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JAN 12 1998

DOE-0254-98

Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF THE DRAFT PRELIMINARY WETLAND MITIGATION ASSESSMENT

Enclosed for your review and approval is the revised draft Preliminary Wetland Mitigation Assessment. In addition, draft responses to the U.S. Environmental Protection Agency (U.S. EPA) comments on the subject document are enclosed. This assessment was revised based on these comments. The assessment evaluates three alternatives for their potential of supporting on-property wetland mitigation. In addition, the assessment provides a recommendation for the most feasible alternative to address a portion of our commitment for wetland mitigation. An additional letter is forthcoming providing a proposed strategy for all wetland mitigation activities at the site.

If you have any questions or require additional information, please contact Pete Yerace at (513) 648-3161, or me at (513) 648-3139.

Sincerely,

Johnny Reising

FEMP:Yerace

Johnny W. Reising
Fernald Remedial Action
Project Manager

Enclosures: As Stated

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PRELIMINARY WETLAND MITIGATION ASSESSMENT

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

DECEMBER 1997

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

20300-RP-0006
REVISION C
DRAFT

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LIST OF ACRONYMS

ACOE	U.S. Army Corps of Engineers
BOD_5	Biochemical Oxygen Demand - 5 Day Method
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWA	Clean Water Act
D.O.	Dissolved Oxygen
DOE	Department of Energy
FEMP	Fernald Environmental Management Project
MSL	mean sea level
NRRP	Natural Resource Restoration Plan
NRTs	Natural Resource Trustees
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
P-T	Total Phosphorous
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
TSS	Total Suspended Solids
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

EXECUTIVE SUMMARY

The U.S. Department of Energy's (DOE) Fernald Environmental Management Project occupies 1,050 acres in rural southwestern Ohio, approximately 18 miles northwest of downtown Cincinnati, Ohio. From 1953 to 1989, Fernald produced high-purity uranium metal products in support of U.S. Defense Programs. Production was halted in 1989, after the U.S. Environmental Protection Agency (USEPA) placed the site on the National Priority List and remedial efforts were initiated under the Comprehensive Environmental Response, Compensation, and Liabilities Act (CERCLA).

The 1993 wetland delineation identified approximately 36 acres of jurisdictional wetlands and 8.9 acres of waters of the United States within the 1,050-acre property. Although Fernald plans to avoid or minimize impacts to these areas to the maximum extent practicable during remediation, some unavoidable impacts requiring mitigation are anticipated. These impacts are potentially subject to compensatory wetland mitigatory requirements under applicable federal and state regulations promulgated to implement the requirements of Sections 404 and 401 of the Clean Water Act (CWA). In recognition of this fact, a comprehensive sitewide approach is in the process of being developed to integrate CWA Section 404 driven mitigatory requirements into the CERCLA process.

On June 20, 1995, DOE met with representatives from USEPA, Ohio Environmental Protection Agency (OEPA), U.S. Fish and Wildlife Service (USFWS), and Ohio Department of Natural Resources (ODNR) to present a conceptual proposal for addressing wetland mitigatory requirements at DOE's Fernald site. Key aspects of the DOE proposal included the preference for addressing mitigatory requirements on-property within the general locale of the 26-acre northern forested wetland, mitigating the entire ten-acre wetland impacts through restoration or creation actions with one concerted effort.

All parties concurred that the DOE conceptual approach represented a reasonable means for addressing the wetland mitigatory issue and agreed to an established mitigation ratio of 1:1.5 acres.

This preliminary wetland mitigation assessment addresses the potential for conducting on-property wetland mitigation through the evaluation of three alternatives. Each alternative was evaluated based on existing data and field observations. While all alternatives possessed some potential for wetland

mitigation, some alternatives were not as feasible based on the issues of habitat fragmentation and inadequate soils and hydrology.

The alternative recommended for further study to potentially conduct on-property wetland mitigation includes the expansion of the 26-acre northern forested wetland by utilizing the southwest meadow area within the woodlot and the open meadow area adjacent and south of the woodlot. This alternative was selected based on accessability, near-term implementation and minimal issues of habitat fragmentation. Based on the results of the watershed study conducted in the forested wetland, there is some uncertainty associated with supporting all 15 acres of mitigated wetlands in the northern woodlot.

1.0 INTRODUCTION

Pursuant to Section 404 of the Clean Water Act (CWA), activities resulting in the discharge of dredge or fill material into waters of the United States, including wetlands, require permit authorization from the U.S. Army Corps of Engineers (ACOE). As part of the Section 404 permitting process, compensatory wetland mitigation in the form of wetland enhancement, restoration, or construction may be required to off-set impacts sustained under a Section 404 permit.

As a result of the on-property wetlands delineation, approximately 36 acres of freshwater wetlands have been identified across the five operable units at the Fernald Environmental Management Project (FEMP). These areas include approximately 27 acres of forested wetlands and nine acres of emergent/scrub wetlands. Based on an analysis of projected wetlands impacts outlined in the remedial investigation/feasibility study (RI/FS) documents it is anticipated that approximately ten acres of on-property emergent wetlands will be impacted during remediation.

On June 20, 1995, the U.S. Department of Energy (DOE) met with representatives from U.S. Environmental Protection Agency (USEPA), the Ohio Environmental Protection Agency (OEPA), U.S. Fish and Wildlife Service (USFWS), and the Ohio Department of Natural Resources (ODNR) to present a conceptual proposal for addressing effective implementation of wetland mitigation in conjunction with the occurrence of remedial activities over a long duration at DOE's Fernald site near Cincinnati, Ohio. Key aspects of the DOE proposal included the preference for addressing mitigatory requirements on-property within the general locale of the 26-acre northern forested wetland, mitigating the entire ten-acre wetland impact through restoration or creation actions with one concerted effort.

After a period of discussion, all parties concurred that the DOE conceptual approach represented a reasonable means for addressing the wetland mitigatory issue. To further clarify the specific aspects of the conceptual approach, a mitigatory ratio of 1:1.5 acres was established at the meeting. DOE also committed to providing all agencies represented at the meeting with additional detail on the feasibility of conducting on-property mitigation within the Paddys Run corridor and within the general locale of

the northern forested and isolated wetland systems located in the northern portion of the site. Specific alternatives that were to be evaluated within each of these are as follows:

- Alternative 1 - Paddys Run Corridor: Establishment of newly created wetland areas in association with the Paddys Run corridor and existing on-property tributaries.
- Alternative 2 - Northern Forested/Northern Isolated Wetland: Expansion of the northern forest wetland and isolated wetland systems within the 100-acre woodlot, through restoration/creation actions.
- Alternative 3 - Northern Forested Wetland: Expansion of the 26-acre northern forested wetland only, utilizing the open meadow area adjacent and south of the 26-acre forested wetland, through restoration/creation actions.

Characterization data (water quality and surface water flow) for the Northern Forested Wetland area were limited; therefore, it was necessary to conduct a watershed study. This study assessed surface water quality and surface water flows within two 40-acre watershed systems by collecting and analyzing influent and effluent samples at five monitoring locations within the watershed systems. Flow weighted composite samples were collected at each monitoring location during independent storm events to determine the quality and quantity of stormwater runoff entering and leaving the watershed. Flow weighted composite samples were analyzed for Biochemical Oxygen Demand - 5 Day Method (BOD_5), Total Suspended Solids (TSS), Total Phosphorous (P-T), Nitrate-Nitrogen, Total Uranium, and Fecal Coliform to determine water quality and mass loadings attributable to stormwater runoff within each watershed. These water quality data provide a baseline which could potentially be used in evaluating the offset of lost water quality functions from impacted wetlands. H-flumes and automated flow meters recorded and totaled stormwater flows throughout the duration of the hydrograph for each storm event.

A total of seven independent storm events were sampled during the Fall of 1995 and Spring of 1996. Data from this study indicate that further study would be conducive for determining the feasibility of on-property wetland mitigation. In addition, the areal extent of on-property wetland mitigation will be determined within a separate wetland mitigation conceptual design plan.

2.0 SITE BACKGROUND

The FEMP occupies 1,050 acres in rural southwestern Ohio, approximately 18 miles northwest of downtown Cincinnati, Ohio. From 1953 to 1989, Fernald produced high-purity uranium metal products in support of U.S. defense programs. Production was halted in 1989, after the USEPA placed the site on the National Priority List and remedial efforts were initiated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The site is bounded by Paddys Run Road on the west, Willey Road to the south, and Route 126 to the north. The eastern boundary is formed by a generally straight line and average of 6,000 feet east of Paddys Run Road. The site is located at approximately 39°18'06" north latitude and 84°42'30" west longitude at its center. Topography is mainly level to gently sloping throughout, with elevations ranging from a high point of approximately 700 feet mean sea level (MSL) within the northeastern reaches of the site, to a low point of 550 feet MSL within the Paddys Run corridor at the southwestern corner of the site. Slopes associated with on-site stream channels are severe. The site lies within the Great Miami River Drainage Basin, with the river flowing approximately 1.5 miles to the east (Figure 1).

Aside from the centrally located former production facility, which occupies approximately 136 acres of the 1,050 acre property, most of the site is either pastureland or a combination of scrub and climax forest. Prior to construction in 1951, nearly the entire site was in agricultural use and portions of the site outside the present-day production area are still leased for cattle grazing. Two pine plantations, located in the northern and southwestern sections of the site, were planted in 1973 as part of an environmental improvement project. Most of the site, with the exception of the easternmost section, drains to the west/southwest towards Paddys Run. Paddys Run is an intermittent ungaged stream that runs roughly parallel to the western boundary of the site. A number of deeply incised smaller tributaries to Paddys Run occur throughout the western and southwestern portions of the site.

3.0 NATURE AND EXTENT OF WETLAND IMPACTS

As a result of a 1993 wetland delineation, approximately 36 acres of jurisdictional wetlands were identified within the Fernald property (Ebasco 1993), which are potentially subject to compensatory wetland mitigation requirements under Sections 404 and 401 of the Clean Water Act (Figure 2). These wetland areas include approximately 26.58 acres of forested wetlands, 6.95 acres of drainage ditch/swales, and 2.37 acres of isolated persistent emergent and isolated scrub/shrub persistent emergent wetlands.

Although DOE plans to avoid and minimize wetland impacts to the maximum extent practicable during remediation of the site under CERCLA, some unavoidable impacts requiring mitigation are anticipated. Wetland mitigation requirements are determined through application of USEPA's 404(b)(1) Guidelines promulgated in 40 CFR Part 230 and are implemented through compliance with substantive permitting requirements during the conduct of response/remedial actions.

DOE has determined that approximately ten acres of unavoidable wetland impacts located south of the forested wetlands, will occur as a result of remedial activities conducted at the site. These impacts consist of drainage ditch/swale and isolated emergent wetland areas located within the footprint of soil excavation (DOE 1995). A sitewide wetland mitigation plan must be developed to address wetland mitigatory requirements as the site moves into the remedial design and remedial action phases of cleanup.

4.0 ANALYSIS OF ALTERNATIVES

A 1995 meeting with the regulatory agencies resulted in an agreement that three alternatives for on-property mitigation would be evaluated. These alternatives included Paddys Run Corridor, Northern Forested/Northern Isolated Wetland, and Northern Forested Wetland Area (Figure 3).

Three principle criteria were used in assessing the potential for converting upland areas to wetlands: topography, soil, and hydrology. Topography was evaluated to indicate the extent of excavation required to obtain adequate hydrology to support the development of hydric soil conditions. Soil types were evaluated to assess their potential to become impermeable. Perched water is generally found between one and ten feet below the surface. The top of the Great Miami Aquifer is about 82 feet beneath the FEMP.

4.1 ALTERNATIVE 1 - PADDYS RUN CORRIDOR

The portion of Paddys Run Corridor which provides the west boundary of the site was evaluated for the potential to support wetland mitigation. Three sampling sites were evaluated along Paddys Run and were selected based on change in vegetation and topography. At each sampling location, topography, soil, and hydrology were observed from three different locations from the center of the stream. No actual samples were taken, only visual observations were recorded in conjunction with review of published data. These observations include the stream bed, stream banks and areas adjacent to the stream bank.

The bed of Paddys Run lies on sands and gravel of the Great Miami Aquifer. Portions of the bed were deeply cut, reaching a depth of 20 feet below the stream banks in some areas. The exposed stream banks of Paddys Run exhibit large deposits of sand and a thin layer of soil in the southern portion of the stream. The northern portion of Paddys Run contained steep banks with an occasional clay lens. Periodic clay layers on the bed of the stream were a contributing factor to periodic pooled areas in the northern part of the stream. Maximum depth of pooled areas was one meter with observed minnow activity and fine clay and silt covering rocks and sand. As clay replaces sand and gravel in the stream bed in the northern portion of Paddys Run, erosion decreases, infiltration to the Great Miami Aquifer decreases, and the stream banks are lower. Perched water is generally 3-5 feet below the ground surface (DOE 1994) of Paddys Run.

The southern two-thirds of Paddys Run Corridor is situated on sand and gravel did not contain water at the time of the study. Two tributaries were dry, with a third tributary entering from the east with minimal water flow. Paddys Run recharges the aquifer at a rate of approximately 14 inches per year in this area. The portion of Paddys Run just south of the K-65 silos continually infiltrates to the Great Miami Aquifer. This area has been eroded by Paddys Run causing exposure of the aquifer.

Soil types within Paddys Run Corridor are classified as Fincastle in the northern reach of Paddys Run and Hennepin in the southern reach (USDA 1982). Fincastle soils are Class C, indicating a somewhat poorly drained soil as evidenced by field observations. Hennepin soils are Class B, indicating a moderate infiltration rate, and are located on slopes along streams.

Paddys Run Corridor would not be conducive to wetland mitigation. The southern reach of Paddys Run does not contain the potential for hydrologic or soil conditions that would support wetland mitigation. Surface water flow rapidly infiltrates into the Great Miami Aquifer and the soil type is moderately well drained. The northern reach of Paddys Run contains the potential to support wetland mitigation. However, since stream flow is intermittent and the stream banks are high in the northern reach, surface water overflow of the western bank does not occur. Extensive excavation of the stream banks would be required to supply wetland hydrology, causing a dramatic change to stream configuration. Any alteration to this portion of the stream would alter the stream ecology and associated habitat of the Sloan's crayfish, which is listed as a threatened species in the State of Ohio.

4.2 ALTERNATIVE 2 - NORTHERN FORESTED/NORTHERN ISOLATED WETLAND

Two meadow areas and one meadow/deciduous forest area adjacent to the northern forested wetlands were assessed for wetland mitigation potential. One meadow is located in the northwest corner of the woodlot and the other two areas are located in the southern portions of the woodlot.

4.2.1 Northwest Meadow

The meadow area in the northwest corner is near the isolated wetland located in the northwest corner of the site, is surrounded by trees and has limited overland flow approaching the area, as most of the land slopes away to the north and south. Some topographic alteration would be required to redirect surface flow toward the meadow to provide sufficient water to support wetland conditions. The soil type is a Class B Xenia silt loam which is moderately well drained (Ebasco 1993). Additional clay soil and soil

compaction would be needed for this meadow area to contain water. Perched water is generally 3-5 feet below the ground surface (DOE 1994); however, perched water data is limited in this area. Equipment access to this remote area is limited and would entail partial deforestation and associated habitat fragmentation of the woodland. The northwest meadow area would require extensive intrusive efforts due to limited water availability and importation of additional soil, causing habitat fragmentation. Therefore, this area is not recommended for wetland mitigation.

4.2.2 Southwest Meadow

The southwest meadow/deciduous forest contains two types of soil, a Class D Ragsdale silty clay loam, which is poorly drained and suitable for wetland formation, and a Class B Xenia silt loam, which is moderately well drained (Ebasco 1993). The western portion of the meadow area is drained by the western most drainage appendage of the forested wetland area. Perched water is generally 3-5 feet below the ground surface (DOE 1994), however, perched water data in this area is limited. To supply water to this meadow area would require construction of a berm to restrict surface water flow into the drainage appendage to cause a backflow. Restriction of surface water flow would impact surface water hydrology of the southernmost reach of this drainage appendage and would preclude the implementation of Alternative 3. This area is elevated. Extensive excavation would be required to lower the elevation of the meadow for adequate surface water supply, causing some habitat fragmentation. In addition, importation of some additional soil and accessibility of equipment would cause some habitat fragmentation of other areas in the northern woodlot. Conducting wetland mitigation in this area would impact the surface water hydrology of the open meadow area under consideration for Alternative 3, which has the potential to support the largest areal extent of on-property wetlands. Therefore, wetland mitigation in the southwestern meadow/deciduous forest area is not recommended.

4.2.3 Southeast Meadow

The southeast meadow contains a Class B Xenia silt loam which is moderately well drained (Ebasco 1993). The western portion of this meadow area is drained by the eastern most drainage appendage of the forested wetland. Perched water is generally 3-5 feet below the ground surface (DOE 1994); however, perched water data in this area is limited. To supply water to this meadow area would require construction of a berm to restrict surface water flow which would impact surface water hydrology of the southern most reach of this drainage appendage and would preclude the

implementation of Alternative 3. Therefore, wetland mitigation in the southeastern meadow is not recommended.

4.3 ALTERNATIVE 3 - NORTHERN FORESTED WETLAND AREA

This alternative is located in the open meadow area adjacent to and south of the 26-acre forested wetland area and is being considered to expand the 26-acre forested wetland area. The topography within the meadow area ranges from 585 feet MSL near the eastern edge to 565 feet MSL of the western edge. Vegetation consists predominately of red fescue with a Class B Xenia silt loam soil which is moderately well drained and a Class C Fincastle silt loam which is somewhat poorly drained (Ebasco 1993). Perched water is generally 3-5 feet below the ground surface (DOE 1994); however, perched water data in this area is limited.

The open meadow area is accessible and conducive for establishing the necessary slopes and depressional areas for wetland mitigation. To assess the potential of conducting on-property wetland mitigation utilizing the open meadow area adjacent and south of the 26-acre forested wetland area, it was necessary to understand the dynamics of the watershed influence upon this open meadow area by conducting a watershed study which is presented in Section 5.

5.0 WATERSHED STUDY

This watershed study was developed to assess general surface water quality and to evaluate surface water flow rates of two 40-acre watershed systems using flume measurements and hydrologic calculations. These watershed boundaries were delineated from a United States Geologic Survey topographic map. The 26-acre forested wetland is located within the watershed systems. Characterization of the watersheds is necessary to evaluate the feasibility of conducting on-property wetland mitigation by using the 26-acre forested wetland to hydrologically capacitate additional wetlands. These watershed systems were selected for study since they are not expected to be impacted by remedial activities. The data acquired from this study will support an evaluation of the potential for using the 26-acre forested wetland as a mitigatory option at Fernald during the design of remedial activities.

The watershed systems are situated at the southern edge of the Till Plains section of the Central Lowland physiographic province. The northern elevation of the watersheds is about 700 feet above MSL, gently sloping at about 580 feet MSL. Natural surface drainage is to the west/southwest towards an intermittent ungaged stream. The watershed is a early to mid-successional woodland with some interspersed open meadows.

5.1 MATERIALS AND METHODS

Three methods and materials are described: H-flume Installation, Surface Water Sampling, and Analytical Procedures.

5.1.1 H-flume Installation

Five sampling stations were established using pre-manufactured fiberglass H-flumes and automated samplers and flow meters. Stations 1, 2, and 3 were used to collect influent samples, and Stations 4 and 5 were used to collect effluent samples from the watersheds (Figure 4). Each flume was installed level with the surface water flow direction within the channel. Plywood backing was mounted to the upstream end of each flume with approximately three feet of plywood extending on each side to the flume to ensure stability within the stream channel and channelization of surface water flow. A pickax was used to excavate a perpendicular trench into the bank of the channel to allow placement of the plywood extension. Bentonite clay was placed within the trench to prevent water seepage under and

around the flume. A 6-inch layer of pea gravel was placed over the bentonite seal to reduce turbidity of surface water. Sand bags were placed between the channel bank and each side of the flume to provide additional stability.

5.1.2 Surface Water Sampling

Battery powered portable samplers and flow meters were used to automatically collect surface water samples and measure flow levels and flow rates. The sampler and flow meter were placed and secured on level wooden pallets. Each portable sampler was connected to a flow meter enabling flow-weighted composite samples to be collected at the downstream end of the flume. Fecal coliform samples were collected manually using thio-bags. Samples were analyzed to determine nutrient concentrations and mass loadings within Watershed A (Sampling Stations 1, 2, 3, and 4) and Watershed B (effluent Sampling Station 5). Influent data were not collected for Watershed B since channelized areas conducive for collecting influent data do not exist for Watershed B (Figure 5).

Concurrent sampling occurred at one hour intervals, obtaining the first sample, if possible within the first 30 minutes of the storm event. When the peak of the hydrograph was established, samples were collected on a flow-proportional basis up to 2-3 hours, depending upon the intensity of flow, to ensure adequate characterization of the storm event. Flow data was collected throughout the duration of each storm event. A 24-hour lag time between storm events ensured representative mass loadings within the watershed. Sampling equipment was installed and operational in August 1995, with the first valid storm event in October 1995.

5.1.3 Analytical Procedures

Surface water quality parameters were analyzed using the following conventional methods and/or instrumentation:

- Total Suspended Solids (TSS) - EPA Method 160.2 "Residue, Non-Filterable"
- Total Uranium - Kinetic Phosphorescence
- Nitrogen as Nitrate/Nitrite (NO_3-NO_2) - Automated Continuous Flow Analyzer
- Fecal Coliform - Membrane Filter Method 9222 D
- Biochemical Oxygen Demand (BOD) - 5-Day BOD Method 5210 B
- Total Phosphorous (P-T) - Ascorbic Acid Method 4500-P E.

Field measurements of pH and dissolved oxygen (D.O.) were obtained by using a Horiba meter.

5.2 RESULTS AND DISCUSSION

Seven independent storm events encountered during the Fall of 1995 and the Spring of 1996 were the basis of the watershed study (Table 1). The data presented in this table indicate general characteristics of the watershed by comparing the amount of flow which passed through each station over the duration of the study. Precipitation data are presented to provide a general idea of the relationship between amount of flow and conditions of watershed saturation.

Results from Table 1 indicate that, in general, as conditions become more saturated more water passes through the watershed. These trends support typical watershed characteristics of increased flows during more saturated conditions. Visual field observations during Storm Event 7 indicated submerged conditions with braided flow, preventing free-flowing conditions and quantification of flow conditions.

Average mass loadings of water quality parameters were relatively uniform for all sampling stations (Table 2). Fecal coliform counts were elevated at the influent sampling stations compared to the effluent sampling stations and may be attributed to the predominance of cattle grazing activity near the influent sampling points. The fecal coliform counts were performed for five storm events since the hold times were exceeded for two storm events. Influent water quality levels are expected to be higher due to the initial flush of water quality parameters into the watershed system. Total Uranium was well below the established final remediation level of 0.53 mg/l (DOE, 1995) and was analyzed to address potential contaminant concerns associated with on-property wetland mitigation.

Mass loadings were calculated and averaged for each sampling station (Table 2). Higher mass loadings for TSS at effluent Stations 4 and 5 may be influenced from increased cattle grazing activity upstream of these stations.

Total runoff volumes were obtained from the flow meters at each sampling station (Table 1). Storm Event 1 (2.46 inches of precipitation) displayed the highest runoff volume, followed by Storm Event 6 (1.8 inches of precipitation). Complications with the flow device precluded the use of flow data from the Station 5 sampler. Continued efforts to correct the problem with the flow device were unsuccessful. Therefore, total runoff flows for Station 5 (Watershed B) were calculated using a ratio containing the known acreage of the watershed drainage basins and the known runoff volume from Station 4 (Watershed B).

Visual field observations during Storm Event 7 indicated submerged conditions with braided flow, preventing free-flowing conditions and thus quantification of flow conditions. It is inferred that 0.9 inches of rain during Storm Event 7 in saturated spring season conditions would further support a linear decrease in percent of watershed uptake. These trends support the expected outcome of higher watershed storage capacity during unsaturated conditions (fall season) and lower watershed storage capacity during saturated conditions (spring season).

Preliminary calculations indicate that 9.8 million gallons of water would be required to inundate 15 acres of surface area at a two foot depth. Data from this study indicate an average flow over six storm events of 218,663 gallons at Stations 4 and 5 (located in the open meadow area) and an average of 291,794 gallons at Stations 4 and 5 during the wetter portion of the season (January-March 1996). These calculations are preliminary and do not account for the type of wetland ecosystem to be supported by the available hydrology. However, these calculations do suggest some uncertainty associated with supporting all 15 acres of mitigated wetlands in the Northern Woodlot. A conceptual design for wetland mitigation will be prepared to provide detail on the areal extent of wetland mitigation and specific vegetation types.

