Y-ER00692
Y-12 Environmental
Restoration Program

AREA SOURCE POLLUTION ASSESSMENT AND CONTROL PLAN

FOR

EAST FORK POPLAR CREEK

SUMMARY REPORT

September 1990

Prepared for:

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1.0 INTRODUCTION

1.1 OBJECTIVES

This report summarizes the programs, sampling activities, and management practices instituted under the plant-wide Area Source Pollution Assessment and Control Plan for East Fork Poplar Creek (EFPC). The work conducted under this far-reaching program supports the commitments to improving area water quality made by Energy Systems in November 1985 at the time the current National Pollutant Discharge Elimination System (NPDES) permit was issued to the Y-12 Plant. The overall objectives for the Area Source Pollution Assessment and Control Plan were to identify non-point source pollutants to EFPC and recommend appropriate corrective actions on a plant-wide basis. Several significant sampling and analysis programs were planned and initiated, as described in this report.

1.2 COMPREHENSIVE SAMPLING PROGRAM OVERVIEW

The Y-12 Plant, originally constructed in 1943, is owned by the DOE, and is currently managed by Energy Systems. It occupies about 800 acres, with over 400 buildings and approximately 5,000 onsite employees. The facility also has over 200 outfalls that discharge cooling waters, treated effluents, runoff, and other process related discharges to the headwaters of EFPC. Bear Creek, another plant surface water, originates at the western end of the Y-12 Plant and receives mostly runoff and groundwater flow.

Under the Clean Water Act (CWA), it is required that an NPDES permit be issued for individual plant outfalls by the U.S. Environmental Protection Agency (EPA) and the Tennessee Department of Health and the Environment (TDHE). The NPDES permit issued for the plant on May 24, 1985, included requirements for the development and implementation of a Best Management Practices (BMP) Plan. An explicit requirement of the BMP Plan was to update the Y-12 Plant Area Source Management Control Proposal entitled "Evaluation and Interim Management of Area Source Discharges to East Fork Poplar Creek" dated February 15, 1984. Energy

Systems did so in November of 1985, compiling the proposal into a document entitled "Plan for Identifying and Controlling Area Source Discharges at the Y-12 Plant."

In this plan, pollutants included any substance listed as toxic under Section 307(a)(1) of the Clean Water Act, oil, as defined in Section 311(a)(1) of the Act, and any substance listed as hazardous under Section 311 of the Act. In general, nonpoint source pollutants at the Y-12 Plant include but are not limited to heavy metals, oil and grease, suspended solids, organics, and radionuclides, transported and discharged to EFPC and other plant surface waters via three types of outfalls.

Category I	-	Precipitation runoff and some groundwater infiltration
Category II	-	Cooling water, condensate, precipitation runoff, and building roof and foundation drains
Category III	-	The above constituents and various untreated process wastewaters, which have since been eliminated or collected for treatment

In addition, some pollutants were transported to EFPC by:

- Seepage
- Infiltration of groundwater into the storm sewer pipes
- Overland flow resulting from precipitation runoff

To implement the plan, Energy Systems contracted with Camp Dresser & McKee Inc. (CDM), an environmental consulting firm, in 1985. The Area Source Pollution Assessment and Control Plan project undertaken by CDM was then refined and organized into the following phases:

Phase I	-	Area Source Characterization
Phase II	-	Conceptual Best Management Practices
Phase III	-	NPDES Permit Assistance
Phase IV	-	Sampling Data Analysis

The scope of work and progress made under the four phases are summarized below.

1.2.1 PHASE I - AREA SOURCE CHARACTERIZATION

Phase I was initiated in June 1986. Investigations undertaken included analyses of surface runoff pollution and infiltration into Category I, II and III Outfalls. Pollution contributions to EFPC by direct groundwater transport were not included. Tasks included the following.

Task 1 - Review Existing Data

This task included reviewing existing sampling data and sampling programs, as well as an independent evaluation of plant hydrology, storm sewer drainage, major waste and material storage areas, and major treatment and disposal areas. CDM and Energy Systems identified data gaps and suspect data sources in terms of database requirements, for developing the comprehensive sampling plan and storm runoff model.

Task 2 - Preliminary Application of Storm Runoff Model

CDM developed a preliminary hydraulic model of area runoff using available data to better understand site drainage characteristics and refine the sampling plan. The model was later calibrated to the data collected during the comprehensive sampling program.

Task 3 - Development of Sampling Plan

The sampling plan developed by CDM addressed area source contamination to EFPC and specified information on sampling methods (i.e., grab, composite, etc.), detection limit requirements, frequencies, and locations. CDM used a two-tiered approach to the sampling program. First, following the review of data in Task 1 and a site visit, CDM and Energy Systems personnel jointly selected a set of key locations for immediate installation of rain gauges, flow

monitors, and water quality sampling stations. These activities comprised the Preliminary Sampling Program.

The second tier involved refining the data from the preliminary sampling program. A comprehensive sampling plan based on available information and the preliminary stormwater model, calibrated with data from the sampling program, was developed. All water sampling and analyses were performed by Energy Systems in accordance with the Quality Assurance and Quality Control (QA/QC) procedures specified by EPA.

Task 4 - Data Analysis

In this task, CDM analyzed the data provided by Energy Systems and quantified the storm induced pollutant loadings from the plant subbasins.

Task 5 - Technical Assistance During Implementation of the Sampling Program

During the sampling program, CDM provided periodic technical assistance to Energy Systems regarding sample collection, QA/QC procedures, and analytical problems.

Phase I concluded with the development of a Comprehensive Sampling Program for the EFPC Area Source Pollution Assessment and Control Plan, which outlined a sampling program consisting of monitoring stations designed to collect flow and water quality data from several dry and wet weather events. The report was delivered to TDHE in mid-1987.

1.2.2 PHASE II - CONCEPTUAL BEST MANAGEMENT PRACTICES

Phase I of the project determined that construction related activities were one of the major sources of nonpoint pollution at the Y-12 Plant. Based on this information, CDM developed a program which included procedures and BMPs to minimize the impact of construction activities on the water quality of EFPC.

This phase consisted of four major tasks, as described below:

Task 1 - Development of a Waste Management Program for the Control of Erosion, Siltation, and Other Pollutants from Construction Related Activities

This task included preparing two plant-wide plans:

- o Interim Guidance for Erosion and Sediment Control (submitted in June 1988)
- o Waste Management Plan for Construction Activities (submitted in October 1988)

Task 2 - Development of a Stream Management and Analysis Program (SMAP)

During Phase I, it appeared that the water quality of EFPC might have been significantly impacted by area source discharges, particularly from construction activities and groundwater contribution. In addition, water quality was governed by other factors such as process discharges, cooling water, condensate, and other plant discharges. To effectively evaluate and select BMPs, it was necessary to integrate the impact of area sources (groundwater and runoff) with point source discharges (wastewater treatment plants, cooling towers, and power facility wastewaters).

To accomplish this, the Stream Management and Analysis Program was developed. This computer simulation tool generates the following: 1) estimated instream pollutant concentration versus distance along EFPC, 2) estimated instream flow versus distance along EFPC, and 3) cumulative pollutant mass loading versus distance along EFPC.

Task 3 - Recommendations for Administrative Controls and Obtaining Data Necessary for Conceptual Design of Control Facilities

The purpose of this task was to evaluate administrative and housekeeping controls to reduce pollutant discharges. CDM developed a list of potential administrative controls and developed a ranking system for the implementation of BMPs based on information provided by Energy Systems and a plant inspection

conducted by CDM. A report which identified potential nonpoint sources and established a mechanism for prioritizing BMPs was finalized in May 1990.

Task 4 - Technical Assistance During Phase II

This task included providing technical assistance to Energy Systems in several area source pollution activities, and conducting a training program to implement the comprehensive sampling program.

1.2.3 PHASE III - NPDES PERMIT ASSISTANCE

In April 1989, with the 1985 NPDES permit due to expire in May 1990, the Y-12 Environmental Management Department retained CDM to prepare the NPDES renewal application for the plant. This phase of the project included three principal tasks, described below:

Task 1 - NPDES Permit Application Assistance

This task consisted of assisting Energy Systems in preparing NPDES permit applications for all Y-12 Plant discharges to EFPC and Bear Creek. The NPDES permit applications were prepared using a computerized database system programmed to transfer information from raw computer files to the application. To support the application, a supplemental attachment was prepared, consisting of seven volumes of text, monitoring data plotted graphically and in analytical tables, and schematic drawings. The effort included:

- Data reduction of over 5 million data points collected for over 200 outfalls and containing information about water characteristics of over 200 parameters, flow, and physical properties of the discharge.
- Data analysis and comparison of observed contaminant concentrations to federal and state water quality standards and human health criteria.
- Recommendation of proposed discharge limits for contaminants that exceeded the proposed limits.
- A monitoring and compliance program proposal.
- Evaluation of the cost-effectiveness of different sampling scenarios.

During the course of the project, the project team conducted bi-weekly meetings with Energy Systems and prepared status reports for each meeting. In addition, several progress meetings were held with the TDHE, DOE and Energy Systems prior to the November 1989 submittal.

Task 2 - Application and Calibration of the Storm RUNOFF Model

The stormwater RUNOFF model of EFPC developed under Phase I used EPA's Stormwater Management Model (SWMM) as a base. In this task, CDM updated the RUNOFF model of the EFPC watershed to reflect existing conditions at the Y-12 Plant, including replacing New Hope Pond with Lake Reality, clearing of Pine Ridge, and incorporating the North-South Pipe. The model also included all areas draining to the crossing of Bear Creek Road over EFPC. The RUNOFF Model Application Report documented this work.

Task 3 - Application and Calibration of the SMAP Model

The SMAP model of EFPC developed in Phase II integrated the impacts of area (i.e., nonpoint) sources at the Y-12 Plant with other plant discharges. The model subdivided the EFPC watershed into 11 basins, each having one monitoring station used during the Comprehensive Sampling Program.

During this task, CDM used SMAP to simulate flow and pollutant loadings to EFPC for six different BMP situations. The three SMAP modules included:

- A Steady-State Water Quality Model
- A Spill Module
- A BMP Module

Three reports were developed as part of this task:

1. Area Source Pollution Reduction Evaluation Report,
2. SMAP Description, Initial Setup and Calibration Report, and
3. SMAP User's Manual.

1.2.4 PHASE IV - DATA ANALYSIS AND FINAL SUMMARY REPORT

This final phase of the project consisted of analyzing data from the comprehensive sampling program and preparing and submitting this summary report.

Task 1 - Sampling Data Analysis

CDM assisted Energy Systems in sorting and analyzing water quality and flow data collected as part of a Comprehensive Sampling Program for the Area Source Pollution Assessment and Control Plan. The purpose of this project was to analyze dry and wet weather event data for EFPC. Water quality data represents selected wet and dry events from April 1988 through May 1989, in accordance with the Comprehensive Sampling Program. Flows and water quality data were obtained from continuous stage (depth of flow) measurements at each of the 11 monitoring stations. CDM also developed rating curves to convert actual stage measurements to flows using a best-fit calibration technique and the Manning's roughness equation.

Flows and water quality data were used to calculate contaminant loadings for parameters of concern in EFPC for the average of dry weather events at each station. The average of dry weather events consists of twelve 24-hour composites and represents baseline conditions, including plant outfalls and groundwater infiltration. Dry and wet weather conditions were then compared to assess the impact of surface runoff on EFPC water quality.

1.3 REPORT ORGANIZATION

This report consists of eight sections. Section 1 provides the framework for the Area Source Pollution Assessment and Control Plan for EFPC and project objectives. The remaining sections are as follows:

2.0 Water Quality Data Summary Report for Wet and Dry Events
Discusses the parameters of concern in EFPC monitored during wet and dry weather events. Submitted April 5, 1990. Comments received from Energy Systems have been addressed in this version.

3.0 Dry and Wet Weather Event Data Analysis Report

Presents contaminant loadings for the parameters of concern in Upper EFPC. Submitted May 21, 1990. These results were presented to Energy Systems in the meeting held on May 14, 1990.

4.0 Groundwater Data Summary Report

Includes groundwater elevations and contaminant concentrations based on groundwater modeling results. Submitted May 10, 1990. Comments received from Energy Systems have been addressed in this version.

5.0 RUNOFF Model Application Report

Contains an update to the stormwater RUNOFF model and calibration information input to SMAP. Submitted June 1, 1990.

6.0 SMAP Description, Initial Setup, and Calibration Report

Designed to accompany the SMAP User's Manual, provides description and general information about the SMAP model and application to Upper EFPC. Submitted June 22, 1990.

7.0 Area Source Pollution Reduction Evaluation Report

Describes six BMPs simulated with SMAP and presents results. Submitted June 8, 1990.

8.0 Summary

Discusses the parameters of concern, contamination reductions needed, water quality standards, and additional sampling recommendations. Submitted May 25, 1990.

SECTION 2.0

WATER QUALITY DATA SUMMARY REPORT FOR WET AND DRY WEATHER EVENTS

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1.0 INTRODUCTION

1.1 OVERVIEW OF DRY AND WET WEATHER EVENTS

Water quality samples were collected by Energy Systems within the Y-12 Plant area of East Fork Poplar Creek (EFPC) for selected dry and wet weather events. The data reported herein include all non-radiological parameters. Radiological data are included in the September 1990 report, "Environmental Programs Affecting Surface Waters at the Y-12 Plant." These data span a 9-month period, from April 1988 through May 1989. Dry weather events represent average or baseline conditions, including plant outfalls and groundwater infiltration, and wet weather events include the impact of surface runoff on Upper EFPC water quality. Guidance criteria used to determine a wet weather event were a rainfall quantity exceeding or equal to 0.5 inches and an antecedent dry period of three or more days. These references were based on long-term statistical analyses of National Weather Service rain gauges in the area.

For each event, approximately 100 parameters were analyzed for each of the eleven monitoring stations (A through K) in EFPC. Stations A, C, E, and K are all downgradient of the north-south pipe and are physically located in the creek. Originally, 13 stations were planned. However, the "old station A" was dropped due to culvert grading which changed the channel cross-section and rendered this location unusable. The thirteenth station was never located due to security restrictions and physical creek limitations.

The dry weather events consist of two consecutive days and samples represent 24-hour composites. The wet weather events represent storms of varying intensities and samples were collected using automatic flow proportional samplers for the storm duration. The specific dry and wet weather event dates are outlined on the following page.

EVENT DATES

Dry Weather	Wet Weather
09/22/88	11/04/88
09/23/88	03/30/89
10/04/88	04/04/89
10/05/88	05/05/89
10/15/88	05/09/89
10/16/88	
12/07/88	
12/08/88	
01/22/89	
01/23/89	
03/10/89 (deleted)	
03/11/89	
04/24/89	

One dry weather event (03/10/89) was deleted due to incomplete data.

Water quality data were received from Energy Systems in ASCII format and were reduced to LOTUS spreadsheets first by event and then by parameter. Data results and statistical analyses are presented in Section 2. These data were compared to potentially applicable standards for EFPC and are discussed in Section 3. Based on this review, critical parameters, namely those most significantly exceeding standards, are summarized and graphed. This water quality data will also be used in ensuing tasks to calculate contaminant loadings, assess the importance of runoff on EFPC water quality, and recommend best management practices (BMPs) to control area source pollutions.

1.2 APPROACH TO DATA REDUCTION

The approach used in reducing the data is described in this section. Parameters which appeared as undetected (U), estimated (J), or were also identified in the laboratory blank sample (B), were excluded from further water quality evaluation and do not appear in the summary tables. For conservative purposes, values reported as less than the detection limit were replaced with the detection limit.

The statistical minimum, average, and maximum concentrations were calculated for each parameter at each station. These calculations were performed

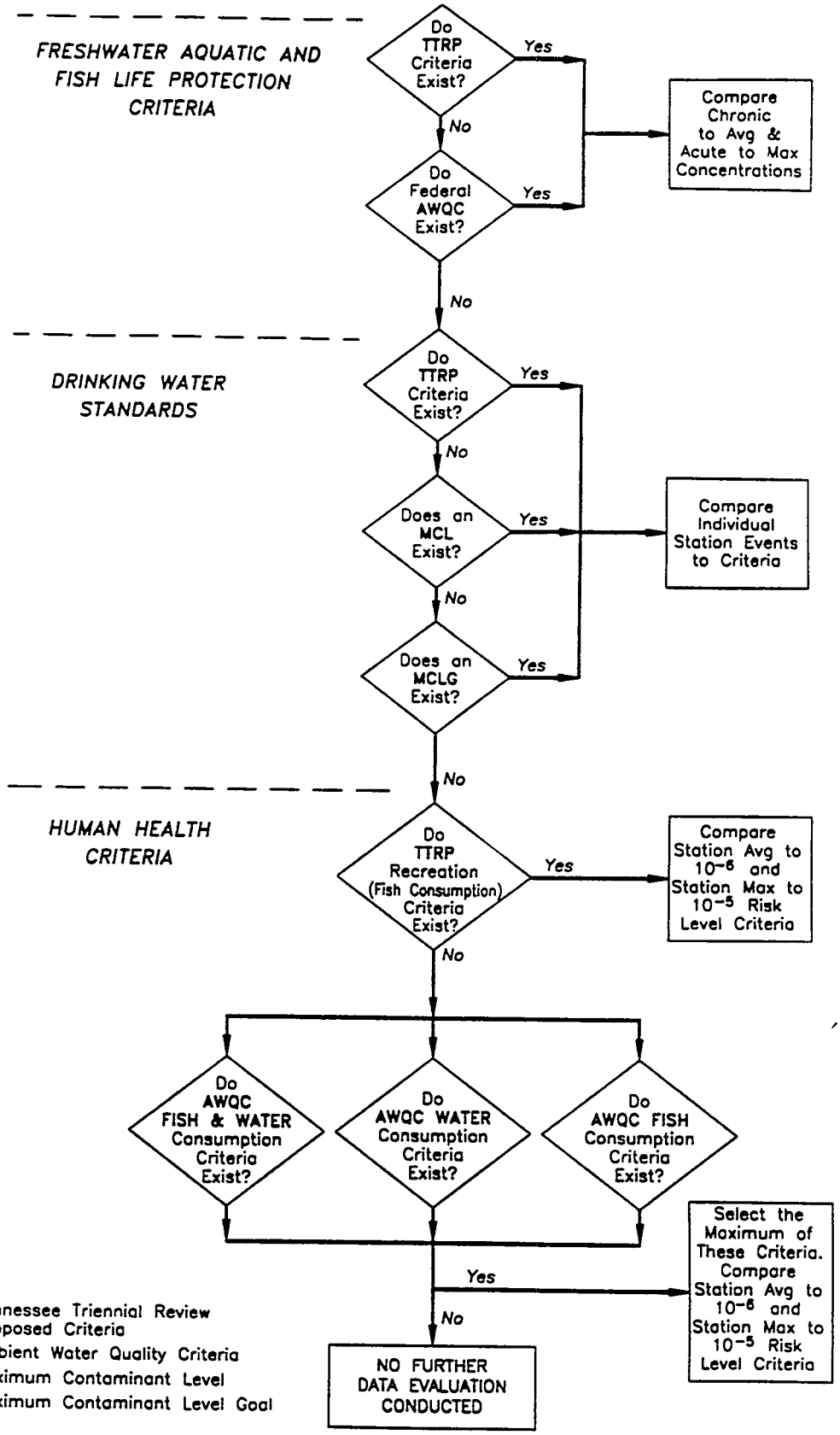
separately for dry and wet events. Undetected values were treated as zero in doing these statistics. The tabular results for both wet and dry events are given in Section 2. The corresponding statistical plots for each parameter for both wet and dry events are given in Appendix A.

1.3 APPROACH TO DATA ANALYSIS

Results of the statistical analysis and individual water quality data were compared to potentially applicable regulatory limits for EFPC. To determine which standards were most appropriate, a schematic flow diagram for prioritizing regulatory standards/criteria was used. This flow diagram decision process is shown in **Figure 1-1**.

Given the directive to establish water quality rather than effluent based limits in EFPC, standards for protection of fish and aquatic life were given precedence in determining pertinent standards. As general guidance, State of Tennessee Triennial Review Proposed (TTRP) Criteria were given first priority where freshwater chronic and acute toxicity values were compared to station average and maximum concentrations, respectively. When no state standards existed, federal ambient water quality criteria (AWQC) were used. Similarly, freshwater chronic and acute toxicity values were compared to average and maximum concentrations, respectively. Where applicable, AWQC were updated with the EPA publication entitled Water Quality Criteria for 1986, more commonly known as the EPA "Gold Book" criteria. When neither state nor federal, freshwater aquatic protection criteria exist, 24-hour average (not to exceed maximum Gold Book values) were used.

For compounds where no fish and aquatic life protection criteria have been developed, drinking water standards are used. Again, the TTRP values are given priority. Federal standards, namely Safe Drinking Water Act (SDWA) Maximum contaminant Levels (MCLs), were considered in the absence of state standards. MCLs were considered before secondary MCLs (SMCLs). If neither of these existed, SDWA Maximum Contaminant Level Goals (MCLGs) were considered. Since only one standard exists in the drinking water category (as opposed to acute and chronic) all sampling data were compared to this value to assess general compliance and parameter significance.



DECISION TREE FOR PRIORITIZING APPLICABLE WATER QUALITY STANDARDS/CRITERIA

DEPARTMENT OF ENERGY Y-12 PLANT

OAK RIDGE, TENNESSEE

FIGURE NO. 1-1

Where aquatic life protection and drinking water criteria do not exist, human health criteria were used. The human health criteria correspond to a 10^{-6} risk level (i.e., one excess carcinogenic occurrence in one million) which is typically used by the state and EPA as a target risk level in evaluating public health impacts. These 10^{-6} risk based standards were compared to average concentrations. However, when evaluating exposures from Superfund sites, the EPA uses a risk range from 10^{-7} to 10^{-4}. Consequently, the maximum concentrations were compared to a 10^{-5} risk level (to be greater than the average target but within this recognized risk range). The TTRP criteria for recreational exposure (i.e., fish ingestion) were given priority. When these do not exist, AWQC were considered. Three possible AWQC exposure scenarios exist: (1) combined water and fish ingestion, 2) fish ingestion only, and (3) drinking water only. Since these scenarios are highly unlikely given the uses of EFPC, the corresponding values will be extremely conservative. Additionally, the standard assumptions used such as 2 liters/day drinking water consumption, 6.5 g/day of fish consumption, and a 70-year exposure are extremely conservative for the Y-12 Plant. Consequently, the largest value from the three AWQC human health criteria was selected. Station averages were compared to a 10^{-6} risk level and station maximums to a 10^{-5} risk level.

If no standards or criteria exist in the above categories (aquatic life protection, drinking water, human health), no further data analysis was conducted. (The same prioritization scheme was used in Attachment A for proposing new effluent limits.)

Table 1-1 lists the water quality criteria by parameter where standards exist. In addition, chlorine has acute and chronic AWQC of 19 μg/L and 11 μg/L, respectively. Typical surface water background concentrations are also given where available. The Clinch River is preferable for comparative purposes since EFPC is a tributary through Poplar Creek. Typical background levels were obtained from the following sources:

- Montgomery, J.M., Water Treatment Principles and Design, John Wiley & Sons, Inc., New York, 1985. (Concentrations apply to natural water bodies, river data where present. The maximum of a range is used.)

WATER QU. _ITY CRITERIA

Revised 09/25/90

	Parameter	TTRP Acute Criteria for Fish and Aquatic Life µg/L	TTRP Chronic Criteria for Fish and Aquatic Life µg/L	AWQC Freshwater Acute Toxicity µg/L	AWQC Freshwater Chronic Toxicity µg/L	TTRP Domestic Water Supply µg/L	SDWA MCLs mg/L existing/proposed
1	acenaphthene			1,700	(algae) 520		
2	acenaphthylene						
3	acetone						
4	acrolein			68	21		
5	acrylonitrile			7,550	2,600		
6	aldrin	3.0		3.0			
7	aluminum						0.05†
8	ammonia			5600-	1100-		
9	anthracene						
10	antimony (total)			9,000	1,600		
11	arsenic (total)	trivalent 360	trivalent 190	850	(algae) 48	50	0.05/—
12	asbestos (fibrous)						—/7 million fibers/L
13	barium					1,000	1.0/5.0
14	benzene			5,300		5.0	0.005/—
15	benzidine			2,500			
16	benzo[a]anthracene						
17	benzo[b]fluoranthene						
18	benzo[k]fluoranthene						
19	3,4-benzofluoranthene						
20	benzo[ghi]perylene (1,12-benzoperylene)						
21	benzo[a]pyrene						
22	beryllium (total)			130	5.3		
23	BHC-Alpha			all BHC isomers 100			
24	BHC-Beta			all BHC isomers 100			
25	BHC-Delta			all BHC isomers 100			
26	BHC-Gamma (lindane)	2.0	0.08	2	0.08	0.2	0.004/0.0002
27	bis(2-chloroethoxy)methane						
28	bis(2-chloroethyl)ether						
29	bis(2-chloroisopropyl)ether			238,000			
30	bis(2-ethylhexyl)phthalate						
31	bis(chloromethyl)ether						
32	boron						
33	bromoform (tribromomethane)					(total THM**) 100	(total THM**) 0.10/—
34	4 bromophenyl phenyl ether						
35	2-butanone (methyl ethyl ketone)						
36	butyl benzyl phthalate						
		[1.28ln (hardness)-3.83]	[0.785ln (hardness)-3.49]				
		e (1) (2) (3)	e (1) (2) (3)	39	11	10	0.01/0.005
37	cadmium (total)	(12.76) (17.2) (20.3)	(1.52) (1.83) (2.20)	39	11	10	0.01/0.005
38	calcium						
39	carbon tetrachloride			35,200		5.0	0.005/—
40	cerium						
41	chemical oxygen demand (COD)						
42	chloride			mg/L 860	mg/L 230		250††
43	chlorobenzene				50		—/0.1 0.1†
44	chlorodane	2.4	0.0043	2.4	0.0043		—/0.002
45	chlorodibromomethane					(total THM**) 100	(total THM**) 0.10/—
46	chloroethane						

48	chloroform (trichloromethane)			28,900	1,240	(total THM**) 100	(total THM**) 0.1/—
49	2-chloronaphthalene			1,600			
50	2-chlorophenol			4,380	2,000		
51	4-chlorophenyl phenyl ether						
52	chromium (total)		50	(VI) 16	(VI) 11	50	(VI) 0.05/0.1
53	chrysene						
54	cobalt						
55	color						15 color units††
56	copper (total)			18	12		1.0††
57	cyanide (total)	22	5.2	22	5.2		
58	4,4'-DDD						
59	4,4'-DDE			1,050			
60	4,4'-DDT	1.1	0.001	1.1	0.001		
61	di-n-butyl phthalate			940	3.0		
62	di-n-octyl phthalate						
63	dibenzo(a,h)anthracene						
64	1,2-dichlorobenzene (ortho)			1,120	763		—/0.6 0.01†
65	1,4-dichlorobenzene (para)			1,120	763	75	0.075/— 0.005†
66	1,3-dichlorobenzene			1,120	763		
67	3,3-dichlorobenzidine						
68	dichlorobromomethane					(total THM**) 100	(total THM**) 0.10/—
69	dichlorodifluoromethane						
70	1,1-dichloroethane						
71	1,2-dichloroethane			118,000	20,000	5.0	0.005/—
72	1,1-dichloroethylene			11,600		7.0	0.007/—
73	1,2-dichloroethylene(trans)			11,600			—/0.1
74	2,4-dichlorophenol			2,020	365		
75	1,2-dichloropropane			23,000	5,700		—/0.005 0.005†
76	1,3-dichloropropene (cis) (as dichloropropenes)			6060	244		
77	1,3-dichloropropene (trans) (as dichloropropenes)			6060	244		
78	1,2-dichloropropylene			6,060	244		
79	dieldrin	2.5	0.0019	1.0	0.0019		
80	diethyl phthalate			940	3.0		
81	dimethyl phthalate			940	3.0		
82	2,4-dimethylphenol			2,120			
83	4,6-dinitro-o-cresol			230	(algae) 150		
84	2,4-dinitrophenol			230	(algae) 150		
85	2,4-dinitrotoluene			330	230		
86	2,6-dinitrotoluene			330	230		
87	1,2-diphenylhydrazine			270			
88	endosulfan-Alpha	0.22	0.056	0.22	0.056		
89	endosulfan-Beta	0.22	0.056	0.22	0.056		
90	endosulfan sulfate						
91	endrin	0.18	0.0023	0.18	0.0023	0.2	0.0002/—
92	endrin aldehyde						
93	ethylbenzene			32,000			—/0.7 0.03†
94	fluoranthene			3,980			
95	fluorene						
96	fluoride						4.0/-- 2.0††
97	gallium						
98	heptachlor	0.52	0.0038	0.52	0.0038		—/0.0004
99	heptachlor epoxide						—/0.0002
100	hexachlorobenzene			250	50		

WATER QUALITY CRITERIA
(continued)

Revised 09/25/90

	Parameter	TTRP Acute Criteria for Fish and Aquatic Life µg/L	TTRP Chronic Criteria for Fish and Aquatic Life µg/L	AWQC Freshwater Acute Toxicity µg/L	AWQC Freshwater Chronic Toxicity µg/L	TTRP Domestic Water Supply µg/L	SDWA MCLs mg/L existing/proposed
101	hexachlorobutadiene			90	9.3		
102	hexachlorocyclopentadiene			7	5.2		
103	hexachloroethane			980	540		
104	indeno(1,2,3-cd)pyrene						
105	iron			1,000			0.3††
106	isophorone			117,000			
107	lanthanum						
108	lead (total)			82	3.2	5	0.05/—
109	lithium						
110	magnesium						
111	manganese						0.05††
112	mercury (total)	2.4	0.012	2.4	0.012	2	0.002/0.002
113	methyl bromide (bromomethane)						
114	methyl chloride (chloromethane)						
115	methylene chloride (dichloromethane)						
116	molybdenum						
117	N-nitrosodi-n-propylamine			5,850			
118	N-nitrosodimethylamine			5,850			
119	N-nitrosodiphenylamine			5,850			
120	naphthalene			2,300	620		
121	nickel (total)	[0.846ln (hardness)+3.36] e (1) (2) (3) (1948) (2373) (2902)	[0.846ln (hardness)+1.164] e (1) (2) (3) (217) (264) (323)	1,800	96		—
122	niobium						
123	nitrate, as nitrogen						10/10
124	nitrite, as nitrogen						—/1.0
125	nitrobenzene			27,000			
126	nitrogen, kjeldahl						
127	nitrogen, total organic						
128	2-nitrophenol			230	(algae) 150		
129	4-nitrophenol			230	(algae) 150		
130	oil and grease						
131	organic carbon, total						
132	para-chloro meta-cresol						
133	PCB-1016 (Aroclor-1016)		0.014	Total PCBs 2	Total PCBs 0.014		Total PCBs —/0.0005
134	PCB-1221 (Aroclor-1221)		0.014	Total PCBs 2	Total PCBs 0.014		Total PCBs —/0.0005
135	PCB-1232 (Aroclor-1232)		0.014	Total PCBs 2	Total PCBs 0.014		Total PCBs —/0.0005
136	PCB-1242 (Aroclor 1242)		0.014	Total PCBs 2	Total PCBs 0.014		Total PCBs —/0.0005
137	PCB-1248 (Aroclor-1248)		0.014	Total PCBs 2	Total PCBs 0.014		Total PCBs —/0.0005
138	PCB-1254 (Aroclor 1254)		0.014	Total PCBs 2	Total PCBs 0.014		Total PCBs —/0.0005
139	PCB-1260 (Aroclor-1260)		0.014	Total PCBs 2	Total PCBs 0.014		Total PCBs —/0.0005
140	pentachlorophenol	[1.005(pH)−4.83] e (4) (5) (6) (203) (25.5) (23.3)	[1.005(pH)−5.29] e (4) (5) (6) (12.8) (16.1) (9.4)	55	3.2		—/0.2 0.03†
141	pH				6.5-9		6.5-8.5††
142	phenanthrene						
143	phenol			phenol 10,200	phenol 2,560		
144	phosphorus						

146	pyrene						
147	residue, filterable TDS						500††
148	residue, non-filterable (TSS)						
149	scandium						
150	selenium (total)	20	5	260	35	50	0.01/0.05
151	silver (total)	[1.721ln (hardness)-6.52] e (1) (2) (3) (7.79) (11.6) (17.5)	0.12	4.1	0.12	50	0.05/— 0.09†
152	sodium						
153	specific conductance						
154	strontium						
155	sulfate						250††
156	sulfide - hydrogen sulfide						
157	sulfite						
158	surfactants (foaming agents)						0.5††
159	temperature			90 F (regional max)	85 F (regional max)		
160	2,3,7,8-tetrachloro-dibenzo-p-dioxin						
161	1,1,2,2-tetrachloroethane			9,320	2,400		
162	tetrachloroethylene			5,280	840		—/0.005
163	thallium (total)			1,400	40		
164	thorium						
165	titanium						
166	toluene			17,500			—/2.0 0.04†
167	total residual chlorine			19	11		
168	total toxic organics						
169	toxaphene	0.73	0.002	1.6	0.013	5.0	0.005/0.005
170	1,2,4 trichlorobenzene			250	50		
171	1,1,1-trichloroethane			18,000	9,400	200	0.2/—
172	1,1,2-trichloroethane			18,000	9,400		
173	trichloroethylene			45,000	21,900	5.0	0.005/—
174	trichlorofluoromethane						
175	2,4,6-trichlorophenol			500,000	970		
176	turbidity						1 - 5 tu
177	vanadium					2.0	0.002/—
178	vinyl chloride						
179	yttrium						
180	zinc (total)	[0.8473ln (hardness)+0.860] e (1) (2) (3) (161.0) (196) (240.0)	[0.8473ln (hardness)+0.76] e (1) (2) (3) (146.0) (177) (217)				5.0††
181	zirconium						

(1) Based on a hardness calculation using 21 calcium and magnesium concentrations of Kerr Hollow and converting to CaCo mg/L equivalent. The mean hardness was 145.7 mg/L and ranged from 116 to 164 mg/L. The calculated number in parenthesis corresponds to the mean.

(2) Based on a seven day toxicity test for McCoy Branch, October 12-19, 1989. The mean hardness was 184 mg/L and ranged from 174 to 192. The calculated number in parenthesis corresponds to the mean.

(3) Based on a seven day toxicity test for Bear Creek, March 10-17, 1988. The mean hardness was 233.4 mg/L and ranged from 70 to 310. The calculated number in parenthesis corresponds to the mean.

(4) Based upon 21 samples taken at Kerr Hollow from 08/86-03/89. The mean pH and ranged from 7.2 to 8.8. The calculated number in parenthesis corresponds to the mean.

(5) Based upon a seven day toxicity test for McCoy Branch on October 12-19, 1989. The mean pH was 8.03 and ranged from 7.97 to 8.07. The calculated number in parenthesis corresponds to the mean.

(6) Based upon a seven day toxicity test for Bear Creek on March 10-17, 1988. The mean pH was 7.94 and ranged from 7.88 to 8.04. The calculated number in parenthesis corresponds to the mean.

** Total Trihalomethanes (THM) = bromodichloromethane + dibromochloromethane + tribromomethane (bromoform) + trichloromethane (chloroform).

†Proposed Secondary Maximum Contaminant Level (SMCL).

††Existing Secondary Maximum Contaminant Level (SMCL).

•Ammonia criteria are both temperature and pH dependent. The numbers given are for pH = 8.0 and temperature = 20 C. The acute value corresponds to a 4-day average concentration while the chronic values is a 1-hour average.

WATER QUALITY CRITERIA
(continued)

Revised 09/25/90

	Parameter	SDWA MCLGs mg/L existing/proposed	TTRP Recreation Human Health Criteria µg/L	AWQC Human Health (10-6) Water and Fish Ingestion µg/L	AWQC Human Health (10-6) Fish Consumption Only µg/L	AWQC Human Health (10-6) Drinking Water Only µg/L	Current Y-12 Permit Limits mg/L	Typical Surface Water Background Concentration mg/L
1	acenaphthene			20		20		
2	acenaphthylene							
3	acetone							
4	acrolein		780	320	780	540		
5	acrylonitrile			0.058	0.65	0.063		
6	aldrin			(ng/L) 0.074	(ng/L) 0.079	(ng/L) 1.2		
7	aluminum							<0.01 (c)
8	ammonia							0.02 (c)
9	anthracene							
10	antimony (total)		45,000	146	(ng/L) 45	146		
11	arsenic (total)		0.0175	(ng/L) 2.2	(ng/L) 17.5	(ng/L) 25		(f)
12	asbestos (fibrous)	—/7 million fibers/L		(fibers/L) 30,000		fibers/L 30,000		
13	barium	—/5.0		1000		1000		0.038 (c)
14	benzene	0/—	5.0	0.66	40	0.67		
15	benzidine			(ng/L) 0.12	(ng/L) 0.53	(ng/L) 0.15		
16	benzo(b)fluoranthene							
17	3,4-benzofluoranthene							
18	benzo(a)anthracene							
19	benzo(a)pyrene		0.0311					
20	benzo(ghi)perylene (1,12-benzoperylene)							
21	benzo(k)fluoranthene							
22	beryllium (total)		0.177	(ng/L) 3.7	(ng/L) 64.1	(ng/L) 3.9		0.001 (b)
23	BHC-Alpha			(ng/L) 9.2		13		
24	BHC-Beta			(ng/L) 16.3	(ng/L) 31	(ng/L) 23.2		
25	BHC-Delta					(ng/L) 17.4		
26	BHC-Gamma (lindane)	—/0.0002		(ng/L) 9.2	31	(ng/L) 13		
27	bis(2-chloroethoxy)methane							
28	bis(2-chloroethyl)ether			0.03	1.36	0.03		
29	bis(2-chloroisopropyl)ether			34.7	(mg/L) 4.36	34.7		
30	bis(2-ethylhexyl)phthalate		50,000					
31	bis(chloromethyl)ether			(ng/L) 0.0038	(ng/L) 1.64	(ng/L) 0.0039		
32	boron							
33	bromoform (tribromomethane)		15.7	0.19	15.7	0.19	0.19-0.38	
34	4-bromophenyl phenyl ether							
35	2-butanone (methyl ethyl ketone)							
36	butyl benzyl phthalate							
37	cadmium (total)	—/0.005	10	10		10	0.26 - 0.69	<.002 (a)
38	calcium							38.2 (a)
39	carbon tetrachloride	0/—		0.4	6.94	0.42		
40	cerium							
41	chemical oxygen demand (COD)							
42	chloride					mg/L 250		14.9 (a)
43	chlorobenzene	—/0.1	488	488		488		
44	chlordane	—/0	0.00048	(ng/L) 0.46	(ng/L) 0.48	(ng/L) 22		
45	chlorodibromomethane						0.19-0.38	
46	chloroethane							
47	2-chloroethyl vinyl ether (mixed)							

49	2-chloronaphthalene																
50	2-chlorophenol																
51	4-chlorophenyl phenyl ether																
52	chromium (total)	—/0.1		(IV)	50	(III)	3.433	(IV)	50			(IV)	50	0.2 - 2.77		.010 (a)
53	chrysene															<0.003 (c)
54	cobalt															
55	color															
56	copper (total)						1,000		1,000		3,433		1,000	1.0 - 3.38		0.01 (b)
57	cyanide (total)						200		200				200	0.65 - 1.20		
58	4,4'-DDD															
59	4,4'-DDE							(ng/L)	0.024	(ng/L)	0.024	(ng/L)	1.2			
60	4,4'-DDT															
61	di-n-butyl phthalate						154,000	(mg/L)	34	(mg/L)	154	(mg/L)	44			
62	di-n-octyl phthalate															
63	dibenzo[a,h]anthracene															
64	1,2-dichlorobenzene (ortho)	—/0.6							400	(mg/L)	2.6		470			
65	1,4-dichlorobenzene (para)	0.075/—							400	(mg/L)	2.6		470			
66	1,3-dichlorobenzene								400	(mg/L)	2.6		470			
67	3,3'-dichlorobenzidine								0.0103		0.02		0.0207			
68	dichlorobromomethane						15.7		0.19		15.7		0.19	0.19-0.38		
69	dichlorodifluoromethane															
70	1,1-dichloroethane															
71	1,2-dichloroethane	0/—							0.94		243		0.94			
72	1,1-dichloroethylene	0.007/—							0.033		1.85		0.03			
73	1,2-dichloroethylene(trans)	—/0.1							0.033		1.85		0.03			
74	2,4-dichlorophenol							(mg/L)	3.09			(mg/L)	3.09			
75	1,2-dichloropropane	—/0														
76	1,3-dichloropropene(cis) (as dichloropropenes)								87		14.1		87			
77	1,3-dichloropropene(trans) (as dichloropropenes)								87		14.1		87			
78	1,2-dichloropropylene								87	(mg/L)	14.1		87			
79	dieldrin							(ng/L)	0.071	(ng/L)	0.76	(ng/L)	1.1			
80	diethyl phthalate							(mg/L)	350	(g/L)	1.8	(mg/L)	434			
81	dimethyl phthalate							(mg/L)	313	(g/L)	2.9	(mg/L)	350			
82	2,4-dimethylphenol								400				400			
83	4,6-dinitro-o-cresol								13.4		765		13.6			
84	2,4-dinitrophenol								70	(mg/L)	14.3		70			
85	2,4-dinitrotoluene								0.11		9.1		0.11			
86	2,6-dinitrotoluene								0.11		9.1		0.11			
87	1,2-diphenylhydrazine							(ng/L)	42		0.56	(ng/L)	46			
88	endosulfan sulfate								74		159		136			
89	endosulfan-Alpha								74		159		136			
90	endosulfan-Beta								74		159		136			
91	endrin								1.0				1.0			
92	endrin aldehyde															
93	ethylbenzene	—/0.7					3,280	(mg/L)	1.4	(mg/L)	3.28	(mg/L)	2.4			
94	fluoranthene								42		54		188			
95	fluorene															0.3 (c)
96	fluoride															
97	gallium															
98	heptachlor	—/0						(ng/L)	0.28	(ng/L)	0.29	(ng/L)	11			
99	heptachlor epoxide	—/0														
100	hexachlorobenzene							(ng/L)	0.72			(ng/L)	21			

WATER QUALITY CRITERIA
(continued)

Revised 09/25/90

	Parameter	SDWA MCLGs mg/L existing/proposed	TTRP Recreation Human Health Criteria µg/L	AWQC Human Health (10-6) Water and Fish Ingestion µg/L	AWQC Human Health (10-6) Fish Consumption Only µg/L	AWQC Human Health (10-6) Drinking Water Only µg/L	Current Y-12 Permit Limits mg/L	Typical Surface Water Background Concentration mg/L
101	hexachlorobutadiene			0.45	50	0.45		
102	hexachlorocyclopentadiene			206	organoleptic 1.0	206		
103	hexachloroethane			1.9	8.74	2.4		
104	indeno(1,2,3-cd)pyrene							
105	iron			(mg/L) 0.3			(maximum) 1.0	.063 (a)
106	isophorone			(mg/L) 5.2	(mg/L) 520	(mg/L) 5.2		
107	lanthanum							0.00035 (b)
108	lead (total)		50	50		50	0.43 - 0.69	.004 (a)
109	lithium							0.008 (c)
110	magnesium							.011 (a,c)
111	manganese			50				24 (a)
112	mercury (total)	—/0.002	0.146	(ng/L) 144	(ng/L) 146	10	0.001 - 0.004	0.0002 (a)
113	methyl bromide (bromomethane)			0.19	15.7	0.19		
114	methyl chloride (chloromethane)			0.19	15.7	0.19		
115	methylene chloride (dichloromethane)		15.7	0.19	15.7	0.19		
116	molybdenum							(ug/l) 0.35 (b)
117	N-nitrosodi-n-propylamine							
118	N-nitrosodimethylamine			(ng/L) 1.4	(ng/L) 16100	(ng/L) 1.4		
119	N-nitrosodiphenylamine			4.9	16.1	7.0		
120	naphthalene							
121	nickel (total)		100	13.4	100	15.4	2.38 - 3.98	0.01 (b)
122	niobium							
123	nitrate, as nitrogen	—/10		(mg/L) 10		(mg/L) 10		0.41 (a)
124	nitrite, as nitrogen	—/1.0						0.02 (c)
125	nitrobenzene			(mg/L) 19.8		(mg/L) 19.8		
126	nitrogen, kjeldahl							
127	nitrogen, total organic							
128	2-nitrophenol							
129	4-nitrophenol							
130	oil and grease						10 - 52	
131	organic carbon, total							
132	para-chloro meta-cresol							
133	PCB-1016 (Aroclor-1016)	Total PCBs —/0	0.000079	total PCBs (ng/L) 0.079	total PCBs (ng/L) 0.079	total PCBs (ng/L) >12.6		
134	PCB-1221 (Aroclor-1221)	Total PCBs —/0	0.000079	total PCBs (ng/L) 0.079	total PCBs (ng/L) 0.079	total PCBs (ng/L) >12.6		
135	PCB-1232 (Aroclor-1232)	Total PCBs —/0	0.000079	total PCBs (ng/L) 0.079	total PCBs (ng/L) 0.079	total PCBs (ng/L) >12.6		
136	PCB-1242 (Aroclor 1242)	Total PCBs —/0	0.000079	total PCBs (ng/L) 0.079	total PCBs (ng/L) 0.079	total PCBs (ng/L) >12.6		
137	PCB-1248 (Aroclor-1248)	Total PCBs —/0	0.000079	total PCBs (ng/L) 0.079	total PCBs (ng/L) 0.079	total PCBs (ng/L) >12.6		
138	PCB-1254 (Aroclor 1254)	Total PCBs —/0	0.000079	total PCBs (ng/L) 0.079	total PCBs (ng/L) 0.079	total PCBs (ng/L) >12.6		
139	PCB-1260 (Aroclor-1260)	Total PCBs —/0	0.000079	total PCBs (ng/L) 0.079	total PCBs (ng/L) 0.079	total PCBs (ng/L) >12.6		
140	pentachlorophenol	—/0.2	30	(mg/L) 1.01		(mg/L) 1.01		
141	pH						6 - 10	8.0 (c)
142	phenanthrene							
143	phenol		total phenols 300	phenol (mg/L) 3.5		phenol (mg/L) 3.5	total phenols 0.04 0.08	
144	phosphorus							0.13 (a)
145	potassium							2.8 (a)
146	pyrene							
147	residue, filtered TDS							155 (c)

149	scandium					10		<1 (a)
150	selenium (total)	--/0.05	10	10		50	0.24 - 0.43	0.0003 (b)
151	silver (total)		50	50				18.3 (a)
152	sodium							
153	specific conductance							0.097 (c)
154	strontium					(mg/L) 250		39.9 (a)
155	sulfate							
156	sulfide - hydrogen sulfide							
157	sulfite							
158	surfactants (foaming agents)						86.9 F	
159	temperature			1.3 E-8	1.4 E-8	2.2 E-7		
160	2,3,7,8-tetrachloro-dibenzo-p-dioxin			0.17	10.7	0.17		
161	1,1,2,2-tetrachloroethane		8.85	0.8	8.85	0.88		
162	tetrachloroethylene	--/0		13	48	17.8		
163	thallium (total)							
164	thorium							0.0086 (b)
165	titanium		424,000	(mg/L) 14.3	(mg/L) 424	(mg/L) 15		
166	toluene	--/2						
167	total residual chlorine						(maximum) 2.13	
168	total toxic organics			(ng/L) 0.71	(ng/L) 0.73	(ng/L) 26		
169	toxaphene	--/0						
170	1,2,4-trichlorobenzene							
171	1,1,1-trichloroethane	0.2/--	1,030,000	18400	(g/L) 1.039	19000		
172	1,1,2-trichloroethane		41.8	0.6	41.8	0.6		
173	trichloroethylene	0/--	80.7	2.7	80.7	2.8		
174	trichlorofluoromethane			0.19	15.7	0.19		
175	2,4,6-trichlorophenol		3.6	1.2	3.6	1.8		
176	turbidity	1 - 5 tu						<0.07 (b)
177	vanadium							
178	vinyl chloride	0/--	525	2	525	2		
179	yttrium							
180	zinc (total)		5,000	(mg/L) 5	(mg/L) 5	(mg/L) 5	1.0 - 2.61	.015 (a)
181	zirconium							

(a) Based upon 2 nationwide sampling events of approximately 300 river stations. Smith, R., S. Alexander, and M. Wolman, USGS Water-Supply Paper 2307, Analysis and Interpretation of Water Quality Trends in Major U.S. Rivers, 1974-81.
(b) Concentrations apply to natural water bodies, river data where present. The maximum of a range is used. James M. Montgomery Consulting Engineers, Water Treatment Principles and Design, John Wiley & Sons, Inc., New York, 1985.
(c) Based on mid-range water quality data for the Clinch River from USGS, Water Resources Data Tennessee Water Year 1988 (Report TN-88-1).

2.0 WATER QUALITY RESULTS

2.1 DRY WEATHER EVENTS

The data summary of dry weather events by parameter is given in **Table 2-1**. As noted, undetected results have been eliminated. The individual results as well as statistical minimum, average, and maximum are analyzed in Section 3. The data summaries by event are given in Appendix B.

2.2 WET WEATHER EVENTS

The data summary of wet weather events by parameter is given in **Table 2-2**. As noted, undetected results have been deleted. These data are compared to applicable standards in Section 3. The data summaries by event are given in Appendix B.

Figure 2-1 shows all monitoring stations used as sampling locations, as well as plant drainage areas.

.3-Jun-90

DR4-RAD.MY1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 1-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
09/22/88	Aluminum	mg/l	200.7	0.08	0.15	0.15	0.09	0.24	0.4	0.09	0.11	0.61	0.14	.69
09/23/88	Aluminum	mg/l	200.7	0.05	.14	0.15	0.07	0.11	0.09	0.11	0.16	[illegible]	0.05	0.15
10/04/88	Aluminum	mg/l	200.7	0.04	0.11	0.04	0.11 ‡	0.18	0.1 ‡	0.15	0.12	[illegible]	0.02	[illegible]
10/05/88	Aluminum	mg/l	200.7	0.08	0.17	0.1	0.36	0.08	0.1	0.15	0.12	0.11	0.16	[illegible]
10/15/88	Aluminum	mg/l	200.7	0.1	0.15	0.1	[illegible]	[illegible]	0.08	0.14	[illegible]	[illegible]	[illegible]	[illegible]
10/16/88	Aluminum	mg/l	200.7	0.1	0.18	0.13	0.42	0.27	0.01 ‡	0.16	.07	[illegible]	[illegible]	[illegible]
12/07/88	Aluminum	mg/l	200.7	0.1	0.1	0.44	0.16	0.42	0.11	0.78	[illegible]	0.65	0.34	[illegible]
12/08/88	Aluminum	mg/l	200.7	[illegible]	0.15	.44	0.06	0.47	0.1	0.74	[illegible]	2.07	0.24	[illegible]
01/22/89	Aluminum	mg/l	200.7	0.25	0.09	0.1	0.05	0.13	0.33	0.09	0.27	0.12	0.47	[illegible]
01/23/89	Aluminum	mg/l	200.7	0.12	0.05	0.12	0.07	0.27	0.09	0.25	0.08	0.14	[illegible]	[illegible]
03/11/89	Aluminum	mg/l	200.7	0.12	0.1	0.12	0.1	0.17	0.1	0.19	0.25	0.19	[illegible]	[illegible]
04/24/89	Aluminum	mg/l	200.7	0.18	0.1	0.19	0.15	0.19	0.11	0.11	0.05	0.19	0.15	[illegible]
	AVERAGE			0.17	0.12	0.17	0.14	0.18	0.12	0.25	0.10	0.51	[illegible]	[illegible]
	MAXIMUM			0.25	0.15	0.44	0.42	0.43	0.40	0.78	0.25	2.07	0.64	[illegible]
	MINIMUM			0.04	0.08	0.04	0.01	0.07	0.01	0.06	0.02	0.07	0.02	0.11
09/22/88	Ammonia	mg/l	350.2	[illegible]	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	0.1 ‡	0.3	[illegible]	[illegible] ‡	[illegible]	[illegible]
09/23/88	Ammonia	mg/l	350.2	[illegible]	0.3	0.1 ‡	[illegible]	0.2	[illegible] ‡	0.2	0.5	[illegible] ‡	[illegible]	[illegible]
10/04/88	Ammonia	mg/l	350.2	[illegible]	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.3	0.3	[illegible]	[illegible]
10/05/88	Ammonia	mg/l	350.2	[illegible]	0.2	[illegible]	0.1 ‡	0.1 ‡	0.1	0.1	0.2 ‡	0.1 ‡	0.2	[illegible] ‡
10/15/88	Ammonia	mg/l	350.2	[illegible]	[illegible]	0.4	[illegible]	0.1 ‡	0.2 ‡	0.1	0.2	0.4	0.3	[illegible]
10/16/88	Ammonia	mg/l	350.2	0.1	0.5	0.4	0.1 ‡	0.1 ‡	0.2 ‡	0.2	0.2 ‡	0.3	0.3	[illegible]
12/07/88	Ammonia	mg/l	350.2	0.7	0.1 ‡	0.7	[illegible]	1.1	0.1 ‡	0.2 ‡	0.2 ‡	7.6	50	[illegible]
12/08/88	Ammonia	mg/l	350.2	1	0.7	1	0.4	1.1	0.2	0.1	0.1	10	74	[illegible]
01/22/89	Ammonia	mg/l	350.2	[illegible]	0.1 ‡	0.3	0.1 ‡	0.3	0.2 ‡	0.2 ‡	0.1 ‡	0.9	0.9	[illegible]
01/23/89	Ammonia	mg/l	350.2	0.9	0.2 ‡	0.3	0.1 ‡	0.4	0.2	0.2 ‡	0.2 ‡	0.8	0.7	0.7
03/11/89	Ammonia	mg/l	350.2	1.1	0.2 ‡	0.1 ‡	[illegible]	0.1 ‡	0.1 ‡	0.2 ‡	0.2 ‡	0.7	[illegible]	0.7
04/24/89	Ammonia	mg/l	350.2	0.29	0.22	0.29	0.31	0.29	0.24	0.34	0.38	0.33	[illegible]	[illegible]
	AVERAGE			[illegible]	0.25	0.37	0.27	0.38	.22	0.23	0.27	1.83	10.71	3.50
	MAXIMUM			1.0	0.50	1.00	0.50	1.10	.24	0.34	0.50	10.00	74.00	0.80
	MINIMUM			0.20	0.20	0.20	0.20	0.20	.20	0.20	0.20	0.20	0.20	0.20
09/22/88	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
09/23/88	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
10/04/88	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
10/05/88	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
10/15/88	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
10/16/88	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
12/07/88	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.15	0.04 ‡	0.04 ‡
12/08/88	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
01/22/89	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
01/23/89	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
03/11/89	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
04/24/89	Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
	AVERAGE			0.04	0.04	0.04	0.04	0.04	[illegible]	0.04	0.04	[illegible]	0.04	0.04
	MAXIMUM			0.04	0.04	0.04	[illegible]	0.04	0.04	0.04	0.04	0.15	0.04	0.04
	MINIMUM			0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
09/22/88	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
09/23/88	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
10/04/88	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
10/05/88	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
10/15/88	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
10/16/88	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
12/07/88	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
12/08/88	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.0058	0.1	0.005 ‡
01/22/89	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
01/23/89	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
03/11/89	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
04/24/89	Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
	AVERAGE			0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.013	0.005
	MAXIMUM			0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.100	0.005
	MINIMUM			0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
09/22/88	Barium	mg/l	200.7	0.0566	0.057	0.0604	0.0546	0.0633	0.0421	0.049	0.115	0.102	0.14	[illegible]
09/23/88	Barium	mg/l	200.7	0.0565	0.0503	0.0598	0.0537	0.0618	[illegible]	0.046	0.117	0.12	0.169	0.0631

13-Jun-90

DRY-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
[illegible]	Barium	mg/l	200.7	0.0517	0.0400	0.0572	0.0668	[illegible]	0.0412	0.043	0.084	[illegible]	0.155	[illegible]
[illegible]	Barium	mg/l	200.7	0.15	0.0458	[illegible]	0.0437	0.0655	0.0405	0.0404	0.09	[illegible]	[illegible]	0.0574
[illegible]	Barium	mg/l	200.7	0.0486	0.0412	0.0522	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Barium	mg/l	200.7	0.0424	0.0442	[illegible]	0.0484	0.0431	[illegible]	0.0243	0.0375	[illegible]	[illegible]	[illegible]
[illegible]	Barium	mg/l	200.7	0.0449	[illegible]	0.0562	0.0564	0.0657	0.043	0.043	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Barium	mg/l	200.7	0.0576	[illegible]	[illegible]	[illegible]	[illegible]	0.0444	0.0419	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Barium	mg/l	200.7	0.0572	[illegible]	[illegible]	0.0601	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Barium	mg/l	200.7	0.0533	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.139	[illegible]
[illegible]	Barium	mg/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Barium	mg/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	AVERAGE			0.0534	[illegible]	0.0556	0.0560	0.0576	0.0392	0.0404	0.1047	[illegible]	[illegible]	[illegible]
	MAXIMUM			0.0612	[illegible]	[illegible]	[illegible]	0.0653	0.0478	[illegible]	0.1250	0.2040	[illegible]	[illegible]
	MINIMUM			0.0424	0.0412	0.0466	0.0446	0.0431	0.0312	0.0243	0.0840	0.0838	0.0854	[illegible]
09/22/88	Benzene	ug/l	624	10 ‡	--	10 ‡	10 ‡	10 ‡	10 ‡	--	10 ‡	10 ‡	--	--
09/23/88	Benzene	ug/l	624	10 ‡	--	10 ‡	--	10 ‡	--	--	--	10 ‡	10 ‡	--
[illegible]	Benzene	ug/l	624	--	--	--	--	10 ‡	10 ‡	10 ‡	--	--	--	--
	AVERAGE			1.67	0.00	1.67	0.83	2.50	1.67	0.83	0.83	1.67	0.83	[illegible]
	MAXIMUM			10.00	[illegible]	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	0.00
	MINIMUM			0.00	0.00	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	Benzo a/anthracene	ug/l	625	--	--	--	--	--	10 ‡	--	--	--	--	--
	AVERAGE			0.00	[illegible]	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	[illegible]
	MAXIMUM			0.00	[illegible]	[illegible]	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/11/89	Benzo a.pyrene	ug/l	625	--	10 ‡	[illegible] ‡	--	--		--	--	--	10 ‡	--
	AVERAGE			0.00	[illegible]	0.83	0.00	0.00		0.00	0.00	0.00	0.83	[illegible]
	MAXIMUM			0.00	[illegible]	10.00	0.00	[illegible]		[illegible]	0.00	0.00	10.00	
	MINIMUM			0.00	[illegible]	[illegible]	0.00	0.00		0.00	0.00	0.00	0.00	
[illegible]/11/89	Benzo(k)fluoranthene	ug/l	625	--	--	--	10 ‡	10 ‡	--	--	--	--	--	--
	AVERAGE			0.00	0.00	0.00	0.83	0.83	0.00	0.00	0.00	0.00	0.00	0.00
	MAXIMUM			0.00	0.00	0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	Benzyl butyl phthalate	ug/l	625	--	--	--	10 ‡	--	--	--	--	--	--	--
12/07/88	Benzyl butyl phthalate	ug/l	625	10 ‡	--	--	--	--	--	--	--	--	--	--
	AVERAGE			0.83	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MAXIMUM			10.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡
09/23/88	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡
10/04/88	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡
10/05/88	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡
10/15/88	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001	0.0001 ‡
10/16/88	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001	0.0001 ‡
12/07/88	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡
12/08/88	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0126	0.0001 ‡	0.0001 ‡
01/22/89	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0002	0.0001 ‡
01/23/89	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0002	0.0001 ‡
03/11/89	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0002	0.0001 ‡
04/24/89	Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0003	0.0001 ‡
	AVERAGE			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0011	0.0002	0.0001
	MAXIMUM			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0126	0.0005	0.0001
	MINIMUM			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
09/22/88	Bis(2-chloroethoxy) methane	ug/l	625	--	--	--	10 ‡	--	--	--	--	--	--	--
	AVERAGE			0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MAXIMUM			0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

13-Jun-90

DFY-FAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
9/22/88	Bis(2-chloroethyl) ether	ug/l	625	--	--	--	--	--	--	--	--	10 I	--	--
10/04/88	Bis(2-chloroethyl) ether	ug/l	625	10 I	--	--	--	10 I	--	--	--	--	10 I	--
10/05/88	Bis(2-chloroethyl) ether	ug/l	625	--	--	10 I	--	--	--	--	--	--	--	10 I
10/16/88	Bis(2-chloroethyl) ether	ug/l	625	10 I	10 I	10 I	10 I	10 I	--	10 I	10 I	10 I	10 I	10 I
12/07/88	Bis(2-chloroethyl) ether	ug/l	625	10 I	--	--	10 I	--	--	--	10 I	10 I	10 I	10 I
01/23/89	Bis(2-chloroethyl) ether	ug/l	625	--	--	--	10 I	--	--	10 I	10 I	10 I	10 I	--
	AVERAGE			2.50	3.83	1.67	2.50	1.67	0.00	1.67	2.50	2.33	3.33	1.50
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	0.00	10.00	10.00	10.00	10.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/11/89	Bis(2-chloroisopropyl) ether	ug/l	625	--	--	--	--	--	10 I	--	--	--	--	--
	AVERAGE			0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00
	MAXIMUM			0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9/22/88	Bis(2-ethylhexyl) phthalate	ug/l	625	--	--	--	10 I	10 I	10	--	--	--	--	--
10/22/88	Bis(2-ethylhexyl) phthalate	ug/l	625	--	--	--	--	--	--	--	--	10 I	--	--
10/04/88	Bis(2-ethylhexyl) phthalate	ug/l	625	10 I	--	--	--	10 I	--	--	--	--	10 I	--
10/05/88	Bis(2-ethylhexyl) phthalate	ug/l	625	--	--	--	--	10 I	--	--	--	--	--	10 I
10/16/88	Bis(2-ethylhexyl) phthalate	ug/l	625	--	--	--	--	--	--	--	--	--	10 I	--
12/07/88	Bis(2-ethylhexyl) phthalate	ug/l	625	10 I	10 I	10 I	--	10 I	--	--	--	--	10 I	--
01/22/89	Bis(2-ethylhexyl) phthalate	ug/l	625	--	--	--	10 I	--	--	10 I	10 I	10 I	10 I	10 I
01/23/89	Bis(2-ethylhexyl) phthalate	ug/l	625	10 I	10 I	10 I	--	10 I	--	10 I	--	--	--	--
	AVERAGE			1.67	1.67	1.67	1.67	4.17	1.17	1.67	0.83	1.67	3.33	1.67
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	Boron	mg/l	200.7	0.071	0.068	0.125	0.061	0.083	0.052	0.062	0.056	0.082	0.312	0.109
09/23/88	Boron	mg/l	200.7	0.068	0.15	0.083	0.046	0.094	0.043	0.063	0.046	0.062	0.242	0.077
10/04/88	Boron	mg/l	200.7	0.093	0.047	0.124	0.066	0.147	0.051	0.048	0.046	0.077	0.351	0.112
[illegible]	Boron	mg/l	200.7	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	[illegible] I	0.007 I	0.007 I	0.015	0.007 I	0.007 I
[illegible]	Boron	mg/l	200.7	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	0.009	0.007 I	0.007 I
10/16/88	Boron	mg/l	200.7	0.029	0.059	0.029	0.027	0.033	0.029	0.022	0.027	0.035	0.079	0.073
12/07/88	Boron	mg/l	200.7	0.051	0.022	0.068	0.027	0.115	0.024	0.051	0.026	1.23	4.11	0.043
12/08/88	Boron	mg/l	200.7	0.069	0.133	0.077	0.025	0.106	0.025	0.024	0.025	0.756	5.33	0.062
01/22/89	Boron	mg/l	200.7	0.036	0.034	0.039	0.025	0.041	0.03	0.028	0.026	0.038	0.107	0.041
01/23/89	Boron	mg/l	200.7	0.031	0.03	0.044	0.027	0.042	0.029	0.029	0.029	0.38	0.1	0.036
03/11/89	Boron	mg/l	200.7	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I	0.007 I
04/24/89	Boron	mg/l	200.7	0.02	0.026	0.021	0.019	0.021	0.17	0.017	0.019	0.02	0.053	0.021
	AVERAGE			0.041	0.033	0.055	0.029	0.066	0.028	0.032	0.027	0.205	0.934	0.047
	MAXIMUM			0.095	0.068	0.135	0.066	0.183	0.162	0.063	0.056	1.230	5.830	0.112
	MINIMUM			0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
09/22/88	Bromodichloromethane	ug/l	624	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	--	10 I
09/23/88	Bromodichloromethane	ug/l	624	10 I	10 I	10 I	10 I	10 I	10 I	--	10 I	10 I	--	--
10/04/88	Bromodichloromethane	ug/l	624	10 I	--	--	--	--	--	--	--	--	--	--
12/07/88	Bromodichloromethane	ug/l	624	10 I	10 I	10 I	--	10 I	10 I	10 I	--	--	--	--
12/08/88	Bromodichloromethane	ug/l	624	--	--	10 I	--	10 I	10 I	10 I	10 I	10 I	--	--
03/11/89	Bromodichloromethane	ug/l	624	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	--	10 I
04/24/89	Bromodichloromethane	ug/l	624	10 I	10 I	10 I	--	10 I	12	10 I	10 I	10 I	--	--
	AVERAGE			5.00	4.17	5.00	2.50	5.00	5.17	4.17	4.17	4.17	0.00	1.67
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	12.00	10.00	10.00	10.00	0.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	Bromoform	ug/l	624	10 I	10 I	10 I	10 I	--	--	--	--	--	--	10 I
09/23/88	Bromoform	ug/l	624	10 I	10	10 I	10 I	--	27	--	--	--	--	--
10/04/88	Bromoform	ug/l	624	10 I	--	10 I	--	10 I	--	10 I	--	--	--	10 I
10/05/88	Bromoform	ug/l	624	10 I	10 I	10 I	--	10 I	10 I	--	--	--	--	10 I
10/16/88	Bromoform	ug/l	624	--	10 I	10 I	10 I	10 I	10 I	10 I	--	--	--	10 I
12/07/88	Bromoform	ug/l	624	--	--	--	--	10 I	10	10 I	10 I	--	--	--
12/08/88	Bromoform	ug/l	624	--	--	10 I	--	10 I	10	10 I	--	--	--	--
01/22/89	Bromoform	ug/l	624	10 I	10 I	--	--	10 I	10 I	--	--	--	--	--
01/23/89	Bromoform	ug/l	624	10 I	--	10 I	10 I	--	10 I	--		--	--	--
03/11/89	Bromoform	ug/l	624	10 I	10 I	10 I	--	--	10 I	10 I	--	--	10 I	10 I

13-Jun-90

DRY-R4D.wk1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
04/24/89	Bromoform	ug/l	624	--	--	--	--	--	--	--	--	--	--	--
	AVERAGE			5.83	5.83	6.67	7.33	5.50	5.50	4.17	[illegible]	[illegible]	5.83	4.17
	MAXIMUM			[illegible]	[illegible]	10.00	13.00	11.00	17.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/22/88	Cadmium	ug/l	200.7	0.006	0.006	.006	0.006	0.006	0.006	.006	0.006	.006	.006	.006
12/22/88	Cadmium	ug/l	200.7	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	--
01/16/89	Cadmium	ug/l	200.7	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	.006
02/15/89	Cadmium	ug/l	200.7	[illegible]	[illegible]	[illegible]	0.006	0.006	0.006	0.006	0.006	0.006	[illegible]	[illegible]
03/15/89	Cadmium	ug/l	200.7	[illegible]	[illegible]	[illegible]	0.006	0.006	0.006	0.006	0.006	0.006	[illegible]	[illegible]
04/18/89	Cadmium	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
05/17/89	Cadmium	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.006	0.006	[illegible]	[illegible]
06/26/89	Cadmium	ug/l	200.7	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.144	0.013	[illegible]
07/11/89	Cadmium	ug/l	200.7	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.124	0.013	[illegible]
07/25/89	Cadmium	ug/l	200.7	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.027	[illegible]	[illegible]
09/11/89	Cadmium	ug/l	200.7	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.027	0.016	[illegible]
04/24/89	Cadmium	ug/l	200.7	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.32	0.16	[illegible]
	AVERAGE			[illegible]	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.028	0.014	0.004
	MAXIMUM			[illegible]	[illegible]	[illegible]	0.006	0.006	0.006	0.006	0.006	0.144	0.032	0.006
	MINIMUM			0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.006	0.006	0.003
09/22/88	Calcium	mg/l	200.7	44.3	39.4	57.6	41.0	60.6	44.8	41.3	56.2	77.8	216	60.0
10/23/88	Calcium	mg/l	200.7	[illegible]	[illegible]	45.9	46.6	51.1	42.4	38.7	51.3	77.1	373	--
11/04/88	Calcium	mg/l	200.7	[illegible]	[illegible]	[illegible]	50.4	[illegible]	[illegible]	39	47.9	84.2	423	50.8
12/05/88	Calcium	mg/l	200.7	[illegible]	40	47.3	39.5	50.5	40.8	42.5	50.1	77.1	463	47.0
01/15/88	Calcium	mg/l	200.7	[illegible]	[illegible]	[illegible]	41.2	54.4	35.6	36.6	52.9	75.2	364	[illegible]
02/16/88	Calcium	mg/l	200.7	41.0	36.9	43.3	42.2	51.4	40.4	40.2	51.1	75.7	371	37.6
11/07/88	Calcium	mg/l	200.7	45.6	42.9	49.3	51	52.6	[illegible]	49.3	61.4	152	141	61.3
12/06/88	Calcium	mg/l	200.7	56.7	43.4	68.7	45	92	[illegible]	52.6	63.7	126	185	68.9
01/22/89	Calcium	mg/l	200.7	65.6	56.1	70.4	42.5	82.7	[illegible]	55.2	54.9	93.2	263	69.1
01/23/89	Calcium	mg/l	200.7	35.2	38.4	67	42.2	76.1	[illegible]	36.4	56.7	95.6	283	[illegible]
03/11/89	Calcium	mg/l	200.7	60.9	42.1	66.6	47	71	39.4	34.6	59.3	94.5	309	
04/24/89	Calcium	mg/l	200.7	63.7	45.6	65.2	47	74	[illegible]	45.3	67.7	71.1	472	
	AVERAGE			50.91	40.85	62.12	45.17	71.56	41.37	40.91	56.11	94.97	321.92	54.75
	MAXIMUM			66.60	46.90	70.40	50.40	92.00	47.70	52.60	67.30	192.00	472.00	61.60
	MINIMUM			31.60	36.30	43.30	39.60	50.50	35.60	34.60	47.90	71.10	141.00	6.00
09/22/88	Carbon tetrachloride	ug/l	624	10	10	--	--	--	--	--	--	--	--	10
10/23/88	Carbon tetrachloride	ug/l	624	10	10	--	--	--	--	--	--	--	--	--
11/04/88	Carbon tetrachloride	ug/l	624	10	10	--	--	--	--	--	--	--	--	--
12/05/88	Carbon tetrachloride	ug/l	624	10	10	--	--	--	--	--	--	--	--	--
01/15/88	Carbon tetrachloride	ug/l	624	10	10	--	--	--	--	--	--	--	--	--
02/16/88	Carbon tetrachloride	ug/l	624	--	10	--	--	--	--	--	--	--	--	10
11/07/88	Carbon tetrachloride	ug/l	624	--	10	--	--	--	--	--	--	--	--	10
12/06/88	Carbon tetrachloride	ug/l	624	--	10	--	--	--	--	--	--	--	--	10
01/22/89	Carbon tetrachloride	ug/l	624	10	12	--	--	--	--	--	--	--	--	--
01/23/89	Carbon tetrachloride	ug/l	624	--	11	--	--	--	--	--	--	--	20	10
03/11/89	Carbon tetrachloride	ug/l	624	10	--	--	--	--	--	--	--	--	--	--
04/24/89	Carbon tetrachloride	ug/l	624	10	21	--	--	--	--	--	--	--	--	10
	AVERAGE			6.67	10.33	0.00	0.00	0.83	0.00	0.00	0.00	0.00	1.67	5.83
	MAXIMUM			10.00	21.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	20.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
10/23/88	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	--
11/04/88	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
12/05/88	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
01/15/88	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
02/16/88	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
11/07/88	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
12/06/88	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.14	0.02	0.02
01/22/89	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
01/23/89	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
03/11/89	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
04/24/89	Cerium	mg/l	200.7	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

13-Jun-90

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MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			.02	[illegible]	[illegible]	[illegible]	[illegible]	.02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			0.02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Chemical Oxygen Demand (COD)	mg/l	410.2	5.[illegible]	5.4	[illegible]	[illegible]	16	13	23	4	[illegible]	[illegible]	[illegible]
[illegible]	Chemical Oxygen Demand (COD)	mg/l	410.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	74	27	20	[illegible]	[illegible]	[illegible]
[illegible]	Chemical Oxygen Demand (COD)	mg/l	410.2	[illegible]	10	[illegible]	8	[illegible]	--	--	11	[illegible]	[illegible]	[illegible]
10/05/88	Chemical Oxygen Demand (COD)	mg/l	410.2	[illegible]	[illegible]	[illegible]	[illegible]	14	5 I	[illegible]	--	[illegible] I	[illegible]	[illegible]
[illegible]	Chemical Oxygen Demand (COD)	mg/l	410.2	17	[illegible]	--	[illegible]	16	9	35	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Chemical Oxygen Demand (COD)	mg/l	410.2	[illegible]	[illegible]	14	[illegible]	[illegible]	[illegible]	22	[illegible]	10	[illegible]	[illegible]
[illegible]	Chemical Oxygen Demand (COD)	mg/l	410.2	[illegible]	[illegible]	[illegible]	15	[illegible]	8	[illegible]	12	[illegible]	[illegible]	[illegible]
12/08/88	Chemical Oxygen Demand (COD)	mg/l	410.2	3	[illegible]	[illegible]	[illegible]	20	12	19	16	[illegible]	[illegible]	[illegible]
[illegible]	Chemical Oxygen Demand (COD)	mg/l	410.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5 I	26	[illegible]	[illegible]	[illegible] I	[illegible]
01/[illegible]/89	Chemical Oxygen Demand (COD)	mg/l	410.2	[illegible]	2200	12	6	[illegible]	7	10	770	[illegible] I	17[illegible]	[illegible]
[illegible]	Chemical Oxygen Demand (COD)	mg/l	410.2	[illegible]	3	[illegible]	[illegible]	[illegible]	24	17	30	[illegible]	[illegible]	[illegible]
[illegible]	Chemical Oxygen Demand (COD)	mg/l	410.2	[illegible]	24	[illegible]	17	11	10	21	17	[illegible]	[illegible]	[illegible]
	AVERAGE			[illegible].11	194.95	[illegible].75	[illegible]	14.[illegible]	15.[illegible]	[illegible].58	80.[illegible]8	8.[illegible]	[illegible]	[illegible]
	MAXIMUM			17.00	[illegible]	[illegible]	19.[illegible]0	20.00	74.00	35.00	770.00	1[illegible].00	170.[illegible]	[illegible]
	MINIMUM			5.00	5.40	[illegible]	3.00	[illegible]	5.00	0.00	0.00	5.[illegible]	3.[illegible]	5.[illegible]
09/22/88	Chlorine, Total Residual	mg/l	330.1	0.24	[illegible]	[illegible]	[illegible]	0.12	1.1	0.12	0.1 I	0.38	0.1 I	0.14
09/23/88	Chlorine, Total Residual	mg/l	330.1	[illegible]	[illegible]	[illegible]	0.[illegible]	[illegible]	0.98	0.12	0.35	0.38	0.1 I	[illegible] I
10/04/88	Chlorine, Total Residual	mg/l	330.1	[illegible]	[illegible]	0.23	.46	0.24	0.87	0.24	0.43	0.45	0.1 I	[illegible] I
[illegible]/05/88	Chlorine, Total Residual	mg/l	330.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible].96	0.24	0.14	0.44	0.36	0.1 I	[illegible] I
[illegible]/15/88	Chlorine, Total Residual	mg/l	330.1	[illegible]	[illegible]	0.[illegible]	[illegible].8	0.4	1.4	0.65	0.46	0.8	0.1 I	[illegible]
[illegible]/16/88	Chlorine, Total Residual	mg/l	330.1	[illegible]	[illegible]	[illegible].24	[illegible]	[illegible]	1.1	0.12	0.47	0.81	0.1 I	[illegible] I
12/07/88	Chlorine, Total Residual	mg/l	330.1	0.46	[illegible].4	[illegible]	0.14	[illegible]	1.[illegible]	0.37	0.4	0.6	0.1 I	[illegible]
12/08/88	Chlorine, Total Residual	mg/l	330.1	[illegible]	[illegible]	0.54	[illegible] I	0.43	0.94	0.45	0.28	0.52	0.1 I	[illegible]
01/[illegible]/89	Chlorine, Total Residual	mg/l	330.1	[illegible]	[illegible].5	0.24	0.21	0.34	1	0.26	0.96	0.58	0.01 I	[illegible]
[illegible]/[illegible]/89	Chlorine, Total Residual	mg/l	330.1	[illegible]	0.38	[illegible].3	[illegible] I	0.45	1.9	1	0.52	0.32	0.1 I	[illegible]
03/11/89	Chlorine, Total Residual	mg/l	330.1	[illegible]	0.44	0.25	0.27	0.48	[illegible]	0.73	0.7	0.58	0.1	[illegible]
04/24/89	Chlorine, Total Residual	mg/l	330.1	0.1 I	0.14	0.1 I	0.2[illegible]	0.2	0.4	0.2	0.1 I	0.1 I	0.5	[illegible]
	AVERAGE			0.25	0.51	[illegible]	0.[illegible]	[illegible]	[illegible].94	0.37	0.44	0.51	0.[illegible]3	[illegible]
	MAXIMUM			0.46	2.2[illegible]	[illegible].50	[illegible].50	0.[illegible]	[illegible]	1.00	0.98	0.81	0.5[illegible]	0.14
	MINIMUM			0.10	[illegible]	[illegible].10	0.[illegible]	[illegible]	[illegible].24	0.12	0.10	0.19	0.01	[illegible].10
09/23/88	Chlorobenzene	ug/l	624	--	--	10 I	--	--	--	--	--	--		--
10/15/88	Chlorobenzene	ug/l	624	--	--	10 I	10 I	[illegible] I	--	--	--	--	--	--
01/23/89	Chlorobenzene	ug/l	624	10 I	--	--	--	--	--	--	--	--	--	--
	AVERAGE			0.83	0.00	[illegible].67	[illegible].83	[illegible].33	[illegible].00	0.00	0.00	0.00	0.00	[illegible].00
	MAXIMUM			10.00	0.00	10.00	10.00	10.00	[illegible]	0.00	0.00	0.00	0.00	[illegible]
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]
09/22/88	Chloroethane	ug/l	624	--	--	--	--	10 I	--	--	--	--	--	--
	AVERAGE			0.00	0.00	0.00	0.00	[illegible].83	0.00	0.00	0.00	0.00	0.00	[illegible]
	MAXIMUM			0.00	0.00	0.00	[illegible].00	10.00	0.00	0.00	0.00	0.00	0.00	[illegible]
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	[illegible].00	0.00	0.00	0.00	0.00
10/04/88	2-Chloroethylvinyl ether	ug/l	624	--	--	--	--	--	--	--	--	--	10 I	[illegible] I
10/05/88	2-Chloroethylvinyl ether	ug/l	624	10 I	10 I	10 I	--	--	10 I	10 I	10 I	10 I	10 I	10 I
	AVERAGE			0.83	0.83	0.83	0.00	0.00	0.83	0.83	0.83	0.83	1.67	1.67
	MAXIMUM			10.00	10.00	10.00	0.00	0.00	10.00	10.00	10.00	10.00	10.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	Chloroform	ug/l	624	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	--	10 I
09/23/88	Chloroform	ug/l	624	10 I	10 I	10 I	--	10 I	10 I	--	10 I	10 I	10 I	10 I
10/05/88	Chloroform	ug/l	624	--	--	--	--	--	--	--	--	--	--	[illegible] I
12/07/88	Chloroform	ug/l	624	10 I	--	--	--	10 I	10 I	10 I	--	--	--	10 I
12/08/88	Chloroform	ug/l	624	10 I	--	10 I	10 I	10 I	10 I	10 I	10 I	10 I	--	[illegible] I
03/11/89	Chloroform	ug/l	624	10 I	10 I	10 I	10 I	10 I	15	10 I	--	10 I	--	[illegible] I
04/24/89	Chloroform	ug/l	624	10 I	10 I	10	10 I	10	28	10 I	10	16	--	[illegible] I
	AVERAGE			5.00	3.33	4.17	3.33	5.00	[illegible].92	4.17	3.33	4.83	0.83	5.83
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	28.00	10.00	10.00	18.00	10.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

13-Jun-90

DRY-RAD.wk1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 3-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	RESULT
03 11.89	2-Chlorophenol	ug/l	625	--	10 ‡	10 ‡	10 ‡	10 ‡	--	--	--	--	--	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
03/22/88	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible]	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
09/22/88	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	--
11/04/88	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
12/05/88	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
01/17/89	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
02/16/89	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible]	[illegible]	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
03/07/89	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
04/06/89	Chromium	ug/l	200.7	[illegible]	[illegible] ‡	[illegible]	[illegible]	[illegible] ‡	[illegible]	[illegible] ‡	[illegible]	[illegible]	[illegible]	[illegible]
05/22/89	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
06/12/89	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
07/11/89	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
08/14/89	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
09/11/89	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
10/24/89	Chromium	ug/l	200.7	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡	[illegible] ‡
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
03/22/88	Chrysene	ug/l	625	--	--	--	--	--	10 ‡	--	--	--	--	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.87	0.00	0.00	0.00	0.00	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	0.00	10.00	0.00	0.00	0.00	0.00	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	0.00	0.00	[illegible]
03/15/88	cis-1,3-Dichloropropene	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 ‡
10/16/88	cis-1,3-Dichloropropene	ug/l	624	--	--	--	10 ‡	--	--	--	10 ‡	--	--	--
	AVERAGE			0.00	0.00	0.00	0.83	0.00	[illegible]	0.00	0.83	0.00	0.00	
	MAXIMUM			0.00	0.00	0.00	10.00	0.00	[illegible]	0.00	10.00	0.00	0.00	
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]
03/22/88	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡
09/22/88	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002	0.002 ‡	0.002 ‡	0.002 ‡	--
10/04/88	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡
11/05/88	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.003	0.002 ‡
12/15/88	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002	0.002 ‡	0.002 ‡	0.002 ‡	0.004	0.002 ‡
10/16/88	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.005	0.002
11/07/89	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.003	0.002 ‡	0.004	0.002 ‡	0.014	0.008	0.002 ‡
12/13/89	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002	0.002 ‡	0.002 ‡	0.01	0.002 ‡
01/22/89	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.006	0.002 ‡
02/23/89	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002	0.006	0.002 ‡
03/14/89	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.004	0.002 ‡
04/24/89	Cobalt	ug/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.017	0.002 ‡
	AVERAGE			0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.014	0.006	0.002
	MAXIMUM			0.002	0.002	0.002	0.002	0.003	0.010	0.004	0.002	0.143	0.017	0.002
	MINIMUM			0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
03/22/88	Copper	ug/l	200.7	0.006	0.011	0.007	0.005	0.009	0.005	0.008	0.004	0.055	0.002	0.009
09/23/88	Copper	ug/l	200.7	0.007	0.01	0.008	0.006	0.009	0.011	0.011	0.003	0.009	0.002	--
11/04/88	Copper	ug/l	200.7	0.006	0.009	0.006	0.006	0.008	0.012	0.01	0.005	0.005	0.002	0.005
12/05/88	Copper	ug/l	200.7	0.007	0.007	0.008	0.005	0.006	0.011	0.007	0.005	0.005	0.002	0.006
01/15/89	Copper	ug/l	200.7	0.021	0.011	0.031	0.008	0.055	0.025	0.013	0.01	0.104	0.002 ‡	0.011
02/16/89	Copper	ug/l	200.7	0.012	0.011	0.015	0.025	0.016	0.016	0.009	0.003	0.005	0.002 ‡	0.011
03/07/89	Copper	ug/l	200.7	0.008	0.011	0.009	0.008	0.01	0.01	0.008	0.005	0.158	0.009	0.01
04/06/89	Copper	ug/l	200.7	0.01	0.012	0.01	0.007	0.01	0.007	0.006	0.005	0.015	0.018	0.008
05/22/89	Copper	ug/l	200.7	0.009	0.009	0.007	0.006	0.009	0.015	0.005	0.002	0.011	0.003	0.005
06/12/89	Copper	ug/l	200.7	0.008	0.007	0.007	0.005	0.01	0.016	0.007	0.007	0.011	0.002 ‡	0.007
07/11/89	Copper	ug/l	200.7	0.011	0.007	0.007	0.007	0.008	0.01	0.007	0.013	0.011	0.002 ‡	0.009
08/24/89	Copper	ug/l	200.7	0.009	0.011	0.009	0.009	0.015	0.013	0.013	0.004	0.014	0.003	0.009
	AVERAGE			0.010	0.010	0.010	0.010	0.014	0.012	0.009	0.005	0.025	0.004	0.008
	MAXIMUM			0.021	0.012	0.031	0.029	0.055	0.025	0.013	0.013	0.158	0.018	0.011
	MINIMUM			0.006	0.007	0.006	0.005	0.006	0.005	0.005	0.002	0.004	0.002	0.005

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
[illegible]	Bromodichloromethane	ug/l	624	10 I	10 I	10 I	10 I	10 I	10 I	--	--	-- I	--	-- I
[illegible]	Bromodichloromethane	ug/l	624	10 I	10 I	10 I	--	--	10 I	--	--	10 I	--	-- I
[illegible]	Bromodichloromethane	ug/l	624	10 I	--	10 I	--	10 I	10 I	10 I	--	--	--	-- I
[illegible]	Bromodichloromethane	ug/l	624	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	--	-- I
[illegible]	Bromodichloromethane	ug/l	624	--	10 I	--	--	--	--	--	--	--	--	--
[illegible]	Bromodichloromethane	ug/l	624	10 I	10 I	10 I	--	--	10 I	10 I	--	--	--	--
[illegible]	Bromodichloromethane	ug/l	624	--	10 I	--	--	--	10 I	10 I	--	--	--	--
[illegible]	Bromodichloromethane	ug/l	624	--	10 I	--	--	--	10 I	--	--	--	--	--
[illegible]	Bromodichloromethane	ug/l	624	--	10 I	--	--	--	10 I	10 I	--	--	--	--
[illegible]	Bromodichloromethane	ug/l	624	10 I	10 I	10 I	--	--	10 I	10 I	10 I	10 I	--	--
04/24/89	Bromodichloromethane	ug/l	624	--	--	--	--	--	10 I	--	--	--	--	--
	AVERAGE			5.00	7.50	5.00	1.67	2.50	8.33	5.00	1.67	2.50	[illegible]	1.33
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	[illegible]	[illegible]
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00
09/22/88	2,4'-D,chlorobenzidine	ug/l	625	--	--	--	--	10 I	43	--	--	--	--	--
	AVERAGE			[illegible]	[illegible]	0.00	[illegible]	[illegible]	3.58	[illegible]	0.00	[illegible]	[illegible]	[illegible]
	MAXIMUM			0.00	[illegible]	0.00	0.00	10.00	43.00	0.00	0.00	0.00	0.00	[illegible]
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[illegible]	1,1-Dichloroethane	ug/l	624	--	--	--	--	--	--	--	10 I	--	10 I	--
[illegible]	1,1-Dichloroethane	ug/l	624	--	--	--	--	--	--	--	--	10 I	--	--
[illegible]	1,1-Dichloroethane	ug/l	624	--	--	--	--	--	--	--	10 I	--	10 I	--
	AVERAGE			0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	1.67	0.83	1.67	[illegible]
	MAXIMUM			[illegible]	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00	10.00	[illegible]	10.00	[illegible]
	MINIMUM			[illegible]	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]	0.00	0.00
10/15/88	1,1-Dichloroethene	ug/l	624	--	--	--	10 I	--	--	--	--	--	--	--
[illegible]	1,1-Dichloroethene	ug/l	624	--	--	--	10 I	--	--	--	--	--	--	--
[illegible]	1,1-Dichloroethene	ug/l	624	--	--	--	--	10 I	--	--	--	--	10 I	10 I
	AVERAGE			0.00	[illegible]	0.00	1.67	0.83	[illegible]	0.00	0.00	[illegible]	0.83	[illegible]
	MAXIMUM			0.00	[illegible]	0.00	10.00	10.00	[illegible]	0.00	0.00	[illegible]	10.00	[illegible]
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]
09/22/88	1,2-Dichloroethane	ug/l	624	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I
[illegible]	1,2-Dichloroethane	ug/l	624	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	--
[illegible]	1,2-Dichloroethane	ug/l	624	10 I	10 I	--	10 I	--	--	--	10 I	--	10 I	10 I
[illegible]	1,2-Dichloroethane	ug/l	624	10 I	10 I	10 I	--	10 I	10 I	10 I	--	--	10 I	10 I
[illegible]	1,2-Dichloroethane	ug/l	624	--	--	--	--	--	--	--	10 I	10 I	10 I	10 I
[illegible]	1,2-Dichloroethane	ug/l	624	--	--	--	10 I	--	--	--	--	--	--	--
	AVERAGE			3.33	3.33	3.33	3.33	2.50	2.50	2.50	3.33	2.50	4.17	3.33
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[illegible]	1,2-Dichloropropane	ug/l	624	--	--	10 I	10 I	--	--	--	10 I	--	10 I	--
[illegible]	1,2-Dichloropropane	ug/l	624	--	--	--	10 I	10 I	--	--	--	10 I	--	10 I
12/07/88	1,2-Dichloropropane	ug/l	624	--	--	--	--	--	10 I	--	--	--	--	--
12/08/88	1,2-Dichloropropane	ug/l	624	--	--	--	--	10 I	--	--	--	--	--	--
[illegible]	1,2-Dichloropropane	ug/l	624	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I	10 I
[illegible]	1,2-Dichloropropane	ug/l	624	--	--	--	10 I	--	--	10 I	10 I	10 I	10 I	10 I
	AVERAGE			0.83	0.83	1.67	3.33	2.50	1.67	1.67	2.50	2.50	2.50	2.50
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	[illegible]
[illegible]	Diethyl phthalate	ug/l	625	--	--	[illegible]	--	--	--	--	--	--	--	--
[illegible]	Diethyl phthalate	ug/l	625	1 I	--	--	--	--	--	--	--	--	--	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Diethyl phthalate	ug/l	625	--	--	--	--	10 I	--	45	--	--	--	--

[illegible]

[illegible]

[illegible]

TABLE [illegible]

[illegible]

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Di-n-butyl phthalate	[illegible]	[illegible]	--	[illegible]	[illegible]	--	--	--	--	--	--	[illegible]
[illegible]	Di-n-octyl phthalate	[illegible]	[illegible]	--	[illegible]	--	--	--	--	[illegible]	--	[illegible]	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Di-n-octyl phthalate	[illegible]	[illegible]	--	--	--	--	--	[illegible]	--	[illegible]	[illegible]	--
[illegible]	Di-n-octyl phthalate	[illegible]	[illegible]	[illegible]	--	[illegible]	--	--	--	--	--	--	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	2,4-Dichlorophenol	[illegible]	[illegible]	--	--	[illegible]	[illegible]	[illegible]	[illegible]	--	--	--	--
[illegible]	2,4-Dichlorophenol	[illegible]	[illegible]	[illegible]	--	--	--	--	--	--	--	--	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]/24/89	2,4-Dinitrotoluene	ug/l	625	--	--	--	--	--	--	--	--	10 I	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]/03/88	Ethyl benzene	ug/l	624	[illegible] I	--	--	--	--	--	--	--	--	--
[illegible]/05/88	Ethyl benzene	ug/l	624	--	[illegible] I	--	--	--	--	--	--	--	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]/88	Gallium	ug/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I
[illegible]/88	Gallium	ug/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I
[illegible]/87	Gallium	ug/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I
[illegible]/87	Gallium	ug/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I
[illegible]/89	Gallium	ug/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]/89	Hexachlorobenzene	ug/l	625	10 I	--	[illegible] I	--	--	--	--	--	--	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]/22/88	Hexachlorocyclopentadiene	ug/l	625	--	--	--	--	--	--	--	--	10 I	10 I
[illegible]/22/88	Hexachlorocyclopentadiene	ug/l	625	10 I	--	10 I	10 I	--	--	--	10 I	10 I	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]/11/89	Indeno(1,2,3-cd)pyrene	ug/l	625	--	10 I	10 I	--	--	--	--	--	--	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]/22/88	Iron	ug/l	200.7	0.09	0.16	0.13	0.33	0.27	[illegible]	0.22	[illegible]	0.56	0.65	[illegible]
[illegible]/22/88	Iron	ug/l	200.7	[illegible]	[illegible]	0.12	[illegible]	0.07	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	--
[illegible]/04/88	Iron	ug/l	200.7	[illegible]	0.18	0.11	0.77	0.19	[illegible]	0.24	0.07	[illegible]	0.12	[illegible]

13-Jun-90

DRY-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
10/05/88	Iron	mg/l	200.7	0.09	0.24	0.14	0.29	0.09	0.15	0.15	0.06	0.17	0.04	0.02
10/15/88	Iron	mg/l	200.7	0.09	0.15	0.19	0.26	0.1	0.2	0.16	0.12	0.05	0.07	0.13
10/16/88	Iron	mg/l	200.7	0.11	0.18	0.15	0.64	0.16	0.2	0.1	0.4	0.05	0.08	0.16
12/07/88	Iron	mg/l	200.7	0.12	0.17	0.16	0.48	0.24	0.03	0.2	0.16	0.07	0.05	0.16
12/08/88	Iron	mg/l	200.7	0.22	0.11	0.24	0.37	0.25	0.05	0.19	0.06	0.43	0.1	0.12
12/22/88	Iron	mg/l	200.7	0.22	0.11	0.41	0.55	0.48	0.07	0.12	0.16	0.12	0.56	0.12
01/23/89	Iron	mg/l	200.7	0.27	0.14	0.4	0.99	0.56	0.1	0.14	0.1	0.15	0.23	0.16
03/11/89	Iron	mg/l	200.7	0.21	0.12	0.3	0.66	0.13	0.07	0.12	0.25	0.15	0.23	0.16
04/24/89	Iron	mg/l	200.7	0.09	0.1	0.12	0.7	0.1	0.04	0.15	0.1	0.9	0.11	0.12
	AVERAGE			0.15	0.4	0.19	0.51	0.22	0.07	0.16	0.09	0.45	0.63	0.09
	MAXIMUM			0.27	0.24	0.41	0.99	0.56	0.24	0.24	0.25	1.71	5.46	0.33
	MINIMUM			0.09	0.09	0.09	0.25	0.07	0.02	0.10	0.04	0.05	0.03	0.09
09/22/88	Isophorone	ug/l	625	--	10 ‡	--	10 ‡	--	10 ‡	10 ‡	--	10 ‡	--	--
09/23/88	Isophorone	ug/l	625	--	--	--	10 ‡	--	--	--	--	--	--	--
10/03/88	Isophorone	ug/l	625	--	--	--	--	--	--	--	--	10 ‡	--	--
	AVERAGE			0.00	0.83	0.00	1.67	0.00	0.83	0.83	0.00	1.67	0.00	0.00
	MAXIMUM			0.00	10.00	0.00	10.00	0.00	10.00	10.00	0.00	10.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
09/23/88	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	--
10/04/88	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
10/05/88	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
10/15/88	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
10/16/88	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
12/07/88	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
12/08/88	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.071	0.003 ‡	0.003 ‡
01/22/89	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
01/23/89	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
03/11/89	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
04/24/89	Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
	AVERAGE			0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.009	0.003	0.003
	MAXIMUM			0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.071	0.003	0.003
	MINIMUM			0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
09/22/88	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
09/23/88	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	--
10/04/88	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
10/05/88	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
10/15/88	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
10/16/88	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
12/07/88	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
12/08/88	Lead	mg/l	200.7	0.016	0.02 ‡	0.02 ‡	0.02 ‡	0.0055	0.02 ‡	0.02 ‡	0.02 ‡	0.14	0.02 ‡	0.02 ‡
01/22/89	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02	0.02 ‡	0.02	0.02 ‡	0.02	0.02 ‡
01/23/89	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
03/11/89	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
04/24/89	Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
	AVERAGE			0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02
	MAXIMUM			0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.14	0.02	0.02
	MINIMUM			0.016	0.020	0.020	0.020	0.006	0.020	0.020	0.020	0.020	0.020	0.000
09/22/88	Lead	mg/l	239.2	0.002 ‡	0.023	0.002 ‡	0.002 ‡	0.0023	0.002 ‡	0.002 ‡	0.0022	0.002	0.002 ‡	0.0022
09/23/88	Lead	mg/l	239.2	0.002 ‡	0.007	0.002 ‡	0.0072	0.002 ‡	0.002 ‡	0.002 ‡	0.0028	0.003	0.0025	0.002
10/04/88	Lead	mg/l	239.2	0.0045	0.0058	0.0025	0.001	0.001 ‡	0.001 ‡	0.003	0.001 ‡	0.001 ‡	0.001 ‡	0.001 ‡
10/05/88	Lead	mg/l	239.2	0.0018	0.0035	0.001 ‡	0.0072	0.001 ‡	0.001 ‡	0.001 ‡	0.001 ‡	0.0018	0.002 ‡	0.001
10/15/88	Lead	mg/l	239.2	0.001 ‡	0.006	0.001 ‡	0.0015	0.001 ‡	0.0015	0.002	0.001 ‡	0.001 ‡	0.001 ‡	0.001
10/16/88	Lead	mg/l	239.2	0.001 ‡	0.011	0.001 ‡	0.002	0.001 ‡	0.0018	0.001 ‡	0.001 ‡	0.001 ‡	0.001 ‡	0.001 ‡
12/07/88	Lead	mg/l	239.2	0.0042	0.0022	0.0025	0.02	0.008	0.0005 ‡	0.024	0.0025	0.0005 ‡	0.0008	0.013
12/08/88	Lead	mg/l	239.2	0.016 ‡	0.0008	0.005	0.0005 ‡	0.02 ‡	0.0025 ‡	0.02	0.0005 ‡	0.0005 ‡	0.0045	0.0045
01/22/89	Lead	mg/l	239.2	0.004	0.009	0.0048	0.019	0.024	0.012	0.012	0.016 ‡	0.01	0.012 ‡	0.0022
01/23/89	Lead	mg/l	239.2	0.024	0.024	0.022	0.018	0.003	0.013	0.024	0.016	0.014	0.004	0.019
03/11/89	Lead	mg/l	239.2	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0015	0.0015	0.0005	0.001	0.0005 ‡	0.0022
04/24/89	Lead	mg/l	239.2	0.0005 ‡	0.01	0.0018	0.001	0.0005 ‡	0.0005 ‡	0.001	0.0005	0.0005 ‡	0.0005 ‡	0.0025
	AVERAGE			0.005	0.009	0.005	0.005	0.006	0.004	0.009	0.004	0.003	0.003	0.005

12-Jun-90

DRY-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	RESULT
	MAXIMUM			0.024	0.024	0.032	[illegible]	0.024	0.023	0.021	0.015	0.14	[illegible]	[illegible]
	MINIMUM			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.01	0.01
09/22/88	Lithium	mg/l	200.7	0.018	0.007	0.023	0.005	0.038	0.063	0.018	0.021	0.009	[illegible]	[illegible]
09/23/88	Lithium	mg/l	200.7	0.013	0.006	0.025	0.006	0.023	0.022	0.008	0.045	0.011	[illegible]	--
10/04/88	Lithium	mg/l	200.7	0.016	0.005	0.021	0.005	0.022	0.014	0.007	0.018	0.008	[illegible]	[illegible]
10/05/88	Lithium	mg/l	200.7	0.012	0.005	0.016	0.004	0.021	0.012	0.047	0.018	0.013	[illegible]	[illegible]
10/15/88	Lithium	mg/l	200.7	0.011	0.005	0.014	0.005	0.015	0.01	0.006	0.013	0.006	0.018	[illegible]
10/16/88	Lithium	mg/l	200.7	0.01	0.004	[illegible]	0.005	0.016	0.014	0.005	0.014	0.005	0.01	[illegible]
12/07/88	Lithium	mg/l	200.7	0.057	0.004	0.087	[illegible]	0.125	0.052	0.135	0.025	0.175	[illegible]	[illegible]
12/08/88	Lithium	mg/l	200.7	0.067	0.004	0.142	0.007	0.117	0.019	0.264	0.031	0.155	[illegible]	[illegible]
01/22/89	Lithium	mg/l	200.7	0.016	0.004	0.022	0.003	[illegible]	[illegible]	0.007	0.013	0.006	[illegible]	[illegible]
01/23/89	Lithium	mg/l	200.7	0.017	0.005	0.019	0.004	0.025	0.018	0.007	0.014	0.01	0.021	[illegible]
03/11/89	Lithium	mg/l	200.7	0.013	0.004	0.021	[illegible]	0.025	0.021	0.004	0.025	0.011	[illegible]	[illegible]
04/24/89	Lithium	mg/l	200.7	0.02	0.004	0.156	0.003	0.172	0.46	0.305	1.046	0.006	[illegible]	[illegible]
	AVERAGE			0.029	0.005	0.045	0.005	0.049	0.071	0.050	0.024	0.042	0.155	0.027
	MAXIMUM			0.086	0.007	0.156	[illegible]	0.172	1.480	0.264	1.046	0.172	0.159	[illegible]
	MINIMUM			0.010	0.004	0.012	0.003	0.015	0.017	0.004	0.013	0.006	0.017	[illegible]
09/22/88	Magnesium	mg/l	200.7	11.5	[illegible]	11.5	10.7	11.8	11.8	11.4	11.5	14.6	34.4	11.2
09/23/88	Magnesium	mg/l	200.7	11.5	10.7	11.9	11	11.6	11.3	10.7	11	14.8	30.6	--
10/04/88	Magnesium	mg/l	200.7	11.1	10.1	11.1	[illegible]	12.5	11.8	11.1	11.2	15.7	57.7	12
10/05/88	Magnesium	mg/l	200.7	11	10.3	11.6	9.98	12	11.3	10.7	11.1	14.2	64.9	11.1
10/15/88	Magnesium	mg/l	200.7	11.2	9.75	11.4	10.7	11.5	9.86	9.10	11.5	14.2	50.1	[illegible]
10/16/88	Magnesium	mg/l	200.7	10.5	9.49	10.6	10.7	11.7	10.7	10.8	11.2	14.1	51	11.1
12/07/88	Magnesium	mg/l	200.7	10.8	11.4	12.5	11.4	12.7	12.2	12	12.9	26.9	28.8	12.4
12/08/88	Magnesium	mg/l	200.7	11.1	11.4	12.8	11.5	13.1	12.5	12.4	13.4	15	35.3	12.1
01/22/89	Magnesium	mg/l	200.7	12.7	9.96	11.5	9.91	11	10.3	9.79	11.1	14.7	35.4	11.5
01/23/89	Magnesium	mg/l	200.7	12.1	9.33	10.5	9.87	11.1	1.3	10.2	12.4	15.6	37.9	11.1
03/11/89	Magnesium	mg/l	200.7	12	9.55	9.55	9.76	13.2	9.94	9.69	10.6	14.8	45.6	12
04/24/89	Magnesium	mg/l	200.7	12.6	10.2	11.9	10.3	12	1.9	10.7	12.3	13.5	66.6	12.5
	AVERAGE			11.63	10.19	11.50	10.74	11.31	11.24	9.87	11.70	15.67	44.66	[illegible]
	MAXIMUM			13.10	11.40	12.90	13.90	13.10	12.50	12.40	13.40	26.90	66.60	[illegible]
	MINIMUM			10.50	8.96	9.55	9.31	10.10	9.86	0.00	10.60	13.50	23.80	0.00
09/22/88	Manganese	mg/l	200.7	0.041	0.065	0.064	0.146	0.076	0.112	0.085	0.067	0.397	0.319	0.102
09/23/88	Manganese	mg/l	200.7	0.041	0.066	0.064	0.152	0.063	0.109	0.084	0.063	0.467	0.482	--
10/04/88	Manganese	mg/l	200.7	0.042	0.076	0.056	0.168	0.075	0.008	0.075	0.047	0.423	0.747	0.057
10/05/88	Manganese	mg/l	200.7	0.04	0.067	0.067	0.129	0.072	0.003	0.071	0.048	0.37	1.06	0.072
10/15/88	Manganese	mg/l	200.7	0.041	0.041	0.056	0.133	0.069	0.003	0.06	0.055	0.435	1.34	0.046
10/16/88	Manganese	mg/l	200.7	0.04	0.049	0.057	0.175	0.063	0.004	0.058	0.045	0.412	1.26	0.073
12/07/88	Manganese	mg/l	200.7	0.056	0.028	0.085	0.245	0.108	0.004	0.065	0.058	1.62	1.44	0.057
12/08/88	Manganese	mg/l	200.7	0.067	0.025	0.134	0.237	0.109	0.008	0.061	0.055	0.767	1.74	0.071
01/22/89	Manganese	mg/l	200.7	0.107	0.056	0.158	0.386	0.174	0.004	0.092	0.096	1	1.9	0.138
01/23/89	Manganese	mg/l	200.7	0.101	0.057	0.157	0.36	0.179	0.004	0.096	0.085	1.01	2.13	0.102
03/11/89	Manganese	mg/l	200.7	0.098	0.054	0.132	0.36	0.13	0.007	0.094	0.115	0.959	1.86	0.185
04/24/89	Manganese	mg/l	200.7	0.066	0.031	0.101	0.336	0.114	0.004	0.086	0.104	0.449	3.46	0.097
	AVERAGE			0.062	0.053	0.092	0.222	0.105	0.006	0.077	0.070	0.692	1.479	0.073
	MAXIMUM			0.107	0.087	0.158	0.386	0.179	0.112	0.096	0.115	1.620	3.460	0.138
	MINIMUM			0.040	0.025	0.056	0.129	0.068	0.003	0.058	0.045	0.370	0.319	0.000
09/22/88	Mercury	mg/l	245.1	0.0018	0.0002	0.0015	0.0004	0.0024	0.0002	0.0002	0.0016	0.0005	0.0002 x	0.007
09/23/88	Mercury	mg/l	245.1	0.0018	0.0002	0.0012	0.0004	0.0012	0.0004	0.0024	0.0015	0.0006	0.0002	0.002
10/04/88	Mercury	mg/l	245.1	0.0018	0.0002	0.0012	0.0004	0.0013	0.0003	0.0004	0.0016	0.0005	0.0002 x	[illegible]
10/05/88	Mercury	mg/l	245.1	0.0015	0.0002 x	0.0015	0.0005	0.0014	0.0002	0.0002	0.0012	0.0005	0.0002 x	0.0019
10/15/88	Mercury	mg/l	245.1	0.0016	0.0002 x	0.0014	0.0002 x	0.0013	0.0002 x	0.0018	0.0004	0.0002 x	0.0013
10/16/88	Mercury	mg/l	245.1	0.0017	0.0002 x	0.0012	0.0002 x	0.0016	0.0002 x	0.0002 x	0.0021	0.0003	0.0002 x	0.0022
12/07/88	Mercury	mg/l	245.1	0.0022	0.0002	0.0019	0.0009	0.0019	0.0003	0.0003	0.0019	0.0005	0.0003	0.0017
12/08/88	Mercury	mg/l	245.1	0.0022	0.0002	0.0019	0.0007	0.0019	0.0003	0.0003	0.0015	0.0006	0.0006	0.0017
01/22/89	Mercury	mg/l	245.1	0.0024	0.0002 x	0.0024	0.0003	0.0029	0.0005	0.0002	0.0016	0.0003	0.0002	0.0018
01/23/89	Mercury	mg/l	245.1	0.0022	0.0002 x	0.0023	0.0003	0.0025	0.0003	0.0002	0.0015	0.0003	0.0002 x	0.0015
03/11/89	Mercury	mg/l	245.1	0.003	0.0002 x	0.0023	0.0003	0.002	0.0003	0.0002 x	0.0025	0.0002	0.0002 x	0.0022
04/24/89	Mercury	mg/l	245.1	0.0012	0.0002	0.0011	0.0006	0.0012	0.0002	0.0002	0.0017	0.0002	0.0002 x	0.0017
	AVERAGE			0.0020	0.0002	0.0017	0.0004	0.0018	0.0003	0.0003	0.0017	0.0004	0.0002	0.0019
	MAXIMUM			0.0030	0.0002	0.0024	0.0009	0.0029	0.0005	0.0004	0.0026	0.0006	0.0006	0.0030
	MINIMUM			0.0012	0.0002	0.0011	0.0002	0.0012	0.0002	0.0002	0.0012	0.0002	0.0002	0.0015

.3-Jun-90

DRY-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
OTHER SAMPLING EVENTS - COMBINED

TABLE 3-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
[illegible]	Methylene chloride	ug/l	624	--	--	--	--	[illegible]	--	--	--	--	--	--
[illegible]	Methylene chloride	ug/l	624	--	--	--	--	--	--	--	[illegible]	--	--	--
[illegible]	Methylene chloride	ug/l	624	--	--	--	--	--	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Methylene chloride	ug/l	624	--	[illegible]	[illegible]	--	--	--	--	--	--	--	[illegible]
[illegible]	Methylene chloride	ug/l	624	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	--	--	[illegible]	[illegible]	[illegible]
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	--
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Molybdenum	ug/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Naphthalene	ug/l	625	[illegible]	--	--	--	--	[illegible]	[illegible]	[illegible]	--	--	--
[illegible]	Naphthalene	ug/l	625	--	[illegible]	--	--	--	--	--	--	--	--	--
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.83	0.00	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10.00	0.00	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	[illegible]	[illegible]
[illegible]	Nickel	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Nickel	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	--
[illegible]	Nickel	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Nickel	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Nickel	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Nickel	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Nickel	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Nickel	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Nickel	ug/l	200.7	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.036	0.214	[illegible]
[illegible]	Nickel	ug/l	200.7	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.017	0.069	0.007
[illegible]	Nickel	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Nickel	ug/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Nickel	ug/l	200.7	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.039	0.154	[illegible]
	AVERAGE			0.009	0.010	[illegible]	[illegible]	0.011	[illegible]	[illegible]	0.011	0.033	0.082	[illegible]
	MAXIMUM			0.010	0.020	[illegible]	[illegible]	0.020	[illegible]	[illegible]	0.017	0.036	0.169	0.214
	MINIMUM			0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.009	0.023	0.006
09/22/88	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	[illegible]
09/23/88	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	--
10/04/88	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
10/05/88	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
10/15/88	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
10/16/88	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
12/07/88	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.15	0.01	0.01
12/08/88	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
01/22/89	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
01/23/89	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
03/11/89	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
04/24/89	Niobium	ug/l	200.7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	AVERAGE			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01
	MAXIMUM			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.15	0.01	0.01
	MINIMUM			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
09/22/88	Nitrate, as Nitrogen	mg/l	353.2	[illegible]	0.53	[illegible]	3.67	4.6	[illegible]	1	14	26	170	[illegible]

13-Jun-90

DRY-WAE.wk1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE D-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	RESULT
5/27/88	Nitrate, as Nitrogen	mg/l	353.3	1.8	0.64	1.1	0.88	0.1 ‡	0.61	1.6	14	3	24	1.1
10/04/88	Nitrate, as Nitrogen	mg/l	353.3	2.6	1.57	4.6	0.34	5.6	1	0.84	9.1	3	24	1.1
10/05/88	Nitrate, as Nitrogen	mg/l	353.3	2.5	0.48	4	1.51	4.4	0.64	0.72	5.6	26	3.7	1.1
10/15/88	Nitrate, as Nitrogen	mg/l	353.3	2.7	0.58	2.6	0.3	4.2	0.57	0.84	1	3	24	0.9
10/16/88	Nitrate, as Nitrogen	mg/l	353.3	2.7	0.58	2.6	0.4	4.8	0.45	1.6	11	3	15	0.9
12/07/88	Nitrate, as Nitrogen	mg/l	353.3	2.5	0.42	4.4	0.33	5.1	0.6	1.6	14	3	330	0.9
12/08/88	Nitrate, as Nitrogen	mg/l	353.3	2.5	0.46	5	0.38	5.2	0.56	1.6	14	3	72	0.9
1/22/89	Nitrate as Nitrogen	mg/l	353.3	4	0.57	5.4	4.3	0.83	0.44	1.1	14	3	15	0.9
1/23/89	Nitrate, as Nitrogen	mg/l	353.3	4.1	0.59	5.4	0.46	0.2	0.55	1.1	14	3	24	0.9
3/31/89	Nitrate, as Nitrogen	mg/l	353.3	4.2	0.58	5.1	1	5.6	0.55	0.84	14	3	30	0.9
4/24/89	Nitrate, as Nitrogen	mg/l	353.3	3.5	0.7	4.8	0.6	5.6	0.4	0.9	16	3	330	0.9
	AVERAGE			3.37	0.49	4.44	1.00	4.46	0.57	1.05	12.65	21.16	224.67	1.14
	MAXIMUM			4.20	1.04	5.60	4.60	5.60	1.30	1.60	16.00	16.00	330.00	4.10
	MINIMUM			2.40	0.30	3.10	0.30	0.10	0.49	1.00	9.20	21.00	15.00	0.90
5/27/88	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
10/04/88	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.4	0.1 ‡	0.22	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
10/04/88	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
10/05/88	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
10/15/88	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
10/16/88	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
12/07/88	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
12/08/88	Nitrite as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
1/22/89	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
1/23/89	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
3/31/89	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
4/24/89	Nitrite, as Nitrogen	mg/l	353.2	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
	AVERAGE			0.10	0.10	0.10	0.10	0.46	0.10	0.11	0.10	0.10	0.10	0.10
	MAXIMUM			0.10	0.10	0.10	0.10	4.40	0.10	0.22	0.10	0.10	0.14	0.10
	MINIMUM			0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
5/27/88	Nitrogen, Kjeldahl	mg/l	351.3	1.5	0.1	0.2 ‡	0.2 ‡	0.1	0.2 ‡	0.3	0.4	0.2	0.2 ‡	
10/04/88	Nitrogen, Kjeldahl	mg/l	351.3	1.1	0.4	0.4	0.2 ‡	0.4	0.3	0.3	0.3	0.4	0.2 ‡	
10/04/88	Nitrogen, Kjeldahl	mg/l	351.3	0.6	0.5	0.4	0.3	0.4	0.4	0.4	0.7	0.4	0.3	0.6
10/05/88	Nitrogen, Kjeldahl	mg/l	351.3	0.6	0.7	0.5	0.2	0.6	0.3	0.5	0.5	0.4	0.2 ‡	0.8
10/15/88	Nitrogen, Kjeldahl	mg/l	351.3	0.3	0.4	0.4	0.3	0.5	0.3	0.44	0.5	0.4	0.2 ‡	0.5
10/16/88	Nitrogen, Kjeldahl	mg/l	351.3	0.4	0.3	0.4	1.5	0.4	0.2	0.4	0.4	0.4	0.2	0.6
12/07/88	Nitrogen, Kjeldahl	mg/l	351.3	1.3	1.6	0.9	0.5	1.3	0.2 ‡	0.3	0.4	5	55	1
12/08/88	Nitrogen, Kjeldahl	mg/l	351.3	1.4	0.7	1.3	0.7	1.4	0.3	0.4	0.6	9.8	72	1.1
01/22/89	Nitrogen, Kjeldahl	mg/l	351.3	1.1	0.4	0.4	0.4	0.4	0.3	0.4	0.4	1.1	1.5	0.9
01/23/89	Nitrogen, Kjeldahl	mg/l	351.3	1.1	0.4	0.5	0.3	0.6	0.3	0.7	0.3	1	3.2 ‡	0.8
03/31/89	Nitrogen, Kjeldahl	mg/l	351.3	1.1	0.3	1.2	0.2 ‡	0.4	0.2 ‡	0.2	0.3	0.5	0.2 ‡	1
04/24/89	Nitrogen, Kjeldahl	mg/l	351.3	0.6	0.2	0.3	0.6	0.2	0.2	0.3	0.5	0.4	0.2	0.9
	AVERAGE			0.86	0.43	0.58	0.47	0.59	0.27	1.04	0.57	1.03	10.63	0.88
	MAXIMUM			1.40	0.70	1.30	1.50	1.50	0.40	3.40	0.80	9.80	72.00	1.70
	MINIMUM			0.40	0.20	0.20	0.20	0.20	0.20	0.30	0.30	0.20	0.20	0.50
4/24/89	Nitrogen, Total	mg/l	551	4.4	0.5	5.1	1.2	5.8	0.7	1.2	16	21	330	5.1
	AVERAGE			0.77	0.04	0.43	0.10	0.46	0.06	0.10	1.33	1.75	27.50	0.43
	MAXIMUM			4.40	0.30	5.10	1.20	5.30	0.70	1.20	16.00	21.00	330.00	5.10
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12/07/88	N-Nitrosodiethylamine	ug/l	625	10 ‡	--	--	--	--	--	--	--	--	--	--
	AVERAGE			0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MAXIMUM			10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9/22/88	Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡
9/23/88	Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2	2 ‡	2	2 ‡	2 ‡
10/04/88	Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2	2 ‡	2 ‡	2 ‡	2 ‡
10/05/88	Oil and Grease	mg/l	413.1	2 ‡	2	2 ‡	2	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡
10/15/88	Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	6	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡
10/16/88	Oil and Grease	mg/l	413.1	5	3	2	3	2	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	0.5
12/07/88	Oil and Grease	mg/l	413.1	2	2.6	2 ‡	2 ‡	4	2	2 ‡	2 ‡	2 ‡	2	2
12/08/88	Oil and Grease	mg/l	413.1	4	4	2 ‡	2 ‡	2	2 ‡	3	2 ‡	2 ‡	2	2 ‡

13-Jun-90

DRY-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	RESULT
09/22/88	Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡
01/23/89	Oil and Grease	mg/l	413.1	2	2	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2	2	2 ‡	2 ‡
03/11/89	Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2	2	2	2 ‡
04/24/89	Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡
	AVERAGE			2.50	2.00	2.00	2.25	2.00	2.42	2.50	2.00	2.00	2.00	2.00
	MAXIMUM			2.00	4.00	2.00	4.00	4.00	6.00	7.00	2.00	2.00	2.00	2.00
	MINIMUM			2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
09/22/88	Organic Carbon, Total (TOC)	mg/l	415.2	2.0	2.4	7.8	2.0	2.2	2.2	5.4	3.4	2.2	2	2.2
09/23/88	Organic Carbon, Total (TOC)	mg/l	415.2	2.4	2.4	2	2.0	3.1	26.0	2.0	2.2	2.2	2.2	2.2
10/04/88	Organic Carbon, Total (TOC)	mg/l	415.2	2.2	2.2	2	2.0	2.4	2	3.0	4.0	2.0	2.0	2.0
10/05/88	Organic Carbon, Total (TOC)	mg/l	415.2	2.0	2.0	2	2.0	2.4	2.4	2.0	2.0	2.0	2.0	2.0
10/15/88	Organic Carbon, Total (TOC)	mg/l	415.2	5.2	5.4	2.0	2.0	2.4	6.7	2.4	2.0	4.2	2.0	2.0
10/16/88	Organic Carbon, Total (TOC)	mg/l	415.2	4.1	2.0	2.0	2.0	2.4	10.0	3.0	4.2	2.0	2.0	4.2
11/07/88	Organic Carbon, Total (TOC)	mg/l	415.2	3.0	2.0	2.0	16.2	15	3.0	2.0	2	5.0	2.0	2.0
12/08/88	Organic Carbon, Total (TOC)	mg/l	415.2	2.0	2.0	4.2	2.0	2	2.0	2.0	2	2	2.0	2.0
01/22/89	Organic Carbon, Total (TOC)	mg/l	415.2/415.2	12	17	2.0	2.0	17	7.0	9.0	2.0	2.0	2.0	2.0
01/23/89	Organic Carbon, Total (TOC)	mg/l	415.2/415.2	2.0	2.0	2.0	2.0	2.0	17	29	2.0	2.0	2.0	2.0
03/11/89	Organic Carbon, Total (TOC)	mg/l	415.2	2.0	2.0	2.0	2.0	2.0	16	18	270	2.0	2.0	2.0
04/24/89	Organic Carbon, Total (TOC)	mg/l	415.2	12	12	2.4	2.1	2	2.4	4.5	4.1	2.1	4.4	--
				12	12	12	27	14	16	13	21	12	30	30
	AVERAGE			14.20	55.4	12.51	1.05	11.40	10.81	12.27	34.41	11.27	24.11	12.86
	MAXIMUM			55.00	550.00	12.00	27.00	26.00	26.00	29.00	270.00	30.00	130.00	30.00
	MINIMUM			2.00	2.00	2.00	2.00	2.00	2.40	5.00	4.20	2.20	4.40	2.00
09/23/88	Pentachlorophenol	ug/l	625	--	--	--	--	30 ‡	30 ‡	--	30 ‡	30 ‡	30 ‡	--
	AVERAGE			0.00	0.00	0.00	0.00	0.50	0.50	0.00	0.50	0.50	0.50	0.00
	MAXIMUM			0.00	0.00	0.00	0.00	30.00	30.00	0.00	30.00	30.00	30.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	pH	units	150.1	7.8	8.2	7.9	8	7.9	8.1	7.9	7.8	7.9	7.7	7.8
09/23/88	pH	units	150.1	7.8	8.2	7.9	8.1	8	8.3	7.9	7.8	7.9	7.7	7.8
10/04/88	pH	units	150.1	8	8.2	8	8.1	8	8.3	7.9	7.9	7.9	7.7	7.8
10/05/88	pH	units	150.1	7.9	8.2	7.9	8.1	7.9	8.2	7.8	7.9	7.8	7.6	8
10/15/88	pH	units	150.1	7.8	7.8	7.9	8.1	7.9	8.1	7.8	7.9	7.9	7.8	8
10/16/88	pH	units	150.1	8	8.1	8	8.2	8	8.3	7.9	8	8	7.8	8.1
11/07/88	pH	units	150.1	8	8.1	8	8.5	8	8.2	8.1	8	7.8	7.4	8
12/08/88	pH	units	150.1	8	8.1	8	8.2	7.9	8.2	8.1	8	8	7.4	8
01/22/89	pH	units	150.1	7.7	8	7.8	8	7.8	8.2	7.9	7.9	7.8	7.5	7.9
01/23/89	pH	units	150.1	7.5	8.1	8	8	7.8	8.2	8	7.9	7.8	7.5	7.9
03/11/89	pH	units	150.1	7.8	8	8	7.9	7.9	8	8	7.7	7.8	7.6	7.9
04/24/89	pH	units	150.1	8	8.1	7.8	7.8	7.8	7.9	8	7.7	7.7	7.5	8.1
	AVERAGE			7.86	8.11	7.93	8.08	7.86	8.18	7.97	7.88	7.77	7.53	7.95
	MAXIMUM			8.00	8.30	8.00	8.50	8.00	8.30	8.10	8.00	8.00	7.70	8.10
	MINIMUM			7.50	7.80	7.80	7.80	7.80	7.90	7.80	7.70	7.50	7.30	7.80
09/23/88	Phenol	ug/l	625	--	--	30 ‡	--	--	--	--	--	--	--	--
	AVERAGE			0.00	0.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MAXIMUM			0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	Phosphorus	mg/l	200.7	0.44	0.71	0.42	0.42	0.44	0.52	0.56	0.34	0.32	0.06	0.45
09/23/88	Phosphorus	mg/l	200.7	0.55	0.87	0.51	0.65	0.49	0.57	0.64	0.42	0.47	0.06 ‡	--
10/04/88	Phosphorus	mg/l	200.7	0.42	0.5	0.41	0.72	0.42	0.45	0.53	0.39	0.29	0.07	0.27
10/05/88	Phosphorus	mg/l	200.7	0.54	0.92	0.44	0.37	0.41	0.49	0.51	0.41	0.33	0.06 ‡	0.44
10/15/88	Phosphorus	mg/l	200.7	0.42	0.81	0.35	0.49	0.38	0.73	0.45	0.57	0.32	0.06 ‡	0.78
10/16/88	Phosphorus	mg/l	200.7	0.36	0.21	0.43	1.34	0.36	0.36	0.39	0.41	0.26	0.06 ‡	0.53
12/07/88	Phosphorus	mg/l	200.7	0.43	1.63	0.48	1.34	0.55	0.5	0.69	0.43	0.05 ‡	0.06 ‡	0.57
12/08/88	Phosphorus	mg/l	200.7	0.56	1.76	0.52	0.91	0.5	0.6	0.58	0.47	0.05 ‡	0.06 ‡	0.67
01/22.89	Phosphorus	mg/l	200.7	0.29	0.27	0.31	0.19	0.33	0.36	0.37	0.29	0.18	0.08	0.33
01/23/89	Phosphorus	mg/l	200.7	0.26	0.23	0.28	0.19	0.3	0.34	0.34	0.27	0.17	0.06	0.31
03/11/89	Phosphorus	mg/l	200.7	0.31	0.37	0.31	0.36	0.32	0.42	0.4	0.51	0.19	0.06 ‡	0.35
04/24/89	Phosphorus	mg/l	200.7	0.27	0.2	0.29	0.17	0.3	0.3	0.3	0.2	0.2	0.08	0.25
	AVERAGE			0.41	0.71	0.40	0.57	0.40	0.45	0.48	0.40	0.24	0.06	0.37
	MAXIMUM			0.56	1.76	0.52	1.34	0.55	0.69	0.69	0.57	0.47	0.08	0.53

13-Jun-90

DRY-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	RESULT
	MINIMUM			0.26	0.20	0.28	0.17	0.21	0.20	0.30	0.29	[illegible]	0.26	[illegible]
09/22/88	Phosphorus, Total	mg/l	365.2	0.41	0.72	0.4	0.41	0.41	0.46	0.55	0.36	[illegible]	[illegible]	[illegible]
09/23/88	Phosphorus, Total	mg/l	365.1	0.47	0.74	0.39	0.49	[illegible]	0.41	0.5	0.41	0.54	[illegible] ‡	0.49
10/04/88	Phosphorus, Total	mg/l	365.2	0.47	0.7	0.42	0.39	0.42	[illegible]	0.53	[illegible]	[illegible]	[illegible]	0.4
10/05/88	Phosphorus, Total	mg/l	365.2	0.52	1	0.47	0.39	0.52	0.45	0.53	0.41	[illegible]	0.1 ‡	0.44
10/15/88	Phosphorus, Total	mg/l	365.1	0.43	0.88	0.78	0.65	0.39	0.39	0.45	[illegible]	[illegible]	0.1 ‡	0.73
10/16/88	Phosphorus, Total	mg/l	365.1	0.45	0.24	0.52	0.4	0.43	0.42	0.47	0.31	0.31	[illegible] ‡	0.47
12/07/88	Phosphorus, Total	mg/l	365.1	0.42	[illegible]	0.47	0.44	0.47	0.37	0.46	0.34	0.79	[illegible]	[illegible]
12/08/88	Phosphorus, Total	mg/l	365.1	0.43	[illegible]	0.4	0.61	0.41	0.42	0.52	[illegible]	0.73	[illegible]	0.75
01/22/89	Phosphorus, Total	mg/l	365.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.41	0.45	0.34	[illegible]	[illegible]	[illegible]
01/23/89	Phosphorus, Total	mg/l	365.1	0.32	0.28	[illegible]	[illegible]	0.37	0.39	0.39	[illegible]	[illegible]	0.1 ‡	[illegible]
03/11/89	Phosphorus, Total	mg/l	365.1	0.38	0.35	[illegible]	0.37	0.49	0.32	0.46	0.35	[illegible]	[illegible]	[illegible]
04/24/89	Phosphorus, Total	mg/l	365.1	0.35	0.26	0.37	0.25	0.42	0.45	0.46	0.36	0.32	0.1 ‡	0.41
	AVERAGE			0.41	0.45	0.40	0.37	0.42	0.43	0.48	0.39	0.73	0.74	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	0.49	[illegible]	[illegible]	0.58	0.51	0.73	[illegible]	[illegible]
	MINIMUM			0.26	0.24	[illegible]	0.17	0.33	0.27	0.38	0.30	0.21	[illegible]	[illegible]
09/22/88	Potassium	mg/l	200.7	1.8	[illegible]	[illegible]	[illegible]	1.8	[illegible]	2.5	1.6	2.5	[illegible]	[illegible]
09/23/88	Potassium	mg/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.5	2.5	1.8	[illegible]	7.5	[illegible]
10/04/88	Potassium	mg/l	200.7	2.1	[illegible]	[illegible]	[illegible]	2.7	1.7	2.3	1.5	1.7	5.8	[illegible]
10/05/88	Potassium	mg/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.1	1.6	[illegible]	6.5	2.4
10/15/88	Potassium	mg/l	200.7	2	1.6	[illegible]	[illegible]	2.3	1.6	2	2.9	1.7	4.9	[illegible]
10/16/88	Potassium	mg/l	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12/07/88	Potassium	mg/l	[illegible]	1.4	1.4	[illegible]	1.4	1.5	1	1.4	2.3	1.5	3.9	[illegible]
12/08/88	Potassium	mg/l	200.7	1.4	[illegible]	[illegible]	[illegible]	[illegible]	1.7	4	1.8	17.5	58.7	[illegible]
01/22/89	Potassium	mg/l	200.7	[illegible]	1.4	[illegible]	[illegible]	4.2	[illegible]	4.5	2.1	11.6	64.7	[illegible]
01/23/89	Potassium	mg/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.6	1.7	1.5	2	3.1	[illegible]
03/11/89	Potassium	mg/l	200.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.9	1.9	2.4	3.3	[illegible]
04/24/89	Potassium	mg/l	200.7	1.5	[illegible]	[illegible]	1.2	1.6	1.2	2.1	[illegible]	2.4	[illegible]	[illegible]
	AVERAGE			1.13	1.28	1.38	1.86	2.57	1.83	2.44	1.98	4.14	14.33	[illegible]
	MAXIMUM			2.49	[illegible]	3.80	2.90	[illegible]	1.56	4.50	2.90	17.50	64.70	
	MINIMUM			1.47	[illegible]	1.40	1.20	[illegible]	1.00	1.40	1.20	1.20	2.80	
09/22/88	Residue, Filterable (TDS)	mg/l	160.1	260	230	350	240	[illegible]	210	240	210	450	1900	[illegible]
09/23/88	Residue, Filterable (TDS)	mg/l	160.1	270	200	300	220	130	210	210	280	420	2300	[illegible]
10/04/88	Residue, Filterable (TDS)	mg/l	160.1	230	200	350	210	410	--	--	270	550	2600	[illegible]
10/05/88	Residue, Filterable (TDS)	mg/l	160.1	240	200	244	208	270	1350	210	--	490	2690	130
10/15/88	Residue, Filterable (TDS)	mg/l	160.1	270	160	310	180	250	170	170	250	430	2400	[illegible]
10/16/88	Residue, Filterable (TDS)	mg/l	160.1	210	160	230	200	240	210	200	390	430	2000	260
12/07/88	Residue, Filterable (TDS)	mg/l	160.1	450	220	610	220	760	210	240	320	3500	3510	[illegible]
12/08/88	Residue, Filterable (TDS)	mg/l	160.1	400	170	550	200	860	[illegible]	220	270	3900	29000	[illegible]
01/22/89	Residue, Filterable (TDS)	mg/l	160.1	300	180	360	220	390	170	180	280	450	1700	[illegible]
01/23/89	Residue, Filterable (TDS)	mg/l	160.1	290	180	340	210	360	200	270	250	470	1500	[illegible]
03/11/89	Residue, Filterable (TDS)	mg/l	160.1	310	220	330	150	350	[illegible]	130	250	450	1600	[illegible]
04/24/89	Residue, Filterable (TDS)	mg/l	160.1	300	192	300	214	300	[illegible]	190	290	300	2000	180
	AVERAGE			300.00	196.00	356.17	214.33	391.67	278.33	191.50	259.17	987.50	4363.83	[illegible]
	MAXIMUM			450.00	230	610	250	760	1350	270	320	3900	29000	[illegible]
	MINIMUM			210.00	170	230	180	240	[illegible]	0	0	300	1300	[illegible]
09/22/88	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	10	5 ‡	[illegible]
09/23/88	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	30	5 ‡	16
10/04/88	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	32	5 ‡
10/05/88	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	5 ‡	5 ‡	5	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	17
10/15/88	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5
10/16/88	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	5 ‡	35	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	12
12/07/88	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	7	5 ‡
12/08/88	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	10	82	5 ‡
01/22/89	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	8	5 ‡
01/23/89	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡
03/11/89	Residue, Non-Filterable (TSS)	mg/l	160.2	6.5	5 ‡	5 ‡	5	5 ‡	5 ‡	5 ‡	17	5 ‡	5 ‡	5 ‡
04/24/89	Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	6	11	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	9	5
	AVERAGE			5.13	5.00	5.38	6.30	5.00	5.10	5.00	5.67	7.92	14.42	[illegible]
	MAXIMUM			6.50	5.00	6.30	35.00	5.00	5.00	5.00	17.00	30.00	82.00	[illegible]
	MINIMUM			5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

13-Jun-90

DRY-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
09/22/88	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
09/23/88	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	--
10/04/88	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
10/05/88	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
10/15/88	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
10/16/88	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
12/07/88	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
12/08/88	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
01/22/89	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
01/23/89	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
03/11/89	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
04/24/89	Scandium	mg/l	200.7	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
	AVERAGE			0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0137	0.0005	0.0004
	MAXIMUM			0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.1350	0.0016	0.0004
	MINIMUM			0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
09/22/88	Silver	mg/l	200.7	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.012	0.004	0.004	0.004
09/23/88	Silver	mg/l	200.7	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.011	0.004	0.004	--
10/04/88	Silver	mg/l	200.7	0.004	0.004	0.004	0.004	0.004	0.004	0.006	0.012	0.004	0.004	0.004
10/05/88	Silver	mg/l	200.7	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.009	0.004	0.004	0.004
10/15/88	Silver	mg/l	200.7	0.004	0.004	0.004	0.021	0.004	0.004	0.004	0.004	0.004	0.004	0.004
10/16/88	Silver	mg/l	200.7	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
12/07/88	Silver	mg/l	200.7	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.026	0.052	0.004	0.004
12/08/88	Silver	mg/l	200.7	0.004	0.004	0.004	0.009	0.004	0.004	0.004	0.014	0.004	0.004	0.004
01/22/89	Silver	mg/l	200.7	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
01/23/89	Silver	mg/l	200.7	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.008	0.004	-0.004	0.004
03/11/89	Silver	mg/l	200.7	0.004	0.004	0.004	0.004	0.004	0.004	0.01	0.025	0.004	0.004	0.004
04/24/89	Silver	mg/l	200.7	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	AVERAGE			0.004	0.004	0.004	0.006	0.004	0.004	0.005	0.011	0.008	0.004	0.004
	MAXIMUM			0.004	0.004	0.004	0.021	0.004	0.004	0.010	0.026	0.052	0.004	0.004
	MINIMUM			0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.000
09/22/88	Sodium	mg/l	200.7	8.78	9.38	10.1	10.1	19.6	8.16	8.16	8.54	9.63	16.9	19.3
09/23/88	Sodium	mg/l	200.7	11.2	8.61	17.3	14.5	18.6	8.75	8.42	7.94	10.4	27.3	--
10/04/88	Sodium	mg/l	200.7	14	11	15.8	8.1	20.6	7.77	6.95	6.68	8.49	19.7	14
10/05/88	Sodium	mg/l	200.7	7.72	8.39	7.65	8.15	8.6	7.08	5.3	7.81	8.78	24	10.8
10/15/88	Sodium	mg/l	200.7	14.7	7.41	18.4	8.41	15.7	8.52	7.15	8.36	7.11	18.7	15.3
10/16/88	Sodium	mg/l	200.7	8.13	5.63	8.1	8.3	8.46	4.39	5.31	7.41	7.54	15.7	7.85
12/07/88	Sodium	mg/l	200.7	63.2	10.3	94.9	9.58	116	8.49	10.4	7.6	1800	6720	38.2
12/08/88	Sodium	mg/l	200.7	67.9	9.19	99.1	9.85	122	8.2	10.3	8.37	1940	8350	39
01/22/89	Sodium	mg/l	200.7	17.3	8.23	15.4	7.73	16.4	7.19	6.67	7.05	10.5	32	14.4
01/23/89	Sodium	mg/l	200.7	15	8.14	14.5	8.81	16.9	6.68	6.95	8.55	11.5	30.1	14
03/11/89	Sodium	mg/l	200.7	16.2	12.1	16.6	11.2	18	6.61	5.66	8.63	11	36.8	15.5
04/24/89	Sodium	mg/l	200.7	15.8	8.59	15.7	7.22	19	3.9	5.41	6.5	6.17	22	11.5
	AVERAGE			21.69	8.42	28.27	9.14	31.62	7.27	7.57	7.77	244.26	1252.77	18.30
	MAXIMUM			67.90	12.10	99.10	14.30	122.10	8.75	10.40	8.63	1800.00	8350.00	39.00
	MINIMUM			6.13	5.63	6.10	6.33	6.48	4.39	5.31	6.30	6.17	15.70	0.00
09/22/88	Specific Conductance	umhos	120.1	640	530	580	300	1060	510	540	660	920	2700	870
09/23/88	Specific Conductance	umhos	120.1	610	500	540	470	550	460	480	590	890	3600	690
10/04/88	Specific Conductance	umhos	120.1	340	350	370	350	420	330	430	590	660	2760	470
10/05/88	Specific Conductance	umhos	120.1	330	330	400	350	450	320	360	420	640	3200	410
10/15/88	Specific Conductance	umhos	120.1	400	320	360	340	370	300	340	410	590	2300	420
10/16/88	Specific Conductance	umhos	120.1	350	320	360	340	390	340	320	410	610	2600	370
12/07/88	Specific Conductance	umhos	120.1	560	360	1400	400	1100	370	400	440	7400	25000	660
12/08/88	Specific Conductance	umhos	120.1	720	370	1500	460	1100	390	360	440	6900	22000	830
01/22/89	Specific Conductance	umhos	120.1	570	340	440	380	670	320	310	420	670	1900	550
01/23/89	Specific Conductance	umhos	120.1	44	350	400	490	570	320	320	420	670	2000	530
03/11/89	Specific Conductance	umhos	120.1	380	340	350	370	370	280	280	420	650	2000	460
04/24/89	Specific Conductance	umhos	120.1	450	350	620	280	670	300	300	350	440	630	420
	AVERAGE			453.67	371.67	611.67	375.33	643.33	355.00	390.83	464.17	1678.33	3885.33	573.33
	MAXIMUM			720	530	1,500	500	1,100	510	560	660	7,400	25,000	870
	MINIMUM			44	320	350	280	370	280	280	350	440	630	370
09/22/88	Strontium	mg/l	200.7	0.149	0.145	0.172	0.124	0.181	0.127	0.147	0.179	0.251	0.943	0.157
09/23/88	Strontium	mg/l	200.7	0.151	0.131	0.161	0.124	0.166	0.1[illegible]	0.133	0.177	0.257	1.17	--

13-Jun-90

DRY-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	RESULT
10/04/88	Strontium	mg/l	200.7	0.157	0.134	0.179	0.16	0.184	0.139	0.135	0.167	[illegible]	1.32	0.73
10/05/88	Strontium	mg/l	200.7	0.143	0.127	0.152	0.127	0.154	0.134	0.481	0.166	[illegible]	1.44	[illegible]
10/15/88	Strontium	mg/l	200.7	0.144	0.12	0.159	0.118	0.145	0.119	0.125	[illegible]	0.252	1.15	0.154
10/16/88	Strontium	mg/l	200.7	0.138	0.12	0.146	0.128	0.139	0.116	0.124	0.173	0.257	1.27	0.153
12/07/88	Strontium	mg/l	200.7	0.0962	0.142	0.142	0.131	0.192	0.137	0.135	0.194	0.679	0.471	0.201
12/08/88	Strontium	mg/l	200.7	0.151	0.145	0.163	0.138	0.206	0.143	0.131	0.182	[illegible]	0.498	0.16
01/22/89	Strontium	mg/l	200.7	0.152	0.118	0.173	0.124	0.186	0.122	0.116	0.134	0.273	0.8	0.154
01/23/89	Strontium	mg/l	200.7	0.132	0.128	0.128	0.125	0.167	0.122	0.12	0.173	0.269	0.559	[illegible]
03/11/89	Strontium	mg/l	200.7	0.138	0.12	0.156	0.121	0.156	0.0864	0.1	0.177	0.27	0.821	0.148
04/24/89	Strontium	mg/l	200.7	0.145	0.124	0.156	0.117	0.159	0.116	0.109	0.19	[illegible]	1.38	0.139
	AVERAGE			0.142	0.127	0.161	0.131	0.170	0.124	0.154	0.177	0.299	1.210	0.145
	MAXIMUM			0.159	0.145	0.179	0.180	0.206	0.143	0.481	0.194	0.679	1.440	0.201
	MINIMUM			0.096	0.118	0.142	0.117	0.139	0.080	0.100	0.163	0.193	0.471	0.000
09/22/88	Sulfate	mg/l	375.4	41	34	91	34	120	34	38	34	38	160	75
09/23/88	Sulfate	mg/l	375.4	50	34	74	31	84	35	35	33	40	150	70
10/04/88	Sulfate	mg/l	375.4	76	33	100	31	110	34	34	31	46	220	82
10/05/88	Sulfate	mg/l	375.4	39	33	40	31	39	35	39	35	42	210	51
10/15/88	Sulfate	mg/l	375.4	68	33	86	31	64	31	33	32	33	88	69
10/16/88	Sulfate	mg/l	375.4	32	31	34	31	36	32	33	31	32	78	42
12/07/88	Sulfate	mg/l	375.4	200	29	300	30	380	33	56	30	2500	16000	130
12/08/88	Sulfate	mg/l	375.4	190	33	290	35	330	35	58	32	2400	21000	210
01/22/89	Sulfate	mg/l	375.4	90	27	110	37	130	33	34	34	43	110	78
01/23/89	Sulfate	mg/l	375.4	82	32	100	34	100	37	34	34	41	100	82
03/11/89	Sulfate	mg/l	375.4	56	25	56	27	84	25	23	27	34	76	63.4
04/24/89	Sulfate	mg/l	375.4	55	24	59	27	68	29	26	28	28	91	49
	AVERAGE			82.42	30.42	111.67	31.58	123.75	32.75	36.92	31.75	437.75	3190.25	83.45
	MAXIMUM			200	34	300	37	380	37	58	35	2,500	21,000	210
	MINIMUM			32	24	34	27	36	25	23	27	26	76	42
09/22/88	Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	--	10 ‡	23	14	10 ‡	10 ‡	10 ‡
09/23/88	Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	18	12	10 ‡	10	‡
10/04/88	Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	--	10 ‡	10 ‡	--	--	10 ‡	10 ‡	‡
10/05/88	Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	--	10 ‡	10 ‡	--	--	10 ‡	10 ‡	‡
10/15/88	Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	15	16	10 ‡	10 ‡	10 ‡
10/16/88	Tetrachloroethene	ug/l	624	--	--	--	--	--	--	--	16	10 ‡	10 ‡	--
12/07/88	Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	--	10 ‡	10 ‡	11	--	22	10 ‡	10 ‡
12/08/88	Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	--	10 ‡	--	10 ‡	10	19	10 ‡	10 ‡
01/22/89	Tetrachloroethene	ug/l	624	10 ‡	--	10 ‡	--	10 ‡	--	--	10 ‡	22	10 ‡	10 ‡
01/23/89	Tetrachloroethene	ug/l	624	10 ‡	--	10 ‡	--	10 ‡	10 ‡	14	10 ‡	20	10 ‡	10 ‡
03/11/89	Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--	--	--	10 ‡	10 ‡
04/24/89	Tetrachloroethene	ug/l	624	10 ‡	--	10 ‡	--	10 ‡	10 ‡	13	16	10 ‡	10 ‡	10 ‡
	AVERAGE			9.17	6.67	9.17	3.33	8.33	7.50	6.67	8.67	12.75	10.00	9.17
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	10.00	23.00	16.00	22.00	10.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
09/22/88	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
09/23/88	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	--
10/04/88	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
10/05/88	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
10/15/88	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
10/16/88	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
12/07/88	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.13	0.01 ‡	0.01 ‡
12/08/88	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
01/22/89	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
01/23/89	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
03/11/89	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
04/24/89	Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
	AVERAGE			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01
	MAXIMUM			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.13	0.01	0.01
	MINIMUM			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
09/22/88	Titanium	mg/l	200.7	0.002 ‡	0.002 ‡	0.003	0.002 ‡	0.004	0.003	0.002 ‡	0.002 ‡	0.008	0.002 ‡	0.01
09/23/88	Titanium	mg/l	200.7	0.004	0.002	0.002	0.003	0.002 ‡	0.002 ‡	0.003	0.002 ‡	0.03	0.002 ‡	--
10/04/88	Titanium	mg/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.006	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡
10/05/88	Titanium	mg/l	200.7	0.002 ‡	0.005	0.002	0.003	0.003	0.004	0.002	0.002	0.003	0.002 ‡	0.01

13-Jun-90

DRY-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1/15/88	Titanium	ug/l	200.7	0.002	0.004	0.002 I	0.002 I	0.002 I	0.002	0.004	0.002 I	0.002	0.002	0.002
1/16/88	Titanium	ug/l	200.7	0.002 I	0.004	0.003	0.002	0.002 I	0.002 I	0.002	0.002 I	0.004	0.002 I	0.002
1/27/88	Titanium	ug/l	200.7	0.004	0.002 I	0.009	0.002 I	0.002	0.002 I	0.002	0.002	0.002	0.002	0.002
12/12/88	Titanium	ug/l	200.7	0.040	0.287	0.31	0.287 I	0.014	0.031 I	0.031	0.031 I	0.017	0.032	0.009
4/[illegible]/89	Titanium	ug/l	200.7	0.020	0.002	0.002	0.002 I	0.002	0.002	0.002 I	0.002 I	0.002 I	0.002	0.002
7/[illegible]/89	Titanium	ug/l	200.7	0.002 I	0.002 I	0.004	0.002 I	0.002	0.002 I	0.002	0.002 I	0.002 I	0.002	0.002
7/11/89	Titanium	ug/l	200.7	0.002	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.005	0.005	0.002 I	0.002 I	0.002
4/24/89	Titanium	ug/l	200.7	0.002 I	0.002 I	0.002 I	0.002	0.002	0.002 I	0.002 I	0.002	0.002	0.002	0.002
	AVERAGE			0.004	0.024	0.004	0.003	0.005	0.002	0.009	0.002	0.002	0.002	0.002
	MAXIMUM			0.040	0.287	0.009	0.006	0.014	0.006	0.031	0.005	0.017	0.002	0.002
	MINIMUM			0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
10/22/88	Toluene	ug/l	624	10 I	--	10 I	10 I	--	10 I	--	10 I	10 I	--	--
11/04/88	Toluene	ug/l	624	--	--	--	--	10 I	--	--	--	--	--	--
10/25/88	Toluene	ug/l	624	10 I	--	--	--	--	--	--	--	--	--	--
10/15/88	Toluene	ug/l	624	--	--	--	--	--	10 I	--	--	--	10 I	--
10/16/88	Toluene	ug/l	624	10 I	10 I	10 I	--	10 I	10 I	10 I	10 I	10 I	10 I	10 I
4/24/89	Toluene	ug/l	624	--	--	--	--	--	10 I	--	10 I	--	--	--
	AVERAGE			1.67	1.67	1.67	1.67	1.67	3.33	0.83	2.5	1.67	1.67	1.67
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/15/88	Total Organic Halides as Cl	ug/l	624	10 I	10 I	10 I	10 I	--	--	--	--	--	--	--
	AVERAGE			0.83	0.83	0.83	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MAXIMUM			10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12/07/88	trans-1,2-Dichloroethene	ug/l	624	--	--	--	--	--	--	--	--	--	10	--
11/23/89	trans-1,2-Dichloroethene	ug/l	624	--	--	--	--	10 I	--	--	--	--	--	--
	AVERAGE			0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.83	0.00
	MAXIMUM			0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	10.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/16/88	trans-1,3-Dichloropropene	ug/l	624	--	--	--	10 I	--	--	--	--	--	--	--
	AVERAGE			0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MAXIMUM			0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/15/88	1,1,1-Trichloroethane	ug/l	624	10 I	10 I	--	10 I	10 I	10 I	10 I	--	10 I	10 I	10 I
10/16/88	1,1,1-Trichloroethane	ug/l	624	--	--	-- I	10 I	10 I	--	--	10 I	--	10 I	10 I
12/07/88	1,1,1-Trichloroethane	ug/l	624	10 I	10 I	--	10 I	10 I	--	10 I	10 I	--	--	--
12/08/88	1,1,1-Trichloroethane	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 I
11/23/89	1,1,1-Trichloroethane	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 I
3/11/89	1,1,1-Trichloroethane	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 I
	AVERAGE			1544.33	1580.47	1990.00	1263.04	1921.51	1246.79	1137.13	1358.62	3229.79	22154.50	1814.2[illegible]
	MAXIMUM			720	2,200	1,500	500	1,100	1,150	560	770	7,400	29,000	1,000
	MINIMUM			0	0	0	0	0	0	0	0	0	0	0
12/07/88	1,1,2-Trichloroethane	ug/l	624	--	--	--	--	10 I	10 I	--	10 I	--	--	--
	AVERAGE			0.00	0.00	0.00	0.00	0.83	0.83	0.00	0.83	0.00	0.00	0.00
	MAXIMUM			0.00	0.00	0.00	0.00	10.00	10.00	0.00	10.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09/22/88	Trichloroethene	ug/l	624	10 I	10 I	10 I	--	--	10 I	--	10 I	--	10 I	10 I
09/23/88	Trichloroethene	ug/l	624	10 I	--	10 I	--	10 I	10 I	10 I	--	--	10 I	--
10/04/88	Trichloroethene	ug/l	624	--	--	--	--	10 I	10 I	10 I	10 I	10 I	0 I	--
10/25/88	Trichloroethene	ug/l	624	10 I	--	--	--	10 I	--	10 I	10 I	10 I	--	--
10/15/88	Trichloroethene	ug/l	624	10 I	10 I	10 I	--	--	10 I	10 I	10 I	10 I	10 I	10 I
10/16/88	Trichloroethene	ug/l	624	--	10 I	10 I	10 I	10 I	10 I	10 I	--	10 I	10 I	10 I
12/07/88	Trichloroethene	ug/l	624	--	--	--	--	--	10 I	10 I	--	10 I	--	--
12/08/88	Trichloroethene	ug/l	624	--	--	--	--	--	--	--	--	10 I	--	--
11/27/89	Trichloroethene	ug/l	624	--	--	10 I	--	10 I	10 I	--	--	10 I	--	--
3/11/89	Trichloroethene	ug/l	624	10 I	10 I	10 I	--	--	10 I	10 I	10 I	10 I	10 I	--

09-Jun-89

DRY-PAR.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE C-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
4/24/89 Trichloroethane	ug/l	624	--	--	--	--	-- I	[illegible] I	--	[illegible]	[illegible] I	--	--
AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] Trichlorofluoromethane	[illegible]	624	--	--	--	--	--	--	--	--	--	--	[illegible]
[illegible] Trichlorotrifluoroethane	[illegible]	[illegible]	--	--	--	--	[illegible]	[illegible] I	--	[illegible] I	--	[illegible] I	--
[illegible]	[illegible]	[illegible]	--	[illegible] I	--	--	[illegible]	[illegible] I	--	--	--	[illegible] I	--
[illegible]	[illegible]	[illegible]	--	--	--	--	[illegible]	[illegible] I	--	--	[illegible]	--	--
AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible]	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	0.004 I	[illegible] I
[illegible] Vanadium	mg/l	200.7	[illegible] I	0.004 I	[illegible]	[illegible] I	[illegible]	[illegible] I	[illegible] I	0.004	[illegible] I	[illegible] I	--
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible]	[illegible] I	[illegible] I	[illegible] I	[illegible]	0.004 I	[illegible] I	[illegible]	[illegible] I
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	0.004 I	[illegible] I	[illegible] I	0.004 I	[illegible] I	0.004 I	[illegible] I
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	0.004 I	[illegible]	[illegible] I	[illegible] I
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible]	[illegible]	0.004 I	0.004 I	0.004 I	0.004 I	0.004 I	[illegible] I
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	0.004 I	0.004 I	0.15	0.009	[illegible] I
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	0.004 I	0.004 I	0.017	[illegible] I
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	0.004 I	0.004 I	0.004 I	0.004 I	[illegible] I
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	0.004 I	0.004 I	0.004 I	[illegible] I
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	0.004 I	0.004 I	0.004 I	0.004 I	[illegible] I
[illegible] Vanadium	mg/l	200.7	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	[illegible] I	0.004 I	0.004 I	0.004 I	[illegible] I
AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.004	[illegible]	0.004	0.016	0.006	[illegible]
MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	0.004	[illegible]	[illegible]	0.004	0.15	0.017	[illegible]
MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.004	0.004	0.004	0.004	[illegible]
[illegible] Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 I	--
[illegible] Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 I	
04/24/89 Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 I	
AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	2.50	[illegible]
MAXIMUM			[illegible]	0.00	0.00	[illegible]	[illegible]	0.00	0.00	0.00	0.00	10.00	0.00
MINIMUM			[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	[illegible]
[illegible]/22/88 Zinc	mg/l	200.7	0.059	0.037	0.168	0.196	0.077	0.095	[illegible]73	0.057	0.057	0.036	0.053
[illegible]/23/88 Zinc	mg/l	200.7	0.083	[illegible]	[illegible]	0.098	0.074	0.09	0.183	0.097	0.183	0.04	--
[illegible]/14/88 Zinc	mg/l	200.7	0.085	0.053	0.08	0.117	0.107	0.107	0.122	0.115	0.079	0.047	0.131
[illegible] Zinc	mg/l	200.7	0.067	0.058	0.093	0.144	0.094	[illegible]	[illegible]75	[illegible]	0.08	0.049	0.059
10/15/88 Zinc	mg/l	200.7	0.077	0.048	0.082	[illegible]	0.099	0.091	[illegible]	0.181	0.08	0.041	0.043
10/16/88 Zinc	mg/l	200.7	0.086	0.045	0.093	[illegible]	[illegible]	0.114	0.104	[illegible]	0.09	0.125	0.053
[illegible]/27/88 Zinc	mg/l	200.7	0.145	0.075	0.169	0.105	[illegible]	0.097	[illegible]	0.105	[illegible]	0.252	[illegible]
12/28/88 Zinc	mg/l	200.7	0.136	0.141	0.207	0.144	[illegible]	0.125	[illegible]	[illegible]	[illegible]	0.315	0.102
01/22/89 Zinc	mg/l	200.7	0.116	0.041	0.064	[illegible]	[illegible]	[illegible]	[illegible]	0.314	0.2[illegible]	0.036	0.057
01/23/89 Zinc	mg/l	200.7	0.184	0.066	0.118	0.045	0.073	[illegible]	[illegible]	0.088	0.075	0.043	0.055
[illegible]/11/89 Zinc	mg/l	200.7	0.079	0.061	0.073	0.106	0.087	[illegible]	[illegible]56	[illegible]	0.077	0.048	0.060
[illegible]/24/89 Zinc	mg/l	200.7	0.081	0.065	0.113	0.196	0.1[illegible]	0.111	[illegible]	0.145	0.08	0.411	0.159
AVERAGE			0.100	0.061	0.[illegible]96	0.100	0.117	0.1[illegible]	[illegible]	0.1[illegible]	0.115	0.113	0.057
MAXIMUM			0.184	0.141	0.207	0.144	0.260	0.2[illegible]	[illegible]75	0.314	0.363	0.411	0.1[illegible]2
MINIMUM			0.059	0.037	0.064	0.046	0.073	0.090	[illegible]77	0.086	0.057	0.035	0.06[illegible]
09/22/88 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I
09/23/88 Zirconium	mg/l	200.7	0.002 I	0.00[illegible]	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	--
10/14/88 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	[illegible]	0.002 I	0.002 I	0.002 I	0.002 I
[illegible]/[illegible]5/88 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I
10/15/88 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I
10/16/88 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.[illegible]3
12/27/88 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.003	0.002 I	0.037	0.[illegible]2 I	[illegible]	0.002 I	0.157	0.002 I	0.002 I
12/28/88 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.002	0.002 I	0.004	[illegible] I	0.002	0.002 I	0.002	0.006	0.002 I
[illegible]/22/89 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	[illegible] I	0.002 I	0.002 I	0.002 I	0.002 I	[illegible] I
01/23/89 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	0.00[illegible]	0.004	0.002 I	0.002 I	0.002 I	[illegible] I
03/11/89 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	[illegible] I	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I
04/24/89 Zirconium	mg/l	200.7	0.002 I	0.002 I	0.002 I	0.002 I	0.002 I	[illegible]	0.002 I	0.002 I	0.002 I	0.002 I	[illegible] I

13-Jun-90

DRY-RAD.wk1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENTS - COMBINED

TABLE 2-1

DRY WEATHER EVENT DATA SUMMARY BY PARAMETER

DATE	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
	AVERAGE			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAXIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MINIMUM			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

* Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).
* Indicates that the radioactive activity level is less than typical background (i.e., a negative value using CCE convention).

13-Jun-9[illegible]

WET-SAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - COMBINED

TABLE 2-2

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
11/04/88 Aluminum	mg/l	200.7	20.3	2.7	11.7	11.5	35.4	3.03	3.25	18.6	--	--	18.7
03/30/89 Aluminum	mg/l	200.7	5.49	2.22	12.5	5.32	0.45	5	2.1	17.3	3.28	19.1	7.51
04/04/89 Aluminum	mg/l	200.7	5.85	2.2	9.38	4.58	10.2	2.8	4.1	15.1	14.5	23.6	2.52
05/05/89 Aluminum	mg/l	200.7	0.39	0.37	--	0.51	0.57	0.66	0.14	0.29	0.69	1	0.18
05/09/89 Aluminum	mg/l	200.7	0.54	0.71	0.75	2.47	5.86	1.89	2.61	4.37	4.01	10.9	1.61
AVERAGE			7.39	1.64	6.67	4.88	11.10	2.72	2.49	11.23	4.50	10.72	4.70
MAXIMUM			20.33	2.70	12.50	11.50	35.40	5.00	4.10	16.60	14.50	23.60	18.70
MINIMUM			0.39	0.37	0.00	0.51	0.45	0.86	0.14	0.29	0.01	0.00	0.19
11/04/88 Ammonia	mg/l	350.2	0.2	0.3	0.2	0.4	0.4	0.2	0.2 ‡	0.6	--	--	0.3
03/30/89 Ammonia	mg/l	350.2	0.2	0.2 ‡	0.2 ‡	0.2	0.2 ‡	0.2 ‡	0.2 ‡	0.2 ‡	0.4	0.2	0.6
04/04/89 Ammonia	mg/l	350.2	0.2	-- ‡	0.2 ‡	0.2 ‡	0.2 ‡	0.2	0.2	0.2 ‡	0.2 ‡	0.2 ‡	0.7
05/05/89 Ammonia	mg/l	350.2	0.2 ‡	0.75	0.2 ‡	0.2	0.2 ‡	0.2 ‡	0.2 ‡	0.2 ‡	0.27	0.3	0.2 ‡
05/09/89 Ammonia	mg/l	350.2	0.33	0.2 ‡	0.2 ‡	0.2 ‡	0.2 ‡	0.2 ‡	0.45	0.2 ‡	0.43	0.56	0.83
AVERAGE			0.25	0.33	0.22	0.24	0.24	0.20	0.25	0.28	0.26	0.25	0.53
MAXIMUM			0.33	0.75	0.30	0.40	0.40	0.20	0.45	0.60	0.43	0.56	0.83
MINIMUM			0.20	0.2	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.00	0.20
05/09/89 Anthracene	ug/l	625	--	--	--	--	--	--	--	10 ‡	--	--	--
AVERAGE			0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
MAXIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Arsenic	mg/l	206.2	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	--	--	0.04 ‡
03/30/89 Arsenic	mg/l	206.2	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
04/04/89 Arsenic	mg/l	206.2	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
05/05/89 Arsenic	mg/l	206.2	0.04 ‡	0.04 ‡	--	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
05/09/89 Arsenic	mg/l	206.2	0.04 ‡	0.04 ‡	0.04 ‡	0.007 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
AVERAGE			0.04	0.04	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.03	0.04
MAXIMUM			0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
MINIMUM			0.04	0.04	0.04	0.01	0.04	0.04	0.04	0.04	0.00	0.00	0.04
11/04/88 Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	--	--	0.005 ‡
03/30/89 Arsenic	mg/l	206.2	0.008	0.095	0.028	0.013	0.005 ‡	0.01	0.005 ‡	0.052	0.005 ‡	0.073	0.005 ‡
04/04/89 Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
05/05/89 Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	--	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
05/09/89 Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
AVERAGE			0.006	0.023	0.007	0.007	0.005	0.006	0.005	0.014	0.004	0.018	0.005
MAXIMUM			0.008	0.095	0.028	0.013	0.005	0.010	0.005	0.052	0.005	0.073	0.005
MINIMUM			0.005	0.005	0.000	0.005	0.005	0.005	0.005	0.005	0.000	0.000	0.005
11/04/88 Barium	mg/l	200.7	0.171	0.0434	0.113	0.105	0.224	0.0449	0.0456	0.173	--	--	0.136
03/30/89 Barium	mg/l	200.7	0.0743	0.0488	0.0863	0.0563	0.0553	0.0465	0.0433	0.138	0.121	0.098	0.0539
04/04/89 Barium	mg/l	200.7	0.0591	0.0413	0.0759	0.0465	0.081	0.038	0.05	0.114	0.119	0.0918	0.0617
05/05/89 Barium	mg/l	200.7	0.0509	0.0413	--	0.0395	0.0524	0.0405	0.0333	0.0903	0.0953	0.103	0.0638
05/09/89 Barium	mg/l	200.7	0.0482	0.0424	0.051	0.0565	0.0891	0.0334	0.0477	0.0801	0.0945	0.107	0.0658
AVERAGE			0.0607	0.0434	0.0652	0.0608	0.1004	0.0407	0.0440	0.1191	0.0860	0.0800	0.0762
MAXIMUM			0.1710	0.0488	0.1130	0.1050	0.2240	0.0465	0.0500	0.1730	0.1210	0.1070	0.1360
MINIMUM			0.0482	0.0413	0.0000	0.0395	0.0524	0.0334	0.0333	0.0801	0.0000	0.0000	0.0539
11/04/88 Benzene	ug/l	624	--	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡
AVERAGE			0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
MAXIMUM			0.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/30/89 Benzo(a)pyrene	ug/l	625	--	--	--	--	--	--	--	71	--	--	--
04/04/89 Benzo(a)pyrene	ug/l	625	--	--	--	--	--	--	--	10 ‡	--	--	--
AVERAGE			0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.20	0.00	0.00	0.00
MAXIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.00	0.00	0.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Benzo(b)fluoranthene	ug/l	625	--	--	--	--	--	--	--	--	--	--	10 ‡
03/30/89 Benzo(b)fluoranthene	ug/l	625	--	--	--	--	--	--	--	85	--	--	--
04/04/89 Benzo(b)fluoranthene	ug/l	625	--	--	--	10 ‡	--	--	--	10 ‡	--	--	--

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - COMBINED

TABLE 2-2

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
05/09/89	Benzo(b)fluoranthene	ug/l	625	--	--	--	--	--	--	10 *	10 *	--	--	--
	AVERAGE			0.00	0.00	0.00	2.00	0.00	0.00	2.00	21.00	0.00	0.00	2.00
	MAXIMUM			0.00	0.00	0.00	10.00	0.00	0.00	10.00	85.00	0.00	0.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88	Beryllium	mg/l	200.7	0.0008	0.0001	0.0005	0.0004	0.0012	0.0001 *	0.0001 *	0.0006	--	--	0.0007
03/30/89	Beryllium	mg/l	200.7	0.0003	0.0001 *	0.0004	0.0001	0.0001 *	0.0002	0.0001 *	0.0004	0.0004	0.0008	0.0001 *
04/04/89	Beryllium	mg/l	200.7	0.0002	0.0001 *	0.0003	0.0001 *	0.0003	0.0001 *	0.0001 *	0.0003	0.0005	0.0008	0.0001 *
05/05/89	Beryllium	mg/l	200.7	0.0001 *	0.0001 *	--	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *
05/09/89	Beryllium	mg/l	200.7	0.0001 *	0.0001 *	0.0001 *	0.0024	0.0003	0.0001 *	0.0001 *	0.0001	0.0001	0.0004	0.0001 *
	AVERAGE			0.0003	[illegible]	0.0003	0.0006	0.0004	0.0001	0.0001	0.0003	0.0002	0.0005	0.0002
	MAXIMUM			0.0008	0.0001	0.0005	0.0024	0.0012	0.0002	0.0001	0.0006	0.0005	0.0008	0.0007
	MINIMUM			0.0001	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0001
04/04/89	Bis(2-ethylhexyl) phthalate	ug/l	625	--	--	--	10 *	--	--	--	--	--	--	10 *
05/05/89	Bis(2-ethylhexyl) phthalate	ug/l	625	10 *	--	--	--	10 *	10 *	--	--	--	10 *	--
05/09/89	Bis(2-ethylhexyl) phthalate	ug/l	625	--	--	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *
	AVERAGE			2.00	0.00	0.00	4.00	4.00	4.00	2.00	2.00	2.00	4.00	4.00
	MAXIMUM			10.00	0.00	0.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88	Boron	mg/l	200.7	0.1	0.059	0.135	0.041	0.007 *	0.132	0.122	0.068	--	--	0.148
03/30/89	Boron	mg/l	200.7	0.023	0.02	0.025	0.022	0.025	0.059	0.021	0.014	0.035	0.031	0.027
04/04/89	Boron	mg/l	200.7	0.023	0.02	0.026	0.02	0.025	0.051	0.025	0.017	0.033	0.035	0.028
05/05/89	Boron	mg/l	200.7	0.054	0.024	--	0.021	0.099	0.682	0.024	0.019	0.038	0.053	0.029
05/09/89	Boron	mg/l	200.7	0.022	0.02	0.033	0.037	0.031	0.155	0.022	0.018	0.035	0.045	0.027
	AVERAGE			0.044	0.029	0.044	0.028	0.037	0.216	0.043	0.027	0.028	0.033	0.052
	MAXIMUM			0.100	0.059	0.135	0.041	0.099	0.682	0.122	0.068	0.038	0.053	0.148
	MINIMUM			0.022	0.020	0.000	0.020	0.007	0.051	0.021	0.014	0.000	0.000	0.027
11/04/88	Bromodichloromethane	ug/l	624	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	--	10 *
03/30/89	Bromodichloromethane	ug/l	624	--	--	--	--	--	10 *	--	--	--	--	--
04/04/89	Bromodichloromethane	ug/l	624	--	--	--	--	--	10 *	--	--	--	--	--
05/05/89	Bromodichloromethane	ug/l	624	10 *	10 *	10 *	--	10 *	10 *	10 *	10 *	10 *	--	10 *
05/09/89	Bromodichloromethane	ug/l	624	--	--	--	--	--	--	10 *	--	--	--	--
	AVERAGE			2.00	4.00	4.00	2.00	4.00	8.00	6.00	4.00	4.00	0.00	4.00
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	0.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88	Bromoform	ug/l	624	10 *	--	--	--	10 *	10 *	10 *	--	--	--	10 *
04/04/89	Bromoform	ug/l	624	--	--	--	--	--	10 *	--	--	--	--	--
05/05/89	Bromoform	ug/l	624	--	--	--	--	--	17	10 *	--	--	--	--
	AVERAGE			2.00	0.00	0.00	0.00	2.00	7.40	4.00	0.00	0.00	0.00	2.00
	MAXIMUM			10.00	0.00	0.00	0.00	10.00	17.00	10.00	0.00	0.00	0.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88	Cadmium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	--	--	0.006 *
03/30/89	Cadmium	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.016	0.003 *	0.003 *
04/04/89	Cadmium	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.006	0.003 *	0.003 *	0.003	0.003 *	0.003 *
05/05/89	Cadmium	mg/l	200.7	0.003 *	0.003 *	--	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.005	0.006	0.003 *
05/09/89	Cadmium	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.006	0.003 *	0.003 *
	AVERAGE			0.004	0.004	0.003	0.004	0.004	0.004	0.004	0.004	0.006	0.003	0.004
	MAXIMUM			0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.016	0.006	0.006
	MINIMUM			0.003	0.003	0.000	0.003	0.003	0.003	0.003	0.003	0.000	0.000	0.003
11/04/88	Calcium	mg/l	200.7	41.2	25.3	33.9	17.7	45.6	30.8	25.5	27	--	--	38.6
03/30/89	Calcium	mg/l	200.7	27.4	30.5	29	16.2	49.9	20.2	34.8	22	79	72.1	57.1
04/04/89	Calcium	mg/l	200.7	27.8	25.2	29.3	14.2	32.7	28.3	31.3	21.2	44.7	53.6	53.3
05/05/89	Calcium	mg/l	200.7	53.2	35.5	--	29.5	68.4	46.1	44.7	55.2	86.7	174	66.9
05/09/89	Calcium	mg/l	200.7	37.8	27.5	57.5	20.1	50	27.3 *	32.4	28.3	77.1	107	62.8
	AVERAGE			37.48	28.80	29.94	19.54	49.32	30.54	33.74	30.74	57.50	81.34	55.74
	MAXIMUM			53.20	35.50	57.50	29.50	68.40	46.10	44.70	55.20	86.70	174.00	66.90
	MINIMUM			27.40	25.20	0.00	14.20	32.70	20.20	25.50	21.20	0.00	0.00	38.60

-Jun-90

WET-PAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - COMBINED

TABLE 2-2

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

PARAMETER	UNITS	METHOD	A RESUL	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
11/04/88 Carbon tetrachloride	ug/l	624	10 ‡	10 ‡	--	--	--	10 ‡	--	--	--	--	--
05/05/89 Carbon tetrachloride	ug/l	624	10 ‡	10 ‡	--	--	--	--	--	--	--	--	--
AVERAGE			4.00	4.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
MAXIMUM			10.00	10.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Cerium	mg/l	200.7	0.03	0.02 ‡	0.02 ‡	0.02 ‡	0.04	0.02 ‡	0.02 ‡	0.02	--	--	0.02
03/30/89 Cerium	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02	0.02 ‡	0.03	0.02 ‡
04/04/89 Cerium	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.03	0.02 ‡
05/05/89 Cerium	mg/l	200.7	0.02 ‡	0.02 ‡	--	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
05/09/89 Cerium	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02	0.02 ‡
AVERAGE			0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
MAXIMUM			0.03	0.02	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.03	0.02
MINIMUM			0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.02
11/04/88 Chemical Oxygen Demand (COD)	mg/l	410.2	48	29	30	30	39	27	--	39	--	--	39
03/30/89 Chemical Oxygen Demand (COD)	mg/l	526	30	32	34	46	28	23	30	44	23	37	18
04/04/89 Chemical Oxygen Demand (COD)	mg/l	410.2	22	22	27	19	54	29	16	30	19	30	27
05/05/89 Chemical Oxygen Demand (COD)	mg/l	410.2	18	14	--	24	21	17	13	26	17	25	17
05/09/89 Chemical Oxygen Demand (COD)	mg/l	410.2	27	28	28	48	49	29	30	42	26	30	43
AVERAGE			29.00	25.00	23.80	33.40	36.40	23.20	17.80	26.20	17.00	24.40	28.80
MAXIMUM			48.00	32.00	34.00	48.00	54.00	29.00	30.00	44.00	26.00	37.00	43.00
MINIMUM			18.00	14.00	0.00	19.00	21.00	17.00	0.00	26.00	0.00	0.00	17.00
11/04/88 Chlorine, Total Residual	mg/l	330.1	0.2	0.1	0.14	0.1	0.2	0.62	0.62	0.17	0.39	0.1 ‡	0.1 ‡
03/30/89 Chlorine, Total Residual	mg/l	330.1	0.1 ‡	0.1 ‡	0.1 ‡	0.1	0.1	0.15	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
04/04/89 Chlorine, Total Residual	mg/l	330.1	0.1 ‡	0.1 ‡	0.1	0.1 ‡	0.1 ‡	0.63	0.16	0.1 ‡	0.1	0.1 ‡	0.1 ‡
05/05/89 Chlorine, Total Residual	mg/l	330.1	0.12	0.12	0.26	0.26	0.36	0.5	0.28	0.2	0.31	0.1 ‡	0.1 ‡
05/09/89 Chlorine, Total Residual	mg/l	330.1	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.28	0.35	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
AVERAGE			0.12	0.10	0.14	0.13	0.17	0.44	0.30	0.12	0.20	0.10	0.10
MAXIMUM			0.20	0.12	0.26	0.26	0.36	0.63	0.62	0.20	0.39	0.10	0.10
MINIMUM			0.10	0.10	0.10	0.10	0.10	0.15	0.10	0.10	0.10	0.10	0.10
11/04/88 Chlorobenzene	ug/l	624	--	--	10 ‡	--	--	--	--	--	--	--	--
AVERAGE			0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAXIMUM			0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MINIMUM			0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Chloroethane	ug/l	624	--	--	-		10 ‡	10 ‡	10 ‡	--	--	10 ‡	10 ‡
AVERAGE			0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00	0.00	2.00	2.00
MAXIMUM			0.00	0.00	0.00	0.00	10.00	10.00	10.00	0.00	0.00	10.00	10.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Chloroform	ug/l	624	--	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--	10 ‡
03/30/89 Chloroform	ug/l	624	--	--	10 ‡	--	10 ‡	10 ‡	--	--	--	10 ‡	10 ‡
04/04/89 Chloroform	ug/l	624	10 ‡	10 ‡	10 ‡	--	10 ‡	11	10 ‡	10 ‡	10 ‡	--	10 ‡
05/05/89 Chloroform	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	11	10 ‡	10 ‡	14	--	10 ‡
05/09/89 Chloroform	ug/l	624	--	--	--	--	10 ‡	10 ‡	10 ‡	--	10 ‡	--	--
AVERAGE			4.00	6.00	8.00	4.00	10.00	10.40	8.00	6.00	8.80	2.00	8.00
MAXIMUM			10.00	10.00	10.00	10.00	10.00	11.00	10.00	10.00	14.00	10.00	10.00
MINIMUM			0.00	0.00	0.00	0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Chromium	mg/l	200.7	0.034	0.007	0.017	0.081	0.036	0.007	0.006 ‡	0.022	--	--	0.023
03/30/89 Chromium	mg/l	200.7	0.014	0.007	0.016	0.009	0.006 ‡	0.015	0.006 ‡	0.025	0.006 ‡	0.023	0.006 ‡
04/04/89 Chromium	mg/l	200.7	0.011	0.006 ‡	0.015	0.006	0.015	0.007	0.014	0.018	0.019	0.025	0.009
05/05/89 Chromium	mg/l	200.7	0.006 ‡	0.006 ‡	--	0.006 ‡	0.006 ‡	0.007	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡
05/09/89 Chromium	mg/l	200.7	0.006 ‡	0.006 ‡	0.006 ‡	0.03	0.015	0.011	0.008	0.008 ‡	0.007	0.016	0.006 ‡
AVERAGE			0.014	0.006	0.011	0.026	0.016	0.009	0.008	0.016	0.008	0.014	0.010
MAXIMUM			0.034	0.007	0.017	0.081	0.036	0.015	0.014	0.025	0.019	0.025	0.023
MINIMUM			0.006	0.006	0.000	0.006	0.006	0.007	0.006	0.006	0.000	0.000	0.006
11/04/88 Chrysene	ug/l	625	--	--	--	--	--	--	--	--	--	--	10 ‡
03/30/89 Chrysene	ug/l	625	--	--	--	--	--	--	--	71	--	-	--
04/04/89 Chrysene	ug/l	625	--	--	--	10 ‡	10 ‡	--	10 ‡	10 ‡	--	-	--

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - COMBINED

TABLE 2-2

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
05/05/89	Chrysene	ug/l	625	10 *	--	--	--	--	--	--	--	--	--	--
05/09/89	Chrysene	ug/l	625	--	--	--	--	--	--	10 *	10 *	--	--	--
	AVERAGE			2.00	0.00	0.00	2.00	2.00	0.00	4.00	18.20	0.00	0.00	2.00
	MAXIMUM			10.00	0.00	0.00	10.00	10.00	0.00	10.00	71.00	0.00	0.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88	Cobalt	mg/l	200.7	0.009	0.002 *	0.005	0.003	0.013	0.002 *	0.003	0.007	--	--	0.008
03/30/89	Cobalt	mg/l	200.7	0.005	0.002 *	0.005	0.003	0.002 *	0.003	0.002 *	0.006	0.003	0.008	0.002 *
04/04/89	Cobalt	mg/l	200.7	0.002	0.002 *	0.004	0.002 *	0.004	0.002 *	0.002	0.005	0.006	0.008	0.002 *
05/05/89	Cobalt	mg/l	200.7	0.002 *	0.002 *	--	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.005	0.002 *
05/09/89	Cobalt	mg/l	200.7	0.002	0.002 *	0.002	0.039	0.006	0.002 *	0.007	0.003	0.003	.007	0.002 *
	AVERAGE			0.004	0.002	0.003	0.010	0.005	0.002	0.003	0.005	0.003	0.006	0.003
	MAXIMUM			0.009	0.002	0.005	0.039	0.013	0.003	0.007	0.007	0.006	0.008	0.008
	MINIMUM			0.002	0.002	0.000	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.002
11/04/88	Copper	mg/l	200.7	0.055	0.023	0.024	0.036	0.047	0.047	0.011	0.018	--	--	0.04
03/30/89	Copper	mg/l	200.7	0.024	0.024	0.021	0.014	0.012	0.025	0.017	0.016	0.014	0.043	0.008
04/04/89	Copper	mg/l	200.7	0.012	0.011	0.015	0.008	0.016	0.016	0.011	0.01	0.019	0.045	0.009
05/05/89	Copper	mg/l	200.7	0.01	0.012	--	0.011	0.008	0.012	0.009	0.004	0.007	0.007	0.005
05/09/89	Copper	mg/l	200.7	0.015	0.014	0.012	0.391	0.018	0.015	0.009	0.006	0.012	0.025	0.009
	AVERAGE			0.022	0.017	0.014	0.032	0.021	0.025	0.011	0.011	0.010	0.024	0.014
	MAXIMUM			0.055	0.024	0.024	0.091	0.047	0.047	0.017	0.018	0.019	0.045	0.049
	MINIMUM			0.010	0.011	0.010	0.008	0.008	0.012	0.009	0.004	0.006	0.006	0.005
04/04/89	Dibromochloromethane	ug/l	624	--	--	--	--	--	10 *	--	--	--	--	--
05/05/89	Dibromochloromethane	ug/l	624	--	--	--	--	10 *	10 *	10 *	--	--	--	--
	AVERAGE			0.00	0.00	0.00	0.00	2.00	4.00	2.00	0.00	0.00	0.00	0.00
	MAXIMUM			0.00	0.00	0.00	0.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88	1,1-Dichloroethane	ug/l	624	--	--	--	--	--	10 *	10 *	10 *	10 *	10 *	--
	AVERAGE			0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	2.00	2.00	0.00
	MAXIMUM			0.00	0.00	0.00	0.00	0.00	10.00	10.00	10.00	10.00	10.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
05/05/89	Diethyl phthalate	ug/l	625	10 *	10 *	--	--	--	--	--	--	--	--	10 *
05/09/89	Diethyl phthalate	ug/l	625	--	10 *	--	10 *	10 *	--	--	--	--	--	--
	AVERAGE			2.00	4.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	2.00
	MAXIMUM			10.00	10.00	0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	10.00
	MINIMUM			0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88	Ethyl benzene	ug/l	624	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *
03/30/89	Ethyl benzene	ug/l	624	10 *	--	--	--	--	--	--	--	--	10 *	--
	AVERAGE			2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	4.00	2.00
	MAXIMUM			10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
05/09/89	Fluoranthene	ug/l	625	--	--	--	--	--	--	10 *	10 *	--	--	--
	AVERAGE			0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00
	MAXIMUM			0.00	0.00	0.00	0.00	0.00	0.00	10.00	10.00	0.00	0.00	0.00
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/30/89	Gallium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
04/04/89	Gallium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
05/05/89	Gallium	mg/l	200.7	0.01 *	0.01 *	--	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
05/09/89	Gallium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.07	0.01 *	0.01 *	0.01 *	0.01	0.01 *	0.01 *	0.01 *
	AVERAGE			0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	MAXIMUM			0.01	0.01	0.01	0.07	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88	Hexachlorobenzene	ug/l	625	--	--	--	--	--	--	--	10 *	--	--	--
	AVERAGE			0.00	0.00	0.00		0.00	0.00	0.00	2.00	0.00	0.00	0.00

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - COMBINED

TABLE 2-2

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
MAXIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
05/09/89 Indeno(1,2,3-cd)pyrene	ug/l	625	--	--	--	--	--	--	--	10 *	--	--	--
AVERAGE			0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
MAXIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Iron	mg/l	200.7	17.1	3.1	9.98	9.11	24.7	2.19	2.61	14.6	--	--	13.7
03/30/89 Iron	mg/l	200.7	7.09	2.59	6.78	5.02	0.67	4.18	2.19	14.7	2.42	16.2	0.57
04/04/89 Iron	mg/l	200.7	4.8	2.1	7.19	3.44	8.16	2.07	2.91	10.5	[illegible]	16.5	1.83
05/05/89 Iron	mg/l	200.7	[illegible]	[illegible]	--	0.66	0.62	0.75	0.29	0.4	0.72	1.06	0.23
05/09/89 Iron	mg/l	200.7	0.68	0.92	0.66	2.28	6.82	1.83	2.95	4.89	4.1	12.2	1.93
AVERAGE			6.02	1.82	5.32	4.14	8.59	2.20	2.19	9.02	3.89	9.19	3.66
MAXIMUM			17.10	3.10	9.99	9.11	24.70	4.18	2.95	14.70	12.00	16.50	13.70
MINIMUM			0.44	0.49	0.00	0.86	0.62	0.75	0.29	0.40	0.00	0.00	0.28
11/04/88 Isophorone	ug/l	625	--	--	--	--	--	10 *	--	--	--	--	--
AVERAGE			0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
MAXIMUM			0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Lanthanum	mg/l	200.7	0.003	0.003 *	0.003 *	0.003 *	0.007	0.003 *	0.003 *	0.003	--	--	0.003
03/30/89 Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003	0.003 *	0.004	0.003 *
04/04/89 Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003	0.004	0.003 *
05/05/89 Lanthanum	mg/l	200.7	0.003 *	0.003 *	--	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *
05/09/89 Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.02	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003	0.003 *
AVERAGE			0.003	0.003	0.002	0.006	0.004	0.003	0.003	0.003	0.002	0.002	0.003
MAXIMUM			0.003	0.003	0.003	0.020	0.007	0.003	0.003	0.003	0.003	0.004	0.003
MINIMUM			0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.000	0.000	0.003
11/04/88 Lead	mg/l	200.7	0.04	0.03	0.02 *	0.02	0.03	0.02 *	0.02 *	0.02	--	--	0.03
03/30/89 Lead	mg/l	200.7	0.02 *	0.03	0.02	0.02 *	0.02 *	0.02	0.02 *	0.02 *	0.02 *	0.05	0.02 *
04/04/89 Lead	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.04	0.02 *
05/05/89 Lead	mg/l	200.7	0.02 *	0.02 *	--	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
05/09/89 Lead	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.03	0.02 *
AVERAGE			0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02
MAXIMUM			0.04	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.05	0.02
MINIMUM			0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.02
11/04/88 Lead	mg/l	239.2	0.0018	0.017	0.0005 *	0.016	0.0038	0.006	0.0058	0.005	--	--	0.0012
03/30/89 Lead	mg/l	239.2	0.016	0.018	0.013	0.0088	0.0005 *	0.025	0.0085	0.0095	0.0048	0.037	0.0018
04/04/89 Lead	mg/l	239.2	0.006	0.0065	0.007	0.0058	0.0098	0.0055	0.0085	0.0092	0.0125	0.025	0.0038
05/05/89 Lead	mg/l	239.2	0.002	0.005	--	0.003	0.002	0.0025	0.0025	0.0015	0.002	0.0032	0.0015
05/09/89 Lead	mg/l	239.2	0.0058	0.0068	0.002	0.003	0.0075	0.0032	0.0035	0.0035	0.0038	0.01	0.0035
AVERAGE			0.0063	0.0107	0.0045	0.0077	0.0047	0.0084	0.0058	0.0057	0.0046	0.0170	0.0025
MAXIMUM			0.0160	0.0180	0.0130	0.0180	0.0098	0.0250	0.0085	0.0095	0.0125	0.0370	0.0038
MINIMUM			0.0018	0.0050	0.0000	0.0030	0.0005	0.0025	0.0025	0.0015	0.0000	0.0000	0.0015
11/04/88 Lithium	mg/l	200.7	0.059	0.006	0.067	0.01	0.102	0.125	0.218	0.079	--	--	0.055
03/30/89 Lithium	mg/l	200.7	0.02	0.005	0.024	0.007	0.024	0.081	0.015	0.031	0.013	0.057	0.02
04/04/89 Lithium	mg/l	200.7	0.02	0.004	0.028	0.005	0.035	0.071	0.065	0.051	0.038	0.109	0.016
05/05/89 Lithium	mg/l	200.7	0.029	0.004	--	0.002	0.045	0.249	0.009	0.03	0.019	0.057	0.013
05/09/89 Lithium	mg/l	200.7	0.024	0.005	0.034	0.022	0.038	0.113	0.014	0.024	0.02	0.066	0.033
AVERAGE			0.030	0.005	0.031	0.009	0.049	0.128	0.064	0.043	0.018	0.058	0.027
MAXIMUM			0.059	0.006	0.067	0.022	0.102	0.249	0.218	0.079	0.038	0.109	0.055
MINIMUM			0.020	0.004	0.000	0.002	0.024	0.071	0.009	0.024	0.000	0.000	0.013
11/04/88 Magnesium	mg/l	200.7	8.98	4.47	6.68	3.79	10.4	7.49	5.09	4.18	--	--	6.28
03/30/89 Magnesium	mg/l	200.7	5.49	5.9	5.78	3.3	9.79	3.76	9.08	4.79	12.3	11.3	10.8
04/04/89 Magnesium	mg/l	200.7	5	3.99	4.9	2.32	5.52	5.57	5.21	4.02	7.14	8.79	9.3
05/05/89 Magnesium	mg/l	200.7	9.34	8.23	--	5.64	8.68	11.4	9.94	8.57	12.7	22	11.7
05/09/89 Magnesium	mg/l	200.7	5.37	4.85	8.29	3.4	7.69	5.65	6.97	4.71	12.3	15.3	10.6
AVERAGE			6.94	5.49	5.13	3.69	8.42	6.77	7.06	5.65	8.89	11.48	10.14

12-Jun-91

WET-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - COMBINED

TABLE 2-2

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
MAXIMUM			7.34	6.23	8.27	5.64	10.40	11.40	9.94	8.57	12.70	22.00	11.70
MINIMUM			5.00	3.99	0.00	2.32	5.52	3.76	5.09	4.02	0.00	0.00	8.28
11/04/88 Manganese	mg/l	200.7	0.584	0.206	0.268	0.242	0.593	0.069	0.065	0.436	--	--	0.43
03/30/89 Manganese	mg/l	200.7	0.289	0.157	0.285	0.169	0.165	0.116	0.102	0.453	0.8	0.4	0.167
04/04/89 Manganese	mg/l	200.7	0.127	0.075	0.177	0.082	0.198	0.057	0.074	0.321	0.331	0.268	0.146
05/05/89 Manganese	mg/l	200.7	0.083	0.076	--	0.159	0.112	0.023	0.084	0.11	0.481	0.777	0.09
05/09/89 Manganese	mg/l	200.7	0.141	0.114	0.102	0.118	0.265	0.049	0.1	0.193	0.409	0.406	0.202
AVERAGE			0.245	0.126	0.166	0.154	0.267	0.063	0.085	0.303	0.404	0.370	0.207
MAXIMUM			0.584	0.206	0.285	0.242	0.593	0.116	0.102	0.453	0.800	0.777	0.430
MINIMUM			0.083	[illegible]	0.000	0.082	0.112	0.023	0.065	0.110	0.000	0.000	0.090
11/04/88 Mercury	mg/l	245.1	0.021	0.0004	0.0032	0.0011	0.0042	0.0004	0.0006	0.0012	--	--	0.0086
03/30/89 Mercury	mg/l	245.1	0.0083	0.0005	0.0054	0.0004	0.0015	0.0005	0.0005	0.001	0.0007	0.0023	0.0013
04/04/89 Mercury	mg/l	245.1	0.0021	0.0002 *	0.0026	0.0002 *	0.0028	0.0008	0.0008	0.0002 *	0.0012	0.0021	0.0019
05/05/89 Mercury	mg/l	245.1	0.0014	0.0002 *	0.001	0.0002	0.0014	0.0003	0.0002 *	0.0007	0.0003	0.0003	0.0013
05/09/89 Mercury	mg/l	245.1	0.0032	0.0004	0.002	0.0003	0.004	0.0004	0.0008	0.0008	0.0006	0.0013	0.0023
AVERAGE			0.0072	0.0003	0.0028	0.0004	0.0028	0.0005	0.0006	0.0008	0.0006	0.0012	0.0031
MAXIMUM			0.0210	0.0005	0.0054	0.0011	0.0042	0.0008	0.0008	0.0012	0.0012	0.0023	0.0066
MINIMUM			0.0014	0.0002	0.0010	0.0002	0.0014	0.0003	0.0002	0.0002	0.0000	0.0000	0.0013
03/30/89 Methylene chloride	ug/l	624	--	--	--	--	--	--	10 *	10 *	10 *	10 *	10 *
05/05/89 Methylene chloride	ug/l	624	10 *	10 *	--	--	--	--	--	--	--	--	--
05/09/89 Methylene chloride	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 *
AVERAGE			2.00	2.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	2.00	4.00
MAXIMUM			10.00	10.00	0.00	0.00	0.00	0.00	10.00	10.00	10.00	10.00	10.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Molybdenum	mg/l	200.7	0.045	0.141	0.06	0.01	0.054	0.148	0.1	0.048	--	--	0.054
03/30/89 Molybdenum	mg/l	200.7	0.041	0.398	0.028	0.007	0.112	0.006 *	0.184	0.006 *	0.006 *	0.009	0.177
04/04/89 Molybdenum	mg/l	200.7	0.069	0.192	0.034	0.009	0.048	0.022	0.219	0.006 *	0.008	0.015	0.174
05/05/89 Molybdenum	mg/l	200.7	0.171	0.507	--	0.038	0.136	0.125	0.355	0.335	0.009	0.033	0.224
05/09/89 Molybdenum	mg/l	200.7	0.084	0.302	0.189	0.013	0.107	0.055	0.166	0.18	0.006	0.021	0.161
AVERAGE			0.082	0.308	0.062	0.015	0.091	0.071	0.205	0.115	0.006	0.016	0.162
MAXIMUM			0.171	0.507	0.189	0.038	0.136	0.148	0.355	0.335	0.009	0.033	0.224
MINIMUM			0.041	0.141	0.000	0.007	0.048	0.006	0.100	0.006	0.000	0.000	0.054
11/04/88 Napthalene	ug/l	625	10 *	10 *	--	--	--	--	--	--	--	--	--
AVERAGE			2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAXIMUM			10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Nickel	mg/l	200.7	0.02	0.01 *	0.01 *	0.01 *	0.02	0.01	0.01 *	0.01 *	--	--	0.02
03/30/89 Nickel	mg/l	200.7	0.012	0.007 *	0.01	0.007	0.007 *	0.015	0.007 *	0.017	0.015	0.027	0.007 *
04/04/89 Nickel	mg/l	200.7	0.008	0.007 *	0.008	0.007 *	0.01	0.007 *	0.007 *	0.023	0.014	0.024	0.007 *
05/05/89 Nickel	mg/l	200.7	0.007 *	0.007 *	--	0.007 *	0.007 *	0.007 *	0.007 *	0.01	0.012	0.039	0.007 *
05/09/89 Nickel	mg/l	200.7	0.007 *	0.007 *	0.009	0.009	0.016	0.007 *	0.02	0.008	0.01	0.024	0.007 *
AVERAGE			0.011	0.008	0.007	0.008	0.012	0.009	0.010	0.014	0.010	0.023	0.010
MAXIMUM			0.020	0.010	0.010	0.010	0.020	0.015	0.020	0.023	0.015	0.039	0.020
MINIMUM			0.007	0.007	0.000	0.007	0.007	0.007	0.007	0.008	0.000	0.009	0.007
11/04/88 Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	--	--	0.01 *
03/30/89 Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
04/04/89 Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
05/05/89 Niobium	mg/l	200.7	0.01 *	0.01 *	--	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
05/09/89 Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
AVERAGE			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
MAXIMUM			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
MINIMUM			0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01
11/04/88 Nitrate, as Nitrogen	mg/l	353.3	1.4	0.52	2.3	0.49	1.4	0.92	0.64	3.2	--	--	1.3
03/30/89 Nitrate, as Nitrogen	mg/l	353.3	0.96	0.29	1.2	0.28	5.4	0.4	0.72	1.2	0.64	15	4.4
04/04/89 Nitrate, as Nitrogen	mg/l	353.3	1.4	0.17	1.4	0.15	2.4	0.56	0.84	1.6	8	5.6	4
05/05/89 Nitrate, as Nitrogen	mg/l	353.3	3.8	0.13	--	54	5	0.68	0.52	10	0.1 *	0.1 *	3.8
05/09/89 Nitrate, as Nitrogen	mg/l	353.3	2	0.14	3.4	3	2.4	0.48	0.68	3.1	13	32	3.2

.3-Jun-90

WET-RAD.WK1

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - COMBINED

TABLE 2-2

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
AVERAGE			1.91	0.25	1.66	0.34	3.52	0.61	0.64	3.96	5.35	10.54	3.34
MAXIMUM			3.80	0.52	3.40	0.54	6.40	0.92	0.72	10.00	18.00	32.00	4.40
MINIMUM			0.76	0.13	0.00	0.15	1.40	0.40	0.52	1.20	0.00	7.00	1.30
11/04/88 Nitrite, as Nitrogen	mg/l	353.3	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	--	--	0.1 ‡
03/30/89 Nitrite, as Nitrogen	mg/l	353.3	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
04/04/89 Nitrite, as Nitrogen	mg/l	353.3	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
05/05/89 Nitrite, as Nitrogen	mg/l	353.3	0.1 ‡	0.1 ‡	--	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	25	88	0.1 ‡
05/09/89 Nitrite, as Nitrogen	mg/l	353.3	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
AVERAGE			0.10	0.10	0.08	0.10	0.10	0.10	0.10	0.10	0.06	17.66	0.10
MAXIMUM			0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	25.00	88.00	0.10
MINIMUM			0.10	0.10	0.00	0.10	0.10	0.10	0.10	0.10	0.00	0.00	0.10
11/04/88 Nitrogen, Kjeldahl	mg/l	351.2	1.7	0.9	1.6	1.6	1.7	0.2	0.8	2.8	--	--	1.5
03/30/89 Nitrogen, Kjeldahl	mg/l	351.3	1.1	0.7	1.3	1.2	0.7	0.7	0.5	1.1	0.9	0.6	1.1
04/04/89 Nitrogen, Kjeldahl	mg/l	351.3	1	0.7	0.6	1	1.1	0.8	0.6	1.2	1	0.9	1.2
05/05/89 Nitrogen, Kjeldahl	mg/l	351.3	1.02	0.8	1.6	0.6	1.3	0.4	0.4	1.3	1.3	2.3	2.8
05/09/89 Nitrogen, Kjeldahl	mg/l	351.3	1.3	0.4	0.7	0.7	0.8	0.6	0.6	0.9	0.7	0.7	1.4
AVERAGE			1.22	0.70	1.20	1.02	1.12	0.74	0.58	1.46	0.78	0.94	1.60
MAXIMUM			1.70	0.90	1.60	1.60	1.70	1.20	0.80	2.80	1.30	2.30	2.80
MINIMUM			1.00	0.40	0.70	0.60	0.70	0.40	0.40	0.90	0.00	0.00	1.10
03/30/89 Nitrogen, Total	mg/l	551	2.1	0.95	2.5	1.4	7.1	1.1	1.2	--	1.7	16	5.5
04/04/89 Nitrogen, Total	mg/l	551	2.4	0.9	2.2	1.1	3.5	1.3	1.3	3	9	6.5	5.2
05/05/89 Nitrogen, Total	mg/l	551	4.8	0.93	7.4	1.1	6.3	1.1	0.52	11	26	90	6.6
05/09/89 Nitrogen, Total	mg/l	551	33	0.54	4.1	0.93	3.2	1.08	1.3	4	19	33	4.6
AVERAGE			8.46	0.66	3.24	0.91	4.02	0.92	0.94	3.60	11.14	29.10	4.39
MAXIMUM			33.00	0.95	7.40	1.40	7.10	1.30	1.30	11.00	26.00	90.00	6.60
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
05/09/89 N-Nitrosodiphenylamine	ug/l	625	--	--	--	--	--	--	--	10 ‡	--	--	--
AVERAGE			0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
MAXIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡
03/30/89 Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡
04/04/89 Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡
05/05/89 Oil and Grease	mg/l	413.1	5	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2	2 ‡	2 ‡
05/09/89 Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡
AVERAGE			2.60	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
MAXIMUM			5.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
MINIMUM			2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
11/04/88 Organic Carbon, Total (TOC)	mg/l	415.2/415.3	12	9.8	9.8	69	56	73	63	20	240	--	17
03/30/89 Organic Carbon, Total (TOC)	mg/l	415.2/415.3	8.6	8.5	11	10	11	1.	8.9	6.7	6.8	7.4	7.4
04/04/89 Organic Carbon, Total (TOC)	mg/l	415.2/415.3	4.9	4	4.6	5.3	14	6.8	6.8	5.2	6.9	7	5.1
05/05/89 Organic Carbon, Total (TOC)	mg/l	415.2/415.3	8.6	7.5	6.7	8.2	4.9	10	14	13	5.9	8	5.6
05/09/89 Organic Carbon, Total (TOC)	mg/l	415.2	8.1	10	11	10	6.7	7.2	9	6.9	7	5.6	15
AVERAGE			8.44	7.96	8.62	20.50	18.52	21.60	24.14	10.56	53.32	5.60	10.02
MAXIMUM			12.00	10.00	11.00	69.00	56.00	73.00	83.00	20.00	240.00	8.00	17.00
MINIMUM			4.90	4.00	4.60	5.30	4.90	6.80	5.80	6.20	5.90	0.00	5.10
11/04/88 PCB, Total	mg/l	608	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡
03/30/89 PCB, Total	mg/l	608	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.001	0.0005 ‡	0.0005 ‡	0.0007	0.0005 ‡	0.0005 ‡
04/04/89 PCB, Total	mg/l	608	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡
05/05/89 PCB, Total	mg/l	608	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.005 ‡	0.0005 ‡
05/09/89 PCB, Total	mg/l	608	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡
AVERAGE			0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0005	0.0005	0.0005	0.0014	0.0005
MAXIMUM			0.0005	0.0005	0.0005	0.0005	0.0005	0.0010	0.0005	0.0005	0.0007	0.0050	0.0005
MINIMUM			0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
11/04/88 pH	units	150.1	7.7	7.7	7.4	7.7	7.8	8.2	8	7.7	7.5	7.3	8
03/30/89 pH	units	150.1	8.3	8.1	7.8	8.1	7.9	7.7	8.2	8.5	8.6	8.5	8

TABLE [illegible]

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
11/04/88 pH	units	150.1	7.8	7.9	7.8	7.8	7.8	5	8.[illegible]	7.6	7.8	7.8	7.8
03/30/89 pH	units	150.1	7.9	8.2	7.9	7.8	6	9.4	8.1	7.7	7.9	7.1	8.1
05/05/89 pH	units	150.1	8	7.5	8	7.8	7.8	7.8	7.9	7.	7.7	7.7	8.[illegible]
AVERAGE			7.[illegible]4	[illegible]	7.[illegible]	7.80	7.82	8.2	8.6	7.84	7.86	7.68	8.02
MAXIMUM			9.[illegible]	9.[illegible]	8.60	8.1	8.[illegible]	9.49	9.26	8.20	9.60	8.50	8.[illegible]
MINIMUM			7.[illegible]	7.4	7.49	7.60	7.89	7.7	7.9	7.60	7.50	7.19	7.80
11/04/88 Phenanthrene	ug/l	625	--	--	--	--	-	-	--	75	--	--	--
AVERAGE			0.[illegible]	0.[illegible]0	0.00	0.[illegible]0	0.[illegible]	[illegible]	0.[illegible]	15.[illegible]	0.[illegible]	0.[illegible]	0.[illegible]
MAXIMUM			0.00		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.[illegible]	.00	0.[illegible]
MINIMUM			0.00		.00	0.[illegible]	0.[illegible]	0.00	[illegible]	00	[illegible]	0.00	[illegible]
11/04/88 Phosphorus	mg/l	200.7	0.57	0.72	0.36	0.43	0.57	0.59	0.75	0.36	--	--	0.47
03/30/89 Phosphorus	mg/l	200.7	0.4[illegible]	0.[illegible]7	0.3	0.32	0.[illegible]	0.3[illegible]	0.35	0.35	0.21	0.37	0.28
04/04/89 Phosphorus	mg/l	200.7	0.3	0.2	0.22	0.24	0.26	0.52	0.42	0.34	0.24	0.5	0.26
05/05/89 Phosphorus	mg/l	200.7	[illegible]	0.15	--	0.28	0.[illegible]	0.51	0.47	0.29	0.25	0.22	0.22
05/09/89 Phosphorus	mg/l	200.7	[illegible].1	0.17	0.24	0.45	0.42	0.51	0.43	0.27	0.[illegible]1	0.87	0.33
AVERAGE			0.26	0.24	0.27	0.36	0.43	0.53	0.41	0.31	0.22	0.37	0.36
MAXIMUM			0.57	0.75	0.75	0.45	0.7	0.59	0.47	0.36	0.34	0.87	0.49
MINIMUM			0.21	0.17	0.09	0.24	0.22	0.[illegible]	0.35	0.27	0.00	0.09	0.22
11/04/88 Phosphorus, Total	mg/l	365.1	.45	0.22	0.38	0.58	0.23	0.[illegible]	--	0.15	--	--	0.45
03/30/89 Phosphorus, Total	mg/l	365.1	0.35	0.26	0.4	0.[illegible]	0.28	0.41	0.5	0.4	0.51	0.44	0.33
04/04/89 Phosphorus, Total	mg/l	365.1	0.23	0.2	0.7	0.22	0.28	0.42	0.37	[illegible]	0.2	0.35	[illegible]
05/05/89 Phosphorus, Total	mg/l	365.1	0.23	0.1	0.36	0.37	0.2	0.5	0.45	0.27	0.24	0.19	0.25
05/09/89 Phosphorus, Total	mg/l	365.1	0.37	0.19	0.24	0.45	0.27	0.44	0.41	0.17	0.31	0.26	0.27
AVERAGE			0.34	0.27	0.25	0.39	0.32	0.49	0.25	0.24	0.25	0.25	0.34
MAXIMUM			0.45	0.46	0.40	0.58	0.39	0.70	0.50	0.40	0.51	0.44	0.45
MINIMUM			0.23	0.1[illegible]	0.17	0.32	0.27	0.41	0.29	0.17	0.00	0.09	0.27
11/04/88 Potassium	mg/l	200.7	6	2.7	4.2	3.6	8.8	2.5	3.8	5.6	--	--	6.2
03/30/89 Potassium	mg/l	200.7	2.4	2.2	4	2.7	1.9	2.7	2.2	4.4	2.6	2.6	2.2
04/04/89 Potassium	mg/l	200.7	2.6	2.2	3.5	2.4	3.5	2.4	3.2	4.6	4.2	5	2.7
05/05/89 Potassium	mg/l	200.7	1	0.8	--	0.5	1.1	1.5	1.2	1.1	1.1	1.4	1.2
05/09/89 Potassium	mg/l	200.7	1	0.9	1.6	1.8	2.7	1.6	1.7	2.1	1.9	4.2	1.3
AVERAGE			2.80	1.76	2.66	2.24	3.60	2.14	2.42	3.56	1.96	2.90	2.74
MAXIMUM			6.00	2.[illegible]	4.20	3.80	8.80	2.70	3.80	5.60	4.20	5.00	6.20
MINIMUM			1.0	0.90	0.[illegible]	[illegible]	1.10	1.50	1.20	1.10	0.00	0.00	1.3
11/04/88 Pyrene	ug/l	625	--	--	--	--	--	--	--	--	--	--	[illegible]
AVERAGE			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0[illegible]	0.00
MAXIMUM			0.0[illegible]	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	10.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Residue, Filterable (TDS)	mg/l	160.1	140	90	180	90	210	130	--	130	--	--	25
03/30/89 Residue, Filterable (TDS)	mg/l	160.1	80	112	130	100	220	65	150	80	470	220	260
04/04/89 Residue, Filterable (TDS)	mg/l	160.1	64	65	120	75	120	100	130	110	200	110	200
05/05/89 Residue, Filterable (TDS)	mg/l	160.1	240	150	--	120	260	46	170	208	320	640	250
05/09/89 Residue, Filterable (TDS)	mg/l	160.1	150	110	234	96	190	100	110	115	250	410	240
AVERAGE			149.80	109.60	132.80	96.20	200.00	88.20	112.00	128.60	270.00	276.00	195.00
MAXIMUM			240.00	150.00	234.00	120.00	260.00	130.00	170.00	208.00	470.00	640.00	360.00
MINIMUM			90.00	80.00	[illegible].00	75.00	120.00	46.00	[illegible].00	80.00	0.00	0.00	25.00
11/04/88 Residue, Non-Filterable (TSS)	mg/l	160.2	460	70	760	270	430	90	--	320	520	--	210
03/30/89 Residue, Non-Filterable (TSS)	mg/l	160.2	370	76	560	450	16	96	40	410	77	530	14
04/04/89 Residue, Non-Filterable (TSS)	mg/l	160.2	190	26	140	9	140	43	39	180	200	360	40
05/05/89 Residue, Non-Filterable (TSS)	mg/l	160.2	[illegible]	7	6	15	12	10	5	[illegible]	39	35	9
05/09/89 Residue, Non-Filterable (TSS)	mg/l	160.2	150	140	93	74	380	41	70	157	78	290	29
AVERAGE			217.80	66.20	315.80	143.60	195.60	56.00	36.80	216.60	162.80	237.00	70.40
MAXIMUM			460.00	140.00	780.00	450.00	430.00	96.00	70.00	410.00	520.00	590.00	360.00
MINIMUM			9.00	7.00	6.00	9.00	12.00	10.00	0.00	6.00	39.00	0.00	9.00
11/04/88 Scandium	mg/l	200.7	0.0042	0.0005	0.0024	0.0019	0.0062	0.0004	0.0005	0.0022	--	--	0.0073
03/30/89 Scandium	mg/l	200.7	0.0019	0.0015	0.0024	0.00	0.0004	0.0011	0.0015	0.0032	0.0006	0.0049	0.0014

WET-AD.W1

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - COMBINED

TABLE 2-2

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
04/04/69 Scandium	mg/l	200.7	0.0013	0.0006	0.0019	0.0009	0.0023	0.0006	0.0008	0.0025	0.0021	0.0052	0.0005
03/30/89 Scandium	mg/l	200.7	0.0004 ‡	0.0004 ‡	--	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡
05/09/89 Scandium	mg/l	200.7	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0126	0.0023	0.0005	0.0007	0.0012	0.0011	0.0036	0.0005
AVERAGE			0.0016	0.0005	0.0014	0.0034	0.0023	0.0006	0.0006	0.0021	0.0010	0.0028	0.0010
MAXIMUM			0.0042	0.0006	0.0024	0.0126	0.0062	0.0011	0.0008	0.0032	0.0021	0.0052	0.0023
MINIMUM			0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0009	0.0004
11/04/68 Silver	mg/l	200.7	0.005	0.004 ‡	0.004 ‡	0.004	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	--	--	0.004 ‡
03/30/89 Silver	mg/l	200.7	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡
04/04/89 Silver	mg/l	200.7	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.005	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡
05/05/89 Silver	mg/l	200.7	0.004 ‡	0.004 ‡	--	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡
05/09/89 Silver	mg/l	200.7	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004	0.004 ‡	0.004 ‡	0.004 ‡
AVERAGE			0.004	0.004	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.004
MAXIMUM			0.005	0.004	0.004	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004
MINIMUM			0.004	0.004	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.004
11/04/68 Sodium	mg/l	200.7	5.31	3.47	7.35	1.34	8.66	4.5	4.84	2.46	--	--	13
03/30/89 Sodium	mg/l	200.7	2.82	4.62	2.22	1.9	5.25	1.33	4.55	1.31	7.52	2.15	8.32
04/04/89 Sodium	mg/l	200.7	4.66	3.51	3.55	1.99	3.27	2.81	4.94	1.97	3.06	1.99	9.36
05/05/89 Sodium	mg/l	200.7	10.3	6.24	--	4.52	10.1	5.92	3.71	3.6	4.86	4.34	6.9
05/09/89 Sodium	mg/l	200.7	5.51	4.06	10.9	2.57	5.98	2.44	3.5	1.9	4.43	2.91	7.66
AVERAGE			6.21	4.47	4.92	2.56	6.65	3.40	4.29	2.27	3.97	2.28	9.03
MAXIMUM			10.30	6.24	10.90	4.52	10.10	5.92	4.84	3.80	7.52	4.34	13.00
MINIMUM			3.88	3.47	9.00	1.84	3.27	1.33	3.50	1.31	0.00	0.00	6.90
11/04/68 Specific Conductance	umhos	120.1	260	270	510	350	690	380	400	730	1100	1700	350
03/30/89 Specific Conductance	umhos	120.1	130	70	180	60	170	170	70	90	100	140	160
04/04/89 Specific Conductance	umhos	120.1	160	180	170	80	320	240	300	160	280	260	270
05/05/89 Specific Conductance	umhos	120.1	370	330	350	300	370	370	300	410	680	1800	410
05/09/89 Specific Conductance	umhos	120.1	120	110	120	100	150	170	200	20	170	160	170
AVERAGE			236.00	192.00	266.00	178.00	340.00	266.00	254.00	332.00	466.00	832.00	272.00
MAXIMUM			390.00	330.00	510.00	350.00	690.00	380.00	400.00	730.00	1100.00	1800.00	410.00
MINIMUM			120.00	70.00	120.00	60.00	150.00	170.00	70.00	90.00	100.00	140.00	160.00
11/04/68 Strontium	mg/l	200.7	0.0935	0.0592	0.0919	0.0441	0.106	0.0925	0.0673	0.082	--	--	0.0913
03/30/89 Strontium	mg/l	200.7	0.0582	0.0677	0.0623	0.0356	0.126	0.043	0.0836	0.0513	0.215	0.151	0.125
04/04/89 Strontium	mg/l	200.7	0.0651	0.0562	0.0675	0.0344	0.0762	0.0632	0.0972	0.0554	0.118	0.126	0.116
05/05/89 Strontium	mg/l	200.7	0.13	0.101	--	0.080	0.144	0.124	0.104	0.142	0.241	0.507	0.137
05/09/89 Strontium	mg/l	200.7	0.0843	0.0681	0.129	0.048	0.0994	0.0634	0.0722	0.0699	0.194	0.286	0.138
AVERAGE			0.0862	0.0704	0.0703	0.0518	0.1103	0.0772	0.0849	0.0801	0.1536	0.2140	0.1215
MAXIMUM			0.130	0.101	0.1290	0.0802	0.1440	0.1240	0.1040	0.1420	0.2410	0.5070	0.1360
MINIMUM			0.0582	0.0562	0.0000	0.0344	0.0762	0.0430	0.0673	0.0513	0.0000	0.0000	0.0913
11/04/68 Sulfate	mg/l	375.4	35	22	51	25	47	29	--	42	--	--	43
03/30/89 Sulfate	mg/l	375.4	30	19	27	22	34	20	25	31	34	27	52
04/04/89 Sulfate	mg/l	375.4	27	18	28	25	33	21	39	37	39	32	46
05/05/89 Sulfate	mg/l	375.4	58	26	--	20	79	36	30	26	44	67	59
05/09/89 Sulfate	mg/l	375.4	33	18	69	10	44	19	27	25	34	40	58
AVERAGE			37.60	20.60	35.40	20.40	47.40	25.00	24.20	32.20	30.20	33.20	52.60
MAXIMUM			58.00	26.00	69.00	25.00	79.00	36.00	39.00	42.00	44.00	67.00	59.00
MINIMUM			27.00	18.00	0.00	10.00	33.00	19.00	0.00	25.00	0.00	0.00	46.00
11/04/68 Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	38	14	10 ‡	10 ‡	10 ‡
03/30/89 Tetrachloroethene	ug/l	624	10 ‡	--	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--	--	10 ‡	10 ‡
04/04/89 Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	--	10 ‡	10 ‡	10	--	--	10 ‡	10 ‡
05/05/89 Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	--	10	10 ‡	10 ‡	19	10 ‡	10 ‡	10 ‡
05/09/89 Tetrachloroethene	ug/l	624	--	--	10 ‡	--	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--
AVERAGE			8.00	6.00	10.00	4.00	10.00	10.00	15.60	8.60	6.00	10.00	8.00
MAXIMUM			10.00	10.00	10.00	10.00	10.00	10.00	38.00	19.00	10.00	10.00	10.00
MINIMUM			0.00	0.00	10.00	0.00	10.00	10.00	10.00	0.00	0.00	10.00	0.00
11/04/68 Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	--	--	0.01 ‡
03/30/89 Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
04/04/89 Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
05/05/89 Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	--	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡

WET-SAD.W1

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - COMBINED

TABLE 2-2

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
5/09/89 Thorium	mg/l	200.7	0.01 #	0.01 #	0.01 #	0.04 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #
AVERAGE			0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
MAXIMUM			0.01	0.01	0.01	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01
MINIMUM			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01
11/04/88 Titanium	mg/l	200.7	0.026	0.015	0.024	0.013	0.023	0.012	0.011	0.017	--	--	0.019
03/30/89 Titanium	mg/l	200.7	0.038	0.008	0.051	0.025	0.002 #	0.025	0.009	0.035	0.017	0.062	0.004
04/04/89 Titanium	mg/l	200.7	0.024	0.014	0.029	0.02	0.032	0.017	0.019	0.032	0.04	0.073	0.014
05/05/89 Titanium	mg/l	200.7	0.005	0.005	--	0.007	0.006	0.009	0.002 #	0.004	0.01	0.012	0.003
05/09/89 Titanium	mg/l	200.7	0.022	0.009	0.008	0.213	0.089	0.026	0.045	0.067	0.068	0.137	0.03
AVERAGE			[illegible]	[illegible]	0.022	0.056	0.030	0.018	0.017	0.031	0.027	0.057	0.014
MAXIMUM			0.038	0.015	0.051	0.213	0.089	0.026	0.045	0.067	0.068	0.137	0.030
MINIMUM			0.005	0.005	0.000	0.007	0.002	0.009	0.002	0.004	0.000	0.000	0.003
03/30/89 Toluene	ug/l	624	10 #	--	10 #	--	--	--	--	--	--	10 #	--
04/04/89 Toluene	ug/l	624	--	--	10 #	10 #	--	--	--	--	--	10 #	--
AVERAGE			2.00	0.00	4.00	2.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00
MAXIMUM			10.00	0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/30/89 trans-1,2-Dichloroethene	ug/l	624	--	--	--	--	--	--	10 #	--	10 #	--	--
AVERAGE			0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
MAXIMUM			0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	10.00	0.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 1,1,1-Trichloroethane	ug/l	624	--	10 #	10 #	10 #	10 #	10 #	10 #	10 #	10 #	10 #	10 #
03/30/89 1,1,1-Trichloroethane	ug/l	624	--	--	--	--	--	10 #	--	--	--	10 #	--
04/04/89 1,1,1-Trichloroethane	ug/l	624	--	--	--	--	--	10 #	--	--	--	10 #	--
AVERAGE			1744.61	927.56	1671.58	1130.05	1814.64	1141.42	1195.03	1686.57	2418.07	2878.08	1423.93
MAXIMUM			590.00	330.00	786.00	450.00	690.00	380.00	400.00	730.00	1140.00	1809.00	410.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Trichloroethene	ug/l	624	10 #	10 #	10 #	10 #	10 #	10 #	10 #	10 #	10 #	10 #	10 #
03/30/89 Trichloroethene	ug/l	624	--	--	--	--	--	10 #	--	--	--	10 #	--
04/04/89 Trichloroethene	ug/l	624	--	--	--	--	10 #	10 #	10 #	--	10 #	10 #	--
05/05/89 Trichloroethene	ug/l	624	--	--	--	--	--	--	--	10 #	10 #	10 #	--
AVERAGE			2.00	2.00	2.00	2.00	4.00	6.00	4.00	4.00	6.00	8.00	2.00
MAXIMUM			10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04/04/89 Trichlorofluoromethane	ug/l	624	--	--	--	--	--	10 #	--	--	--	--	--
AVERAGE			0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
MAXIMUM			0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Vanadium	mg/l	200.7	0.026	0.004	0.016	0.014	0.037	0.004 #	0.004	0.021	--	--	0.021
03/30/89 Vanadium	mg/l	200.7	0.01	0.004 #	0.013	0.006	0.004 #	0.006	0.004 #	0.017	0.004 #	0.027	0.004 #
04/04/89 Vanadium	mg/l	200.7	0.009	0.004 #	0.012	0.006	0.015	0.004	0.005	0.017	0.021	0.034	0.004 #
05/05/89 Vanadium	mg/l	200.7	0.004 #	0.004 #	--	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #
05/09/89 Vanadium	mg/l	200.7	0.004 #	0.004 #	0.004 #	0.1	0.015	0.004 #	0.005	0.008	0.008	0.026	0.004 #
AVERAGE			0.011	0.004	0.009	0.026	0.015	0.004	0.004	0.013	0.007	0.018	0.007
MAXIMUM			0.026	0.004	0.016	0.100	0.037	0.006	0.005	0.021	0.021	0.034	0.021
MINIMUM			0.004	0.004	0.000	0.004	0.004	0.004	0.004	0.004	0.000	0.000	0.004
03/30/89 Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 #	--
04/04/89 Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 #	--
05/05/89 Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 #	--
05/09/89 Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 #	--
AVERAGE			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	0.00
MAXIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
MINIMUM			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11/04/88 Zinc	mg/l	200.7	0.297	0.142	0.154	0.233	0.261	0.36	0.159	0.124	--	--	0.249

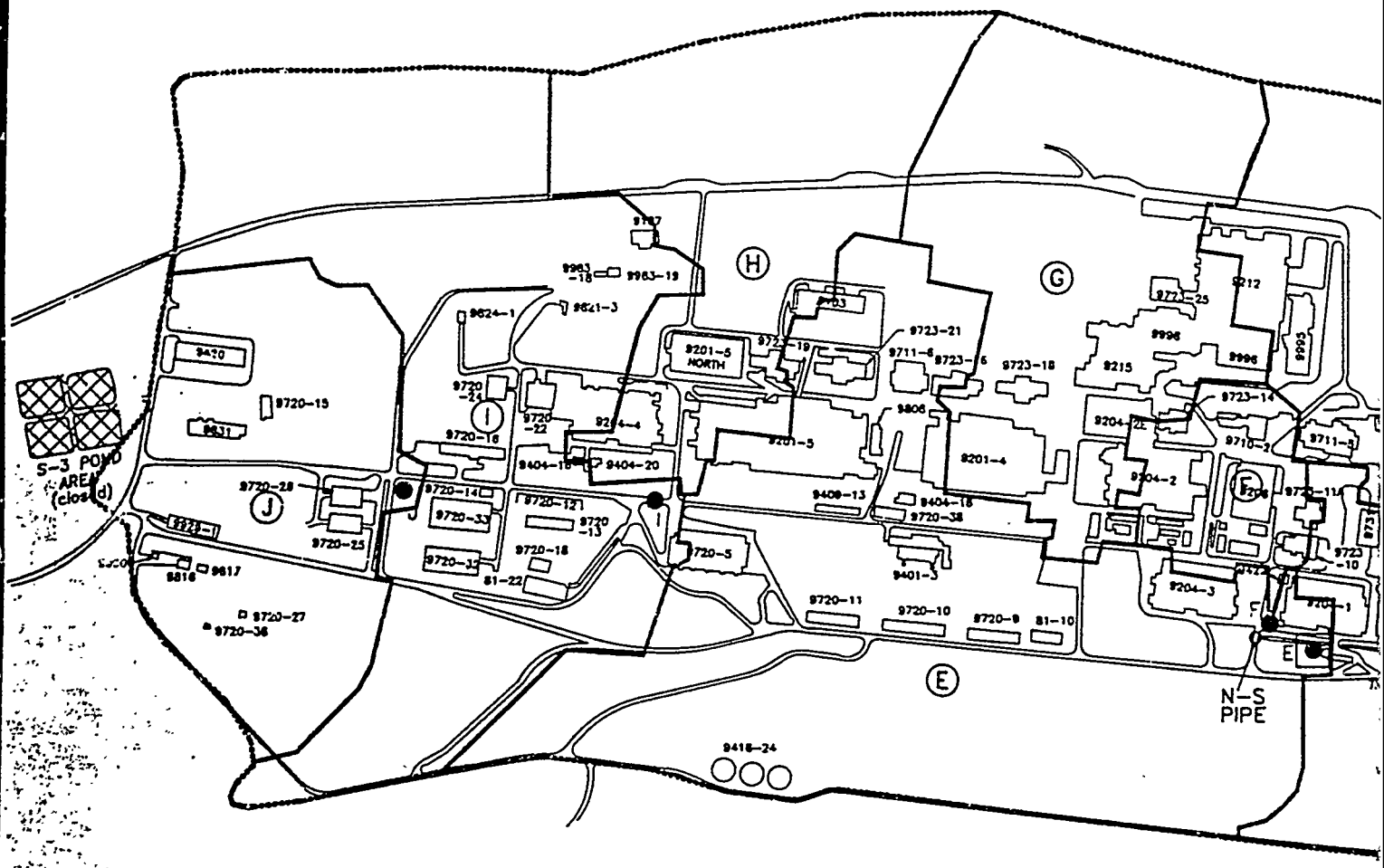
MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - COMBINED

TABLE 2-2

WET WEATHER EVENT DATA SUMMARY BY PARAMETER

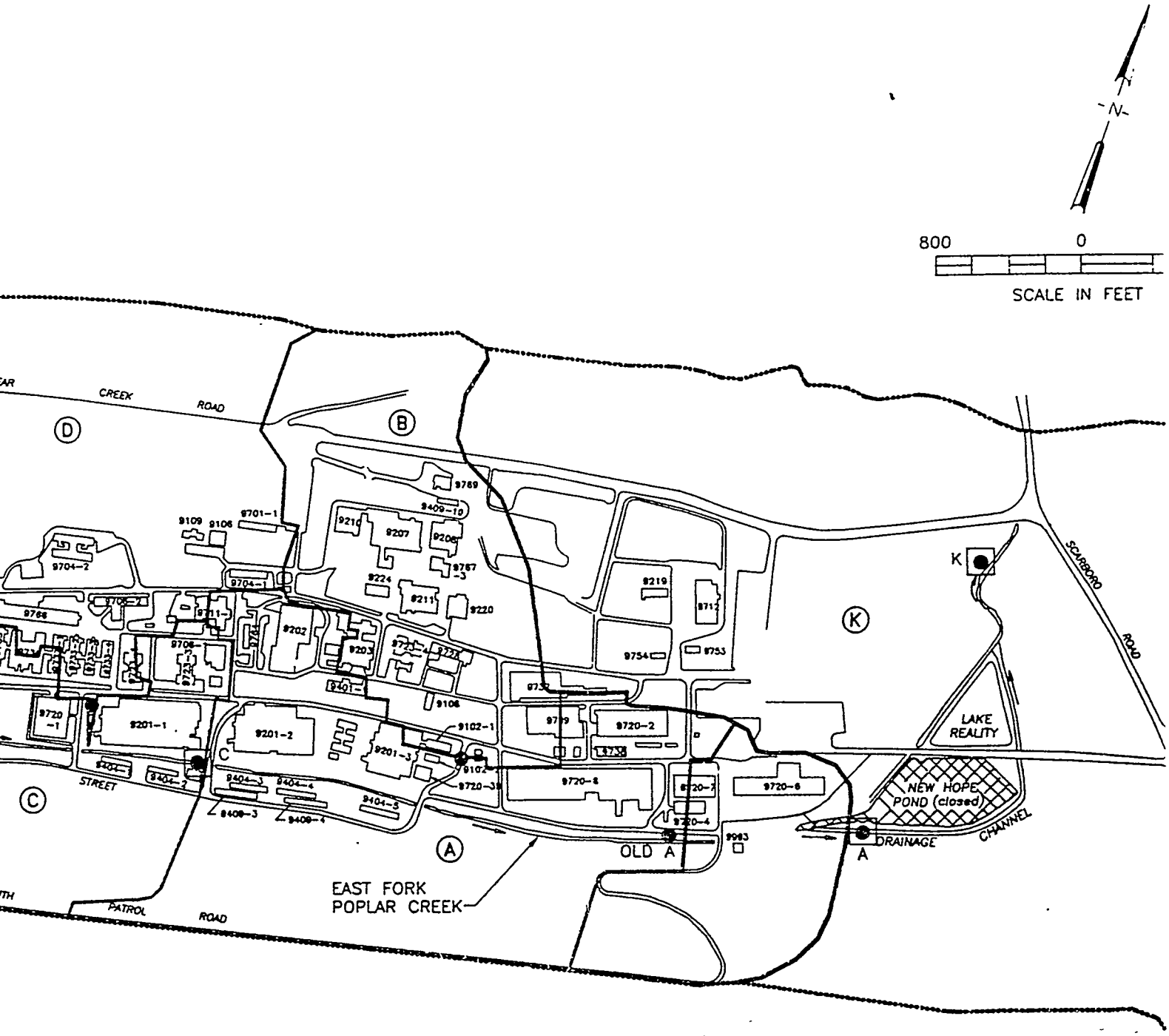
	PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
03/30/89	Zinc	mg/l	200.7	0.17	0.126	0.158	0.164	0.122	0.531	0.158	0.131	0.181	0.305	0.08
04/04/89	Zinc	mg/l	200.7	0.139	0.092	0.146	0.079	0.177	0.664	0.126	0.097	0.133	0.256	0.075
05/05/89	Zinc	mg/l	200.7	0.109	0.056	--	0.125	0.13	0.172	0.133	0.108	0.182	0.422	0.064
05/09/89	Zinc	mg/l	200.7	0.11	0.076	0.103	0.095	0.151	0.207	0.141	0.08	0.141	0.301	0.078
	AVERAGE			0.165	0.099	0.112	0.139	0.168	0.387	0.142	0.108	0.127	0.257	0.109
	MAXIMUM			0.257	0.143	0.158	0.233	0.261	0.664	0.159	0.131	0.182	0.422	0.249
	MINIMUM			0.109	0.056	0.000	0.079	0.122	0.172	0.126	0.080	0.000	0.000	0.064
11/04/88	Zirconium	mg/l	200.7	0.009	0.002 ‡	0.005	0.004	0.012	0.002 ‡	0.002 ‡	0.007	--	--	0.007
03/30/89	Zirconium	mg/l	200.7	0.004	0.002 ‡	0.005	0.002	0.002 ‡	0.003	0.002	0.006	0.002 ‡	0.01	0.002 ‡
04/04/89	Zirconium	mg/l	200.7	[illegible]	0.002 ‡	0.004	0.002 ‡	0.004	0.002 ‡	0.002 ‡	0.005	[illegible]	0.01	0.002 ‡
05/05/89	Zirconium	mg/l	200.7	[illegible]	[illegible] ‡	--	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	[illegible] ‡	0.002 ‡	0.002 ‡	0.002 ‡
05/09/89	Zirconium	mg/l	200.7	[illegible]	0.002 ‡	0.002 ‡	0.013	0.006	0.002 ‡	0.003	0.002	0.003	0.007	0.002
	AVERAGE			0.004	0.002	0.003	0.006	0.005	0.002	0.002	0.004	0.003	0.006	0.003
	MAXIMUM			0.009	0.002	0.005	0.018	0.012	0.003	0.003	0.007	0.006	0.010	0.007
	MINIMUM			0.002	0.002	0.000	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.002

A value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).
‡ Indicates that the radioactive activity level is less than typical background (i.e., a negative value using DOE convention).



