South 96th Street Source Control Project

Agreement No. G9500236

FINAL REPORT

February 8, 1999

Prepared for:
Washington State Department of Ecology

Prepared by:
King County Water and Land Resources Division

David Funke
KCWLRD
206 296 9066

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EXECUTIVE SUMMARY

In 1995, the King County Water and Land Resources Division initiated a three-year project in the Hamm Creek Watershed to work with businesses and residents on implementing pollution prevention practices.

The goal of the project was to enhance the water quality of Hamm Creek and the Duwamish Waterway by reducing the on-going pollution problem from various industrial and residential activities. To meet this goal, the project had four main objectives:

1) increase business and residential community knowledge of water quality protection and build a cooperative atmosphere for implementation of stormwater controls;
2) offer on-site consultations to businesses to provide technical assistance and ensure knowledgeable and proper implementation of best management practices;
3) educate the residential community about Hamm Creek, water quality, and pollution prevention practices; and
4) monitor water quality to determine the effectiveness of the outreach and assistance efforts.

In the three years of this project, King County has accomplished all four objectives.

Technical Assistance and Compliance

- 114 businesses received comprehensive on-site technical assistance.
  - 62 of the businesses are still in compliance with the County's water quality code and are implementing all best management practices (BMP).
  - Approximately 40 of the remaining businesses have minor outstanding BMP issues that keep them from receiving a compliance letter.
  - The remaining businesses will probably require enforcement letters to gain compliance with the County's water quality code.
  - 4 enforcement actions were started during the course of the project.
- Businesses who came into compliance with water quality codes through this project became members of the Businesses for Clean Water program. As members, businesses received continuing educational materials and were promoted and recognized for their pollution prevention efforts.

Outreach and Education

- 13 educational events were hosted in the watershed, reaching over 400 people.
- 5 mailings of educational material were sent to all watershed residents (over 6000).
- 16 educational and informational materials were developed and distributed.
- 3 educational articles were published.
- Pre and post residential surveys show a 30% increase in awareness of Hamm Creek.

Monitoring

- 13 sites were monitored for water quality information over three years.

- Five automatic sampling sites, eight water quality grab sites and eight sediment sites.
- No general trends came out of any of the monitoring sites. There was no correlation of the monitoring data with the pollution prevention work of this project.
- The monitoring analysis was made difficult by factors such as construction activities, landslides, historic contamination, and the contribution of roadway drainage.
- Although perception may differ, the pollutant concentrations in Hamm Creek are not much different than those in the streams of Bellevue, a mature suburban area.
- Data from this project will be used by future projects and can serve as a comprehensive baseline of water quality in the watershed.

I. PURPOSE AND BACKGROUND

The South 96th Street Source Control project was funded through a grant from the Washington State Department of Ecology - Centennial Clean Water Fund. King County applied for this grant while discussing the design of water quality treatment facilities in the Hamm Creek Watershed. The intent of this project was to implement a comprehensive source control effort in the highly industrial area before considering any treatment alternatives.

Goals and Objectives

The goal of this project was to enhance the water quality of Hamm Creek and the Duwamish Waterway by reducing the on-going pollution problem from various industrial and residential activities.

The objectives of the project were to:

1. increase business and residential community knowledge of water quality protection and build a cooperative atmosphere for implementation of stormwater controls;
2. offer on-site consultations to businesses to provide technical assistance and ensure knowledgeable and proper implementation of best management practices;
3. educate the residential community about Hamm Creek, water quality, and pollution prevention practices; and
4. monitor water quality to determine the effectiveness of the outreach and assistance efforts.

Background - The Problem, its Nature and Severity

The Hamm Creek sub-basin (WDFW Water Resource Inventory Area 09.0002) is composed of four perennial tributaries: the South Fork, Middle Fork, Lost Fork, and North Fork. These streams originate on the upland plateau west of the Duwamish River valley, except for the Lost Fork, which is formed by seep and spring near the valley floor. Prior to extensive settlement of the area, dense forests blanketed the plateau and the steep ravines. On the valley floor, these tributaries braided across alluvial fans at the mouths of the ravines before converging in a matrix of forested swamps, inter-tidal sloughs, salt marshes, and unvegetated tide flats within the Duwamish estuary. Following timber harvest and clearing and drainage for agriculture in the late 19th century, the valley floor wetlands were extensively filled and converted to the present array of urban land uses. Over past decades, the upland plateau and hill slope areas have been converted to residential development and golf courses. See Map 1 – Aerial Map of the Basin.

Today, the Hamm Creek watershed contains two distinct land uses. The upper watershed is predominantly established single- and multi-family residential land use with two large golf courses. The lower watershed is primarily industrial and commercial land uses. The forks of the Hamm Creek system originate in the upper residential area and flow north. The South Fork skirts the majority of the industrial area. The other forks however, flow

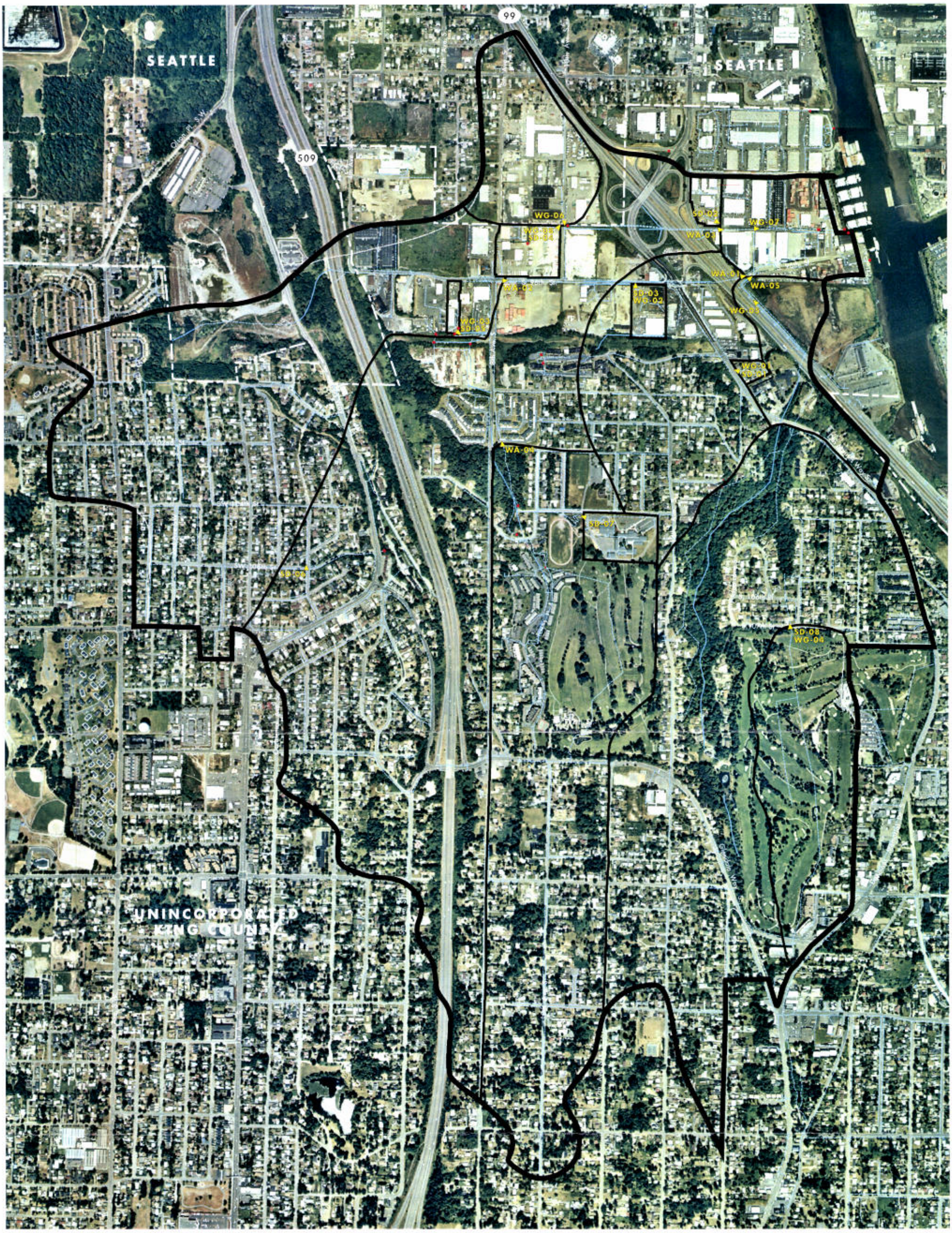
through the South 96th Street industrial area before discharging to the Duwamish Waterway.

As a result of the changes in the watershed, the stream system has been extensively altered. The variety of urban impacts includes: changes in flow regime; removal of riparian vegetation and instream large woody debris; piping; channelization dredging; flood plain filling; and extensive pollution from a variety of residential and industrial sources. The two primary sources of pollutants include transport of historic contamination in the soils and sediments and current nonpoint source pollution from existing activities.

The idea for this project originated from the recommendations of the South 96th Street Water Quality Engineering Report completed by Herrera Environmental Consultants in 1994. The report was funded by Washington State Department of Ecology and King County in response to the nonpoint pollution recommendations in the Green/Duwamish Watershed Nonpoint Action Plan (King County 1991). The Engineering Report recommends a three-phase program to address the nonpoint sources of pollution in the lower Hamm Creek system:

> Phase 1 – A source control program for the watershed that includes cleanup and mitigation of existing pollutant sources, ongoing source tracking, public education and involvement, implementation of site- specific best management practices (BMPs) and water and sediment quality monitoring..
>
> Phase 2 – Construction of water quality projects to bypass or divert the main forks of Hamm Creek, separating relatively good quality water from the contaminated runoff in the lower industrial portion of the watershed.
>
> Phase 3 – Collection and review of monitoring data, and if necessary, construction of stormwater treatment facilities for the contaminated runoff from the lower industrial portion of the watershed.

This South 96th Street Source Control Project successfully completed the Phase 1 recommendation above. Phase 2 is under design with construction to possibly take place in 2000. Implementation of Phase 3 is still questionable and is waiting on the Seattle City Light north project (hopefully to be constructed in 1999).



Map 1

Hamm Creek

Source Control Project

- Open Channel Stream
- Piped Stream
- Basin Boundary
- Subcatchment Boundary
- Outfall
- Sampling Site
- WA-01 Automatic Samplers
- WG-03 Stormwater Grab Site
- SD-01 Sediment Grab Site

N

0 500 1,000 Feet

Map produced by the King County DNR
Visual Communication & GIS Unit
File Name: HammCrAerialMap.ai FB

II. TASK 1 - PROJECT MANAGEMENT

The project was divided into five tasks 1) project management; 2) source control priorities; 3) on-site consultations/technical assistance; 4) public education and outreach; and 5) monitoring and evaluation.

The project team consisted of six people at any one time, a project manager, two education specialists, a water quality engineer, and two monitoring staff. The project manager was responsible for administering the project, including:

- developing work plans, and conducting, coordinating, and scheduling all project activities;
- hiring and supervising some project staff;
- ensuring quality control and maintenance of all records;
- tracking the schedule and implementation of the project;
- developing annual budget packages, tracking spending, and allocating resources; and
- writing and communicating progress reports to internal management and the Department of Ecology.

Throughout the project, the manager submitted progress reports on a quarterly basis, followed by the quarterly billing. The overall management of the project ran smoothly.

The project team included the following staff (from 1995-1998):
Sandra Kilroy – project manager
Sue Clarke – technical assistance and enforcement compliance
Bob Spencer – public education and outreach specialist
David Funke – monitoring and evaluation
Brendan Grant – monitoring and evaluation
Aimee Beckwith – business education and outreach specialist 1998
Sara Johnson – business education and outreach specialist 1996-1997
Ruth Bell – business education and outreach specialist 1995 - 1996

Additional staff contributed to the project throughout its duration including Tom Hubbard, Larry Gettle, Kate Rhoads, Tom Georgianna, Zahid Kahn, Tim Cheatum, Lee Dorigan and many others.

III. TASK 2 – SOURCE CONTROL PRIORITIES

County staff became familiar with existing problems in the area before the project began as a result of extensive site visits through the County's complaint process and communication with other county, state, and federal agency staff. To adequately assess the priorities for source control for this project however, staff reviewed existing documents and interviewed additional agency staff.

Staff reviewed existing data, reports, and materials to determine where source control measures were needed, including:

- Previous King County Drainage Investigation Complaints
- Metro Trouble Call Complaints
- NPDES illicit connection files
- Commercial Retention/Detention and Drainage Inventory files
- King County drainage system mapping
- South 96th Street Water Quality Engineering Report. 1994
- King County Reconnaissance Report No. 26 Duwamish River Basin. 1987
- Development of an Aquatic Management Plan for the Elliot Bay and Duwamish Estuary: A Study. 1993
- Green-Duwamish Watershed Nonpoint Action Plan. 1991

Staff also analyzed and confirmed the list of businesses originally generated by the South 96th Street Water Quality Engineering Report. The list was taken and updated by staff who actually conducted drive-by visits to confirm businesses and locations.

Once the list of businesses in the area was confirmed staff rated each business in four areas:

1. How significant does the business' activities contribute to water quality problems – priority of the type of business?
2. Were they covered under the requirements for an industrial NPDES permit?
3. Have they received a water quality consultation in the past?
4. Have they had a water quality complaint in the past?

The rating appears in Table 1 on the following page. The approach was to conduct an on-site consultation with the high priority businesses first and then work to medium and low until all businesses had been visited.

Because the project spanned an extended time period, numerous properties changed ownership or management and many tenants within the three large business parks changed. Therefore, the priority list became very "fluid." In addition, because we only had business names, the actual activities the businesses were involved with were unknown to us at the time of the priority setting. Therefore some of the rankings were not accurate, i.e. Wire Rope Industries was ranked "High" but when visited turned out to be an indoor storage facility only. And conversely, Schauer NW was ranked "Low" and

turned out to be a business that was doing a lot of work outside, using solvents, and other hazardous materials.

The multifamily properties were not ranked with the other "commercial" business properties. Therefore, not all the apartment complexes were visited. Many of the apartment buildings allow vehicle washing and car repair/maintenance, which contributes a variety of pollutants that can be controlled with the implementation of source control BMPs. Property Managers were sent information and educational materials through the property manager outreach effort described under Task 4.

Table 1 – Source Control Priorities Rating of Hamm Businesses

Hamm Creek/S 96th St
Business List
9/21/95

ID	company	priority	WQC	WQA	NPDES	address
1	Ace Galvanizing	H	Y	Y	Y	429 S. 96th St.
2	All City Wrecking & Sales	H	Y	Y	Y	9438 Des Moines Way
3	Clark Lift of Washington/ Alaska	H	Y	Y	Y	1313 S 96th
4	Penberthy Electromelt	H	Y	Y	Y	631 S 96th St.
5	Precision Engineering Inc.	H	Y	Y	Y	1231 S Director St.
6	Segale Sand & Gravel	H	Y	Y	Y	1115 S 96th St.
7	Advance Electroplating	H	Y	Y	N	9585 8th Ave. S.
8	Allied Body Works	H	Y	Y	N	625 S. 96th
9	Flamespray Northwest	H	Y	Y	N	1605 S 93rd
10	Marco's Mobile Wash, Inc.	H	Y	Y	N	9400 4th Ave S
11	Security Contractor Services	H	Y	Y	N	9618 8th S
12	Sound Delivery Service	H	Y	Y	N	9999 8th Ave S
13	Sunnydale Construction Materials	H	Y	Y	N	1115 S 96th St.
14	Woodcraft	H	Y	Y	N	1705 S 93rd F-5
15	PSF Mechanical Inc.	H	Y	N	Y	9322 14th S
16	Delta Marine Industries Inc.	H	N	N	Y	1608 S 96th
17	Puget Sound Coatings Inc.	H	N	N	Y	9220 8th S
18	Bridge Brass & Aluminum	H	N	N	N	1605 S 93rd St. EE
19	Clyde West Construction	H	N	N	N	9615 W Marginal Way S
20	J.D.'s Hydraulic Repair Co.	H	N	N	N	1705 S 93rd F-12
21	John Burns Construction Co.	H	N	N	N	1605 S 93rd G
22	MPC/Multi Custom Plastics	H	N	N	N	1601 S. 92nd Pl.
23	Nelson Trucking Co. Inc.	H	N	N	N	1621 S. 92nd Pl., J.
24	Professional Coatings Inc.	H	N	N	N	1705 S 93rd F-22
25	Pure Water Corp.	H	N	N	N	9411 8th Ave S
26	Qual-Fab Precision Sheet Metal	H	N	N	N	1605 S 93rd Unit S
27	Rod's Auto & Marine Repair	H	N	N	N	1505 S. 93rd
28	Wire Rope Industries Inc.	H	N	N	N	1501 S 92nd Pl C

Table 1 (continued)

Hamm Creek/S 96th St
Business List
9/21/95

ID	company	priority	WQC	WQA	NPDES	address
29	Ocean Pride Seafoods	M	Y	Y	Y	9411 8th S
30	Pacific Utility Equipment Co.	M	Y	Y	Y	1303 S 96th
31	Glen Acres Golf Course	M	Y	Y	N	1000 S 112th
32	Rainier Golf & County Club	M	Y	Y	N	1856 S 112th
33	Dominic's Plaza	M	Y			
34	Fruehauf Trailers	M	N	Y	N	9426 8th S
35	Itel Terminal	M	N	N	Y	1818 S 93rd
36	Accurate Machine Co.	M			N	9320 15th S. C-F
37	Accurate Surface Grinding	M			N	430 S. 96th
38	Aero-Lec	M	N	N	N	420 S. 96th
39	Ahmius Manufacturing	M	N	N	N	1425 S. 93rd
40	American Filter	M	N	N	N	1605 S. 93rd G-U
41	Auto Malk	M	N	N	N	1505 S. 93rd
42	Aviatek Aeronautical	M	N	N	N	420 S. 96th
43	B&B Electric Motors	M	N	N	N	1605 S 93rd E-2
44	Beck Electric	M	N	N	N	1605 S 93rd E-F
45	Black Dog Woodworks	M	N	N	N	420 S. 96th
46	Centimark Corp.	M	N	N	N	430 S 96th St.
47	Class A Welding	M	N	N	N	1605 S. 93rd
48	Cloverdale Paint Corp.	M	N	N	N	1521 S. 92nd Pl.
49	Custom Metal Spinning Co.	M	N	N	N	9330 15th S
50	Dave's Pump Service & Repair	M	N	N	N	430 S 96th
51	Gilmore Door Inc.	M	N	N	N	420 S 96th
52	Golden Touch Autobody & Paint	M	N	N	N	1705 S 93rd St.
53	HDI, Inc.	M	N	N	N	400 S. 96th
54	International Aircraft Services	M	N	N	N	420 S. 96th
55	International Paint Co.	M	N	N	N	1601 S 92nd Pl
56	Lafferty Electric NW, Inc.	M	N	N	N	430 S. 96th
57	Lacoq Machine Works	M	N	N	N	1605 S 93rd St. G-1
58	Marx Landing Restaurant & Lounge	M	N	N	N	1605 S. 93rd
59	McDonalds	M				
60	Nehl Woodcraft	M	N	N	N	1605 S 93rd St.
61	Northwest Connecting Rod	M	N	N	N	1705 S 93rd St. F-9
62	Pony Express	M	N	N	N	8813 14th S
63	Propulsion Controls Engineering	M	N	N	N	1605 S 93rd F-10
64	Puget Sound Pattern Works	M	N	N	N	1605 S 93rd E-O
65	Pyrometric Service Co.	M	N	N	N	1312 S 96th
66	Repair Technology Inc.	M	N	N	N	400 S 96th
67	Stanley Priesner Tooling	M	N	N	N	1505 S. 93rd
68	Ultrapak Printing & Packaging	M	N	N	N	1600 S. 92nd Pl.
69	United Grinding	M	N	N	N	1605 S 93rd E-N

Hamm Creek/S 96th St
Business List
9/21/95

Table 1 (continued)

ID	company	priority	WQC	WQA	NPDES	address
70	Selland Auto Transport	L	Y	Y	Y	615 S 96th St.
71	Chas. A Lesster Trucking	L	Y	Y	N	515 S 96th
72	AAAA Mini Storage	L	N	N	N	1421 S 96th
73	Air Commodities, Inc.	L	N	N	N	1620 S. 92nd Pl.
74	All American Cookie Co.	L	N	N	N	1601 "A" S. 92nd Pl
75	AMS Laser	L	N	N	N	430 S. 96th
76	Antique Race Boats Foundation	L	N	N	N	1605 S. 93rd St. D
77	Associated Industries Inc.	L	N	N	N	1505 S 93rd
78	B& C Telephone ,Inc.	L	N	N	N	430 S. 96th
79	B&T Conveyors Inc.	L	N	N	N	1705 S 93rd F-16
80	Burgess Enterprises	L	N	N	N	1505 S. 93rd
81	Burnhams and Sharpe Mixers	L	N	N	N	1541 "A" S 92nd Pl
82	Carlson & Fredricks Co. Inc.	L	N	N	N	1541 "C" S 92nd Pl
83	Central Carpet Co. Inc.	L	N	N	N	9330 15th S
84	Clark Productions, Inc.	L	N	N	N	9130 15th Pl. S.
85	Coast Industrial Supply	L	N	N	N	1505 S 93rd
86	Cold Sea Refridgeration	L	N	N	N	1605 S 93rd E-H
87	Cosgrove Engineering	L	N	N	N	1605 S. 93rd
88	Deliverex	L	N	N	N	9100 15th Pl. S.
89	Design Direct	L	N	N	N	9330 15th S.
90	Diesel Engineering Supply Co.	L	N	N	N	727 S 96th
91	Distribution Resources	L	N	N	N	9130 15th Pl. S.
92	Duwamish Yacht Club	L	N	N	N	1801 S 93rd
93	Ecology & Environment, Inc.	L	N	N	N	1605 S 93rd
94	Gates & Controls	L	N	N	N	1605 S. 93rd
95	Hayes Inspection Service Inc.	L	N	N	N	9130 15th Pl. S.
96	Hydroplane & Raceboat Museum	L	N	N	N	1605 S. 93rd
97	Intl. Aerospace Support, Inc./ Intl. Aeronotics Systems, I	L	N	N	N	430 S. 96th
98	Jim Harvey Industries	L	N	N	N	9320 15th S.
99	Liftparts Northwest Inc.	L	N	N	N	1605 S 93rd St.
100	LR Sanders & Co.	L	N	N	N	430 S 96th Unit 2
101	Marine Controls	L	N	N	N	9330 15th S.
102	National Partitions	L	N	N	N	1501 "A" S 92nd Pl
103	Norman Property	L			N	11603 10th Ave S
104	Northwest EDM Supplies Inc.	L	N	N	N	420 S 96th
105	Nova Graphics	L	N	N	N	1314 S 96th
106	Progressive Intl.	L	N	N	N	1600 S. 92nd Pl.
107	Pump Industries, Inc.	L	N	N	N	9330 15th S.
108	Rifle USA / BOSA Shirt Co.	L	N	N	N	9100 15th Pl. S.
109	Sahara Club/YGM, Inc.	L	N	N	N	9100 15th Pl. S.
110	Schauer NW, Inc.	L	N	N	N	9330 15th S.
111	The Natl. Co. Inc.	L	N	N	N	1521 S. 92nd Pl.
112	UMC Mixer Parts	L	N	N	N	1505 S 93rd
113	UN Oriental Food	L	N	N	N	1505 S 93rd B

IV. TASK 3 – BUSINESS SITE CONSULTATIONS, TECHNICAL ASSISTANCE, AND ENFORCEMENTS

The Technical Assistance/On-site Consultation portion of this project officially started January 1, 1996 and was to end December 31, 1997 (we actually continued site consultations through mid-1998). The purpose of the on-site visits was to assist businesses in reducing the amount of pollution discharged from their site by implementing source control Best Management Practices (BMPs). The objectives were to:

1. Inspect businesses for improper use, storage and/or disposal of materials and for on-site drainage problems;
2. Provide technical assistance on planning and implementation of appropriate stormwater best management practices; and construction of treatment systems
3. Take enforcement action as necessary to bring businesses into compliance;
4. Distribute educational materials; and
5. Create a cooperative working relationship between the County and the business with respect to implementing best management practices.

Some site visits were also directed to residents where "home based" business activities were contributing pollutants to surface waters.

Staff used the King County Stormwater Pollution Control Manual to identify potential pollution problems and necessary best management practices needed for each business. Staff identified numerous pollution problems on sites including:

- illicit connections to the storm drainage system,
- uncontrolled washwater to storm drainage system due to washing of vehicles and equipment,
- improper storage of chemicals and wastes,
- improper storage of food wastes, oils and grease;
- lack of spill clean up materials on site,
- clogged storm drainage systems,
- outside processing, and
- signs of direct dumping to the storm drainage system.

The technical on-site consultation consisted of the engineer walking through the business with the owner or manager and identifying pollution problems and best management practices, which needed to be implemented. After the consultation, the Engineer mailed a follow-up letter to the business outlining the best management practices needing to be implemented in order to comply with water quality laws. The engineer then conducted follow-up visits with each business. If a business implemented all necessary best management practices they were sent a letter confirming their compliance with local water quality laws.

Site Consultations were completed at approximately 114 businesses. Sixteen (16) of the site visits were categorized as mini-site-visits as these businesses were more of a distribution center or office and had minimal BMP requirements and no site consultation letter was sent to the business. As of April of 1998, 62 of the businesses were still in compliance with King County Code 9.12 (water quality) and were implementing all BMPs. Approximately 40 of the remaining businesses have minor outstanding BMP issues that keep them from receiving a compliance letter. The additional remaining businesses will probably require enforcement letters to gain compliance with King County's Water Quality Code. Table 2 includes names of businesses in the watershed. Appendix A includes detailed information on the businesses visited through this project.

During the course of the project, four (4) enforcement actions were started against businesses. The four businesses were Duwamish Manor Industrial Park, Rainier Golf Course and Country Club, Water District #20, and Merlino Construction. All but the Duwamish Manor Industrial Park enforcement action have been closed. Three (3) violation notices were issued to residents, two (2) of which have been closed. The third violation is still open and the property now has violation notices issued by many other King County agencies.

The most prevalent BMPs that were needed in the watershed were:

- covering outside storage,
- containing liquids stored outside,
- cleaning/sweeping rather than washing storage and parking areas, and
- vehicle washing. Vehicle washing is still one of the most difficult issues to educate people that pollution from this activity causes a toxic problem in surface waters.

One problem found in the watershed that is quite unique was the large amount of cement kiln dust that has been used for fill over the years on many of the parcels. These parcels are still gravel surfaced, not paved, and so the pH of the runoff from these lots is typically fairly high. Two of the sites are under redevelopment, so the sites will be capped, however four large parcels have no plans in the immediate future for capping.

As S. 96th Street is a largely manufacturing/industrial area a large volume of diesel truck and trailer rigs use this roadway and its side streets. Until water quality components are added or built into the roadways themselves, oil and grease will continue to be a problem.

In addition to the technical assistance offered businesses, King County also developed and distributed educational materials to businesses, including:

- Educational Calendars featuring a best management practice and pollution prevention tip for every month.
- Educational Note Pads listing eight pollution prevention messages.
- Educational Posters to remind employees that the pollution from the activities at their site can affect the natural resources of the region.

Businesses were also recognized for their efforts to prevent pollution in the watershed. Two Hamm Creek Watershed businesses were awarded the Green Globe Award in 1997 for their water quality efforts. Staff participated in the planning and implementation of the King County Green Globe Awards Ceremony, in which two Hamm Creek businesses, PSF Industries and D&J Automotive were recognized for their environmental accomplishments. Staff wrote press releases on these two businesses and coordinated their participation. Staff also wrote an article for the Duwamish Community Newsletter on PSF Industries.

Staff developed and distributed two success stories on businesses in the watershed. One success story was written for Dominic's Plaza for their pollution prevention efforts and assistance with educational efforts. The other was for PSF industries for their outstanding efforts to reduce pollution from their site.

In December 1997 we ran a series of four advertisements in the South District Business Journal thanking businesses in the watershed for their efforts to protect Hamm Creek. Businesses who came into compliance with the County's water quality code were recognized in the paper.

Businesses in the watershed who complied with the County's water quality code were eligible to become members of the County's Businesses for Clean Water program. These businesses received updates and reminders to continue implementing pollution prevention practices, as well as recognition for their efforts.

Copies of all the educational materials created and referenced above are included in Appendix B.

Table 2 – Businesses in the Hamm Creek Watershed

0438 4-plex units	9916 DesMoines Memorial Dr. S.
0442 4-plex units	9920 DesMoines Memorial Drive S
Schaur Northwest	9330 - 15th S. #16 Unit G
0439 4-plex units	9926 DesMoines Memorial Dr. S
0440 4-plex units	9918 DesMoines Memorial Drive S
0441 4-plex	9924 DesMoines Memorial Dr. S
0443 4-plex units	9924 DesMoines Memorial Dr. S
0434 4-plex	9914 DesMoines Memorial Drive #3
4 plex units	9928 DesMoines Memorial Dr. S.
A.P. & J. Automotive	10806 1st Avenue South
Abawi/Best Auto Body	12025 DesMoines Way S.
Accurate Grinding	430 S. 96th Street Suite 4
Ace Galvanizing	429 S. 96th Street
Ace Galvanizing	429 South 96th Street
Advanced Electroplating	9585 Eight Avenue S
Ahrenius Manufacturing	1425 S. 93rd Street
All City Auto Wrecking	9438 DesMoines Way South
Allied Body Works Inc.	625 South 96th Street
AMS Laser Supply	430-8 S. 96th Street
Arrow Cutting Dies	430-6 S. 96th Street
Auto Magik	1505 S. 93rd Street Unit P
B and C Telephone Inc	410-5 S. 96th Street
Basin Oil	8700 Dallas Avenue
Basin Oil	1605 South 93rd Street Bldg E
Baszile Metals Service	1231 A South Director Street
Big O Tire	8510 Dallas Ave. So
Black Dog Woodworks	430 S. 96th Street
BRAVO Environmental Services	19552 -38th Avenue NE
Brightwood Manor Apartments	10025 Des Moines Memorial Drive S
Burkes Auto Storage	S. 96th Street between 4th and 8th S.
Cascade View Apartment Building 1	12035 Des Moines Memorial Drive South
C B Finishing	9585 - 8th Avenue South
Cain's Pressure Washing	21925 SE 249th Pl.
Camerons Residential Doors	410 S. 96th Street Unit 7
Carey Limousine Service	1237 S. Director Street
Cascade Vue Apartments Bldg 3	12037 DesMoines Memorial Drive South
Cascade Vue Apartments Bldg. 2	12035 Des Moines Memorial Drive
Centimark Corporation	430 S. 96th Street Unit 5
Chiyoda International Corp. owns 1237 S. Director	1100 Olive Way #500/1237 S. Director
Clarklift of Washington / Alaska	1313 South 96th Street
Clear Concepts L.L.C.	16410 S. 143rd /st,
Cloverdale Paint Corporation	1501 S. 92nd Place
Coach House Apartments	10245 Des Moines Memorial Dr. S
Country Club Apartments	11233 Des Moines Way South

Country Squire Apartments	11209 Des Moines Memorial Drive South
D & J Automotive and Electric	10806 1st Avenue South
Dave's Pump Service	430-7 S. 96th Street
Design Direct Sound	9320 15th Avenue South
Dominic's Plaza / Colello Family Partnership	9630 DesMoines Memorial Drive South
Dominic's Red Apple Market	9627 Des Moines Memorial Drive South
Duwamish Manor Industrial Park	1705 S. 93rd Street
Duwamish Yacht Club	1801 S. 93rd Street
Executive Terrace Apartments	9901 14th Avenue South
Fibres International Glass Recycling	9208 4th Ave. S
Folcol Tool and Mold Co.	420 S. 96th Street Unit 24
Fruehauf Trailer Corporation	9426 - 8th Avenue South
Gary Merlino Construction Co., Inc.	9125 - 10th Avenue South
Gaston Brothers Excavating	10740 Myers Way South
Georgetown Upholstry	430-14 S. 96th Street
Glen Acres Condominiums	10746 Glen Acres Drive South
Glen Acres Golf and Country Club	1000 South 112th Street
Glendale Heating Oil	12462 DesMoines Memorial Dr. s
Goldstar Laundry, Inc.	10766 Myers Way South
Harmony Gardens Care Center	10010 Des Moines Way S.
Harsch Investment Corp. (Noffsinger Management Svcs)	309 S. Cloverdale, Ste B-14
Hi View Apartments	2043 S. 113th Street
Industrial Automation, Inc.	1421 S. 93rd Street
Insulation Contractors, Inc.	1501 South 92nd Place, Suite B
International Aerospace Support	430 S. 96th Street
International Aircraft Services, Inc.	420 S. 96th Street Suite 3
International Paint	1601 South 92nd Place #C
ITEL annex on 96th	8th Avenue South and South 96th Street
ITEL Terminals	1818 South 93rd Street
J.D. Ott	1705 S. 93rd Street
Java Trading Company	420-6 S. 96th St.
Kings Unlimited Detail	11315 1/2 DesMoines Way S
Kodo Construction	12557 SE Green Valley Road
KRS Marine, Inc.	S. 93rd Place and Duwamish River
Lafferty Electric Northwest	430 S. 96th Street Unit 3
LECOQ Machine Works	1605 S. 93rd Street Bldg E. Unit G2
Le-Roy's Equipment Repair	11202 1st Avenue S
Libby Fredricks, Inc.	1541 South 92nd Place
Marcos Mobile Wash	9400 - 4th Avenue S.
McCoy Enterprises, Inc.	11064 First Avenue South
Merlino vacant property	1030 S. 96th Street
MoiMoi residence	10118 DesMoines Way South
Moulded Chemical Products Inc.	1601 S. 92nd Place Bldg H Suite A
National Partitions, Inc.	22001 Pacific HWY S.,Ste 106
Noffsinger Management Services	400 S. 96th St.

Pacific Northwest Motor Freight Lines/ Chas. A. Lasater	515 S. 96th St.
Pacific Rim Transport Inc.	910 - 96th Avenue S
Pacific Utility Equipment Inc.	1303 South 96th Street
Pony Express	855 S. Barton
Precision Engineering	1231 South Director Street
Professional Coatings Inc. PROCOAT	1705 S. 93rd Street, Suite F22
Providential Investments	9922/9926 Des Moines Way So
PSF Industries Main office	PO Box 3747
PSF Industries, Inc.	9332 14th Ave. S. PO Box 3747 (98124)
PSF Mechanical Inc.	9322 14th Avenue South
Puget Sound Coatings	9400 15th Avenue S
Pyrometric Service Company	1312 S. 96th Street
Quadrant/KMS Management Services	12886 Interurban Ave. S.
Rainier Golf and Country Club	1856 South 112th Street
Rainier Vista Sewer District	S. 100th St. east of Myers Way
Rascals Restaurant	9635 Des Moines Memorial Drive South
Rasmussen Wire Rope Corp.	9999 8th Avenue S
Repair Technology, Inc.	400 South 96th Street PO Box 80426
Residence	2430 S. 116th Way
Sea-King Ind Park/KMS/Quadrant Corp.	2886 Interurban Avenue South
Security Contractor Services	9619 - 8th Avenue South
Selland Auto Transport, Inc.	615 South 96th Street
Sharpe Mixers	1541 S. 92nd Place
Sound Delivery Service	9999 - 8th Avenue South
Speedy Plumbing	430-14 S. 96th Street
Spiral Arts	430-5 S. 96th Street
Sunnydale Construction, Storage and Topsoil	1119 S. 96th Street
The National Company	1521 S. 92nd Place Suite C
TK Hood and Duct Cleaning	PO Box 47148
Toxgon Corporation	631 S. 96th Street
Tukwila Roofing	1237A S. Director Street
U Do It Car Wash	11315 Des Moines Way South
Vern's Quality Cleaners	11851 Glendale Way South
Water District 20	12606 First Avenue South
Winsor Corporation	410 S. 96th Street Unit 7
Wire Rope Industries	1501 S. 92nd Place Unit C
Zion Sr. Services Center	1443 S 99th St.

V. TASK 4 – PUBLIC EDUCATION AND OUTREACH

Residents of the Hamm Creek watershed represent cultural, ethnic, and economic diversity. The residents are white, African-American, Latino, Asian/South Pacific Islander, Russian/Eastern European, as well as others. There is a mix of low and middle income and single family and multifamily residences.

Our initial plan was to focus our pollution prevention messages on car maintenance and repair activities and yard and garden activities. We evaluated our efforts by conducting a residential survey at the beginning of the project and again at the end, to measure change in awareness and knowledge.

After our first survey we were struck by the fact that most people did not even know there was a creek in their neighborhood, let alone worry about protecting it. At that point we decided to focus our initial attention on raising the awareness of the creek itself. Our plan was to get information out on the creek, where it was, its value, ways to protect it, and how to prevent pollution.

Below is a summary of the residential and business outreach and education conducted during this project. Copies of all materials created and referenced are included in Appendix C.

Residential Outreach and Education

Planning

- Contacting Locals - In mid 1995 at the start of the project we contacted local citizen activists, community groups, and others to learn more about the watershed and establish contacts in the community.
- Develop Plan – In fall of 1995 we developed the Public Outreach and Education Plan.

Plantings

- Volunteer Planting – In October 1995 we organized a volunteer planting effort on the South Fork of Hamm Creek as part of the Green/Duwamish Festival of the Rivers Celebration. We had 24 volunteers plant 40 shrubs and remove lots of invasive blackberries at the Point Rediscovery site. These trees and shrubs shade the creek and control erosion.

- Volunteer Planting – On March 8, 1997 we organized a volunteer planting at the South Fork –Point Rediscovery site. Twenty-three volunteers showed up on a beautifully sunny day to plant over 400 tree and shrubs around a newly reconstructed open water wetland adjacent to the creek. Of these volunteers, seven were from the extended Hamm Creek basin. Recruitment efforts included partnering with long-standing community group I'M A PAL, a direct mailing to the 6000+ basin residences, and press releases in local news, including the Seattle

Times travel section. Plantings here will control erosion, provide habitat values, and eventually shade the creek, helping to regulate water temperature.

Educational Materials

- Information Sheets – In the fall of 1995 we sent out two mailings to all residents of the basin notifying them that we were starting an educational pollution prevention project in their neighborhood.

- Project Fact Sheet - In spring 1996 we began producing "Just the Facts" a two page fact sheet giving information on this project as well as other county projects occurring in the watershed.

- Tour Brochure - "Discover the Hidden Hamm: A Self-Guided Tour of Hamm Creek" was produced in June 1996 in response to people who did not realize a creek was in their neighborhood. The brochure includes information on the creek, a map, and directions to four sites where the creek can be viewed or accessed. The brochure was distributed at the Hammboree and throughout the project. We updated and reprinted it in 1998 to reflect changes, due to landslides, in the watershed. It was then distributed as part of our apartment outreach efforts.

- Educational Sponges – In June 1996 we produced a educational give-away sponge which carries the message "Wipe Out Water Pollution - Keep Hamm Creek Clean." These were distributed at the Hammboree and throughout the project. The sponge was used as both an educational and promotional piece.

- Educational Vehicle Trash Bags – In October 1997 we developed vehicle trash bags printed with educational information on preventing pollution from car maintenance and washing. We stuffed the bag with additional educational information (including local disposal sites for used automotive fluids) and mailed it to over 4000 single family and apartment residents.

Informational Booths and Events

- Attendance at Event – In November 1995 we represented this project at the Puget Sound Urban Resources Project Grant Ceremony at the Point Rediscovery Site on South Fork.

- Hamm Creek Open House – In January 1996 King County staff hosted a open house/public meeting in south park to inform residents of the watershed about all of the county activities occurring in the basin. The event was well attended and informational fact sheets on the creek and this project were distributed.

- Hammboree - On June 15,1996 we put on the Hammboree, an informational, educational, and fun festival for the residents of the watershed. The Hammboree was

held at Dominic's Plaza in the heart of the watershed. Approximately 120 people attended. The event offered short workshops (roughly 20-25 minutes long) on gardening and yard activities, household cleaning activities, and household hazardous waste handling and disposal. A short seminar on the South Fork featured stream macro invertebrates as indicators of water quality. Fin the Giant Salmon was there to raise the awareness of salmon and water quality. Informational and interactive booths throughout the site provided printed information on pollution prevention and opportunities for involvement. Active local groups such as ECOSS, I'm A PAL, and SCA also had booths. A local Boy Scout Troop conducted a Flag Ceremony. Local Businesses for Clean Water members were presented with awards during the fair. To encourage participation door prizes were awarded to attendees. Local businesses donated over $500 worth of prizes.

- Hamm Creek Festival of the Rivers – In October 1996 we participated in this event with an educational display booth. Approximately 40 people visited the booth. Staff distributed the Hamm Creek Tour brochures and sponges and spoke with fairgoers. Fair visitors were able to visit the North Fork interpretive site adjacent to the fair.

- BMP information Table – On July 18, 1997 we hosted an informational table outside the local Red Apple Market, in the heart of the watershed. Staff gave away samples of organic fertilizer, offered information on gardening, car washing, and lawn care best management practices. Approximately 50 people stopped by, picked up information, and asked questions about the location of the creek and residential practices affecting it.

- BMP information Table – On November 14, 1997 we hosted another information table at Red Apple. Over 50 people were engaged in a discussion about the creek, with 10 percent of that number discussing creek issues in depth. Information and materials available included the Hamm Creek tour brochure, information on car maintenance (including local oil recycling sites), car washing, and lawn care. Additionally, educational material on watersheds, streams, and salmon were available. A map of the watershed showed people the relationship between their house and the nearest fork of the creek.

Storm Drain Stenciling and School Outreach

- School Outreach and Stenciling – In Spring 1996 we recruited Water Watch (a nonprofit organization) to conduct outreach to school children in the watershed. Waterwatch used Americorps volunteers to do a water quality presentations and storm drain stenciling. Four schools were targeted including Concord Elementary, Cascade Middle School, Mountain View Elementary, and Southern Heights. Through this project youth made over four presentations and stenciled well over 100 drains with the message "dump no waste drains to stream."

- Stenciling - Eight international teens from Cascadia Quest also learned about Hamm Creek and stenciled over 50 drains along the Middle Fork in October 1996 with the message "dump no waste drains to stream."

Newsletters and Articles

- First Newsletter - In April 1996 we developed and distributed the first Hamm Creek newsletter to over 6000 people in the watershed. The newsletter accomplished a number of goals by: introducing Hamm Creek, its value and location; providing answers to the questions we received from the first survey; advertising the Hammboree; discussing the Project; and recognizing businesses in the area. The Newsletter also told the history of the creek and its namesake Mr. Dietrich Hamm.

- Second Newsletter – In the summer of 1997 we created and mailed a second Hamm Newsletter to over 6000 watershed residents. The newsletter had articles on residential best management practices on lawn care and car care, business awards and other issues in the watershed.

- Final Newsletter – In Summer 1998 we created and distributed a final newsletter to all residents. This newsletter included the accomplishments of the project, results of the survey; pollution prevention tips, and thanks to residents and businesses in the watershed that have taken efforts to prevent pollution.

- In the Spring of 1996 we had an article in the Surface Water Management Division's Downstream Newsletter about the Hamm Creek project and upcoming events.

- Two Hamm Creek Property Managers were featured in an article in the FORUM newsletter for commercial Building Leasing & Management in January 1997. The article featured the work of SeaKing Industrial Park and South 96th Business Park in keeping Hamm Creek clean.

- An article written by county staff on pollution prevention tips for apartments was published in the On-site Magazine (for Apartment Managers) and the Apartment Association of Seattle/King County Newsletter in their April 1998 issues.

Watershed Signs

- In May 1998 we produced and installed five watershed signs in conspicuous places throughout the watershed. The signs were a one-color illustration of a watershed with the message "Hamm Creek Watershed." These signs were posted along high traffic streets to raise the awareness of local residents.

Miscellaneous Activities

- Illegal dumping – In June 1996 we received complaints about extensive dumping of yard waste into the ravine on the middle fork. We sent a letter and hand delivered educational information to all residents in the immediate neighborhood and posted a

sign at the site. We received a number of calls in response and saw a dramatic decrease in the amount of dumping.

Apartment and Property Manager Outreach

From the beginning the project staff realized that multi-family properties represented a large part of the watershed population and needed some targeted efforts. Apartments in particular are challenging because the complex itself is considered a business, while the tenants are of course residents. We developed an apartment and property management outreach campaign to work with both entities.

In 1996 we sent a letter to all multi-family property owners in the watershed, requesting their cooperation in pollution prevention efforts. There are over 40 multi-family units with over 30 different managers. We explained that we would be working with multi-family complexes in two ways. First, because they are considered commercial properties we would be conducting on-site consultations as we do with other businesses. Second, we asked for their cooperation in sending an educational message to their tenants. We received six responses from property owners as a result of this letter and conducted on-site visits with them as well as encouraged their cooperation with educating their tenants.

In 1997 staff drafted a letter with pollution prevention information for apartment tenants. A letter was also drafted and translated into Spanish, at the request of one of the building owners. This letter along with other water quality information was sent to appropriate apartment managers to distribute to their tenants.

In February 1998 we launched a comprehensive campaign to educate multi-family property managers and tenants. Staff surveyed a number of apartment managers to find out their willingness to work with us on educating their tenants. We developed the Property Management Resource Kit containing a variety of educational materials for both apartment managers and residents that included coupons for car washes and oil draintainers encouraging environmentally sound car washing and maintenance. In addition, we included a letter and tip sheet for apartment managers and a sample memo to tenants. Other information included maps, tour guides and other materials specific to Hamm Creek.

The property manager resource kit was sent to 19 "problem" apartments in the watershed. Staff made follow up calls to secure a commitment from the managers to distribute materials to their tenants. More than half (10) of the managers agreed to distribute the information to their tenants and post water quality educational posters in a central place. In addition a number of managers requested storm drain stencils.

All totaled, 10 of the 19 apartment managers contacted distributed information to 479 out of 760 tenants for a 63% response. In addition, the response to the mailing was overwhelmingly positive. For example, the owner of Brightwood Manor sent a thank

you letter to the county for the friendly reminders and educational materials. They also posted their Businesses for Clean water certificate to encourage their tenants to keep up the good work. The manager at Cascade Vue Apartments requested translations of our material into Spanish. County staff were able to translate the memo to tenants into Spanish and sent it to the complex within a couple weeks. In addition, the manager at Park South Apartments (a much larger complex) agreed to include information in their move-in packets for new tenants.

We were also able to partner with three different businesses in the area to provide help with pollution prevention. Ken Matthiesen owner of K & K Auto Parts agreed to offer oil draintainers (for recycling used oil) at a reduced price with the purchase of oil. We developed a coupon for this and distributed over 4000 of them throughout the watershed. In addition, a local car wash and car detailer agreed to a pilot project to provide discounts to apartment tenants. Two apartments were selected for the pilot. We produced a coupon/card that was given to all residents in these two apartments. The card entitles the resident to a discount every time he/she uses the car wash or detailer.

Residential Awareness Survey

As part this project, King County conducted pre and post surveys to determine changes in awareness among South Seattle residents of the creek and the importance of pollution prevention.

Staff developed a pre-project survey to assess the awareness of residents on: Hamm Creek as a resource, nonpoint pollution, pollution prevention practices, and their interest in participating in events. The pre-project survey went out to 6311 residents in early March 1996 (this included some residents out of basin due to postal routes being organized by zip code and not basin boundaries). 152 surveys were returned (2.4% return rate – considered a good return for cold mailings) and the survey generated over 30 phone calls. We learned three key points:

1) A large number of people were not aware that Hamm Creek existed or if they knew there was a creek they did not know it had a name.
2) Most people are fairly knowledgeable about proper pollution prevention practices.
3) Most people are interested in learning more about things they can do to improve the health of the creek.

In June 1998 we developed and mailed the post survey to the same database of residents (6098 residences). 122 surveys were returned (2% return rate) and again it generated many phone calls. Overall the survey results indicated an increase in the awareness of Hamm Creek and the role of individuals in pollution prevention.

The results of the survey comparison follow. The majority of respondents (80%) had lived at their present location two or more years. The first survey, conducted in 1996, indicated that 68 out of 152 respondents (45%) did not know there was a creek in their

neighborhood. Therefore, outreach efforts focused on raising awareness of the creek and the need to prevent further pollution of it. Results of the post survey, conducted in May 1998, indicate that awareness of the creek rose by 30% to an awareness level of 75%.

More than half (53%) of respondents said that Hamm Creek was a fantastic natural resource in their community – a 43% increase over the previous survey. Twice as many people agreed with the statement that Hamm Creek supports a salmon run for a total of 32%. The same percentage of respondents agreed with the statement: Hamm Creek is seriously polluted.

In terms of sources of pollution found in Hamm Creek, 85% of survey respondents acknowledged that pollution comes from households – a 21% increase in awareness from the previous survey. When compared with the pre-survey, just over half (51%) of respondents pointed to industry as a source of pollution for a 15% increase in awareness. Awareness of pollution from households increased 21% from 64% to 85%. Awareness from cars increased 20% from 47% to 67% of respondents. Only 32% pointed to animals as a potential source of pollution.

Awareness of environmental terminology also increased substantially. 80% of respondents knew that BMP stood for Best Management Practice – a 47% increase from the pre-survey results. Respondents chose the following responses as examples of Best Management Practices:

- Preventing pesticides, fertilizers, soap and oils and grease from entering storm drains (84%).
- Disposing of used oil at a recycling facility (75%).
- Washing their car without soap (56%).
- Stenciling storm drains on your property (42%).

According to the pre-survey, 47% of respondents claimed not to know what non-point source pollution was. 48% of 1998 respondents agreed with the statement that non-point source pollution is created by everyday activities of everyone. This represents a 99% increase in awareness as a direct result of outreach and educational efforts. However, only 38% agreed with the statement that non-point pollution is a problem on Hamm Creek representing an increase of only 5%.

84% of respondents agreed with the statement: what I do makes a difference, up 22% from the previous survey. When asked what household activities they participate in, respondents answered in the following way:

Household Activities	Percentage	Pollution Prevention Measures	Pre-Survey Comparison
Gardening	75% of respondents garden	88% of respondents compost grass clippings or yard waste	Up 7%
		40% use curbside yard pickup to dispose of yard waste	Up 3%
Lawncare	73% take care of their own lawn	41% don't use fertilizers	Up 11%
		36% don't use pesticides, weedkillers or fertilizers	Up 6%
		40% use organic fertilizers	Down 7%
Car repair, maintenance, washing	88% wash their car	49% go to a commercial car wash	No change
		11% don't use soap when washing their car themselves	Up 6%
	30% repair their car.	34% change their oil or antifreeze	Down 10%
		37% recycled at auto store/transfer station	Down 7%
Household cleaning	Indoor	40% use commercial nontoxic products such as Simple Green, Ecover, etc.	Down 2%
		41% use homemade nontoxic cleaning solutions such as baking soda and vinegar	Up 11%
	Outdoor	70% use a broom to clean their sidewalk or driveway	No change
		19% use a hose	Down 4%
Other activities	45% volunteer		Up 6%

In terms of outreach efforts, 75% of respondents remembered receiving the Hamm Creek Update and 63% reported reading the newsletter. 32% remembered the Hamm Creek Tour brochure/map, 25% remembered the car garbage bags and 5% remembered the water quality consortium posters. Overall, 71% said that the materials they received were useful. Of those, 35% felt the materials to be very useful.

VI. TASK 5 – MONITORING AND EVALUATION

Task 5 of this grant was to administer a comprehensive monitoring program to evaluate the effectiveness of the outreach efforts in reducing pollution. The evaluation was accomplished by comparing the stormwater and sediment data from the first year with the data from the final year.

The monitoring project was divided into two phases: a first year baseline investigation and a third year follow-up sampling of the same locations. The first phase consisted of three tasks.

1. Analyze a full pollutant scan at a downstream location to provide information to identify the pollutants present and confirm the selected parameters to be analyzed throughout the project.
2. Characterize current pollutant loadings in the watershed. This was performed at 5 water sites and 8 sediment sites throughout the watershed. This provided information on the current level of pollutant loadings in order to develop a baseline for comparison purposes with the second set at the end of the project.
3. Characterize specific sites. This was performed at 5 sites in the watershed and provided a "close-up" picture of the effects of the outreach efforts on individual sites.

The phase two monitoring duplicated phase one with the exception of the pollutant scan and some site alterations or parameter changes based on the results and experience gained in the first phase.

The QA/QC plan was developed at the beginning of the project and approved by the Department of Ecology on November 6, 1995.

Hamm Creek is composed of four perennial tributaries: the South Fork, Middle Fork, Lost Fork, and North Fork. The mouth of Hamm Creek enters the river through a six-foot diameter round corrugated metal pipe that daylights at the toe of a steep, riprapped bank within the Duwamish Yacht Club boat basin. The watershed totals 1,408 acres. Sampling took place throughout the watershed.

In the 1995-1996 wet season (water year 1996), we obtained up to nine stormwater samples from five flow gauged locations and eight grab sample locations prior to the source control activities, as well as a set of sediment samples from eleven sites. Follow up sampling at the same sites was performed in the 1997-1998 wet season (water year 1998). Two of the flow gage locations, WA01 and WA04 were discontinued for the follow up sampling. The first round results for these sites were low enough that we believed no improvement could be detected.

Monitoring tasks included:

1) providing a scan for a broad range of conventional and organic pollutants from a location that integrated most of the watershed runoff;
2) isolating some small sites where we had targeted outreach activities;
3) characterizing pollutant loadings from various sub-basins and land use types in the watershed in a manner that would allow a statistically valid comparison of before and after conditions.

These tasks were all completed. The following sections discuss the monitoring activities and results for the three tasks.

In addition to the work of this project, there were a number of other projects that occurred in the basin during the monitoring period.

- Widening of highway 509;
- Widening of South 96th Street;
- Removal of an old sewage treatment plant and creation of wetlands on the South Fork and;
- Massive landslide and stabilization work on the North Fork.

These projects undoubtedly influenced the monitoring results. The County may detect increased pollutant concentrations during phases when sites were disturbed and lower concentrations after construction projects were completed.

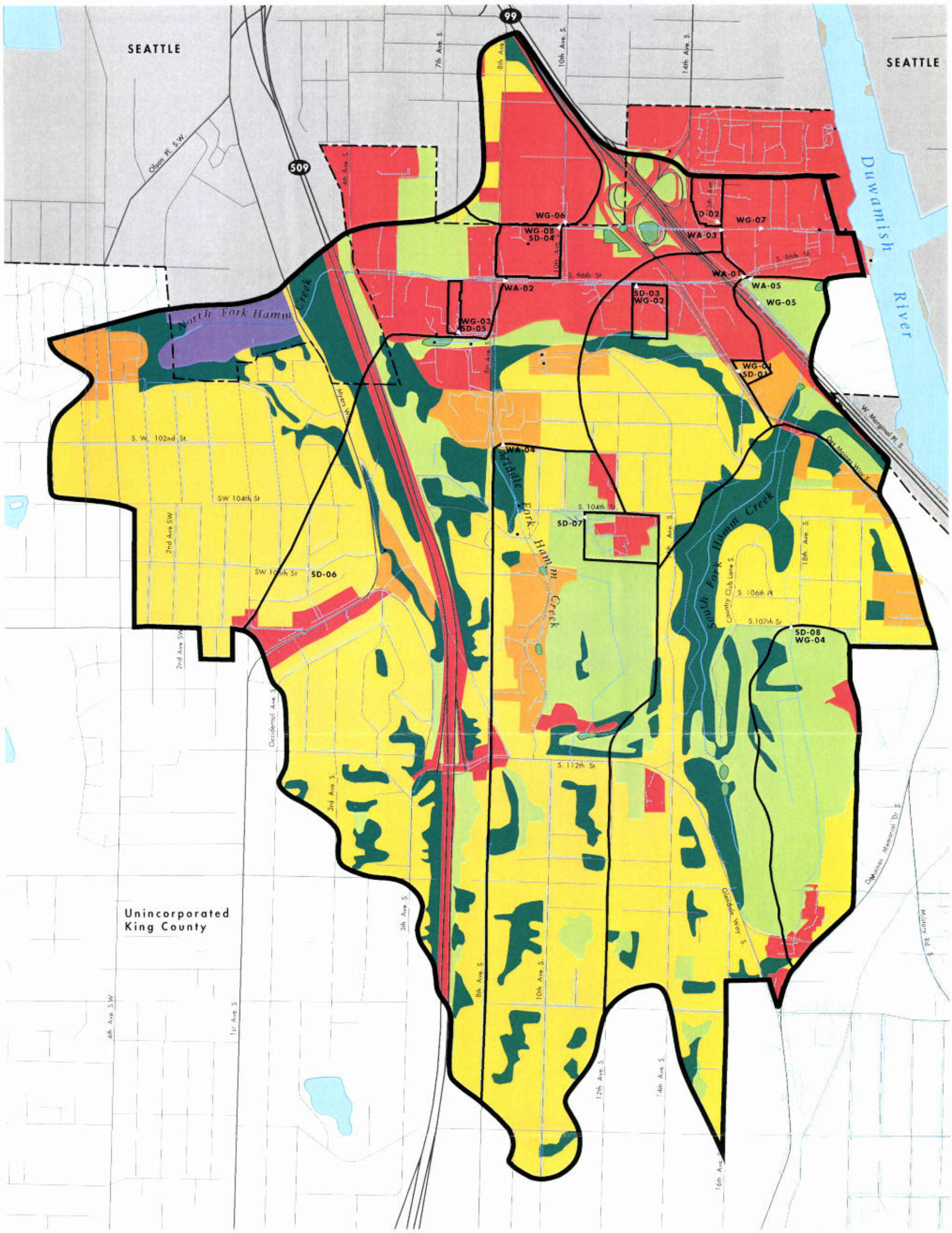
The challenge this project faced was that this is an incredibly complicated system to monitor. The results of this monitoring project were very difficult to interpret given all the activities occurring in the basin, including the historic extensive sediment and groundwater contamination.

Site Descriptions

Monitoring sites were chosen to represent both the overall basin and site specific activities being conducted in the basin. Samples were also taken to isolate pollutants sources beyond our control, such as highway runoff and discharges from the City of Seattle.

Five (5) automatic water quality monitoring sites; eight (8) water quality grab sites; and eight (8) sediment monitoring sites that were sampled for this project.

The samples sites are included on MAP 2 – Basin Land Use (as well as Map 1). The following pages include a description of our sampling methods and each site's location, characterization, and monitoring results.



Map 2

Hamm Creek

Source Control Project

- Open Channel Stream
- Piped Stream
- Basin Boundary
- Subcatchment Boundary
- Outfall
- Sampling Site
- WA-01 Automatic Samplers
- WG-03 Stormwater Grab Site
- SD-01 Sediment Grab Site
- Commercial & Highways
- Multifamily
- Single Family High Density
- Grass
- Forest
- Quarry/Landfill
- Wetland/Pond
- Incorporated Area

N

0 500 1,000 Feet

Map produced by the King County DNR Visual Communication & GIS Unit
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Sample Methods

Flow gage sites

The monitoring plan called for collecting flow-weighted composite samples from five sites. We installed stream gage equipment at each of the five sites. Each site included a stilling well, either a pressure transducer or capacitance probe water level measuring instrument, a programmable data logger that monitored water level every 15 seconds, an automatic water sampler, and a large housing for the sampler, data logger and miscellaneous equipment.

The sites were operated as standard King County stream gages. Routine site visits were made every five weeks. Discharge measurements were made, stream stage was noted, and the data logger downloaded to a portable computer. We developed stage - discharge relationships for each site from logarithmic plots of the discharge measurements and hydraulic analysis of pipe systems. It was possible to program a stage-discharge rating into the data loggers. The data logger could then measure total flow at the gage and command the samplers to pump at specified flow intervals, creating a flow proportional composite sample. A minimum water level rise can be set to begin a sampling period.

We have had good success using the above equipment and method for producing flow-weighted samples on other projects. The Hamm Creek locations each presented difficulties that we could not overcome. The stage-discharge relationships (rating) at each of the sites was very unstable. It was not possible for us to determine an accurate rating in time to program the data loggers before sampling. Four of the five sites had confined space constraints that precluded frequent access. It was possible, using standard stream gauging procedures, to apply corrections and produce accurate discharge records for periods of time. These records we used to determine the flow component of pollutant loading calculations. Sample mean concentrations were determined from time composite samples. A composite of samples collected at set time intervals is not as representative of the in-stream water quality over the sample period as flow weighted composites. In our case, we chose to the consistency of time composites over inaccurately proportioned composites. Two technicians visited the sites near the onset of a storm and determined when to turn on the samplers. Samples were pumped from the stream every 10 minutes and added to the composite bottle for six hours. The time composite samples allowed us to sample a range of storm sizes with a high rate of success.

Grab Samples

Grab samples were collected at the seven sites specified in the monitoring plan. Three of these sites were to be collected only at the onset of the sampling season, to scan the effect of sources outside our control. Four sites were to be sampled each storm to evaluate specific sites. One of the initial scan sites became a regularly monitored site. An eighth site (WG-08) was added by request of the water quality engineer. Grab sample sites were visited and samples collected after the automatic samplers had been turned on. Individual

bottles provided by the laboratory were filled at the discharge point. Temperature and pH were measured with hand held instruments.

Results of Water Quality Sampling

The primary purpose of the water quality monitoring was to determine if we could detect an effect from our source control efforts. Additionally, we believed that even if improvement in stormwater quality could not be demonstrated after a year and a half of source control efforts, the data collected will be useful simply as a characterization of current conditions in the watershed. To better understand the significance of the results, we have compared the data with State Water Quality Standards, the results of other studies in the region, and local requirements. This analysis should give some perspective to the numbers and assist in determining the seriousness of water quality conditions in the watershed. Samples taken in the 1995-1996 wet season are referred to as "1996 samples"; those taken in 1997-1998 as "1998 samples".

Water Quality Standards for the State of Washington are specified in WAC Chapter 173. A standard exists for ammonia. It varies dependent on the temperature and pH of the water. None of our results came close to exceeding the value for ammonia. The water quality standards for metals pollutants are the most relevant to our study. Standards for metals are compared to the dissolved portion found in the sample. They are based on toxicity analyses performed by the EPA. Criteria were developed and published as guidance for enforcing the Clean Water Act (EPA, 1986). The State of Washington adopted the EPA criteria, and in some cases made the standard more protective (State of Washington, 1998). Prior to 1996, the total recoverable metal concentration was used for calculating the State Water Quality Standards. Most studies reported the total recoverable metal concentration. The dissolved portion is the biologically active portion, and is what the EPA criteria were based on. Until recently, accurate and economical laboratory analysis of the dissolved portion was not available. We had each sample tested for both total recoverable and for the dissolved portion of each metal. The toxicity of the conventional metals decreases as the hardness of the water increases. The standards for each metal are a calculation based on the hardness of the water. At times and in locations where the hardness is low, the standards are more likely to be exceeded. Two standards are specified. In general, acute standards for exposure to the toxicant specify a concentration that should never be exceeded. Chronic exposure standards are lower concentrations that may be exceeded but only for short periods. We used a spreadsheet to calculate acute and chronic standards and determine exceedances by the sample concentrations. We have used the acute exposure standards for comparison to the Hamm Creek results.

Many agencies have performed stormwater quality studies in King County. We compared results from some of these studies to the Hamm Creek concentrations. A University of Washington Masters Thesis (Chandler, 1993) summarized the results of nine local studies into mean concentrations for use in estimating pollutant loading. The City of Bellevue (City of Bellevue Utilities Department, 1995) sampled twelve locations from 1988

through 1993 to characterize pollutant loading from various land uses. King County and its consultant (Herrera, 1994) studied stormwater quality in the Hamm Creek watershed to assist in formulating water quality engineering solutions. King County Water and Land Resources Division (then Surface Water Management, unpublished) collected stormwater samples in the urbanizing watersheds of the County to screen for water quality problems.

The King County Surface water Design Manual (King County Department of Natural Resources, 1998) calls for oil/water separators to be installed in high use sites upstream of sensitive areas. The performance criteria for these separators is a release of 10 - 15 mg/l TPH. We used this standard to compare to our TPH results.

We accumulated the following summary statistics for each site by measured parameter: arithmetic mean, maximum, minimum, median, sample mean based on the natural logarithm of each result. We used the median value of each parameter from the entire data to make general comparisons. We used the log transformed sample mean as described in the Bellevue characterization study (City of Bellevue Utilities Department, 1995), or the median value of each sites data for comparison to other sample sets. For calculating loadings, we used the log transformed sample mean.

Many sample results were reported as below the laboratory method detection limit (MDL) or at or below the reporting detection limit (RDL). For computing statistics, when the laboratory results were below MDL, we substituted a value of one-half the MDL value. This allowed the effect of the below MDL results to be included in the logarithmic transform data sets.

The results of the sampling are discussed below. The quantitative results from the water quality sampling are contained in numerous tables in the Appendix D as listed here.

- For each automatic sampler site sampled in 1996 and 1998 (WA2, WA3, and WA5), the Appendix contains the following tables:
  - Storm WQ Statistics – containing the complete results from laboratory testing of the samples along with a statistical summary.
  - Runoff Summary – describing the flow and rainfall conditions for each storm.
  - Loading by Storm - computing the total load of each pollutant for each sample period (this is combined with Storm WQ Statistics for sites WA1 and WA4).
  - Annual Storm Loading Comparison - presenting the calculations of storm season loading.
  - A Hydrograph of each sampled storm.

- The table Hamm Creek Unit Loading Comparison presents for each automatic sampling site the wet season storm loading by hectare.

- The six-page table Hamm Creek Grab Sample Sites WQ Results contains the laboratory results from the grab sample sites.

- The five-page table Hamm Creek Results Compared to WA State WQ Standards is a printout of the metals criteria based on hardness for each sample and the result of the comparison of the sample concentration to the calculated criteria.

- A Statisticians Report compares the 1996 water quality sampling results to those for 1998 to determine if there was a statistically significant change in the concentration of pollutants.

Results of Scan samples

Scan sites were not sampled to determine the effects of source control activities. The results were used to verify the appropriateness of the parameters we were sampling for and to gage the pollutant input from areas outside our control such as Highway runoff and runoff from the City of Seattle (outside our jurisdiction).

The overall watershed scan sample (WG-07) was used to determine the breadth of parameters we should be monitoring for. The scan sample was taken at the beginning of the project. We analyzed for conventional pollutants, trace metals, and priority organic pollutants. Of the organic pollutants tested for, some solvents and combustion byproducts were found at close to the detection limits. The insecticide diazinon was detected. Diazinon was also found upstream in the Middle Fork sample. No petroleum hydrocarbons were detected. The results for conventional pollutants and trace metals were all within the range of expected values for urban runoff in the Puget Sound area.

Highway 99 (WG-05) – At the WG-05 location, we were looking for any unusually high or unexpected contribution from the highway runoff, a source that would be unaffected by our prevention efforts. This site was sampled twice, December 9, 1995 and November 19, 1997. The 1997 sample had 30 times the TSS of the 1995 sample. It was raining harder then and a considerable amount of roadside dirt was mobilized. The total metals concentrations were two to ten times higher than the maximum concentrations in South Fork Hamm Creek. Total and dissolved concentrations of both Pb and Zn were some of the highest in the study, but lower than concentrations found in other studies. Only the Zn concentration in the sediment laden sample was abnormally high compared to other studies. The TPH was concentration was very low, less than 1 mg/l., although another test found diesel and heavy oil at a concentration of 2 mg/l. The hardness adjusted State Water Quality Standards for acute exposure to dissolved Cu and Zn were exceeded. Highway 99 runoff may be a significant contributor of total and dissolved Cu, Pb and Zn to South Fork Hamm Creek.

City of Seattle (WG-06) - This site isolated runoff entering Hamm Creek from an area inside the City of Seattle limits. One sample was taken in the 1996 sampling and nine taken in the 1998 sampling. This drained a commercial area with heavy truck traffic, as well as some Highway 99 runoff. The estimated discharge ranged 0.2 to 1.0 cfs, usually at about 0.5 cfs. The pH of the samples was high, reflecting the nearby kiln dust deposits. The concentrations in the runoff samples from this site were among the highest for TSS,

both total and dissolved Cr, total Cu, total Ni, total Pb, and total Zn. Concentrations for dissolved Cu, Ni, and Zn were some of the lowest of the study. The total zinc concentrations were the equal of the highest found in the Bellevue Characterization study. The dissolved metals concentrations exceeded State Water Quality Standards for acute exposure to Zn once (the 1996 sample). TPH concentrations ranged close to the median value of the study. The runoff from the 10th AV drain contributes considerable suspended sediment with a heavy load of metals, especially total and dissolved Cr and particulate Zn.

Results of Fecal Coliform Sampling

In response to some citizen concerns about potential water quality effects from septic tanks in the South Fork Hamm Creek drainage, storm samples were collected and tested for bacteria. Three samples were taken from various seeps along the South Fork of Hamm Creek that are adjacent to properties that are still served by septic tank systems for sewage disposal rather than sanitary sewer connections to the Val Vue Sewer District sewer distribution system. Concerns had been raised that these 14 or so properties may have failing septic systems that were contributing fecal coliforms to the stream system. Samples were taken from 3 separate seeps in the high bank area of the South Fork System, upstream from the Des Moines Way culvert crossing. These samples were taken during the month of November when saturation of soils would show potential failures of these systems. The fecal coliform counts ranged from 2 - 370 CFU/100 ml. which is very normal for stormwater, especially since this area is fairly wooded and many wild and domesticated animals frequent this reach of the stream system. This sampling does not indicate any effect from leaking septic tanks.

Results of Source Control Effectiveness Monitoring Sites

Five sites were sampled with automatic samplers and flow gages. These sites collected about 30 separate samples during a six-hour period and composited the water in one bottle. This composite was sub-sampled for laboratory analysis to produce a Sample Mean Concentration (SMC) for each pollutant. For each site, we compared SMC's from the 1996 sample set to the 1998 samples. We also used the SMC's to compare with the results from other studies in the region as well as legal standards. The SMC's were also used with the flow record at each site to calculate pollutant loadings during the sample period. The sample event loadings were extrapolated to seasonal loadings by using a local precipitation record. Pollutant export coefficients for the wet season were calculated by dividing the seasonal loading by the watershed area.

Analysis of SMC's

There was little change in the SMC's from 1996 to 1998. We also tested the results from the grab sample sites. Any significant changes determined at those sites have been mentioned above. A discussion of the statistical analysis is contained in Appendix D in the Statistician's Report.

WA01 and WA04 were discontinued after 1996 because the concentrations were so low we didn't think any improvement could be detected. WA05 results were even lower, but we continued there because of the importance of the South Fork resources. We determined the following statistically significant changes in site SMC's:

- WA-02 showed a decrease in total and dissolved Cr and dissolved Ni.
- WA-03 - Main stem had a decrease in dissolved Ni, TSS increased. The TSS is likely due to a road construction project at 509 that had difficulty with erosion control.
- WA-05 South Fork had a decrease in dissolved Zn, an increase in total Nitrogen.

Pollutant Loadings

By comparing the total pollutant load we take into consideration the quantity of runoff in addition to the pollutant concentration. If we assume the amount of pollutant available for washoff is limited, then a wet season with more overall rainfall should have lower concentrations because more runoff is carrying the same amount of material. Calculation of loading involves another measurement (flow) that introduces more error into the results.

We used two methods of calculating the annual stormwater pollutant load at the automatic sampler sites. These methods are discussed in detail in the Bellevue stormwater characterization study (City of Bellevue Utilities Department, 1995). Unlike Bellevue, we did not perform an analysis of baseflow loading. Both methods use the SMC to represent the range of pollutant concentrations in the stream during storm runoff conditions. The methods also use stream discharge data for the sample period. We determined the mean discharge at each automatic sampler site for each sample period.

The Direct Average Method uses the product of the SMC and the mean discharge for the sample period to give the mass pollutant load for the sample period. Mean stream discharge for the sample period is assumed to be proportional to the total rainfall for the sample period. The sample loadings are expanded to seasonal loadings using rainfall data and the ratio:

Total rain in study period / Total rain contributing sampled runoff

The rainfall ratio varied slightly from site to site because of different sample start times and start dates, and our estimation of time of concentration in the catchment. For WA03, the ratio in 1996 was 46.76/3.59 inches. In 1998 the ratio was 28.86/3.85 inches.

The Wet Season pollutant load using the Direct Average Method is the product of:

(the sum of the individual sample period loadings) x (the rainfall ratio.)

The Modified Direct Average Method calculates the Wet Season pollutant load with the product of:

(the statistically appropriate mean of pollutant SMC's) x (the total sample period flow volume) x (the rainfall ratio).

The statistic used to estimate the annual storm runoff pollutant concentration has some uncertainty. If the sample concentrations at each site never varied, the two methods would achieve the same results and the variance would be 0. This was not the case. We followed the method Bellevue used to calculate confidence intervals around the mean SMC's. The confidence intervals as variability in the set of individual SMC's increases. A table summarizing the calculations for the Direct Average Method is included for each site. The table Wet Season Loading Comparison contains the statistics for the Modified Direct Average Method for each site and the change between 1996 and 1998.

Export Coefficients

We calculated pollutant export coefficients for the wet season for each automatic sampler site. The samples for both 1996 and 1998 are combined for the three sites that were not discontinued after 1996. These numbers tend to lose meaning as a watershed gets larger and more varied in land use. The coefficients can serve as an index of pollutant washoff from the catchment area. Export coefficients are not very accurate. For example, the confidence intervals for storm export coefficients calculated for the Bellevue study (City of Bellevue Utilities Department, 1995) were frequently separated by factors in excess of twenty. Accuracy is affected by the variability in stormwater concentrations and the quality of the flow data. When using the Hamm Creek export coefficients for comparison to other watersheds, keep in mind they represent loading from stormwater runoff in the wet season (October - April) and do not include baseflow loading.

Site WA-04, Middle Fork Hamm Creek had by far the lowest export coefficients for every parameter tested. WA-01, Lost Fork had the second lowest coefficients for every parameter. WA-03 Main Stem had the highest values for every parameter except Zn. Except for Zn at WA-02 and WA-03, most storm export coefficients for the Hamm Creek sites were the same or lower than those reported for various land use types in the Bellevue study.

Site by Site Analysis

The following pages provide a site by site analysis of the water quality sampling.

[redacted]	WA-01	[redacted]	Automatic Water Quality Sampling
[redacted]	Lost Fork tributary to Hamm Creek		
[redacted]	Manhole east of highway 99 at corner of South 96th and West Marginal PL South. Flow is conveyed through a 24 inch corrugated metal pipe.		

DESCRIPTION OF DRAINAGE: This site collects flow from the South 96th Street drain east of 10th Avenue South, an area of about 114 acres. Land use within the subbasin consists of approximately 60 percent residential use, 25 percent commercial and light industrial use, and 15 percent open space, mostly electrical transmission right of way. About five acres of SR 99 runoff is collected. (Herrera, 1994)

DESCRIPTION OF DISCHARGE MONITORING: This was monitored in a large catch basin east of Highway 99. Water level measured with a capacitance probe instrument. A rating was developed from a backwater analysis of the outlet pipe that was calibrated with two direct discharge measurements. The water level at this site was influenced by the tidal condition of the Duwamish River.

RESULTS: We collected eight samples in 1996. The median TSS of 65 mg/l was the middle of the automatic sampler sites. One sample with 337 mg/l TSS affected the results. Road construction activities upstream may have contributed to the TSS then. The median was about 30% lower than TSS at similar sites in Bellevue, and about 50% of Chandlers TSS concentration for Seattle area stormwater. Metals concentrations were average for the study. Concentrations for total metals were 1/4 - 1/2 those found in similar land use areas in the Bellevue study. No samples exceeded State Water Quality Standards. One TPH result exceeded 10 mg/l. The rest of the samples were in the expected range for a basin with heavy auto use.

This site was not sampled in 1997-98 because the pollutant concentrations were low enough to lead us to believe no change could be detected. Also, road work caused diversion of stormflows and some mixing with South Fork flow, enough to make a before and after comparison unreliable.

Site No.	WA-02	Type	Automatic Water Quality Sampling
Site Name	North Fork of Hamm Creek		
Location	Monitor in manhole at corner of South 96th Street and 8th Avenue South.		

DESCRIPTION OF DRAINAGE: Flow is conveyed through a 36 inch corrugated metal pipe. Represents an area of about 200 acres including light industrial land use along South 96th. Despite repeated efforts over many years, the exact makeup of this drainage system is not known.

DESCRIPTION OF DISCHARGE MONITORING: This flow was monitored in a catch basin on the road shoulder. A capacitance probe measured water level. All instrumentation was contained in the catch basin. Access was difficult to this confined space. A backwater analysis was made on the outlet pipe to produce a rating. Two direct discharge measurements were made in the catch basin to calibrate the rating. Gravel and debris would frequently partially block the outlet pipe, rendering the rating inaccurate. We could estimate the effect of the debris by looking at changes in the baseflow water level.

RESULTS: We collected eight samples in 1996, ten in 1998. TSS and Hardness were similar in both 1996 and 1998. The TSS concentration was about 1/2 that found in other studies of similar watersheds. There was a statistically significant reduction in the SMC's of two dissolved metals, Cr and Ni. Dissolved Cr concentrations in 1998 were reduced to 1/8 those in 1996. Total Cr was reduced to 1/3 the 1996 level. Dissolved Ni was reduced 1/2 from 1996 to 1998. As, Cd, Cu, and Pb stayed about the same. None of the samples exceeded the State Water Quality Standards for acute exposure for those metals and the SMC's were similar or below those found in other studies in the region. Total and dissolved Zn was higher here than any other site. Total Zn concentrations averaged about 0.5 mg/l and were two times higher than the next highest site, and two times higher than regional average concentrations. Dissolved Zn concentrations exceeded State Water Quality Standards for acute exposure in 16 out of 18 samples. The Zn SMC's showed a slight (not statistically significant) increase from 1996 to 1998.

TPH did not change significantly between 1996 to 1998. TPH SMC's were about 2 mg/l. No samples exceeded 10 mg/l.

The wet season loading for metals was reduced from 1996 to 1998. The loading of Cd, Cr and Ni were reduced by over one-half.

COMMENTS: This sampling site is downstream from the Advance Electroplating site that was involved in an EPA Superfund cleanup. No downstream analysis was done at the completion of this cleanup as offsite mitigation was not addressed during the EPA cleanup. The potential plume of contaminants was touched upon during the clean up and on site mitigation but further data collection was not completed as part of the cleanup effort. Contamination of downstream sites was not addressed during the EPA site

mitigation and cleanup or offsite impacts from this specific site were not addressed or further researched. Also, a question still exists as to whether or not the drainage systems from upstream businesses such as Ace Galvanizing truly drain to this monitoring site. If the onsite drainage systems from businesses such as Ace Galvanizing, Allied Body Works, Selland Trucking, and Northwest Motor Freight/Lassiter Trucking do in fact drain to this manhole, then these would all be sources of metal sources. However, all of these businesses have implemented source control BMPs to the extent that the King County Code 9.12 requires. In fact the majority of these businesses are King County Businesses for Clean Water members.

Other commercial sites may drain to this sampling site. Such businesses include Sound Delivery Services and Rasmussen Wire Rope storage yard facility. These two sites have had extensive filling with CKD (cement kiln dust) that have shown high metals concentrations on other sites within the basin. As these sites are not paved and are strictly storage facilities, BMP requirements have been somewhat difficult to implement.

[redacted]	WA-03	[redacted]	Automatic Water Quality Sampling
[redacted]	Mainstem of Hamm Creek		
[redacted]	Monitor in manhole at corner of 95th and 15th Avenue South, east of highway 99.		

DESCRIPTION OF DRAINAGE: Collects flow from about 950 acres and includes flow from the North and Middle Forks of Hamm Creek. Flow is conveyed through a 72 inch corrugated metal pipe.

DESCRIPTION OF DISCHARGE MONITORING: Flow was monitored in a large catch basin east of Highway 99. A two-meter capacitance probe measured water level. The rating was developed from direct discharge measurements. The probe signal wire and the sampler intake tube were routed about 25 feet through a pipe and out a small grate to a wooden housing for the data logger and sampler. This site experienced significant tidal influence. Storm hydrographs based on measured water level were inaccurate. We corrected for tidal influence when calculating discharge during sampling periods.

RESULTS: We collected nine samples in 1996, ten in 1998. The TSS results showed 44 mg/l to 108 mg/l in 1998. A major highway construction project in the upper watershed had erosion control problems and contributed noticeably to the statistically significant change from 1996 to 1998 increasing from a mean SMC of sediment load in the Main Stem. A large lot with exposed soil in the lower watershed also had difficulty keeping sediment laden runoff from entering the stream. Hardness increased slightly from 1996 to 1998.

Total metals concentrations tended to increase by about 30% from 1996 to 1998. The increase in particulate metals corresponds to the increase in TSS. Dissolved metal SMC's showed variable change. Dissolved Cr increased by about 35%, dissolved Cu decreased 22%, and dissolved Ni decreased 37%. The concentrations for Cr, Cu, and Pb were the highest of the automatic sampler sites. Concentrations of these metals were higher than in samples from Mercer Creek in Bellevue, a watershed with a similarly varied land use. Zn was much lower. The Mercer Creek samples had about the same TSS as at WA03. The State Water Quality Standard for acute exposure to Zn was exceeded in five of the nineteen samples.

TPH did not significantly change from 1996 to 1998. Two samples in 1996 were about 10 mg/l TPH. The remaining 17 samples of the study ranged close to 1 mg/l.

COMMENTS: This sampling site may have been affected by a business park that has a variety of businesses that seem to be transitory in nature and very little involvement from the property owner/manager in implementation of BMPs.

[redacted]	WA-04	[redacted]	Automatic Water Quality Sampling
[redacted]	Middle Fork of Hamm Creek		
[redacted]	Monitor in a six-foot diameter catch basin above South Park Apartments.		

DESCRIPTION OF DRAINAGE: Flow from the Middle Fork is conveyed through a 48 inch round concrete pipe. It drains a residential and golf course area of about 480 acres. The drainage also includes: two public schools, two large churches and a large condominium complex.

DESCRIPTION OF DISCHARGE MONITORING: Monitored in a deep catch basin downstream of a wooded ravine. The rating was developed from a backwater analysis of the flow through the structure. Debris accumulations in the catch basin made the rating inaccurate much of the time. This is a confined space site.

RESULTS: We collected eight samples in 1996. TSS was very low for urban runoff. The hardness was typical, 56 mg/l. Nutrients were in the normal range of runoff from urban residential watersheds. Total P concentrations were lower than those found in grab samples taken by King County at the site in 1993. Metals concentrations were about 1/2 those found in Mercer Creek in Bellevue and much less than the grab samples taken by King County in 1993. No samples exceeded State Water Quality Standards for acute exposure to metals. Concentrations of As were about the same as those at WA03, about 0.005 mg/l total, 0.0035 dissolved. One sample had TPH of 9 mg/l. The rest were about 1 mg/l. Diazinon, an insecticide, was detected in the December 9,1995 sample at a concentration of 0.419 parts per billion (ppb). The United States Geologic Survey (Bortleson and Davis, 1997) reported Diazinon in Seattle area urban streams in concentrations ranging from 0.009 to 0.14 ppb. The National Academy of Sciences (National Academy of Science, 1972) recommends a maximum aquatic concentration of 0.009 ppb for Diazinon. This effectively means no detectable Diazinon is acceptable. We continued to sample for Diazinon but it was not detected again. No other pesticides or herbicides were found.

This site was not sampled in 1997-98 because the pollutant concentrations were low enough to lead us to believe no change could be detected.

COMMENTS: This sampling site collects drainage after going through a heavily wooded and native growth area. Flows are naturally treated though this area and pollutants are likely removed through this section of very natural landscape.

Site No.	WA-05	Type	Automatic Water Quality Sampling
Site Name	South Fork of Hamm Creek		
Location	Monitor in a channel east of highway 99 near the corner of South 96th and West Marginal Place South.		

DESCRIPTION OF DRAINAGE: Flow is monitored in an open channel before it enters a 48-inch round concrete pipe through a berm. The channel is approximately six feet wide. Drains 300 acres of residential and golf course and includes about 3 acres of highway 99 drainage.

DESCRIPTION OF DISCHARGE MONITORING: This was an open channel site monitored about 100 feet before the stream enters a pipe system. Here, a combination of beaver dam construction in the pipe downstream along with human interventions made the rating unreliable in the short term. We did not have extra time available to measure discharge, calculate rating shifts and reprogram the data logger before storms.

RESULTS: We collected nine samples in 1996, ten in 1998. TSS concentrations increased somewhat from 1996 to 1998. Increased hillside erosion in the ravine upstream of the monitoring site contributed to the increase. The median TSS was much lower than that found at streams in Bellevue. TSS was variable, ranging from 61 mg/l to 180 mg/l. Hardness was 65 mg/l, typical. Despite the increase in TSS, average Total P concentrations were about 20% lower in 1998. Total P was on the low end of normal compared to the results of the Bellevue study. Total N showed a statistically significant increase of about 35% from 1996 to 1998. The 1998 Total N concentrations were about two times that of the samples from the Rainier Golf Course. On the other hand, the average Ammonia concentration at WA05 was about 1/2 that at the golf course. The 1998 Total N concentrations were twice as high as found in studies of similar watersheds. We did notice more spawning salmon in the South Fork in 1998, which may have contributed to the increase in Total N.

Total metals concentrations stayed the same or decreased a little between 1996 and 1998. Dissolved Zn was reduced by about 1/2, and showed a statistically significant decrease. Other dissolved metals stayed the same or showed a slight decrease. Metals concentrations were very low compared to other studies in the region. No samples exceeded State Water Quality Standards for exposure to metals.
Of 19 samples tested for TPH, two were about 9 mg/l, nine were 2 mg/l or less, and seven were below detection limit.

Comments: The South Fork shows some affect from its urban setting, but generally the stormwater quality is good.

Site Site	WG-01	Water Quality Grab Sample	
Site Name	Multi-Family Site		
Description	Sample from the 12-inch pipe from the detention control structure for the apartments at 9914 Des Moines Way South where it drains into a catch basin on the east side of the street.		

DESCRIPTION OF DRAINAGE: This site is a 1.8-acre site that has been developed into eight six-plex apartment units. Each building is owned by a different individual, therefore making BMP implementation extremely difficult. The site is almost 100% impervious. This site drains to the "Lost Fork" by way of flows along Des Moines Way South, which conveys flows to the ditch next to McDonalds and the Auto wrecking yard. These flows don't get to the South Fork directly. They mix at the cross culvert under W. Marginal or HWY 599 and possibly the pipe section to Delta Marine.

DESCRIPTION OF MONITORING: Runoff from an apartment complex collected in a floatables separating catch basin. This discharged through a small pipe to a catch basin along Des Moines Memorial Way S. Lab bottles were filled directly from the discharge pipe.

RESULTS: Eight samples were collected in 1996, ten in 1998. The samples from this site were very low in suspended solids and hardness. The metals concentrations were lower than the median values for all samples in this study, and much lower than the results from other studies. The results for As, Cd, and Cr were all near the detection limit. Results for dissolved Cu and dissolved Ni were at the median for the study and about the same as the concentration found in the Lost Fork. Although the concentrations were relatively low, five samples exceeded the standards for acute exposure to Cu and eight samples that of Zn. The very low hardness of the runoff made the criteria very low. For example, the sample mean for dissolved Cu at site WA01 was a bit higher than that at WG01, but because the samples at WA01 had three times the hardness they did not exceed the acute standard.

Median nutrient concentrations were not high compared to other sites in the study, but some of the highest individual sample concentrations for Total Phosphorous and total Nitrogen came from this site. Median Phosphorous was about 50% higher here than in Bellevue high density residential sites, but lower than from other land uses. The 1998 sample phosphorous concentrations were lower than those of 1996. Nitrate+Nitrite concentrations significantly increased from 1996 to 1998. The 1996 sample concentrations were very low compared to the South Fork and other similar sites. The 1998 concentrations were about four times higher than in 1996, and similar to the concentration in the South Fork.

TPH results were among the highest of the study. The sample mean was about the same as Bellevue found from an established high density residential site, but much higher than from a recently constructed multifamily neighborhood. The King County Surface water Design Manual (King County Department of Natural Resources, 1998) calls for oil/water

separators to be installed in high use sites upstream of sensitive areas. The performance criteria for these separators is a release of 10 - 15 mg/l TPH. Of 17 samples at WG01, one failed to meet the 10 mg/l criteria, and one was slightly above 15 mg/l.

This site was probably typical of other high density residential areas along the Des Moines Way corridor that drain to the South Fork. The runoff from this site contributed nutrients to the Lost Fork at about the same rate as the rest of the watershed, metals concentrations were not unusual, and the oil separator was reasonably effective at keeping petroleum products out of the system. If this site is typical of the area, the same would hold true for the effect on water quality in that drainage.

COMMENTS: Some of the property owners have made attempts to implement BMPs and the newer owners are much more receptive to the requirements of KC Code 9.12. The tenants in general do not speak English and therefore we have found a cultural barrier in making changes to such activities as on site vehicle maintenance, vehicle washing, etc. Some of the newer owners of the property have been very interested in doing some outreach to their tenants and getting the complex cleaned up in a general sense.

