

APPENDIX HY-I

Surface Water Quality Data  
Big Basin Redwoods State Park  
Santa Cruz County, California

1997 ANNUAL WATER QUALITY REPORT

To: Water System Customer

From: Big Basin State Park 4410301  
 Water System Name / Number

The following water quality information is provided annually as required by state law. A description of any actions which have been taken to correct water quality problems during 1997 is provided at the end of this report.

Primary Standards: Mandatory Health-Related Standards Established by the State of California, Department of Health Services						
PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	DISTRIBUTION SYSTEM			
<b>MICROBIOLOGICAL</b>						
Coliform Bacteria	No. Samples Positive per Month	1	Range: NA			
	No. of Acute Violations (a)	0	Range: NA			
<b>LEAD AND COPPER RULE</b>						
Lead	mg/L	0.015 (b)	90th Percentile: NA	90th Percentile:		
Copper	mg/L	1.3 (b)	90th Percentile: NA	90th Percentile:		
PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	SURFACE RANGE	WATER AVE	GROUND RANGE	WATER AVE
<b>SURFACE WATER TREATMENT RULE</b>						
Turbidity	NTU	0.5				
<b>ORGANIC CHEMICALS</b>						
Total Trihalomethanes	ug/L	100	ND	⊙		
Benzene	ug/L	1	ND	⊙		
Carbon Tetrachloride	ug/L	0.5	ND	⊙		
1,2-Dichlorobenzene	ug/L	600	ND	⊙		
1,4-Dichlorobenzene	ug/L	5	ND	⊙		
1,1-Dichloroethane	ug/L	5	ND	⊙		
1,2-Dichloroethane	ug/L	0.5	ND	⊙		
1,1-Dichloroethylene	ug/L	6	ND	⊙		
cis-1,2-Dichloroethylene	ug/L	6	ND	⊙		
trans-1,2-Dichloroethylene	ug/L	10	ND	⊙		
Dichloromethane	ug/L	5	ND	⊙		
1,2-Dichloropropane	ug/L	5	ND	⊙		
1,3-Dichloropropene	ug/L	0.5	ND	⊙		
Ethylbenzene	ug/L	700	ND	⊙		
Monochlorobenzene	ug/L	70	ND	⊙		
Styrene	ug/L	100	ND	⊙		
1,1,2,2-Tetrachloroethane	ug/L	1	ND	⊙		
Tetrachloroethylene	ug/L	5	ND	⊙		
Toluene	ug/L	150	ND	⊙		
1,2,4-Trichlorobenzene	ug/L	70	ND	⊙		
1,1,1-Trichloroethane	ug/L	200	ND	⊙		
1,1,2-Trichloroethane	ug/L	5	ND	⊙		
Trichloroethylene	ug/L	5	ND	⊙		
Trichlorofluoromethane	ug/L	150	ND	⊙		
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/L	1200	ND	⊙		
Vinyl Chloride	ug/L	0.5	ND	⊙		
Xylenes	ug/L	1750	ND	⊙		
Alachlor	ug/L	2	ND	⊙		

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PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	SURFACE	WATER	GROUND	WATER
			RANGE	AVE	RANGE	AVE
Atrazine	ug/L	3	ND	⊖		
Bentazon	ug/L	18	ND	⊖		
Benzo(a)pyrene	ug/L	0.2	ND	⊖		
Carbofuran	ug/L	18	ND	⊖		
Chlordane	ug/L	0.1	ND	⊖		
2,4-D	ug/L	70	ND	⊖		
Dalapon	ug/L	200	ND	⊖		
Dibromochloropropane	ug/L	0.2	ND	⊖		
Di(2-ethylhexyl)adipate	ug/L	400	ND	⊖		
Di(2-ethylhexyl)phthalate	ug/L	4	ND	⊖		
Dinoseb	ug/L	7	ND	⊖		
Diquat	ug/L	20	ND	⊖		
Endothall	ug/L	100	ND	⊖		
Endrin	ug/L	2	ND	⊖		
Ethylene Dibromide	ug/L	0.05	ND	⊖		
Glyphosate	ug/L	700	ND	⊖		
Heptachlor	ug/L	0.01	ND	⊖		
Heptachlor Epoxide	ug/L	0.01	ND	⊖		
Hexachlorobenzene	ug/L	1	ND	⊖		
Hexachlorocyclopentadiene	ug/L	50	ND	⊖		
Lindane	ug/L	0.2	ND	⊖		
Methoxychlor	ug/L	40	ND	⊖		
Molinate	ug/L	20	ND	⊖		
Oxamyl	ug/L	200	ND	⊖		
Pentachlorophenol	ug/L	1	ND	⊖		
Pichloram	ug/L	500	ND	⊖		
Polychlorinated Biphenyls	ug/L	0.5	ND	⊖		
Simazine	ug/L	4	ND	⊖		
Thiobencarb	ug/L	70	ND	⊖		
Toxaphene	ug/L	3	ND	⊖		
2,3,7,8-TCDD (Dioxin)	ug/L	0.00003	ND	⊖		
2,4,5-TP (Silvex)	ug/L	50	ND	⊖		
INORGANIC CHEMICALS						
Aluminum	ug/L	1000	ND	⊖		
Antimony	ug/L	8	ND	⊖		
Arsenic	ug/L	50	ND	⊖		
Asbestos	MFL	7	ND	⊖		
Barium	ug/L	1000		33		
Beryllium	ug/L	4	ND	⊖		
Cadmium	ug/L	5		0.071		
Chromium	ug/L	50		2.6		
Cyanide	ug/L	200	ND	⊖		
Fluoride	mg/L	1.4-2.4 (c)	ND	⊖		
Mercury	ug/L	2	ND	⊖		
Nickel	ug/L	100	ND	⊖		
Nitrate (as nitrate)	mg/L	45	ND	⊖		
Nitrate + Nitrite (sum as nitrogen)	ug/L	10000	ND	⊖		
Nitrite (as nitrogen)	ug/L	1000	ND	⊖		
Selenium	ug/L	50		.51		
Thallium	ug/L	2	ND	⊖		

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PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	SURFACE	WATER	GROUND	WATER
			RANGE	AVE	RANGE	AVE
<b>RADIOACTIVITY</b>						
Gross Alpha Activity	pCi/L	15	N/A	N/A		
Gross Beta Activity	pCi/L	50	NA	NA	NA	NA
Tritium	pCi/L	20000	NA	NA	NA	NA
Strontium-90	pCi/L	8	NA	NA	NA	NA
Radium 226 & 228 Combined	pCi/L	5	N/A	N/A		
Uranium	pCi/L	20	N/A	N/A		

Secondary Standards: Aesthetic Standards Established by the State of California, Department of Health Services

PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	SURFACE RANGE	WATER AVE	GROUND RANGE	WATER AVE
Aluminum	ug/L	200	NO	0		
Chloride	mg/L	500		16		
Color	Units	15		80		
Copper	ug/L	1000	NO	0		
Foaming Agents (MBAS)	mg/L	0.5		.032		
Iron	ug/L	300		340		
Manganese	ug/L	50		41		
Odor--Threshold	Units	3	NO	0		
Silver	ug/L	100		N.D.		
Specific Conductance	umhos/cm	1600		150		
Sulfate	mg/L	500		17		
Thiobencarb	ug/L	1	NO	0		
Total Dissolved Solids	mg/L	1000		110		
Turbidity	Units	5		6.3		
Zinc	ug/L	5000	NO	0		

Additional Constituents Analyzed:

PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	SURFACE RANGE	WATER AVE	GROUND RANGE	WATER AVE
pH	Units	No Standard		7.4		
Bicarbonate Alkalinity	mg/L	No Standard		44		
Carbonate Alkalinity	mg/L	No Standard	ND	0		
Hydroxide Alkalinity	mg/L	No Standard	ND	0		
Calcium	mg/L	No Standard		15		
Magnesium	mg/L	No Standard		3		
Sodium	mg/L	No Standard		7.1		
Total Hardness	mg/L	No Standard		56		

ACTIONS TAKEN TO CORRECT OUR WATER SYSTEM QUALITY PROBLEMS

Water Quality Problem	Corrective Action	Date
Excessive Iron in Old Iron Pipes at Upper Residences	Flushing at Upper Residences and at the shops	Every 2 months or as needed.

- (a) Violation of Title 22, Chapter 15, Sections 64426.1(b)(3 or 4).
- (b) Action level at the 90th percentile level.
- (c) Fluoride standard depends on temperature.

mg/L = milligrams per liter (parts per million)  
 ug/L = micrograms per liter (parts per billion)  
 pCi/L = pico Curies per liter  
 MFL = million fibers per liter  
 umhos/cm = micromhos per centimeter

NA = not applicable  
 ND = not detected  
 NR = not required  
 1 mg/L = 1000 ug/L

In addition to the above constituents, we have conducted monitoring for 49 additional organic chemicals for which the California Department of Health Services has not yet set a standard and all results are below detection levels unless otherwise noted.

For further water system information or to inquire about the most recent water quality information available, please contact:

Daniel Carroll  
 Name of Contact

408-358-8875  
 Telephone Number

3/22/98  
 Date of Report

APPENDIX HY-II

Groundwater Water Quality Data  
Big Basin Redwoods State Park  
Santa Cruz County, California



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MCL/Reporting Units	Constituent	Entry #	Analyses Results	DLR
1000 µg/L	Aluminum (Al)	01105	--	50
6.0 µg/L	Antimony	01097	--	6.0
50 µg/L	Arsenic (As)	01002	0.61	2.0
1000 µg/L	Barium (Ba)	01007	23	100
4.0 µg/L	Beryllium	01012	--	1.0
5.0 µg/L	Cadmium (Cd)	01027	0.14	1.0
50 µg/L †	Chromium (Total Cr)	01034	2.1	10
1000 µg/L +	Copper (Cu)	01042	--	50
300 µg/L	Iron (Fe)	01045	3200	100
µg/L	Lead (Pb)	01051	6.4	5.0
50 µg/L	Manganese (Mn)	01055	86	30
2.0 µg/L	Mercury (Hg)	71900	N.D.	1.0
100 µg/L	Nickel	01067	--	10
50 µg/L	Selenium (Se)	01147	2.0	5.0
100 µg/L	Silver (Ag)	01077	N.D.	10
2.0 µg/L	Thallium	01059	--	1.0
5000 µg/L	Zinc (Zn)	01092	--	50

**ADDITIONAL ANALYSES**

NTU	Field Turbidity	82078	--	--
C	Source Temperature	00010	--	--
	Langelier Index Source Temp.	71814	--	--
	Langelier Index at 60 C	71813	--	--
Std. Units	Field pH	00400	--	--
	Aggressiveness Index	82383	--	--
mg/L	Silica	00955	--	--
mg/L	Phosphate	00650	--	--
mg/L	Iodide	71865	--	--
	Sodium Absorption Ratio	00931	--	--
7 MFL	Asbestos (*)	81855	--	0.20
	Boron	01020	--	--
1,000 µg/L	Nitrate as N (Nitrogen)	00618	--	400
10,000 µg/L	Nitrate + Nitrite as N	A-029	--	400
1,000 µg/L	Nitrite as N (Nitrogen)	00620	--	400
200 µg/L	Cyanide	01291	--	100
mg/L	Ammonia	00612	--	--
µg/L	Lithium	01132	--	--
mg/L	Bromide	82298	--	--
mg/L	Bromate	A-027	--	--

**SEQUOIA ANALYTICAL**

† indicates Secondary Drinking Water Standards

\* Detection Limit for Reporting Purposes

  
 Camille G. Alcaide  
 Project Manager

FEB 2 1998



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Date of Report: Jan 28, 1998 Sampler Name: D. Carroll Date/Time Sample Collected: 1/11/98 1500  
Lab Name: Sequoia Analytical Employed by: Big Basin State Park  
Date/Time Sample Received @ Lab: 1/12/98 1825  
Sample ID No.: 9801-481 02 Date Completed: Jan 15, 1998

## ORGANIC CHEMICAL ANALYSES (EPA 515.1)

# RDO

System Name: Big Basin State Park

System Number: \_\_\_\_\_

Name/No. of Sample Source: RDO 4410306

User ID:   _   H   _   E   _   N   _	Station Number:   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _   _
Date/Time of Sample:   9   _   8   _   0   _   1   _   1   _   1   _   1   _   5   _   0   _   0   _	Laboratory Code:   5   _   1   _   1   _   3   _
	Date Analyses Completed:   9   _   8   _   0   _   1   _   1   _   5   _
Submitted by: _____	Phone #: _____

### REGULATED ORGANIC CHEMICALS

Test Method	Constituent ALL CONSTITUENTS REPORTED µg/L	Entry #	Analyses Results	MCL µg/L	* DLR µg/L
EPA 502.2	Bromodichloromethane	32101	--	--	0.50
EPA 502.2	Bromoform	32104	--	--	0.50
EPA 502.2	Chloroform (Trichloromethane)	32106	--	--	0.50
EPA 502.2	Dibromochloromethane	32105	--	--	0.50
EPA 502.2	Total Trihalomethanes (THMs/TTHM)	82080	--	100	0.50
EPA 502.2	Benzene	34030	--	1	0.50
EPA 502.2	Carbon Tetrachloride	32102	--	0.5	0.50
EPA 502.2	1,2-Dichlorobenzene (o-DCB)	34536	--	600	0.50
EPA 502.2	1,4-Dichlorobenzene (p-DCB)	34571	--	5	0.50
EPA 502.2	1,1-Dichloroethane (1,1-DCA)	34496	--	5	0.50
EPA 502.2	1,2-Dichloroethane (1,2-DCA)	34531	--	0.5	0.50
EPA 502.2	1,1-Dichloroethylene (1,1-DCE)	34501	--	6	0.50
EPA 502.2	cis-1,2-Dichloroethylene (c-1,2-DCE)	77093	--	6	0.50
EPA 502.2	trans-1,2-Dichloroethylene (t-1,2-DCE)	34546	--	10	0.50
EPA 502.2	Dichloromethane (Methylene Chloride)	34423	--	5	0.50
EPA 502.2	1,2-Dichloropropane	34541	--	5	0.50
EPA 502.2	Total 1,3-Dichloropropene	34561	--	0.5	0.50
EPA 502.2	Ethyl Benzene	34371	--	700	0.50
EPA 502.2	Monochlorobenzene (Chlorobenzene)	34301	--	70	0.50
EPA 502.2	Styrene	77128	--	100	0.50
EPA 502.2	1,1,2,2-Tetrachloroethane	34516	--	1	0.50
EPA 502.2	Tetrachloroethylene (PCE)	34475	--	5	0.50

\* Detection Limit for Reporting Purposes



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## REGULATED ORGANIC CHEMICALS CONTINUED

