15	0.11	0.07
908	218.0	2	06AUG81:13:40	0.01	0.63	0.51	0.08	.	0.08	0.05	0.03
909	223.0	2	11AUG81:20:14	0.34	1.00	0.62	0.01	0.57	0.23	0.13	0.09
910	242.0	2	30AUG81:09:18	0.24	0.92	0.79	0.03	0.45	0.18	0.12	0.10
911	243.0	2	31AUG81:11:57	0.33	1.13	0.72	0.03	0.67	0.16	0.09	0.07
912	251.0	2	08SEP81:14:07	0.11	0.82	0.61	0.03	1.67	0.07	0.04	0.01
913	258.0	2	15SEP81:17:52	0.21	0.50	0.33	0.07	0.40	0.13	0.10	0.08
914	260.0	2	17SEP81:20:49	0.12	0.76	0.63	0.15	1.41	0.17	0.14	0.12
915	270.0	2	27SEP81:19:21	0.17	.	0.97	0.05	1.25	0.27	0.18	0.15
916	279.0	2	06OCT81:11:08	0.10	1.55	0.33	0.03	1.78	0.14	0.05	0.04
917	295.0	2	23OCT81:14:16	0.13	0.91	0.82	0.05	0.75	0.14	0.11	0.10
918	298.0	2	25OCT81:20:33	0.06	0.66	0.55	0.04	0.95	0.17	0.09	0.02
919	299.0	2	26OCT81:12:33	0.17	0.79	0.50	0.06	0.39	0.19	0.14	0.12
920	309.0	2	05NOV81:21:05	0.25	1.21	0.50	0.15	0.71	0.32	0.13	0.13
921	335.0	2	01DEC81:11:05	0.12	1.15	0.59	0.06	1.52	0.14	0.12	0.10
922	338.0	2	04DEC81:18:52	0.09	0.67	0.61	0.12	2.62	0.09	0.09	0.05

STATION NUTRIENT DATA

STA=51UR18

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
923	39.0	2	08FEB81:13:55	0.07	1.99	.	0.49	0.46	.	0.94	.
924	54.0	2	23FEB81:09:27	0.48	.	.	0.20	0.32	.	.	0.13
925	121.0	2	01MAY81:16:04	0.41	1.78	1.43	0.27	0.29	0.38	0.29	0.18
926	139.0	2	19MAY81:15:55	0.06	2.43	1.61	0.11	0.36	0.33	0.20	0.12
927	154.0	2	03JUN81:23:49	0.20	2.38	1.49	0.43	0.53	0.73	0.43	0.35
928	157.0	2	06JUN81:01:11	0.02	1.97	1.33	0.40	0.65	0.54	0.36	0.34
929	255.0	2	15SEP81:17:25	0.05	.	.	0.80	0.74	.	.	0.58
930	299.1	2	26OCT81:21:10	0.07	1.83	1.57	0.16	0.39	0.49	0.43	0.34

STA=51UR19

OBS	STRMNO	TYPE	TII	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
931	51.0	2	20FEB81:00:07	0.084	0.47	0.47	0.12	.	0.04	0.03	0.01
932	51.1	2	20FEB81:15:07	0.032	0.40	0.40	0.06	.	0.03	0.02	0.01
933	53.0	2.	22FEB81:16:40	0.051	0.39	0.27	0.08	0.86	0.02	0.01	0.01
934	63.0	2	04MAR81:23:00	0.032	0.40	0.38	0.11	1.00	0.02	0.01	0.01
935	75.0	2	16MAR81:14:16	0.017	0.57	0.51	0.14	2.64	0.06	0.04	0.01
936	89.0	2	30MAR81:09:59	0.024	0.44	0.40	0.07	1.76	0.04	0.03	0.01
937	95.0	2	05APR81:19:20	0.034	0.41	0.41	.05	1.20	0.04	0.03	0.01
938	99.0	2	09APR81:12:09	0.042	0.37	0.37	0.05	1.03	0.04	0.03	0.02
939	101.0	2	11APR81:11:34	0.024	0.44	0.42	0.13	0.86	0.02	0.02	0.00
940	103.0	2	13APR81:10:57	0.014	0.27	0.27	0.05	0.90	0.02	0.01	0.00
941	113.0	2	23APR81:21:31	0.052	0.47	0.45	0.10	1.64	0.04	0.03	0.01
942	121.0	2	01MAY81:11:08	0.117	0.51	0.38	0.16	1.14	0.04	0.03	0.01
943	130.0	2	10MAY81:17:25	0.027	0.51	0.42	.	.	0.03	0.02	.
944	135.0	2	15MAY81:13:07	0.045	0.54	0.45	0.09	1.24	0.02	0.01	0.00
945	138.0	2	18MAY81:21:48	0.032	0.24	0.24	0.05	0.86	0.02	0.02	0.00
946	148.0	2	28MAY81:09:25	0.010	0.66	0.62	0.17	1.30	0.03	0.03	0.01
947	150.0	2	30MAY81:23:15	0.017	0.64	0.51	0.04	1.18	0.06	0.03	0.01
948	164.0	2	13JUN81:19:02	0.051	0.33	0.23	0.05	1.12	0.20	0.02	0.00
949	171.0	2	20JUN81:06:33	0.012	0.85	0.85	0.04	2.63	0.19	0.04	0.00
950	176.0	2	25JUN81:07:53	0.029	0.60	0.47	0.04	1.51	0.05	0.05	0.00
951	183.0	2	02JUL81:14:40	0.018	0.39	0.39	0.04	0.91	0.07	0.07	0.02
952	202.0	2	21JUL81:00:53	0.005	0.82	0.57	0.10	1.62	0.10	0.10	0.01
953	205.0	2	24JUL81:20:45	0.007	0.63	0.53	0.02	1.84	0.11	0.10	0.01
954	209.0	2	28JUL81:10:22	0.054	0.36	0.32	0.07	1.00	0.05	0.05	0.02
955	218.0	2	06AUG81:13:02	0.031	0.40	0.40	0.06	1.15	0.09	0.07	0.02
956	220.0	2	08AUG81:06:22	0.020	0.79	0.34	0.08	0.99	0.24	0.18	0.03
957	223.0	2	11AUG81:19:27	0.282	0.38	0.36	0.02	0.71	0.03	0.02	.
958	227.0	2	15AUG81:21:34	0.022	0.91	0.81	0.15	0.93	0.04	0.03	0.02
959	242.0	2	30AUG81:09:20	0.041	0.68	0.68	0.07	0.74	0.04	0.04	0.01
960	255.0	2	15SEP81:17:34	0.115	0.39	0.31	0.05	0.63	0.04	0.04	0.01
961	265.0	2	22SEP81:18:39	0.002	0.59	0.42	0.03	1.65	0.13	0.10	0.03
962	291.0	2	18OCT81:20:11	0.009	1.08	0.90	0.04	1.85	0.07	0.05	0.01
963	295.0	2	23OCT81:10:52	0.033	0.60	0.55	0.06	0.91	0.05	0.04	0.00
964	298.0	2	25OCT81:16:56	0.069	0.90	0.86	0.15	0.45	0.02	0.01	0.00
965	310.0	2	06NOV81:00:34	0.016	0.45	0.45	0.07	1.05	0.03	0.02	0.01

STATION NUTRIENT DATA

STA=51UR20

OBS	STRMNO	TYPE	TI1	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
966	258	2	15SEP81:17:41	4.11	1.01	0.57	0.11	0.55	0.11	0.04	0.01
967	265	2	22SEP81:19:06	15.56	1.86	0.61	0.23	0.64	0.22	0.04	0.01
968	274	2	01OCT81:17:13	11.25	1.70	1.18	0.59	0.66	0.20	0.10	0.08
969	279	2	06OCT81:18:56	15.18	3.00	1.68	0.63	0.54	1.28	0.97	.
970	291	2	18OCT81:18:15	2.25	2.61	1.63	0.63	1.25	0.22	0.06	0.02
971	296	2	23OCT81:09:49	3.75	1.83	0.93	0.15	0.69	0.38	0.18	0.13
972	298	2	25OCT81:14:54	0.84	1.09	0.71	0.09	0.69	0.09	0.04	0.01
973	299	2	26OCT81:12:12	9.63	0.93	0.49	0.06	0.18	0.19	0.05	0.02
974	309	2	05NOV81:21:04	4.48	1.79	0.99	0.27	0.83	0.22	0.07	0.03
975	335	2	01DEC81:10:24	1.20	1.42	0.93	0.36	0.98	0.17	0.07	0.02
976	4	2	04JAN82:15:06	0.51	1.81	1.42	0.69	1.18	0.09	0.03	0.00

STA=51UR21

OBS	STRMNO	TYPE	TI1	FLO	TKN	SKN	NH3	NO23	TP	TSP	OP
977	.	1	21SEP81:09:20	0.035	0.79	0.58	0.12	0.23	0.04	0.02	0.01
978	.	1	28SEP81:08:36	0.029	0.82	0.79	0.11	0.25	0.02	0.01	0.00
979	.	1	05OCT81:08:55	0.028	0.60	0.42	0.17	0.27	0.05	0.03	0.01
980	.	1	12OCT81:09:15	0.014	0.71	0.66	0.05	0.28	0.02	0.00	0.00
981	299	2	26OCT81:16:33	0.420	1.57	0.87	0.18	0.29	0.25	0.06	0.02
982	.	1	02NOV81:08:55	0.019	0.44	0.33	0.16	0.27	0.03	0.02	0.01
983	.	1	09NOV81:08:35	0.035	0.56	0.54	0.07	0.22	0.02	0.01	0.00
984	.	1	16NOV81:08:35	0.023	0.62	0.56	0.06	0.22	0.03	0.03	0.00
985	.	1	23NOV81:08:30	0.023	0.45	0.33	0.10	0.19	0.02	0.01	0.00
986	.	1	30NOV81:08:45	0.014	0.80	0.58	0.06	0.21	0.03	0.02	.
987	.	1	07DEC81:08:55	0.011	0.70	0.53	0.07	.	0.04	0.02	0.01

STATION CHEMICAL DATA

STA=51UR03

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
148	292.00	2	18OCT80:09:18	0.12000	7.2	315	.	.	.	.	.	.
149	292.00	2	18OCT80:10:14	0.12000	8.8	360	.	.	.	.	.	.
150	292.00	2	18OCT80:11:19	0.09000	9.5	305	.	.	.	.	.	.
151	292.00	2	18OCT80:12:27	0.06000	9.4	345	.	.	.	.	.	.
152	292.00	2	18OCT80:14:12	0.03000	.	325	.	.	.	.	.	.
153	292.10	2	18OCT80:16:48	0.58000	9.8	165	.	.	.	.	.	.
154	292.10	2	18OCT80:16:58	0.42000	8.5	80	.	.	.	.	.	.
155	292.10	2	18OCT80:17:18	0.12000	7.7	205	.	.	.	.	.	.
156	292.10	2	18OCT80:17:53	0.12000	7.6	165	.	.	.	.	.	.
157	292.10	2	18OCT80:18:26	0.33000	7.7	75	.	.	.	.	.	.
158	292.10	2	18OCT80:18:34	1.11000	9.3	75	.	.	.	.	.	.
159	292.10	2	18OCT80:18:39	0.89000	8.4	125	.	.	.	.	.	.
160	292.10	2	18OCT80:18:44	0.89000	8.0	75	.	.	.	.	.	.
161	292.10	2	18OCT80:18:50	0.67000	7.9	50	.	.	.	.	.	.
162	292.10	2	18OCT80:18:57	0.42000	7.8	55	.	.	.	.	.	.
163	292.10	2	18OCT80:19:07	0.42000	7.7	50	.	.	.	.	.	.
164	292.10	2	18OCT80:19:15	0.42000	7.7	50	.	.	.	.	.	.
165	292.10	2	18OCT80:19:24	0.42000	7.6	55	.	.	.	.	.	.
166	292.10	2	18OCT80:19:33	0.42000	7.6	60	.	.	.	.	.	.
167	292.10	2	18OCT80:19:44	0.33000	7.5	60	.	.	.	.	.	.
168	292.10	2	18OCT80:19:56	0.33000	7.3	55	.	.	.	.	.	.
169	292.10	2	18OCT80:20:11	0.21000	7.3	55	.	.	.	.	.	.
170	292.10	2	18OCT80:20:29	0.21000	7.3	65	.	.	.	.	.	.
171	292.10	2	18OCT80:20:48	0.67000	2.8	390	.	.	.	.	.	.
172	292.10	2	18OCT80:20:52	1.11000	5.2	30	.	.	.	.	.	.
173	292.10	2	18OCT80:20:57	1.23000	5.7	45	.	.	.	.	.	.
174	292.10	2	18OCT80:21:02	0.89000	6.1	50	.	.	.	.	.	.
175	292.10	2	18OCT80:21:08	0.67000	6.3	50	.	.	.	.	.	.
176	292.10	2	18OCT80:21:16	0.42000	6.4	55	.	.	.	.	.	.
177	309.00	2	04NOV80:08:22	0.19000	6.7	45	.	.	.	.	.	.
178	314.00	2	09NOV80:15:44	0.58000	6.7	150	.	.	.	.	.	.
179	329.00	2	24NOV80:05:27	0.36000	5.6	90	.	.	.	.	.	.
180	332.00	2	27NOV80:16:56	0.12000	6.4	130	.	.	.	.	.	.
181	344.00	2	09DEC80:12:55	0.24000	5.7	120	.	.	.	.	.	.
182	358.00	2	23DEC80:08:19	0.15000	5.2	250	.	.	.	.	.	.
183	51.00	2	20FEB81:00:14	0.61000	7.0	35	.	.	.	.	.	.
184	51.10	2	20FEB81:13:15	0.15000	6.7	170	.	.	.	.	.	.
185	52.00	2	21FEB81:15:32	0.16064	6.6	310	.	.	.	.	.	.
186	53.00	2	22FEB81:17:11	0.33264	6.9	140	.	.	.	.	.	.
187	63.00	2	04MAR81:19:57	0.47000	5.8	120	26	.	.	.	.	.
188	75.00	2	16MAR81:12:11	0.05000	6.9	105	.	.	.	.	.	.
189	89.01	2	30MAR81:07:36	0.18000	.	.	.	.	.	.	.	.
190	89.01	2	30MAR81:08:04	0.18000	.	.	.	.	.	.	.	.
191	89.01	2	30MAR81:08:28	0.27000	.	.	.	.	.	.	.	.
192	89.01	2	30MAR81:08:45	0.33000	.	.	.	.	.	.	.	.
193	89.01	2	30MAR81:09:00	0.39000	.	.	.	.	.	.	.	.
194	89.01	2	30MAR81:09:13	0.42000	.	.	.	.	.	.	.	.
195	89.01	2	30MAR81:09:24	0.45000	.	.	.	.	.	.	.	.
196	89.01	2	30MAR81:09:36	0.36000	.	.	.	.	.	.	.	.
197	89.01	2	30MAR81:09:53	0.24000	.	.	.	.	.	.	.	.
198	89.01	2	30MAR81:10:19	0.15000	.	.	.	.	.	.	.	.
199	89.03	2	30MAR81:13:20	0.47000	5.5	85	.	.	.	.	.	.
200	90.00	2	31MAR81:10:44	0.12682	6.1	.	.	.	.	.	.	.
201	95.00	2	05APR81:17:30	0.60000	6.5	85	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UR03

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
202	99.0	2	09APR81:10:56	0.53000	6.7	75	.	.	.	.	.	.
203	102.0	2	12APR81:18:53	0.27689	6.2	120	.	.	.	.	.	.
204	104.0	2	14APR81:16:23	0.15000	6.8	205	.	.	.	.	.	.
205	107.0	2	17APR81:06:24	0.13301	7.3	190	58.5	0	.	.	.	.
206	113.0	2	23APR81:19:08	0.22646	6.8	215	.	.	.	.	.	.
207	130.0	2	10MAY81:14:23	0.29437	7.4	145	.	.	.	.	.	.
208	138.0	2	19MAY81:13:38	0.26000	7.1	165	.	.	.	.	.	.
209	148.0	2	28MAY81:01:07	0.24000	7.0	235	.	.	.	.	.	.
210	149.0	2	29MAY81:18:33	0.10000	7.3	305	.	.	.	.	.	.
211	150.0	2	30MAY81:23:40	0.09000	7.3	245	.	.	.	.	.	.
212	152.0	2	01JUN81:13:15	0.22000	6.9	130	.	.	.	.	.	.
213	154.0	2	03JUN81:19:25	0.09000	6.9	245	.	.	.	.	.	.
214	155.0	2	04JUN81:20:56	0.06000	8.0	500	.	.	.	.	.	.
215	157.1	2	06JUN81:21:10	0.09465	7.0	170	.	.	.	.	.	.
216	159.0	2	08JUN81:21:20	0.12000	7.1	285	.	.	.	.	.	.
217	161.0	2	10JUN81:01:08	0.25876	7.1	165	.	.	.	.	.	.
218	164.0	2	13JUN81:17:18	0.14000	6.8	160	.	.	.	.	.	.
219	170.0	2	19JUN81:23:34	1.32000	6.0	125	.	.	.	.	.	.
220	176.0	2	25JUN81:20:12	0.58929	6.3	180	.	.	.	.	.	.
221	184.0	2	03JUL81:05:11	0.20000	6.2	85	.	.	.	.	.	.
222	185.0	2	04JUL81:06:09	5.60000	6.3	35	11.5	0	.	.	.	.
223	201.0	2	20JUL81:19:41	0.14143	7.3	220	.	.	.	.	.	.
224	202.0	2	21JUL81:15:32	0.15363	7.5	205	.	.	.	.	.	.
225	205.0	2	24JUL81:14:24	0.26000	7.4	105	.	.	.	.	.	.
226	207.0	2	26JUL81:19:54	0.18191	7.6	140	.	.	.	.	.	.
227	209.0	2	28JUL81:00:16	0.18000	7.4	245	.	.	.	.	.	.
228	215.0	2	03AUG81:16:26	0.10000	7.6	330	.	.	.	.	.	.
229	218.0	2	06AUG81:10:32	0.16000	7.6	305	.	.	.	.	.	.
230	219.0	2	07AUG81:18:23	0.08596	7.7	345	.	.	.	.	.	.
231	223.0	2	11AUG81:20:04	0.19403	6.8	170	.	.	.	.	.	.
232	227.0	2	15AUG81:20:44	0.26000	7.1	240	.	.	.	.	.	.
233	242.0	2	30AUG81:08:48	0.48000	7.4	100	.	.	.	.	.	.
234	243.0	2	31AUG81:10:20	0.33417	7.2	90	.	.	.	.	.	.
235	251.0	2	08SEP81:13:08	1.40000	6.5	85	.	.	.	.	.	.
236	258.0	2	15SEP81:17:41	0.92000	6.0	50	.	.	.	.	.	.
237	260.0	2	17SEP81:20:42	0.34000	6.9	110	.	.	.	.	.	.
238	265.0	2	22SEP81:19:15	0.18000	7.3	160	.	.	.	.	.	.
239	270.0	2	27SEP81:19:20	0.24000	7.4	435	.	.	.	.	.	.
240	274.0	2	01OCT81:21:49	0.36000	6.1	205	.	.	.	.	.	.
241	291.0	2	18OCT81:17:57	0.44000	7.7	285	21.5	0	.	.	.	.
242	296.0	2	23OCT81:13:10	0.24000	7.3	2115	.	.	.	.	.	.
243	297.0	2	24OCT81:21:52	0.15000	7.4	5110	.	.	.	.	.	.
244	299.0	2	26OCT81:12:04	0.54000	6.6	175	.	.	.	.	.	.
245	300.0	2	27OCT81:08:24	0.33000	7.0	105	.	.	.	.	.	.
246	335.0	2	01DEC81:11:40	0.20000	7.0	85	18.5	0	.	.	.	.

STATION CHEMICAL DATA

STA=51UR04

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
247	329	2	24NOV80:14:54	0.68004	5.4	55	.	.	.	.	.	.
248	332	2	27NOV80:22:48	0.54714	7.3	55	.	.	.	.	.	.
249	33	2	02FEB81:10:36	0.18000	5.2	85	.	.	.	.	.	.
250	42	2	11FEB81:04:56	0.76000	7.1	35	13.5	.	.	.	.	.
251	50	2	19FEB81:15:29	0.15000	7.2	35	.	.	.	.	.	.
252	53	2	22FEB81:16:45	0.45000	6.9	90	.	.	.	.	.	.
253	89	2	30MAR81:16:09	0.33795	6.0	70	.	.	.	.	.	.
254	90	2	31MAR81:13:51	0.20009	6.4	90	.	.	.	.	.	.
255	95	2	05APR81:17:49	0.21676	6.4	85	.	.	.	.	.	.
256	99	2	09APR81:13:25	0.13000	6.8	100	.	.	.	.	.	.
257	102	2	12APR81:20:02	0.59418	7.1	200	.	.	.	.	.	.
258	104	2	14APR81:15:46	0.11000	6.0	70	.	.	.	.	.	.
259	107	2	17APR81:20:50	0.05000	6.4	85	.	.	.	.	.	.
260	110	2	20APR81:07:56	0.05002	6.0	80	.	.	.	.	.	.
261	121	2	01MAY81:13:25	0.58455	6.4	95	.	.	.	.	.	.
262	131	2	11MAY81:11:58	0.52000	8.8	160	.	.	.	.	.	.
263	135	2	15MAY81:14:22	0.49068	6.7	75	.	.	.	.	.	.
264	139	2	19MAY81:09:42	0.09000	7.0	80	.	.	.	.	.	.
265	153	2	02JUN81:05:58	0.11000	7.0	80	.	.	.	.	.	.
266	154	2	03JUN81:20:00	0.16000	6.9	100	.	.	.	.	.	.
267	161	2	10JUN81:05:38	0.29999	7.1	75	.	.	.	.	.	.
268	164	2	13JUN81:22:10	0.34000	7.0	70	.	.	.	.	.	.
269	171	2	20JUN81:15:50	0.48000	6.8	70	.	.	.	.	.	.
270	176	2	25JUN81:20:32	0.16000	6.3	75	.	.	.	.	.	.
271	185	2	04JUL81:08:10	1.30000	6.2	55	.	.	.	.	.	.
272	207	2	26JUL81:21:34	0.15000	6.7	220	.	.	.	.	.	.
273	208	2	27JUL81:12:32	0.09872	6.4	205	.	.	.	.	.	.
274	223	2	11AUG81:20:39	0.30000	6.9	165	.	.	.	.	.	.
275	227	2	15AUG81:20:55	0.35000	6.7	110	.	.	.	.	.	.
276	242	2	30AUG81:14:20	0.24000	6.9	45	.	.	.	.	.	.
277	243	2	31AUG81:09:32	0.60000	6.7	55	.	.	.	.	.	.
278	258	2	15SEP81:21:01	0.50000	6.2	55	.	.	.	.	.	.
279	260	2	17SEP81:21:10	0.17335	6.2	55	.	.	.	.	.	.
280	274	2	01OCT81:23:01	0.28000	6.5	90	.	.	.	.	.	.
281	299	2	26OCT81:12:52	0.35000	7.1	105	16.5	0	.	.	.	.

STA=51UR05

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
282	224.10	.	.	.	.	.	.	.	.	.	.	.
283	279.00	.	.	.	.	.	.	.	.	.	.	.
284	261.00	2	17SEP80:18:51	0.04	7.5	30	.	.	.	.	.	.
285	269.00	2	25SEP80:03:08	0.27	7.3	60	.	.	.	.	.	.
286	309.00	2	04NOV80:08:15	0.04	6.7	95	.	.	.	.	.	.
287	314.00	2	09NOV80:15:41	0.03	6.8	95	.	.	.	.	.	.
288	321.00	2	16NOV80:01:16	0.03	5.3	110	.	.	.	.	.	.
289	329.01	2	24NOV80:01:22	0.10	5.7	75	.	.	.	.	.	.
290	329.02	2	24NOV80:10:25	0.35	5.4	75	.	.	.	.	.	.
291	329.03	2	24NOV80:15:02	0.07	5.3	100	.	.	.	.	.	.
292	332.00	2	27NOV80:08:26	0.10	4.9	75	.	.	.	.	.	.
293	344.00	2	09DEC80:10:58	0.03	7.0	25	.	.	.	.	.	.
294	33.00	2	02FEB81:06:17	0.08	5.3	155	14.5	0	.	.	.	.

STATION CHEMICAL DATA

STA=51UR05

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
295	39.0	2	08FEB81:10:36	0.03	5.2	110	.	.	.	.	.	.
296	41.0	2	10FEB81:23:08	0.09	6.9	75	24.5	0	.	.	.	.
297	50.0	2	19FEB81:16:00	0.07	6.9	145	.	.	.	.	.	.
298	63.0	2	04MAR81:19:29	0.09	6.7	110	17.0	.	.	.	.	.
299	75.0	2	16MAR81:05:14	0.07	6.6	70	.	.	.	.	.	.
300	89.0	2	30MAR81:07:25	0.05	6.8	65	.	.	.	.	.	.
301	91.0	2	01APR81:13:40	0.06	6.4	100	.	.	.	.	.	.
302	95.0	2	05APR81:13:16	0.06	6.7	55	.	.	.	.	.	.
303	99.0	2	09APR81:11:31	0.07	6.7	65	.	.	.	.	.	.
304	101.0	2	11APR81:10:41	0.09	6.2	80	.	.	.	.	.	.
305	102.0	2	12APR81:18:48	0.08	6.2	90	.	.	.	.	.	.
306	103.0	2	13APR81:14:32	0.05	6.3	90	.	.	.	.	.	.
307	107.0	2	17APR81:08:53	0.05	5.9	130	25.5	0	.	.	.	.
308	118.0	2	28APR81:17:17	0.01	5.8	320	.	.	.	.	.	.
309	118.0	2	28APR81:18:12	0.41	6.4	80	.	.	.	.	.	.
310	118.0	2	28APR81:18:22	0.04	6.6	85	.	.	.	.	.	.
311	121.0	2	01MAY81:14:53	0.13	6.2	90	.	.	.	.	.	.
312	130.0	2	10MAY81:14:35	0.07	6.7	195	.	.	.	.	.	.
313	131.0	2	11MAY81:11:29	0.08	6.6	95	.	.	.	.	.	.
314	135.0	2	15MAY81:11:55	0.10	6.9	60	.	.	.	.	.	.
315	135.1	2	15MAY81:18:25	0.05	6.5	45	.	.	.	.	.	.
316	138.0	2	18MAY81:21:12	0.04	6.8	30	.	.	.	.	.	.
317	148.0	2	28MAY81:01:12	0.08	7.0	80	.	.	.	.	.	.
318	150.0	2	30MAY81:22:02	0.04	6.8	145	.	.	.	.	.	.
319	152.0	2	01JUN81:13:27	0.03	7.0	95	.	.	.	.	.	.
320	154.0	2	03JUN81:20:20	0.01	6.9	240	.	.	.	.	.	.
321	160.0	2	09JUN81:16:04	0.04	7.0	85	.	.	.	.	.	.
322	161.0	2	10JUN81:14:54	0.03	6.4	360	.	.	.	.	.	.
323	164.0	2	13JUN81:17:47	0.05	6.9	245	.	.	.	.	.	.
324	173.0	2	22JUN81:15:54	0.02	6.5	140	.	.	.	.	.	.
325	182.0	2	01JUL81:07:48	0.10	6.2	135	.	.	.	.	.	.
326	201.0	2	20JUL81:18:41	0.04	6.5	5365	.	.	.	.	.	.
327	209.1	2	28JUL81:16:16	0.05	6.5	210	.	.	.	.	.	.
328	223.0	2	11AUG81:19:37	0.09	3.6	205	.	.	.	.	.	.
329	224.1	2	12AUG81:08:27	0.14	4.6	230	.	.	.	.	.	.
330	243.1	2	31AUG81:12:53	0.15	3.8	155	.	.	.	.	.	.
331	252.0	2	09SEP81:03:13	0.02	3.3	7030	.	.	.	.	.	.
332	258.0	2	15SEP81:17:23	0.16	3.0	135	.	.	.	.	.	.
333	258.1	2	15SEP81:20:04	0.06	3.9	315	.	.	.	.	.	.
334	265.0	2	22SEP81:19:33	0.24	4.1	165	.	.	.	.	.	.
335	274.0	2	01OCT81:21:45	0.09	6.0	700	10.5	0	.	.	.	.
336	279.0	2	06OCT81:18:59	0.04	6.6	315	.	.	.	.	.	.
337	296.0	2	23OCT81:06:06	0.03	6.5	1195	.	.	.	.	.	.
338	298.0	2	25OCT81:14:14	0.03	6.5	665	.	.	.	.	.	.
339	299.0	2	26OCT81:12:14	0.07	6.4	185	.	.	.	.	.	.
340	300.0	2	27OCT81:08:27	0.06	6.8	105	.	.	.	.	.	.
341	309.0	2	05NOV81:21:07	0.11	6.0	445	.	.	.	.	.	.
342	335.0	2	01DEC81:11:57	0.03	6.0	580	7.5	0	.	.	.	.
343	338.0	2	04DEC81:18:00	0.02	6.1	3890	6.0	0	.	.	.	.
344	349.0	2	15DEC81:11:33	0.05	.	.	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UR06

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
345	299.00	2	25OCT80:05:39	0.33	6.4	100	26.0	0	.	.	.	.
346	322.00	2	17NOV80:15:59	0.29	6.6	75	.	.	.	.	.	.
347	329.00	2	24NOV80:10:22	0.58	5.6	75	.	.	.	.	.	.
348	332.00	2	27NOV80:21:04	0.09	6.2	135	.	.	.	.	.	.
349	33.01	2	02FEB81:06:27	0.50	5.5	140	16.0	0	.	.	.	.
350	33.02	2	02FEB81:12:13	0.10	5.6	165	.	.	.	.	.	.
351	39.00	2	06FEB81:13:43	0.14	5.5	135	.	.	.	.	.	.
352	42.00	2	11FEB81:04:24	0.29	6.9	60	28.5	0	.	.	.	.
353	50.00	2	19FEB81:23:04	0.31	7.0	170	.	.	.	.	.	.
354	51.00	2	20FEB81:23:55	0.12	7.0	185	.	.	.	.	.	.
355	53.10	2	22FEB81:23:38	0.26	7.1	150	.	.	.	.	.	.
356	64.00	2	05MAR81:04:17	0.07	6.5	185	.	.	.	.	.	.
357	99.00	2	09APR81:11:46	0.14	6.6	120	.	.	.	.	.	.
358	102.00	2	12APR81:19:09	0.12	6.9	130	.	.	.	.	.	.
359	121.00	2	01MAY81:10:07	0.51	6.2	90	.	.	.	.	.	.
360	131.00	2	11MAY81:03:05	0.26	6.7	150	.	.	.	.	.	.
361	139.00	2	19MAY81:05:03	0.16	7.2	150	.	.	.	.	.	.
362	148.00	2	28MAY81:07:26	0.06	6.9	170	.	.	.	.	.	.
363	149.00	2	29MAY81:20:02	0.18	7.1	115	.	.	.	.	.	.
364	150.00	2	30MAY81:21:48	0.23	6.9	135	.	.	.	.	.	.
365	152.00	2	01JUN81:14:45	0.18	7.1	140	.	.	.	.	.	.
366	161.00	2	10JUN81:06:32	0.17	6.8	130	.	.	.	.	.	.
367	164.00	2	13JUN81:19:46	0.24	7.2	90	.	.	.	.	.	.
368	171.00	2	20JUN81:14:35	0.60	6.7	70	.	.	.	.	.	.
369	172.00	2	21JUN81:20:12	0.28	6.1	150	.	.	.	.	.	.
370	185.00	2	04JUL81:07:08	1.13	6.3	60	19.5	0	.	.	.	.
371	209.00	2	28JUL81:11:45	1.08	7.0	145	.	.	.	.	.	.
372	223.00	2	11AUG81:19:51	1.01	6.2	110	.	.	.	.	.	.
373	227.00	2	15AUG81:20:33	1.93	6.5	115	.	.	.	.	.	.
374	242.00	2	30AUG81:10:55	0.28	6.8	70	.	.	.	.	.	.
375	258.00	2	15SEP81:16:54	0.19	6.7	155	.	.	.	.	.	.
376	296.00	2	23OCT81:16:23	0.06	7.1	100	.	.	.	.	.	.
377	299.00	2	26OCT81:12:42	0.23	7.6	110	.	.	.	.	.	.

STA=51UR07

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
378	204.0	2	22JUL80:19:26	5.2300	6.2	35	.	.	.	.	.	.
379	204.1	2	22JUL80:22:50	1.2700	6.5	85	.	.	.	.	.	.
380	211.0	2	29JUL80:02:06	0.4900	6.6	145	.	.	.	.	.	.
381	214.0	2	01AUG80:14:06	0.6000	6.5	215	.	.	.	.	.	.
382	216.0	2	03AUG80:16:06	0.8400	6.7	145	.	.	.	.	.	.
383	216.1	2	03AUG80:23:47	1.0700	6.5	120	.	.	.	.	.	.
384	231.0	2	18AUG80:05:52	1.0500	7.0	90	.	.	.	.	.	.
385	232.0	2	19AUG80:02:57	0.8000	6.3	95	.	.	.	.	.	.
386	.	1	08SEP80:15:00	0.0055	.	.	.	.	6.7	8.20	26.0	440
387	254.0	2	10SEP80:01:09	0.3400	6.1	150	.	.	.	.	.	.
388	.	1	15SEP80:10:35	0.0021	.	.	.	.	7.2	8.15	20.0	480
389	.	1	22SEP80:15:30	0.0021	.	.	.	.	8.1	5.00	24.0	305
390	269.0	2	25SEP80:03:55	0.0939	7.3	195	.	.	.	.	.	.
391	269.0	2	25SEP80:05:52	0.2340	7.6	70	.	.	.	.	.	.
392	269.0	2	25SEP80:07:44	0.2340	7.6	80	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UR07

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
393	269.0	2	25SEP80:08:06	0.1340	7.5	105	.	.	.	.	.	.
394	269.0	2	25SEP80:10:55	0.0407	7.3	200	.	.	.	.	.	.
395	269.0	2	25SEP80:12:43	0.0186	7.1	180	.	.	.	.	.	.
396	.	3	29SEP80:12:45	0.0686	.	.	40.0	0	7.9	8.3	21.0	215
397	276.0	2	02OCT80:21:50	0.1600	6.2	595	.	.	.	.	.	.
398	.	1	06OCT80:10:00	0.0021	.	.	.	.	6.7	9.8	13.5	290
399	.	1	20OCT80:09:25	0.0105	.	.	.	.	5.8	9.8	12.0	220
400	299.0	2	25OCT80:09:00	7.1100	5.5	60	26.5	0	.	.	.	.
401	.	1	27OCT80:10:20	0.0234	.	.	39.5	0	5.4	11.8	11.0	165
402	302.0	2	28OCT80:06:20	0.1100	5.5	145	.	.	.	.	.	.
403	.	1	03NOV80:08:30	0.0143	.	.	41.0	0	6.5	10.4	6.0	190
404	309.0	2	04NOV80:08:13	0.8200	6.8	65	.	.	.	.	.	.
405	.	1	10NOV80:14:45	0.0073	.	.	.	.	6.4	10.4	10.0	155
406	329.0	2	24NOV80:03:18	1.0200	5.5	95	.	.	.	.	.	.
407	332.0	2	27NOV80:15:56	0.4200	6.1	105	.	.	.	.	.	.
408	.	1	01DEC80:14:45	0.0105	.	.	37.5	0	6.6	10.2	12.0	240
409	.	1	08DEC80:08:30	0.0021	.	.	.	.	5.5	10.8	8.5	190
410	.	1	15DEC80:10:30	0.0073	.	.	.	.	6.4	11.4	7.0	185
411	.	1	22DEC80:14:25	0.0143	.	.	.	.	6.7	13.6	0.5	385
412	.	1	26JAN81:14:20	0.0021	.	.	.	.	5.9	11.8	5.0	195
413	.	1	09FEB81:13:50	0.0143	.	.	.	.	6.4	13.2	2.0	125
414	52.0	2	21FEB81:00:10	0.1800	6.7	135	.	.	.	.	.	.
415	53.0	2	22FEB81:12:08	0.6600	6.3	120	.	.	.	.	.	.
416	63.0	2	04MAR81:16:00	0.1300	6.8	115	.	.	.	.	.	.
417	.	1	09MAR81:14:15	0.0234	.	.	33.0	0	6.5	11.4	7.0	120
418	.	1	23MAR81:14:05	0.0186	.	.	.	.	6.2	11.6	7.5	120
419	89.0	2	30MAR81:07:54	0.2900	6.2	85	.	.	.	.	.	.
420	91.0	2	01APR81:13:19	0.6000	6.1	105	.	.	.	.	.	.
421	.	1	06APR81:16:00	0.0186	.	.	.	.	6.0	10.6	10.5	140
422	99.0	2	09APR81:09:22	0.4800	7.2	85	.	.	.	.	.	.
423	102.0	2	12APR81:17:40	0.9100	6.9	90	.	.	.	.	.	.
424	104.0	2	14APR81:17:06	0.5400	7.3	135	.	.	.	.	.	.
425	107.0	2	17APR81:09:12	0.4100	5.2	95	.	.	.	.	.	.
426	.	1	20APR81:14:40	0.0050	.	.	27.5	0	5.9	9.0	13.0	130
427	.	1	27APR81:14:35	0.0186	.	.	.	.	5.8	9.8	18.0	115
428	120.0	2	30APR81:09:20	0.2600	6.1	180	.	.	.	.	.	.
429	120.1	2	30APR81:23:03	0.4400	6.8	110	.	.	.	.	.	.
430	121.0	2	01MAY81:09:36	3.6000	.	.	.	.	.	.	.	.
431	.	1	04MAY81:14:30	0.0186	.	.	.	.	6.0	8.8	17.0	120
432	130.0	2	10MAY81:14:24	0.3600	6.5	90	.	.	.	.	.	.
433	130.1	2	10MAY81:20:15	1.2200	6.7	50	.	.	.	.	.	.
434	131.0	2	11MAY81:02:08	0.2500	7.4	105	.	.	.	.	.	.
435	131.1	2	11MAY81:11:02	1.8800	7.0	60	.	.	.	.	.	.
436	131.2	2	11MAY81:19:51	1.1400	6.8	45	.	.	.	.	.	.
437	132.0	2	12MAY81:00:47	0.5800	7.2	50	.	.	.	.	.	.
438	135.0	2	15MAY81:11:50	0.6400	6.5	90	.	.	.	.	.	.
439	.	1	18MAY81:13:45	0.0186	.	.	.	.	6.3	9.6	14.0	115
440	139.0	2	19MAY81:02:57	0.4200	6.7	95	.	.	.	.	.	.
441	139.1	2	19MAY81:13:15	0.4200	7.0	100	.	.	.	.	.	.
442	149.0	2	29MAY81:20:56	0.6800	6.7	95	.	.	.	.	.	.
443	152.0	2	01JUN81:12:20	0.1400	7.2	90	.	.	.	.	.	.
444	153.0	2	02JUN81:03:50	2.3200	7.3	40	.	.	.	.	.	.
445	.	1	06JUN81:15:05	0.0288	.	.	.	.	5.3	6.5	27.0	460
446	161.1	2	10JUN81:18:12	0.9200	7.0	80	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UR07

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
447	164.0	2	13JUN81:21:47	1.7100	6.6	60	.	.	.	.	.	.
448	171.0	2	20JUN81:15:53	0.6600	6.5	150	.	.	.	.	.	.
449	172.0	2	21JUN81:19:58	4.1600	6.7	60	.	.	.	.	.	.
450	.	1	22JUN81:14:22	0.0143	.	.	.	.	6.2	8.0	26.0	345
451	176.0	2	25JUN81:20:20	3.2300	6.1	55	.	.	.	.	.	.
452	.	1	29JUN81:14:15	0.0045	.	.	.	.	6.8	9.2	29.0	295
453	183.1	2	02JUL81:23:01	1.2700	6.3	140	.	.	.	.	.	.
454	185.0	2	04JUL81:05:47	7.0700	6.5	35	.	.	.	.	.	.
455	.	1	13JUL81:13:40	0.0143	.	.	.	.	6.5	7.9	23.5	390
456	.	1	20JUL81:14:35	0.0045	.	.	.	.	6.1	7.9	31.0	800
457	205.0	2	24JUL81:13:52	0.6500	6.5	385	.	.	.	.	.	.
458	206.0	2	25JUL81:07:24	3.8500	6.4	200	.	.	.	.	.	.
459	.	1	27JUL81:14:33	0.0686	.	.	.	.	6.4	7.9	29.0	285
460	215.0	2	03AUG81:14:49	0.1200	6.2	210	.	.	.	.	.	.

STA=51UR08

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
461	214.0	2	01AUG80:14:30	1.4400	6.8	310	.	.	.	.	.	.
462	229.0	2	16AUG80:02:49	0.0400	6.8	225	.	.	.	.	.	.
463	231.1	2	18AUG80:06:12	0.3500	6.4	170	.	.	.	.	.	.
464	232.0	2	19AUG80:07:31	0.2800	6.4	85	.	.	.	.	.	.
465	.	1	06SEP80:15:05	0.0061	.	.	.	.	6.7	6.5	25.0	415
466	269.0	2	25SEP80:05:32	0.0406	7.3	255	.	.	.	.	.	.
467	269.0	2	25SEP80:06:32	0.1176	7.2	240	.	.	.	.	.	.
468	269.0	2	25SEP80:10:05	0.0406	7.3	125	.	.	.	.	.	.
469	269.0	2	25SEP80:13:08	0.0121	7.2	175	.	.	.	.	.	.
470	.	1	29SEP80:13:00	0.0089	.	.	44.5	0	7.7	8.0	19.0	240
471	.	1	06OCT80:10:10	0.0009	.	.	.	.	6.8	7.6	14.0	245
472	285.0	2	11OCT80:15:39	2.3600	6.6	235	.	.	.	.	.	.
473	.	1	20OCT80:10:50	0.0018	.	.	.	.	6.4	8.8	11.0	225
474	299.0	2	25OCT80:08:15	6.2000	5.5	65	35.0	0	.	.	.	.
475	.	1	27OCT80:10:35	0.0089	.	.	42.5	0	5.7	11.4	11.0	150
476	.	1	03NOV80:08:30	0.0089	.	.	39.0	0	6.1	11.2	6.0	165
477	309.0	2	04NOV80:08:27	0.3400	6.6	140	.	.	.	.	.	.
478	.	1	10NOV80:14:50	0.0038	.	.	.	.	6.2	10.0	10.0	140
479	322.0	2	17NOV80:15:41	0.9200	6.6	55	.	.	.	.	.	.
480	332.0	2	27NOV80:16:20	0.4900	5.9	110	.	.	.	.	.	.
481	.	1	01DEC80:14:50	0.0158	.	.	31.0	0	6.3	10.6	11.5	175
482	337.0	2	02DEC80:19:44	0.1275	5.3	110	.	.	.	.	.	.
483	337.0	2	02DEC80:20:04	0.3280	5.5	95	.	.	.	.	.	.
484	337.0	2	02DEC80:21:12	0.1275	5.8	80	.	.	.	.	.	.
485	.	1	08DEC80:08:30	0.0089	.	.	.	.	6.5	10.6	7.5	165
486	344.0	2	09DEC80:10:05	0.3200	6.6	85	.	.	.	.	.	.
487	.	1	15DEC80:10:30	0.0018	.	.	.	.	6.5	12.4	6.0	150
488	.	1	22DEC80:13:50	0.0018	.	.	.	.	6.7	11.9	0.0	260
489	.	1	26JAN81:14:20	0.0018	.	.	.	.	6.1	10.8	3.0	205
490	39.0	2	08FEB81:10:21	0.3000	7.0	50	.	.	.	.	.	.
491	.	1	09FEB81:13:50	0.0121	.	.	.	.	6.8	8.6	3.0	155
492	50.0	2	19FEB81:23:00	0.9000	6.7	100	.	.	.	.	.	.
493	51.0	2	20FEB81:09:47	0.2500	7.0	150	.	.	.	.	.	.
494	52.0	2	21FEB81:00:30	0.3000	6.7	145	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UR08

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
495	53.1	2	23FEB81:09:10	1.3000	6.3	130	.	.	.	.	.	.
496	.	1	09MAR81:14:15	0.0350	.	.	38	0	5.5	10.2	8	120
497	.	1	23MAR81:14:05	0.0200	.	.	.	.	6.9	13.0	7	115
498	89.0	2	30MAR81:08:13	0.4900	6.8	85	.	.	.	.	.	.
499	91.0	2	01APR81:13:40	0.4600	6.7	105	.	.	.	.	.	.
500	95.0	2	05APR81:13:29	0.4800	6.5	95	.	.	.	.	.	.
501	.	1	06APR81:16:00	0.0200	.	.	.	.	6.1	7.8	13	130
502	99.0	2	09APR81:09:43	0.5500	6.7	85	.	.	.	.	.	.
503	102.0	2	12APR81:18:13	1.0000	6.4	90	.	.	.	.	.	.
504	104.0	2	14APR81:17:42	0.2200	6.0	185	.	.	.	.	.	.
505	107.0	2	17APR81:10:07	0.2100	6.2	115	.	.	.	.	.	.
506	.	1	20APR81:14:45	0.0200	.	.	31	0	6.5	8.2	16	120
507	113.0	2	23APR81:21:11	1.1000	6.2	70	.	.	.	.	.	.
508	117.0	2	27APR81:03:32	0.2700	.	.	.	.	.	.	.	.
509	.	1	27APR81:14:45	0.0250	.	.	.	.	5.2	6.2	23	115
510	120.0	2	30APR81:09:35	0.2600	6.1	105	.	.	.	.	.	.
511	120.1	2	30APR81:23:47	0.3900	6.3	85	.	.	.	.	.	.
512	121.0	2	01MAY81:10:56	1.1600	6.4	60	.	.	.	.	.	.
513	.	1	04MAY81:14:33	0.0121	.	.	.	.	6.4	5.4	24	120
514	131.1	2	11MAY81:11:25	2.5400	6.5	85	.	.	.	.	.	.
515	135.0	2	15MAY81:12:05	0.2400	7.1	105	.	.	.	.	.	.
516	.	1	18MAY81:13:45	0.0121	.	.	.	.	6.1	8.4	14	115
517	149.0	2	29MAY81:21:22	0.5600	6.7	150	.	.	.	.	.	.
518	.	1	08JUN81:14:54	0.0200	.	.	.	.	5.5	7.3	27	355
519	161.1	2	10JUN81:18:19	1.0500	7.1	80	.	.	.	.	.	.
520	164.0	2	13JUN81:22:00	1.3900	7.2	75	.	.	.	.	.	.
521	171.0	2	20JUN81:15:23	0.4100	6.6	150	.	.	.	.	.	.
522	172.0	2	21JUN81:20:22	1.2200	6.7	85	.	.	.	.	.	.
523	.	1	22JUN81:14:20	0.0061	.	.	.	.	6.1	6.4	30	210
524	176.0	2	25JUN81:20:41	3.7100	6.3	65	.	.	.	.	.	.
525	.	1	29JUN81:14:25	0.0089	.	.	.	.	6.2	6.8	28	245
526	183.0	2	02JUL81:13:35	0.3000	6.2	160	.	.	.	.	.	.
527	184.0	2	03JUL81:04:50	0.5100	6.2	135	.	.	.	.	.	.
528	185.0	2	04JUL81:02:51	4.8200	6.4	45	.	.	.	.	.	.
529	.	1	13JUL81:13:50	0.0061	.	.	.	.	6.4	7.3	28	350
530	.	1	20JUL81:14:35	0.0038	.	.	.	.	6.4	7.1	30	335
531	205.0	2	24JUL81:14:24	0.5900	6.6	550	.	.	.	.	.	.
532	206.0	2	25JUL81:07:44	3.6700	6.6	270	.	.	.	.	.	.
533	.	1	27JUL81:14:41	0.0465	.	.	.	.	6.2	10.3	31	185
534	215.0	2	03AUG81:12:00	0.2600	6.4	225	.	.	.	.	.	.