LEGEND

- ● SAMPLING STATION FOR STORM DRAINS
- ●A A,C,E,&K SAMPLING STATION PHYSICALLY LOCATED IN EAST FORK POPLAR CREEK
- FLOW DIRECTION
- WATERSHED BOUNDARY
- BASIN DRAINAGE SUBAREA BOUNDARY



COMPREHENSIVE SAMPLING PROGRAM
STATIONS AND SUBBASINS

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLAN
OAK RIDGE, TENNESSEE

3.0 DATA ANALYSIS

In assessing the parameters of greater concern in EFPC for both dry and wet weather events, contaminants which were consistently reported at concentrations less than analytical detection limits were eliminated from further consideration. The remaining parameters were compared to applicable water quality standards. Parameters for which no standards exist were not subject to further analysis. Both the frequency and magnitude of contaminant concentrations exceeding standards were noted. In general, isolated events, such as an exceedence at one station for one or two events, were not deemed to be significant. Parameters which showed exceedences for multiple events and multiple stations were selected as parameters of greater concern. Those contaminants common to both dry and wet events were plotted showing station locations and event statistics. A separate discussion of the water quality analysis for dry and wet weather events is provided. A list of the analytical parameters and methods is provided in Appendix C.

3.1 DRY WEATHER EVENTS

The majority of parameters analyzed were not detected or were reported at concentrations below detection limits. A summary of the parameters reported at concentrations below detection limits is given in **Table 3-1**. In addition to this group, 26 reported parameters do not have established standards, although many of these had concentrations less than the detection limits as well. All station maximum and average aluminum concentrations exceeded the proposed secondary MCL. However, since there is no promulgated standard, aluminum was not selected as a parameter of concern.

Eight parameters were detected at concentrations below the applicable standard(s) and, consequently, were not selected as parameters of concern. These include arsenic, barium, bromodichloromethane, carbon tetrachloride, nickel, pH, tetrachloroethene, and trans-1,2-dichloroethene.

TABLE 3-1

PARAMETERS REPORTED AT CONCENTRATIONS BELOW DETECTION LIMITS
DRY WEATHER EVENTS
MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE

Benzene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(k)fluoranthene
Benzyl-butyl-phthalate
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
Chlorobenzene
Chloroethane
2-Chloroethylvinyl ether
2-Chlorophenol
Chrysene
Cis-1,3-Dichloropropene
Dibromochloromethane
(also chlorodibromomethane)
1,1-Dichloroethane
1,1-Dichloroethene
1,2-Dichloroethane
1,2-Dichloropropane
2,4-Dinitrophenol
2,4-Dinitrotoluene
Di-n-octyl phthalate
Ethyl benzene
Gallium
Hexachlorobenzene
Hexachlorocyclopentadiene
Indeno(1,2,3-cd)pyrene
Isophorone
Lanthanum
Methylene Chloride
Napthalene
N-Nitrosodimethylamine
Pentachlorophenol
Phenol
Toluene
Total Organic Halides as Cl
Trans-1,3-Dichloropropene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethane
Trichlorofluoromethene
Vinyl Chloride

Contaminants which were detected but not perceived to be significant due to relatively isolated standard exceedences include ammonia, bis(2-ethyl-hexyl)phthalate, bromoform, cadmium, chloroform, 3,3-dichlorobenzidine, diethyl phthalate, dimethyl phthalate, di-n-butyl phthalate, iron, and nitrite (as nitrogen).

Three parameters, silver, sulfate, and zinc, showed more frequent exceedences, but were not considered to be overall parameters of concern. For silver, three station maximums exceeded the acute TTRP criteria. Ten additional samples were above the chronic TTRP concentration. However, the chronic level is an order of magnitude less than the analytical detection limit. Only one sample exceeded the TTRP domestic water supply criteria. Based on this review, silver was not selected as a parameter of concern. Sulfate exceeded secondary maximum contaminant levels in a total of eight samples. However, only four of these samples (two stations, two samples each) showed high concentrations relative to the standard. Using a human health based criteria for a 10^{-5} risk level, only two samples for one station exceeded this level which are considered to be relatively isolated events. Using average hardness data for EFPC, four station maximums exceeded the acute TTRP for zinc. No station averages exceeded the chronic value. Zinc is similarly not selected as a parameter of concern.

Seven parameters were detected at concentrations above standards at greater frequencies. These include total residual chlorine, copper, lead, manganese, mercury, nitrate (as nitrogen), and total dissolved solids (TDS). Each of these is individually discussed. Using acute and chronic AWQC of 19 μg/L and 11 μg/L, respectively, all chlorine station maximums and averages exceeded these criteria, respectively. Although these AWQC are below the analytical detection limits, 80 percent of all samples were identified above the detection limit and chlorine was identified in all samples. Chlorine was thus selected as a significant parameter. For copper, six stations had maximum concentrations exceeding the acute AWQC of 18 μg/L. Two of the station averages exceeded the chronic AWQC of 12 μg/L. A total of 15 samples or 11 percent exceeded the chronic AWQC; of these samples, 6 percent also exceeded acute AWQC. For lead, no station maximums exceeded the acute AWQC. However, all station averages exceeded the lead chronic AWQC of 3.2 μg/L. Six percent of all samples exceeded this concentration. For manganese, 10 of the 11

stations had maximum and average concentrations exceeding the secondary MCL of 50 μg/L. Seventy-nine percent of all samples exceeded this value. Acute and chronic TTRP AWQC for mercury are 2.4 and 0.012 μg/L, respectively. Four station maximums exceeded the acute concentration and all station averages exceeded the chronic. Although the chronic AWQC is below detection limits, mercury was detected in all samples, and 84 percent of the samples had concentrations above detection limits. For nitrate (as nitrogen), all samples from Stations I and J and one-half those from H exceeded the human health AWQC (10^{-6} risk level) of 10 mg/L. (The proposed MCL and MCLG are also 10 μg/L.) This number represents 23 percent of all samples. Lastly, filterable residue (TDS) exceeded the secondary MCL in 22 samples from six stations which represents 17 percent of the total samples. A summary of these significant parameters, the corresponding standards, and percentage of samples (with respect to the total samples - 11 stations with 12 samples at each) exceeding applicable standards is given in **Table 3-2**.

3.2 WET WEATHER EVENTS

Many parameters were not detected and 26 parameters were reported at concentrations below the detection limits. A summary of parameters reported at concentrations below detection limits is given in **Table 3-3**. In addition, 28 parameters had no standards, but many of these had results below or close to detection limits. Similar to dry events, all station maximum and average aluminum concentrations exceeded the proposed secondary MCL. However, since the aluminum standard has not been promulgated, aluminum was not selected as a parameter of concern.

Additionally, eight parameters had results less than standards for all samples. These parameters include ammonia, barium, beryllium, nickel, kjeldahl nitrogen, pH, sulfate, and tetrachloroethene.

Contaminants which were detected but not perceived to be significant due to relatively isolated standard exceedences include arsenic, benzo(a)pyrene, bromoform, cadmium, chloroform, chromium, nitrate (as nitrogen), nitrite (as nitrogen, silver and TDS. Two of the more toxic compounds, arsenic and benzo(a)pyrene, are described. For arsenic, all station maximum and average

TABLE 3-2

DRY WEATHER EVENTS
WATER QUALITY SUMMARY FOR SIGNIFICANT PARAMETERS
MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE

Compound	Standard		% Exceedences
Chlorine	AWQC Acute	19 μg/L	100
	AWQC Chronic	11 μg/L	100
Copper	AWQC Acute	18 μg/L	6
	AWQC Chronic	12 μg/L	11
Lead	AWQC Acute	82 μg/L	0
	AWQC Chronic	3.2 μg/L	6
Manganese	Secondary MCL	50 μg/L	79
Mercury	TTRP Acute	2.4 μg/L	3
	TTRP Chronic	0.012 μg/L	100
Nitrate (as Nitrogen)	AWQC Human Health (10^{-6})	10 mg/L	23
	(Proposed MCL	10 mg/L)	
TDS	Secondary MCL	500 mg/L	17

TDS = Total Dissolved Solids.

TABLE 3-3

PARAMETERS REPORTED AT CONCENTRATIONS BELOW DETECTION LIMITS
WET WEATHER EVENTS
MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE

Anthracene
Benzene
Bis(2-ethylhexyl)phthalate
Bromodichloromethane
Carbon Tetrachloride
Chlorobenzene
Chloroethane
Dibromochloromethane
1,1-Dichloroethane
Diethylphthalate
Ethylbenzene
Fluoranthene
Hexachlorobenzene
Indeno(1,2,3-cd)pyrene
Isophorone
Methylene Chloride
Napthalene
Niobium
N-Nitrosodiphenylamine
Pyrene
Toluene
Trans-1,3-Dichloropropene
1,1,1-Trichloroethane
Trichloroethene
Trichlorofluoromethane
Vinyl Chloride

concentrations were below acute and chronic AWQC, respectively. Three samples (one event, three stations) exceeded the chronic concentration. For benzo(a)pyrene, one sample (one station, one event) exceeded the TTRP human health criteria based on recreational use. These occurrences are not deemed to be critical. Five of the above compounds (bromoform, cadmium, chloroform, chromium, and nitrite) also had isolated occurrences for dry weather events. Furthermore, three of the parameters, bromoform, nitrite, and TDS, only had exceedences for the May 5, 1989 wet weather event. Due to early sampling for this one event (i.e., before the actual storm hit), these three parameters are more indicative of dry weather conditions. (TDS was identified as a parameter of concern for dry events which further supports this rationale.)

Seven parameters were identified at concentrations above standards at greater frequencies. These include total residual chlorine, copper, iron, lead, manganese, mercury, and zinc. (All of these parameters except iron and zinc were also identified for dry weather events.) Each of these parameters is addressed below. The percent exceedences do not consider the May 5, 1989 wet weather event due to the early sampling as noted.

The chlorine analytical detection limit is above the acute and chronic AWQC. However, chlorine was detected in all samples and 39 percent were reported at concentrations above the detection limit. The maximum and averages for nine stations exceeded the AWQC. (The remaining two stations showed concentrations below detection limits). Copper results showed nine station maximums exceeding acute AWQC and eight station averages exceeding chronic AWQC. Sixty-four percent of the individual samples exceeded chronic levels, and of these, 34 percent exceeded the acute concentration. For iron, all station averages and maximums exceeded the acute AWQC of 1 mg/L. (No chronic AWQC exists.) A total of 84 percent of the samples analyzed exceeded this level. For lead, no station maximums exceeded the acute AWQC. However, 10 station averages exceeded the chronic concentration. Seventy-seven percent of the samples exceeded the chronic AWQC. Ninety-five percent of the samples analyzed for manganese exceeded the secondary MCL. All station maximums and averages exceeded this level. Four station maximums and all station averages exceeded acute and chronic TTRP for mercury. Seventy-nine percent of the samples exceeded chronic levels, and of these, 11 percent exceeded acute levels. Using

an average hardness value for EFPC, six station maximums exceeded acute and two station averages exceeded chronic TTRP for zinc. Twenty-two percent of the total samples exceeded the chronic TTRP, and of these, 2 percent exceeded acute. A summary of the significant parameters for wet events, the corresponding criteria, and percent of total samples exceeding standards is provided in **Table 3-4**.

3.3 SUMMARY OF KEY PARAMETERS

A comparison of significant parameters for both wet and dry events is given in **Table 3-5**. Five parameters - chlorine, copper, lead, manganese, and mercury - are common to both events. The analytical results for these five parameters are geographically plotted in **Figures 3-1** through **3-5**, respectively.

Comparing the wet and dry events, it can be seen that chlorine, mercury, nitrate (as nitrogen), and TDS are present in higher concentrations in base flows (i.e., outfall discharge and groundwater infiltration) than in runoff, as seen by a greater percentage of dry weather standard exceedences. On the other hand, copper, iron, lead, manganese and zinc have significant contributions from runoff as seen by a greater percentage of wet weather exceedences. Potential controls and BMPs considered in later tasks will consider these generalized sources.

TABLE 3-4

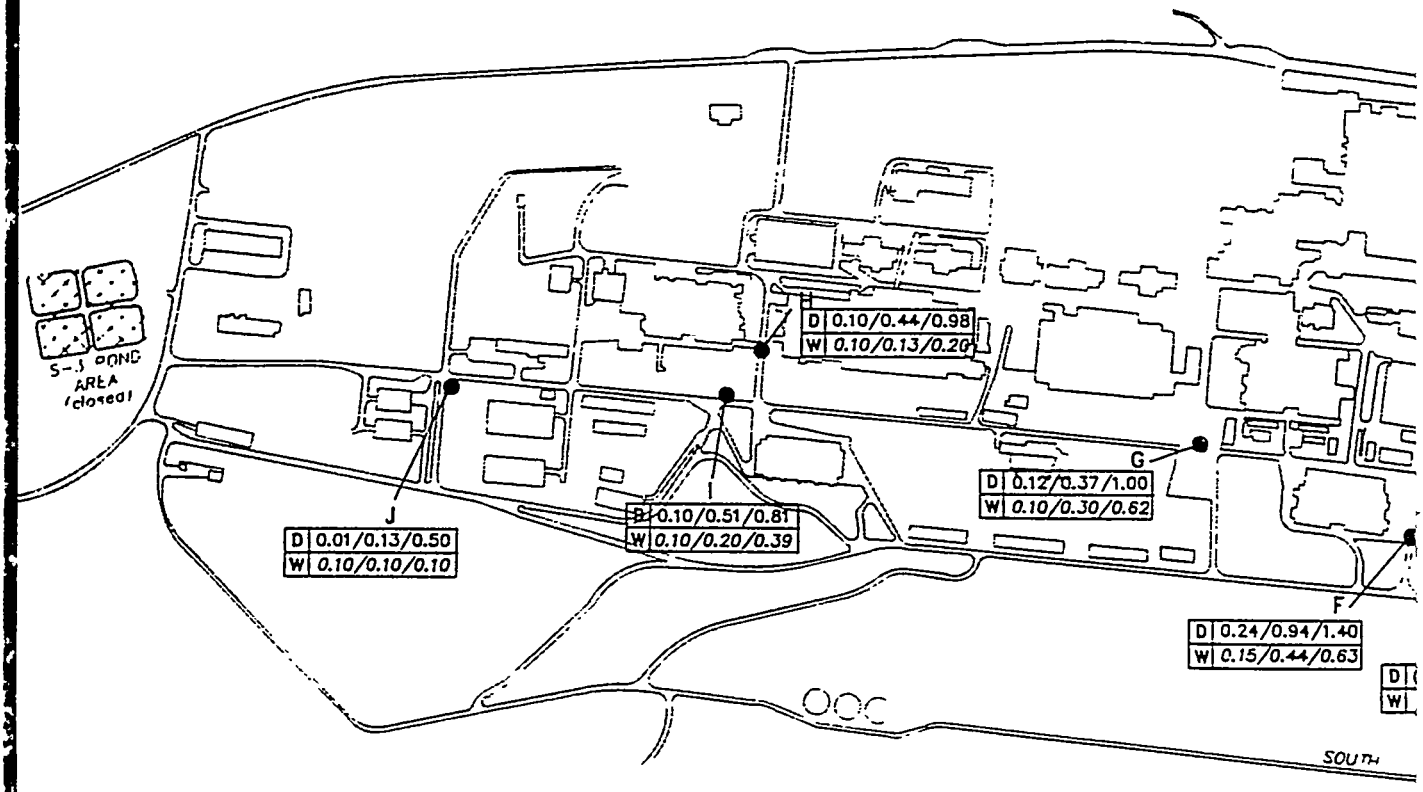
WET WEATHER EVENTS
WATER QUALITY SUMMARY FOR SIGNIFICANT PARAMETERS
MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE

Compound	Standard		% Exceedences
Chlorine	AWQC Acute	19 μg/L	39
	AWQC Chronic	11 μg/L	39
Copper	AWQC Acute	18 μg/L	34
	AWQC Chronic	12 μg/L	64
Iron	AWQC Acute	1.000 μg/L	84
Lead	AWQC Acute	82 μg/L	0
	AWQC Chronic	3.2 μg/L	77
Manganese	Secondary MCL	50 μg/L	95
Mercury	TTRP Acute	2.4 μg/L	11
	TTRP Chronic	0.012 μg/L	79
Zinc	TTRP Acute	219 μg/L	20
	TTRP Chronic	198 μg/L	22

TABLE 3-5

COMPARISON OF DRY AND WET WEATHER WATER QUALITY
MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE

Parameter	Percent Exceedences	
	Dry Weather	Wet Weather
Chlorine	100	39
Copper	11	64
Iron		84
Lead	6	77
Manganese	79	95
Mercury	100	79
Nitrate (as Nitrogen)	23	
TDS	17	
Zinc		22

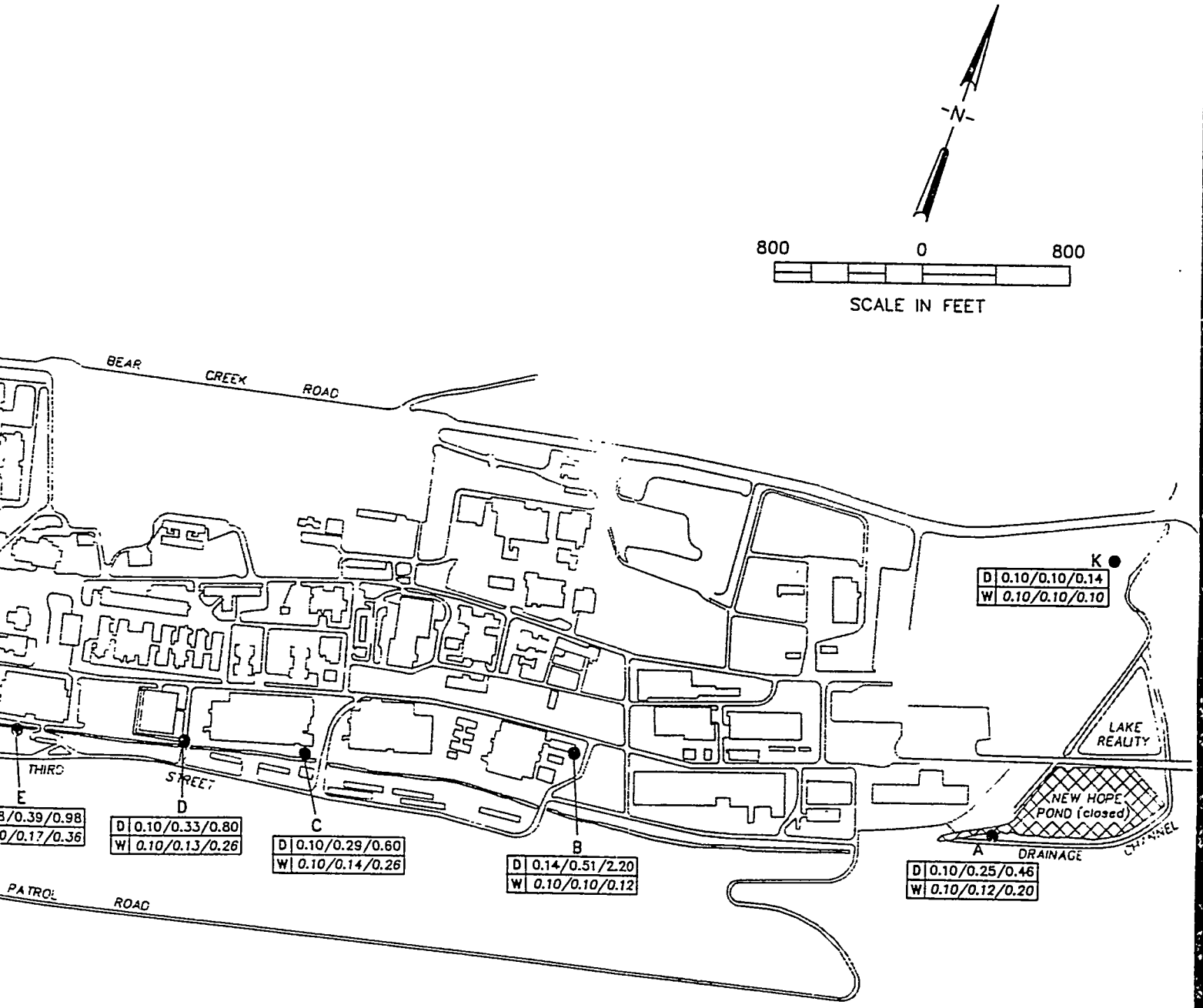


LEGEND

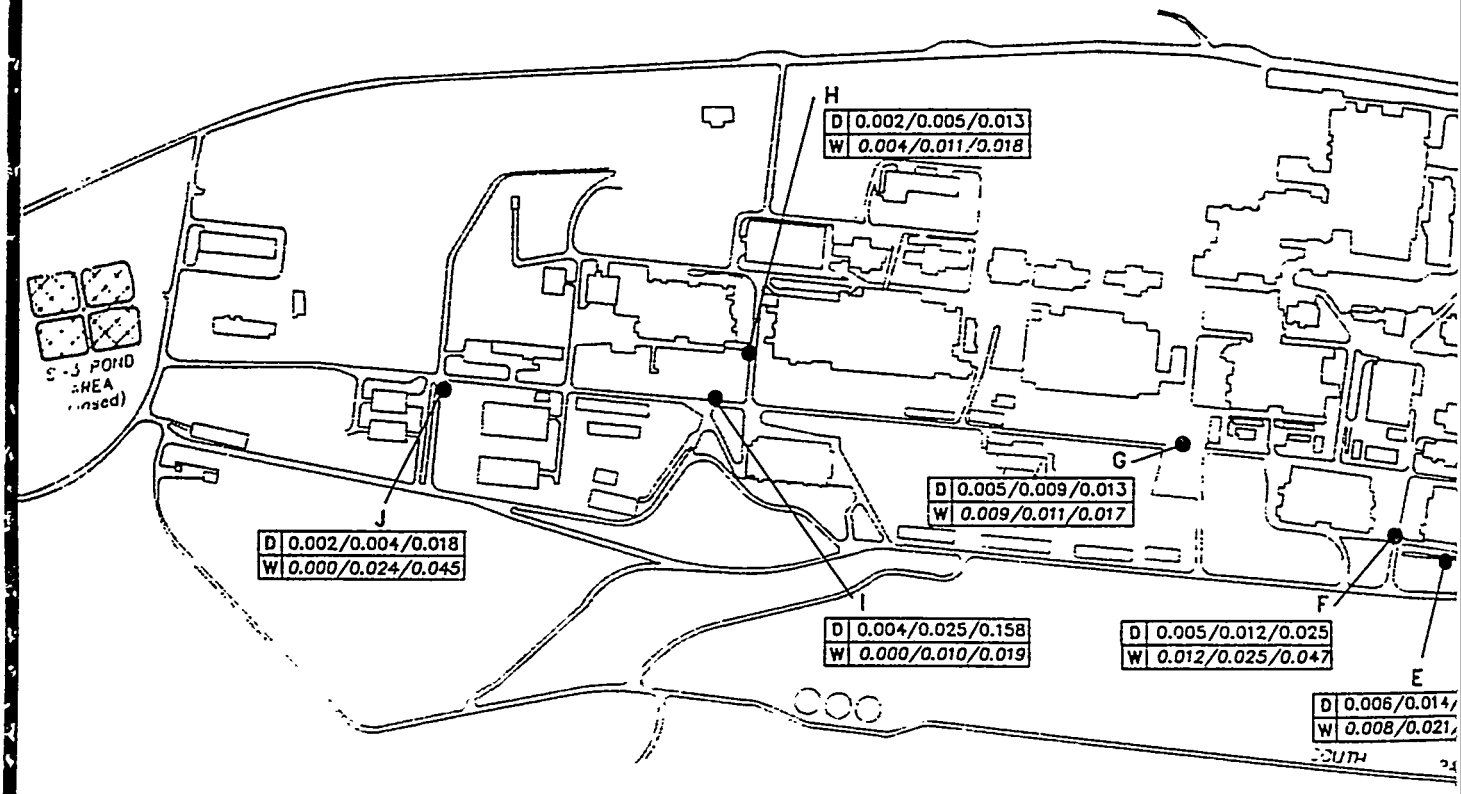
● MONITORING STATION

D 0.12/0.37/1.00 — MINIMUM/AVERAGE/MAXIMUM CONTAMINANT CONCENTRATIONS (mg/l) FOR DRY WEATHER EVENTS

W 0.10/0.30/0.62 — MINIMUM/AVERAGE/MAXIMUM CONTAMINANT CONCENTRATIONS (mg/l) FOR WET WEATHER EVENTS



MINIMUM/AVERAGE/MAXIMUM CHLORINE CONCENTRATIONS	FIGURE NO.
DEPARTMENT OF ENERGY Y-12 PLANT OAK RIDGE, TENNESSEE	3-1

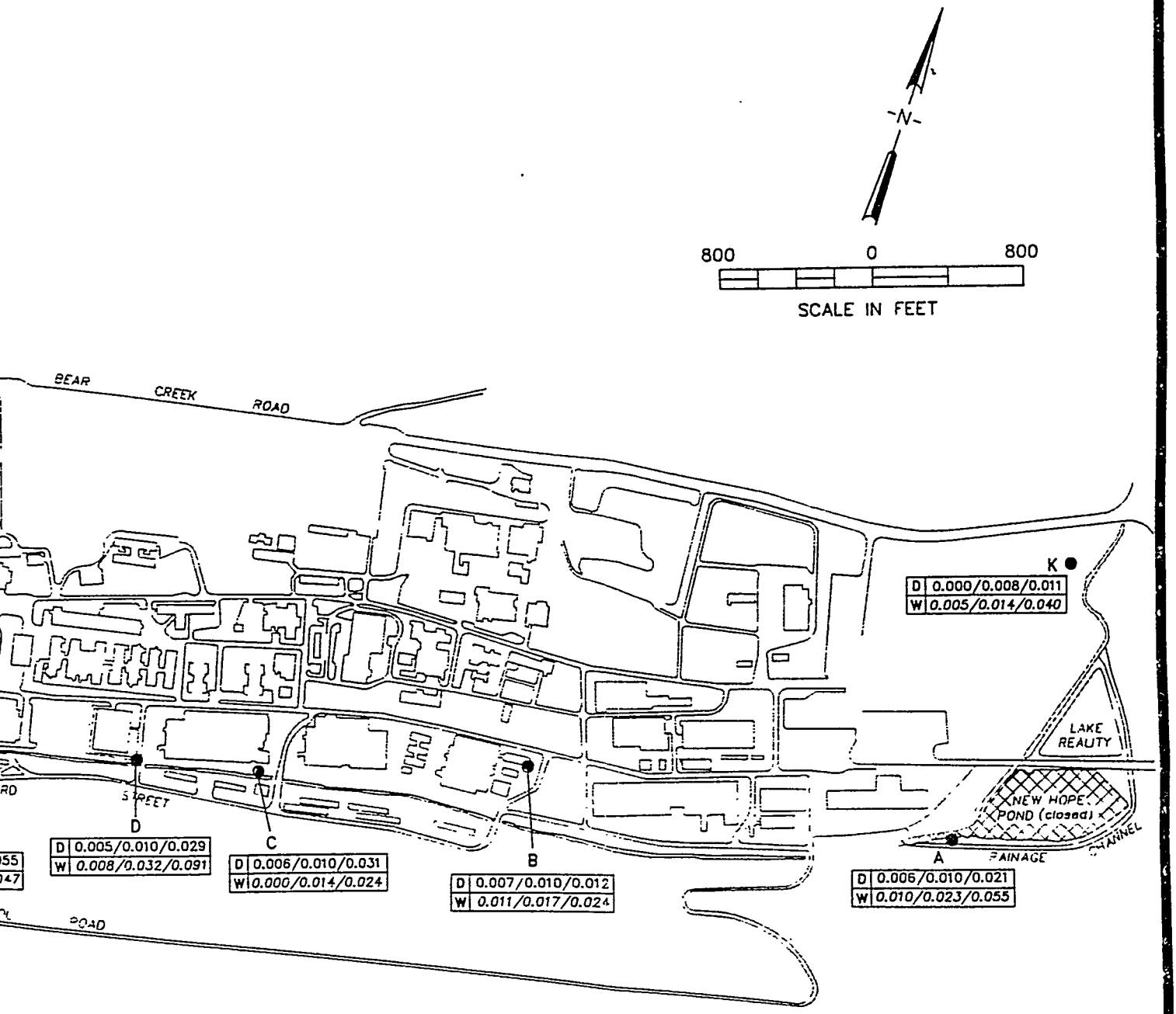


LEGEND

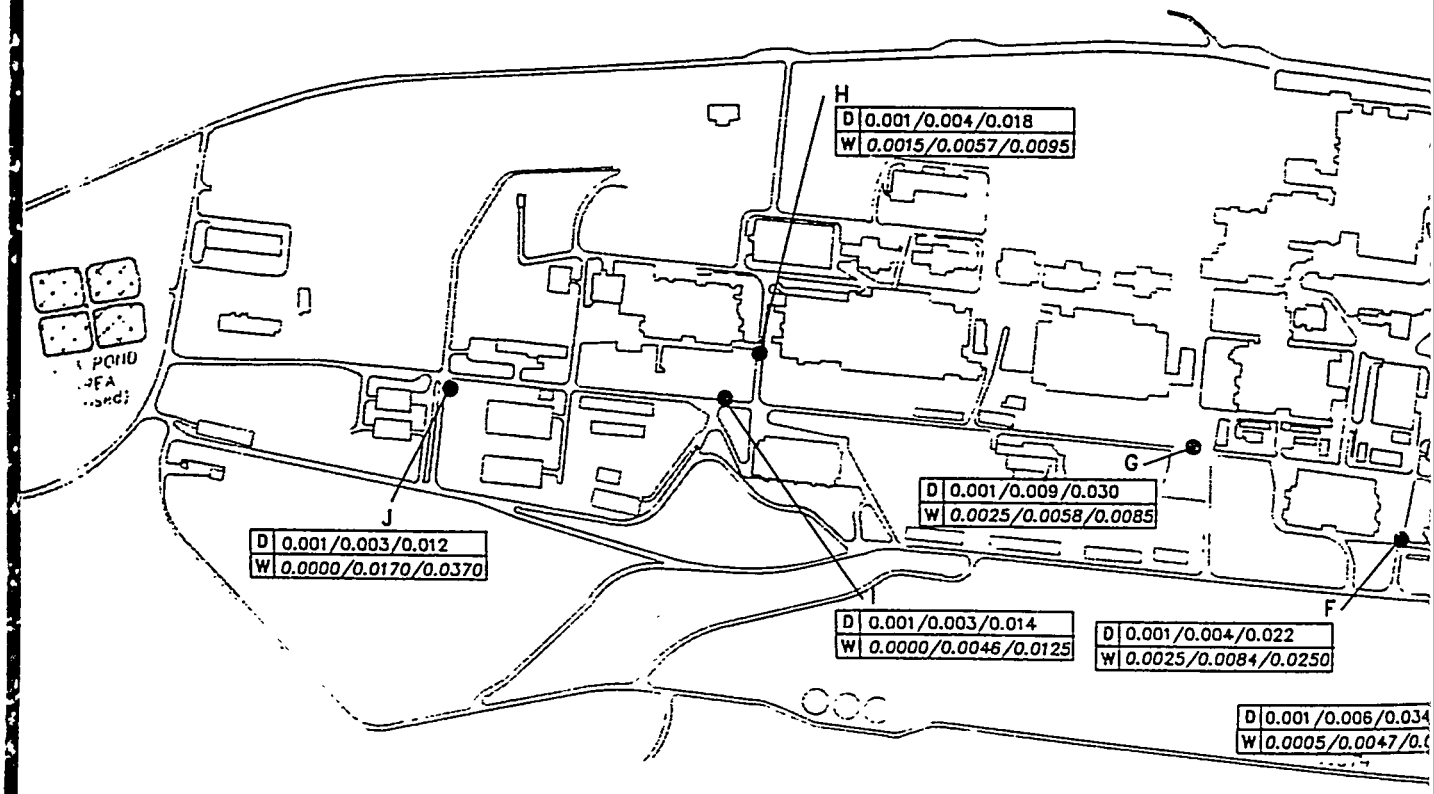
● MONITORING STATION

D 0.005/0.009/0.013 — MINIMUM/AVERAGE/MAXIMUM CONTAMINANT CONCENTRATIONS (mg/l) FOR DRY WEATHER EVENTS

W 0.009/0.011/0.017 — MINIMUM/AVERAGE/MAXIMUM CONTAMINANT CONCENTRATIONS (mg/l) FOR WET WEATHER EVENTS

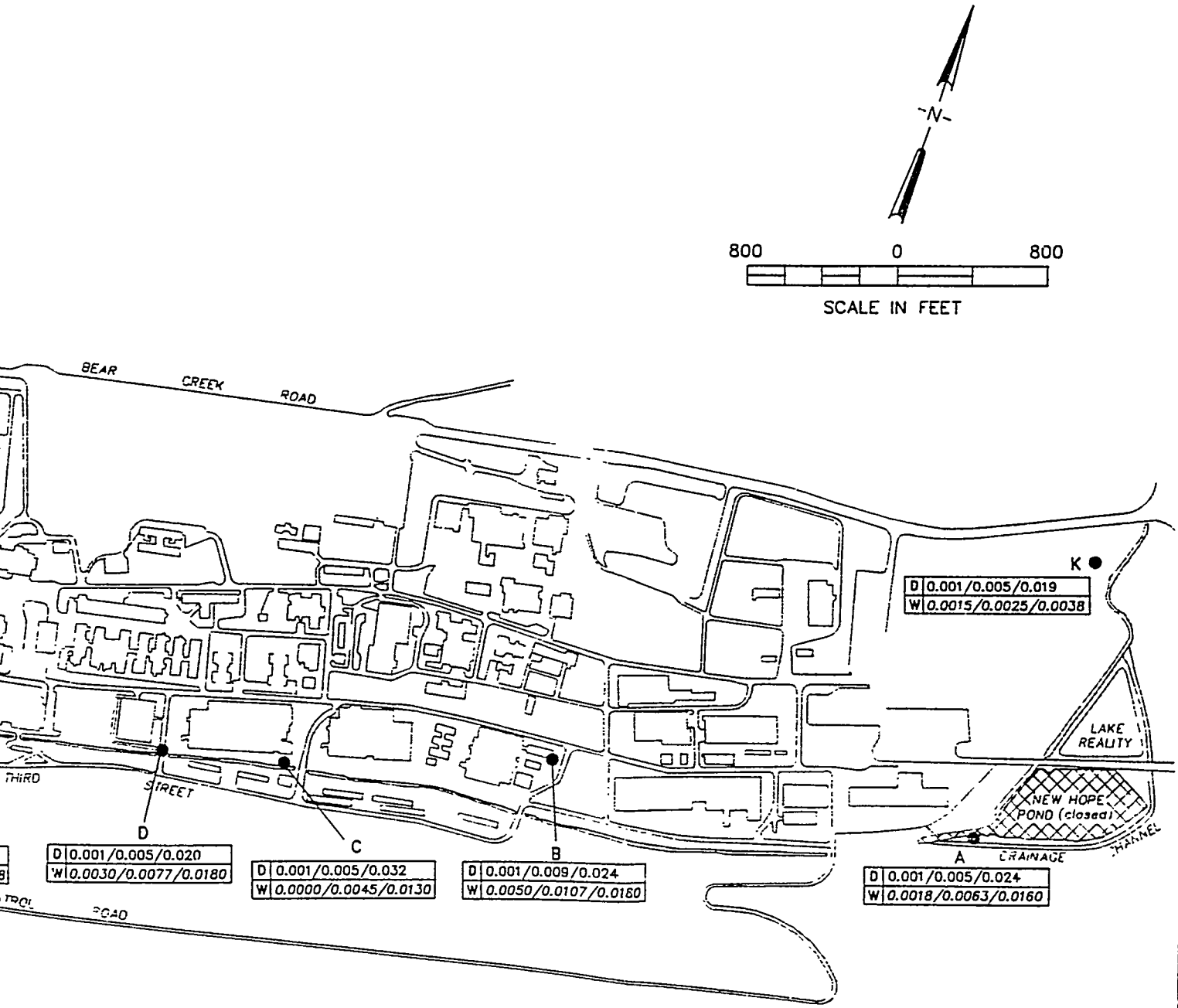


MINIMUM/AVERAGE/MAXIMUM COPPER CONCENTRATIONS	FIGURE NO.
DEPARTMENT OF ENERGY Y-12 PLANT OAK RIDGE, TENNESSEE	3-2

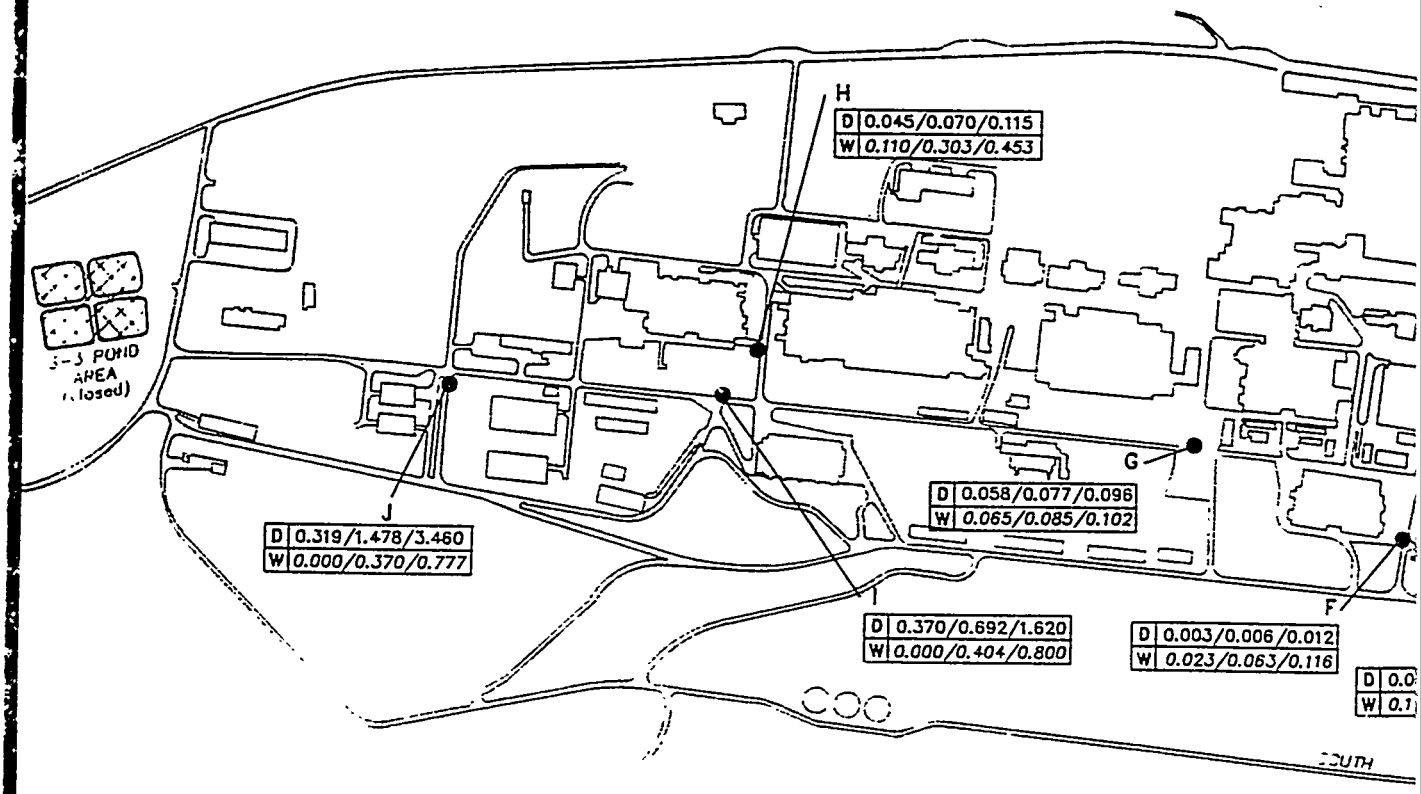


LEGEND

●	MONITORING STATION
D 0.001/0.009/0.030	MINIMUM/AVERAGE/MAXIMUM CONTAMINANT CONCENTRATIONS (mg/l) FOR DRY WEATHER EVENTS
W 0.0025/0.0058/0.0085	MINIMUM/AVERAGE/MAXIMUM CONTAMINANT CONCENTRATIONS (mg/l) FOR WET WEATHER EVENTS



MINIMUM/AVERAGE/MAXIMUM LEAD CONCENTRATIONS	FIGURE NO.
DEPARTMENT OF ENERGY Y-12 PLANT OAK RIDGE, TENNESSEE	3-3

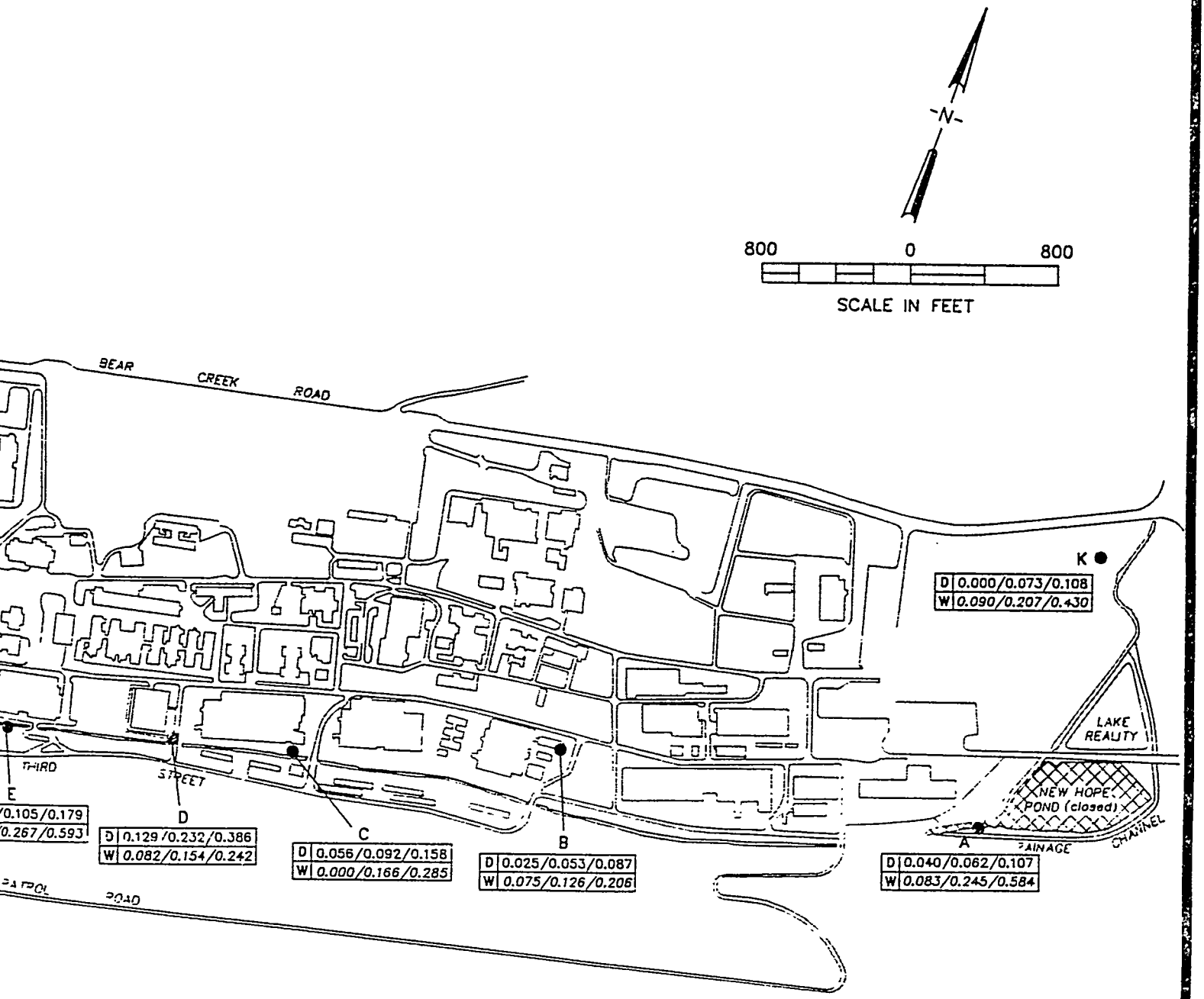


LEGEND

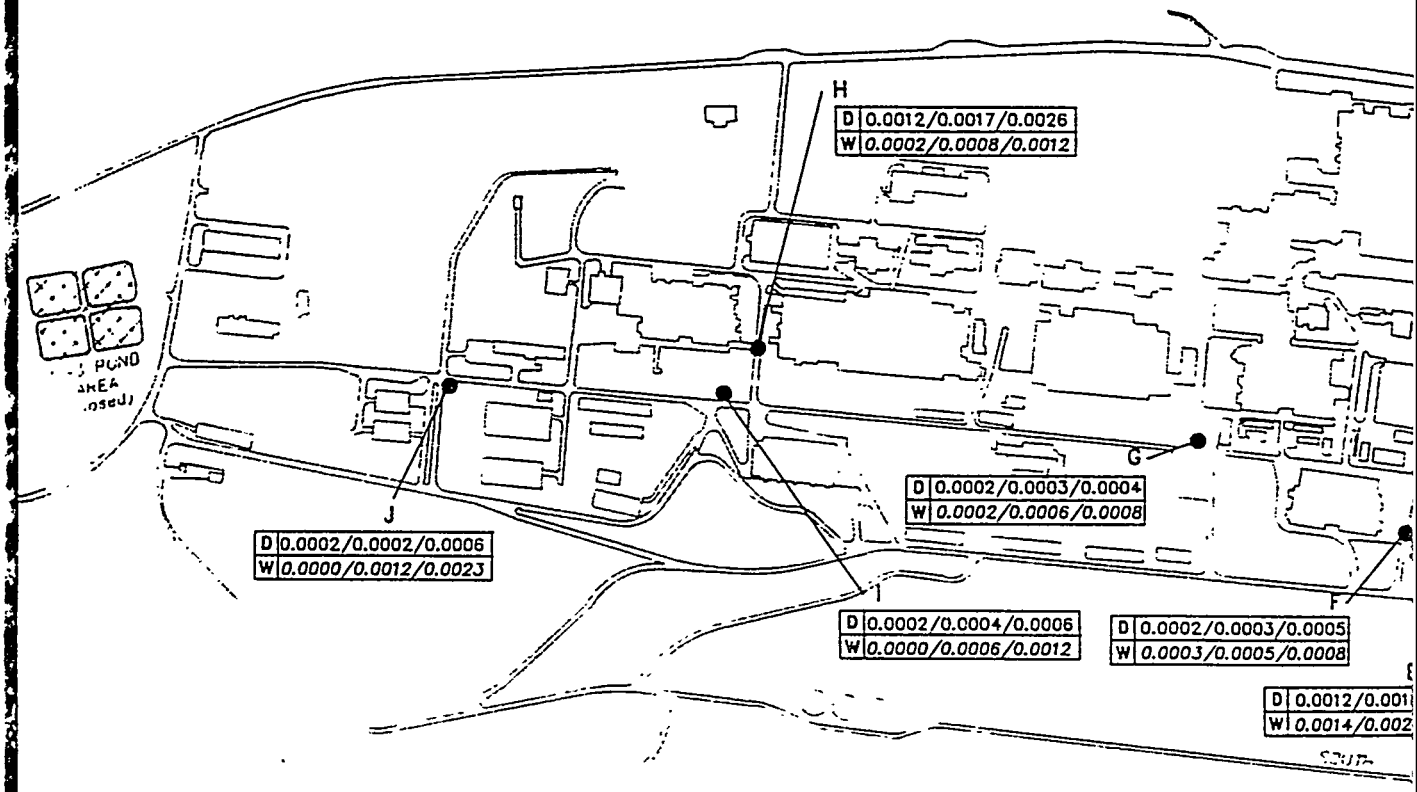
● MONITORING STATION

D 0.058/0.077/0.096 — MINIMUM/AVERAGE/MAXIMUM CONTAMINANT CONCENTRATIONS (mg/l) FOR DRY WEATHER EVENTS

W 0.065/0.085/0.102 — MINIMUM/AVERAGE/MAXIMUM CONTAMINANT CONCENTRATIONS (mg/l) FOR WET WEATHER EVENTS



MINIMUM/AVERAGE/MAXIMUM MANGANESE CONCENTRATIONS	FIGURE NO.
DEPARTMENT OF ENERGY Y-12 PLANT OAK RIDGE, TENNESSEE	3-4

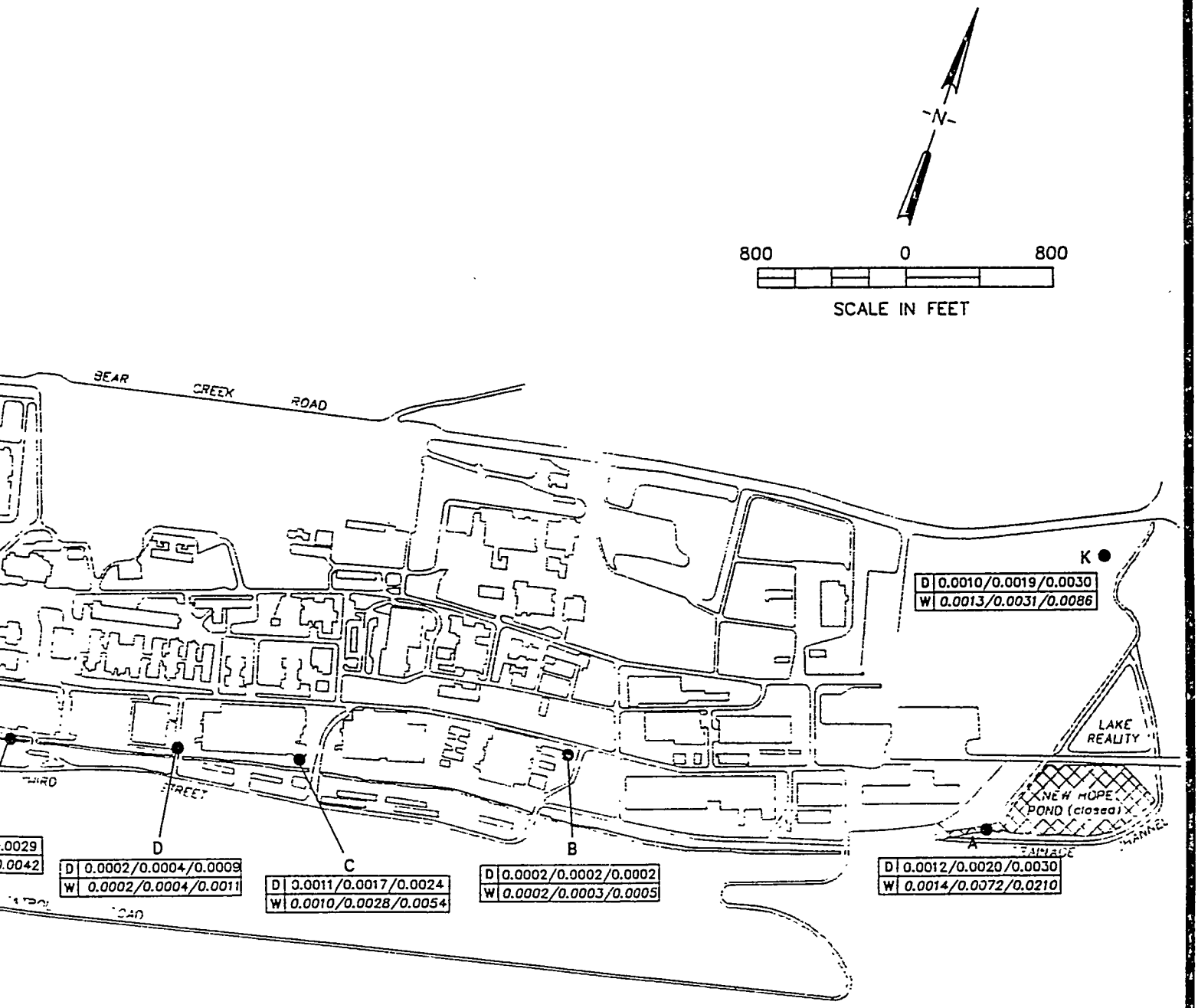


LEGEND

● MONITORING STATION

D 0.0002/0.0003/0.0004 — MINIMUM/AVERAGE/MAXIMUM CONTAMINANT CONCENTRATIONS (mg/l) FOR DRY WEATHER EVENTS

W 0.0002/0.0006/0.0008 — MINIMUM/AVERAGE/MAXIMUM CONTAMINANT CONCENTRATIONS (mg/l) FOR WET WEATHER EVENTS



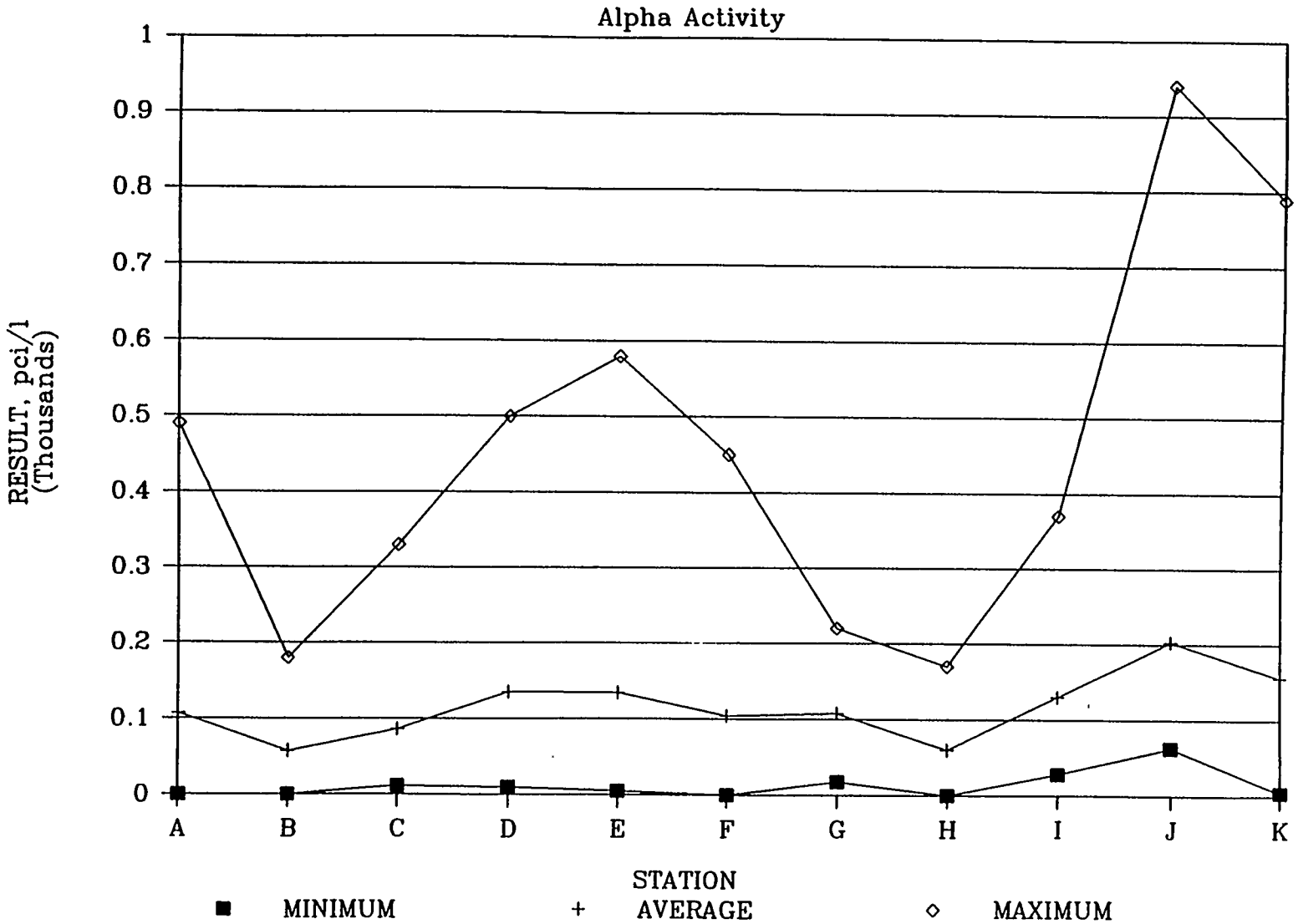
MINIMUM/AVERAGE/MAXIMUM MERCURY CONCENTRATIONS	FIGURE NO.
DEPARTMENT OF ENERGY Y-12 PLANT OAK RIDGE, TENNESSEE	3-5

APPENDIX A

STATISTICAL PLOTS OF WATER QUALITY PARAMETERS

DRY EVENTS

DRY WEATHER WATER QUALITY DATA



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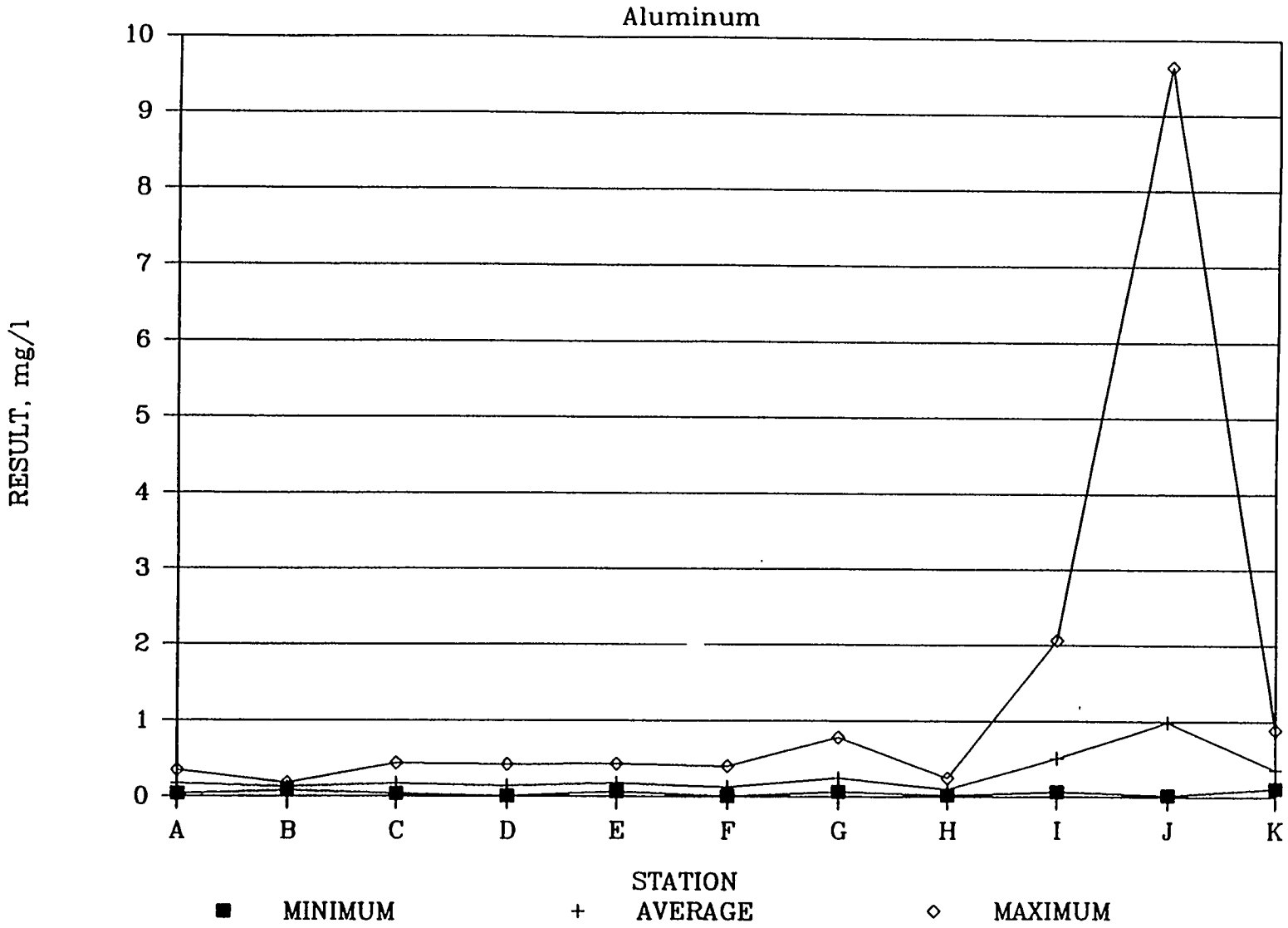

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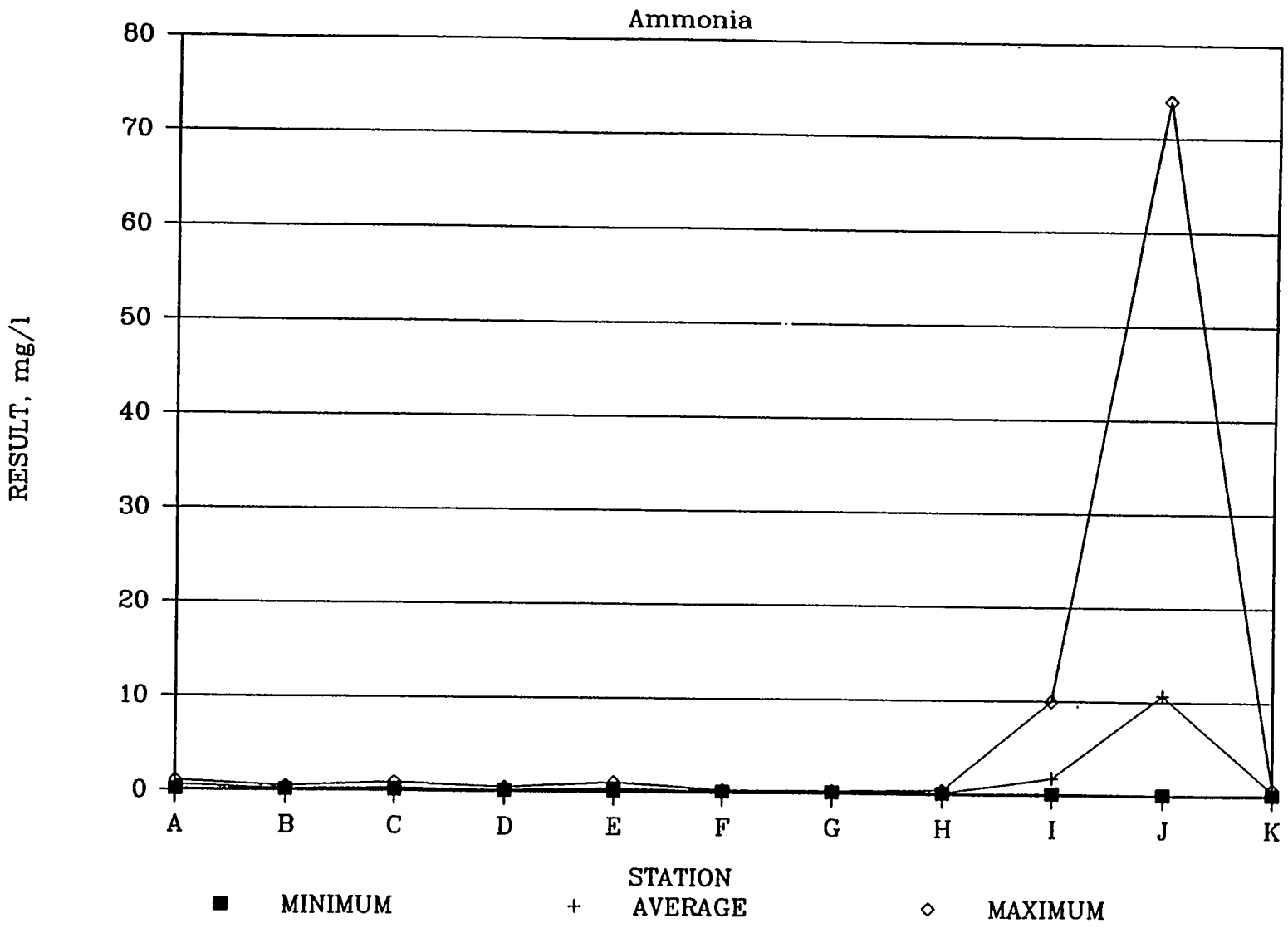

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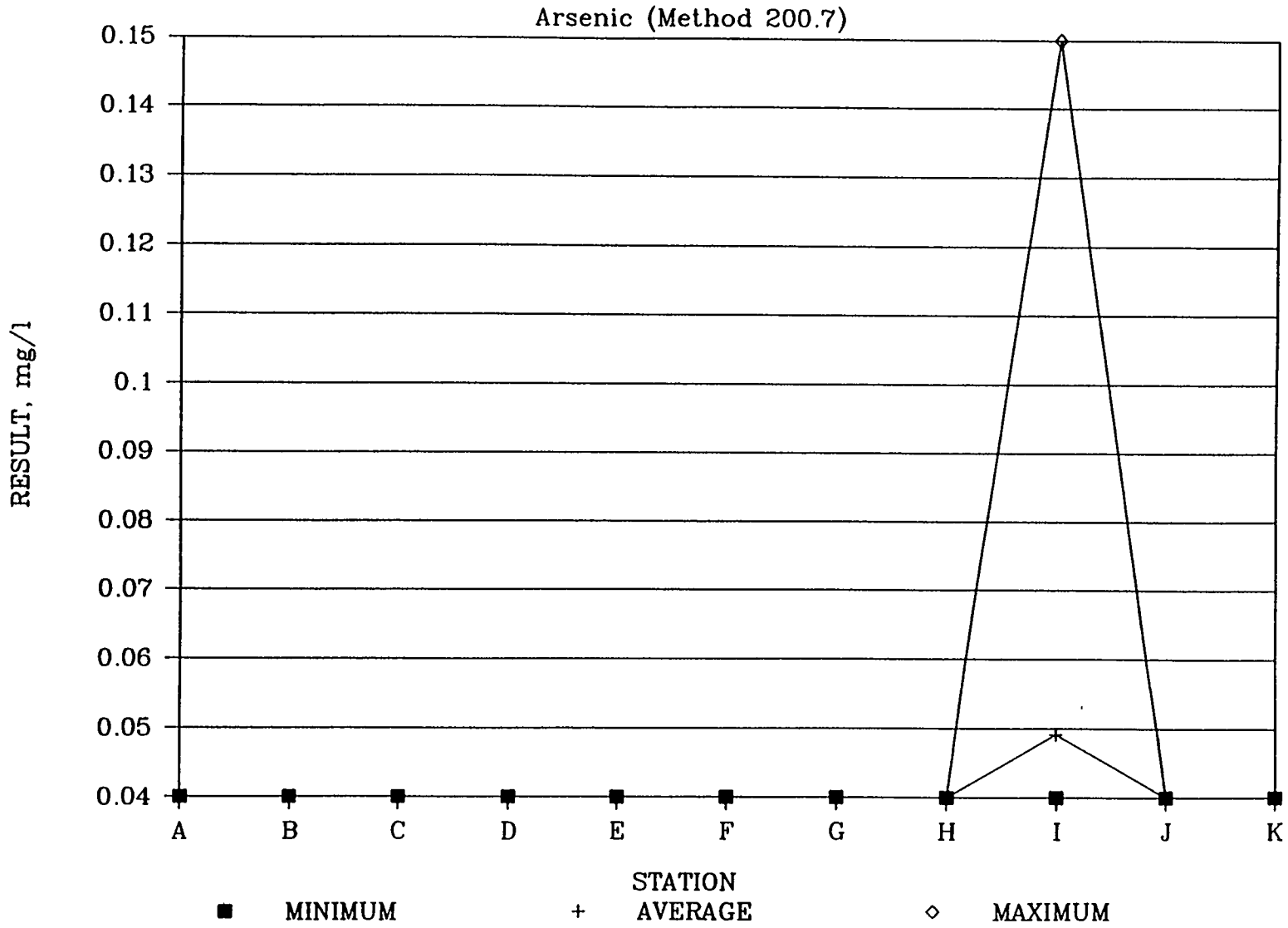

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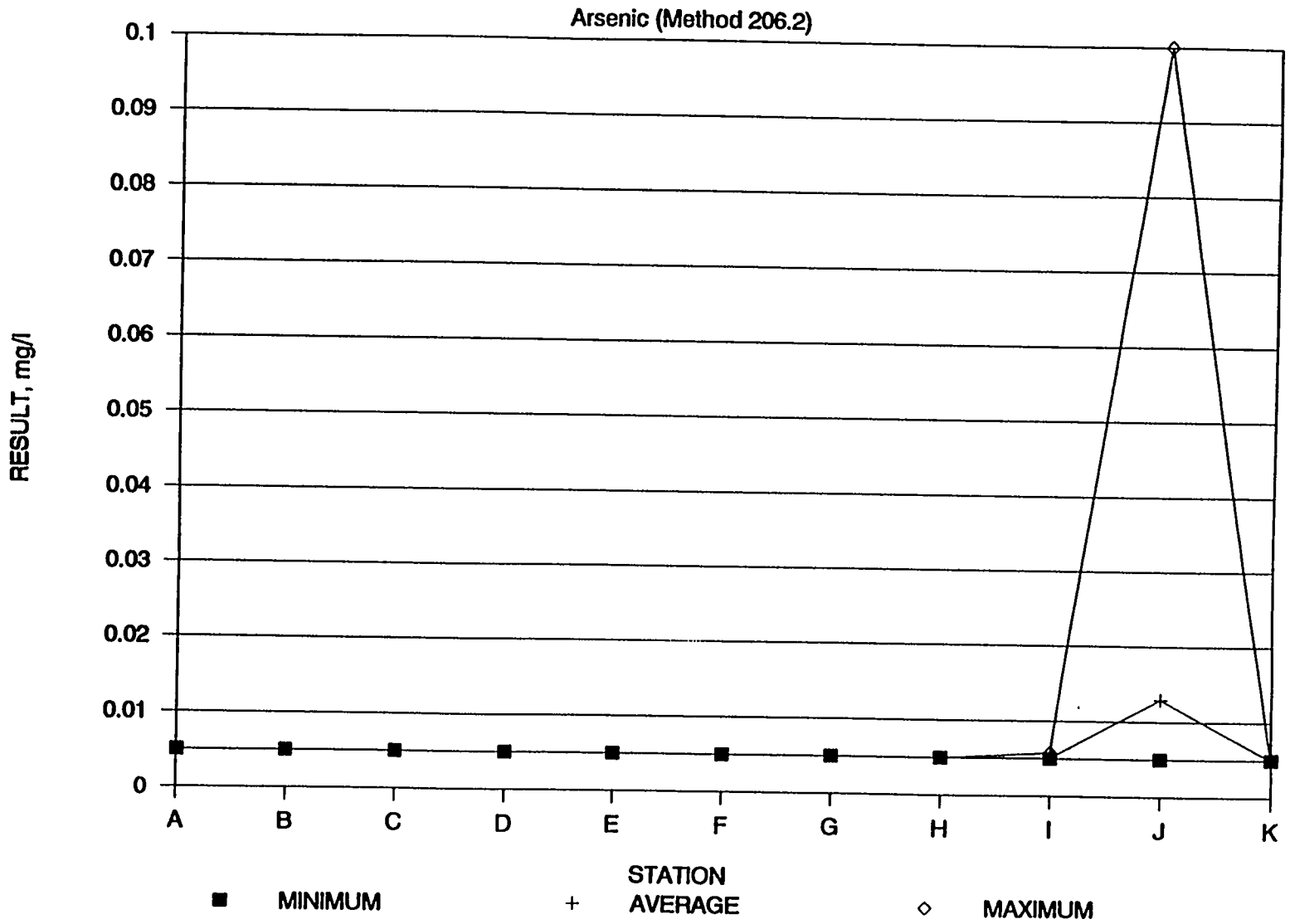

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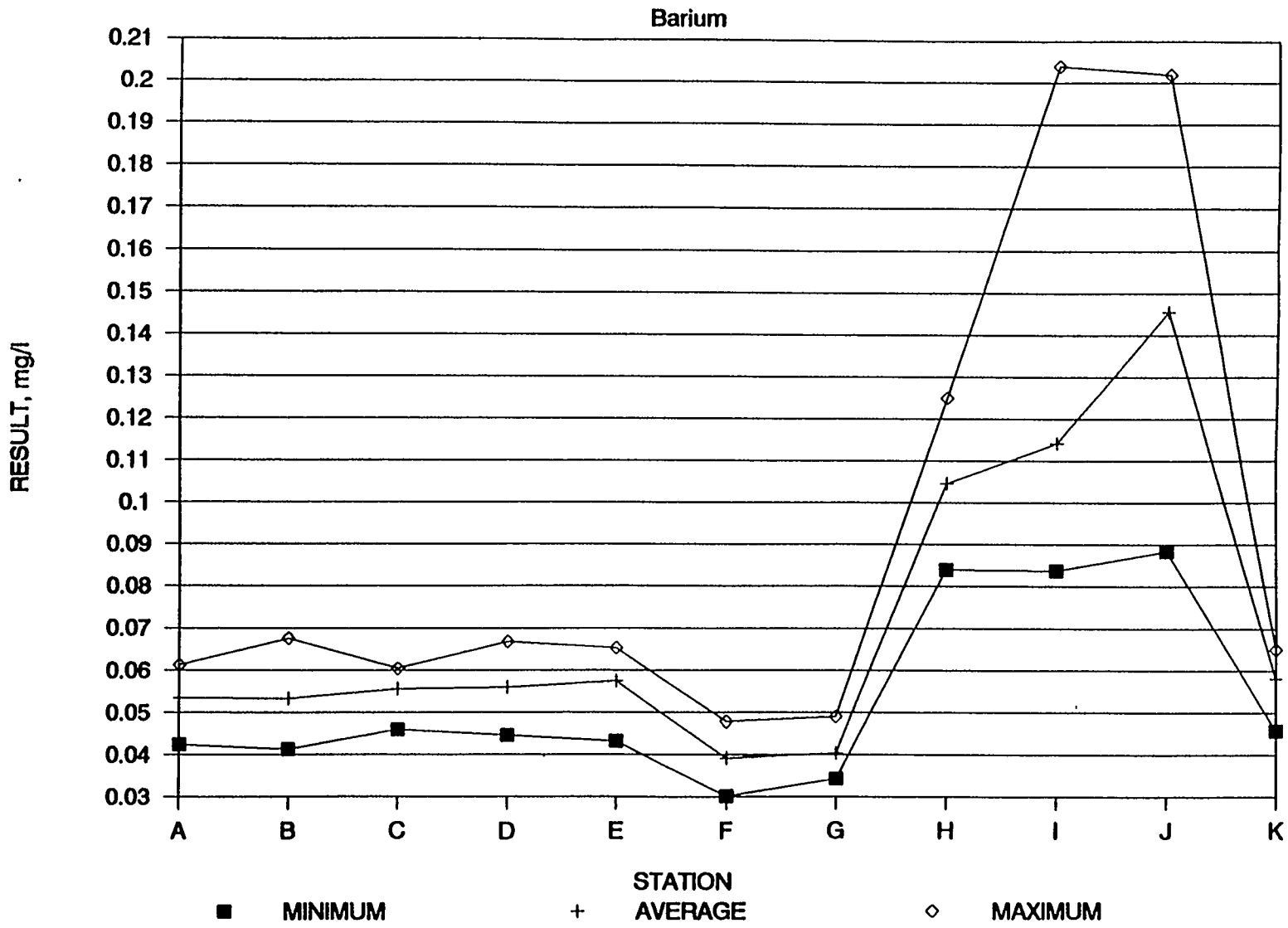

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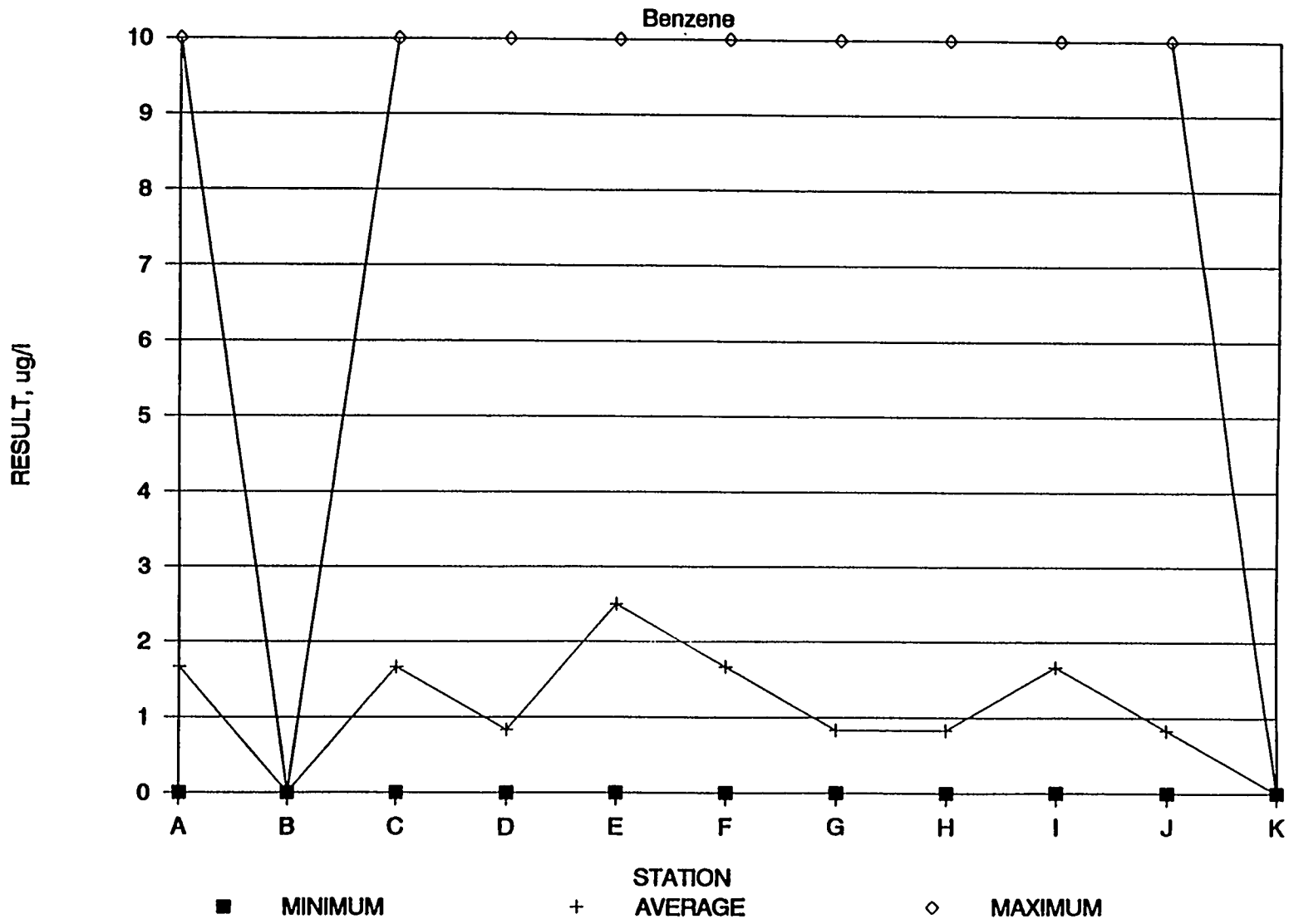

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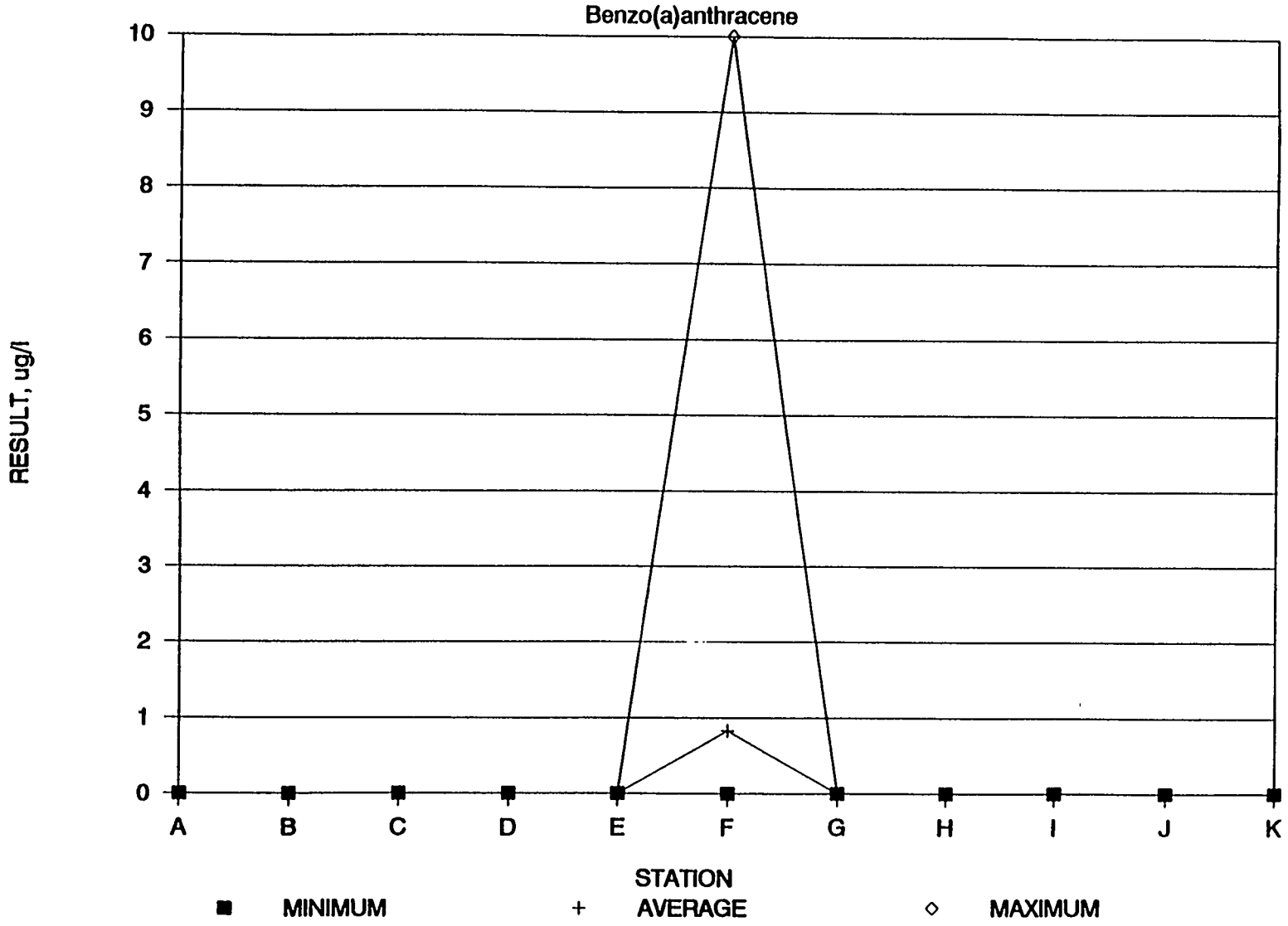

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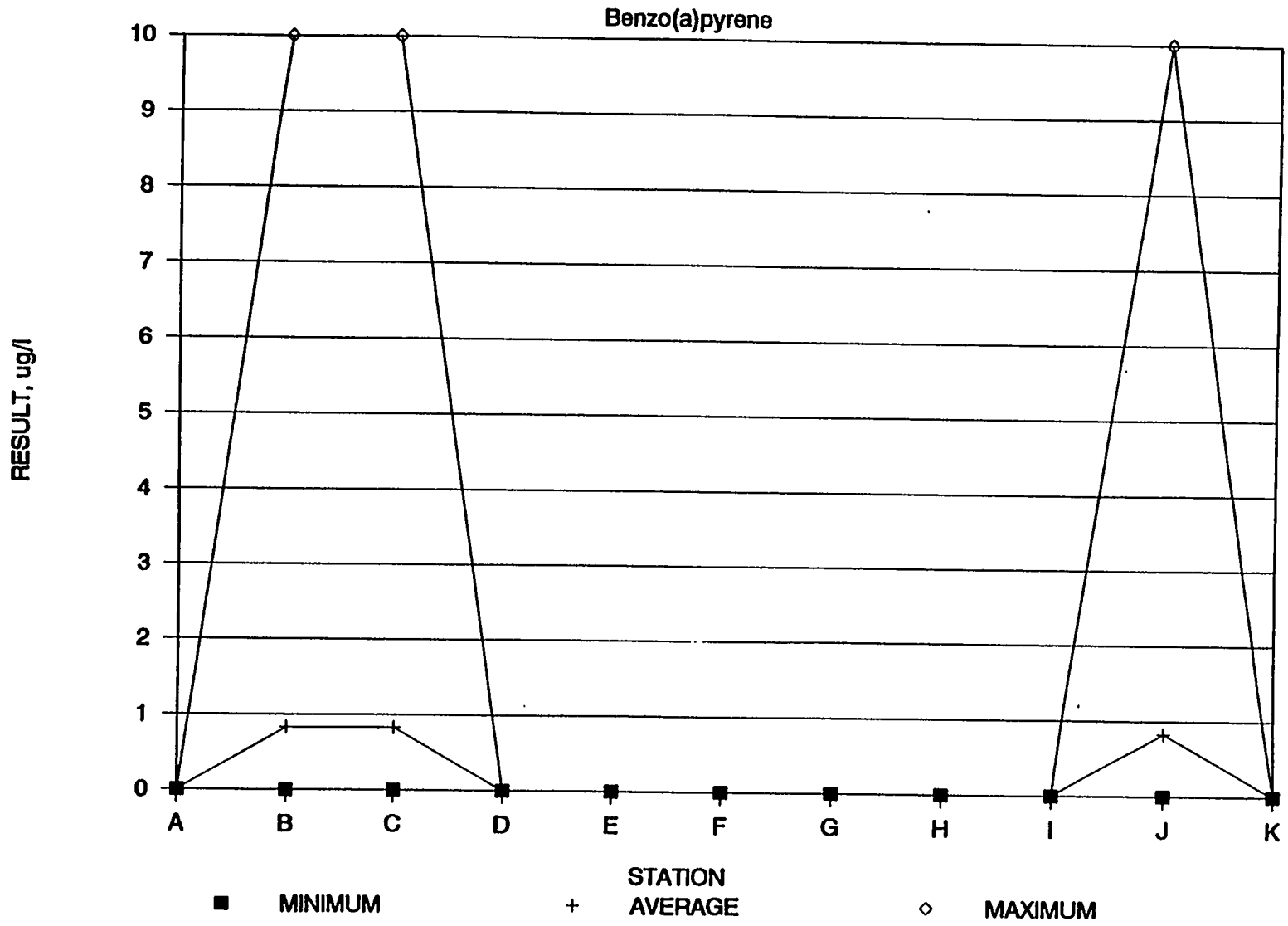

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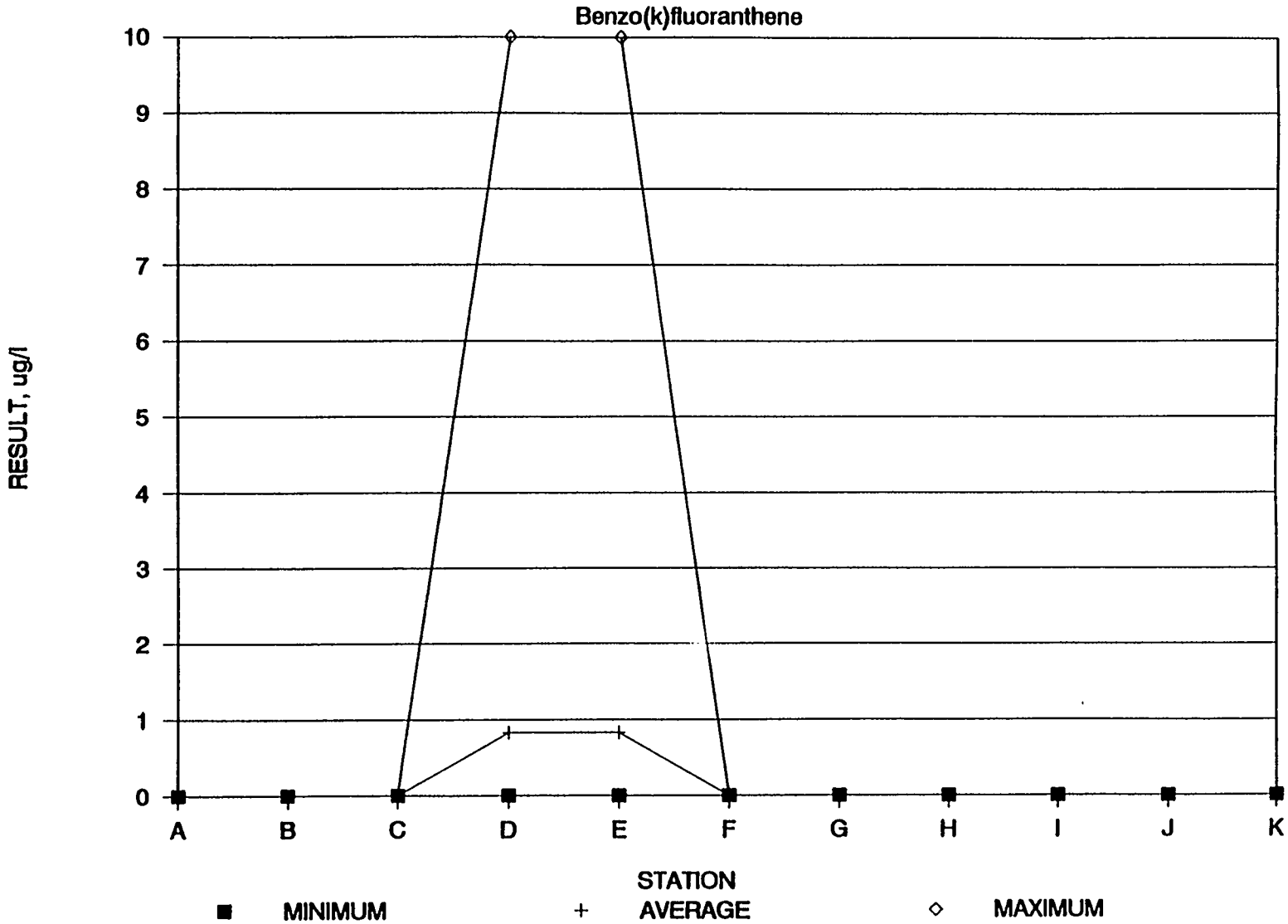

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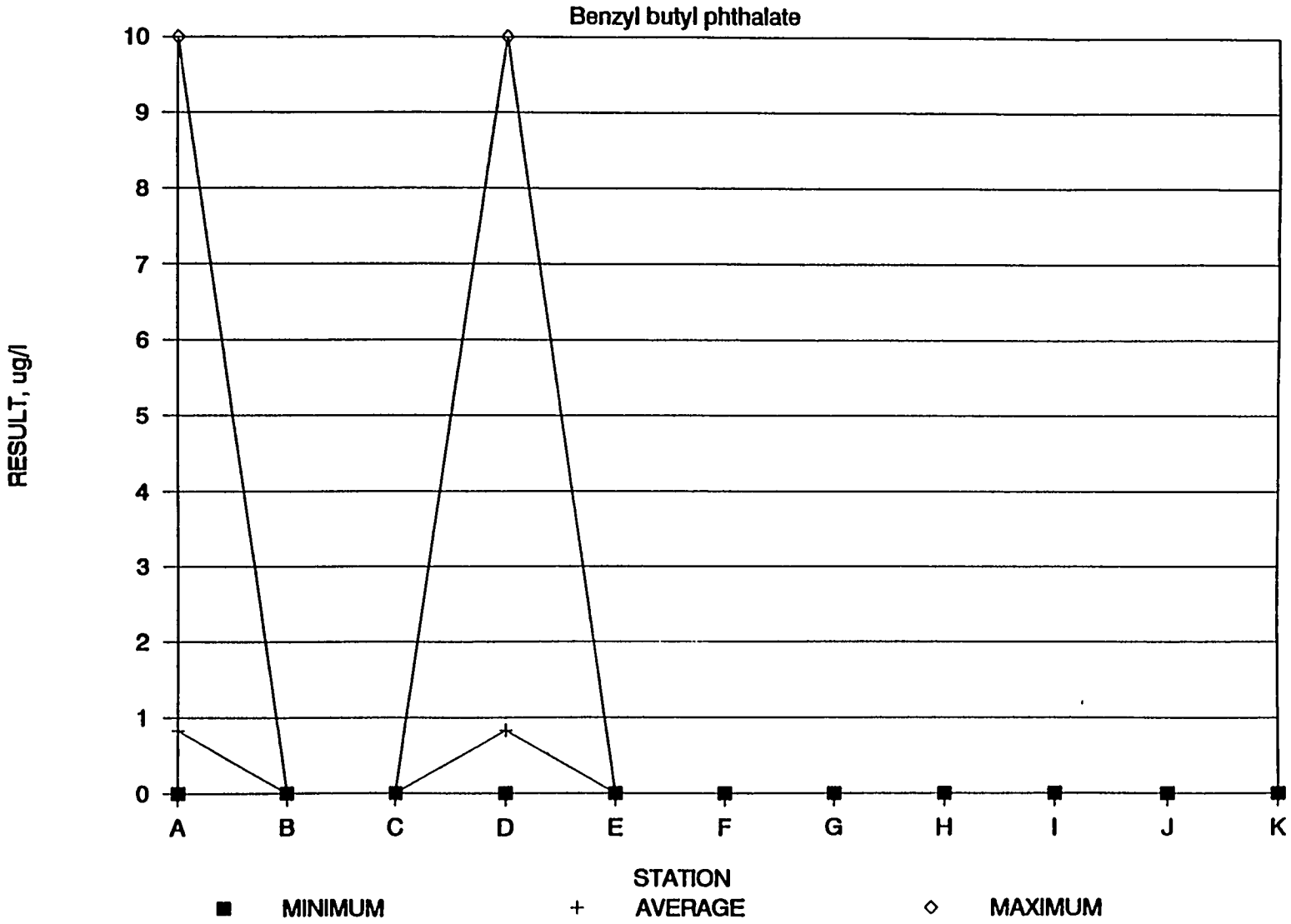

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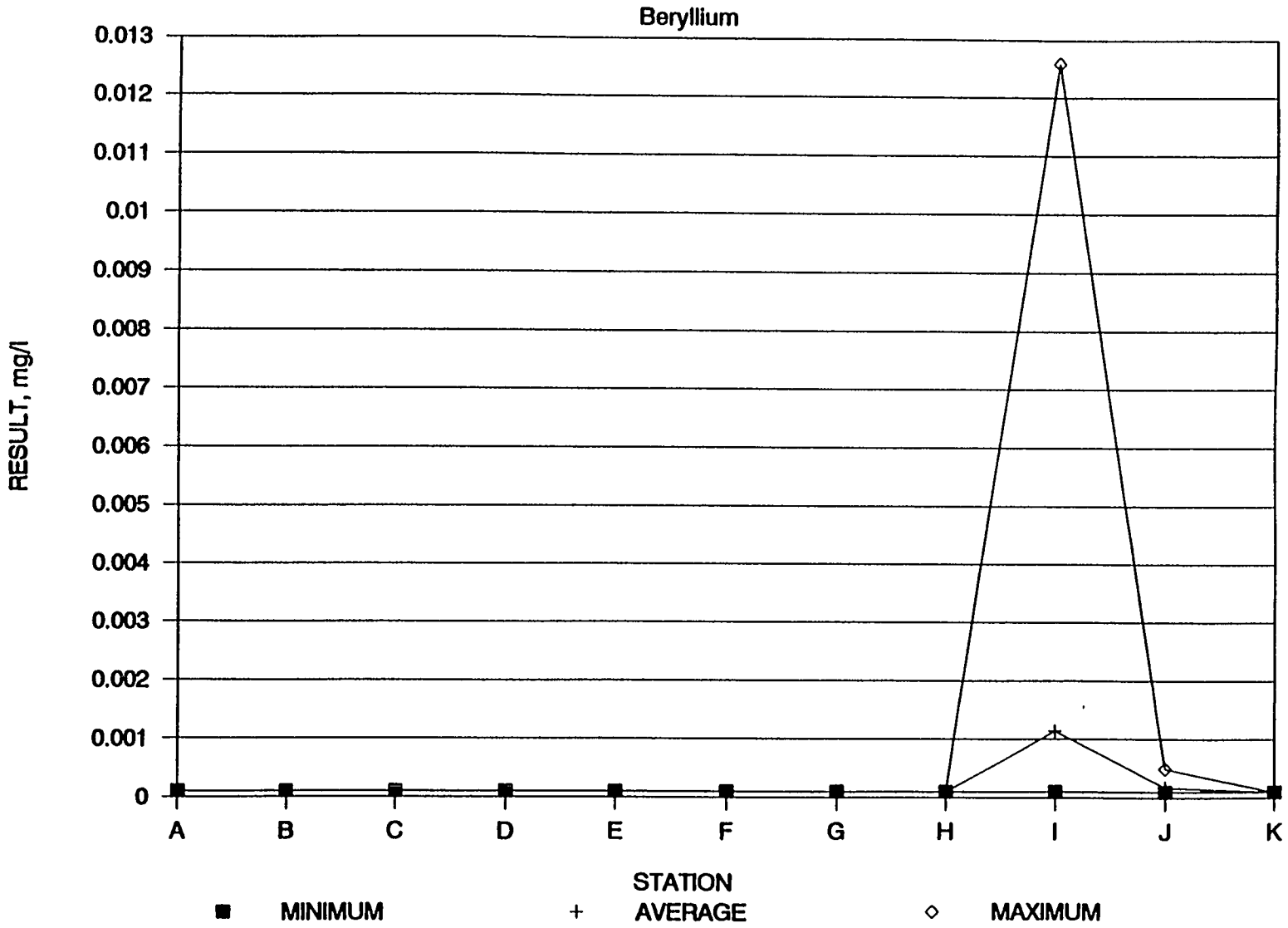

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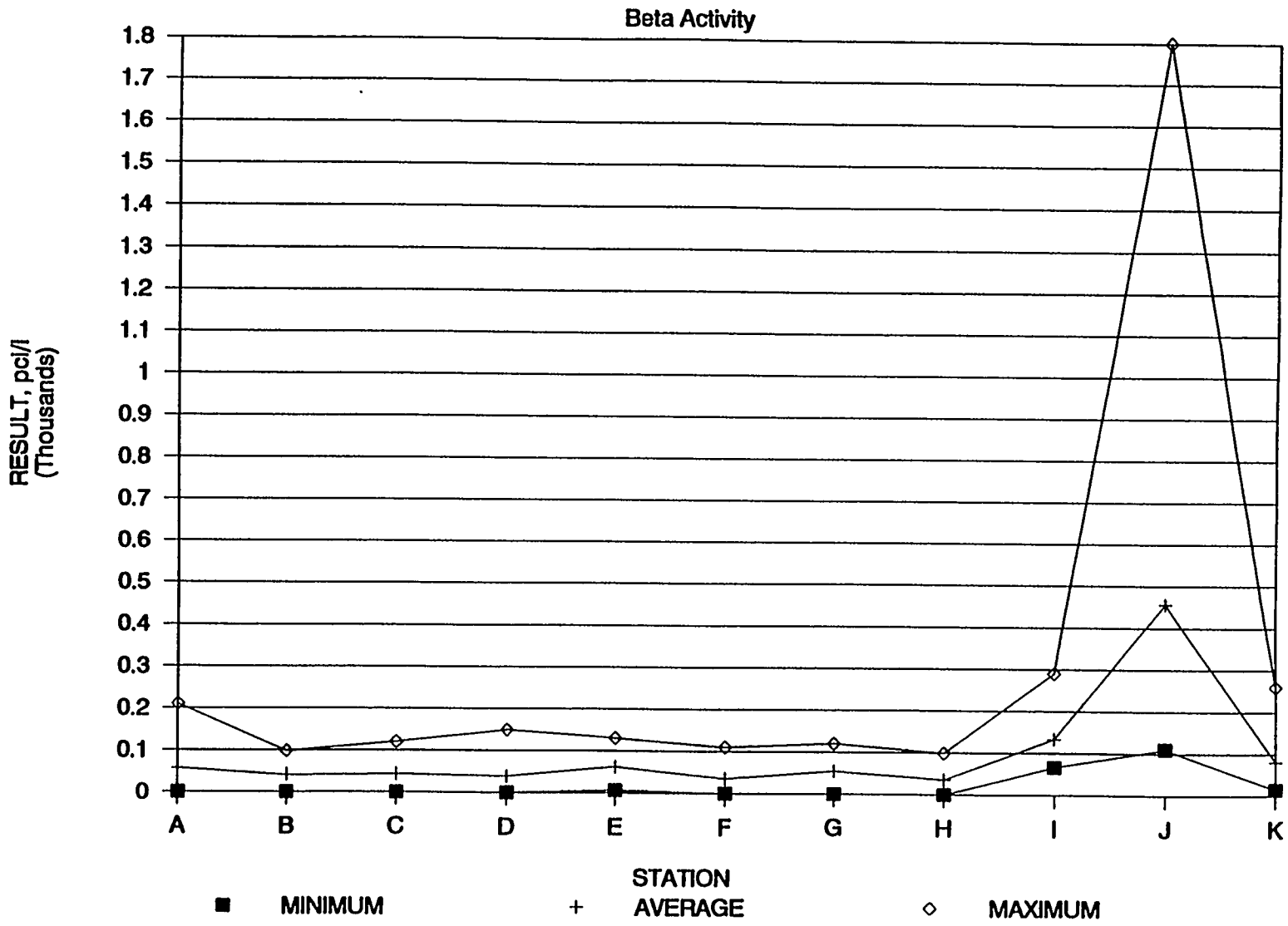

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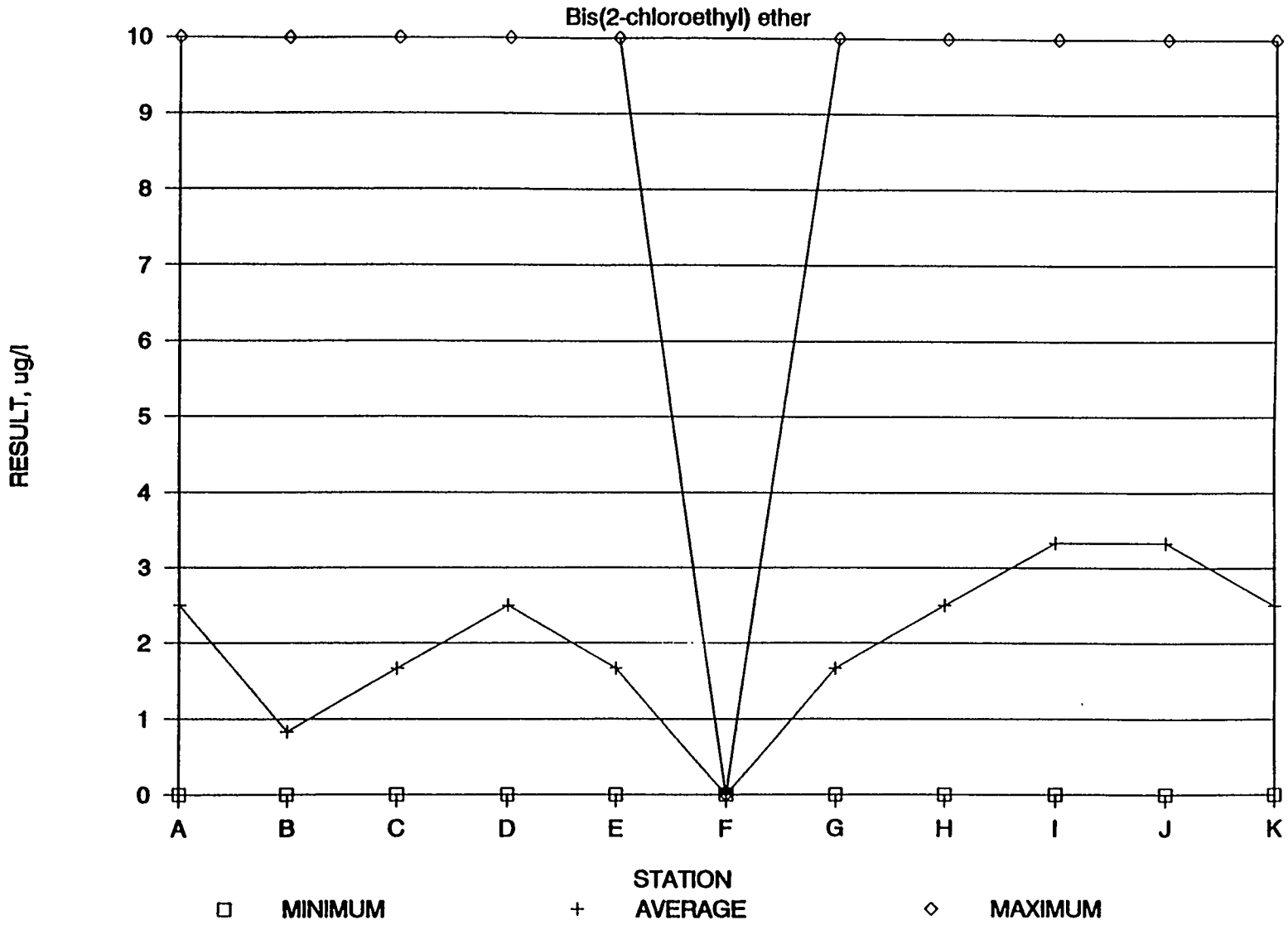

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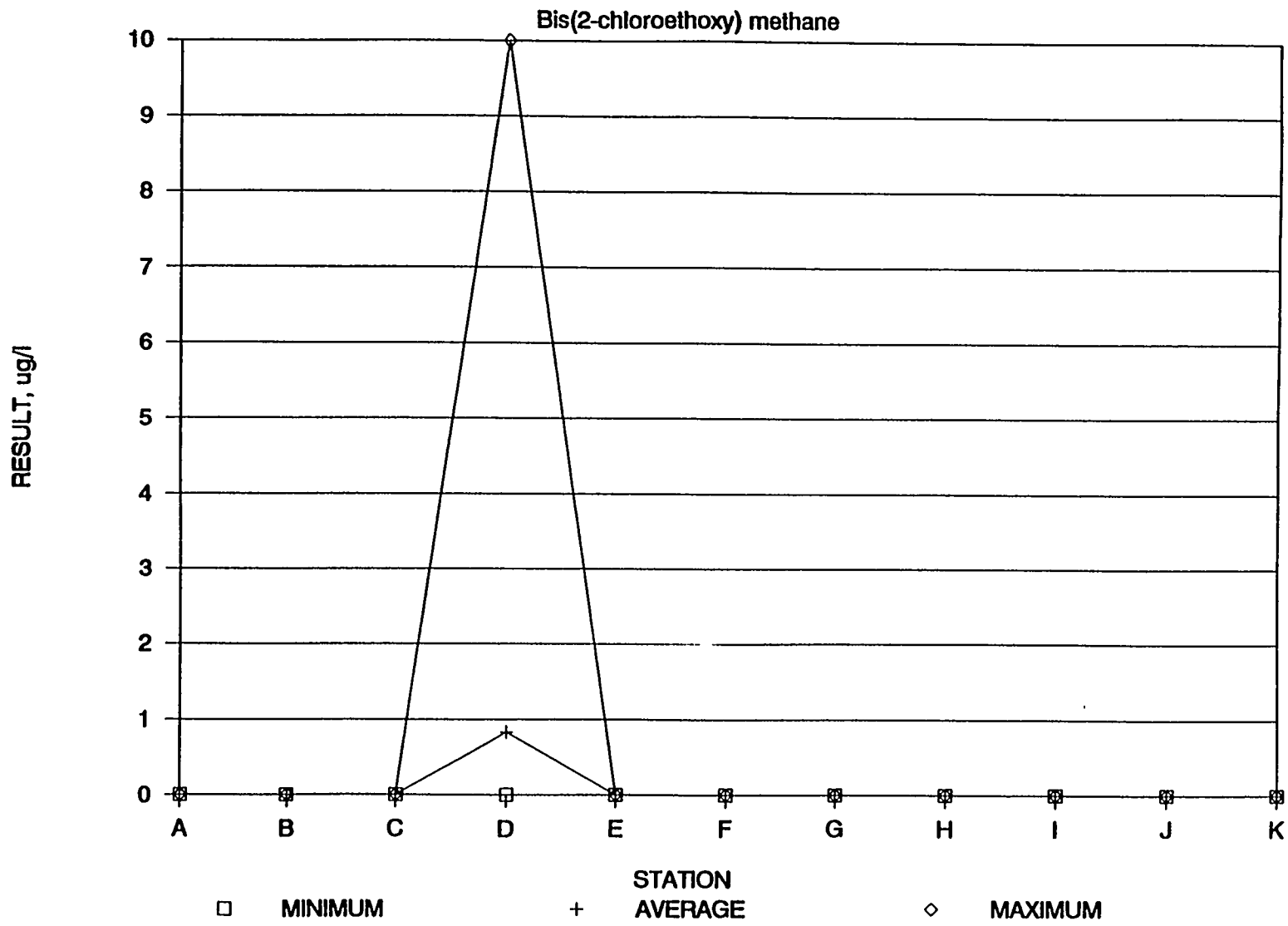

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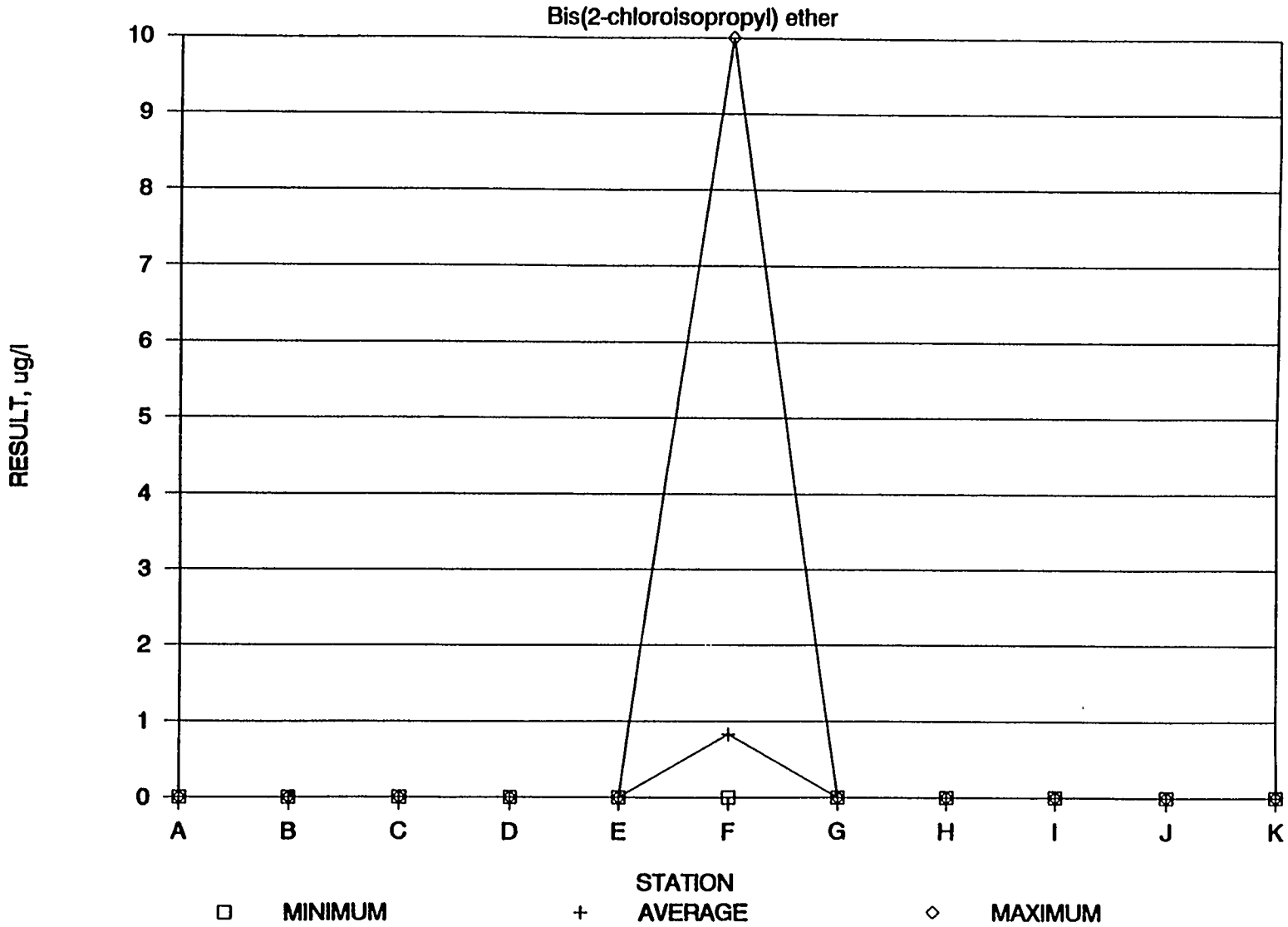

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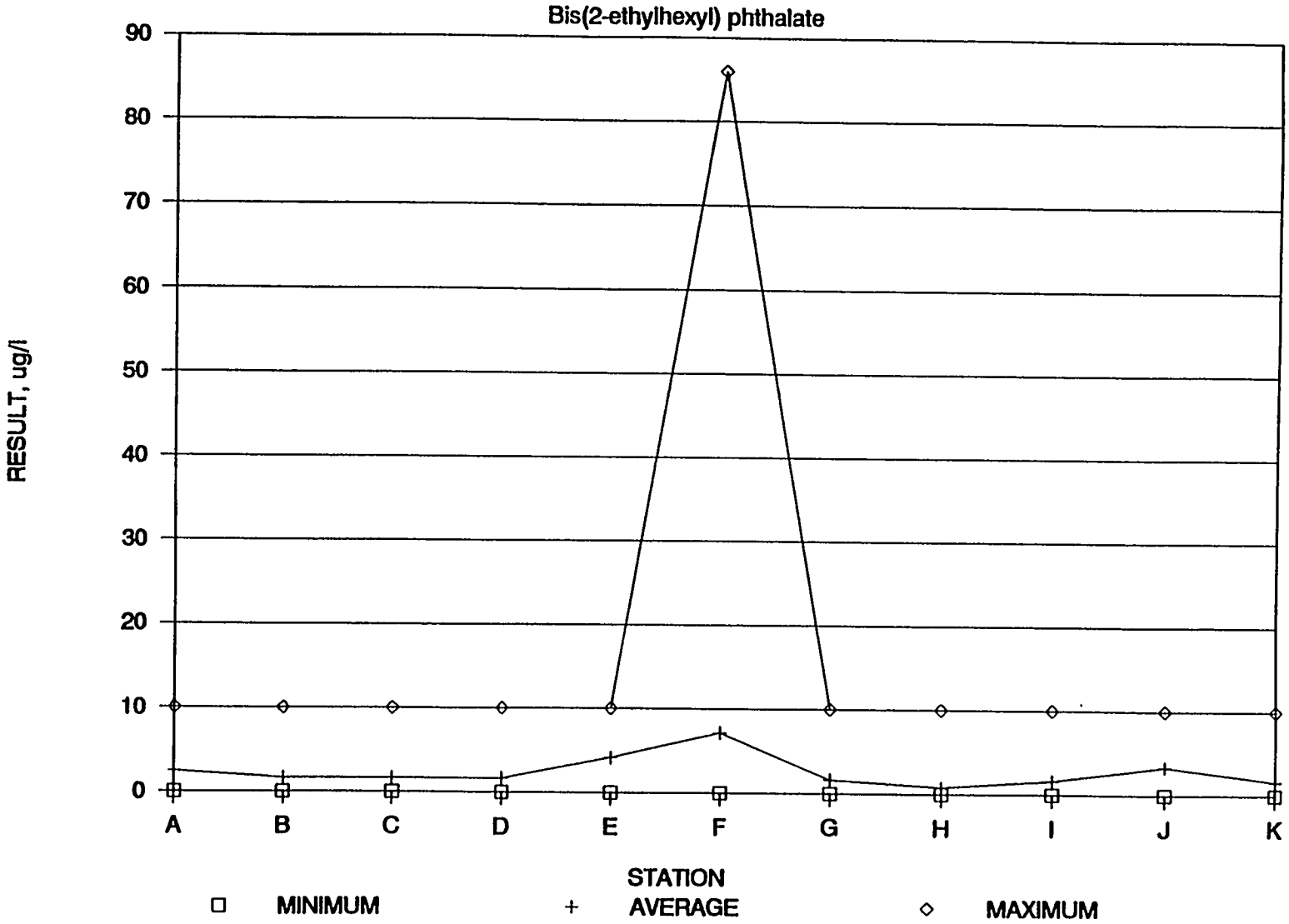

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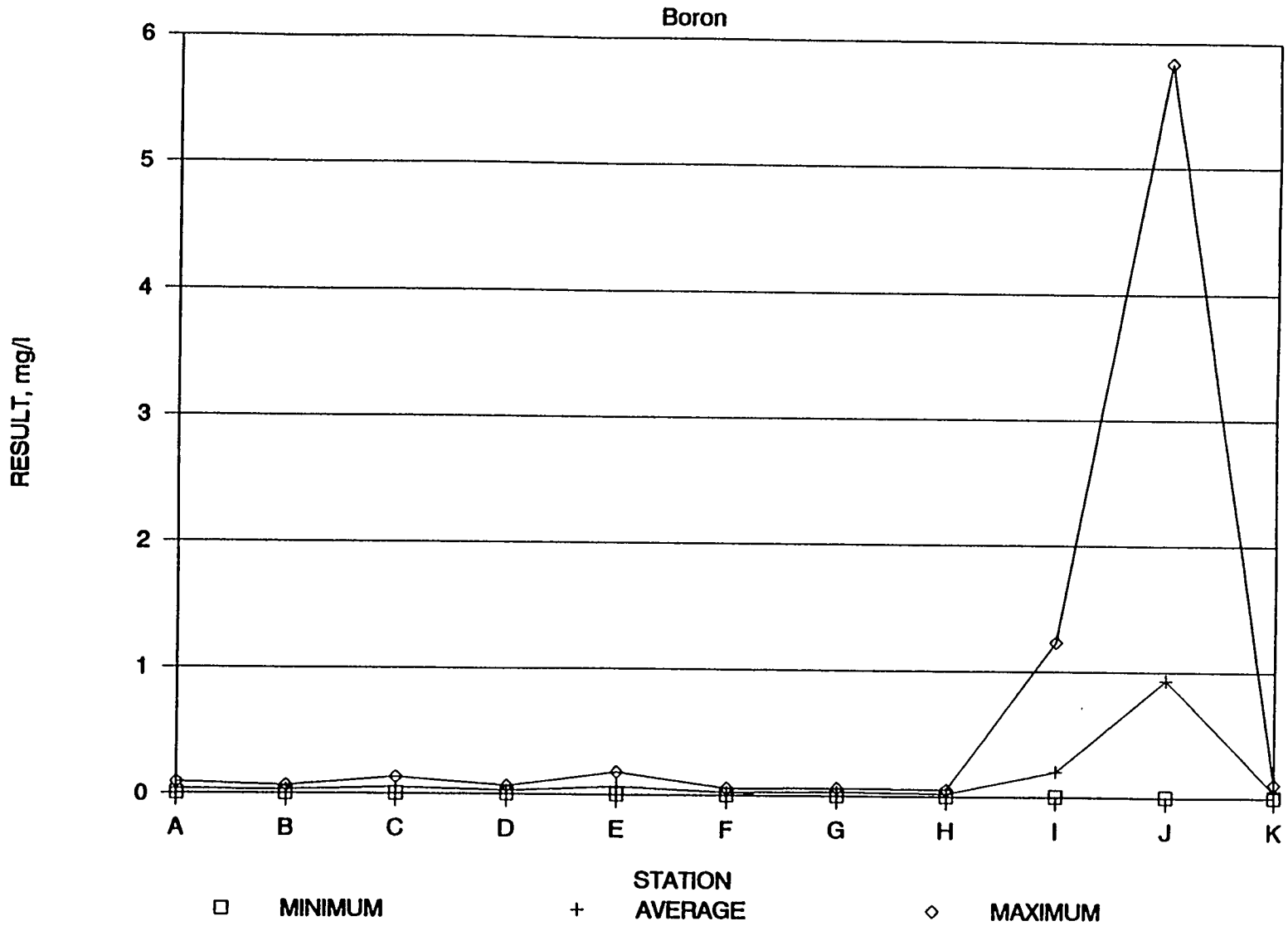

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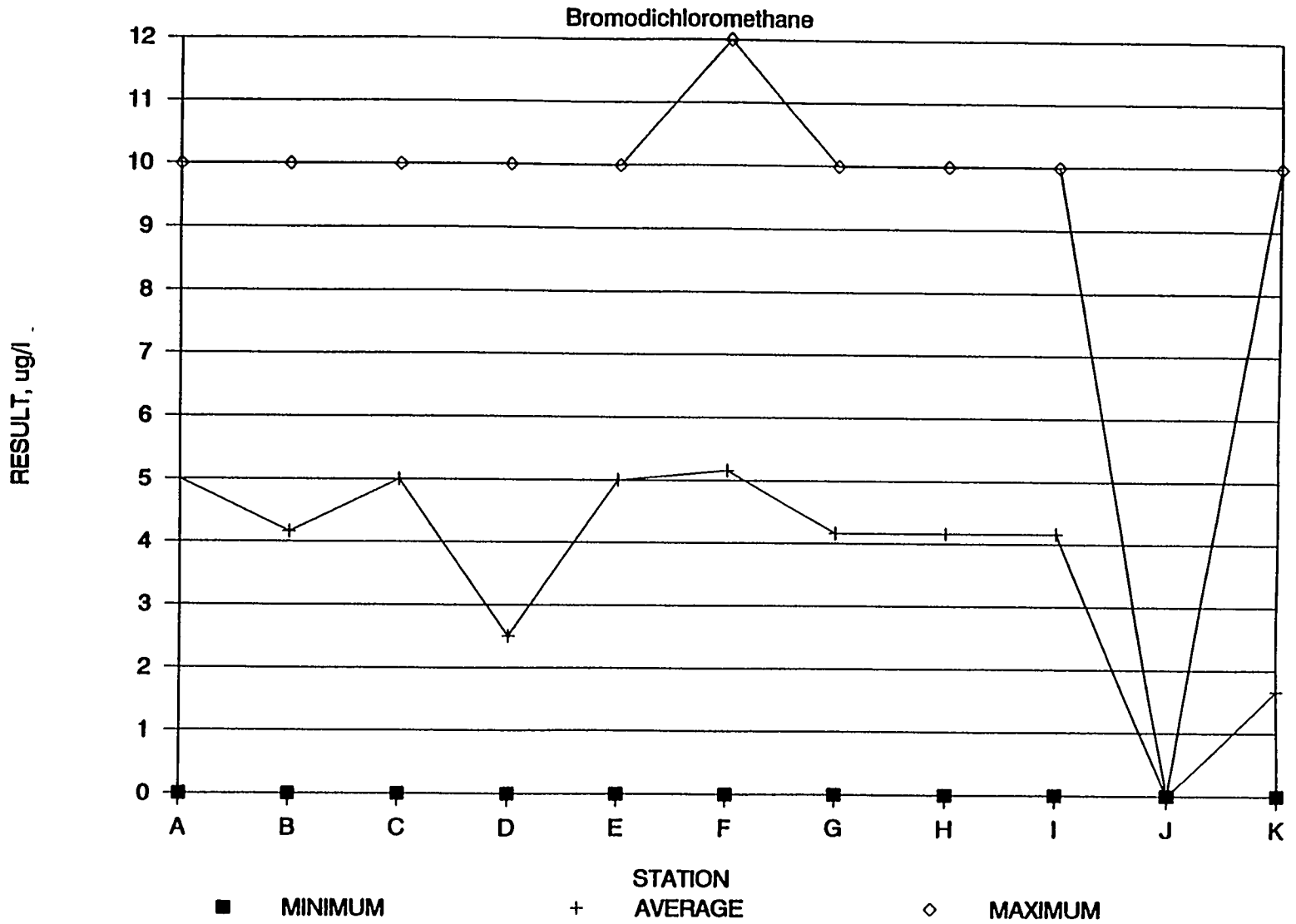

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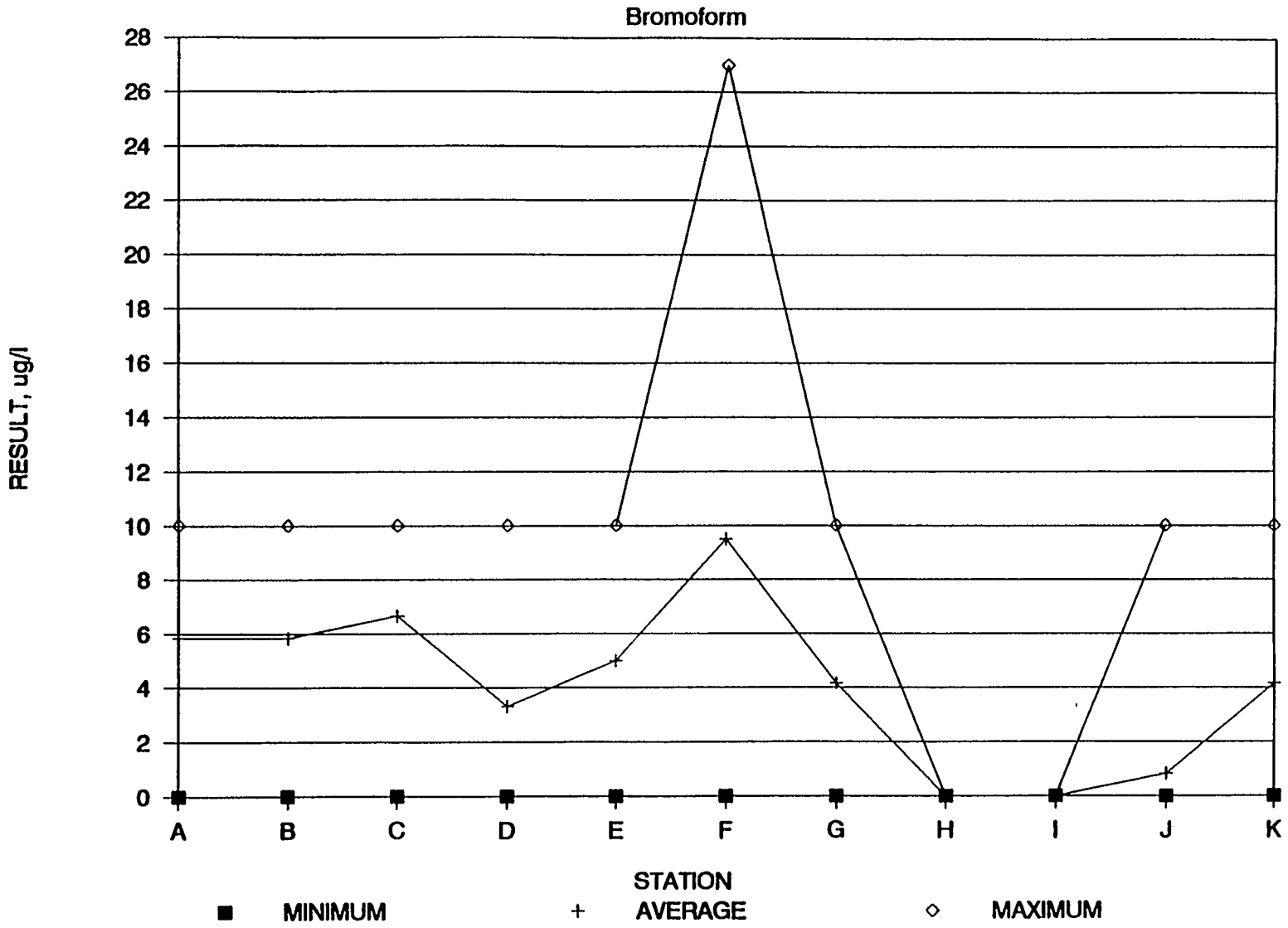

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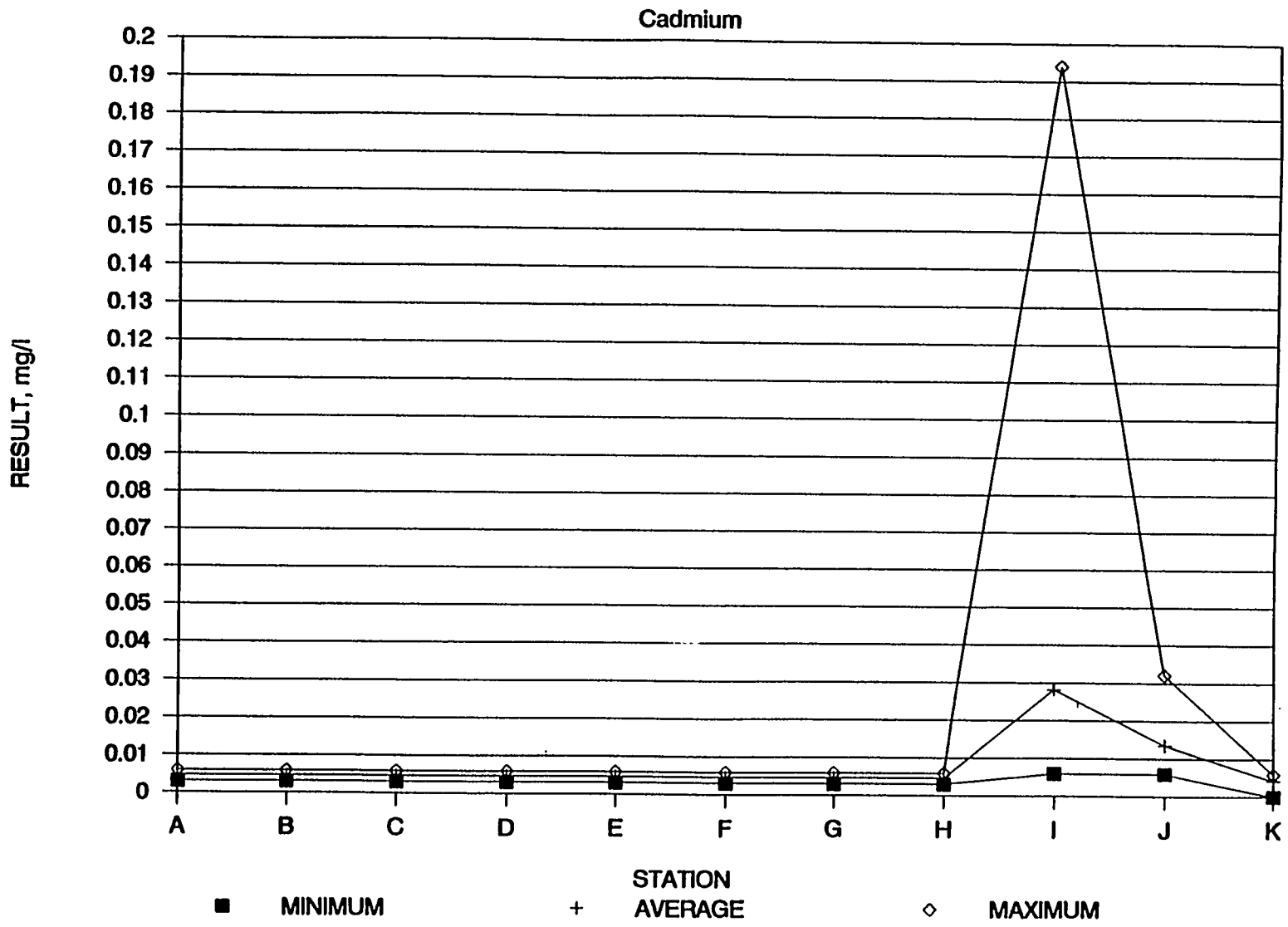

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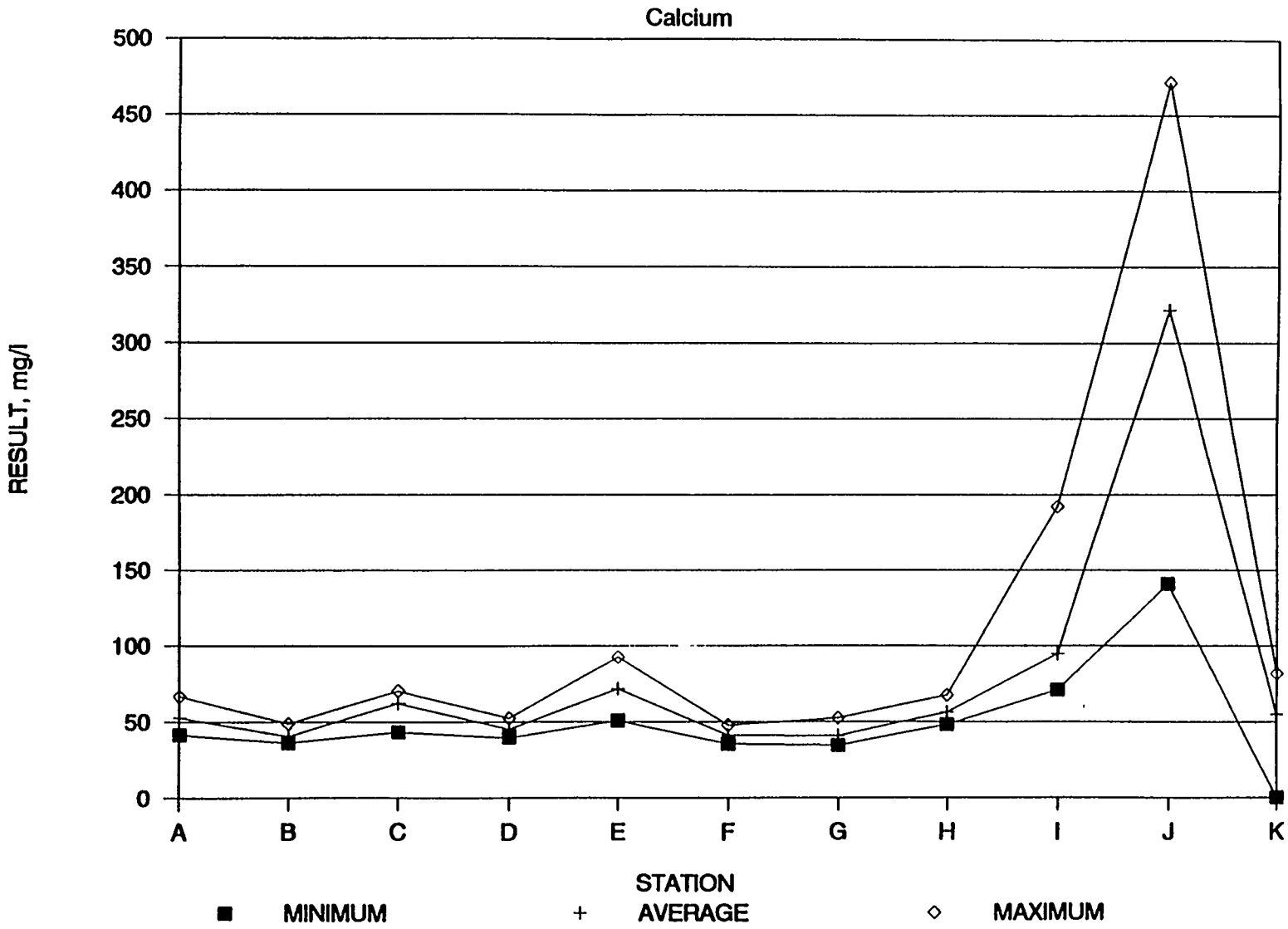

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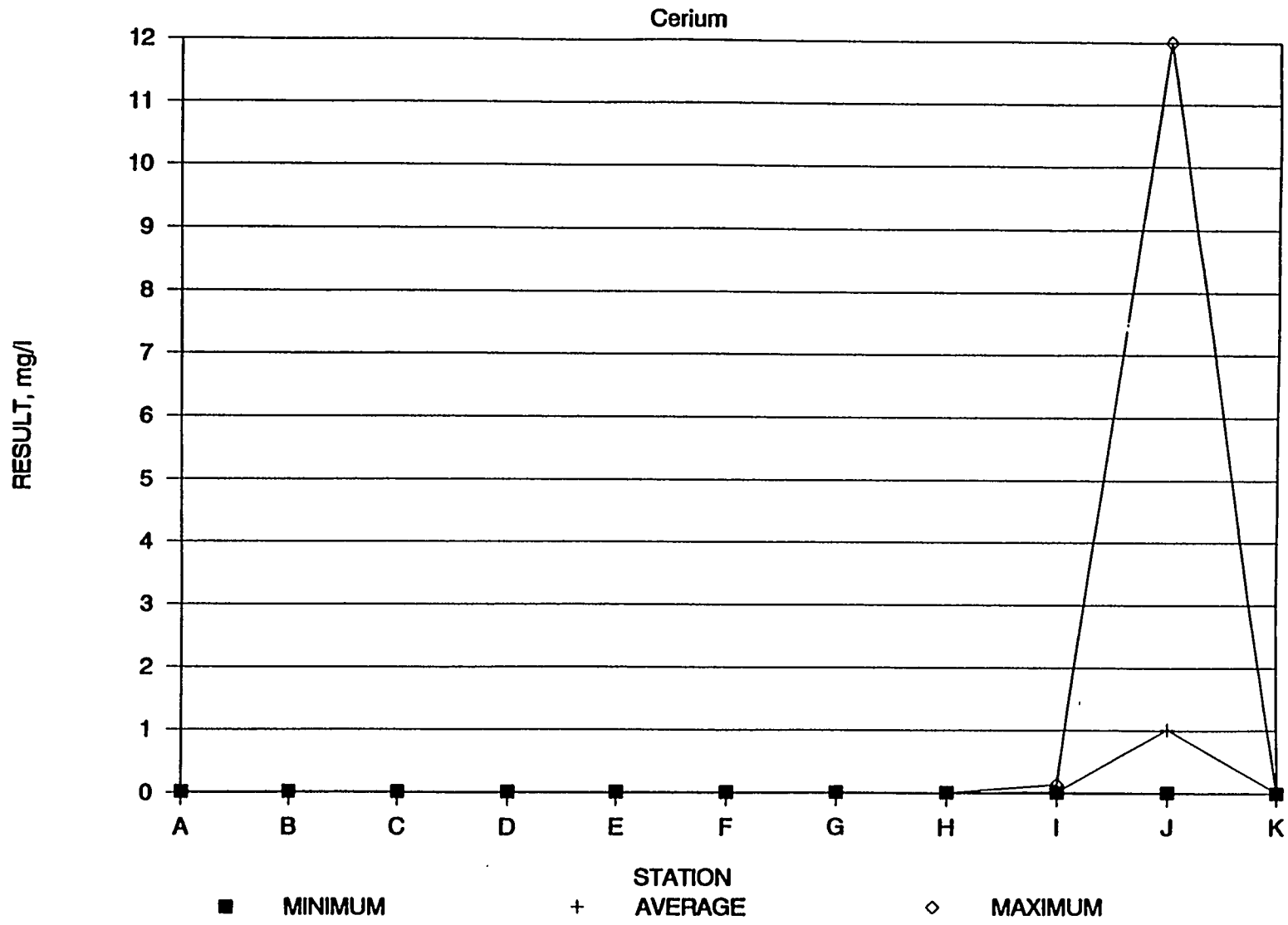

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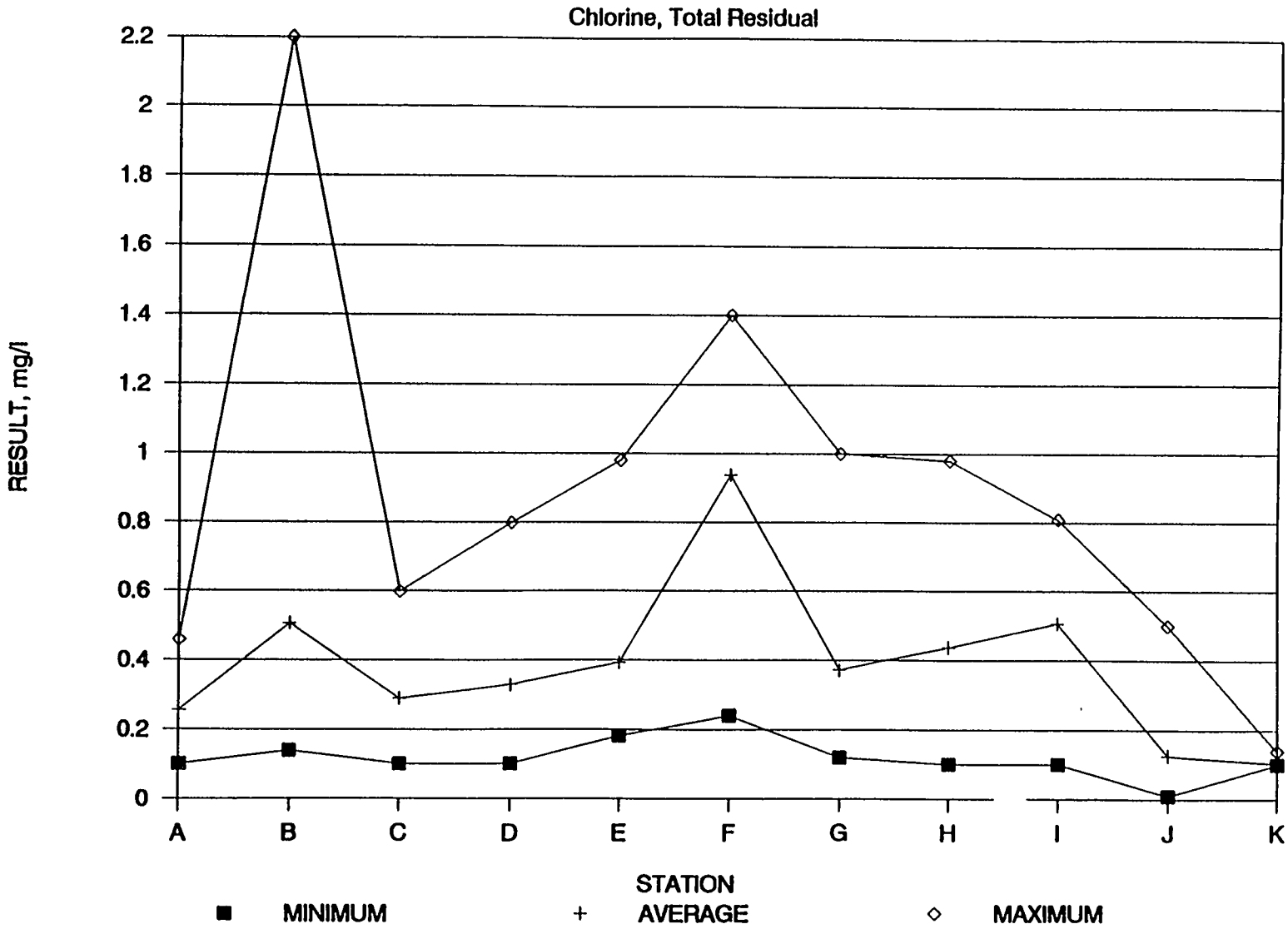

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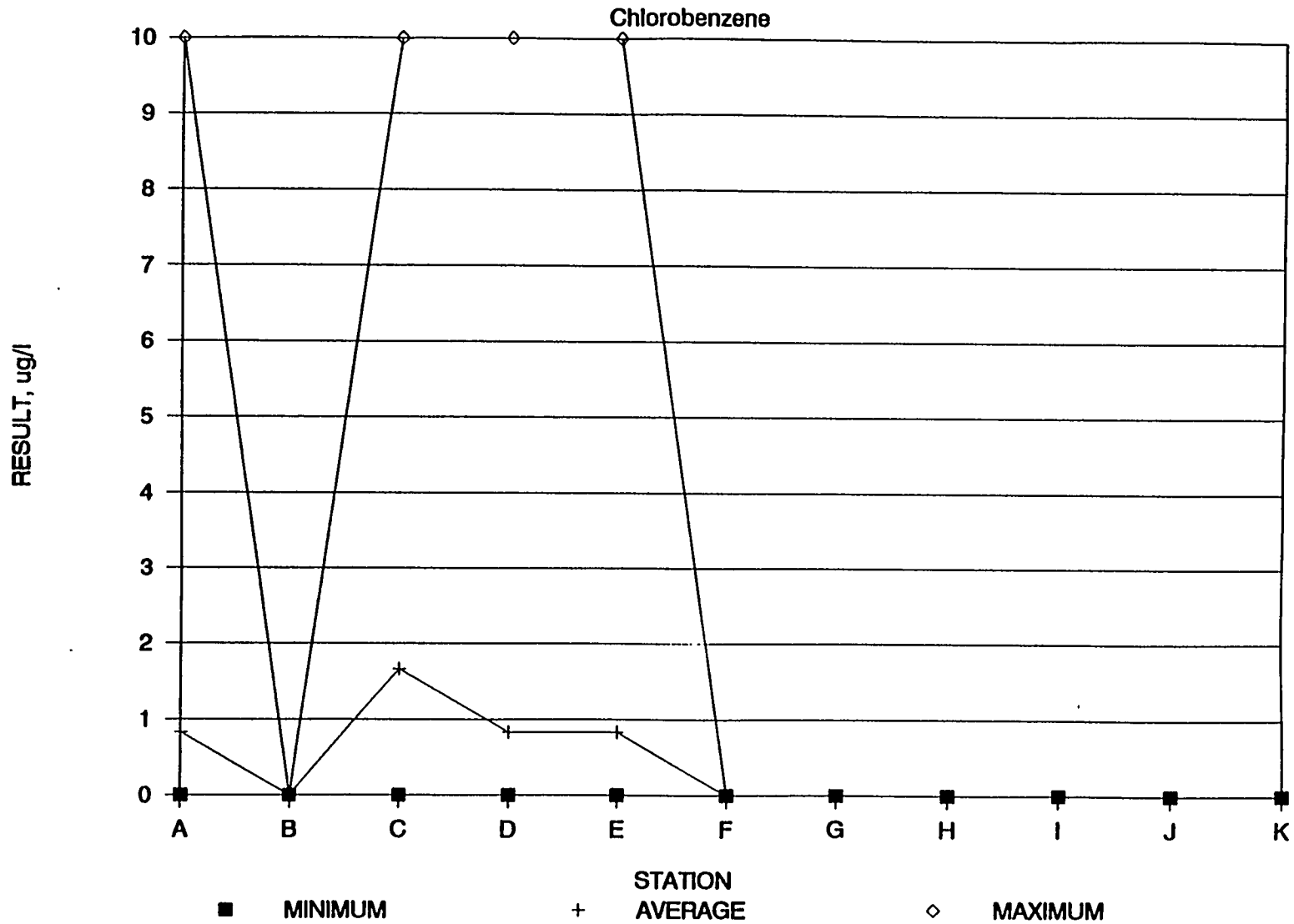

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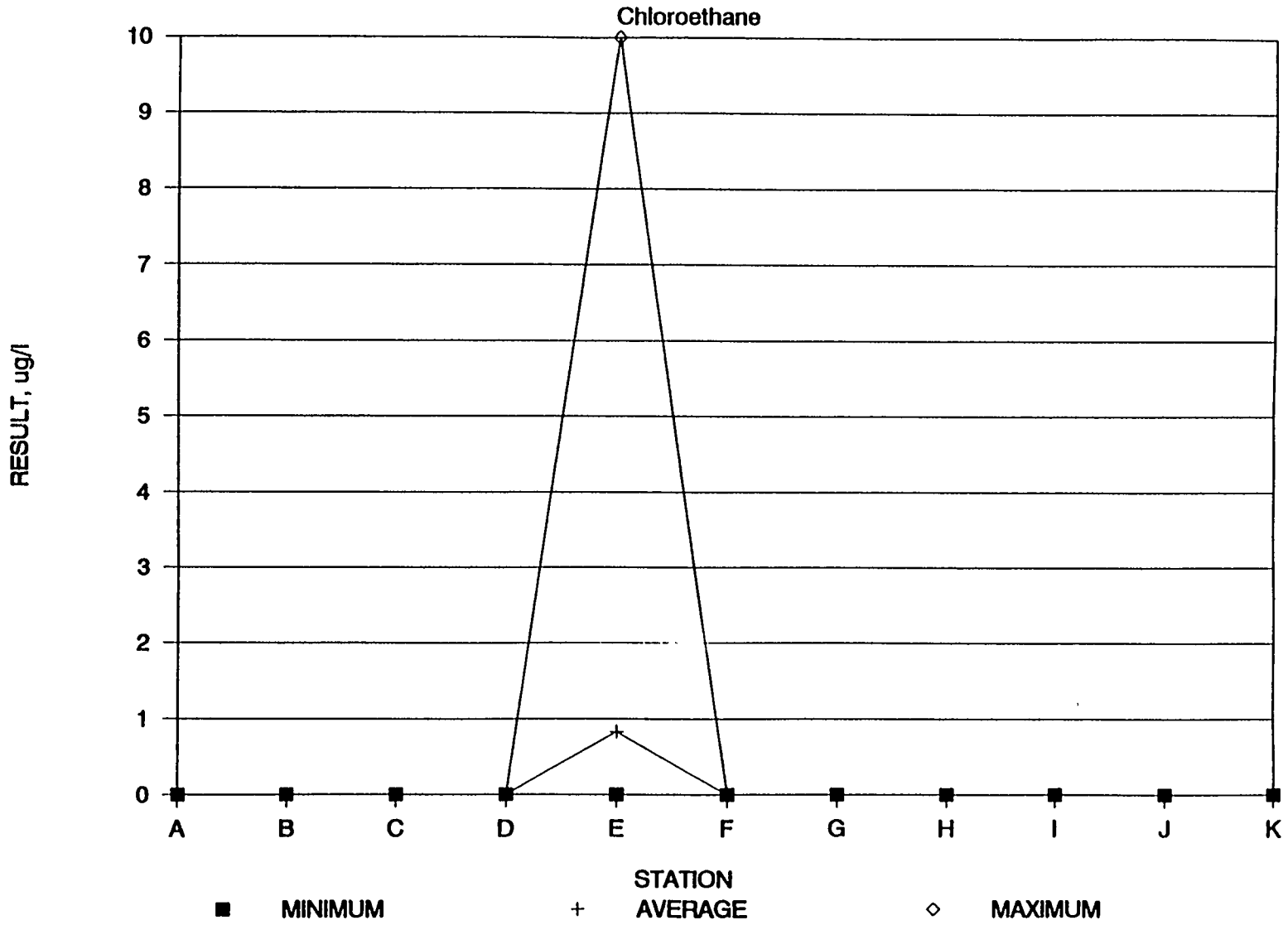

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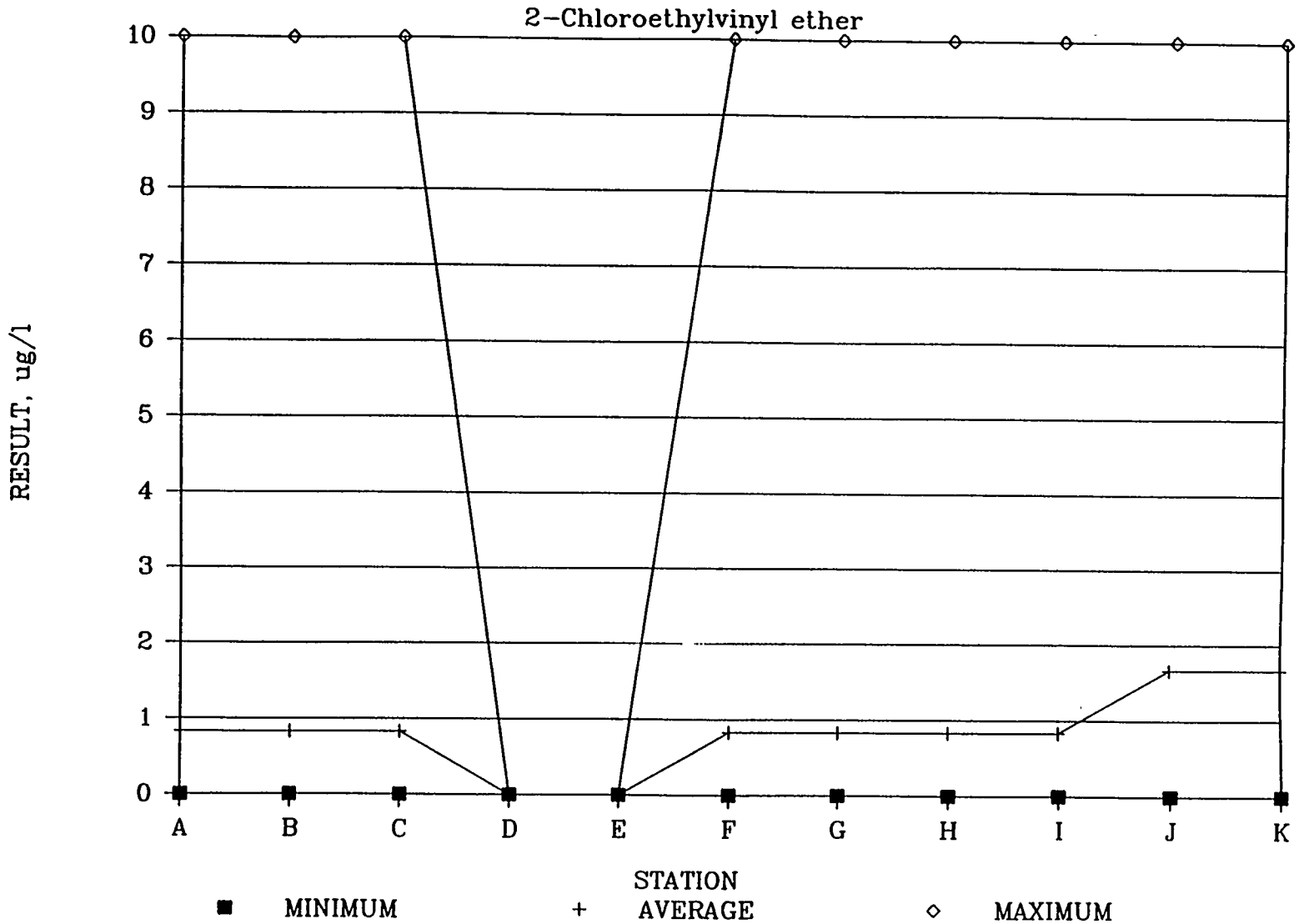

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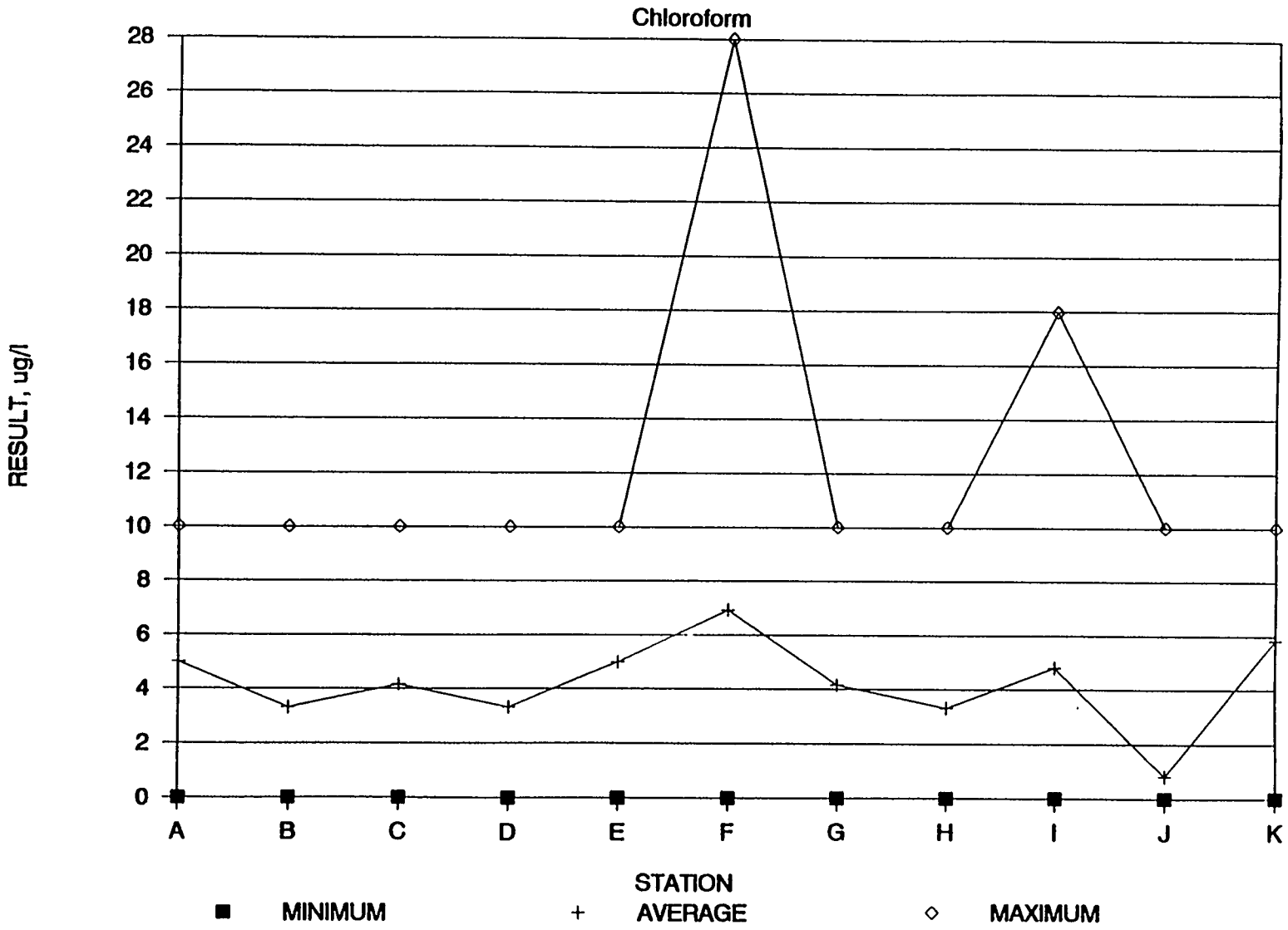

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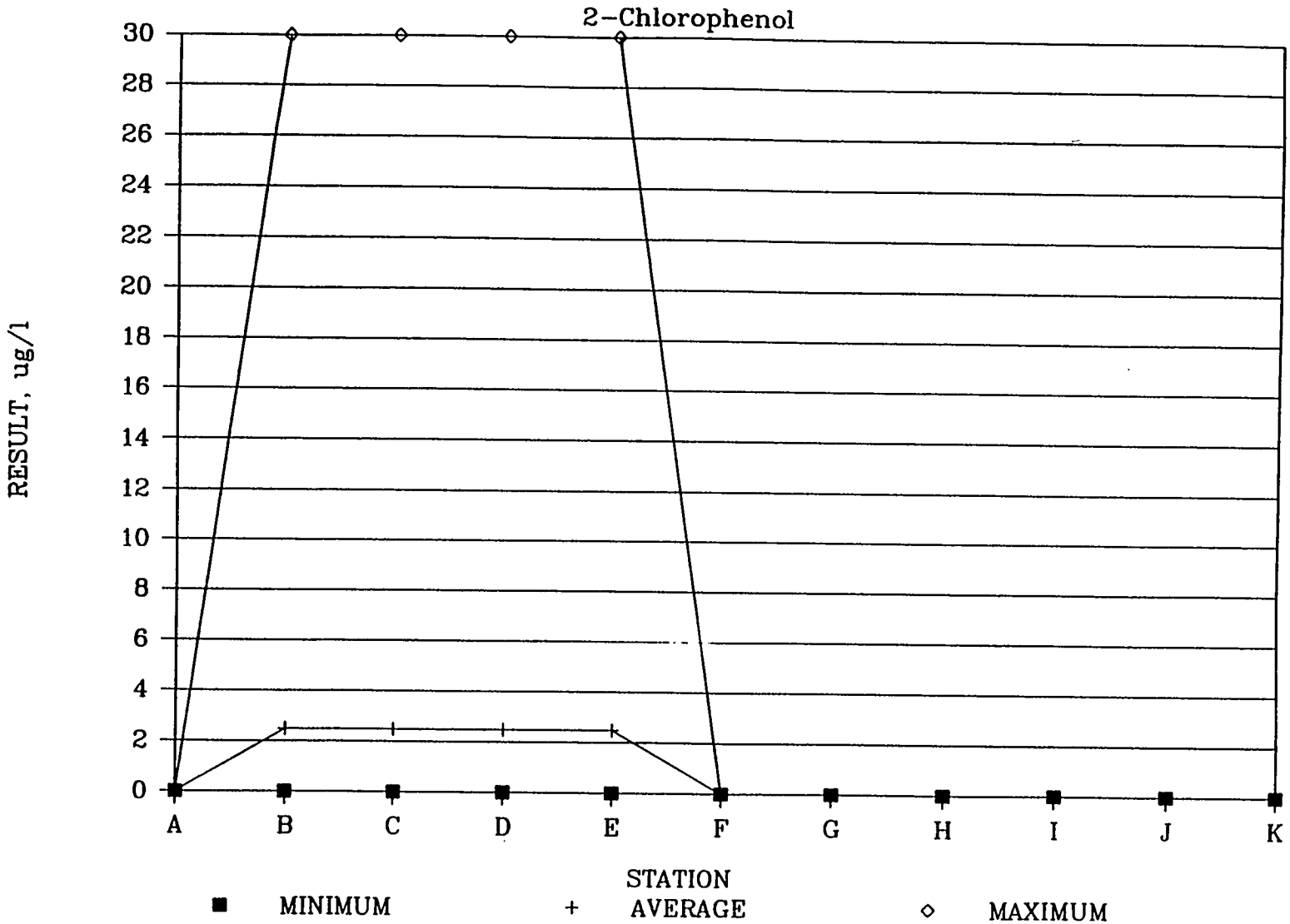

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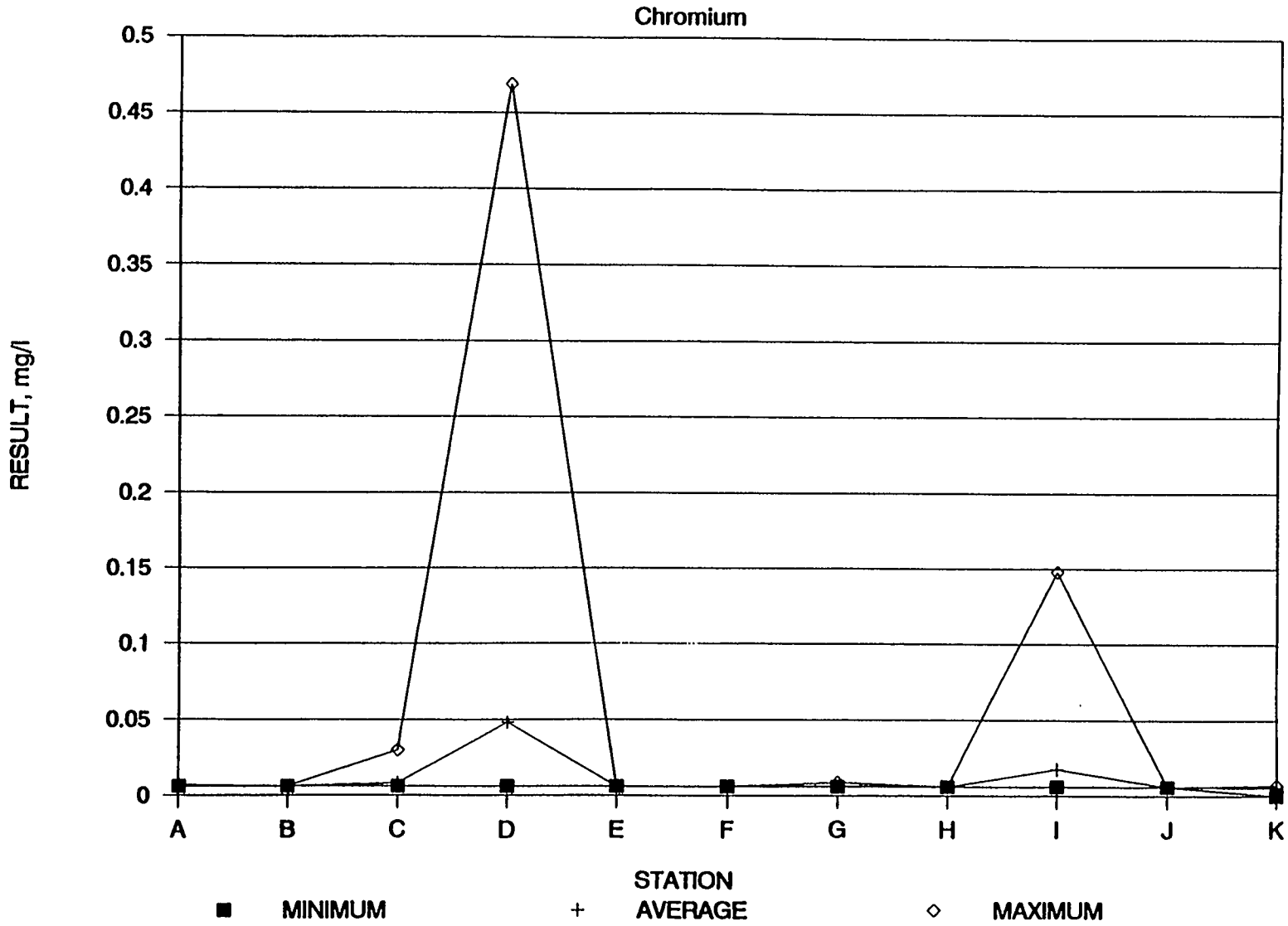

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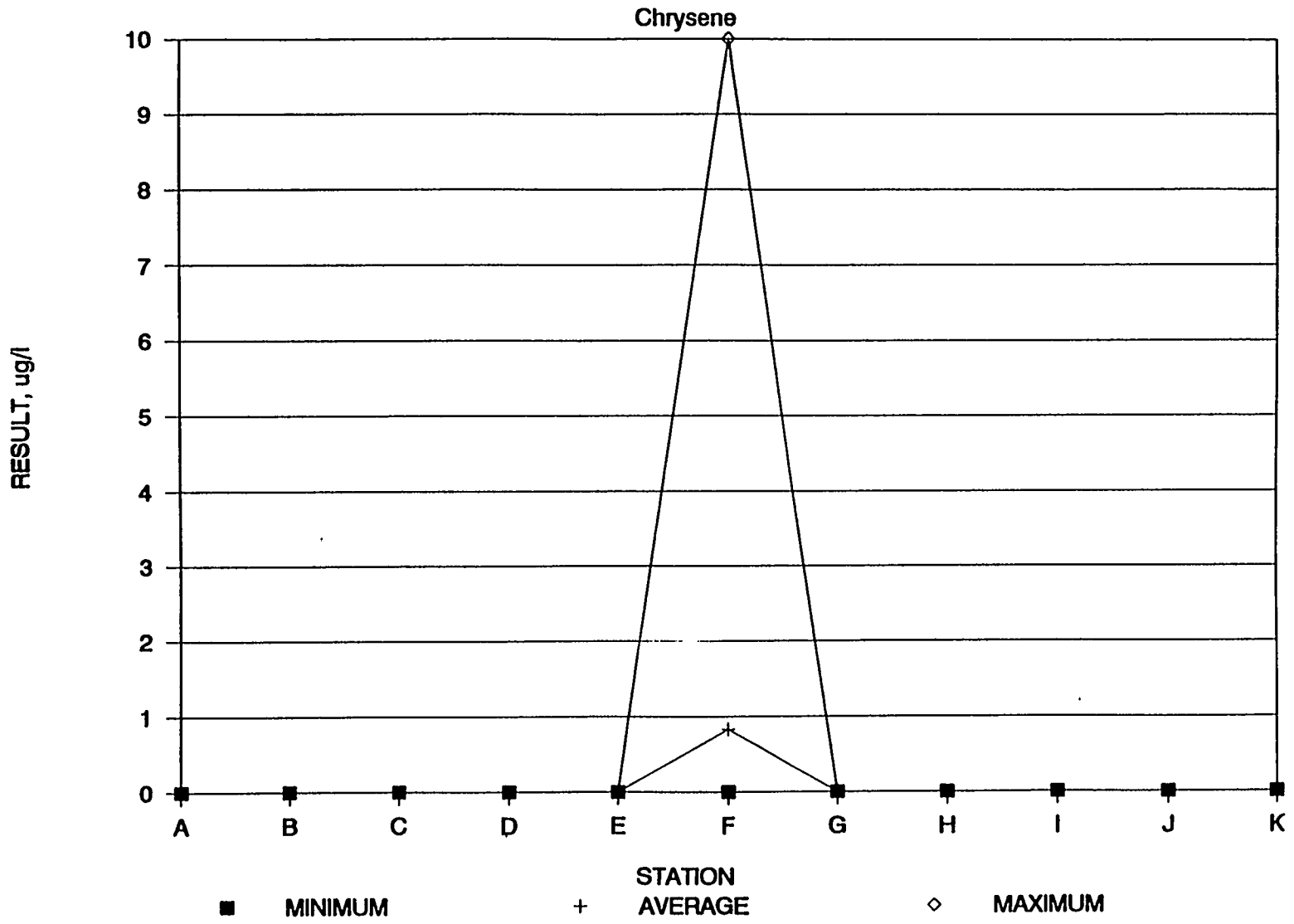

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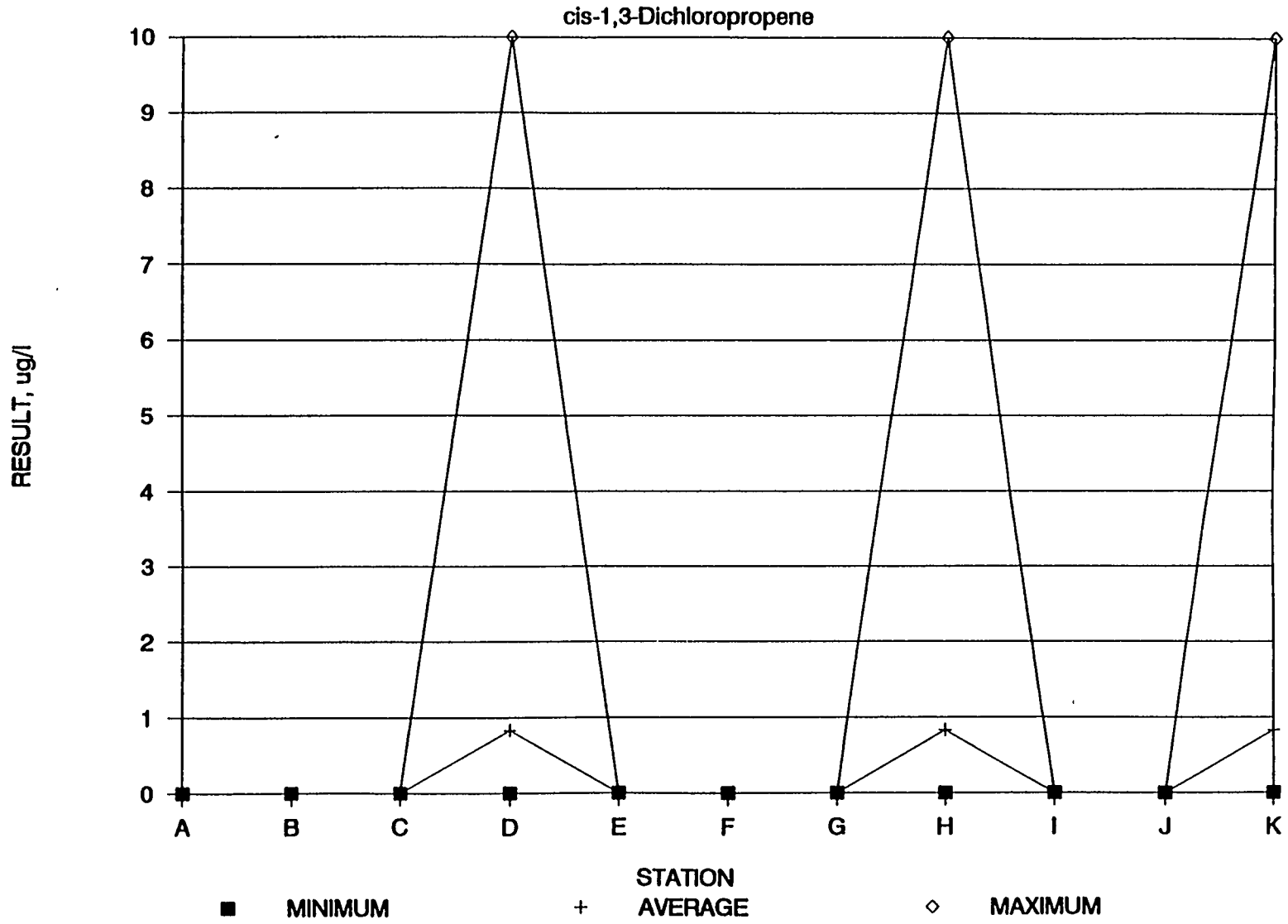
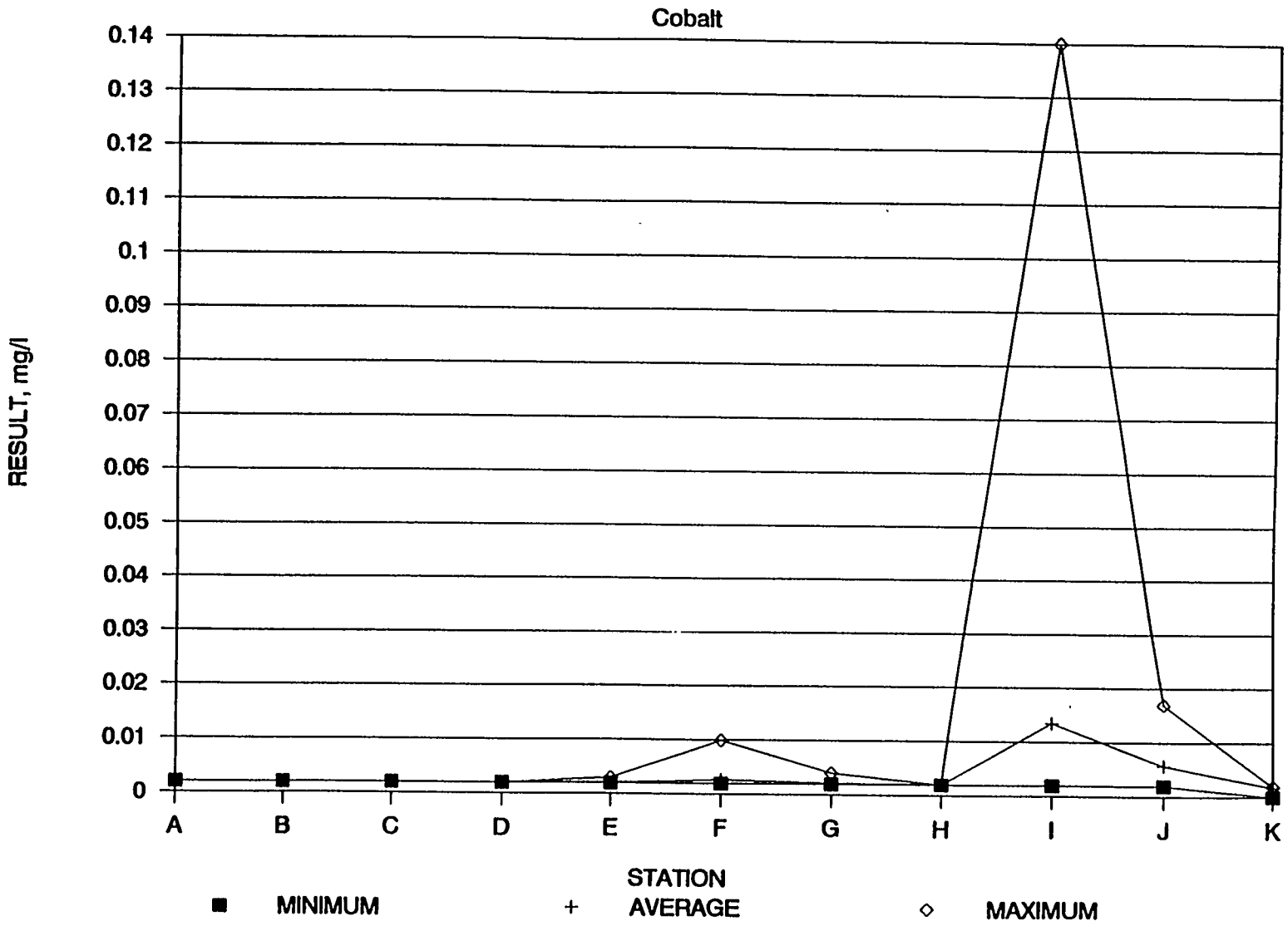


DRY WEATHER WATER QUALITY DATA



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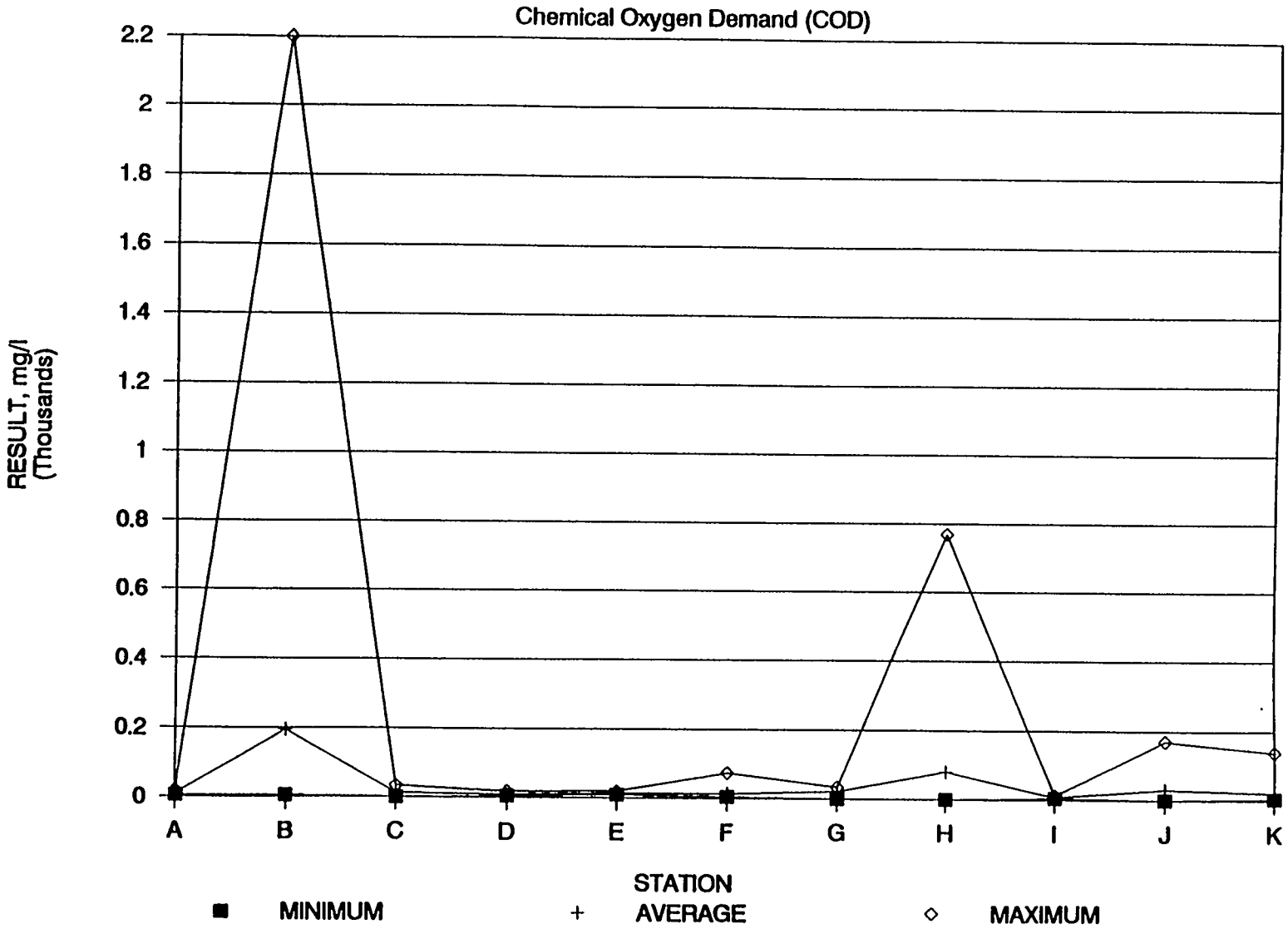

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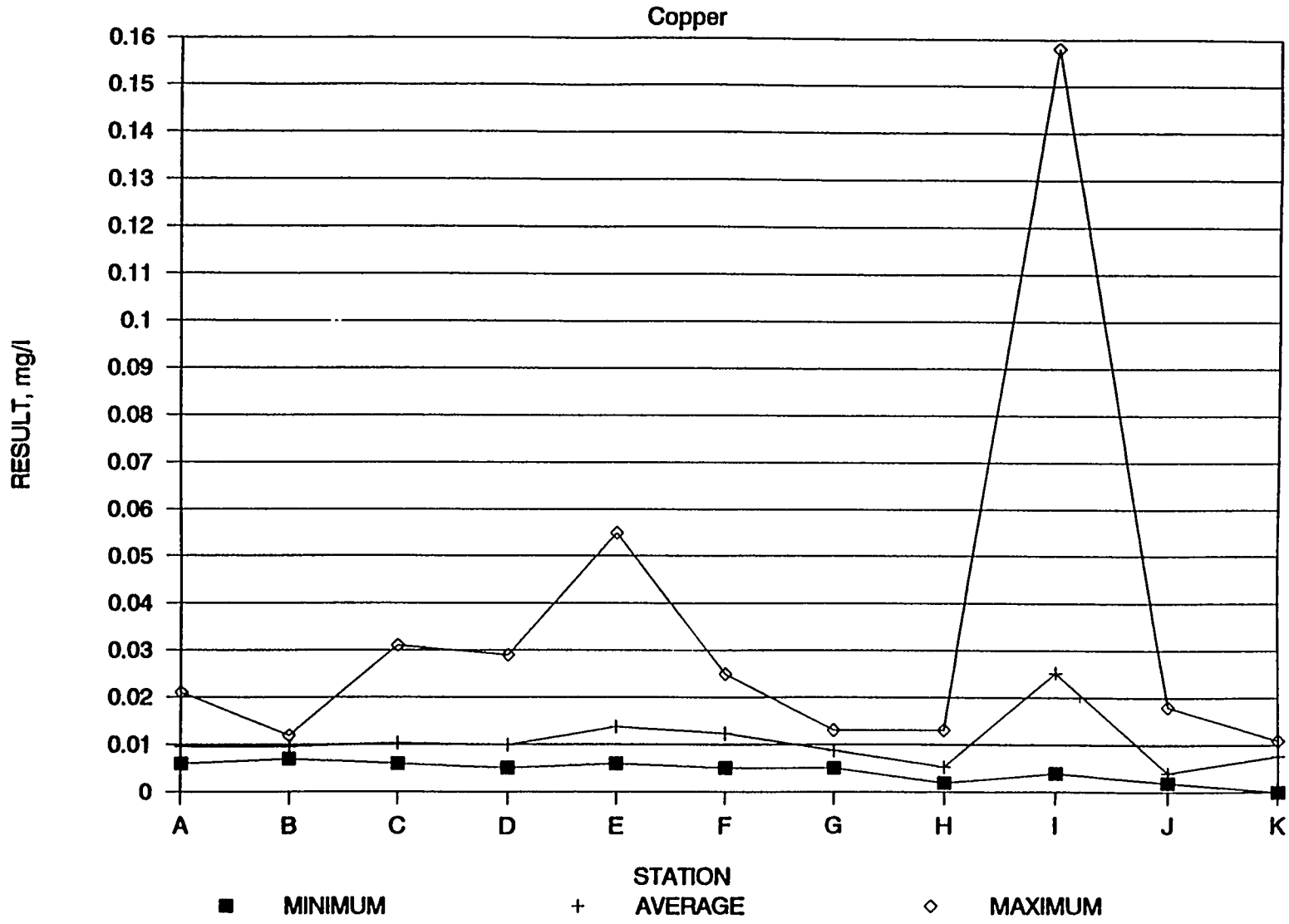

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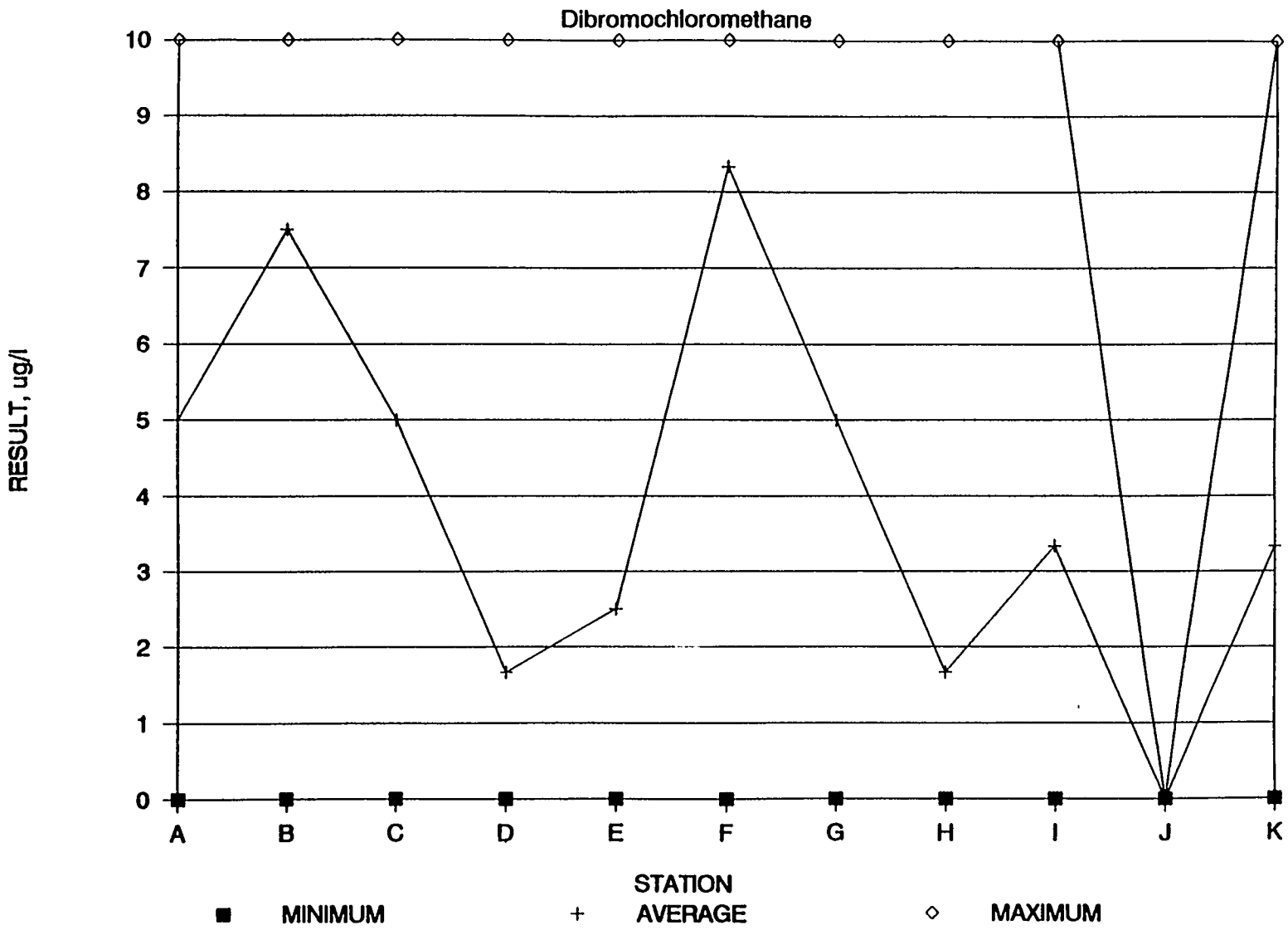

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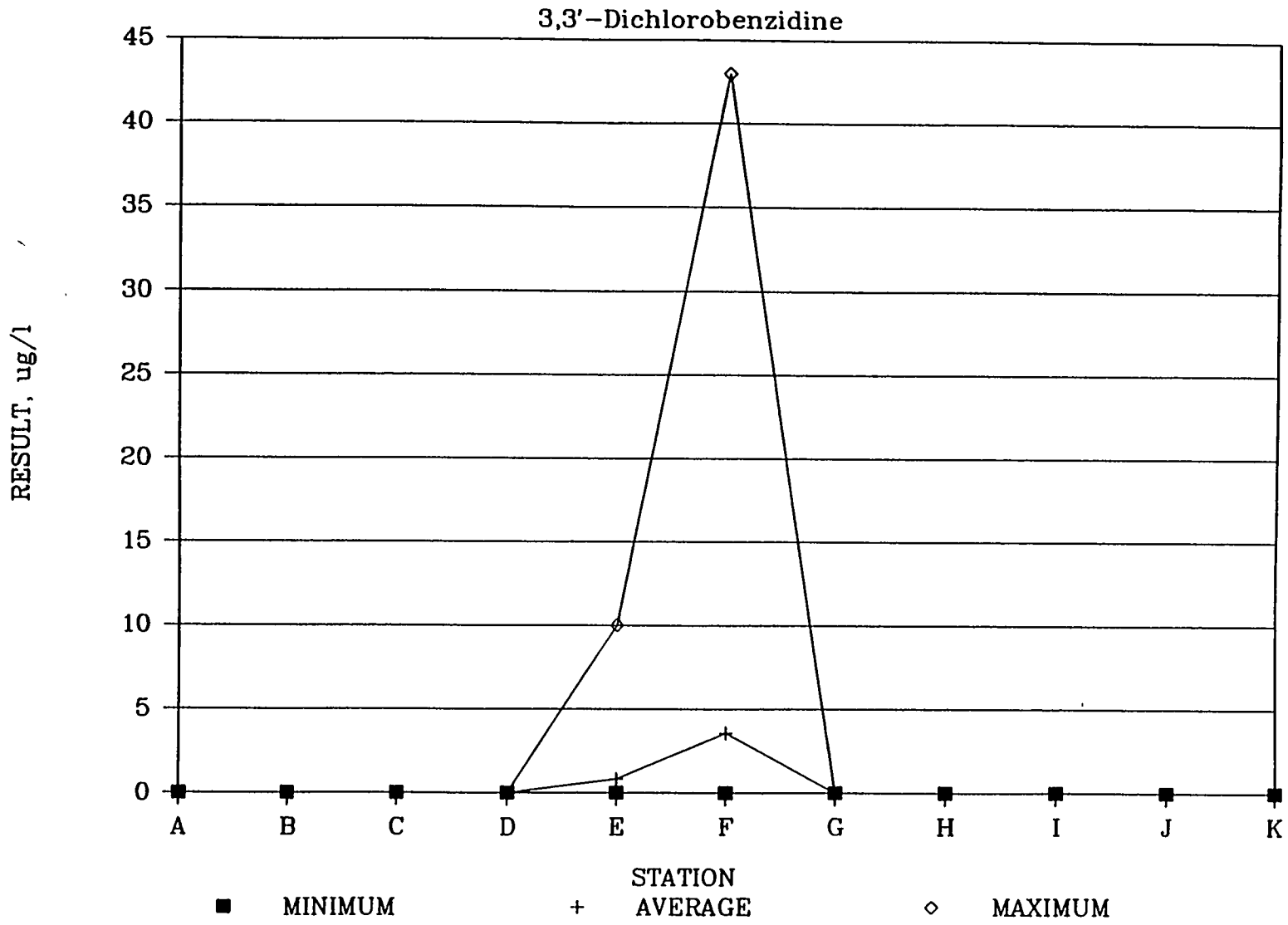