Test Method	Constituent ALL CONSTITUENTS REPORTED µg/L	Entry #	Analyses Results	MCL µg/L	* DLR µg/L
EPA 502.2	Toluene	34010	--	150	0.50
EPA 502.2	1,2,4-Trichlorobenzene	34551	--	70	0.50
EPA 502.2	1,1,1-Trichloroethane (1,1,1-TCA)	34506	--	200	0.50
EPA 502.2	1,1,2-Trichloroethane (1,1,2-TCA)	34511	--	5	0.50
EPA 502.2	Trichloroethylene (TCE)	39180	--	5	0.50
EPA 502.2	Trichlorofluoromethane (Freon 11)	34488	--	150	5.0
EPA 502.2	Trichlorotrifluoroethane (Freon 113)	81611	--	1200	10
EPA 502.2	Vinyl Chloride (VC)	39175	--	0.50	0.50
EPA 502.2	m,p Xylene	A-014	--	--	0.50
EPA 502.2	o-Xylene	77135	--	--	0.50
EPA 502.2	Total Xylenes (m,p, & o)	81551	--	1750	0.50
EPA 504	Dibromochloropropane (DBCP)	38761	--	0.2	0.010
EPA 504	Ethylene Dibromide (EDB)	77651	--	0.05	0.020
EPA 505	Endrin	39390	--	2	0.10
EPA 505	Lindane (gamma-BHC)	39340	--	0.2	0.20
EPA 505	Methoxychlor	39480	--	40	10
EPA 505	Toxaphene	39400	--	3	1.0
EPA 505	Chlordane	39350	--	0.10	0.10
EPA 525.2	Diethylhexylphthalate (DEHP)	39100	--	4	3.0
EPA 505	Heptachlor	39410	--	0.010	0.010
EPA 505	Heptachlor epoxide	39420	--	0.010	0.010
EPA 507	Atrazine (AATREX)	39033	--	3	1.0
EPA 507	Molinate (ORDRAM)	82199	--	20	2.0
EPA 507	Simazine (PRINCEP)	39055	--	4	1.0
EPA 507	Thiobencarb (BOLERO)	A-001	--	70	1.0
EPA 505	Alachlor (ALANEX)	77825	--	2	1.0
EPA 515.1	Bentazon (BASAGRAN)	38710	N.D.	18	2.0
EPA 550	Benzo (a) pyrene	34247	--	0.2	0.10
EPA 550	2,3,7,8-TCDD (Dioxin)	34676	--	3E-5	5E-6
EPA 515.1	2,4-D	39730	N.D.	70	10
EPA 515.1	2,4,5-TP (SILVEX)	39045	N.D.	50	1.0
EPA 531.1	Carbofuran (FURADAN)	81405	--	18	5.0
EPA 515.1	Dalapon	38432	N.D.	200	10
EPA 515.1	Dinoseb (DNBP)	81287	N.D.	7.0	2.0
EPA 549	Diquat	78885	--	20	4.0
EPA 525.2	Di (2-ethylhexyl) adipate	A-026	--	400	5.0
EPA 548	Endothal	38926	--	100	45
EPA 547	Glyphosate	79743	--	700	25
EPA 505	Hexachlorobenzene	39700	--	1.0	0.50
EPA 505	Hexachlorocyclopentadiene	34386	--	50	0.50
EPA 531.1	Oxamyl (Vydate)	38865	--	200	20
EPA 515.1	Pentachlorophenol (PCP)	39032	N.D.	1.0	0.20
EPA 515.1	Picloram	39720	N.D.	500	1.0
EPA 505	Polychlorinated Biphenyls (Total PCB's)	39516	--	0.50	0.50

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## UNREGULATED ORGANIC CHEMICALS CONTINUED

Test Method	Constituent ALL CONSTITUENTS REPORTED µg/L	Entry #	Analyses Results	MCL µg/L	* DLR µg/L
EPA 502.2	Bromobenzene	81555	--	--	0.50
EPA 502.2	Bromochloromethane	A-012	--	--	0.50
EPA 502.2	Bromomethane (Methyl Bromide)	34413	--	--	0.50
EPA 502.2	n-Butylbenzene	A-010	--	--	0.50
EPA 502.2	sec-Butylbenzene	77350	--	--	0.50
EPA 502.2	tert-Butylbenzene	77353	--	--	0.50
EPA 502.2	Choroethane	34311	--	--	0.50
EPA 502.2	2-Chloroethylvinyl Ether	34576	--	--	1.0
EPA 502.2	Chloromethane (Methyl Chloride)	34418	--	--	0.50
EPA 502.2	2-Chlorotoluene	A-008	--	--	0.50
EPA 502.2	4-Chlorotoluene	A-009	--	--	0.50
EPA 502.2	Dibromomethane	77596	--	--	0.50
EPA 502.2	1,3-Dichlorobenzene (m-DCB)	34566	--	--	0.50
EPA 502.2	Dichlorodifluoromethane	34668	--	--	1.0
EPA 502.2	1,3-Dichloropropane	77173	--	--	0.50
EPA 502.2	2,2-Dichloropropane	77170	--	--	0.50
EPA 502.2	1,1-Dichloropropene	77168	--	--	0.50
EPA 502.2	Hexachlorobutadiene	34391	--	--	0.50
EPA 502.2	Isopropylbenzene (Cumene)	77223	--	--	0.50
EPA 502.2	p-Isopropyltoluene	A-011	--	--	0.50
EPA 524.2	Naphthalene	34696	--	--	0.50
EPA 502.2	n-Propylbenzene	77224	--	--	0.50
EPA 502.2	1,1,1,2-Tetrachloroethane	77562	--	--	0.50
EPA 502.2	1,2,3-Trichlorobenzene	77613	--	--	0.50
EPA 502.2	1,2,3-Trichloropropane	77443	--	--	0.50
EPA 502.2	1,2,4-Trimethylbenzene	77222	--	--	0.50
EPA 502.2	1,3,5-Trimethylbenzene	77226	--	--	0.50
EPA 524.2	Methyl ethyl ketone (MEK, Butanone)	81595	--	--	5.0
EPA 524.2	Methyl isobutyl ketone (MIBK)	81596	--	--	5.0
EPA 525.2	bis (2-Chloroethyl) ether	34273	--	--	5.0
EPA 531.1	Aldicarb (TEMIK)	39053	--	--	3.0
EPA 531.1	Aldicarb Sulfone	A-020	--	--	4.0
EPA 531.1	Aldicarb Sulfoxide	A-019	--	--	3.0
EPA 505	Aldrin	39330	--	--	0.075
EPA 507	Bromacil (HYVAR)	82198	--	--	10
EPA 507	Butachlor	77860	--	--	0.38
EPA 531.1	Carbaryl (Sevin)	77700	--	--	5.0
EPA 508	Chlorothalonil (DACONIL, BRAVO)	70314	--	--	5.0



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## UNREGULATED ORGANIC CHEMICALS CONTINUED

Test Method	Constituent ALL CONSTITUENTS REPORTED µg/L	Entry #	Analyses Results	MCL µg/L	* DLR µg/L
EPA 507	DiazInon	39570	--	--	0.25
EPA 515.1	Dicamba (BANVEL)	82052	N.D.	--	0.081
EPA 505	Dieldrin	39380	--	--	0.020
EPA 507	Dimethoate (CYGON)	38458	--	--	10
EPA 632	Diuron	39650	--	--	1.0
EPA 531.1	3-Hydroxycarbofuran	A-021	--	--	3.0
EPA 531.1	Methomyl	39051	--	--	2.0
EPA 507	Metolachlor	39356	--	--	--
EPA 507	Metribuzin	81408	--	--	--
EPA 507	Prometryn (CAPAROL)	39057	--	--	2.0
EPA 505	Propachlor	38533	--	--	0.50

\*\* New or revised MCL is pending

Note and describe any additional compounds found: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SEQUOIA ANALYTICAL

Camille G. Alcayde  
Project Manager

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FEB 2 1998

9801-481.BBB <14>





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**Sequoia  
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## NATURE CTR.

### INORGANIC CHEMICALS

MCL/Reporting Units	Constituent	Entry #	Analyses Results	DLR
1000 µg/L	Aluminum (Al)	01105	--	50
6.0 µg/L	Antimony	01097	--	6.0
50 µg/L	Arsenic (As)	01002	0.34	2.0
1000 µg/L	Barium (Ba)	01007	41	100
4.0 µg/L	Beryllium	01012	--	1.0
5.0 µg/L	Cadmium (Cd)	01027	0.021	1.0
50 µg/L †	Chromium (Total Cr)	01034	2.8	10
1000 µg/L +	Copper (Cu)	01042	--	50
300 µg/L	Iron (Fe)	01045	170	100
µg/L	Lead (Pb)	01051	2.7	5.0
50 µg/L	Manganese (Mn)	01055	10	30
2.0 µg/L	Mercury (Hg)	71900	N.D.	1.0
100 µg/L	Nickel	01067	--	10
50 µg/L	Selenium (Se)	01147	1.4	5.0
100 µg/L	Silver (Ag)	01077	N.D.	10
2.0 µg/L	Thallium	01059	--	1.0
5000 µg/L	Zinc (Zn)	01092	--	50

### ADDITIONAL ANALYSES

NTU	Field Turbidity	82078	--	--
C	Source Temperature	00010	--	--
	Langelier Index Source Temp.	71814	--	--
	Langelier Index at 60 C	71813	--	--
Std. Units	Field pH	00400	--	--
	Aggressiveness Index	82383	--	--
mg/L	Silica	00955	--	--
mg/L	Phosphate	00650	--	--
mg/L	Iodide	71865	--	--
	Sodium Absorption Ratio	00931	--	--
7 MFL	Asbestos (*)	81855	--	0.20
	Boron	01020	--	--
1,000 µg/L	Nitrate as N (Nitrogen)	00618	--	400
10,000 µg/L	Nitrate + Nitrite as N	A-029	--	400
1,000 µg/L	Nitrite as N (Nitrogen)	00620	--	400
200 µg/L	Cyanide	01291	--	100
mg/L	Ammonia	00612	--	--
µg/L	Lithium	01132	--	--
mg/L	Bromide	82298	--	--
mg/L	Bromate	A-027	--	--

### SEQUOIA ANALYTICAL

† indicates Secondary Drinking Water Standards

\* Detection Limit for Reporting Purposes

*Camille G. Alcayde*  
Camille G. Alcayde  
Project Manager





# Sequoia Analytical

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 819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 971-9600 FAX (916) 921-0100

Date of Report: Jan 28, 1998 Sampler Name: D. Carroll Date/Time Sample Collected: 1/11/98 1400  
 Lab Name: Sequoia Analytical Employed by: Big Basin State Park  
 Date/Time Sample Received @ Lab: 1/12/98 1825  
 Sample ID No.: 9801-481 03 Date Completed: Jan 15, 1998

## ORGANIC CHEMICAL ANALYSES (EPA 515.1)

# NATURE

System Name: Big Basin State Park  
 Name/No. of Sample Source: SVNC 4410304

System Number: \_\_\_\_\_

# CENTER

User ID: HEUN Station Number: \_\_\_\_\_  
 Date/Time of Sample: 980111400 Laboratory Code: 5113  
Y Y M M D D T T T T  
 Date Analyses Completed: 980115  
Y Y M M D D  
 Submitted by: \_\_\_\_\_ Phone #: \_\_\_\_\_

## REGULATED ORGANIC CHEMICALS

Test Method	Constituent ALL CONSTITUENTS REPORTED µg/L	Entry #	Analyses Results	MCL µg/L	* DLR µg/L
EPA 502.2	Bromodichloromethane	32101	--	--	0.50
EPA 502.2	Bromoform	32104	--	--	0.50
EPA 502.2	Chloroform (Trichloromethane)	32106	--	--	0.50
EPA 502.2	Dibromochloromethane	32105	--	--	0.50
EPA 502.2	Total Trihalomethanes (THMs/TTHM)	82080	--	100	0.50
EPA 502.2	Benzene	34030	--	1	0.50
EPA 502.2	Carbon Tetrachloride	32102	--	0.5	0.50
EPA 502.2	1,2-Dichlorobenzene (o-DCB)	34536	--	600	0.50
EPA 502.2	1,4-Dichlorobenzene (p-DCB)	34571	--	5	0.50
EPA 502.2	1,1-Dichloroethane (1,1-DCA)	34496	--	5	0.50
EPA 502.2	1,2-Dichloroethane (1,2-DCA)	34531	--	0.5	0.50
EPA 502.2	1,1-Dichloroethylene (1,1-DCE)	34501	--	6	0.50
EPA 502.2	cis-1,2-Dichloroethylene (c-1,2-DCE)	77093	--	6	0.50
EPA 502.2	trans-1,2-Dichloroethylene (t-1,2-DCE)	34546	--	10	0.50
EPA 502.2	Dichloromethane (Methylene Chloride)	34423	--	5	0.50
EPA 502.2	1,2-Dichloropropane	34541	--	5	0.50
EPA 502.2	Total 1,3-Dichloropropene	34561	--	0.5	0.50
EPA 502.2	Ethyl Benzene	34371	--	700	0.50
EPA 502.2	Monochlorobenzene (Chlorobenzene)	34301	--	70	0.50
EPA 502.2	Styrene	77128	--	100	0.50
EPA 502.2	1,1,2,2-Tetrachloroethane	34516	--	1	0.50
EPA 502.2	Tetrachloroethylene (PCE)	34475	--	5	0.50

\* Detection Limit for Reporting Purposes

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# NATURE CTR.

## REGULATED ORGANIC CHEMICALS CONTINUED

Test Method	Constituent ALL CONSTITUENTS REPORTED µg/L	Entry #	Analyses Results	MCL µg/L	* DLR µg/L
EPA 502.2	Toluene	34010	--	150	0.50
EPA 502.2	1,2,4-Trichlorobenzene	34551	--	70	0.50
EPA 502.2	1,1,1 Trichloroethane (1,1,1-TCA)	34506	--	200	0.50
EPA 502.2	1,1,2 Trichloroethane (1,1,2-TCA)	34511	--	5	0.50
EPA 502.2	Trichloroethylene (TCE)	39180	--	5	0.50
EPA 502.2	Trichlorofluoromethane (Freon 11)	34488	--	150	5.0
EPA 502.2	Trichlorotrifluoroethane (Freon 113)	81611	--	1200	10
EPA 502.2	Vinyl Chloride (VC)	39175	--	0.50	0.50
EPA 502.2	m,p-Xylene	A-014	--	--	0.50
EPA 502.2	o-Xylene	77135	--	--	0.50
EPA 502.2	Total Xylenes (m,p, & o)	81551	--	1750	0.50
EPA 504	Dibromochloropropane (DBCP)	38761	--	0.2	0.010
EPA 504	Ethylene Dibromide (EDB)	77651	--	0.05	0.020
EPA 505	Endrin	39390	--	2	0.10
EPA 505	Lindane (gamma-BHC)	39340	--	0.2	0.20
EPA 505	Methoxychlor	39480	--	40	10
EPA 505	Toxaphene	39400	--	3	1.0
EPA 505	Chlordane	39350	--	0.10	0.10
EPA 525.2	Diethylhexylphthalate (DEHP)	39100	--	4	3.0
EPA 505	Heptachlor	39410	--	0.010	0.010
EPA 505	Heptachlor epoxide	39420	--	0.010	0.010
EPA 507	Atrazine (AATREX)	39033	--	3	1.0
EPA 507	Molinate (ORDRAM)	82199	--	20	2.0
EPA 507	Simazine (PRINCEP)	39055	--	4	1.0
EPA 507	Thiobencarb (BOLERO)	A-001	--	70	1.0
EPA 505	Alachlor (ALANEX)	77825	--	2	1.0
EPA 515.1	Bentazon (BASAGRAN)	38710	N.D.	18	2.0
EPA 550	Benzo (a) pyrene	34247	--	0.2	0.10
EPA 550	2,3,7,8-TCDD (Dioxin)	34676	--	3E-5	5E-6
EPA 515.1	2,4 D	39730	N.D.	70	10
EPA 515.1	2,4,5-TP (SILVEX)	39045	N.D.	50	1.0
EPA 531.1	Carbofuran (FURADAN)	81405	--	18	5.0
EPA 515.1	Dalapon	38432	N.D.	200	10
EPA 515.1	Dinoseb (DNBP)	81287	N.D.	7.0	2.0
EPA 519	Diquat	78885	--	20	4.0
EPA 525.2	DI (2-ethylhexyl) adipate	A-026	--	400	5.0
EPA 548	Endothal	38926	--	100	45
EPA 547	Glyphosate	79743	--	700	25
EPA 505	Hexachlorobenzene	39700	--	1.0	0.50
EPA 505	Hexachlorocyclopentadiene	34386	--	50	0.50
EPA 531.1	Oxamyl (Vydate)	38865	--	200	20
EPA 515.1	Pentachlorophenol (PCP)	39032	N.D.	1.0	0.20
EPA 515.1	Picloram	39720	N.D.	500	1.0
EPA 505	Polychlorinated Biphenyls (Total PCB's)	39516	--	0.50	0.50

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# NATURE CTR.