STA=51UR09

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
535	276.00	2	02OCT80:16:46	0.22	6.3	600	.	.	.	.	.	.
536	299.00	2	25OCT80:03:40	0.82	6.4	2140	20.0	0	.	.	.	.
537	309.00	2	04NOV80:14:29	0.11	5.3	105	.	.	.	.	.	.
538	314.00	2	09NOV80:00:27	0.19	6.3	125	.	.	.	.	.	.
539	322.00	2	17NOV80:16:03	0.70	6.6	75	.	.	.	.	.	.
540	329.01	2	24NOV80:07:06	1.20	5.7	100	.	.	.	.	.	.
541	329.03	2	24NOV80:18:34	0.11	5.5	195	.	.	.	.	.	.
542	332.00	2	27NOV80:14:12	0.06	5.3	135	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UR09

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
543	344.0	2	09DEC80:12:19	0.13	6.8	95	.	.	.	.	.	.
544	351.0	2	16DEC80:04:07	0.19	6.8	165	.	.	.	.	.	.
545	358.0	2	23DEC80:11:05	0.20	5.4	140	.	.	.	.	.	.
546	33.0	2	02FEB81:06:24	0.47	5.3	185	16.5	0	.	.	.	.
547	39.0	2	08FEB81:12:30	0.22	5.7	140	.	.	.	.	.	.
548	42.0	2	11FEB81:00:45	0.46	6.8	90	32.0	0	.	.	.	.
549	50.0	2	19FEB81:15:11	0.30	6.9	255	.	.	.	.	.	.
550	51.0	2	20FEB81:15:20	0.21	6.9	235	.	.	.	.	.	.
551	53.0	2	22FEB81:13:50	0.24	7.0	175	.	.	.	.	.	.
552	89.0	2	30MAR81:09:09	0.08	6.6	110	.	.	.	.	.	.
553	91.0	2	01APR81:15:12	0.36	6.9	140	.	.	.	.	.	.
554	95.0	2	05APR81:16:56	0.19	6.6	105	.	.	.	.	.	.
555	99.0	2	09APR81:10:48	0.18	6.7	85	.	.	.	.	.	.
556	104.0	2	14APR81:05:22	0.46	7.0	120	33.0	0	.	.	.	.
557	107.0	2	17APR81:11:15	0.36	6.1	175	.	.	.	.	.	.
558	110.0	2	20APR81:01:55	0.25	6.1	195	.	.	.	.	.	.
559	121.0	2	01MAY81:08:15	0.57	6.2	105	.	.	.	.	.	.
560	130.0	2	10MAY81:15:38	0.32	6.5	145	.	.	.	.	.	.
561	135.0	2	15MAY81:12:19	0.72	7.0	100	.	.	.	.	.	.
562	138.0	2	18MAY81:20:21	0.17	6.9	125	.	.	.	.	.	.
563	154.0	2	03JUN81:20:57	1.07	7.3	65	.	.	.	.	.	.
564	155.0	2	04JUN81:17:01	1.15	7.1	70	.	.	.	.	.	.
565	171.0	2	20JUN81:00:56	0.62	6.7	130	.	.	.	.	.	.
566	182.0	2	01JUL81:07:10	0.67	6.1	775	.	.	.	.	.	.
567	184.0	2	03JUL81:15:28	1.39	6.3	75	.	.	.	.	.	.
568	209.0	2	28JUL81:10:29	1.25	6.5	305	.	.	.	.	.	.
569	216.0	2	06AUG81:10:24	0.59	4.7	170	.	.	.	.	.	.
570	219.0	2	07AUG81:23:53	1.08	3.7	345	.	.	.	.	.	.
571	223.0	2	11AUG81:18:54	1.25	3.2	375	.	.	.	.	.	.
572	242.0	2	30AUG81:07:42	0.15	3.3	790	.	.	.	.	.	.
573	243.1	2	31AUG81:11:19	0.59	3.7	280	.	.	.	.	.	.
574	251.0	2	08SEP81:15:41	0.24	3.4	585	.	.	.	.	.	.
575	256.0	2	15SEP81:16:40	0.33	3.6	990	.	.	.	.	.	.
576	260.0	2	17SEP81:04:18	0.18	3.6	1530	.	.	.	.	.	.
577	274.0	2	01OCT81:21:14	0.31	6.1	610	.	.	.	.	.	.
578	291.0	2	18OCT81:17:36	0.10	3.5	1735	.	.	.	.	.	.
579	296.0	2	23OCT81:07:35	0.20	6.8	325	12.0	0	.	.	.	.
580	298.0	2	25OCT81:14:58	0.05	7.0	455	.	.	.	.	.	.
581	299.0	2	26OCT81:12:39	0.28	6.9	155	.	.	.	.	.	.
582	300.0	2	27OCT81:05:42	0.35	6.4	105	.	.	.	.	.	.
583	309.0	2	05NOV81:23:54	0.58	7.0	530	.	.	.	.	.	.
584	335.0	2	01DEC81:11:04	0.14	6.6	280	9.5	0	.	.	.	.

STATION CHEMICAL DATA

----- STA=51UR10 -----

OBS	STRMNO	TYPE	TI1	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
585	292.1	2	18OCT80:15:25	0.34000	6.5	.	.	.	.	.	.	.
586	299.0	2	25OCT80:03:38	1.60000	6.5	50	6.5	0	.	.	.	.
587	299.1	2	25OCT80:14:03	1.54000	6.3	120	36.0	0	.	.	.	.
588	322.0	2	17NOV80:15:48	0.89000	6.7	60	.	.	.	.	.	.
589	329.0	2	24NOV80:10:05	1.24000	5.7	50	.	.	.	.	.	.
590	344.0	2	09DEC80:13:48	0.28777	6.6	185	.	.	.	.	.	.
591	33.0	2	02FEB81:06:25	0.49000	5.7	290	16.0	0	.	.	.	.
592	39.0	2	08FEB81:11:34	0.58000	5.6	495	.	.	.	.	.	.
593	50.0	2	19FEB81:23:18	0.55000	7.2	150	.	.	.	.	.	.
594	51.0	2	20FEB81:22:49	0.35000	7.0	180	.	.	.	.	.	.
595	53.0	2	22FEB81:22:48	0.43000	7.1	380	.	.	.	.	.	.
596	75.0	2	16MAR81:12:45	0.27559	6.6	85	.	.	.	.	.	.
597	91.0	2	01APR81:16:30	1.06000	7.1	65	.	.	.	.	.	.
598	95.0	2	05APR81:16:39	0.66000	6.8	60	.	.	.	.	.	.
599	99.0	2	09APR81:09:52	0.48000	6.7	70	.	.	.	.	.	.
600	101.0	2	11APR81:10:18	0.77000	6.8	75	.	.	.	.	.	.
601	104.0	2	14APR81:05:32	1.02972	6.9	75	.	.	.	.	.	.
602	121.0	2	01MAY81:08:07	0.93000	6.7	75	.	.	.	.	.	.
603	130.0	2	10MAY81:21:38	0.25362	6.4	240	.	.	.	.	.	.
604	131.0	2	11MAY81:12:15	0.16399	6.5	130	.	.	.	.	.	.
605	138.0	2	18MAY81:20:32	0.08104	6.7	65	.	.	.	.	.	.
606	139.0	2	19MAY81:13:47	0.23000	7.1	90	.	.	.	.	.	.
607	147.0	2	27MAY81:14:53	0.36000	6.8	290	.	.	.	.	.	.
608	148.0	2	28MAY81:13:02	0.24000	7.0	340	.	.	.	.	.	.
609	149.0	2	29MAY81:14:26	0.30000	6.9	270	.	.	.	.	.	.
610	150.0	2	30MAY81:11:10	0.23000	6.9	365	.	.	.	.	.	.
611	152.0	2	01JUN81:13:59	0.29000	6.7	185	.	.	.	.	.	.
612	154.0	2	03JUN81:14:35	0.99000	7.1	85	.	.	.	.	.	.
613	155.0	2	04JUN81:17:06	0.39000	7.0	270	.	.	.	.	.	.
614	156.0	2	05JUN81:22:40	0.15699	7.0	355	.	.	.	.	.	.
615	160.0	2	09JUN81:11:24	0.21512	7.1	240	.	.	.	.	.	.
616	164.0	2	13JUN81:22:45	0.57000	7.1	200	.	.	.	.	.	.
617	183.0	2	02JUL81:13:10	8.88889	6.2	125	.	.	.	.	.	.
618	184.0	2	03JUL81:15:25	0.44768	6.3	40	12.0	0	.	.	.	.
619	205.0	2	24JUL81:14:30	0.06892	6.8	140	.	.	.	.	.	.
620	209.1	2	28JUL81:16:21	1.03000	6.6	150	.	.	.	.	.	.
621	219.0	2	08AUG81:05:35	0.71429	7.0	270	.	.	.	.	.	.
622	223.0	2	11AUG81:18:52	0.15306	6.5	195	.	.	.	.	.	.
623	227.0	2	15AUG81:20:25	3.66667	6.5	95	.	.	.	.	.	.
624	258.0	2	15SEP81:16:45	0.57000	6.4	390	.	.	.	.	.	.
625	260.0	2	17SEP81:04:11	1.20370	6.7	50	.	.	.	.	.	.
626	274.0	2	01OCT81:21:08	0.37267	6.2	155	.	.	.	.	.	.
627	296.0	2	23OCT81:08:04	0.16000	6.9	20	11.5	0	.	.	.	.
628	299.0	2	26OCT81:11:26	0.64000	6.8	55	16.0	0	.	.	.	.
629	335.0	2	01DEC81:09:28	0.16000	6.7	135	17.5	0	.	.	.	.
630	348.0	2	14DEC81:15:20	0.34000	.	.	.	.	.	.	.	.
631	357.0	2	23DEC81:05:01	0.18598	.	.	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UR11

OBS	STRMNO	TYPE	TI1	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
632	277.00	2	03OCT80:10:15	0.00100	6.5	120	.	.	.	.	.	.
633	277.00	2	03OCT80:11:13	0.00100	3.5	275	.	.	.	.	.	.
634	277.00	2	03OCT80:12:06	0.00100	5.5	160	.	.	.	.	.	.
635	277.00	2	03OCT80:13:03	0.00400	5.1	90	.	.	.	.	.	.
636	292.00	2	18OCT80:08:54	0.03000	8.2	230	.	.	.	.	.	.
637	292.00	2	18OCT80:09:06	0.06000	8.0	155	.	.	.	.	.	.
638	292.00	2	18OCT80:09:17	0.06000	8.0	140	.	.	.	.	.	.
639	292.00	2	18OCT80:09:28	0.06000	7.8	170	.	.	.	.	.	.
640	292.00	2	18OCT80:09:39	0.05000	7.8	115	.	.	.	.	.	.
641	292.00	2	18OCT80:09:51	0.05000	7.7	115	.	.	.	.	.	.
642	292.00	2	18OCT80:10:06	0.04000	7.7	105	.	.	.	.	.	.
643	292.00	2	18OCT80:10:23	0.03000	7.6	155	.	.	.	.	.	.
644	292.00	2	18OCT80:10:42	0.03000	7.5	130	.	.	.	.	.	.
645	292.00	2	18OCT80:11:10	0.00500	7.6	60	.	.	.	.	.	.
646	299.00	2	25OCT80:04:39	0.86000	6.2	30	7.5	0	.	.	.	.
647	309.00	2	04NOV80:08:46	0.16000	6.7	510	.	.	.	.	.	.
648	329.01	2	24NOV80:10:36	1.40000	5.5	35	.	.	.	.	.	.
649	329.02	2	24NOV80:22:05	0.52000	5.7	45	.	.	.	.	.	.
650	332.00	2	27NOV80:22:26	0.12000	5.8	95	.	.	.	.	.	.
651	344.00	2	09DEC80:14:10	0.11000	6.2	240	.	.	.	.	.	.
652	33.00	2	02FEB81:06:57	0.76000	5.6	280	12.5	0	.	.	.	.
653	99.00	2	09APR81:10:51	0.53000	6.7	60	.	.	.	.	.	.
654	101.00	2	11APR81:10:57	0.58000	7.3	65	.	.	.	.	.	.
655	130.00	2	10MAY81:21:52	0.44000	6.6	125	.	.	.	.	.	.
656	131.00	2	11MAY81:12:39	0.49000	6.7	75	.	.	.	.	.	.
657	138.00	2	18MAY81:21:18	0.10000	6.7	90	.	.	.	.	.	.
658	139.00	2	19MAY81:14:20	0.50000	7.4	60	.	.	.	.	.	.
659	148.00	2	28MAY81:06:26	0.32000	7.0	95	.	.	.	.	.	.
660	148.10	2	28MAY81:15:44	0.65000	6.9	100	.	.	.	.	.	.
661	149.00	2	29MAY81:14:36	0.71000	7.0	85	.	.	.	.	.	.
662	150.00	2	30MAY81:22:00	0.45000	6.9	130	.	.	.	.	.	.
663	152.00	2	01JUN81:15:50	0.72000	6.9	90	.	.	.	.	.	.
664	155.00	2	04JUN81:11:44	0.75000	7.3	75	.	.	.	.	.	.
665	157.00	2	06JUN81:01:33	0.65000	7.2	60	.	.	.	.	.	.
666	171.00	2	20JUN81:12:56	0.19784	6.4	260	.	.	.	.	.	.
667	172.00	2	21JUN81:20:50	0.26000	6.5	145	.	.	.	.	.	.
668	176.00	2	25JUN81:19:08	0.15152	6.4	345	.	.	.	.	.	.
669	183.00	2	02JUL81:15:29	0.08592	6.6	190	.	.	.	.	.	.
670	184.00	2	03JUL81:16:02	0.53000	6.5	70	16.5	0	.	.	.	.
671	209.10	2	28JUL81:15:35	1.56000	6.6	175	.	.	.	.	.	.
672	218.00	2	06AUG81:12:09	0.52764	6.9	245	.	.	.	.	.	.
673	219.00	2	07AUG81:23:47	0.41000	7.0	155	.	.	.	.	.	.
674	258.00	2	15SEP81:17:33	0.30000	6.9	50	.	.	.	.	.	.
675	274.00	2	01OCT81:23:03	0.26611	5.8	100	.	.	.	.	.	.
676	299.00	2	26OCT81:11:56	0.48000	7.0	55	15.5	0	.	.	.	.
677	335.00	2	01DEC81:11:46	0.12000	6.9	130	13.0	0	.	.	.	.
678	348.00	2	14DEC81:16:29	0.19000	.	.	.	.	.	.	.	.
679	357.00	2	23DEC81:04:07	0.19666	.	.	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UP15

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
680	299.0	2	25OCT80:02:54	0.16	6.2	200	.	.	.	.	.	.
681	299.0	2	25OCT80:03:19	0.08	6.5	55	.	.	.	.	.	.
682	299.0	2	25OCT80:03:43	0.16	6.6	45	.	.	.	.	.	.
683	299.0	2	25OCT80:04:29	0.16	6.6	35	.	.	.	.	.	.
684	299.0	2	25OCT80:05:11	0.16	3.7	100	.	.	.	.	.	.
685	299.0	2	25OCT80:05:37	0.08	5.6	25	.	.	.	.	.	.
686	299.0	2	25OCT80:06:01	0.08	5.9	30	.	.	.	.	.	.
687	299.0	2	25OCT80:06:24	0.16	6.0	35	.	.	.	.	.	.
688	299.0	2	25OCT80:07:11	0.05	6.1	20	.	.	.	.	.	.
689	299.0	2	25OCT80:07:45	0.01	6.2	10	.	.	.	.	.	.
690	299.1	2	25OCT80:10:53	0.01	6.4	70	.	.	.	.	.	.
691	299.1	2	25OCT80:11:28	0.03	6.5	40	.	.	.	.	.	.
692	299.1	2	25OCT80:12:01	0.12	6.4	105	.	.	.	.	.	.
693	299.1	2	25OCT80:13:52	0.03	6.4	40	.	.	.	.	.	.
694	299.1	2	25OCT80:14:36	0.08	6.3	100	.	.	.	.	.	.
695	299.1	2	25OCT80:14:55	0.22	6.1	105	.	.	.	.	.	.
696	299.1	2	25OCT80:15:15	0.12	6.7	135	.	.	.	.	.	.
697	299.1	2	25OCT80:15:41	0.08	6.4	120	.	.	.	.	.	.
698	299.1	2	25OCT80:16:03	0.12	6.2	160	.	.	.	.	.	.
699	299.1	2	25OCT80:16:24	0.12	6.3	55	.	.	.	.	.	.
700	299.1	2	25OCT80:16:43	0.08	6.6	60	.	.	.	.	.	.
701	299.1	2	25OCT80:17:06	0.22	6.4	70	.	.	.	.	.	.
702	299.1	2	25OCT80:17:26	0.08	6.2	70	.	.	.	.	.	.
703	299.1	2	25OCT80:17:50	0.12	6.4	130	.	.	.	.	.	.
704	299.1	2	25OCT80:18:09	0.12	6.2	135	.	.	.	.	.	.
705	344.0	2	04DEC80:12:51	0.59	6.9	50	.	.	.	.	.	.
706	21.0	2	21JAN81:10:41	0.25	5.7	8525	.	.	.	.	.	.
707	33.0	2	02FEB81:05:58	2.23	5.9	135	10	0	.	.	.	.
708	39.0	2	08FEB81:10:57	0.82	5.9	185	.	.	.	.	.	.
709	50.0	2	19FEB81:22:56	0.85	7.2	100	.	.	.	.	.	.
710	51.0	2	20FEB81:22:47	0.83	6.9	120	.	.	.	.	.	.
711	52.0	2	21FEB81:16:49	0.04	6.5	435	.	.	.	.	.	.
712	53.0	2	22FEB81:12:40	0.87	6.9	140	.	.	.	.	.	.
713	63.0	2	04MAR81:20:15	0.33	5.9	70	.	.	.	.	.	.
714	95.0	2	05APR81:17:00	0.33	6.6	475	.	.	.	.	.	.
715	95.0	2	05APR81:18:11	0.84	6.9	100	.	.	.	.	.	.
716	95.0	2	05APR81:18:49	0.33	6.8	200	.	.	.	.	.	.
717	99.0	2	09APR81:10:36	0.75	6.7	1230	.	.	.	.	.	.
718	99.0	2	09APR81:11:07	1.00	6.9	115	.	.	.	.	.	.
719	99.0	2	09APR81:11:40	0.50	7.0	130	.	.	.	.	.	.
720	99.0	2	09APR81:12:11	0.21	6.6	1220	.	.	.	.	.	.
721	101.0	2	11APR81:09:59	0.25	7.3	95	.	.	.	.	.	.
722	101.0	2	11APR81:10:20	0.79	7.4	55	.	.	.	.	.	.
723	101.0	2	11APR81:10:50	1.04	7.4	40	.	.	.	.	.	.
724	101.0	2	11APR81:11:27	0.25	7.2	105	.	.	.	.	.	.
725	102.0	2	12APR81:19:11	0.75	7.1	55	.	.	.	.	.	.
726	102.0	2	12APR81:19:32	1.80	7.3	45	.	.	.	.	.	.
727	102.0	2	12APR81:19:45	1.00	7.2	45	.	.	.	.	.	.
728	102.0	2	12APR81:20:17	0.21	7.0	70	.	.	.	.	.	.
729	102.0	2	12APR81:20:51	2.84	7.2	45	.	.	.	.	.	.
730	102.0	2	12APR81:20:54	4.68	7.3	35	.	.	.	.	.	.
731	102.0	2	12APR81:20:58	3.34	7.2	35	.	.	.	.	.	.
732	102.0	2	12APR81:21:07	1.25	7.2	45	.	.	.	.	.	.
733	102.0	2	12APR81:21:22	0.96	7.2	50	.	.	.	.	.	.

STATION CHEMICAL DATA

-- STA=51UR15 --

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
734	102.0	2	12APR81:21:39	0.75000	7.2	50	.	.	.	.	.	.
735	102.0	2	12APR81:22:15	0.50000	7.1	80	.	.	.	.	.	.
736	102.0	2	12APR81:23:19	0.46000	7.1	65	.	.	.	.	.	.
737	102.0	2	12APR81:23:45	1.50000	7.2	45	.	.	.	.	.	.
738	102.0	2	13APR81:00:00	0.96000	7.3	45	.	.	.	.	.	.
739	102.0	2	13APR81:00:28	0.21000	6.9	70	.	.	.	.	.	.
740	102.0	2	13APR81:01:58	0.21000	7.0	130	.	.	.	.	.	.
741	102.0	2	13APR81:04:49	0.21000	7.0	175	.	.	.	.	.	.
742	102.0	2	13APR81:07:52	0.04000	7.0	200	.	.	.	.	.	.
743	103.0	2	13APR81:10:17	0.28000	7.1	145	.	.	.	.	.	.
744	113.0	2	23APR81:20:59	1.04000	6.1	70	.	.	.	.	.	.
745	113.0	2	23APR81:21:06	1.84000	6.2	50	.	.	.	.	.	.
746	113.0	2	23APR81:21:26	0.79000	6.3	50	.	.	.	.	.	.
747	121.0	2	01MAY81:10:23	1.12000	.	.	.	.	.	.	.	.
748	130.0	2	10MAY81:21:25	0.91000	6.7	60	.	.	.	.	.	.
749	131.0	2	11MAY81:12:09	0.40000	6.8	65	.	.	.	.	.	.
750	135.0	2	15MAY81:12:10	0.19060	7.3	55	.	.	.	.	.	.
751	138.0	2	16MAY81:19:44	0.17000	7.2	100	.	.	.	.	.	.
752	139.0	2	19MAY81:14:22	0.29000	7.3	45	.	.	.	.	.	.
753	146.0	2	25MAY81:12:08	0.40580	7.0	55	.	.	.	.	.	.
754	152.0	2	01JUN81:17:13	0.76000	7.2	50	.	.	.	.	.	.
755	154.0	2	03JUN81:21:40	1.70000	6.6	50	.	.	.	.	.	.
756	157.0	2	06JUN81:00:20	1.42000	7.3	60	.	.	.	.	.	.
757	161.0	2	10JUN81:02:41	0.55000	7.5	50	.	.	.	.	.	.
758	164.0	2	13JUN81:22:42	1.54000	7.2	100	.	.	.	.	.	.
759	182.0	2	01JUL81:15:32	0.21000	6.5	80	.	.	.	.	.	.
760	182.1	2	01JUL81:21:10	0.06000	6.5	60	.	.	.	.	.	.
761	201.0	2	20JUL81:18:16	3.98000	6.5	105	.	.	.	.	.	.
762	209.0	2	28JUL81:11:53	0.67000	6.6	480	.	.	.	.	.	.
763	209.1	2	28JUL81:19:23	0.42000	6.9	160	.	.	.	.	.	.
764	218.0	2	06AUG81:10:16	0.39000	7.0	115	.	.	.	.	.	.
765	220.0	2	08AUG81:00:21	0.26000	7.0	145	.	.	.	.	.	.
766	223.0	2	11AUG81:18:54	0.76000	6.4	125	.	.	.	.	.	.
767	227.0	2	15AUG81:20:25	0.57000	6.4	70	.	.	.	.	.	.
768	242.0	2	30AUG81:07:23	0.78000	6.6	45	.	.	.	.	.	.
769	243.0	2	31AUG81:04:02	0.44000	6.9	70	.	.	.	.	.	.
770	251.0	2	08SEP81:13:40	0.36000	6.7	95	.	.	.	.	.	.
771	258.1	2	15SEP81:16:58	0.49000	7.0	65	.	.	.	.	.	.
772	274.0	2	01OCT81:21:10	0.29000	6.6	100	.	.	.	.	.	.
773	291.0	2	18OCT81:17:34	1.30000	7.8	120	.	.	.	.	.	.
774	296.0	2	23OCT81:07:58	0.32000	6.9	85	17.5	0	.	.	.	.
775	298.0	2	25OCT81:14:46	0.45000	7.4	110	22.0	0	.	.	.	.
776	309.0	2	05NOV81:23:05	0.29762	6.8	115	.	.	.	.	.	.
777	335.0	2	01DEC81:12:32	0.35000	6.8	75	11.0	0	.	.	.	.

STATION CHEMICAL DATA

---------- STA=51UR16 ----------

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
778	228.0	2	15AUG80:18:30	1.850	6.7	75	.	.	.	.	.	.
779	.	1	15SEP80:13:48	0.005	.	.	.	.	7.6	8.1	23.0	85
780	.	1	22SEP80:10:05	0.005	.	.	.	.	8.4	5.6	26.0	90
781	.	1	29SEP80:09:50	0.005	.	.	20.5	0	7.5	8.5	18.0	70
782	.	1	06OCT80:13:30	0.005	.	.	.	.	7.7	9.4	19.0	80
783	.	1	20OCT80:14:15	0.005	.	.	.	.	8.4	9.6	16.0	75
784	.	1	27OCT80:11:10	0.005	.	.	16.5	0	6.7	10.7	10.0	65
785	.	1	03NOV80:11:06	0.010	.	.	17.0	0	6.7	10.8	10.0	70
786	.	1	10NOV80:10:20	0.010	.	.	.	.	8.4	11.0	12.5	65
787	.	1	17NOV80:09:45	0.010	.	.	.	.	7.5	12.0	6.0	65
788	322.0	2	17NOV80:16:37	0.630	5.4	75	.	.	.	.	.	.
789	329.0	2	24NOV80:06:47	1.220	5.7	70	.	.	.	.	.	.
790	.	1	01DEC80:09:30	0.010	.	.	14.5	0	6.2	12.2	9.5	65
791	.	1	08DEC80:13:30	0.010	.	.	.	.	5.3	10.6	11.0	70
792	.	1	15DEC80:14:00	0.010	.	.	.	.	5.4	11.6	4.0	85
793	.	1	22DEC80:09:45	0.005	.	.	.	.	6.0	12.6	2.5	80
794	.	1	12JAN81:13:00	0.005	.	.	.	.	5.1	12.4	0.0	315
795	.	1	26JAN81:10:40	0.005	.	.	.	.	6.0	11.0	5.0	370
796	.	1	09FEB81:10:25	0.005	.	.	.	.	6.2	14.4	2.0	265
797	51.0	2	20FEB81:01:19	0.490	6.7	235	.	.	.	.	.	.
798	51.1	2	20FEB81:23:38	0.490	6.1	210	.	.	.	.	.	.
799	54.0	2	23FEB81:00:08	0.720	6.0	190	.	.	.	.	.	.
800	63.0	2	04MAR81:11:17	0.100	6.0	155	.	.	.	.	.	.
801	.	1	09MAR81:11:20	0.010	.	.	28.0	0	6.5	11.0	5.5	125
802	.	1	16MAR81:10:00	0.020	.	.	.	.	6.0	12.2	8.0	135
803	75.0	2	16MAR81:13:09	0.130	6.9	140	.	.	.	.	.	.
804	.	1	23MAR81:09:30	0.010	.	.	.	.	6.1	16.2	6.0	125
805	89.0	2	30MAR81:09:03	0.100	6.7	175	.	.	.	.	.	.
806	91.0	2	01APR81:17:27	0.270	7.2	175	.	.	.	.	.	.
807	.	1	06APR81:10:35	0.005	.	.	.	.	6.5	11.0	11.0	85
808	99.0	2	09APR81:10:59	0.350	6.7	170	.	.	.	.	.	.
809	101.0	2	11APR81:10:35	0.250	.	.	.	.	.	.	.	.
810	104.0	2	14APR81:03:17	0.380	6.9	490	.	.	.	.	.	.
811	107.0	2	17APR81:11:31	0.020	6.3	115	.	.	.	.	.	.
812	.	1	20APR81:10:50	0.010	.	.	21.5	0	6.8	10.2	15.0	285
813	113.0	2	23APR81:11:51	0.290	6.2	145	.	.	.	.	.	.
814	.	1	27APR81:09:40	0.010	.	.	.	.	8.5	10.6	17.0	120
815	118.0	2	28APR81:17:31	0.130	.	.	.	.	.	.	.	.
816	121.0	2	01MAY81:10:44	1.080	6.4	155	.	.	.	.	.	.
817	.	1	04MAY81:09:58	0.005	.	.	.	.	6.2	8.4	16.0	110
818	130.0	2	10MAY81:16:30	0.230	6.6	120	.	.	.	.	.	.
819	.	1	11MAY81:10:00	0.020	.	.	.	.	6.4	8.4	19.0	110
820	131.0	2	11MAY81:12:46	0.180	6.9	120	.	.	.	.	.	.
821	135.0	2	15MAY81:12:39	0.070	7.0	120	.	.	.	.	.	.
822	.	1	18MAY81:09:35	0.005	.	.	.	.	6.0	7.6	15.0	100
823	138.0	2	18MAY81:20:36	0.060	7.4	110	.	.	.	.	.	.
824	139.0	2	19MAY81:15:09	0.140	7.2	110	.	.	.	.	.	.
825	148.0	2	28MAY81:15:45	0.420	6.9	110	.	.	.	.	.	.
826	.	1	01JUN81:11:00	0.005	.	.	.	.	6.2	7.8	23.0	105
827	153.0	2	02JUN81:04:20	0.260	7.1	105	.	.	.	.	.	.
828	154.0	2	03JUN81:22:03	1.290	7.2	95	.	.	.	.	.	.
829	157.0	2	06JUN81:01:26	0.070	7.0	100	.	.	.	.	.	.
830	.	1	08JUN81:11:45	0.005	.	.	.	.	6.2	7.4	24.0	70
831	161.0	2	10JUN81:02:50	0.220	7.1	90	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UR16

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
832	164	2	13JUN81:23:20	0.300	6.9	90	.	.	.	.	.	.
833	171	2	20JUN81:01:06	0.190	6.6	105	.	.	.	.	.	.
834	176	2	25JUN81:19:48	0.190	7.0	100	.	.	.	.	.	.
835	183	2	02JUL81:13:09	0.800	6.4	90	.	.	.	.	.	.
836	185	2	04JUL81:08:04	1.700	6.1	80	.	.	.	.	.	.
837	201	2	20JUL81:18:27	0.980	6.8	90	.	.	.	.	.	.
838	.	1	27JUL81:09:50	0.005	.	.	.	.	6.9	8.00	24	100
839	209	2	28JUL81:12:55	0.270	6.7	250	.	.	.	.	.	.
840	218	2	06AUG81:12:37	0.240	7.2	230	.	.	.	.	.	.
841	220	2	08AUG81:01:02	0.180	.	.	.	.	.	.	.	.
842	.	1	10AUG81:11:55	0.000	.	.	.	.	8.1	6.60	27	85
843	.	1	24AUG81:12:50	0.000	.	.	.	.	7.3	7.50	26	80
844	242	2	30AUG81:08:12	0.510	7.0	80	.	.	.	.	.	.
845	251	2	08SEP81:15:44	0.140	7.0	100	.	.	.	.	.	.
846	256	2	15SEP81:17:27	0.350	6.9	85	.	.	.	.	.	.
847	.	1	21SEP81:12:25	0.005	.	.	.	.	8.9	8.70	19	70
848	274	2	01OCT81:21:57	0.150	6.8	100	.	.	.	.	.	.
849	.	1	05OCT81:11:45	0.005	.	.	.	.	9.2	9.15	18	70
850	.	1	12OCT81:12:15	0.005	.	.	.	.	9.3	9.30	15	75
851	291	2	18OCT81:17:57	0.210	8.4	100	.	.	.	.	.	.
852	296	2	23OCT81:10:52	0.260	7.0	105	21.5	0	.	.	.	.
853	298	2	25OCT81:17:11	0.350	6.9	100	.	.	.	.	.	.
854	.	1	02NOV81:10:15	0.005	.	.	.	.	7.3	8.70	16	75
855	310	2	06NOV81:01:49	0.140	7.3	85	.	.	.	.	.	.
856	.	1	09NOV81:10:10	0.005	.	.	.	.	7.3	13.10	13	80
857	.	1	16NOV81:10:10	0.005	.	.	11.5	0	7.3	10.30	11	75
858	.	1	23NOV81:09:35	0.005	.	.	.	.	7.9	9.90	4	75
859	.	1	30NOV81:09:58	0.005	.	.	.	.	7.4	10.90	7	75
860	335	2	01DEC81:10:22	0.190	7.0	95	17.0	0	.	.	.	.
861	.	1	07DEC81:10:10	0.005	.	.	17.0	0	7.1	10.20	5	80

STA=51UR17

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
862	262.0	2	18SEP80:03:00	0.11	.	.	.	.	.	.	.	.
863	262.0	2	18SEP80:06:25	0.07	7.3	270	.	.	.	.	.	.
864	262.0	2	18SEP80:10:30	0.04	7.5	190	.	.	.	.	.	.
865	265.0	2	21SEP80:19:53	0.03	7.0	180	.	.	.	.	.	.
866	265.0	2	21SEP80:21:04	0.03	7.0	165	.	.	.	.	.	.
867	292.0	2	18OCT80:20:10	0.24	7.3	105	.	.	.	.	.	.
868	292.0	2	18OCT80:22:02	0.17	7.3	110	.	.	.	.	.	.
869	292.0	2	19OCT80:01:34	0.05	7.3	95	.	.	.	.	.	.
870	292.0	2	19OCT80:06:05	0.02	7.2	115	.	.	.	.	.	.
871	292.0	2	19OCT80:12:37	0.00	7.2	70	.	.	.	.	.	.
872	332.0	2	27NOV80:15:34	0.15	6.4	175	.	.	.	.	.	.
873	344.0	2	09DEC80:12:34	0.07	6.1	155	.	.	.	.	.	.
874	358.0	2	23DEC80:09:40	0.17	5.3	395	.	.	.	.	.	.
875	21.0	2	21JAN81:04:33	0.02	6.2	650	.	.	.	.	.	.
876	33.0	2	02FEB81:06:46	1.21	5.4	175	19	0	.	.	.	.
877	39.0	2	08FEB81:10:59	0.15	5.7	200	.	.	.	.	.	.
878	42.0	2	11FEB81:04:52	0.18	6.9	55	27	0	.	.	.	.
879	50.0	2	19FEB81:22:37	0.08	7.1	130	.	.	.	.	.	.

STATION CHEMICALDATA

STA=51UR17

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
880	53.0	2	23FEB81:11:45	0.25	.	.	.	.	.	.	.	.
881	75.0	2	16MAR81:13:25	0.08	6.8	180	.	.	.	.	.	.
882	89.0	2	30MAR81:07:43	0.17	6.8	110	.	.	.	.	.	.
883	95.0	2	05APR81:17:35	0.36	6.6	105	.	.	.	.	.	.
884	99.0	2	09APR81:11:34	0.24	6.7	135	.	.	.	.	.	.
885	102.0	2	12APR81:19:54	0.11	6.2	120	.	.	.	.	.	.
886	104.0	2	14APR81:17:59	0.08	6.9	205	.	.	.	.	.	.
887	107.0	2	17APR81:10:59	0.07	6.2	170	.	.	.	.	.	.
888	113.0	2	23APR81:20:42	0.32	6.3	150	.	.	.	.	.	.
889	120.0	2	30APR81:10:36	0.06	6.0	205	.	.	.	.	.	.
890	121.0	2	01MAY81:10:31	0.16	7.3	90	.	.	.	.	.	.
891	130.0	2	10MAY81:15:15	0.17	7.8	135	.	.	.	.	.	.
892	131.0	2	11MAY81:12:29	0.20	7.2	100	.	.	.	.	.	.
893	135.0	2	15MAY81:12:12	0.54	6.5	120	.	.	.	.	.	.
894	135.1	2	15MAY81:14:47	0.11	7.0	190	.	.	.	.	.	.
895	138.0	2	18MAY81:12:01	0.05	6.6	210	.	.	.	.	.	.
896	139.0	2	19MAY81:14:14	0.06	6.7	190	.	.	.	.	.	.
897	148.0	2	28MAY81:06:19	0.15	7.1	155	.	.	.	.	.	.
898	152.0	2	01JUN81:13:16	0.22	7.0	155	.	.	.	.	.	.
899	161.0	2	10JUN81:04:26	0.18	6.9	90	.	.	.	.	.	.
900	164.0	2	13JUN81:18:42	0.08	7.7	120	.	.	.	.	.	.
901	171.0	2	20JUN81:00:06	0.25	6.1	125	.	.	.	.	.	.
902	176.0	2	25JUN81:20:21	0.41	6.9	85	.	.	.	.	.	.
903	184.0	2	03JUL81:05:58	0.07	6.2	210	.	.	.	.	.	.
904	202.0	2	21JUL81:15:30	0.19	6.9	100	.	.	.	.	.	.
905	205.0	2	24JUL81:16:02	0.31	7.1	170	.	.	.	.	.	.
906	207.0	2	26JUL81:19:46	0.12	7.6	345	.	.	.	.	.	.
907	215.0	2	03AUG81:15:23	0.23	7.0	245	.	.	.	.	.	.
908	218.0	2	06AUG81:13:40	0.01	7.3	.	.	.	.	.	.	.
909	223.0	2	11AUG81:20:14	0.34	6.4	110	.	.	.	.	.	.
910	242.0	2	30AUG81:09:16	0.24	7.0	90	.	.	.	.	.	.
911	243.0	2	31AUG81:11:57	0.33	7.0	80	.	.	.	.	.	.
912	251.0	2	08SEP81:14:07	0.11	7.2	155	.	.	.	.	.	.
913	258.0	2	15SEP81:17:52	0.21	6.9	95	.	.	.	.	.	.
914	260.0	2	17SEP81:20:49	0.12	7.0	115	.	.	.	.	.	.
915	270.0	2	27SEP81:19:21	0.17	7.0	110	.	.	.	.	.	.
916	279.0	2	06OCT81:11:08	0.10	6.7	95	.	.	.	.	.	.
917	296.0	2	23OCT81:14:16	0.13	7.0	100	.	.	.	.	.	.
918	298.0	2	25OCT81:20:33	0.06	7.4	155	.	.	.	.	.	.
919	299.0	2	26OCT81:12:33	0.17	7.1	100	.	.	.	.	.	.
920	309.0	2	05NOV81:21:05	0.25	7.0	100	.	.	.	.	.	.
921	335.0	2	01DEC81:11:05	0.12	7.2	140	22	0	.	.	.	.
922	338.0	2	04DEC81:18:52	0.09	7.5	180	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UR18

OBS	STRMNO	TYPE	TI1	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
923	39.0	2	06FEB81:13:55	0.07	5.9	95	.	.	.	.	.	.
924	54.0	2	23FEB81:09:27	0.48	6.0	100	.	.	.	.	.	.
925	121.0	2	01MAY81:16:04	0.41	6.0	75	.	.	.	.	.	.
926	139.0	2	19MAY81:15:55	0.06	7.0	125	.	.	.	.	.	.
927	154.0	2	03JUN81:23:49	0.20	7.3	60	.	.	.	.	.	.
928	157.0	2	06JUN81:01:11	0.02	7.0	100	.	.	.	.	.	.
929	258.0	2	15SEP81:17:25	0.05	6.8	105	.	.	.	.	.	.
930	299.1	2	26OCT81:21:10	0.07	6.8	100	27.5	0	.	.	.	.

STA=51UR19

OBS	STRMNO	TYPE	TI1	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
931	51.0	2	20FEB81:00:07	0.084	7.7	345	.	.	.	.	.	.
932	51.1	2	20FEB81:15:07	0.032	7.8	340	.	.	.	.	.	.
933	53.0	2	22FEB81:16:40	0.051	8.4	285	.	.	.	.	.	.
934	63.0	2	04MAR81:23:00	0.032	6.6	300	100.5	0	.	.	.	.
935	75.0	2	16MAR81:14:15	0.017	7.0	340	.	.	.	.	.	.
936	89.0	2	30MAR81:09:59	0.024	6.8	395	.	.	.	.	.	.
937	95.0	2	05APR81:19:20	0.034	6.8	355	.	.	.	.	.	.
938	99.0	2	09APR81:12:09	0.042	6.6	335	.	.	.	.	.	.
939	101.0	2	11APR81:11:34	0.024	6.9	305	.	.	.	.	.	.
940	103.0	2	13APR81:10:57	0.014	6.8	315	.	.	.	.	.	.
941	113.0	2	23APR81:21:31	0.052	7.0	345	112.0	0	.	.	.	.
942	121.0	2	01MAY81:11:08	0.117	7.4	295	.	.	.	.	.	.
943	130.0	2	10MAY81:17:25	0.027	7.9	310	.	.	.	.	.	.
944	135.0	2	15MAY81:13:07	0.045	7.2	290	.	.	.	.	.	.
945	138.0	2	18MAY81:21:48	0.032	7.8	285	.	.	.	.	.	.
946	148.0	2	28MAY81:09:25	0.010	7.0	420	.	.	.	.	.	.
947	150.0	2	30MAY81:23:15	0.017	7.2	350	.	.	.	.	.	.
948	164.0	2	13JUN81:19:02	0.051	8.1	260	.	.	.	.	.	.
949	171.0	2	20JUN81:06:33	0.012	5.9	395	.	.	.	.	.	.
950	176.0	2	25JUN81:07:53	0.029	6.7	455	.	.	.	.	.	.
951	183.0	2	02JUL81:14:40	0.018	6.3	340	.	.	.	.	.	.
952	202.0	2	21JUL81:00:53	0.005	8.0	400	.	.	.	.	.	.
953	205.0	2	24JUL81:20:45	0.007	8.2	450	.	.	.	.	.	.
954	209.0	2	28JUL81:10:22	0.054	8.2	420	.	.	.	.	.	.
955	218.0	2	06AUG81:13:02	0.031	8.1	385	.	.	.	.	.	.
956	220.0	2	08AUG81:06:22	0.020	8.1	535	.	.	.	.	.	.
957	223.0	2	11AUG81:19:27	0.282	8.5	210	.	.	.	.	.	.
958	227.0	2	15AUG81:21:34	0.022	7.6	300	.	.	.	.	.	.
959	242.0	2	30AUG81:09:20	0.041	7.8	255	.	.	.	.	.	.
960	258.0	2	15SEP81:17:34	0.115	8.4	305	.	.	.	.	.	.
961	265.0	2	22SEP81:18:39	0.002	7.8	630	.	.	.	.	.	.
962	291.0	2	18OCT81:20:11	0.009	9.1	410	.	.	.	.	.	.
963	296.0	2	23OCT81:10:52	0.033	8.6	370	118.0	0	.	.	.	.
964	298.0	2	25OCT81:10:56	0.069	8.0	240	.	.	.	.	.	.
965	310.0	2	05NOV81:00:34	0.016	8.0	285	.	.	.	.	.	.

STATION CHEMICAL DATA

STA=51UR20

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
966	258	2	15SEP81:17:41	4.11	9.4	120	.	.	.	.	.	.
967	265	2	22SEP81:19:06	15.56	6.7	110	.	.	.	.	.	.
968	274	2	01OCT81:17:13	11.25	6.3	105	.	.	.	.	.	.
969	279	2	06OCT81:18:56	15.18	6.4	50	.	.	.	.	.	.
970	291	2	18OCT81:18:15	2.25	7.9	110	.	.	.	.	.	.
971	296	2	23OCT81:09:49	3.75	6.6	50	.	.	.	.	.	.
972	298	2	25OCT81:14:54	0.84	6.5	50	.	.	.	.	.	.
973	299	2	26OCT81:12:12	9.63	6.7	50	.	.	.	.	.	.
974	309	2	05NOV81:21:04	4.48	7.0	80	.	.	.	.	.	.
975	335	2	01DEC81:10:24	1.20	6.6	110	15	0	.	.	.	.
976	4	2	04JAN82:15:06	0.51	.	.	.	.	.	.	.	.

STA=51UR21

OBS	STRMNO	TYPE	TII	FLO	LPH	LCOND	LTALK	LCALK	PH	DO	TEMP	COND
977	.	1	21SEP81:09:20	0.035	.	.	.	.	6.9	7.1	17.0	60
978	.	1	28SEP81:08:36	0.029	.	.	.	.	6.8	6.5	17.0	60
979	.	1	05OCT81:08:55	0.028	.	.	.	.	7.0	7.8	16.0	60
980	.	1	12OCT81:09:15	0.014	.	.	.	.	6.5	7.9	13.5	65
981	299	2	26OCT81:16:33	0.420	10.2	150	.	.	.	.	.	.
982	.	1	02NOV81:08:55	0.019	.	.	.	.	7.2	7.3	15.0	50
983	.	1	09NOV81:08:35	0.035	.	.	.	.	6.5	10.5	12.0	40
984	.	1	16NOV81:08:35	0.023	.	.	11.5	0	6.4	10.3	12.0	40
985	.	1	23NOV81:08:30	0.023	.	.	.	.	6.5	8.0	5.5	40
986	.	1	30NOV81:08:45	0.014	.	.	.	.	6.3	10.5	7.0	45
987	.	1	07DEC81:08:55	0.011	.	.	7.5	0	6.2	9.5	7.0	45

STATION SOLIDS AND ORGANICS DATA

STA=51UR03

OBS	STRMNO	TYPE	TI1	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
148	292.00	2	18OCT80:09:18	0.12000	324.0	87.0		.		.
149	292.00	2	18OCT80:10:14	0.12000	284.0	25.0		.		.
150	292.00	2	18OCT80:11:19	0.09000	244.0	11.0		.		.
151	292.00	2	18OCT80:12:27	0.06000	244.0	18.0		.		.
152	292.00	2	18OCT80:14:12	0.03000	240.0	9.0		.		.
153	292.10	2	18OCT80:16:48	0.58000	308.0	437.0		.		.
154	292.10	2	18OCT80:16:58	0.42000	116.0	127.0		.		.
155	292.10	2	18OCT80:17:18	0.12000	128.0	56.0		.		.
156	292.10	2	18OCT80:17:53	0.12000	82.0	22.0		.		.
157	292.10	2	18OCT80:18:26	0.33000	98.0	63.0		.		.
158	292.10	2	18OCT80:18:34	1.11000	314.0	296.0		.		.
159	292.10	2	18OCT80:18:39	0.89000	162.0	126.0		.		.
160	292.10	2	18OCT80:18:44	0.89000	38.0	55.0		.		.
161	292.10	2	18OCT80:18:50	0.67000	26.0	39.0		.		.
162	292.10	2	18OCT80:18:57	0.42000	36.0	15.0		.		.
163	292.10	2	18OCT80:19:07	0.42000	22.0	23.0		.		.
164	292.10	2	18OCT80:19:15	0.42000	16.0	15.0		.		.
165	292.10	2	18OCT80:19:24	0.42000	16.0	24.0		.		.
166	292.10	2	18OCT80:19:33	0.42000	50.4	14.0		.		.
167	292.10	2	18OCT80:19:44	0.33000	60.1	5.0		.		.
168	292.10	2	18OCT80:19:56	0.33000	42.7	5.0		.		.
169	292.10	2	18OCT80:20:11	0.21000	46.7	4.0		.		.
170	292.10	2	18OCT80:20:29	0.21000	.	6.0		.		.
171	292.10	2	18OCT80:20:48	0.67000	144.0	323.0		.		.
172	292.10	2	18OCT80:20:52	1.11000	113.0	136.0		.		.
173	292.10	2	18OCT80:20:57	1.23000	42.7	55.0		.		.
174	292.10	2	18OCT80:21:02	0.89000	38.8	29.0		.		.
175	292.10	2	18OCT80:21:08	0.67000	.	23.0		.		.
176	292.10	2	18OCT80:21:16	0.42000	24.4	23.0		.		.
177	309.00	2	04NOV80:08:22	0.19000	16.0	13.0		.		.
178	314.00	2	09NOV80:15:44	0.58000	56.0	154.0		.		.
179	329.00	2	24NOV80:05:27	0.36000	12.0	8.0		3.5		6.3
180	332.00	2	27NOV80:16:56	0.12000	4.0	1.0		.		.
181	344.00	2	09DEC80:12:55	0.29000	40.0	21.0		.		.
182	356.00	2	23DEC80:08:19	0.15000	32.0	5.5		.		.
183	51.00	2	20FEB81:00:14	0.61000	40.0	39.0		.		.
184	51.10	2	20FEB81:13:15	0.15000	36.0	23.0		.		.
185	52.00	2	21FEB81:15:32	0.16064	46.0	19.0		.		.
186	53.00	2	22FEB81:17:11	0.33264	20.0	17.0		.		.
187	63.00	2	04MAR81:19:57	0.47000	.	18.0		4.2		8.8
188	75.00	2	16MAR81:12:11	0.05000	33.3	22.0		.		.
189	89.01	2	30MAR81:07:36	0.18000	.	84.0		.		.
190	89.01	2	30MAR81:08:04	0.18000	.	49.0		.		.
191	89.01	2	30MAR81:08:28	0.27000	.	141.0		.		.
192	89.01	2	30MAR81:08:45	0.33000	.	98.0		.		.
193	89.01	2	30MAR81:09:00	0.39000	.	73.0		.		.
194	89.01	2	30MAR81:09:13	0.42000	.	67.0		.		.
195	89.01	2	30MAR81:09:24	0.45000	.	429.0		.		.
196	89.01	2	30MAR81:09:36	0.36000	.	200.0		.		.
197	89.01	2	30MAR81:09:53	0.24000	.	57.0		.		.
198	89.01	2	30MAR81:10:19	0.15000	.	34.0		.		.
199	89.03	2	30MAR81:13:20	0.47000	51.8	102.0		.		.
200	90.00	2	31MAR81:10:44	0.12682	24.9	11.0		.		.
201	95.00	2	05APR81:17:30	0.60000	180.0	57.0		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR03

OBS	STRMNU	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
202	99.0	2	09APR81:10:56	0.53000	44.3	60.0		.		.
203	102.0	2	12APR81:18:53	0.27689	30.0	21.0		.		.
204	104.0	2	14APR81:16:23	0.15000	14.0	5.3		.		.
205	107.0	2	17APR81:06:24	0.13301	22.0	4.0		1.9		3.8
206	113.0	2	23APR81:19:08	0.22646	12.2	12.0		.		.
207	130.0	2	10MAY81:14:23	0.29437	30.0	6.0		.		.
208	138.0	2	19MAY81:13:36	0.26000	30.1	5.0		.		.
209	148.0	2	28MAY81:01:07	0.24000	36.0	19.0		.		.
210	149.0	2	29MAY81:18:33	0.10000	24.5	0.0		.		.
211	150.0	2	30MAY81:23:40	0.09000	61.2	1.0		.		.
212	152.0	2	01JUN81:13:15	0.22000	32.6	6.0		.		.
213	154.0	2	03JUN81:19:25	0.09000	36.7	9.0		.		.
214	155.0	2	04JUN81:20:56	0.06000	36.0	3.0		.		.
215	157.1	2	06JUN81:21:10	0.09465	20.0	123.0		.		.
216	159.0	2	08JUN81:21:20	0.12000	40.0	2.0		.		.
217	161.0	2	10JUN81:01:08	0.25876	24.0	12.0		.		.
218	164.0	2	13JUN81:17:18	0.14000	24.0	5.0		.		.
219	170.0	2	19JUN81:23:34	1.32000	60.0	63.0		.		.
220	176.0	2	25JUN81:20:12	0.58929	20.0	12.0		.		.
221	184.0	2	03JUL81:05:11	0.20000	34.3	10.0		.		.
222	185.0	2	04JUL81:06:09	5.60000	6.1	11.0		2.5		5.5
223	201.0	2	20JUL81:19:41	0.14143	71.5	28.0		.		.
224	202.0	2	21JUL81:15:32	0.15363	28.0	15.0		.		.
225	205.0	2	24JUL81:14:24	0.26000	24.0	4.0		.		.
226	207.0	2	26JUL81:19:54	0.18191	20.0	12.0		.		.
227	209.0	2	28JUL81:00:16	0.18000	24.0	.		.		.
228	215.0	2	03AUG81:16:26	0.10000	27.8	6.0		.		.
229	218.0	2	06AUG81:10:32	0.16000	28.5	6.0		.		.
230	219.0	2	07AUG81:18:23	0.08596	23.3	2.0		.		.
231	223.0	2	11AUG81:20:04	0.19403	35.8	11.0		.		.
232	227.0	2	15AUG81:20:44	0.26000	24.5	20.0		.		.
233	242.0	2	30AUG81:08:48	0.48000	39.7	10.0		.		.
234	243.0	2	31AUG81:10:20	0.33417	39.7	16.0		.		.
235	251.0	2	08SEP81:13:08	1.40000	42.7	36.0		.		.
236	258.0	2	15SEP81:17:41	0.92000	34.6	4.5		.		.
237	260.0	2	17SEP81:20:42	0.34000	81.6	13.5		.		.
238	265.0	2	22SEP81:19:15	0.18000	37.7	19.5		.		.
239	270.0	2	27SEP81:19:20	0.24000	31.5	21.0		.		.
240	274.0	2	01OCT81:21:49	0.36000	39.3	10.0		.		.
241	291.0	2	18OCT81:17:57	0.44000	48.2	31.0		.		.
242	296.0	2	23OCT81:13:10	0.24000	32.1	.		.		.
243	297.0	2	24OCT81:21:52	0.15000	61.0	13.0		.		.
244	299.0	2	26OCT81:12:04	0.54000	27.9	8.0		.		.
245	300.0	2	27OCT81:08:24	0.33000	47.1	18.5		.		.
246	335.0	2	01DEC81:11:40	0.20000	35.4	26.0		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR04

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
247	329	2	24NOV80:14:54	0.68004	16.0	20.0		.		.
248	332	2	27NOV80:22:48	0.54714	8.0	4.0		.		.
249	33	2	02FEB81:10:36	0.18000	28.0	19.0		.		.
250	42	2	11FEB81:04:56	0.76000	23.1	24.0		3.5		.
251	50	2	19FEB81:15:29	0.15000	36.0	20.0		.		.
252	53	2	22FEB81:18:45	0.45000	36.0	19.0		.		.
253	89	2	30MAR81:16:09	0.33795	30.0	29.0		.		.
254	90	2	31MAR81:13:51	0.20009	36.5	10.0		.		.
255	95	2	05APR81:17:49	0.21676	29.4	16.0		.		.
256	99	2	09APR81:13:25	0.13000	.	22.0		.		.
257	102	2	12APR81:20:02	0.59418	26.3	25.0		.		.
258	104	2	14APR81:15:46	0.11000	26.3	21.0		.		.
259	107	2	17APR81:20:50	0.05000	.	23.0		.		.
260	110	2	20APR81:07:56	0.05002	.	24.0		.		.
261	121	2	01MAY81:13:25	0.58455	25.7	21.0		.		.
262	131	2	11MAY81:11:58	0.52000	90.0	22.0		.		.
263	135	2	15MAY81:14:22	0.49068	22.0	17.0		.		.
264	139	2	19MAY81:09:42	0.09000	15.8	16.0		.		.
265	153	2	02JUN81:05:58	0.11000	24.5	12.0		.		.
266	154	2	03JUN81:20:00	0.16000	57.1	78.0		.		.
267	161	2	10JUN81:05:38	0.29999	36.0	18.0		.		.
268	164	2	13JUN81:22:10	0.34000	36.0	10.0		.		.
269	171	2	20JUN81:15:50	0.48000	27.9	7.0		.		.
270	176	2	25JUN81:20:32	0.16000	40.0	7.0		.		.
271	185	2	04JUL81:08:10	1.30000	27.5	10.0		.		.
272	207	2	26JUL81:21:34	0.15000	11.9	4.0		.		.
273	208	2	27JUL81:12:32	0.09872	19.9	5.0		.		.
274	223	2	11AUG81:20:39	0.30000	17.4	5.0		.		.
275	227	2	15AUG81:20:55	0.35000	6.1	1.0		.		.
276	242	2	30AUG81:14:20	0.24000	11.8	7.0		.		.
277	243	2	31AUG81:09:32	0.60000	17.9	10.0		.		.
278	258	2	15SEP81:21:01	0.50000	24.6	10.5		.		.
279	260	2	17SEP81:21:10	0.17335	30.5	9.0		.		.
280	274	2	01OCT81:23:01	0.28000	29.5	11.0		.		.
281	299	2	26OCT81:12:52	0.35000	20.7	17.0		.		.

