

Data Report for
Shenandoah Watershed Study
and
Virginia Trout Stream Sensitivity Study
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Report Submitted by:

Frank A. Deviney, Jr., Database Manager
Suzanne Maben, Laboratory Analyst
James R. Webb, Project Coordinator
Dept. of Environmental Sciences
University of Virginia

Report Submitted to:

Christi Gordon
Air Resource Specialist
Shenandoah National Park
3655 US Highway 211 East
Luray, VA 22835

Dr. John Karish
US Department of the interior
National Park Service
209B Ferguson Blvd.
University Park, PA 15802

Dr. Steve Paulsen
U.S. Environmental Protection Agency
Environmental Research Laboratory
200 S. W. 35th Street
Corvallis, OR 97333

John Bellemore
George Washington National Forest
Jefferson National Forest
5162 Valleypointe Parkway
Roanoke, VA 24019

1. Data Reported:

- a) Analyses of Stream Samples (quarterly sample sites, weekly/episode sample sites, and synoptic survey sites)
Time period: 1 July 2001 through 30 June 2002
- b) Daily Stream Discharge (episode sample sites)
Time period: 1 October 2001 through 30 September 2002
- c) Trends in quarterly data using Seasonal Kendall Tau analysis
Time period: 1 October 1987 through 30 September 2001

2. Summary Description of Sampling Program

The reported data are for samples collected from streams draining forested mountain watersheds in Shenandoah National Park and western Virginia. The reported data include chemical analysis for water samples collected quarterly, weekly, and more-frequently during storm flows.

Quarterly samples are collected at 60 headwater stream sites in 20 western Virginia counties. Most of the streams drain National Forest, National Park or other public land. Samples are collected during the last seven days of January, April, July, and October.

Weekly samples are collected at six sites in Shenandoah National Park. This report includes data for three streams for which continuous discharge measurements and flow-actuated episodic high-flow event samples are also obtained. This report includes analyses of weekly and episodic event samples, as well as discharge measurements.

A listing of all sites is provided in Table 1.

3. Data Collection and Analysis:

The samples were collected at established sites by personnel with the Department of Environmental Sciences at UVA, the Shenandoah National Park, the USDA Forest Service, as well as volunteers organized by Trout Unlimited.

Samples are collected in 500 ml low-density and 250 ml high-density polyethylene (Nalgene) bottles that are pre-washed with HCl and rinsed with de-ionized water. Prior to sample collection each bottle is rinsed three times with the sampled streamwater. Upon collection the samples are placed in insulated containers with refrigerant for delivery to the project laboratory at the Department of Environmental Sciences at the University of Virginia. Upon receipt at the laboratory the samples, minus an aliquot poured off for DOC and aluminum analysis, are preserved by addition of chloroform (0.5ml/500ml) and stored at ambient laboratory temperature (about 23 deg. C). The DOC/aluminum aliquot is preserved by refrigeration. Analyses include major acid-base constituents and DOC. Samples from all projects are analyzed concurrently. Methods of analysis are summarized in Table 2. DOC analysis is performed at the Appalachian Environmental Laboratory at the University of Maryland. All other analyses are performed at the Department of Environmental Science, University of Virginia.

The Paine Run, Piney River, and Staunton River watersheds are gauged using standard methods of the U.S. Geological Survey (Rantz et al., 1982). Discharge data for all sites having periods of missing gage data has been estimated using linear regression on discharge at other gauged sites within SNP.

4. Data Quality Assurance:

Quality assurance data for analysis of stream-water samples are obtained by charge balance determination and by analysis of reference samples. 619 samples were collected during the report period. Percent charge balance error for the samples is defined as $100 \times (\text{sum cations} - \text{sum anions}) / (\text{sum cations} + \text{sum anions})$.