Watershed A and Watershed B are comparatively similar. Surface water enters the site at the northern boundary and becomes channelized until it reaches a flat, open area in the middle of the watershed. Once this flat open area becomes saturated, surface water rechannelizes and continues to an open meadow area and eventually to Paddys Run. The data available to characterize Watershed B is limited to the effluent since a channelized area conducive to collecting influent data does not exist. Since Watershed B is approximately 0.5 acres larger than Watershed A, with similar topographic relief, it is assumed that influent data would be similar to Watershed A. Average concentrations and mass loadings of BOD_5, were higher in Watershed B, while total runoff volumes were nearly the same as compared to effluent Station 4 of Watershed A.

Alternative 3 is recommended for further pursuit of on-property wetland mitigation based on accessibility, near-term implementation, and supporting watershed data. The type and size of wetland system to be created will be determined during conceptual design. Total runoff volume data collected during wetter than average fall and spring seasons (Table 3) will be addressed within the conceptual

design plan. Table 3 indicates the duration of the watershed study experienced 5.71 inches of rainfall above the 30-year average.

6.0 CONCLUSION

This preliminary wetland mitigation assessment addresses the potential for conducting on-property wetland mitigation through the evaluation of three alternatives. Each alternative was evaluated based on existing data and primary criteria of typography, soil, and hydrology. While all alternatives possessed some potential for wetland mitigation, some alternatives were not as feasible based on available wetland parameters, accessability, and habitat fragmentation.

Alternative 1, the Paddys Run Corridor, would not be conducive to wetland mitigation. The southern reach of Paddys Run does not contain the potential for hydrologic or soil conditions that would support wetland mitigation. Surface water flow rapidly infiltrates into the Great Miami Aquifer and the soil type is moderately well drained. The northern reach of Paddys Run contains the potential to support wetland mitigation. However, since stream flow is intermittent and the stream banks are high in the northern reach, surface water overflow of the banks does not occur. Extensive excavation of the stream banks would be required to supply wetland hydrology, causing a dramatic change to stream configuration. Any alteration to this portion of the stream would alter the stream ecology and associated habitat of the Sloan's crayfish, which is listed as a threatened species in the State of Ohio.

Alternative 2 consisted of three meadow areas adjacent to the northern forested wetlands that are not recommended for wetland mitigation. The northwest meadow would require additional clay soil and soil compaction for this meadow area to contain water. Equipment access to this remote area is limited and would entail partial deforestation and associated habitat fragmentation of the woodland. The northwest meadow area would require extensive intrusive efforts due to limited water availability and importation of additional soil, causing habitat fragmentation. The supply of hydrology to the southwest meadow/deciduous forest and southeast meadow areas would require construction of a berm to restrict surface water flow into the drainage appendage to cause a backflow. Restriction of surface water flow would impact surface water hydrology of the southernmost reach of this drainage appendage and would preclude the implementation of Alternative 3. In addition, due to the elevation of the southwest/deciduous forest and southeast meadow areas, extensive excavation would be required to lower the elevation for adequate water supply, causing some habitat fragmentation. In addition, importation of some additional soil and accessability of equipment would cause some habitat fragmentation of other areas in the northern woodlot. Conducting wetland mitigation in these areas

would impact the surface water hydrology of the open meadow area under consideration for Alternative 3, which has the potential to support the largest areal extent of on-property wetlands. Therefore, wetland mitigation in the southwest/deciduous forest area and southeastern meadow is not recommended.

Alternative 3 was recommended to further evaluate conducting on-property wetland mitigation based on accessability, near-term implementation, minimal issues of habitat fragmentation, and supporting watershed data. Additional clay and soil compaction may be necessary to implement this alternative. However, the results of the watershed study conducted in the forested wetland suggest some uncertainty associated with establishing all 15 acres of mitigated wetlands in the northern woodlot.

The results from seven independent storm events which comprised the watershed study indicated mass loading of water quality parameters into the dual watershed. Total suspended solids and BOD_5 mass loadings were most prevalent at all sampling stations. The contribution of these two water quality parameters may be related to land use within and adjacent to the watersheds. Cattle grazing within the watershed and agricultural practices upstream and adjacent to the watershed may be influencing mass loading. This water quality data provides a baseline which could potentially be used in evaluating the offset of lost water quality functions from impacted wetlands.

The two 40-acre watershed systems exhibited an expected initial high storage during unsaturated conditions followed by decreased storage during saturated conditions. Total runoff volumes indicate it is conducive to further evaluate the feasibility of supporting on-property wetland mitigation. The type and size of wetland system to be supported by such hydrology will be determined during conceptual design. Total runoff volume data collected during a wetter than average spring season will also be addressed within the conceptual design plan.

The conceptual design plan for wetland mitigation will be evaluated and presented as part of the Natural Resource Restoration Plan (NRRP) for the Fernald Site. The NRRP presents proposed final land use which will be established by implementing natural resource restoration projects (e.g., wetland mitigation).

The NRRP was submitted to the regulatory agencies and the Natural Resource Trustees (NRTs) in July 1997. The NRRP proposes expansion of the Northern Forested Wetland as a possible restoration project. Future versions of the NRRP will contain a conceptual design plan for on-property wetland mitigation if determined feasible.

Upon review of this Preliminary Wetland Mitigation Assessment and the NRRP by regulatory agencies and NRTs, a consensus will be reached regarding the feasibility of conducting on-property wetland mitigation.

REFERENCES

Ebasco Environmental, 1993, "Wetlands Delineation Report of the Fernald Environmental Management Project, Butler and Hamilton Counties, Ohio," prepared for FERMCO, Cincinnati, OH.

U.S. Department of Agriculture, Soil Conservation Service, 1982, Soil Survey of Hamilton County, Ohio, in cooperation with Ohio Department of Natural Resources, Division of Lands and Soil, and Ohio Agricultural Research and Development Center.

U.S. Department of Energy, 1995, "Feasibility Study/Proposed Plan for Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Field Office, Cincinnati, Ohio

U.S. Department of Energy, 1994, "Remedial Investigation for Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Field Office, Cincinnati, Ohio

TABLE 1
DURATION, TOTAL FLOW, AND PRECIPITATION OF ALL STORM EVENTS

Duration and Total Flow of Storm Events[1]

Station	Event 1 (10-5-95)	Event 2 (11-11-95)	Event 3 (12-18-95)	Event 4 (1-19-96)	Event 5 (2-23-96)	Event 6 (3-9-96)	Event 7 (4-20-96)
1	13.7 hrs 3.090*	58.08 hrs 1.528 *	81.34 hrs 14.196 *	35.28 hrs 10.177 *	46.39 hrs 14.120 *	61.08 hrs 16.396 *	80.65 hrs 5.715 *
2	6.6 hrs 0.544 *	9.8 hrs 0.263 *	40.54 hrs 2.463 *	21.7 hrs 2.608 *	22.81 hrs 2.313 *	NA[2] 4.089 *	61.78 hrs 2.281 *
3	8.2 hrs 3.70 *	9.8 hrs 0.107 *	64.09 hrs 5.006 *	23.52 hrs 5.514 *	29.89 hrs 10.290 *	NA[2] 13.142 *	20.27 hrs 4.553 *
4	7.2 hrs 0.451 *	32.2 hrs 0.267 *	69.13 hrs 42.464 *	12.8 hrs 6.728 *	17.59 hrs 26.338*	58.48 hrs 53.514 *	NA[3]
5	7.2 hrs 0.461 *	32.2 hrs 0.272 *	69.13 hrs 43.403 *	12.8 hrs 6.877 *	17.59 hrs 26.921 *	58.48 hrs 54.701*	NA[3]
Rainfall (inches)[4]	2.46 in.	1.11 in.	1.8 in.	0.98 in.	1.79 in.	1.99 in.	1.24 in.

[1] Duration was calculated in hours from developed hydrographs using streamlog software
[2] Not Available (NA) - A memory-wrap malfunction in the flow meter prevented generation of channel data and associated hydrograph
[3] Not Available (NA) - Submerged and braided flow conditions precluded the capture of flow data and generation of a hydrograph
[4] Data acquired from Fernald meteorological tower
*Flow is in million gallons

TABLE 2

AVERAGE MASS LOADINGS BY PARAMETER FOR ALL STORM EVENTS FROM SAMPLING STATIONS

	Average Mass Loadings				
Parameter[1]	Station 1	Station 2	Station 3	Station 4	Station 5
BOD_5	306.48	39.74	136.25	291.30	409.8
P-T	95.02	11.2	28	30.38	26.02
TSS	7711.42	885.79	8098.97	16310.72	5344.59
Total Uranium	0.10	0.017	0.085	1.77	0.73
Nitrate-Nitrogen	76.66	9.05	21.29	51.51	14.60

[1] Average mass loadings reported in kg.

TABLE 3

COMPARISON OF TOTAL MONTHLY RAINFALL DURING THE WATERSHIP STUDY TO THE MONTHLY 30-YEAR AVERAGE (1965-1995)

	Oct. 1995	Nov. 1995	Dec. 1995	Jan. 1996	Feb. 1996	Mar. 1996	Apr. 1996	Totals (inches)
Totals During Study[1]	4.50	2.10	3.09	4.14	1.42	4.19	8.95	28.39
30-Year Average[2]	2.8	3.46	3.15	2.59	2.69	4.24	3.75	22.68

[1] Data obtained from the Fernald meteorological tower
[2] Channel 12 - WKRC Tri-State Almanac, 1995

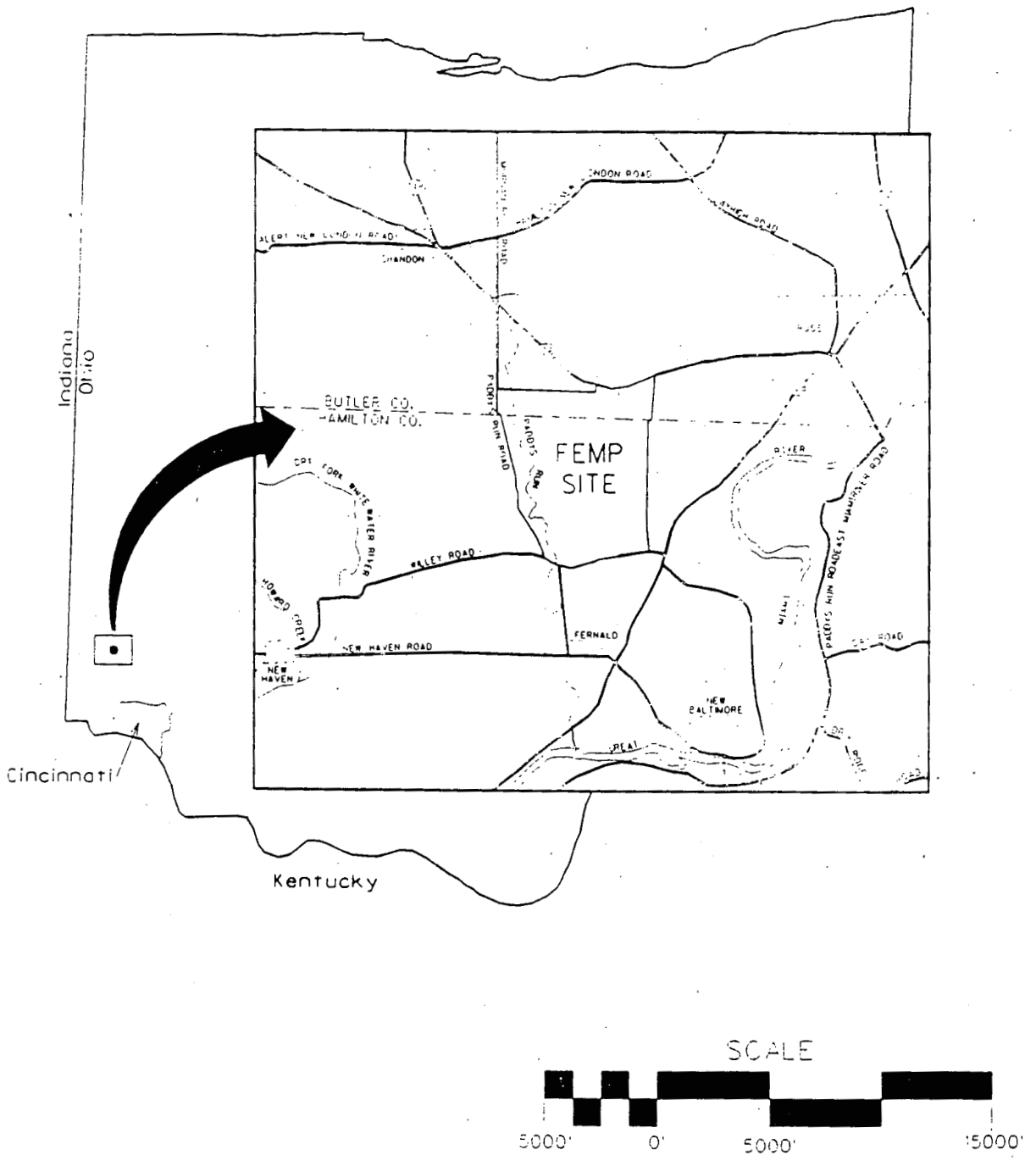


FIGURE 1. FERNALD ENVIRONMENTAL MANAGEMENT PROJECT LOCATION

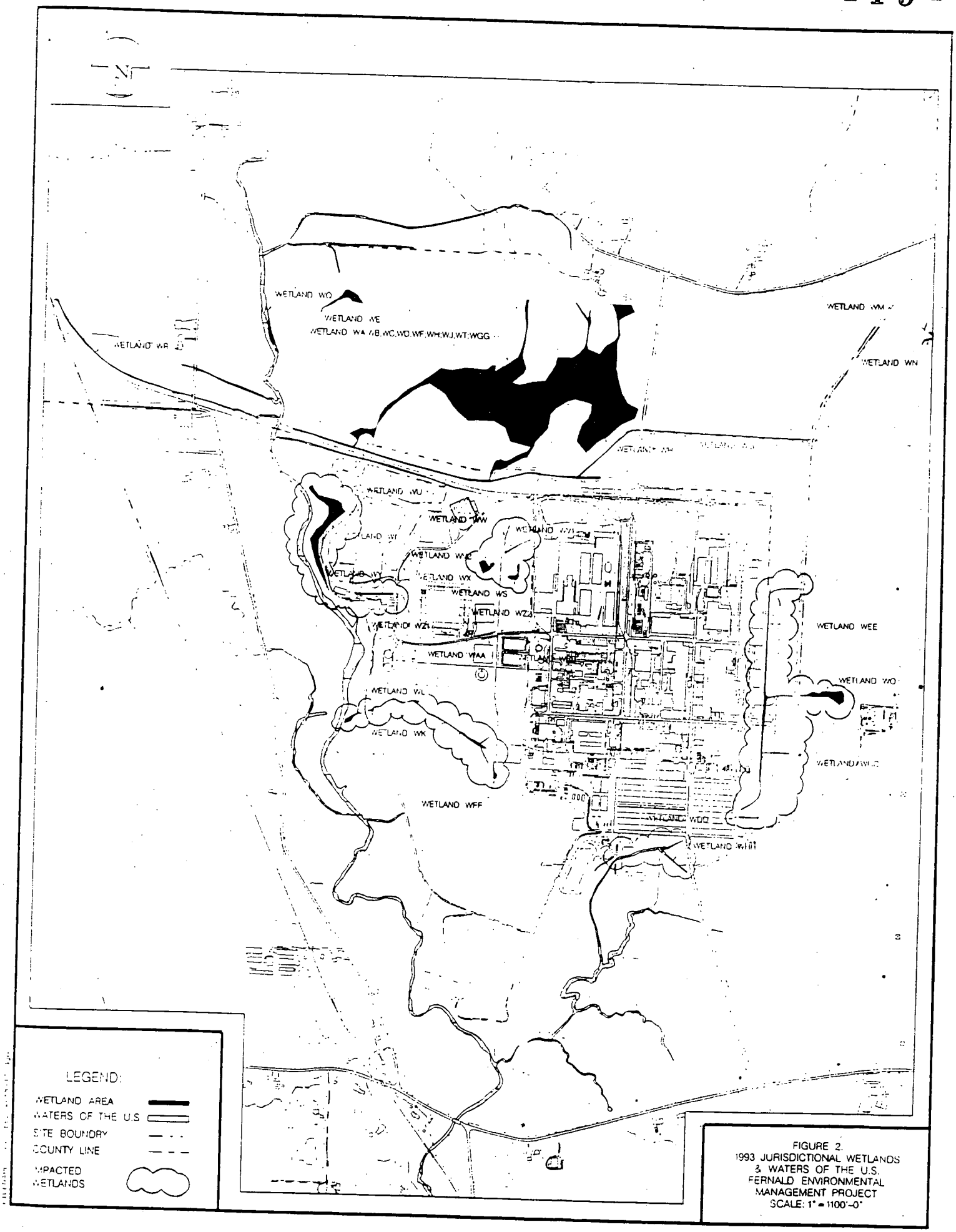


FIGURE 2.
1993 JURISDICTIONAL WETLANDS & WATERS OF THE U.S.
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SCALE: 1" = 1100'-0"

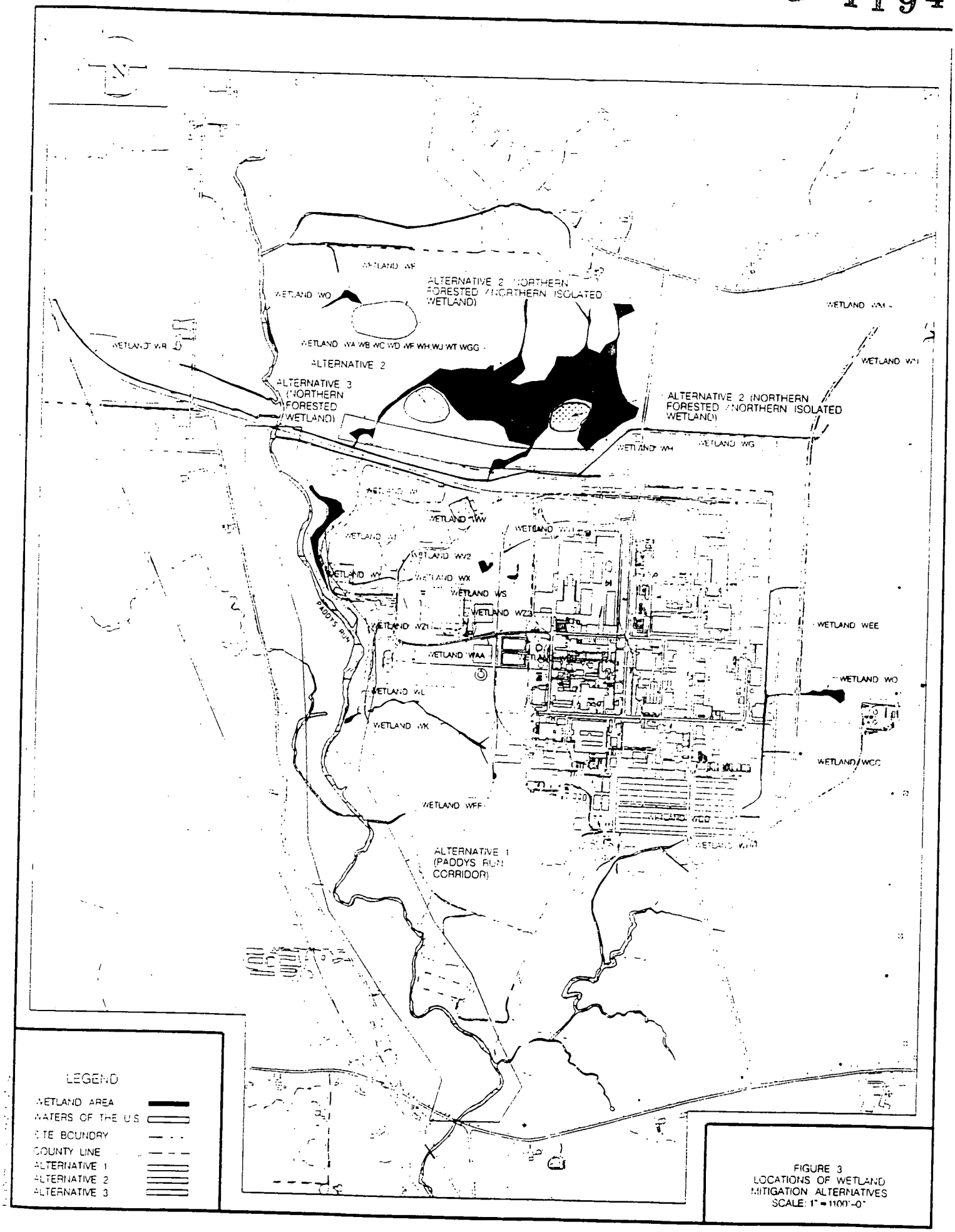


FIGURE 3
LOCATIONS OF WETLAND MITIGATION ALTERNATIVES
SCALE: 1" = 1100'-0"

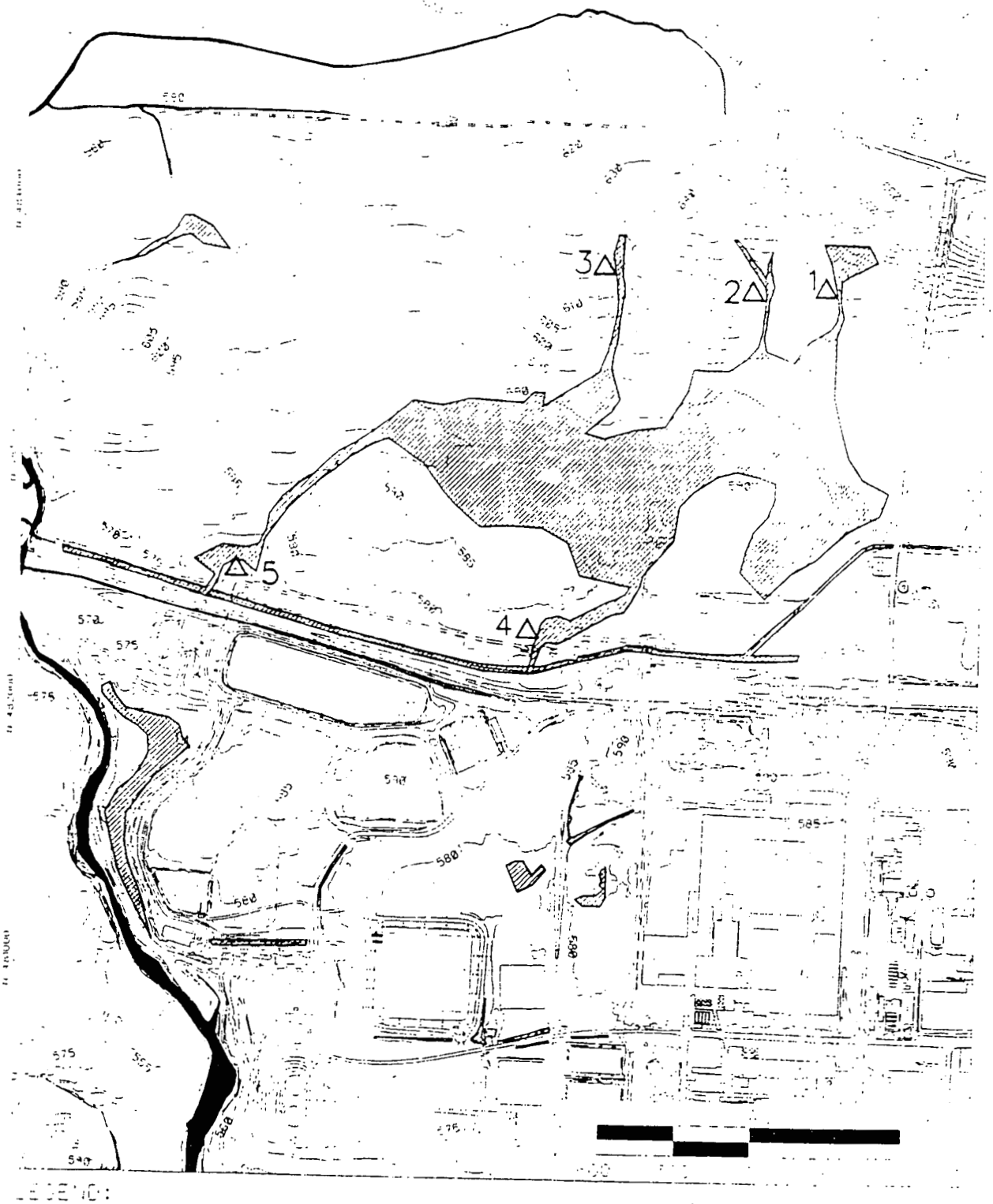
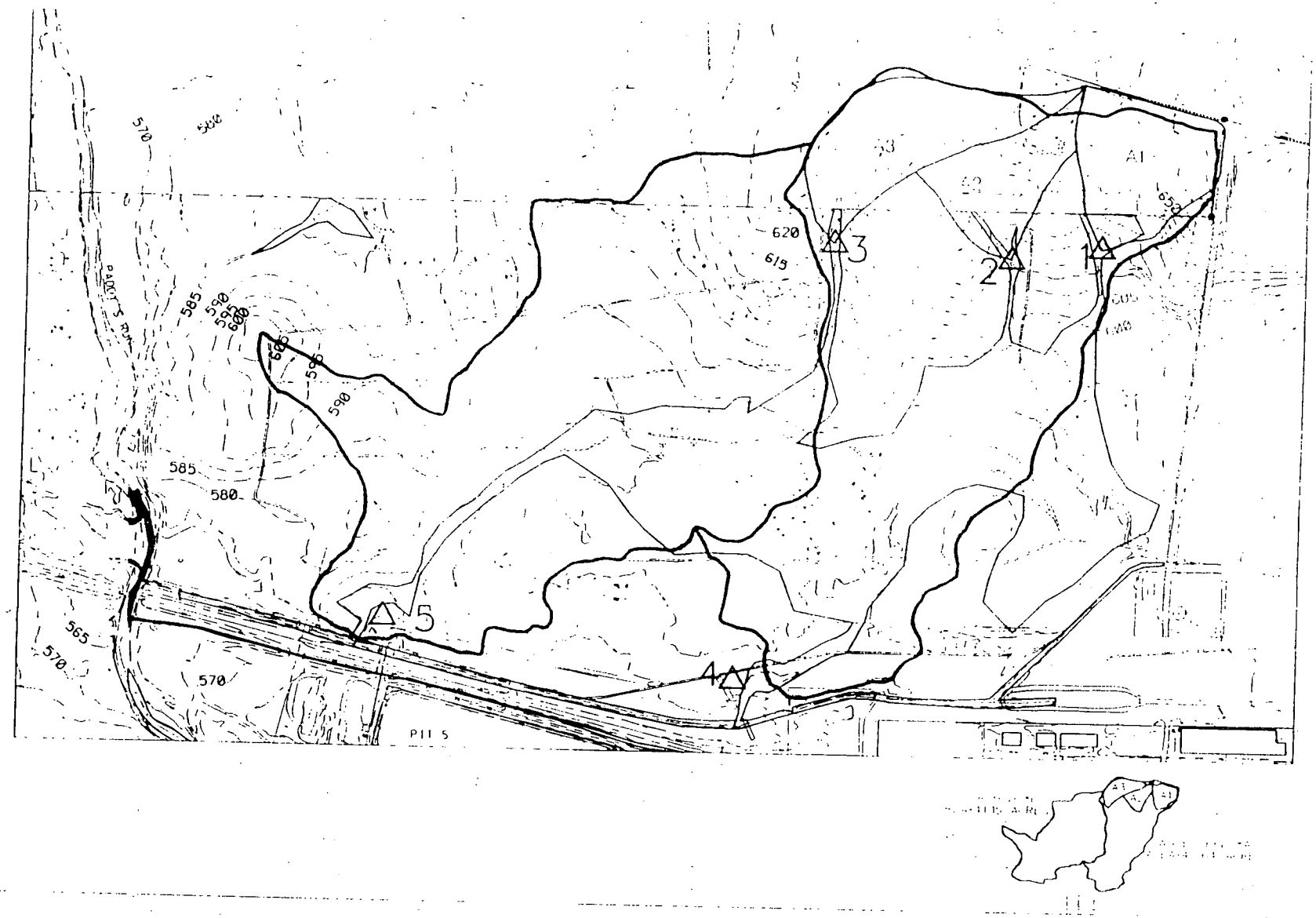