STA=51UR05

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
282	224.10	.	.	.	.	.		.		.
283	279.00	.	.	.	.	.		.		.
284	261.00	2	17SEP80:18:51	0.04	41.4	12.0		.		.
285	269.00	2	25SEP80:03:08	0.27	36.3	6.0		.		.
286	304.00	2	04NOV80:08:15	0.04	20.0	11.5		.		.
287	314.00	2	09NOV80:15:41	0.03	60.0	152.0		.		.
288	321.00	2	16NOV80:01:16	0.03	60.0	9.0		.		.
289	329.01	2	24NOV80:01:22	0.10	14.0	3.0		.		.
290	329.02	2	24NOV80:10:25	0.35	28.0	5.0		.		.
291	329.03	2	24NOV80:15:02	0.07	32.0	7.0		.		.
292	332.00	2	27NOV80:08:26	0.10	19.0	3.0		.		.
293	344.00	2	09DEC80:10:58	0.03	46.0	22.0		.		.
294	33.00	2	02FEB81:06:17	0.08	56.0	44.0	G	10.0	G	18.0

STATION SOLIDS AND ORGANICS DATA

STA=51UR05

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
295	39.0	2	08FEB81:10:36	0.03	56.0	24.0		.		.
296	41.0	2	10FEB81:23:08	0.09	55.0	43.0		6.5	G	10.0
297	50.0	2	19FEB81:16:00	0.07	52.0	20.0		.		.
298	63.0	2	04MAR81:19:29	0.09	.	6.0		4.8		9.4
299	75.0	2	16MAR81:05:14	0.07	45.1	10.0		.		.
300	89.0	2	30MAR81:07:25	0.05	72.0	37.0		.		.
301	91.0	2	01APR81:13:40	0.06	76.8	81.0		.		.
302	95.0	2	05APR81:13:16	0.06	68.6	25.0		.		.
303	99.0	2	09APR81:11:31	0.07	28.2	16.0		.		.
304	101.0	2	11APR81:10:41	0.09	42.0	23.5		.		.
305	102.0	2	12APR81:18:48	0.08	42.0	14.0		.		.
306	103.0	2	13APR81:14:32	0.05	26.0	31.0		.		.
307	107.0	2	17APR81:08:53	0.05	44.4	14.0		4.6		9.4
308	118.0	2	28APR81:17:17	0.01	.	101.0		.		.
309	118.0	2	28APR81:18:12	0.41	.	169.0		.		.
310	118.0	2	28APR81:18:22	0.04	.	41.0		.		.
311	121.0	2	01MAY81:14:53	0.13	34.0	10.0		.		.
312	130.0	2	10MAY81:14:35	0.07	37.8	21.0		.		.
313	131.0	2	11MAY81:11:29	0.08	33.8	24.0		.		.
314	135.0	2	15MAY81:11:55	0.10	66.1	51.0		.		.
315	135.1	2	15MAY81:18:25	0.05	54.1	54.0		.		.
316	138.0	2	18MAY81:21:12	0.04	30.1	17.0		.		.
317	148.0	2	28MAY81:01:12	0.08	84.0	53.0		.		.
318	150.0	2	30MAY81:22:02	0.04	44.9	8.0		.		.
319	152.0	2	01JUN81:13:27	0.03	28.6	4.0		.		.
320	154.0	2	03JUN81:20:20	0.01	58.0	12.0		.		.
321	160.0	2	09JUN81:16:04	0.04	52.0	16.0		.		.
322	161.0	2	10JUN81:14:54	0.03	60.0	12.0		.		.
323	164.0	2	13JUN81:17:47	0.05	32.0	26.0		.		.
324	173.0	2	22JUN81:15:54	0.02	43.8	43.0		.		.
325	182.0	2	01JUL81:07:48	0.10	87.3	94.0		.		.
326	201.0	2	20JUL81:18:41	0.04	139.0	53.0		.		.
327	209.1	2	28JUL81:16:16	0.05	37.7	9.0		.		.
328	223.0	2	11AUG81:19:37	0.09	50.1	42.0		.		.
329	224.1	2	12AUG81:05:27	0.14	25.6	6.0		.		.
330	243.1	2	31AUG81:12:53	0.15	45.6	10.0		.		.
331	252.0	2	09SEP81:03:13	0.02	84.3	12.0		.		.
332	258.0	2	15SEP81:17:23	0.16	71.2	35.0		.		.
333	258.1	2	15SEP81:20:04	0.06	34.6	7.5		.		.
334	265.0	2	22SEP81:18:33	0.24	58.0	21.5		.		.
335	274.0	2	01OCT81:21:45	0.09	39.3	12.0		.		.
336	279.0	2	06OCT81:18:59	0.04	42.6	6.5		.		.
337	296.0	2	23OCT81:06:06	0.03	35.2	10.5		.		.
338	298.0	2	25OCT81:14:14	0.03	25.4	8.5		.		.
339	299.0	2	26OCT81:12:14	0.07	57.0	.		.		.
340	300.0	2	27OCT81:08:27	0.06	31.3	14.5		.		.
341	309.0	2	05NOV81:21:07	0.11	52.5	27.0		.		.
342	335.0	2	01DEC81:11:57	0.03	26.6	7.5		.		.
343	338.0	2	04DEC81:18:00	0.02	62.8	16.0		.		.
344	349.0	2	15DEC81:11:33	0.05	34.8	.		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR06

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
345	299.00	2	25OCT80:05:39	0.33	46.0	48.0		2.3		8.5
346	322.00	2	17NOV80:15:59	0.29	42.0	63.0		.		.
347	329.00	2	24NOV80:10:22	0.58	12.0	52.0		.		.
348	332.00	2	27NOV80:21:04	0.09	10.0	15.0		.		.
349	33.01	2	02FEB81:06:27	0.50	96.0	221.0	G	10.0	G	18.0
350	33.02	2	02FEB81:12:13	0.10	.	10.0		.		.
351	39.00	2	08FEB81:13:43	0.14	71.0	65.0		.		.
352	42.00	2	11FEB81:04:24	0.29	62.0	119.0		5.3	G	10.0
353	50.00	2	19FEB81:23:04	0.31	60.0	49.0		.		.
354	51.00	2	20FEB81:23:55	0.12	48.0	31.0		.		.
355	53.10	2	22FEB81:23:38	0.26	50.0	72.0		.		.
356	64.00	2	05MAR81:04:17	0.07	.	25.0		.		.
357	99.00	2	09APR81:11:46	0.14	84.6	73.0		.		.
358	102.00	2	12APR81:19:09	0.12	58.0	64.0		.		.
359	121.00	2	01MAY81:10:07	0.51	68.0	148.0		.		.
360	131.00	2	11MAY81:03:05	0.26	60.0	30.0		.		.
361	139.00	2	19MAY81:05:03	0.16	60.0	14.0		.		.
362	148.00	2	28MAY81:07:26	0.06	65.8	18.0		.		.
363	149.00	2	29MAY81:20:02	0.18	56.0	109.0		.		.
364	150.00	2	30MAY81:21:48	0.23	56.0	65.0		.		.
365	152.00	2	01JUN81:14:45	0.18	56.0	22.0		.		.
366	161.00	2	10JUN81:06:32	0.17	52.0	19.0		.		.
367	164.00	2	13JUN81:19:46	0.24	28.0	94.0		.		.
368	171.00	2	20JUN81:14:35	0.60	31.8	111.0		.		.
369	172.00	2	21JUN81:20:12	0.28	43.8	37.0		.		.
370	185.00	2	04JUL81:07:08	1.13	22.2	28.0		2.4		6.0
371	209.00	2	28JUL81:11:45	1.08	41.9	56.0		.		.
372	223.00	2	11AUG81:19:51	1.01	28.6	18.0		.		.
373	227.00	2	15AUG81:20:33	1.93	23.5	28.0		.		.
374	242.00	2	30AUG81:10:55	0.28	45.2	14.0		.		.
375	258.00	2	15SEP81:16:54	0.19	69.4	24.0		.		.
376	290.00	2	23OCT81:16:23	0.06	62.0	10.6		.		.
377	299.00	2	26OCT81:12:42	0.23	42.0	9.5		.		.

STA=51UR07

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
378	204.0	2	22JUL80:19:26	5.2300	36.2	247.0		.		.
379	204.1	2	22JUL80:22:50	1.2700	46.6	424.0		.		.
380	211.0	2	29JUL80:02:06	0.4900	60.8	66.0		.		.
381	214.0	2	01AUG80:14:06	0.6000	.	116.0		.		.
382	216.0	2	03AUG80:16:05	0.8400	.	120.0		.		.
383	216.1	2	03AUG80:23:47	1.0700	74.2	144.0		.		.
384	231.0	2	18AUG80:05:52	1.0500	140.0	825.0		.		.
385	232.0	2	19AUG80:02:57	0.8000	33.2	99.0		.		.
386	.	1	08SEP80:15:00	0.0055	21.0	34.0		.		.
387	254.0	2	10SEP80:01:09	0.3400	132.0	294.0		.		.
388	.	1	15SEP80:10:35	0.0021	4.8	13.4		.		.
389	.	1	22SEP80:15:30	0.0021	11.6	1.5		.		.
390	269.0	2	25SEP80:03:55	0.0939	70.2	80.0		.		.
391	269.0	2	25SEP80:05:52	0.2340	.	154.0		.		.
392	269.0	2	25SEP80:07:44	0.2340	33.2	42.0		.		.

STATION SOLIDS AND ORGANICS DATA

-- STA=51UR07 --

OBS	STRENO	TYPE	TI1	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
393	269.0	2	25SEP80:08:06	0.1340	27.6	20.0		.		.
394	269.0	2	25SEP80:10:55	0.0407	27.8	12.0		.		.
395	269.0	2	25SEP80:12:43	0.0186	34.0	12.0		.		.
396	.	3	29SEP80:12:45	0.0686	2.4	0.0		1.9		.
397	276.0	2	02OCT80:21:50	0.1600	.	230.0		.		.
398	.	1	06OCT80:10:00	0.0021	4.8	0.0		.		.
399	.	1	20OCT80:09:25	0.0105	9.1	1.5		.		.
400	299.0	2	25OCT80:09:00	7.1100	40.0	514.0		.		.
401	.	1	27OCT80:10:20	0.0234	8.2	2.0		2.5		.
402	302.0	2	28OCT80:06:20	0.1100	22.0	25.0		.		.
403	.	1	03NOV80:08:30	0.0143	22.0	0.5		1.0		.
404	309.0	2	04NOV80:05:13	0.8200	28.0	16.0		.		.
405	.	1	10NOV80:14:45	0.0073	10.0	1.5		.		.
406	329.0	2	24NOV80:03:18	1.0200	64.0	66.0		.		.
407	332.0	2	27NOV80:15:56	0.4200	12.0	28.0		.		.
408	.	1	01DEC80:14:45	0.0105	25.6	32.0		1.1		6.6
409	.	1	08DEC80:08:30	0.0021	13.8	1.0		.		.
410	.	1	15DEC80:10:30	0.0073	5.2	0.0		.		.
411	.	1	22DEC80:14:25	0.0143	7.6	39.0		.		.
412	.	1	26JAN81:14:20	0.0021	10.4	1.0		.		.
413	.	1	09FEB81:13:50	0.0143	8.6	2.4		3.0		5.0
414	52.0	2	21FEB81:00:10	0.1800	32.0	41.0		.		.
415	53.0	2	22FEB81:12:08	0.6600	58.0	487.0		.		.
416	63.0	2	04MAR81:16:00	0.1300	.	23.0		.		.
417	.	1	09MAR81:14:15	0.0234	3.4	0.5		2.9		3.6
418	.	1	23MAR81:14:05	0.0186	3.8	0.5		.		.
419	89.0	2	30MAR81:07:54	0.2900	116.0	531.0		.		.
420	91.0	2	01APR81:13:19	0.6000	53.8	96.0		.		.
421	.	1	06APR81:16:00	0.0186	19.4	1.0		.		.
422	99.0	2	09APR81:09:22	0.4800	24.0	32.0		.		.
423	102.0	2	12APR81:17:40	0.9100	26.0	110.0		.		.
424	104.0	2	14APR81:17:06	0.5400	26.0	240.0		.		.
425	107.0	2	17APR81:09:12	0.4100	.	11.0		.		.
426	.	1	20APR81:14:40	0.0050	11.3	1.0		1.8		3.7
427	.	1	27APR81:14:35	0.0186	21.8	1.0		.		.
428	120.0	2	30APR81:09:20	0.2600	64.0	104.0		.		.
429	120.1	2	30APR81:23:03	0.4400	42.7	30.0		.		.
430	121.0	2	01MAY81:09:36	3.6000	113.0	292.0		.		.
431	.	1	04MAY81:14:30	0.0186	11.3	1.0		.		.
432	130.0	2	10MAY81:14:24	0.3600	54.0	83.0		.		.
433	130.1	2	10MAY81:20:15	1.2200	62.0	190.0		.		.
434	131.0	2	11MAY81:02:06	0.2500	22.0	14.0		.		.
435	131.1	2	11MAY81:11:02	1.8800	30.0	47.0		.		.
436	131.2	2	11MAY81:19:51	1.1400	96.0	248.0		.		.
437	132.0	2	12MAY81:00:47	0.5800	18.0	40.0		.		.
438	135.0	2	15MAY81:11:50	0.6400	88.0	158.0		.		.
439	.	1	18MAY81:13:45	0.0186	10.1	2.0		.		.
440	139.0	2	19MAY81:02:57	0.4200	32.0	38.0		.		.
441	139.1	2	19MAY81:13:15	0.4200	24.0	12.0		.		.
442	149.0	2	29MAY81:20:56	0.6800	86.9	86.0		.		.
443	152.0	2	01JUN81:12:20	0.1400	33.9	43.0		.		.
444	153.0	2	02JUN81:03:50	2.3200	73.4	235.0		.		.
445	.	1	08JUN81:15:05	0.0288	2.1	0.0		.		.
446	161.1	2	10JUN81:18:12	0.9200	76.0	291.0		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR07

OBS	STRMNO	TYPE	TI1	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
447	164.0	2	13JUN81:21:47	1.7100	64.0	267		.		.
448	171.0	2	20JUN81:15:53	0.6600	84.0	109		.		.
449	172.0	2	21JUN81:19:58	4.1600	60.0	174		.		.
450	.	1	22JUN81:14:22	0.0143	14.5	2		.		.
451	176.0	2	25JUN81:20:20	3.2300	108.0	114		.		.
452	.	1	29JUN81:14:15	0.0045	5.7	7		.		.
453	183.1	2	02JUL81:23:01	1.2700	35.8	28		.		.
454	185.0	2	04JUL81:05:47	7.0700	27.9	97		.		.
455	.	1	13JUL81:13:40	0.0143	7.1	1	L	1	L	1
456	.	1	20JUL81:14:35	0.0045	31.8	64		.		.
457	205.0	2	24JUL81:13:52	0.6500	102.0	124		.		.
458	206.0	2	25JUL81:07:24	3.8500	73.8	108		.		.
459	.	1	27JUL81:14:33	0.0686	22.1	1		.		.
460	215.0	2	03AUG81:14:49	0.1200	85.0	191		.		.

STA=51UR08

OBS	STRMNO	TYPE	TI1	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
461	214.0	2	01AUG80:14:30	1.4400	45.8	86.0		.		.
462	229.0	2	16AUG80:02:49	0.0400	28.4	3209.0		.		.
463	231.1	2	18AUG80:06:12	0.3500	212.0	132.0		.		.
464	232.0	2	19AUG80:07:31	0.2600	41.6	508.0		.		.
465	.	1	08SEP80:15:05	0.0061	15.4	34.0		.		.
466	269.0	2	25SEP80:05:32	0.0406	64.4	478.0		.		.
467	269.0	2	25SEP80:06:32	0.1176	.	658.0		.		.
468	269.0	2	25SEP80:10:05	0.0406	28.8	100.0		.		.
469	269.0	2	25SEP80:13:08	0.0121	28.8	32.0		.		.
470	.	1	29SEP80:13:00	0.0089	25.4	144.0		3.1		.
471	.	1	06OCT80:10:10	0.0009	7.6	3.0		.		.
472	285.0	2	11OCT80:15:39	2.3600	67.8	47.0		.		.
473	.	1	20OCT80:10:50	0.0018	91.3	10.0		.		.
474	299.0	2	25OCT80:08:15	6.2000	22.0	184.0		.		.
475	.	1	27OCT80:10:35	0.0089	10.0	2.0		6.9		8.7
476	.	1	03NOV80:06:30	0.0089	6.0	1.5		1.3		.
477	309.0	2	04NOV80:08:27	0.3400	16.0	159.0		.		.
478	.	1	10NOV80:14:50	0.0038	18.0	2.5		.		.
479	322.0	2	17NOV80:15:41	0.9200	28.0	117.0		.		.
480	332.0	2	27NOV80:16:20	0.4900	4.0	27.0		.		.
481	.	1	01DEC80:14:50	0.0158	9.9	0.0	L	1.0		2.4
482	337.0	2	02DEC80:19:44	0.1275	16.0	74.0		.		.
483	337.0	2	02DEC80:20:04	0.3280	44.0	74.0		.		.
484	337.0	2	02DEC80:21:12	0.1275	36.0	27.0		.		.
485	.	1	08DEC80:08:30	0.0089	13.8	3.0		.		.
486	344.0	2	09DEC80:10:05	0.3200	74.0	48.0		.		.
487	.	1	15DEC80:10:30	0.0018	6.8	6.0		.		.
488	.	1	22DEC80:13:50	0.0018	6.4	7.0		.		.
489	.	1	26JAN81:14:20	0.0018	12.8	11.0		.		.
490	39.0	2	08FEB81:10:21	0.3000	30.0	59.0		.		.
491	.	1	09FEB81:13:50	0.0121	13.9	9.6		3.2		4.9
492	50.0	2	19FEB81:23:00	0.9000	40.0	240.0		.		.
493	51.0	2	20FEB81:09:47	0.2500	20.0	34.0		.		.
494	52.0	2	21FEB81:00:30	0.3000	24.0	48.0		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR08

OBS	STRMNO	TYPE	TI1	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
495	53.1	2	23FEB81:09:10	1.3000	54.0	384.0		.		.
496	.	1	09MAR81:14:15	0.0350	7.0	0.5		2.6		3.4
497	.	1	23MAR81:14:05	0.0200	2.6	0.5		.		.
498	89.0	2	30MAR81:08:13	0.4900	78.0	543.0		.		.
499	91.0	2	01APR81:13:40	0.4600	69.1	351.0		.		.
500	95.0	2	05APR81:13:29	0.4800	65.3	332.0		.		.
501	.	1	06APR81:16:00	0.0200	20.2	2.0		.		.
502	99.0	2	09APR81:09:43	0.5500	26.0	71.0		.		.
503	102.0	2	12APR81:18:13	1.0000	26.0	88.0		.		.
504	104.0	2	14APR81:17:42	0.2200	26.3	150.0		.		.
505	107.0	2	17APR81:10:07	0.2100	22.2	25.0		.		.
506	.	1	20APR81:14:45	0.0200	13.2	2.0		1.6		3.4
507	113.0	2	23APR81:21:11	1.1000	112.0	466.0		.		.
508	117.0	2	27APR81:03:32	0.2700	.	44.0		.		.
509	.	1	27APR81:14:45	0.0250	19.4	7.0		.		.
510	120.0	2	30APR81:09:35	0.2600	24.5	36.0		.		.
511	120.1	2	30APR81:23:47	0.3900	.	126.0		.		.
512	121.0	2	01MAY81:10:56	1.1600	52.0	410.0		.		.
513	.	1	04MAY81:14:33	0.0121	17.5	4.0		.		.
514	131.1	2	11MAY81:11:25	2.5400	34.0	93.0		.		.
515	135.0	2	15MAY81:12:05	0.2400	52.0	104.0		.		.
516	.	1	18MAY81:13:45	0.0121	8.2	4.0		.		.
517	149.0	2	29MAY81:21:22	0.5600	27.8	55.0		.		.
518	.	1	08JUN81:14:54	0.0200	9.4	6.0		.		.
519	161.1	2	10JUN81:18:19	1.0500	72.0	560.0		.		.
520	164.0	2	13JUN81:22:00	1.3900	100.0	562.0		.		.
521	171.0	2	20JUN81:15:23	0.4100	44.0	114.0		.		.
522	172.0	2	21JUN81:20:22	1.2200	72.0	301.0		.		.
523	.	1	22JUN81:14:20	0.0061	18.7	4.0		.		.
524	176.0	2	25JUN81:20:41	3.7100	76.6	369.0		.		.
525	.	1	29JUN81:14:25	0.0089	10.4	13.0		.		.
526	183.0	2	02JUL81:13:35	0.3000	55.7	125.0		.		.
527	184.0	2	03JUL81:04:50	0.5100	35.8	101.0		.		.
528	185.0	2	04JUL81:02:51	4.8200	55.7	228.0		.		.
529	.	1	13JUL81:13:50	0.0061	15.4	4.5		1.6		3.4
530	.	1	20JUL81:14:35	0.0038	16.1	1.0		.		.
531	205.0	2	24JUL81:14:24	0.5900	146.0	380.0		.		.
532	206.0	2	25JUL81:07:44	3.6700	93.8	300.0		.		.
533	.	1	27JUL81:14:41	0.0465	13.1	0.5		.		.
534	215.0	2	03AUG81:12:00	0.2600	52.6	127.0		.		.

STA=51UR09

OBS	STRMNO	TYPE	TI1	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
535	276.00	2	02OCT80:16:46	0.22	92.6	4.0		.		.
536	299.00	2	25OCT80:03:40	0.82	138.0	21.0		3.3		6.8
537	309.00	2	04NOV80:14:29	0.11	24.0	0.0		.		.
538	314.00	2	09NOV80:00:27	0.19	48.0	110.0		.		.
539	322.00	2	17NOV80:16:03	0.70	24.0	4.0		.		.
540	329.01	2	24NOV80:07:06	1.20	20.0	.		.		.
541	329.03	2	24NOV80:18:34	0.11	32.0	6.0		.		.
542	332.00	2	27NOV80:14:12	0.06	36.0	3.5		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR09

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
543	344.0	2	09DEC80:12:19	0.13	60.0	9.0		.		.
544	351.0	2	16DEC80:04:07	0.19	68.0	11.0		.		.
545	358.0	2	23DEC80:11:05	0.20	.	72.0		.		.
546	33.0	2	02FEB81:06:24	0.47	48.0	50.0	G	10.0	G	16.0
547	39.0	2	08FEB81:12:30	0.22	47.0	13.0		.		.
548	42.0	2	11FEB81:00:45	0.46	61.0	13.0		4.2		10.0
549	50.0	2	19FEB81:15:11	0.30	60.0	12.0		.		.
550	51.0	2	20FEB81:15:20	0.21	46.0	9.0		.		.
551	53.0	2	22FEB81:13:50	0.24	52.0	11.0		.		.
552	89.0	2	30MAR81:09:09	0.08	44.0	6.0		.		.
553	91.0	2	01APR81:15:12	0.36	58.0	68.0		.		.
554	95.0	2	05APR81:16:56	0.19	39.2	10.0		.		.
555	99.0	2	09APR81:10:48	0.18	36.3	11.0		.		.
556	104.0	2	14APR81:05:22	0.46	49.5	13.0		2.0		5.5
557	107.0	2	17APR81:11:15	0.36	.	14.0		.		.
558	110.0	2	20APR81:01:55	0.25	49.0	28.0		.		.
559	121.0	2	01MAY81:08:15	0.57	40.0	4.0		.		.
560	130.0	2	10MAY81:15:38	0.32	48.0	6.0		.		.
561	135.0	2	15MAY81:12:19	0.72	62.1	39.0		.		.
562	138.0	2	18MAY81:20:21	0.17	41.9	10.0		.		.
563	154.0	2	03JUN81:20:57	1.07	48.0	11.0		.		.
564	155.0	2	04JUN81:17:01	1.15	60.0	25.0		.		.
565	171.0	2	20JUN81:00:56	0.62	59.7	91.0		.		.
566	182.0	2	01JUL81:07:10	0.67	79.4	45.0		.		.
567	184.0	2	03JUL81:15:28	1.39	45.2	55.0		.		.
568	209.0	2	28JUL81:10:29	1.25	16.0	8.0		.		.
569	216.0	2	06AUG81:10:24	0.59	59.5	17.0		.		.
570	219.0	2	07AUG81:23:53	1.08	38.8	32.0		.		.
571	223.0	2	11AUG81:18:54	1.25	41.4	.		.		.
572	242.0	2	30AUG81:07:42	0.15	80.5	14.0		.		.
573	243.1	2	31AUG81:11:19	0.59	47.1	11.0		.		.
574	251.0	2	08SEP81:15:41	0.24	40.4	10.0		.		.
575	258.0	2	15SEP81:16:40	0.33	66.5	2.5		.		.
576	260.0	2	17SEP81:04:18	0.18	77.4	4.0		.		.
577	274.0	2	01OCT81:21:14	0.31	72.7	30.0		.		.
578	291.0	2	18OCT81:17:36	0.10	86.8	113.0		.		.
579	296.0	2	23OCT81:07:35	0.20	42.4	69.0		4.9		8.9
580	298.0	2	25OCT81:14:58	0.05	19.3	0.5		.		.
581	299.0	2	26OCT81:12:39	0.28	25.4	5.5		.		.
582	300.0	2	27OCT81:05:42	0.35	27.4	10.0		.		.
583	309.0	2	05NOV81:23:54	0.58	60.6	24.0		.		.
584	335.0	2	01DEC81:11:04	0.14	25.6	5.0		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR10

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
585	292.1	2	18OCT80:15:25	0.34000	62.3	45.0		.		.
586	299.0	2	25OCT80:03:38	1.60000	26.0	19.0		2.5		6.5
587	299.1	2	25OCT80:14:03	1.54000	54.0	42.0		.		.
588	322.0	2	17NOV80:15:48	0.89000	22.0	18.0		.		.
589	329.0	2	24NOV80:10:05	1.24000	8.0	68.0		.		.
590	344.0	2	09DEC80:13:48	0.28777	60.0	33.0		.		.
591	33.0	2	02FEB81:06:25	0.49000	60.0	145.0	G	10.0	G	18.0
592	39.0	2	08FEB81:11:34	0.58000	72.0	49.0		.		.
593	50.0	2	19FEB81:23:18	0.55000	80.0	37.0		.		.
594	51.0	2	20FEB81:22:49	0.35000	40.0	34.0		.		.
595	53.0	2	22FEB81:22:48	0.43000	56.0	21.0		.		.
596	75.0	2	16MAR81:12:45	0.27559	17.6	44.0		.		.
597	91.0	2	01APR81:16:30	1.06000	70.0	238.0		.		.
598	95.0	2	05APR81:16:39	0.66000	68.6	148.0		.		.
599	99.0	2	09APR81:09:52	0.48000	56.4	80.0		.		.
600	101.0	2	11APR81:10:18	0.77000	37.6	90.0		.		.
601	104.0	2	14APR81:05:32	1.02972	37.6	80.0		.		.
602	121.0	2	01MAY81:08:07	0.93000	32.0	55.0		.		.
603	130.0	2	10MAY81:21:38	0.25362	40.0	67.0		.		.
604	131.0	2	11MAY81:12:15	0.16399	.	43.0		.		.
605	138.0	2	18MAY81:20:32	0.08104	33.9	12.0		.		.
606	139.0	2	19MAY81:13:47	0.23000	23.8	14.0		.		.
607	147.0	2	27MAY81:14:53	0.36000	97.4	52.0		.		.
608	148.0	2	28MAY81:13:02	0.24000	37.8	22.0		.		.
609	149.0	2	29MAY81:14:26	0.30000	45.7	12.0		.		.
610	150.0	2	30MAY81:11:10	0.23000	28.0	11.0		.		.
611	152.0	2	01JUN81:13:59	0.29000	21.9	5.0		.		.
612	154.0	2	03JUN81:14:35	0.99000	44.0	119.0		.		.
613	155.0	2	04JUN81:17:06	0.39000	52.0	87.0		.		.
614	156.0	2	05JUN81:22:40	0.15699	40.0	17.0		.		.
615	160.0	2	09JUN81:11:24	0.21512	48.0	13.0		.		.
616	164.0	2	13JUN81:22:45	0.57000	48.0	47.0		.		.
617	183.0	2	02JUL81:13:10	8.88889	94.9	86.0		.		.
618	184.0	2	03JUL81:15:25	0.44768	18.2	36.0		2.6		4.7
619	205.0	2	24JUL81:14:30	0.06892	100.0	12.0		.		.
620	209.1	2	28JUL81:16:21	1.03000	56.0	176.0		.		.
621	219.0	2	08AUG81:05:35	0.71429	30.4	32.0		.		.
622	223.0	2	11AUG81:18:52	0.15306	22.3	43.0		.		.
623	227.0	2	15AUG81:20:25	3.66667	17.4	34.0		.		.
624	258.0	2	15SEP81:16:45	0.57000	21.2	15.5		.		.
625	260.0	2	17SEP81:04:11	1.20370	23.1	14.0		.		.
626	274.0	2	01OCT81:21:08	0.37267	92.4	74.0		.		.
627	296.0	2	23OCT81:08:04	0.16000	27.1	66.0		.		.
628	299.0	2	26OCT81:11:26	0.64000	24.6	15.0		.		.
629	335.0	2	01DEC81:09:28	0.16000	50.6	37.0		.		.
630	346.0	2	14DEC81:15:20	0.34000	21.9	24.0		.		.
631	357.0	2	23DEC81:05:01	0.18598	.	56.0		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR11

OBS	STRMNO	TYPE	TI1	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
632	277.00	2	03OCT80:10:15	0.00100	58.2	16.0		.		.
633	277.00	2	03OCT80:11:13	0.00100	75.0	18.0		.		.
634	277.00	2	03OCT80:12:06	0.00100	46.8	12.0		.		.
635	277.00	2	03OCT80:13:03	0.00400	50.6	44.0		.		.
636	292.00	2	18OCT80:08:54	0.03000	22.0	56.0		.		.
637	292.00	2	18OCT80:09:06	0.06000	73.9	41.0		.		.
638	292.00	2	18OCT80:09:17	0.06000	67.9	30.0		.		.
639	292.00	2	18OCT80:09:28	0.06000	72.9	31.0		.		.
640	292.00	2	18OCT80:09:39	0.05000	64.7	25.0		.		.
641	292.00	2	18OCT80:09:51	0.05000	62.1	20.0		.		.
642	292.00	2	18OCT80:10:06	0.04000	55.9	20.0		.		.
643	292.00	2	18OCT80:10:23	0.03000	55.5	15.0		.		.
644	292.00	2	18OCT80:10:42	0.03000	59.7	20.0		.		.
645	292.00	2	18OCT80:11:10	0.00500	41.3	31.0		.		.
646	299.00	2	25OCT80:04:39	0.86000	30.0	59.0		2.6		6.4
647	309.00	2	04NOV80:08:46	0.16000	38.0	32.0		.		.
648	329.01	2	24NOV80:10:36	1.40000	8.0	30.0		.		.
649	329.02	2	24NOV80:22:05	0.52000	.	31.0		.		.
650	332.00	2	27NOV80:22:26	0.12000	0.0	15.0		.		.
651	344.00	2	09DEC80:14:10	0.11000	32.0	10.0		.		.
652	33.00	2	02FEB81:06:57	0.76000	44.0	120.0	G	11.0	G	16.0
653	94.00	2	09APR81:10:51	0.53000	20.2	13.0		.		.
654	101.00	2	11APR81:10:57	0.58000	17.8	13.0		.		.
655	130.00	2	10MAY81:21:52	0.44000	36.0	14.0		.		.
656	131.00	2	11MAY81:12:39	0.49000	24.0	5.0		.		.
657	136.00	2	18MAY81:21:18	0.10000	25.9	9.0		.		.
658	139.00	2	19MAY81:14:20	0.50000	11.9	10.0		.		.
659	148.00	2	28MAY81:06:26	0.32000	40.0	10.0		.		.
660	148.10	2	28MAY81:15:44	0.65000	20.0	1.0		.		.
661	149.00	2	29MAY81:14:36	0.71000	24.0	2.0		.		.
662	150.00	2	30MAY81:22:00	0.45000	21.9	0.0		.		.
663	152.00	2	01JUN81:15:50	0.72000	25.9	9.0		.		.
664	155.00	2	04JUN81:11:44	0.75000	34.0	18.0		.		.
665	157.00	2	06JUN81:01:33	0.65000	20.0	18.0		.		.
666	171.00	2	20JUN81:12:56	0.19784	27.9	136.0		.		.
667	172.00	2	21JUN81:20:50	0.26000	11.9	11.0		.		.
668	176.00	2	25JUN81:19:08	0.15152	18.2	9.0		.		.
669	183.00	2	02JUL81:15:29	0.08592	30.3	10.0		1.7		4.3
670	184.00	2	03JUL81:16:02	0.53000	0.0	12.0		.		.
671	209.10	2	28JUL81:15:35	1.56000	10.0	36.0		.		.
672	218.00	2	06AUG81:12:09	0.52764	28.5	6.0		.		.
673	219.00	2	07AUG81:23:47	0.41000	12.1	8.0		.		.
674	258.00	2	15SEP81:17:33	0.30000	27.8	3.0		.		.
675	274.00	2	01OCT81:23:03	0.26011	66.8	21.0		.		.
676	299.00	2	26OCT81:11:56	0.48000	20.7	5.5		.		.
677	335.00	2	01DEC81:11:45	0.12000	41.1	6.4		.		.
678	348.00	2	14DEC81:16:29	0.19000	22.9	14.0		.		.
679	357.00	2	23DEC81:04:07	0.19666	.	7.0		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR15

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
680	299.0	2	25OCT80:02:54	0.16	208.0	42		.		.
681	299.0	2	25OCT80:03:19	0.08	60.0	46		.		.
682	299.0	2	25OCT80:03:43	0.16	24.0	14		.		.
683	299.0	2	25OCT80:04:29	0.16	24.0	14		.		.
684	299.0	2	25OCT80:05:11	0.16	34.0	26		.		.
685	299.0	2	25OCT80:05:37	0.08	16.0	10		.		.
686	299.0	2	25OCT80:06:01	0.08	20.0	6		.		.
687	299.0	2	25OCT80:06:24	0.16	12.0	2		.		.
688	299.0	2	25OCT80:07:11	0.05	22.0	12		.		.
689	299.0	2	25OCT80:07:45	0.01	12.0	12		.		.
690	299.1	2	25OCT80:10:53	0.01	23.4	130		.		.
691	299.1	2	25OCT80:11:28	0.03	23.7	16		.		.
692	299.1	2	25OCT80:12:01	0.12	23.3	6		.		.
693	299.1	2	25OCT80:13:52	0.03	32.0	36		.		.
694	299.1	2	25OCT80:14:36	0.08	52.0	10		.		.
695	299.1	2	25OCT80:14:55	0.22	64.0	4		.		.
696	299.1	2	25OCT80:15:15	0.12	76.0	8		.		.
697	299.1	2	25OCT80:15:41	0.08	120.0	6		.		.
698	299.1	2	25OCT80:16:03	0.12	86.0	6		.		.
699	299.1	2	25OCT80:16:24	0.12	56.0	18		.		.
700	299.1	2	25OCT80:16:43	0.08	60.0	16		.		.
701	299.1	2	25OCT80:17:06	0.22	60.0	4		.		.
702	299.1	2	25OCT80:17:26	0.08	24.0	8		.		.
703	299.1	2	25OCT80:17:50	0.12	23.4	6		.		.
704	299.1	2	25OCT80:18:09	0.12	23.3	11		.		.
705	344.0	2	09DEC80:12:51	0.59	44.0	36		.		.
706	21.0	2	21JAN81:10:41	0.25	.	404		.		.
707	33.0	2	02FEB81:05:58	2.23	76.0	604	G	9	G	17.0
708	39.0	2	08FEB81:10:57	0.82	63.0	171		.		.
709	50.0	2	19FEB81:22:56	0.85	40.0	149		.		.
710	51.0	2	20FEB81:22:47	0.63	36.0	64		.		.
711	52.0	2	21FEB81:16:49	0.04	56.0	21		.		.
712	53.0	2	22FEB81:12:40	0.87	40.0	55		.		.
713	63.0	2	04MAR81:20:15	0.33	20.0	27		3	G	5.5
714	95.0	2	05APR81:17:00	0.33	56.8	91		.		.
715	95.0	2	05APR81:18:11	0.84	29.4	72		.		.
716	95.0	2	05APR81:18:49	0.33	21.6	16		.		.
717	99.0	2	09APR81:10:36	0.75	.	45		.		.
718	99.0	2	09APR81:11:07	1.00	.	39		.		.
719	99.0	2	09APR81:11:40	0.50	.	24		.		.
720	99.0	2	09APR81:12:11	0.21	.	13		.		.
721	101.0	2	11APR81:09:59	0.25	.	65		.		.
722	101.0	2	11APR81:10:20	0.79	.	45		.		.
723	101.0	2	11APR81:10:50	1.04	.	92		.		.
724	101.0	2	11APR81:11:27	0.25	.	18		.		.
725	102.0	2	12APR81:19:11	0.75	.	237		.		.
726	102.0	2	12APR81:19:32	1.80	.	100		.		.
727	102.0	2	12APR81:19:45	1.00	.	60		.		.
728	102.0	2	12APR81:20:17	0.21	.	20		.		.
729	102.0	2	12APR81:20:51	2.84	85.5	159		.		.
730	102.0	2	12APR81:20:54	4.68	.	175		.		.
731	102.0	2	12APR81:20:58	3.34	33.8	120		.		.
732	102.0	2	12APR81:21:07	1.25	29.8	49		.		.
733	102.0	2	12APR81:21:22	0.96	37.8	23		.		.

STATION SOLIDS AND ORGANICS DATA

-- STA=51UR15 --

OBS	STRMNO	TYPE	TI1	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
734	102.0	2	12APR81:21:39	0.75000	.	11.0		.		.
735	102.0	2	12APR81:22:15	0.50000	.	12.0		.		.
736	102.0	2	12APR81:23:19	0.46000	.	8.0		.		.
737	102.0	2	12APR81:23:45	1.50000	21.9	8.0		.		.
738	102.0	2	13APR81:00:00	0.96000	25.8	9.0		.		.
739	102.0	2	13APR81:00:29	0.21000	.	4.0		.		.
740	102.0	2	13APR81:01:58	0.21000	.	2.0		.		.
741	102.0	2	13APR81:04:49	0.21000	.	2.0		.		.
742	102.0	2	13APR81:07:52	0.04000	.	2.0		.		.
743	103.0	2	13APR81:10:17	0.28000	62.0	70.0		.		.
744	113.0	2	23APR81:20:59	1.04000	72.7	110.0		.		.
745	113.0	2	23APR81:21:06	1.84000	64.6	137.0		.		.
746	113.0	2	23APR81:21:26	0.79000	32.3	43.0		.		.
747	121.0	2	01MAY81:10:23	1.12000	44.4	22.0		.		.
748	130.0	2	10MAY81:21:25	0.91000	65.5	165.0		.		.
749	131.0	2	11MAY81:12:09	0.40000	33.8	24.0		.		.
750	135.0	2	15MAY81:12:10	0.19060	46.1	102.0		.		.
751	138.0	2	18MAY81:19:44	0.17000	56.0	20.0		.		.
752	139.0	2	19MAY81:14:22	0.29000	32.0	6.0		.		.
753	148.0	2	26MAY81:12:08	0.40580	112.0	75.0		.		.
754	152.0	2	01JUN81:17:13	0.76000	41.9	26.0		.		.
755	154.0	2	03JUN81:21:40	1.70000	44.0	67.0		.		.
756	157.0	2	06JUN81:00:20	1.42000	44.0	18.0		.		.
757	161.0	2	10JUN81:02:41	0.55000	32.0	23.0		.		.
758	164.0	2	13JUN81:22:42	1.54000	44.0	33.0		.		.
759	182.0	2	01JUL81:15:32	0.21000	95.3	162.0		.		.
760	182.1	2	01JUL81:21:10	0.06000	43.7	28.0		.		.
761	201.0	2	20JUL81:18:16	3.98000	63.5	148.0		.		.
762	209.0	2	28JUL81:11:53	0.67000	119.0	152.0		.		.
763	209.1	2	28JUL81:19:23	0.42000	43.7	32.0		.		.
764	216.0	2	06AUG81:10:16	0.39000	28.5	10.0		.		.
765	220.0	2	08AUG81:00:21	0.26000	22.3	6.0		.		.
766	223.0	2	11AUG81:18:54	0.76000	28.2	23.0		.		.
767	227.0	2	15AUG81:20:25	0.57000	29.6	33.0		.		.
768	242.0	2	30AUG81:07:23	0.78000	47.1	7.0		.		.
769	243.0	2	31AUG81:04:02	0.44000	33.4	17.0		.		.
770	251.0	2	08SEP81:13:40	0.36000	42.3	19.0		.		.
771	258.1	2	15SEP81:16:58	0.49000	30.8	75.0		.		.
772	274.0	2	01OCT81:21:10	0.29000	51.1	24.0		.		.
773	291.0	2	18OCT81:17:34	1.30000	131.0	102.0		.		.
774	296.0	2	23OCT81:07:58	0.32000	29.0	61.0		5.9		10.6
775	298.0	2	25OCT81:14:46	0.45000	31.0	21.0		.		.
776	309.0	2	05NOV81:23:05	0.29762	56.6	58.0		.		.
777	335.0	2	01DEC81:12:32	0.35000	.	25.5		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR16

OBS	STRMOD	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
778	226.0	2	15AUG80:18:30	1.850	17.2	9.3		.		.
779	.	1	15SEP80:13:48	0.005	24.0	9.6		.		.
780	.	1	22SEP80:10:05	0.005	28.6	7.5		.		.
781	.	1	29SEP80:09:50	0.005	23.2	4.5	L	1.0		.
782	.	1	06OCT80:13:30	0.005	13.9	3.0		.		.
783	.	1	20OCT80:14:15	0.005	15.9	1.5		.		.
784	.	1	27OCT80:11:10	0.005	13.2	4.0		3.7		5.3
785	.	1	03NOV80:11:06	0.010	14.0	3.0		1.3		.
786	.	1	10NOV80:10:20	0.010	10.0	2.0		.		.
787	.	1	17NOV80:09:45	0.010	.	2.5		.		.
788	322.0	2	17NOV80:16:37	0.630	10.0	6.0		.		.
789	329.0	2	24NOV80:06:47	1.220	8.0	17.0		.		.
790	.	1	01DEC80:09:30	0.010	23.7	4.0		1.6		5.9
791	.	1	08DEC80:13:30	0.010	23.7	11.0		.		.
792	.	1	15DEC80:14:00	0.010	25.6	9.0		.		.
793	.	1	22DEC80:09:45	0.005	24.4	7.0		.		.
794	.	1	12JAN81:13:00	0.005	18.7	5.0		.		.
795	.	1	26JAN81:16:40	0.005	21.4	3.5		.		.
796	.	1	09FEB81:10:25	0.005	36.0	28.0		7.7	G	12.0
797	51.0	2	20FEB81:01:19	0.490	32.0	11.0		.		.
798	51.1	2	20FEB81:23:38	0.490	32.0	.		.		.
799	54.0	2	23FEB81:00:08	0.720	24.0	22.0		.		.
800	63.0	2	04MAR81:11:17	0.100	.	13.0		.		.
801	.	1	09MAR81:11:20	0.010	19.8	4.0		4.8		8.4
802	.	1	16MAR81:10:00	0.020	26.2	3.0		.		.
803	75.0	2	16MAR81:13:09	0.130	37.2	6.0		.		.
804	.	1	23MAR81:09:30	0.010	21.0	1.0		.		.
805	87.0	2	30MAR81:09:03	0.100	30.0	12.0		.		.
806	91.0	2	01APR81:17:27	0.270	15.4	8.0		.		.
807	.	1	06APR81:10:35	0.005	47.8	2.0		.		.
808	99.0	2	09APR81:10:59	0.350	28.2	14.0		.		.
809	101.0	2	11APR81:10:35	0.250	37.6	8.5		.		.
810	104.0	2	14APR81:03:17	0.380	50.0	7.0		.		.
811	107.0	2	17APR81:11:31	0.020	.	10.0		.		.
812	.	1	20APR81:10:50	0.010	19.0	7.0		4.2		8.6
813	113.0	2	23APR81:11:51	0.290	12.2	6.0		.		.
814	.	1	27APR81:09:40	0.010	21.8	7.0		.		.
815	118.0	2	28APR81:17:31	0.130	26.1	5.0		.		.
816	121.0	2	01MAY81:10:44	1.080	25.7	10.0		.		.
817	.	1	04MAY81:09:58	0.005	25.7	3.0		.		.
818	130.0	2	10MAY81:16:30	0.230	32.0	4.0		.		.
819	.	1	11MAY81:10:00	0.020	26.2	3.0		.		.
820	131.0	2	11MAY81:12:46	0.180	36.0	5.0		.		.
821	135.0	2	15MAY81:12:39	0.070	.	9.0		.		.
822	.	1	18MAY81:09:35	0.005	27.7	8.0		.		.
823	136.0	2	18MAY81:20:36	0.060	.	6.0		.		.
824	139.0	2	19MAY81:15:09	0.140	40.0	8.0		.		.
825	[illegible]	2	28MAY81:15:45	0.420	20.0	3.0		.		.
826	.	1	01JUN81:11:00	0.005	27.3	5.0		.		.
827	153.0	2	02JUN81:04:20	0.260	21.9	5.0		.		.
828	154.0	2	03JUN81:22:03	1.290	8.0	10.0		.		.
829	157.0	2	05JUN81:01:26	0.070	20.0	5.0		.		.
830	.	1	08JUN81:11:45	0.005	17.3	5.0		.		.
831	161.0	2	10JUN81:02:50	0.220	28.0	10.0		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR16

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
832	164	2	13JUN81:23:20	0.300	20.0	10.0		.		.
833	171	2	20JUN81:01:06	0.190	35.8	19.0		.		.
834	176	2	25JUN81:19:48	0.190	59.5	30.0		.		.
835	183	2	02JUL81:13:09	0.800	60.9	21.0		.		.
836	185	2	04JUL81:08:04	1.700	49.1	14.0		.		.
837	201	2	20JUL81:18:27	0.980	28.0	75.0		.		.
838	.	1	27JUL81:09:50	0.005	70.1	28.0		.		.
839	209	2	28JUL81:12:55	0.270	59.6	36.0		.		.
840	214	2	06AUG81:12:37	0.240	40.6	19.0		.		.
841	220	2	08AUG81:01:02	0.180	.	7.0		.		.
842	.	1	10AUG81:11:55	0.000	.	12.0		.		.
843	.	1	24AUG81:12:50	0.000	46.1	6.0		.		.
844	242	2	30AUG81:08:12	0.510	38.7	11.0		.		.
845	251	2	05SEP81:15:44	0.140	57.7	23.0		.		.
846	258	2	15SEP81:17:27	0.350	42.3	18.0		.		.
847	.	1	21SEP81:12:25	0.005	40.0	17.5		.		.
848	274	2	01OCT81:21:57	0.150	53.1	20.0		.		.
849	.	1	05OCT81:11:45	0.005	39.5	13.5		.		.
850	.	1	12OCT81:12:15	0.005	43.3	13.5		.		.
851	291	2	18OCT81:17:57	0.210	61.7	18.0		.		.
852	295	2	23OCT81:10:52	0.260	52.1	20.5		.		.
853	[illegible]	2	25OCT81:17:11	0.350	27.1	10.0		.		.
854	.	1	02NOV81:10:15	0.005	22.3	1.0		.		.
855	[illegible]	2	06NOV81:01:49	0.140	34.3	2.0		.		.
856	.	1	09NOV81:10:10	0.005	17.9	1.0		.		.
857	.	1	16NOV81:10:10	0.005	16.0	1.0		3		5
858	.	1	23NOV81:09:35	0.005	13.5	2.5		.		.
859	.	1	30NOV81:09:58	0.005	13.3	0.5		.		.
860	335	2	01DEC81:10:22	0.190	.	5.0		.		.
861	.	1	07DEC81:10:10	0.005	11.9	0.5		.		.