## UNREGULATED ORGANIC CHEMICALS CONTINUED

Test Method	Constituent ALL CONSTITUENTS REPORTED µg/L	Entry #	Analyses Results	MCL µg/L	* DLR µg/L
EPA 502.2	Bromobenzene	81555	--	--	0.50
EPA 502.2	Bromochloromethane	A-012	--	--	0.50
EPA 502.2	Bromomethane (Methyl Bromide)	34413	--	--	0.50
EPA 502.2	n-Butylbenzene	A-010	--	--	0.50
EPA 502.2	sec-Butylbenzene	77350	--	--	0.50
EPA 502.2	tert-Butylbenzene	77353	--	--	0.50
EPA 502.2	Choroethane	34311	--	--	0.50
EPA 502.2	2-Chloroethylvinyl Ether	34576	--	--	1.0
EPA 502.2	Chloromethane (Methyl Chloride)	34418	--	--	0.50
EPA 502.2	2-Chlorotoluene	A-008	--	--	0.50
EPA 502.2	4-Chlorotoluene	A-009	--	--	0.50
EPA 502.2	Dibromomethane	77596	--	--	0.50
EPA 502.2	1,3-Dichlorobenzene (m-DCB)	34566	--	--	0.50
EPA 502.2	Dichlorodifluoromethane	34668	--	--	1.0
EPA 502.2	1,3-Dichloropropane	77173	--	--	0.50
EPA 502.2	2,2-Dichloropropane	77170	--	--	0.50
EPA 502.2	1,1-Dichloropropene	77168	--	--	0.50
EPA 502.2	Hexachlorobutadiene	34391	--	--	0.50
EPA 502.2	Isopropylbenzene (Cumene)	77223	--	--	0.50
EPA 502.2	p-Isopropyltoluene	A-011	--	--	0.50
EPA 524.2	Naphthalene	34696	--	--	0.50
EPA 502.2	n-Propylbenzene	77224	--	--	0.50
EPA 502.2	1,1,1,2-Tetrachloroethane	77562	--	--	0.50
EPA 502.2	1,2,3-Trichlorobenzene	77613	--	--	0.50
EPA 502.2	1,2,3-Trichloropropane	77443	--	--	0.50
EPA 502.2	1,2,4-Trimethylbenzene	77222	--	--	0.50
EPA 502.2	1,3,5-Trimethylbenzene	77226	--	--	0.50
EPA 524.2	Methyl ethyl ketone (MEK, Butanone)	81595	--	--	5.0
EPA 524.2	Methyl isobutyl ketone (MIBK)	81596	--	--	5.0
EPA 525.2	bis (2-Chloroethyl) ether	34273	--	--	5.0
EPA 531.1	Aldicarb (TEMIK)	39053	--	--	3.0
EPA 531.1	Aldicarb Sulfone	A-020	--	--	4.0
EPA 531.1	Aldicarb Sulfoxide	A-019	--	--	3.0
EPA 505	Aldrin	39330	--	--	0.075
EPA 507	Bromacil (HYVAR)	82198	--	--	10
EPA 507	Butachlor	77860	--	--	0.38
EPA 531.1	Carbaryl (Sevin)	77700	--	--	5.0
EPA 508	Chlorothalonil (DACONIL, BRAVO)	70314	--	--	5.0





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UNREGULATED ORGANIC CHEMICALS CONTINUED

Test Method	Constituent ALL CONSTITUENTS REPORTED µg/L	Entry #	Analyses Results	MCL µg/L	* DLR µg/L
-------------	---	---------	------------------	----------	------------

EPA 507	Diazinon	39570	--	--	0.25
EPA 515.1	Dicamba (BANVEL)	82052	N.D.	--	0.081
EPA 505	Dieldrin	39380	--	--	0.020
EPA 507	Dimethoate (CYGON)	38458	--	--	10
EPA 632	Diuron	39650	--	--	1.0
EPA 531.1	3-Hydroxycarbofuran	A-021	--	--	3.0
EPA 531.1	Methomyl	39051	--	--	2.0
EPA 507	Metolachlor	39356	--	--	--
EPA 507	Metribuzin	81408	--	--	--
EPA 507	Prometryn (CAPAROL)	39057	--	--	2.0
EPA 505	Propachlor	38533	--	--	0.50

\*\* New or revised MCL is pending

Note and describe any additional compounds found: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SEQUOIA ANALYTICAL

  
Camille G. Alcayde  
Project Manager

FEB 2 1998



APPENDIX HY-III

Dams Located in Watersheds of  
Big Basin Redwoods State Park  
Santa Cruz County, California

# Information About the SEMPERVIRENS Dam



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[OCR 64](#)



[Santa cruz Cty](#)



['S' dams](#)



[Photo?](#)



[Bulletin 17](#)

## General Information

Name	DWR Number	National ID	Owner	Year Completed
SEMPERVIRENS	1-023	CA00013	STATE DEPT OF PARKS AND REC	1951

## Location Information

County	Latitude	Longitude	Crest Elevation	Stream
<a href="#">Santa cruz</a>	37 d, 11.4 m	122 d, 12.4 m	1233 ft 376 m	SEMPERVIRENS CR

Baseline / Meridian	Section	Township	Range
MD	32	8S	3W

## Dam Characteristics

Dam Type	Parapet Type	Crest Length	Total Freeboard	Height
Earth	None	260 ft 79 m	8.0 ft 2.4 m	42 ft 13 m

Material Volume	Parapet Height	Crest Width	Operating Freeboard
46572 cu yd 35606 cu m		12 ft 4 m	

## Reservoir Characteristics

Storage Capacity	Drainage Area	Reservoir Area
78 acre-ft 96 sq dm	0.36 sq mi 0.93 sq km	4 acre 2 hect

# Information About the MILL CREEK Dam



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[OCR 47](#)



[Santa cruz Cty](#)



['M' dams](#)



[Photo?](#)



[Bulletin 17](#)

## General Information

Name	DWR Number	National ID	Owner	Year Completed
MILL CREEK	630-000	CA00688	LOCKHEED MISSILES & SPACE CO	1889

## Location Information

County	Latitude	Longitude	Crest Elevation	Stream
<a href="#">Santa cruz</a>	37 d, 7.0 m	122 d, 12.6 m	1487 ft 453 m	MILL CREEK

Baseline / Meridian	Section	Township	Range
MD	29	9S	3W

## Dam Characteristics

Dam Type	Parapet Type	Crest Length	Total Freeboard	Height
Hydraulic Fill	None	250 ft 76 m	15.5 ft 4.7 m	76 ft 23 m

Material Volume	Parapet Height	Crest Width	Operating Freeboard
		35 ft 11 m	13 ft 4 m

## Reservoir Characteristics

Storage Capacity	Drainage Area	Reservoir Area
223 acre-ft 275 sq dm	0.94 sq mi 2.43 sq km	12 acre 5 hect

# Information About the GREEN OAKS NO 1 Dam


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[OCR 27](#)

[San mateo Cty](#)

['G' dams](#)

[Photo?](#)

[Bulletin 17](#)

## General Information

Name	DWR Number	National ID	Owner	Year Completed
GREEN OAKS NO 1	1604-002	CA01010	CAPITOLA INVESTMENTS INC	1936

## Location Information

County	Latitude	Longitude	Crest Elevation	Stream
San mateo	37 d, 7.5 m	122 d, 18.9 m	107 ft 32 m	GREEN OAKS CREEK

Baseline / Meridian	Section	Township	Range
MD	29	9S	4W

## Dam Characteristics

Dam Type	Parapet Type	Crest Length	Total Freeboard	Height
Earth	None	880 ft 268 m	6.0 ft 1.8 m	39 ft 12 m

Material Volume	Parapet Height	Crest Width	Operating Freeboard
42934 cu yd 32825 cu m		12 ft 4 m	3 ft 0 m

## Reservoir Characteristics

Storage Capacity	Drainage Area	Reservoir Area
322 acre-ft 397 sq dm	1.10 sq mi 2.85 sq km	22 acre 9 hect

# Information About the COASTWAYS Dam



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[OCR 14](#)



[San mateo Cty](#)



['C' dams](#)



[Photo?](#)



[Bulletin 17](#)

## General Information

Name	DWR Number	National ID	Owner	Year Completed
COASTWAYS	1600-000	CA01007	MR JON D HUDSON	1951

## Location Information

County	Latitude	Longitude	Crest Elevation	Stream
<a href="#">San mateo</a>	37 d, 7.0 m	122 d, 18.1 m	117 ft 35 m	TR ANO NUEVO CREEK

Baseline / Meridian	Section	Township	Range
MD	28	9S	4W

## Dam Characteristics

Dam Type	Parapet Type	Crest Length	Total Freeboard	Height
Earth	None	1000 ft 305 m	5.3 ft 1.6 m	46 ft 14 m

Material Volume	Parapet Height	Crest Width	Operating Freeboard
20000 cu yd 15290 cu m		25 ft 8 m	2 ft 0 m

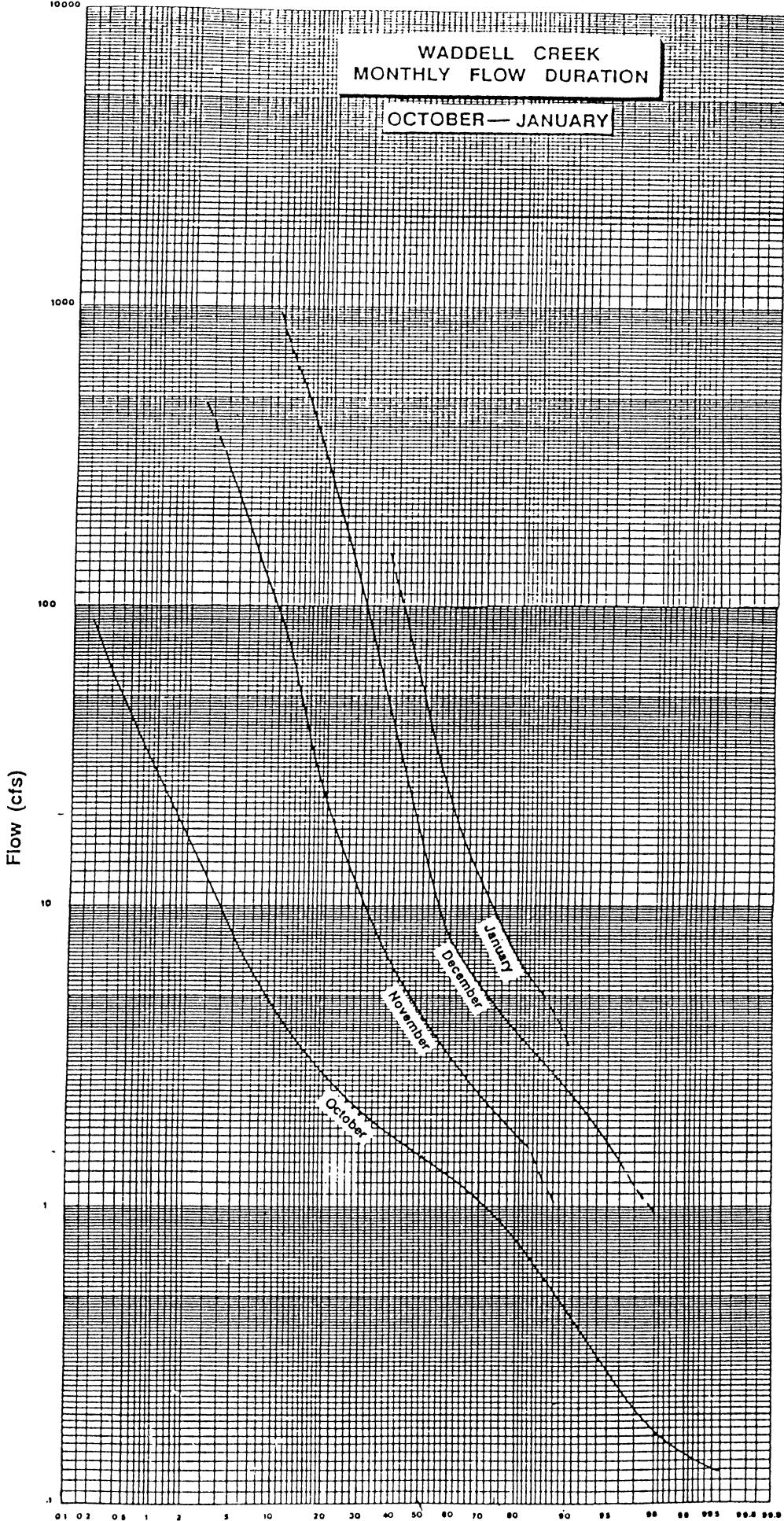
## Reservoir Characteristics

Storage Capacity	Drainage Area	Reservoir Area
100 acre-ft 123 sq dm	0.12 sq mi 0.31 sq km	9 acre 4 hect

APPENDIX HY-IV

Flow Duration Curves for Waddell Creek  
Big Basin Redwoods State Park  
Santa Cruz County, California

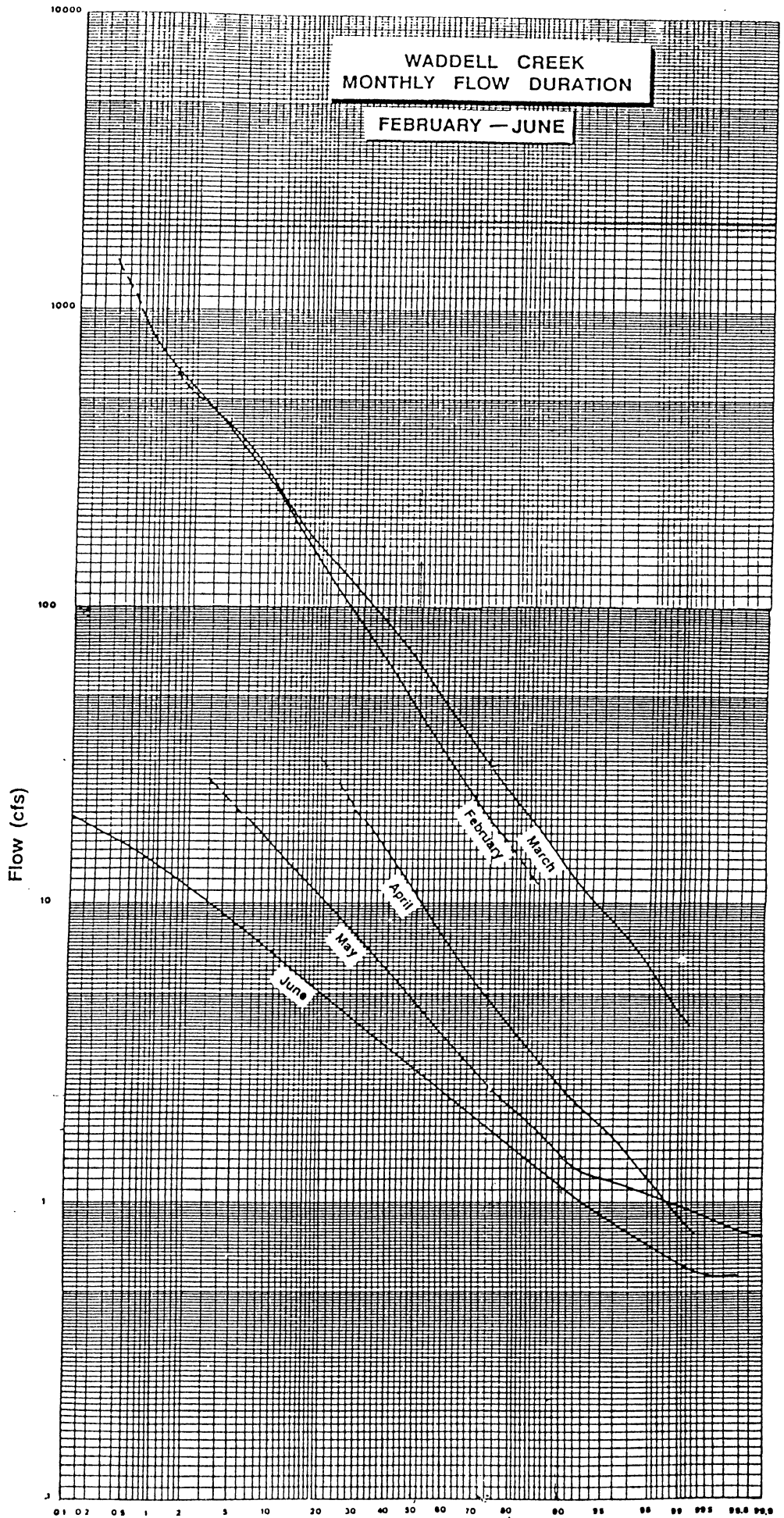
WADDELL CREEK  
MONTHLY FLOW DURATION  
OCTOBER — JANUARY