The capability of a process to fall within specified limits is often quantified using the C_p or C_{pk} , also known as process capability ratios. The formulas for C_p and C_{pk} are:

$$C_p = \frac{USL - LSL}{6\sigma}$$
$$C_{pk} = \min\left(\frac{USL - \mu}{3\sigma}, \frac{\mu - LSL}{3\sigma}\right)$$

where USL and LSL are the upper specification limit and lower specification limit, respectively. When a process is "on target", or no target is known, the C_p is appropriate. When the process is off-target, the C_{pk} provides a better metric of the process's ability to remain within specification limits. For an off-target process, the C_p provides a metric of the process's ability to operate within limits *if it were on-target*. Generally, a C_p or C_{pk} in excess of 1.3 is desired (Montgomery, 1997). We report the C_{pk} because the average charge balance of our samples is less than zero. Confidence intervals for C_{pk} can be large for small sample size. Figure 1 graphically illustrates the frequency with which percent charge balance error falls within the target specification limits of $\pm 15\%$, and gives a confidence interval for the C_{pk} .

Actual Process Capability: Sample Charge Balance

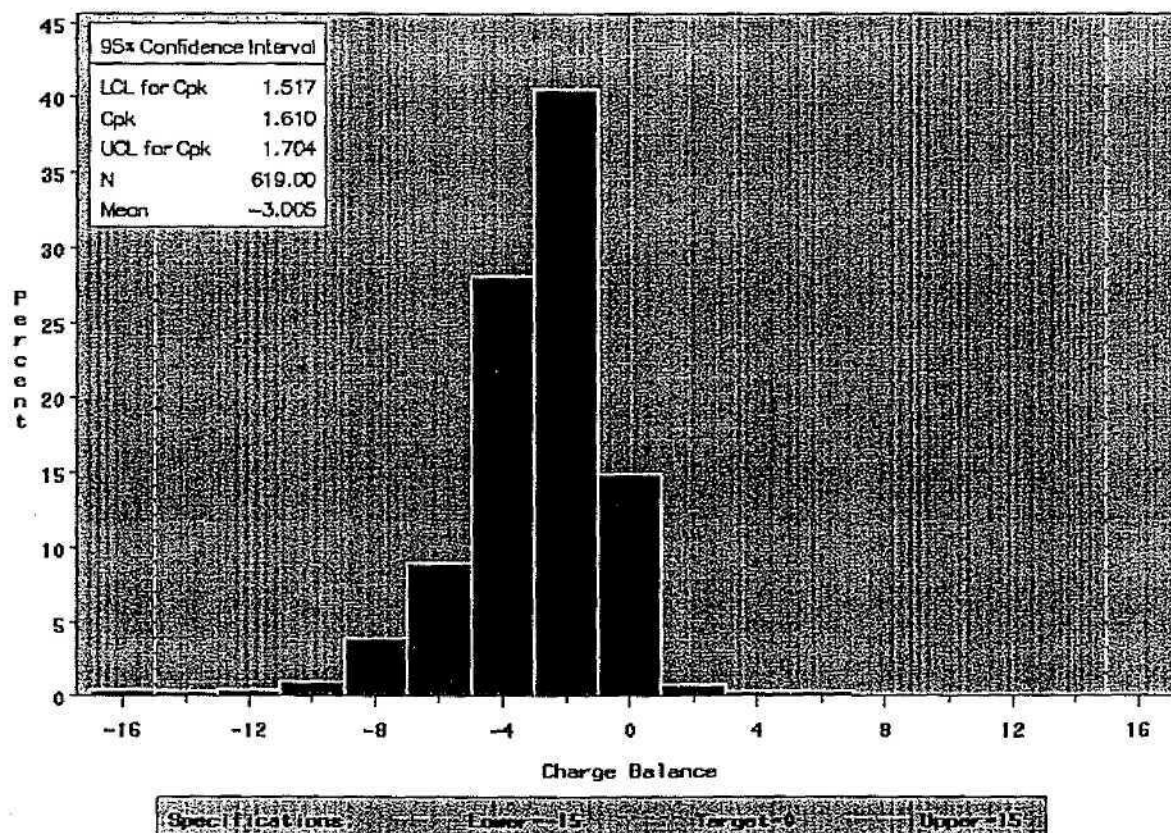


Figure 1

Reference samples were analyzed during all analysis sessions for pH, alkalinity, conductivity, cations, anions, aluminum, DOC, and silica. Analysis results for reference samples are summarized in Tables 3.