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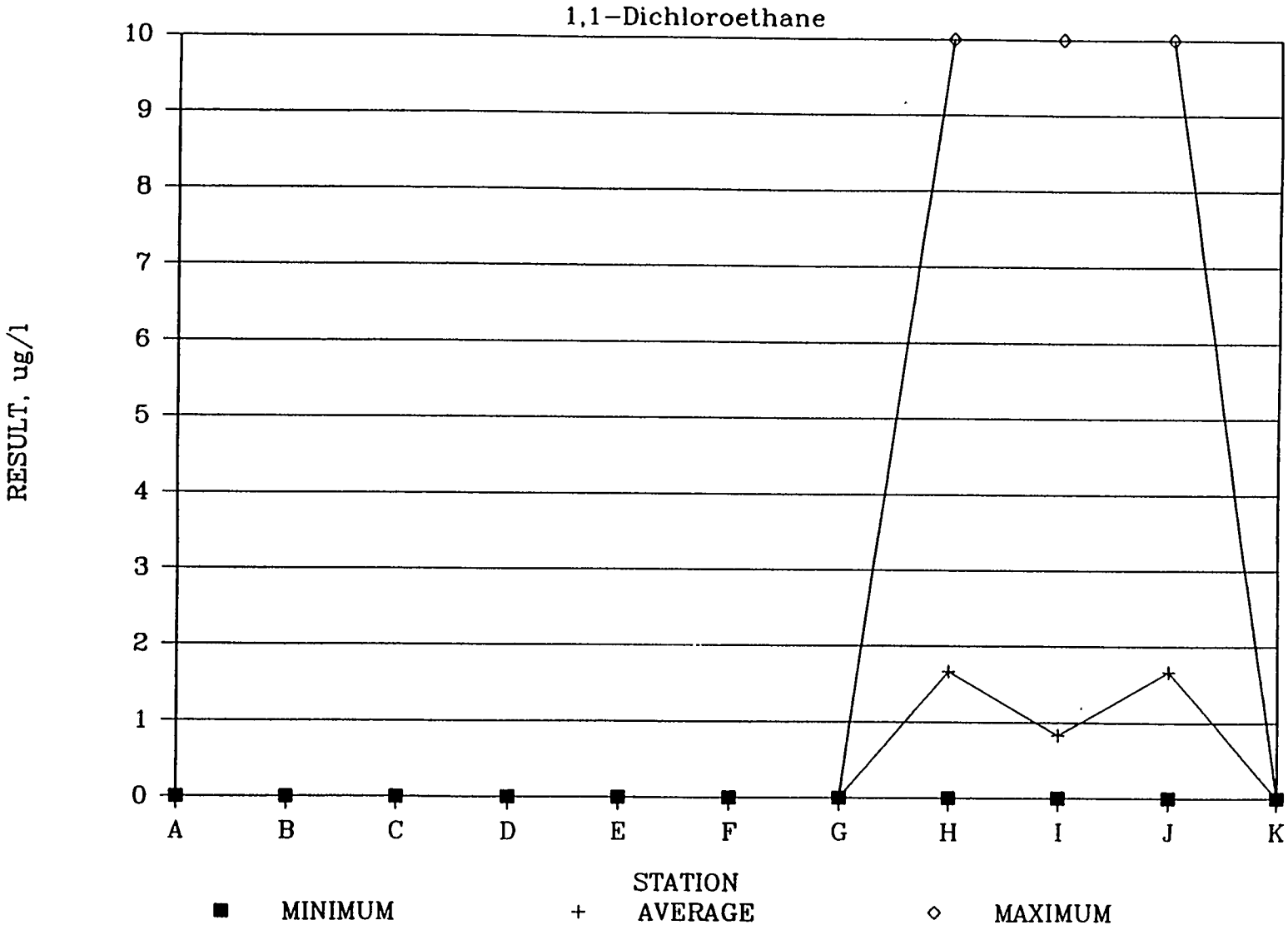

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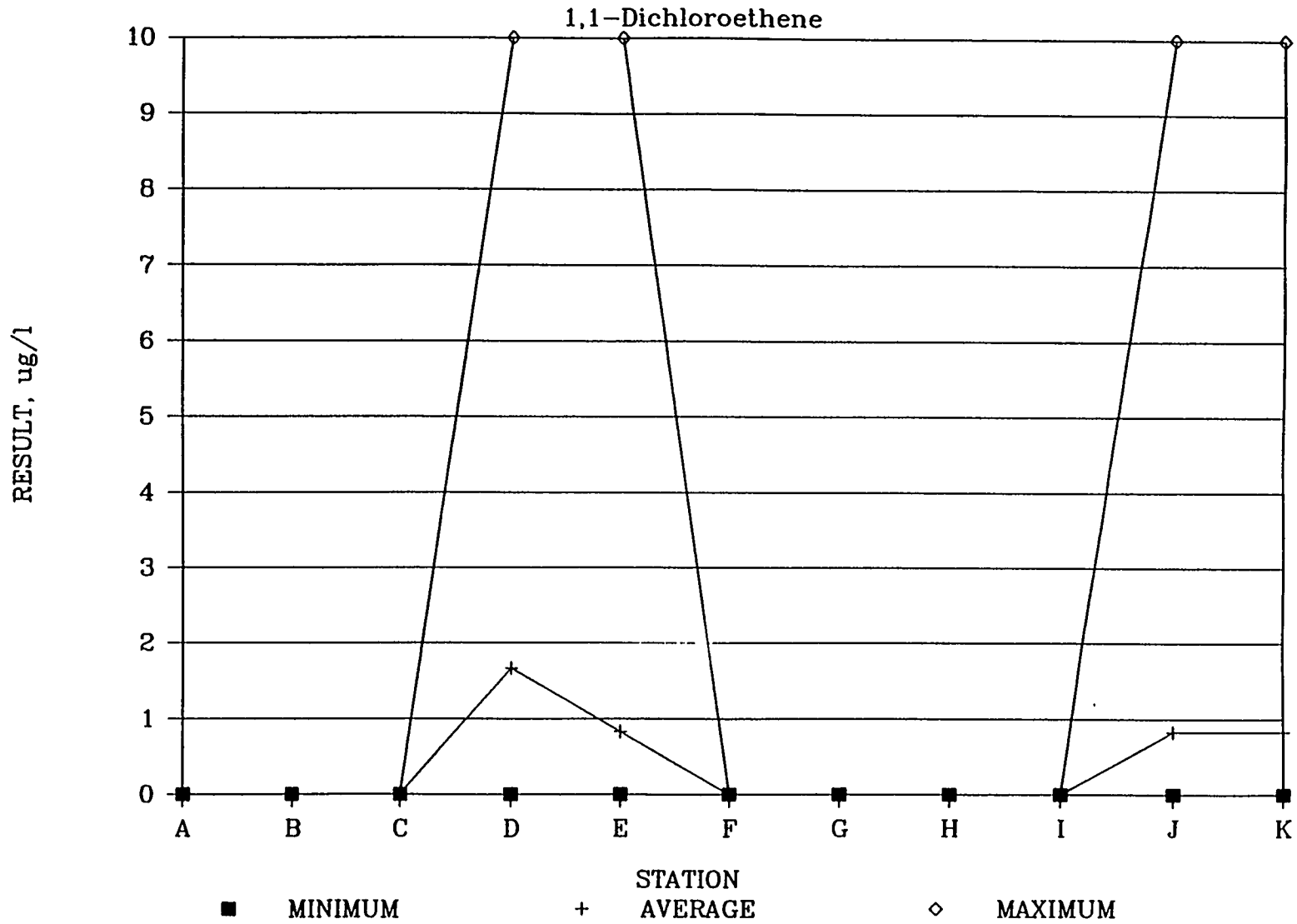

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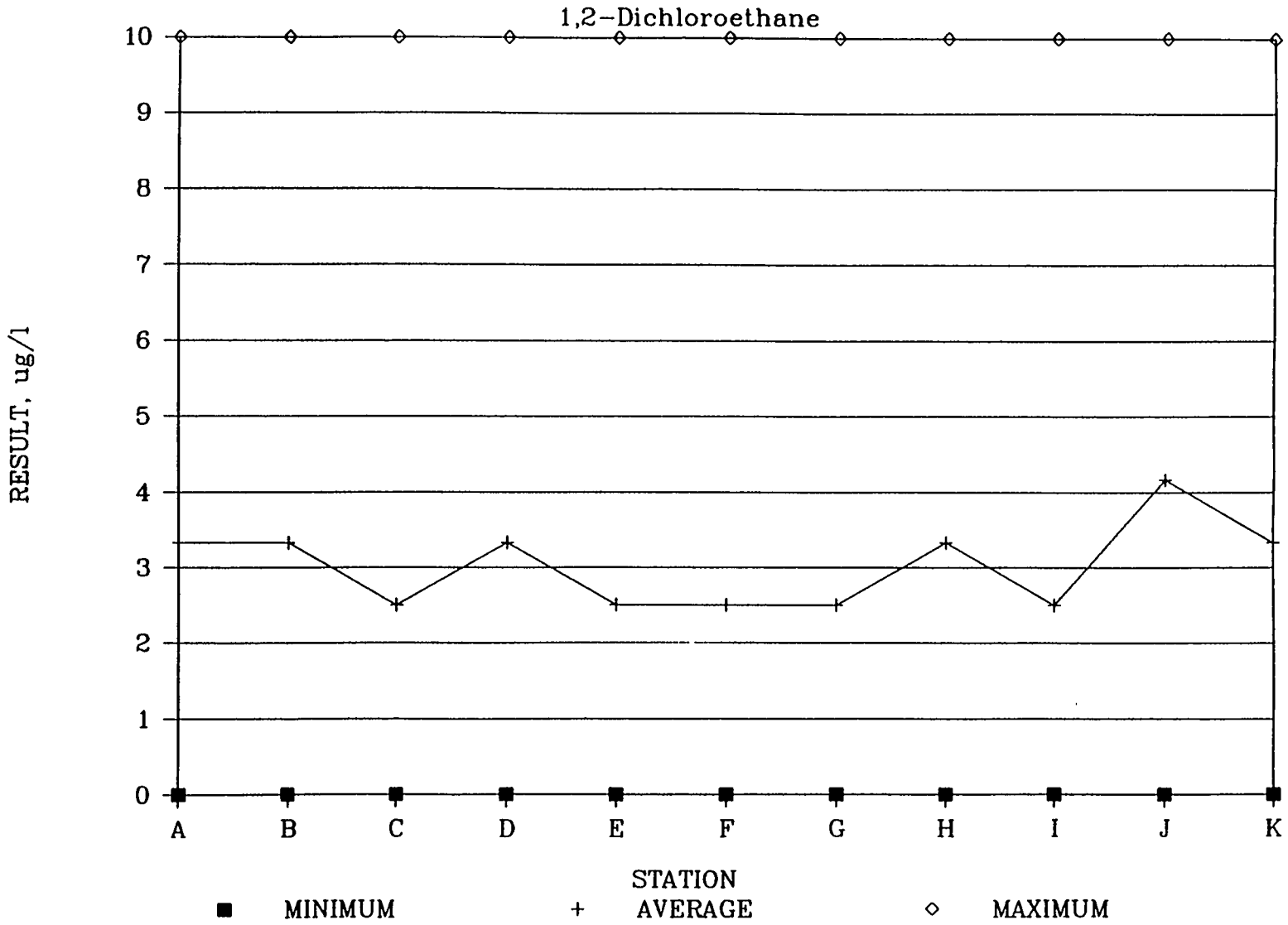

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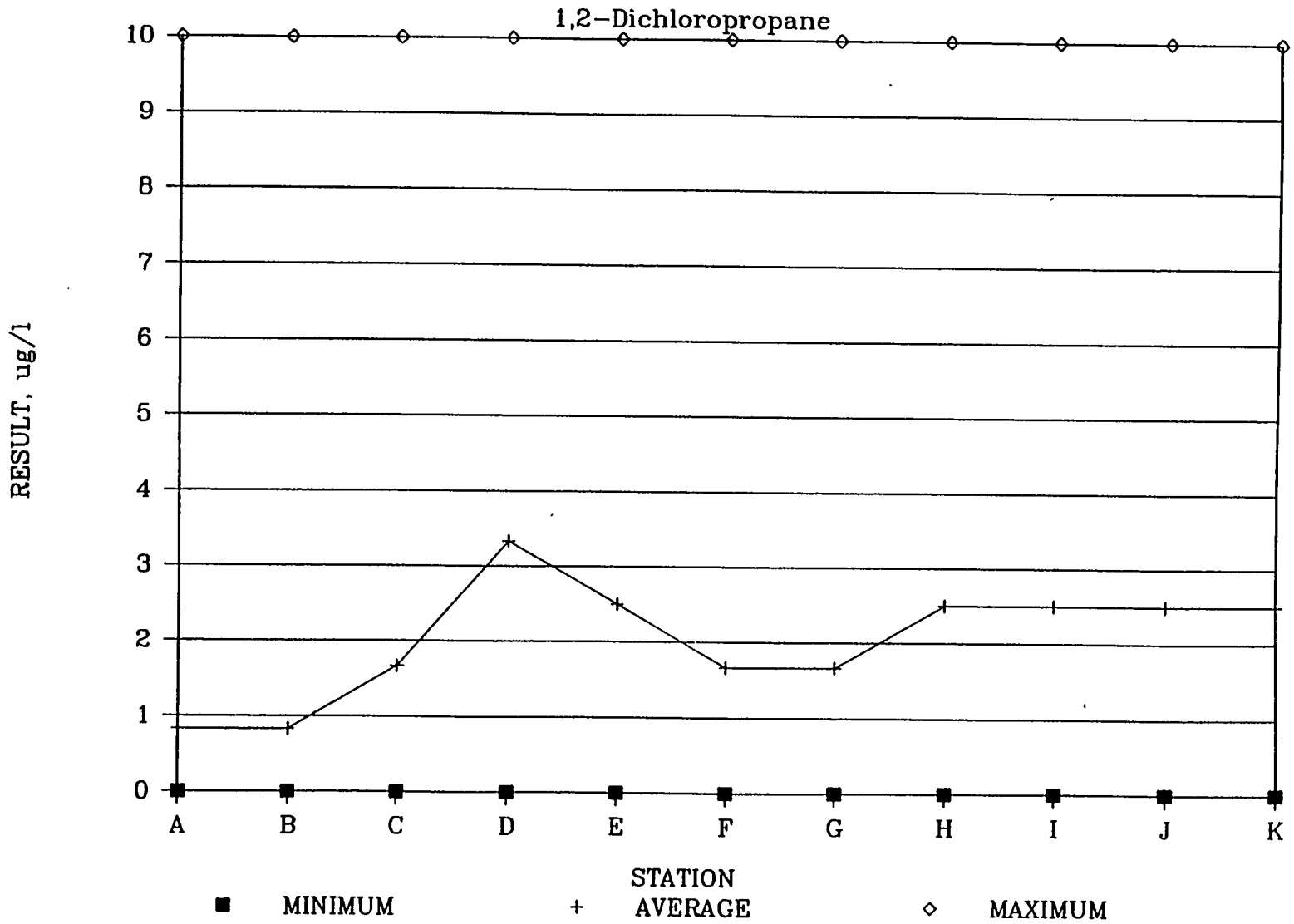

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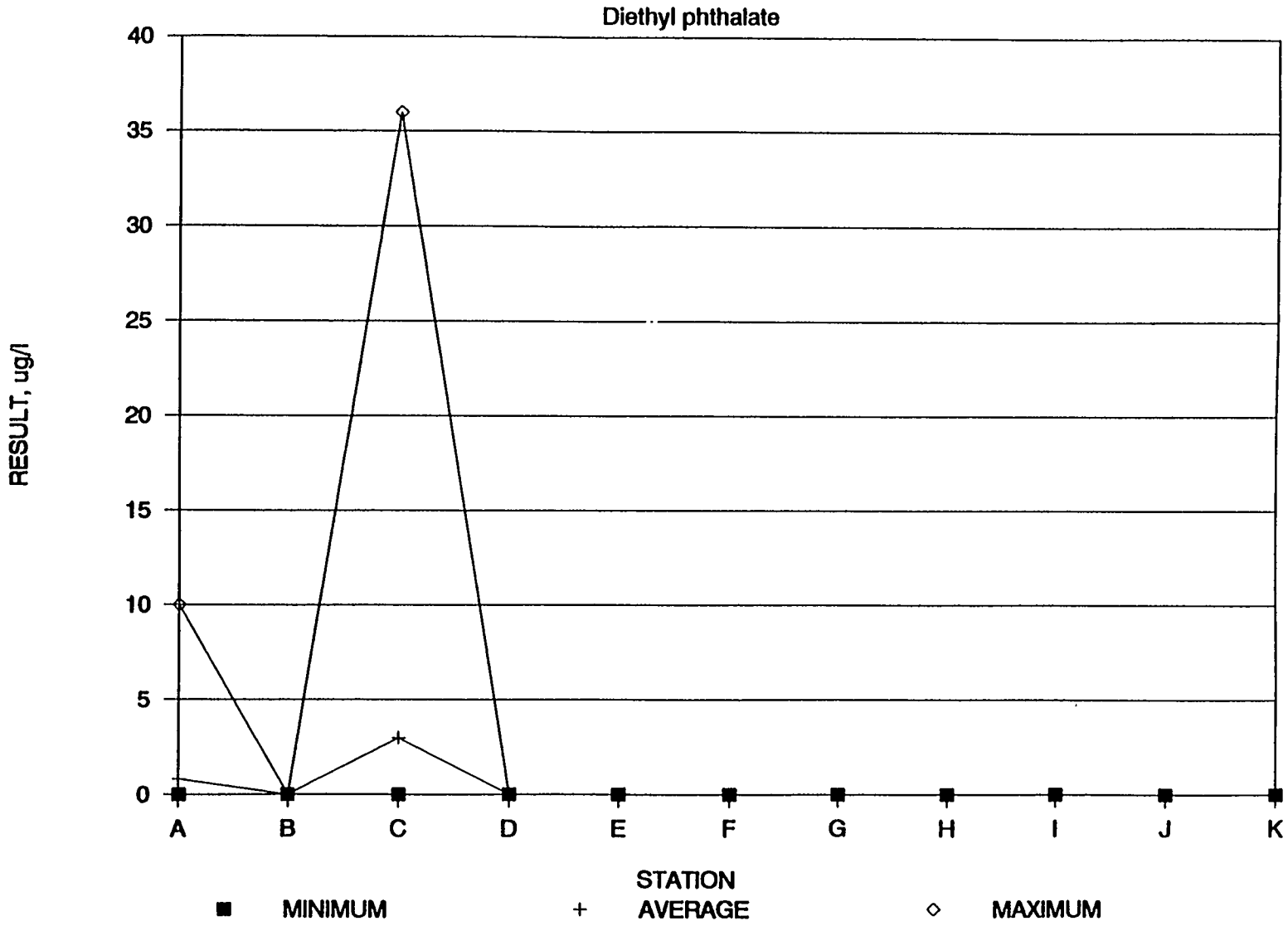

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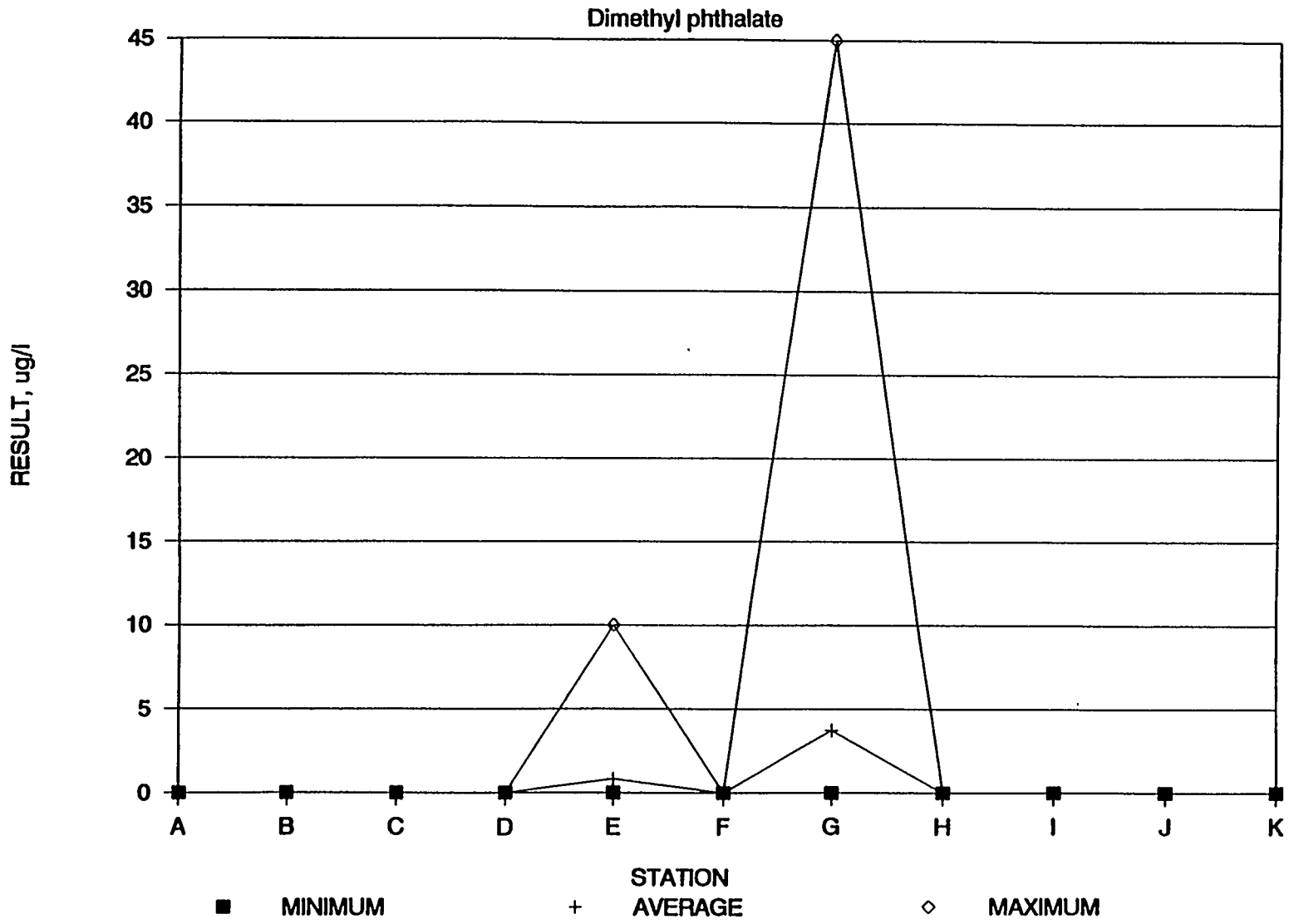

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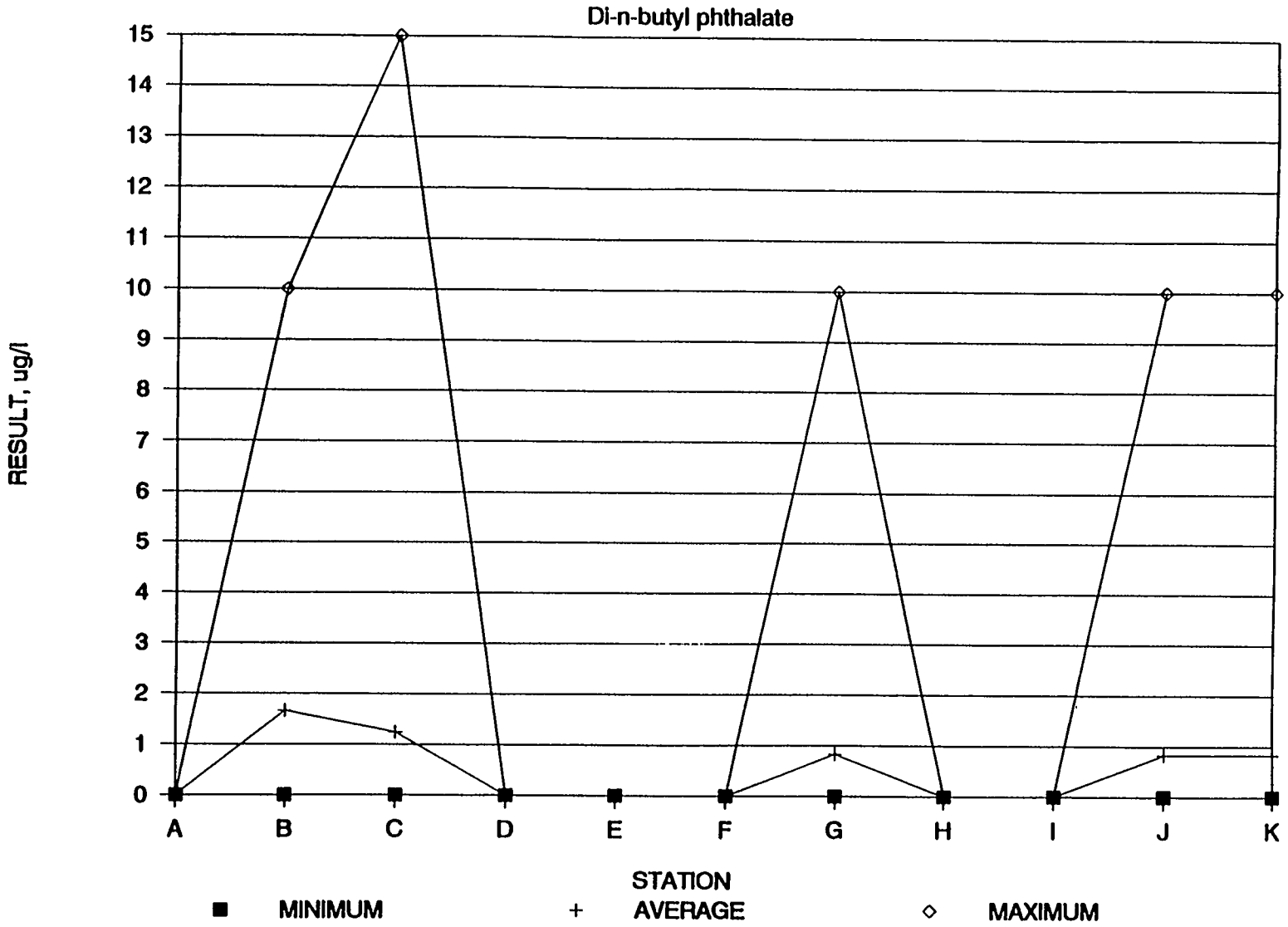

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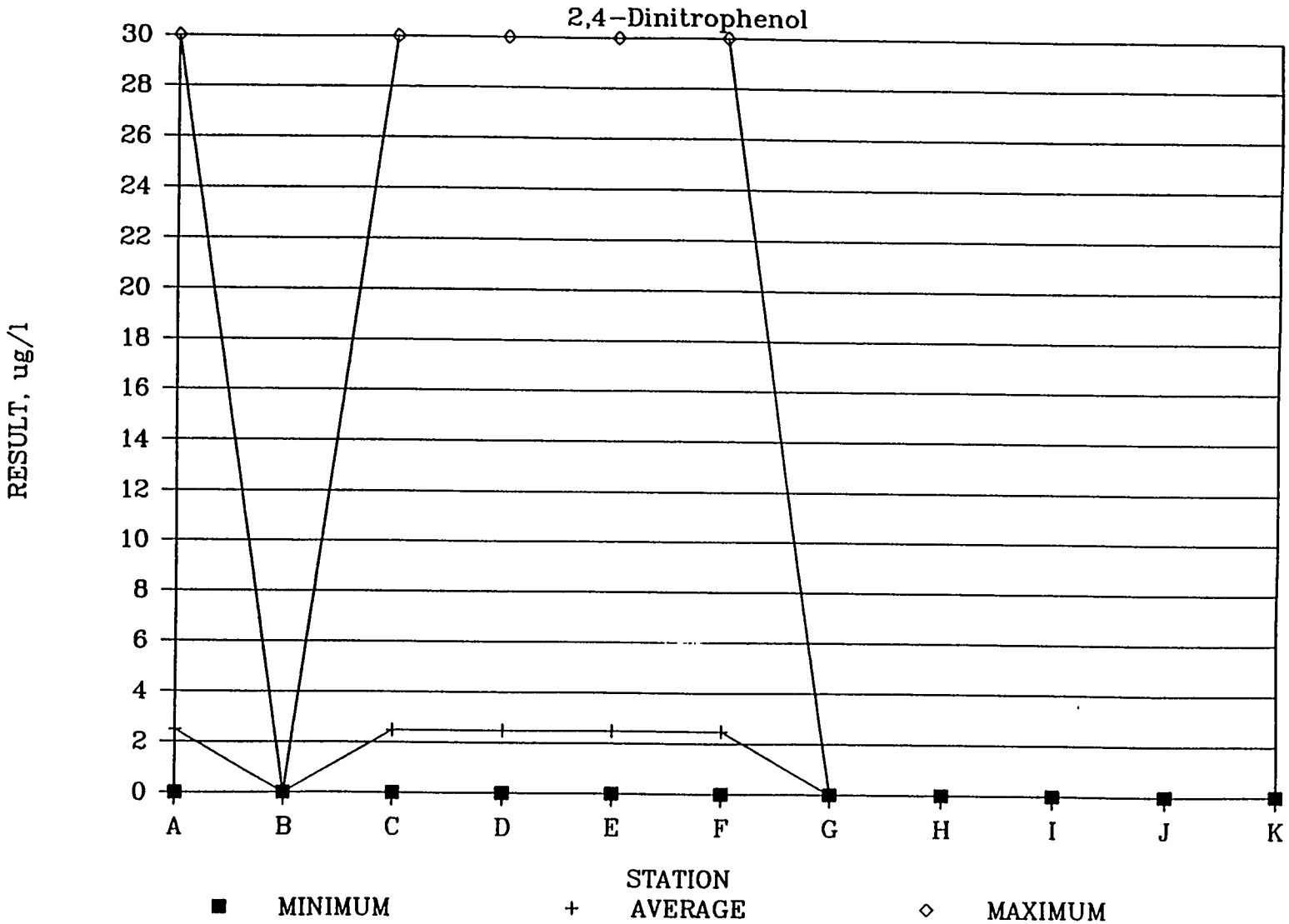

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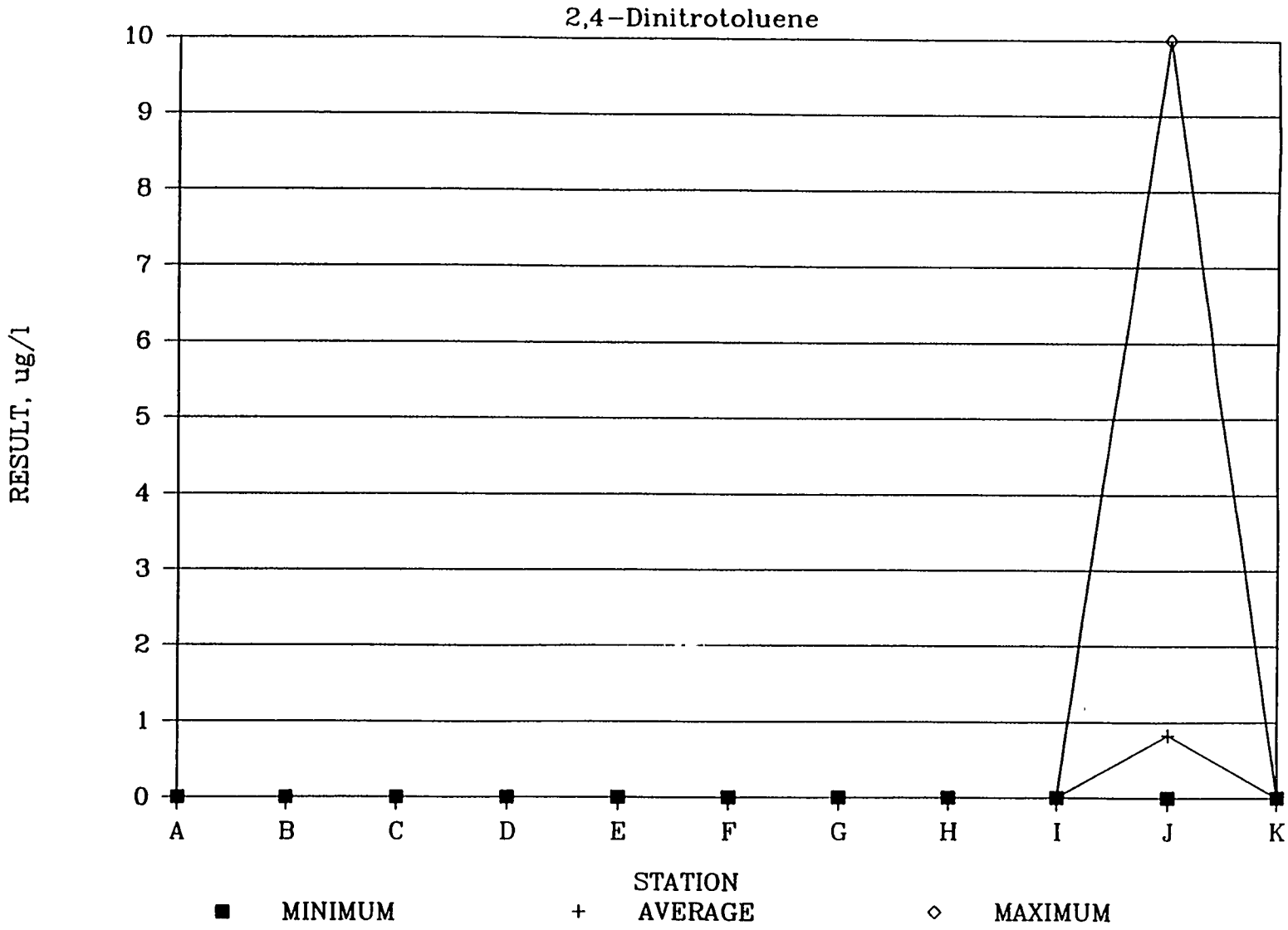

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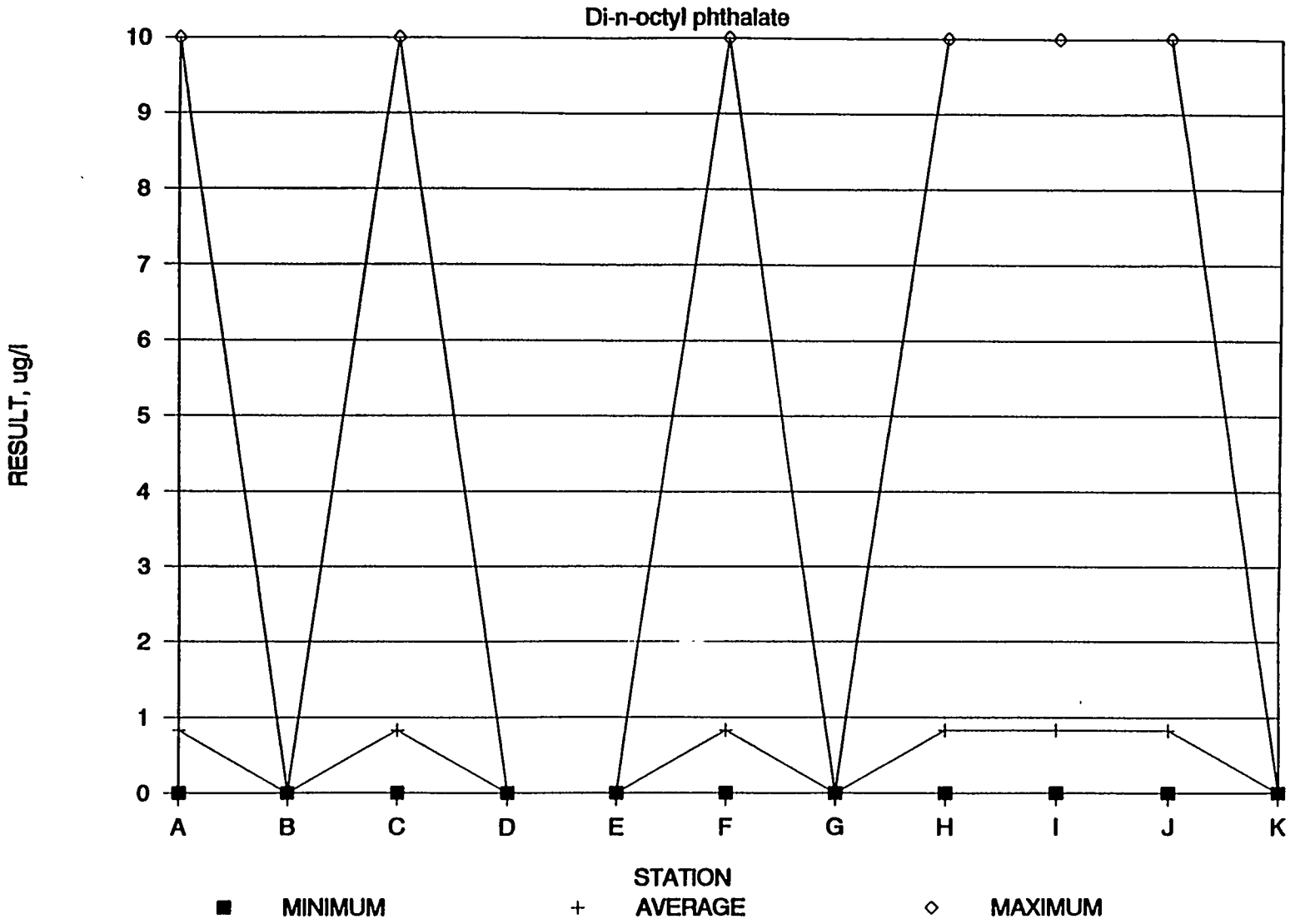

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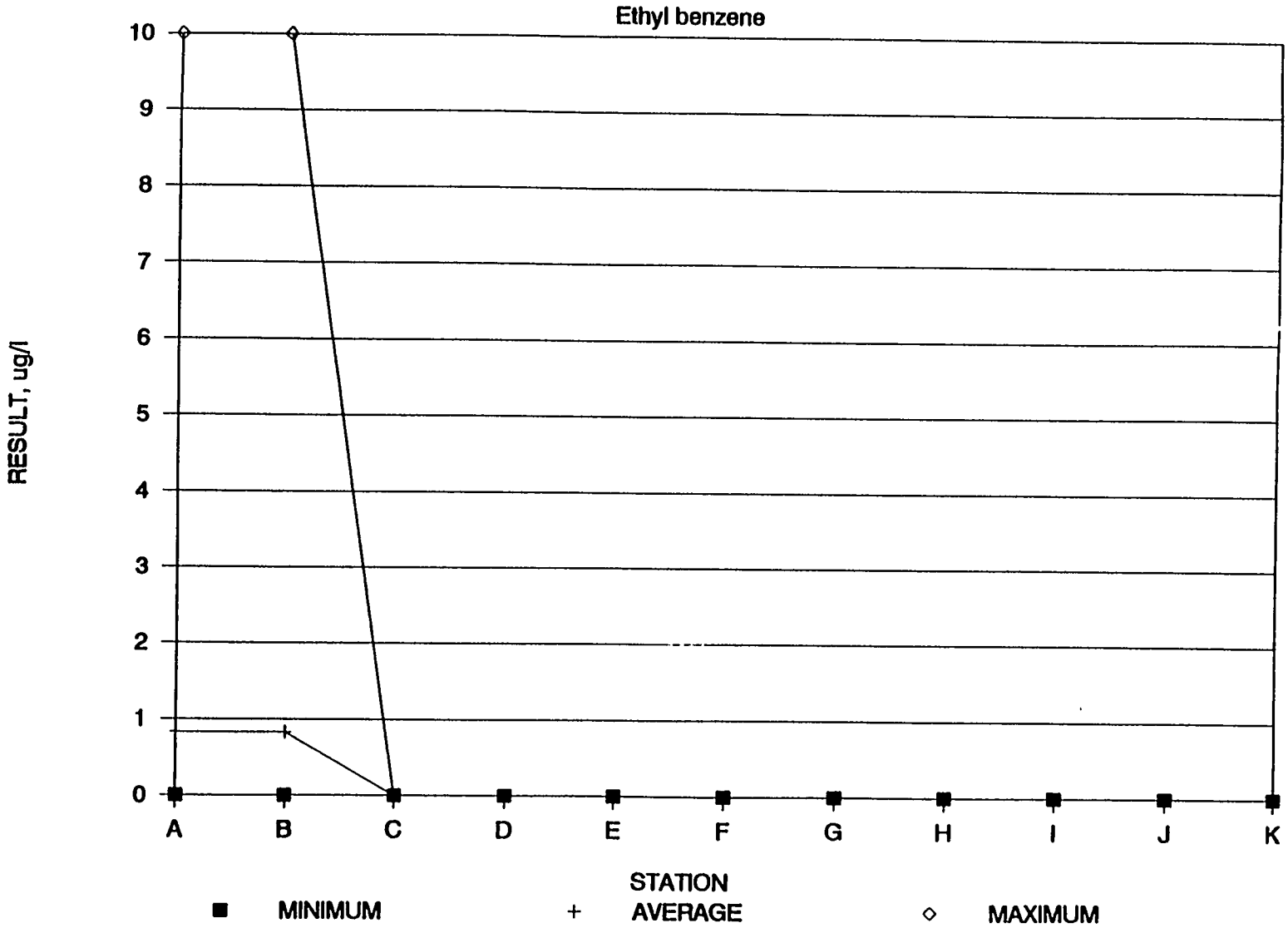

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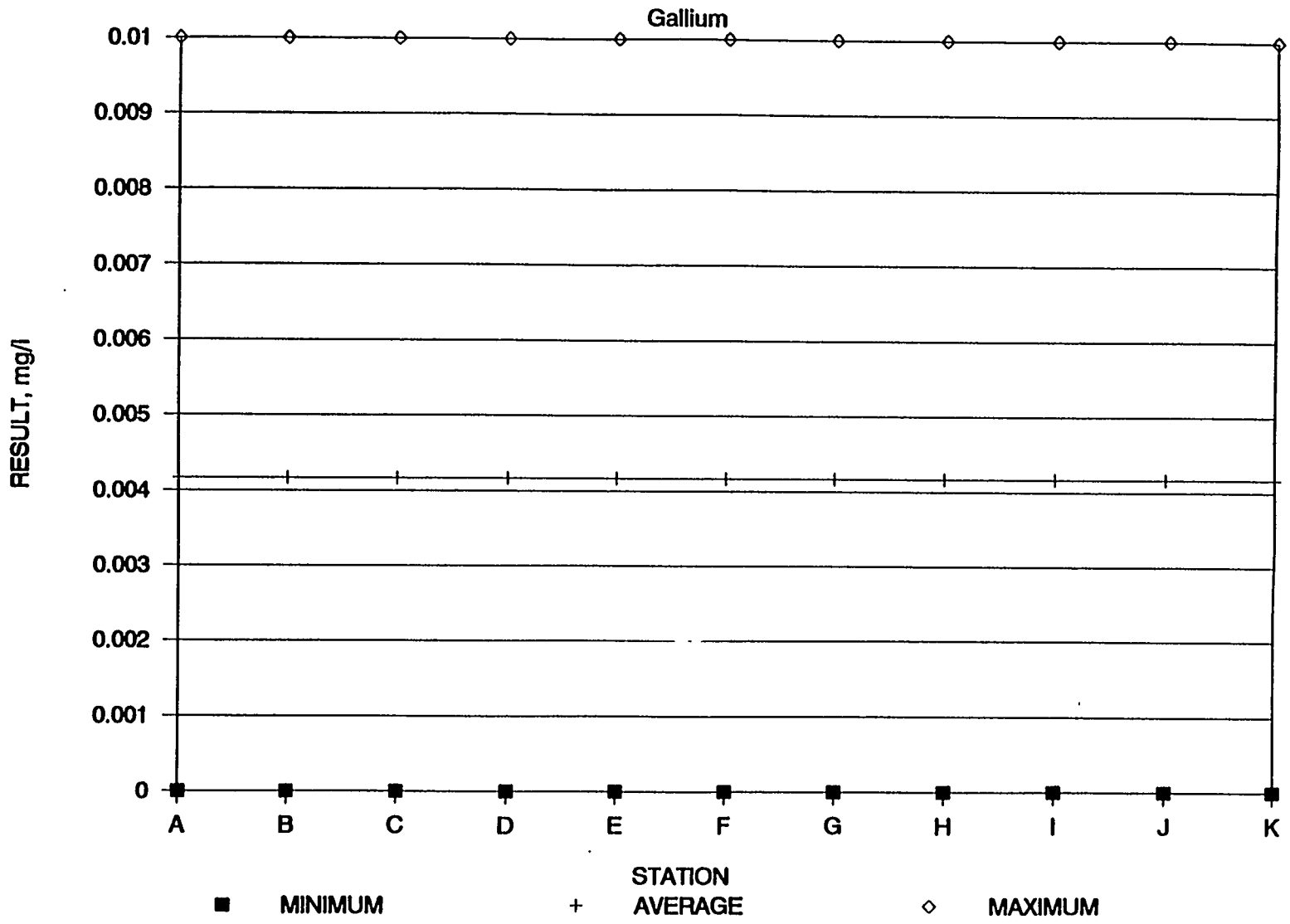

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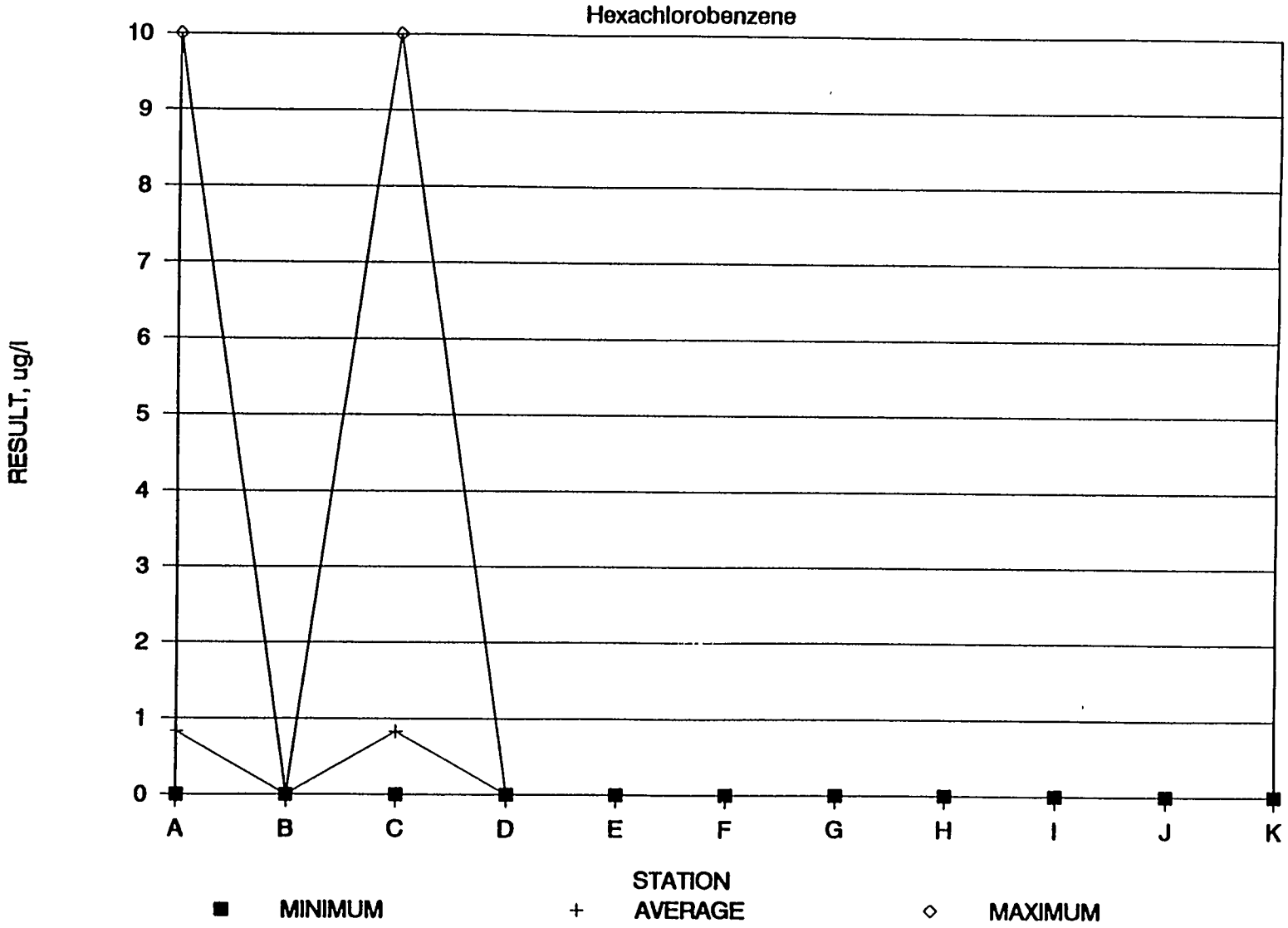

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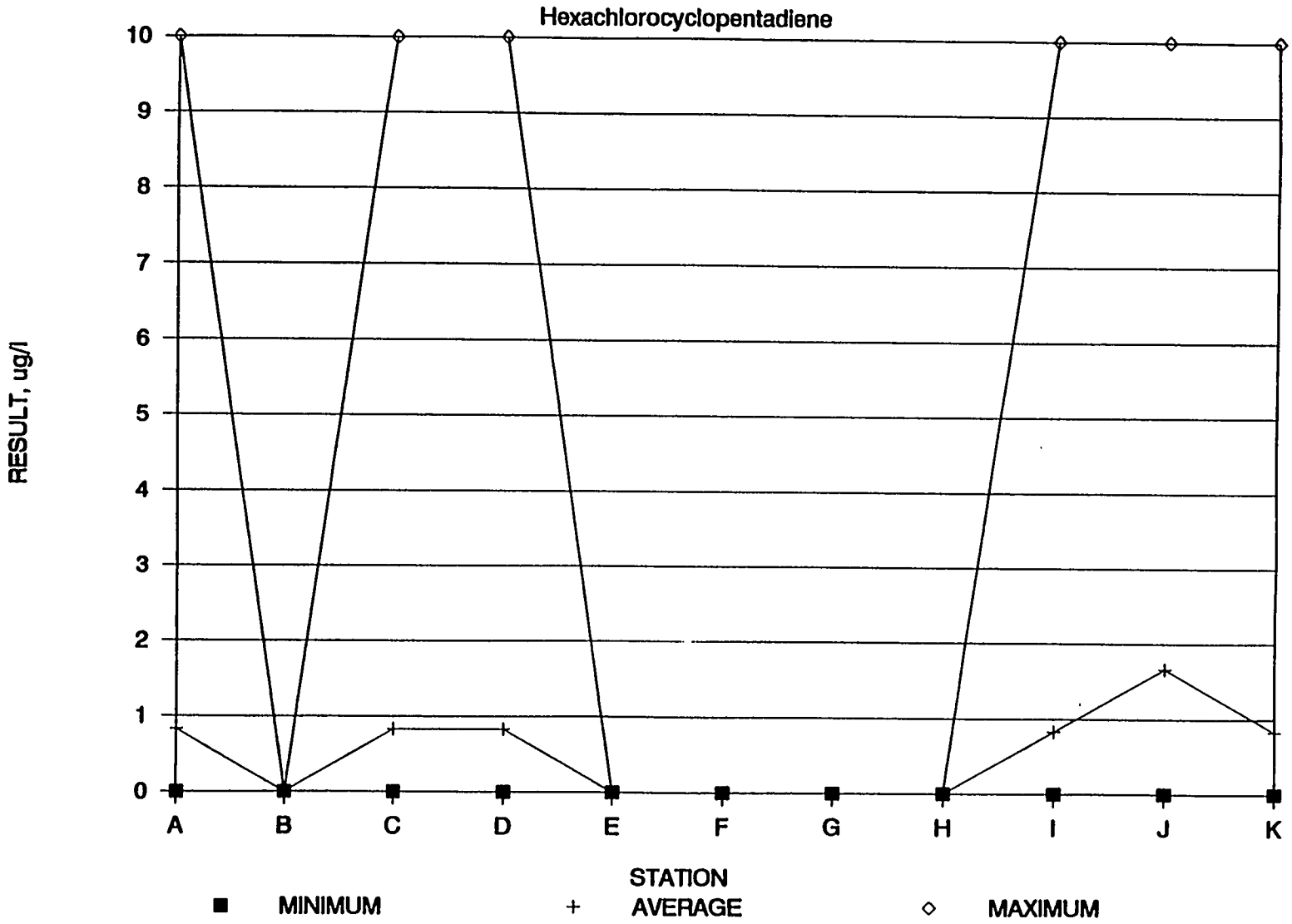

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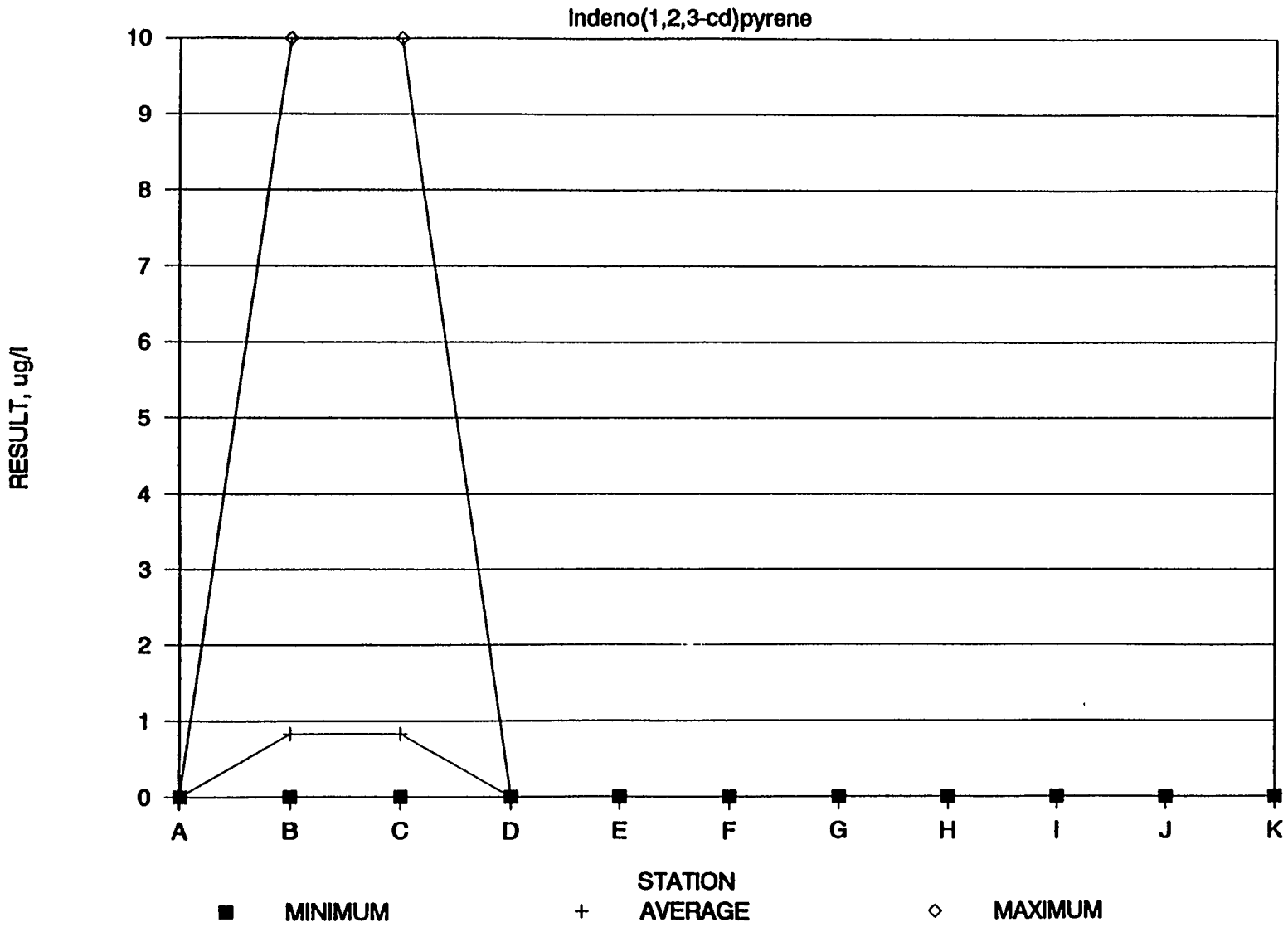

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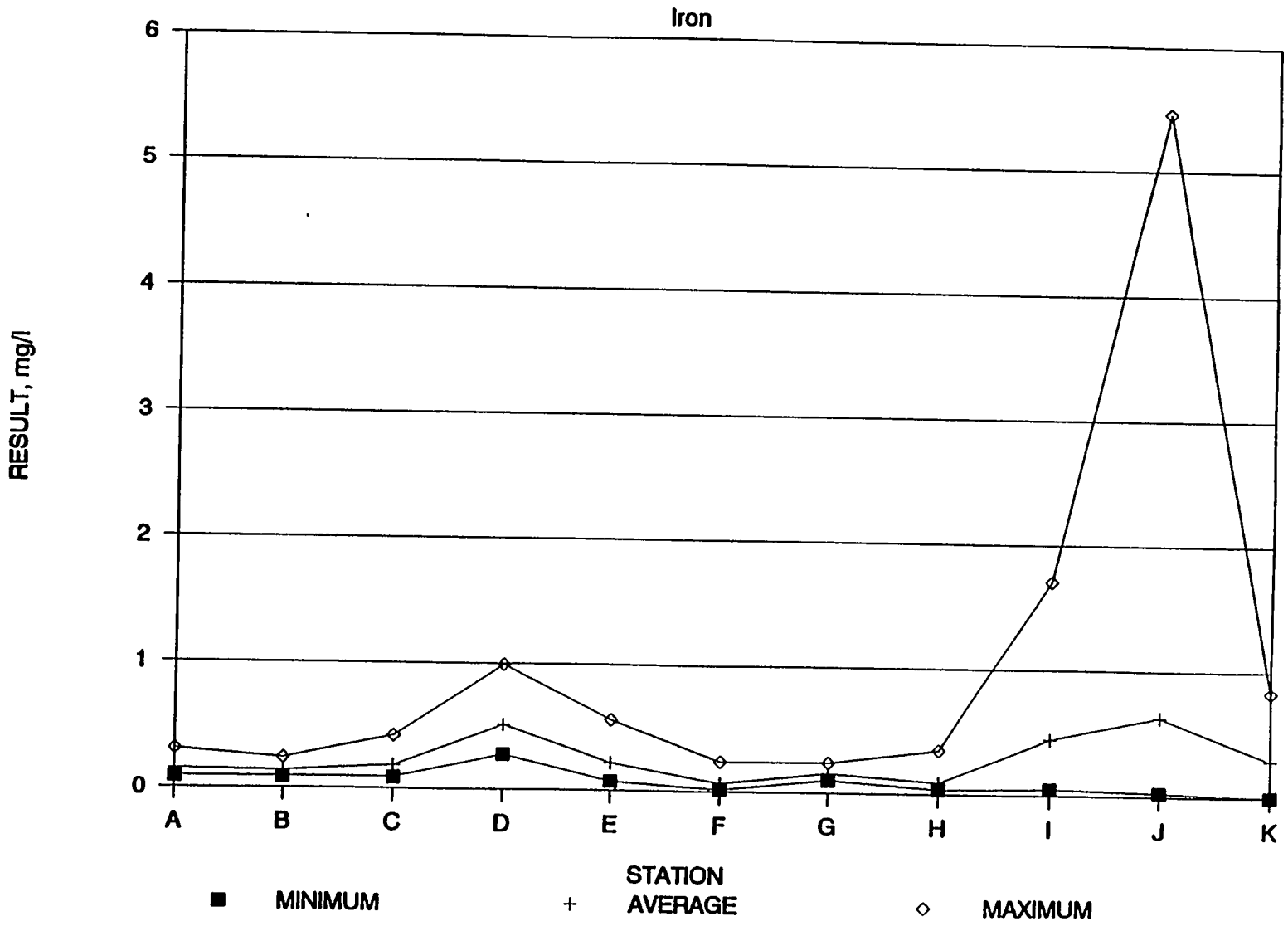

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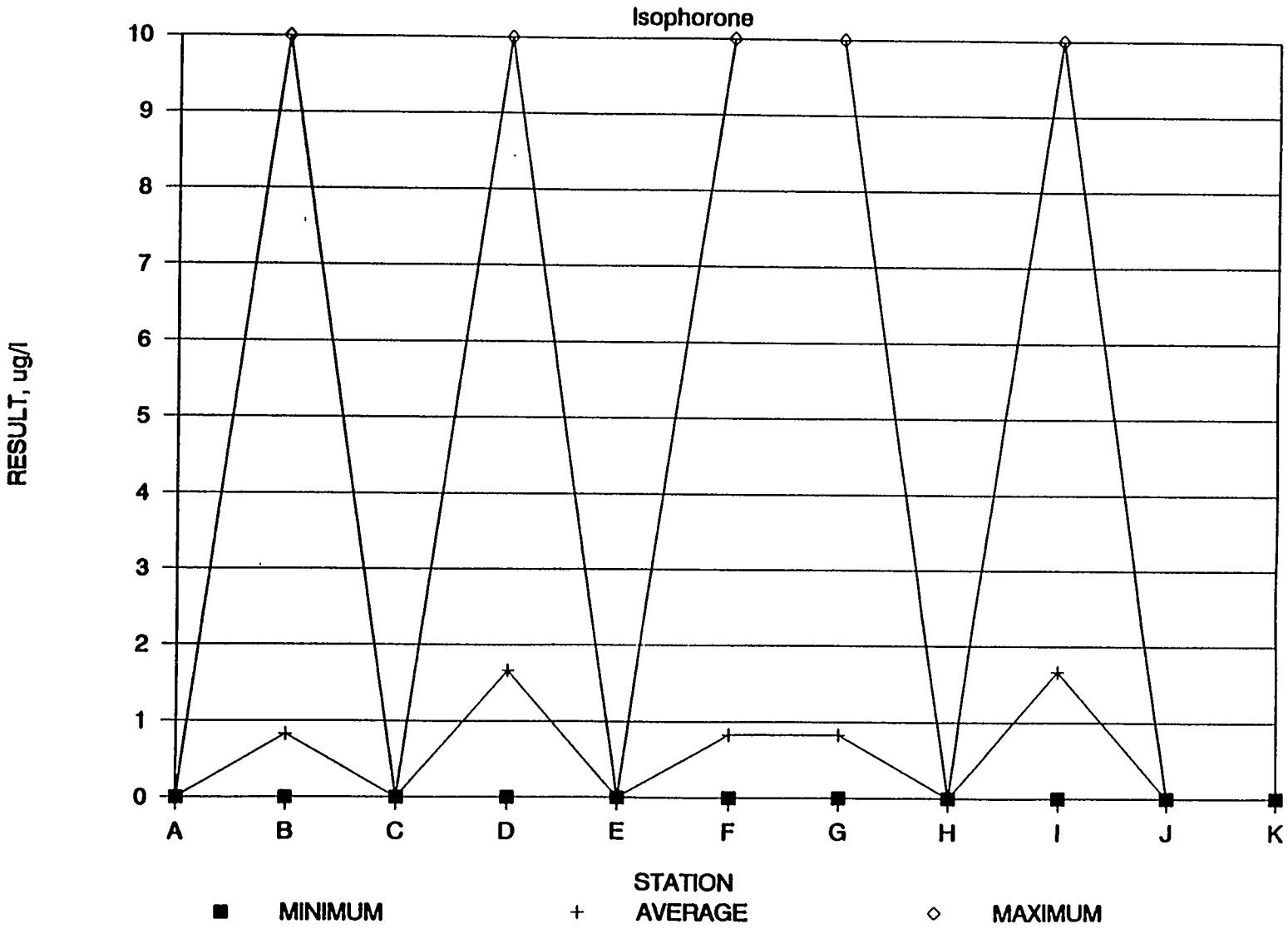

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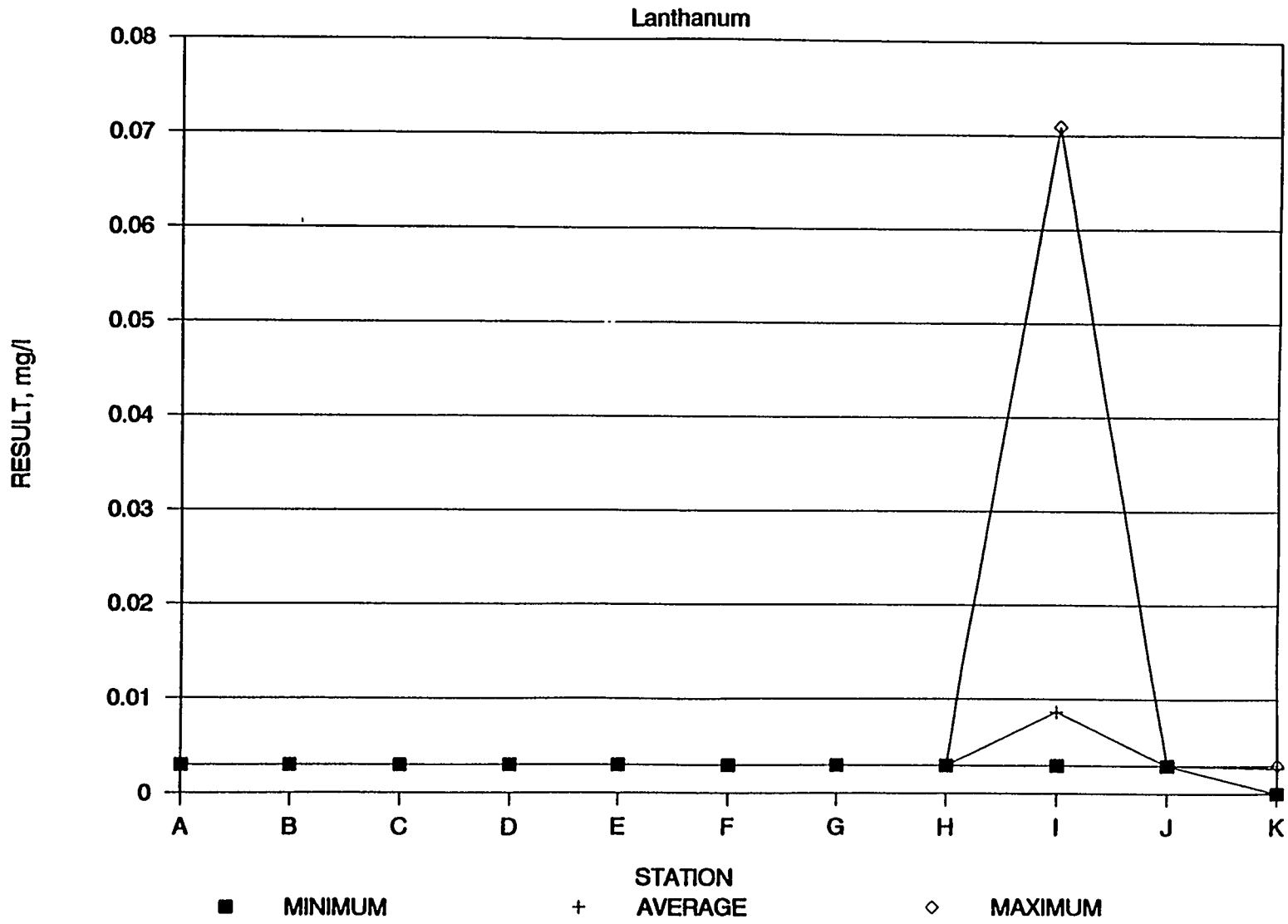

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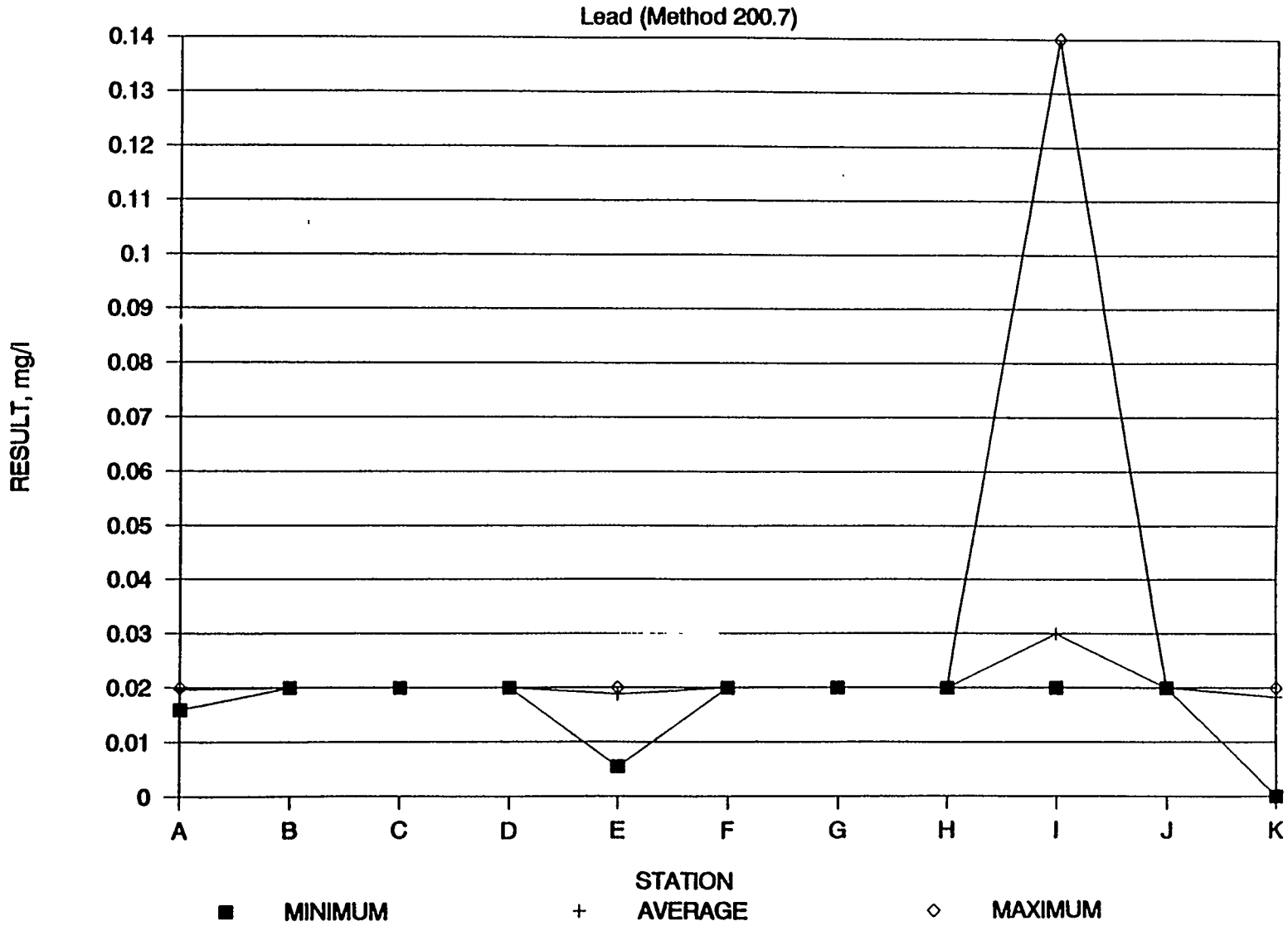

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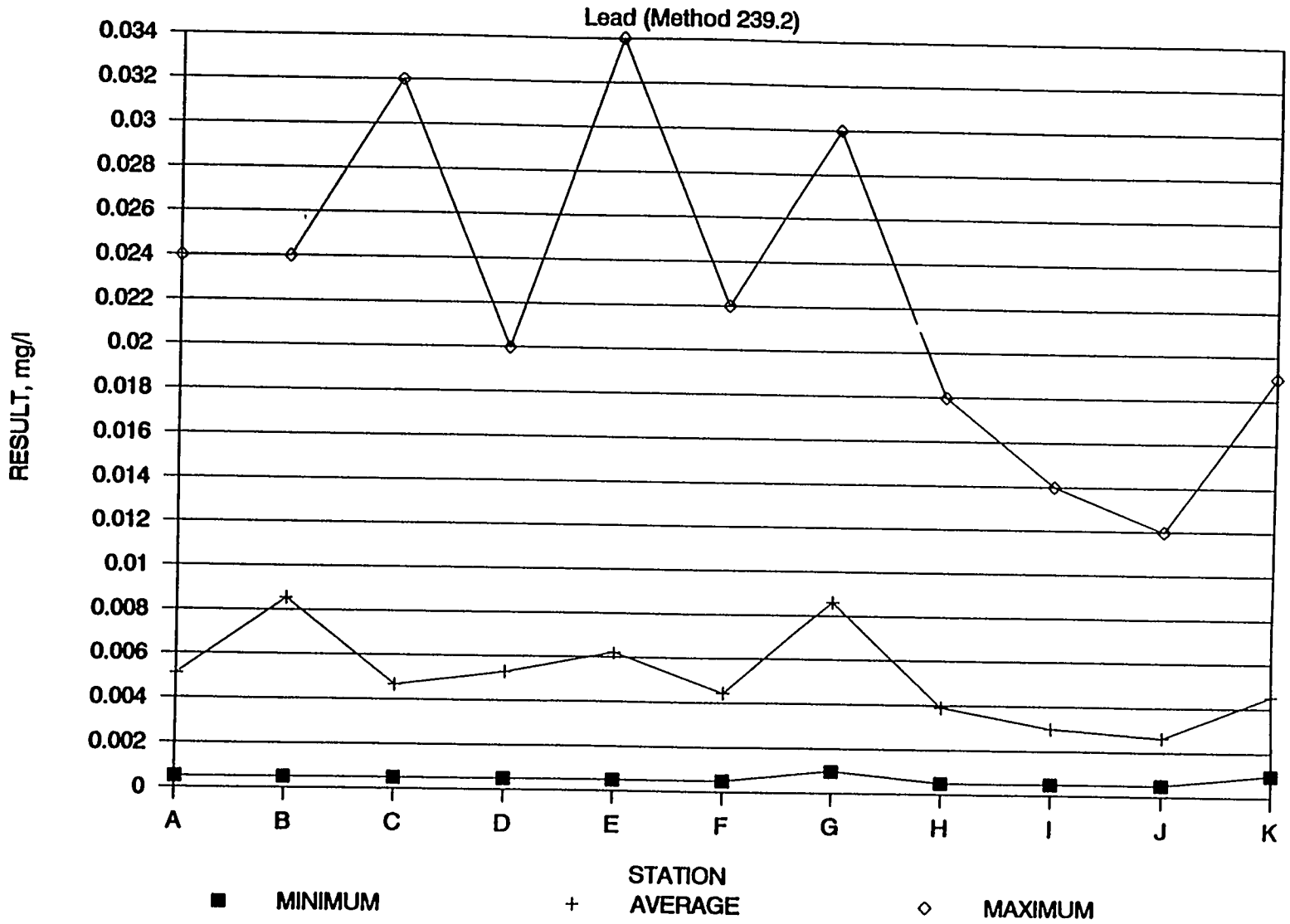

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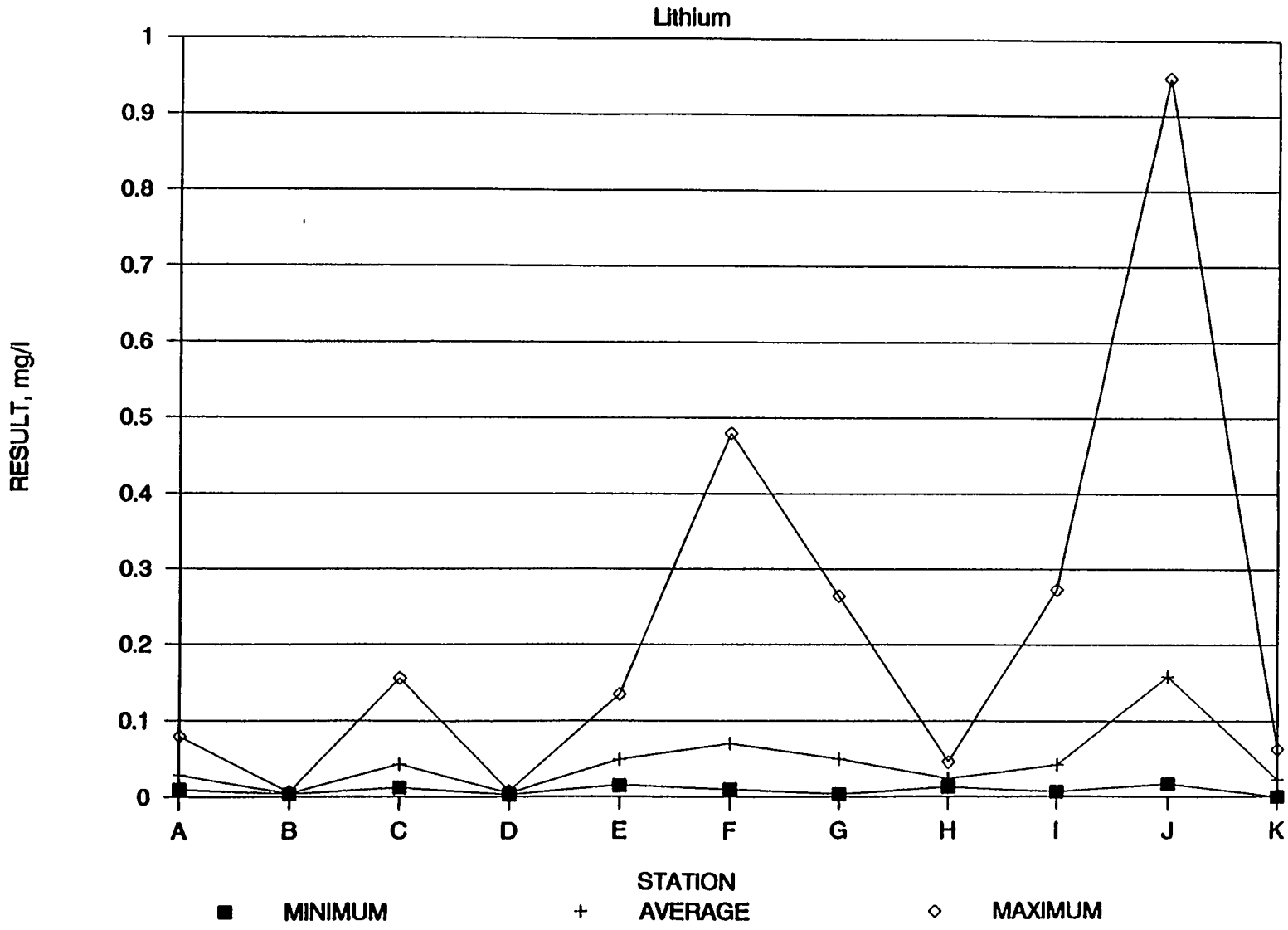

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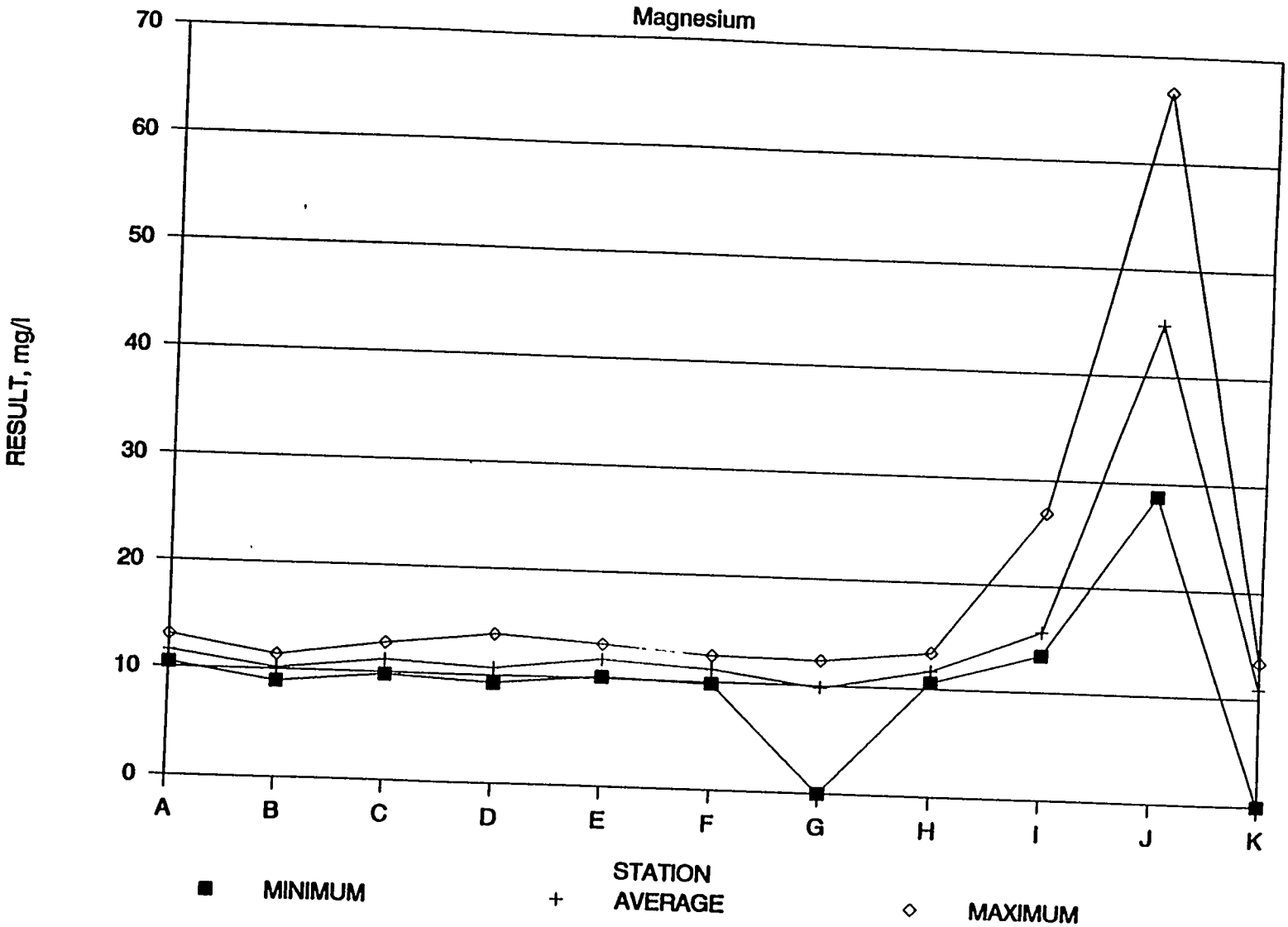

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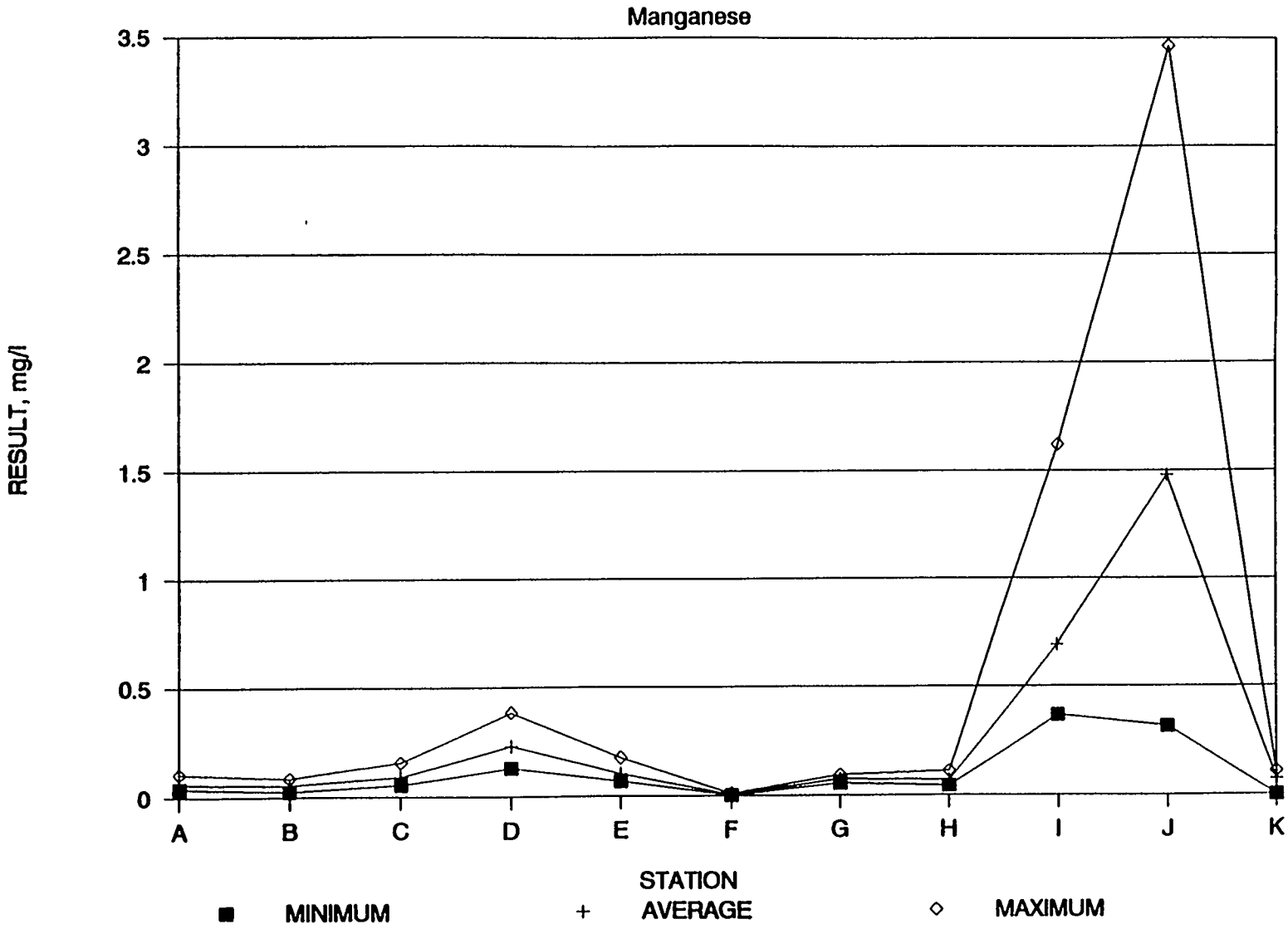

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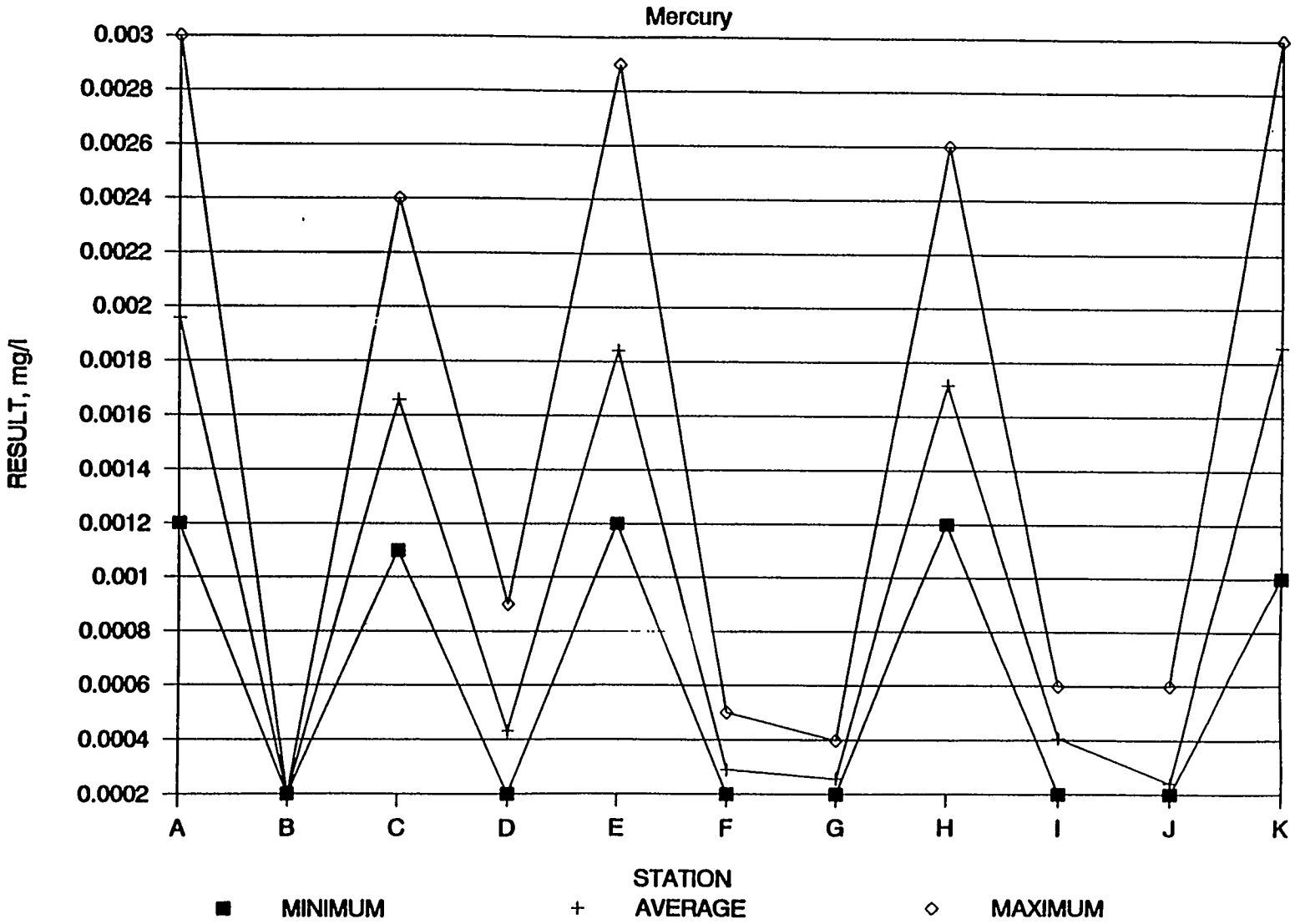

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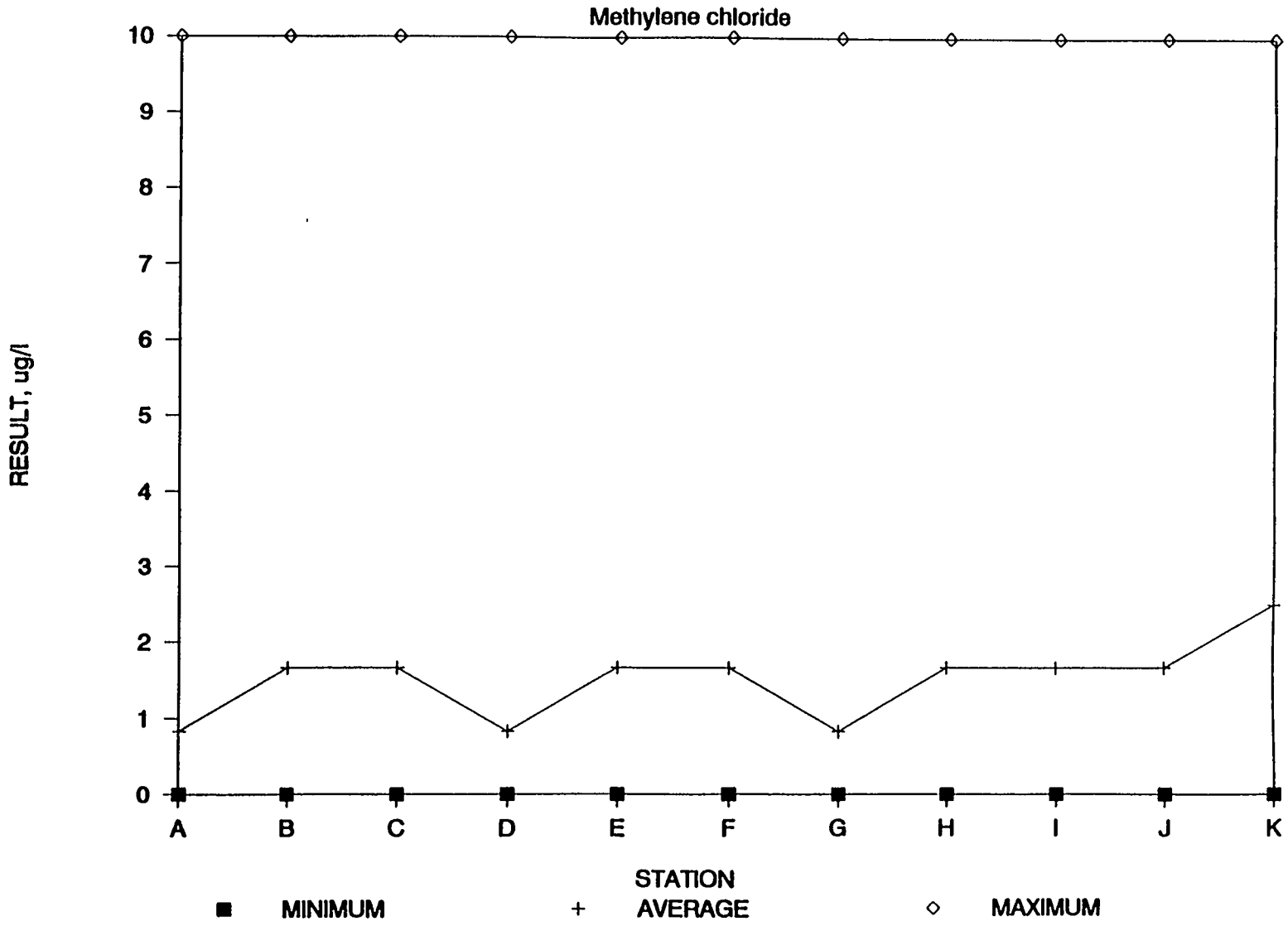

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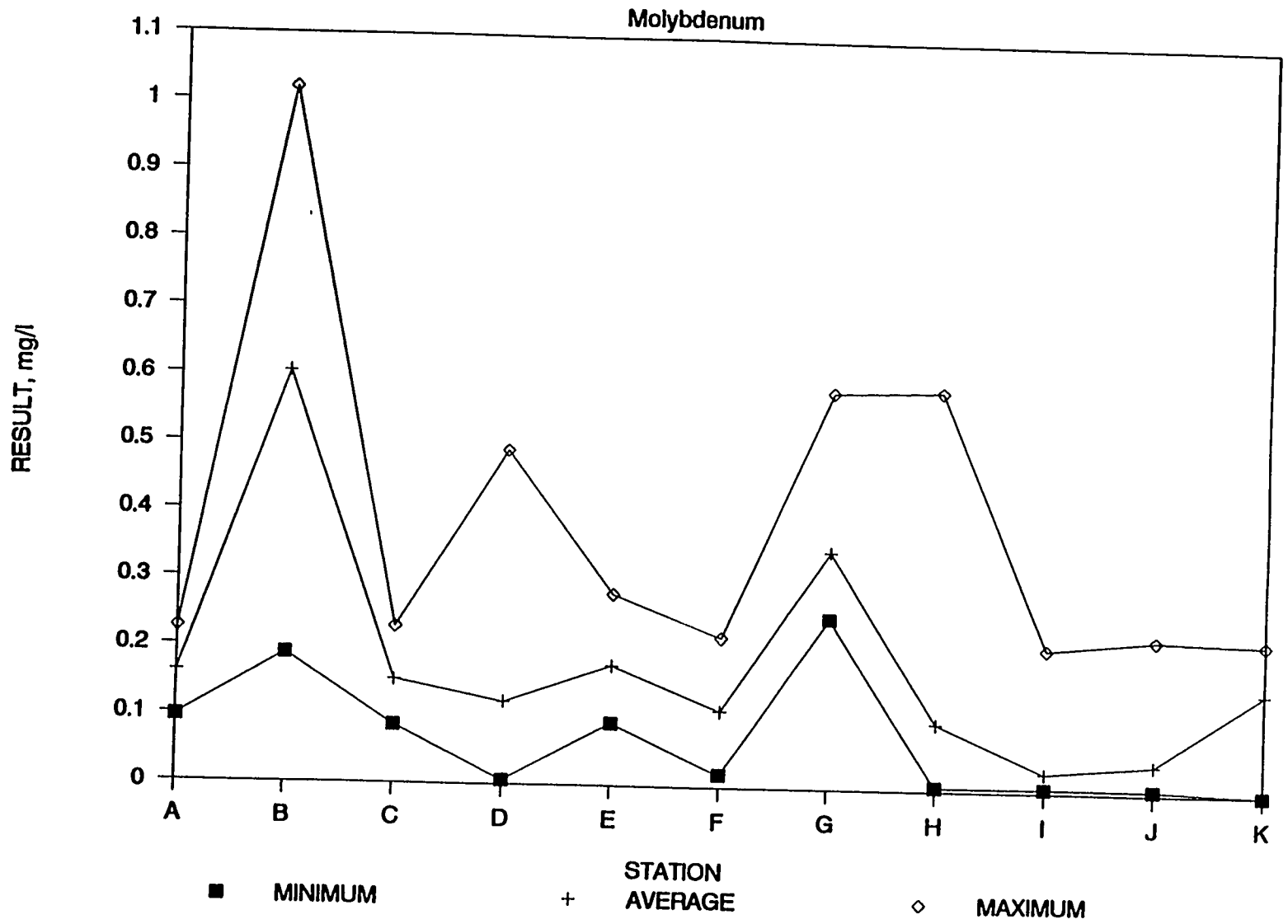

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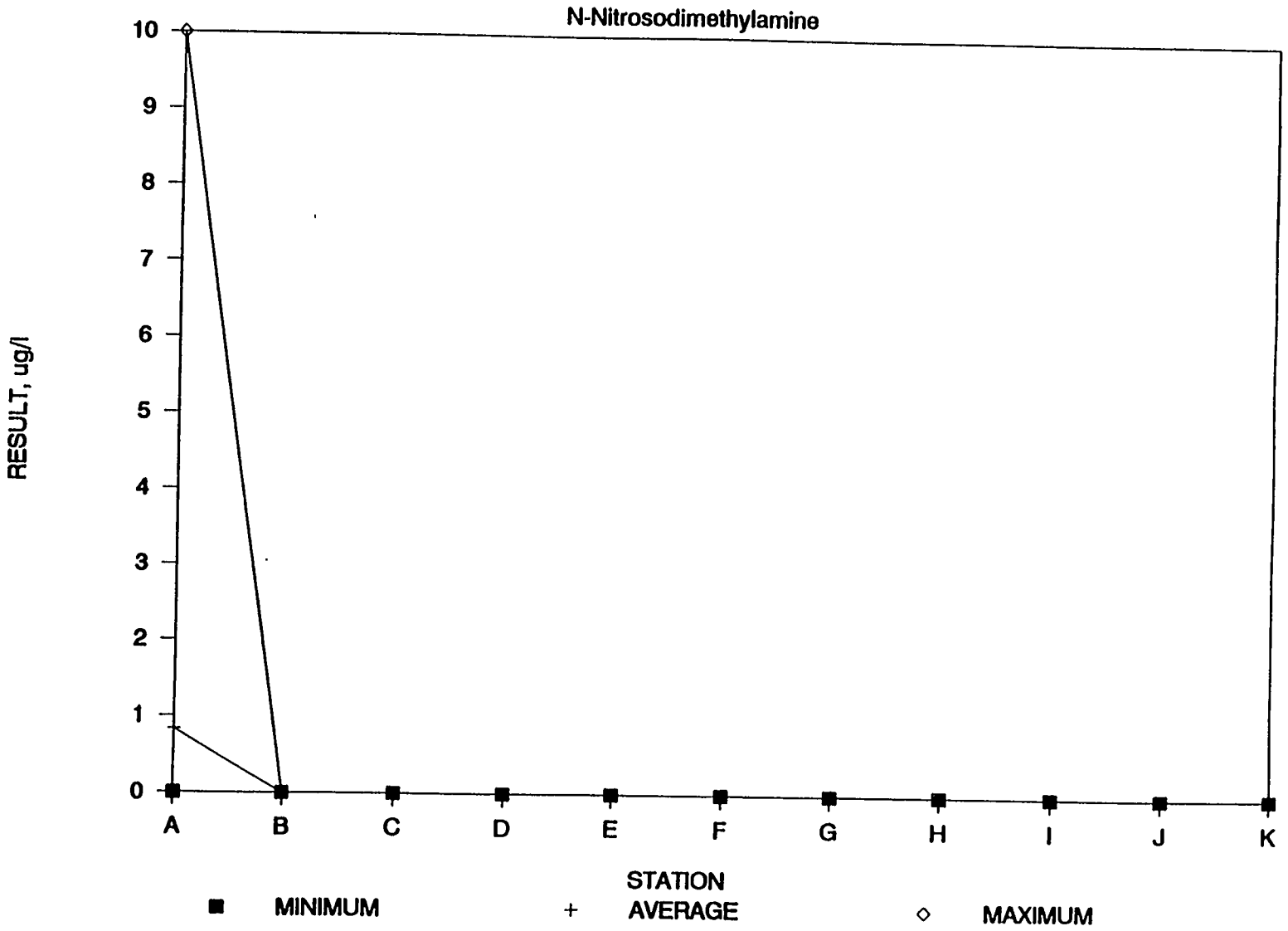

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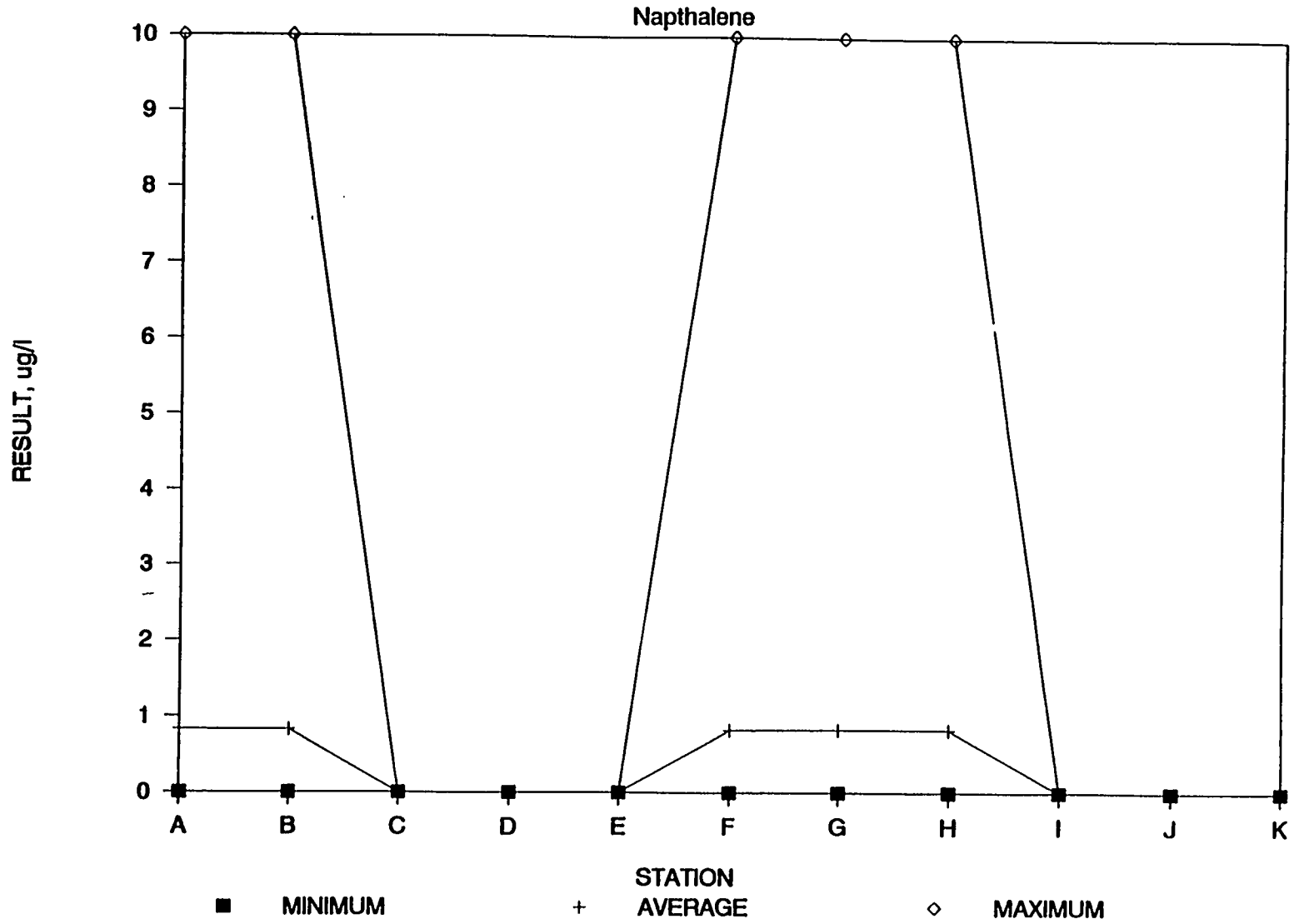

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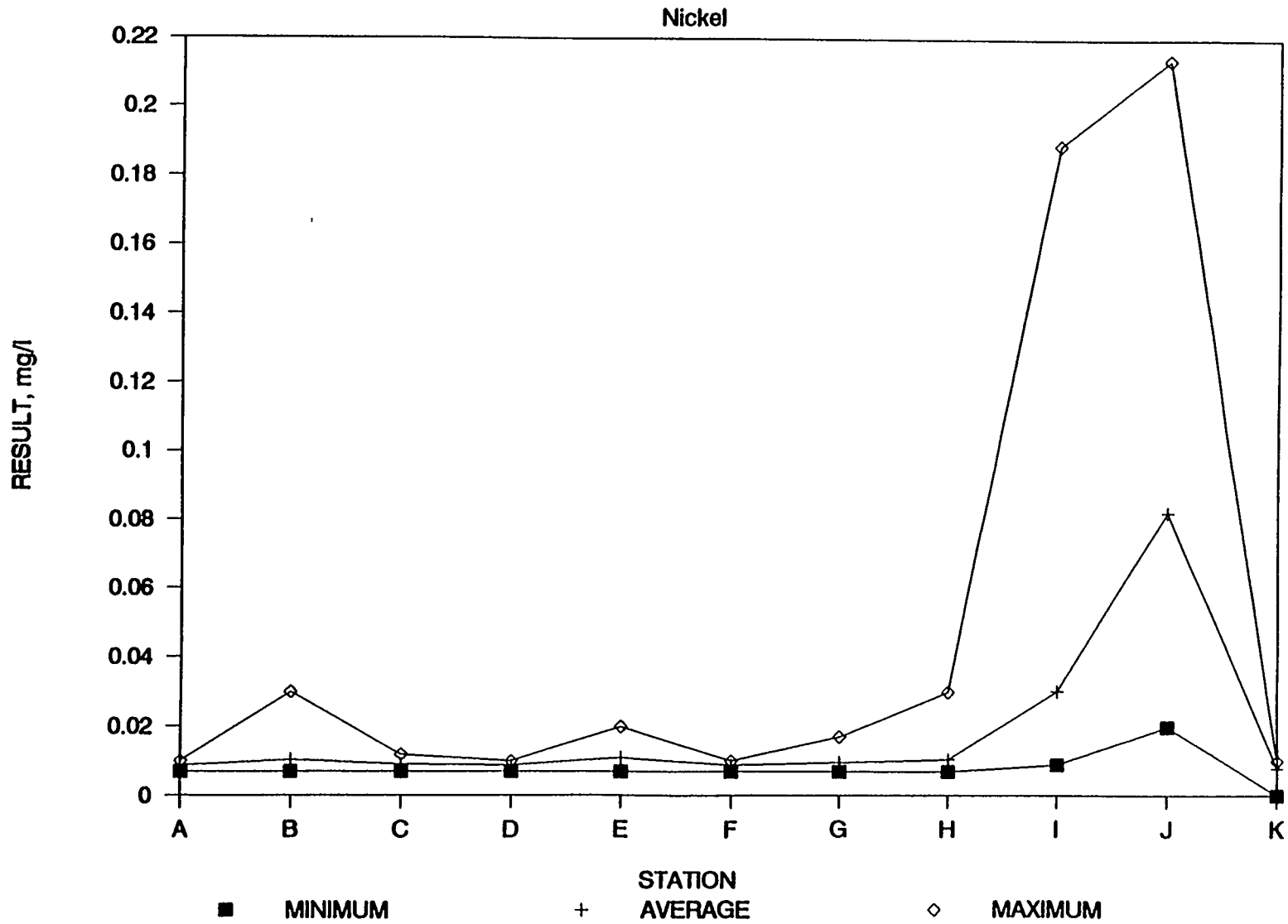

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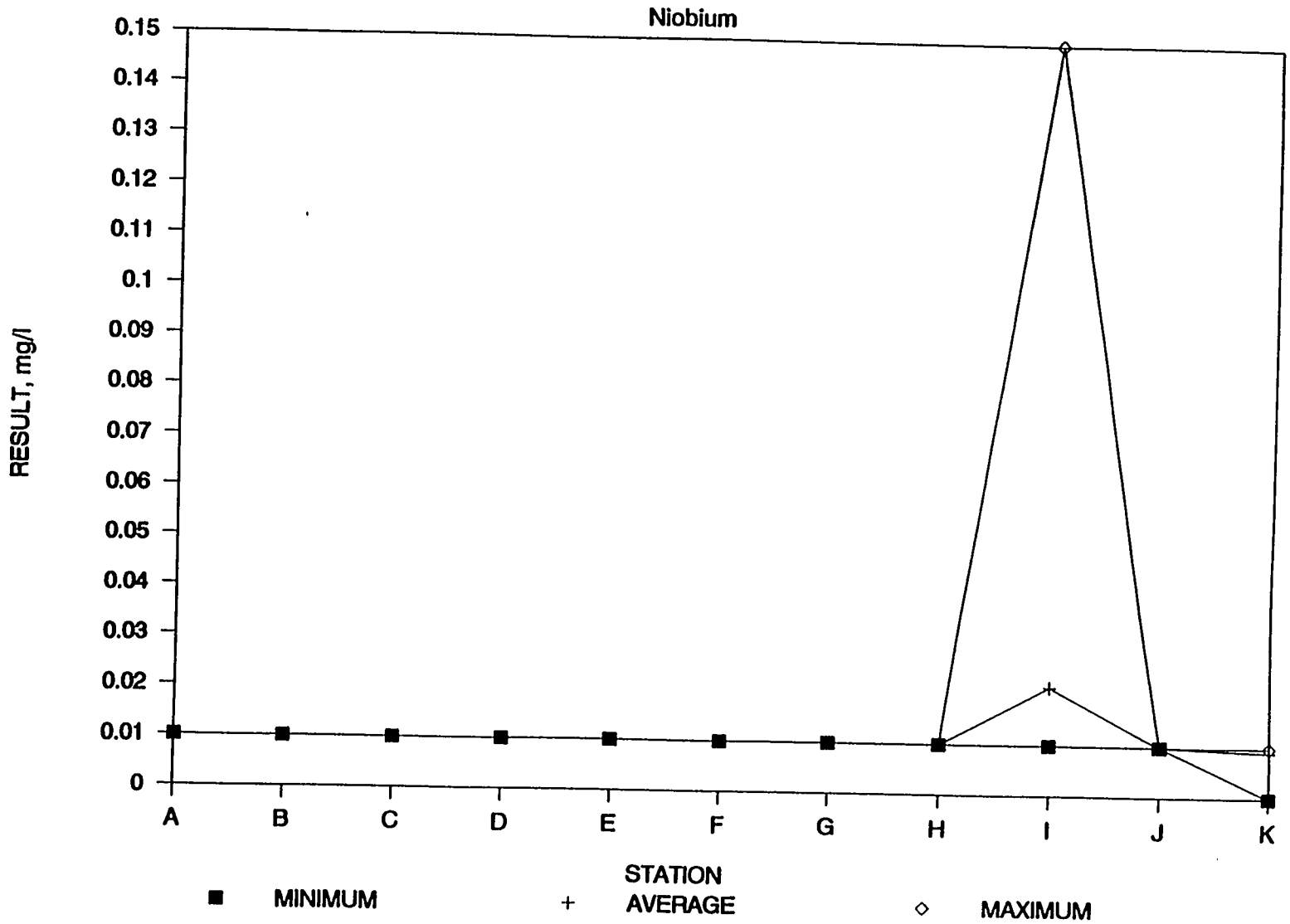

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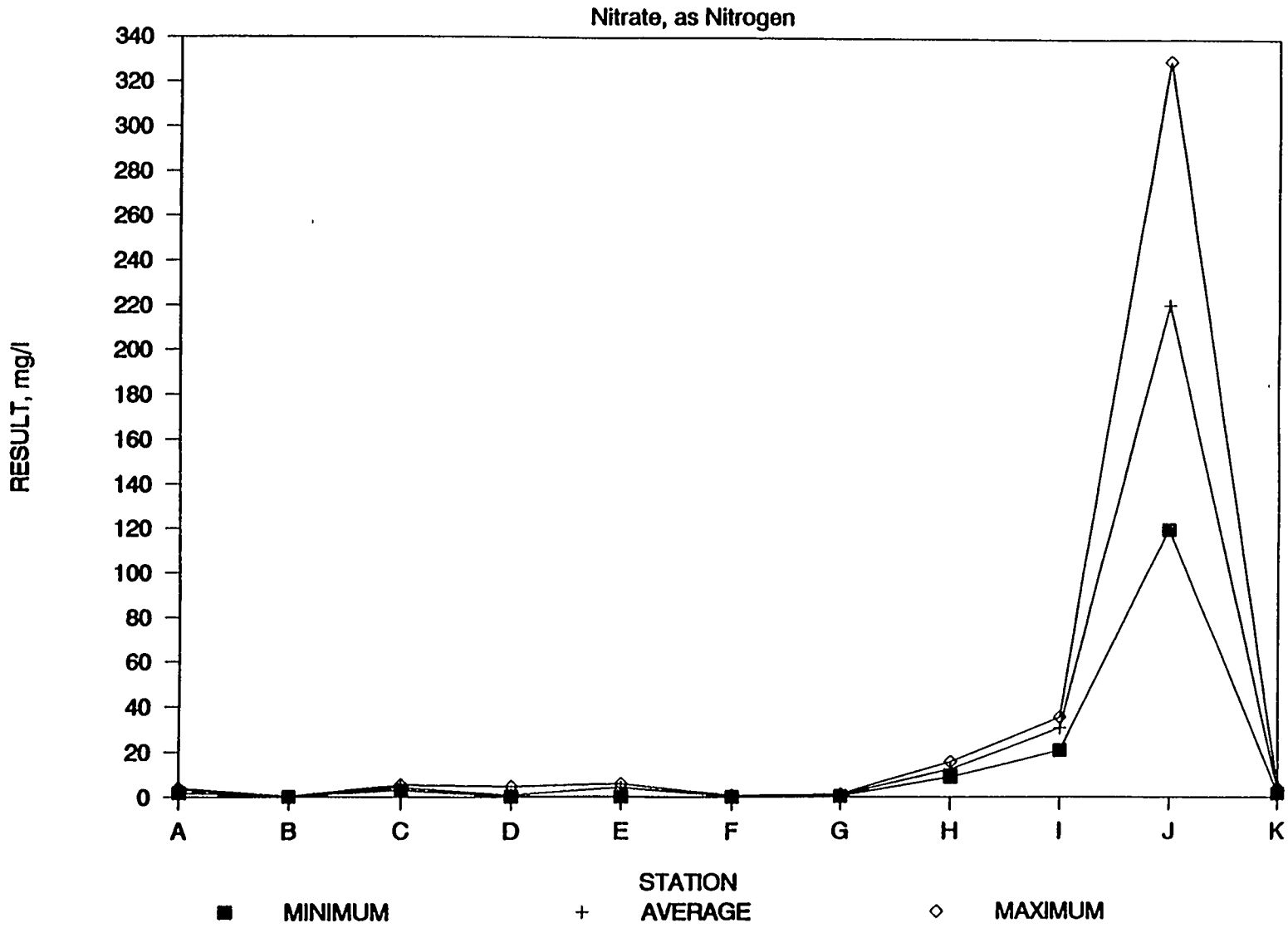

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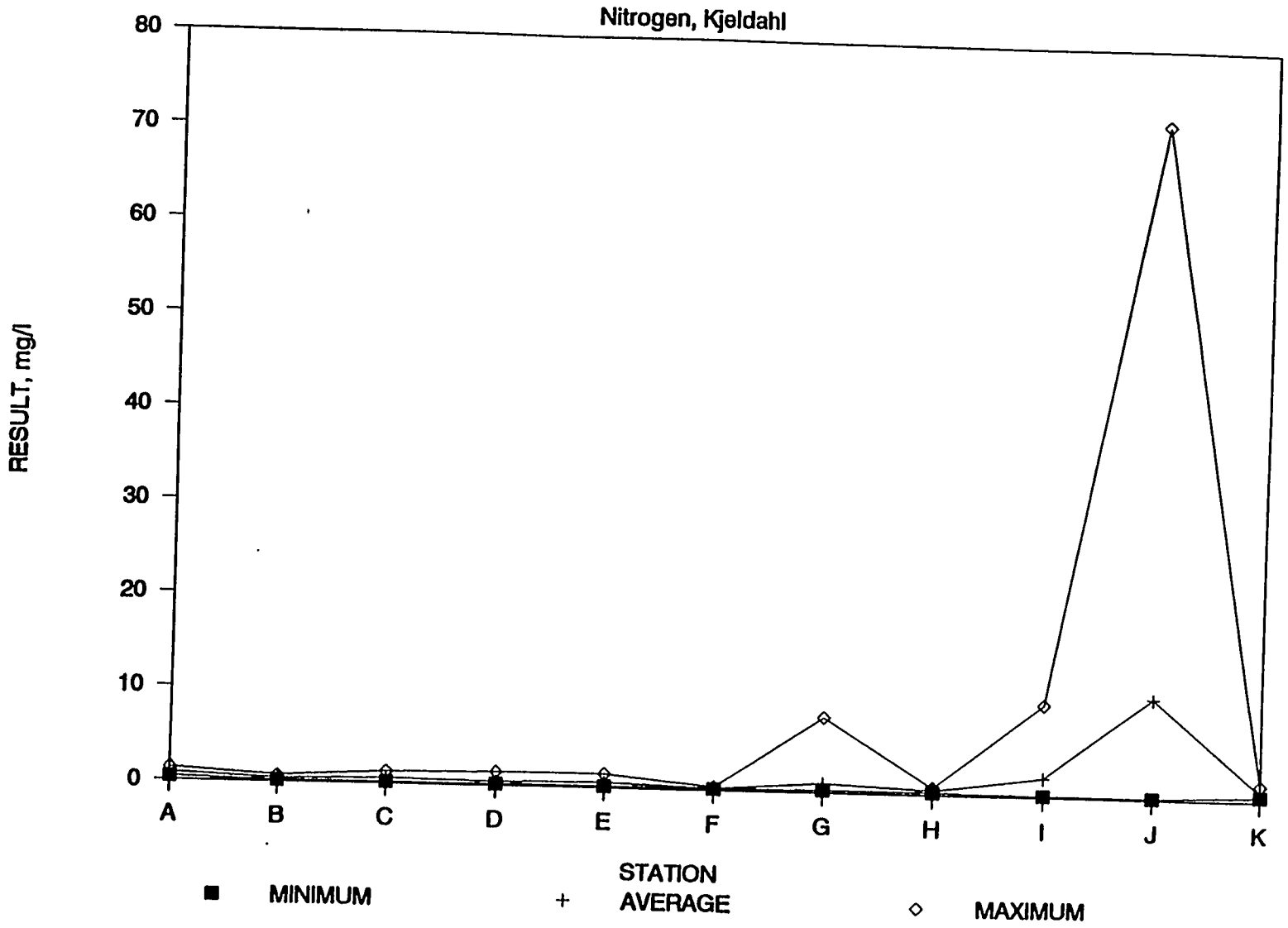

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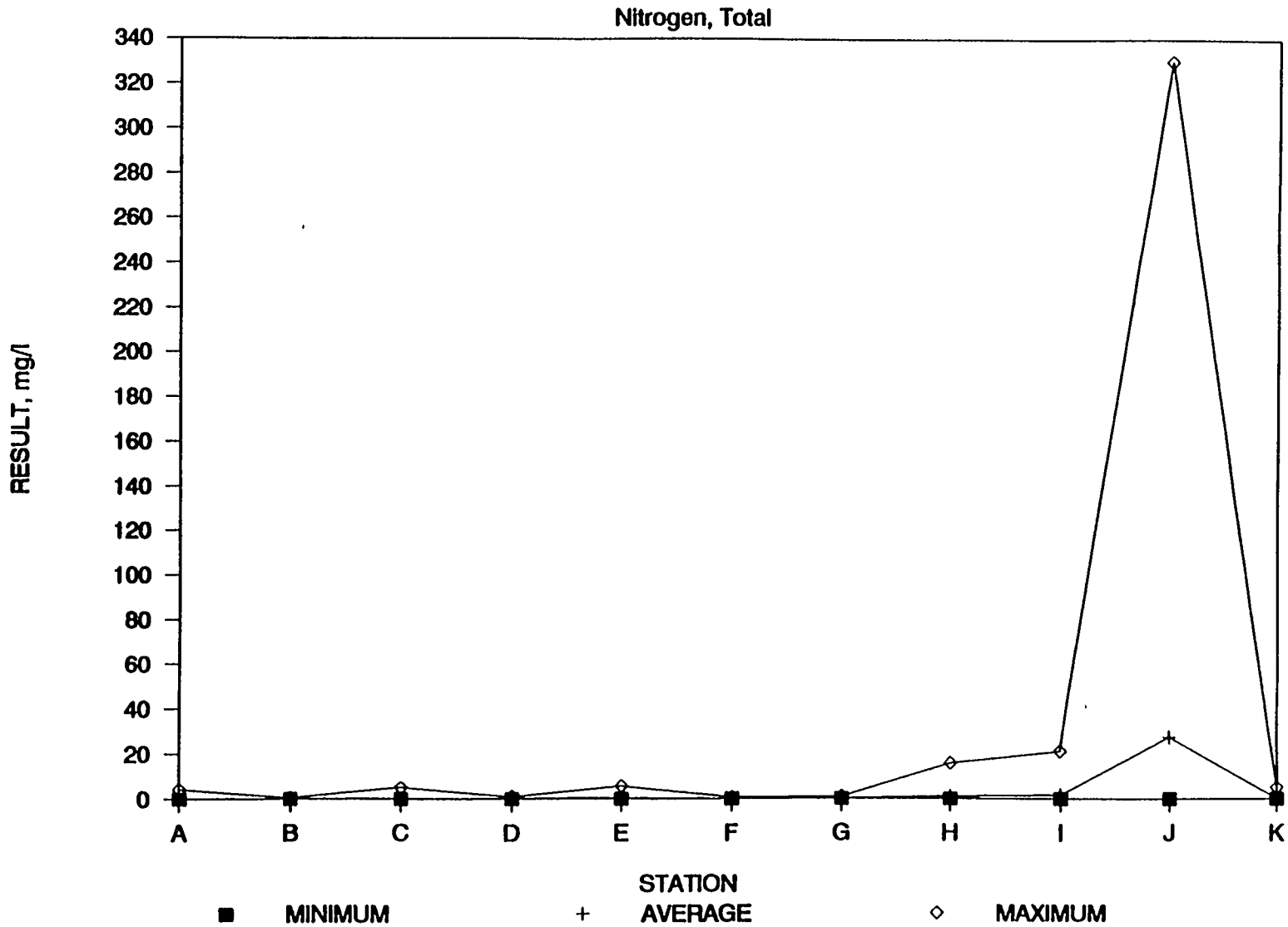

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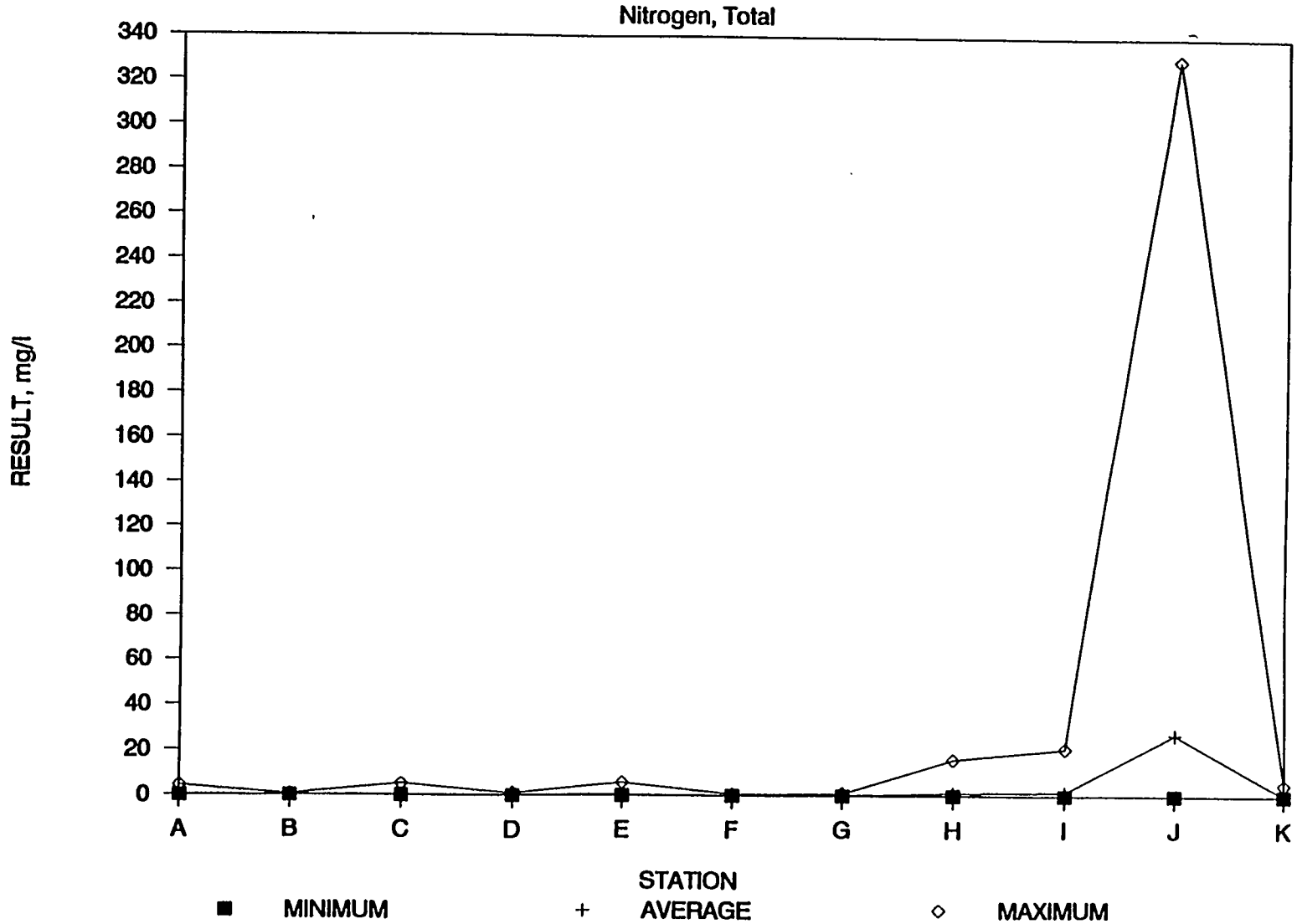

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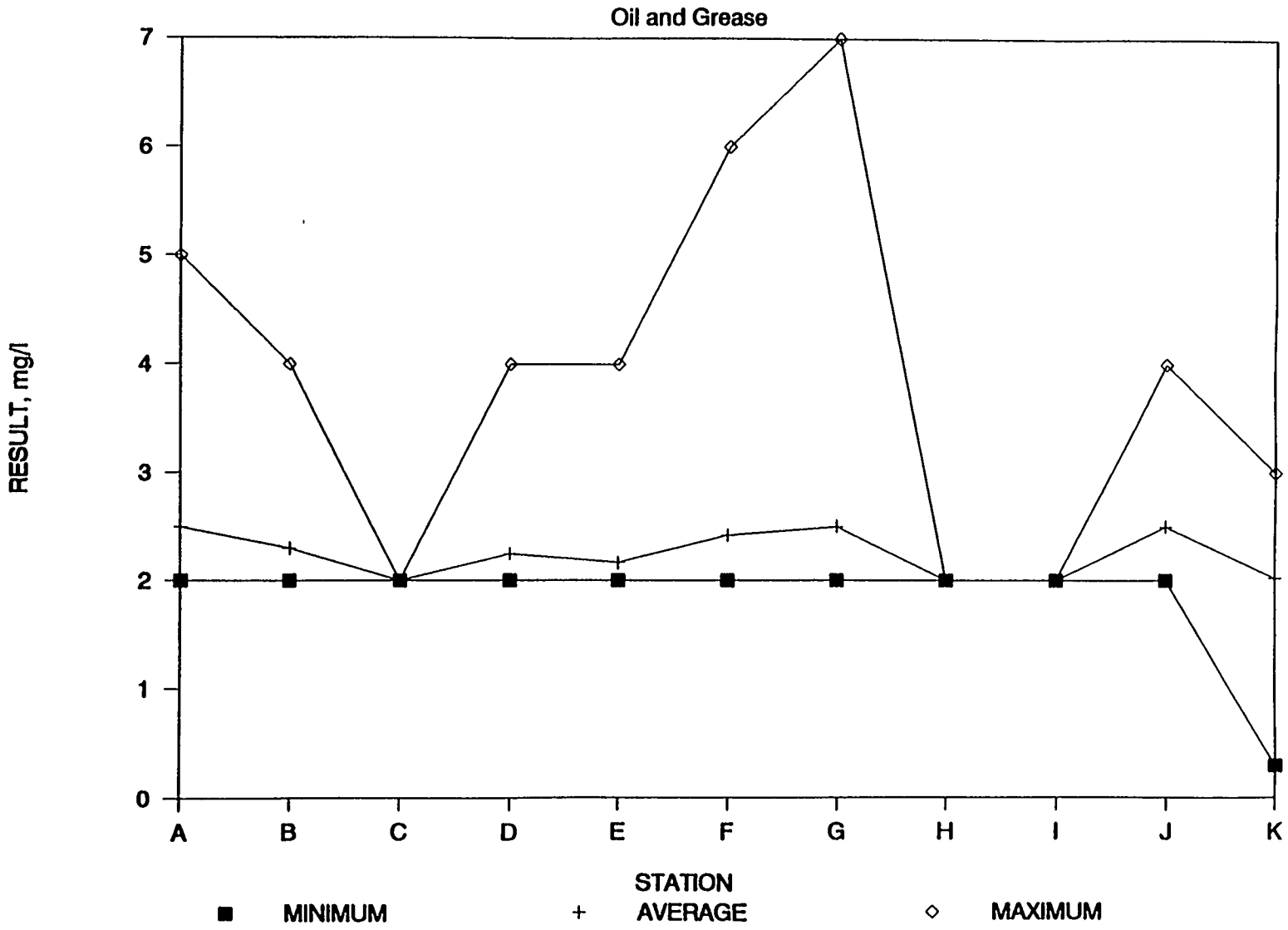

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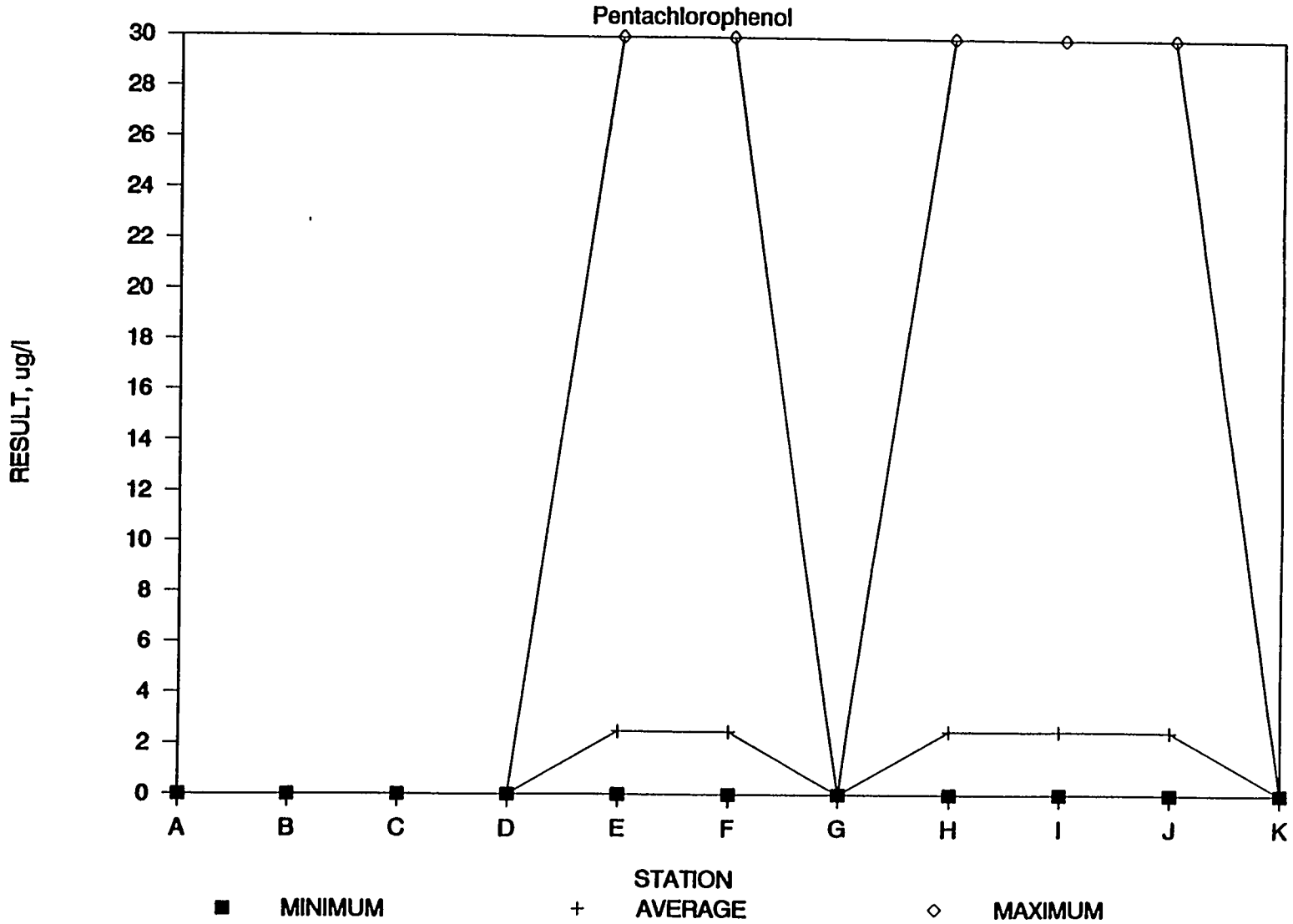

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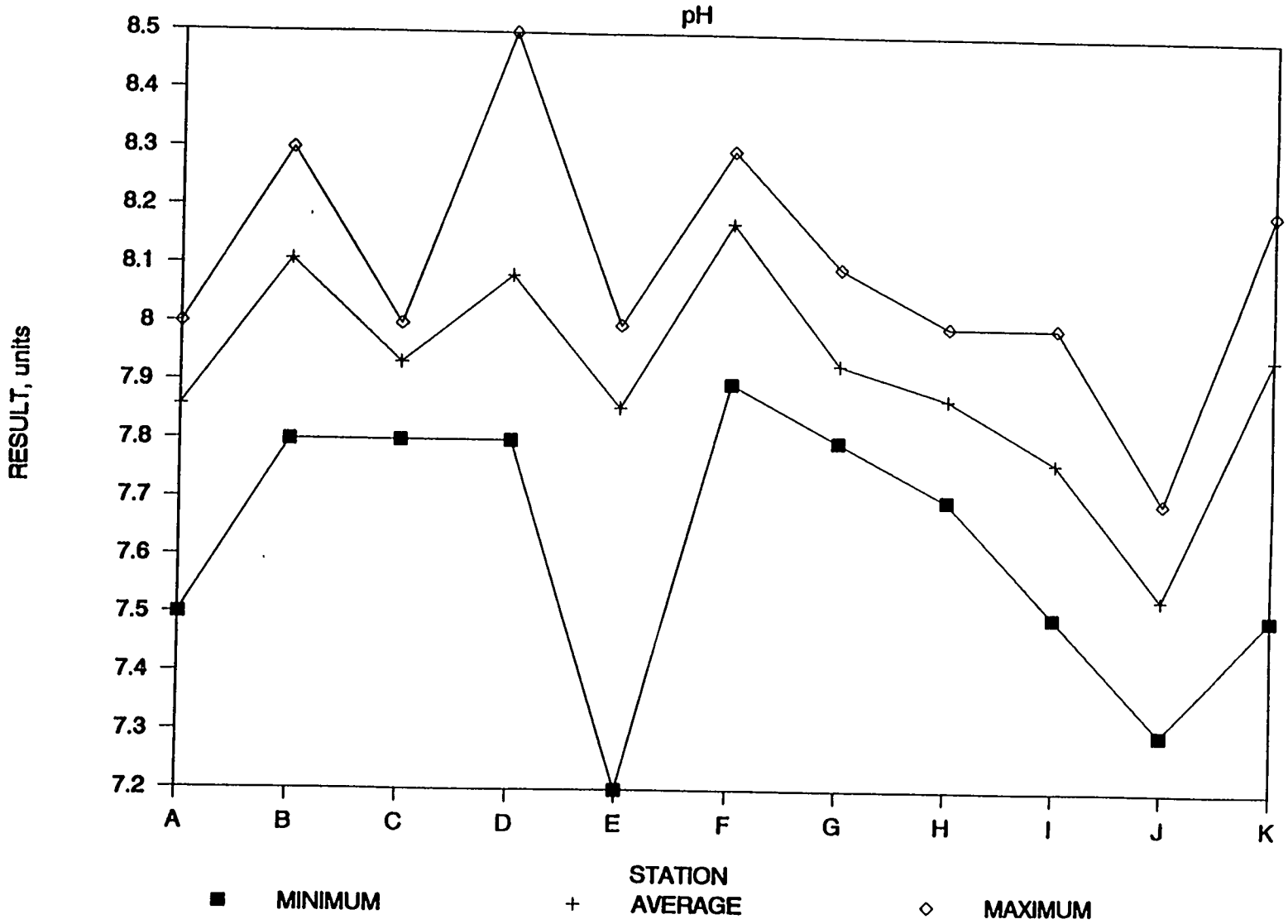

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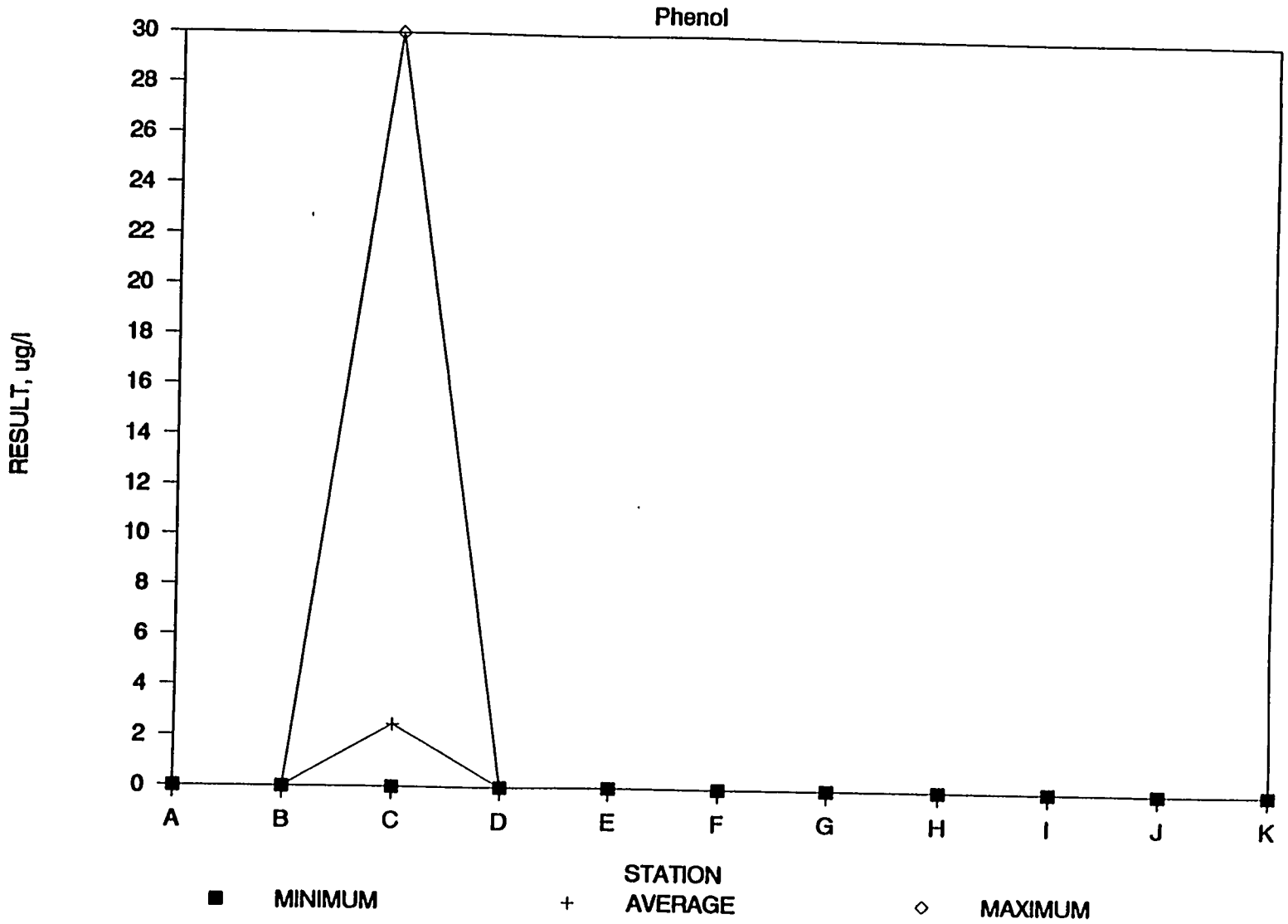

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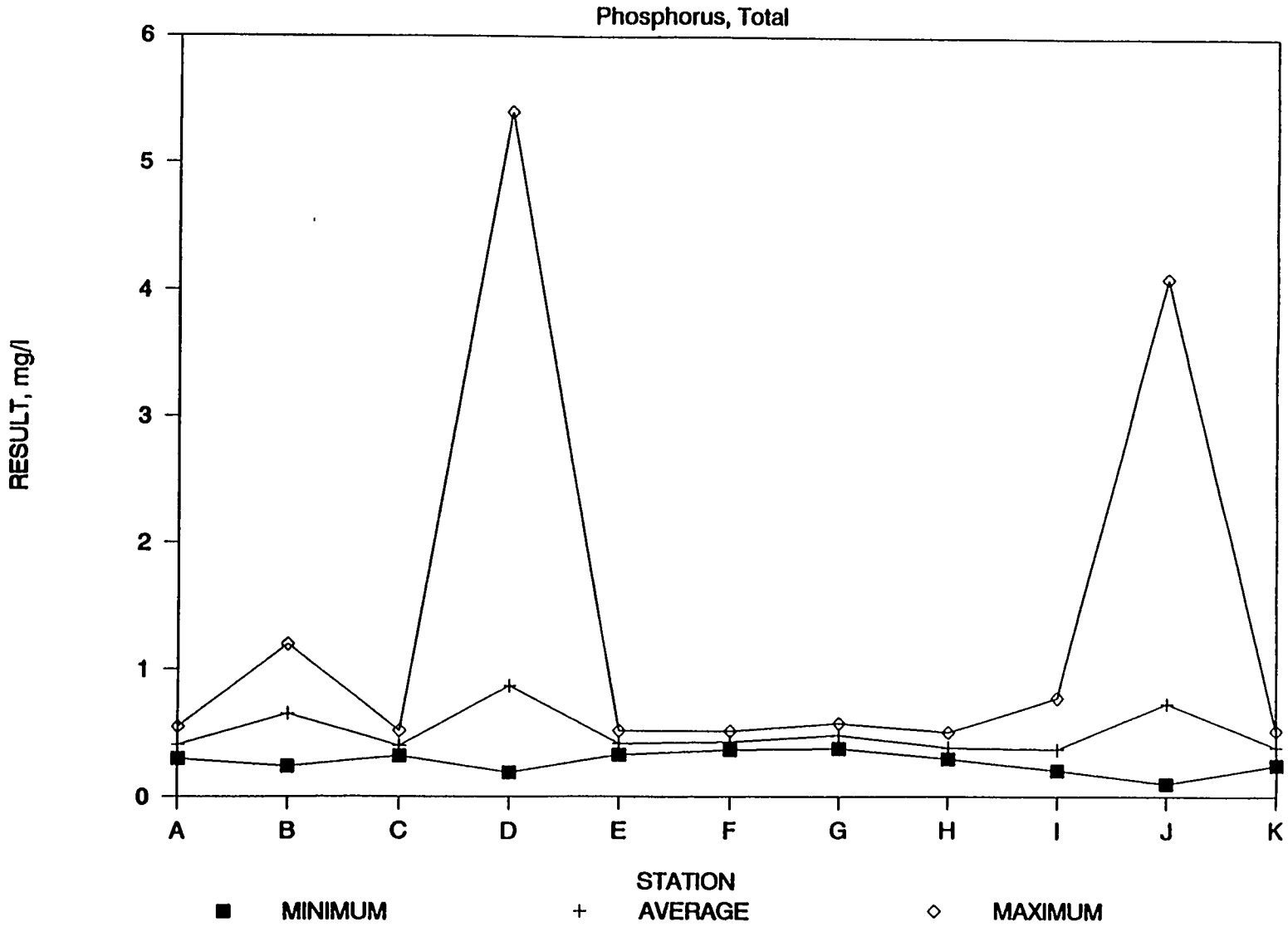

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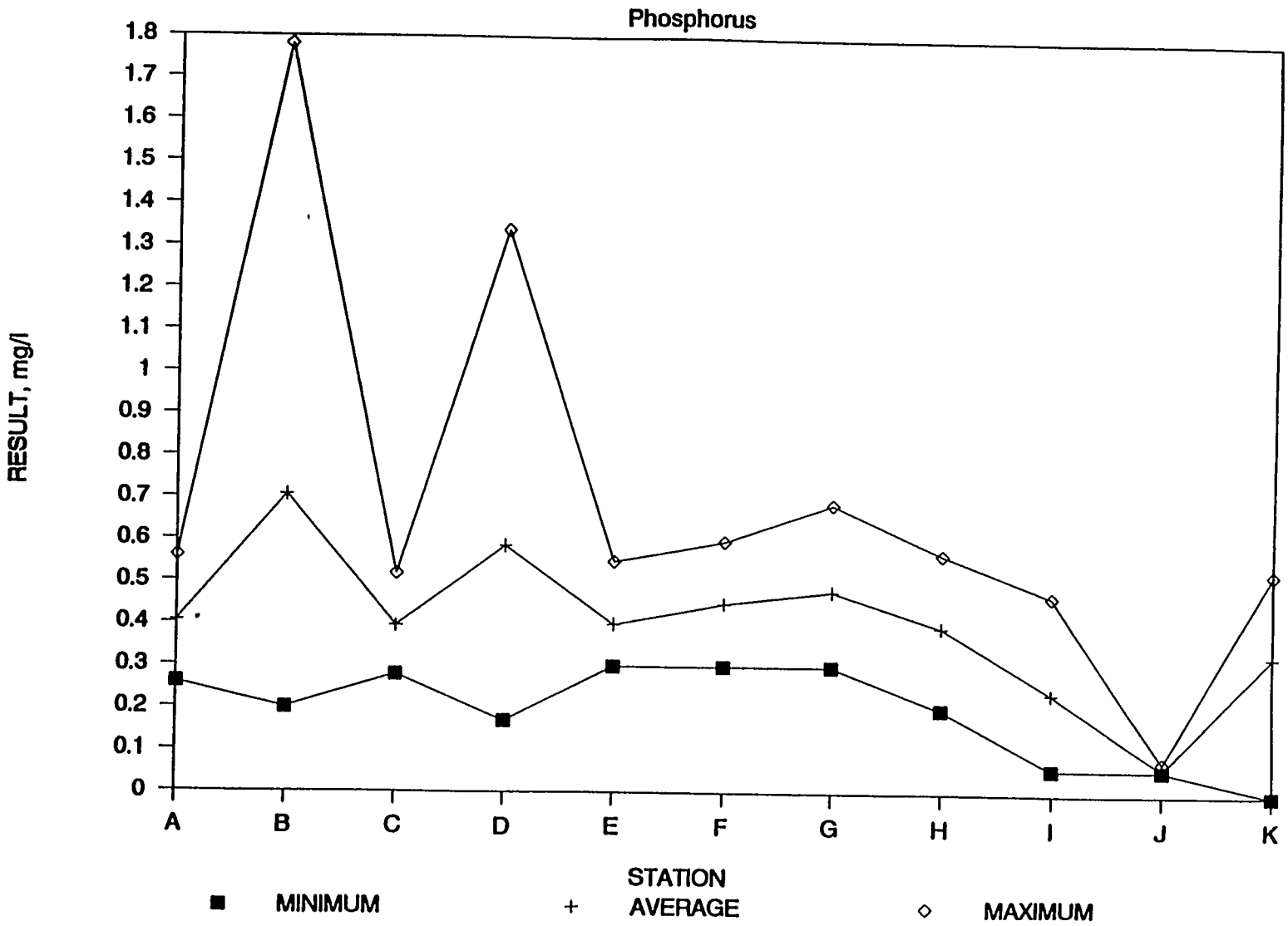

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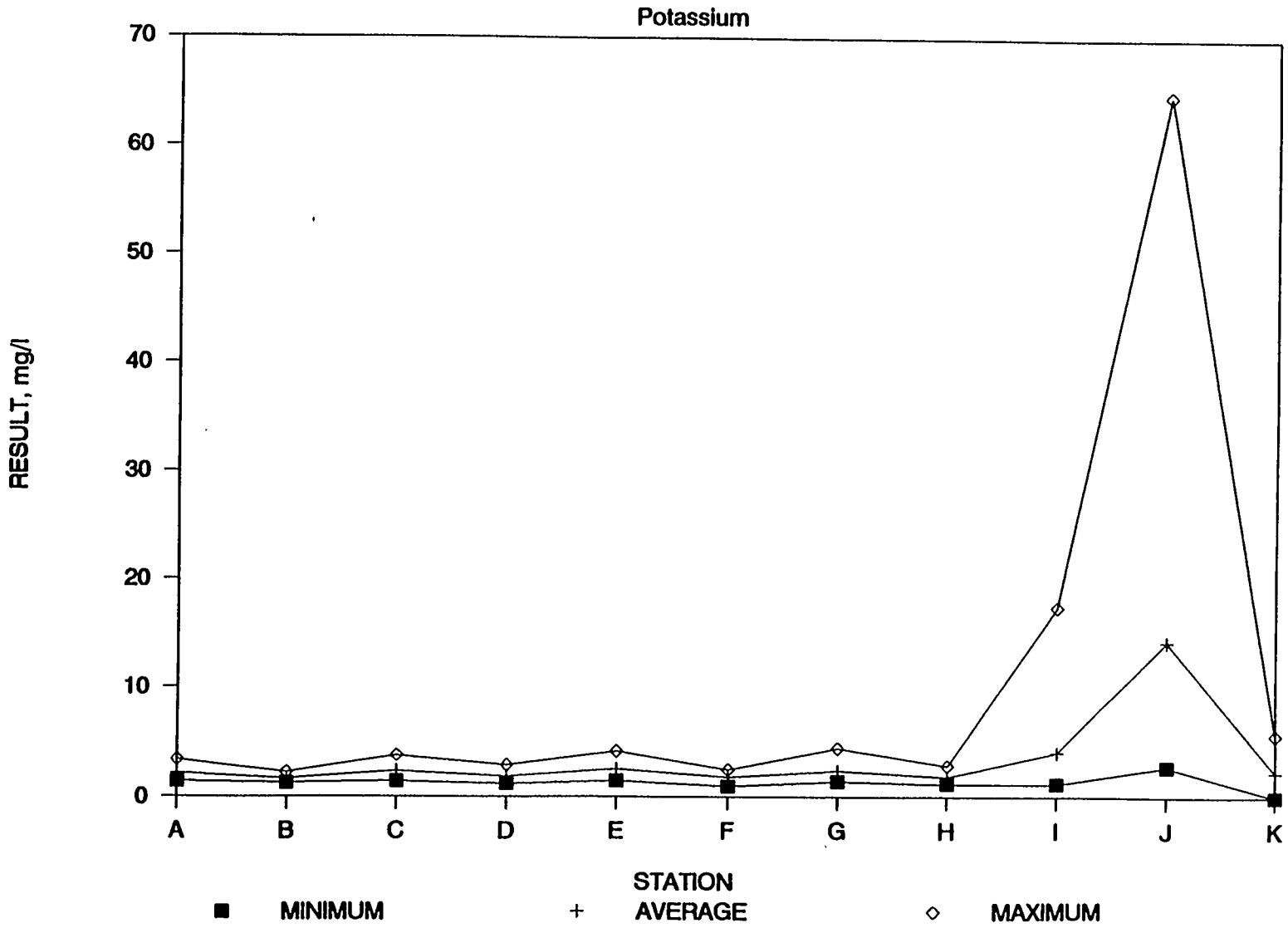

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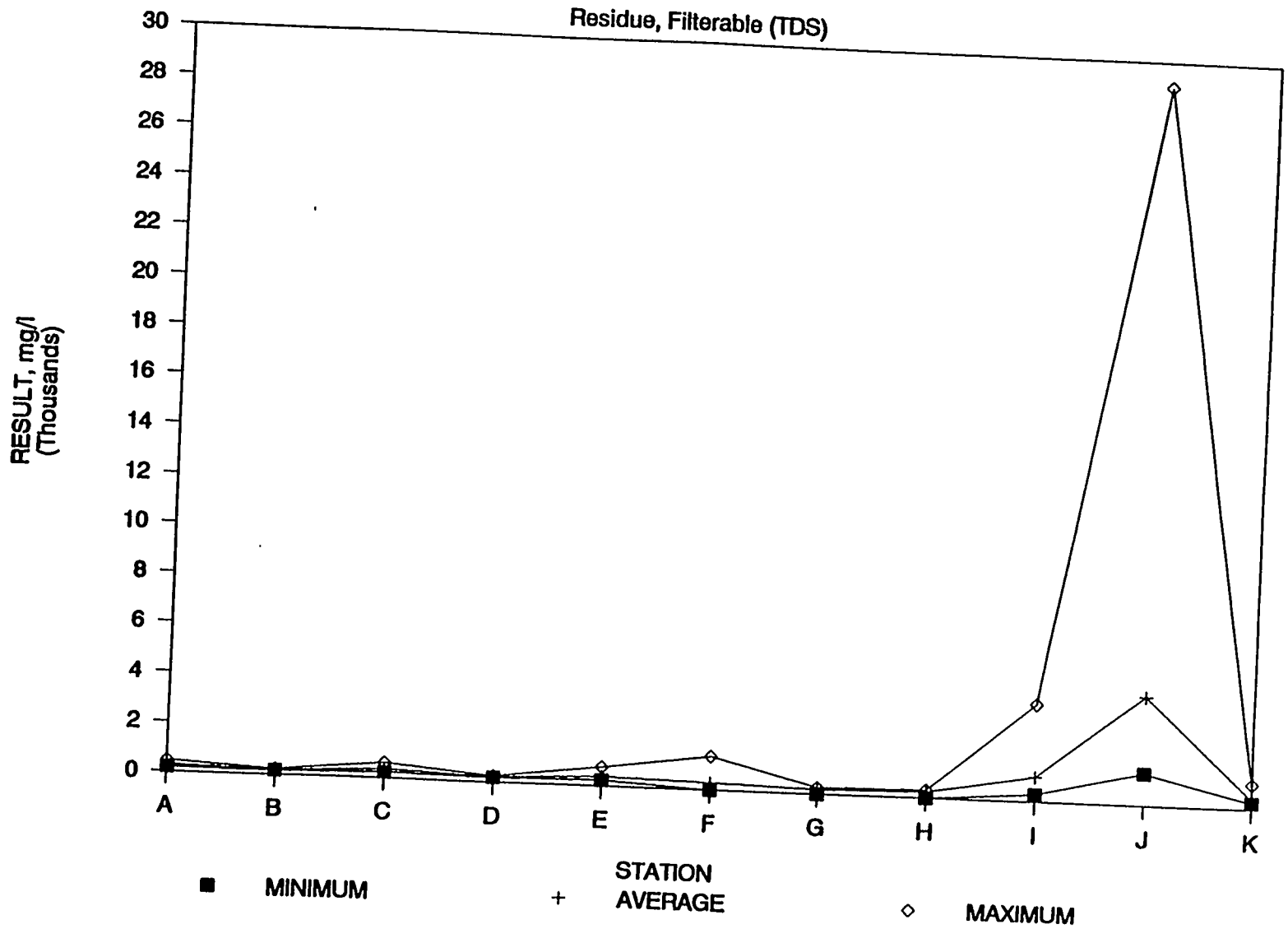

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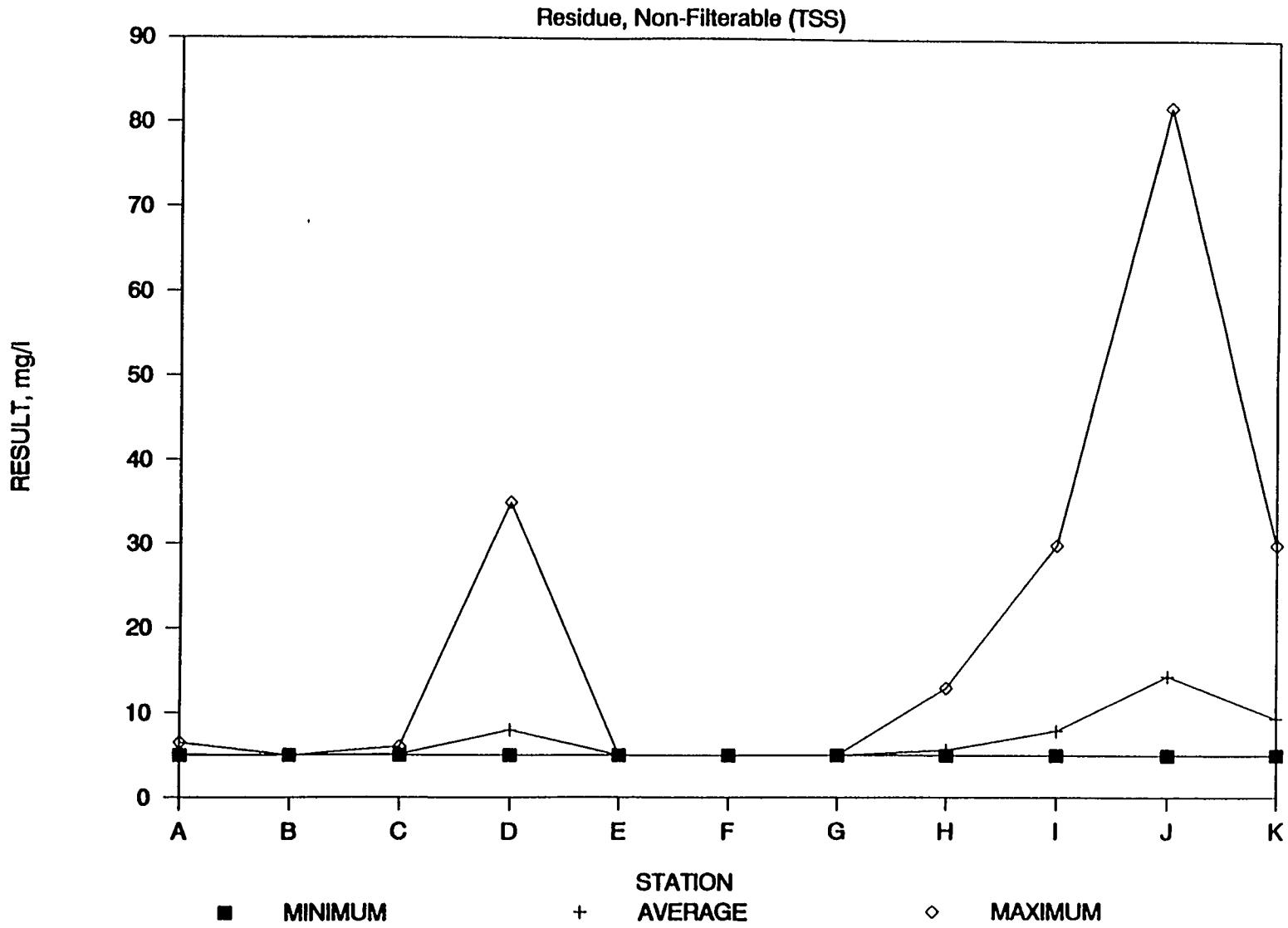

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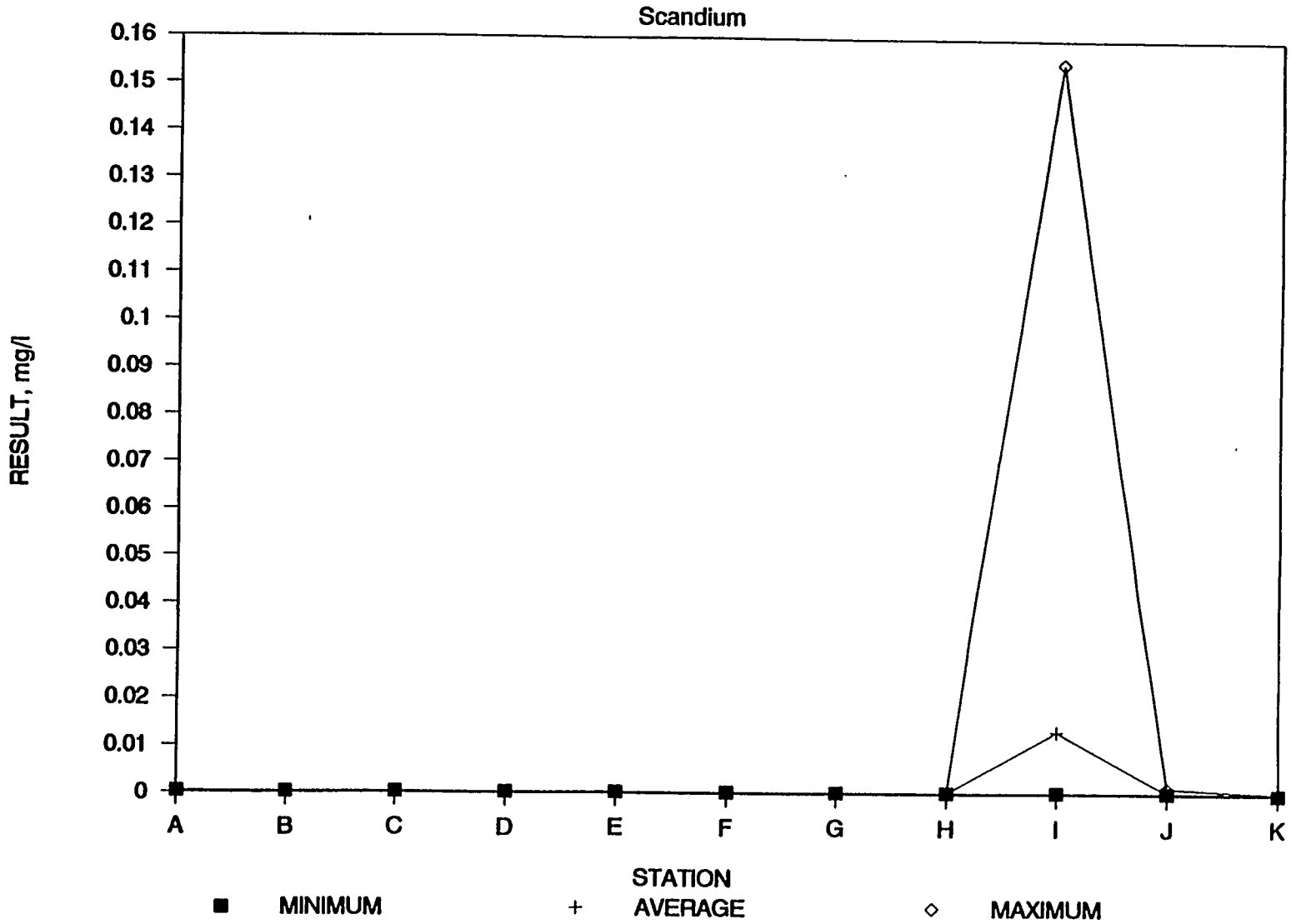

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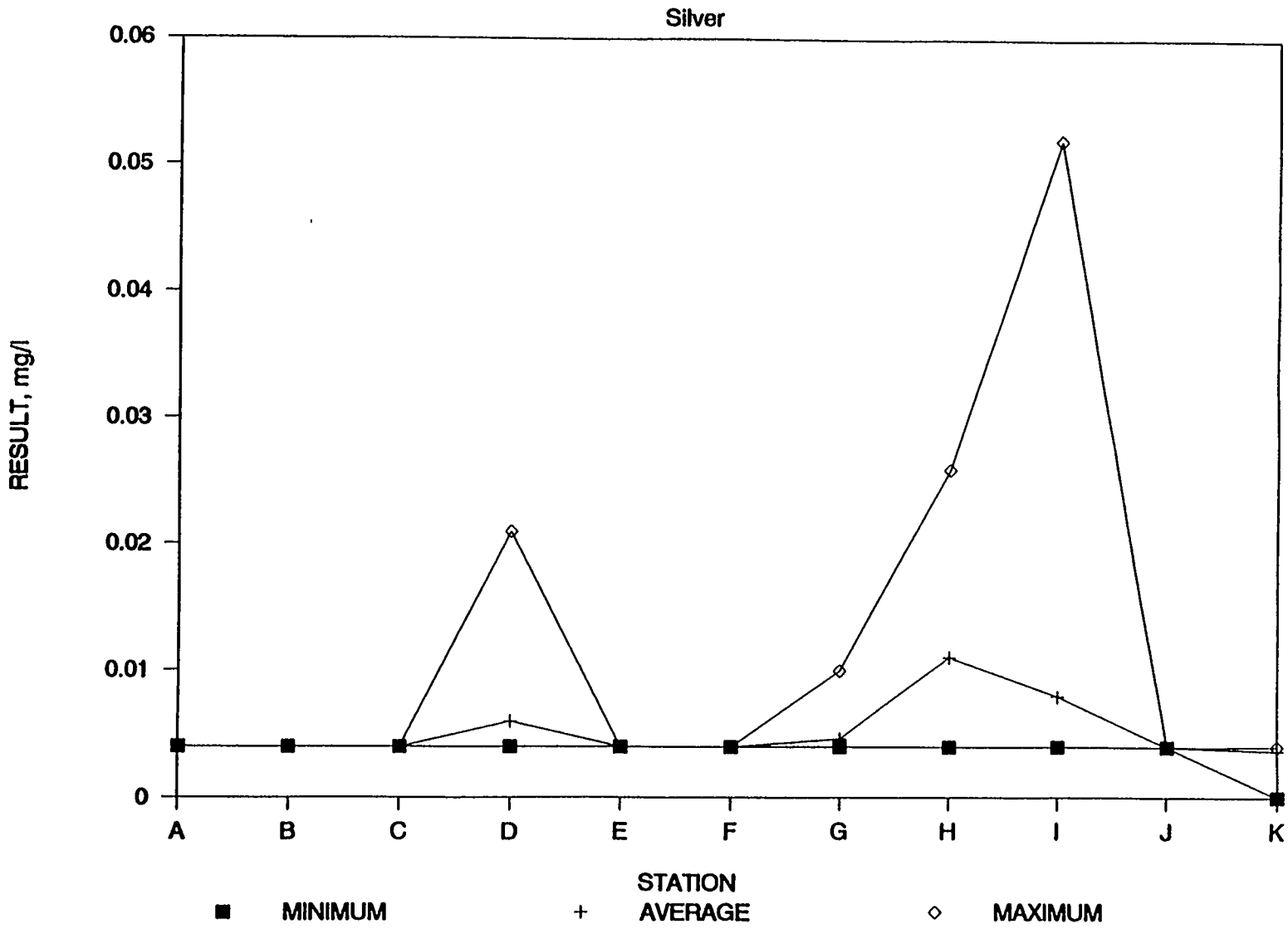

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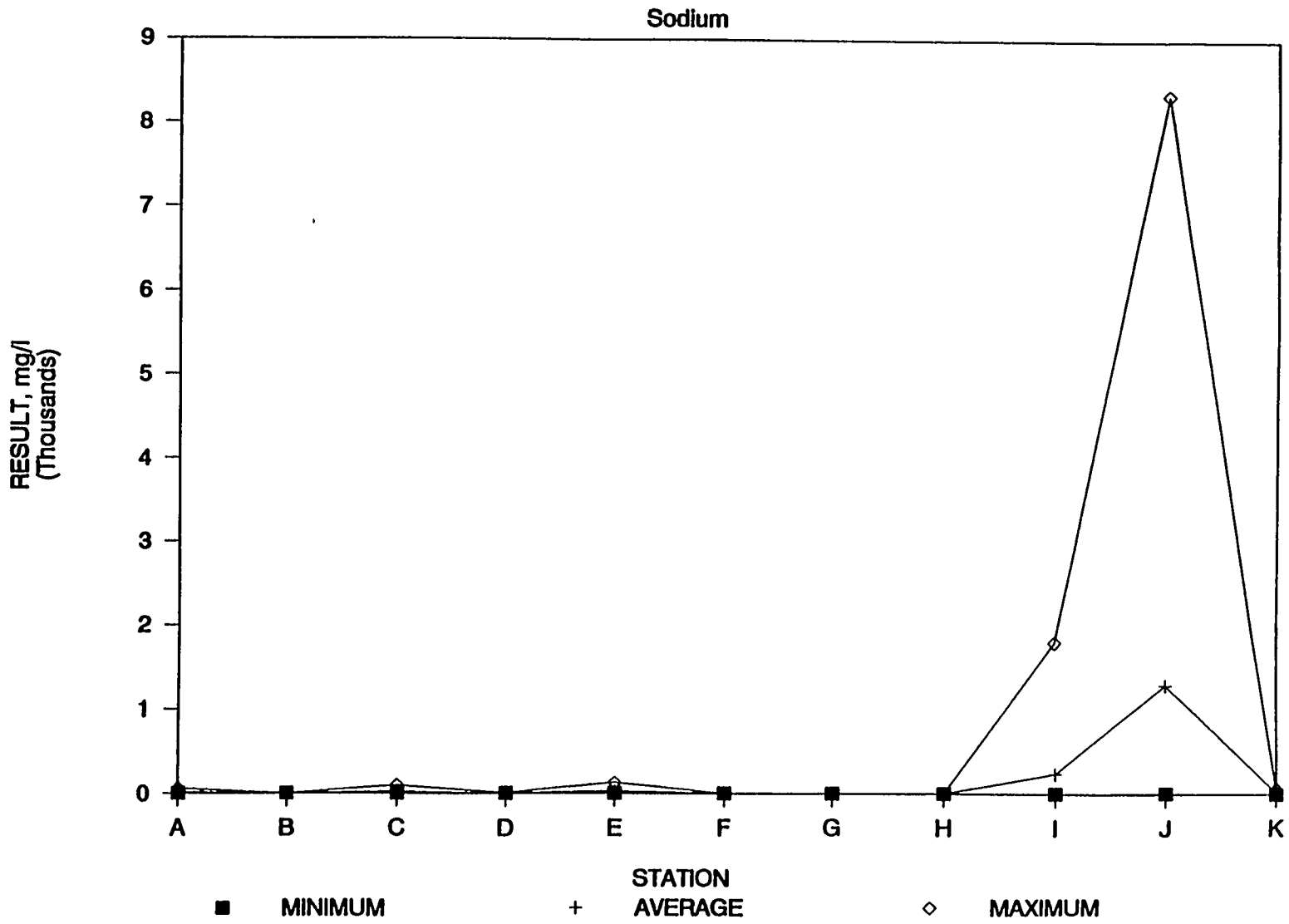

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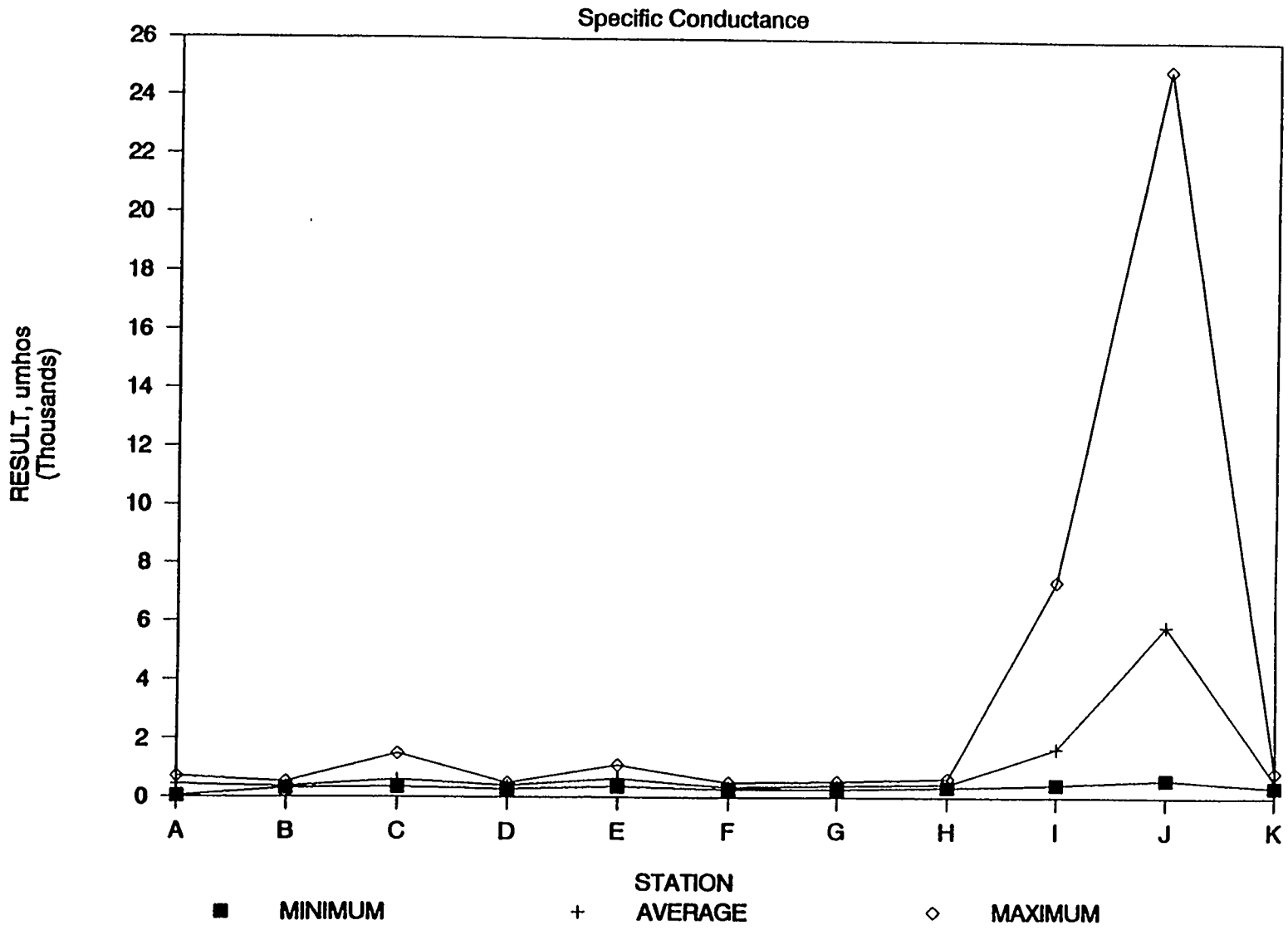

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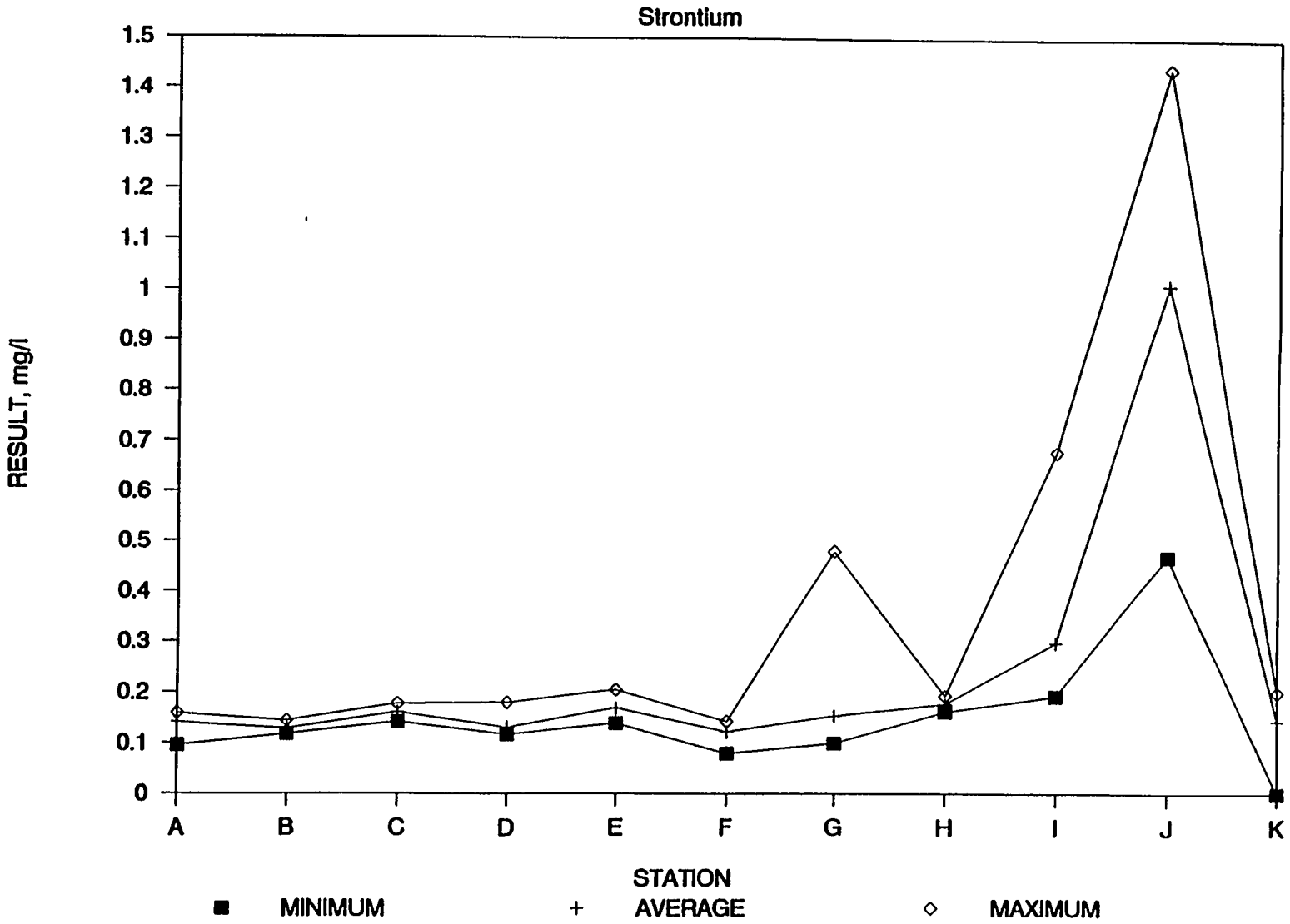

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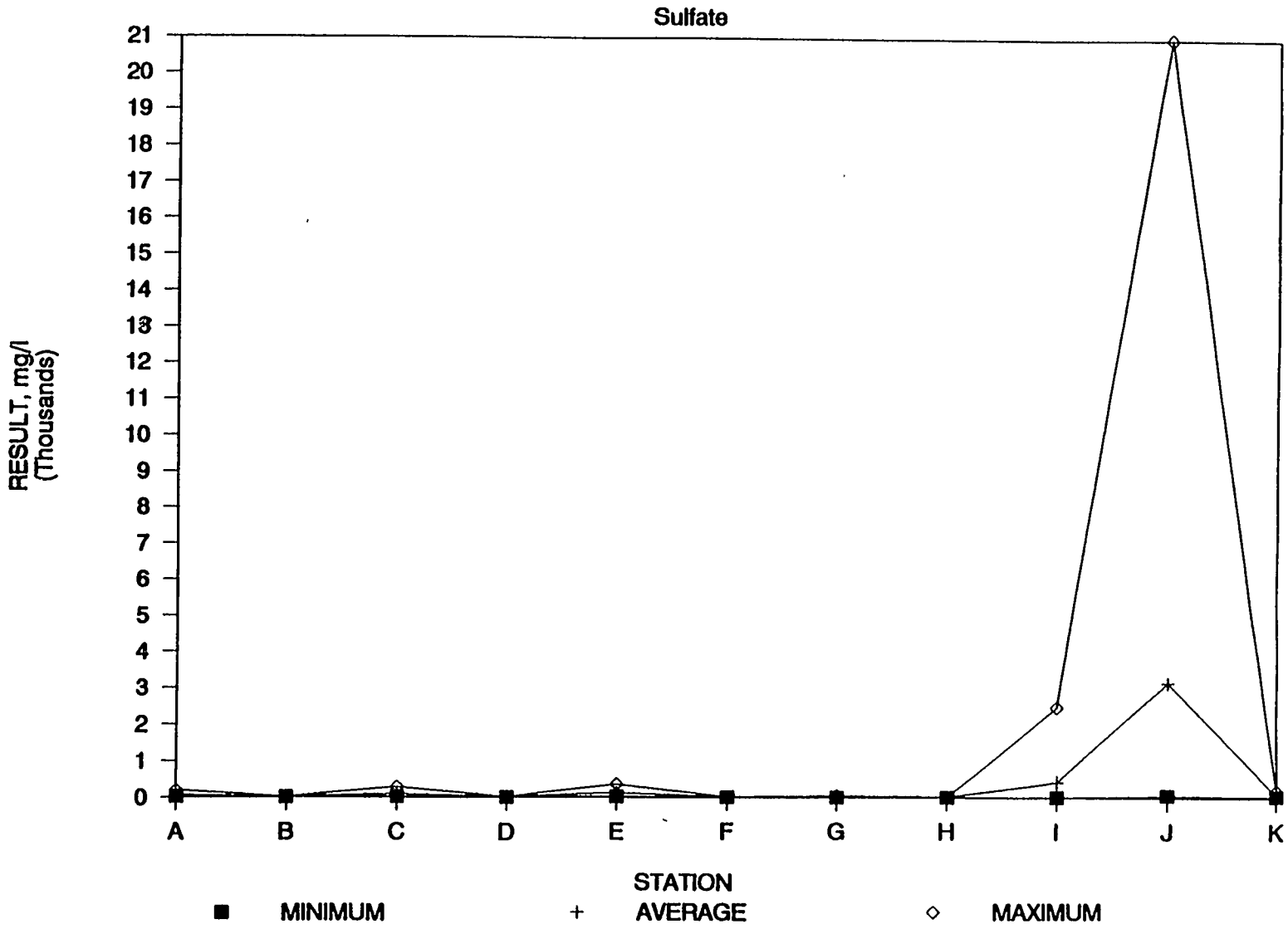

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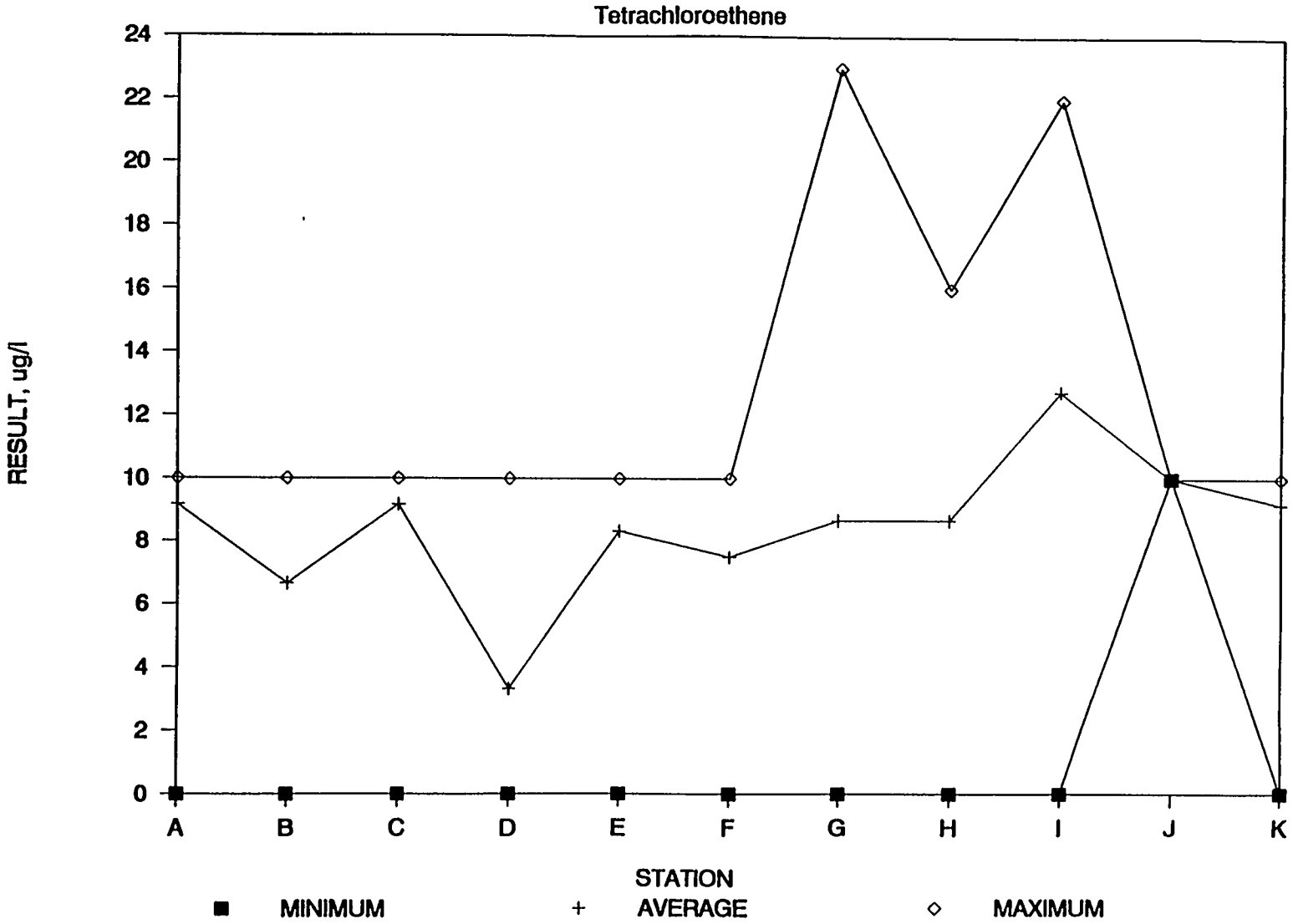

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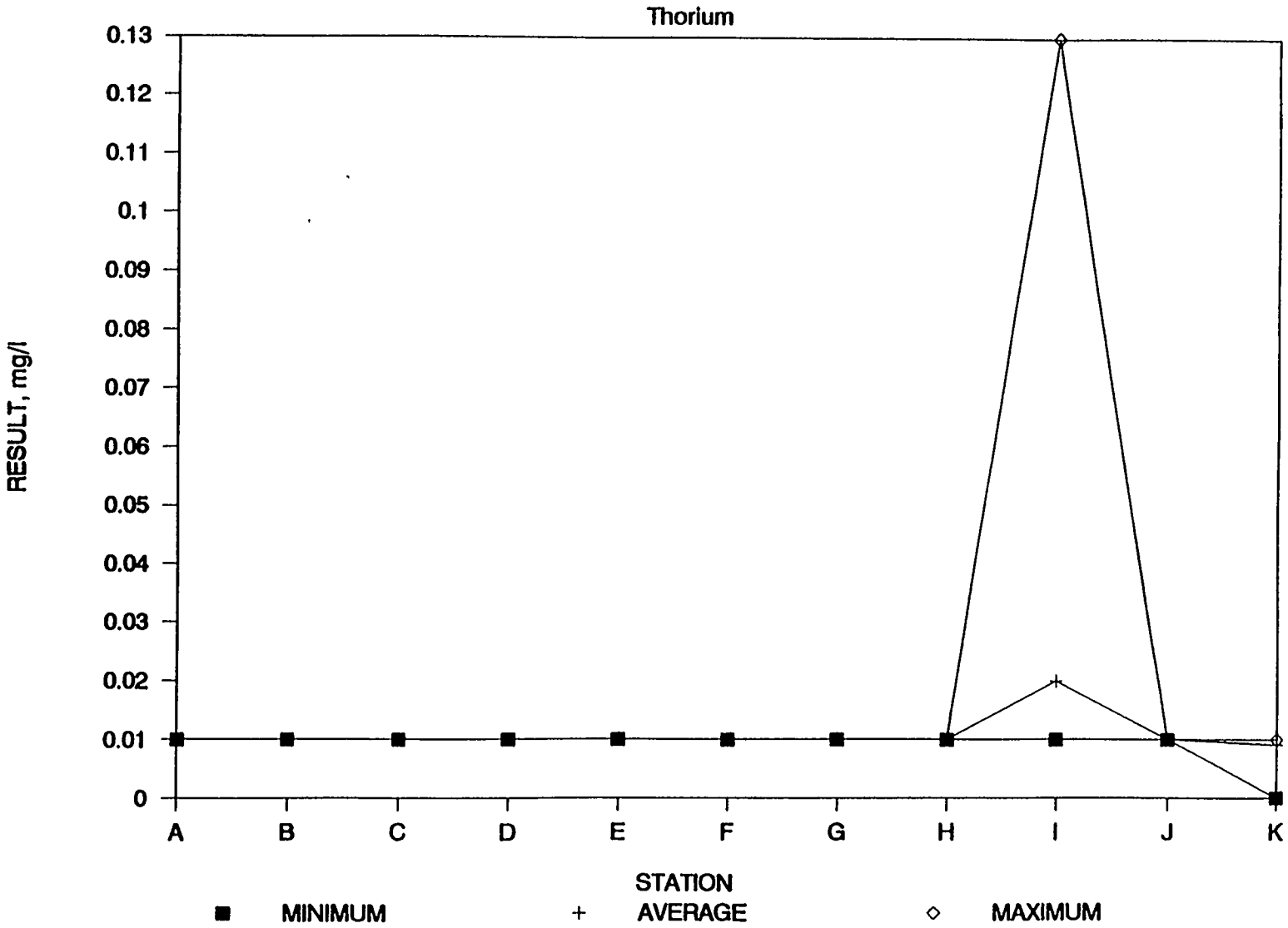

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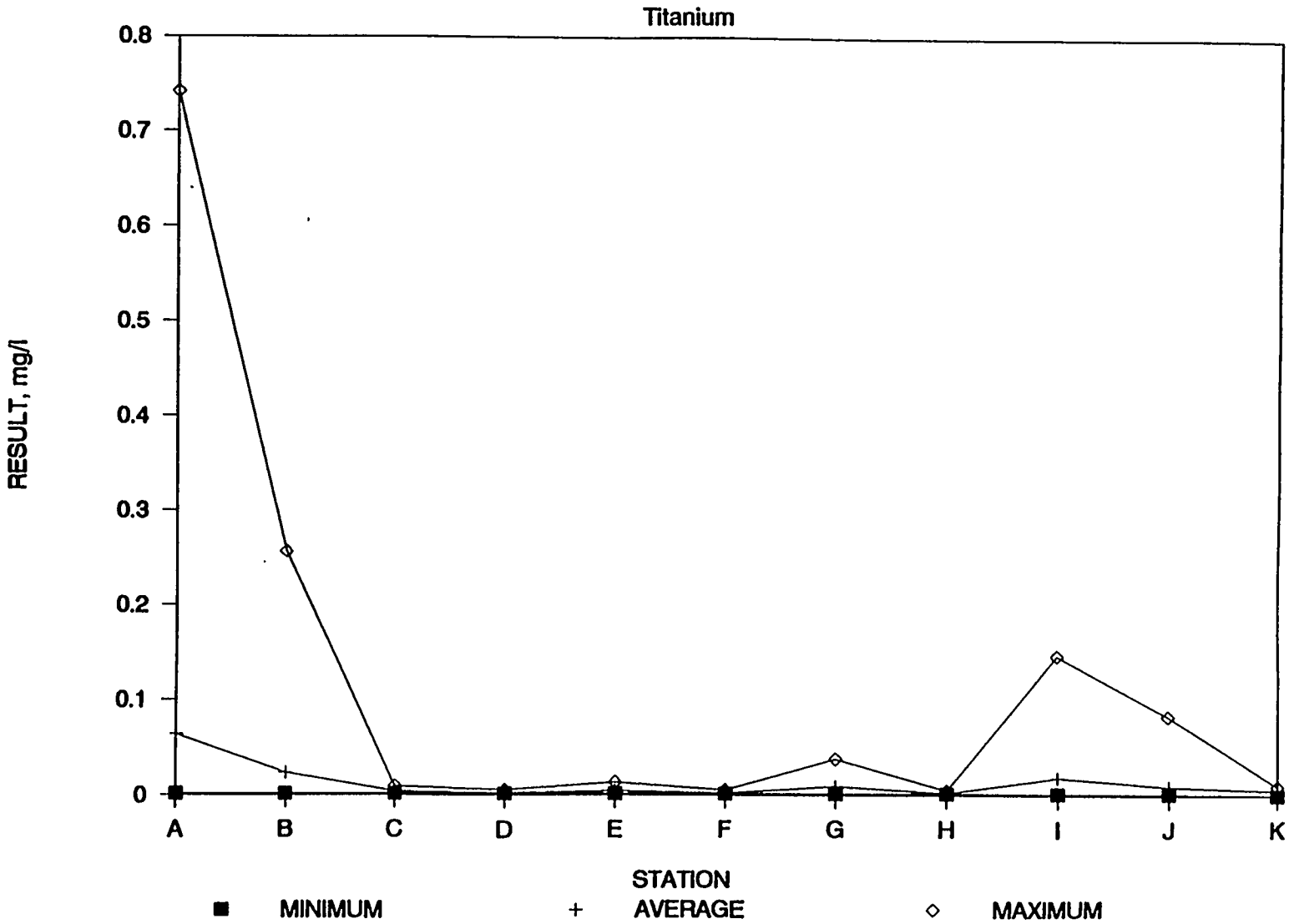

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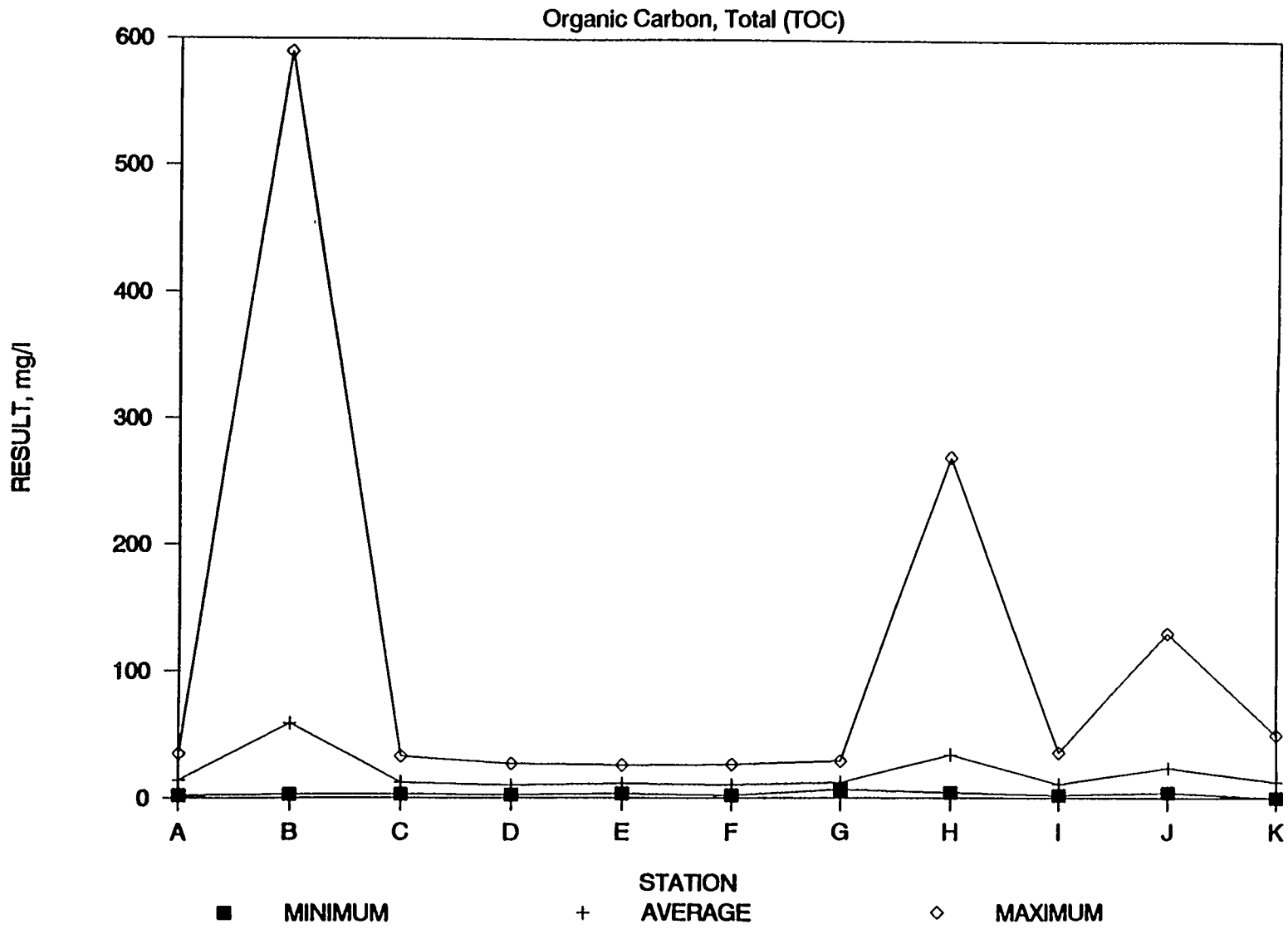

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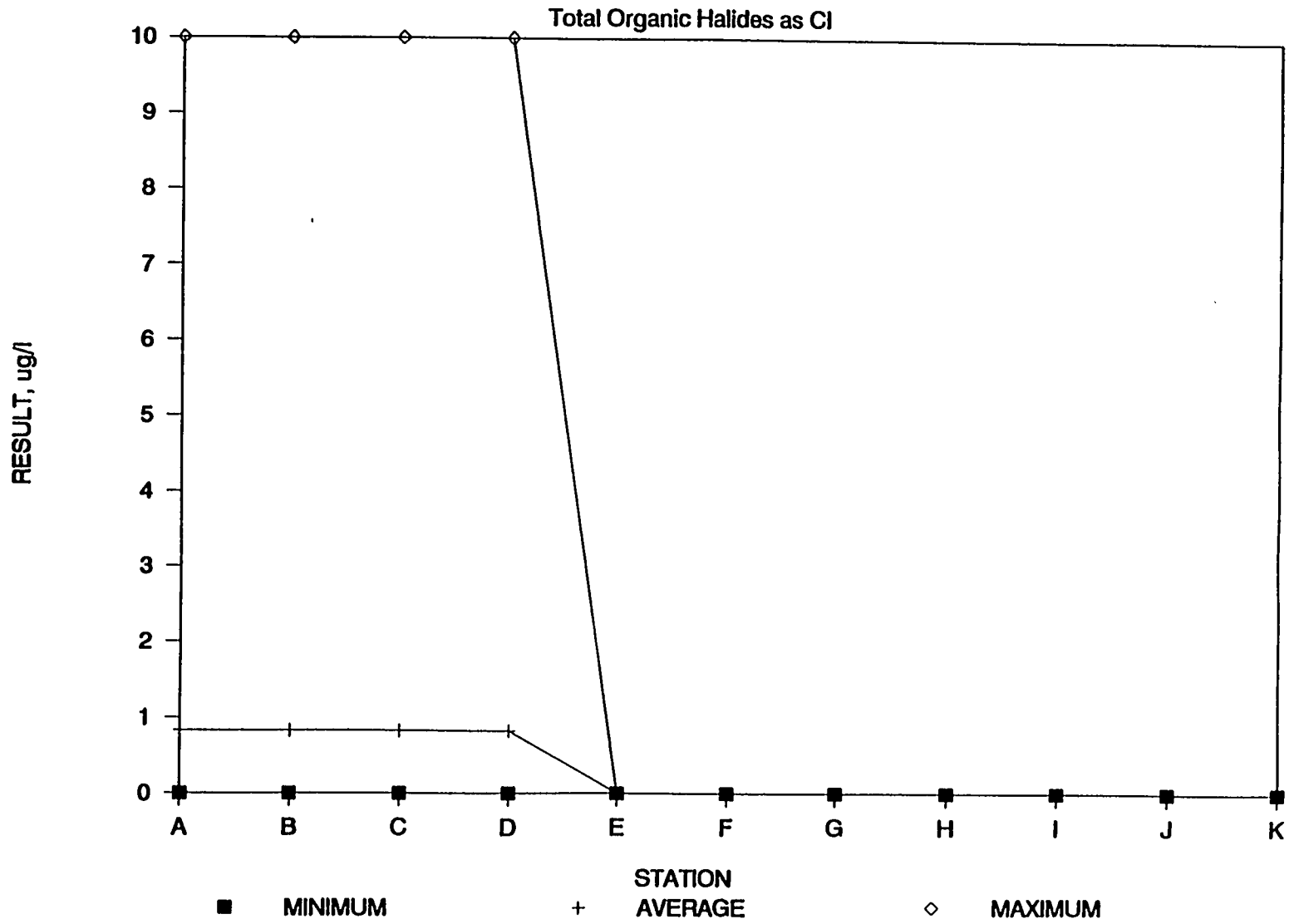

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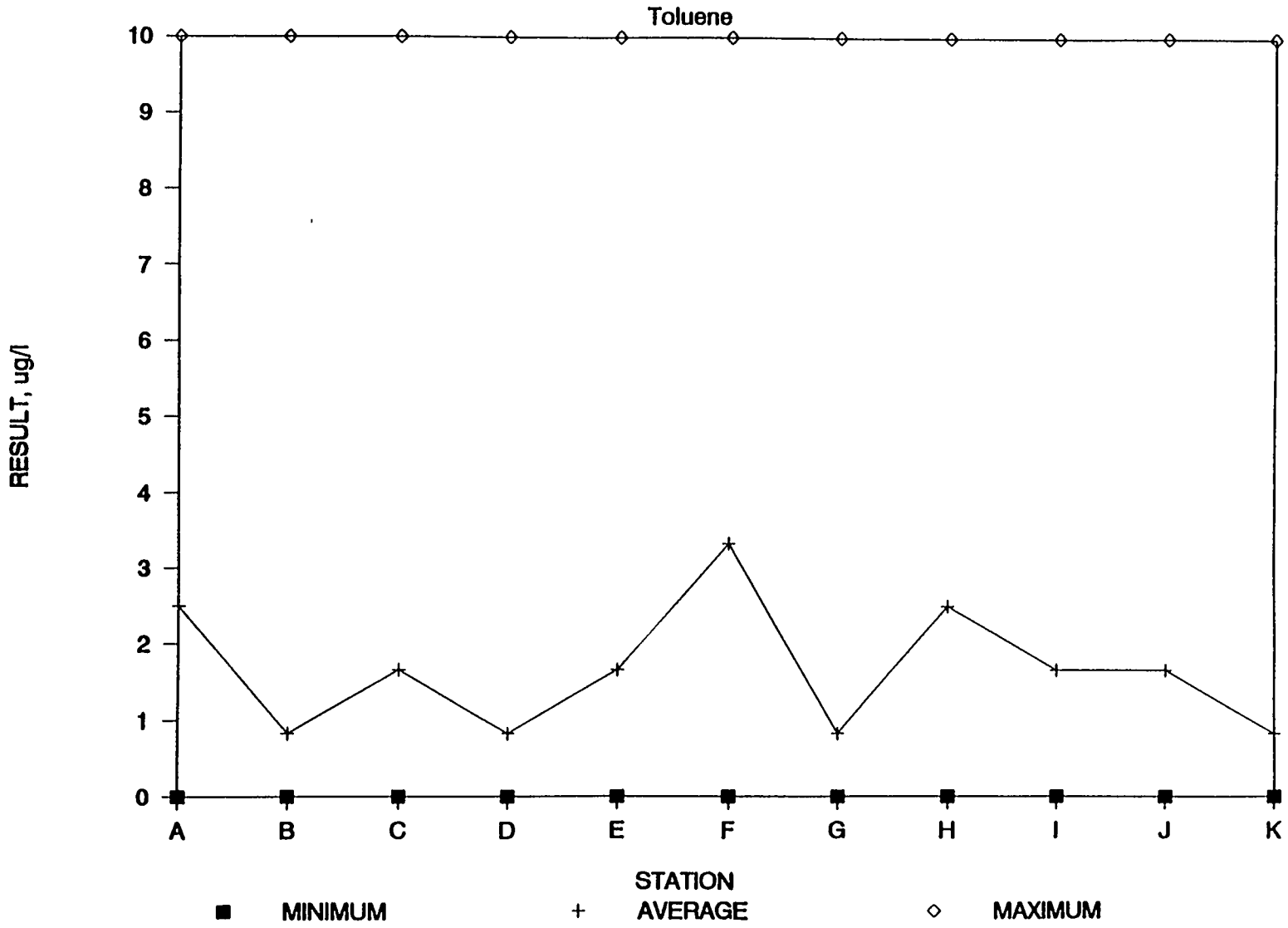

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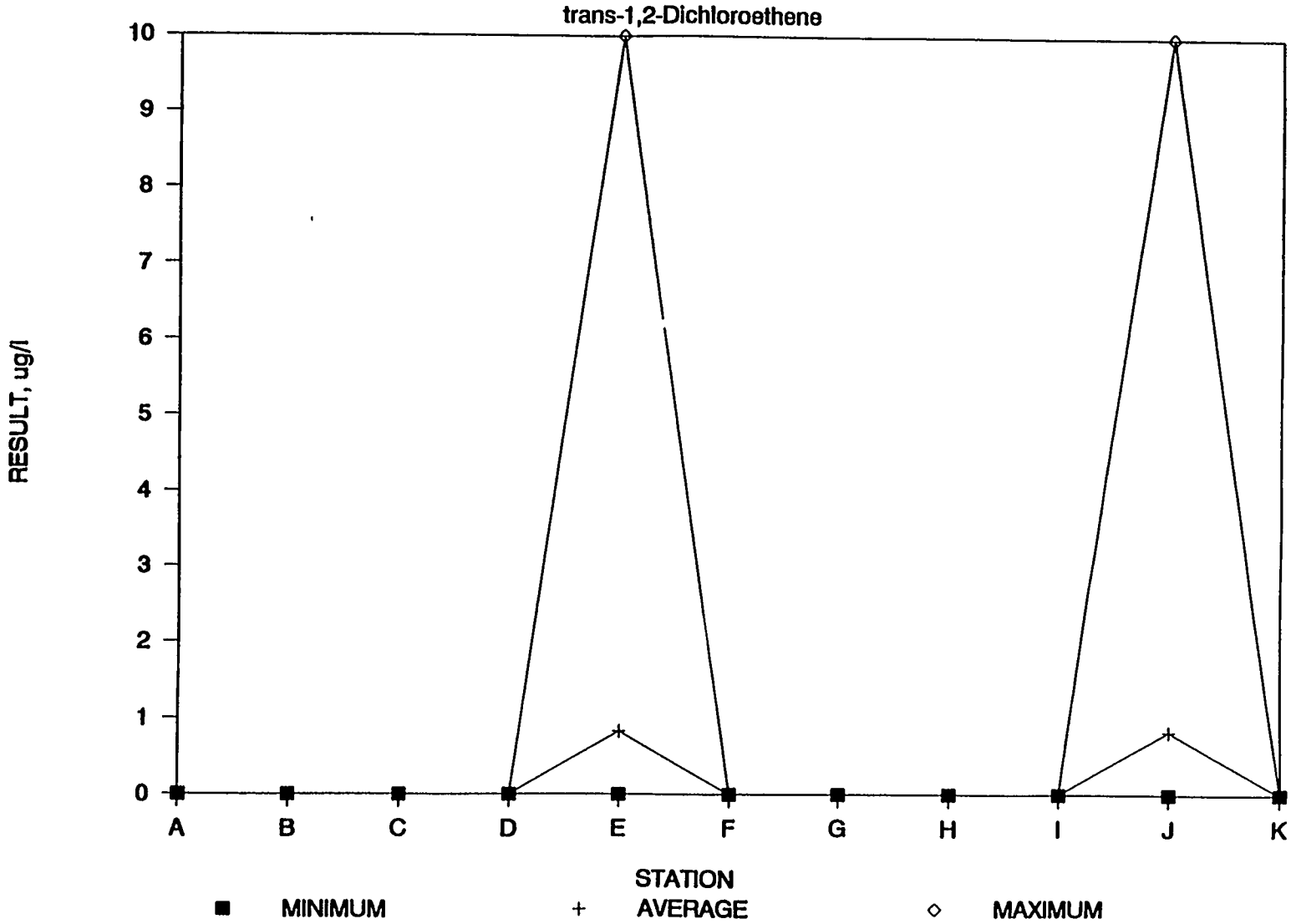