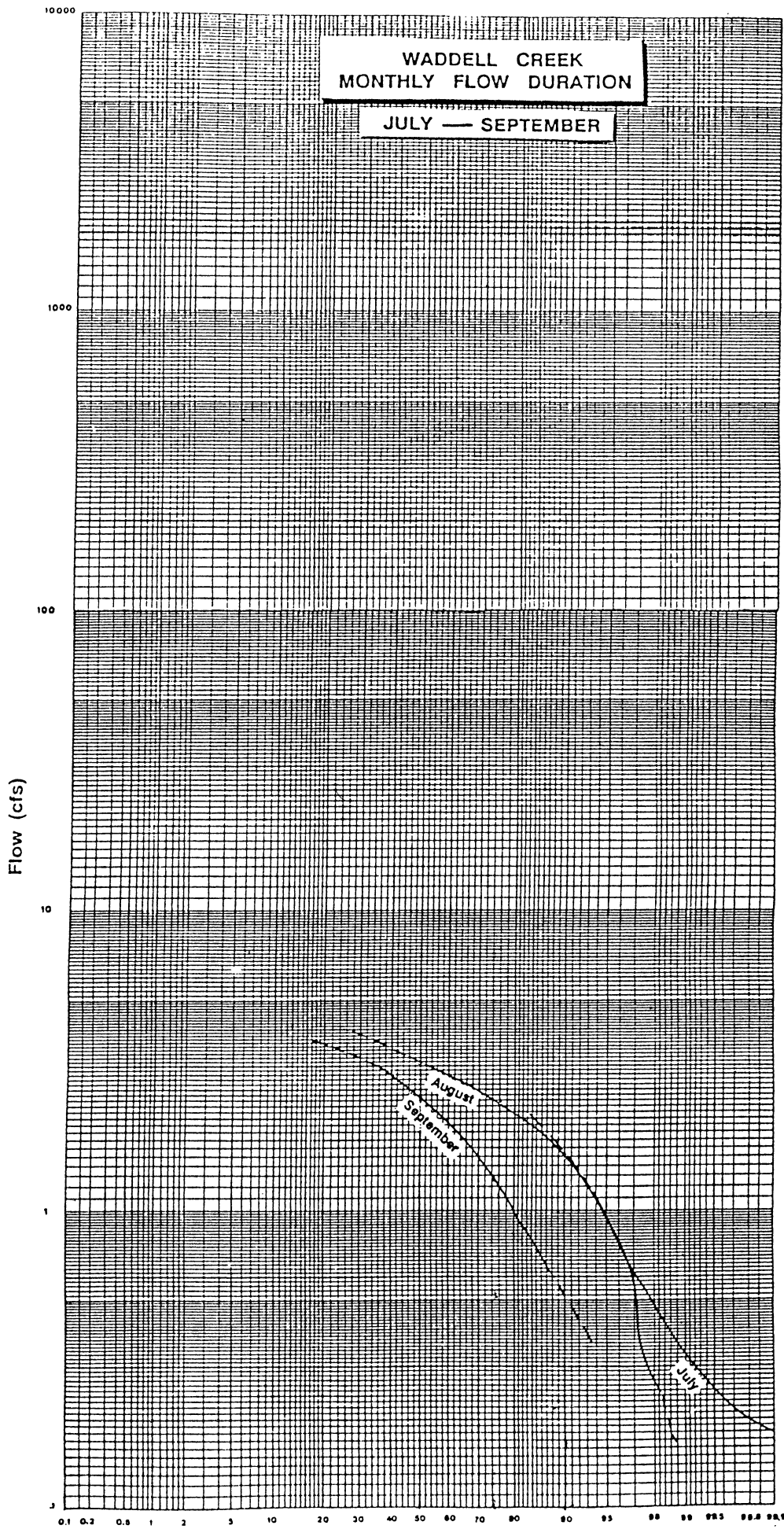
WADDELL CREEK  
MONTHLY FLOW DURATION

FEBRUARY - JUNE



WADDELL CREEK  
MONTHLY FLOW DURATION

JULY — SEPTEMBER



APPENDIX HY-V

Figures & Tables of  
Absolute and Relative Waddell Creek Flow  
Santa Cruz County, California



01-Apr						
02-Apr		21.47				
03-Apr						
04-Apr				27.9		
05-Apr	11.55					
06-Apr						
07-Apr						
08-Apr		20.35				
09-Apr				19.987		
10-Apr						
11-Apr						
12-Apr	11.17	5.2		4.9		
13-Apr						
14-Apr				15.67		
15-Apr				15.54	42	10.5
16-Apr						
17-Apr						
18-Apr		11.78				
19-Apr						
20-Apr	11.09					
21-Apr				5.37		
22-Apr						
23-Apr						
24-Apr			3.17			
25-Apr		9.05				
26-Apr						
27-Apr	9.09					
28-Apr						
29-Apr						
30-Apr						
01-May				4.3		
02-May						
03-May						
04-May				7.66		
05-May						
06-May						
07-May	7.15					
08-May						
09-May			4.85			
10-May				3.87		
11-May	6.78					
12-May						
13-May						
14-May				3.5	6.3	
15-May						22
16-May						5.4
17-May						
18-May						
19-May	6.07					
20-May						
21-May		4.49		5.35		
22-May						
23-May						
24-May						
25-May						
26-May	5.16		3.87	5.05		
27-May						
28-May						
29-May					3.19	
30-May				4.35		
31-May		8.53		5.07		
01-Jun			3.31			
02-Jun						
03-Jun						
04-Jun						
05-Jun					1.77	
06-Jun						
07-Jun		4.19				
08-Jun						
09-Jun				5.94		
10-Jun						
11-Jun			2.65	4.06		
12-Jun					1.48	
13-Jun						
14-Jun						
15-Jun			3.47			14
16-Jun			2.33			3.16
17-Jun						
18-Jun						
19-Jun	4.22					
20-Jun	4.33					
21-Jun			3.42	2.57	1.7	
22-Jun						
23-Jun			2.3			
24-Jun					1.9	
25-Jun		1.93				
26-Jun		5.05				
27-Jun						
28-Jun				3.44	1.38	
29-Jun				2.65		
30-Jun			6.43	3.09		
01-Jul						
02-Jul					1.33	
03-Jul						
04-Jul						
05-Jul						



10-Oct										
11-Oct				0.78						
12-Oct					1.31	1.53				
13-Oct										
14-Oct	3.32									
15-Oct									3.5	1
16-Oct							0.82			4.5
17-Oct										4
18-Oct										5
19-Oct					1.43	12.6				4
20-Oct										4.5
21-Oct										5
22-Oct										3.5
23-Oct										
24-Oct		1.88						23.54		
25-Oct				0.83						
26-Oct								17.82		
27-Oct				5.48						
28-Oct				1.53						
29-Oct				2.45				17.27		
30-Oct										
31-Oct				1.9						
01-Nov			2.91	1.61						
02-Nov								15.45		
03-Nov								15.81		
04-Nov										
05-Nov										
06-Nov				1.47						
07-Nov										
08-Nov										
09-Nov										
10-Nov										
11-Nov										
12-Nov										
13-Nov				1.25				13.53		
14-Nov										
15-Nov										
16-Nov										
17-Nov										
18-Nov										
19-Nov										
20-Nov								12.03		
21-Nov										
22-Nov				2.29						
23-Nov										
24-Nov										
25-Nov	2.97									
26-Nov										
27-Nov										
28-Nov										
29-Nov								10.58		
30-Nov				1.16						
01-Dec				1.28						
02-Dec										
03-Dec										
04-Dec								9.7		
05-Dec										
06-Dec										
07-Dec										
08-Dec										
09-Dec										
10-Dec								8.54		
11-Dec				1.28						
12-Dec										
13-Dec										
14-Dec										
15-Dec										
16-Dec										
17-Dec								7.17		
18-Dec										
19-Dec										
20-Dec										
21-Dec										
22-Dec				1.65						
23-Dec										
24-Dec										
25-Dec										
26-Dec								6.9		
27-Dec										
28-Dec										
29-Dec										
30-Dec										
31-Dec				12.9						

ANNUAL MINIMUM FLOW, WADDELL CREEK, A & B BRIGGS

Year	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	MEAN
Min. cfs	-	-	-	1.16	1.32	1.14	0.78	1.31	1.27	0.53	1.07
Date				sept 30	Oct 3	Sept 11	Oct 11	Oct 12	sept 24	Sept 6	
RAINFALL in.				23.65	44.43	28.28	21.66	20.96	25.95	26.32	27.32

Date	Rainfall	Min Q	Max Q	SEPT. Q	August Q	June Q
1934	26	0.7	278	0.9	0.9	2.5
1935	21	2	625	2.5	4.5	14
1936	32	1	1590	4.5	5	15
1937	40	3	1390	5	5.5	15
1938	41	2	1540	5	5	6
1939	51	4	114	4	6	5
1940	24	5	114	4.5	4.5	20
1941	45	4	2500	5	6	20
1942	61		1800	10	15	25
Ave.	37.88889			4.14	5.24	0 12.25

June  
Regression Output:  
Constant 8.196935  
Std Err of Y Est 7.944393  
R Squared 0.061788  
No. of Observations 9  
Degrees of Freedom 7

X Coefficient(s) 0.142896  
Std Err of Coef. 0.21046

	Precip.	Sept.	Aug.
1988	26.32		
1989	25.95		
1990	20.96		
1991	21.66		
1992	28.28		
1993	44.33		
1994	23.65	44.43	28.28
1995	44.43	21.66	20.96
1996	28.28	3	4.5
1997	21.66	2.3	4
1998		2	2.6
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			

Aug. Regression Output:  
Constant -2.59435  
Std Err of Y Est 2.483197  
R Squared 0.61962  
No. of Observations 9  
Degrees of Freedom 7

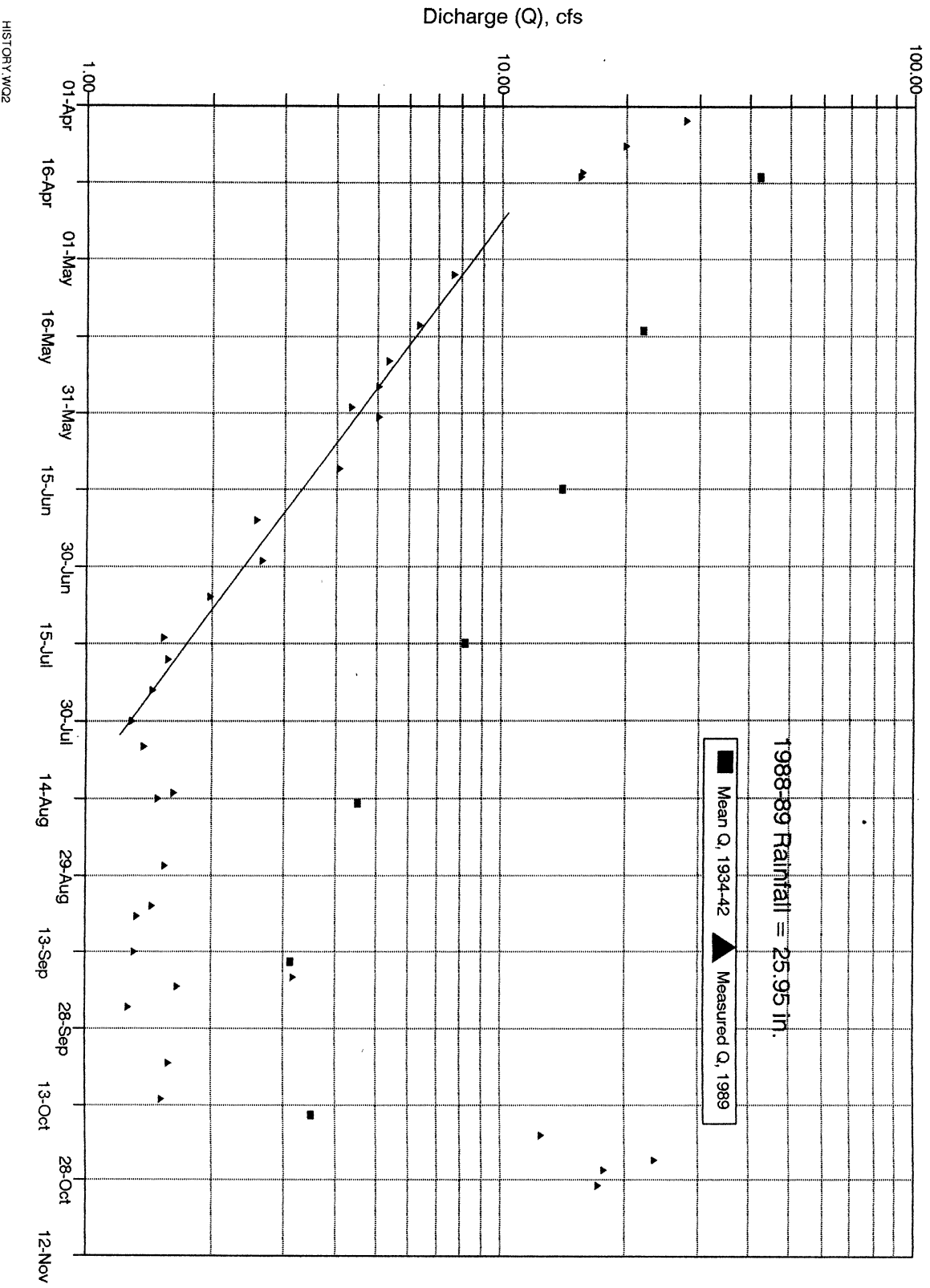
X Coefficient(s) 0.222138  
Std Err of Coef. 0.065784

June Regression Output:  
Constant 8.196935  
Std Err of Y Est 7.944393  
R Squared 0.061788  
No. of Observations 9  
Degrees of Freedom 7

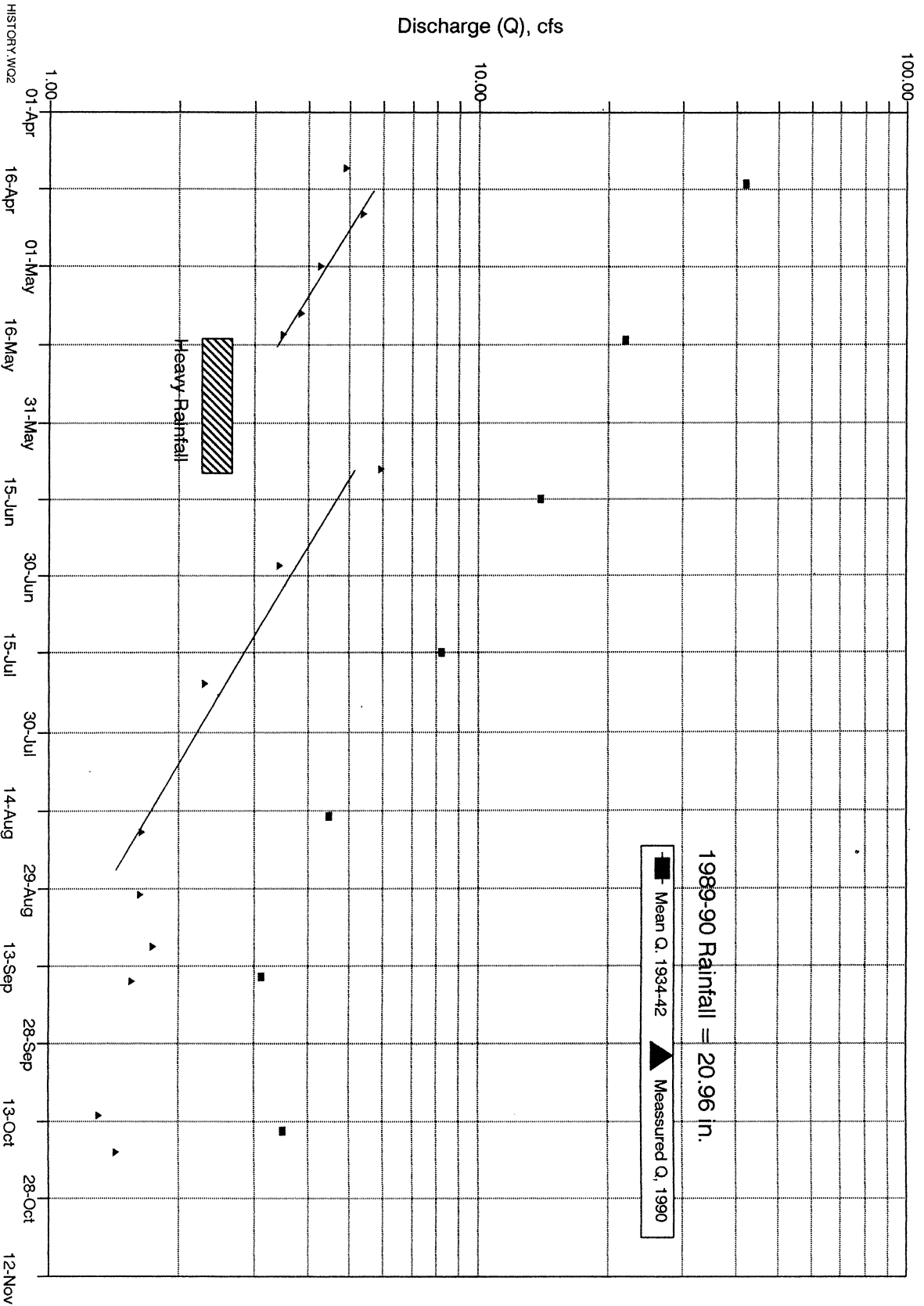
X Coefficient(s) 0.142896  
Std Err of Coef. 0.21046