STA=51UR17

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
862	262.0	2	18SEP80:03:00	0.11	.	.		.		.
863	262.0	2	18SEP80:06:25	0.07	41.4	37.0		.		.
864	262.0	2	18SEP80:10:30	0.04	39.8	26.0		.		.
865	265.0	2	21SEP80:19:53	0.03	88.6	68.0		.		.
866	265.0	2	21SEP80:21:04	0.03	52.6	5.0		.		.
867	292.0	2	18OCT80:20:10	0.24	60.0	16.0		.		.
868	292.0	2	18OCT80:22:02	0.17	48.0	17.0		.		.
869	292.0	2	19OCT80:01:34	0.05	54.0	12.0		.		.
870	292.0	2	19OCT80:06:05	0.02	24.0	4.0		.		.
871	292.0	2	19OCT80:12:37	0.00	30.0	10.0		.		.
872	332.0	2	27NOV80:15:34	0.15	34.0	111.0		.		.
873	344.0	2	09DEC80:12:34	0.07	72.0	12.5		.		.
874	358.0	2	23DEC80:09:40	0.17	46.0	5.0		.		.
875	21.0	2	21JAN81:04:33	0.02	44.0	10.0		.		.
876	33.0	2	02FEB81:06:46	1.21	40.0	96.0		5.6	G	10.0
877	35.0	2	08FEB81:10:59	0.15	46.0	15.0		.		.
878	42.0	2	11FEB81:04:52	0.16	88.0	210.0		3.6		9.8
879	50.0	2	19FEB81:22:37	0.08	36.0	51.0		.		.

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STATION SOLIDS AND ORGANICS DATA

-- STA=51UR17 --

OBS	STRMNO	TYPE	TI1	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
880	53.0	2	23FEB81:11:45	0.25	.	.		.		.
881	75.0	2	16MAR81:13:25	0.08	21.6	11.5		.		.
882	89.0	2	30MAR81:07:43	0.17	76.0	225.0		.		.
883	95.0	2	05APR81:17:35	0.36	41.9	25.0		.		.
884	99.0	2	09APR81:11:34	0.24	32.2	18.0		.		.
885	102.0	2	12APR81:19:54	0.11	26.0	122.0		.		.
886	104.0	2	14APR81:17:59	0.08	16.0	11.0		.		.
887	107.0	2	17APR81:10:59	0.07	18.2	7.0		.		.
888	113.0	2	23APR81:20:42	0.32	36.7	10.0		.		.
889	120.0	2	30APR81:10:36	0.06	40.0	8.0		.		.
890	121.0	2	01MAY81:10:31	0.16	28.0	34.0		.		.
891	130.0	2	10MAY81:15:15	0.17	34.0	37.0		.		.
892	131.0	2	11MAY81:12:29	0.20	26.1	30.0		.		.
893	135.0	2	15MAY81:12:12	0.54	15.8	58.0		.		.
894	135.1	2	15MAY81:14:47	0.11	19.6	77.0		.		.
895	138.0	2	18MAY81:12:01	0.05	7.9	2.0		.		.
896	139.0	2	19MAY81:14:14	0.06	4.5	3.0		.		.
897	148.0	2	28MAY81:05:19	0.15	45.9	72.0		.		.
898	152.0	2	01JUN81:13:16	0.22	16.0	7.0		.		.
899	161.0	2	10JUN81:04:26	0.18	32.0	49.0		.		.
900	164.0	2	13JUN81:18:42	0.08	44.0	28.0		.		.
901	171.0	2	20JUN81:00:06	0.25	88.0	192.0		.		.
902	176.0	2	25JUN81:20:21	0.41	47.6	222.0		.		.
903	184.0	2	03JUL81:05:56	0.07	30.3	8.0		.		.
904	202.0	2	21JUL81:15:30	0.19	47.6	56.0		.		.
905	205.0	2	24JUL81:16:02	0.31	15.9	20.0		.		.
906	207.0	2	26JUL81:19:46	0.12	25.9	8.0		.		.
907	215.0	2	03AUG81:15:23	0.23	51.6	1.0		.		.
908	218.0	2	06AUG81:13:40	0.01	26.8	1.0		.		.
909	223.0	2	11AUG81:20:14	0.34	28.3	53.0		.		.
910	242.0	2	30AUG81:09:18	0.24	47.1	29.0		.		.
911	243.0	2	31AUG81:11:57	0.33	25.6	69.0		.		.
912	251.0	2	08SEP81:14:07	0.11	.	5.0		.		.
913	258.0	2	15SEP81:17:52	0.21	22.6	14.0		.		.
914	260.0	2	17SEP81:20:49	0.12	20.6	16.0		.		.
915	270.0	2	27SEP81:19:21	0.17	32.7	40.0		.		.
916	279.0	2	06OCT81:11:08	0.10	32.7	31.0		.		.
917	295.0	2	23OCT81:14:16	0.13	23.2	10.5		.		.
918	298.0	2	25OCT81:20:33	0.06	9.7	3.0		.		.
919	299.0	2	26OCT81:12:33	0.17	20.7	35.0		.		.
920	309.0	2	05NOV81:21:05	0.25	40.8	105.0		.		.
921	335.0	2	01DEC81:11:05	0.12	24.0	8.0		.		.
922	336.0	2	04DEC81:18:52	0.09	62.8	3.3		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR18

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
923	39.0	2	06FEB81:13:55	0.07	.	76		.		.
924	54.0	2	23FEB81:09:27	0.48	48.0	19		.		.
925	121.0	2	01MAY81:16:04	0.41	51.7	33		.		.
926	139.0	2	19MAY81:15:55	0.06	92.0	18		.		.
927	154.0	2	03JUN81:23:49	0.20	72.0	117		.		.
928	157.0	2	06JUN81:01:11	0.02	60.0	25		.		.
929	255.0	2	15SEP81:17:25	0.05	75.4	129		.		.
930	299.1	2	26OCT81:21:10	0.07	45.9	18		.		.

STA=51UR19

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
931	51.0	2	20FEB81:00:07	0.084	54.0	8.0		.		.
932	51.1	2	20FEB81:15:07	0.032	34.0	1.0		.		.
933	53.9	2	22FEB81:16:40	0.051	26.0	3.0		.		.
934	53.6	2	04MAR81:23:00	0.032	.	3.0		1.9		3.9
935	75.5	2	16MAR81:14:16	0.017	25.5	2.0		.		.
936	86.0	2	30MAR81:09:59	0.024	34.0	2.0		.		.
937	95.0	2	05APR81:19:20	0.034	25.5	0.0		.		.
938	99.0	2	09APR81:12:09	0.042	18.0	1.0		.		.
939	101.0	2	11APR81:11:34	0.024	18.2	3.0		.		.
940	103.0	2	13APR81:10:57	0.014	10.1	0.0		.		.
941	113.5	2	23APR81:21:31	0.052	36.0	4.0		1.5		3.8
942	121.0	2	01MAY81:11:08	0.117	16.0	9.0		.		.
943	130.0	2	10MAY81:17:25	0.027	23.9	1.0		.		.
944	135.0	2	15MAY81:13:07	0.045	26.1	2.0		.		.
945	136.0	2	18MAY81:21:48	0.032	4.0	0.0		.		.
946	142.0	2	28MAY81:09:25	0.010	25.9	3.0		.		.
947	150.0	2	30MAY81:23:15	0.017	21.9	9.0		.		.
948	154.0	2	13JUN81:19:02	0.051	8.0	1.0		.		.
949	171.0	2	20JUN81:06:33	0.012	19.9	1.0		.		.
950	176.0	2	25JUN81:07:53	0.029	7.0	5.0		.		.
951	183.0	2	02JUL81:14:40	0.018	21.6	1.0		.		.
952	202.0	2	21JUL81:00:53	0.005	19.9	1.0		.		.
953	205.0	2	24JUL81:20:45	0.007	24.0	4.0		.		.
954	209.0	2	28JUL81:10:22	0.054	14.0	4.0		.		.
955	215.0	2	06AUG81:13:02	0.031	21.6	1.0		.		.
956	220.0	2	08AUG81:06:22	0.020	6.1	1.5		.		.
957	223.0	2	11AUG81:19:27	0.282	3.8	1.0		.		.
958	227.0	2	15AUG81:21:34	0.022	37.8	1.0		.		.
959	242.0	2	30AUG81:09:20	0.041	12.9	.		.		.
960	250.0	2	15SEP81:17:34	0.115	8.8	2.0		.		.
961	265.0	2	22SEP81:18:39	0.002	21.6	1.0		.		.
962	271.0	2	18OCT81:20:11	0.009	48.2	2.5		.		.
963	296.0	2	23OCT81:10:52	0.033	19.4	0.5		.		.
964	270.0	2	25OCT81:16:56	0.069	5.2	4.5		.		.
965	310.0	2	06NOV81:00:34	0.016	20.2	4.0		.		.

STATION SOLIDS AND ORGANICS DATA

STA=51UR20

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
966	258	2	15SEP81:17:41	4.11	46.2	32		.		.
967	265	2	22SEP81:19:06	15.56	54.0	114		.		.
968	274	2	01OCT81:17:13	11.25	49.2	27		.		.
969	279	2	06OCT81:18:56	15.18	68.4	41		.		.
970	291	2	18OCT81:18:15	2.25	82.9	32		.		.
971	296	2	23OCT81:09:49	3.75	45.9	38		.		.
972	298	2	25OCT81:14:54	0.84	28.5	12		.		.
973	299	2	26OCT81:12:12	9.63	29.2	176		.		.
974	304	2	05NOV81:21:04	4.48	53.3	78		.		.
975	335	2	01DEC81:10:24	1.20	62.8	39		.		.
976	4	2	04JAN82:15:06	0.51	.	.		.		.

STA=51UR21

OBS	STRMNO	TYPE	TII	FLO	COD	TSS	DBOD5	BOD5	DBOD20	BOD20
977	.	1	21SEP81:09:20	0.035	14.4	9.5		.		.
978	.	1	28SEP81:08:36	0.029	17.0	4.5		.		.
979	.	1	05OCT81:08:55	0.028	14.8	3.5		.		.
980	.	1	12OCT81:09:15	0.014	10.8	2.5		.		.
981	299	2	28OCT81:16:33	0.420	40.1	173.0		.		.
982	.	1	02NOV81:08:55	0.019	9.1	0.5		.		.
983	.	1	09NOV81:08:35	0.035	12.0	1.0		.		.
984	.	1	16NOV81:08:35	0.023	12.5	4.0		2		3.5
985	.	1	23NOV81:08:30	0.023	11.6	1.5		.		.
986	.	1	30NOV81:08:45	0.014	13.3	3.5		.		.
987	.	1	07DEC81:08:55	0.011	10.9	1.0		.		.

STA=51UR03

OBS	STRGNO	TYPE	TTT	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
148	292.00	2	18OCT80:09:18	0.12000	240	0	100	40	100	20	.	.
149	292.00	2	18OCT80:10:14	0.12000	200	0	75	35	0	0	.	.
150	292.00	2	18OCT80:11:19	0.09000	0	0	100	20	60	0	.	.
151	292.00	2	18OCT80:12:27	0.06000	100	100	0	.	50	0	.	.
152	292.00	2	18OCT80:14:12	0.03000	0	0	60	25	80	0	.	.
153	292.10	2	18OCT80:16:48	0.58000	440	0	350	25	310	0	.	.
154	292.10	2	18OCT80:16:58	0.42000	0	0	80	10	0	0	.	.
155	292.10	2	18OCT80:17:18	0.12000	0	0	0	.	0	0	.	.
156	292.10	2	18OCT80:17:53	0.12000	0	0	0	.	40	0	.	.
157	292.10	2	18OCT80:18:26	0.33000	0	0	0	.	0	0	.	.
158	292.10	2	18OCT80:18:34	1.11000	180	0	230	0	0	0	.	.
159	292.10	2	18OCT80:18:39	0.69000	0	0	110	0	0	0	.	.
160	292.10	2	18OCT80:18:44	0.69000	0	0	20	20	0	0	.	.
161	292.10	2	18OCT80:18:50	0.67000	0	0	25	0	0	0	.	.
162	292.10	2	18OCT80:18:57	0.42000	0	0	25	15	0	0	.	.
163	292.10	2	18OCT80:19:07	0.42000	0	0	30	20	25	0	.	.
164	292.10	2	18OCT80:19:15	0.42000	0	0	90	15	30	0	.	.
165	292.10	2	18OCT80:19:24	0.42000	0	0	15	15	40	0	.	.
166	292.10	2	18OCT80:19:33	0.42000	0	0	25	10	0	0	.	.
167	292.10	2	18OCT80:19:44	0.33000	0	0	0	0	0	0	.	.
168	292.10	2	18OCT80:19:56	0.33000	0	0	30	.	0	0	.	.
169	292.10	2	18OCT80:20:11	0.21000	0	0	30	20	0	0	.	.
170	292.10	2	18OCT80:20:29	0.21000	0	0	0	0	0	0	.	.
171	292.10	2	18OCT80:20:48	0.67000	350	220	280	210	20	20	.	.
172	292.10	2	18OCT80:20:52	1.11000	0	0	90	10	0	0	.	.
173	292.10	2	18OCT80:20:57	1.23000	0	0	25	0	0	0	.	.
174	292.10	2	18OCT80:21:02	0.69000	0	0	30	0	0	0	.	.
175	292.10	2	18OCT80:21:08	0.67000	0	0	20	20	0	0	.	.
176	292.10	2	18OCT80:21:16	0.42000	0	0	25	15	0	0	.	.
177	[illegible]	2	06NOV80:08:22	0.19000	0	0	50	.	0	0	.	.
178	314.00	2	09NOV80:15:46	0.59000	0	0	100	60	0	.	.	.
179	[illegible]	2	24NOV80:05:27	0.36000	0	0	0	.	0	0	.	.
180	332.00	2	27NOV80:16:56	0.12000	0	0	15	15	0	0	.	.
181	346.00	2	09DEC80:12:55	0.29000	0	0	20	15	0	0	.	.
182	[illegible]	2	23DEC80:08:19	0.15000	0	0	70	30	0	0	.	.
183	51.00	2	20FEB81:00:14	0.61000	0	0	0	.	0	0	.	.
184	51.10	2	20FEB81:13:15	0.15000	0	0	0	0	0	0	.	.
185	52.00	2	21FEB81:15:32	0.16064	0	0	0	.	0	.	.	.
186	53.00	2	22FEB81:17:11	0.33264	0	0	0	0	0	0	.	.
187	[illegible]	2	04APR81:19:57	0.47000	0	0	25	0	25	0	.	.
188	[illegible]	2	16APR81:12:11	0.05000	0	0	30	25	0	0	.	.
189	[illegible]	2	30APR81:07:36	0.18000	.	0	.	140	.	0	.	.
190	[illegible]	2	30APR81:08:04	0.18000	.	0	.	80	.	0	.	.
191	[illegible]	2	30APR81:08:28	0.27000	.	0	.	75	.	0	.	.
192	[illegible]	2	30APR81:08:45	0.33000	.	0	.	60	.	25	.	.
193	[illegible]	2	30APR81:09:00	0.37000	.	0	.	40	.	0	.	.
194	[illegible]	2	30APR81:09:13	0.42000	.	0	.	80	.	0	.	.
195	[illegible]	2	30APR81:09:26	0.45000	.	0	.	25	.	0	.	.
196	[illegible]	2	30APR81:09:35	0.36000	.	0	.	75	.	25	.	.
197	[illegible]	2	30APR81:09:53	0.24000	.	0	.	70	.	0	.	.
198	[illegible]	2	30APR81:10:19	0.15000	.	0	.	0	.	0	.	.
199	[illegible]	2	30APR81:13:26	0.47000	0	0	35	.	0	0	.	.
200	[illegible]	2	31APR81:10:44	0.12652	0	0	0	0	0	0	.	.
201	[illegible]	2	05MAY81:17:30	0.60000	0	0	25	20	0	0	.	.

----- STA=51UP03 -----

OBS	[illegible]	TYPE	TIME	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
202	99.0	2	[illegible]81:10:56	0.53000	0	0	40	35	0	0	.	.
203	102.0	2	[illegible]81:1[illegible]:53	0.27689	0	0	125	30	0	0	.	.
204	104.0	2	[illegible]81:1[illegible]:23	0.15000	0	0	0	.	0	0	.	.
205	107.0	2	17[illegible]81:06:2[illegible]	0.13391	0	0	0	.	30	20	.	.
206	113.0	2	2[illegible]81:19:06	1.22646	0	0	40	0	0	0	.	.
207	130.0	2	10[illegible]81:14:23	0.29437	0	0	0	.	0	0	.	.
208	13[illegible].0	2	[illegible]81:14:1[illegible]	0.25000	0	0	115	20	25	0	.	.
209	1[illegible].0	2	[illegible]81:01:07	0.24000	0	0	65	30	0	0	.	.
210	1[illegible]7.0	2	29[illegible]81:15:33	0.10000	0	0	0	0	0	0	.	.
211	136.0	2	30[illegible]81:23:40	0.09000	0	0	75	65	0	0	.	.
212	152.0	2	01JUN81:13:15	0.22000	0	0	35	0	0	0	.	.
213	154.0	2	03JUN81:19:25	0.09000	0	0	20	0	0	0	.	.
214	155.0	2	04JUN81:20:[illegible]	0.08000	0	.	45	.	0	0	.	.
215	157.1	2	06JUN81:21:10	0.09465	0	0	50	0	20	0	97.8	.
216	159.0	2	08JUN81:21:20	0.12000	0	0	0	.	0	.	9.4	.
217	161.0	2	10JUN81:01:08	0.25876	0	0	35	25	0	0	72.2	.
218	164.0	2	13JUN81:17:1[illegible]	0.14000	0	0	20	20	0	0	1.9	.
219	170.0	2	19JUN81:23:3[illegible]	1.32000	0	0	60	45	0	0	20.3	.
220	176.0	2	25JUN81:20:12	0.55929	0	0	25	0	0	0	5.0	.
221	184.0	2	03JUL81:05:11	0.20000	0	0	40	0	0	0	.	.
222	185.0	2	04JUL81:06:04	5.60000	0	.	20	0	0	0	.	.
223	201.0	2	20JUL81:1[illegible]:41	0.14163	0	.	40	40	30	20	16.0	.
224	202.0	2	21JUL81:15:32	0.15363	0	.	0	.	0	0	3.0	.
225	205.0	2	24JUL81:14:24	0.26000	0	.	0	.	0	0	3.0	.
226	207.0	2	26JUL81:19:54	0.18191	0	.	20	20	20	0	6.0	.
227	209.0	2	28JUL81:00:16	0.18000	0	.	40	0	0	0	96.0	.
228	215.0	2	03AUG81:16:26	0.10000	0	.	40	20	0	0	12.0	57
229	218.0	2	06AUG81:10:32	0.16000	0	.	30	25	0	0	13.0	52
230	219.0	2	07AUG81:14:23	0.08596	0	0	70	50	25	0	11.0	94
231	223.0	2	11AUG81:20:04	0.19403	0	0	90	0	20	0	10.0	29
232	227.0	2	15AUG81:20:44	0.26000	0	0	95	0	105	0	95.0	131
233	242.0	2	30AUG81:08:48	0.48000	0	.	0	.	20	.	9.0	39
234	243.0	2	31AUG81:10:20	0.33417	0	0	0	0	20	0	9.0	32
235	251.0	2	08SEP81:13:08	1.40000	.	0	.	55	.	0	.	.
236	258.0	2	15SEP81:17:41	0.92000	0	0	20	0	0	0	7.0	30
237	260.0	2	17SEP81:20:42	0.34000	0	0	35	0	0	0	.	.
238	265.0	2	22SEP81:19:15	0.15000	0	0	40	25	0	0	.	.
239	270.0	2	27SEP81:19:20	0.24000	0	0	50	35	0	0	11.0	55
240	274.0	2	01OCT81:21:49	0.36000	0	0	0	.	0	0	7.0	16
241	291.0	2	18OCT81:17:57	0.44000	0	0	95	70	0	0	47.0	93
242	296.0	2	23OCT81:13:10	0.24000	130	0	20	20	0	0	19.0	44
243	297.0	2	24OCT81:21:52	0.15000	320	.	100	95	0	.	24.0	105
244	299.0	2	26OCT81:12:04	0.54000	0	0	0	0	0	0	6.0	28
245	300.0	2	27OCT81:08:24	0.33000	0	0	0	0	0	.	10.0	27
246	335.0	2	01DEC81:11:49	0.20000	0	0	20	20	.	.	22.0	38

STA=SIUR04

OBS	STAMNO	TYPE	TII	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
247	329	2	24NOV80:14:54	0.68004	0	0	90	10	0	0	.	.
248	332	2	27NOV80:22:48	0.54714	.	.	.	.	.	.	.	.
249	13	2	02FEB81:10:36	0.16000	0	0	0	0	0	0	.	.
250	42	2	11FEB81:04:56	0.76000	0	0	0	0	0	0	.	.
251	50	2	19FEB81:15:24	0.15000	0	0	0	.	0	.	.	.
252	53	2	22FEB81:18:45	0.45000	0	0	30	0	0	0	.	.
253	89	2	30APR81:16:09	0.33795	0	0	365	0	0	0	.	.
254	90	2	31MAR81:13:51	0.20003	0	0	0	0	0	0	.	.
255	95	2	05APR81:17:49	0.21676	0	0	30	0	0	0	.	.
256	99	2	09APR81:13:25	0.13000	0	0	0	0	30	0	.	.
257	102	2	12APR81:20:02	0.59418	0	0	0	.	0	0	.	.
258	104	2	14APR81:15:46	0.11000	0	0	0	0	0	0	.	.
259	107	2	17APR81:20:50	0.05000	0	0	0	0	25	0	.	.
260	110	2	20APR81:07:56	0.05002	.	0	.	0	.	0	.	.
261	121	2	01MAY81:13:25	0.58455	0	0	0	0	0	0	.	.
262	131	2	11MAY81:11:58	0.52000	0	0	225	35	65	0	.	.
263	135	2	15MAY81:14:22	0.49068	0	0	60	20	20	0	.	.
264	139	2	19MAY81:09:42	0.09000	0	0	20	20	0	0	.	.
265	151	2	02JUN81:05:58	0.11000	0	0	0	0	0	0	.	.
266	154	2	03JUN81:20:00	0.16000	0	0	60	0	10	0	.	.
267	161	2	10JUN81:05:38	0.29999	0	0	30	20	0	0	18.5	.
268	164	2	13JUN81:22:10	0.34000	0	0	0	.	0	0	4.1	.
269	171	2	20JUN81:15:50	0.48000	0	0	25	20	0	0	6.2	.
270	176	2	25JUN81:20:32	0.16000	0	0	25	20	0	0	9.4	.
271	185	2	04JUL81:08:10	1.30000	0	.	0	0	0	0	3.0	.
272	207	2	26JUL81:21:44	0.15000	0	.	45	0	0	0	8.0	.
273	208	2	27JUL81:12:32	0.09872	0	.	25	.	0	0	0.0	.
274	223	2	11AUG81:20:39	0.30000	0	0	0	0	0	0	.	.
275	227	2	15AUG81:20:55	0.35000	0	0	55	0	0	0	.	.
276	242	2	30AUG81:14:20	0.24000	0	0	0	0	0	0	.	.
277	243	2	31AUG81:09:32	0.60000	0	0	0	0	0	0	6.0	16
278	258	2	15SEP81:21:01	0.50000	0	0	0	0	0	0	.	.
279	260	2	17SEP81:21:10	0.17335	0	0	0	0	0	0	.	.
280	274	2	01OCT81:23:01	0.28000	0	0	0	0	0	0	.	.
281	299	2	26OCT81:12:52	0.35000	0.	0	0	0	0	0	.	.

STA=SIUR05

OBS	STMNO	TYPE	TII	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
282	224.16	.	.	.	.	.	.	.	.	.	14.0	41
283	275.00	.	.	.	.	.	.	.	.	.	8.0	44
284	261.00	2	17SEP80:14:51	0.04	0	0	150	140	40	0	.	.
285	269.00	2	25SEP80:03:08	0.27	0	.	0	.	0	0	.	.
286	309.00	2	04NOV80:06:15	0.04	0	0	80	80	.	0	.	.
287	314.00	2	09NOV80:15:41	0.03	130	0	250	195	40	0	.	.
288	321.00	2	16NOV80:01:16	0.03	0	0	160	.	0	0	.	.
289	324.01	2	24NOV80:01:22	0.10	0	0	60	55	30	0	.	.
290	324.02	2	24NOV80:10:25	0.35	0	0	0	.	0	0	.	.
291	326.00	2	26NOV80:15:02	0.07	0	.	0	.	40	.	.	.
292	332.00	2	27NOV80:06:20	0.10	0	0	45	40	0	0	.	.
293	344.00	2	09DEC80:10:58	0.03	0	.	60	.	0	.	.	.
294	33.00	2	02FEB81:06:17	0.08	0	0	110	60	0	0	.	.

STATION METALS DATA

---------- STA=51UR05 ----------

OBS	[illegible]	TYPE	TIME	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
295	36.0	2	05FEB81:10:36	0.03	0	0	80	40	0	0	.	.
296	41.0	2	10FEB81:23:08	0.09	0	0	30	25	25	0	.	.
297	50.0	2	19FEB81:16:00	0.07	0	0	35	30	0	0	.	.
298	63.0	2	04MAR81:19:29	0.09	0	0	60	40	0	0	.	.
299	75.1	2	16MAR81:05:14	0.07	0	0	85	.	0	.	.	.
300	89.0	2	30MAR81:07:25	0.05	0	0	90	80	25	0	.	.
301	91.0	2	01APR81:14:40	0.66	0	0	95	60	0	0	.	.
302	95.0	2	05APR81:13:16	0.06	0	0	80	65	0	0	.	.
303	99.0	2	09APR81:11:31	0.07	0	0	30	30	0	0	.	.
304	101.0	2	11APR81:10:41	0.09	.	0	.	60	.	0	.	.
305	102.0	2	12APR81:15:46	0.06	0	0	145	30	0	0	.	.
306	103.0	2	13APR81:14:32	0.05	0	0	40	40	0	0	.	.
307	107.0	2	17APR81:08:53	0.05	0	0	40	.	40	.	.	.
308	113.0	2	23APR81:17:17	0.01	0	0	275	255	0	0	.	.
309	118.0	2	28APR81:16:12	0.41	150	0	140	100	0	0	.	.
310	119.0	2	29APR81:18:22	0.04	0	0	135	80	0	0	.	.
311	121.0	2	01MAY81:14:53	0.13	0	0	155	40	25	0	.	.
312	130.0	2	10MAY81:14:35	0.07	0	0	65	45	0	0	.	.
313	131.0	2	11MAY81:11:29	0.08	0	0	30	25	0	0	.	.
314	135.0	2	15MAY81:11:55	0.10	0	0	120	115	20	0	.	.
315	135.1	2	15MAY81:14:25	0.05	0	0	85	60	0	0	.	.
316	136.0	2	16MAY81:21:12	0.04	0	0	80	40	0	0	.	.
317	148.0	2	28MAY81:01:12	0.08	210	0	180	70	25	25	.	.
318	150.0	2	30MAY81:22:02	0.04	0	0	35	35	20	20	.	.
319	152.0	2	01JUN81:13:27	0.03	0	0	25	25	20	20	.	.
320	154.0	2	03JUN81:20:20	0.01	0	0	90	30	30	20	.	.
321	160.0	2	09JUN81:15:04	0.04	0	0	50	50	0	0	10.4	.
322	161.0	2	10JUN81:14:54	0.03	0	0	75	.	0	0	14.9	.
323	164.0	2	13JUN81:17:47	0.05	0	0	85	75	25	0	38.7	.
324	173.0	2	22JUN81:15:54	0.02	0	0	100	90	0	0	28.1	.
325	182.0	2	01JUL81:07:48	0.10	0	0	170	.	50	20	88.0	.
326	201.0	2	20JUL81:18:41	0.04	0	.	860	.	70	65	102.0	.
327	209.1	2	28JUL81:10:16	0.05	0	.	60	.	0	0	16.0	80
328	223.0	2	11AUG81:19:37	0.09	0	0	90	.	0	0	81.0	125
329	224.1	2	12AUG81:05:27	0.14	0	0	0	.	0	0	.	.
330	243.1	2	31AUG81:12:53	0.15	0	0	0	.	20	0	23.0	50
331	252.0	2	09SEP81:03:13	0.02	250	240	210	.	0	0	16.0	226
332	258.0	2	15SEP81:17:23	0.16	0	0	130	130	40	35	70.0	147
333	258.1	2	15SEP81:20:04	0.06	.	.	.	.	.	.	.	.
334	265.0	2	22SEP81:10:33	0.24	0	0	60	60	0	0	35.0	71
335	274.0	2	01OCT81:21:45	0.09	120	0	35	.	0	0	26.0	76
336	279.0	2	06OCT81:16:59	0.04	0	0	0	.	0	0	.	.
337	296.0	2	23OCT81:06:06	0.03	0	0	115	95	0	.	25.0	135
338	298.0	2	25OCT81:14:14	0.03	0	0	55	55	0	0	21.0	58
339	299.0	2	26OCT81:12:14	0.07	0	0	20	20	0	0	20.0	47
340	300.0	2	27OCT81:08:27	0.06	0	0	30	.	0	.	25.0	33
341	307.0	2	03NOV81:21:07	0.11	0	.	80	80	.	.	34.0	104
342	335.0	2	01DEC81:11:57	0.03	0	0	30	.	.	.	14.0	65
343	342.0	2	08DEC81:13:00	0.02	580	0	165	165	.	.	25.0	173
344	349.0	2	15DEC81:11:33	0.05	.	0	.	55	.	.	.	.

STATION METALS DATA

STA=51UR06

OBS	SITENO	TYPE	TIM	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
345	222.00	2	25OCT80:05:39	0.33	0	0	70	30	0	0	.	.
346	326.00	2	17NOV80:15:59	0.29	0	0	40	.	0	0	.	.
347	329.00	2	24NOV80:10:22	0.58	0	0	30	30	0	0	.	.
348	332.00	2	27NOV80:21:04	0.09	0	.	55	.	0	.	.	.
349	45.01	2	02FEB81:06:27	0.50	0	0	190	90	40	0	.	.
350	43.02	2	02FEB81:12:13	0.10	.	0	.	75	.	0	.	.
351	47.00	2	05FEB81:13:43	0.14	0	0	80	70	40	30	.	.
352	48.00	2	11FEB81:04:24	0.29	0	0	105	75	0	0	.	.
353	50.00	2	19FEB81:23:04	0.31	0	0	100	60	0	.	.	.
354	51.00	2	20FEB81:23:55	0.12	0	0	70	55	0	0	.	.
355	53.10	2	22FEB81:23:38	0.26	0	0	80	50	0	.	.	.
356	56.00	2	05MAR81:04:17	0.07	0	0	95	65	20	0	.	.
357	59.00	2	09APR81:11:46	0.14	0	0	55	40	0	0	.	.
358	112.00	2	12APR81:19:09	0.12	0	0	0	.	0	0	.	.
359	121.00	2	01MAY81:10:07	0.51	0	0	100	75	20	0	.	.
360	131.00	2	11MAY81:03:05	0.26	0	0	95	95	20	20	.	.
361	139.00	2	19MAY81:05:03	0.16	0	0	110	100	0	0	.	.
362	140.00	2	26MAY81:07:26	0.06	0	0	120	110	35	30	.	.
363	145.00	3	29MAY81:20:02	0.18	0	0	80	45	0	0	.	.
364	150.00	2	30MAY81:21:48	0.23	0	0	80	50	0	0	.	.
365	152.00	2	01JUN81:14:45	0.18	0	0	150	55	0	0	.	.
366	151.00	2	10JUN81:06:32	0.17	0	0	85	75	25	25	.	.
367	164.00	2	13JUN81:19:46	0.24	0	0	55	50	0	0	.	.
368	171.00	2	20JUN81:14:35	0.60	0	0	80	45	20	0	30.0	.
369	172.01	2	21JUN81:20:12	0.26	0	0	80	45	0	0	16.9	.
370	175.03	2	04JUL81:07:08	1.13	0	.	45	30	0	0	.	.
371	215.00	2	20JUL81:11:45	1.06	0	.	35	.	0	0	16.0	.
372	223.00	2	11AUG81:14:51	1.01	0	0	40	40	0	0	.	.
373	227.00	2	15AUG81:20:33	1.93	0	0	0	.	0	0	.	.
374	252.00	2	30AUG81:10:55	0.28	0	0	0	.	0	0	.	.
375	252.00	2	15SEP81:16:54	0.19	.	.	.	.	.	.	.	.
376	230.00	2	23OCT81:16:23	0.06	0	0	145	100	30	0	.	.
377	239.00	2	26OCT81:12:42	0.23	0	0	65	55	30	25	.	.

STA=51UR07

OBS	SITENO	TYPE	TIM	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
378	204.0	2	21JUL80:19:26	5.2300	120	0	150	30	0	0	.	.
379	208.1	2	22JUL80:22:50	1.2700	0	0	90	35	130	0	.	.
380	211.0	2	29JUL80:02:06	0.4900	0	0	190	30	0	0	.	.
381	214.0	2	01AUG80:14:06	0.6000	180	0	190	80	20	0	.	.
382	216.0	2	03AUG80:14:06	0.8400	160	0	260	60	50	0	.	.
383	217.1	2	03AUG80:23:47	1.0700	220	0	210	70	30	0	.	.
384	231.0	2	16AUG80:05:52	1.0500	300	0	500	10	0	0	.	.
385	236.0	2	19AUG80:02:57	0.8000	0	0	250	35	0	0	.	.
386	.	1	05SEP80:15:00	0.0055	0	0	100	25	0	0	.	.
387	250.0	2	10SEP80:01:09	0.3400	340	0	350	120	55	0	.	.
388	.	1	15SEP80:10:35	0.0021	0	0	0	0	0	0	.	.
389	.	1	22SEP80:15:30	0.0021	0	0	190	155	0	0	.	.
390	262.0	2	25SEP80:03:55	0.0939	0	0	350	95	100	0	.	.
391	264.0	2	25SEP80:05:52	0.2340	300	0	250	105	65	0	.	.
392	264.0	2	25SEP80:07:44	0.2340	0	.	50	50	0	0	.	.

STATION METALS DATA

STA=510R07

OBS	STREAM	TYPE	TIT	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
393	[illegible]	2	25SEP80:09:06	0.1340	0	0	325	60	100	0	.	.
394	[illegible]	2	25SEP80:10:55	0.0407	0	0	.	60	.	0	.	.
395	[illegible]	2	25SEP80:12:43	0.0186	0	0	100	45	0	0	.	.
396	.	[illegible]	29SEP80:12:45	0.0586	0	0	65	50	0	0	.	.
397	[illegible]	2	02OCT80:21:56	0.1600	720	0	425	220	0	0	.	.
398	.	1	06OCT80:10:00	0.0021	0	0	65	65	0	0	.	.
399	.	1	20OCT80:09:25	0.0105	0	0	75	65	0	0	.	.
400	[illegible]	2	25OCT80:07:00	7.1100	0	0	60	35	40	0	.	.
401	.	1	27OCT80:10:20	0.0234	0	0	65	.	0	0	.	.
402	302.0	2	28OCT80:06:20	0.1100	0	0	60	20	0	0	.	.
403	.	1	03NOV80:08:30	0.0143	0	0	80	60	0	0	.	.
404	[illegible]	2	05NOV80:04:13	0.8200	0	0	80	70	0	0	.	.
405	.	1	10NOV80:14:45	0.0073	0	0	85	75	0	0	.	.
406	[illegible]	2	24NOV80:03:18	1.0200	0	0	80	30	0	0	.	.
407	[illegible]	2	27NOV80:15:56	0.4200	0	0	100	35	0	0	.	.
408	.	1	01DEC80:14:45	0.0105	0	0	105	100	0	0	.	.
409	.	1	08DEC80:08:30	0.0021	0	0	50	50	0	0	.	.
410	.	1	15DEC80:10:30	0.0073	0	0	65	55	0	0	.	.
411	.	1	22DEC80:14:25	0.0143	180	0	185	100	35	0	.	.
412	.	1	29JAN81:14:20	0.0021	0	0	0	.	0	0	.	.
413	.	1	09FEB81:13:50	0.0143	0	0	0	.	0	0	.	.
414	52.0	2	21FEB81:00:10	0.1600	0	0	40	40	25	0	.	.
415	53.0	2	22FEB81:12:0[illegible]	0.6000	0	0	65	20	0	.	.	.
416	53.0	2	04MAR81:16:00	0.1300	0	0	50	40	0	0	.	.
417	.	1	09MAR81:14:15	0.0234	.	0	.	75	.	50	.	.
418	.	1	23MAR81:14:05	0.0186	0	0	25	25	0	0	.	.
419	[illegible]	2	30MAR81:07:56	0.2900	410	0	140	.	0	.	.	.
420	[illegible]	2	01APR81:13:14	0.6000	0	0	95	.	0	.	.	.
421	.	1	06APR81:16:00	0.0186	0	0	50	30	0	0	.	.
422	[illegible]	2	09APR81:09:22	0.4800	0	0	0	.	0	0	.	.
423	[illegible]	2	12APR81:17:46	0.9100	0	0	105	35	0	0	.	.
424	[illegible]	2	14APR81:17:06	0.5400	0	0	210	.	25	.	.	.
425	107.0	2	17APR81:09:12	0.4100	0	0	35	.	0	.	.	.
426	.	1	20APR81:14:40	0.0050	0	0	70	60	0	0	.	.
427	.	1	27APR81:14:35	0.0186	0	0	35	35	0	0	.	.
428	[illegible]	2	30APR81:04:20	0.2600	0	0	160	60	20	0	.	.
429	[illegible]	2	30APR81:23:03	0.4400	0	0	85	45	30	0	.	.
430	121.0	2	01MAY81:04:36	3.6000	0	0	140	70	30	0	.	.
431	.	1	04MAY81:14:30	0.0186	0	0	35	.	0	0	.	.
432	139.0	2	10MAY81:14:24	0.3500	110	0	75	65	0	0	.	.
433	140.1	2	10MAY81:20:15	1.2200	160	.	110	.	0	.	.	.
434	131.0	2	11MAY81:02:08	0.2500	0	.	70	.	0	.	.	.
435	131.1	2	11MAY81:11:02	1.6800	0	0	50	0	0	0	.	.
436	131.2	2	11MAY81:1[illegible]:51	1.1400	240	0	95	60	0	0	.	.
437	[illegible]	2	12MAY81:00:47	0.5[illegible]00	0	0	95	50	0	0	.	.
438	[illegible]	2	15MAY81:11:50	0.6400	140	0	115	115	0	0	.	.
439	.	1	18MAY81:13:45	0.0186	0	0	25	.	0	0	.	.
440	[illegible]	2	19MAY81:02:57	0.4200	0	0	50	30	0	0	.	.
441	[illegible]	2	19MAY81:13:15	0.4200	0	0	40	30	0	0	.	.
442	[illegible]	2	[illegible]MAY81:20:[illegible]	0.6800	350	0	245	105	0	0	.	.
443	[illegible]	2	01JUN81:12:20	0.1400	0	0	65	25	0	0	.	.
444	[illegible]	2	02JUN81:03:50	2.3200	140	0	80	.	20	.	.	.
445	.	1	08JUN81:15:05	0.0286	0	0	30	30	0	0	.	.
446	[illegible]	2	10JUN81:18:12	0.9200	0	0	90	45	0	0	.	.

STATION METALS DATA

STA=51UR07

OBS	STORM	TYPE	TIME	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
447	[illegible]	2	13JUN81:21:47	1.7100	220	0	125	70	0	0	78.6	.
448	[illegible]	2	20JUN81:15:53	0.6600	140	0	170	85	25	0	83.0	.
449	[illegible]	2	21JUN81:19:56	4.1600	170	0	115	35	0	0	88.9	.
450	.	1	22JUN81:14:22	0.0143	0	.	65	.	0	0	.	.
451	[illegible]	2	25JUN81:20:20	3.2300	0	0	30	70	0	0	49.8	.
452	.	1	28JUN81:14:15	0.0045	0	.	160	155	0	0	.	.
453	[illegible]	2	02JUL81:23:01	1.2700	0	0	60	60	0	0	42.0	.
454	[illegible]	2	03JUL81:05:47	7.0700	0	.	35	20	0	0	42.0	.
455	.	1	13JUL81:13:40	0.0143	0	.	85	.	0	.	.	.
456	.	1	20JUL81:14:35	0.0045	0	.	490	150	0	0	.	.
457	[illegible]	2	24JUL81:13:52	0.6500	120	.	135	115	0	0	114.0	.
458	[illegible]	2	25JUL81:07:24	3.6500	130	.	75	75	0	0	132.0	.
459	.	1	27JUL81:14:33	0.0086	0	.	0	.	0	0	.	.
460	[illegible]	2	[illegible]:14:49	0.1200	0	.	160	95	40	0	.	.

STA=51UR08

OBS	STORM	TYPE	TIME	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
461	[illegible]	2	[illegible]	1.4400	0	0	80	20	0	0	.	.
462	[illegible]	2	[illegible]	0.0400	0	0	100	30	0	0	.	.
463	[illegible]	2	[illegible]	[illegible]	400	0	1200	30	50	0	.	.
464	[illegible]	2	[illegible]	0.2500	0	0	100	15	0	0	.	.
465	.	1	[illegible]	0.0051	0	0	0	.	0	0	.	.
466	[illegible]	2	[illegible]	0.0405	0	0	300	95	0	0	.	.
467	[illegible]	2	[illegible]	0.1176	300	0	380	55	0	0	.	.
468	[illegible]	2	[illegible]	0.0405	0	0	60	45	0	0	.	.
469	[illegible]	2	[illegible]	0.0121	.	0	.	40	.	0	.	.
470	.	1	[illegible]	0.0009	0	0	260	200	0	0	.	.
471	.	1	06OCT80:10:10	0.0009	0	0	40	40	0	0	.	.
472	[illegible]	2	[illegible]	2.3000	.	110	.	40	.	0	.	.
473	.	1	[illegible]	0.0018	0	0	30	0	0	0	.	.
474	[illegible]	2	[illegible]	6.2000	0	0	40	20	0	0	.	.
475	.	1	[illegible]	0.0069	0	0	30	0	0	0	.	.
476	.	1	[illegible]	0.0069	0	0	40	30	0	0	.	.
477	[illegible]	2	[illegible]	0.3400	0	0	80	40	20	0	.	.
478	.	1	[illegible]	[illegible]	0	0	30	.	0	0	.	.
479	[illegible]	2	[illegible]	[illegible]	0	0	50	.	0	0	.	.
480	[illegible]	2	[illegible]	0.4900	0	0	35	.	0	0	.	.
481	.	1	[illegible]	0.0158	0	0	20	20	0	0	.	.
482	[illegible]	2	[illegible]	0.1275	0	0	35	0	0	0	.	.
483	[illegible]	[illegible]	[illegible]	0.3200	0	0	50	30	0	0	.	.
484	[illegible]	[illegible]	[illegible]	0.1275	0	0	40	30	0	0	.	.
485	.	1	[illegible]:30	0.0089	0	0	25	25	0	0	.	.
486	[illegible]	2	05DEC80:10:05	0.3200	0	0	50	40	0	0	.	.
487	.	1	15DEC80:10:30	0.0018	0	0	30	30	0	0	.	.
488	.	1	22DEC80:14:50	0.0018	0	0	80	75	0	0	.	.
489	.	1	26JAN81:14:20	0.0018	0	0	50	.	40	0	.	.
490	[illegible]	2	06FEB81:10:21	0.3000	.	.	.	.	.	.	.	.
491	.	1	[illegible]FEB81:13:56	0.0121	0	0	0	.	0	0	.	.
492	[illegible]	2	19FEB81:23:00	0.9000	0	0	50	35	0	0	.	.
493	[illegible]	2	20FEB81:09:47	0.2500	0	0	25	25	0	0	.	.
494	[illegible]	2	[illegible]FEB81:00:30	0.3000	0	0	25	25	0	0	.	.

STATION METALS DATA

STA=51UR08

OBS	SEQ	TYPE	TIME	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
495	[illegible]	2	[illegible]	1.3000	120	0	55	25	0	0	.	.
496	.	1	[illegible]	0.0350	.	0	.	30	.	0	.	.
497	.	1	[illegible]	0.0200	0	0	30	0	0	0	.	.
498	[illegible]	2	[illegible]	0.4900	160	0	275	65	0	.	.	.
499	[illegible]	2	[illegible]	0.4600	0	0	60	45	0	.	.	.
500	[illegible]	2	[illegible]	0.4200	0	0	85	85	0	0	.	.
501	.	1	[illegible]	0.0200	0	0	25	20	0	0	.	.
502	[illegible]	2	[illegible]:09:43	0.5500	0	0	50	0	0	0	.	.
503	[illegible]	2	12APR81:14:13	1.0000	0	0	30	0	0	0	.	.
504	[illegible]	2	14APR81:17:42	0.2200	0	0	60	0	0	0	.	.
505	107.0	2	17APR81:10:07	0.2100	0	0	90	20	0	0	.	.
506	.	1	20APR81:14:45	0.0200	0	0	25	0	0	0	.	.
507	[illegible]	2	23APR81:21:11	1.1000	0	0	135	.	0	.	.	.
508	[illegible]	2	27APR81:03:32	0.2700	.	.	.	.	.	.	.	.
509	.	1	27APR81:14:45	0.0250	0	0	65	50	0	0	.	.
510	[illegible]	2	30APR81:05:35	0.2600	0	0	70	25	0	0	.	.
511	[illegible]	2	[illegible]:23:47	0.3900	0	0	110	80	0	0	.	.
512	[illegible]	2	[illegible]:10:56	1.1600	0	.	125	65	0	0	.	.
513	.	1	[illegible]	0.0121	0	0	20	.	0	0	.	.
514	131.1	2	[illegible]:11:25	2.5400	0	0	65	50	0	0	.	.
515	[illegible]	2	[illegible]:12:05	0.2400	0	0	245	0	20	0	.	.
516	.	1	[illegible]:13:45	0.0121	0	0	0	.	0	0	.	.
517	[illegible]	2	[illegible]:21:22	0.5600	0	0	250	0	0	0	.	.
518	.	1	[illegible]	0.0200	0	0	75	75	0	0	.	.
519	[illegible]	2	10JUN81:12:19	1.0500	0	0	105	40	0	0	.	.
520	[illegible]	2	13JUN81:22:30	1.3900	110	0	130	45	50	0	95.3	.
521	[illegible]	2	20JUN81:15:23	0.4100	0	0	245	50	0	0	45.6	.
522	[illegible]	2	21JUN81:20:22	1.2200	0	0	135	25	0	0	69.8	.
523	.	1	22JUN81:14:20	0.0061	0	.	30	0	0	0	.	.
524	[illegible]	2	25JUN81:20:41	3.7100	0	0	130	45	25	0	68.4	.
525	.	1	29JUN81:14:25	0.0089	0	.	0	.	0	.	.	.
526	[illegible]	2	02JUL81:13:35	0.3000	0	0	75	55	0	0	69.0	.
527	[illegible]	2	03JUL81:04:59	0.5100	0	0	65	20	0	0	46.0	.
528	[illegible]	2	04JUL81:07:51	4.2200	0	.	105	.	20	20	47.0	.
529	.	1	13JUL81:13:50	0.0061	0	.	0	.	0	0	.	.
530	.	1	20JUL81:14:35	0.0038	0	.	0	.	0	0	.	.
531	205.0	2	26JUL81:14:24	0.5900	110	.	115	60	0	0	108.0	.
532	206.0	2	25JUL81:07:44	3.6700	115	.	110	50	0	0	135.0	.
533	.	1	27JUL81:14:41	0.0465	0	.	30	.	0	.	.	.
534	[illegible]	2	03AUG81:12:06	0.2600	0	.	80	65	0	.	.	.

STA=51UR09

OBS	SEQ_NO	TYPE	TIME	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
535	270.00	2	02OCT80:16:46	0.22	0	0	.	185	0	.	.	.
536	[illegible]	2	25OCT80:03:40	[illegible]	120	100	65	65	0	0	.	.
537	[illegible]	2	04NOV80:14:29	0.11	0	0	65	.	0	0	.	.
538	[illegible]	2	09NOV80:00:27	0.19	0	0	80	80	0	0	.	.
539	[illegible]	2	17NOV80:16:03	0.70	0	0	50	40	0	0	.	.
540	[illegible]	2	24NOV80:07:06	1.20	0	0	50	.	0	0	.	.
541	[illegible]	2	24NOV80:18:34	0.11	0	0	.	220	0	0	.	.
542	[illegible]	2	27NOV80:14:12	0.06	0	0	50	50	0	.	.	.