	WG-02	Water Quality Grab Sample
	Drainage from Clarklift	
	Sample from the outlet of 12 inch concrete pipe that drains into the roadside ditch along south side of South 96th, 15 feet east of entrance to parking lot of Clark Lift.	

DESCRIPTION OF DRAINAGE: Clarklift is a 2.3-acre site that is 100 % impervious. All drainage from this site drains to the sampling site. The business deals with heavy equipment leasing and maintenance and has extensive outside storage of the equipment.

DESCRIPTION OF MONITORING: Runoff from this commercial site discharged from an eight-inch diameter pipe to a roadside ditch. The discharge pipe was partially submerged by the ditch water level most of the time. Bottles were filled inside the mouth of the outlet pipe. There was adequate flow out the pipe so that the ditch water was not sampled.

RESULTS: Eight samples were collected in 1996, ten in 1998. No sample pollutant concentrations had statistically significant changes from 1996 to 1998. WG02 had some of the highest Cd concentrations of the study, mainly because Cd was rarely detected at other sites. The Cd concentrations were in line with those of the Bellevue characterization study industrial sites, and the median value from Chandler's study. Concentrations of dissolved Cu and dissolved Zn were comparable to highway runoff and all eighteen samples were in excess of State Water Quality Standards for acute exposure, due in part to the low hardness of the sample water. The concentrations for those two dissolved metals were similar at site WA03, Main Stem Hamm Creek, yet only one of nineteen WA03 dissolved Cu samples exceeded the State Water Quality Standard for acute exposure, and five of nineteen samples exceeded the acute standard for dissolved Zn.

Every sample from WG02 had detectable TPH. Most samples were in the 2 mg/l - 5 mg/l range. The first sample of the 1998 season had 124 mg/l TPH, the highest of the study. This was about ten times the next highest value. The field sampler observed quantities of coagulated grease in the sample. The median TPH value from eight samples from a Bellevue Warehouse site was 8.9 mg/l.

The Clarklift site contributes a detectable amount of metals to the Hamm Creek system, but appears to be no more than an average source. Eighty three per cent of the TPH samples met the 10 mg/l performance standard for oil water separators.

COMMENTS: This site has implemented a wash rack system where water from steam cleaning activities is discharged to the sanitary sewer system through a two-way connection. During steam cleaning activity the connection to the sanitary sewer system is activated by way of a two-way switching system located in their designated wash area.

Washwater is discharged to the sanitary sewer system through a series of oil water separators. When equipment washing is not occurring a valve is activated that redirects storm water through the onsite storm drainage system that also goes through a series of oil/water separators. Concerns still exist with this dual system in regards to residue that may build up in the conveyance system that may be flushed into the stormwater system during the change over from sanitary to storm. This method falls within compliance regulations of both King County and the State DOE regarding BMPs for businesses. After site visits with Clarklift changes such as outside storage practices, type of paint used in repair of forklifts to reduce potential heavy metal contributions, alternative disposal of paint booth filters, and policies on how to deal with forklifts that were stored outside waiting for repair work was handled.

	WG-03	Water Quality Grab Sample
	Allied Body Works	
	Sample from the outlet of 24 inch concrete pipe that flows from the control structure into the ditch along the east property line near the back of the property. 625 S. 96th Street	

DESCRIPTION OF DRAINAGE: This is a 1.7-acre site that is 100% impervious. The property has an onsite R/D system that the property owner has maintained to King County standards each year. This site is adjacent to the Penberthy Electromelt property and does receive some stormwater flows from that property.

DESCRIPTION OF MONITORING: Runoff from this commercial site collected in a discharge control vault before discharging through a twelve-inch pipe to a ditch. The outlet pipe was partially submerged by the ditch water level. Bottles were filled in the mouth of the pipe and in 1996, there was adequate flow out the pipe so that ditch water was not sampled. In the 1998 sampling season, the ditch became severely overgrown with vegetation. The water level was frequently backed up over the top of the pipe. We did not sample during this condition. We took one sample directly from the control structure.

RESULTS: Seven samples were collected in 1996, six in 1998. Submergence of the outfall kept us from obtaining some samples. No statistically significant changes were observed from 1996 to 1998. Hardness and TSS were very low. Most metals were low compared to other sites in the study. Mean dissolved Cu concentration was about 60% that of WA02, North Fork Hamm Creek, which WG03 appears to drain into. Dissolved Cr and Ni were less than 1/3 the concentration at WA02. The exception is Zn, both total and dissolved. Total Zn was at the high end of the range of typical stormwater concentrations. The median dissolved Zn concentration matched that at site WA02, North Fork Hamm Creek, which WG03 drains into.

Two TPH samples were between 10 mg/l and 15 mg/l. Of the remaining 11 samples, three were no detects, three were less than 1 mg/l, and five were less than 3 mg/l. Given the activities at this site and density of parked vehicles, the metals and TPH concentrations are pretty low. The site appears to be an average source of dissolved Zn for this part of the watershed.

COMMENTS: When first visited, this business had a lot of metal parts from vehicles they were working on stored outside on the ground with out any covering. They also did welding and burning outside and were not very good about sweeping up the metal debris or cuttings left on the ground. They had fuel, waste oil and barrels of unknown contents stored outside. After working with the owner, outside storage is now raised off the ground and covered where necessary. Secondary containment and cover has been provided for liquids stored outside. Cutting/welding has been moved inside, but when it does occur on an occasional basis, the metals are swept up right away. The shop manager

has been very helpful in getting staff trained in BMPs and implementing new policies. The owner has also been very helpful and supportive in initiating changes.

[redacted]	WG-04	[redacted]	Water Quality Grab Sample
[redacted]	Rainier Golf Course		
[redacted]	Sample from the shallow catch basin by the gate in the golf course fence near corner of South 107th and 20th Avenue South.		

DESCRIPTION OF DRAINAGE: The majority of the drainage to this catch basin is from the golf course greens and fairways. Some of the drainage is also from roadways (Glendale Way South) and residential and condominium properties that have tied private footing drains into the golf courses drainage system.

DESCRIPTION OF MONITORING: Sampled from a shallow catch basin from a twelve inch pipe that conducted flow from a portion of the golf course.

RESULTS: Seven samples were taken in 1996, ten in 1998. TSS and Hardness were about average for the study however; WG04 had the highest TSS concentrations of any of the sites tested for nutrients.

Total P had the highest mean concentration of the study at 0.312 mg/l. Total P concentrations tend to increase in stormwater as TSS increases, with the carried soil adding to the phosphorous load. This was the case in Hamm Creek too. The phosphorous results were similar to those found in other studies in the region. Concentrations in the Bellevue study ranged from 0.16 mg/l to 0.46 mg/l. Chandlers mean TP concentration synthesized from Puget Sound studies was 0.32 mg/l.

There was no pattern to the results for nutrients. Nitrate+Nitrite at WG04 was also typical for stormwater in the region but lower than other Hamm Creek sites. Ammonia was lower than most of the concentrations in the Bellevue study, but two to three times higher than other Hamm Creek sites.

Dissolved Zn showed a statistically significant decrease from 1996 to 1998. The average sample concentration was reduced about 30% from 1996 to 1998. Total Pb and Zn had decreases of 20% and 25% respectively. Dissolved Zn ranged from 25% to 100% of the Total Zn concentration. Metals concentrations were low in the WG04 samples compared to other stormwater results in the region. None of the metals samples exceeded State Water Quality Standards for acute exposure.

One sample had 9 mg/l TPH. The rest were at or below 1 mg/l. Samples from WG04 were also tested for pesticides and herbicides. All results were below detection limits.

COMMENTS: Rainier Golf Course started to implement stormwater BMPs in their maintenance shop area after a water quality audit was completed with maintenance staff/ Washwater from maintenance of vehicles has been temporarily rerouted to a grassy area for infiltration. An upgraded washwater recirculation system is in the works for 1999. Upgrades and reconstruction of greens and fairways has occurred during the past year and

a half that may have contributed to elevated TSS results. Also, new construction and work by the local water and sewer utility district may have contributed to some of the results in our sampling data. Uncontrolled roadway drainage from Glendale Way may have effects that were not considered when choosing this site for sampling.

	WG-05	Water Quality Grab Sample
	Highway 99 Runoff	
	Sample from the 12-inch concrete pipe that flows into South Fork Hamm Creek channel along West Marginal Place South, approximately 100 feet south of South 96th Street.	

DESCRIPTION OF DRAINAGE: Road drainage from the northbound and southbound lanes of Highway 99 is collected in a median area and conveyed to a shallow pipe and catch basin system along W Marginal PL South. The frontage roadside also contributed to the runoff.

DESCRIPTION OF MONITORING: We sampled runoff from a pipe draining a section of highway 99 that paralleled West Marginal PL South, south of S 96th ST. This culvert drained into the South Fork of Hamm Creek, about 100 meters above our gage location. This was sampled once in 1996 and once in 1998. The 1998 sample was obtained from the first catch basin upstream of the pipe outlet. The South Fork channel had changed and the pipe outlet was submerged.

RESULTS: We were looking for any unusually high or unexpected contribution from the highway runoff, a source that would be unaffected by our prevention efforts. This site was sampled twice, December 9, 1995 and November 19, 1997. The 1997 sample had 30 times the TSS of the 1995 sample. It was raining harder then and a considerable amount of roadside dirt was mobilized. The total metals concentrations were two to ten times higher than the maximum concentrations in South Fork Hamm Creek. Total and dissolved concentrations of both lead and zinc were some of the highest in the study. Only the zinc concentrations were abnormally high for compared to other studies. The TPH was concentration was very low, less than 1 mg/l., although another test found diesel and heavy oil at a concentration of 2 mg/l. The hardness adjusted State Water Quality Standards for acute exposure to dissolved Cu and Zn were exceeded.

COMMENTS: Highway 99 runoff may be a significant contributor of total and dissolved copper, lead and zinc to South Fork Hamm Creek. Improved street sweeping or catch basin maintenance could keep the particulates out of the stream system.

[redacted]	WG-06	[redacted]	Water Quality Grab Sample
[redacted]	City of Seattle Drainage from North		
[redacted]	Sample in the shallow catch basin on northwest corner of 10th Avenue South and the extension of South 95th Street. By the entrance to Zimmerman Moving and Storage.		

DESCRIPTION OF DRAINAGE: This area is business properties located in the Seattle City limits but draining to Hamm Creek. It consists of a combination of gravel and paved areas and various sizes and types of piped conveyance systems. As this is in the City of Seattle, we had little information on which sites had R/D systems.

DESCRIPTION OF MONITORING: We sampled runoff from inside the City of Seattle limits entering the Hamm Creek watershed. This drained a commercial area with heavy truck traffic, as well as some Highway 99 runoff.

RESULTS: One sample was taken in 1996 and nine taken in 1998. This drained a commercial area with heavy truck traffic, as well as some highway 99 runoff. The estimated discharge ranged 0.2 to 1.0 cfs, usually at about 0.5 cfs. The pH of the samples was high, reflecting the nearby kiln dust deposits. The concentrations in the runoff samples from this site were among the highest for TSS, both total and dissolved Cr, total Cu, total Ni, total Pb, total Zn. Concentrations for dissolved Cu, Ni, and Zn were some of the lowest of the study. The total zinc concentrations were the equal of the highest found in the Bellevue Characterization study. The dissolved metals concentrations exceeded State Water Quality Standards for acute exposure to Zn once (the 1996 sample). TPH concentrations ranged close to the median value of the study. The runoff from the 10th AV drain contributes considerable suspended sediment with a heavy load of metals, especially total and dissolved Cr and particulate Zn.

COMMENTS: As this area is under the jurisdiction of the City of Seattle, we were hesitant at doing much more than technical assistance site visits. We did receive the OK from the City to tell the businesses that the City has similar Ordinances to King County and did want the businesses to implement BMPs we suggested. None of the sites visited have come into compliance with the County's Water Quality Code.

	WG-07	Water Quality Grab Sample
	Initial water scan site	
	A composite from grab samples taken at sites WA-01, WA-04, and WA-05. Access to the 72-inch culvert entering Duwamish River was not accessible at this storm.	

DESCRIPTION OF DRAINAGE: The initial scan site is representative of the entire watershed - a mix of residential and industrial land uses.

DESCRIPTION OF MONITORING: The sample that was analyzed for a full scan of pollutants was obtained December 9, 1995. Access problems precluded obtaining a single sample from near the mouth of Hamm Creek. We composited grab samples from the three forks of Hamm Creek before their confluence. The samples were composited proportionally based on measured flow in the channels and then subsampled into bottles for laboratory analysis.

RESULTS: This site was only monitored during the 1995-96 storm season. We analyzed for conventional pollutants, trace metals, and priority organic pollutants. Of the organic pollutants tested for, some solvents and combustion byproducts were found at close to the detection limits. The insecticide diazinon was detected. Diazinon was also found upstream in the Middle Fork sample. No petroleum hydrocarbons were detected. The results for conventional pollutants and trace metals were all within the range of expected values for urban runoff in the Puget Sound area.

No samples taken in 1997-98 storm season.

[redacted]	WG-08	[redacted]	Water Quality Grab Sample
[redacted]	Freuhauf Trucking		
[redacted]	10th Ave - north of S. 96th street.		

DESCRIPTION OF DRAINAGE: The contributing drainage area to this site is a 4.5 acre gravel parking and storage lot for truck and trailer rigs. There is an R/D pipe for the easterly portion of the property.

DESCRIPTION OF MONITORING: This site was added at the request of the Water Quality Engineer. Runoff from a large graveled truck and trailer parking area and maintenance shop was sampled from a catch basin in the parking area. In 1996, samples were taken from a 36-inch diameter pipe that conveyed most of the runoff from the property. Another smaller pipe also added a small amount of drainage to the catch basin; this was not sampled. In 1998, downstream conditions created a backwater into the catch basin that often submerged the 36-inch pipe. Only three samples were taken from this pipe in 1998. The fourth 1998 sample was taken from the mixed water in the catch basin.

RESULTS: Three samples were collected in 1996, four in 1998. The pH of the samples here was very high. The areas kiln dust deposits are responsible for these results. The TSS and hardness were by far the highest of the study. The fines in the parking lot gravel were easily washed into the conveyance system. This site had the highest total metals concentrations of the study, as could be expected given the high TSS. Concentrations of dissolved As, Cr, Cu, and Pb were all the highest of the study. Dissolved Zn was the lowest mean concentration of all the sites. Thanks to the high hardness in the samples, only one sample result exceeded State Water Quality Standards for acute exposure. The concentrations for total metals were about the same at this site as Bellevue found in runoff from light industrial areas.

The results for TPH were variable, ranging from no detect to 44 mg/l. Some samples had a strong petroleum odor. The samples were tested for volatile and semi-volatile organic compounds. Low concentrations of solvent compounds were detected and some combustion related phthalates in two of the samples in 1998.

COMMENTS: This property was leased to an independent trucking company (RPCI) during most of this project. This independent company was reluctant and difficult to work with as far as implementing BMPs. Trucks and trailers were parked on this site adjacent to catch basins that collect uncontrolled site runoff of stormwater. Therefore, the potential for adding pollutants to the adjacent stormwater systems where samples were being taken was very high. This site is entirely gravel and also one of the sites that have had cement kiln dust used for fill over the years. This business (RPCI) no longer occupies the site, Fruehoff Trailer (and its new parent company) now have control over the site. The property owner has initiated additional work on BMPs and this site should show improvements in the quality of stormwater runoff from the site.

Results of Sediment Sampling

Sediment samples were collected from stormdrain catch basins in the Hamm Creek drainage basin during 1996 and 1998. This section documents the results of the chemical analysis of the sediment samples and also attempts to trace general sources of contaminants using information obtained from a previous analysis of street dust in South Seattle (Galvin and Moore, 1982), and previous stormdrain sediment studies in South Seattle (Tetra Tech 1988). Of the parameters analyzed for, 46 were detected in 1996 and 44 were detected in 1998. The highest concentration of any parameter found in both years was petroleum hydrocarbon in the heavy oil, or lubricating oil range in a stormdrain catch basin in a multifamily residential area. Most catch basin sediments showed concentrations of polynuclear aromatic hydrocarbons (PAHs), metals, and other chemicals that were consistent with concentrations previously reported in street dust (Galvin and Moore, 1982). However, concentrations of certain metals, PAHs, and lubricating oil in the catch basin sediments indicate other sources of these contaminants.

The laboratory results are summarized in two tables in Appendix D, 1996 Hamm Creek Sediment Sample Results and 1998 Hamm Creek Sediment Sample Results. The tables report only the parameters that were actually detected in the samples.

Methods

Samples were scooped by hand held stainless steel instruments from catch basins. An effort was made to collect sediment from representative locations in the catch basin. Samples were composited in stainless steel pots and laboratory jars filled from the composite. Clean equipment was used at each site.

Results

Pesticides and herbicides were tested for at two sites SD06, residential catch basin and SD08, the Rainier Golf Course catch basin. The banned but persistent insecticide Chlordane was detected in significant concentration at the residential catch basin.

Petroleum hydrocarbons in the heavy oil, or lubricating oil range were detected in every catch basin. No other previous studies were found that analyzed total petroleum hydrocarbons (TPH) in stormdrain sediments. This would be useful for comparisons to the current study to determine what levels of TPH are consistent with urban runoff and what levels are likely from a spill. However, the samples in both years for SD-01 were noted to be almost pure oil. Oil was also reported in the samples from SD-02 in 1998, SD-03 in 1996 and 1998, in SD-04 in 1996, in SD-05 in 1996 and 1998, and in SD-06 in 1996.

PAHs were also detected in most samples. High density PAHs (HPAHs) are byproducts of the combustion of fossil fuels, while low density PAHs (LPAHs) are more likely to be from uncombusted fossil fuels (Lee et al. 1977). Vehicle use and maintenance are likely to be sources for both LPAHs and HPAHs and are commonly found in urban runoff (Tetra Tech, 1988) (Galvin and Moore, 1982). In 1996, the highest PAH concentrations

were found at SD-02, however the sample from SD-01 could not be tested for these chemicals because it was too oily. In 1998, the highest PAH concentrations were found at both SD-01 and SD-02. Both LPAH and HPAH concentrations at these two catch basins exceeded the range of PAHs found in street dust from residential, commercial and industrial areas (Galvin and Moore, 1982), suggesting a source of PAHs other than urban street dust. The results of the toxicity test on some of the sediment samples are discussed below.

LPAH to HPAH ratios in analyzed samples can also suggest a relative source (Tetra Tech, 1988). The LPAH to HPAH ratio of SD-02 was approximately 1:6 in 1996 and was 1:8.7 in 1998. The ratio was fairly consistent showing that the source of PAHs to SD-01 was probably similar. The PAH ratio at SD-03 in 1996 was 1:6 showing that the sources of PAH to SD-03 and SD-2 were similar. The PAH ratio at SD-04 was 1:1 showing that the source of PAHs to this stormdrain were likely different than SD-02 and SD-03. SD-02 and SD-03 were located in light industrial areas serving a machine shop and truck repair shop whereas SD-04 was near a warehouse on highway 99. The PAH ratio at SD-05 was 1:3 in 1996. SD-05 was also located near a truck shop but the PAH ratio apparently shows a different PAH source. Two residential catch basins showed PAH ratios of 1:2 indicating similar sources of PAHs.

The highest concentrations of metals were consistently detected at SD-05 in 1996 and at SD-05 and SD-04 in 1998. The metals concentrations in the catch basin samples in the residential neighborhoods (SD-01, SD-06, SD-07, SD-08) were all within the range of metals concentrations found in urban street dust (Galvin and Moore, 1982). Concentrations of certain metals at the industrial sites exceeded the range of concentrations found in street dust suggesting additional sources of these metals (See Table 3).

Table 3. Catch basins that Exceeded the Range of Metals Concentrations Found in Urban Street Dust (from Galvin and Moore, 1982).

	1996	1998
Cadmium	SD-02, SD-03, SD-04, SD-05	SD-02, SD-03, SD-05
Copper		SD-02
Nickel	SD-02, SD-03, SD-05	SD-02, SD-05
Selenium	SD-04	
Silver	SD-02, SD-03	SD-04
Zinc	SD-05	SD-05

Cadmium levels at SD-05 were multiple orders of magnitude higher than catch basin samples from residential areas and were twice a high as the next highest industrial catch

basin. Nickel levels at SD-02 and SD-05 were several times higher than catch basin samples in residential areas and other industrial catch basins in both years. Zinc was also several times higher at SD-05 than at other catch basins.

Conventionals analysis showed that the highest total organic carbon (TOC) levels of 12.4 and 12.3 percent were recorded at SD-05 in 1996 and 1998 respectively. At other industrial sites, TOC ranged from 1.46 percent at SD-04 in 1998 to 8.28 percent at SD-03 in 1998. Total solids ranged from 27.5 percent at SD-08 in 1998 to 82.1 percent at SD-07 in 1996. No particle size analysis was performed on the samples. Particle size is of interest because metals and organics are more likely to adsorb to the finer particles and lighter organic matter in sediments. However particle size can be inferred from TOC, percent solids, and field notes. The highest TOC results were at SD-05. Also, total solids at SD-05 were relatively low at 41 to 48 percent. The lower the total solids the lower amount of coarse sediment, such as sand and gravel. This would indicate that the sample at SD-05 was composed of mostly fine grain silts. Field notes also estimate that this sample is mostly sandy silt. The low total solids, the high fraction of light organic particles, and field notes describing sandy silt all indicate that this catch basin is doing a good job capturing fine particles where most chemicals are adsorbed. This is also consistent with high metals concentrations at this catch basin. In contrast at SD-02, TOC ranged from 1.94 to 3.38, total solids ranged from 79.4 to 81.4 percent, and field notes described sand and gravel. This would indicate that most of the finer particles, where organic chemicals and metals adsorb, have been washed out of the catch basin. Therefore it is possible that if the catch basin were better at capturing the finer particles, the concentrations of organic chemicals and metals would be higher.

1996 to 1998 Comparison

There was little change in the sediment results from 1996 to 1998. The same pollutants showed up at the same places in about the same amounts.

Toxicity Tests

In both 1996 and 1998, samples from sites SD03 Clarklift, SD04 10th Ave. truck maintenance site, SD05 Allied truck body shop, SD07 Glendale Elementary School, and SD08 Rainier Golf Course were tested for toxicity using the Microtox bioassay test. This test uses luminescent bacteria as a test organism and measures the reduction in light production as an indicator of toxicity. A discussion of the methods and results by the laboratory is contained in Appendix D. All samples were found to be toxic except the 1996 sample from SD04, the truck maintenance shop. The laboratory is vague about whether the results imply any information about the relative toxicity of the sediment from each site. Notable was the low concentration compared to other sites of sediment from the golf course, SD08 required to produce a lethal reaction in the bioassay bacteria. The concentrations of petroleum products and other toxicants were the lowest at this site compared to the other study sites. It is possible that the detection limits for the pesticides tested for were not low enough to detect toxic residues. Also, the tests performed by the

laboratory for herbicides and pesticides could not detect some recently developed but commonly used products.

Sediment Conclusions

Chemical analyses of sediments from stormwater catch basins in the Hamm Creek drainage basin show high concentrations of heavy oil in industrial areas. Lower concentrations of heavy oil were found in catch basins in residential neighborhoods (with one exception). This trend shows that business practices in industrial areas of the basin may be contributing to the pollutant load in storm runoff above what has been found in street dust in other industrial, commercial, and residential areas. The one exception was SD-01, located in a multi-family residential neighborhood, where high heavy oil concentrations appeared to be caused by a spill (or direct dumping of oil). The concentrations of other organic compounds and metals at this catch basin are similar to other residential neighborhoods. Organic compound and metal concentrations in catch basin sediments located in industrial areas in the Hamm Creek drainage basin also show that business practices may be contributing to the pollutant load in storm runoff. Certain organic compounds and metals were found in concentrations above what has been found in street dust in other industrial areas.

Two factors could be influencing the results of the sampling. First, we were unable to arrange a cleaning of the catch basins between samplings. Our original plan was to sample, clean the catch basins and sample again. This cleaning did not occur. None of the catch basins were maintained during the project. Therefore sediment and any contaminants continued to accumulate throughout the project. Second, historically there is both sediment and ground water contamination in the project area. The influence of this historical contamination has not been factored into the analysis.

Site by Site Analysis

The following pages provide a site by site analysis of the sediment sampling

[redacted]	SD-01	[redacted]	Sediment Grab Sample
[redacted]	Multi-Family Site.		
[redacted]	Same site as WG-01.		

DESCRIPTION OF DRAINAGE: This site is a 1.8-acre site that has been developed into eight six-plex apartment units. Each building is owned by a different individual, therefore making BMP implementation extremely difficult as each building is owned by a separate entity. The site is almost 100% impervious.

DESCRIPTION OF MONITORING: Take the sediment sample from the first catch basin upstream from WG-01. This catch basin is an oil-water separator.

RESULTS: The sample was an oily, sandy mixture. The catch basin did not appear to have been cleaned between 1996 and 1998. Test results showed the samples to be between 30 percent and 40 percent heavy oil. Metals concentrations were low.

COMMENTS: The drainage system here was likely a receptacle for waste oil and regular maintenance of the facility does not seem to have been performed. Since the sampling ended, the properties at this sampling location have gone through ownership changes. These ownership changes have recently shown changes in behavior at the property. Basic things such as vehicle maintenance and vehicle washing have been changed to reduce pollution impacts to the drainage system. If we can continue to work with these new owners, we may see positive changes that were not happening during the course of the Hamm Creek project. Unfortunately, the sampling process has ended and we may not be able to show improvements other than through visual inspections through our continued commercial inspection program that has been re-instituted for 1999.

Site No.	SD-02	Type	Sediment Grab Sample
Site Name	15th Ave. South		
Location	Sample from the catch basin in the driveway of 9330 15th Ave. S. this is near S. 95th Street		

DESCRIPTION OF DRAINAGE: This sampling site may have been affected by a business park that has a variety of businesses that seem to be transitory in nature and very little involvement from the property owner/manager in implementation of BMPs.

DESCRIPTION OF MONITORING: Sample taken from a street catch basin about 6 feet deep. Sediment scooped out and composited.

RESULTS: The samples were a wet mixture of sand, gravel and oil. The 1996 sample was about 1 percent oil, the 1998 sample 0.5 percent oil. Significant amounts of Cd, Cr, Cu, Ni and Si were found.

COMMENTS: No improvement at this site between 1996 and 1998.

[redacted]	SD-03	[redacted]	Sediment Grab Sample
[redacted]	Clarklift.		
[redacted]	Same site as WG-02. Sample from the catch basin in the parking lot closest to the outfall in the ditch.		

DESCRIPTION OF DRAINAGE: Clarklift is a 2.3-acre site that is 100 % impervious. All drainage from this site drains to the sampling site. The business deals with heavy equipment leasing and maintenance and has extensive outside storage of the equipment.

DESCRIPTION OF MONITORING: Sampled from a floatables separating catch basin in the middle of a parking lot. Samples were a wet mixture of dark gray silt and sand.

RESULTS: Samples were a wet mixture of dark gray silt and sand. The 1996 sample was about 2 percent oil, the 1998 sample about 3 percent oil. Cd, Ni and Si were above street dust levels. Most metals showed a noticeable decrease between 1996 and 1998. Still, Cd, Cr, Cu, Ni, Si, and Zn concentrations were higher than the mean found in commercial area catch basin sediments by King County in 1993.

Site No.	SD-04	Type	Sediment Grab Sample
Site Name	10th Ave. South.		
Location	Same site as WG-08. Sample from the catch basin in the PRSTI?? Parking lot.		

DESCRIPTION OF DRAINAGE: The contributing drainage area to this site is a 4.5 acre gravel parking and storage lot for truck and trailer rigs. There is an R/D pipe for the easterly portion of the property.

DESCRIPTION OF MONITORING: Sediment was scooped out of the same catch basin water samples were taken from at site WG-08.

RESULTS: The samples were a wet mixture of silt and sand. The 1996 sample was about 0.7% oil, the 1998 sample about 0.5% oil. The concentration of Selenium was 21 ppm, about ten times higher than the other sample sites, which ranged between 1.5 and 3 ppm. Calcium at this site was about 20 times higher than at other sites, reflecting the kiln dust used on the parking area. Cd, Cu, Silver, and Zn were metals found in higher concentrations than King County found in commercial area catch basin sediments in 1993.

COMMENTS: There was no change in the results between 1996 and 1998.

[redacted]	SD-05	[redacted]	Sediment Grab Sample
[redacted]	Allied Body Works		
[redacted]	Same as WG-03. Sample in the control structure.		

DESCRIPTION OF DRAINAGE: This is a 1.7-acre site that is 100% impervious. The property has an onsite R/D system that the property owner has maintained to King County standards each year. This site is adjacent to the Penberthy Electromelt property and does receive some stormwater flows from that property.

DESCRIPTION OF MONITORING: Samples were scooped from a stormwater control catch basin.

RESULTS: The samples were a wet mixture of sand and silt. The 1996 sample was about 3% oil; the 1998 sample about 1.5% oil. Metals concentrations were the highest of all the sites. The same concentrations were found in 1996 and 1998.

COMMENTS: If the catch basin was not cleaned between 1996 and 1998, the results of improved BMP activities would not be reflected in the sediment samples.

[illegible]	SD-06	[illegible]	Sediment Grab Sample
[illegible]	Residential.		
[illegible]	Corner of S. 106th and 2nd Ave. S. Sample from the catch basin in the SW quadrant of the intersection.		

DESCRIPTION OF DRAINAGE: An area of single family homes. No curb and gutter on the streets.

DESCRIPTION OF MONITORING: Samples taken from a shallow catch basin.

RESULTS: Both samples were about 0.1% oil. The 1998 sample had a detect of 319 ppb Chlordane, a persistent organic pesticide. Metals concentrations were normal for residential catch basin sediment. The results did not change between 1996 and 1998.

[redacted]	SD-07	Sediment Grab Sample
	Glendale Elementary School	
	Take sample in the catch basin #10, which is 40' south of the west parking lot entrance on the east curb.	

DESCRIPTION OF DRAINAGE: Elementary school.

DESCRIPTION OF MONITORING: Sediment from 3 catch basins was composited and subsampled.

RESULTS: The samples contained less than 0.1% oil. The metals concentrations were among the lowest of the study.

COMMENTS: These samples indicate no source control problems at the Glendale School site.

Site No.	SD-08	Type	Sediment Grab Sample
Site Name	Rainier Golf Course		
Location	sample from the catch basin on 107th Ave. S. near 20th Ave. S., the first catch basin upstream from WG-04		

DESCRIPTION OF DRAINAGE: All drainage to this catch basin is from golf course greens and fairways.

DESCRIPTION OF MONITORING: Samples were scooped from a catch basin a few feet upstream of where the WG04 samples were taken.

RESULTS: The samples were a wet mixture of silt and sand with some plant material. The samples were less than 0.1% oil. Cd, Cr, and Ni concentrations were about twice as high as King County found in catch basin sediments in 1993. The results did not change between 1996 and 1998. No pesticides or herbicides were found.

Monitoring Conclusions

The monitoring results, when put to rigorous statistical tests, do not demonstrate an improvement in the stormwater quality in the Hamm Creek watershed from 1996 to 1998. The concentrations of some dissolved metals decreased at four sites, total metals increased at one site, and nutrient concentrations went up at two sites. One goal of our study was to determine if source control and public education could noticeably improve the water quality over a short period of time. We must conclude that we could not demonstrate a definite improvement in the one and a half year period.

It must be recognized that this study did not adequately take into account the impact from roadway drainage. We made conclusions based on business practices, however could not quantifiably address the additional affects from roadway drainage. We made comparisons with other industrial areas but the South 96th Street corridor varies significantly from other areas in its traffic use. The high average daily traffic trip ratio for S. 96th Street is probably much higher and concentrated than other areas studied based on the fact that it is a very narrow road right of way corridor with heavy truck and tractor trailer use. We had no way to control the pollutant input from roadway drainage. We can only assume its magnitude in this case based on the two samples taken from Highway 99 drainage.

Looking at the data more qualitatively, using average concentrations, the 1998 results show some improvement. Five grab sample sites had before and after data for seven metals. Of the 35 comparisons of 1996 to 1998 average concentrations of total metals, 14 showed improvement of 30% or more, 3 sites went up 30% or more, and the remainder did not change or the concentrations were too low to compare. For dissolved metals, 7 concentrations improved, 2 got worse. Three automatic sampler sites had before and after samples. For the 21 total metals concentrations, 2 improved, 5 got worse. For dissolved metals, 5 improved, no concentrations got 30% higher. When we consider loading at the three automatic sampler sites with before and after data, the total pollutant wash-off during the wet season improved for nearly every parameter from 1996 to 1998. In some cases the improvement was quite large. Much of this improvement though may be explained by the fact there was considerably less rain in 1998 and so less runoff.

The in-stream concentrations of toxic pollutants were significant but not unusual for the region. While the reputation the Hamm Creek may be that it is toxic, and suffers extreme water quality problems, the numbers do not bear this out. The pollutant concentrations in Hamm Creek are not much different than those in the streams of Bellevue, a mature suburban area. This is not to say that water quality is not a problem in Hamm Creek, but that if beneficial uses of the stream are degraded, water quality is not the only problem, and may not be the limiting factor.

VII. CONCLUSION

Overall this project was successful at meeting its intended goals.

- We developed a very comprehensive educational and assistance campaign.
- We reached some 6000 households on a regular basis with information about the creek and protecting the quality of its waters.
- We were successful in increasing awareness about the creek among businesses and residents.
- We were successful at forming a cooperative relationship with businesses for pollution prevention.
- We were successful at getting businesses to implement pollution prevention practices.
- We completed a comprehensive water quality monitoring project that gave us excellent baseline data to determine the state of water quality in this watershed.

Business Assistance

The business assistance work was successful in large part due to the visibility King County was able to achieve in the watershed. The blue King County van attracted attention and was a "reminder" to the business people that their BMPs needed to be in place and monitored on a regular basis. After the first few months the Water Quality Engineer's cell phone would ring when she was in the watershed and invariably it would be one of the business owners or managers calling with a question or problem.

The Businesses for Clean Water Program was also beneficial during the project. A business could become a member of the program once they were in compliance. Many of the businesses looked at this as a type of competition amongst themselves as far as getting the "blue BCW" sticker on their window.

In general, the business owners, managers, and staff were very enjoyable to work with and were interested in learning about protecting water quality. Many of the people working for these businesses live in or near the Hamm Creek Watershed. Many have lived in the area all their lives, or their families have lived in the area and remember when they could catch fish in Hamm Creek.

The most difficult business/properties to work with were the apartment complexes. So many of the tenants are very transitory and many do not speak English. It was very frustrating to see an apartment complex start to look good, then have a new group of tenants move in and have to start all over again with the education process. Also, there are three large business parks in the watershed. Two of the business parks have excellent property management and provide new tenants with information regarding pollution prevention when they move in. However, one of the business parks has an owner/property manager that isn't as involved, therefore new tenants are not informed of any requirements and education is once again left up to government agencies.

We will continue to follow up with businesses that have not yet gained compliance under our existing Water Quality Compliance Program. These files are still considered open cases that need to be resolved.

Residential Education and Outreach

The residential education and outreach activities were also successful in educating residents about the creek and pollution prevention practices. The residential survey data showed improvement in the awareness of Hamm Creek and pollution prevention practices between the beginning and end of the project. We produced and distributed a prodigious amount of both new and existing materials. We reached over 6000 households on a regular basis with information about the creek and protecting the quality of its waters. The majority of feedback we received from residents, whether written or verbal, was of a positive nature.

This work however, also posed many challenges. First, we came into this community cold. The community had not asked for education or assistance with these issues, nor did initial monitoring efforts indicate that residents were a major contributor of pollutants to the creek. This community also appeared fragmented. It appeared as though segments of the community disavowed other segments of the community. For instance, the industrial areas of the basin weren't considered part of the community comprised by the more affluent residences surrounding the golf courses. The large number of multifamily/rental units in the basin contributed to a more transient population. This can contribute to a perceived lack of need to make an investment in the community. A variety of cultures and languages are also present in this neighborhood. Targeting specific language materials to these populations is difficult and expensive. This area however, did have some existing community groups that were utilized in dissemination of information, organizing of volunteers, and outreach.

In general we were not able to build a community wide interest or enthusiasm in protecting Hamm Creek. It may be fair to say that the protection of a natural drainage system (which is primarily in culverts) is considered far less pressing in this area than maintaining housing, fighting crime, keeping the car running, and handling other aspects of daily living. What made it even more difficult to create interest in the creek was the lack of access to the creek in order to build appreciation and connection. Without the relationship to the resource, all the education in the world falls on deaf ears. It's like being told a relative you never knew has come down sick.

What we did successfully accomplish was increasing people's awareness of the creek. In the future, this will allow the county and other local groups to continue to build on the messages of environmental protection.

Monitoring

The original goal of the monitoring program was to detect an improvement in water quality between the beginning and end of the project. It was clear at the beginning that this would be a highly difficult task, based both on the short time frame (only 1.5 years) and the small number of samples we were taking. We decided to move forward knowing the monitoring data would also provide us with valuable baseline water quality information to be used to proceed with the Phase 2 and 3 plans for water quality improvement in the area.

No general trends came out of any of the monitoring sites. The monitoring results, when put to rigorous statistical tests, do not demonstrate an improvement in the stormwater quality in the Hamm Creek watershed in the one and half year period between 1996 to 1998.

The challenge this project faced was that this is an incredibly complicated system to monitor. After years of working in the area including smoke testing to map the constructed drainage system, we still have difficulty tracking the pipes and direction of flow. The results of this monitoring project were also very difficult to interpret given three factors:

1. the numerous construction activities(including a major landslide) occurring in the basin which disrupted our sampling locations and potentially contributed additional pollutants,
2. the historic sediment and groundwater contamination, and
3. the heavy traffic use leading to contaminated roadway drainage which was not accounted for.

While the reputation of Hamm Creek is that it is toxic and suffers extreme water quality problems, the numbers do not bear this out. The in-stream concentrations of toxic pollutants were significant but not unusual for the region. The pollutant concentrations in Hamm Creek are not much different than those in the streams of Bellevue, a mature suburban area. This is not to say that water quality is not a problem in Hamm Creek, but that if beneficial uses of the stream are degraded, water quality is currently not the only problem, and may not be the limiting factor.

It should be recognized though that federal, state and local government agencies have focused extensive pollution prevention efforts in this basin for the last decade leading to a significant improvement in business pollution practices. Based on the density of businesses in the area and the heavy industrial nature of the businesses continued source control and pollution prevention will be necessary to ensure no further degradation of water quality in Hamm Creek.

REFERENCES

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APPENDIX A

BUSINESS DATABASE SHEETS

Business Information

Tracking #	
Business Name	4 plexes
Contact Name	
Salutation	
First Name	Zaffu
Last Name	Fisseha
Address	9926 DesMoines Memorial Dr. S.
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Apartment
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint

Dates

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	4 plexes
Contact Name	
Salutation	
First Name	Zaffu
Last Name	Fisseha
Address	9928 DesMoines Memorial Dr. S.
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Apartment
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
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☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint

Dates

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	4 plex 0434
Contact Name	
Salutation	
First Name	Kim
Last Name	Nguyen
Address	9914 DesMoines Memorial Drive #3
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Apartment
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Drip Pan
O/W Sep
WW Disposal

Dates

07/27/1993 Letter Sent	letter returned

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	0438 4 plexes
Contact Name	
Salutation	
First Name	Martin
Last Name	Savol
Address	9916 DesMoines Memorial Dr. S.
City	Seattle
State	WA
Zip Code	98108
Mail Address	4710 Lakeridge Drive E
Mail City	Sumner
Mail State	WA
Mail Zip	98390
Phone	
Fax	
Business Type	Apartment
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	04394 plexes
Contact Name	
Salutation	
First Name	Ernst and Linda
Last Name	Jensen
Address	9926 DesMoines Memorial Dr. S
City	Seattle
State	WA
Zip Code	98108
Mail Address	2453 1st Avenue W
Mail City	Seattle
Mail State	WA
Mail Zip	98119
Phone	
Fax	
Business Type	Apartment
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

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☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint

Dates

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	0440 4 plexes
Contact Name	
Salutation	
First Name	Danny
Last Name	Fast
Address	9918 DesMoines Memorial Drive S
City	Seattle
State	WA
Zip Code	98108
Mail Address	16818 108th SE #7
Mail City	Renton
Mail State	WA
Mail Zip	98055
Phone	
Fax	
Business Type	Apartment
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint

Dates

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	0441 4 plex
Contact Name	
Salutation	
First Name	Maikele & Asegeheh
Last Name	Mengesha
Address	9924 DesMoines Memorial Dr. S
City	Seattle
State	WA
Zip Code	98108
Mail Address	11:00 3rd Avenue NE #221
Mail City	Seattle
Mail State	WA
Mail Zip	98125
Phone	
Fax	
Business Type	Apartment
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Au	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
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☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint

Dates

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	0442 4 plexes
Contact Name	
Salutation	
First Name	David
Last Name	Perry
Address	9920 DesMoines Memorial Drive S
City	Seattle
State	WA
Zip Code	98108
Mail Address	2130 42nd Ave SW
Mail City	Seattle
Mail State	WA
Mail Zip	98126
Phone	
Fax	
Business Type	Apartment
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

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☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐

BMPs

CB Maint

Dates

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	0443 4 plexes
Contact Name	
Salutation	
First Name	Sarin
Last Name	Soeun
Address	9924 DesMoines Memorial Dr. S
City	Seattle
State	WA
Zip Code	98108
Mail Address	9922 DesMoines Memorial Dr. S
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	
Fax	
Business Type	Apartment
Business Desc	
Comments	
BCW Comments	

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershe .	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint

Dates

Renewals

Community Partner Info

Business Information

Tracking #	94-0443
Business Name	Abawi/Best Auto Body
Contact Name	Masood and Mokfar Abawi
Salutation	Mr.
First Name	Masood
Last Name	Abawi
Address	12025 DesMoines Way S.
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 242-0455
Fax	
Business Type	Auto Repair
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

Dates

08/12/1994 Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Accurate Grinding
Contact Name	
Salutation	
First Name	
Last Name	
Address	430 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-5205
Fax	
Business Type	Other
Business Desc	office/distribution for grinder repair
Comments	no bmps office only No investigation report
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	7/22/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Sanitary

Dates

08/10/1997 Review	inside office work only

Renewals

Community Partner Info

Business Information

Tracking #	94-0215
Business Name	Ace Galvanizing
Contact Name	
Salutation	
First Name	Mike
Last Name	Buckland
Address	429 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 782-8300
Fax	
Business Type	Manufacturing
Business Desc	galvanizing/hotdip
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	11/16/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐

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☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint	
Contain	
Cover	
NPDES SWPPP	
Illicit Connection	corrected with new construction
Stencil	

Dates

05/21/1996 On-Site Consult

Renewals

Community Partner Info

Business Information

Tracking #	93-0039
Business Name	Advanced Electroplating
Contact Name	
Salutation	Mr.
First Name	Boyd
Last Name	Coleman
Address	9585 Eight Avenue S
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 768-1130
Fax	
Business Type	
Business Desc	
Comments	also known as CB finishing
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	3/24/98
Who Entered	Admin
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☐	☐	☐	☐	☐	☑	☐

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☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint	cb's in bad shape
Cover	
Drip Pan	
Sweep/Clean	
Sweep/Clean	

Dates

01/14/1998	On-Site Consult
03/12/1998	Follow-up
07/27/1998	Letter Sent
08/26/1998	Check Back

Renewals

Community Partner Info

Business Information

Tracking #	96-0579
Business Name	Ahrenius Manufacturing
Contact Name	Dennis Ahrenius
Salutation	Mr.
First Name	Dennis
Last Name	Ahrenius
Address	1425 S. 93rd Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-5597
Fax	
Business Type	Manu
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Sanitary
Stencil
Sweep/Clean

Dates

02/22/1996	On-Site Consult	
03/12/1996	Letter Sent	Letter also sent 7/23/96
04/16/1996	Check Back	
06/18/1996	Follow-up	
07/23/1996	Compliance	

Renewals

Community Partner Info

Business Information

Tracking #	94-0136
Business Name	All City Auto Wrecking
Contact Name	
Salutation	
First Name	George
Last Name	Human
Address	9438 DesMoines Way South
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-9996
Fax	
Business Type	Auto Related Service
Business Desc	wrecking yard
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain	
NPDES SWPPP	need to write a plan
Spill Ctrl	

Dates

03/18/1994	Review	are working on NOI for DOE
11/01/1998	Check Back	business sold

Renewals

Community Partner Info

Business Information

Tracking #	93-1044
Business Name	Allied Body Works Inc.
Contact Name	
Salutation	Mr.
First Name	Rich
Last Name	Minins
Address	625 South 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Auto Related Service
Business Desc	
Comments	
BCW Comments	Joined in 1998

Survey Recd	☐
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	3/24/98
Who Entered	Admin
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	4/3/98
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☑	☐	☐	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
O/W Sep
Sweep/Clean
Stencil

Dates

10/20/1997	Letter Sent	Letter also sent 11/7/96
10/31/1997	Compliance	
11/19/1997	Check Back	

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	AMS Laser Supply
Contact Name	
Salutation	
First Name	
Last Name	
Address	430-8 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 764-3344
Fax	
Business Type	Retail
Business Desc	small office/laser printer supplies
Comments	all work done inside No bmps for stormwater No investigation report
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	7/22/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

Cover
Sanitary

Dates

07/21/1997 Review	all work inside

Renewals

Community Partner Info

Business Information

Tracking #	97-1012
Business Name	A.P. & J. Automotive
Contact Name	Joe Mallow/Mark Billings
Salutation	Mr.
First Name	Joe
Last Name	Mallow
Address	10806 1st Avenue South
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 433-0613
Fax	(206) 433-0697
Business Type	Auto Related Service
Business Desc	
Comments	old D&J site
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☑	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
Septic
Sweep/Clean

Dates

06/04/1997	On-Site Consult	
06/16/1997	Letter Sent	
07/16/1997	Check Back	
04/09/1998	Closed	business closed new operator

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Arrow Cutting Dies
Contact Name	
Salutation	
First Name	
Last Name	
Address	430-6 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 742-3743
Fax	
Business Type	Other
Business Desc	distributor for dies

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments No bmps office only No investigation report

BCW Comments

Action	
Category	
Date Entered	7/22/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Sanitary

Dates

08/10/1997	Review	retail/distributor office

Renewals

Community Partner Info

Business Information

Tracking #	97-1013
Business Name	Auto Magik
Contact Name	Bob Anderson
Salutation	Mr.
First Name	Bob
Last Name	Anderson
Address	1505 S. 93rd Street Unit P
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-1009
Fax	
Business Type	Auto Repair
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N97608
Watershed	Green River
Basin	Hamm Creek

Comments Duwamish Manor Industrial Park When this business moved, they left drums of waste behind at the park.

BCW Comments Business park owner is pursuing legal action against Bob Anderson, Auto Majik owner.

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☑	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain
Cover
Sanitary
Spill Ctrl
Sweep/Clean

Dates

06/03/1997	On-Site Consult	
06/16/1997	Letter Sent	
07/16/1997	Check Back	
03/01/1998	Follow-up	business is moving to Auburn is in compliance
06/12/1998	Closed	business has closed

Renewals

Community Partner Info

Business Information

Tracking #	93-0277
Business Name	Basin Oil
Contact Name	
Salutation	
First Name	Terry
Last Name	Drexler
Address	8700 Dallas Avenue
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Other
Business Desc	Oil recycling and refining
Commer .s	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	11/16/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☐	☐	☐	☑	☐	☑	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain	contaminated soil issues

Dates

10/24/1996	Review	DOE/EPA investigation

Renewals

Community Partner Info

Business Information

Tracking #	97-0001
Business Name	Ba. Oil
Contact Name	
Salutation	
First Name	Terry
Last Name	Drexler
Address	1605 South 93rd Street Bldg E
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Recycle/Scrap
Business Desc	oil recycling and remanufacture
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/27/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☑	☐	☐	☑	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Cover
Drip Pan
Illicit Connection
Sanitary

Dates

06/12/1997	Review	illicit connection possible to sanitary sewer oil dump
07/09/1997	On-Site Consult	

Renewals

Community Partner Info

Business Information

Tracking #	96-1275
Business Name	Baszile Metals Service
Contact Name	Shella Rodriguez
Salutation	Ms.
First Name	Shella
Last Name	Rodriguez
Address	1231 A South Director Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	1231A S. Director St.
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 763-3035
Fax	(206) 763-7834
Business Type	manufacturer
Business Desc	aluminum distributor
Comments	
BCW Comments	

Survey Recd	☐
Renewal Rcvd	☐
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☑	☑	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Sanitary
Sweep/Clean
Stencil

Dates

06/11/1996	On-Site Consult
07/09/1996	Compliance
07/09/1996	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	B and C Telephone Inc
Contact Name	
Salutation	
First Name	Bill
Last Name	Brouillet
Address	410-5 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 763-9991
Fax	
Business Type	Other
Business Desc	telephone installation

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments no stormwater issues No investigation report

BCW Comments

Action	
Category	
Date Entered	7/24/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Sanitary	
Other	all work done inside

Dates

08/03/1996	Review	no bmps	phone installers office

Renewals

Community Partner Info

Business Information

Tracking #	93-1013
Business Name	Big O Tire
Contact Name	
Salutation	Mr.
First Name	Bob
Last Name	Kent
Address	8510 Dallas Ave So
City	Seattle
State	WA
Zip Code	
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Auto Repair
Business Desc	
Comments	
BCW Comments	

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	3/19/99
Who Entered	Admin
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Contain
Spill Ctrl
Sweep/Clean

Dates

12/20/1993	On-Site Consult
01/05/1994	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Black Dog Woodworks
Contact Name	
Salutation	
First Name	
Last Name	
Address	430 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-4940
Fax	
Business Type	Construction
Business Desc	small woodworking projects

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments: Small woodworking shop. No chemicals or finishes. Not enough bmps. NO investigation report

BCW Comments:

Action	
Category	
Date Entered	7/22/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Sanitary
Sweep/Clean

Dates

08/10/1997 Review	All work inside No pollutant potential to stormwater

Renewals

Community Partner Info

Business Information

Tracking #	97-0807
Business Name	BRAVO Environmental Services
Contact Name	Robert Buchmeyer/Al Schumacher
Salutation	Mr.
First Name	Al Schumacher or
Last Name	Robert Buchmayer
Address	19552 -38th Avenue NE
City	Seattle
State	WA
Zip Code	98155
Mail Address	19552 - 38th Ave NE
Mail City	Seattle
Mail State	WA
Mail Zip	98155
Phone	(206) 782-8147
Fax	(206) 782-8974
Business Type	Services
Business Desc	
Comments	Mobile vactor service
BCW Comments	

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	Commercial Building and Property Maintenance
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Community Partner
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☑	☐	☑	☐	☑	☐	☐	☑	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Sanitary
NPDES SWPPP
Stencil

Dates

06/11/1997	On-Site Consult
07/03/1997	Compliance
07/03/1997	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	96-2056
Business Name	Brightwood Manor Apartments
Contact Name	Mr. Fischer
Salutation	Mr.
First Name	Ferry
Last Name	Fischer
Address	10025 Des Moines Memorial Drive S
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 824-2078
Fax	
Business Type	Apartment
Business Desc	
Comments	
BCW Comments	Wrote letter of support

Survey Recd	☐
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☑	☐	☐	☑	☐	☐	☐	☑	☑	☐	☑	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☑	☐	☐	☐	☑	☐	☐	☑	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

Dates

04/15/1998	Follow-up	Minor problems still with site.

Renewals

Community Partner Info

Business Information

Tracking #	97-1215
Business Name	Burkes Auto Storage
Contact Name	
Salutation	
First Name	David
Last Name	Burke
Address	S. 96th Street btween 4th and 8th S.
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 246-5514
Fax	(206) 516-5299
Business Type	Auto Related Service
Business Desc	wrecking yard of sorts
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Drip Pan
Spill Ctrl

Dates

07/31/1997 Review	rented property from Acc Galvanizing

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Cain's Pressure Washing
Contact Name	
Salutation	Mr.
First Name	Troy
Last Name	Cain
Address	21925 SE 249th Pl.
City	Maple Valley
State	WA
Zip Code	98038
Mail Address	21925 SE 249th Pl.
Mail City	Maple Valley
Mail State	WA
Mail Zip	98038
Phone	(425) 413-8826
Fax	
Business Type	Mobile Maintenance Services
Business Desc	pressure washing for residential and commercial pr
Comments	
BCW Comments	Sits on the board of ECOSS Interested in community

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☑	☐	☑	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Insert
Contain
Sanitary
Stencil
Sweep/Clean
WW Disposal

Dates

06/07/1996 BCW

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Camerons Residential Doors
Contact Name	
Salutation	
First Name	
Last Name	
Address	
City	
State	
Zip Code	
Mail Address	430 - 8 S. 96th Streeet
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	
Fax	
Business Type	Construction
Business Desc	Installs doors

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments no stormwater issues. Door installers only. No investigation report

BCW Comments

Action	
Category	
Date Entered	7/24/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Sanitary

Dates

08/03/1996 Review	no stormwater impacts

Renewals

Community Partner Info

Business Information

Tracking #	98-0291
Business Name	Carey Limousine Service
Contact Name	
Salutation	Mr.
First Name	Jim
Last Name	Colemen
Address	1237 S. Director Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	same as above
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-3517
Fax	(206) 768-1607
Business Type	Auto Related Service
Business Desc	Limousine car rental
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N97610
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	4/24/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☑	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Sanitary

Dates

03/13/1998	On-Site Consult	vehicle washing onsite
04/26/1998	Letter Sent	

Renewals

Community Partner Info

Business Information

Tracking #	96-2054
Business Name	Cascade Vue Apartments Building 2
Contact Name	
Salutation	
First Name	Jacqueline
Last Name	Doman
Address	12035 Des Moines Memorial Drive South
City	Seattle
State	WA
Zip Code	98168
Mail Address	12028 25th Avenue N.E.
Mail City	Seattle
Mail State	WA
Mail Zip	98125
Phone	(206) 634-4736
Fax	
Business Type	Apartment
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments: Frederick Frank sold building to Jacqueline Doman. Doug Walters contacted Jaqueline on 6/8/98 and informed her of previous site consultation findings and requirements from January 17, 1997 letter.

BCW Comments:

Action	
Category	
Date Entered	7/6/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Dates

01/17/1997 On-Site Consult

04/15/1998 Follow-up

Renewals

Community Partner Info

Business Information

Tracking #	96-2055
Business Name	Cascade Vue Apartments Bldg 3
Contact Name	Paul Chapman
Salutation	Mr.
First Name	Paul
Last Name	Chapman
Address	12037 DesMoines Memorial Drive South
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 546-3849
Fax	
Business Type	Apartment
Business Desc	
Comments	Paul Chapman, owner mailling address is 20104 - 21st Ave NW Seattle, WA 98177
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☑	☑	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Dates

01/17/1997 On-Site Consult

04/15/1998 Follow-up

Renewals

Community Partner Info

Business Information

Tracking #	93-0039
Business Name	C B Finishing
Contact Name	
Salutation	
First Name	Claude
Last Name	Benson
Address	9585 - 8th Avenue South
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Manufacturing
Business Desc	metal finishing
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	D9
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	7/23/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Sanitary	
Stencil	
Other	need BMPs for vehicle repair and vehicle washing by t
CB Maint	
Cover	

Dates

01/17/1997	Letter Sent	
02/14/1997	Check Back	
04/15/1998	Follow-up	No BMPs in place at time of visit.

Renewals

Community Partner Info

Business Information

Tracking #	96-0002
Business Name	Centimark Corporation
Contact Name	
Salutation	
First Name	
Last Name	
Address	430 S. 96th Street Unit 5
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Construction
Business Desc	distribution office no current construction in KC
Comments	non-audit
BCW Comments	non-audit

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
Spill Ctrl
Sanitary
Sweep/Clean
Stencil

Dates

05/10/1998	On-Site Consult
07/27/1998	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	96-1276
Business Name	Chiyoda International Corp owns 1237 S. Director
Contact Name	Mark Travis
Salutation	Mr.
First Name	Mark
Last Name	Travis
Address	1100 Olive Way #500/1237 S. Director
City	Seattle
State	WA
Zip Code	98101
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Property Management
Business Desc	
Comments	
BCW Comments	

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☐	☐	☐	☑	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Sanitary

Dates

08/03/1996 Review	office only

Renewals

Community Partner Info

Business Information

Tracking #	94-0216
Business Name	Clarklift of Washington / Alaska
Contact Name	Curt Bish
Salutation	Mr.
First Name	Curt
Last Name	Bish
Address	1313 South 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	1313 S. 96th St.
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 762-7440
Fax	(206) 762-6862
Business Type	equipment rental/repair
Business Desc	forklift dealership: sales, service and rentals
Comments	
BCW Comments	Interested in being a community partner. Need sign

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DOES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☑	☐	☑	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Maint	
Illicit Connection	
Stencil	
Wash Pad	uncontrolled vehicle washing

Dates

06/05/1996	On-Site Consult	
06/19/1996	Letter Sent	
07/19/1996	Check Back	
04/06/1998	Closed	property sold

Renewals

Community Partner Info

Business Information

Tracking #	96-0027
Business Name	Clear Concepts L.L.C.
Contact Name	Brian Confer VP/Dir of Manufacturing
Salutation	Mr.
First Name	Barbie
Last Name	Williamson
Address	16410 S. 143rd /st,
City	Tukwila
State	WA
Zip Code	98168
Mail Address	6410 S. 143rd St.
Mail City	Tukwila
Mail State	WA
Mail Zip	98168
Phone	(206) 763-3369
Fax	(206) 763-3292
Business Type	manufacturer
Business Desc	manufacture of acrylic displays and fixtures
Comments	
BCW Comments	Moved in December 1997. Now in Incorporated King

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☑	☐	☐	☐	☑	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
NPDES SWPPP
O/W Sep
Stencil
Wash Pad
Sweep/Clean

Dates

01/26/1996	On-Site Consult	
02/05/1996	Letter Sent	letter also sent May 30, 1996
04/23/1996	Check Back	
05/19/1996	Follow-up	
05/22/1996	Follow-up	
05/28/1996	Compliance	

Renewals

Community Partner Info

Business Information

Tracking #	95-0761
Business Name	Coach House Apartments
Contact Name	
Salutation	Ms.
First Name	Kekai
Last Name	Moe
Address	10245 Des Mones Memorial Dr S
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-9109
Fax	
Business Type	Apartment
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	3/24/98
Who Entered	Admin
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

09/22/1995 Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	97-1211
Business Name	Country Club Apartments
Contact Name	
Salutation	
First Name	Pat
Last Name	Collins
Address	11233 Des Moines Way South
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 433-1917
Fax	
Business Type	Apartment
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	1/27/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DOES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Drip Pan
Sanitary
Stencil

Dates

12/09/1997 On-Site Consult

Renewals

Community Partner Info

Business Information

Tracking #	97-0237
Business Name	Country Squire Apartments
Contact Name	Richard Elliss Sally Eastey 215-9800
Salutation	Mr.
First Name	Scott
Last Name	Spanier
Address	11209 Des Moines Memorial Drive South
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Apartment
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N97646
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☑	☑	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☑	☑	☑	☑	☐	☐	☐	☐

BMPs

Sweep/clean
Contain
Sanitary

Dates

01/03/1997	On-Site Consult
01/17/1997	Letter Sent
03/15/1997	Check Back
12/09/1997	Follow-up

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Daves Pump Service
Contact Name	
Salutation	
First Name	
Last Name	
Address	430-7 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-7885
Fax	
Business Type	Other
Business Desc	mobile pump repair and service

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments: business is mobile but only works inside no pollutant potential No investigation report

BCW Comments:

Action	
Category	
Date Entered	7/22/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	

Business OK by DDES ☐
Business OK by HW ☐
Business OK by PSAPCA ☐
Business OK by Health ☐
Date Letter/Certificate Mailed
Member Wants Advertising ☐
Business Description for Directory
Directory Category

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Cover
Sanitary

Dates

08/10/1997 Review	not enough bmps work inside only

Renewals

Community Partner Info

Business Information

Tracking #	96-0026
Business Name	Design Direct Sound
Contact Name	
Salutation	
First Name	Bob
Last Name	Rice
Address	9320 15th Avenue South
City	Seattle
State	WA
Zip Code	98108
Mail Address	same
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-6456
Fax	(206) 762-8682
Business Type	Manufacturing
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	6/12/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain
Cover
Sanitary
Sweep/Clean

Dates

11/07/1997	On-Site Consult	most bmps in place some debris outside
05/14/1998	Compliance	
05/14/1998	Follow-up	in compliance
06/22/1998	Letter Sent	
07/17/1998	Check Back	

Renewals

Community Partner Info

Business Information

Tracking #	96-0791
Business Name	D & J Automotive and Electric
Contact Name	Danny Hurley
Salutation	Mr.
First Name	Danny
Last Name	Hurley
Address	10806 1st Avenue South
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 431-8379
Fax	
Business Type	Auto
Business Desc	
Comments	New ownership. Needs follow-up.
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by SDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☑	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain
Cover
Drip Pan
Spill Ctrl

Dates

03/15/1996	On-Site Consult
05/07/1996	Letter Sent
08/09/1996	Follow-up
11/25/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	96-1361
Business Name	Dominic's Plaza / Colello Family Partnership
Contact Name	Dominic Colello
Salutation	Mr.
First Name	Joe & Dominic
Last Name	Colello
Address	9630 DesMoines Memorial Drive South
City	Seattle
State	WA
Zip Code	98108
Mail Address	9635 Des Moines Memorial Dr. S.
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 762-2535
Fax	
Business Type	property manager
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Community Partner
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Stencil
Sweep/Clean

Dates

04/23/1996	On-Site Consult
06/11/1996	Letter Sent
06/14/1996	Check Back
06/20/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	96-1140
Business Name	Dominic's Red Apple Market
Contact Name	Dominic Colello
Salutation	Mr.
First Name	Dominic
Last Name	Colello
Address	9627 Des Moines Memorial Drive South
City	Seattle
State	WA
Zip Code	98108
Mail Address	9627 Des Moines Memorial Dr. S.
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	
Fax	
Business Type	grocer
Business Desc	
Comments	
BCW Comments	

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☑	☐	☐	☐	☑	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Sweep/Clean
Stencil
Spill Ctrl

Dates

06/01/1996	On-Site Consult
06/13/1996	Letter Sent
07/13/1996	Check Back

Renewals

Community Partner Info

Business Information

Tracking #	97-1015
Business Name	Duwamish Manor Industrial Park
Contact Name	
Salutation	
First Name	Birney
Last Name	Dempcy
Address	1705 S. 93rd Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	PO Box 40072
Mail City	Bellevue
Mail State	WA
Mail Zip	98015
Phone	(425) 453-6371
Fax	
Business Type	Other
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N97608
Watershed	Green River
Basin	Hamm Creek

Comments Violation notice sent due to dumping on May 7, 1998. Mr. Dempsey responded 5/19/98. DOE involved with clean up issues. Test results in file.

BCW Comments

Action	
Category	
Date Entered	6/12/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
O/W Sep
Sanitary

Dates

04/28/1998	Enforcement	
05/07/1998	Letter Sent	
05/19/1998	Follow-up	check on cleanup by Foss Environmental

Renewals

Community Partner Info

Business Information

Tracking #	97-1458
Business Name	Duwamish Yacht Club
Contact Name	
Salutation	
First Name	Doug
Last Name	Hunter
Address	1801 S. 93rd Street
City	Seattle
State	Wa
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-9330
Fax	(206) 767-2661
Business Type	Boat/Ship
Business Desc	Marina
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N97607
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	7/24/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☑	☑	☐	☑	☑	☐	☐	☑	☑	☐	☐	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint	
Stencil	
Sweep/Clean	
Other	pump out station for boaters

Dates

10/21/1997	On-Site Consult
10/30/1997	Letter Sent
01/20/1998	Follow-up
07/27/1998	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	94-0816
Business Name	Executive Terrace Apartments
Contact Name	Sherry Zane or Jana Phillips Mngmnt Co
Salutation	Ms.
First Name	Sherry
Last Name	Zane
Address	9901 14th Avenue South
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 622-8600
Fax	
Business Type	Apartment
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	D95587
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☑	☐	☐	☐	☑	☐	☐	☑	☐	☑	☑	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☑	☐	☑	☐	☐	☐	☐	☐

BMPs

Sweep/clean
Cover
Contain
Stencil
CB Maint
O/W Sep
Sanitary

Dates

11/25/1996	On-Site Consult
12/19/1996	Letter Sent
06/15/1997	Check Back
12/09/1997	Follow-up

Renewals

Community Partner Info

Business Information

Tracking #	94-0379
Business Name	Fibres International Glass Recycling
Contact Name	
Salutation	Mr.
First Name	Greg
Last Name	Greg Matheson
Address	9208 4th Ave S
City	Seattle
State	WA
Zip Code	98009
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(601) 972-0220
Fax	
Business Type	
Business Desc	
Comments	
BCW Comments	

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	3/24/98
Who Entered	Admin
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

11/15/1994 Letters sent	Leters also sent 7/2/93, 8/26/92

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Folcol Tool and Mold Co.
Contact Name	
Salutation	
First Name	Rick
Last Name	Collado
Address	420 S. 96th Street Unit 24
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-1330
Fax	
Business Type	Manufacturing
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments: Work inside shop only. No outside storage. Not enough bmps. No investigation report

BCW Comments:

Action	
Category	
Date Entered	7/24/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

Cover
Sanitary
Spill Ctrl

Dates

08/04/1996 Review	all work inside no stormwater issues

Renewals

Community Partner Info

Business Information

Tracking #	95-0928
Business Name	Fruehauf Trailer Corporation
Contact Name	Dale Ballard
Salutation	Mr.
First Name	Ed
Last Name	Woolcock
Address	9426 - 8th Avenue South
City	Seattle
State	WA
Zip Code	98108
Mail Address	9426 Eighth Ave S.
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 762-5800
Fax	
Business Type	Manufacturing
Business Desc	manufacture and repair trailers
Comments	
BCW Comments	Did not send in renewal form in 1997.

Survey Recd	☐
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	D95601
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Business for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
O/W Sep
Stencil

Dates

10/27/1995	On-Site Consult	
11/14/1995	Letter Sent	
12/14/1995	Check Back	
02/23/1996	Follow-up	
04/06/1996	Follow-up	
06/05/1996	Follow-up	
08/09/1996	Compliance	
04/01/1998	Follow-up	New manager and site extended to old PRTI property
04/16/1998	Letter Sent	both consultation letters and additional work needed

Renewals

Community Partner Info

Business Information

Tracking #	97-0801
Business Name	Gary Merlino Construction Co., Inc.
Contact Name	Ike Brown
Salutation	Mr.
First Name	Ike
Last Name	Brown
Address	9125 - 10th Avenue South
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-9125
Fax	(206) 763-4178
Business Type	Construction
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments joint visit with industrial waste need NPDES permit per John Drabek DOE OK's with City of Seattle, city will get drainage system along Barton and 10th Ave S maintained.

BCW Comments

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☐	☐	☑	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☑	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Dates

05/21/1997	On-Site Consult	On-Site Consult 4/30/97?
06/03/1997	Letter Sent	letters sent 5/22/97, 6/3/1997
07/03/1997	Check Back	

Renewals

Community Partner Info

Business Information

Tracking #	98-0174
Business Name	Gaston Brothers Excavating
Contact Name	
Salutation	Mr.
First Name	Gary
Last Name	Gaston
Address	10740 Myers Way South
City	Seattle
State	WA
Zip Code	98108
Mail Address	12622 4th SW
Mail City	Seattle
Mail State	WA
Mail Zip	98146
Phone	(206) 241-0827
Fax	(206) 767-2771
Business Type	Construction
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	D97773
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	3/11/98
Who Entered	Admin
Type of Organization	Business
Date of Contact	3/9/98
Number of People Contacted	0
Form of First Contact	Engineer visit
How did they hear about us	Complaint
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☑	☐	☑	☐	☑	☐	☐	☑	☐	☑	☐	☐	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint	r/d tank and cbs have soap in them
Contain	
Cover	
Drip Pan	
ESC	This applies to vacant land at 4th avenue S and S Barto
O/W Sep	
WW Disposal	need to hook up to sanitary
Spill Ctrl	needed on vacant land
Stencil	not yet done
Sweep/Clean	need to do more often
Wash Pad	need to install
Other	

Dates

03/09/1998	On-Site Consult	veh and eqip wash
03/13/1998	Enforcement	stop work posted by DDES
03/16/1998	Letter Sent	

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Georgetown Upholstry
Contact Name	
Salutation	
First Name	
Last Name	
Address	430-14 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	PO Box 80792
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 763-7790
Fax	
Business Type	Other
Business Desc	Furniture reupholstery

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments Not enough bmps. All work is done inside the shop. No investigation report

BCW Comments

Action	
Category	
Date Entered	7/22/96
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

Sweep/Clean

Dates

07/21/1997 Review	not enough bmps all work inside

Renewals

Community Partner Info

Business Information

Tracking #	96-1641
Business Name	Glen Acres Condominiums
Contact Name	
Salutation	
First Name	Bill
Last Name	Clymer, West Ruth
Address	10746 Glen Acres Drive South
City	Seattle
State	WA
Zip Code	989168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 242-0636
Fax	
Business Type	Apartment
Business Desc	condominiums/residential
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N97826
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	11/16/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☑	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☑	☐	☐	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Sanitary
Sweep/Clean

Dates

09/10/1996 Review

Renewals

Community Partner Info

Business Information

Tracking #	96-1642
Business Name	Glen Acres Golf and Country Club
Contact Name	
Salutation	
First Name	Dan
Last Name	Kukla
Address	1000 South 112th Street
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Golf Course
Business Desc	Golf Course
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N97826
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	11/16/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☑	☑	☑	☐	☑	☑	☐	☑	☑	☑	☐	☐	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☑	☑	☑	☑	☑	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Sweep/Clean
Spill Ctrl

Dates

03/15/1996 Review

Renewals

Community Partner Info

Business Information

Tracking #	97-0767
Business Name	Glendale Heating Oil
Contact Name	
Salutation	
First Name	Dave
Last Name	
Address	12462 DesMoines Memorial Dr. s.
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-7184
Fax	
Business Type	Other
Business Desc	Heating oil storage and delivery
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	11/16/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☑	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

Dates

Renewals

Community Partner Info

Business Information

Tracking #	96-1597
Business Name	Goldstar Laundry, Inc.
Contact Name	Bill Ratzburg
Salutation	Mr.
First Name	Bill
Last Name	Ratzburg
Address	10766 Meyers Way South
City	Seattle
State	WA
Zip Code	98168
Mail Address	10766 Meyers Way S.
Mail City	Seattle
Mail State	WA
Mail Zip	98168
Phone	(206) 241-9088
Fax	
Business Type	cleaning services
Business Desc	commercial laundry
Comments	
BCW Comments	

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	D97772
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Sanitary
O/W Sep
Sweep/Clean
Stencil

Dates

09/18/1996	On-Site Consult
10/07/1996	Letter Sent
11/25/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	97-0516
Business Name	Harmony Gardens Care Center
Contact Name	Tom Dhanens
Salutation	Mr.
First Name	Marita
Last Name	Smith
Address	10010 Des Moines Way S.
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-0166
Fax	
Business Type	Services
Business Desc	
Comments	
BCW Comments	Joined in 1997.

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☑
Change Address	☐
Facility Number	N97734
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☑	☐	☑	☑	☐	☐	☑	☑	☑	☑	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Sanitary
Stencil
WW Disposal

Dates

03/04/1997	On-Site Consult
03/21/1997	Letter Sent
04/21/1997	Check Back
04/24/1997	Follow-up
05/13/1997	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	- 18
Business Name	Harsch Investment Corp. (Noffsinger Management Ser
Contact Name	
Salutation	Ms.
First Name	Lisa
Last Name	Clark
Address	309 S. Cloverdale, Ste B-14
City	Seattle
State	WA
Zip Code	98108
Mail Address	309 S. Cloverdale, B 14
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 763-6200
Fax	206-763-2451
Business Type	property manager
Business Desc	

Survey Recd	☐
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments: Changed name from Noffsinger Management Services.

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

Renewals

Community Partner Info

Business Information

Tracking #	97-1212
Business Name	Hi View Apartments
Contact Name	
Salutation	
First Name	
Last Name	
Address	2043 S. 113th Street
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Apartment
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	1/27/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☑	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☑	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Dates

Renewals

Community Partner Info

Business Information

Tracking #	96-0578
Business Name	Industrial Automation, Inc
Contact Name	Tom McKown
Salutation	Mr.
First Name	Tom
Last Name	McKown
Address	1421 S. 93rd Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 763-1025
Fax	(206) 763-3226
Business Type	Manu
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
Spill Ctrl
Sweep/Clean

Dates

03/22/1996	Check Back	
03/29/1996	Letter Sent	
04/29/1998	Follow-up	Site still out of compliance. Will revisit site in appro
06/17/1998	Compliance	
06/17/1998	Follow-up	In compliance at time of visit

Renewals

Community Partner Info

Business Information

Tracking #	96-1365
Business Name	Insulation Contractors, Inc.
Contact Name	Jackie Lacktorin
Salutation	Ms.
First Name	Jackie
Last Name	Lacktorin
Address	1501 South 92nd Place, Suite B
City	Seattle
State	WA
Zip Code	98108
Mail Address	1501 S. 92nd Pl., Ste. B
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 764-0535
Fax	(206) 764-0545
Business Type	commercial building and p
Business Desc	commercial building insulation
Comments	
BCW Comments	Moved to Kent. No longer part of SeaKing

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☑
Facility Number	D97751
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	☑	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Dates

07/13/1996	On-Site Consult
07/26/1996	Check Back
07/26/1996	Letter Sent
09/10/1996	Follow-up
09/22/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	International Aircraft Services, Inc
Contact Name	
Salutation	
First Name	John
Last Name	McEvoy
Address	420 S. 96th Street Suite 3
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-0814
Fax	(206) 767-4105
Business Type	Other
Business Desc	engineering

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments no stormwater impacts. All work inside. Office only. No investigation report

BCW Comments

Action	
Category	
Date Entered	7/24/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Sanitary

Dates

08/03/1996 Review	engineering for specialized aircraft interiors

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	International Aerospace Support
Contact Name	
Salutation	
First Name	
Last Name	
Address	430 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 764-5010
Fax	
Business Type	Other
Business Desc	Engineering

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments This business is basically an office. No BMPs. No investigation form filled out

BCW Comments

Action	
Category	
Date Entered	7/22/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Sanitary

Dates

06/19/1997 Review

Renewals

Community Partner Info

Business Information

Tracking #	96-1273
Business Name	International Paint
Contact Name	Greg Love
Salutation	Mr.
First Name	Greg
Last Name	Love
Address	1601 South 92nd Place #C
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 763-8003
Fax	(206) 762-5239
Business Type	Retail/Wholesale
Business Desc	
Comments	not enough BMPs to qualify as a BCW member
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

Cover	all supplies inside
Sweep/Clean	

Dates

07/25/1996	On-Site Consult
08/01/1996	Compliance
08/01/1996	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	96-1484
Business Name	ITEL annex on 98th
Contact Name	Mark Gonzalez
Salutation	Mr.
First Name	Mark
Last Name	Gonzalez
Address	8th Avenue South and South 98th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-4248
Fax	(206) 767-4980
Business Type	Tran
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DOES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☐	☑	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Drip Pan
O/W Sep
Wash Pad

Dates

08/14/1996	On-Site Consult	
12/10/1997	Follow-up	
06/08/1998	Follow-up	washpad tied to sanitart

Renewals

Community Partner Info

Business Information

Tracking #	96-0028
Business Name	ITEL Terminals
Contact Name	Mark L. Gonzalez
Salutation	Mr.
First Name	Mark
Last Name	Gonzalez
Address	1818 South 93rd Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-4248
Fax	(206) 767-4980
Business Type	Tran
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☐	☐	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Insert
CB Maint
Contain
Cover
Spill Ctrl
WW Disposal

Dates

02/06/1996	On-Site Consult	On-Site Consult 1/8/95?
03/12/1996	Letter Sent	
05/08/1996	Check Back	

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Java Trading Company
Contact Name	
Salutation	
First Name	
Last Name	
Address	420-6 S. 96th St
City	Seattle
State	WA
Zip Code	98108
Mail Address	PO Box 527
Mail City	Mercer Island
Mail State	WA
Mail Zip	98040
Phone	(206) 236-1392
Fax	
Business Type	Other
Business Desc	Distributor
Comments	Business is only a distributor. No BMPs..No investigation report
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	7/22/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

Renewals

Community Partner Info

Business Information

Tracking #	98-0606
Business Name	J.D. Ott
Contact Name	
Salutation	
First Name	Bill
Last Name	Cook
Address	1705 S. 93rd Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	115 S. Lucille Street
Mail City	Seattle
Mail State	WA
Mail Zip	
Phone	
Fax	
Business Type	Manufacturing
Business Desc	Metal shop
Comments	
BCW Comments	

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	11/16/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Dates

Renewals

Community Partner Info

Business Information

Tracking #	97-0002
Business Name	Kings Unlimited Detail
Contact Name	
Salutation	
First Name	Frank
Last Name	
Address	11315 1/2 DesMoines Way S
City	Seattle
State	WA
Zip Code	98146
Mail Address	4643 S. Fontanelle
Mail City	Seattle
Mail State	WA
Mail Zip	98118
Phone	(206) 246-6431
Fax	
Business Type	Auto Related Service
Business Desc	car detailer
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/27/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain

Dates

03/21/1997 On-Site Consult

Renewals

Community Partner Info

Business Information

Tracking #	97-1618
Business Name	Kodo Construction
Contact Name	Kiyoshi Osada
Salutation	
First Name	Kiyoshi
Last Name	Osada
Address	12557 SE Green Valley Road
City	Auburn
State	WA
Zip Code	98092
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(253) 833-0911
Fax	
Business Type	Construction
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments This business is under contract with Transit for completeing the accessibility work for ADA requirements for bus stops throughout King County. Paul Eng Transit will have inspector for project speak with Kodo Construction staff.

BCW Comments

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain
CB Maint
WW Disposal

Dates

01/01/1998 On-Site Consult
01/25/1998 Letter Sent
06/12/1998 Closed

Renewals

Community Partner Info

Business Information

Tracking #	96-1272
Business Name	KRS Marine, Inc.
Contact Name	Jack Page
Salutation	Mr.
First Name	Jack
Last Name	Page
Address	S. 93rd Place and Duwamish River
City	Seattle
State	WA
Zip Code	98104
Mail Address	2404 Boyer Ave E.
Mail City	Seattle
Mail State	WA
Mail Zip	98112
Phone	(206) 499-3854
Fax	
Business Type	property manager
Business Desc	
Comments	
BCW Comments	Do not renew. Sue Clark says they have problems.

Survey Recd	☐
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain
Cover
Drip Pan
Spill Ctrl

Dates

08/15/1996	On-Site Consult
08/27/1996	Letter Sent
09/27/1996	Check Back
10/15/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Lafferty Electric Northwest
Contact Name	
Salutation	
First Name	
Last Name	
Address	430 S. 96th Street Unit 3
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Other
Business Desc	Factory rep for electric motors
Comments	non-audit no stormwater issues no investigation report
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Sanitary

Dates

08/03/1996 Review

Renewals

Community Partner Info

Business Information

Tracking #	97-1014
Business Name	LECOQ Machine Works
Contact Name	Jacques L. LeCoq
Salutation	Mr.
First Name	Jacques
Last Name	LeCoq
Address	1605 S. 93rd Street Bldg E. Unit G2
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-4606
Fax	(206) 763-2021
Business Type	Manufacturing
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N97628
Watershed	Green River
Basin	Hamm Creek

Comments business in Duwamish Manor Park.. Need to set up a site visit with owner Berney Dempsey, as housekeeping overal on the site is not very good. Need BMPs implemented.

BCW Comments

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Sanitary
Spill Ctrl
Sweep/Clean

Dates

06/16/1997	On-Site Consult	
07/16/1997	Check Back	
04/15/1998	Follow-up	
04/15/1998	Compliance	Site in compliance at time of visit.
06/16/1998	Letter Sent	

Renewals

Community Partner Info

Business Information

Tracking #	97-0421
Business Name	Le-Roy's Equipment Repair
Contact Name	LeRoy Balster
Salutation	Mr.
First Name	Le-Roy A.
Last Name	Balster
Address	11202 1st Avenue S
City	Seattle
State	WA
Zip Code	98198
Mail Address	714 S. 206th St.
Mail City	Seattle
Mail State	WA
Mail Zip	98198
Phone	(206) 241-0233
Fax	
Business Type	equipment rental/repair
Business Desc	
Comments	
BCW Comments	No signature on renewal form.

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DOES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain
Cover
Drip Pan
Spill Ctrl

Dates

06/11/1997	On-Site Consult
07/03/1997	Compliance
07/03/1997	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	96-1270
Business Name	Libby Fredricks, Inc
Contact Name	Eric Fredricks
Salutation	Mr.
First Name	Eric
Last Name	Fredricks
Address	1541 South 92nd Place
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-2244
Fax	(206) 764-7149
Business Type	Cons
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DOES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☑	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☑	☐	☐	☐	☐	☐	☑	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain
Cover
Sweep/Clean

Dates

07/23/1996	Compliance	Onsite also 6/6/1996
08/29/1996	Check Back	
04/15/1998	Follow-up	Business no longer at above address.

Renewals

Community Partner Info

Business Information

Tracking #	94-0135
Business Name	Marcos Mobile Wash
Contact Name	
Salutation	
First Name	Marco
Last Name	Desimone
Address	9400 - 4th Avenue S.
City	Seattle
State	WA
Zip Code	98108
Mail Address	9435 4th Ave S.
Mail City	Seattle
Mail State	Wa
Mail Zip	98108
Phone	(206) 762-9245
Fax	
Business Type	Mobile Maintenance Services
Business Desc	vehicle fleet washing

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Insert
Contain
WW Disposal

Dates

03/11/1994	On-Site Consult	site is also used for topsoil operation..??

Renewals

Community Partner Info

Business Information

Tracking #	96-1112
Business Name	McCoy Enterprises, Inc
Contact Name	Jim Reich
Salutation	Mr.
First Name	Jim
Last Name	Reich
Address	11064 First Avenue South
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 246-0828
Fax	
Business Type	Auto Repair
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain
Cover
Sanitary
Spill Ctrl

Dates

09/05/1996	On-Site Consult	On-site consult 5/14/96?
10/15/1996	Letter Sent	
01/15/1997	Check Back	

Renewals

Community Partner Info

Business Information

Tracking #	97-1080
Business Name	Merlino vacant property
Contact Name	Ike Brown
Salutation	Mr.
First Name	Ike
Last Name	Brown
Address	1030 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-9125
Fax	(206) 763-4178
Business Type	Construction
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments Notice of violation issued to Merlino construction. Vactor decanted to wetland on Merlino property. this is vacant land used for storage of construction materials.

BCW Comments

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Dates

06/17/1997	On-Site Consult
06/25/1997	Letter Sent
08/12/1997	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	93-0602
Business Name	MoiMoi residence
Contact Name	
Salutation	
First Name	Laki
Last Name	MoiMoi
Address	10118 DesMoines Way South
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Residential
Business Desc	home base business car repair
Comments	This is a private residence with many enforcement issues outstanding with both us and other agencies
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	11/16/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

08/18/1994	Review	
02/10/1995	Check Back	this is an enforcement with ddes

Renewals

Community Partner Info

Business Information

Tracking #	96-1412
Business Name	Moulded Chemical Products Inc.
Contact Name	Brad Donovan
Salutation	Mr.
First Name	Brad
Last Name	Donovan
Address	1601 S. 92nd Place Bldg H Suite A
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 763-7774
Fax	(206) 763-7759
Business Type	Manu
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DOES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain	
Sweep/Clean	
Other	outside storage of empty resin barrels.

Dates

09/23/1996	Check Back	
04/15/1998	Follow-up	
04/15/1998	Compliance	Site in compliance at time of visit

Renewals

Community Partner Info

Business Information

Tracking #	96-1269
Business Name	The National Company
Contact Name	Donna Yenne
Salutation	Ms.
First Name	Donna
Last Name	Yenne
Address	1521 S. 92nd Place Suite C
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	RetW
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

Sweep/Clean	all activities are in

Dates

07/23/1996	On-Site Consult
07/26/1996	Compliance
07/26/1996	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	96-1266
Business Name	National Partitions, Inc.
Contact Name	Frank McClelland/Ruth Sarchet
Salutation	Mr.
First Name	Frank McClelland
Last Name	Ms. Ruth Sarchet or Mr. Frank McClelland
Address	22001 Pacific HWY S.,Ste 106
City	Des Moines
State	WA
Zip Code	98198
Mail Address	22001 Pacific Highway S., Ste 106
Mail City	Des Moines
Mail State	WA
Mail Zip	98198
Phone	(206) 762-9827
Fax	(206) 762-2925
Business Type	commercial building and p
Business Desc	manufacture plastic laminate restroom partitions
Comments	
BCW Comments	Give reminders regarding the requirements as shown

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☑
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Dates

07/17/1996	On-Site Consult
07/26/1996	Check Back
07/26/1996	Letter Sent
09/22/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	96-1546
Business Name	Noffsinger Management Services
Contact Name	
Salutation	Ms.
First Name	Lisa
Last Name	Clark
Address	400 S. 96th St
City	Seattle
State	WA
Zip Code	98108
Mail Address	309 S. Cloverdale Suite B-14
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 763-6200
Fax	
Business Type	Prop. Mgmt.
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	3/24/98
Who Entered	Admin
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by ODES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

09/22/1996 Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	96-1001
Business Name	Pacific Northwest Motor Freight Lines/ Chas. A. La
Contact Name	
Salutation	Mr.
First Name	Bob
Last Name	Morrow
Address	515 S. 96th St.
City	Seattle
State	WA
Zip Code	98108
Mail Address	515 S. 96th St.
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 767-2693
Fax	763-4118
Business Type	Transportation
Business Desc	
Comments	
BCW Comments	Nancy A. Brown is a member of ECOSS

Survey Recd	☐
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	D95002
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
NPDES SWPPP
Drip Pan
O/W Sep
Sweep/Clean

Dates

06/06/1996	On-Site Consult
09/18/1996	Check Back
11/14/1996	Follow-up
12/21/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	96-1405
Business Name	Pacific Rim Transport Inc
Contact Name	Chris Racioppo
Salutation	Mr.
First Name	Chris
Last Name	Racioppo
Address	910 - 96th Avenue S
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 763-6862
Fax	(206) 763-6862
Business Type	Transportation/Trucking
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	D95601
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint	
Cover	
Spill Ctrl	
Other	need driver training and erosion control as parking lot i

Dates

07/15/1996	On-Site Consult	
08/01/1996	Letter Sent	
09/01/1996	Check Back	
04/15/1998	Closed	business closed entire site is now Fruehauf Trailer

Renewals

Community Partner Info

Business Information

Tracking #	94-0737
Business Name	Pacific Utility Equipment Inc
Contact Name	Dave Blanding or Jim Young
Salutation	Mr.
First Name	Dave
Last Name	Blanding
Address	1303 South 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	PO Box 24387
Mail City	Seattle
Mail State	WA
Mail Zip	98124
Phone	(206) 764-5025
Fax	(206) 762-4973
Business Type	Manufacturing
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N97741
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	Engineer visit
How did they hear about us	Complaint
How did they hear about us OTHER	
Membership Status	Business for Clean Water member
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☐	☐	☑	☐	☑	☐	☑	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☑

BMPs

CB Maint
Contain
Cover
NPDES SWPPP
Sanitary
O/W Sep
Stencil
Spill Ctrl
WW Disposal
Sweep/Clean

Dates

01/27/1997	Letter Sent	
02/27/1997	Check Back	
01/02/1998	Closed	
04/15/1998	Follow-up	Site in compliance at the time of site visit.

Renewals

Community Partner Info

Business Information

Tracking #	96-5000
Business Name	Pony Express
Contact Name	
Salutation	
First Name	Chris
Last Name	Chrisman
Address	855 S. Barton
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 763-3660
Fax	
Business Type	Transportation/Trucking
Business Desc	courier/delivery

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments: distinct fuel smell in drainage system. Need system pumped immediately to see where the fuel may be coming from.