5. Inter-laboratory Quality Assurance:

The project laboratory at the Department of Environmental Sciences at the University of Virginia participates in inter-laboratory quality assurance (QA) studies administered by Environment Canada's National Water Research Institute (NWRI). Environmental programs in both the United States and Canada participate in these studies which are designed for laboratories analyzing acid rain and surface waters. The purpose of these QA studies is to provide a useful means of quantifying laboratory performance and data quality. The QA report for each study includes an assessment of any systematic bias and indicates any results flagged as a result of poor precision. A bias of greater than 5% is considered excessive by NWRI for most parameters in the studies. A result is flagged if its value is beyond that of the median (target) plus or minus the acceptable difference. The acceptable difference is calculated by NWRI using the following formula:

$(\text{Target} - \text{LLBAE}) \times \text{CEI} + \text{BAE}$, where

LLBAE = Lower Limit for use of Basic Acceptable Error

CEI = Concentration Error Increment

BAE = Basic Acceptable Error

(The values for these terms are determined by NWRI.)

Each study consists of ten samples, which are analyzed by the project laboratory by the same means as the project samples and usually included in analysis sessions along with project samples. The analysis results are then reported to the NWRI. The results for the studies in which the project laboratory has participated to date are given in Table A.

Table A: Project Laboratory Results for NWRI Inter-laboratory Quality Assurance Studies

Study Date	pH	specific conductance	alkalinity-Gran	chloride	nitrate	sulfate	ammonia	reactive silica	sodium	potassium	calcium	magnesium
10-MAY-94	A	A	N	A	A	A	A	A	A	A	A	A
15-JAN-95	A	1	A	2	A	A	A	3	A	A	A	4
05-SEP-95	A	A	A	A	A	A	N	A	A	A	A	A
01-SEP-96	A	A	A	A	A	A	A	A	5	A	A	A
02-SEP-97	A	A	A	A	A	A	A	A	A	A	A	A
01-SEP-98	A	A	A	A	A	A	6	A	A	A	A	A
01-SEP-99	A	A	A	A	A	A	7	A	A	A	A	A
28-AUG-00	A	A	A	A	A	A	A	8	A	A	A	A
27-AUG-01	A	A	A	A	A	A	9	10	A	A	A	11
03-SEP-02	A	12	A	A	A	A	A	13	A	A	A	A

Notes:

- A) Acceptable
- N) No results
- 1) Although no results are flagged, ranking indicates a slight bias low.
- 2) Although no results are flagged, ranking indicates a slight bias low. After these results were submitted, the ion chromatography column used for chloride analyses was replaced.
- 3) Acceptable, except for high on one out of ten samples.
- 4) Although no results are flagged, ranking indicates a slight bias high.
- 5) Flagged very high on one out of ten samples. This was due to a calculation error made after analysis.
- 6) Two out of 10 samples flagged: one extremely low, one low.
- 7) Two out of 10 samples flagged: both very low.
- 8) Flagged extremely low on one sample out of 10.
- 9) Three out of 10 samples flagged: one extremely low, one very low, and one low.
- 10) Satisfactory, except for low on one out of 10 samples.
- 11) Flagged extremely high on one sample out of 10.
- 12) Four out of 10 samples flagged low. Ranking indicates a low bias: -4.64%, blank -0.3536.
- 13) Two out of 10 samples flagged: one very low, one low.