FIGURE 4. WATERSHED SAMPLING LOCATIONS



SCALE

0 500 1000 FEET

LEGEND:

WETLAND AREA

SAMPLING STATIONS △

WATERSHED "A" SUBBASINS
A1 - 4.39 ACRES
A2 - 3.11 ACRES
A3 - 5.15 ACRES

FIGURE 5. WATERSHED BOUNDARIES

000033

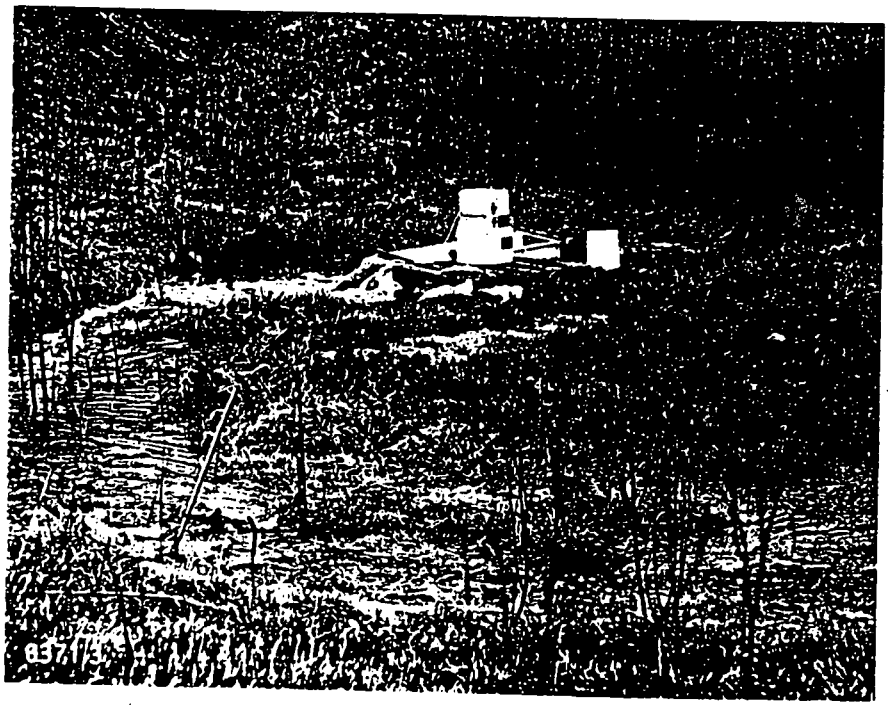
1194

APPENDIX A

SITE PHOTOGRAPHS OF STORM EVENT 7

PHOTOGRAPHS OF STORM EVENT #7 (APRIL 23,1996)

Submerged Conditions At Sampling Station #4



Braided Flow Conditions At Sampling Station #5

APPENDIX B

LABORATORY ANALYSES

DATE 01-JUL-96 SUMMARY REPORT PAGE 1
TIME 14:35:00

RELEASE NUMBER : 1000008732
PROJECT NAME : FORESTED WETLAND SURFACE WATER STUDY

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	VQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200188076	410898	SP-1		SOLIDS	31	mg/L			05-OCT-95	10-OCT-95	B
INORGANICS-EPM	200188077	410901	SP-2		SOLIDS	22	mg/L			05-OCT-95	10-OCT-95	B
INORGANICS-EPM	200188078	410904	SP-3		SOLIDS	116	mg/L			05-OCT-95	10-OCT-95	B
INORGANICS-EPM	200188079	410907	SP-4		SOLIDS	20	mg/L			05-OCT-95	10-OCT-95	B
INORGANICS-EPM	200188080	410910	SP-5		SOLIDS	13	mg/L			05-OCT-95	10-OCT-95	B
INORGANICS-EPM	200188082	410899	SP-1		URANIUM	1.1	ug/L			05-OCT-95	12-OCT-95	B
INORGANICS-EPM	200188084	410902	SP-2		URANIUM	0.8	ug/L			05-OCT-95	12-OCT-95	B
INORGANICS-EPM	200188085	410905	SP-3		URANIUM	1.4	ug/L			05-OCT-95	12-OCT-95	B
INORGANICS-EPM	200188086	410908	SP-4		URANIUM	5.3	ug/L			05-OCT-95	12-OCT-95	B
INORGANICS-EPM	200188087	410911	SP-5		URANIUM	0.9	ug/L			05-OCT-95	12-OCT-95	B
INORGANICS-EPM	200188117	410900	SP-1		NITRITE-NITRATE-NITROGEN	7.6	mg/L			05-OCT-95	06-OCT-95	B
INORGANICS-EPM	200188118	410903	SP-2		NITRITE-NITRATE-NITROGEN	0.5	mg/L			05-OCT-95	06-OCT-95	B
INORGANICS-EPM	200188119	410906	SP-3		NITRITE-NITRATE-NITROGEN	0.4	mg/L			05-OCT-95	06-OCT-95	B
INORGANICS-EPM	200188120	410909	SP-4		NITRITE-NITRATE-NITROGEN	0.1	mg/L	U		05-OCT-95	06-OCT-95	B
INORGANICS-EPM	200188121	410912	SP-5		NITRITE-NITRATE-NITROGEN	0.1	mg/L	U		05-OCT-95	06-OCT-95	B
WATER TREATMENT	200188828	410888	SP-1		BIOLOGICAL OXYGEN DEMAND	2.92	mg/L			05-OCT-95	19-OCT-95	B
WATER TREATMENT	200188829	410890	SP-2		BIOLOGICAL OXYGEN DEMAND	1.52	mg/L			05-OCT-95	19-OCT-95	B
WATER TREATMENT	200188830	410892	SP-3		BIOLOGICAL OXYGEN DEMAND	2.54	mg/L			05-OCT-95	19-OCT-95	B
WATER TREATMENT	200188831	410894	SP-4		BIOLOGICAL OXYGEN DEMAND	2.46	mg/L			05-OCT-95	19-OCT-95	B
WATER TREATMENT	200188832	410896	SP-5		BIOLOGICAL OXYGEN DEMAND	2.17	mg/L			05-OCT-95	19-OCT-95	B
WATER TREATMENT	200188833	410889	SP-1		PHOSPHATE (TOTAL)	0.99	mg/L			05-OCT-95	19-OCT-95	B
WATER TREATMENT	200188834	410891	SP-2		PHOSPHATE (TOTAL)	1.80	mg/L			05-OCT-95	19-OCT-95	B
WATER TREATMENT	200188835	410893	SP-3		PHOSPHATE (TOTAL)	0.81	mg/L			05-OCT-95	19-OCT-95	B
WATER TREATMENT	200188836	410895	SP-4		PHOSPHATE (TOTAL)	0.55	mg/L			05-OCT-95	19-OCT-95	B
WATER TREATMENT	200188837	410897	SP-5		PHOSPHATE (TOTAL)	0.47	mg/L			05-OCT-95	19-OCT-95	B

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Release Number: 1000008732 Component: %-LR Submission ID: % Project Name: %
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END OF REPORT

DATE 01-JUL-96
TIME 14:35:45

SUMMARY REPORT

RELEASE NUMBER : 1000009170
PROJECT NAME : FORESTED WETLAND SURFACE WATER STUDY

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	VQ	DATE SAMPLED	DATE PERFORMED	TASK ASL
INORGANICS-EPM	200197865	411193	SP-1		SOLIDS	85	mg/L			11-NOV-95	17-NOV-95	B
INORGANICS-EPM	200197866	411196	SP-2		SOLIDS	54	mg/L			11-NOV-95	17-NOV-95	B
INORGANICS-EPM	200197867	411199	SP-3		SOLIDS	804	mg/L			11-NOV-95	17-NOV-95	B
INORGANICS-EPM	200197868	411202	SP-4		SOLIDS	16	mg/L			11-NOV-95	17-NOV-95	B
INORGANICS-EPM	200197869	411205	SP-5		SOLIDS	5	mg/L			11-NOV-95	17-NOV-95	B
INORGANICS-EPM	200197870	411194	SP-1		URANIUM	2.4	ug/L			11-NOV-95	16-NOV-95	B
INORGANICS-EPM	200197871	411197	SP-2		URANIUM	2.0	ug/L			11-NOV-95	16-NOV-95	B
INORGANICS-EPM	200197872	411200	SP-3		URANIUM	3.8	ug/L			11-NOV-95	16-NOV-95	B
INORGANICS-EPM	200197873	411203	SP-4		URANIUM	28.7	ug/L			11-NOV-95	16-NOV-95	B
INORGANICS-EPM	200197873	411203	SP-4		URANIUM	25.1	ug/L			11-NOV-95	21-NOV-95	B
INORGANICS-EPM	200197874	411206	SP-5		URANIUM	8.3	ug/L			11-NOV-95	15-NOV-95	B
INORGANICS-EPM	200197875	411195	SP-1		NITRATE-NITROGEN	1.9	mg/L			11-NOV-95	13-NOV-95	B
INORGANICS-EPM	200197876	411198	SP-2		NITRATE-NITROGEN	0.6	mg/L			11-NOV-95	13-NOV-95	B
INORGANICS-EPM	200197877	411201	SP-3		NITRATE-NITROGEN	0.9	mg/L			11-NOV-95	13-NOV-95	B
INORGANICS-EPM	200197878	411204	SP-4		NITRATE-NITROGEN	0.4	mg/L			11-NOV-95	13-NOV-95	B
INORGANICS-EPM	200197879	411207	SP-5		NITRATE-NITROGEN	0.2	mg/L			11-NOV-95	13-NOV-95	B
WATER TREATMENT	200197880	411208	SP-1		BIOLOGICAL OXYGEN DEMAND	8.63	mg/L			11-NOV-95	18-NOV-95	B
WATER TREATMENT	200197881	411210	SP-2		BIOLOGICAL OXYGEN DEMAND	5.50	mg/L			11-NOV-95	18-NOV-95	B
WATER TREATMENT	200197882	411212	SP-3		BIOLOGICAL OXYGEN DEMAND	17.57	mg/L			11-NOV-95	18-NOV-95	B
WATER TREATMENT	200197883	411214	SP-4		BIOLOGICAL OXYGEN DEMAND	4.00	mg/L			11-NOV-95	18-NOV-95	B
WATER TREATMENT	200197884	411216	SP-5		BIOLOGICAL OXYGEN DEMAND	3.77	mg/L			11-NOV-95	18-NOV-95	B
WATER TREATMENT	200197885	411209	SP-1		PHOSPHATE (TOTAL)	1.19	mg/L			11-NOV-95	29-NOV-95	B
WATER TREATMENT	200197893	411211	SP-2		PHOSPHATE (TOTAL)	2.27	mg/L			11-NOV-95	29-NOV-95	B
WATER TREATMENT	200197894	411213	SP-3		PHOSPHATE (TOTAL)	1.07	mg/L			11-NOV-95	29-NOV-95	B
WATER TREATMENT	200197895	411215	SP-4		PHOSPHATE (TOTAL)	0.48	mg/L			11-NOV-95	29-NOV-95	B
WATER TREATMENT	200197896	411217	SP-5		PHOSPHATE (TOTAL)	1.23	mg/L			11-NOV-95	29-NOV-95	B
WATER TREATMENT	200197911	411188	#1		FECAL COLIFORM	7800	#/100 mL			11-NOV-95	14-NOV-95	B
WATER TREATMENT	200197912	411189	#2		FECAL COLIFORM	7800	#/100 mL			11-NOV-95	14-NOV-95	B
WATER TREATMENT	200197913	411190	#3		FECAL COLIFORM	7800	#/100 mL			11-NOV-95	17-NOV-95	B
WATER TREATMENT	200197914	411191	#4		FECAL COLIFORM	66	#/100 mL			11-NOV-95	14-NOV-95	B
WATER TREATMENT	200197915	411192	#5		FECAL COLIFORM	140	#/100 mL			11-NOV-95	14-NOV-95	B

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Your Selection Criteria Was:
Release Number: 1000009170 Component: %-LR Submission ID: % Project Name: %
From Received Date: % Display Text? N

DATE 01-JUL-96 SUMMARY REPORT PAGE 1
TIME 14:36:01

RELEASE NUMBER : 1000009617
PROJECT NAME : FORESTED WETLAND SURFACE WATER STUDY

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INORGANICS-EPM	200204687	411228	SP-1A		SOLIDS	152	mg/L			18-DEC-95	19-DEC-95	B
INORGANICS-EPM	200204688	411231	SP-1B		SOLIDS	212	mg/L			18-DEC-95	19-DEC-95	B
INORGANICS-EPM	200204689	411234	SP-2A		SOLIDS	41	mg/L			18-DEC-95	19-DEC-95	B
INORGANICS-EPM	200204690	411237	SP-2B		SOLIDS	44	mg/L			18-DEC-95	19-DEC-95	B
INORGANICS-EPM	200204691	411240	SP-3A		SOLIDS	297	mg/L			18-DEC-95	19-DEC-95	B
INORGANICS-EPM	200204692	411243	SP-3B		SOLIDS	331	mg/L			18-DEC-95	19-DEC-95	B
INORGANICS-EPM	200204693	411246	SP-4A		SOLIDS	45	mg/L			18-DEC-95	19-DEC-95	B
INORGANICS-EPM	200204694	411249	SP-4B		SOLIDS	50	mg/L			18-DEC-95	19-DEC-95	B
INORGANICS-EPM	200204695	411252	SP-5A		SOLIDS	15	mg/L			18-DEC-95	19-DEC-95	B
INORGANICS-EPM	200204696	411255	SP-5B		SOLIDS	125	mg/L			18-DEC-95	19-DEC-95	B
INORGANICS-EPM	200204697	411229	SP-1A		URANIUM	5.2	ug/L			18-DEC-95	20-DEC-95	B
INORGANICS-EPM	200204698	411232	SP-1B		URANIUM	4.0	ug/L			18-DEC-95	20-DEC-95	B
INORGANICS-EPM	200204699	411235	SP-2A		URANIUM	1.5	ug/L			18-DEC-95	20-DEC-95	B
INORGANICS-EPM	200204700	411238	SP-2B		URANIUM	1.7	ug/L			18-DEC-95	20-DEC-95	B
INORGANICS-EPM	200204701	411241	SP-3A		URANIUM	4.2	ug/L			18-DEC-95	20-DEC-95	B
INORGANICS-EPM	200204702	411244	SP-3B		URANIUM	3.9	ug/L			18-DEC-95	20-DEC-95	B
INORGANICS-EPM	200204703	411247	SP-4A		URANIUM	36.7	ug/L			18-DEC-95	20-DEC-95	B
INORGANICS-EPM	200204704	411250	SP-4B		URANIUM	40.3	ug/L			18-DEC-95	20-DEC-95	B
INORGANICS-EPM	200204705	411253	SP-5A		URANIUM	9.2	ug/L			18-DEC-95	20-DEC-95	B
INORGANICS-EPM	200204706	411256	SP-5B		URANIUM	9.1	ug/L			18-DEC-95	20-DEC-95	B
INORGANICS-EPM	200204707	411230	SP-1A		NITRATE-NITROGEN	2.1	mg/L			18-DEC-95	18-DEC-95	B
INORGANICS-EPM	200204708	411233	SP-1B		NITRATE-NITROGEN	2.0	mg/L			18-DEC-95	18-DEC-95	B
INORGANICS-EPM	200204709	411236	SP-2A		NITRATE-NITROGEN	0.8	mg/L			18-DEC-95	18-DEC-95	B
INORGANICS-EPM	200204710	411239	SP-2B		NITRATE-NITROGEN	0.8	mg/L			18-DEC-95	18-DEC-95	B
INORGANICS-EPM	200204711	411242	SP-3A		NITRATE-NITROGEN	1.2	mg/L			18-DEC-95	18-DEC-95	B
INORGANICS-EPM	200204712	411245	SP-3B		NITRATE-NITROGEN	1.2	mg/L			18-DEC-95	18-DEC-95	B
INORGANICS-EPM	200204713	411248	SP-4A		NITRATE-NITROGEN	0.7	mg/L			18-DEC-95	18-DEC-95	B
INORGANICS-EPM	200204714	411251	SP-4B		NITRATE-NITROGEN	0.8	mg/L			18-DEC-95	18-DEC-95	B
INORGANICS-EPM	200204715	411254	SP-5A		NITRATE-NITROGEN	0.2	mg/L			18-DEC-95	18-DEC-95	B
INORGANICS-EPM	200204716	411257	SP-5B		NITRATE-NITROGEN	0.2	mg/L			18-DEC-95	18-DEC-95	B
WATER TREATMENT	200204982	411258	SP-1A		BIOLOGICAL OXYGEN DEMAND	8.97	mg/L			18-DEC-95	27-DEC-95	B
WATER TREATMENT	200204983	411260	SP-1B		BIOLOGICAL OXYGEN DEMAND	8.19	mg/L			18-DEC-95	27-DEC-95	B

****

Your Selection Criteria Was:
Release Number: 1000009617 Component: %-LR Submission ID: % Project Name: %
From Received Date: % Display Text? N

RELEASE NUMBER : 1000009617
PROJECT NAME : FORESTED WETLAND SURFACE WATER STUDY

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	VQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
WATER TREATMENT	200204984	411262	SP-2A		BIOLOGICAL OXYGEN DEMAND	8.34	mg/L			18-DEC-95	27-DEC-95	B
WATER TREATMENT	200204985	411264	SP-2B		BIOLOGICAL OXYGEN DEMAND	7.71	mg/L			18-DEC-95	27-DEC-95	B
WATER TREATMENT	200204986	411266	SP-3A		BIOLOGICAL OXYGEN DEMAND	13.14	mg/L			18-DEC-95	27-DEC-95	B
WATER TREATMENT	200204987	411268	SP-3B		BIOLOGICAL OXYGEN DEMAND	12.54	mg/L			18-DEC-95	27-DEC-95	B
WATER TREATMENT	200204988	411270	SP-4A		BIOLOGICAL OXYGEN DEMAND	4.50	mg/L			18-DEC-95	27-DEC-95	B
WATER TREATMENT	200204989	411272	SP-4B		BIOLOGICAL OXYGEN DEMAND	4.19	mg/L			18-DEC-95	27-DEC-95	B
WATER TREATMENT	200204990	411274	SP-5A		BIOLOGICAL OXYGEN DEMAND	6.62	mg/L			18-DEC-95	27-DEC-95	B
WATER TREATMENT	200204991	411276	SP-5B		BIOLOGICAL OXYGEN DEMAND	7.17	mg/L			18-DEC-95	27-DEC-95	B
WATER TREATMENT	200204992	411259	SP-1A		PHOSPHATE (TOTAL)	2.12	mg/L			18-DEC-95	23-DEC-95	B
WATER TREATMENT	200204993	411261	SP-1B		PHOSPHATE (TOTAL)	2.12	mg/L			18-DEC-95	23-DEC-95	B
WATER TREATMENT	200204994	411263	SP-2A		PHOSPHATE (TOTAL)	4.57	mg/L			18-DEC-95	23-DEC-95	B
WATER TREATMENT	200204995	411265	SP-2B		PHOSPHATE (TOTAL)	4.64	mg/L			18-DEC-95	23-DEC-95	B
WATER TREATMENT	200204996	411267	SP-3A		PHOSPHATE (TOTAL)	2.46	mg/L			18-DEC-95	23-DEC-95	B
WATER TREATMENT	200204997	411269	SP-3B		PHOSPHATE (TOTAL)	2.43	mg/L			18-DEC-95	23-DEC-95	B
WATER TREATMENT	200204998	411271	SP-4A		PHOSPHATE (TOTAL)	1.63	mg/L			18-DEC-95	23-DEC-95	B
WATER TREATMENT	200204999	411273	SP-4B		PHOSPHATE (TOTAL)	1.60	mg/L			18-DEC-95	23-DEC-95	B
WATER TREATMENT	200205000	411275	SP-5A		PHOSPHATE (TOTAL)	1.26	mg/L			18-DEC-95	23-DEC-95	B
WATER TREATMENT	200205001	411277	SP-5B		PHOSPHATE (TOTAL)	1.47	mg/L			18-DEC-95	23-DEC-95	B
WATER TREATMENT	200205002	411218	SP-1A		FECAL COLIFORM	7200	#/100 mL			15-DEC-95	16-DEC-95	B
WATER TREATMENT	200205003	411219	SP-1B		FECAL COLIFORM	6800	#/100 mL			15-DEC-95	16-DEC-95	B
WATER TREATMENT	200205004	411220	SP-2A		FECAL COLIFORM	2500	#/100 mL			15-DEC-95	16-DEC-95	B
WATER TREATMENT	200205005	411221	SP-2B		FECAL COLIFORM	2700	#/100 mL			15-DEC-95	16-DEC-95	B
WATER TREATMENT	200205006	411222	SP-3A		FECAL COLIFORM	>8000	#/100 mL			15-DEC-95	16-DEC-95	B
WATER TREATMENT	200205007	411223	SP-3B		FECAL COLIFORM	>8000	#/100 mL			15-DEC-95	16-DEC-95	B
WATER TREATMENT	200205008	411224	SP-4A		FECAL COLIFORM	210	#/100 mL			15-DEC-95	16-DEC-95	B
WATER TREATMENT	200205009	411225	SP-4B		FECAL COLIFORM	180	#/100 mL			15-DEC-95	16-DEC-95	B
WATER TREATMENT	200205010	411226	SP-5A		FECAL COLIFORM	200	#/100 mL	U		15-DEC-95	16-DEC-95	B
WATER TREATMENT	200205011	411227	SP-5B		FECAL COLIFORM	200	#/100 mL	U		15-DEC-95	16-DEC-95	B