BCW Comments:

Action	
Category	
Date Entered	1/27/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Sweep/Clean
Contain
Sanitary

Dates

12/08/1996 On-Site Consult

Renewals

Community Partner Info

Business Information

Tracking #	93-1011
Business Name	Precision Engineering
Contact Name	Nils Sandstrom
Salutation	Mr.
First Name	Nils
Last Name	Sandstrom
Address	1231 South Director Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 763-0320
Fax	(206) 764-6099
Business Type	Manu
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☐	☐	☐	☑	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
NPDES SWPPP
O/W Sep
Sanitary
Stencil
Sweep/Clean

Dates

07/18/1996	On-Site Consult
07/29/1996	Letter Sent
08/25/1996	Check Back
09/22/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	97-1011
Business Name	Professional Coatings Inc. PROCOAT
Contact Name	Paul Sparks
Salutation	Mr.
First Name	Paul
Last Name	Sparks
Address	1705 S. 93rd Street, Suite F22
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 228-9464
Fax	
Business Type	Manufacturing
Business Desc	wood products and painting
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☑	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☑	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
Sanitary
Stencil
Spill Ctrl
NPDES SWPPP
Sweep/Clean

Dates

06/04/1997	On-Site Consult
06/16/1997	Letter Sent
12/10/1997	Follow-up
05/14/1998	Follow-up
06/16/1998	Compliance
07/27/1998	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	93-0454
Business Name	Providential Investments
Contact Name	
Salutation	Mr.
First Name	Mike
Last Name	Malnerick
Address	9922/9926 Des Moines Way So
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(2 3) 296-8170
Fax	
Business Type	Apartment
Business Desc	
Comments	8 taxparcels for 8 - 4 plex units
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	3/24/98
Who Entered	Admin
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

08/30/1994 Letter Sent	Letters also sent 7/19/93

Renewals

Community Partner Info

Business Information

Tracking #	96-0582
Business Name	PSF Industries, Inc.
Contact Name	Bill Wood Jim Norris
Salutation	Mr.
First Name	Bill Wood
Last Name	Jim Norris
Address	9332 14th Ave S. PO Box 3747 (98124)
City	Seattle
State	WA
Zip Code	98108
Mail Address	P.O. Box 3747
Mail City	Seattle
Mail State	WA
Mail Zip	98124
Phone	(206) 622-1252
Fax	
Business Type	manufacturer
Business Desc	steel plate fabrication and erection, and boiler r
Comments	
BCW Comments	Mentored Young Corporation.Told them about Busines

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Community Partner
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	2	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
Sanitary
Spill Ctrl
Sweep/Clean
Stencil

Dates

02/16/1996	On-Site Consult
02/22/1996	Check Back
03/12/1996	Letter Sent
06/19/1996	Follow-up
07/23/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	97-0395
Business Name	PSF Industries Main office
Contact Name	
Salutation	
First Name	Bill
Last Name	Woods
Address	PO Box 3747
City	Seattle
State	WA
Zip Code	98124
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 622-1252
Fax	
Business Type	Manufacturing
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	12/11/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
NPDES SWPPP
Stencil
Sweep/Clean

Dates

02/05/1997	On-Site Consult
03/10/1997	Check Back
03/19/1997	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	96-0580
Business Name	PSF Mechanical Inc
Contact Name	Donald M. Hurst
Salutation	Mr.
First Name	Donald
Last Name	Hurst
Address	9322 14th Avenue South
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 764-9663
Fax	(206) 762-8381
Business Type	Manufacturing
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐	☐	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
O/W Sep
Sanitary
Stencil
Sweep/Clean

Dates

02/16/1996	On-Site Consult
03/12/1996	Compliance
03/12/1996	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	98-0327
Business Name	Pugel Sound Coatings
Contact Name	
Salutation	
First Name	Rich Tyman
Last Name	Dean Hutchinson
Address	9400 *th Avenue S
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-3600
Fax	
Business Type	Construction
Business Desc	Marine painting facility
Comments	
BCW Comments	

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	11/16/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☑	☐	☐	☐	☑	☑	☑	☑	☐	☑	☐	☐	☑	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Contain
Stencil
Sweep/Clean
WW Disposal

Dates

01/12/1998	On-Site Consult	joint visit with ECOSS

Renewals

Community Partner Info

Business Information

Tracking #	97-1276
Business Name	Pyrometric Service Company
Contact Name	
Salutation	
First Name	Phil
Last Name	Mendenhall
Address	1312 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	same
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-8307
Fax	(206) 763-9459
Business Type	Manufacturing
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	D95590
Watershed	Green River
Basin	Hamm Creek

Comments: No work outside. Only BMP is to keep dumpster closed and to maintain drainage system.

BCW Comments:

Action	
Category	
Date Entered	6/12/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
Stencil

L ıtes

03/11/1998 Closed

Renewals

Community Partner Info

Business Information

Tracking #	95-0377
Business Name	Rainier Golf and Country Club
Contact Name	
Salutation	Mr.
First Name	Ron
Last Name	Proctor
Address	1856 South 112th Street
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 242-2222
Fax	
Business Type	Services
Business Desc	Golf Course
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N9
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	3/18/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☑	☑	☐	☐	☑	☑	☐	☑	☐	☑	☐	☐	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Drip Pan	
Contain	needed for 2 tanks
CB Maint	
Stencil	
Cover	
Sanitary	
Wash Pad	

Dates

03/16/1998	Enforcement
04/29/1998	On-Site Consult
05/12/1998	Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	97-0515
Business Name	Rainier Vista Sewer District
Contact Name	
Salutation	
First Name	Dana
Last Name	Dick
Address	S. 100th St east of Myers Way
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 764-4254
Fax	
Business Type	Residential
Business Desc	sewer utility district

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments Odor in storm manhole Is there an illicit connection from sanitary..or failing septic identified homes still on septic and only 8 homes are potential problems. Did sampling...no fecal detects... checked sanitary..no cross connects found

BCW Comments

Action	
Category	
Date Entered	1/27/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

Dates

Renewals

Community Partner Info

Business Information

Tracking #	96-1360
Business Name	Rascals Restaurant
Contact Name	Joe Colello
Salutation	Mr.
First Name	Joe
Last Name	Colello
Address	9635 Des Moines Memorial Drive South
City	Seattle
State	WA
Zip Code	98108
Mail Address	9635 Des Moines Mem. Dr. S.
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 763-7428
Fax	
Business Type	restaurant
Business Desc	
Comments	
BCW Comments	Plans on repainting all drains. Policed parking lo

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDE	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☑	☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
O/W Sep
Stencil

Dates

05/08/1996	On-Site Consult
06/11/1996	Letter Sent
06/18/1996	Check Back
06/20/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	94-0315
Business Name	Rasmussen Wire Rope Corp.
Contact Name	
Salutation	
First Name	
Last Name	
Address	9999 8th Avenue S
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Construction
Business Desc	
Comments	
BCW Comments	

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	5/12/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☑	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

Cover

Dates

04/15/1994 Review	initial review of kiln dust problems

Renewals

Community Partner Info

Business Information

Tracking #	96-1653
Business Name	Repair Technology, Inc.
Contact Name	Bill Mitchell, President
Salutation	Mr.
First Name	W.P. (Bill)
Last Name	Mitchell
Address	400 South 96th Street PO Box 80426
City	Seattle
State	WA
Zip Code	98108
Mail Address	P.O. Box 80426
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 762-6221
Fax	(206) 762-8646
Business Type	equipment rental/repair
Business Desc	industrial repair shop repairing machinery compone

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	N
Watershed	Green River
Basin	Hamm Creek

Comments: Part of S96th St. Business Park managed by Noffsinger Mngmnt Greg Allan is their environmental consultant 868-7804. RTI was investigated and listed by DOE toxic program. But Health dept has not reinspected for removal. I could find no evidence of problem.

SCW Comments: Like Program. Noted on renewal form that they recy

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☐	☐	☐	☐	☑	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Contain

Cover

NPDES SWPPP

Sweep/Clean

Dates

09/18/1996 On-Site Consult

10/15/1996 Compliance

10/15/1996 Letter Sent

Renewals

Community Partner Info

Business Information

Tracking #	98-0852
Business Name	Residence
Contact Name	
Salutation	
First Name	Larry
Last Name	Brucker
Address	2430 S. 116th Way
City	Seattle
State	Wa
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-7617
Fax	
Business Type	Residential
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

12/10/1998	Review	garbage dumped in creek
01/08/1999	Letter Sent	

Renewals

Community Partner Info

Business Information

Tracking #	97-1016
Business Name	Scheur Northwest
Contact Name	
Salutation	
First Name	Don
Last Name	Howard
Address	9330 - 15th S. #16 Unit G
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Manufacturing
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

07/24/1998 Review

Renewals

Community Partner Info

Business Information

Tracking #	95-0929
Business Name	Sea-King Ind Park/KMS/Quadrant Corp
Contact Name	LaVonna Pavel
Salutation	Ms.
First Name	LaVonna
Last Name	Pavel
Address	2886 Interurban Avenue South
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 248-7300
Fax	
Business Type	prop
Business Desc	
Comments	also N97749 and N97750
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	D97751
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Business for Clean Water member
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☑	☐	☐	☐	☑	☐	☐	☑	☐	☑	☑	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Cover
O/W Sep
Sanitary
Stencil
Sweep/Clean

Dates

06/19/1996	On-Site Consult
07/09/1996	Letter Sent
08/09/1996	Check Back
09/10/1996	Follow-up
09/22/1996	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	94-0032
Business Name	Security Contractor Services
Contact Name	Jeff Novitsky
Salutation	Mr.
First Name	Jeff
Last Name	Novitsky
Address	9619 - 8th Avenue South
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-7383
Fax	
Business Type	Manufacturing
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	Business for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	4/3/98
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☐	☐	☐	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Sweep/clean
Spill Ctrl
Cover
Contain
Stencil
CB Maint
O/W Sep
Wash Pad
WW Disposal
Sanitary

Dates

07/15/1996	On-Site Consult	
08/01/1996	Letter Sent	letter sent 2/4/94
09/01/1996	Check Back	
01/21/1997	Follow-up	
06/18/1997	Follow-up	
02/11/1998	Follow-up	
02/23/1998	Compliance	

Renewals

Community Partner Info

Business Information

Tracking #	95-0437
Business Name	Selland Auto Transport, Inc
Contact Name	Larry de Turenne
Salutation	Mr.
First Name	Larry
Last Name	de Turenne
Address	615 South 96th Street
City	Seattle
State	WA
Zip Code	98122
Mail Address	615 S 96th St.
Mail City	Seattle
Mail State	WA
Mail Zip	98108
Phone	(206) 767-5960
Fax	(206) 767-0604
Business Type	trucking service
Business Desc	auto transport company transporting new and used a
Comments	
BCW Comments	

Survey Recd	☑
Renewal Recd	☑
OK to recognize/Ad	☑
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	Business
Date of Contact	
Number of People Contacted	1
Form of First Contact	
How did they hear about us	County Staff Visit
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☑
Business OK by HW	☑
Business OK by PSAPCA	☑
Business OK by Health	☑
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☑	☐	☑	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Insert
CB Maint
Contain
Cover
Drip Pan
NPDES SWPPP
Spill Ctrl
Stencil
Sweep/Clean
Other

Dates

05/16/1995	On-Site Consult	
03/22/1996	Follow-up	
05/19/1996	Letter Sent	letter sent 4/5/96
08/18/1996	Check Back	

Renewals

Community Partner Info

Business Information

Tracking #	98-0338
Business Name	Sound Delivery Service
Contact Name	
Salutation	
First Name	Larry
Last Name	Lawrence
Address	9999 - 8th Avenue South
City	Seattle
State	WA
Zip Code	98108
Mail Address	PO Box 58722
Mail City	Seattle
Mail State	WA
Mail Zip	98138
Phone	(206) 762-3564
Fax	(206) 763-1764
Business Type	Transportation/Trucking
Business Desc	Heavy Hauling and truck/trailer repair
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N9
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	10/15/98
Who Entered	sueclarke
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☐	☑	☐	☑	☐	☑	☐	☐	☐	☑	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover
Drip Pan
NPDES SWPPP
Sanitary
Spill Ctrl
Wash Pad
WW Disposal

Dates

05/12/1998	On-Site Consult	met with Larry
10/11/1998	Letter Sent	Larry called 10/15 to let me know he had received let

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Speedy Plumbing
Contact Name	•
Salutation	
First Name	
Last Name	
Address	430-14 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 243-5227
Fax	
Business Type	Other
Business Desc	dispatcher for speedy plumbing

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments Dispatcher for Speedy Plumbing and Rooter service. Everything ends up in the sanitary system. No bmps No investigation report

BCW Comments

Action	
Category	
Date Entered	7/22/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Sanitary

Dates

08/10/1997 Review	no bmps office only

Renewals

Community Partner Info

Business Information

Tracking #	
Business Name	Spiral Arts
Contact Name	
Salutation	
First Name	
Last Name	
Address	430-5 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-1357
Fax	
Business Type	Retail
Business Desc	art supply house

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments small retail type business No bmp issues All inside storage No investigation report

BCW Comments

Action	
Category	
Date Entered	7/22/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Sweep/Clean
Sanitary

Dates

08/10/1997 Review	retail type distributor indoors only no bmps

Renewals

Community Partner Info

Business Information

Tracking #	95-0654
Business Name	Sunnydale Construction, Storage andTopsoil
Contact Name	
Salutation	Ms.
First Name	Dorothy
Last Name	Collello
Address	1119 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-0432
Fax	
Business Type	Construction
Business Desc	

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments

BCW Comments

Action	
Category	
Date Entered	4/3/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	

Business OK by DDES ☐
Business OK by HW ☐
Business OK by PSAPCA ☐
Business OK by Health ☐

Date Letter/Certificate Mailed	

Member Wants Advertising ☐

Business Description for Directory	
Directory Category	

Activities

BMPs

Cover
ESC

Dates

08/19/1995	Review	
04/03/1998	Closed	property sold business closed

Renewals

Community Partner Info

Business Information

Tracking #	97-1609
Business Name	TK Hood and Duct Cleaning
Contact Name	Terry B. King
Salutation	Mr.
First Name	Terry
Last Name	King
Address	PO Box 47148
City	Seattle
State	WA
Zip Code	98146
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 244-8208
Fax	
Business Type	Mobile Services
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments Mobil restaurant equipment cleaning service Restaurant where complaint originated Dumanji has been visited by Health Dept. Letter sent to Mr. King in the form of a complaint.

BCW Comments

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

WW Disposal

Dates

12/31/1997	On-Site Consult	
01/05/1998	Letter Sent	
06/12/1998	Closed	closed with info. letter

Renewals

Community Partner Info

Business Information

Tracking #	93-1045
Business Name	Toxgon Corportation
Contact Name	
Salutation	
First Name	Bill
Last Name	Whitacre
Address	631 S. 96th Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 762-5583
Fax	
Business Type	Manufacturing
Business Desc	Hazardous Waste Vitrifier
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/25/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☑	☑	☐	☐	☐	☐	☑	☑	☑	☑	☐	☐	☐	☐	☑	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☑	☑	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint	
NPDES SWPPP	
Illicit Connection	pipe from furnaces removed from outleting to stream
Spill Ctrl	

Dates

11/16/1995	Review	working with DOE on cleanup
03/28/1996	Follow-up	

Renewals

Community Partner Info

Business Information

Tracking #	96-1274
Business Name	Tukwila Roofing
Contact Name	Bill Baily
Salutation	Mr.
First Name	Bill
Last Name	Baily
Address	1237A S. Director Street
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 241-5385
Fax	
Business Type	Construction
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	N97610
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☑	☐	☑	☐	☐	☐	☑	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Contain
Cover

Dates

06/11/1996	On-Site Consult	
07/09/1996	Letter Sent	
08/09/1996	Check Back	
02/02/1998	Closed	business closed new owner

Renewals

Community Partner Info

Business Information

Tracking #	97-0613
Business Name	U Do It Car Wash
Contact Name	
Salutation	
First Name	Ed
Last Name	Coleman
Address	11315 Des Moines Way South
City	Seattle
State	WA
Zip Code	98108
Mail Address	1624 - 44th SW
Mail City	Seattle
Mail State	WA
Mail Zip	98116
Phone	(206) 932-8966
Fax	
Business Type	Other
Business Desc	car wash
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	1/27/99
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☐	☐	☑	☐	☑	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
O/W Sep
Sanitary

Dates

03/21/1997 On-Site Consult

Renewals

Community Partner Info

Business Information

Tracking #	97-1120
Business Name	Vern's Quality Cleaners
Contact Name	
Salutation	
First Name	Jan
Last Name	Snow
Address	11851 Glendale Way South
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 242-1128
Fax	
Business Type	Other
Business Desc	Laundry and Dry Cleaner
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	7/22/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint	
Sanitary	
Sweep/Clean	
Other	dry cleaning fluid disposal

Dates

05/15/1998	Compliance	
05/15/1998	On-Site Consult	came in as a complaint
07/27/1998	Letter Sent	

Renewals

Community Partner Info

Business Information

Tracking #	97-1167
Business Name	Water District 20
Contact Name	Ron Malaspino,gen mngr Dick Swaab Field
Salutation	Mr.
First Name	Ron
Last Name	Malaspino
Address	12606 First Avenue South
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 243-3990
Fax	(206) 244-7514
Business Type	Construction
Business Desc	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	D95971
Watershed	Green River
Basin	Hamm Creek

Comments site audit for both maintenance shop/ yard/ main offices and all construction sites and consultant work by water district contractors

BCW Comments

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☑	☑	☑	☐	☑	☑	☐	☑	☑	☑	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☑	☐	☑	☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint	
Cover	
O/W Sep	
Sanitary	
Spill Ctrl	
Stencil	
WW Disposal	inside floor drains go to sanitary

Dates

07/09/1997	On-Site Consult
07/23/1997	Letter Sent
08/23/1997	Check Back
10/10/1997	Compliance

Renewals

Community Partner Info

Business Information

Tracking #	96-1545
Business Name	Winsor Corporation
Contact Name	Jeff Hamaker
Salutation	Ms.
First Name	Lari
Last Name	Winsor
Address	410 S. 96th Street Unit 7
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 767-4070
Fax	
Business Type	Manufacturing
Business Desc	ceramic sign and display manufacturing

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Comments Printing ceramic fritz work, discharge to sink of some of the wastes May want to check with IW for discharge authorization

BCW Comments

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	Businesses for Clean Water member
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☑
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☐	☐	☑	☑	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

BMPs

Cover
Sanitary
Sweep/Clean

Dates

09/18/1996	On-Site Consult
10/22/1996	Letter Sent
05/02/1998	Compliance
05/19/1998	Letter Sent
06/18/1998	Check Back

Renewals

Community Partner Info

Business Information

Tracking #	96-1267
Business Name	Wire Rope Industries
Contact Name	Rick Axt
Salutation	Mr.
First Name	Rick
Last Name	Axt
Address	1501 S. 92nd Place Unit C
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 764-9473
Fax	(206) 762-8929
Business Type	dist
Business Desc	
Comments	Business has moved to Kent valley location
BCW Comments	

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	
Who Entered	
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☑	☐	☐	☐	☐	☑	☐	☐	☑	☐	☐	☐	☐	☐	☐	☑	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

Cover
Sweep/Clean

Dates

06/13/1996	On-Site Consult
07/09/1996	Letter Sent
08/09/1996	Check Back
09/11/1996	Compliance
09/11/1996	Follow-up

Renewals

Community Partner Info

Business Information

Tracking #	95-0676
Business Name	Zion Sr Services Center
Contact Name	
Salutation	Mr.
First Name	Tom
Last Name	Rasmussen
Address	1443 S 99th St
City	Seattle
State	WA
Zip Code	98108
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	(206) 722-0317
Fax	
Business Type	
Business Desc	
Comments	
BCW Comments	

Survey Recd ☐
Renewal Recd ☐
OK to recognize/Ad ☐
Change Address ☐

Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	3/24/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☑	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐

BMPs

CB Maint
Stencil

Dates

08/21/1996 Compliance

Renewals

Community Partner Info

Business Information

Tracking #	95-0227
Business Name	
Contact Name	
Salutation	Mr.
First Name	Rafael
Last Name	Barajas
Address	800 South 105th Street
City	Seattle
State	WA
Zip Code	98168
Mail Address	
Mail City	
Mail State	
Mail Zip	
Phone	
Fax	
Business Type	Residential
Business Desc	
Comments	
BCW Comments	

Survey Recd	☐
Renewal Recd	☐
OK to recognize/Ad	☐
Change Address	☐
Facility Number	
Watershed	Green River
Basin	Hamm Creek

Action	
Category	
Date Entered	3/24/98
Who Entered	Admin
Type of Organization	
Date of Contact	
Number of People Contacted	0
Form of First Contact	
How did they hear about us	
How did they hear about us OTHER	
Membership Status	
Business OK by DDES	☐
Business OK by HW	☐
Business OK by PSAPCA	☐
Business OK by Health	☐
Date Letter/Certificate Mailed	
Member Wants Advertising	☐
Business Description for Directory	
Directory Category	

Activities

BMPs

Dates

10/27/1996 Letter Sent

Renewals

Community Partner Info

APPENDIX B

BUSINESS EDUCATIONAL MATERIALS

In Separate Envelope
Not attached to Final Report

APPENDIX C

RESIDENTIAL AND MULTI-FAMILY EDUCATIONAL MATERIALS

In Separate Envelope
Not attached to Final Report

APPENDIX D

MONITORING RESULTS

Appendix D includes:

RESULTS FROM SITE WA - 01

RESULTS FROM SITE WA - 02

RESULTS FROM SITE WA – 03

RESULTS FROM SITE WA – 04

RESULTS FROM SITE WA - 05

HAMM CREEK UNIT LOADING COMPARISON

GRAB SAMPLE SITES WATER QUALITY RESULTS

RESULTS COMPARED TO STATE
WATER QUALITY STANDARDS

STATISTICIAN'S REPORT

1996 AND 1998 SEDIMENT SAMPLE RESULTS

MICROTOX DISCUSSION

RESULTS FROM SITE WA - 01

Locator	Date	SampleID	Ph	Total Suspended Solids	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms	Mean Q
		<MDL Value		***0***	***0***	***0.1***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	
		MDL		***0.5***	***0.3***	***0.2***	***0.0005***	***0.0005***	***0.0002***	***0.0002***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	
		RDL		1	2	1.25	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
WA-01	11/17/95	L7371-1		53	4.2	65	0.0039	0.0017	0.0004	***0.0001***	0.0054	0.0010	0.0124	0.0047	0.0058	0.0025	0.0114	0.0008	0.0547	0.0107	
WA-01	12/09/95	L7517-1		35	1.2	47	0.0028	0.0014	0.0002	***0.0001***	0.0036	0.0006	0.0098	0.0033	0.0044	0.0017	0.0074	***0.0002***	0.0498	0.0234	
WA-01	01/08/96	L7665-1		33	0.8	60	0.0027	0.0014	0.0002	***0.0001***	0.0028	***0.0002***	0.0067	0.0030	0.0035	0.0018	0.0076	0.0007	0.0373	0.0101	
WA-01	02/05/96	L7842-1		357	9.0	82	0.0082	0.0017	0.0006	***0.0001***	0.0176	0.0006	0.0396	0.0027	0.0208	0.0017	0.0412	***0.0002***	0.1250	0.0046	
WA-01	03/03/96	L8017-1	7.2	22	11.8	76	0.0024	0.0013	0.0003	***0.0001***	0.0020	0.0009	0.0080	0.0040	0.0037	0.0021	0.0046	***0.0002***	0.0997	0.0172	
WA-01	03/22/96	L8159-1		109	1.1	72	0.0047	0.0013	0.0005	***0.0001***	0.0080	0.0005	0.0197	0.0035	0.0092	0.0018	0.0201	***0.0002***	0.0917	0.0119	
WA-01	03/31/96	L8209-1	7.5	62	0.9	60	0.0041	0.0011	0.0004	***0.0001***	0.0059	0.0007	0.0161	0.0035	0.0067	0.0016	0.0193	***0.0002***	0.0858	0.0121	
WA-01	04/22/96	L8369-1	7.3	94	0.7	74		0.0014	0.0006	***0.0001***		0.0013	0.0271	0.0043	0.0123	0.0017	0.0286	***0.0002***	0.1250	0.0110	
WA-01	05/22/96	L8669-1	7.8	20	***0.1***	50	0.0025	0.0014	***0.0001***	***0.0001***	0.0024	0.0011	0.0077	0.0036	0.0038	0.0019	0.0060	0.0006	0.0487	0.0432	
Sample size:			4	9	9	9	8	9	9	9	8	9	9	9	9	9	9	9	9	9	
Arithmetic mean:			7.5	86	3.3	65	0.0039	0.0014	0.0004	0.0001	0.0060	0.0008	0.0163	0.0036	0.0078	0.0019	0.0163	0.0004	0.0731	0.0160	
Max value:			7.8	357	11.8	82	0.0082	0.0017	0.0006	0.0001	0.0176	0.0013	0.0396	0.0047	0.0208	0.0025	0.0412	0.0006	0.1250	0.0432	
Min value:			7.2	20	***0.1***	47	0.0024	0.0011	0.0001	0.0001	0.0020	0.0002	0.0067	0.0027	0.0035	0.0016	0.0046	0.0002	0.0373	0.0046	
Median:			7.4	53	1.1	65	0.0034	0.0014	0.0004	0.0001	0.0045	0.0007	0.0124	0.0035	0.0058	0.0018	0.0114	0.0002	0.0547	0.0119	
Est. mean of population:			7.3	94	3.9	67	0.0041	0.0014	0.0004	0.0001	0.0066	0.0008	0.0178	0.0036	0.0084	0.0019	0.0184	0.0003	0.0774	0.0129	
1996 Arithmetic Mean:			7.3	95	3.7	67	0.0041	0.0014	0.0004	0.0001	0.0065	0.0007	0.0174	0.0036	0.0083	0.0019	0.0175	0.0003	0.0761	0.0126	
							Total seconds * cfs * mg/l * .02832 for grams														
Loading by storm:				Kg	Kg	Kg	grams	grams	grams	grams	grams	grams	grams	grams	grams	grams	grams	grams	grams	grams	cfs
	11/17/95			28.2	2.26	35.1	2.12	0.91	0.19	0.05	2.90	0.54	6.67	2.52	3.14	1.32	6.13	0.40	29.42	5.76	0.96
	12/9/95			44.3	1.51	59.5	3.57	1.77	0.25	0.13	4.48	0.72	12.39	4.16	5.55	2.14	9.35	0.25	62.79	29.50	1.98
	1/8/96			156.4	4.01	287.0	13.02	6.68	0.95	0.48	13.45	0.95	32.09	14.11	16.64	8.58	36.05	3.34	177.85	48.16	7.80
	2/5/96			894.7	22.5	206.0	20.58	4.26	1.60	0.25	44.11	1.45	99.25	6.72	52.13	4.26	103.26	0.50	313.28	11.40	4.10
	3/3/96			9.9	5.19	33.6	1.03	0.57	0.11	0.04	0.88	0.40	3.51	1.76	1.61	0.93	2.04	0.09	17.47	7.57	0.72
	3/22/96			83.7	0.89	58.3	3.81	1.06	0.41	0.08	6.54	0.41	16.02	2.83	7.46	1.46	16.34	0.16	74.55	9.67	1.33
	3/31/96			78.1	1.13	75.2	5.08	1.38	0.48	0.13	7.38	0.86	20.18	4.41	8.45	2.00	24.19	0.25	107.52	15.16	2.46
	4/22/96			109.7	0.76	86.5		1.64	0.67	0.12		1.53	31.81	5.07	14.44	2.00	33.57	0.23	146.71	12.91	1.92
	5/22/96			17.8	0.09	45.4	2.25	1.27	0.09	0.09	2.21	1.00	6.95	3.26	3.41	1.73	5.48	0.51	44.22	39.23	1.55

SAMPLE TIME AND INFO

Date	Sampler Start Time	Sampler End Time	Duration (Hours)	Duration (Seconds)	Mean Q,cfs	Rainfall, inches	24 Hr Antecedent	72 Hr Antecedent	7 Day Antecedent	total volume, liters
11/17/95	19:00	0:30	5:30	19800	0.96	0.2	0.02	0.25	1.57	538,307
12/9/95	13:15	19:30	6:15	22500	1.98	0.41	0.16	0.16	1.02	1,261,656
1/7/96	2:30	8:30	6:00	21600	7.8	0.98	0.48	0.73	0.86	4,771,354
2/5/96	16:30	22:30	6:00	21600	4.1	0.46	0.44	0.9	0.96	2,508,019
3/3/96	11:00	17:00	6:00	21600	0.72	0.15	0.12	0.12	0.12	440,433
3/22/96	8:15	14:15	6:00	21600	1.33	0.29	0.13	0.31	0.34	813,577
3/31/96	17:30	22:30	5:00	18000	2.46	0.48	0.25	0.41	0.41	1,254,010
4/22/96	13:00	19:00	6:00	21600	1.92	0.41	0.23	0.25	1.28	1,174,487
5/22/96	3:30	9:15	5:45	20700	1.55	0.21	0.31	0.32	1.41	908,647
1996 total rain contributing sampled runoff						3.59	wet season runoff:			1996 sampled runoff
1996 rain Nov - May						46.76		178,059,069		13,670,489

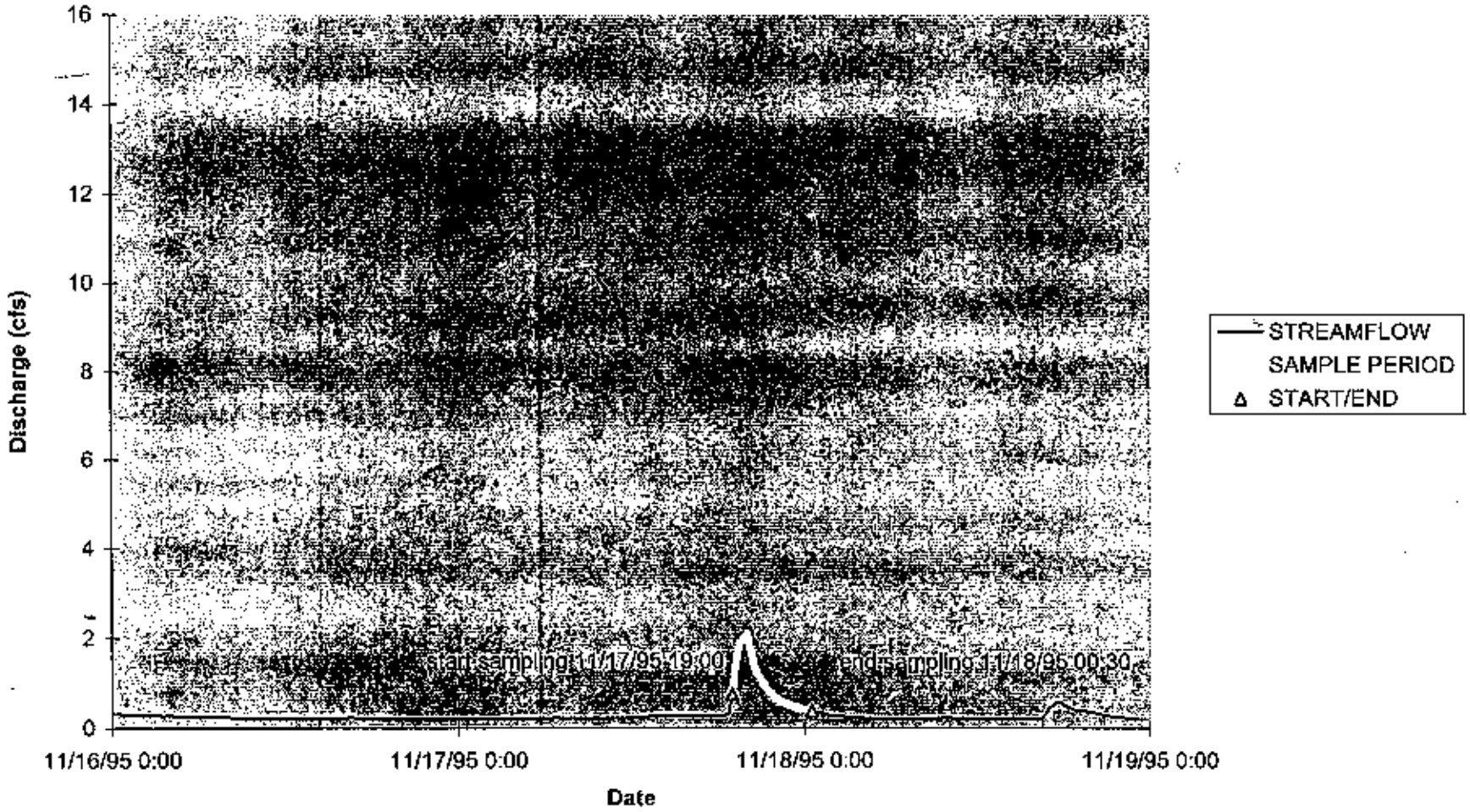
Hamm Creek WA 1, Lost Fork Hamm Creek 1996 Storm Loading

LOADINGS (in grams unless noted) 454 grams in a pound. Sub-basin area = 114 acres hecatre = 2.471 acres

	TSS, KG	TPH, KG	As, total	As, diss.	Cd, Total	Cd, diss.	Cr, total	Cr, diss.	Cu, total	Cu, diss.	Ni, total	Ni, diss.	Pb, total	Pb, diss.	Zn, total	Zn, diss.
1996 Sampled Events Total	1439	48	53	19	5	1	84	7	229	45	113	25	234	5	962	155
1996 Annual Storm Total, Direct Method	18740	627	688	253	64	18	1100	97	2977	585	1467	321	3053	70	12533	2025
1996 Sample Mean Concentration (SMC) statistics																
stats mean	84.66	4.28	0.0039	0.0014	0.0004	0.0001	0.0060	0.0008	0.0165	0.0036	0.0078	0.0019	0.0168	0.0004	0.0739	0.0162
CI upper	189.20	71.05	0.0050	0.0015	0.0005	0.0001	0.0104	0.0012	0.0246	0.0040	0.0117	0.0020	0.0294	0.0005	0.0978	0.0243
CI lower	37.88	0.26	0.0031	0.0013	0.0003	0.0001	0.0035	0.0008	0.0111	0.0033	0.0052	0.0017	0.0096	0.0002	0.0558	0.0108
1996 Loading, Modified Direct Method	15074	762	698	252	66	18	1071	147	2944	645	1392	332	2992	64	13162	2888
1996 Storm Loading, KG/hectare, 1996 by Direct Method	406	13.6	0.0149	0.0055	0.0014	0.0004	0.0238	0.0021	0.0645	0.0127	0.0318	0.0070	0.0662	0.0015	0.2717	0.0439
1996 Storm Loading, KG/hectare, 1996 by Modified Direct Method	327	16.5	0.0151	0.0055	0.0014	0.0004	0.0232	0.0032	0.0638	0.0140	0.0302	0.0072	0.0649	0.0014	0.2853	0.0626

Nov 17 Chart

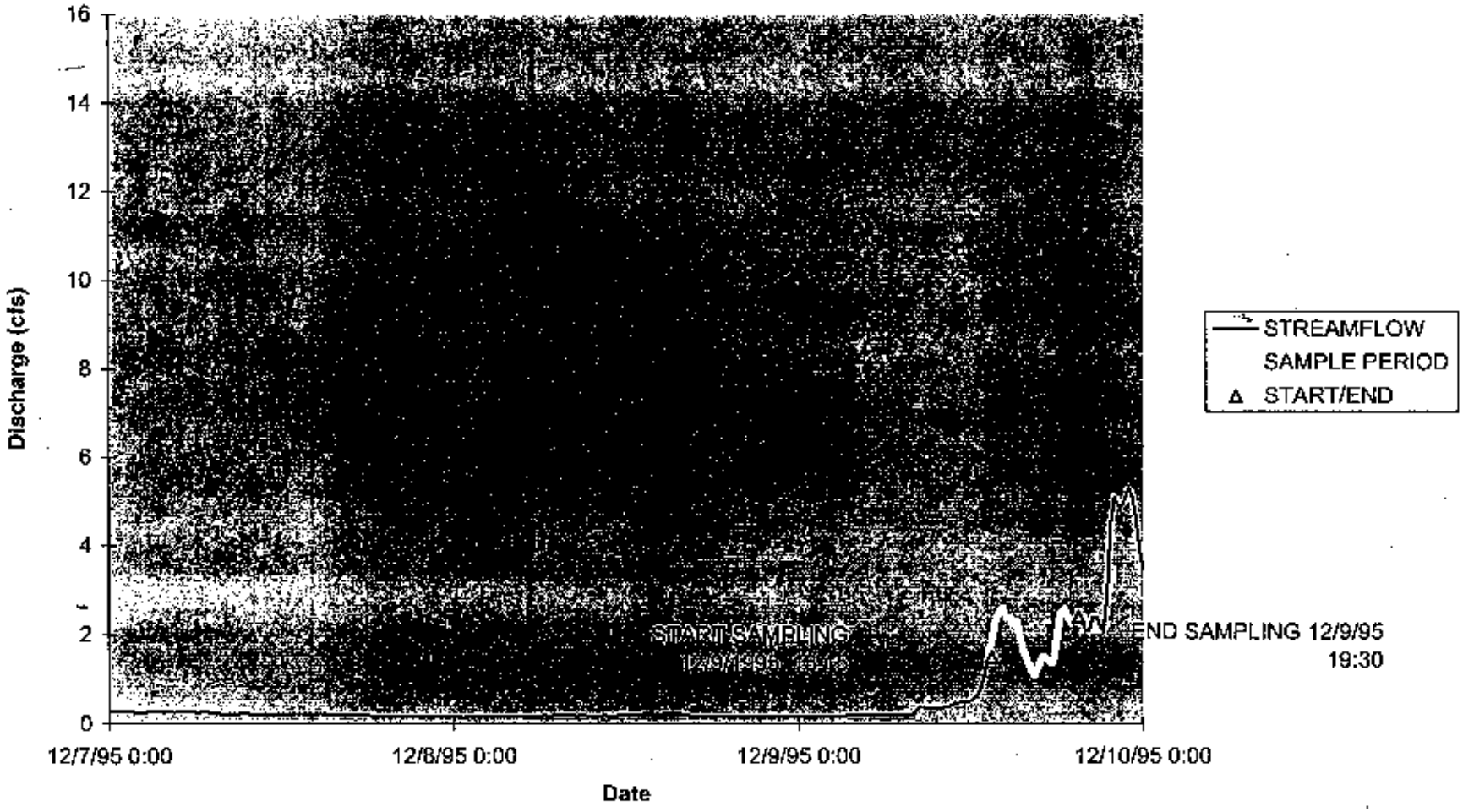
WA1-Lost Fork Storm Sample 1 for WY 1996



WATER QUALITY DATA FOR WA01

Dec 9 chart

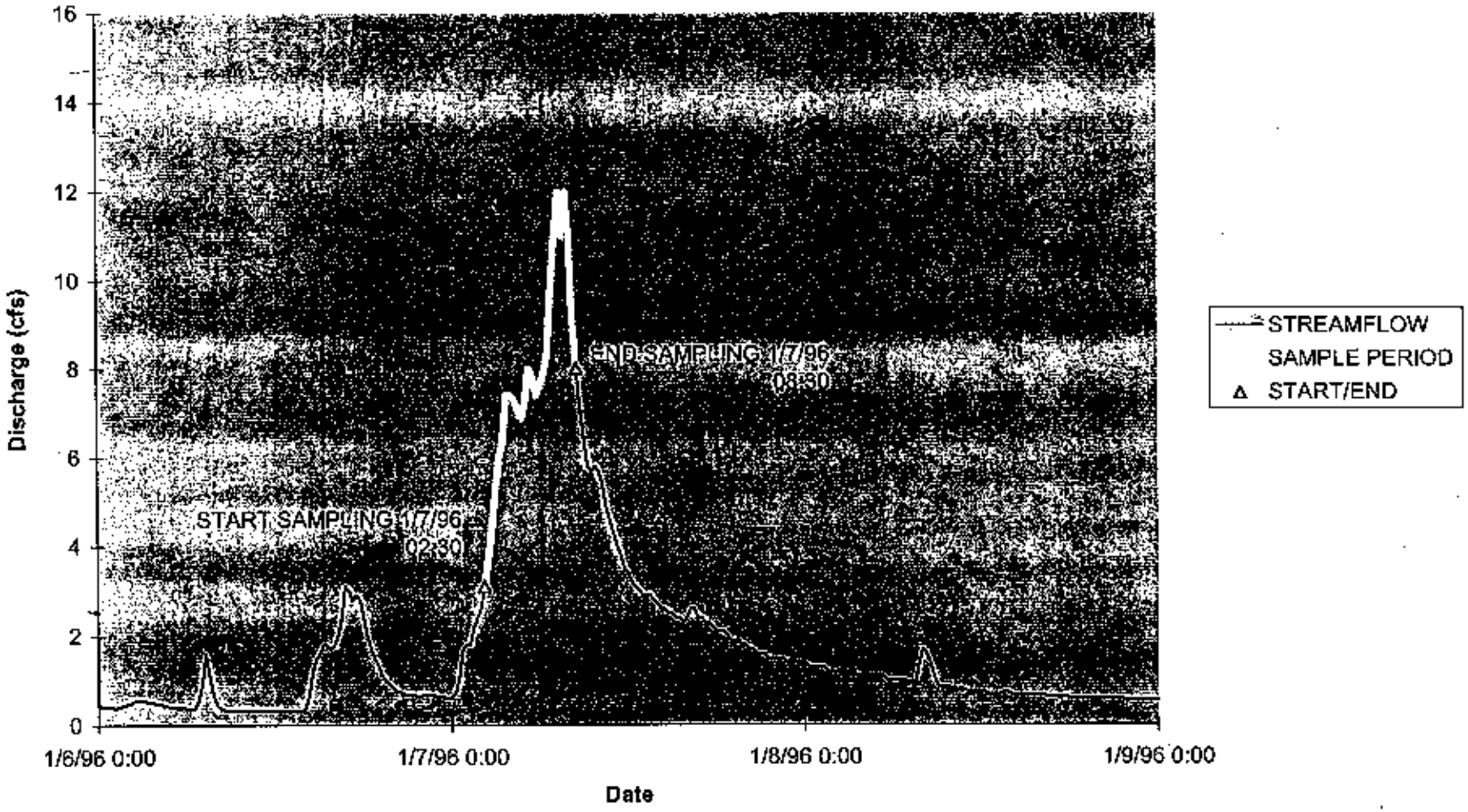
WA1-Lost Fork Storm Sample 2 for WY 1996



WATER QUALITY DATA FOR WA01

Jan 7 chart

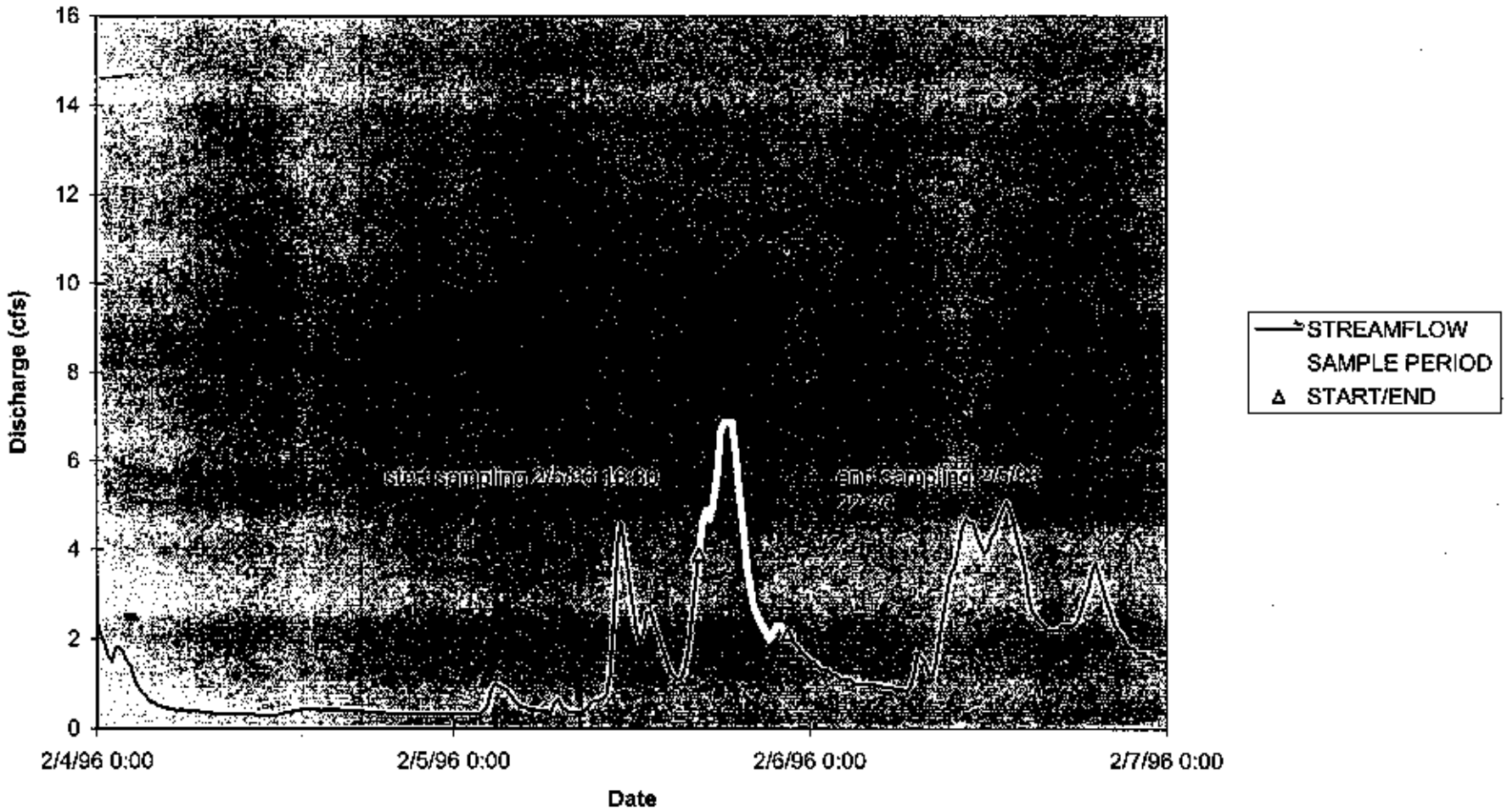
WA1-Lost Fork Storm Sample 3 for WY 1996



WATER QUALITY DATA FOR WA01

Feb 5 Chart

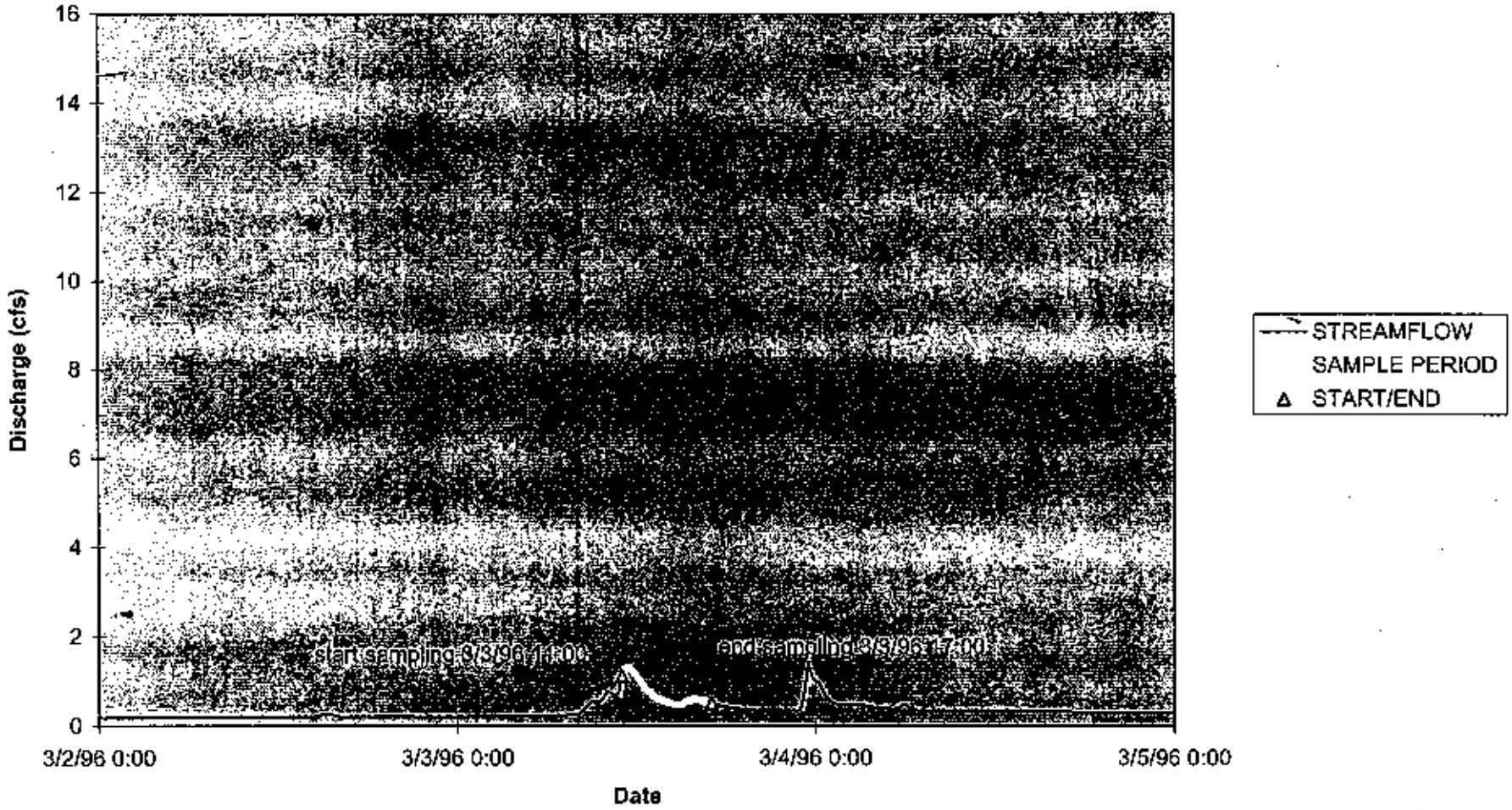
WA1-Lost Fork Sample Session 4 for WY 96



WATER QUALITY DATA FOR WA01

March 3 Chart

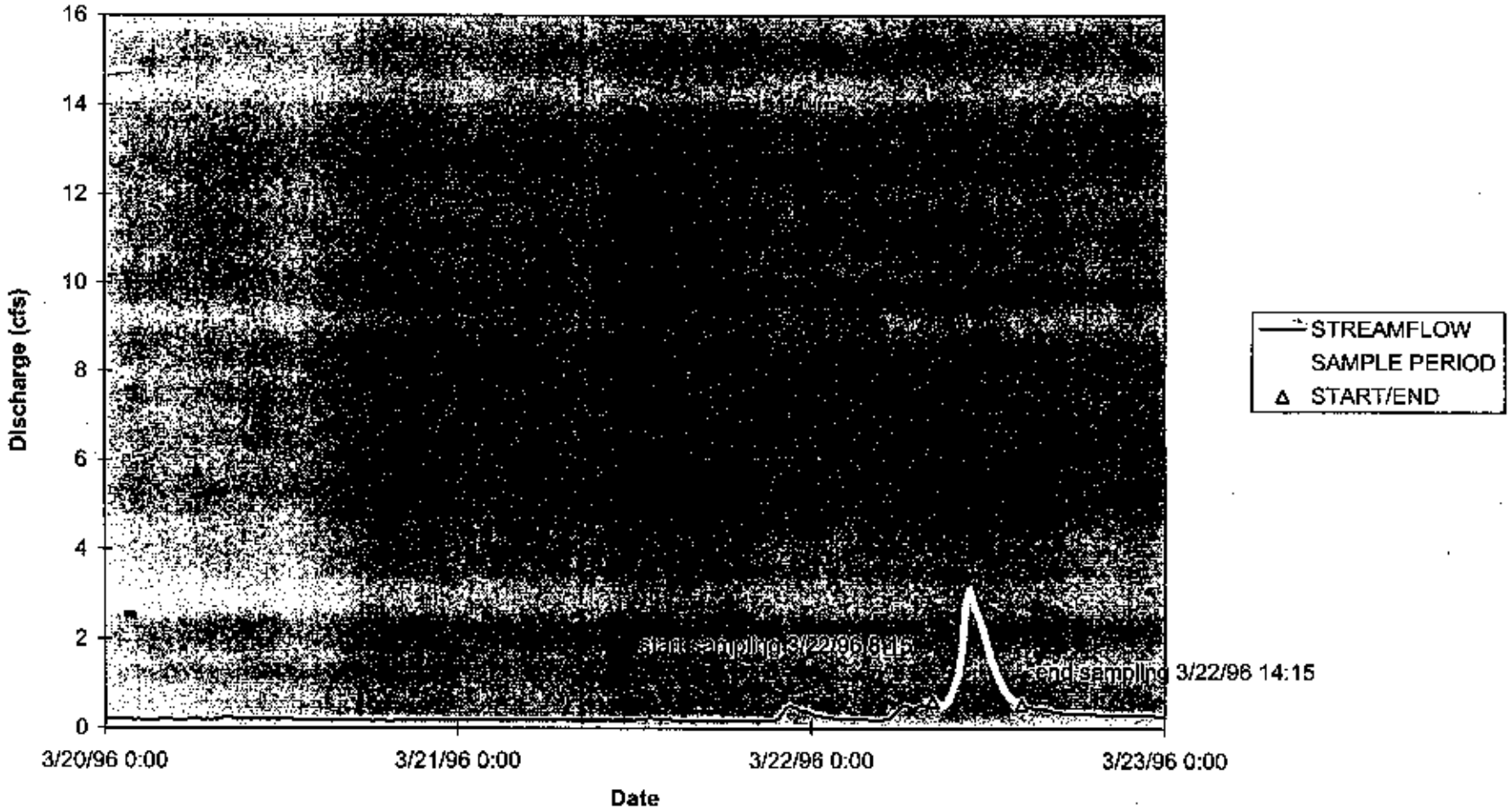
WA1-Lost Creek Storm Sample Session 5 for WY 96



WATER QUALITY DATA FOR WA01

March 22 Chart

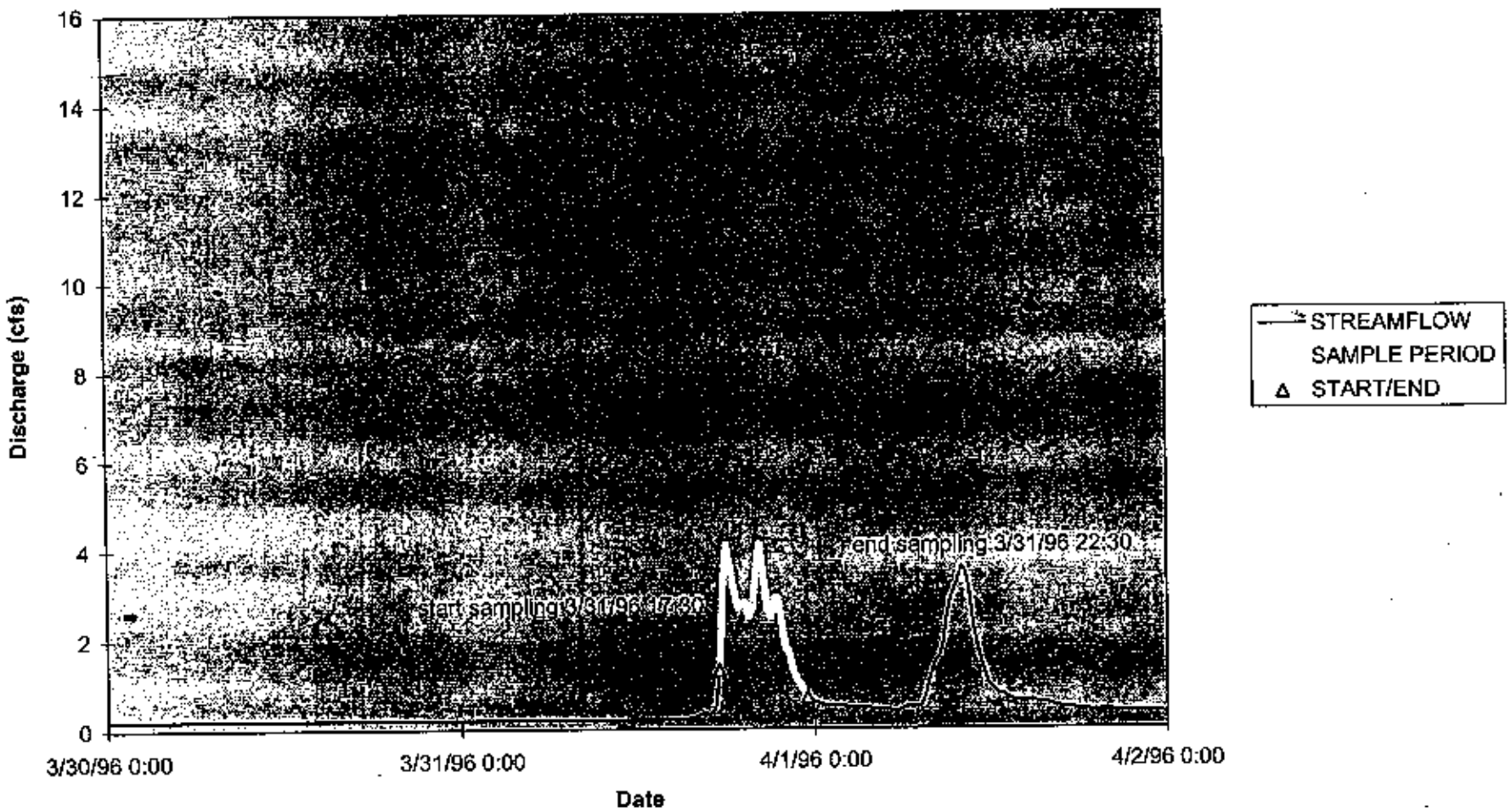
WA1-Lost Creek Storm Sample Session 6 for WY 96



WATER QUALITY DATA FOR WA01

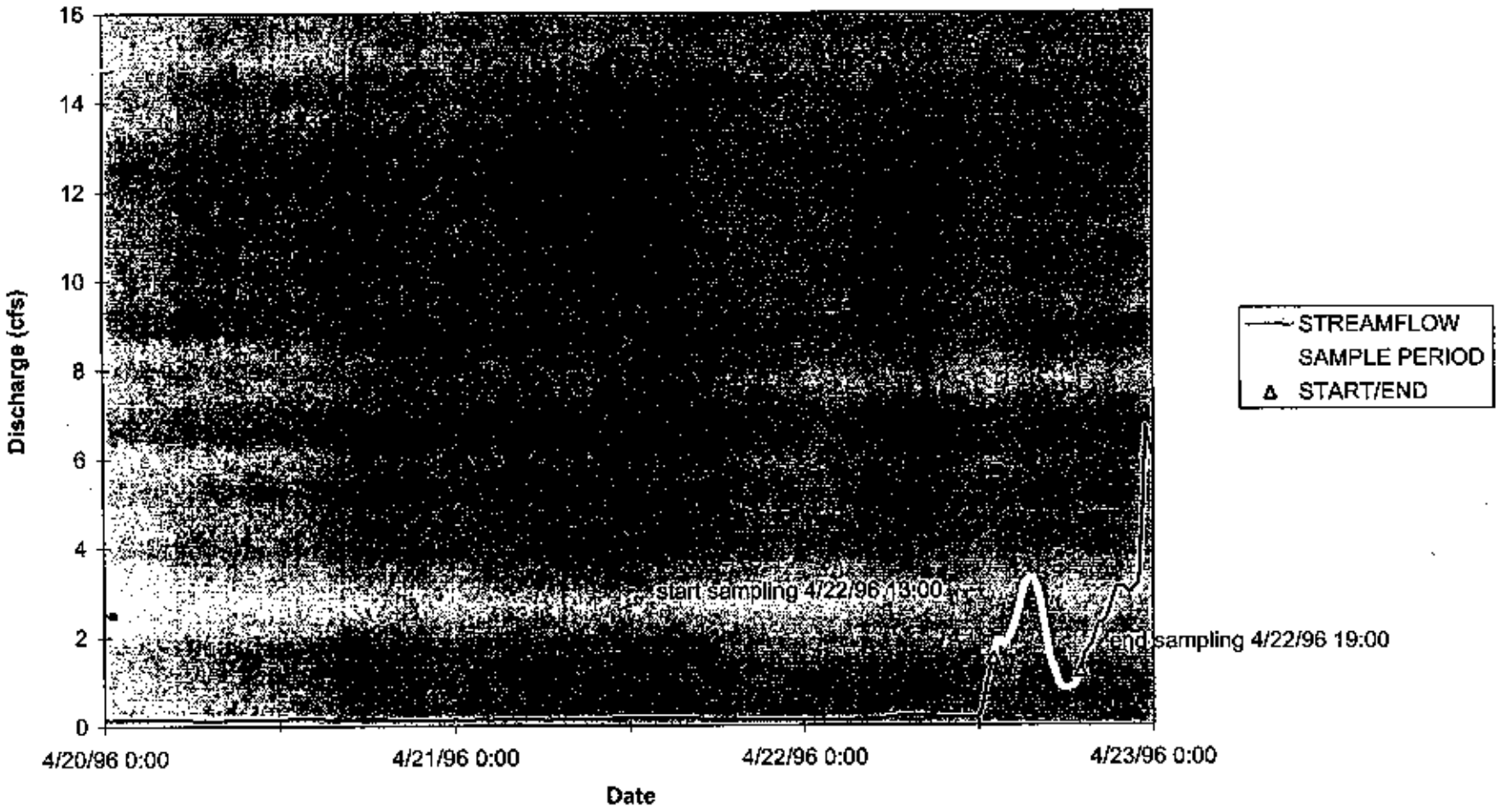
March 31 Chart

WA1-Lost Fork Storm Sample Session 7 for WY 96



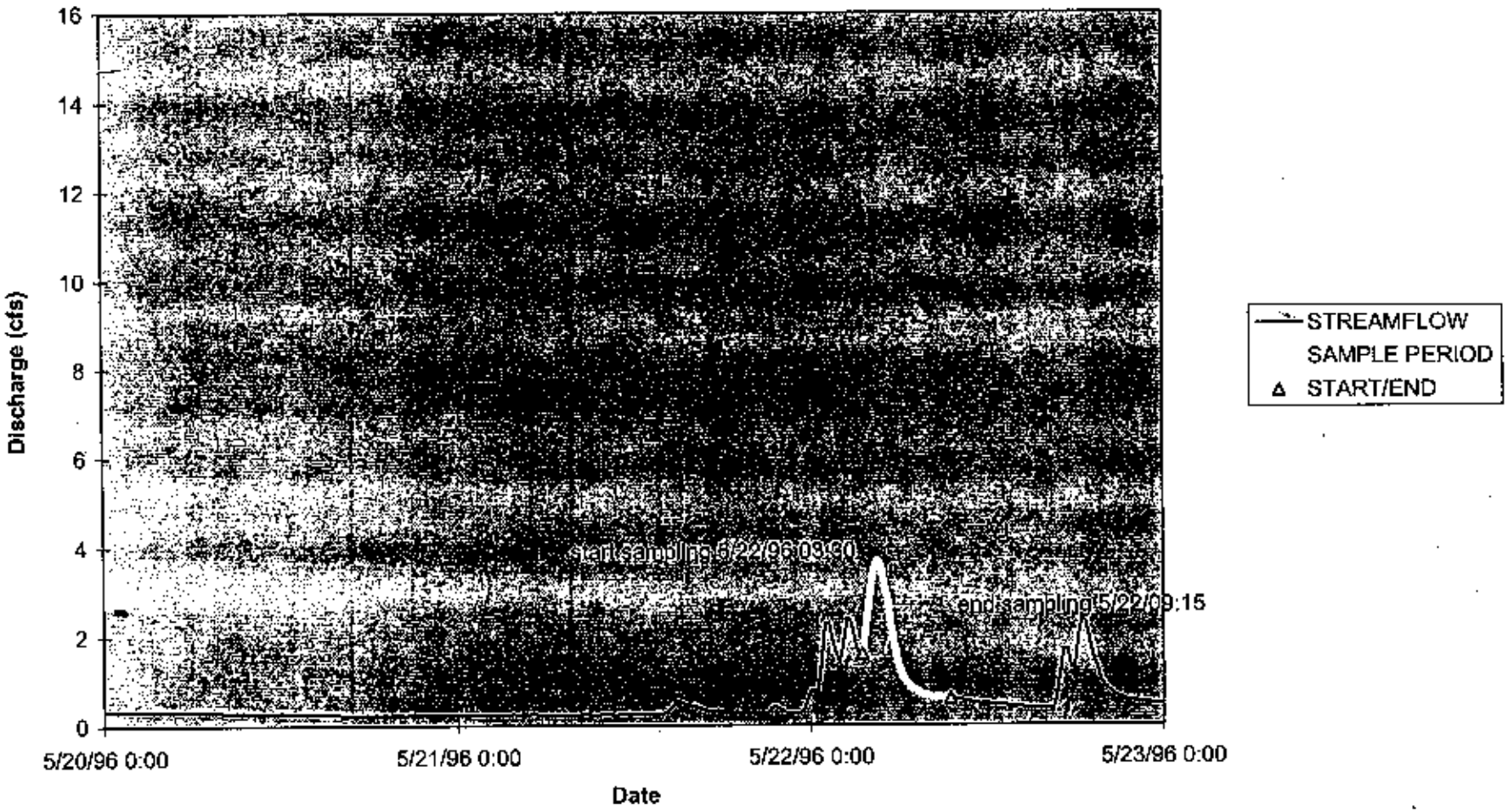
WATER QUALITY DATA FOR WA01

WA1-LOST FORK Storm Sample Session 8 for WY 96



May 22 Chart

WA1-Lost Fork Storm Sample Session 9 for WY 1996



WATER QUALITY DATA FOR WA01

RESULTS FROM SITE WA - 02

Values < RDL in **bold**, < ***MDL*** estimated in ***bold italic***.

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms
		<MDL Value		***0***	***0***	***0***	***0***	***0***	***0.1***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***
		MDL		***0.5***	***0.005***	**0.05**	***0.02***	***0.3***	***0.2***	***0.0005***	***0.0005***	***0.0002***	***0.0002***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***
		RDL		**1**	**0.01**	**0.1**	**0.04**	**2**	**1.25**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WA-02	11/17/95	L7371-2		17				5.7	82	**0.0016**	**0.0014**	0.0002	***0.0001***	0.0367	0.0359	0.0090	0.0047	0.0140	0.0123	0.0069	**0.0007**	0.2120	0.0554
WA-02	12/09/95	L7517-2		63				**0.4**	53	0.0024	**0.0009**	0.0007	0.0003	0.0122	0.0046	0.0212	0.0052	0.0143	0.0064	0.0236	***0.0002***	0.2650	0.0854
WA-02	1/7/96	L7685-2		49				**1.5**	45	**0.0018**	***0.0002***	**0.0003**	***0.0001***	0.0124	0.0029	0.0140	0.0034	0.0095	0.0036	0.0213	**0.0011**	0.3350	0.1300
WA-02	02/05/96	L7842-2		182				6.9	52	0.0037	**0.0008**	**0.0004**	***0.0001***	0.0195	0.0089	0.0250	0.0033	0.0213	0.0047	0.0350	***0.0002***	0.3030	0.0570
WA-02	03/22/96	L8159-2		66				**1.7**	57	**0.0017**	**0.0007**	**0.0004**	**0.0002**	0.1060	0.0418	0.0167	0.0049	0.0189	0.0133	0.0182	**0.0014**	1.0400	0.4430
WA-02	03/31/96	L8209-2	7.4	66				2.2	47	**0.0010**	**0.0008**	**0.0004**	**0.0002**	0.0140	0.0092	0.0117	0.0048	0.0125	0.0096	0.0112	***0.0002***	0.3640	0.1760
WA-02	04/22/96	L8389-2	7.2	56				**1.1**	40	***0.0021***	**0.0007**	**0.0018**	**0.0009**	***0.0294***	0.0117	0.0197	0.0051	0.0163	0.0070	0.0241	**0.0006**	0.6670	0.3180
WA-02	05/22/96	L8669-2	7.7	44				**0.4**	41	0.0022	**0.0008**	**0.0007**	***0.0001***	0.0109	0.0044	0.0157	0.0037	0.0186	0.0087	0.0218	***0.0002***	0.3290	0.1070
WA-02	11/19/97	L12314-1	7.5	47				***0.0***	50	**0.0017**	**0.0007**	**0.0003**	***0.0001***	0.0070	**0.0014**	0.0136	0.0034	0.0091	0.0034	0.0144	**0.0007**	0.4080	0.1630
WA-02	12/15/97	L12509-1	7.5	86				**1.2**	56	0.0023	**0.0006**	**0.0005**	***0.0001***	0.0095	**0.0016**	0.0182	0.0035	0.0134	0.0051	0.0186	**0.0006**	0.6400	0.2830
WA-02	12/17/97	L12531-1	7.1	188				**0.6**	56	0.0036	**0.0007**	***0.0005***	***0.0001***	0.0160	**0.0015**	0.0329	0.0038	0.0227	0.0032	0.0425	**0.0009**	0.8790	0.1800
WA-02	01/04/98	L12599-1	7.4	31				**0.4**	59	**0.0014**	**0.0008**	**0.0003**	***0.0001***	0.0044	**0.0019**	0.0085	0.0030	0.0073	0.0044	0.0084	***0.0002***	0.1970	0.0932
WA-02	01/14/98	L12655-1	7.0	105				**1.1**	47	0.0029	**0.0006**	**0.0007**	***0.0001***	0.0156	**0.0011**	0.0258	0.0031	0.0170	0.0027	0.0468	**0.0007**	0.7810	0.2330
WA-02	01/23/98	L12698-1	7.2	87				**2.3**	36	0.0026	**0.0007**	**0.0004**	***0.0001***	0.0086	**0.0010**	0.0175	0.0028	0.0110	0.0025	0.0236	**0.0005**	0.4820	0.1540
WA-02	02/06/98	L12787-1	7.5	10				***0.0***	62	**0.0013**	**0.0008**	**0.0002**	***0.0001***	0.0035	**0.0019**	0.0067	0.0028	0.0062	0.0048	0.0048	***0.0002***	0.2570	0.1710
WA-02	02/12/98	L12813-1	6.9	46				**1.0**	48	**0.0019**	**0.0008**	**0.0003**	***0.0001***	0.0074	**0.0015**	0.0173	0.0039	0.0080	0.0032	0.0229	**0.0006**	0.6140	0.2350
WA-02	03/09/98	L12863-1	7.3	67				**1.1**	43	**0.0015**	**0.0010**	**0.0003**	***0.0001***	0.0071	**0.0017**	0.0136	0.0037	0.0077	0.0037	0.0169	**0.0006**	0.4480	0.2330
WA-02	03/22/98	L13039-1	7.2	86				**1.1**	66	0.0028	**0.0009**	**0.0006**	***0.0001***	0.0093	0.0027	0.0207	0.0065	0.0138	0.0063	0.0231	**0.0008**	0.4980	0.2060
	Sample size:		13	18	0	0	0	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	Arithmetic mean:		7.3	72				1.7	52	0.0021	0.0008	0.0005	0.0002	0.0183	0.0074	0.0171	0.0040	0.0134	0.0058	0.0213	0.0006	0.4844	0.1846
	Max value:		7.7	188				8.9	82	0.0037	0.0014	0.0018	0.0009	0.1060	0.0418	0.0329	0.0065	0.0227	0.0133	0.0468	0.0014	1.0400	0.4430
	Min value:		6.9	10				***0.0***	36	0.0010	0.0002	0.0002	0.0001	0.0035	0.0010	0.0067	0.0028	0.0062	0.0025	0.0048	0.0002	0.1970	0.0554
	Median:		7.3	65				1.1	51	0.0020	0.0008	0.0004	0.0001	0.0116	0.0023	0.0170	0.0037	0.0136	0.0047	0.0216	0.0006	0.4280	0.1735
	Est. mean of population:		7.3	75				1.9	52	0.0021	0.0008	0.0005	0.0002	0.0171	0.0066	0.0173	0.0040	0.0135	0.0058	0.0220	0.0006	0.4876	0.1683
	1996 Arithmetic Mean:		7.5	66				2.4	52	0.0020	0.0008	0.0006	0.0002	0.0276	0.0132	0.0163	0.0043	0.0149	0.0077	0.0196	0.0006	0.4359	0.1705
	1998 Arithmetic Mean:		7.2	79				1.0	52	0.0023	0.0008	0.0004	0.0001	0.0090	0.0017	0.0179	0.0037	0.0119	0.0040	0.0231	0.0006	0.5329	0.1987

SAMPLE TIME AND INFO

Date	Sampler Start Time	Sampler End Time	Duration (Hours)	Duration (Seconds)	Mean Q	Rainfall (1 hour prior to end	24 Hr Antecedent	72 Hr Antecedent	7 Day Antecedent	total volume, liters	
11/17/95	18:45	0:15	5:30	19800	1.45	0.2	0.02	0.25	1.57	813067	
12/9/95	12:30	18:30	6:00	21600	1.98	0.38	0.16	0.16	1.02	1211190	
1/7/96	2:30	8:30	6:00	21600	4.6	0.94	0.48	0.73	0.86	2813875	
2/5/96	15:45	21:45	6:00	21600	2.7	0.44	0.44	0.9	0.96	1651622	
3/22/96	8:15	14:15	6:00	21600	1.41	0.29	0.13	0.31	0.34	862514	
3/31/96	17:00	23:00	6:00	21600	2.03	0.48	0.25	0.41	0.41	1241775	
4/22/96	13:15	19:15	6:00	21600	2.19	0.33	0.31	0.33	1.36	1339649	
5/22/96	3:15	9:15	6:00	21600	1.8	0.21	0.31	0.32	1.41	1101082	
1996 total rain contributing sampled runoff						3.27	wet season runoff:				1996 sampled runoff
1996 rain Nov - May						46.76		157,793,904		11034775	
11/19/97	9:30	15:30	6:00	21600	2.3	0.42	0.09	0.97	0.97	1406938	
12/15/97	15:30	21:30	6:00	21600	1.56	0.31	0.03	0.04	0.14	954271	
12/16/97	11:00	17:00	6:00	21600	3.2	0.45	1.16	1.17	1.27	1957478	
1/4/98	11:00	17:00	6:00	21600	1.74	0.28	0.18	0.6	0.98	1064379	
1/14/98	6:00	12:00	6:00	21600	2.3	0.37	0.66	1.12	1.14	1406938	
1/23/98	5:30	11:30	6:00	21600	2.95	0.49	0.39	0.95	2.08	1804550	
2/8/98	9:00	15:00	6:00	21600	1.07	0.24	0.16	0.2	0.53	654532	
2/12/98	10:00	16:00	6:00	21600	1.89	0.25	0.56	0.74	1.23	1156136	
3/9/98	10:00	16:00	6:00	21600	2.43	0.24	0.36	0.54	0.69	1486460	
3/22/98	2:50	8:50	6:00	21600	2.99	0.56	0.39	0.39	0.53	1829019	
1998 total rain contributing sampled runoff						3.61	wet season runoff:				1998 sampled runoff
1998 rain Nov - May						28.86		109,689,586		13720700	

Hamm Creek WA 2 Annual Storm Loading Comparison.

LOADINGS (In grams unless noted) 454 grams in a pound.

	TSS, KG	Total P	Nitrogen	Ammonia Nitrogen	TPH, KG	Hardness, Calc, Kg	As, total	As, diss.	Cd, Total	Cd, diss.	Cr, total	Cd, diss.	Cu, total	Cu, diss.	Ni, total	Ni, diss.	Pb, total	Pb, diss.	Zn, total	Zn, diss.
1996 Sampled Events Total	792				30		23	7	7	3	272	122	186	46	165	78	238	7	4538	1752
1996 Annual Total by Direct Method	11324				431		331	107	95	39	3886	1744	2662	661	2355	1115	3399	97	64893	25048
1998 Sampled Events Total	1170				13		32	11	6	1	130	22	260	52	171	53	335	9	7533	2662
1998 Annual Total by Direct Method	9356				106		257	84	45	11	1043	178	2079	414	1370	421	2680	69	60224	21277
Change 1996 to 1998	-1968				-324		-74	-22	-50	-28	-2843	-1566	-582	-247	-986	-693	-718	-28	-4669	-3771
% Change	-17%				-75%		-22%	-21%	-53%	-72%	-73%	-90%	-22%	-37%	-42%	-62%	-21%	-29%	-7%	-15%
1996 Sample Mean Concentration (SMC) statistics																				
stats mean	69.88				3.04		0.0021	0.0008	0.0006	0.0003	0.0295	0.0152	0.0168	0.0044	0.0158	0.0063	0.0209	0.0006	0.4396	0.1760
CI upper	107.39				11.82		0.0026	0.0012	0.0010	0.0005	0.0551	0.0389	0.0203	0.0049	0.0183	0.0109	0.0284	0.0012	0.6028	0.3090
CI lower	45.48				0.78		0.0017	0.0006	0.0004	0.0001	0.0156	0.0058	0.0139	0.0040	0.0136	0.0064	0.0154	0.0003	0.3206	0.1003
1996 LOADING - MODIFIED DIRECT METHOD	11027				480		325	129	99	41	4652	2403	2647	694	2488	1317	3299	97	69366	27778
1998 SMC statistics																				
stats mean	82.18				1.12		0.0022	0.0008	0.0004	0.0001	0.0090	0.0016	0.0178	0.0036	0.0117	0.0039	0.0233	0.0006	0.5310	0.1969
CI upper	147.68				1.56		0.0027	0.0008	0.0005	0.0001	0.0118	0.0019	0.0233	0.0042	0.0147	0.0046	0.0365	0.0006	0.6903	0.2331
CI lower	45.73				0.81		0.0018	0.0007	0.0003	0.0001	0.0068	0.0014	0.0136	0.0032	0.0093	0.0034	0.0149	0.0004	0.4085	0.1662
1998 LOADING - MODIFIED DIRECT METHOD	9014				123		242	84	43	11	983	180	1952	400	1280	432	2557	66	58245	21592
Loading Change 1996 to 1998	-2013				-357		-83	-45	-56	-30	-3669	-2224	-694	-294	-1207	-885	-742	-31	-11121	-6185
% Change	-18%				-74%		-25%	-35%	-56%	-73%	-79%	-93%	-26%	-42%	-49%	-67%	-22%	-32%	-16%	-22%

Hamm Creek WA 2 unit area loadings comparison

LOADINGS (in grams unless noted) 454 grams in a pound. Sub-basin area = 200 acres

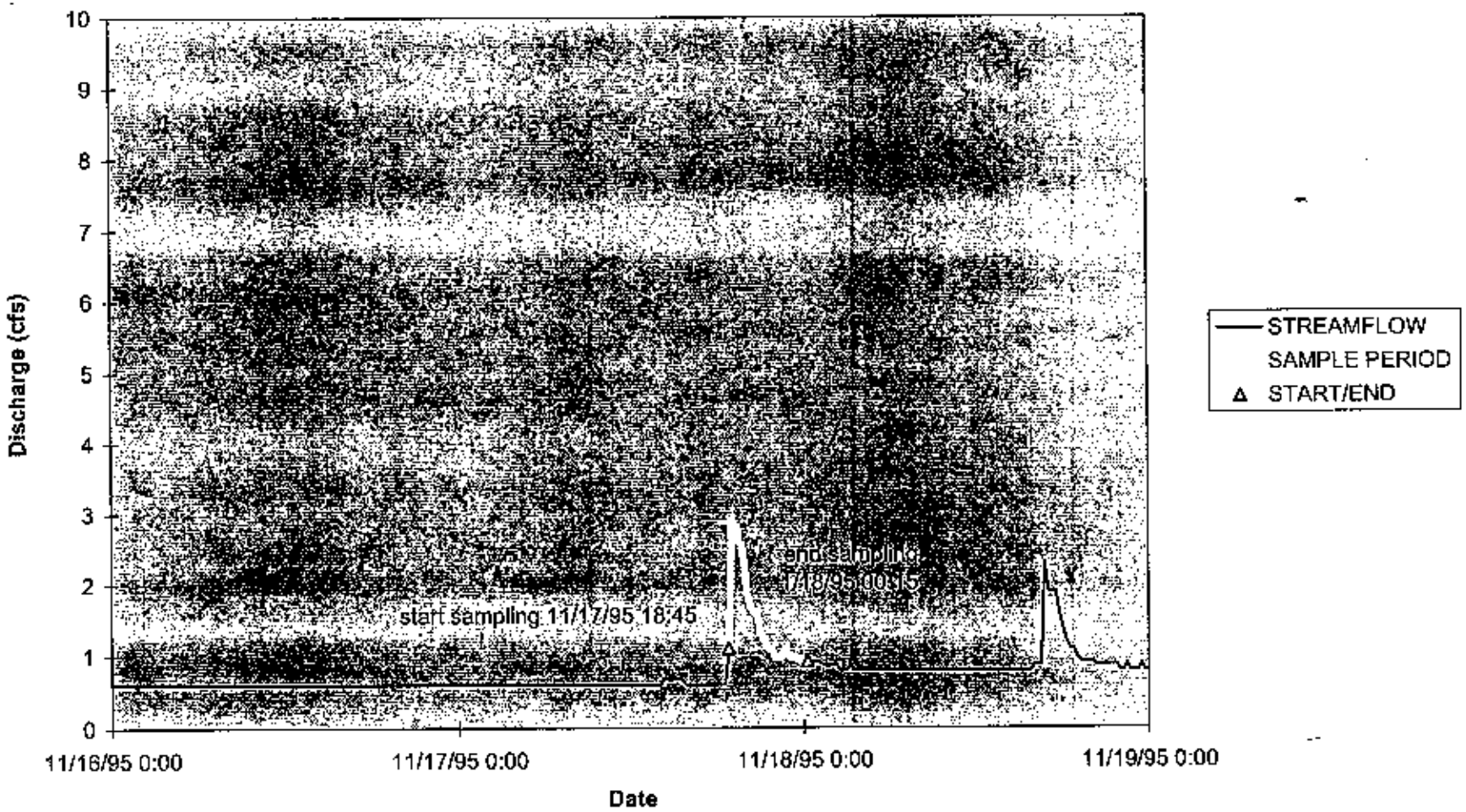
	TSS, KG	TPH, KG	As, total	As, diss.	Cd, Total	Cd, diss.	Cr, total	Cr, diss.	Cu, total	Cu, diss.	Ni, total	Ni, diss.	Pb, total	Pb, diss.	Zn, total	Zn, diss.
1996 Annual Total by Direct Method	11324	431	331	107	95	39	3886	1744	2662	661	2355	1115	3399	97	64893	25048
1998 Annual Total by Direct Method	9356	106	257	84	45	11	1043	178	2079	414	1370	421	2680	69	60224	21277
Annual Storm Loading, KG/hectare, combined 1996 & 1998 by Direct Method	128	3.3	3.6	1.2	0.0009	0.0003	0.0305	0.0119	0.0293	0.0066	0.0230	0.0095	0.0376	0.0010	0.7729	0.2862
1996 SMC statistics																
stats mean	69.88	3.04	0.0021	0.0008	0.0006	0.0003	0.0295	0.0152	0.0166	0.0044	0.0158	0.0083	0.0209	0.0006	0.4396	0.1760
1996 LOADING - MODIFIED DIRECT METHOD	11027	480	325	129	99	41	4652	2403	2647	694	2488	1317	3299	97	69366	27778
1998 SMC statistics																
stats mean	82.18	1.12	0.0022	0.0008	0.0004	0.0001	0.0090	0.0016	0.0178	0.0036	0.0117	0.0039	0.0233	0.0006	0.5310	0.1969
1998 LOADING - MODIFIED DIRECT METHOD	9014	123	242	84	43	11	983	180	1952	400	1280	432	2557	66	58245	21592
Annual Storm Loading, KG/hectare, combined 1996 & 1998 by Modified Direct Method	124	4	3.5	1.3	0.0009	0.0003	0.0348	0.0160	0.0284	0.0068	0.0233	0.0108	0.0362	0.0010	0.7883	0.3050

WA2 Loading by Storm

LOADINGS (in grams unless noted)					Total seconds * cfs * mg/l * .02832 for grams									454 grams in a pound.					
Date	SampleID	Total Suspended Solids, Kg	Total Petroleum Hydrocarbon, Kg	Hardness, Calc, Kg	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms	Mean Q, cfs
11/17/95	L7371-2	14	4.6	66.6	1.2	1.1	0.2	0.1	29.8	29.2	7.3	3.8	11.4	10.0	5.6	0.6	172.2	45.0	1.45
12/09/95	L7517-2	76	0.5	63.5	2.9	1.1	0.9	0.4	14.8	5.5	25.7	6.3	17.3	7.7	28.6	0.2	320.7	103.4	1.98
1/7/96	L7665-2	138	4.2	126.8	5.1	0.6	0.9	0.3	34.9	8.0	39.4	9.6	26.8	10.2	59.9	3.1	942.0	365.5	4.6
02/05/96	L7842-2	300	14.7	86.3	6.1	1.3	0.7	0.2	32.2	11.3	41.3	5.5	35.2	7.7	57.8	0.3	500.1	94.1	2.7
03/22/96	L8159-2	59	1.5	49.2	1.5	0.6	0.3	0.2	91.4	36.0	14.4	4.2	16.3	11.5	15.7	1.2	896.4	381.8	1.41
03/31/96	L8209-2	82	2.7	58.4	1.2	1.0	0.5	0.3	17.4	11.4	14.5	6.0	15.5	11.9	13.9	0.2	451.7	218.4	2.03
04/22/96	L8369-2	75	1.5	52.9	2.8	0.9	2.4	1.2	39.4	15.7	26.4	6.8	21.8	9.3	32.3	0.8	892.9	425.7	2.19
05/22/96	L8669-2	48	0.4	44.8	2.5	0.8	0.8	0.1	12.0	4.8	17.3	4.1	20.5	9.6	24.0	0.2	362.0	117.7	1.8
11/19/97	L12314-1	66	0.0	69.6	2.4	1.0	0.4	0.1	9.8	2.0	19.1	4.8	12.7	4.8	20.2	1.0	573.6	229.2	2.3
12/15/97	L12509-1	82	1.1	53.2	2.2	0.6	0.4	0.1	9.1	1.5	17.4	3.4	12.8	4.8	17.7	0.6	610.3	269.9	1.56
12/17/97	L12531-1	368	1.2	108.6	7.0	1.4	1.0	0.2	31.3	2.9	64.4	7.4	44.4	6.2	83.1	1.7	1719.4	352.1	3.2
01/04/98	L12599-1	33	0.4	62.2	1.5	0.9	0.3	0.1	4.7	2.0	9.0	3.2	7.8	4.6	8.9	0.2	209.5	99.1	1.74
01/14/98	L12655-1	148	1.5	65.9	4.1	0.8	1.0	0.1	21.9	1.5	36.3	4.3	23.9	3.9	65.8	1.0	1098.0	327.6	2.3
01/23/98	L12698-1	157	4.2	64.0	4.6	1.3	0.6	0.2	15.4	1.8	31.6	5.0	19.8	4.5	42.6	1.0	869.2	277.7	2.95
02/08/98	L12787-1	7	0.0	40.6	0.9	0.5	0.1	0.1	2.3	1.2	4.4	1.8	4.0	3.1	3.1	0.1	168.1	111.8	1.07
02/12/98	L12813-1	53	1.1	55.3	2.2	0.9	0.3	0.1	8.5	1.7	20.0	4.5	9.2	3.6	26.5	0.7	709.4	271.5	1.89
03/09/98	L12883-1	100	1.6	64.3	2.2	1.5	0.5	0.1	10.5	2.5	20.2	5.4	11.4	5.5	25.1	0.9	665.5	346.1	2.43
03/22/98	L13039-1	157	2.0	120.3	5.0	1.7	1.0	0.2	17.0	5.0	37.8	11.8	25.2	11.5	42.2	1.5	910.2	376.5	2.99