6. Data Format:

- a. Analysis results are provided on CD in Excel format. Sample data and discharge, along with data definitions, are provided in spreadsheet CHEM.XLS and spreadsheet FLOW.XLS.
- b. A printout of analysis results is provided in Table 4.
- c. Seasonal Kendall Tau (Hirsch and Slack, 1984) trend results are listed in Table 5.

7. References

- Hirsch, R.M. and Slack, J.R., 1984. A nonparametric trend test for seasonal data with serial dependence. *Water Resources Research*, 20(6), 727-732.
- Rantz, S. E., et al., 1982. Measurement and computation of streamflow: Volume 1. Measurement of stage and discharge. US. *Geol. Surv. Water-Supply Paper* 2175, U.S. Geological Survey, Washington, DC.
- Montgomery, D.C., 1997, *Introduction to Statistical Quality Control, Third Edition*, John Wiley & Sons, Inc., New York.

Table 1: Collection Sites

Site	Stream	County	USGS 7.5 minute Topo Map	Universal Transverse Mercator coordinates (meters- easting)	Universal Transverse Mercator coordinates (meters- northing)	elevation in feet	area in square kilometers
DR01	DEEP RUN	ROCKINGHAM	GROTTOES	695591	4238919	1360	3.12
M002	LAUREL BED CREEK	RUSSELL	SALTVILLE	429939	4091720	3560	4.34
M003	LAUREL BED LAKE	RUSSELL	SALTVILLE	427573	4089919	3520	6.34
M004	RED BRANCH	RUSSELL	SALTVILLE	425196	4086953	2480	4.60
MAD2	MADISON RUN	ROCKINGHAM	MCGAHEYSVILLE	697162	4235896	1460	5.15
NFDR	NF OF THE DRY RUN	PAGE	THORNTON GAP	729933	4279183	1600	2.31
PAIN	PAINE RUN	AUGUSTA	CRIMORA	693243	4229927	1390	12.39
PINE	PINEY RIVER	RAPPAHANNOCK	THORNTON GAP	737523	4287155	1180	12.59
STAN	STAUNTON RIVER	MADISON	MADISON	729396	4258233	1010	10.50
SY21	LITTLE LAUREL CREEK	SMYTH	WHITETOP MTN VA	444934	4060652	3320	3.60
VT01	HELTON CREEK	GRAYSON	WHITETOP MTN	448925	4055170	4000	3.57
VT02	LEWIS FORK	GRAYSON	WHITETOP MTN	453592	4060345	3620	6.67
VT03	FOX CREEK	GRAYSON	WHITETOP MTN	453518	4060913	3580	2.30
VT04	LITTLE WILSON CR	GRAYSON	TROUT DALE	457848	4054507	3500	5.38
VT05	RACCOON BRANCH	SMYTH	TROUT DALE	461965	4066538	2740	4.37
VT06	ROWLAND CREEK	SMYTH	WHITETOP MTN	449700	4065483	2585	7.63
VT07	COVE BRANCH	TAZEWELL	HUTCHINSON ROCK	461331	4100685	3050	3.06
VT08	ROARING FORK-UPPER	TAZEWELL	HUTCHINSON ROCK	461394	4100630	3050	8.80
VT09	ROARING FORK-LOWER	TAZEWELL	HUTCHINSON ROCK	457305	4098662	2180	13.45
VT10	LAUREL RUN	BATH	BURNSVILLE	616516	4224450	2380	3.45
VT11	MARE RUN	BATH	WARM SPRINGS	608742	4208518	2030	6.02
VT12	PANTHER RUN	BATH	WARM SPRINGS	608750	4208463	2030	4.04
VT14	LITTLE WILSON CR	BATH	HEALING SPRINGS	608402	4204360	1860	3.27
VT15	PORTERS CREEK	BATH	HEALING SPRINGS	607872	4203442	1980	2.12
VT16	N BR SIMPSON CR	ALLEGHANY	LONGDALE FURNACE	616905	4186568	1400	7.65
VT18	BEARWALLOW RUN	HIGHLAND	THORNWOOD	618975	4265821	3140	4.11
VT19	LOST RUN	HIGHLAND	THORNWOOD	619016	4266075	3140	2.43
VT22	CORNELIUS CREEK	BOTETOURT	ARNOLD VALLEY	627860	4154336	1460	4.90
VT23	FALLINGWATER	BOTETOURT	PEAKS OF OTTER	624227	4147778	1660	4.55