60 RECORDS PRINTED

END OF REPORT

DATE 01-JUL-96 SUMMARY REPORT PAGE 1
TIME 15:00:14

RELEASE NUMBER : 1000009929
PROJECT NAME : FORESTED WETLAND SURFACE WATER STUDY

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	VQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200210738	411685	SP #1		SOLIDS	353	mg/L			19-JAN-96	20-JAN-96	B
INORGANICS-EPM	200210739	411688	SP #2		SOLIDS	151	mg/L			19-JAN-96	20-JAN-96	B
INORGANICS-EPM	200210740	411691	SP #3		SOLIDS	341	mg/L			19-JAN-96	20-JAN-96	B
INORGANICS-EPM	200210741	411694	SP #4		SOLIDS	14	mg/L			19-JAN-96	20-JAN-96	B
INORGANICS-EPM	200210742	411697	SP #5		SOLIDS	433	mg/L			19-JAN-96	20-JAN-96	B
INORGANICS-EPM	200210743	411686	SP #1		URANIUM	0.1	mg/L	U		19-JAN-96	24-JAN-96	B
INORGANICS-EPM	200210743	411686	SP #1	RE	URANIUM	1.7	ug/L			19-JAN-96	31-JAN-96	B
INORGANICS-EPM	200210744	411689	SP #2		URANIUM	0.1	mg/L	U		19-JAN-96	24-JAN-96	B
INORGANICS-EPM	200210744	411689	SP #2	RE	URANIUM	2.0	ug/L			19-JAN-96	31-JAN-96	B
INORGANICS-EPM	200210745	411692	SP #3		URANIUM	0.1	mg/L	U		19-JAN-96	24-JAN-96	B
INORGANICS-EPM	200210745	411692	SP #3	RE	URANIUM	2.3	ug/L			19-JAN-96	31-JAN-96	B
INORGANICS-EPM	200210746	411695	SP #4		URANIUM	0.1	mg/L	U		19-JAN-96	24-JAN-96	B
INORGANICS-EPM	200210746	411695	SP #4	RE	URANIUM	1.8	ug/L			19-JAN-96	31-JAN-96	B
INORGANICS-EPM	200210747	411698	SP #5		URANIUM	0.1	mg/L	U		19-JAN-96	24-JAN-96	B
INORGANICS-EPM	200210747	411698	SP #5	RE	URANIUM	2.0	ug/L			19-JAN-96	31-JAN-96	B
INORGANICS-EPM	200210748	411687	SP #1		NITRATE-NITROGEN	1.7	mg/L			19-JAN-96	22-JAN-96	B
INORGANICS-EPM	200210749	411690	SP #2		NITRATE-NITROGEN	1.1	mg/L			19-JAN-96	22-JAN-96	B
INORGANICS-EPM	200210750	411693	SP #3		NITRATE-NITROGEN	0.8	mg/L			19-JAN-96	22-JAN-96	B
INORGANICS-EPM	200210751	411696	SP #4		NITRATE-NITROGEN	0.3	mg/L			19-JAN-96	22-JAN-96	B
INORGANICS-EPM	200210752	411699	SP #5		NITRATE-NITROGEN	0.2	mg/L			19-JAN-96	22-JAN-96	B
WATER TREATMENT	200212002	411670	SP-1		BIOLOGICAL OXYGEN DEMAND	11.04	mg/L			19-JAN-96	19-JAN-96	B
WATER TREATMENT	200212005	411671	SP-1		PHOSPHATE (TOTAL)	0.95	mg/L			19-JAN-96	19-JAN-96	B
WATER TREATMENT	200212006	411672	SP-2		BIOLOGICAL OXYGEN DEMAND	6.90	mg/L			19-JAN-96	19-JAN-96	B
WATER TREATMENT	200212007	411673	SP-2		PHOSPHATE (TOTAL)	0.74	mg/L			19-JAN-96	19-JAN-96	B
WATER TREATMENT	200212008	411674	SP-3		BIOLOGICAL OXYGEN DEMAND	5.82	mg/L			19-JAN-96	19-JAN-96	B
WATER TREATMENT	200212009	411675	SP-3		PHOSPHATE (TOTAL)	0.38	mg/L			19-JAN-96	19-JAN-96	B
WATER TREATMENT	200212010	411676	SP-4		BIOLOGICAL OXYGEN DEMAND	4.11	mg/L			19-JAN-96	19-JAN-96	B
WATER TREATMENT	200212011	411677	SP-4		PHOSPHATE (TOTAL)	0.40	mg/L			19-JAN-96	19-JAN-96	B
WATER TREATMENT	200212012	411678	SP-5		BIOLOGICAL OXYGEN DEMAND	4.08	mg/L			19-JAN-96	19-JAN-96	B
WATER TREATMENT	200212013	411679	SP-5		PHOSPHATE (TOTAL)	0.61	mg/L			19-JAN-96	19-JAN-96	B
WATER TREATMENT	200212014	411680	SP #1		FECAL COLIFORM	310	#/100 mL			18-JAN-96	18-JAN-96	B
WATER TREATMENT	200212015	411681	SP #2		FECAL COLIFORM	160	#/100 mL			18-JAN-96	18-JAN-96	B

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Your Selection Criteria Was:
Release Number: 1000009929 Component: %-LR Submission ID: % Project Name: %
From Received Date: % Display Text? N

RELEASE NUMBER : 1000009929
PROJECT NAME : FORESTED WETLAND SURFACE WATER STUDY

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	VQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
WATER TREATMENT	200212016	411682	SP #3		FECAL COLIFORM	210	#/100 mL			18-JAN-96	18-JAN-96	B
WATER TREATMENT	200212017	411683	SP #4		FECAL COLIFORM	80	#/100 mL			18-JAN-96	18-JAN-96	B
WATER TREATMENT	200212018	411684	SP #5		FECAL COLIFORM	20	#/100 mL			18-JAN-96	18-JAN-96	B

35 RECORDS PRINTED

END OF REPORT

DATE 01-JUL-96 SUMMARY REPORT PAGE 1
TIME 16:32:13

RELEASE NUMBER : 1000009966
PROJECT NAME : FORESTED WETLAND SURFACE WATER STUDY

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	VQ	DATE SAMPLED	DATE PERFORMED	TASK ASL
INORGANICS-EPM	200211843	411715	SP #1		SOLIDS	241	mg/L			23-JAN-96	30-JAN-96	B
INORGANICS-EPM	200211844	411718	SP #2		SOLIDS	13	mg/L			23-JAN-96	30-JAN-96	B
INORGANICS-EPM	200211845	411721	SP #3		SOLIDS	252	mg/L			23-JAN-96	30-JAN-96	B
INORGANICS-EPM	200211846	411724	SP #4		SOLIDS	23	mg/L			23-JAN-96	30-JAN-96	B
INORGANICS-EPM	200211847	411727	SP #5		SOLIDS	21	mg/L			23-JAN-96	30-JAN-96	B
INORGANICS-EPM	200211848	411716	SP #1		URANIUM	2.1	ug/L			23-JAN-96	31-JAN-96	B
INORGANICS-EPM	200211849	411719	SP #2		URANIUM	1.7	ug/L			23-JAN-96	31-JAN-96	B
INORGANICS-EPM	200211850	411722	SP #3		URANIUM	6.2	ug/L			23-JAN-96	31-JAN-96	B
INORGANICS-EPM	200211851	411725	SP #4		URANIUM	5.4	ug/L			23-JAN-96	31-JAN-96	B
INORGANICS-EPM	200211852	411728	SP #5		URANIUM	1.8	ug/L			23-JAN-96	31-JAN-96	B
INORGANICS-EPM	200211853	411717	SP #1		NITRITE-NITRATE-NITROGEN	1.2	mg/L			23-JAN-96	26-JAN-96	B
INORGANICS-EPM	200211854	411720	SP #2		NITRITE-NITRATE-NITROGEN	1.1	mg/L			23-JAN-96	26-JAN-96	B
INORGANICS-EPM	200211855	411723	SP #3		NITRITE-NITRATE-NITROGEN	0.8	mg/L			23-JAN-96	26-JAN-96	B
INORGANICS-EPM	200211856	411726	SP #4		NITRITE-NITRATE-NITROGEN	0.1	mg/L	U		23-JAN-96	26-JAN-96	B
INORGANICS-EPM	200211857	411729	SP #5		NITRITE-NITRATE-NITROGEN	0.1	mg/L	U		23-JAN-96	26-JAN-96	B
WATER TREATMENT	200212422	411705	SP #1		BIOLOGICAL OXYGEN DEMAND	8.19	mg/L			23-JAN-96	30-JAN-96	B
WATER TREATMENT	200212423	411707	SP #2		BIOLOGICAL OXYGEN DEMAND	2.18	mg/L			23-JAN-96	30-JAN-96	B
WATER TREATMENT	200212424	411709	SP #3		BIOLOGICAL OXYGEN DEMAND	4.97	mg/L			23-JAN-96	30-JAN-96	B
WATER TREATMENT	200212425	411711	SP #4		BIOLOGICAL OXYGEN DEMAND	4.08	mg/L			23-JAN-96	30-JAN-96	B
WATER TREATMENT	200212426	411713	SP #5		BIOLOGICAL OXYGEN DEMAND	4.68	mg/L			23-JAN-96	30-JAN-96	B
WATER TREATMENT	200212427	411706	SP #1		PHOSPHATE (TOTAL)	0.87	mg/L			23-JAN-96	25-JAN-96	B
WATER TREATMENT	200212428	411708	SP #2		PHOSPHATE (TOTAL)	0.50	mg/L			23-JAN-96	25-JAN-96	B
WATER TREATMENT	200212429	411710	SP #3		PHOSPHATE (TOTAL)	0.54	mg/L			23-JAN-96	25-JAN-96	B
WATER TREATMENT	200212430	411712	SP #4		PHOSPHATE (TOTAL)	0.41	mg/L			23-JAN-96	25-JAN-96	B
WATER TREATMENT	200212431	411714	SP #5		PHOSPHATE (TOTAL)	0.37	mg/L			23-JAN-96	25-JAN-96	B
WATER TREATMENT	200212432	411700	SP #1		TOTAL COLIFORMS	>6000	#/100 mL			23-JAN-96	23-JAN-96	B
WATER TREATMENT	200212433	411701	SP #2		TOTAL COLIFORMS	>6000	#/100 mL			23-JAN-96	23-JAN-96	B
WATER TREATMENT	200212434	411702	SP #3		TOTAL COLIFORMS	>6000	#/100 mL			23-JAN-96	23-JAN-96	B
WATER TREATMENT	200212435	411703	SP #4		TOTAL COLIFORMS	>6000	#/100 mL			23-JAN-96	23-JAN-96	B
WATER TREATMENT	200212436	411704	SP #5		TOTAL COLIFORMS	>6000	#/100 mL			23-JAN-96	23-JAN-96	B

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Your Selection Criteria Was:
Release Number: 1000009966 Component: %-LR Submission ID: % Project Name: %
From Received Date: % Display Text? N

30 RECORDS PRINTED

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DATE 01-JUL-96 SUMMARY REPORT PAGE 1
TIME 16:51:55

RELEASE NUMBER : 1000010659
PROJECT NAME : FORESTED WETLAND SURFACE WATER STUDY

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	VQ	DATE SAMPLED	DATE PERFORMED	TASK ASL
INORGANICS-EPM	200223004	411740	SP #1		SOLIDS	79	mg/L			19-MAR-96	26-MAR-96	B
INORGANICS-EPM	200223005	411743	SP #2		SOLIDS	123	mg/L			19-MAR-96	26-MAR-96	B
INORGANICS-EPM	200223006	411746	SP #3		SOLIDS	36	mg/L			19-MAR-96	26-MAR-96	B
INORGANICS-EPM	200223007	411749	SP #4		SOLIDS	518	mg/L			19-MAR-96	26-MAR-96	B
INORGANICS-EPM	200223008	411752	SP #5		SOLIDS	30	mg/L			19-MAR-96	26-MAR-96	B
INORGANICS-EPM	200223009	411741	SP #1		URANIUM	1.0	ug/L			19-MAR-96	27-MAR-96	B
INORGANICS-EPM	200223010	411744	SP #2		URANIUM	2.5	ug/L			19-MAR-96	27-MAR-96	B
INORGANICS-EPM	200223011	411747	SP #3		URANIUM	2.5	ug/L			19-MAR-96	27-MAR-96	B
INORGANICS-EPM	200223012	411750	SP #4		URANIUM	5.8	ug/L			19-MAR-96	27-MAR-96	B
INORGANICS-EPM	200223013	411753	SP #5		URANIUM	12.5	ug/L			19-MAR-96	26-MAR-96	B
INORGANICS-EPM	200223015	411742	SP #1		NITRATE-NITROGEN	1.4	mg/L			19-MAR-96	20-MAR-96	B
INORGANICS-EPM	200223016	411745	SP #2		NITRATE-NITROGEN	1.7	mg/L			19-MAR-96	20-MAR-96	B
INORGANICS-EPM	200223017	411748	SP #3		NITRATE-NITROGEN	1.0	mg/L			19-MAR-96	20-MAR-96	B
INORGANICS-EPM	200223018	411751	SP #4		NITRATE-NITROGEN	0.5	mg/L			19-MAR-96	20-MAR-96	B
INORGANICS-EPM	200223019	411754	SP #5		NITRATE-NITROGEN	0.1	mg/L	U		19-MAR-96	20-MAR-96	B
WATER TREATMENT	200223020	411755	SP #1		BIOLOGICAL OXYGEN DEMAND	6.84	mg/L			19-MAR-96	26-MAR-96	B
WATER TREATMENT	200223021	411757	SP #2		BIOLOGICAL OXYGEN DEMAND	3.30	mg/L			19-MAR-96	26-MAR-96	B
WATER TREATMENT	200223022	411759	SP #3		BIOLOGICAL OXYGEN DEMAND	2.82	mg/L			19-MAR-96	26-MAR-96	B
WATER TREATMENT	200223023	411761	SP #4		BIOLOGICAL OXYGEN DEMAND	2.02	mg/L			19-MAR-96	26-MAR-96	B
WATER TREATMENT	200223024	411763	SP #5		BIOLOGICAL OXYGEN DEMAND	2.0	mg/L	U		19-MAR-96	26-MAR-96	B
WATER TREATMENT	200223025	411756	SP #1		PHOSPHATE (TOTAL)	2.62	mg/L			19-MAR-96	28-MAR-96	B
WATER TREATMENT	200223026	411758	SP #2		PHOSPHATE (TOTAL)	1.92	mg/L			19-MAR-96	28-MAR-96	B
WATER TREATMENT	200223027	411760	SP #3		PHOSPHATE (TOTAL)	0.96	mg/L			19-MAR-96	28-MAR-96	B
WATER TREATMENT	200223028	411762	SP #4		PHOSPHATE (TOTAL)	0.1	mg/L	U		19-MAR-96	28-MAR-96	B
WATER TREATMENT	200223029	411764	SP #5		PHOSPHATE (TOTAL)	0.1	mg/L	U		19-MAR-96	28-MAR-96	B
WATER TREATMENT	200223035	411735	SP #5		FECAL COLIFORM	50	#/100 mL			19-MAR-96	19-MAR-96	B
WATER TREATMENT	200223036	411736	SP #4		FECAL COLIFORM	20	#/100 mL	U		19-MAR-96	19-MAR-96	B
WATER TREATMENT	200223037	411737	SP #3		FECAL COLIFORM	7400	#/100 mL			19-MAR-96	19-MAR-96	B
WATER TREATMENT	200223038	411738	SP #1		FECAL COLIFORM	6500	#/100 mL			19-MAR-96	19-MAR-96	B
WATER TREATMENT	200223039	411739	SP #2		FECAL COLIFORM	10600	#/100 mL			19-MAR-96	19-MAR-96	B

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Your Selection Criteria Was:
Release Number: 1000010659 Component: %-LR Submission ID: % Project Name: %
From Received Date: % Display Text? N

DATE 01-JUL-96 SUMMARY REPORT PAGE 1
TIME 16:56:29

RELEASE NUMBER : 1000010993
PROJECT NAME : FORESTED WETLAND SURFACE WATER STUDY

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	VQ	DATE SAMPLED	DATE PERFORMED	ASL
INORGANICS-EPM	200230225	411785	SP #1		SOLIDS	463	mg/L			23-APR-96	26-APR-96	B
INORGANICS-EPM	200230226	411788	SP #2		SOLIDS	322	mg/L			23-APR-96	26-APR-96	B
INORGANICS-EPM	200230227	411791	SP #3		SOLIDS	1870	mg/L			23-APR-96	26-APR-96	B
INORGANICS-EPM	200230228	411794	SP #4		SOLIDS	34	mg/L			23-APR-96	26-APR-96	B
INORGANICS-EPM	200230229	411797	SP #5		SOLIDS	54	mg/L			23-APR-96	26-APR-96	B
INORGANICS-EPM	200230234	411786	SP #1		URANIUM	1.9	ug/L			23-APR-96	01-MAY-96	B
INORGANICS-EPM	200230235	411789	SP #2		URANIUM	3.1	ug/L			23-APR-96	01-MAY-96	B
INORGANICS-EPM	200230236	411792	SP #3		URANIUM	5.4	ug/L			23-APR-96	01 MAY 96	B
INORGANICS-EPM	200230237	411795	SP #4		URANIUM	4.4	ug/L			23-APR-96	01 MAY 96	B
INORGANICS-EPM	200230238	411798	SP #5		URANIUM	1.7	ug/L			23-APR-96	01-MAY-96	B
INORGANICS-EPM	200230239	411787	SP #1		NITRATE-NITROGEN	0.3	mg/L			23-APR-96	25-APR-96	B
INORGANICS-EPM	200230240	411790	SP #2		NITRATE-NITROGEN	0.6	mg/L			23-APR-96	25-APR-96	B
INORGANICS-EPM	200230241	411793	SP #3		NITRATE-NITROGEN	0.4	mg/L			23-APR-96	25-APR-96	B
INORGANICS-EPM	200230242	411796	SP #4		NITRATE-NITROGEN	0.1	mg/L	U		23-APR-96	25-APR-96	B
INORGANICS-EPM	200230243	411799	SP #5		NITRATE-NITROGEN	0.1	mg/L	U		23-APR-96	25-APR-96	B
WATER TREATMENT	200230246	411775	SP #1		BIOLOGICAL OXYGEN DEMAND	7.32	mg/L			23-APR-96	30-APR-96	B
WATER TREATMENT	200230247	411777	SP #2		BIOLOGICAL OXYGEN DEMAND	2.48	mg/L			23-APR-96	30 APR 96	B
WATER TREATMENT	200230248	411779	SP #3		BIOLOGICAL OXYGEN DEMAND	6.12	mg/L			23-APR-96	30-APR-96	B
WATER TREATMENT	200230249	411781	SP #4		BIOLOGICAL OXYGEN DEMAND	2.41	mg/L			23-APR-96	30-APR-96	B
WATER TREATMENT	200230250	411783	SP #5		BIOLOGICAL OXYGEN DEMAND	3.26	mg/L			23-APR-96	30-APR-96	B
WATER TREATMENT	200230251	411776	SP #1		PHOSPHATE (TOTAL)	1.60	mg/L			23-APR-96	08-MAY-96	B
WATER TREATMENT	200230252	411778	SP #2		PHOSPHATE (TOTAL)	1.70	mg/L			23-APR-96	08-MAY-96	B
WATER TREATMENT	200230253	411780	SP #3		PHOSPHATE (TOTAL)	0.96	mg/L			23-APR-96	08-MAY-96	B
WATER TREATMENT	200230254	411782	SP #4		PHOSPHATE (TOTAL)	0.76	mg/L			23-APR-96	08-MAY-96	B
WATER TREATMENT	200230255	411784	SP #5		PHOSPHATE (TOTAL)	0.60	mg/L			23-APR-96	08-MAY-96	B
WATER TREATMENT	200231676	411770	SP #1		FECAL COLIFORM	2400	#/100 mL			15-APR-96	15-APR-96	B
WATER TREATMENT	200231677	411771	SP #2		FECAL COLIFORM	200	#/100 mL	U		15-APR-96	15-APR-96	B
WATER TREATMENT	200231678	411772	SP #3		FECAL COLIFORM	6400	#/100 mL			15-APR-96	15-APR-96	B
WATER TREATMENT	200231679	411773	SP #4		FECAL COLIFORM	1900	#/100 mL			15-APR-96	15-APR-96	B
WATER TREATMENT	200231680	411774	SP #5		FECAL COLIFORM	200	#/100 mL	U		15-APR-96	15-APR-96	B

****

Your Selection Criteria Was:
Release Number: 1000010993 Component: %-LR Submission ID: % Project Name: %
From Received Date: % Display Text? N