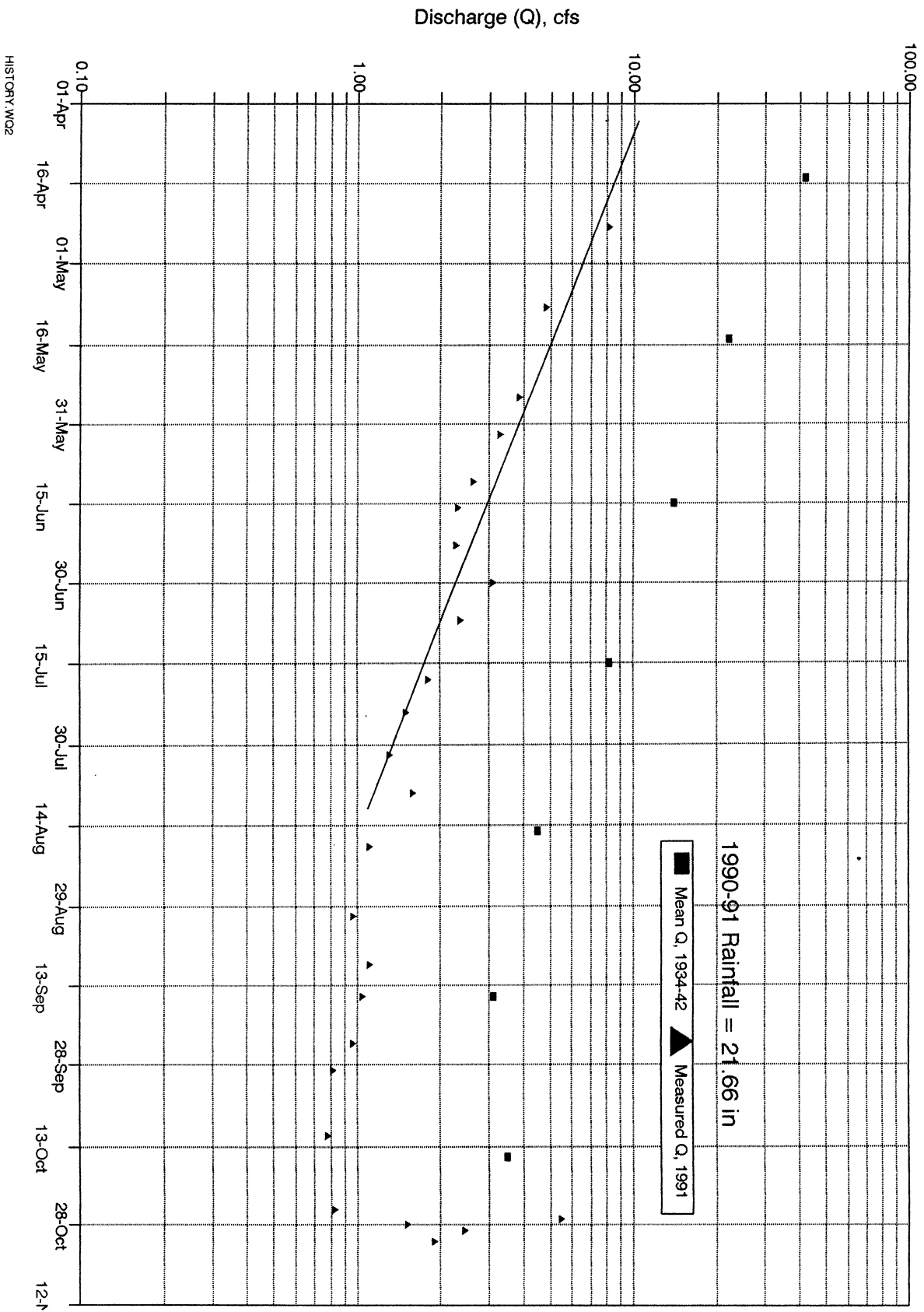
# 1989 WADDELL CREEK DISCHARGE (Q) & 1934 TO 1942 MONTHLY MEAN Q



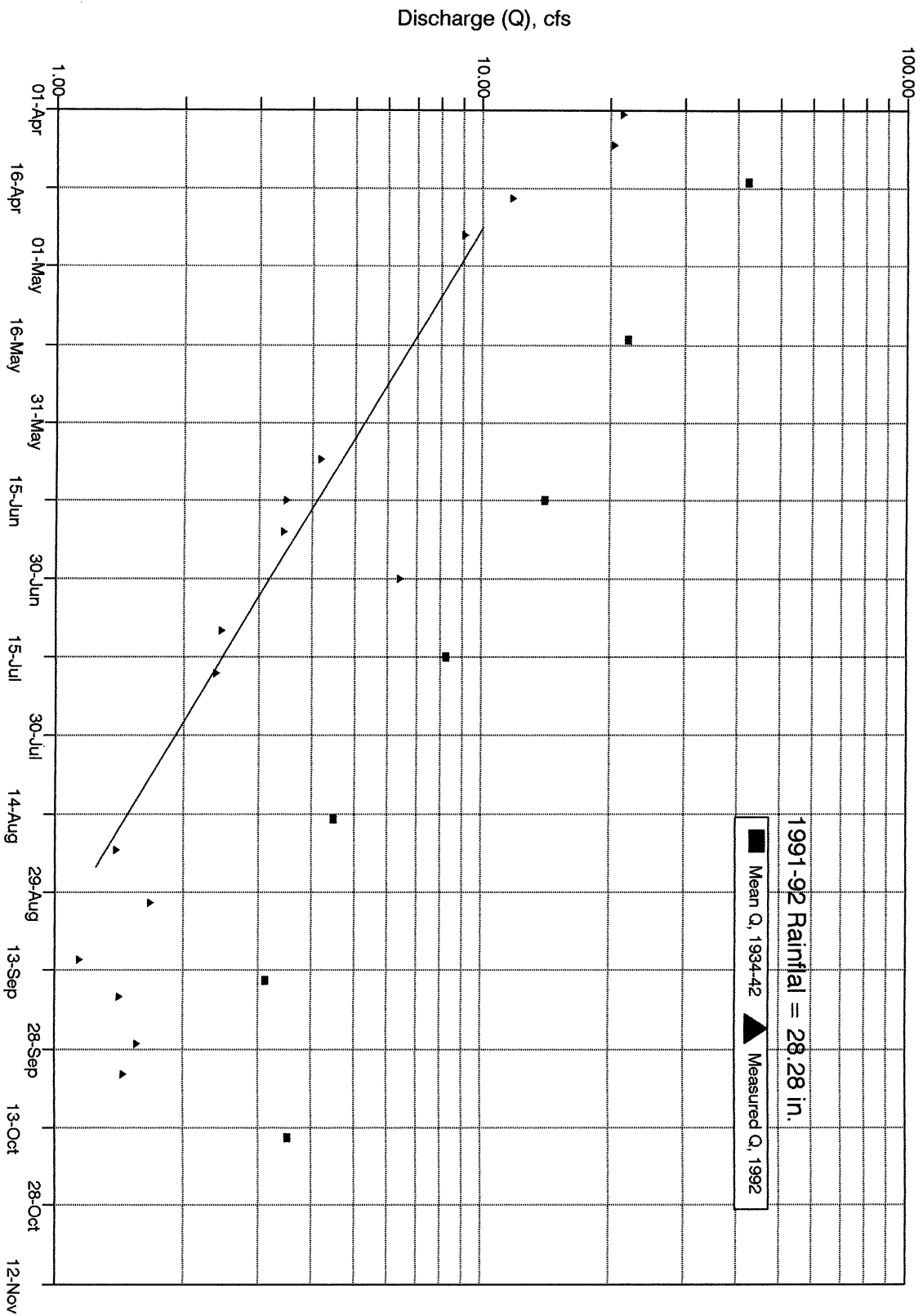
# 1990 WADDELL CREEK DISCHARGE (Q) & 1934 TO 1942 MONTHLY MEAN Q



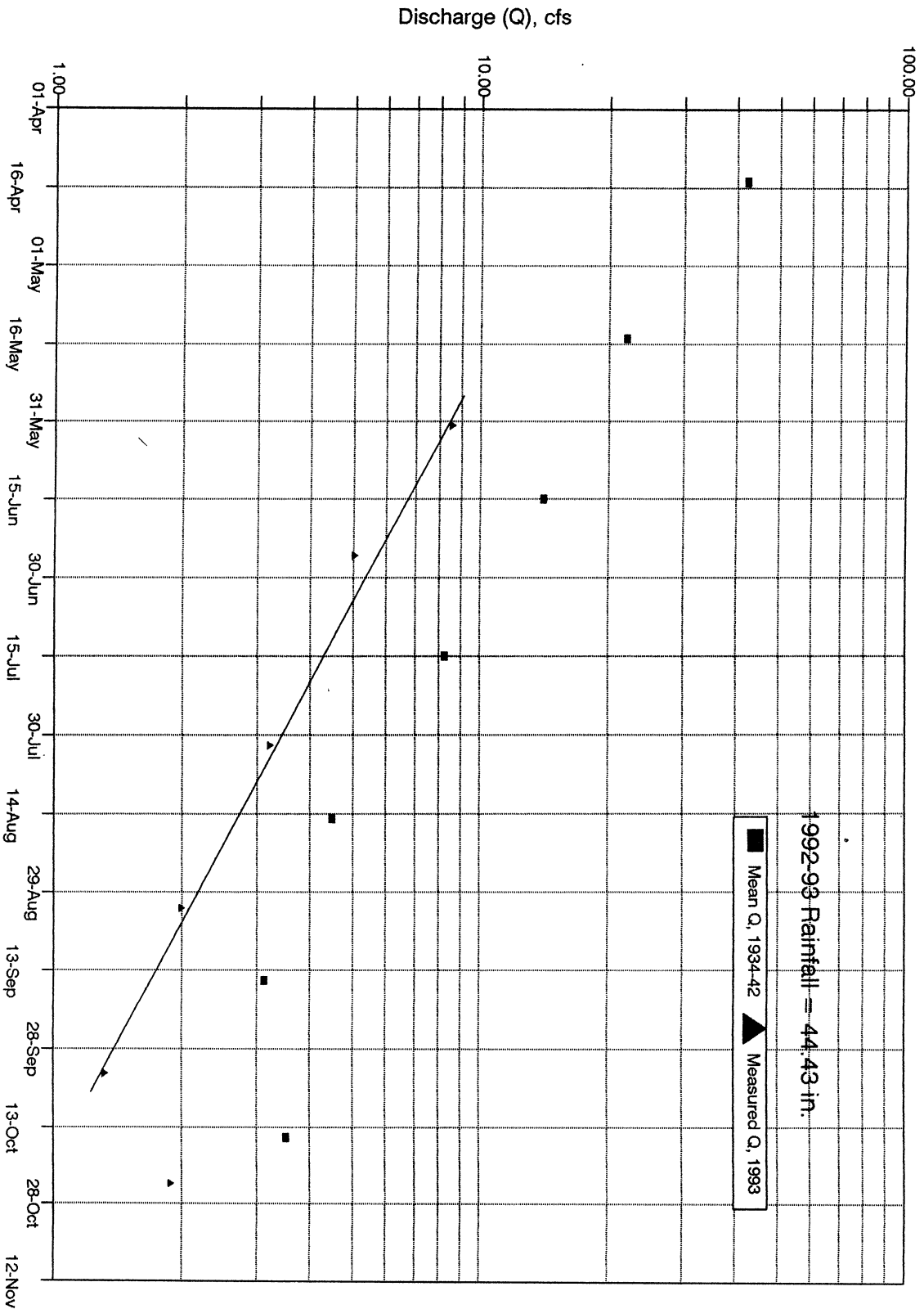
# 1991 WADELLE CREEK DISCHARGE (Q) & 1934 TO 1942 MONTHLY MEAN Q



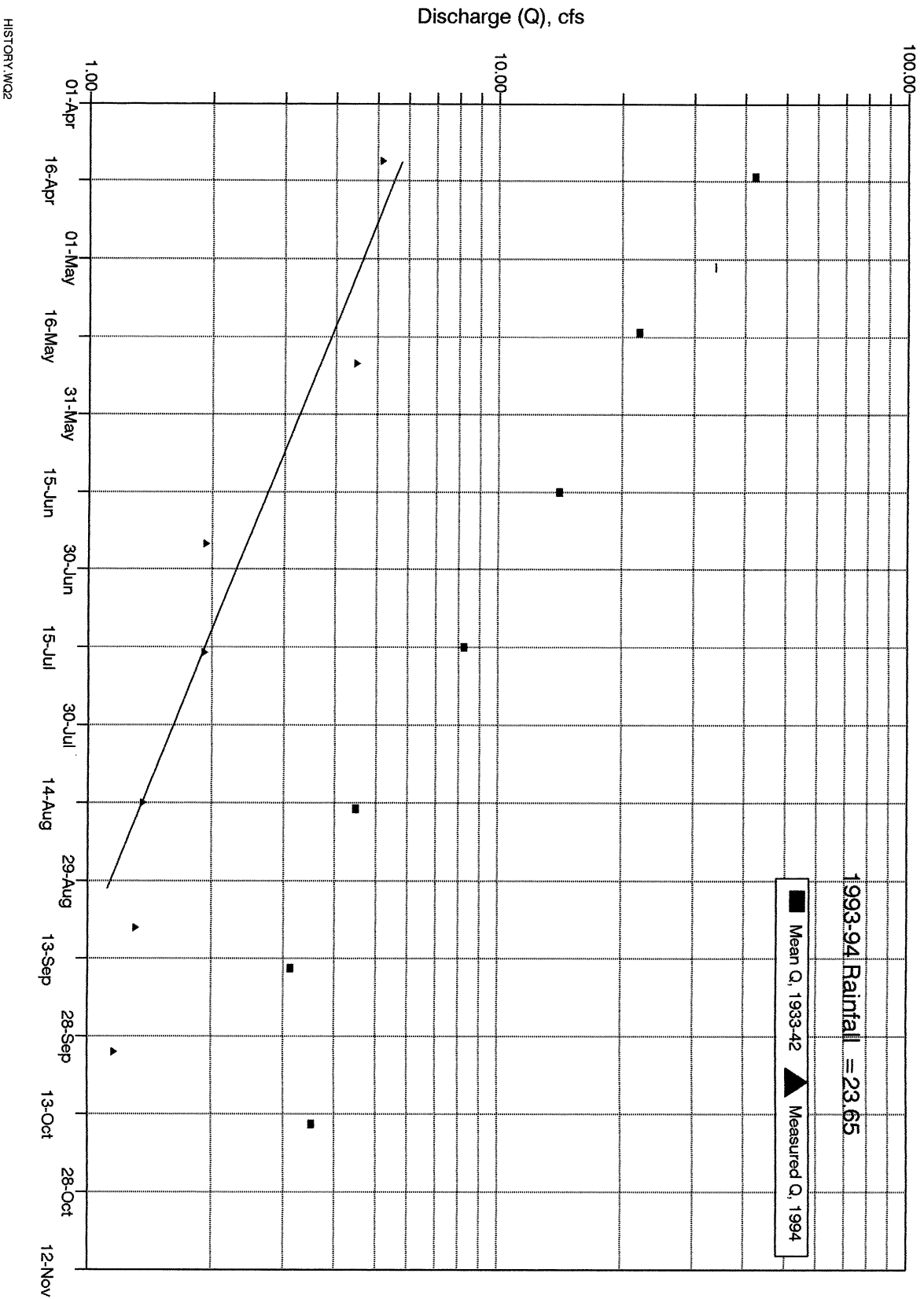
# 1992 WADDELL CREEK DISCHARGE (Q) & 1934 TO 1942 MONTHLY MEAN Q