STATION METALS DATA

STA=STUR09

OBS	STRMNO	TYPE	TI	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
543	344.0	2	03DEC80:12:19	0.13	0	0	20	.	0	0	.	.
544	351.0	2	16DEC80:04:07	0.19	0	0	0	.	0	0	.	.
545	356.0	2	23DEC80:11:05	0.20	0	.	100	.	65	.	.	.
546	13.0	2	02FEB81:06:24	0.47	0	0	130	70	0	0	.	.
547	17.0	2	06FEB81:12:30	0.22	0	0	90	55	0	.	.	.
548	42.0	2	11FEB81:00:45	0.46	0	0	70	70	0	0	.	.
549	50.0	2	19FEB81:15:11	0.30	0	0	100	65	0	0	.	.
550	51.0	2	20FEB81:15:20	0.21	0	0	165	95	0	0	.	.
551	53.0	2	22FEB81:13:50	0.24	0	0	85	65	0	0	.	.
552	54.0	2	03MAR81:03:09	0.08	0	0	0	.	0	.	.	.
553	61.0	2	01APR81:15:12	0.36	0	0	65	60	0	.	.	.
554	65.0	2	05APR81:16:56	0.19	0	0	80	50	25	25	.	.
555	79.0	2	09APR81:10:48	0.18	0	0	35	30	0	0	.	.
556	104.0	2	14APR81:05:22	0.46	0	0	120	65	0	0	.	.
557	107.0	2	17APR81:11:15	0.36	0	0	50	20	0	.	.	.
558	110.0	2	20APR81:01:55	0.25	0	0	60	30	0	0	.	.
559	121.0	2	01MAY81:08:15	0.57	0	0	90	80	25	0	.	.
560	130.0	2	10MAY81:15:38	0.32	0	0	75	.	0	0	.	.
561	135.0	2	15MAY81:12:19	0.72	0	0	80	70	0	0	.	.
562	138.0	2	19MAY81:20:21	0.17	0	0	50	50	0	.	.	.
563	150.0	2	03JUN81:20:57	1.07	0	0	40	40	0	0	.	.
564	155.0	2	04JUN81:17:01	1.15	0	0	30	30	0	0	.	.
565	171.0	2	20JUN81:00:56	0.62	0	0	140	75	0	0	38.3	.
566	182.0	2	01JUL81:07:10	0.67	0	0	85	70	0	0	.	.
567	184.0	2	03JUL81:15:28	1.39	0	0	60	25	0	0	.	.
568	209.0	2	29JUL81:10:29	1.25	0	.	125	65	25	0	3.0	.
569	218.0	2	05AUG81:10:24	0.59	0	.	100	.	0	.	.	.
570	219.0	2	07AUG81:23:53	1.08	0	0	65	65	0	0	.	.
571	223.0	2	11AUG81:18:54	1.25	0	0	90	90	20	0	.	.
572	242.0	2	30AUG81:07:42	0.15	0	0	85	85	20	0	.	.
573	243.1	2	31AUG81:11:19	0.59	0	0	0	.	20	0	.	.
574	251.0	2	08SEP81:15:41	0.24	0	0	75	75	0	0	.	.
575	258.0	2	15SEP81:16:40	0.33	0	0	335	260	20	0	.	.
576	260.0	2	17SEP81:04:18	0.18	0	0	130	130	0	0	.	.
577	274.0	2	01OCT81:21:14	0.31	0	0	145	140	20	0	.	.
578	281.0	2	15OCT81:17:36	0.10	.	.	.	.	.	.	.	.
579	288.0	2	23OCT81:07:35	0.20	0	0	75	55	0	0	.	.
580	296.0	2	25OCT81:14:58	0.05	0	0	60	60	0	0	.	.
581	297.0	2	25OCT81:12:39	0.28	0	0	65	50	0	0	.	.
582	300.0	2	27OCT81:05:42	0.35	0	0	60	25	0	.	.	.
583	305.0	2	05NOV81:23:54	0.58	0	0	115	95	.	.	.	.
584	335.0	2	01DEC81:11:04	0.14	0	0	50	.	.	.	.	.

STATION METALS DATA

STA=STUR10

OBS	STORMNO	TYPE	TTT	FLO	EFB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
585	272.1	2	18OCT80:15:25	0.34000	0	0	95	60	0	0	.	.
586	299.0	2	25OCT80:03:36	1.60000	0	0	115	20	0	0	.	.
587	299.1	2	25OCT80:14:03	1.54000	0	0	170	30	0	0	.	.
588	322.0	2	17NOV80:15:48	0.59000	0	0	185	20	0	0	.	.
589	327.0	2	24NOV80:10:55	1.24000	0	0	140	25	60	0	.	.
590	344.0	2	09DEC80:13:48	0.28777	0	0	225	60	25	0	.	.
591	33.0	2	02FEB81:06:25	0.49000	0	0	160	70	0	0	.	.
592	39.0	2	05FEB81:11:34	0.58000	0	0	130	65	25	0	.	.
593	50.0	2	14FEB81:23:18	0.55000	100	0	75	.	0	.	.	.
594	51.0	2	20FEB81:22:47	0.35000	0	0	65	30	0	.	.	.
595	53.0	2	22FEB81:22:16	0.43000	0	0	35	25	0	0	.	.
596	73.0	2	16MAR81:12:45	0.27559	110	0	85	85	0	0	.	.
597	91.0	2	01APR81:16:30	1.06000	110	0	85	70	0	.	.	.
598	95.0	2	05APR81:15:39	0.66000	110	0	155	75	0	0	.	.
599	99.0	2	09APR81:09:52	0.48000	0	0	85	55	0	0	.	.
600	101.0	2	11APR81:10:18	0.77000	0	0	70	40	0	0	.	.
601	104.0	2	14APR81:05:32	1.02972	0	0	50	35	0	0	.	.
602	121.0	2	01MAY81:08:07	0.93000	0	0	100	75	0	0	.	.
603	130.0	2	10MAY81:21:38	0.25362	0	0	130	45	20	20	.	.
604	131.0	2	11MAY81:12:15	0.16399	0	0	75	25	0	0	.	.
605	136.0	2	13MAY81:20:32	0.08104	0	0	25	25	0	0	.	.
606	139.0	2	19MAY81:13:47	0.23000	0	0	70	35	0	0	.	.
607	147.0	2	27MAY81:14:53	0.36000	120	0	130	75	0	.	.	.
608	148.0	2	28MAY81:13:02	0.24000	120	0	65	.	0	0	.	.
609	149.0	2	29MAY81:14:26	0.30000	0	0	65	.	0	.	.	.
610	150.0	2	30MAY81:11:10	0.23000	0	0	125	25	0	0	.	.
611	152.0	2	01JUN81:13:59	0.29000	0	0	25	25	0	0	.	.
612	154.0	2	03JUN81:14:35	0.99000	100	0	65	50	0	0	.	.
613	155.0	2	04JUN81:17:06	0.39000	0	0	95	.	0	.	.	.
614	156.0	2	05JUN81:22:40	0.15699	0	0	35	35	0	0	18.1	.
615	160.0	2	09JUN81:11:24	0.21512	0	0	50	50	0	0	26.7	.
616	164.0	2	13JUN81:22:45	0.57000	0	0	35	35	0	0	21.3	.
617	183.0	2	02JUL81:13:10	6.88889	0	0	80	0	0	0	.	.
618	189.0	2	03JUL81:15:25	0.44768	0	.	35	.	0	.	.	.
619	205.0	2	24JUL81:14:30	0.06892	110	.	170	120	25	0	103.0	.
620	207.1	2	29JUL81:16:21	1.03000	110	.	65	45	0	0	100.0	.
621	217.0	2	06AUG81:05:35	0.71429	.	0	.	30	.	0	.	.
622	223.0	2	11AUG81:18:52	0.15306	0	0	30	30	0	0	16.0	52
623	227.0	2	15AUG81:20:25	3.66667	0	0	25	25	0	0	21.0	69
624	255.0	2	15SEP81:16:45	0.57000	0	0	40	30	20	0	23.0	51
625	260.0	2	17SEP81:04:11	1.20370	0	0	80	50	30	0	25.0	90
626	274.0	2	01OCT81:21:08	0.37267	210	0	95	95	25	20	59.0	164
627	295.0	2	23OCT81:05:04	0.16000	0	0	65	55	0	0	23.0	63
628	297.0	2	26OCT81:11:26	0.64000	0	0	20	20	0	0	24.0	45
629	335.0	2	01DEC81:09:25	0.16000	0	0	60	60	.	.	44.0	82
630	348.0	2	14DEC81:15:20	0.34000	.	0	.	75	.	.	.	.
631	357.0	2	23DEC81:05:01	0.18598	360	0	245	50	35	0	.	.

STATION METALS DATA

STA=S10R11

OBS	STRMRM	TYPE	TIT	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
632	277.00	2	03OCT80:10:15	0.00100	0	0	70	35	0	0	.	.
633	277.00	2	03OCT80:11:13	0.00100	0	0	60	60	0	0	.	.
634	277.00	2	03OCT80:12:05	0.00100	170	0	60	40	0	0	.	.
635	277.00	2	03OCT80:13:03	0.00400	0	0	55	55	0	0	.	.
636	292.00	2	18OCT80:08:54	0.03000	0	0	155	110	0	0	.	.
637	292.00	2	18OCT80:09:06	0.06000	0	0	185	90	0	0	.	.
638	292.00	2	18OCT80:09:17	0.06000	100	0	220	80	0	0	.	.
639	292.00	2	18OCT80:09:28	0.06000	0	0	215	80	0	0	.	.
640	292.00	2	18OCT80:09:39	0.05000	0	0	90	60	0	0	.	.
641	292.00	2	18OCT80:09:51	0.05000	0	0	60	55	0	0	.	.
642	292.00	2	18OCT80:10:06	0.04000	0	0	65	45	0	0	.	.
643	292.00	2	18OCT80:10:23	0.03000	0	0	60	40	0	0	.	.
644	292.00	2	18OCT80:10:42	0.03000	100	0	90	45	0	0	.	.
645	292.00	2	18OCT80:11:10	0.00500	140	0	190	30	20	0	.	.
646	299.00	2	25OCT80:04:39	0.86000	0	.	50	.	0	.	.	.
647	309.00	2	04NOV80:08:46	0.16000	.	.	.	.	.	.	.	.
648	324.01	2	24NOV80:10:36	1.40000	0	0	40	40	0	0	.	.
649	324.02	2	24NOV80:22:05	0.52000	0	.	30	.	0	.	.	.
650	332.00	2	27NOV80:22:26	0.12000	0	.	50	.	30	.	.	.
651	[illegible]	2	03DEC80:16:10	0.11000	0	0	45	40	0	0	.	.
652	43.00	2	02FEB81:06:57	0.76000	0	0	150	70	0	0	.	.
653	49.00	2	09FEB81:10:51	0.53000	0	0	40	30	0	0	.	.
654	101.00	2	11APR81:10:57	0.58000	0	0	55	30	0	0	.	.
655	130.00	2	10MAY81:21:52	0.44000	0	0	55	45	0	0	.	.
656	131.00	2	11MAY81:12:39	0.49000	0	0	0	.	0	0	.	.
657	138.00	2	18MAY81:21:18	0.10000	0	0	35	30	0	0	.	.
658	139.00	2	19MAY81:14:20	0.50000	0	0	40	25	0	0	.	.
659	148.00	2	28MAY81:06:26	0.32000	0	0	90	45	0	0	.	.
660	148.10	2	28MAY81:15:44	0.65000	0	0	90	45	20	0	.	.
661	149.00	2	29MAY81:14:35	0.71000	0	0	50	40	0	0	.	.
662	150.00	2	30MAY81:22:00	0.45000	0	0	30	30	0	0	.	.
663	152.00	2	01JUN81:15:50	0.72000	0	0	100	35	0	0	.	.
664	155.00	2	04JUN81:11:44	0.75000	0	0	30	.	20	20	14.2	.
665	157.00	2	06JUN81:01:33	0.65000	0	0	0	.	0	0	16.8	.
666	171.00	2	20JUN81:12:56	0.19784	0	0	25	20	0	0	9.8	.
667	172.00	2	21JUN81:20:50	0.26000	0	0	30	0	0	0	15.8	.
668	176.00	2	25JUN81:19:08	0.15152	0	0	80	25	0	.	6.8	.
669	183.00	2	02JUL81:15:29	0.08592	0	0	35	20	0	0	.	.
670	184.00	2	03JUL81:15:02	0.53000	0	.	40	35	0	0	.	.
671	209.10	2	28JUL81:15:35	1.56000	0	.	35	35	0	0	8.0	.
672	218.00	2	06AUG81:12:09	0.52764	0	.	60	60	0	0	12.0	84
673	219.00	2	07AUG81:23:47	0.41000	0	0	40	35	25	0	14.0	58
674	258.00	2	15SEP81:17:33	0.30000	0	0	30	30	0	0	13.0	43
675	274.00	2	01OCT81:23:03	0.26611	0	0	0	.	0	0	6.0	35
676	289.00	2	16OCT81:11:56	0.48000	0	0	0	0	0	0	7.0	25
677	335.00	2	01DEC81:11:46	0.12000	0	0	30	30	.	.	22.0	47
678	348.00	2	14DEC81:14:29	0.19000	.	0	.	100	.	.	.	.
679	357.00	2	23DEC81:04:07	0.19666	0	0	70	50	0	0	.	.

STATION METALS DATA

STA=51UR15

OBS	STRENO	TYPE	TTT	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
680	299.0	2	25OCT80:02:54	0.16	.	.	.	.	.	.	.	.
681	299.0	2	25OCT80:03:19	0.09	.	.	.	.	.	.	.	.
682	299.0	2	25OCT80:03:43	0.16	0	0	45	0	0	0	.	.
683	299.0	2	25OCT80:04:29	0.16	0	0	20	0	0	0	.	.
684	299.0	2	25OCT80:05:11	0.16	110	110	40	40	0	0	.	.
685	299.0	2	25OCT80:05:37	0.08	0	0	0	0	0	0	.	.
686	299.0	2	25OCT80:06:01	0.08	0	0	0	0	0	0	.	.
687	299.0	2	25OCT80:06:24	0.16	0	0	0	0	0	0	.	.
688	299.0	2	25OCT80:07:11	0.05	0	0	0	0	0	0	.	.
689	299.0	2	25OCT80:07:45	0.01	0	0	0	0	0	0	.	.
690	299.1	2	25OCT80:10:53	0.01	.	.	.	.	.	.	.	.
691	299.1	2	25OCT80:11:28	0.03	.	.	.	.	.	.	.	.
692	299.1	2	25OCT80:12:01	0.12	0	0	20	15	0	0	.	.
693	299.1	2	25OCT80:13:52	0.03	110	.	55	.	0	.	.	.
694	299.1	2	25OCT80:14:36	0.08	0	.	40	.	0	.	.	.
695	299.1	2	25OCT80:14:55	0.22	0	.	30	.	0	.	.	.
696	299.1	2	25OCT80:15:15	0.12	.	.	.	.	.	.	.	.
697	299.1	2	25OCT80:15:41	0.08	0	0	25	15	0	0	.	.
698	299.1	2	25OCT80:16:03	0.12	0	.	40	.	0	.	.	.
699	299.1	2	25OCT80:16:24	0.12	.	.	.	.	.	.	.	.
700	299.1	2	25OCT80:16:43	0.08	0	0	30	20	0	0	.	.
701	299.1	2	25OCT80:17:06	0.22	0	.	25	.	0	.	.	.
702	299.1	2	25OCT80:17:25	0.08	0	0	20	20	0	0	.	.
703	299.1	2	25OCT80:17:50	0.12	0	0	20	.	0	.	.	.
704	299.1	2	25OCT80:18:09	0.12	0	.	25	.	0	.	.	.
705	344.0	2	09DEC80:12:51	0.59	0	0	45	15	0	0	.	.
706	21.0	2	21JAN81:10:41	0.25	220	0	345	0	60	30	.	.
707	33.0	2	02FEB81:05:55	2.23	160	0	180	100	0	.	.	.
708	39.0	2	08FEB81:19:57	0.82	160	.	75	.	35	.	.	.
709	50.0	2	19FEB81:22:56	0.85	0	0	0	0	0	0	.	.
710	51.0	2	20FEB81:22:47	0.83	0	0	20	0	0	.	.	.
711	52.0	2	21FEB81:16:49	0.04	0	0	3	30	30	20	.	.
712	53.0	2	22FEB81:12:40	0.87	0	0	20	0	0	0	.	.
713	63.0	2	04MAR81:20:15	0.33	0	0	0	0	0	0	.	.
714	95.0	2	05APR81:17:00	0.33	0	0	75	0	30	0	.	.
715	95.0	2	05APR81:18:11	0.84	0	0	45	0	0	0	.	.
716	95.0	2	05APR81:18:49	0.33	0	0	0	0	0	0	.	.
717	99.0	2	09APR81:10:36	0.75	0	0	110	0	0	0	.	.
718	99.0	2	09APR81:11:07	1.00	0	0	30	0	0	0	.	.
719	99.0	2	09APR81:11:40	0.50	0	0	20	0	0	0	.	.
720	99.0	2	09APR81:12:11	0.21	0	0	70	0	0	0	.	.
721	101.0	2	11APR81:09:59	0.25	120	0	205	30	35	0	.	.
722	101.0	2	11APR81:10:20	0.79	120	0	40	25	20	0	.	.
723	101.0	2	11APR81:10:50	1.04	120	0	20	20	0	0	.	.
724	101.0	2	11APR81:11:27	0.25	0	0	25	0	0	0	.	.
725	102.0	2	12APR81:19:11	0.75	0	0	460	25	0	0	.	.
726	102.0	2	12APR81:19:32	1.80	0	0	50	30	0	0	.	.
727	102.0	2	12APR81:19:45	1.00	0	0	0	.	0	0	.	.
728	102.0	2	12APR81:20:17	0.21	0	0	0	0	0	0	.	.
729	102.0	2	12APR81:20:51	2.84	0	0	0	.	0	0	.	.
730	102.0	2	12APR81:20:54	4.68	0	0	100	0	0	0	.	.
731	102.0	2	12APR81:20:58	3.34	0	0	460	0	0	0	.	.
732	102.0	2	12APR81:21:07	1.25	0	0	50	0	0	0	.	.
733	102.0	2	12APR81:21:22	0.96	0	0	0	0	0	0	.	.

STATION METALS DATA

STA=51UR15

OBS	STRKD	TYPE	TII	FLO	EPB	SPH	EZN	SZN	ECU	SCU	PBF	ZNF
734	102.0	2	12APR81:21:39	0.75000	0	0	0	0	0	0	.	.
735	102.0	2	12APR81:22:15	0.50000	0	0	0	0	0	0	.	.
736	102.0	2	12APR81:23:19	0.46000	0	0	100	20	0	0	.	.
737	102.0	2	12APR81:23:45	1.50000	0	0	0	0	0	0	.	.
738	102.0	2	13APR81:00:00	0.96000	0	0	105	0	0	0	.	.
739	102.0	2	13APR81:00:28	0.21000	0	0	20	20	0	0	.	.
740	102.0	2	13APR81:01:58	0.21000	.	0	.	25	.	0	.	.
741	102.0	2	13APR81:04:49	0.21000	0	0	25	.	0	0	.	.
742	102.0	2	13APR81:07:52	0.04000	0	0	0	0	0	0	.	.
743	103.0	2	13APR81:10:17	0.28000	0	0	40	20	0	0	.	.
744	113.0	2	23APR81:20:59	1.04000	0	0	65	35	0	0	.	.
745	113.0	2	23APR81:21:06	1.84000	0	0	65	25	0	0	.	.
746	113.0	2	23APR81:21:26	0.79000	0	0	210	25	120	0	.	.
747	121.0	2	01MAY81:10:23	1.12000	0	0	0	.	0	0	.	.
748	130.0	2	10MAY81:21:25	0.91000	0	0	60	25	0	0	.	.
749	131.0	2	11MAY81:12:09	0.40000	0	0	20	.	0	0	.	.
750	135.0	2	15MAY81:12:10	0.19060	0	0	40	40	0	0	.	.
751	136.0	2	16MAY81:19:44	0.17000	0	.	70	.	0	.	.	.
752	139.0	2	19MAY81:14:22	0.29000	0	.	240	.	0	.	.	.
753	148.0	2	28MAY81:12:08	0.40580	220	0	225	30	0	0	.	.
754	152.0	2	01JUN81:17:13	0.76000	0	0	40	0	0	0	.	.
755	154.0	2	03JUN81:21:40	1.70000	0	0	80	20	25	0	.	.
756	157.0	2	06JUN81:00:20	1.42000	0	0	0	.	0	0	19.5	.
757	161.0	2	10JUN81:02:41	0.55000	0	0	0	.	0	0	34.0	.
758	164.0	2	13JUN81:22:42	1.54000	0	0	40	30	0	0	33.3	.
759	182.0	2	01JUL81:15:32	0.21000	170	0	100	45	0	0	160.0	.
760	182.1	2	01JUL81:21:10	0.06000	0	0	40	25	0	0	.	.
761	201.0	2	20JUL81:16:16	3.96000	0	.	45	45	0	0	47.0	.
762	205.0	2	24JUL81:11:53	0.67000	0	.	175	50	50	0	21.0	.
763	209.1	2	28JUL81:19:23	0.42000	0	.	20	.	0	0	25.0	.
764	218.0	2	06AUG81:10:15	0.39000	0	.	35	35	0	0	21.0	53
765	220.0	2	08AUG81:00:21	0.26000	0	0	20	.	0	0	13.0	40
766	223.0	2	11AUG81:12:54	0.76000	0	0	0	.	0	0	12.0	46
767	227.0	2	15AUG81:20:25	0.57000	0	0	0	.	0	0	17.0	45
768	242.0	2	30AUG81:07:23	0.78000	0	0	20	0	0	0	14.0	33
769	243.0	2	31AUG81:04:02	0.44000	0	0	25	25	20	0	26.0	64
770	251.0	2	08SEP81:13:40	0.36000	0	0	50	30	0	0	39.0	63
771	258.1	2	15SEP81:16:58	0.49000	0	0	25	0	0	0	16.0	35
772	274.0	2	01OCT81:21:10	0.29000	0	0	45	30	0	0	33.0	51
773	291.0	2	18OCT81:17:34	1.30000	0	0	95	90	0	0	35.0	160
774	296.0	2	23OCT81:07:58	0.32000	0	0	20	0	0	0	24.0	30
775	298.0	2	25OCT81:14:46	0.45000	0	0	20	.	0	0	21.0	24
776	309.0	2	05NOV81:23:05	0.29762	0	.	45	.	.	.	39.0	69
777	335.0	2	01DEC81:12:32	0.35000	0	0	30	25	.	.	23.0	47

STATION METALS DATA

STA=51UR16

OBS	STRMDO	TYPE	TI1	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PAF	ZNF
778	228.0	2	15AUG80:18:30	1.850	0	0	0	0	0	0	.	.
779	.	1	15SEP80:13:48	0.005	0	0	95	30	0	0	.	.
780	.	1	22SEP80:10:05	0.005	0	0	60	40	0	0	.	.
781	.	1	29SEP80:09:50	0.005	0	0	0	.	80	0	.	.
782	.	1	06OCT80:13:30	0.005	0	0	45	30	0	0	.	.
783	.	1	20OCT80:14:15	0.005	0	0	80	15	0	0	.	.
784	.	1	27OCT80:11:10	0.005	0	0	60	55	0	0	.	.
785	.	1	03NOV80:11:06	0.010	0	0	40	30	0	0	.	.
786	.	1	10NOV80:10:20	0.010	0	0	25	0	0	0	.	.
787	.	1	17NOV80:09:45	0.010	0	0	30	20	0	0	.	.
788	322.0	2	17NOV80:15:37	0.630	0	0	0	0	0	0	.	.
789	329.0	2	24NOV80:06:47	1.220	0	0	0	0	0	0	.	.
790	.	1	01DEC80:09:30	0.010	0	0	95	40	30	0	.	.
791	.	1	08DEC80:13:30	0.010	0	0	30	25	0	0	.	.
792	.	1	15DEC80:14:00	0.010	0	0	85	35	25	0	.	.
793	.	1	22DEC80:09:45	0.005	0	0	65	55	0	0	.	.
794	.	1	12JAN81:13:00	0.005	0	0	0	.	0	0	.	.
795	.	1	26JAN81:10:40	0.005	0	0	0	.	45	0	.	.
796	.	1	09FEB81:10:25	0.005	0	0	25	.	0	0	.	.
797	51.0	2	20FEB81:01:19	0.490	0	0	25	25	0	0	.	.
798	51.1	2	20FEB81:23:38	0.490	0	0	35	20	0	0	.	.
799	54.0	2	23FEB81:00:08	0.720	0	0	0	.	0	0	.	.
800	63.0	2	04MAR81:11:17	0.100	0	0	30	30	0	0	.	.
801	.	1	09MAR81:11:20	0.010	.	0	.	45	.	0	.	.
802	.	1	16MAR81:10:00	0.020	0	0	40	40	0	0	.	.
803	75.0	2	16MAR81:13:09	0.130	0	0	25	25	0	0	.	.
804	.	1	23MAR81:09:30	0.010	0	0	40	40	0	0	.	.
805	89.0	2	30MAR81:09:03	0.100	0	0	0	.	0	.	.	.
806	91.0	2	01APR81:17:27	0.270	0	0	25	25	0	.	.	.
807	.	1	06APR81:10:35	0.005	0	0	40	35	0	0	.	.
808	99.0	2	09APR81:10:59	0.350	0	0	100	30	25	0	.	.
809	101.0	2	11APR81:10:35	0.250	0	0	0	0	0	0	.	.
810	104.0	2	14APR81:03:17	0.380	0	0	20	20	0	0	.	.
811	107.0	2	17APR81:11:31	0.020	.	0	.	50	.	0	.	.
812	.	1	20APR81:10:50	0.010	0	0	40	0	25	0	.	.
813	113.0	2	23APR81:11:51	0.290	0	0	0	.	0	.	.	.
814	.	1	27APR81:09:40	0.010	0	0	0	.	0	0	.	.
815	118.0	2	28APR81:17:31	0.130	.	0	.	30	.	0	.	.
816	121.0	2	01MAY81:10:44	1.080	0	0	30	30	20	0	.	.
817	.	1	04MAY81:09:58	0.005	0	0	175	70	0	0	.	.
818	130.0	2	10MAY81:10:30	0.230	0	0	60	55	0	0	.	.
819	.	1	11MAY81:10:00	0.020	0	0	30	30	0	0	.	.
820	131.0	2	11MAY81:12:46	0.180	0	0	0	.	0	0	.	.
821	135.0	2	15MAY81:12:39	0.070	.	.	.	.	.	.	2.0	.
822	.	1	18MAY81:09:35	0.005	0	0	65	50	0	0	.	.
823	138.0	2	18MAY81:20:36	0.060	0	.	200	.	25	.	.	.
824	139.0	2	19MAY81:15:09	0.140	0	.	150	.	50	.	.	.
825	146.0	2	26MAY81:15:45	0.420	0	0	45	20	0	0	.	.
826	.	1	01JUN81:11:00	0.005	0	0	30	30	0	0	.	.
827	153.0	2	02JUN81:04:20	0.260	0	0	35	0	0	0	.	.
828	154.0	2	03JUN81:22:03	1.290	0	0	0	.	0	0	.	.
829	157.0	2	06JUN81:01:26	0.070	0	0	35	35	20	20	4.2	.
830	.	1	08JUN81:11:45	0.005	0	0	215	125	20	0	.	.
831	161.0	2	10JUN81:02:50	0.220	0	0	30	30	0	0	5.4	.

STATION METALS DATA

STA=51UR16

OBS	STRMNO	TYPE	TIM	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
832	164	2	13JUN81:23:20	0.300	0	0	20	20	0	0	10.6	.
833	171	2	20JUN81:01:06	0.190	0	0	25	0	0	0	4.0	.
834	176	2	25JUN81:19:48	0.190	0	0	35	35	0	0	8.4	.
835	183	2	02JUL81:13:09	0.800	0	0	20	20	0	0	8.0	.
836	[illegible]	2	04JUL81:06:04	1.700	0	.	20	.	0	.	7.0	.
837	201	2	20JUL81:10:27	0.980	0	0	800	475	50	.	27.0	.
838	.	1	27JUL81:09:50	0.005	0	.	25	.	0	0	.	.
839	[illegible]	2	28JUL81:12:55	0.270	0	0	20	.	0	.	6.0	.
840	21[illegible]	2	06AUG81:12:37	0.240	0	.	80	25	50	0	23.0	97
841	22[illegible]	2	07AUG81:01:02	0.180	.	.	.	.	.	.	.	.
842	.	1	19AUG81:11:55	0.000	0	.	0	.	0	.	.	.
843	.	1	24AUG81:12:50	0.000	0	0	70	60	0	0	.	.
844	242	2	30AUG81:08:12	0.510	0	0	0	0	0	0	4.0	26
845	251	2	08SEP81:15:44	0.140	.	0	.	0	.	0	.	.
846	255	2	15SEP81:17:27	0.350	0	0	0	0	25	0	9.0	28
847	.	1	21SEP81:12:25	0.005	0	0	40	0	0	0	.	.
848	274	2	01OCT81:21:57	0.150	0	0	35	0	0	0	20.0	82
849	.	1	05OCT81:11:45	0.005	100	0	65	0	.	.	.	.
850	.	1	12OCT81:12:15	0.005	0	0	55	20	.	.	.	.
851	291	2	18OCT81:17:57	0.210	.	.	.	.	.	.	.	.
852	290	2	23OCT81:10:52	0.260	0	0	0	0	0	0	5.0	24
853	298	2	25OCT81:17:11	0.350	0	0	20	0	0	0	8.0	24
854	.	1	02NOV81:10:15	0.005	0	0	45	45	.	.	.	.
855	310	2	06NOV81:01:49	0.140	0	0	0	0	.	.	6.0	30
856	.	1	09NOV81:10:10	0.005	0	0	20	20	.	.	.	.
857	.	1	16NOV81:19:10	0.005	0	0	50	30	.	.	.	.
858	.	1	23NOV81:09:35	0.005	0	0	0	.	.	.	.	.
859	.	1	30NOV81:09:58	0.005	0	0	0	.	.	.	.	.
860	335	2	01DEC81:10:22	0.190	0	0	0	0	.	.	3.0	17
861	.	1	07DEC81:10:10	0.005	.	0	.	30	.	.	.	.

STA=51UR17

OBS	STRMNO	TYPE	TIM	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
862	262.0	2	18SEP80:03:00	0.11	0	.	270	.	25	.	.	.
863	262.0	2	18SEP80:06:25	0.07	0	.	75	75	270	0	.	.
864	262.0	2	18SEP80:10:30	0.04	.	120	.	40	.	0	.	.
865	265.0	2	21SEP80:19:53	0.03	0	0	200	30	35	0	.	.
866	265.0	2	21SEP80:21:04	0.03	0	.	70	20	20	0	.	.
867	292.0	2	15OCT80:20:10	0.24	0	0	80	50	35	0	.	.
868	292.0	2	18OCT80:22:02	0.17	0	.	195	.	40	.	.	.
869	292.0	2	19OCT80:01:34	0.05	0	.	60	.	40	.	.	.
870	292.0	2	19OCT80:06:05	0.02	0	0	20	0	0	0	.	.
871	292.0	2	19OCT80:12:37	0.00	.	.	.	.	.	.	.	.
872	332.0	2	27NOV80:16:34	0.15	0	.	190	30	25	25	.	.
873	344.0	2	04DEC80:12:34	0.07	0	0	40	35	0	0	.	.
874	350.0	2	23DEC80:09:40	0.17	0	0	80	80	0	0	.	.
875	21.0	2	21JAN81:04:33	0.02	0	0	50	.	0	0	.	.
876	33.0	2	02FEB81:06:46	1.21	0	0	135	55	30	0	.	.
877	39.0	2	08FEB81:10:59	0.15	0	0	30	30	0	0	.	.
878	42.0	2	11FEB81:04:52	0.18	0	0	60	40	0	0	.	.
879	50.0	2	19FEB81:22:37	0.08	0	0	195	25	0	.	.	.

STATION METALS DATA

STA=51UR17

OBS	STRAND	TYPE	TTT	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
880	53.0	2	23FEB81:11:45	0.25	.	.	.	.	.	.	.	.
881	75.0	2	16MAR81:13:25	0.08	0	0	40	40	0	.	.	.
882	89.0	2	30MAR81:07:43	0.17	0	0	80	30	25	20	.	.
883	95.0	2	05APR81:17:35	0.36	0	0	30	25	0	0	.	.
884	99.0	2	09APR81:11:34	0.24	0	0	340	125	50	0	.	.
885	102.0	2	12APR81:19:54	0.11	0	0	35	30	30	0	.	.
886	104.0	2	14APR81:17:59	0.08	0	0	75	0	50	0	.	.
887	107.0	2	17APR81:10:59	0.07	0	0	0	.	0	0	.	.
888	113.0	2	23APR81:20:42	0.32	0	0	65	50	0	.	.	.
889	120.0	2	30APR81:10:36	0.06	0	0	40	40	0	0	.	.
890	121.0	2	01MAY81:10:31	0.16	0	0	90	45	0	0	.	.
891	130.0	2	10MAY81:15:15	0.17	0	0	90	55	30	25	.	.
892	131.0	2	11MAY81:12:29	0.20	0	0	0	.	0	0	.	.
893	135.0	2	15MAY81:12:12	0.54	0	0	65	40	0	0	.	.
894	135.1	2	15MAY81:14:47	0.11	0	0	70	20	0	0	.	.
895	138.0	2	18MAY81:12:01	0.05	0	0	50	25	0	0	.	.
896	139.0	2	19MAY81:14:14	0.06	0	0	20	0	0	0	.	.
897	144.0	2	24MAY81:06:19	0.15	100	0	50	35	30	0	.	.
898	152.0	2	01JUN81:13:16	0.22	0	0	0	0	0	0	.	.
899	161.0	2	10JUN81:04:26	0.18	0	0	50	0	0	0	38.4	.
900	164.0	2	13JUN81:18:42	0.08	0	0	40	40	0	0	31.1	.
901	171.0	2	20JUN81:00:06	0.25	0	0	160	55	40	0	65.8	.
902	176.0	2	25JUN81:20:21	0.41	0	0	105	50	20	0	43.9	.
903	184.0	2	03JUL81:05:58	0.07	0	.	20	0	0	0	.	.
904	202.0	2	21JUL81:15:30	0.19	0	.	40	40	0	0	8.0	.
905	205.0	2	24JUL81:15:02	0.31	0	.	20	20	0	0	8.0	.
906	207.0	2	26JUL81:19:46	0.12	0	.	20	20	0	0	4.0	.
907	215.0	2	03AUG81:15:23	0.23	.	.	.	40	.	0	.	.
908	216.0	2	06AUG81:13:40	0.01	.	.	.	.	.	.	.	.
909	223.0	2	11AUG81:20:14	0.34	0	0	30	30	20	0	36.0	65
910	242.0	2	30AUG81:09:18	0.24	0	0	40	30	0	0	24.0	48
911	243.0	2	31AUG81:11:57	0.33	0	0	35	20	0	0	34.0	49
912	251.0	2	08SEP81:14:07	0.11	0	0	35	0	25	0	7.0	43
913	258.0	2	15SEP81:17:52	0.21	0	0	30	20	0	0	14.0	42
914	260.0	2	17SEP81:20:49	0.12	0	0	40	30	0	0	9.0	47
915	270.0	2	27SEP81:19:21	0.17	.	.	.	.	.	.	.	.
916	279.0	2	06OCT81:11:08	0.10	0	0	0	0	0	0	8.0	29
917	296.0	2	23OCT81:14:15	0.13	0	0	35	25	0	0	14.0	34
918	298.0	2	25OCT81:20:33	0.06	0	0	0	0	0	0	4.0	15
919	299.0	2	26OCT81:12:33	0.17	120	0	30	0	0	0	18.0	37
920	309.0	2	05NOV81:21:05	0.25	0	0	55	25	.	.	40.0	68
921	335.0	2	01DEC81:11:05	0.12	0	0	30	30	.	.	3.0	51
922	338.0	2	04DEC81:16:52	0.09	0	0	0	.	.	.	5.0	32

STATION METALS DATA

STA=51UR18

OBS	STRMMI	TYPE	TII	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
923	34.0	2	06FEB81:13:55	0.07	0	0	195	100	35	0	.	.
924	54.0	2	23FEB81:09:27	0.48	0	0	180	170	0	0	.	.
925	121.0	2	01MAY81:16:04	0.41	0	0	175	175	0	0	.	.
926	134.0	2	19MAY81:15:55	0.06	0	.	180	.	0	.	.	.
927	154.0	2	03JUN81:23:49	0.20	0	0	175	90	0	0	.	.
928	157.0	2	06JUN81:01:11	0.02	0	0	105	.	0	0	1.8	.
929	256.0	2	15SEP81:17:25	0.05	0	0	120	70	0	0	12.0	129
930	279.1	2	26OCT81:21:10	0.07	0	0	110	110	0	0	6.0	135

STA=51UR19

OBS	STRMMI	TYPE	TII	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
931	51.0	2	20FEB81:00:07	0.084	150	0	45	0	0	0	.	.
932	51.1	2	20FEB81:15:07	0.032	130	0	0	0	0	0	.	.
933	53.0	2	22FEB81:16:40	0.051	150	0	0	0	0	0	.	.
934	63.0	2	04MAR81:23:00	0.032	0	0	0	0	0	0	.	.
935	75.0	2	15MAR81:14:16	0.017	0	0	0	0	0	0	.	.
936	89.0	2	30MAR81:09:59	0.024	0	0	0	0	0	0	.	.
937	95.0	2	05APR81:19:20	0.034	0	0	20	20	0	0	.	.
938	97.0	2	09APR81:12:09	0.042	0	0	0	0	0	0	.	.
939	101.0	2	11APR81:11:34	0.024	0	0	0	0	0	0	.	.
940	103.0	2	13APR81:10:57	0.014	0	0	0	0	0	0	.	.
941	113.0	2	23APR81:21:31	0.052	0	0	220	40	0	0	.	.
942	121.0	2	01MAY81:11:08	0.117	0	0	0	0	0	0	.	.
943	130.0	2	10MAY81:17:25	0.027	0	0	215	0	50	0	.	.
944	135.0	2	15MAY81:13:07	0.045	0	0	20	20	0	0	.	.
945	135.0	2	18MAY81:21:48	0.032	0	0	400	25	35	20	.	.
946	146.0	2	28MAY81:09:25	0.010	0	0	0	0	0	0	.	.
947	150.0	2	30MAY81:23:15	0.017	0	0	0	0	25	0	.	.
948	164.0	2	13JUN81:19:02	0.051	0	0	25	25	0	0	2.2	.
949	171.0	2	20JUN81:05:33	0.012	0	0	35	30	0	0	0.0	.
950	175.0	2	25JUN81:07:53	0.029	0	0	95	45	40	20	2.7	.
951	183.0	2	02JUL81:14:40	0.018	0	0	0	.	0	0	0.0	.
952	202.0	2	21JUL81:00:53	0.005	0	.	0	.	20	0	0.0	.
953	205.0	2	24JUL81:20:45	0.007	0	.	60	45	25	25	0.0	.
954	207.0	2	26JUL81:10:22	0.054	0	.	.	50	0	0	0.0	.
955	219.0	2	06AUG81:13:02	0.031	0	.	20	20	20	.	6.0	40
956	221.0	2	08AUG81:06:22	0.020	0	0	85	85	50	40	4.0	112
957	223.0	2	11AUG81:19:27	0.282	0	0	20	0	0	0	4.0	38
958	227.0	2	15AUG81:21:34	0.022	0	0	0	0	0	0	4.0	30
959	242.0	2	30AUG81:09:20	0.041	0	0	0	0	0	0	1.0	19
960	255.0	2	15SEP81:17:34	0.115	0	0	30	0	0	0	2.0	42
961	265.0	2	22SEP81:18:39	0.002	0	0	30	0	25	20	3.0	45
962	291.0	2	18OCT81:20:11	0.009	0	0	0	0	0	0	3.0	25
963	296.0	2	23OCT81:10:52	0.033	0	0	0	0	0	0	1.0	12
964	298.0	2	25OCT81:16:56	0.069	0	0	0	0	0	0	4.0	20
965	310.0	2	06NOV81:00:34	0.016	0	0	0	0	.	.	0.0	17

STATION METALS DATA

STA=51UR20

OBS	STNNO	TYPE	TII	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
966	258	2	15SEP81:17:41	4.11	0	0	100	0	0	0	45	108
967	265	2	22SEP81:19:06	15.56	120	.	195	.	25	.	130	202
968	274	2	01OCT81:17:13	11.25	0	.	70	.	0	.	27	129
969	279	2	06OCT81:16:56	15.18	130	0	70	70	0	0	44	126
970	291	2	16OCT81:18:15	2.25	.	.	.	.	.	.	.	.
971	295	2	23OCT81:09:49	3.75	120	0	100	55	0	0	32	110
972	293	2	25OCT81:14:54	0.84	100	0	90	70	0	0	21	95
973	299	2	26OCT81:12:12	9.63	0	0	45	40	0	.	26	69
974	309	2	05NOV81:21:04	4.48	0	.	70	40	.	.	38	91
975	335	2	01DEC81:10:24	1.20	0	0	120	120	.	.	25	140
976	4	2	04JAN82:15:06	0.51	.	.	.	35	.	0	.	.

STA=51UR21

OBS	STNNO	TYPE	TII	FLO	EPB	SPB	EZN	SZN	ECU	SCU	PBF	ZNF
977	.	1	21SEP81:09:20	0.035	0	0	55	25	20	0	.	.
978	.	1	28SEP81:08:36	0.029	0	0	70	25	.	0	.	.
979	.	1	05OCT81:08:55	0.028	0	0	30	30	.	.	.	.
980	.	1	12OCT81:09:15	0.014	.	.	.	.	.	.	.	.
981	297	2	26OCT81:10:33	0.420	0	0	80	0	75	0	42	100
982	.	1	02NOV81:08:55	0.019	0	0	70	40	.	.	.	.
983	.	1	09NOV81:08:35	0.035	0	0	0	.	.	.	.	.
984	.	1	16NOV81:08:35	0.023	0	0	0	.	.	.	.	.
985	.	1	23NOV81:08:30	0.023	0	0	0	.	.	.	.	.
986	.	1	30NOV81:08:45	0.014	0	0	30	30	.	.	.	.
987	.	1	07DEC81:08:55	0.011	.	0	.	55	.	.	.	.

STA=51UR03

OBS	STRMNO	TYPE	TTT	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
148	292.00	2	18OCT80:09:18	0.12000	150	80	.	415	.	0	0	.	0	.
149	292.00	2	18OCT80:10:14	0.12000	100	80	.	185	.	25	0	.	0	.
150	292.00	2	18OCT80:11:19	0.09000	50	.	.	120	.	0	0	.	0	.
151	292.00	2	18OCT80:12:27	0.06000	25	.	.	200	.	0	0	.	0	.
152	292.00	2	18OCT80:14:12	0.03000	100	60	.	200	.	0	0	.	0	.
153	292.10	2	18OCT80:16:48	0.58000	300	0	.	220	.	25	0	.	0	.
154	292.10	2	18OCT80:16:58	0.42000	80	20	.	100	.	0	0	.	0	.
155	292.10	2	18OCT80:17:18	0.12000	0	.	.	210	.	0	0	.	0	.
156	292.10	2	18OCT80:17:53	0.12000	0	0	.	110	.	0	0	.	0	.
157	292.10	2	18OCT80:18:26	0.33000	0	0	.	125	.	0	0	.	0	.
158	292.10	2	18OCT80:18:34	1.11000	60	0	.	0	.	0	0	.	0	.
159	292.10	2	18OCT80:18:39	0.89000	20	0	.	100	.	0	0	.	0	.
160	292.10	2	18OCT80:18:44	0.89000	40	0	.	140	.	0	0	.	0	.
161	292.10	2	18OCT80:18:50	0.67000	0	0	175	125	0	0	0	0	0	.
162	292.10	2	18OCT80:18:57	0.42000	120	0	200	100	0	0	0	0	0	.
163	292.10	2	18OCT80:19:07	0.42000	20	0	150	90	0	0	0	30	0	.
164	292.10	2	18OCT80:19:15	0.42000	0	0	85	85	25	0	0	30	0	.
165	292.10	2	18OCT80:19:24	0.42000	0	0	250	75	0	0	0	60	0	.
166	292.10	2	18OCT80:19:33	0.42000	0	0	150	0	0	0	0	30	0	.
167	292.10	2	18OCT80:19:44	0.33000	0	0	220	155	0	0	0	0	0	.
168	292.10	2	18OCT80:19:56	0.33000	0	0	80	80	0	0	0	30	0	.
169	292.10	2	18OCT80:20:11	0.21000	0	0	0	0	0	0	0	60	0	.
170	292.10	2	18OCT80:20:29	0.21000	0	0	100	100	0	0	0	0	0	.
171	292.10	2	18OCT80:20:48	0.67000	180	120	.	445	.	195	0	70	0	.
172	292.10	2	18OCT80:20:52	1.11000	50	0	2350	115	0	0	0	0	0	.
173	292.10	2	18OCT80:20:57	1.23000	25	0	975	85	50	0	0	60	0	.
174	292.10	2	18OCT80:21:02	0.89000	210	0	350	220	0	0	0	75	0	.
175	292.10	2	18OCT80:21:08	0.67000	20	0	525	140	0	0	0	50	0	.
176	292.10	2	18OCT80:21:16	0.42000	0	0	200	150	20	0	0	20	0	.
177	309.00	2	04NOV80:08:22	0.19000	0	0	115	0	.	0	0	0	0	.
178	314.00	2	09NOV80:15:44	0.58000	85	0	220	50	0	0	0	0	0	.
179	329.00	2	24NOV80:05:27	0.36000	25	0	100	.	.	25	0	0	0	.
180	332.00	2	27NOV80:16:56	0.12000	.	0	120	.	.	0	0	.	0	.
181	344.00	2	09DEC80:12:55	0.29000	0	0	.	100	.	0	0	0	0	.
182	358.00	2	23DEC80:08:19	0.15000	40	25	200	80	0	0	0	0	.	.
183	51.00	2	20FEB81:00:14	0.61000	.	0	.	170	.	0	.	.	0	.
184	51.10	2	20FEB81:13:15	0.15000	.	0	.	465	.	0	.	.	0	.
185	52.00	2	21FEB81:15:32	0.16064	.	0	.	160	.	0	.	.	0	.
186	53.00	2	22FEB81:17:11	0.33264	.	0	.	555	.	0	.	.	0	.
187	63.00	2	04MAR81:19:57	0.47000	25	25	180	150	0	0	0	.	0	.
188	75.00	2	15MAR81:12:11	0.05000	.	30	.	0	.	0	.	.	40	.
189	89.01	2	30MAR81:07:36	0.18000	.	80	.	140	.	0	.	.	0	.
190	89.01	2	30MAR81:08:04	0.18000	.	35	.	185	.	0	.	.	0	.
191	89.01	2	30MAR81:08:28	0.27000	.	0	.	190	.	0	.	.	0	.
192	89.01	2	30MAR81:08:45	0.33000	.	0	.	170	.	0	.	.	0	.
193	89.01	2	30MAR81:09:00	0.39000	.	0	.	190	.	0	.	.	0	.
194	89.01	2	30MAR81:09:13	0.42000	.	0	.	185	.	0	.	.	0	.
195	89.01	2	30MAR81:09:24	0.45000	.	0	.	520	.	0	.	.	0	.
196	89.01	2	30MAR81:09:36	0.36000	.	0	.	190	.	0	.	.	0	.
197	89.01	2	30MAR81:09:53	0.24000	.	0	.	230	.	0	.	.	0	.
198	89.01	2	30MAR81:10:19	0.15000	.	25	.	0	.	0	.	.	0	.
199	89.03	2	30MAR81:13:20	0.47000	.	0	.	230	.	0	.	.	0	.
200	90.00	2	31MAR81:10:44	0.12682	.	0	.	305	.	0	.	.	0	.
201	95.00	2	05APR81:17:30	0.60000	.	0	.	160	.	0	.	.	0	.