Nov 17 Chart

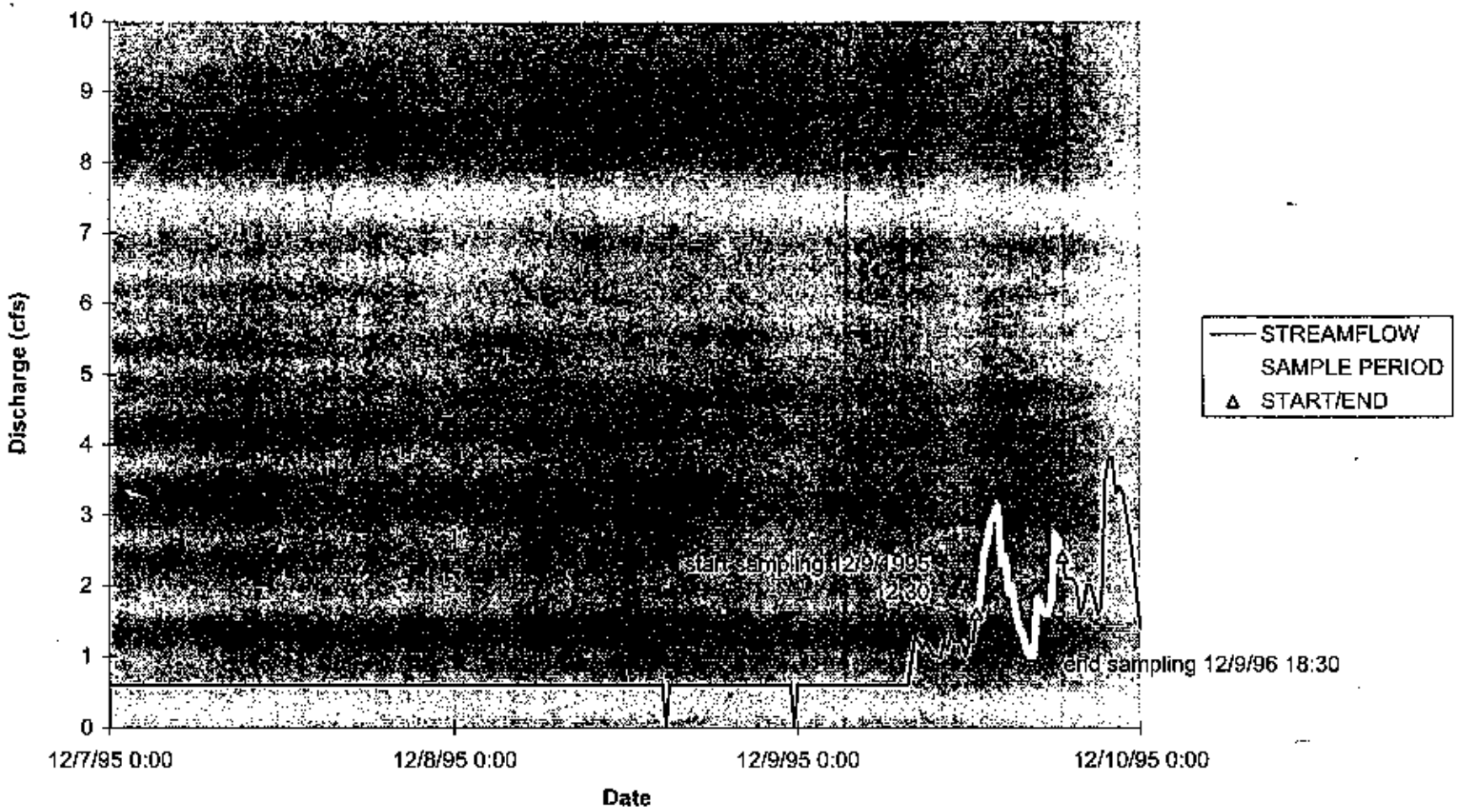
WA2 - North Fork Storm Sample 1 for WY 1996



WATER QUALITY DATA FOR WA02

Dec 9 chart

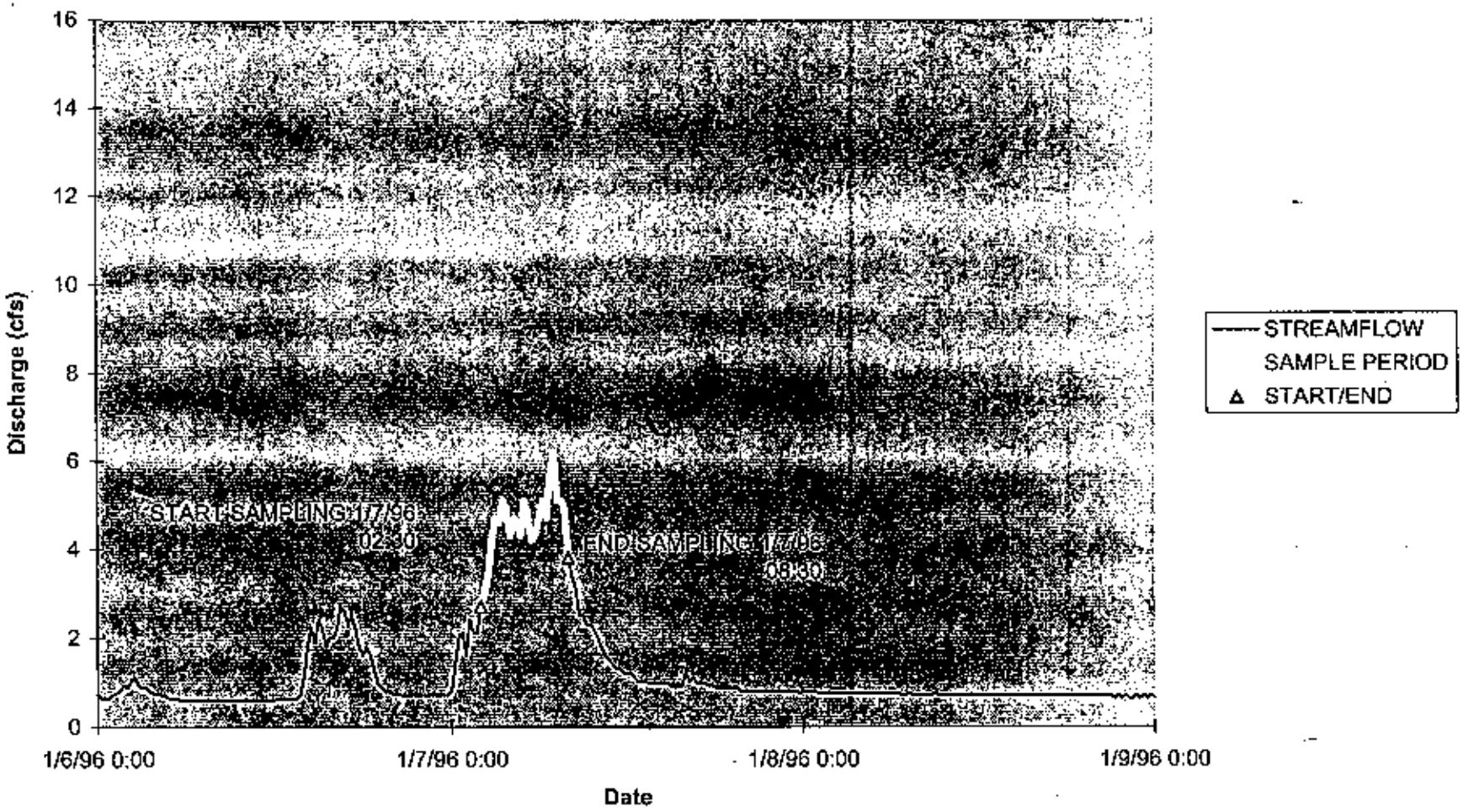
WA2-North Fork Storm Sample 2 for WY 1996



WATER QUALITY DATA FOR WA02

Jan 7 chart

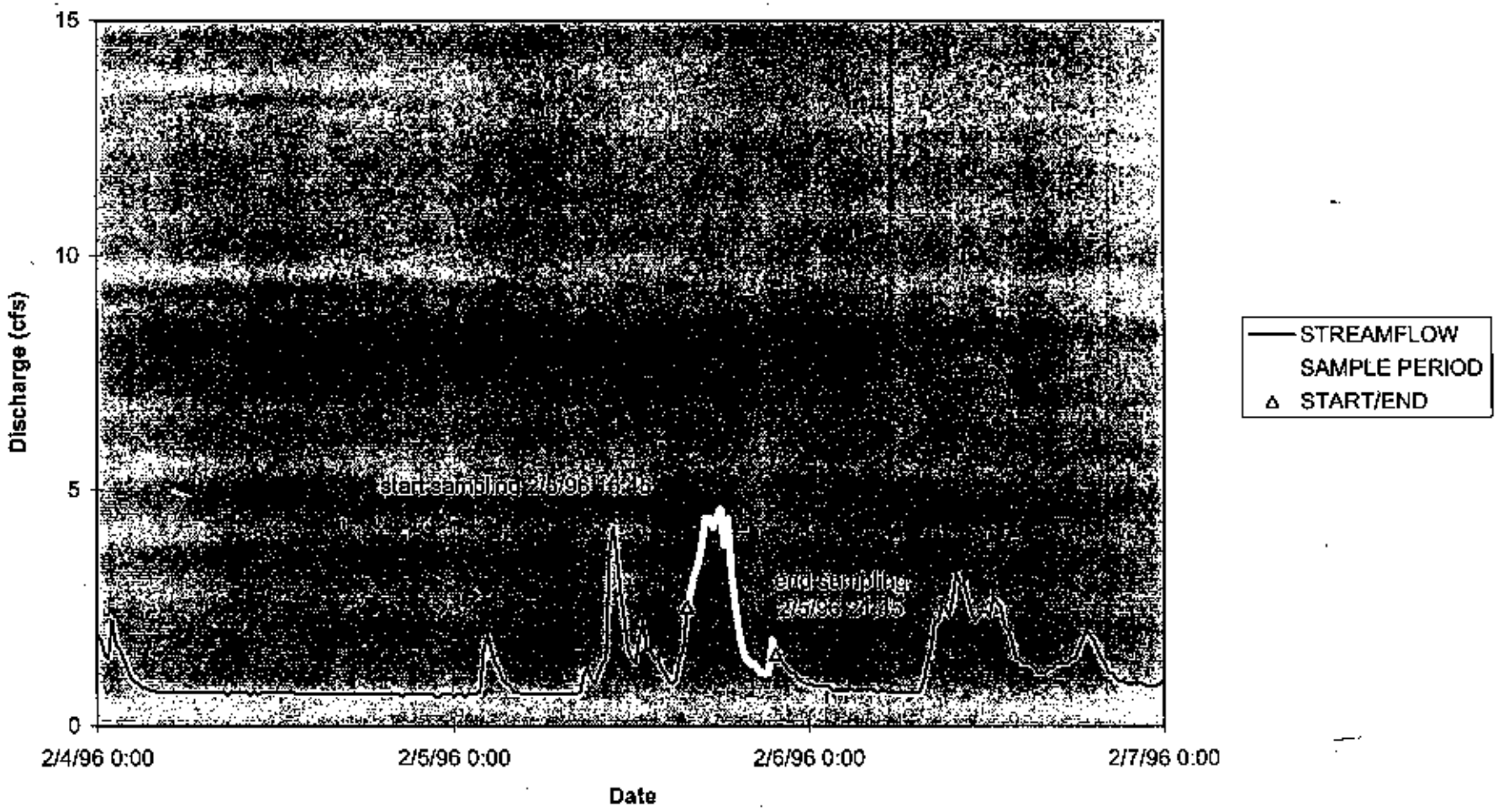
WA2-North Fork Storm Sample 3 for WY 1996



WATER QUALITY DATA FOR WA02

Feb 5 Chart

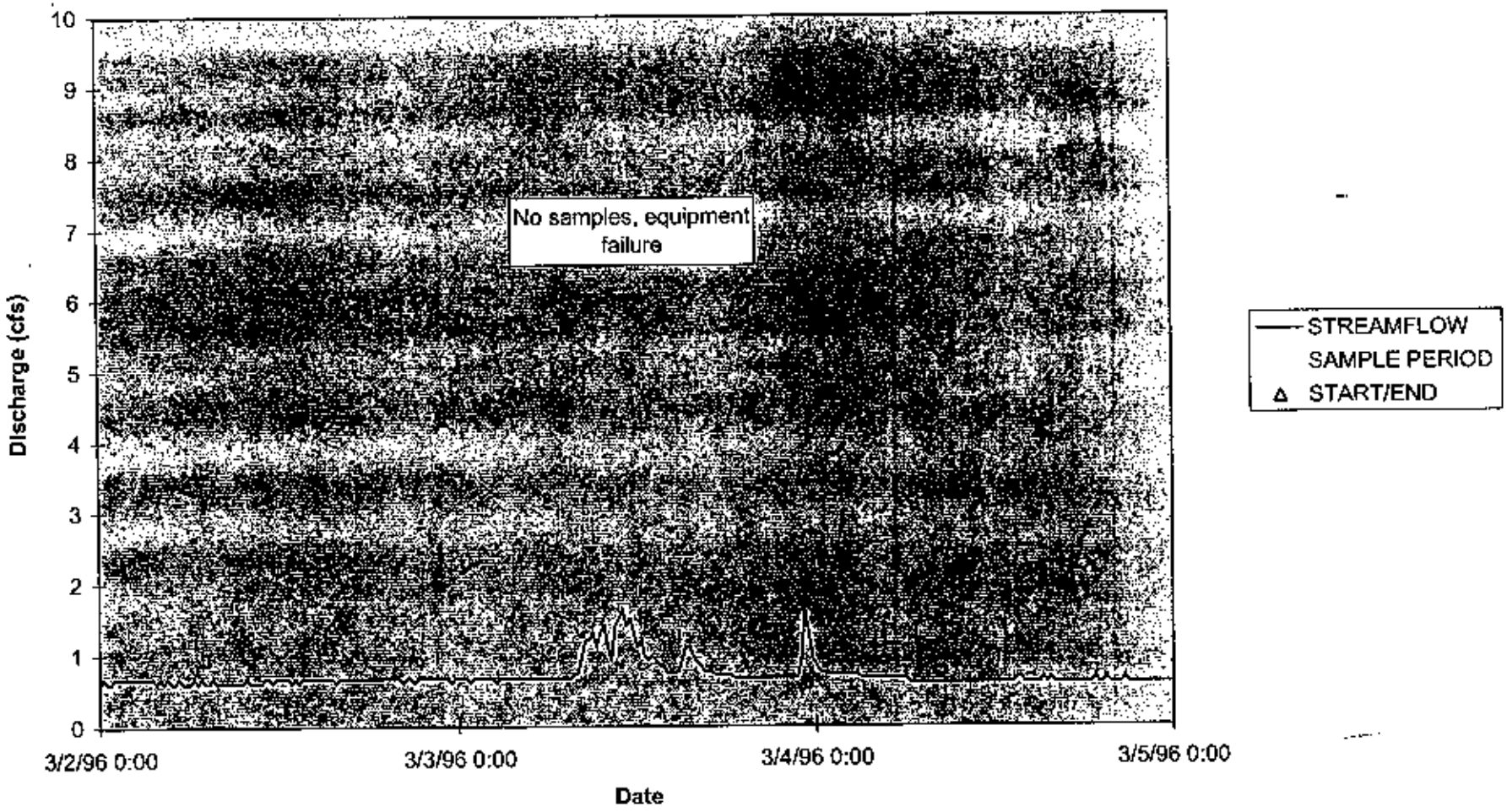
WA2-Hamm Creek, North Fork Sample Session 4 for WY 96



WATER QUALITY DATA FOR WA02

March 3 Chart

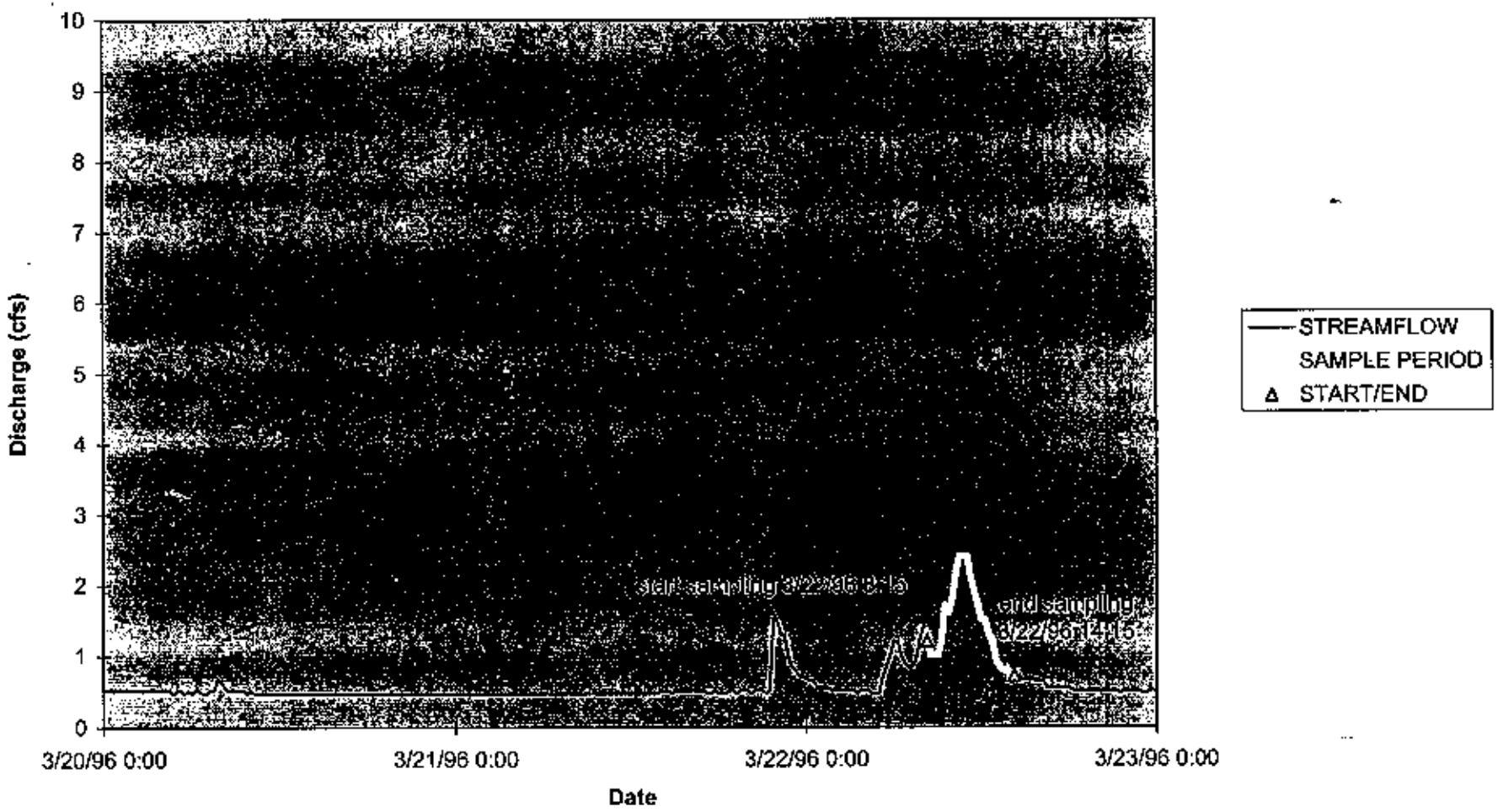
WA2-North Fork Storm Sample Session 5 for WY 96



WATER QUALITY DATA FOR WA02

March 22 Chart

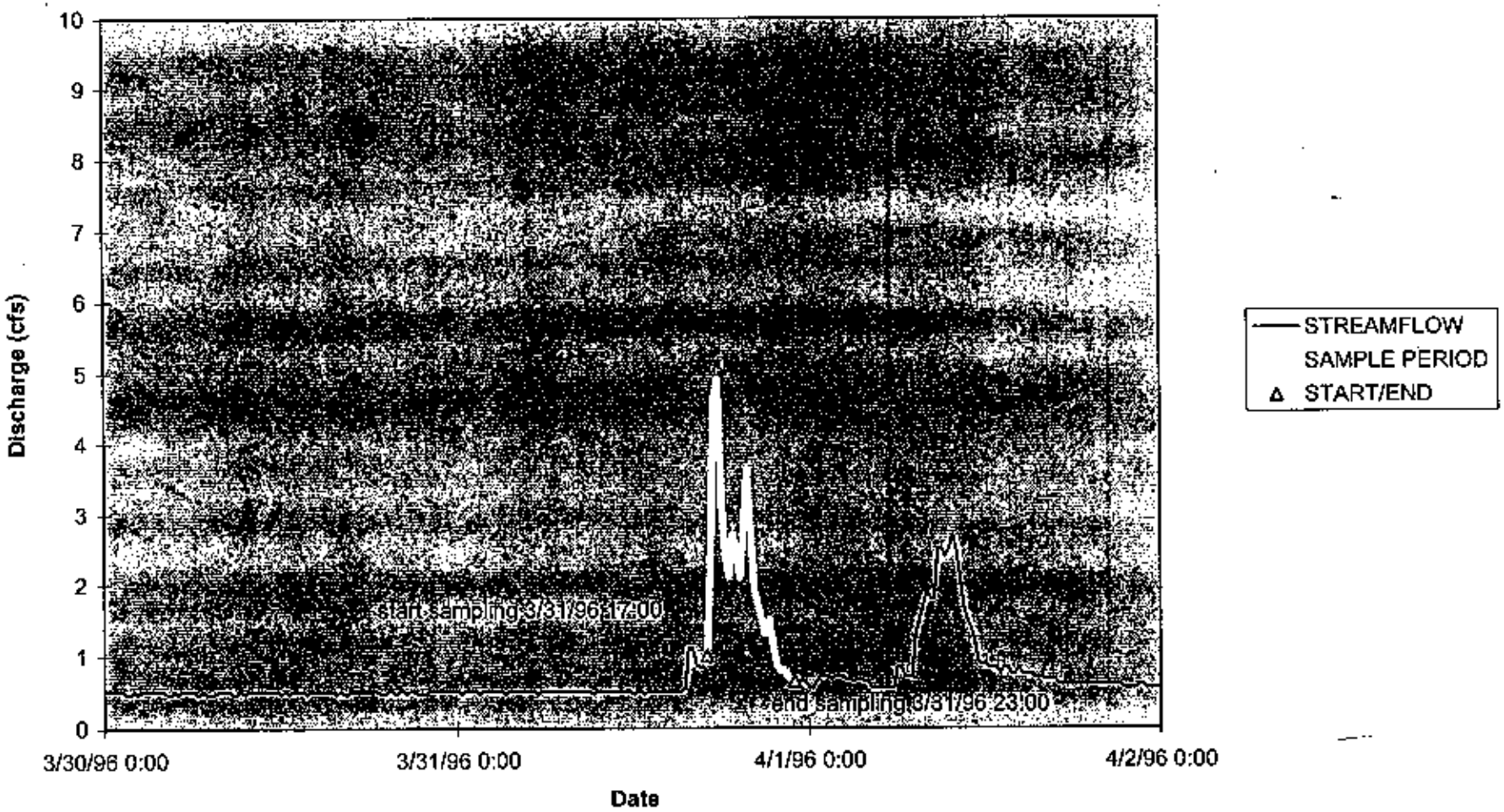
WA2- North Fork Storm Sample Session 6 for WY 96



WATER QUALITY DATA FOR WA02

March 31 Chart

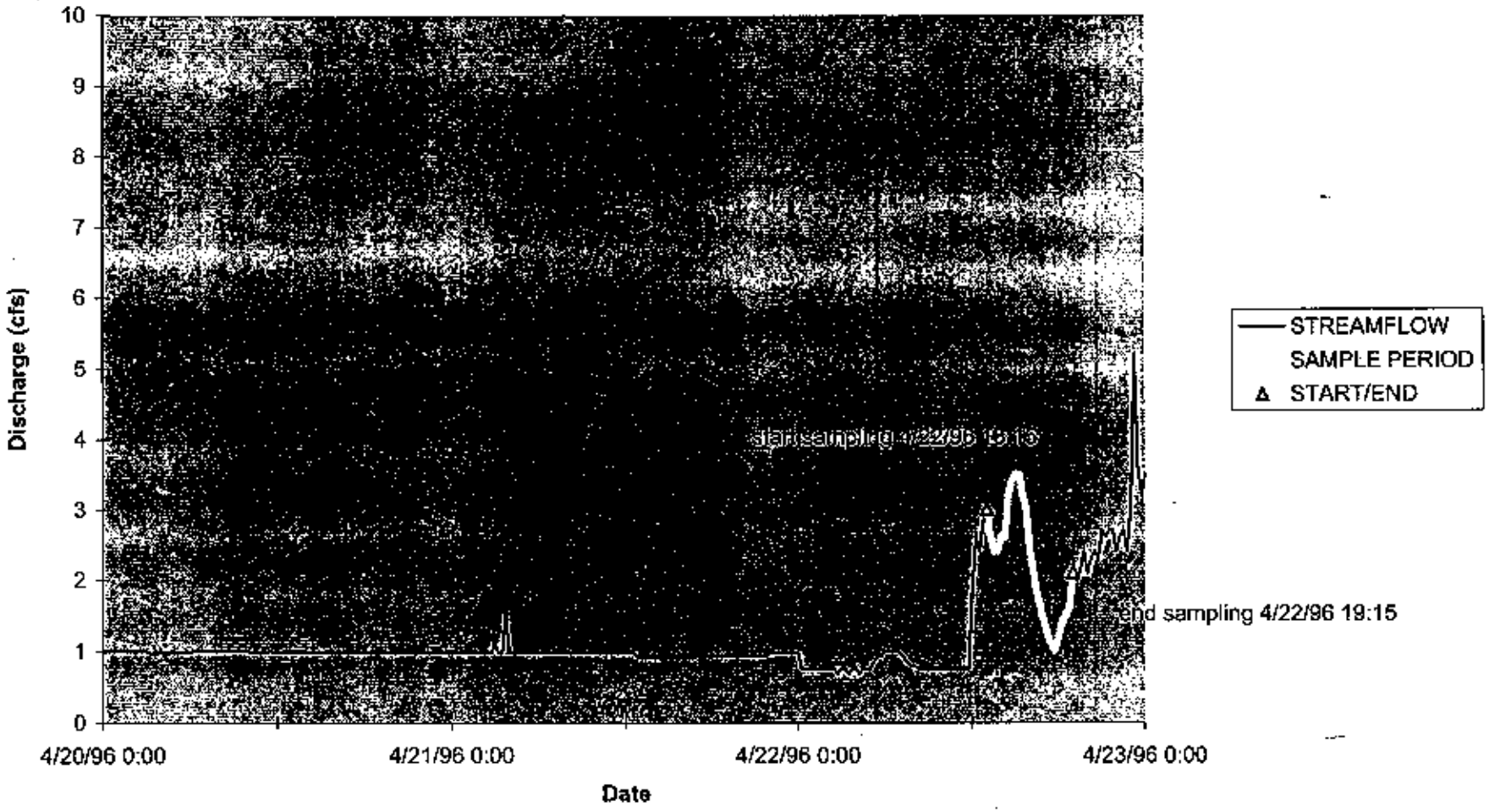
WA2- North Fork Storm Sample Session 7 for WY 96



WATER QUALITY DATA FOR WA02

Apr 22 Chart

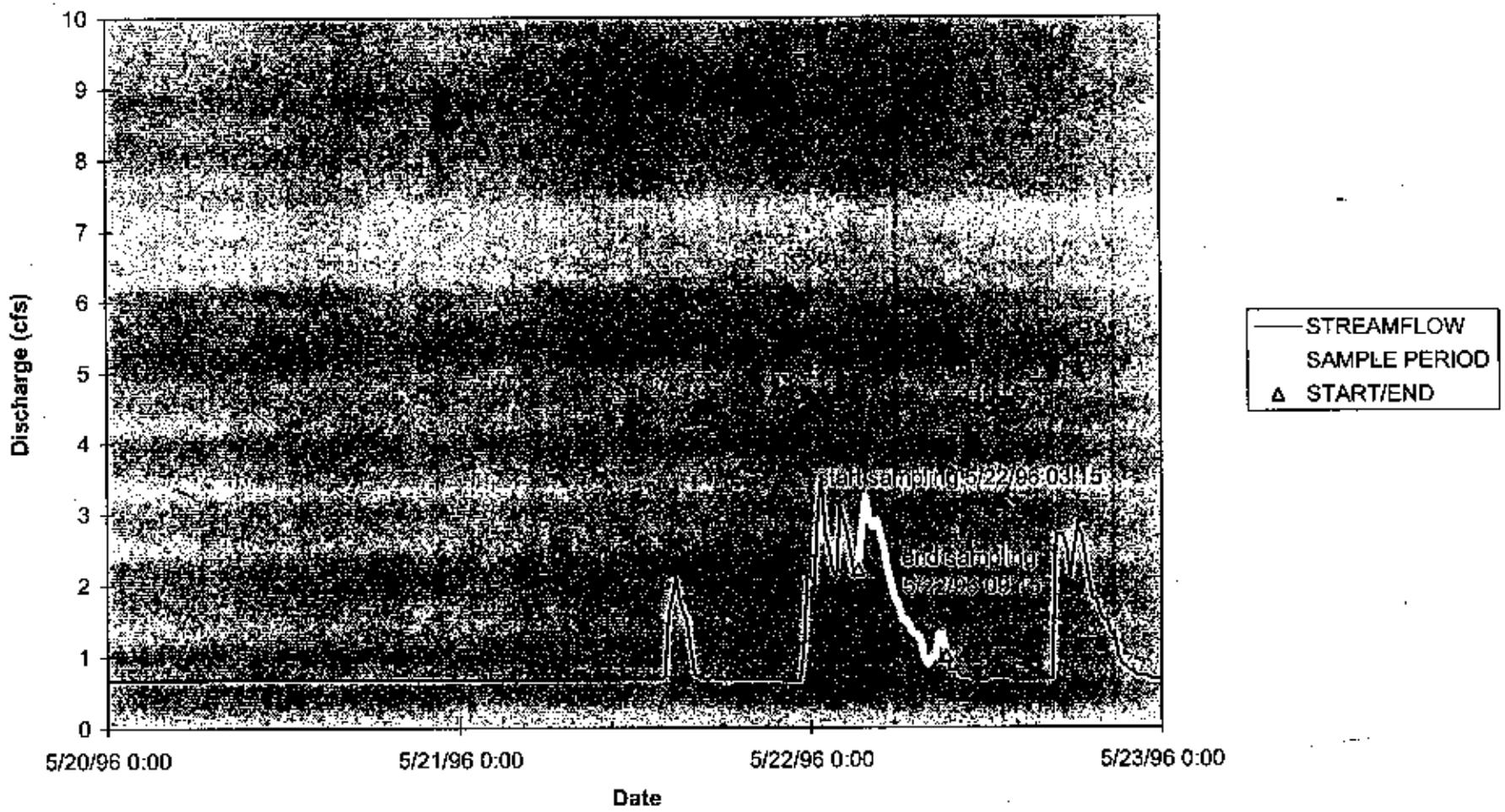
WA2- NORTH FORK Storm Sample Session 8 for WY 96



WATER QUALITY DATA FOR WA02

May 22 Chart

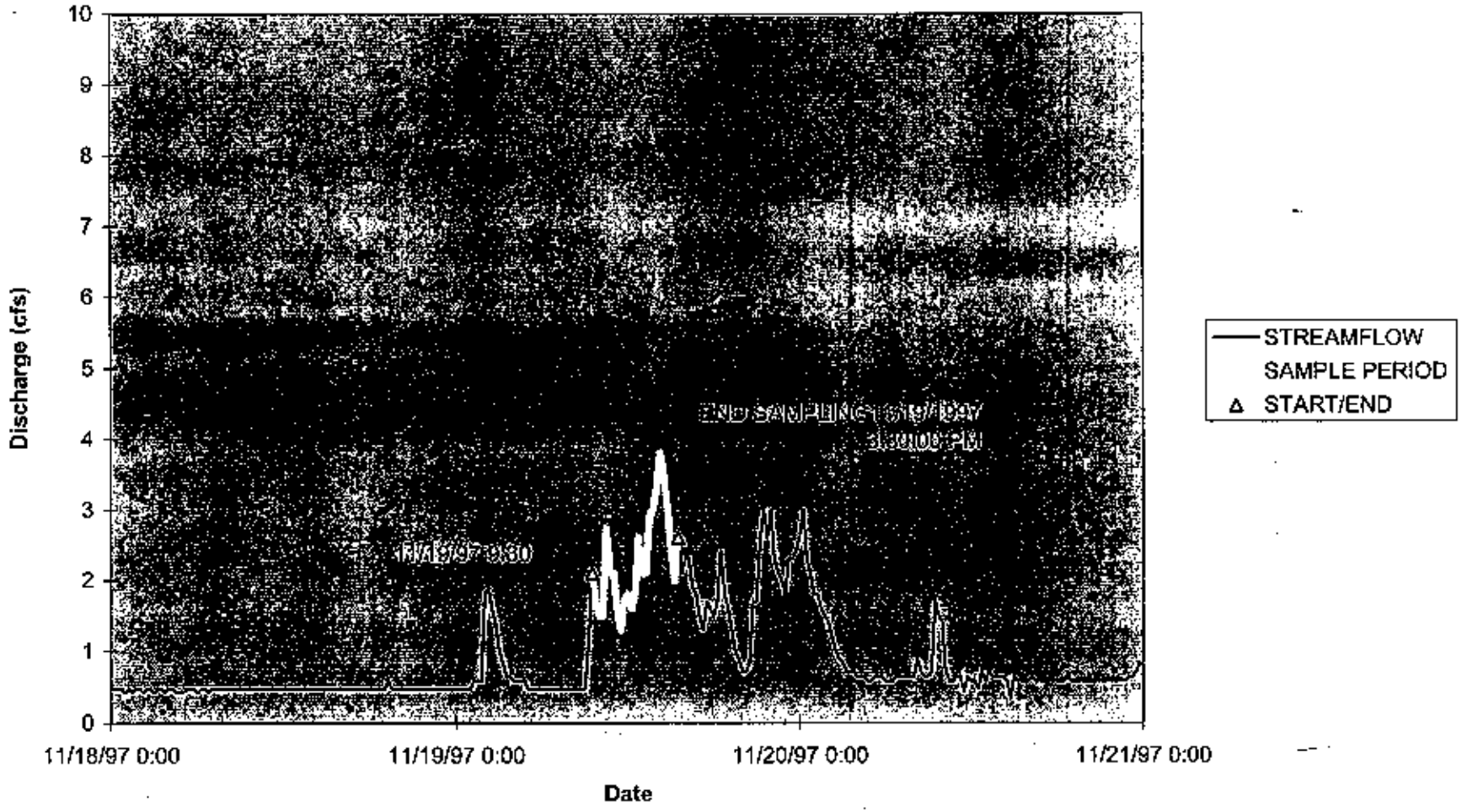
WA2- North Fork Storm Sample Session 9 for WY 1996



WATER QUALITY DATA FOR WA02

Nov 19 Chart

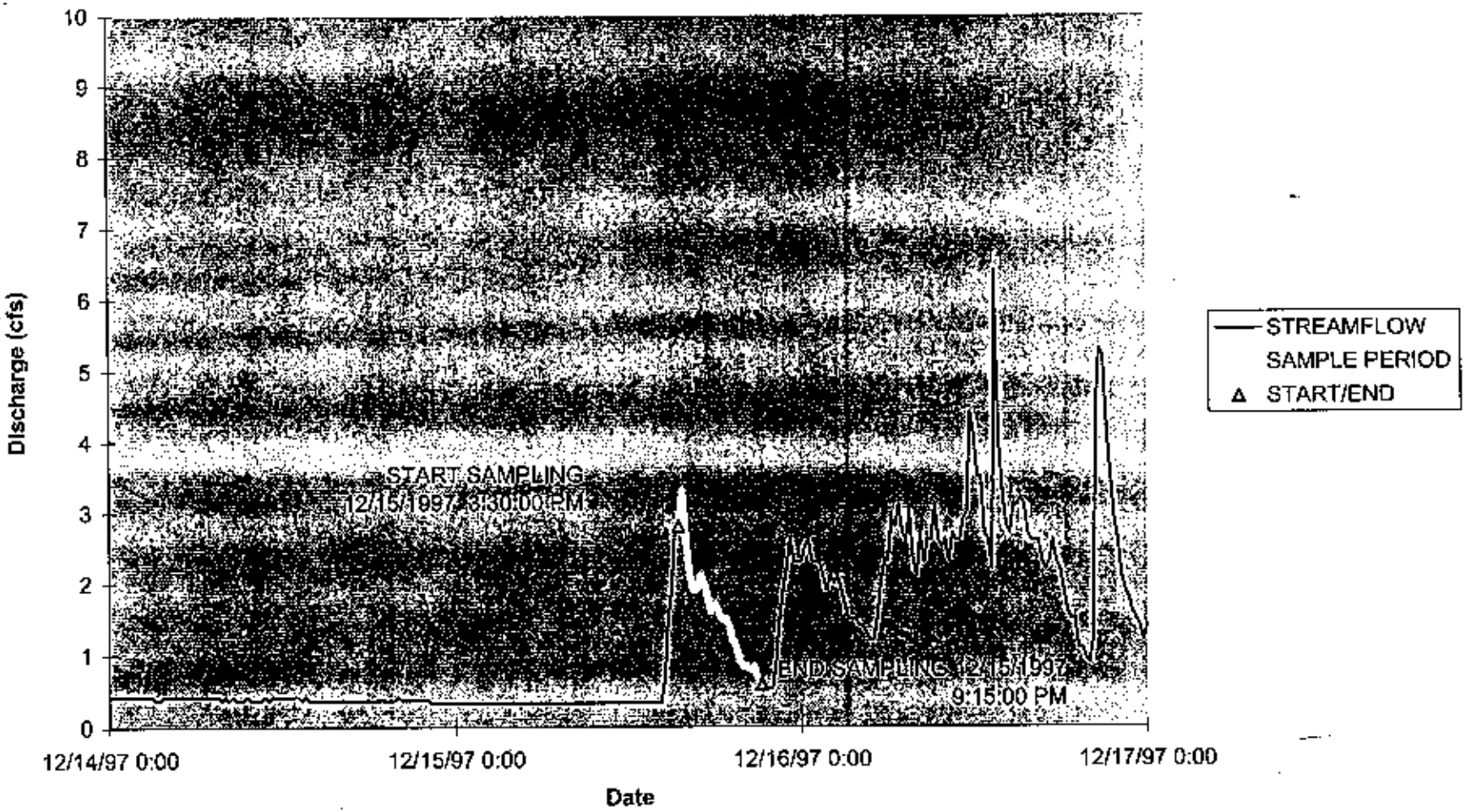
WA-2 North Fork Storm Sample 1 for WY 1998



WATER QUALITY DATA FOR WA02

Dec 15 chart

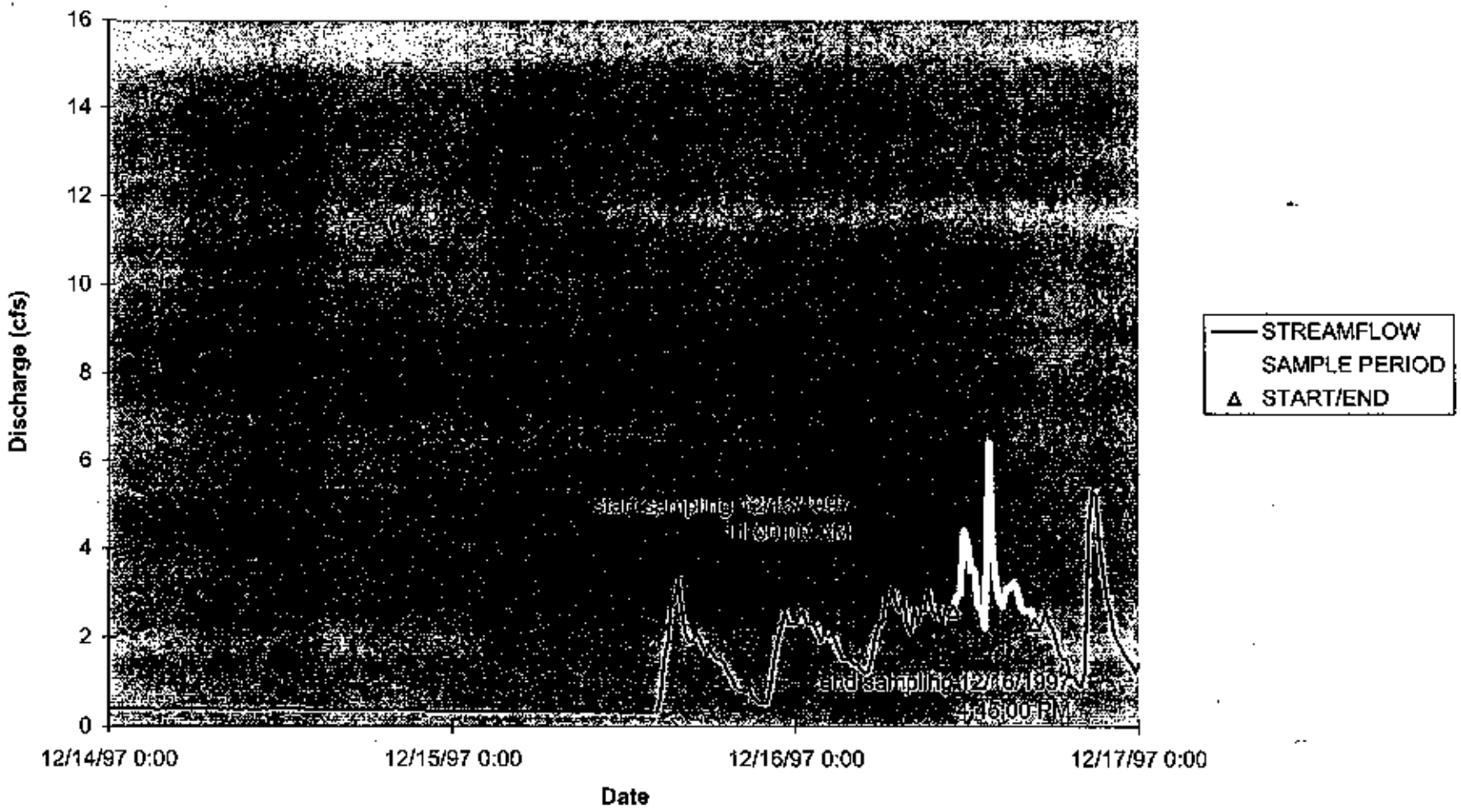
WA2-North Fork Storm Sample 2 for WY 1998



WATER QUALITY DATA FOR WA02

Dec 16 chart

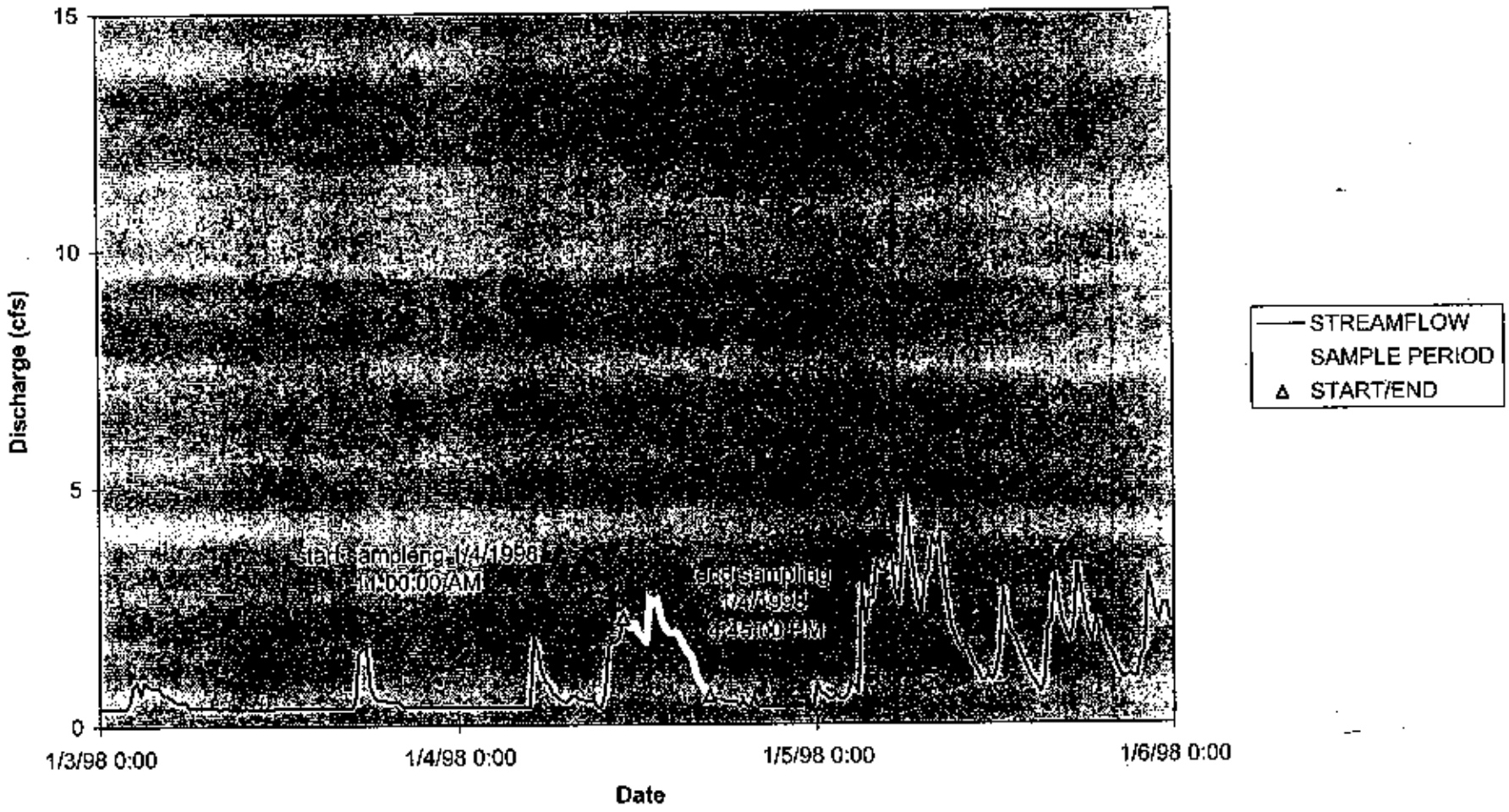
WA2-North Fork Storm Sample 3 for WY 1998



WATER QUALITY DATA FOR WA02

Jan 4 Chart

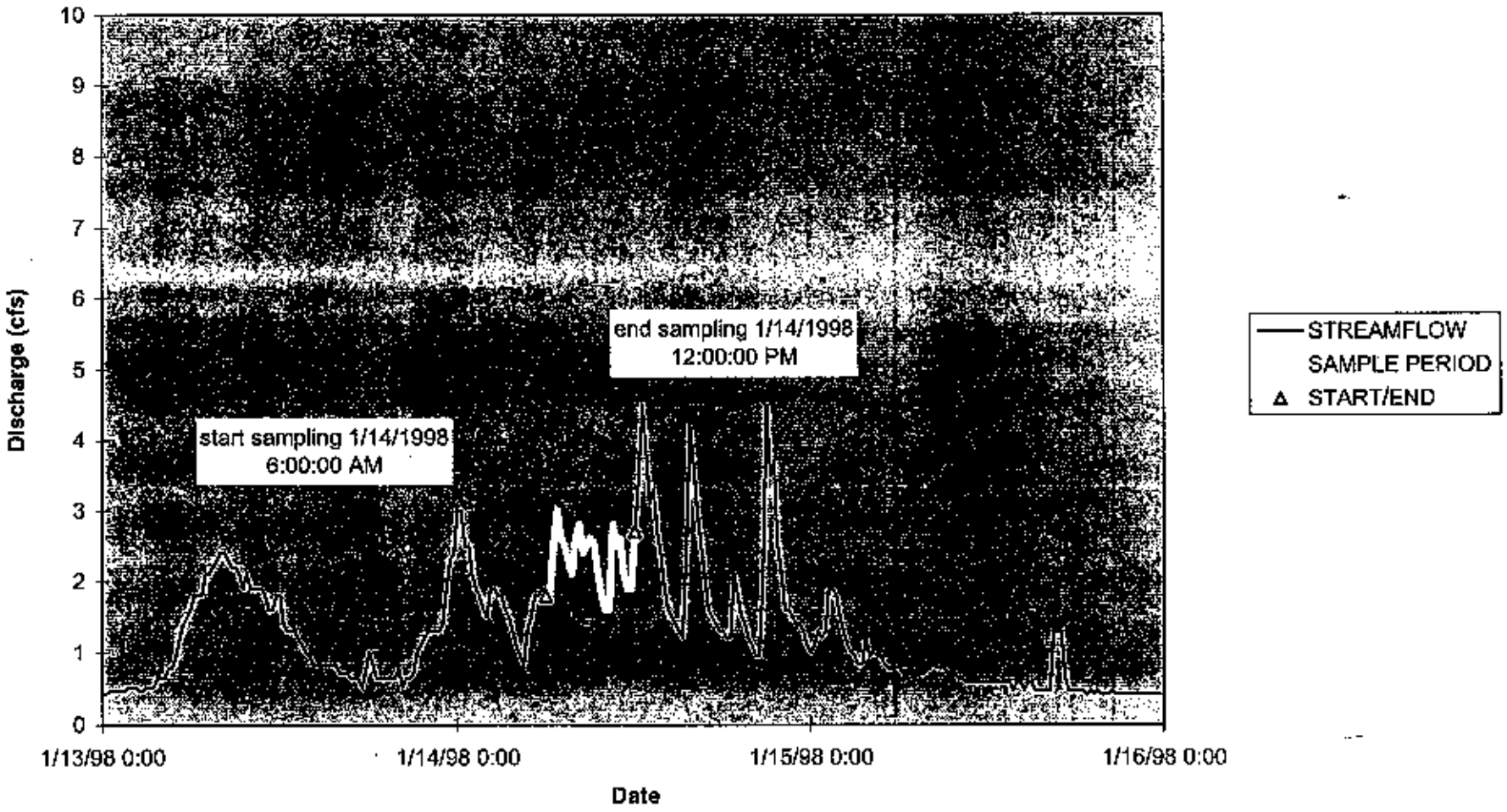
WA2-Hamm Creek, North Fork Sample Session 4 for WY 98



WATER QUALITY DATA FOR WA02

Jan 14 Chart

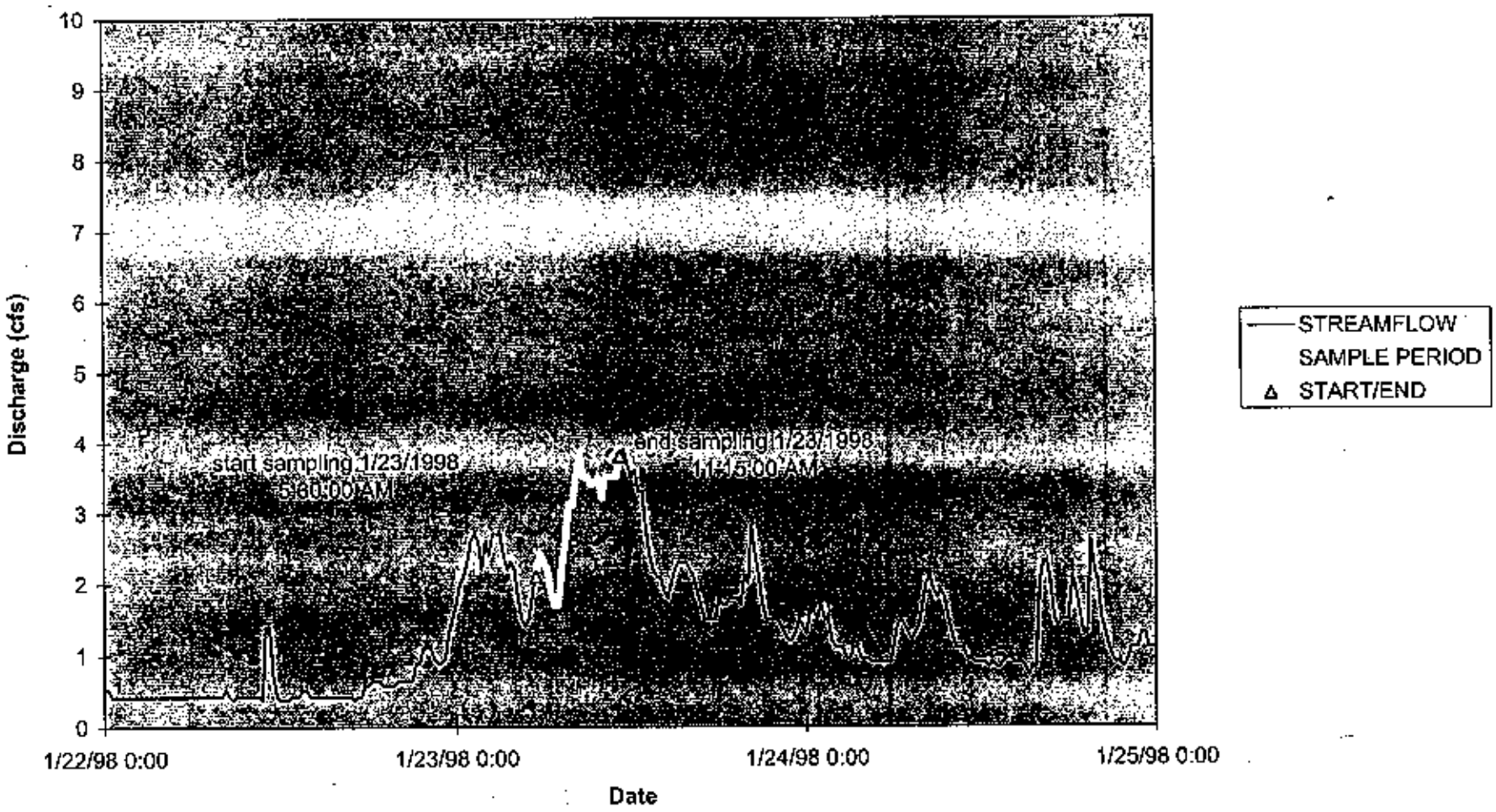
WA2-North Forkk Storm Sample Session 5 for WY 98



WATER QUALITY DATA FOR WA02

jan 23 Chart

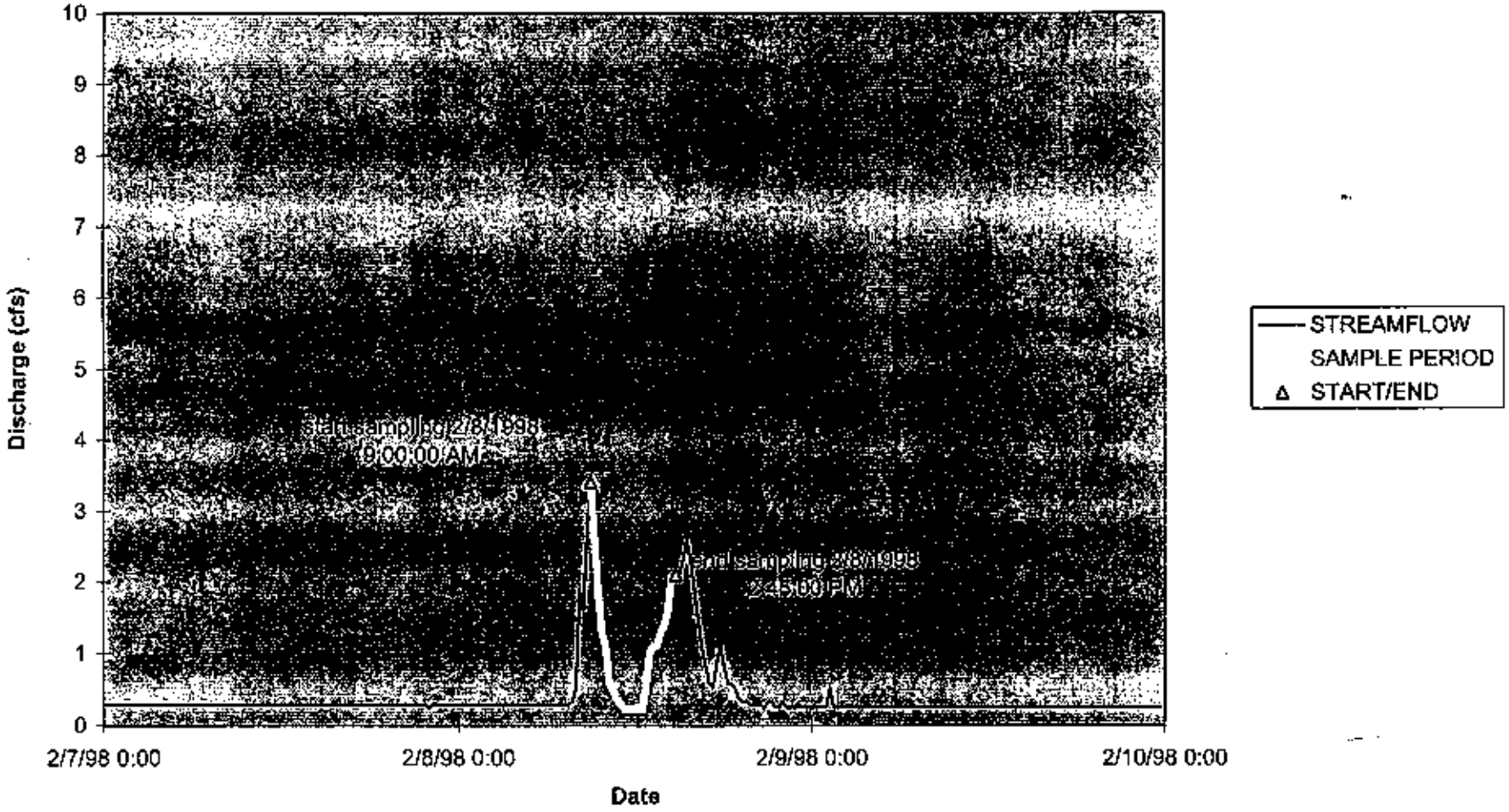
WA2- North Fork Storm Sample Session 6 for WY 98



WATER QUALITY DATA FOR WA02

Feb 8 Chart

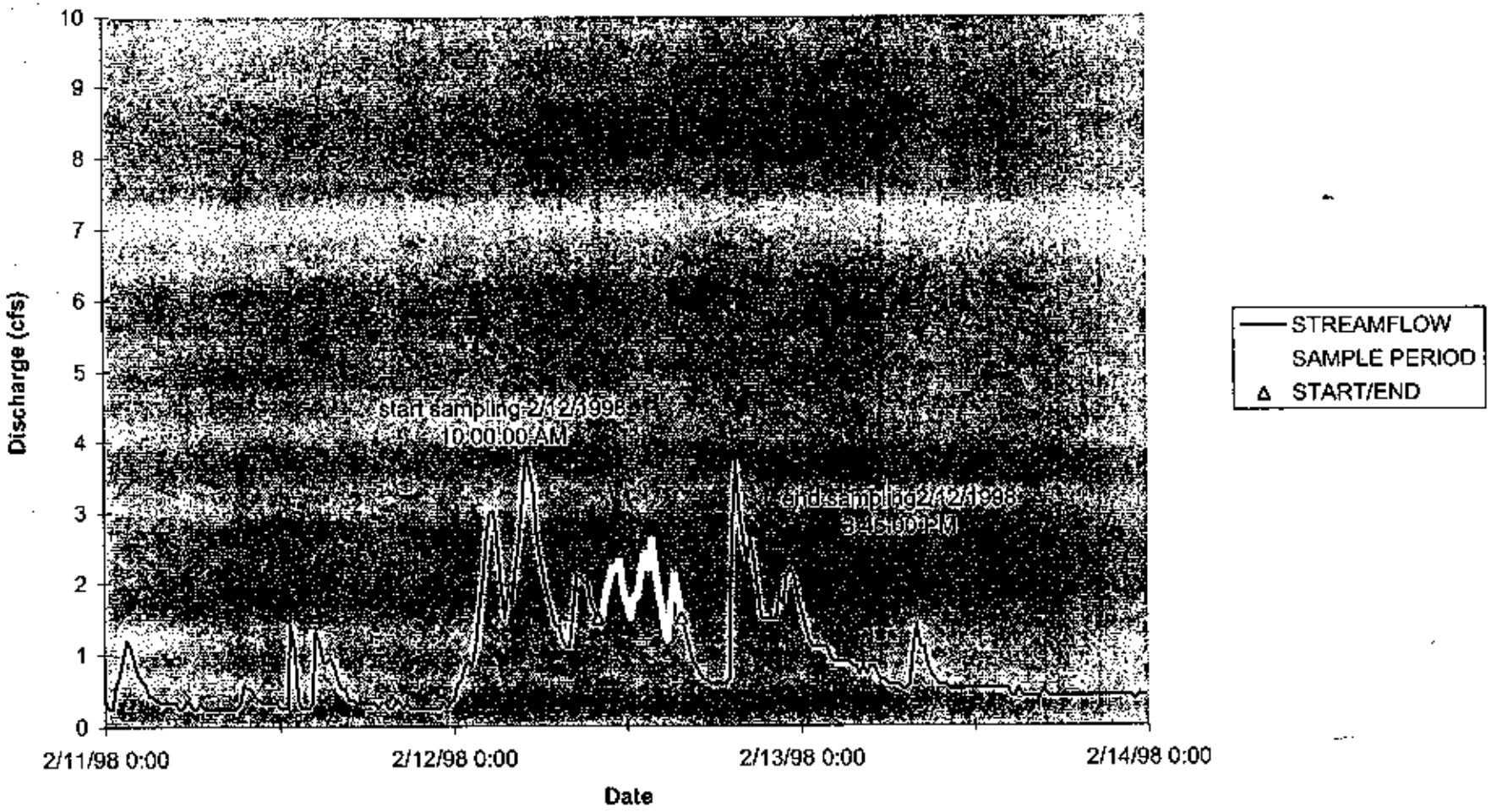
WA2- North Fork Storm Sample Session 7 for WY 98



WATER QUALITY DATA FOR WA02

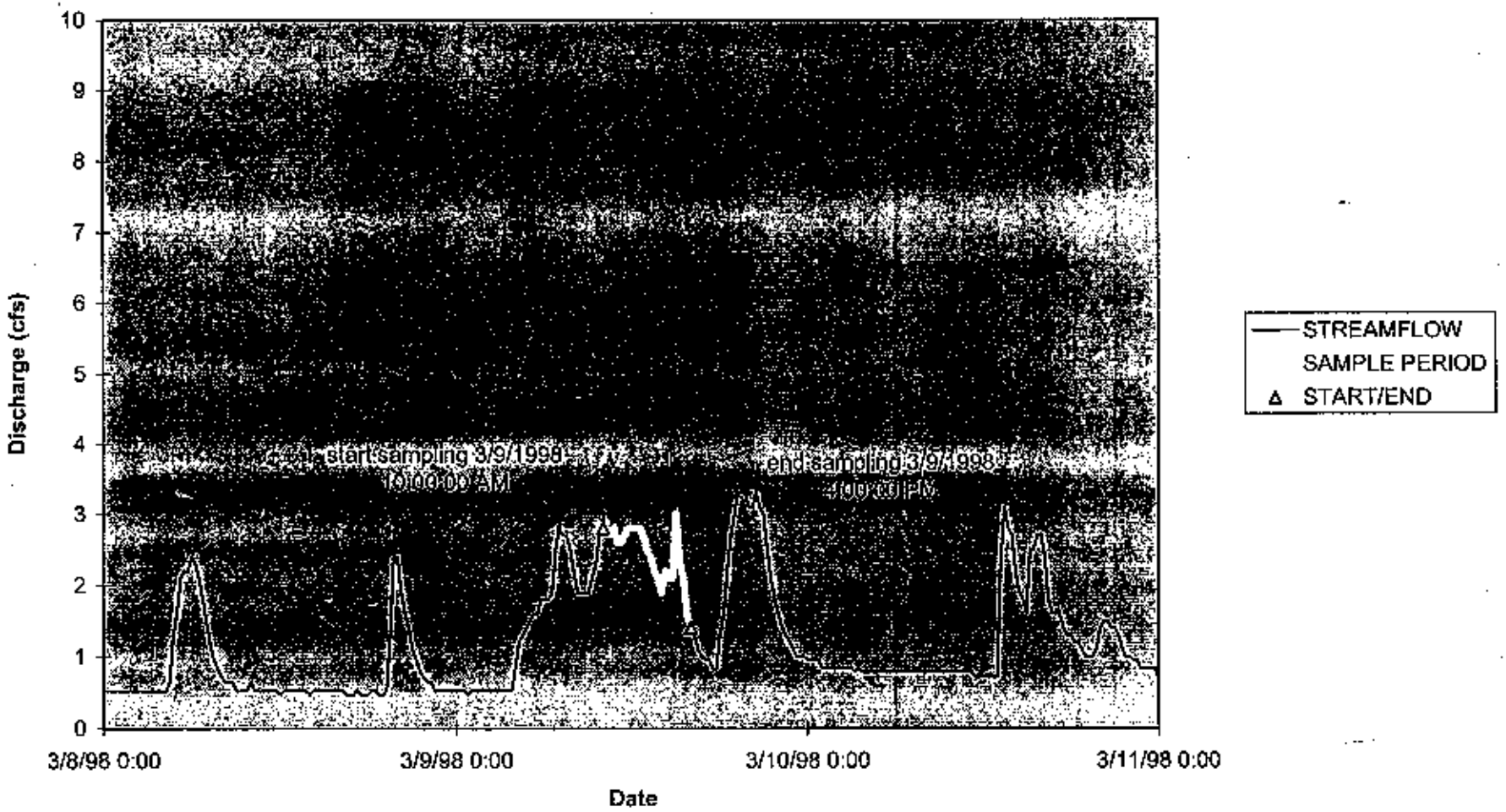
Feb 12 Chart

WA2- NORTH FORK Storm Sample Session 8 for WY 98



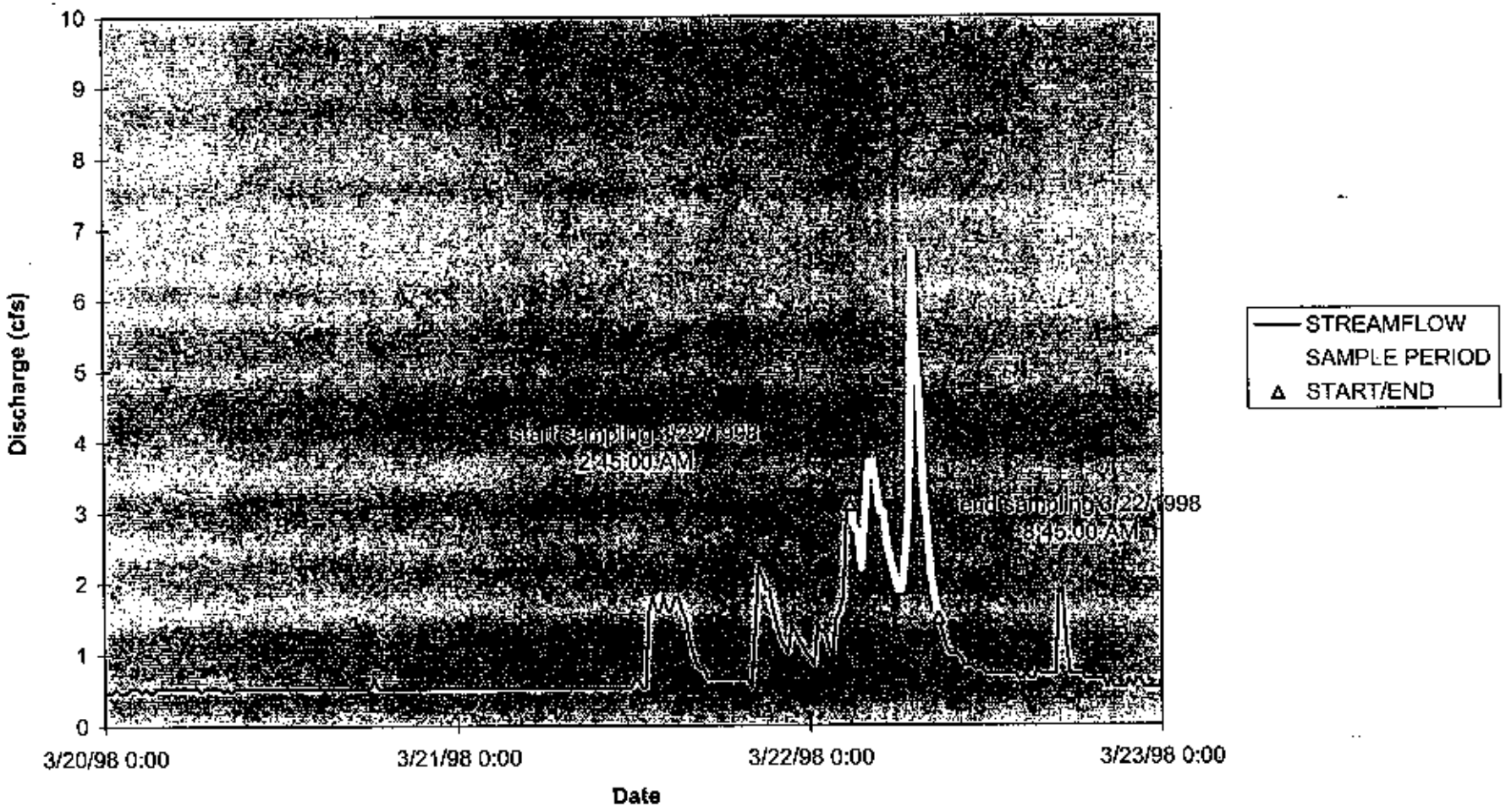
WATER QUALITY DATA FOR WA02

WA2- North Fork Storm Sample Session 9 for WY 1998



Mar 22 chart

WA2- North Fork Storm Sample Session 10 for WY 1998



WATER QUALITY DATA FOR WA02

RESULTS FROM SITE WA – 03

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms
		<MDL Value		***0***	***0***	***0***	***0***	***0***	***0.1***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***
		MDL		***0.5***	***0.005***	***0.05***	***0.02***	***0.3***	***0.2***	***0.0005***	***0.0005***	***0.0002***	***0.0002***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***
		RDL		**1**	**0.01**	**0.1**	**0.04**	**2**	**1.25**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WA-03	11/17/95	L7371-3		47.5				**1.1**	69.3	0.0044	**0.0018**	**0.0005**	**0.0002**	0.0256	0.0083	0.0320	0.0151	0.0111	0.0066	0.0192	**0.0016**	0.2980	0.0880
WA-03	12/09/95	L7517-3		43.4				**0.7**	40.4	0.0030	**0.0018**	**0.0004**	***0.0001***	0.0098	0.0038	0.0188	0.0049	0.0091	0.0033	0.0137	**0.0007**	0.2400	0.0722
WA-03	01/08/96	L7665-3		41				**0.9**	68.3	0.0041	0.0020	**0.0003**	***0.0001***	0.0126	0.0055	0.0157	0.0045	0.0089	0.0040	0.0159	**0.0014**	0.2250	0.0523
WA-03	02/05/96	L7842-3		100				9.0	60.5	0.0053	0.0024	**0.0005**	***0.0001***	0.0131	0.0051	0.0223	0.0050	0.0118	0.0033	0.0289	**0.0008**	0.2250	0.0132
WA-03	03/03/96	L8017-2	7.3	8				10.4	104.	0.0039	0.0029	**0.0002**	***0.0001***	0.0228	0.0152	0.0103	0.0063	0.0083	0.0070	0.0062	**0.0014**	0.1500	0.0822
WA-03	03/22/96	L8159-3		96.7				**1.2**	100.	0.0082	0.0033	**0.0007**	***0.0001***	0.0387	0.0101	0.0310	0.0060	0.0150	0.0049	0.0455	**0.0010**	0.4890	0.0394
WA-03	03/31/96	L8209-3	7.7	12.6				**1.0**	59.8	0.0031	0.0020	**0.0004**	***0.0001***	0.0119	0.0057	0.0142	0.0063	0.0067	0.0042	0.0120	**0.0012**	0.1620	0.0734
WA-03	04/22/96	L8369-3	7.7	28.3				**0.8**	59.7		0.0027	**0.0004**	***0.0001***		0.0058	0.0160	0.0068	0.0066	0.0040	0.0178	**0.0014**	0.2020	0.0352
WA-03	05/22/96	L8669-3	7.6	15.8				***0.1***	65.7	0.0045	0.0030	**0.0004**	***0.0001***	0.0164	0.0105	0.0148	0.0066	0.0102	0.0064	0.0127	**0.0014**	0.1560	0.0691
WA-03	11/07/97	L12263-1	7.6	161				***0.1***	64.6	0.0055	0.0028	**0.0014**	**0.0003**	0.0180	0.0066	0.0314	0.0067	0.0142	0.0031	0.0333	**0.0018**	0.4520	0.0756
WA-03	11/19/97	L12314-2	7.7	80.5				***0.1***	66.2	0.0041	0.0024	**0.0004**	***0.0001***	0.0146	0.0079	0.0209	0.0060	0.0093	0.0030	0.0150	**0.0013**	0.2150	0.0514
WA-03	12/15/97	L12509-2	7.8	97.7				**0.4**	89.2	0.0055	0.0023	**0.0005**	***0.0001***	0.0274	0.0122	0.0339	0.0059	0.0156	0.0033	0.0248	**0.0010**	0.3610	0.0686
WA-03	12/17/97	L12531-2	7.4	207				**1.2**	73.5	0.0070	0.0022	**0.0009**	***0.0001***	0.0265	0.0055	0.0490	0.0054	0.0215	0.0026	0.0579	**0.0013**	0.6760	0.0494
WA-03	01/04/98	L12599-2	7.5	74.4				***0.1***	56.5	0.0046	0.0022	**0.0005**	***0.0001***	0.0153	0.0074	0.0169	0.0041	0.0081	0.0027	0.0183	**0.0010**	0.1950	0.0483
WA-03	01/14/98	L12655-2	7.5	134				**1.7**	53.2	0.0041	0.0022	**0.0004**	***0.0001***	0.0133	0.0056	0.0217	0.0047	0.0091	0.0024	0.0247	**0.0010**	0.2870	0.0653
WA-03	01/23/98	L12698-2	7.4	74.2				**1.2**	46.3	0.0042	0.0021	**0.0006**	***0.0001***	0.0125	0.0055	0.0178	0.0039	0.0082	0.0020	0.0223	**0.0009**	0.2840	0.0592
WA-03	02/08/98	L12787-2	7.5	47.5				***0.1***	105	0.0037	0.0020	**0.0004**	***0.0001***	0.0268	0.0155	0.0252	0.0044	0.0115	0.0032	0.0159	***0.0002***	0.2040	0.0391
WA-03	03/09/98	L12883-2	7.5	126				**1.1**	104	0.0061	0.0029	**0.0007**	***0.0001***	0.0324	0.0175	0.0514	0.0067	0.0215	0.0035	0.0272	**0.0006**	0.2510	0.0270
WA-03	03/22/98	L13039-2	7.1	73.5				***0.1***	99.8	0.0049	0.0027		***0.0001***	0.0372	0.0219	0.0219	0.0056	0.0123	0.0045	0.0135	**0.0008**	0.1890	0.0615
	Sample size:		14	19	0	0	0	19	19	18	19	18	19	18	19	19	19	19	19	19	19	19	19
	Arithmetic mean:		7.5	77				1.6	73	0.0048	0.0024	0.0005	0.0001	0.0208	0.0092	0.0245	0.0060	0.0115	0.0039	0.0224	0.0011	0.2769	0.0563
	Max value:		7.8	207				10.4	105	0.0082	0.0033	0.0014	0.0003	0.0387	0.0219	0.0514	0.0151	0.0215	0.0070	0.0579	0.0016	0.6760	0.0880
	Min value:		7.1	8				***0.1***	40	0.0030	0.0018	0.0002	0.0001	0.0098	0.0038	0.0103	0.0039	0.0066	0.0020	0.0062	0.0002	0.1500	0.0132
	Median:		7.5	74				0.9	66	0.0044	0.0023	0.0005	0.0001	0.0172	0.0074	0.0217	0.0059	0.0102	0.0033	0.0183	0.0010	0.2250	0.0592
	Est. mean of population:		7.5	85				1.8	73	0.0048	0.0024	0.0005	0.0001	0.0209	0.0092	0.0245	0.0060	0.0115	0.0039	0.0225	0.0011	0.2756	0.0577
	1996 Arithmetic Mean:		7.6	44				2.8	70	0.0046	0.0024	0.0004	0.0001	0.0189	0.0078	0.0195	0.0068	0.0097	0.0048	0.0191	0.0012	0.2386	0.0583
	1998 Arithmetic Mean:		7.5	108				0.6	76	0.0050	0.0024	0.0006	0.0001	0.0224	0.0106	0.0290	0.0053	0.0131	0.0030	0.0253	0.0010	0.3114	0.0545

SAMPLE TIME AND INFO

Date	Sampler Start Time	Sampler End Time	Duration (Hours)	Duration (Seconds)	Mean Q,cfs	Rainfall, inches	24 Hr Antecedent	72 Hr Antecedent	7 Day Antecedent	total volume, liters
11/17/95	18:30	23:45	5:15	18900	11.0	0.2	0.02	0.25	1.57	5,887,728
12/9/95	13:00	19:00	6:00	21600	17.1	0.41	0.16	0.16	1.02	10,460,275
1/7/96	2:30	8:30	6:00	21600	31.0	0.98	0.48	0.73	0.86	18,963,072
2/5/96	16:30	22:30	6:00	21600	23.7	0.46	0.44	0.9	0.96	14,497,574
3/3/96	10:45	16:45	6:00	21600	9.1	0.15	0.12	0.12	0.12	5,566,579
3/22/96	7:15	13:15	6:00	21600	11.7	0.29	0.13	0.31	0.34	7,157,030
3/31/96	17:30	22:30	5:00	18000	16.3	0.48	0.25	0.41	0.41	8,309,088
4/22/96	13:00	19:00	6:00	21600	16.0	0.41	0.23	0.25	1.28	9,787,392
5/22/96	3:15	9:15	6:00	21600	13.6	0.21	0.31	0.32	1.41	8,319,283
1996 total rain contributing sampled runoff						3.59	wet season runoff:			1996 sampled runoff
1996 rain Nov - May						46.76		1,158,554,186		88,948,022
11/7/97	7:00	13:00	6:00	21600	14.8	0.54	0.27	0.47	0.65	9,053,338
11/19/97	12:00	18:00	6:00	21600	19.0	0.4	0.23	1.11	1.11	11,622,528
12/15/97	17:30	23:30	6:00	21600	11.2	0.2	0.28	0.29	0.39	6,851,174
12/16/97	11:15	17:15	6:00	21600	26.3	0.47	1.12	1.13	1.23	16,088,026
1/4/98	11:30	17:30	6:00	21600	15.0	0.28	0.18	0.6	0.98	9,175,680
1/14/98	6:45	12:45	6:00	21600	20.6	0.42	0.71	1.17	1.19	12,601,267
1/23/98	6:05	12:05	6:00	21600	18.5	0.5	0.42	0.98	2.07	11,316,672
2/8/98	9:15	15:15	6:00	21600	8.6	0.26	0.06	0.1	0.43	5,260,723
3/9/98	10:38	16:38	6:00	21600	12.1	0.25	0.36	0.54	0.69	7,389,481
3/22/98	4:00	9:50	5:50	21000	11.4	0.53	0.41	0.41	0.55	6,797,650
1998 total rain contributing sampled runoff						3.85	wet season runoff:			1998 sampled runoff
1998 rain Nov - May						28.86		720,799,403		96,156,539

Hamm Creek WA 3, Main Stem Annual Storm Loading Comparison

LOADINGS (in grams unless noted)

454 grams in a pound.