Site	Stream	County	USGS 7.5 minute Topo Map	Universal Transverse Mercator coordinates (meters- easting)	Universal Transverse Mercator coordinates (meters- northing)	elevation in feet	area in square kilometers
	CR						
VT24	SHAWVERS RUN	CRAIG	POTTS CREEK	572792	4163370	1860	5.92
VT25	COVE BRANCH	CRAIG	POTTS CREEK	576985	4158727	1840	10.67
VT26	PINE SWAMP BRANCH	GILES	INTERIOR	534934	4141489	2380	1.95
VT28	NF STONY CREEK	GILES	INTERIOR	538618	4143428	2740	20.92
VT29	WAR SPUR BRANCH	GILES	WAITEVILLE	546564	4138819	2320	3.19
VT31	NOBUSINESS CREEK	GILES	MECHANICSBURG	507203	4121194	2410	17.42
VT32	LAUREL CREEK	GILES	INTERIOR	537402	4136979	3090	4.59
VT33	GUYS RUN	ROCKBRIDGE	GOSHEN	632054	4199009	1620	10.05
VT34	LAUREL RUN	ROCKBRIDGE	GOSHEN	635745	4198824	1270	8.43
VT36	MEADOW RUN	AUGUSTA	CRIMORA	691758	4225462	1480	8.86
VT37	NORTH RIVER	AUGUSTA	PALO ALTO	649882	4251522	2660	12.36
VT38	RAMSEYS DRAFT	AUGUSTA	WEST AUGUSTA	643961	4241976	2320	23.94
VT39	KENNEDY CREEK	AUGUSTA	BIG LEVELS	674300	4203231	1840	5.98
VT40	MILLS CREEK	AUGUSTA	BIG LEVELS	675131	4200825	1980	6.64
VT41	ST MARYS R- LOWER	AUGUSTA	VESUVIUS	663725	4198876	1740	26.93
VT42	HUNTING CREEK	BEDFORD	SNOWDEN	635627	4154888	1880	5.52
VT43	GREASY SPRING BR	AMHERST	MONTEBELLO	662531	4183685	2460	2.63
VT44	GEORGES CREEK	AMHERST	MONTEBELLO	664723	4180372	1600	3.46
VT45	OTTER CREEK	AMHERST	BUENA VISTA	646478	4166256	1300	3.65
VT46	LITTLE COVE CREEK	AMHERST	FORKS OF BUFFALO	658616	4176700	1660	3.51
VT48	BIG MACK CREEK	PULASKI	HIWASSEE	530259	4089949	2160	19.39
VT49	LITTLE STONY CREEK-LOWER	SHENANDOAH	WOLF GAP	704088	4312384	1530	11.09
VT50	LAUREL RUN	SHENANDOAH	WOLF GAP	696758	4308486	1720	4.60
VT51	JEREMYS RUN	PAGE	LURAY	727652	4288251	930	21.97
VT52	MORGAN RUN	PAGE	TENTH LEGION	703720	4266381	1600	3.29
VT53	TWO MILE RUN	ROCKINGHAM	MCGAHEYSVILLE	703527	4245225	1220	5.56
VT54	GERMAN RIVER-UPPER	ROCKINGHAM	COW KNOB	668399	4283080	2500	4.86
VT56	WOLF RUN	ROCKINGHAM	REDDISH KNOB	662303	4254949	1950	5.79
VT57	BLACK RUN- LOWER	ROCKINGHAM	RAWLEY SPRINGS	668572	4263923	1720	28.65
VT58	BROKENBACK	MADISON	OLD RAG MTN	735102	4272372	1080	9.86