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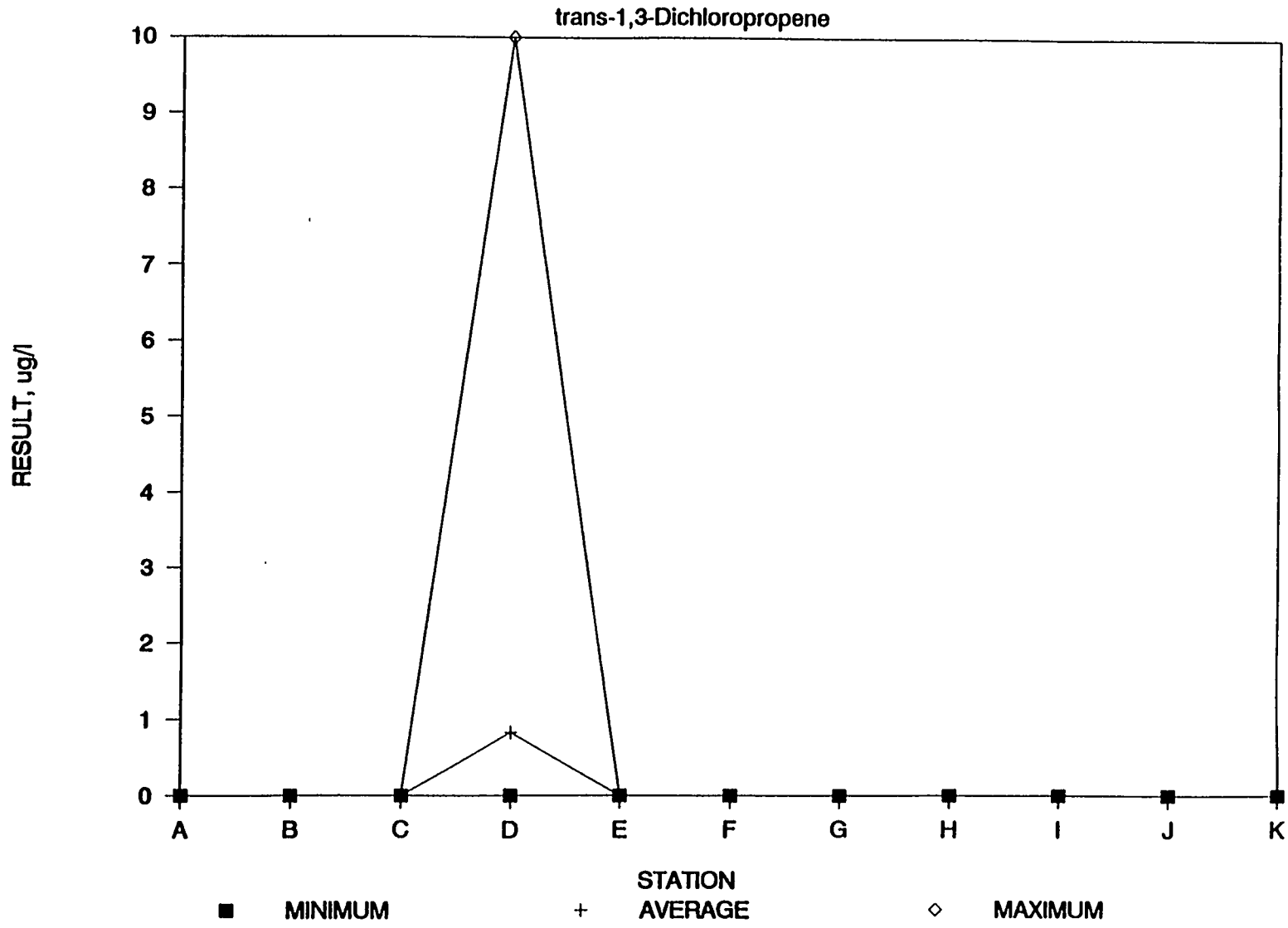

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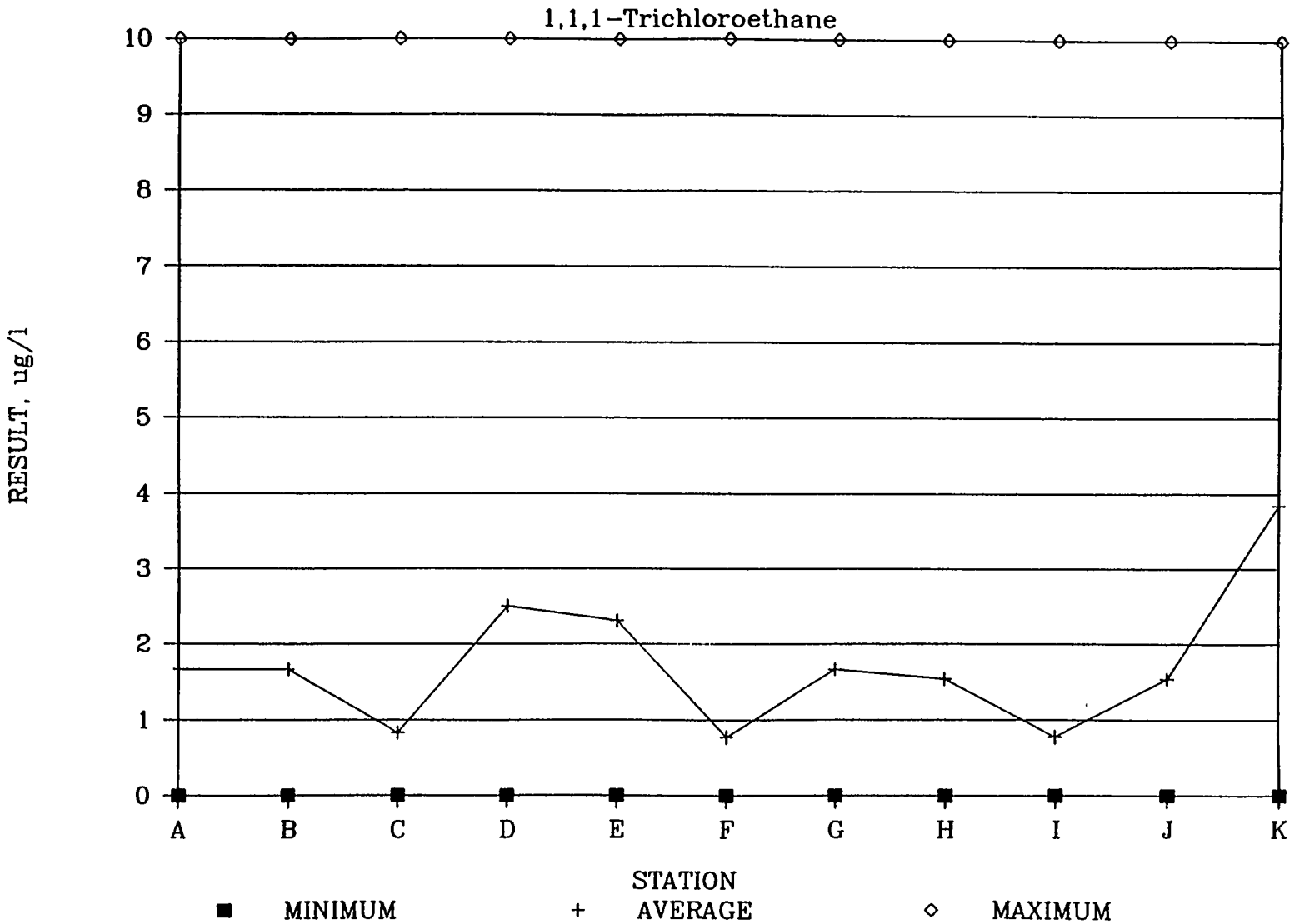

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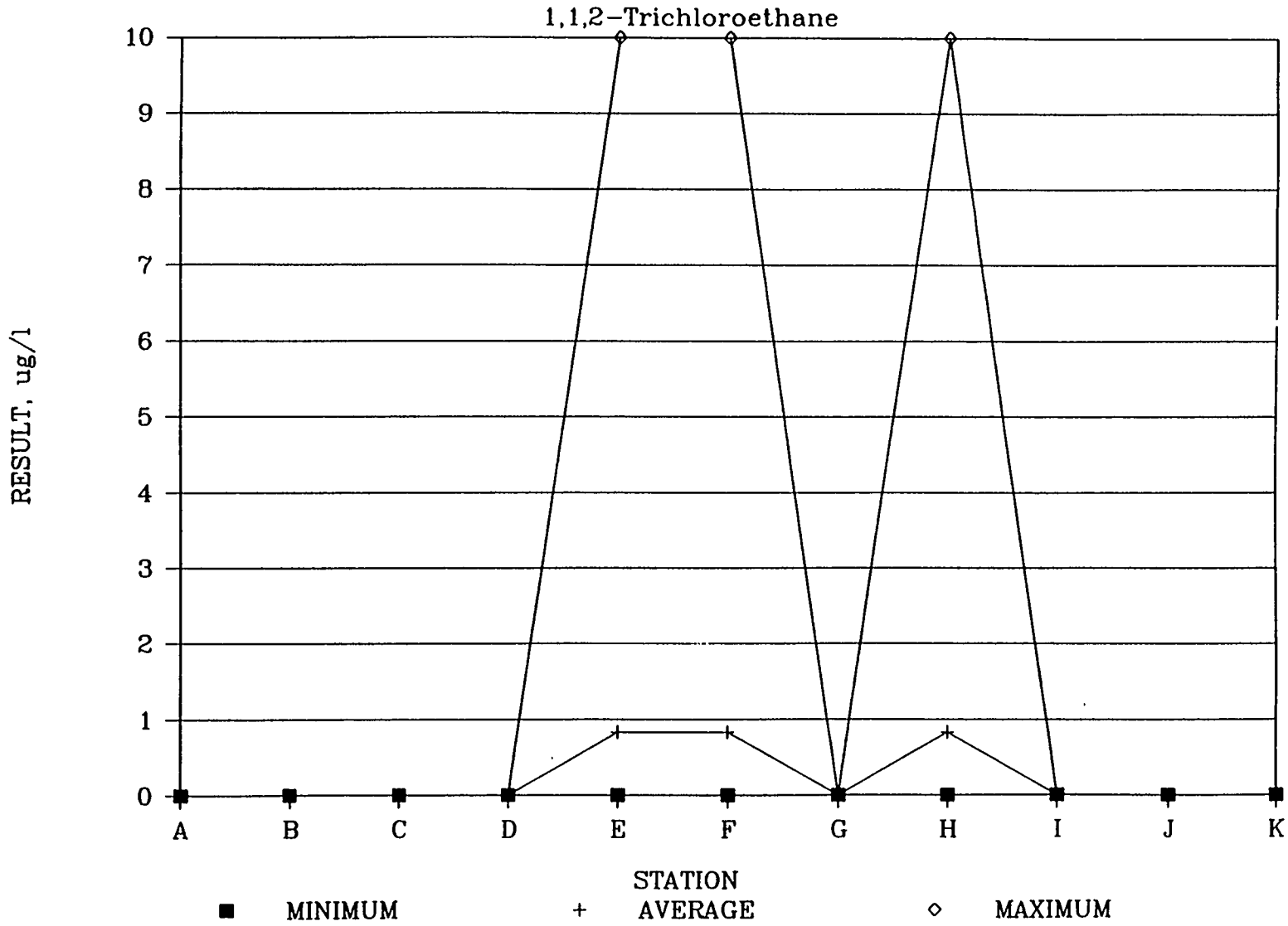

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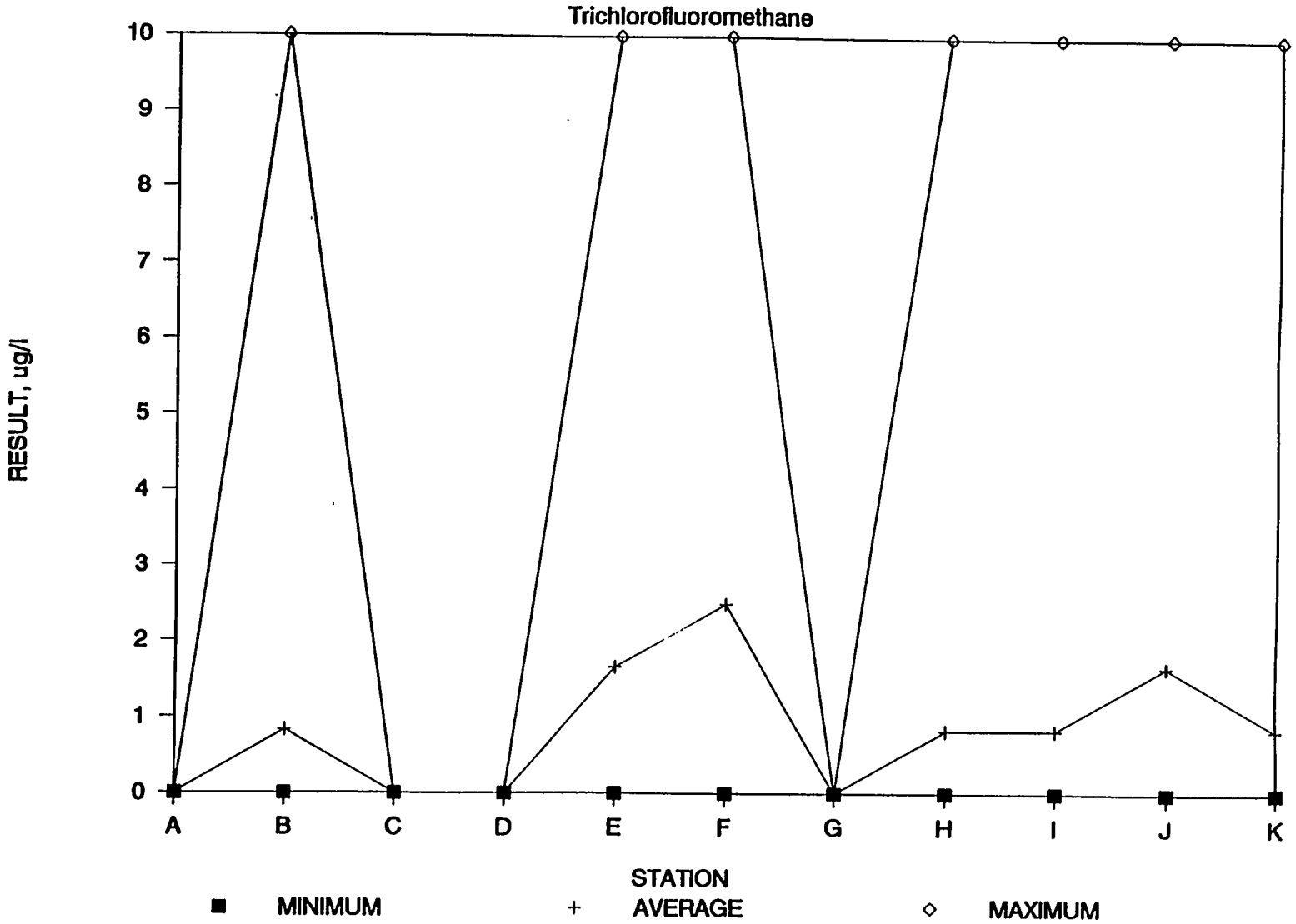

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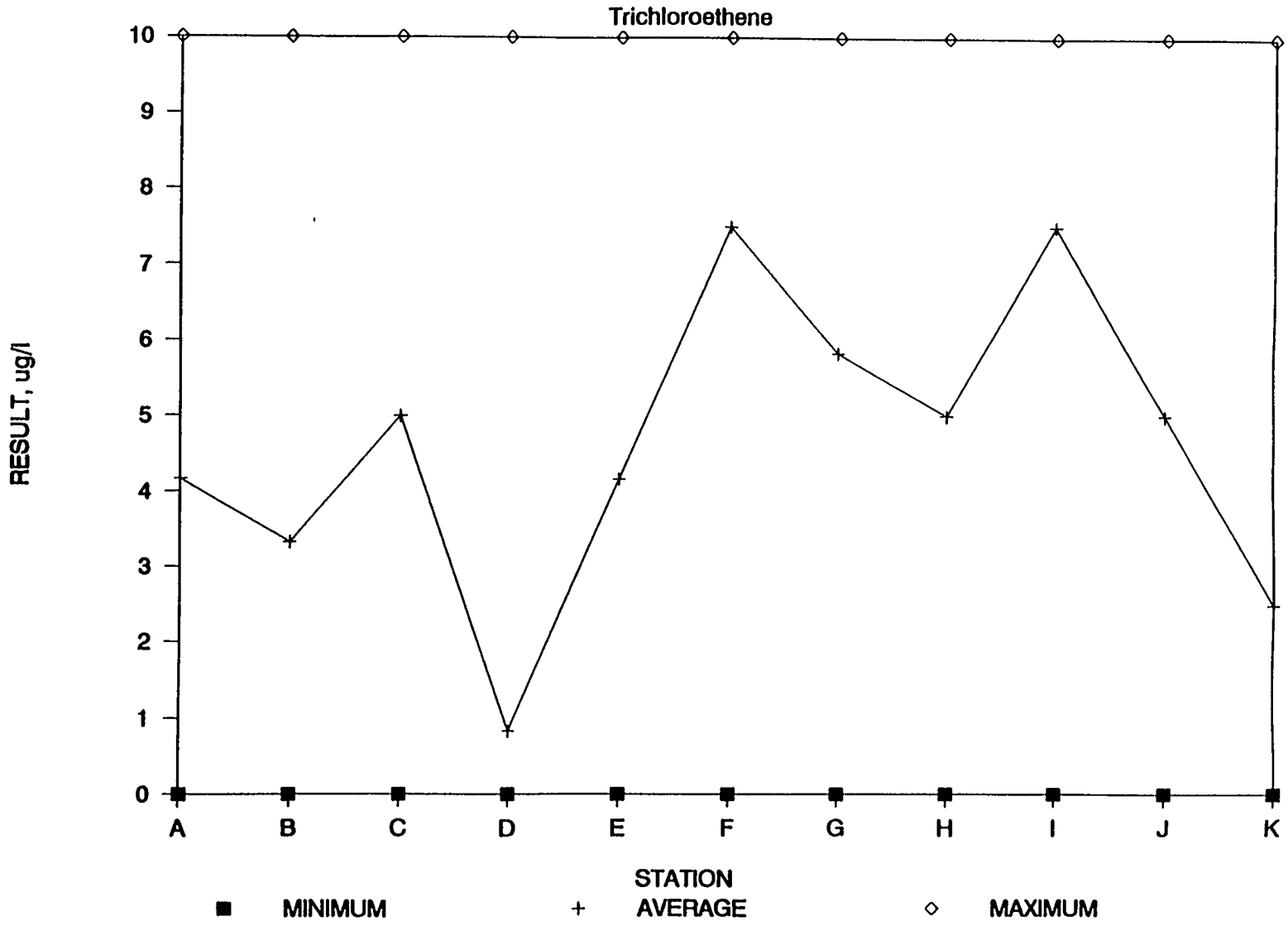

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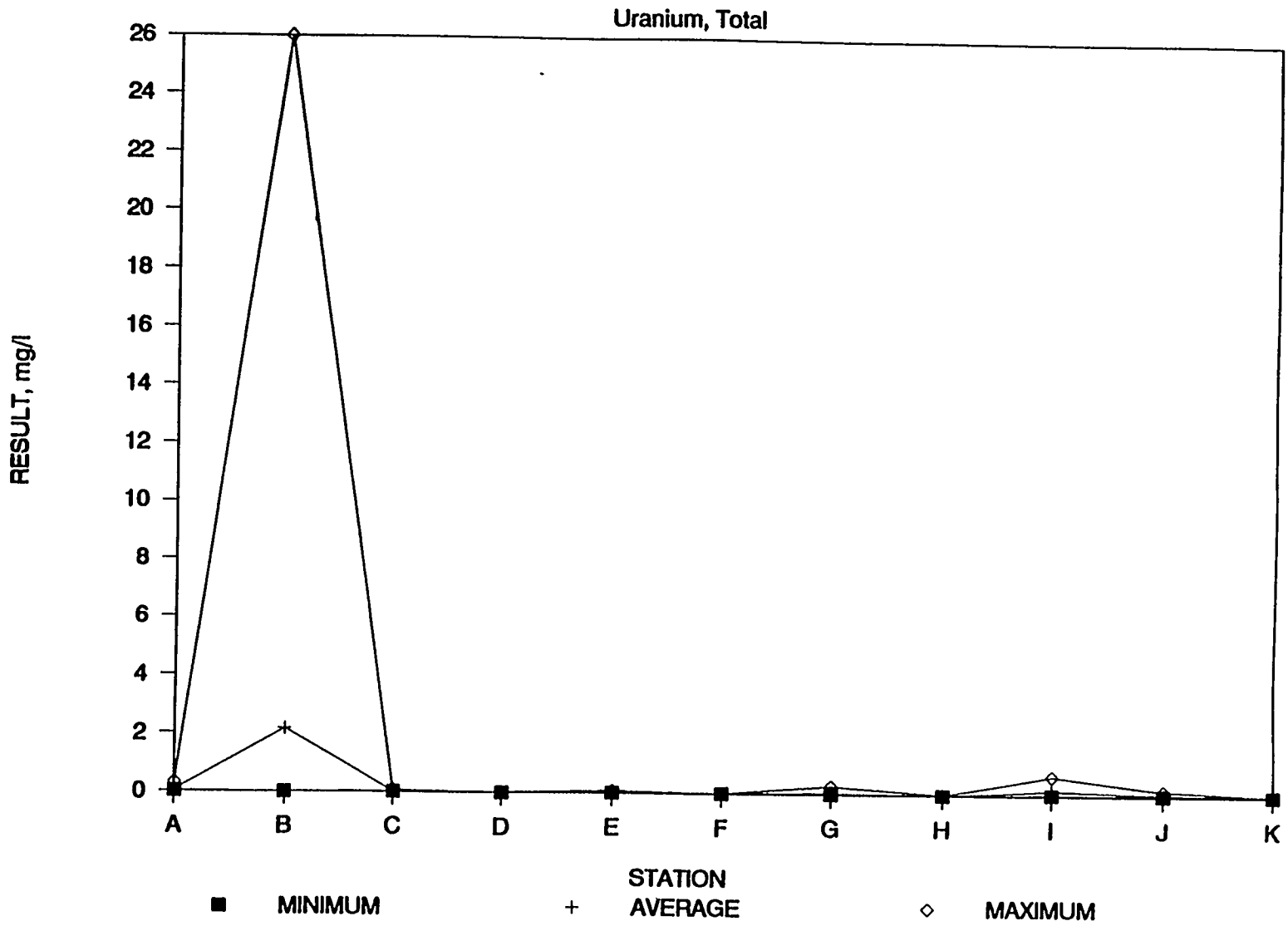

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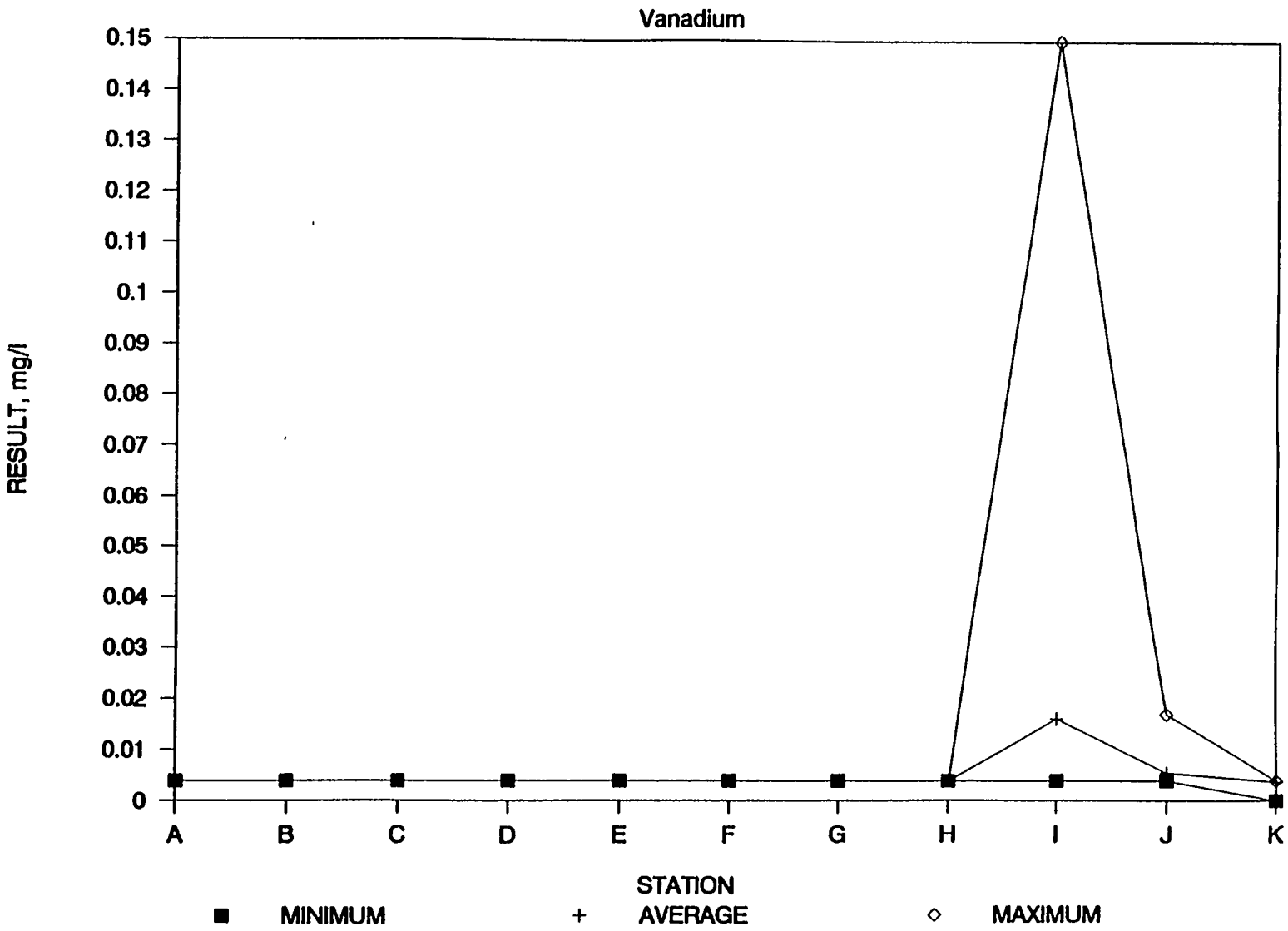

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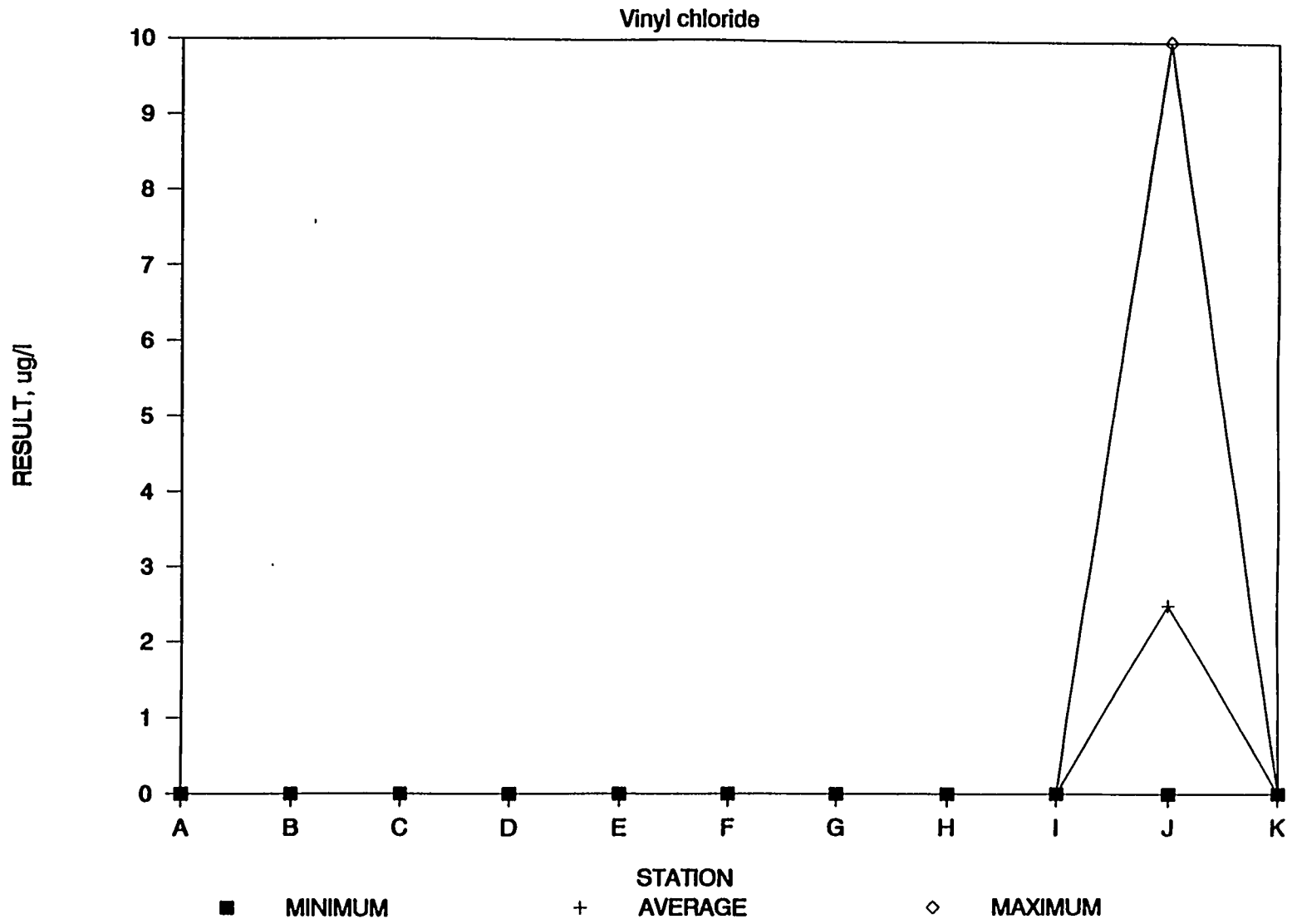

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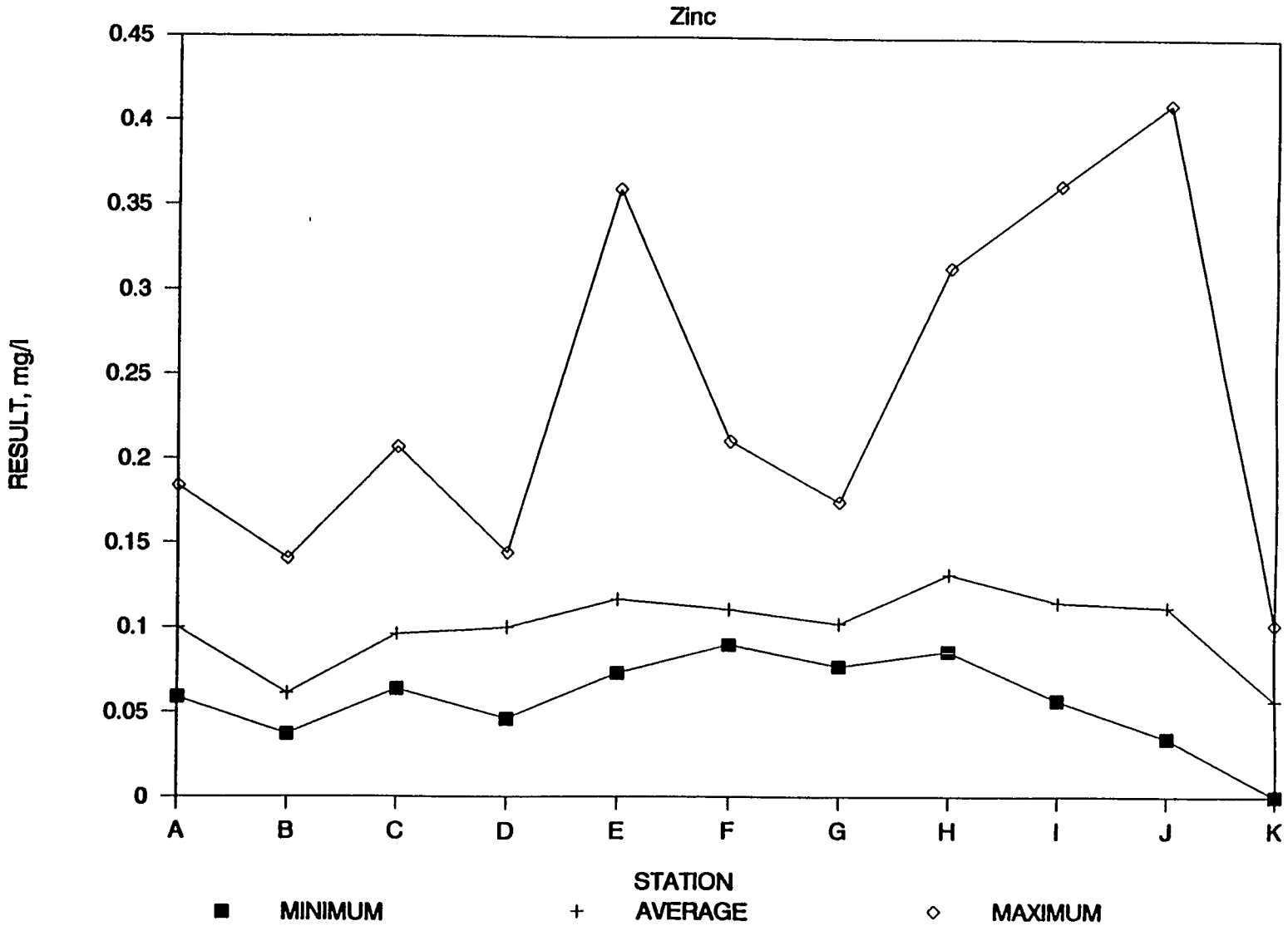

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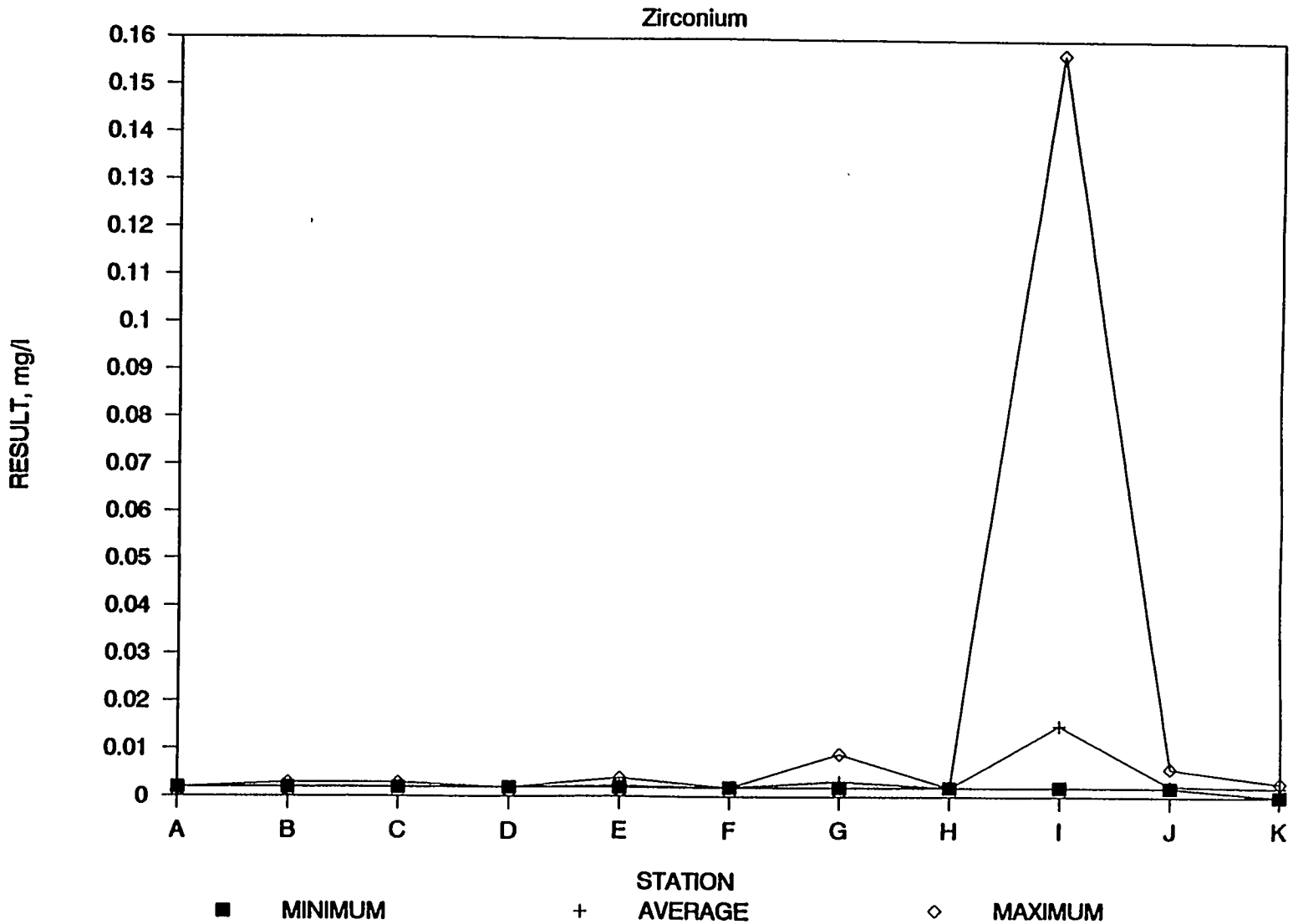

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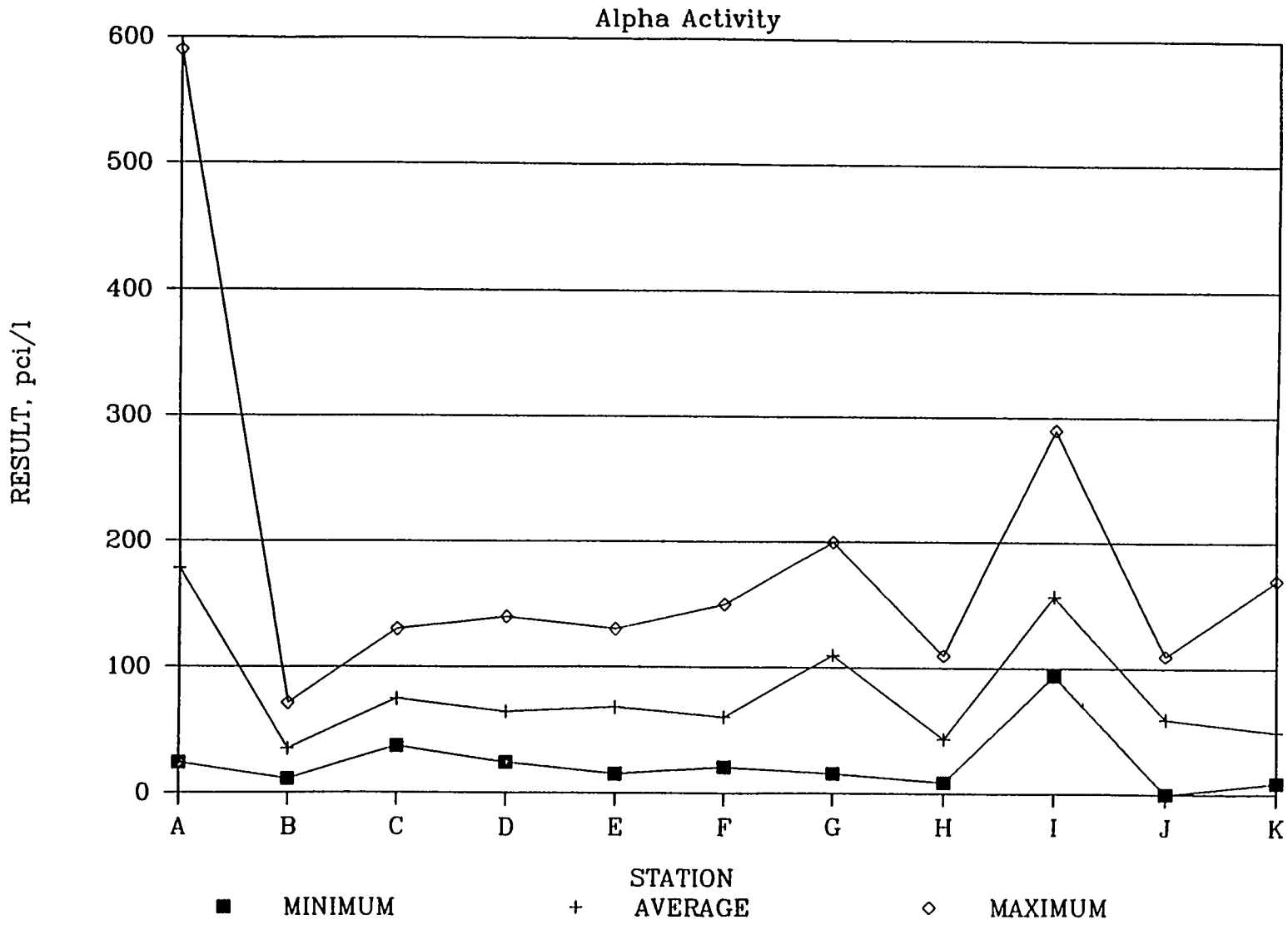

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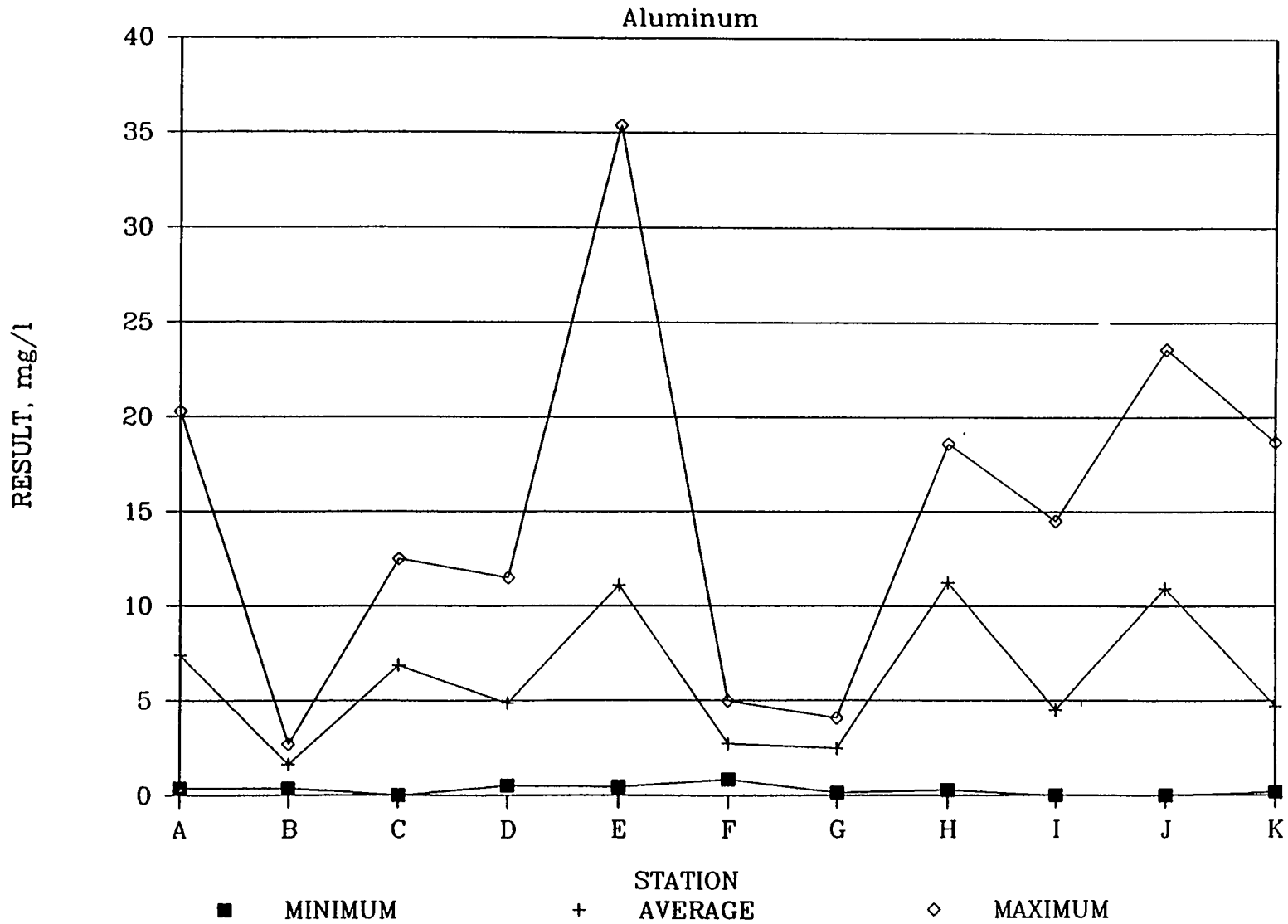

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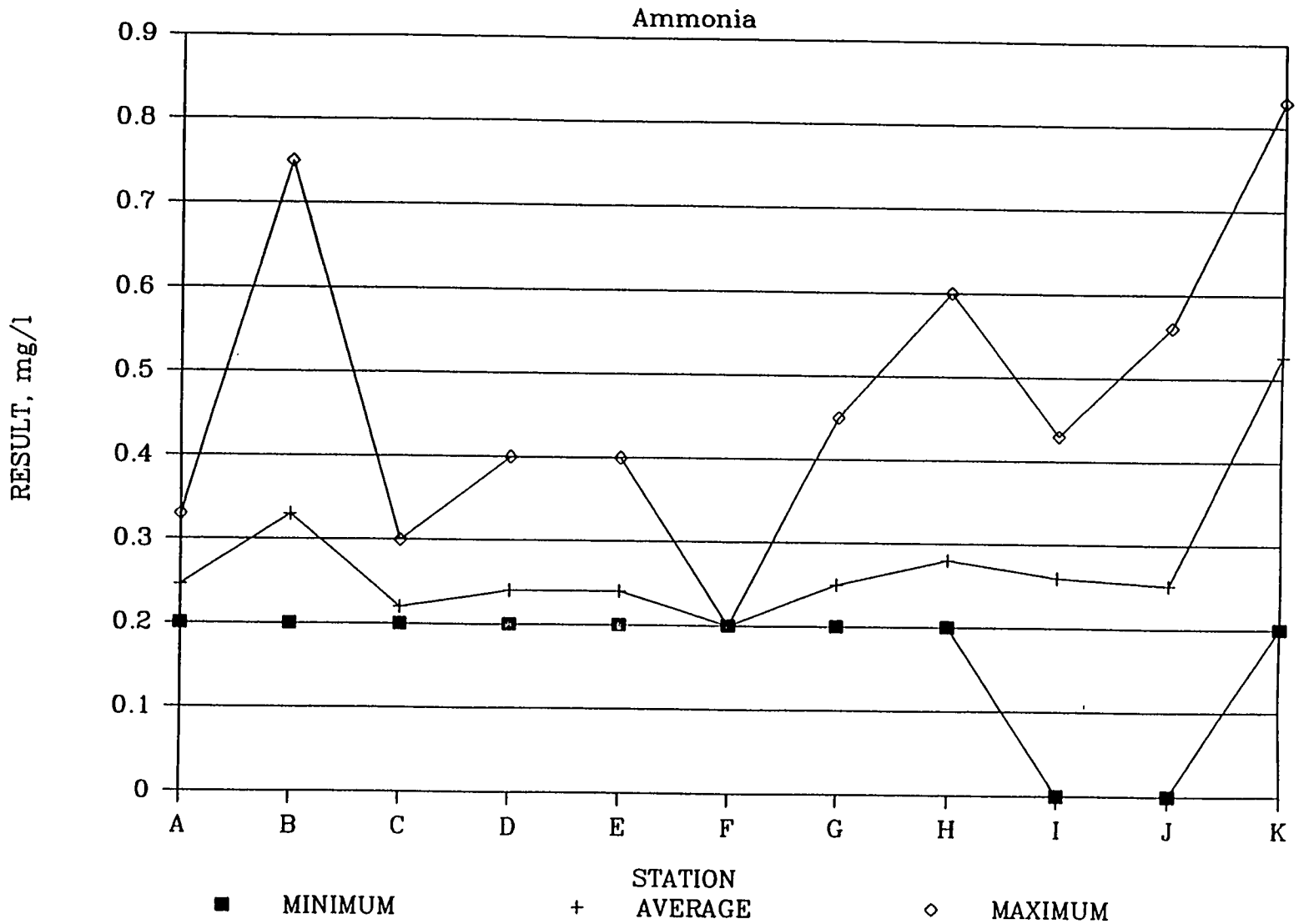

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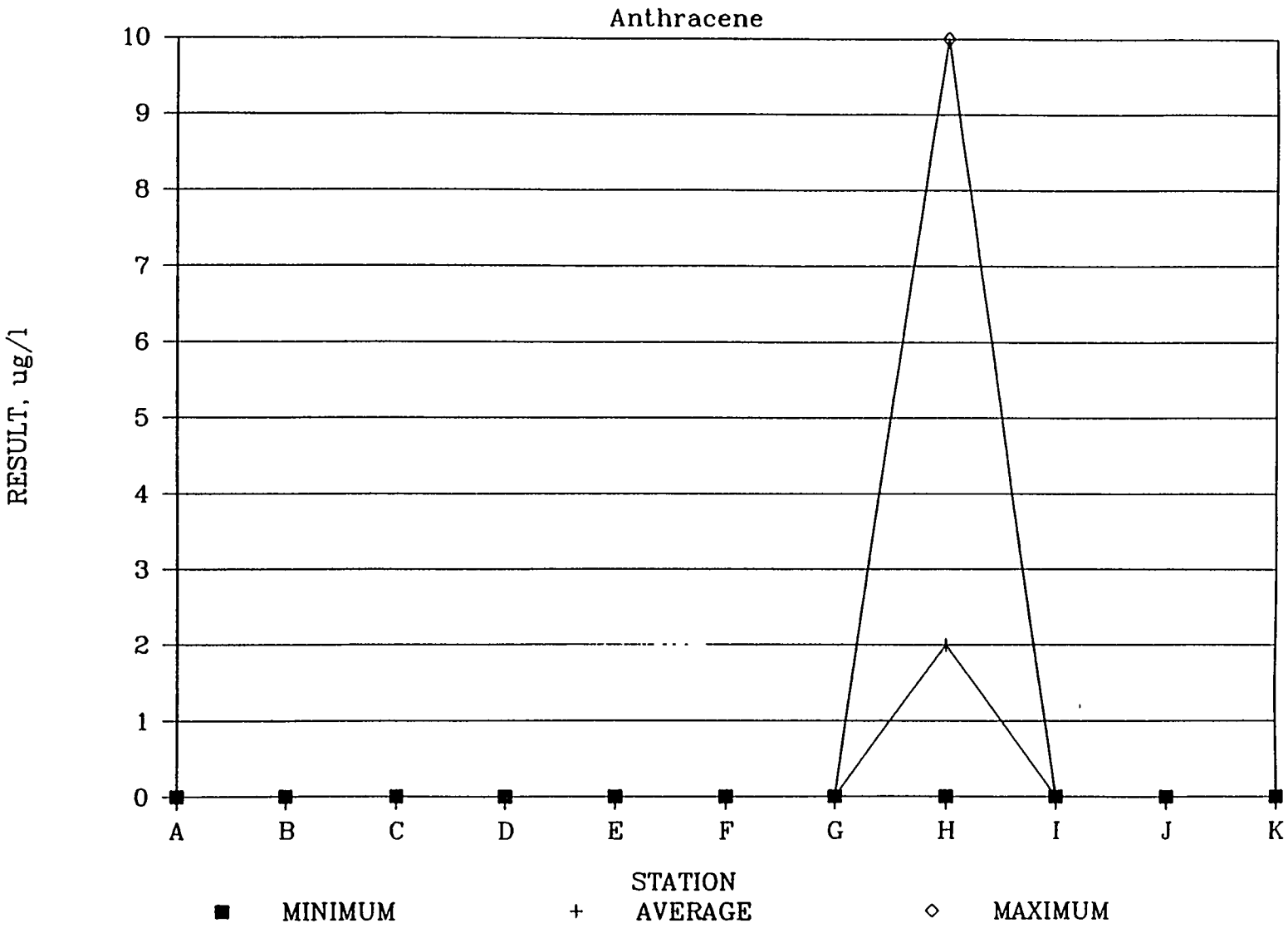

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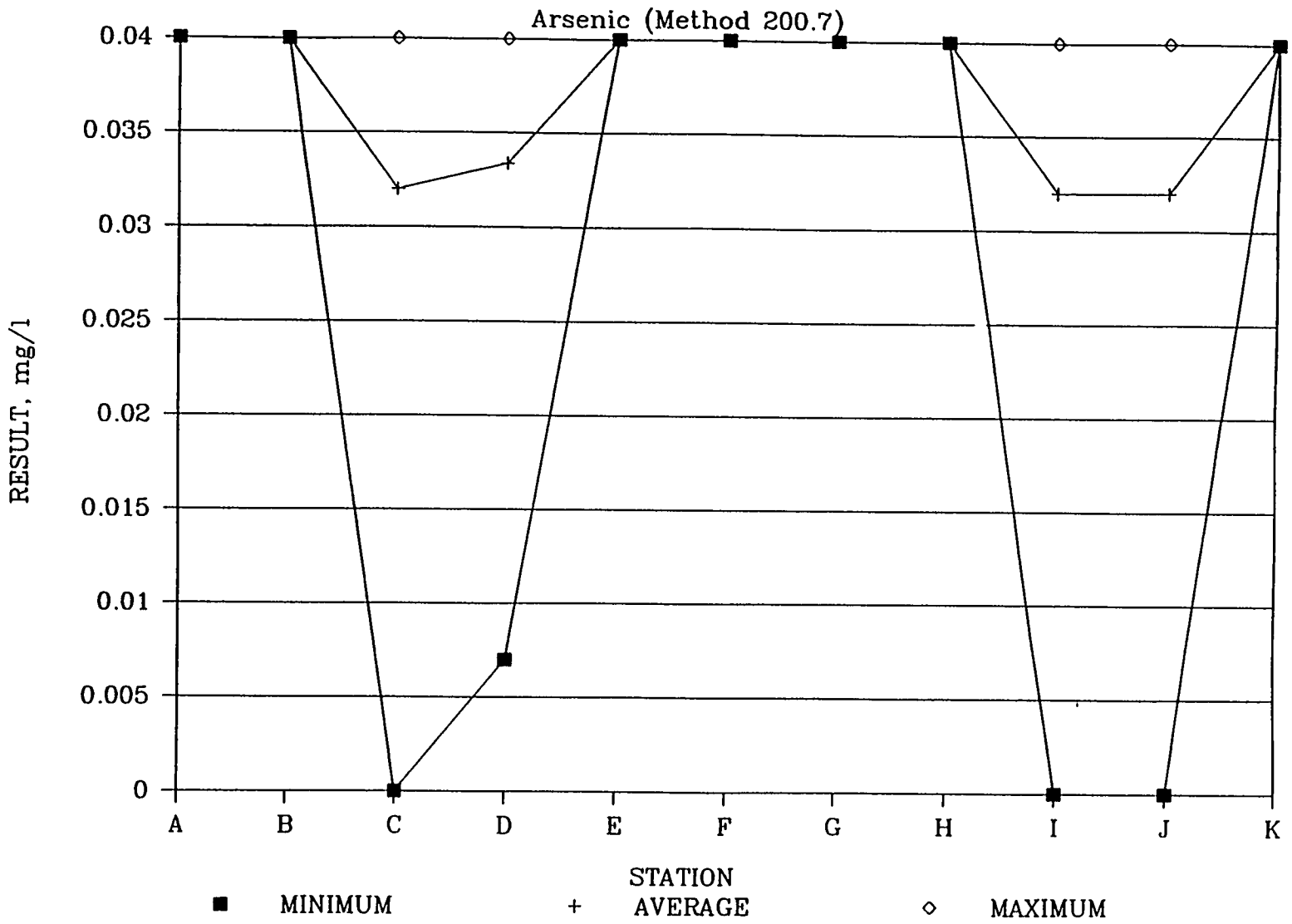

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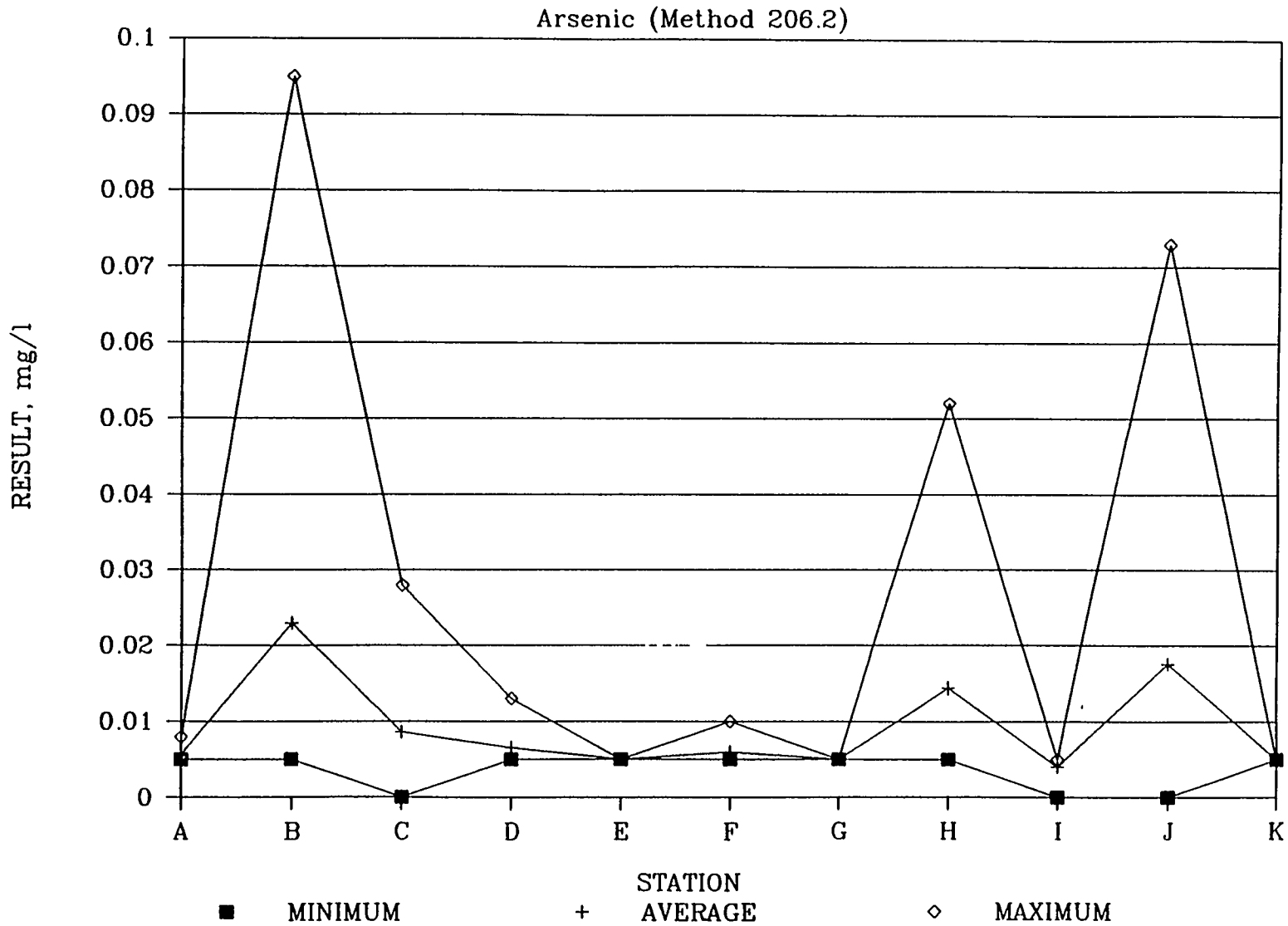

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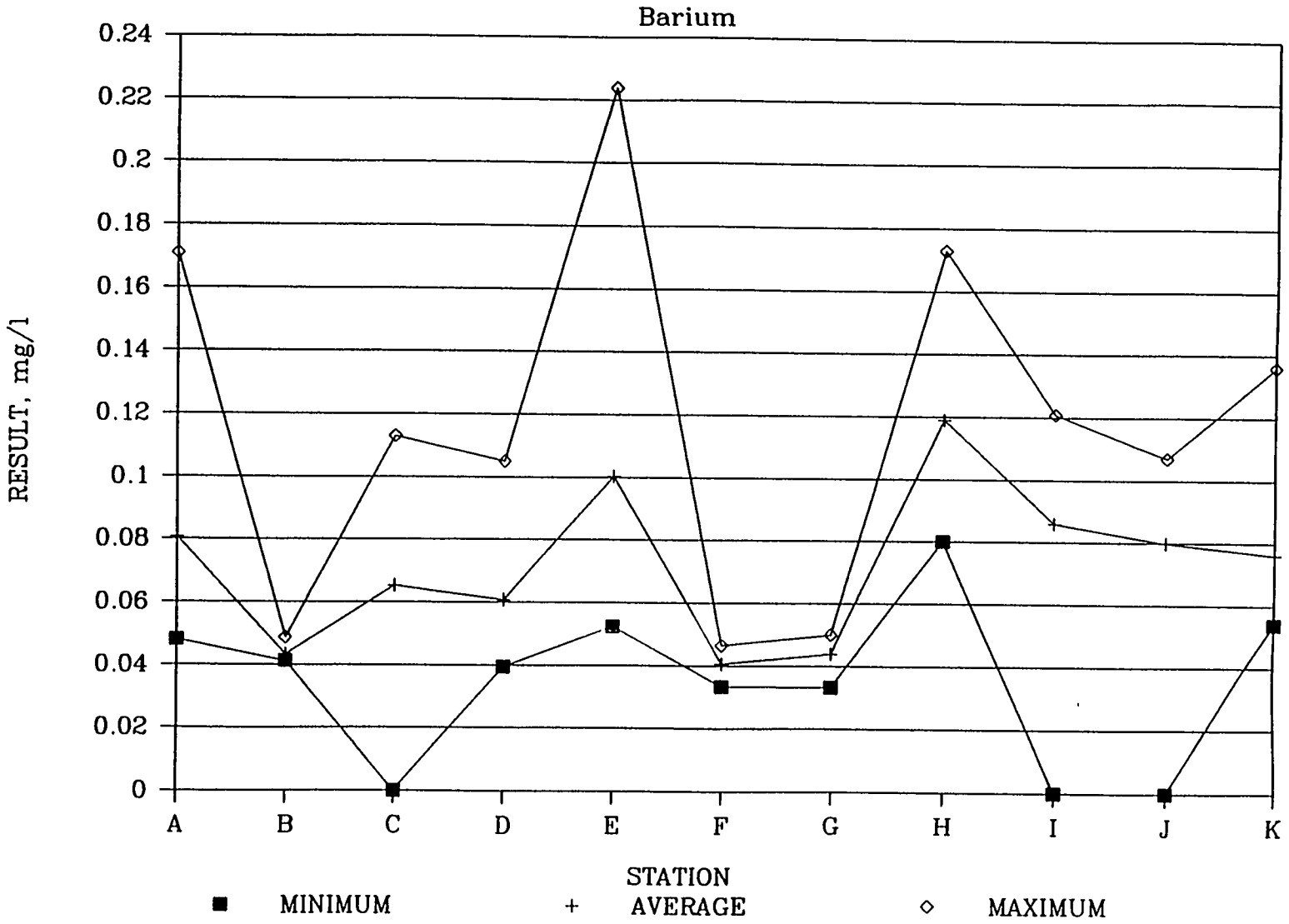

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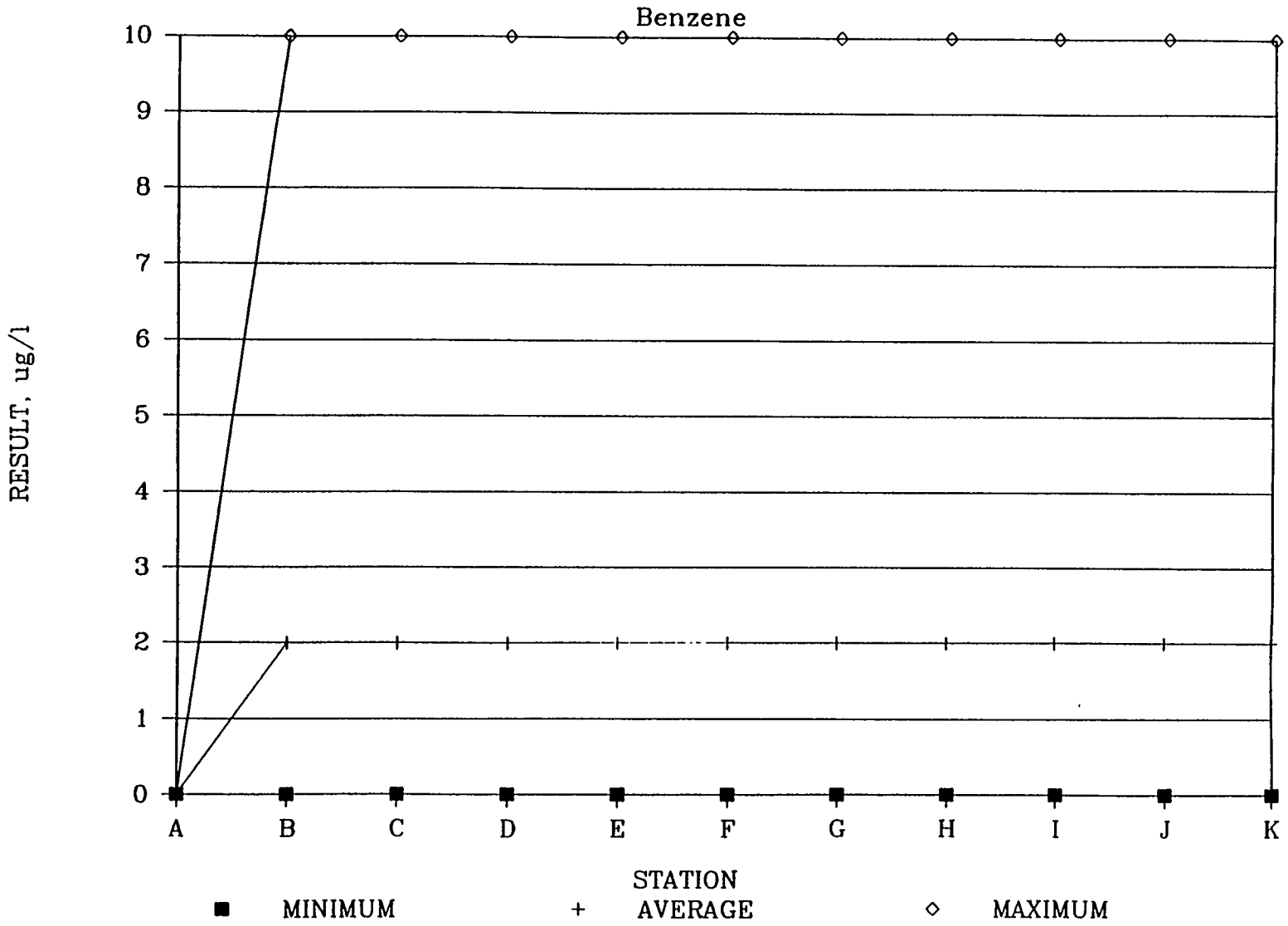

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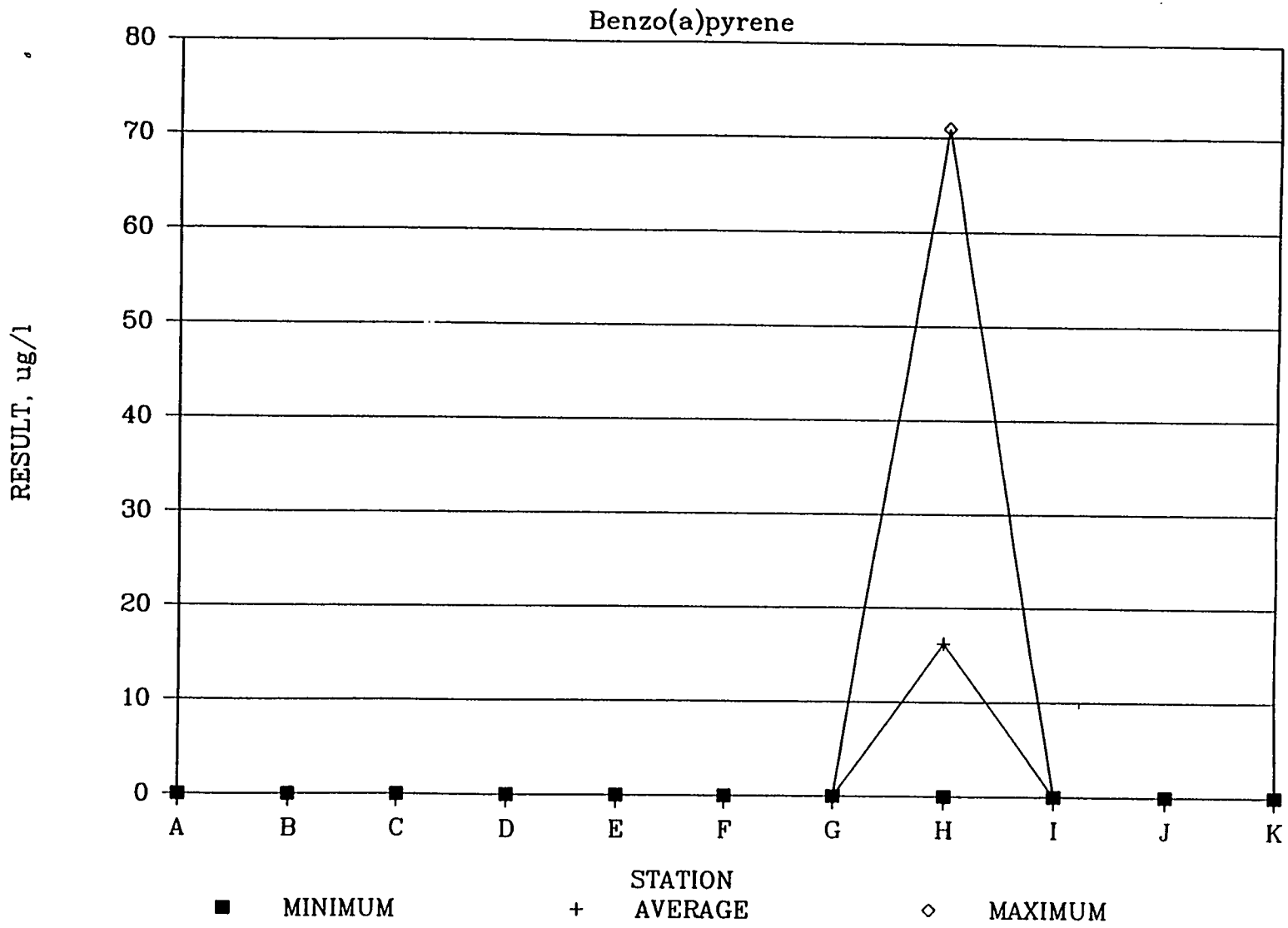

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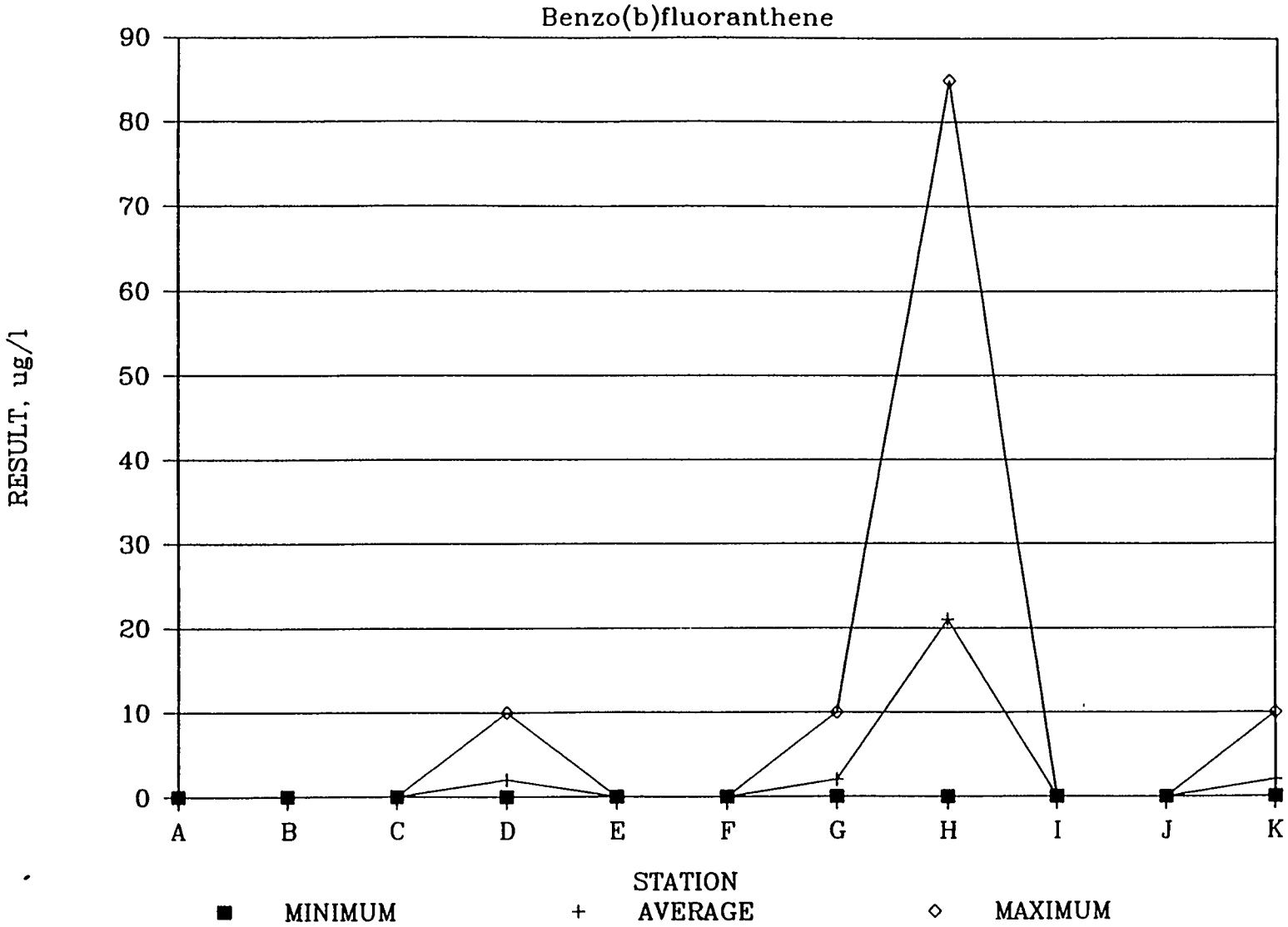

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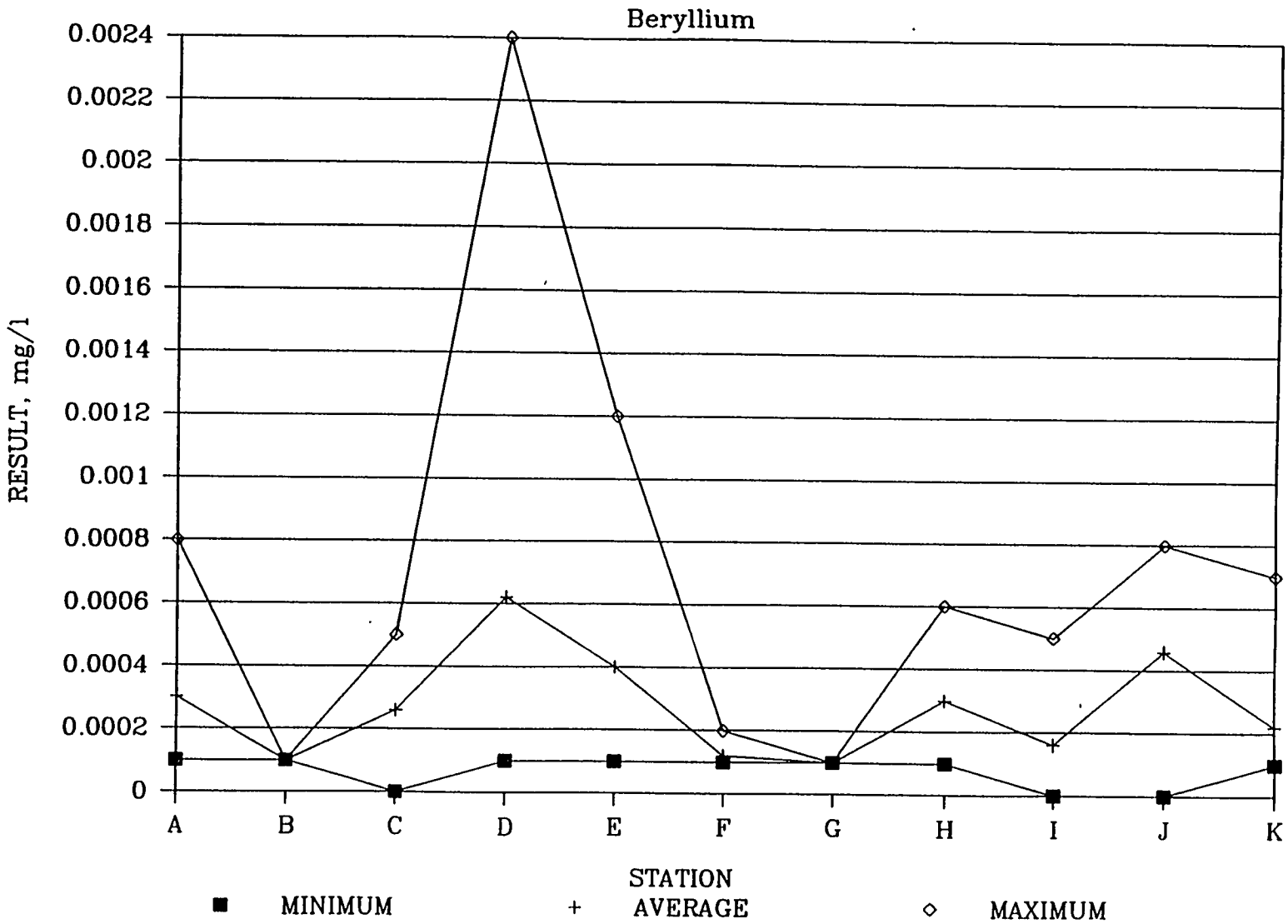

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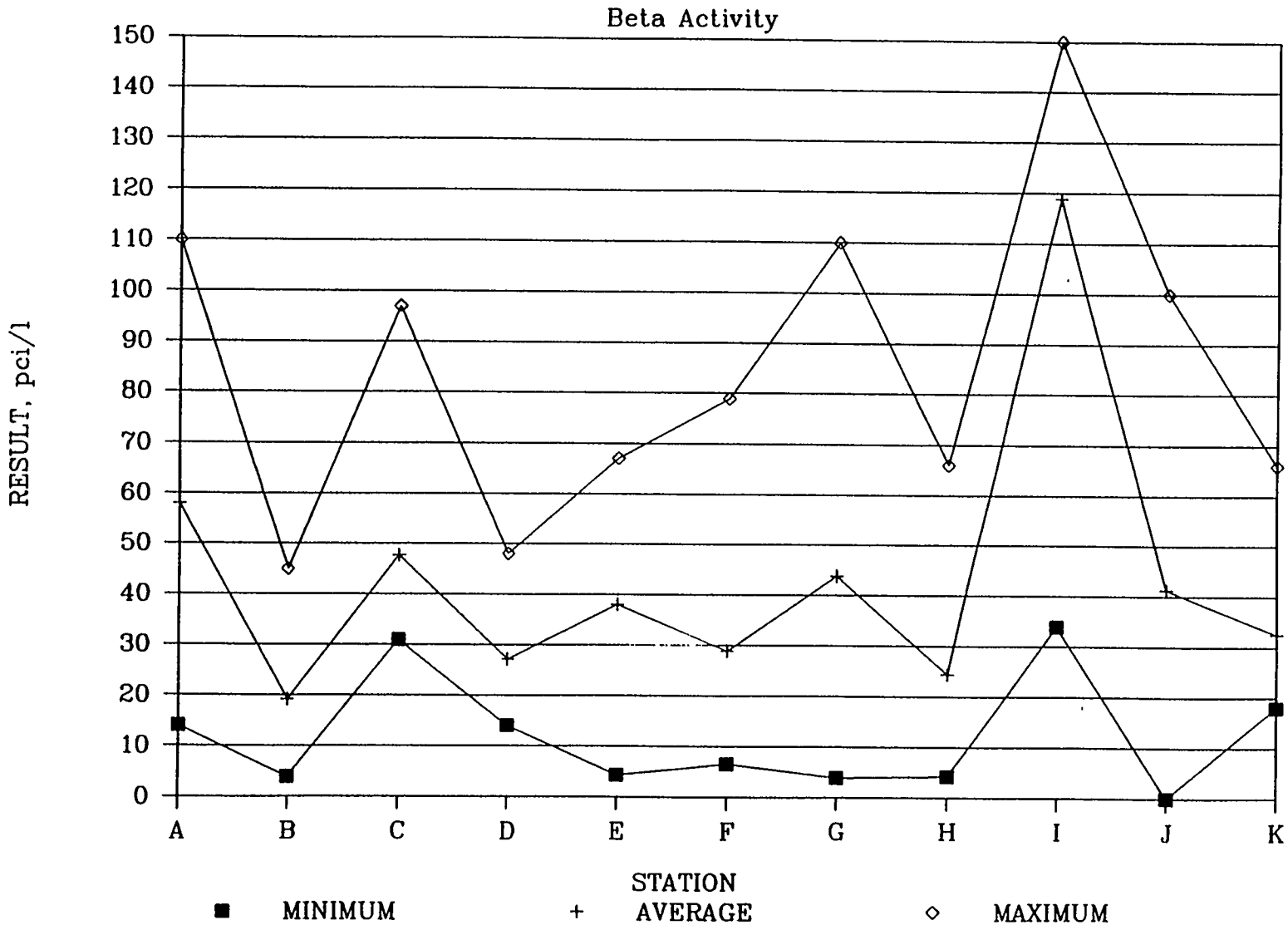

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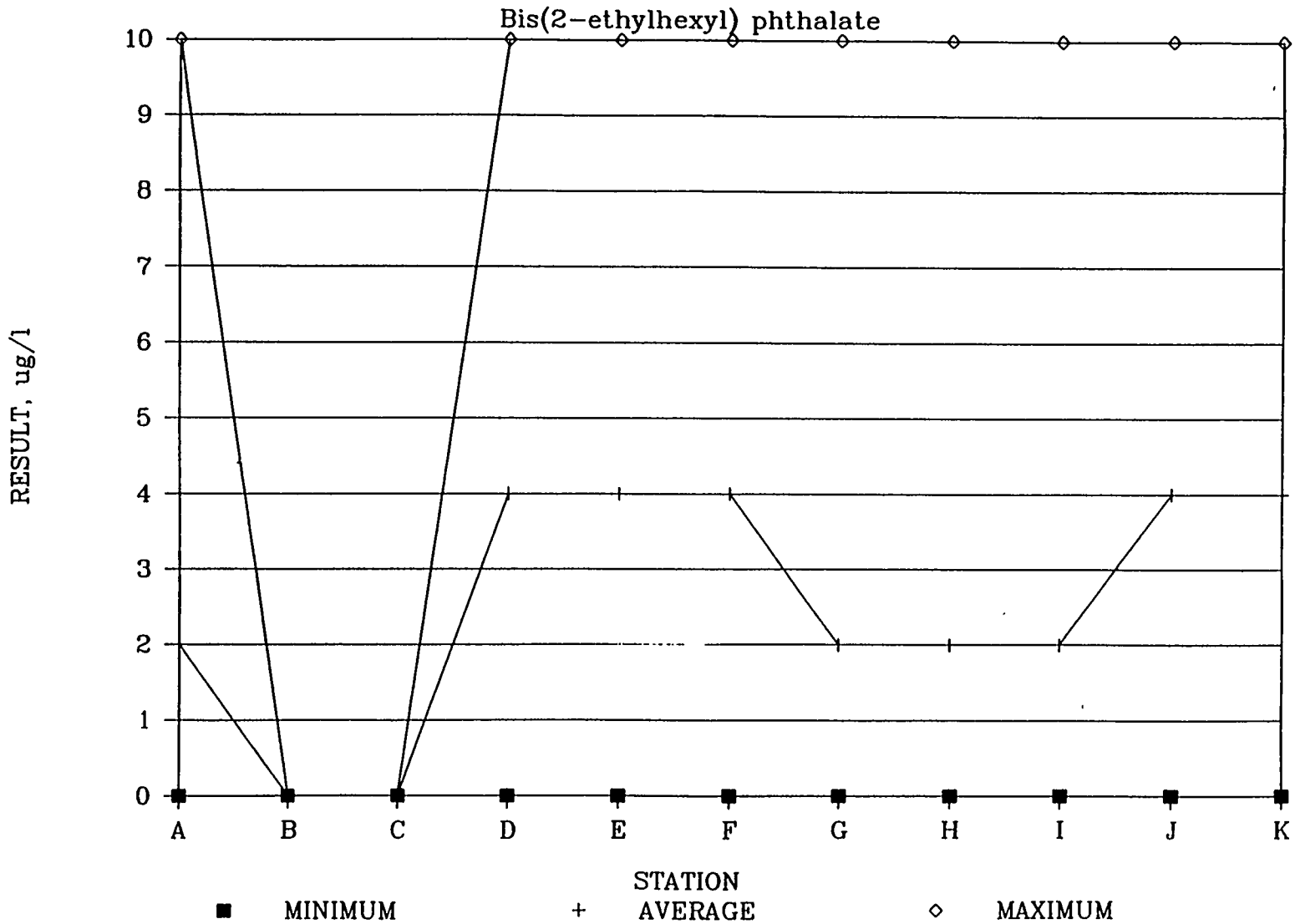

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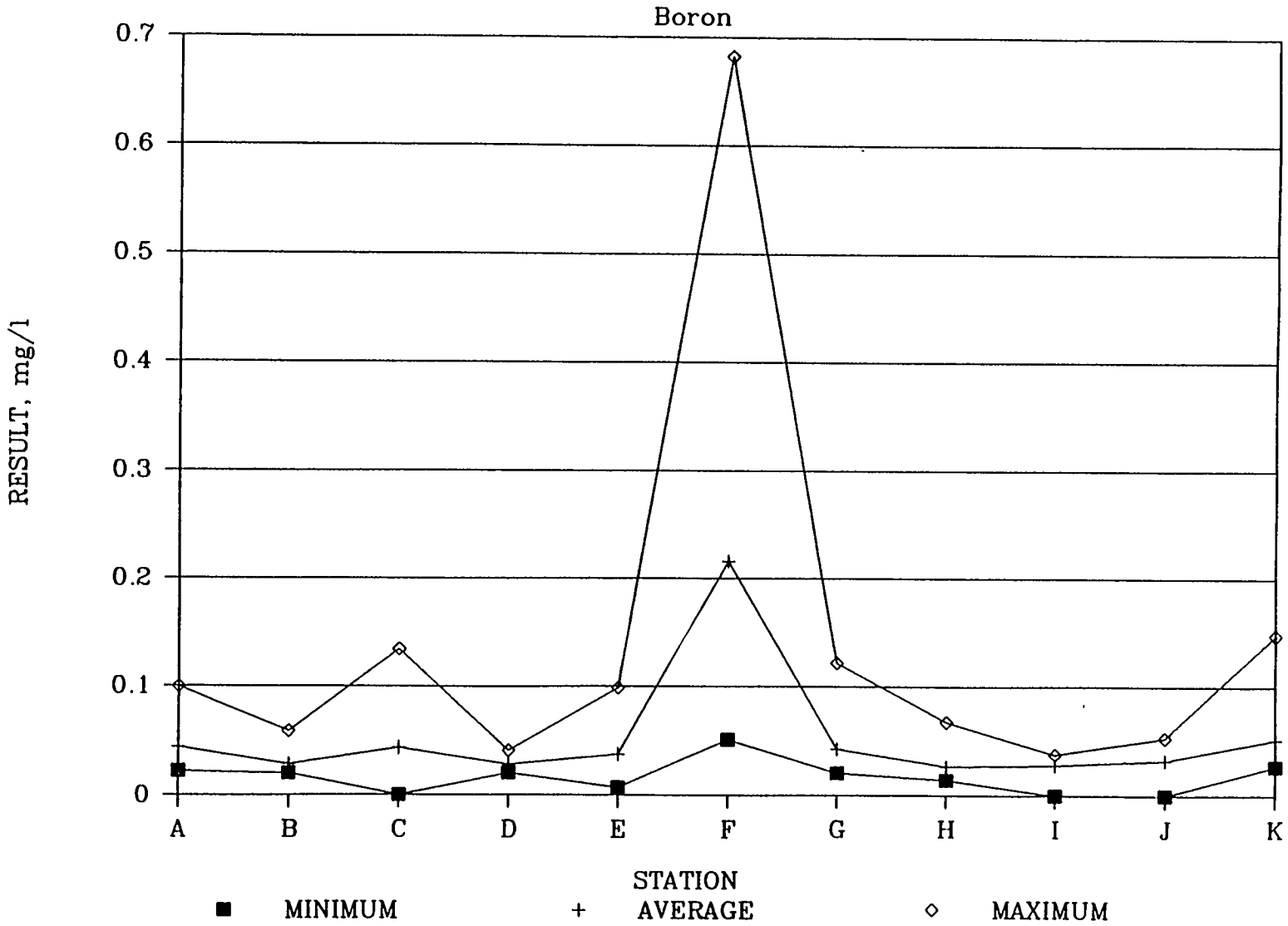

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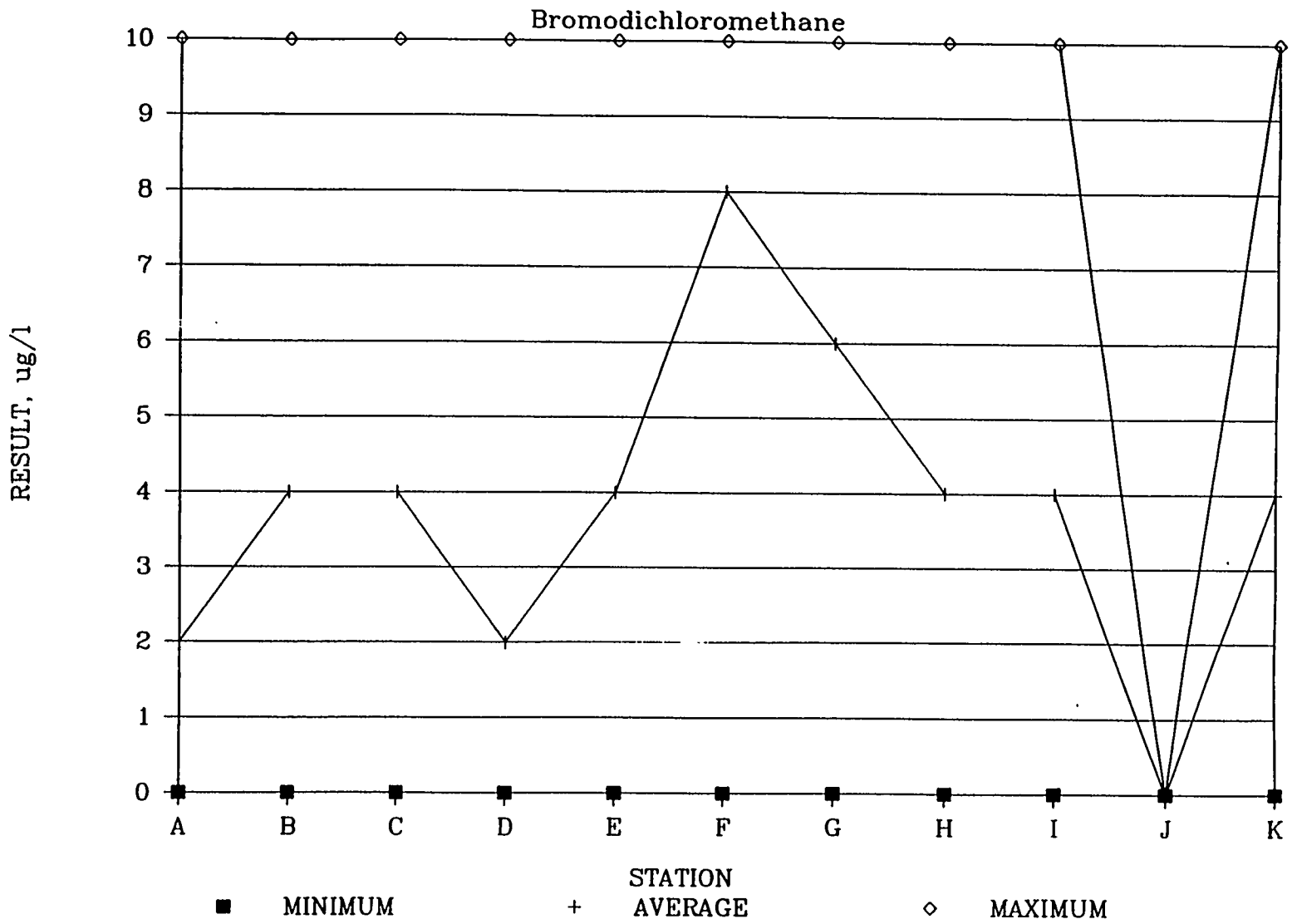

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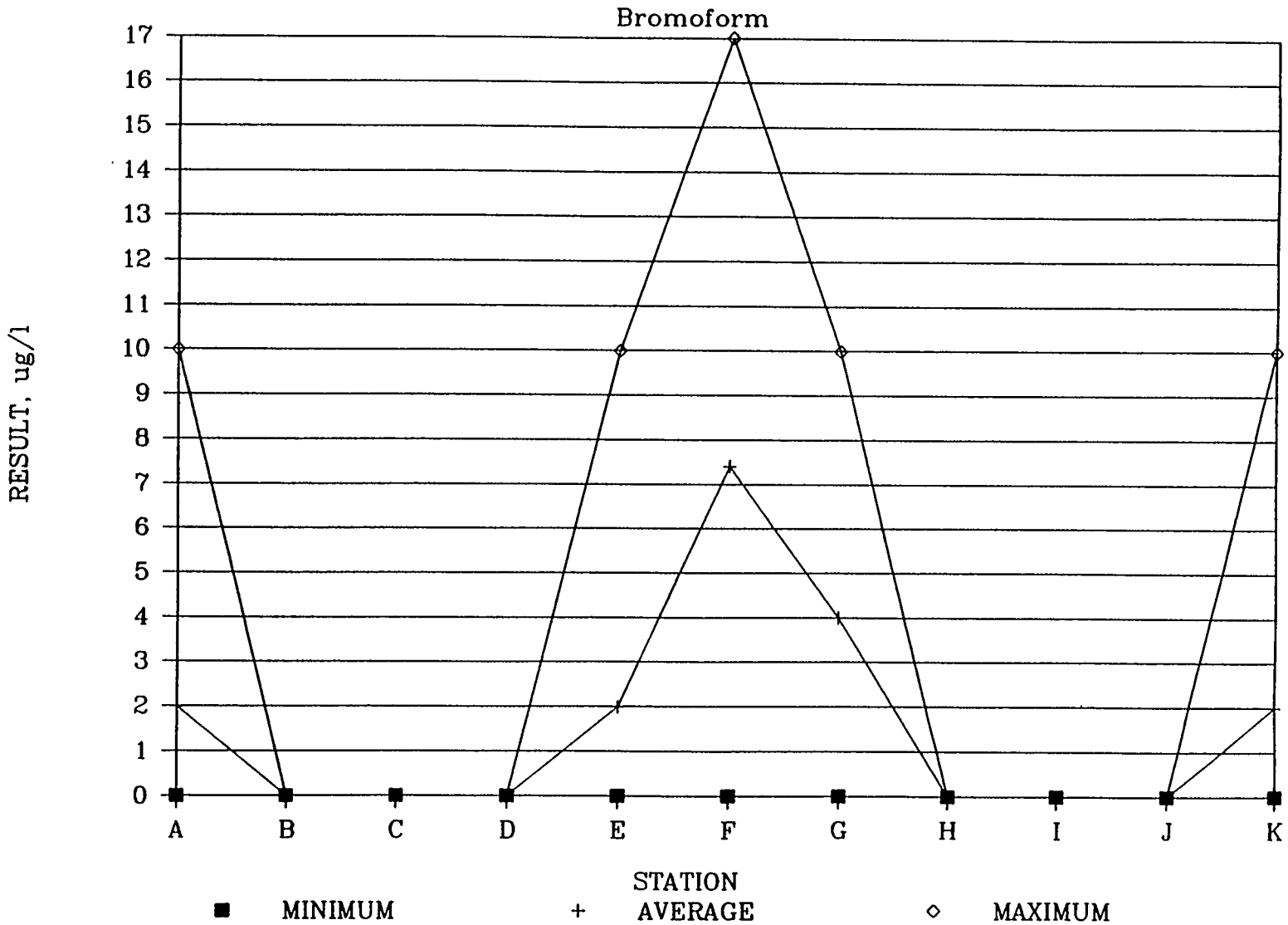

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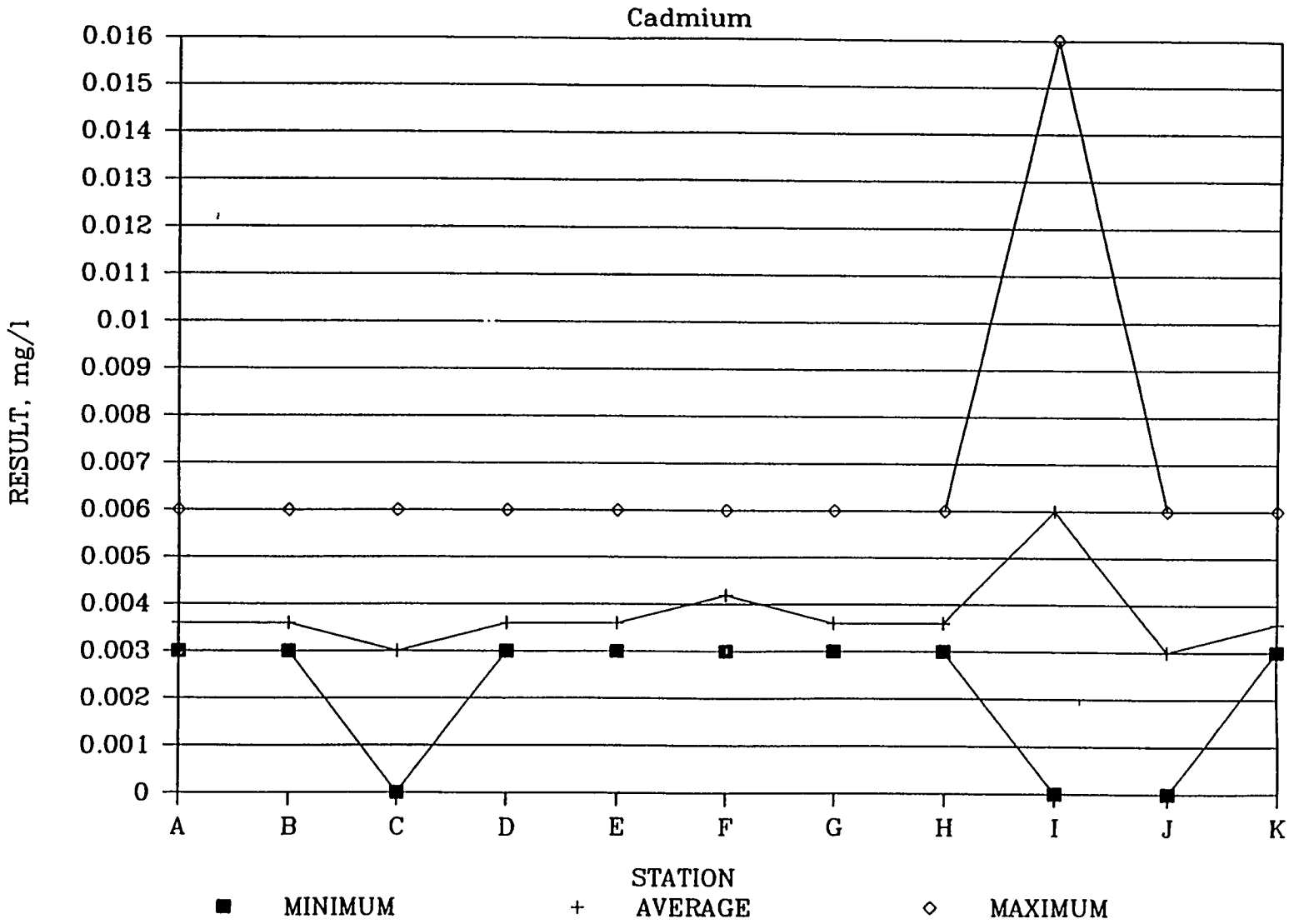

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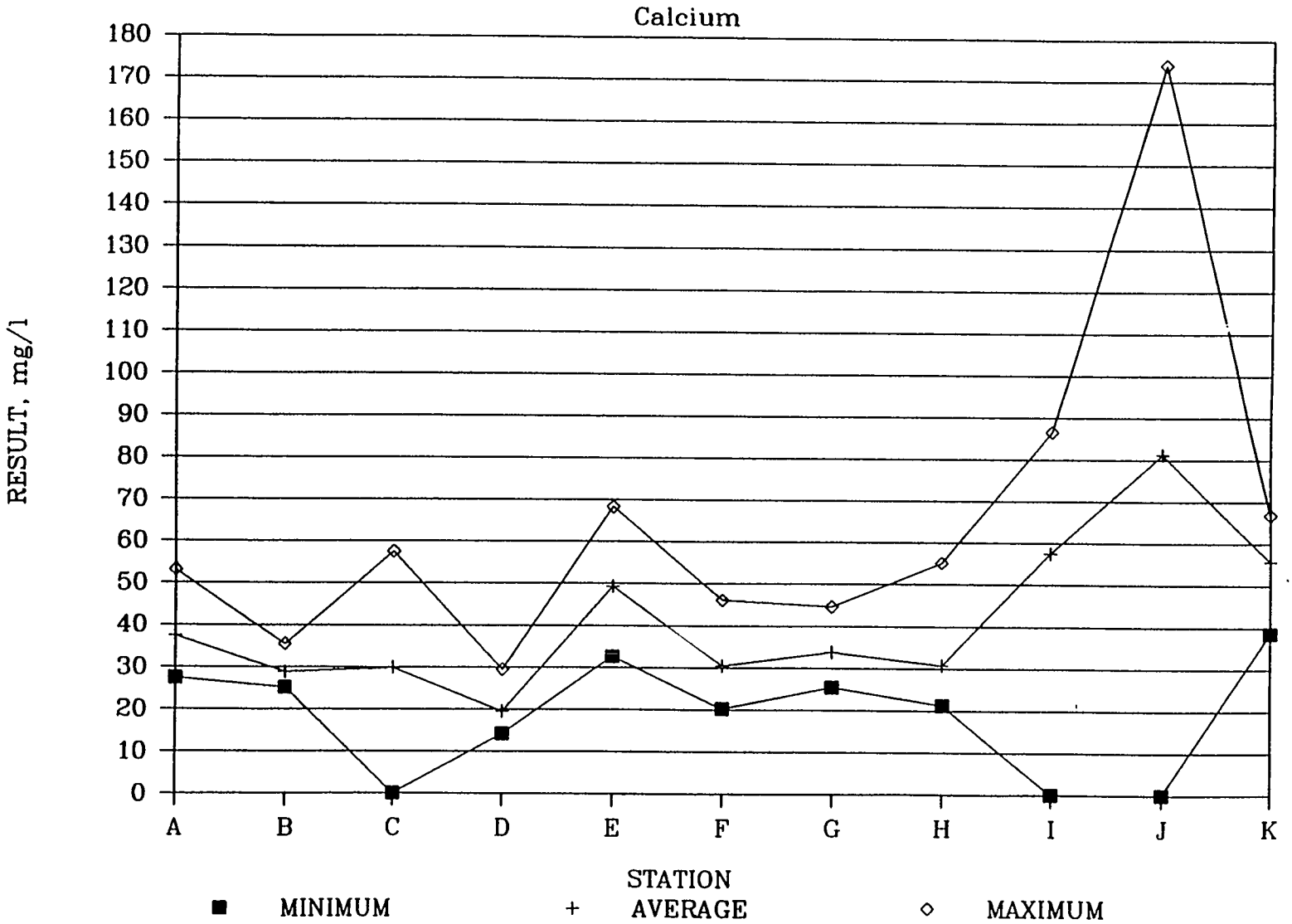

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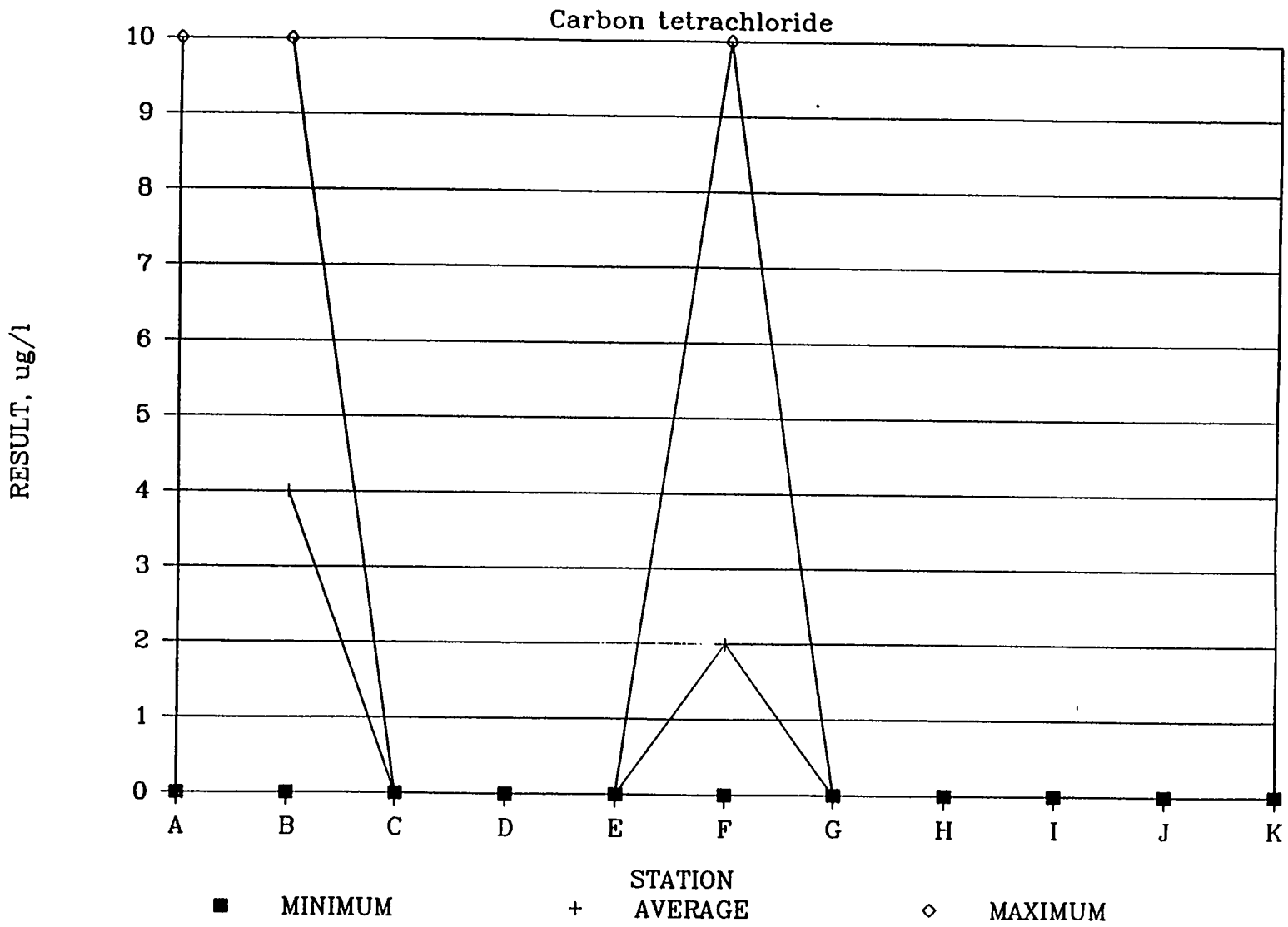

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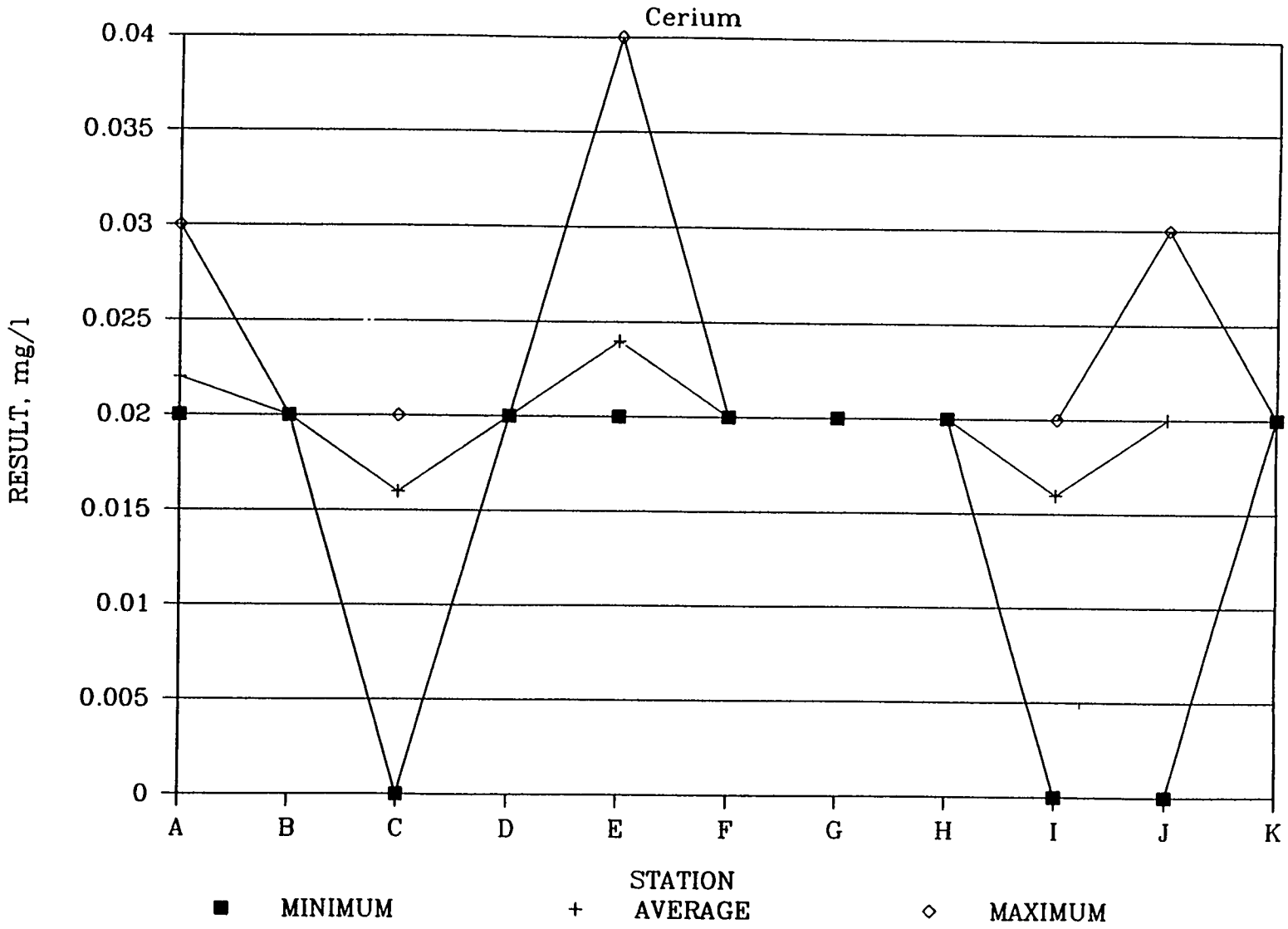

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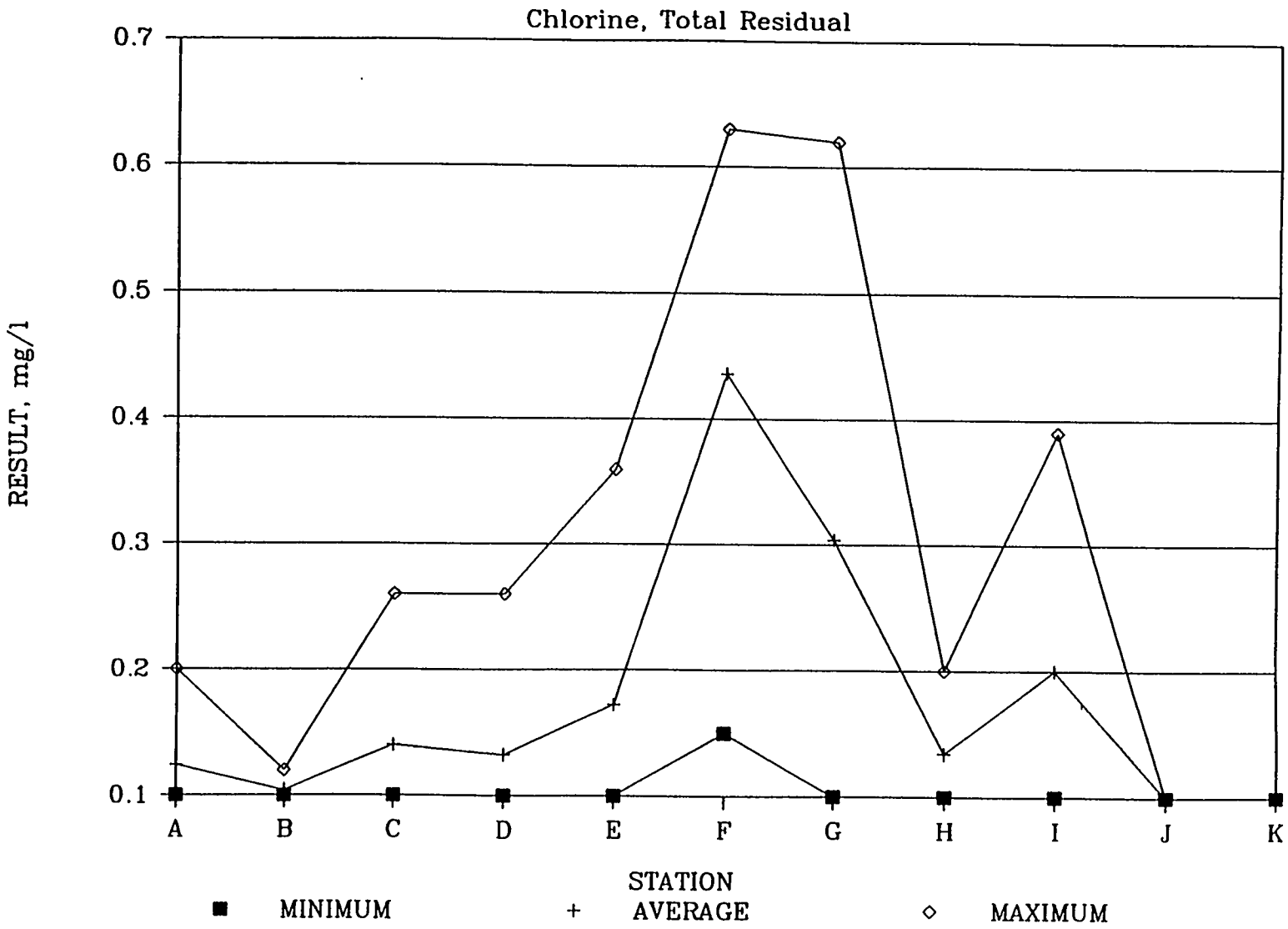

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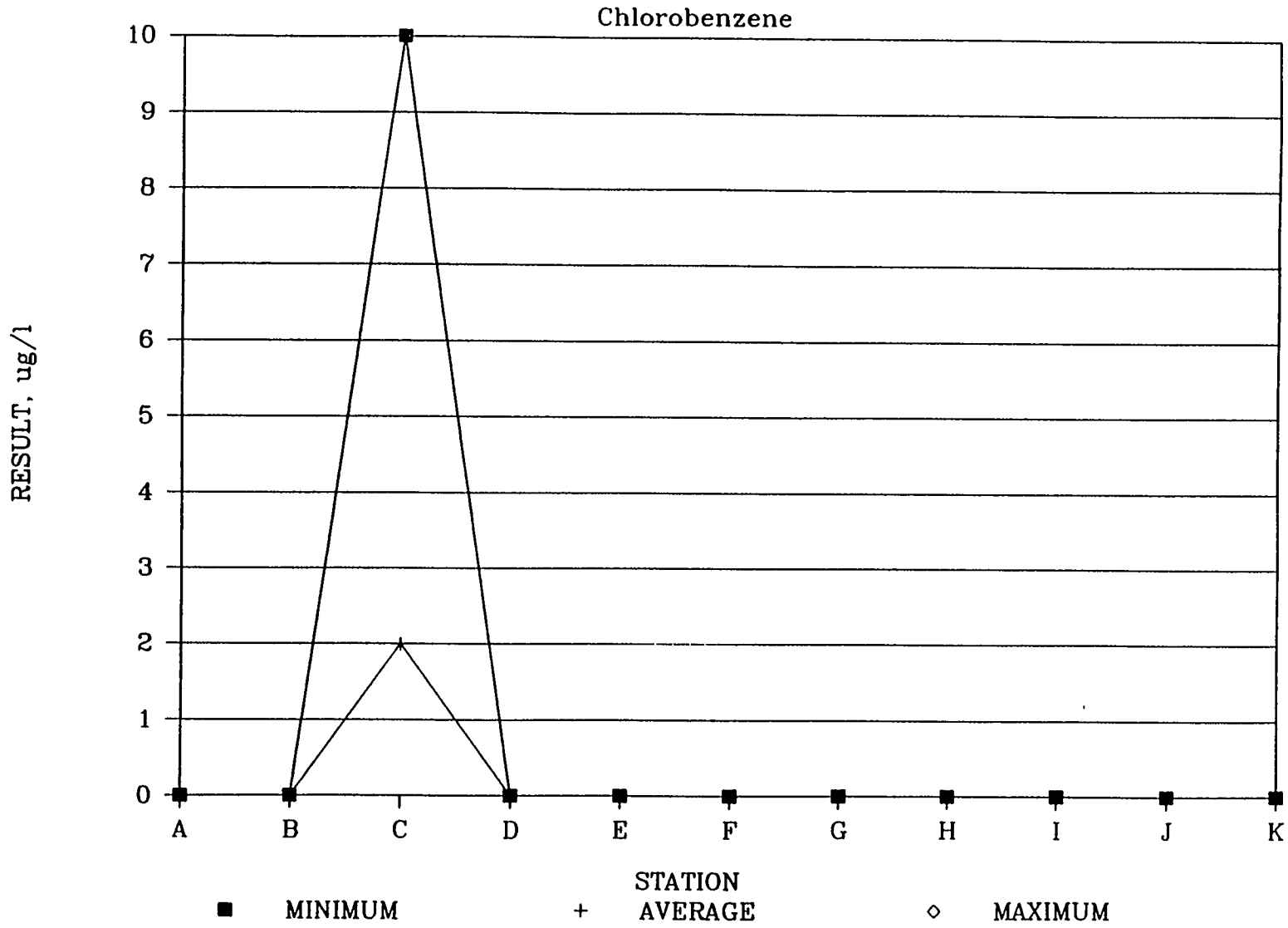

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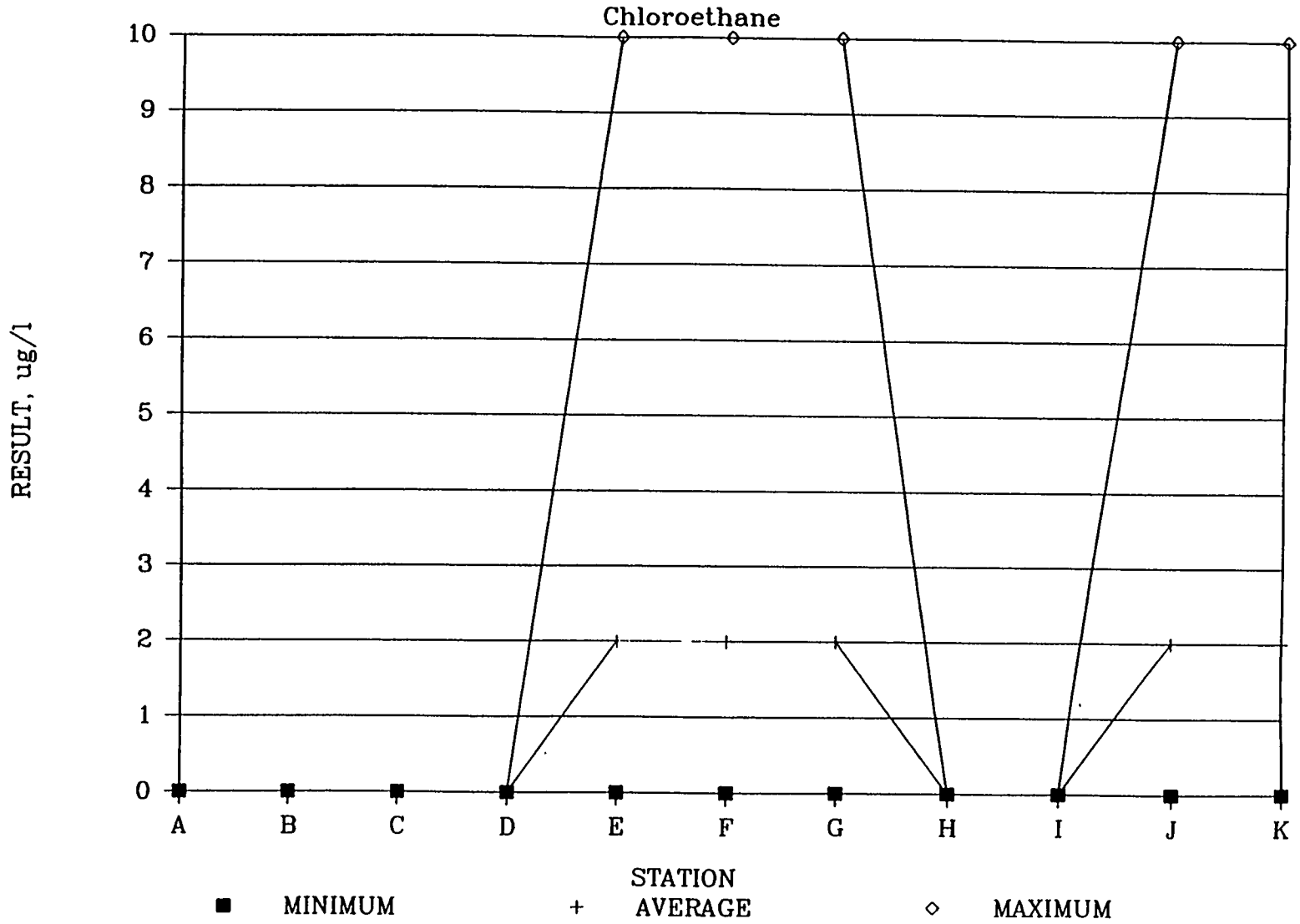

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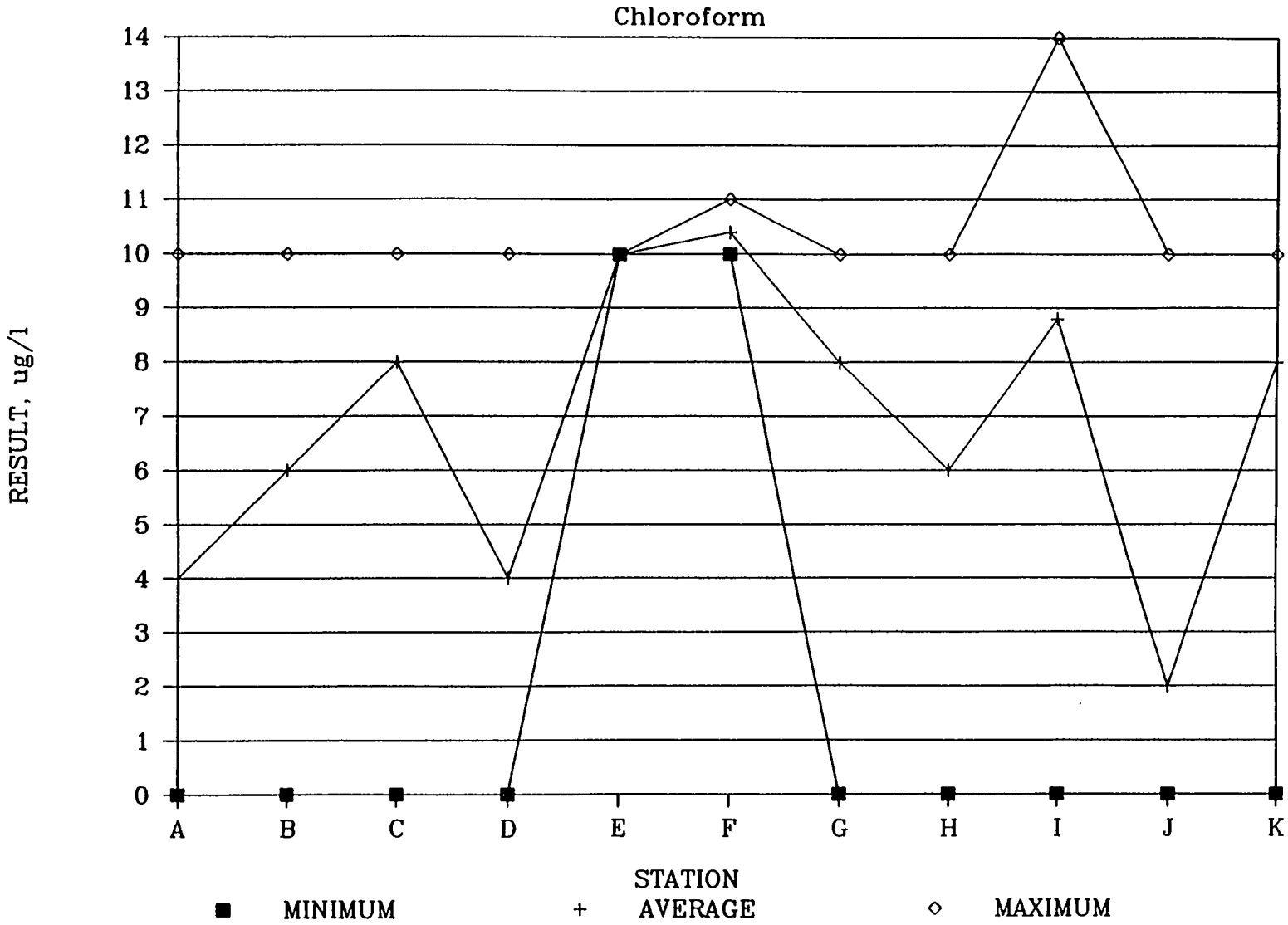

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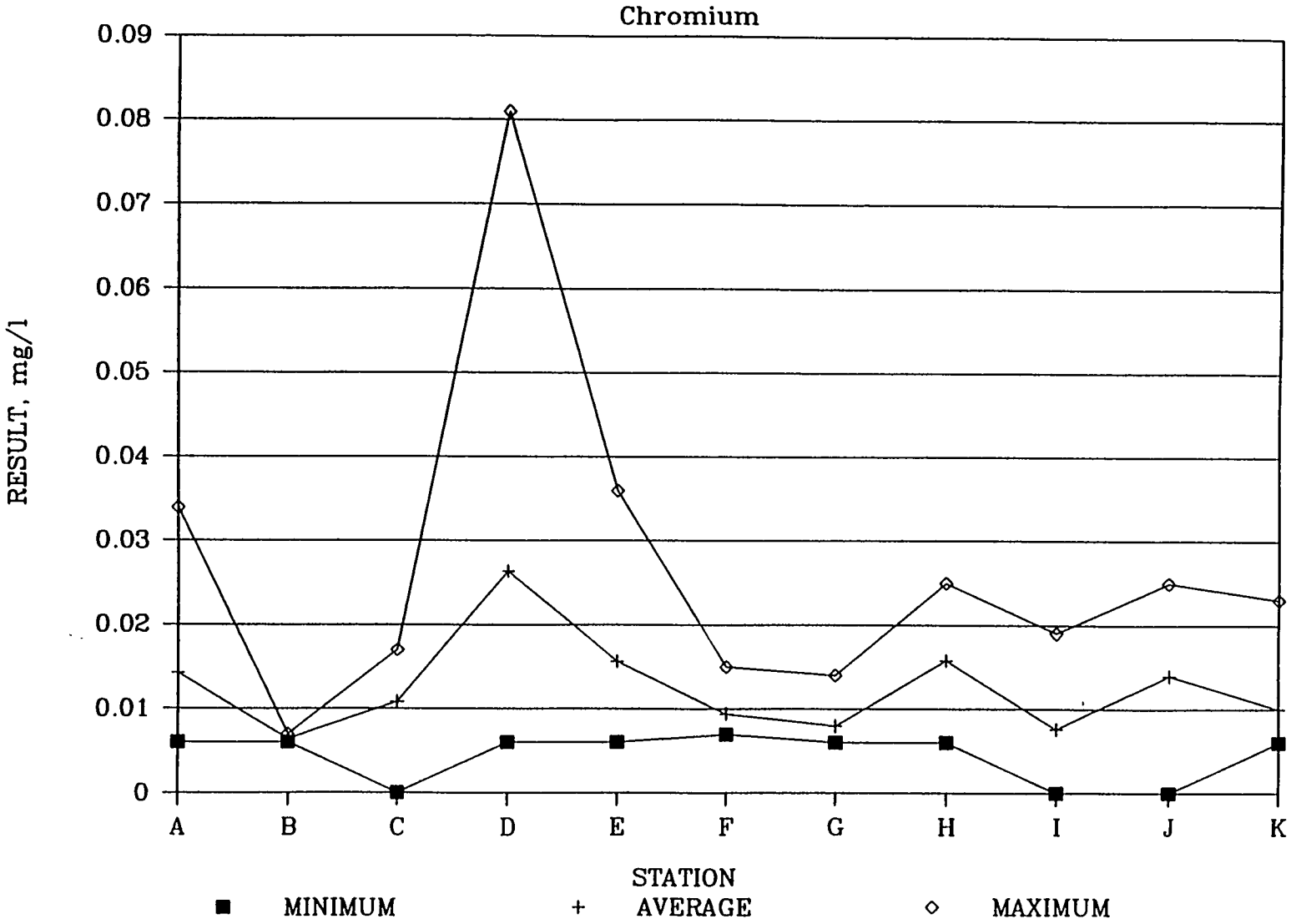

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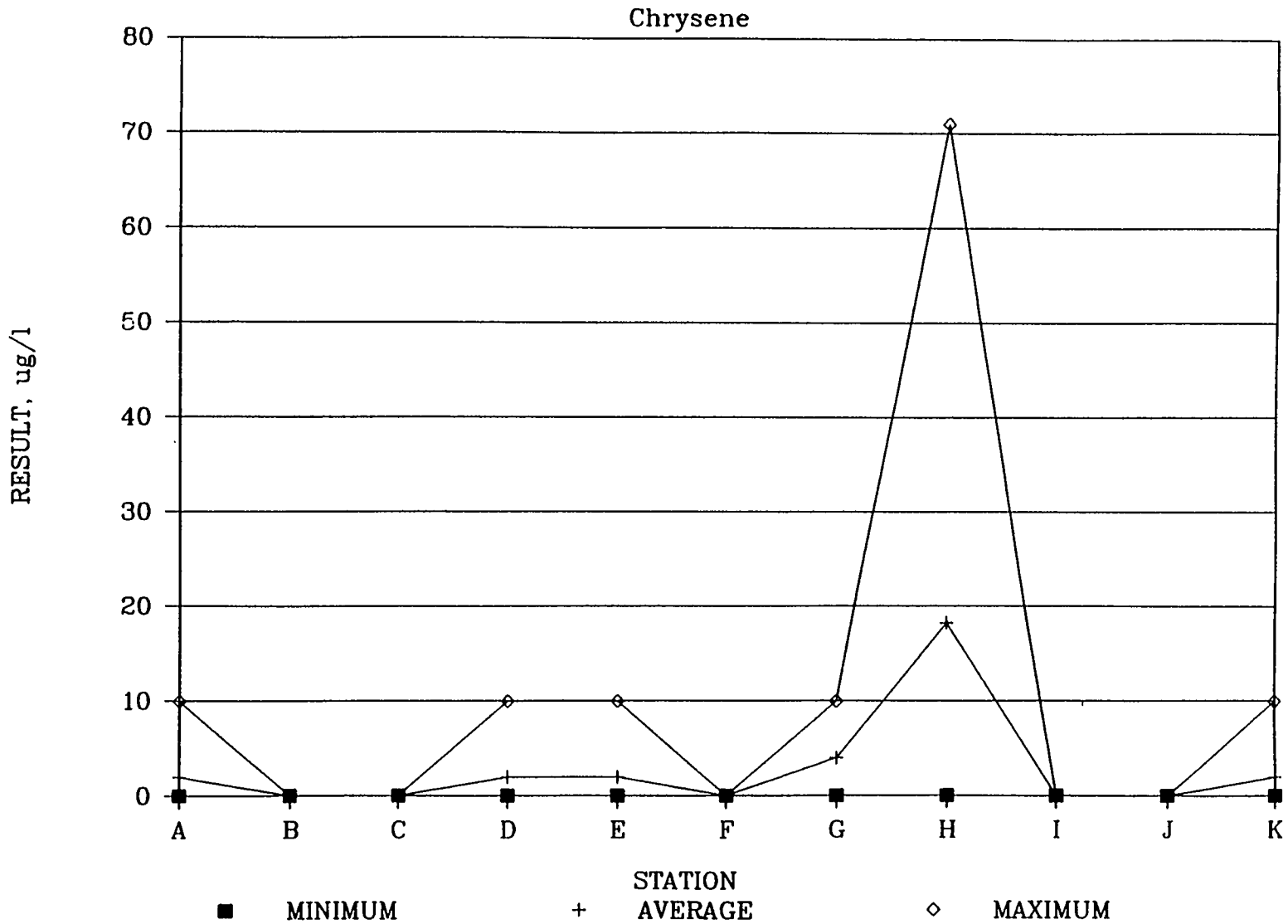

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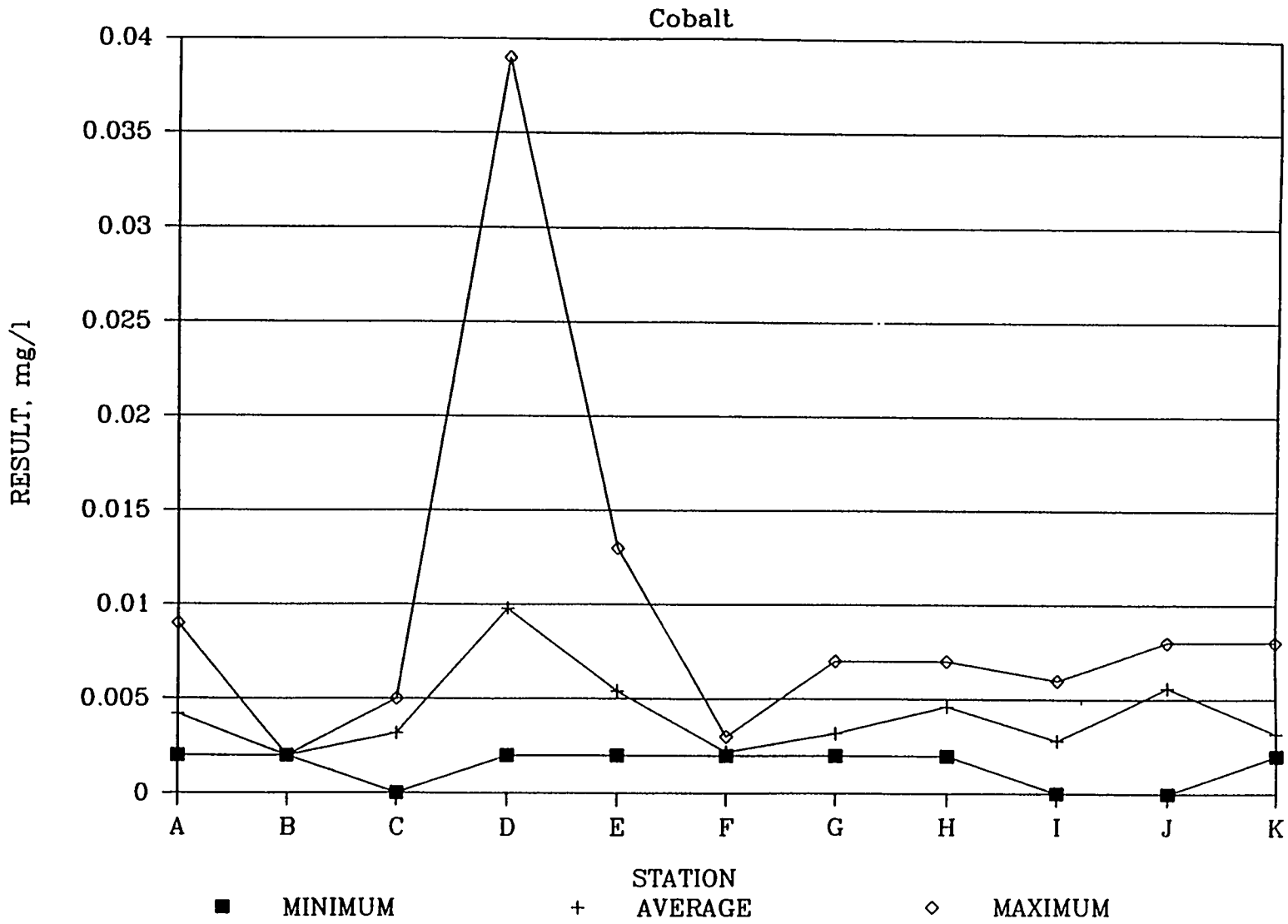

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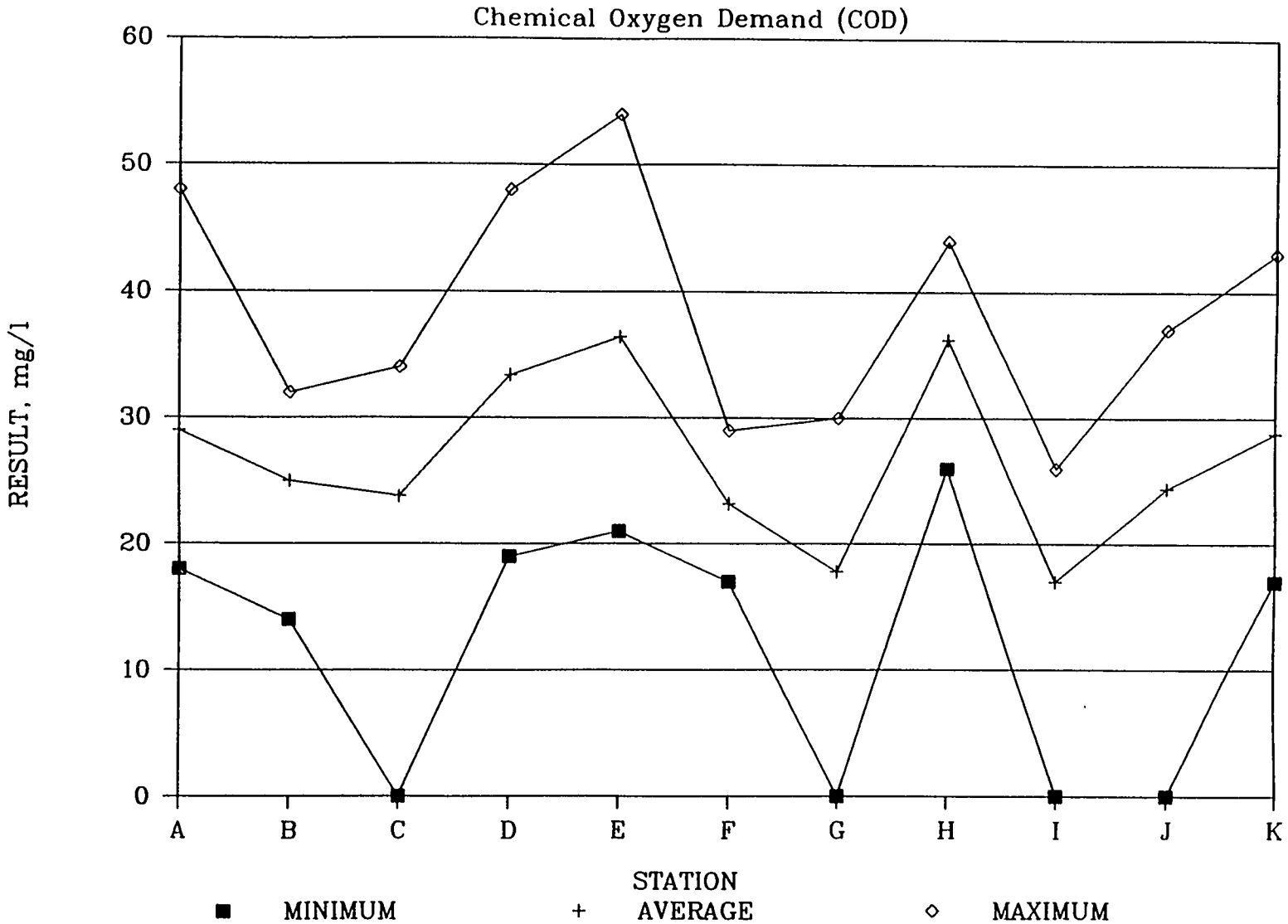

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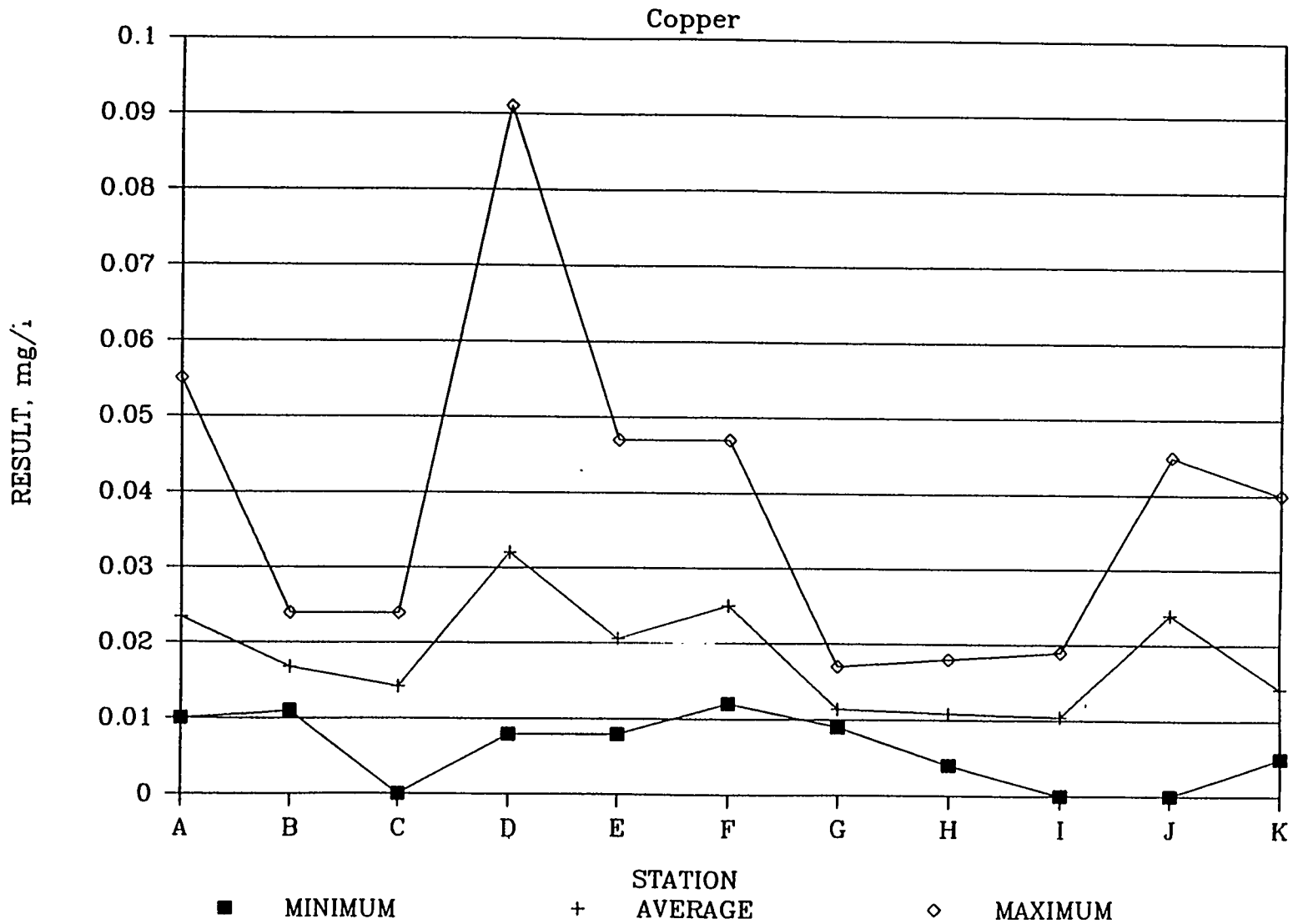

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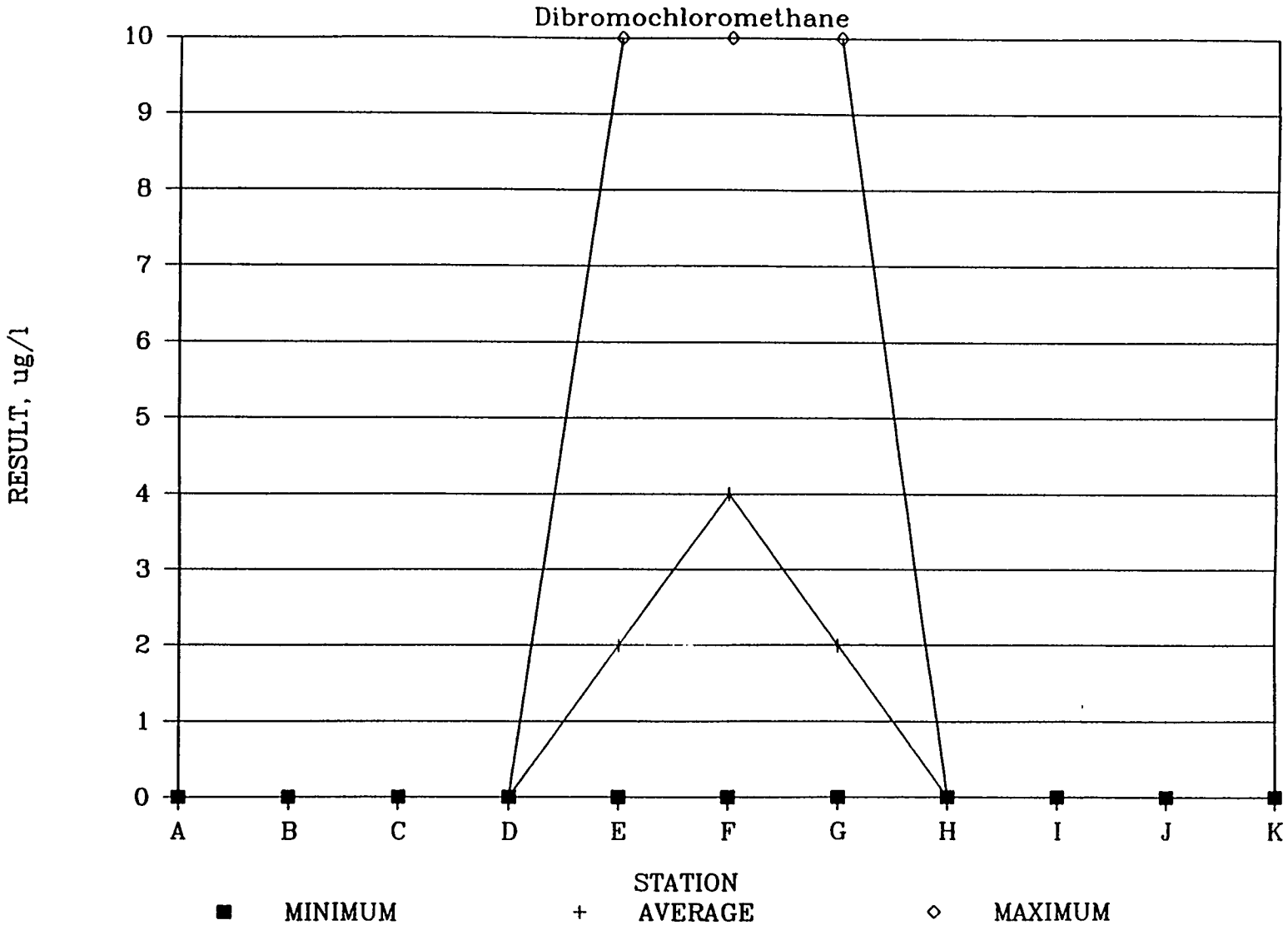

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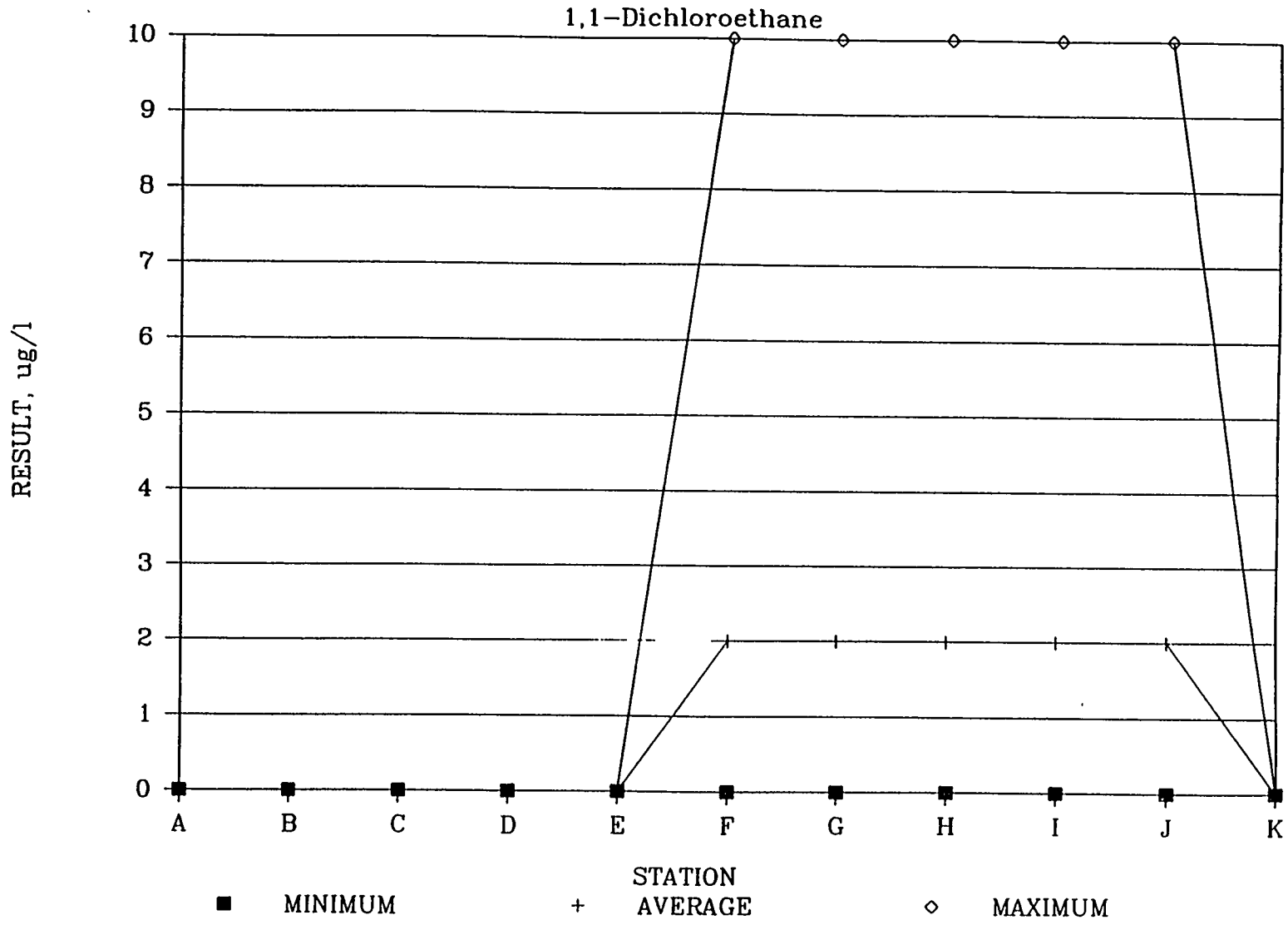

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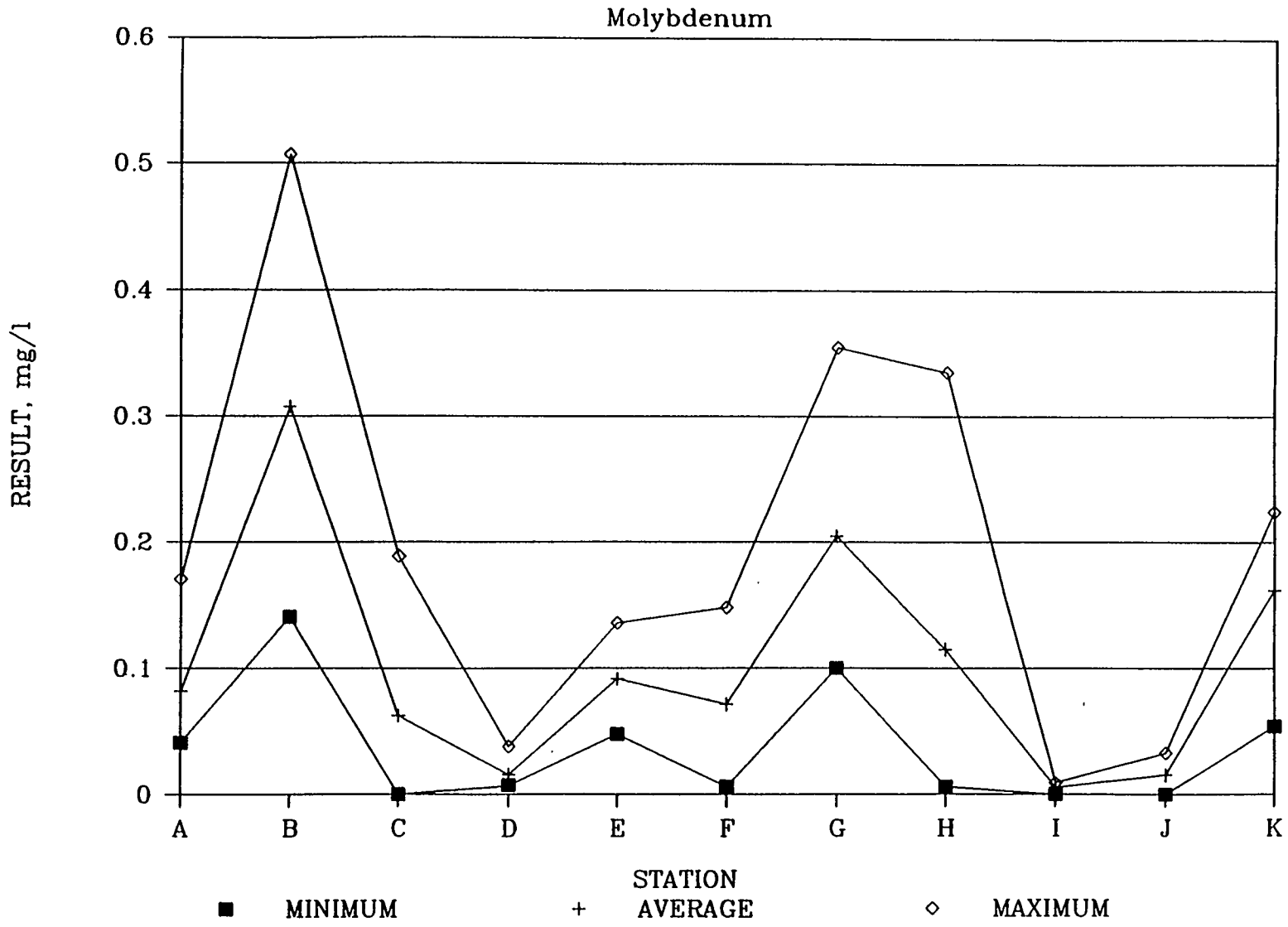

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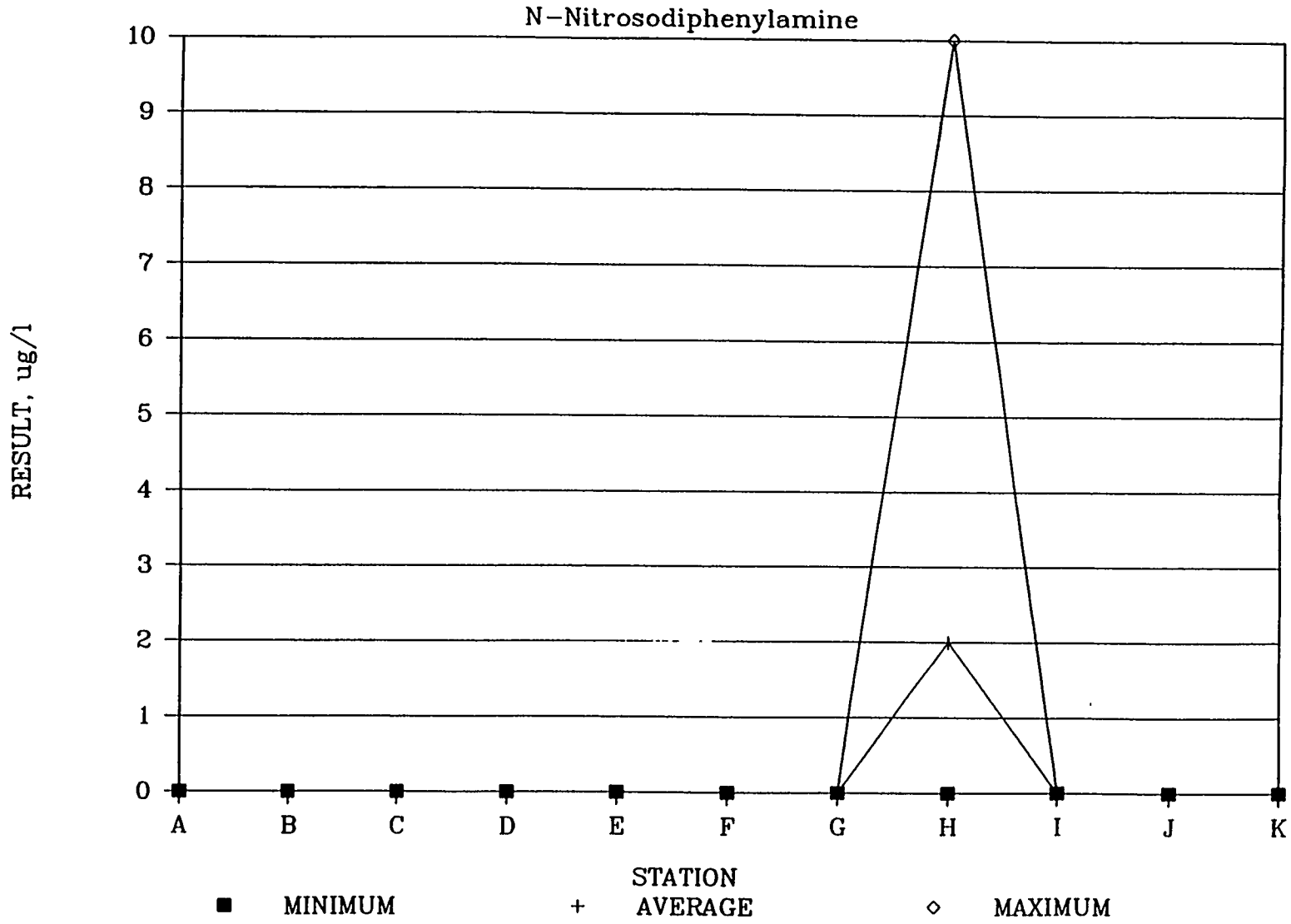

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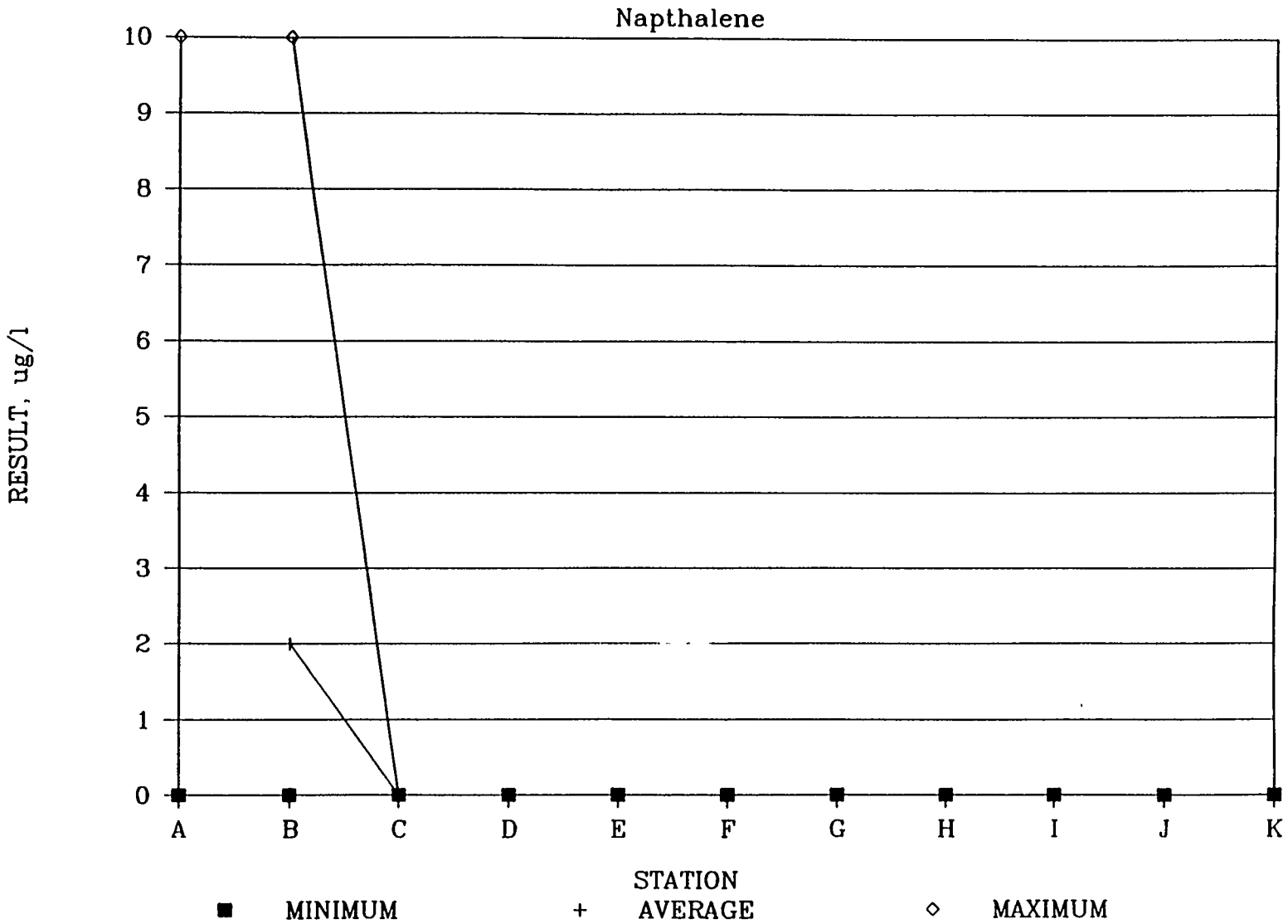

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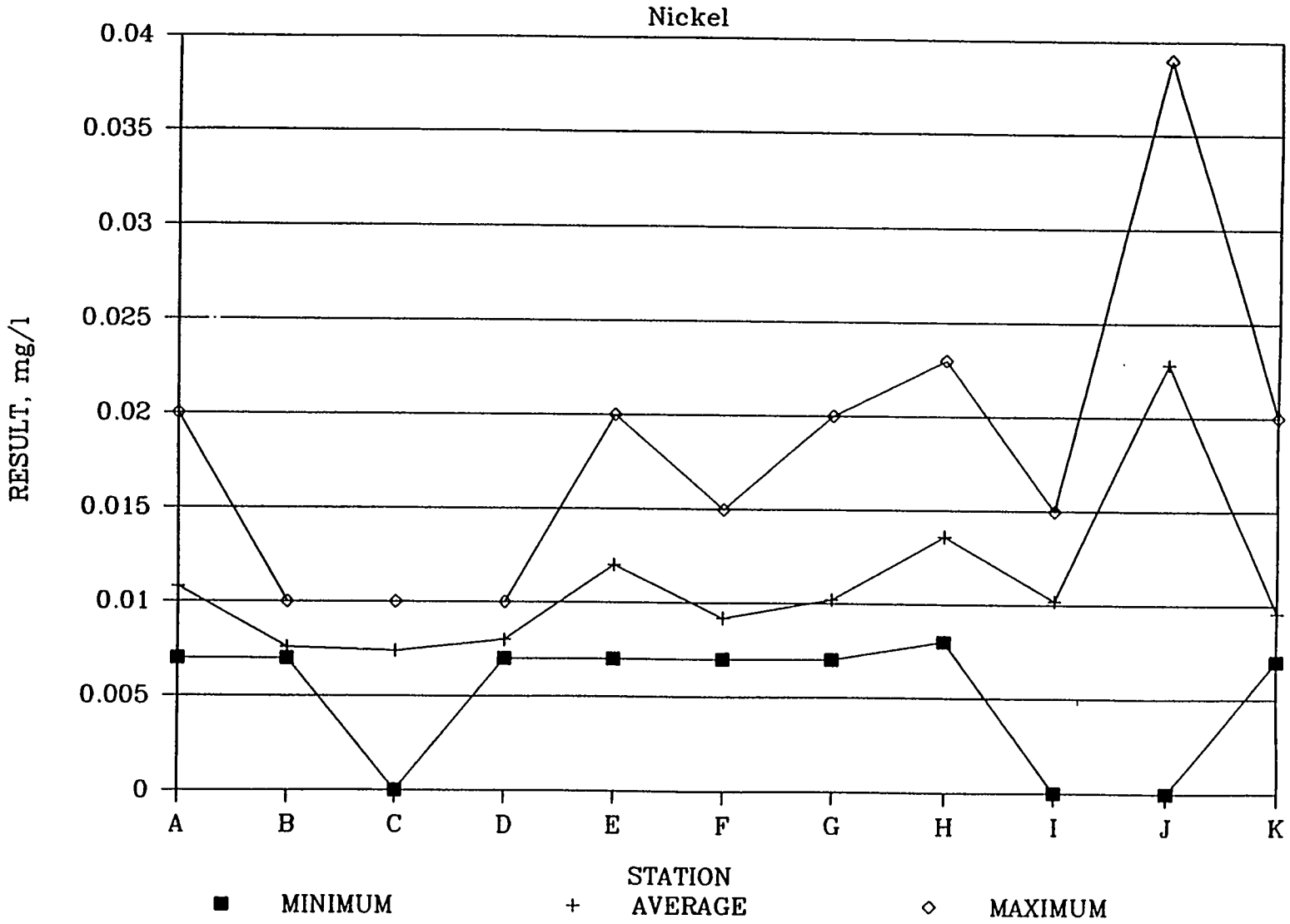

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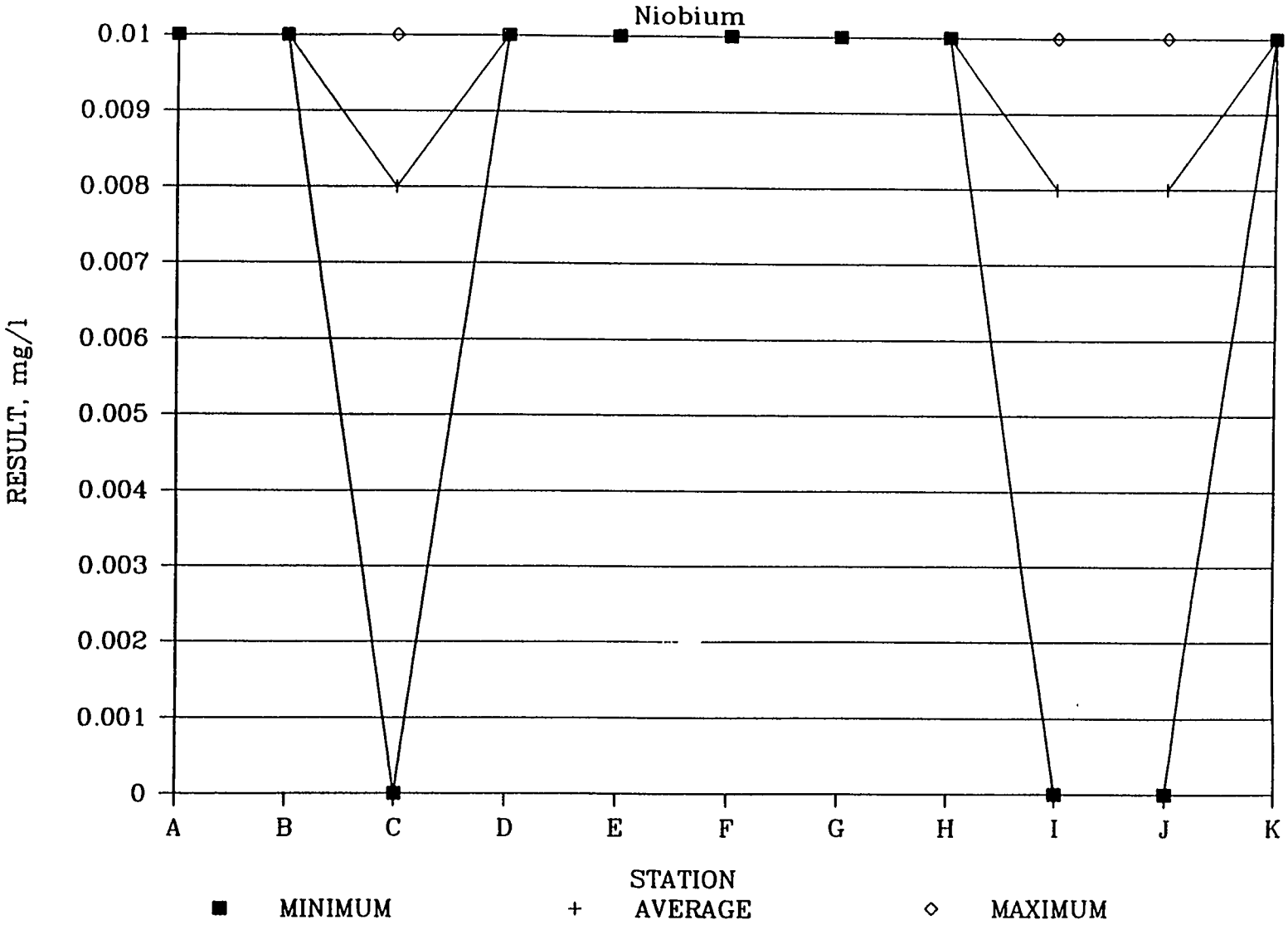

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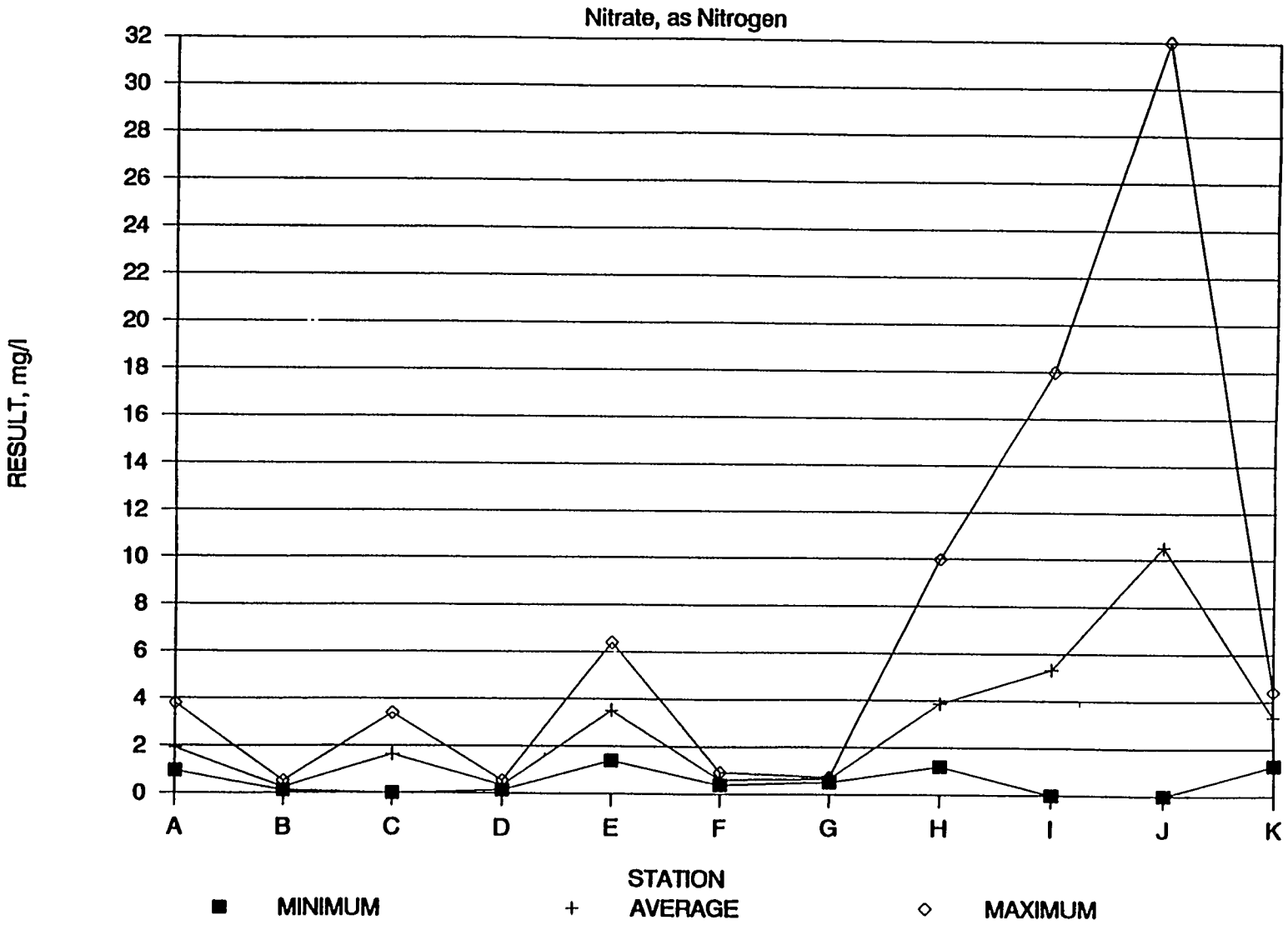

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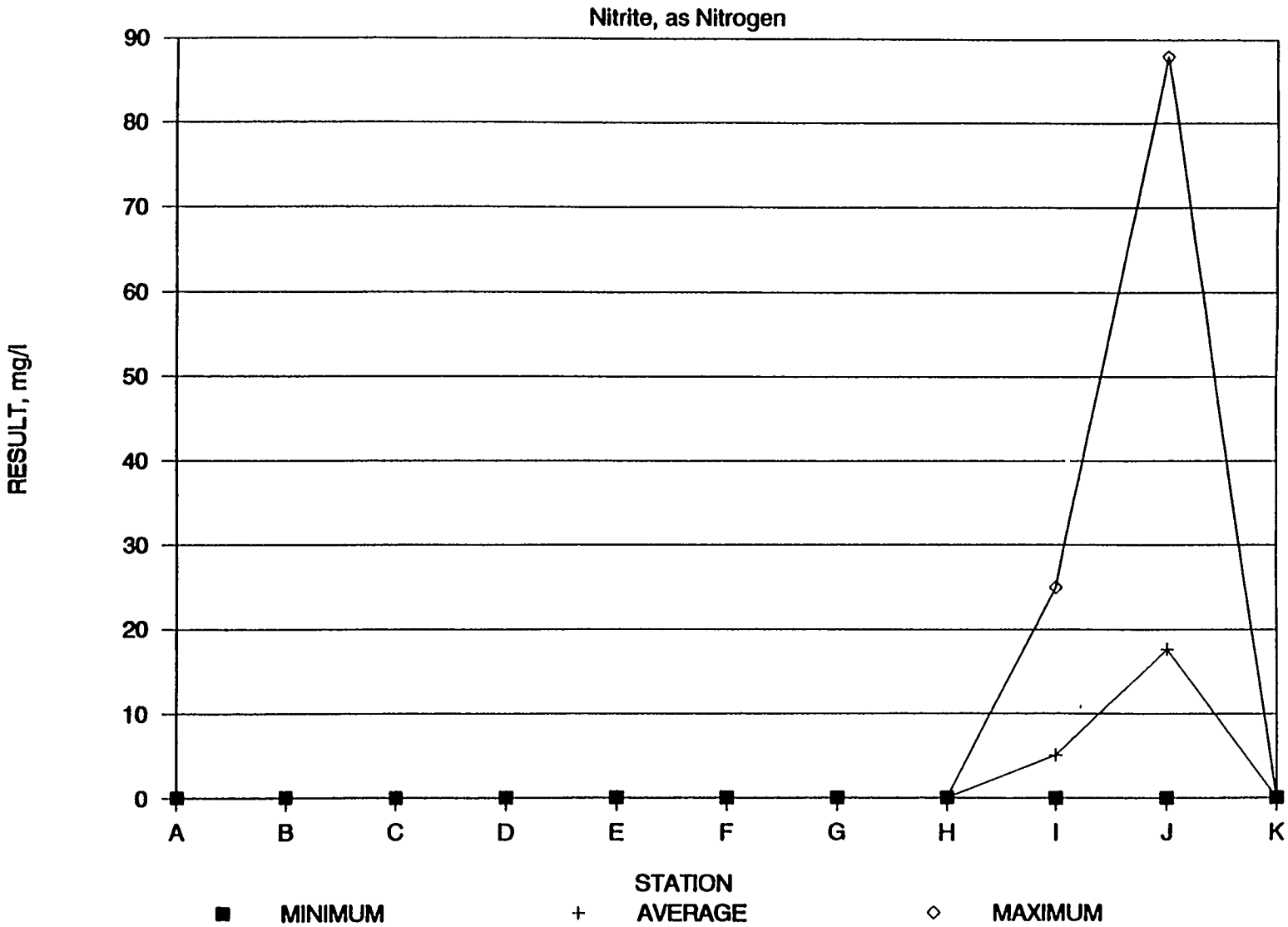

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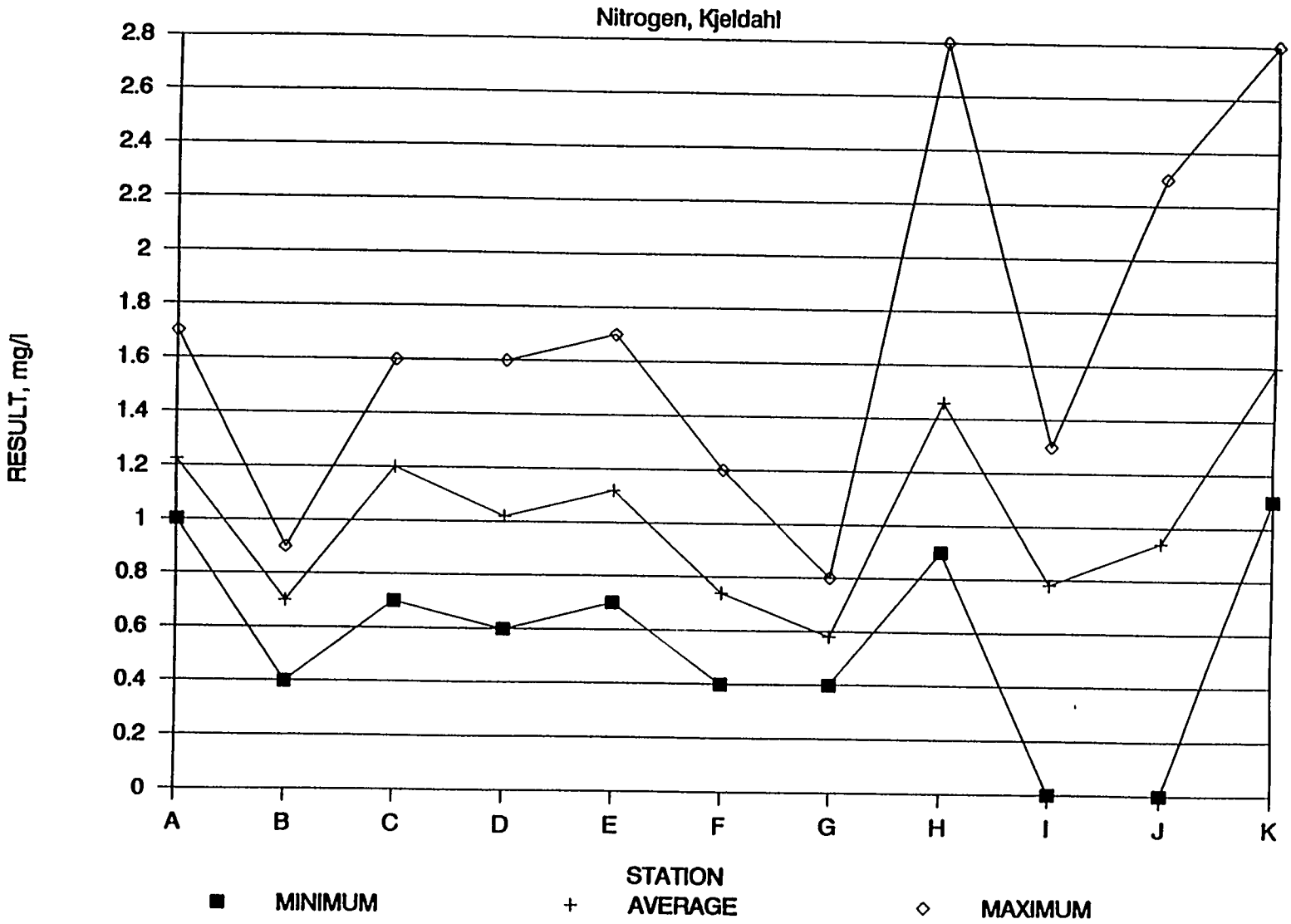

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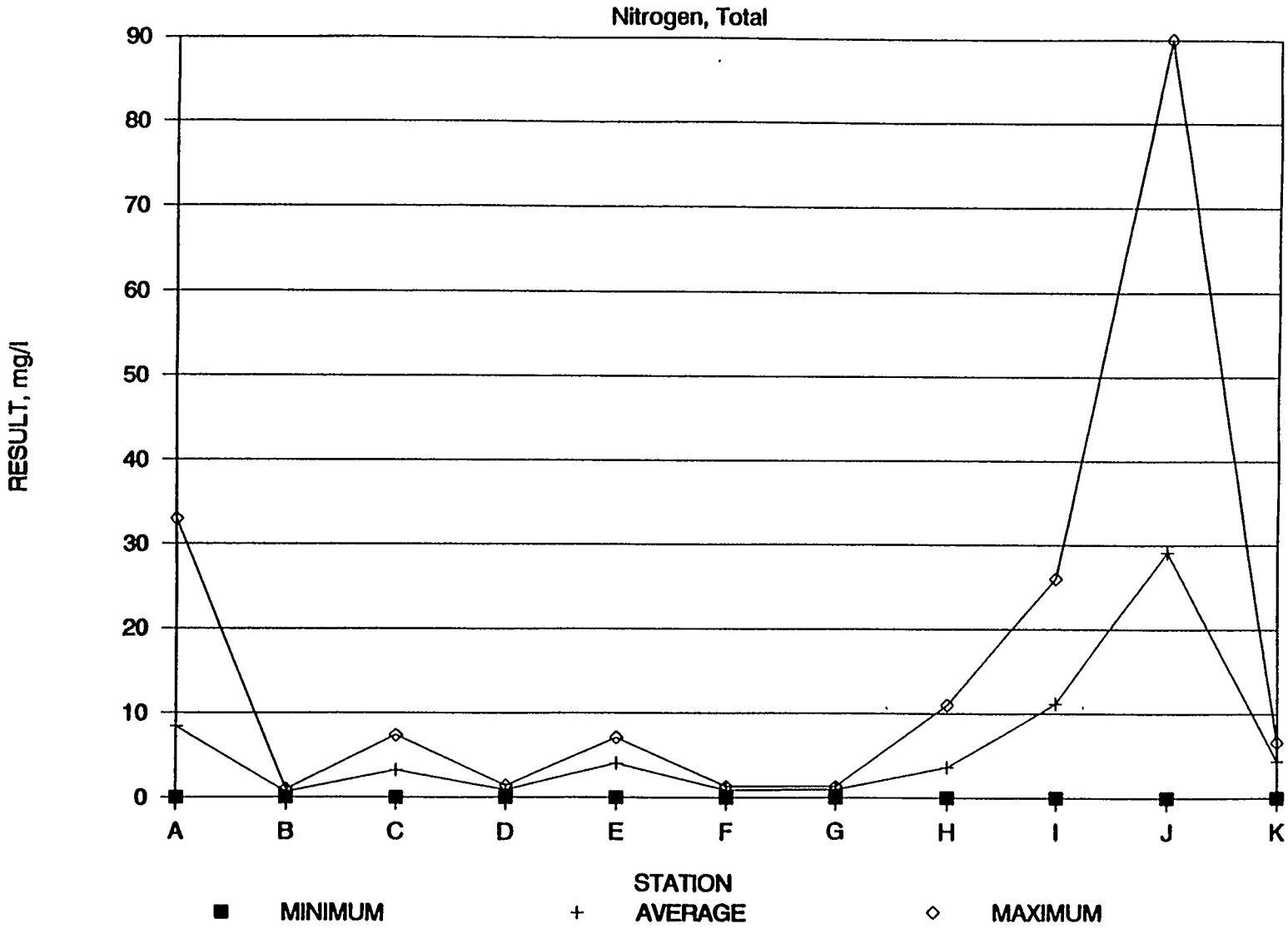

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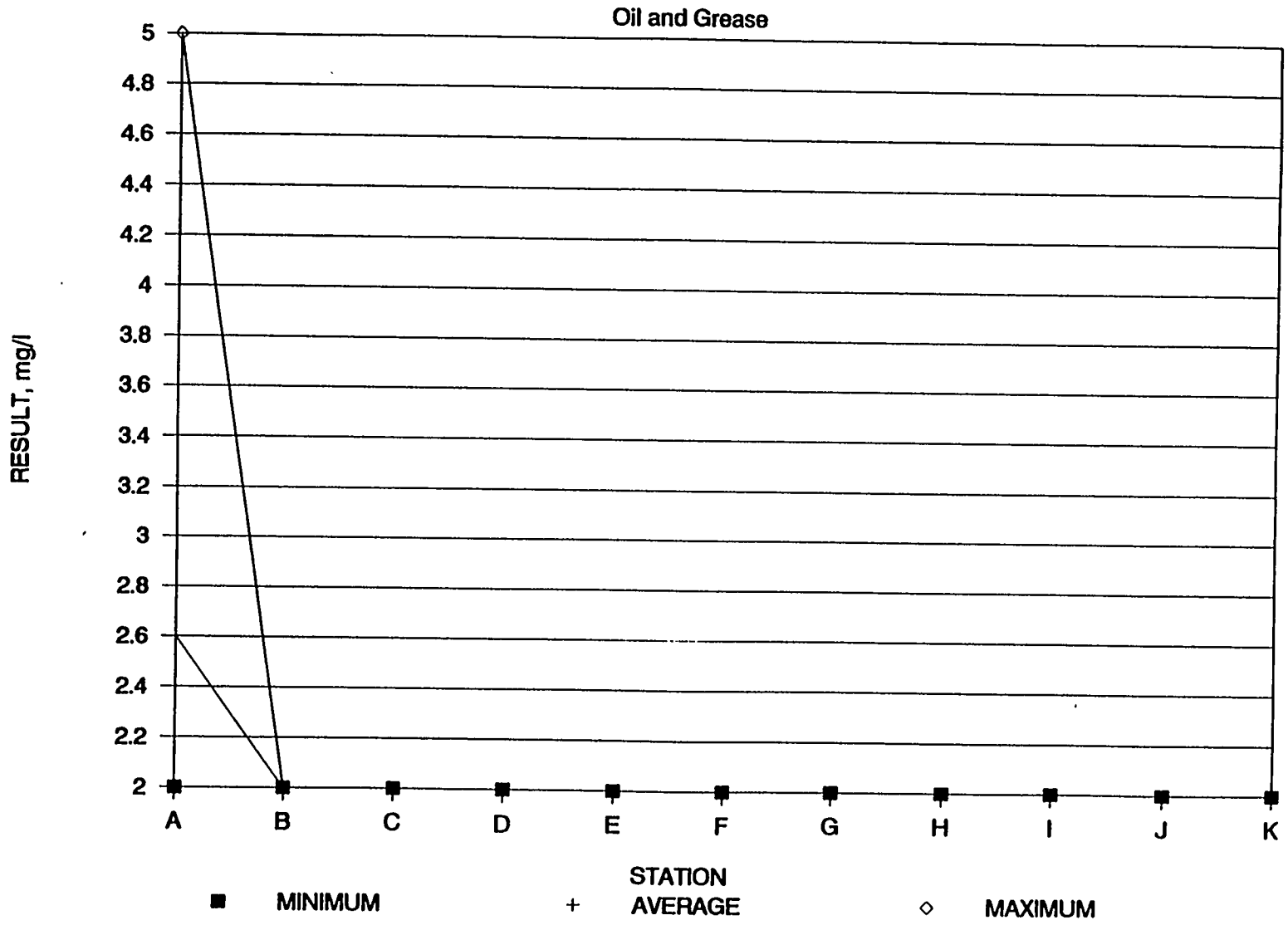

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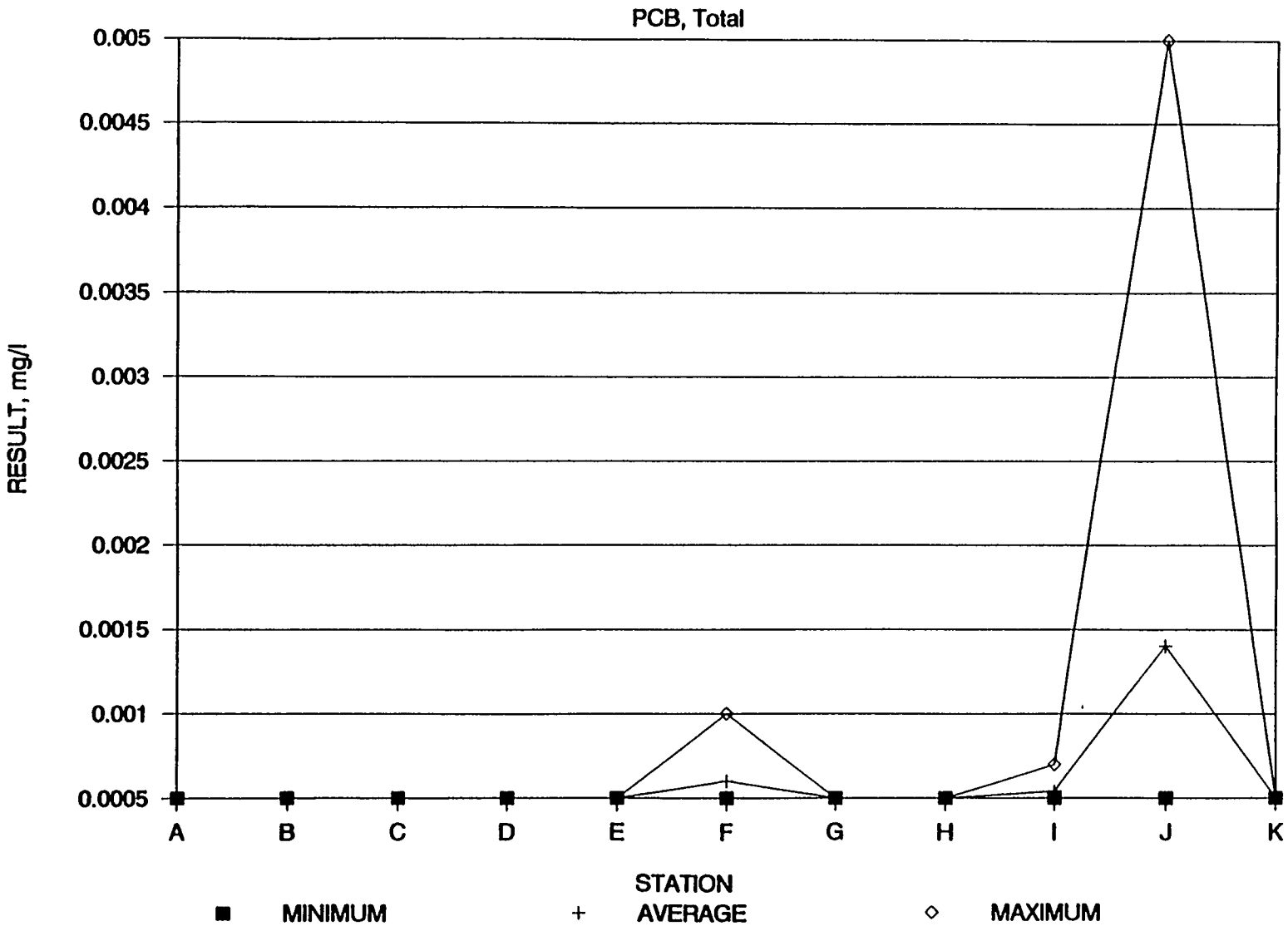

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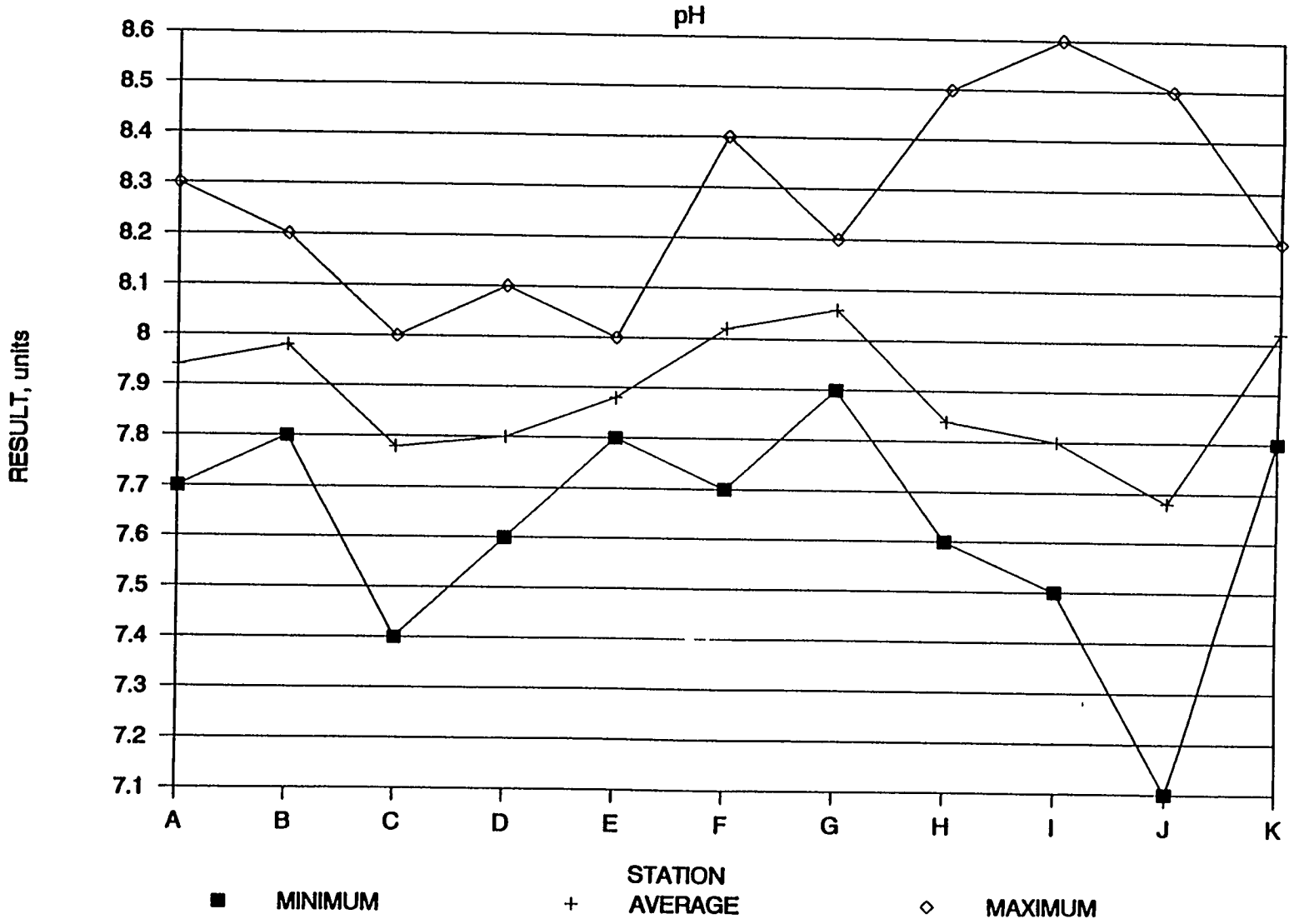

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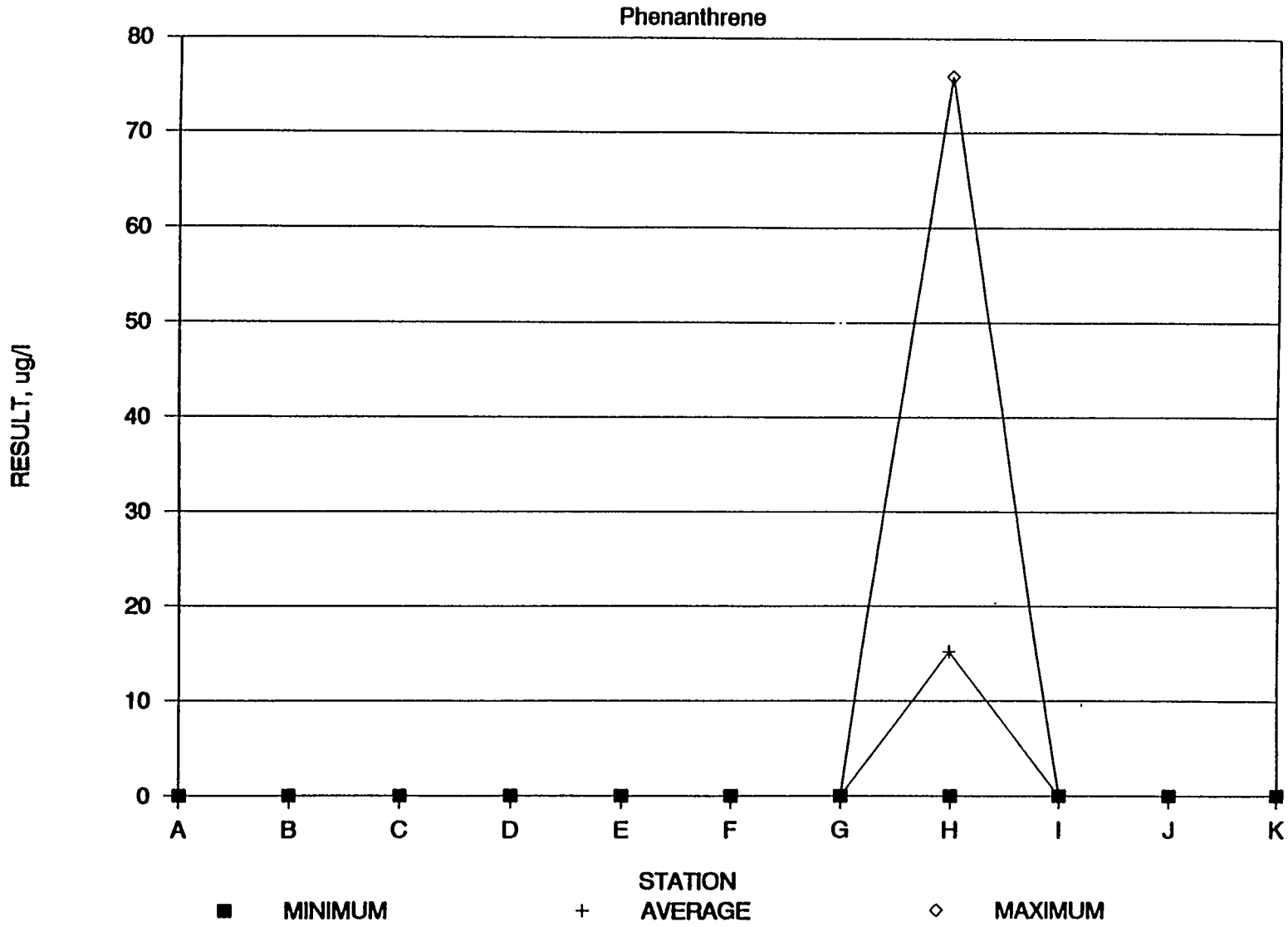

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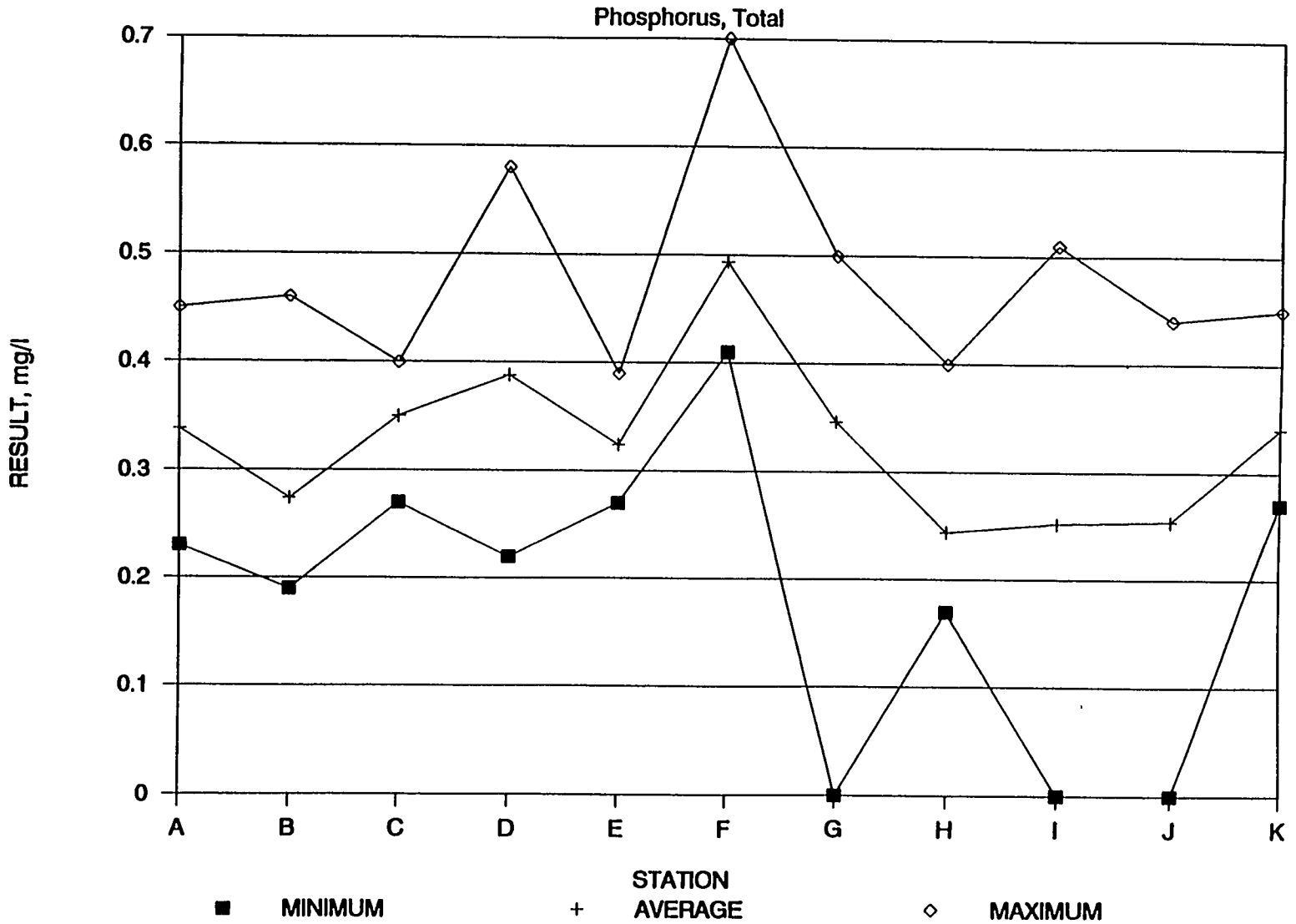

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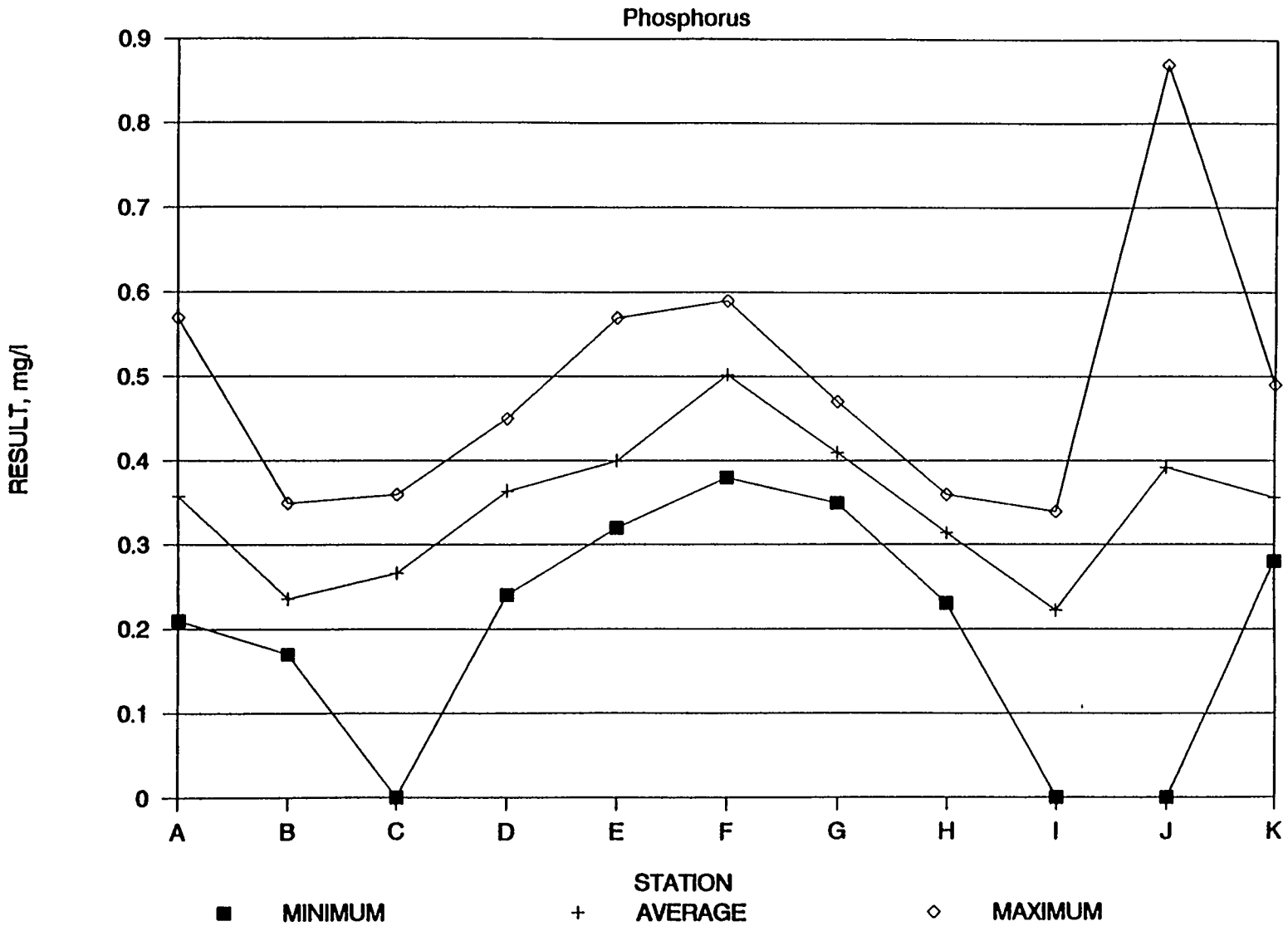