	TSS, KG	TPH, KG	As, total	As, diss.	Cd, Total	Cd, diss.	Cr, total	Cr, diss.	Cu, total	Cu, diss.	Ni, total	Ni, diss.	Pb, total	Pb, diss.	Zn, total	Zn, diss.
1996 Sampled Events Total	4208	244	354	209	36	10	1320	615	1682	548	859	395	1715	104	20735	4722
1996 Annual Storm Total, Direct Method	54805	3175	4617	2716	475	124	17192	8005	21906	7135	11183	5151	22344	1359	270071	61504
1998 Sampled Events Total	11276	65	486	225	59	12	2028	883	2837	508	1274	278	2683	100	32749	5302
1998 Annual Storm Total, Direct Method	84529	488	3646	1687	441	88	15202	6621	21266	3809	9548	2082	20114	749	245490	39745
Change 1996 to 1998	29724	-2687	-971	-1028	-35	-36	-1990	-1384	-639	-3326	-1635	-3069	-2230	-610	-24581	-21759
% Change	54%	-85%	-21%	-38%	-7%	-29%	-12%	-17%	-3%	-47%	-15%	-60%	-10%	-45%	-9%	-35%
1996 Sample Mean Concentration (SMC) statistics																
stats mean	52.32	3.05	0.0046	0.0024	0.0004	0.0001	0.0194	0.0075	0.0202	0.0066	0.0097	0.0047	0.0204	0.0012	0.2496	0.0606
CI upper	114.35	10.84	0.0056	0.0027	0.0005	0.0001	0.0268	0.0097	0.0253	0.0085	0.0114	0.0055	0.0297	0.0014	0.3086	0.0919
CI lower	23.94	0.86	0.0038	0.0021	0.0004	0.0001	0.0141	0.0058	0.0162	0.0055	0.0083	0.0039	0.0140	0.0010	0.2017	0.0400
1996 LOADING - MODIFIED DIRECT METHOD	60611	3539	5316	2724	497	132	22533	8667	23435	7909	11269	5395	23600	1381	289117	70226
1998 SMC statistics																
stats mean	108.57	1.18	0.0050	0.0024	0.0008	0.0001	0.0228	0.0106	0.0291	0.0053	0.0132	0.0030	0.0253	0.0010	0.3113	0.0550
CI upper	138.93	1.69	0.0055	0.0025	0.0008	0.0002	0.0281	0.0144	0.0362	0.0059	0.0161	0.0034	0.0322	0.0014	0.3909	0.0648
CI lower	84.84	0.82	0.0045	0.0022	0.0005	0.0001	0.0182	0.0079	0.0235	0.0048	0.0108	0.0027	0.0199	0.0007	0.2479	0.0467
1998 LOADING - MODIFIED DIRECT METHOD	78254	850	3587	1710	465	88	16290	7672	20993	3849	9513	2184	18239	735	224411	39646
Loading Change 1996 to 1998	17643	-2690	-1729	-1014	-32	-44	-6243	-995	-2441	-4059	-1756	-3210	-5361	-646	-64706	-30580
% Change	29%	-76%	-33%	-37%	-6%	-33%	-28%	-11%	-10%	-51%	-16%	-60%	-23%	-47%	-22%	-44%

Hamm Creek WA 3 unit area loadings comparison

LOADINGS (in grams unless noted) 454 grams in a pound. Sub-basin area = 950 acres

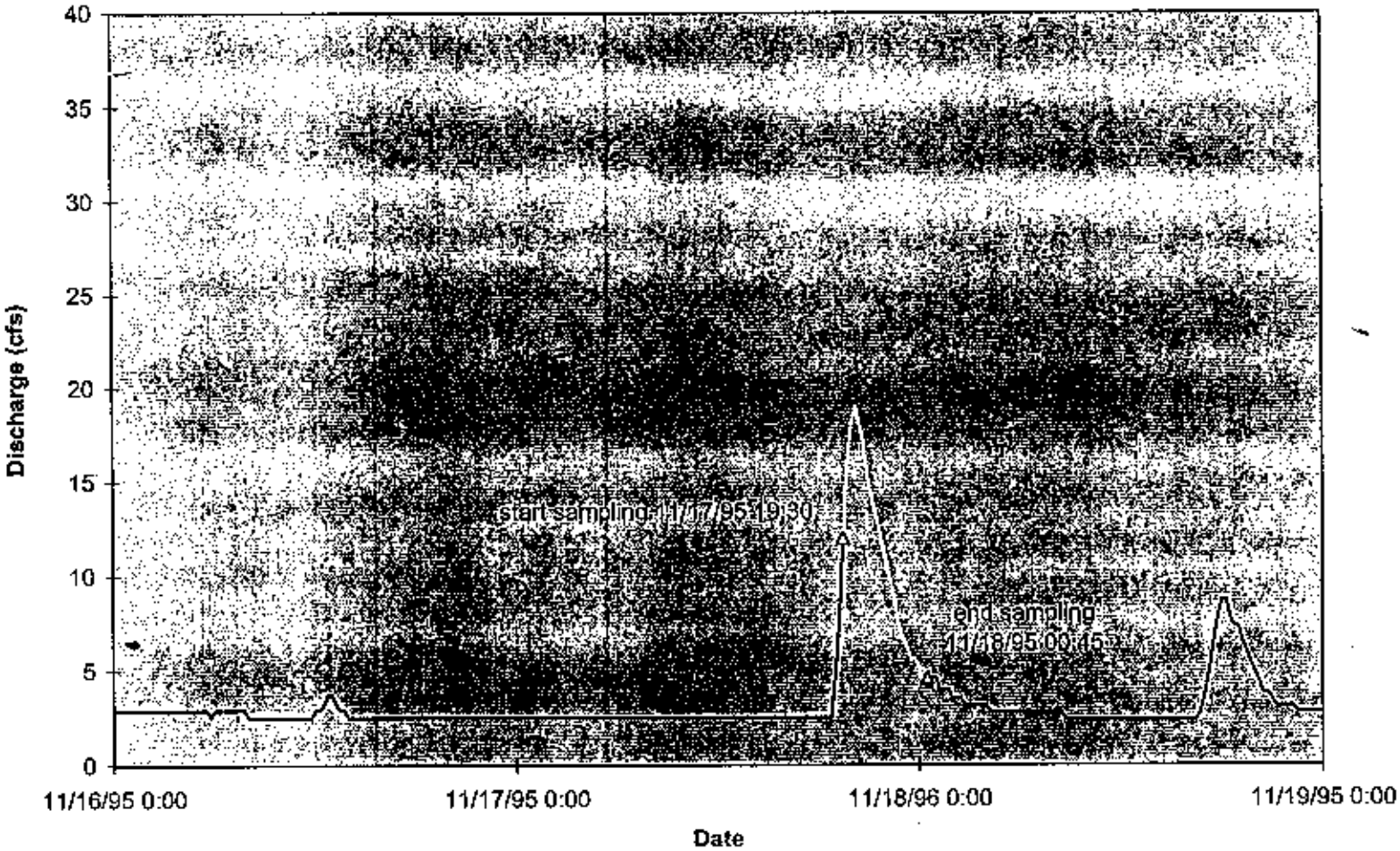
	TSS, KG	TPH, KG	As, total	As, diss.	Cd, Total	Cd, diss.	Cr, total	Cr, diss.	Cu, total	Cu, diss.	Ni, total	Ni, diss.	Pb, total	Pb, diss.	Zn, total	Zn, diss.
1996 Annual Total by Direct Method	54805	3175	4617	2716	475	124	17192	8005	21906	7135	11183	5151	22344	1359	270071	61504
1998 Annual Total by Direct Method	92981	537	4011	1856	485	97	16722	7283	23393	4190	10503	2291	22125	824	270039	43719
Annual Storm Loading, KG/hectare, combined 1996 & 1998 by Direct Method	192	5	0.0112	0.0059	0.0012	0.0003	0.0441	0.0199	0.0589	0.0147	0.0282	0.0097	0.0578	0.0026	0.7024	0.1368
1996 SMC statistics																
stats mean	52.32	3.05	0.0046	0.0024	0.0004	0.0001	0.0194	0.0075	0.0202	0.0068	0.0097	0.0047	0.0204	0.0012	0.2496	0.0606
1996 LOADING - MODIFIED DIRECT METHOD	60611	3539	5316	2724	497	132	22533	8667	23435	7909	11269	5395	23600	1381	289117	70226
1998 SMC statistics																
stats mean	108.57	1.18	0.0050	0.0024	0.0006	0.0001	0.0226	0.0108	0.0291	0.0053	0.0132	0.0030	0.0253	0.0010	0.3113	0.0550
1998 LOADING - MODIFIED DIRECT METHOD	78254	850	3587	1710	465	88	16290	7672	20993	3849	9513	2184	18239	735	224411	39646
Annual Storm Loading, KG/hectare, combined 1996 & 1998 by Modified Direct Method	181	6	0.0116	0.0058	0.0013	0.0003	0.0505	0.0212	0.0578	0.0153	0.0270	0.0099	0.0544	0.0028	0.6679	0.1429

WA03 Loading by Storm

LOADINGS (in grams unless noted)				Total seconds * cfs * mg/l * .02832 for grams									454 grams in a pound.					
Date	Total Suspended Solids, Kg	Total Petroleum Hydrocarbon, Kg	Hardness, Calc, Kg	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms	Mean Q, cfs
11/17/95	279	6.5	408	26	11	3	1	151	49	188	89	65	39	113	9	1753	518	11.0
12/9/95	454	7.3	422	32	19	4	1	102	40	197	51	95	34	143	7	2509	755	17.1
1/8/96	777	17.8	1294	78	38	6	2	239	104	298	85	169	75	301	27	4264	991	33.0
2/5/96	1449	129.8	876	76	34	7	1	190	74	323	72	171	47	419	11	3260	191	23.7
3/3/96	45	57.9	579	22	16	1	1	127	85	57	35	46	39	35	8	834	457	9.1
3/22/96	692	8.6	715	58	23	5	1	277	72	222	43	107	35	325	7	3497	282	12.6
3/31/96	105	8.3	497	26	17	3	1	99	48	118	53	56	35	100	10	1345	609	16.3
4/22/96	277	7.6	584	0	26	4	1	0	57	156	66	65	39	174	14	1976	344	16.0
5/22/96	131	0.0	546	37	25	3	1	136	87	123	55	85	53	106	12	1297	574	13.6
11/7/97	1457	0.0	584	50	26	13	3	163	60	284	61	128	28	301	14	4089	684	16.4
11/19/97	935	0.0	769	48	28	5	1	170	92	243	69	108	35	174	15	2497	597	20.3
12/15/97	669	2.7	611	38	16	3	1	188	84	232	40	107	22	170	7	2472	470	13.6
12/16/97	3328	19.3	1182	112	35	14	2	426	89	788	87	346	42	931	21	10868	794	26.8
1/4/98	682	0.0	518	42	20	5	1	140	68	155	38	75	24	168	9	1788	443	24.1
1/14/98	1687	21.4	670	51	27	5	1	167	71	273	59	114	30	311	13	3614	822	26.0
1/23/98	839	13.6	524	48	24	6	1	141	62	201	44	93	23	252	10	3212	669	18.5
2/8/98	250	0.0	552	20	11	2	1	141	81	132	23	60	17	84	1	1072	206	12.6
3/9/98	930	8.1	768	45	21	5	1	239	129	380	49	159	26	201	5	1853	199	12.1
3/22/98	499	0.0	678	33	18	0	1	253	149	149	38	64	31	92	5	1284	418	11.4

Nov 17 Chart

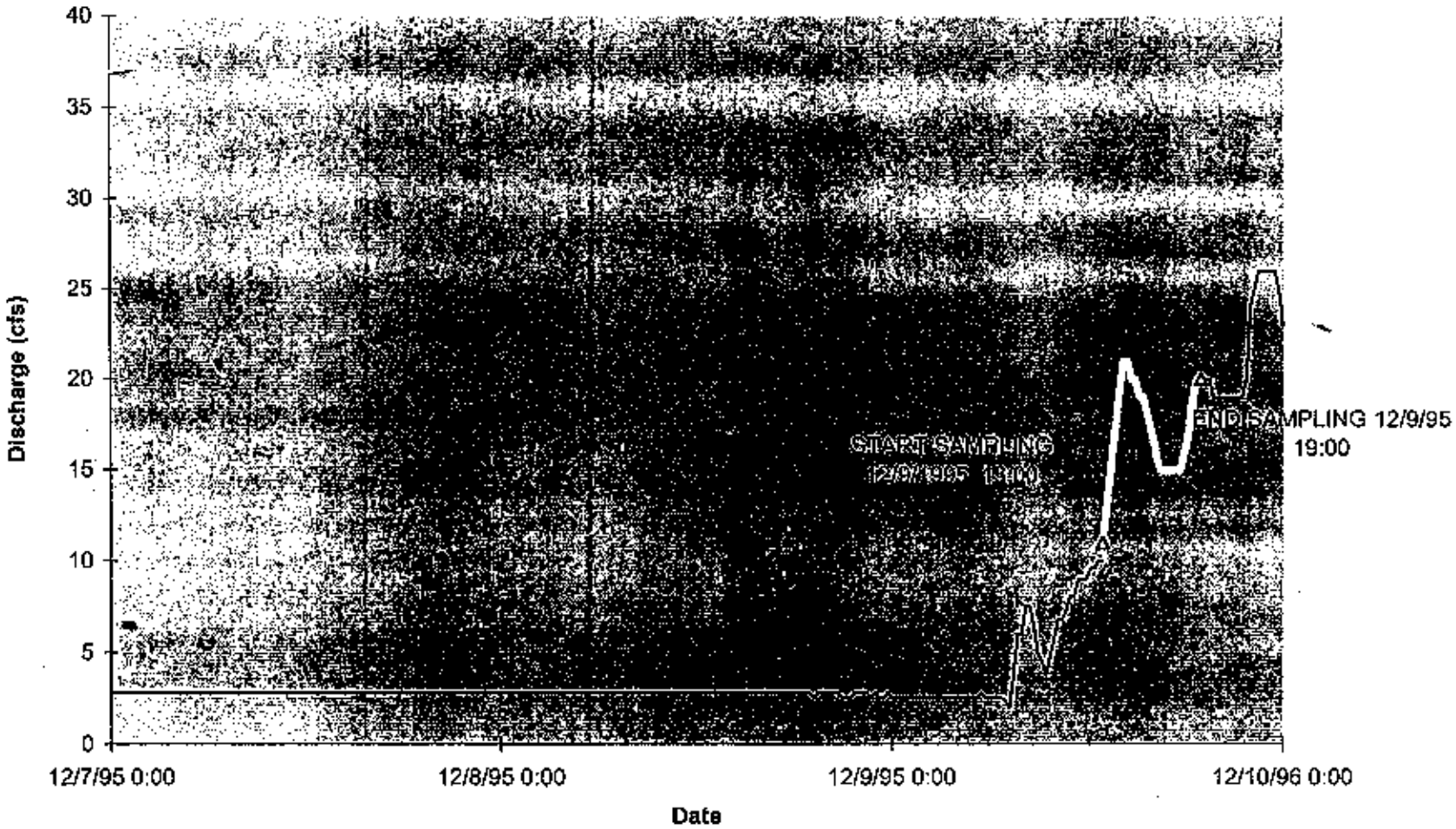
WA3-Hamm Creek, Main Stem Storm Sample Session 1 WY 1996



WATER QUALITY DATA FOR WA03

Dec 9 Chart

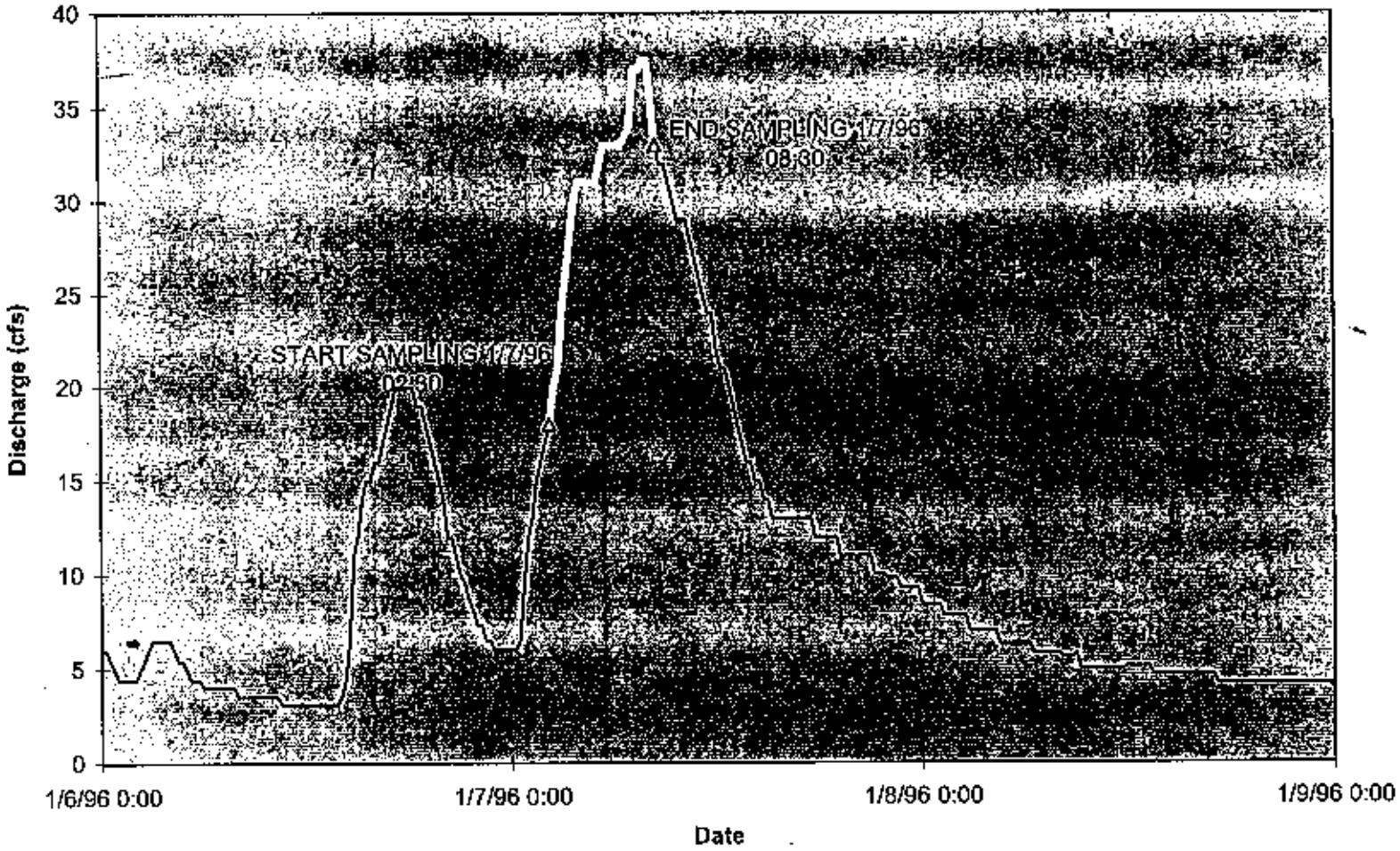
WA3 Hamm Creek, Main Stem Storm Sample 2 for WY 96



WATER QUALITY DATA FOR WA03

Jan 7 Chart

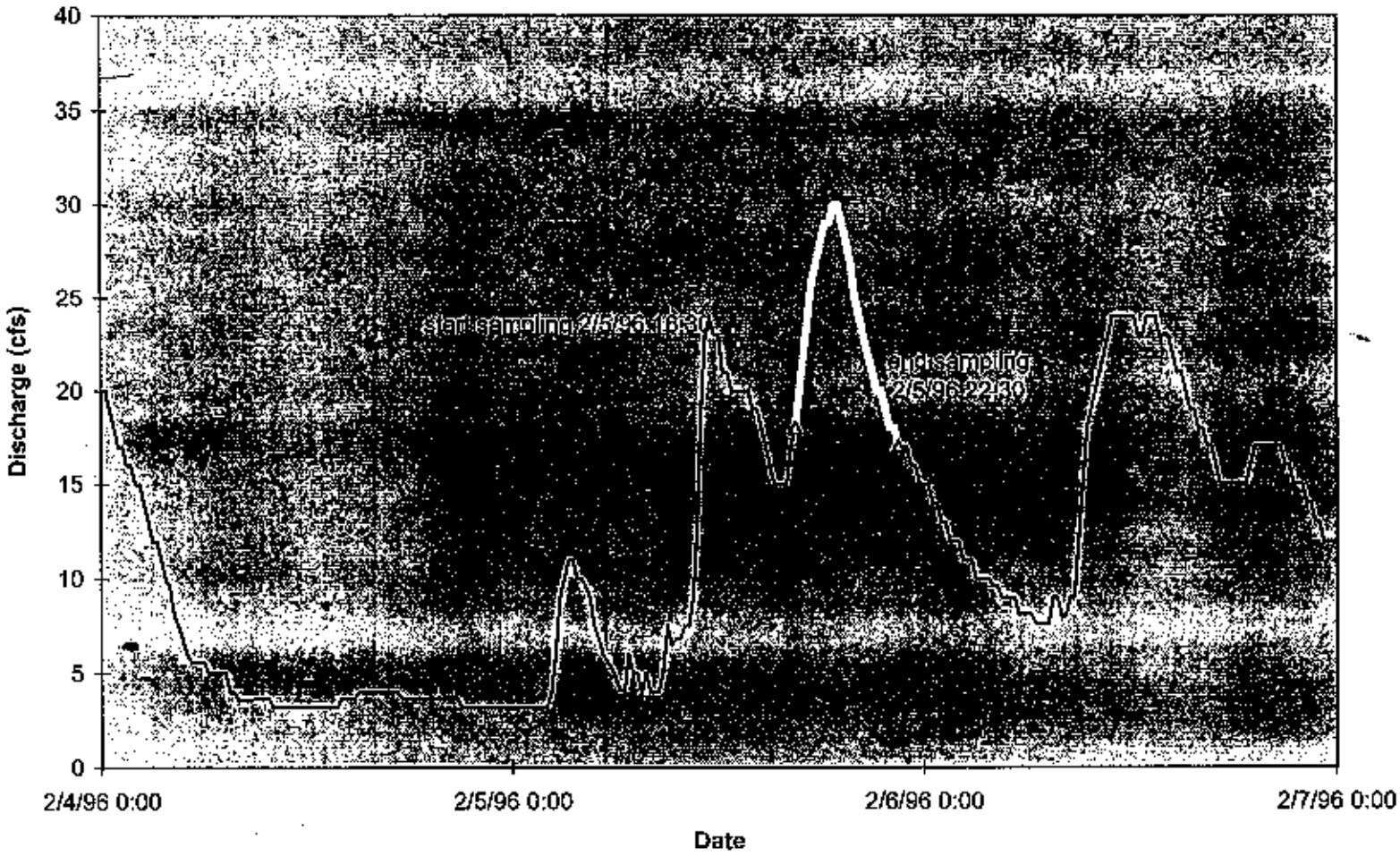
WA3-Hamm Creek, Main Stem Sample Session 3 for WY 96



WATER QUALITY DATA FOR WA03

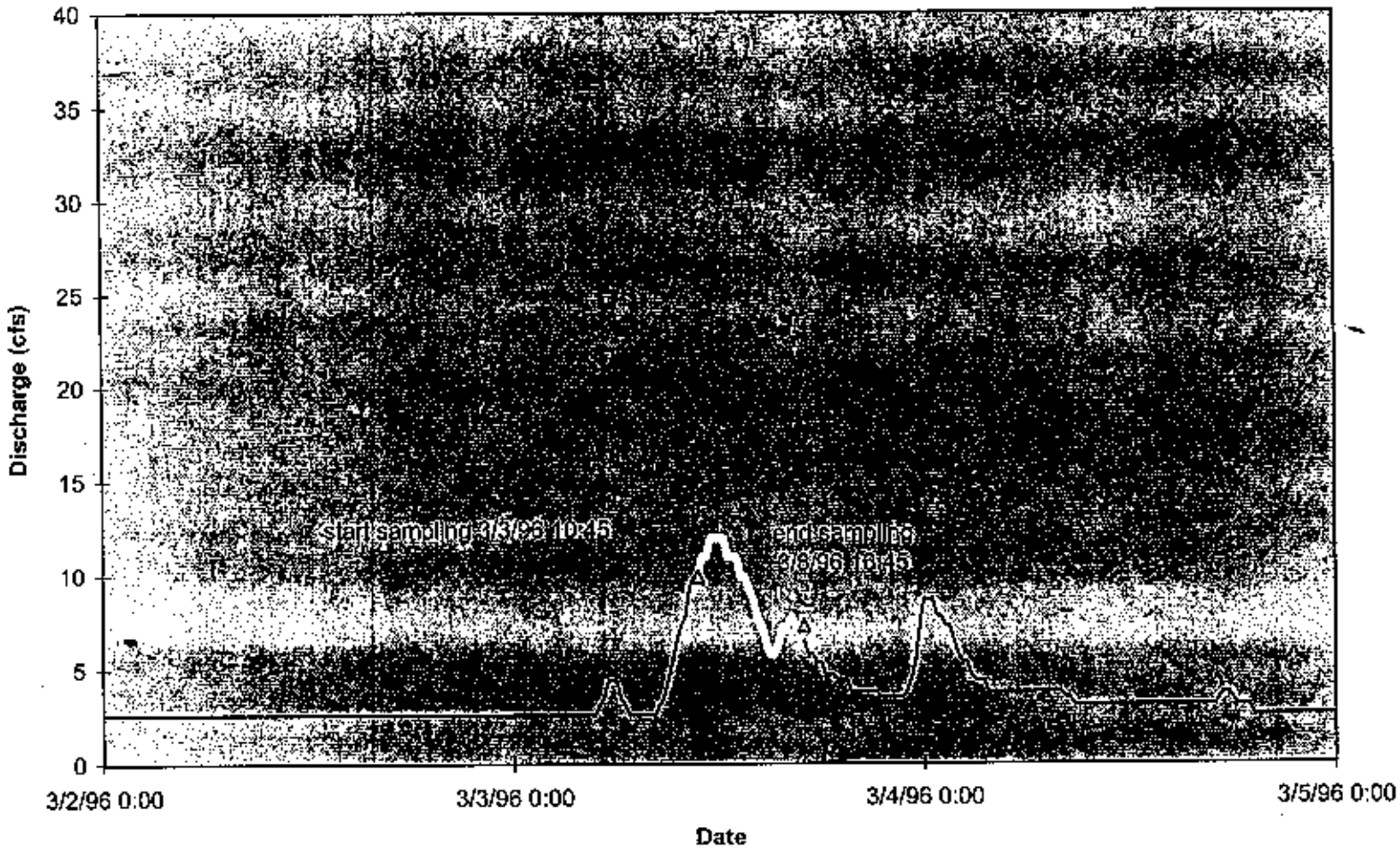
Feb 5 Chart

WA3-Hamm Creek, Main Stem Sample Session 4 for WY 96



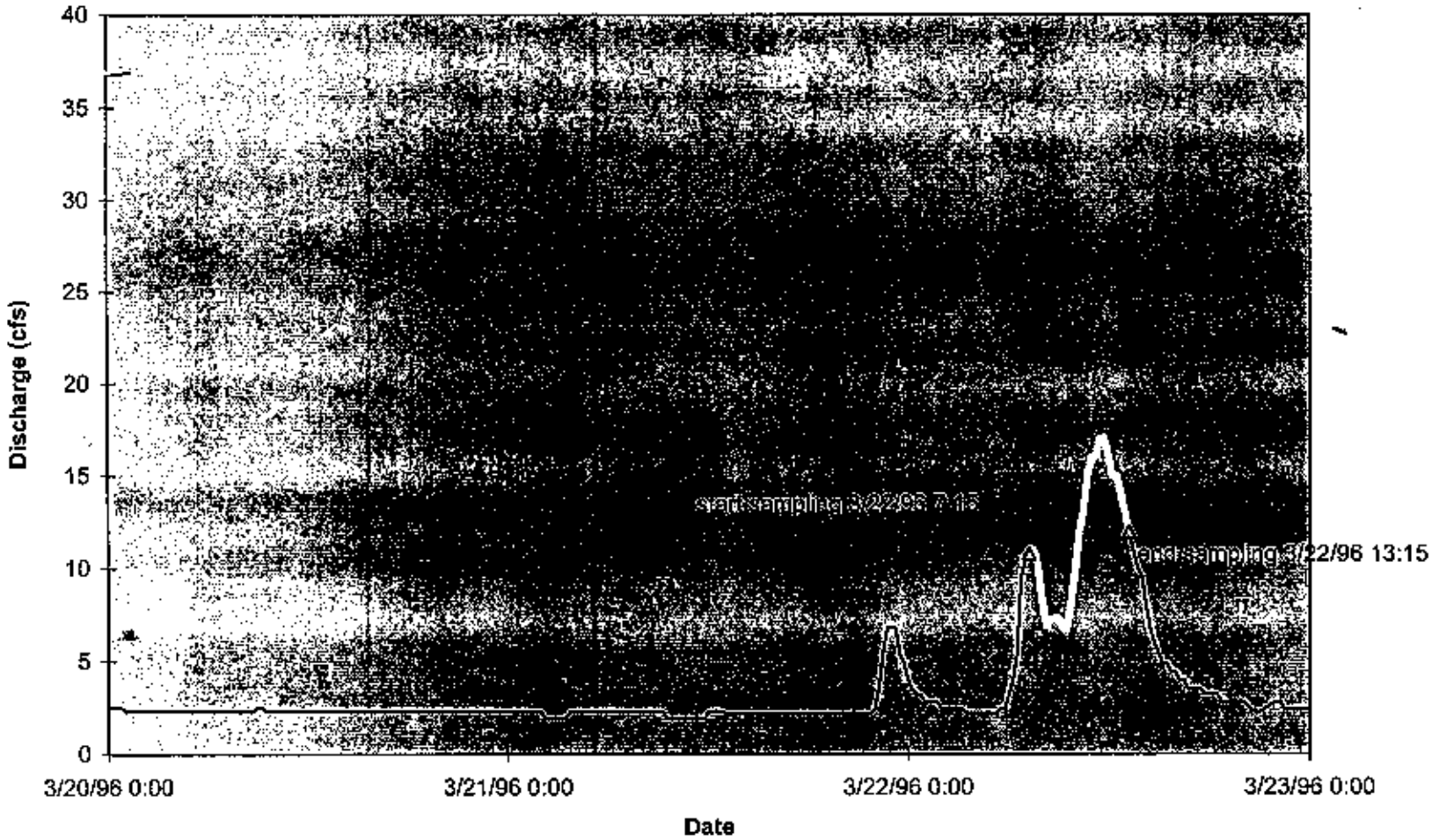
WATER QUALITY DATA FOR WA03

WA3-Hamm Creek, Main Stem Storm Sample Session 5 for WY 96



March 22 Chart

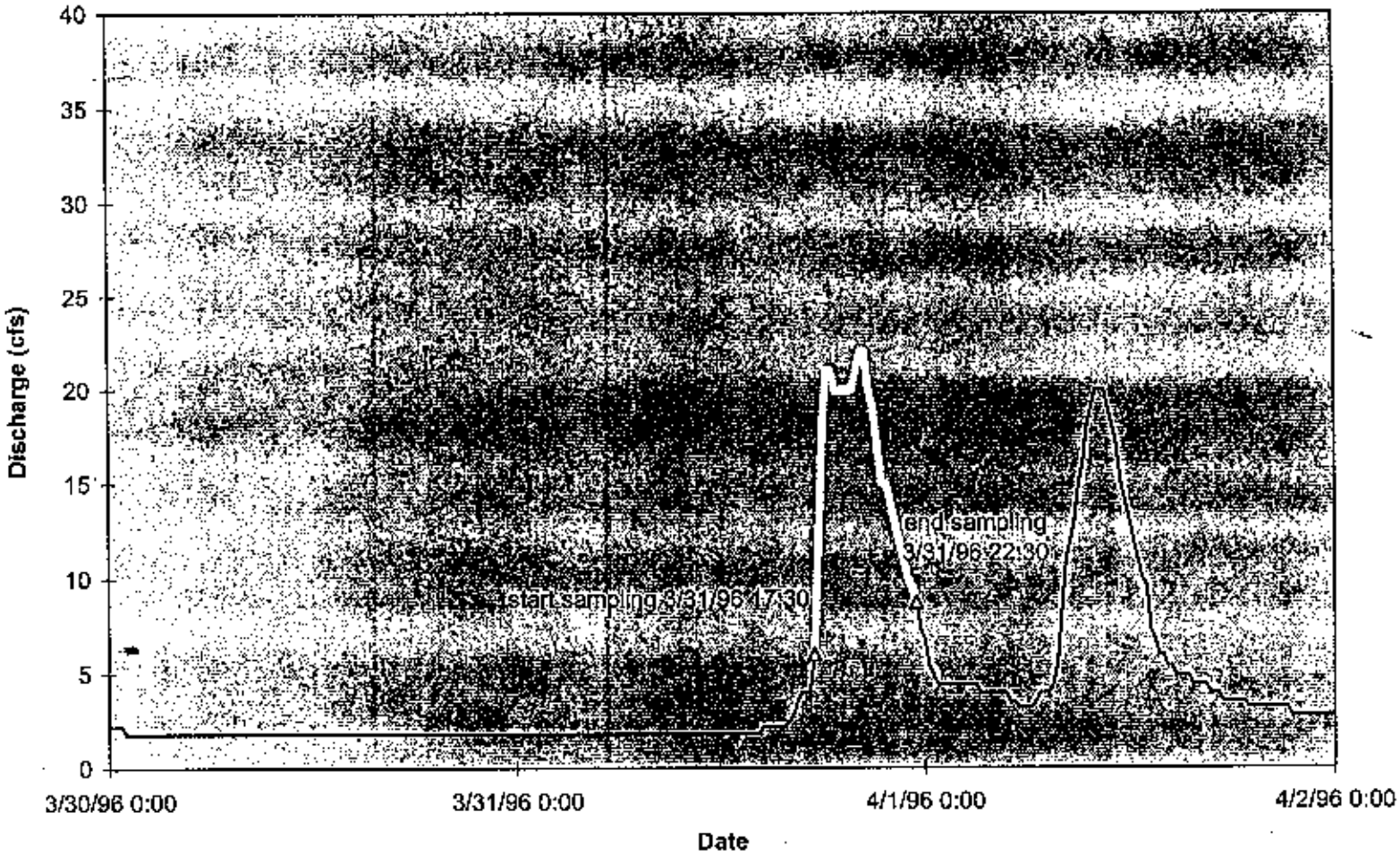
WA3-Hamm Creek, Main Stem Storm Sample Session 6 for WY 96



WATER QUALITY DATA FOR WA03

March 31 Chart

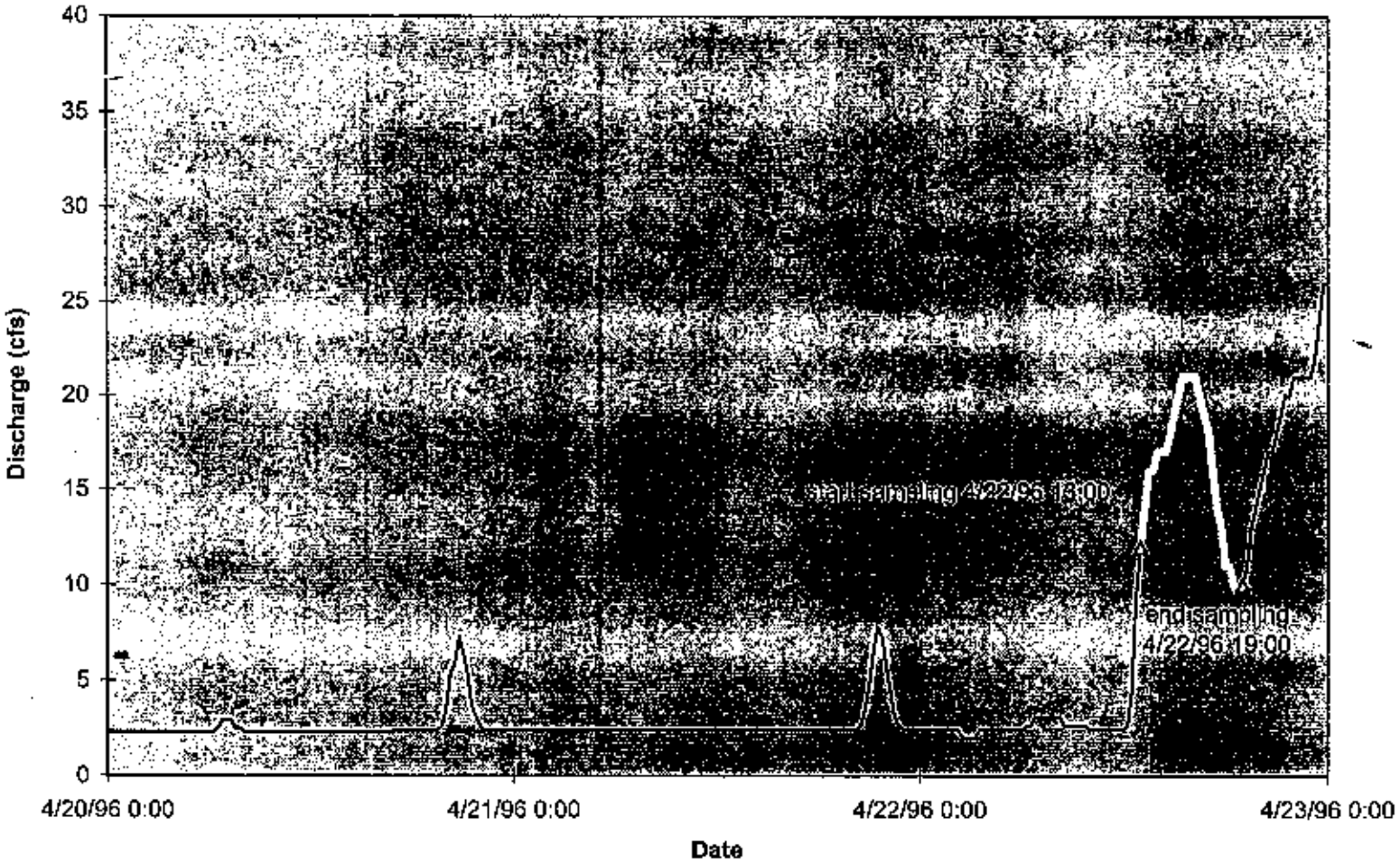
WA3-Hamm Creek, Main Stem Storm Sample Session 7 for WY 96



WATER QUALITY DATA FOR WA03

Apr 22 Chart

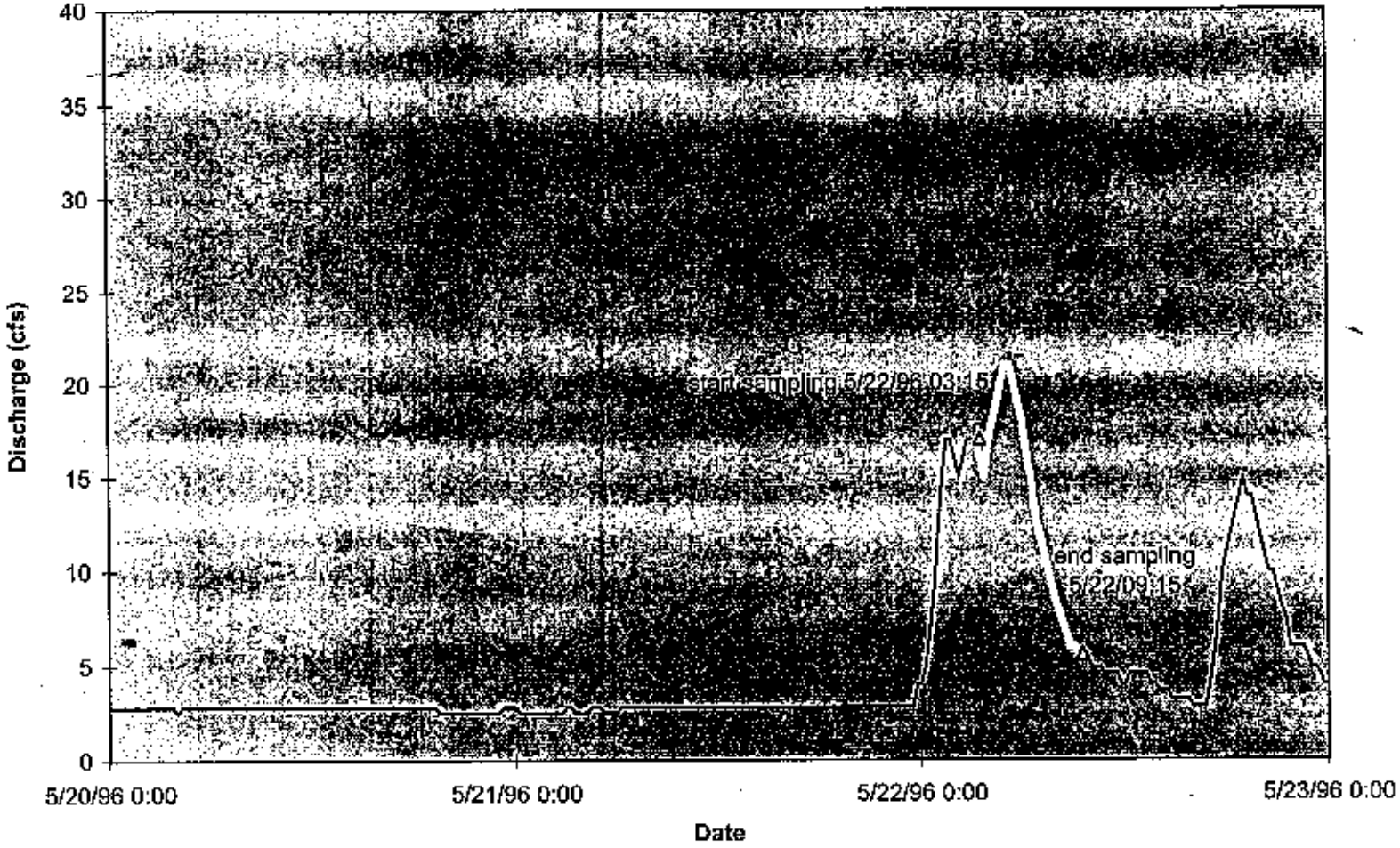
WA3-Hamm Creek, Main Stem Storm Sample Session 8 for WY 96



WATER QUALITY DATA FOR WA03

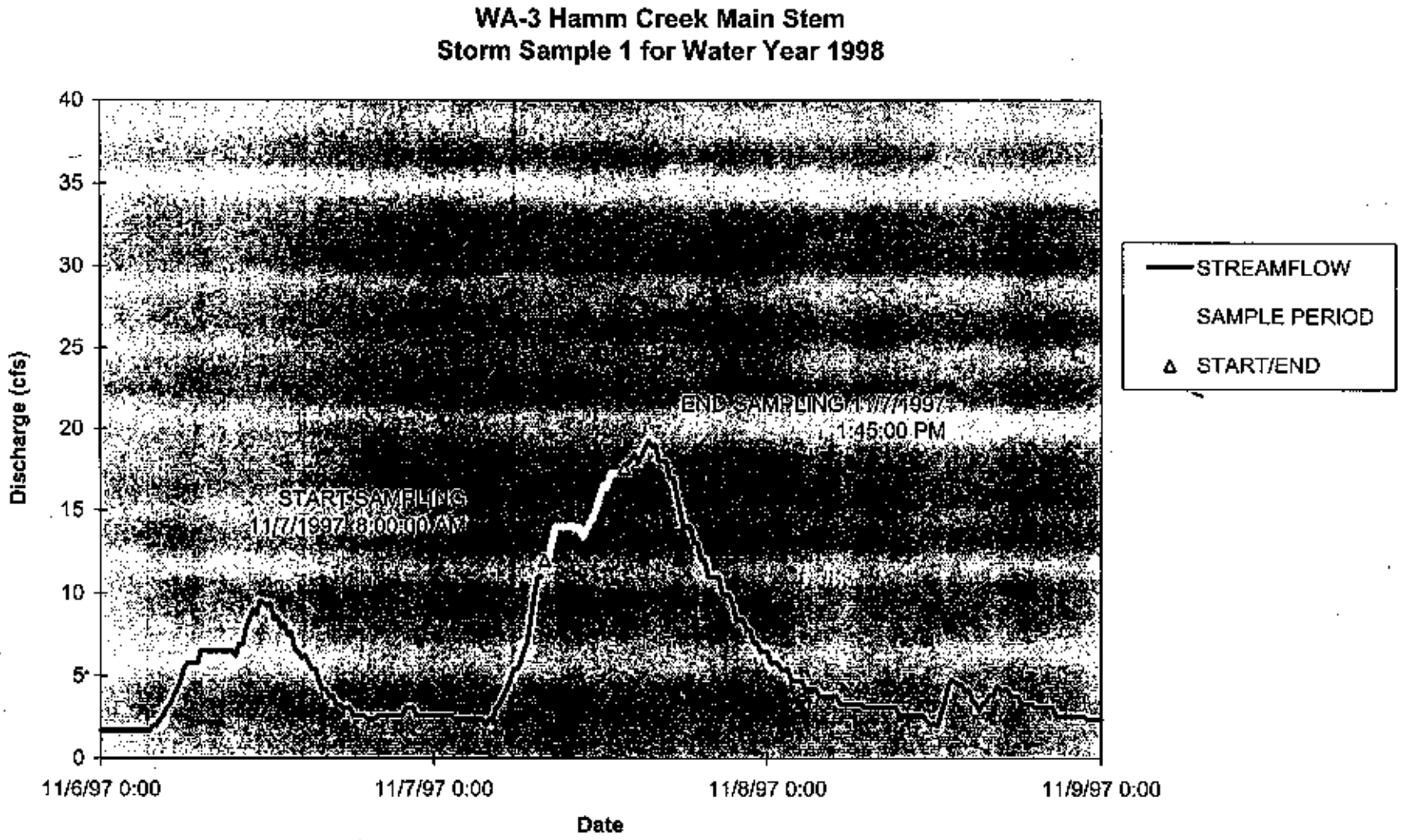
May 22 Chart

WA3-Hamm Creek, Main Stem Storm Sample Session 9 for WY 1996



WATER QUALITY DATA FOR WA03

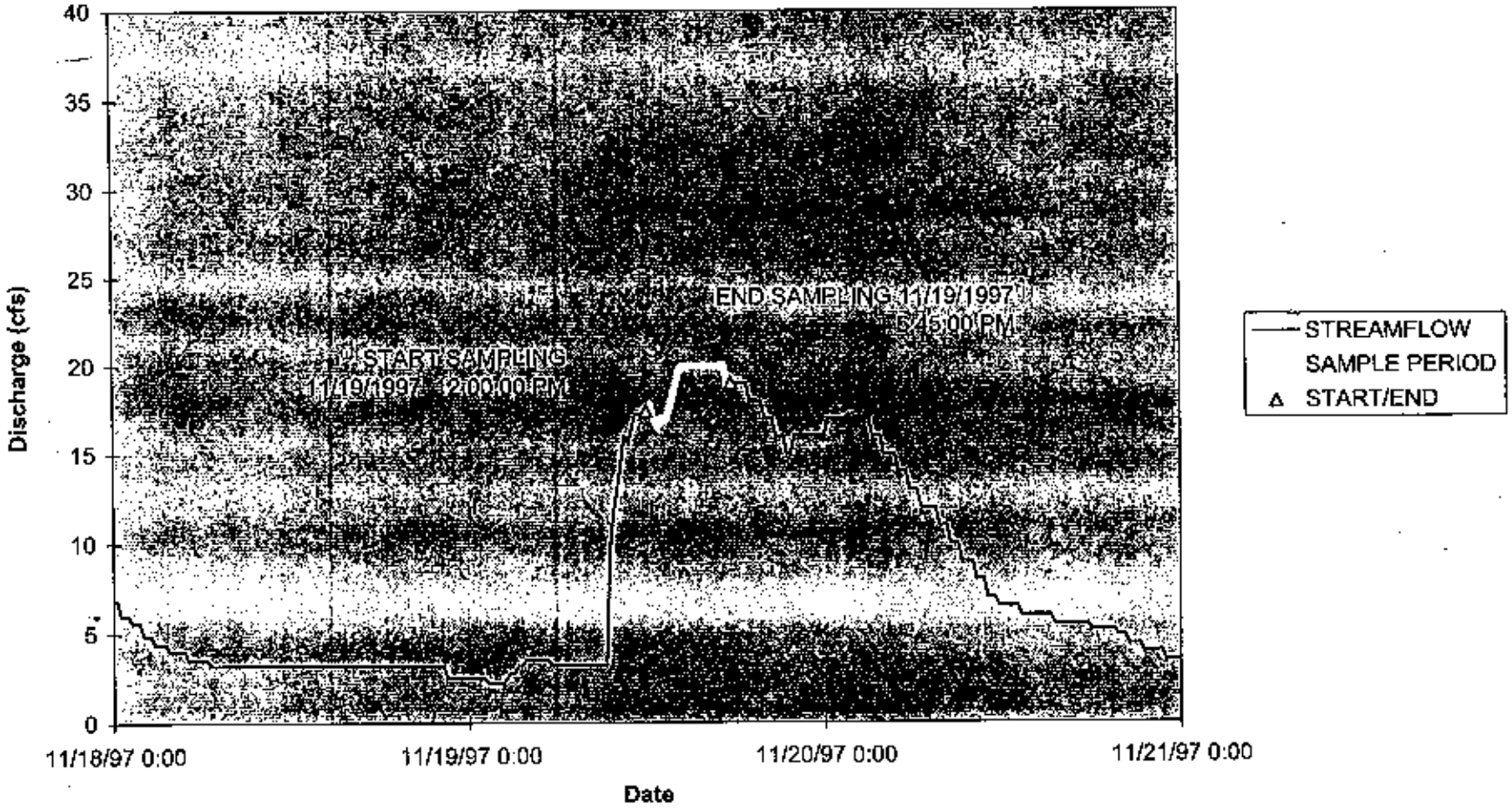
Nov 7 Chart



WATER QUALITY DATA FOR WA03

Nov 19 Chart

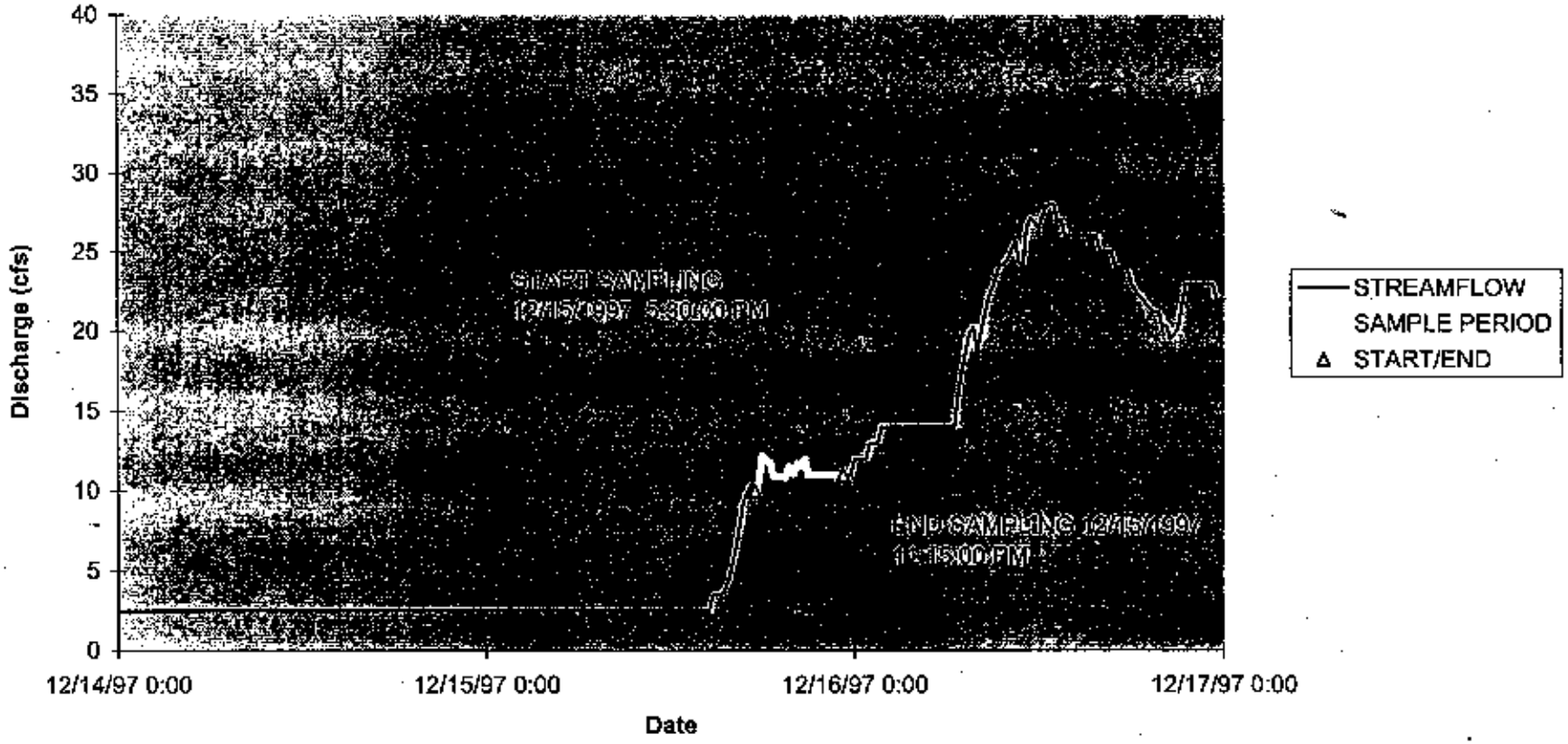
WA-3 Hamm Creek Main Stem
Storm Sample 2 for Water Year 1998



WATER QUALITY DATA FOR WA03

Dec 15 chart

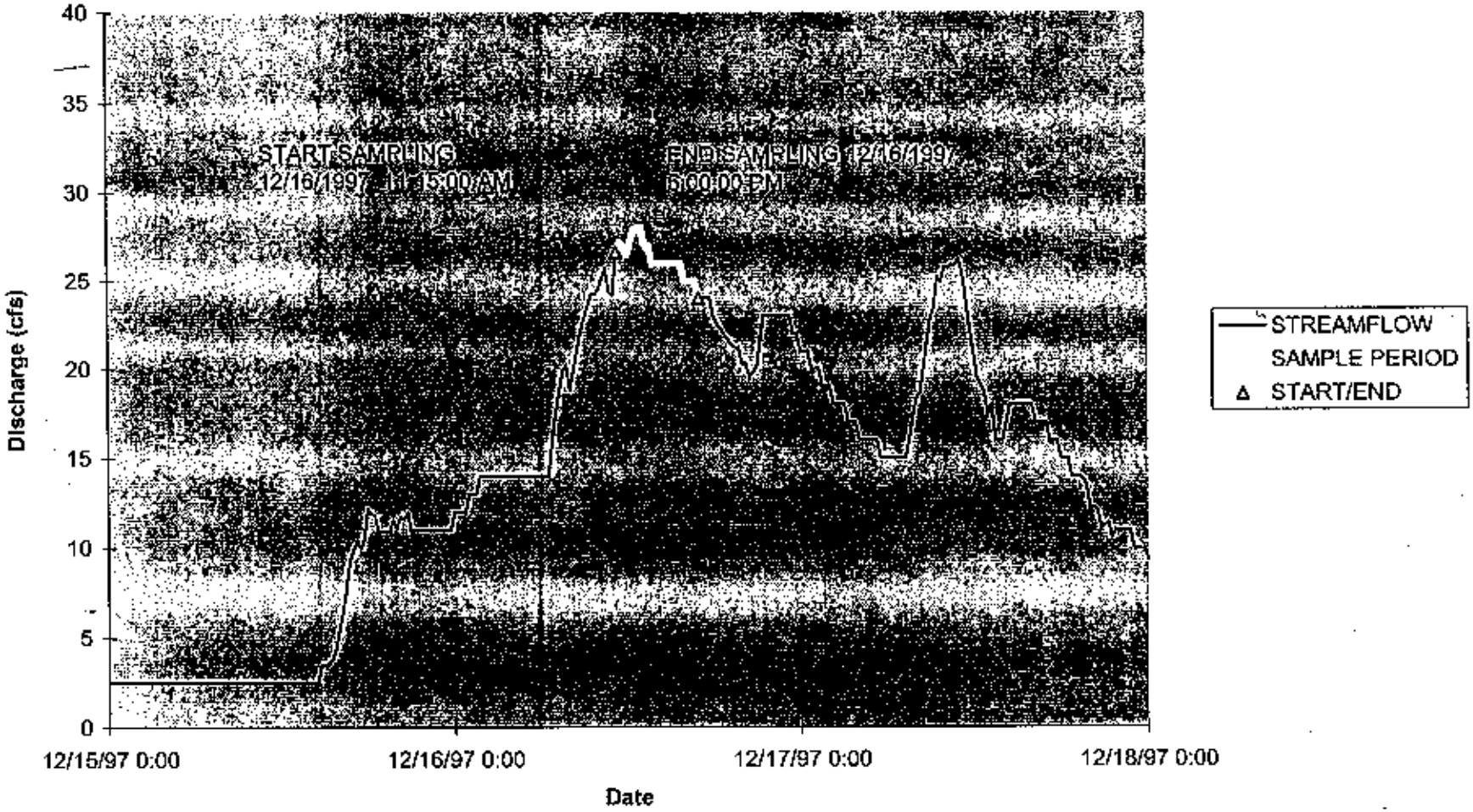
WA-3 Hamm Creek Main Stem
Storm Sample 3 for Water Year 1998



WATER QUALITY DATA FOR WA03

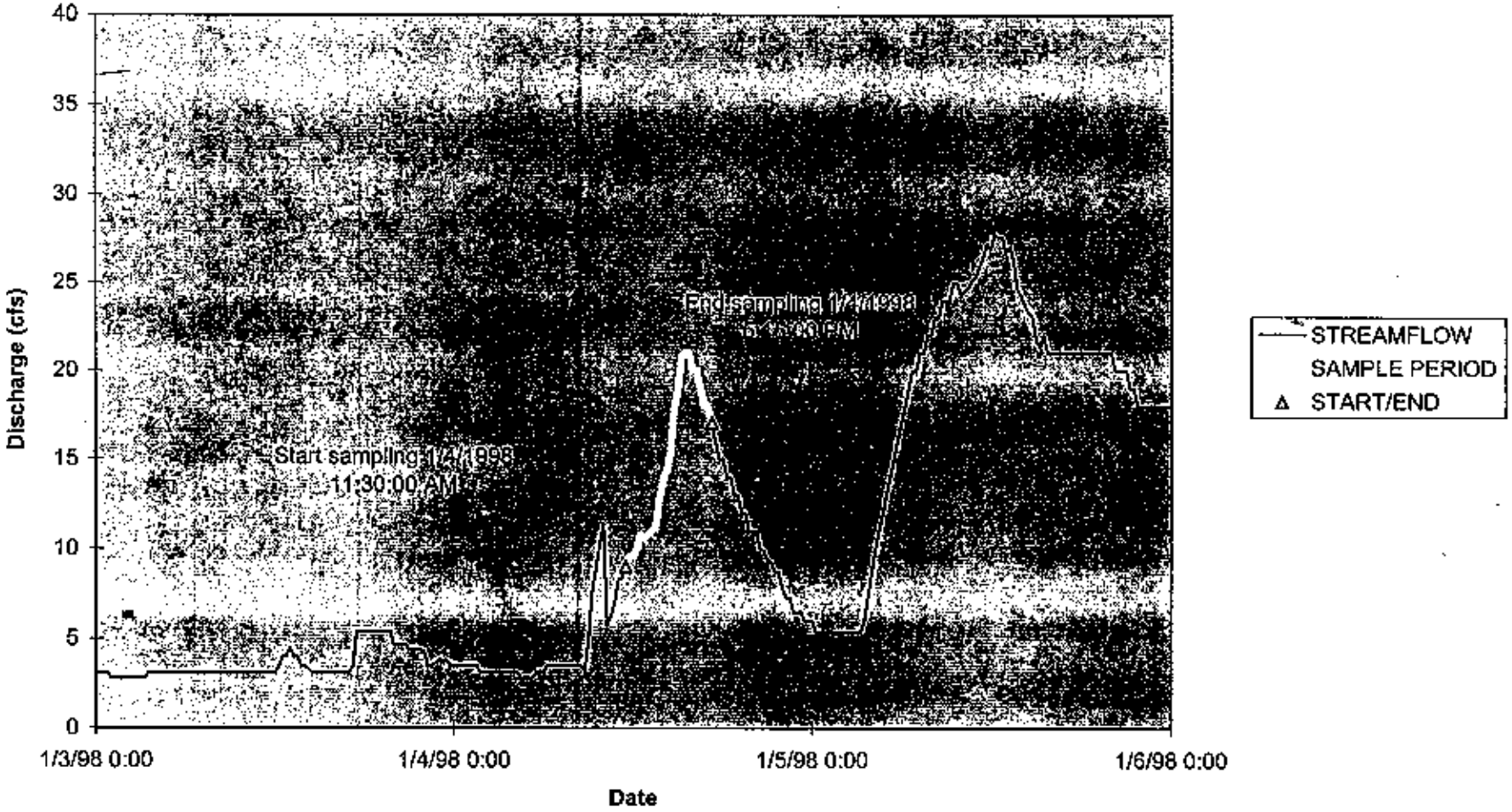
Dec 16 chart

WA-3 Hamm Creek Main Stem
Storm Sample 4 for Water Year 1998

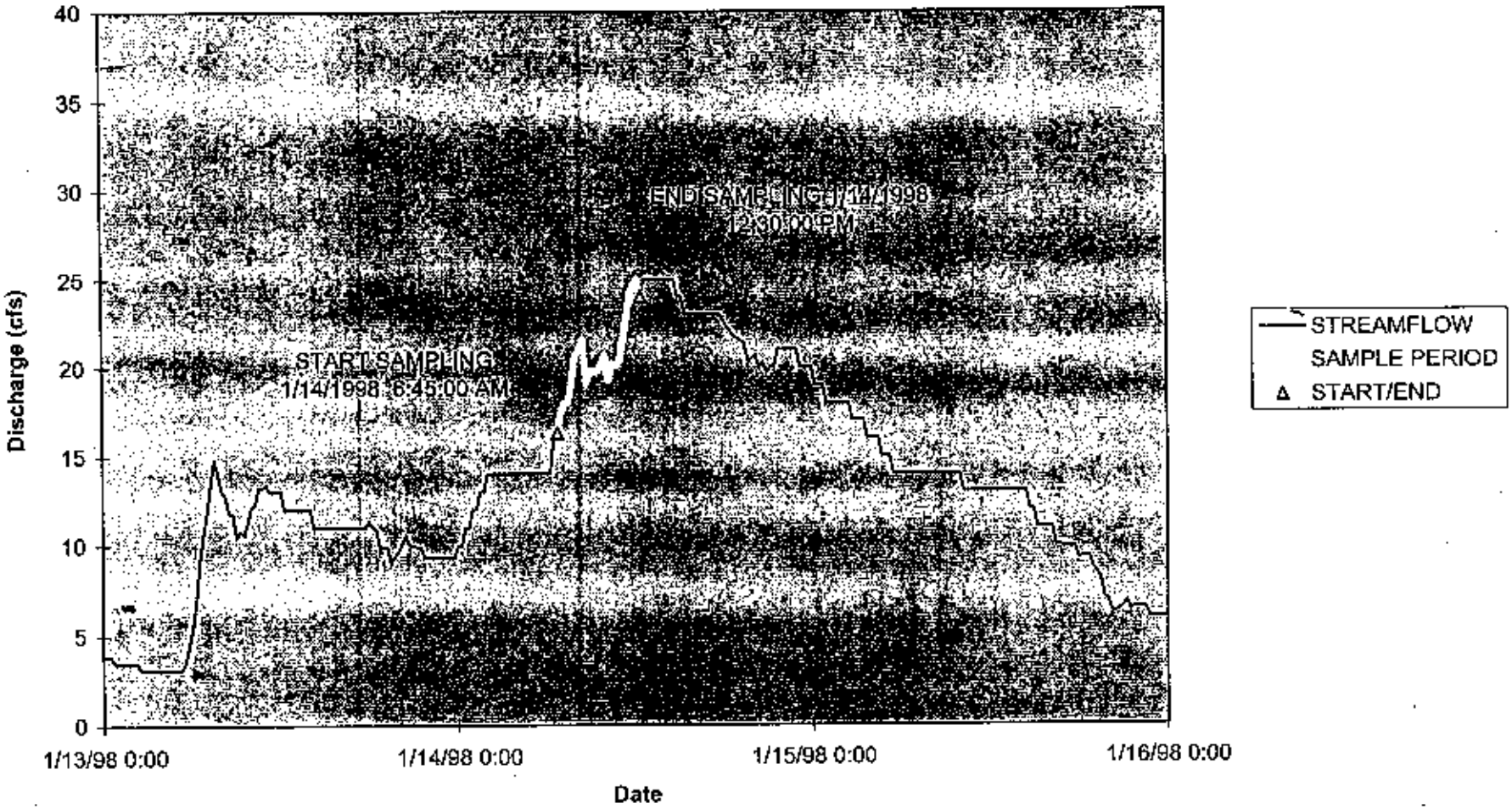


WATER QUALITY DATA FOR WA03

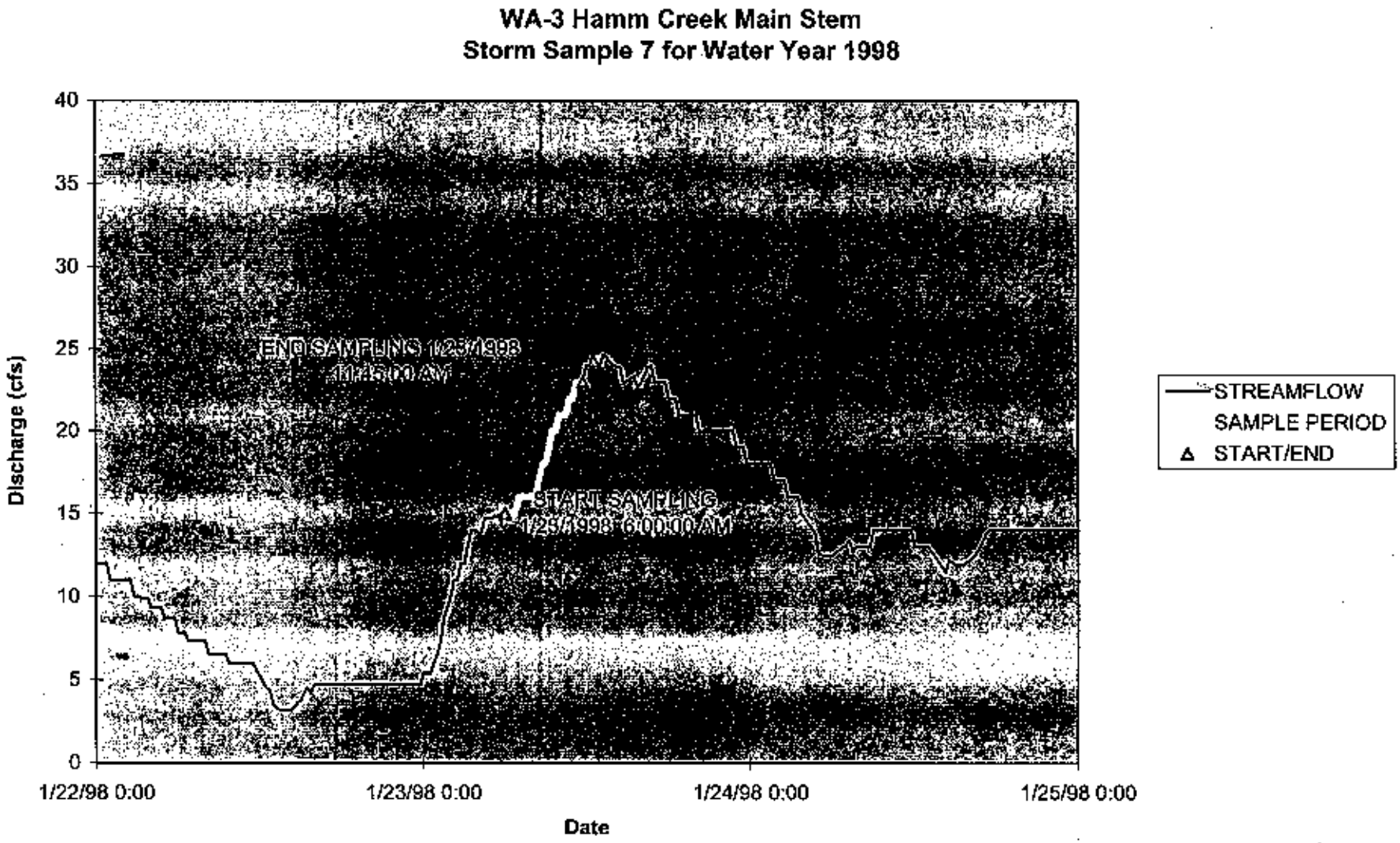
WA-3 Hamm Creek Main Stem
Storm Sample 5 for Water Year 1998



WA-3 Hamm Creek Main Stem
Storm Sample 6 for Water Year 1998

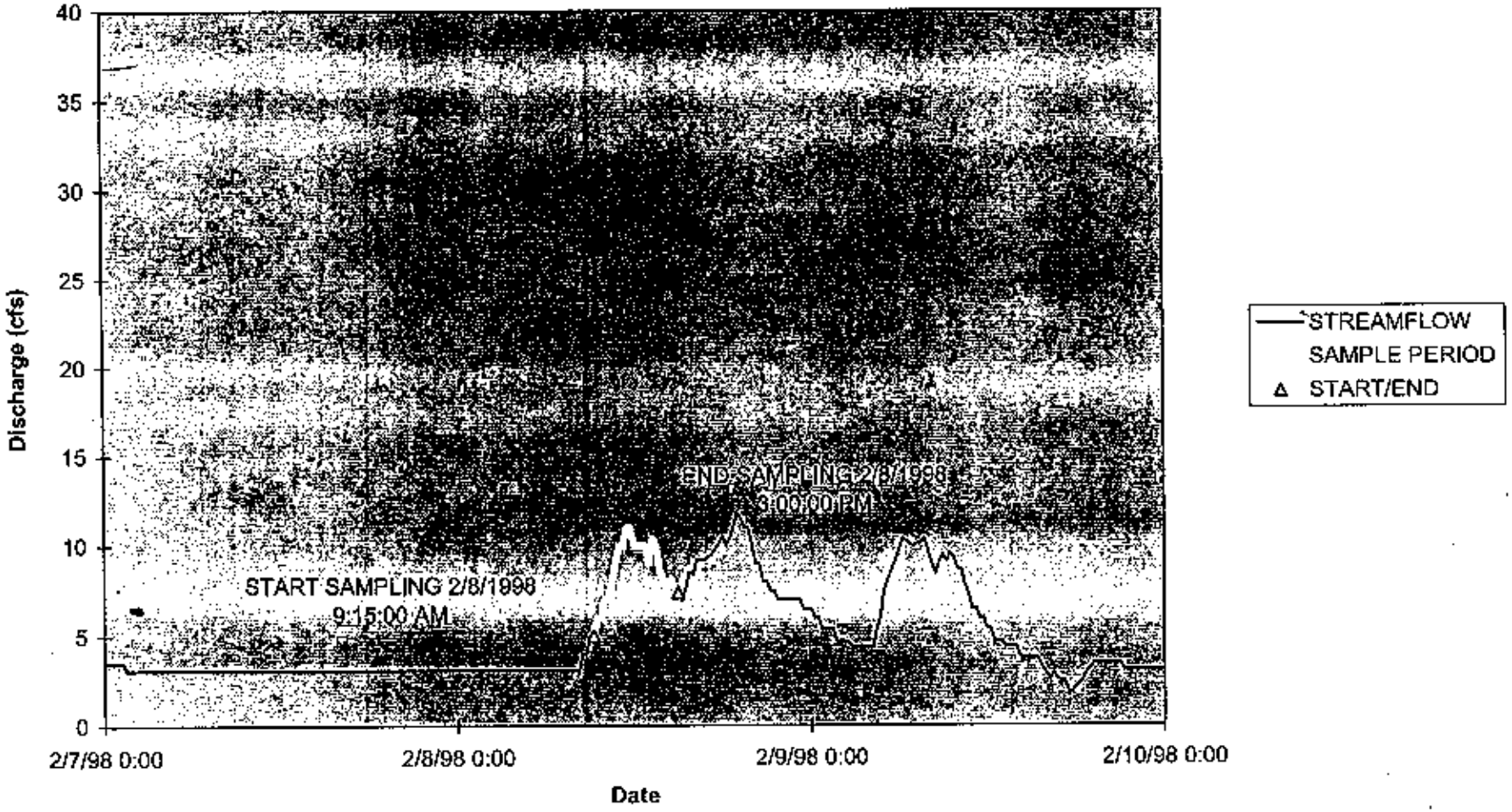


jan 23 Chart

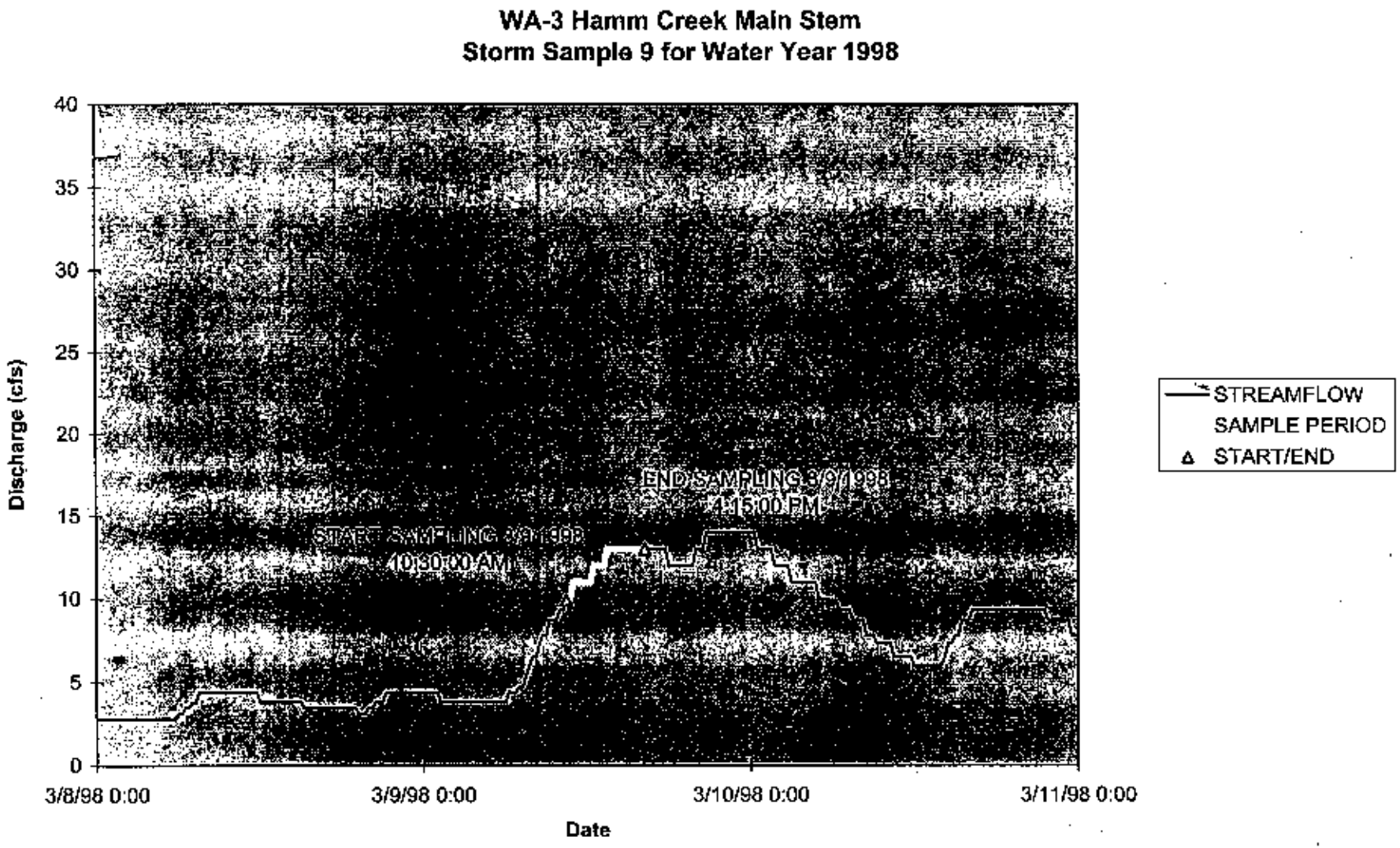


WATER QUALITY DATA FOR WA03

WA-3 Hamm Creek Main Stem
Storm Sample 7 for Water Year 1998



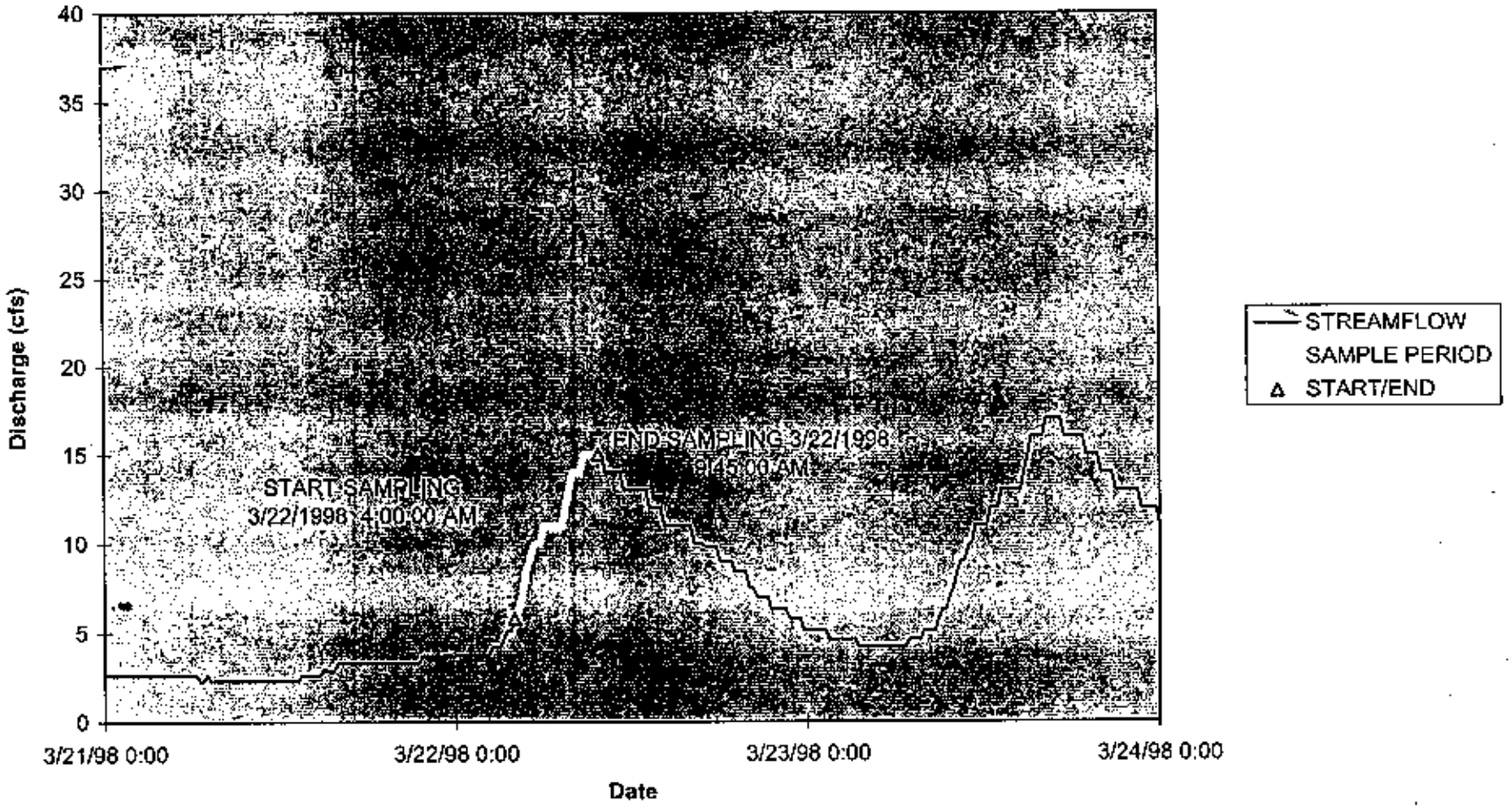
Mar 9 chart



WATER QUALITY DATA FOR WA03

Mar 22 chart

WA-3 Hamm Creek Main Stem
Storm Sample 10 for Water Year 1998



WATER QUALITY DATA FOR WA03

RESULTS FROM SITE WA – 04

Values < RDL in **bold**, < ***MDL*** estimated in ***bold italic***.

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms	Mean Q
		<MDL Value		***0***	***0***	***0***	***0***	***0***	***0.1***	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	
		MDL		***0.5***	***0.005***	***0.05***	***0.02***	***0.3***	***0.2***	***0.0005***	***0.0005***	***0.0002***	***0.0002***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	
		RDL		**1**	**0.01**	**0.1**	**0.04**	**2**	**1.25**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
WA-04	11/17/95	L7371-4		32.7	0.236	1.23		0.6	62.5	0.0049	0.0042	***0.0002***	***0.0001***	0.0039	0.0021	0.0076	0.0050	0.0045	0.0031	0.0041	***0.0002***	0.0227	0.0157	
WA-04	12/9/95	L7517-4		32.7	0.257	0.76	0.07	0.5	34.	0.0039	0.0030	***0.0002***	***0.0001***	0.0032	0.0013	0.0068	0.0038	0.0036	0.0022	0.0038	***0.0002***	0.0204	0.0122	
WA-04	1/8/96	L7665-4		39.8	0.225	0.99	0.06	1.0	59.	0.0038	0.0025	0.0002	***0.0001***	0.0031	0.0012	0.0070	0.0044	0.0044	0.0031	0.0042	0.0006	0.0203	0.0119	
WA-04	2/5/96	L7842-4		29.3	0.243	0.89	0.13	9.1	37.8	0.0034	0.0026	***0.0002***	***0.0001***	0.0028		0.0083	0.0057	0.0038	0.0028	0.0044	0.0006	0.0217	0.0239	
WA-04	3/22/96	L8159-4		55.5	0.238	1.01	0.06	1.1	67.6	0.0078	0.0047	***0.0002***	***0.0001***	0.0058	0.0021	0.0092	0.0034	0.0052	0.0021	0.0078	***0.0002***	0.0339	0.0439	
WA-04	3/31/96	L8209-4	7.7	18.8	0.264	0.79		0.5	55.8	0.0064	0.0045	***0.0002***	***0.0001***	0.0054	0.0026	0.0087	0.0035	0.0040	0.0016	0.0076	***0.0002***	0.0394	0.0471	
WA-04	4/22/96	L8369-4	7.4	34.3	0.270	0.79	0.04	0.7	68.		0.0013	0.0002	***0.0001***		***0.0002***	0.0104	0.0038	0.0050	0.0017	0.0142	***0.0002***	0.0464	0.0077	
WA-04	5/22/96	L8669-4	7.7	20.4	0.227	0.86	0.071	***0***	59	0.0068	0.00428	0.00022	***0.0001***	0.00532	0.0019	0.0101	0.00453	0.00574	0.00289	0.00854	0.00078	0.0319	0.0152	
Sample size:			3	8	8	8	6	8	8	7	8	8	8	7	7	8	8	8	8	8	8	8	8	
Arithmetic mean:			7.6	33	0.2475	0.92	0.071	1.7	55	0.0053	0.0034	0.0002	0.0001	0.0042	0.0016	0.0085	0.0043	0.0045	0.0024	0.0068	0.0004	0.0296	0.0222	
Max value:			7.7	56	0.284	1.23	0.127	9.1	68	0.0078	0.0047	0.0002	0.0001	0.0058	0.0026	0.0104	0.0057	0.0057	0.0031	0.0142	0.0008	0.0464	0.0471	
Min value:			7.4	19	0.225	0.76	0.041	***0.0***	34	0.0034	0.0013	0.0002	0.0001	0.0028	0.0002	0.0068	0.0034	0.0036	0.0016	0.0038	0.0002	0.0203	0.0077	
Median:			7.7	33	0.2405	0.88	0.065	0.6	59	0.0049	0.0036	0.0002	0.0001	0.0039	0.0019	0.0085	0.0041	0.0045	0.0025	0.0060	0.0002	0.0273	0.0155	
Est. mean of population:			7.6	33	0.2476	0.92	0.072	1.7	56	0.0053	0.0035	0.0002	0.0001	0.0042	0.0019	0.0085	0.0043	0.0045	0.0024	0.0069	0.0004	0.0298	0.0226	
1996 Arithmetic Mean:			7.6	33	0.2	0.9	0.1	1.7	55	0.0053	0.0034	0.0002	0.0001	0.0042	0.0016	0.0085	0.0043	0.0045	0.0024	0.0068	0.0004	0.0296	0.0222	
										Total seconds * cfs * mg/l * .02832 for grams														
Loading by storm:				Kg	Kg	Kg	Kg	Kg	Kg	grams	grams	grams	grams	grams	grams	grams	grams	grams	grams	grams	grams	grams	grams	cfs
	11/17/95			5.7	0.04	0.21		0.10	10.9	0.86	0.73	0.03	0.02	0.67	0.36	1.32	0.87	0.79	0.53	0.71	0.03	3.94	2.73	0.31
	12/9/95			10.4	0.08	0.24	0.02	0.16	10.8	1.24	0.94	0.06	0.03	1.01	0.41	2.15	1.22	1.13	0.70	1.22	0.06	6.48	3.88	0.52
	1/8/96			48.7	0.28	1.22	0.08	1.21	72.1	4.61	3.02	0.26	0.12	3.83	1.47	8.51	5.40	5.40	3.74	5.13	0.67	24.82	14.55	2.0
	2/5/96			17.4	0.14	0.53	0.08	5.38	22.4	2.02	1.54	0.12	0.06	1.65	0.00	4.95	3.39	2.26	1.64	2.59	0.33	12.87	14.17	0.97
	3/22/96			21.4	0.09	0.39	0.02	0.42	26.0	3.00	1.81	0.08	0.04	2.23	0.79	3.54	1.29	2.01	0.80	3.02	0.08	13.06	16.91	0.63
	3/31/96			7.4	0.11	0.31		0.20	21.9	2.53	1.76	0.08	0.04	2.13	1.02	3.41	1.38	1.55	0.63	2.98	0.08	15.45	18.47	0.77
	4/22/96			14.0	0.11	0.32	0.02	0.28	27.8	0.00	0.53	0.10	0.04	0.00	0.08	4.26	1.57	2.03	0.70	5.82	0.08	19.00	3.15	0.67
	5/22/96			7.4	0.08	0.31	0.03	0.00	21.3	2.45	1.54	0.08	0.04	1.92	0.69	3.64	1.63	2.07	1.04	3.08	0.28	11.50	5.48	0.59

SAMPLE TIME AND INFO

Date	Sampler Start Time	Sampler End Time	Duration (Hours)	Duration (Seconds)	Mean Q,cfs	Rainfall, inches	24 Hr Antecedent	72 Hr Antecedent	7 Day Antecedent	total volume, liters
11/17/95	19:00	0:30	5:30	19800	0.31	0.2	0.02	0.25	1.57	173,828
12/9/95	13:30	19:30	6:00	21600	0.52	0.41	0.16	0.16	1.02	318,090
1/7/96	2:15	8:15	6:00	21600	2	0.98	0.48	0.73	0.86	1,223,424
2/5/96	16:00	22:00	6:00	21600	0.97	0.46	0.44	0.9	0.96	593,361
3/22/96	7:15	13:15	6:00	21600	0.63	0.29	0.13	0.31	0.34	385,379
3/31/96	17:30	22:30	5:00	18000	0.77	0.48	0.25	0.41	0.41	392,515
4/22/96	13:00	19:00	6:00	21600	0.67	0.41	0.23	0.25	1.28	409,847
5/22/96	3:15	9:15	6:00	21600	0.59	0.21	0.31	0.32	1.41	360,910
1996 total rain contributing sampled runoff						3.44	wet season runoff:			1996 sampled runoff
1996 rain Nov - May						46.76		52,433,102	3,857,354	

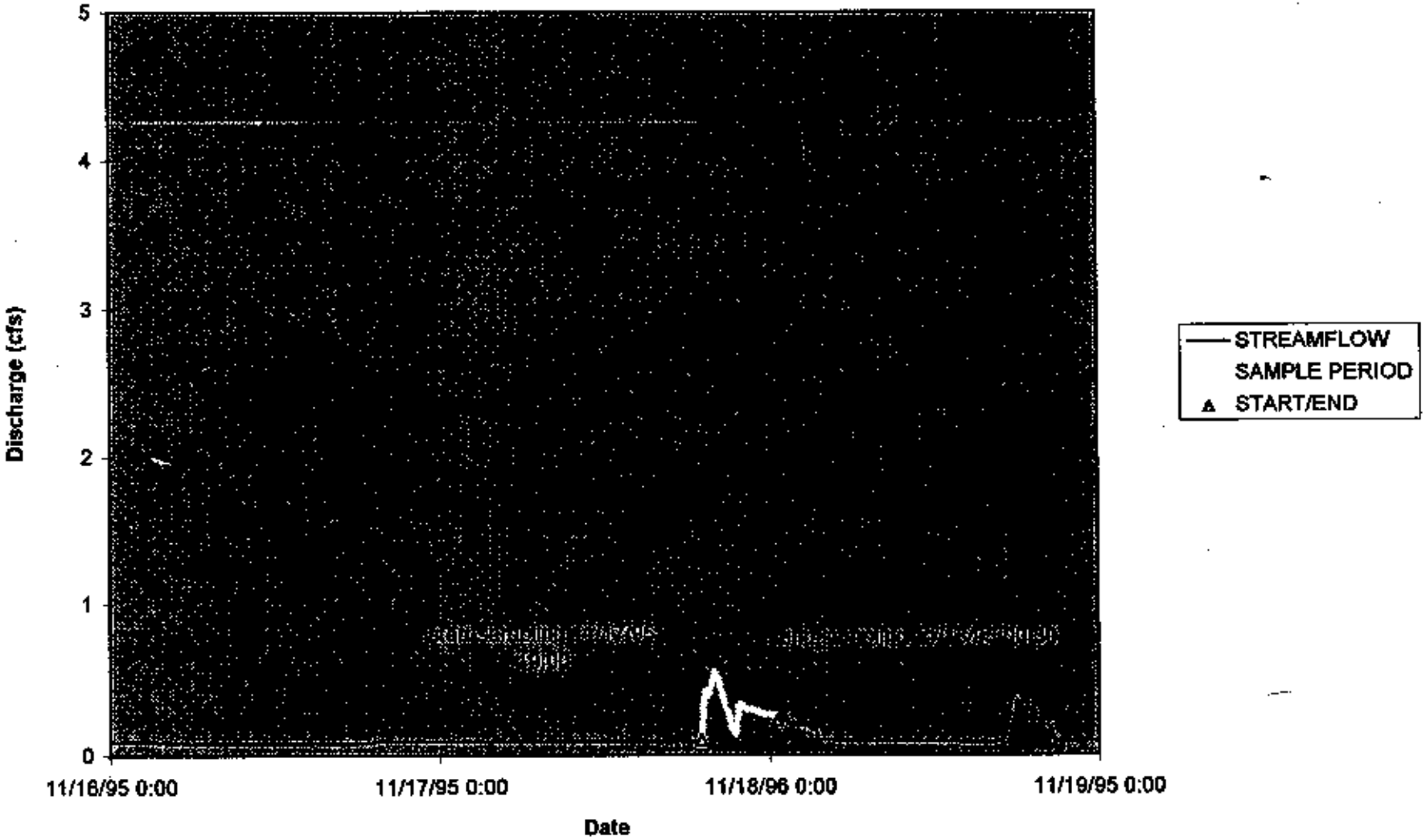
Hamm Creek WA 4, Middle Fork Hamm Creek 1996 Storm Loading

LOADINGS (in grams unless noted) 454 grams in a pound. Sub-basin area = 480 acres hecatre = 2.471 acres

	TSS, KG	Total P, Kg	Nitrite + Nitrate N	Ammonia Nitrog.	TPH, KG	As, total	As, diss.	Cd, Total	Cd, diss.	Cr, total	Cr, diss.	Cu, total	Cu, diss.	Ni, total	Ni, diss.	Pb, total	Pb, diss.	Zn, total	Zn, diss.
1996 Sampled Events Total	132	0.9	3.5	0.24	8	17	12	1	0	13	5	32	17	17	10	25	2	107	79
1996 Annual Storm Total, Direct Method	1723	12	46	3	101	217	155	11	5	175	63	414	218	225	127	320	21	1395	1033
1996 Sample Mean Concentration (SMC) statistics																			
stats mean	33.20	0.25	0.92	0.07	1.68	0.0051	0.0035	0.0002	0.0001	0.0041	0.0019	0.0085	0.0043	0.0045	0.0024	0.0069	0.0004	0.0298	0.0226
CI upper	40.51	0.26	1.01	0.09	4.89	0.0061	0.0045	0.0002	0.0001	0.0049	0.0040	0.0093	0.0047	0.0050	0.0028	0.0091	0.0005	0.0358	0.0346
CI lower	27.21	0.24	0.84	0.06	0.58	0.0042	0.0027	0.0002	0.0001	0.0034	0.0009	0.0078	0.0039	0.0041	0.0021	0.0052	0.0002	0.0247	0.0146
1996 Loading, Modified Direct Method	1741	13	48	4	88	266	181	11	5	213	100	447	225	238	127	361	19	1560	1186
1996 Storm Loading, KG/hectare, 1996 by Direct Method	9	0.06	0.24	0.02	0.52	0.0011	0.0008	0.0001	0.0000	0.0009	0.0003	0.0021	0.0011	0.0012	0.0007	0.0016	0.0001	0.0072	0.0053
1996 Storm Loading, KG/hectare, 1996 by Modified Direct Method	9	0.07	0.25	0.02	0.45	0.0014	0.0009	0.0001	0.0000	0.0011	0.0005	0.0023	0.0012	0.0012	0.0007	0.0019	0.0001	0.0080	0.0061

Nov 17 Chart

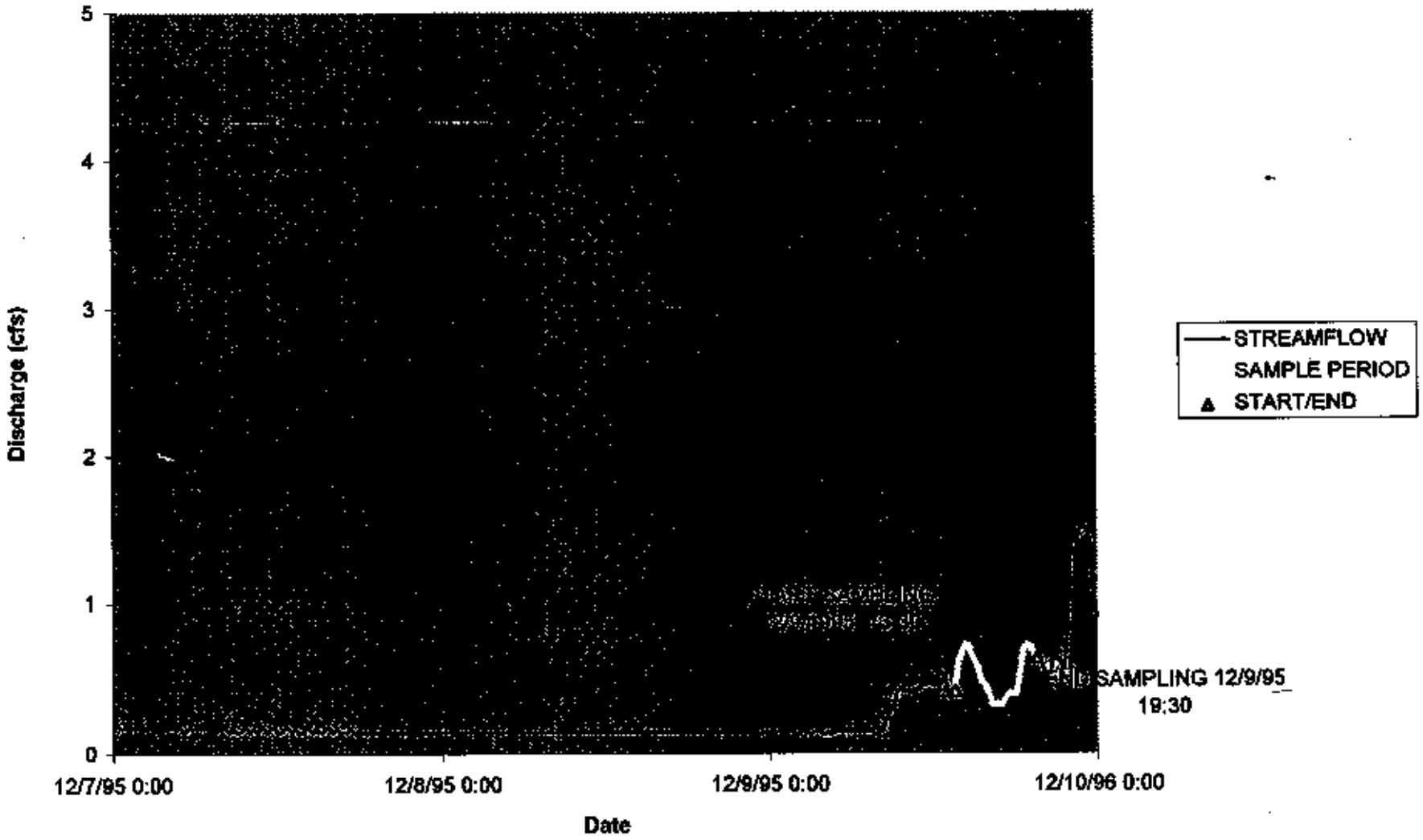
WA4-Hamm Creek, Middle Fork Storm Sample Session 1 WY 1996