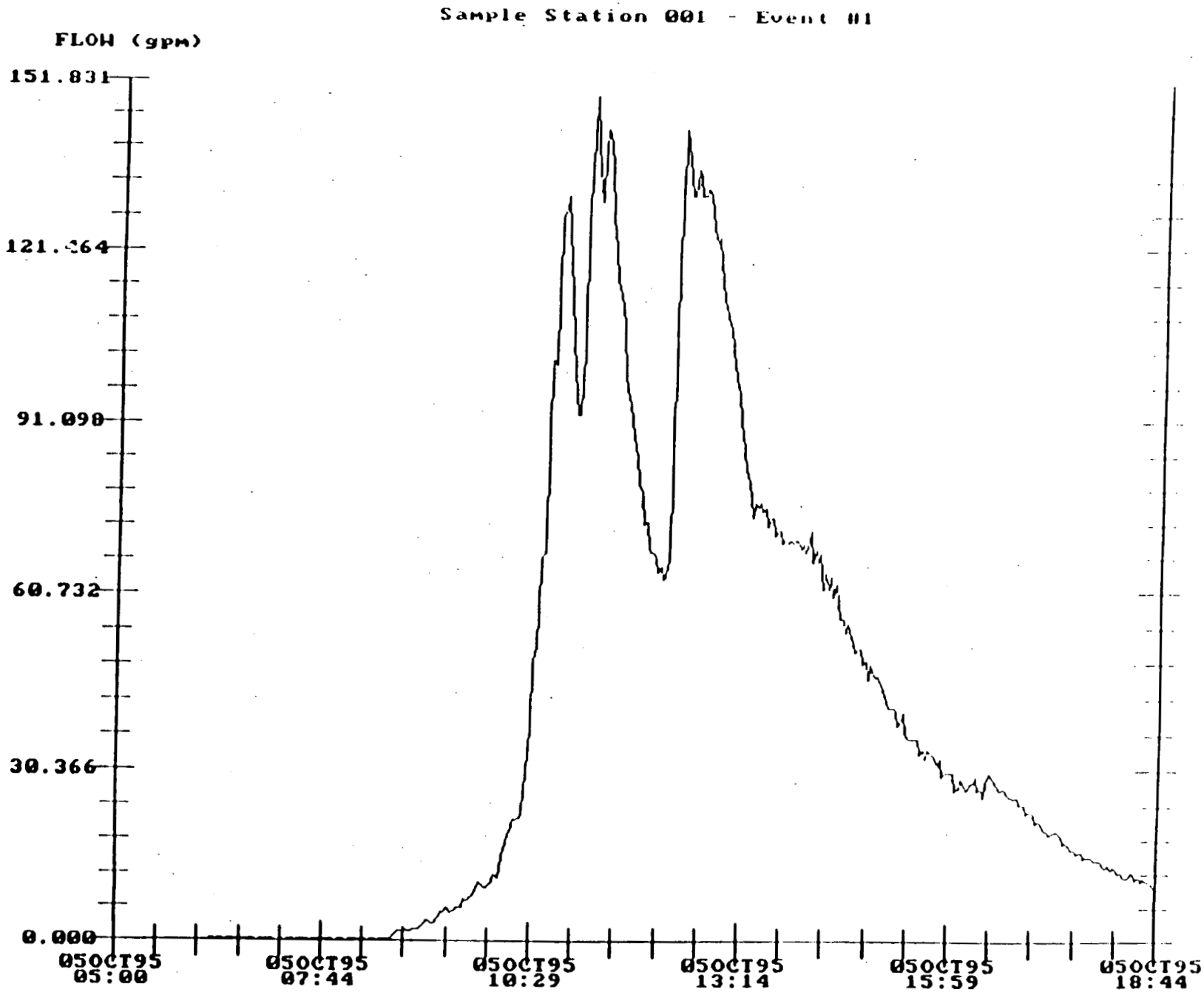
30 RECORDS PRINTED

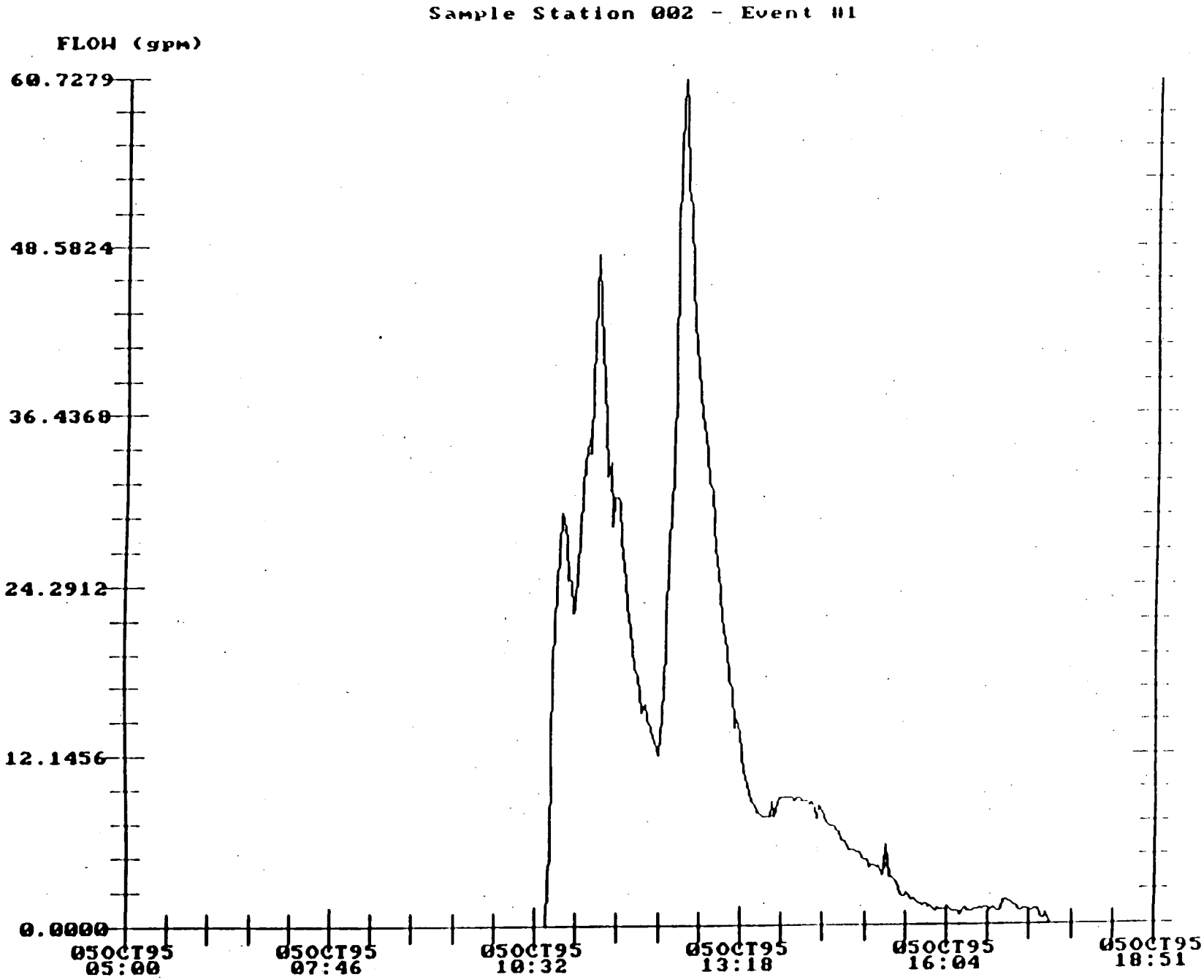
0000045

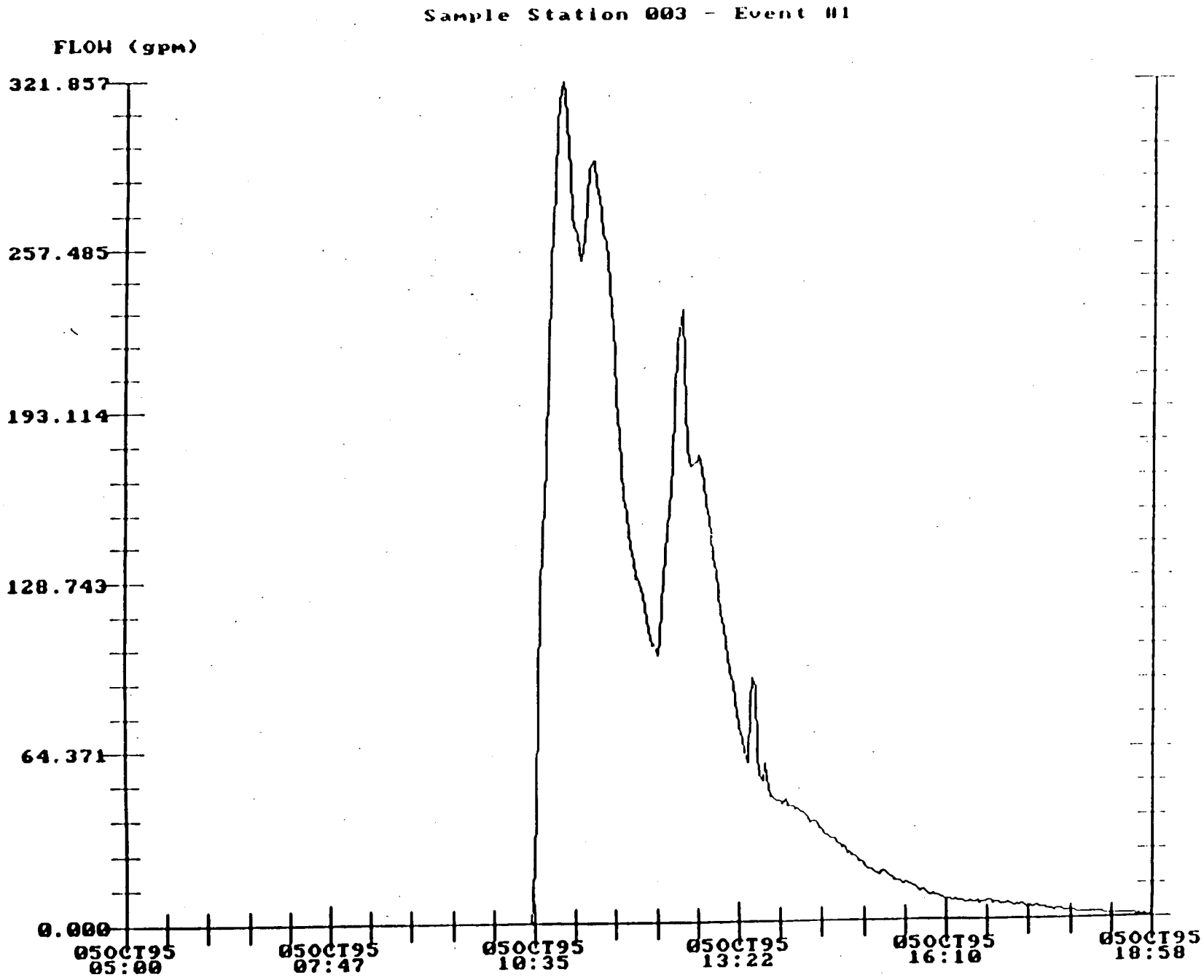
F 1 of 9

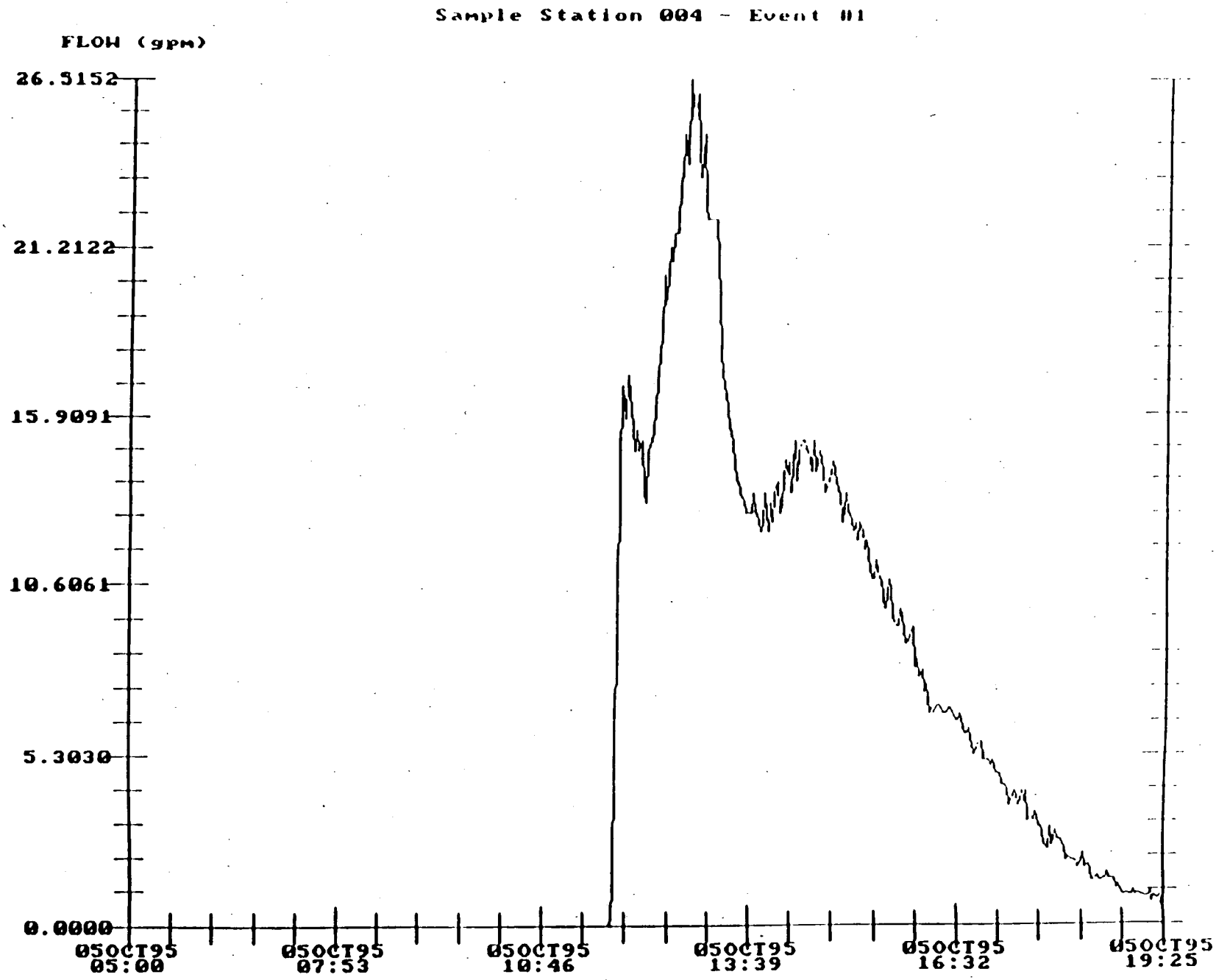
APPENDIX C

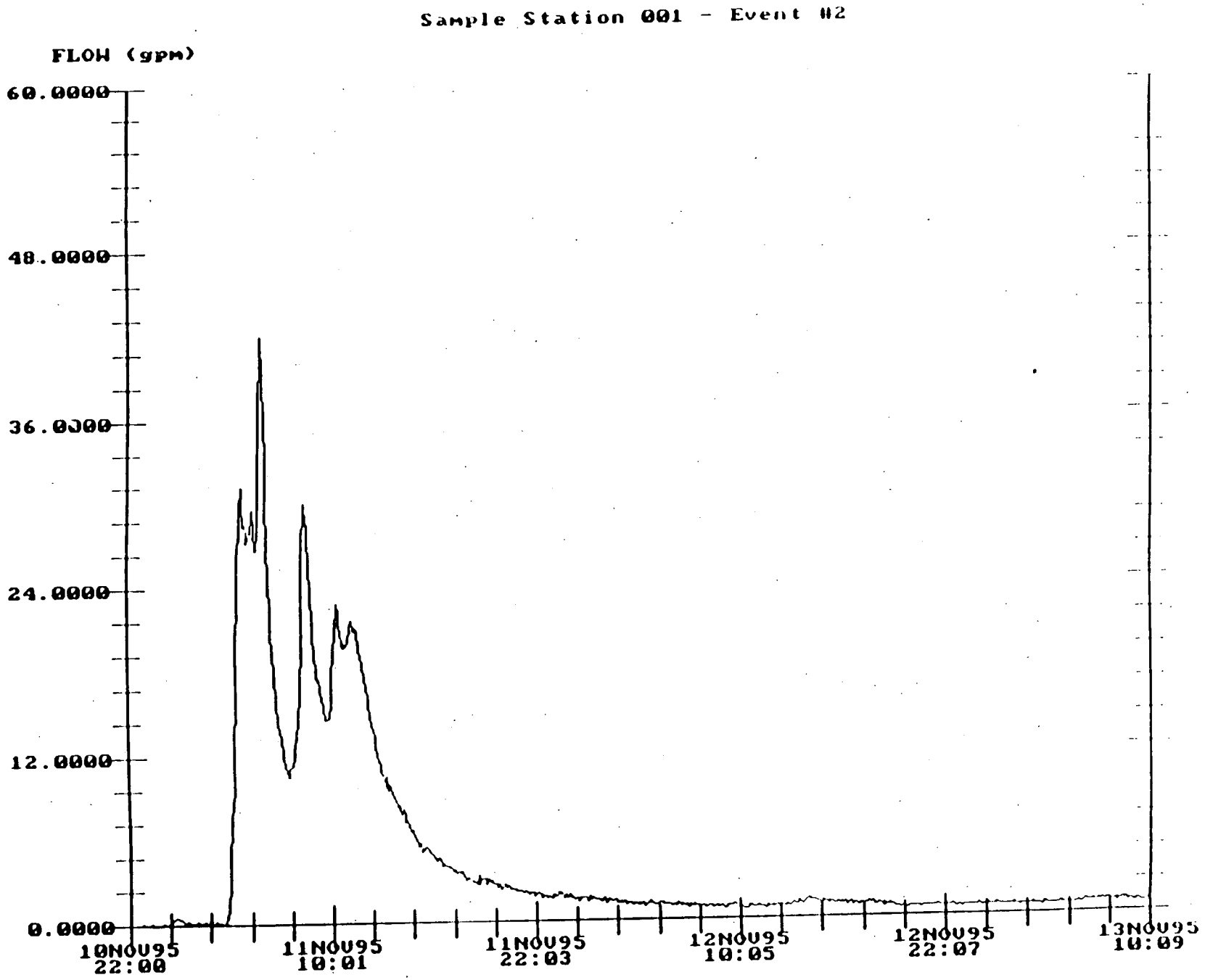
HYDROGRAPHS

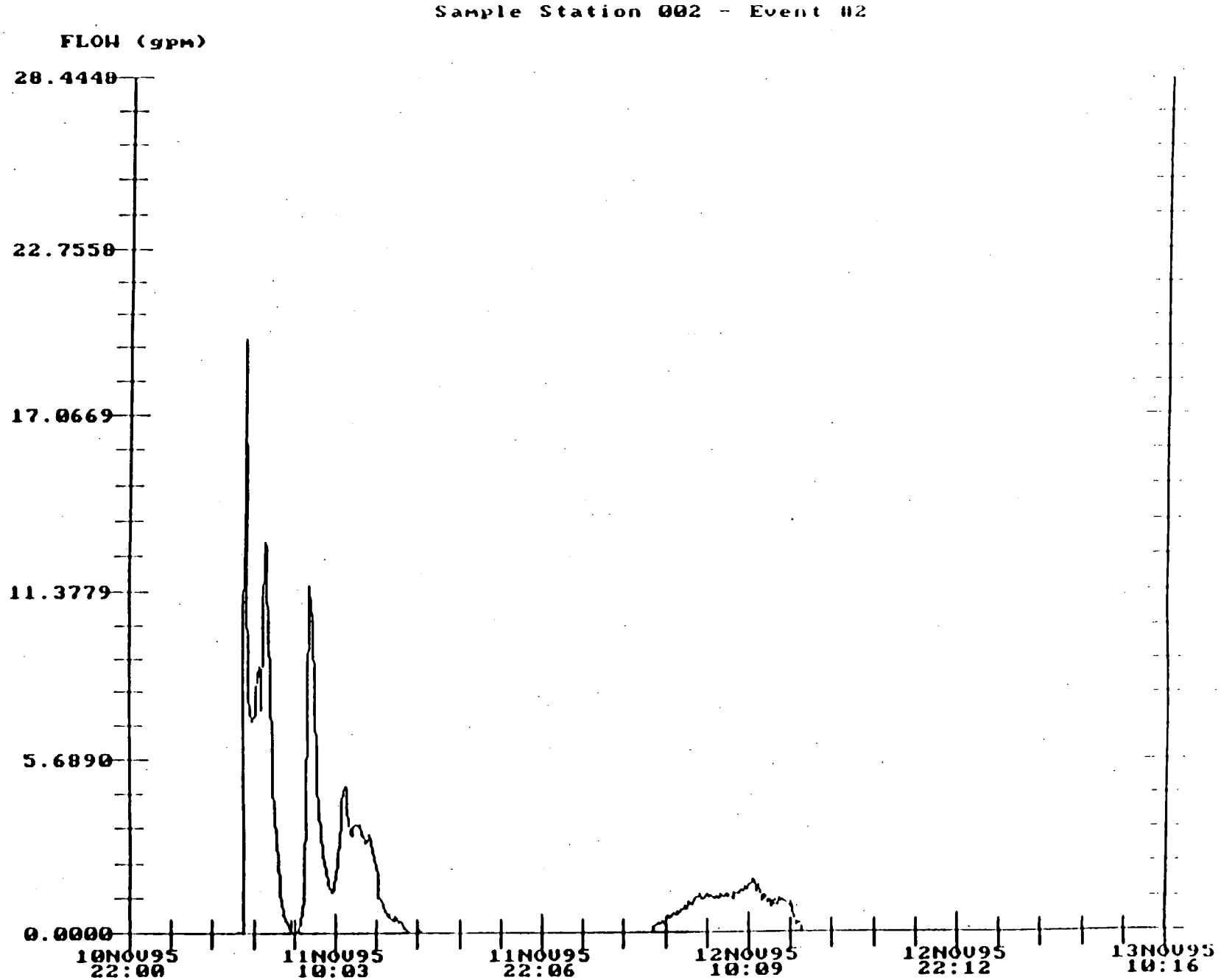

Sample Station 001 - Event 01
FLOW (gpm)
151.831
121.464
91.098
60.732
30.366
0.000
05OCT95 05:00
05OCT95 07:44
05OCT95 10:29
05OCT95 13:14
05OCT95 15:59
05OCT95 18:44

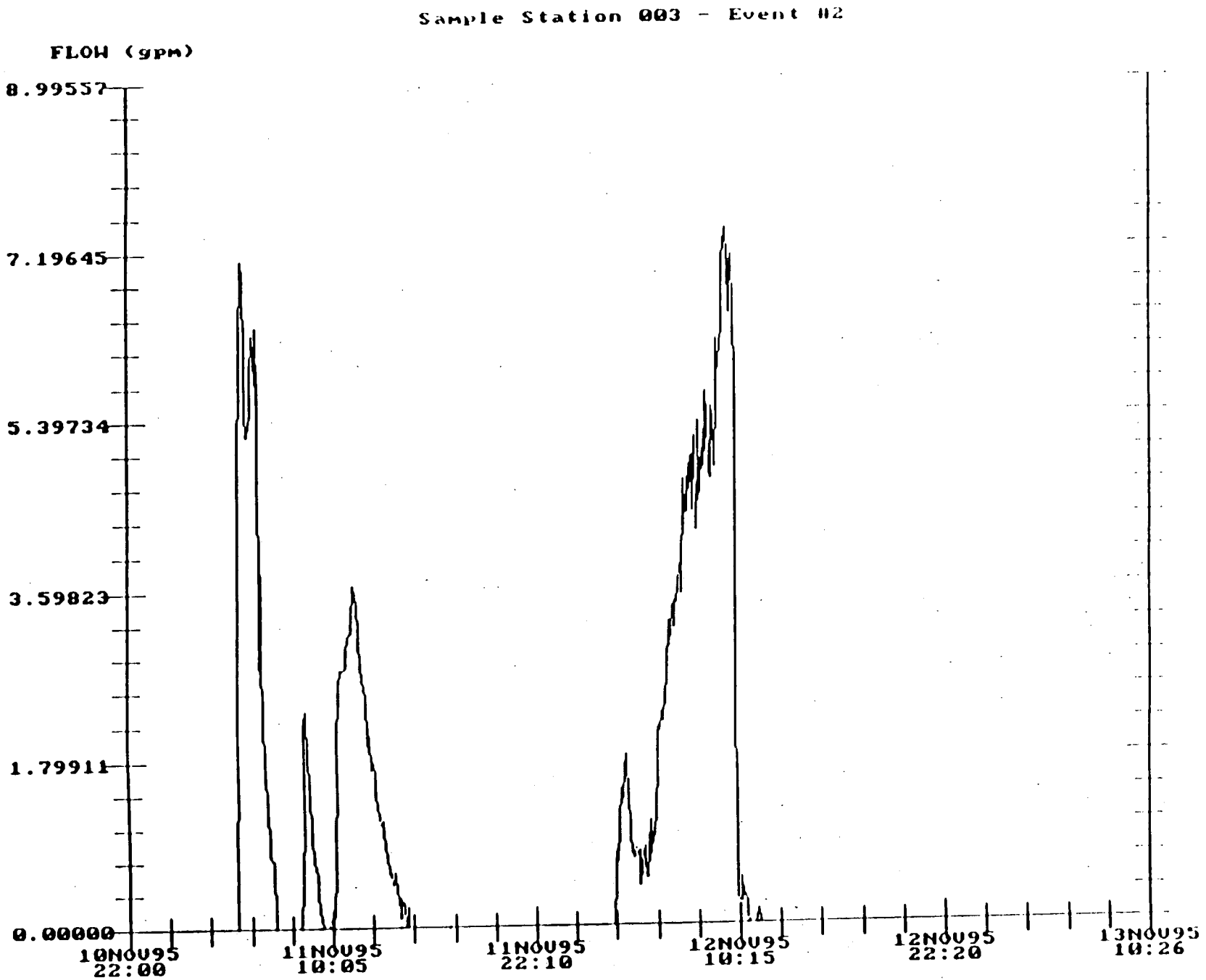

Sample Station 002 - Event #1
FLOW (gpm)
60.7279
48.5824
36.4368
24.2912
12.1456
0.0000
05OCT95
05:00
05OCT95
07:46
05OCT95
10:32
05OCT95
13:18
05OCT95
16:04
05OCT95
18:51