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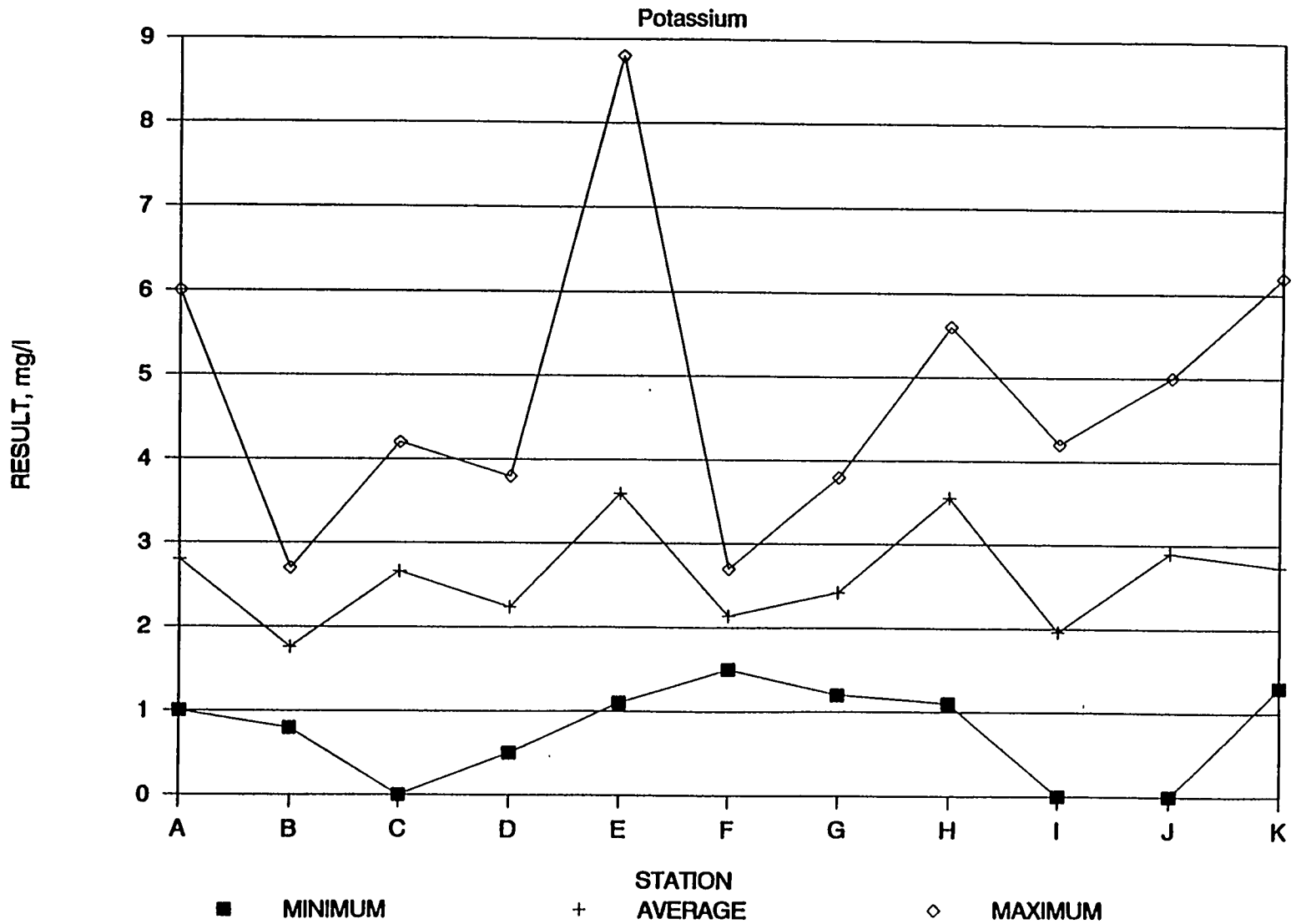

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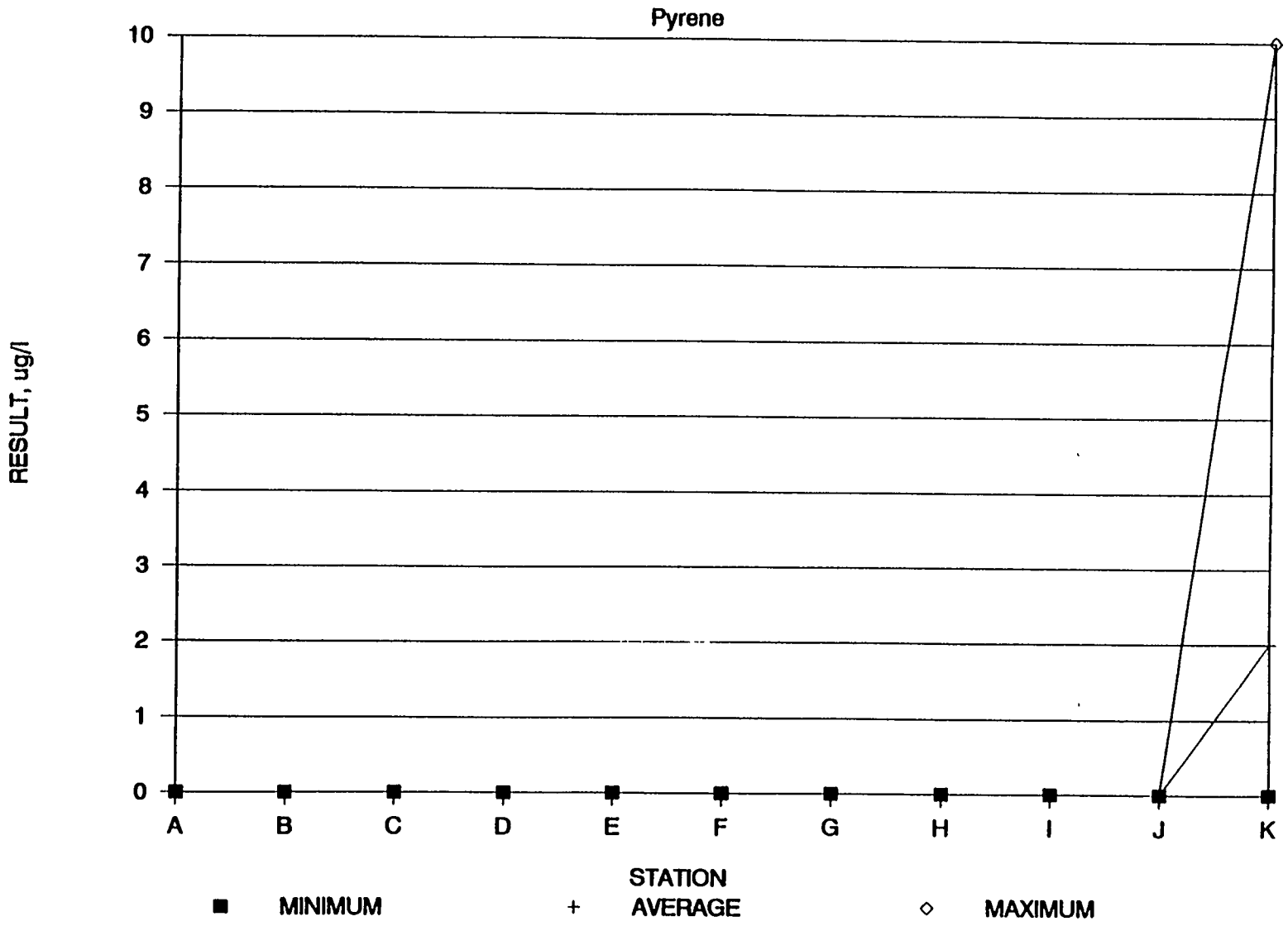

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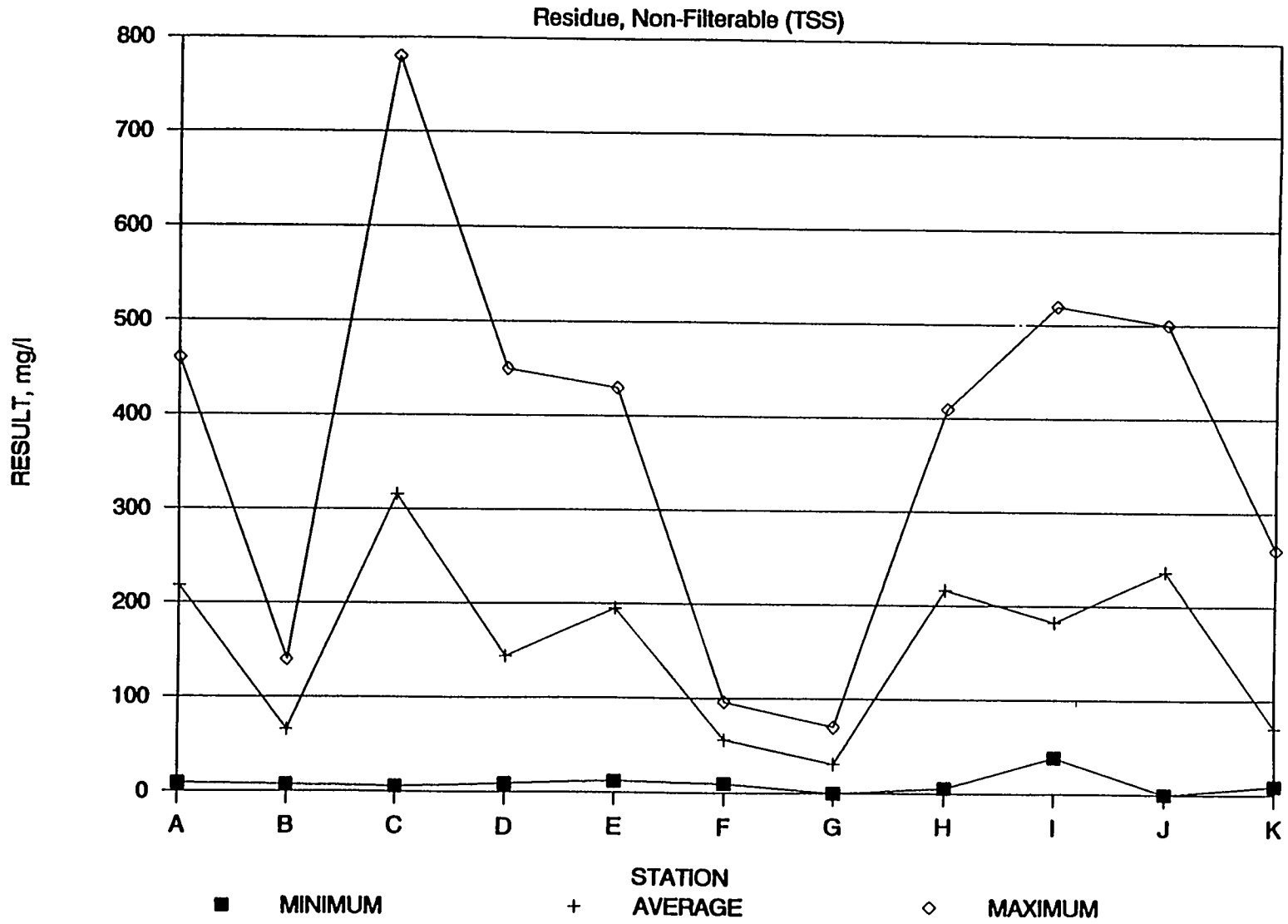

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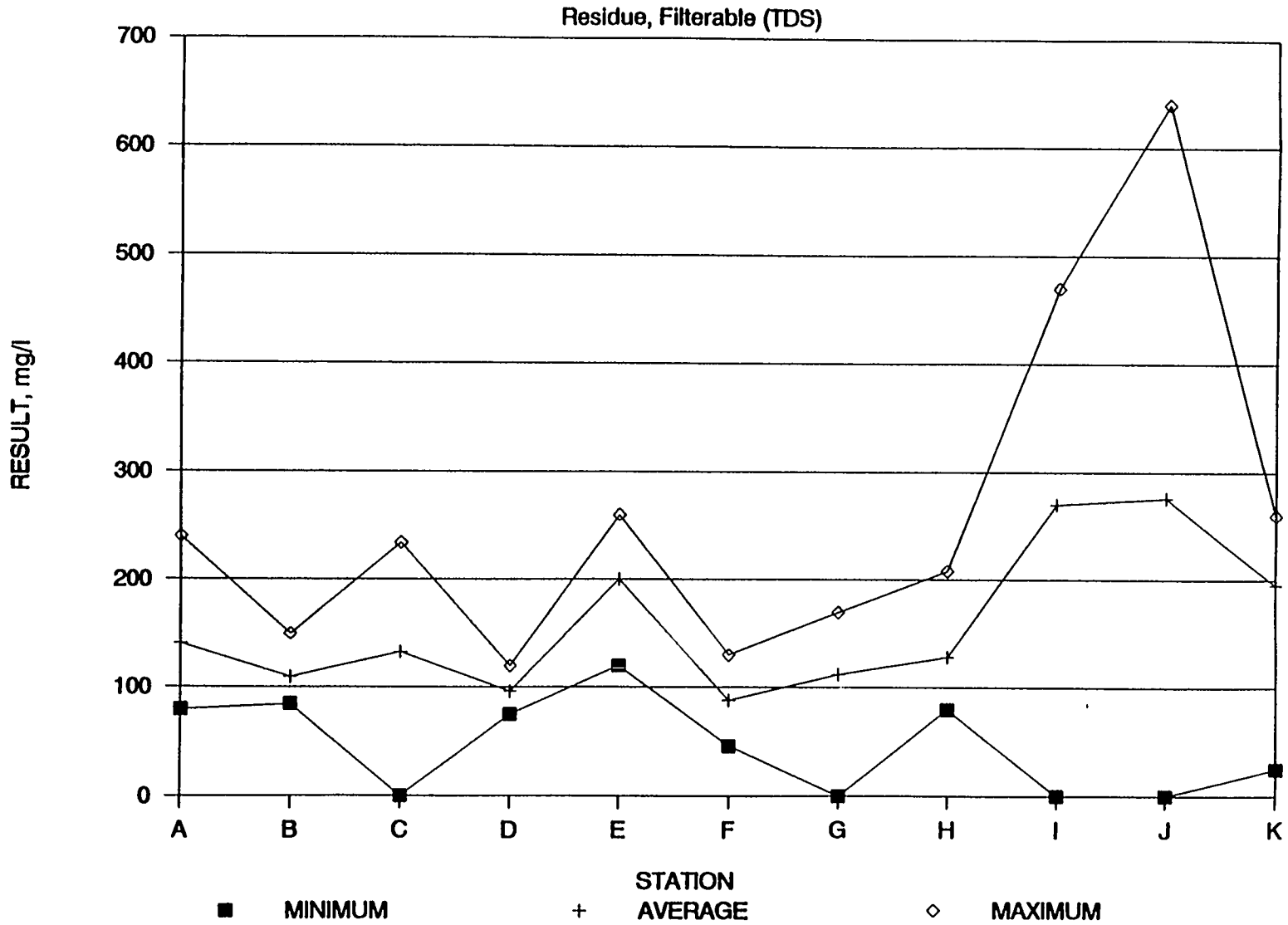

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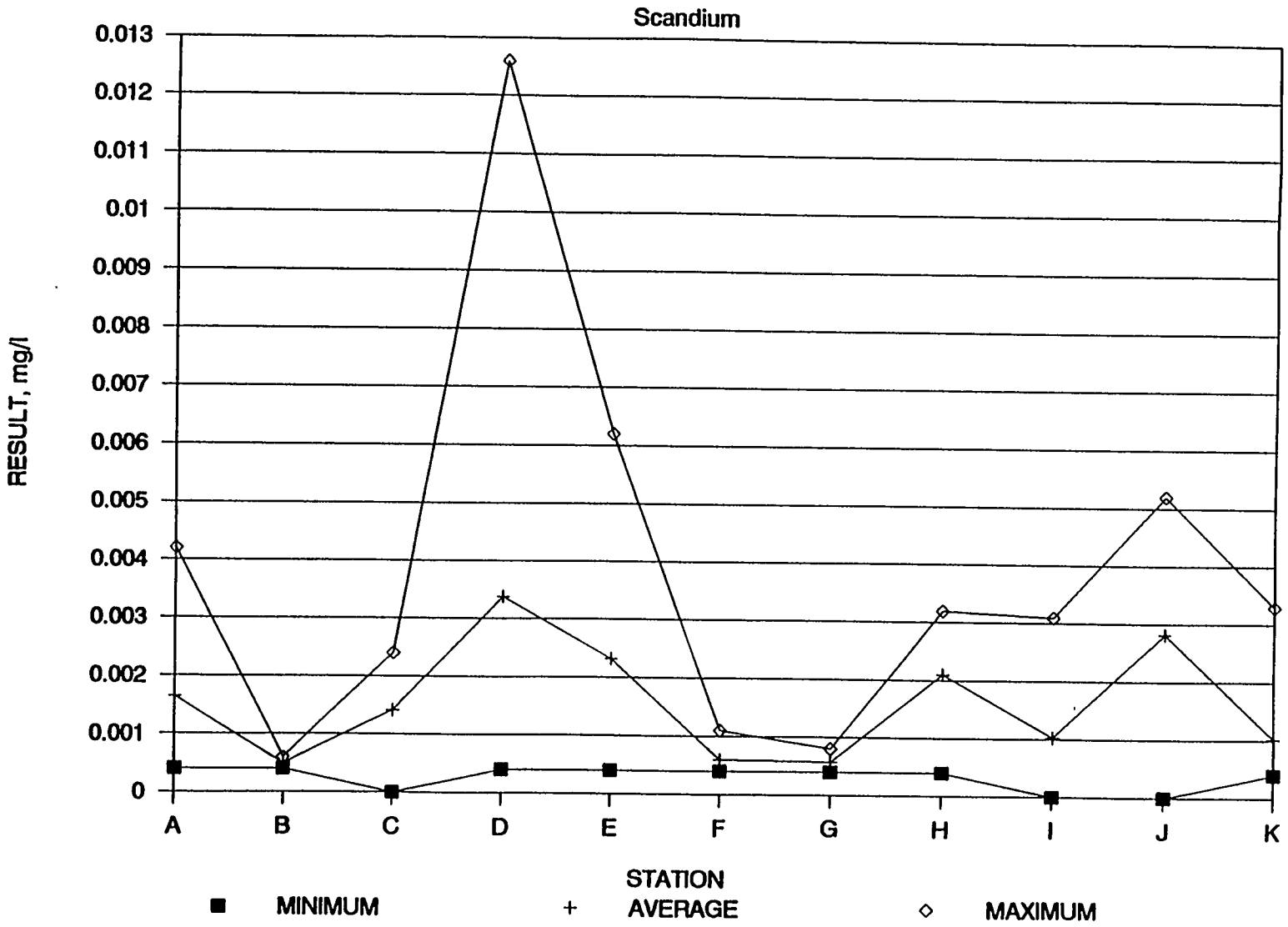

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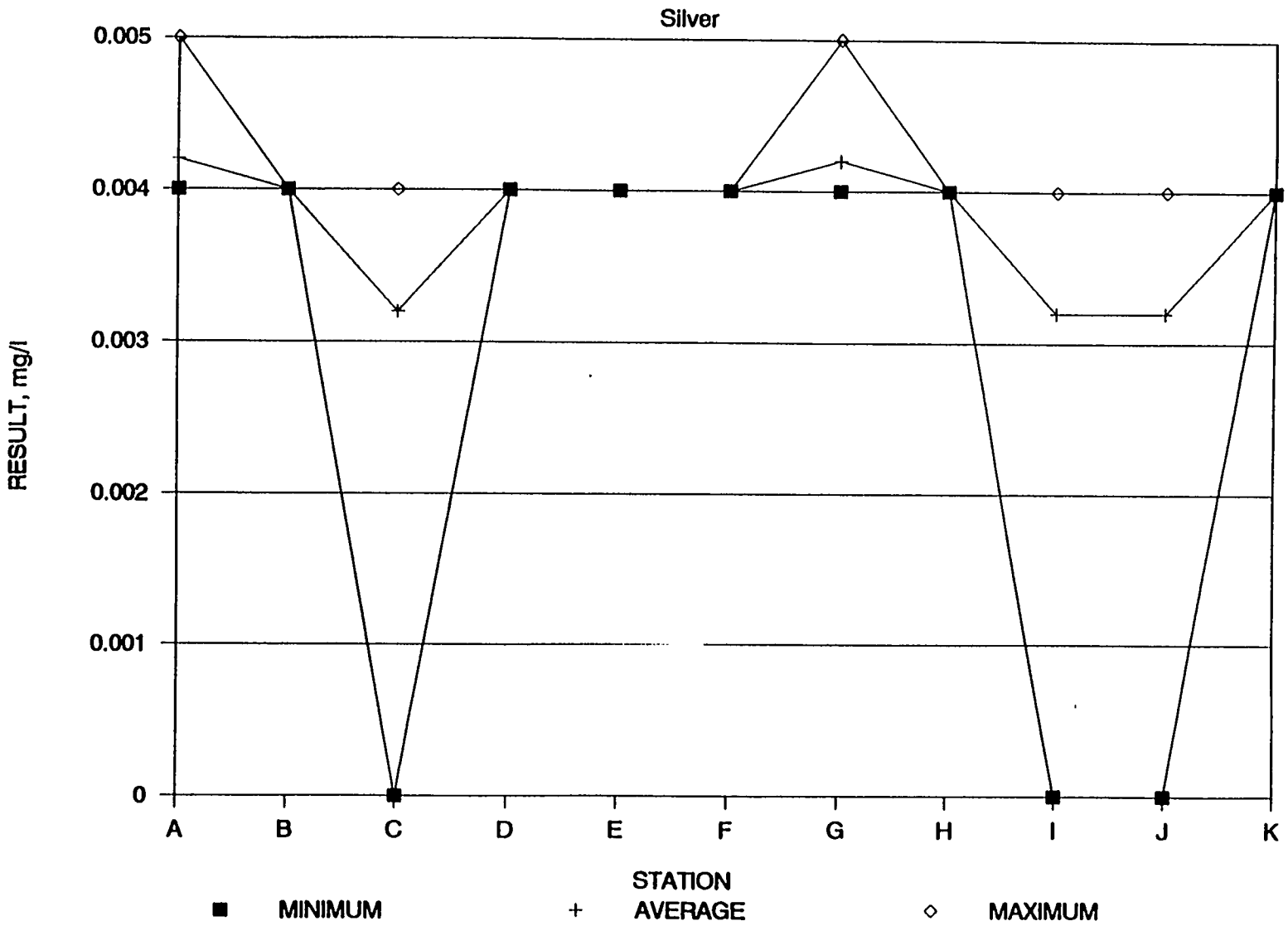

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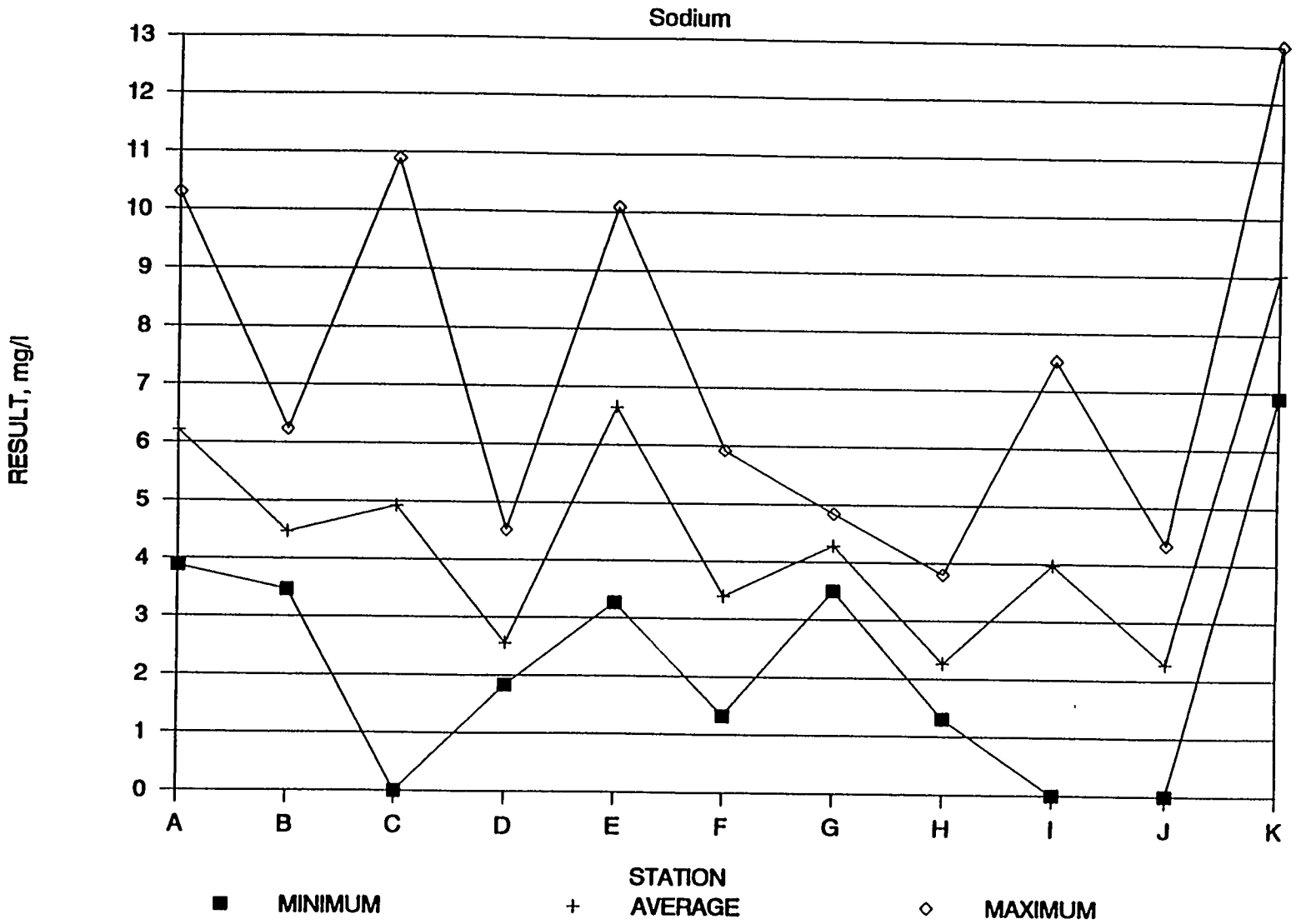

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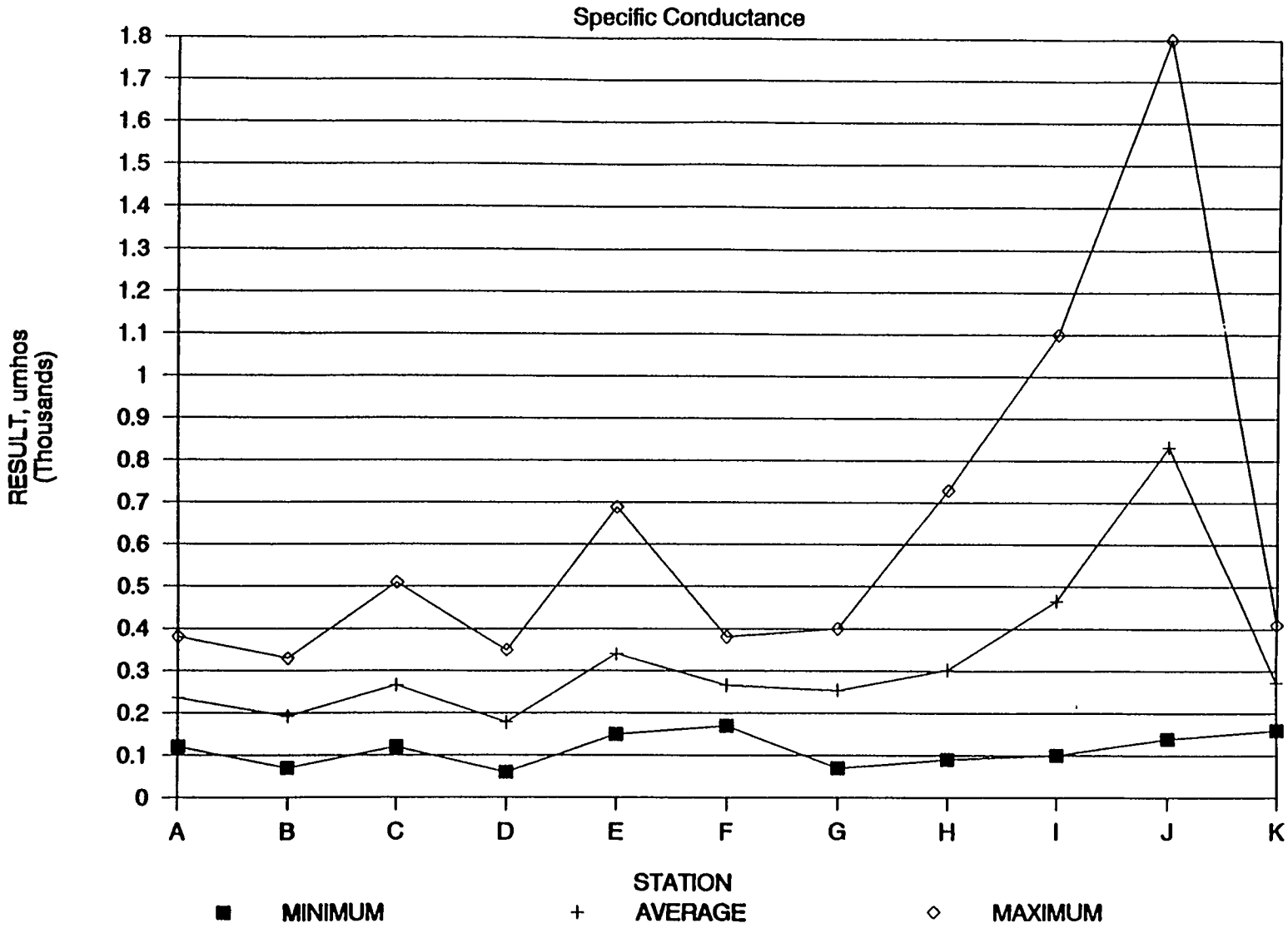

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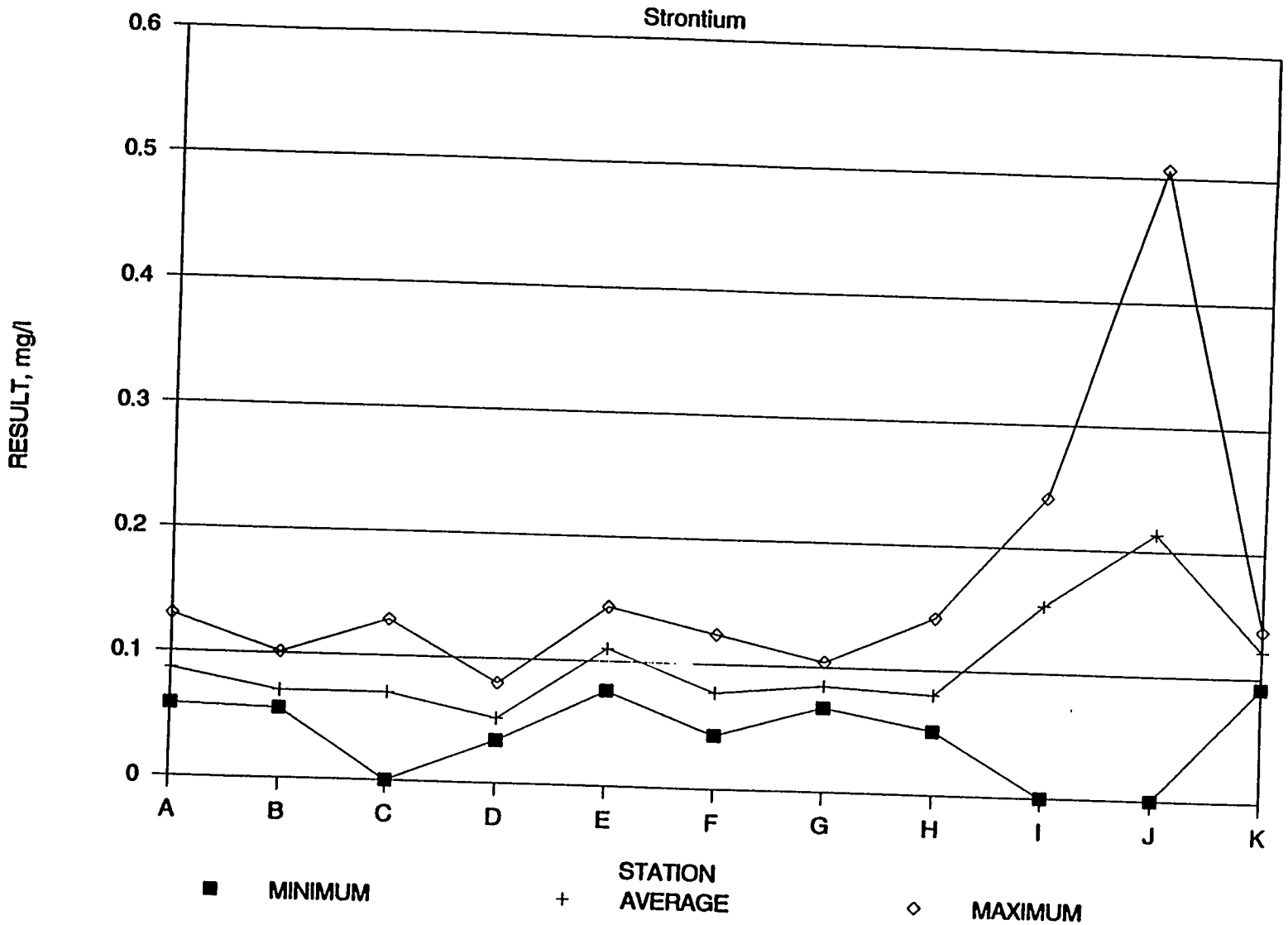

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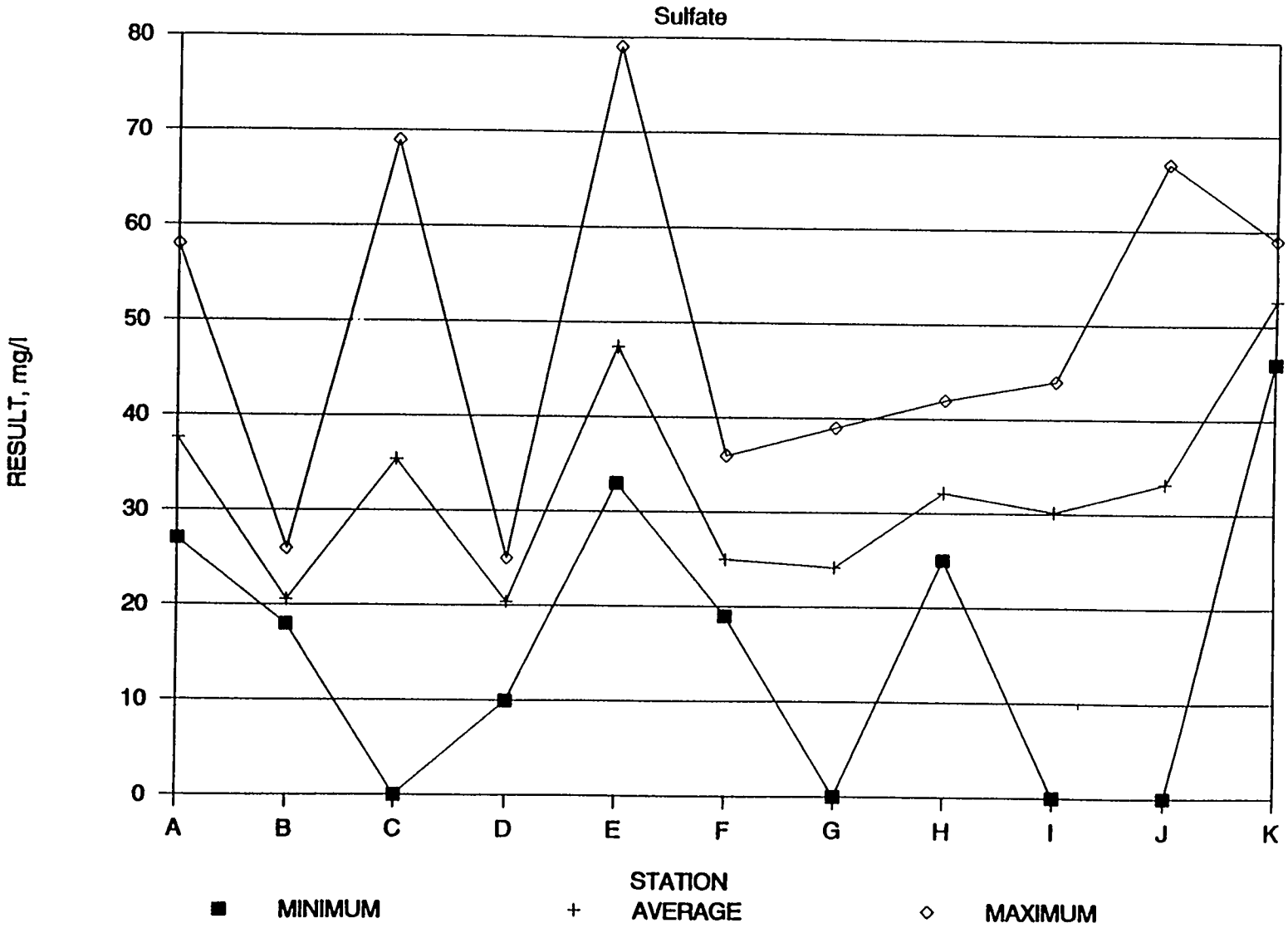

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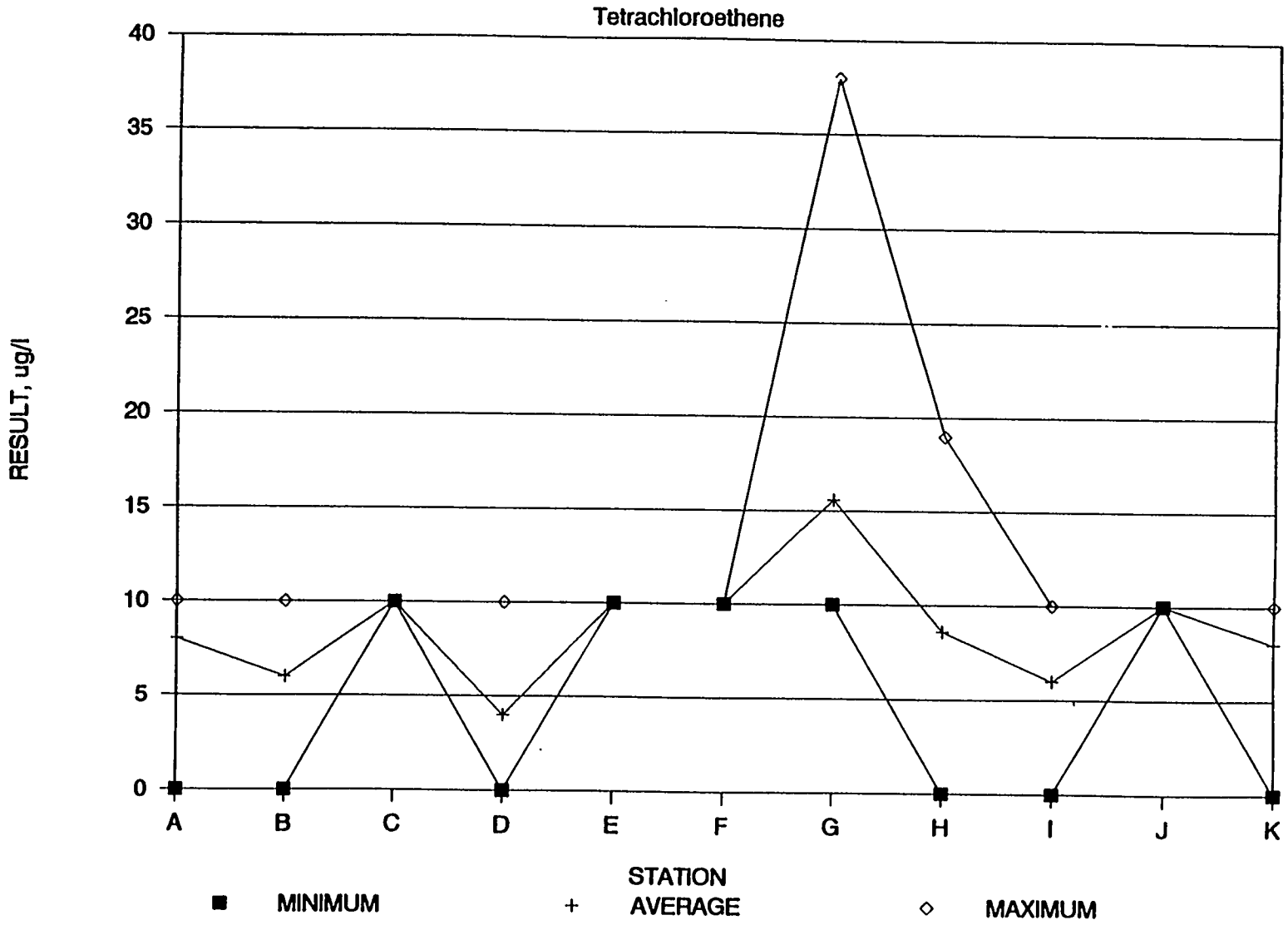

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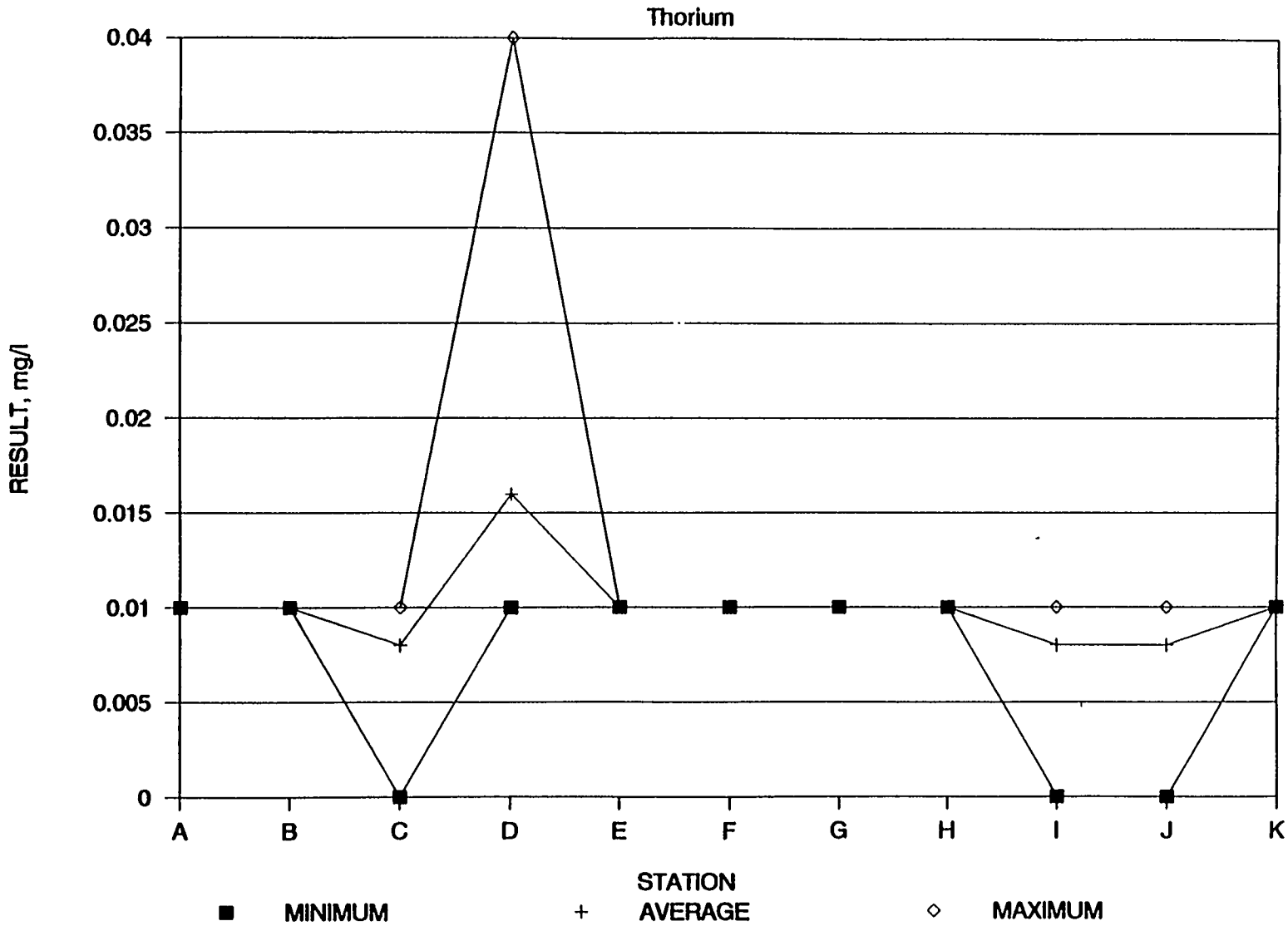

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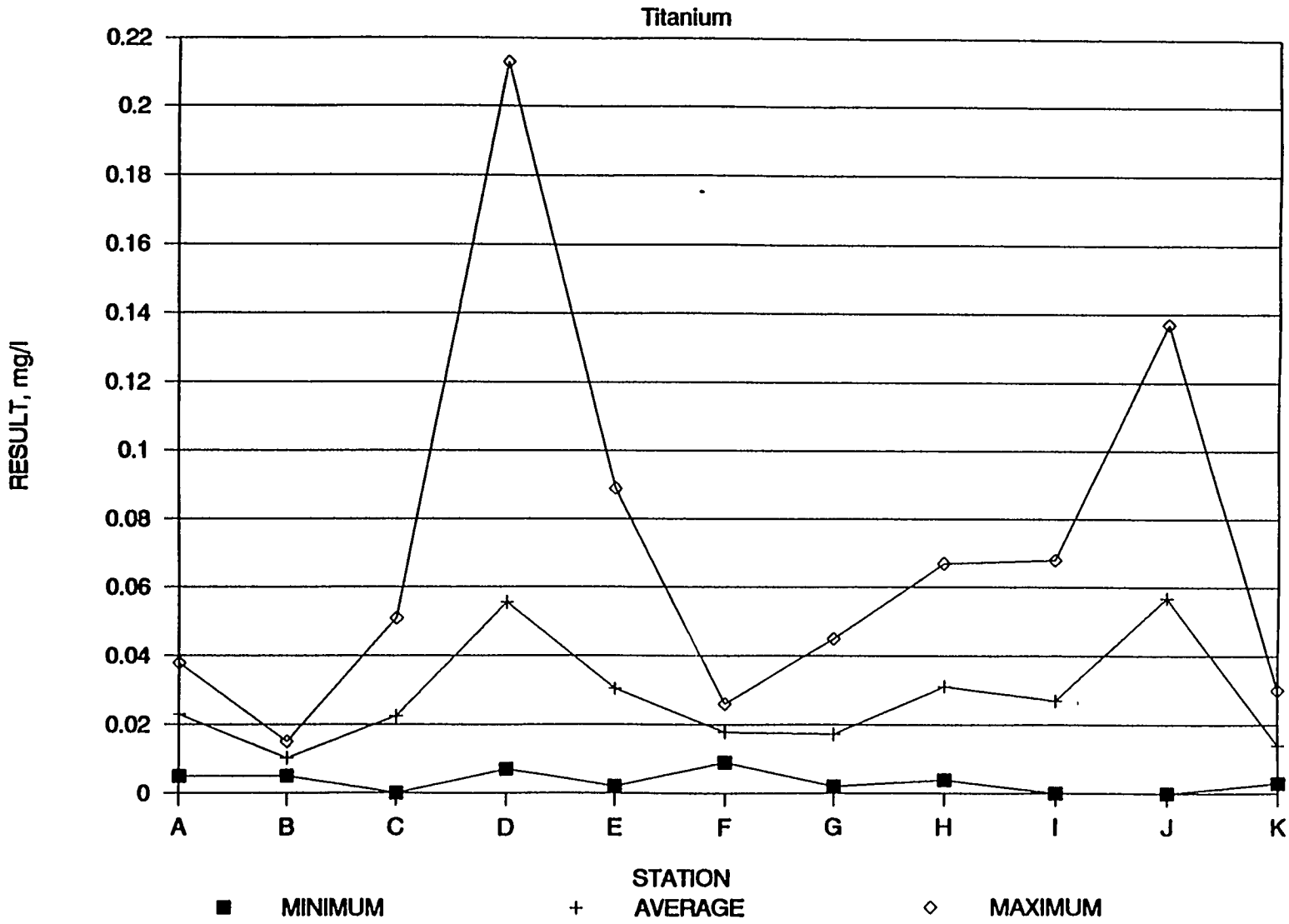

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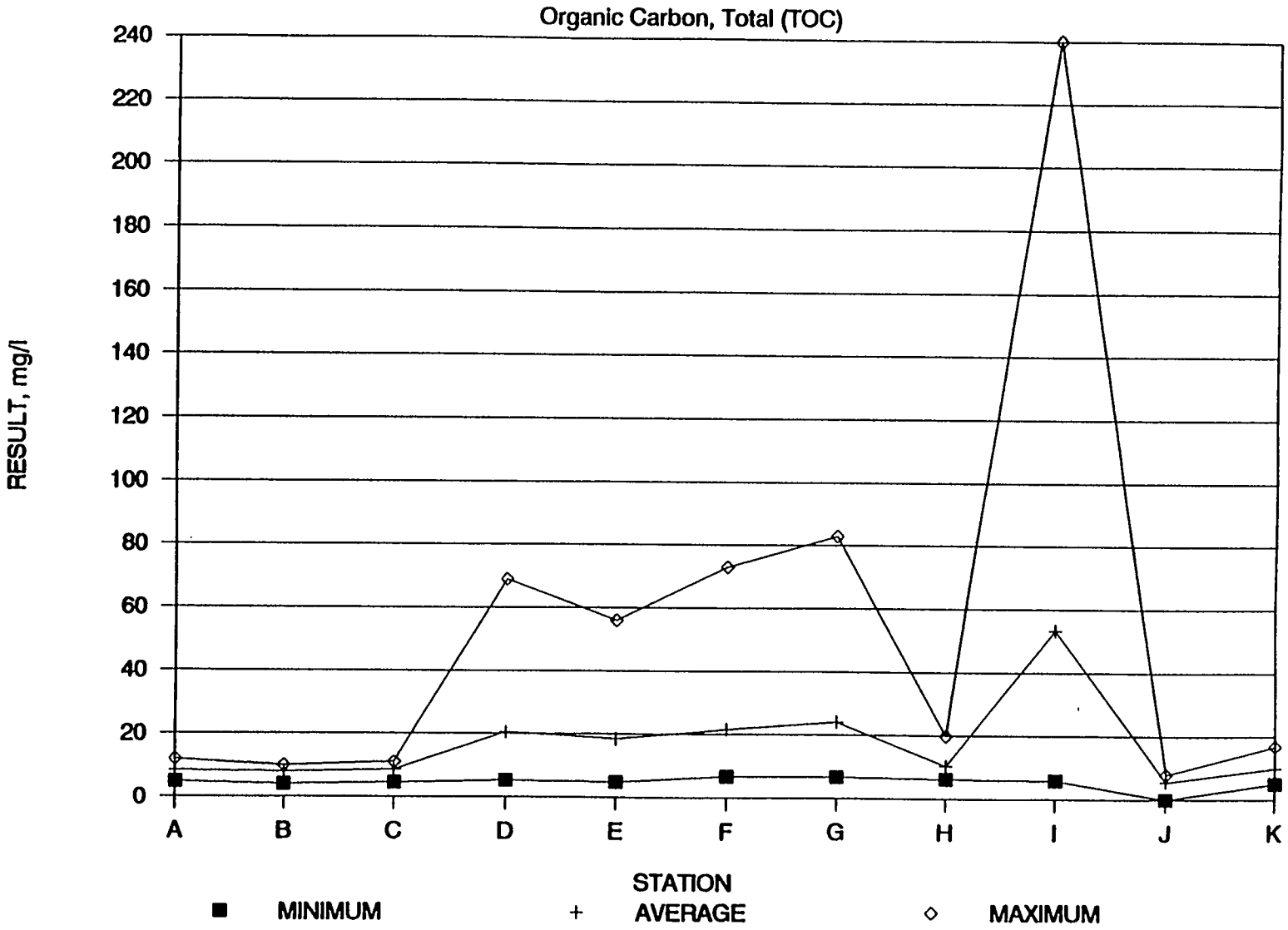

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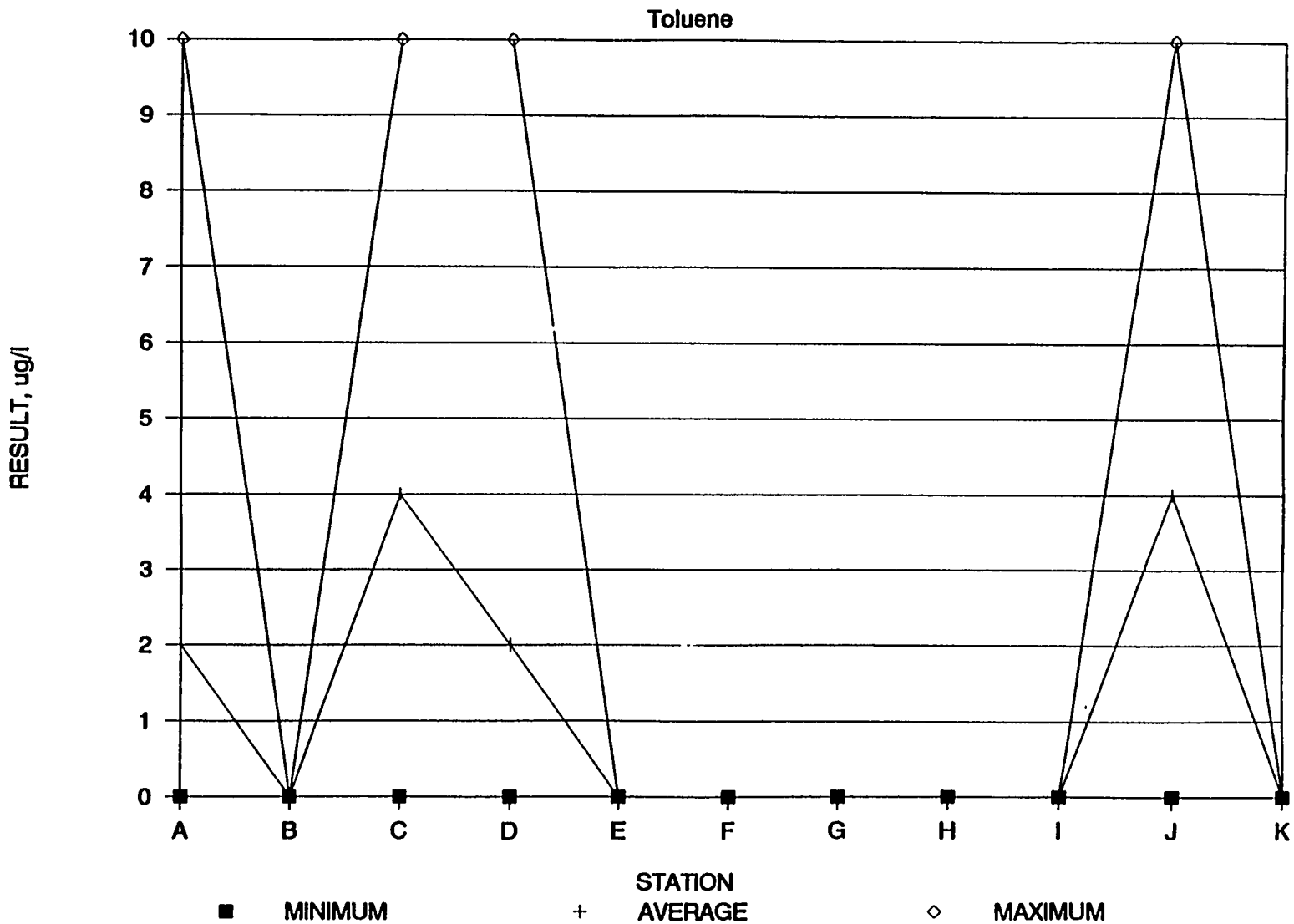

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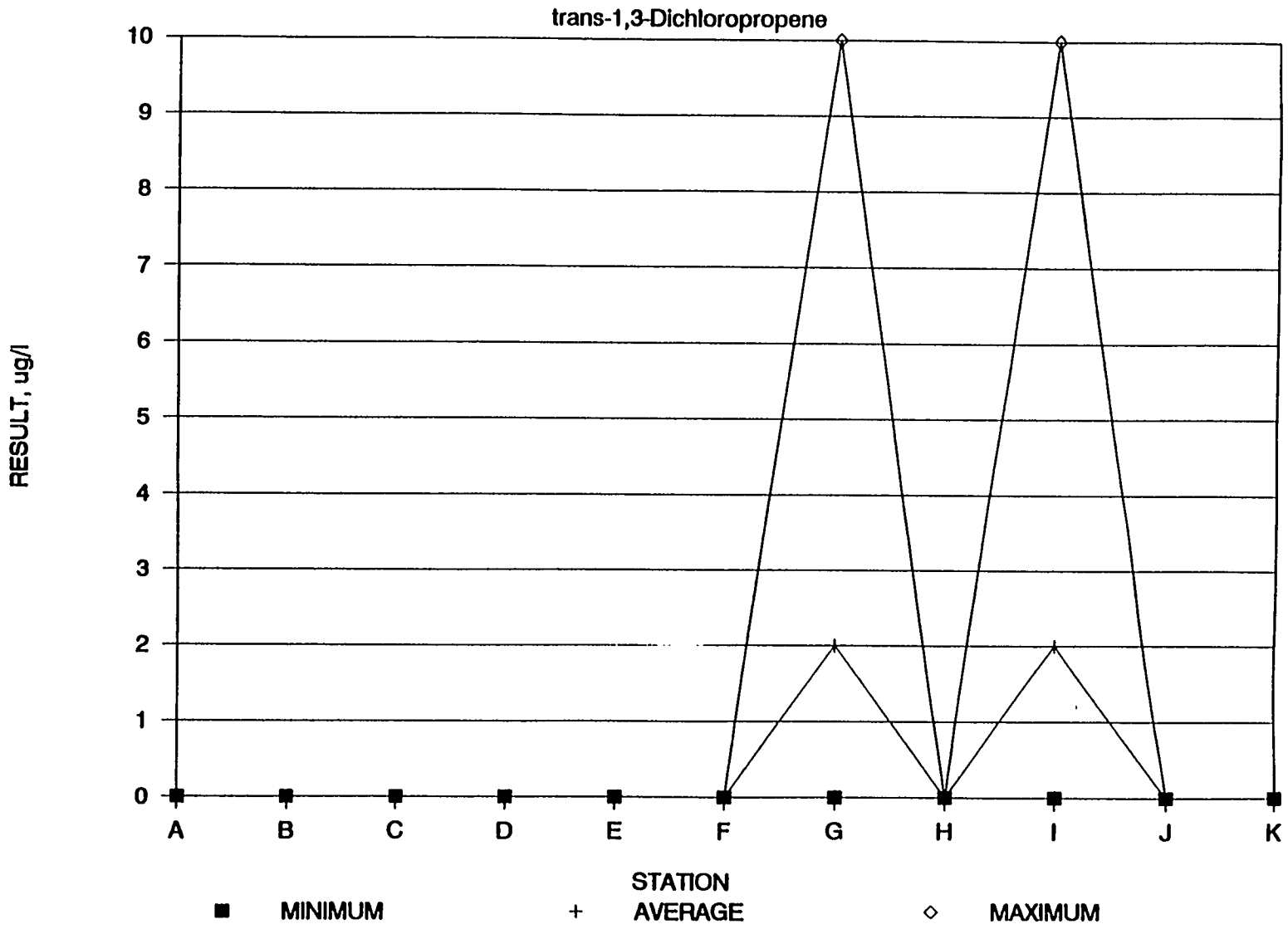

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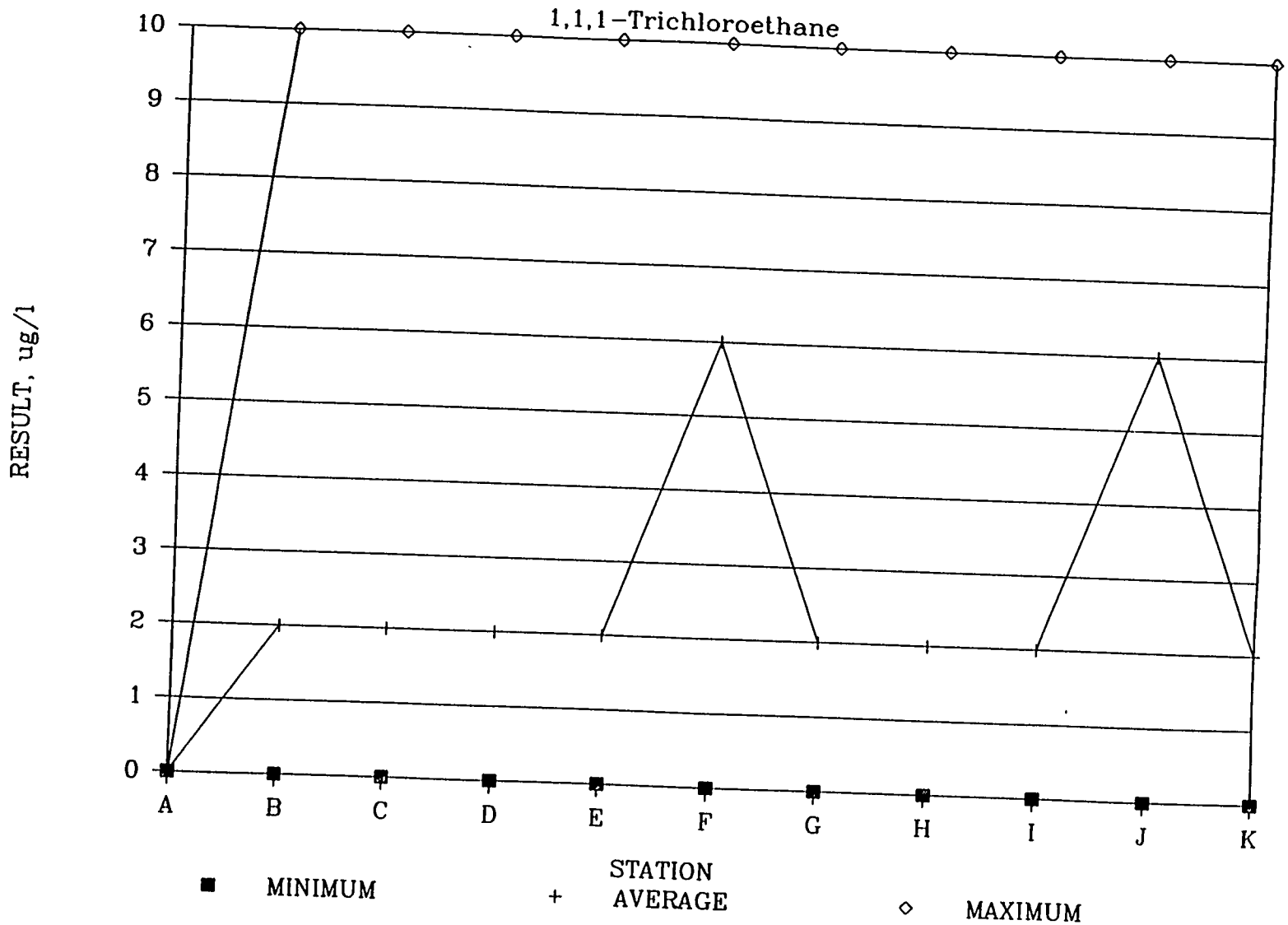

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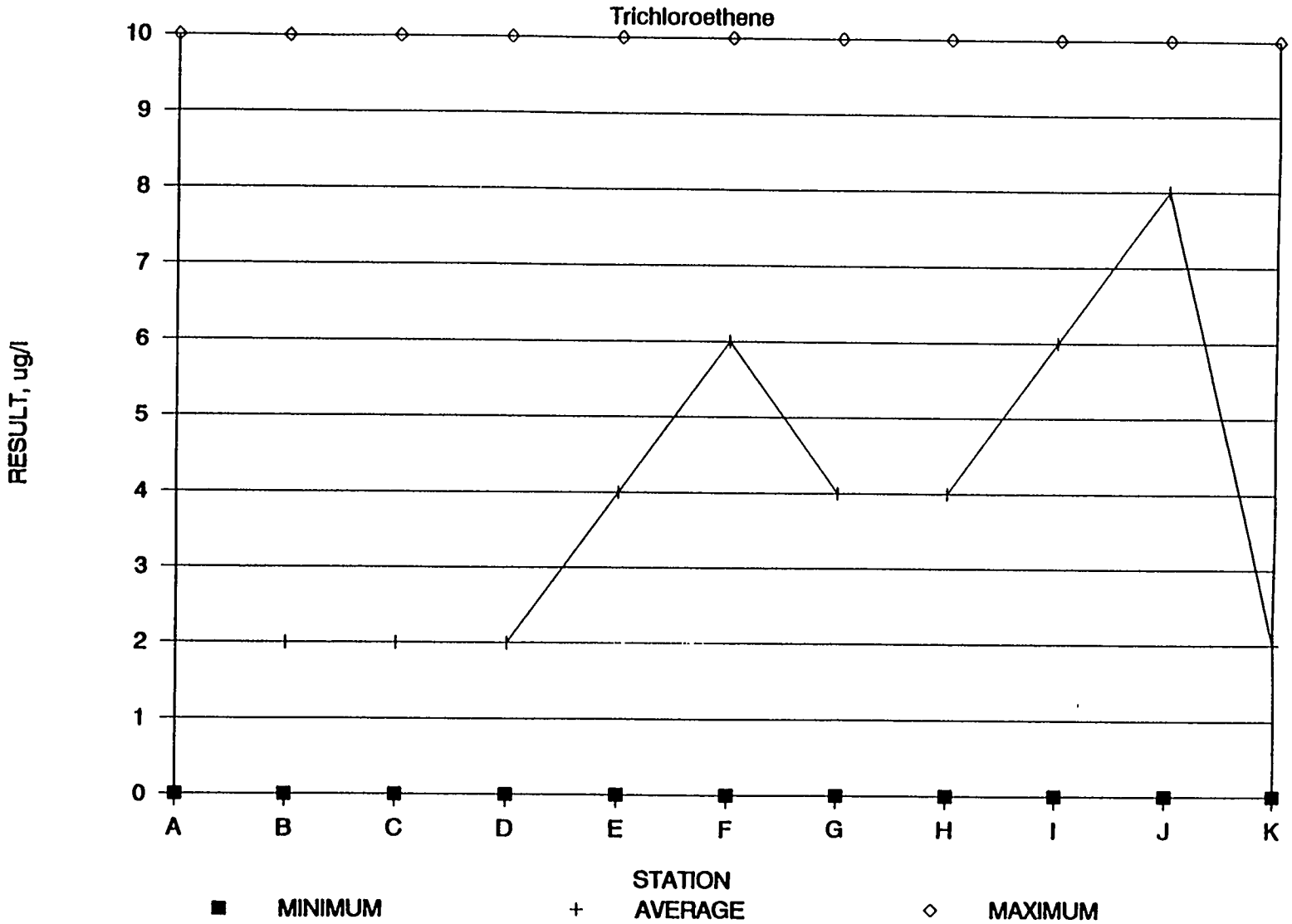

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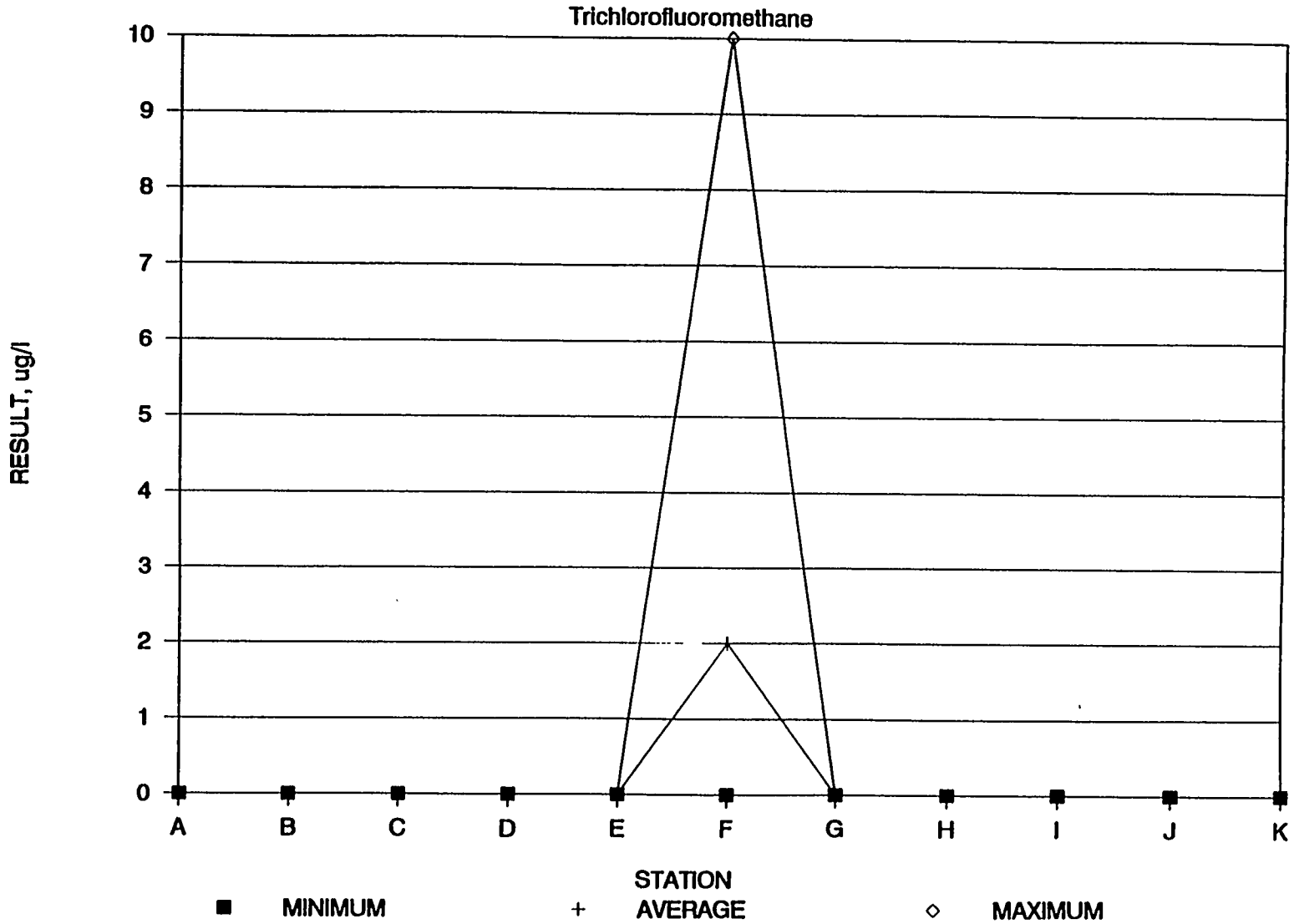

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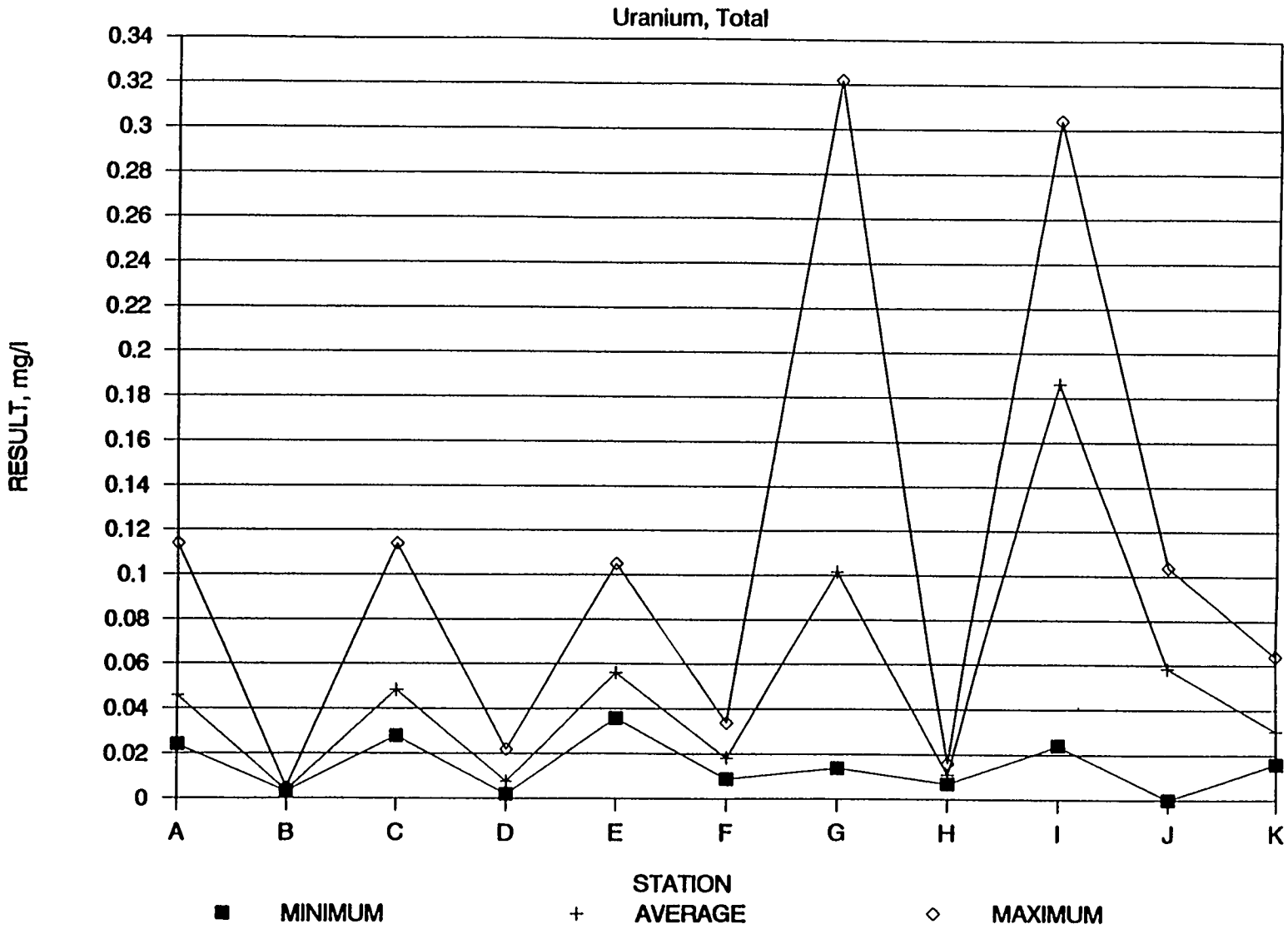

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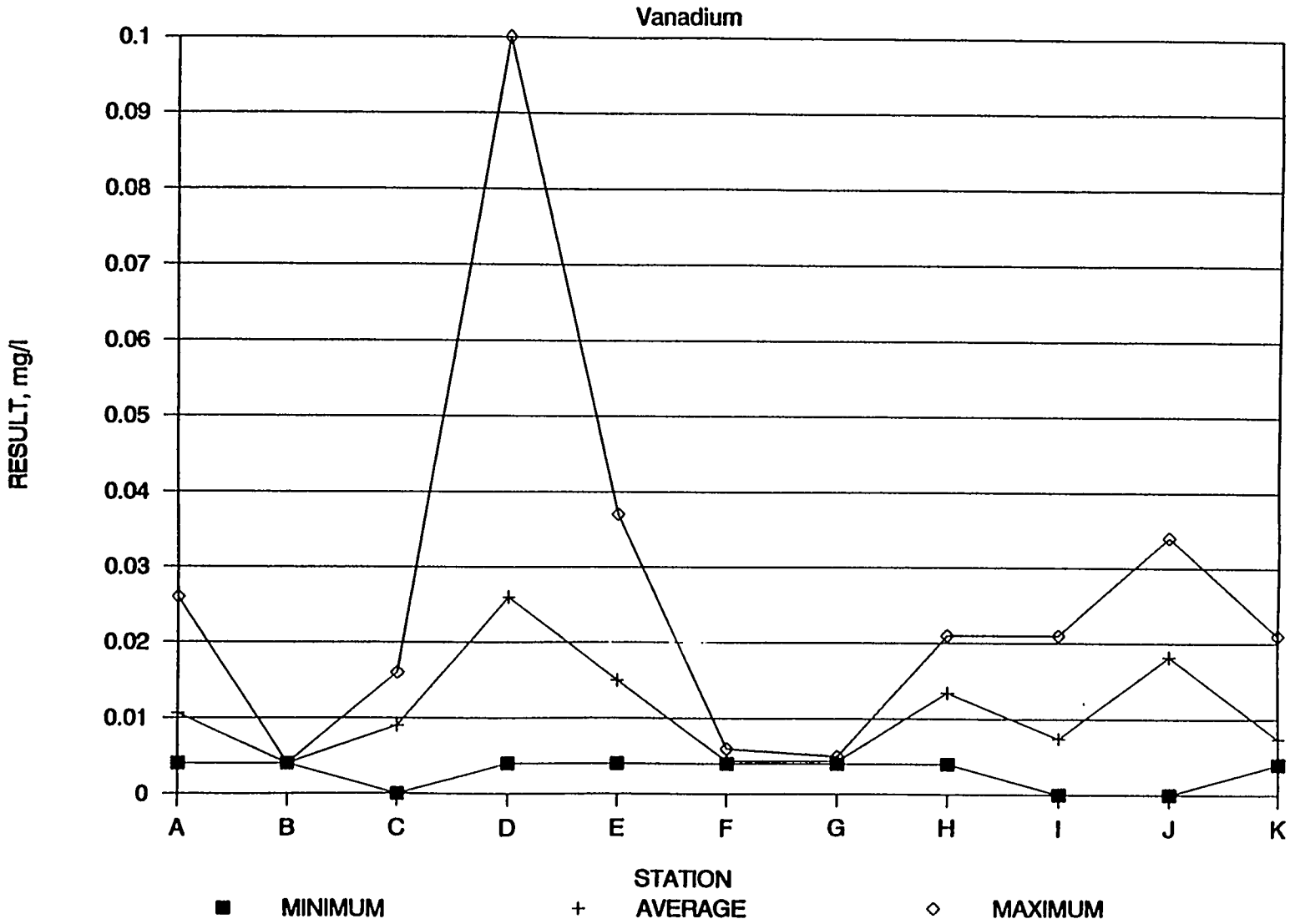

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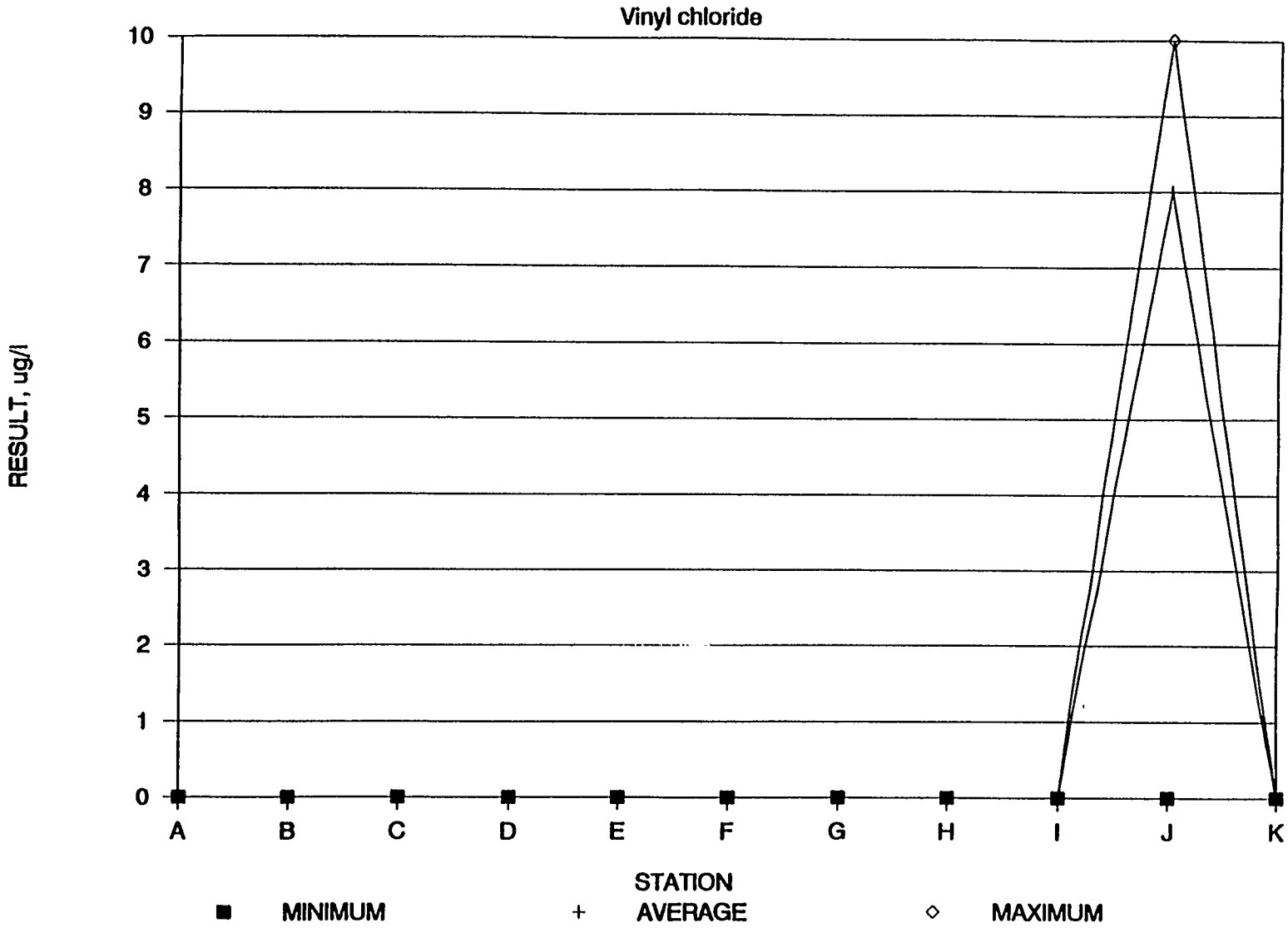

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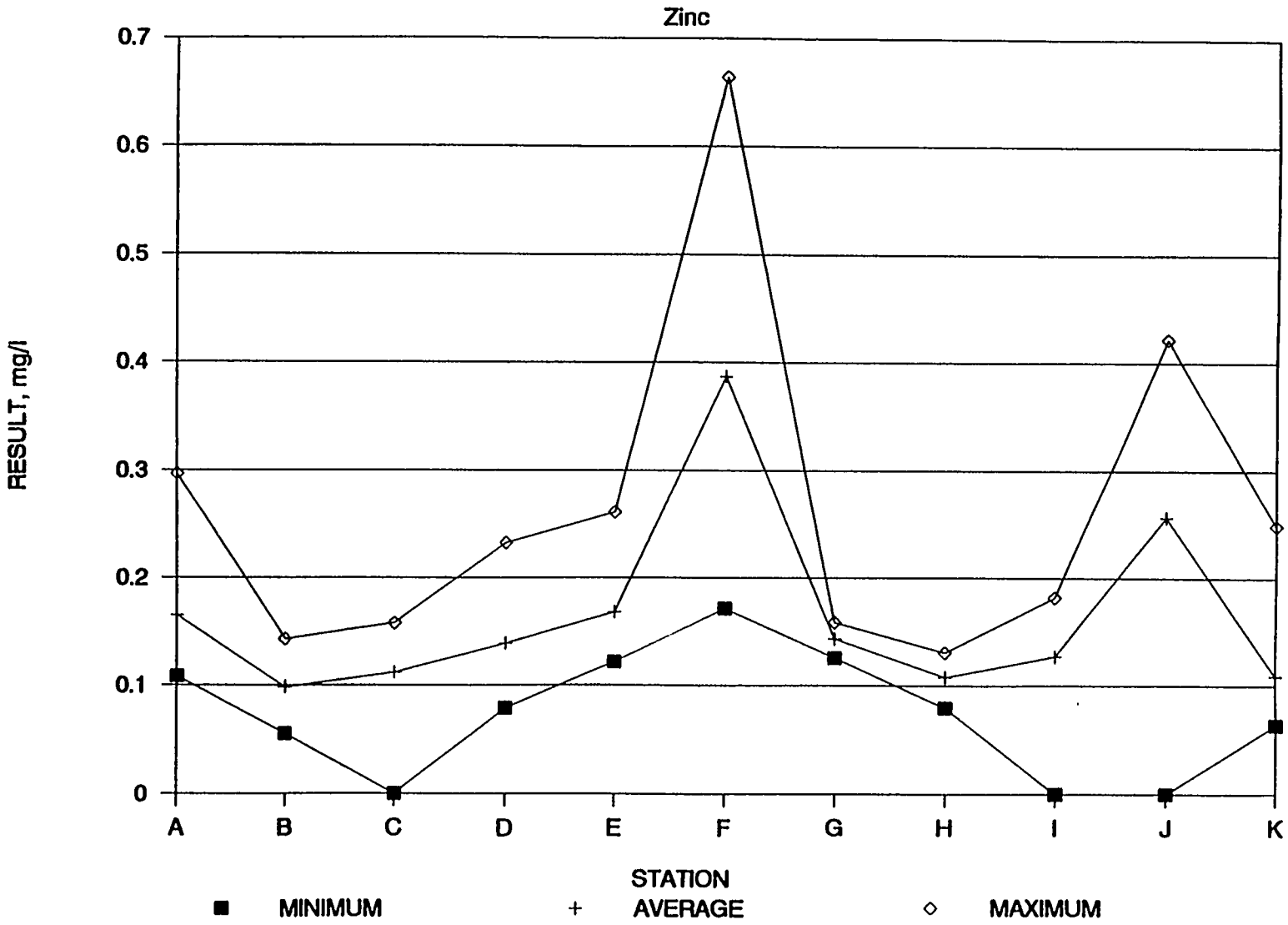

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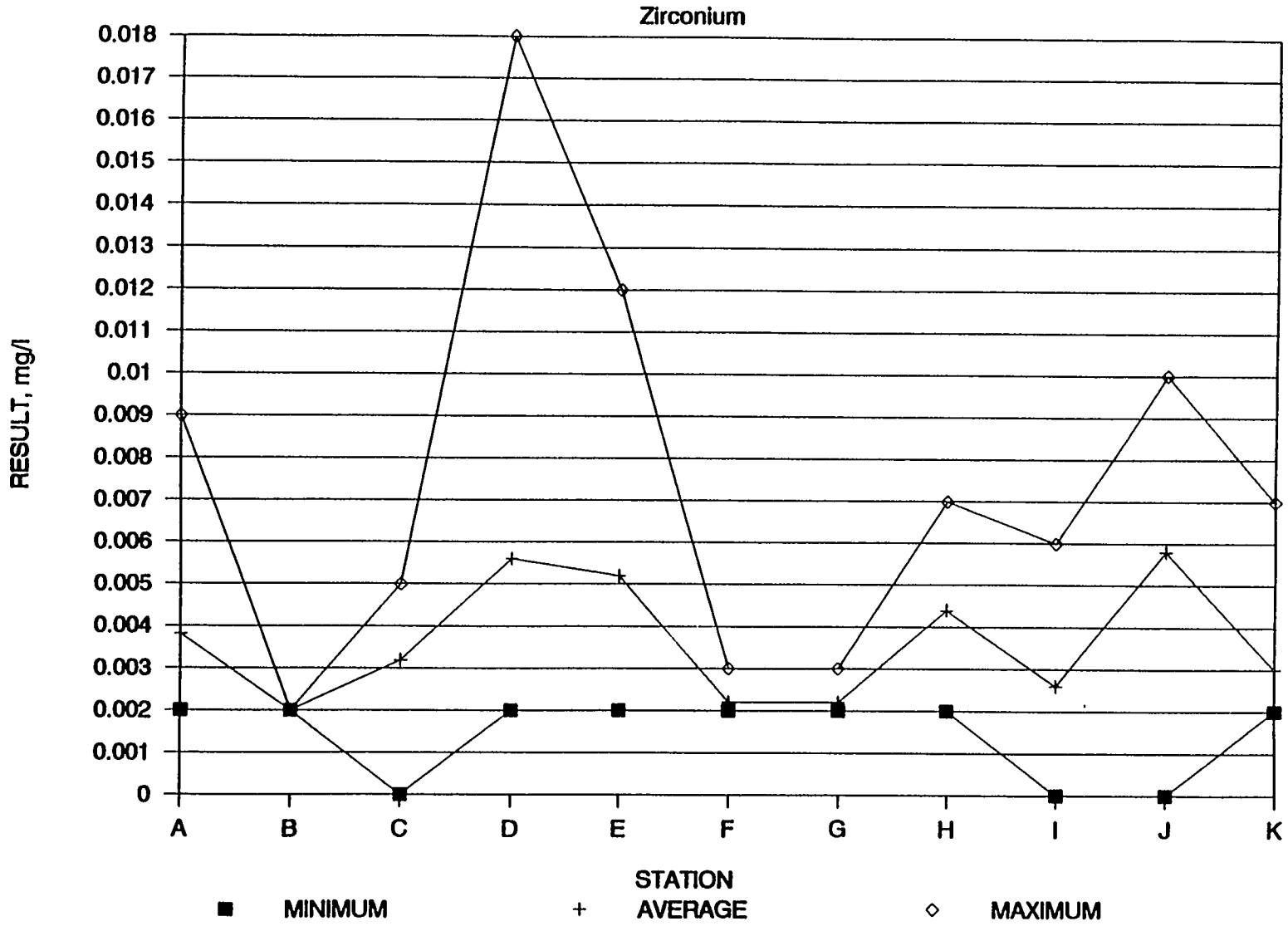

APPENDIX B

DATA SUMMARIES PER EVENT

DRY EVENTS

09-22-88.WK1 30-Aug-89

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 09/22/88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,2-Dichloroethane	ug/l	624	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	ug/l	625	--	--	--	--	10 U	43	--	--	--	--	--
Alpha Activity	pci/l	749	0	73	57	79	240	150	100	95	120	190	90
Aluminum	mg/l	200.7	0.08	0.15	0.15	0.09	0.34	0.4	0.09	0.11	0.61	0.04	0.09
Ammonia	mg/l	350.2	0.6	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.3	0.3	0.2 U	0.3	0.5
Arsenic	mg/l	200.7	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Arsenic	mg/l	206.2	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Barium	mg/l	200.7	0.0544	0.057	0.0604	0.0548	0.0633	0.0421	0.049	0.115	0.102	0.14	0.0432
Benzene	ug/l	624	10 U	--	10 U	10 U	10 U	10 U	--	10 U	10 U	--	--
Benzo(a)anthracene	ug/l	625	--	--	--	--	--	10 U	--	--	--	--	--
Benzyl butyl phthalate	ug/l	625	--	--	--	10 U	--	--	--	--	--	--	--
Beryllium	mg/l	200.7	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Beta Activity	pci/l	741	2.2	22	14	0	81	60	100	56	84	240	59
Bis(2-chloroethoxy) methane	ug/l	625	--	--	--	10 U	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate	ug/l	625	--	--	--	10 U	10 U	86	--	--	--	--	--
Boron	mg/l	200.7	0.071	0.060	0.135	0.061	0.103	0.062	0.062	0.056	0.082	0.312	0.109
Bromodichloromethane	ug/l	624	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	--	10 U
Bromoform	ug/l	624	10 U	10 U	10 U	10 U	--	--	--	--	--	--	10 U
Cadmium	mg/l	200.7	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U
Calcium	mg/l	200.7	44.8	39.4	67.6	43.6	80.6	44.8	41.3	56.2	77.8	216	60.6
Carbon tetrachloride	ug/l	624	10 U	10 U	--	--	--	--	--	--	--	--	10 U
Cerium	mg/l	200.7	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Chemical Oxygen Demand (COD)	mg/l	410.2	8.3	5.4	12	14	16	10	29	14	5	18	14
Chlorine, Total Residual	mg/l	330.1	0.24	0.28	0.12	0.28	0.18	1.1	0.12	0.1 U	0.38	0.1 U	0.14
Chloroethane	ug/l	624	--	--	--	--	10 U	--	--	--	--	--	--
Chloroform	ug/l	624	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	--	10 U
Chromium	mg/l	200.7	0.006 U	0.006 U	0.006 U	0.009	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U
Chrysene	ug/l	625	--	--	--	--	--	10 U	--	--	--	--	--
Cobalt	mg/l	200.7	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Copper	mg/l	200.7	0.006	0.011	0.007	0.005	0.009	0.005	0.008	0.004	0.055	0.002	0.009
Dibromochloromethane	ug/l	624	10 U	10 U	10 U	10 U	10 U	10 U	--	--	10 U	--	10 U
Diethyl phthalate	ug/l	625	--	--	--	--	10 U	--	45	--	--	--	--
Di-n-butyl phthalate	ug/l	625	--	10 U	15	--	--	--	--	--	--	--	10 U
Hexachlorocyclopentadiene	ug/l	625	--	--	--	--	--	--	--	--	--	10 U	10 U
Iron	mg/l	200.7	0.09	0.16	0.13	0.33	0.27	0.24	0.22	0.06	0.56	0.05	0.83
Isophorone	ug/l	625	--	10 U	--	10 U	--	10 U	10 U	--	10 U	--	--
Lanthanum	mg/l	200.7	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
Lead	mg/l	200.7	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Lead	mg/l	239.2	0.002 U	0.023	0.002 U	0.002 U	0.0028	0.002 U	0.002 U	0.0022	0.002	0.002 U	0.0022
Lithium	mg/l	200.7	0.018	0.007	0.028	0.005	0.038	0.003	0.008	0.031	0.009	0.027	0.027
Magnesium	mg/l	200.7	11.1	10.6	11.5	10.7	11.8	11.8	11.4	11.6	14.6	34.4	12.2
Manganese	mg/l	200.7	0.041	0.065	0.064	0.146	0.076	0.012	0.085	0.067	0.397	0.319	0.102
Mercury	mg/l	245.1	0.0018	0.0002	0.0015	0.0004	0.0024	0.0002	0.0002	0.0016	0.0005	0.0002 U	0.003
Molybdenum	mg/l	200.7	0.138	0.318	0.15	0.099	0.164	0.035	0.382	0.006 U	0.006 U	0.006 U	0.145
Napthalene	ug/l	625	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--
Nickel	mg/l	200.7	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.03	0.01 U
Niobium	mg/l	200.7	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Nitrate, as Nitrogen	mg/l	353.3	2	0.53	3.6	0.67	4.6	0.6	1	14	26	170	1.8
Nitrite, as Nitrogen	mg/l	353.3	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nitrogen, Kjeldahl	mg/l	351.3	0.5	0.2	0.2 U	0.2 U	0.2	0.2 U	0.3	0.4	0.2	0.2 U	0.6
Oil and Grease	mg/l	413.1	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Organic Carbon, Total (TOC)	mg/l	415.2	2.3	4.4	3.8	3.3	4.2	3.3	9.4	6.4	2.7	7	3.7
pH	units	150.1	7.8	8.2	7.9	8	7.9	8.2	7.9	7.8	7.9	7.7	7.9
Phosphorus	mg/l	200.7	0.44	0.71	0.42	0.42	0.44	0.52	0.56	0.34	0.32	0.06	0.46
Phosphorus, Total	mg/l	365.2	0.41	0.72	0.4	0.41	0.41	0.46	0.55	0.36	0.36	0.12	0.52
Potassium	mg/l	200.7	1.8	2.2	2.6	2.3	2.8	2.3	2.5	1.8	2.5	5.2	5.7
Residue, Filterable (TDS)	mg/l	160.1	240	230	350	240	390	210	240	310	460	1900	310
Residue, Non-Filterable (TSS)	mg/l	160.2	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10	5 U	30
Scandium	mg/l	200.7	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Silver	mg/l	200.7	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.012	0.004 U	0.004 U	0.004 U
Sodium	mg/l	200.7	8.98	9.38	16.1	10.1	18.8	8.16	8.16	8.54	9.63	16.9	19.3
Specific Conductance	umhos	120.1	640	530	500	500	1060	510	540	660	920	2700	870
Strontium	mg/l	200.7	0.149	0.145	0.172	0.124	0.181	0.127	0.143	0.179	0.251	0.943	0.157
Sulfate	mg/l	375.4	41	36	91	34	120	34	38	34	38	160	75
Tetrachloroethene	ug/l	624	10 U	10 U	10 U	10 U	--	10 U	23	14	10 U	10 U	10 U
Thorium	mg/l	200.7	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Titanium	mg/l	200.7	0.002 U	0.002 U	0.003	0.002 U	0.004	0.003	0.002 U	0.002 U	0.008	0.002 U	0.01
Toluene	ug/l	624	10 U	--	10 U	10 U	--	10 U	--	10 U	10 U	--	--
Trichloroethene	ug/l	624	10 U	10 U	10 U	--	--	10 U	--	10 U	--	10 U	10 U
Uranium, Total	mg/l	752	0.012	0.002	0.017	0.005	0.019	0.01	0.024	0.007	0.066	0.077	0.013

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1998

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 09/22/88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
Vanadium	mg/l	200.7	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #
Zinc	mg/l	200.7	0.059	0.037	0.066	0.096	0.077	0.098	0.078	0.087	0.057	0.036	0.053
Zirconium	mg/l	200.7	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #

Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1992

09-23-88.WI1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 09/23/88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,2-Dichloroethane	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--
2,4-Dinitrophenol	ug/l	625	--	--	30 ‡	30 ‡	30 ‡	30 ‡	--	--	--	--	--
Alpha Activity	pci/l	739	110	48	89	52	200	50	92	69	51	130	790
Aluminum	mg/l	200.7	0.35	0.14	0.15	0.37	0.11	0.09	0.11	0.06	2	0.05	0.56
Ammonia	mg/l	350.2	0.9	0.3	0.2 ‡	0.2	0.2	0.2 ‡	0.2	0.5	0.2 ‡	0.3	0.7
Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
Barium	mg/l	200.7	0.0565	0.0503	0.0598	0.0537	0.0618	0.0478	0.048	0.117	0.12	0.169	0.0651
Benzene	ug/l	624	10 ‡	--	10 ‡	--	10 ‡	--	--	--	10 ‡	10 ‡	--
Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡
Beta Activity	pci/l	-741	51	98	39	21	45	1.9	68	59	84	210	170
Bis(2-chloroethyl) ether	ug/l	625	--	--	--	--	--	--	--	--	10 ‡	--	--
Bis(2-ethyhexyl) phthalate	ug/l	625	--	--	--	--	--	--	--	--	10 ‡	--	--
Boron	mg/l	200.7	0.068	0.05	0.083	0.046	0.094	0.049	0.063	0.046	0.062	0.242	0.077
Bromodichloromethane	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--	10 ‡	10 ‡	--	--
Bromoform	ug/l	624	10 ‡	10	10 ‡	10 ‡	--	27	--	--	--	--	--
Cadmium	mg/l	200.7	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.007	--
Calcium	mg/l	200.7	51.2	41.7	60.5	44.8	61.1	42.4	38.7	51.8	77.1	373	--
Carbon tetrachloride	ug/l	624	10 ‡	10 ‡	--	--	10 ‡	--	--	--	--	--	--
Cerium	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	--
Chemical Oxygen Demand (COD)	mg/l	410.2	8	9	12	7	13	74	27	20	6	14	6
Chlorine, Total Residual	mg/l	330.1	0.18	0.39	0.16	0.2	0.21	0.98	0.12	0.35	0.38	0.1 ‡	0.1 ‡
Chlorobenzene	ug/l	624	--	--	10 ‡	--	--	--	--	--	--	--	--
Chloroform	ug/l	624	10 ‡	10 ‡	10 ‡	--	10 ‡	10 ‡	--	10 ‡	10 ‡	10 ‡	10 ‡
Chromium	mg/l	200.7	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006	0.006 ‡	0.006 ‡	0.006 ‡	--
Cobalt	mg/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002	0.002 ‡	0.002 ‡	0.002 ‡	--
Copper	mg/l	200.7	0.007	0.01	0.008	0.006	0.009	0.011	0.011	0.003	0.009	0.002	--
Dibromochloromethane	ug/l	624	10 ‡	10 ‡	10 ‡	--	--	10 ‡	--	--	10 ‡	--	10 ‡
Di-n-butyl phthalate	ug/l	625	--	10 ‡	--	--	--	--	10 ‡	--	--	10 ‡	--
Di-n-octyl phthalate	ug/l	625	--	--	--	--	--	10 ‡	--	10 ‡	10 ‡	10 ‡	--
Ethyl benzene	ug/l	624	10 ‡	--	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	ug/l	625	10 ‡	--	10 ‡	10 ‡	--	--	--	--	10 ‡	10 ‡	--
Iron	mg/l	200.7	0.11	0.11	0.12	0.35	0.07	0.03	0.11	0.04	1.71	0.03	--
Isophorone	ug/l	625	--	--	--	10 ‡	--	--	--	--	--	--	--
Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	--
Lead	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	--
Lead	mg/l	239.2	0.002 ‡	0.007	0.002 ‡	0.0072	0.002 ‡	0.002 ‡	0.002 ‡	0.0028	0.003	0.0025	0.002
Lithium	mg/l	200.7	0.018	0.006	0.025	0.006	0.028	0.022	0.008	0.045	0.011	0.035	--
Magnesium	mg/l	200.7	11.3	10.9	11.9	11	11.6	11.3	10.7	11	14.8	30.6	--
Manganese	mg/l	200.7	0.041	0.066	0.064	0.152	0.068	0.009	0.084	0.063	0.467	0.482	--
Mercury	mg/l	245.1	0.0018	0.0002	0.0012	0.0004	0.0012	0.0004	0.0004	0.0015	0.0006	0.0002	0.0023
Molybdenum	mg/l	200.7	0.14	0.361	0.146	0.093	0.156	0.019	0.36	0.006 ‡	0.006 ‡	0.007	--
Nickel	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01	0.01 ‡	0.01 ‡	0.01 ‡	0.02	--
Niobium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	--
Nitrate, as Nitrogen	mg/l	353.3	3.8	0.64	3.1	0.88	0.1 ‡	0.61	1.6	14	30	240	2.1
Nitrite, as Nitrogen	mg/l	353.3	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	4.4	0.1 ‡	0.22	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
Nitrogen, Kjeldahl	mg/l	351.3	1.1	0.4	0.4	0.2 ‡	0.4	0.3	8	0.8	0.4	0.2 ‡	1.7
Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2	2 ‡	2	2 ‡	2 ‡
Organic Carbon, Total (TOC)	mg/l	415.2	17	3.3	4	2.8	5.1	26.5	9.9	6.3	2.7	5.7	3.8
Pentachlorophenol	ug/l	625	--	--	--	--	30 ‡	30 ‡	--	30 ‡	30 ‡	30 ‡	--
pH	units	150.1	7.8	8.2	7.9	8.1	8	6.3	7.9	7.8	7.9	7.7	7.5
Phenol	ug/l	625	--	--	30 ‡	--	--	--	--	--	--	--	--
Phosphorus	mg/l	200.7	0.55	0.87	0.51	0.65	0.49	0.59	0.64	0.42	0.47	0.06 ‡	--
Phosphorus, Total	mg/l	365.1	0.47	0.74	0.39	0.45	0.38	0.41	0.5	0.41	0.34	0.1 ‡	0.49
Potassium	mg/l	200.7	2.3	2.3	2.7	2.9	2.7	2.5	2.5	1.8	3	7.5	--
Residue, Filterable (TDS)	mg/l	160.1	270	200	300	220	330	210	210	280	420	2300	290
Residue, Non-Filterable (TSS)	mg/l	160.2	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	5 ‡	30	5 ‡	10
Scandium	mg/l	200.7	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0006	0.0004 ‡	--
Silver	mg/l	200.7	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.011	0.004 ‡	0.004 ‡	--
Sodium	mg/l	200.7	13.2	8.61	17.3	14.5	18.8	8.75	8.42	7.94	10.4	27.3	--
Specific Conductance	umhos	120.1	610	500	540	470	550	460	480	590	890	3600	690
Strontium	mg/l	200.7	0.151	0.131	0.161	0.124	0.166	0.13	0.133	0.177	0.257	1.17	--
Sulfate	mg/l	375.4	60	34	74	31	84	35	35	33	40	150	70
Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	18	12	10 ‡	10	10 ‡
Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	--
Titanium	mg/l	200.7	0.004	0.002	0.002	0.003	0.002 ‡	0.002 ‡	0.002	0.002 ‡	0.03	0.002 ‡	--
Trichloroethene	ug/l	624	10 ‡	--	10 ‡	--	10 ‡	10 ‡	10 ‡	--	--	10 ‡	--
Uranium, Total	mg/l	752	0.01	0.002	0.014	0.002	0.014	0.01	0.025	0.008	0.097	0.077	0.011
Vanadium	mg/l	200.7	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	--
Zinc	mg/l	200.7	0.063	0.04	0.078	0.098	0.074	0.09	0.083	0.093	0.083	0.04	--

DOES NOT CONTAIN
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Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1998

09-23-88.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 09/23/88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	P RESULT
Zirconium	mg/l	200.7	0.002 #	0.003	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	--

Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G Porter
Y-12 Classification Specialist
Date: 2/26 1992

10-04-88.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 10/04/88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,2-Dichloroethane	ug/l	624	10 *	10 *	--	10 *	--	--	--	10 *	--	10 *	10 *
2-Chloroethylvinyl ether	ug/l	624	--	--	--	--	--	--	--	--	--	10 *	10 *
Alpha Activity	pci/l	739	60	40	54	210	310	95	46	170	80	940	370
Aluminum	mg/l	200.7	0.04	0.11	0.04	0.01 *	0.08	0.01 *	0.26	0.02	0.1	0.02	0.11
Ammonia	mg/l	350.2	0.2	0.2 *	0.2 *	0.2 *	0.2 *	0.2 *	0.2 *	0.3	0.3	0.3	0.3
Arsenic	mg/l	200.7	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Arsenic	mg/l	206.2	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *
Barium	mg/l	200.7	0.0517	0.0466	0.0572	0.0668	0.059	0.0413	0.043	0.084	0.101	0.155	0.0565
Beryllium	mg/l	200.7	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *
Beta Activity	pci/l	741	34	48	30	51	67	51	29	78	140	430	58
Bis(2-chloroethyl) ether	ug/l	625	10 *	--	--	--	10 *	--	--	--	--	10 *	--
Bis(2-ethyhexyl) phthalate	ug/l	625	10 *	--	--	--	10 *	--	--	--	--	10 *	--
Boron	mg/l	200.7	0.095	0.047	0.124	0.066	0.147	0.052	0.048	0.046	0.077	0.351	0.112
Bromodichloromethane	ug/l	624	10 *	--	--	--	--	--	--	--	--	--	--
Bromoform	ug/l	624	10 *	--	10 *	--	10 *	--	10 *	--	--	--	10 *
Cadmium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *
Calcium	mg/l	200.7	52.8	37.3	60.3	52.4	72.3	41.5	39	47.9	84.2	423	56.8
Carbon tetrachloride	ug/l	624	10 *	10 *	--	--	--	--	--	--	--	--	--
Cerium	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Chemical Oxygen Demand (COD)	mg/l	410.2	7	10	5	6	10	7	--	11	5	12	8
Chlorine, Total Residual	mg/l	330.1	0.23	2.2	0.23	0.48	0.24	0.89	0.24	0.43	0.45	0.1 *	0.1 *
Chromium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.007	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *
Cobalt	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *
Copper	mg/l	200.7	0.006	0.009	0.006	0.006	0.008	0.012	0.01	0.005	0.005	0.002	0.005
Dibromochloromethane	ug/l	624	10 *	--	10 *	--	10 *	10 *	10 *	--	--	--	10 *
Diethyl phthalate	ug/l	625	--	--	36	--	--	--	--	--	--	--	--
Iron	mg/l	200.7	0.12	0.18	0.11	0.37	0.19	0.1	0.24	0.07	0.14	0.12	0.17
Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *
Lead	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Lead	mg/l	239.2	0.0045	0.0058	0.0025	0.001	0.001 *	0.001 *	0.003	0.001 *	0.001 *	0.001 *	0.001 *
Lithium	mg/l	200.7	0.016	0.005	0.021	0.005	0.026	0.014	0.007	0.018	0.008	0.033	0.017
Magnesium	mg/l	200.7	11.1	10.3	11.2	13.9	12.6	11.8	11.1	11.2	15.7	57.7	12
Manganese	mg/l	200.7	0.042	0.076	0.056	0.168	0.075	0.008	0.075	0.047	0.423	0.747	0.057
Mercury	mg/l	245.1	0.0018	0.0002	0.0012	0.0004	0.0018	0.0003	0.0004	0.0016	0.0005	0.0002 *	0.001
Methylene chloride	ug/l	624	--	--	--	--	10 *	--	--	--	--	--	--
Molybdenum	mg/l	200.7	0.196	0.293	0.218	0.491	0.257	0.177	0.584	0.006 *	0.006 *	0.006 *	0.222
Nickel	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.03	0.01 *
Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Nitrate, as Nitrogen	mg/l	353.3	2.6	0.53	4.6	0.64	5.6	1	0.84	9.2	33	250	3
Nitrite, as Nitrogen	mg/l	353.3	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *
Nitrogen, Kjeldahl	mg/l	351.3	0.4	0.5	0.4	0.3	0.4	0.4	0.4	0.7	0.4	0.5	0.7
Oil and Grease	mg/l	413.1	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *
Organic Carbon, Total (TOC)	mg/l	415.2	3.3	3.2	3	3.2	3.4	3	6.8	4.6	2.9	5.3	4
pH	units	150.1	8	8.2	8	8.1	8	8.3	7.9	7.9	7.9	7.6	8
Phosphorus	mg/l	200.7	0.42	0.6	0.41	0.72	0.42	0.45	0.53	0.39	0.29	0.07	0.37
Phosphorus, Total	mg/l	365.2	0.47	0.7	0.42	0.59	0.42	0.5	0.56	0.43	0.32	0.12	0.4
Potassium	mg/l	200.7	2.1	1.5	2.2	2.3	2.7	1.9	2.3	1.5	1.9	5.8	2.2
Residue, Filterable (TDS)	mg/l	160.1	300	200	350	200	400	--	--	290	550	2600	313
Residue, Non-Filterable (TSS)	mg/l	160.2	5 *	5	5 *	5 *	5 *	5 *	5 *	5 *	5 *	32	5 *
Scandium	mg/l	200.7	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *
Silver	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.006	0.012	0.004 *	0.004 *	0.004 *
Sodium	mg/l	200.7	14	7.1	16.8	8.1	20.6	7.07	6.95	6.66	8.49	19.7	14
Specific Conductance	umhos	120.1	340	350	390	350	420	350	480	590	660	2700	470
Strontium	mg/l	200.7	0.159	0.134	0.179	0.18	0.184	0.139	0.135	0.163	0.311	1.32	0.173
Sulfate	mg/l	375.4	76	33	100	31	110	34	34	31	46	220	82
Tetrachloroethene	ug/l	624	10 *	10 *	10 *	--	10 *	10 *	--	--	10 *	10 *	10 *
Thorium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Titanium	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.006	0.002 *	0.002 *	0.002 *	0.002 *
Toluene	ug/l	624	--	--	--	--	10 *	--	--	--	--	--	--
Trichloroethene	ug/l	624	--	--	--	--	10 *	10 *	10 *	10 *	10 *	10 *	--
Uranium, Total	mg/l	752	0.012	0.005	0.021	0.004	0.021	0.012	0.044	0.005	0.089	0.107	0.015
Vanadium	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Zinc	mg/l	200.7	0.085	0.053	0.08	0.119	0.107	0.107	0.122	0.115	0.079	0.047	0.051
Zirconium	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002	0.002 *	0.002 *	0.002 *	0.002 *

* Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

DOES NOT CONTAIN
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NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26/ 1992

19-:5-88.WI

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 10/05/88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,2-Dichloroethane	ug/l	624	10 *	10 *	10 *	--	10 *	10 *	10 *	--	--	10 *	10 *
2-Chloroethylvinyl ether	ug/l	624	10 *	10 *	10 *	--	--	10 *	10 *	10 *	10 *	10 *	10 *
Alpha Activity	pci/l	739	0	0	15	72	10	40	86	--	62	100	82
Aluminum	mg/l	200.7	0.08	0.17	0.1	0.08	0.08	0.1	0.16	0.12	0.11	0.05	0.75
Ammonia	mg/l	350.2	0.2	0.2	0.2	0.2 *	0.2 *	0.3	0.2	0.2 *	0.2 *	0.2	0.2 *
Arsenic	mg/l	200.7	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Arsenic	mg/l	206.2	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *
Barium	mg/l	200.7	0.05	0.0458	0.0535	0.0489	0.0556	0.0465	0.0404	0.09	0.0731	0.169	0.0574
Beryllium	mg/l	200.7	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001	0.0001 *
Beta Activity	pci/l	741	55	67	17	23	92	31	47	--	129	230	59
Bis(2-chloroethyl) ether	ug/l	625	--	--	10 *	--	--	--	--	--	--	--	10 *
Bis(2-ethyhexyl) phthalate	ug/l	625	--	--	--	--	10 *	--	--	--	--	--	10 *
Boron	mg/l	200.7	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.013	0.007 *	0.007 *
Bromoform	ug/l	624	10 *	10 *	10 *	--	10 *	10 *	--	--	--	--	10 *
Cadmium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.106 *	0.01	0.006 *
Calcium	mg/l	200.7	43.6	40	47.5	39.5	50.5	40.8	42.5	59.1	7[illegible].1	463	47.8
Carbon tetrachloride	ug/l	624	10 *	10 *	--	--	--	--	--	--	--	--	--
Cerium	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Chemical Oxygen Demand (COD)	mg/l	410.2	8	12	19	12	14	5 *	30	--	5 *	12	8.5
Chlorine, Total Residual	mg/l	330.1	0.28	0.42	0.26	0.2	0.98	0.24	0.14	0.44	0.36	0.1 *	0.1 *
Chloroform	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 *
Chromium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *
Cobalt	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.003	0.002 *
Copper	mg/l	200.7	0.007	0.007	0.008	0.005	0.006	0.011	0.007	0.015	0.065	0.002	0.006
Dibromochloromethane	ug/l	624	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	--	10 *
Ethyl benzene	ug/l	624	--	10 *	--	--	--	--	--	--	--	--	--
Iron	mg/l	200.7	0.09	0.24	0.14	0.29	0.09	0.05	0.15	0.06	0.13	0.04	0.62
Isophorone	ug/l	625	--	--	--	--	--	--	--	--	10 *	--	--
Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *
Lead	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Lead	mg/l	239.2	0.0018	0.0035	0.001 *	0.0072	0.001 *	0.001 *	0.001 *	0.001 *	0.0018	0.002 *	0.001
Lithium	mg/l	200.7	0.012	0.005	0.016	0.004	0.021	0.012	0.047	0.018	0.008	0.032	0.015
Magnesium	mg/l	200.7	11	10.3	11.6	9.98	12	11.3	10.7	11.1	14.2	64.9	11.1
Manganese	mg/l	200.7	0.04	0.087	0.067	0.129	0.072	0.003	0.071	0.048	0.37	1.06	0.073
Mercury	mg/l	245.1	0.0016	0.0002 *	0.0015	0.0005	0.0014	0.0002	0.0003	0.0012	0.0005	0.0002 *	0.0019
Methylene chloride	ug/l	624	--	--	--	--	--	--	--	10 *	--	--	--
Molybdenum	mg/l	200.7	0.226	0.19	0.229	0.067	0.281	0.22	0.544	0.02	0.021	0.006 *	0.212
Nickel	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.02	0.01 *	0.01 *	0.01 *	0.01 *	0.05	0.01 *
Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Nitrate, as Nitrogen	mg/l	353.3	2.8	0.48	4	0.51	4.4	0.64	0.72	9.6	35	320	2.8
Nitrite, as Nitrogen	mg/l	353.3	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *
Nitrogen, Kjeldahl	mg/l	351.3	0.6	0.7	0.5	0.2	0.6	0.3	0.5	0.5	0.4	0.2 *	0.8
Oil and Grease	mg/l	413.1	2 *	2	2 *	2	2 *	2 *	2 *	2 *	2 *	3	3
Organic Carbon, Total (TOC)	mg/l	415.2	34	32	33	4.3	6.7	2.4	9.5	4.3	2.2	4.7	3.5
pH	units	150.1	7.9	8.3	7.9	8.1	7.9	8.2	7.8	7.9	7.9	7.6	8
Phosphorus	mg/l	200.7	0.54	0.92	0.44	0.37	0.41	0.45	0.51	0.41	0.33	0.06 *	0.44
Phosphorus, Total	mg/l	365.2	0.55	1	0.47	0.39	0.52	0.45	0.53	0.41	0.32	0.1 *	0.44
Potassium	mg/l	200.7	2	1.4	2.1	1.7	2	2	3.1	1.6	2	6.5	2.4
Residue, Filterable (TDS)	mg/l	160.1	240	200	244	208	270	1350	210	--	490	2690	330
Residue, Non-Filterable (TSS)	mg/l	160.2	5 *	5 *	5 *	5 *	5	5 *	5 *	5 *	5 *	5 *	17
Scandium	mg/l	200.7	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *
Silver	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.009	0.004 *	0.004 *	0.004 *
Sodium	mg/l	200.7	7.92	6.39	7.65	8.13	6.6	7.08	9.3	7.81	6.78	24	10.8
Specific Conductance	umhos	120.1	380	330	400	350	450	320	360	420	640	3200	410
Strontium	mg/l	200.7	0.143	0.127	0.152	0.127	0.154	0.134	0.481	0.166	0.271	1.44	0.151
Sulfate	mg/l	375.4	39	30	40	31	39	35	39	35	42	210	51
Tetrachloroethene	ug/l	624	10 *	10 *	10 *	--	10 *	10 *	--	--	10 *	10 *	10 *
Thorium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Titanium	mg/l	200.7	0.002 *	0.005	0.002	0.003	0.003	0.004	0.002	0.002	0.003	0.002 *	0.01
Toluene	ug/l	624	10 *	--	--	--	--	--	--	--	--	--	--
Trichloroethene	ug/l	624	10 *	--	--	--	10 *	--	10 *	10 *	10 *	--	--
Uranium, Total	mg/l	752	0.012	0.006	0.016	0.002	0.024	0.012	0.038	0.006	0.68	0.099	0.016
Vanadium	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Zinc	mg/l	200.7	0.087	0.058	0.095	0.094	0.094	0.099	0.175	0.12	0.08	0.049	0.059
Zirconium	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *

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-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

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Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1993

10-15-88.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 10/15/88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,1,1-Trichloroethane	ug/l	624	10 *	10 *	--	10 *	10 *	10 *	10 *	--	15 *	10 *	10 *
1,1-Dichloroethene	ug/l	624	--	--	--	10 *	--	--	--	--	--	--	--
1,2-Dichloropropane	ug/l	624	--	--	10 *	10 *	--	--	--	10 *	--	10 *	--
Alpha Activity	pci/l	739	91	53	43	130	17	450	220	0	40	76	4.3
Aluminum	mg/l	200.7	0.1	0.18	0.1	0.1	0.1	0.08	0.14	0.14	0.07	0.11	0.21
Ammonia	mg/l	350.2	0.3	0.2	0.4	0.5	0.2 *	0.2 *	0.3	0.2	0.4	0.3	0.2
Arsenic	mg/l	200.7	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Arsenic	mg/l	206.2	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *
Barium	mg/l	200.7	0.0466	0.0412	0.0523	0.0446	0.0498	0.0364	0.0365	0.0967	0.0972	0.15	0.0517
Beryllium	mg/l	200.7	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001	0.0001 *
Beta Activity	pci/l	741	0	30	7.6	36	67	95	11	5.5	160	140	41
Bis(2-chloroethyl) ether	ug/l	625	10 *	10 *	10 *	10 *	10 *	--	10 *	10 *	10 *	10 *	10 *
Bis(2-ethylhexyl) phthalate	ug/l	625	--	--	--	--	--	--	--	--	--	10 *	--
Boron	mg/l	200.7	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.009	0.007 *	0.007 *
Cadmium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.007	0.005	0.006 *
Calcium	mg/l	200.7	52.2	36.5	57.4	43.2	54.4	35.0	36.6	51.9	75.2	364	50.2
Carbon tetrachloride	ug/l	624	10 *	10 *	--	--	--	--	--	--	--	--	10 *
Cerium	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Chemical Oxygen Demand (COD)	mg/l	410.2	19	8	--	12	18	5	35	20	1	11	14
Chlorine, Total Residual	mg/l	330.1	0.25	0.35	0.4	0.8	0.4	1.4	0.65	0.46	0.8	0.1 *	0.1 *
Chlorobenzene	ug/l	624	--	--	10 *	10 *	10 *	--	--	--	--	--	--
Chromium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.012	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *
cis-1,3-Dichloropropene	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 *
Cobalt	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.01	0.002 *	0.002 *	0.002 *	0.004	0.002 *
Copper	mg/l	200.7	0.021	0.011	0.031	0.098	0.055	0.025	0.013	0.01	0.004	0.002 *	0.011
Iron	mg/l	200.7	0.09	0.15	0.09	0.28	0.1	0.03	0.16	0.12	0.06	0.07	0.18
Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *
Lead	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Lead	mg/l	239.2	0.001 *	0.006	0.001 *	0.0015	0.011 *	0.0015	0.002	0.001 *	0.001 *	0.001 *	0.001
Lithium	mg/l	200.7	0.011	0.005	0.014	0.005	0.015	0.01	0.006	0.013	0.006	0.018	0.013
Magnesium	mg/l	200.7	11.2	9.75	11.4	10.9	11.6	9.86	10	11.6	14.2	50.1	11
Manganese	mg/l	200.7	0.041	0.041	0.056	0.133	0.069	0.003	0.06	0.055	0.435	1.34	0.046
Mercury	mg/l	245.1	0.0016	0.0002 *	0.0014	0.0002 *	0.0013	0.0002 *	0.0002 *	0.0018	0.0004	0.0002 *	0.0013
Molybdenum	mg/l	200.7	0.202	0.343	0.19	0.084	0.253	0.179	0.266	0.588	0.041	0.006 *	0.191
Nickel	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.02	0.01	0.01 *	0.01 *	0.01 *	0.05	0.01 *
Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Nitrate, as Nitrogen	mg/l	353.3	2.7	0.36	3.6	0.3	4.8	0.53	0.88	10	30	260	2.2
Nitrite, as Nitrogen	mg/l	353.3	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *
Nitrogen, Kjeldahl	mg/l	351.3	0.5	0.4	0.4	0.5	0.5	0.3	0.44	0.5	0.4	0.2 *	0.5
Oil and Grease	mg/l	413.1	2 *	2 *	2 *	2 *	2 *	6	2 *	2 *	2 *	2 *	2 *
Organic Carbon, Total (TOC)	mg/l	415.2	5.2	5.7	3.2	5.9	4.4	10.6	6.6	4.3	4.8	6.3	4.1
pH	units	150.1	7.8	7.8	7.9	8.1	7.3	6.1	7.8	7.9	7.9	7.6	8
Phosphorus	mg/l	200.7	0.42	0.81	0.35	0.49	0.39	0.38	0.45	0.57	0.32	0.04 *	0.38
Phosphorus, Total	mg/l	365.1	0.43	0.88	0.39	0.65	0.39	0.39	0.45	0.5	0.31	0.1 *	0.39
Potassium	mg/l	200.7	2	1.6	2.3	2	2.3	1.6	2	2.9	1.7	4.9	2.1
Residue, Filterable (TDS)	mg/l	160.1	270	180	310	180	250	170	170	250	430	2000	270
Residue, Non-Filterable (TSS)	mg/l	160.2	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5
Scandium	mg/l	200.7	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *
Silver	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.021	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Sodium	mg/l	200.7	14.7	7.41	18.4	8.41	15.3	6.52	7.15	8.36	7.11	18.7	15.3
Specific Conductance	umhos	120.1	400	320	360	340	370	300	340	410	590	2300	420
Strontium	mg/l	200.7	0.144	0.12	0.159	0.118	0.145	0.119	0.123	0.166	0.252	1.15	0.154
Sulfate	mg/l	375.4	68	30	86	31	64	31	33	32	33	88	69
Tetrachloroethene	ug/l	624	10 *	10 *	10 *	10 *	10 *	10 *	15	16	10 *	10 *	10 *
Thorium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Titanium	mg/l	200.7	0.002	0.004	0.002 *	0.002 *	0.002 *	0.002	0.004	0.002 *	0.003	0.003	0.005
Toluene	ug/l	624	--	--	--	--	--	10 *	--	--	--	10 *	--
Total Organic Halides as Cl	ug/l	624	10 *	10 *	10 *	10 *	--	--	--	--	--	--	--
Trichloroethene	ug/l	624	10 *	10 *	10 *	--	--	10 *	10 *	10 *	10 *	10 *	10 *
Trichlorofluoromethane	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 *
Uranium, Total	mg/l	752	0.014	0.002	0.018	0.003	0.019	0.014	0.056	0.006	0.047	0.038	0.014
Vanadium	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Zinc	mg/l	200.7	0.077	0.048	0.082	0.106	0.099	0.091	0.111	0.181	0.08	0.041	0.043
Zirconium	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.003

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DOES NOT CONTAIN
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Y-12 Classification Specialist
Date: 2/26 1993

10-16-88.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 10/16/88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,1,1-Trichloroethane	ug/l	624	--	--	10 *	10 *	10 *	--	--	10 *	--	10 *	10 *
1,2-Dichloroethane	ug/l	624	--	--	--	--	--	--	--	10 *	10 *	10 *	10 *
1,2-Dichloropropane	ug/l	624	--	--	--	10 *	10 *	--	--	--	10 *	--	10 *
Alpha Activity	pci/l	739	490	180	36	65	53	--	160	39	92	120	140
Aluminum	mg/l	200.7	0.1	0.18	0.13	0.42	0.07	0.01 *	0.06	0.07	0.11	0.02	0.36
Ammonia	mg/l	350.2	0.3	0.5	0.4	0.2 *	0.2 *	0.2 *	0.2	0.2 *	0.3	0.3	0.2
Arsenic	mg/l	200.7	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Arsenic	mg/l	206.2	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *
Barium	mg/l	200.7	0.0424	0.0443	0.046	0.0464	0.0431	0.0302	0.0343	0.0875	0.065	0.146	0.0457
Beryllium	mg/l	200.7	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *
Beta Activity	pci/l	741	210	42	73	0	7.3	--	9	0	66	110	260
Bis(2-chloroethyl) ether	ug/l	625	10 *	--	--	10 *	--	--	--	10 *	10 *	10 *	10 *
Boron	mg/l	200.7	0.029	0.059	0.029	0.027	0.033	0.029	0.032	0.027	0.035	0.079	0.033
Bromoform	ug/l	624	--	10 *	10 *	10 *	10 *	10 *	10 *	--	--	--	10 *
Cadmium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006	0.009	0.006 *
Calcium	mg/l	200.7	41.6	36.9	43.3	42.3	51.4	40.4	40.2	51.1	75.7	371	47.6
Carbon tetrachloride	ug/l	624	--	10 *	--	--	--	--	--	--	--	--	10 *
Cerium	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Chemical Oxygen Demand (COD)	mg/l	410.2	10	11	14	10	15	9	32	22	19	21	22
Chlorine, Total Residual	mg/l	330.1	0.26	0.32	0.24	0.8	0.2	1.1	0.12	0.49	0.81	0.1 *	0.1 *
Chromium	mg/l	200.7	0.006 *	0.006 *	0.008	0.037	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *
cis-1,3-Dichloropropene	ug/l	624	--	--	--	10 *	--	--	--	10 *	--	--	--
Cobalt	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.005	0.002
Copper	mg/l	200.7	0.012	0.011	0.015	0.025	0.016	0.018	0.009	0.005	0.005	0.002 *	0.011
Dibromochloromethane	ug/l	624	--	10 *	--	--	--	--	--	--	--	--	--
Iron	mg/l	200.7	0.11	0.18	0.15	9.64	0.16	0.02	0.1	0.04	0.05	0.06	0.36
Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *
Lead	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Lead	mg/l	239.2	0.001 *	0.011	0.001 *	0.002	0.001 *	0.0018	0.001 *	0.001 *	0.001 *	0.001 *	0.001 *
Lithium	mg/l	200.7	0.01	0.004	0.012	0.005	0.015	0.114	0.005	0.014	0.006	0.017	0.01
Magnesium	mg/l	200.7	10.5	9.49	10.6	10.3	11.9	10.7	10.8	11.2	14.1	51	11.1
Manganese	mg/l	200.7	0.04	0.049	0.037	0.135	0.068	0.004	0.058	0.045	0.412	1.26	0.073
Mercury	mg/l	245.1	0.0017	0.0002 *	0.0012	0.0002 *	0.0016	0.0002 *	0.0002 *	0.0021	0.0003	0.0002 *	0.0022
Molybdenum	mg/l	200.7	0.214	0.35	0.205	0.146	0.255	0.135	0.277	0.524	0.006 *	0.006 *	0.193
Nickel	mg/l	200.7	0.01	0.03	0.01 *	0.01 *	0.01 *	0.01	0.01 *	0.01	0.01 *	0.02	0.01 *
Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Nitrate, as Nitrogen	mg/l	353.3	2.6	0.35	3.8	0.4	4.6	0.45	0.6	11	31	180	2.5
Nitrite, as Nitrogen	mg/l	353.3	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *
Nitrogen, Kjeldahl	mg/l	351.3	0.4	0.3	0.4	1.5	0.4	0.2	0.4	0.4	0.4	0.2	0.6
Oil and Grease	mg/l	413.1	5	3	2	3	2	2 *	2 *	2 *	2 *	2 *	0.3
Organic Carbon, Total (TOC)	mg/l	415.2	4.1	5	13.9	16.2	15	6.9	12	7	5.8	7.9	8.2
pH	units	150.1	8	8.2	8	8.2	8	8.3	7.8	8	8	7.6	8.1
Phosphorus	mg/l	200.7	0.36	0.21	0.43	1.34	0.36	0.36	0.39	0.41	0.26	0.06 *	0.33
Phosphorus, Total	mg/l	365.1	0.43	0.24	0.52	5.4	0.43	0.43	0.47	0.51	0.31	0.1 *	0.43
Potassium	mg/l	200.7	1.4	1.4	1.4	1.4	1.5	1	1.4	2.3	1.5	3.9	1.7
Residue, Filterable (TDS)	mg/l	160.1	210	180	230	200	240	210	200	300	430	2000	260
Residue, Non-Filterable (TSS)	mg/l	160.2	5 *	5 *	5 *	35	5 *	5 *	5 *	5 *	5 *	5 *	12
Scandium	mg/l	200.7	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *
Silver	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Sodium	mg/l	200.7	6.13	5.63	6.1	6.3	6.48	4.59	5.31	7.41	7.54	15.7	7.85
Specific Conductance	umhos	120.1	350	320	360	340	390	340	320	410	610	2600	370
Strontium	mg/l	200.7	0.138	0.12	0.146	0.128	0.139	0.116	0.124	0.173	0.257	1.27	0.153
Sulfate	mg/l	375.4	32	31	34	31	36	32	33	31	32	78	42
Tetrachloroethene	ug/l	624	--	--	--	--	--	--	--	16	10 *	10 *	--
Thorium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Titanium	mg/l	200.7	0.002 *	0.004	0.003	0.006	0.002 *	0.002 *	0.002 *	0.002 *	0.004	0.002 *	0.006
Toluene	ug/l	624	10 *	10 *	10 *	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *
trans-1,3-Dichloropropene	ug/l	624	--	--	--	10 *	--	--	--	--	--	--	--
Trichloroethene	ug/l	624	--	10 *	10 *	10 *	10 *	10 *	10 *	--	10 *	10 *	10 *
Uranium, Total	mg/l	752	0.01	0.003	0.012	0.003	0.014	0.012	0.017	0.006	0.041	0.04	0.013
Vanadium	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Zinc	mg/l	200.7	0.086	0.046	0.093	0.129	0.112	0.114	0.104	0.133	0.082	0.035	0.058
Zirconium	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *

* Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1992

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 12/07/89

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,1,1-Trichloroethane	ug/l	624	10 U	10 U	--	10 U	10 U	--	10 U	10 U	--	--	--
1,1,2-Trichloroethane	ug/l	624	--	--	--	--	10 U	10 U	--	10 U	--	--	--
1,1-Dichloroethane	ug/l	624	--	--	--	--	--	--	--	10 U	--	--	--
1,1-Dichloroethene	ug/l	624	--	--	--	10 U	--	--	--	--	--	10 U	--
1,2-Dichloroethane	ug/l	624	--	--	--	10 U	--	--	--	--	--	--	--
1,2-Dichloropropane	ug/l	624	--	--	--	--	--	10 U	--	--	--	--	--
2,4-Dinitrophenol	ug/l	625	30 U	--	--	--	--	--	--	--	--	--	--
Alpha Activity	pci/l	739	160	33	87	89	98	37	93	42	140	200	57
Aluminum	mg/l	200.7	0.3	0.1	0.44	0.16	0.42	0.11	0.78	0.08	0.65	0.84	0.39
Ammonia	mg/l	350.2	0.9	0.2 U	0.7	0.3	1.1	0.2 U	0.2 U	0.2 U	7.6	50	0.6
Arsenic	mg/l	200.7	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.15	0.04 U	0.04 U
Arsenic	mg/l	206.2	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.05 U	0.005 U
Barium	mg/l	200.7	0.0449	0.0527	0.0502	0.0564	0.0653	0.043	0.043	0.119	0.204	0.0884	0.0619
Benzene	ug/l	624	--	--	--	--	--	--	--	--	--	--	--
Benzyl butyl phthalate	ug/l	624	10 U	--	--	--	10 U	10 U	10 U	--	--	--	--
Beryllium	mg/l	200.7	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0126	0.0001 U	0.0001 U
Beta Activity	pci/l	741	32 U	2.3 U	89	9 U	130	17	25	9.5	170	1300	15 U
Bis(2-ethylhexyl) phthalate	ug/l	625	10 U	10 U	10 U	--	10 U	--	--	--	--	10 U	--
Boron	mg/l	200.7	0.051	0.032	0.068	0.027	0.105	0.024	0.051	0.026	1.23	4.11	0.043
Bromodichloromethane	ug/l	624	10 U	10 U	10 U	--	10 U	10 U	10 U	--	--	--	--
Bromoform	ug/l	624	--	--	--	--	10 U	17	10 U	10 U	--	--	--
Cadmium	mg/l	200.7	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.194	0.018	0.003 U
Calcium	mg/l	200.7	45.6	48.9	69.5	51	92.6	45.1	49.3	61.4	192	141	81.8
Carbon tetrachloride	ug/l	624	--	10 U	--	--	--	--	--	--	--	--	10 U
Cerium	mg/l	200.7	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.14	0.02 U	0.02 U
Chemical Oxygen Demand (COD)	mg/l	410.2	11	20	10	15	16	8	14	12	11	26	13
Chlorine, Total Residual	mg/l	330.1	0.46	0.4	0.6	0.14	0.6	1.1	0.39	0.4	0.6	0.1 U	0.1
Chloroform	ug/l	624	10 U	--	--	--	10 U	10 U	10 U	--	--	--	10 U
Chromium	mg/l	200.7	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.009	0.006 U	0.148	0.006 U	0.006 U
Cobalt	mg/l	200.7	0.002 U	0.002 U	0.002 U	0.002 U	0.003	0.002 U	0.004	0.002 U	0.14	0.008	0.002 U
Copper	mg/l	200.7	0.008	0.011	0.009	0.008	0.01	0.01	0.008	0.005	0.158	0.009	0.01
Dibromochloromethane	ug/l	624	10 U	10 U	10 U	--	--	10 U	10 U	--	--	--	--
Diethyl phthalate	ug/l	625	10 U	--	--	--	--	--	--	--	--	--	--
Gallium	mg/l	200.7	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Iron	mg/l	200.7	0.12	0.09	0.18	0.48	0.24	0.03	0.2	0.06	0.73	0.49	0.16
Lanthanum	mg/l	200.7	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.071	0.003 U	0.003 U
Lead	mg/l	200.7	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.14	0.02 U	0.02 U
Lead	mg/l	239.2	0.0042	0.0022	0.0025	0.02	0.008	0.0005 U	0.024	0.0025	0.0005 U	0.0008	0.015
Lithium	mg/l	200.7	0.057	0.004	0.081	0.008	0.128	0.032	0.235	0.025	0.273	0.678	0.052
Magnesium	mg/l	200.7	10.8	11.4	10.6	11.4	12.7	12.2	12	12.9	26.9	28.8	13.4
Manganese	mg/l	200.7	0.056	0.028	0.085	0.245	0.108	0.004	0.065	0.058	1.62	1.44	0.057
Mercury	mg/l	245.1	0.0022	0.0002	0.0019	0.0009	0.0019	0.0003	0.0003	0.0019	0.0005	0.0003	0.0017
Molybdenum	mg/l	200.7	0.127	1	0.108	0.133	0.147	0.092	0.369	0.006 U	0.21	0.224	0.145
Naphthalene	ug/l	625	--	10 U	--	--	--	--	--	--	--	--	--
Nickel	mg/l	200.7	0.007 U	0.007 U	0.007 U	0.007 U	0.013	0.007 U	0.017	0.008	0.189	0.142	0.007 U
Niobium	mg/l	200.7	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.15	0.01 U	0.01 U
Nitrate, as Nitrogen	mg/l	353.3	3.5	0.48	4.4	0.83	5.2	0.6	1.6	14	30	120	3.4
Nitrite, as Nitrogen	mg/l	353.3	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nitrogen, Kjeldahl	mg/l	351.3	1.3	0.6	0.9	0.5	1.5	0.2 U	0.3	0.4	9	53	1
N-Nitrosodimethylamine	ug/l	625	10 U	--	--	--	--	--	--	--	--	--	--
Oil and Grease	mg/l	413.1	2	2.6	2 U	2 U	4	3	2 U	2 U	2 U	3	3
Organic Carbon, Total (TOC)	mg/l	415.2	8.9	7.8	12	5.9	10	2.8	14	11	5	11	12
pH	units	150.1	8	8.1	8	8.5	8	8.2	8.1	8	7.6	7.4	8
Phosphorus	mg/l	200.7	0.44	1.63	0.48	1.34	0.55	0.6	0.69	0.48	0.06 U	0.06 U	0.53
Phosphorus, Total	mg/l	345.1	0.42	1.2	0.42	0.94	0.43	0.37	0.46	0.34	0.75	3.7	0.4
Potassium	mg/l	200.7	3.4	2	3.7	2.3	4	1.7	4	1.8	17.5	58.7	2.8
Residue, Filterable (TDS)	mg/l	160.1	450	220	610	220	760	210	240	320	3500	3500	520
Residue, Non-Filterable (TSS)	mg/l	160.2	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	7	5 U
Scandium	mg/l	200.7	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.155	0.0004 U	0.0004 U
Silver	mg/l	200.7	0.004 U	0.004 U	0.004 U	0.006	0.004 U	0.004 U	0.004 U	0.026	0.052	0.004 U	0.004 U
Sodium	mg/l	200.7	63.2	10.3	94.9	9.58	116	8.49	10.4	7.6	1800	6920	38.2
Specific Conductance	umhos	120.1	560	360	1400	400	1100	370	400	440	7400	25000	840
Strontium	mg/l	200.7	0.0962	0.142	0.142	0.131	0.192	0.137	0.135	0.194	0.679	0.471	0.201
Sulfate	mg/l	375.4	200	29	300	30	380	33	56	30	2500	16000	130
Tetrachloroethene	ug/l	624	10 U	10 U	10 U	--	10 U	10 U	11	--	22	10 U	10 U
Thorium	mg/l	200.7	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.13	0.01 U	0.01 U
Titanium	mg/l	200.7	0.004	0.002 U	0.009	0.002 U	0.013	0.002 U	0.038	0.002	0.147	0.006	0.008
trans-1,2-Dichloroethene	ug/l	624	--	--	--	--	--	--	--	--	--	10	--
Trichloroethene	ug/l	624	--	--	--	--	--	10 U	10 U	--	10 U	--	--
Trichlorofluoromethane	ug/l	624	--	--	--	--	10 U	10 U	--	10 U	--	10 U	--
Uranium, Total	mg/l	752	0.053	0.005	0.07	0.008	0.099	0.01	0.193	0.005	0.129	0.198	0.029

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Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1992

12-07-88.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 12/07/88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
Vanadium	mg/l	200.7	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.15	0.009	0.004 ‡
Zinc	mg/l	200.7	0.145	0.076	0.086	0.105	0.113	0.097	0.101	0.105	0.343	0.252	0.08
Zirconium	mg/l	200.7	0.002 ‡	0.002 ‡	0.003	0.002 ‡	0.003	0.002 ‡	0.009	0.002 ‡	0.157	0.002 ‡	0.002 ‡

‡ Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).
‡ Result detected was below typical background.

DOES NOT CONTAIN
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NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1995

12-16-88.W-1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 12/08/88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,1,1-Trichloroethane	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 *
1,2-Dichloropropane	ug/l	624	--	--	--	--	10 *	--	--	--	--	--	--
Alpha Activity	pci/l	739	110	130	330	500	580	120	200	110	170	220	120
Aluminum	mg/l	200.7	0.33	0.13	0.44	0.08	0.43	0.1	0.74	0.1	2.07	9.64	0.28
Ammonia	mg/l	350.2	1	0.3	1	0.4	1.1	0.2	0.2	0.3	10	74	0.8
Arsenic	mg/l	200.7	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Arsenic	mg/l	206.2	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.0059	0.1	0.005 *
Barium	mg/l	200.7	0.0576	0.0537	0.0581	0.0604	0.0574	0.0444	0.0417	0.106	0.0982	0.1	0.0596
Beryllium	mg/l	200.7	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0002	0.0001 *
Beta Activity	pci/l	741	54	51	120	150	92	-6.2	120	83	290	1800	68
Boron	mg/l	200.7	0.069	0.053	0.097	0.026	0.166	0.026	0.036	0.025	0.56	3.83	0.066
Bromodichloromethane	ug/l	624	--	--	10 *	--	10 *	10 *	10 *	10 *	10 *	--	--
Bromoform	ug/l	624	--	--	10 *	--	10 *	20	10 *	--	--	--	--
Cadmium	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.024	0.018	0.003 *
Calcium	mg/l	200.7	56.7	43.4	68.7	45	92	42.2	52.6	63.7	126	185	68.9
Carbon tetrachloride	ug/l	624	--	10 *	--	--	--	--	--	--	--	--	--
Cerium	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Chemical Oxygen Demand (COD)	mg/l	410.2	5	13	6	9	20	12	10	16	12	45	14
Chlorine, Total Residual	mg/l	330.1	0.4	0.26	0.54	0.1 *	0.45	0.94	0.45	0.28	0.52	0.1 *	0.1 *
Chloroform	ug/l	624	10 *	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *	--	10 *
Chromium	mg/l	200.7	0.007	0.006 *	0.03	0.469	0.006 *	0.006 *	0.008	0.006 *	0.006 *	0.006	0.007
Cobalt	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002	0.002 *	0.002 *	0.01	0.002 *
Copper	mg/l	200.7	0.01	0.012	0.01	0.007	0.01	0.007	0.008	0.005	0.015	0.018	0.008
Dibromochloromethane	ug/l	624	--	10 *	--	--	--	10 *	10 *	--	--	--	--
Gallium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Iron	mg/l	200.7	0.22	0.11	0.24	0.47	0.23	0.08	0.19	0.06	1.43	5.46	0.2
Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *
Lead	mg/l	200.7	0.016	0.02 *	0.02 *	0.02 *	0.0055	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Lead	mg/l	239.2	0.02 *	0.0008	0.005	0.0005 *	0.02 *	0.0005 *	0.03	0.0005 *	0.0005 *	0.0045	0.0045
Lithium	mg/l	200.7	0.067	0.004	0.103	0.007	0.113	0.019	0.264	0.031	0.156	0.95	0.063
Magnesium	mg/l	200.7	13.1	11.4	12.8	11.5	13.2	12.5	12.4	13.4	15	35.3	12.8
Manganese	mg/l	200.7	0.067	0.025	0.104	0.237	0.109	0.008	0.061	0.055	0.767	1.74	0.071
Mercury	mg/l	245.1	0.0022	0.0002	0.0019	0.0007	0.0019	0.0003	0.0003	0.0015	0.0006	0.0006	0.0017
Molybdenum	mg/l	200.7	0.146	0.822	0.146	0.12	0.16	0.159	0.36	0.006 *	0.029	0.226	0.147
Nickel	mg/l	200.7	0.007 *	0.007 *	0.012	0.007 *	0.008	0.007 *	0.007 *	0.007 *	0.036	0.214	0.007
Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Nitrate, as Nitrogen	mg/l	353.3	3.8	0.48	5	0.35	5.8	0.56	1.5	14	32	120	3.9
Nitrite, as Nitrogen	mg/l	353.3	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *
Nitrogen, Kjeldahl	mg/l	351.3	1.4	0.7	1.3	0.7	1.4	0.3	0.4	0.6	9.8	72	1.1
Oil and Grease	mg/l	413.1	4	4	2 *	2 *	2	2 *	3	2 *	2 *	2	2 *
Organic Carbon, Total (TOC)	mg/l	415.2	13	5.8	4.2	12	17	9.2	6.7	18	36	52	17
pH	units	150.1	8	8.1	8	8.2	7.9	8.2	8.1	8	7.7	7.4	8
Phosphorus	mg/l	200.7	0.56	1.78	0.52	0.51	0.5	0.6	0.58	0.47	0.06 *	0.06 *	0.52
Phosphorus, Total	mg/l	365.1	0.43	1.2	0.4	0.61	0.41	0.42	0.52	0.33	0.78	4.1	0.38
Potassium	mg/l	200.7	2.9	1.4	3.8	1.5	4.2	1.6	4.5	2.1	11.6	64.7	3
Residue, Filterable (TDS)	mg/l	160.1	400	170	550	200	660	210	220	270	3900	29000	1000
Residue, Non-Filterable (TSS)	mg/l	160.2	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5 *	10	82	5
Scandium	mg/l	200.7	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0014	0.0004 *
Silver	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.009	0.004 *	0.004 *	0.004 *	0.014	0.004 *	0.004 *	0.004 *
Sodium	mg/l	200.7	67.9	9.19	99.1	9.55	132	8.2	10.3	8.37	1940	8350	59
Specific Conductance	umhos	120.1	720	370	1500	480	1100	390	560	440	6000	22000	830
Strontium	mg/l	200.7	0.151	0.143	0.163	0.138	0.206	0.143	0.131	0.182	0.31	0.498	0.16
Sulfate	mg/l	375.4	190	33	290	35	330	35	58	32	2400	21000	210
Tetrachloroethene	ug/l	624	10 *	10 *	10 *	--	10 *	--	10 *	10	19	10 *	10 *
Thorium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Titanium	mg/l	200.7	0.742	0.257	0.01	0.002 *	0.014	0.002 *	0.031	0.002 *	0.017	0.083	0.006
Trichloroethene	ug/l	624	--	--	--	--	--	--	--	--	10 *	--	--
Uranium, Total	mg/l	752	0.056	0.004	0.089	0.005	0.108	0.009	0.297	0.005	0.189	0.189	0.047
Vanadium	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.017	0.004 *
Zinc	mg/l	200.7	0.136	0.141	0.207	0.144	0.36	0.125	0.105	0.314	0.232	0.315	0.102
Zirconium	mg/l	200.7	0.002 *	0.002 *	0.002	0.002 *	0.004	0.002 *	0.008	0.002 *	0.002	0.006	0.002 *

* Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/24 1993

01-22-89.WB1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 01/23/89

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	F RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,1-Dichloroethane	ug/l	624	--	--	--	--	--	--	--	--	10 *	--	--
1,2-Dichloropropane	ug/l	624	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *
Alpha Activity	pci/l	739	57	58	170	91	25	200	34	110	370	170	87
Aluminum	mg/l	200.7	0.23	0.08	0.11	0.05	0.13	0.33	0.09	0.07	.12	0.47	0.19
Ammonia	mg/l	350.2	0.8	0.2 *	0.3	0.2 *	0.3	0.2 *	0.2 *	0.2 *	0.9	0.9	0.7
Arsenic	mg/l	200.7	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Arsenic	mg/l	206.2	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *
Barium	mg/l	200.7	0.0572	0.0572	0.057	0.0601	0.0601	0.0356	0.0359	0.092	0.13	0.139	0.0601
Beryllium	mg/l	200.7	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0002	0.0001 *
Beta Activity	pci/l	741	79	56	56	110	91	110	94	99	150	220	150
Bis(2-chloroethyl) ether	ug/l	625	--	--	--	10 *	--	--	10 *	10 *	10 *	10 *	--
Bis(2-ethyhexyl) phthalate	ug/l	625	--	--	--	10 *	--	--	10 *	10 *	10 *	10 *	10 *
Boron	mg/l	200.7	0.038	0.034	0.035	0.025	0.041	0.03	0.028	0.026	0.099	0.107	0.041
Bromoform	ug/l	624	10 *	10 *	--	--	10 *	10 *	--	--	--	--	--
Cadmium	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003	0.003 *	0.003 *	0.003 *	0.027	0.015	0.003 *
Calcium	mg/l	200.7	66.6	36.2	70.4	43.4	82.7	36.2	35.2	54.9	93.2	263	60.2
Carbon tetrachloride	ug/l	624	10 *	12	--	--	--	--	--	--	--	20 *	10 *
Cerium	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	12	0.02 *
Chemical Oxygen Demand (COD)	mg/l	410.2	10	18	13	5	12	5 *	26	19	8	0.1 *	5 *
Chlorine, Total Residual	mg/l	330.1	0.26	0.5	0.24	0.31	0.34	1	0.26	0.98	0.58	0.01 *	0.1 *
Chromium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.007	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *
Cobalt	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.006	0.002 *
Copper	mg/l	200.7	0.009	0.008	0.007	0.006	0.009	0.015	0.005	0.002	0.011	0.003	0.008
Dibromochloromethane	ug/l	624	--	10 *	--	--	--	10 *	--	--	--	--	--
Gallium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Iron	mg/l	200.7	0.31	0.11	0.41	0.55	0.48	0.07	0.12	0.06	0.17	0.56	0.26
Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *
Lead	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02	0.02 *	0.02 *	0.02 *	0.02	0.02 *
Lead	mg/l	239.2	0.004	0.009	0.0048	0.019	0.034	0.022 *	0.012	0.018 *	0.01	0.012 *	0.0032
Lithium	mg/l	200.7	0.018	0.004	0.022	0.003	0.025	0.02	0.007	0.013	0.009	0.02	0.016
Magnesium	mg/l	200.7	12.7	8.96	10.5	9.21	11	10.3	9.79	11.1	14.7	35.4	11.6
Manganese	mg/l	200.7	0.107	0.056	0.156	0.386	0.174	0.004	0.092	0.096	1	1.9	0.108
Mercury	mg/l	245.1	0.0024	0.0002 *	0.0024	0.0003	0.0029	0.0005	0.0002	0.0016	0.0003	0.0002	0.0018
Methylene chloride	ug/l	624	--	--	--	--	--	10 *	10 *	10 *	10 *	10 *	10 *
Molybdenum	mg/l	200.7	0.097	0.007	0.086	0.112	0.092	0.047	0.255	0.006 *	0.006 *	0.006 *	0.104
Nickel	mg/l	200.7	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.017	0.069	0.007 *
Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Nitrate, as Nitrogen	mg/l	353.3	4	0.59	5.4	4.8	6.63	0.44	1.1	14	34	170	3.9
Nitrite, as Nitrogen	mg/l	353.3	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1	0.1 *
Nitrogen, Kjeldahl	mg/l	351.3	1.1	0.4	0.4	0.4	0.4	0.3	0.4	0.4	1.1	0.5	0.5
Oil and Grease	mg/l	413.1	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *
Organic Carbon, Total (TOC)	mg/l	415.2/375.2	28	17	22	11	26	19	39	19	24	22	30
pH	units	150.1	7.7	8	7.6	8	7.8	8.2	7.9	7.9	7.6	7.5	7.9
Phosphorus	mg/l	200.7	0.29	0.27	0.31	0.19	0.33	0.36	0.37	0.29	0.18	0.08	0.23
Phosphorus, Total	mg/l	365.1	0.3	0.27	0.33	0.24	0.33	0.41	0.45	0.34	0.21	0.1	0.28
Potassium	mg/l	200.7	2.2	1.5	1.8	1.3	2	1.6	1.7	1.5	2	3.1	1.8
Residue, Filterable (TDS)	mg/l	160.1	300	180	360	230	390	170	180	280	450	1300	290
Residue, Non-Filterable (TSS)	mg/l	160.2	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5 *	8	5 *
Scandium	mg/l	200.7	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *
Silver	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Sodium	mg/l	200.7	17.3	8.23	15.4	7.78	18.4	7.19	6.67	7.05	10.5	32	14.4
Specific Conductance	umhos	120.1	570	340	440	380	670	320	310	420	670	1900	550
Strontium	mg/l	200.7	0.152	0.118	0.173	0.134	0.186	0.122	0.118	0.184	0.273	0.8	0.154
Sulfate	mg/l	375.4	90	27	110	37	130	33	34	34	43	110	78
Tetrachloroethene	ug/l	624	10 *	--	10 *	--	10 *	--	--	10 *	22	10 *	10 *
Thorium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Titanium	mg/l	200.7	0.003	0.002	0.006	0.002 *	0.003	0.006	0.002	0.002 *	0.002 *	0.005	0.003
Trichlorofluoromethane	ug/l	624	--	10 *	--	--	10 *	10 *	--	--	10 *	10 *	--
Uranium, Total	mg/l	752	0.32	0.006	0.039	0.003	0.046	0.01	0.016	0.008	0.336	0.05	0.032
Vanadium	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 *	--
Zinc	mg/l	200.7	0.116	0.041	0.064	0.051	0.073	0.09	0.077	0.086	0.075	0.036	0.057
Zirconium	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *

* Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1993

01-23-87.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 01/23/87

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,1,1-Trichloroethane	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 *
1,1-Dichloroethene	ug/l	624	--	--	--	--	10 *	--	--	--	--	10 *	10 *
1,2-Dichloropropane	ug/l	624	--	--	--	10 *	--	--	10 *	10 *	10 *	10 *	10 *
Alpha Activity	pci/l	739	170	7.2	150	150	60	76	150	38	180	140	74
Aluminum	mg/l	200.7	0.12	0.08	0.12	0.07	0.21	0.09	0.35	0.06	0.14	0.22	0.13
Ammonia	mg/l	350.2	0.9	0.2 *	0.3	0.2 *	0.4	0.2	0.2 *	0.2 *	0.8	0.7	0.7
Arsenic	mg/l	200.7	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Arsenic	mg/l	206.2	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *
Barium	mg/l	200.7	0.0533	0.0601	0.0556	0.0567	0.0555	0.0546	0.0564	0.0537	0.127	0.14	0.0578
Beryllium	mg/l	200.7	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0002	0.0001 *
Beta Activity	pci/l	741	75	0.006	9	0	37	38	97	2.5	110	150	20
Bis(2-ethylhexyl) phthalate	ug/l	625	10 *	10 *	10 *	--	10 *	--	10 *	--	--	--	--
Boron	mg/l	200.7	0.031	0.03	0.044	0.027	0.042	0.029	0.029	0.029	0.08	0.1	0.036
Bromoform	ug/l	624	10 *	--	17 *	10 *	--	10 *	--	--	--	--	--
Cadmium	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003	0.003 *	0.003 *	0.003 *	0.027	0.016	0.003 *
Calcium	mg/l	200.7	55.2	38.4	67	42.3	76.1	45.3	36.4	36.7	95.6	283	61.1
Carbon tetrachloride	ug/l	624	--	11	--	--	--	--	--	--	--	--	--
Cerium	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Chemical Oxygen Demand (COD)	mg/l	410.2	8	2200	12	6	19	7	10	370	5 *	170	12
Chlorine, Total Residual	mg/l	330.1	0.26	0.35	0.3	0.1 *	0.46	0.5	1	0.52	0.51	0.1 *	0.1
Chlorobenzene	ug/l	624	10 *	--	--	--	--	--	--	--	--	--	--
Chromium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *
Cobalt	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002	0.006	0.002 *
Copper	mg/l	200.7	0.008	0.007	0.007	0.005	0.01	0.016	0.007	0.007	0.011	0.02 *	0.007
Dibromochloromethane	ug/l	624	--	10 *	--	--	--	10 *	10 *	--	--	--	--
Gallium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Iron	mg/l	200.7	0.27	0.14	0.42	0.99	0.56	0.1	0.14	0.1	0.15	0.33	0.26
Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *
Lead	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Lead	mg/l	239.2	0.024	0.024	0.032	0.0018	0.003	0.018	0.024	0.016	0.014	0.004	0.019
Lithium	mg/l	200.7	0.017	0.005	0.017	0.004	0.023	0.018	0.007	0.014	0.01	0.021	0.015
Magnesium	mg/l	200.7	12.1	9.33	10.5	9.87	11.1	11.3	10.2	12.4	15.6	37.9	11.3
Manganese	mg/l	200.7	0.101	0.057	0.157	0.36	0.179	0.004	0.096	0.185	1.01	2.13	0.102
Mercury	mg/l	245.1	0.0002	0.0002 *	0.0003	0.0003	0.0025	0.0003	0.0002	0.0015	0.0003	0.0002 *	0.0015
Methylene chloride	ug/l	624	--	10 *	10 *	--	--	--	--	--	--	--	10 *
Molybdenum	mg/l	200.7	0.096	0.827	0.089	0.099	0.092	0.07	0.258	0.006 *	0.006 *	0.006 *	0.094
Nickel	mg/l	200.7	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.022	0.078	0.007 *
Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Nitrate, as Nitrogen	mg/l	353.3	4.1	0.59	5.4	0.96	6.2	0.52	1.1	12	36	190	3.9
Nitrite, as Nitrogen	mg/l	353.3	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.11	0.1 *
Nitrogen, Kjeldahl	mg/l	351.3	1.1	0.4	0.5	0.5	0.6	0.3	0.7	0.3	1	0.2 *	0.8
Oil and Grease	mg/l	413.1	3	2	2 *	2 *	2 *	2 *	7	2	2	4	2 *
Organic Carbon, Total (TOC)	mg/l	375.2/415.2	16	590	25	16	22	16	18	270	25	130	18
pH	units	150.1	7.5	8.1	8	8	7.2	8.2	8	7.9	7.6	7.5	7.7
Phosphorus	mg/l	200.7	0.26	0.23	0.28	0.19	0.3	0.34	0.34	0.27	0.17	0.06	0.21
Phosphorus, Total	mg/l	365.1	0.32	0.28	0.32	0.19	0.37	0.37	0.38	0.3	0.26	0.1 *	0.25
Potassium	mg/l	200.7	2	1.5	1.7	1.5	2.2	2.1	1.8	1.7	2.4	3.3	1.7
Residue, Filterable (TDS)	mg/l	160.1	290	180	340	210	360	230	270	250	470	1500	420
Residue, Non-Filterable (TSS)	mg/l	160.2	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5 *	5 *
Scandium	mg/l	200.7	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *
Silver	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.006	0.004 *	0.004 *	0.004 *
Sodium	mg/l	200.7	15	8.14	14.5	6.82	16.9	8.68	6.95	8.55	11.5	30.1	14
Specific Conductance	umhos	120.1	44	350	400	490	570	320	370	420	670	2000	530
Strontium	mg/l	200.7	0.132	0.128	0.168	0.125	0.167	0.122	0.12	0.176	0.269	0.859	0.152
Sulfate	mg/l	375.4	82	32	100	34	100	37	34	34	41	100	82
Tetrachloroethene	ug/l	624	10 *	--	10 *	--	10 *	10 *	14	10 *	20	10 *	10 *
Thorium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Titanium	mg/l	200.7	0.002 *	0.002 *	0.004	0.002 *	0.006	0.002 *	0.016	0.002 *	0.002 *	0.003	0.003
trans-1,2-Dichloroethene	ug/l	624	--	--	--	--	10 *	--	--	--	--	--	--
Trichloroethene	ug/l	624	--	--	10 *	--	10 *	10 *	--	--	10 *	--	--
Uranium, Total	mg/l	752	0.025	26	0.034	0.004	0.039	0.01	0.018	0.006	0.29	0.047	0.028
Vanadium	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 *	--
Zinc	mg/l	200.7	0.184	0.066	0.118	0.046	0.078	0.103	0.086	0.101	0.077	0.043	0.056
Zirconium	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.004	0.002 *	0.002 *	0.002 *	0.002 *

* Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1993

03-11-89.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 03/11/89

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,1,1-Trichloroethane	ug/l	624	--	--	--	--	--	--	--	--	--	--	10 ‡
1,1-Dichloroethane	ug/l	624	--	--	--	--	--	--	--	10 ‡	--	10 ‡	--
2-Chlorophenol	ug/l	625	--	30 ‡	30 ‡	30 ‡	30 ‡	10 ‡	--	--	--	10 ‡	--
Alpha Activity	pci/l	739	16	59	11 ‡	170	5.3 ‡	14	91	42	230	93	29
Aluminum	mg/l	200.7	0.2	0.1	0.12	0.1	0.13	0.1	0.09	0.25	0.09	0.18	0.2
Ammonia	mg/l	350.2	1.1	0.2 ‡	0.2 ‡	0.3	0.2 ‡	0.2 ‡	0.2 ‡	0.2 ‡	0.7	0.6	0.7
Arsenic	mg/l	206.2	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡	0.005 ‡
Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
Barium	mg/l	200.7	0.0412	0.0676	0.058	0.0631	0.0589	0.0346	0.0366	0.116	0.127	0.149	0.0422
Benzo(a)pyrene	ug/l	625	--	10 ‡	10 ‡	--	--	--	--	--	--	10 ‡	--
Benzo(b)fluoranthene	ug/l	625	--	--	--	10 ‡	10 ‡	--	--	--	--	--	--
Beryllium	mg/l	200.7	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0001 ‡	0.0003	0.0001 ‡
Beta Activity	pci/l	741	64	74	48	68	19 ‡	10	51	2.3	150	270	44
Bis(2-chloroisopropyl) ether	ug/l	625	--	--	--	--	--	10 ‡	--	--	--	--	--
Boron	mg/l	200.7	0.007 ‡	0.007 ‡	0.007 ‡	0.007 ‡	0.007 ‡	0.007 ‡	0.007 ‡	0.007 ‡	0.007 ‡	0.007 ‡	0.007 ‡
Bromodichloromethane	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--	10 ‡
Bromoform	ug/l	624	10 ‡	10 ‡	10 ‡	--	--	10 ‡	10 ‡	--	--	10 ‡	10 ‡
Cadmium	mg/l	200.7	0.006 ‡	0.006 ‡	<0.006	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.02	0.016	0.006 ‡
Calcium	mg/l	200.7	60.9	42.3	66.6	47	71	39.4	34.6	59.3	94.6	309	63.5
Carbon tetrachloride	ug/l	624	10 ‡	--	--	--	--	--	--	--	--	--	10 ‡
Cerium	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
Chemical Oxygen Demand (COD)	mg/l	410.2	12	9	12	9	15	24	13	30	7	18	7
Chlorine, Total Residual	mg/l	330.1	0.11	0.44	0.28	0.27	0.48	1.2	0.78	0.7	0.58	0.1	0.1 ‡
Chloroform	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	15	10 ‡	--	10 ‡	--	10 ‡
Chromium	mg/l	200.7	0.006 ‡	0.006 ‡	0.006 ‡	0.006	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡	0.006 ‡
Cobalt	mg/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.004	0.002 ‡
Copper	mg/l	200.7	0.011	0.007	0.007	0.029	0.008	0.01	0.007	0.013	0.011	0.002 ‡	0.008
Dibromochloromethane	ug/l	624	10 ‡	10 ‡	10 ‡	--	--	10 ‡	10 ‡	10 ‡	10 ‡	--	--
Di-n-octyl phthalate	ug/l	625	10 ‡	--	10 ‡	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/l	625	--	10 ‡	10 ‡	--	--	--	--	--	--	--	--
Iron	mg/l	200.7	0.21	0.12	0.13	0.68	0.13	0.03	0.13	0.35	0.16	0.23	0.16
Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡
Lead	mg/l	200.7	0.02 ‡	0.02 ‡	<0.02	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡
Lead	mg/l	239.2	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0025	0.0015	0.0005	0.001	0.0005 ‡	0.0022
Lithium	mg/l	200.7	0.018	0.004	0.021	0.003	0.025	0.023	0.004	0.025	0.011	0.048	0.021
Magnesium	mg/l	200.7	12	9.59	9.85	9.76	10.2	9.94	8.69	10.6	14.8	45.6	12
Manganese	mg/l	200.7	0.098	0.054	0.132	0.36	0.15	0.007	0.094	0.115	0.959	1.86	0.085
Mercury	mg/l	245.1	0.003	0.0002 ‡	0.0023	0.0003	0.002	0.0003	0.0002 ‡	0.0026	0.0002	0.0002 ‡	0.0022
Methylene chloride	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--	--	10 ‡	10 ‡	10 ‡
Molybdenum	mg/l	200.7	0.175	0.911	0.127	0.006	0.115	0.116	0.251	0.066 ‡	0.006 ‡	0.006 ‡	0.15
Nickel	mg/l	200.7	0.01 ‡	0.01 ‡	0.01	0.01 ‡	0.01 ‡	0.01 ‡	0.01	0.03	0.03	0.08	0.01 ‡
Niobium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
Nitrate, as Nitrogen	mg/l	353.3	4.2	0.56	5.6	1	5.6	0.52	0.84	14	35	200	4.1
Nitrite, as Nitrogen	mg/l	353.3	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1	0.1 ‡
Nitrogen, Kjeldahl	mg/l	351.3	1.1	0.3	1.2	0.2 ‡	0.4	0.2 ‡	0.3	0.8	0.9	0.2 ‡	1
Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	4	2 ‡	2 ‡	2 ‡	2 ‡	2	4	2
Organic Carbon, Total (TOC)	mg/l	415.2	3.6	7.3	4	11	9	14	8.5	41	8.1	4.4	--
pH	units	150.1	7.8	8	8	7.9	7.9	8	8	7.7	7.5	7.5	7.9
Phosphorus	mg/l	200.7	0.31	0.27	0.31	0.26	0.32	0.42	0.4	0.51	0.19	0.06 ‡	0.25
Phosphorus, Total	mg/l	365.1	0.35	0.35	0.39	0.27	0.49	0.52	0.46	0.35	0.22	0.1	0.28
Potassium	mg/l	200.7	2.5	2.1	2.5	2.2	2.8	2.2	2.1	2.2	2.4	5.5	2.5
Residue, Filterable (TDS)	mg/l	160.1	310	220	330	250	350	200	180	260	450	1600	290
Residue, Non-Filterable (TSS)	mg/l	160.2	6.5	5 ‡	5 ‡	5	5 ‡	5 ‡	5 ‡	13	5 ‡	5 ‡	5 ‡
Scandium	mg/l	200.7	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡	0.0004 ‡
Silver	mg/l	200.7	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.01	0.025	0.004 ‡	0.004 ‡	0.004 ‡
Sodium	mg/l	200.7	16.2	12.1	16.8	11.2	18	6.61	5.86	8.63	11	36.8	15.5
Specific Conductance	umhos	120.1	380	340	350	370	370	280	280	420	650	2800	460
Strontium	mg/l	200.7	0.138	0.12	0.156	0.121	0.156	0.0904	0.1	0.177	0.27	0.821	0.148
Sulfate	mg/l	375.4	56	28	56	27	84	25	23	27	34	76	63.4
Tetrachloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--	--	--	10 ‡	10 ‡
Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
Titanium	mg/l	200.7	0.003	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.005	0.005	0.002 ‡	0.002 ‡	0.003
Trichloroethene	ug/l	624	10 ‡	10 ‡	10 ‡	--	--	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--
Trichlorofluoromethane	ug/l	624	--	--	--	--	--	10 ‡	--	--	--	--	--
Uranium, Total	mg/l	752	0.032	0.004	0.045	0.012	0.05	0.008	0.012	0.008	0.395	0.051	0.037
Vanadium	mg/l	200.7	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡
Zinc	mg/l	200.7	0.079	0.041	0.073	0.108	0.089	0.106	0.008	0.145	0.08	0.048	0.063
Zirconium	mg/l	200.7	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡	0.002 ‡

‡ Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).
‡ Result detected was below typical background.

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1993

04-24-89.WK1

MARTIN MARIETTA ENERGY SYSTEMS
DRY WEATHER SAMPLING EVENT - 04/24/89

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
2,4-Dinitrotoluene	ug/l	625	--	--	--	--	--	--	--	--	--	10 *	--
Alpha Activity	pci/l	739	15	4.9	11	10	9.9	12	18	7.9	20	63	24
Aluminum	mg/l	200.7	0.08	0.1	0.09	0.18	0.09	0.11	0.11	0.08	0.09	0.18	0.22
Ammonia	mg/l	350.2	0.29	0.32	0.29	0.31	0.29	0.34	0.34	0.38	0.33	0.6	0.4
Arsenic	mg/l	200.7	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Arsenic	mg/l	206.2	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *
Barium	mg/l	200.7	0.0603	0.0621	0.0589	0.0599	0.0608	0.0395	0.038	0.125	0.0838	0.202	0.0544
Beryllium	mg/l	200.7	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0001 *	0.0005	0.0001 *
Beta Activity	pci/l	741	19	6.3	28	4.2	25	5	9.1	22	77	380	21
Boron	mg/l	200.7	0.02	0.026	0.021	0.019	0.021	0.017	0.017	0.019	0.02	0.053	0.021
Bromodichloromethane	ug/l	624	10 *	10 *	10 *	--	10 *	12	10 *	10 *	10 *	--	--
Bromoform	ug/l	624	--	10 *	--	--	--	--	--	--	--	--	--
Cadmium	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.008	0.032	0.003 *
Calcium	mg/l	200.7	63.7	45.6	66.2	47	74	47.7	43.3	67.3	71.1	472	58.5
Carbon tetrachloride	ug/l	624	10 *	21	--	--	--	--	--	--	--	--	10 *
Cerium	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Chemical Oxygen Demand (COD)	mg/l	410.2	15	24	33	19	11	10	21	27	12	18	140
Chlorine, Total Residual	mg/l	330.1	0.1 *	0.14	0.1 *	0.26	0.2	0.4	0.2	0.1 *	0.1 *	0.5	0.1 *
Chloroform	ug/l	624	10 *	10 *	10	10 *	10	28	10 *	10	10	--	10 *
Chromium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006	0.006 *	0.006 *	0.006 *
Cobalt	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.017	0.002 *
Copper	mg/l	200.7	0.009	0.011	0.009	0.009	0.015	0.008	0.013	0.004	0.014	0.003	0.009
Dibromochloromethane	ug/l	624	--	--	--	--	--	10 *	--	--	--	--	--
Gallium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Hexachlorobenzene	ug/l	625	10 *	--	10 *	--	--	--	--	--	--	--	--
Iron	mg/l	200.7	0.09	0.1	0.12	0.7	0.1	0.04	0.16	0.1	0.09	0.11	0.26
Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *
Lead	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *
Lead	mg/l	239.2	0.0005 *	0.01	0.0018	0.001	0.0005 *	0.0005 *	0.001	0.0005	0.0005 *	0.0005 *	0.0025
Lithium	mg/l	200.7	0.08	0.004	0.156	0.003	0.135	0.48	0.095	0.046	0.006	0.022	0.029
Magnesium	mg/l	200.7	12.6	10.3	11.9	10.3	12	11.9	10.7	12.3	13.5	66.6	12.5
Manganese	mg/l	200.7	0.066	0.031	0.101	0.336	0.114	0.004	0.006	0.104	0.449	3.46	0.097
Mercury	mg/l	245.1	0.0012	0.0002	0.0011	0.0006	0.0012	0.0003	0.0002	0.0017	0.0002	0.0002 *	0.0017
Molybdenum	mg/l	200.7	0.184	1.02	0.132	0.011	0.138	0.105	0.289	0.006 *	0.006 *	0.006 *	0.19
Nickel	mg/l	200.7	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007 *	0.007	0.009	0.154	0.007 *
Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Nitrate, as Nitrogen	mg/l	353.3	3.8	0.3	4.8	0.6	5.6	0.4	0.9	16	21	330	4.1
Nitrite, as Nitrogen	mg/l	353.3	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.14	0.1 *
Nitrogen, Kjeldahl	mg/l	351.3	0.6	0.2	0.3	0.6	0.2	0.2	0.3	0.6	0.4	0.2	0.9
Nitrogen, Total	mg/l	551	4.4	0.5	5.1	1.2	5.8	0.7	1.2	16	21	330	5.1
Oil and Grease	mg/l	413.1	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *
Organic Carbon, Total (TOC)	mg/l	415.2	35	27	22	27	14	16	18	21	16	33	50
pH	units	150.1	8	8.1	7.8	7.8	7.8	7.9	8	7.7	7.7	7.3	8.2
Phosphorus	mg/l	200.7	0.27	0.2	0.29	0.17	0.3	0.3	0.3	0.2	0.21	0.08	0.26
Phosphorus, Total	mg/l	365.1	0.35	0.26	0.37	0.28	0.43	0.45	0.46	0.36	0.32	0.1 *	0.41
Potassium	mg/l	200.7	1.5	1.3	1.5	1.2	1.6	1.4	1.4	1.2	1.2	2.8	1.4
Residue, Filterable (TDS)	mg/l	160.1	300	192	300	214	300	200	190	300	300	2000	280
Residue, Non-Filterable (TSS)	mg/l	160.2	5 *	5 *	6	11	5 *	5 *	5 *	5 *	5 *	9	8
Scandium	mg/l	200.7	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004 *	0.0004	0.0004 *	0.0004 *	0.0004 *
Silver	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Sodium	mg/l	200.7	15.8	8.59	15.7	7.22	18	5.9	5.41	6.3	6.17	22	11.3
Specific Conductance	umhos	120.1	450	350	620	280	670	300	300	350	440	630	420
Strontium	mg/l	200.7	0.145	0.124	0.156	0.117	0.159	0.118	0.109	0.19	0.193	1.38	0.139
Sulfate	mg/l	375.4	55	24	59	27	68	29	26	28	28	91	49
Tetrachloroethene	ug/l	624	10 *	--	10 *	--	10 *	10 *	13	16	10 *	10 *	10 *
Thorium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Titanium	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.003	0.003	0.002 *	0.002 *	0.002	0.005	0.003	0.004
Toluene	ug/l	624	--	--	--	--	--	10 *	--	10 *	--	--	--
Trichloroethene	ug/l	624	--	--	--	--	-- *	10 *	--	10 *	10 *	--	--
Uranium, Total	mg/l	752	0.016	0.004	0.018	0.003	0.02	0.009	0.015	0.007	0.08	0.056	0.02
Vanadium	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *
Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 *	--
Zinc	mg/l	200.7	0.081	0.065	0.113	0.106	0.13	0.211	0.1	0.105	0.095	0.411	0.059
Zirconium	mg/l	200.7	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *	0.002 *

* Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1992

WET EVENTS

11-04-88.W01

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - 11/04.88

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,1,1-Trichloroethane	ug/l	624	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *
1,1-Dichloroethane	ug/l	624	--	--	--	--	--	10 *	10 *	10 *	10 *	10 *	--
Alpha Activity	pci/l	739	590	52	130	140	130	150	200	110	250	--	170
Aluminum	mg/l	200.7	20.3	1.7	11.7	11.5	35.4	3.03	3.25	18.6	--	--	18.7
Ammonia	mg/l	350.2	0.2	0.3	0.3	0.4	0.4	0.2	0.2 *	0.6	--	--	0.3
Arsenic	mg/l	200.7	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	--	--	0.04 *
Arsenic	mg/l	206.2	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	--	--	0.005 *
Barium	mg/l	200.7	0.171	0.0434	0.113	0.105	0.224	0.0449	0.0456	0.173	--	--	0.136
Benzene	ug/l	624	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *
Benzo(b)fluoranthene	ug/l	625	--	--	--	--	--	--	--	--	--	--	10 *
Beryllium	mg/l	200.7	0.0008	0.0001	0.0005	0.0004	0.0012	0.0001 *	0.0001 *	0.0006	--	--	0.0007
Beta Activity	pci/l	741	110	5.9	92	41	4.3	79	110	66	150	--	66
Boron	mg/l	200.7	0.1	0.055	0.135	0.041	0.007 *	0.132	0.122	0.066	--	--	0.148
Bromodichloromethane	ug/l	624	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	--	10 *
Bromoform	ug/l	624	10 *	--	--	--	10 *	10 *	10 *	--	--	--	10 *
Cadmium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	0.006 *	--	--	0.006 *
Calcium	mg/l	200.7	41.2	25.3	33.9	17.7	45.6	39.8	25.5	27	--	--	38.6
Carbon tetrachloride	ug/l	624	10 *	10 *	--	--	--	10 *	--	--	--	--	--
Cerium	mg/l	200.7	0.03	0.02 *	0.02 *	0.02 *	0.04	0.02 *	0.02 *	0.02	--	--	0.02
Chemical Oxygen Demand (COD)	mg/l	410.2	48	29	30	10	39	27	--	39	--	--	39
Chlorine, Total Residual	mg/l	330.1	0.2	0.1	0.14	0.1	0.2	0.62	0.62	0.17	0.39	0.1 *	0.1 *
Chlorobenzene	ug/l	624	--	--	10 *	--	--	--	--	--	--	--	--
Chloroethane	ug/l	624	--	--	--	--	10 *	10 *	10 *	--	--	10 *	10 *
Chloroform	ug/l	624	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	--	10 *
Chromium	mg/l	200.7	0.034	0.007	0.017	0.061	0.036	0.007	0.006 *	0.022	--	--	0.023
Chrysene	ug/l	625	--	--	--	--	--	--	--	--	--	--	10 *
Cobalt	mg/l	200.7	0.009	0.002 *	0.005	0.003	0.013	0.002 *	0.003	0.007	--	--	0.008
Copper	mg/l	200.7	0.055	0.023	0.024	0.036	0.047	0.047	0.011	0.015	--	--	0.04
Ethyl benzene	ug/l	624	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *
Hexachlorobenzene	ug/l	625	--	--	--	--	--	--	--	10 *	--	--	--
Iron	mg/l	200.7	17.1	3.1	9.98	9.11	24.7	2.19	2.61	14.6	--	--	13.7
Isophorone	ug/l	625	--	--	--	--	--	10 *	--	--	--	--	--
Lanthanum	mg/l	200.7	0.003	0.003 *	0.003 *	0.003 *	0.007	0.003 *	0.003 *	0.003	--	--	0.003
Lead	mg/l	200.7	0.04	0.03	0.02 *	0.02	0.03	0.02 *	0.02 *	0.02	--	--	0.03
Lead	mg/l	239.2	0.0018	0.017	0.0005 *	0.018	0.0038	0.006	0.0058	0.005	--	--	0.0018
Lithium	mg/l	200.7	0.059	0.036	0.067	0.01	0.102	0.125	0.218	0.079	--	--	0.055
Magnesium	mg/l	200.7	8.98	4.47	6.68	3.79	10.4	7.49	5.09	6.18	--	--	8.28
Manganese	mg/l	200.7	0.584	0.206	0.268	0.242	0.593	0.069	0.065	0.436	--	--	0.43
Mercury	mg/l	245.1	0.021	0.0004	0.0032	0.0011	0.0042	0.0004	0.0006	0.0012	--	--	0.0086
Molybdenum	mg/l	200.7	0.045	0.141	0.06	0.01	0.054	0.148	0.1	0.048	--	--	0.054
Napthalene	ug/l	625	10 *	10 *	--	--	--	--	--	--	--	--	--
Nickel	mg/l	200.7	0.02	0.01 *	0.01 *	0.01 *	0.02	0.01	0.01 *	0.01 *	--	--	0.02
Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	--	--	0.01 *
Nitrate, as Nitrogen	mg/l	353.3	1.4	0.52	2.3	0.46	1.4	0.92	0.64	3.2	--	--	1.3
Nitrite, as Nitrogen	mg/l	353.3	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	--	--	0.1 *
Nitrogen, Kjeldahl	mg/l	351.2	1.7	0.9	1.6	1.6	1.7	1.2	0.8	2.8	--	--	1.5
Oil and Grease	mg/l	413.1	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *
Organic Carbon, Total (TOC)	mg/l	415.2/415.3	12	9.8	9.8	67	56	73	83	20	240	--	17
PCB, Total	mg/l	608	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *
pH	units	150.1	7.7	7.9	7.4	7.7	7.8	8.2	8	7.7	7.5	7.3	8
Phosphorus	mg/l	200.7	0.57	0.35	0.36	0.43	0.57	0.59	0.35	0.36	--	--	0.49
Phosphorus, Total	mg/l	365.1	0.45	0.33	0.38	0.58	0.35	0.7	--	0.18	--	--	0.45
Potassium	mg/l	200.7	6	2.7	4.2	3.6	8.8	2.5	3.8	5.6	--	--	6.2
Pyrene	ug/l	625	--	--	--	--	--	--	--	--	--	--	10 *
Residue, Filterable (TDS)	mg/l	160.1	140	90	180	90	210	130	--	130	--	--	25
Residue, Non-Filterable (TSS)	mg/l	160.2	460	70	780	170	430	90	--	320	520	--	260
Scandium	mg/l	200.7	0.0042	0.0005	0.0024	0.0019	0.0062	0.0004	0.0005	0.0032	--	--	0.0033
Silver	mg/l	200.7	0.005	0.004 *	0.004 *	0.004	0.004 *	0.004 *	0.004 *	0.004 *	--	--	0.004 *
Sodium	mg/l	200.7	5.31	3.47	7.95	1.84	6.66	4.5	4.84	2.46	--	--	13
Specific Conductance	umhos	120.1	380	270	510	350	690	380	400	730	1100	1700	350
Strontium	mg/l	200.7	0.0935	0.0592	0.0919	0.0441	0.106	0.0925	0.0673	0.082	--	--	0.0913
Sulfate	mg/l	375.4	35	22	51	25	47	29	--	42	--	--	48
Tetrachloroethene	ug/l	624	10 *	10 *	10 *	10 *	10 *	10 *	38	14	10 *	10 *	10 *
Thorium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	--	--	0.01 *
Titanium	mg/l	200.7	0.026	0.015	0.024	0.013	0.023	0.012	0.011	0.017	--	--	0.019
Trichloroethene	ug/l	624	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *
Uranium, Total	mg/l	752	0.114	0.005	0.114	0.008	0.105	0.034	0.322	0.016	0.136	--	0.064
Vanadium	mg/l	200.7	0.026	0.004	0.016	0.014	0.037	0.004 *	0.004	0.021	--	--	0.021
Zinc	mg/l	200.7	0.297	0.143	0.158	0.233	0.261	0.36	0.159	0.124	--	--	0.249
Zirconium	mg/l	200.7	0.009	0.002 *	0.005	0.004	0.012	0.002 *	0.002 *	0.007	--	--	0.007

* Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

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NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1992

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - 03/30/89

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,1,1-Trichloroethane	ug/l	624	--	--	--	--	--	10 ‡	--	--	--	10 ‡	--
Alpha Activity	pci/l	739	100	71	99	73	72	65	73	64	160	23	8.9 ‡
Aluminum	mg/l	200.7	9.48	2.23	12.3	5.32	0.45	5	2.1	17.3	3.28	19.1	0.51
Ammonia	mg/l	350.2	0.2	0.2 ‡	0.2 ‡	0.2	0.2 ‡	0.2 ‡	0.2 ‡	0.2 ‡	0.4	0.2	0.4
Arsenic	mg/l	200.7	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡	0.04 ‡
Arsenic	mg/l	206.2	0.008	0.095	0.020	0.013	0.005 ‡	0.01	0.005 ‡	0.052	0.005 ‡	0.073	0.005 ‡
Barium	mg/l	200.7	0.0743	0.0488	0.0863	0.0543	0.0353	0.0465	0.0433	0.138	0.121	0.098	0.0539
Benzo(a)pyrene	ug/l	625	--	--	--	--	--	--	--	71	--	--	--
Benzo(b)fluoranthene	ug/l	625	--	--	--	--	--	--	--	85	--	--	--
Beryllium	mg/l	200.7	0.0003	0.0001 ‡	0.0004	0.0001	0.0001 ‡	0.0002	0.0001 ‡	0.0004	0.0001	0.0008	0.0001 ‡
Beta Activity	pci/l	741	79	25 ‡	31	48	24	6.6	4 ‡	4.2 ‡	34	17	22
Boron	mg/l	200.7	0.023	0.02	0.025	0.022	0.025	0.059	0.021	0.014	0.035	0.031	0.027
Bromodichloromethane	ug/l	624	--	--	--	--	--	10 ‡	--	--	--	--	--
Cadmium	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.016	0.003 ‡	0.003 ‡
Calcium	mg/l	200.7	27.4	30.5	29	16.2	49.9	20.2	34.8	22	79	72.1	57.1
Cerium	mg/l	200.7	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02 ‡	0.02	0.02 ‡	0.03	0.02 ‡
Chemical Oxygen Demand (COD)	mg/l	526	30	32	34	46	28	23	30	44	23	37	18
Chlorine, Total Residual	mg/l	330.1	0.1 ‡	0.1 ‡	0.1 ‡	0.1	0.1	0.15	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
Chloroform	ug/l	624	--	--	10 ‡	--	10 ‡	10 ‡	--	--	--	10 ‡	10 ‡
Chromium	mg/l	200.7	0.014	0.007	0.016	0.009	0.006 ‡	0.015	0.006 ‡	0.025	0.006 ‡	0.023	0.006 ‡
Chrysene	ug/l	625	--	--	--	--	--	--	--	71	--	--	--
Cobalt	mg/l	200.7	0.005	0.002 ‡	0.005	0.003	0.002 ‡	0.003	0.002 ‡	0.006	0.003	0.008	0.002 ‡
Copper	mg/l	200.7	0.024	0.024	0.021	0.014	0.012	0.035	0.017	0.016	0.014	0.043	0.008
Ethyl benzene	ug/l	624	10 ‡	--	--	--	--	--	--	--	--	10 ‡	--
Gallium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
Iron	mg/l	200.7	7.09	2.39	8.78	5.02	0.67	4.18	2.19	14.7	2.42	16.2	0.57
Lanthanum	mg/l	200.7	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003 ‡	0.003	0.003 ‡	0.004	0.003 ‡
Lead	mg/l	200.7	0.02 ‡	0.03	0.02	0.02 ‡	0.02 ‡	0.02	0.02 ‡	0.02 ‡	0.02 ‡	0.05	0.02 ‡
Lead	mg/l	239.2	0.016	0.018	0.013	0.0088	0.0005 ‡	0.025	0.0085	0.0095	0.0048	0.037	0.0018
Lithium	mg/l	200.7	0.02	0.005	0.024	0.007	0.024	0.081	0.015	0.031	0.013	0.057	0.02
Magnesium	mg/l	200.7	5.49	5.9	5.78	3.3	9.79	3.76	8.08	4.79	12.3	11.3	10.8
Manganese	mg/l	200.7	0.289	0.157	0.285	0.169	0.163	0.116	0.102	0.453	0.8	0.4	0.167
Mercury	mg/l	245.1	0.0083	0.0005	0.0054	0.0004	0.0015	0.0005	0.0005	0.001	0.0007	0.0023	0.0013
Methylene chloride	ug/l	624	--	--	--	--	--	--	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡
Molybdenum	mg/l	200.7	0.041	0.396	0.028	0.007	0.112	0.006 ‡	0.184	0.006 ‡	0.006 ‡	0.009	0.177
Nickel	mg/l	200.7	0.012	0.007 ‡	0.01	0.007	0.007 ‡	0.015	0.007 ‡	0.017	0.015	0.027	0.007 ‡
Niobium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
Nitrate, as Nitrogen	mg/l	353.3	0.96	0.29	1.2	0.28	6.4	0.4	0.72	1.2	0.64	15	4.4
Nitrite, as Nitrogen	mg/l	353.3	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡	0.1 ‡
Nitrogen, Kjeldahl	mg/l	351.3	1.1	0.7	1.3	1.2	0.7	0.7	0.5	1.1	0.9	0.8	1.1
Nitrogen, Total	mg/l	551	2.1	0.95	2.5	1.4	7.1	1.1	1.2	--	1.7	16	5.5
Oil and Grease	mg/l	413.1	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡	2 ‡
Organic Carbon, Total (TOC)	mg/l	415.2/415.3	8.6	8.5	11	10	11	11	8.9	6.7	6.8	7.4	7.4
PCB, Total	mg/l	608	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.0005 ‡	0.001	0.0005 ‡	0.0005 ‡	0.0007	0.0005 ‡	0.0005 ‡
pH	units	150.1	8.3	8.1	7.8	8.1	7.9	7.7	8.2	8.5	8.6	8.5	8
Phenanthrene	ug/l	625	--	--	--	--	--	--	--	76	--	--	--
Phosphorus	mg/l	200.7	0.41	0.27	0.3	0.32	0.32	0.38	0.35	0.35	0.21	0.37	0.28
Phosphorus, Total	mg/l	365.1	0.39	0.46	0.4	0.36	0.38	0.41	0.5	0.4	0.51	0.44	0.33
Potassium	mg/l	200.7	3.4	2.2	4	2.7	1.9	2.7	2.2	4.4	2.6	3.8	2.2
Residue, Filterable (TDS)	mg/l	160.1	80	113	130	100	220	65	150	80	470	220	260
Residue, Non-Filterable (TSS)	mg/l	160.2	370	76	560	450	16	96	40	410	77	500	14
Scandium	mg/l	200.7	0.0019	0.0006	0.0024	0.0011	0.0004 ‡	0.0011	0.0005	0.0032	0.0006	0.0049	0.0004 ‡
Silver	mg/l	200.7	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡	0.004 ‡
Sodium	mg/l	200.7	3.08	4.68	2.22	1.9	5.25	1.33	4.55	1.31	7.52	2.15	8.32
Specific Conductance	umhos	120.1	130	70	180	60	170	170	70	90	100	140	160
Strontium	mg/l	200.7	0.0582	0.0677	0.0633	0.0356	0.126	0.043	0.0036	0.0513	0.215	0.151	0.125
Sulfate	mg/l	375.4	30	19	29	22	34	20	25	31	34	27	52
Tetrachloroethene	ug/l	624	10 ‡	--	10 ‡	10 ‡	10 ‡	10 ‡	10 ‡	--	--	10 ‡	10 ‡
Thorium	mg/l	200.7	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡	0.01 ‡
Titanium	mg/l	200.7	0.038	0.008	0.051	0.025	0.002 ‡	0.025	0.009	0.036	0.017	0.062	0.004
Toluene	ug/l	624	10 ‡	--	10 ‡	--	--	--	--	--	--	10 ‡	--
trans-1,3-Dichloropropene	ug/l	624	--	--	--	--	--	--	10 ‡	--	10 ‡	--	--
Trichloroethene	ug/l	624	--	--	--	--	--	10 ‡	--	--	--	10 ‡	--
Uranium, Total	mg/l	752	0.028	0.004	0.036	0.022	0.036	0.025	0.014	0.015	0.024	0.055	0.021
Vanadium	mg/l	200.7	0.01	0.004 ‡	0.013	0.006	0.004 ‡	0.006	0.004 ‡	0.017	0.004 ‡	0.027	0.004 ‡
Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 ‡	--
Zinc	mg/l	200.7	0.17	0.126	0.158	0.164	0.122	0.531	0.158	0.131	0.181	0.305	0.08
Zirconium	mg/l	200.7	0.004	0.002 ‡	0.005	0.002	0.002 ‡	0.003	0.002	0.006	0.002 ‡	0.01	0.002 ‡

‡ Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).
‡ Result detected was below typical background.

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1992

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - 04/04/89

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
1,1,1-Trichloroethane	ug/l	624	--	--	--	--	--	10 #	--	--	--	10 #	--
Alpha Activity	pci/l	739	70	20	51	24	15	35	120	14	120	110	22
Aluminum	mg/l	200.7	5.85	2.2	9.38	4.58	10.2	2.8	4.1	15.1	14.5	23.6	2.52
Ammonia	mg/l	350.2	0.3	0.2 #	0.2 #	0.2 #	0.2 #	0.2	0.2	0.2 #	0.2 #	0.2 #	0.7
Arsenic	mg/l	200.7	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #
Arsenic	mg/l	206.2	0.005 #	0.005 #	0.005 #	0.005 #	0.005 #	0.005 #	0.005	0.005 #	0.005 #	0.005 #	0.005 #
Barium	mg/l	200.7	0.0591	0.0413	0.0759	0.0465	0.081	0.038	0.05	0.114	0.119	0.0918	0.0417
Benzo(a)pyrene	ug/l	625	--	--	--	--	--	--	--	10 #	--	--	--
Benzo(b)fluoranthene	ug/l	625	--	--	--	10 #	--	--	--	10 #	--	--	--
Beryllium	mg/l	200.7	0.0002	0.0001 #	0.0003	0.0001 #	0.0003	0.0001 #	0.0001 #	0.0003	0.0005	0.0008	0.0001 #
Beta Activity	pci/l	741	14	45 #	42	18	59	22	30	15 #	140	21	25
Bis(2-ethyhexyl) phthalate	ug/l	625	--	--	--	10 #	--	--	--	--	--	--	10 #
Boron	mg/l	200.7	0.023	0.02	0.026	0.02	0.025	0.051	0.025	0.017	0.033	0.035	0.028
Bromodichloromethane	ug/l	624	--	--	--	--	--	10 #	--	--	--	--	--
Bromoform	ug/l	624	--	--	--	--	--	10 #	--	--	--	--	--
Cadmium	mg/l	200.7	0.003 #	0.003 #	0.003 #	0.003 #	0.003 #	0.006	0.003 #	0.003 #	0.003	0.003 #	0.003 #
Calcium	mg/l	200.7	27.8	25.2	29.3	14.2	32.7	28.3	31.3	21.2	44.7	53.6	53.3
Cerium	mg/l	200.7	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.03	0.02 #
Chemical Oxygen Demand (COD)	mg/l	410.2	22	22	27	19	54	20	16	30	19	30	27
Chlorine, Total Residual	mg/l	330.1	0.1 #	0.1 #	0.1	0.1 #	0.1 #	0.63	0.16	0.1 #	0.1	0.1 #	0.1 #
Chloroform	ug/l	624	10 #	10 #	10 #	--	10 #	11	10 #	10 #	10 #	--	10 #
Chromium	mg/l	200.7	0.011	0.006 #	0.015	0.006	0.015	0.007	0.014	0.018	0.019	0.025	0.009
Chrysene	ug/l	625	--	--	--	10 #	10 #	--	10 #	10 #	--	--	--
Cobalt	mg/l	200.7	0.003	0.002 #	0.004	0.002 #	0.004	0.002 #	0.002	0.005	0.006	0.008	0.002 #
Copper	mg/l	200.7	0.013	0.011	0.015	0.008	0.018	0.016	0.011	0.01	0.019	0.045	0.009
Dibromochloromethane	ug/l	624	--	--	--	--	--	10 #	--	--	--	--	--
Gallium	mg/l	200.7	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #
Iron	mg/l	200.7	4.8	2.01	7.19	3.44	8.16	2.07	2.91	10.5	12	16.5	1.83
Lanthanum	mg/l	200.7	0.003 #	0.003 #	0.003 #	0.003 #	0.003 #	0.003 #	0.003 #	0.003 #	0.003	0.004	0.003 #
Lead	mg/l	200.7	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.04	0.02 #
Lead	mg/l	239.2	0.006	0.0065	0.007	0.0058	0.0098	0.0055	0.0085	0.0092	0.0125	0.035	0.0038
Lithium	mg/l	200.7	0.02	0.004	0.028	0.005	0.035	0.071	0.065	0.051	0.038	0.109	0.016
Magnesium	mg/l	200.7	5	3.99	4.9	2.32	5.52	5.57	5.21	4.02	7.14	8.79	9.3
Manganese	mg/l	200.7	0.127	0.075	0.177	0.082	0.198	0.057	0.074	0.321	0.331	0.268	0.146
Mercury	mg/l	245.1	0.0021	0.0002 #	0.0026	0.0002 #	0.0020	0.0008	0.0008	0.0002 #	0.0012	0.0021	0.0019
Molybdenum	mg/l	200.7	0.069	0.192	0.034	0.009	0.048	0.022	0.219	0.006 #	0.008	0.015	0.174
Nickel	mg/l	200.7	0.008	0.007 #	0.008	0.007 #	0.01	0.007 #	0.007 #	0.023	0.014	0.024	0.007 #
Niobium	mg/l	200.7	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #
Nitrate, as Nitrogen	mg/l	353.3	1.4	0.17	1.4	0.15	2.4	0.56	0.64	1.8	8	5.6	4
Nitrite, as Nitrogen	mg/l	353.3	0.1 #	0.1 #	0.1 #	0.1 #	0.1 #	0.1 #	0.1 #	0.1 #	0.1 #	0.1 #	0.1 #
Nitrogen, Kjeldahl	mg/l	351.3	1	0.7	0.8	1	1.1	0.8	0.6	1.2	1	0.9	1.2
Nitrogen, Total	mg/l	551	2.4	0.9	2.2	1.1	3.5	1.3	1.3	3	9	6.5	5.2
Oil and Grease	mg/l	413.1	2 #	2 #	2 #	2 #	2 #	2 #	2 #	2 #	2	2 #	2 #
Organic Carbon, Total (TOC)	mg/l	415.2/415.3	4.9	4	4.6	5.3	14	6.8	6.8	6.2	6.9	7	5.1
PCB, Total	mg/l	608	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #
pH	units	150.1	7.8	7.9	7.8	7.8	7.8	8	8.1	7.6	7.6	7.8	7.8
Phosphorus	mg/l	200.7	0.3	0.2	0.33	0.24	0.34	0.52	0.43	0.34	0.34	0.5	0.36
Phosphorus, Total	mg/l	365.1	0.23	0.2	0.27	0.22	0.28	0.42	0.37	0.2	0.2	0.38	0.3
Potassium	mg/l	200.7	2.6	2.2	3.5	2.4	3.5	2.4	3.2	4.6	4.2	5	2.7
Residue, Filterable (TDS)	mg/l	160.1	84	85	120	75	120	100	130	110	200	110	200
Residue, Non-Filterable (TSS)	mg/l	160.2	100	38	140	9	140	43	39	180	200	340	40
Scandium	mg/l	200.7	0.0013	0.0006	0.0019	0.0009	0.0023	0.0006	0.0008	0.0025	0.0031	0.0052	0.0005
Silver	mg/l	200.7	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.005	0.004 #	0.004 #	0.004 #	0.004 #
Sodium	mg/l	200.7	4.66	3.91	3.53	1.99	3.27	2.81	4.84	1.97	3.06	1.99	9.26
Specific Conductance	umhos	120.1	180	180	170	80	320	240	300	160	280	260	270
Strontium	mg/l	200.7	0.0451	0.0562	0.0675	0.0344	0.0762	0.0632	0.0972	0.0554	0.118	0.126	0.116
Sulfate	mg/l	375.4	27	18	28	25	33	21	39	37	39	32	46
Tetrachloroethene	ug/l	624	10 #	10 #	10 #	--	10 #	10 #	10	--	--	10 #	10 #
Thorium	mg/l	200.7	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #
Titanium	mg/l	200.7	0.024	0.014	0.029	0.02	0.032	0.017	0.019	0.032	0.04	0.073	0.014
Toluene	ug/l	624	--	--	10 #	10 #	--	--	--	--	--	10 #	--
Trichloroethene	ug/l	624	--	--	--	--	10 #	10 #	10 #	--	10 #	10 #	--
Trichlorofluoromethane	ug/l	624	--	--	--	--	--	10 #	--	--	--	--	--
Uranium, Total	mg/l	752	0.033	0.003	0.036	0.002	0.057	0.014	0.128	0.007	0.304	0.061	0.029
Vanadium	mg/l	200.7	0.009	0.004 #	0.012	0.006	0.015	0.004	0.005	0.017	0.021	0.034	0.004 #
Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 #	--
Zinc	mg/l	200.7	0.139	0.092	0.146	0.079	0.177	0.644	0.126	0.097	0.133	0.256	0.075
Zirconium	mg/l	200.7	0.002	0.002 #	0.004	0.002 #	0.004	0.002 #	0.002 #	0.005	0.006	0.01	0.002 #

Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).
B Result detected was below typical background.

DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: L.G. Porter
Y-12 Classification Specialist
Date: 2/26 1993

05-05-89.WK1

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - 05/05/89

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
Alpha Activity	pci/l	739	24	14	37	31	44	21	16	8.8	94	83	17
Aluminum	mg/l	200.7	0.39	0.37	--	0.51	0.57	0.86	0.14	0.29	0.69	1	0.18
Ammonia	mg/l	350.2	0.2 #	0.75	0.2 #	0.2	0.2 #	0.2 #	0.2 #	0.2 #	0.27	0.3	0.2 #
Arsenic	mg/l	200.7	0.04 #	0.04 #	--	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #	0.04 #
Arsenic	mg/l	206.2	0.005 #	0.005 #	--	0.005 #	0.005 #	0.005 #	0.005 #	0.005 #	0.005 #	0.005 #	0.005 #
Barium	mg/l	200.7	0.0509	0.0413	--	0.0395	0.0524	0.0405	0.0333	0.0903	0.0953	0.103	0.0638
Beryllium	mg/l	200.7	0.0001 #	0.0001 #	--	0.0001 #	0.0001 #	0.0001 #	0.0001 #	0.0001 #	0.0001 #	0.0001 #	0.0001 #
Beta Activity	pci/l	741	20	4	32	14	36	10	17	14	140	100	18
Bis(2-ethyhexyl) phthalate	ug/l	625	10 #	--	--	--	10 #	10 #	--	--	--	10 #	--
Boron	mg/l	200.7	0.054	0.024	--	0.021	0.099	0.682	0.024	0.019	0.036	0.053	0.029
Bromodichloromethane	ug/l	624	10 #	10 #	10 #	--	10 #	10 #	10 #	10 #	10 #	--	10 #
Bromoform	ug/l	624	--	--	--	--	--	17	10 #	--	--	--	--
Cadmium	mg/l	200.7	0.003 #	0.003 #	--	0.003 #	0.003 #	0.003 #	0.003 #	0.003 #	0.005	0.006	0.003 #
Calcium	mg/l	200.7	53.2	35.5	--	25.5	68.4	46.1	44.7	55.2	86.7	174	66.9
Carbon tetrachloride	ug/l	624	10 #	10 #	--	--	--	--	--	--	--	--	--
Cerium	mg/l	200.7	0.02 #	0.02 #	--	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #
Chemical Oxygen Demand (COD)	mg/l	410.2	18	14	--	24	21	17	13	26	17	25	17
Chlorine, Total Residual	mg/l	330.1	0.12	0.12	0.26	0.26	0.36	0.5	0.28	0.2	0.31	0.1 #	0.1 #
Chloroform	ug/l	624	10 #	10 #	10 #	10 #	10 #	11	10 #	10 #	14	--	10 #
Chromium	mg/l	200.7	0.006 #	0.006 #	--	0.006 #	0.006 #	0.007	0.006 #	0.006 #	0.006 #	0.006 #	0.006 #
Chrysene	ug/l	625	10 #	--	--	--	--	--	--	--	--	--	--
Cobalt	mg/l	200.7	0.002 #	0.002 #	--	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.005	0.002 #
Copper	mg/l	200.7	0.01	0.012	--	0.011	0.008	0.012	0.009	0.004	0.007	0.007	0.005
Dibromochloromethane	ug/l	624	--	--	--	--	10 #	10 #	10 #	--	--	--	--
Diethyl phthalate	ug/l	625	10 #	10 #	--	--	--	--	--	--	--	--	10 #
Gallium	mg/l	200.7	0.01 #	0.01 #	--	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #
Iron	mg/l	200.7	0.44	0.49	--	0.86	0.62	0.75	0.29	0.4	0.92	1.16	0.28
Lanthanum	mg/l	200.7	0.003 #	0.003 #	--	0.003 #	0.003 #	0.003 #	0.003 #	0.003 #	0.003 #	0.003 #	0.003 #
Lead	mg/l	200.7	0.02 #	0.02 #	--	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #	0.02 #
Lead	mg/l	239.2	0.002	0.005	--	0.003	0.002	0.0025	0.0025	0.0015	0.002	0.0032	0.0015
Lithium	mg/l	200.7	0.029	0.004	--	0.002	0.045	0.249	0.009	0.03	0.019	0.057	0.013
Magnesium	mg/l	200.7	9.34	8.23	--	5.64	8.68	11.4	9.94	8.57	12.7	22	11.7
Manganese	mg/l	200.7	0.083	0.076	--	0.159	0.112	0.023	0.084	0.11	0.481	0.777	0.09
Mercury	mg/l	245.1	0.0014	0.0002 #	0.001	0.0002	0.0014	0.0003	0.0002 #	0.0007	0.0003	0.0003	0.0013
Methylene chloride	ug/l	624	10 #	10 #	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	200.7	0.171	0.507	--	0.038	0.136	0.125	0.355	0.335	0.009	0.033	0.224
Nickel	mg/l	200.7	0.007 #	0.007 #	--	0.007 #	0.007 #	0.007 #	0.007 #	0.01	0.012	0.039	0.007 #
Niobium	mg/l	200.7	0.01 #	0.01 #	--	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #
Nitrate, as Nitrogen	mg/l	353.3	3.8	0.13	--	0.54	5	0.68	0.52	10	0.1 #	0.1 #	3.8
Nitrite, as Nitrogen	mg/l	353.3	0.1 #	0.1 #	--	0.1 #	0.1 #	0.1 #	0.1 #	0.1 #	25	38	0.1 #
Nitrogen, Kjeldahl	mg/l	351.3	1.02	0.8	1.6	0.6	1.3	0.4	0.4	1.3	1.3	2.3	2.8
Nitrogen, Total	mg/l	551	4.8	0.93	7.4	1.1	5.[illegible]	[illegible]	0.92	11	26	90	6.6
Oil and Grease	mg/l	413.1	5	2 #	2 #	2 #	2 #	[illegible] #	2 #	2 #	2 #	2 #	2 #
Organic Carbon, Total (TOC)	mg/l	415.2/415	8.6	7.5	6.7	8.2	4.9	10	14	13	5.9	8	5.6
PCB, Total	mg/l	608	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.0005 #	0.005 #	0.0005 #
pH	units	150.1	7.9	8.2	7.9	7.8	8	6.4	8.1	7.7	7.6	7.1	8.1
Phosphorus	mg/l	200.7	0.3	0.19	--	0.38	0.33	0.51	0.47	0.29	0.25	0.22	0.32
Phosphorus, Total	mg/l	365.2	0.29	0.19	0.36	0.33	0.3	0.5	0.45	0.27	0.24	0.19	0.35
Potassium	mg/l	200.7	1	0.8	--	0.5 #	1.1	1.5	1.2	1.1	1.1	1.4	1.3
Residue, Filterable (TDS)	mg/l	160.1	240	150	--	170	260	46	170	200	330	640	250
Residue, Non-Filterable (TSS)	mg/l	160.2	9	7	6	15	12	10	5 #	6	39	35	9
Scandium	mg/l	200.7	0.0004 #	0.0004 #	--	0.0004 #	0.0004 #	0.0004 #	0.0004 #	0.0004 #	0.0004 #	0.0004 #	0.0004 #
Silver	mg/l	200.7	0.004 #	0.004 #	--	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #
Sodium	mg/l	200.7	10.3	6.24	--	4.52	16.1	5.92	3.71	5.6	4.86	4.34	6.9
Specific Conductance	umhos	120.1	370	330	350	300	370	370	300	410	680	1300	410
Strontium	mg/l	200.7	0.13	0.101	--	0.0802	0.144	0.124	0.104	0.142	0.241	0.507	0.137
Sulfate	mg/l	375.4	58	26	--	20	29	36	30	26	44	67	59
Tetrachloroethene	ug/l	624	10 #	10 #	10 #	--	10	10 #	10 #	19	10 #	10 #	10 #
Thorium	mg/l	200.7	0.01 #	0.01 #	--	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #	0.01 #
Titanium	mg/l	200.7	0.005	0.005	--	0.007	0.006	0.009	0.002 #	0.004	0.01	0.012	0.003
Trichloroethene	ug/l	624	--	--	--	--	--	--	--	10 #	10 #	10 #	--
Uranium, Total	mg/l	752	0.024	0.003	0.029	0.003	0.043	0.01	0.016	0.008	0.172	0.104	0.016
Vanadium	mg/l	200.7	0.004 #	0.004 #	--	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #	0.004 #
Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 #	--
Zinc	mg/l	200.7	0.109	0.056	--	0.125	0.13	0.172	0.133	0.108	0.182	0.422	0.064
Zirconium	mg/l	200.7	0.002 #	0.002 #	--	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #	0.002 #

Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (U), estimated (J), or identified in the blank sample (B).