STA=51UR03

OBS	STRMNO	TYPE	TTT	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
202	99.0	2	09APR81:10:56	0.53000	.	0	.	113	.	0	.	.	0	.
203	102.0	2	12APR81:18:53	0.27689	.	0	.	430	.	0	.	.	0	.
204	104.0	2	14APR81:16:23	0.15000	.	0	.	0	.	0	.	.	0	.
205	107.0	2	17APR81:06:24	0.13301	.	0	.	0	.	0	.	.	0	.
206	113.0	2	23APR81:19:08	0.22646	.	.	.	.	.	.	.	.	.	.
207	130.0	2	10MAY81:14:23	0.29437	.	.	.	.	.	.	.	.	.	.
208	138.0	2	19MAY81:13:38	0.26000	.	.	.	.	.	.	.	.	.	.
209	148.0	2	20MAY81:01:07	0.24000	.	.	.	.	.	.	.	.	.	.
210	149.0	2	29MAY81:18:33	0.10000	.	.	.	.	.	.	.	.	.	.
211	150.0	2	30MAY81:23:40	0.09000	.	.	.	.	.	.	.	.	.	.
212	152.0	2	01JUN81:13:15	0.22000	.	0	.	0	.	0	.	.	.	.
213	154.0	2	03JUN81:19:25	0.09000	.	.	.	.	.	.	.	.	.	.
214	155.0	2	04JUN81:20:56	0.06000	.	.	.	.	.	.	.	.	.	.
215	157.1	2	06JUN81:21:10	0.09465	.	.	.	.	.	.	.	.	.	.
216	159.0	2	08JUN81:21:20	0.12000	.	.	.	.	.	.	.	.	.	.
217	161.0	2	10JUN81:01:08	0.25876	.	.	.	.	.	.	.	.	.	.
218	164.0	2	13JUN81:17:18	0.14000	.	.	.	.	.	.	.	.	.	.
219	170.0	2	19JUN81:23:34	1.32000	.	.	.	.	.	.	.	.	.	.
220	176.0	2	25JUN81:20:12	0.58929	.	.	.	.	.	.	.	.	.	.
221	184.0	2	03JUL81:05:11	0.20000	.	0	.	.	.	0	.	.	.	.
222	185.0	2	04JUL81:06:09	5.60000	.	.	.	.	.	.	.	.	.	.
223	201.0	2	20JUL81:19:41	0.14143	.	.	.	.	.	.	.	.	.	.
224	202.0	2	21JUL81:15:32	0.15363	.	.	.	.	.	.	.	.	.	.
225	205.0	2	24JUL81:14:24	0.26000	.	.	.	.	.	.	.	.	.	.
226	207.0	2	26JUL81:19:54	0.18191	.	.	.	.	.	.	.	.	.	.
227	209.0	2	28JUL81:00:16	0.18000	.	.	.	.	.	.	.	.	.	.
228	215.0	2	03AUG81:16:26	0.10000	.	.	.	.	.	.	.	.	.	0
229	218.0	2	06AUG81:10:32	0.16000	0	.	165	.	0	.	0	0	.	0
230	219.0	2	07AUG81:18:23	0.08596	.	.	.	.	.	.	.	.	.	0
231	223.0	2	11AUG81:20:04	0.19403	.	.	.	.	.	.	.	.	.	0
232	227.0	2	15AUG81:20:44	0.26000	.	.	.	.	.	.	.	.	.	117
233	242.0	2	30AUG81:08:48	0.48000	.	.	.	.	.	.	.	.	.	0
234	243.0	2	31AUG81:10:20	0.33417	.	.	.	.	.	.	.	.	.	0
235	251.0	2	08SEP81:13:08	1.40000	.	.	.	.	.	.	.	.	.	.
236	258.0	2	15SEP81:17:41	0.92000	0	0	0	0	0	0	0	0	0	0
237	260.0	2	17SEP81:20:42	0.34000	.	.	.	.	.	.	.	.	.	.
238	265.0	2	22SEP81:19:15	0.18000	.	.	.	.	.	.	.	.	.	.
239	270.0	2	27SEP81:19:20	0.24000	.	.	.	.	.	.	.	.	.	5
240	274.0	2	01OCT81:21:49	0.36000	.	20	.	180	.	0	.	.	0	0
241	291.0	2	18OCT81:17:57	0.44000	.	.	.	.	.	.	.	.	.	0
242	295.0	2	23OCT81:13:10	0.24000	.	.	.	.	.	.	.	.	.	0
243	297.0	2	24OCT81:21:52	0.15000	.	.	.	.	.	.	.	.	.	10
244	299.0	2	26OCT81:12:04	0.54000	25	0	150	150	0	.	0	0	0	0
245	300.0	2	27OCT81:06:24	0.33000	.	.	.	.	.	.	.	.	.	0
246	335.0	2	01DEC81:11:40	0.20000	.	.	.	.	20	0	0	.	.	0

STA=51UR04

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
247	329	2	24NOV80:14:54	0.68004	60	0	370	105	.	0	0	20	0	.
248	332	2	27NOV80:22:48	0.54714	.	.	.	.	.	.	.	.	.	.
249	33	2	02FEB81:10:36	0.18000	.	30	.	330	.	0	.	.	0	.
250	42	2	11FEB81:04:56	0.76000	85	35	525	370	0	0	0	0	0	.
251	50	2	19FEB81:13:29	0.15000	.	35	.	860	.	0	.	.	0	.
252	53	2	22FEB81:16:45	0.45000	.	40	.	610	.	0	.	.	0	.
253	89	2	30MAR81:16:09	0.33795	.	0	.	630	.	0	.	.	0	.
254	90	2	31MAR81:13:51	0.20009	.	0	.	375	.	0	.	.	0	.
255	95	2	05APR81:17:49	0.21676	.	0	.	120	.	0	.	.	0	.
256	99	2	09APR81:13:25	0.13000	.	0	.	110	.	0	.	.	0	.
257	102	2	12APR81:20:02	0.59418	.	.	.	.	.	.	.	.	.	.
258	104	2	14APR81:15:46	0.11000	.	.	.	.	.	.	.	.	.	.
259	107	2	17APR81:20:50	0.05000	.	.	.	.	.	.	.	.	.	.
260	110	2	20APR81:07:56	0.05002	.	.	.	.	.	.	.	.	.	.
261	121	2	01MAY81:13:25	0.58455	.	.	.	.	.	.	.	.	.	.
262	131	2	11MAY81:11:56	0.52000	.	.	.	.	.	.	.	.	.	.
263	135	2	15MAY81:14:22	0.49068	.	.	.	.	.	.	.	.	.	.
264	139	2	19MAY81:09:42	0.09000	.	.	.	.	.	.	.	.	.	.
265	153	2	02JUN81:05:58	0.11000	.	.	.	.	.	.	.	.	.	.
266	154	2	03JUN81:20:00	0.16000	.	.	.	.	.	.	.	.	.	.
267	161	2	10JUN81:05:38	0.29999	.	.	.	.	.	.	.	.	.	.
268	164	2	13JUN81:22:10	0.34000	.	.	.	.	.	.	.	.	.	.
269	171	2	20JUN81:15:50	0.48000	.	.	.	.	.	.	.	.	.	.
270	176	2	25JUN81:20:32	0.16000	.	.	.	.	.	.	.	.	.	.
271	185	2	04JUL81:08:10	1.30000	.	.	.	.	.	.	.	.	.	.
272	207	2	26JUL81:21:34	0.15000	.	.	.	.	.	.	.	.	.	.
273	208	2	27JUL81:12:32	0.09872	.	.	.	.	.	.	.	.	.	.
274	223	2	11AUG81:20:39	0.30000	35	0	480	115	0	0	0	0	0	.
275	227	2	15AUG81:20:55	0.35000	.	.	.	.	.	.	.	.	.	.
276	242	2	30AUG81:14:20	0.24000	.	.	.	.	.	.	.	.	.	.
277	243	2	31AUG81:09:32	0.60000	.	.	.	.	.	.	.	.	.	0
278	253	2	15SEP81:21:01	0.50000	45	0	440	0	0	0	0	0	0	.
279	260	2	17SEP81:21:10	0.17335	.	.	.	.	.	.	.	.	.	.
280	274	2	01OCT81:23:01	0.28000	.	.	.	.	.	.	.	.	.	.
281	299	2	26OCT81:12:52	0.35000	45	0	450	205	0	0	0	0	0	.

STA=51UR05

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
282	224.10	.	.	.	.	.	.	.	.	.	.	.	.	0
283	279.00	.	.	.	.	.	.	.	.	.	.	.	.	0
284	261.00	2	17SEP80:18:51	0.04	25	25	150	0	.	0	0	0	0	.
285	269.00	2	25SEP80:03:08	0.27	25	20	200	75	.	0	0	0	0	.
286	309.00	2	04NOV80:08:15	0.04	35	35	.	0	.	0	.	.	0	.
287	314.00	2	04NOV80:15:41	0.03	50	50	1040	65	.	0	0	0	.	.
288	321.00	2	16NOV80:01:16	0.03	50	.	560	200	.	0	0	0	.	.
289	329.01	2	24NOV80:01:22	0.10	0	.	110	80	.	0	0	0	.	.
290	329.02	2	24NOV80:10:25	0.35	0	.	260	120	.	0	0	0	.	.
291	329.03	2	24NOV80:15:02	0.07	0	.	200	.	.	.	0	0	.	.
292	332.00	2	27NOV80:08:26	0.10	0	.	220	75	.	0	0	0	0	.
293	344.00	2	09DEC80:10:58	0.03	30	.	540	.	.	.	0	0	.	.
294	33.00	2	02FEB81:06:17	0.08	80	35	.	185	0	0	0	25	0	.

STA=51UR05

OBS	STRMNO	TYPE	TIME	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
295	39.0	2	08FEB81:10:36	0.03	.	30	.	0	.	0	.	.	20	.
296	41.0	2	10FEB81:23:08	0.09	60	0	730	210	0	0	0	0	0	.
297	50.0	2	19FEB81:16:00	0.07	.	0	.	145	.	0	.	.	0	.
298	63.0	2	04MAR81:19:29	0.09	65	30	0	0	0	0	0	.	0	.
299	75.0	2	16MAR81:05:14	0.07	.	0	.	105	.	0	.	.	0	.
300	89.0	2	30MAR81:07:25	0.05	.	55	.	0	.	0	.	.	0	.
301	91.0	2	01APR81:13:40	0.06	.	30	.	130	.	0	.	.	0	.
302	95.0	2	05APR81:13:16	0.06	.	0	.	0	.	0	.	.	0	.
303	99.0	2	09APR81:11:31	0.07	.	0	.	0	.	0	.	.	0	.
304	101.0	2	11APR81:10:41	0.09	.	40	.	0	.	0	.	.	0	.
305	102.0	2	12APR81:18:48	0.08	.	0	.	0	.	0	.	.	0	.
306	103.0	2	13APR81:14:32	0.05	.	20	.	0	.	0	.	.	0	.
307	107.0	2	17APR81:08:53	0.05	.	.	.	.	.	.	.	.	.	.
308	118.0	2	28APR81:17:17	0.01	.	.	.	.	.	.	.	.	.	.
309	118.0	2	28APR81:18:12	0.41	.	.	.	.	.	.	.	.	.	.
310	118.0	2	28APR81:18:22	0.04	.	.	.	.	.	.	.	.	.	.
311	121.0	2	01MAY81:14:53	0.13	.	.	.	.	.	.	.	.	.	.
312	130.0	2	10MAY81:14:35	0.07	.	.	.	.	.	.	.	.	.	.
313	131.0	2	11MAY81:11:29	0.08	.	.	.	.	.	.	.	.	.	.
314	135.0	2	15MAY81:11:55	0.10	.	.	.	.	.	.	.	.	.	.
315	135.1	2	15MAY81:18:25	0.05	.	.	.	.	.	.	.	.	.	.
316	139.0	2	18MAY81:21:12	0.04	.	.	.	.	.	.	.	.	.	.
317	148.0	2	26MAY81:01:12	0.08	.	.	.	.	.	.	.	.	.	.
318	150.0	2	30MAY81:22:02	0.04	.	.	.	.	.	.	.	.	.	.
319	152.0	2	01JUN81:13:27	0.03	.	.	.	.	.	.	.	.	.	.
320	154.0	2	03JUN81:20:20	0.01	.	.	.	.	.	.	.	.	.	.
321	160.0	2	09JUN81:16:04	0.04	.	.	.	.	.	.	.	.	.	.
322	161.0	2	10JUN81:14:54	0.03	.	.	.	.	.	.	.	.	.	.
323	164.0	2	13JUN81:17:47	0.05	.	.	.	.	.	.	.	.	.	.
324	173.0	2	22JUN81:15:54	0.02	.	.	.	.	.	.	.	.	.	.
325	182.0	2	01JUL81:07:48	0.10	.	.	.	.	.	.	.	.	.	.
326	201.0	2	20JUL81:18:41	0.04	.	.	.	.	.	.	.	.	.	.
327	209.1	2	28JUL81:16:16	0.05	.	.	.	.	.	.	.	30	.	0
328	223.0	2	11AUG81:19:37	0.09	.	.	.	.	.	.	.	.	.	0
329	224.1	2	12AUG81:08:27	0.14	.	.	.	.	.	.	.	.	.	.
330	243.1	2	31AUG81:12:53	0.15	.	.	.	.	.	.	.	.	.	0
331	252.0	2	09SEP81:03:13	0.02	.	.	.	.	.	.	.	.	.	10
332	258.0	2	15SEP81:17:23	0.16	35	35	700	340	170	.	0	0	0	0
333	258.1	2	15SEP81:20:04	0.06	.	.	.	.	.	.	.	.	.	.
334	265.0	2	22SEP81:18:33	0.24	25	.	330	.	40	.	0	30	.	0
335	274.0	2	01OCT81:21:45	0.09	.	.	.	.	.	.	.	.	.	0
336	279.0	2	06OCT81:18:59	0.04	.	.	.	.	.	.	.	.	.	.
337	296.0	2	23OCT81:06:06	0.03	.	.	.	.	.	.	.	.	.	0
338	298.0	2	25OCT81:14:14	0.03	.	.	.	.	.	.	.	.	.	0
339	299.0	2	26OCT81:12:14	0.07	20	0	175	125	0	.	0	0	.	0
340	300.0	2	27OCT81:08:27	0.06	.	.	.	.	.	.	.	.	.	0
341	309.0	2	05NOV81:21:07	0.11	.	.	.	.	.	.	.	.	.	0
342	335.0	2	01DEC81:11:57	0.03	.	.	.	.	0	0	0	.	.	0
343	338.0	2	04DEC81:18:00	0.02	.	.	.	.	.	.	.	.	.	7
344	349.0	2	15DEC81:11:33	0.05	.	.	.	.	.	.	.	.	.	.

STA=51UR06

OBS	STRMNO	TYPE	TTI	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
345	299.00	2	25OCT80:05:39	0.33	30	0	1660	260	.	0	0	0	0	.
346	322.00	2	17NOV80:15:59	0.24	1490	0	2240	585	.	0	0	0	0	.
347	329.00	2	24NOV80:10:22	0.58	30	30	2275	1060	.	0	0	0	0	.
348	332.00	2	27NOV80:21:04	0.09	0	.	620	.	.	.	0	0	.	.
349	33.01	2	02FEB81:06:27	0.50	265	70	.	900	0	0	0	70	0	.
350	33.02	2	02FEB81:12:13	0.10	.	95	.	120	.	0	.	.	0	.
351	39.00	2	06FEB81:13:43	0.14	.	70	.	390	.	0	.	.	0	.
352	42.00	2	11FEB81:04:24	0.29	150	25	1760	365	0	0	0	0	0	.
353	50.00	2	13FEB81:23:04	0.31	.	30	.	590	.	0	.	.	0	.
354	51.00	2	20FEB81:23:55	0.12	.	25	.	770	.	0	.	.	0	.
355	53.10	2	22FEB81:23:38	0.26	55	0	1050	503	0	0	0	0	0	.
356	64.00	2	05MAR81:04:17	0.07	50	35	360	350	0	0	0	.	0	.
357	99.00	2	09APR81:11:46	0.14	.	0	.	175	.	0	.	.	0	.
358	102.00	2	12APR81:19:09	0.12	.	0	.	360	.	0	.	.	0	.
359	121.00	2	01MAY81:10:07	0.51	.	.	.	.	.	.	.	.	.	.
360	131.00	2	11MAY81:03:05	0.26	.	.	.	.	.	.	.	.	.	.
361	139.00	2	19MAY81:05:03	0.16	.	.	.	.	.	.	.	.	.	.
362	148.00	2	26MAY81:07:26	0.06	.	.	.	.	.	.	.	.	.	.
363	149.00	2	29MAY81:20:02	0.18	.	.	.	.	.	.	.	.	.	.
364	150.00	2	30MAY81:21:48	0.23	.	.	.	.	.	.	.	.	.	.
365	152.00	2	01JUN81:14:45	0.18	.	.	.	.	.	.	.	.	.	.
366	161.00	2	10JUN81:06:32	0.17	.	.	.	.	.	.	.	.	.	.
367	164.00	2	13JUN81:19:46	0.74	.	.	.	.	.	.	.	.	.	.
368	171.00	2	20JUN81:14:35	0.60	.	.	.	.	.	.	.	.	.	.
369	172.00	2	21JUN81:20:12	0.28	.	.	.	.	.	.	.	.	.	.
370	185.00	2	04JUL81:07:08	1.13	.	.	.	.	.	.	.	.	.	.
371	209.00	2	28JUL81:11:45	1.08	.	.	.	.	.	.	.	.	.	.
372	223.00	2	11AUG81:19:51	1.01	0	0	530	0	0	0	0	0	0	.
373	227.00	2	15AUG81:20:33	1.93	.	.	.	.	.	.	.	.	.	.
374	242.00	2	30AUG81:10:55	0.28	.	.	.	.	.	.	.	.	.	.
375	258.00	2	15SEP81:16:54	0.19	.	.	.	.	.	.	.	.	.	.
376	296.00	2	23OCT81:15:23	0.06	.	.	.	.	.	.	.	.	.	.
377	299.00	2	26OCT81:12:42	0.23	25	0	250	250	0	0	0	0	0	.

STA=51UR07

OBS	STRMNO	TYPE	TTI	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
378	204.0	2	22JUL80:19:26	5.2300	160	0	1690	640	.	0	0	0	0	.
379	204.1	2	22JUL80:22:50	1.2700	230	0	3280	2910	.	0	0	0	0	.
380	211.0	2	29JUL80:02:06	0.4900	670	20	3110	370	.	0	0	20	0	.
381	214.0	2	01AUG80:14:06	0.6000	810	330	4100	475	.	0	0	0	0	.
382	216.0	2	03AUG80:16:06	0.8400	690	100	3490	975	.	0	0	30	0	.
383	216.1	2	03AUG80:23:47	1.0700	450	30	2360	290	.	0	0	110	0	.
384	231.0	2	18AUG80:05:52	1.0500	1475	20	17300	905	.	0	0	100	0	.
385	232.0	2	19AUG80:02:57	0.8000	225	0	1650	185	.	0	0	50	0	.
386	.	1	06SEP80:15:00	0.0055	.	25	.	100	.	0	.	.	0	.
387	254.0	2	10SEP80:01:09	0.3400	800	255	6350	300	.	0	0	0	.	.
388	.	1	15SEP80:10:35	0.0021	.	410	.	390	.	0	.	.	0	.
389	.	1	22SEP80:15:30	0.0021	.	875	.	785	.	0	.	.	0	.
390	269.0	2	25SEP80:03:55	0.0939	1300	725	9825	1050	.	0	0	0	0	.
391	269.0	2	25SEP80:05:52	0.2340	350	90	4625	280	.	0	0	0	0	.
392	269.0	2	25SEP80:07:44	0.2340	250	80	1250	390	.	0	0	25	0	.

STA=SIUR07

OBS	STRMNO	TYPE	TTT	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
393	269.0	2	25SEP80:08:06	0.1340	250	120	725	230	.	0	0	100	0	.
394	269.0	2	25SEP80:10:55	0.0407	.	300	.	500	.	0	0	.	0	.
395	269.0	2	25SEP80:12:43	0.0166	150	.	1350	730	.	0	0	125	0	.
396	.	3	29SEP80:12:45	0.0686	250	225	725	440	0	0	0	0	0	.
397	276.0	2	02OCT80:21:50	0.1600	375	140	9800	280	.	0	0	125	50	.
398	.	1	06OCT80:10:00	0.0021	.	295	.	330	.	0	.	.	0	.
399	.	1	20OCT80:09:25	0.0105	.	570	.	750	.	0	.	.	0	.
400	299.0	2	25OCT80:09:00	7.1100	280	0	4570	1860	.	0	0	50	0	.
401	.	1	27OCT80:10:20	0.0234	790	760	1260	645	0	0	0	0	0	.
402	302.0	2	28OCT80:06:20	0.1100	440	0	900	510	.	0	0	30	25	.
403	.	1	03NOV80:08:30	0.0143	395	385	1530	0	0	0	0	0	0	.
404	309.0	2	04NOV80:08:13	0.8200	240	60	4025	250	.	0	0	25	0	.
405	.	1	10NOV80:14:45	0.0073	.	430	.	1205	.	0	.	.	0	.
406	324.0	2	24NOV80:03:18	1.0200	115	100	2365	1490	.	0	0	0	0	.
407	332.0	2	27NOV80:15:56	0.4200	160	100	1120	560	.	0	0	30	0	.
408	.	1	01DEC80:14:45	0.0105	500	500	2125	1080	0	0	0	30	0	.
409	.	1	08DEC80:08:30	0.0021	.	.	.	400	.	.	.	.	.	.
410	.	1	15DEC80:10:30	0.0073	.	.	.	430	.	.	.	.	.	.
411	.	1	22DEC80:14:25	0.0143	.	.	.	130	.	.	.	.	.	.
412	.	1	26JAN81:14:20	0.0021	.	.	.	.	.	.	.	.	.	.
413	.	1	03FEB81:13:50	0.0143	385	345	620	440	0	0	0	0	0	.
414	52.0	2	21FEB81:00:10	0.1800	.	215	.	785	.	0	.	.	0	.
415	53.0	2	22FEB81:12:08	0.6600	.	0	.	425	.	0	.	.	0	.
416	63.0	2	04MAR81:16:00	0.1300	380	315	625	335	0	0	0	.	25	.
417	.	1	09MAR81:14:15	0.0234	.	.	.	.	.	.	.	.	.	.
418	.	1	23MAR81:14:05	0.0186	.	.	.	.	.	.	.	.	.	.
419	89.0	2	30MAR81:07:54	0.2900	.	30	.	265	.	0	.	.	0	.
420	91.0	2	01APR81:13:19	0.6000	.	0	.	505	.	0	.	.	0	.
421	.	1	06APR81:16:00	0.0186	.	.	.	.	.	.	.	.	.	.
422	99.0	2	09APR81:09:22	0.4800	.	0	.	150	.	0	.	.	0	.
423	102.0	2	12APR81:17:40	0.9100	.	.	.	.	.	.	.	.	.	.
424	104.0	2	14APR81:17:06	0.5400	.	.	.	.	.	.	.	.	.	.
425	107.0	2	17APR81:09:12	0.4100	.	.	.	.	.	.	.	.	.	.
426	.	1	20APR81:14:40	0.0050	630	540	1170	965	0	0	0	0	0	.
427	.	1	27APR81:14:35	0.0186	.	.	.	.	.	.	.	.	.	.
428	120.0	2	30APR81:09:20	0.2600	.	.	.	.	.	.	.	.	.	.
429	120.1	2	30APR81:23:03	0.4400	.	.	.	.	.	.	.	.	.	.
430	121.0	2	01MAY81:09:36	3.6000	.	.	.	.	.	.	.	.	.	.
431	.	1	04MAY81:14:30	0.0186	.	.	.	.	.	.	.	.	.	.
432	130.0	2	10MAY81:14:24	0.3600	.	.	.	.	.	.	.	.	.	.
433	130.1	2	10MAY81:20:15	1.2200	.	.	.	.	.	.	.	.	.	.
434	131.0	2	11MAY81:02:08	0.2500	.	.	.	.	.	.	.	.	.	.
435	131.1	2	11MAY81:11:02	1.8800	.	.	.	.	.	.	.	.	.	.
436	131.2	2	11MAY81:19:51	1.1400	.	.	.	.	.	.	.	.	.	.
437	132.0	2	12MAY81:00:47	0.5800	.	.	.	.	.	.	.	.	.	.
438	135.0	2	15MAY81:11:50	0.6400	.	.	.	.	.	.	.	.	.	.
439	.	1	18MAY81:13:45	0.0186	.	.	.	.	.	.	.	.	.	.
440	139.0	2	19MAY81:02:57	0.4200	.	.	.	.	.	.	.	.	.	.
441	139.1	2	19MAY81:13:15	0.4200	.	.	.	.	.	.	.	.	.	.
442	149.0	2	29MAY81:20:56	0.6800	.	.	.	.	.	.	.	.	.	.
443	152.0	2	01JUN81:12:20	0.1400	.	.	.	.	.	.	.	.	.	.
444	153.0	2	02JUN81:03:50	2.3200	.	.	.	.	.	.	.	.	.	.
445	.	1	06JUN81:15:05	0.0288	.	.	.	.	.	.	.	.	.	.
446	161.1	2	10JUN81:18:12	0.9200	.	.	.	.	.	.	.	.	.	.

STA=51UR07

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
447	164.0	2	13JUN81:21:47	1.7100	.	.	.	.	.	.	.	.	.	.
448	171.0	2	20JUN81:15:53	0.6600	.	.	.	.	.	.	.	.	.	.
449	172.0	2	21JUN81:19:58	4.1600	.	.	.	.	.	.	.	.	.	.
450	.	1	22JUN81:14:22	0.0143	.	.	.	.	.	.	.	.	.	.
451	176.0	2	25JUN81:20:20	3.2300	.	.	.	.	.	.	.	.	.	.
452	.	1	29JUN81:14:15	0.0045	420	.	1400	.	0	.	0	0	.	.
453	183.1	2	02JUL81:23:01	1.2700	.	.	.	.	.	.	.	.	.	.
454	185.0	2	04JUL81:05:47	7.0700	.	.	.	.	.	.	.	.	.	.
455	.	1	13JUL81:13:40	0.0143	.	.	.	.	.	.	.	.	.	.
456	.	1	20JUL81:14:35	0.0045	.	.	.	.	.	.	.	.	.	.
457	205.0	2	24JUL81:13:52	0.6500	.	.	.	.	.	.	.	.	.	.
458	206.0	2	25JUL81:07:24	3.6500	.	.	.	.	.	.	.	.	.	.
459	.	1	27JUL81:14:33	0.0686	450	90	840	.	0	.	0	0	0	.
460	215.0	2	03AUG81:14:49	0.1200	660	.	5430	.	85	.	0	0	.	.

STA=51UR08

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
461	214.0	2	01AUG80:14:30	1.4400	625	80	1040	580	900	0	0	840	0	.
462	229.0	2	16AUG80:02:49	0.0400	615	.	.	1090	.	0	0	.	0	.
463	231.1	2	18AUG80:06:12	0.3500	4260	0	.	1275	50	0	0	25	0	.
464	232.0	2	19AUG80:07:31	0.2800	520	0	10800	800	100	0	60	50	0	.
465	.	1	08SEP80:15:05	0.0061	.	3000	.	140	.	0	.	.	0	.
466	269.0	2	25SEP80:05:32	0.0406	1460	700	20500	1180	150	0	0	100	0	.
467	269.0	2	25SEP80:06:32	0.1176	1280	495	8100	1555	100	0	0	60	0	.
468	269.0	2	25SEP80:10:05	0.0406	300	220	.	1510	.	0	0	.	0	.
469	269.0	2	25SEP80:13:08	0.0121	.	235	1175	540	50	0	.	100	0	.
470	.	1	29SEP80:13:00	0.0089	925	525	3250	1000	0	0	0	0	0	.
471	.	1	06OCT80:10:10	0.0009	.	365	.	565	.	0	.	.	0	.
472	285.0	2	11OCT80:15:39	2.3600	.	60	.	330	.	0	.	.	0	.
473	.	1	20OCT80:10:50	0.0018	.	380	.	450	.	0	.	.	0	.
474	299.0	2	25OCT80:08:15	6.2000	115	0	7600	1645	50	0	0	50	0	.
475	.	1	27OCT80:10:35	0.0089	320	130	755	400	0	0	0	0	0	.
476	.	1	03NOV80:08:30	0.0089	200	150	405	320	0	0	0	0	0	.
477	309.0	2	04NOV80:08:27	0.3400	465	25	5175	160	75	0	0	50	0	.
478	.	1	10NOV80:14:50	0.0038	.	150	.	320	.	0	.	.	0	.
479	322.0	2	17NOV80:15:41	0.9200	365	60	2760	840	0	0	0	0	0	.
480	332.0	2	27NOV80:16:20	0.4900	180	120	685	660	0	0	0	0	0	.
481	.	1	01DEC80:14:50	0.0158	180	170	390	85	0	0	0	30	0	.
482	337.0	2	02DEC80:19:44	0.1275	495	0	2365	160	0	0	0	0	0	.
483	337.0	2	02DEC80:20:04	0.3280	490	0	2240	170	0	0	0	0	0	.
484	337.0	2	02DEC80:21:12	0.1275	300	40	1115	300	0	0	0	0	0	.
485	.	1	05DEC80:08:30	0.0089	.	.	.	210	.	.	.	.	.	.
486	344.0	2	09DEC80:10:05	0.3200	220	0	1310	200	0	0	0	0	0	.
487	.	1	15DEC80:10:30	0.0018	.	.	.	165	.	.	.	.	.	.
488	.	1	22DEC80:13:50	0.0018	.	.	.	210	.	.	.	.	.	.
489	.	1	25JAN81:14:20	0.0018	.	.	.	.	.	.	.	.	.	.
490	39.0	2	08FEB81:10:21	0.3000	.	.	.	.	.	.	.	.	.	.
491	.	1	09FEB81:13:50	0.0121	.	320	.	360	.	0	.	.	0	.
492	50.0	2	19FEB81:23:00	0.9000	.	.	.	845	.	0	.	.	0	.
493	51.0	2	20FEB81:09:47	0.2500	.	80	.	805	.	0	.	.	0	.
494	52.0	2	21FEB81:00:30	0.3000	.	90	.	640	.	0	.	.	0	.

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STA=51UR08

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
495	53.1	2	23FEB81:09:10	1.3000	.	30	.	625	.	0	.	.	20	.
496	.	1	09MAR81:14:15	0.0350	.	.	.	.	.	.	.	.	.	.
497	.	1	23MAR81:14:05	0.0200	.	.	.	.	.	.	.	.	.	.
498	89.0	2	30MAR81:08:13	0.4900	.	30	.	350	.	0	.	.	35	.
499	91.0	2	01APR81:13:40	0.4600	.	0	.	280	.	0	.	.	0	.
500	95.0	2	05APR81:13:29	0.4800	.	0	.	340	.	0	.	.	0	.
501	.	1	06APR81:16:00	0.0200	.	.	.	.	.	.	.	.	.	.
502	99.0	2	09APR81:09:43	0.5500	.	.	.	.	.	.	.	.	.	.
503	102.0	2	12APR81:18:13	1.0000	.	.	.	.	.	.	.	.	.	.
504	104.0	2	14APR81:17:42	0.2200	.	.	.	.	.	.	.	.	.	.
505	107.0	2	17APR81:10:07	0.2100	.	.	.	.	.	.	.	.	.	.
506	.	1	20APR81:14:45	0.0200	390	0	1040	735	0	0	0	0	0	.
507	113.0	2	23APR81:21:11	1.1000	.	.	.	.	.	.	.	.	.	.
508	117.0	2	27APR81:03:32	0.2700	.	.	.	.	.	.	.	.	.	.
509	.	1	27APR81:14:45	0.0250	.	.	.	.	.	.	.	.	.	.
510	120.0	2	30APR81:09:35	0.2600	.	.	.	.	.	.	.	.	.	.
511	120.1	2	30APR81:23:47	0.3900	.	.	.	.	.	.	.	.	.	.
512	121.0	2	01MAY81:10:56	1.1600	.	.	.	.	.	.	.	.	.	.
513	.	1	04MAY81:14:33	0.0121	.	.	.	.	.	.	.	.	.	.
514	131.1	2	11MAY81:11:25	2.5400	.	.	.	.	.	.	.	.	.	.
515	135.0	2	15MAY81:12:05	0.2400	.	.	.	.	.	.	.	.	.	.
516	.	1	18MAY81:13:45	0.0121	.	.	.	.	.	.	.	.	.	.
517	149.0	2	29MAY81:21:22	0.5600	.	.	.	.	.	.	.	.	.	.
518	.	1	08JUN81:14:54	0.0200	.	.	.	.	.	.	.	.	.	.
519	161.1	2	10JUN81:18:19	1.0500	.	.	.	.	.	.	.	.	.	.
520	164.0	2	13JUN81:22:00	1.3900	.	.	.	.	.	.	.	.	.	.
521	171.0	2	20JUN81:15:23	0.4100	.	.	.	.	.	.	.	.	.	.
522	172.0	2	21JUN81:20:22	1.2200	.	.	.	.	.	.	.	.	.	.
523	.	1	22JUN81:14:20	0.0061	.	.	.	.	.	.	.	.	.	.
524	176.0	2	25JUN81:20:41	3.7100	.	.	.	.	.	.	.	.	.	.
525	.	1	29JUN81:14:25	0.0089	1130	.	1270	.	0	.	0	30	.	.
526	183.0	2	02JUL81:13:35	0.3000	.	160	.	.	.	0	.	.	.	.
527	184.0	2	03JUL81:04:50	0.5100	.	55	.	.	.	0	.	.	.	.
528	185.0	2	04JUL81:02:51	4.8200	.	.	.	.	.	.	.	.	.	.
529	.	1	13JUL81:13:50	0.0061	.	.	.	.	.	.	.	.	.	.
530	.	1	20JUL81:14:35	0.0038	.	.	.	.	.	.	.	.	.	.
531	205.0	2	24JUL81:14:24	0.5900	.	.	.	.	.	.	.	.	.	.
532	206.0	2	25JUL81:07:44	3.6700	.	.	.	.	.	.	.	.	.	.
533	.	1	27JUL81:14:41	0.0465	205	100	1005	.	0	.	0	0	0	.
534	215.0	2	03AUG81:12:00	0.2600	625	.	6600	.	0	.	0	0	.	.

STA=51UR09

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
535	276.00	2	02OCT80:16:46	0.72	0	0	.	105	.	0	0	.	40	.
536	299.00	2	25OCT80:03:40	0.82	0	0	0	0	.	0	0	30	20	.
537	309.00	2	04NOV80:14:29	0.11	0	.	0	0	0	0	0	0	0	.
538	314.00	2	09NOV80:00:27	0.19	90	75	0	0	0	0	0	70	35	.
539	322.00	2	17NOV80:16:03	0.70	0	0	0	0	0	0	0	0	0	.
540	329.01	2	24NOV80:07:06	1.20	0	.	0	.	0	0	0	0	.	.
541	329.03	2	24NOV80:18:34	0.11	0	0	.	310	.	0	0	.	0	.
542	332.00	2	27NOV80:14:12	0.06	0	0	0	0	0	0	0	0	0	.

STA=51UR09

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
543	344.0	2	09DEC80:12:19	0.13	40	30	0	0	0	0	0	0	0	.
544	351.0	2	16DEC80:04:07	0.19	75	75	260	0	0	0	0	60	40	.
545	358.0	2	23DEC80:11:05	0.20	140	.	2440	.	25	.	0	65	.	.
546	33.0	2	02FEB81:06:24	0.47	60	0	.	315	0	0	0	30	0	.
547	39.0	2	08FEB81:12:30	0.22	45	30	.	120	0	0	0	0	.	.
548	42.0	2	11FEB81:00:45	0.46	0	0	235	235	0	0	0	0	0	.
549	50.0	2	19FEB81:15:11	0.30	.	0	.	250	.	0	.	.	0	.
550	51.0	2	20FEB81:15:20	0.21	.	30	.	215	.	0	.	.	0	.
551	53.0	2	22FEB81:13:50	0.24	.	0	.	240	.	0	.	.	0	.
552	89.0	2	30MAR81:09:09	0.08	.	0	.	0	.	0	.	.	0	.
553	91.0	2	01APR81:15:12	0.36	.	0	.	135	.	0	.	.	35	.
554	95.0	2	05APR81:16:56	0.19	.	0	.	130	.	0	.	.	0	.
555	99.0	2	09APR81:10:48	0.18	.	0	.	0	.	0	.	.	0	.
556	104.0	2	14APR81:05:22	0.46	.	0	.	0	.	0	.	.	0	.
557	107.0	2	17APR81:11:15	0.36	.	.	.	.	.	.	.	.	.	.
558	110.0	2	20APR81:01:55	0.25	.	.	.	.	.	.	.	.	.	.
559	121.0	2	01MAY81:08:15	0.57	.	.	.	.	.	.	.	.	.	.
560	130.0	2	10MAY81:15:38	0.32	.	.	.	.	.	.	.	.	.	.
561	135.0	2	15MAY81:12:19	0.72	.	.	.	.	.	.	.	.	.	.
562	138.0	2	18MAY81:20:21	0.17	.	.	.	.	.	.	.	.	.	.
563	154.0	2	03JUN81:20:57	1.07	.	.	.	.	.	.	.	.	.	.
564	155.0	2	04JUN81:17:01	1.15	.	.	.	.	.	.	.	.	.	.
565	171.0	2	20JUN81:00:56	0.62	.	.	.	.	.	.	.	.	.	.
566	182.0	2	01JUL81:07:10	0.67	.	25	.	.	.	0	.	.	.	.
567	184.0	2	03JUL81:15:28	1.39	.	0	.	.	.	0	.	.	.	.
568	209.0	2	28JUL81:10:29	1.25	.	.	.	.	.	.	.	.	.	.
569	218.0	2	06AUG81:10:24	0.59	70	.	230	.	0	.	0	0	.	.
570	219.0	2	07AUG81:23:53	1.08	.	.	.	.	.	.	.	.	.	.
571	223.0	2	11AUG81:18:54	1.25	.	.	.	.	.	.	.	.	.	.
572	242.0	2	30AUG81:07:42	0.15	.	.	.	.	.	.	.	.	.	.
573	243.1	2	31AUG81:11:19	0.59	.	.	.	.	.	.	.	.	.	.
574	251.0	2	08SEP81:15:41	0.24	.	.	.	.	.	.	.	.	.	.
575	258.0	2	15SEP81:16:40	0.33	0	.	285	180	295	250	0	0	0	.
576	260.0	2	17SEP81:04:18	0.18	.	.	.	.	.	.	.	.	.	.
577	274.0	2	01OCT81:21:14	0.31	.	.	.	.	.	.	.	.	.	.
578	291.0	2	18OCT81:17:36	0.10	.	.	.	.	.	.	.	.	.	.
579	296.0	2	23OCT81:07:35	0.20	.	.	.	.	.	.	.	.	.	.
580	298.0	2	25OCT81:14:58	0.05	.	.	.	.	.	.	.	.	.	.
581	299.0	2	26OCT81:12:39	0.26	20	0	0	0	0	0	0	0	0	.
582	300.0	2	27OCT81:05:42	0.35	.	.	.	.	.	.	.	.	.	.
583	309.0	2	05NOV81:23:54	0.56	.	.	.	.	.	.	.	.	.	.
584	335.0	2	01DEC81:11:04	0.14	.	.	.	.	0	0	0	.	.	.

STA=51UR10

OBS	STRMNO	TYPE	TI1	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
585	292.1	2	18OCT80:15:25	0.34000	65	20	560	160	0	0	0	80	0	.
586	299.0	2	25OCT80:03:38	1.60000	130	0	2945	120	0	0	0	30	0	.
587	299.1	2	25OCT80:14:03	1.54000	60	0	1155	160	0	0	0	40	0	.
588	322.0	2	17NOV80:15:48	0.89000	45	0	680	170	0	0	0	25	0	.
589	329.0	2	24NOV80:10:05	1.24000	65	20	900	255	0	0	0	30	0	.
590	344.0	2	09DEC80:13:48	0.28777	65	0	2780	100	40	0	0	40	0	.
591	33.0	2	02FEB81:06:25	0.49000	195	45	.	425	0	.	0	60	0	.
592	39.0	2	08FEB81:11:34	0.58000	145	50	.	775	25	0	0	130	25	.
593	50.0	2	19FEB81:23:18	0.55000	.	55	.	1390	.	0	.	.	0	.
594	51.0	2	20FEB81:22:49	0.35000	.	0	.	150	.	0	.	.	0	.
595	53.0	2	22FEB81:22:48	0.43000	.	0	.	340	.	0	.	.	0	.
596	75.0	2	16MAR81:12:45	0.27559	.	35	.	205	.	0	.	.	0	.
597	91.0	2	01APR81:16:30	1.06000	.	0	.	120	.	0	.	.	0	.
598	95.0	2	05APR81:16:39	0.66000	.	0	.	185	.	0	.	.	35	.
599	99.0	2	09APR81:09:52	0.48000	.	0	.	0	.	0	.	.	0	.
600	101.0	2	11APR81:10:18	0.77000	.	0	.	0	.	0	.	.	0	.
601	104.0	2	14APR81:05:32	1.02972	.	25	.	295	.	0	.	.	0	.
602	121.0	2	01MAY81:08:07	0.93000	.	.	.	.	.	.	.	.	.	.
603	130.0	2	10MAY81:21:38	0.25362	.	.	.	.	.	.	.	.	.	.
604	131.0	2	11MAY81:12:15	0.16399	.	.	.	.	.	.	.	.	.	.
605	138.0	2	18MAY81:20:32	0.08104	.	.	.	.	.	.	.	.	.	.
606	139.0	2	19MAY81:13:47	0.23000	.	.	.	.	.	.	.	.	.	.
607	147.0	2	27MAY81:14:53	0.36000	.	.	.	.	.	.	.	.	.	.
608	148.0	2	28MAY81:13:02	0.24000	.	.	.	.	.	.	.	.	.	.
609	149.0	2	29MAY81:14:26	0.30000	.	.	.	.	.	.	.	.	.	.
610	150.0	2	30MAY81:11:10	0.23000	.	.	.	.	.	.	.	.	.	.
611	152.0	2	01JUN81:13:59	0.29000	.	.	.	.	.	.	.	.	.	.
612	154.0	2	03JUN81:14:35	0.99000	.	.	.	.	.	.	.	.	.	.
613	155.0	2	04JUN81:17:06	0.39000	.	.	.	.	.	.	.	.	.	.
614	156.0	2	05JUN81:22:40	0.15699	.	.	.	.	.	.	.	.	.	.
615	160.0	2	09JUN81:11:24	0.21512	.	.	.	.	.	.	.	.	.	.
616	164.0	2	13JUN81:22:45	0.57000	.	.	.	.	.	.	.	.	.	.
617	183.0	2	02JUL81:13:10	6.88889	.	0	.	.	.	0	.	.	.	.
618	184.0	2	03JUL81:15:25	0.44768	.	.	.	.	.	.	.	.	.	.
619	205.0	2	24JUL81:14:30	0.06892	.	.	.	.	.	.	.	.	.	.
620	209.1	2	28JUL81:16:21	1.03000	.	.	.	.	.	.	.	.	.	.
621	219.0	2	08AUG81:05:35	0.71429	.	0	.	280	.	35	.	.	0	.
622	223.0	2	11AUG81:18:52	0.15306	.	.	.	.	.	.	.	.	.	0
623	227.0	2	15AUG81:20:25	3.66667	.	.	.	.	.	.	.	.	.	0
624	258.0	2	15SEP81:16:45	0.57000	0	0	330	0	0	0	0	0	0	0
625	260.0	2	17SEP81:04:11	1.20370	.	.	.	.	.	.	.	.	.	0
626	274.0	2	01OCT81:21:06	0.37267	.	.	.	.	.	.	.	.	.	0
627	295.0	2	23OCT81:08:04	0.16000	.	.	.	.	.	.	.	.	.	0
628	299.0	2	26OCT81:11:26	0.64000	25	0	230	0	0	0	0	0	0	0
629	335.0	2	01DEC81:09:28	0.16000	.	.	.	.	0	0	0	.	.	0
630	348.0	2	14DEC81:15:20	0.34000	.	.	.	.	.	.	.	.	.	.
631	357.0	2	23DEC81:05:01	0.18598	925	0	1940	330	30	0	0	125	0	.

STA=51UR11

OBS	STRMNO	TYPE	III	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
632	277.00	2	03OCT80:10:15	0.00100	50	0	600	135	0	0	0	35	0	.
633	277.00	2	03OCT80:11:13	0.00100	100	40	1025	260	0	.	0	100	50	.
634	277.00	2	03OCT80:12:06	0.00100	50	0	400	150	0	0	0	95	70	.
635	277.00	2	03OCT80:13:03	0.00400	.	0	.	140	0	0	0	50	0	.
636	292.00	2	18OCT80:08:54	0.03000	45	25	.	240	.	0	0	.	45	.
637	292.00	2	18OCT80:09:06	0.06000	60	25	.	140	.	0	0	.	50	.
638	292.00	2	18OCT80:09:17	0.06000	55	0	925	135	0	0	0	75	40	.
639	292.00	2	18OCT80:09:28	0.06000	50	0	1900	170	0	0	0	50	50	.
640	292.00	2	18OCT80:09:39	0.05000	45	25	.	195	.	0	0	.	60	.
641	292.00	2	18OCT80:09:51	0.05000	.	30	.	230	.	0	0	0	.	.
642	292.00	2	18OCT80:10:06	0.04000	50	30	400	110	0	.	0	0	.	.
643	292.00	2	18OCT80:10:23	0.03000	.	30	.	110	.	0	0	105	45	.
644	292.00	2	18OCT80:10:42	0.03000	.	0	.	390	.	0	0	115	60	.
645	292.00	2	18OCT80:11:10	0.00500	.	0	.	100	.	0	0	120	50	.
646	299.00	2	25OCT80:04:39	0.86000	80	.	5240	.	0	.	0	40	.	.
647	309.00	2	04NOV80:08:46	0.16000	.	.	.	.	.	.	.	.	.	.
648	329.01	2	24NOV80:10:36	1.40000	50	25	1400	990	0	0	0	.	0	.
649	329.02	2	24NOV80:22:05	0.52000	60	.	1890	.	0	.	0	90	.	.
650	332.00	2	27NOV80:22:26	0.12000	70	.	550	.	0	.	0	95	.	.
651	344.00	2	09DEC80:14:10	0.11000	0	0	220	85	0	0	.	100	0	.
652	33.00	2	02FEB81:06:57	0.76000	245	50	.	240	0	0	0	45	0	.
653	49.00	2	09APR81:10:51	0.53000	.	0	.	0	.	0	.	.	0	.
654	101.00	2	11APR81:10:57	0.58000	.	0	.	255	.	0	.	.	0	.
655	130.00	2	10MAY81:21:52	0.44000	.	.	.	.	.	.	.	.	.	.
656	131.00	2	11MAY81:12:39	0.49000	.	.	.	.	.	.	.	.	.	.
657	138.00	2	18MAY81:21:18	0.10000	.	.	.	.	.	.	.	.	.	.
658	139.00	2	19MAY81:14:20	0.50000	.	.	.	.	.	.	.	.	.	.
659	148.00	2	28MAY81:06:26	0.32000	.	.	.	.	.	.	.	.	.	.
660	148.10	2	28MAY81:15:44	0.65000	.	.	.	.	.	.	.	.	.	.
661	149.00	2	29MAY81:14:36	0.71000	.	.	.	.	.	.	.	.	.	.
662	150.00	2	30MAY81:22:00	0.45000	.	.	.	.	.	.	.	.	.	.
663	152.00	2	01JUN81:15:50	0.72000	.	0	.	0	.	0	.	.	0	.
664	155.00	2	04JUN81:11:44	0.75000	.	.	.	.	.	.	.	.	.	.
665	157.00	2	06JUN81:01:33	0.65000	.	.	.	.	.	.	.	.	.	.
666	171.00	2	20JUN81:12:56	0.19784	.	.	.	.	.	.	.	.	.	.
667	172.00	2	21JUN81:20:50	0.26000	.	.	.	.	.	.	.	.	.	.
668	176.00	2	25JUN81:19:08	0.15152	.	.	.	.	.	.	.	.	.	.
669	183.00	2	02JUL81:15:29	0.08592	.	0	.	.	.	0	.	.	.	.
670	184.00	2	03JUL81:16:02	0.53000	.	.	.	.	.	.	.	.	.	.
671	209.10	2	28JUL81:15:35	1.56000	.	.	.	.	.	.	.	.	.	.
672	218.00	2	06AUG81:12:09	0.52764	.	.	.	.	.	.	.	.	.	0
673	219.00	2	07AUG81:23:47	0.41000	25	0	270	110	0	0	0	0	0	0
674	258.00	2	15SEP81:17:33	0.30000	0	0	0	0	0	0	0	0	0	0
675	274.00	2	01OCT81:23:03	0.26611	.	.	.	.	.	.	.	.	.	0
676	299.00	2	26OCT81:11:56	0.48000	45	0	105	105	0	.	0	0	0	0
677	335.00	2	01DEC81:11:46	0.12000	.	.	.	.	0	0	0	.	.	0
678	348.00	2	14DEC81:16:29	0.19000	.	.	.	.	.	.	.	.	.	.
679	357.00	2	23DEC81:04:07	0.19666	25	0	290	290	0	0	0	25	25	.

STA=51UR15

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
680	299.0	2	25OCT80:02:54	0.16	.	.	.	.	.	.	.	.	.	.
681	299.0	2	25OCT80:03:19	0.08	.	.	.	.	.	.	.	.	.	.
682	299.0	2	25OCT80:03:43	0.16	0	0	600	0	50	0	0	0	0	.
683	299.0	2	25OCT80:04:29	0.16	0	0	725	0	50	0	0	0	0	.
684	299.0	2	25OCT80:05:11	0.16	30	25	675	140	200	30	0	300	0	.
685	299.0	2	25OCT80:05:37	0.08	0	0	.	0	.	0	0	.	0	.
686	299.0	2	25OCT80:06:01	0.08	0	0	250	0	0	0	0	150	0	.
687	299.0	2	25OCT80:06:24	0.16	210	0	.	0	.	0	0	.	0	.
688	299.0	2	25OCT80:07:11	0.05	0	0	650	0	0	0	0	0	0	.
689	299.0	2	25OCT80:07:45	0.01	0	0	625	0	0	0	0	0	0	.
690	299.1	2	25OCT80:10:53	0.01	.	.	.	.	.	.	.	.	.	.
691	299.1	2	25OCT80:11:28	0.03	.	.	.	.	.	.	.	.	.	.
692	299.1	2	25OCT80:12:01	0.12	0	0	400	0	0	0	0	175	0	.
693	299.1	2	25OCT80:13:52	0.03	40	.	.	.	.	.	0	.	.	.
694	299.1	2	25OCT80:14:36	0.08	0	.	450	.	0	.	0	225	.	.
695	299.1	2	25OCT80:14:55	0.22	0	.	300	.	0	.	0	90	.	.
696	299.1	2	25OCT80:15:15	0.12	.	.	.	.	.	.	.	.	.	.
697	299.1	2	25OCT80:15:41	0.08	0	0	290	180	0	0	0	70	0	.
698	299.1	2	25OCT80:16:03	0.12	0	.	1100	.	0	.	0	200	.	.
699	299.1	2	25OCT80:16:24	0.12	.	.	.	.	.	.	.	.	.	.
700	299.1	2	25OCT80:16:43	0.08	.	0	.	0	.	0	.	.	0	.
701	299.1	2	25OCT80:17:06	0.22	.	.	.	.	.	.	.	.	.	.
702	299.1	2	25OCT80:17:26	0.08	.	0	.	0	.	0	.	.	0	.
703	299.1	2	25OCT80:17:50	0.12	.	35	.	0	.	0	.	.	0	.
704	299.1	2	25OCT80:18:09	0.12	.	.	.	.	.	.	.	.	.	.
705	344.0	2	09DEC80:12:51	0.59	30	0	1350	0	75	0	0	275	0	.
706	21.0	2	21JAN81:10:41	0.25	.	40	.	100	.	0	.	.	110	.
707	33.0	2	02FEB81:05:58	2.23	300	50	.	760	30	0	0	60	0	.
708	39.0	2	06FEB81:10:57	0.82	.	.	.	.	.	.	.	.	.	.
709	50.0	2	19FEB81:22:56	0.85	.	0	.	1075	.	0	.	.	0	.
710	51.0	2	20FEB81:22:47	0.83	.	0	.	530	.	0	.	.	0	.
711	52.0	2	21FEB81:16:49	0.04	.	0	.	615	.	0	.	.	40	.
712	53.0	2	22FEB81:12:40	0.87	.	0	.	980	.	0	.	.	0	.
713	63.0	2	04MAR81:20:15	0.33	55	0	135	0	0	0	0	.	0	.
714	95.0	2	05APR81:17:00	0.33	.	0	.	0	.	0	.	.	0	.
715	95.0	2	05APR81:18:11	0.84	.	0	.	0	.	0	.	.	0	.
716	95.0	2	05APR81:18:49	0.33	.	0	.	0	.	0	.	.	0	.
717	99.0	2	09APR81:10:36	0.75	.	0	.	0	.	0	.	.	0	.
718	99.0	2	09APR81:11:07	1.00	.	0	.	0	.	0	.	.	0	.
719	99.0	2	09APR81:11:40	0.50	.	0	.	0	.	0	.	.	0	.
720	99.0	2	09APR81:12:11	0.21	.	0	.	0	.	0	.	.	0	.
721	101.0	2	11APR81:09:59	0.25	.	0	.	0	.	0	.	.	0	.
722	101.0	2	11APR81:10:20	0.79	.	0	.	0	.	0	.	.	0	.
723	101.0	2	11APR81:10:50	1.04	.	0	.	0	.	0	.	.	40	.
724	101.0	2	11APR81:11:27	0.25	.	0	.	0	.	0	.	.	0	.
725	102.0	2	12APR81:19:11	0.75	.	0	.	0	.	0	.	.	0	.
726	102.0	2	12APR81:19:32	1.80	.	0	.	0	.	0	.	.	0	.
727	102.0	2	12APR81:19:45	1.00	.	0	.	0	.	0	.	.	0	.
728	102.0	2	12APR81:20:17	0.21	.	0	.	120	.	0	.	.	0	.
729	102.0	2	12APR81:20:51	2.84	.	0	.	0	.	0	.	.	0	.
730	102.0	2	12APR81:20:54	4.68	.	0	.	0	.	0	.	.	0	.
731	102.0	2	12APR81:20:58	3.34	.	0	.	0	.	0	.	.	0	.
732	102.0	2	12APR81:21:07	1.25	.	0	.	110	.	0	.	.	0	.
733	102.0	2	12APR81:21:22	0.96	.	0	.	250	.	0	.	.	0	.