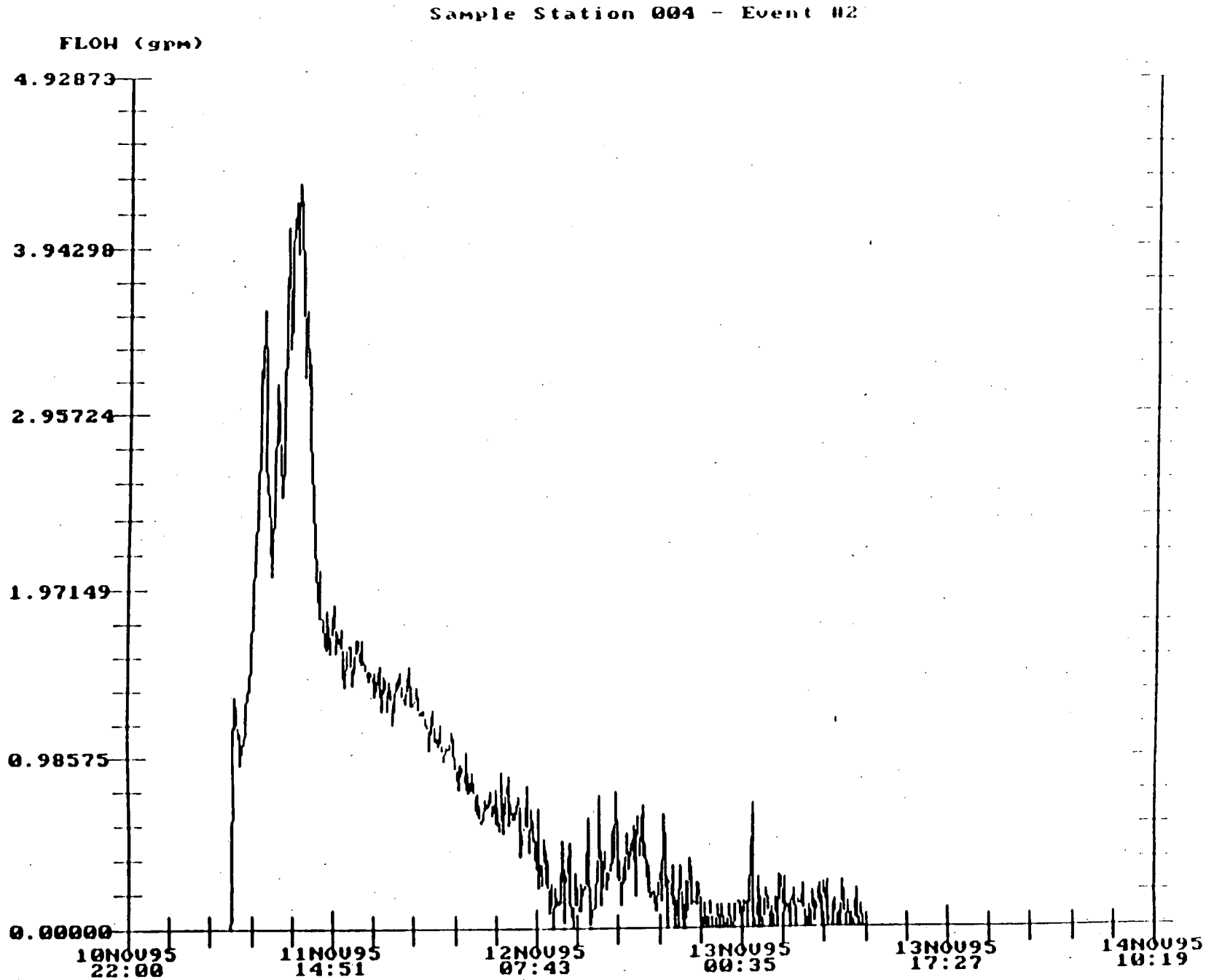


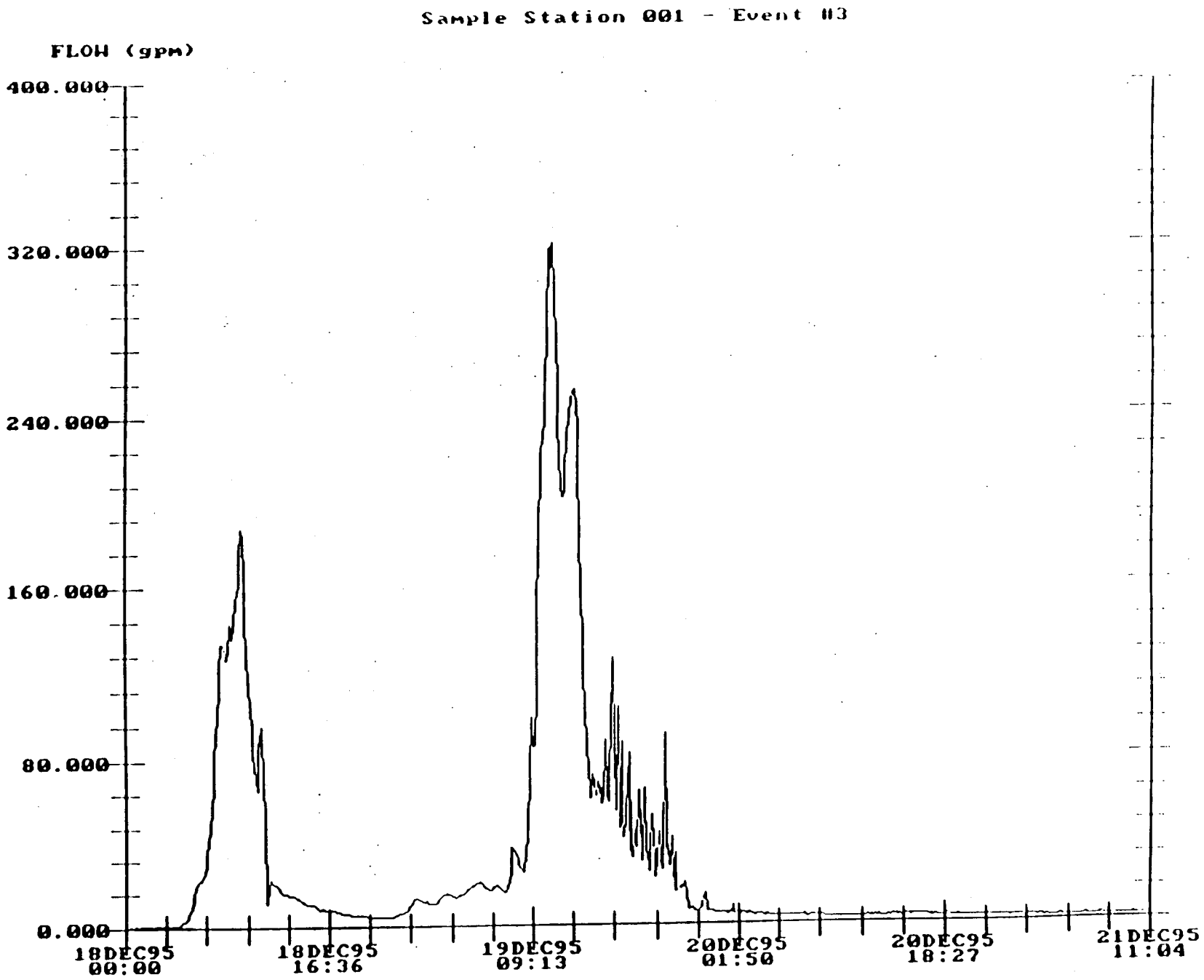

Sample Station 004 - Event #1
FLOW (gpm)
26.5152
21.2122
15.9091
10.6061
5.3030
0.0000
05OCT95 05:00
05OCT95 07:53
05OCT95 10:46
05OCT95 13:39
05OCT95 16:32
05OCT95 19:25

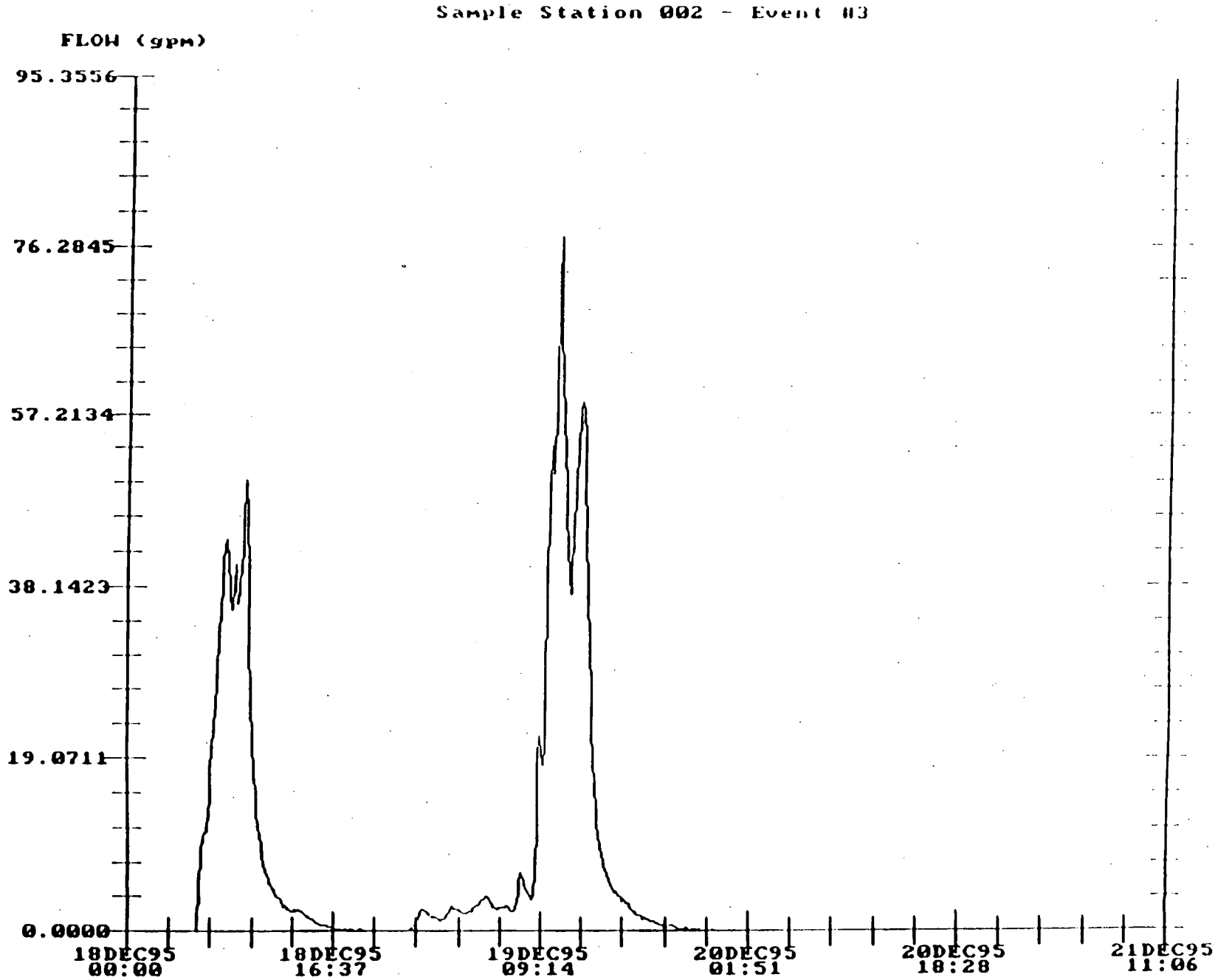

Sample Station 001 - Event #2
FLOW (gpm)
60.0000
48.0000
36.0000
24.0000
12.0000
0.0000
10NOV95 22:00
11NOV95 10:01
11NOV95 22:03
12NOV95 10:05
12NOV95 22:07
13NOV95 10:09

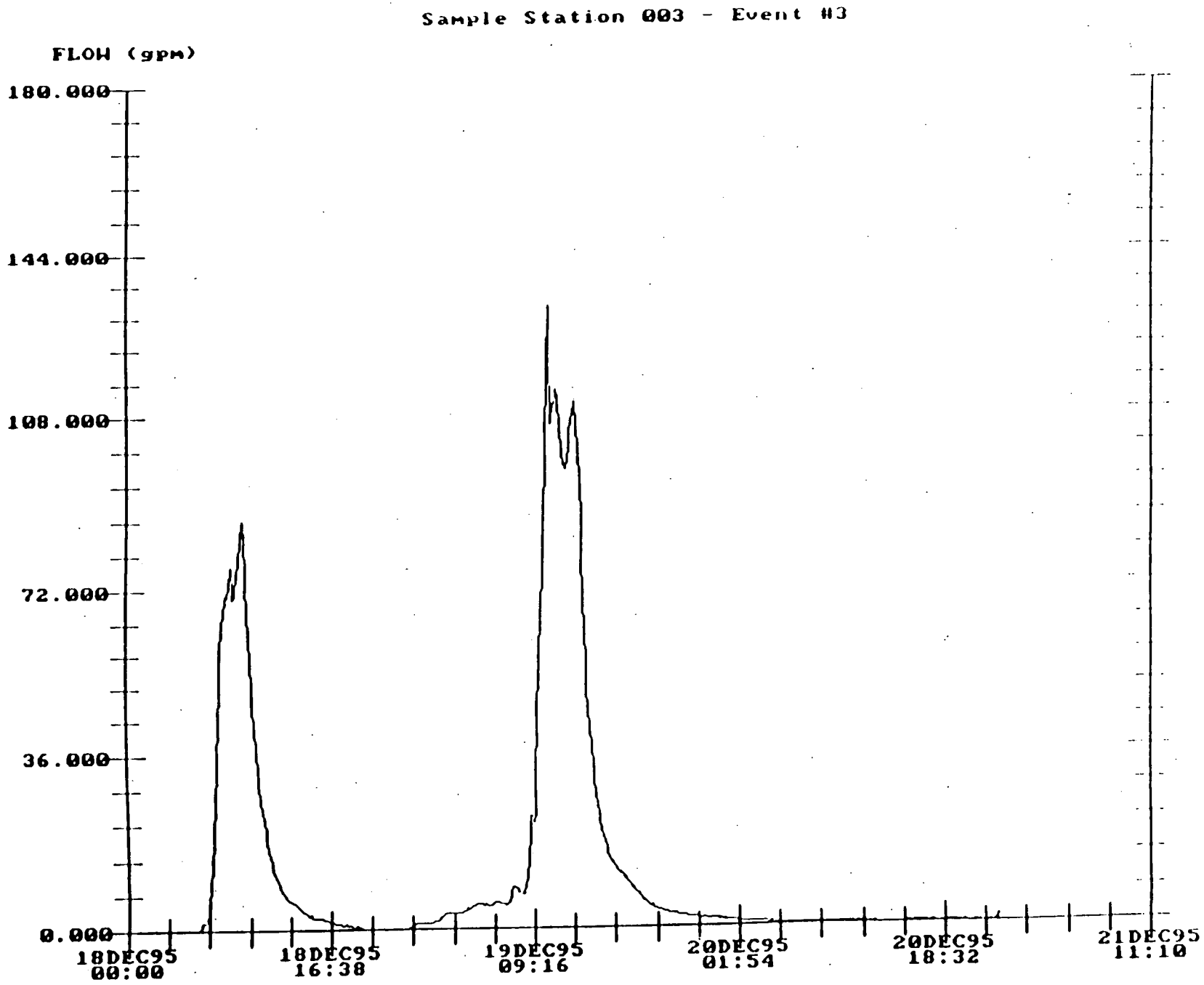

Sample Station 002 - Event 82
FLOW (gpm)
28.4440
22.7550
17.0669
11.3779
5.6890
0.0000
10NOV95
22:00
11NOV95
10:03
11NOV95
22:06
12NOV95
10:09
12NOV95
22:12
13NOV95
10:16


Sample Station 003 - Event #2
FLOW (gpm)
8.99557
7.19645
5.39734
3.59823
1.79911
0.00000
10NOV95 22:00
11NOV95 10:05
11NOV95 22:10
12NOV95 10:15
12NOV95 22:20
13NOV95 10:26


Sample Station 004 - Event #2
FLOW (gpm)
4.92873
3.94298
2.95724
1.97149
0.98575
0.00000
10NOV95 22:00
11NOV95 14:51
12NOV95 07:43
13NOV95 00:35
13NOV95 17:27
14NOV95 10:19

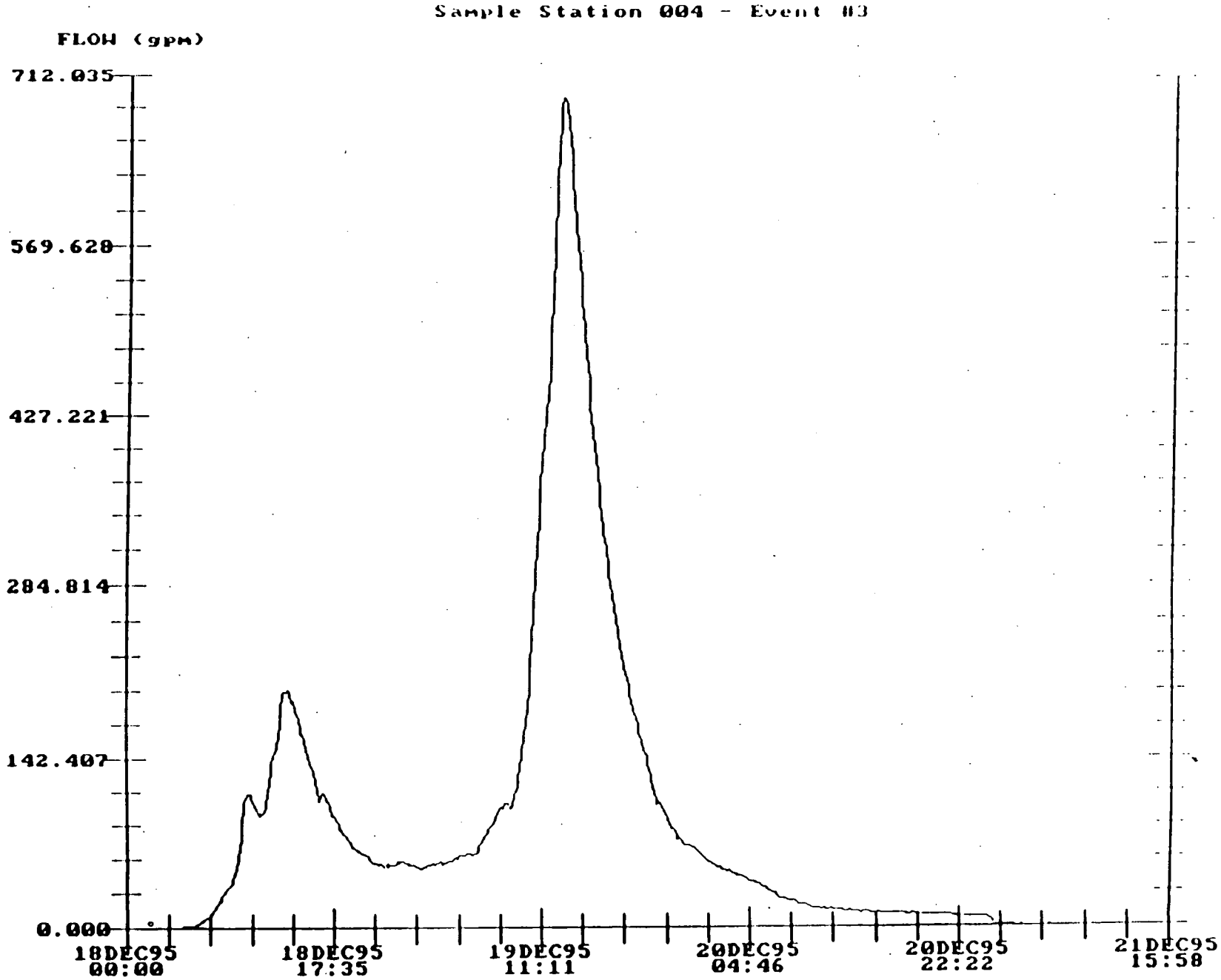

Sample Station 001 - Event #3
FLOW (gpm)
400.000
320.000
240.000
160.000
80.000
0.000
18DEC95 00:00
18DEC95 16:36
19DEC95 09:13
20DEC95 01:50
20DEC95 18:27
21DEC95 11:04

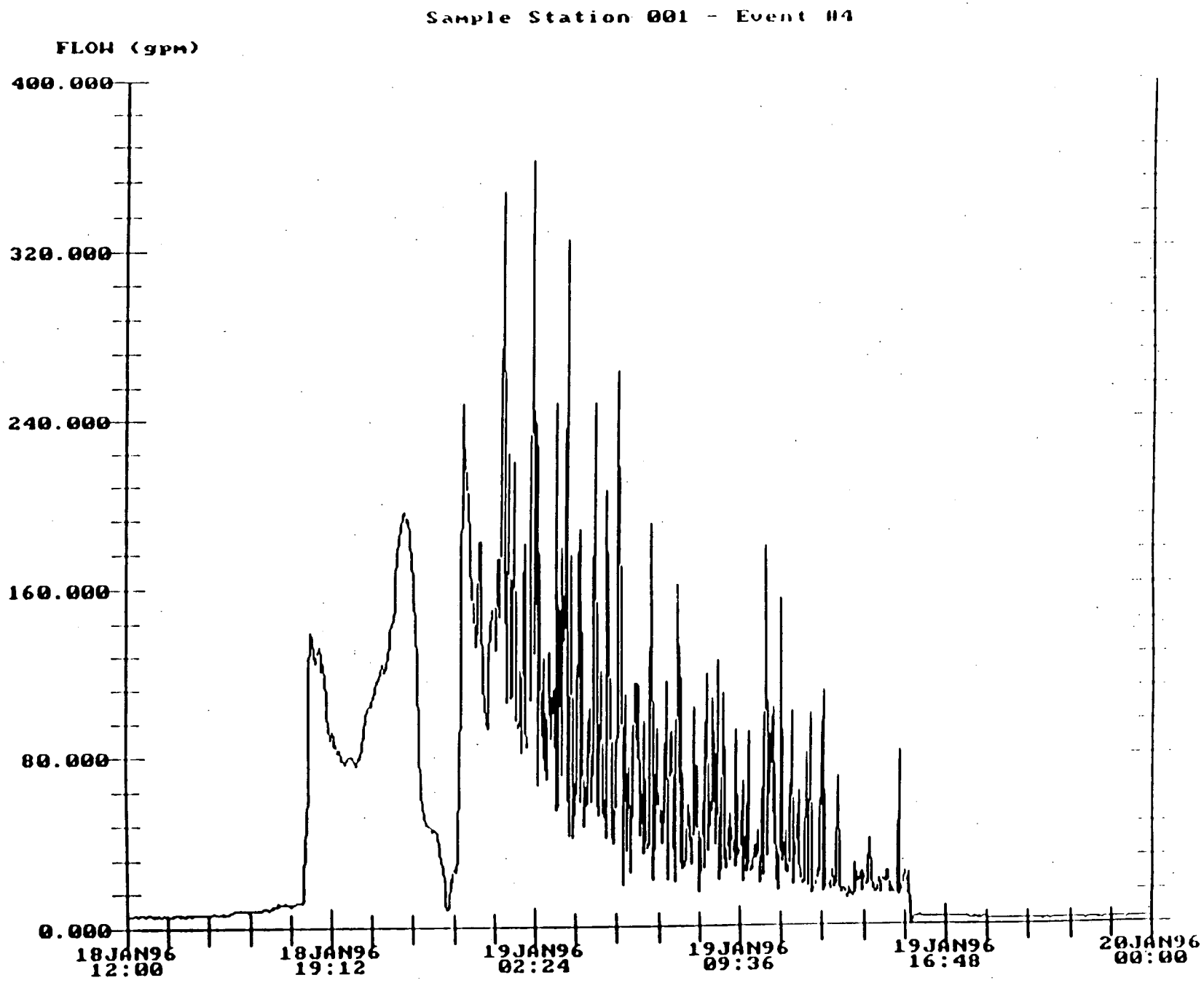


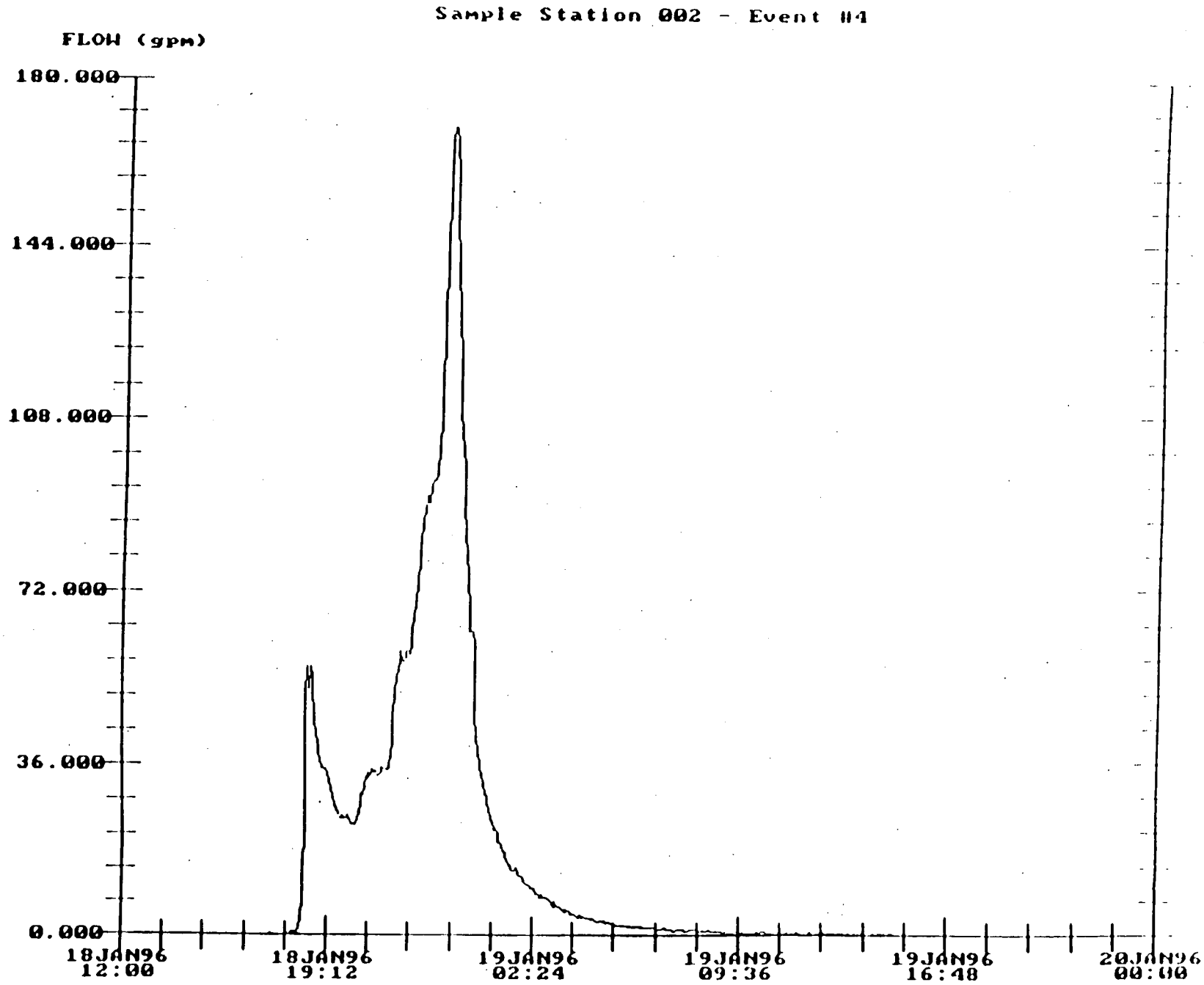

Sample Station 003 - Event #3
FLOW (gpm)
180.000
144.000
108.000
72.000
36.000
0.000
18DEC95
00:00
18DEC95
16:38
19DEC95
09:16
20DEC95
01:54
20DEC95
18:32
21DEC95
11:10