WATER QUALITY DATA FOR WA04

Dec 9 Chart

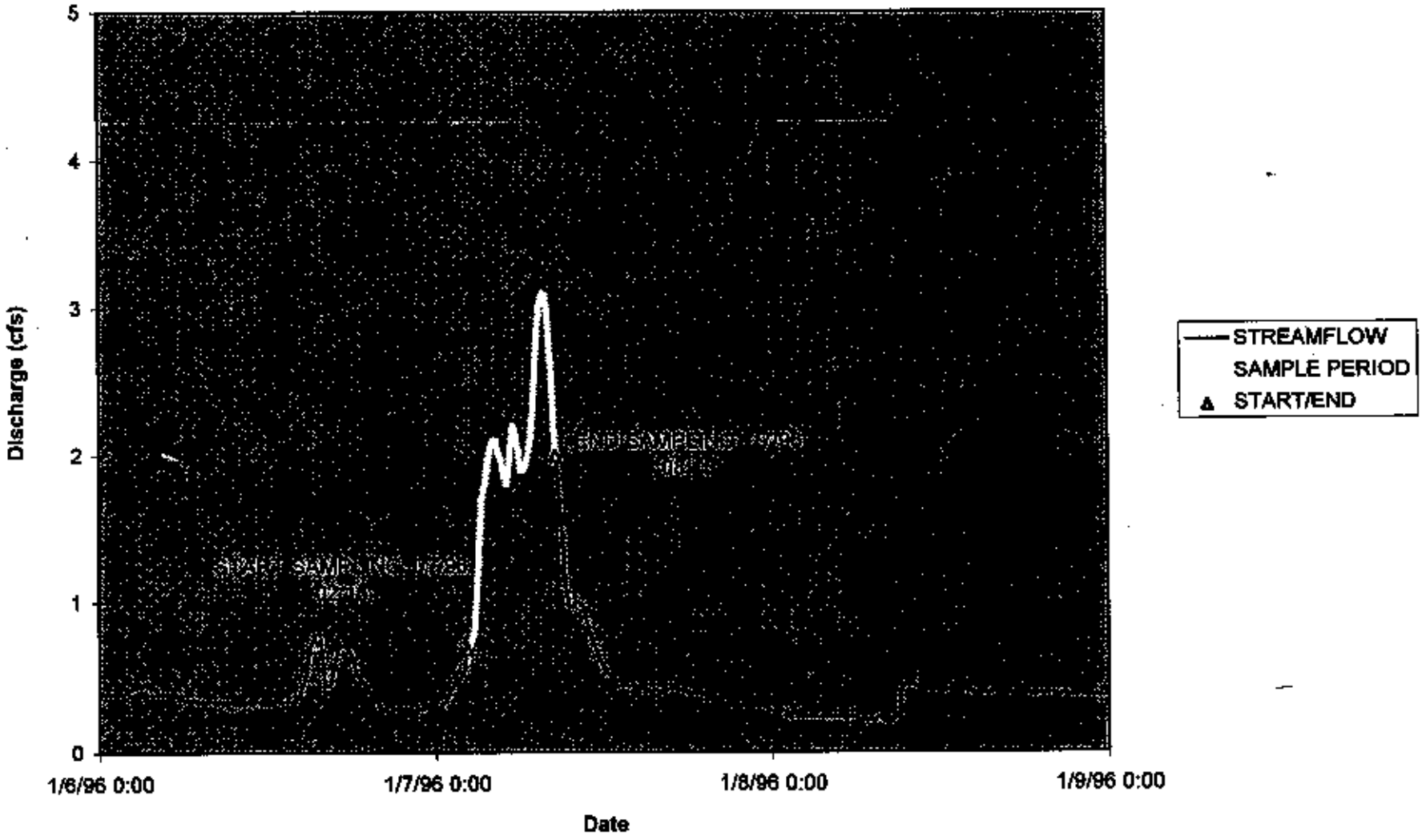
WA4-Hamm Creek, Middle Fork Storm Sample 2 for WY 96



WATER QUALITY DATA FOR WA04

Jan 7 Chart

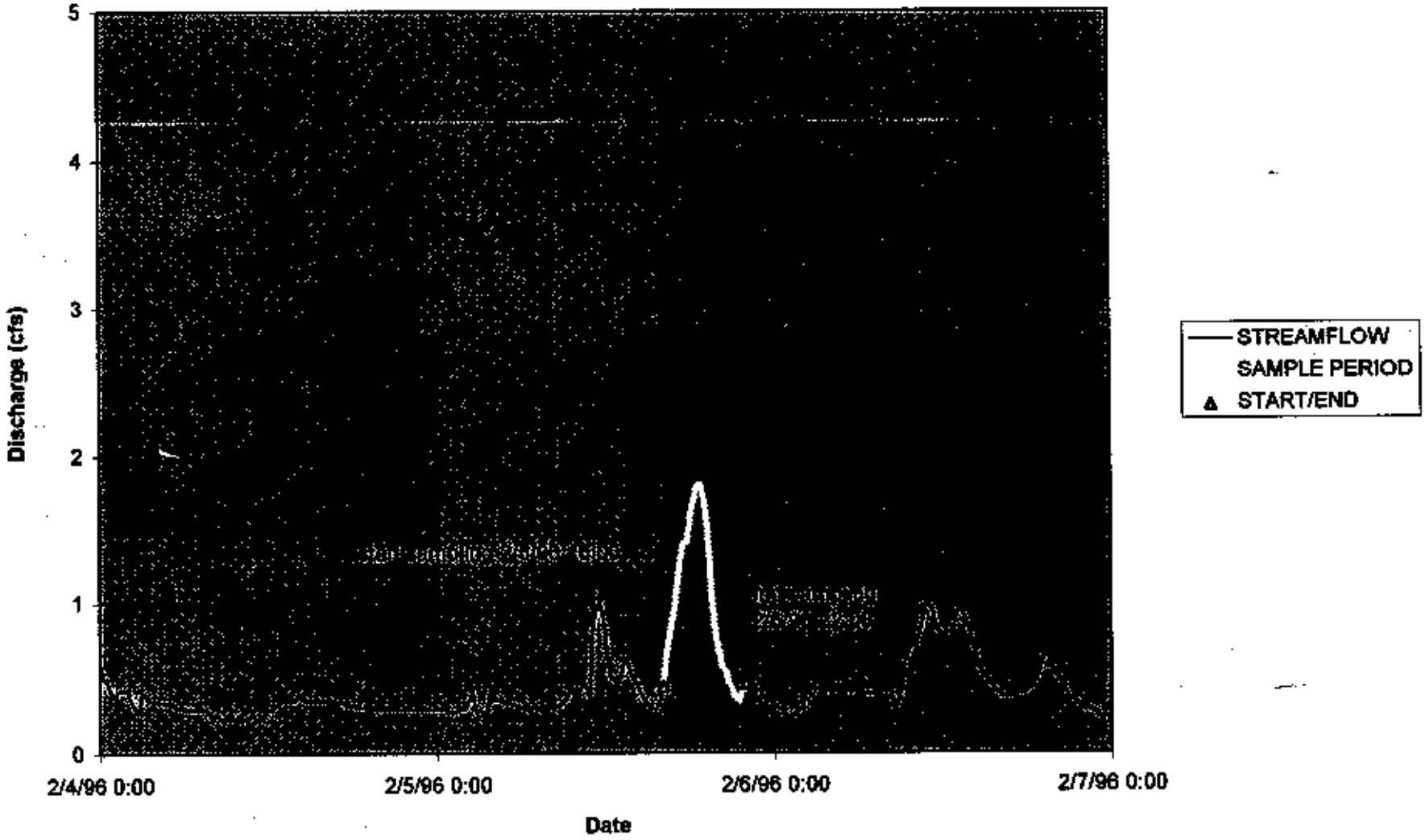
WA4-Hamm Creek, Middle Fork Sample Session 3 for WY 96



WATER QUALITY DATA FOR WA04

Feb 5 Chart

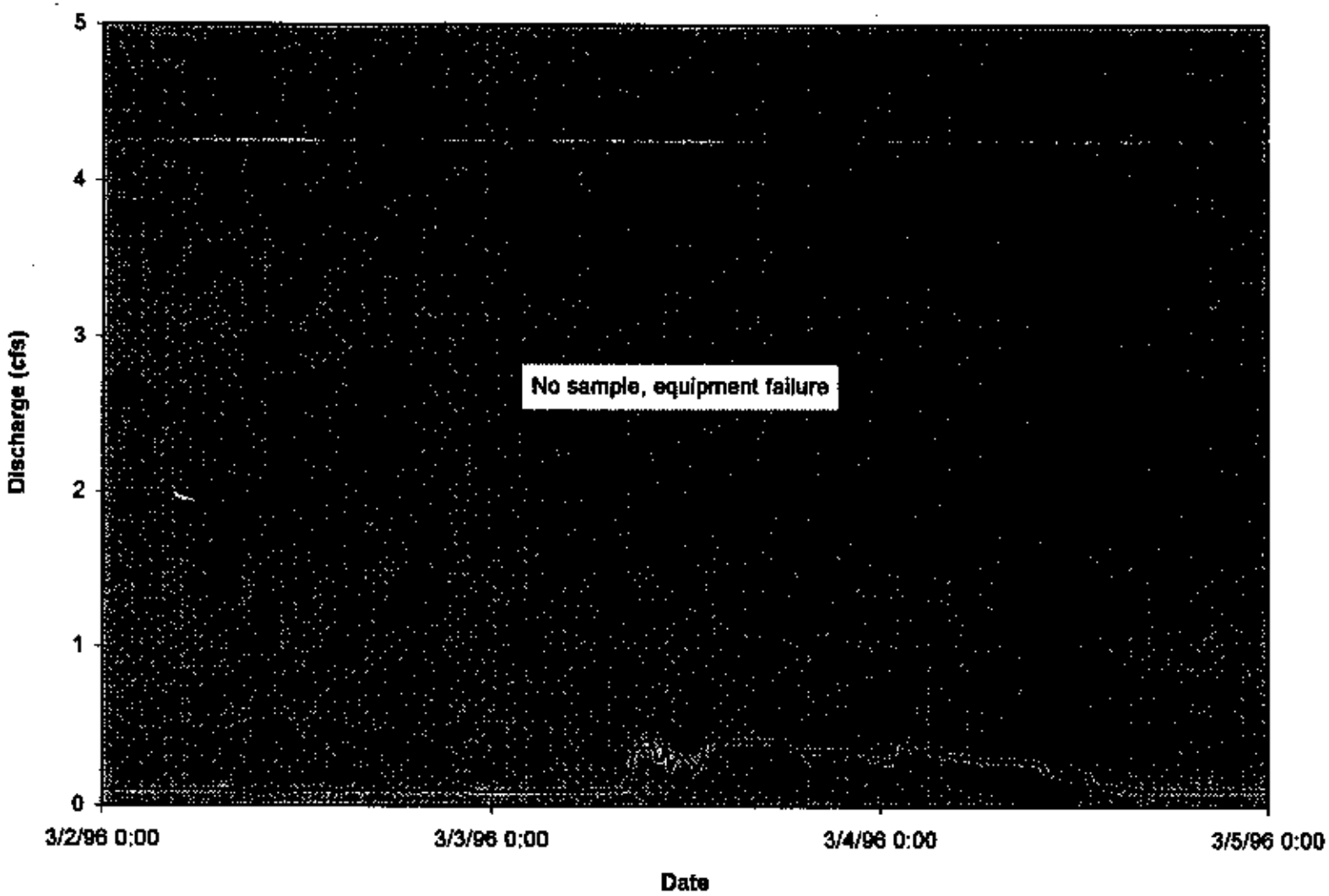
WA4-Hamm Creek, Middle Fork Sample Session 4 for WY 96



WATER QUALITY DATA FOR WA04

March 3 Chart

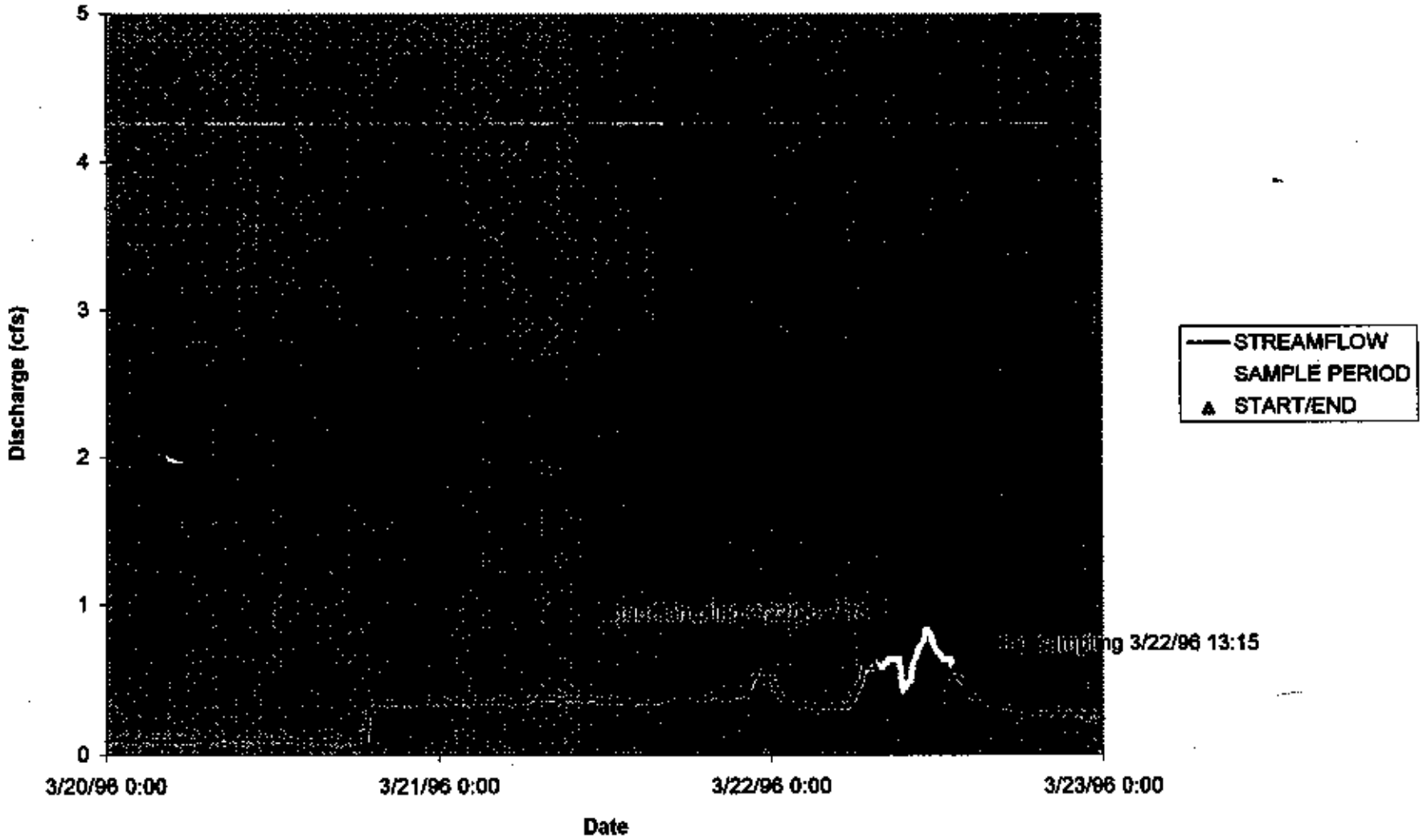
WA4-Hamm Creek, Middle Fork Storm Sample Session 5 for WY 96



WATER QUALITY DATA FOR WA04

March 22 Chart

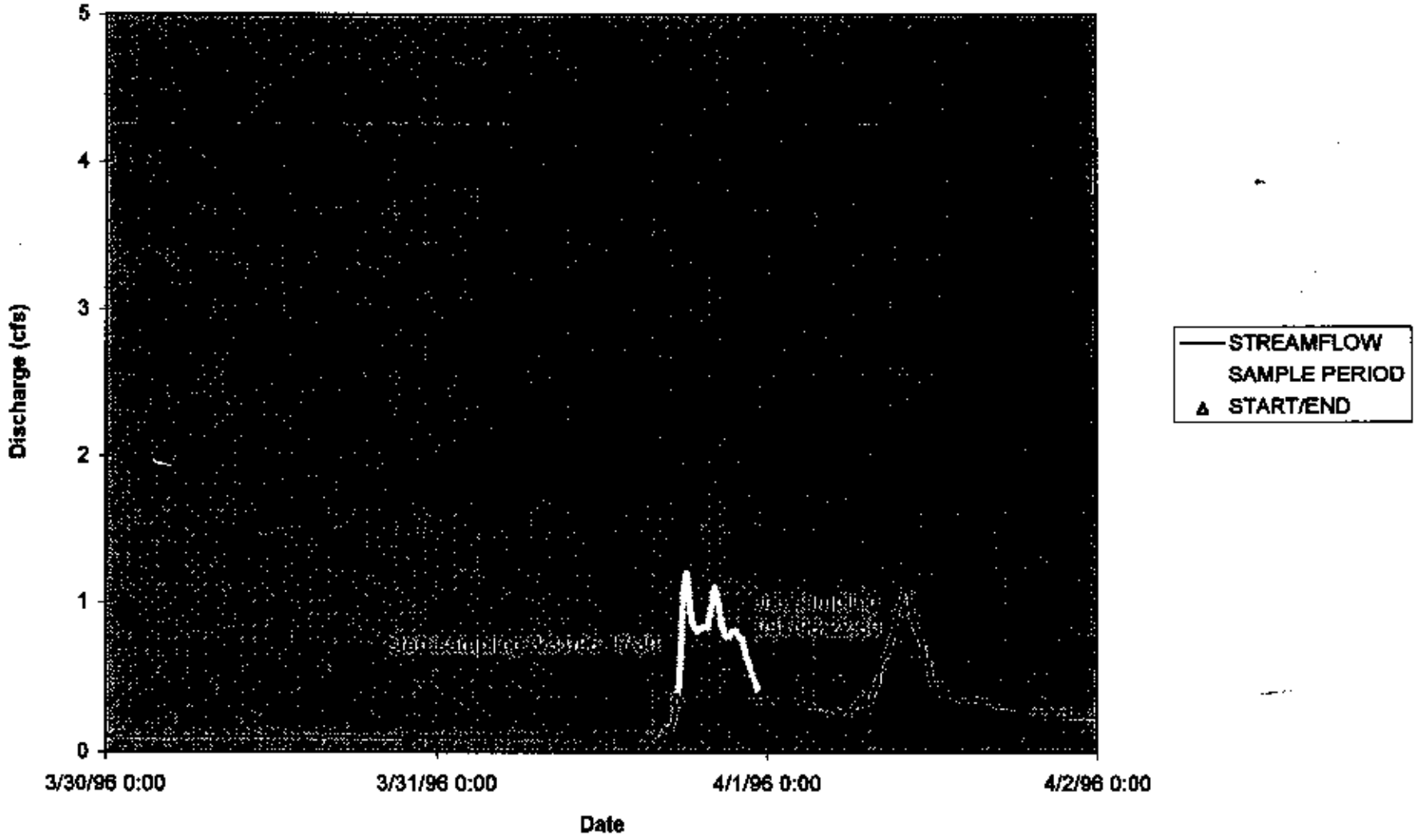
WA4-Hamm Creek, Middle Fork Storm Sample Session 6 for WY 96



WATER QUALITY DATA FOR WA04

March 31 Chart

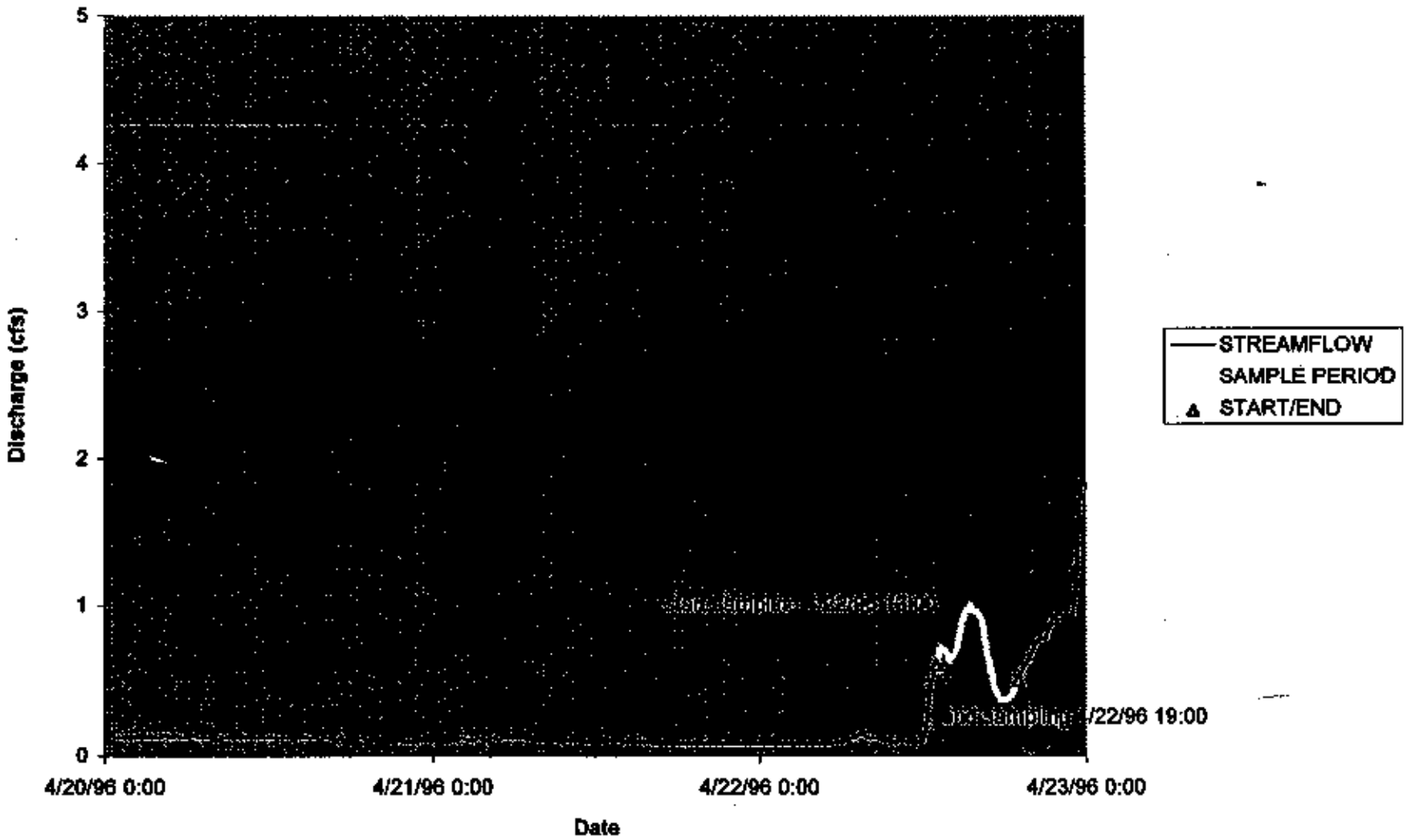
WA4-Hamm Creek, Middle Fork Storm Sample Session 7 for WY 96



WATER QUALITY DATA FOR WA04

Apr 22 Chart

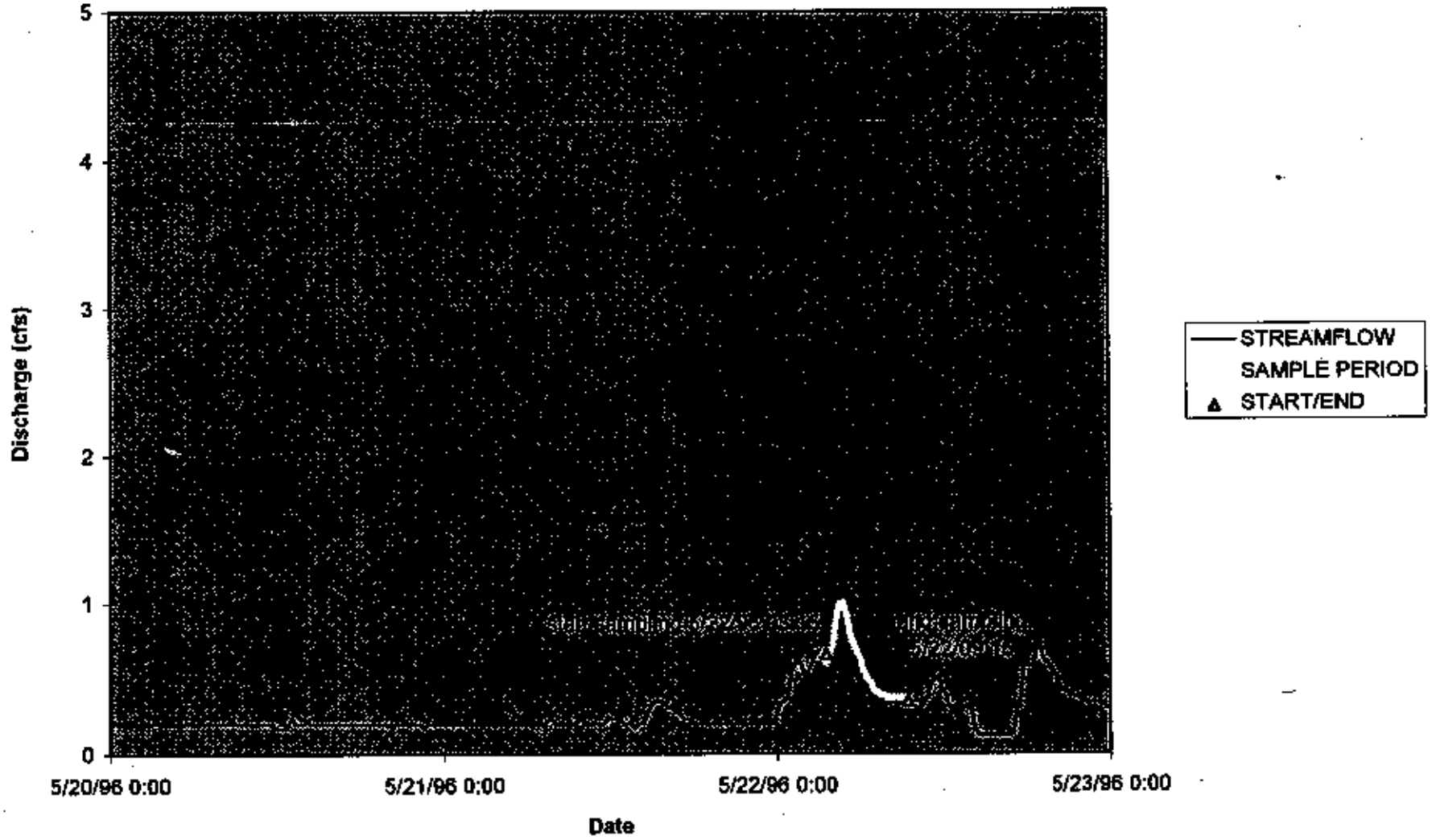
WA4-Hamm Creek, Middle Fork Storm Sample Session 8 for WY 96



WATER QUALITY DATA FOR WA04

May 22 Chart

WA4-Hamm Creek, Middle Fork Storm Sample Session 9 for WY 1996



WATER QUALITY DATA FOR WA04

RESULTS FROM SITE WA - 05

Values < RDL in **bold**, < ***MDL*** estimated in ***bold italic***.

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms
		<MDL Value		*0*	*0*	*0*	*0*	*0*	*0.1*	***0.0002***	***0.0002***	***0.0001***	***0.0001***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***	***0.0002***
		MDL		*0.5*	*0.005*	0.05	*0.02*	*0.3*	*0.2*	***0.0005***	***0.0005***	***0.0002***	***0.0002***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***	***0.0005***
		RDL		1	**0.01**	**0.1**	**0.04**	**2**	**1.25**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**	**0.002**
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WA-05	11/17/95	L7371-5		24	0.125	1.14		**0.5**	61	**0.0018**	**0.0012**	**0.0002**	***0.0001***	**0.0013**	***0.0002***	0.0057	0.0038	0.0027	**0.0018**	0.0033	***0.0002***	0.0178	0.0070
WA-05	12/09/95	L7517-5		29	0.158	1.07	0.05	***0.1***	52	**0.0018**	**0.0011**	**0.0002**	***0.0001***	**0.0017**	***0.0002***	0.0074	0.0043	0.0030	**0.0017**	0.0046	***0.0002***	0.0208	0.0437
WA-05	01/08/96	L7665-5		43	0.194	1.02	0.04	**1.2**	63	0.0024	**0.0010**	**0.0002**	***0.0001***	0.0023	**0.0006**	0.0067	0.0031	0.0037	**0.0017**	0.0070	***0.0002***	0.0244	0.0057
WA-05	02/05/96	L7842-5		156	0.193	1.02	0.09	8.5	53	0.0051	**0.0011**	**0.0004**	***0.0001***	0.0070		0.0178	0.0048	0.0084	**0.0016**	0.0286	***0.0002***	0.0752	0.0158
WA-05	03/03/96	L8017-3	7.5	6	0.120	1.44	0.05	9.8	84	**0.0017**	**0.0011**	**0.0002**	***0.0001***	**0.0012**	**0.0014**	0.0039	0.0024	0.0023	**0.0015**	0.0027	***0.0002***	0.0200	0.0134
WA-05	03/22/96	L8159-5		53	0.166	1.14	0.05	**0.9**	78	0.0032	**0.0012**	**0.0003**	***0.0001***	0.0028	***0.0002***	0.0079	0.0023	0.0041	**0.0013**	0.0105	***0.0002***	0.0367	0.0133
WA-05	03/31/96	L8209-5	7.3	42	0.304	0.91	0.05	**1.4**	67	0.0029	**0.0012**	**0.0002**	***0.0001***	0.0029	**0.0006**	0.0078	0.0022	0.0040	**0.0013**	0.0099	***0.0002***	0.0634	0.0263
WA-05	04/22/96	L8369-5	7.6	15	0.266	0.77	0.02	**0.7**	56		0.0050	**0.0002**	***0.0001***		0.0026	0.0060	0.0039	0.0031	0.0020	0.0029	***0.0002***	0.0135	0.0334
WA-05	05/22/96	L8669-5	7.7	15	0.181	0.89	0.05	***0.1***	71	0.0028	**0.0016**	***0.0001***	***0.0001***	0.0021	**0.0008**	0.0063	0.0029	0.0039	0.0020	0.0060	***0.0002***	0.0232	0.0087
WA-05	11/07/97	L12263-2	7.8	33	0.092	1.25	0.15	***0.1***	63	0.0023	**0.0012**	**0.0003**	***0.0001***	0.0022	***0.0002***	0.0072	0.0037	0.0041	0.0024	0.0047	**0.0005**	0.0213	0.0088
WA-05	11/19/97	L12314-3	7.5	35	0.162	1.29	0.04	***0.1***	72	**0.0020**	**0.0011**	***0.0001***	***0.0001***	0.0021	***0.0002***	0.0056	0.0027	0.0033	**0.0016**	0.0043	***0.0002***	0.0208	0.0078
WA-05	12/15/97	L12509-3	7.6	28	0.144	1.55	0.07	***0.1***	81	0.0024	**0.0011**	***0.0001***	***0.0001***	0.0021	***0.0002***	0.0054	0.0022	0.0031	**0.0014**	0.0044	***0.0002***	0.0227	0.0055
WA-05	12/17/97	L12531-3	7.4	44	0.011	1.45	***0.03***	***0.1***	56	0.0028	**0.0011**	***0.0001***	***0.0001***	0.0030	**0.0007**	0.0073	0.0032	0.0043	**0.0017**	0.0063	***0.0002***	0.0267	0.0088
WA-05	01/04/98	L12599-3	7.6	36	0.153	1.36	0.04	***0.1***	67	**0.0020**	**0.0011**	***0.0001***	***0.0001***	**0.0019**	***0.0002***	0.0050	0.0024	0.0031	**0.0016**	0.0043	***0.0002***	0.0184	0.0064
WA-05	01/14/98	L12655-3	7.2	27	0.174	1.40	0.05	**0.5**	53	**0.0018**	**0.0010**	***0.0001***	***0.0001***	0.0023	**0.0005**	0.0057	0.0032	0.0031	**0.0017**	0.0042	***0.0002***	0.0204	0.0119
WA-05	01/23/98	L12698-3	7.2	178	0.362	1.15	0.05	**1.2**	52	0.0051	**0.0011**	**0.0003**	***0.0001***	0.0070	**0.0007**	0.0150	0.0031	0.0084	**0.0015**	0.0211	***0.0002***	0.0584	0.0074
WA-05	02/08/98	L12787-3	7.5	16	0.119	1.69	***0.03***	***0.1***	85	**0.0017**	**0.0011**	***0.0001***	***0.0001***	**0.0013**	***0.0002***	0.0042	**0.0016**	0.0023	**0.0012**	0.0031	***0.0002***	0.0144	0.0077
WA-05	03/09/98	L12883-3	7.5	69	0.185	1.25	***0.03***	**0.7**	67	0.0033	**0.0015**	***0.0001***	***0.0001***	0.0033	**0.0005**	0.0087	0.0028	0.0045	**0.0016**	0.0099	***0.0002***	0.0309	0.0071
WA-05	03/22/98	L13039-3	7.3	81	0.177	1.48	***0.03***	2.2	75	0.0042	**0.0018**	***0.0001***	***0.0001***	0.0038	**0.0007**	0.0077	0.0025	0.0047	**0.0015**	0.0077	***0.0002***	0.0242	0.0060
	Sample size:		14	19	19	19	18	19	19	18	19	19	19	18	18	19	19	19	19	19	19	19	19
	Arithmetic mean:		7.5	49	0.1729	1.22	0.052	1.5	66	0.0027	0.0014	0.0002	0.0001	0.0028	0.0006	0.0074	0.0030	0.0040	0.0016	0.0077	0.0002	0.0291	0.0129
	Max value:		7.8	178	0.362	1.69	0.149	9.8	85	0.0051	0.0050	0.0004	0.0001	0.0070	0.0026	0.0178	0.0048	0.0084	0.0024	0.0286	0.0005	0.0752	0.0437
	Min value:		7.2	6	0.0113	0.77	0.02	***0.1***	52	0.0017	0.0010	0.0001	0.0001	0.0012	0.0002	0.0039	0.0016	0.0023	0.0012	0.0027	0.0002	0.0135	0.0055
	Median:		7.5	35	0.166	1.25	0.05	0.5	67	0.0024	0.0011	0.0002	0.0001	0.0022	0.0005	0.0067	0.0029	0.0037	0.0016	0.0047	0.0002	0.0227	0.0087
	Est. mean of population:		7.5	49	0.1911	1.23	0.051	1.5	66	0.0027	0.0014	0.0002	0.0001	0.0028	0.0006	0.0074	0.0030	0.0040	0.0016	0.0075	0.0002	0.0288	0.0125
	1996 Arithmetic Mean:		7.5	43	0.2	1.0	0.1	2.6	65	0.0027	0.0016	0.0002	0.0001	0.0027	0.0008	0.0077	0.0033	0.0039	0.0017	0.0084	0.0002	0.0328	0.0186
	1998 Arithmetic Mean:		7.5	55	0.2	1.4	0.1	0.5	67	0.0027	0.0012	0.0001	0.0001	0.0029	0.0004	0.0072	0.0027	0.0041	0.0016	0.0070	0.0002	0.0258	0.0077

SAMPLE TIME AND INFO

Date	Sampler Start Time	Sampler End Time	Duration (Hours)	Duration (Seconds)	Mean Q	Rainfall (1 hour prior to end	24 Hr Antecedent	72 Hr Antecedent	7 Day Antecedent	total volume, liters	
11/17/95	19:45	1:00	5:15	18900	1.38	0.2	0.02	0.25	1.57	738,642	
12/9/95	13:45	19:45	6:00	21600	4.58	0.41	0.16	0.16	1.02	2,801,641	
1/8/96	2:45	8:45	6:00	21600	9.5	0.98	0.48	0.73	0.86	5,811,264	
2/5/96	16:00	22:00	6:00	21600	5.6	0.46	0.44	0.9	0.96	3,425,587	
3/3/96	10:30	16:30	6:00	21600	1.85	0.15	0.12	0.12	0.12	1,131,667	
3/22/96	8:30	14:30	6:00	21600	2.1	0.29	0.13	0.31	0.34	1,284,595	
3/31/96	17:30	23:30	6:00	21600	3.1	0.48	0.25	0.41	0.41	1,896,307	
4/22/96	13:00	19:00	6:00	21600	2.82	0.41	0.23	0.25	1.28	1,725,028	
5/22/96	3:30	9:30	6:00	21600	5.27	0.21	0.31	0.32	1.41	3,223,722	
1996 total rain contributing sampled runoff						3.59	wet season runoff:				
1996 rain Nov - May						46.76		287,052,399		22,038,454	1996 sampled runoff
11/7/97	7:00	13:00	6:00	21600	4.21	0.54	0.27	0.47	0.65	2,575,308	
11/19/97	10:00	16:00	6:00	21600	2.78	0.4	0.09	0.97	0.97	1,700,559	
12/15/97	17:15	23:15	6:00	21600	3.88	0.18	0.25	0.26	0.36	2,373,443	
12/16/97	11:30	17:30	6:00	21600	6.33	0.46	1.16	1.17	1.27	3,872,137	
1/4/98	11:20	17:20	6:00	21600	3.12	0.28	0.18	0.6	0.98	1,908,541	
1/14/98	6:30	12:30	6:00	21600	6.97	0.43	0.68	1.14	1.16	4,263,633	
1/23/98	5:45	11:45	6:00	21600	7.58	0.46	0.39	0.95	2.08	4,636,777	
2/8/98	9:00	15:00	6:00	21600	3.48	0.28	0.03	0.07	0.4	2,128,758	
3/9/98	10:35	16:35	6:00	21600	5.4	0.26	0.34	0.52	0.67	3,303,245	
3/22/98	4:15	10:15	6:00	21600	5.69	0.51	0.43	0.43	0.57	3,480,641	
1998 total rain contributing sampled runoff						3.8	wet season runoff:				
1998 rain Nov - May						28.86		229,687,940		30,243,041	1998 sampled runoff

Hamm Creek WA 5, South Fork Annual Loading Comparison

LOADINGS (in grams unless noted) 454 grams in a pound.

	TSS, KG	Total P, KG	Nitrite + Nitrate Nitrogen, KG	Ammonia Nitrogen, KG	TPH, KG	As, total	As, diss.	Cd, Total	Cd, diss.	Cr, total	Cd, diss.	Cu, total	Cu, diss.	Ni, total	Ni, diss.	Pb, total	Pb, diss.	Zn, total	Zn, diss.
1996 Sampled Events Total	1112	4.3	22	1.09	53	58	32	5	2	60	14	184	75	94	37	213	4	758	382
1996 Annual Total by Direct Method	14481	55.9	290	14.23	693	755	422	65	29	781	183	2403	981	1221	485	2779	57	9878	4979
1998 Sampled Events Total	1975	5.3	43	1.58	19	92	38	5	3	100	14	243	88	138	51	250	7	879	248
1998 Annual Total by Direct Method	16197	42.7	348	12.85	160	750	307	37	25	821	119	1985	715	1127	412	2052	58	7188	2017.3
Change 1996 to 1998	1715	-13.2	58	-1.39	-533	-5	-115	-28	-3	40	-64	-418	-266	-94	-72	-728	0	-2690	-2962
% Change	12%	-24%	20%	-10%	-77%	-1%	-27%	-43%	-12%	5%	-35%	-17%	-27%	-8%	-15%	-26%	0%	-27%	-59%
1996 Sample Mean Concentration (SMC) statistics																			
stats mean	49	0.19	1.07	0.052	3.66	0.0027	0.0016	0.0002	0.0001	0.0028	0.0009	0.0079	0.0034	0.0039	0.0016	0.0067	0.0002	0.0344	0.0207
CI upper	121	0.23	1.18	0.068	70.19	0.0034	0.0022	0.0003	0.0001	0.0042	0.0026	0.0102	0.0040	0.0049	0.0018	0.0167	0.0002	0.0514	0.0345
CI lower	20	0.16	0.96	0.040	0.19	0.0021	0.0011	0.0002	0.0001	0.0016	0.0003	0.0061	0.0028	0.0031	0.0015	0.0046	0.0002	0.0230	0.0124
1996 LOADING - MODIFIED DIRECT METHOD	14194	55	306	15	1052	774	449	68	29	792	251	2266	968	1116	464	2509	57	9878	5949
1998 SMC statistics																			
stats mean	47	0.19	1.33	0.054	0.30	0.0026	0.0012	0.0001	0.0001	0.0027	0.0004	0.0070	0.0028	0.0040	0.0017	0.0067	0.0002	0.0256	0.0080
CI upper	76	0.42	1.46	0.071	0.86	0.0031	0.0013	0.0002	0.0001	0.0034	0.0006	0.0085	0.0032	0.0048	0.0019	0.0093	0.0003	0.0315	0.0090
CI lower	29	0.09	1.21	0.041	0.10	0.0022	0.0011	0.0001	0.0001	0.0021	0.0003	0.0058	0.0025	0.0033	0.0015	0.0048	0.0002	0.0209	0.0072
1998 LOADING - MODIFIED DIRECT METHOD	10770	44	306	12	68	598	272	31	23	618	97	1614	639	921	385	1540	53	5888	1840
Loading Change 1996 to 1998	-3423	-11	0	-3	-983	-177	-177	-37	-6	-174	-153	-653	-328	-195	-79	-969	-5	-3990	-4109
% Change	-24%	-21%	0%	-17%	-93%	-23%	-39%	-54%	-20%	-22%	-61%	-29%	-34%	-17%	-17%	-39%	-8%	-40%	-69%

Hamm Creek WA 5 unit area loadings comparison

LOADINGS (in grams unless noted) 454 grams in a pound. Sub-basin area = 300 acres

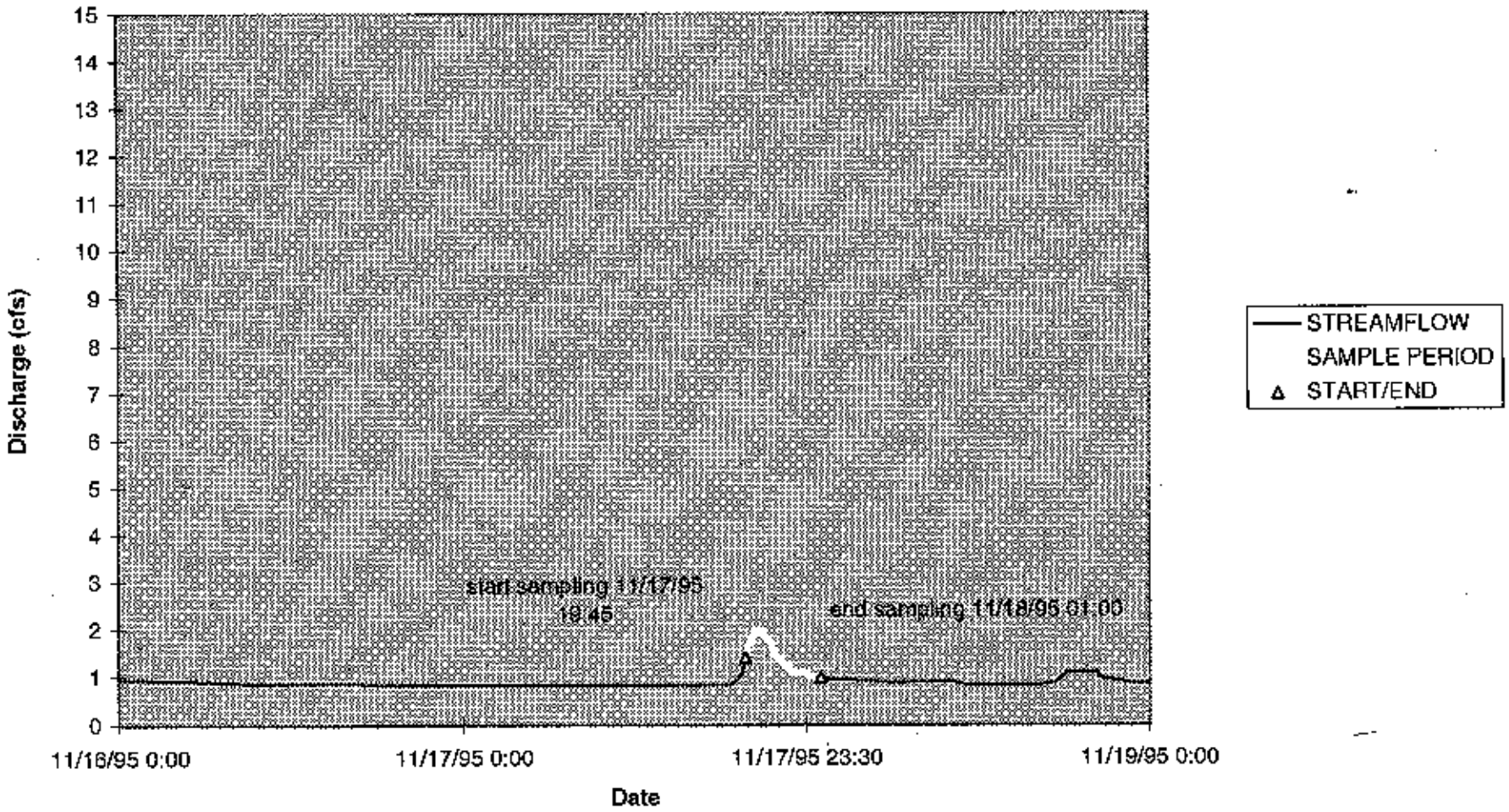
	TSS, KG	Total P, KG	Nitrite + Nitrate Nitrogen, KG	Ammonia Nitrogen, KG	TPH, KG	As, total	As, diss.	Cd, Total	Cd, diss.	Cr, total	Cd, diss.	Cu, total	Cu, diss.	Ni, total	Ni, diss.	Pb, total	Pb, diss.	Zn, total	Zn, diss.
1996 Annual Total by Direct Method	14481	55.9	290	14.23	693	755	422	65	29	781	183	2403	981	1221	485	2779	57	9878	4979
1998 Annual Total by Direct Method	16197	42.7	348	12.85	160	750	307	37	25	821	119	1985	715	1127	412	2052	58	7188	2017
Annual Storm Loading, KG/hectare, combined 1996 & 1998 by Direct Method	126	0.4	2.6	0.1	3.5	0.0062	0.0030	0.0004	0.0002	0.0066	0.0012	0.0181	0.0070	0.0097	0.0037	0.0199	0.0005	0.0703	0.0288
1996 SMC statistics stats mean	49	0.19	1.07	0.052	3.66	0.0027	0.0016	0.0002	0.0001	0.0028	0.0009	0.0079	0.0034	0.0039	0.0016	0.0087	0.0002	0.0344	0.0207
1996 LOADING - MODIFIED DIRECT METHOD	14194	55	306	15	1052	774	449	68	29	792	251	2266	968	1116	464	2509	57	9878	5949
1998 SMC statistics stats mean	47	0.19	1.33	0.054	0.30	0.0026	0.0012	0.0001	0.0001	0.0027	0.0004	0.0070	0.0028	0.0040	0.0017	0.0067	0.0002	0.0256	0.0080
1998 LOADING - MODIFIED DIRECT METHOD	10770	44	306	12	68	598	272	31	23	618	97	1614	639	921	385	1540	53	5888	1840
Annual Storm Loading, KG/hectare, combined 1996 & 1998 by Modified Direct Method	103	0.4	2.5	0.1	4.6	0.0057	0.0030	0.0004	0.0002	0.0058	0.0014	0.0160	0.0066	0.0084	0.0035	0.0167	0.0005	0.0649	0.0321

WA5 Loading by Storm

LOADINGS (in grams unless noted)								Total seconds * cfs * mg/l * .02832 for grams										454 grams in a pound.					
Date	SampleID	Total Suspended Solids, Kg	Total P, KG	Nitrite + Nitrate Nitrogen, KG	Ammonia Nitrogen, KG	Total Petroleum Hydrocarbon, Kg	Hardness, Calc, Kg	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms	Mean Q, cfs
11/17/95	L7371-5	18	0.1	0.8	0.00	0.4	45.2	1.3	0.9	0.1	0.1	1.0	0.1	4.2	2.6	2.0	1.3	2.4	0.1	13.1	5.2	1.38
12/09/95	L7517-5	82	0.4	3.0	0.15	0.3	146.1	5.0	3.1	0.6	0.3	4.8	0.6	20.6	12.0	8.4	4.8	12.9	0.6	58.2	122.3	4.58
01/08/96	L7665-5	249	1.1	5.9	0.23	7.0	365.9	14.0	5.8	1.2	0.6	13.1	3.4	38.7	18.1	21.4	9.9	40.8	1.2	141.7	33.0	9.5
02/05/96	L7842-5	534	0.7	3.5	0.30	29.2	182.1	17.3	3.8	1.5	0.3	23.9	0.0	60.9	16.4	28.8	5.5	97.9	0.7	257.4	54.1	5.6
03/03/96	L8017-3	7	0.1	1.6	0.06	11.1	95.4	1.9	1.2	0.2	0.1	1.4	1.6	4.4	2.7	2.5	1.7	3.0	0.2	22.6	15.2	1.85
03/22/96	L8159-5	68	0.2	1.5	0.07	1.2	100.5	4.1	1.5	0.3	0.1	3.6	0.3	10.1	2.9	5.2	1.7	13.5	0.3	47.1	17.1	2.1
03/31/96	L8209-5	80	0.6	1.7	0.09	2.7	126.6	5.4	2.3	0.4	0.2	5.5	1.0	14.7	4.2	7.6	2.5	18.7	0.4	120.1	49.8	3.1
04/22/96	L8369-5	26	0.5	1.3	0.03	1.1	96.5	0.0	8.7	0.3	0.2	0.0	4.6	10.4	6.7	5.3	3.5	5.0	0.3	23.3	57.6	2.82
05/22/96	L8669-5	49	0.6	2.9	0.16	0.3	229.7	8.9	5.2	0.3	0.3	6.6	2.5	20.3	9.4	12.6	6.5	19.3	0.6	74.7	28.0	5.27
11/07/97	L12263-2	84	0.2	3.2	0.4	0.3	161	5.8	3.1	0.6	0.3	5.6	0.5	16.4	9.5	10.7	6.3	12.2	1.3	54.8	22.5	4.21
11/19/97	L12314-3	59	0.3	2.2	0.1	0.2	122	3.4	1.9	0.2	0.2	3.5	0.3	9.5	4.5	5.7	2.7	7.2	0.3	35.3	13.2	2.78
12/15/97	L12509-3	66	0.3	3.7	0.2	0.2	191	5.6	2.6	0.2	0.2	4.9	0.5	12.8	5.2	7.3	3.3	10.5	0.5	53.8	13.1	3.88
12/17/97	L12531-3	170	0.0	5.6	0.1	0.4	217	10.7	4.3	0.4	0.4	11.4	2.6	28.3	12.5	16.8	6.6	24.5	0.8	103.3	33.9	6.33
01/04/98	L12599-3	69	0.3	2.6	0.1	0.2	128	3.8	2.1	0.2	0.2	3.6	0.4	9.5	4.6	5.8	3.1	8.2	0.4	35.1	12.1	5.12
01/14/98	L12655-3	113	0.7	6.0	0.2	2.2	226	7.7	4.0	0.4	0.4	9.8	2.1	24.2	13.5	13.1	7.2	18.1	0.9	86.9	50.7	6.97
01/23/98	L12698-3	825	1.7	5.3	0.2	5.6	239	23.4	5.1	1.5	0.5	32.3	3.0	69.5	14.1	38.9	7.0	97.8	0.9	270.6	34.1	7.58
02/08/98	L12787-3	34	0.3	3.6	0.1	0.2	181	3.6	2.3	0.2	0.2	2.8	0.4	8.9	3.4	5.0	2.6	6.5	0.4	30.6	16.5	3.48
03/09/98	L12883-3	229	0.6	4.1	0.1	2.2	221	10.9	5.0	0.3	0.3	10.8	1.8	28.8	9.1	14.7	5.3	32.6	0.7	102.0	23.4	5.4
03/22/98	L13039-3	262	0.6	5.1	0.1	7.7	262	14.5	6.3	0.3	0.3	13.1	2.5	26.6	8.8	16.4	5.2	26.9	0.7	84.2	20.8	5.69

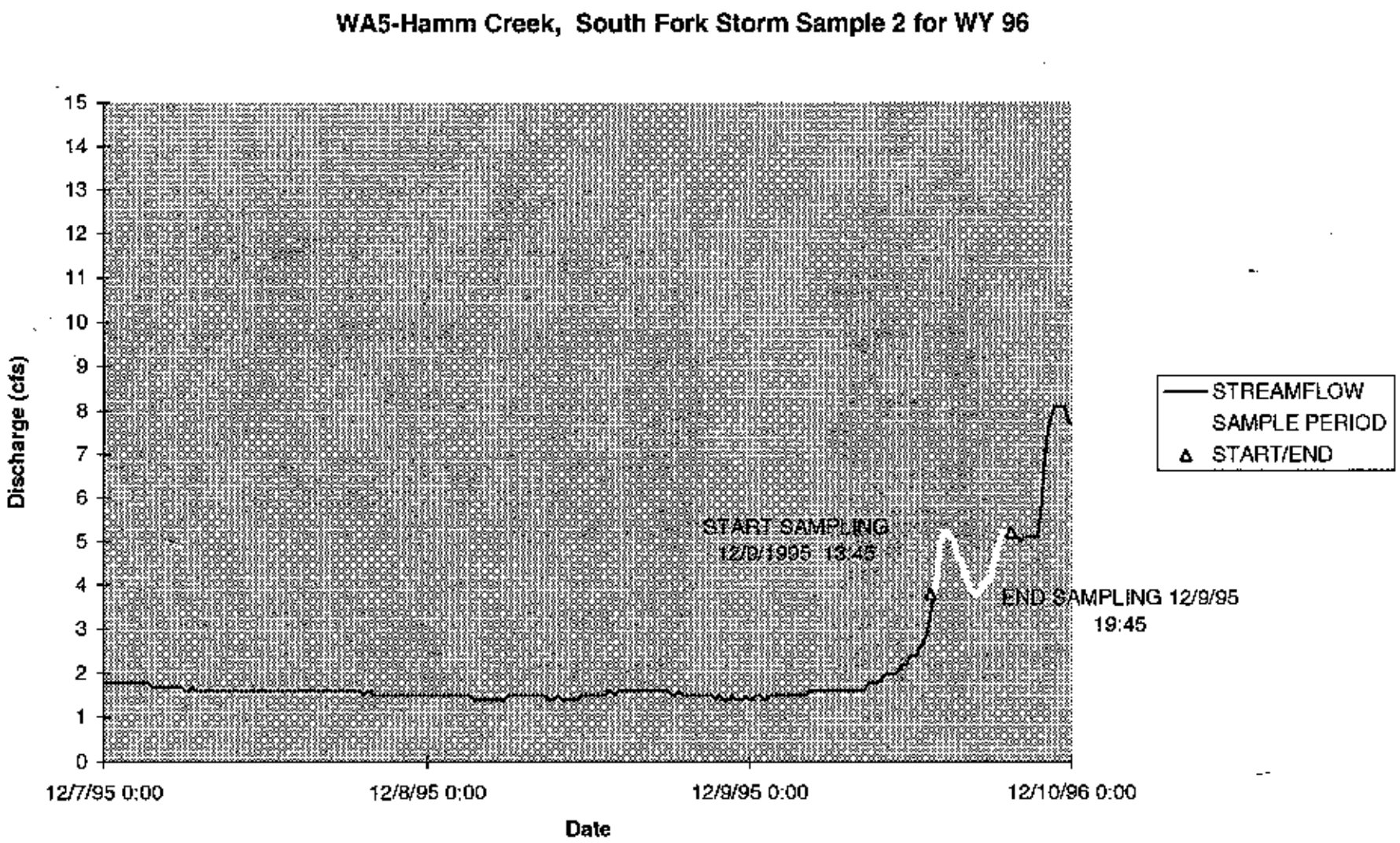
Nov 17 Chart

WA5-Hamm Creek, South Fork Storm Sample Session 1 WY 1996



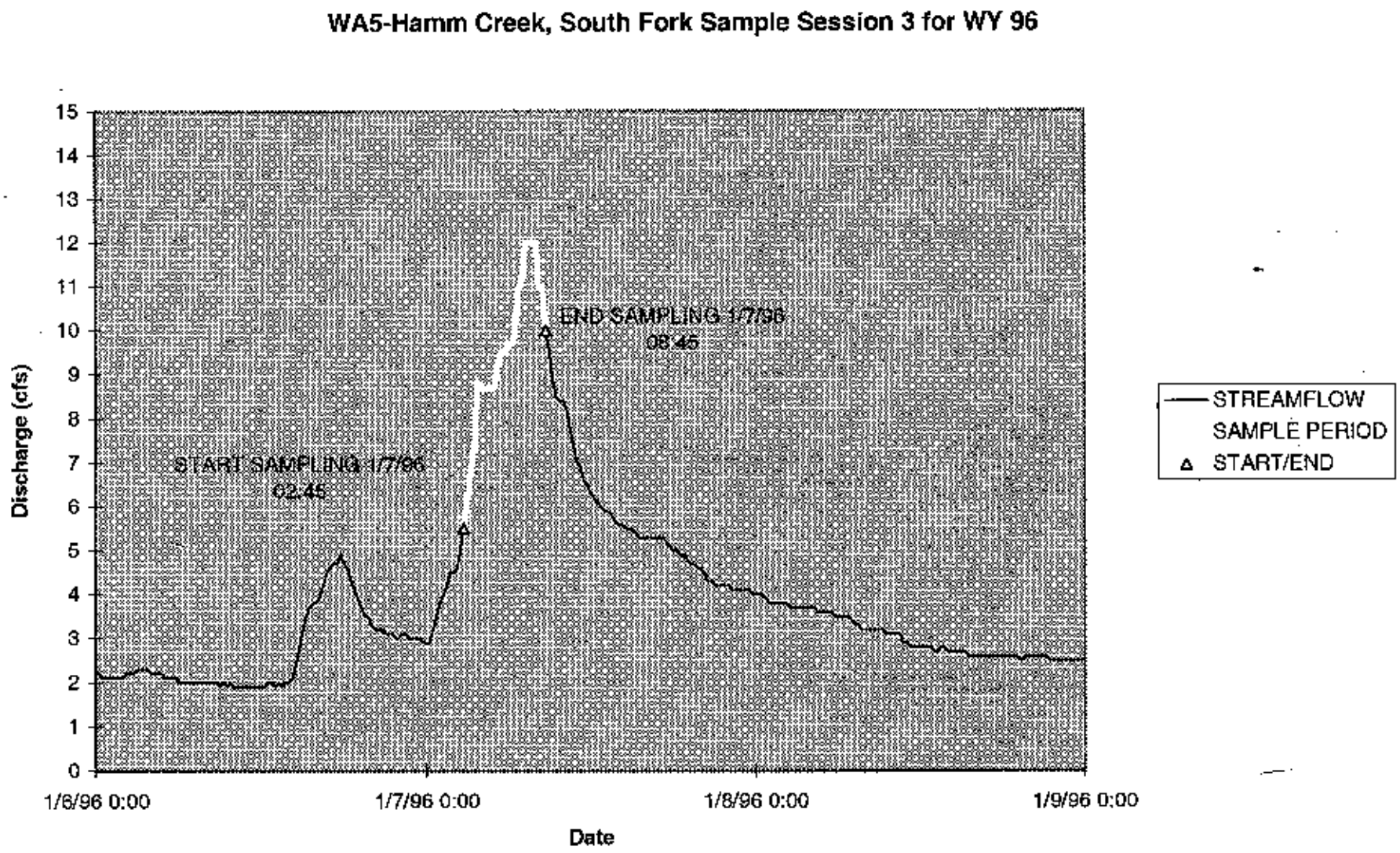
WATER QUALITY DATA FOR WA05

Dec 9 Chart



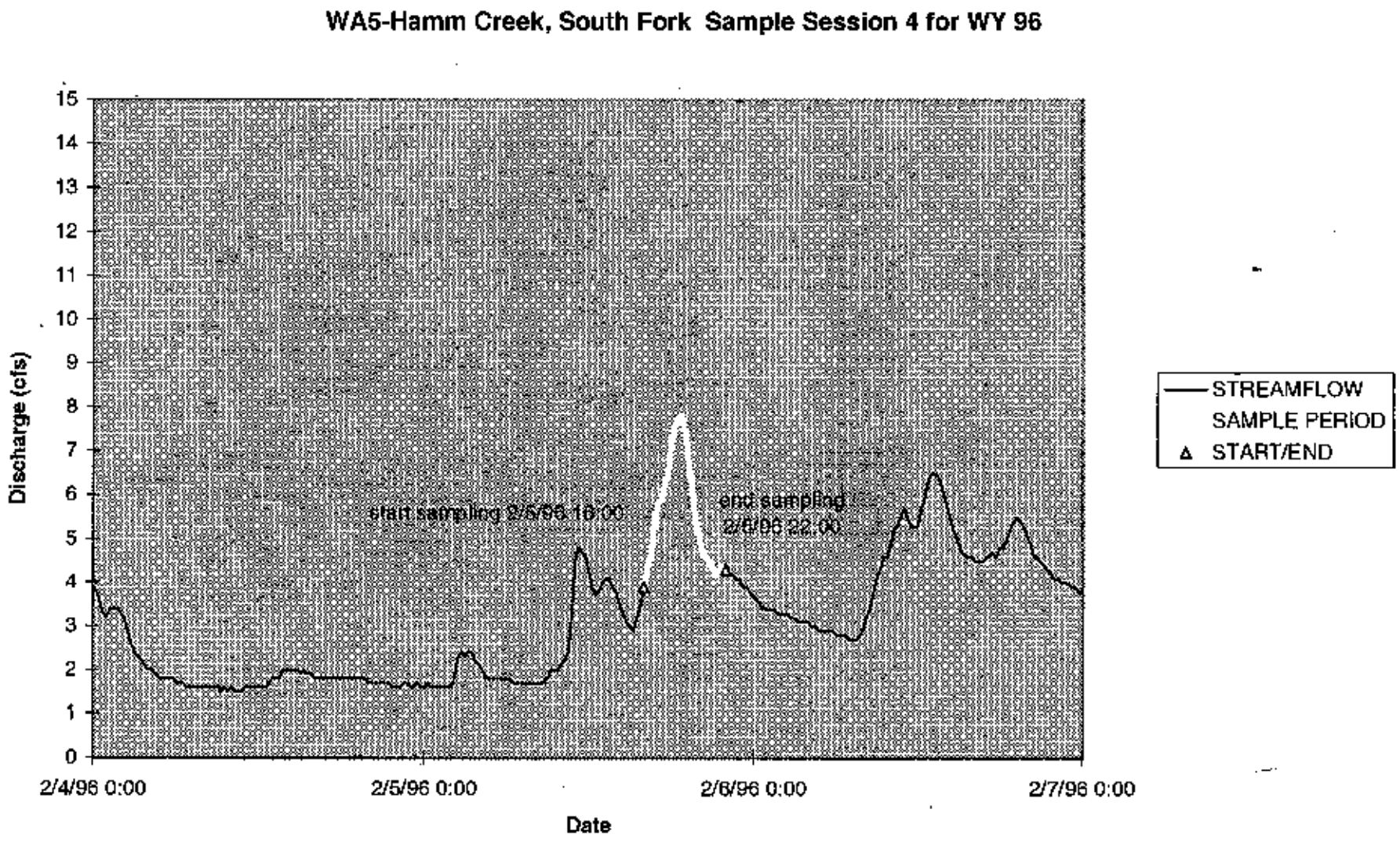
WATER QUALITY DATA FOR WA05

Jan 7 Chart



WATER QUALITY DATA FOR WA05

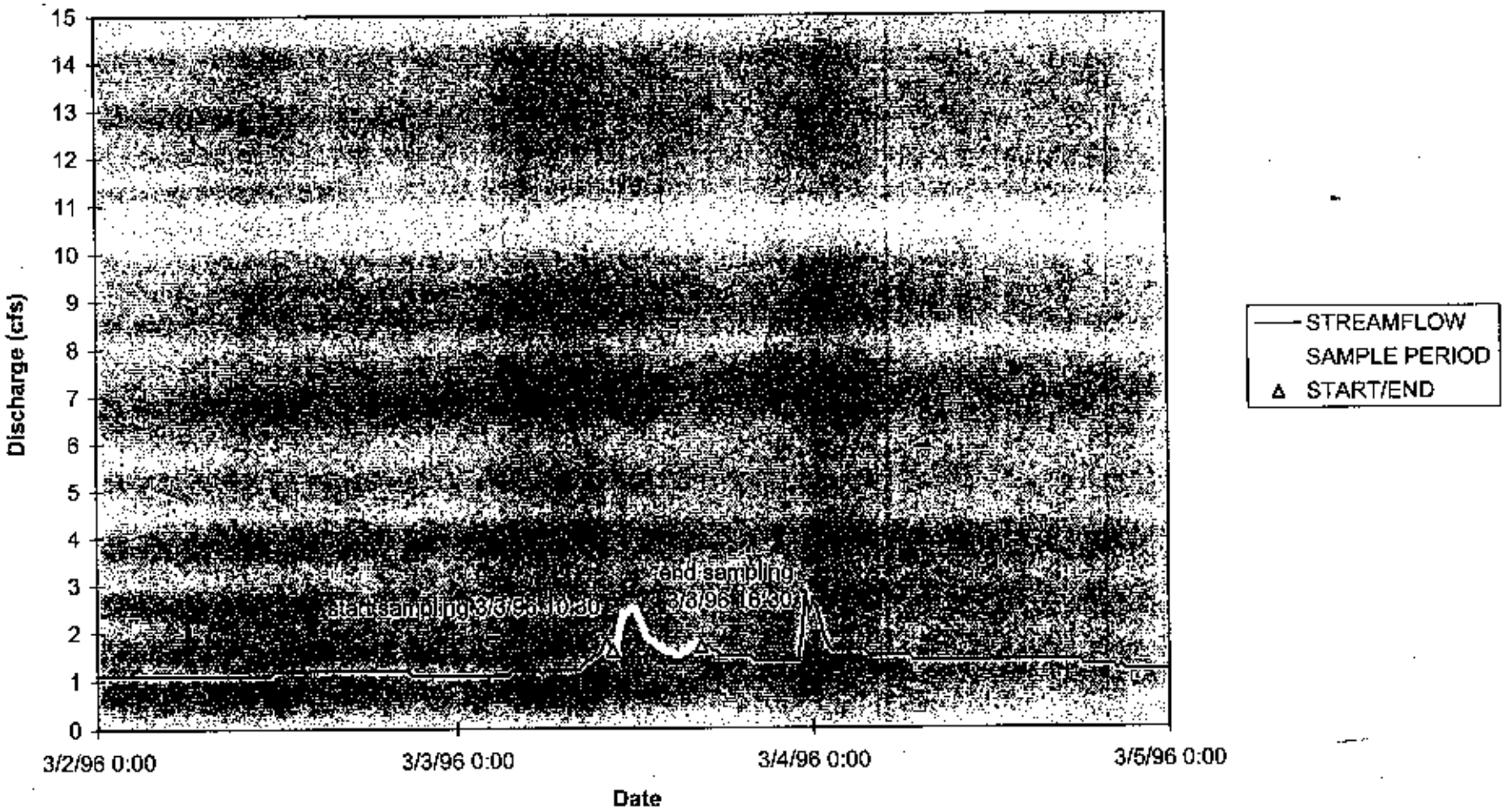
Feb 5 Chart



WATER QUALITY DATA FOR WA05

March 3 Chart

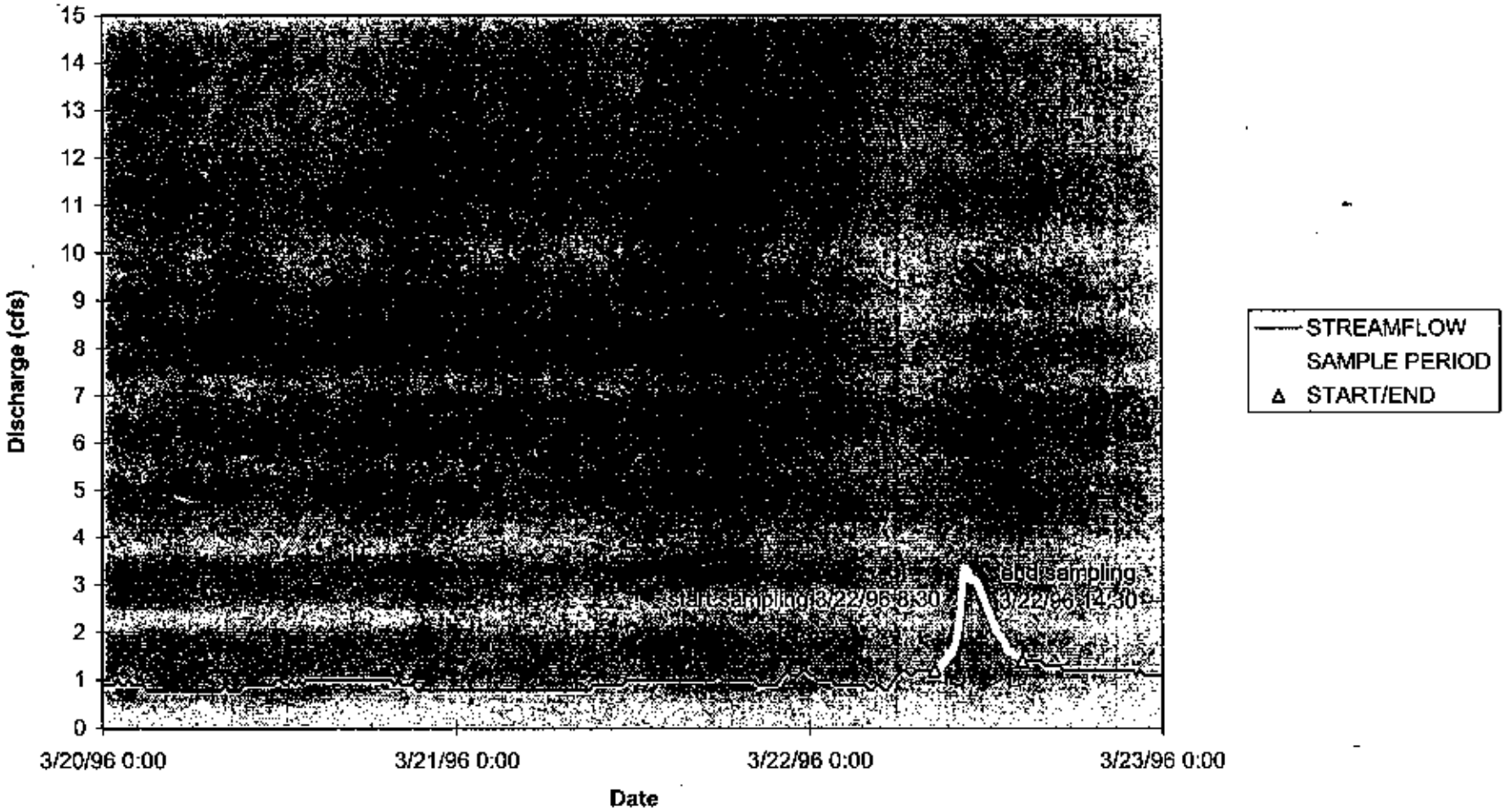
WA5-Hamm Creek, South Fork Storm Sample Session 5 for WY 96



WATER QUALITY DATA FOR WA05

March 22 Chart

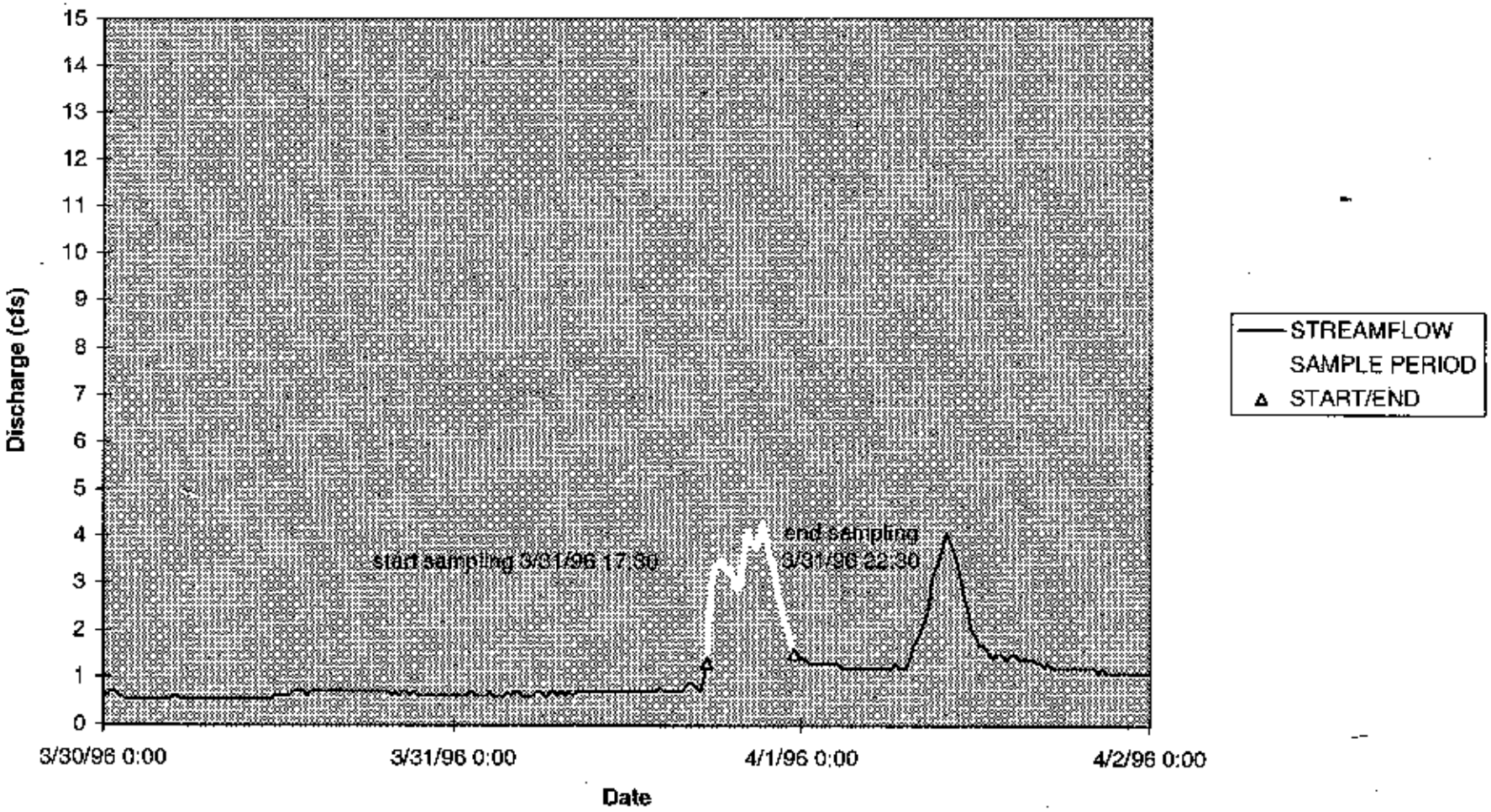
WA5-Hamm Creek, South Fork Storm Sample Session 6 for WY 96



WATER QUALITY DATA FOR WA05

March 31 Chart

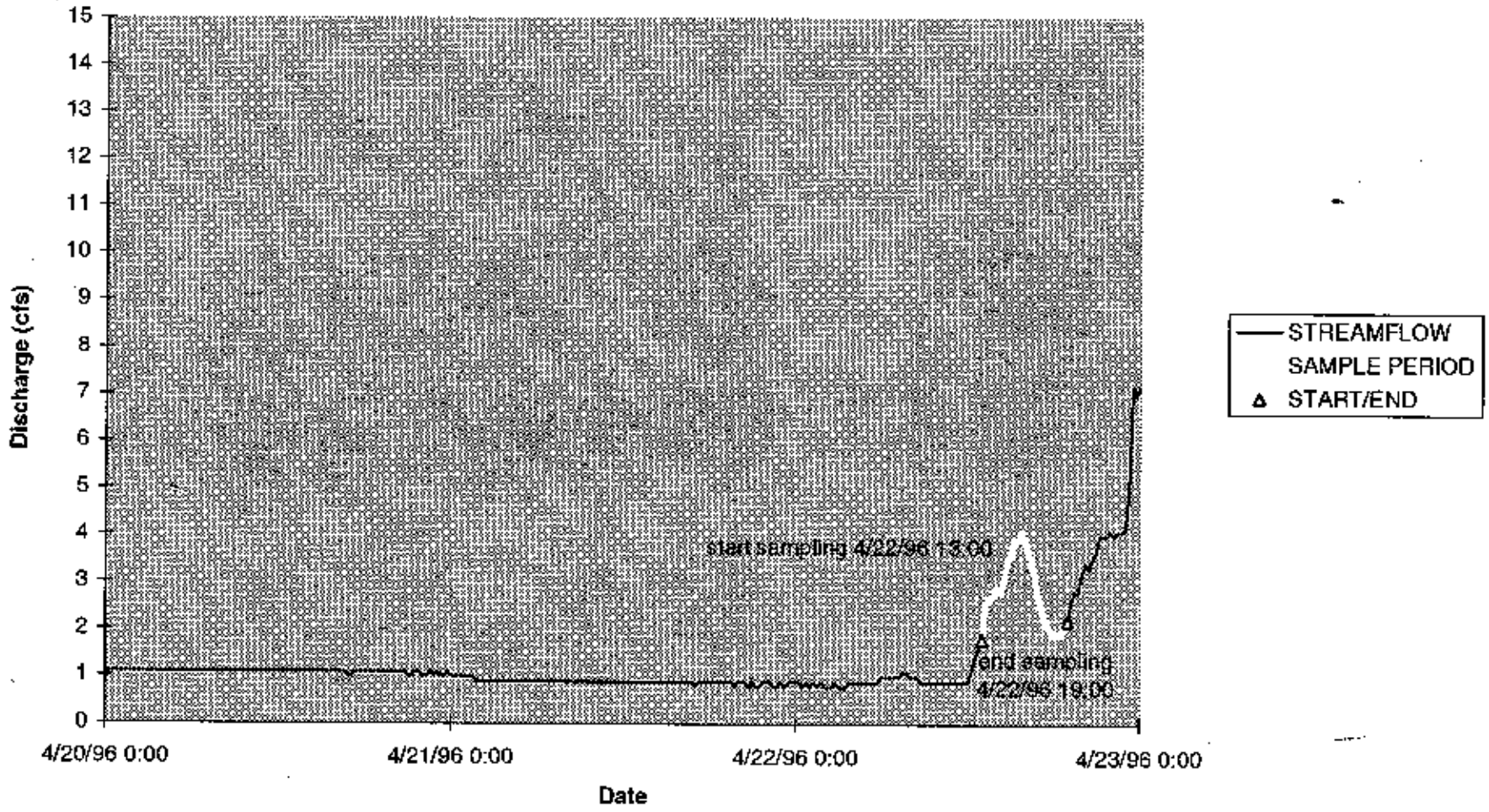
WA5-Hamm Creek, South Fork Storm Sample Session 7 for WY 96



WATER QUALITY DATA FOR WA05

Apr 22 Chart

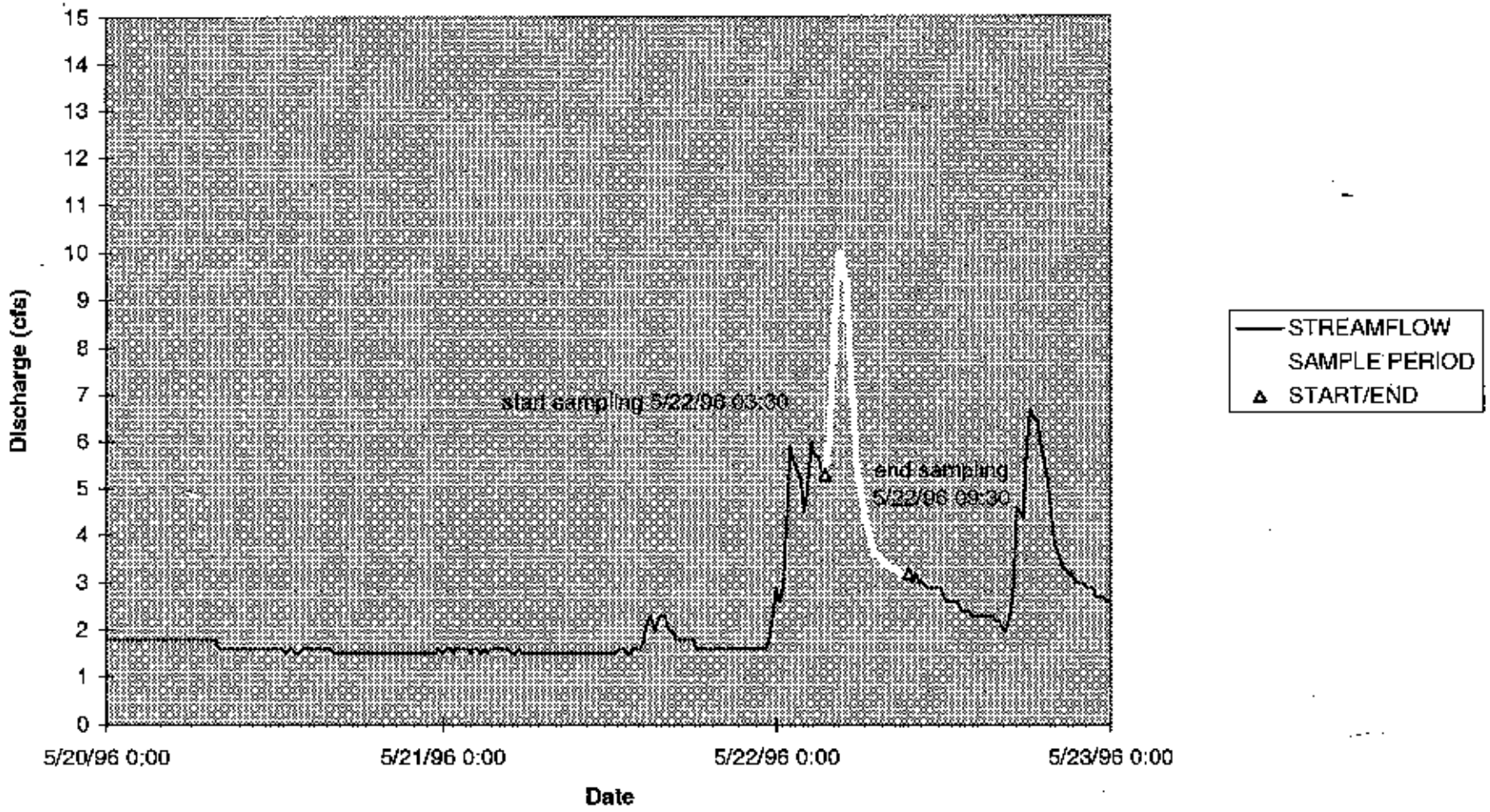
WA5-Hamm Creek, South Fork Storm Sample Session 8 for WY 96



WATER QUALITY DATA FOR WA05

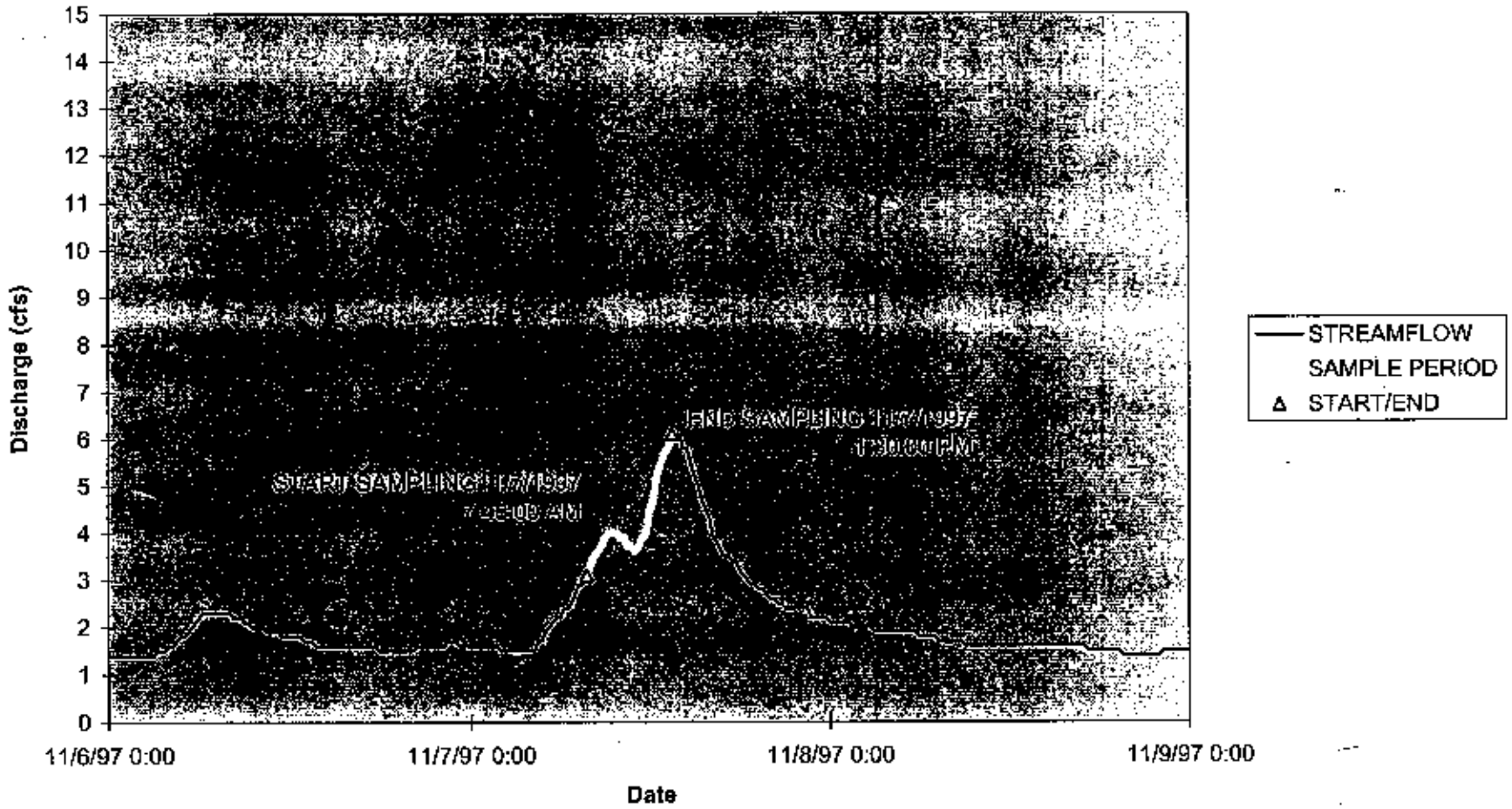
May 22 Chart

WA5-Hamm Creek, South Fork Storm Sample Session 9 for WY 1996



WATER QUALITY DATA FOR WA05

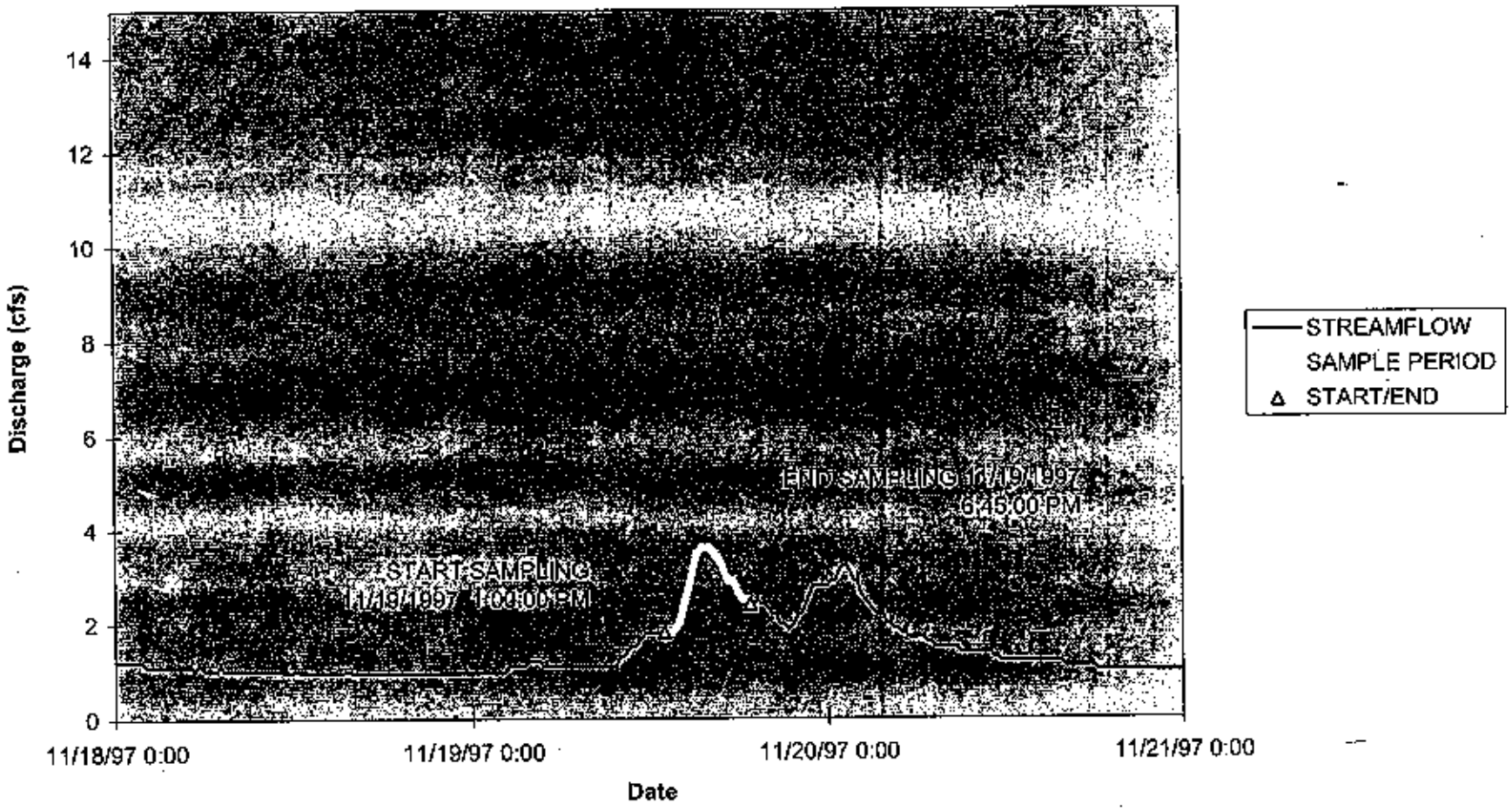
WA-5 Hamm Creek South Fork
Storm Sample 1 for Water Year 1998