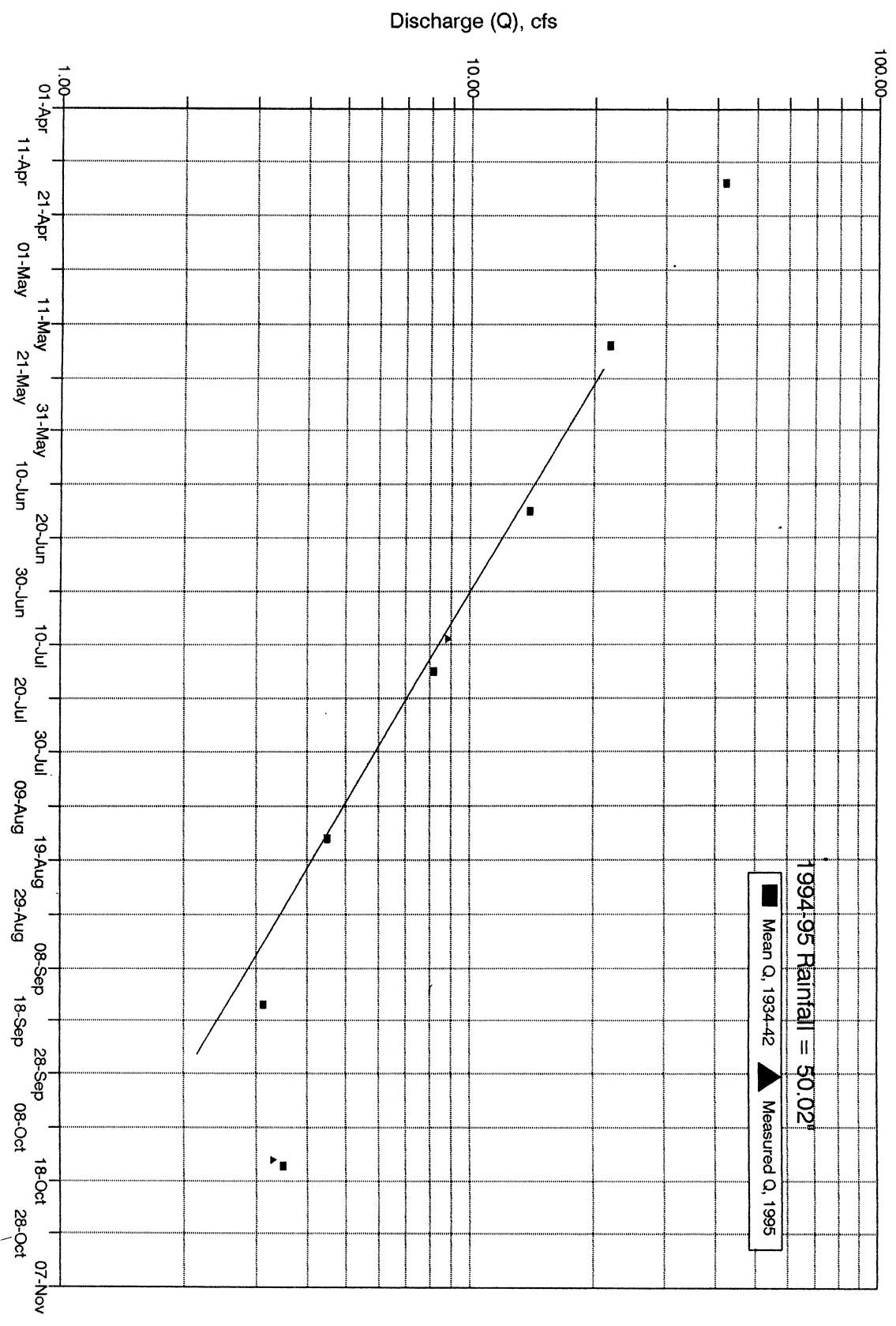
# 1993 WADELLE CREEK DISCHARGE (Q) & 1934 to 1942 MONTHLY MEAN Q