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05-09-89.WK1

MARTIN MARIETTA ENERGY SYSTEMS
WET WEATHER SAMPLING EVENT - 05/09/89

PARAMETER	UNITS	METHOD	A RESULT	B RESULT	C RESULT	D RESULT	E RESULT	F RESULT	G RESULT	H RESULT	I RESULT	J RESULT	K RESULT
Alpha Activity	pci/l	749	100	11	56	52	77	31	140	21	120	83	29
Aluminum	mg/l	200.7	0.94	0.71	0.75	2.47	8.86	1.89	2.81	4.87	4.01	10.9	1.61
Ammonia	mg/l	350.2	0.33	0.2 *	0.2 *	0.2 *	0.2 *	0.2 *	0.45	0.2 *	0.43	0.56	0.83
Anthracene	ug/l	625	--	--	--	--	--	--	--	10 *	--	--	--
Arsenic	mg/l	200.7	0.04 *	0.04 *	0.04 *	0.007 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.005 *	0.04 *
Arsenic	mg/l	206.2	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.04 *	0.005 *
Barium	mg/l	200.7	0.0482	0.0424	0.051	0.0565	0.0891	0.0334	0.0477	0.0801	0.0745	0.107	0.0658
Benzo(b)fluoranthene	ug/l	625	--	--	--	--	--	--	10 *	10 *	--	--	--
Beryllium	mg/l	200.7	0.0001 *	0.0001 *	0.0001 *	0.0024	0.0003	0.0001 *	0.0001 *	0.0001	0.0001	0.0006	0.0001 *
Beta Activity	pci/l	941	67	12	37	15	67	27	58	23	130	69	32
Bis(2-ethylhexyl) phthalate	ug/l	625	--	--	--	10 *	10 *	10 *	10 *	10 *	10 *	10 *	10 *
Boron	mg/l	200.7	0.022	0.02	0.033	0.037	0.031	0.155	0.022	0.018	0.035	0.065	0.027
Bromodichloromethane	ug/l	624	--	--	--	--	--	--	10 *	--	--	--	--
Cadmium	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.006	0.003 *	0.003 *
Calcium	mg/l	200.7	37.8	27.5	57.5	20.1	50	27.3 *	32.4	28.3	77.1	107	62.8
Cerium	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.0. *	0.02 *	0.02 *	0.02 *	0.03	0.02 *
Chemical Oxygen Demand (COD)	mg/l	410.2	27	28	28	48	40	29	31	42	26	30	43
Chlorine, Total Residual	mg/l	330.1	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.28	0.36	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform	ug/l	624	--	--	--	--	.0 *	10 *	10 *	--	10 *	--	--
Chromium	mg/l	200.7	0.006 *	0.006 *	0.006 *	0.03	0.015	0.011	0.006	0.006 *	0.007	0.016	0.006 *
Chrysene	ug/l	625	--	--	--	--	--	--	10 *	10 *	--	--	--
Cobalt	mg/l	200.7	0.002	0.002 *	0.002	0.039	0.006	0.002 *	0.007	0.003	0.003	0.007	0.002 *
Copper	mg/l	200.7	0.015	0.014	0.011	0.091	0.018	0.015	0.009	0.006	0.012	0.025	0.009
Diethyl phthalate	ug/l	625	--	10 *	--	10 *	10 *	--	--	--	--	--	--
Fluoranthene	ug/l	625	--	--	--	--	--	--	10 *	10 *	--	--	--
Gallium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.07	0.01 *	0.01 *	0.01 *	0.01	0.01 *	0.01 *	0.01 *
Indeno(1,2,3-cd)pyrene	ug/l	625	--	--	--	--	--	--	--	10 *	--	--	--
Iron	mg/l	200.7	0.68	0.92	0.66	2.28	8.82	1.83	2.95	4.89	4.1	12.2	1.93
Lanthanum	mg/l	200.7	0.003 *	0.003 *	0.003 *	0.02	0.003 *	0.003 *	0.003 *	0.003 *	0.003 *	0.003	0.003 *
Lead	mg/l	200.7	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.02 *	0.03	0.02 *
Lead	mg/l	239.2	0.0058	0.0068	0.002	0.003	0.0075	0.0032	0.0035	0.0035	0.0038	0.01	0.0035
Lithium	mg/l	200.7	0.024	0.005	0.034	0.022	0.038	0.113	0.014	0.024	0.02	0.066	0.033
Magnesium	mg/l	200.7	5.87	4.85	8.29	3.4	7.69	5.65	6.97	4.71	12.3	15.3	10.6
Manganese	mg/l	200.7	0.141	0.114	0.142	0.116	0.265	0.049	0.1	0.193	0.409	0.406	0.202
Mercury	mg/l	245.1	0.0032	0.0004	0.002	0.0003	0.004	0.0004	0.0008	0.0006	0.0006	0.0013	0.0023
Methylene chloride	ug/l	624	--	--	--	--	--	--	--	--	--	--	108 *
Molybdenum	mg/l	200.7	0.464	0.302	0.189	0.013	0.107	0.055	0.166	0.18	0.006	0.021	0.181
Nickel	mg/l	200.7	0.007 *	0.007 *	0.009	0.009	0.016	0.007 *	0.02	0.008	0.01	0.024	0.007 *
Niobium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Nitrate, as Nitrogen	mg/l	353.3	2	0.14	3.4	0.23	2.4	0.48	0.68	3.1	18	32	3.2
Nitrite, as Nitrogen	mg/l	353.3	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *	0.1 *
Nitrogen, Kjeldahl	mg/l	351.3	1.3	0.4	0.7	0.7	0.8	0.6	0.6	0.5	0.7	0.7	1.4
Nitrogen, Total	mg/l	551	33	0.54	4.1	0.93	3.2	1.08	1.3	4	19	33	4.6
N-Nitrosodiphenylamine	ug/l	625	--	--	--	--	--	--	--	10 *	--	--	--
Oil and Grease	mg/l	413.1	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *	2 *
Organic Carbon, Total (TOC)	mg/l	415.2	6.1	10	11	10	6.7	7.2	8	6.9	7	5.6	15
PCB, Total	mg/l	608	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *
pH	units	150.1	6	7.8	8	7.6	7.9	7.8	7.9	7.7	7.7	7.7	8.2
Phosphorus	mg/l	200.7	0.21	0.17	0.34	0.45	0.42	0.51	0.45	0.23	0.31	0.87	0.33
Phosphorus, Total	mg/l	365.2	0.33	0.19	0.34	0.45	0.27	0.44	0.41	0.17	0.31	0.26	0.27
Potassium	mg/l	200.7	1	0.9	1.6	1.8	2.7	1.6	1.7	2.1	1.9	4.3	1.3
Residue, Filterable (TDS)	mg/l	160.1	160	110	234	96	190	100	110	115	350	410	240
Residue, Non-Filterable (TSS)	mg/l	160.2	150	140	93	74	380	41	70	167	78	290	29
Scandium	mg/l	200.7	0.0004 *	0.0004 *	0.0004 *	0.0126	0.0023	0.0005	0.0007	0.0012	0.0011	0.0036	0.0005
Silver	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004 *	0.004	0.004 *	0.004 *	0.004 *
Sodium	mg/l	200.7	6.91	4.06	10.9	2.57	5.98	2.44	3.5	1.8	4.43	2.91	7.66
Specific Conductance	umhos	120.1	120	110	120	100	150	170	200	120	170	260	170
Strontium	mg/l	200.7	0.0843	0.0681	0.129	0.0648	0.0994	0.0634	0.0722	0.0699	0.194	0.286	0.138
Sulfate	mg/l	375.4	38	18	69	10	44	19	27	25	34	40	58
Tetrachloroethene	ug/l	624	--	--	10 *	--	10 *	10 *	10 *	10 *	10 *	10 *	--
Thorium	mg/l	200.7	0.01 *	0.01 *	0.01 *	0.04 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Titanium	mg/l	200.7	0.022	0.009	0.008	0.213	0.089	0.026	0.045	0.067	0.068	0.137	0.03
Uranium, Total	mg/l	752	0.03	0.003	0.028	0.003	0.04	0.009	0.028	0.009	0.256	0.073	0.023
Vanadium	mg/l	200.7	0.004 *	0.004 *	0.004 *	0.1	0.015	0.004 *	0.005	0.008	0.008	0.026	0.004 *
Vinyl chloride	ug/l	624	--	--	--	--	--	--	--	--	--	10 *	--
Zinc	mg/l	200.7	0.11	0.076	0.103	0.095	0.151	0.207	0.141	0.08	0.141	0.301	0.078
Zirconium	mg/l	200.7	0.002	0.002 *	0.002 *	0.018	0.006	0.002 *	0.003	0.002	0.003	0.007	0.002

* Value listed is the detection limit since the reported value was below this concentration.
-- Result deleted since the reported value was undetected (UD), estimated (J), or identified in the blank sample (B).

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APPENDIX C

ANALYTICAL PARAMETERS AND METHODS

TABLE C-1

ANALYTICAL PARAMETERS AND METHODS

PARAMETERS	METHOD	PROCEDURE NUMBER
1. Miscellaneous Parameters		
1.1 Mercury, Total	Atomic Absorption (AA) - cold vapor flameless	EPA-245.2
1.2 Uranium, Total	Fluorometric	
1.3 Total Suspended Solids (TSS)	Gravimetric Analysis	EPA-160.2
1.4 Total Kjedahl Nitrogen (TKN)	Colorimetric semi-automated block digestion - Autoanalyzer II	EPA-351.2
1.5 Phosphorus, Total	Colorimetric, Automated, Block Digestion, Autoanalyzer II	EPA-365.4
1.6 Ammonia	Colorimetric, Autoanalyzer II	EPA-350.3
1.7 Nitrate	Colorimetric, Autoanalyzer II	EPA-300.0
1.8 ICP Metals	Inductively Coupled Plasma (ICP) emissions spectroscopy	EPA-200.7
1.9 Arsenic	AA, gaseous hydride	EPA-206.3
1.10 Lead	AA, furnace technique	EPA-239.2
1.11 Sulfate	Colorimetric	EPA-300.0
1.12 Nitrite	Colorimetric, Autoanalyzer II	EPA-300.0
1.13 Gross Alpha, Beta	Thin window proportional counting	
1.14 Chemical Oxygen Demand (COD)	Colorimetric	EPA-410.4
1.15 Total Residual Chlorine	Spectrophotometric	EPA-330.5
1.16 Specific Conductance	Conductivity Meter	EPA-120.1
1.17 Total Dissolved Solids (TDS)	Gravimetric	EPA-160.3
1.18 pH	Electrometric (pH meter)	EPA-150.1
2. Total Organic Carbon (TOC)	Wet chemical oxidation - infrared detector method	EPA-415.1
3. Volatile Organic Compounds (VOC)	Purge and trap gas chromatography (GC)	EPA-624
4. PCBs	GC - Electron capture detector (ECD)	EPA-608
5. Base Neutral/Acid Extractibles	Extraction GC/MS	EPA-625
6. Oil and Grease	Gravimetric, Extraction	EPA-413.2

SECTION 3.0

DRY AND WET WEATHER EVENT DATA ANALYSIS REPORT

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1.0 INTRODUCTION

The purpose of this report is to analyze dry and wet weather event data in East Fork Poplar Creek (EFPC). Water quality data represents selected wet and dry events from April 1988 through May 1989, in accordance with the Comprehensive Sampling Program for EFPC Area Source Pollution Assessment and Control Plan (CDM, 1987). Flows and water quality data were obtained from continuous stage (depth of flow) measurements at each of the eleven comprehensive sampling program stations shown on **Figure 1-1**. The rating curves presented in **Table 1-1** were developed to convert actual stage measurements to flows using a best-fit calibration technique and the Manning equation. The equations in Table 1-1 are updated and replace the ones included in the Hydraulic Analysis and Flow Data Summary Report (CDM, 1989). A fourth order polynomial, such as the following expression was used as the best-fit equation for all circular pipes (B,D,F,G,I and J):

$$Q = a + bH + cH^2 + dH^3 - eH^4$$

where:

Q	= flow, cfs
H	= depth of flow, feet
a, b, c, d, e	= are constants.

An equation for the circular pipe where Station H is located was not derived due to poor accessibility and because this pipe contained several inches of sediment covering the flow measuring probe which generated erroneous stage measurements. Flow in the open channel stations (A, C, E, and K) was estimated using an equation of the form:

$$Q = aH^x$$

where:

Q	= flow,
H	= depth of flow, feet
a and x	= are constants.

The above expression is typically used for modified trapezoidal cross sectional areas like these stations.

Table 1-1 Best-Fit Equations for the Sampling Stations

Station	Equation
A	$Qa = 54.71*H^{1.7108}$
B	$Qb = -(0.5197*H)+(18.869*H^2)+(0.3755*H^3)-(0.718*H^4)$
C	$Qc = 18.4166 * (H)^{2.236}$
D	$Qd = (1.9607*H)+(4.1488*H^2)+(1.858*H^3)-(0.4695*H^4)$
E	$Qe = 9.46804 * (H-0.03714)^{2.08545}$
F	$Qf = (0.5794*H)+(5.148*H^2)+(1.5622*H^3)-(0.7734*H^4)$
G	$Qg = (0.1958*H)+(11.2*H^2)+(1.0544*H^3)-(0.6268*H^4)$
H	Not available
I	$Qi = (7.3729*H)+(28.9548*H^2)+(5.055*H^3)-(1.18*H^4)$
J	$Qj = (0.9641*H)+(13.8095*H^2)+(3.606*H^3)-(1.9063*H^4)$
K	$Qk = 2.6265 * (H-0.033)^{3.4546}$

Notes: Qn = Flow, cubic feet per second.
H = depth of flow, feet

Flows and water quality data were used to calculate contaminant loadings for parameters of concern in EFPC (as identified in the Water Quality Report for Wet and Dry Weather Events (CDM, 1990). These loadings were calculated for the average of dry weather events at each station. The average of dry weather events consists of twelve 24-hour composites and represents baseline conditions including plant outfalls and groundwater infiltration. Dry and wet weather conditions were then compared to assess the impact of surface runoff on EFPC water Quality. In this way, stations contributing to the most significant contaminant loadings will be considered in the subsequent scoping and evaluation of the best management practices (BMPs).

2.0 DRY WEATHER DATA ANALYSIS

This section includes the data analysis performed on seven dry weather events monitored in the study area. The dry weather events consisted of collecting flow and water quality data from 11 monitoring stations at the Y-12 Plant. Figure 1-1 shows the sampling station locations. The primary objective of monitoring several stations during dry weather periods is to quantify contaminant loadings to EFPC that are not caused by rainfall or runoff. This information is also useful in establishing baseline characteristics that can be used to quantify actual contaminant loadings attributable to wet weather events.

As indicated in CDM's Water Quality Data Summary Report (1990), the parameters of concern for dry weather events include:

- Chlorine, total residual
- Copper
- Lead
- Manganese
- Mercury
- Nitrates
- Total dissolved solids

The results of the analysis, presented in the following paragraphs, are based on average flow and contaminant concentrations during the dry weather events. The results are summarized in **Table 2-1**.

2.1 DRY WEATHER FLOW ANALYSIS

The dry weather flow was monitored using continuous depth of flow (stage) monitoring devices at each of the 11 sampling stations. The depth of flow measurements were converted to discharge using a best-fit calibration curve developed for each station (Table 1-1). Therefore, the accuracy of the flow

TABLE 2-1

SUMMARY OF DRY WEATHER EVENT DATA

Parameter	K	A	B+C	C	D+E	E	NS+F	NS	B	D	F	G	H	I	J
Flow, cfs	11.70	9.70	7.00	5.50	5.30	4.50	4.50	2.20	1.50	0.80	2.30	0.50	0.20	0.60	0.10
Flow, mgd	7.56	6.27	4.52	3.56	3.43	2.91	2.91	1.42	0.97	0.52	1.49	0.32	0.13	0.39	0.06
Distance from K	0	-2270	-3570	-5010	-5610	-5900	-6000	-6100	-3570	-5610	N.A.	N.A.	N.A.	N.A.	N.A.
	100.0%	82.9%	59.8%	47.0%	45.3%	38.5%	38.5%	18.8%	12.8%	6.8%	19.7%	4.3%	1.7%	5.1%	0.9%
COD, mg/l	10.29	10.11		11.75		14.17			11.62	10.33	15.00	20.58	15.92	8.08	16.26
COD, lbs/day	649	529	442	348	388	344	285	99	94	45	186	55	17	26	9
Total Residual Chlorine, mg/l	0.10	0.25		0.29		0.39			0.51	0.33	0.94	0.37	0.44	0.51	0.13
Total Residual Chlorine, lbs/day	6.52	13.29	12.67	8.57	10.96	9.54	14.74	3.11	4.10	1.42	11.62	1.00	0.47	1.64	0.07
Copper, mg/l	0.008	0.009		0.010		0.014			0.010	0.010	0.012	0.009	0.005	0.025	0.004
Copper, lbs/day	0.48	0.50	0.38	0.31	0.38	0.33	0.26	0.11	0.08	0.04	0.15	0.02	0.01	0.08	0.00
Lead, mg/l	0.005	0.005		0.005		0.006			0.009	0.005	0.004	0.009	0.004	0.003	0.003
Lead, lbs/day	0.32	0.26	0.22	0.15	0.17	0.15	0.09	0.04	0.07	0.02	0.05	0.02	0.00	0.01	0.00
Mercury, mg/l	0.0019	0.0020		0.0017		0.0018			0.0000	0.0004	0.0003	0.0003	0.0017	0.0004	0.0000
Mercury, lbs/day	0.12	0.10	0.05	0.05	0.05	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese, mg/l	0.073	0.062		0.092		0.110			0.053	0.232	0.006	0.077	0.070	0.692	1.478
Manganese, lbs/day	4.58	3.22	3.15	2.72	3.67	2.67	2.60	2.52	0.43	1.00	0.07	0.21	0.08	2.24	0.80
Nitrates, mg/l	3.14	3.33		4.44		5.20			0.49	1.00	0.57	1.00	12.00	31.00	220.00
Nitrates, lbs/day	198.16	173.88	135.67	131.70	130.44	126.15	123.01	115.91	3.97	4.29	7.10	2.70	12.94	100.27	118.60
Total Dissolved Solids, mg/l	324	300		356		392			196	214	278	193	259	988	4365
Total Dissolved Solids, lbs/day	20,437	15,688	12,141	10,556	10,433	9,510	7,442	3,995	1,585	923	3,447	520	279	3,196	2,353
Total Suspended Solids, mg/l	9	5.13		5.1		5			5	8	5	5	5.7	8	14.4
Total Suspended Solids, lbs/day	568	268	192	151	156	121	107	46	40	35	62	13	6	26	8

estimate is based on the accuracy of the instruments used for stage measurements and on the accuracy of the data collected to develop the rating curve. A summary of the average flow conditions observed at the 11 monitoring stations is shown on **Figure 2-1**. Likewise, **Figure 2-2** shows the fractional dry weather flow for each station, relative to Station K.

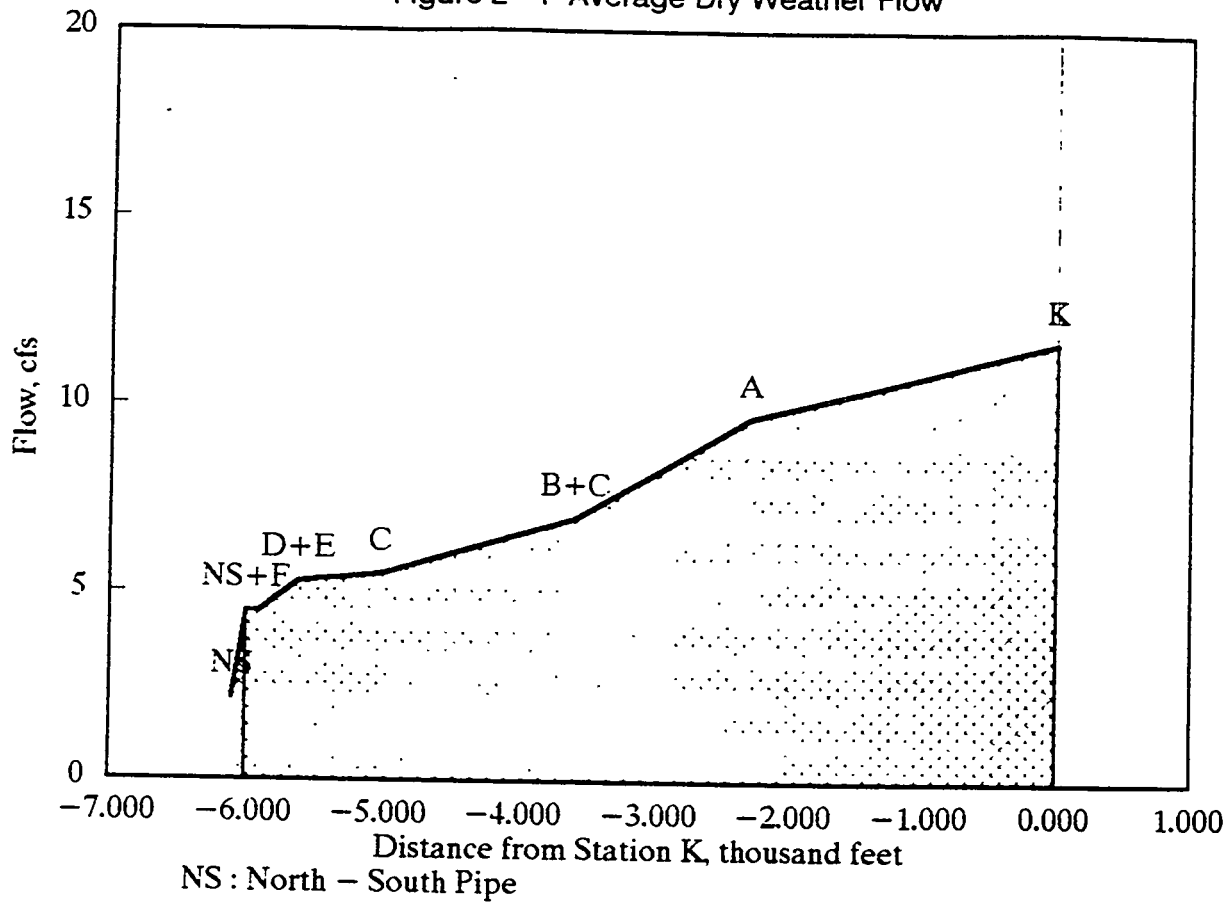
2.2 CHLORINE, TOTAL RESIDUAL

As previously discussed in CDM's Water Quality Data Summary Report (1990), total residual chlorine exceeded the ambient water quality criteria (AWQC) acute and chronic levels (19 and 11 ug/l, respectively) for all the dry weather samples collected. As shown on **Figure 2-3**, the total residual chlorine loading to EFPC is about 20 pounds per day of which approximately 70 percent is either stripped to the atmosphere due to aeration or reacts chemically with other compounds. The most significant free chlorine source of all the monitoring stations is Station F, which contributes about 57.2 percent of the total average daily loading to EFPC. Other significant sources of free residual chlorine are the tributaries to Station B. The total residual chlorine concentration decreases at several locations in the creek, primarily due to aeration and stripping, and it dissipates further below Lake Reality. Figure 2-3 indicates that the total residual chlorine concentration decreases by approximately 50 percent between Stations A and K, which are above and below Lake Reality.

2.3 COPPER

Total copper loadings to EFPC are about 0.4 pounds per day, of which about 31.6 percent of the loading is attributed to the subbasin contributing to Station F. Approximately 20 percent of the copper loading comes from other sources not monitored in the comprehensive sampling program. In addition, about 16 percent of the loading each, or approximately 38 percent of the total loading, comes from tributaries to Stations I and B. However, about 90 percent of the copper measurements are lower than the AWQC (acute = 18 ug/l; chronic = 12 ug/l) standards. **Figure 2-4** includes the copper data analysis and graphics.

Figure 2−1 Average Dry Weather Flow

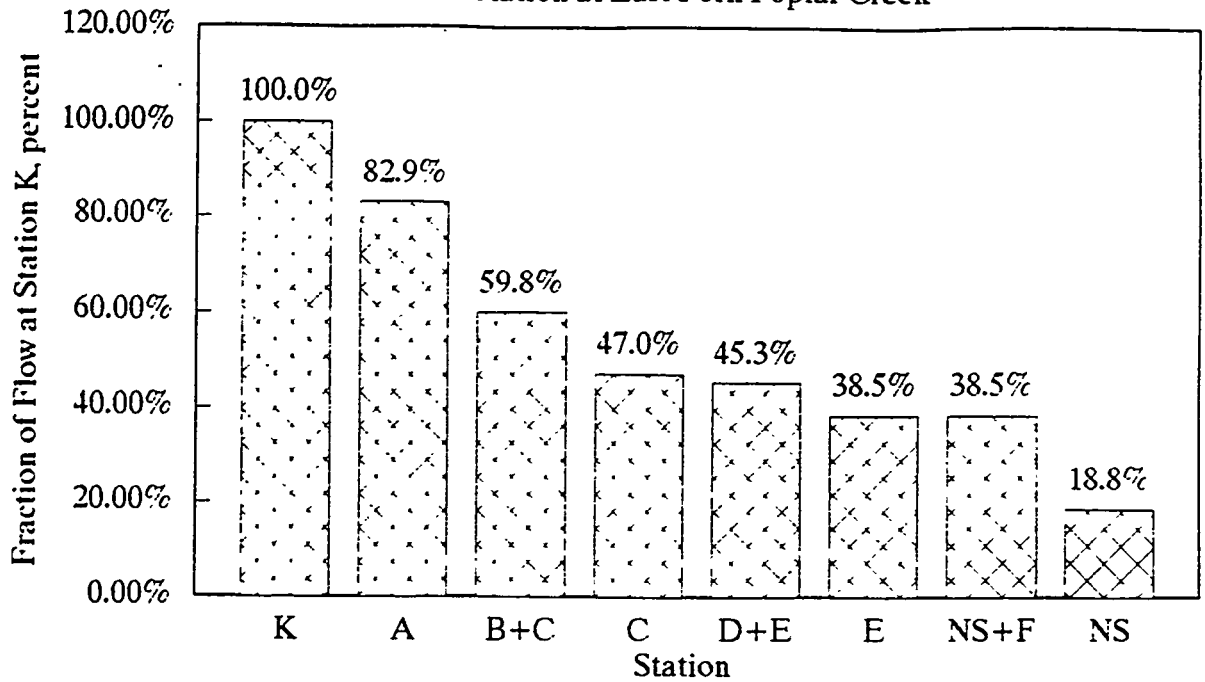


NS : North − South Pipe

Station	K	A	B+C	C	D+E	E	NS+F	NS
Flow, cfs	11.70	9.70	7.00	5.50	5.30	4.50	4.50	2.20
Flow, mgd	7.56	6.27	4.52	3.56	3.43	2.91	2.91	1.42
Distance from K, ft.	0	-2270	-3570	-5010	-5610	-5900	-6000	-6100
Fraction of flow @ Station K	100.0%	82.9%	59.8%	47.0%	45.3%	38.5%	38.5%	18.8%

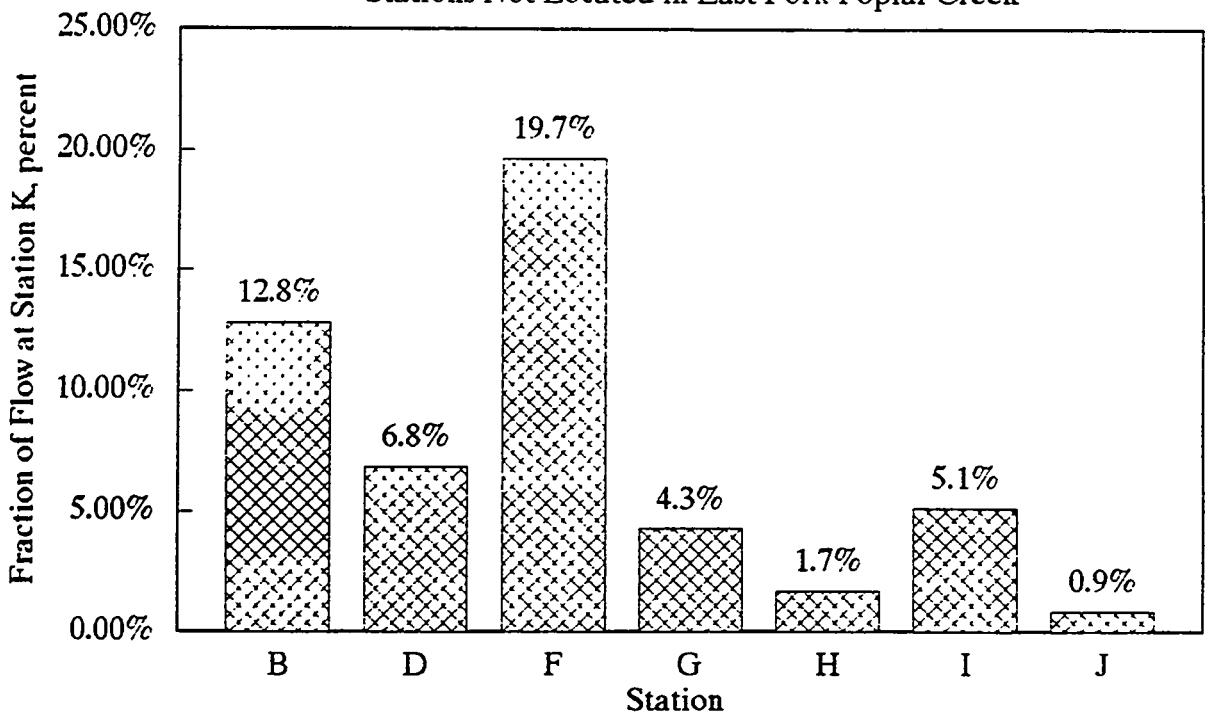
Station	B	D	F	G	H	I	J
Flow, cfs	1.50	0.80	2.30	0.50	0.20	0.60	0.10
Flow, mgd	0.97	0.52	1.49	0.32	0.13	0.39	0.06
Distance from K, ft.	-3570	-5610	N.A.	N.A.	N.A.	N.A.	N.A.
Fraction of flow @ Station K	12.8%	6.8%	19.7%	4.3%	1.7%	5.1%	0.9%

Figure 2–2 Fractional Dry Weather Flow Components
Station at East Fork Poplar Creek



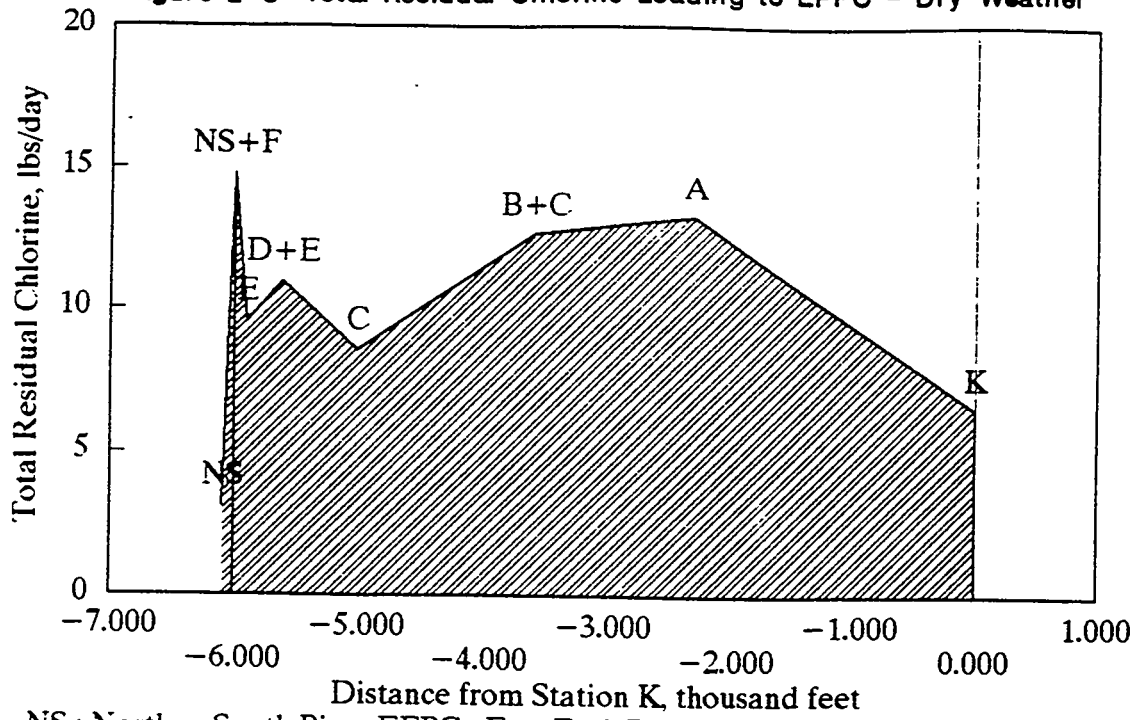
NS : North – South Pipe

Stations Not Located in East Fork Poplar Creek



NS : North – South Pipe

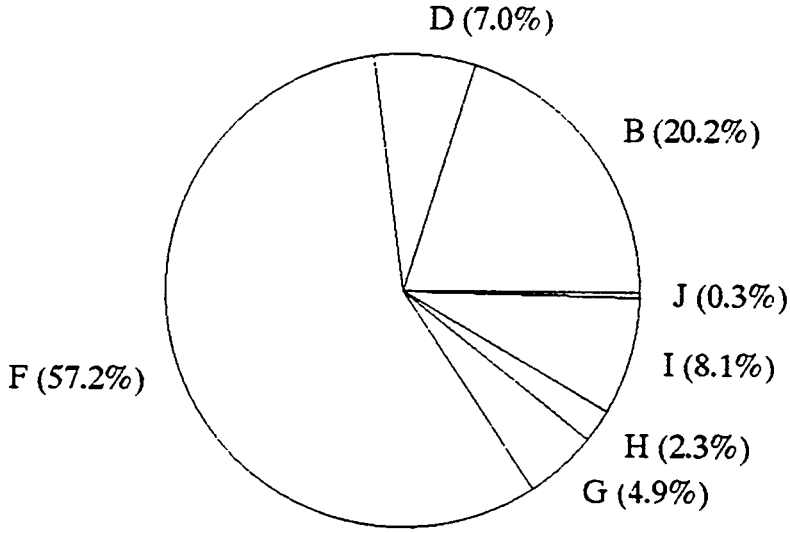
Figure 2-3 Total Residual Chlorine Loading to EFPC - Dry Weather



NS : North − South Pipe, EFPC : East Fork Poplar Creek

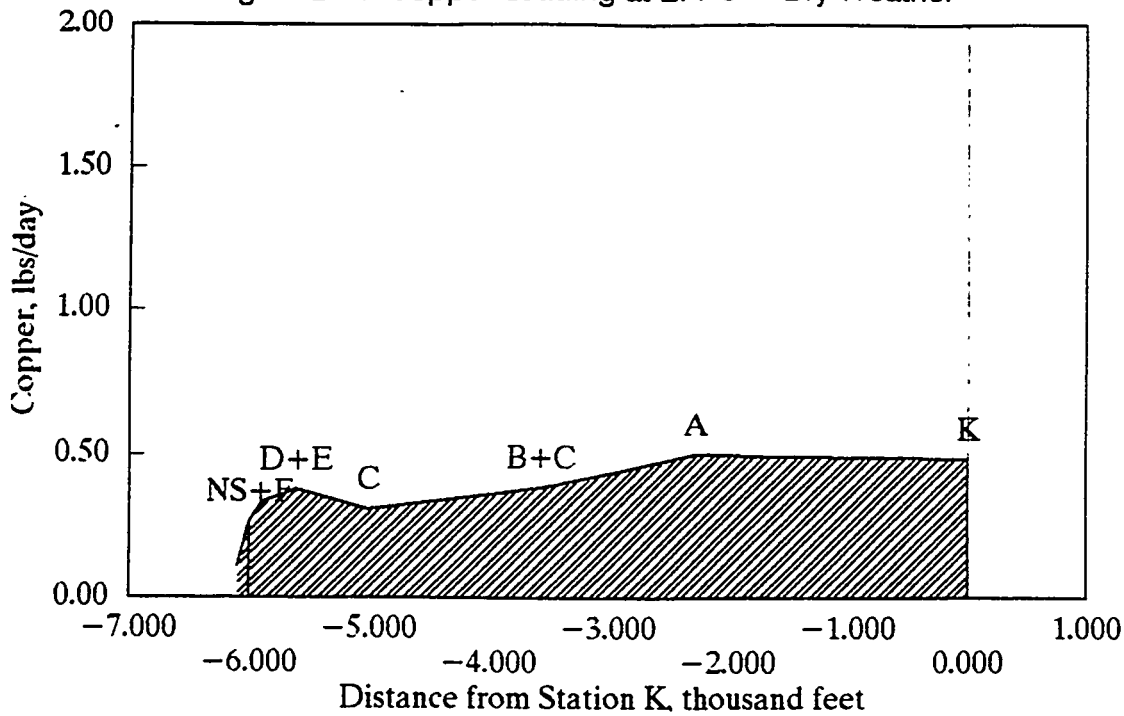
Station	B	D	F	G	H	I	J
Total Residual Chlorine, mg/l	0.51	0.33	0.94	0.37	0.44	0.51	0.13
Total Residual Chlorine, lbs/day	4.10	1.42	11.62	1.00	0.47	1.64	0.07

Average Dry−Weather Total Residual Chlorine Loadings
Measured at Different Monitoring Stations



Total Loading : 20.3 lbs/day

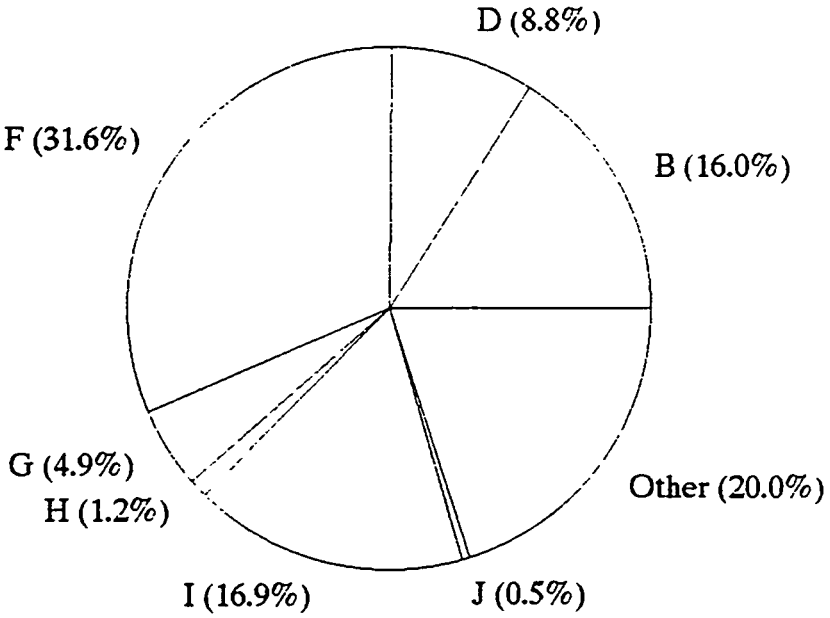
Figure 2–4 Copper Loading at EFPC – Dry Weather



NS : North – South Pipe. EFPC : East Fork Poplar Creek

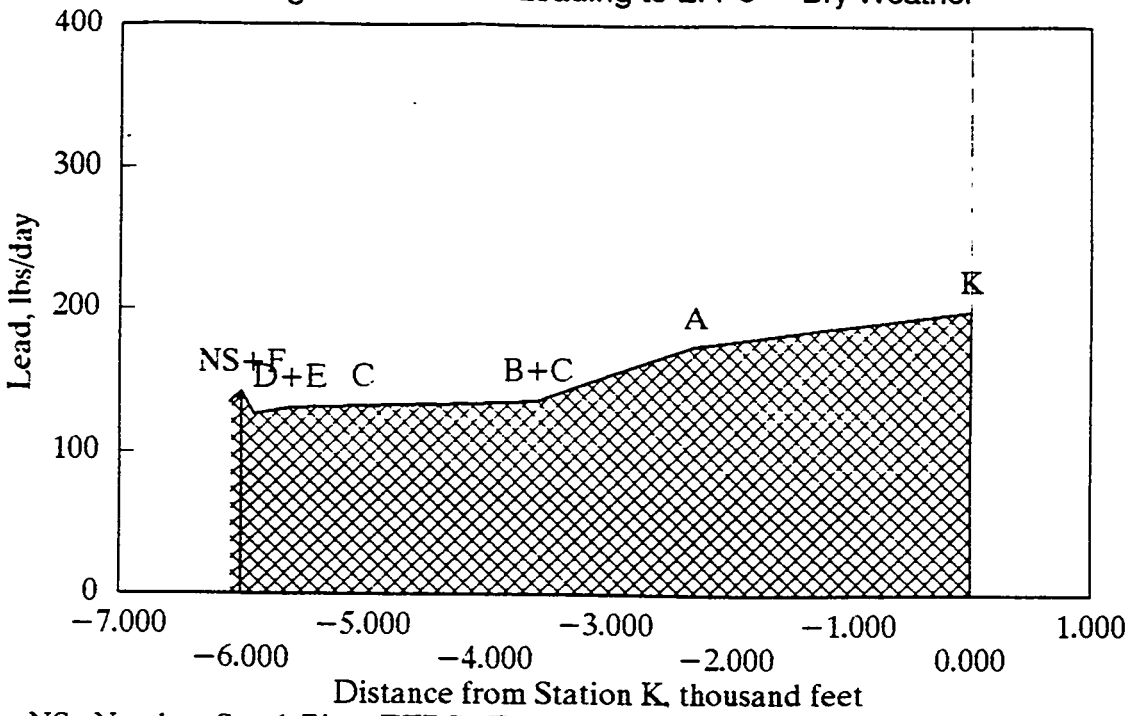
Station	B	D	F	G	H	I	J	Other
Copper, mg/l	0.010	0.010	0.012	0.009	0.005	0.025	0.004	
Copper, lbs/day	0.08	0.04	0.15	0.02	0.01	0.08	0.00	0.10

Average Dry–Weather Copper Loadings
Measured at Different Monitoring Stations



Total Loading : 0.39 lbs/day

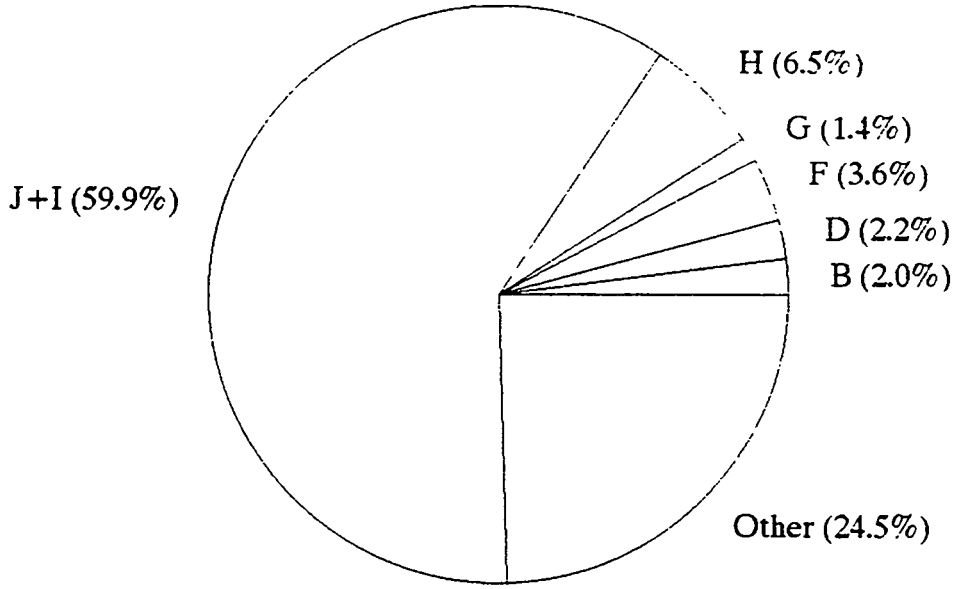
Figure 2–5 Lead Loading to EFPC – Dry Weather



NS : North – South Pipe, EFPC : East Fork Poplar Creek

Station	B	D	F	G	H	J+I	Other
Lead, mg/l	0.49	1.00	0.57	1.00	12.00	220.00	
Lead, lbs/day	3.97	4.29	7.10	2.70	12.94	118.60	48.57

Average Dry–Weather Lead Loadings
Measured at Different Monitoring Stations



Total Loading: 200 lbs/day

2.4 LEAD

As previously discussed in CDM's Water Quality Data Summary Report (1990), lead exceeded the AWQC chronic level (3.2 ug/l) for six percent of the dry weather samples collected. As shown on **Figure 2-5**, the lead loading to EFPC is about 200 pounds per day of which approximately 60 percent comes from Station I and J. Other significant lead sources contributing about 25 percent of the dry weather load were identified, but these appear to be introduced to EFPC downstream from the discharge from Station B, and are not attributed to the Subbasin B area.

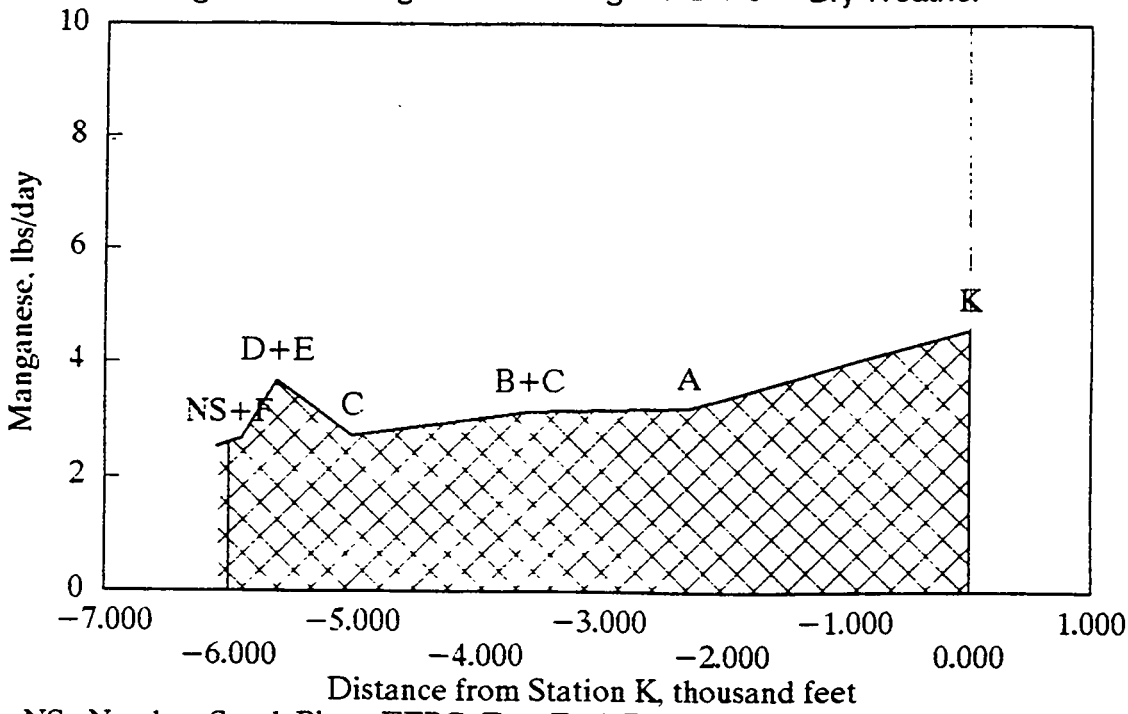
2.5 MANGANESE

About 80 percent of the dry weather samples exceeded the secondary maximum contaminant level (MCL) for manganese of 50 ug/l. As shown on **Figure 2-6**, about 50 percent of all the dry weather loadings at EFPC are derived from the service area that contributes to the monitoring stations I and J. In addition, approximately 22 percent of the loading comes from tributaries to Station D. The reduction of manganese in the creek could be partially attributed to chlorine oxidation. It is interesting to note that the presence of copper ions may act as a catalyst aiding the removal of manganese. The total loading to EFPC is about 4.6 pounds per day.

2.6 MERCURY

Unlike other contaminants, mercury levels observed at the EFPC appear to be derived from past releases to the environment. Although creek sediments may also be a source of mercury, the most likely sources are probably continual releases from old plant process areas. As shown in **Figure 2-7**, more than 97 percent of the load observed at Station K occurs downstream from the North-South (NS) Pipe. However, the total dry weather mercury loading is less than 0.12 pounds per day.

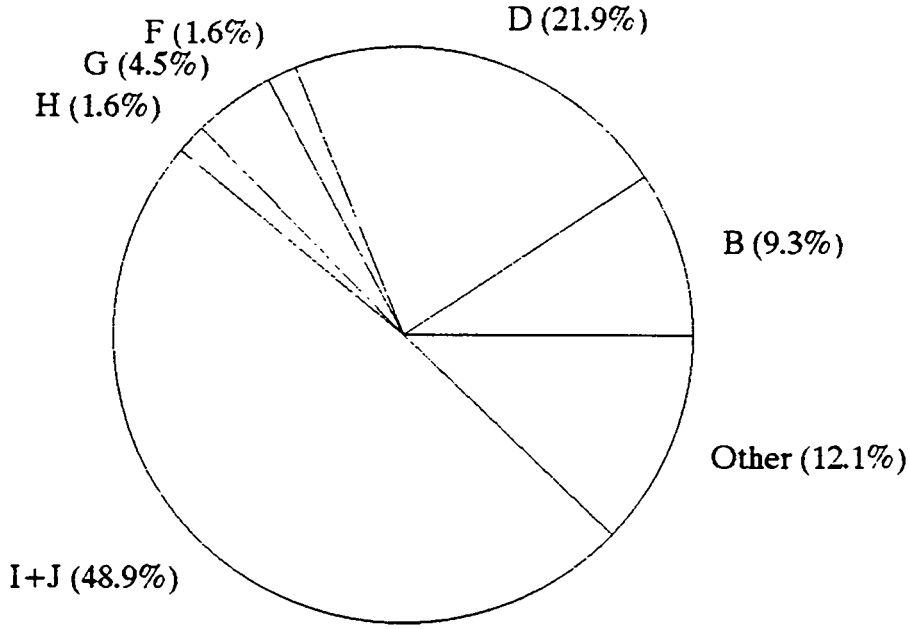
Figure 2–6 Manganese Loadings to EFPC – Dry Weather



NS : North – South Pipe. EFPC: East Fork Poplar Creek

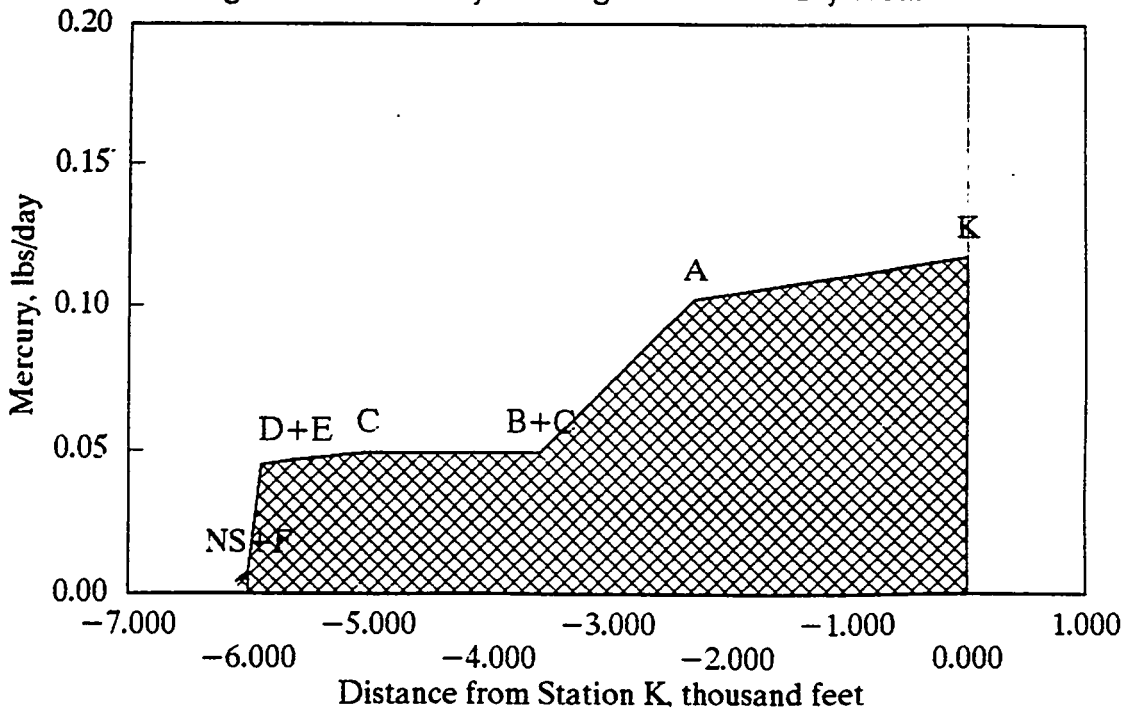
Station	B	D	F	G	H	I+J	Other
Manganese, mg/l	0.053	0.232	0.006	0.077	0.070	0.692	
Manganese, lbs/day	0.43	1.00	0.07	0.21	0.08	2.24	0.55

Average Dry–Weather Manganese Loadings
Measured at Different Monitoring Stations



Total Loading : 4.58 lbs/day

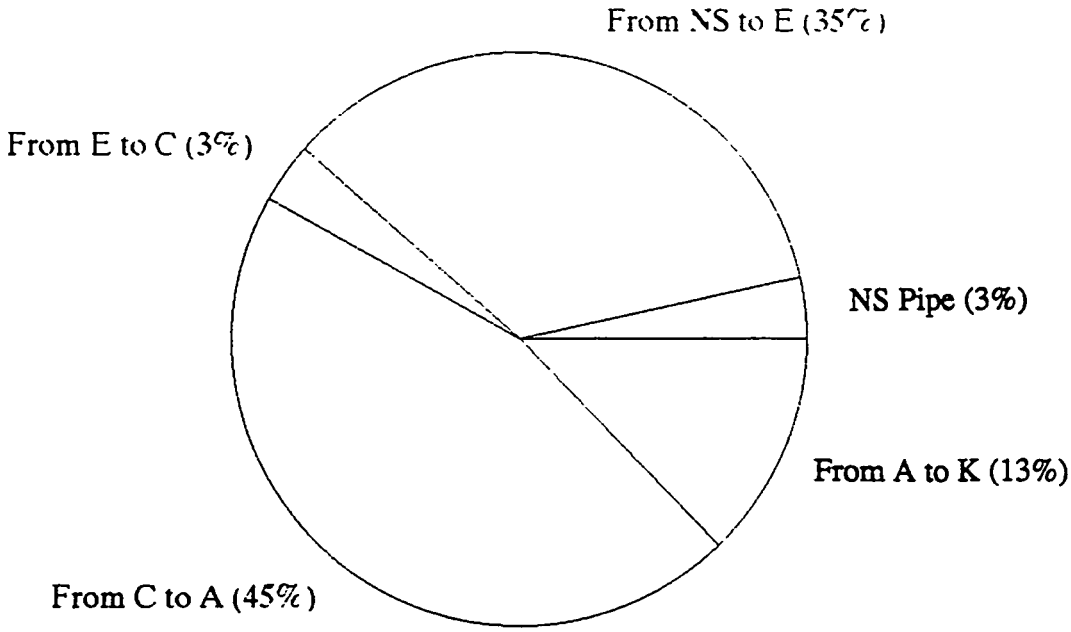
Figure 2–7 Mercury Loadings to EFPC – Dry Weather



NS : North – South Pipe, EFPC: East Fork Poplar Creek

Station	K	A	B+C	C	D+E	E	NS+F	NS
Mercury, mg/l	0.0019	0.0020		0.0017		0.0018		
Mercury, lbs/day	0.117	0.102	0.049	0.049	0.047	0.045	0.007	0.004

Average Dry–Weather Mercury Loadings
Measured at Different Monitoring Stations



Total Loading : 0.117 lbs/day

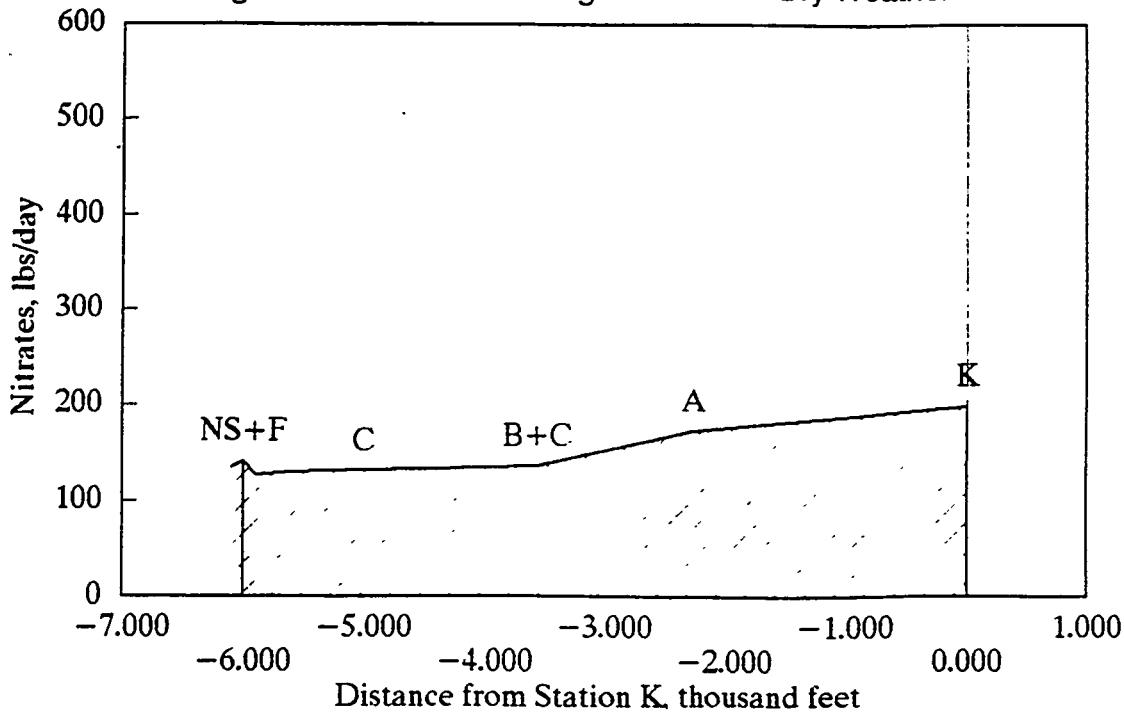
2.7 NITRATES

About 23 percent of the samples collected during dry weather at the 11 monitoring stations exceeded the AWQC (10-6 human health risk) and the proposed MCL for nitrates of 10 mg/l. As shown on **Figure 2-8**. about 60 percent of the nitrates load is attributed to Subbasin J in the western area of the Y-12 Plant. The loadings to EFPC remain virtually unchanged along the entire length of the creek. Total loading to EFPC is about 198 pounds per day.

2.8 TOTAL DISSOLVED SOLIDS

About 85 percent of the total dissolved solids (TDS) observed at Station K enter EFPC from sources downstream from the North-South (NS) Pipe. More than 35 percent of the TDS loadings downstream from the NS pipe can be attributed to the area contributing to Station F. The TDS graphics and statistical data are shown on **Figure 2-9**. As indicated in this figure, the TDS loading from Station C to Station K increases gradually and accounts for more than 48 percent of the total loading to EFPC of 20,440 pounds per day.

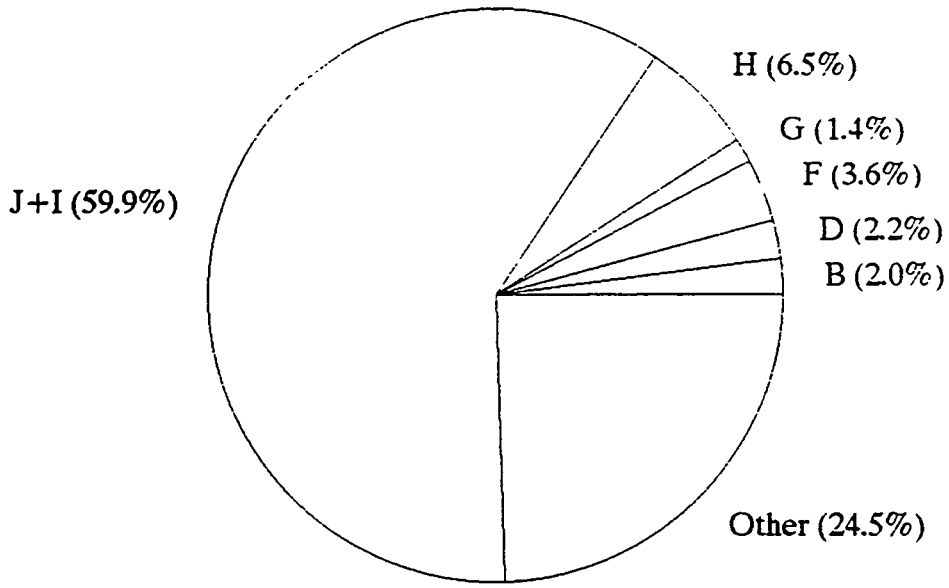
Figure 2–8 Nitrate Loadings to EFPC – Dry Weather



NS : North – South Pipe, EFPC : East Fork Poplar Creek

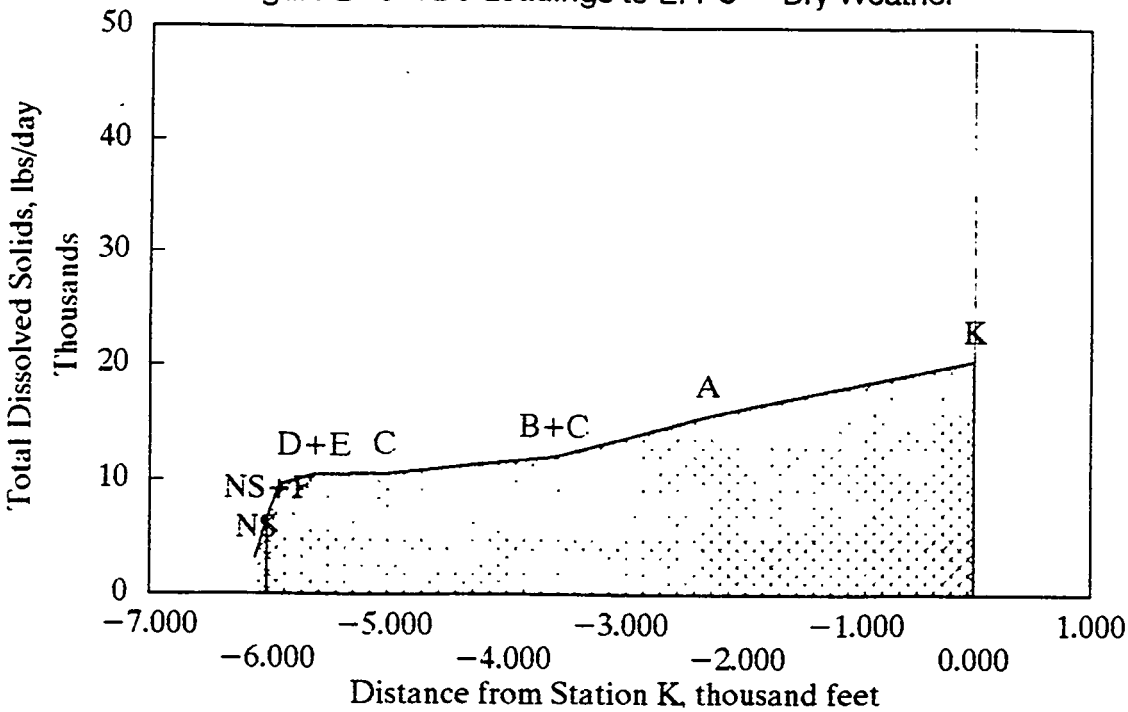
Station	B	D	F	G	H	J+I	Other
Nitrates, mg/l	0.49	1.00	0.57	1.00	12.00	220.00	
Nitrates, lbs/day	3.97	4.29	7.10	2.70	12.94	118.60	48.56554

Average Dry–Weather Nitrate Loadings
Measured at Different Monitoring Stations



Total Loading : 198 lbs/day

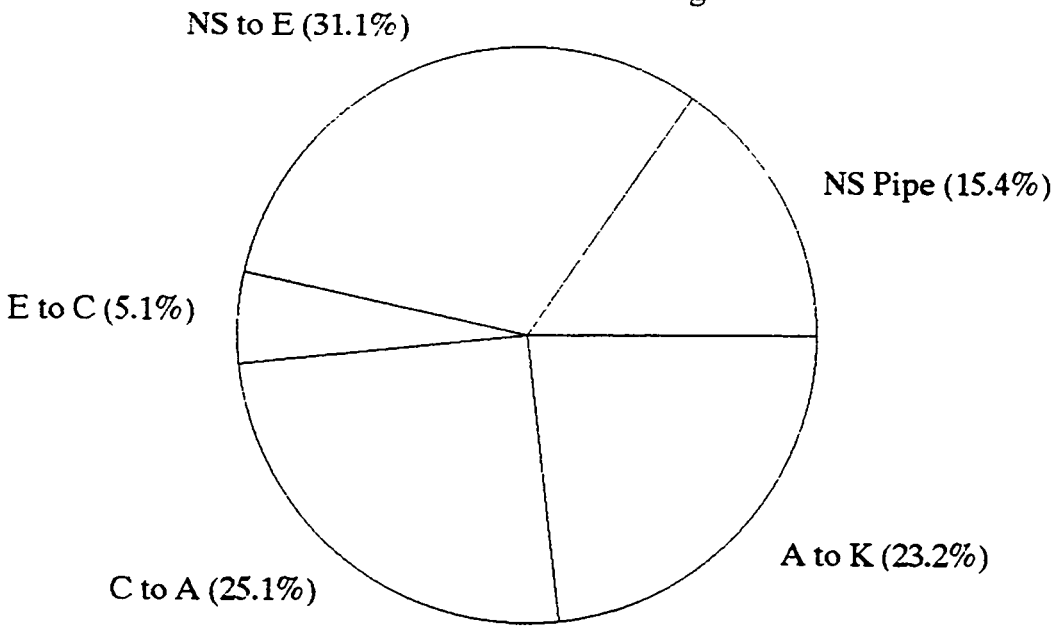
Figure 2–9 TDS Loadings to EFPC – Dry Weather



NS : North – South Pipe. EFPC : East Fork Poplar Creek

Station	B	D	F	G	H	J	Other
Total Dissolved Solids, mg/l	196	214	278	193	259	4365	
Total Dissolved Solids, lbs/day	1,585	923	3,447	520	279	2,353	11,329

Average Dry–Weather TDS Loadings
Measured at Different Monitoring Stations



Total Loading : 20,440 lbs/day

3.0 WET WEATHER DATA ANALYSIS

This section includes the data analysis performed on five wet weather events monitored in the study area. The wet weather events consisted of collecting flow and water quality data from 11 monitoring stations at the Y-12 Plant. Figure 1-1 previously showed the sampling station locations.

The parameters of concern for wet weather events include:

- o Chlorine, total residual
- o Copper
- o Iron
- o Lead
- o Manganese
- o Mercury
- o Total suspended solids
- o Zinc

In addition, chemical oxygen demand (COD) was also analyzed for reasons described below. The wet weather event monitoring data collected are presented in **Table 3-1**. Of all five events, wet weather Event #2 (03/30/1989) provided the most complete data set for analysis. This event also had the highest rainfall intensity. The contaminant loading analysis is consequently based on Event #2 and the results are presented in the following paragraphs. Additional wet weather event data are included in the tables and figures in the Appendix, which includes the hydrographs of individual stations and rainfall data for each event.

3.1 CHLORINE, TOTAL RESIDUAL

Total residual chlorine is included as a contaminant of concern in CDM's Water Quality Data Summary Report for Wet and Dry Events (1990), because the maximum and average concentrations for nine stations exceeded AWQC. (The remaining two

TABLE 3-1

SUMMARY OF WET WEATHER EVENT DATA

DATE of WET WEATHER EVENT No.	STATION	AUTOMATIC SAMPLER		STORM EVENT		BASE FLOW	PEAK FLOW DATA			STORM VOLUME	
		START	STOP	START	END	CFS	CFS	TIME	DATE	CU. FT.	GALLONS
11/04/88	A	--	--	--	--	--	--	--	--	--	--
11/04/88	B	16:30	21:15	16:00	04:00	1.44	10.40	18:30	11/04/88	112,042	838,074
11/04/88	C	16:30	21:15	16:00	04:00	6.21	203.00	17:36	11/04/88	2,094,385	15,666,000
11/04/88	D	16:12	19:40	16:00	04:00	0.87	33.02	17:20	11/04/88	107,410	803,427
11/04/88	E	16:00	18:00	16:00	04:00	6.81	72.02	00:18	11/05/88	889,420	6,652,862
11/04/88	F	--	--	--	--	--	--	--	--	--	--
11/04/88	G	--	--	--	--	--	--	--	--	--	--
11/04/88	H	--	--	--	--	--	--	--	--	--	--
11/04/88	I	--	--	--	--	--	--	--	--	--	--
11/04/88	J	--	--	--	--	--	--	--	--	--	--
11/04/88	K	17:42	20:00	16:00	04:00	11.34	85.64	16:20	11/04/88	2,171,650	16,243,942
03/30/89	A	00:00	08:30	06:10	09:00	11.15	313.70	08:00	03/30/89	2,263,760	16,932,925
03/30/89	B	06:00	09:15	06:30	09:00	1.83	35.20	08:50	03/30/89	142,826	1,068,338
03/30/89	C	06:00	09:15	06:10	09:00	6.81	369.87	08:00	03/30/89	1,798,300	13,451,204
03/30/89	D	06:00	09:15	06:10	09:00	0.60	55.76	08:30	03/30/89	210,544	1,574,869
03/30/89	E	00:00	06:20	06:10	09:00	5.61	152.76	08:24	03/30/89	678,040	5,071,739
03/30/89	F	06:00	09:15	06:42	09:00	0.92	6.52	09:00	03/30/89	36,504	273,050
03/30/89	G	--	--	06:12	09:00	--	10.25	06:42	03/30/89	7,119	53,250
03/30/89	H	--	--	--	--	--	--	--	--	--	--
03/30/89	I	--	--	06:30	09:00	0.57	131.55	08:20	03/30/89	385,106	2,880,593
03/30/89	J	06:00	08:00	06:30	09:00	0.41	16.45	07:36	03/30/89	114,473	856,258
03/30/89	K	00:00	09:00	06:10	09:00	12.83	495.28	08:54	03/30/89	2,943,294	22,015,839
04/04/89	A	05:40	08:00	04:30	09:00	9.88	85.67	08:30	04/04/89	1,300,000	9,724,000
04/04/89	B	05:40	08:00	05:30	09:00	1.78	9.46	08:36	04/04/89	70,689	528,754
04/04/89	C	05:45	09:00	04:30	09:00	6.27	73.14	08:30	04/04/89	1,227,190	9,179,381
04/04/89	D	05:50	08:40	05:20	09:00	1.01	11.50	07:55	04/04/89	134,643	1,007,130
04/04/89	E	04:40	07:45	04:30	09:00	6.16	39.78	07:50	04/04/89	558,506	4,177,625
04/04/89	F	05:50	08:40	04:24	09:00	0.78	3.70	07:55	04/04/89	120,278	899,679
04/04/89	G	05:50	08:40	04:30	09:00	0.77	1.08	17:15	04/04/89	7,935	59,354
04/04/89	H										
04/04/89	I	05:50	08:40	04:20	09:00	0.88	51.36	07:55	04/04/89	445,679	3,333,679
04/04/89	J	05:50	08:40	04:12	09:00	0.60	5.21	14:54	04/04/89	80,109	599,215
04/04/89	K	06:00	08:30	04:30	09:00	13.17	87.95	09:00	04/04/89	1,650,030	12,342,224
05/05/89	A	17:00*	11:00	10:50	16:00	7.57	181.13	11:30	05/05/89	1,719,940	12,865,151
05/05/89	B										
05/05/89	C	17:30	10:15	10:50	16:00	4.92	193.24	12:10	05/05/89	1,811,630	13,550,992
05/05/89	D										
05/05/89	E	00:00	10:00	10:50	16:00	4.74	92.94	13:10	05/05/89	782,340	5,851,903
05/05/89	F										
05/05/89	G										
05/05/89	H										
05/05/89	I										
05/05/89	J										
05/05/89	K	09:00	11:30	10:50	16:00	10.72	252.30	14:50	05/05/89	2,815,138	21,057,232
05/09/89	A	12:00	15:15	13:50	16:00	12.27	136.29	15:06	05/09/89	753,732	5,637,915
05/09/89	B										
05/09/89	C	12:00	16:00	13:50	16:00	7.03	149.50	15:35	05/09/89	707,670	5,293,372
05/09/89	D										
05/09/89	E	12:00	16:00	13:50	16:00	6.14	71.34	16:50	05/09/89	317,030	2,371,384
05/09/89	F										
05/09/89	G										
05/09/89	H										
05/09/89	I										
05/09/89	J										
05/09/89	K	01:00	12:00	13:50	16:00	13.79	149.56	16:20	05/09/89	883,740	6,610,375

* Previous day

stations showed concentrations below detection limits). However, total residual chlorine is not addressed in the wet weather contaminant loading analysis for the following reasons:

- For some of the wet weather events, the automatic samplers collected a fraction of the base flow that produced total residual chlorine concentrations that exceeded the allowable AWQC.
- All the free available chlorine measurements for Event #2 were below the analytical detection limit of 0.01 mg/l. The automatic samplers were synchronized with the storm duration for Event #2 and base flow was not part of the sample. Event #2 provided the highest dilution of the base flow or dry weather loadings.

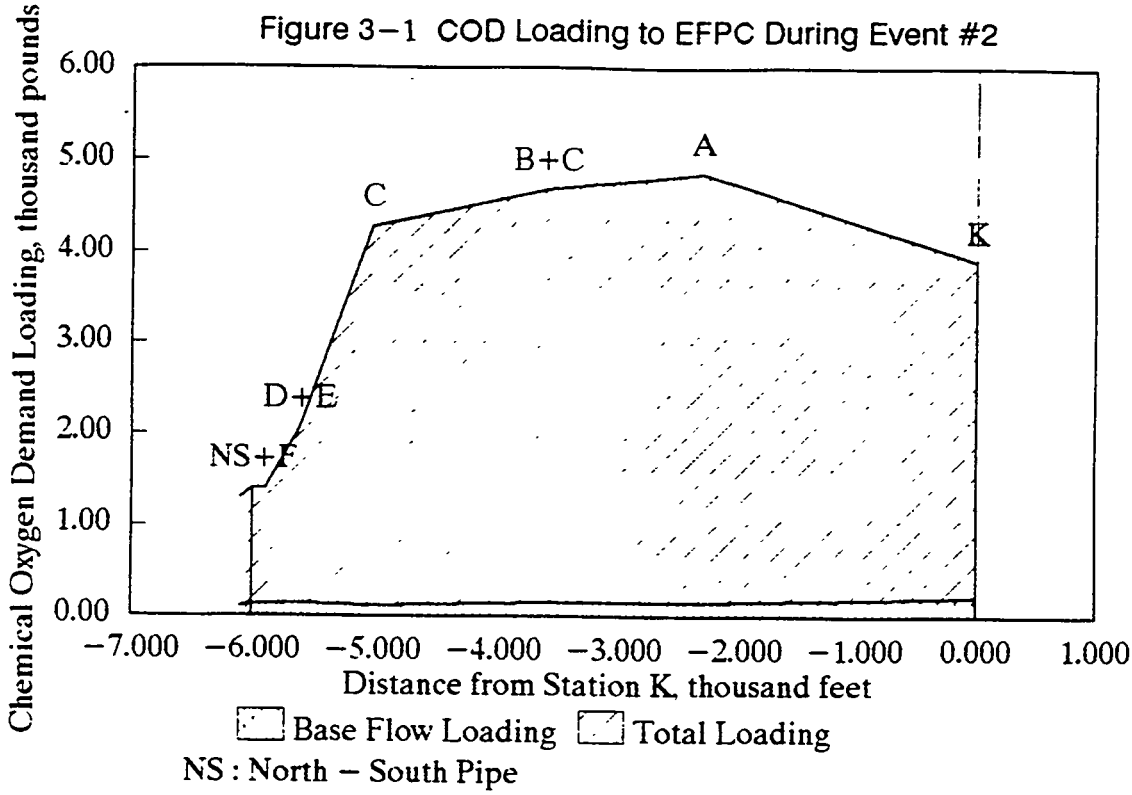
3.2 CHEMICAL OXYGEN DEMAND

COD is a widely used indicator to estimate the total oxygen requirements for oxidizing organic matter to carbon dioxide and water. Wet weather COD loadings for Event #2 exceeded the observed average dry weather COD loadings by about 30 times. This parameter does not have any regulatory standards and is therefore used only as an indicator. However, the range of 18 to 46 mg/l in combined runoff and base flow is comparable to other urban areas using EPA observations (1979) in Durham, North Carolina where a range of 0.7 to 605 mg/l, mean of 161 mg/l, and standard deviation of 57 mg/l were observed for COD. (These statistics consider four rainfall events.) Also, the maximum COD concentration of 46 mg/l in Station D is significantly lower than the typical concentration for a weak industrial wastewater, which is 110 mg/l. The most probable COD source may be organic matter accumulated in impervious areas (i.e. parking lots and streets). **Figure 3-1** shows the results and statistics for this event.

3.3 COPPER

Copper loadings observed during Event #2 are about twice those observed during the average dry weather events. Five stations exceeded the acute AWQC and eight stations exceeded the chronic AWQC for copper. However, the base flow and the storm concentrations observed at Station K are about the same. This suggests that most of the copper is adsorbed or bounded to suspended solids that are retained by Lake Reality, which captures over 90 percent of the copper observed at Station A. **Figure 3-2** shows the copper results and statistics.

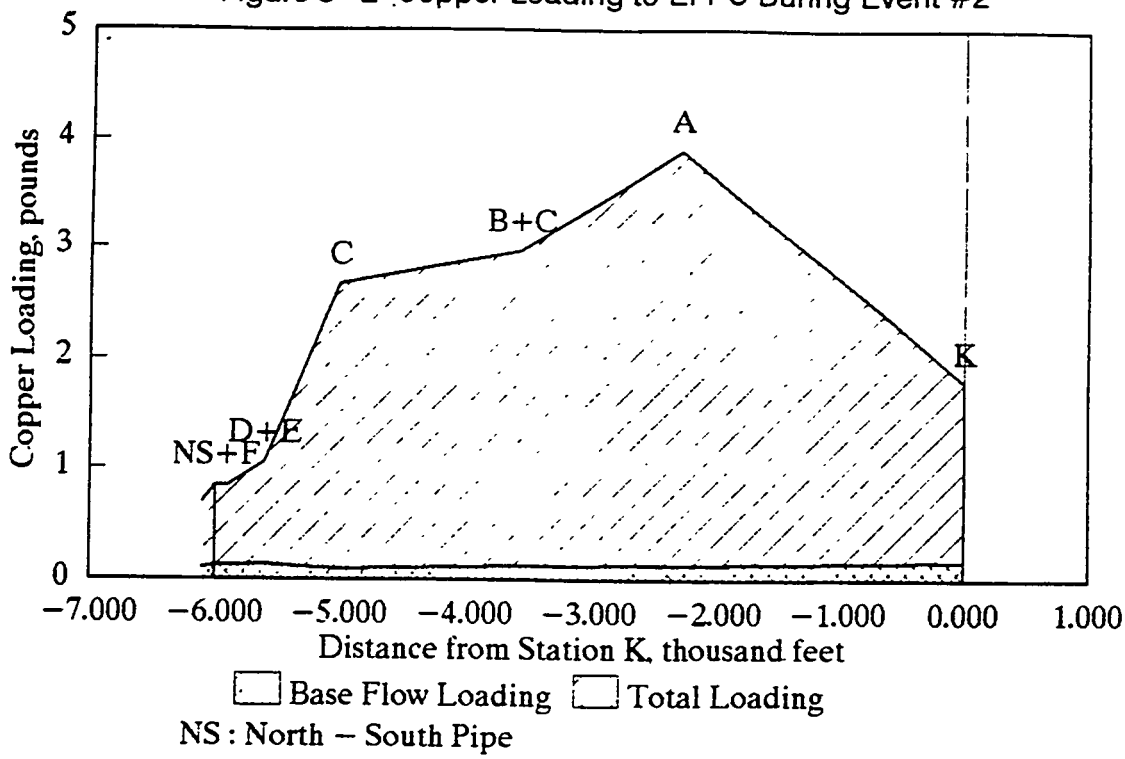
Figure 3−1 COD Loading to EFPC During Event #2



CHEMICAL OXYGEN DEMAND	STORM EVENT # 2 March 30, 1989					Rainfall	1.53 inches	
Station	K	A	B+C	C	D+E	E	NS+F	NS
Runoff Concentration, mg/l	18.85	32.19	36.15	35.95	32.36	27.33	27.33	27.29
Runoff Loading, lbs	3,461	4,546	4,377	4,034	1,794	1,156	1,156	1,092
Base Flow Concentration, mg/l	10.29	10.11	11.72	11.75	13.80	14.17	14.17	14.01
Base Flow Loading, lbs	207.54	157.03	149.25	115.82	134.71	124.97	124.97	103.27
Combined Runoff & Base Con., mg/l	18.00	30.00	33.82	34.00	29.58	28.00	25.06	25.22
Total Loading, lbs.	3,668	4,703	4,527	4,149	1,929	1,281	1,281	1,195

CHEMICAL OXYGEN DEMAND							
Station	B	D	F	G	H	I	J
Storm Concentration, mg/l	38.58	48.56	28.08	55.68	44.71	23.86	38.87
Storm Loading, lbs	344	638	64	25	556	573	278
Base Flow Concentration, mg/l	11.62	10.33	15.00	20.58	15.92	8.08	16.26
Base Flow Loading, lbs	33.43	9.74	21.69	24.91	5.01	11.18	10.48
Combined Runoff & Base Con., mg/l	32.00	46.00	23.00	30.00	44.00	23.00	37.00
Total Loading, lbs.	377	648	86	50	561	584	288

Figure 3–2 Copper Loading to EFPC During Event #2



COPPER	STORM EVENT # 2 March 30, 1989					Rainfall 1.53 inches		
Station	K	A	B+C	C	D+E	E	NS+F	NS
Runoff Concentration, mg/l	0.008	0.026	0.022	0.022	0.014	0.014	0.014	0.012
Runoff Loading, lbs	1.47	3.62	2.72	2.46	0.78	0.59	0.59	0.48
Base Flow Concentration, mg/l	0.008	0.009	0.010	0.010	0.014	0.014	0.014	0.014
Base Flow Loading, lbs	0.161	0.140	0.127	0.099	0.133	0.123	0.123	0.11
Combined Runoff & Base Con., mg/l	0.008	0.024	0.021	0.021	0.014	0.014	0.014	0.012
Total Loading, lbs.	1.63	3.76	2.85	2.56	0.92	0.72	0.72	0.59

COPPER							
Station	B	D	F	G	H	I	J
Storm Concentration, mg/l	0.029	0.014	0.050	0.039	0.016	0.013	0.047
Storm Loading, lbs	0.25	0.19	0.11	0.02	0.20	0.32	0.33
Base Flow Concentration, mg/l	0.010	0.010	0.012	0.009	0.005	0.025	0.004
Base Flow Loading, lbs	0.029	0.009	0.017	0.011	0.002	0.035	0.003
Combined Runoff & Base Con., mg/l	0.024	0.014	0.035	0.017	0.016	0.014	0.043
Total Loading, lbs.	0.28	0.20	0.13	0.03	0.20	0.36	0.33

3.4 IRON

Iron loadings observed during Event #2 are nearly 500 times those observed during the average dry weather events (1,110 lbs wet weather v. 2.3 lbs dry weather for Station A). With the exception of Station K, all the stations exceeded the acute AWQC (1 mg/l) for iron. However, the concentration measured at Station K during the storm (0.6 mg/l) was only slightly higher than the average dry weather concentration (0.29 mg/l) for the same station. This suggests that most of the iron is adsorbed or bounded to suspended particles that are retained by Lake Reality, which captures over 90 percent, or about 1,000 pounds, of the iron loading observed at Station A during Event #2. **Figure 3-3** shows the iron results and statistics. Iron loadings during wet weather may be attributed to rusted equipment in rooftops and other impervious areas in the plant.

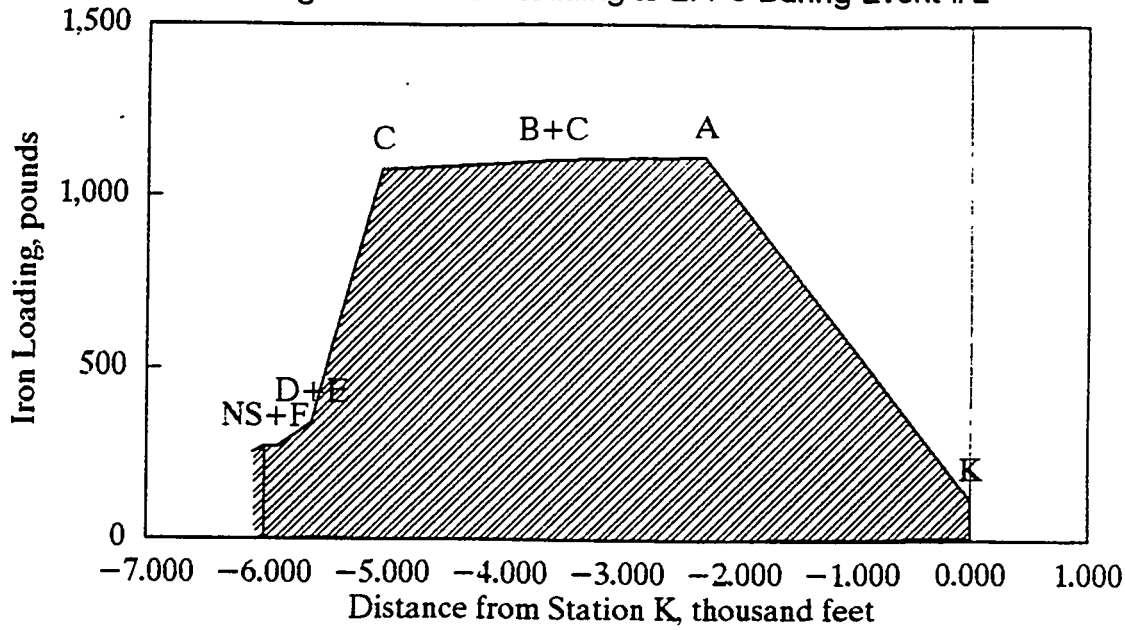
3.5 LEAD

Peak lead loadings observed during Event #2 are about 30 times those observed during the average dry weather events (2.5 lbs wet weather v. 0.078 lbs dry weather for Station A). All the stations exceeded the chronic AWQC (3.2 ug/l) for lead but were below the acute AWQC (82 ug/l) during Event #2. The concentration measured at Station K during the storm (0.18 mg/l) was about three times higher than the average dry weather concentration (0.07 mg/l) for the same station. Approximately 26 percent, or about 11.8 pounds, of the loading observed at Station A during Event #2 was removed by Lake Reality. This suggests that most of the lead may be in soluble form. **Figure 3-4** shows the iron results and statistics.

3.6 MANGANESE

All EFPC stations exceeded the MCL for manganese during wet weather Event #2. Although a fraction of the manganese loading generated during the storm was retained by Lake Reality, this rainfall event increased the loading by more than twice the observed average dry weather manganese loading. **Figure 3-5** includes the results and statistics for manganese.

Figure 3–3 Iron Loading to EFPC During Event #2



Base Flow Loading Total Loading

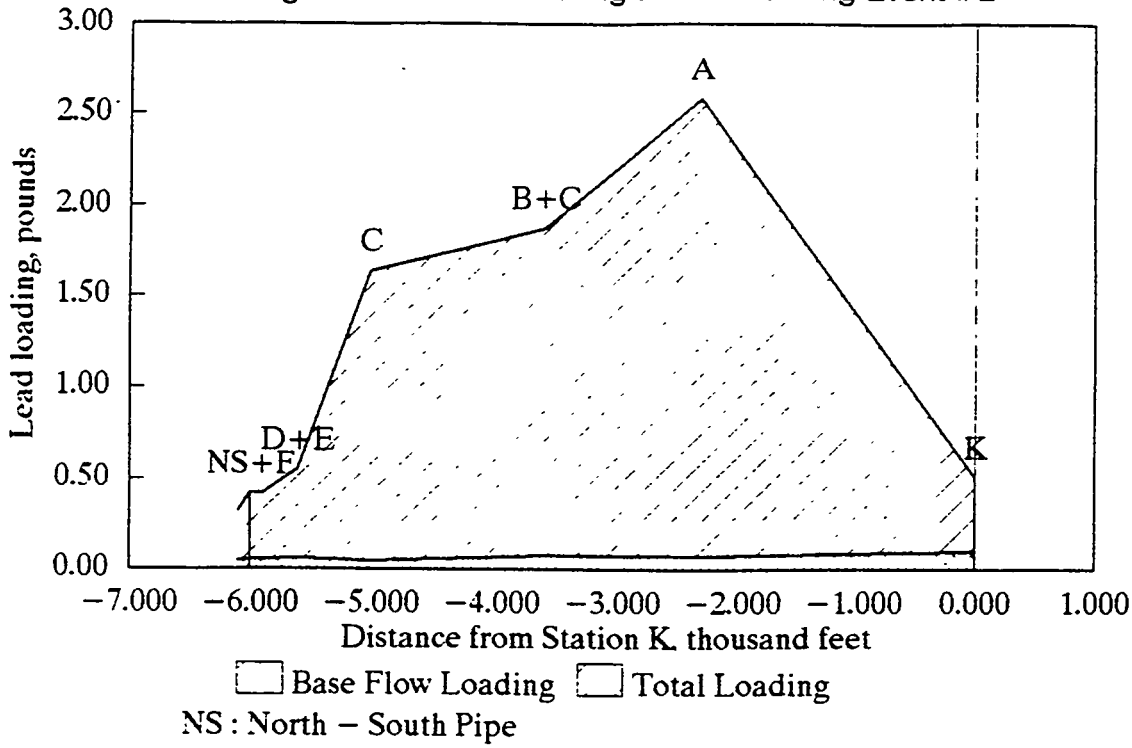
NS : North – South Pipe

Note: The base flow loading is insignificant for this parameter

IRON	STORM EVENT # 2 March 30, 1989					Rainfall 1.53 inches		
Station	K	A	B+C	C	D+E	E	NS+F	NS
Runoff Concentration, mg/l	0.601	7.853	9.082	9.535	6.069	6.295	6.295	6.267
Runoff Loading, lbs	110.31	1109.05	1099.77	1069.64	336.45	266.26	266.26	250.79
Base Flow Concentration, mg/l	0.290	0.150	0.179	0.190	0.248	0.220	0.220	0.249
Base Flow Loading, lbs	5.849	2.330	2.276	1.873	2.421	1.940	1.940	1.84
Combined Runoff & Base Con., mg/l	0.570	7.090	8.235	8.780	5.198	5.247	5.247	5.330
Total Loading, lbs.	116.16	1111.38	1102.04	1071.52	338.87	268.20	268.20	252.63

IRON							
Station	B	D	F	G	H	I	J
Storm Concentration, mg/l	3.381	5.344	6.790	7.723	15.069	2.533	17.605
Storm Loading, lbs	30.13	70.19	15.46	3.43	187.49	60.86	125.72
Base Flow Concentration, mg/l	0.140	0.510	0.070	0.160	0.090	0.450	0.630
Base Flow Loading, lbs	0.403	0.481	0.101	0.194	0.028	0.623	0.406
Combined Runoff & Base Con., mg/l	2.590	5.020	4.180	2.190	14.700	2.420	16.200
Total Loading, lbs.	30.53	70.67	15.56	3.62	187.52	61.49	126.13

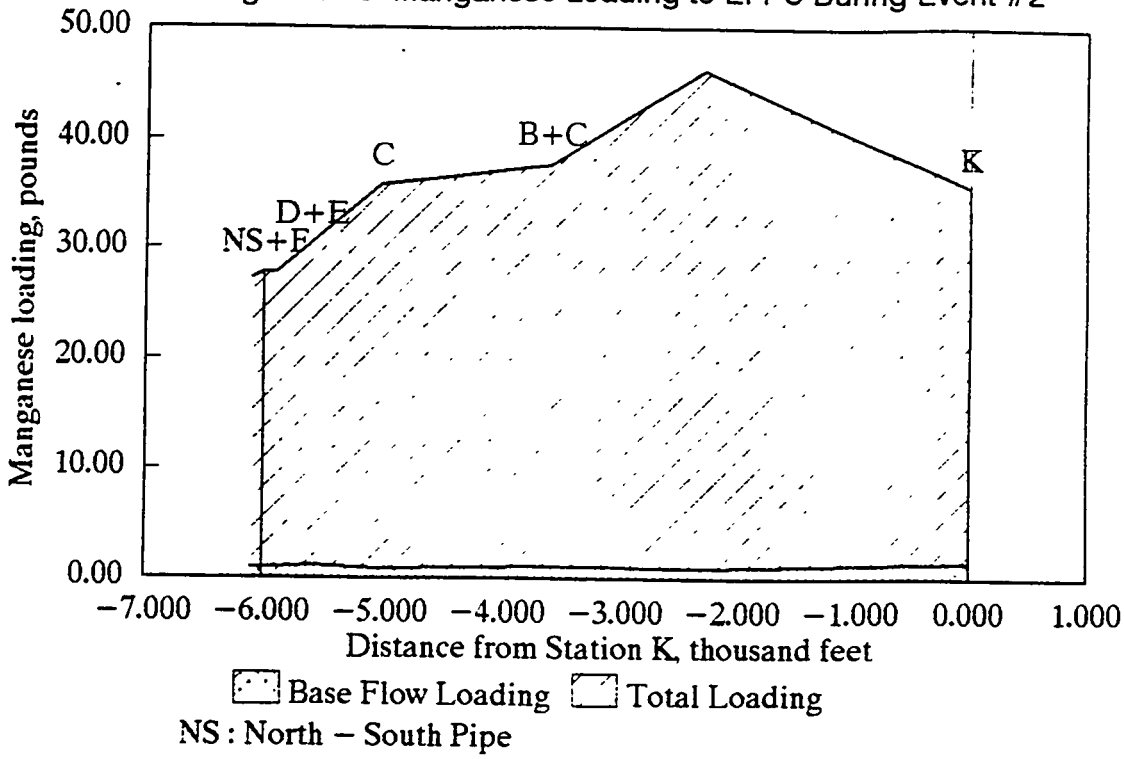
Figure 3–4 Lead Loading to EFPC During Event #2



LEAD	STORM EVENT # 2 March 30, 1989					Rainfall 1.53 inches		
Station	K	A	B+C	C	D+E	E	NS+F	NS
Runoff Concentration, mg/l	0.002	0.017	0.014	0.014	0.008	0.007	0.007	0.006
Runoff Loading, lbs	0.307	2.430	1.724	1.537	0.431	0.310	0.310	0.222
Base Flow Concentration, mg/l	0.005	0.005	0.006	0.005	0.006	0.006	0.006	0.006
Base Flow Loading, lbs	0.101	0.078	0.075	0.049	0.059	0.053	0.053	0.047
Combined Runoff & Base Con., mg/l	0.002	0.016	0.013	0.013	0.008	0.007	0.007	0.006
Total Loading, lbs.	0.408	2.508	1.799	1.587	0.489	0.363	0.363	0.269

LEAD							
Station	B	D	F	G	H	I	J
Storm Concentration, mg/l	0.021	0.009	0.038	0.009	0.010	0.005	0.040
Storm Loading, lbs	0.186	0.121	0.087	0.004	0.126	0.123	0.286
Base Flow Concentration, mg/l	0.009	0.006	0.004	0.009	0.004	0.003	0.003
Base Flow Loading, lbs	0.026	0.006	0.006	0.011	0.001	0.004	0.002
Combined Runoff & Base Con., mg/l	0.018	0.009	0.025	0.009	0.010	0.005	0.037
Total Loading, lbs.	0.212	0.127	0.093	0.015	0.128	0.127	0.288

Figure 3–5 Manganese Loading to EFPC During Event #2



MANGANESE	STORM EVENT # 2 March 30, 1989					Rainfall 1.53 inches		
Station	K	A	B+C	C	D+E	E	NS+F	NS
Runoff Concentration, mg/l	0.18	0.31	0.29	0.30	0.50	0.61	0.61	0.63
Runoff Loading, lbs	32.56	44.34	35.57	33.87	27.90	25.74	25.74	25.31
Base Flow Concentration, mg/l	0.07	0.06	0.08	0.09	0.12	0.11	0.11	0.13
Base Flow Loading, lbs	1.47	0.96	1.06	0.91	1.19	0.97	0.97	0.96
Combined Runoff & Base Con., mg/l	0.17	0.29	0.27	0.29	0.45	0.17	0.52	0.55
Total Loading, lbs.	34.03	45.30	36.63	34.78	29.08	26.71	26.71	26.27

MANGANESE							
Station	B	D	F	G	H	I	J
Storm Concentration, mg/l	0.19	0.16	0.19	0.17	0.46	0.81	0.30
Storm Loading, lbs	1.70	2.16	0.42	0.08	5.76	19.37	2.16
Base Flow Concentration, mg/l	0.05	0.23	0.01	0.08	0.07	0.69	1.48
Base Flow Loading, lbs	0.15	0.22	0.01	0.09	0.02	0.96	0.95
Combined Runoff & Base Con., mg/l	0.16	0.17	0.12	0.10	0.45	0.80	0.40
Total Loading, lbs.	1.85	2.38	0.43	0.17	5.78	20.33	3.11

3.7 MERCURY

Like the dry weather loadings, the source of mercury during wet weather events appears to be in the EFPC sediments. This may be caused by suspension and transport of mercury-containing sediments. Station A showed the maximum loadings observed during Event #2. As shown on **Figure 3-6**, the peak mercury wet weather loading for Event #2 was 1.27 pounds at Station A of which approximately 80 percent, or about one pound, was retained by Lake Reality.

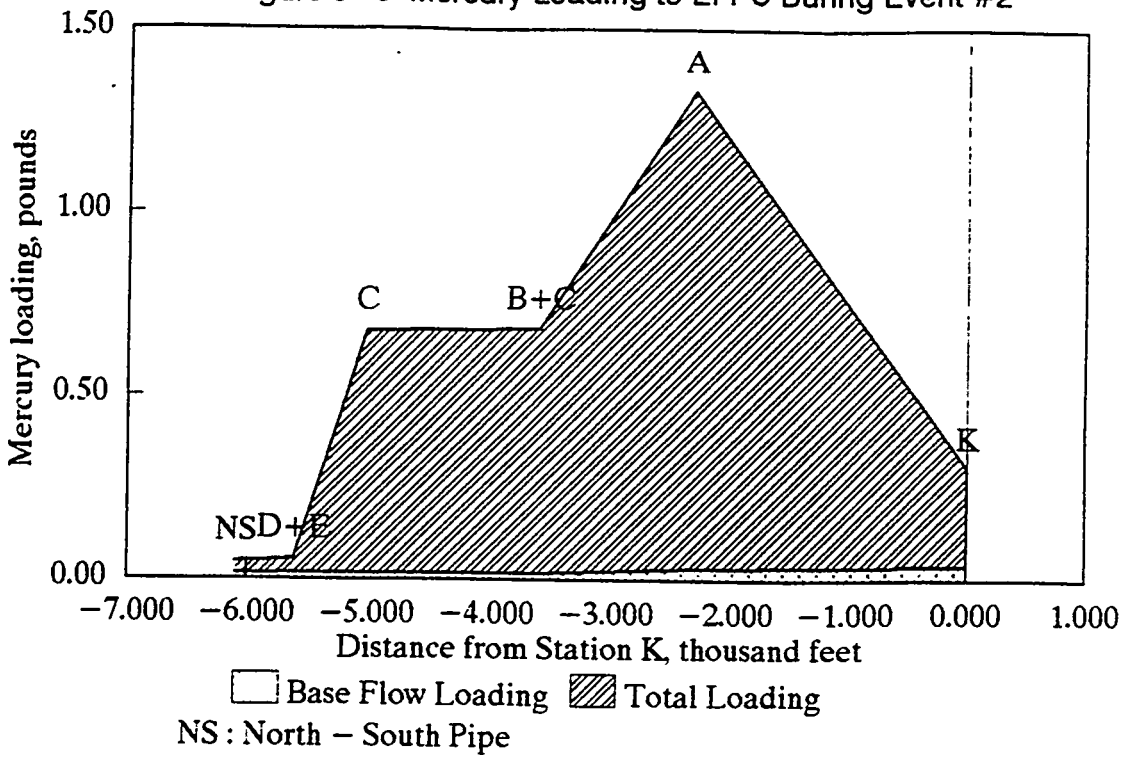
3.8 TOTAL SUSPENDED SOLIDS

A high total suspended solids (TSS) loading which exceeded baseline (dry weather) loadings by about two orders of magnitude was observed in EFPC during Event #2. However, more than 95 percent of the solids generated by the storm, or about 28 dry tons, was retained by Lake Reality. **Figure 3-7** shows the TSS loadings during Event #2.

3.9 ZINC

Zinc loadings observed during Event #2 are approximately 12 times those observed during the average dry weather events (26.65 lbs wet weather v. 2.31 lbs dry weather for Station A). Stations F, G and J exceeded both the acute and chronic AWQC (0.189 and 0.219 mg/l, respectively) for zinc. The concentration measured at Station K during the storm (0.178 mg/l) was about twice the average dry weather concentration (0.083 mg/l) for the same station. Approximately 40 percent, or about 9.9 pounds, of the loading observed at Station A during Event #2 was retained in Lake Reality. This suggests that most of the zinc may be in soluble form. **Figure 3-8** shows the zinc results and statistics.

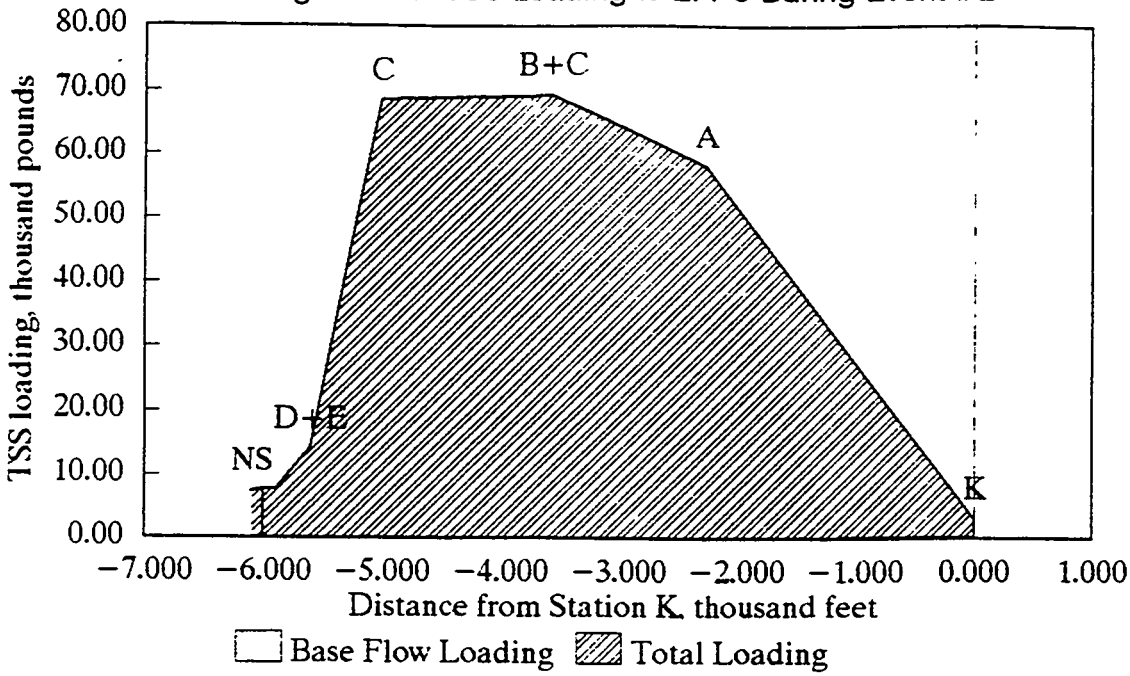
Figure 3–6 Mercury Loading to EFPC During Event #2



MERCURY	STORM EVENT # 2 March 30, 1989					Rainfall 1.53 inches		
Station	K	A	B+C	C	D+E	E	NS+F	NS
Runoff Concentration, mg/l	0.0012	0.0090	0.0054	0.0057	0.0004	0.0004	0.0004	0.0004
Runoff Loading, lbs	0.2266	1.2700	0.6482	0.6423	0.0226	0.0174	0.0174	0.0159
Base Flow Concentration, mg/l	0.0019	0.0020	0.0013	0.0017	0.0017	0.0018	0.0018	0.0021
Base Flow Loading, lbs	0.0383	0.0311	0.0168	0.0168	0.0163	0.0159	0.0159	0.0154

MERCURY							
Station	B	D	F	G	H	I	J
Storm Concentration, mg/l	0.0007	0.0004	0.0006	0.0010	0.0010	0.0007	0.0025
Storm Loading, lbs	0.0059	0.0053	0.0014	0.0005	0.0122	0.0172	0.0179
Base Flow Concentration, mg/l	0.0000	0.0004	0.0003	0.0003	0.0017	0.0004	0.0000
Base Flow Loading, lbs	0.0000	0.0004	0.0004	0.0004	0.0005	0.0006	0.0000

Figure 3–7 TSS Loading to EFPC During Event #2



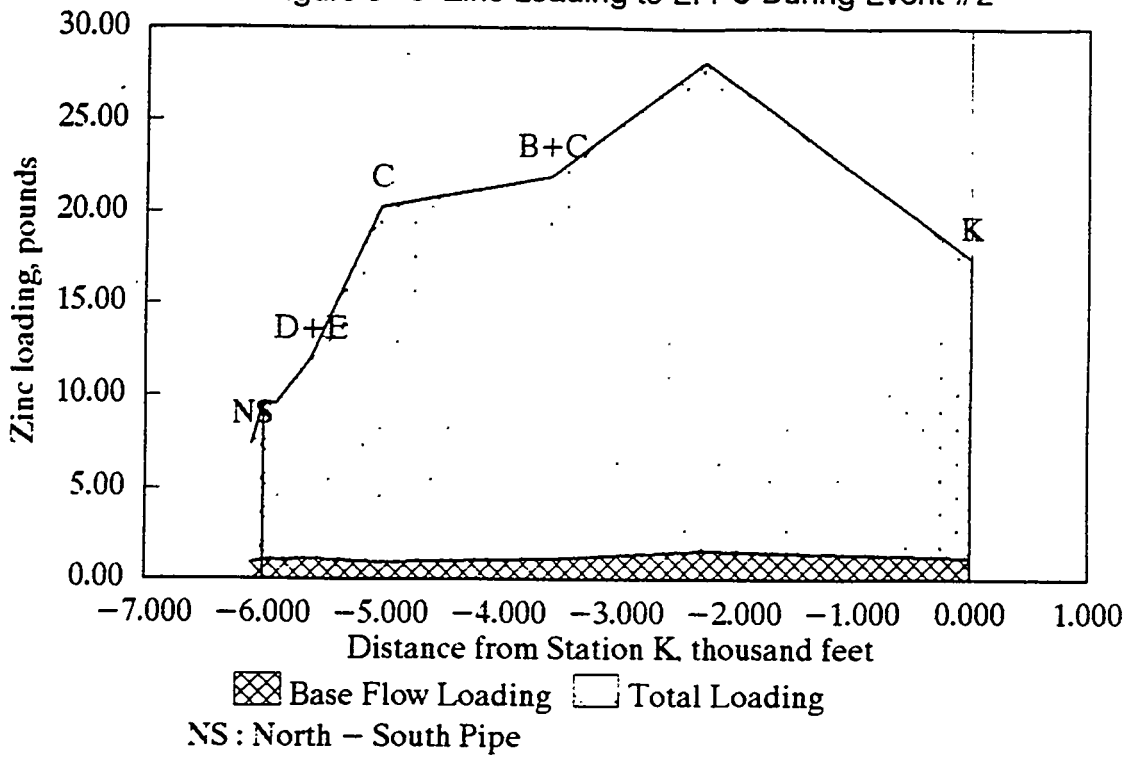
NS : North – South Pipe

Note: the base flow loading is insignificant for this parameter.

TOTAL SUSPENDED SOLIDS	STORM EVENT # 2	March 30, 1989				Rainfall	1.53 inches	
Station	K	A	B+C	C	D+E	E	NS+F	NS
Runoff Concentration, mg/l	15	410	571	609	251	179	179	180
Runoff Loading, lbs	2,671	57,919	69,174	68,292	13,894	7,566	7,566	7,216
Base Flow Concentration, mg/l	9	5	5	5	5	5	5	5
Base Flow Loading, lbs	182	80	65	50	52	44	44	37
Combined Runoff & Base Con., mg/l	14	370	517	560	214	16	149	153
Total Loading, lbs.	2,853	57,998	69,238	68,343	13,945	7,610	7,610	7,253

TOTAL SUSPENDED SOLIDS						
Station	B	D	F	G	H	I
Storm Concentration, mg/l	99	482	154	135	420	81
Storm Loading, lbs	881	6,327	350	60	5,228	1,945
Base Flow Concentration, mg/l	5	8	5	5	6	8
Base Flow Loading, lbs	14	8	7	6	2	11
Combined Runoff & Base Con., mg/l	76	450	96	40	410	77
Total Loading, lbs.	896	6,335	357	66	5,230	1,956

Figure 3–8 Zinc Loading to EFPC During Event #2



ZINC	STORM EVENT # 2 March 30, 1989					Rainfall 1.53 inches		
Station	K	A	B+C	C	D+E	E	NS+F	NS
Runoff Concentration, mg/l	0.083	0.178	0.162	0.163	0.175	0.177	0.177	0.141
Runoff Loading, lbs	15.15	25.09	19.65	18.34	9.69	7.48	7.48	5.66
Base Flow Concentration, mg/l	0.057	0.100	0.088	0.096	0.115	0.117	0.117	0.118
Base Flow Loading, lbs	1.15	1.55	1.12	0.95	1.13	1.03	1.03	0.87
Combined Runoff & Base Con., mg/l	0.080	0.170	0.155	0.158	0.166	0.122	0.166	0.138
Total Loading, lbs.	16.30	26.65	20.77	19.28	10.82	8.51	8.51	6.53

ZINC							
Station	B	D	F	G	H	I	J
Storm Concentration, mg/l	0.147	0.169	0.798	0.308	0.131	0.185	0.322
Storm Loading, lbs	1.31	2.21	1.82	0.14	1.63	4.44	2.30
Base Flow Concentration, mg/l	0.061	0.100	0.111	0.103	0.132	0.115	0.113
Base Flow Loading, lbs	0.18	0.09	0.16	0.12	0.04	0.16	0.07
Combined Runoff & Base Con., mg/l	0.126	0.164	0.531	0.158	0.131	0.181	0.305
Total Loading, lbs.	1.49	2.31	1.98	0.26	1.67	4.60	2.37

REFERENCES

REFERENCES

Camp Dresser & McKee Inc.. 1990. Water Quality Data Summary Report for Wet and Dry Weather Events at the Oak Ridge Y-12 Plant. Oak Ridge. Tennessee.

Camp Dresser & McKee Inc.. 1989. Preliminary Hydraulic Analysis and Flow Data Summary Report for East Fork Poplar Creek Area Source Pollution Assessment and Control Plan. Oak Ridge. Tennessee.

Camp Dresser & McKee Inc.. 1987. Comprehensive Sampling Program for East Fork Poplar Creek Area Source Pollution Assessment and Control Plan. Atlanta. Georgia.

Environmental Protection Agency (EPA). 1979. Urban Rainfall - Runoff - Quality Data Base Update with Statistical Analysis. EPA 600/8-79-004. Cincinnati, Ohio.

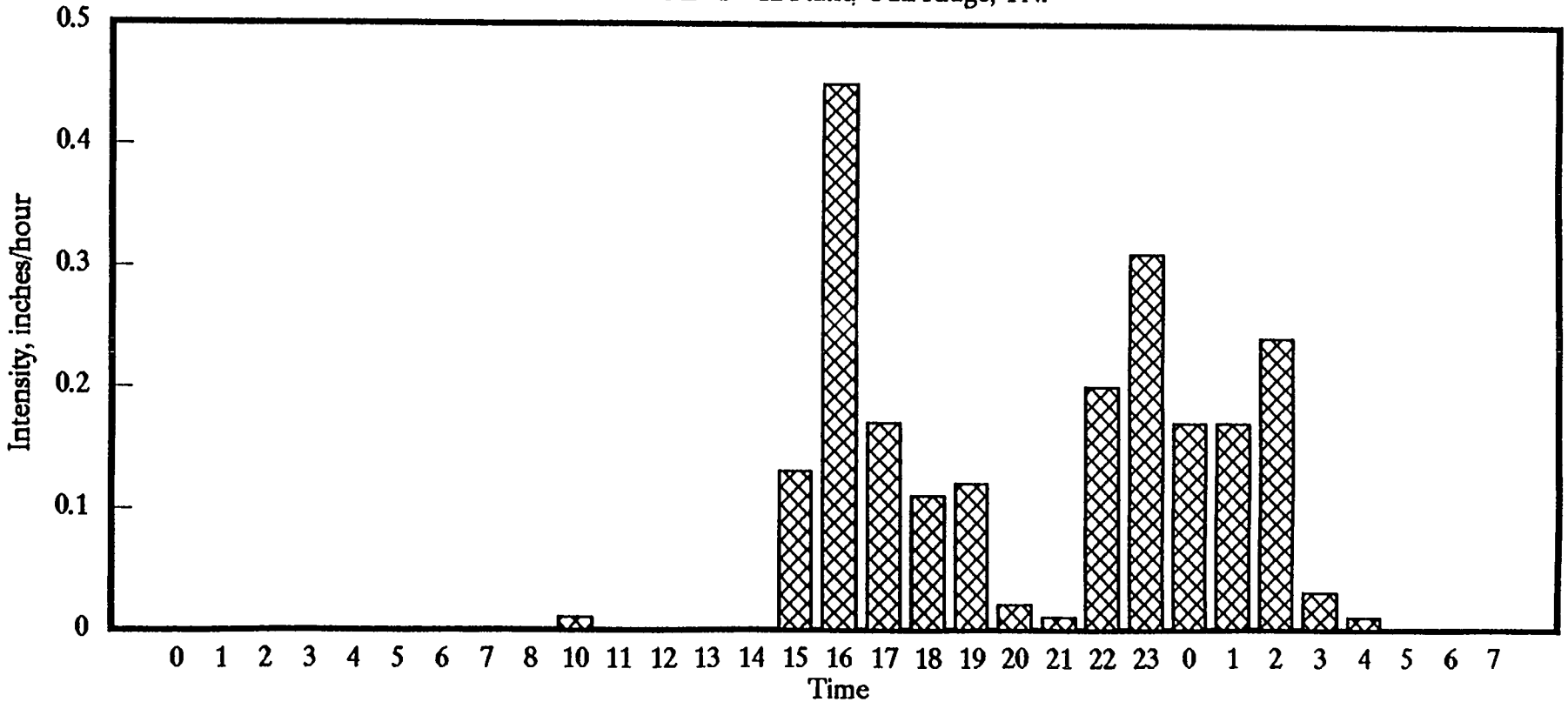
APPENDIX

WET WEATHER EVENTS DATA

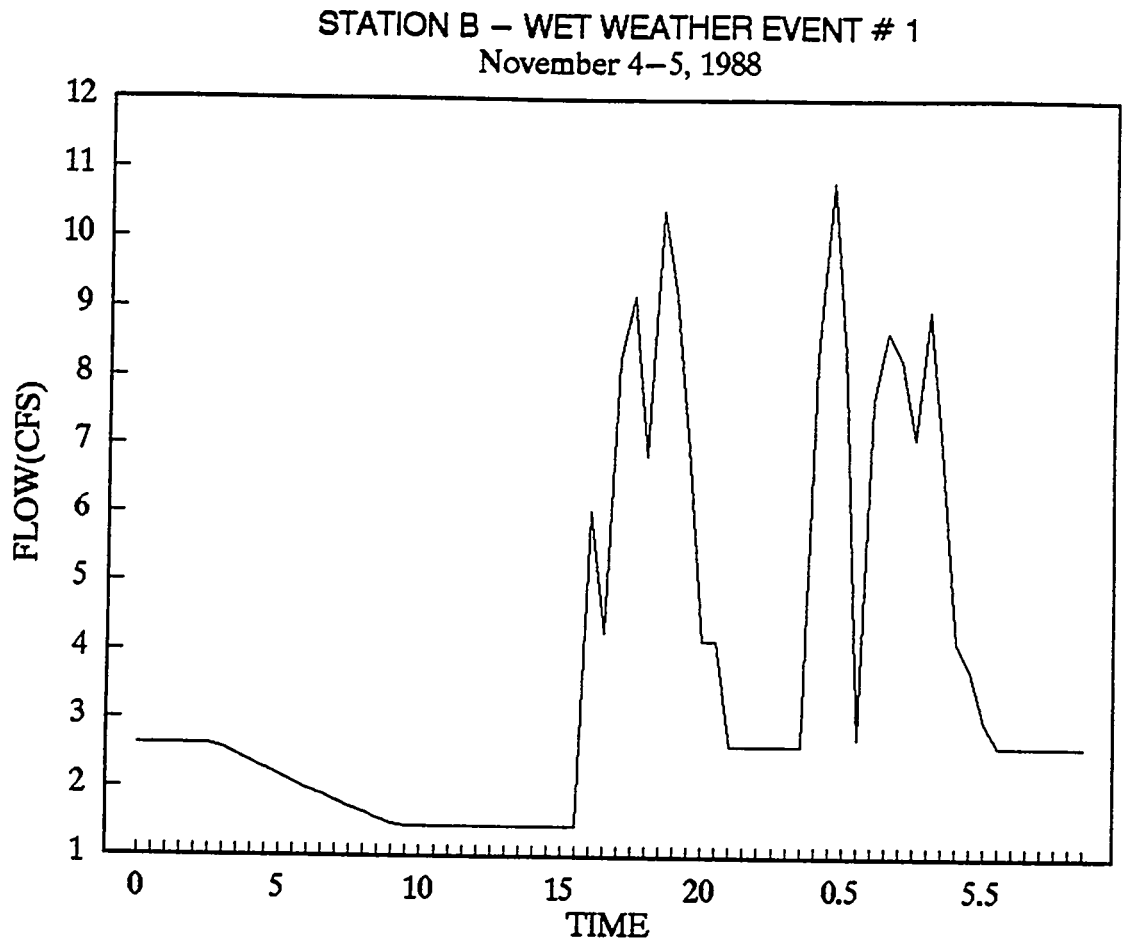
WET WEATHER EVENT #1

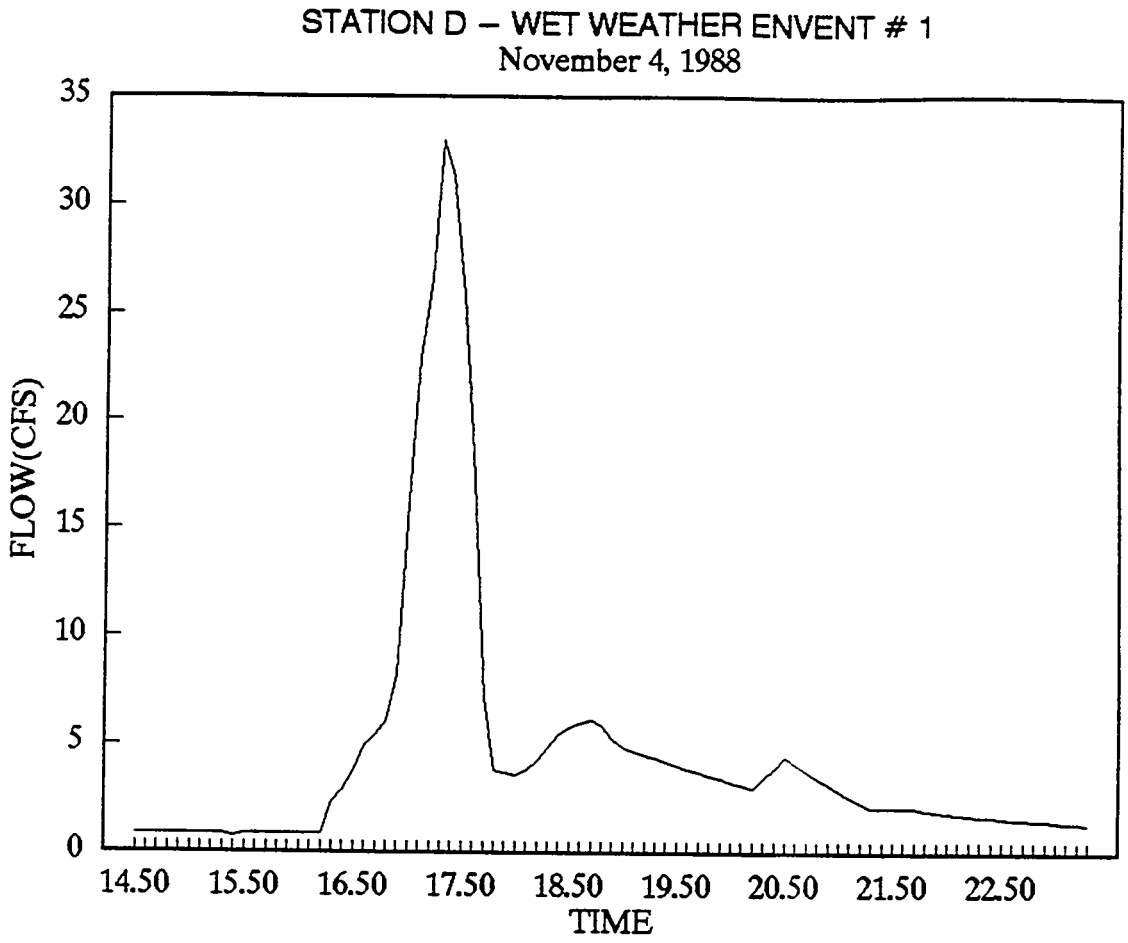
Rainfall Event # 1 – November 4–5, 1988

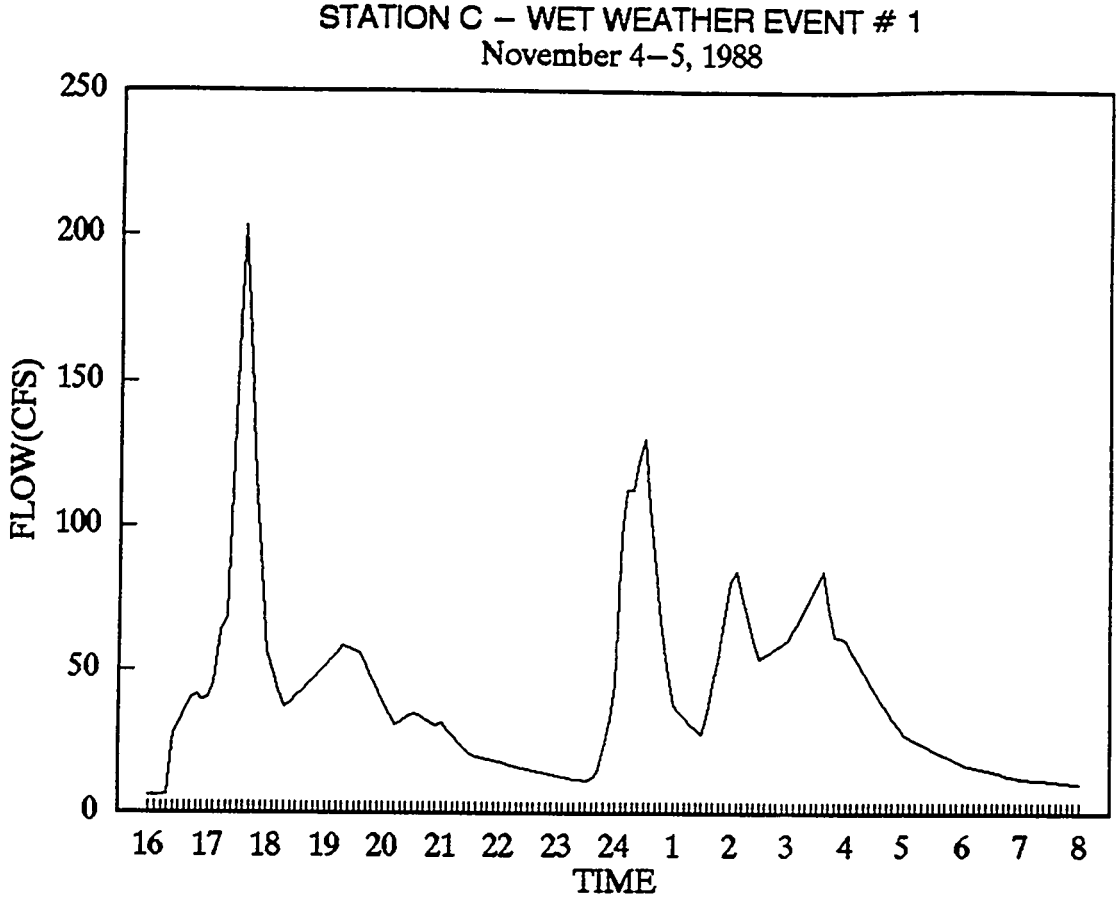
DOE Y–12 Plant, Oak Ridge, TN.

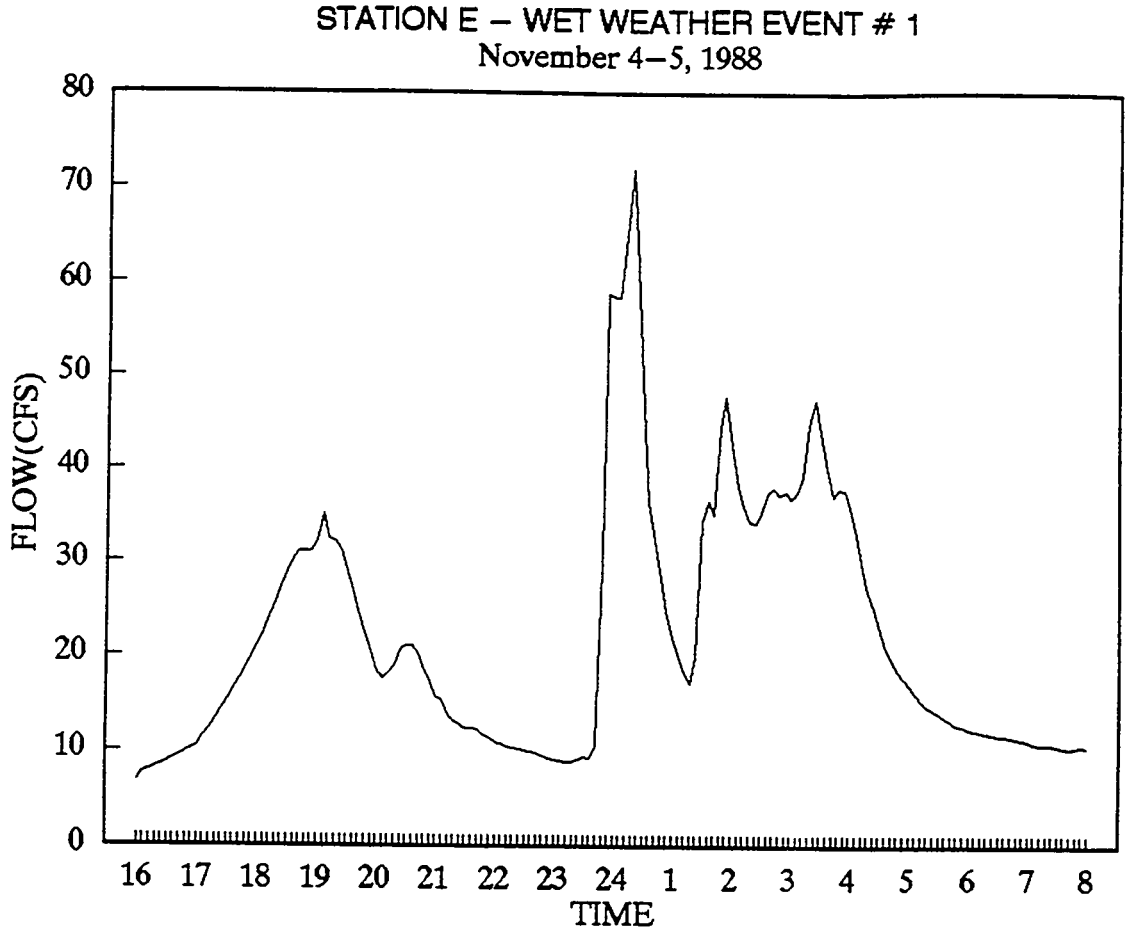


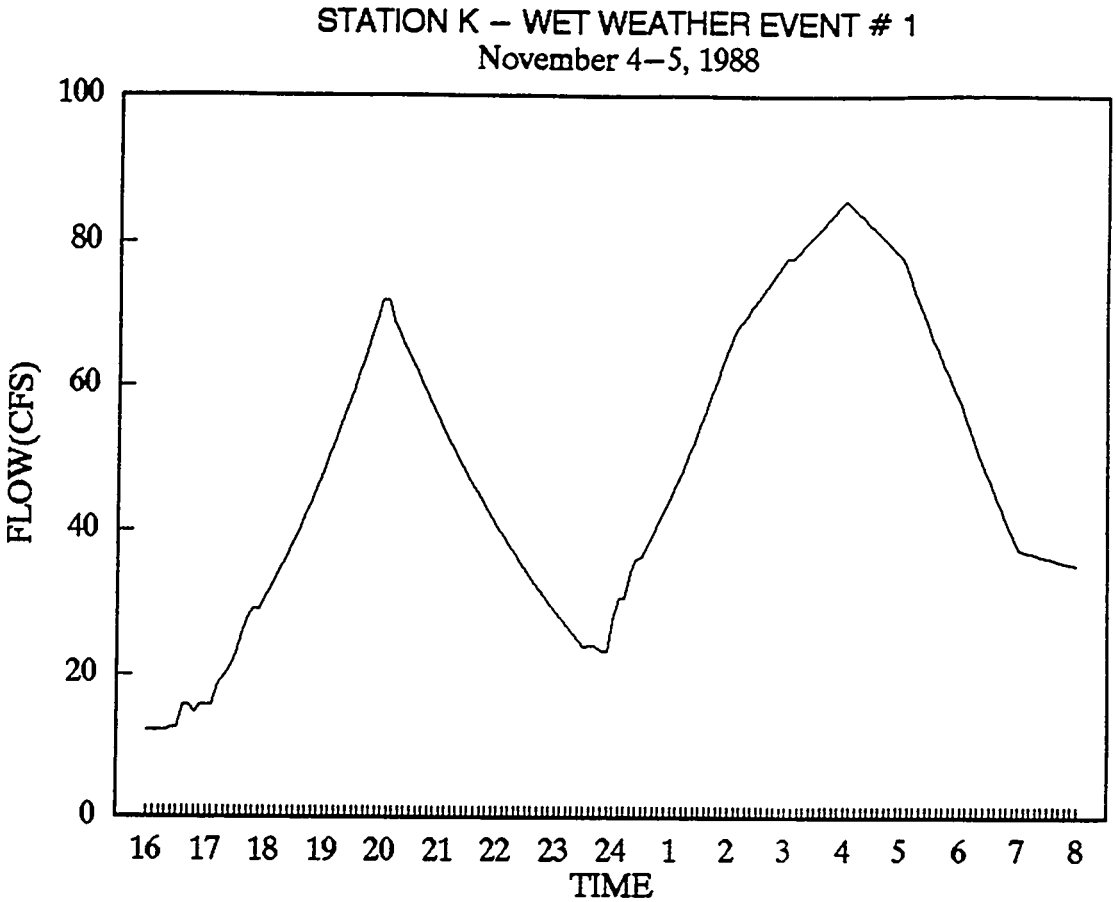
Total Rainfall: 2.15 inches


STATION B – WET WEATHER EVENT # 1
November 4–5, 1988
FLOW(CFS)
12
11
10
9
8
7
6
5
4
3
2
1
0
5
10
15
20
0.5
5.5
TIME


STATION D – WET WEATHER ENVENT # 1
November 4, 1988
FLOW(CFS)
35
30
25
20
15
10
5
0
14.50
15.50
16.50
17.50
18.50
19.50
20.50
21.50
22.50
TIME


STATION C – WET WEATHER EVENT # 1
November 4–5, 1988
250
200
150
100
50
0
FLOW(CFS)
16 17 18 19 20 21 22 23 24 1 2 3 4 5 6 7 8
TIME

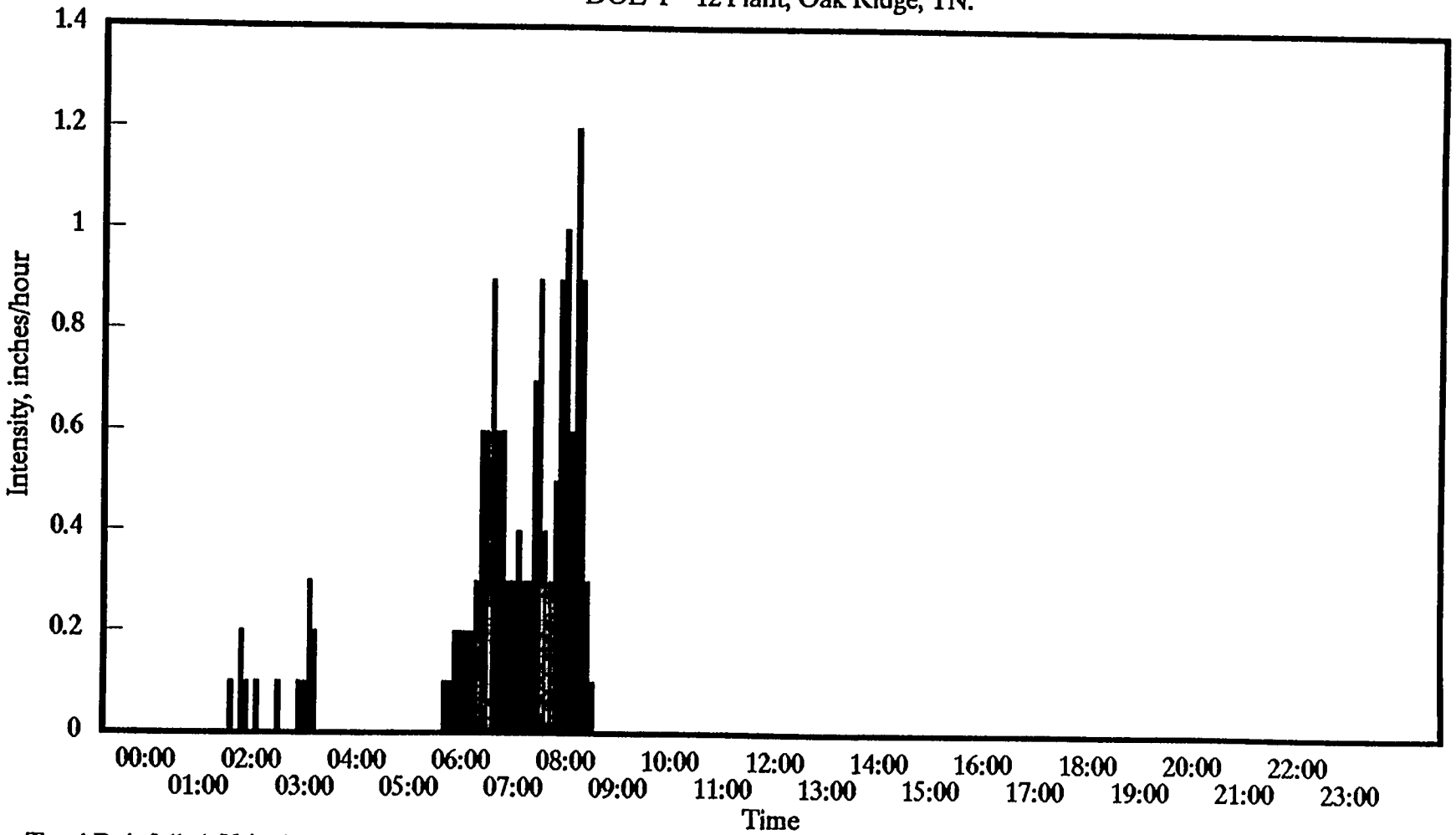

STATION E – WET WEATHER EVENT # 1
November 4–5, 1988
FLOW(CFS)
80
70
60
50
40
30
20
10
0
16 17 18 19 20 21 22 23 24 1 2 3 4 5 6 7 8
TIME


STATION K – WET WEATHER EVENT # 1
November 4–5, 1988
FLOW(CFS)
100
80
60
40
20
0
16 17 18 19 20 21 22 23 24 1 2 3 4 5 6 7 8
TIME

WET WEATHER EVENT #2

Rainfall Event #2 – March 31, 1989

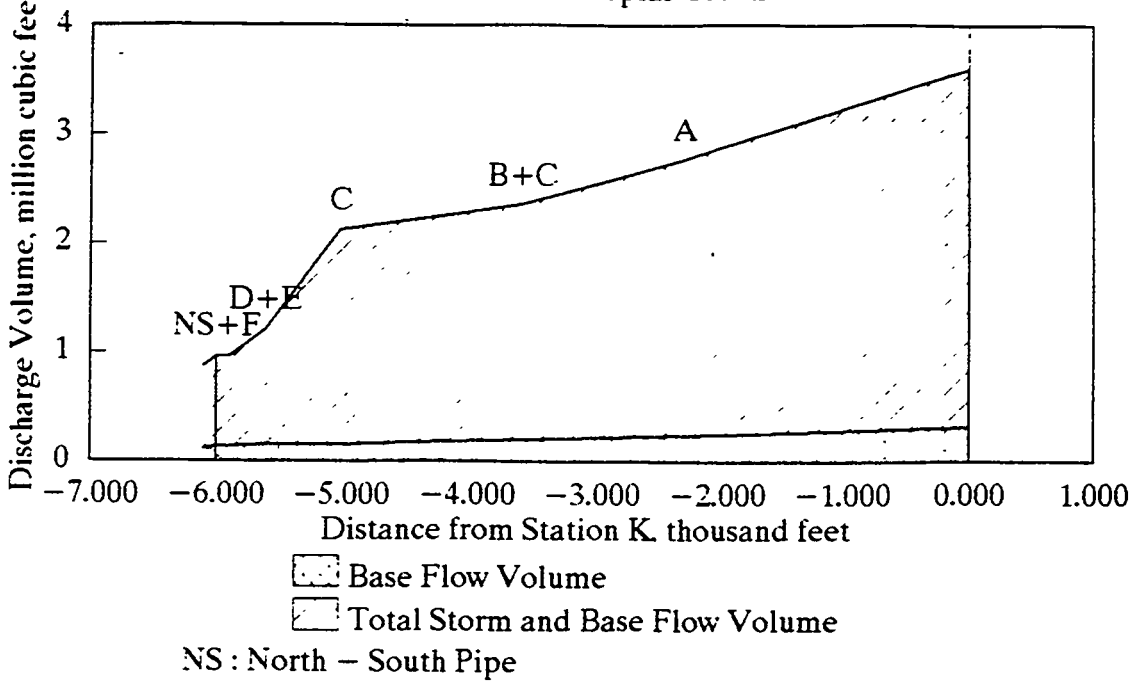
DOE Y–12 Plant, Oak Ridge, TN.



Total Rainfall: 1.53 inches

Flow for Wet Weather Event #2

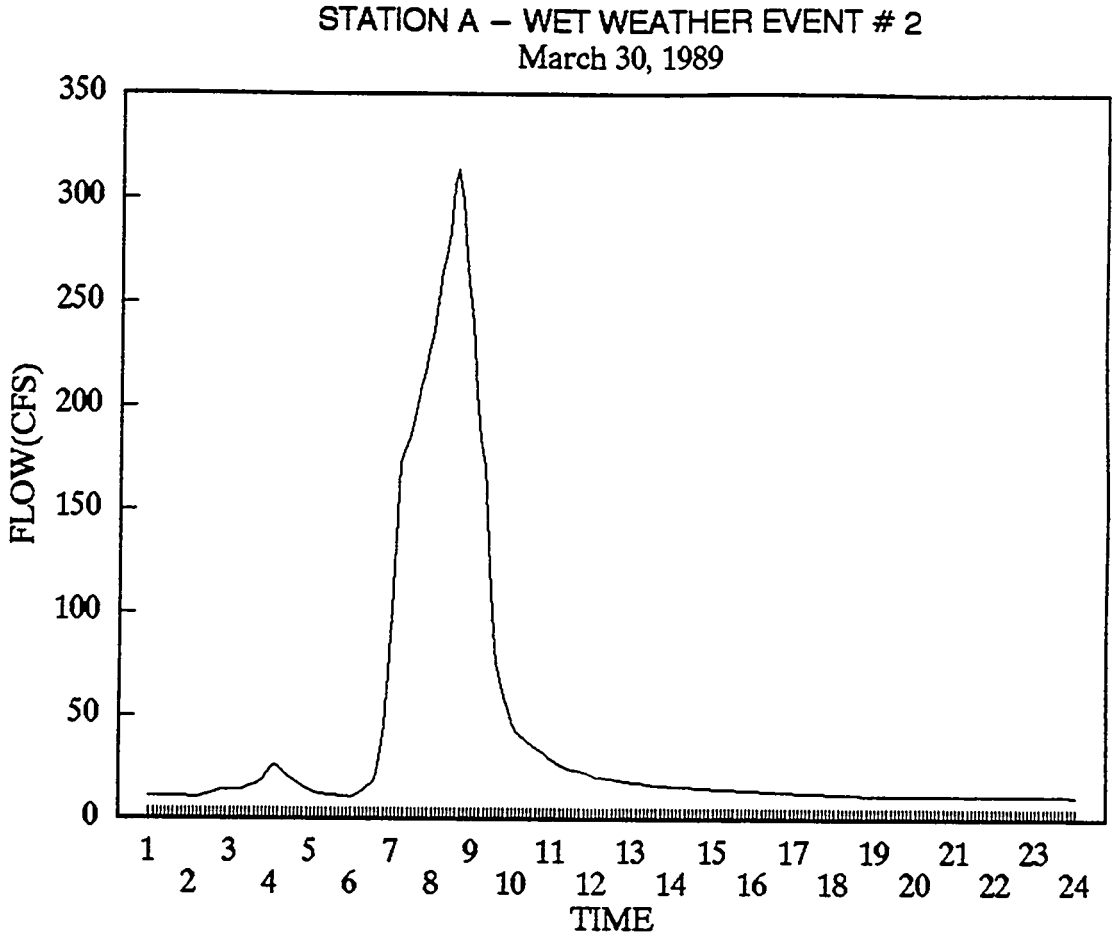
East Fork Poplar Creek



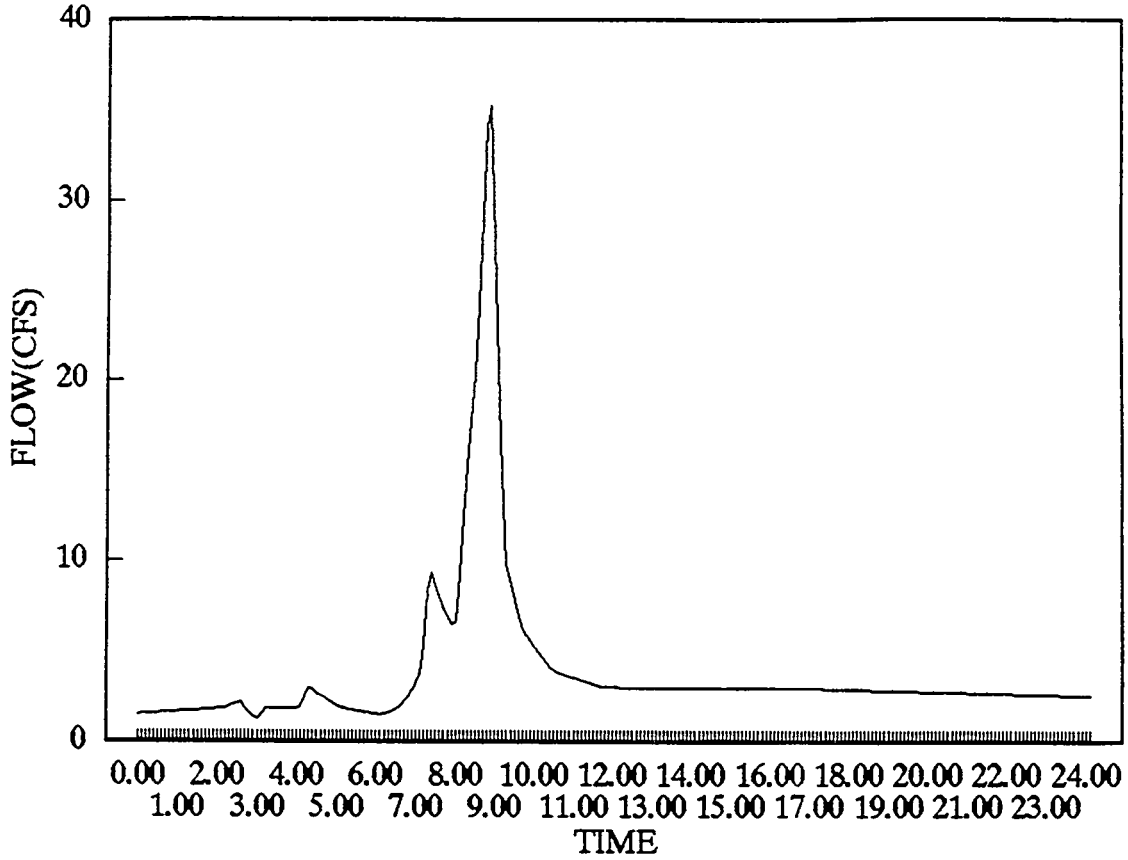
STORM EVENT # 2 March 30, 1989 Rainfall : 1.53 inches

Station	K	A	B+C	C	D+E	E	NS+F	NS
Storm Volume, cubic feet	2,943,294	2,263,760	1,941,126	1,798,300	888,584	678,040	678,040	641,536
Storm Volume, million gallons	22.02	16.93	14.52	13.45	6.65	5.07	5.07	4.80
Distance from K, ft.	0	-2270	-3570	-5010	-5610	-5900	-6000	-6100
Fraction of flow @ Station K	100.0%	76.9%	66.0%	61.1%	30.2%	23.0%	23.0%	21.8%
Base Flow, cfs	12.83	9.88	8.10	6.27	6.21	5.61	5.61	4.69
Storm Flow Time Interval, hours	7	7	7	7	7	7	7	7
Base Flow Volume During the Storm, cf	323,316	248,976	204,120	158,004	156,492	141,372	141,372	118,188
Base Flow Volume During the Storm, MG	2.418	1.862	1.527	1.182	1.171	1.057	1.057	0.884
Total Storm and Base Flow, CF	3,266,610	2,512,736	2,145,246	1,956,304	1,045,076	819,412	819,412	759,724
Total Storm and Base Flow, MG	24.434	18.795	16.046	14.633	7.817	6.129	6.129	5.683

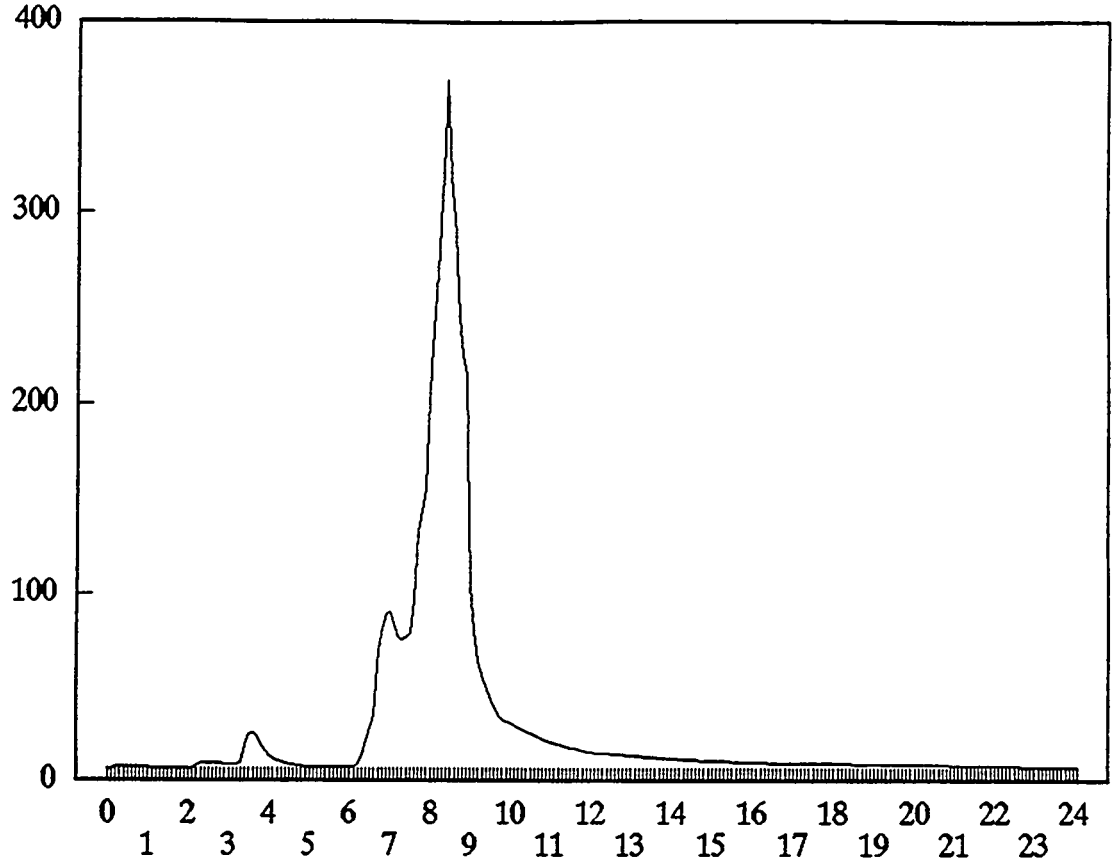
Station	B	D	F	G	H	I	J
Storm Volume, cubic feet	142,826	210,544	36,504	7,119	199,449	385,106	114,473
Storm Volume, million gallons	1.068	1.575	0.273	0.053	1.492	2.881	0.856
Distance from K, ft.	-3570	-5610	N.A.	N.A.	N.A.	N.A.	N.A.
Fraction of flow @ Station K	4.9%	7.2%	1.2%	0.2%	6.8%	13.1%	3.9%
	1.83	0.6	0.92	0.77	0.20	0.88	0.41
Storm Flow Time Interval, hours	7	7	7	7	7	7	7
Base Flow Volume During the Storm, cf	46,116	15,120	23,184	19,404	5,040	22,176	10,332
Base Flow Volume During the Storm, MG	0.345	0.113	0.173	0.145	0.038	0.166	0.077
Total Storm and Base Flow, CF	188,942	225,664	59,688	26,523	204,489	407,282	124,805
Total Storm and Base Flow, MG	1.413	1.688	0.446	0.198	1.530	3.046	0.934


STATION A – WET WEATHER EVENT # 2
March 30, 1989
FLOW(CFS)
350
300
250
200
150
100
50
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME

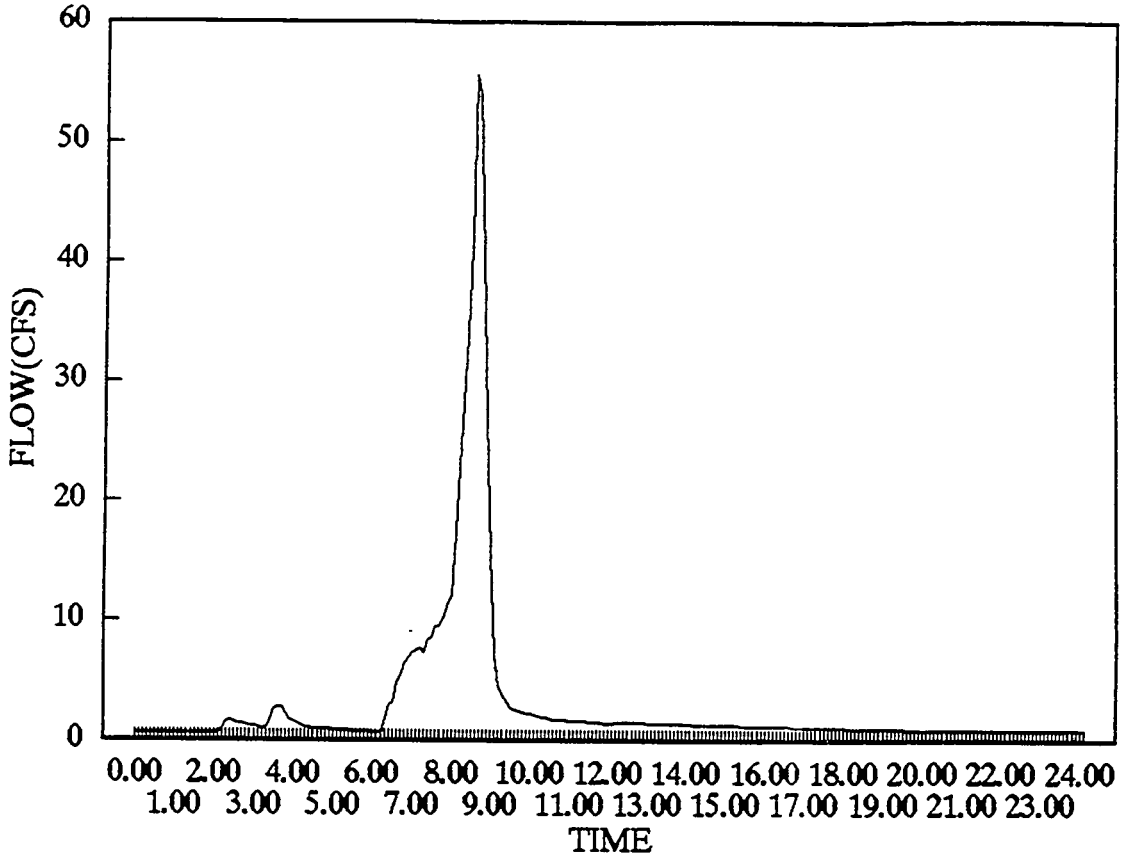
STATION B – WET WEATHER EVENT # 2
March 30, 1989

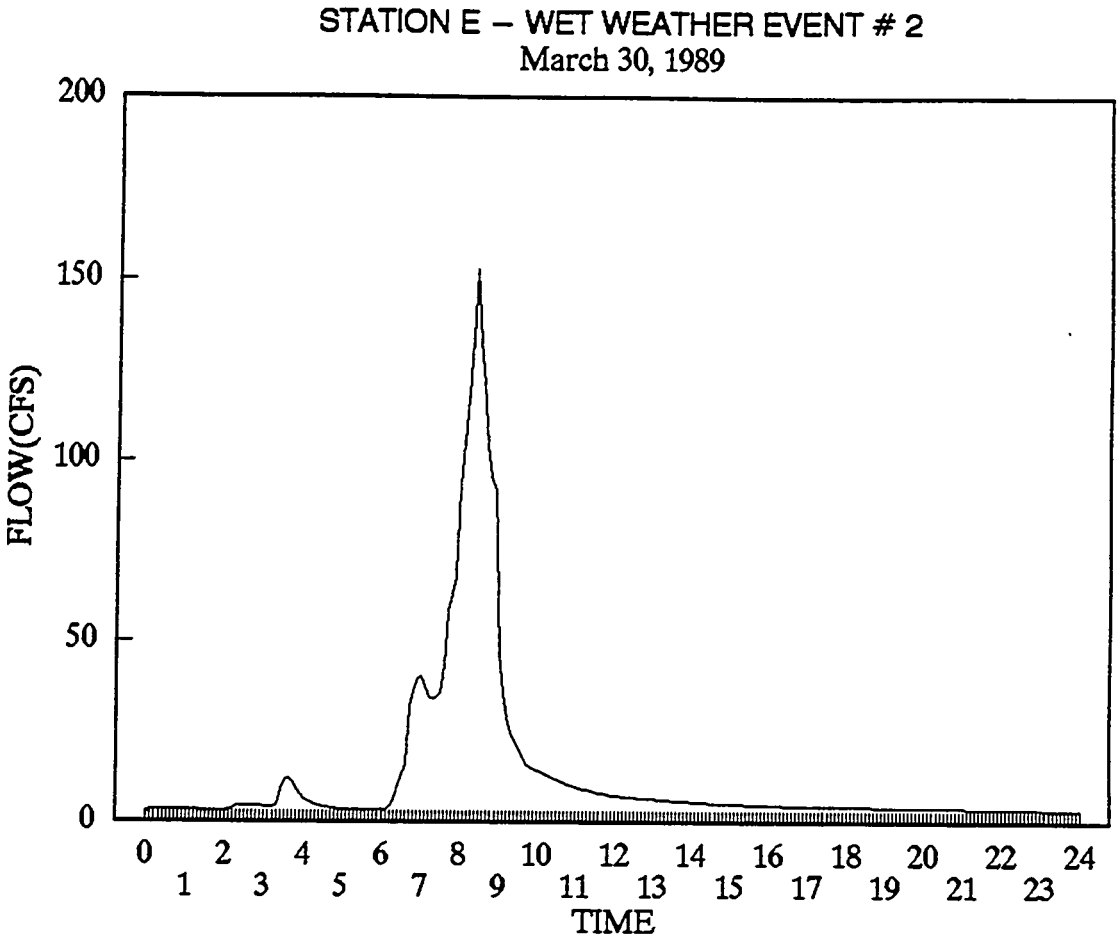


STATION C – WET WEATHER EVENT # 2
March 30, 1989

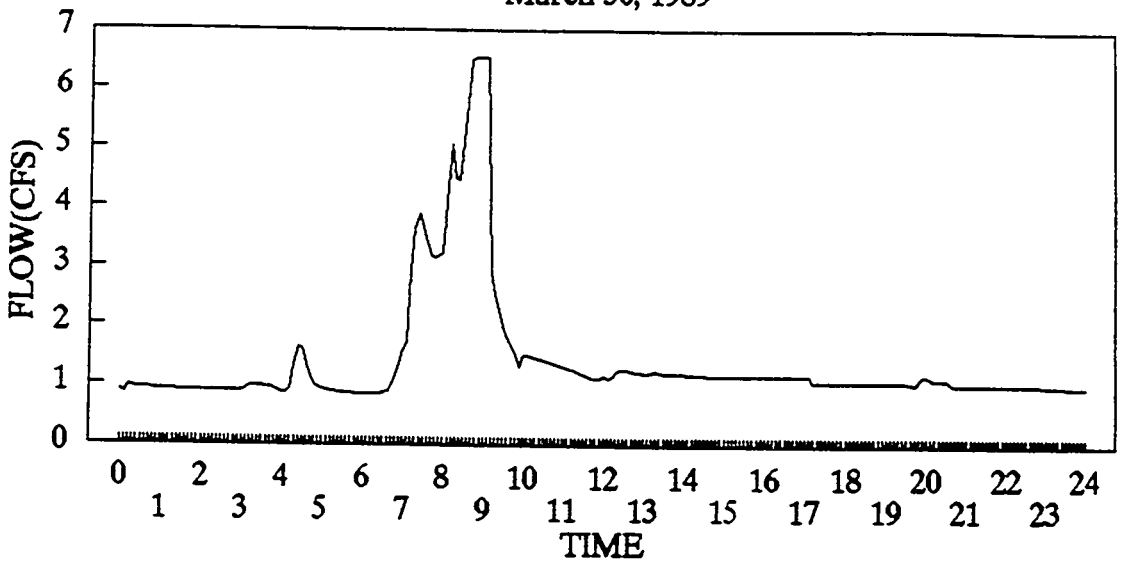


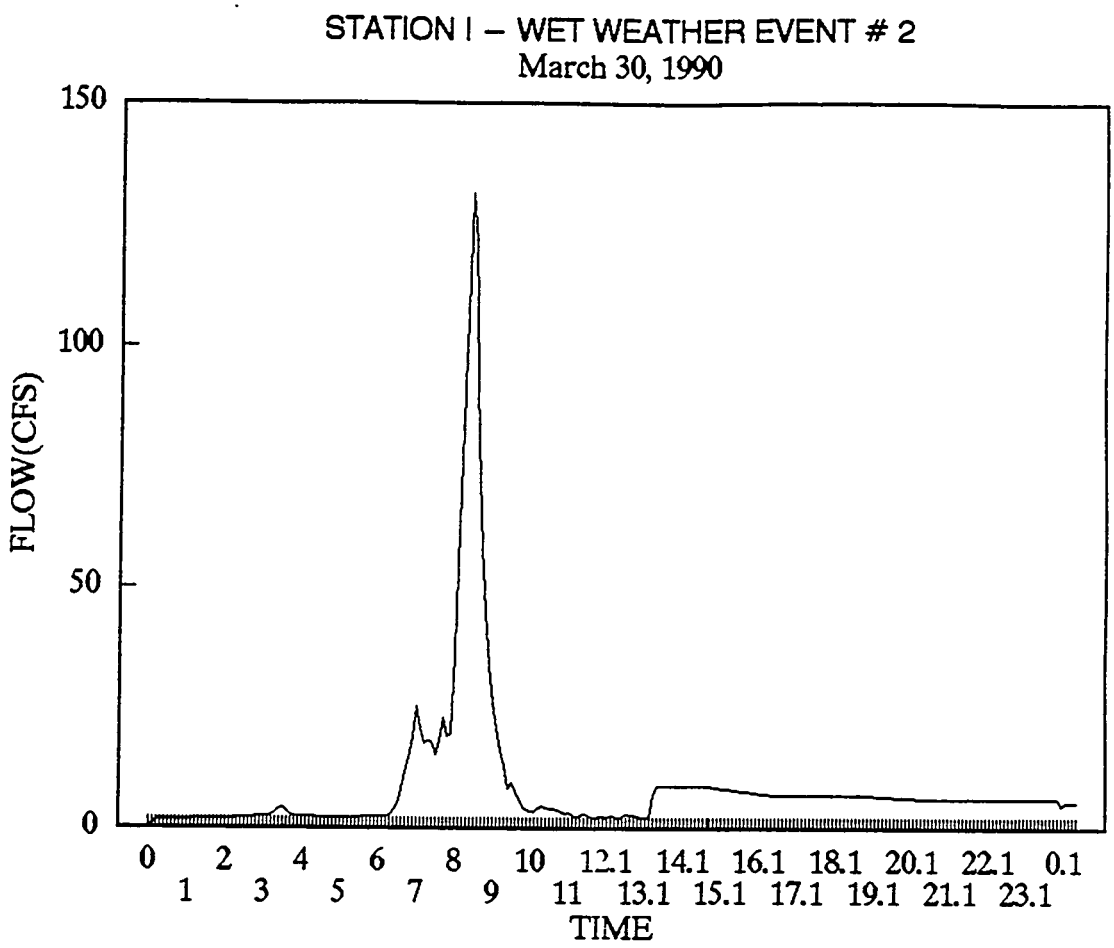
STATION D – WET WEATHER EVENT # 2
March 30, 1989



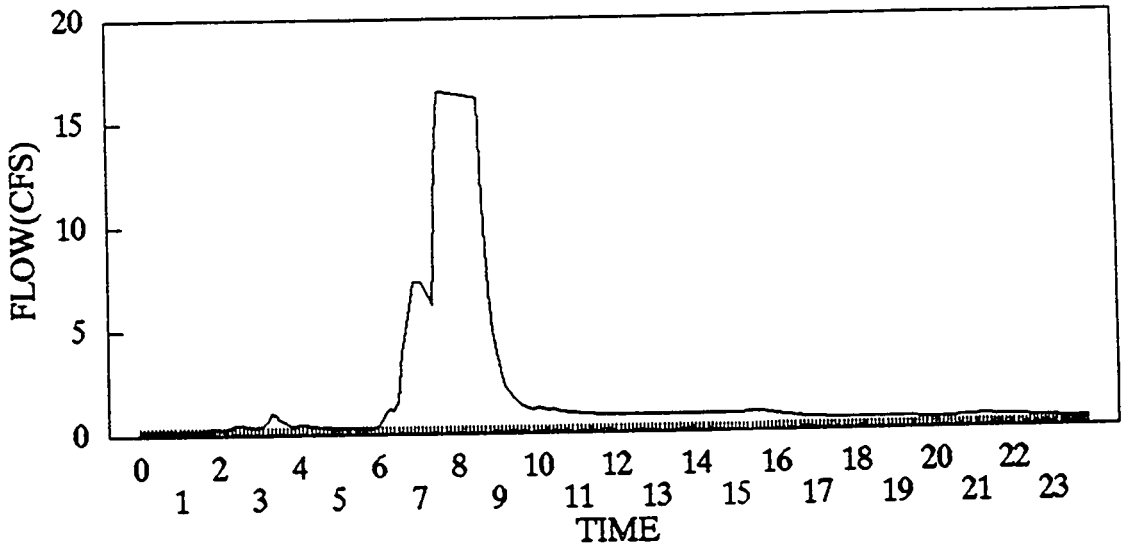

STATION E – WET WEATHER EVENT # 2
March 30, 1989
200
150
100
50
0
FLOW(CFS)
0 2 4 6 8 10 12 14 16 18 20 22 24
1 3 5 7 9 11 13 15 17 19 21 23
TIME

STATION F – WET WEATHER EVENT # 2
March 30, 1989

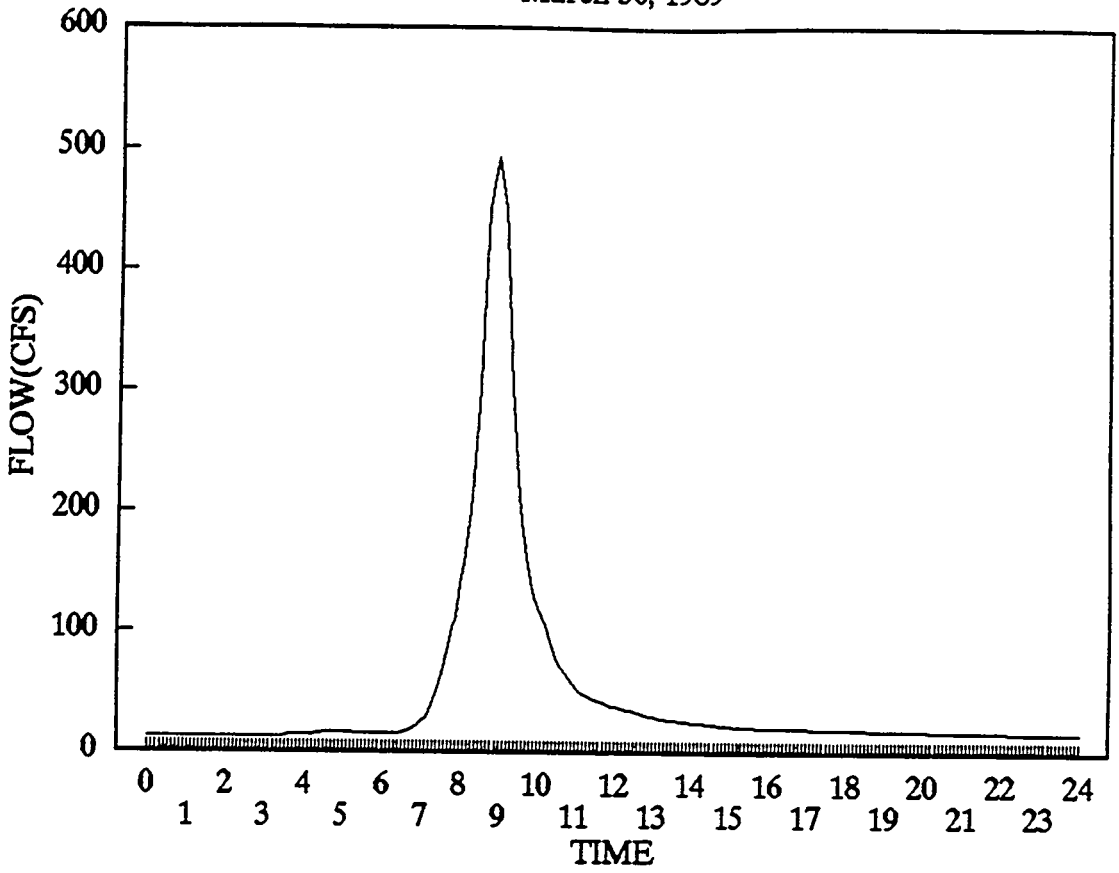



STATION I – WET WEATHER EVENT # 2
March 30, 1990
150
100
50
0
FLOW(CFS)
0 2 4 6 8 10 12.1 14.1 16.1 18.1 20.1 22.1 0.1
1 3 5 7 9 11 13.1 15.1 17.1 19.1 21.1 23.1
TIME

STATION J – WET WEATHER EVENT # 2
March 30, 1989



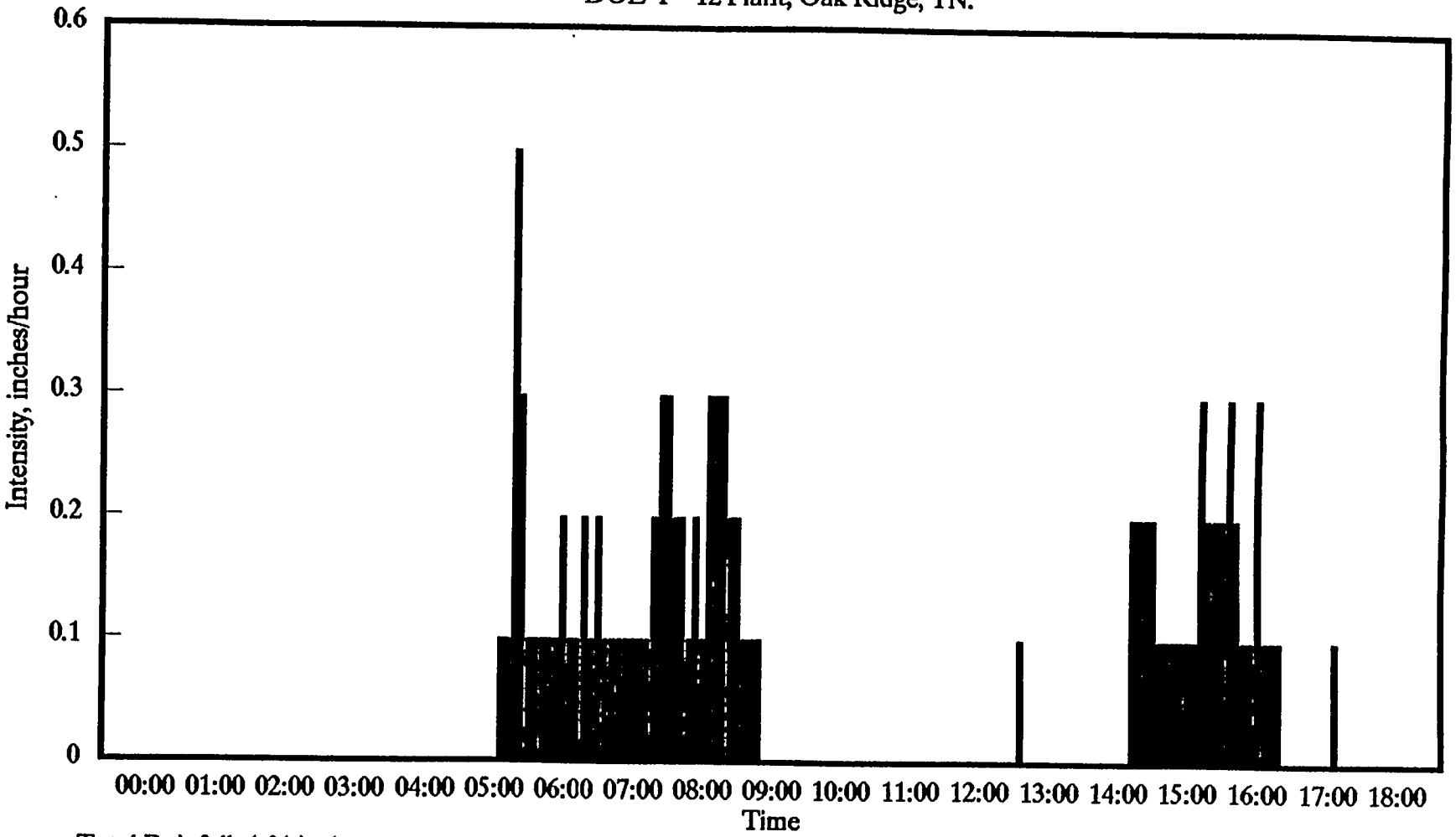
STATION K – WET WEATHER EVENT # 2
March 30, 1989



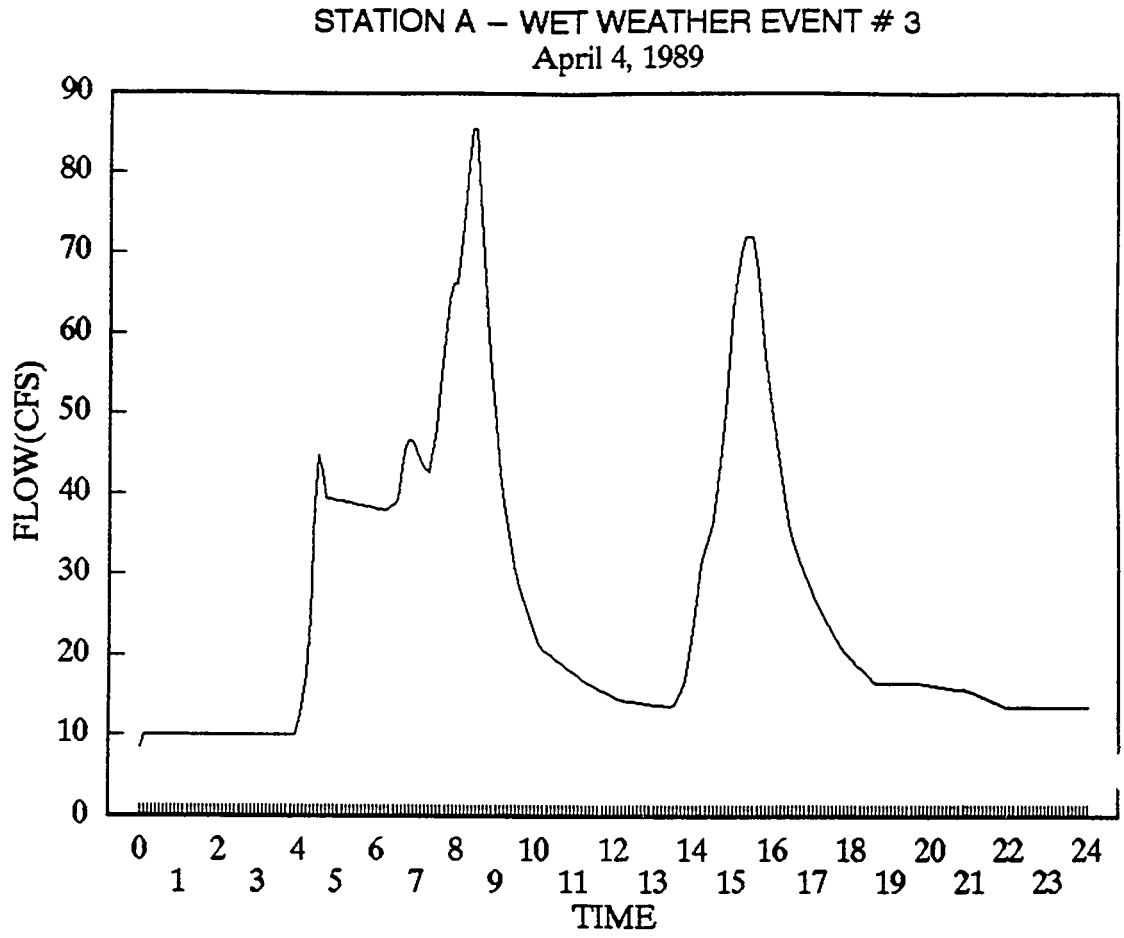
WET WEATHER EVENT #3

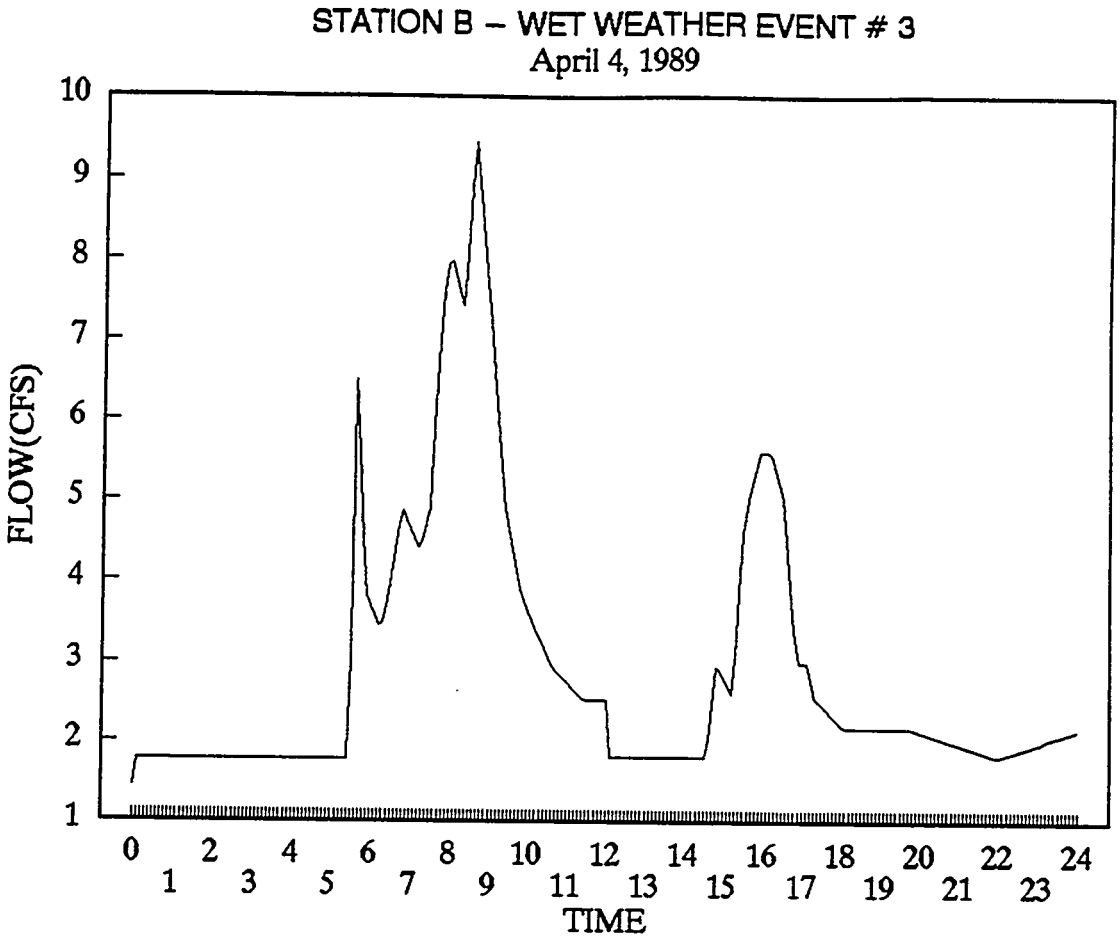
Rainfall Event # 3 – April 4, 1989

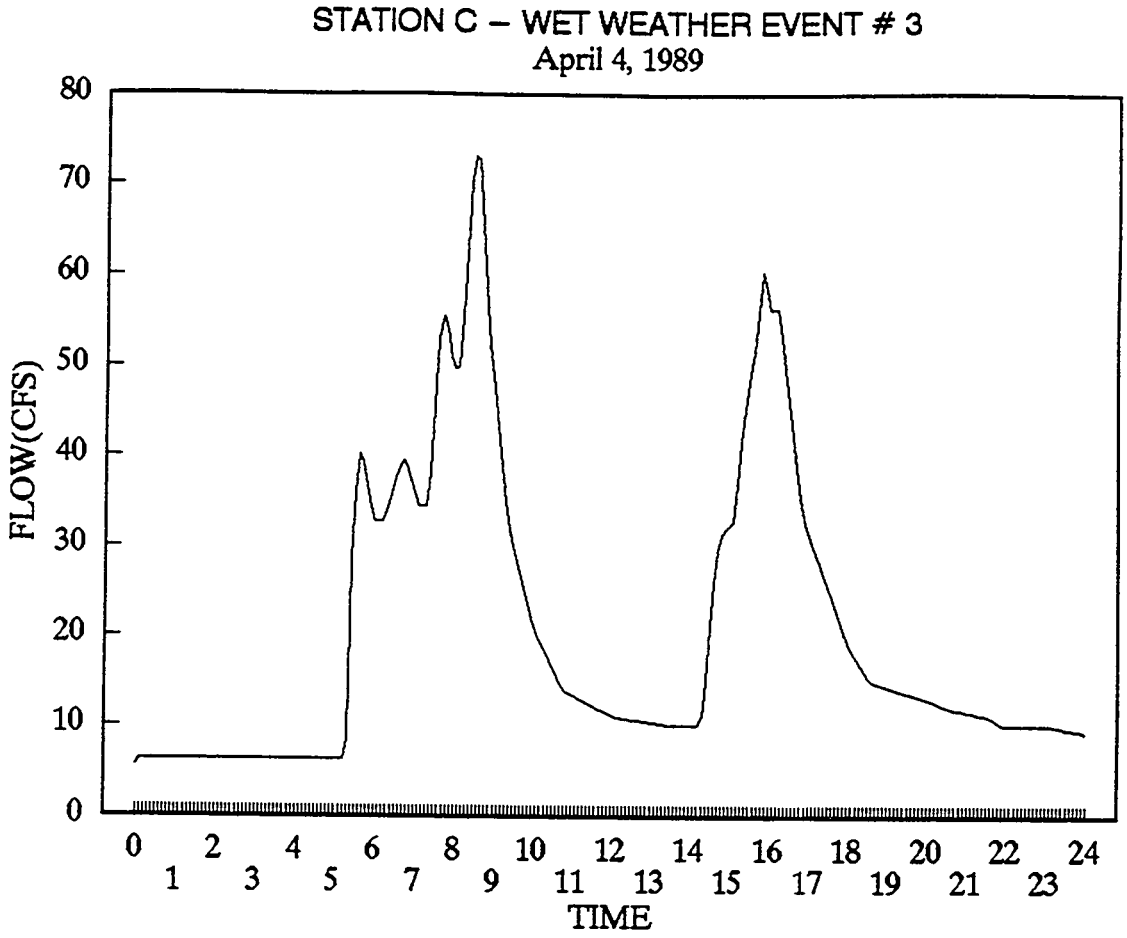
DOE Y–12 Plant, Oak Ridge, TN.

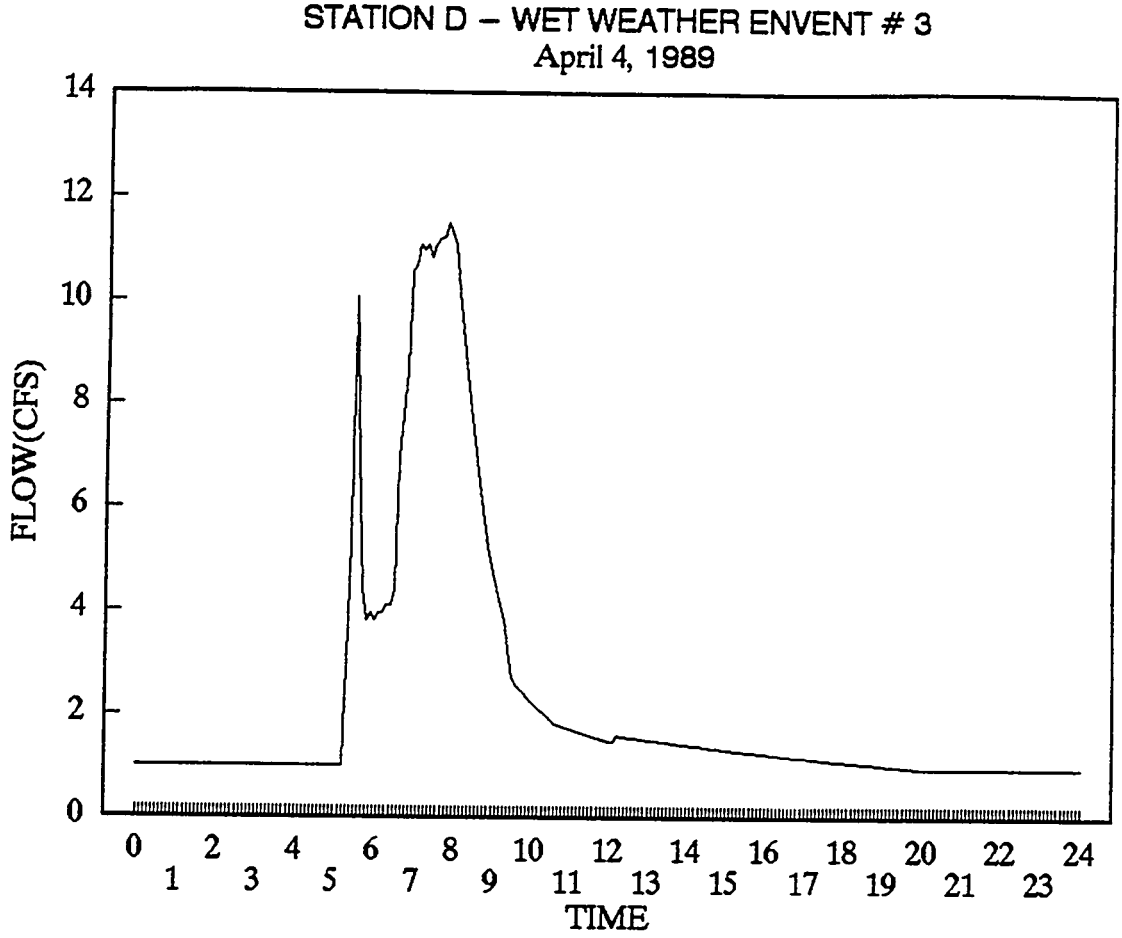


Total Rainfall: 1.01 inches

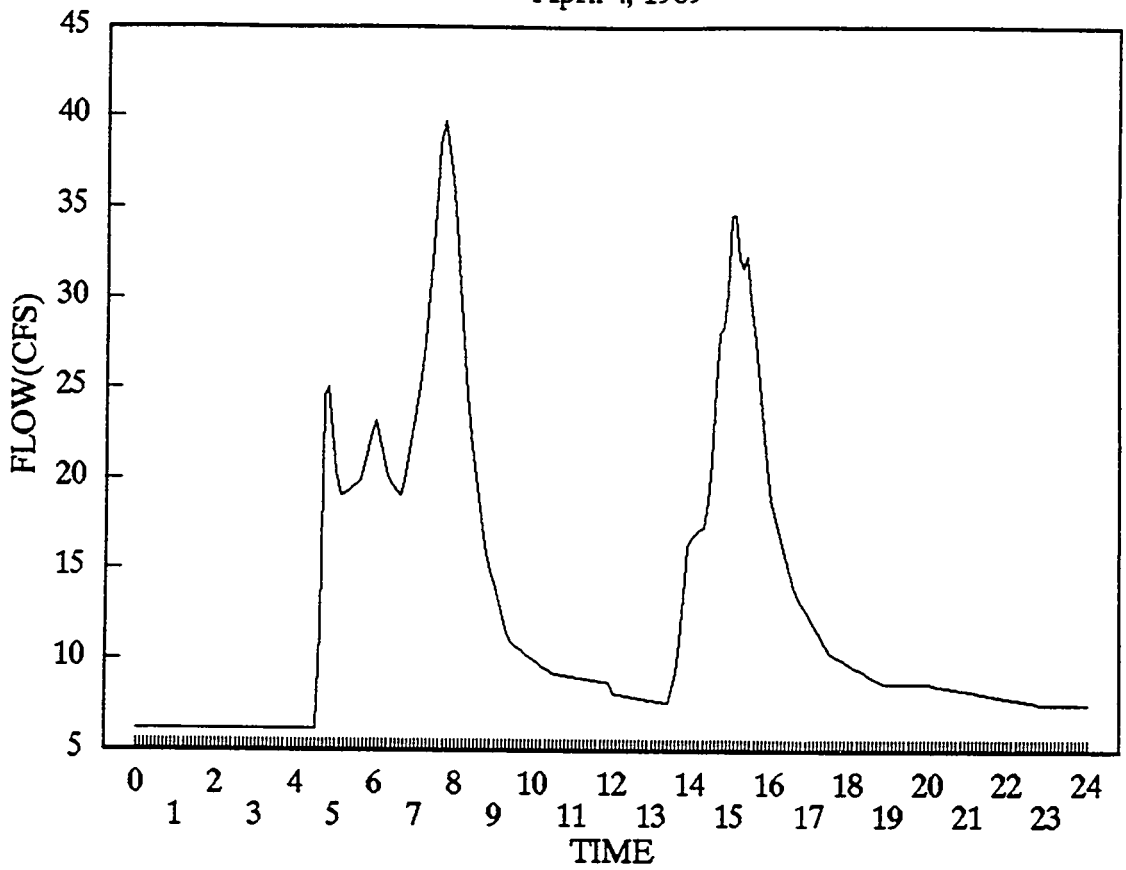

STATION A – WET WEATHER EVENT # 3
April 4, 1989
FLOW(CFS)
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME

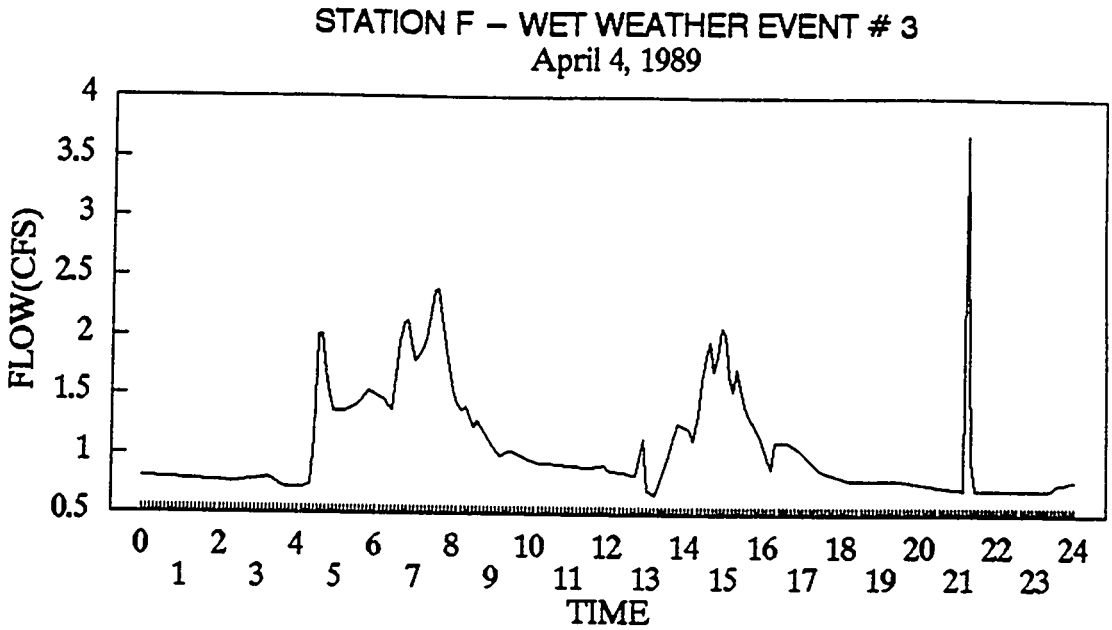

STATION B – WET WEATHER EVENT # 3
April 4, 1989
FLOW(CFS)
10
9
8
7
6
5
4
3
2
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME


STATION C – WET WEATHER EVENT # 3
April 4, 1989
FLOW(CFS)
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME

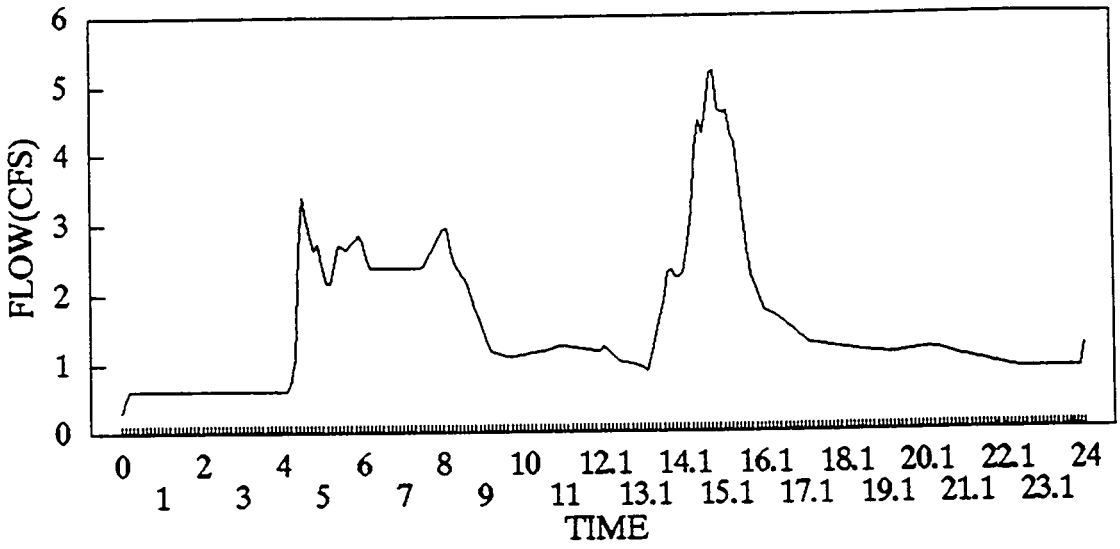

STATION D – WET WEATHER ENVENT # 3
April 4, 1989
FLOW(CFS)
14
12
10
8
6
4
2
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME

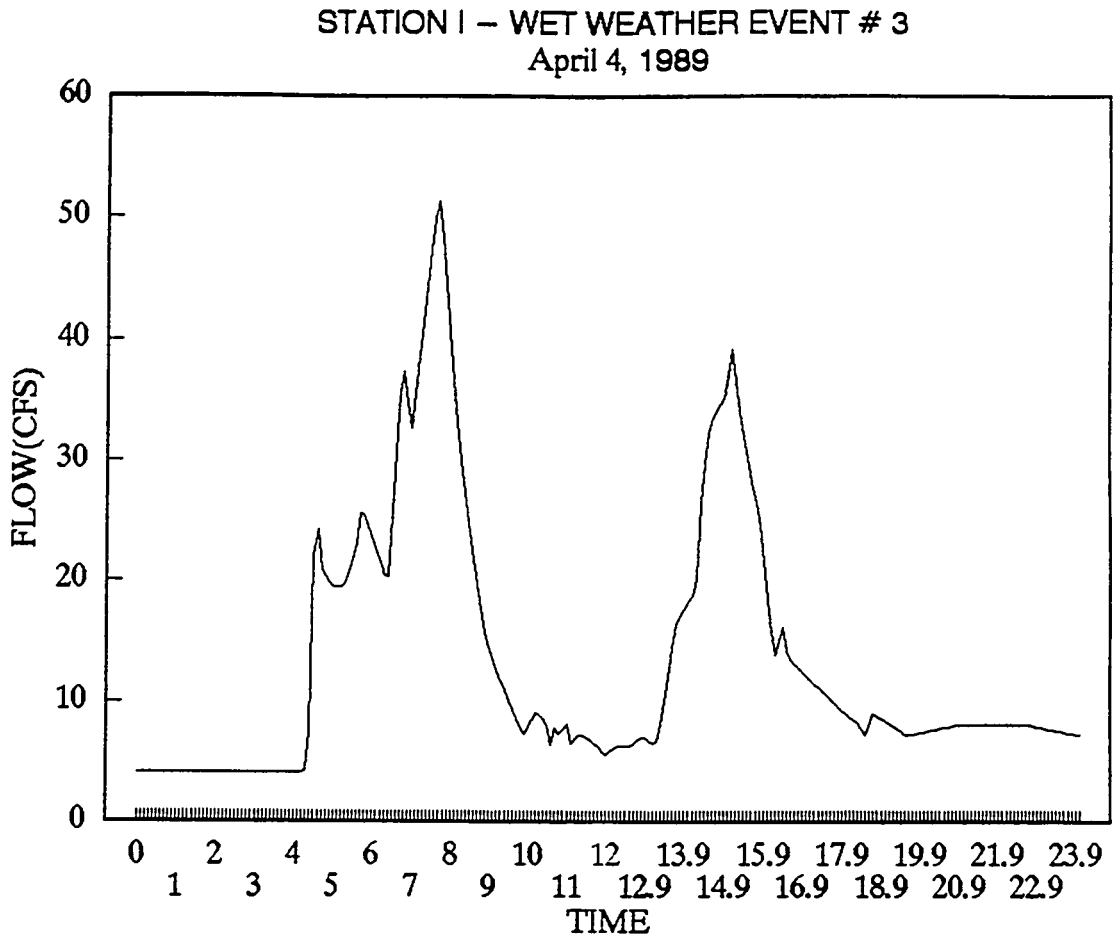
STATION E – WET WEATHER EVENT # 3
April 4, 1989

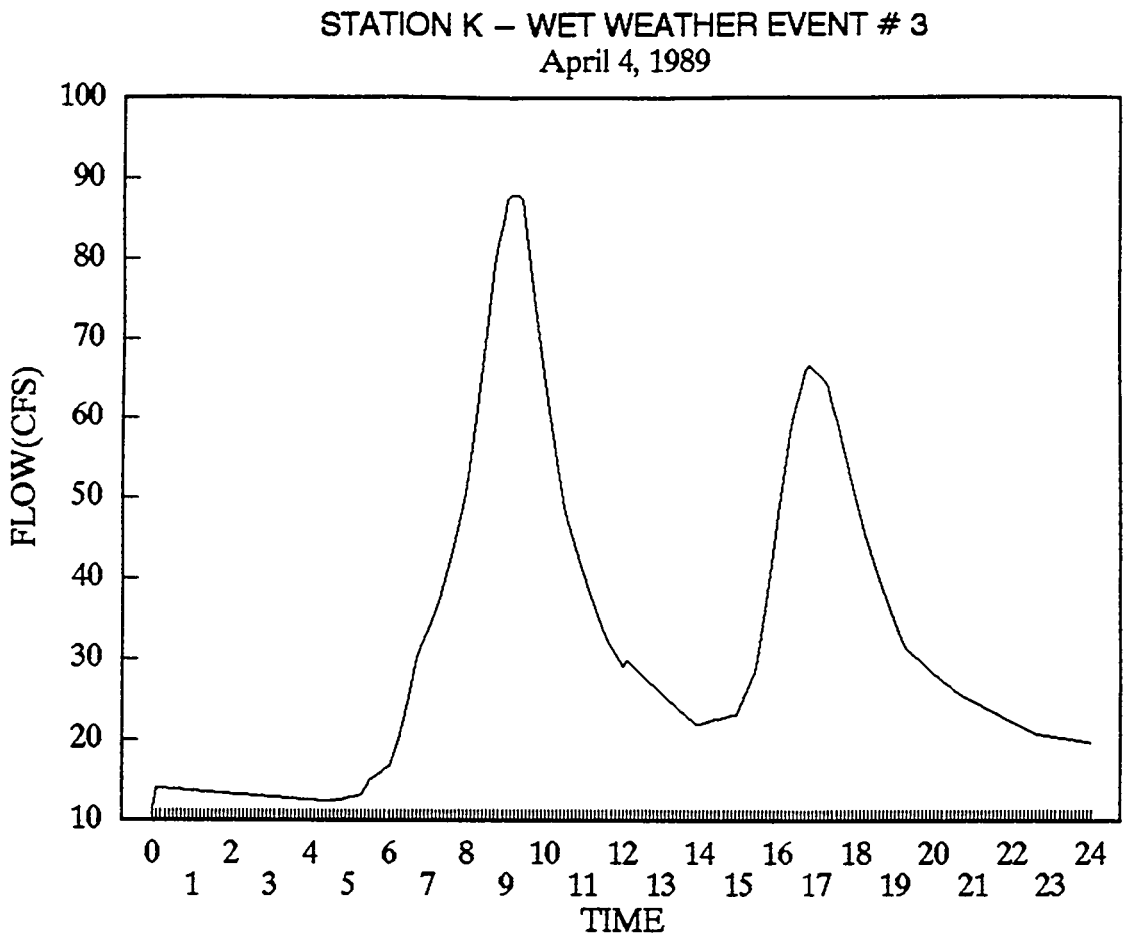



STATION F – WET WEATHER EVENT # 3
April 4, 1989
FLOW(CFS)
4
3.5
3
2.5
2
1.5
1
0.5
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME

STATION J – WET WEATHER EVENT # 3
April 4, 1989



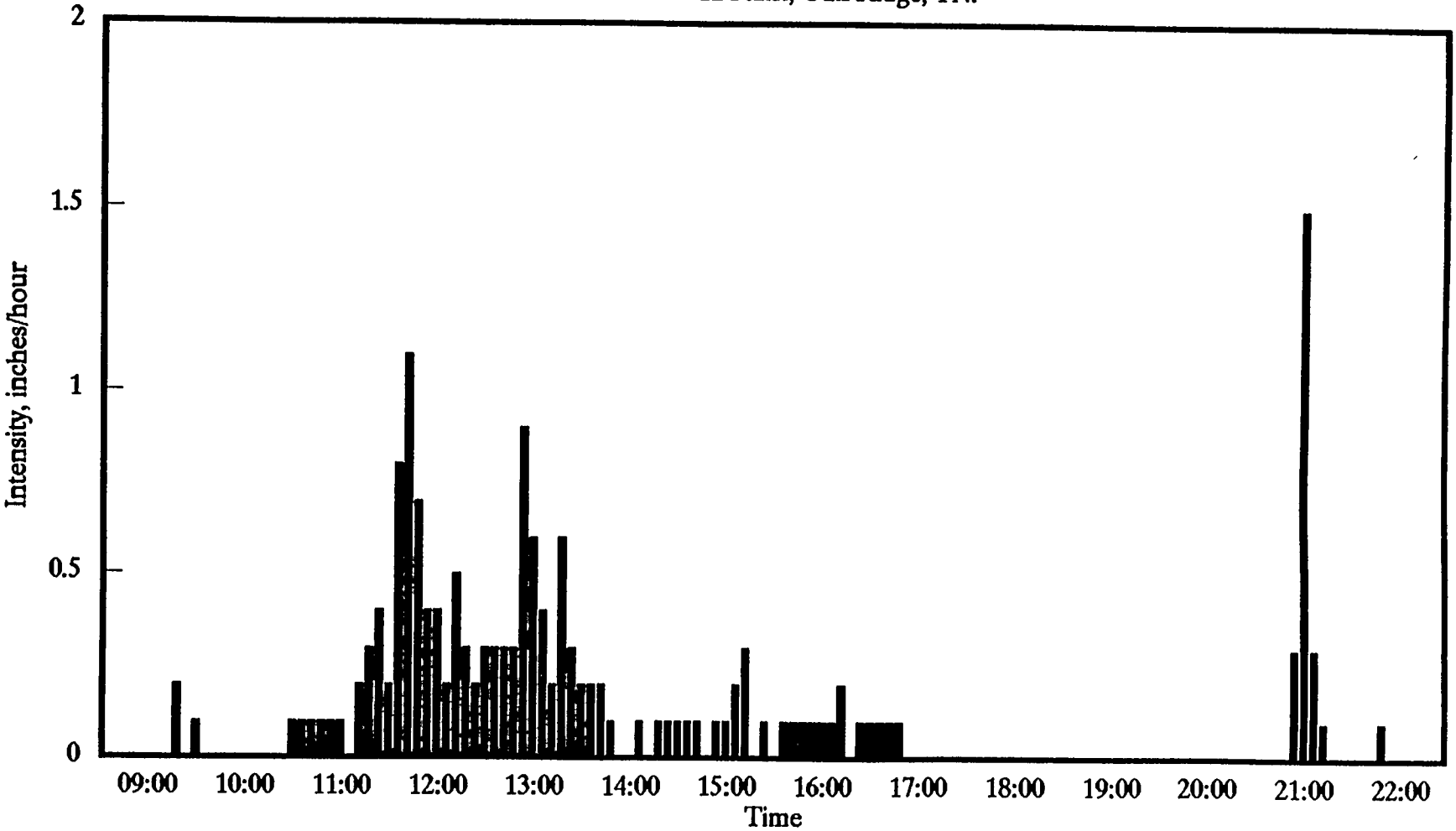

STATION I – WET WEATHER EVENT # 3
April 4, 1989
FLOW(CFS)
60
50
40
30
20
10
0
0 2 4 6 8 10 12 13.9 15.9 17.9 19.9 21.9 23.9
1 3 5 7 9 11 12.9 14.9 16.9 18.9 20.9 22.9
TIME


STATION K – WET WEATHER EVENT # 3
April 4, 1989
FLOW(CFS)
100
90
80
70
60
50
40
30
20
10
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME

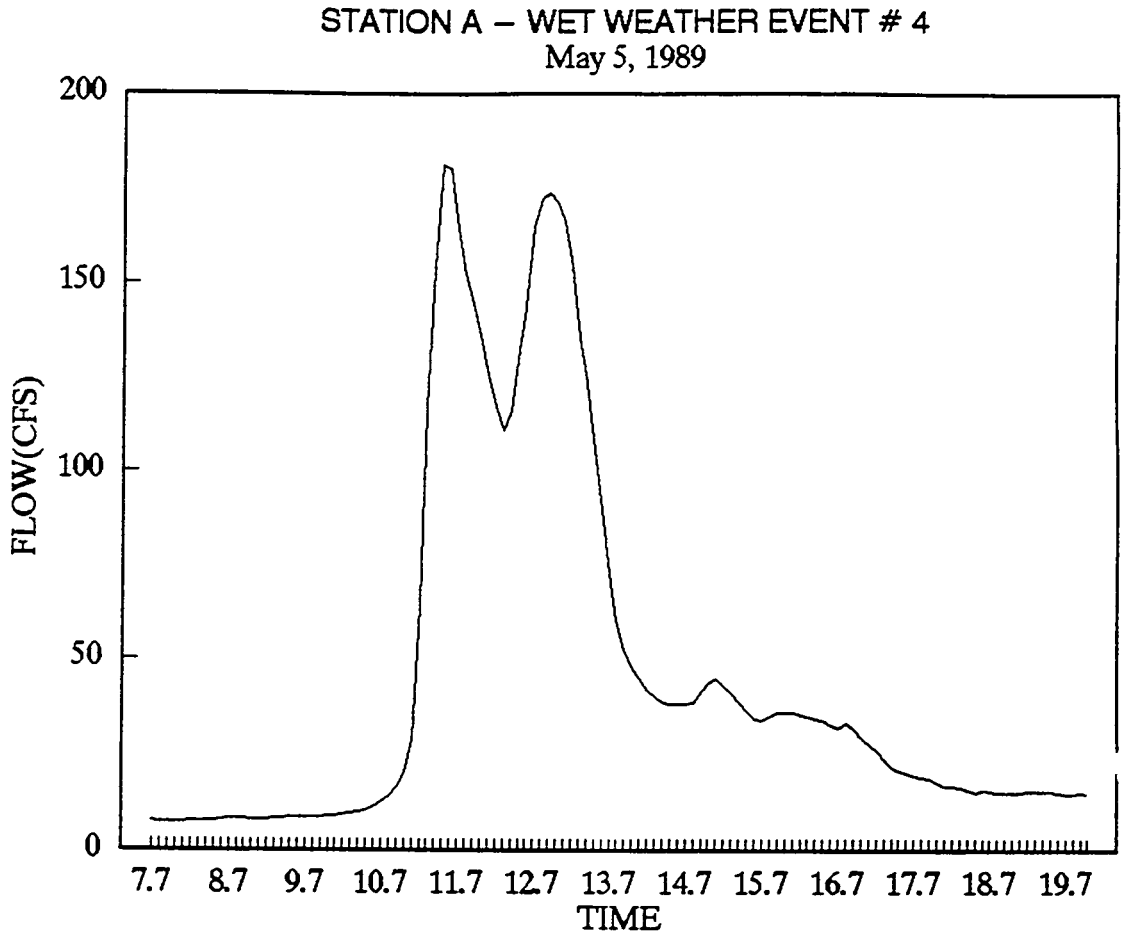
WET WEATHER EVENT #4

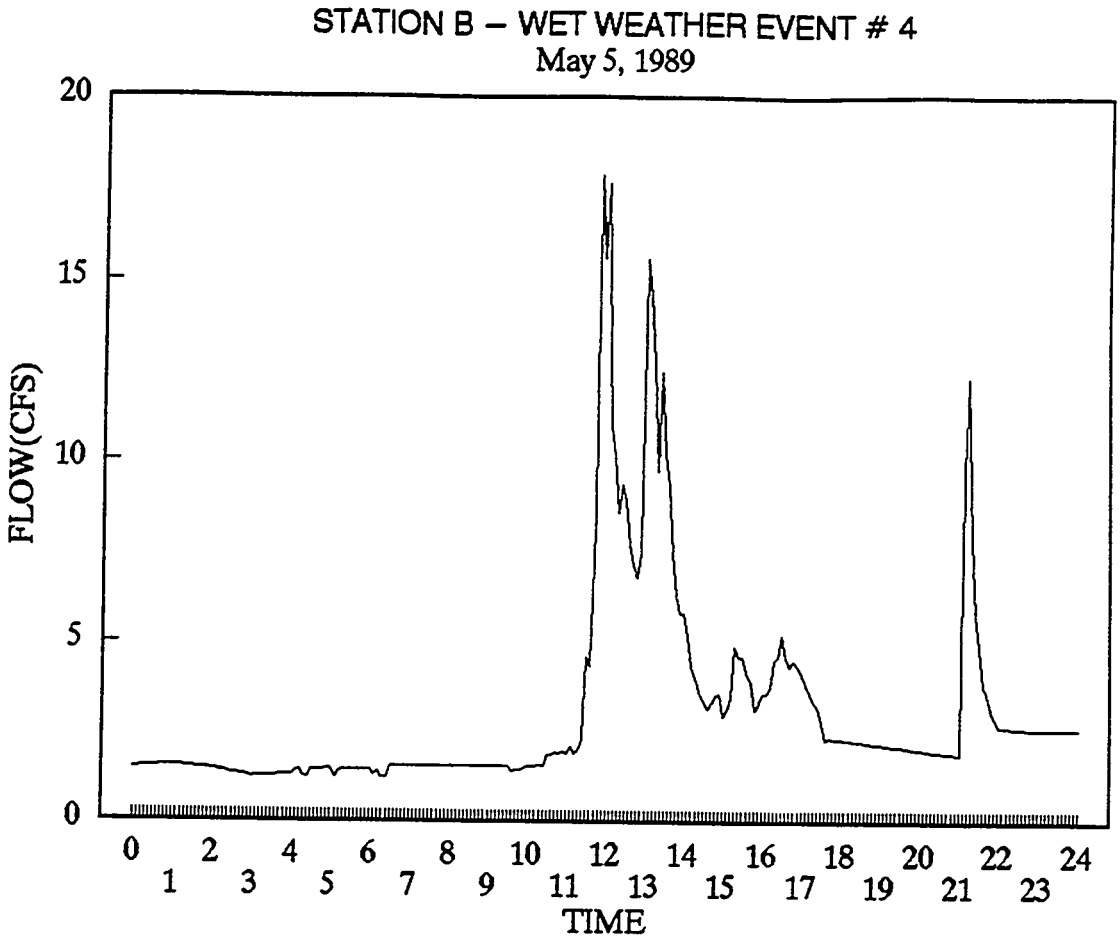
Rainfall Event # 4 – May 5, 1989

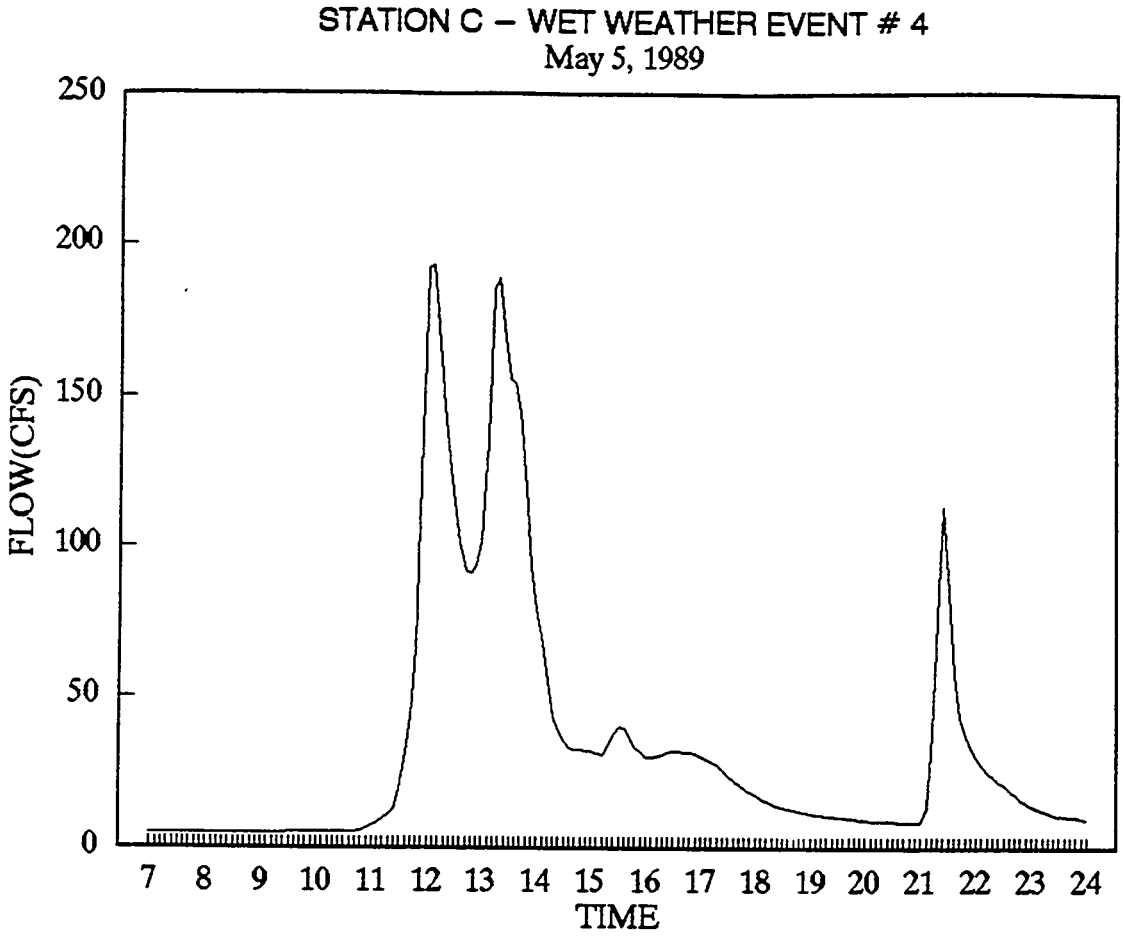
DOE Y–12 Plant, Oak Ridge, TN.