WATER QUALITY DATA FOR WA05

Nov 19 Chart

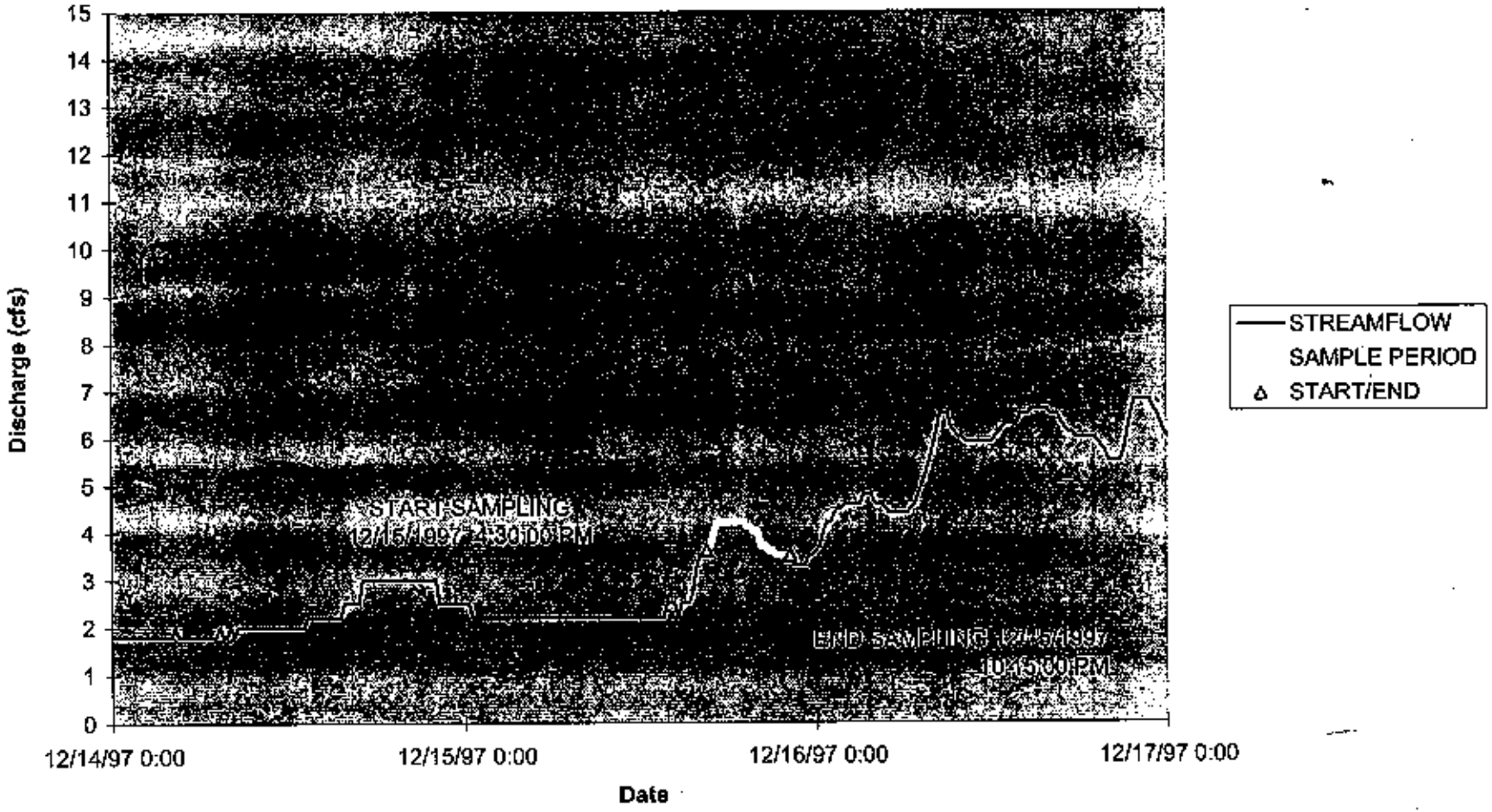
WA-5 Hamm Creek South Fork
Storm Sample 2 for WY 1998



WATER QUALITY DATA FOR WA05

Dec 15 chart

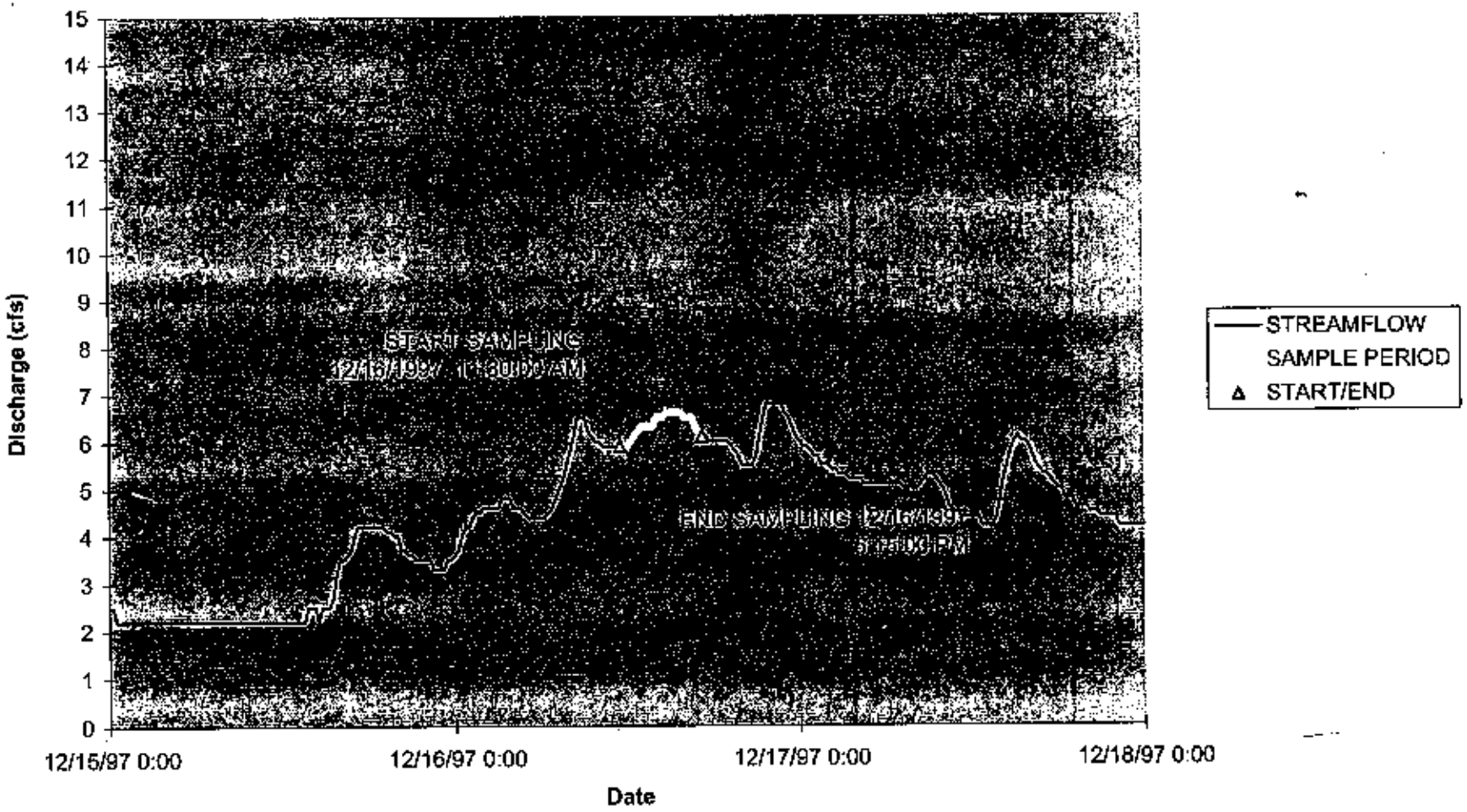
WA-5 Hamm Creek South Fork Storm
Sample 3 for Water Year 1998



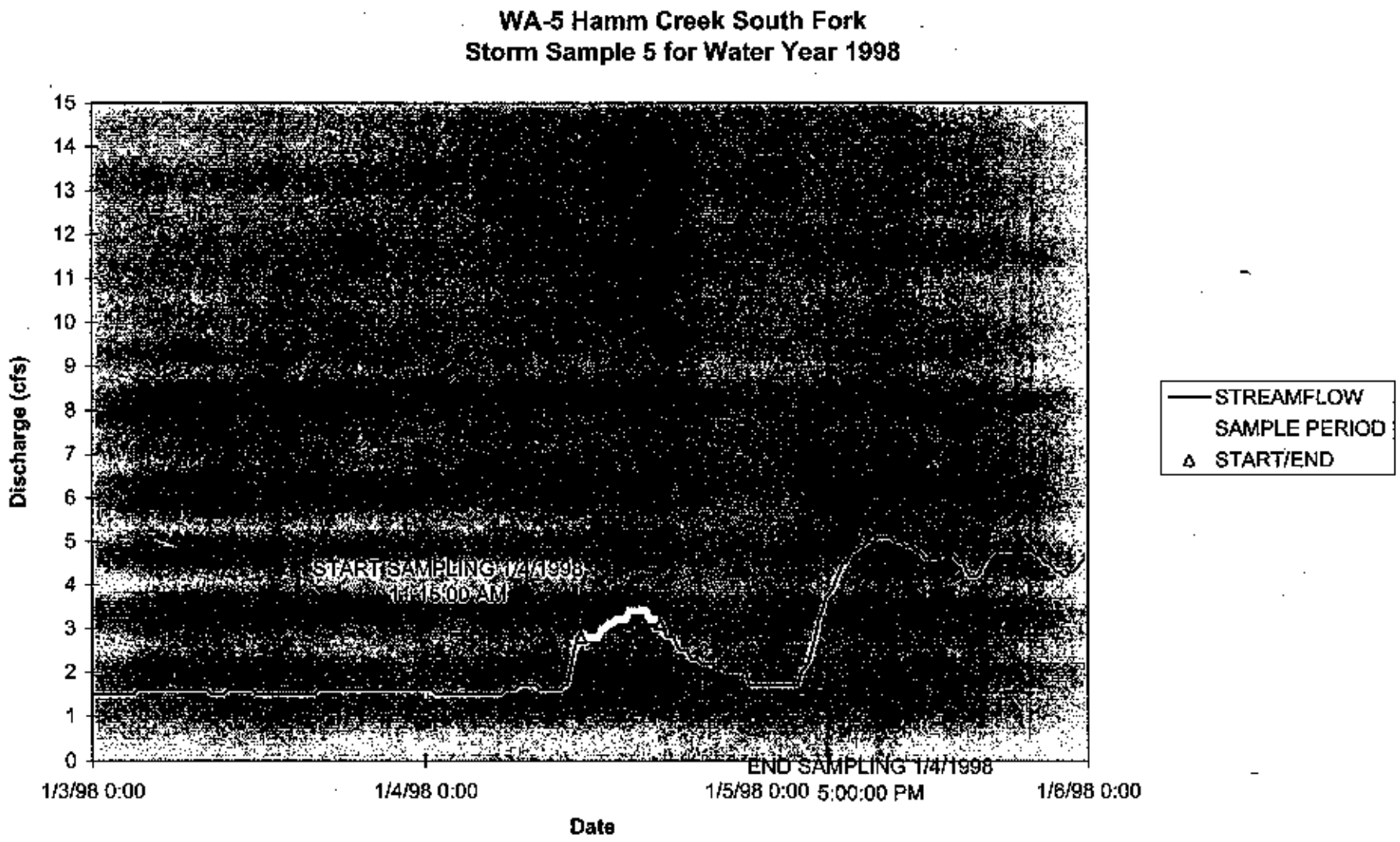
WATER QUALITY DATA FOR WA05

Dec 16 chart

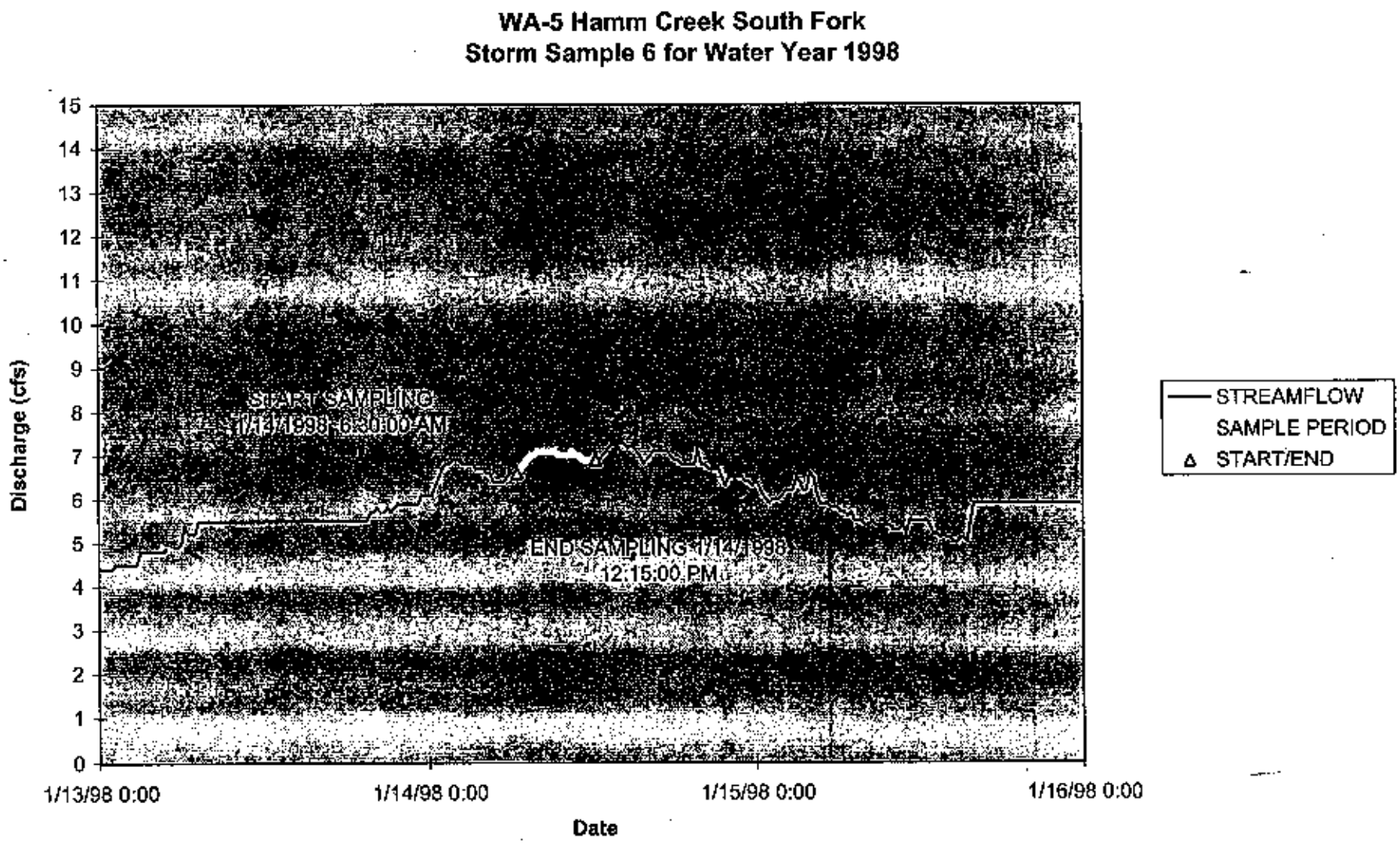
WA-5 Hamm Creek South Fork
Storm Sample 4 for Water Year 1998



WATER QUALITY DATA FOR WA05

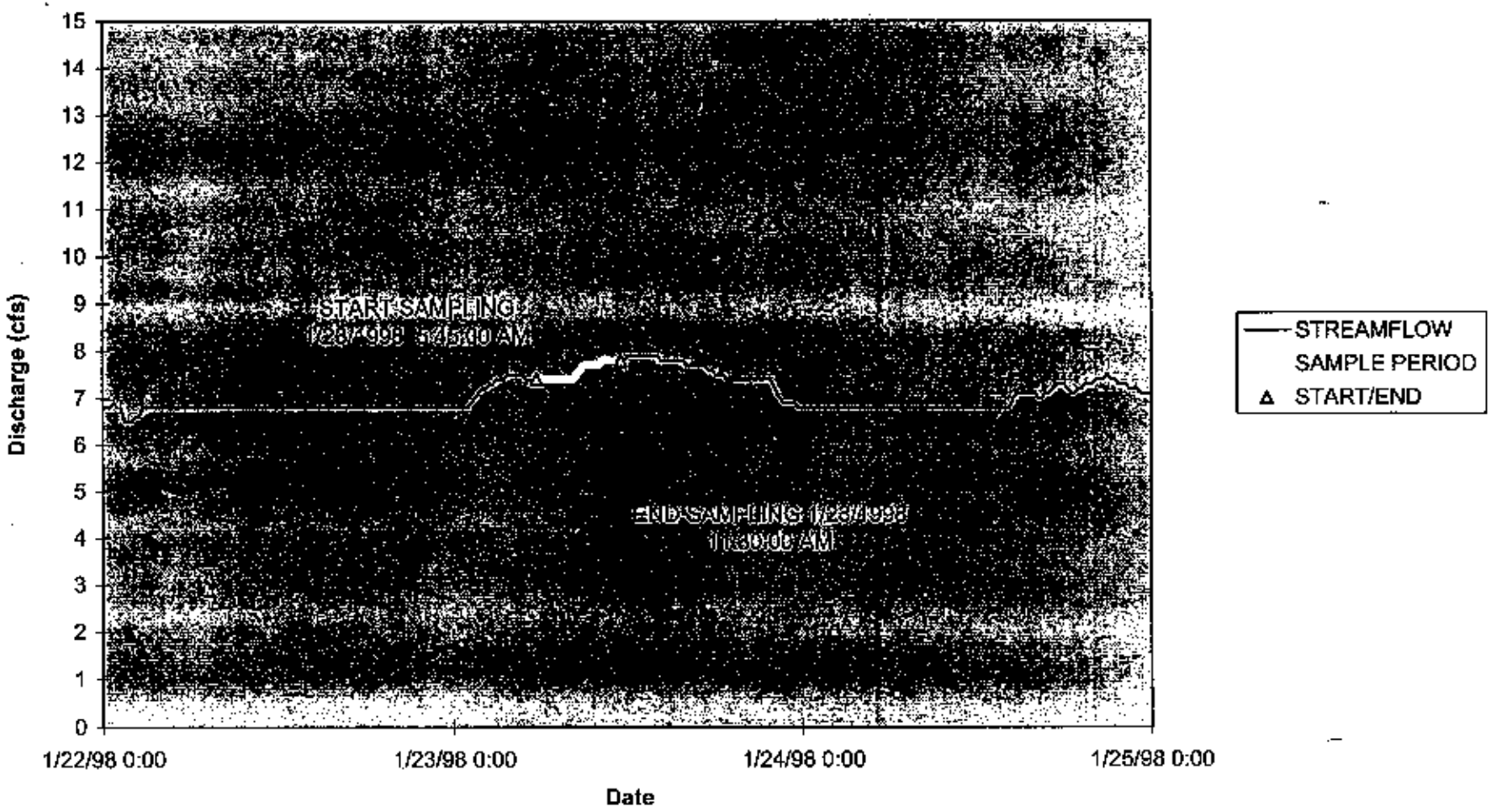

WA-5 Hamm Creek South Fork
Storm Sample 5 for Water Year 1998
Discharge (cfs)
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
START SAMPLING 1/4/1998
11:15:00 AM
END SAMPLING 1/4/1998
5:00:00 PM
1/3/98 0:00
1/4/98 0:00
1/5/98 0:00
1/6/98 0:00
Date
STREAMFLOW
SAMPLE PERIOD
START/END

Jan 14 Chart



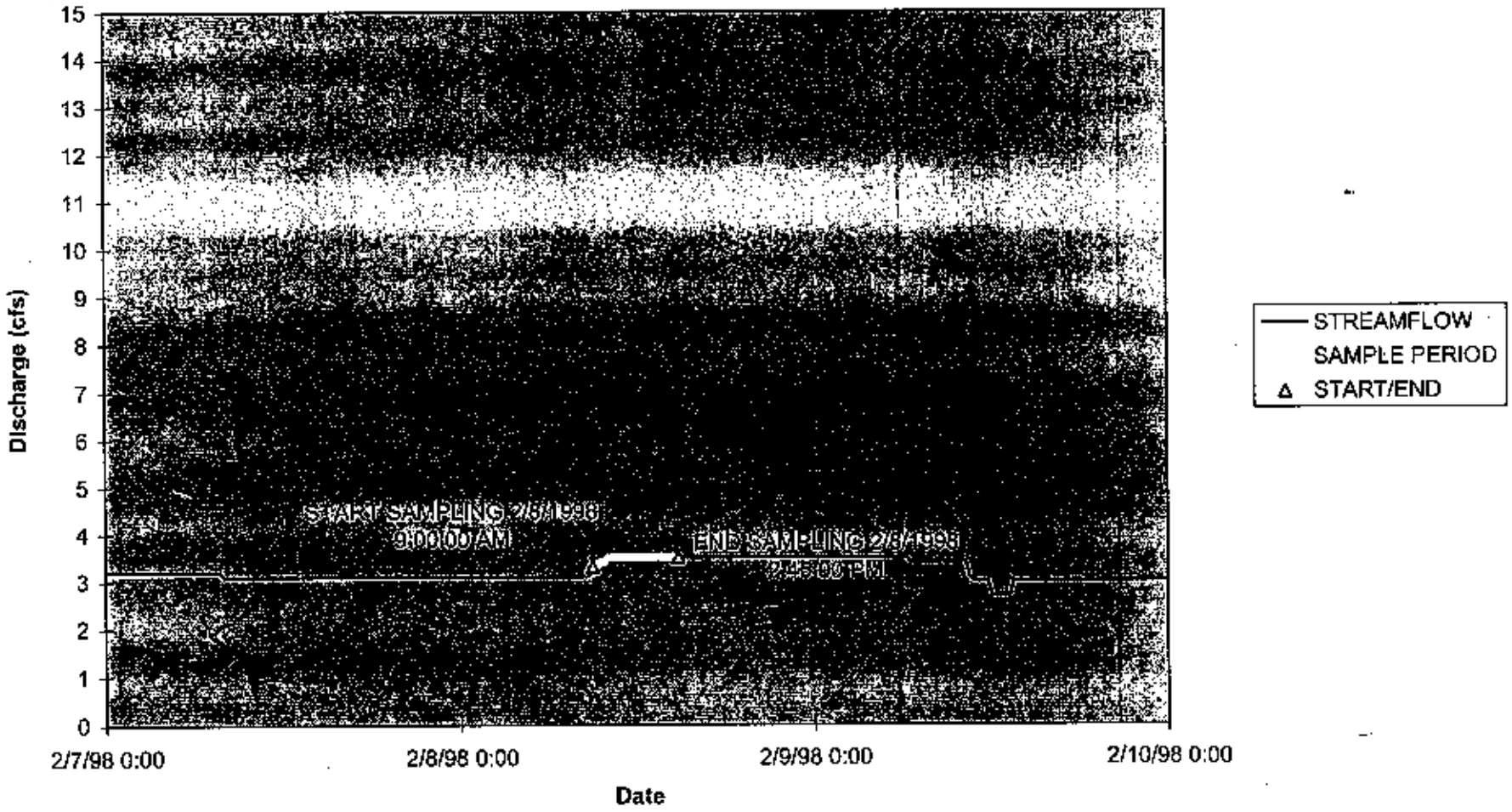
WATER QUALITY DATA FOR WA05

WA-5 Hamm Creek South Fork
Storm Sample 7 for Water Year 1998



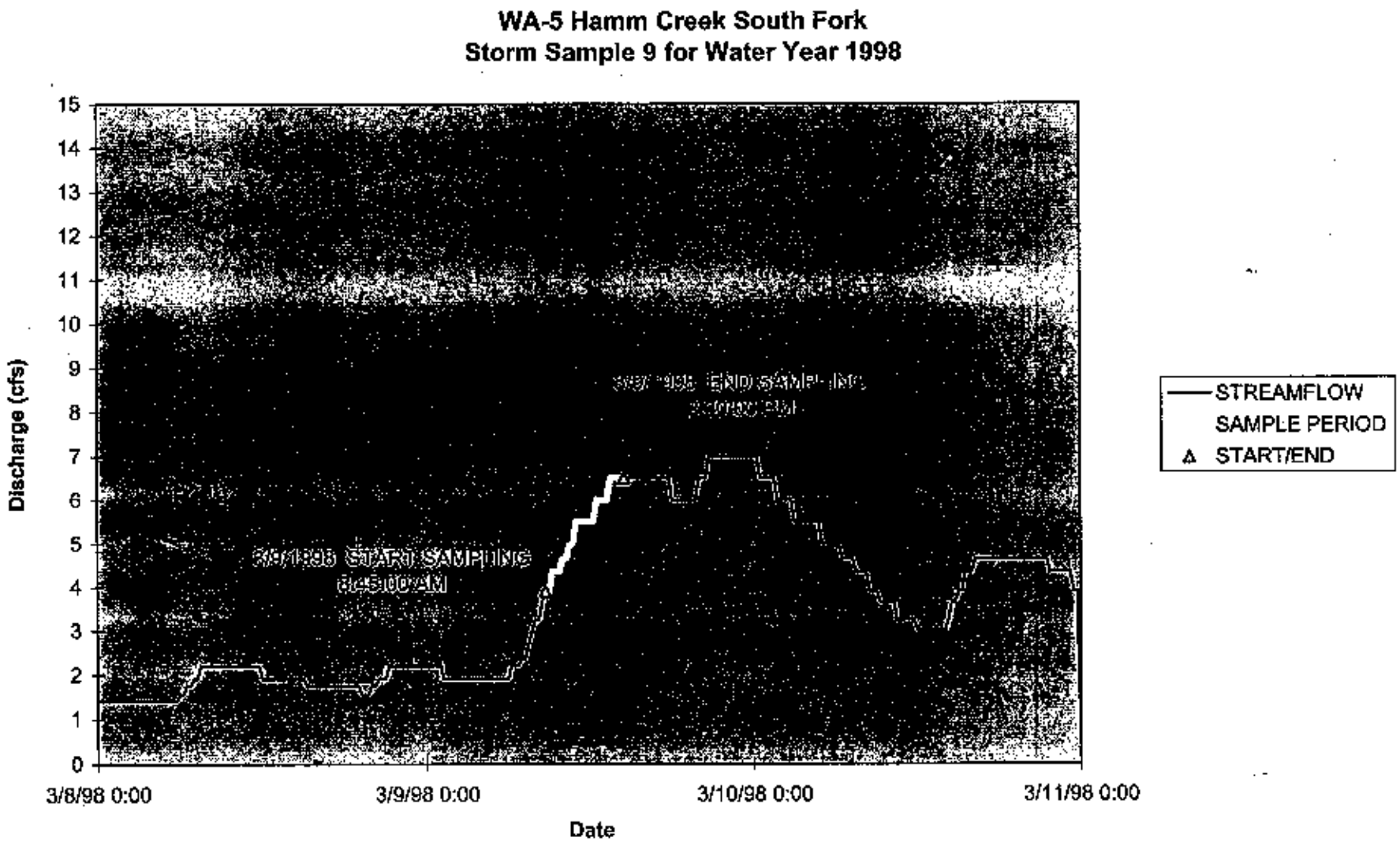
Feb 8 Chart

WA-5 Hamm Creek South Fork
Storm Sample 7 for Water Year 1998



WATER QUALITY DATA FOR WA05

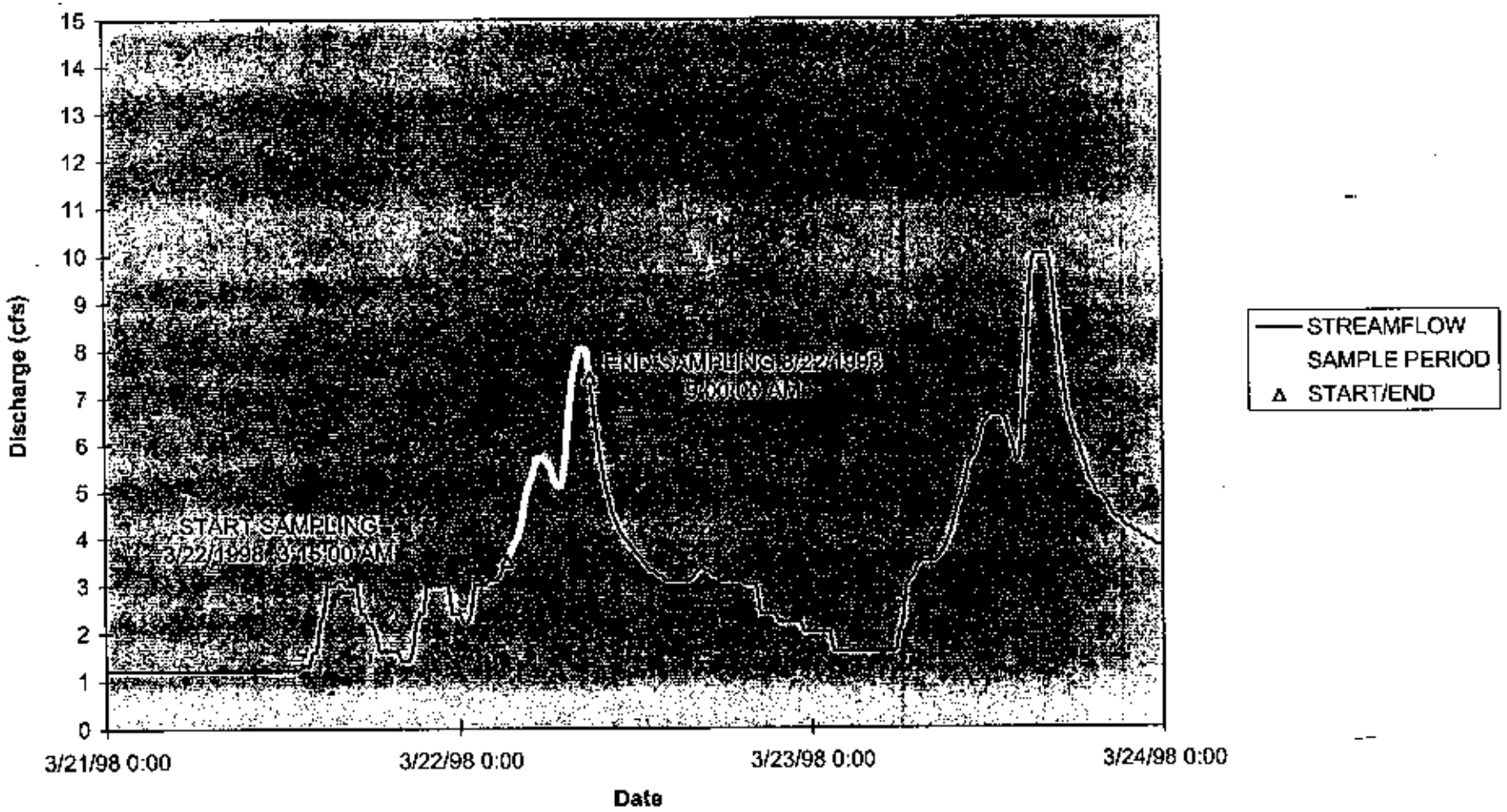
Mar 9 chart



WATER QUALITY DATA FOR WA05

Mar 22 chart

WA-5 Hamm Creek South Fork
Storm Sample 10 for Water Year 1998



WATER QUALITY DATA FOR WA05

HAMM CREEK UNIT LOADING COMPARISON

Hamm Creek Unit Loading Comparison

LOADINGS (in grams unless noted) kg = 2.2 pounds. 1 hecatre = 2.471 acres

	Area, hectares	TSS	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	TPH	As, total	As, diss.	Cd, Total	Cd, diss.	Cr, total	Cr, diss.	Cu, total	Cu, diss.	Ni, total	Ni, diss.	Pb, total	Pb, diss.	Zn, total	Zn, diss.
Storm Loading, KG/hectare, by Direct Method																				
WA1 1996	**114**	96				3.23	0.0035	0.0013	0.0003	0.0001	0.0057	0.0005	0.0153	0.0030	0.0076	0.0017	0.0157	0.0004	0.0645	0.0104
WA2 1996 & 1998	**200**	128				3.32	0.0036	0.0012	0.0009	0.0003	0.0305	0.0119	0.0293	0.0066	0.0230	0.0095	0.0376	0.0010	0.7729	0.2862
WA3 1996 & 1998	**950**	181				4.76	0.0107	0.0057	0.0012	0.0003	0.0421	0.0190	0.0561	0.0142	0.0270	0.0094	0.0552	0.0027	0.6705	0.1317
WA4 1996	**480**	9	0.063	0.237	0.016	0.52	0.0011	0.0008	0.0001	0.0000	0.0009	0.0003	0.0021	0.0011	0.0012	0.0007	0.0016	0.0001	0.0072	0.0053
WA5 1996 & 1998	**300**	120	0.389	2.491	0.107	3.45	0.0059	0.0029	0.0004	0.0002	0.0063	0.0012	0.0173	0.0067	0.0092	0.0035	0.0191	0.0005	0.0675	0.0280
Storm Loading, KG/hectare, by Modified Direct Method																				
WA1 1996	**114**	78				3.92	0.0036	0.0013	0.0003	0.0001	0.0055	0.0008	0.0152	0.0033	0.0072	0.0017	0.0154	0.0003	0.0678	0.0149
WA2 1996 & 1998	**200**	124				3.73	0.0035	0.0013	0.0009	0.0003	0.0348	0.0160	0.0284	0.0068	0.0233	0.0108	0.0362	0.0010	0.7883	0.3050
WA3 1996 & 1998	**950**	181				5.71	0.0116	0.0058	0.0013	0.0003	0.0505	0.0212	0.0578	0.0153	0.0270	0.0099	0.0544	0.0028	0.6679	0.1429
WA4 1996	**480**	9	0.067	0.247	0.019	0.45	0.0014	0.0009	0.0001	0.0000	0.0011	0.0005	0.0023	0.0012	0.0012	0.0007	0.0019	0.0001	0.0080	0.0061
WA5 1996 & 1998	**300**	103	0.406	2.519	0.113	4.61	0.0057	0.0030	0.0004	0.0002	0.0058	0.0014	0.0160	0.0066	0.0084	0.0035	0.0167	0.0005	0.0649	0.0321

GRAB SAMPLE SITES WATER QUALITY RESULTS

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms
		<MDL Value		*0*	*0*	*0*	*0*	*0*	*0.1*	*0.0002*	*0.0002*	*0.0001*	*0.0001*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*
		MDL		*0.5*	*0.005*	*0.05*	*0.02*	*0.3*	*0.2*	*0.0005*	*0.0005*	*0.0002*	*0.0002*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
		RDL		1	0.01	0.1	0.04	2	1.25	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WG-01	12/09/95	L7517-6		18	0.108	0.24	0.12		16.8	***0.0002***	***0.0002***	**0.0002**	***0.0001***	**0.0010**	***0.0002***	0.0042	0.0023	0.0034	0.0028	0.0041	***0.0002***	0.0369	0.0302
WG-01	01/06/96	L7663-1		12.4	0.131	0.28	**0.04**	3.5	15.1	**0.0006**	***0.0002***	**0.0002**	***0.0001***	0.0020	***0.0002***	0.0063	0.0023	0.0039	0.0023	0.0092	**0.0006**	0.0411	0.0255
WG-01	02/05/96	L7842-6		13.4	0.200	0.70	**0.03**	10.9	21.4	**0.0008**	**0.0006**	**0.0002**	***0.0001***	**0.0019**		0.0058	0.0026	0.0034	0.0021	0.0081	***0.0002***	0.0372	0.0245
WG-01	03/22/96	L8159-6		60.6	0.329	0.17	0.20	4.0	22.7	**0.0012**	**0.0005**	**0.0004**	***0.0001***	0.0039	***0.0002***	0.0155	0.0034	0.0063	0.0026	0.0171	***0.0002***	0.0734	0.0410
WG-01	03/31/96	L8209-6	6.6	16	1.390			3.8	13.2	**0.0005**	**0.0008**	**0.0004**	***0.0001***	**0.0012**	**0.0009**	0.0107	0.0053	0.0081	0.0072	0.0053	**0.0011**	0.0618	0.0862
WG-01	04/22/96	L8369-6	7.8	24.3	0.279	**0.07**	**0.02**	15.4	15.3		***0.0002***		***0.0001***		***0.0002***	0.0090	0.0025	0.0036	0.0022	0.0065	***0.0002***	0.0560	0.0318
WG-01	05/22/96	L8669-6	6.6	3.4	0.122	0.39	0.148	***0.1***	20	**0.0008**	**0.0007**	***0.0001***	***0.0001***	**0.0010**	**0.0009**	0.0049	0.0035	0.0035	0.0028	0.0027	**0.0006**	0.0239	0.0196
WG-01	07/18/96	L9105-1	6	14	0.494	**0.123**	0.718	**1.9**	24	**0.0015**	**0.0013**	**0.0005**	**0.0002**	0.0027	**0.0009**	0.0185	0.0088	0.0067	0.0049	0.0162	0.0033	0.0876	0.0536
WG-01	11/07/97	L12263-3	7.4	9.8	0.356	1.28	0.048	**1**	27	***0.0014***	**0.0012**	***0.0001***	***0.0001***	**0.0013**	**0.0008**	0.0081	0.0053	0.0045	0.0039	0.0033	**0.0008**	0.0335	0.0262
WG-01	11/19/97	L12308-1	7.0	18.8	0.114	0.525	0.119	**0.67**	17	***0.0008***	**0.0006**	***0.0001***	***0.0001***	0.0020	***0.0002***	0.0065	0.0027	0.0035	0.0021	0.0062	***0.0002***	0.0391	0.0231
WG-01	12/16/97	L12509-4	6.3	12	0.285	3.29	0.118	2.16	30	***0.0016***	**0.0010**	***0.0001***	***0.0001***	**0.0017**	**0.0006**	0.0054	0.0032	0.0030	0.0021	0.0041	***0.0002***	0.0303	0.0241
WG-01	01/04/98	L12599-4	6.6	16.8	0.093	0.713	***0.038***	**1.8**	16	***0.0006***	***0.0002***	***0.0001***	***0.0001***	**0.0014**	**0.0005**	0.0049	0.0022	0.0028	0.0021	0.0053	***0.0002***	0.0346	0.0235
WG-01	01/14/98	L12655-4	6.2	8.4	0.166	2.07	0.071	3.83	31	***0.0011***	**0.0008**	***0.0001***	***0.0001***	**0.0016**	**0.0006**	0.0055	0.0033	0.0035	0.0025	0.0035	**0.0006**	0.0278	0.0187
WG-01	01/23/98	L12698-4	6.6	11.3	0.139	1.16	***0.035***	3.04	27	***0.0009***	**0.0009**	***0.0001***	***0.0001***	**0.0013**	**0.0007**	0.0045	0.0029	0.0025	**0.0018**	0.0042	**0.0006**	0.0252	0.0172
WG-01	02/08/98	L12787-4	6.5	22.1	0.088	0.442	***0.01***	***2***	23	***0.0006***	***0.0002***	***0.0001***	***0.0001***	0.0021	***0.0002***	0.0078	0.0022	0.0039	**0.0017**	0.0060	***0.0002***	0.0392	0.0230
WG-01	02/12/98	L12813-2	6.5	13	0.179	0.71	***0.029***	**1.5**	26	***0.0012***	**0.0008**	***0.0001***	***0.0001***	0.0022	**0.0009**	0.0062	0.0034	0.0036	0.0025	0.0062	**0.0007**	0.0314	0.0192
WG-01	03/09/98	L12883-4	7.5	24	0.09	0.263	0.043	2.1	17	***0.0009***	**0.0008**	***0.0001***	***0.0001***	**0.0018**	**0.0006**	0.0053	0.0027	0.0030	0.0022	0.0057	***0.0002***	0.0308	0.0208
WG-01	03/22/98	L13039-4	6.0	9.6	0.089	1.15	***0.031***	**0.61**	21	***0.0012***	**0.0010**	***0.0001***	***0.0001***	**0.0016**	**0.0008**	0.0055	0.0040	0.0036	0.0028	0.0037	**0.0009**	0.0298	0.0233
	Sample size:		14	18	18	17	17	17	18	17	18	17	18	17	17	18	18	18	18	18	18	18	18
	Arithmetic mean:		6.7	17.11	0.258	0.799	0.106	3.431	21	0.0009	0.0007	0.0002	0.0001	0.0018	0.0005	0.0075	0.0035	0.0040	0.0028	0.0065	0.0006	0.0411	0.0295
	Max value:		7.8	60.6	1.39	3.29	0.718	15.4	31	0.0016	0.0013	0.0005	0.0002	0.0039	0.0009	0.0185	0.0088	0.0081	0.0072	0.0171	0.0033	0.0876	0.0862
	Min value:		6	3.4	0.088	0.066	0.01	0.1	13	0.0002	0.0002	0.0001	0.0001	0.0010	0.0002	0.0042	0.0022	0.0025	0.0017	0.0027	0.0002	0.0239	0.0172
	Median:		6.6	13.7	0.153	0.525	0.043	2.1	21	0.0009	0.0008	0.0001	0.0001	0.0017	0.0006	0.0060	0.0030	0.0036	0.0024	0.0055	0.0004	0.0359	0.0238
	Est. mean of population:		6.7	17.15	0.243	0.854	0.099	3.952	21	0.0010	0.0007	0.0002	0.0001	0.0018	0.0006	0.0074	0.0035	0.0040	0.0028	0.0064	0.0006	0.0410	0.0291
	1996 Arithmentic Mean:		6.8	20.3	0.382	0.282	0.181	5.66	19	0.0008	0.0006	0.0003	0.0001	0.0019	0.0005	0.0094	0.0038	0.0048	0.0034	0.0086	0.0008	0.0522	0.0391
	1998 Arithmentic Mean:		6.7	14.6	0.160	1.16	0.054	1.87	23	0.0010	0.0008	0.0001	0.0001	0.0017	0.0006	0.0060	0.0032	0.0034	0.0024	0.0048	0.0005	0.0322	0.0219

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms
		<MDL Value		*0*	*0*	*0*	*0*	*0*	*0.1*	*0.0002*	*0.0002*	*0.0001*	*0.0001*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*
		MDL		*0.5*	*0.005*	0.05	*0.02*	*0.3*	*0.2*	*0.0005*	*0.0005*	*0.0002*	*0.0002*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
		RDL		1	0.01	0.1	0.04	2	1.25	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WG-02	12/09/95	L7517-7		5.4				**1.5**	9.4	**0.0005**	***0.0002***	**0.0011**	**0.0011**	**0.0011**	**0.0006**	0.0107	0.0062	**0.0017**	**0.0014**	0.0044	**0.0009**	0.0927	0.0914
WG-02	01/06/96	L7663-2		16.8				3.3	9.2	**0.0006**	***0.0002***	**0.0011**	**0.0009**	0.0020	**0.0005**	0.0122	0.0042	0.0021	**0.0012**	0.0152	**0.0016**	0.0933	0.0670
WG-02	02/05/96	L7842-7		34.6				11.5	10.4	**0.0010**	***0.0002***	**0.0013**	**0.0007**	0.0037	**0.0006**	0.0190	0.0030	0.0030	**0.0010**	0.0305	**0.0009**	0.1260	0.0635
WG-02	03/03/96	L8017-4	7.1	14.8				14.3	13.3	**0.0011**	**0.0006**	**0.0016**	**0.0013**	0.0023	**0.0010**	0.0168	0.0121	0.0029	0.0020	0.0121	**0.0012**	0.1480	0.1310
WG-02	03/22/96	L8159-7		46.3				4.3	14.2	**0.0016**	**0.0009**	**0.0016**	**0.0009**	0.0038	**0.0009**	0.0309	0.0151	0.0041	0.0020	0.0313	**0.0009**	0.1710	0.1030
WG-02	03/31/96	L8209-7	6.8	39.8				2.1	8.3	**0.0006**	**0.0007**	**0.0011**	**0.0008**	**0.0016**	**0.0005**	0.0148	0.0085	0.0025	**0.0013**	0.0106	**0.0006**	0.1500	0.1230
WG-02	04/22/96	L8369-7	7.4	150				6.3	18.7		**0.0006**	0.0020	**0.0006**		**0.0007**	0.0353	0.0069	0.0069	**0.0011**	0.0640	**0.0017**	0.2010	0.0549
WG-02	05/22/96	L8669-7	8	18.5				**1.7**	8.4	**0.0009**	**0.0006**	**0.0010**	**0.0006**	0.0024	**0.0005**	0.0130	0.0045	0.0021	**0.0008**	0.0246	**0.0012**	0.0965	0.0556
WG-02	11/07/97	L12263-4	8.8	31.5				124	16	***0.0007***	***0.0002***	**0.0011**	**0.0007**	0.0024	***0.0002***	0.0167	0.0067	0.0033	**0.0014**	0.0142	0.0023	0.1160	0.0722
WG-02	11/19/97	L12308-2	7.0	55.6				2.45	9.1	***0.0012***	***0.0002***	**0.0012**	**0.0004**	0.0053	***0.0002***	0.0282	0.0032	0.0041	**0.0009**	0.0462	**0.0012**	0.1290	0.0512
WG-02	12/16/97	L12509-5	7.5	22.1				3.51	9.1	***0.0009***	***0.0002***	**0.0009**	**0.0007**	0.0026	***0.0002***	0.0143	0.0033	0.0025	**0.0013**	0.0185	0.0025	0.0873	0.0602
WG-02	01/04/98	L12599-5	6.8	19.7				2.67	6.3	***0.0007***	***0.0002***	**0.0007**	**0.0005**	0.0029	**0.0009**	0.0111	0.0032	0.0021	**0.0011**	0.0136	**0.0011**	0.0705	0.0481
WG-02	01/14/98	L12655-5	6.3	32.5				2.13	13	***0.0013***	***0.0002***	**0.0011**	**0.0006**	0.0036	***0.0002***	0.0153	0.0029	0.0041	**0.0014**	0.0153	***0.0002***	0.1050	0.0628
WG-02	01/23/98	L12698-5	7.5	15.4				2.82	8.2	***0.0009***	***0.0002***	**0.0007**	**0.0006**	**0.0019**	**0.0005**	0.0107	0.0032	0.0020	**0.0009**	0.0145	0.0021	0.0719	0.0474
WG-02	02/08/98	L12787-5	5.9	20.3				**1.9**	8.8	***0.0018***	**0.0009**	**0.0008**	**0.0006**	0.0021	***0.0002***	0.0170	0.0076	0.0026	**0.0011**	0.0186	**0.0015**	0.0713	0.0492
WG-02	02/12/98	L12813-3	6.3	89.7				4.56	17	***0.0015***	***0.0002***	**0.0011**	**0.0005**	0.0042	***0.0002***	0.0240	0.0042	0.0042	**0.0011**	0.0367	**0.0018**	0.1290	0.0537
WG-02	03/09/98	L12883-5	7.4	60.4				2.7	16	***0.0015***	**0.0006**	**0.0014**	**0.0008**	0.0048	**0.0008**	0.0414	0.0123	0.0053	**0.0016**	0.0229	**0.0014**	0.1120	0.0554
WG-02	03/22/98	L13039-5	7.3	15.5				**0.98**	20	***0.0009***	***0.0002***	**0.0012**	**0.0010**	**0.0017**	***0.0002***	0.0117	0.0059	0.0026	**0.0015**	0.0070	**0.0018**	0.0776	0.0601
	Sample size:		14	18	0	0	0	18	18	17	18	18	18	17	18	18	18	18	18	18	18	18	18
	Arithmetic mean:		7.2	38.27				10.7	12	0.0010	0.0004	0.0012	0.0007	0.0029	0.0005	0.0191	0.0063	0.0032	0.0013	0.0222	0.0014	0.1138	0.0694
	Max value:		8.8	150				124	20	0.0018	0.0009	0.0020	0.0013	0.0053	0.0010	0.0414	0.0151	0.0069	0.0020	0.0640	0.0025	0.2010	0.1310
	Min value:		5.9	5.4				0.98	6.3	0.0005	0.0002	0.0007	0.0004	0.0011	0.0002	0.0107	0.0029	0.0017	0.0008	0.0044	0.0002	0.0705	0.0474
	Median:		7.2	26.8				2.76	9.9	0.0009	0.0002	0.0011	0.0007	0.0024	0.0005	0.0160	0.0052	0.0028	0.0013	0.0169	0.0013	0.1085	0.0602
	Est. mean of population:		7.2	38.51				6.988	12	0.0010	0.0004	0.0012	0.0007	0.0029	0.0005	0.0190	0.0063	0.0032	0.0013	0.0226	0.0014	0.1140	0.0693
	1996 Arithmentic Mean:		7.3	40.8				5.62	11	0.0009	0.0005	0.0014	0.0009	0.0024	0.0007	0.0191	0.0076	0.0031	0.0013	0.0241	0.0011	0.1348	0.0862
	1998 Arithmentic Mean:		7.1	36.3				14.77	12	0.0011	0.0003	0.0010	0.0006	0.0032	0.0004	0.0190	0.0053	0.0033	0.0012	0.0207	0.0016	0.0970	0.0560

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms
		<MDL Value		*0*	*0*	*0*	*0*	*0*	*0.1*	*0.0002*	*0.0002*	*0.0001*	*0.0001*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*
		MDL		*0.5*	*0.005*	*0.05*	*0.02*	*0.3*	*0.2*	*0.0005*	*0.0005*	*0.0002*	*0.0002*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
		RDL		1	0.01	0.1	0.04	2	1.25	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WG-02	12/09/95	L7517-7		5.4				1.5	9.4	**0.0005**	***0.0002***	**0.0011**	**0.0011**	**0.0011**	**0.0006**	0.0107	0.0062	**0.0017**	**0.0014**	0.0044	**0.0009**	0.0927	0.0914
WG-02	01/06/96	L7663-2		16.8				3.3	9.2	**0.0006**	***0.0002***	**0.0011**	**0.0009**	0.0020	**0.0005**	0.0122	0.0042	0.0021	**0.0012**	0.0152	**0.0016**	0.0933	0.0670
WG-02	02/05/96	L7842-7		34.6				11.5	10.4	**0.0010**	***0.0002***	**0.0013**	**0.0007**	0.0037	**0.0006**	0.0190	0.0030	0.0030	**0.0010**	0.0305	**0.0009**	0.1260	0.0635
WG-02	03/03/96	L8017-4	7.1	14.8				14.3	13.3	**0.0011**	**0.0006**	**0.0016**	**0.0013**	0.0023	**0.0010**	0.0168	0.0121	0.0029	0.0020	0.0121	**0.0012**	0.1480	0.1310
WG-02	03/22/96	L8159-7		46.3				4.3	14.2	**0.0016**	**0.0009**	**0.0016**	**0.0009**	0.0038	**0.0009**	0.0309	0.0151	0.0041	0.0020	0.0313	**0.0009**	0.1710	0.1030
WG-02	03/31/96	L8209-7	6.8	39.8				2.1	8.3	**0.0006**	**0.0007**	**0.0011**	**0.0008**	**0.0016**	**0.0005**	0.0148	0.0085	0.0025	**0.0013**	0.0106	**0.0005**	0.1500	0.1230
WG-02	04/22/96	L8369-7	7.4	150				6.3	18.7		**0.0006**	0.0020	**0.0006**		**0.0007**	0.0353	0.0069	0.0069	**0.0011**	0.0640	**0.0017**	0.2010	0.0549
WG-02	05/22/96	L8669-7	8	18.5				1.7	8.4	**0.0009**	**0.0006**	**0.0010**	**0.0006**	0.0024	**0.0005**	0.0130	0.0045	0.0021	**0.0008**	0.0246	**0.0012**	0.0965	0.0556
WG-02	11/07/97	L12263-4	8.8	31.5				124	16	***0.0007***	***0.0002***	**0.0011**	**0.0007**	0.0024	***0.0002***	0.0167	0.0067	0.0033	**0.0014**	0.0142	0.0023	0.1160	0.0722
WG-02	11/19/97	L12308-2	7.0	55.6				2.45	9.1	***0.0012***	***0.0002***	**0.0012**	**0.0004**	0.0053	***0.0002***	0.0282	0.0032	0.0041	**0.0009**	0.0462	**0.0012**	0.1290	0.0512
WG-02	12/16/97	L12509-5	7.5	22.1				3.51	9.1	***0.0009***	***0.0002***	**0.0009**	**0.0007**	0.0026	***0.0002***	0.0143	0.0033	0.0025	**0.0013**	0.0185	0.0025	0.0873	0.0602
WG-02	01/04/98	L12599-5	6.8	19.7				2.67	6.3	***0.0007***	***0.0002***	**0.0007**	**0.0005**	0.0029	**0.0009**	0.0111	0.0032	0.0021	**0.0011**	0.0136	**0.0011**	0.0705	0.0481
WG-02	01/14/98	L12655-5	6.3	32.5				2.13	13	***0.0013***	***0.0002***	**0.0011**	**0.0006**	0.0036	***0.0002***	0.0153	0.0029	0.0041	**0.0014**	0.0153	***0.0002***	0.1050	0.0628
WG-02	01/23/98	L12698-5	7.5	15.4				2.82	8.2	***0.0009***	***0.0002***	**0.0007**	**0.0006**	**0.0019**	**0.0005**	0.0107	0.0032	0.0020	**0.0009**	0.0145	0.0021	0.0719	0.0474
WG-02	02/08/98	L12787-5	5.9	20.3				1.9	8.8	***0.0018***	**0.0009**	**0.0008**	**0.0006**	0.0021	***0.0002***	0.0170	0.0076	0.0026	**0.0011**	0.0186	**0.0015**	0.0713	0.0492
WG-02	02/12/98	L12813-3	6.3	89.7				4.56	17	***0.0015***	***0.0002***	**0.0011**	**0.0005**	0.0042	***0.0002***	0.0240	0.0042	0.0042	**0.0011**	0.0367	**0.0018**	0.1290	0.0537
WG-02	03/09/98	L12883-5	7.4	60.4				2.7	16	***0.0015***	**0.0006**	**0.0014**	**0.0008**	0.0048	**0.0008**	0.0414	0.0123	0.0053	**0.0016**	0.0229	**0.0014**	0.1120	0.0554
WG-02	03/22/98	L13039-5	7.3	15.5				0.98	20	***0.0009***	***0.0002***	**0.0012**	**0.0010**	**0.0017**	***0.0002***	0.0117	0.0059	0.0026	**0.0015**	0.0070	**0.0018**	0.0776	0.0601
	Sample size:		14	18	0	0	0	18	18	17	18	18	18	17	18	18	18	18	18	18	18	18	18
	Arithmetic mean:		7.2	38.27				10.7	12	0.0010	0.0004	0.0012	0.0007	0.0029	0.0005	0.0191	0.0063	0.0032	0.0013	0.0222	0.0014	0.1138	0.0694
	Max value:		8.8	150				124	20	0.0018	0.0009	0.0020	0.0013	0.0053	0.0010	0.0414	0.0151	0.0069	0.0020	0.0640	0.0025	0.2010	0.1310
	Min value:		5.9	5.4				0.98	6.3	0.0005	0.0002	0.0007	0.0004	0.0011	0.0002	0.0107	0.0029	0.0017	0.0008	0.0044	0.0002	0.0705	0.0474
	Median:		7.2	26.8				2.76	9.9	0.0009	0.0002	0.0011	0.0007	0.0024	0.0005	0.0160	0.0052	0.0028	0.0013	0.0169	0.0013	0.1085	0.0602
	Est. mean of population:		7.2	38.51				6.988	12	0.0010	0.0004	0.0012	0.0007	0.0029	0.0005	0.0190	0.0063	0.0032	0.0013	0.0226	0.0014	0.1140	0.0693
	1996 Arithmentic Mean:		7.3	40.8				5.62	11	0.0009	0.0005	0.0014	0.0009	0.0024	0.0007	0.0191	0.0076	0.0031	0.0013	0.0241	0.0011	0.1348	0.0862
	1998 Arithmentic Mean:		7.1	36.3				14.77	12	0.0011	0.0003	0.0010	0.0006	0.0032	0.0004	0.0190	0.0053	0.0033	0.0012	0.0207	0.0016	0.0970	0.0560

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms
		<MDL Value		*0*	*0*	*0*	*0*	*0*	*0.1*	*0.0002*	*0.0002*	*0.0001*	*0.0001*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*
		MDL		*0.5*	*0.005*	*0.05*	*0.02*	*0.3*	*0.2*	*0.0005*	*0.0005*	*0.0002*	*0.0002*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
		RDL		1	0.01	0.1	0.04	2	1.25	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WG-03	12/09/95	L7517-8		2.2				3.0	3.	***0.0002***	0.0006	0.0005	0.0005	0.0008	0.0006	0.0028	0.0017	0.0008	0.0007	0.0013	***0.0002***	0.2090	0.2240
WG-03	01/06/96	L7663-3		9.5				0.3	3.9	0.0007	0.0006	0.0005	0.0004	0.0015	***0.0002***	0.0042	0.0014	0.0011	0.0006	0.0043	***0.0002***	0.2590	0.2120
WG-03	02/05/96	L7842-8		15.8				11.2	5.4	0.0012	0.0007	0.0011	0.0006	0.0023	***0.0002***	0.0061	0.0012	0.0016	0.0006	0.0086	***0.0002***	0.2180	0.1540
WG-03	03/22/96	L8159-8		113				2.4	6.3	0.0009	***0.0002***	0.0011	0.0007	0.0034	0.0007	0.0093	0.0043	0.0028	0.0016	0.0107	***0.0002***	0.4140	0.3200
WG-03	03/31/96	L8209-8	7.1	7.8				1.3	5.	0.0006	***0.0002***	0.0009	0.0005	0.0037	***0.0002***	0.0092	0.0022	0.0021	0.0007	0.0152	***0.0002***	0.2660	0.1780
WG-03	04/22/96	L8369-8	6.2	12.9				1.2	3.7		***0.0002***	0.0007	0.0004		0.0007	0.0060	0.0028	0.0013	0.0006	0.0086	***0.0002***	0.2010	0.1660
WG-03	05/22/96	L8669-8	7.4	6.3				0.4	4.4	0.0009	0.0008	0.0005	0.0004	0.0015	***0.0002***	0.0047	0.0018	0.0012	0.0006	0.0051	***0.0002***	0.1710	0.1590
WG-03	11/07/97	L12263-5	8.5	29.7				***0.1***	7.8	***0.0012***	***0.0002***	0.0009	0.0003	0.0032	***0.0002***	0.0094	0.0020	0.0029	0.0007	0.0099	***0.0002***	0.3100	0.1660
WG-03	11/19/97	L12306-3	8.0	26.8				***0.1***	5	***0.0010***	***0.0002***	0.0008	***0.0001***	0.0078	0.0010	0.0097	0.0013	0.0027	0.0005	0.0234	***0.0002***	0.2400	0.1220
WG-03	12/16/97	L12509-6	7.6	13.3				***0.1***	5.4	***0.0008***	***0.0002***	***0.0005***	0.0003	0.0026	***0.0002***	0.0061	0.0012	0.0015	0.0005	0.0063	***0.0002***	0.2210	0.1530
WG-03	02/12/98	L12813-4	6.5	10				0.67	5.3	***0.0006***	***0.0002***	0.0005	0.0003	0.0015	0.0005	0.0047	0.0015	0.0012	0.0005	0.0043	***0.0002***	0.2300	0.1730
WG-03	03/09/98	L12883-6	7.4	22				14.6	5.7	***0.0006***	***0.0002***	0.0008	0.0004	0.0030	0.0006	0.0076	0.0024	0.0019	0.0010	0.0089	***0.0002***	0.2590	0.1870
WG-03	04/23/98	L13135-1	7.0	20.7				1.5	12	***0.0013***	0.0009	0.0012	0.0007	0.0045	0.0013	0.0172	0.0104	0.0043	0.0026	0.0118	0.0009	0.5320	0.2470
	Sample size:		9	13	0	0	0	13	13	12	13	13	13	12	13	13	13	13	13	13	13	13	13
	Arithmetic mean:		7.3	22.46				2.639	5.6	0.0008	0.0004	0.0008	0.0004	0.0030	0.0005	0.0074	0.0026	0.0020	0.0009	0.0091	0.0003	0.2715	0.1893
	Max value:		8.5	113				14.6	12	0.0013	0.0009	0.0012	0.0007	0.0078	0.0013	0.0172	0.0104	0.0043	0.0026	0.0234	0.0009	0.5320	0.3200
	Min value:		6.2	2.2				0.1	3	0.0002	0.0002	0.0005	0.0001	0.0008	0.0002	0.0028	0.0012	0.0008	0.0005	0.0013	0.0002	0.1710	0.1220
	Median:		7.4	13.3				1.2	5.3	0.0009	0.0002	0.0008	0.0004	0.0028	0.0005	0.0061	0.0018	0.0016	0.0006	0.0086	0.0002	0.2400	0.1730
	Est. mean of population:		7.3	22.4				3.597	5.6	0.0009	0.0004	0.0008	0.0004	0.0030	0.0005	0.0075	0.0025	0.0020	0.0008	0.0096	0.0002	0.2712	0.1895
	1996 Arithmentic Mean:		7.2	24.3				6.377	8.3	0.0009	0.0005	0.0010	0.0006	0.0022	0.0004	0.0123	0.0041	0.0023	0.0010	0.0141	0.0009	0.1629	0.1231
	1998 Arithmentic Mean:		7.3	26.5				2.24	6.1	0.0009	0.0003	0.0008	0.0004	0.0034	0.0006	0.0084	0.0030	0.0022	0.0009	0.0104	0.0003	0.2844	0.1871

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms
		<MDL Value		*0*	*0*	*0*	*0*	*0*	*0.1*	*0.0002*	*0.0002*	*0.0001*	*0.0001*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*
		MDL		*0.5*	*0.005*	*0.05*	*0.02*	*0.3*	*0.2*	*0.0005*	*0.0005*	*0.0002*	*0.0002*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
		RDL		1	0.01	0.1	0.04	2	1.25	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WG-04	12/09/95	L7517-9		11.5	0.127	1.62	0.13	**0.4**	50.8	**0.0015**	**0.0011**	**0.0002**	***0.0001***	**0.0012**	**0.0007**	0.0050	0.0043	0.0052	0.0050	**0.0015**	***0.0002***	0.0178	0.0173
WG-04	01/06/96	L7663-4		72.5	0.373	0.61	0.13	**0.4**	43.7	0.0035	**0.0012**	**0.0003**	***0.0001***	0.0045	**0.0006**	0.0092	0.0038	0.0067	0.0036	0.0118	***0.0002***	0.0381	0.0201
WG-04	02/05/96	L7842-9		54.2	0.282	0.51	0.14	9.3	23.8	0.0021	**0.0009**	**0.0002**	***0.0001***	0.0038		0.0086	0.0039	0.0050	0.0024	0.0138	***0.0002***	0.0385	0.0242
WG-04	03/22/96	L8159-9		171	0.665	1.02	0.45	**1.4**	64.2	0.0056	**0.0011**	**0.0006**	***0.0001***	0.0088	**0.0010**	0.0153	0.0041	0.0108	0.0031	0.0158	***0.0002***	0.1000	0.0421
WG-04	03/31/96	L8209-9	7	34.8	0.315	0.80	0.26	**0.9**	53.4	0.0049	**0.0017**	**0.0003**	***0.0001***	0.0035	**0.0009**	0.0103	0.0038	0.0052	0.0025	0.0131	***0.0002***	0.0505	0.0210
WG-04	04/22/96	L8369-9	6.4	135	0.772	0.35	0.16	**0.6**	45.7		**0.0014**	**0.0006**	***0.0001***		**0.0007**	0.0183	0.0043	0.0124	0.0035	0.0269	**0.0005**	0.0870	0.0210
WG-04	05/22/96	L8669-9	6.6	16.4	0.203	0.537	0.162	***0.1***	48	0.0032	0.0023	***0.0001***	***0.0001***	0.0022	**0.0010**	0.0063	0.0046	0.0070	0.0059	0.0032	**0.0008**	0.0253	0.0266
WG-04	11/07/97	L12263-6	7.1	115	0.343	0.643	0.708	***0.1***	40	***0.0040***	**0.0013**	***0.0004***	***0.0001***	0.0072	**0.0005**	0.0140	0.0039	0.0121	0.0049	0.0142	***0.0002***	0.0609	0.0231
WG-04	11/19/97	L12308-4	7.0	67.9	0.2	0.72	0.192	***0.1***	37	***0.0031***	**0.0011**	***0.0002***	***0.0001***	0.0049	**0.0006**	0.0098	0.0033	0.0083	0.0040	0.0113	***0.0002***	0.0416	0.0148
WG-04	12/16/97	L12509-7	6.3	94.6	0.448	0.655	0.127	***0.1***	30	***0.0036***	**0.0006**	***0.0001***	***0.0001***	0.0049	***0.0002***	0.0093	0.0028	0.0076	0.0028	0.0109	***0.0002***	0.0439	0.0180
WG-04	01/04/98	L12599-6	6.7	41.5	0.21	0.748	0.093	**0.52**	34	***0.0021***	**0.0007**	***0.0001***	***0.0001***	0.0038	**0.0005**	0.0065	0.0031	0.0063	0.0035	0.0050	***0.0002***	0.0253	0.0141
WG-04	01/14/98	L12655-6	6.1	30.5	0.191	1.18	0.127	**0.69**	31	***0.0016***	**0.0007**	***0.0001***	***0.0001***	0.0026	***0.0002***	0.0058	0.0032	0.0047	0.0031	0.0045	***0.0002***	0.0277	0.0195
WG-04	01/23/98	L12698-6	6.6	58.8	0.282	0.722	0.116	**0.99**	28	***0.0026***	**0.0007**	***0.0001***	***0.0001***	0.0043	**0.0006**	0.0075	0.0026	0.0057	0.0026	0.0110	***0.0002***	0.0377	0.0176
WG-04	02/08/98	L12787-6	6.5	32.7	0.207	1.19	0.189	**0.37**	72	***0.0020***	**0.0010**	***0.0001***	***0.0001***	0.0027	***0.0002***	0.0096	0.0033	0.0100	0.0053	0.0032	***0.0002***	0.0267	0.0148
WG-04	02/12/98	L12813-5	6.2	70.4	0.243	0.836	0.164	**0.79**	48	***0.0029***	**0.0010**	***0.0003***	***0.0001***	0.0069	**0.0008**	0.0112	0.0037	0.0103	0.0036	0.0064	***0.0002***	0.0336	0.0164
WG-04	03/09/98	L12883-7	7.2	44	0.206	0.443	0.105	**0.72**	38	***0.0026***	**0.0012**	***0.0001***	***0.0001***	0.0032	**0.0006**	0.0082	0.0037	0.0070	0.0041	0.0056	***0.0002***	0.0282	0.0165
WG-04	03/22/98	L13039-6	6.2	26.3	0.255	0.783	0.154	***0.1***	49	***0.0029***	**0.0016**	***0.0001***	***0.0001***	0.0027	**0.0006**	0.0091	0.0054	0.0082	0.0057	0.0032	***0.0002***	0.0275	0.0175
	Sample size:		14	18	17	17	17	18	18	17	18	18	18	17	17	18	18	18	18	18	18	18	18
	Arithmetic mean:		6.7	61.31	0.313	0.786	0.2	1.102	41	0.0029	0.0011	0.0003	0.0001	0.0041	0.0006	0.0096	0.0037	0.0075	0.0037	0.0095	0.0003	0.0553	0.0295
	Max value:		7.3	171	0.772	1.62	0.708	9.3	72	0.0056	0.0023	0.0008	0.0004	0.0088	0.0010	0.0183	0.0054	0.0124	0.0059	0.0269	0.0008	0.2844	0.1871
	Min value:		6.1	11.5	0.127	0.346	0.093	0.1	6.1	0.0009	0.0003	0.0001	0.0001	0.0012	0.0002	0.0050	0.0026	0.0022	0.0009	0.0015	0.0002	0.0178	0.0141
	Median:		6.6	49.1	0.255	0.722	0.154	0.565	42	0.0029	0.0011	0.0002	0.0001	0.0038	0.0006	0.0091	0.0038	0.0070	0.0036	0.0107	0.0002	0.0379	0.0188
	Est. mean of population:		6.6	65.53	0.312	0.788	0.194	0.924	43	0.0030	0.0012	0.0002	0.0001	0.0042	0.0006	0.0096	0.0038	0.0078	0.0039	0.0100	0.0002	0.0416	0.0202
	1996 Arithmentic Mean:		6.7	70.8	0.391	0.777	0.203	1.873	47	0.0035	0.0014	0.0003	0.0001	0.0040	0.0008	0.0104	0.0041	0.0075	0.0037	0.0123	0.0003	0.0510	0.0246
	1998 Arithmentic Mean:		6.6	58.2	0.385	0.76	0.266	0.45	41	0.0028	0.0010	0.0002	0.0001	0.0043	0.0005	0.0091	0.0035	0.0080	0.0039	0.0075	0.0002	0.0353	0.0172

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms
		<MDL Value		*0*	*0*	*0*	*0*	*0*	*0.1*	*0.0002*	*0.0002*	*0.0001*	*0.0001*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*
		MDL		*0.5*	*0.005*	*0.05*	*0.02*	*0.3*	*0.2*	*0.0005*	*0.0005*	*0.0002*	*0.0002*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
		RDL		1	0.01	0.1	0.04	2	1.26	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WG-05	12/09/95	L7517-10		7.4				**0.8**	25	0.0020	**0.0017**	**0.0002**	**0.0002**	**0.0015**	**0.0008**	0.0075	0.0047	0.0033	0.0029	0.0075	0.0024	0.1450	0.1290
WG-05	11/19/97	L12308-5	8.3	265				**0.89**	51	***0.0054***	**0.0010**	**0.0015**	**0.0002**	0.0207	**0.0009**	0.0719	0.0080	0.0169	0.0020	0.0886	**0.0015**	0.6910	0.1160
	Sample size:		1	2	0	0	0	2	2	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000	2.0000
	Arithmetic mean:		8.3	136.2				0.845	38	0.0037	0.0013	0.0009	0.0002	0.0111	0.0008	0.0397	0.0064	0.0101	0.0025	0.0481	0.0020	0.4180	0.1225
	Max value:		8.3	265				0.89	51	0.0054	0.0017	0.0015	0.0002	0.0207	0.0009	0.0719	0.0080	0.0169	0.0029	0.0886	0.0024	0.6910	0.1290
	Min value:		8.3	7.4				0.8	25	0.0020	0.0010	0.0002	0.0002	0.0015	0.0008	0.0075	0.0047	0.0033	0.0020	0.0075	0.0015	0.1450	0.1160
	Median:		8.3	136.2				0.845	38	0.0037	0.0013	0.0009	0.0002	0.0111	0.0008	0.0397	0.0064	0.0101	0.0025	0.0481	0.0020	0.4180	0.1225
	Est. mean of population:																						
WG-06	12/09/95	L7517-11		21.8				**0.4**	37	0.0021	**0.0018**	**0.0003**	***0.0001***	0.0140	0.0121	0.0119	0.0046	0.0040	**0.0019**	0.0075	**0.0009**	0.5890	0.2190
WG-06	11/19/97	L12308-6	9.2	168				**1.1**	50	***0.0040***	0.0021	**0.0008**	***0.0001***	0.0152	0.0026	0.0391	0.0036	0.0138	**0.0009**	0.0389	***0.0002***	0.6590	0.0077
WG-06	12/16/97	L12509-8	7.9	123				**0.93**	48	***0.0044***	0.0026	**0.0005**	***0.0001***	0.0135	0.0038	0.0307	0.0039	0.0120	**0.0011**	0.0288	**0.0008**	0.4420	0.0175
WG-06	01/04/98	L12599-7	8.8	108					42	***0.0040***	0.0025	***0.0005***	***0.0001***	0.0106	0.0036	0.0224	0.0057	0.0084	**0.0007**	0.0369	**0.0006**	0.4030	0.0084
WG-06	01/14/98	L12655-7	9.1	110				2.53	47	***0.0038***	0.0021	***0.0005***	***0.0001***	0.0164	0.0084	0.0263	0.0034	0.0111	**0.0011**	0.0261	**0.0007**	0.4410	0.0133
WG-06	01/23/98	L12698-7	8.8	128				3.07	51	***0.0068***	0.0031	**0.0008**	***0.0001***	0.0157	0.0062	0.0278	0.0027	0.0105	**0.0008**	0.0688	**0.0011**	0.8040	0.0118
WG-06	02/08/98	L12787-7	8.3	116				**2**	59	***0.0041***	0.0024	**0.0007**	***0.0001***	0.0226	0.0079	0.0385	0.0033	0.0145	**0.0006**	0.0436	***0.0002***	1.0200	0.0071
WG-06	02/12/98	L12813-6	7.3	80				**1.6**	50	***0.0028***	0.0023	***0.0004***	***0.0001***	0.0207	0.0220	0.0191	0.0033	0.0085	**0.0015**	0.0261	**0.0008**	0.3970	0.0388
WG-06	03/09/98	L12883-8	8.1	164				**1.4**	64	***0.0043***	0.0022	**0.0007**	***0.0001***	0.0372	0.0199	0.0411	0.0035	0.0182	**0.0011**	0.0493	**0.0006**	0.4830	0.0141
WG-06	03/22/98	L13039-7	7.1	477				**0.64**	110	***0.0034***	**0.0015**		***0.0001***	0.0501	0.0259	0.0907	0.0061	0.0442	**0.0015**	0.0304	***0.0002***	0.5420	0.0298
	Sample size:		9	10	0	0	0	9	10	10	10	9	10	10	10	10	10	10	10	10	10	10	10
	Arithmetic mean:		8.3	149.6				1.519	56	0.0040	0.0023	0.0006	0.0001	0.0216	0.0112	0.0348	0.0040	0.0145	0.0011	0.0356	0.0006	0.5780	0.0367
	Max value:		9.2	477				3.07	110	0.0068	0.0031	0.0008	0.0001	0.0501	0.0259	0.0907	0.0061	0.0442	0.0019	0.0688	0.0011	1.0200	0.2190
	Min value:		7.1	21.8				0.4	37	0.0021	0.0015	0.0003	0.0001	0.0106	0.0026	0.0119	0.0027	0.0040	0.0006	0.0075	0.0002	0.3970	0.0071
	Median:		8.3	119.5				1.4	50	0.0040	0.0023	0.0005	0.0001	0.0161	0.0081	0.0293	0.0035	0.0116	0.0011	0.0337	0.0006	0.5125	0.0137
	Est. mean of population:		8.3	156.8				1.586	56	0.0040	0.0023	0.0006	0.0001	0.0216	0.0118	0.0350	0.0040	0.0146	0.0011	0.0374	0.0006	0.5790	0.0314

Locator	Date	SampleID	Ph	Total Suspended Solids	Total P	Nitrite + Nitrate Nitrogen	Ammonia Nitrogen	Total Petroleum Hydrocarbon	Hardness, Calc	Arsenic, Total, Icp-Ms	As-Icpms, Diss	Cadmium, Total, Icp-Ms	Cd-Icpms, Diss	Chromium, Total, Icp-Ms	Chromium, Dissolved, Icp-Ms	Copper, Total, Icp-Ms	Copper, Dissolved, Icp-Ms	Nickel, Total, Icp-Ms	Nickel, Dissolved, Icp-Ms	Lead, Total, Icp-Ms	Lead, Dissolved, Icp-Ms	Zinc, Total, Icp-Ms	Zinc, Dissolved, Icp-Ms
		<MDL Value		*0*	*0*	*0*	*0*	*0*	*0.1*	*0.0002*	*0.0002*	*0.0001*	*0.0001*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*	*0.0002*
		MDL		*0.5*	*0.005*	*0.05*	*0.02*	*0.3*	*0.2*	*0.0005*	*0.0005*	*0.0002*	*0.0002*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*	*0.0005*
		RDL		1	0.01	0.1	0.04	2	1.25	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WG-07	12/09/95	L7517-12		33.8	0.215	0.954	0.205	***0.1***	57	0.0032	0.0021	**0.0010**	**0.0005**	0.0090	0.0051	0.0159	0.0055	0.0070	0.0035	0.0116	**0.0008**	0.1580	0.0598
WG-08	04/22/96	L8369-11	10	404				44.3	1020		0.0821	0.0087	***0.0001***		0.0038	0.2770	0.0242	0.0827	0.0031	0.8900	0.0031	1.2500	0.0036
WG-08	05/22/96	L8669-11	9.8	109				***0.1***	75	0.0321	0.0297	**0.0011**	***0.0001***	0.0084	**0.0017**	0.0375	0.0109	0.0110	**0.0017**	0.0533	**0.0013**	0.2710	0.0058
WG-08	07/18/96	L9105-3	10	523				4.95	471	0.1540	0.1280	0.0056	***0.0001***	0.0638	0.0074	0.2510	0.0683	0.0834	0.0098	0.2960	0.0051	0.9160	0.0131
WG-08	11/07/97	L12263-7	9.7	177				***0.1***	75	***0.0183***	0.0152	**0.0009**	***0.0001***	0.0084	**0.0011**	0.0322	0.0066	0.0102	**0.0013**	0.0446	**0.0013**	0.1560	0.0049
WG-08	11/19/97	L12308-7	9.7	146				***0.1***	266	***0.0441***	0.0326	0.0033	***0.0001***	0.0236	**0.0018**	0.1010	0.0106	0.0321	***0.0020***	0.1800	**0.0017**	0.4290	0.0039
WG-08	12/16/97	L12509-9	9.3	62.6				**1.2**	65	***0.0150***	0.0108	**0.0009**	***0.0001***	0.0067	**0.0011**	0.0296	0.0057	0.0087	**0.0013**	0.0318	0.0024	0.1670	0.0117
WG-08	04/23/98	L13135-2	10.3	227				1	160	***0.0318***	0.0315	0.0023	***0.0001***	0.0129	0.0022	0.0599	0.0216	0.0207	0.0034	0.0676	**0.0006**	0.4430	0.0042
	Sample size:		7	7	0	0	0	7	7	6	7	7	7	6	7	7	7	7	7	7	7	7	7
	Arithmetic mean:		9.9	235.5				7.393	305	0.0492	0.0471	0.0033	0.0001	0.0206	0.0027	0.1126	0.0211	0.0355	0.0032	0.2233	0.0022	0.5189	0.0068
	Max value:		10	523				44.3	1020	0.1540	0.1280	0.0087	0.0001	0.0638	0.0074	0.2770	0.0683	0.0834	0.0098	0.8900	0.0051	1.2500	0.0131
	Min value:		9.3	62.6				0.1	65	0.0150	0.0108	0.0009	0.0001	0.0067	0.0011	0.0296	0.0057	0.0087	0.0013	0.0318	0.0006	0.1560	0.0036
	Median:		9.8	177				1	160	0.0320	0.0315	0.0023	0.0001	0.0107	0.0018	0.0599	0.0109	0.0207	0.0020	0.0676	0.0017	0.4290	0.0049
	Est. mean of population:		9.9	247				12.52	323	0.0495	0.0496	0.0035	0.0001	0.0208	0.0028	0.1193	0.0215	0.0380	0.0032	0.2344	0.0023	0.5440	0.0068
	1996 Arithmentic Mean:		10	345.3				16.45	522	0.0931	0.0799	0.0051	0.0001	0.0361	0.0043	0.1865	0.0345	0.0590	0.0048	0.4131	0.0032	0.8123	0.0075
	1996 Arithmentic Mean:		9.8	153.2				0.6	142	0.0273	0.0225	0.0018	0.0001	0.0129	0.0016	0.0557	0.0111	0.0179	0.0020	0.0810	0.0015	0.2988	0.0062

RESULTS COMPARED TO STATE WATER QUALITY STANDARDS

HAMM CREEK RESULTS COMPARED TO WA STATE WQ CRITERIA FOR METALS

Locator	Date	Hardness, Calc	As CHRONIC CRITERIA	TOTAL As > CHRONIC CRITERIA?	Cd ACUTE CRITERIA	DISS Cd > ACUTE CRITERIA?	Cd CHRONIC CRITERIA	DISS Cd > CHRONIC CRITERIA?	Cr ACUTE CRITERIA	DISS Cr > ACUTE CRITERIA?	Cr CHRONIC CRITERIA	DISS Cr > CHRONIC CRITERIA?	Cu ACUTE CRITERIA	DISS Cu > ACUTE CRITERIA?	Cu CHRONIC CRITERIA	DISS Cu > CHRONIC CRITERIA?	Ni ACUTE CRITERIA	DISS Ni > ACUTE CRITERIA?	Ni CHRONIC CRITERIA	DISS Ni > CHRONIC CRITERIA?	Pb ACUTE CRITERIA	DISS Pb > ACUTE CRITERIA?	Pb CHRONIC CRITERIA	DISS Pb > CHRONIC CRITERIA?	Zn ACUTE CRITERIA	DISS Zn > ACUTE CRITERIA?	Zn CHRONIC CRITERIA	DISS Zn > CHRONIC CRITERIA?
WA-01	11/17/95	65	0.1900	NO	0.0021	NO	0.0007	NO	1.2249	NO	0.1460	NO	0.0102	NO	0.0071	NO	0.9395	NO	0.1044	NO	0.0326	NO	0.0013	NO	0.0727	NO	0.0658	NO
WA-01	12/09/95	47	0.1900	NO	0.0015	NO	0.0005	NO	0.9389	NO	0.1119	NO	0.0075	NO	0.0054	NO	0.7139	NO	0.0794	NO	0.0216	NO	0.0008	NO	0.0552	NO	0.0500	NO
WA-01	01/08/96	60	0.1900	NO	0.0019	NO	0.0007	NO	1.1460	NO	0.1366	NO	0.0095	NO	0.0066	NO	0.8770	NO	0.0975	NO	0.0294	NO	0.0011	NO	0.0678	NO	0.0614	NO
WA-01	02/05/96	82	0.1900	NO	0.0027	NO	0.0008	NO	1.4790	NO	0.1763	NO	0.0127	NO	0.0086	NO	1.1414	NO	0.1269	NO	0.0437	NO	0.0017	NO	0.0883	NO	0.0800	NO
WA-01	03/03/96	76	0.1900	NO	0.0025	NO	0.0008	NO	1.3929	NO	0.1660	NO	0.0119	NO	0.0081	NO	1.0729	NO	0.1193	NO	0.0398	NO	0.0016	NO	0.0830	NO	0.0752	NO
WA-01	03/22/96	72	0.1900	NO	0.0023	NO	0.0008	NO	1.3224	NO	0.1576	NO	0.0112	NO	0.0077	NO	1.0168	NO	0.1130	NO	0.0367	NO	0.0014	NO	0.0787	NO	0.0712	NO
WA-01	03/31/96	60	0.1900	NO	0.0019	NO	0.0007	NO	1.1428	NO	0.1362	NO	0.0094	NO	0.0066	NO	0.8746	NO	0.0972	NO	0.0293	NO	0.0011	NO	0.0676	NO	0.0613	NO
WA-01	04/22/96	74	0.1900		0.0024	NO	0.0008	NO	1.3525	NO	0.1612	NO	0.0115	NO	0.0079	NO	1.0408	NO	0.1157	NO	0.0380	NO	0.0015	NO	0.0805	NO	0.0729	NO
WA-01	05/22/96	50	0.1900	NO	0.0016	NO	0.0006	NO	0.9843	NO	0.1173	NO	0.0080	NO	0.0056	NO	0.7496	NO	0.0833	NO	0.0232	NO	0.0009	NO	0.0580	NO	0.0525	NO
WA-02	11/17/95	82	0.1900	NO	0.0027	NO	0.0008	NO	1.4760	NO	0.1759	NO	0.0127	NO	0.0086	NO	1.1391	NO	0.1266	NO	0.0436	NO	0.0017	NO	0.0881	NO	0.0798	NO
WA-02	12/09/95	53	0.1900	NO	0.0016	NO	0.0006	NO	1.0244	NO	0.1221	NO	0.0083	NO	0.0059	NO	0.7811	NO	0.0868	NO	0.0247	NO	0.0010	NO	0.0604	Y	0.0547	Y
WA-02	01/08/96	45	0.1900	NO	0.0014	NO	0.0005	NO	0.9046	NO	0.1078	NO	0.0072	NO	0.0052	NO	0.6869	NO	0.0764	NO	0.0204	NO	0.0008	Y	0.0531	Y	0.0481	Y
WA-02	02/05/96	52	0.1900	NO	0.0016	NO	0.0006	NO	1.0212	NO	0.1217	NO	0.0083	NO	0.0059	NO	0.7786	NO	0.0866	NO	0.0246	NO	0.0010	NO	0.0602	NO	0.0545	Y
WA-02	03/22/96	57	0.1900	NO	0.0018	NO	0.0006	NO	1.0974	NO	0.1308	NO	0.0090	NO	0.0063	NO	0.8387	NO	0.0932	NO	0.0275	NO	0.0011	Y	0.0649	Y	0.0587	Y
WA-02	03/31/96	47	0.1900	NO	0.0015	NO	0.0005	NO	0.9373	NO	0.1117	NO	0.0075	NO	0.0054	NO	0.7126	NO	0.0792	NO	0.0215	NO	0.0008	NO	0.0551	Y	0.0499	Y
WA-02	04/22/96	40	0.1900		0.0012	NO	0.0005	Y	0.8115	NO	0.0967	NO	0.0064	NO	0.0046	Y	0.6140	NO	0.0683	NO	0.0172	NO	0.0007	NO	0.0475	Y	0.0430	Y
WA-02	05/22/96	41	0.1900	NO	0.0012	NO	0.0005	NO	0.8316	NO	0.0991	NO	0.0066	NO	0.0047	NO	0.6298	NO	0.0700	NO	0.0179	NO	0.0007	NO	0.0487	Y	0.0441	Y
WA-02	11/19/97	50	0.1900	NO	0.0015	NO	0.0006	NO	0.9762	NO	0.1164	NO	0.0079	NO	0.0056	NO	0.7432	NO	0.0826	NO	0.0229	NO	0.0009	NO	0.0575	Y	0.0520	Y
WA-02	12/15/97	56	0.1900	NO	0.0018	NO	0.0006	NO	1.0769	NO	0.1284	NO	0.0088	NO	0.0062	NO	0.8225	NO	0.0914	NO	0.0267	NO	0.0010	NO	0.0636	Y	0.0576	Y
WA-02	12/17/97	56	0.1900	NO	0.0017	NO	0.0006	NO	1.0721	NO	0.1278	NO	0.0088	NO	0.0062	NO	0.8187	NO	0.0910	NO	0.0265	NO	0.0010	NO	0.0633	Y	0.0573	Y
WA-02	01/04/98	59	0.1900	NO	0.0019	NO	0.0006	NO	1.1194	NO	0.1334	NO	0.0092	NO	0.0064	NO	0.8560	NO	0.0952	NO	0.0283	NO	0.0011	NO	0.0662	Y	0.0600	Y
WA-02	01/14/98	47	0.1900	NO	0.0014	NO	0.0005	NO	0.9340	NO	0.1113	NO	0.0075	NO	0.0053	NO	0.7100	NO	0.0789	NO	0.0214	NO	0.0008	NO	0.0549	Y	0.0497	Y
WA-02	01/23/98	36	0.1900	NO	0.0011	NO	0.0004	NO	0.7436	NO	0.0886	NO	0.0058	NO	0.0042	NO	0.5610	NO	0.0624	NO	0.0150	NO	0.0006	NO	0.0434	Y	0.0393	Y
WA-02	02/03/98	62	0.1900	NO	0.0020	NO	0.0007	NO	1.1755	NO	0.1401	NO	0.0098	NO	0.0068	NO	0.9004	NO	0.1001	NO	0.0306	NO	0.0012	NO	0.0696	Y	0.0631	Y
WA-02	02/12/98	48	0.1900	NO	0.0015	NO	0.0006	NO	0.9503	NO	0.1133	NO	0.0076	NO	0.0054	NO	0.7228	NO	0.0804	NO	0.0220	NO	0.0009	NO	0.0559	Y	0.0506	Y
WA-02	03/09/98	43	0.1900	NO	0.0013	NO	0.0005	NO	0.8749	NO	0.1043	NO	0.0069	NO	0.0050	NO	0.6637	NO	0.0738	NO	0.0193	NO	0.0008	NO	0.0513	Y	0.0465	Y
WA-02	03/22/98	66	0.1900	NO	0.0021	NO	0.0007	NO	1.2326	NO	0.1469	NO	0.0103	NO	0.0071	NO	0.9456	NO	0.1051	NO	0.0329	NO	0.0013	NO	0.0731	Y	0.0662	Y