# 1994 WADDELL CREEK DISCHARGE (Q) & 1934 to 1942 MONTHLY MEAN Q

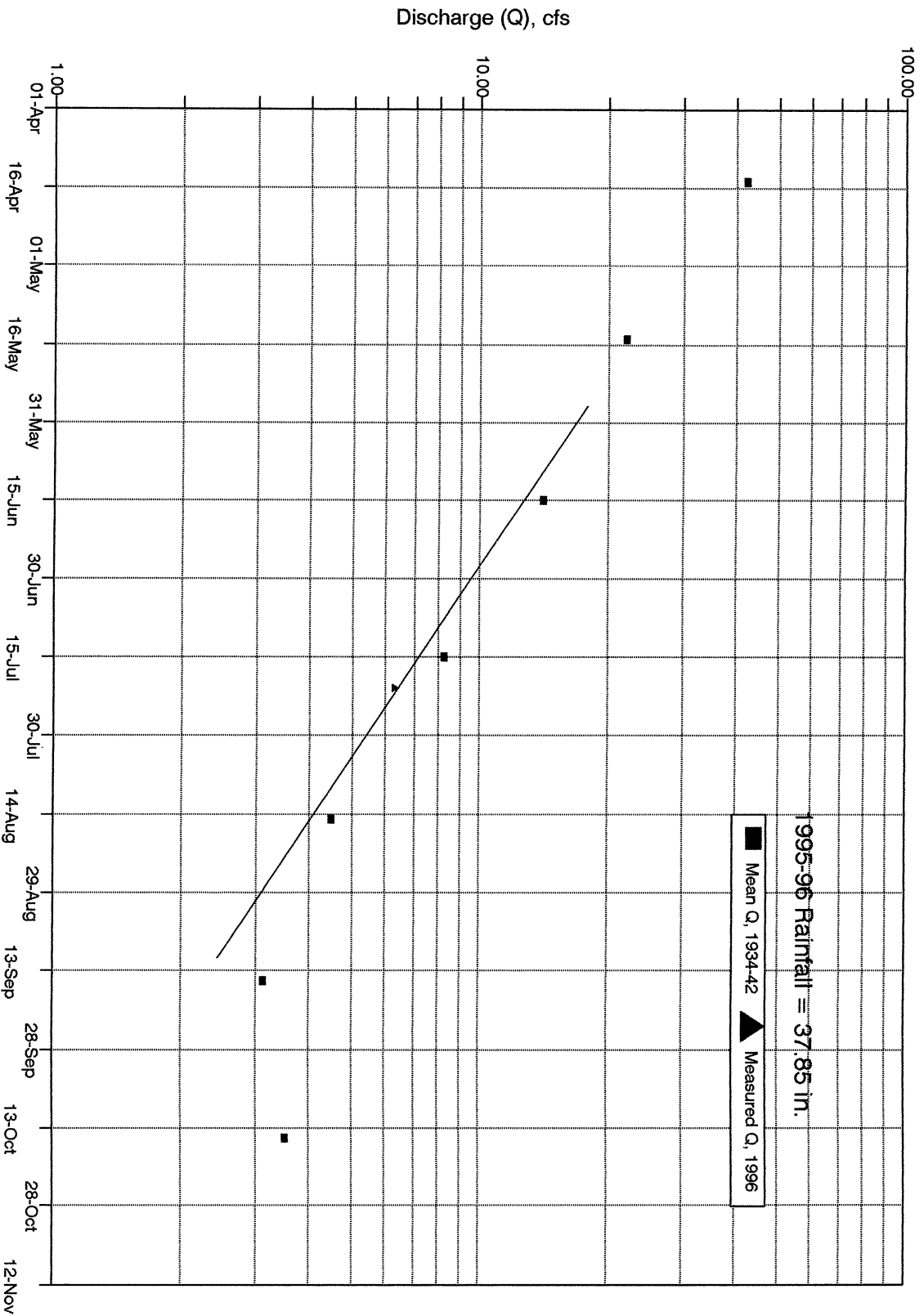


### 1995 WADDELL CREEK DISCHARGE (Q) & 1934 TO 1942 MONTHLY MEAN Q



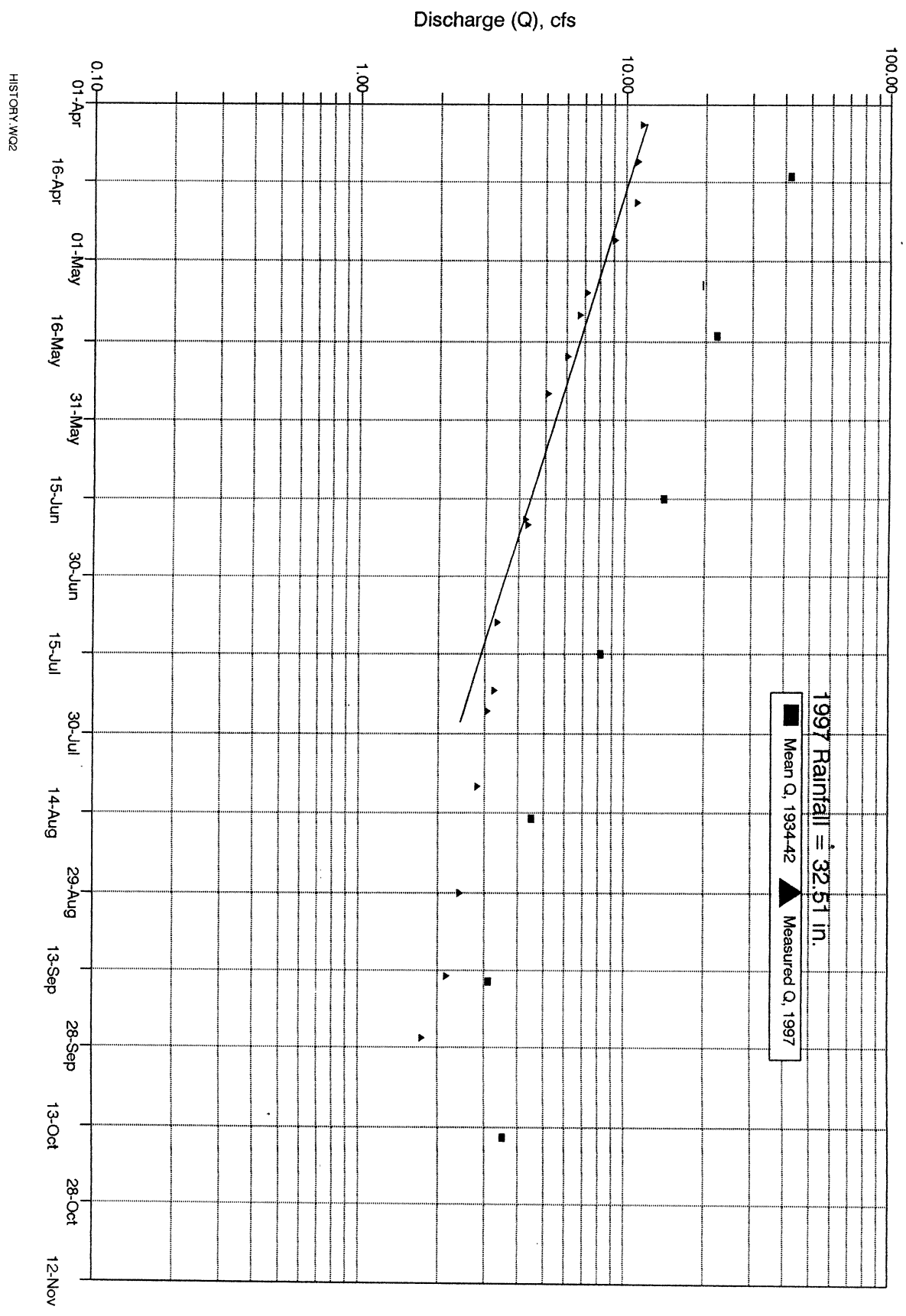
HISTORY.WQ2

# 1996 WADDELL CREEK DISCHARGE (Q) & 1934 TO 1942 MONTHLY MEAN Q



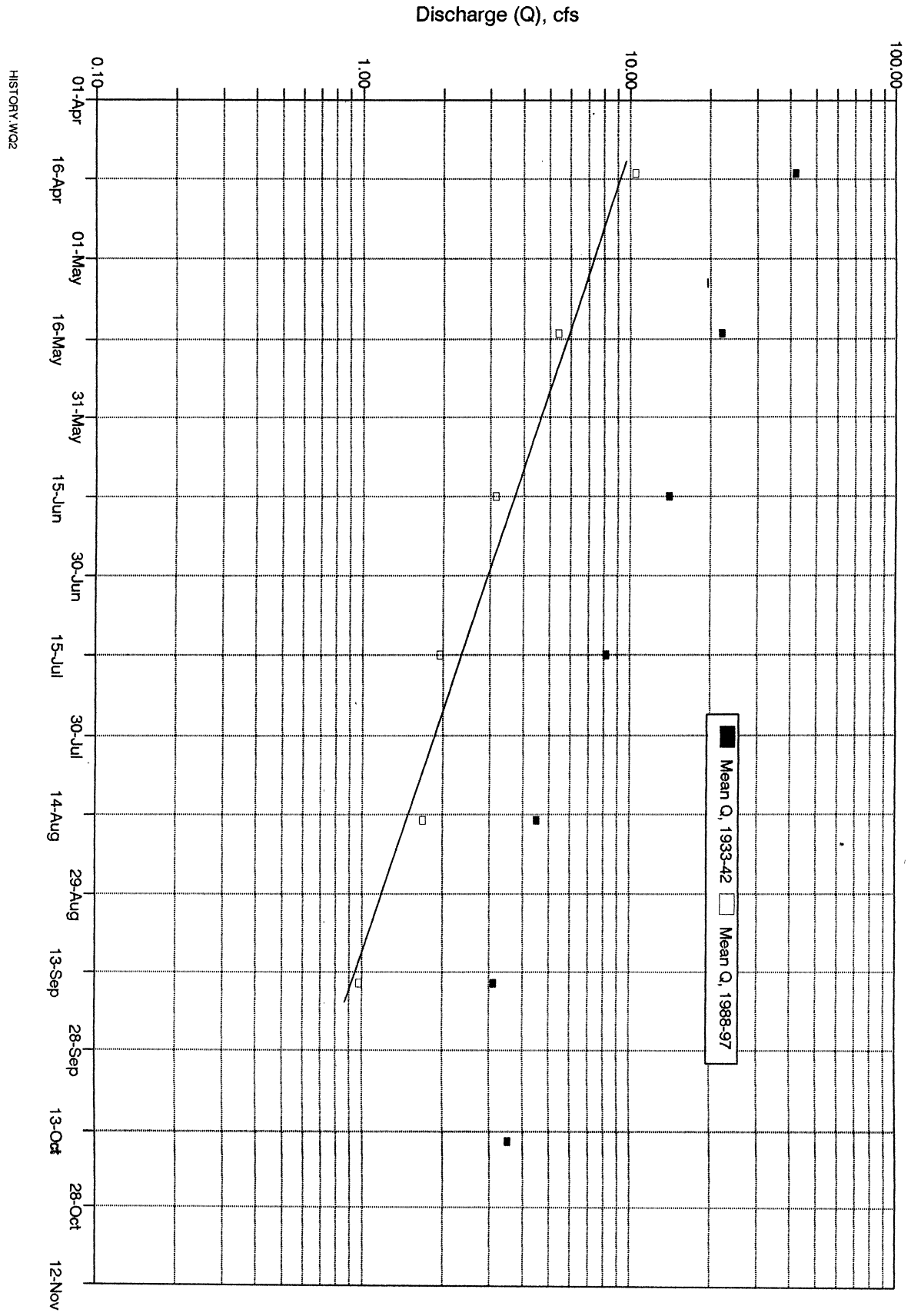


### 1997 WADDELL CREEK DISCHARGE (Q) & 1934 TO 1942 MONTHLY MEAN Q



# WADDELL CREEK DISCHARGE

1933-42 Mean & 1988-97 Mean



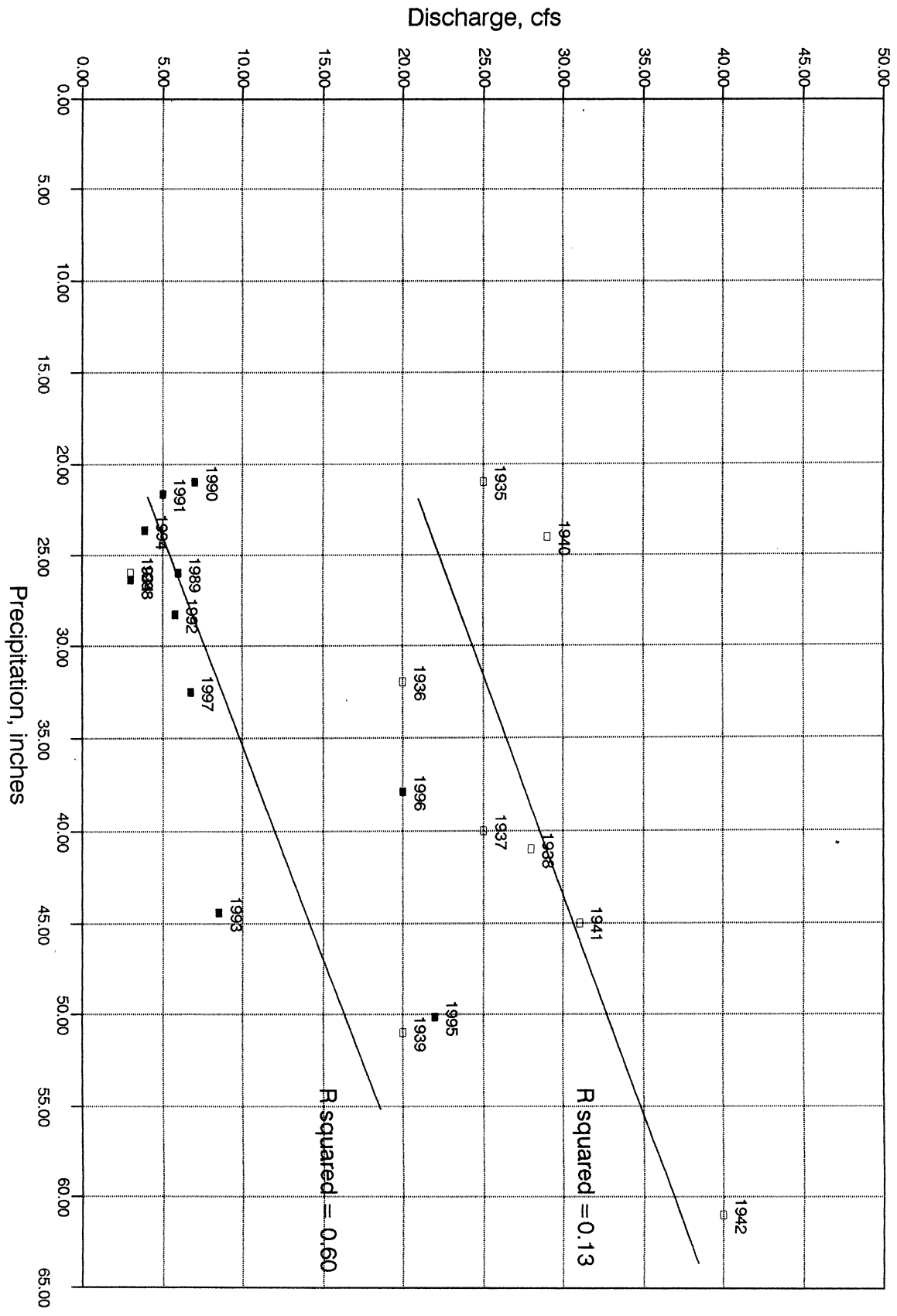
## Waddell Creek Rainfall and Flow for Two Periods

Year	Precip. In.	Mean Q, cfs				
		May	Sept.	Aug	July	June
1990	20.96	7	1.6	1.7	2.8	4.5
1991	21.66	5	1.05	1	1.7	3
1994	23.65	3.9	1.2	1.3	1.9	2.7
1989	25.95	6	1.3	1.5	1.7	3.2
1988	26.32	3	0.5	0.7	1.1	1.9
1992	28.28	5.8	1.1	1.5	2.4	3.9
1997	32.51	6.7	2	2.6	3.2	4.1
1996	37.85	20	2.3	3.5	4.5	8
1993	44.43	8.5	1.7	2.5	3.9	6
1995	50.2	22	3.1	4.5	6.5	11
Ave.	31.18	8.79	1.59	2.08	2.97	4.83
1934	26	3	0.9	0.9	1	2.5
1935	21	25	2.5	4.5	5	14
1936	32	20	4.5	5	5	15
1937	40	25	5	5.5	18	19
1938	41	28	5	5	7	17
1939	51	20	5.5	6	9	25
1940	24	29	4.5	4.5	5	17
1941	45	31	5	6	9	20
1942	61	40	8.5	8	12	25
Ave.	37.89	27.25	5.06	5.56	8.75	19.00
ratio av.			0.31	0.37	0.34	0.25
ratio av.			3.19	2.67	2.95	3.93

history2

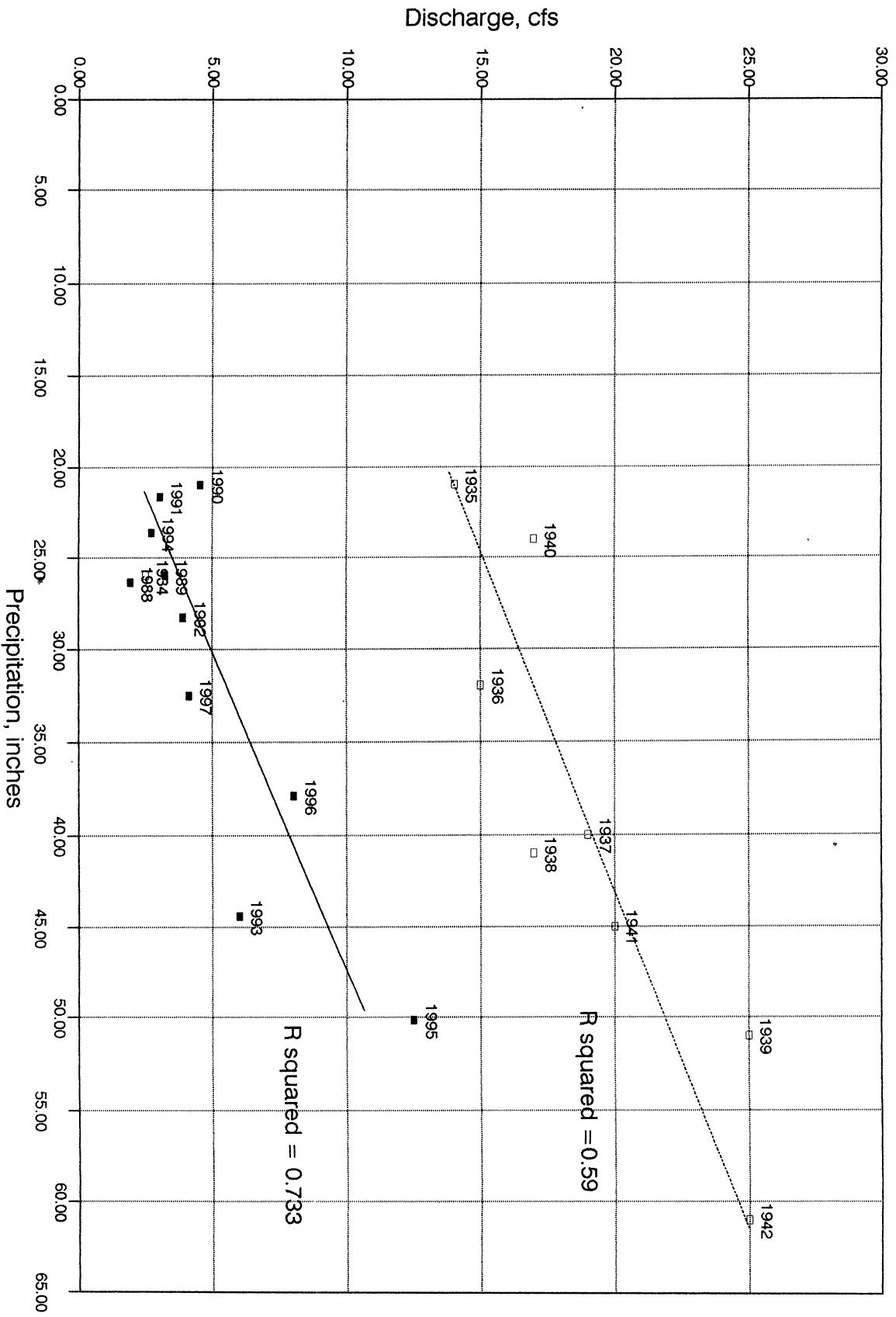
14

### Discharge vs. Precipitation May, 1988-97, 1934-42



history2.wq2

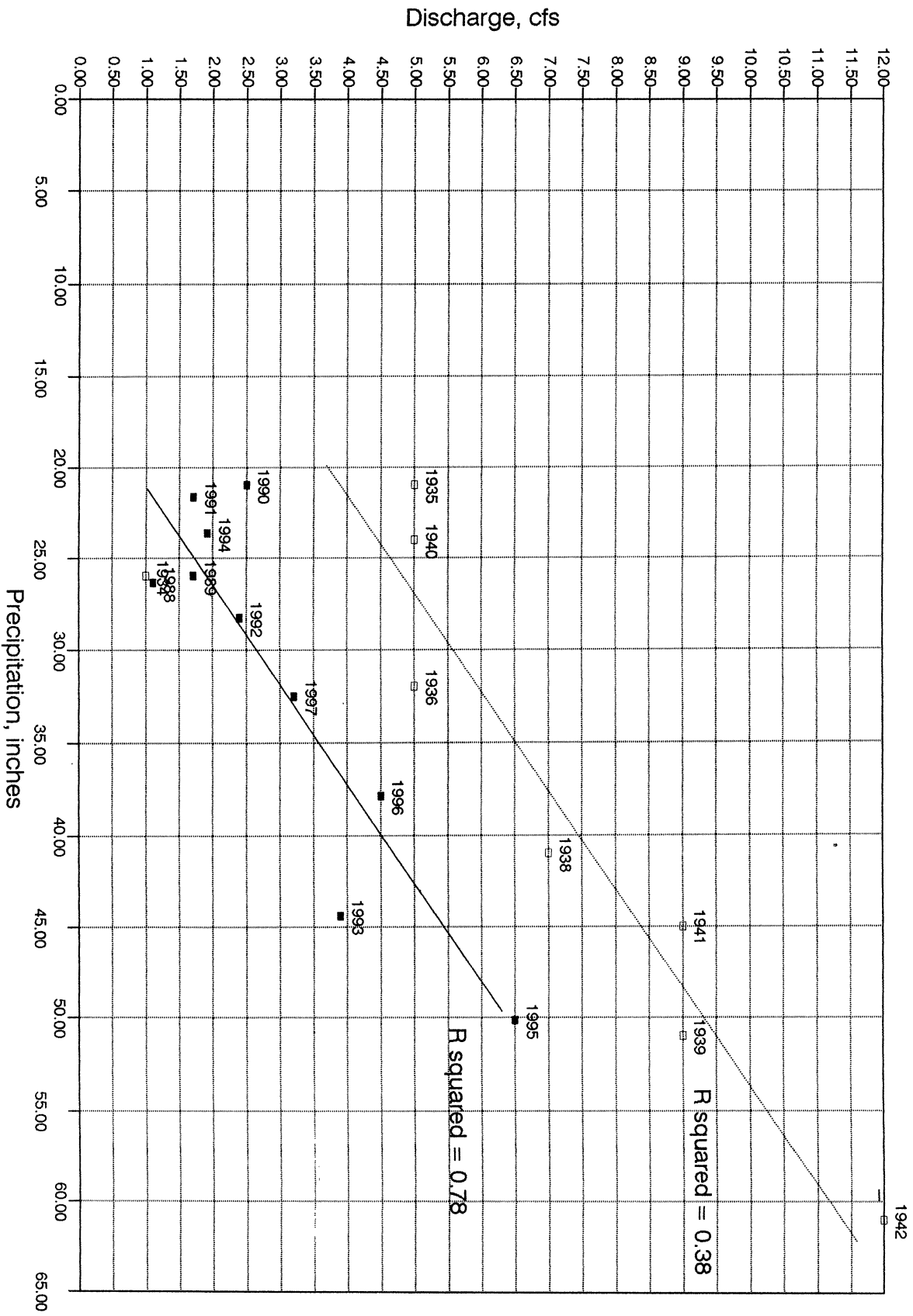
# Discharge vs. Precipitation June, 1988-97, 1934-42