Site	Stream	County	USGS 7.5 minute Topo Map	Universal Transverse Mercator coordinates (meters- easting)	Universal Transverse Mercator coordinates (meters- northing)	elevation in feet	area in square kilometers
	RUN						
VT61	NF THORNTON RIVER	RAPPAHANNOCK	THORNTON GAP	736982	4286022	1100	19.08
VT62	HAZEL RUN	RAPPAHANNOCK	OLD RAG MTN	738348	4277397	1080	13.24
VT63	SHOE CREEK	NELSON	MASSIES MILL	666996	4184076	1420	12.60
VT64	CRABTREE CREEK	NELSON	MASSIES MILL	669052	4190771	1580	3.53
VT65	MEADOW CREEK	NELSON	MASSIES MILL	668843	4190742	1620	2.74
VT66	ROSE RIVER	MADISON	OLD RAG MTN	729550	4266066	1120	23.73
VT67	EF CHESTNUT CREEK-LOWER	GRAYSON	LAMBSBURG	518771	4047289	2620	3.50
VT75	WHITE OAK CANYON R	MADISON	OLD RAG MTN	730905	4268968	1160	14.08
VT76	BELFAST CREEK	ROCKBRIDGE	SNOWDEN	633209	4159337	1040	2.07
VT77	MATTS CREEK	BEDFORD	SNOWDEN	639963	4162295	840	2.77
VT78	LITTLE TUMBLING CREEK	TAZEWELL	BROADFORD	438250	4091591	2620	17.90
VT80	LITTLE STONY CREEK-UPPER	SHENANDOAH	WOLF GAP	.	.	1720	.
VT81	EF CHESTNUT CREEK-UPPER	GRAYSON	LAMBSBURG	.	.	.	.
WOR1	WHITE OAK RUN	ROCKINGHAM	MCGAHEYSVILLE	696960	4235772	1480	5.13

Table 2: Summary Of Laboratory Analytical Methods

Aliquot	Instrumentation	Method
a pH	Beckman Psi 21 pH meter (Part No. 123114) used for analyses 7/5/01-7/26/01. Orion model 811 pH meter used for analyses 7/30/01 and later. Corning Combination pH Electrode (Cat. No. 476087).	Potentiometric measurement with open-system samples. Within-aliquot stability (< 0.01 units/min.) and sequential-aliquot agreement (^ 0.03 units difference) obtained for all readings.
b Alkalinity	Beckman Psi 21 pH meter (Part No. 123114) used for analyses 7/5/01-7/26/01. Orion model 811 pH meter used for analyses 7/30/01 and later. Corning Combination pH Electrode (Cat. No. 476087).	Two-point Gran titration with 100 ml sample volumes and 0.005 N HCl titrant. Titration endpoints were approx. 4.5 and 4.2. Within-aliquot stability (% 0.01 units/min.) was obtained for endpoint determinations.
c Sulfate, Chloride, Nitrate	Dionex Model 14 Ion Chromatograph; HPIC AS14 Separator Column; HPIC AG14 Guard Column; AMMS Anion Micro-Membrane Suppressor	Simultaneous determination by ion chromatography. Injection volume: 200 ul. Eluent: 2.2 mi 3.5-4.5 mM Na ₂ CO ₃ /minute. Regenerant: 3-4 ml 0.035 N H ₂ SO ₄ /minute.
d Calcium, Magnesium, Sodium, Potassium	Thermo Jarrell Ash AA/AE Spectrophotometer Model Smith-Hieftje 22	Flame atomic absorption spectrophotometry. Li/La added to aliquot.
e Silica	Technicon Autoanalyzer II	Colorimetric detection by molybdate blue technique.
f Conductivity	YSI Model 31 Conductivity Bridge; Beckman CEL-G01 pipette type cell	Standard conductivity bridge and cell. Readings obtained at ambient lab temperature (about 23 deg. C).
g Aluminum, Total and Organic Monomeric	Technicon Autoanalyzer II	Colorimetric detection with open-system samples by pyrocatechol violet technique. Fractionation with ion-exchange resin.
h Ammonium	Technicon Autoanalyzer EI	Coforimetric detection by Indophenol blue technique.
i Dissolved Organic Carbon	Dohrmann Phoenix 8000 TOC Analyzer	Ultra-violet promoted per sulfate oxidation technique followed by infrared detection. External sparging is used to remove inorganic carbon.