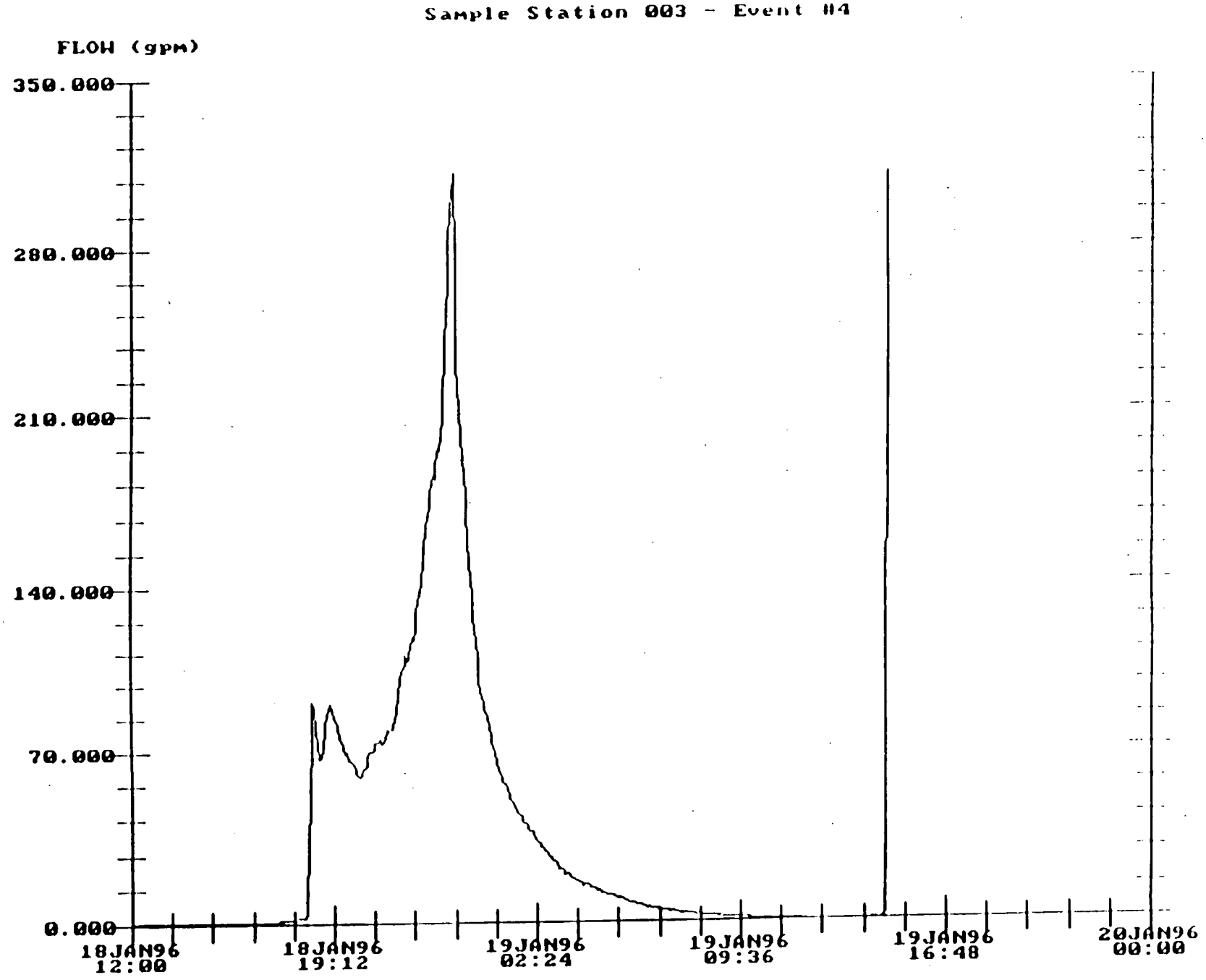
250000

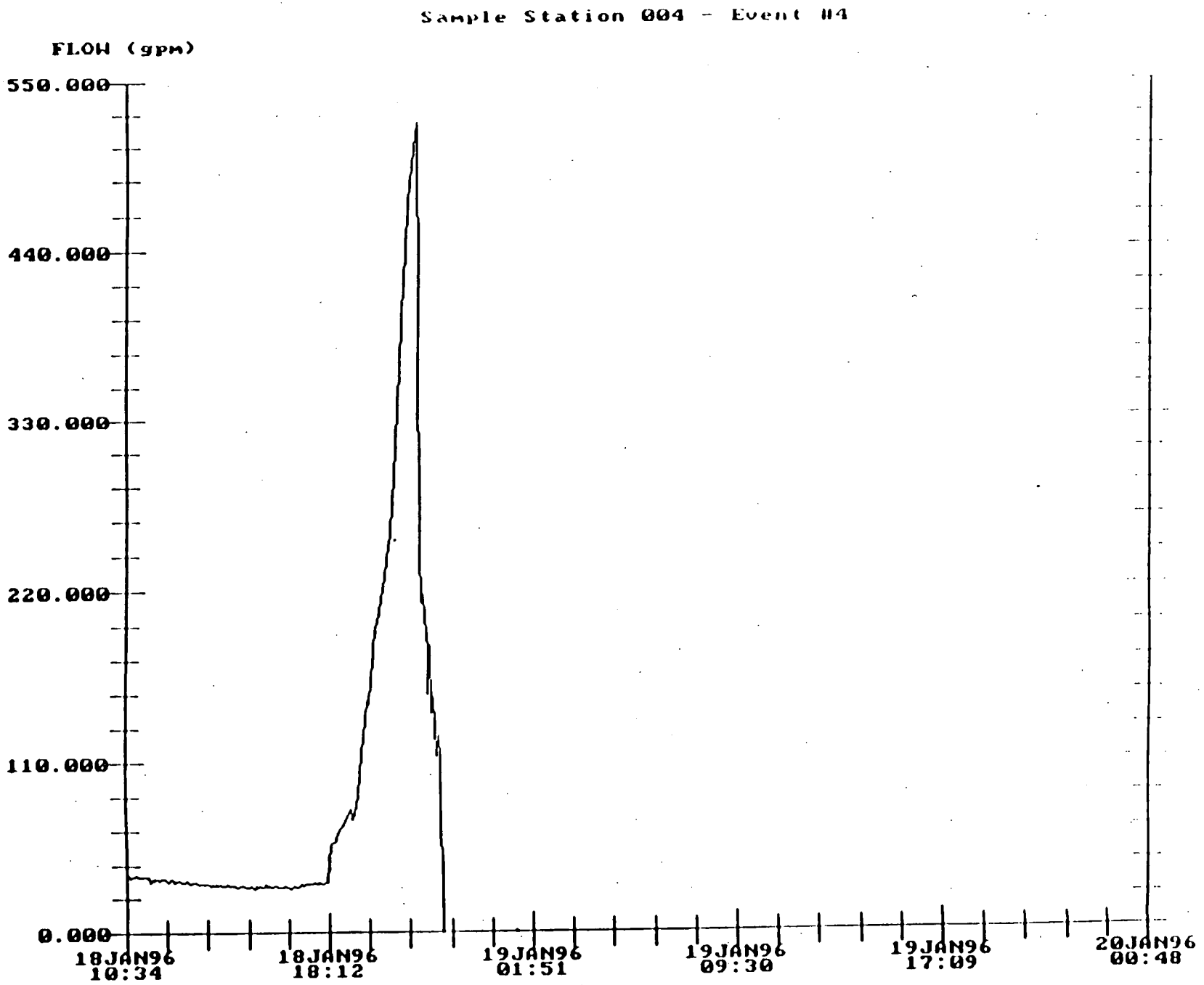
1694

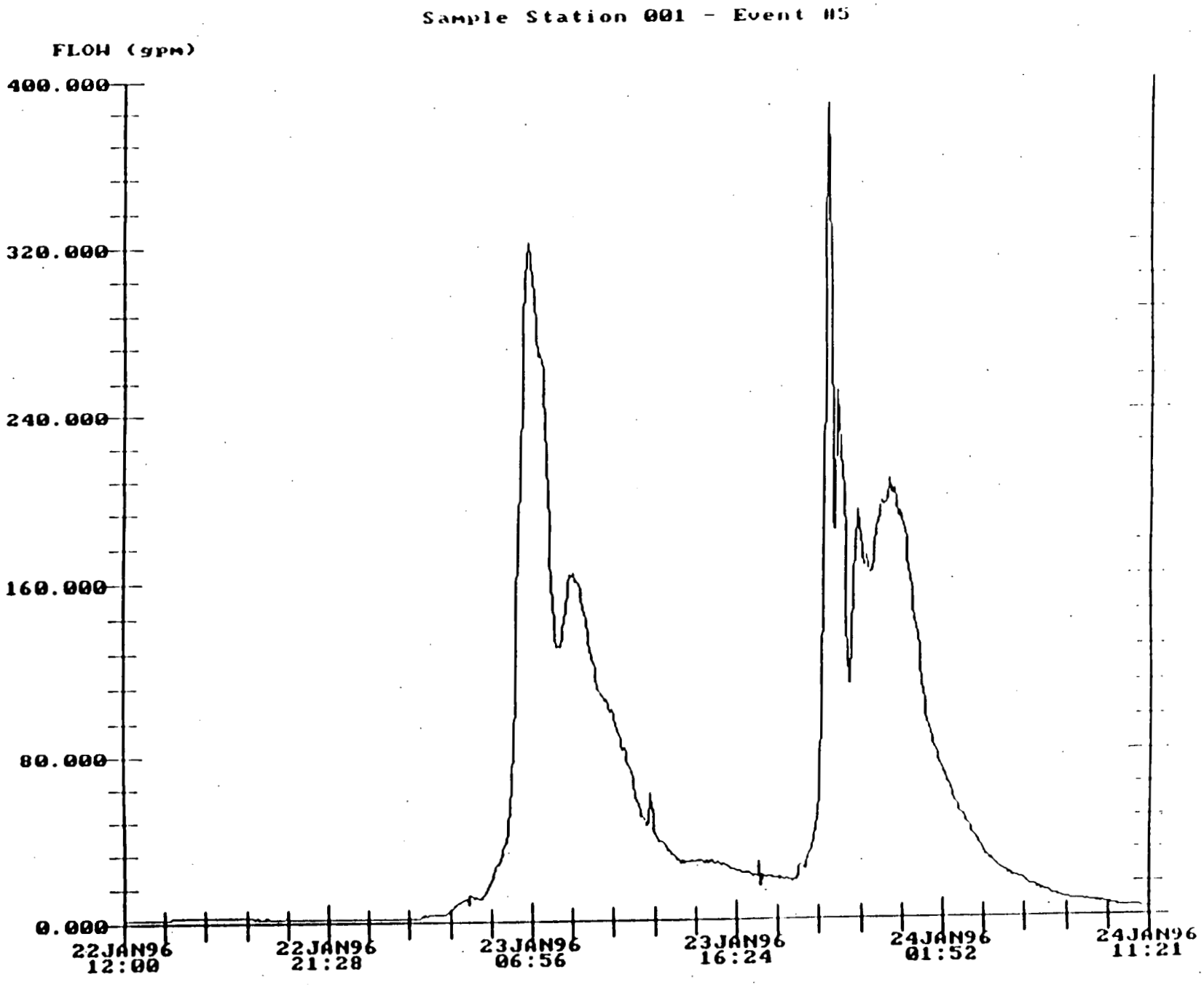

Sample Station 004 - Event #3
FLOW (gpm)
712.035
569.628
427.221
284.814
142.407
0.000
18DEC95 00:00
18DEC95 17:35
19DEC95 11:11
20DEC95 04:46
20DEC95 22:22
21DEC95 15:58

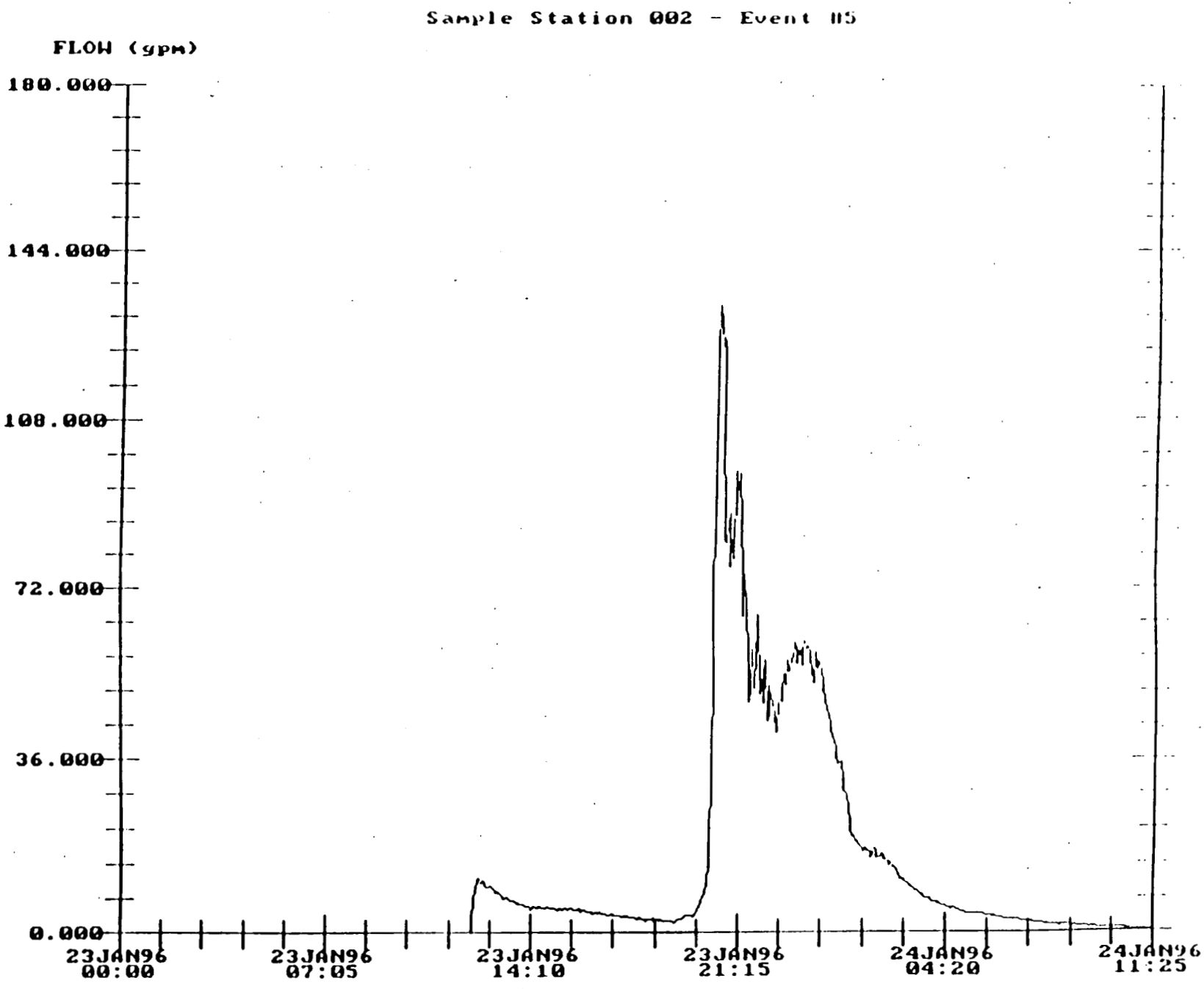

Sample Station 001 - Event #4
FLOW (gpm)
400.000
320.000
240.000
160.000
80.000
0.000
18JAN96 12:00
18JAN96 19:12
19JAN96 02:24
19JAN96 09:36
19JAN96 16:48
20JAN96 00:00

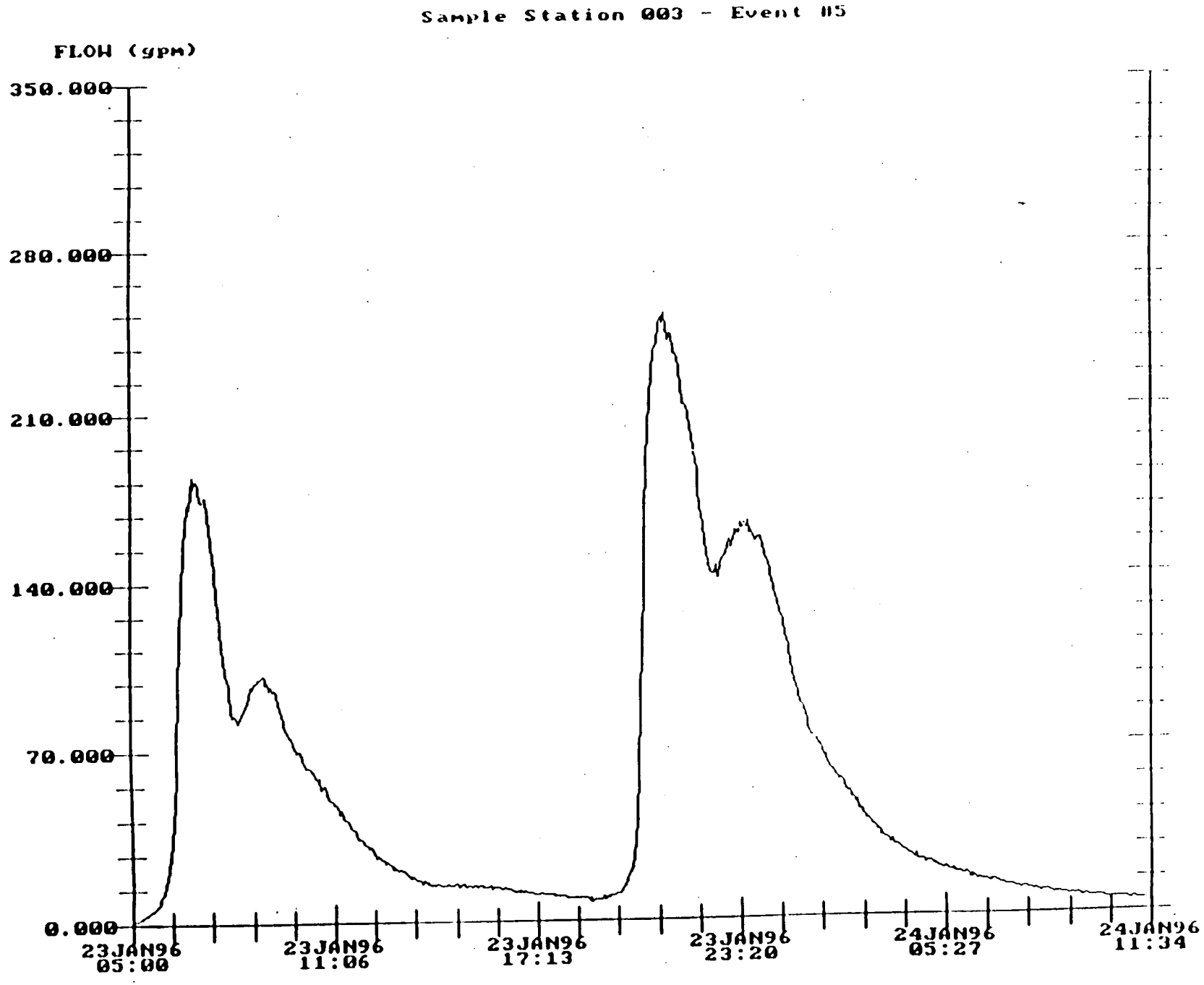

Sample Station 002 - Event #4
FLOW (gpm)
180.000
144.000
108.000
72.000
36.000
0.000
18JAN96 12:00
18JAN96 19:12
19JAN96 02:24
19JAN96 09:36
19JAN96 16:48
20JAN96 00:00

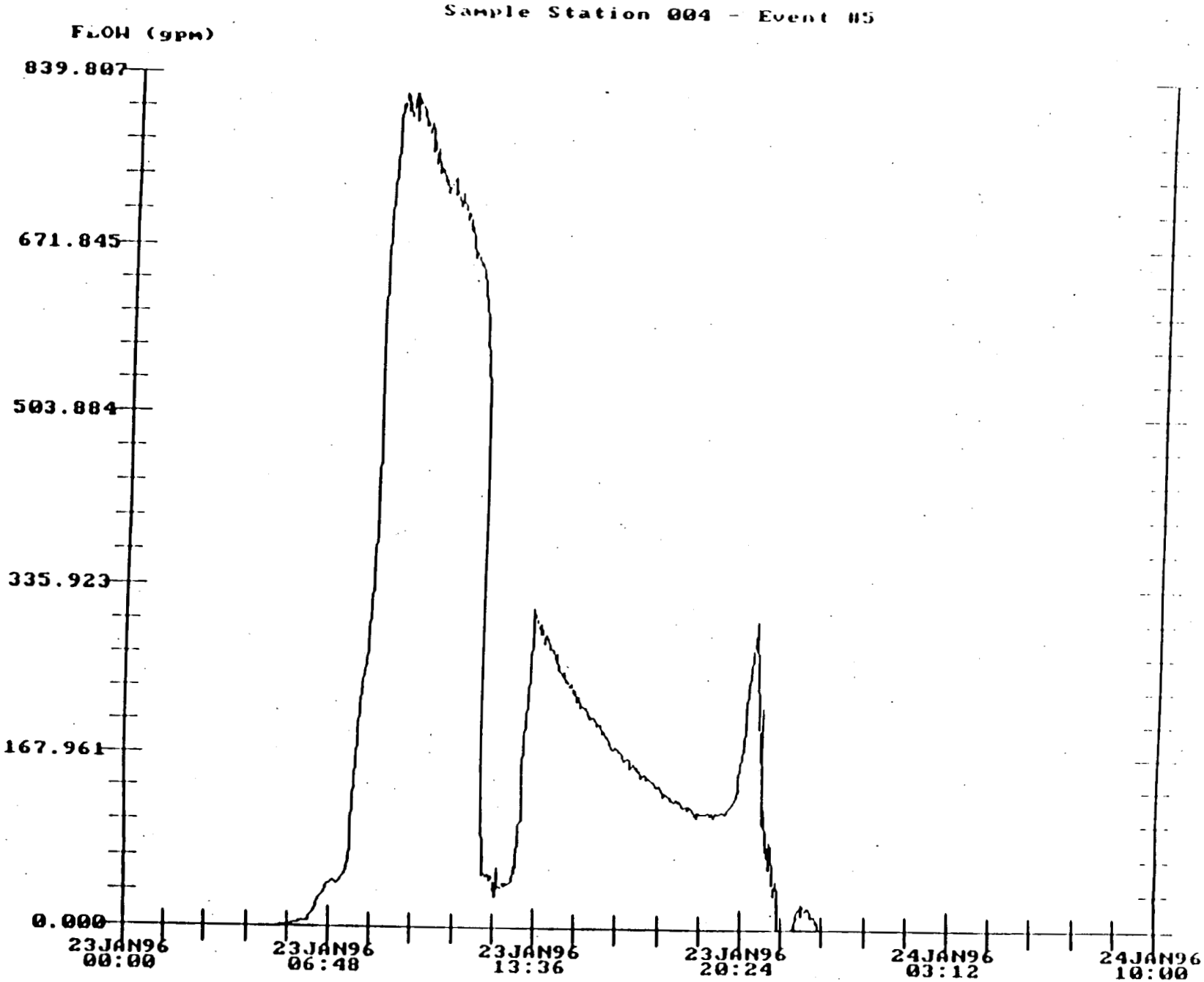


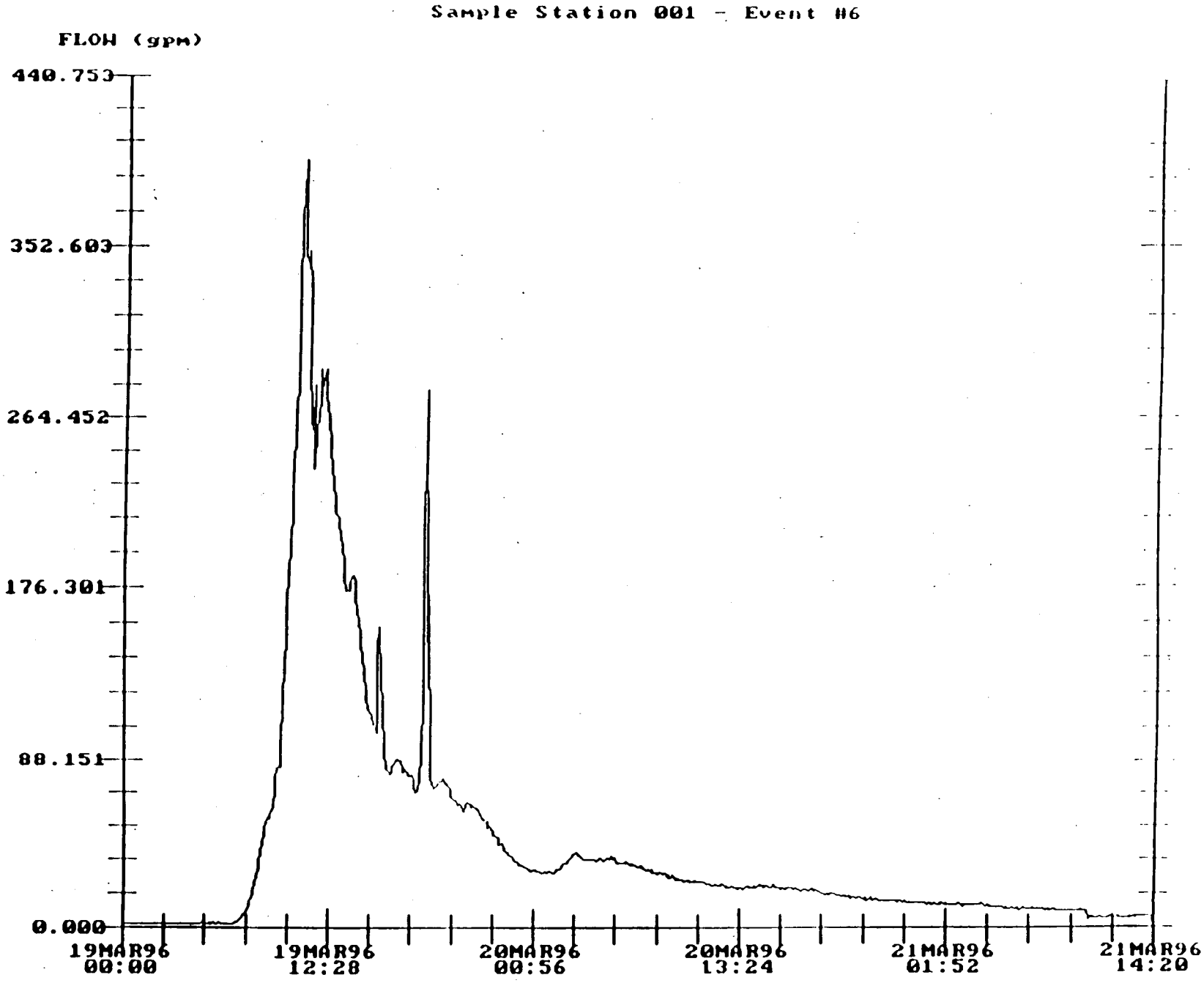

Sample Station 004 - Event 04
FLOW (gpm)
550.000
440.000
330.000
220.000
110.000
0.000
18JAN96 10:34
18JAN96 18:12
19JAN96 01:51
19JAN96 09:30
19JAN96 17:09
20JAN96 00:48