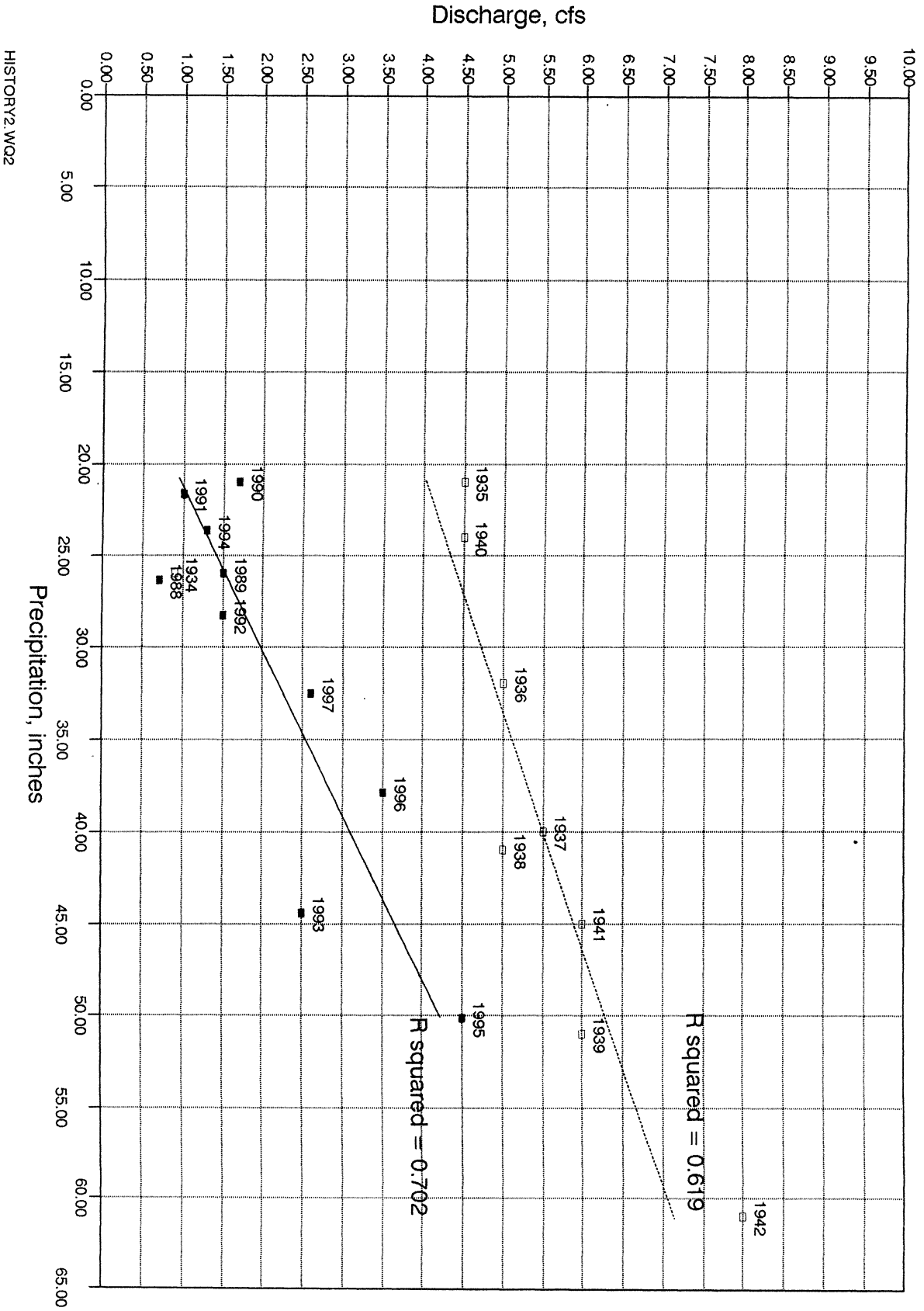
history2.wrq2

# Discharge vs. Precipitation

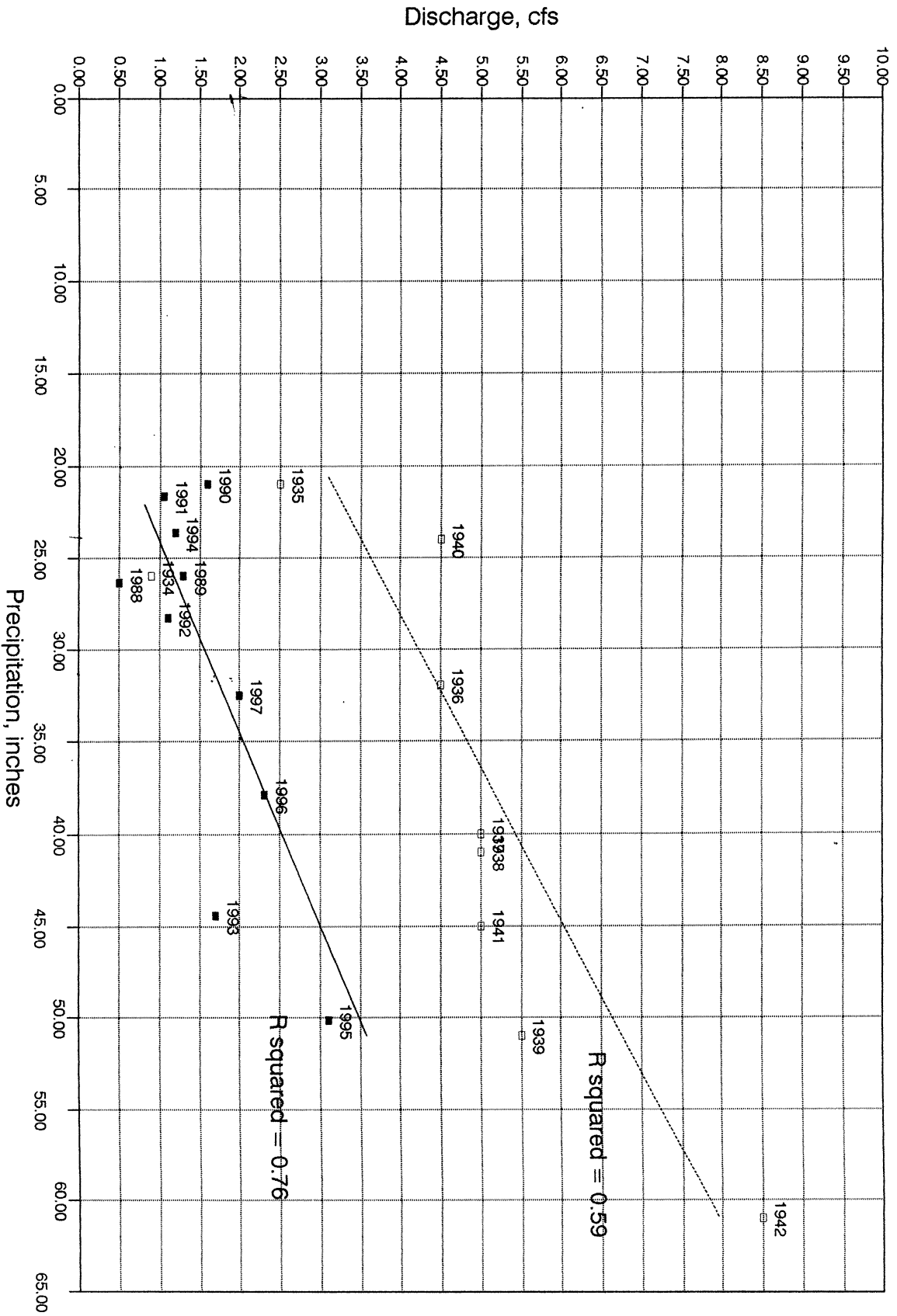
## July, 1988-97, 1934-42



# Discharge vs. Precipitation August, 1988-97, 1934-42

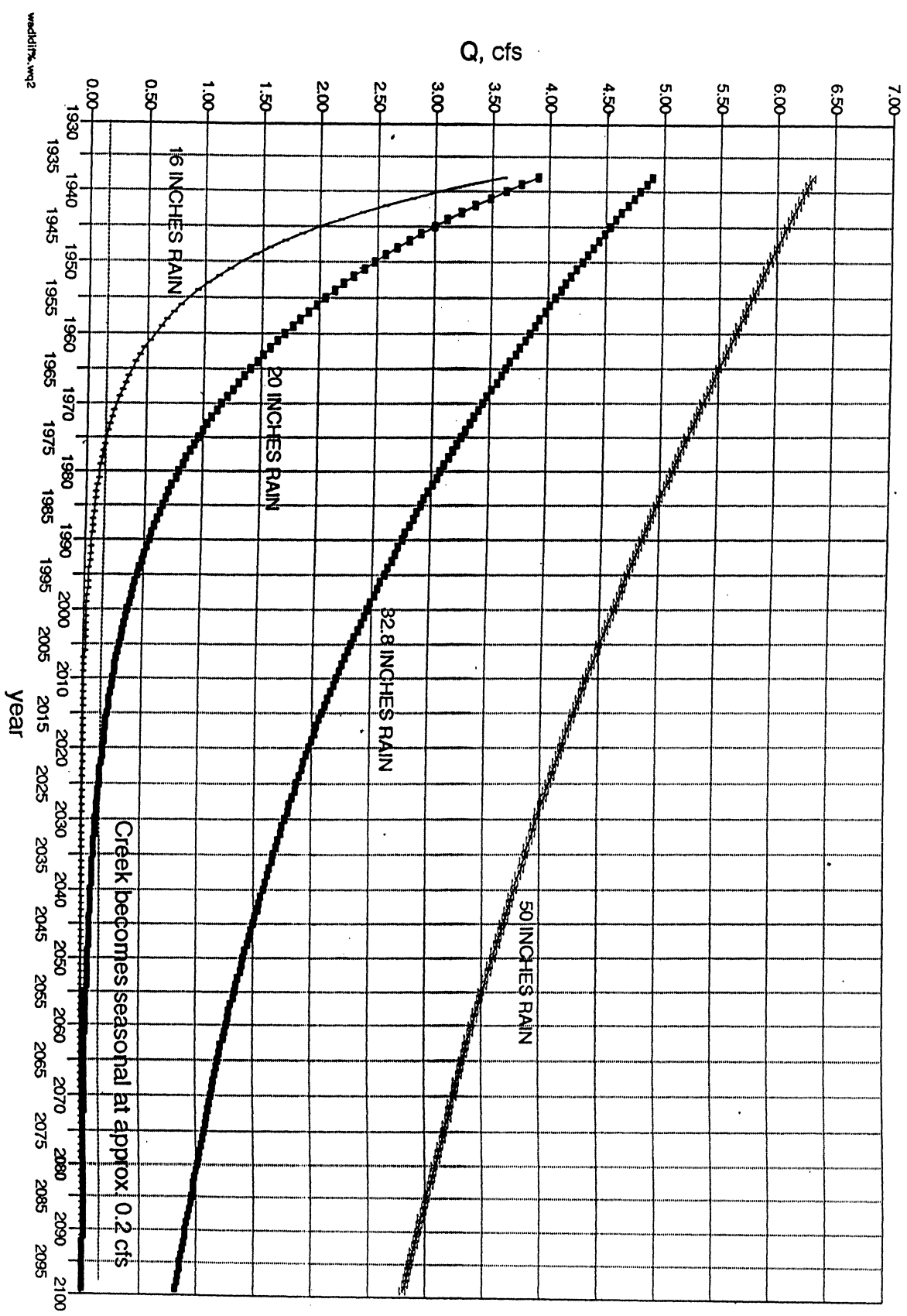


# Discharge vs. Precipitation September, 1988-97, 1934-42

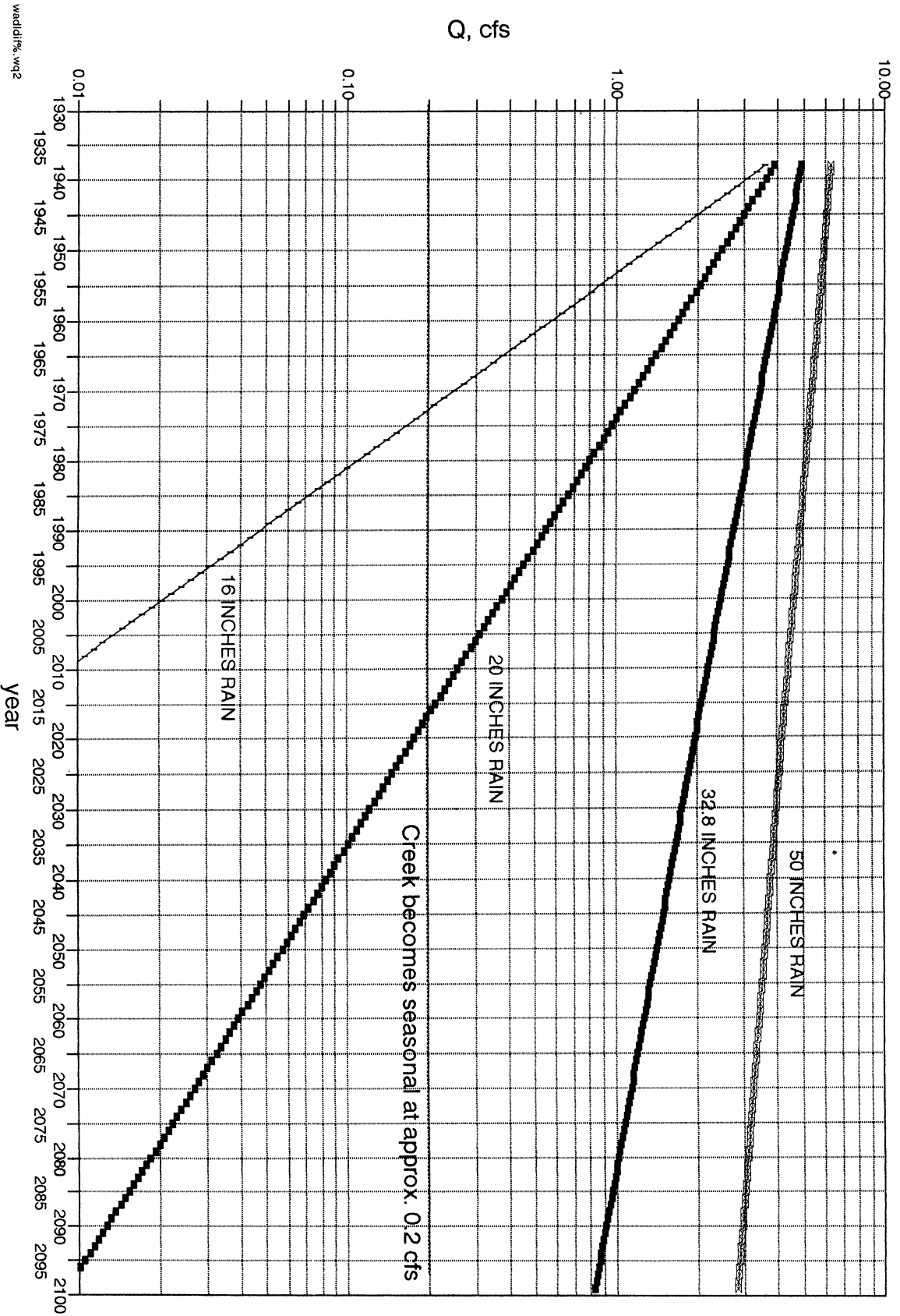




Predicted Aug. Discharge, Waddell Creek  
for 16", 20", 32.8" & 50" rainfall

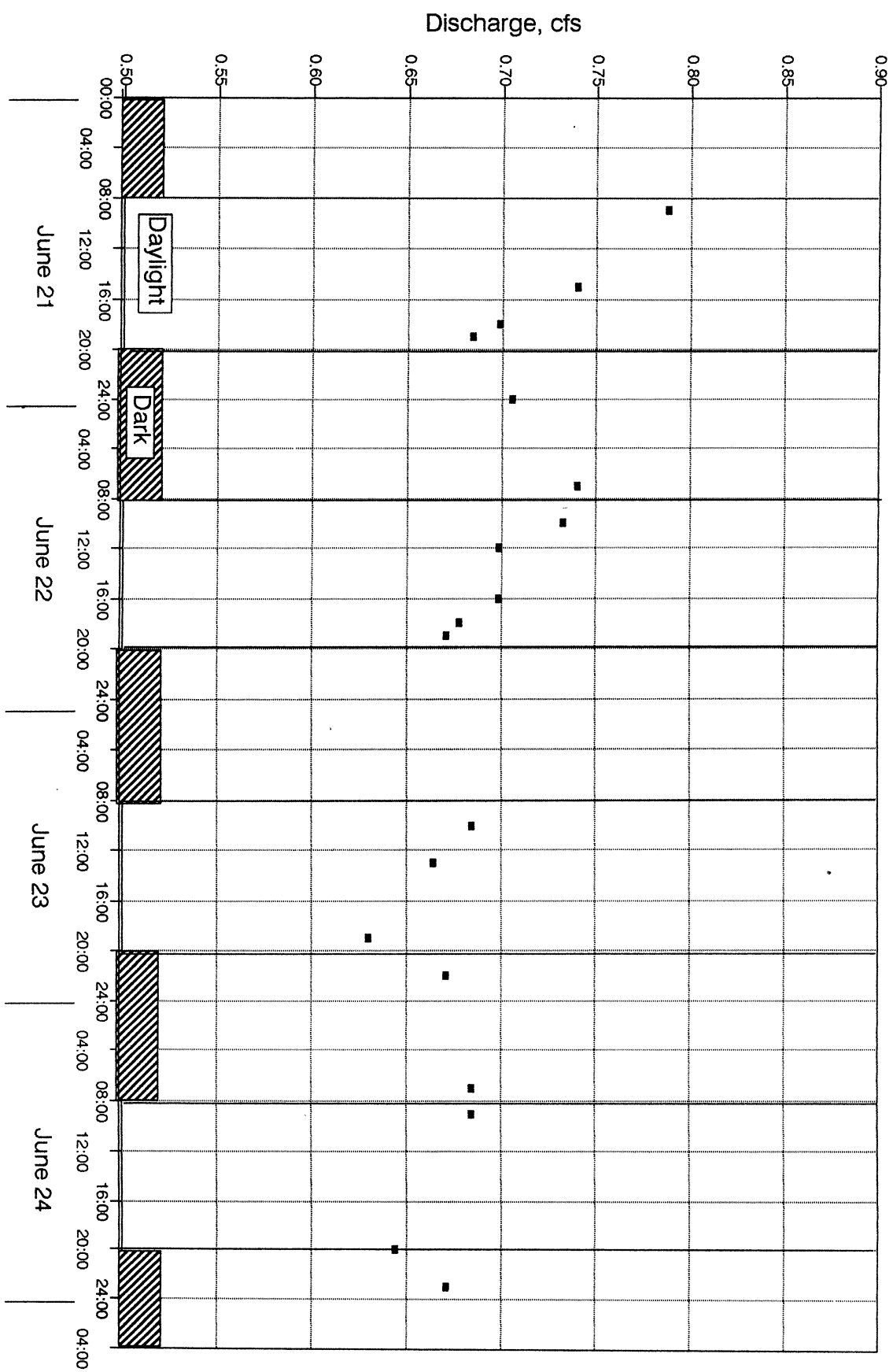


# Predicted Aug. Discharge, Waddell Creek for 16", 20", 32.8" & 50" rainfall



# Waddell Creek Flow, June 21 - 24, 1977

## Showing Diurnal Oscillation



DIURNAL.WG2

### Waddell Creek Flow, Summer, 1977 Parshall Flume Read at 9:00 a.m.