Table 3: Summary of Reference Sample and Field Duplicate Analyses for Sample Period: July 2001 through June 2002

3.1 Analysis of samples used at University of Virginia

3.1.A Reference Samples

Concentrations in ueq/L (alkalinity and ions), umol/L (SiO₂), uS/cm (conductivity), ug/L (T_AL=total monomeric aluminum, O_AL=organic monomeric aluminum), and mg/L (DOC),

Chloroform (1 mL) added to bulk streamwater samples (other than aluminum aliquots).

Natural audit samples provided by Environmental Assessment Department, Lockheed Engineering and Sciences. Listed target values are based on data collected from multiple laboratories. Samples are maintained at approximately 4 °C.

Synthetic audit samples purchased from High Purity Standards, Charleston, South Carolina. Listed target values are provided by High Purity Standards, Samples are maintained at approximately 4°C.

C_p is only reported for n>30. See text for definition of C_p.

QC Type	Site ID	Date	n	Analyte	Mean	Std. Dev.	Min	Max	Target	Recovery low	Recovery High	Std Error	Op
Bulk	NFDR	03/07/2001	53	ALK	51.89	2.05	48.67	57.81	.	.	.	0.28	0.81
Bulk	NFDR	03/07/2001	3	CA	78.18	1.22	77.00	79.44	.	.	.	0.71	.
Bulk	NFDR	03/07/2001	8	CL	27.42	0.33	27.04	28.03	.	.	.	0.12	.
Bulk	NFDR	03/07/2001	76	COND	22.80	1.30	18.00	26.00	.	.	.	0.15	0.26
Bulk	NFDR	03/07/2001	3	K	7.91	0.37	7.60	8.32	.	.	.	0.21	.
Bulk	NFDR	03/07/2001	3	MG	46.06	1.77	44.69	48.06	.	.	.	1.02	.
Bulk	NFDR	03/07/2001	3	NA	70.43	0.70	69.86	71.21	.	.	.	0.40	.
Bulk	NFDR	03/07/2001	8	NO3	21.89	0.16	21.66	22.09	.	.	.	0.06	.
Bulk	NFDR	03/07/2001	73	PH	6.22	0.08	6.07	6.39	.	.	.	0.01	0.63
Bulk	NFDR	03/07/2001	2	SIO2	151.41	0.47	151.08	151.74	.	.	.	0.33	.
Bulk	NFDR	03/07/2001	8	SO4	99.00	0.21	98.76	99.38	.	.	.	0.08	.