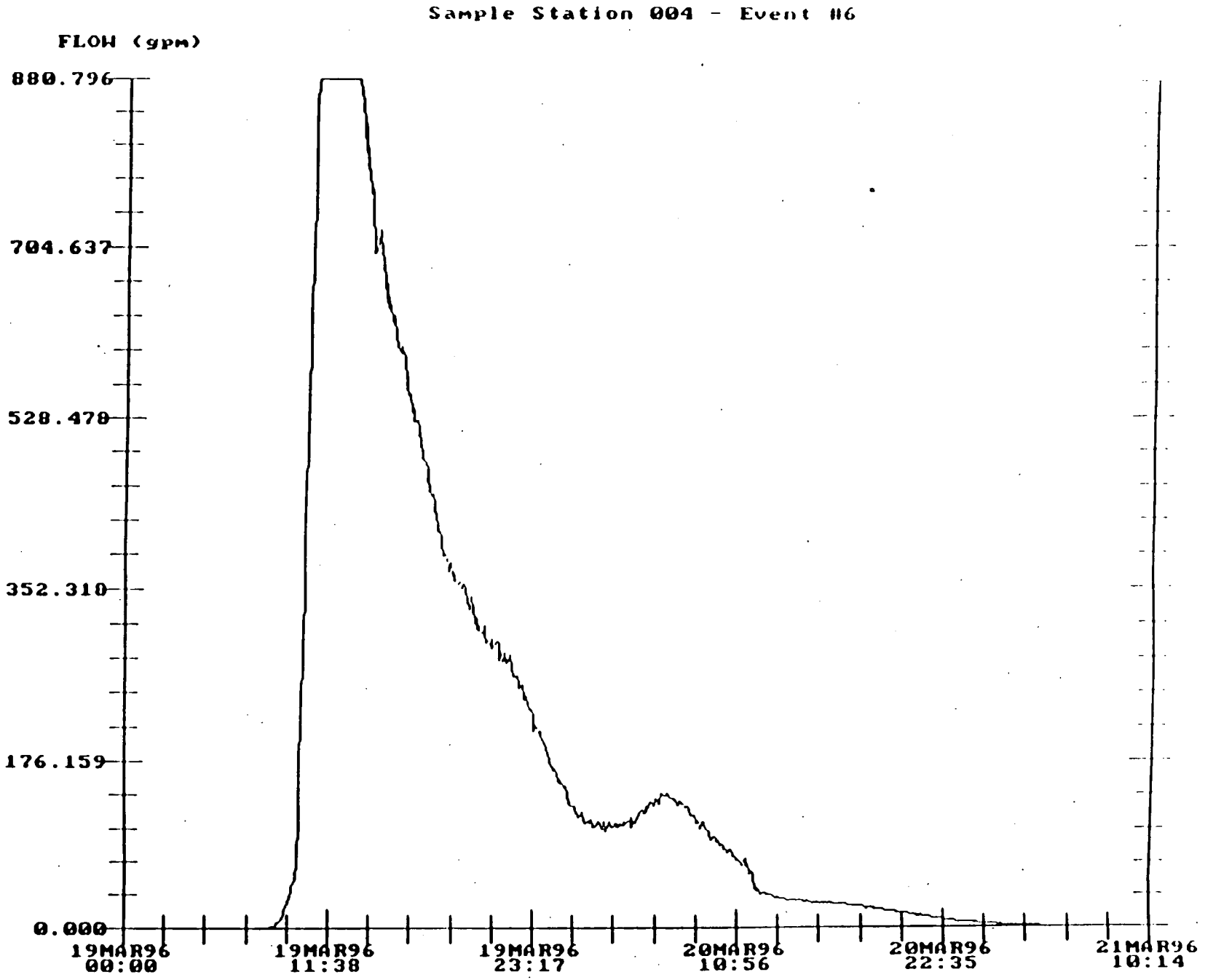

Sample Station 001 - Event #5
FLOW (gpm)
400.000
320.000
240.000
160.000
80.000
0.000
22JAN96 12:00
22JAN96 21:28
23JAN96 06:56
23JAN96 16:24
24JAN96 01:52
24JAN96 11:21


Sample Station 002 - Event 05
FLOW (gpm)
180.000
144.000
108.000
72.000
36.000
0.000
23JAN96 00:00
23JAN96 07:05
23JAN96 14:10
23JAN96 21:15
24JAN96 04:20
24JAN96 11:25



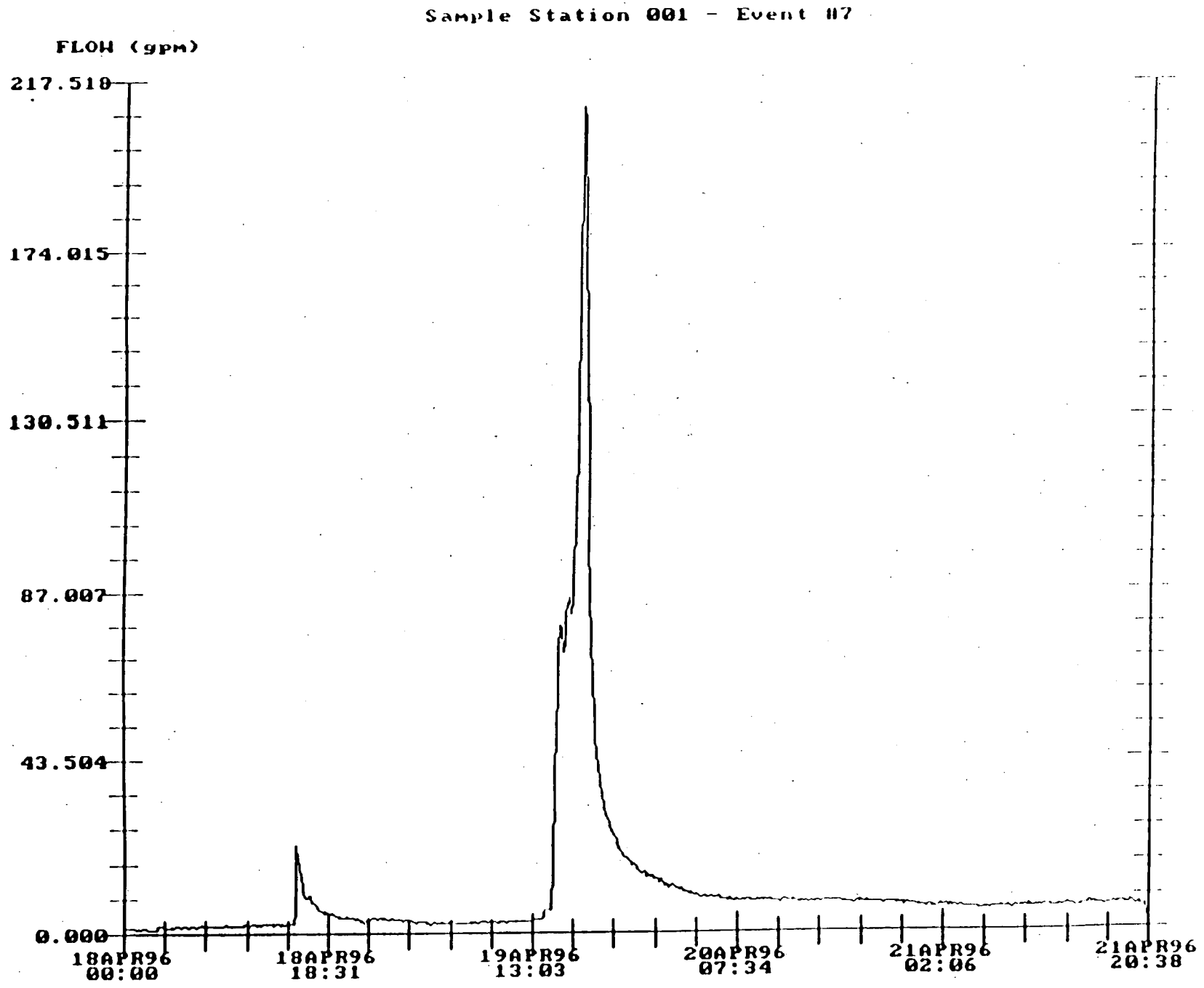

Sample Station 004 - Event 85
FLOW (gpm)
839.807
671.845
503.884
335.923
167.961
0.000
23JAN96 00:00
23JAN96 06:48
23JAN96 13:36
23JAN96 20:24
24JAN96 03:12
24JAN96 10:00

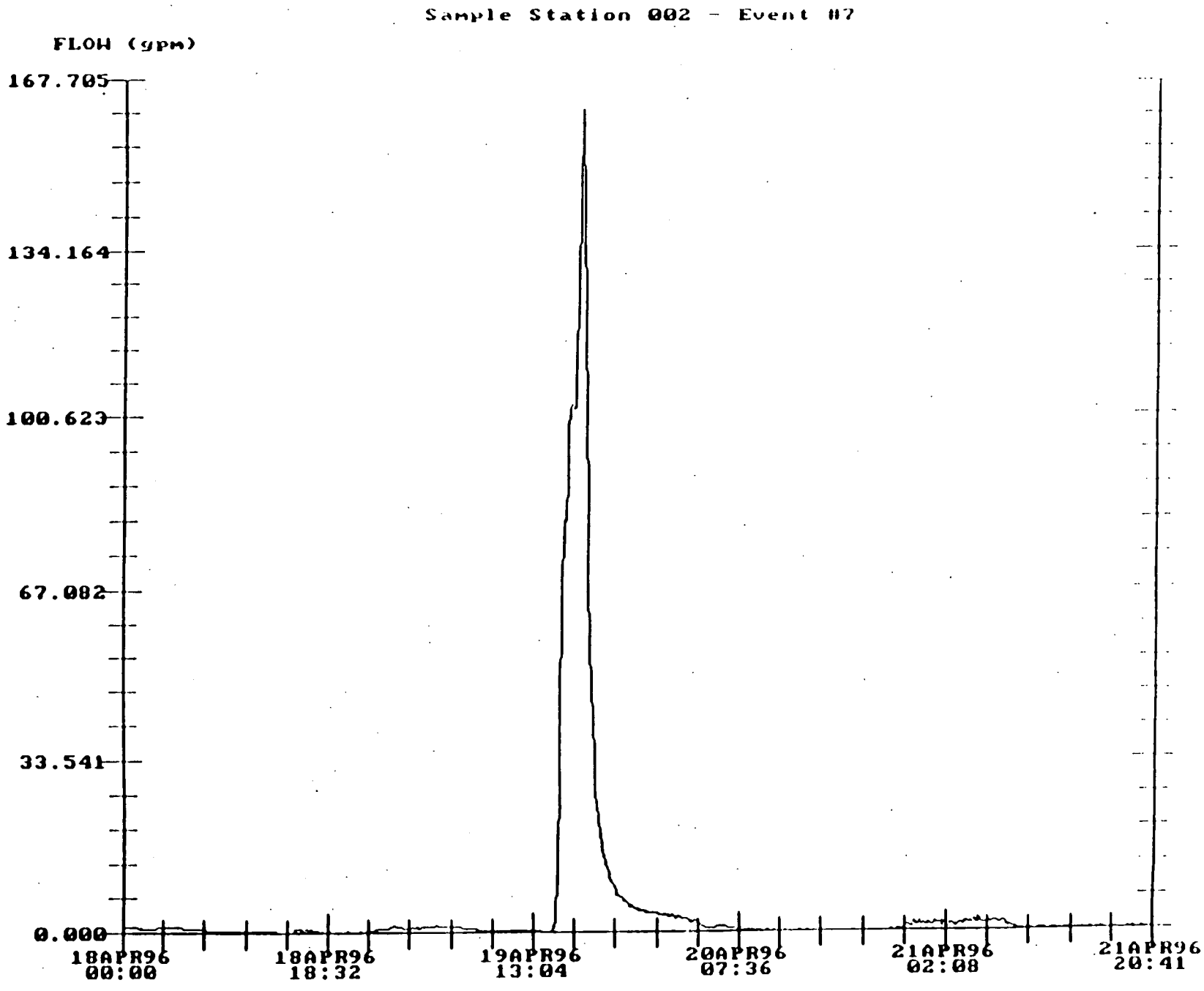

Sample Station 001 - Event #6
FLOW (gpm)
440.753
352.603
264.452
176.301
88.151
0.000
19MAR96 00:00
19MAR96 12:28
20MAR96 00:56
20MAR96 13:24
21MAR96 01:52
21MAR96 14:20

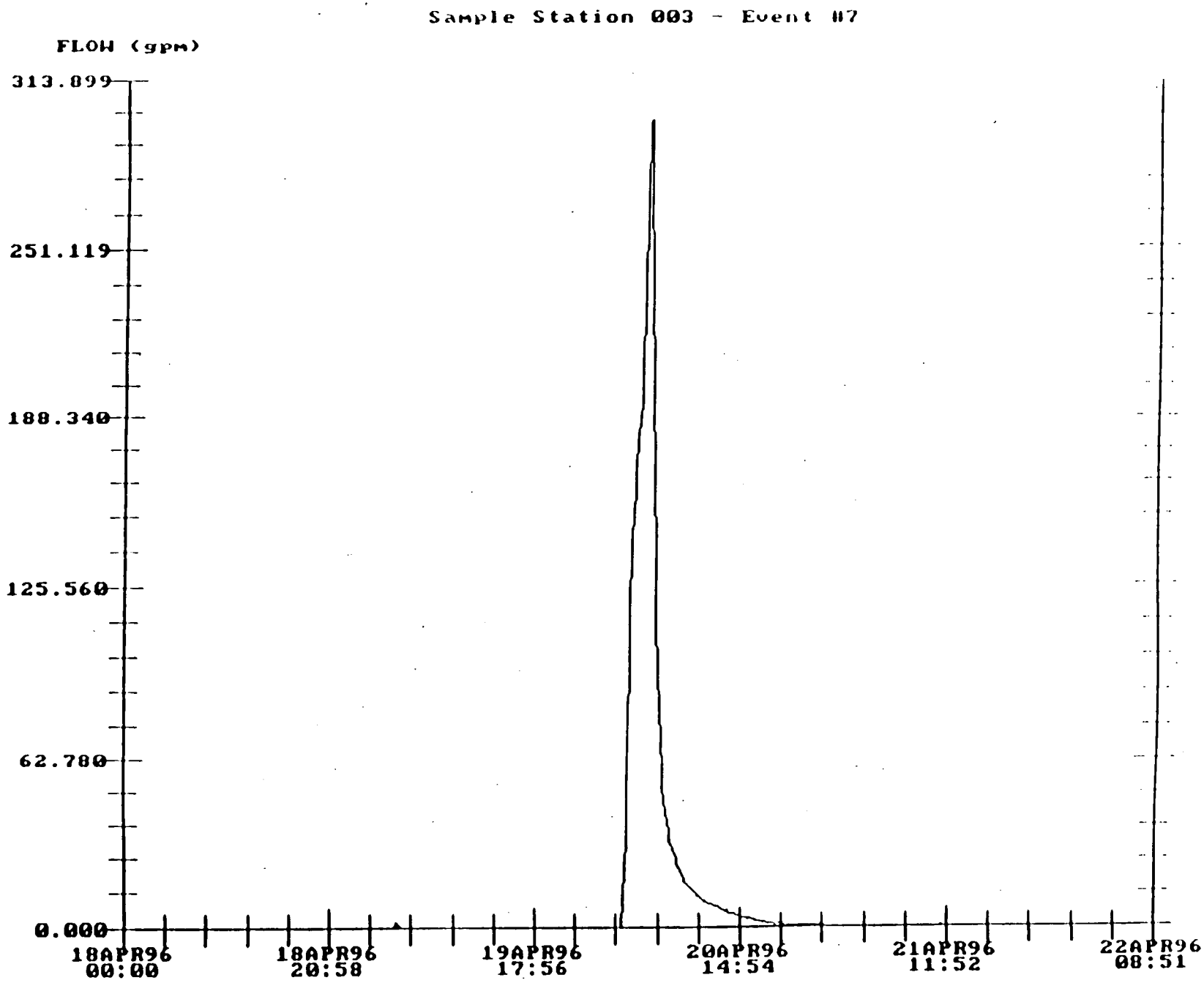

Sample Station 004 - Event #6
FLOW (gpm)
880.796
704.637
528.478
352.310
176.159
0.000
19MAR96 00:00
19MAR96 11:38
19MAR96 23:17
20MAR96 10:56
20MAR96 22:35
21MAR96 10:14

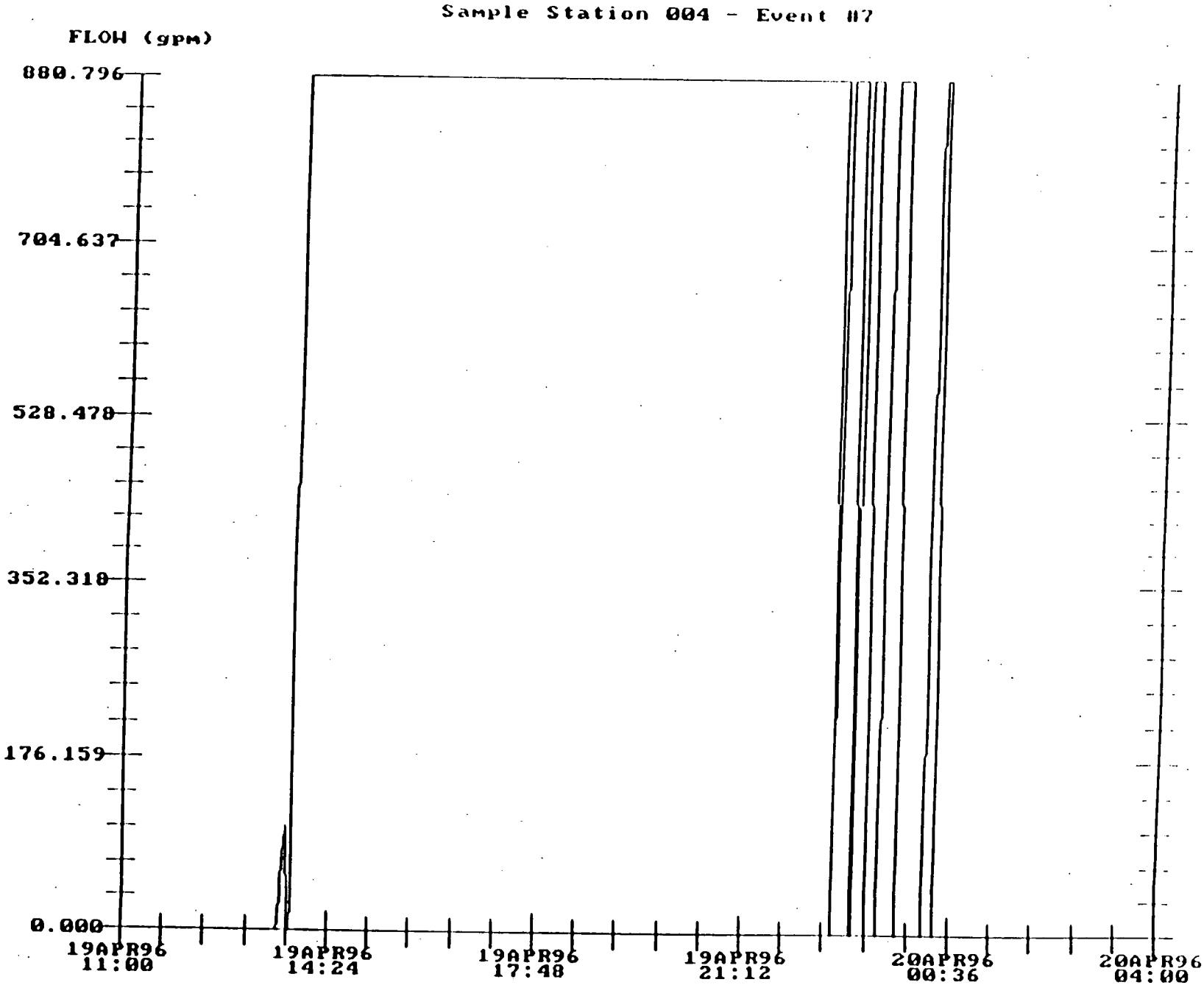
890000

1194


Sample Station 001 - Event #7
FLOW (gpm)
217.518
174.015
130.511
87.007
43.504
0.000
18APR96 00:00
18APR96 18:31
19APR96 13:03
20APR96 07:34
21APR96 02:06
21APR96 20:38


Sample Station 002 - Event #7
FLOW (gpm)
167.705
134.164
100.623
67.082
33.541
0.000
18APR96 00:00
18APR96 18:32
19APR96 13:04
20APR96 07:36
21APR96 02:08
21APR96 20:41


Sample Station 003 - Event #7
FLOW (gpm)
313.899
251.119
188.340
125.560
62.780
0.000
18APR96 00:00
18APR96 20:58
19APR96 17:56
20APR96 14:54
21APR96 11:52
22APR96 08:51


Sample Station 004 - Event #7
FLOW (gpm)
880.796
704.637
528.478
352.318
176.159
0.000
19APR96 11:00
19APR96 14:24
19APR96 17:48
19APR96 21:12
20APR96 00:36
20APR96 04:00