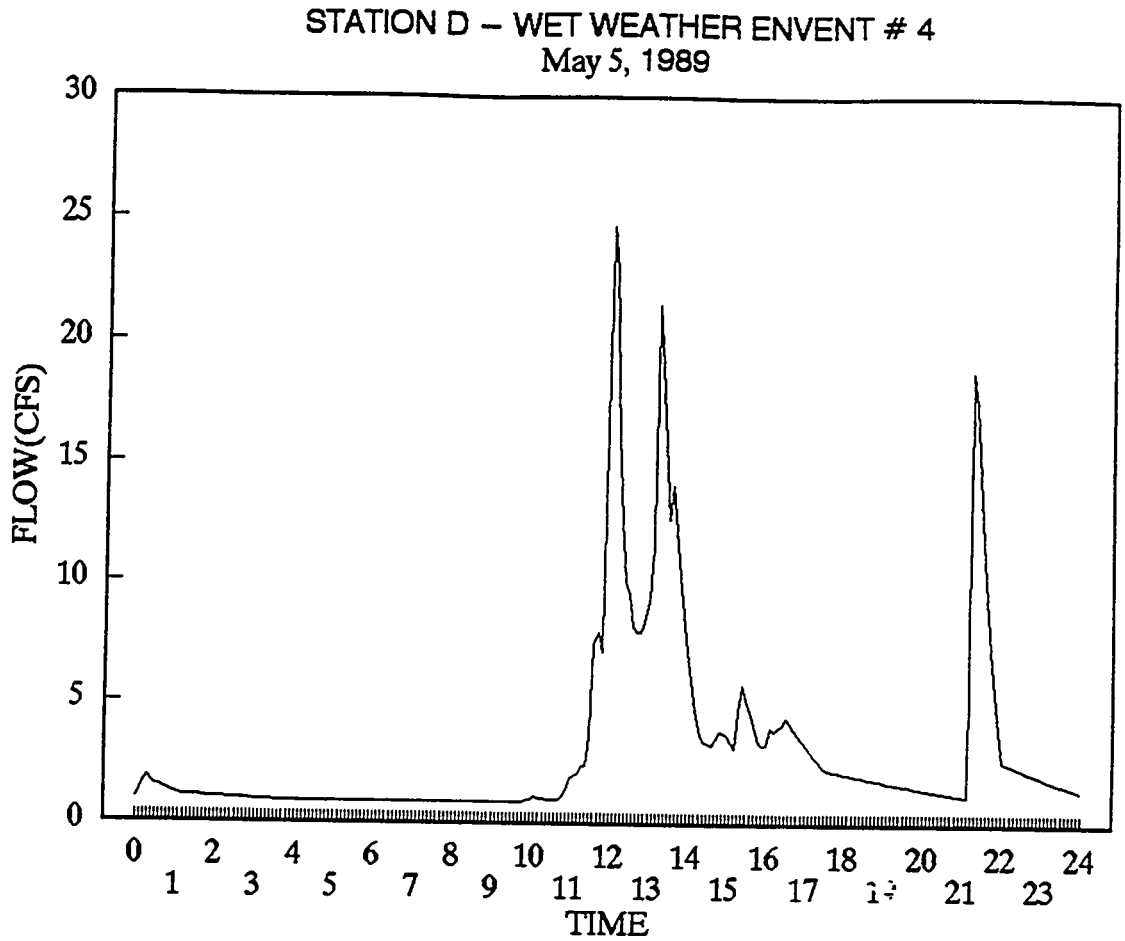


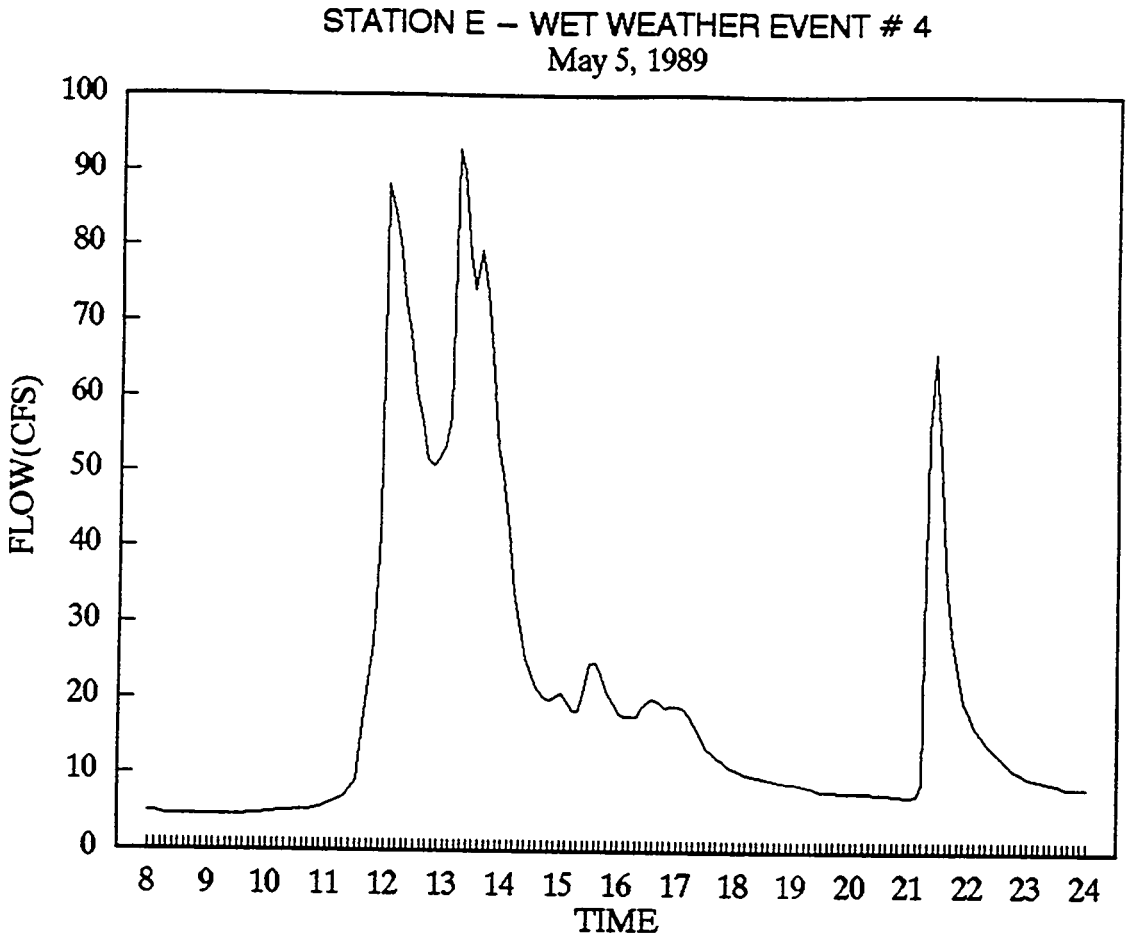
Total Rainfall : 1.65 inches

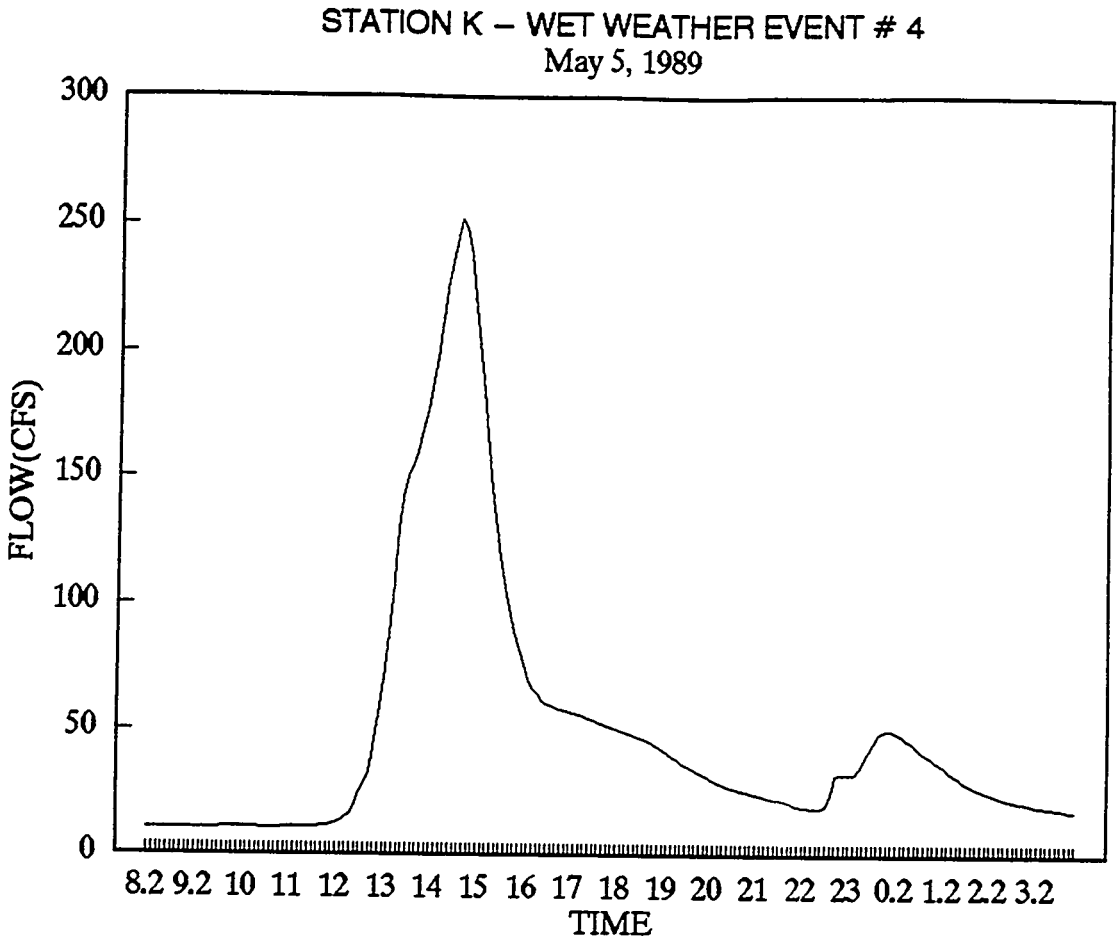

STATION A – WET WEATHER EVENT # 4
May 5, 1989
200
150
100
50
0
FLOW(CFS)
7.7
8.7
9.7
10.7
11.7
12.7
13.7
14.7
15.7
16.7
17.7
18.7
19.7
TIME


STATION B – WET WEATHER EVENT # 4
May 5, 1989
FLOW(CFS)
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME


STATION C – WET WEATHER EVENT # 4
May 5, 1989
FLOW(CFS)
250
200
150
100
50
0
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME


STATION D – WET WEATHER ENVENT # 4
May 5, 1989
FLOW(CFS)
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22 23 24
TIME

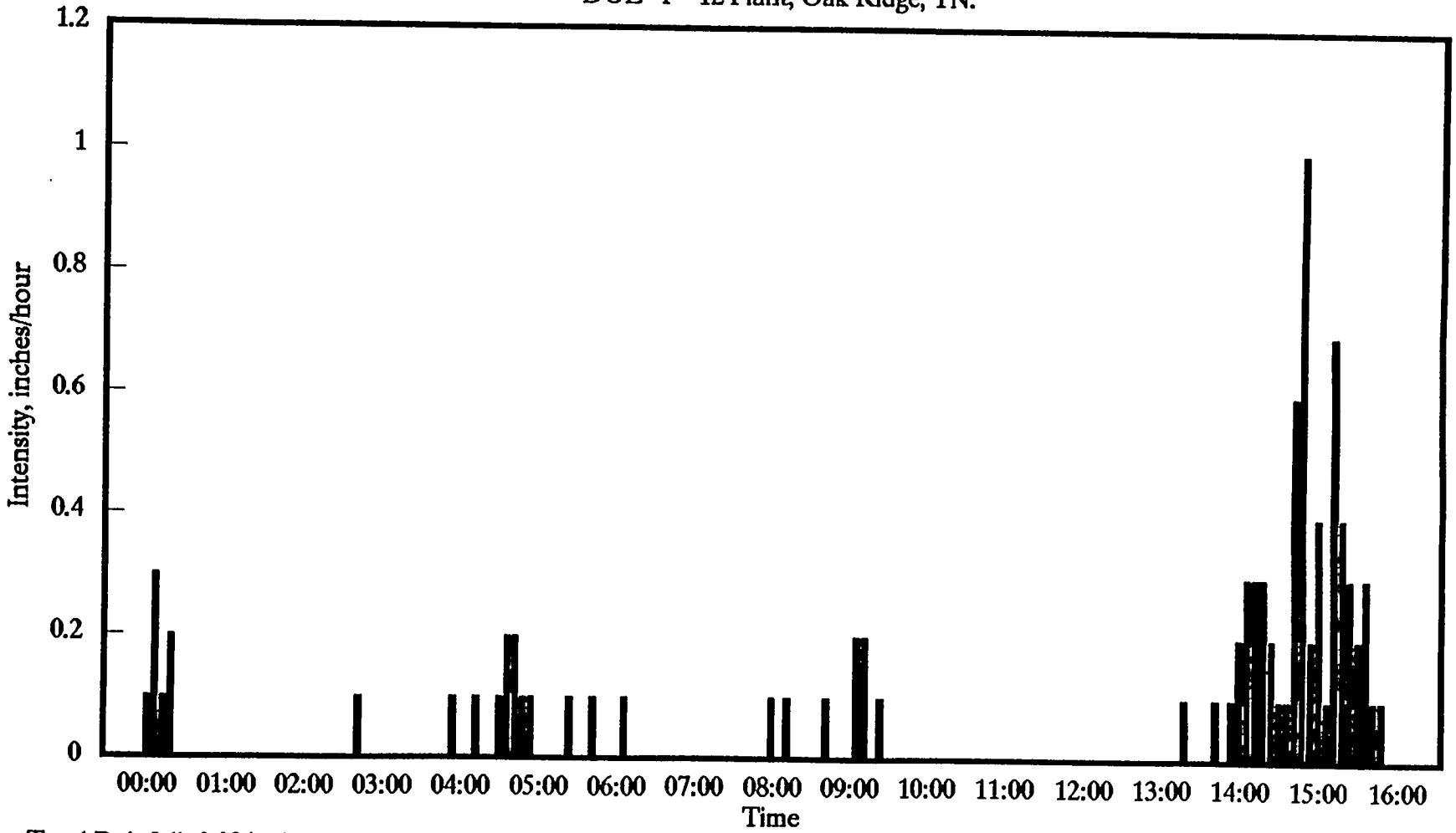

STATION E – WET WEATHER EVENT # 4
May 5, 1989
FLOW(CFS)
100
90
80
70
60
50
40
30
20
10
0
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
TIME


STATION K – WET WEATHER EVENT # 4
May 5, 1989
300
250
200
150
100
50
0
FLOW(CFS)
8.2 9.2 10 11 12 13 14 15 16 17 18 19 20 21 22 23 0.2 1.2 2.2 3.2
TIME

WET WEATHER EVENT #5

Rainfall Event # 5 – May 9, 1989

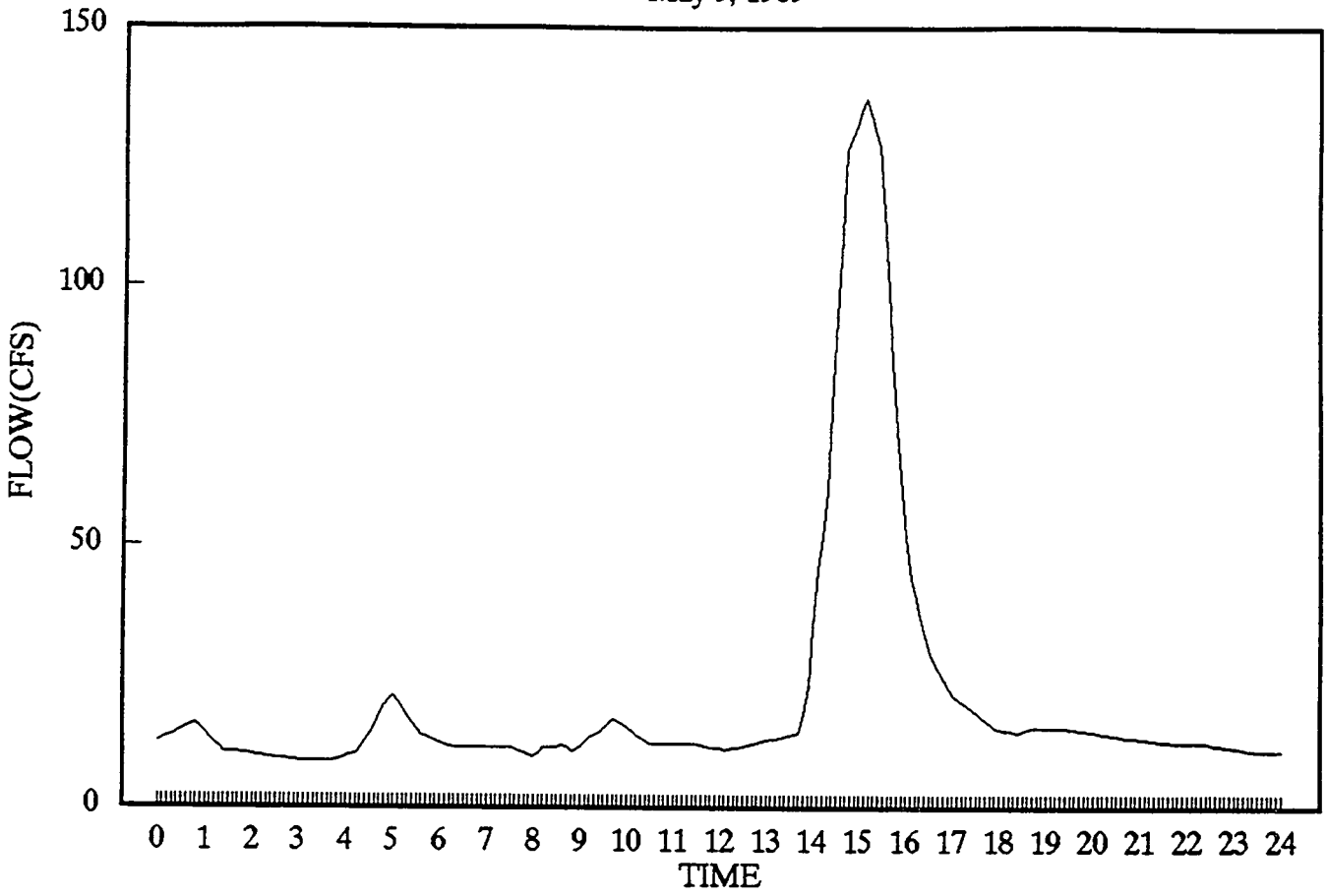
DOE Y–12 Plant, Oak Ridge, TN.



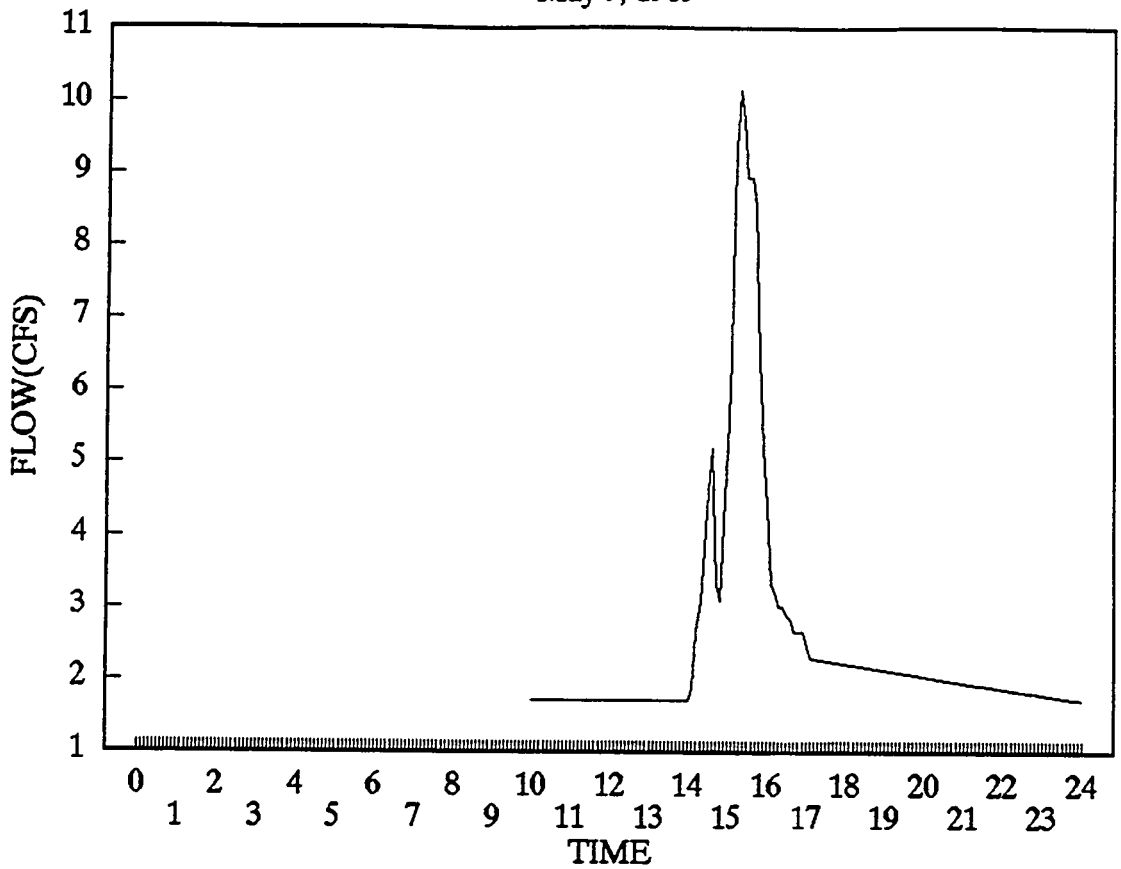
Total Rainfall: 0.92 inches

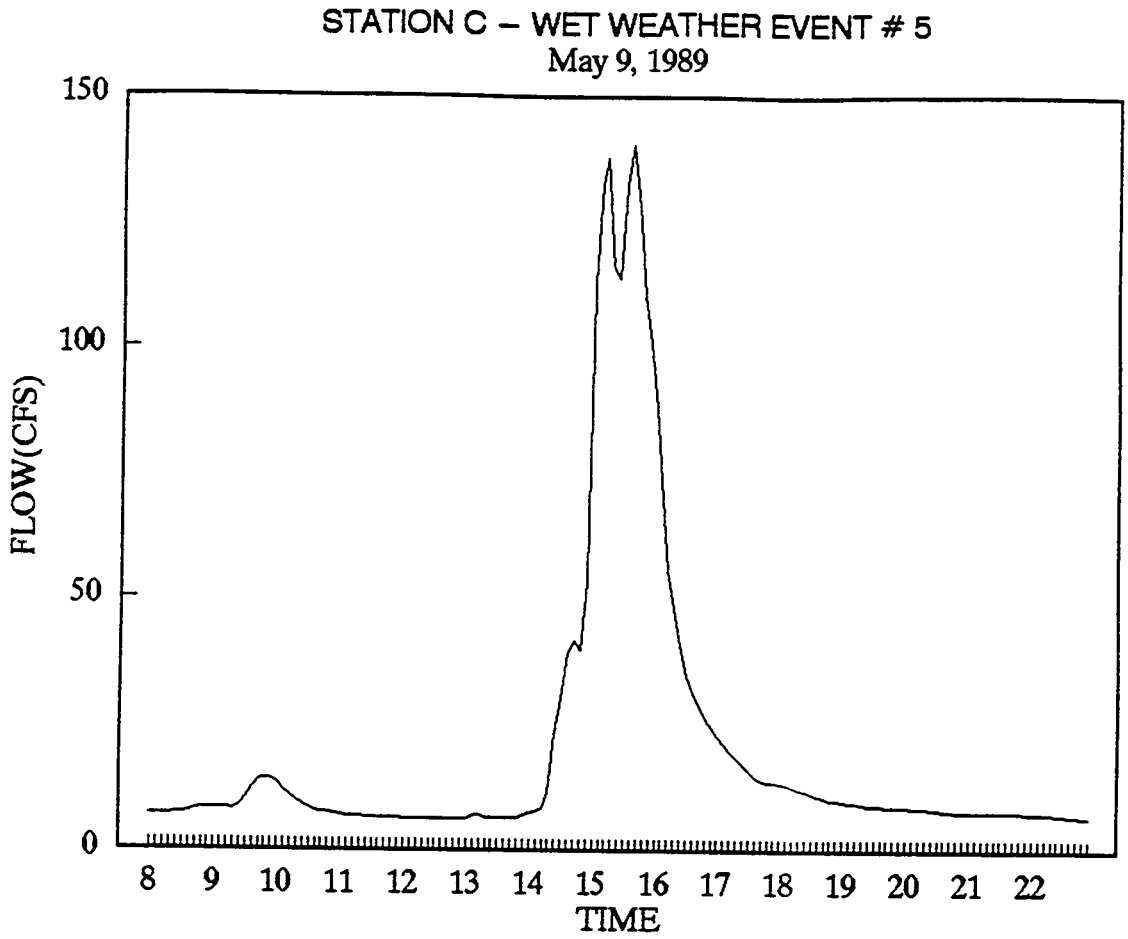
STATION A – WET WEATHER EVENT # 5

May 9, 1989

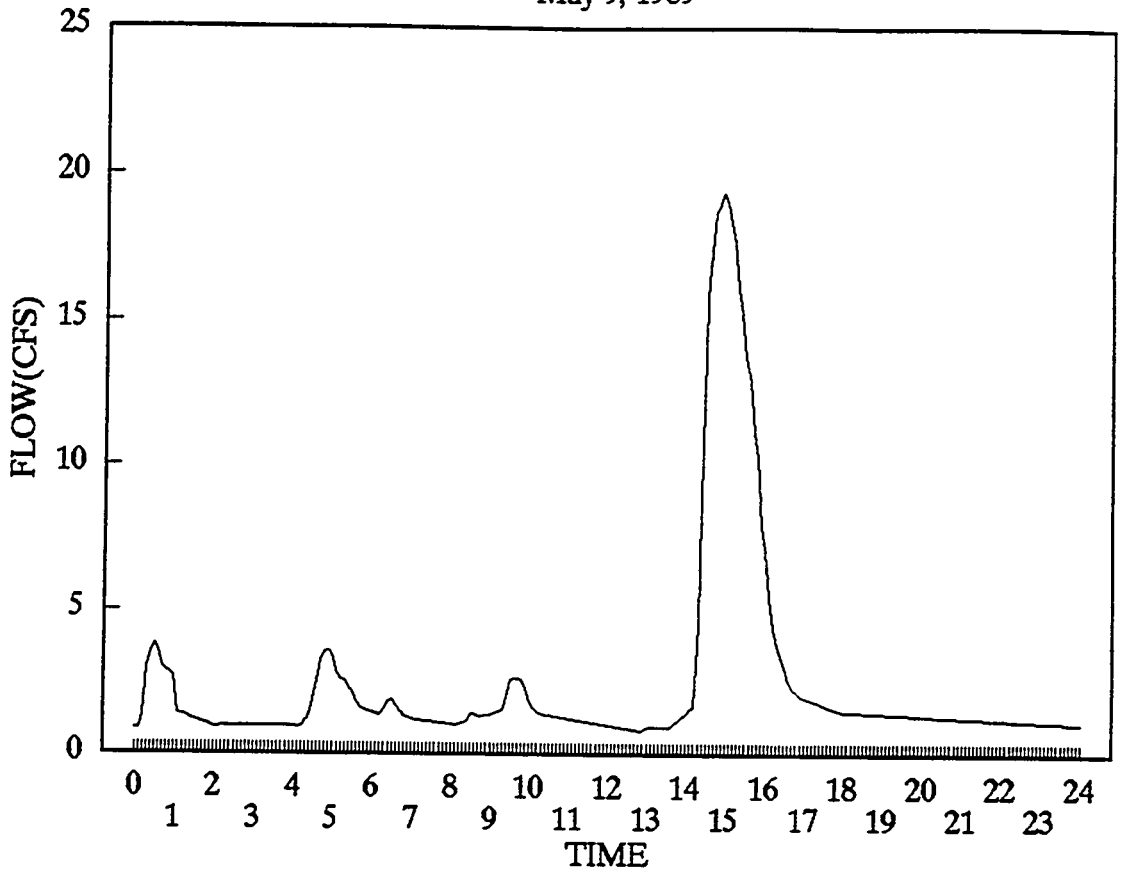


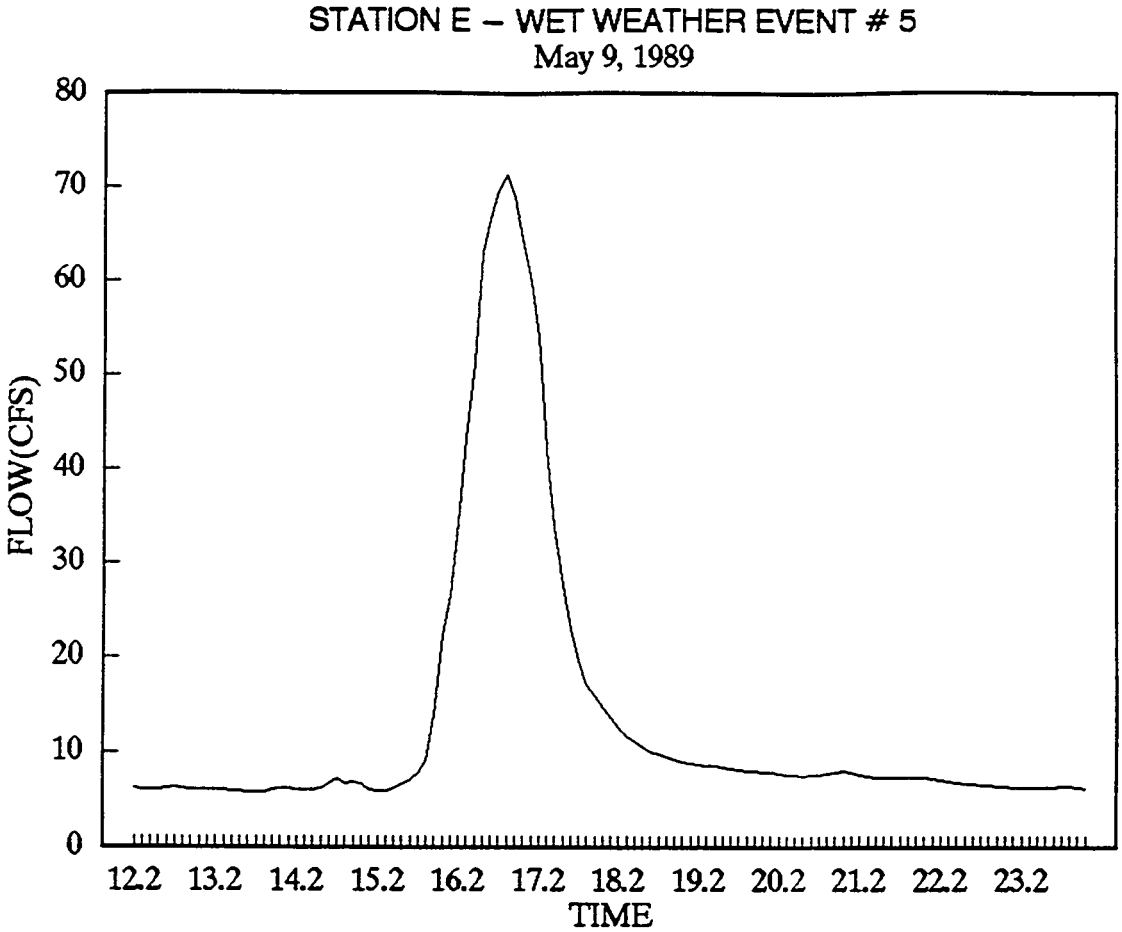
STATION B – WET WEATHER EVENT # 5
May 9, 1989

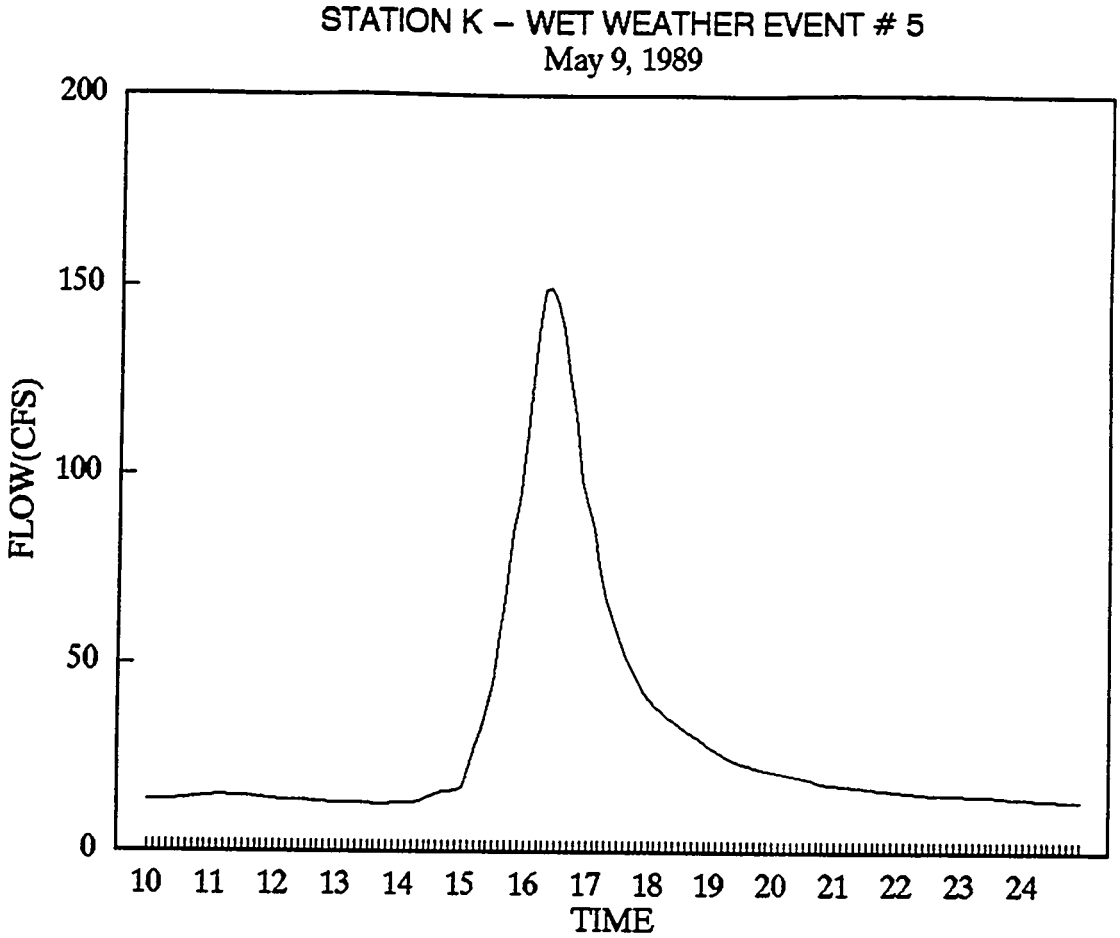



STATION C – WET WEATHER EVENT # 5
May 9, 1989
150
100
50
0
FLOW(CFS)
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
TIME

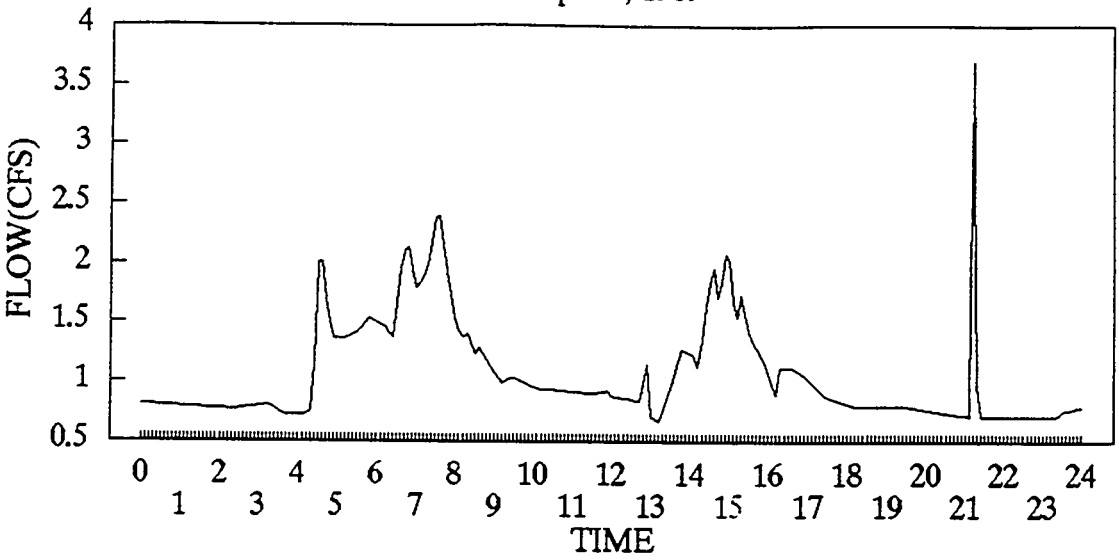
STATION D – WET WEATHER ENVENT # 5
May 9, 1989



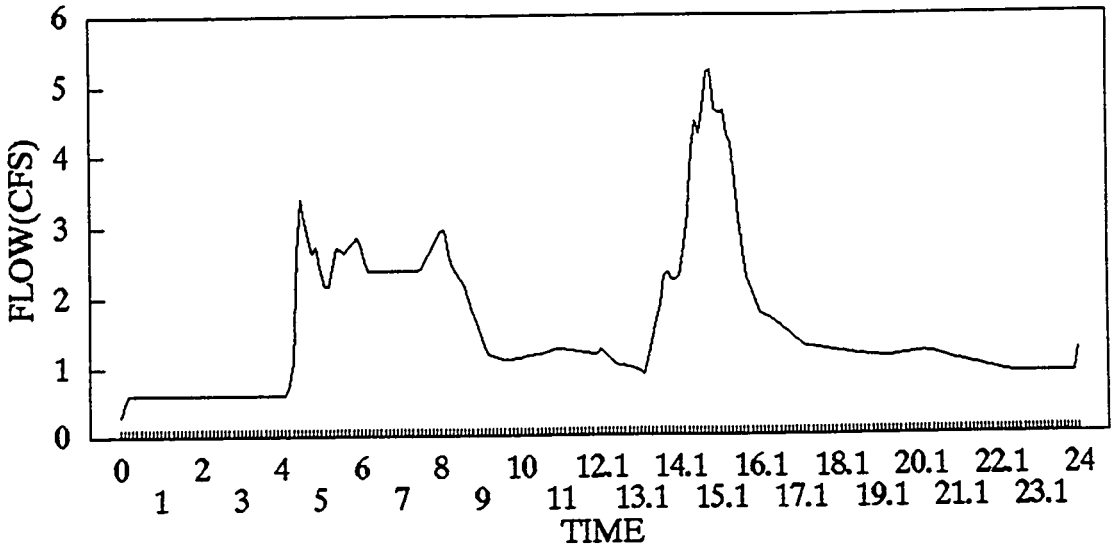

STATION E – WET WEATHER EVENT # 5
May 9, 1989
FLOW(CFS)
80
70
60
50
40
30
20
10
0
12.2
13.2
14.2
15.2
16.2
17.2
18.2
19.2
20.2
21.2
22.2
23.2
TIME

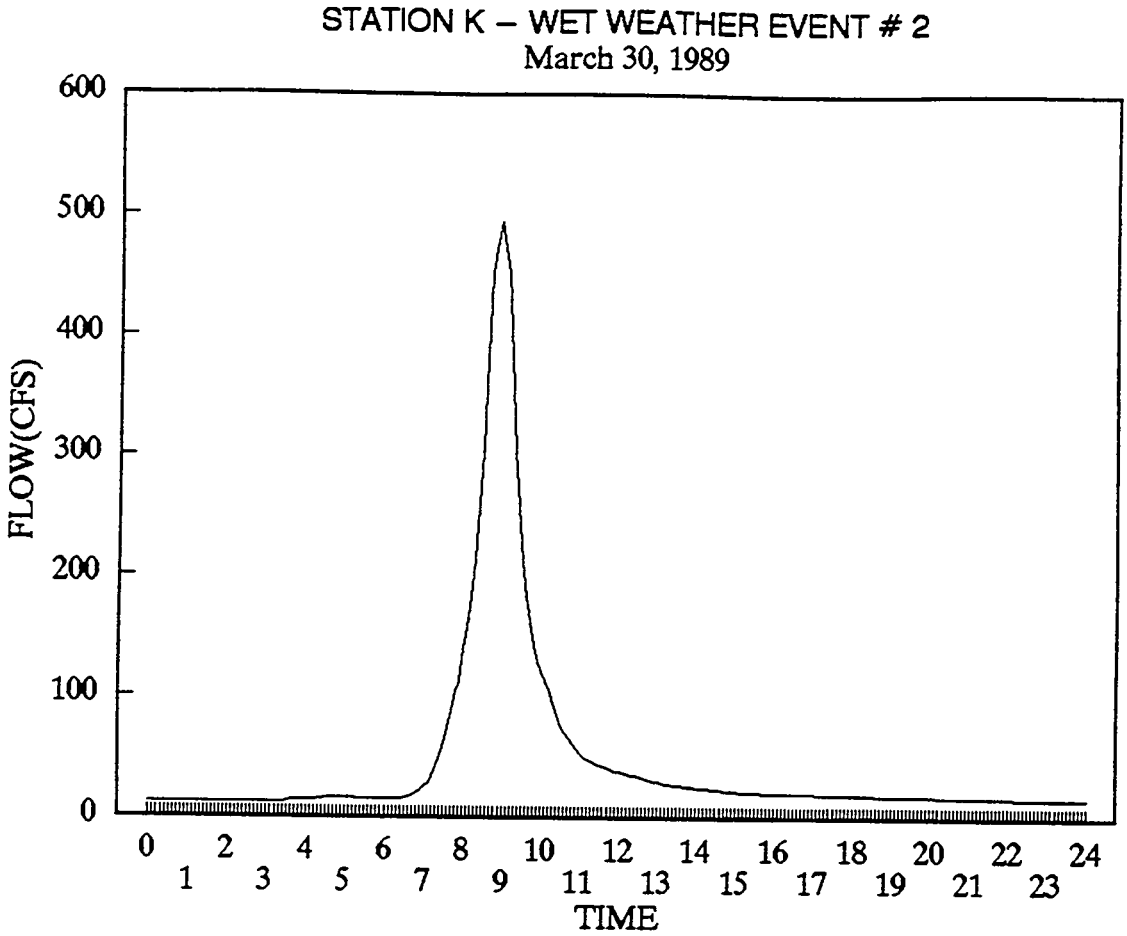

STATION K – WET WEATHER EVENT # 5
May 9, 1989
200
150
100
50
0
FLOW(CFS)
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME

STATION F – WET WEATHER EVENT # 3
April 4, 1989

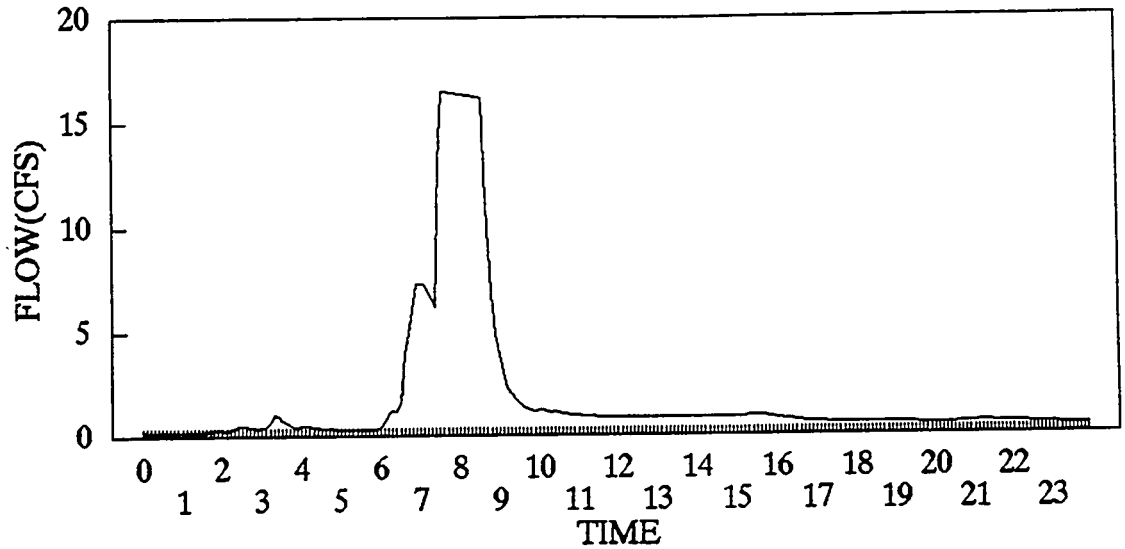


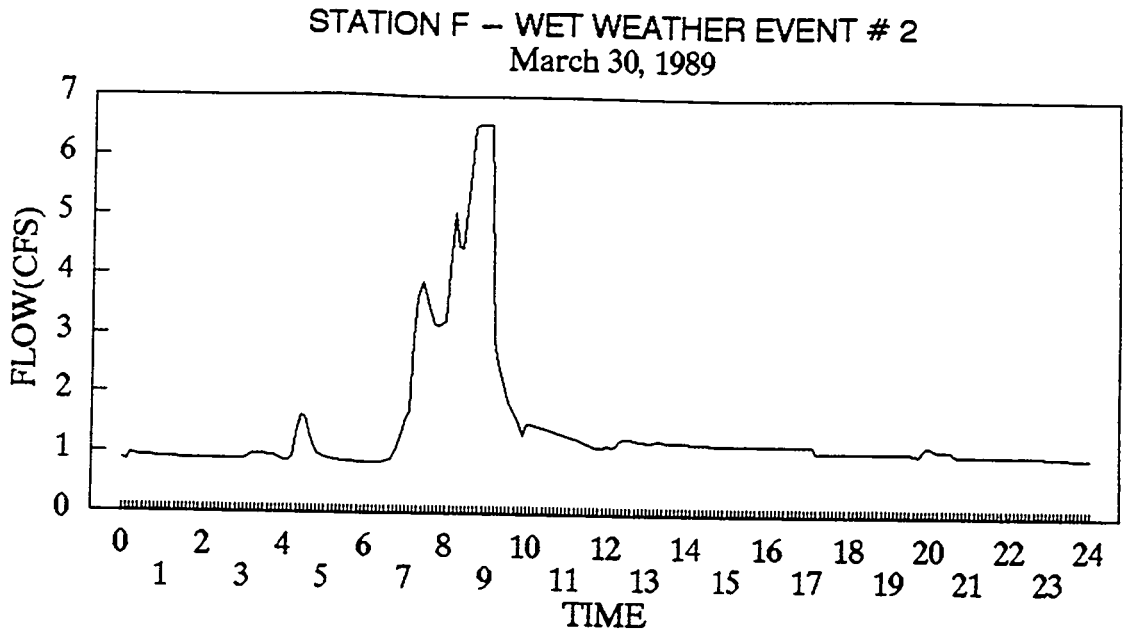
STATION J – WET WEATHER EVENT # 3
April 4, 1989




STATION K – WET WEATHER EVENT # 2
March 30, 1989
FLOW(CFS)
600
500
400
300
200
100
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME

STATION J – WET WEATHER EVENT # 2
March 30, 1989




STATION F – WET WEATHER EVENT # 2
March 30, 1989
FLOW(CFS)
0
1
2
3
4
5
6
7
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME

SECTION 4.0

GROUNDWATER DATA SUMMARY REPORT

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1.0 INTRODUCTION

1.1 OVERVIEW OF GROUNDWATER DATA ANALYSIS

Groundwater enters East Fork Poplar Creek (EFPC) through infiltration into storm drains located below the water table, springs and seeps discharging to the drainage system, and seepage directly to the creek. Contaminants present in groundwater may also enter EFPC through these conduits. For the purposes of area source modeling of contaminant migration into EFPC, all pertinent and available groundwater quality data, groundwater level data, and monitor well installation data were collected, reviewed, reduced, and analyzed by Camp Dresser & McKee Inc. (CDM). This report presents the results of CDM's analysis.

The period of record for the groundwater quality and level data used spans from 1986 through 1988. Average values over this period for water level and water quality parameters were calculated and are presented in **Table 1-1**. The locations of the monitor wells listed in Table 1-1 are shown in **Figure 1-1**. These data were used to produce the general groundwater level contour map presented in Section 2.0 and the groundwater quality information maps presented in Section 3.0. Recommendations as to where additional water level and/or water quality information would be most useful for estimating groundwater infiltration and contaminant migration into EFPC are presented in Section 4.0. Monitoring frequency recommendations are also noted in Section 4.0.

The data presented in this report are to be used to help calibrate the groundwater infiltration component in the Stream Management and Analysis Program (SMAP) developed for EFPC. SMAP was developed by CDM as a planning tool to evaluate the impacts of area source discharges within the Y-12 Plant area on water quality in EFPC. Given the general predictive nature, SMAP will be run using these groundwater level and quality data. The groundwater infiltration results will be compared to actual baseflow measurements for each of the subbasin areas delineated in SMAP, and adjustments in the underground drainage pipe characteristics of each subbasin will be made so that the simulated results more closely reproduce the observed results.

TABLE 1-1

COMPILED GROUNDWATER DATA
MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE

WELL I.D.	AQUIFER	NORTHING	EASTING	AVERAGE WATER ELEVATION (FT MSL)	AVERAGE MERCURY CONCENTRATION (UG/L)	AVERAGE COPPER CONCENTRATION (UG/L)	AVERAGE NITRATE CONCENTRATION (MG/L)
GW-100	U/WB	29758	50957	980.3	0.21	11.9	304.8
GW-101	U/WB	30241	51845	997.6	20.03	41.0	4414.5
GW-103	U/WB	30057	52291	996.6	1.90	3000.0	2054.0
GW-104	WB	30059	52303	997.2	13.30	205.0	6457.0
GW-105	U/WB	30416	52833	1008.4	ND	6.8	1596.1
GW-106	WB	30417	52844	1010.3	0.49	ND	1131.8
GW-107	U	30079	53207	990.5	0.25	6.8	35.2
GW-108	WB	30069	53207	989.2	0.23	ND	18326.7
GW-109	B	30055	53207	993.4	140.70	ND	19516.8
GW-115	WB	31073	52685	1040.7	0.20	ND	ND
GW-122	B	29741	51807	988.9	ND	ND	880.8
GW-123	B	29742	51794	998.7	ND	28.2	ND
GW-124	B	29656	52223	986.6	ND	ND	479.0
GW-125	B	29646	52208	992.6	0.23	6.0	19.0
GW-127	U/WB	29850	51828	991.1	0.89	120.0	21.6
GW-128	WB/B	30086	64422	899.7	---	---	---
GW-129	WB/B	29455	64844	924.6	---	---	---
GW-130	WB/B	28661	65090	904.5	---	---	---
GW-131	WB/B	27989	65059	913.8	---	---	---
GW-133	WB/B	30659	52637	1023.4	---	---	---
GW-134	WB/B	29741	52533	988.0	---	---	---
GW-135	WB/B	28731	53053	1020.6	---	---	---
GW-148	U	29202	63817	901.3	0.26	14.9	0.1
GW-149	WB	29201	63824	900.7	0.22	8.8	ND
GW-150	U	28959	64222	902.6	0.24	13.8	0.9
GW-151	B	28958	64232	902.5	ND	4.6	0.1
GW-152	U	28614	63718	902.4	0.23	18.7	1.8
GW-153	WB	28613	63728	902.5	0.20	6.4	1.5
GW-154	U	28987	63346	901.0	1.88	7.3	0.4
GW-167	U	28661	65146	903.9	---	---	---
GW-168	B	28699	65167	903.4	---	---	---
GW-173	WB	28271	59472	966.0	0.27	39.8	1.4
GW-174	WB	28205	59215	994.0	ND	79.0	0.4
GW-175	B	28676	58686	962.0	ND	---	0.3
GW-176	WB	28294	58450	1007.7	0.23	27.1	0.7
GW-177	WB	28483	57497	1039.7	ND	30.5	0.2
GW-178	B	28552	57808	1052.9	ND	---	0.3
GW-179	B	28522	58569	1016.1	0.21	250.1	0.2
GW-180	B	28494	59220	988.5	ND	---	0.1
GW-181	B	28048	57736	976.4	ND	---	ND
GW-191	WB	30780	54279	1004.9	ND	16.2	ND
GW-192	WB	30772	54277	1002.5	ND	9.4	ND
GW-194	U	30583	54218	988.3	ND	15.8	0.2
GW-195	U	30573	54089	995.6	0.27	194.3	ND
GW-196	U	30829	53906	1017.6	0.23	114.8	0.2
GW-197	U	30734	54087	999.6	0.22	36.3	ND
GW-198	WB	30455	62466	943.3	0.22	6.4	1.0
GW-199	WB	30283	62464	943.7	ND	13.0	0.5

TABLE 1-1

COMPILED GROUNDWATER DATA
MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE

WELL I.D.	AQUIFER	NORTHING	EASTING	AVERAGE WATER ELEVATION (FT MSL)	AVERAGE MERCURY CONCENTRATION (UG/L)	AVERAGE COPPER CONCENTRATION (UG/L)	AVERAGE NITRATE CONCENTRATION (MG/L)
GW-200	WB	30373	61906	952.0	ND	4.1	ND
GW-201	WB	30378	61914	949.3	ND	4.6	1.7
GW-202	WB	30597	61987	957.3	ND	9.5	0.1
GW-208	B	31612	64007	894.0	---	---	---
GW-220	WB	28949	64225	902.6	ND	4.8	1.0
GW-222	WB	28954	63324	903.0	0.38	5.2	3.1
GW-223	B	28938	63311	903.0	ND	ND	1.1
GW-236	WB	29712	50453	972.1	1.33	---	656.2
GW-239	B	28715	65089	903.7	---	---	---
GW-240	WB	28604	63726	903.1	ND	4.8	1.9
GW-243	WB	30155	51990	997.1	37.91	1700.0	6856.0
GW-244	WB	30060	51974	996.7	2.15	---	5813.8
GW-245	WB	29977	51992	995.3	0.31	ND	3473.8
GW-246	WB	29992	52098	995.2	2.94	---	3811.0
GW-247	WB	30005	52181	995.5	0.21	---	3519.5
GW-251	U	29467	53843	984.5	0.30	700.0	88.8
GW-252	U	29326	53920	1000.3	.23	94.0	1.5
GW-253	U	29404	54057	994.6	2.92	137666.7	771.6
GW-254	WB	29546	54132	966.9	1.15	347.3	632.8
GW-255	WB	29330	53906	999.0	0.20	34.2	12.3
GW-256	U	29542	54116	985.0	2.28	12633.3	393.2
GW-261	U	30914	53094	1029.4	0.27	105.2	0.2
GW-262	WB	30913	53106	1030.3	0.20	74.0	ND
GW-263	U	30885	53674	1025.2	ND	17.9	0.5
GW-264	WB	30872	53670	1025.3	0.20	77.1	ND
GW-265	U	30763	53308	1019.4	0.20	28.6	0.1
GW-266	U	30699	53392	1015.3	ND	15.5	ND
GW-267	U	30700	53464	1014.5	ND	5.6	0.3
GW-268	U	30616	53608	1008.6	0.23	36.0	ND
GW-269	U	30649	53779	1006.1	ND	27.1	0.2
GW-270	U	30424	53236	1005.0	0.24	27.2	344.2
GW-271	WB	30435	53234	1006.0	ND	13.2	0.3
GW-272	U	30485	53737	1000.2	0.20	20.7	1.1
GW-273	U	30201	53261	997.3	0.20	61.4	358.3
GW-274	U	30152	53673	989.7	1.24	22.3	11250.9
GW-275	WB	30151	53688	992.1	0.31	15.9	9647.9
GW-276	U	29926	52557	994.4	1.11	356.0	1190.3
GW-277	WB	29937	52565	994.9	ND	5.0	2000.2
GW-278	U	29649	53593	988.5	ND	21.9	2.3
GW-279	WB	29639	53591	988.0	ND	19.1	5.4
GW-280	B	29630	53589	987.0	ND	9.5	62.6
GW-313	B	29351	52016	988.0	ND	4.1	3.0
GW-314	B	29419	52125	988.3	ND	4.1	9.6
GW-315	B	29455	52268	988.9	ND	ND	17.8
GW-316	B	29336	52412	990.1	ND	7.6	0.2
GW-317	B	29285	52192	989.2	0.22	61.8	0.1
GW-322	B	28241	58912	976.9	ND	---	0.2
GW-323	B	28985	52106	1043.9	ND	7.1	ND

TABLE 1-1

COMPILED GROUNDWATER DATA
MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE

WELL I.D.	AQUIFER	NORTHING	EASTING	AVERAGE WATER ELEVATION (FT MSL)	AVERAGE MERCURY CONCENTRATION (UG/L)	AVERAGE COPPER CONCENTRATION (UG/L)	AVERAGE NITRATE CONCENTRATION (MG/L)
GW-324	B	30307	50700	986.6	---	---	---
GW-325	U	30306	50689	985.2	---	---	---
GW-331	U	30054	54827	969.9	---	---	---
GW-332	U	30058	54882	971.5	---	---	---
GW-333	U	30090	54878	972.2	---	---	---
GW-334	U	30117	54829	971.9	---	---	---
GW-335	U	30123	54692	973.6	---	---	---
GW-336	U	30057	54694	975.7	---	---	---
GW-337	U	30057	54519	976.7	---	---	---
GW-338	U	30134	54430	978.3	---	---	---
GW-345	U	30029	50700	976.1	ND	---	1917.5
GW-346	B	30030	50703	977.8	ND	---	2740.0
GW-347	U	29292	50750	980.6	ND	---	0.2
GW-348	B	29294	50763	977.4	ND	---	15.5
GW-349	U	29766	53588	988.2	ND	---	ND
GW-350	B	29764	53595	988.2	ND	---	0.2
GW-511	B	28056	57739	976.8	ND	---	ND
GW-380	U	28714	62938	902.6	0.40	---	4.4
GW-381	B	28715	62947	902.4	ND	---	ND
GW-382	B	28716	62956	901.4	ND	---	2.0
GW-383	U	29201	63522	901.0	ND	---	ND
GW-384	B	29216	63529	898.5	ND	---	ND
GW-385	B	29208	63526	905.6	ND	---	ND
1003	WB	29939	51595	989.6	---	---	---
1004	WB	29732	50456	971.5	---	---	---
1005	U	29579	51064	981.4	---	---	---
1006	U	30056	52202	997.2	---	---	---
1007	U	29995	52310	996.0	---	---	---
1008	U	29933	52128	995.1	---	---	---
1009	U	30096	52418	998.2	---	---	---
1010	U	30556	52206	1010.7	---	---	---
1011	U	29981	52016	995.6	---	---	---
1080	B	28392	57782	1022.7	ND	7.0	0.3
53-1A	U	30176	53815	989.6	0.20	26.6	3117.1
54-1A	U	30010	54703	973.3	---	---	---
54-2A	U	30009	54855	970.7	---	---	---
55-1A	WB	30470	55014	975.8	---	---	---
55-1B	WB	30469	55010	975.7	---	---	---
55-1C	WB/B	30467	55013	975.3	---	---	---
55-2A	U/WB	30085	55195	968.2	---	---	---
55-2B	WB	30085	55199	968.6	---	---	---
55-2C	WB/B	30085	55203	968.1	---	---	---
55-3A	WB	29959	55695	963.0	---	---	---
55-3B	WB	29959	55699	961.4	---	---	---
55-3C	WB/B	29959	55703	962.4	---	---	---
55-4B	WB	30763	55695	994.6	---	---	---
55-4C	WB/B	30763	55698	991.0	---	---	---
55-5A	U	30698	55557	956.2	---	---	---

TABLE 1-1

COMPILED GROUNDWATER DATA
MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE

WELL I.D.	AQUIFER	NORTHING	EASTING	AVERAGE WATER ELEVATION (FT MSL)	AVERAGE MERCURY CONCENTRATION (UG/L)	AVERAGE COPPER CONCENTRATION (UG/L)	AVERAGE NITRATE CONCENTRATION (MG/L)
55-6A	U	30667	55907	979.9	---	---	---
56-1A	WB	30351	56079	960.8	---	---	---
56-1C	B	30355	56077	962.8	---	---	---
56-2A	U	29881	56229	955.7	---	---	---
56-2B	U	29884	56226	955.0	---	---	---
56-2C	B	29885	56231	956.1	---	---	---
56-3A	U	29867	56453	952.7	---	---	---
56-3B	U	29867	56448	953.2	---	---	---
56-3C	WB	29859	56449	952.6	---	---	---
56-4A	U/WB	29820	56802	952.9	---	---	---
56-4B	WB	29815	56799	952.4	---	---	---
56-4C	B	29815	56804	952.1	---	---	---
56-5A	U	29380	56824	957.5	---	---	---
56-5B	U	29382	56828	940.5	---	---	---
56-5C	WB/B	29375	56819	937.5	---	---	---
56-6A	U	29783	56915	948.4	---	---	---
56-7A	U	29449	56814	941.4	---	---	---
56-8A	U	29466	56456	944.4	---	---	---
56-9A	U	29533	56043	952.9	---	---	---
58-2A	U	29500	58772	930.1	---	---	---
59-1A	WB	29831	59885	941.6	---	---	---
59-1B	U	29835	59885	942.0	---	---	---
59-1C	WB	29834	59882	942.4	---	---	---
60-1A	U	29226	60200	917.6	---	---	---
60-1B	U	29225	60204	917.5	---	---	---
60-2A	U	29097	60119	918.8	---	---	---

LEGEND

U - Unconsolidated Overburden
WB - Weathered Bedrock
B - Unweathered Bedrock

ND - Not Detected
--- - Not Measured

NOTE: Most of the water level and water quality data used to generate this table was supplied by H & R Technical Associates, Inc., Oak Ridge Tennessee. The rest of the data came from the following documents:

- Haase, C.S., Gillis, G.A., and King, H.L., 1987.
- Geraghty & Miller Inc., 1988.
- Geraghty & Miller Inc., 1989a.
- Geraghty & Miller Inc., 1989b.
- Geraghty & Miller Inc., 1989c.

1.2 APPROACH TO DATA REDUCTION

Data reduction consisted of averaging the water level and water quality measurements provided to CDM by Martin Marietta Energy Systems, at each monitor well in the drainage basin over the period of record (1986-1988). Because SMAP is a planning tool designed for general predictive purposes, average water level and water quality values are used to calibrate the groundwater infiltration component. Before data reduction proceeded, however, the data set was reviewed for possible erroneous or unrepresentative measurements which could unduly bias the average calculation. These measurements were removed from the data set prior to data reduction. For example, some water level measurements were taken after the well had been purged and sampled for water quality parameters. If the groundwater level in the well does not recover quickly, these water level measurements are not representative of the natural groundwater level. Removal of these measurements from the data set is therefore needed to prevent a biased calculation.

Determining the average water level elevation in each well was a straight forward calculation using the water level data as measured. Determining the average chemical concentrations in each well, however, required assumptions to be made in each case where the chemical concentration was below the detection level. For the purposes of this analysis, a conservative approach was taken. Chemicals not detected in some samples but detected in other samples were assumed to be at a concentration equal to the detection level when not detected. Chemicals not detected in any of the samples were assigned a non-detect label instead of calculating an average value.

2.0 GROUNDWATER LEVELS

The amount of groundwater entering the drainage system and eventually entering into EFPC depends on the groundwater level. The higher the water table, the greater the groundwater infiltration. Therefore, analysis of groundwater levels in the EFPC drainage basin is essential to area source modeling of contaminant migration into EFPC.

Average groundwater levels are posted and general groundwater level contours are drawn in **Figure 2-1**. Note that where monitor well clusters are present, only the water level in the uppermost well is posted. Note also that this groundwater level contour map provides a very simplistic two-dimensional representation of shallow groundwater flow in the EFPC drainage basin and should not be used to determine detailed contaminant assessments such as specific migration pathways or travel times. The groundwater flow system in the EFPC drainage basin is a very complex three-dimensional system and although this contour map indicates the general areal shallow groundwater flow directions, contaminant migration may take a much different path than indicated by this figure.

As can be seen in Figure 2-1, groundwater flow at the Y-12 Plant is generally toward EFPC. EFPC acts as a sink providing a mechanism for groundwater to discharge to surface water. The groundwater divide between the EFPC drainage basin and the Bear Creek drainage basin to the west is located around the S-3 Pond area.

Based on the groundwater contours presented in Figure 2-1, the water levels presented in **Table 2-1** were selected to represent average groundwater levels for each subbasin area in SMAP.

FIGURE 2-1

TABLE 2-1

AVERAGE SUBBASIN GROUNDWATER LEVELS
MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Water Level (ft MSL)
A	915
B	950
C	925
D	950
E	955
F	950
G	960
H	975
I	990
J	1,000
K	915

3.0 GROUNDWATER QUALITY

Based on dry weather event water quality data for EFPC (CDM, 1990a), three chemicals of concern were identified for this groundwater analysis. As indicated in Table 1-1, these chemicals include nitrate, mercury, and copper. The presence of these chemicals in the EFPC groundwater basin is discussed in the following sections.

3.1 NITRATE

Average nitrate concentrations in groundwater are posted in **Figure 3-1**. Note that where monitor well clusters are present, only the largest average concentration is posted. Based on the available data, the only part of the EFPC drainage basin identified as having a nitrate problem in groundwater is the western part (Subbasins I and J). Wells in these two subbasins are the only wells in the EFPC drainage area having average nitrate concentrations greater than 10 milligrams per liter (mg/l), which is the primary drinking water standard for nitrate. However, there are data gaps in the groundwater nitrate concentration data base. Subbasins B, D, F, G, and H are void of any groundwater quality data, and subbasins A, C, and E are void of any groundwater quality data in the main plant area.

3.2 MERCURY

Average mercury concentrations in groundwater are posted in **Figure 3-2**. Note that where monitor well clusters are present, only the largest average concentration is posted. Based on the available data, the only subbasins identified as having possible mercury contamination problems in groundwater are subbasins A, I, J, and K. Wells in these four subbasins are the only wells in the EFPC drainage area having average mercury concentrations greater than 0.3 micrograms per liter (ug/l), which is the apparent groundwater background concentration for mercury based on the data presented in Table 1-1. However, there are data gaps in the groundwater mercury concentration data base. As noted above, subbasins B, D, F, G, and H are void of any groundwater quality

data, and subbasins A, C, and E are void of any groundwater quality data in the main plant area.

3.3 COPPER

Average copper concentrations in groundwater are posted in **Figure 3-3**. Note that where monitor well clusters are present, only the largest average concentration is posted. Based on the available data, the only subbasins identified as having possible copper contamination problems in groundwater are subbasins A, C, E, I, J, and K. Wells in these six subbasins have average copper concentrations greater than 12 ug/l, which is the Ambient Water Quality Criteria freshwater chronic toxicity concentration. Since these six subbasins are the only subbasins monitored for groundwater quality, however, the entire EFPC drainage basin may have a copper contamination problem in groundwater. As noted above subbasins B, D, F, G, and H are void of any groundwater quality data, and subbasins A, C, and E are void of any groundwater quality data in the main plant area.

4.0 CONCLUSIONS

The following observations and conclusions have been reached after reviewing the initial results of the EFPC area source sampling and flow measurement program (CDM, 1990b):

- Groundwater infiltration to EFPC from subbasins D, G, and H appears to be minimal.
- Significant nitrate loads to EFPC are coming from subbasins A, J, and K. Nitrate contamination in groundwater in subbasin J is already well documented. The presence or absence of significant nitrate contamination in groundwater in subbasins A and K, however, has not been documented.
- Significant mercury loads to EFPC are coming from subbasins A, E, and K. The presence or absence of significant mercury contamination in groundwater in these subbasins has not been documented.
- Significant copper loads to EFPC are coming from subbasins B, E, F, and I. Copper contamination in groundwater in subbasin I is already well documented. The presence or absence of significant copper contamination in groundwater in subbasins B, E, and F, however, has not been documented.
- Several parameters of concern (chlorine, copper, lead, manganese, mercury, nitrate, and total dissolved solids) have been found to exceed applicable water quality standards during the EFPC area source dry weather sampling and flow measurement program to date (CDM, 1990a).

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SECTION 5.0

RUNOFF MODEL APPLICATION REPORT

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1.0 INTRODUCTION

A stormwater runoff simulation model of the East Fork Poplar Creek (EFPC) was previously developed by CDM. The program used, herein called RUNOFF, was adapted by CDM from the USEPA Storm Water Management Model. The primary use of the model in this study is to prepare runoff volumes generated by different observed and synthetic rainfall events for input to the Stream Management Analysis Program (SMAP).

The initial model setup and calibration of RUNOFF are described in detail in Section 3.0 of the Comprehensive Sampling Program for East Fork Poplar Creek Area Source Pollution Assessment and Control Plan (CDM, 1987).

The model was updated to represent changes made in the EFPC watershed drainage system since the previous modeling effort. The model was then calibrated/verified to simulate flows for the five wet-weather events monitored in the comprehensive sampling program. Finally, the RUNOFF model is applied to develop inputs for SMAP to predict area source concentrations and loads from various areas in Y-12. SMAP requires total runoff volumes which it then applies to event mean concentrations to estimate the resulting areas source concentration and load contributions to EFPC.

2.0 MODEL UPDATE

The RUNOFF model of EFPC was modified and updated to represent the following changes that have taken place in the Y-12 drainage system:

- clearing of hillsides.
- Polaris parking lot.
- drainage system modifications upstream of the North-South pipe.
- model extended to Station K where EFPC leaves the Y-12 Plant.
- New Hope Pond replaced by Lake Reality.

The updated model subbasins are shown on Figure 1 and the model network is displayed on Figure 2.

Subbasin and pipe inputs determine the runoff characteristics of the basin. The updated data inputs for the subbasins and pipes are shown on Tables 1 and 2, respectfully.

TABLE 1
SUMMARY OF EAST FORK POPLAR CREEK SUBBASINS

SUBCATCH-MENT NO.	GUTTER OR INLET	WIDTH (FT)	AREA (AC)	PERCENT IMPERV.	SLOPE (FT/FT)	MANNINGS COEF. IMPERV.	MANNINGS COEF. PERV.
5000	60115	702	2.82	90	0.035	0.019	0.2
5002	60110	1322	22.76	2	0.200	0.014	0.2
5003	5025	578	1.99	70	0.020	0.026	0.2
5004	5015	889	14.29	1	0.214	0.014	0.2
5010	5010	518	4.52	90	0.013	0.019	0.2
5050	5050	546	2.32	60	0.027	0.014	0.2
5055	5055	308	1.66	90	0.021	0.028	0.2
5060	5060	565	2.01	100	0.032	0.040	0.2
5065	5065	166	0.97	100	0.012	0.074	0.2
5070	5071	392	2.52	70	0.018	0.039	0.2
5075	5075	445	4.39	100	0.018	0.023	0.2
SUBTOTAL			60.25	34.2			
10001	10010	525	2.71	60	0.020	0.014	0.2
10002	10020	1076	8.40	60	0.013	0.050	0.2
10003	10010	1465	27.58	1	0.152	0.014	0.2
10010	10510	663	10.04	60	0.450	0.057	0.2
10030	10500	319	2.71	40	0.013	0.057	0.2
10050	10520	503	5.48	60	0.008	0.057	0.2
10055	10530	314	3.71	80	0.029	0.036	0.2
10060	10530	571	8.26	40	0.045	0.057	0.2
10065	10565	560	6.11	80	0.053	0.079	0.2
10120	10540	673	1.93	50	0.120	0.083	0.2
10130	10550	233	1.31	10	0.049	0.014	0.2
10160	10560	425	6.19	1	0.181	0.014	0.2
10170	10570	632	5.80	1	0.225	0.014	0.2
10180	10600	306	2.99	60	0.028	0.028	0.2
10190	10610	578	4.78	50	0.022	0.031	0.2
10200	10630	1119	6.68	10	0.228	0.014	0.2
SUBTOTAL			104.68	33.0			
15000	15005	455	1.62	80	0.052	0.025	0.2
15001	15105	1133	8.06	90	0.026	0.043	0.2
15060	15035	558	4.87	90	0.023	0.043	0.2
15070	15075	513	3.06	100	0.046	0.023	0.2
15100	15095	389	2.10	85	0.030	0.034	0.2
15160	15155	487	5.63	80	0.030	0.036	0.2
SUBTOTAL			25.34	87.9			

TABLE 1 (CONTINUED)
SUMMARY OF EAST FORK POPLAR CREEK SUBBASINS

SUBCATCH-MENT NO.	GUTTER OR INLET	WIDTH (FT)	AREA (AC)	PERCENT IMPERV.	SLOPE (FT/FT)	MANNINGS COEF. IMPERV.	MANNINGS COEF. PERV.
20001	20001	1073	7.88	80	0.028	0.068	0.2
20002	20002	431	3.56	90	0.039	0.014	0.2
20004	20000	761	9.61	1	0.273	0.014	0.2
20005	20005	471	2.81	30	0.046	0.014	0.2
20015	20210	1321	4.70	40	0.019	0.014	0.2
20020	20011	446	5.58	30	0.037	0.014	0.2
20030	20011	625	5.60	30	0.041	0.028	0.2
20040	20031	599	6.87	90	0.014	0.014	0.2
20130	20121	788	9.59	40	0.028	0.014	0.2
20160	20160	982	8.57	10	0.263	0.014	0.2
20200	20200	767	6.16	10	0.287	0.014	0.2
20210	20004	563	4.65	80	0.050	0.036	0.2
20230	20220	433	4.60	50	0.039	0.014	0.2
20250	20231	361	3.98	85	0.104	0.014	0.2
20310	20300	758	3.83	80	0.082	0.014	0.2
20320	20311	1280	7.64	1	0.385	0.014	0.2
20340	20300	666	8.33	90	0.033	0.071	0.2
20350	20350	1140	11.80	0	0.135	0.014	0.2
20360	20360	488	2.52	80	0.053	0.089	0.2
SUBTOTAL			118.28	41.6			
25001	25000	1113	10.99	55	0.037	0.053	0.2
25003	25000	965	17.73	1	0.219	0.014	0.2
25020	25020	338	3.03	80	0.046	0.036	0.2
25040	25040	396	4.50	80	0.033	0.014	0.2
SUBTOTAL			36.25	33.8			
30001	30000	944	8.45	60	0.039	0.071	0.2
30002	30000	1006	15.70	1	0.272	0.014	0.2
30020	30001	183	1.51	90	0.039	0.014	0.2
30040	30021	310	3.52	90	0.036	0.024	0.2
30060	30041	488	3.47	80	0.039	0.057	0.2
30070	30070	327	3.12	40	0.022	0.014	0.2
30120	30121	272	2.06	85	0.055	0.075	0.2
SUBTOTAL			37.83	41.0			

TABLE 1 (CONTINUED)
SUMMARY OF EAST FORK POPLAR CREEK SUBBASINS

SUBCATCH-MENT NO.	GUTTER OR INLET	WIDTH (FT)	AREA (AC)	PERCENT IMPERV.	SLOPE (FT/FT)	MANNINGS COEF. IMPERV.	MANNINGS COEF. PERV.
35000	35000	311	1.25	40	0.046	0.014	0.2
35002	35010	544	4.93	50	0.030	0.014	0.2
35003	35000	1017	14.59	1	0.200	0.014	0.2
35004	35010	677	6.99	1	0.200	0.014	0.2
35030	35030	672	5.40	90	0.051	0.071	0.2
35050	35231	733	5.55	80	0.024	0.068	0.2
35110	35101	556	5.51	90	0.035	0.081	0.2
35300	35300	560	6.36	30	0.036	0.043	0.2
35340	35311	370	4.54	90	0.022	0.052	0.2
35400	35400	891	10.74	80	0.020	0.014	0.2
35405	35400	242	2.36	70	0.028	0.014	0.2
35410	35461	3274	16.46	10	0.187	0.014	0.2
35420	35461	972	2.78	100	0.049	0.014	0.2
35500	35501	7260	3.50	80	0.038	0.036	0.2
SUBTOTAL			90.96	45.0			
40001	40000	412	3.78	60	0.033	0.014	0.2
40010	40001	528	2.00	40	0.026	0.036	0.2
40040	40021	355	2.69	90	0.036	0.014	0.2
40050	40021	287	2.50	60	0.040	0.071	0.2
40100	40071	503	4.99	20	0.069	0.014	0.2
40150	40150	535	8.59	60	0.029	0.057	0.2
40200	40005	554	6.29	20	0.030	0.014	0.2
40210	40000	658	10.58	1	0.179	0.014	0.2
40220	40035	725	5.49	40	0.036	0.068	0.2
40230	40035	478	10.14	1	0.135	0.014	0.2
40240	40025	655	4.89	60	0.046	0.043	0.2
40500	40065	342	2.26	70	0.028	0.051	0.2
40510	40095	160	0.57	100	0.045	0.091	0.2
40520	40105	480	8.05	80	0.041	0.068	0.2
40530	40135	575	11.15	90	0.026	0.014	0.2
40540	40155	1979	39.31	0	0.227	0.014	0.2
40550	40200	567	4.62	70	0.039	0.075	0.2
40600	40055	278	1.31	70	0.059	0.014	0.2
SUBTOTAL			129.21	32.9			

TABLE 1 (CONTINUED)
SUMMARY OF EAST FORK POPLAR CREEK SUBBASINS

SUBCATCH-MENT NO.	GUTTER OR INLET	WIDTH (FT)	AREA (AC)	PERCENT IMPERV.	SLOPE (FT/FT)	MANNINGS COEF. IMPERV.	PERV.
45000	45000	277	2.82	40	0.034	0.014	0.2
45001	45000	749	8.68	40	0.036	0.014	0.2
45002	45000	873	18.03	1	0.139	0.014	0.2
45020	45021	335	3.25	60	0.043	0.071	0.2
SUBTOTAL			32.78	20.5			
50000	50010	1119	14.00	30	0.040	0.028	0.2
50001	50010	415	6.00	60	0.238	0.057	0.2
50002	50030	648	8.92	1	0.250	0.014	0.2
50003	50020	2299	25.12	10	0.149	0.014	0.2
50004	50050	1528	30.00	20	0.076	0.014	0.2
50005	50030	503	6.64	50	0.038	0.048	0.2
50006	50070	809	11.89	40	0.019	0.014	0.2
50007	50020	556	21.07	1	0.050	0.014	0.2
50008	50020	332	12.60	0	0.203	0.014	0.2
SUBTOTAL			136.24	18.1			
60000	60000	623	16.10	15	0.258	0.014	0.2
60010	60003	843	32.40	20	0.041	0.014	0.2
60020	60010	354	13.80	20	0.035	0.014	0.2
60030	60030	804	20.30	20	0.223	0.036	0.2
60035	60035	833	30.10	15	0.124	0.014	0.2
60040	60040	916	65.20	5	0.082	0.014	0.2
60050	60045	617	8.50	15	0.042	0.014	0.2
60060	60050	400	12.50	75	0.029	0.014	0.2
60065	60050	385	11.70	40	0.026	0.014	0.2
60070	60074	674	17.80	50	0.049	0.023	0.2
60080	60105	464	29.80	5	0.039	0.014	0.2
60090	60105	628	46.10	5	0.050	0.014	0.2
60100	60105	537	43.80	5	0.045	0.014	0.2
60110	60110	1435	49.40	5	0.107	0.014	0.2
99001	60042	0	2.70	0	0.000	0.000	0
SUBTOTAL			400.20	14.0			
TOTAL			1172.02	27.8			

TABLE 2
SUMMARY OF EAST FORK POPLAR CREEK PIPE NETWORK

	GUTTER NUMBER (1)	GUTTER DOWNSTREAM	TYPE (2)	WIDTH OR DIAMETER (FT)	LENGTH (FT)	SLOPE (FT/FT)	SIDE SLOPES LEFT (FT/FT)	SIDE SLOPES RIGHT (FT/FT)	MANNING N	MAX DEPTH (FT)
1	5005 *	60115	2	7.78	460	0.0077			0.014	
2	5010 *	5005	2	2.00	100	0.0100			0.014	
3	5015 *	5005	2	6.79	73	0.0077			0.014	
4	5025	5015	1	15.00	300	0.0039	1.77	2.31	0.030	7.90
5	5035	5025	1	15.00	300	0.0039	1.65	2.12	0.030	7.63
6	5050 *	5025	2	3.00	75	0.4570			0.014	
7	5055 *	5035	2	4.00	108	0.0239			0.014	
8	5060 *	5050	2	2.00	201	0.0120			0.014	
9	5065 *	5055	2	3.00	212	0.0120			0.014	
10	5071 *	5060	2	2.00	331	0.0208			0.014	
11	5075 *	5065	2	1.50	151	0.0320			0.014	
12	10000	5035	1	15.00	350	0.0039	1.65	2.12	0.030	7.63
13	10010	10000	1	15.00	300	0.0039	1.51	1.89	0.030	7.32
14	10020	10010	1	15.00	447	0.0039	1.51	1.89	0.030	7.32
15	10500 *	10020	2	5.19	285	0.0057			0.014	
16	10510 *	10500	2	2.00	240	0.0200			0.014	
17	10520 *	10500	2	4.00	442	0.0256			0.014	
18	10530 *	10520	2	4.00	276	0.0575			0.014	
19	10540 *	10530	2	3.00	895	0.0102			0.014	
20	10550 *	10540	2	3.00	204	0.1008			0.014	
21	10560 *	10550	2	3.00	220	0.0185			0.014	
22	10565 *	10530	2	3.00	265	0.0064			0.014	
23	10570 *	10550	2	3.00	250	0.0278			0.014	
24	10600 *	10530	2	3.00	376	0.0158			0.014	
25	10610 *	10600	2	2.00	375	0.0089			0.014	
26	10620 *	10610	2	2.00	157	0.0817			0.014	
27	10630 *	10620	2	3.00	410	0.0676			0.014	
28	15000	10020	1	15.00	784	0.0039	1.36	1.64	0.030	6.99
29	15005 *	15000	2	2.59	198	0.0215			0.014	
30	15035 *	15005	2	2.59	260	0.0100			0.014	
31	15060 *	15035	2	2.00	91	0.0390			0.014	
32	15075 *	15060	2	2.00	195	0.0199			0.014	
33	15095 *	15075	2	1.50	131	0.0237			0.014	
34	15105	15000	1	15.00	390	0.0039	1.23	1.43	0.030	6.70
35	15115	15105	1	15.00	390	0.0039	1.23	1.43	0.030	6.70
36	15135 *	15115	2	2.00	185	0.0205			0.014	
37	15155 *	15135	2	1.50	303	0.0087			0.014	

TABLE 2 (CONTINUED)
SUMMARY OF EAST FORK POPLAR CREEK PIPE NETWORK

	GUTTER NUMBER (1)	GUTTER DOWNSTREAM	TYPE (2)	WIDTH OR DIAMETER (FT)	LENGTH (FT)	SLOPE (FT/FT)	SIDE SLOPES LEFT (FT/FT)	SIDE SLOPES RIGHT (FT/FT)	MANNING N	MAX DEPTH (FT)
38	20000	15115	1	15.00	330	0.0039	1.17	1.33	0.030	6.56
39	20001	20000	1	15.00	400	0.0039	1.09	1.21	0.030	6.39
40	20002 *	20001	2	4.50	340	0.0031			0.014	
41	20004 *	20002	2	4.50	320	0.0202			0.014	
42	20005 *	20004	2	3.00	174	0.0376			0.014	
43	20011 *	20005	2	3.00	250	0.0130			0.014	
44	20015 *	20210	2	1.50	320	0.0200			0.014	
45	20031 *	20011	2	2.00	473	0.0443			0.014	
46	20051 *	20031	2	2.00	238	0.0085			0.014	
47	20121 *	20011	2	3.00	485	0.0177			0.014	
48	20141 *	20121	2	3.00	616	0.0177			0.014	
49	20160 *	20141	2	2.33	81	0.0177			0.014	
50	20170 *	20121	2	3.00	332	0.0394			0.014	
51	20190 *	20170	2	3.00	362	0.0300			0.014	
52	20200 *	20190	2	2.00	124	0.0300			0.014	
53	20210 *	20004	2	2.00	378	0.0180			0.014	
54	20220 *	20210	2	2.00	300	0.0180			0.014	
55	20231 *	20220	2	2.00	368	0.0661			0.014	
56	20281 *	20220	2	3.00	380	0.0200			0.014	
57	20300 *	20281	2	3.00	250	0.0200			0.014	
58	20311 *	20300	2	3.00	740	0.0200			0.014	
59	20331 *	20300	2	3.00	237	0.0200			0.014	
60	20350 *	20331	2	2.50	415	0.0200			0.014	
61	20360 *	20281	2	1.50	382	0.0200			0.014	
62	25000	20001	1	15.00	370	0.0039	1.02	1.09	0.030	6.24
63	25001 *	25000	2	2.00	292	0.0122			0.014	
64	25020 *	25001	2	3.00	46	0.0024			0.014	
65	25040 *	25050	2	3.00	334	0.0024			0.014	
66	25050	25000	1	15.00	270	0.0039	0.97	1.01	0.030	6.13
67	30000	25050	1	15.00	550	0.0039	0.92	0.92	0.030	6.00
68	30001 *	30000	2	3.00	220	0.0020			0.014	
69	30021 *	30001	2	3.00	172	0.0169			0.014	
70	30041 *	30021	2	3.00	440	0.0094			0.014	
71	30070 *	30041	2	3.00	241	0.0220			0.014	
72	30121 *	30070	2	3.00	129	0.0078			0.014	

TABLE 2 (CONTINUED)
SUMMARY OF EAST FORK POPLAR CREEK PIPE NETWORK

	GUTTER NUMBER (1)	GUTTER DOWNSTREAM	TYPE (2)	WIDTH OR DIAMETER (FT)	LENGTH (FT)	SLOPE (FT/FT)	SIDE SLOPES LEFT (FT/FT)	SIDE SLOPES RIGHT (FT/FT)	MANNING N	MAX DEPTH (FT)
73	35000 *	30000	2	10.25	732	0.0080			0.014	
74	35005 *	35000	2	4.00	251	0.0220			0.014	
75	35010 *	35000	2	9.10	608	0.0080			0.014	
76	35011 *	35005	2	4.00	237	0.0135			0.014	
77	35030 *	35011	2	4.00	81	0.0110			0.014	
78	35041 *	35030	2	4.00	220	0.0100			0.014	
79	35061 *	35041	2	4.00	432	0.0142			0.014	
80	35101 *	35061	2	2.50	245	0.0020			0.014	
81	35231 *	35041	2	1.50	209	0.0184			0.014	
82	35300 *	35061	2	4.00	89	0.0100			0.014	
83	35311 *	35300	2	4.00	308	0.0509			0.014	
84	35350 *	35311	2	3.00	73	0.0810			0.014	
85	35400 *	35311	2	4.00	293	0.0247			0.014	
86	35461 *	35400	2	3.00	616	0.0388			0.014	
87	35501 *	35010	2	3.00	272	0.0343			0.014	
88	40000 *	35010	2	8.75	373	0.0100			0.014	
89	40001 *	40000	2	3.00	237	0.0121			0.014	
90	40005 *	40000	2	8.75	579	0.0287			0.014	
91	40015 *	40005	2	4.00	216	0.0100			0.014	
92	40021 *	40001	2	3.00	305	0.0121			0.014	
93	40025 *	40015	2	3.00	172	0.0250			0.014	
94	40035 *	40005	2	6.00	407	0.0135			0.014	
95	40045 *	40015	2	4.00	284	0.0100			0.014	
96	40055 *	40035	2	6.00	342	0.0090			0.014	
97	40060 *	40021	2	3.00	330	0.0120			0.014	
98	40065 *	40045	2	4.00	117	0.0248			0.014	
99	40071 *	40060	2	3.00	296	0.0236			0.014	
100	40075 *	40065	2	4.00	73	0.0150			0.014	
101	40085 *	40055	2	4.00	116	0.0026			0.014	
102	40095 *	40085	2	4.00	124	0.0067			0.014	
103	40105 *	40095	2	4.00	263	0.0082			0.014	
104	40115 *	40105	2	4.00	104	0.0334			0.014	
105	40125 *	40115	2	4.00	340	0.0156			0.014	
106	40135 *	40125	2	4.00	335	0.0170			0.014	
107	40145 *	40135	2	3.00	174	0.0195			0.014	
108	40150 *	40060	2	3.00	132	0.0105			0.014	
109	40155 *	40145	2	3.00	245	0.0215			0.014	
110	40200 *	40095	2	3.00	87	0.0534			0.014	
111	45000 *	40055	2	6.00	324	0.0230			0.014	
112	45001 *	45000	2	3.00	226	0.0173			0.014	
113	45021 *	45001	2	3.00	161	0.0111			0.014	

TABLE 2 (CONTINUED)
SUMMARY OF EAST FORK POPLAR CREEK PIPE NETWORK

GUTTER NUMBER (1)		GUTTER DOWNSTREAM	TYPE (2)	WIDTH OR DIAMETER (FT)	LENGTH (FT)	SLOPE (FT/FT)	SIDE SLOPES LEFT (FT/FT)	SIDE SLOPES RIGHT (FT/FT)	MANNING N	MAX DEPTH (FT)
114	50000 *	45000	2	6.00	396	0.0106			0.014	
115	50001 *	50000	2	5.00	573	0.0081			0.014	
116	50010 *	50000	2	5.00	50	0.0300			0.014	
117	50020 *	50001	2	5.00	110	0.0707			0.014	
118	50025 *	50010	2	3.00	409	0.0150			0.014	
119	50030 *	50025	2	3.00	432	0.0110			0.014	
120	50050 *	50030	2	1.50	176	0.0368			0.014	
121	50060 *	50030	2	3.00	118	0.0195			0.014	
122	50070 *	50060	2	3.00	139	0.0122			0.014	
123	60000	99999	1	16.50	450	0.0024	2.00	2.00	0.030	7.10
124	60001 *	60000	2	10.00	125	0.0024			0.014	
125	60003	60001	1	16.50	350	0.0024	2.00	2.00	0.030	7.10
126	60005 *	60003	2	4.00	200	0.0419			0.014	
127	60007	60005	1	4.00	600	0.0247	2.00	2.00	0.034	7.10
128	60010 *	60007	2	4.00	520	0.0202			0.014	
129	60020 *	60010	2	4.00	800	0.0479			0.014	
130	60025 *	60020	2	1.50	50	0.0110			0.014	
131	60030 *	60025	2	4.00	225	0.0420			0.014	
132	60035 *	60010	2	3.00	270	0.0534			0.014	
133	60040	60003	1	15.00	450	0.0024	1.00	1.00	0.030	7.10
134	60042 R	60045	5							
135	60043 *	60042	2	5.91	25	0.0244			0.014	
136	60045	60040	1	15	750	0.0024	2.00	2.00	0.030	6.50
137	60050 *	60045	2	3	450	0.0084			0.014	
138	60060 *	60050	2	3	675	0.0221			0.014	
139	60062 *	60060	2	3	750	0.0202			0.014	
140	60064 *	60050	2	3	200	0.0300			0.014	
141	60065 *	60064	2	2	150	0.0600			0.014	
142	60066 *	60065	2	1.5	525	0.0324			0.014	
143	60070 *	60062	2	3	225	0.0203			0.014	
144	60074 *	60070	2	2	50	0.0122			0.014	
145	60075 *	60074	2	1.5	150	0.0267			0.014	
146	60105 *	60043	2	10	60	0.0024			0.014	
147	60110	60105	1	16.5	1100	0.0024	1.00	1.00	0.014	7.00
148	60115 *	60110	2	10.08	330	0.0024			0.014	

TOTAL NUMBER OF GUTTERS/PIPES/CHANNELS/RESERVOIRS = 148

1 - ASTERISK (*) DENOTES CIRCULAR PIPE, DIAMETER = WIDTH
LETTER (R) DENOTES RESERVOIR TYPE

2 - TYPE 1 DENOTES TRAPEZIODAL CHANNEL
TYPE 2 DENOTES CIRCULAR PIPE
TYPE 5 DENOTES RESERVOIR

3.0 MODEL CALIBRATION

The RUNOFF model of EFPC was calibrated/verified using the flow data measured during the comprehensive sampling program. The observed flow data and observed rainfall data used in the calibration are presented below. The rainfall data was entered into the RUNOFF model and the simulation results are compared with those observed.

3.1 OBSERVED FLOW DATA

In this sampling effort flows and concentrations were monitored for five storm events between November 1988 and May 1989:

- EVENT 1 - November 4, 1988
- EVENT 2 - March 30, 1989
- EVENT 3 - April 4, 1989
- EVENT 4 - May 5, 1989
- EVENT 5 - May 9, 1989

During the comprehensive sampling program, the depth of flow was measured at 11 sampling locations labeled A through K shown on Figure 3 . Rating curves were developed and applied to convert the depths to flow rates. Subsequent data problems prevented the use of Stations H and G in this calibration analysis. Station H is highly affected by sedimentation making the depth of flow measurements unreliable. The depth of flow observed at Station G showed no correlation to the rainfall events recorded. Due to the limited data available to prepare flow rating curves, the observed flows at all stations must be considered approximate.

The RUNOFF model characteristics representing the monitoring locations are presented on Table 3. The RUNOFF model pipe identification, drainage area, and percent imperviousness for monitoring locations A through K and their drainage basins are shown on Table 3.

TABLE 3
CHARACTERISTICS OF COMPREHENSIVE SAMPLING PROGRAM
STATIONS AND BASINS

SAMPLING POINT DATA				BASIN DATA		
SAMPLING LOCATION	RUNOFF PIPE ID	DRAINAGE AREA (ACRES)	PERCENT IMPERVIOUS	BASIN	DRAINAGE AREA (ACRES)	PERCENT IMPERVIOUS
A	60110	771.8	35	A	124.3	40
B	10500	66.0	42	B	66.0	42
C	20000	581.6	33	C	53.7	35
D	20002	100.8	42	D	100.8	42
E	30000	427.0	31	E	126.1	30
F	30001	13.7	75	F	13.7	75
G	35011	59.7	139	G	59.7	58
H	40105	58.5	28	H	58.5	28
I	45000	169.0	19	I	111.6	15
J	50030	57.5	25	J	57.5	25
K	60003	1172.0	28	K	400.2	14
				TOTAL	1172.0	6

3.2 OBSERVED RAINFALL DATA

The RUNOFF model requires the input of observed rainfall to simulate the resulting runoff hydrographs. Two rainfall monitors are located at Y-12 called herein the East and West gages. Continuous strip charts from the East and West rainfall monitors were used to determine the rainfall at six-minute intervals for input to the RUNOFF Model. Figures 4 through 9 show the rainfall hyetographs and Table 4 summarizes rainfall characteristics for all five storms. Observed rainfall is not available for the West gage for all storm events except number 2. In addition, six-minute rainfall data are not available for either gage for the November storm; only hourly and total rainfall data are available for Event 1. Consequently, model calibration was performed for events 2, 3, 4, and 5.

Due to spatial rainfall variations over the drainage basins and unknowns about the calibration of the rainfall gages, the observed rainfall must also be considered approximate.

3.3 MODEL CALIBRATION

The data presented in Tables 1 and 2 were developed primarily in the model setup described in the previous report titled Comprehensive Sampling Program for East Fork Poplar Creek Area Source Pollution Assessment and Control Plan (CDM, 1987).

In the model update described herein, it is assumed that the basic model inputs were previously calibrated. The following parameters were obtained from maps of the subbasin and documented soil infiltration characteristics:

- Subbasin
  - Drainage Area
  - Width
  - Percent impervious
  - Average basin slope
  - Soil infiltration characteristics

FIGURE 4

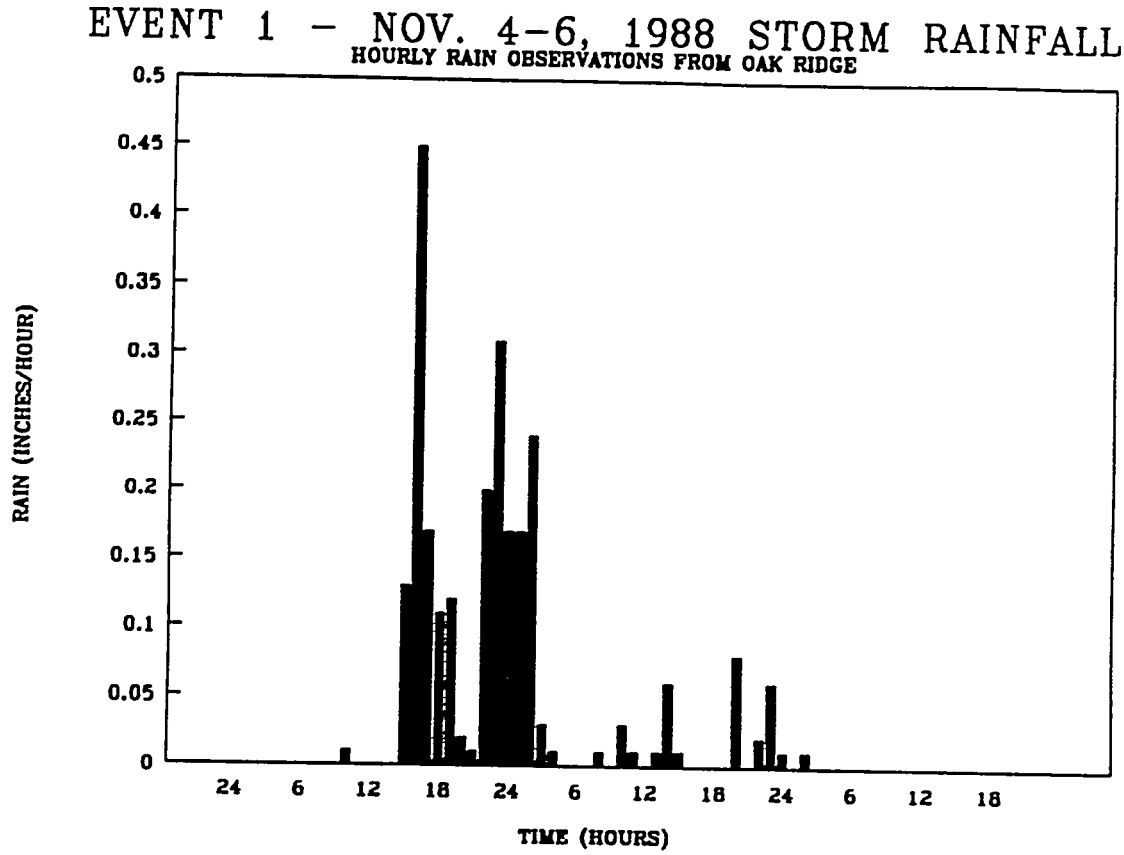

EVENT 1 - NOV. 4-6, 1988 STORM RAINFALL
HOURLY RAIN OBSERVATIONS FROM OAK RIDGE
RAIN (INCHES/HOUR)
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
24
6
12
18
24
6
12
18
24
6
12
18
TIME (HOURS)

FIGURE 5

EVENT 2 - March 30, 1989 STORM RAINFALL

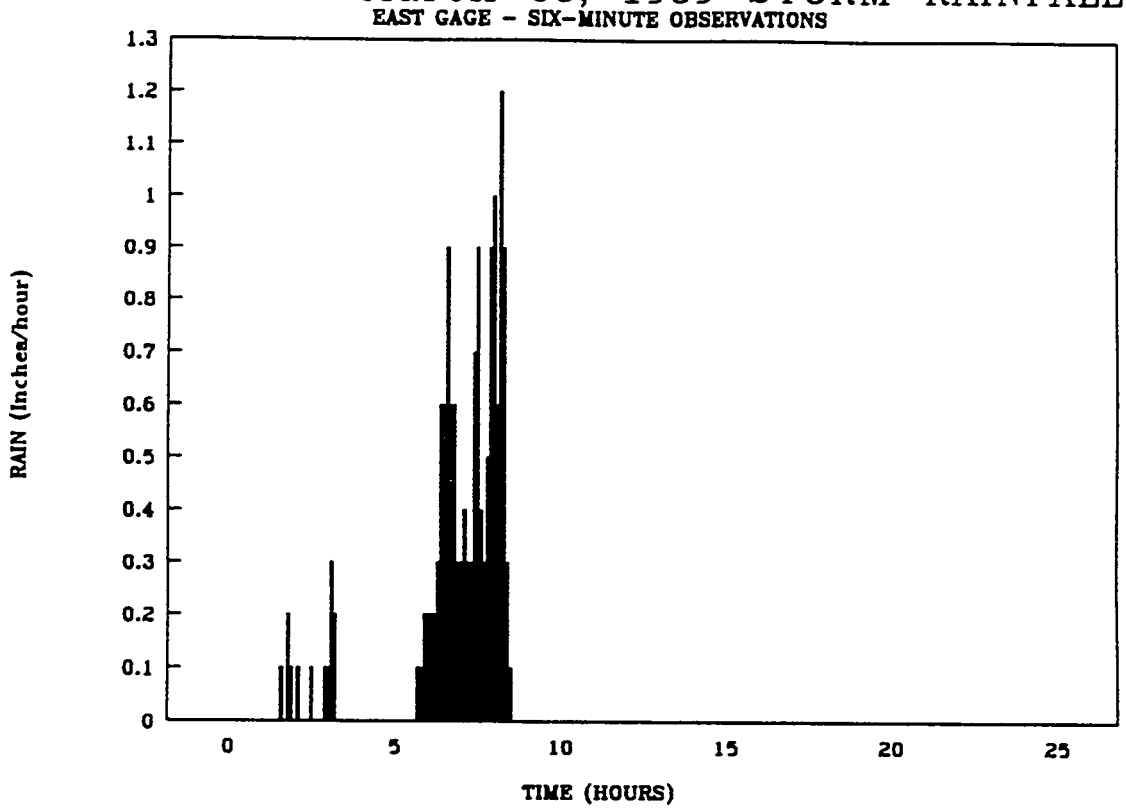


FIGURE 6

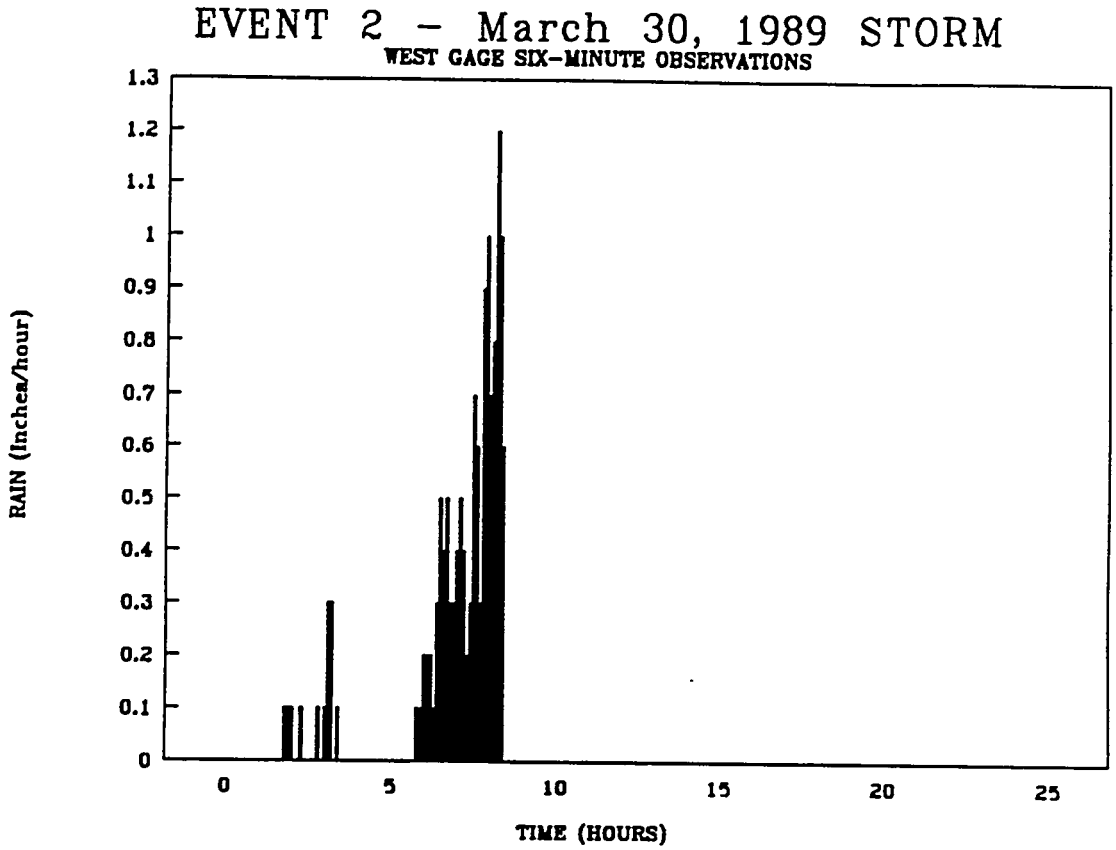

EVENT 2 - March 30, 1989 STORM
WEST GAGE SIX-MINUTE OBSERVATIONS
RAIN (Inches/hour)
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
5
10
15
20
25
TIME (HOURS)

FIGURE 7

EVENT 3 - APRIL 4, 1989 STORM RAINFALL

EAST GAGE - SIX-MINUTE OBSERVATIONS

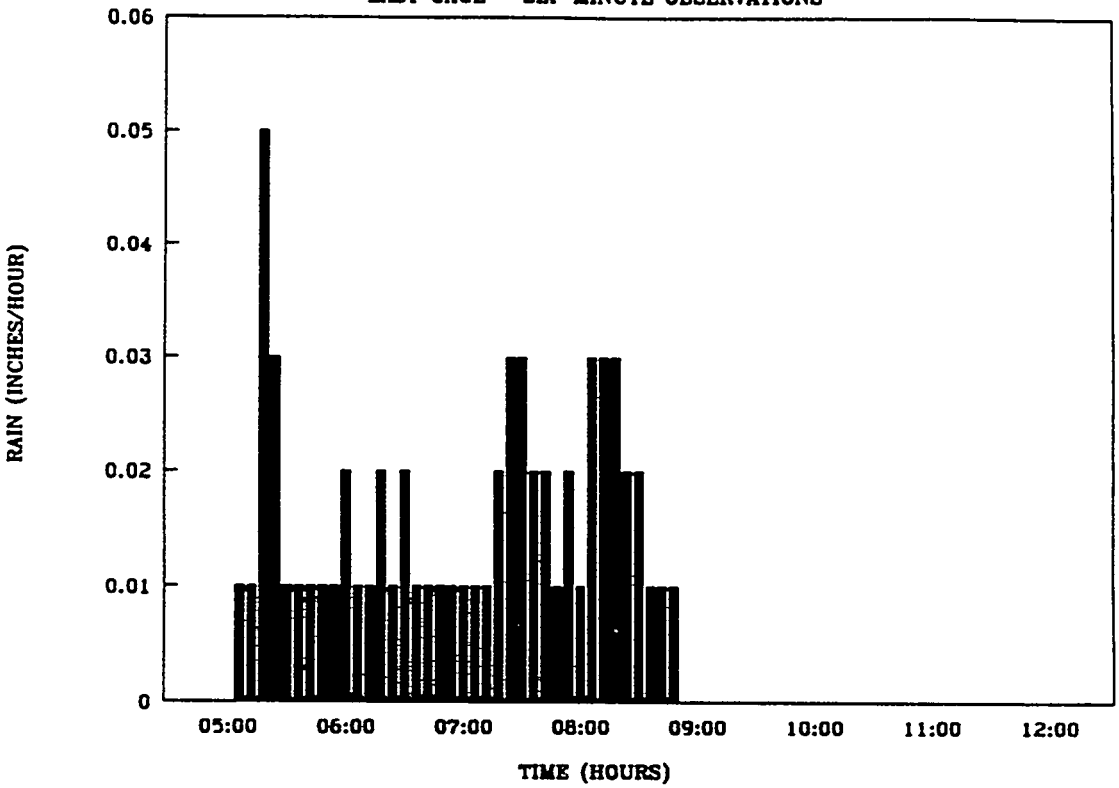


FIGURE 8

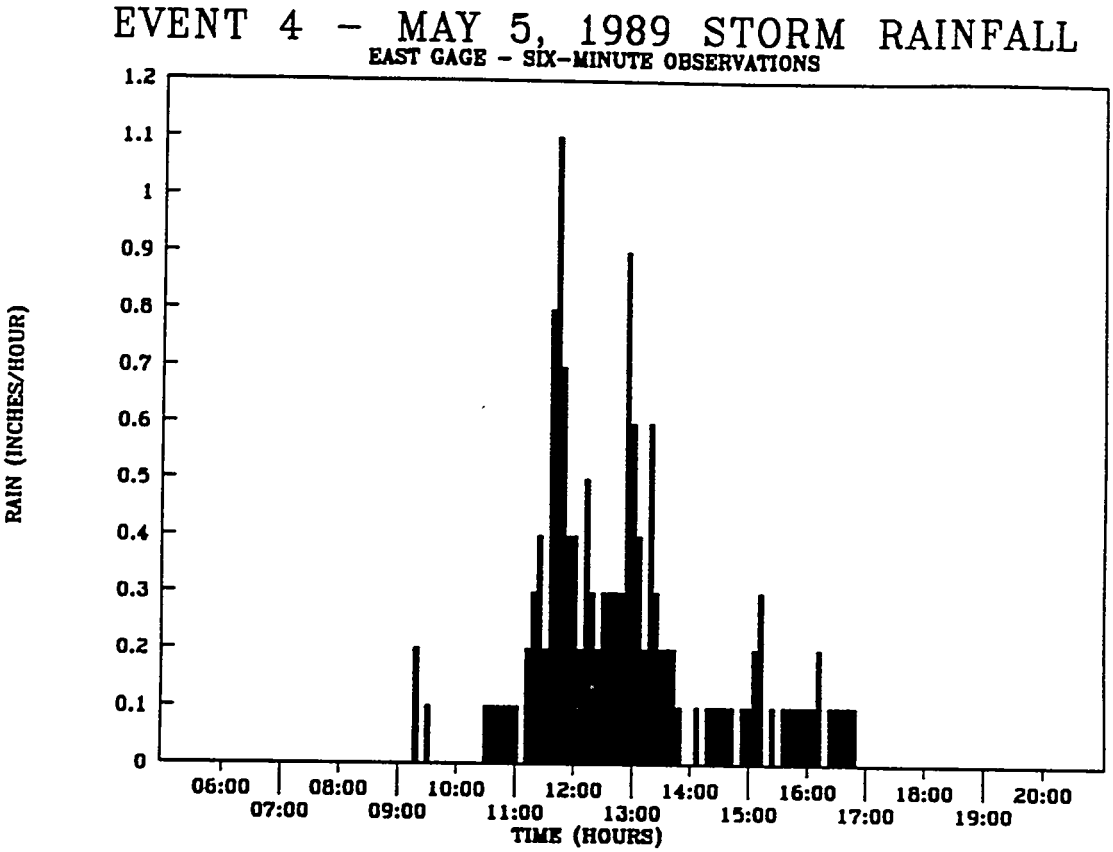

EVENT 4 - MAY 5, 1989 STORM RAINFALL
EAST GAGE - SIX-MINUTE OBSERVATIONS
RAIN (INCHES/HOUR)
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
TIME (HOURS)

FIGURE 9

EVENT 5 – MAY 9, 1989 STORM RAINFALL

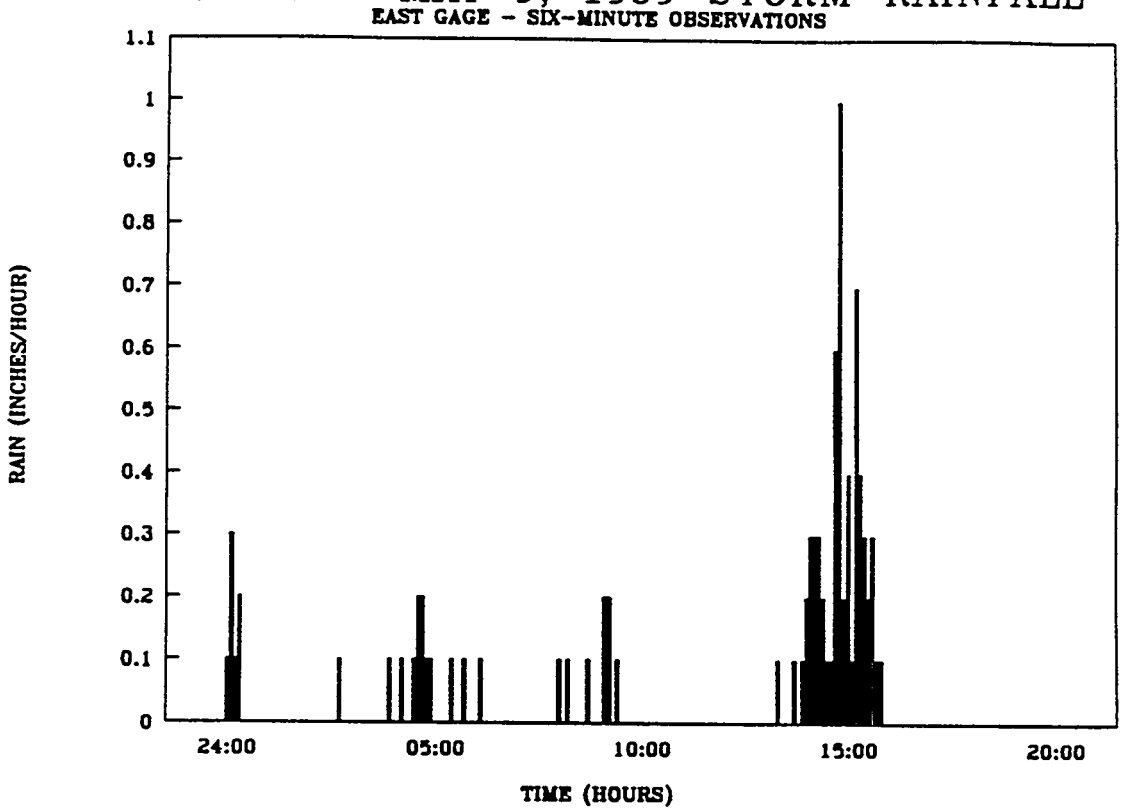


TABLE 4

EVENT RAINFALL SUMMARY

EVENT NUMBER	RAIN GAGE	RAINFALL VOLUME (INCHES)	MAXIMUM SIX-MINUTE INTENSITY (INCHES/HOUR)	TIME OF OCCURRENCE
1	(1)	2.46	0.45	11/4/88 16:00
2	EAST	1.53	1.2	3/31/89 8:12
	WEST	1.41	1.2	3/31/89 8:12
3	EAST	0.63	0.5	4/4/89 5:18
4	EAST	1.42	1.1	5/5/89 11:42
5	EAST	0.9	0.9	5/9/89 14:48

(1) - Rainfall Station @ Oak Ridge
(2) - Maximum 1-Hour Duration Rainfall

Pipe/Channel

- Size and shape
- Length
- Slope

This leaves the following characteristics to be adjusted to calibrate the model to match observed flows:

Subbasin

- Pervious area Mannings roughness coefficient
- Impervious area Mannings roughness coefficient
- Pervious area depression storage
- Impervious area depression storage
- Maximum infiltration volume

Pipe/Channel

- Mannings roughness coefficient

The impervious area Mannings roughness coefficients were set up as described in the previous report. The pervious area Mannings coefficients were set equal to 0.2. In the small storms available for calibration, very little runoff originates from the pervious areas. Much of the rainfall falling on the open areas infiltrates into the soil. Therefore, pervious Mannings coefficient could not be calibrated.

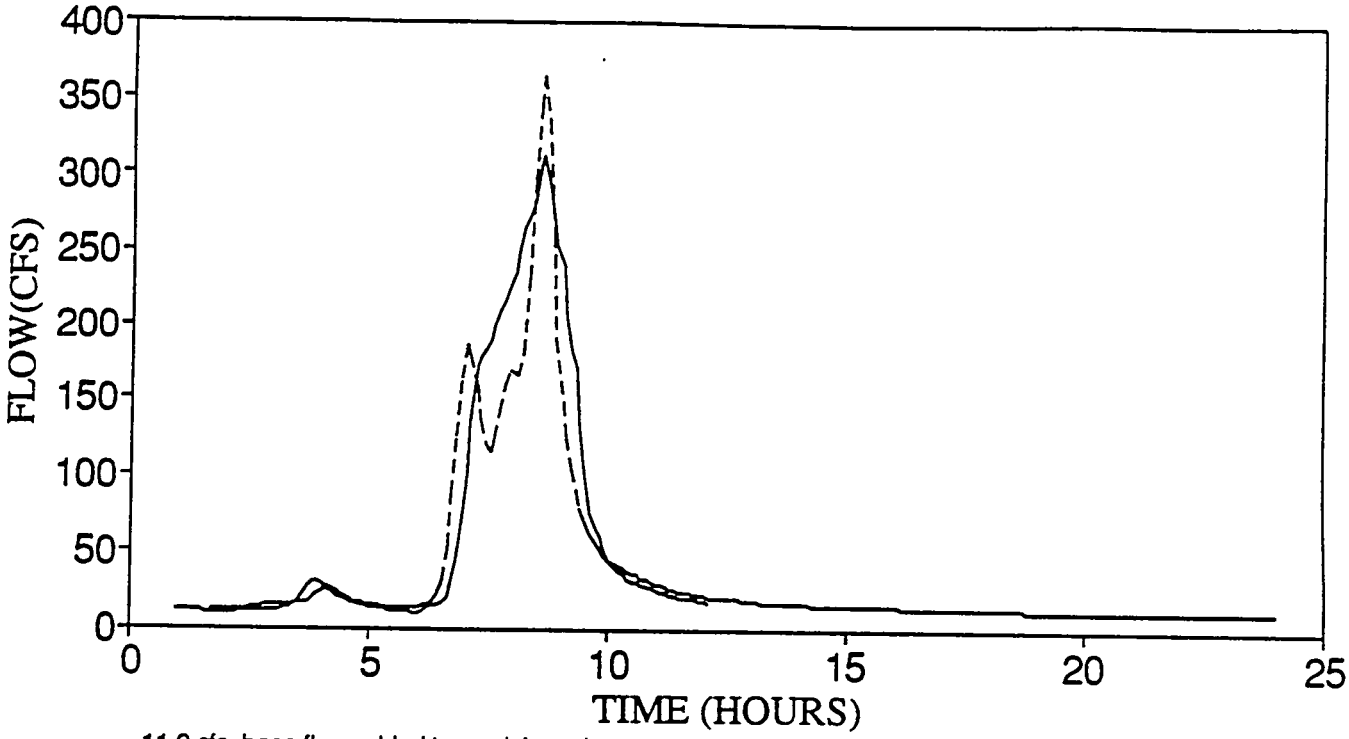
Model results were fairly insensitive to depression storage and pipe/channel Mannings roughness coefficient when varied within reasonable limits. This leaves a single parameter, the maximum infiltration volume to be adjusted to match observed flows. This parameter may vary from storm to storm to match antecedent moisture characteristics.

The observed flows are compared with simulated flows in Figures 10 through 41. These plots show that the model results generally reproduce the timing and magnitude of the rainfall produced peak runoff rates. However, the runoff volume represents the critical calibration parameter when applying the RUNOFF model for application to SMAP.

Figure 10

STATION A EVENT 2

3/30/89



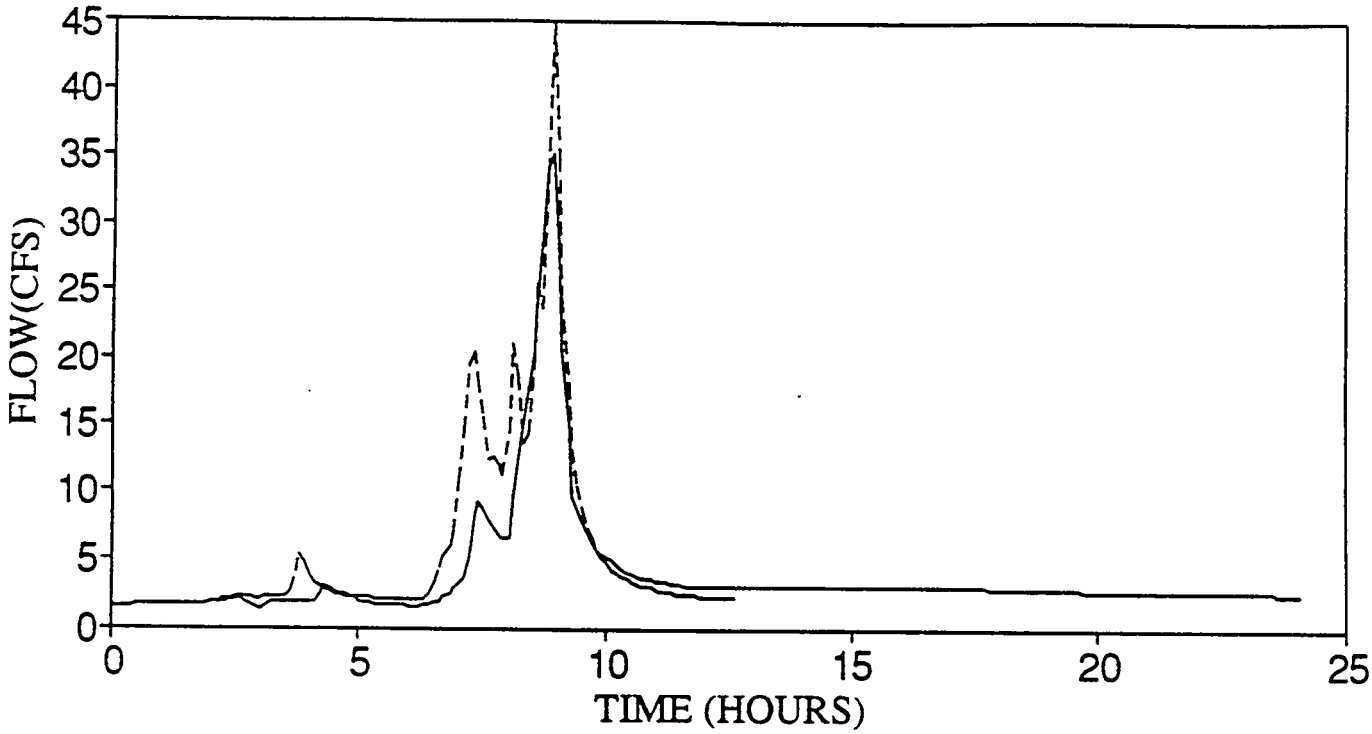
11.2 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 11

STATION B EVENT 2

3/30/89



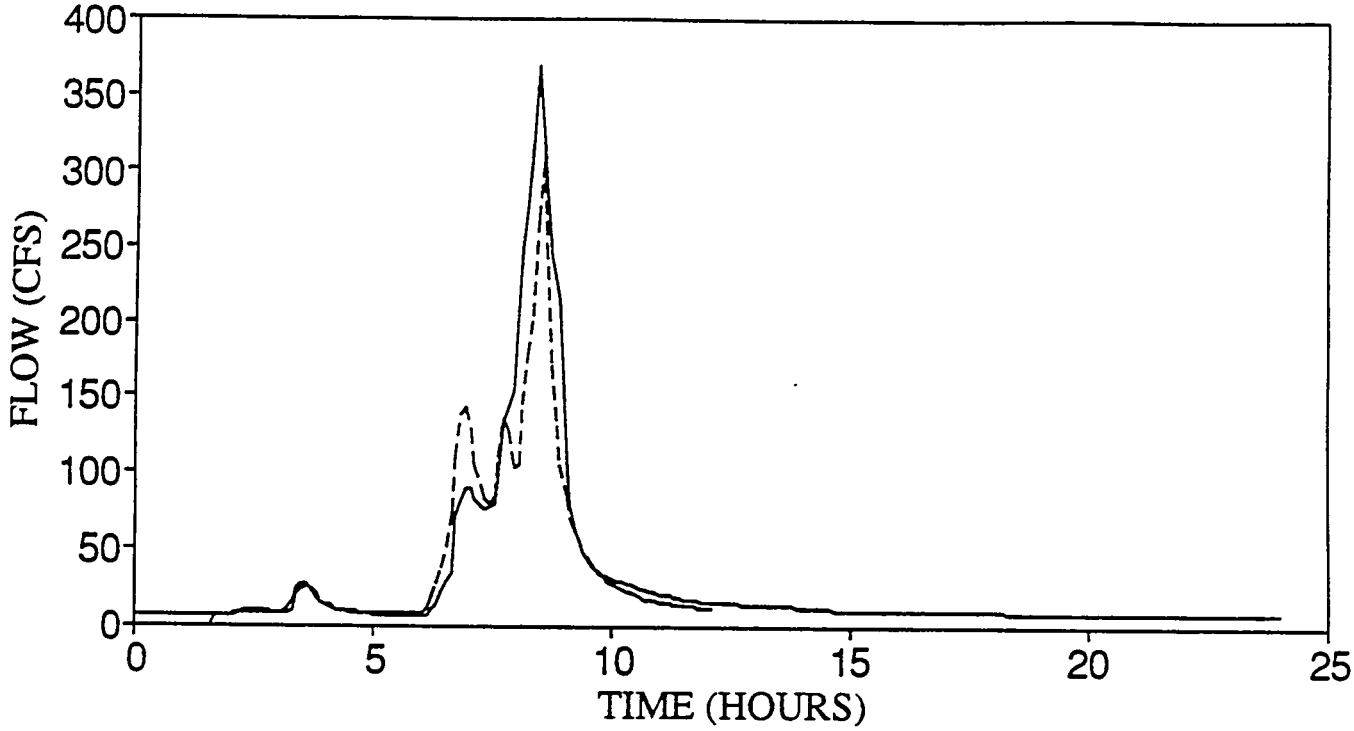
2 cfs base flow added to model results
Model results time-shifted 30 min. ahead

—— OBSERVED ---- MODELED

Figure 12

STATION C EVENT 2

3/30/89



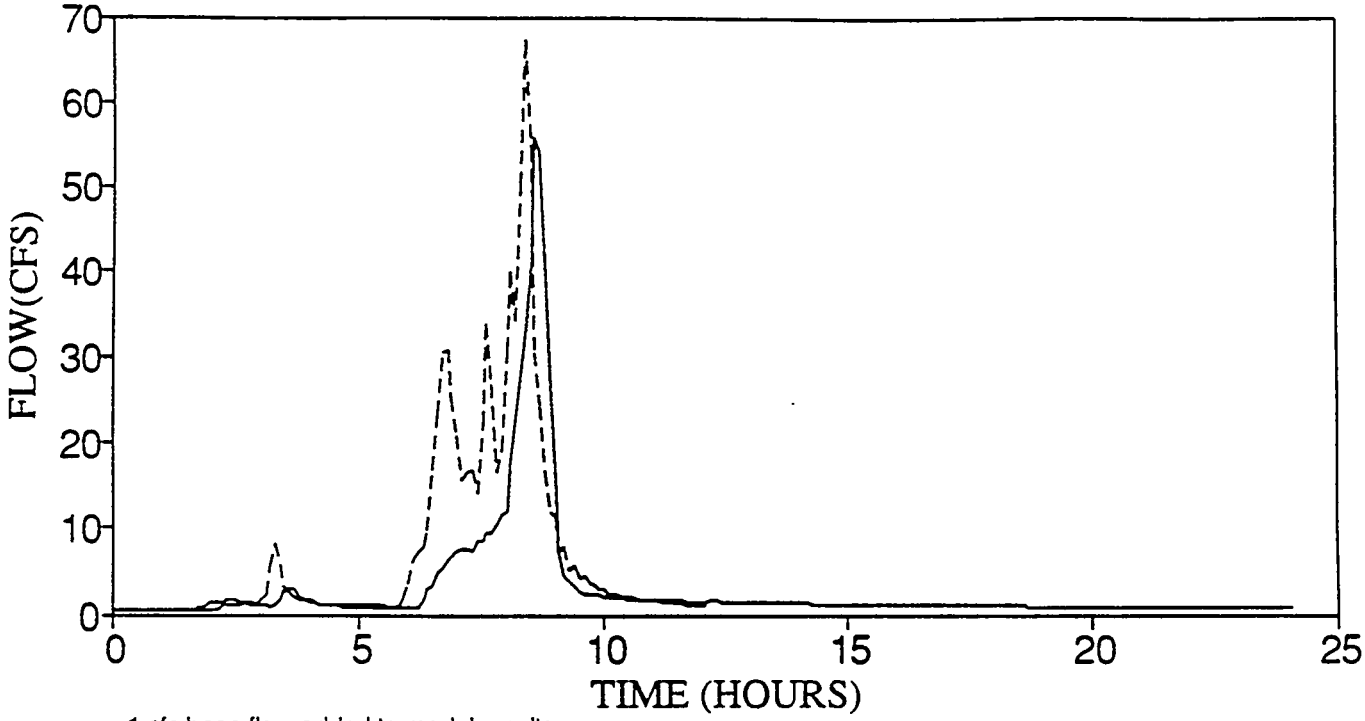
6.8 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 13

STATION D EVENT 2

3/30/89



1 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 14

STATION E EVENT 2

3/30/89

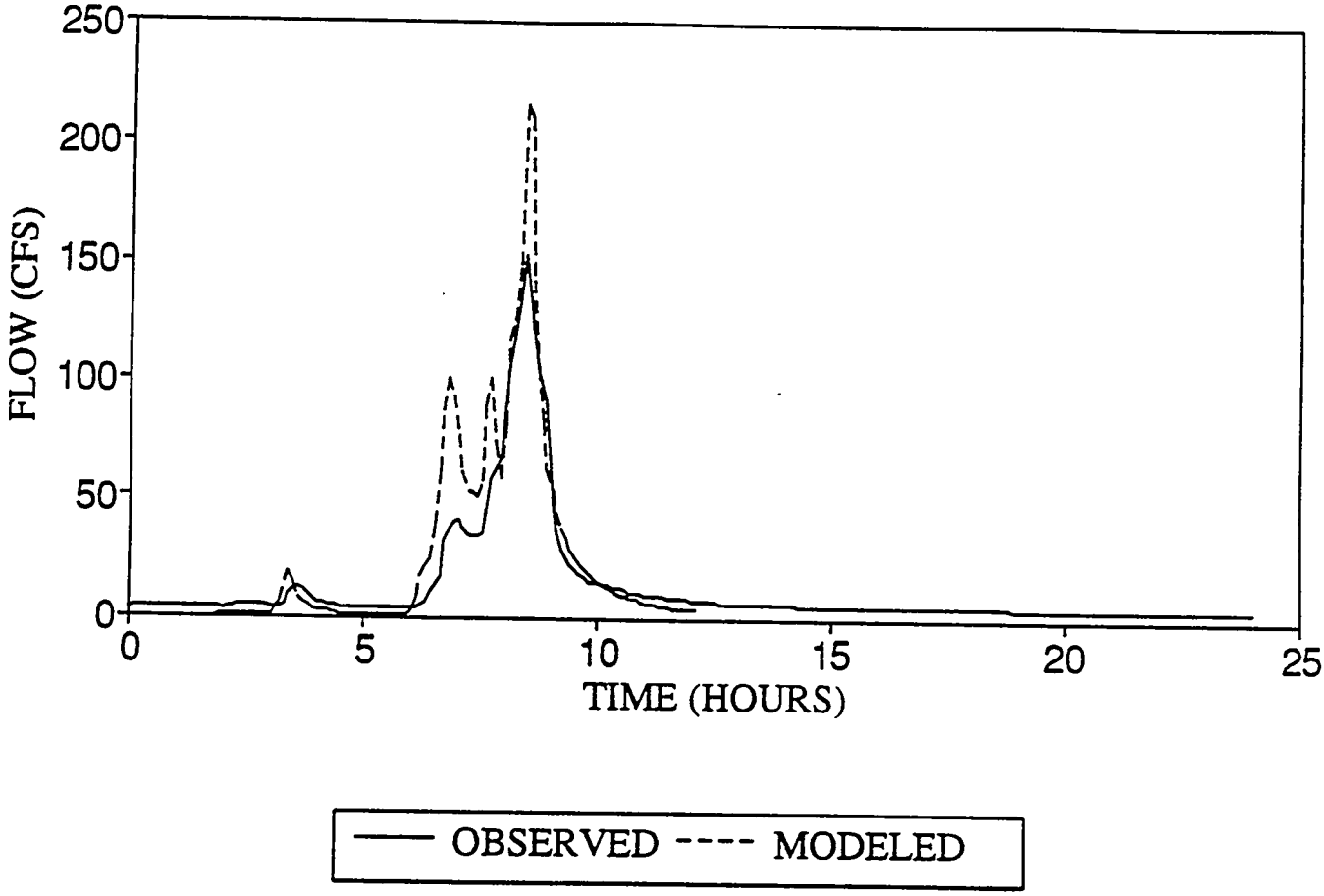


Figure 15

STATION F EVENT 2

3/30/89

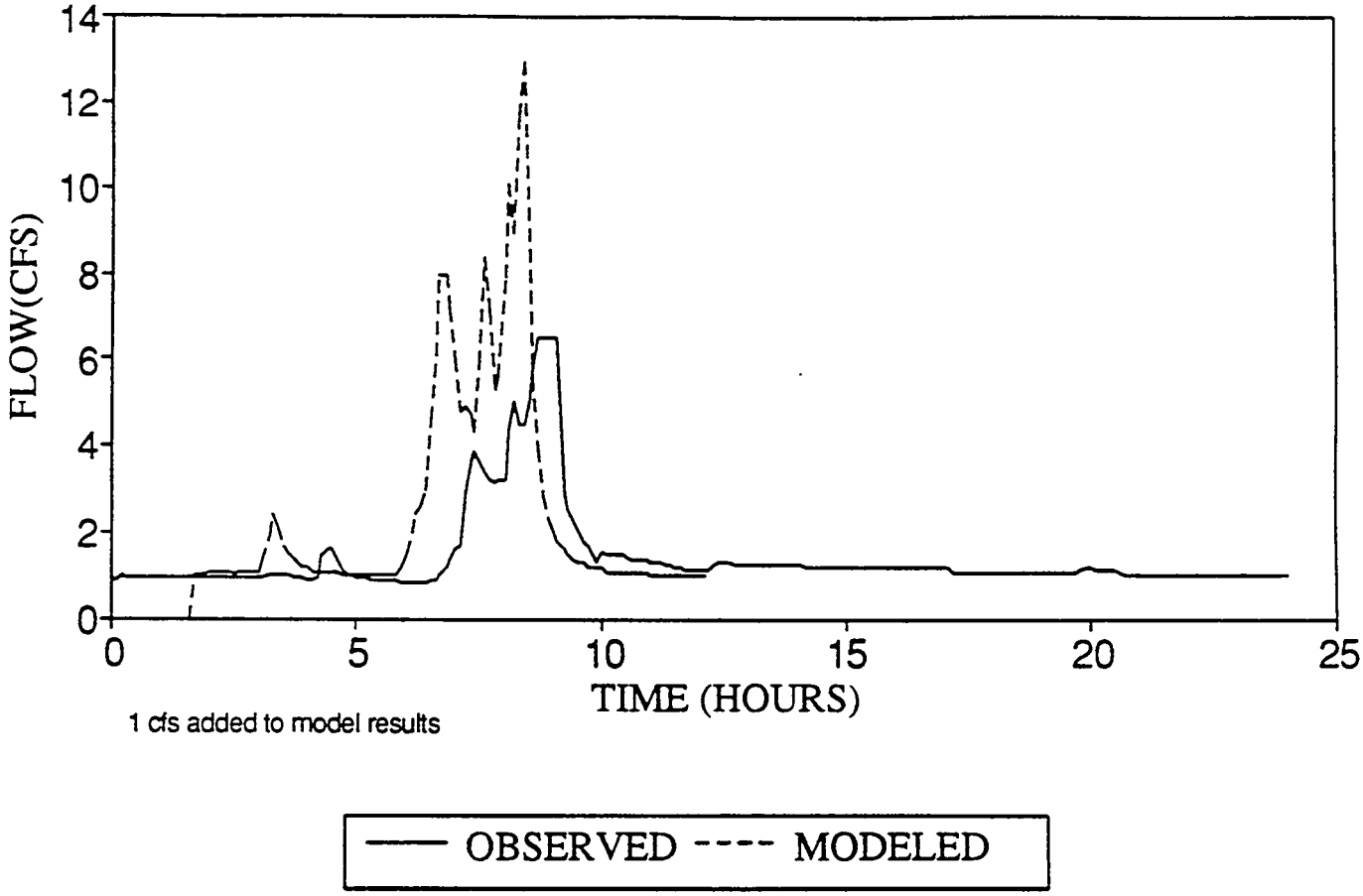


Figure 16

STATION I EVENT 2

3/30/89

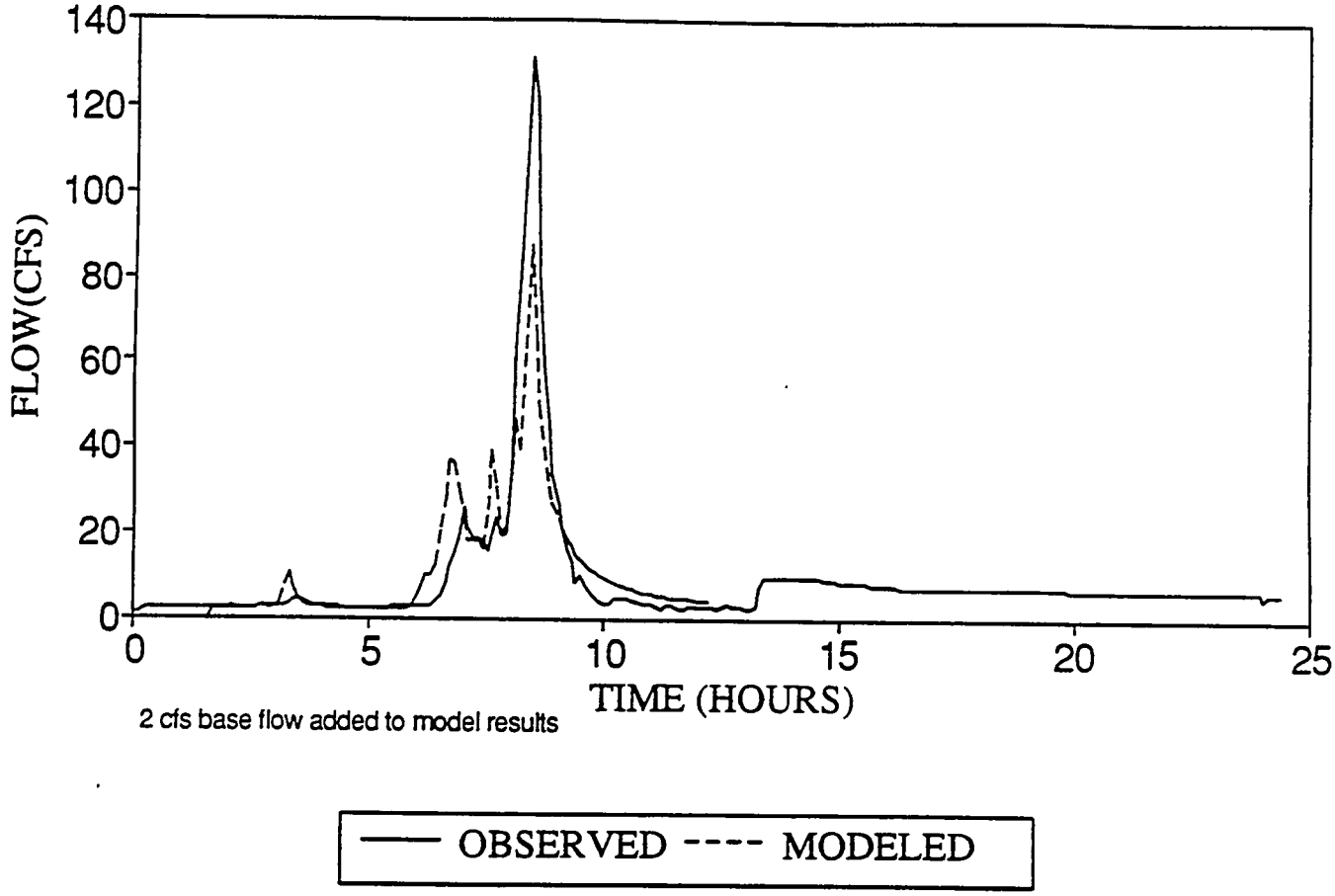
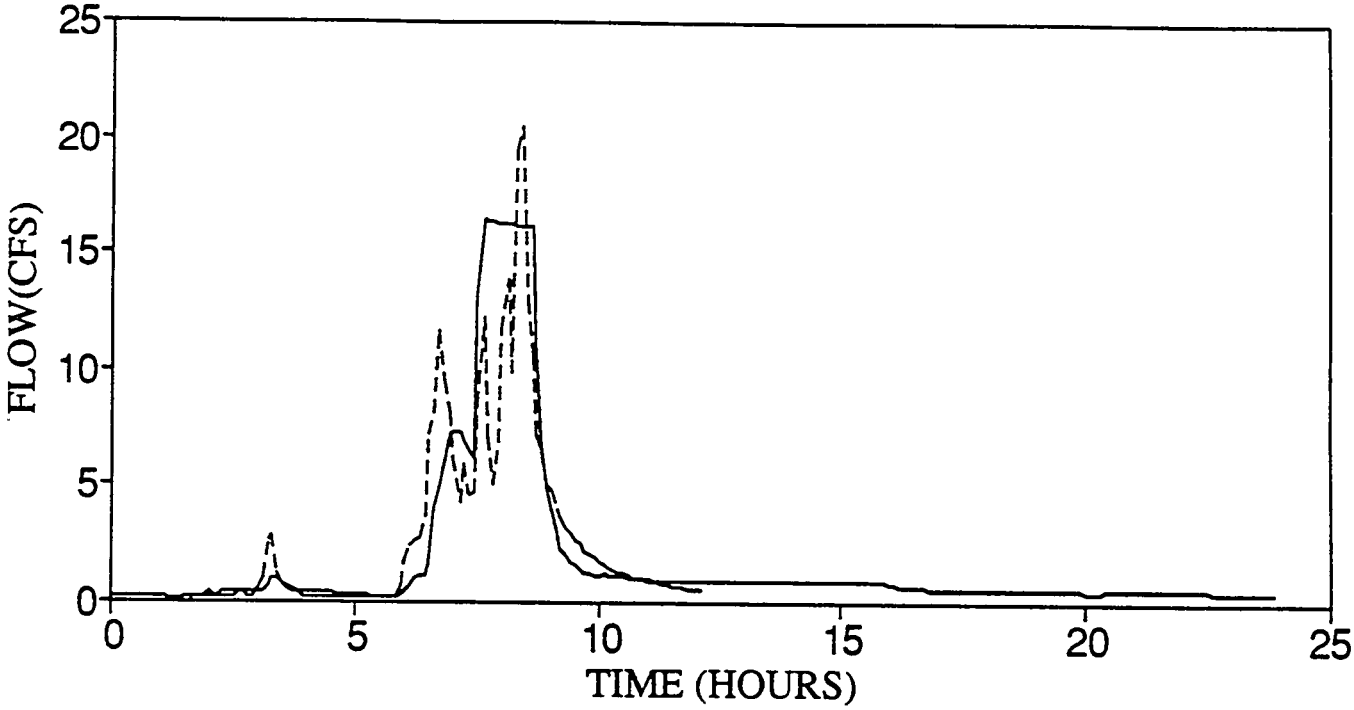


Figure 17

STATION J - EVENT 2

3/30/89



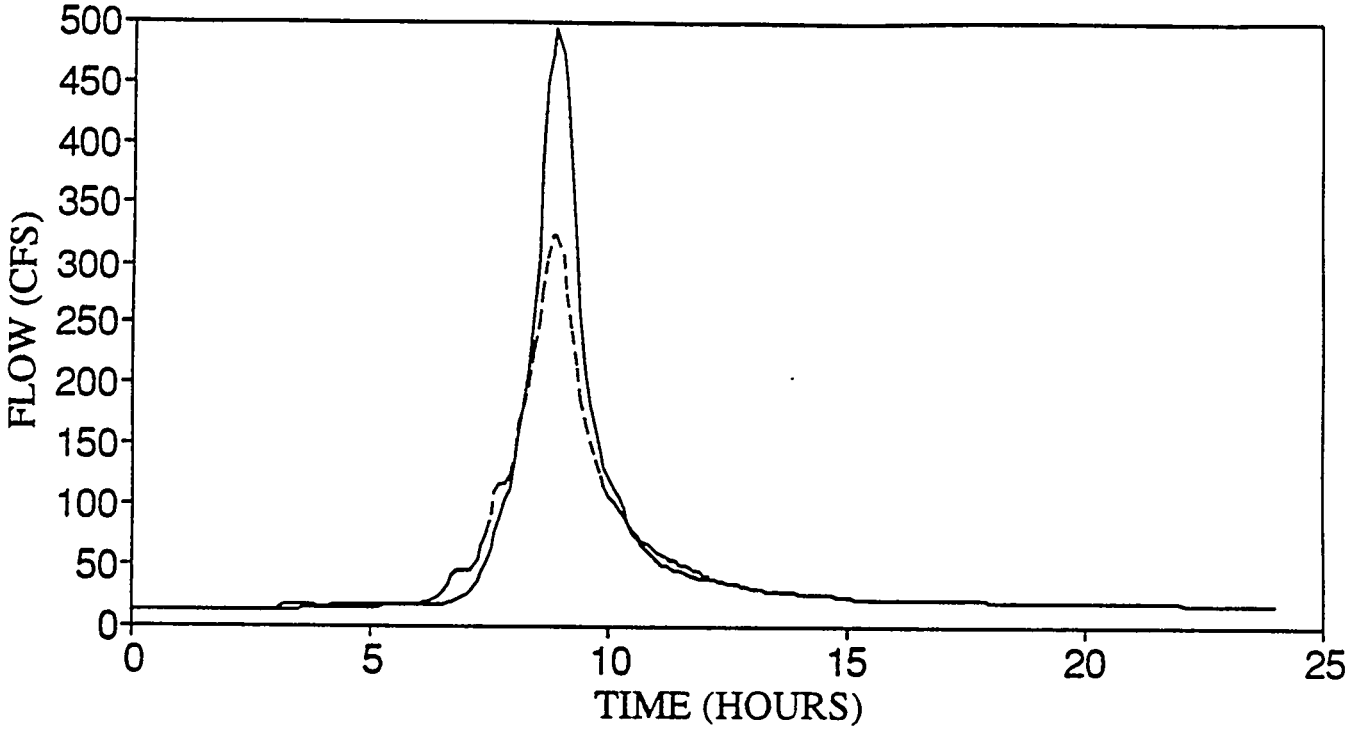
0.2 cfs base flow added to modeled results

—— OBSERVED ---- MODELED

Figure 18

STATION K EVENT 2

3/30/89



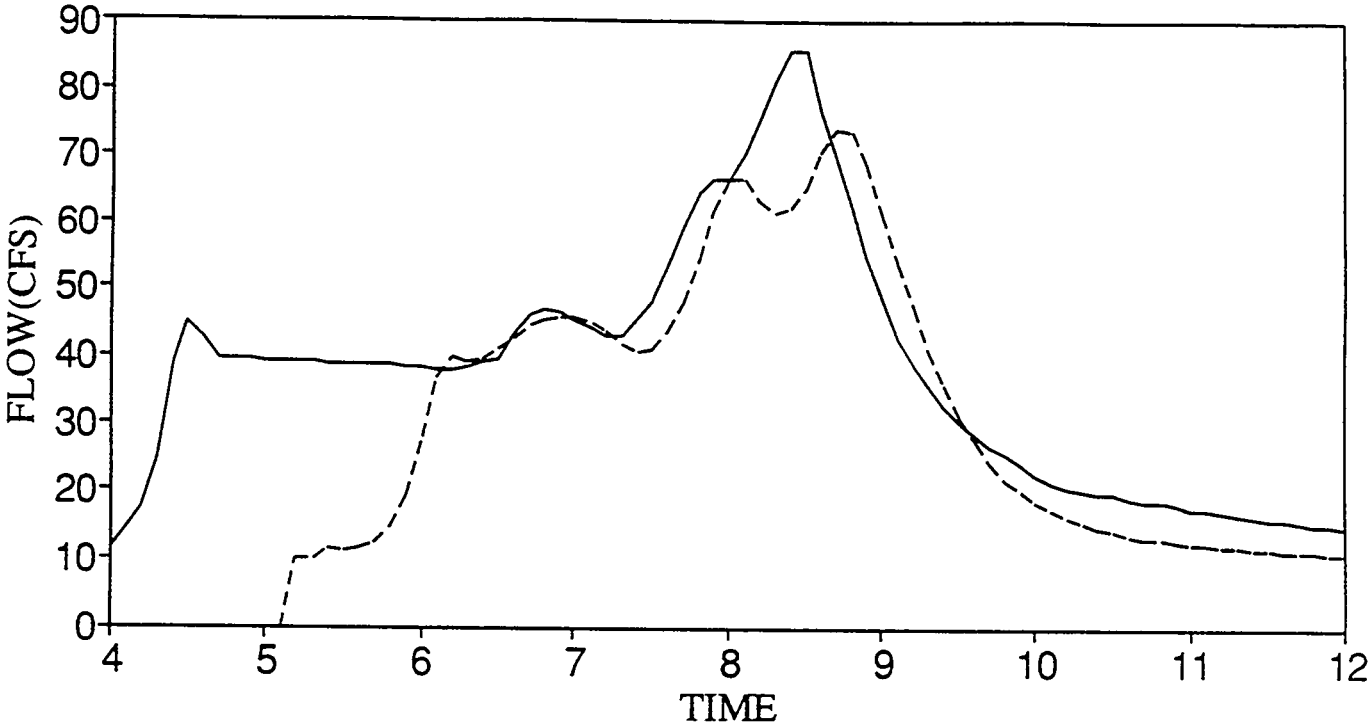
13 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 19

STATION A EVENT 3

4/4/89



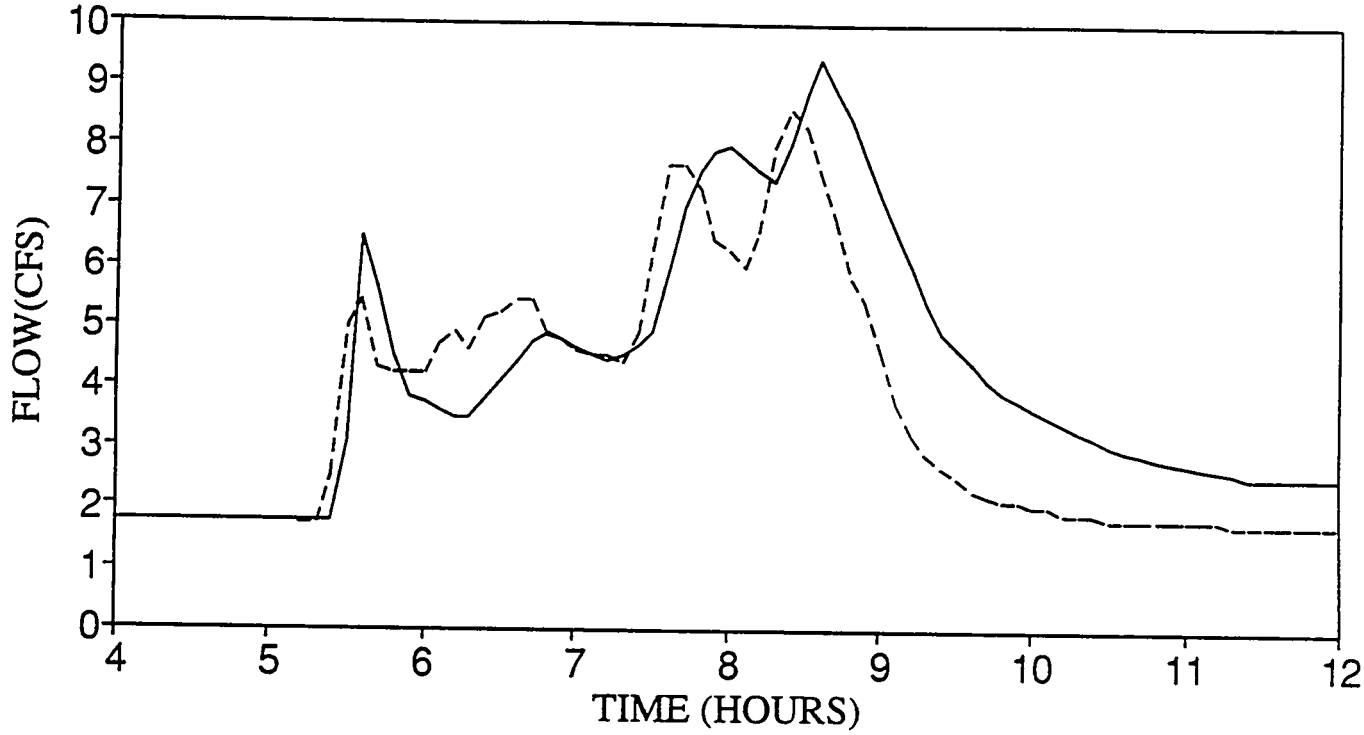
10 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 20

STATION B EVENT 3

4/4/89



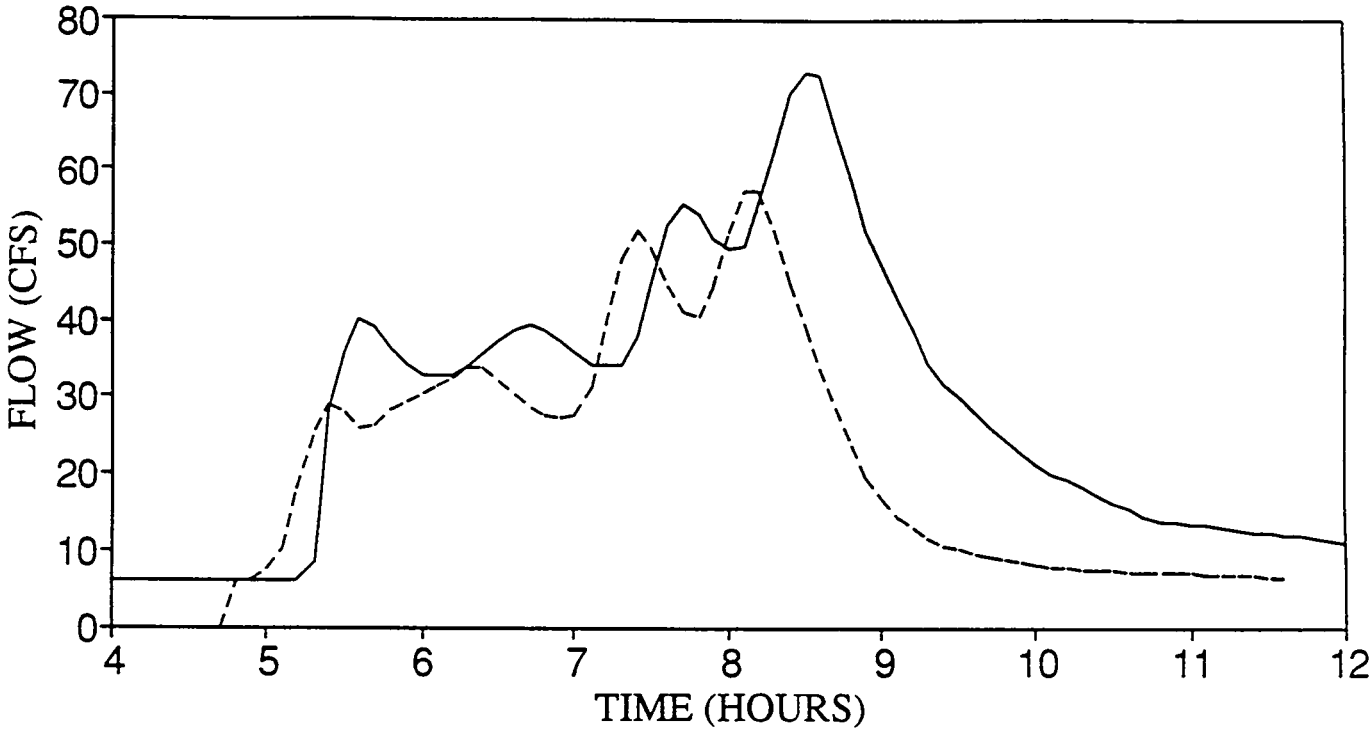
1.7 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 21

STATION C EVENT 3

4/4/89



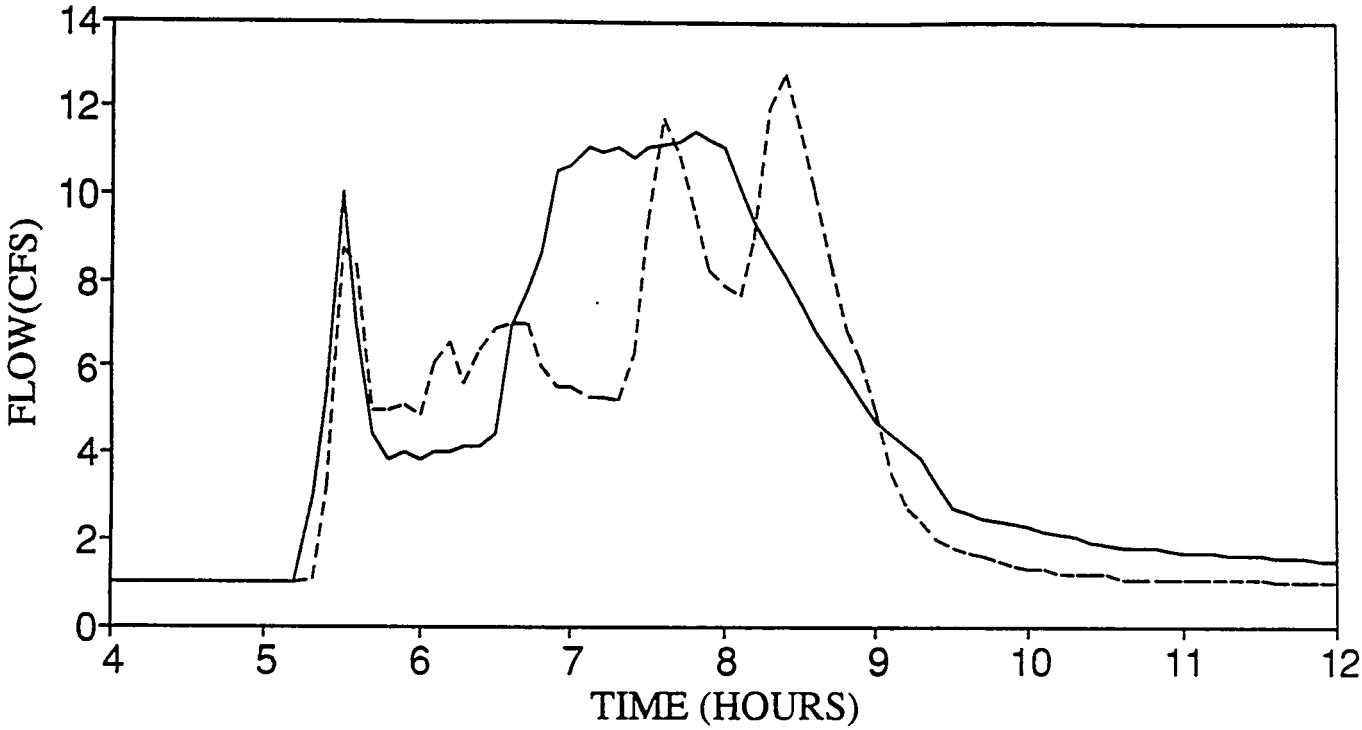
6.3 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 22

STATION D EVENT 3

4/4/89



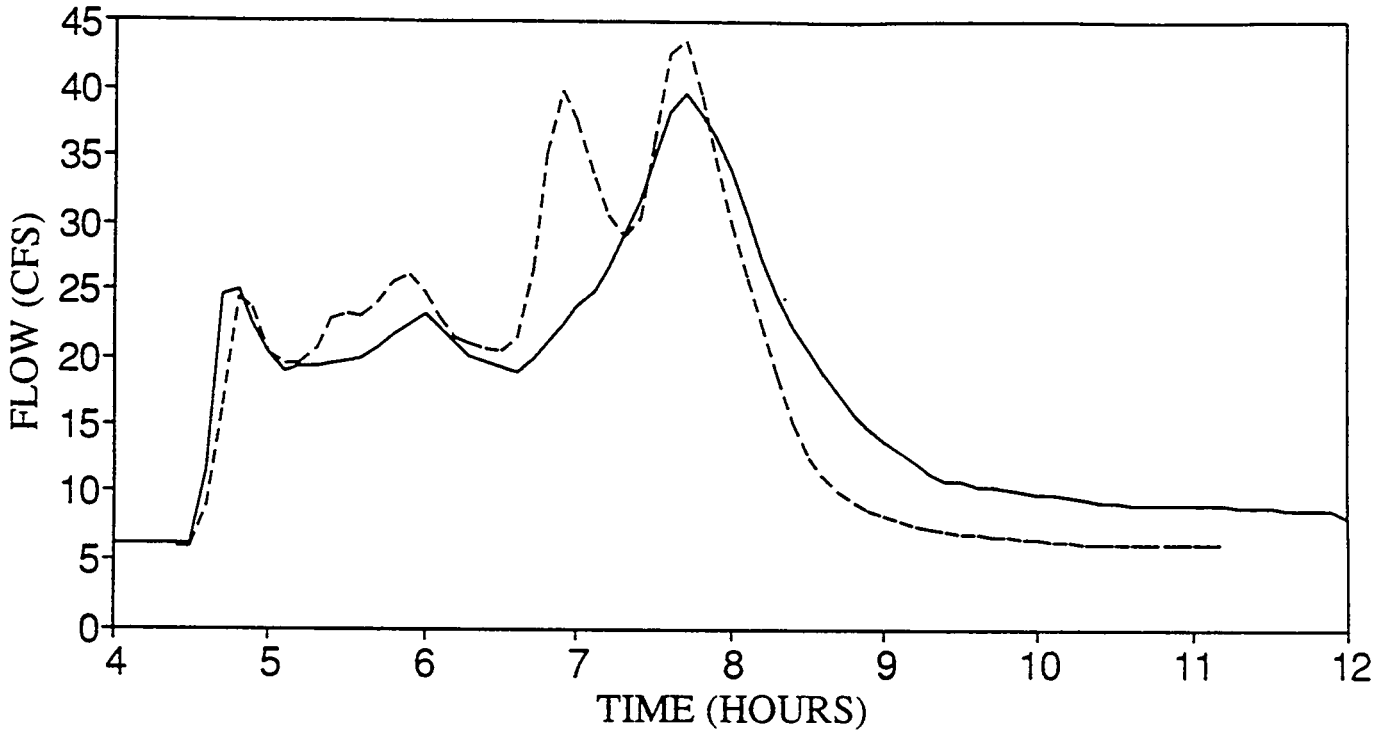
1 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 23

STATION E EVENT 3

4/4/89



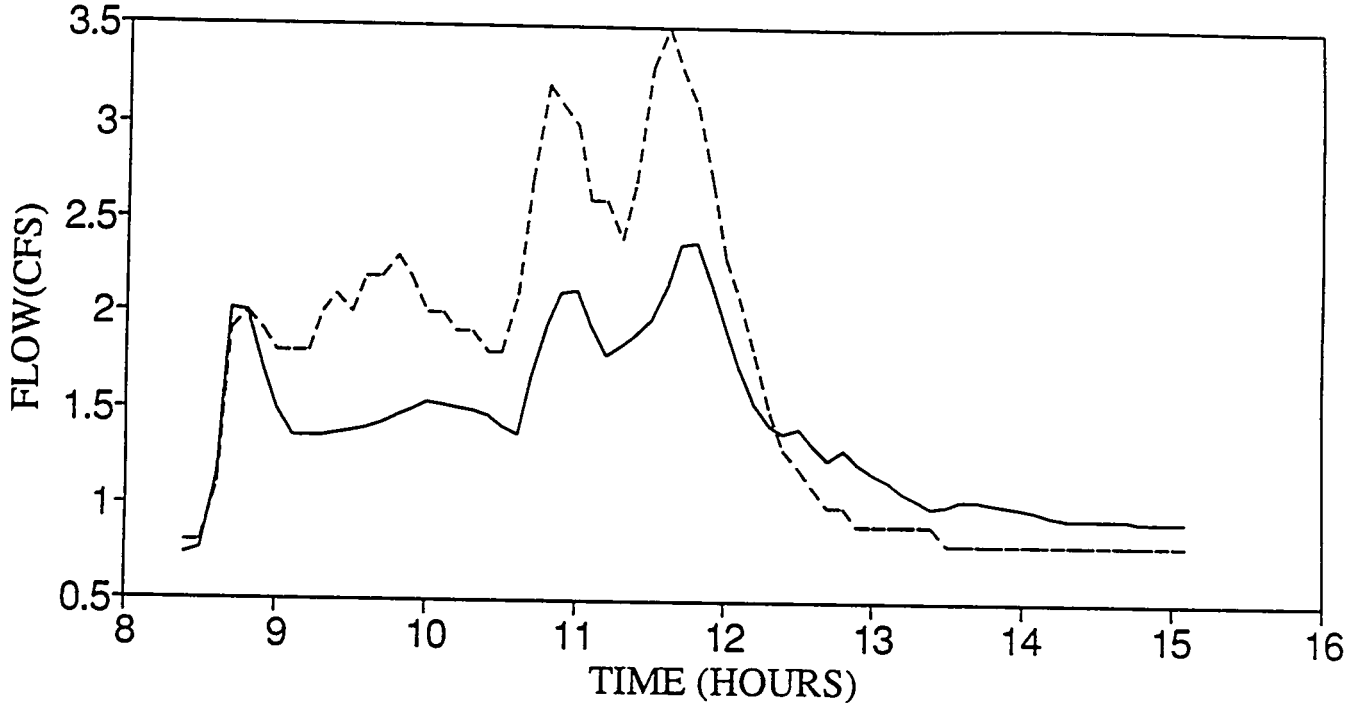
6 cfs base flow added to model results
Model results time-shifted 48 min. back

—— OBSERVED ---- MODELED

Figure 24

STATION F EVENT 3

4/4/89



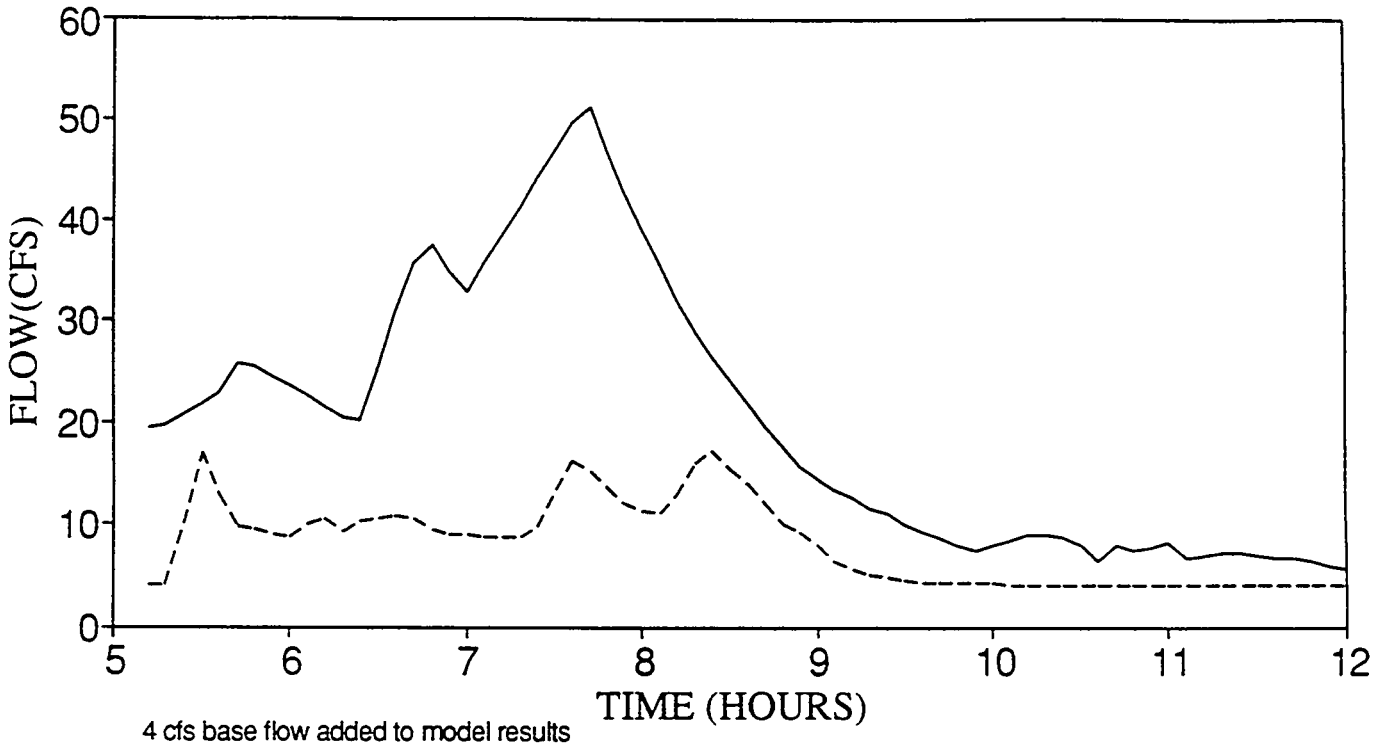
Model results time-shifted 3.2 hours forward
0.7 base flow added to model results.

—— OBSERVED ---- MODELED

Figure 25

STATION I EVENT 3

4/4/89



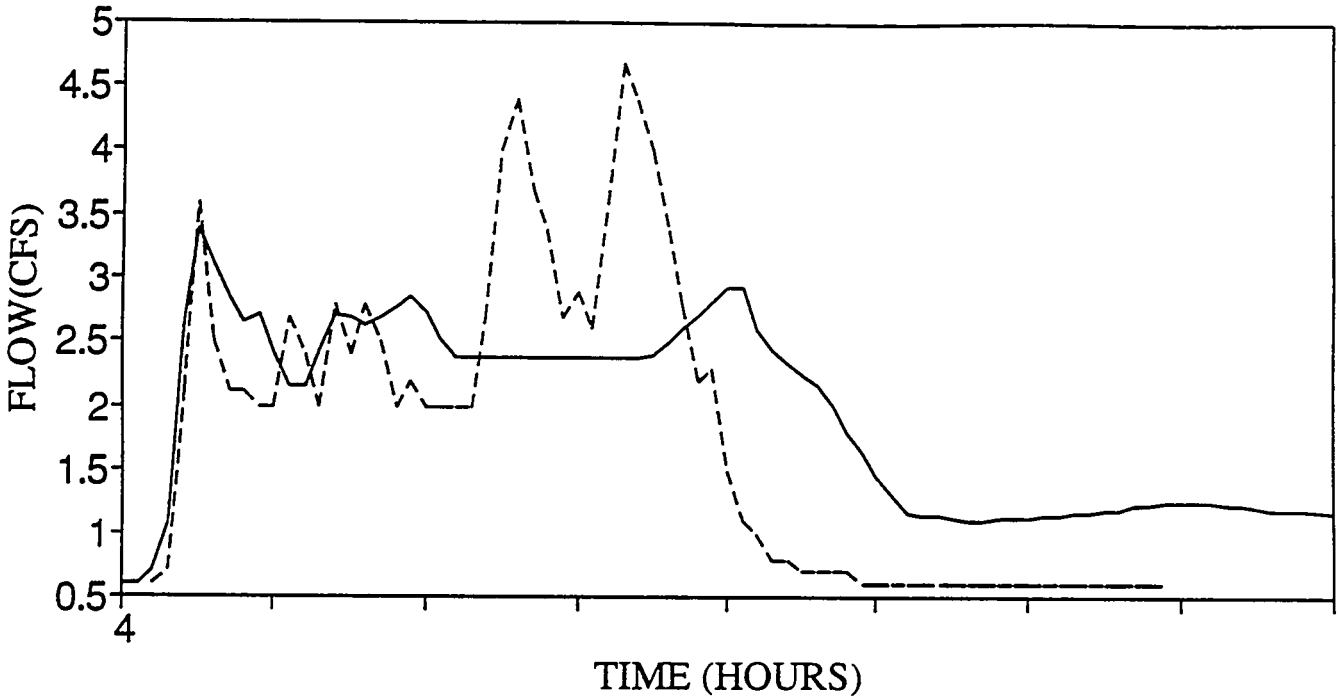
4 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 26

STATION J - EVENT 3

4/4/89



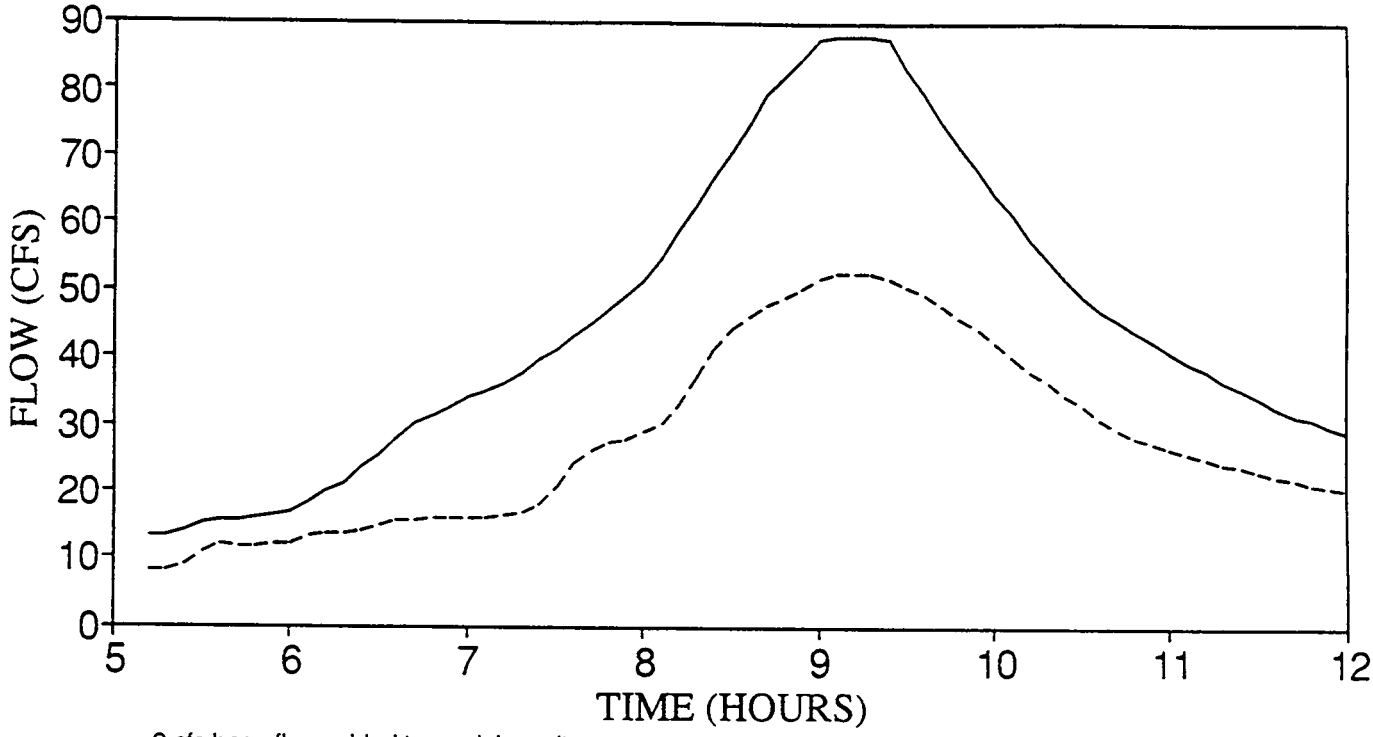
0.6 cfs base flow added to modeled results
Modeled results time-shifted 1 hour back

—— OBSERVED ---- MODELED

Figure 27

STATION K EVENT 3

4/4/89



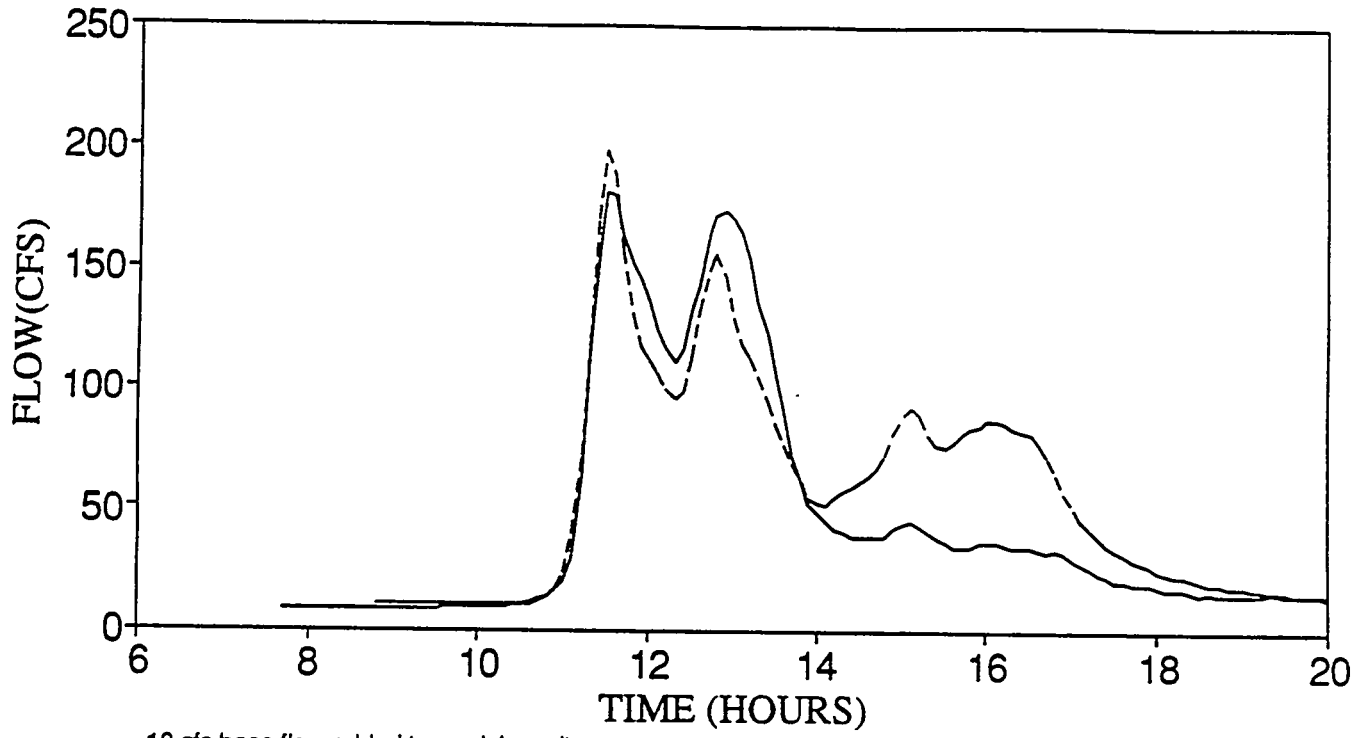
8 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 28

STATION A EVENT 4

5/5/89



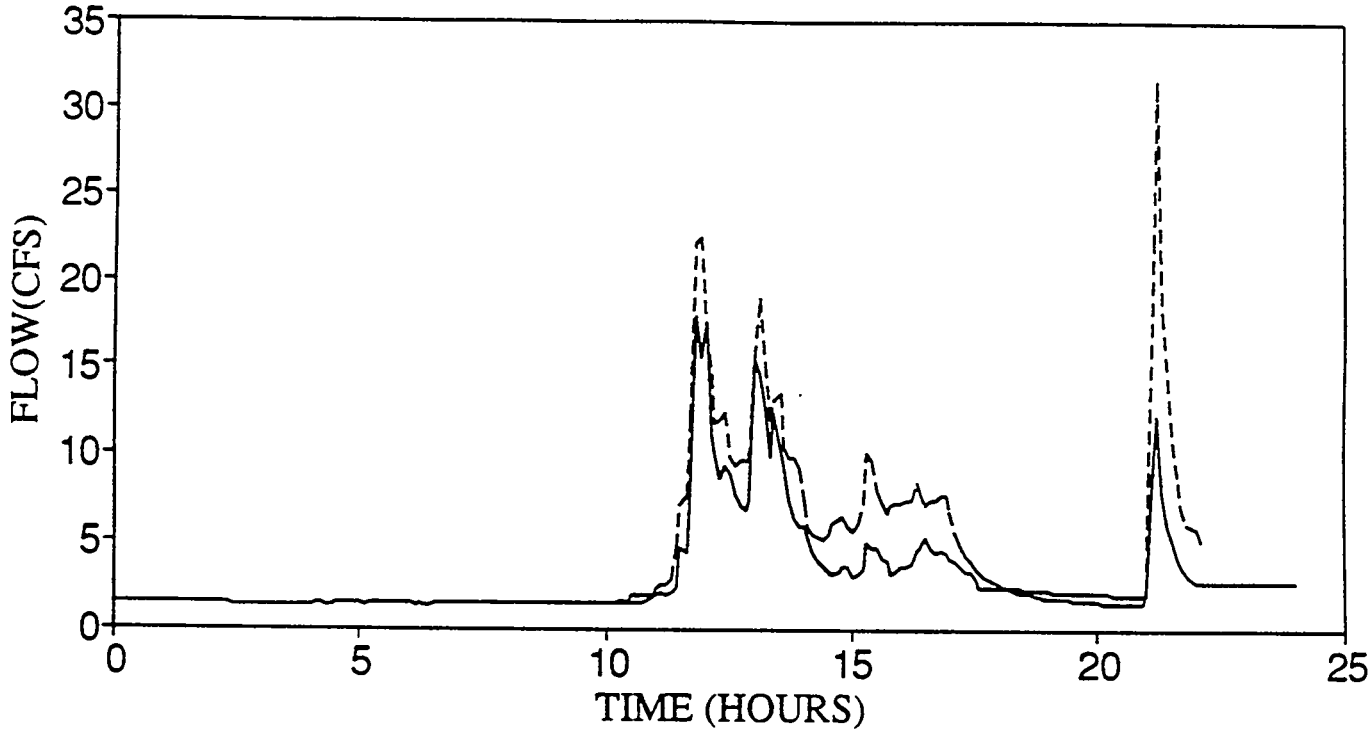
10 cfs base flow added to model results
Model results time-shifted 36 min. back

—— OBSERVED ---- MODELED

Figure 29

STATION B EVENT 4

5/5/89



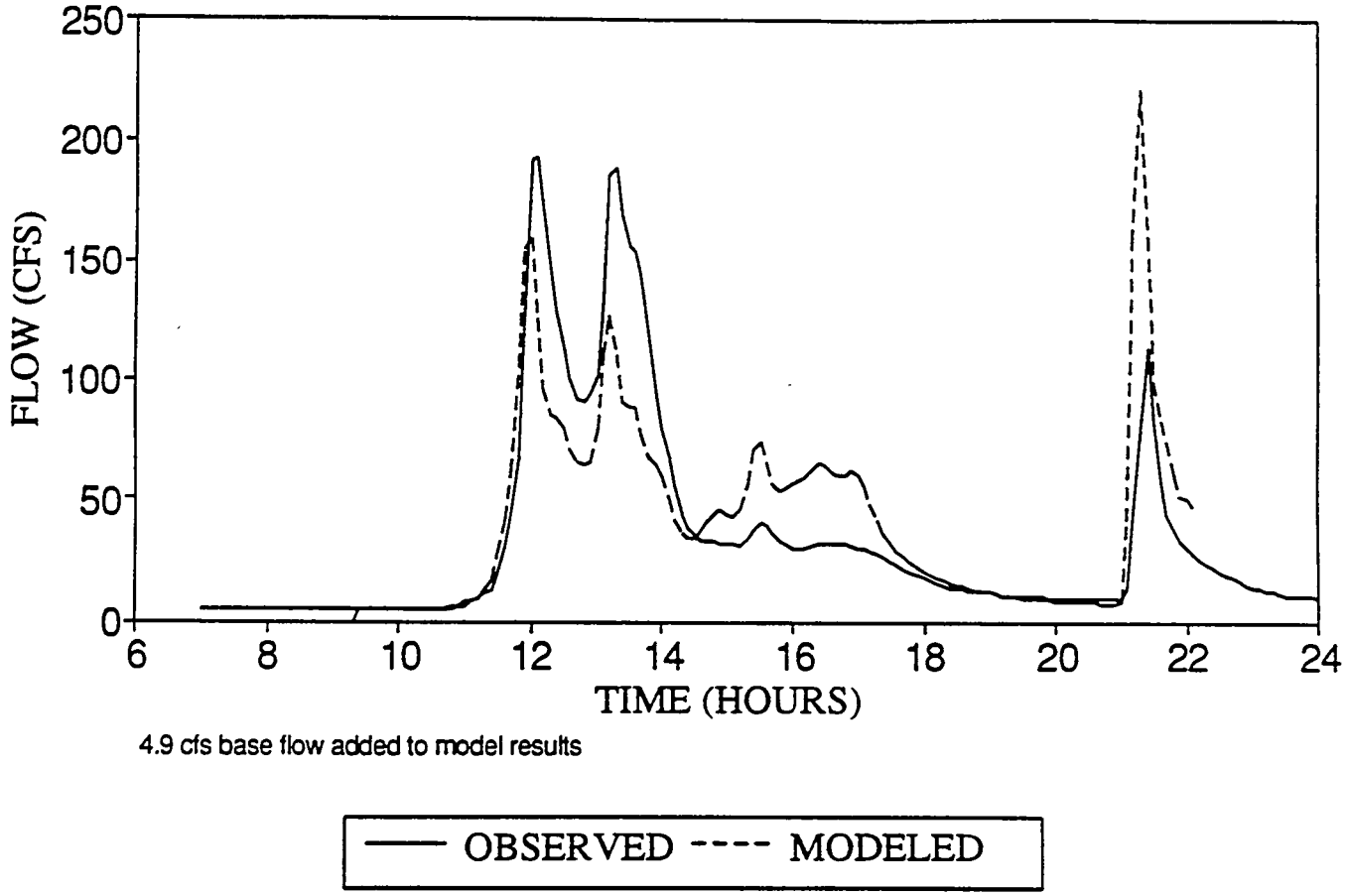
1.4 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 30

STATION C EVENT 4

5/5/89

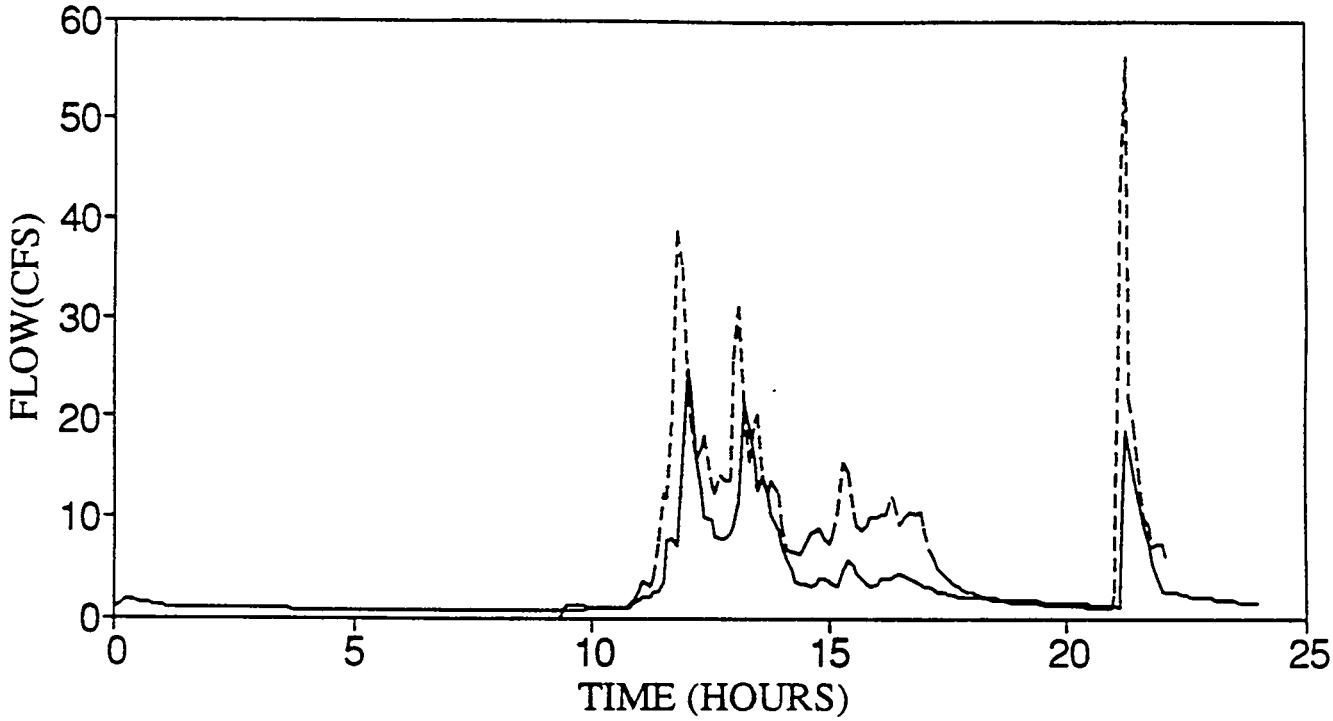


4.9 cfs base flow added to model results

Figure 31

STATION D EVENT 4

5/5/90



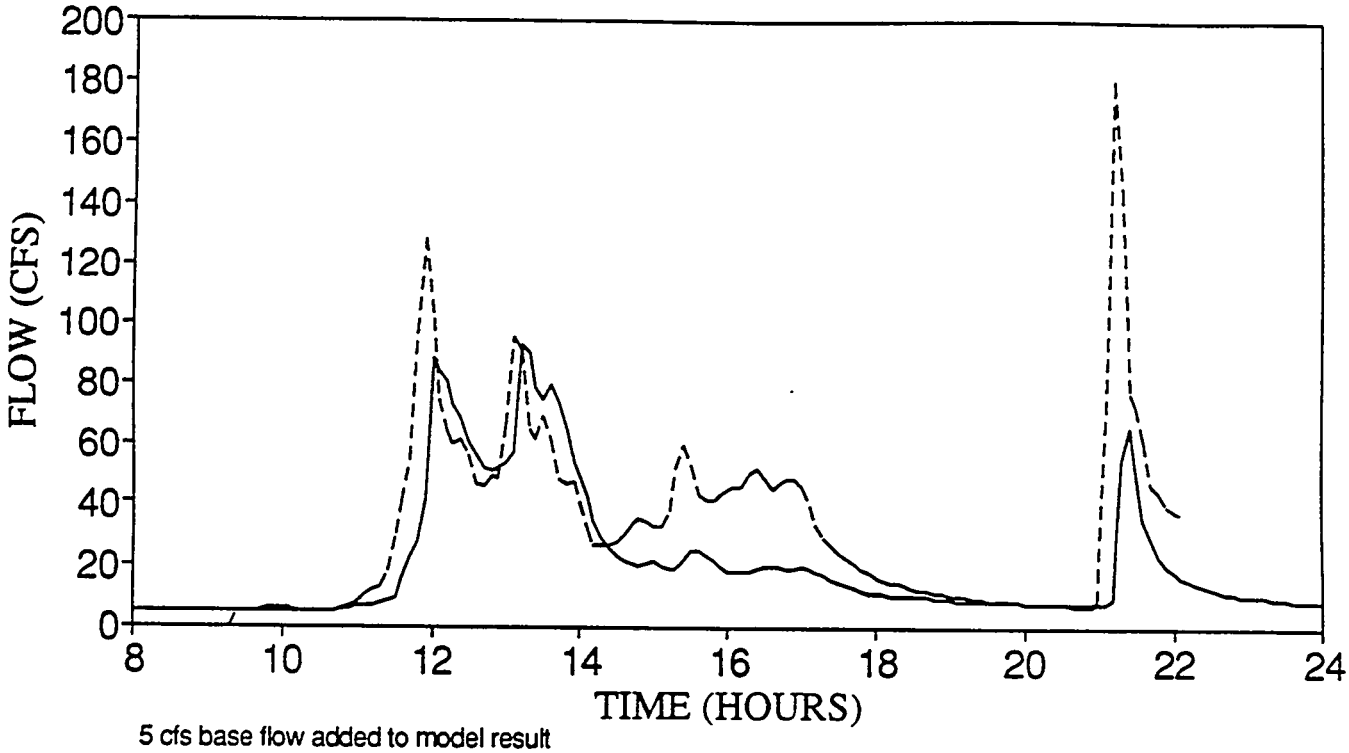
1 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 32

STATION E EVENT 4

5/5/89



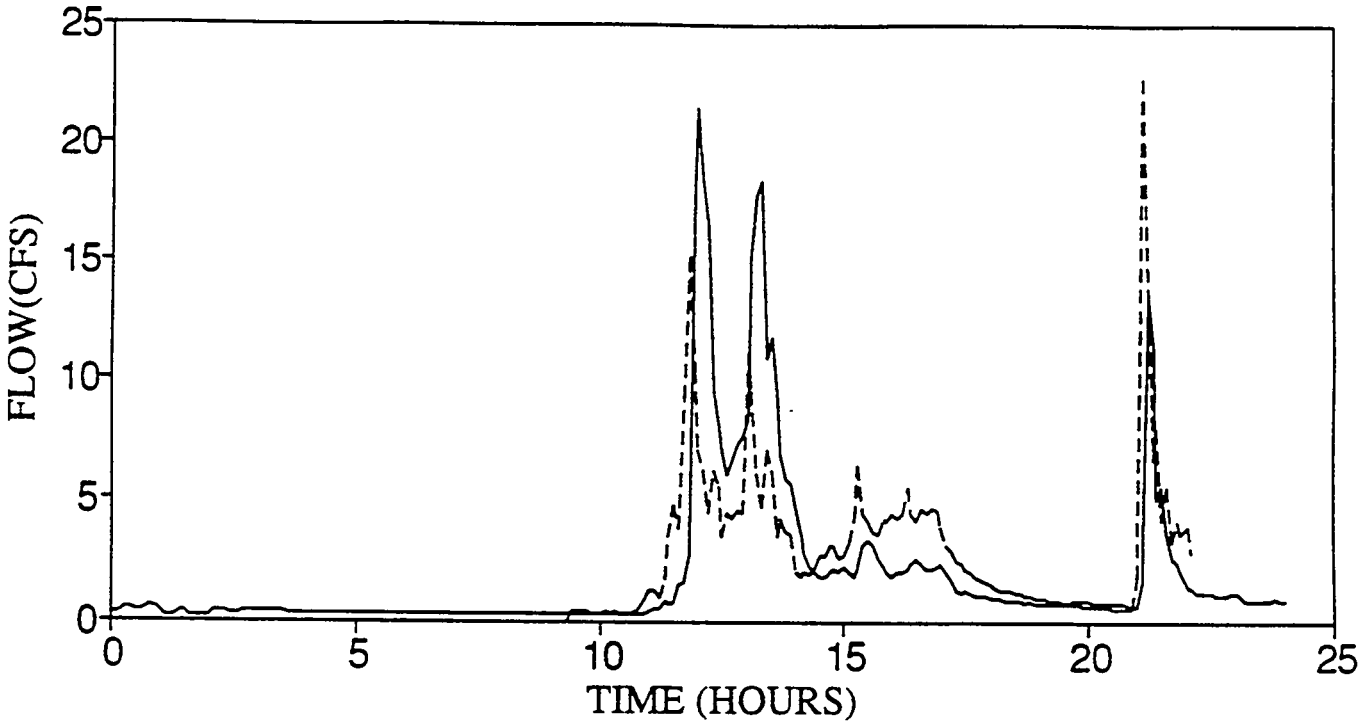
5 cfs base flow added to model result

—— OBSERVED ---- MODELED

Figure 33

STATION J EVENT 4

5/5/89



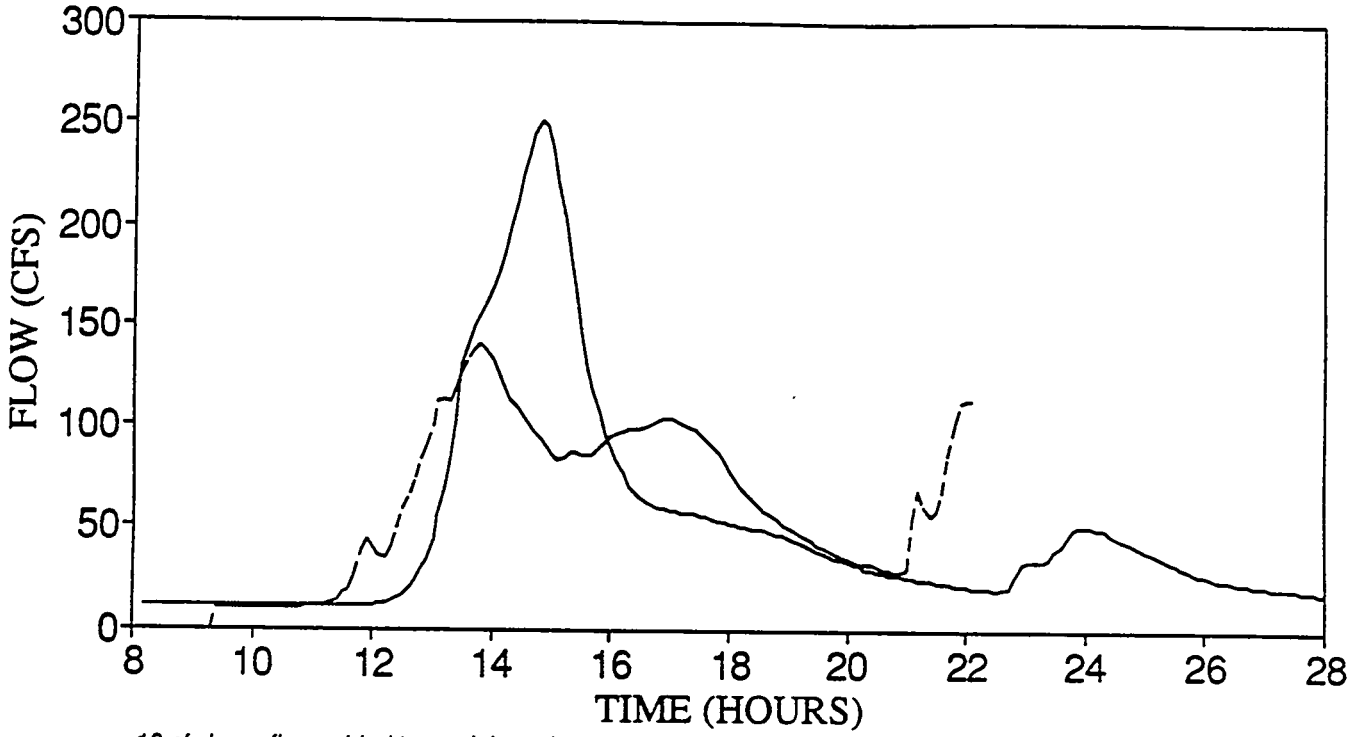
0.45 base flow added to model results

—— OBSERVED ---- MODELED

Figure 34

STATION K EVENT 4

5/5/89



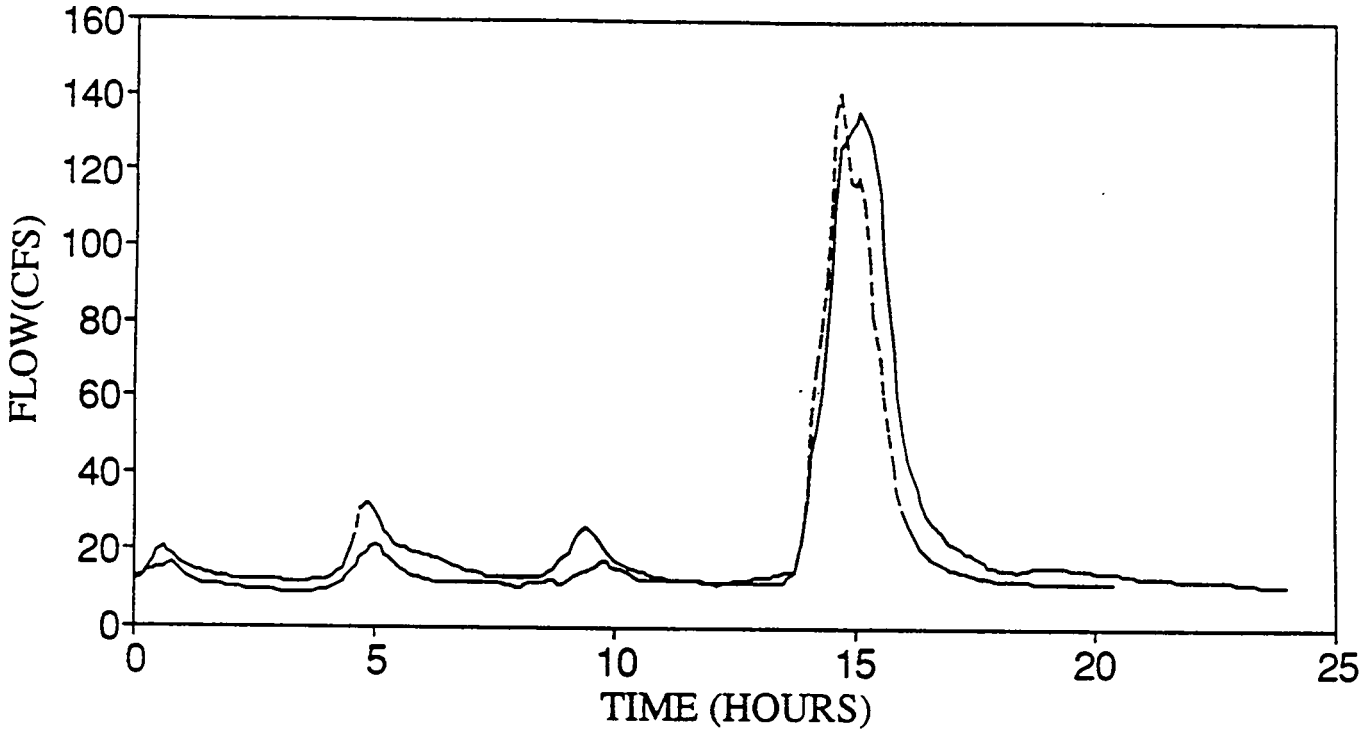
10 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 35

STATION A EVENT 5

5/9/89



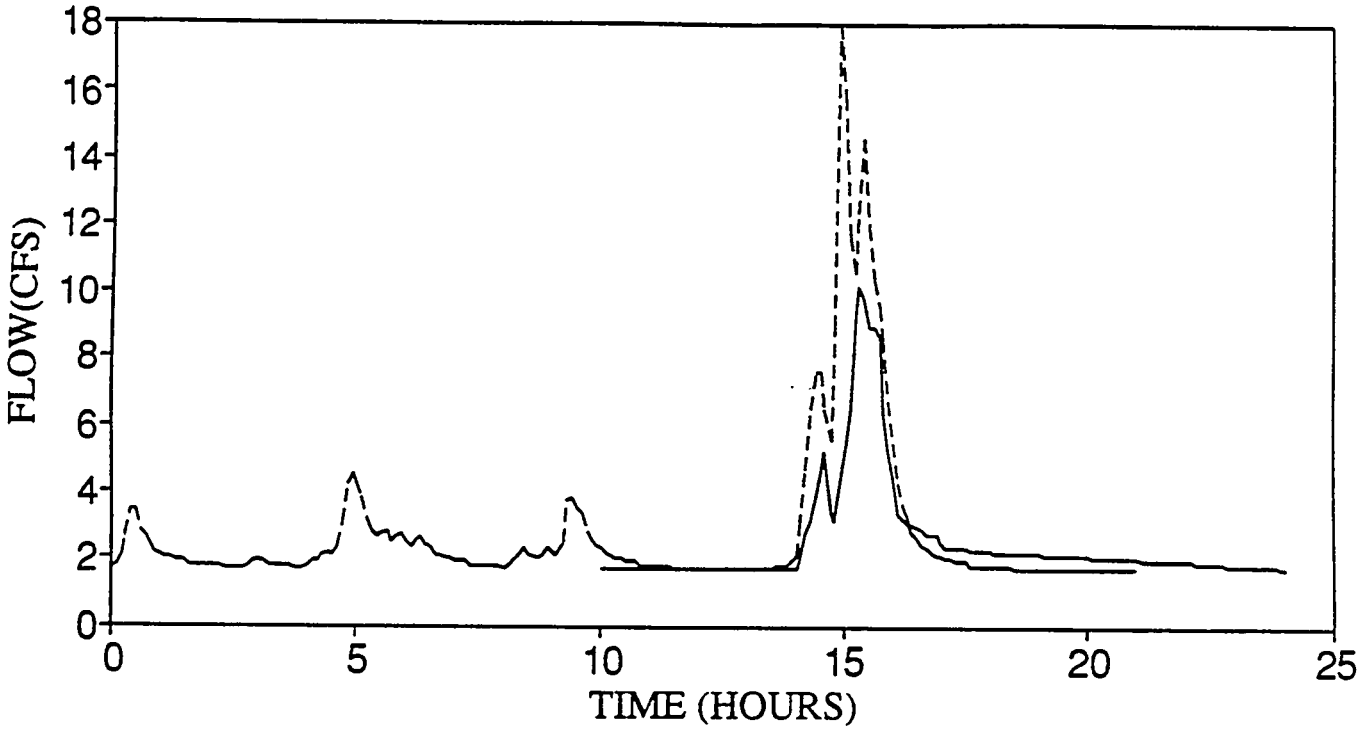
11 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 36

STATION B EVENT 5

5/9/89



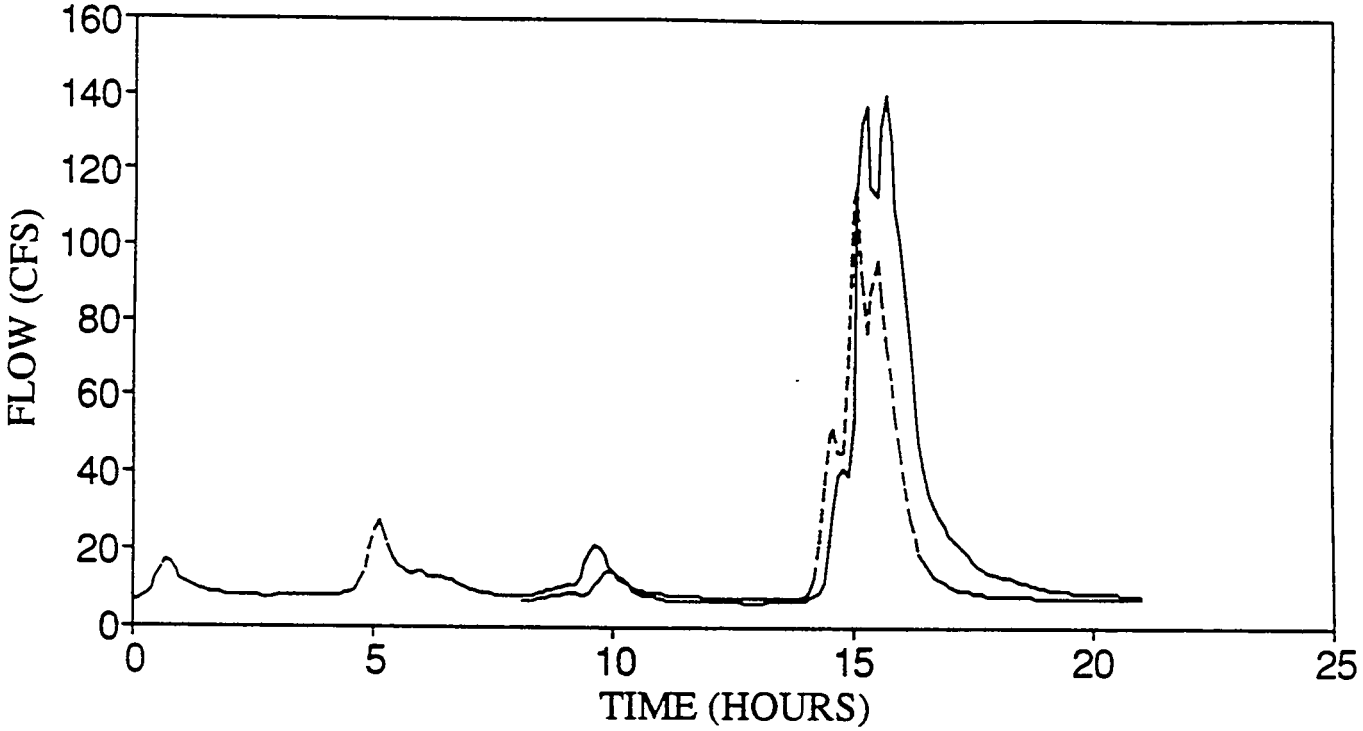
1.7 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 37

STATION C EVENT 5

5/9/89



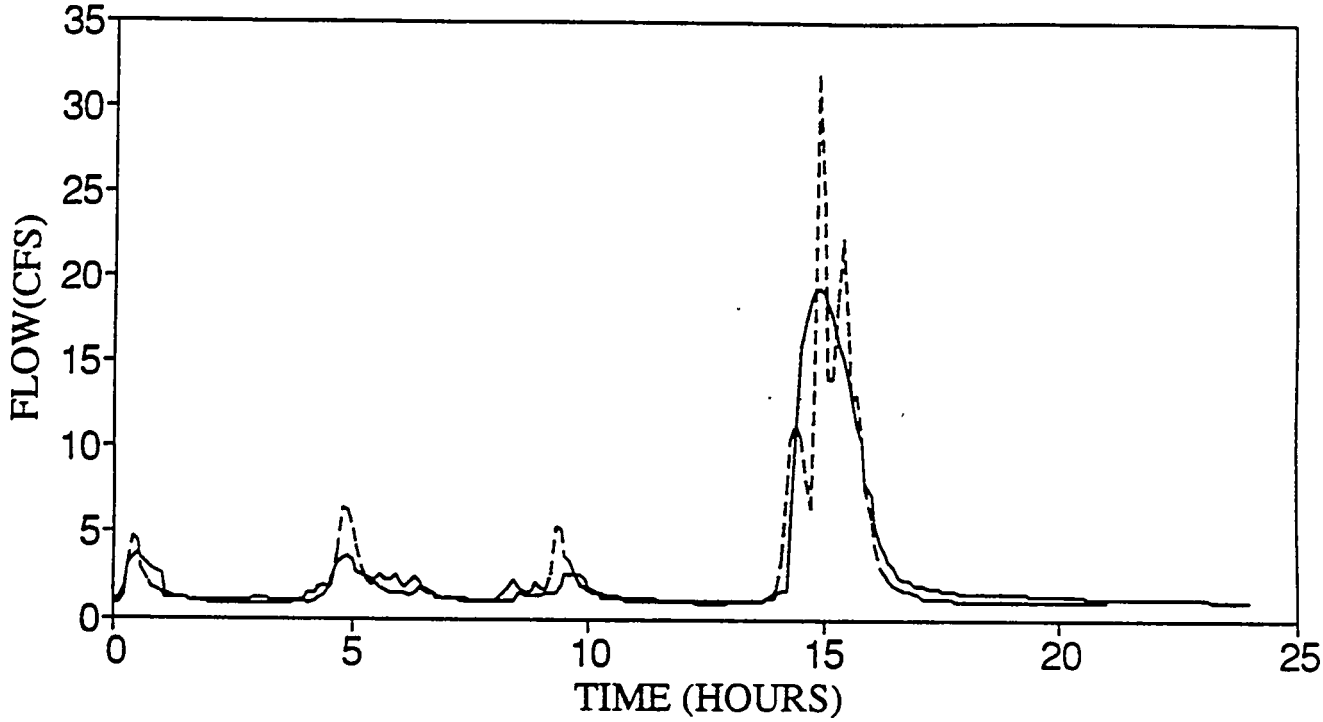
7 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 38

STATION D EVENT 5

5/9/90



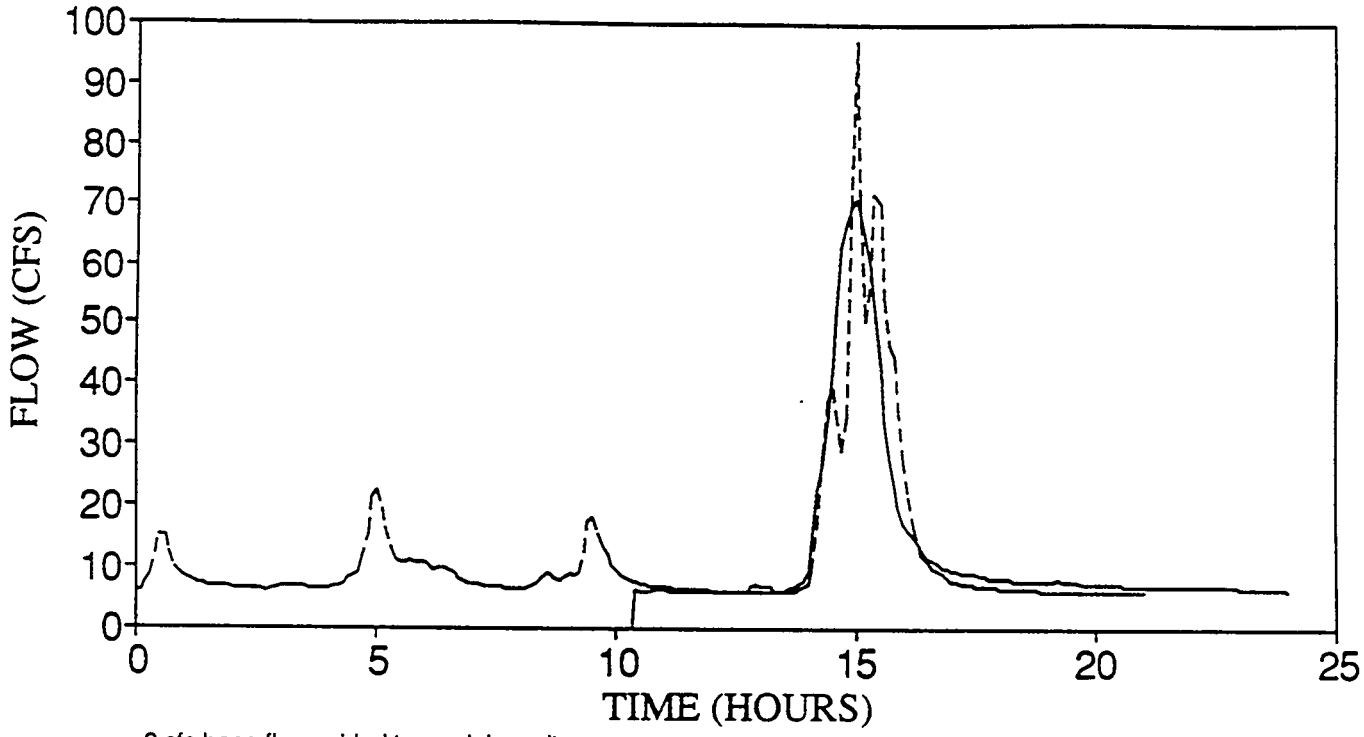
1 cfs base flow added to model results

—— OBSERVED ---- MODELED

Figure 39

STATION E EVENT 5

5/9/89



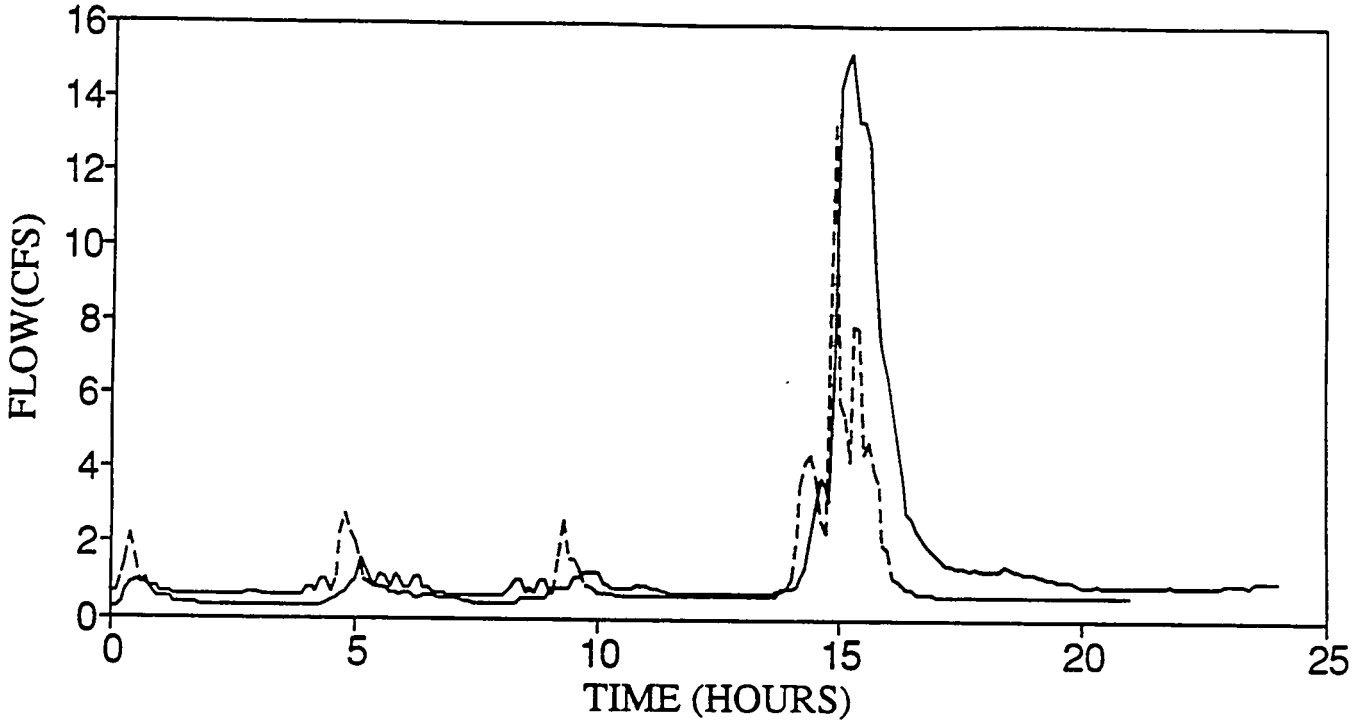
6 cfs base flow added to model result
model results time-shifted 1 hr. 48 min. ahead

—— OBSERVED ---- MODELED

Figure 40

STATION J EVENT 5

5/9/89



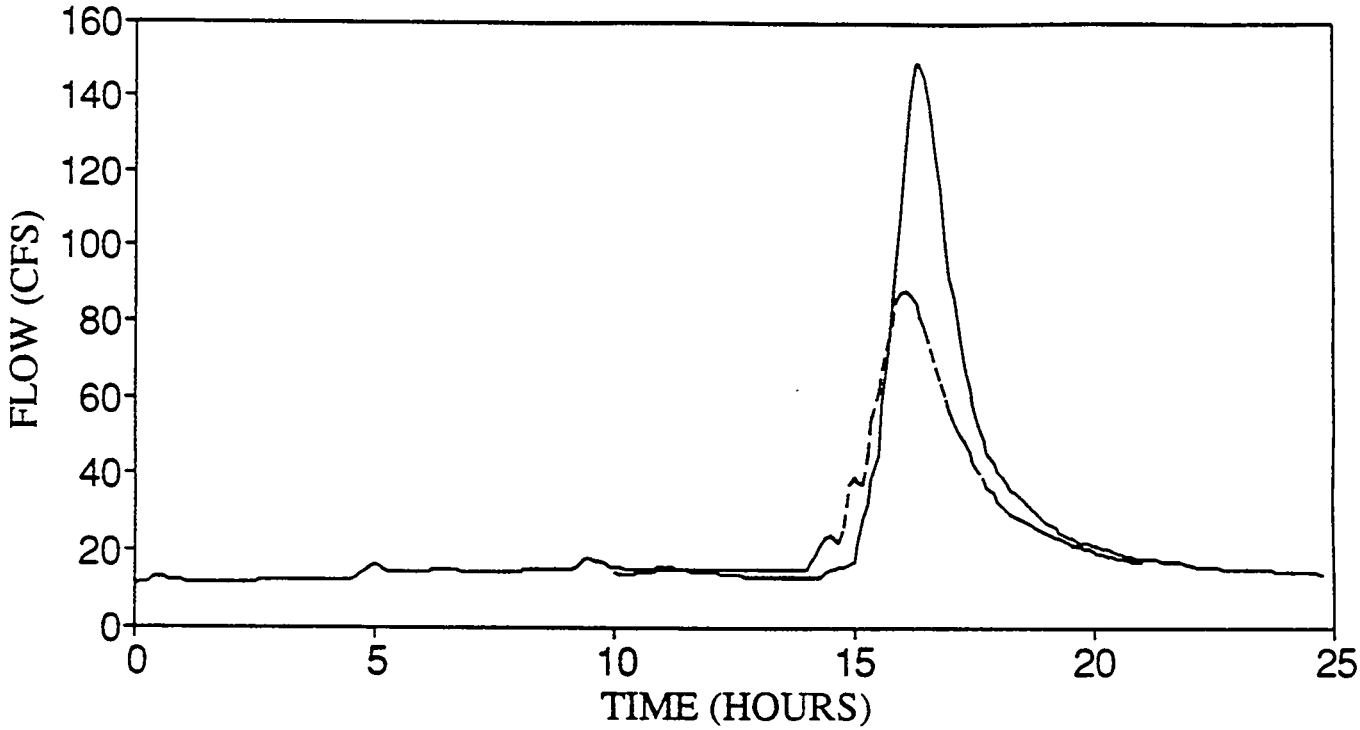
0.6 base flow added to model results

—— OBSERVED ---- MODELED

Figure 41

STATION K EVENT 5

5/9/89



11 cfs base flow added to model results

—— OBSERVED ---- MODELED

Table 5 summarizes the observed and simulated runoff volumes in cubic feet for all storms and monitor locations for which observed flows were available. This table shows that the average event difference between observed and simulated runoff volumes varies between 1 and 35 percent and averages 22 percent. The following conclusions summarize the comparison of simulated and observed flows:

- the match between simulated and observed flows is best for in-stream monitoring stations A, C, and E.