STA=51UR15

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
734	102.0	2	12APR81:21:39	0.75000	.	0	.	180	.	0	.	.	0	.
735	102.0	2	12APR81:22:15	0.50000	.	0	.	270	.	0	.	.	0	.
736	102.0	2	12APR81:23:19	0.46000	.	0	.	165	.	0	.	.	0	.
737	102.0	2	12APR81:23:45	1.50000	.	0	.	0	.	0	.	.	0	.
738	102.0	2	13APR81:00:00	0.96000	.	0	.	105	.	0	.	.	0	.
739	102.0	2	13APR81:00:28	0.21000	.	0	.	200	.	0	.	.	0	.
740	102.0	2	13APR81:01:58	0.21000	.	0	.	415	.	0	.	.	0	.
741	102.0	2	13APR81:04:49	0.21000	.	.	.	.	.	.	.	.	.	.
742	102.0	2	13APR81:07:52	0.04000	.	.	.	.	.	.	.	.	.	.
743	103.0	2	13APR81:10:17	0.28000	.	0	.	215	.	0	.	.	0	.
744	113.0	2	23APR81:20:59	1.04000	.	.	.	.	.	.	.	.	.	.
745	113.0	2	23APR81:21:06	1.84000	.	.	.	.	.	.	.	.	.	.
746	113.0	2	23APR81:21:26	0.79000	.	.	.	.	.	.	.	.	.	.
747	121.0	2	01MAY81:10:23	1.12000	.	.	.	.	.	.	.	.	.	.
748	130.0	2	10MAY81:21:25	0.91000	.	.	.	.	.	.	.	.	.	.
749	131.0	2	11MAY81:12:09	0.40000	.	.	.	.	.	.	.	.	.	.
750	135.0	2	15MAY81:12:10	0.19060	.	.	.	.	.	.	.	.	.	.
751	138.0	2	18MAY81:19:44	0.17000	.	.	.	.	.	.	.	.	.	.
752	139.0	2	19MAY81:14:22	0.29000	.	.	.	.	.	.	.	.	.	.
753	148.0	2	28MAY81:12:08	0.40580	.	.	.	.	.	.	.	.	.	.
754	152.0	2	01JUN81:17:13	0.76000	.	.	.	.	.	.	.	.	.	.
755	154.0	2	03JUN81:21:40	1.70000	.	50	.	0	.	0	.	.	0	.
756	157.0	2	05JUN81:00:20	1.42000	.	.	.	.	.	.	.	.	.	.
757	161.0	2	10JUN81:02:41	0.55000	.	.	.	.	.	.	.	.	.	.
758	164.0	2	13JUN81:22:42	1.54000	.	.	.	.	.	.	.	.	.	.
759	162.0	2	01JUL81:15:32	0.21000	.	20	.	.	.	0	.	.	.	.
760	162.1	2	01JUL81:21:10	0.06000	.	0	.	.	.	0	.	.	.	.
761	201.0	2	20JUL81:18:16	3.98000	.	.	.	.	.	.	.	.	.	.
762	209.0	2	28JUL81:11:53	0.67000	.	.	.	.	.	.	.	.	.	.
763	209.1	2	28JUL81:19:23	0.42000	.	.	.	.	.	.	.	.	.	.
764	218.0	2	06AUG81:10:16	0.39000	20	.	190	.	0	.	0	0	.	0
765	220.0	2	08AUG81:00:21	0.26000	.	.	.	.	.	.	.	.	.	0
766	223.0	2	11AUG81:18:54	0.76000	.	.	.	.	.	.	.	.	.	0
767	227.0	2	15AUG81:20:25	0.57000	.	.	.	.	.	.	.	.	.	0
768	242.0	2	30AUG81:07:23	0.78000	.	.	.	.	.	.	.	.	.	0
769	243.0	2	31AUG81:04:02	0.44000	.	.	.	.	.	.	.	.	.	0
770	251.0	2	05SEP81:13:40	0.35000	.	.	.	.	.	.	.	.	.	0
771	258.1	2	15SEP81:16:58	0.49000	0	0	120	0	0	0	0	85	0	0
772	274.0	2	01OCT81:21:10	0.29000	.	.	.	.	.	.	.	.	.	6
773	291.0	2	18OCT81:17:34	1.30000	.	.	.	.	.	.	.	.	.	0
774	296.0	2	23OCT81:07:58	0.32000	.	.	.	.	.	.	.	.	.	0
775	298.0	2	25OCT81:14:46	0.45000	.	.	.	.	.	.	.	.	.	0
776	309.0	2	05NOV81:23:05	0.29762	.	.	.	.	.	.	.	.	.	0
777	335.0	2	01DEC81:12:32	0.35000	.	.	.	.	0	0	0	.	.	0

STA=51UR16

OBS	STRMNO	TYPE	TIM	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
778	228.0	2	15AUG80:18:30	1.850	.	0	.	260	.	0	.	.	0	.
779	.	1	15SEP80:13:46	0.005	.	0	.	265	.	60	.	.	0	.
780	.	1	22SEP80:10:05	0.005	.	0	.	85	.	0	.	.	0	.
781	.	1	29SEP80:09:50	0.005	0	0	0	.	0	0	0	0	0	.
782	.	1	06OCT80:13:30	0.005	.	0	.	170	.	0	.	.	0	.
783	.	1	20OCT80:14:15	0.005	.	20	.	165	.	0	.	.	0	.
784	.	1	27OCT80:11:10	0.005	20	0	430	220	0	0	0	0	0	.
785	.	1	03NOV80:11:06	0.010	50	0	120	120	0	0	0	0	0	.
786	.	1	10NOV80:10:20	0.010	.	0	.	65	.	0	.	.	0	.
787	.	1	17NOV80:09:45	0.010	.	0	.	70	.	0	.	.	0	.
788	322.0	2	17NOV80:16:37	0.630	40	0	0	0	0	0	0	0	0	.
789	329.0	2	24NOV80:06:47	1.220	40	0	500	395	0	0	0	0	.	.
790	.	1	01DEC80:09:30	0.010	50	35	260	260	0	0	0	45	0	.
791	.	1	08DEC80:13:30	0.010	.	.	.	270	.	.	.	.	.	.
792	.	1	15DEC80:14:00	0.010	.	.	.	185	.	.	.	.	.	.
793	.	1	22DEC80:09:45	0.005	.	40	.	80	.	0	.	.	0	.
794	.	1	12JAN81:13:00	0.005	.	.	.	.	.	.	.	.	.	.
795	.	1	26JAN81:10:40	0.005	.	.	.	.	.	.	.	.	.	.
796	.	1	09FEB81:10:25	0.005	.	105	.	400	.	0	.	.	0	.
797	51.0	2	20FEB81:01:19	0.490	.	80	.	885	.	30	.	.	0	.
798	51.1	2	20FEB81:23:38	0.490	.	125	.	275	.	0	.	.	0	.
799	54.0	2	23FEB81:00:08	0.720	.	65	.	660	.	0	.	.	0	.
800	63.0	2	04MAR81:11:17	0.100	.	140	.	820	.	0	.	.	0	.
801	.	1	09MAR81:11:20	0.010	.	.	.	.	.	.	.	.	.	.
802	.	1	16MAR81:10:00	0.020	.	.	.	.	.	.	.	.	.	.
803	75.0	2	16MAR81:13:09	0.130	.	105	.	1080	.	0	.	.	0	.
804	.	1	23MAR81:09:30	0.010	.	.	.	.	.	.	.	.	.	.
805	89.0	2	30MAR81:09:03	0.100	.	45	.	495	.	0	.	.	0	.
806	91.0	2	01APR81:17:27	0.270	130	110	890	.	0	0	0	0	0	.
807	.	1	06APR81:10:35	0.005	.	125	.	930	.	0	.	.	0	.
808	99.0	2	09APR81:10:59	0.350	.	95	.	590	.	0	.	.	0	.
809	101.0	2	11APR81:10:35	0.250	.	.	.	.	.	.	.	.	.	.
810	104.0	2	14APR81:03:17	0.380	.	.	.	.	.	.	.	.	.	.
811	107.0	2	17APR81:11:31	0.020	.	.	.	.	.	.	.	.	.	.
812	.	1	20APR81:10:50	0.010	0	0	945	390	0	0	0	0	0	.
813	113.0	2	23APR81:11:51	0.290	.	.	.	.	.	.	.	.	.	.
814	.	1	27APR81:09:40	0.010	.	.	.	.	.	.	.	.	.	.
815	118.0	2	28APR81:17:31	0.130	.	.	.	.	.	.	.	.	.	.
816	121.0	2	01MAY81:10:44	1.080	.	.	.	.	.	.	.	.	.	.
817	.	1	04MAY81:09:58	0.005	.	.	.	.	.	.	.	.	.	.
818	130.0	2	10MAY81:16:30	0.230	.	.	.	.	.	.	.	.	.	.
819	.	1	11MAY81:10:00	0.020	.	.	.	.	.	.	.	.	.	.
820	131.0	2	11MAY81:12:46	0.180	.	.	.	.	.	.	.	.	.	.
821	135.0	2	15MAY81:12:39	0.070	.	.	.	.	.	.	.	.	.	.
822	.	1	18MAY81:09:35	0.005	.	.	.	.	.	.	.	.	.	.
823	134.0	2	18MAY81:20:36	0.060	.	.	.	.	.	.	.	.	.	.
824	139.0	2	19MAY81:15:09	0.140	.	.	.	.	.	.	.	.	.	.
825	148.0	2	28MAY81:15:45	0.420	.	.	.	.	.	.	.	.	.	.
826	.	1	01JUN81:11:00	0.005	.	.	.	.	.	.	.	.	.	.
827	153.0	2	02JUN81:04:20	0.260	.	0	.	0	.	0	.	.	85	.
828	154.0	2	03JUN81:22:03	1.290	.	.	.	.	.	.	.	.	.	.
829	157.0	2	06JUN81:01:26	0.070	.	.	.	.	.	.	.	.	.	.
830	.	1	08JUN81:11:45	0.005	.	.	.	.	.	.	.	.	.	.
831	161.0	2	10JUN81:02:50	0.220	.	.	.	.	.	.	.	.	.	.

STA=51UR16

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
832	164	2	13JUN81:23:20	0.300	.	.	.	.	.	.	.	.	.	.
833	171	2	20JUN81:01:06	0.190	.	.	.	.	.	.	.	.	.	.
834	175	2	25JUN81:19:48	0.190	.	.	.	.	.	.	.	.	.	.
835	183	2	02JUL81:13:09	0.800	.	90	.	.	.	0	.	.	.	.
836	185	2	04JUL81:08:04	1.700	.	.	.	.	.	.	.	.	.	.
837	201	2	20JUL81:18:27	0.980	.	.	.	.	.	.	.	.	.	.
838	.	1	27JUL81:09:50	0.005	175	0	1060	570	0	0	0	0	0	.
839	209	2	28JUL81:12:55	0.270	.	.	.	.	.	.	.	.	.	.
840	218	2	06AUG81:12:37	0.240	230	.	2000	.	0	.	0	0	.	0
841	220	2	08AUG81:01:02	0.180	.	.	.	.	.	.	.	.	.	.
842	.	1	10AUG81:11:55	0.000	.	.	.	.	.	.	.	.	.	.
843	.	1	24AUG81:12:50	0.000	85	0	950	600	0	0	0	0	0	.
844	242	2	30AUG81:08:12	0.510	.	.	.	.	.	.	.	.	.	0
845	251	2	08SEP81:15:44	0.140	.	.	.	.	.	.	.	.	.	.
846	258	2	15SEP81:17:27	0.350	130	0	2225	275	0	0	0	0	0	0
847	.	1	21SEP81:12:25	0.005	65	.	775	.	0	.	0	0	.	.
848	274	2	01OCT81:21:57	0.150	.	.	.	.	.	.	.	.	.	0
849	.	1	05OCT81:11:45	0.005	.	.	.	.	0	0	0	.	.	.
850	.	1	12OCT81:12:15	0.005	.	.	.	.	.	.	.	.	.	.
851	291	2	18OCT81:17:57	0.210	.	.	.	.	.	.	.	.	.	.
852	296	2	23OCT81:10:52	0.260	.	.	.	.	.	.	.	.	.	0
853	298	2	25OCT81:17:11	0.350	50	0	265	105	0	0	0	0	0	0
854	.	1	02NOV81:10:15	0.005	.	.	.	.	0	0	0	.	.	.
855	310	2	06NOV81:01:49	0.140	.	.	.	.	.	.	.	.	.	0
856	.	1	09NOV81:10:10	0.005	.	.	.	.	.	.	.	.	.	.
857	.	1	16NOV81:10:10	0.005	.	.	.	.	.	.	.	.	.	.
858	.	1	23NOV81:09:35	0.005	.	.	.	.	.	.	.	.	.	.
859	.	1	30NOV81:09:58	0.005	.	.	.	.	.	.	.	.	.	.
860	335	2	01DEC81:10:22	0.190	.	.	.	.	0	.	0	.	.	0
861	.	1	07DEC81:10:10	0.005	.	.	.	.	.	0	.	.	.	.

STA=51UR17

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
862	262.0	2	18SEP80:03:00	0.11	.	.	.	.	.	.	.	.	.	.
863	262.0	2	18SEP80:06:25	0.07	.	0	.	0	.	0	.	.	0	.
864	262.0	2	18SEP80:10:30	0.04	.	0	.	100	.	0	.	.	0	.
865	265.0	2	21SEP80:19:53	0.03	.	35	.	70	.	0	.	.	0	.
866	265.0	2	21SEP80:21:04	0.03	.	0	.	0	.	0	.	.	0	.
867	292.0	2	18OCT80:20:10	0.24	.	0	.	50	.	0	.	.	0	.
868	292.0	2	18OCT80:22:02	0.17	.	.	.	.	.	.	.	.	.	.
869	292.0	2	19OCT80:01:34	0.05	.	.	.	.	.	.	.	.	.	.
870	292.0	2	19OCT80:06:05	0.02	.	0	.	0	.	0	.	.	0	.
871	292.0	2	19OCT80:12:37	0.00	.	.	.	.	.	.	.	.	.	.
872	332.0	2	27NOV80:16:34	0.15	.	0	.	65	.	0	.	.	0	.
873	344.0	2	09DEC80:12:34	0.07	.	25	.	60	.	0	.	.	0	.
874	358.0	2	23DEC80:09:40	0.17	.	45	.	60	.	0	.	.	30	.
875	21.0	2	21JAN81:04:33	0.02	.	105	.	0	.	0	.	.	0	.
876	33.0	2	02FEB81:06:46	1.21	105	20	.	265	0	0	0	70	0	.
877	39.0	2	08FEB81:10:59	0.15	.	0	.	0	.	0	.	.	0	.
878	42.0	2	11FEB81:04:52	0.18	0	.	235	135	0	0	0	0	0	.
879	50.0	2	19FEB81:22:37	0.08	.	25	.	105	.	0	.	.	0	.

STA=51UR17

OBS	STRMNO	TYPE	TI1	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
880	53.0	2	23FEB81:11:45	0.25	.	.	.	.	.	.	.	.	.	.
881	75.0	2	16MAR81:13:25	0.08	.	0	.	0	.	0	.	.	0	.
882	89.0	2	30MAR81:07:43	0.17	.	30	.	0	.	0	.	.	0	.
883	95.0	2	05APR81:17:35	0.36	.	0	.	0	.	0	.	.	0	.
884	99.0	2	09APR81:11:34	0.24	.	0	.	0	.	0	.	.	0	.
885	102.0	2	12APR81:19:54	0.11	.	0	.	395	.	0	.	.	0	.
886	104.0	2	14APR81:17:59	0.08	.	0	.	0	.	0	.	.	0	.
887	107.0	2	17APR81:10:59	0.07	.	.	.	.	.	.	.	.	.	.
888	113.0	2	23APR81:20:42	0.32	.	.	.	.	.	.	.	.	.	.
889	120.0	2	30APR81:10:36	0.06	.	.	.	.	.	.	.	.	.	.
890	121.0	2	01MAY81:10:31	0.16	.	.	.	.	.	.	.	.	.	.
891	130.0	2	10MAY81:15:15	0.17	.	.	.	.	.	.	.	.	.	.
892	131.0	2	11MAY81:12:29	0.20	.	.	.	.	.	.	.	.	.	.
893	135.0	2	15MAY81:12:12	0.54	.	.	.	.	.	.	.	.	.	.
894	135.1	2	15MAY81:14:47	0.11	.	.	.	.	.	.	.	.	.	.
895	138.0	2	18MAY81:12:01	0.05	.	.	.	.	.	.	.	.	.	.
896	139.0	2	19MAY81:14:14	0.06	.	.	.	.	.	.	.	.	.	.
897	148.0	2	28MAY81:06:19	0.15	.	.	.	.	.	.	.	.	.	.
898	152.0	2	01JUN81:13:16	0.22	.	.	.	.	.	.	.	.	.	.
899	161.0	2	10JUN81:04:26	0.18	.	.	.	.	.	.	.	.	.	.
900	164.0	2	13JUN81:18:42	0.08	.	.	.	.	.	.	.	.	.	.
901	171.0	2	20JUN81:00:06	0.25	.	.	.	.	.	.	.	.	.	.
902	176.0	2	25JUN81:20:21	0.41	.	.	.	.	.	.	.	.	.	.
903	184.0	2	03JUL81:05:58	0.07	.	.	.	.	.	.	.	.	.	.
904	202.0	2	21JUL81:15:30	0.19	.	.	.	.	.	.	.	.	.	.
905	205.0	2	24JUL81:16:02	0.31	.	.	.	.	.	.	.	.	.	.
906	207.0	2	26JUL81:19:46	0.12	.	.	.	.	.	.	.	.	.	.
907	215.0	2	03AUG81:15:23	0.23	.	.	.	.	.	.	.	.	.	.
908	218.0	2	06AUG81:13:40	0.01	.	.	.	.	.	.	.	.	.	.
909	223.0	2	11AUG81:20:14	0.34	.	.	.	.	.	.	.	.	.	0
910	242.0	2	30AUG81:09:18	0.24	.	.	.	.	.	.	.	.	.	0
911	243.0	2	31AUG81:11:57	0.33	.	.	.	.	.	.	.	.	.	0
912	251.0	2	08SEP81:14:07	0.11	.	.	.	.	.	.	.	.	.	0
913	258.0	2	15SEP81:17:52	0.21	0	0	460	100	0	0	0	40	0	0
914	260.0	2	17SEP81:20:49	0.12	.	.	.	.	.	.	.	.	.	0
915	270.0	2	27SEP81:19:21	0.17	.	.	.	.	.	.	.	.	.	.
916	279.0	2	06OCT81:11:08	0.10	.	.	.	.	.	.	.	.	.	0
917	296.0	2	23OCT81:14:16	0.13	.	.	.	.	.	.	.	.	.	0
918	298.0	2	25OCT81:20:33	0.06	.	.	.	.	.	.	.	.	.	0
919	299.0	2	26OCT81:12:33	0.17	.	0	.	155	.	0	.	.	0	0
920	309.0	2	05NOV81:21:05	0.25	.	.	.	.	.	.	.	.	.	0
921	335.0	2	01DEC81:11:05	0.12	.	.	.	.	0	.	0	.	.	0
922	338.0	2	04DEC81:16:52	0.09	.	.	.	.	.	.	.	.	.	0

STA=51UR18

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
923	39.0	2	08FEB81:13:55	0.07	.	30	.	270	.	0	.	.	0	.
924	54.0	2	23FEB81:09:27	0.48	.	0	.	660	.	0	.	.	0	.
925	121.0	2	01MAY81:16:04	0.41	.	.	.	.	.	.	.	.	.	.
926	139.0	2	19MAY81:15:55	0.06	.	.	.	.	.	.	.	.	.	.
927	154.0	2	03JUN81:23:49	0.20	.	.	.	.	.	.	.	.	.	.
928	157.0	2	06JUN81:01:11	0.02	.	.	.	.	.	.	.	.	.	.
929	258.0	2	15SEP81:17:25	0.05	160	0	2545	350	0	0	0	0	0	5
930	299.1	2	26OCT81:21:10	0.07	30	0	360	.	0	0	0	0	0	0

STA=51UR19

OBS	STRMNO	TYPE	TII	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
931	51.0	2	20FEB81:00:07	0.084	.	0	.	0	.	0	.	.	0	.
932	51.1	2	20FEB81:15:07	0.032	.	0	.	0	.	0	.	.	0	.
933	53.0	2	22FEB81:16:40	0.051	.	0	.	0	.	0	.	.	0	.
934	63.0	2	04MAR81:23:00	0.032	40	0	0	0	0	0	0	.	0	.
935	75.0	2	16MAR81:14:16	0.017	.	0	.	0	.	0	.	.	0	.
936	89.0	2	30MAR81:09:59	0.024	.	0	.	0	.	0	.	.	0	.
937	95.0	2	05APR81:19:20	0.034	.	0	.	0	.	0	.	.	0	.
938	99.0	2	09APR81:12:09	0.042	.	.	.	.	.	.	.	.	.	.
939	101.0	2	11APR81:11:34	0.024	.	.	.	.	.	.	.	.	.	.
940	103.0	2	13APR81:10:57	0.014	.	.	.	.	.	.	.	.	.	.
941	113.0	2	23APR81:21:31	0.052	.	.	.	.	.	.	.	.	.	.
942	121.0	2	01MAY81:11:08	0.117	.	.	.	.	.	.	.	.	.	.
943	130.0	2	10MAY81:17:25	0.027	.	.	.	.	.	.	.	.	.	.
944	135.0	2	15MAY81:13:07	0.045	.	.	.	.	.	.	.	.	.	.
945	138.0	2	18MAY81:21:48	0.032	.	.	.	.	.	.	.	.	.	.
946	148.0	2	26MAY81:09:25	0.010	.	.	.	.	.	.	.	.	.	.
947	150.0	2	30MAY81:23:15	0.017	.	.	.	.	.	.	.	.	.	.
948	164.0	2	13JUN81:19:02	0.051	.	.	.	.	.	.	.	.	.	.
949	171.0	2	20JUN81:06:33	0.012	.	.	.	.	.	.	.	.	.	.
950	176.0	2	25JUN81:07:53	0.029	.	.	.	.	.	.	.	.	.	.
951	183.0	2	02JUL81:14:40	0.018	.	0	.	.	.	0	.	.	.	.
952	202.0	2	21JUL81:00:53	0.005	.	.	.	.	.	.	.	.	.	.
953	205.0	2	24JUL81:20:45	0.007	.	.	.	.	.	.	.	.	.	.
954	209.0	2	28JUL81:10:22	0.054	.	.	.	.	.	.	.	.	.	.
955	218.0	2	05AUG81:13:02	0.031	.	.	.	.	.	.	.	.	.	0
956	220.0	2	08AUG81:06:22	0.020	.	.	.	.	.	.	.	.	.	0
957	223.0	2	11AUG81:19:27	0.262	.	.	.	.	.	.	.	.	.	0
958	227.0	2	15AUG81:21:34	0.022	.	.	.	.	.	.	.	.	.	0
959	242.0	2	30AUG81:09:20	0.041	.	.	.	.	.	.	.	.	.	0
960	258.0	2	15SEP81:17:34	0.115	.	.	.	.	.	.	.	.	.	5
961	265.0	2	22SEP81:18:39	0.002	.	.	.	.	.	.	.	.	.	0
962	291.0	2	18OCT81:20:11	0.009	.	.	.	.	.	.	.	.	.	0
963	296.0	2	23OCT81:10:52	0.033	.	.	.	.	.	.	.	.	.	0
964	298.0	2	25OCT81:16:56	0.069	.	0	.	0	.	25	.	.	0	0
965	310.0	2	06NOV81:00:34	0.016	.	.	.	.	.	.	.	.	.	0

STA=SIUR20

OBS	STRMNO	TYPE	TI	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
966	258	2	15SEP81:17:41	4.11	90	0	1240	0	0	0	0	25	0	0
967	265	2	22SEP81:19:06	15.56	.	.	.	.	.	.	.	.	.	6
968	274	2	01OCT81:17:13	11.25	.	.	.	.	.	.	.	.	.	0
969	279	2	06OCT81:16:56	15.18	.	.	.	.	.	.	.	.	.	0
970	291	2	18OCT81:18:15	2.25	.	.	.	.	.	.	.	.	.	.
971	296	2	23OCT81:09:49	3.75	.	.	.	.	.	.	.	.	.	0
972	298	2	25OCT81:14:54	0.84	.	.	.	.	.	.	.	.	.	0
973	299	2	26OCT81:12:12	9.63	85	30	1940	290	0	0	0	0	0	0
974	309	2	05NOV81:21:04	4.48	.	.	.	.	.	.	.	.	.	0
975	335	2	01DEC81:10:24	1.20	.	.	.	.	0	.	0	.	.	0
976	4	2	04JAN82:15:06	0.51	.	20	.	140	.	0	.	.	25	.

STA=SIUR21

OBS	STRMNO	TYPE	TI	FLO	EMN	SMN	EFE	SFE	ECR	SCR	ECD	ENI	SNI	CDF
977	.	1	21SEP81:09:20	0.035	40	.	140	.	0	.	0	0	.	.
978	.	1	28SEP81:08:36	0.029	.	.	.	.	.	.	.	.	.	.
979	.	1	05OCT81:08:55	0.028	.	.	.	.	0	0	0	.	.	.
980	.	1	12OCT81:09:15	0.014	.	.	.	.	.	.	.	.	.	.
981	299	2	26OCT81:15:33	0.420	.	0	.	105	.	0	.	.	20	95
982	.	1	02NOV81:08:55	0.019	.	.	.	.	0	0	0	.	.	.
983	.	1	09NOV81:08:35	0.035	.	.	.	.	.	.	.	.	.	.
984	.	1	16NOV81:08:35	0.023	.	.	.	.	.	.	.	.	.	.
985	.	1	23NOV81:08:30	0.023	.	.	.	.	.	.	.	.	.	.
986	.	1	30NOV81:08:45	0.014	.	.	.	.	.	0	.	.	.	.
987	.	1	07DEC81:08:55	0.011	.	.	.	.	.	0	.	.	.	.

APPENDIX F

RAW DATA LISTINGS

ATMOSPHERIC SOURCE STUDIES

WETFALL STATION DATA

STA=51WF01

OBS	T1	T2	EPH	SPH	EZN	SZN	ECU	SCU	EMN	SMN	EFE	SFE	ECR	SCR	ECD	SCD	ENI	SNI	PRECIP	LPH	LCOND	COD	TKN	NH3	NO23	TP	TSP	OP	PWF
1	05JAN81:12:50	08JAN81:12:45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.5	.	.	.	.	.	.	.	.	.
2	08JAN81:12:45	16JAN81:11:05	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4.3	.	.	.	.	.	.	.	.	.
3	16JAN81:11:05	22JAN81:13:30	0	.	200	.	20	.	.	.	.	.	.	.	.	.	.	.	.	3.8	.	.	.	.	.	.	.	.	.
4	22JAN81:13:30	03FEB81:13:30	0	.	20	.	45	.	0	.	0	.	0	.	0	.	0	.	.	4.3	35	6.2	0.39	0.21	0.21	0.00	0.00	0.00	.
5	03FEB81:13:30	09FEB81:12:00	0	0	30	25	50	0	0	0	0	0	0	0	0	0	0	0	.	5.5	40	8.6	0.70	0.25	0.61	0.08	0.07	0.00	.
6	09FEB81:12:00	12FEB81:13:50	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	.	4.2	45	3.3	1.64	0.15	0.19	.	0.04	0.04	.
7	12FEB81:13:50	24FEB81:13:40	0	0	0	0	0	0	25	25	0	0	0	0	0	0	.	0	.	4.5	35	4.0	0.32	0.18	0.32	0.01	0.01	0.01	.
8	24FEB81:13:40	09MAR81:12:50	0	0	0	.	0	.	0	.	0	0	0	0	0	0	.	0	.	4.1	35	24.0	0.77	0.53	0.72	0.02	0.02	0.01	.
9	25MAR81:11:55	02APR81:14:20	.	0	.	0	.	0	.	20	.	0	.	0	.	0	.	0	.	4.0	35	4.0	0.25	0.20	0.72	0.04	0.04	0.01	.
10	02APR81:14:20	10APR81:13:45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5.0	10	.	.	.	.	.	.	.	.
11	10APR81:13:45	15APR81:09:45	0	0	110	0	90	0	.	0	.	0	.	0	.	0	.	0	.	3.7	75	12.0	.	0.55	0.82	.	.	0.01	.
12	15APR81:09:45	22APR81:09:20	.	0	.	45	.	0	.	70	.	105	.	0	.	0	.	0	.	3.8	30	24.0	1.66	0.47	1.61	0.13	0.03	0.01	.
13	22APR81:09:20	30APR81:12:55	0	0	25	25	0	0	.	.	.	.	.	.	.	.	.	.	.	4.0	5	20.0	1.26	0.55	0.70	0.08	0.03	0.00	.
14	30APR81:12:55	06MAY81:12:35	0	0	80	80	0	0	.	.	.	.	.	.	.	.	.	.	.	3.6	75	15.2	0.95	0.69	1.43	0.03	0.03	0.00	.
15	06MAY81:12:35	13MAY81:09:30	.	0	.	20	0	0	.	.	.	.	.	.	.	.	.	.	.	3.8	50	19.8	0.42	0.26	0.74	0.03	0.03	0.00	.
16	13MAY81:09:30	20MAY81:13:45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.8	45	.	.	.	.	.	.	.	.
17	20MAY81:13:45	28MAY81:12:50	0	0	20	.	0	0	.	.	.	.	.	.	.	.	.	.	.	3.6	90	8.1	0.50	0.25	2.08	0.03	0.02	0.00	.
18	28MAY81:12:50	04JUN81:14:35	0	0	20	20	0	0	.	.	.	.	.	.	.	.	.	.	.	4.2	50	6.0	1.03	0.29	0.60	0.03	0.00	0.00	.
19	04JUN81:14:35	12JUN81:15:50	0	0	35	35	0	0	.	.	.	.	.	.	.	.	.	.	.	4.3	20	16.1	0.22	0.07	0.36	0.03	0.02	0.00	.
20	12JUN81:15:50	19JUN81:10:55	0	0	50	.	0	.	.	.	.	.	.	.	.	.	.	.	.	3.8	.	22.2	0.34	0.09	0.75	0.01	0.01	0.00	.
21	19JUN81:10:55	25JUN81:13:00	0	.	20	20	0	0	.	.	.	.	.	.	.	.	.	.	.	3.9	50	20.2	0.38	0.16	0.61	0.02	0.01	0.01	.
22	25JUN81:13:00	02JUL81:11:00	0	.	50	50	0	0	.	.	.	.	.	.	.	.	.	.	.	4.0	50	17.7	0.70	0.33	0.62	0.03	0.01	0.01	.
23	01JUL81:11:00	08JUL81:13:20	0	.	0	0	0	0	.	.	.	.	.	.	.	.	.	.	.	4.1	30	0.7	0.28	0.11	0.23	0.00	0.00	0.00	5
24	08JUL81:13:20	15JUL81:09:30	0	.	0	0	0	0	.	.	.	.	.	.	.	.	.	.	.	3.7	75	.	0.93	0.31	0.59	0.05	0.02	0.00	13
25	15JUL81:09:30	23JUL81:13:45	0	.	0	.	0	0	.	.	.	.	.	.	.	.	.	.	.	4.0	50	25.5	0.84	0.37	0.53	0.04	0.04	0.00	9
26	23JUL81:13:45	29JUL81:12:40	0	.	0	0	0	0	.	.	.	.	.	.	.	.	.	.	.	3.8	50	6.8	0.37	0.17	0.44	0.01	0.01	0.01	6
27	06AUG81:11:35	14AUG81:11:35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	3.9	75	9.9	0.63	0.31	0.64	0.02	0.01	0.01	.
28	14AUG81:11:35	19AUG81:13:15	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	.	3.5	270	19.9	0.75	0.22	1.53	0.02	0.01	0.01	.
29	26AUG81:12:20	03SEP81:13:21	0	0	0	.	0	0	.	.	.	.	.	.	.	.	.	.	.	4.0	50	6.2	0.46	0.14	0.36	0.01	0.01	0.00	.
30	03SEP81:13:21	10SEP81:09:30	0	0	40	40	0	0	.	.	.	.	.	.	.	.	.	.	.	3.7	110	33.1	0.94	0.58	1.05	0.06	0.05	0.01	.
31	10SEP81:09:30	17SEP81:10:50	0	0	0	.	0	0	.	.	.	.	.	.	.	.	.	.	.	4.1	40	5.9	0.36	0.20	0.50	0.03	0.01	0.00	.
32	21SEP81:12:55	24SEP81:14:20	0	0	30	30	0	0	0	0	150	140	0	0	0	0	0	0	.	3.4	105	25.4	1.07	0.80	0.79	0.02	.	0.01	.
33	01OCT81:10:55	02OCT81:13:11	0	0	40	.	0	0	.	.	.	.	.	.	.	.	.	.	.	3.7	105	16.2	0.91	0.63	0.49	0.04	0.03	0.00	.
34	02OCT81:13:11	08OCT81:12:15	0	0	20	20	0	0	.	.	.	.	.	.	.	.	.	.	.	4.7	50	22.5	0.39	0.09	0.32	0.01	0.01	0.00	.
35	14OCT81:12:00	20OCT81:13:20	0	0	20	20	0	0	.	.	.	.	.	.	.	.	.	.	.	3.8	100	14.9	1.01	0.66	0.50	0.07	0.06	0.05	.
36	20OCT81:13:20	26OCT81:10:55	0	0	35	25	0	0	0	0	0	0	0	0	0	0	25	25	.	4.2	55	2.6	0.37	0.12	0.20	0.06	0.05	0.03	.
37	04NOV81:10:50	06NOV81:11:05	.	0	.	45	.	.	.	.	.	.	.	0	.	0	.	.	.	4.6	30	.	0.42	0.23	0.34	0.08	0.08	0.08	.
38	25NOV81:12:15	03DEC81:14:06	110	0	0	.	.	.	.	.	.	.	.	0	25	0	.	.	.	4.0	60	4.6	0.55	0.46	0.50	0.02	0.01	0.01	.
39	10DEC81:13:30	16DEC81:14:31	0	0	0	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5.4	0.18	0.12	0.26	0.00	0.00	0.00	.
40	30DEC81:09:35	08JAN82:13:17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	4.0	30	34.1	0.83	0.05	0.18	0.02	0.02	0.00	.

STA=51WF02

OBS	TI1	TI2	EPB	SPB	EZN	SZN	ECU	SCU	EMN	SMN	EFE	SFE	ECR	SCR	ECD	SCD	ENI	SNI	PRECIP	LPH	LCOND	COD	TKN	NH3	NO23	TP	TSP	OP	PWF
41	10FEB81:10:02	12FEB81:12:40	0	0	35	25	0	0	0	.	0	0	0	0	0	0	0	0	0.92	4.1	25	8.6	1.98	0.17	0.57	0.03	0.01	0.00	.
42	12FEB81:12:40	24FEB81:13:15	0	0	0	0	0	0	20	20	0	0	0	0	0	0	.	0	1.61	4.5	50	0.0	0.40	0.28	0.32	0.01	0.01	0.01	.
43	24FEB81:13:15	09MAR81:11:15	0	0	0	.	0	0	0	.	0	0	0	0	0	0	.	0	0.46	4.1	30	16.0	0.75	0.50	0.78	0.02	0.01	0.01	.
44	09MAR81:11:15	17MAR81:14:40	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0.19	4.7	30	0.0	1.00	0.49	1.61	0.04	0.03	0.03	.
45	17MAR81:14:40	01APR81:14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.96	4.2	65	6.0	0.38	0.13	0.19	0.02	0.02	0.01	.
46	01APR81:14:15	02APR81:10:10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0.18	3.9	50	.	.	0.41	0.67	0.05	.	0.03	.
47	02APR81:10:10	06APR81:10:05	0	0	0	.	0	.	0	0	0	0	0	0	0	0	30	0	0.42	4.5	20	0.0	0.23	0.17	0.25	0.04	0.04	0.01	.
48	06APR81:10:05	10APR81:10:40	0	0	40	0	0	0	.	0	.	0	.	0	.	0	.	0	0.32	4.6	0	0.0	0.22	0.12	0.27	0.02	0.02	0.00	.
49	10APR81:10:40	15APR81:11:55	0	0	25	0	0	0	.	50	.	0	.	0	.	0	.	0	0.72	3.8	70	4.0	0.55	0.34	0.60	0.03	0.03	0.01	.
50	15APR81:11:55	30APR81:10:05	.	0	.	80	0	0	.	.	.	.	.	.	.	.	.	.	0.54	4.0	25	26.6	1.12	0.51	0.94	0.08	0.03	0.00	.
51	30APR81:10:05	06MAY81:11:15	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	1.34	3.6	50	9.5	0.67	0.49	0.96	0.04	0.03	0.00	.
52	06MAY81:11:16	14MAY81:10:20	.	0	.	30	0	0	.	.	.	.	.	.	.	.	.	.	1.08	4.1	35	0.0	0.34	0.24	0.34	0.03	0.03	0.00	.
53	14MAY81:10:20	21MAY81:11:15	.	0	.	25	0	0	.	.	.	.	.	.	.	.	.	.	1.18	3.9	45	11.9	0.73	0.39	0.51	0.05	0.04	0.01	.
54	21MAY81:11:15	29MAY81:10:15	0	0	20	20	0	0	.	.	.	.	.	.	.	.	.	.	0.37	4.1	45	6.0	0.44	0.19	0.43	0.00	0.00	0.00	.
55	29MAY81:10:15	05JUN81:12:50	0	0	35	35	0	0	.	.	.	.	.	.	.	.	.	.	0.90	4.0	60	18.0	0.66	0.33	1.02	0.00	0.00	0.00	.
56	05JUN81:12:50	12JUN81:11:15	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	0.68	4.4	20	8.0	0.15	0.15	0.28	0.02	0.02	0.00	.
57	12JUN81:11:15	18JUN81:10:15	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	0.54	3.9	.	12.1	0.33	0.25	0.76	0.02	0.01	0.01	.
58	18JUN81:10:15	26JUN81:12:00	0	.	0	0	0	0	.	.	.	.	.	.	.	.	.	.	1.91	4.0	45	12.1	0.39	0.22	0.44	0.05	0.04	0.02	.
59	01JUL81:14:30	08JUL81:14:20	0	.	0	0	0	0	.	.	.	.	.	.	.	.	.	.	2.87	4.4	20	3.6	0.23	0.10	0.25	0.01	0.00	0.00	3
60	17JUL81:10:40	23JUL81:12:05	0	.	0	0	0	0	.	.	.	.	.	.	.	.	.	.	0.68	3.9	50	9.9	0.76	0.39	0.55	0.02	0.01	0.00	5
61	23JUL81:12:05	30JUL81:11:20	0	.	.	50	0	0	.	.	.	.	.	.	.	.	.	.	1.85	3.9	60	4.7	0.37	0.21	0.60	0.01	0.01	0.01	3
62	30JUL81:11:20	06AUG81:10:00	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	0.50	3.9	195	18.6	0.39	0.17	0.76	0.01	0.01	0.01	.
63	06AUG81:10:00	14AUG81:10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.31	3.9	85	.	0.56	0.29	0.68	0.00	0.00	0.00	.
64	14AUG81:10:15	19AUG81:10:45	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	0.50	3.7	145	7.7	0.47	0.14	1.05	0.02	.	0.01	.
65	26AUG81:08:35	02SEP81:11:15	0	.	40	.	0	.	.	.	.	.	.	.	.	.	.	.	1.30	4.2	45	4.4	0.48	0.21	0.36	0.01	0.01	0.00	.
66	02SEP81:11:15	09SEP81:11:50	0	.	40	.	0	.	.	.	.	.	.	.	.	.	.	.	0.23	4.0	60	8.2	0.39	0.25	0.57	0.04	0.04	0.00	.
67	09SEP81:11:50	17SEP81:11:50	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	1.75	4.2	55	2.1	0.30	0.20	0.36	0.02	0.01	0.00	.
68	17SEP81:11:50	21SEP81:12:05	0	0	40	40	0	0	.	.	.	.	.	.	.	.	.	.	0.32	3.6	145	10.9	0.77	0.44	2.47	0.02	0.02	0.00	.
69	21SEP81:12:05	25SEP81:09:05	0	0	35	35	0	0	0	0	0	0	0	0	0	0	0	0	0.36	3.6	85	16.4	0.88	0.72	0.84	0.02	0.02	0.00	.
70	25SEP81:09:05	01OCT81:12:30	0	0	.	150	.	20	.	.	.	.	.	.	.	.	.	.	0.28	4.0	55	14.5	.	0.63	0.45	0.04	0.02	0.00	.
71	01OCT81:12:30	02OCT81:09:07	0	.	755	.	0	.	.	.	.	.	.	.	.	.	.	.	0.52	4.0	55	14.5	0.80	0.59	0.47	0.03	0.00	0.00	.
72	02OCT81:09:07	07OCT81:09:40	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0.26	3.7	105	17.4	0.75	0.33	0.45	0.03	0.03	0.00	.
73	16OCT81:13:40	20OCT81:15:35	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0.15	3.7	110	27.4	.	1.06	0.86	0.06	0.05	0.03	.
74	20OCT81:15:35	28OCT81:12:35	0	0	85	0	0	0	.	0	.	120	.	0	.	0	.	0	2.20	4.3	85	2.8	0.41	0.18	0.17	0.01	0.01	.	.
75	04NOV81:11:40	05NOV81:13:20	0	0	100	.	0	.	0	.	0	.	0	.	0	0	90	.	0.64	4.2	30	4.0	0.33	0.22	0.29	0.01	0.01	0.01	.
76	25NOV81:12:55	03DEC81:13:15	110	0	75	75	.	.	.	.	.	.	.	0	0	0	.	.	0.58	3.9	55	10.6	0.55	0.42	0.60	0.02	0.02	0.01	.
77	10DEC81:13:35	16DEC81:14:30	0	0	0	0	.	.	.	.	.	.	.	.	.	.	.	.	1.55	.	.	4.3	0.22	0.14	0.27	0.01	0.01	0.00	.
78	16DEC81:14:30	23DEC81:14:00	.	0	.	140	.	.	.	.	.	.	.	.	.	.	.	.	0.15	.	.	.	0.46	0.24	0.40	0.01	0.01	0.01	.
79	30DEC81:11:15	14JAN82:10:10	0	0	25	25	0	0	0	0	0	0	0	0	0	0	20	0	1.50	4.4	25	6.4	0.42	0.06	0.20	0.03	0.02	0.00	.

STA=51WF03

OBS	T1	T2	EPH	SPH	EZN	SZN	ECU	SCU	EMN	SMN	EFE	SFE	ECR	SCR	ECD	SCD	ENI	SNI	PRECIP	LPH	LCOND	COD	TKN	NH3	NO23	TP	TSP	OP	PBF
80	22APR81:13:00	30APR81:10:50	.	0	.	245	0	0	.	.	.	.	.	.	.	.	.	.	0.32	3.7	50	98.9	1.26	0.47	1.99	0.07	0.03	0.00	.
81	30APR81:10:50	06MAY81:11:30	0	0	0	.	0	0	.	.	.	.	.	.	.	.	.	.	1.34	3.8	55	9.9	0.65	0.49	0.98	0.03	0.03	0.00	.
82	06MAY81:11:30	14MAY81:11:00	.	0	.	140	0	0	.	.	.	.	.	.	.	.	.	.	1.08	4.1	25	0.0	0.30	0.22	0.54	0.03	0.02	0.00	.
83	14MAY81:11:00	21MAY81:11:00	0	0	165	.	20	20	.	.	.	.	.	.	.	.	.	.	1.18	.9	45	26.1	0.60	0.37	0.61	0.04	0.03	0.00	.
84	21MAY81:11:00	29MAY81:10:07	0	0	235	.	0	0	.	.	.	.	.	.	.	.	.	.	0.37	4.0	55	2.0	0.48	0.17	0.63	0.02	0.02	0.01	.
85	29MAY81:10:07	05JUN81:12:40	.	0	140	85	30	0	.	.	.	.	.	.	.	.	.	.	0.90	3.7	85	12.1	0.61	0.33	1.77	0.00	0.00	0.00	.
86	05JUN81:12:40	12JUN81:11:05	0	0	90	60	0	0	.	.	.	.	.	.	.	.	.	.	0.68	4.3	20	6.0	0.23	0.07	0.30	0.02	0.02	0.00	.
87	12JUN81:11:05	18JUN81:10:25	0	0	185	150	0	0	.	.	.	.	.	.	.	.	.	.	0.54	3.7	.	12.1	0.48	0.23	1.36	0.05	0.04	0.01	.
88	18JUN81:10:25	25JUN81:09:45	0	.	150	150	0	0	.	.	.	.	.	.	.	.	.	.	1.26	4.1	30	12.1	0.31	0.15	0.44	0.01	0.01	0.00	.
89	25JUN81:09:45	02JUL81:14:30	0	.	240	240	0	0	.	.	.	.	.	.	.	.	.	.	0.73	3.9	55	8.1	0.54	0.29	0.55	0.02	0.01	0.01	.
90	01JUL81:14:30	08JUL81:14:35	0	.	30	20	0	0	.	.	.	.	.	.	.	.	.	.	2.87	4.3	25	10.3	0.21	0.06	0.29	0.00	0.00	0.00	4
91	16JUL81:10:18	23JUL81:12:25	0	.	270	.	0	0	.	.	.	.	.	.	.	.	.	.	0.68	4.0	50	25.3	0.62	0.40	0.57	0.02	0.01	0.00	7
92	23JUL81:12:25	30JUL81:11:40	0	.	155	75	0	0	.	.	.	.	.	.	.	.	.	.	1.85	3.8	55	4.7	0.41	0.19	0.62	0.01	0.01	0.01	4
93	30JUL81:11:40	06AUG81:09:45	0	0	115	115	0	0	0	0	0	.	0	0	0	0	0	0	0.50	3.9	180	14.5	0.44	0.07	1.14	0.01	0.00	0.00	.
94	06AUG81:09:45	14AUG81:09:20	0	0	100	100	0	0	.	.	.	.	.	.	.	.	.	.	1.31	4.0	65	7.9	0.54	0.25	0.54	0.01	0.01	0.00	.
95	14AUG81:09:20	19AUG81:11:00	0	0	170	170	0	0	.	.	.	.	.	.	.	.	.	.	0.50	4.0	100	6.7	0.31	0.12	0.30	0.03	0.02	0.00	.
96	26AUG81:09:10	02SEP81:11:05	0	0	50	50	0	0	.	.	.	.	.	.	.	.	.	.	1.30	4.3	40	3.2	0.46	0.19	0.39	0.01	0.01	0.00	.
97	02SEP81:11:00	09SEP81:11:45	0	0	200	.	0	0	.	.	.	.	.	.	.	.	.	.	0.23	4.0	65	7.6	0.41	0.30	0.60	0.03	0.03	0.00	.
98	09SEP81:11:45	17SEP81:11:40	0	0	70	70	0	0	.	.	.	.	.	.	.	.	.	.	1.75	4.3	25	1.3	0.53	0.18	0.34	0.02	0.01	0.00	.
99	17SEP81:11:40	21SEP81:12:00	0	.	160	.	0	.	0	.	0	.	0	.	0	.	0	.	0.32	3.6	150	10.7	0.81	0.42	0.76	0.02	0.02	0.01	.
100	21SEP81:12:00	25SEP81:09:12	.	0	.	165	.	0	.	.	.	.	.	.	.	.	.	.	0.36	3.4	105	14.1	1.02	0.66	0.66	0.02	0.01	0.00	.
101	25SEP81:09:12	30SEP81:11:30	.	0	.	375	.	0	.	.	.	.	.	.	.	.	.	.	0.28	4.1	50	13.0	0.42	0.27	0.45	0.03	0.02	0.01	.
102	30SEP81:11:30	02OCT81:09:00	0	0	490	465	0	0	.	.	.	.	.	.	.	.	.	.	0.52	4.0	55	13.7	0.75	0.45	0.39	0.03	0.03	0.00	.
103	02OCT81:09:00	07OCT81:10:00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0.26	3.8	95	11.9	0.97	0.59	0.41	0.08	0.07	0.02	.
104	16OCT81:13:30	20OCT81:15:30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0.15	3.8	110	25.6	1.85	1.10	1.00	0.08	0.05	0.03	.
105	20OCT81:15:30	28OCT81:12:15	0	0	60	50	0	0	0	0	0	0	0	0	0	0	20	0	2.20	4.2	85	2.5	0.31	0.05	0.16	0.01	0.01	0.00	.
106	04NOV81:11:25	06NOV81:13:25	0	0	30	25	.	.	.	.	.	.	.	30	.	0	.	.	0.64	4.3	30	4.5	0.59	0.38	0.29	0.01	0.01	0.01	.
107	25NOV81:12:45	03DEC81:13:25	110	0	160	155	.	.	.	.	.	.	.	0	30	0	.	.	0.58	4.1	55	7.5	0.53	0.38	0.48	0.01	0.01	0.01	.
108	10DEC81:13:45	16DEC81:14:20	0	0	0	0	.	.	.	.	.	.	.	.	.	.	.	.	1.55	.	.	15.3	0.22	0.20	0.25	0.00	0.00	0.00	.
109	30DEC81:12:00	14JAN82:11:05	0	0	65	60	0	0	0	0	110	0	0	0	0	0	170	0	1.50	4.4	25	6.4	0.42	0.13	0.18	0.01	0.01	0.00	.