HAMM CREEK RESULTS COMPARED TO WA STATE WQ CRITERIA FOR METALS

Locator	Date	Hardness, Calc	As CHRONIC CRITERIA	TOTAL As > CHRONIC CRITERIA?	Cd ACUTE CRITERIA	DISS Cd > ACUTE CRITERIA?	Cd CHRONIC CRITERIA	DISS Cd > CHRONIC CRITERIA?	Cr ACUTE CRITERIA	DISS Cr > ACUTE CRITERIA?	Cr CHRONIC CRITERIA	DISS Cr > CHRONIC CRITERIA?	Cu ACUTE CRITERIA	DISS Cu > ACUTE CRITERIA?	Cu CHRONIC CRITERIA	DISS Cu > CHRONIC CRITERIA?	Ni ACUTE CRITERIA	DISS Ni > ACUTE CRITERIA?	Ni CHRONIC CRITERIA	DISS Ni > CHRONIC CRITERIA?	Pb ACUTE CRITERIA	DISS Pb > ACUTE CRITERIA?	Pb CHRONIC CRITERIA	DISS Pb > CHRONIC CRITERIA?	Zn ACUTE CRITERIA	DISS Zn > ACUTE CRITERIA?	Zn CHRONIC CRITERIA	DISS Zn > CHRONIC CRITERIA?
WA-03	11/17/95	69	0.1900	NO	0.0022	NO	0.0007	NO	1.2860	NO	0.1533	NO	0.0108	Y	0.0075	Y	0.9879	NO	0.1098	NO	0.0352	NO	0.0014	Y	0.0764	Y	0.0692	Y
WA-03	12/09/95	40	0.1900	NO	0.0012	NO	0.0005	NO	0.8266	NO	0.0985	NO	0.0065	NO	0.0047	Y	0.6259	NO	0.0696	NO	0.0177	NO	0.0007	Y	0.0484	Y	0.0438	Y
WA-03	01/08/96	68	0.1900	NO	0.0022	NO	0.0007	NO	1.2708	NO	0.1515	NO	0.0107	NO	0.0074	NO	0.9759	NO	0.1085	NO	0.0345	NO	0.0013	Y	0.0755	NO	0.0684	NO
WA-03	02/05/96	61	0.1900	NO	0.0019	NO	0.0007	NO	1.1506	NO	0.1371	NO	0.0095	NO	0.0066	NO	0.8807	NO	0.0979	NO	0.0296	NO	0.0012	NO	0.0681	NO	0.0617	NO
WA-03	03/03/96	104	0.1900	NO	0.0035	NO	0.0010	NO	1.7932	NO	0.2137	NO	0.0159	NO	0.0105	NO	1.3928	NO	0.1548	NO	0.0590	NO	0.0023	NO	0.1078	NO	0.0976	NO
WA-03	03/22/96	100	0.1900	NO	0.0034	NO	0.0010	NO	1.7365	NO	0.2070	NO	0.0153	NO	0.0102	NO	1.3473	NO	0.1498	NO	0.0561	NO	0.0022	NO	0.1043	NO	0.0944	NO
WA-03	03/31/96	60	0.1900	NO	0.0019	NO	0.0007	NO	1.1397	NO	0.1358	NO	0.0094	NO	0.0066	NO	0.8721	NO	0.0970	NO	0.0291	NO	0.0011	Y	0.0674	Y	0.0611	Y
WA-03	04/22/96	60	0.1900		0.0019	NO	0.0007	NO	1.1382	NO	0.1357	NO	0.0094	NO	0.0066	Y	0.8709	NO	0.0968	NO	0.0291	NO	0.0011	Y	0.0673	NO	0.0610	NO
WA-03	05/22/96	66	0.1900	NO	0.0021	NO	0.0007	NO	1.2310	NO	0.1467	NO	0.0103	NO	0.0071	NO	0.9444	NO	0.1050	NO	0.0329	NO	0.0013	Y	0.0730	NO	0.0662	Y
WA-03	11/07/97	65	0.1900	NO	0.0021	NO	0.0007	NO	1.2141	NO	0.1447	NO	0.0101	NO	0.0070	NO	0.9310	NO	0.1035	NO	0.0322	NO	0.0013	Y	0.0720	Y	0.0652	Y
WA-03	11/19/97	66	0.1900	NO	0.0021	NO	0.0007	NO	1.2387	NO	0.1476	NO	0.0104	NO	0.0072	NO	0.9504	NO	0.1057	NO	0.0332	NO	0.0013	Y	0.0735	NO	0.0666	NO
WA-03	12/15/97	89	0.1900	NO	0.0030	NO	0.0009	NO	1.5813	NO	0.1885	NO	0.0137	NO	0.0092	NO	1.2232	NO	0.1360	NO	0.0485	NO	0.0019	NO	0.0946	NO	0.0857	NO
WA-03	12/17/97	74	0.1900	NO	0.0024	NO	0.0008	NO	1.3495	NO	0.1609	NO	0.0114	NO	0.0078	NO	1.0384	NO	0.1154	NO	0.0379	NO	0.0015	NO	0.0803	NO	0.0728	NO
WA-03	01/04/98	57	0.1900	NO	0.0018	NO	0.0006	NO	1.0879	NO	0.1297	NO	0.0089	NO	0.0063	NO	0.8312	NO	0.0924	NO	0.0271	NO	0.0011	NO	0.0643	NO	0.0582	NO
WA-03	01/14/98	53	0.1900	NO	0.0017	NO	0.0006	NO	1.0356	NO	0.1234	NO	0.0084	NO	0.0059	NO	0.7899	NO	0.0878	NO	0.0251	NO	0.0010	Y	0.0611	Y	0.0553	Y
WA-03	01/23/98	46	0.1900	NO	0.0014	NO	0.0005	NO	0.9242	NO	0.1102	NO	0.0074	NO	0.0053	NO	0.7024	NO	0.0781	NO	0.0210	NO	0.0008	Y	0.0543	Y	0.0492	Y
WA-03	02/08/98	105	0.1900	NO	0.0036	NO	0.0010	NO	1.8073	NO	0.2154	NO	0.0160	NO	0.0106	NO	1.4041	NO	0.1561	NO	0.0597	NO	0.0023	NO	0.1087	NO	0.0984	NO
WA-03	03/09/98	104	0.1900	NO	0.0035	NO	0.0010	NO	1.7932	NO	0.2137	NO	0.0159	NO	0.0105	NO	1.3928	NO	0.1548	NO	0.0590	NO	0.0023	NO	0.1078	NO	0.0976	NO
WA-03	03/22/98	100	0.1900	NO	0.0034	NO	0.0010	NO	1.7337	NO	0.2066	NO	0.0153	NO	0.0102	NO	1.3451	NO	0.1495	NO	0.0559	NO	0.0022	NO	0.1041	NO	0.0943	NO
WA-04	11/17/95	63	0.1900	NO	0.0020	NO	0.0007	NO	1.1817	NO	0.1409	NO	0.0098	NO	0.0068	NO	0.9053	NO	0.1006	NO	0.0308	NO	0.0012	NO	0.0700	NO	0.0634	NO
WA-04	12/09/95	34	0.1900	NO	0.0010	NO	0.0004	NO	0.7177	NO	0.0855	NO	0.0055	NO	0.0041	NO	0.5409	NO	0.0601	NO	0.0142	NO	0.0006	NO	0.0418	NO	0.0379	NO
WA-04	01/08/96	59	0.1900	NO	0.0019	NO	0.0006	NO	1.1272	NO	0.1344	NO	0.0093	NO	0.0065	NO	0.8622	NO	0.0959	NO	0.0287	NO	0.0011	NO	0.0667	NO	0.0604	NO
WA-04	02/05/96	38	0.1900	NO	0.0011	NO	0.0005	NO	0.7828		0.0933		0.0061	NO	0.0044	Y	0.5916	NO	0.0658	NO	0.0163	NO	0.0006	NO	0.0457	NO	0.0414	NO
WA-04	03/22/96	68	0.1900	NO	0.0022	NO	0.0007	NO	1.2601	NO	0.1502	NO	0.0106	NO	0.0073	NO	0.9674	NO	0.1075	NO	0.0341	NO	0.0013	NO	0.0748	NO	0.0678	NO
WA-04	03/31/96	56	0.1900	NO	0.0018	NO	0.0006	NO	1.0769	NO	0.1284	NO	0.0088	NO	0.0062	NO	0.8225	NO	0.0914	NO	0.0267	NO	0.0010	NO	0.0636	NO	0.0576	NO
WA-04	04/22/96	68	0.1900		0.0022	NO	0.0007	NO	1.2662	NO	0.1509	NO	0.0106	NO	0.0073	NO	0.9722	NO	0.1081	NO	0.0343	NO	0.0013	NO	0.0752	NO	0.0681	NO
WA-04	05/22/96	59	0.1900	NO	0.0019	NO	0.0006	NO	1.1272	NO	0.1344	NO	0.0093	NO	0.0065	NO	0.8622	NO	0.0959	NO	0.0287	NO	0.0011	NO	0.0667	NO	0.0604	NO

HAMM CREEK RESULTS COMPARED TO WA STATE WQ CRITERIA FOR METALS

Locator	Date	Hardness, Calc	As CHRONIC CRITERIA	TOTAL As > CHRONIC CRITERIA?	Cd ACUTE CRITERIA	DISS Cd > ACUTE CRITERIA?	Cd CHRONIC CRITERIA	DISS Cd > CHRONIC CRITERIA?	Cr ACUTE CRITERIA	DISS Cr > ACUTE CRITERIA?	Cr CHRONIC CRITERIA	DISS Cr > CHRONIC CRITERIA?	Cu ACUTE CRITERIA	DISS Cu > ACUTE CRITERIA?	Cu CHRONIC CRITERIA	DISS Cu > CHRONIC CRITERIA?	Ni ACUTE CRITERIA	DISS Ni > ACUTE CRITERIA?	Ni CHRONIC CRITERIA	DISS Ni > CHRONIC CRITERIA?	Pb ACUTE CRITERIA	DISS Pb > ACUTE CRITERIA?	Pb CHRONIC CRITERIA	DISS Pb > CHRONIC CRITERIA?	Zn ACUTE CRITERIA	DISS Zn > ACUTE CRITERIA?	Zn CHRONIC CRITERIA	DISS Zn > CHRONIC CRITERIA?
WA-05	11/17/96	61	0.1900	NO	0.0019	NO	0.0007	NO	1.1615	NO	0.1384	NO	0.0096	NO	0.0067	NO	0.8893	NO	0.0689	NO	0.0300	NO	0.0012	NO	0.0688	NO	0.0623	NO
WA-05	12/09/96	52	0.1900	NO	0.0016	NO	0.0006	NO	1.0196	NO	0.1215	NO	0.0083	NO	0.0058	NO	0.7774	NO	0.0864	NO	0.0245	NO	0.0010	NO	0.0601	NO	0.0544	NO
WA-05	01/08/97	63	0.1900	NO	0.0020	NO	0.0007	NO	1.1894	NO	0.1418	NO	0.0099	NO	0.0069	NO	0.9114	NO	0.1013	NO	0.0311	NO	0.0012	NO	0.0705	NO	0.0638	NO
WA-05	02/05/96	53	0.1900	NO	0.0017	NO	0.0006	NO	1.0356		0.1234		0.0084	NO	0.0059	NO	0.7689	NO	0.0878	NO	0.0251	NO	0.0010	NO	0.0611	NO	0.0553	NO
WA-05	03/03/96	84	0.1900	NO	0.0028	NO	0.0009	NO	1.5113	NO	0.1801	NO	0.0130	NO	0.0088	NO	1.1672	NO	0.1298	NO	0.0452	NO	0.0018	NO	0.0903	NO	0.0818	NO
WA-05	03/22/96	78	0.1900	NO	0.0026	NO	0.0008	NO	1.4212	NO	0.1694	NO	0.0121	NO	0.0083	NO	1.0955	NO	0.1218	NO	0.0411	NO	0.0016	NO	0.0847	NO	0.0768	NO
WA-05	03/31/96	67	0.1900	NO	0.0022	NO	0.0007	NO	1.2479	NO	0.1487	NO	0.0104	NO	0.0072	NO	0.9577	NO	0.1065	NO	0.0336	NO	0.0013	NO	0.0741	NO	0.0671	NO
WA-05	04/22/96	56	0.1900		0.0018	NO	0.0006	NO	1.0801	NO	0.1287	NO	0.0088	NO	0.0062	NO	0.8250	NO	0.0917	NO	0.0268	NO	0.0010	NO	0.0638	NO	0.0578	NO
WA-05	05/22/96	71	0.1900	NO	0.0023	NO	0.0008	NO	1.3163	NO	0.1569	NO	0.0111	NO	0.0076	NO	1.0120	NO	0.1125	NO	0.0365	NO	0.0014	NO	0.0783	NO	0.0709	NO
WA-05	11/07/97	63	0.1900	NO	0.0020	NO	0.0007	NO	1.1817	NO	0.1409	NO	0.0098	NO	0.0068	NO	0.9053	NO	0.1006	NO	0.0308	NO	0.0012	NO	0.0700	NO	0.0634	NO
WA-05	11/18/97	72	0.1900	NO	0.0023	NO	0.0008	NO	1.3254	NO	0.1580	NO	0.0112	NO	0.0077	NO	1.0192	NO	0.1133	NO	0.0369	NO	0.0014	NO	0.0788	NO	0.0714	NO
WA-05	12/15/97	81	0.1900	NO	0.0027	NO	0.0008	NO	1.4553	NO	0.1735	NO	0.0125	NO	0.0085	NO	1.1226	NO	0.1248	NO	0.0426	NO	0.0017	NO	0.0869	NO	0.0787	NO
WA-05	12/17/97	56	0.1900	NO	0.0018	NO	0.0006	NO	1.0801	NO	0.1287	NO	0.0088	NO	0.0062	NO	0.8250	NO	0.0917	NO	0.0268	NO	0.0010	NO	0.0638	NO	0.0578	NO
WA-05	01/04/98	67	0.1900	NO	0.0022	NO	0.0007	NO	1.2494	NO	0.1489	NO	0.0105	NO	0.0072	NO	0.9589	NO	0.1066	NO	0.0336	NO	0.0013	NO	0.0742	NO	0.0672	NO
WA-05	01/14/98	53	0.1900	NO	0.0017	NO	0.0006	NO	1.0324	NO	0.1231	NO	0.0084	NO	0.0059	NO	0.7874	NO	0.0875	NO	0.0250	NO	0.0010	NO	0.0609	NO	0.0551	NO
WA-05	01/23/98	52	0.1900	NO	0.0016	NO	0.0006	NO	1.0084	NO	0.1202	NO	0.0082	NO	0.0058	NO	0.7685	NO	0.0854	NO	0.0241	NO	0.0009	NO	0.0594	NO	0.0538	NO
WA-05	02/06/98	85	0.1900	NO	0.0028	NO	0.0009	NO	1.5245	NO	0.1817	NO	0.0132	NO	0.0089	NO	1.1778	NO	0.1309	NO	0.0458	NO	0.0018	NO	0.0911	NO	0.0825	NO
WA-05	03/08/98	87	0.1900	NO	0.0022	NO	0.0007	NO	1.2494	NO	0.1489	NO	0.0105	NO	0.0072	NO	0.9589	NO	0.1066	NO	0.0336	NO	0.0013	NO	0.0742	NO	0.0672	NO
WA-05	03/22/96	75	0.1900	NO	0.0025	NO	0.0008	NO	1.3765	NO	0.1641	NO	0.0117	NO	0.0080	NO	1.0598	NO	0.1178	NO	0.0391	NO	0.0015	NO	0.0820	NO	0.0743	NO
WG-01	12/09/95	17	0.1900	NO	0.0005	NO	0.0002	NO	0.4029	NO	0.0480	NO	0.0028	NO	0.0022	Y	0.2979	NO	0.0331	NO	0.0058	NO	0.0002	NO	0.0230	Y	0.0208	Y
WG-01	01/06/96	15	0.1900	NO	0.0004	NO	0.0002	NO	0.3692	NO	0.0440	NO	0.0026	NO	0.0020	Y	0.2722	NO	0.0303	NO	0.0051	NO	0.0002	Y	0.0210	Y	0.0190	Y
WG-01	02/05/96	21	0.1900	NO	0.0006	NO	0.0003	NO	0.4912		0.0586		0.0036	NO	0.0027	NO	0.3656	NO	0.0406	NO	0.0079	NO	0.0003	NO	0.0282	NO	0.0256	NO
WG-01	03/22/96	23	0.1900	NO	0.0006	NO	0.0003	NO	0.5155	NO	0.0614	NO	0.0038	NO	0.0029	Y	0.3843	NO	0.0427	NO	0.0085	NO	0.0003	NO	0.0297	Y	0.0269	Y
WG-01	03/31/96	13	0.1900	NO	0.0003	NO	0.0002	NO	0.3307	NO	0.0394	NO	0.0023	Y	0.0018	Y	0.2429	NO	0.0270	NO	0.0043	NO	0.0002	Y	0.0188	Y	0.0170	Y
WG-01	04/22/96	15	0.1900		0.0004	NO	0.0002	NO	0.3732	NO	0.0445	NO	0.0026	NO	0.0020	Y	0.2752	NO	0.0306	NO	0.0051	NO	0.0002	NO	0.0212	Y	0.0192	Y
WG-01	05/22/96	20	0.1900	NO	0.0006	NO	0.0003	NO	0.4686	NO	0.0558	NO	0.0034	Y	0.0026	Y	0.3482	NO	0.0387	NO	0.0073	NO	0.0003	Y	0.0269	NO	0.0244	NO
WG-01	07/18/96	24	0.1900	NO	0.0007	NO	0.0003	NO	0.5433	NO	0.0648	NO	0.0040	Y	0.0030	Y	0.4057	NO	0.0451	NO	0.0092	NO	0.0004	Y	0.0313	Y	0.0284	Y
WG-01	11/07/97	27	0.1900	NO	0.0008	NO	0.0003	NO	0.5870	NO	0.0700	NO	0.0044	Y	0.0033	Y	0.4395	NO	0.0489	NO	0.0104	NO	0.0004	Y	0.0340	NO	0.0308	NO
WG-01	11/19/97	17	0.1900	NO	0.0005	NO	0.0002	NO	0.4029	NO	0.0480	NO	0.0028	NO	0.0022	Y	0.2979	NO	0.0331	NO	0.0058	NO	0.0002	NO	0.0230	Y	0.0208	Y
WG-01	12/16/97	30	0.1900	NO	0.0009	NO	0.0004	NO	0.6478	NO	0.0772	NO	0.0049	NO	0.0036	NO	0.4865	NO	0.0541	NO	0.0121	NO	0.0005	NO	0.0376	NO	0.0340	NO
WG-01	01/04/98	16	0.1900	NO	0.0004	NO	0.0002	NO	0.3832	NO	0.0457	NO	0.0027	NO	0.0021	Y	0.2828	NO	0.0314	NO	0.0054	NO	0.0002	NO	0.0218	Y	0.0198	Y
WG-01	01/14/98	31	0.1900	NO	0.0009	NO	0.0004	NO	0.6672	NO	0.0795	NO	0.0051	NO	0.0038	NO	0.5016	NO	0.0558	NO	0.0127	NO	0.0005	Y	0.0388	NO	0.0351	NO
WG-01	01/23/98	27	0.1900	NO	0.0008	NO	0.0003	NO	0.5870	NO	0.0700	NO	0.0044	NO	0.0033	NO	0.4395	NO	0.0489	NO	0.0104	NO	0.0004	Y	0.0340	NO	0.0308	NO
WG-01	02/08/98	23	0.1900	NO	0.0006	NO	0.0003	NO	0.5211	NO	0.0621	NO	0.0038	NO	0.0029	NO	0.3886	NO	0.0432	NO	0.0086	NO	0.0003	NO	0.0300	NO	0.0272	NO
WG-01	02/12/98	26	0.1900	NO	0.0008	NO	0.0003	NO	0.5834	NO	0.0695	NO	0.0044	NO	0.0033	Y	0.4367	NO	0.0485	NO	0.0103	NO	0.0004	Y	0.0337	NO	0.0306	NO
WG-01	03/09/98	17	0.1900	NO	0.0004	NO	0.0002	NO	0.3990	NO	0.0476	NO	0.0028	NO	0.0022	Y	0.2949	NO	0.0328	NO	0.0057	NO	0.0002	NO	0.0228	NO	0.0206	Y
WG-01	03/22/98	21	0.1900	NO	0.0006	NO	0.0003	NO	0.4742	NO	0.0565	NO	0.0034	Y	0.0026	Y	0.3525	NO	0.0392	NO	0.0075	NO	0.0003	Y	0.0272	NO	0.0247	NO

HAMM CREEK RESULTS COMPARED TO WA STATE WQ CRITERIA FOR METALS

Locator	Date	Hardness, Calc	As CHRONIC CRITERIA	TOTAL As > CHRONIC CRITERIA?	Cd ACUTE CRITERIA	DISS Cd > ACUTE CRITERIA?	Cd CHRONIC CRITERIA	DISS Cd > CHRONIC CRITERIA?	Cr ACUTE CRITERIA	DISS Cr > ACUTE CRITERIA?	Cr CHRONIC CRITERIA	DISS Cr > CHRONIC CRITERIA?	Cu ACUTE CRITERIA	DISS Cu > ACUTE CRITERIA?	Cu CHRONIC CRITERIA	DISS Cu > CHRONIC CRITERIA?	Ni ACUTE CRITERIA	DISS Ni > ACUTE CRITERIA?	Ni CHRONIC CRITERIA	DISS Ni > CHRONIC CRITERIA?	Pb ACUTE CRITERIA	DISS Pb > ACUTE CRITERIA?	Pb CHRONIC CRITERIA	DISS Pb > CHRONIC CRITERIA?	Zn ACUTE CRITERIA	DISS Zn > ACUTE CRITERIA?	Zn CHRONIC CRITERIA	DISS Zn > CHRONIC CRITERIA?
WG-02	12/09/95	9	0.1900	NO	0.0002	Y	0.0002	Y	0.2495	NO	0.0297	NO	0.0016	Y	0.0013	Y	0.1816	NO	0.0202	NO	0.0027	NO	0.0001	Y	0.0140	Y	0.0127	Y
WG-02	01/06/96	9	0.1900	NO	0.0002	Y	0.0002	Y	0.2463	NO	0.0294	NO	0.0016	Y	0.0013	Y	0.1792	NO	0.0199	NO	0.0027	NO	0.0001	Y	0.0138	Y	0.0125	Y
WG-02	02/05/96	10	0.1900	NO	0.0003	Y	0.0002	Y	0.2720	NO	0.0324	NO	0.0018	Y	0.0015	Y	0.1986	NO	0.0221	NO	0.0031	NO	0.0001	Y	0.0153	Y	0.0139	Y
WG-02	03/03/96	13	0.1900	NO	0.0003	Y	0.0002	Y	0.3327	NO	0.0397	NO	0.0023	Y	0.0018	Y	0.2445	NO	0.0272	NO	0.0043	NO	0.0002	Y	0.0189	Y	0.0171	Y
WG-02	03/22/96	14	0.1900	NO	0.0004	Y	0.0002	Y	0.3511	NO	0.0418	NO	0.0024	Y	0.0019	Y	0.2584	NO	0.0287	NO	0.0047	NO	0.0002	Y	0.0199	Y	0.0181	Y
WG-02	03/31/96	8	0.1900	NO	0.0002	Y	0.0001	Y	0.2268	NO	0.0270	NO	0.0015	Y	0.0012	Y	0.1646	NO	0.0183	NO	0.0024	NO	0.0001	Y	0.0127	Y	0.0115	Y
WG-02	04/22/96	19	0.1900		0.0005	Y	0.0003	Y	0.4399	NO	0.0524	NO	0.0031	Y	0.0024	Y	0.3262	NO	0.0363	NO	0.0066	NO	0.0003	Y	0.0252	Y	0.0228	Y
WG-02	05/22/96	8	0.1900	NO	0.0002	Y	0.0001	Y	0.2293	NO	0.0273	NO	0.0015	Y	0.0012	Y	0.1664	NO	0.0185	NO	0.0024	NO	0.0001	Y	0.0128	Y	0.0116	Y
WG-02	11/07/97	16	0.1900	NO	0.0004	Y	0.0002	Y	0.3931	NO	0.0469	NO	0.0028	Y	0.0022	Y	0.2904	NO	0.0323	NO	0.0056	NO	0.0002	Y	0.0224	Y	0.0203	Y
WG-02	11/19/97	9	0.1900	NO	0.0002	Y	0.0001	Y	0.2432	NO	0.0290	NO	0.0016	Y	0.0013	Y	0.1769	NO	0.0197	NO	0.0026	NO	0.0001	Y	0.0136	Y	0.0124	Y
WG-02	12/16/97	9	0.1900	NO	0.0002	Y	0.0001	Y	0.2430	NO	0.0290	NO	0.0016	Y	0.0013	Y	0.1767	NO	0.0196	NO	0.0026	NO	0.0001	Y	0.0136	Y	0.0123	Y
WG-02	01/04/98	6	0.1900	NO	0.0002	Y	0.0001	Y	0.1809	NO	0.0216	NO	0.0011	Y	0.0010	Y	0.1303	NO	0.0145	NO	0.0017	NO	0.0001	Y	0.0100	Y	0.0091	Y
WG-02	01/14/98	13	0.1900	NO	0.0003	Y	0.0002	Y	0.3245	NO	0.0387	NO	0.0022	Y	0.0018	Y	0.2383	NO	0.0265	NO	0.0041	NO	0.0002	Y	0.0184	Y	0.0167	Y
WG-02	01/23/98	8	0.1900	NO	0.0002	Y	0.0001	Y	0.2246	NO	0.0268	NO	0.0015	Y	0.0012	Y	0.1629	NO	0.0181	NO	0.0023	NO	0.0001	Y	0.0126	Y	0.0114	Y
WG-02	02/08/98	9	0.1900	NO	0.0002	Y	0.0001	Y	0.2375	NO	0.0283	NO	0.0015	Y	0.0013	Y	0.1726	NO	0.0192	NO	0.0025	NO	0.0001	Y	0.0133	Y	0.0121	Y
WG-02	02/12/98	17	0.1900	NO	0.0004	Y	0.0002	Y	0.3990	NO	0.0476	NO	0.0028	Y	0.0022	Y	0.2949	NO	0.0328	NO	0.0057	NO	0.0002	Y	0.0228	Y	0.0206	Y
WG-02	03/09/98	16	0.1900	NO	0.0004	Y	0.0002	Y	0.3832	NO	0.0457	NO	0.0027	Y	0.0021	Y	0.2828	NO	0.0314	NO	0.0054	NO	0.0002	Y	0.0218	Y	0.0198	Y
WG-02	03/22/98	20	0.1900	NO	0.0005	Y	0.0003	Y	0.4609	NO	0.0549	NO	0.0033	Y	0.0026	Y	0.3423	NO	0.0381	NO	0.0071	NO	0.0003	Y	0.0264	Y	0.0239	Y
WG-03	12/09/95	3	0.1900	NO	0.0001	Y	0.0001	Y	0.0980	NO	0.0117	NO	0.0006	Y	0.0005	Y	0.0692	NO	0.0077	NO	0.0006	NO	0.0000	Y	0.0053	Y	0.0048	Y
WG-03	01/06/96	4	0.1900	NO	0.0001	Y	0.0001	Y	0.1206	NO	0.0144	NO	0.0007	Y	0.0006	Y	0.0857	NO	0.0095	NO	0.0009	NO	0.0000	Y	0.0066	Y	0.0060	Y
WG-03	02/05/96	5	0.1900	NO	0.0001	Y	0.0001	Y	0.1600	NO	0.0191	NO	0.0010	Y	0.0008	Y	0.1148	NO	0.0128	NO	0.0014	NO	0.0001	Y	0.0088	Y	0.0080	Y
WG-03	03/22/96	6	0.1900	NO	0.0002	Y	0.0001	Y	0.1811	NO	0.0216	NO	0.0011	Y	0.0010	Y	0.1305	NO	0.0145	NO	0.0017	NO	0.0001	Y	0.0101	Y	0.0091	Y
WG-03	03/31/96	5	0.1900	NO	0.0001	Y	0.0001	Y	0.1498	NO	0.0179	NO	0.0009	Y	0.0008	Y	0.1072	NO	0.0119	NO	0.0012	NO	0.0000	Y	0.0083	Y	0.0075	Y
WG-03	04/22/96	4	0.1900		0.0001	Y	0.0001	Y	0.1175	NO	0.0140	NO	0.0007	Y	0.0006	Y	0.0834	NO	0.0093	NO	0.0009	NO	0.0000	Y	0.0064	Y	0.0058	Y
WG-03	05/22/96	4	0.1900	NO	0.0001	Y	0.0001	Y	0.1335	NO	0.0159	NO	0.0008	Y	0.0007	Y	0.0952	NO	0.0106	NO	0.0010	NO	0.0000	Y	0.0073	Y	0.0066	Y
WG-03	11/07/97	8	0.1900	NO	0.0002	Y	0.0001	Y	0.2147	NO	0.0256	NO	0.0014	Y	0.0012	Y	0.1555	NO	0.0173	NO	0.0022	NO	0.0001	Y	0.0120	Y	0.0109	Y
WG-03	11/19/97	5	0.1900	NO	0.0001	NO	0.0001	Y	0.1493	NO	0.0178	NO	0.0009	Y	0.0008	Y	0.1069	NO	0.0119	NO	0.0012	NO	0.0000	Y	0.0082	Y	0.0075	Y
WG-03	12/16/97	5	0.1900	NO	0.0001	Y	0.0001	Y	0.1583	NO	0.0189	NO	0.0010	Y	0.0008	Y	0.1135	NO	0.0126	NO	0.0014	NO	0.0001	Y	0.0088	Y	0.0079	Y
WG-03	02/12/98	5	0.1900	NO	0.0001	Y	0.0001	Y	0.1557	NO	0.0186	NO	0.0010	Y	0.0008	Y	0.1115	NO	0.0124	NO	0.0013	NO	0.0001	Y	0.0086	Y	0.0078	Y
WG-03	03/09/98	6	0.1900	NO	0.0001	Y	0.0001	Y	0.1672	NO	0.0199	NO	0.0010	Y	0.0009	Y	0.1201	NO	0.0134	NO	0.0015	NO	0.0001	Y	0.0093	Y	0.0084	Y
WG-03	04/23/98	12	0.1900	NO	0.0003	Y	0.0002	Y	0.3059	NO	0.0365	NO	0.0021	Y	0.0017	Y	0.2241	NO	0.0249	NO	0.0038	NO	0.0001	Y	0.0173	Y	0.0157	Y

HAMM CREEK RESULTS COMPARED TO WA STATE WQ CRITERIA FOR METALS

Locator	Date	Hardness, Calc	As CHRONIC CRITERIA	TOTAL As > CHRONIC CRITERIA?	Cd ACUTE CRITERIA	DISS Cd > ACUTE CRITERIA?	Cd CHRONIC CRITERIA	DISS Cd > CHRONIC CRITERIA?	Cr ACUTE CRITERIA	DISS Cr > ACUTE CRITERIA?	Cr CHRONIC CRITERIA	DISS Cr > CHRONIC CRITERIA?	Cu ACUTE CRITERIA	DISS Cu > ACUTE CRITERIA?	Cu CHRONIC CRITERIA	DISS Cu > CHRONIC CRITERIA?	Ni ACUTE CRITERIA	DISS Ni > ACUTE CRITERIA?	Ni CHRONIC CRITERIA	DISS Ni > CHRONIC CRITERIA?	Pb ACUTE CRITERIA	DISS Pb > ACUTE CRITERIA?	Pb CHRONIC CRITERIA	DISS Pb > CHRONIC CRITERIA?	Zn ACUTE CRITERIA	DISS Zn > ACUTE CRITERIA?	Zn CHRONIC CRITERIA	DISS Zn > CHRONIC CRITERIA?
WG-04	12/09/95	51	0.1900	NO	0.0016	NO	0.0006	NO	0.9972	NO	0.1189	NO	0.0081	NO	0.0057	NO	0.7597	NO	0.0845	NO	0.0237	NO	0.0009	NO	0.0587	NO	0.0532	NO
WG-04	01/06/96	44	0.1900	NO	0.0013	NO	0.0005	NO	0.8815	NO	0.1051	NO	0.0070	NO	0.0050	NO	0.6688	NO	0.0744	NO	0.0196	NO	0.0008	NO	0.0517	NO	0.0468	NO
WG-04	02/05/96	24	0.1900	NO	0.0007	NO	0.0003	NO	0.5359		0.0639		0.0040	NO	0.0030	Y	0.4000	NO	0.0445	NO	0.0090	NO	0.0004	NO	0.0309	NO	0.0280	NO
WG-04	02/22/96	64	0.1900	NO	0.0021	NO	0.0007	NO	1.2080	NO	0.1440	NO	0.0101	NO	0.0070	NO	0.9261	NO	0.1030	NO	0.0319	NO	0.0012	NO	0.0716	NO	0.0649	NO
WG-04	03/31/96	53	0.1900	NO	0.0017	NO	0.0006	NO	1.0388	NO	0.1238	NO	0.0085	NO	0.0060	NO	0.7925	NO	0.0881	NO	0.0252	NO	0.0010	NO	0.0613	NO	0.0555	NO
WG-04	04/22/96	46	0.1900		0.0014	NO	0.0005	NO	0.9144	NO	0.1090	NO	0.0073	NO	0.0052	NO	0.6946	NO	0.0772	NO	0.0207	NO	0.0008	NO	0.0537	NO	0.0486	NO
WG-04	05/22/96	48	0.1900	NO	0.0015	NO	0.0006	NO	0.9536	NO	0.1137	NO	0.0077	NO	0.0055	NO	0.7254	NO	0.0806	NO	0.0221	NO	0.0009	NO	0.0561	NO	0.0508	NO
WG-04	11/07/97	40	0.1900	NO	0.0012	NO	0.0005	NO	0.8233	NO	0.0981	NO	0.0065	NO	0.0047	NO	0.6232	NO	0.0693	NO	0.0176	NO	0.0007	NO	0.0482	NO	0.0436	NO
WG-04	11/19/97	37	0.1900	NO	0.0011	NO	0.0004	NO	0.7675	NO	0.0915	NO	0.0060	NO	0.0043	NO	0.5797	NO	0.0644	NO	0.0158	NO	0.0006	NO	0.0448	NO	0.0406	NO
WG-04	12/16/97	30	0.1900	NO	0.0009	NO	0.0004	NO	0.6389	NO	0.0762	NO	0.0048	NO	0.0036	NO	0.4797	NO	0.0533	NO	0.0119	NO	0.0005	NO	0.0371	NO	0.0336	NO
WG-04	01/04/98	34	0.1900	NO	0.0010	NO	0.0004	NO	0.7229	NO	0.0862	NO	0.0056	NO	0.0041	NO	0.5449	NO	0.0606	NO	0.0144	NO	0.0006	NO	0.0421	NO	0.0381	NO
WG-04	01/14/98	31	0.1900	NO	0.0009	NO	0.0004	NO	0.6619	NO	0.0789	NO	0.0050	NO	0.0037	NO	0.4975	NO	0.0553	NO	0.0125	NO	0.0005	NO	0.0384	NO	0.0348	NO
WG-04	01/23/98	28	0.1900	NO	0.0008	NO	0.0004	NO	0.6032	NO	0.0719	NO	0.0045	NO	0.0034	NO	0.4520	NO	0.0502	NO	0.0108	NO	0.0004	NO	0.0349	NO	0.0316	NO
WG-04	02/08/98	72	0.1900	NO	0.0023	NO	0.0008	NO	1.3269	NO	0.1582	NO	0.0112	NO	0.0077	NO	1.0204	NO	0.1134	NO	0.0369	NO	0.0014	NO	0.0789	NO	0.0715	NO
WG-04	02/12/98	48	0.1900	NO	0.0015	NO	0.0006	NO	0.9568	NO	0.1140	NO	0.0077	NO	0.0055	NO	0.7279	NO	0.0809	NO	0.0222	NO	0.0009	NO	0.0563	NO	0.0510	NO
WG-04	03/09/98	38	0.1900	NO	0.0011	NO	0.0005	NO	0.7845	NO	0.0935	NO	0.0061	NO	0.0044	NO	0.5929	NO	0.0659	NO	0.0163	NO	0.0006	NO	0.0458	NO	0.0415	NO
WG-04	03/22/98	49	0.1900	NO	0.0015	NO	0.0006	NO	0.9682	NO	0.1154	NO	0.0078	NO	0.0055	NO	0.7369	NO	0.0819	NO	0.0226	NO	0.0009	NO	0.0570	NO	0.0516	NO
WG-05	12/09/95	25	0.1900	NO	0.0007	NO	0.0003	NO	0.5579	NO	0.0665	NO	0.0041	Y	0.0031	Y	0.4170	NO	0.0464	NO	0.0096	NO	0.0004	Y	0.0322	Y	0.0292	Y
WG-05	11/19/97	51	0.1900	NO	0.0016	NO	0.0006	NO	0.9956	NO	0.1187	NO	0.0081	NO	0.0057	Y	0.7584	NO	0.0843	NO	0.0236	NO	0.0009	Y	0.0586	Y	0.0531	Y
WG-06	12/09/95	37	0.1900	NO	0.0011	NO	0.0004	NO	0.7658	NO	0.0913	NO	0.0060	NO	0.0043	Y	0.5783	NO	0.0643	NO	0.0157	NO	0.0006	Y	0.0447	Y	0.0405	Y
WG-06	11/19/97	50	0.1900	NO	0.0016	NO	0.0006	NO	0.9875	NO	0.1177	NO	0.0080	NO	0.0057	NO	0.7521	NO	0.0836	NO	0.0233	NO	0.0009	NO	0.0582	NO	0.0527	NO
WG-06	12/16/97	48	0.1900	NO	0.0015	NO	0.0006	NO	0.9503	NO	0.1133	NO	0.0076	NO	0.0054	NO	0.7228	NO	0.0804	NO	0.0220	NO	0.0009	NO	0.0559	NO	0.0506	NO
WG-06	01/04/98	42	0.1900	NO	0.0013	NO	0.0005	NO	0.8450	NO	0.1007	NO	0.0067	NO	0.0048	Y	0.6402	NO	0.0712	NO	0.0183	NO	0.0007	NO	0.0495	NO	0.0448	NO
WG-06	01/14/98	47	0.1900	NO	0.0015	NO	0.0005	NO	0.9373	NO	0.1117	NO	0.0075	NO	0.0054	NO	0.7126	NO	0.0792	NO	0.0215	NO	0.0008	NO	0.0551	NO	0.0499	NO
WG-06	01/23/98	51	0.1900	NO	0.0016	NO	0.0006	NO	1.0020	NO	0.1194	NO	0.0081	NO	0.0057	NO	0.7635	NO	0.0849	NO	0.0239	NO	0.0009	Y	0.0590	NO	0.0535	NO
WG-06	02/08/98	59	0.1900	NO	0.0019	NO	0.0006	NO	1.1241	NO	0.1340	NO	0.0093	NO	0.0065	NO	0.8597	NO	0.0956	NO	0.0285	NO	0.0011	NO	0.0665	NO	0.0602	NO
WG-06	02/12/98	50	0.1900	NO	0.0015	NO	0.0006	NO	0.9762	NO	0.1164	NO	0.0079	NO	0.0056	NO	0.7432	NO	0.0826	NO	0.0229	NO	0.0009	NO	0.0575	NO	0.0520	NO
WG-06	03/09/98	64	0.1900	NO	0.0020	NO	0.0007	NO	1.2033	NO	0.1434	NO	0.0100	NO	0.0070	NO	0.9224	NO	0.1025	NO	0.0317	NO	0.0012	NO	0.0713	NO	0.0646	NO
WG-06	03/22/98	110	0.1900	NO	0.0038	NO	0.0011	NO	1.8775	NO	0.2238	NO	0.0167	NO	0.0111	NO	1.4605	NO	0.1624	NO	0.0633	NO	0.0025	NO	0.1130	NO	0.1024	NO
WG-07	12/09/95	57	0.1900	NO	0.0018	NO	0.0006	NO	1.0974	NO	0.1308	NO	0.0090	NO	0.0063	NO	0.8387	NO	0.0932	NO	0.0275	NO	0.0011	NO	0.0649	NO	0.0587	Y
WG-08	04/22/96	1020	0.1900		0.0466	NO	0.0061	NO	11.6338	NO	1.3867	NO	0.1363	NO	0.0742	NO	9.6106	NO	1.0684	NO	1.0785	NO	0.0420	NO	0.7460	NO	0.6757	NO
WG-08	05/22/96	75	0.1900	NO	0.0025	NO	0.0008	NO	1.3720	NO	0.1635	NO	0.0117	NO	0.0080	Y	1.0563	NO	0.1174	NO	0.0389	NO	0.0015	NO	0.0817	NO	0.0740	NO
WG-08	07/18/96	471	0.1900	NO	0.0195	NO	0.0033	NO	6.1785	NO	0.7364	NO	0.0858	Y	0.0383	Y	4.9986	NO	0.5557	NO	0.4033	NO	0.0157	NO	0.3876	NO	0.3511	NO
WG-08	11/07/97	75	0.1900	NO	0.0025	NO	0.0008	NO	1.3720	NO	0.1635	NO	0.0117	NO	0.0080	NO	1.0563	NO	0.1174	NO	0.0389	NO	0.0015	NO	0.0817	NO	0.0740	NO
WG-08	11/19/97	266	0.1900	NO	0.0102	NO	0.0021	NO	3.8695	NO	0.4612	NO	0.0384	NO	0.0235	NO	3.0826	NO	0.3427	NO	0.1949	NO	0.0076	NO	0.2389	NO	0.2163	NO
WG-08	12/16/97	65	0.1900	NO	0.0021	NO	0.0007	NO	1.2218	NO	0.1456	NO	0.0102	NO	0.0071	NO	0.9371	NO	0.1042	NO	0.0325	NO	0.0013	Y	0.0725	NO	0.0656	NO
WG-08	04/23/96	160	0.1900	NO	0.0058	NO	0.0014	NO	2.5518	NO	0.3042	NO	0.0238	NO	0.0152	Y	2.0052	NO	0.2229	NO	0.1020	NO	0.0040	NO	0.1553	NO	0.1406	NO

STATISTICIAN'S REPORT

Statistician's Report

South 96th Street/Hamm Creek Source Control Project
Statistical Analysis of Water Quality Monitoring Data

Statistical analysis was conducted to determine if there was statistically significant differences at sites in the Hamm Creek Basin following the institution of programs. In order to reduce the probability of a false finding, the threshold of statistically significant change was set very high (see Section 1). As a result the number of changes found following the Hamm Creek Programs were few. There were some decreases in concentrations in metals, notably zinc, chromium and nickel. Decreases in one or more of these metals were found at sites WA-2, WA-3, WA-5, and WG-4. There were increases at two sites in total suspended solids (WA-02) and nitrite + nitrate nitrogen (WG-01) (see sections 2 and 3).

Method of Statistical Analysis:

The data from Hamm Creek represents two periods of time, one before and one after programs were put in place in Hamm Creek Basin. The "before" and "after" data were compared to see if any changes had occurred in concentrations of pollutants as a result of the programs. The statistical test applied to the data was the Mann-Whitney non-parametric rank test. The Mann-Whitney test was supported by development of box plots for a visual representation of the data.

With statistical tests of several pollutants at several sites a problem of multiple comparisons arises. If each test bears a probability of five per cent error (confidence level of 95%) the probability of error across all tests is much higher than five per cent. In the case of 14 pollutants and nine sites the probability of error with multiple comparisons approaches 100 per cent. That is to say, with that number of comparisons, we are almost guaranteed at least one finding of significant before and after change, just by chance, independent of any program that was initiated. To lower the multiple comparison probability of error, the confidence level of the individual tests was raised to 99.5%. This lowered the probability of error for the multiple comparisons to about 15%.

Results From Sampling Data:

There are five sites where auto-samplers were employed. The site designations for the auto-sampler sites are WA-01, WA-02, WA-03, WA-04, and WA-05. Of these five sites there were two which were not sampled during the period following the implementation of the programs and so did not have any "after" data. Statistical tests could not be applied to those two sites, WA-01 and WA-04. The remaining three sites had data for the following pollutants:

Ammonia, Cadmium (dissolved and total), Copper (dissolved and total), Chromium (dissolved and total), Nickel (dissolved and total), Lead (dissolved and total), Zinc (dissolved and total), TSS, Hardness, total petroleum hydrocarbons, nitrate-nitrite nitrogen, Ph, and total phosphorus.

The results by site were as follows:

WA-01 No results for WA-01. There was no after data.

WA-02 Of the tested pollutants, 3 have statistically significant differences; Cr-dissolved, Cr-total, and Ni-dissolved, which show decreases in concentration.

WA-03 Of the tested pollutants, 1 has a statistically significant decrease in concentration, Ni - dissolved, and 1 has a statistically significant increase in concentration, TSS.

WA-04 No results for WA-04. There was no after data.

WA-05 Of the tested pollutants, 1 has a statistically significant increase in concentration, Total Nitrogen.

WG-01 Of the tested pollutants, 1 has a statistically significant increase in concentration, Total Nitrogen, 1 had a statistically significant decrease, Zn-dissolved.

WG-02 No statistically significant changes.

WG-03 No statistically significant changes.

WG-04 Of the tested there were one pollutant with a statistically significant decrease, Zn-dissolved. (Zn-total was very close to asignificant decrease also.

The remaining grab sample sites did not have enough cases to perform statistical analysis.

1996 AND 1998 SEDIMENT SAMPLE RESULTS

1998 Hamm Creek Sediment Sample Results

Bold = < RDL
Blank = < MDL

HAMM CREEK/ S 96TH

COLLECT DATE = 4/22/98

METALS BY:
METRO 16-02-004
Dry Weight

	Locator		labSampleNum	Total Solids	Total Organic Carbon	Heavy Oil Range (>C24)	Diesell Range (>C12 - C24)	Gasoline Range (C7-C12)	Aluminum, Total, ICP	Arsenic, Total, ICP	Cadmium, Total, ICP	Chromium, Total, ICP	Copper, Total, ICP	Iron, Total, ICP	Lead, Total, ICP	Nickel, Total, ICP	Silver, Total, ICP	Zinc, Total, ICP	Effective Conc., 50%-Mbongx 15
Old dirty apartment complex, very oily sample	SD-01	MULTI-FAMILY	L13244-1	0.544	not done	399000			5590		1.49	19.7	74.4	8070	148	21.3		614	
Lite industrial area, machine shops	SD-02	15TH AV S	L13244-2	0.814	19400	5420		71	9260	6.8	4.34	75.4	334	18100	249	267	0.34	536	760
Truck shop	SD-03	CLARK LIFT	L13244-3	0.540	82800	32000		15.5	10100	5.4	5.37	67	159	24800	307	42.6	1	656	1000
Trucking company	SD-04	10TH AV S	L13244-4	0.485	14600	3730	1460		12200	12	1.62	17.8	53	13900	119	18.5	1.7	239	2100
Truck body shop	SD-05	ALLIED	L13244-5	0.480	123000	15800		44	17000	17	11.8	131	200	42500	279	89.4	0.67	2350	120
single family,no sidewalks	SD-06	RESIDENTIAL	L13244-6	0.697		1160		11	7790		0.42	26.3	29.3	9810	51.9	15.9		111	
catchbasin in grammar school	SD-07	SCHOOL	L13244-7	0.639	29700	388			8590		0.27	17.5	18	14300	9.7	20.2		80.9	8200
Golf Course	SD-08	RANIER GC	L13244-8	0.275	66200	201			19800	11	1.1	40.4	37.1	23500	46.2	48		123	80

	Locator		labSampleNum	2-Methylnaphthalene	4-Methylphenol	Anthracene	Benzo(A)Anthracene	Benzo(A)Pyrene	Benzo(B)Fluoranthene	Benzo(G,H,I)Perylene	Benzo(K)Fluoranthene	Benzoic Acid	Benzyl Butyl Phthalate	Bis(2-Ethylhexyl)Phthalate	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octyl Phthalate	Dibenzo(A,H)Anthracene	Dibenzofuran	Dimethyl Phthalate	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene	N-Nitrosodiphenylamine	Naphthalene	Phenanthrene	Pyrene
Old dirty apartment complex, very oily sample	SD-01	MULTI-FAMILY	L13244-1	4200		3290	6140	7210	8290	9100	2600		16300	69300		4470	4430	2780				6860	2670	3570			4520	26700
Lite industrial area, machine shops	SD-02	15TH AV S	L13244-2			5900	26000	26300	35000	12900	15400		6340	19700	6190	26500	2080		3880			61700	1330	16700			23300	45800
Truck shop	SD-03	CLARK LIFT	L13244-3										9870	52600			3650	3350				1300						1740
Trucking company	SD-04	10TH AV S	L13244-4										10100	13300														
Truck body shop	SD-05	ALLIED	L13244-5										14500	41700		1600	3960	2900			1700	2050					1500	1840
single family,no sidewalks	SD-06	RESIDENTIAL	L13244-6		*Semi volatiles not tested for at SD-06.*								*Pesticides & herbicides tested at SD-06 and SD-08, 319 ug/kg Chlordane found at SD-06.*															
catchbasin in grammar school	SD-07	SCHOOL	L13244-7											12900														
Golf Course	SD-08	RANIER GC	L13244-8											1960								190						

1996 Hamm Creek Sediment Sample Results

Bold = < RDL
Blank = < MDL

HAMM CREEK/ S 96TH

CollectDate 6-Aug-96

METALS BY:
METRO 16-02-004
Dry Weight

	Locator		labSampleNum	Total Solids	Total Organic Carbon	Heavy Oil Range (>C24)	Aluminum, Total, ICP	Arsenic, Total, ICP	Cadmium, Total, ICP	Chromium, Total, ICP	Copper, Total, ICP	Iron, Total, ICP	Lead, Total, ICP	Nickel, Total, ICP	Silver, Total, ICP	Zinc, Total, ICP	Effective Conc., 50%-Mborgx 15
Old dirty apartment complex, very oily sample	SD-01	MULTI-FAMILY	L9159-1	0.64	not done	316000	445		0.375	2.27	24.1	717	19.8	**1.88**		263	
Lite industrial area, machine shops	SD-02	15TH AV S	L9159-2	0.718	33800	11200	10300	11.1	5.64	76.9	212	21300	153	103	5.1	698	
Truck shop	SD-03	CLARK LIFT	L9159-3	0.559	79400	20600	14300	11.3	7.6	80.1	199	31500	379	52.6	1.5	905	215
Trucking company	SD-04	10TH AV S	L9159-4	0.598	82300	7440	14100		2.68	23.7	63.9	19700	109	23.4		346	not toxic
Truck body shop	SD-05	ALLIED	L9159-5	0.416	124000	29300	25000	26.4	15.7	123	202	45000	269	107		2000	4090
single family,no sidewalks	SD-06	RESIDENTIAL	L9159-6	0.677		963	10700	7.39	0.487	35.5	29.7	12700	120	17.3		104	
catchbasin in grammar school	SD-07	SCHOOL	L9159-7	0.821	8390	275	8660			16.1	14.7	12400	8.77	15.3		63.5	2920
Golf Course	SD-08	RANIER GC	L9159-8	0.515	21600	129	17200	9.51	0.388	38.1	23.1	21000	24.3	40.8		86.8	177

	Locator		labSampleNum	2-Methylnaphthalene	4-Methylphenol	Anthracene	Benzo(A)Anthracene	Benzo(A)Pyrene	Benzo(B)Fluoranthene	Benzo(G,H,I)Perylene	Benzo(K)Fluoranthene	Benzoic Acid	Benzyl Butyl Phthalate	Bis(2-Ethylhexyl)Phthalate	Carbazole	Chrysene	Di-N-Butyl Phthalate	Di-N-Octyl Phthalate	Dibenzo(A,H)Anthracene	Dibenzofuran	Dimethyl Phthalate	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene	N-Nitrosodiphenylamine	Naphthalene	Phenanthrene	Pyrene
Old dirty apartment complex, very oily sample	SD-01	MULTI-FAMILY	L9159-1																									
Lite industrial area, machine shops	SD-02	15TH AV S	L9159-2	1160		5950	26300	23800	38900	8470	12800	1040	5450	29900	8130	26200			3680	865		43300	2170	14200			30200	53900
Truck shop	SD-03	CLARK LIFT	L9159-3				614						3350	41300		1790	1060					1790	85.9				961	4240
Trucking company	SD-04	10TH AV S	L9159-4			268	184							4060		375				485		373	824				1010	624
Truck body shop	SD-05	ALLIED	L9159-5	817	601	240	1020						7860			2300	625				1440	2980	385		774	649	2200	4980
single family,no sidewalks	SD-06	RESIDENTIAL	L9159-6		*Semi volatiles not tested for at SD-06.*						*No pesticides or herbicides found at SD-06 or SD-08*																	
catchbasin in grammar school	SD-07	SCHOOL	L9159-7										646	4290		86.5	619	206				93.8					73.1	
Golf Course	SD-08	RANIER GC	L9159-8											346									46.6					111

MICROTOX DISCUSSION

Sandy Kiling

1996 Microtox Discussion

King County
Water Pollution Control Division
Environmental Laboratory
Department of Natural Resources
322 West Ewing Street
Seattle, WA 98119-1507
(206) 684-2300

October 1, 1996

TO: Michael Grigsby, Surface Water Management

FROM: Mary Silva, Laboratory Project Manager
WPCD Environmental Laboratory

SUBJECT: Attached Report for Project 421195CF, Hamm Creek Sediments
Samples L9159-3 - 8. Additional Data

Attached is the Microtox report for the soil samples delivered to the laboratory on August 6, 1996. This data was inadvertently omitted from the report sent on September 19, 1996. The laboratory apologizes for any inconvenience this error may have caused.

Microbiology:

Extraction and Concentration

The samples were delivered to the lab on August 6, 1996. All of the samples were placed into the 4°C refrigerator for preservation. For the next several days starting on August 7, the samples were organically extracted by the following method: The samples were weighed out, in clean sample jars, so that the final weight equaled 10 grams dry weight. This was performed by doing a dry weight to wet weight conversion based on total solids data derived previously.

The samples were then mixed with $NaSO_4$ to dry them. The amount of $NaSO_4$ varied depending on the moisture content of the soil. The samples were mixed with $NaSO_4$ until the sample took on a grainy texture resembling sand. 100 mL of methylene chloride were added to the samples and the samples were placed into a sonifier bath with a mixture of ice and water an inch deep. The samples were sonicated, with frequent stirring, for fifteen minutes and then decanted through a funnel, containing glass wool and NaSO4, into a Kuderna-Danish (K-D) flask with a concentration tube attached to the bottom. 100 mL of methylene chloride were again added and the procedure was repeated two more times.

After the final sonication, the entire contents of the processing jar were placed into the funnel, and the contents and funnel were rinsed with methylene chloride. The collected methylene chloride was then concentrated to approximately 6 mL in the K-D flask by placing the flask in a 100 degrees C water bath. The concentration tubes were removed from the K-D flasks and further concentrated to one mL under nitrogen gas. 100 ul of this final concentrate was placed into three mL of absolute ethanol. This mixture was evaporated with nitrogen gas to about one-half the original volume. This step was performed to evaporate the remaining methylene chloride from the sample, since methylene chloride is acutely toxic. The sample was then brought back to a volume of three mL with absolute ethanol. This was the final extract that was used for Microtox analysis. Along with each extraction batch, an extraction blank was included.

CLEANWATER—A SOUND INVESTMENT

Microtox Analysis

Microtox is a bioassay that uses luminescent bacteria, commonly found in the sea, as the test organism. It measures toxicity by the percentage reduction of light production as a function of sample concentration. These organisms are packaged in a lyophilized state by the Microbics Corp. They are mixed with a reconstitution fluid and become a suspension that can be used for testing.

Small standardized aliquots of the suspended, reconstituted organisms (containing about one million of the organisms) are transferred to a cuvette containing a standard diluent and allowed to stabilize the amount of light production. To these stabilized organisms, varying known concentrations of a suspect toxicant are added, and the resulting loss of light production is monitored. The measure of light reduction is recorded in units called gamma. Gamma is the percentage of light reduction divided by 100 percent minus the percentage of light reduction (%LR/(100%-%LR)). Microtox results are reported in concentrations of toxicant that cause 50% light reduction. This value is called the EC50, or Effective Concentration of the toxicant to reduce the light output by 50%. Concentrations are in the units of ppm or mg/kg; they may also be reported as % of sample. The concentrations are derived from the amount of soil that was originally extracted, and from any subsequent dilution of the extract. The EC50 is measured at different time intervals, and in this case the EC50s were calculated for a fifteen minute exposure to the sample extraction (5,15, and 30 minutes are usually measured for aqueous samples, organic sediment extracts are usually measured at 5 and 15 minutes). The larger the gamma, the larger the reduction in light output. If the sample is toxic, the gammas will become larger as the working concentrations of the sample become larger. If the gamma is converted to natural logs and graphed against the natural logs of the concentrations, generally there will be a linear correlation. This will vary depending on the toxicant. In most of the samples run for these tests the graphs are linear.

The Microtox analysis of the extracted samples and extraction blanks were run according to the standard Microtox procedure for liquid samples. Samples L9159-3 & -7 were diluted 1:10 in water with 2% NaCl and this final concentration was used during the procedure. Sample L9159-8 was diluted 1:20 because at the 1:10 dilution level there was acute toxicity to the test organisms resulting in a total loss of light generating ability by the organisms. pH of the samples were taken from this final dilution.

Data Reduction

To calculate the final EC50s and the linear regression, the mean of the gamma from the extraction blank was subtracted from the sample gammas, at the different concentrations, and this number was then used for the final gamma of the sample. This can be found on the data sheets as Delta Gamma. The natural logs of the Delta Gammas (ln Delta Gammas) were taken, and a linear regression was calculated against the natural log of the concentrations (ln Conc.).

The Adjusted R Square tells the percentage of correlation between the independent variable (the concentration) and the dependent variable (the gammas). If an Adjusted R Square has a value of .90, then 90% of the effect on the resultant gamma values can be explained by changes in the concentration. The closer the Adjusted R Square is to the value one, the larger the correlation between changes in concentration and changes in gammas. This can be seen visually on the graphs.

The natural log of the Delta Gammas was plotted against the natural log of the Concentrations. If the values of the gammas are similar for a given concentration, then only one point (or box) will be displayed

on the graph, due to overlapping of the data points. Generally, if the graph is linear, and the points are close together for a given concentration, then the adjusted R Square will be larger.

For all the samples except for L9159-4 (where a linear regression could not be calculated because the samples had gammas equal to or lower than the blank gammas), the Adjusted R Squares are relatively large and show a good correlation between concentration and gamma. In some of the samples, the gammas are missing for the lower concentrations. This is because in these cases the gamma values were either negative or zero. A negative gamma indicates that the amount of light production actually increased with the introduction of the sample. This is most probably due to the sample having a stimulatory effect on these organisms, either as an energy source at lower dilutions (the ethanol or other organic molecules) or by directly stimulating light production. In other samples the gammas are missing at the higher concentrations. This is due to the toxicity in the samples causing the test organisms to stop producing light and therefore not allowing a gamma to be calculated.

The line equation was used to calculate the EC50s. By definition, the EC50 is the point where the gamma value equals one. Since these data were converted to natural logs, the EC50 would be where y equals zero, or the X-Intercept. The X-intercepts are given on the tables as "Intercept".

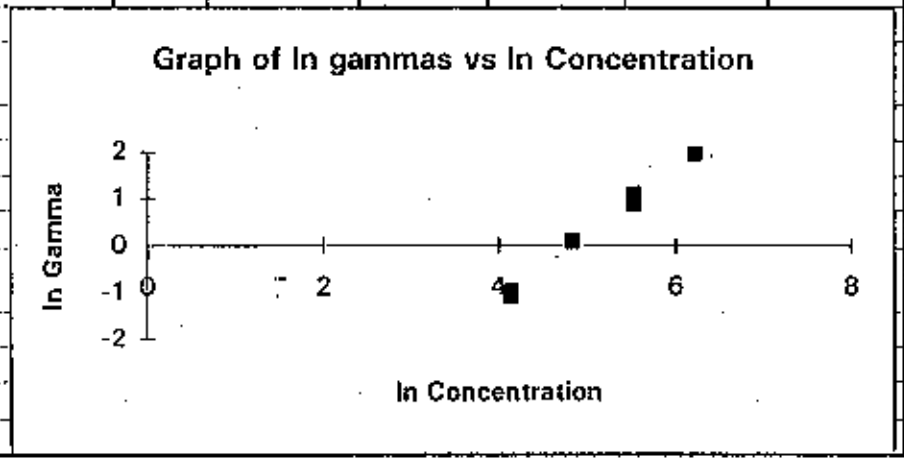
Results

The EC50s are relative values. The samples have inherent toxicity due to suspension in absolute alcohol, concentration of the total organic components, and other unknown factors. Because these samples contained a large amount of petroleum based compounds that were concentrated during extraction, the toxicity in these samples certainly can be attributed in a large part to the high amount of petroleum based products in the samples. Subtraction of the method blank from the sample, in theory, is done to subtract the portion of toxicity due to the absolute alcohol. Portions of the total organic components may not be toxic at dilute levels, but may become toxic when concentrated through the extraction process. The extraction process removes almost all of the organic components from the samples, and depending on the composition of the samples, the amount of organic components could be very large. Since these samples came from catch basins with high amounts of petroleum products, it should be assumed that the sample extracts would contain a large amount of organic components that were concentrated into one mL during the process. Therefore, when interpreting these data, the calculated EC50 value, as a concentration, should not be considered to be absolute. Petroleum products, especially when concentrated, are toxic (and can be extremely toxic) to some microorganisms. Samples L9159-3 & -8 had higher amounts of toxicity than samples L9159- 5 & -7, but again this is relative, and it should be noted that the differences in toxicity between these could not be that substantial. Sample L9159-4 had toxicity less than or equal to the blank extraction control, and therefore by the method used in this laboratory, is considered to be non-toxic. Although sample L9159-4 did contain petroleum based products, the absence of certain types of organic compounds could determine the toxicity.

Ethanol controls were performed each day before the processing of any microtox samples.

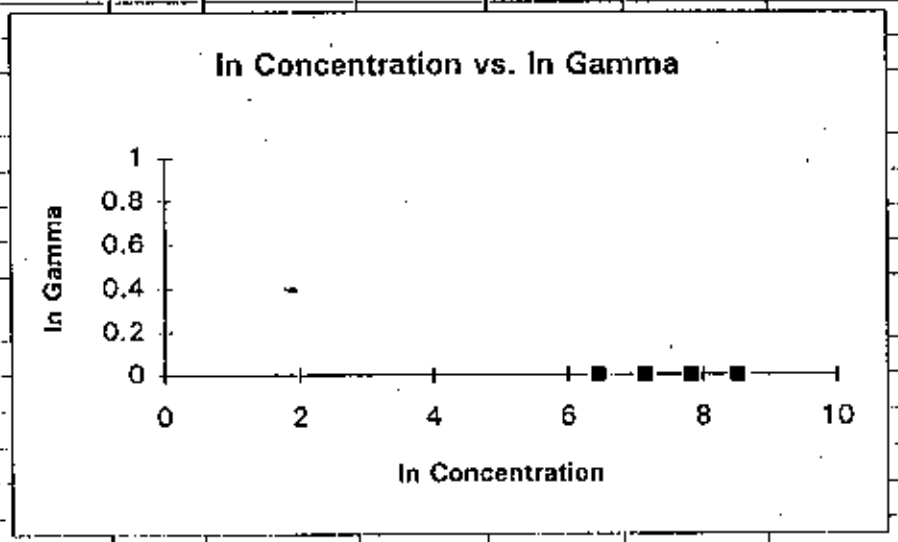
If you have any questions or need additional information, please call me at 684-2359.

Sample Numbers	Conc.	Sample Gammas	Blank Gammas	Delta Gammas	ln Conc.	ln Delta Gammas
9159-3	62.5	0.337	0	0.337	4.13517	-1.0877
	62.5	0.379	0	0.379	4.13517	-0.9702
	125	1.08	0	1.08	4.82831	0.07696
	125	1.103	0	1.103	4.82831	0.09803
	250	3.011	0	3.011	5.52146	1.10227
	250	2.394	0	2.394	5.52146	0.87297
	500	7.103	0	7.103	6.21461	1.96052
	500	7.103	0	7.103	6.21461	1.96052

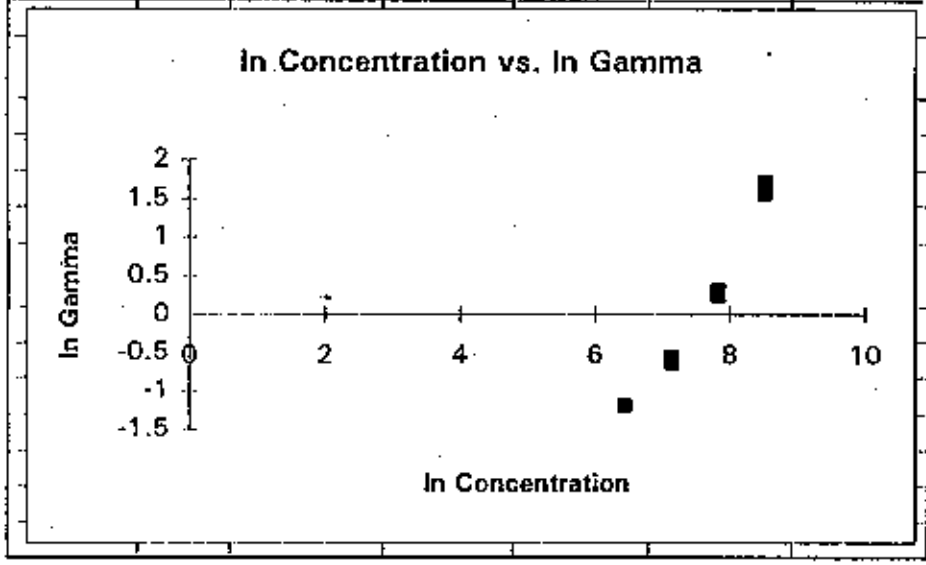


SUMMARY OUTPUT					
Regression Statistics					
Multiple R	0.997337				
R Square	0.994682				
Adjusted R Square	0.993795				
Standard Error	0.065259				
Observations	8				
ANOVA					
	df	*SS*	*MS*	*F*	*ignificance F*
Regression	1	4.778978	4.779	##	4.71E-06
Residual	6	0.025552	0.0043		
Total	7	4.80453			
	Coefficients	*tandard Err*	*t Stat*	*val*	*Lower 95%*
Intercept	4.824396	0.025334	190.43	0	4.7624058
X Variable 1	0.698647	0.020856	33.499	0	0.6476148
EC50	120	124.5112			

Sample Numbers	Conc.	Sample Gammas	Blank Gammas	Delta Gammas	ln Conc.	ln Delta Gammas
9159-4	625	0	0	0	6.43775	0
	625	0	0	0	6.43775	0
	1250	0.092	0.094	-0.002	7.1309	0
	1250	0.023	0.094	-0.071	7.1309	0
	2500	0.33	0.552	-0.222	7.82405	0
	2500	0.28	0.552	-0.272	7.82405	0
	5000	1.571	3.246	-1.675	8.51719	0
	5000	1.549	3.246	-1.697	8.51719	0



Sample Numbers	Conc.	Sample Gammas	Blank Gammas	Delta Gammas	ln Conc.	ln Delta Gammas
9159-5	625	0.343	0	0.343	6.43775	-1.07
	625	0.306	0	0.306	6.43775	-1.1842
	1250	0.662	0.094	0.568	7.1309	-0.5656
	1250	0.625	0.094	0.531	7.1309	-0.633
	2500	1.925	0.552	1.373	7.82405	0.317
	2500	1.827	0.552	1.275	7.82405	0.24295
	5000	8.786	3.246	5.54	8.51719	1.71199
	5000	8.081	3.246	4.835	8.51719	1.57588



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.97868
R Square	0.957815
Adjusted R Square	0.950784
Standard Error	0.183793
Observations	8

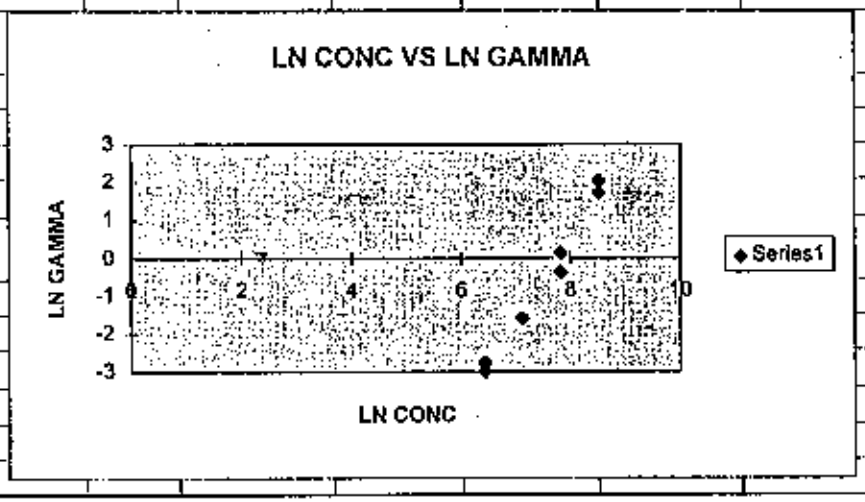
ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	1	4.601852	4.6019	##	2.384E-05
Residual	6	0.202678	0.0338		
Total	7	4.80453			

	Coefficients	*tandard Err*	*t Stat*	*val*	*Lower 95%*
Intercept	7.441812	0.065052	114.4	0	7.2826349
X Variable 1	0.722235	0.061879	11.672	0	0.5708236

EC50	1,700	1705.838

Sample Numbers	Conc.	Sample Gammas	Blank Gammas	Delta Gammas	ln Conc.	ln Delta Gammas
9159-7	625	0.05	0	0.05	6.43775	-2.9957
	625	0.062	0	0.062	6.43775	-2.7806
	1250	0.296	0.094	0.202	7.1309	-1.5995
	1250	0.295	0.094	0.201	7.1309	-1.6045
	2500	1.684	0.552	1.132	7.82405	0.12399
	2500	1.243	0.552	0.691	7.82405	-0.3696
	5000	10.681	3.246	7.435	8.51719	2.0062
	5000	8.711	3.246	5.465	8.51719	1.69836



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.991216
R Square	0.98251
Adjusted R Square	0.979595
Standard Error	0.118344
Observations	8

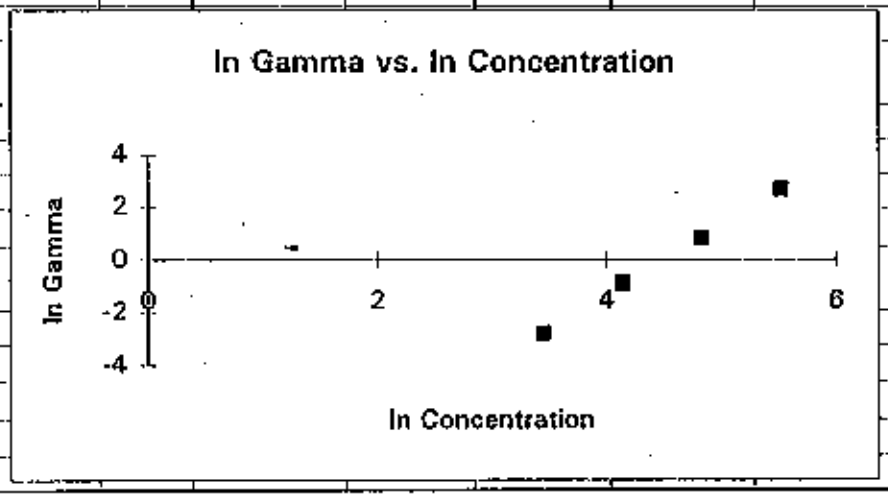
ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	1	4.720499	4.7205	##	1.683E-06
Residual	6	0.084031	0.014		
Total	7	4.80453			

	Coefficients	*tandard Err*	*t Stat*	*val*	*Lower 95%*
Intercept	7.77684	0.044906	173.18	0	7.6669585
X Variable 1	0.433759	0.023626	18.359	0	0.3759467

EC 50	2,400	2384.727

Sample Numbers	Conc.	Sample Gammas	Blank Gammas	Delta Gammas	ln Conc.	ln Delta Gammas
9159-B	31.3	0.056	0	0.056	3.44202	-2.8824
	31.3	0.059	0	0.059	3.44202	-2.8302
	62.5	0.428	0	0.428	4.13517	-0.8486
	62.5	0.383	0	0.383	4.13517	-0.9597
	125	2.277	0	2.277	4.82831	0.82286
	125	2.252	0	2.252	4.82831	0.81182
	250	14.394	0	14.394	5.52146	2.66681
	250	14.213	0	14.213	5.52146	2.65416



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.999611
R Square	0.999221
Adjusted R Square	0.999091
Standard Error	0.024972
Observations	8

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	1	4.800789	4.8008	##	1.476E-10
Residual	6	0.003742	0.0006		
Total	7	4.80453			

	Coefficients	*tandard Err*	*t Stat*	*val*	*Lower 95%*
Intercept	4.508527	0.008834	510.35	0	4.48691
X Variable 1	0.379056	0.00432	87.741	0	0.368485

EC 50 91 90.78799

King County Environmental Lab Analytical Report

PROJECT: 421195CF

Locator:	SD-03	SD-04	SD-05	SD-07
Sampled:	Aug 06, 96	Aug 06, 96	Aug 06, 96	Aug 06, 96
Lab ID:	L9159-3	L9159-4	L9159-5	L9159-7
Matrix:	OTHR SOLID	OTHR SOLID	OTHR SOLID	OTHR SOLID
% Solids:	55.9	59.8	41.6	82.1

Parameters	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units	Value	Qual	MDL	RDL	Units
	Dry Weight Basis					Dry Weight Basis					Dry Weight Basis					Dry Weight Basis				
MICRO																				
M.Code=METRO MC MM 6.6.2																				
Effective Conc., 50%-MBORGX 15	120				mg/Kg	sample is non-toxic		>MR		mg/Kg	1700				mg/Kg	2400				mg/Kg

King County Environmental Lab Analytical Report

PROJECT: 421195CF

Locator:	SD-08
Sampled:	Aug 06, 96
Lab ID:	L9159-8
Matrix:	OTHR SOLID
% Solids:	51.5

Parameters	Value	Qual	MDL	RDL	Units
	Dry Weight Basis				
MICRO					
M.Code=METRO MC MM 6.6.2					
Effective Conc., 50%-MBORGX 15	91				mg/Kg

Laboratory Microtox Discussion, 1998 Samples

Microbiology:

Extraction and Concentration

The samples were delivered to the lab on April 22, 1998. They were placed into the 4°C refrigerator for preservation. On May 22, the samples were organically extracted by the following method: The samples were weighed out, in clean sample jars, so that the final weight equaled 10 grams dry weight. This was calculated by doing a dry weight to wet weight conversion based on total solids data that was previously generated.

The samples were then mixed with $NaSO_4$ to remove moisture. The amount of $NaSO_4$ varied depending on the moisture content of the soil. The samples were mixed with $NaSo_4$ until the sample took a grainy texture resembling sand. 100 mL of methylene chloride was added to the samples and they were placed into a sonifier bath with a mixture of ice and water an inch deep. The samples were sonicated, with frequent stirring, for fifteen minutes and then decanted through a funnel, containing glass wool and $NaSO_4$, into a Kuderna-Danish (K-D) flask with a concentration tube attached. 100 mL of methylene chloride was again added and the procedure was repeated two more times.

After the final sonication the entire contents of the processing jar were placed into the funnel, and the contents and funnel were rinsed with methylene chloride. The collected methylene chloride was then concentrated to approximately 6 mL in the K-D flask by placing the flask in a 100°C water bath. The concentration tubes were removed from the K-D flasks and further concentrated to 1 mL under nitrogen gas. 100ul of this final concentrate was placed into 3 mL of absolute ethanol. This mixture was evaporated with nitrogen gas to about one-half the original volume. This step was performed to evaporate the remaining methylene chloride from the sample, since methylene chloride is acutely toxic. The sample was then brought back to a volume of 3 mL with absolute ethanol. This was the final extract that was used for Microtox analysis. Along with each extraction batch, an extraction blank was included.

Microtox Analysis

Microtox is a bioassay that uses luminescent bacteria, commonly found in the sea, as the test organism. It measures toxicity by the percentage reduction of light production as a function of sample concentration. These organisms are packaged in a lyophilized state by the Azur (Microbics) Corp., are mixed with a reconstitution fluid, and become a suspension that can be used for testing.

Small standardized aliquots of the suspended, reconstituted organisms (containing about one million of the organisms) are transferred to cuvette containing a standard diluent and allowed to stabilize the amount of light production. To these stabilized organisms varying known concentrations of a suspect toxicant are added and the resulting loss of light production over time is monitored. The measure of light reduction is recorded in units called gamma. Gamma is the percentage of light reduction divided by 100 percent minus the percentage of light reduction (%LR/(100%-%LR)).

Microtox results are reported in concentrations of toxicant that cause 50% light reduction. This value is called the EC50, or Effective Concentration of the toxicant to reduce the light output by 50%. Concentrations are in the units of ppm or mg/kg; they may also be reported as % of sample. The concentrations are derived from the amount of soil that was originally extracted, and from any subsequent dilution of the extract. The EC50 is measured at different time intervals, and in this case the EC50s were calculated for a fifteen minute

exposure to the sample extraction (5,15, and 30 minutes are usually measured for aqueous samples, organic sediment extracts are usually measured at 5 and 15 minutes). The larger the gamma, the larger the reduction in light output. If the gamma is converted to logs and graphed against the logs of the concentrations, generally there will be a linear correlation. This will vary depending on the toxicant and the mode of action.

A microtox analysis was performed with an Ethanol Standard before the processing of any microtox sample. Testing a standard confirms and checks the performance of the complete test system (analyzer, Reagent, Diluent and Reconstitution Solution). Screen Assays were run on all samples to identify the optimal dilution range. The Microtox analysis of the samples and extraction blank were run according to the standard Microtox procedure for liquid samples. Samples L13244-2, 3, 4 & 7 were diluted 1:10 in water with 2% NaCl and this final concentration was used during the procedure. Samples L13244-5 & 8 were diluted 1:20 because at the 1:10 dilution level there was acute toxicity to the test organisms resulting in a total loss of light generating ability by the organisms.

Data Reduction & Results

To calculate the final EC50s and the linear regression, the mean of the gamma from the extraction blank was subtracted from the sample gammas, at the different concentrations, and this number was then used for the final gamma of the sample. The log (10) of the final Gammas (L10Gamma) were taken, and a linear regression was calculated against the log (10) of the concentrations (L10 Conc.).

The Adjusted R Square tells the percentage of correlation between the independent variable (the concentration) and the dependent variable (the gammas). If an Adjusted R Square has a value of .90, then 90% of the effect on the resultant gamma values can be explained by changes in the concentration. The closer the Adjusted R Square is to the value one, the greater the correlation between changes in concentration and changes in gammas. This can be seen visually in the graphs. All samples tested demonstrated a linear response.

The Adjusted R Square for these samples range from .834 to .995, which indicates that the correlation between the changes in concentration and in gammas are very close to the value one. See Table (R3)

In the graphs, the log (10) of the final Gammas was plotted against the log (10) of the Concentrations. If the values of the gammas are similar for a given concentration, then only one point (or box) will be displayed on the graph, due to overlapping of the data points. Generally, if the graph is linear, and the points are close together for a given concentration, then the Adjusted R Square will be larger.

A negative gamma indicates that the amount of light production actually increased with the introduction of the sample. In Samples L13244-4, 5, & 7, some of the gamma values were negative. This is probably due to the sample having a stimulatory effect on these organisms, either as an energy source at lower dilutions (the ethanol or other organic molecules) or by directly stimulating light production.

In the graph on Samples L13244-2 and the duplicate sample, notice that the data points for both samples demonstrate similar curves and each clearly shows two linear lines which may be due to two enzymes reacting with one toxicant and producing two EC50s (second order kinetics). A cubic form of these samples was performed and the Adjusted R Square for both lines were .98, which indicates a good correlation of these two EC50s. A toxicant molecule can inhibit the function of an enzyme. Sometimes the differences in enzyme structure can effect and cause a difference in intercepts in a dose-response curve.

The line equation was used to calculate the EC50s. By definition, the EC50 is the point where the gamma value equals one. Since the data was converted to Log (10), the EC50 would be where y equals zero or the X-Intercept. See Table (R4)

Discussion

Because the samples have inherent toxicity due to suspension in absolute alcohol, concentration of the total organic components, and other unknown factors, the EC50s are relative values. The samples may have contained large amounts of organic compounds that were concentrated during extraction; the toxicity in these samples can be attributed to the release of these organic products in the samples by the extraction process. In theory, subtraction of the method blank from the sample is done to subtract the portion of toxicity due to the absolute alcohol. Portions of the total organic components may not be toxic at dilute levels, but may become toxic when concentrated through the extraction process. The extraction process removes almost all of the organic components from the samples, and depending on the composition of the samples, the amount of organic components could be very large. Since these samples came from catch basins with potentially high amounts of petroleum products, it can be assumed that the sample extracts would contain a large amount of organic components that were concentrated into 1mL during the process.

Therefore, when interpreting these data, the calculated EC50 value, as a concentration, should not be considered to be absolute. The EC50 value is calculated based on the toxic response generated by the amount of organic compound extracted from 10 gms of sediment. All the samples tested were toxic. Petroleum products, especially when concentrated, may be toxic (and can be extremely toxic) to some microorganisms; and as with all biological test systems, synergism may play a role in causing a toxic response.

Table R3 (Adjusted R Square for Samples L13244)

Sample Number	Multiple R	R Square	Adjusted R Square	Std. Error of the Estimate	Observations
L13244-2	.926	.858	.834	.1464	8
L13244-3	.967	.936	.925	9.866E-02	8
L13244-4	.960	.922	.909	.1087	8
L13244-5	.993	.986	.984	4.546E-02	8
L13244-7	.949	.901	.876	9.471E-02	8
L13244-8	.998	.986	.983	4.666E-02	8
L13244-2 Lab Dup.	.957	.916	.902	.1124	8

Table R4 (EC 50s for Samples L13244)

Sample Number	**EC 50 mg/kg**
L13244-2	**620**
L13244-3	**560**
L13244-4	**1000**
L13244-5	**59**
L13244-7	**5200**
L13244-8	**22**
Lab Duplicate L13244-2	**500**

Regression: Sample -2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.926[a]	.858	.834	.1464

a. Predictors: (Constant), L10GAMMA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.778	1	.778	36.276	.001[a]
	Residual	.129	6	2.144E-02		
	Total	.906	7			

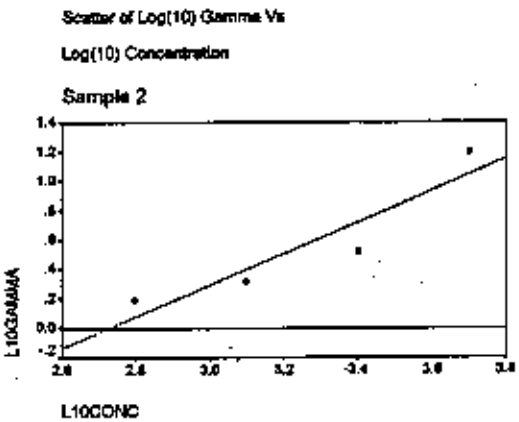
a. Predictors: (Constant), L10GAMMA

b. Dependent Variable: L10CONC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.798	.091		30.835	.000
	L10GAMMA	.804	.134	.926	6.023	.001

a. Dependent Variable: L10CONC



Regression: Sample -3

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.967[a]	.936	.925	9.864E-02

a. Predictors: (Constant), L10GAMMA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.848	1	.848	87.135	.000[a]
	Residual	5.838E-02	6	9.730E-03		
	Total	.906	7			

a. Predictors: (Constant), L10GAMMA

b. Dependent Variable: L10CONC

Coefficients[a]

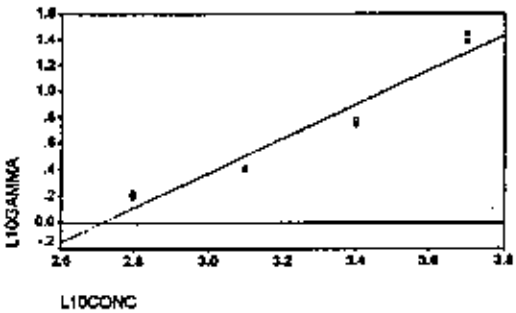
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.750	.064		43.165	.000
	L10GAMMA	.707	.076	.967	9.335	.000

a. Dependent Variable: L10CONC

Scatter of Log (1) Gamma Vs

Log (10) Concentration

Sample -3



Regression: Sample 4

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.960[a]	.922	.909	.1087

a. Predictors: (Constant), L10GAMMA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.835	1	.835	70.657	.000[a]
	Residual	7.093E-02	6	1.182E-02		
	Total	.906	7			

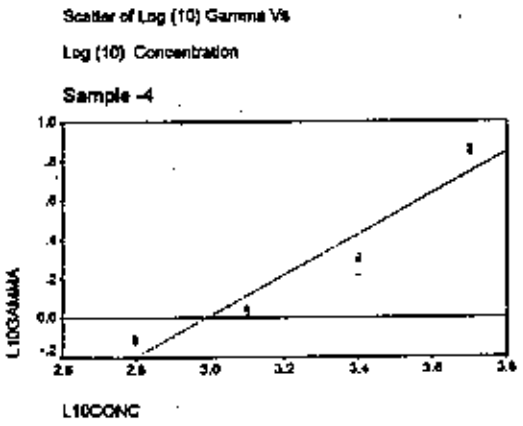
a. Predictors: (Constant), L10GAMMA

b. Dependent Variable: L10CONC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.009	.048		62.933	.000
	L10GAMMA	.879	.105	.960	8.406	.000

a. Dependent Variable: L10CONC



Regression: Sample -7

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.949[a]	.901	.876	9.471E-02

a. Predictors: (Constant), L10GAMMA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.327	1	.327	36.406	.004[a]
	Residual	3.588E-02	4	8.971E-03		
	Total	.362	5			

a. Predictors: (Constant), L10GAMMA

b. Dependent Variable: L10CONC

Coefficients[a]

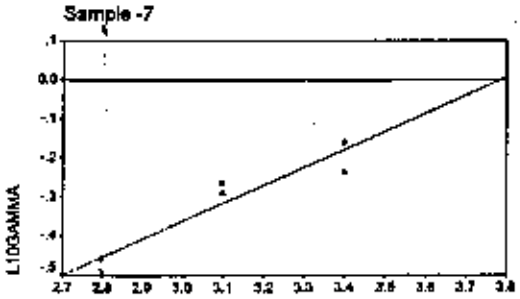
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.717	.110		33.839	.000
	L10GAMMA	1.965	.326	.949	6.034	.004

a. Dependent Variable: L10CONC

Scatter of Log (10) Gamma Vs

Log(10) Concentration

Sample -7



Regression: Sample -5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.993[a]	.986	.984	4.546E-02

a. Predictors: (Constant), L10GAMMA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.894	1	.894	432.576	.000[a]
	Residual	1.240E-02	6	2.066E-03		
	Total	.906	7			

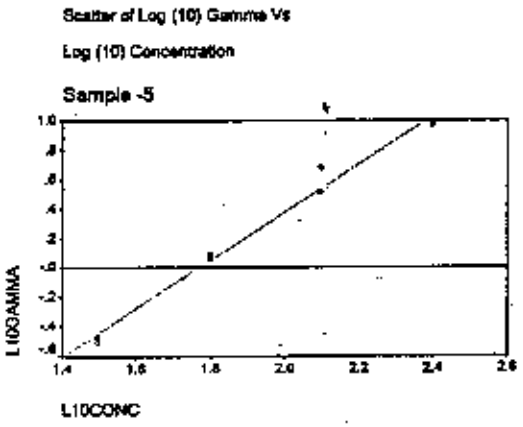
a. Predictors: (Constant), L10GAMMA

b. Dependent Variable: L10CONC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.769	.018		97.315	.000
	L10GAMMA	.605	.029	.993	20.798	.000

a. Dependent Variable: L10CONC



Regression: Sample -8

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.993[a]	.986	.983	4.666E-02

a. Predictors: (Constant), L10GAMMA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.893	1	.893	410.153	.000[a]
	Residual	1.307E-02	6	2.178E-03		
	Total	.906	7			

a. Predictors: (Constant), L10GAMMA

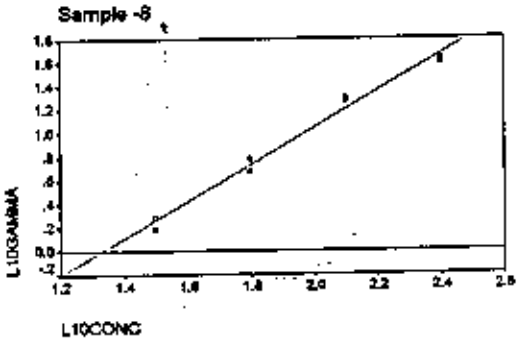
b. Dependent Variable: L10CONC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.337	.034		38.936	.000
	L10GAMMA	.632	.031	.993	20.252	.000

a. Dependent Variable: L10CONC

Scatter of Log (10) Gamma Vs

Log (10) Concentration

Sample -8