- differences at Stations B, D, F, I, and J are accentuated by the small observed flow rates.

- simulated peak flows and volumes at Station K generally underestimate the observed flows.

- for any flow monitoring location the simulated results are high for some storms and low for others when compared to the observed volumes. There is no consistent bias high or low for any monitoring location.

- for any storm the simulated runoff volumes may be high or low for different monitoring locations. Again, there is no consistent bias.

The differences between observed and simulated runoff volumes may be partially attributed to the following factors:

- rating curves used to determine flows are based on a limited sample of data at relatively low flow rates.

- significant extrapolation of the rating curves was required to determine flow rates observed during storm events.

- creek stations A, C, E, and K have irregular channel cross-sections and gravel bottoms, which are difficult to prepare accurate rating curves for.

TABLE 5

SUMMARY OF OBSERVED AND SIMULATED RUNOFF VOLUMES

STATION		RUNOFF VOLUMES (1000 CU.FT.) EVENT 2	3	4	5
A	OBSERVED	2,262.0	771.0	1,611.0	863.5
	SIMULATED	1,977.0	573.0	2,380.0	832.0
	DIFFERENCE	(285.0)	(198.0)	769.0	(31.5)
B	OBSERVED	138.0	52.9	143.0	40.8
	SIMULATED	184.0	55.8	221.0	81.3
	DIFFERENCE	46.0	2.9	78.0	40.5
C	OBSERVED	1,847.0	661.4	1,812.0	708.0
	SIMULATED	1,487.0	424.9	1,830.0	615.0
	DIFFERENCE	(360.0)	(236.5)	18.0	(93.0)
D	OBSERVED	211.0	115.8	207.5	137.0
	SIMULATED	286.0	89.2	345.6	128.0
	DIFFERENCE	75.0	(26.6)	138.1	(9.0)
E	OBSERVED	804.0	319.8	921.0	317.0
	SIMULATED	1,075.0	298.4	1,340.0	433.0
	DIFFERENCE	271.0	(21.4)	419.0	116.0
F	OBSERVED	36.5	15.3		
	SIMULATED	57.9	21.1		
	DIFFERENCE	21.4	5.8		
I	OBSERVED	385.0	405.8		
	SIMULATED	400.0	97.8		
	DIFFERENCE	15.0	(308.0)		
J	OBSERVED	114.0	36.2	138.5	73.0
	SIMULATED	105.0	29.3	133.0	42.4
	DIFFERENCE	(9.0)	(6.9)	(5.5)	(30.6)
K	OBSERVED	2,943.0	813.3	2,815.0	883.0
	SIMULATED	2,204.0	498.3	2,560.0	861.0
	DIFFERENCE	(739.0)	(315.0)	(255.0)	(22.0)
AVERAGE EVENT DIFFERENCE		-11.0%	-34.6%	15.2%	-1.0%
AVERAGE EVENT ABSOLUTE DIFFERENCE		20.8%	35.1%	22.0%	11.3%

- the rating curve developed from measured flows at Station K overestimates the actual flows when extrapolated to higher flow rates.

- rating curves for Pipe Stations B, D, F, I, and J were developed assuming that the pipes are circular in shape. Corrosion sedimentation, and alternative cross-sections could result in departures from the computed flows.

- changes in plant discharge rates could significantly affect calibration results at stations with low flow rates;, B, D, F, I, and J.

- backwater effects from downstream constrictions and other hydraulic phenominon could affect flows at all stations.

- changes throughout the Y-12 Plant (e.g., construction, paving, drainage improvements, clearing) result in constantly changing runoff characteristics.

- spatial rainfall variation across the watershed could produce some of the observed variation.

The following conclusions are drawn from the above observations:

- with the flow and runoff data available, it would be difficult to obtain a better match between observed and simulated flows.

- a wider range of flow measurements including higher flow rates would greatly improve the accuracy of flow rating curves.

- as with any model, more events and more data would lead to a more refined calibration.

- the model is sufficiently calibrated to be used to provide runoff volumes for input to the SMAP model as described in the next section.

4.0 MODEL APPLICATION

The RUNOFF model was applied to prepare storm runoff volumes for input to the SMAP Model for the one-year return period storm event. The one-year return period, 24-hour duration rainfall volume in Oak Ridge equals approximately 2.85 inches (U.S.W.B., 1961). This rainfall volume was applied to a Soil Conservation Service Type II distribution to prepare the input rainfall hyetograph to the model at six-minute intervals. This rainfall distribution is representative of a severe 24-hour duration event typical of the eastern United States. The resulting rainfall input to the RUNOFF model is shown on Figure 41.

Figure 42 shows the resulting runoff hydrograph at Station K, the outlet from Y- 12. This figure shows that the approximate duration of runoff equals 12 hours.

The RUNOFF program provides runoff volumes for each subbasin in the model shown on Figure 1. These are accumulated to represent the runoff volumes for the 11 comprehensive sampling location drainage basins shown on Figure 2. Table 6 shows the RUNOFF subbasins in each comprehensive sampling program basin. The resulting runoff volumes in inches for each sampling basin are summarized in Table 7. These inputs, along with the duration of the runoff event duration of 12 hours provide the required input to SMAP to simulate the runoff concentration and loads delivered to EFPC by this storm event.

FIGURE 42

1-YEAR, 24-HOUR RAINFALL HYETOGRAPH

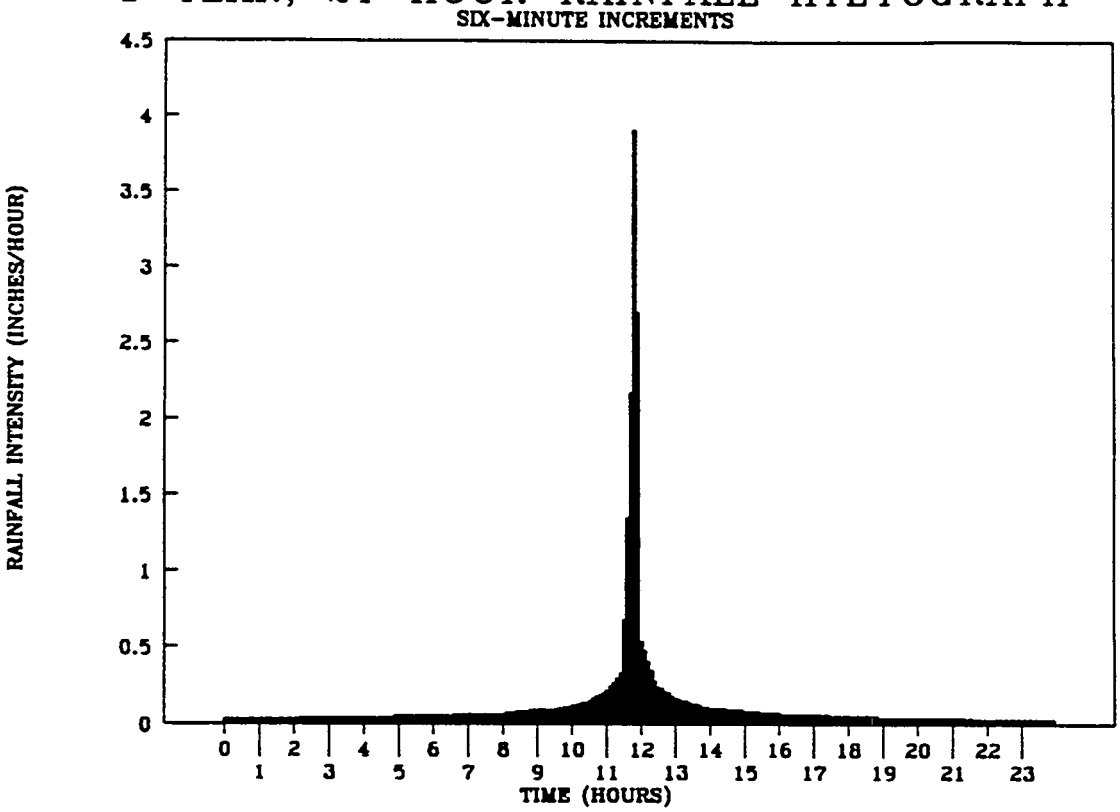


FIGURE 43

1-YEAR, 24-HOUR STORM RUNOFF HYDROGRAPH

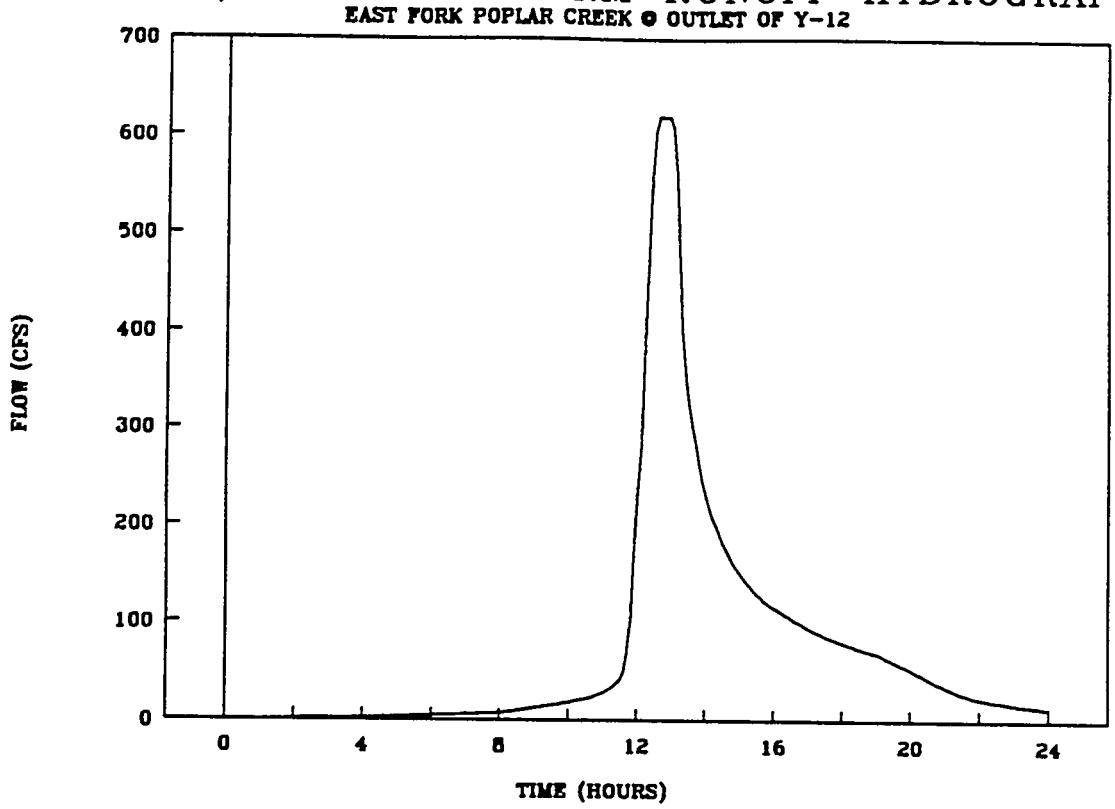


TABLE 6
CORRELATION OF RUNOFF SUBBASINS TO
COMPREHENSIVE SAMPLING PROGRAM BASINS

COMPREHENSIVE SAMPLING BASIN	RUNOFF MODEL SUBBASINS
A	5000 5002 5003 5004 5010 5050 5055 5060 5065 5070 5075 10001 10002 10003 15000 15001 15060 15070 15100 15160
B	10010 10030 10050 10055 10060 10065 10120 10130 10160 10170 10180 10190 10200
C	20001 20004 25001 25003 25020 25040
D	20002 20005 20015 20020 20030 20040 20130 20160 20200 20210 20230 20250 20310 20320 20340 20350 20360
E	30001 30002 35000 35002 35003 35004 35500 40001 40010 40040 40050 40100 40150 40200 40210 40220 40230 40240 40500 40510 40550 40600
F	30020 30040 30060 30070 30120
G	35030 35050 35110 35300 35340 35400 35405 35410 35420
H	40520 40530 40540
I	45000 45001 45002 45020 50000 50001 50003 50007 50008
J	50002 50004 50005 50006
K	60000 60010 60020 60030 60035 60040 60050 60060 60065 60070 60080 60090 60100 60110 99001

TABLE 7
1-YEAR, 24-HOUR STORM RUNOFF VOLUME FOR BASINS
RUNOFF DURATION - 12 HOURS

BASIN DATA				SAMPLING POINT DATA			
BASIN	DRAINAGE AREA (ACRES)	RUNOFF VOLUME (INCHES)	(1000 CU.FT)	SAMPLING STATION	DRAINAGE AREA (ACRES)	RUNOFF VOLUME (INCHES)	(1000 CU.FT)
A	124.28	1.77	796	A	771.8	1.69	4745
B	65.99	1.80	431	B	66.0	1.80	431
C	53.74	1.69	331	C	581.6	1.67	3519
D	100.79	1.81	662	D	100.8	1.81	662
E	126.11	1.62	743	E	427.0	1.63	2526
F	13.68	2.25	112	F	13.7	2.25	112
G	59.70	2.03	439	G	59.7	2.03	439
H	58.51	1.60	339	H	58.5	1.60	339
I	111.57	1.41	569	I	169.0	1.45	892
J	57.45	1.55	323	J	57.5	1.55	323
K	400.20	1.33	1929	K	1172.0	1.57	6675

5.0 SUMMARY AND CONCLUSIONS

The previously developed RUNOFF model of East Fork Poplar Creek was updated to represent several changes that have been made in the drainage system. The updated model was then used to simulate flows produced by four storm events monitored in the comprehensive sampling program. The simulated flows are compared with flows observed during the storms.

The RUNOFF model of the Y-12 Plant has two purposes in this study:

1. It serves as a predictive tool to simulate runoff volumes for different storm events.

2. It serves to generate input to the SMAP model which will calculate contaminant loadings from different storm events.

The model could be applied in the future to provide estimates of peak flow rates produced by different return period events from 1 to 100 years and evaluate/optimize the storm drainage system of the Y-12 Plant.

References

Camp Dresser & McKee Inc., "Comprehensive Sampling Program for East Fork Poplar Creek Area Source Pollution Assessment and Control Plan," March 1987.

Camp Dresser & McKee Inc. "RUNOFF USERS Manual and Documentation," October 1980.

United States Weather Bureau, "Rainfall Frequency Atlas of the United States," Technical Paper Number 40, May 1961.

SECTION 6.0

SMAP DESCRIPTION, INITIAL SETUP AND CALIBRATION REPORT

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1.0 INTRODUCTION

The Stream Management and Analysis Program (SMAP) was developed by Camp Dresser & McKee Inc. (CDM) to provide a planning tool to evaluate the impacts of area source discharges within the Y-12 Plant site on water quality in East Fork Poplar Creek (EFPC). SMAP was developed for Martin Marietta Energy Systems (MMES) as one component in the EFPC Area Source Pollution Assessment and Control Plan.

SMAP is an integrated computer program that simulates the various components of area source discharges to EFPC and evaluates the impact of Best Management Practices (BMPs) on the stream water quality. The program computes the flows, chemical constituent concentrations, and pollutant loads produced within specific subbasins of the Y-12 Plant. In addition, SMAP is designed to compute the resulting flows, concentrations, and loads at specified points in EFPC.

SMAP consists of three modules:

- A steady-state water quality module used to simulate the flow and water quality impacts on EFPC from variations in the quality and/or quantity of nonpoint source runoff, groundwater infiltration, and point source discharges
- A spill module used to simulate the water quality impacts on EFPC from spills occurring within the Y-12 Plant
- A BMP module used to simulate the flow and water quality impacts on EFPC of structural and nonstructural pollution controls applied to point source, nonpoint source, and/or groundwater infiltration

This report provides a description of the functional capabilities, logic, and components of SMAP, and also describes the initial setup and calibration of SMAP for the Y-12 EFPC drainage basin, based on data obtained from the EFPC Comprehensive Sampling Program from April 1988 through May 1989. A user's manual describing how to use the program has also been prepared by CDM and submitted to MMES as a separate document (CDM, 1990a).

2.0 SMAP DESCRIPTION

2.1 OVERVIEW

2.1.1 PROGRAM FORMULATION

SMAP is written in Pascal using a modular approach. Separate modules or procedures which perform specific tasks use and/or modify specific records to input, modify, or summarize program data and results, or to perform mass balance and in-stream calculations. These independent program modules are linked through a pull-down menu system into a single integrated program.

The program uses a database system that allows for the optimum flexibility in setting up and using the program. Separate records that represent groups of major data input or output are used. As an example, data associated with groundwater infiltration calculations (storm drain area, average storm drain invert elevation, infiltration rate, etc.) within a subbasin are grouped into a single data unit along with a subbasin identifier and a scenario ID. These data records and the specific data fields contained in each record are a critical part of the initial program design and are described in detail below. Using this formulation, the program itself places no limits on the number of subbasins, chemical constituents, etc., that can be modeled. In actual practice, however, the maximum size of an analysis is limited by the level of detail required, the availability of data to support the level of detail, and the disk storage space available for a specific application.

Default values representing best estimates of present day conditions are assigned for several of the model input parameters. Certain records, however, are associated with a user defined scenario ID and therefore change as the scenario ID selection changes. In this manner, input for a specific scenario can be modified and saved for future use. The actual SMAP calculations can only be performed for one chemical constituent at a time. Similarly, the resulting simulated concentrations and loads can only be viewed or printed for a single chemical constituent at a time. However, since input data for all

constituents are stored, results for the various constituents can be viewed or printed simply by changing the constituent field for the scenario ID selected.

2.1.2 PHYSICAL REPRESENTATION

SMAP simulates the flows and the chemical constituent concentrations and loads produced within specific areas of the Y-12 Plant, as well as the resulting flows, concentrations, and loads in EFPC. To accomplish this, the plant must be divided into subbasins according to land use, soils, slopes, storm sewer characteristics, and impervious cover. Since SMAP requires data input describing the quantity and quality of point source, nonpoint source, and groundwater components from each subbasin, SMAP uses the 11 major subdivisions currently being monitored through the Comprehensive Sampling Program (see **Figure 2-1**) to make best use of the available data. These subbasins were delineated during CDM's previous SWMM-RUNOFF model study (CDM, 1990b).

Each subbasin serves as the basis for computing water quality and quantity contributions to EFPC. Nonpoint and groundwater infiltration flows and concentrations are computed for each subbasin according to land use and groundwater quality zones. Point source discharges are identified by the subbasin from which they discharge, with the total flow and pollutant load from these sources accumulated for each subbasin. Any BMPs are also applied at the subbasin level to compute the flows, concentrations, and loads from the subbasins for which they are specified. SMAP has been structured so that in the future, if desired, each major subbasin can be further broken down into smaller subbasins as data become available to quantify pollutant sources within the Y-12 Plant.

The subbasin flows, concentrations, and loads are computed and applied at specified inflow nodes to EFPC. Inflow nodes represent the major locations of discharge of the storm sewers or drainageways to EFPC between the North-South pipes and the basin outlet. Flows and pollutant loads from upstream basins are accumulated at each inflow node. Finally the flows, concentrations, and loads are computed for specific locations in EFPC. Mass balance equations are used to perform the calculations within the stream.

2.2 CHEMICAL CONSTITUENTS

SMAP can simulate an unlimited number of chemical constituents for which nonpoint source, point source, and/or groundwater loading concentrations can be determined. Note, however, that SMAP has been initially set up and calibrated to simulate only six chemical constituents (total residual chlorine, nitrate, copper, iron, mercury, and uranium) as described in Section 3.0. To simulate any other chemical constituents, additional data are required. SMAP simulates and stores the results for a single constituent at one time to conserve disk storage space. Different constituents for which the required data are stored in SMAP are simulated by changing a single input selection through the menu system.

SMAP assumes that the simulated constituent is conservative, that is, the constituent does not volatilize, react with or degrade to other chemicals, or settle within the EFPC drainage system. These processes are too complex and unpredictable to be incorporated into a planning tool such as SMAP. SMAP therefore provides a conservative analysis of pollutant loads in EFPC. Considering the short travel time and distance to EFPC from any location in the Y-12 Plant, this conservative assumption is appropriate for most chemical constituents to be simulated. For those chemical constituents where the nonconservative processes identified above are important, the SMAP simulation results should be reviewed with these processes in mind.

Estimates of the event mean runoff concentrations produced by various zones of relatively uniform pollutant sources within the Y-12 Plant are required for each constituent. These zones may be defined as process areas, storage areas, parking lots, hillsides, or other unique areas of the plant where nonpoint pollution concentrations are approximately the same. The percentage of each subbasin lying within each nonpoint source zone is used to compute the contribution from nonpoint sources as described in Section 2.3.1. As described in Section 3.0, for the initial setup of SMAP, a single nonpoint source zone is assigned to each subbasin due to the limited amount of available data.

In a similar manner, estimates of the concentrations of each simulated constituent can be defined for specific groundwater zones. The percentage of

each subbasin lying within each groundwater zone is used to compute the contribution from groundwater sources as described in Section 2.3.2. As described in Section 3.0, for the initial setup of SMAP, a single groundwater zone is assigned to each subbasin due to the limited amount of available data.

Estimates of the concentration of the simulated constituents present in point source discharges are also required. As described in Section 3.0, for the initial setup of SMAP, a single point source flow and set of pollutant concentrations is assigned to each subbasin due to the limited amount of data available. SMAP, however, has the capability to store and simulate flows and pollutant concentrations for specific processes within each subbasin. This capability can be implemented in the future as more detailed information about the processes is obtained.

The BMP module allows the evaluation of facilities and/or practices which reduce flows and/or pollutant loads from any source specified in SMAP. For each BMP, the fraction of each constituent load which can be removed by each BMP is input to SMAP. One or more BMPs can be applied to an entire subbasin or fraction thereof. The pollutant removal efficiency of each BMP is multiplied by the constituent concentration to compute the net pollutant load delivered to EFPC.

2.3 SUBBASIN CALCULATIONS

Subbasins form the smallest unit of calculation within SMAP. The methods used to compute the contribution from nonpoint sources, groundwater infiltration, and point sources within a subbasin are described below.

2.3.1 NONPOINT SOURCE

In SMAP, nonpoint sources represent the contributions to EFPC from runoff. Runoff can transport both suspended and dissolved chemical constituents from contaminated areas.

SMAP simulates the runoff flows and concentrations as a steady-state condition. Rainfall runoff, expressed in units of inches of runoff over each subbasin over

the runoff duration, is input directly into SMAP. Rainfall runoff can be measured directly through the Comprehensive Sampling Program, or the SWMM-RUNOFF model developed previously by CDM for the EFPC drainage basin can be used to simulate the rainfall runoff produced by design or actual rainfall events. The RUNOFF model automatically includes the runoff volume variations produced by different land uses, slopes, soils, and drainage characteristics within the subbasins.

In SMAP, the constituent concentrations are assumed to be constant over the duration of the runoff event. Sufficient data seldom exist to support any variation in concentrations within a storm event. Within any drainage basin, the event mean concentrations (EMCs) are related to present and past land uses. The land uses important in differentiating the variation in runoff concentrations from different areas in the drainage basin and the development of event mean concentrations for these land uses are input to SMAP.

For each subbasin, the percent of the total area covered by each nonpoint source region is also input to SMAP. The total nonpoint source load from the subbasin is computed by SMAP as follows:

$$LOAD = \sum_{i=1}^{N} EMC_i * (PER_i * VOL) \qquad \text{(Equation 2-1)}$$

where:

LOAD	=	Total constituent load (mass)
PER_i	=	Fraction of basin covered by land use i
EMC_i	=	Event Mean Concentration for land use i (mass/length^3)
VOL	=	Runoff volume for subbasin (length^3)
N	=	Number of land uses in subbasin

The nonpoint source event mean concentration (CONC) is computed by SMAP as:

$$CONC = LOAD/VOL \qquad \text{(Equation 2-2)}$$

total nonpoint source flow, load, and concentration are computed and stored for each subbasin for use in calculating instream flows, loads, and concentrations.

2.3.2 . GROUNDWATER SOURCE

In SMAP, groundwater sources represent the flow of contaminated groundwater into the EFPC drainage system. Groundwater enters EFPC through infiltration into storm sewers located below the water table, springs and seeps discharging to the drainage system, and seepage directly to the creek. The groundwater component comprises the naturally occurring baseflow present in the stream between rainfall events and is fairly constant over time. However, the flow rate may vary with the long-term rainfall trends as the water table rises or falls.

As with the nonpoint sources described in Section 2.3.1, the groundwater infiltration contribution is computed for each subbasin in SMAP. SMAP uses a lumped parameter approach, similar to that used in sanitary sewer infiltration analyses, to calculate the quantity of groundwater infiltration into the EFPC drainage system. The amount of groundwater entering the drainage system depends on the amount of storm sewer exposed to the groundwater, the condition of the storm sewer (age, material, etc.), and the elevation of the groundwater in relation to the sewer pipe invert. Groundwater infiltration from any particular subbasin is computed as follows:

$$Q = A * (Z_{gw} - Z_i) * L \qquad \text{(Equation 2-3)}$$

where:

Q = Groundwater infiltration rate (cfs)

A = Total sewer pipe surface area (inch-miles)

Z_{gw} = Average groundwater elevation (feet above mean sea level)

Z_i = Average sewer pipe invert elevation (feet above mean sea level)

L = Average sewer pipe leakance rate (cfs/inch-mile/feet)

Note that SMAP assigns a zero value to groundwater infiltration when the groundwater elevation is less than the sewer pipe invert elevation. Note also that for the most part, all the parameters in Equation 1 are known or can be measured except for the sewer pipe leakance rate. The sewer pipe leakance rate

is thus usually considered the calibration parameter for groundwater infiltration calculations in SMAP.

The quality of the groundwater entering the EFPC drainage system varies depending on the location within the plant site. Groundwater quality is determined using a similar approach as that used for nonpoint sources. Zones of groundwater with similar constituent concentrations are delineated as areas with relatively uniform groundwater quality characteristics. The fraction of each subbasin covered by each groundwater quality zone is input to SMAP and the total subbasin groundwater component contribution for a given constituent is computed as follows:

$$LOAD = \sum_{i=1}^{N} CONC_i * (PER_i * GWFLOW) \qquad \text{(Equation 2-4)}$$

where:

LOAD	=	Total groundwater component constituent load (mass/time)
$CONC_i$	=	Concentration of constituent in zone i (mass/length^3)
PER_i	=	Fraction of basin covered by zone i
GWFLOW	=	Total groundwater flow from subbasin (length^3/time)
N	=	Number of groundwater zones in subbasin

The average groundwater contribution concentration (CONC) for the subbasin is computed by SMAP as:

$$CONC = LOAD/GWFLOW \qquad \text{(Equation 2-5)}$$

The total groundwater source flow, load, and concentration are computed and stored for each subbasin for use in calculating instream flows, loads, and concentrations.

This formulation for computing groundwater quality does not allow for overlapping of groundwater zones. For example, if two separate plumes of two constituents that overlap are identified, three groundwater zones need to be identified: one for each non-overlapping plume, plus a third for the area where

they overlap. If concentrations vary within a plume, it may be appropriate to subdivide the plume into several groundwater zones.

2.3.3 POINT SOURCE

In SMAP, point sources represent the discharge of cooling waters or process waters directly into the drainage system. SMAP will accept specific point sources or point source categories with similar constituent concentration characteristics. The total point source discharge from each subbasin is computed by SMAP as follows:

$$PSFLOW = \sum_{i=1}^{N} Q_i \qquad \text{(Equation 2-6)}$$

where:

PSFLOW	=	Total point source flow in subbasin (length^3/time)
Q_i	=	Total flow of category i in subbasin (length^3/time)
N	=	Number of point source categories in subbasin

The total point source load for the simulated constituent is computed by SMAP as follows:

$$LOAD = \sum_{i=1}^{N} Q_i * CONC_i \qquad \text{(Equation 2-7)}$$

where:

LOAD	=	Total point source component constituent load (mass/time)
$CONC_i$	=	Concentration of constituent for point source category i (mass\length^3)

The average point source concentration (CONC) for the subbasin is computed by SMAP as:

$$CONC = LOAD/PSFLOW \qquad \text{(Equation 2-8)}$$

The total point source flow, load, and concentration are computed and stored for each subbasin for use in calculating instream flows, loads, and concentrations.

2.3.4 BEST MANAGEMENT PRACTICES

Within SMAP, BMPs are defined as structural or non-structural management procedures or treatment alternatives that serve to reduce the flow and/or concentration within a subbasin for either nonpoint source, groundwater source, or point source components of flow to EFPC. The BMP identified for any subbasin treats the component flow from all of the subbasin or a fraction thereof. BMP calculations are performed after the calculations for nonpoint source, groundwater source, or point source components are completed for all subbasins.

BMPs simulations require the following data input:

- Flow component being affected (nonpoint, groundwater, point source)
- Fraction of subbasin flow component being treated (SBFRACT)
- Fractional reduction in flow (QRED)
- Fractional reduction of the constituent load in the remaining flow (CRED)

Some BMPs may act to remove all or a portion of the flow. In this case, SMAP assumes that the inflow to the BMP has concentrations equal to those computed for the subbasin in the subbasin calculations. In other words, the total load is reduced by the same fraction as the reduction in flow:

$$Q_{out} = Q_{in} * SBFRACT * (1-QRED) + Q_{in} * (1-SBFRACT) \quad \text{(Equation 2-9)}$$

$$LOAD_{out} = LOAD_{in} * SBFRACT * (1-QRED) + LOAD_{in} * (1-SBFRACT) \quad \text{(Equation 2-10)}$$

BMPs may also treat the flow by removing a portion of the load in the flow passing through it. The concentrations and loads are reduced by the same fraction (CRED). The constituent concentration and load leaving this type of BMP are calculated as follows:

$$CONC_{out} = CONC_{in} * SBFRACT * (1\text{-}CRED) + CONC_{in} * (1\text{-}SBFRACT) \quad \text{(Equation 2-11)}$$

$$LOAD_{out} = LOAD_{in} * SBFRACT * (1\text{-}CRED) + LOAD_{in} * (1\text{-}SBFRACT) \quad \text{(Equation 2-12)}$$

In cases where a BMP removes both a portion of the flow and reduces the constituent concentration in the remaining flow being treated, a two-step calculation is performed by SMAP. First, the load remaining in the flow being treated by the BMP, after flow reduction occurs, is calculated as follows:

$$LOAD_{out1} = LOAD_{in} * SBFRACT * (1\text{-}QRED) \quad \text{(Equation 2-13)}$$

The flow, load, and constituent concentration remaining after treatment by the BMP are then calculated as:

$$Q_{out} = Q_{in} * SBFRACT * (1\text{-}QRED) + Q_{in} * (1\text{-}SBFRACT) \quad \text{(Equation 2-14)}$$

$$LOAD_{out2} = LOAD_{out1} * (1\text{-}CRED) + LOAD_{in} * (1\text{-}SBFRACT) \quad \text{(Equation 2-15)}$$

$$CONC_{out} = LOAD_{out2} / Q_{out} \quad \text{(Equation 2-16)}$$

The total component flow, load, and concentration after BMP implementation are computed and stored for each subbasin for use in calculating instream flows, loads, and concentrations.

2.4 STREAM NODE CALCULATIONS

Total flows and pollutant loads computed for the subbasins are first accumulated at stream inflow nodes. Inflow nodes are usually located at outfalls of major storm drains into the stream. No inflow node may be located upstream of another inflow node. For the single constituent being modeled, the total nonpoint, groundwater, and point source flows and loads from all upstream subbasins are accumulated at a stream inflow node. The total flows and loads are then discharged from the inflow node to a stream node. The relationship of subbasins to inflow nodes and stream nodes is illustrated in **Figure 2-2**.

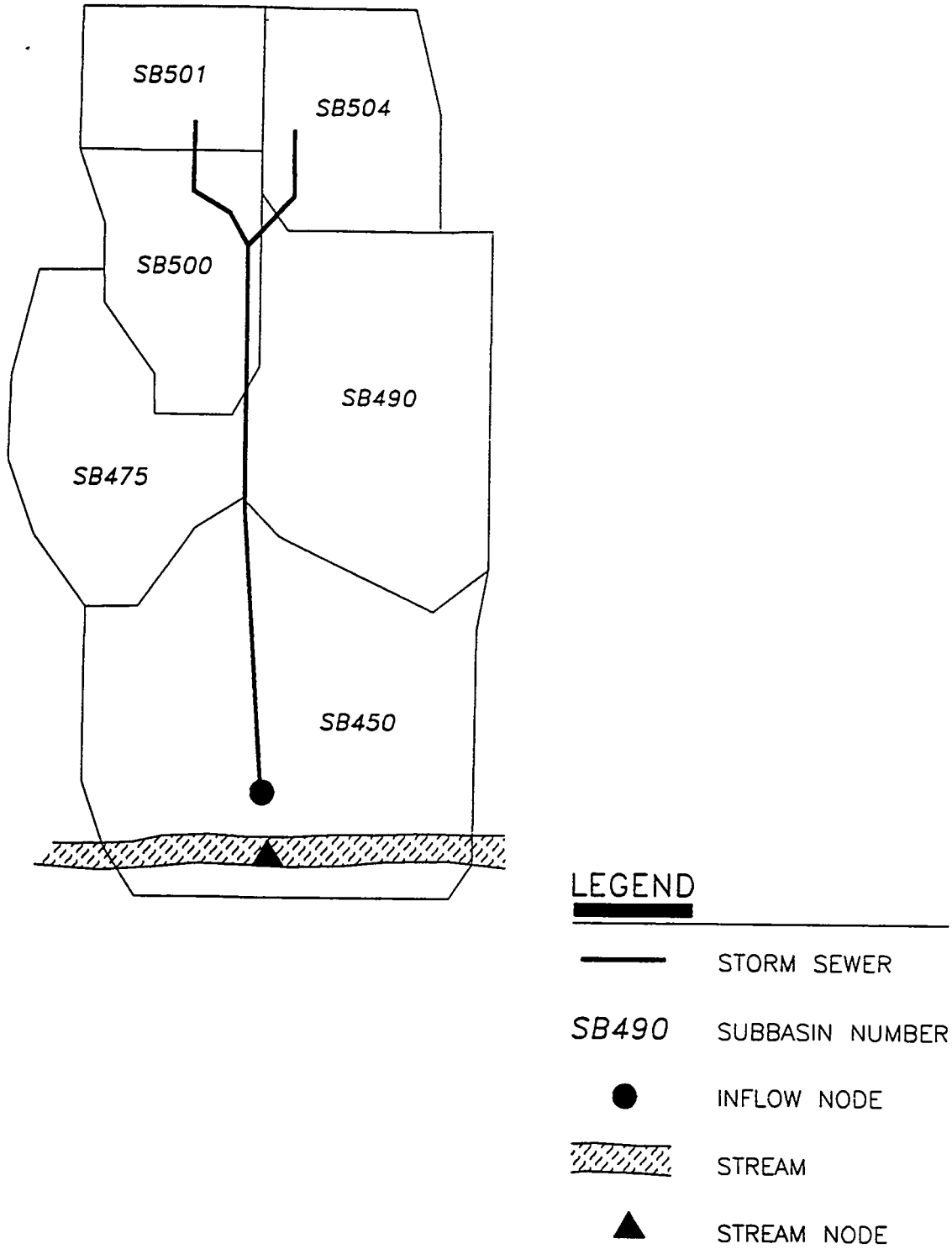

Figure 2-2
RELATIONSHIP OF SUBBASINS TO INFLOW AND STREAM NODES

The stream is broken into discrete stream segments based on channel cross-section geometry, storm sewer inflow locations, and defined points of interest. Stream nodes separate the defined stream segments. Only one stream node may be located upstream of another stream node. The stream segments are identified by their respective upstream nodes. SMAP uses a steady-state mass balance formulation to translate the flows and loads from one stream node to the next. At inflow points, flows and pollutant loads are calculated based on the following mass balance equation:

$$Q_{j+1}\ C_{j+1} = Q_j\ C_j + \sum_{i=1}^{N} Q_i\ C_i \qquad \text{(Equation 2-17)}$$

where:

Q = Flow (length^3/time)

C = Concentration (mass/length^3)

$_j$ = Stream reach upstream of an inflow point

$_{j+1}$ = Stream reach downstream of an inflow point

N = Number of inflow nodes entering stream node $j+1$

This equation assumes that complete mixing throughout the water column is achieved in computing the pollutant concentration the results from the specified inflows.

2.5 SPILL MODULE CALCULATIONS

The spill module is used to compute the concentrations and time-of-travel of a spill within the stream. The two main components of these calculations are:

- Mass transport calculations
- Time-of-travel calculations

All of the calculations are performed in the spill module, which is accessed through the SMAP menu system.

2.5.1 MASS TRANSPORT

The spill is specified either as a mass inflow rate (e.g., milligrams per day) or as a flow rate and concentration from which SMAP computes the mass inflow rate. The spill duration and identification of the first stream node to receive the spill are also entered for the spill. SMAP computes the total concentration at the receiving node assuming that complete mixing occurs. The background nonpoint, groundwater, and point source contributions of flow and constituent mass at each node are determined by the latest SMAP scenario simulated. These results are read directly from the model results file stored by SMAP. The spill module then computes the maximum concentrations at downstream nodes by using the continuity and mass balance equations presented above to sum flows and loads from the various sources. Assuming that complete mixing occurs, the maximum concentration at each downstream node is computed from the total source flows and loads.

2.5.2 TIME-OF-TRAVEL

The spill module also computes the time-of-travel for the spill to reach each node within the stream. The overland travel time to the first stream node is first entered into SMAP. If the spill is input to an inflow node, SMAP assumes a zero travel time to the first stream node encountered. Time-of-travel between stream nodes is computed based on a normal flow assumption using Manning's equation for flow in a stream channel. Normal flow means that flows are not varying with time or distance such that the slope of the water surface can be approximated from the slope of the channel bottom. Manning's flow friction formulation is used to compute flow depths in the stream channel, which is approximated as a trapezoidal channel. The average flow velocity is then calculated and used in conjunction with the channel length to compute the time-of-travel to the next node. The cumulative time-of-travel is then computed for each downstream node until the basin outlet is reached.

3.0 INITIAL SMAP SETUP AND CALIBRATION

The SMAP model described in the previous section was initially set up and calibrated for the Y-12 Plant EFPC drainage basin using all available flow, water quality, water elevation, and drainage system data provided by MMES. Where data gaps were found, however, assumptions were made, and as additional data continue to become available, adjustments to the initial SMAP setup will likely be required. The data and assumptions used in this initial model setup are described in the following sections. The database files that include this SMAP model setup are included on the program disk accompanying this report.

3.1 DRY WEATHER SETUP AND CALIBRATION

Dry weather flow in EFPC has two components: point source discharges and groundwater infiltration. The initial setup and calibration of the flow and water quality parameters for these two components are described below.

3.1.1 DRY WEATHER FLOW

The flow and water level data used to calibrate the dry weather flow parameters in SMAP are provided in **Table 3-1**. These data are assumed to represent average baseflow conditions for each of the EFPC subbasins. The flow data are based on flow measurements taken at the 11 comprehensive sampling stations during the period April 1988 through May 1989. These flow measurements are presented in the Dry and Wet Weather Data Analysis Report (CDM, 1990c). The groundwater elevation data used for calibration are based on average Y-12 Plant monitor well water level data recorded for the period 1986 through 1988. These water level data are presented in the Groundwater Data Summary Report (CDM, 1990d).

3.1.1.1 Point Source Discharges

Several Y-12 Plant process streams discharge process wastewater directly into EFPC. Most of the point source discharges, however, come from once-through

TABLE 3-1

SMAP DRY WEATHER FLOW CALIBRATION DATA

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Total Flow (cfs)	Groundwater Elevation (feet msl)
A	2.7	915
B	1.5	950
C	0.4	925
D	0.6	950
E	0.9	955
F	2.3	950
G	0.5	960
H	0.2	975
I	0.5	990
J	0.1	1000
K	2.0	915
TOTAL	11.7	----

cooling water or cooling tower discharges. Based on a water balance of the Y-12 Plant, approximately 95 percent of the point source discharges to EFPC are estimated to be either once-through cooling water or cooling tower discharges (CDM, 1989). Point source discharges for each subbasin were therefore initially estimated based on the once-through cooling water discharge estimates (**Table 3-2**) and cooling tower discharge measurements (**Table 3-3**) provided by MMES. All other dry weather flow from each subbasin was then initially attributed to groundwater infiltration. As the dry weather flow calibration of SMAP proceeded, however, it became apparent that the initial point source discharges assigned to Subbasins D, F, G, and H were underestimated when groundwater infiltration could not reasonably account for the remaining dry weather flow. Additional point source discharges of unknown origin were therefore assumed for these subbasins, and additional flow was added to the initial point source discharge estimates. **Table 3-4** presents the final calibration subbasin point source discharge distribution. This table also shows the remaining subbasin flows attributed to groundwater infiltration.

3.1.1.2 Groundwater Infiltration

Maps of the storm sewer system provided by MMES were used to determine the sewer pipe materials, lengths, diameters, and invert elevations. The maps used represent the condition of the storm sewer system in 1986. Based on the information provided on the maps, thirteen sewer pipe classifications were identified and input to SMAP:

- RCP - reinforced concrete
- RCP Lined - lined reinforced concrete
- CMP - corrugated metal
- VC - vitrified clay
- VC Half-tile - vitrified clay half-tile
- Half-tile
- TC - terra-cotta
- C - concrete
- STL - steel

TABLE 3-2

COOLING WATER DISCHARGE ESTIMATES
MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Building No.	Description	Average Flow (cfs)	EFPC Outfall No.	Subbasin
9201-3	OTCW for AC Chiller and Condensate	0.32	34	A
9203-A	Lab Cooling Water	0.04	47/48	A
9202	Lab Cooling Water and Condensate	0.52	47/48	A
9201-2	Pump Cooling Water Cooling Water Line Bleed. ATF Equipment Drain	0.28	49	A
9201-2	Cooling Water for Vacuum Pumps	0.07	63	A
9201-1	HUB Cooling Water for Vacuum Pumps	0.12	67	C
9767-8	Cooling Water for an Ozone Generator	0.02	73	C
9767-5	Cooling Water Bleed Off	0.84	21/22	B
9204-2	Cooling Water for Vacuum Pumps and Condensate	0.10	135	F
9204-2E	Cooling Water for Vacuum Pumps and Condensate	0.08	135	F
9213	HVAC	0.27	-	I
9201-3	HVAC	0.80	34	A
9723-16	HVAC	0.20	-	E
9401-3	Pump Bearings	0.09	-	E
9204-1	HVAC	0.32	-	E
9212	Chemical Vacuum	0.33	150 or 109	D
9206	Chemical Vacuum	0.17	135	F
9764	HVAC	0.03	47/48	A

Source: Martin Marietta Energy Systems

TABLE 3-3

COOLING TOWER DISCHARGE MEASUREMENTS
MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Building No.	EFPC Outfall No.	Average Flow (cfs)	Subbasin
9409-2	87	0.03	C
9409-4	210	0.03	A
9409-6	109	0.01	D
9409-10	135	0.03	F
9409-12	160	0.06	E
9409-13	169	0.09	E
9409-15	145	0.01	E
9409-17	135	0.02	F
9409-18/31*	48	0.05	A
9409-19	21/22	0.02	B
9409-20	-	0.04	H
9409-22	150	0.02	G
9409-23	109	0.04	D
9409-24	150	0.04	G
9409-26	150	0.04	G
9409-28/29*	21/22	0.02	B
9409-30	20	0.02	B
9409-32	21/22	0.02	B

* Discharge from the same point

Source: Martin Marietta Energy Systems

TABLE 3-4

SMAP CALIBRATED DRY WEATHER FLOW DISTRIBUTION

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Total Flow (cfs)	Point Source Flow (cfs)	Groundwater Infiltration Flow (cfs)
A	2.7	2.1	0.6
B	1.5	0.9	0.6
C	0.4	0.2	0.2
D	0.6	0.6	0
E	0.9	0.8	0.1
F	2.3	2.2	0.1
G	0.5	0.5	0
H	0.2	0.2	0
I	0.5	0.3	0.2
J	0.1	0	0.1
K	2.0	0	2.0
TOTAL	11.7	7.8	3.9

- o CI - cast iron
- o Basin A Creek - Section of EFPC in Subbasin A
- o Basin C Creek - Section of EFPC in Subbasin C
- o Basin K Creek - Section of EFPC in Subbasin K

The total surface area of sewer pipe in each subbasin is represented in SMAP by the sewer inch-miles, computed as the length of sewer pipe (miles) multiplied by the diameter (inches). Based on the information provided on the storm sewer system maps, the total inch-miles for each sewer type for those storm sewers 18 inches or greater in diameter were calculated for each subbasin and input to SMAP. The average invert elevation of each sewer type was also determined for each subbasin and input to SMAP. **Table 3-5** presents the storm sewer input data for each of the eleven subbasins. Note that the open stream channel sections of EFPC in Subbasins A, C, and K are represented as separate sewer types with their own infiltration characteristics. The inch-miles for these stream segments were computed as the average wetted perimeter (inches) multiplied by the stream length (miles).

As stated in Section 2.3.2, the storm sewer leakance rate is the calibration parameter in SMAP for calculating groundwater infiltration. The average groundwater elevations used for the dry weather calibration are presented in Table 3-1. The sewer pipe leakance rates, computed as cubic feet per second (cfs) per inch-mile of pipe per foot of depth below the water table, were initially estimated based on values determined in studies of sanitary sewer infiltration. As the dry weather flow calibration proceeded, however, these initial estimates were adjusted until the total subbasin groundwater infiltration flow rates computed by SMAP were as close as possible to the subbasin groundwater infiltration flow rates shown in Table 3-4. To simplify the initial dry weather flow calibration of SMAP, all storm sewer pipes constructed of the same material are assumed to have the same leakance property, regardless of the subbasin in which they are buried. Table 3-5 presents the final calibration sewer pipe leakance rates and presents the final calibration SMAP-computed groundwater infiltration flow rates. As can be seen, the SMAP-computed groundwater infiltration flow rates compare very well with the groundwater infiltration flow rates presented in Table 3-4.

TABLE 3-5

GROUNDWATER INFILTRATION CALIBRATION DATA AND RESULTS

MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE, TENNESSEE

BASIN	SEWER PIPE TYPE	SEWER PIPE SURFACE AREA (inch-miles)	SEWER PIPE LEAKANCE RATE (cfs/in-mile/ft)	AVERAGE GROUNDWATER ELEVATION (ft. msl)	AVERAGE PIPE INVERT ELEVATION (ft. msl)	SIMULATED GROUNDWATER INFILTRATION (cfs)
A	RCP	33.68	0.0005	915	917.82	0.00
	CMP	9.98	0.0040	915	909.40	0.22
	VC HALFTILE	0.82	0.0350	915	929.07	0.00
	VC	1.03	0.0350	915	922.78	0.00
	STL	3.06	0.0001	915	936.15	0.00
	CREEK	128.02	0.0016	915	913.00	0.41
	TOTAL A	176.59				0.63
B	RCP	35.27	0.0005	950	944.76	0.09
	CMP	4.02	0.0040	950	984.93	0.00
	VC	2.24	0.0350	950	943.54	0.51
	C	3.96	0.0010	950	972.30	0.00
	TOTAL B	45.49				0.60
C	RCP	7.66	0.0005	925	931.19	0.00
	CMP	7.13	0.0040	925	934.97	0.00
	VC	0.93	0.0350	925	934.75	0.00
	C	2.97	0.0010	925	930.01	0.00
	STL	0.19	0.0001	925	932.38	0.00
	CREEK	65.45	0.0016	925	923.00	0.21
	TOTAL C	84.33				0.21
D	RCP	52.78	0.0005	950	963.68	0.00
	CMP	2.61	0.0040	950	992.98	0.00
	C	1.48	0.0010	950	992.53	0.00
	HALFTILE	0.44	0.0350	950	982.86	0.00
	TOTAL D	57.31				0.00
E	RCP	73.92	0.0005	955	964.99	0.00
	RCP-LINED	87.65	0.0001	955	957.21	0.00
	CMP	17.51	0.0040	955	955.65	0.00
	VC	1.90	0.0350	955	953.60	0.09
	TOTAL E	180.98				0.09

TABLE 3-5 (cont.)

GROUNDWATER INFILTRATION CALIBRATION DATA AND RESULTS

MARTIN MARIETTA ENERGY SYSTEMS
OAK RIDGE, TENNESSEE

BASIN	SEWER PIPE TYPE	SEWER PIPE SURFACE AREA (inch-miles)	SEWER PIPE LEAKANCE RATE (cfs/in-mile/ft)	AVERAGE GROUNDWATER ELEVATION (ft. msl)	AVERAGE PIPE INVERT ELEVATION (ft. msl)	SIMULATED GROUNDWATER INFILTRATION (cfs)
F	RCP	9.48	0.0005	950	946.41	0.02
	VC	0.20	0.0350	950	939.69	0.07
	TOTAL F	9.68				0.09
G	RCP	30.43	0.0005	960	979.09	0.00
	RCP-LINED	5.69	0.0001	960	951.39	0.00
	TOTAL G	36.12				0.00
H	RCP	25.82	0.0005	975	981.55	0.00
	RCP-LINED	4.40	0.0001	975	968.81	0.00
	TOTAL H	30.22				0.00
I	RCP	28.52	0.0005	990	976.40	0.19
	RCP-LINED	3.13	0.0001	990	978.50	0.00
	CMP	4.55	0.0040	990	1001.56	0.00
	C	0.12	0.0010	990	1103.00	0.00
	CI	0.07	0.0010	990	1009.19	0.00
	TOTAL I	36.39				0.20
J	RCP	15.43	0.0005	1000	990.07	0.08
	CMP	0.27	0.0040	1000	1024.86	0.00
	TOTAL J	15.70				0.08
K	RCP	26.28	0.0005	915	926.41	0.00
	CMP	12.77	0.0040	915	915.38	0.00
	C	1.82	0.0010	915	896.49	0.03
	CI	0.10	0.0010	915	933.65	0.00
	STL	0.17	0.0001	915	905.99	0.00
	TC	0.32	0.0350	915	948.80	0.00
	CREEK	71.59	0.0016	915	898.00	1.95
	TOTAL K	113.05				1.98
	TOTAL Y-12	785.86				3.89

3.1.2 DRY WEATHER WATER QUALITY

As indicated in the Water Quality Data Summary Report for Wet and Dry Weather Events at the Oak Ridge Y-12 Plant (CDM, 1990e), several water quality parameters in EFPC are exceeding state and/or federal water quality criteria. SMAP was therefore initially setup to simulate several of these water quality parameters. The parameters included in the initial SMAP setup for dry weather (baseflow) conditions are total residual chlorine, nitrate, copper, iron, and mercury. The data used to initially setup and calibrate SMAP for these five water quality parameters are based on the water quality and flow measurements taken at the 11 comprehensive sampling stations during the period of April 1988 through May 1989. These water quality and flow measurements are presented in the Dry and Wet Weather Data Analysis Report (CDM, 1990c).

3.1.2.1 Total Residual Chlorine

The data used to initially calibrate SMAP for dry weather total residual chlorine simulations are presented in **Table 3-6**, where average total subbasin loads and concentrations measured under dry weather conditions are shown. The actual distribution of the subbasin total residual chlorine loads between point source and groundwater contributions is unknown. In calibrating SMAP, all total residual chlorine loads coming from Subbasins A through I are assumed to be point source discharge loads, since total residual chlorine is believed to be a point source problem. Since no point source discharges were identified for Subbasin J, however, the total residual chlorine loads measured for this subbasin are assumed to come from groundwater infiltration. The final calibration subbasin total residual chlorine concentration distribution is presented in **Table 3-7**, along with the simulated load distribution under average baseflow conditions.

Note that the total loads and concentrations used to calibrate the total residual chlorine distribution for Subbasins B, D, F, G, H, I, and J (shown in Table 3-6), are based on measurements taken directly for these subbasins at monitoring stations B, D, F, G, H, I, and J. However, since no direct measurements can be taken for Subbasins A, C, E, and K, and since a significant

TABLE 3-6

SMAP DRY WEATHER TOTAL RESIDUAL CHLORINE CALIBRATION DATA

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Total Flow (cfs)	Concentration (mg/l)	Total Load (lbs/day)
A	2.7	----	----
B	1.5	0.51	4.10
C	0.4	----	----
D	0.6	0.44	1.42
E	0.9	----	----
F	2.3	0.94	11.62
G	0.5	0.37	1.00
H	0.2	0.44	0.47
I	0.5	0.58	1.57
J	0.1	0.13	0.07
K	2.0	----	----
TOTAL	11.7	----	----

---- - Could not be determined from the comprehensive sampling monitoring data due to volatilization and chemical reaction of total residual chlorine in the drainage system.

TABLE 3-7

SMAP DRY WEATHER TOTAL RESIDUAL CHLORINE CALIBRATION RESULTS

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Point Source Flow (cfs)	Point Source Concentration (mg/l)	Point Source Load (lbs/day)	Groundwater Flow (cfs)	Groundwater Concentration (mg/l)	Groundwater Load (lbs/day)
A	2.1	0.68	7.70	0.63	0	0
B	0.9	0.85	4.12	0.60	0	0
C	0.2	0.68	0.73	0.21	0	0
D	0.6	0.44	1.42	0	0	0
E	0.8	0.68	2.93	0.09	0	0
F	2.2	0.98	11.62	0.09	0	0
G	0.5	0.37	1.00	0	0	0
H	0.2	0.44	0.47	0	0	0
I	0.3	0.98	1.58	0.20	0	0
J	0	0	0	0.08	0.13	0.056
K	0	0	0	1.98	0	0
TOTAL	7.8	0.75*	31.57	3.89	0.003*	0.056

* Total Concentration = Total Load / Total Flow

amount of total residual chorine is lost through volatilization and chemical reaction. total residual chlorine concentrations and loads could not be computed directly for these subbasins based on the monitoring station data. The final calibration point source loads and concentrations given in Table 3-7 for Subbasins A. C. E. and K are based on the average point source concentration of total residual chlorine calibrated for Subbasins B. D. F. G. H. and I. This average concentration is assumed to be representative of the point source discharges from Subbasins A. C. E. and K. and was therefore assigned to these subbasins.

Because SMAP does not incorporate volatilization or chemical reaction of a contaminant due to the complexity and unpredictable nature of these processes, any total chlorine simulation will be a conservative simulation. Total residual chlorine is volatile and reactive. and as the total residual chlorine contaminated water flows through the drainage system. some of the chlorine is lost to the atmosphere through aeration and stripping. and some is lost through chemical reaction. Thus. the simulated concentrations of chlorine in EFPC will most likely be higher than those which actually occur.

3.1.2.2 Nitrate

The data used to initially calibrate SMAP for dry weather nitrate simulations are presented in **Table 3-8,** where average total subbasin loads and concentrations measured under dry weather conditions are shown. The actual distribution of the subbasin nitrate loads between point source and groundwater contributions is unknown. In calibrating SMAP. the groundwater infiltration nitrate concentrations for Subbasins A through H are assumed to be at a background concentration of 0.2 mg/l since no nitrate groundwater contamination has been identified in these subbasins. The remainder of the nitrate loads measured for these subbasins are assumed to come from point source discharges. All nitrate loads measured for Subbasins I, J, and K are assumed to come from groundwater infiltration, since no point source discharges were identified for Subbasins J and K. and since Subbasins I and J have elevated nitrate concentrations in groundwater. The final calibration subbasin nitrate

TABLE 3-8

SMAP DRY WEATHER NITRATE CALIBRATION DATA

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Total Flow (cfs)	Concentration (mg/l)	Total Load (lbs/day)
A	2.7	2.65	38.5
B	1.5	0.49	4.0
C	0.4	1.07	2.3
D	0.6	1.00	3.2
E	0.9	0.64	3.1
F	2.3	0.57	7.1
G	0.5	1.00	2.7
H	0.2	12.00	12.9
I	0.5	2.00	5.4
J	0.1	220.00	94.9
K	2.0	2.24	24.1
TOTAL	11.7	3.14*	198.2

* Total Concentration = Total Load / Total Flow

concentration distribution is presented in **Table 3-9**, along with the simulated load distribution under average baseflow conditions.

3.1.2.3 Copper

The data used to initially calibrate SMAP for dry weather copper simulations are presented in **Table 3-10**, where average total subbasin loads and concentrations measured under dry weather conditions are shown. The actual distribution of the subbasin copper loads between point source and groundwater contributions is unknown. In calibrating SMAP, the groundwater infiltration copper concentrations for Subbasins A through H are assumed to be at a background concentration of 5.0 ug/l since no copper groundwater contamination has been identified for these subbasins. The remainder of the copper loads measured for these subbasins are assumed to come from point source discharges. All copper loads measured for Subbasins I, J, and K are assumed to come from groundwater infiltration, since no point source discharges were identified for Subbasins J and K, and since Subbasins I, J, and K have elevated copper concentrations in groundwater. The final calibration subbasin copper concentration distribution is presented in **Table 3-11**, along with the simulated load distribution under average baseflow conditions.

3.1.2.4 Iron

The data used to initially calibrate SMAP for dry weather iron simulations are presented in **Table 3-12**, where average total subbasin loads and concentrations measured under dry weather conditions are shown. The actual distribution of the subbasin iron loads between point source and groundwater contributions is unknown. In calibrating SMAP, the groundwater infiltration iron concentrations for Subbasins A through I are assumed to be at a background concentration of 0.1 mg/l since no iron groundwater contamination has been identified for these subbasins. The remainder of the iron loads measured for these subbasins are assumed to come from point source discharges. All iron loads measured for Subbasins J and K are assumed to come from groundwater infiltration, since no point source discharges were identified for these subbasins. The final calibration subbasin iron concentration distribution is

TABLE 3-9

SMAP DRY WEATHER NITRATE CALIBRATION RESULTS

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Point Source Flow (cfs)	Point Source Concentration (mg/l)	Point Source Load (lbs/day)	Groundwater Flow (cfs)	Groundwater Concentration (mg/l)	Groundwater Load (lbs/day)
A	2.1	3.35	37.9	0.63	0.20	0.7
B	0.9	0.70	3.4	0.60	0.20	0.6
C	0.2	1.95	2.1	0.21	0.20	0.2
D	0.6	1.00	3.2	0	0.20	0
E	0.8	0.70	3.0	0.09	0.20	0.1
F	2.2	0.59	7.0	0.09	0.20	0.1
G	0.5	1.00	2.7	0	0.20	0
H	0.2	12.00	12.9	0	0.20	0
I	0.3	0	0	0.20	5.01	5.4
J	0	0	0	0.08	220.00	94.9
K	0	0	0	1.98	2.26	24.1
TOTAL	7.8	1.72*	72.2	3.89	6.01*	126.1

* Total Concentration = Total Load / Total Flow

TABLE 3-10

SMAP DRY WEATHER COPPER CALIBRATION DATA

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Total Flow (cfs)	Concentration (ug/l)	Total Load (lbs/day)
A	2.7	1.2	0.018
B	1.5	10.0	0.081
C	0.4	0	0
D	0.6	10.0	0.032
E	0.9	16.7	0.081
F	2.3	12.0	0.149
G	0.5	9.0	0.024
H	0.2	5.0	0.005
I	0.5	29.3	0.079
J	0.1	4.0	0.002
K	2.0	3.2	0.034
TOTAL	11.7	8.0*	0.505

* Total Concentration = Total Load / Total Flow

TABLE 3-11

SMAP DRY WEATHER COPPER CALIBRATION RESULTS

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Point Source Flow (cfs)	Point Source Concentration (ug/l)	Point Source Load (lbs/day)	Groundwater Flow (cfs)	Groundwater Concentration (ug/l)	Groundwater Load (lbs/day)
A	2.1	0.2	0.002	0.63	5.0	0.017
B	0.9	13.4	0.065	0.60	5.0	0.016
C	0.2	0	0	0.21	5.0	0.006
D	0.6	10.0	0.032	0	5.0	0
E	0.8	18.3	0.079	0.09	5.0	0.002
F	2.2	12.3	0.146	0.09	5.0	0.002
G	0.5	9.0	0.024	0	5.0	0
H	0.2	5.0	0.005	0	5.0	0
I	0.3	0	0	0.20	73.3	0.079
J	0	0	0	0.08	4.0	0.002
K	0	0	0	1.98	3.2	0.034
TOTAL	7.8	8.4*	0.353	3.89	7.5*	0.158

* Total Concentration = Total Load / Total Flow

TABLE 3-12

SMAP DRY WEATHER IRON CALIBRATION DATA

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Total Flow (cfs)	Concentration (mg/l)	Total Load (lbs/day)
A	2.7	0.07	1.08
B	1.5	0.14	1.13
C	0.4	0	0
D	0.6	0.51	1.65
E	0.9	0.71	3.45
F	2.3	0.07	0.87
G	0.5	0.16	0.43
H	0.2	0.09	0.10
I	0.5	0.08	0.22
J	0.1	0.63	0.27
K	2.0	0.97	10.45
TOTAL	11.7	0.31*	19.65

* Total Concentration = Total Load / Total Flow

presented in **Table 3-13**, along with the simulated load distribution under average baseflow conditions.

3.1.2.5 Mercury

The data used to initially calibrate SMAP for dry weather mercury simulations are presented in **Table 3-14**, where average total subbasin loads and concentrations measured under dry weather conditions are shown. The actual distribution of the subbasin mercury loads between point source and groundwater contributions is unknown. In calibrating SMAP, the point source discharge mercury concentrations for Subbasins A, B, C, E, F, I, J, and K are assumed to be at a background concentration of 0.3 ug/l. The remainder of the mercury loads measured for these subbasins are assumed to come from groundwater infiltration since mercury appears to be a groundwater infiltration problem during dry weather. The mercury loads measured for Subbasins D, G, and H are assumed to come from point source discharges, since zero groundwater infiltration was calibrated for these subbasins. The final calibration subbasin mercury concentration distribution is presented in **Table 3-15**, along with the simulated load distribution under average baseflow conditions.

3.2 WET WEATHER SETUP AND CALIBRATION

Wet weather flow in EFPC has three components: point source discharges, groundwater infiltration, and nonpoint source runoff. The initial setup and calibration of SMAP for the first two components (point source discharges and groundwater infiltration) is described above. These two components provide the baseflow during storm events and are assumed to be the same during wet weather events as during dry weather events. Wet weather setup and calibration therefore included only the setup and calibration of nonpoint source runoff parameters.

To initially setup SMAP for wet weather events, the data collected for wet weather Event #2 (March 30, 1989) described in CDM's Dry and Wet Weather Data Analysis Report (1990c) were used. Of all the wet weather events for which

TABLE 3-13

SMAP DRY WEATHER IRON CALIBRATION RESULTS

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Point Source Flow (cfs)	Point Source Concentration (mg/l)	Point Source Load (lbs/day)	Groundwater Flow (cfs)	Groundwater Concentration (mg/l)	Groundwater Load (lbs/day)
A	2.1	0.07	0.79	0.63	0.1	0.34
B	0.9	0.17	0.82	0.60	0.1	0.32
C	0.2	0	0	0.21	0.1	0.11
D	0.6	0.51	1.65	0	0.1	0
E	0.8	0.79	3.41	0.09	0.1	0.05
F	2.2	0.07	0.83	0.09	0.1	0.05
G	0.5	0.16	0.43	0	0.1	0
H	0.2	0.09	0.10	0	0.1	0
I	0.3	0.07	0.11	0.20	0.1	0.11
J	0	0	0	0.08	0.63	0.27
K	0	0	0	1.98	0.97	10.35
TOTAL	7.8	0.19*	8.14	3.89	0.55*	11.60

* Total Concentration = Total Load / Total Flow

TABLE 3-14

SMAP DRY WEATHER MERCURY CALIBRATION DATA

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Total Flow (cfs)	Concentration (ug/l)	Total Load (lbs/day)
A	2.7	3.8	0.055
B	1.5	0	0
C	0.4	3.2	0.007
D	0.6	0.4	0.001
E	0.9	7.0	0.034
F	2.3	0.3	0.004
G	0.5	0.3	0.001
H	0.2	1.7	0.002
I	0.5	0.4	0.001
J	0.1	0	0
K	2.0	1.4	0.015
TOTAL	11.7	1.9*	0.120

* Total Concentration = Total Load / Total Flow

TABLE 3-15

SMAP DRY WEATHER MERCURY CALIBRATION RESULTS

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Point Source Flow (cfs)	Point Source Concentration (ug/l)	Point Source Load (lbs/day)	Groundwater Flow (cfs)	Groundwater Concentration (ug/l)	Groundwater Load (lbs/day)
A	2.1	0.3	0.003	0.63	16.1	0.055
B	0.9	0.3	0.001	0.60	0	0
C	0.2	0.3	0	0.21	6.5	0.007
D	0.6	0.4	0.001	0	0	0
E	0.8	0.3	0.001	0.09	61.2	0.030
F	2.2	0.3	0.004	0.09	0	0
G	0.5	0.3	0.001	0	0	0
H	0.2	1.7	0.002	0	0	0
I	0.3	0.3	0	0.20	0.5	0.001
J	0	0.3	0	0.08	0	0
K	0	0.3	0	1.98	1.4	0.015
TOTAL	7.8	0.3*	0.013	3.89	5.2*	0.108

* Total Concentration = Total Load / Total Flow

data were collected during the comprehensive sampling program. Event #2 provided the most complete data set for analysis. This event also had the highest rainfall intensity and therefore provided the greatest flow rates in EFPC. The initial wet weather setup and calibration of SMAP is described below.

3.2.1 WET WEATHER FLOW

For wet weather simulation, SMAP requires the event duration and total runoff volumes from each subbasin, which it then applies to EMCs to estimate the resulting area source contaminant load contributions from each subbasin to EFPC. Wet weather Event #2 was a 7-hour storm event with a maximum rainfall intensity of approximately 1.2 inches/hour. The rainfall volume at the Y-12 Plant East and West Gages was 1.53 and 1.41 inches, respectively. The runoff volumes calculated for each of the EFPC subbasins and input to SMAP as part of the initial wet weather setup are presented in **Table 3-16**.

3.2.2 WET WEATHER WATER QUALITY

Of the five chemical parameters included in the initial SMAP setup for dry weather (baseflow) conditions, only iron, copper, and mercury have been identified as parameters of concern for wet weather conditions (CDM, 1990e). Therefore, only these three parameters were included in the initial wet weather setup of SMAP.

3.2.2.1 Iron

The data used to initially set up SMAP for wet weather iron simulations are presented in **Table 3-17,** where the subbasin runoff iron concentrations measured or calculated for wet weather Event #2 are shown. These iron concentrations are assumed to represent the average wet weather EMCs for all storm events, and were input directly into SMAP as the subbasin nonpoint source iron concentrations. Also shown in Table 3-17 are the wet weather Event #2 iron load contributions calculated for each subbasin.

TABLE 3-16

WET WEATHER EVENT #2 RUNOFF VOLUMES

MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Area (acres)	Runoff Volume (inches)	Runoff Volume (cubic feet)
A	124.28	0.715	322,634
B	65.99	0.596	142,826
C	53.74	4.663	909,716
D	100.79	0.575	210,544
E	126.11	0.109	49,862
F	13.68	0.735	36,504
G	59.70	0.033	7,119
H	58.51	0.939	199,449
I	111.57	0.668	270,633
J	57.45	0.549	114,473
K	400.20	0.468	679,534
TOTAL	1172.0	0.692	2,943,294

TABLE 3-17

WET WEATHER EVENT #2 IRON DATA
MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Runoff Volume (cubic feet)	Event Mean Concentration (mg/l)	Total Load (lbs)
A	322,634	0.46	9.3
B	142,826	3.38	30.1
C	909,716	12.92	733.2
D	210,544	5.34	70.2
E	49,862	0	0
F	36,504	6.79	15.5
G	7,119	7.72	3.4
H	199,449	15.09	187.5
I	270,633	0	0
J	114,473	17.61	125.7
K	679,534	0	0
TOTAL	2,943,294	6.40*	1174.9

* Total Concentration = Total Load / Total Volume

3.2.2.2 Copper

The data used to initially set up SMAP for wet weather copper simulations are presented in **Table 3-18,** where the subbasin runoff copper concentrations measured or calculated for wet weather Event #2 are shown. These copper concentrations are assumed to represent the average wet weather EMCs for all storm events, and were input directly into SMAP as the subbasin nonpoint source copper concentrations. Also shown in Table 3-18 are the wet weather Event #2 copper load contributions calculated for each subbasin.

3.2.2.3 Mercury

The data used to initially set up SMAP for wet weather mercury simulations are presented in **Table 3-19,** where the subbasin runoff mercury concentrations measured or calculated for wet weather Event #2 are shown. These mercury concentrations are assumed to represent the average wet weather EMCs for all storm events, and were input directly into SMAP as the subbasin nonpoint source mercury concentrations. Also shown in Table 3-19 the wet weather Event #2 mercury load contributions calculated for each subbasin.

TABLE 3-18

WET WEATHER EVENT #2 COPPER DATA
MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Runoff Volume (cubic feet)	Event Mean Concentration (mg/l)	Total Load (lbs)
A	322,634	0.045	0.90
B	142,826	0.029	0.25
C	909,716	0.030	1.68
D	210,544	0.014	0.19
E	49,862	0	0
F	36,504	0.050	0.11
G	7,119	0.039	0.02
H	199,449	0.016	0.20
I	270,633	0	0
J	114,473	0.047	0.33
K	679,534	0	0
TOTAL	2,943,294	0.020*	3.68

* Total Concentration = Total Load / Total Volume

TABLE 3-19

WET WEATHER EVENT #2 MERCURY DATA
MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Subbasin	Runoff Volume (cubic feet)	Event Mean Concentration (ug/l)	Total Load (lbs)
A	322,634	30.9	0.622
B	142,826	0.7	0.006
C	909,716	10.9	0.620
D	210,544	0.4	0.005
E	49,862	0	0
F	36,504	0.6	0.001
G	7,119	1.1	0.001
H	199,449	1.0	0.012
I	270,633	0	0
J	114,473	2.5	0.018
K	679,534	0	0
TOTAL	2,943,294	7.0*	1.285

* Total Concentration = Total Load / Total Volume

4.0 REFERENCES

Camp Dresser & McKee Inc., 1989. Y-12 Plant Water Balance. Memorandum from Elio Arniella to Lori Muhs of Martin Marietta Energy Systems.

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Camp Dresser & McKee Inc., 1990c. Dry and Wet Weather Data Analysis Report for the Oak Ridge Y-12 Plant. Oak Ridge, Tennessee.

Camp Dresser & McKee Inc., 1990d. Groundwater Data Summary Report for the Oak Ridge Y-12 Plant. Oak Ridge, Tennessee.

Camp Dresser & McKee Inc., 1990e. Water Quality Data Summary Report for Wet and Dry Weather Events at the Oak Ridge Y-12 Plant. Oak Ridge, Tennessee.

SECTION 7.0

AREA SOURCE POLLUTION REDUCTION EVALUATION REPORT

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1.0 INTRODUCTION

As indicated in the Water Quality Data Summary Report for Wet and Dry Weather Events at the Oak Ridge Y-12 Plant (CDM. 1990a). several water quality parameters are exceeding state and/or federal water quality criteria in East Fork Poplar Creek (EFPC). To meet the state and/or federal water quality criteria. area source pollutant loads to EFPC must be reduced. The Stream Management and Analysis Program (SMAP) developed by Camp Dresser & McKee Inc. (CDM) for EFPC was used to evaluate the reductions necessary to meet the water quality criteria for several of the parameters of concern. The purpose of this report is to present the results of these area source pollution reduction evaluations.

In this report. the reduction of any particular pollutant load is referred to as a Best Management Practice (BMP). A total of six BMPs were selected for analysis and presentation. These BMPs are divided into two categories: dry weather BMPs and wet weather BMPs. The dry weather BMPs address parameters of concern for dry weather events. while the wet weather BMPs address parameters of concern for wet weather events as identified in CDM's Water Quality Summary Report (1990a).

The three dry weather BMP evaluations included in this report are described in detail in Section 2.0. The dry weather BMPs include:

- o BMP 1 - A reduction in total residual chlorine loads from all EFPC point source contributions
- o BMP 2 - A reduction in nitrate loads from Subbasin I and J groundwater contributions to EFPC
- o BMP 3 - A reduction in copper loads from Subbasin I groundwater contributions to EFPC

The three wet weather BMP evaluations included in this report are described in detail in Section 3.0. The wet weather BMPs include:

- BMP 4 - A reduction in iron loads from all EFPC nonpoint source contributions

- BMP 5 - A reduction in copper loads from all EFPC nonpoint source contributions

- BMP 6 - A reduction in mercury loads from Subbasin A and C nonpoint source and groundwater contributions to EFPC

To perform these BMP evaluations, SMAP was initially setup and calibrated based on the data presented in the Dry and Wet Weather Data Analysis Report (CDM, 1990b). A description of the initial SMAP setup and calibration is provided in the SMAP User's Guide (CDM, 1990c). All the BMP SMAP simulations were performed under average annual EFPC baseflow conditions. The wet weather BMP SMAP simulations were also performed under the 1-year return period 24-hour duration storm event conditions as simulated with the RUNOFF model developed specifically for the EFPC drainage basin. The RUNOFF model results for this storm event are presented in the RUNOFF Model Update and Calibration Report (CDM, 1990d).

2.0 . DRY WEATHER BMP EVALUATIONS

2.1 BMP 1 - TOTAL RESIDUAL CHLORINE REDUCTION

As previously discussed in CDM's Water Quality Data Summary Report (1990a), total residual chlorine concentrations exceeded the ambient water quality criteria (AWQC) acute and chronic levels (19 and 11 ug/l, respectively) in all the dry weather samples collected at the 11 monitoring stations from April 1988 through May 1989. Total residual chlorine pollutant loads to EFPC are assumed to be primarily point source contributions, and SMAP was calibrated based on this assumption. To reduce the concentrations of total residual chlorine in EFPC below the AWQC, the concentration of total residual chlorine in the point source contributions to EFPC must therefore be reduced.

For this BMP evaluation, SMAP was used to estimate the overall percent reduction in the point source loads of total residual chlorine from all subbasins in the EFPC drainage basin needed to meet the AWQC chronic level of 11 ug/l in EFPC. Based on the SMAP simulation results, a 99 percent reduction was determined to be necessary to meet this goal. The total residual chlorine BMP simulation results are presented in **Figure 2-1**, where both the simulated pre- and post-BMP total residual chlorine concentrations in EFPC under normal baseflow conditions are plotted. The SMAP reports for the pre- and post-BMP simulations are provided in Appendix A.

Note that a 99 percent reduction in point source total residual chlorine loads is a very conservative estimate of the reduction needed to meet the AWQC. Total residual chlorine is volatile and reactive , and as the total residual chlorine contaminated water flows through the drainage system, some of the total residual chlorine is lost to the atmosphere through aeration and stripping and some is lost through chemical reactions. SMAP, however, does not take these processes into account due to their complexity and unpredictable nature. SMAP was therefore set up conservatively, assuming no loss of total residual chlorine by volatilization or chemical reaction. Thus, the simulated concentrations of total residual chlorine in EFPC are most likely higher than those which actually occur, and the actual amount of total residual chlorine

SMAP DRY WEATHER CHLORINE BMP RESULTS

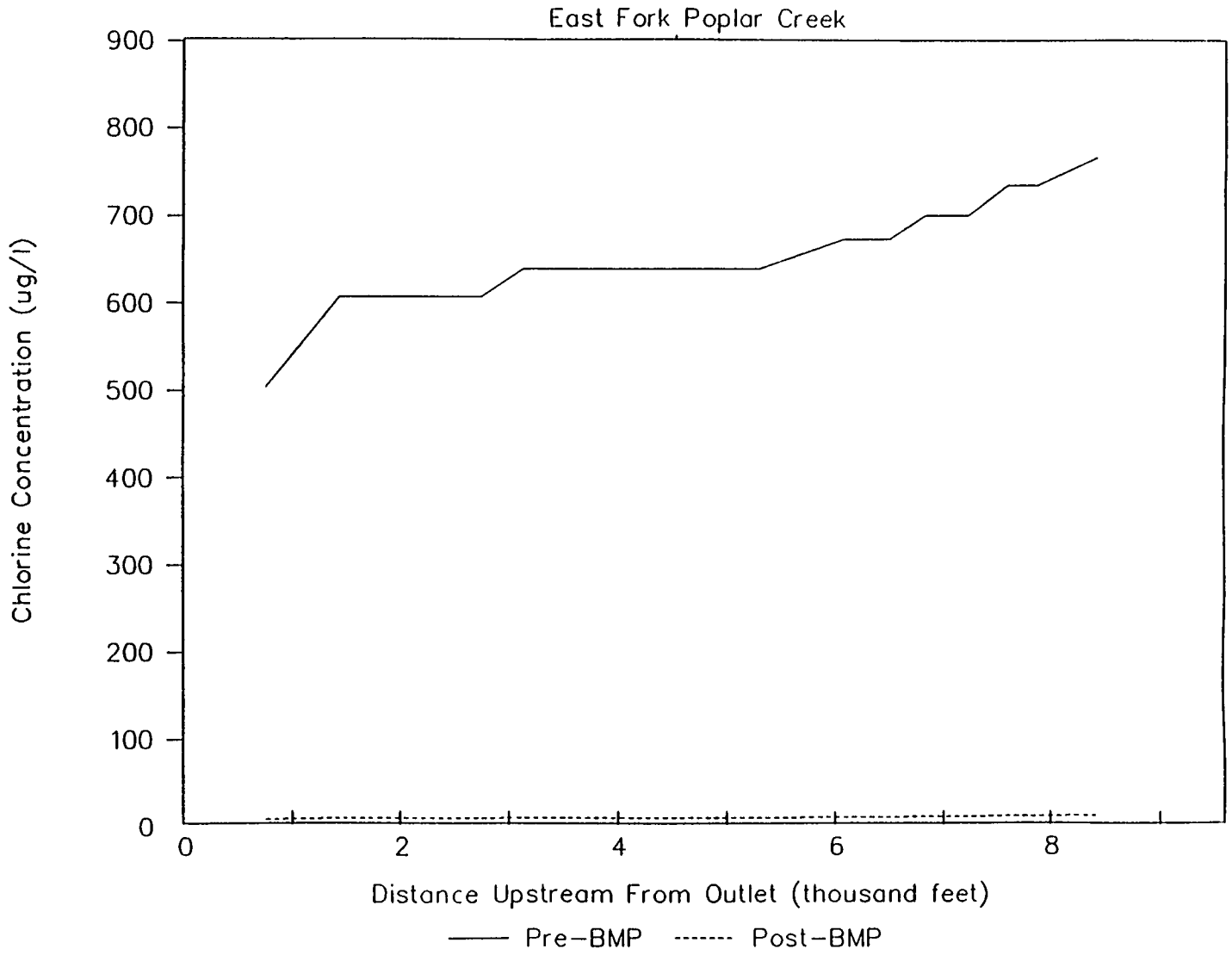

Figure 2-1

load reduction needed to meet the AWQC will most likely be less than the 99 percent indicated by SMAP.

2.2 BMP 2 - NITRATE REDUCTION

Nitrate concentrations in about 23 percent of the samples collected during dry weather at the 11 monitoring stations from April 1989 through May 1990 exceeded the AWQC and the proposed Maximum Contaminant Level (MCL) for nitrates of 10 mg/l. However, none of the samples taken from instream EFPC monitoring stations (Stations A, C, E, and K) during this time period had nitrate concentrations exceeding 10 mg/l. All exceedances were at upstream EFPC monitoring stations H, I, and J.

Most of the nitrate pollutant loads to EFPC are assumed to be groundwater source contributions from Subbasin J. As indicated in CDM's Dry and Wet Weather Data Analysis Report (1990b), approximately 60 percent of the nitrate load can be attributed to Subbasin J. Nitrate contamination of groundwater in Subbasins I and J has been well documented, and groundwater remediation of this area has been proposed. Therefore, although nitrate concentrations in EFPC are below the AWQC and proposed MCL, for this BMP evaluation, SMAP was used to estimate the percent reduction in the groundwater source load of nitrate from Subbasins I and J needed to meet the AWQC and MCL concentration of 10 mg/l at monitoring stations I and J. Based on the SMAP simulation results, a 96 percent reduction was determined to be necessary to meet this goal. The impact of this nitrate BMP on EFPC is shown in **Figure 2-2**, where both the simulated pre- and post-BMP nitrate concentrations in EFPC under normal baseflow conditions are plotted. The SMAP reports for the pre- and post-BMP simulations are provided in Appendix B.

2.3 BMP 3 - COPPER REDUCTION

Copper concentrations exceeded the AWQC acute and chronic levels (18 and 12 ug/l, respectively) in approximately 11 percent of the dry weather samples collected at the 11 monitoring stations from April 1988 through May 1989. Most of the copper load to EFPC appears to come from Subbasins B, F and I. The sources of the loads coming from Subbasins B and F, however, are unknown due to

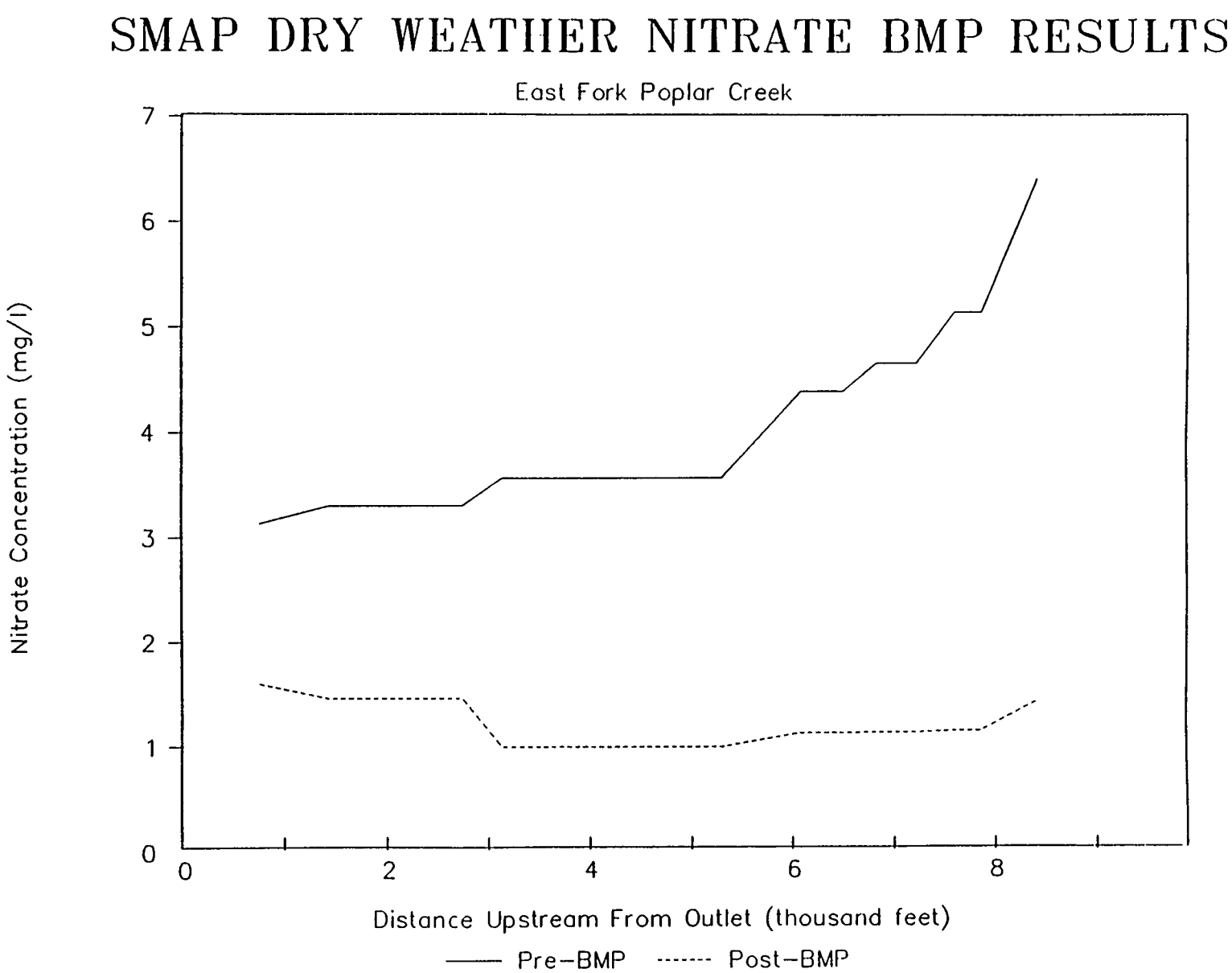
SMAP DRY WEATHER NITRATE BMP RESULTS
East Fork Poplar Creek
Nitrate Concentration (mg/l)
0
1
2
3
4
5
6
7
0
2
4
6
8
Distance Upstream From Outlet (thousand feet)
Pre-BMP
Post-BMP

Figure 2-2

a lack of groundwater and point source concentration data for these subbasins. Because copper contamination of groundwater in Subbasins I and J, on the other hand, has been documented (CDM, 1990e), copper pollutant loads to EFPC coming from Subbasin I are assumed to be primarily groundwater source contributions. SMAP was calibrated based on this assumption.

For this BMP evaluation, SMAP was used to estimate the percent reduction in the groundwater source load of copper from Subbasin I needed to meet the AWQC chronic level of 12 egg/l in EFPC. Based on the SMAP simulation results, a 70 percent reduction was determined to be necessary to meet this goal. The copper BMP simulation results are presented in **Figure 2-3**, where both the simulated pre- and post-BMP copper concentrations in EFPC under normal baseflow conditions are plotted. The SMAP reports for the pre- and post-BMP simulations are provided in Appendix C.

SMAP DRY WEATHER COPPER BMP RESULTS

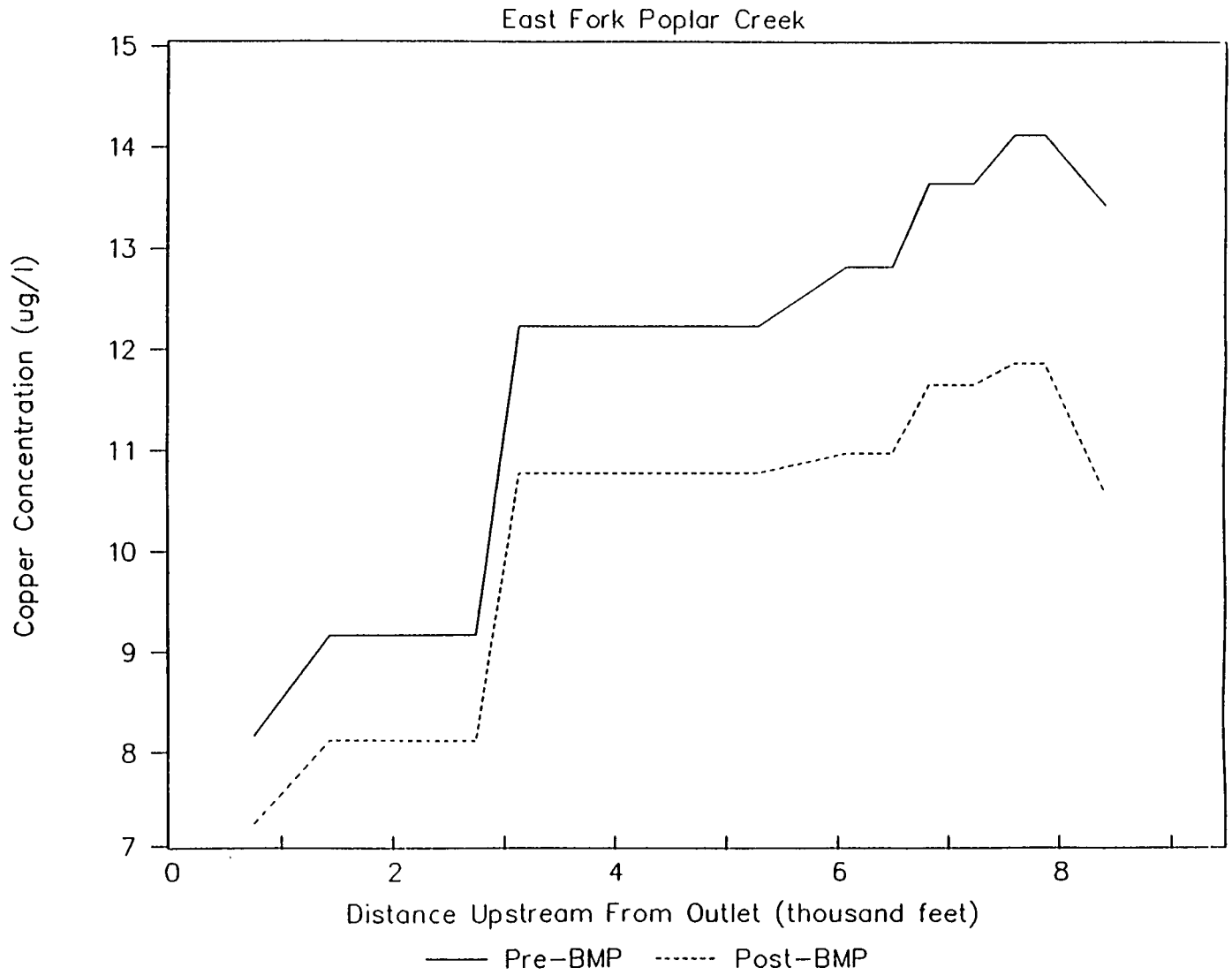

Figure 2-3

3.0 WET WEATHER BMP EVALUATIONS

3.1 BMP 4 - IRON REDUCTION

As previously discussed in CDM's Water Quality Data Summary Report (1990a), iron concentrations exceeded the AWQC acute level of 1 mg/l in approximately 84 percent of the wet weather samples collected at the 11 monitoring stations during the five storm events monitored between April 1988 and May 1989. In addition, iron concentrations exceeded the AWQC acute level during at least three of the five storm events at each of the 11 monitoring stations, indicating iron contamination of EFPC during storm events is a basinwide nonpoint source problem. One source of iron loads during wet weather may be rusted equipment on rooftops.

For this BMP evaluation, SMAP was used to estimate the overall percent reduction in the nonpoint source loads of iron from all subbasins in the EFPC drainage basin needed to meet the AWQC acute level of 1 mg/l in EFPC. Based on the SMAP simulation results, a 90 percent reduction was determined to be necessary to meet this goal. The iron BMP simulation results are presented in **Figure 3-1**, where both the simulated pre- and post-BMP iron concentrations in EFPC for the 1-year return period 24-hour duration storm event are plotted. The SMAP reports for the pre- and post-BMP simulations are provided in Appendix D.

3.2 BMP 5 - COPPER REDUCTION

Copper concentrations exceeded the AWQC acute level of 18 ug/l in approximately 34 percent of the wet weather samples collected at the 11 monitoring stations during the five storm events monitored between April 1988 and May 1989. In addition, except for monitoring station G, copper concentrations equaled or exceeded the AWQC acute level during at least one of the five storm events at each of the 11 monitor stations, indicating copper contamination of EFPC during storm events is also a basin-wide nonpoint source problem. The physical source of this copper contamination, however, is unknown.

SMAP WET WEATHER IRON BMP RESULTS

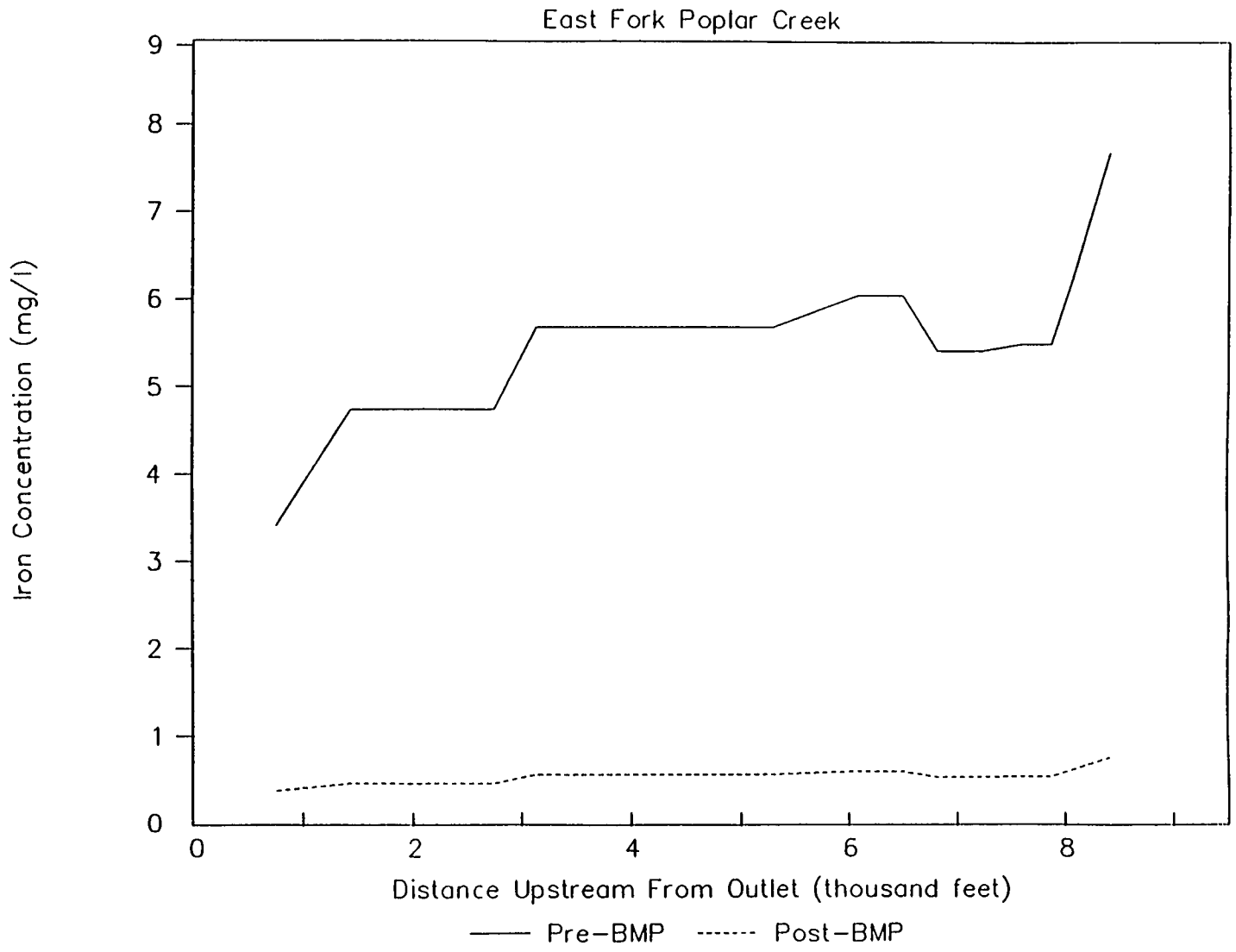

Figure 3-1

For this BMP evaluation, SMAP was used to estimate the overall percent reduction in the nonpoint source loads of copper from all subbasins in the EFPC drainage basin needed to meet the AWQC acute level of 18 ug/l in EFPC. Based on the SMAP simulation results, a 25 percent reduction was determined to be necessary to meet this goal. The copper BMP simulation results are presented in **Figure 3-2**, where both the simulated pre- and post-BMP copper concentrations in EFPC for the 1-year return period 24-hour duration storm event are plotted. The SMAP reports for the pre- and post-BMP simulations are provided in Appendix E.

3.3 BMP 6 - MERCURY REDUCTION

Mercury concentrations exceeded the Tennessee Triennial Review Proposed (TTRP) Criteria acute level of 2.4 ug/l in approximately 11 percent of the wet weather samples collected at the 11 monitoring stations during the five storm events monitored between April 1988 and May 1989. As discussed in CDM's Dry and Wet Weather Data Analysis Report (1990b), most of the mercury load to EFPC appears to come from Subbasins A and C, and the source of the load is most likely the EFPC sediments which are stirred and suspended during storm events. To reduce the mercury concentrations in EFPC during storm events, lining of EFPC to prevent the sediments from being suspended has been proposed.

For this BMP evaluation, SMAP was used to estimate the percent reduction in the nonpoint source loads of mercury from Subbasins A and C needed to meet the TTRP Criteria acute level of 2.4 ug/l in EFPC. Since the intent of this SMAP simulation was to evaluate the effect that lining EFPC would have on the mercury concentrations in EFPC, a 98 percent reduction in the groundwater source contributions of mercury from Subbasins A and C was assumed for this BMP evaluation. Based on the SMAP simulation results, a 70 percent reduction in nonpoint source loads of mercury was determined to be necessary to meet this goal. The mercury BMP simulation results are presented in **Figure 3-3**, where both the simulated pre- and post-BMP mercury concentrations in EFPC for the 1-year return period 24-hour duration storm event are plotted. The SMAP reports for the pre- and post- BMP simulations are provided in Appendix F.

TABLE 3-2

COOLING WATER DISCHARGE ESTIMATES
MARTIN MARIETTA ENERGY SYSTEMS Y-12 PLANT
OAK RIDGE, TENNESSEE

Building No.	Description	Average Flow (cfs)	EFPC Outfall No.	Subbasin
9201-3	OTCW for AC Chiller and Condensate	0.32	34	A
9203-A	Lab Cooling Water	0.04	47/48	A
9202	Lab Cooling Water and Condensate	0.52	47/48	A
9201-2	Pump Cooling Water Cooling Water Line Bleed. ATF Equipment Drain	0.28	49	A
9201-2	Cooling Water for Vacuum Pumps	0.07	63	A
9201-1	HUB Cooling Water for Vacuum Pumps	0.12	67	C
9767-8	Cooling Water for an Ozone Generator	0.02	73	C
9767-5	Cooling Water Bleed Off	0.84	21/22	B
9204-2	Cooling Water for Vacuum Pumps and Condensate	0.10	135	F
9204-2E	Cooling Water for Vacuum Pumps and Condensate	0.08	135	F
9213	HVAC	0.27	-	I
9201-3	HVAC	0.80	34	A
9723-16	HVAC	0.20	-	E
9401-3	Pump Bearings	0.09	-	E
9204-1	HVAC	0.32	-	E
9212	Chemical Vacuum	0.33	150 or 109	D
9206	Chemical Vacuum	0.17	135	F
9764	HVAC	0.03	47/48	A

Source: Martin Marietta Energy Systems

SMAP WET WEATHER COPPER BMP RESULTS

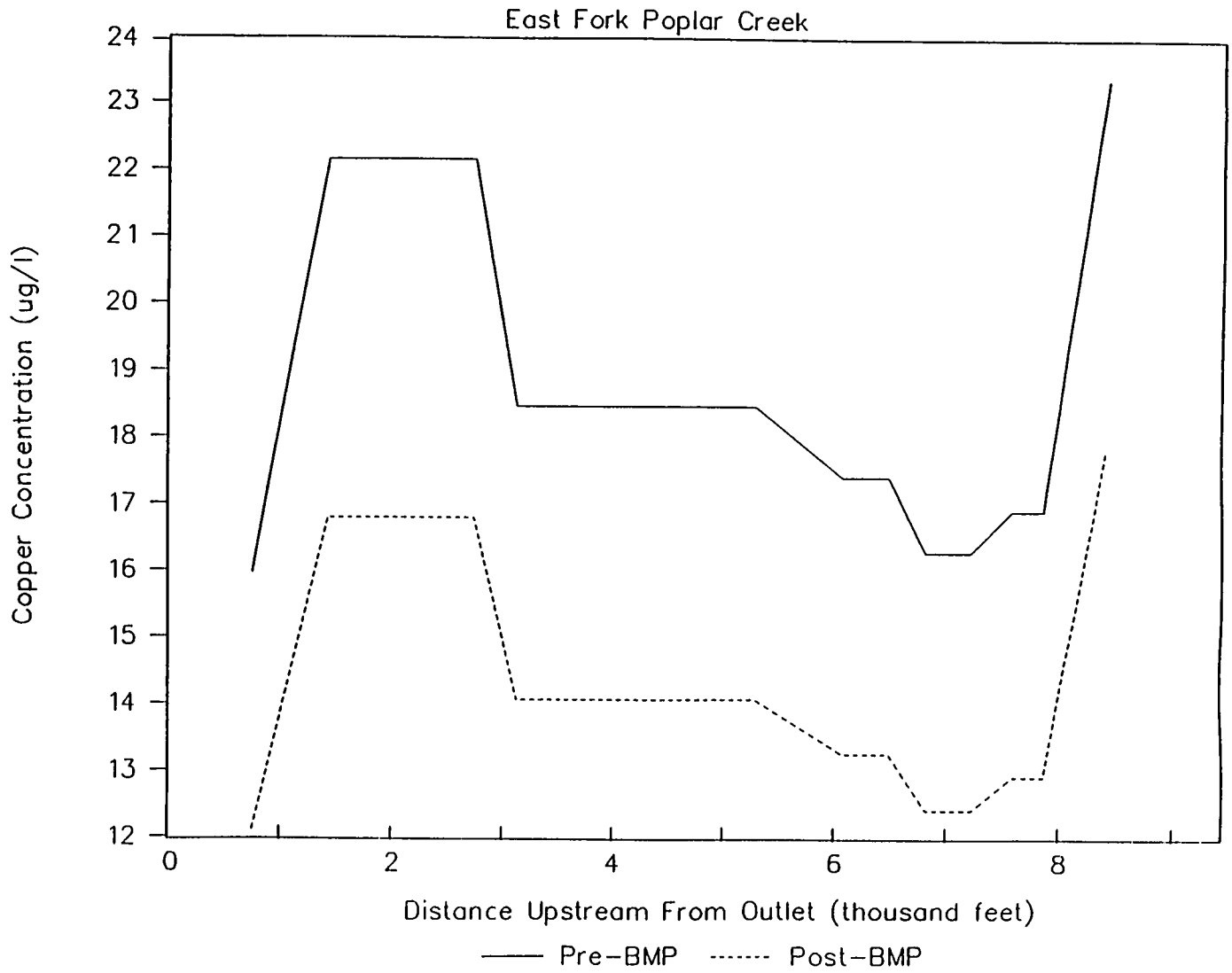

Figure 3-2

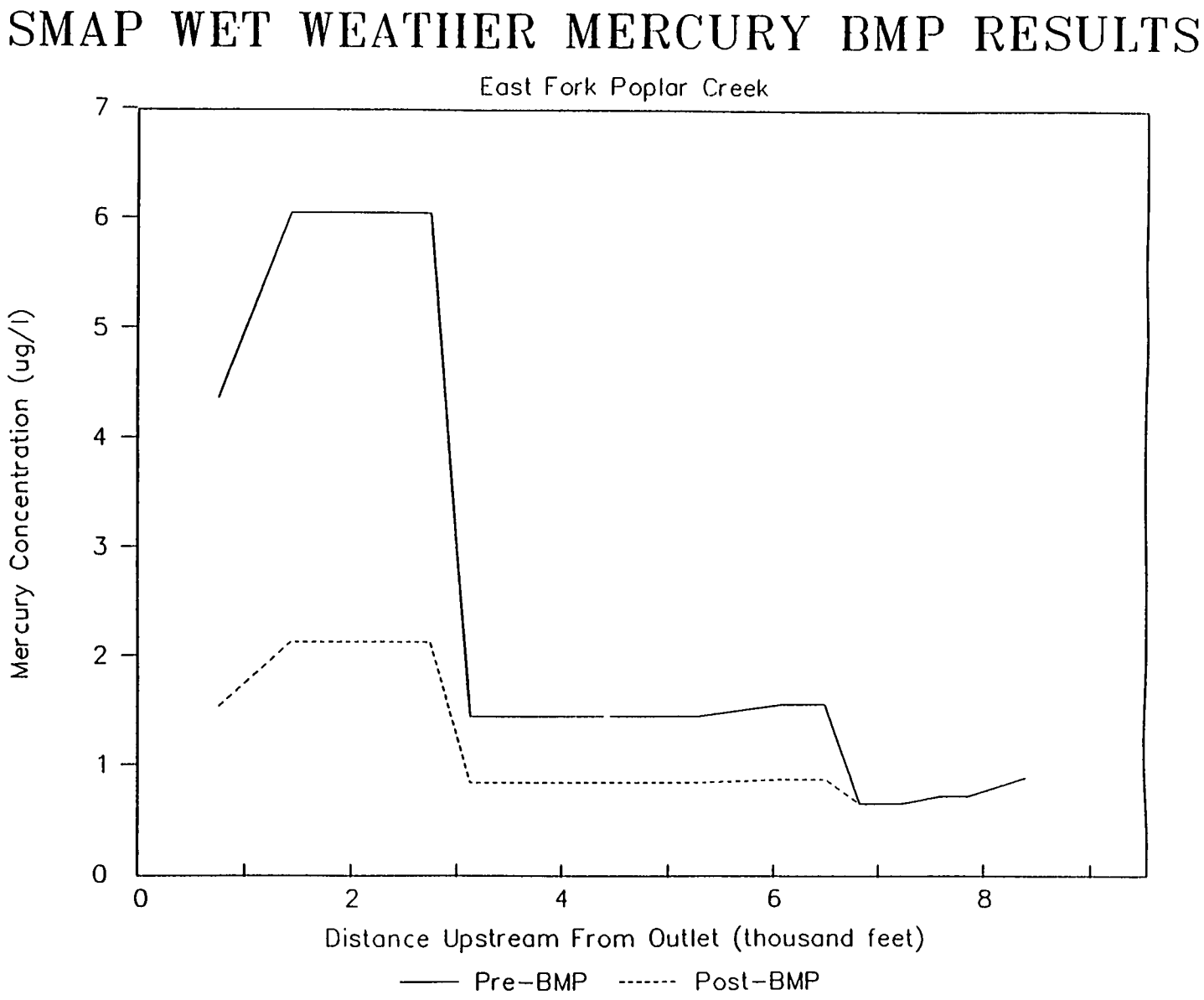
SMAP WET WEATHER MERCURY BMP RESULTS
East Fork Poplar Creek
Mercury Concentration (ug/l)
0
1
2
3
4
5
6
7
0
2
4
6
8
Distance Upstream From Outlet (thousand feet)
Pre-BMP
Post-BMP

Figure 3-3

4.0 REFERENCES

Camp Dresser & McKee Inc., 1990a. Water Quality Data Summary Report for Wet and Dry Weather Events at the Oak Ridge Y-12 Plant. Oak Ridge, Tennessee.

Camp Dresser & McKee Inc., 1990b. Dry and Wet Weather Data Analysis Report for the Oak Ridge Y-12 Plant. Oak Ridge, Tennessee.

Camp Dresser & McKee Inc., 1990c. Stream Management and Analysis Program (SMAP) User's Guide. Oak Ridge, Tennessee.

Camp Dresser & McKee Inc., 1990d. RUNOFF Model of East Fork Poplar Creek Update and Calibration Report. Oak Ridge, Tennessee.

Camp Dresser & McKee Inc., 1990e. Groundwater Data Summary Report for the Oak Ridge Y-12 Plant. Oak Ridge, Tennessee.

APPENDIX A

DRY WEATHER TOTAL RESIDUAL CHLORINE BMP SMAP REPORTS

PRE-BMP SMAP REPORT

Analysis ID - Default
Groundwater ID - Average Elevs.
Constituent ID - Chlorine
Runoff ID - No Rainfall

NODE RESULTS

Node	Source	Flow cfs	Concentration ug/l	Load ug/1.0 days
A	Point Source	2.10	680.00	3494098944.0
A	NonPoint Source	0.00	0.00	0.0
A	Groundwater	0.63	0.00	0.0
A	Total	2.73	522.46	3494098944.0
B	Point Source	0.90	850.00	1871838720.0
B	NonPoint Source	0.00	0.00	0.0
B	Groundwater	0.60	0.00	0.0
B	Total	1.50	510.38	1871838720.0
C	Point Source	0.20	680.00	332771328.0
C	NonPoint Source	0.00	0.00	0.0
C	Groundwater	0.21	0.00	0.0
C	Total	0.41	332.16	332771328.0
D	Point Source	0.60	440.00	645967872.0
D	NonPoint Source	0.00	0.00	0.0
D	Groundwater	0.00	0.00	0.0
D	Total	0.60	440.00	645967872.0
E	Point Source	0.80	680.00	1331085312.0
E	NonPoint Source	0.00	0.00	0.0
E	Groundwater	0.09	0.00	0.0
E	Total	0.89	609.11	1331085312.0
F	Point Source	2.20	980.00	5275404288.0
F	NonPoint Source	0.00	0.00	0.0
F	Groundwater	0.09	0.00	0.0
F	Total	2.29	941.82	5275404288.0
G	Point Source	0.50	370.00	452666880.0
G	NonPoint Source	0.00	0.00	0.0
G	Groundwater	0.00	0.00	0.0
G	Total	0.50	366.41	452666880.0
H	Point Source	0.20	440.00	215322624.0
H	NonPoint Source	0.00	0.00	0.0
H	Groundwater	0.00	0.00	0.0
H	Total	0.20	434.09	215322624.0
I	Point Source	0.30	980.00	719373312.0
I	NonPoint Source	0.00	0.00	0.0
I	Groundwater	0.20	0.00	0.0
I	Total	0.50	590.91	719373312.0
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	0.00	0.00	0.0
J	Groundwater	0.08	130.00	24368877.4
J	Total	0.08	130.00	24368877.4
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	0.00	0.00	0.0
K	Groundwater	1.98	0.00	0.0

K				
	Total	1.98	0.00	0.0
30000	Point Source	3.20	850.94	6662767104.0
30000	NonPoint Source	0.00	0.00	0.0
30000	Groundwater	0.37	26.85	24368877.4
30000	Total	3.57	765.33	6687135981.3
25050	Point Source	4.00	816.75	7993852416.0
25050	NonPoint Source	0.00	0.00	0.0
25050	Groundwater	0.46	21.46	24368877.4
25050	Total	4.46	734.08	8018221293.3
25000	Point Source	4.00	816.75	7993852416.0
25000	NonPoint Source	0.00	0.00	0.0
25000	Groundwater	0.46	21.46	24368877.4
25000	Total	4.46	734.08	8018221293.3
20001	Point Source	4.60	767.61	8639820287.9
20001	NonPoint Source	0.00	0.00	0.0
20001	Groundwater	0.46	21.46	24368877.4
20001	Total	5.06	699.23	8664189165.3
20000	Point Source	4.60	767.61	8639820287.9
20000	NonPoint Source	0.00	0.00	0.0
20000	Groundwater	0.46	21.46	24368877.4
20000	Total	5.06	699.23	8664189165.3
15115	Point Source	4.80	763.96	8972591615.9
15115	NonPoint Source	0.00	0.00	0.0
15115	Groundwater	0.67	14.79	24368877.4
15115	Total	5.47	671.78	8996960493.3
15105	Point Source	4.80	763.96	8972591615.9
15105	NonPoint Source	0.00	0.00	0.0
15105	Groundwater	0.67	14.79	24368877.4
15105	Total	5.47	671.78	8996960493.3
15000	Point Source	4.80	763.96	8972591615.9
15000	NonPoint Source	0.00	0.00	0.0
15000	Groundwater	0.67	14.79	24368877.4
15000	Total	5.47	671.78	8996960493.3
10020	Point Source	5.70	777.54	10844430336.0
10020	NonPoint Source	0.00	0.00	0.0
10020	Groundwater	1.27	7.83	24368877.4
10020	Total	6.97	637.08	10868799213.0
10010	Point Source	5.70	777.54	10844430336.0
10010	NonPoint Source	0.00	0.00	0.0
10010	Groundwater	1.27	7.83	24368877.4
10010	Total	6.97	637.08	10868799213.0
10000	Point Source	5.70	777.54	10844430336.0
10000	NonPoint Source	0.00	0.00	0.0
10000	Groundwater	1.27	7.83	24368877.4
10000	Total	6.97	637.08	10868799213.0
5035	Point Source	5.70	777.54	10844430336.0
5035	NonPoint Source	0.00	0.00	0.0
5035	Groundwater	1.27	7.83	24368877.4

5035	Total	6.97	637.08	10868799213.0
5025	Point Source	5.70	777.54	10844430336.0
5025	NonPoint Source	0.00	0.00	0.0
5025	Groundwater	1.27	7.83	24368877.4
5025	Total	6.97	637.08	10868799213.0
5015	Point Source	5.70	777.54	10844430336.0
5015	NonPoint Source	0.00	0.00	0.0
5015	Groundwater	1.27	7.83	24368877.4
5015	Total	6.97	637.08	10868799213.0
5005	Point Source	5.70	777.54	10844430336.0
5005	NonPoint Source	0.00	0.00	0.0
5005	Groundwater	1.27	7.83	24368877.4
5005	Total	6.97	637.08	10868799213.0
5000	Point Source	5.70	777.54	10844430336.0
5000	NonPoint Source	0.00	0.00	0.0
5000	Groundwater	1.27	7.83	24368877.4
5000	Total	6.97	637.08	10868799213.0
2000	Point Source	7.80	751.28	14338529280.0
2000	NonPoint Source	0.00	0.00	0.0
2000	Groundwater	1.91	5.23	24368877.4
2000	Total	9.71	604.80	14362898157.0
1510	Point Source	7.80	751.28	14338529280.0
1510	NonPoint Source	0.00	0.00	0.0
1510	Groundwater	1.91	5.23	24368877.4
510	Total	9.71	604.80	14362898157.0
1500	Point Source	7.80	751.28	14338529280.0
1500	NonPoint Source	0.00	0.00	0.0
1500	Groundwater	1.91	5.23	24368877.4
1500	Total	9.71	604.80	14362898157.0
1000	Point Source	7.80	751.28	14338529280.0
1000	NonPoint Source	0.00	0.00	0.0
1000	Groundwater	3.89	2.56	24368877.4
1000	Total	11.69	502.28	14362898157.0

POST-BMP SMAP REPORT

697/25

Analysis ID - PS Chlorine BMP
Groundwater ID - Average Elevs.
Constituent ID - Chlorine
Runoff ID - No Rainfall

NODE RESULTS

Node	Source	Flow cfs	Concentration ug/l	Load ug/1.0 days
A	Point Source	2.10	6.80	34940989.4
A	NonPoint Source	0.00	0.00	0.0
A	Groundwater	0.63	0.00	0.0
A	Total	2.73	5.22	34940989.4
B	Point Source	0.90	8.50	18718387.2
B	NonPoint Source	0.00	0.00	0.0
B	Groundwater	0.60	0.00	0.0
B	Total	1.50	5.10	18718387.2
C	Point Source	0.20	6.80	3327713.3
C	NonPoint Source	0.00	0.00	0.0
C	Groundwater	0.21	0.00	0.0
C	Total	0.41	3.32	3327713.3
D	Point Source	0.60	4.40	6459678.7
D	NonPoint Source	0.00	0.00	0.0
D	Groundwater	0.00	0.00	0.0
D	Total	0.60	4.40	6459678.7
E	Point Source	0.80	6.80	13310853.1
E	NonPoint Source	0.00	0.00	0.0
E	Groundwater	0.09	0.00	0.0
E	Total	0.89	6.09	13310853.1
F	Point Source	2.20	9.80	52754042.9
F	NonPoint Source	0.00	0.00	0.0
F	Groundwater	0.09	0.00	0.0
F	Total	2.29	9.42	52754042.9
G	Point Source	0.50	3.70	4526668.8
G	NonPoint Source	0.00	0.00	0.0
G	Groundwater	0.00	0.00	0.0
G	Total	0.50	3.66	4526668.8
H	Point Source	0.20	4.40	2153226.2
H	NonPoint Source	0.00	0.00	0.0
H	Groundwater	0.00	0.00	0.0
H	Total	0.20	4.34	2153226.2
I	Point Source	0.30	9.80	7193733.1
I	NonPoint Source	0.00	0.00	0.0
I	Groundwater	0.20	0.00	0.0
I	Total	0.50	5.91	7193733.1
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	0.00	0.00	0.0
J	Groundwater	0.08	130.00	24368877.4
J	Total	0.08	130.00	24368877.4
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	0.00	0.00	0.0
K	Groundwater	1.98	0.00	0.0

K	Total	1.98	0.00	0.0
30000	Point Source	3.20	8.51	66627671.0
30000	NonPoint Source	0.00	0.00	0.0
30000	Groundwater	0.37	26.85	24368877.4
30000	Total	3.57	10.41	90996548.4
25050	Point Source	4.00	8.17	79938524.2
25050	NonPoint Source	0.00	0.00	0.0
25050	Groundwater	0.46	21.46	24368877.4
25050	Total	4.46	9.55	104307401.5
25000	Point Source	4.00	8.17	79938524.2
25000	NonPoint Source	0.00	0.00	0.0
25000	Groundwater	0.46	21.46	24368877.4
25000	Total	4.46	9.55	104307401.5
20001	Point Source	4.60	7.68	86398202.9
20001	NonPoint Source	0.00	0.00	0.0
20001	Groundwater	0.46	21.46	24368877.4
20001	Total	5.06	8.94	110767080.3
20000	Point Source	4.60	7.68	86398202.9
20000	NonPoint Source	0.00	0.00	0.0
20000	Groundwater	0.46	21.46	24368877.4
20000	Total	5.06	8.94	110767080.3
15115	Point Source	4.80	7.64	89725916.2
15115	NonPoint Source	0.00	0.00	0.0
15115	Groundwater	0.67	14.79	24368877.4
15115	Total	5.47	8.52	114094793.5
15105	Point Source	4.80	7.64	89725916.2
15105	NonPoint Source	0.00	0.00	0.0
15105	Groundwater	0.67	14.79	24368877.4
15105	Total	5.47	8.52	114094793.5
15000	Point Source	4.80	7.64	89725916.2
15000	NonPoint Source	0.00	0.00	0.0
15000	Groundwater	0.67	14.79	24368877.4
15000	Total	5.47	8.52	114094793.5
10020	Point Source	5.70	7.78	108444303.4
10020	NonPoint Source	0.00	0.00	0.0
10020	Groundwater	1.27	7.83	24368877.4
10020	Total	6.97	7.78	132813180.7
10010	Point Source	5.70	7.78	108444303.4
10010	NonPoint Source	0.00	0.00	0.0
10010	Groundwater	1.27	7.83	24368877.4
10010	Total	6.97	7.78	132813180.7
10000	Point Source	5.70	7.78	108444303.4
10000	NonPoint Source	0.00	0.00	0.0
10000	Groundwater	1.27	7.83	24368877.4
10000	Total	6.97	7.78	132813180.7
5035	Point Source	5.70	7.78	108444303.4
5035	NonPoint Source	0.00	0.00	0.0
5035	Groundwater	1.27	7.83	24368877.4

5035	Total	6.97	7.78	132813180.7
5025	Point Source	5.70	7.78	108444303.4
5025	NonPoint Source	0.00	0.00	0.0
5025	Groundwater	1.27	7.83	24368877.4
5025	Total	6.97	7.78	132813180.7
5015	Point Source	5.70	7.78	108444303.4
5015	NonPoint Source	0.00	0.00	0.0
5015	Groundwater	1.27	7.83	24368877.4
5015	Total	6.97	7.78	132813180.7
5005	Point Source	5.70	7.78	108444303.4
5005	NonPoint Source	0.00	0.00	0.0
5005	Groundwater	1.27	7.83	24368877.4
5005	Total	6.97	7.78	132813180.7
5000	Point Source	5.70	7.78	108444303.4
5000	NonPoint Source	0.00	0.00	0.0
5000	Groundwater	1.27	7.83	24368877.4
5000	Total	6.97	7.78	132813180.7
2000	Point Source	7.80	7.51	143385292.8
2000	NonPoint Source	0.00	0.00	0.0
2000	Groundwater	1.91	5.23	24368877.4
2000	Total	9.71	7.06	167754170.2
1510	Point Source	7.80	7.51	143385292.8
1510	NonPoint Source	0.00	0.00	0.0
1510	Groundwater	1.91	5.23	24368877.4
510	Total	9.71	7.06	167754170.2
1500	Point Source	7.80	7.51	143385292.8
1500	NonPoint Source	0.00	0.00	0.0
1500	Groundwater	1.91	5.23	24368877.4
1500	Total	9.71	7.06	167754170.2
1000	Point Source	7.80	7.51	143385292.8
1000	NonPoint Source	0.00	0.00	0.0
1000	Groundwater	3.89	2.56	24368877.4
1000	Total	11.69	5.87	167754170.2

APPENDIX B

DRY WEATHER NITRATE BMP SMAP REPORTS

PRE-BMP SMAP REPORT

697/25

Analysis ID - Default
Groundwater ID - Average Elevs.
Constituent ID - Nitrate
Runoff ID - No Rainfall

NODE RESULTS

Node	Source	Flow cfs	Concentration mg/l	Load mg/1.0 days
A	Point Source	2.10	3.35	17213575.7
A	NonPoint Source	0.00	0.00	0.0
A	Groundwater	0.63	0.20	309876.7
A	Total	2.73	2.62	17523452.3
B	Point Source	0.90	0.70	1541514.2
B	NonPoint Source	0.00	0.00	0.0
B	Groundwater	0.60	0.20	293069.5
B	Total	1.50	0.50	1834583.7
C	Point Source	0.20	1.95	954270.7
C	NonPoint Source	0.00	0.00	0.0
C	Groundwater	0.21	0.20	102493.6
C	Total	0.41	1.05	1056764.3
D	Point Source	0.60	1.00	1468108.8
D	NonPoint Source	0.00	0.00	0.0
D	Groundwater	0.00	0.00	0.0
D	Total	0.60	1.00	1468108.8
E	Point Source	0.80	0.70	1370234.9
E	NonPoint Source	0.00	0.00	0.0
E	Groundwater	0.09	0.20	45560.3
E	Total	0.89	0.65	1415795.2
F	Point Source	2.20	0.59	3176008.7
F	NonPoint Source	0.00	0.00	0.0
F	Groundwater	0.09	0.20	43645.2
F	Total	2.29	0.57	3219653.9
G	Point Source	0.50	1.00	1223424.0
G	NonPoint Source	0.00	0.00	0.0
G	Groundwater	0.00	0.20	2397.5
G	Total	0.50	0.99	1225821.5
H	Point Source	0.20	12.00	5872435.2
H	NonPoint Source	0.00	0.00	0.0
H	Groundwater	0.00	0.20	1332.8
H	Total	0.20	11.84	5873768.0
I	Point Source	0.30	0.00	0.0
I	NonPoint Source	0.00	0.00	0.0
I	Groundwater	0.20	5.01	2421530.1
I	Total	0.50	1.99	2421530.1
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	0.00	0.00	0.0
J	Groundwater	0.08	220.00	41239638.6
J	Total	0.08	220.00	41239638.6
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	0.00	0.00	0.0
K	Groundwater	1.98	2.26	10955179.5

K				
	Total	1.98	2.26	10955179.5
30000	Point Source	3.20	1.31	10271867.9
30000	NonPoint Source	0.00	0.00	0.0
30000	Groundwater	0.37	48.15	43708544.3
30000	Total	3.57	6.18	53980412.2
25050	Point Source	4.00	1.19	11642102.8
25050	NonPoint Source	0.00	0.00	0.0
25050	Groundwater	0.46	38.53	43754104.6
25050	Total	4.46	5.07	55396207.4
25000	Point Source	4.00	1.19	11642102.8
25000	NonPoint Source	0.00	0.00	0.0
25000	Groundwater	0.46	38.53	43754104.6
25000	Total	4.46	5.07	55396207.4
20001	Point Source	4.60	1.16	13110211.6
20001	NonPoint Source	0.00	0.00	0.0
20001	Groundwater	0.46	38.53	43754104.6
20001	Total	5.06	4.59	56864316.2
20000	Point Source	4.60	1.16	13110211.6
20000	NonPoint Source	0.00	0.00	0.0
20000	Groundwater	0.46	38.53	43754104.6
20000	Total	5.06	4.59	56864316.2
15115	Point Source	4.80	1.20	14064482.3
15115	NonPoint Source	0.00	0.00	0.0
15115	Groundwater	0.67	26.61	43856598.2
15115	Total	5.47	4.32	57921080.5
15105	Point Source	4.80	1.20	14064482.3
15105	NonPoint Source	0.00	0.00	0.0
15105	Groundwater	0.67	26.61	43856598.2
15105	Total	5.47	4.32	57921080.5
15000	Point Source	4.80	1.20	14064482.3
15000	NonPoint Source	0.00	0.00	0.0
15000	Groundwater	0.67	26.61	43856598.2
15000	Total	5.47	4.32	57921080.5
10020	Point Source	5.70	1.12	15605996.5
10020	NonPoint Source	0.00	0.00	0.0
10020	Groundwater	1.27	14.18	44149667.6
10020	Total	6.97	3.50	59755664.2
10010	Point Source	5.70	1.12	15605996.5
10010	NonPoint Source	0.00	0.00	0.0
10010	Groundwater	1.27	14.18	44149667.6
10010	Total	6.97	3.50	59755664.2
10000	Point Source	5.70	1.12	15605996.5
10000	NonPoint Source	0.00	0.00	0.0
10000	Groundwater	1.27	14.18	44149667.6
10000	Total	6.97	3.50	59755664.2
5035	Point Source	5.70	1.12	15605996.5
5035	NonPoint Source	0.00	0.00	0.0
5035	Groundwater	1.27	14.18	44149667.6

5035	Total	6.97	3.50	59755664.2
5025	Point Source	5.70	1.12	15605996.5
5025	NonPoint Source	0.00	0.00	0.0
5025	Groundwater	1.27	14.18	44149667.6
5025	Total	6.97	3.50	59755664.2
5015	Point Source	5.70	1.12	15605996.5
5015	NonPoint Source	0.00	0.00	0.0
5015	Groundwater	1.27	14.18	44149667.6
5015	Total	6.97	3.50	59755664.2
5005	Point Source	5.70	1.12	15605996.5
5005	NonPoint Source	0.00	0.00	0.0
5005	Groundwater	1.27	14.18	44149667.6
5005	Total	6.97	3.50	59755664.2
5000	Point Source	5.70	1.12	15605996.5
5000	NonPoint Source	0.00	0.00	0.0
5000	Groundwater	1.27	14.18	44149667.6
5000	Total	6.97	3.50	59755664.2
2000	Point Source	7.80	1.72	32819572.2
2000	NonPoint Source	0.00	0.00	0.0
2000	Groundwater	1.91	9.54	44459544.3
2000	Total	9.71	3.25	77279116.5
1510	Point Source	7.80	1.72	32819572.2
1510	NonPoint Source	0.00	0.00	0.0
1510	Groundwater	1.91	9.54	44459544.3
1510	Total	9.71	3.25	77279116.5
1500	Point Source	7.80	1.72	32819572.2
1500	NonPoint Source	0.00	0.00	0.0
1500	Groundwater	1.91	9.54	44459544.3
1500	Total	9.71	3.25	77279116.5
1000	Point Source	7.80	1.72	32819572.2
1000	NonPoint Source	0.00	0.00	0.0
1000	Groundwater	3.89	5.83	55414723.8
1000	Total	11.69	3.09	88234296.0

POST-BMP SMAP REPORT

697/25

Analysis ID - GW Nitrate BMP
Groundwater ID - Average Elevs.
Constituent ID - Nitrate
Runoff ID - No Rainfall

NODE RESULTS

Node	Source	Flow cfs	Concentration mg/l	Load mg/1.0 days
A	Point Source	2.10	3.35	17213575.7
A	NonPoint Source	0.00	0.00	0.0
A	Groundwater	0.63	0.20	309876.7
A	Total	2.73	2.62	17523452.3
B	Point Source	0.90	0.70	1541514.2
B	NonPoint Source	0.00	0.00	0.0
B	Groundwater	0.60	0.20	293069.5
B	Total	1.50	0.50	1834583.7
C	Point Source	0.20	1.95	954270.7
C	NonPoint Source	0.00	0.00	0.0
C	Groundwater	0.21	0.20	102493.6
C	Total	0.41	1.05	1056764.3
D	Point Source	0.60	1.00	1468108.8
D	NonPoint Source	0.00	0.00	0.0
D	Groundwater	0.00	0.00	0.0
D	Total	0.60	1.00	1468108.8
E	Point Source	0.80	0.70	1370234.9
E	NonPoint Source	0.00	0.00	0.0
E	Groundwater	0.09	0.20	45560.3
E	Total	0.89	0.65	1415795.2
F	Point Source	2.20	0.59	3176008.7
F	NonPoint Source	0.00	0.00	0.0
F	Groundwater	0.09	0.20	43645.2
F	Total	2.29	0.57	3219653.9
G	Point Source	0.50	1.00	1223424.0
G	NonPoint Source	0.00	0.00	0.0
G	Groundwater	0.00	0.20	2397.5
G	Total	0.50	0.99	1225821.5
H	Point Source	0.20	12.00	5872435.2
H	NonPoint Source	0.00	0.00	0.0
H	Groundwater	0.00	0.20	1332.8
H	Total	0.20	11.84	5873768.0
I	Point Source	0.30	0.00	0.0
I	NonPoint Source	0.00	0.00	0.0
I	Groundwater	0.20	0.20	96861.2
I	Total	0.50	0.08	96861.2
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	0.00	0.00	0.0
J	Groundwater	0.08	8.80	1649585.5
J	Total	0.08	8.80	1649585.5
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	0.00	0.00	0.0
K	Groundwater	1.98	2.26	10955179.5

K	Total	1.98	2.26	10955179.5
30000	Point Source	3.20	1.31	10271867.9
30000	NonPoint Source	0.00	0.00	0.0
30000	Groundwater	0.37	1.98	1793822.3
30000	Total	3.57	1.38	12065690.2
25050	Point Source	4.00	1.19	11642102.8
25050	NonPoint Source	0.00	0.00	0.0
25050	Groundwater	0.46	1.62	1839382.6
25050	Total	4.46	1.23	13481485.4
25000	Point Source	4.00	1.19	11642102.8
25000	NonPoint Source	0.00	0.00	0.0
25000	Groundwater	0.46	1.62	1839382.6
25000	Total	4.46	1.23	13481485.4
20001	Point Source	4.60	1.16	13110211.6
20001	NonPoint Source	0.00	0.00	0.0
20001	Groundwater	0.46	1.62	1839382.6
20001	Total	5.06	1.21	14949594.2
20000	Point Source	4.60	1.16	13110211.6
20000	NonPoint Source	0.00	0.00	0.0
20000	Groundwater	0.46	1.62	1839382.6
20000	Total	5.06	1.21	14949594.2
15115	Point Source	4.80	1.20	14064482.3
15115	NonPoint Source	0.00	0.00	0.0
15115	Groundwater	0.67	1.18	1941876.2
15115	Total	5.47	1.20	16006358.5
15105	Point Source	4.80	1.20	14064482.3
15105	NonPoint Source	0.00	0.00	0.0
15105	Groundwater	0.67	1.18	1941876.2
15105	Total	5.47	1.20	16006358.5
15000	Point Source	4.80	1.20	14064482.3
15000	NonPoint Source	0.00	0.00	0.0
15000	Groundwater	0.67	1.18	1941876.2
15000	Total	5.47	1.20	16006358.5
10020	Point Source	5.70	1.12	15605996.5
10020	NonPoint Source	0.00	0.00	0.0
10020	Groundwater	1.27	0.72	2234945.6
10020	Total	6.97	1.05	17840942.2
10010	Point Source	5.70	1.12	15605996.5
10010	NonPoint Source	0.00	0.00	0.0
10010	Groundwater	1.27	0.72	2234945.6
10010	Total	6.97	1.05	17840942.2
10000	Point Source	5.70	1.12	15605996.5
10000	NonPoint Source	0.00	0.00	0.0
10000	Groundwater	1.27	0.72	2234945.6
10000	Total	6.97	1.05	17840942.2
5035	Point Source	5.70	1.12	15605996.5
5035	NonPoint Source	0.00	0.00	0.0
5035	Groundwater	1.27	0.72	2234945.6

5035	Total	6.97	1.05	17840942.2
5025	Point Source	5.70	1.12	15605996.5
5025	NonPoint Source	0.00	0.00	0.0
5025	Groundwater	1.27	0.72	2234945.6
5025	Total	6.97	1.05	17840942.2
5015	Point Source	5.70	1.12	15605996.5
5015	NonPoint Source	0.00	0.00	0.0
5015	Groundwater	1.27	0.72	2234945.6
5015	Total	6.97	1.05	17840942.2
5005	Point Source	5.70	1.12	15605996.5
5005	NonPoint Source	0.00	0.00	0.0
5005	Groundwater	1.27	0.72	2234945.6
5005	Total	6.97	1.05	17840942.2
5000	Point Source	5.70	1.12	15605996.5
5000	NonPoint Source	0.00	0.00	0.0
5000	Groundwater	1.27	0.72	2234945.6
5000	Total	6.97	1.05	17840942.2
2000	Point Source	7.80	1.72	32819572.2
2000	NonPoint Source	0.00	0.00	0.0
2000	Groundwater	1.91	0.55	2544822.3
2000	Total	9.71	1.49	35364394.5
1510	Point Source	7.80	1.72	32819572.2
1510	NonPoint Source	0.00	0.00	0.0
1510	Groundwater	1.91	0.55	2544822.3
510	Total	9.71	1.49	35364394.5
1500	Point Source	7.80	1.72	32819572.2
1500	NonPoint Source	0.00	0.00	0.0
1500	Groundwater	1.91	0.55	2544822.3
1500	Total	9.71	1.49	35364394.5
1000	Point Source	7.80	1.72	32819572.2
1000	NonPoint Source	0.00	0.00	0.0
1000	Groundwater	3.89	1.42	13500001.8
1000	Total	11.69	1.62	46319574.0

APPENDIX C

DRY WEATHER COPPER BMP SMAP REPORTS

PRE-BMP SMAP REPORT

Analysis ID - Default
Groundwater ID - Average Elevs.
Constituent ID - Copper
Runoff ID - No Rainfall

NODE RESULTS

Node	Source	Flow cfs	Concentration ug/l	Load ug/1.0 days
A	Point Source	2.10	0.20	1027676.2
A	NonPoint Source	0.00	0.00	0.0
A	Groundwater	0.63	5.00	7746916.5
A	Total	2.73	1.31	8774592.7
B	Point Source	0.90	13.40	29508986.9
B	NonPoint Source	0.00	0.00	0.0
B	Groundwater	0.60	5.00	7326736.4
B	Total	1.50	10.04	36835723.3
C	Point Source	0.20	0.00	0.0
C	NonPoint Source	0.00	0.00	0.0
C	Groundwater	0.21	5.00	2562339.2
C	Total	0.41	2.56	2562339.2
D	Point Source	0.60	10.00	14681088.0
D	NonPoint Source	0.00	0.00	0.0
D	Groundwater	0.00	0.00	0.0
D	Total	0.60	10.00	14681088.0
E	Point Source	0.80	18.30	35821854.7
E	NonPoint Source	0.00	0.00	0.0
E	Groundwater	0.09	5.00	1139007.7
E	Total	0.89	16.91	36960862.5
F	Point Source	2.20	12.30	66211706.9
F	NonPoint Source	0.00	0.00	0.0
F	Groundwater	0.09	5.00	1091130.3
F	Total	2.29	12.02	67302837.1
G	Point Source	0.50	9.00	11010816.0
G	NonPoint Source	0.00	0.00	0.0
G	Groundwater	0.00	5.00	59936.6
G	Total	0.50	8.96	11070752.6
H	Point Source	0.20	5.00	2446848.0
H	NonPoint Source	0.00	0.00	0.0
H	Groundwater	0.00	5.00	33321.2
H	Total	0.20	5.00	2480169.2
I	Point Source	0.30	0.00	0.0
I	NonPoint Source	0.00	0.00	0.0
I	Groundwater	0.20	73.30	35428773.9
I	Total	0.50	29.10	35428773.9
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	0.00	0.00	0.0
J	Groundwater	0.08	4.00	749811.6
J	Total	0.08	4.00	749811.6
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	0.00	0.00	0.0
K	Groundwater	1.98	3.20	15511758.6

K				
	Total	1.98	3.20	15511758.6
30000	Point Source	3.20	10.17	79669370.9
30000	NonPoint Source	0.00	0.00	0.0
30000	Groundwater	0.37	41.16	37362973.6
30000	Total	3.57	13.39	117032344.4
25050	Point Source	4.00	11.80	115491225.6
25050	NonPoint Source	0.00	0.00	0.0
25050	Groundwater	0.46	33.91	38501981.3
25050	Total	4.46	14.10	153993206.9
25000	Point Source	4.00	11.80	115491225.6
25000	NonPoint Source	0.00	0.00	0.0
25000	Groundwater	0.46	33.91	38501981.3
25000	Total	4.46	14.10	153993206.9
20001	Point Source	4.60	11.57	130172313.6
20001	NonPoint Source	0.00	0.00	0.0
20001	Groundwater	0.46	33.91	38501981.3
20001	Total	5.06	13.61	168674294.9
20000	Point Source	4.60	11.57	130172313.6
20000	NonPoint Source	0.00	0.00	0.0
20000	Groundwater	0.46	33.91	38501981.3
20000	Total	5.06	13.61	168674294.9
15115	Point Source	4.80	11.08	130172313.6
15115	NonPoint Source	0.00	0.00	0.0
15115	Groundwater	0.67	24.92	41064320.5
15115	Total	5.47	12.79	171236634.1
15105	Point Source	4.80	11.08	130172313.6
15105	NonPoint Source	0.00	0.00	0.0
15105	Groundwater	0.67	24.92	41064320.5
15105	Total	5.47	12.79	171236634.1
15000	Point Source	4.80	11.08	130172313.6
15000	NonPoint Source	0.00	0.00	0.0
15000	Groundwater	0.67	24.92	41064320.5
15000	Total	5.47	12.79	171236634.1
10020	Point Source	5.70	11.45	159681300.5
10020	NonPoint Source	0.00	0.00	0.0
10020	Groundwater	1.27	15.54	48391057.0
10020	Total	6.97	12.20	208072357.4
10010	Point Source	5.70	11.45	159681300.5
10010	NonPoint Source	0.00	0.00	0.0
10010	Groundwater	1.27	15.54	48391057.0
10010	Total	6.97	12.20	208072357.4
10000	Point Source	5.70	11.45	159681300.5
10000	NonPoint Source	0.00	0.00	0.0
10000	Groundwater	1.27	15.54	48391057.0
10000	Total	6.97	12.20	208072357.4
5035	Point Source	5.70	11.45	159681300.5
5035	NonPoint Source	0.00	0.00	0.0
5035	Groundwater	1.27	15.54	48391057.0

5035	Total	6.97	12.20	208072357.4
5025	Point Source	5.70	11.45	159681300.5
5025	NonPoint Source	0.00	0.00	0.0
5025	Groundwater	1.27	15.54	48391057.0
5025	Total	6.97	12.20	208072357.4
5015	Point Source	5.70	11.45	159681300.5
5015	NonPoint Source	0.00	0.00	0.0
5015	Groundwater	1.27	15.54	48391057.0
5015	Total	6.97	12.20	208072357.4
5005	Point Source	5.70	11.45	159681300.5
5005	NonPoint Source	0.00	0.00	0.0
5005	Groundwater	1.27	15.54	48391057.0
5005	Total	6.97	12.20	208072357.4
5000	Point Source	5.70	11.45	159681300.5
5000	NonPoint Source	0.00	0.00	0.0
5000	Groundwater	1.27	15.54	48391057.0
5000	Total	6.97	12.20	208072357.4
2000	Point Source	7.80	8.42	160708976.6
2000	NonPoint Source	0.00	0.00	0.0
2000	Groundwater	1.91	12.04	56137973.5
2000	Total	9.71	9.13	216846950.1
1510	Point Source	7.80	8.42	160708976.6
1510	NonPoint Source	0.00	0.00	0.0
1510	Groundwater	1.91	12.04	56137973.5
510	Total	9.71	9.13	216846950.1
1500	Point Source	7.80	8.42	160708976.6
1500	NonPoint Source	0.00	0.00	0.0
1500	Groundwater	1.91	12.04	56137973.5
1500	Total	9.71	9.13	216846950.1
1000	Point Source	7.80	8.42	160708976.6
1000	NonPoint Source	0.00	0.00	0.0
1000	Groundwater	3.89	7.53	71649732.1
1000	Total	11.69	8.13	232358708.7

POST-BMP SMAP REPORT

Analysis ID - GW Copper BMP
Groundwater ID - Average Elevs.
Constituent ID - Copper
Runoff ID - No Rainfall

NODE RESULTS

Node	Source	Flow cfs	Concentration ug/l	Load ug/1.0 days
A	Point Source	2.10	0.20	1027676.2
A	NonPoint Source	0.00	0.00	0.0
A	Groundwater	0.63	5.00	7746916.5
A	Total	2.73	1.31	8774592.7
B	Point Source	0.90	13.40	29508986.9
B	NonPoint Source	0.00	0.00	0.0
B	Groundwater	0.60	5.00	7326736.4
B	Total	1.50	10.04	36835723.3
C	Point Source	0.20	0.00	0.0
C	NonPoint Source	0.00	0.00	0.0
C	Groundwater	0.21	5.00	2562339.2
C	Total	0.41	2.56	2562339.2
D	Point Source	0.60	10.00	14681088.0
D	NonPoint Source	0.00	0.00	0.0
D	Groundwater	0.00	0.00	0.0
D	Total	0.60	10.00	14681088.0
E	Point Source	0.80	18.30	35821854.7
E	NonPoint Source	0.00	0.00	0.0
E	Groundwater	0.09	5.00	1139007.7
E	Total	0.89	16.91	36960862.5
F	Point Source	2.20	12.30	66211706.9
F	NonPoint Source	0.00	0.00	0.0
F	Groundwater	0.09	5.00	1091130.3
F	Total	2.29	12.02	67302837.1
G	Point Source	0.50	9.00	11010816.0
G	NonPoint Source	0.00	0.00	0.0
G	Groundwater	0.00	5.00	59936.6
G	Total	0.50	8.96	11070752.6
H	Point Source	0.20	5.00	2446848.0
H	NonPoint Source	0.00	0.00	0.0
H	Groundwater	0.00	5.00	33321.2
H	Total	0.20	5.00	2480169.2
I	Point Source	0.30	0.00	0.0
I	NonPoint Source	0.00	0.00	0.0
I	Groundwater	0.20	21.99	10628632.2
I	Total	0.50	8.73	10628632.2
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	0.00	0.00	0.0
J	Groundwater	0.08	4.00	749811.6
J	Total	0.08	4.00	749811.6
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	0.00	0.00	0.0
K	Groundwater	1.98	3.20	15511758.6

K				
	Total	1.98	3.20	15511758.6
30000	Point Source	3.20	10.17	79669370.9
30000	NonPoint Source	0.00	0.00	0.0
30000	Groundwater	0.37	13.84	12562831.9
30000	Total	3.57	10.56	92232202.7
25050	Point Source	4.00	11.80	115491225.6
25050	NonPoint Source	0.00	0.00	0.0
25050	Groundwater	0.46	12.07	13701839.6
25050	Total	4.46	11.83	129193065.2
25000	Point Source	4.00	11.80	115491225.6
25000	NonPoint Source	0.00	0.00	0.0
25000	Groundwater	0.46	12.07	13701839.6
25000	Total	4.46	11.83	129193065.2
20001	Point Source	4.60	11.57	130172313.6
20001	NonPoint Source	0.00	0.00	0.0
20001	Groundwater	0.46	12.07	13701839.6
20001	Total	5.06	11.61	143874153.2
20000	Point Source	4.60	11.57	130172313.6
20000	NonPoint Source	0.00	0.00	0.0
20000	Groundwater	0.46	12.07	13701839.6
20000	Total	5.06	11.61	143874153.2
15115	Point Source	4.80	11.08	130172313.6
15115	NonPoint Source	0.00	0.00	0.0
15115	Groundwater	0.67	9.87	16264178.8
15115	Total	5.47	10.93	146436492.4
15105	Point Source	4.80	11.08	130172313.6
15105	NonPoint Source	0.00	0.00	0.0
15105	Groundwater	0.67	9.87	16264178.8
15105	Total	5.47	10.93	146436492.4
15000	Point Source	4.80	11.08	130172313.6
15000	NonPoint Source	0.00	0.00	0.0
15000	Groundwater	0.67	9.87	16264178.8
15000	Total	5.47	10.93	146436492.4
10020	Point Source	5.70	11.45	159681300.5
10020	NonPoint Source	0.00	0.00	0.0
10020	Groundwater	1.27	7.58	23590915.3
10020	Total	6.97	10.74	183272215.7
10010	Point Source	5.70	11.45	159681300.5
10010	NonPoint Source	0.00	0.00	0.0
10010	Groundwater	1.27	7.58	23590915.3
10010	Total	6.97	10.74	183272215.7
10000	Point Source	5.70	11.45	159681300.5
10000	NonPoint Source	0.00	0.00	0.0
10000	Groundwater	1.27	7.58	23590915.3
10000	Total	6.97	10.74	183272215.7
5035	Point Source	5.70	11.45	159681300.5
5035	NonPoint Source	0.00	0.00	0.0
5035	Groundwater	1.27	7.58	23590915.3

5035	Total	6.97	10.74	183272215.7
5025	Point Source	5.70	11.45	159681300.5
5025	NonPoint Source	0.00	0.00	0.0
5025	Groundwater	1.27	7.58	23590915.3
5025	Total	6.97	10.74	183272215.7
5015	Point Source	5.70	11.45	159681300.5
5015	NonPoint Source	0.00	0.00	0.0
5015	Groundwater	1.27	7.58	23590915.3
5015	Total	6.97	10.74	183272215.7
5005	Point Source	5.70	11.45	159681300.5
5005	NonPoint Source	0.00	0.00	0.0
5005	Groundwater	1.27	7.58	23590915.3
5005	Total	6.97	10.74	183272215.7
5000	Point Source	5.70	11.45	159681300.5
5000	NonPoint Source	0.00	0.00	0.0
5000	Groundwater	1.27	7.58	23590915.3
5000	Total	6.97	10.74	183272215.7
2000	Point Source	7.80	8.42	160708976.6
2000	NonPoint Source	0.00	0.00	0.0
2000	Groundwater	1.91	6.72	31337831.8
2000	Total	9.71	8.09	192046808.4
1510	Point Source	7.80	8.42	160708976.6
1510	NonPoint Source	0.00	0.00	0.0
1510	Groundwater	1.91	6.72	31337831.8
1510	Total	9.71	8.09	192046808.4
1500	Point Source	7.80	8.42	160708976.6
1500	NonPoint Source	0.00	0.00	0.0
1500	Groundwater	1.91	6.72	31337831.8
1500	Total	9.71	8.09	192046808.4
1000	Point Source	7.80	8.42	160708976.6
1000	NonPoint Source	0.00	0.00	0.0
1000	Groundwater	3.89	4.93	46849590.4
1000	Total	11.69	7.26	207558567.0

APPENDIX D

WET WEATHER IRON BMP SMAP REPORTS

PRE-BMP SMAP REPORT

697/25

Analysis ID - Default
Groundwater ID - Average Elevs.
Constituent ID - Iron
Runoff ID - 1-yr, 24-hr SCS

NODE RESULTS

Node	Source	Flow cfs	Concentration mg/l	Load mg/0.5 days
A	Point Source	2.10	0.07	179843.3
A	NonPoint Source	18.48	0.46	10402024.2
A	Groundwater	0.63	0.10	77469.2
A	Total	21.22	0.41	10659336.7
B	Point Source	0.90	0.17	187183.9
B	NonPoint Source	9.98	3.38	41271746.8
B	Groundwater	0.60	0.10	73267.4
B	Total	11.48	2.96	41532198.1
C	Point Source	0.20	0.00	0.0
C	NonPoint Source	7.63	12.92	120623631.0
C	Groundwater	0.21	0.10	25623.4
C	Total	8.04	12.26	120649254.4
D	Point Source	0.60	0.51	374367.7
D	NonPoint Source	15.33	5.34	100143506.5
D	Groundwater	0.00	0.00	0.0
D	Total	15.93	5.16	100517874.3
E	Point Source	0.80	0.79	773204.0
E	NonPoint Source	17.17	0.00	0.0
E	Groundwater	0.09	0.10	11390.1
E	Total	18.06	0.04	784594.0
F	Point Source	2.20	0.07	188407.3
F	NonPoint Source	2.59	6.79	21484433.5
F	Groundwater	0.09	0.10	10911.3
F	Total	4.88	3.64	21683752.1
G	Point Source	0.50	0.16	97873.9
G	NonPoint Source	10.18	7.72	96177434.1
G	Groundwater	0.00	0.10	599.4
G	Total	10.69	7.36	96275907.4
H	Point Source	0.20	0.09	22021.6
H	NonPoint Source	7.87	15.09	145219466.7
H	Groundwater	0.00	0.10	333.2
H	Total	8.07	14.71	145241821.5
I	Point Source	0.30	0.07	25691.9
I	NonPoint Source	13.22	0.00	0.0
I	Groundwater	0.20	0.10	24167.0
I	Total	13.72	0.00	49858.9
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	7.48	17.61	161200581.5
J	Groundwater	0.08	0.63	59047.7
J	Total	7.56	17.44	161259629.2
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	44.72	0.00	0.0
K	Groundwater	1.98	0.97	2351000.9

K				
	Total	46.70	0.04	2351000.9
30000	Point Source	3.20	0.09	333994.8
30000	NonPoint Source	41.34	8.39	424081915.8
30000	Groundwater	0.37	0.21	95058.5
30000	Total	44.91	7.73	424510969.1
25050	Point Source	4.00	0.23	1107198.7
25050	NonPoint Source	58.50	5.93	424081915.8
25050	Groundwater	0.46	0.19	106448.6
25050	Total	62.97	5.52	425295563.1
25000	Point Source	4.00	0.23	1107198.7
25000	NonPoint Source	58.50	5.93	424081915.8
25000	Groundwater	0.46	0.19	106448.6
25000	Total	62.97	5.52	425295563.1
20001	Point Source	4.60	0.26	1481566.5
20001	NonPoint Source	73.83	5.80	524225422.3
20001	Groundwater	0.46	0.19	106448.6
20001	Total	78.89	5.45	525813437.3
20000	Point Source	4.60	0.26	1481566.5
20000	NonPoint Source	73.83	5.80	524225422.3
20000	Groundwater	0.46	0.19	106448.6
20000	Total	78.89	5.45	525813437.3
15115	Point Source	4.80	0.25	1481566.5
15115	NonPoint Source	81.46	6.47	644849053.3
15115	Groundwater	0.67	0.16	132072.0
15115	Total	86.94	6.08	646462691.7
15105	Point Source	4.80	0.25	1481566.5
15105	NonPoint Source	81.46	6.47	644849053.3
15105	Groundwater	0.67	0.16	132072.0
15105	Total	86.94	6.08	646462691.7
15000	Point Source	4.80	0.25	1481566.5
15000	NonPoint Source	81.46	6.47	644849053.3
15000	Groundwater	0.67	0.16	132072.0
15000	Total	86.94	6.08	646462691.7
10020	Point Source	5.70	0.24	1668750.3
10020	NonPoint Source	91.44	6.13	686120800.1
10020	Groundwater	1.27	0.13	205339.3
10020	Total	98.42	5.71	687994889.8
10010	Point Source	5.70	0.24	1668750.3
10010	NonPoint Source	91.44	6.13	686120800.1
10010	Groundwater	1.27	0.13	205339.3
10010	Total	98.42	5.71	687994889.8
10000	Point Source	5.70	0.24	1668750.3
10000	NonPoint Source	91.44	6.13	686120800.1
10000	Groundwater	1.27	0.13	205339.3
10000	Total	98.42	5.71	687994889.8
5035	Point Source	5.70	0.24	1668750.3
5035	NonPoint Source	91.44	6.13	686120800.1
5035	Groundwater	1.27	0.13	205339.3

5035	Total	98.42	5.71	687994889.8
5025	Point Source	5.70	0.24	1668750.3
5025	NonPoint Source	91.44	6.13	686120800.1
5025	Groundwater	1.27	0.13	205339.3
5025	Total	98.42	5.71	687994889.8
5015	Point Source	5.70	0.24	1668750.3
5015	NonPoint Source	91.44	6.13	686120800.1
5015	Groundwater	1.27	0.13	205339.3
5015	Total	98.42	5.71	687994889.8
5005	Point Source	5.70	0.24	1668750.3
5005	NonPoint Source	91.44	6.13	686120800.1
5005	Groundwater	1.27	0.13	205339.3
5005	Total	98.42	5.71	687994889.8
5000	Point Source	5.70	0.24	1668750.3
5000	NonPoint Source	91.44	6.13	686120800.1
5000	Groundwater	1.27	0.13	205339.3
5000	Total	98.42	5.71	687994889.8
2000	Point Source	7.80	0.19	1848593.7
2000	NonPoint Source	109.93	5.18	696522824.3
2000	Groundwater	1.91	0.12	282808.5
2000	Total	119.63	4.77	698654226.5
1510	Point Source	7.80	0.19	1848593.7
1510	NonPoint Source	109.93	5.18	696522824.3
1510	Groundwater	1.91	0.12	282808.5
1510	Total	119.63	4.77	698654226.5
1500	Point Source	7.80	0.19	1848593.7
1500	NonPoint Source	109.93	5.18	696522824.3
1500	Groundwater	1.91	0.12	282808.5
1500	Total	119.63	4.77	698654226.5
1000	Point Source	7.80	0.19	1848593.7
1000	NonPoint Source	154.65	3.68	696522824.3
1000	Groundwater	3.89	0.55	2633809.4
1000	Total	166.34	3.44	701005227.4

POST-BMP SMAP REPORT

697/25

Analysis ID - NPS Iron BMP
Groundwater ID - Average Elevs.
Constituent ID - Iron
Runoff ID - 1-yr, 24-hr SCS

NODE RESULTS

Node	Source	Flow cfs	Concentration mg/l	Load mg/0.5 days
A	Point Source	2.10	0.07	179843.3
A	NonPoint Source	17.67	0.05	994335.8
A	Groundwater	0.63	0.10	77469.2
A	Total	20.40	0.05	1251648.2
B	Point Source	0.90	0.17	187183.9
B	NonPoint Source	9.98	0.34	4127174.7
B	Groundwater	0.60	0.10	73267.4
B	Total	11.48	0.31	4387625.9
C	Point Source	0.20	0.00	0.0
C	NonPoint Source	7.63	1.29	12062363.1
C	Groundwater	0.21	0.10	25623.4
C	Total	8.04	1.23	12087986.5
D	Point Source	0.60	0.51	374367.7
D	NonPoint Source	15.33	0.53	10014350.7
D	Groundwater	0.00	0.00	0.0
D	Total	15.93	0.53	10388718.4
E	Point Source	0.80	0.79	773204.0
E	NonPoint Source	17.17	0.00	0.0
E	Groundwater	0.09	0.10	11390.1
E	Total	18.06	0.04	784594.0
F	Point Source	2.20	0.07	188407.3
F	NonPoint Source	2.59	0.68	2148443.4
F	Groundwater	0.09	0.10	10911.3
F	Total	4.88	0.39	2347761.9
G	Point Source	0.50	0.16	97873.9
G	NonPoint Source	10.18	0.77	9617743.4
G	Groundwater	0.00	0.10	599.4
G	Total	10.69	0.74	9716216.7
H	Point Source	0.20	0.09	22021.6
H	NonPoint Source	7.87	1.51	14521946.7
H	Groundwater	0.00	0.10	333.2
H	Total	8.07	1.47	14544301.5
I	Point Source	0.30	0.07	25691.9
I	NonPoint Source	13.22	0.00	0.0
I	Groundwater	0.20	0.10	24167.0
I	Total	13.72	0.00	49858.9
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	7.48	1.76	16120058.2
J	Groundwater	0.08	0.63	59047.7
J	Total	7.56	1.75	16179105.8
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	26.37	0.00	0.0
K	Groundwater	0.01	0.97	6906.2

K				
	Total	26.38	0.00	6906.2
30000	Point Source	3.20	0.09	333994.8
30000	NonPoint Source	41.34	0.84	42408191.6
30000	Groundwater	0.37	0.21	95058.5
30000	Total	44.91	0.78	42837244.8
25050	Point Source	4.00	0.23	1107198.7
25050	NonPoint Source	58.50	0.59	42408191.6
25050	Groundwater	0.46	0.19	106448.6
25050	Total	62.97	0.57	43621838.9
25000	Point Source	4.00	0.23	1107198.7
25000	NonPoint Source	58.50	0.59	42408191.6
25000	Groundwater	0.46	0.19	106448.6
25000	Total	62.97	0.57	43621838.9
20001	Point Source	4.60	0.26	1481566.5
20001	NonPoint Source	73.83	0.58	52422542.2
20001	Groundwater	0.46	0.19	106448.6
20001	Total	78.89	0.56	54010557.3
20000	Point Source	4.60	0.26	1481566.5
20000	NonPoint Source	73.83	0.58	52422542.2
20000	Groundwater	0.46	0.19	106448.6
20000	Total	78.89	0.56	54010557.3
15115	Point Source	4.80	0.25	1481566.5
15115	NonPoint Source	81.46	0.65	64484905.3
15115	Groundwater	0.67	0.16	132072.0
15115	Total	86.94	0.62	66098543.8
15105	Point Source	4.80	0.25	1481566.5
15105	NonPoint Source	81.46	0.65	64484905.3
15105	Groundwater	0.67	0.16	132072.0
15105	Total	86.94	0.62	66098543.8
15000	Point Source	4.80	0.25	1481566.5
15000	NonPoint Source	81.46	0.65	64484905.3
15000	Groundwater	0.67	0.16	132072.0
15000	Total	86.94	0.62	66098543.8
10020	Point Source	5.70	0.24	1668750.3
10020	NonPoint Source	91.44	0.61	68612080.0
10020	Groundwater	1.27	0.13	205339.3
10020	Total	98.42	0.59	70486169.7
10010	Point Source	5.70	0.24	1668750.3
10010	NonPoint Source	91.44	0.61	68612080.0
10010	Groundwater	1.27	0.13	205339.3
10010	Total	98.42	0.59	70486169.7
10000	Point Source	5.70	0.24	1668750.3
10000	NonPoint Source	91.44	0.61	68612080.0
10000	Groundwater	1.27	0.13	205339.3
10000	Total	98.42	0.59	70486169.7
5035	Point Source	5.70	0.24	1668750.3
5035	NonPoint Source	91.44	0.61	68612080.0
5035	Groundwater	1.27	0.13	205339.3

5035	Total	98.42	0.59	70486169.7
5025	Point Source	5.70	0.24	1668750.3
5025	NonPoint Source	91.44	0.61	68612080.0
025	Groundwater	1.27	0.13	205339.3
5025	Total	98.42	0.59	70486169.7
5015	Point Source	5.70	0.24	1668750.3
5015	NonPoint Source	91.44	0.61	68612080.0
5015	Groundwater	1.27	0.13	205339.3
5015	Total	98.42	0.59	70486169.7
5005	Point Source	5.70	0.24	1668750.3
5005	NonPoint Source	91.44	0.61	68612080.0
5005	Groundwater	1.27	0.13	205339.3
5005	Total	98.42	0.59	70486169.7
5000	Point Source	5.70	0.24	1668750.3
5000	NonPoint Source	91.44	0.61	68612080.0
5000	Groundwater	1.27	0.13	205339.3
5000	Total	98.42	0.59	70486169.7
2000	Point Source	7.80	0.19	1848593.7
2000	NonPoint Source	109.11	0.52	69606415.8
2000	Groundwater	1.91	0.12	282808.5
2000	Total	118.82	0.49	71737817.9
1510	Point Source	7.80	0.19	1848593.7
1510	NonPoint Source	109.11	0.52	69606415.8
1510	Groundwater	1.91	0.12	282808.5
510	Total	118.82	0.49	71737817.9
1500	Point Source	7.80	0.19	1848593.7
1500	NonPoint Source	109.11	0.52	69606415.8
1500	Groundwater	1.91	0.12	282808.5
1500	Total	118.82	0.49	71737817.9
1000	Point Source	7.80	0.19	1848593.7
1000	NonPoint Source	135.48	0.42	69606415.8
1000	Groundwater	1.91	0.12	289714.7
1000	Total	145.20	0.40	71744724.1

APPENDIX E

WET WEATHER COPPER BMP SMAP REPORTS

PRE-BMP SMAP REPORT

Analysis ID - Default
Groundwater ID - Average Elevs.
Constituent ID - Copper
Runoff ID - 1-yr, 24-hr SCS

NODE RESULTS

Node	Source	Flow cfs	Concentration ug/l	Load ug/0.5 days
A	Point Source	2.10	0.20	513838.1
A	NonPoint Source	18.48	45.00	1017589323.4
A	Groundwater	0.63	5.00	3873458.3
A	Total	21.22	39.37	1021976619.7
B	Point Source	0.90	13.40	14754493.4
B	NonPoint Source	9.98	29.00	354106703.5
B	Groundwater	0.60	5.00	3663368.2
B	Total	11.48	26.52	372524565.1
C	Point Source	0.20	0.00	0.0
C	NonPoint Source	7.63	30.00	280085830.4
C	Groundwater	0.21	5.00	1281169.6
C	Total	8.04	28.60	281367000.1
D	Point Source	0.60	10.00	7340544.0
D	NonPoint Source	15.33	14.00	262548518.9
D	Groundwater	0.00	0.00	0.0
D	Total	15.93	13.85	269889062.9
E	Point Source	0.80	18.30	17910927.4
E	NonPoint Source	17.17	0.00	0.0
E	Groundwater	0.09	5.00	569503.9
E	Total	18.06	0.84	18480431.2
F	Point Source	2.20	12.30	33105853.4
F	NonPoint Source	2.59	50.00	158206432.3
F	Groundwater	0.09	5.00	545565.1
F	Total	4.88	32.17	191857850.8
G	Point Source	0.50	9.00	5505408.0
G	NonPoint Source	10.18	39.00	485870457.2
G	Groundwater	0.00	5.00	29968.3
G	Total	10.69	37.58	491405833.5
H	Point Source	0.20	5.00	1223424.0
H	NonPoint Source	7.87	16.00	153976903.1
H	Groundwater	0.00	5.00	16660.6
H	Total	8.07	15.72	155216987.6
I	Point Source	0.30	0.00	0.0
I	NonPoint Source	13.22	0.00	0.0
I	Groundwater	0.20	73.30	17714386.9
I	Total	13.72	1.06	17714386.9
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	7.48	47.00	430234374.3
J	Groundwater	0.08	4.00	374905.8
J	Total	7.56	46.56	430609280.1
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	44.72	0.00	0.0
K	Groundwater	1.98	3.20	7755879.3

K				
	Total	46.70	0.14	7755879.3
30000	Point Source	3.20	10.17	39834685.4
30000	NonPoint Source	41.34	24.29	1228288166.7
30000	Groundwater	0.37	41.16	18681486.8
30000	Total	44.91	23.42	1286804339.0
25050	Point Source	4.00	11.80	57745612.8
25050	NonPoint Source	58.50	17.16	1228288166.7
25050	Groundwater	0.46	33.91	19250990.6
25050	Total	62.97	16.94	1305284770.2
25000	Point Source	4.00	11.80	57745612.8
25000	NonPoint Source	58.50	17.16	1228288166.7
25000	Groundwater	0.46	33.91	19250990.6
25000	Total	62.97	16.94	1305284770.2
20001	Point Source	4.60	11.57	65086156.8
20001	NonPoint Source	73.83	16.51	1490836685.7
20001	Groundwater	0.46	33.91	19250990.6
20001	Total	78.89	16.32	1575173833.1
20000	Point Source	4.60	11.57	65086156.8
20000	NonPoint Source	73.83	16.51	1490836685.7
20000	Groundwater	0.46	33.91	19250990.6
20000	Total	78.89	16.32	1575173833.1
15115	Point Source	4.80	11.08	65086156.8
15115	NonPoint Source	81.46	17.77	1770922516.1
15115	Groundwater	0.67	24.92	20532160.3
15115	Total	86.94	17.46	1856540833.2
15105	Point Source	4.80	11.08	65086156.8
15105	NonPoint Source	81.46	17.77	1770922516.1
15105	Groundwater	0.67	24.92	20532160.3
15105	Total	86.94	17.46	1856540833.2
15000	Point Source	4.80	11.08	65086156.8
15000	NonPoint Source	81.46	17.77	1770922516.1
15000	Groundwater	0.67	24.92	20532160.3
15000	Total	86.94	17.46	1856540833.2
10020	Point Source	5.70	11.45	79840650.2
10020	NonPoint Source	91.44	18.99	2125029219.6
10020	Groundwater	1.27	15.54	24195528.5
10020	Total	98.42	18.51	2229065398.3
10010	Point Source	5.70	11.45	79840650.2
10010	NonPoint Source	91.44	18.99	2125029219.6
10010	Groundwater	1.27	15.54	24195528.5
10010	Total	98.42	18.51	2229065398.3
10000	Point Source	5.70	11.45	79840650.2
10000	NonPoint Source	91.44	18.99	2125029219.6
10000	Groundwater	1.27	15.54	24195528.5
10000	Total	98.42	18.51	2229065398.3
5035	Point Source	5.70	11.45	79840650.2
5035	NonPoint Source	91.44	18.99	2125029219.6
5035	Groundwater	1.27	15.54	24195528.5

5035	Total	98.42	0.87	104321916.1
5025	Point Source	5.70	0.36	2508019.2
5025	NonPoint Source	91.44	0.85	94689024.3
025	Groundwater	1.27	4.58	7124872.6
5025	Total	98.42	0.87	104321916.1
5015	Point Source	5.70	0.36	2508019.2
5015	NonPoint Source	91.44	0.85	94689024.3
5015	Groundwater	1.27	4.58	7124872.6
5015	Total	98.42	0.87	104321916.1
5005	Point Source	5.70	0.36	2508019.2
5005	NonPoint Source	91.44	0.85	94689024.3
5005	Groundwater	1.27	4.58	7124872.6
5005	Total	98.42	0.87	104321916.1
5000	Point Source	5.70	0.36	2508019.2
5000	NonPoint Source	91.44	0.85	94689024.3
5000	Groundwater	1.27	4.58	7124872.6
5000	Total	98.42	0.87	104321916.1
2000	Point Source	7.80	0.34	3278776.3
2000	NonPoint Source	109.93	2.26	304312424.9
2000	Groundwater	1.91	3.16	7374323.4
2000	Total	119.63	2.15	314965524.6
1510	Point Source	7.80	0.34	3278776.3
1510	NonPoint Source	109.93	2.26	304312424.9
1510	Groundwater	1.91	3.16	7374323.4
510	Total	119.63	2.15	314965524.6
1500	Point Source	7.80	0.34	3278776.3
1500	NonPoint Source	109.93	2.26	304312424.9
1500	Groundwater	1.91	3.16	7374323.4
1500	Total	119.63	2.15	314965524.6
1000	Point Source	7.80	0.34	3278776.3
1000	NonPoint Source	154.65	1.61	304312424.9
1000	Groundwater	3.89	2.26	10767520.5
1000	Total	166.34	1.56	318358721.8

POST-BMP SMAP REPORT

Analysis ID - NPS Copper BMP
Groundwater ID - Average Elevs.
Constituent ID - Copper
Runoff ID - 1-yr, 24-hr SCS

NODE RESULTS

Node	Source	Flow cfs	Concentration ug/l	Load ug/0.5 days
A	Point Source	2.10	0.20	513838.1
A	NonPoint Source	18.48	33.75	763191992.6
A	Groundwater	0.63	5.00	3873458.3
A	Total	21.22	29.57	767579288.9
B	Point Source	0.90	13.40	14754493.4
B	NonPoint Source	9.98	21.75	265580027.6
B	Groundwater	0.60	5.00	3663368.2
B	Total	11.48	20.22	283997889.3
C	Point Source	0.20	0.00	0.0
C	NonPoint Source	7.63	22.50	210064372.8
C	Groundwater	0.21	5.00	1281169.6
C	Total	8.04	21.48	211345542.4
D	Point Source	0.60	10.00	7340544.0
D	NonPoint Source	15.33	10.50	196911389.2
D	Groundwater	0.00	0.00	0.0
D	Total	15.93	10.48	204251933.2
E	Point Source	0.80	18.30	17910927.4
E	NonPoint Source	17.17	0.00	0.0
E	Groundwater	0.09	5.00	569503.9
E	Total	18.06	0.84	18480431.2
F	Point Source	2.20	12.30	33105853.4
F	NonPoint Source	2.59	37.50	118654824.2
F	Groundwater	0.09	5.00	545565.1
F	Total	4.88	25.53	152306242.8
G	Point Source	0.50	9.00	5505408.0
G	NonPoint Source	10.18	29.25	364402842.9
G	Groundwater	0.00	5.00	29968.3
G	Total	10.69	28.29	369938219.2
H	Point Source	0.20	5.00	1223424.0
H	NonPoint Source	7.87	12.00	115482677.3
H	Groundwater	0.00	5.00	16660.6
H	Total	8.07	11.82	116722761.9
I	Point Source	0.30	0.00	0.0
I	NonPoint Source	13.22	0.00	0.0
I	Groundwater	0.20	73.30	17714386.9
I	Total	13.72	1.06	17714386.9
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	7.48	35.25	322675780.7
J	Groundwater	0.08	4.00	374905.8
J	Total	7.56	34.93	323050686.5
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	44.72	0.00	0.0
K	Groundwater	1.98	3.20	7755879.3

K	Total	46.70	0.14	7'55879.3
30000	Point Source	3.20	10.17	39834685.4
30000	NonPoint Source	41.34	18.22	921216125.1
30000	Groundwater	0.37	41.16	18681486.8
30000	Total	44.91	17.83	979732297.3
25050	Point Source	4.00	11.80	57745612.8
25050	NonPoint Source	58.50	12.87	921216125.1
25050	Groundwater	0.46	33.91	19250990.6
25050	Total	62.97	12.96	998212728.5
25000	Point Source	4.00	11.80	57745612.8
25000	NonPoint Source	58.50	12.87	921216125.1
25000	Groundwater	0.46	33.91	19250990.6
25000	Total	62.97	12.96	998212728.5
20001	Point Source	4.60	11.57	65086156.8
20001	NonPoint Source	73.83	12.38	1118127514.3
20001	Groundwater	0.46	33.91	19250990.6
20001	Total	78.89	12.46	1202464661.7
20000	Point Source	4.60	11.57	65086156.8
20000	NonPoint Source	73.83	12.38	1118127514.3
20000	Groundwater	0.46	33.91	19250990.6
20000	Total	78.89	12.46	1202464661.7
15115	Point Source	4.80	11.08	65086156.8
15115	NonPoint Source	81.46	13.33	1328191887.1
15115	Groundwater	0.67	24.92	20532160.3
15115	Total	86.94	13.29	1413810204.1
15105	Point Source	4.80	11.08	65086156.8
15105	NonPoint Source	81.46	13.33	1328191887.1
15105	Groundwater	0.67	24.92	20532160.3
15105	Total	86.94	13.29	1413810204.1
15000	Point Source	4.80	11.08	65086156.8
15000	NonPoint Source	81.46	13.33	1328191887.1
15000	Groundwater	0.67	24.92	20532160.3
15000	Total	86.94	13.29	1413810204.1
10020	Point Source	5.70	11.45	79840650.2
10020	NonPoint Source	91.44	14.25	1593771914.7
10020	Groundwater	1.27	15.54	24195528.5
10020	Total	98.42	14.10	1697808093.4
10010	Point Source	5.70	11.45	79840650.2
10010	NonPoint Source	91.44	14.25	1593771914.7
10010	Groundwater	1.27	15.54	24195528.5
10010	Total	98.42	14.10	1697808093.4
10000	Point Source	5.70	11.45	79840650.2
10000	NonPoint Source	91.44	14.25	1593771914.7
10000	Groundwater	1.27	15.54	24195528.5
10000	Total	98.42	14.10	1697808093.4
5035	Point Source	5.70	11.45	79840650.2
5035	NonPoint Source	91.44	14.25	1593771914.7
5035	Groundwater	1.27	15.54	24195528.5

5035	Total	98.42	14.10	1697808093.4
5025	Point Source	5.70	11.45	79840650.2
5025	NonPoint Source	91.44	14.25	1593771914.7
5025	Groundwater	1.27	15.54	24195528.5
5025	Total	98.42	14.10	1697808093.4
5015	Point Source	5.70	11.45	79840650.2
5015	NonPoint Source	91.44	14.25	1593771914.7
5015	Groundwater	1.27	15.54	24195528.5
5015	Total	98.42	14.10	1697808093.4
5005	Point Source	5.70	11.45	79840650.2
5005	NonPoint Source	91.44	14.25	1593771914.7
5005	Groundwater	1.27	15.54	24195528.5
5005	Total	98.42	14.10	1697808093.4
5000	Point Source	5.70	11.45	79840650.2
5000	NonPoint Source	91.44	14.25	1593771914.7
5000	Groundwater	1.27	15.54	24195528.5
5000	Total	98.42	14.10	1697808093.4
2000	Point Source	7.80	8.42	80354488.3
2000	NonPoint Source	109.93	17.53	2356963907.3
2000	Groundwater	1.91	12.04	28068986.7
2000	Total	119.63	16.84	2465387382.3
1510	Point Source	7.80	8.42	80354488.3
1510	NonPoint Source	109.93	17.53	2356963907.3
1510	Groundwater	1.91	12.04	28068986.7
.510	Total	119.63	16.84	2465387382.3
1500	Point Source	7.80	8.42	80354488.3
1500	NonPoint Source	109.93	17.53	2356963907.3
1500	Groundwater	1.91	12.04	28068986.7
1500	Total	119.63	16.84	2465387382.3
1000	Point Source	7.80	8.42	80354488.3
1000	NonPoint Source	154.65	12.46	2356963907.3
1000	Groundwater	3.89	7.53	35824866.0
1000	Total	166.34	12.15	2473143261.6

APPENDIX F

WET WEATHER MERCURY BMP SMAP REPORTS

PRE-BMP SMAP REPORT

697/25

Analysis ID - Default
Groundwater ID - Average Elevs.
Constituent ID - Mercury
Runoff ID - 1-yr, 24-hr SCS

NODE RESULTS

Node	Source	Flow cfs	Concentration ug/l	Load ug/0.5 days
A	Point Source	2.10	0.30	770757.1
A	NonPoint Source	18.48	30.90	698744668.7
A	Groundwater	0.63	16.10	12472535.6
A	Total	21.22	27.43	711987961.4
B	Point Source	0.90	0.30	330324.5
B	NonPoint Source	9.98	0.70	8547403.2
B	Groundwater	0.60	0.00	0.0
B	Total	11.48	0.63	8877727.7
C	Point Source	0.20	0.30	73405.4
C	NonPoint Source	7.63	10.90	101764518.4
C	Groundwater	0.21	6.50	1665520.5
C	Total	8.04	10.52	103503444.3
D	Point Source	0.60	0.40	293621.8
D	NonPoint Source	15.33	0.40	7501386.3
D	Groundwater	0.00	0.00	0.0
D	Total	15.93	0.40	7795008.0
E	Point Source	0.80	0.30	293621.8
E	NonPoint Source	17.17	0.00	0.0
E	Groundwater	0.09	61.20	6970727.4
E	Total	18.06	0.33	7264349.2
F	Point Source	2.20	0.30	807459.8
F	NonPoint Source	2.59	0.60	1898477.2
F	Groundwater	0.09	0.00	0.0
F	Total	4.88	0.45	2705937.0
G	Point Source	0.50	0.30	183513.6
G	NonPoint Source	10.18	1.10	13704038.5
G	Groundwater	0.00	0.00	0.0
G	Total	10.69	1.06	13887552.1
H	Point Source	0.20	1.70	415964.2
H	NonPoint Source	7.87	1.00	9623556.4
H	Groundwater	0.00	0.00	0.0
H	Total	8.07	1.02	10039520.6
I	Point Source	0.30	0.30	110108.2
I	NonPoint Source	13.22	0.00	0.0
I	Groundwater	0.20	0.50	120834.8
I	Total	13.72	0.01	230943.0
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	7.48	2.50	22884807.1
J	Groundwater	0.08	0.00	0.0
J	Total	7.56	2.47	22884807.1
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	44.72	0.00	0.0
K	Groundwater	1.98	1.40	3393197.2

K				
	Total	46.70	0.06	3393197.2
30000	Point Source	3.20	0.39	1517045.8
30000	NonPoint Source	41.34	0.95	48110879.3
30000	Groundwater	0.37	0.27	120834.8
30000	Total	44.91	0.91	49748759.9
25050	Point Source	4.00	0.37	1810667.5
25050	NonPoint Source	58.50	0.67	48110879.3
25050	Groundwater	0.46	12.49	7091562.2
25050	Total	62.97	0.74	57013109.1
25000	Point Source	4.00	0.37	1810667.5
25000	NonPoint Source	58.50	0.67	48110879.3
25000	Groundwater	0.46	12.49	7091562.2
25000	Total	62.97	0.74	57013109.1
20001	Point Source	4.60	0.37	2104289.3
20001	NonPoint Source	73.83	0.62	55612265.6
20001	Groundwater	0.46	12.49	7091562.2
20001	Total	78.89	0.67	64808117.1
20000	Point Source	4.60	0.37	2104289.3
20000	NonPoint Source	73.83	0.62	55612265.6
20000	Groundwater	0.46	12.49	7091562.2
20000	Total	78.89	0.67	64808117.1
15115	Point Source	4.80	0.37	2177694.7
15115	NonPoint Source	81.46	1.58	157376784.0
15115	Groundwater	0.67	10.63	8757082.7
15115	Total	86.94	1.58	168311561.4
15105	Point Source	4.80	0.37	2177694.7
15105	NonPoint Source	81.46	1.58	157376784.0
15105	Groundwater	0.67	10.63	8757082.7
15105	Total	86.94	1.58	168311561.4
15000	Point Source	4.80	0.37	2177694.7
15000	NonPoint Source	81.46	1.58	157376784.0
15000	Groundwater	0.67	10.63	8757082.7
15000	Total	86.94	1.58	168311561.4
10020	Point Source	5.70	0.36	2508019.2
10020	NonPoint Source	91.44	1.48	165924187.1
10020	Groundwater	1.27	5.63	8757082.7
10020	Total	98.42	1.47	177189289.1
10010	Point Source	5.70	0.36	2508019.2
10010	NonPoint Source	91.44	1.48	165924187.1
10010	Groundwater	1.27	5.63	8757082.7
10010	Total	98.42	1.47	177189289.1
10000	Point Source	5.70	0.36	2508019.2
10000	NonPoint Source	91.44	1.48	165924187.1
10000	Groundwater	1.27	5.63	8757082.7
10000	Total	98.42	1.47	177189289.1
5035	Point Source	5.70	0.36	2508019.2
5035	NonPoint Source	91.44	1.48	165924187.1
5035	Groundwater	1.27	5.63	8757082.7

5035	Total	98.42	1.47	177189289.1
5025	Point Source	5.70	0.36	2508019.2
5025	NonPoint Source	91.44	1.48	165924187.1
5025	Groundwater	1.27	5.63	8757082.7
5025	Total	98.42	1.47	177189289.1
5015	Point Source	5.70	0.36	2508019.2
5015	NonPoint Source	91.44	1.48	165924187.1
5015	Groundwater	1.27	5.63	8757082.7
5015	Total	98.42	1.47	177189289.1
5005	Point Source	5.70	0.36	2508019.2
5005	NonPoint Source	91.44	1.48	165924187.1
5005	Groundwater	1.27	5.63	8757082.7
5005	Total	98.42	1.47	177189289.1
5000	Point Source	5.70	0.36	2508019.2
5000	NonPoint Source	91.44	1.48	165924187.1
5000	Groundwater	1.27	5.63	8757082.7
5000	Total	98.42	1.47	177189289.1
2000	Point Source	7.80	0.34	3278776.3
2000	NonPoint Source	109.93	6.43	864668855.9
2000	Groundwater	1.91	9.11	21229618.3
2000	Total	119.63	6.08	889177250.5
1510	Point Source	7.80	0.34	3278776.3
1510	NonPoint Source	109.93	6.43	864668855.9
1510	Groundwater	1.91	9.11	21229618.3
1510	Total	119.63	6.08	889177250.5
1500	Point Source	7.80	0.34	3278776.3
1500	NonPoint Source	109.93	6.43	864668855.9
1500	Groundwater	1.91	9.11	21229618.3
1500	Total	119.63	6.08	889177250.5
1000	Point Source	7.80	0.34	3278776.3
1000	NonPoint Source	154.65	4.57	864668855.9
1000	Groundwater	3.89	5.18	24622815.5
1000	Total	166.34	4.39	892570447.7

POST-BMP SMAP REPORT

Analysis ID - Mercury BMP
Groundwater ID - Average Elevs.
Constituent ID - Mercury
Runoff ID - 1-yr, 24-hr SCS

NODE RESULTS

Node	Source	Flow cfs	Concentration ug/l	Load ug/0.5 days
A	Point Source	2.10	0.30	770757.1
A	NonPoint Source	18.48	9.27	209623400.6
A	Groundwater	0.63	0.32	249450.7
A	Total	21.22	8.12	210643608.5
B	Point Source	0.90	0.30	330324.5
B	NonPoint Source	9.98	0.70	8547403.2
B	Groundwater	0.60	0.00	0.0
B	Total	11.48	0.63	8877727.7
C	Point Source	0.20	0.30	73405.4
C	NonPoint Source	7.63	3.27	30529355.5
C	Groundwater	0.21	0.13	33310.4
C	Total	8.04	3.11	30636071.4
D	Point Source	0.60	0.40	293621.8
D	NonPoint Source	15.33	0.40	7501386.3
D	Groundwater	0.00	0.00	0.0
D	Total	15.93	0.40	7795008.0
E	Point Source	0.80	0.30	293621.8
E	NonPoint Source	17.17	0.00	0.0
E	Groundwater	0.09	61.20	6970727.4
E	Total	18.06	0.33	7264349.2
F	Point Source	2.20	0.30	807459.8
F	NonPoint Source	2.59	0.60	1898477.2
F	Groundwater	0.09	0.00	0.0
F	Total	4.88	0.45	2705937.0
G	Point Source	0.50	0.30	183513.6
G	NonPoint Source	10.18	1.10	13704038.5
G	Groundwater	0.00	0.00	0.0
G	Total	10.69	1.06	13887552.1
H	Point Source	0.20	1.70	415964.2
H	NonPoint Source	7.87	1.00	9623556.4
H	Groundwater	0.00	0.00	0.0
H	Total	8.07	1.02	10039520.6
I	Point Source	0.30	0.30	110108.2
I	NonPoint Source	13.22	0.00	0.0
I	Groundwater	0.20	0.50	120834.8
I	Total	13.72	0.01	230943.0
J	Point Source	0.00	0.00	0.0
J	NonPoint Source	7.48	2.50	22884807.1
J	Groundwater	0.08	0.00	0.0
J	Total	7.56	2.47	22884807.1
K	Point Source	0.00	0.00	0.0
K	NonPoint Source	44.72	0.00	0.0
K	Groundwater	1.98	1.40	3393197.2

K	Total	46.70	0.06	3393197.2
30000	Point Source	3.20	0.39	1517045.8
30000	NonPoint Source	41.34	0.95	48110879.3
30000	Groundwater	0.37	0.27	120834.8
30000	Total	44.91	0.91	49748759.9
25050	Point Source	4.00	0.37	1810667.5
25050	NonPoint Source	58.50	0.67	48110879.3
25050	Groundwater	0.46	12.49	7091562.2
25050	Total	62.97	0.74	57013109.1
25000	Point Source	4.00	0.37	1810667.5
25000	NonPoint Source	58.50	0.67	48110879.3
25000	Groundwater	0.46	12.49	7091562.2
25000	Total	62.97	0.74	57013109.1
20001	Point Source	4.60	0.37	2104289.3
20001	NonPoint Source	73.83	0.62	55612265.6
20001	Groundwater	0.46	12.49	7091562.2
20001	Total	78.89	0.67	64808117.1
20000	Point Source	4.60	0.37	2104289.3
20000	NonPoint Source	73.83	0.62	55612265.6
20000	Groundwater	0.46	12.49	7091562.2
20000	Total	78.89	0.67	64808117.1
15115	Point Source	4.80	0.37	2177694.7
15115	NonPoint Source	81.46	0.86	86141621.1
15115	Groundwater	0.67	8.65	7124872.6
15115	Total	86.94	0.90	95444188.4
15105	Point Source	4.80	0.37	2177694.7
15105	NonPoint Source	81.46	0.86	86141621.1
15105	Groundwater	0.67	8.65	7124872.6
15105	Total	86.94	0.90	95444188.4
15000	Point Source	4.80	0.37	2177694.7
15000	NonPoint Source	81.46	0.86	86141621.1
15000	Groundwater	0.67	8.65	7124872.6
15000	Total	86.94	0.90	95444188.4
10020	Point Source	5.70	0.36	2508019.2
10020	NonPoint Source	91.44	0.85	94689024.3
10020	Groundwater	1.27	4.58	7124872.6
10020	Total	98.42	0.87	104321916.1
10010	Point Source	5.70	0.36	2508019.2
10010	NonPoint Source	91.44	0.85	94689024.3
10010	Groundwater	1.27	4.58	7124872.6
10010	Total	98.42	0.87	104321916.1
10000	Point Source	5.70	0.36	2508019.2
10000	NonPoint Source	91.44	0.85	94689024.3
10000	Groundwater	1.27	4.58	7124872.6
10000	Total	98.42	0.87	104321916.1
5035	Point Source	5.70	0.36	2508019.2
5035	NonPoint Source	91.44	0.85	94689024.3
5035	Groundwater	1.27	4.58	7124872.6

5035	Total	98.42	0.87	104321916.1
5025	Point Source	5.70	0.36	2508019.2
5025	NonPoint Source	91.44	0.85	94689024.3
5025	Groundwater	1.27	4.58	7124872.6
5025	Total	98.42	0.87	104321916.1
5015	Point Source	5.70	0.36	2508019.2
5015	NonPoint Source	91.44	0.85	94689024.3
5015	Groundwater	1.27	4.58	7124872.6
5015	Total	98.42	0.87	104321916.1
5005	Point Source	5.70	0.36	2508019.2
5005	NonPoint Source	91.44	0.85	94689024.3
5005	Groundwater	1.27	4.58	7124872.6
5005	Total	98.42	0.87	104321916.1
5000	Point Source	5.70	0.36	2508019.2
5000	NonPoint Source	91.44	0.85	94689024.3
5000	Groundwater	1.27	4.58	7124872.6
5000	Total	98.42	0.87	104321916.1
2000	Point Source	7.80	0.34	3278776.3
2000	NonPoint Source	109.93	2.26	304312424.9
2000	Groundwater	1.91	3.16	7374323.4
2000	Total	119.63	2.15	314965524.6
1510	Point Source	7.80	0.34	3278776.3
1510	NonPoint Source	109.93	2.26	304312424.9
1510	Groundwater	1.91	3.16	7374323.4
1510	Total	119.63	2.15	314965524.6
1500	Point Source	7.80	0.34	3278776.3
1500	NonPoint Source	109.93	2.26	304312424.9
1500	Groundwater	1.91	3.16	7374323.4
1500	Total	119.63	2.15	314965524.6
1000	Point Source	7.80	0.34	3278776.3
1000	NonPoint Source	154.65	1.61	304312424.9
1000	Groundwater	3.89	2.26	10767520.5
1000	Total	166.34	1.56	318358721.8

8.0 SUMMARY

8.1 PARAMETERS OF CONCERN

Water quality samples collected by MMES in EFPC for selected dry and wet weather events spanned a 9-month duration from April 1988 through May 1989. Dry weather events represent average or baseline conditions, including plant outfalls and groundwater infiltration; wet weather events include the impact of surface runoff on EFPC water quality. Approximately 100 parameters were analyzed for each of the eleven monitoring stations (A through K) in EFPC for each event.

The dry weather events consisted of two consecutive dry days, and samples represent 24-hour composites. The wet weather events represent storms of varying intensities and samples were collected using automatic flow proportional samplers for the storm duration. Data for a total of 12 dry weather and 5 wet weather events were analyzed.

The statistical minimum, average, and maximum concentrations were calculated for each parameter at each station. These calculations were performed separately for dry and wet events. These data were then compared to potentially applicable standards for EFPC. In general, water quality based limits, namely ambient water quality criteria (AWQC), were given priority in determining pertinent standards. These were followed by drinking water standards, and human health criteria. State of Tennessee standards were given priority over federal standards where both existed.

In assessing parameters of greater concern in EFPC, those which exceeded applicable water quality standards for multiple events and multiple stations were selected. Isolated exceedances, such as one station for one or two events, were not deemed to be significant. For AWQC, the chronic values were compared to station averages and acute to station maximums. Seven dry weather parameters of concern were selected; these include total residual chlorine, copper, lead, manganese, mercury, nitrate (as nitrogen), and total dissolved solids (TDS). The wet weather parameters of concern included total residual

chlorine, copper, iron, lead, manganese, mercury, and zinc. Based upon this initial screening, contaminant loadings to EFPC were calculated.

Flows and water quality data were used to calculate contaminant loadings for parameters of concern in EFPC. Loadings were calculated for the average of dry weather events. These results were then compared to the most significant storm event to assess the impact of surface runoff on EFPC water quality. In this way, stations and subbasins contributing the most significant contaminant loadings were considered in the scoping and evaluation of BMPs.

8.2 CONTAMINANT REDUCTIONS

To meet state and/or federal water quality criteria, area source pollution reductions were calculated using the CDM Stream Management and Analysis Program (SMAP). SMAP was developed as a planning tool for MMES to evaluate the impact of discharges and BMPs within the Y-12 Plant on water quality in EFPC. The program computes the flows, chemical constituent concentrations, and pollutant loads produced within specific subbasins of the Y-12 Plant. In addition, SMAP is designed to compute the resulting flows, concentrations, and loads at specified points in EFPC.

Available groundwater quality and level data were reviewed, reduced, and analyzed. These data were used to help calibrate the groundwater infiltration component of SMAP.

In addition, stormwater runoff volumes required for SMAP were input using a model developed for EFPC (RUNOFF). The RUNOFF model was calibrated for the five wet-weather events monitored.

For purposes of this study, the reduction of any particular pollutant load is referred to as a BMP. The six BMPs analyzed and the corresponding contaminant reductions are listed below. The first three BMPs correspond to dry weather events and the latter three to wet events.

- BMP 1 - A 99 percent reduction in total residual chlorine loads from all EFPC point source contributions.

- o BMP 2 - A 96 percent reduction in nitrate loads from Subbasin I and J groundwater contributions to EFPC.

- o BMP 3 - A 70 percent reduction in copper loads from Subbasin I groundwater contributions to EFPC.

- o BMP 4 - A 90 percent reduction in iron loads from all EFPC nonpoint source contributions.

- o BMP 5 - A 25 percent reduction in copper loads from all EFPC nonpoint source contributions.

- o BMP 6 - A 98 percent reduction in the groundwater mercury loads from Subbasin A and C and a 70 percent reduction in the nonpoint source contributions to EFPC.

All of the above BMP SMAP simulations were performed under average annual EFPC baseflow conditions. The wet weather BMP SMAP simulations were performed under the 1-year return period 24-hour duration storm event conditions.

8.3 ADDITIONAL SAMPLING RECOMMENDATIONS

After evaluating the comprehensive sampling station and groundwater data, recommendations for additional sampling were made. The objective is to outline additional sampling requirements which address data gaps, better define/confirm contaminant sources, and help assess the effectiveness of BMPs. The sampling requirements have been grouped into three major categories:

- o Short-Term Monitoring Program
- o Long-Term Monitoring Program
- o Groundwater Monitoring Program

These general monitoring programs are discussed in the following paragraphs.

8.3.1 SHORT-TERM MONITORING PROGRAM

The short-term monitoring program is considered applicable for the next 12 to 18 months. The purpose is to fill data gaps and to obtain additional information that may confirm or improve the confidence level of some of the comprehensive sampling program results. This program addresses contaminants of concern that have exceeded established water quality standards in EFPC. The recommended short-term monitoring programs include:

1. Chlorine Residual Monitoring Plan. The objective of this plan is to obtain information regarding diurnal variations of free and total residual chlorine data at different locations in the Y-12 Plant. This data will be used for evaluating BMPs for the control of free and total chlorine discharges to EFPC. The use of EPA approved portable chlorine measuring equipment is recommended for this activity. All portable units should be calibrated using laboratory analyses.

2. EFPC Sediments Monitoring Plan. The objective of this monitoring plan is to obtain data regarding sediment concentrations of selected parameters of concern, namely, mercury and uranium, that contribute to observed dry and wet weather loadings. These data will be used to confirm the presence or absence of these two parameters in the sediments and to provide information for corrective action and BMPs. Most of the sampling activities should be concentrated between Stations A and C, since this is the stretch where the greatest loadings were observed and since the creek bottom contains more sediments and less gravel in this interval than in other sections. Samples from the surface and subsurface sediments should be collected at different locations along the creek and should be analyzed for mercury and uranium.

3. Point Sources Monitoring Plan at EFPC. The objective of this plan is to obtain wet weather grab samples from different outfalls discharging to EFPC that were not sampled during the Comprehensive Sampling Program. The contaminants that should be targeted for this effort are: chemical oxygen demand, copper, iron, lead, manganese, mercury, total suspended solids, and zinc. In addition, grab samples from selected outfalls in EFPC should be collected and analyzed for mercury and uranium.

4. Rooftop Runoff Sampling. The purpose of this plan is to collect data for the assessment of heavy metal loadings to EFPC derived from rooftop nonpoint sources. This program would include identifying key building and sampling the rooftop drains during storm events. Monitoring copper, iron, lead, manganese, mercury, uranium, and zinc is recommended.

8.3.2 LONG-TERM MONITORING PROGRAM

The purpose of this program is to provide a long-term monitoring plan that will produce data which can be used to verify the effectiveness of BMPs implemented under the Area Source Pollution Assessment and Control Plan. Note that long-term is considered to be two years prior to BMP implementation and five years after. The recommended program establishes nine permanent monitoring stations to track the parameters of concern identified during the Comprehensive Sampling Program. (Two of the eleven comprehensive sampling stations were eliminated; Station G was deleted due to poor data correlation and Station H due to sediment buildup and corresponding unreliable results).

The monitoring stations consist of existing "blue houses," or a similar setup. Existing blue houses should be upgraded and retrofitted to the site specific data needs. Blue houses located in areas not recommended for long-term monitoring should be relocated to stations that are part of the program and do not have a blue house. **Table 8-1** presents the proposed monitoring requirements for each of the nine stations. These requirements are based on contaminant loadings previously identified. In addition to the parameters of concern identified based on events and loadings, it is also recommended that aluminum be monitored for all stations during wet and dry weather events. Although aluminum exceeded the proposed secondary maximum contaminant level (MCL) for all station maximums and averages for wet and dry events, it was not selected as a parameter of concern because the standard has not been promulgated. Consequently, long-term aluminum monitoring is suggested.

Prior to establishing permanent stations, a more detailed investigation and retrofit design, outside the scope of this project, should be conducted to obtain the most benefits from this program. Long-term monitoring should also include an operations, maintenance and data management program. In addition to relocating the existing stations and retrofitting them as needed, it is recommended that a new bridge or "cat walk" type structure be designed and installed in Stations A and K, and that a permanent flow monitoring device be installed at the Lake Reality discharge.

TABLE 8-1

PROPOSED LONG-TERM MONITORING PLAN FOR EFPC

Parameter	Type of Monitoring*	STATION								
		A	B	C	D	E	F	I	J	K
Flow	c	o	o	o	o	o	o	o	o	o
pH & temperature	d	o	o	o		o				o
Chemical oxygen demand	w	o	o	o		o				o
Chlorine Residual, Total	d	o	o	o	o	o	o	o		o
Copper	d-w	o	o	o		o				o
Iron	w	o	o	o	o	o	o	o	o	o
Lead	d-w	o		o		o		o	o	o
Manganese	d-w	o	o	o	o	o		o	o	o
Mercury	d-w	o		o		o				o
Nitrates	d	o		o		o		o	o	o
Total dissolved solids	d-w	o	o	o	o	o	o	o	o	o
Total suspended solids	w	o	o	o	o	o	o	o	o	o
Zinc	w	o	o	o	o	o	o	o	o	o

* c = continuous
d = dry weather only
d-w = dry and wet weather
w = wet weather only