STA=51WF04

OBS	T1	T2	EPH	SPH	EZN	SZN	ECU	SCU	EMN	SMN	EFE	SFE	ECR	SCR	ECD	SCD	ENI	SNI	PRECIP	LPH	LCOND	COD	TKN	NH3	NO23	TP	TSP	OP	PBF
110	11JUN81:13:40	18JUN81:11:53	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	0.54	4.0	.	16.1	0.41	0.39	0.67	0.01	0.01	.	.
111	18JUN81:11:53	25JUN81:09:55	0	.	25	25	20	20	.	.	.	.	.	.	.	.	.	.	0.31	3.9	50	16.1	0.55	0.24	0.60	0.00	0.00	0.00	.
112	25JUN81:09:55	02JUL81:10:35	0	.	760	25	30	30	.	.	.	.	.	.	.	.	.	.	0.38	4.0	80	20.2	0.83	0.28	0.99	0.04	0.01	0.00	.
113	02JUL81:10:35	08JUL81:12:20	0	.	20	20	0	0	.	.	.	.	.	.	.	.	.	.	1.73	4.5	15	5.5	0.17	0.11	0.23	0.00	0.00	0.00	0
114	16JUL81:10:10	23JUL81:11:50	0	.	0	.	25	.	.	.	.	.	.	.	.	.	.	.	0.10	3.8	80	.	1.06	0.75	1.31	0.01	0.01	0.00	1
115	23JUL81:11:50	29JUL81:11:50	0	.	.	60	20	20	.	.	.	.	.	.	.	.	.	.	1.85	3.8	65	5.6	0.48	0.29	0.58	0.01	0.01	0.01	23
116	05AUG81:13:10	13AUG81:10:10	120	0	0	0	20	0	0	0	0	0	0	0	0	0	80	0	2.14	4.0	65	20.2	0.39	0.23	0.58	0.01	0.01	0.00	.
117	13AUG81:10:10	19AUG81:10:35	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	0.74	4.0	140	8.0	0.46	0.20	0.32	0.01	0.01	0.00	.

STA=SIWF04

OBS	T1	T2	EPB	SPB	EZN	SZN	ECU	SCU	EMN	SMN	EFE	SFE	ECR	SCR	ECD	SCD	ENI	SNI	PRECIP	LPH	LCOND	COD	TKN	NH3	NO23	TP	TSP	OP	PHF
118	26AUG81:10:42	02SEP81:12:35	.	0	.	0	.	25	.	.	.	.	.	.	.	.	.	.	1.96	4.5	30	2.9	0.55	0.21	0.36	0.01	0.01	0.01	.
119	02SEP81:12:35	09SEP81:13:40	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	0.36	4.1	50	7.8	0.42	0.29	0.54	0.02	0.02	0.01	.
120	09SEP81:13:46	17SEP81:10:30	0	0	60	60	0	0	0	0	0	0	0	0	0	0	0	0	1.28	4.1	40	3.8	0.57	0.30	0.56	0.02	0.01	0.00	.
121	30SEP81:11:20	02OCT81:13:30	0	0	595	365	0	.	.	.	.	.	.	.	.	.	.	.	0.40	4.1	55	14.2	0.86	0.47	0.53	0.03	0.01	0.01	.
122	15OCT81:10:30	20OCT81:11:00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0.27	3.8	110	19.4	.	1.00	0.94	.	.	0.02	.
123	20OCT81:11:00	28OCT81:12:20	0	0	30	0	0	0	0	.	0	0	0	0	0	0	130	0	2.34	4.5	55	7.4	0.73	0.28	0.34	0.10	0.09	0.07	.
124	04NOV81:13:15	06NOV81:12:50	.	0	.	40	.	.	.	.	.	.	.	100	.	0	.	.	0.20	3.7	100	8.8	0.76	0.45	0.69	0.02	0.01	0.01	.
125	25NOV81:12:07	03DEC81:11:42	0	0	0	.	.	.	.	.	.	.	.	0	30	0	.	.	0.62	4.1	135	5.1	0.47	0.32	0.42	0.02	0.02	0.00	.
126	10DEC81:12:25	16DEC81:12:05	0	0	130	145	.	.	.	.	.	.	.	.	.	.	.	.	1.00	.	.	3.2	0.58	0.24	0.14	0.02	0.01	0.01	.

STA=51DF01

OBS	T11	T12	TOTS	COD	NH3	TKN	NO23	OP	TP	EPB	EZN	ECU	EMN	EFE	ECR	ECU	ENI	PBF
1	10DEC80:09:35	17DEC80:09:55	.	200.0	2.84	4.03	6.95	0.08	0.39	0	474	0	.	.	.	.	.	.
2	17DEC80:09:55	22DEC80:12:35	782	210.0	1.18	8.37	4.98	0.32	0.63	0	592	237	.	.	.	.	.	.
3	05JAN81:12:50	08JAN81:12:45	308	106.0	1.03	3.40	3.63	0.08	0.16	0	316	158	.	.	.	.	.	.
4	08JAN81:12:45	16JAN81:11:05	972	341.0	1.03	4.98	5.77	0.00	0.32	869	869	237	.	.	.	.	.	.
5	16JAN81:11:05	22JAN81:13:30	632	268.0	2.05	5.69	6.67	0.08	0.63	0	2291	237	.	.	.	.	.	.
6	22JAN81:13:30	03FEB81:13:30	1260	407.0	3.40	8.37	6.00	1.25	.	1106	869	553	632	21919	0	0	237	.
7	03FEB81:13:30	09FEB81:12:00	569	197.0	0.87	2.53	2.92	0.08	0.71	0	513	395	197	5687	0	0	0	.
8	09FEB81:12:00	12FEB81:13:50	63	85.3	1.50	5.77	6.95	0.24	0.71	0	474	0	158	3693	0	0	0	.
9	12FEB81:13:50	24FEB81:13:40	395	221.0	5.85	13.27	7.35	.	0.79	0	671	0	.	.	.	.	.	.
10	24FEB81:13:40	09MAR81:12:50	2820	1110.0	1.11	16.90	12.01	0.08	2.21	948	987	158	750	25039	0	0	276	.
11	09MAR81:12:50	25MAR81:11:55	2690	921.0	1.11	22.20	18.72	0.16	1.74	1264	908	237	987	.	0	0	.	.
12	25MAR81:11:55	02APR81:14:20	908	284.0	0.55	5.77	5.77	0.16	0.95	0	553	0	276	.	.	0	.	.
13	10APR81:13:45	15APR81:09:45	395	569.0	2.21	10.98	3.55	0.08	1.03	0	1856	0	.	.	.	.	.	.
14	15APR81:09:45	22APR81:09:20	1185	569.0	5.77	29.38	6.95	0.16	2.45	0	671	0	.	.	.	.	.	.
15	22APR81:09:20	30APR81:12:55	964	.	3.00	14.30	3.95	0.32	2.29	0	671	0	.	.	.	.	.	.
16	30APR81:12:55	06MAY81:12:35	600	.	3.71	.	5.85	1.42	.	.	.	.	.	.	.	.	.	.
17	06MAY81:12:35	13MAY81:09:30	237	270.0	1.42	7.50	3.71	0.00	0.79	.	.	0	.	.	.	.	.	.
18	20MAY81:13:45	28MAY81:12:50	806	573.0	0.71	13.20	4.50	0.16	1.66	0	1896	0	.	.	.	.	.	.
19	28MAY81:12:50	04JUN81:14:35	529	333.0	22.40	28.40	4.42	1.66	3.16	0	948	0	.	.	.	.	.	.
20	04JUN81:14:35	12JUN81:15:50	1367	1272.0	5.77	19.19	4.27	2.05	7.50	0	990	160	.	.	.	.	.	.
21	12JUN81:15:50	19JUN81:10:55	537	223.0	0.87	7.42	3.40	0.08	0.71	0	470	0	.	.	.	.	.	.
22	19JUN81:10:55	25JUN81:13:00	395	255.0	4.11	18.70	1.82	0.95	1.11	0	390	0	.	.	.	.	.	.
23	25JUN81:13:00	02JUL81:11:00	474	435.0	3.40	19.20	2.61	0.55	1.58	0	950	0	.	.	.	.	.	.
24	01JUL81:11:00	08JUL81:13:20	442	299.0	5.29	27.73	2.76	2.53	3.71	0	671	0	.	.	.	.	.	300
25	08JUL81:13:20	15JUL81:09:30	900	209.0	0.16	6.00	4.50	0.00	0.63	0	158	0	.	.	.	.	.	371
26	15JUL81:09:30	23JUL81:13:45	284	227.0	0.63	2.21	3.40	0.08	0.55	0	750	0	.	.	.	.	.	332
27	23JUL81:13:45	29JUL81:12:40	253	107.0	0.71	0.95	2.53	0.08	0.16	0	434	0	.	.	.	.	.	427
28	29JUL81:12:40	06AUG81:11:35	727	251.0	0.32	2.21	3.79	0.08	0.55	0	395	0	197	7030	0	0	0	.
29	06AUG81:11:35	14AUG81:11:35	727	409.0	14.53	63.32	2.05	5.13	7.11	0	671	0	.	.	.	.	.	.
30	14AUG81:11:35	19AUG81:13:15	758	274.0	8.14	70.77	2.05	7.03	8.45	0	316	0	.	.	.	.	.	.
31	19AUG81:13:15	26AUG81:12:20	190	167.0	0.63	4.58	2.84	0.16	0.55	0	513	0	.	.	.	.	.	.
32	26AUG81:12:20	03SEP81:13:21	600	88.5	0.79	4.82	2.21	0.00	0.55	0	434	0	.	.	.	.	.	.
33	03SEP81:13:21	10SEP81:09:30	142	116.0	0.47	3.40	2.53	0.00	1.03	0	197	0	.	.	.	.	.	.
34	10SEP81:09:30	17SEP81:10:50	1500	2050.0	0.32	5.45	7.82	0.00	0.95	0	395	0	790	17417	0	0	0	.
35	17SEP81:10:50	21SEP81:12:55	379	143.0	1.58	5.37	4.90	0.00	0.47	0	316	0	.	.	.	.	.	.
36	21SEP81:12:55	24SEP81:14:28	174	.	2.37	7.50	1.26	0.00	0.55	0	316	0	158	4186	0	0	0	.
37	24SEP81:14:28	01OCT81:10:55	253	175.0	0.71	3.55	2.61	0.08	0.55	0	316	0	.	.	.	.	.	.
38	01OCT81:10:55	02OCT81:13:11	31	133.0	1.03	6.32	1.26	0.08	0.47	0	237	0	.	.	.	.	.	.
39	02OCT81:13:11	08OCT81:12:15	379	284.0	0.67	16.19	1.82	0.16	1.34	.	.	.	.	.	.	.	.	.
40	08OCT81:12:15	14OCT81:12:00	316	98.0	0.79	2.05	2.53	0.03	0.32	0	316	0	.	.	.	.	.	.
41	14OCT81:12:00	20OCT81:13:20	95	183.0	0.16	3.24	2.53	0.00	0.55	0	474	197	197	4779	0	0	0	.
42	20OCT81:13:20	28OCT81:10:55	237	146.0	3.32	7.66	4.74	0.08	0.47	0	632	237	158	3476	0	0	0	.
43	28OCT81:10:55	04NOV81:10:50	458	147.0	1.26	3.32	2.76	0.24	0.32	0	553	0	.	.	.	.	.	.
44	04NOV81:10:50	06NOV81:11:06	126	51.3	0.79	1.82	0.71	0.16	0.16	0	237	0	.	.	.	.	.	.
45	06NOV81:11:06	12NOV81:11:30	553	176.0	3.46	12.60	2.13	0.39	0.95	790	513	.	.	.	.	.	.	.
46	12NOV81:11:30	18NOV81:13:50	553	194.0	0.63	2.13	2.92	0.00	0.39	0	395	.	.	.	.	.	.	.
47	18NOV81:13:50	25NOV81:12:15	.	129.0	0.63	4.34	3.79	0.08	0.32	869	395	.	.	.	.	.	.	.
48	25NOV81:12:15	03DEC81:14:06	174	.	.	.	.	.	.	948	355	.	.	.	.	197	.	.
49	03DEC81:14:06	10DEC81:13:30	442	207.0	1.42	4.66	4.42	0.08	0.55	790	434	.	.	.	.	.	.	.
50	10DEC81:13:30	16DEC81:14:31	806	222.0	1.26	4.90	2.69	0.08	0.32	0	276	.	.	.	.	.	.	.
51	16DEC81:14:31	23DEC81:09:35	126	173.0	1.03	2.53	0.87	0.16	0.24	0	276	.	.	.	.	.	.	.
52	23DEC81:09:35	29DEC81:12:10	.	.	1.03	.	3.24	1.11	.	.	.	.	.	.	.	.	.	.
53	30DEC81:09:35	08JAN82:13:17	.	238.0	1.97	5.61	3.32	0.00	0.32	1185	948	355	592	19313	0	0	197	.

STA=51DF02

OBS	TI1	TI2	TOTS	COD	NH3	TKN	NO23	OP	TP	EPB	EZN	ECU	EMN	EFE	ECR	ECD	ENI	PBF
54	10FEB81:10:02	12FEB81:12:40	126	26.1	1.18	2.92	2.76	0.00	0.16	0	474	0	0	790	0	0	0	.
55	12FEB81:12:40	24FEB81:13:15	205	158.0	6.00	8.69	6.71	0.08	0.32	0	869	0	.	.	.	.	.	.
56	24FEB81:13:15	09MAR81:11:15	450	190.0	3.32	7.35	5.85	0.08	0.47	0	790	0	474	2923	0	0	.	.
57	09MAR81:11:15	17MAR81:14:40	63	126.0	1.50	2.37	2.45	0.16	0.39	869	197	0	0	2528	0	0	158	.
58	17MAR81:14:40	26MAR81:13:15	300	237.0	1.42	6.08	3.00	0.16	0.71	0	237	0	0	4621	0	0	158	.
59	26MAR81:13:15	01APR81:14:15	245	47.4	1.18	4.50	1.66	0.16	0.55	0	474	0	0	2528	197	0	237	.
60	01APR81:14:15	02APR81:10:10	103	.	0.87	.	1.34	0.08	.	0	316	0	0	0	0	0	276	.
61	02APR81:10:10	06APR81:10:05	205	126.0	0.87	4.66	1.34	0.08	0.47	0	0	0	0	1580	0	0	276	.
62	06APR81:10:05	10APR81:10:40	205	63.2	0.63	3.08	1.66	0.00	0.47	0	0	0	.	.	.	.	.	.
63	10APR81:10:40	15APR81:11:55	126	316.0	.	6.40	.	.	0.63	0	237	0	.	.	.	.	.	.
64	15APR81:11:55	30APR81:10:05	1398	1264.0	4.19	46.84	8.21	0.08	5.92	.	.	0	.	.	.	.	.	.
65	30APR81:10:05	06MAY81:11:15	442	270.0	3.00	13.82	4.11	0.47	1.42	0	158	0	.	.	.	.	.	.
66	06MAY81:11:16	14MAY81:10:20	190	250.0	2.37	7.03	1.58	0.16	0.63	.	.	0	.	.	.	.	.	.
67	14MAY81:10:20	21MAY81:11:15	284	219.0	2.45	6.87	2.21	0.08	0.95	0	1264	0	.	.	.	.	.	.
68	21MAY81:11:15	29MAY81:10:15	450	301.0	0.39	6.24	2.84	0.00	0.47	0	395	0	.	.	.	.	.	.
69	29MAY81:10:15	05JUN81:12:50	221	190.0	2.92	6.79	0.47	0.00	0.16	0	553	0	.	.	.	.	.	.
70	05JUN81:12:50	12JUN81:11:15	265	190.0	1.03	3.00	1.66	0.08	0.39	0	320	0	.	.	.	.	.	.
71	12JUN81:11:15	18JUN81:10:15	292	159.0	1.34	2.69	2.21	0.00	0.24	0	240	0	.	.	.	.	.	.
72	18JUN81:10:15	25JUN81:12:00	126	64.0	0.32	2.69	1.18	0.00	0.39	0	240	0	.	.	.	.	.	.
73	26JUN81:12:00	01JUL81:14:30	300	64.0	0.00	2.21	1.34	0.00	0.24	0	1300	0	.	.	.	.	.	.
74	01JUL81:14:30	08JUL81:14:20	474	46.6	1.90	4.98	0.71	0.00	0.24	0	237	0	.	.	.	.	.	134
75	08JUL81:14:20	17JUL81:10:40	158	82.2	0.95	3.48	2.13	0.00	0.47	0	0	0	.	.	.	.	.	111
76	17JUL81:10:40	23JUL81:12:05	253	156.0	0.63	1.74	2.13	0.00	0.24	0	474	0	.	.	.	.	.	103
77	23JUL81:12:05	30JUL81:11:20	111	73.5	0.87	1.42	1.11	0.08	0.16	0	197	0	.	.	.	.	.	142
78	30JUL81:11:20	06AUG81:10:00	190	115.0	0.55	1.11	1.58	0.08	0.16	0	237	0	.	.	.	.	.	.
79	06AUG81:10:00	14AUG81:10:15	221	122.0	2.92	5.69	6.64	0.08	0.16	0	355	869	0	3870	0	0	0	.
80	14AUG81:10:15	19AUG81:10:45	190	43.4	0.47	1.66	1.11	0.08	0.24	0	197	0	.	.	.	.	.	.
81	19AUG81:10:45	26AUG81:08:35	253	133.0	0.79	3.08	2.69	0.08	0.32	869	474	0	.	.	.	.	.	.
82	26AUG81:08:35	02SEP81:11:15	95	88.5	0.39	4.03	1.66	0.08	0.32	0	0	0	.	.	.	.	.	.
83	02SEP81:11:15	09SEP81:11:50	205	.	1.90	3.71	2.13	0.00	0.39	0	237	0	.	.	.	.	.	.
84	09SEP81:11:50	17SEP81:11:50	363	98.7	0.55	2.84	1.74	0.00	0.39	.	237	0	.	.	.	.	.	.
85	17SEP81:11:50	21SEP81:12:05	79	41.9	1.03	3.16	0.95	0.00	0.16	0	0	0	237	0	0	0	0	.
86	21SEP81:12:05	25SEP81:09:05	269	80.6	0.95	3.79	1.58	0.00	0.24	0	434	0	.	.	.	.	.	.
87	25SEP81:09:05	01OCT81:12:30	490	60.8	0.39	2.69	0.95	0.08	0.39	.	.	.	.	.	.	.	.	.
88	01OCT81:12:30	02OCT81:09:07	348	31.0	0.55	3.24	0.47	0.08	0.16	0	0	0	.	.	.	.	.	.
89	02OCT81:09:07	07OCT81:09:40	47	36.0	0.24	.	0.79	0.00	.	0	434	0	.	.	.	.	.	.
90	07OCT81:09:40	16OCT81:13:40	363	140.0	1.11	2.45	2.37	0.00	0.16	0	474	0	.	.	.	.	.	.
91	16OCT81:13:40	20OCT81:15:35	205	49.0	0.79	4.19	1.42	0.00	0.16	0	434	0	.	.	.	.	.	.
92	20OCT81:15:35	28OCT81:12:35	63	54.5	2.05	5.61	3.08	0.32	0.47	0	513	0	237	987	0	0	0	.
93	28OCT81:12:35	04NOV81:11:40	126	86.9	1.30	2.13	1.82	0.24	0.24	0	395	0	.	.	.	.	.	.
94	04NOV81:11:40	06NOV81:13:20	63	72.9	1.26	1.97	1.18	0.08	0.68	0	237	0	.	.	.	.	.	.
95	06NOV81:13:20	13NOV81:08:45	126	64.0	1.26	1.97	1.50	0.08	0.24	0	0	.	.	.	.	.	.	.
96	13NOV81:08:45	19NOV81:11:05	95	31.6	1.58	2.13	2.13	0.00	0.16	0	0	.	.	.	.	.	.	.
97	19NOV81:11:05	25NOV81:12:55	237	61.6	2.84	5.45	3.79	0.00	0.24	0	316	.	.	.	.	.	.	.
98	25NOV81:12:55	03DEC81:13:15	443	39.5	1.58	2.84	2.13	0.00	0.24	869	158	.	.	.	.	0	.	.
99	03DEC81:13:15	10DEC81:13:35	743	67.1	3.00	3.63	1.74	0.08	0.16	0	237	.	.	.	0	158	.	.
100	10DEC81:13:35	16DEC81:14:30	458	94.8	1.58	4.27	3.40	0.00	0.08	0	1027	.	.	.	.	.	.	.
101	16DEC81:14:30	23DEC81:14:00	47	33.2	2.69	5.06	3.40	0.08	0.16	0	474	.	.	.	.	.	.	.
102	23DEC81:14:00	30DEC81:11:45	47	47.4	1.11	4.58	0.95	0.24	0.32	0	237	.	.	.	.	.	.	.

STA=51DF03

OBS	TI1	TI2	TOTS	COD	NH3	TKN	NO23	OP	TP	EPB	EZN	ECU	EMN	EFE	ECR	ECD	ENI	PWF
103	22APR81:13:00	30APR81:10:50	900.0	571.0	1.42	30.88	5.21	0.00	4.03	.	.	0	.	.	.	.	.	.
104	30APR81:10:50	06MAY81:11:30	434.0	312.0	1.58	11.14	2.92	0.00	1.11	.	.	0	.	.	.	.	.	.
105	06MAY81:11:30	14MAY81:11:00	845.0	406.0	3.00	12.80	1.90	0.08	0.87	.	.	0	.	.	.	.	.	.
106	14MAY81:11:00	21MAY81:11:00	743.0	522.0	1.49	46.05	4.34	5.85	7.90	.	.	0	.	.	.	.	.	.
107	21MAY81:11:00	29MAY81:10:07	513.0	396.0	3.40	20.60	3.40	0.95	2.37	0	553	0	.	.	.	.	.	.
108	29MAY81:10:07	05JUN81:12:40	245.0	222.0	3.87	7.98	0.95	0.00	0.24	0	1027	0	.	.	.	.	.	.
109	05JUN81:12:40	12JUN81:11:05	387.0	285.0	4.03	4.27	0.95	0.00	0.47	0	590	0	.	.	.	.	.	.
110	12JUN81:11:05	18JUN81:10:25	142.0	446.0	1.18	3.00	2.21	0.00	0.32	0	470	0	.	.	.	.	.	.
111	18JUN81:10:25	25JUN81:09:45	284.0	64.0	0.79	3.40	1.58	0.00	0.39	0	390	0	.	.	.	.	.	.
112	25JUN81:09:45	02JUL81:14:30	474.0	158.0	0.79	3.95	2.45	0.08	0.63	0	790	0	.	.	.	.	.	.
113	01JUL81:14:30	08JUL81:14:35	47.3	73.5	2.21	4.96	1.18	0.08	0.24	0	355	0	.	.	.	.	.	111
114	16JUL81:10:18	23JUL81:12:25	126.0	156.0	2.69	15.64	1.18	1.58	2.05	0	474	0	.	.	.	.	.	190
115	23JUL81:12:25	30JUL81:11:40	79.0	115.0	1.82	2.76	0.79	0.08	0.24	0	632	0	.	.	.	.	.	395
116	30JUL81:11:40	06AUG81:09:45	221.0	139.0	0.55	1.26	0.79	0.16	0.16	0	0	0	0	2607	0	0	0	.
117	06AUG81:09:45	14AUG81:09:20	332.0	115.0	2.61	5.45	1.11	0.00	0.24	0	632	0	.	.	.	.	.	.
118	14AUG81:09:20	19AUG81:11:00	221.0	160.0	1.26	7.90	1.11	0.95	1.97	0	276	0	.	.	.	.	.	.
119	19AUG81:11:00	26AUG81:09:10	964.0	190.0	0.16	3.95	4.58	0.00	0.95	0	513	0	.	.	.	.	.	.
120	26AUG81:09:10	02SEP81:11:05	2733.0	.	1.03	9.32	4.03	0.00	1.66	0	513	0	.	.	.	.	.	.
121	02SEP81:11:00	09SEP81:11:45	821.0	178.0	1.18	5.21	4.03	0.08	0.63	0	829	0	.	.	.	.	.	.
122	09SEP81:11:45	17SEP81:11:40	537.0	179.0	3.15	10.96	3.63	0.24	0.95	0	790	0	.	.	.	.	.	.
123	17SEP81:11:40	21SEP81:12:00	.	128.0	1.42	4.34	0.95	0.00	0.32	0	237	0	158	2449	0	0	0	.
124	21SEP81:12:00	25SEP81:09:12	506.0	94.0	5.37	7.66	5.06	0.00	0.24	0	395	0	.	.	.	.	.	.
125	25SEP81:09:12	30SEP81:11:30	348.0	81.4	0.55	0.95	1.26	0.00	0.16	0	395	0	.	.	.	.	.	.
126	30SEP81:11:30	02OCT81:09:00	79.0	73.5	0.87	5.77	1.26	0.08	0.24	0	1422	0	.	.	.	.	.	.
127	02OCT81:09:00	07OCT81:10:00	221.0	52.1	0.39	3.55	0.95	0.00	0.24	.	.	.	.	.	.	.	.	.
128	07OCT81:10:00	16OCT81:13:30	490.0	227.0	1.42	2.84	3.32	0.00	0.39	0	1501	158	.	.	.	.	.	.
129	16OCT81:13:30	20OCT81:15:30	300.0	89.3	0.79	3.87	1.11	0.08	0.16	0	434	0	.	.	.	.	.	.
130	20OCT81:15:30	28OCT81:12:15	427.0	233.0	3.32	9.48	4.98	0.39	0.79	869	790	0	158	2765	0	0	0	.
131	28OCT81:12:15	04NOV81:11:25	300.0	130.0	1.42	2.92	1.82	0.16	0.16	0	434	0	.	.	.	.	.	.
132	04NOV81:11:25	06NOV81:13:25	221.0	32.4	1.11	4.50	0.87	0.08	0.16	0	237	.	.	.	.	.	.	.
133	06NOV81:13:25	13NOV81:08:30	158.0	72.7	.	1.50	1.66	0.00	0.24	0	316	.	.	.	.	.	.	.
134	13NOV81:08:30	19NOV81:11:15	111.0	52.3	1.74	1.97	2.61	0.00	0.16	0	513	.	.	.	.	.	.	.
135	19NOV81:11:15	25NOV81:12:45	363.0	74.3	1.58	5.45	3.95	0.08	0.24	790	1264	.	.	.	.	.	.	.
136	25NOV81:12:45	03DEC81:13:25	.	78.2	1.74	2.84	3.16	0.00	0.16	0	237	.	.	.	0	158	.	.
137	03DEC81:13:25	10DEC81:13:45	403.0	117.7	2.53	4.11	1.42	0.08	0.24	0	592	.	.	.	.	.	.	.
138	10DEC81:13:45	16DEC81:14:20	284.0	82.2	1.90	2.61	4.19	0.08	0.08	0	1145	.	.	.	.	.	.	.
139	16DEC81:14:20	23DEC81:13:40	95.0	78.2	1.34	3.32	2.05	0.08	0.08	0	1145	.	.	.	.	.	.	.
140	23DEC81:13:40	30DEC81:12:00	213.0	6.3	2.05	6.16	1.90	0.16	0.32	0	237	.	.	.	.	.	.	.

STA=51DF04

OBS	TI1	TI2	TOTS	COD	NH3	TKN	NO23	OP	TP	EPB	EZN	ECU	EMN	EFE	ECR	ECD	ENI	PWF
141	11JUN81:13:40	18JUN81:11:53	47.0	127.0	0.87	2.69	1.11	0.00	0.16	0	390	0	.	.	.	.	.	.
142	18JUN81:11:53	25JUN81:09:55	63.0	64.0	0.47	3.08	1.82	0.00	0.39	0	320	0	.	.	.	.	.	.
143	25JUN81:09:55	02JUL81:10:35	300.0	95.0	0.79	3.40	1.82	0.00	0.24	0	350	0	.	.	.	.	.	.
144	02JUL81:10:35	08JUL81:12:20	15.8	50.6	2.13	4.98	1.32	0.24	0.55	0	316	0	.	.	.	.	.	63
145	08JUL81:12:20	16JUL81:10:10	142.0	55.1	1.11	4.50	1.97	0.08	0.08	0	0	0	.	.	.	.	.	16
146	16JUL81:10:10	23JUL81:11:50	32.0	54.5	0.63	1.74	3.24	0.08	0.24	0	158	0	.	.	.	.	.	39
147	23JUL81:11:50	29JUL81:11:50	15.5	99.5	1.34	2.29	0.79	0.08	0.16	0	.	0	.	.	.	.	.	39
148	29JUL81:11:50	05AUG81:13:10	379.0	99.5	0.71	1.58	1.58	0.08	0.39	0	0	0	.	.	.	.	.	.
149	05AUG81:13:10	13AUG81:10:10	1122.0	56.1	1.82	6.87	1.11	0.16	0.87	0	513	316	592	8926	0	0	158	.
150	13AUG81:10:10	19AUG81:10:35	506.0	50.6	0.32	2.76	1.26	0.08	0.55	0	0	0	.	.	.	.	.	.

STA=510F04

OBS	TI1	TI2	TOTS	COD	NH3	TKN	NO23	OP	TP	EPB	EZN	ECU	EMN	EFE	ECR	ECD	ENI	PBF
151	19AUG81:10:35	26AUG81:10:42	316	136.0	0.47	3.24	1.26	0.24	0.79	948	237	0	.	.	.	.	.	.
152	26AUG81:10:42	02SEP81:12:35	379	251.0	0.64	21.80	2.53	2.05	2.84	0	158	0	.	.	.	.	.	.
153	02SEP81:12:35	09SEP81:13:40	679	210.0	9.95	30.09	1.58	2.29	3.40	0	0	0	.	.	.	.	.	.
154	09SEP81:13:40	17SEP81:10:36	.	30.0	0.95	2.59	1.90	0.00	0.32	0	158	0	0	1185	0	0	0	.
155	17SEP81:10:36	24SEP81:12:20	79	82.2	0.95	5.45	2.37	0.00	0.39	0	316	0	.	.	.	.	.	.
156	24SEP81:12:20	30SEP81:11:28	221	120.0	0.95	3.48	1.74	0.16	0.39	.	.	.	.	.	.	.	.	.
157	30SEP81:11:28	02OCT81:13:30	142	31.5	0.71	1.34	1.82	0.00	0.16	0	2567	0	.	.	.	.	.	.
158	02OCT81:09:07	07OCT81:10:00	79	23.7	0.39	2.84	0.79	0.08	0.16	.	.	.	.	.	.	.	.	.
159	07OCT81:10:00	15OCT81:10:30	47	30.8	0.63	3.40	1.74	0.08	0.08	0	355	0	.	.	.	.	.	.
160	15OCT81:10:30	20OCT81:11:00	158	24.5	0.95	3.16	1.42	0.06	0.16	0	237	0	.	.	.	.	.	.
161	20OCT81:11:00	28OCT81:12:20	505	11.9	0.95	2.76	0.39	0.16	0.16	0	0	0	0	0	0	0	0	.
162	28OCT81:12:20	04NOV81:13:15	253	45.6	0.79	2.13	1.50	0.24	0.24	.	237	0	.	.	.	.	.	.
163	04NOV81:13:15	06NOV81:12:50	47	44.2	0.63	3.63	0.71	0.08	0.24	0	197	.	.	.	.	.	.	.
164	06NOV81:12:50	12NOV81:12:15	47	45.6	1.11	3.00	1.34	0.08	0.24	0	276	.	.	.	.	.	.	.
165	12NOV81:12:15	18NOV81:12:42	47	15.8	0.79	3.06	1.50	0.00	0.16	0	0	.	.	.	.	.	.	.
166	18NOV81:12:42	25NOV81:12:07	.	30.0	1.74	4.74	2.29	0.00	0.16	869	197	.	.	.	.	.	.	.
167	25NOV81:12:07	03DEC81:11:42	464	12.6	1.74	2.53	2.05	0.00	0.16	0	0	.	.	.	.	237	.	.
168	03DEC81:11:42	10DEC81:12:25	790	56.9	2.05	3.24	2.37	0.00	0.16	0	0	.	.	.	.	.	.	.
169	10DEC81:12:25	16DEC81:12:05	190	22.1	1.26	1.97	0.79	0.08	0.08	0	0	.	.	.	.	.	.	.

HIGH VOLUME STATION DATA

STA=51HV01

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
1	15APR80	34.3	0.36	0.02	0.31	0.01	0.04	0.07	0.01	.	.	.	.
2	15MAY80	56.2	0.40	0.03	1.31	0.01	0.05	0.10	0.00	.	.	.	.
3	14JUN80	79.9	0.64	0.05	0.11	0.02	0.09	0.64	0.03	.	.	.	.
4	14JUL80	60.6	0.56	0.04	1.09	0.01	0.08	0.24	0.00	.	.	.	.
5	13AUG80	61.9	.	0.04	1.48	0.01	0.11	0.18	0.00	.	.	.	.
6	24SEP80	46.6	0.24	0.04	0.65	0.01	0.06	0.13	0.03	.	.	.	.
7	18OCT80	.	0.19	0.03	0.60	0.01	0.15	0.17	0.00	.	.	.	.
8	29NOV80	31.8	0.53	0.01	0.33	0.01	0.02	0.16	0.03	.	.	.	.
9	16JAN81	69.0	1.15	0.04	.	.	0.04	0.25	0.06	.	.	.	.
10	15FEB81	75.0	.	.	.	.	.	.	.	.	.	.	.
11	17MAR81	35.0	0.47	0.02	.	.	0.05	0.10	0.00	.	.	.	.
12	16APR81	84.3	0.59	.	0.75	0.02	0.05	0.58	0.03	.	.	.	.
13	16MAY81	44.4	0.45	0.04	0.62	0.01	0.38	0.10	0.18	.	.	.	.
14	15JUN81	74.4	1.66	0.06	1.10	0.02	0.11	0.26	0.22	.	.	.	.
15	15JUL81	53.1	0.30	0.04	0.29	0.01	0.08	0.20	0.21	0.01	0.23	0.11	0
16	14AUG81	91.5	1.23	0.06	1.63	.	0.09	0.41	0.19	.	.	.	.
17	13SEP81	109.0	2.65	0.07	1.48	0.02	0.09	0.31	0.00	.	.	.	.
18	13OCT81	60.7	0.53	0.04	1.36	0.01	0.14	0.45	0.00	0.03	0.59	0.12	0
19	18NOV81	60.2	2.03	0.04	1.72	0.02	0.09	0.15	0.00	.	.	.	.
20	18DEC81	48.3	0.89	0.02	0.92	0.01	0.10	0.26	0.00	.	.	.	.

STA=51HV02

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
21	15APR80	35.6	0.26	0.03	0.30	0.02	0.07	0.11	0.02	.	.	.	.
22	15MAY80	56.5	0.79	0.03	0.95	0.01	0.04	0.10	0.01	.	.	.	.
23	14JUN80	75.6	0.63	0.04	1.37	0.03	0.18	0.34	0.05	.	.	.	.
24	14JUL80	75.2	0.60	0.07	1.34	0.03	0.17	0.44	0.02	.	.	.	.
25	13AUG80	73.7	.	0.04	1.08	0.01	0.35	0.23	0.02	.	.	.	.
26	24SEP80	62.3	0.30	0.05	0.70	0.02	0.19	0.14	0.06	.	.	.	.
27	18OCT80	.	0.24	0.03	0.52	0.01	0.35	0.11	0.00	.	.	.	.
28	17NOV80	35.4	0.33	0.02	0.31	0.01	0.13	0.23	0.06	.	.	.	.
29	16JAN81	93.0	.	0.03	2.93	0.02	0.54	0.42	0.05	.	.	.	.
30	15FEB81	85.7	0.75	0.06	2.11	0.02	0.20	0.94	0.07	.	.	.	.
31	17MAR81	43.2	0.31	0.05	0.57	0.01	0.09	0.09	0.00	.	.	.	.
32	16APR81	65.0	0.68	0.18	0.65	0.03	0.19	0.11	0.09	.	.	.	.
33	16MAY81	41.1	0.35	0.04	0.54	0.01	0.10	0.16	0.30	.	.	.	.
34	15JUN81	85.7	1.50	0.07	1.10	0.01	1.08	0.19	0.14	.	.	.	.
35	15JUL81	47.4	0.33	0.05	0.83	0.01	0.59	0.21	0.17	0.01	0.22	0.10	0
36	20AUG81	64.5	0.49	0.08	1.17	0.02	0.20	0.31	0.26	.	.	.	.
37	13SEP81	86.6	3.18	0.07	1.44	0.02	0.58	0.20	0.00	.	.	.	.
38	13OCT81	53.3	0.48	0.05	1.20	0.01	0.13	0.42	0.00	0.01	0.17	0.11	0
39	18NOV81	56.5	2.04	0.04	1.57	0.01	0.13	0.24	0.00	.	.	.	.
40	18DEC81	35.2	1.36	0.02	0.96	0.01	0.28	0.26	0.00	.	.	.	.

HIGH VOLUME STATION DATA

STA=51HV03

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
41	15APR80	28.78	0.14	0.01	1.99	.	0.04	0.04	0.01	.	.	.	.
42	15MAY80	43.80	0.08	0.01	3.06	.	0.07	0.10	0.00	.	.	.	.
43	14JUL80	53.52	0.13	0.01	5.05	.	0.05	0.17	0.06	.	.	.	.
44	13AUG80	51.15	0.10	0.02	4.30	.	0.04	0.13	0.02	.	.	.	.
45	18SEP80	42.02	0.17	0.02	4.74	.	0.03	0.19	0.05	.	.	.	.
46	18OCT80	34.77	.	.	1.82	.	0.04	0.09	0.04	.	.	.	.
47	17NOV80	32.95	0.39	0.01	2.75	.	0.04	0.59	0.04	.	.	.	.
48	23NOV80	60.16	0.39	0.01	3.19	.	0.04	0.59	0.04	.	.	.	.
49	17DEC80	35.90	0.30	0.00	4.34	.	0.04	0.27	0.04	.	.	.	.
50	15FEB81	82.52	1.67	0.07	8.06	.	0.09	0.55	0.00	.	.	.	.
51	17MAR81	46.07	0.23	0.03	2.88	.	0.09	0.05	0.00	.	.	.	.
52	16APR81	45.55	0.44	0.09	3.77	.	0.06	0.04	0.00	.	.	.	.
53	16MAY81	36.76	0.32	0.03	2.48	.	0.10	0.11	0.15	.	.	.	.
54	15JUN81	68.26	0.63	0.06	3.68	.	0.09	0.15	0.15	.	.	.	.
55	14AUG81	77.53	0.78	0.07	6.65	.	0.30	0.20	0.27	.	.	.	.
56	13SEP81	85.43	1.26	0.06	5.14	.	0.14	0.26	0.21	.	.	.	.
57	13OCT81	42.02	0.31	0.04	4.96	.	0.09	0.29	0.25	0.01	0.11	0	0

STA=51HV04

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
58	15APR80	27.72	0.06	0.01	1.95	.	0.01	0.04	0.03	.	.	.	.
59	15MAY80	51.26	0.11	0.02	4.43	.	0.01	0.26	0.06	.	.	.	.
60	14JUL80	65.61	0.22	0.02	5.67	.	0.02	0.18	0.08	.	.	.	.
61	25AUG80	67.79	0.14	0.02	5.67	.	0.07	0.27	0.00	.	.	.	.
62	18SEP80	55.30	0.16	0.02	5.09	.	0.04	0.23	0.14	.	.	.	.
63	18OCT80	41.24	0.03	0.01	1.06	.	0.02	0.26	0.05	.	.	.	.
64	23NOV80	71.16	0.49	0.02	5.14	.	0.02	0.69	0.02	.	.	.	.
65	15FEB81	78.50	0.84	0.06	10.19	.	0.04	0.66	0.00	.	.	.	.
66	17MAR81	24.85	0.20	0.03	2.97	.	0.01	0.11	0.00	.	.	.	.
67	16APR81	61.50	0.40	0.10	3.59	.	0.02	0.27	0.64	.	.	.	.
68	16MAY81	34.16	0.24	0.02	2.04	.	0.02	0.10	0.22	.	.	.	.

STA=51HV05

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
69	15APR80	28.28	0.07	0.01	1.64	.	0.01	0.07	0.02	.	.	.	.
70	15MAY80	42.70	0.04	0.02	2.04	.	0.01	0.04	0.00	.	.	.	.
71	14JUL80	54.74	0.15	0.02	5.94	.	0.02	0.12	0.05	.	.	.	.
72	13AUG80	49.02	0.07	0.02	3.28	.	0.03	0.04	0.00	.	.	.	.
73	18SEP80	41.41	0.36	0.03	3.99	.	0.04	0.18	0.05	.	.	.	.
74	18OCT80	52.94	0.04	0.01	1.46	.	0.04	0.21	0.10	.	.	.	.
75	17NOV80	40.20	.	.	2.84	.	0.02	0.37	0.09	.	.	.	.
76	23NOV80	58.26	.	.	4.47	.	0.02	0.43	0.09	.	.	.	.
77	17DEC80	60.88	0.56	0.01	4.70	.	0.05	0.60	0.03	.	.	.	.
78	16JAN81	86.37	1.25	0.08	12.23	.	0.05	0.45	0.00	.	.	.	.
79	15FEB81	77.89	0.59	0.06	8.24	.	0.04	0.55	0.00	.	.	.	.
80	16APR81	55.17	0.38	0.09	3.59	.	0.02	0.15	0.00	.	.	.	.
81	16MAY81	39.59	0.50	0.03	3.59	.	0.04	0.07	0.22	.	.	.	.
82	15JUL81	92.71	0.29	0.04	1.86	.	0.04	0.15	0.22	0.01	0.28	0.05	0

HIGH VOLUME STATION DATA

STA=51HV05

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
83	14AUG81	96.76	0.86	0.06	6.02	.	0.04	0.37	0.21	.	.	.	.
84	13SEP81	93.59	1.68	0.05	6.20	.	0.07	0.30	0.25	.	.	.	.
85	13OCT81	72.30	0.71	0.07	5.32	.	0.05	0.36	0.26	0.08	0.2	0.05	0

STA=51HV06

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
86	15APR80	30	0.28	0.02	.	.	0.04	0.18	0.00	.	.	.	.
87	15MAY80	57	.	.	.	.	0.06	0.23	0.00	.	.	.	.
88	14JUN80	77	0.60	0.03	.	.	0.05	0.27	0.06	.	.	.	.
89	14JUL80	71	0.52	0.03	.	.	0.07	0.62	0.00	.	.	.	.
90	13AUG80	83	.	.	.	.	0.08	0.28	0.00	.	.	.	.
91	18OCT80	37	0.19	0.03	.	.	0.06	0.21	0.09	.	.	.	.
92	17NOV80	39	0.22	0.02	.	.	0.05	0.36	0.04	.	.	.	.
93	17DEC80	56	0.62	0.03	.	.	0.13	0.52	0.00	.	.	.	.
94	16JAN81	91	0.75	0.04	.	.	0.15	0.30	0.00	.	.	.	.
95	15FEB81	118	.	.	.	.	0.17	1.26	0.00	.	.	.	.
96	17MAR81	29	0.26	0.04	0.44	0.01	0.06	0.10	0.00	.	.	.	.
97	16APR81	62	2.02	0.16	.	.	0.09	0.35	0.00	.	.	.	.
98	16MAY81	35	0.56	0.04	0.25	0.00	0.08	0.09	0.00	.	.	.	.
99	15JUN81	63	1.20	0.09	1.80	0.02	0.26	0.24	0.18	.	.	.	.
100	15JUL81	33	0.25	0.04	0.79	0.01	0.10	0.27	0.23	0.03	0.13	0	0
101	14AUG81	72	0.96	0.07	3.11	0.00	0.18	0.39	0.24	.	.	.	.
102	13SEP81	90	1.27	0.04	1.14	0.02	0.11	0.24	0.25	.	.	.	.
103	13OCT81	56	0.33	0.05	1.17	0.01	0.05	0.47	0.33	0.02	0.32	0	0
104	18NOV81	53	1.63	0.03	1.40	0.01	0.04	0.21	0.25	.	.	.	.
105	18DEC81	36	1.07	0.01	.	.	0.04	0.21	0.18	.	.	.	.
106	17JAN82	45	0.28	0.02	0.62	0.00	0.18	0.11	0.18	0.01	0.15	0	0

STA=51HV07

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
107	15APR80	21.6	0.20	0.03	0.37	0.00	0.09	0.04	0.00	.	.	.	.
108	15MAY80	49.2	.	0.03	0.83	0.01	0.09	0.06	0.00	.	.	.	.
109	14JUN80	60.7	0.45	0.04	1.19	0.04	0.14	0.10	0.00	.	.	.	.
110	14JUL80	49.4	0.43	0.04	1.19	0.02	0.11	0.14	0.00	.	.	.	.
111	13AUG80	57.2	0.34	0.03	0.83	0.03	0.13	0.09	0.00	.	.	.	.
112	18SEP80	46.8	0.56	0.02	2.36	.	0.14	0.19	0.00	.	.	.	.
113	15OCT80	61.4	0.44	0.01	1.84	.	0.15	0.17	0.00	.	.	.	.
114	17NOV80	35.3	0.33	0.01	1.16	.	0.15	0.24	0.16	.	.	.	.
115	14DEC80	24.2	0.28	0.02	.	.	0.09	0.10	0.27	.	.	.	.
116	16JAN81	92.5	1.57	0.06	.	.	0.93	0.24	0.02	.	.	.	.
117	15FEB81	85.5	0.97	0.06	.	.	0.06	0.46	0.01	.	.	.	.
118	13MAR81	54.0	0.50	0.06	.	.	0.04	0.06	0.00	.	.	.	.
119	16APR81	79.0	0.85	.	.	.	0.04	0.14	0.00	.	.	.	.
120	16MAY81	36.8	1.11	0.13	.	.	0.02	0.04	0.04	.	.	.	.
121	15JUN81	71.0	1.40	0.05	0.90	0.01	0.04	0.08	0.19	.	.	.	.
122	15JUL81	.	0.00	0.02	.	.	0.02	0.01	0.40	0.01	0.02	0	0
123	14AUG81	69.4	0.92	0.05	1.50	0.00	0.08	0.17	0.38	.	.	.	.
124	16SEP81	.	0.43	0.03	0.84	0.01	0.07	0.26	0.08	.	.	.	.

HIGH VOLUME STATION DATA

STA=51HV07

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
125	13OCT81	43.3	0.43	0.02	1.33	0.01	0.07	0.28	0.04	0.01	0.18	0	0
126	15NOV81	29.7	0.06	0.02	0.69	0.00	0.04	0.11	0.08	.	.	.	.
127	18DEC81	36.7	0.91	0.01	0.91	0.00	0.03	0.14	0.05	.	.	.	.
128	14JAN82	56.4	1.33	0.01	1.25	0.00	0.04	0.21	0.14	0.01	0.11	0	0

STA=51HV08

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
129	15APR80	21.0	0.27	0.01	0.34	0.00	0.14	0.02	0.00	.	.	.	.
130	15MAY80	44.5	0.39	0.02	0.54	0.01	0.22	0.12	0.00	.	.	.	.
131	14JUN80	54.6	0.30	0.04	1.05	0.03	0.34	0.17	0.00	.	.	.	.
132	14JUL80	44.5	0.41	0.03	0.92	0.03	0.20	0.16	0.00	.	.	.	.
133	13AUG80	52.8	0.95	0.04	0.74	0.02	0.04	0.27	0.00	.	.	.	.
134	18SEP80	44.4	0.63	0.03	1.26	.	0.03	0.17	0.00	.	.	.	.
135	15OCT80	88.8	0.45	0.03	.	.	0.03	0.62	0.00	.	.	.	.
136	17NOV80	45.8	0.53	0.02	1.14	.	0.04	0.57	0.11	.	.	.	.
137	14DEC80	29.8	0.12	0.00	.	.	0.04	0.09	0.33	.	.	.	.
138	16JAN81	75.9	.	.	.	.	0.07	0.30	0.05	.	.	.	.
139	15FEB81	49.9	0.14	0.03	.	.	0.03	0.12	0.00	.	.	.	.
140	13MAR81	61.8	0.38	0.08	.	.	0.03	0.09	0.00	.	.	.	.
141	16APR81	59.3	0.60	0.06	.	.	0.03	0.12	0.00	.	.	.	.
142	16MAY81	48.3	0.67	0.02	0.31	0.00	0.02	0.07	0.00	.	.	.	.
143	15JUN81	80.4	1.39	0.05	1.05	0.01	0.06	0.17	0.13	.	.	.	.
144	15JUL81	77.2	0.24	0.06	0.66	0.00	0.04	0.12	0.36	0.02	0.59	0	0
145	14AUG81	90.4	0.76	0.05	1.14	0.00	0.03	0.18	0.35	.	.	.	.
146	16SEP81	.	0.53	0.04	0.42	0.01	0.03	0.17	0.02	.	.	.	.
147	13OCT81	52.3	0.39	0.02	1.19	0.01	0.04	0.48	0.05	0.02	0.25	0	0
148	15NOV81	30.2	0.13	0.02	0.55	0.00	0.02	0.11	0.07	.	.	.	.
149	18DEC81	36.9	0.91	0.01	0.59	0.00	0.02	0.21	0.04	.	.	.	.
150	14JAN82	52.9	1.32	0.02	0.24	0.00	0.03	0.20	0.06	0.01	0.09	0	0

STA=51HV09

OBS	DATE	TSUSP	TKN	TP	NO23	OP	ECU	EPB	EZN	EMN	EFE	ECR	ECD
151	14AUG81	68.25	0.63	0.05	5.63	.	0.06	0.26	0.16	.	.	.	.
152	13OCT81	59.13	0.53	0.04	6.78	.	0.06	0.55	0.22	0.02	0.14	0.04	0

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