QC Type	Site ID	Date	n	Analyte	Mean	Std. Dev.	Min	Max	Target	Recovery low	Recovery High	Std Error	C _p
Bulk	PAIN	02/06/2001	53	ALK	-6.18	2.64	-10.00	0.32	.	.	.	0.36	0.63
Bulk	PAIN	02/06/2001	3	CA	30.01	0.15	29.84	30.14	.	.	.	0.09	.
Bulk	PAIN	02/06/2001	8	CL	24.14	0.44	23.32	24.87	.	.	.	0.15	.
Bulk	PAIN	02/06/2001	76	COND	21.01	1.37	16.20	24.10	.	.	.	0.16	0.24
Bulk	PAIN	02/06/2001	3	K	38.70	0.77	38.17	39.58	.	.	.	0.44	.
Bulk	PAIN	02/06/2001	3	MG	50.64	0.67	50.04	51.36	.	.	.	0.38	.
Bulk	PAIN	02/06/2001	3	NA	22.01	0.44	21.62	22.49	.	.	.	0.25	.
Bulk	PAIN	02/06/2001	8	NO3	0.12	0.06	0.02	0.19	.	.	.	0.02	.
Bulk	PAIN	02/06/2001	73	PH	5.14	0.11	4.99	5.35	.	.	.	0.01	0.22
Bulk	PAIN	02/06/2001	2	SIO2	79.81	0.02	79.80	79.83	.	.	.	0.02	.
Bulk	PAIN	02/06/2001	8	SO4	115.14	1.65	113.21	118.50	.	.	.	0.58	.
De-ionized	DIW	.	53	ALK	0.60	3.28	-9.55	5.91	.	.	.	0.45	0.51
De-ionized	DIW	.	4	CA	-0.60	0.59	-1.45	-0.15	.	.	.	0.30	.
De-ionized	DIW	.	12	CL	0.28	0.35	-0.06	1.13	.	.	.	0.10	.
De-ionized	DIW	.	76	COND	0.61	0.15	0.20	1.00	.	.	.	0.02	2.29
De-ionized	DIW	.	4	K	-0.20	0.32	-0.67	0.05	.	.	.	0.16	.
De-ionized	DIW	.	4	MG	0.14	0.32	-0.17	0.49	.	.	.	0.16	.
De-ionized	DIW	.	4	NA	-0.45	0.32	-0.78	-0.04	.	.	.	0.16	.
De-ionized	DIW	.	6	NH4	-0.00	0.07	-0.11	0.06	.	.	.	0.03	.
De-ionized	DIW	.	12	NO3	0.14	0.05	0.06	0.24	.	.	.	0.01	.

QC Type	Site ID	Date	n	Analyte	Mean	Std. Dev.	Min	Max	Target	Recovery low	Recovery High	Std Error	C _p
De-ionized	DIW	.	3	SIO2	0.14	0.31	-0.13	0.48	.	.	.	0.18	.
De-ionized	DIW	.	12	SO4	0.14	0.14	-0.04	0.52	.	.	.	0.04	.
De-ionized	DIW	.	7	T_AL	0.62	0.30	0.17	1.01	.	.	.	0.11	.
Mineral	1185	09/16/1992	4	CA	195.75	1.86	193.51	197.55	199.60	96.95	98.97	0.93	.
Mineral	1185	09/16/1992	4	K	24.83	0.60	24.01	25.47	25.60	93.80	99.50	0.30	.
Mineral	1185	09/16/1992	4	MG	82.96	1.68	81.40	84.69	82.30	98.90	102.90	0.84	.
Mineral	1185	09/16/1992	3	NA	174.23	7.17	168.48	182.27	174.00	96.83	104.75	4.14	.
Mineral	1185	09/16/1992	8	SO4	83.66	0.39	83.14	84.22	83.20	99.93	101.22	0.14	.
Natural	FN10	01/01/1990	5	O_AL	45.91	0.89	44.72	46.84	42.00	106.49	111.52	0.40	.
Natural	FN10	01/01/1990	6	T_AL	151.23	3.72	145.43	155.94	158.00	92.04	98.70	1.52	.
Natural	FN13	04/14/1994	4	CA	105.26	1.77	103.84	107.83	99.26	104.62	108.64	0.89	.
Natural	FN13	04/14/1994	9	CL	10.49	0.35	9.96	11.05	11.91	83.59	92.82	0.12	.
Natural	FN13	04/14/1994	4	K	8.20	0.09	8.14	8.35	8.95	91.01	93.30	0.05	.
Natural	FN13	04/14/1994	4	MG	40.55	1.06	39.67	41.97	38.74	102.41	108.36	0.53	.
Natural	FN13	04/14/1994	4	NA	24.24	0.47	23.71	24.84	25.39	93.37	97.82	0.23	.
Natural	FN13	04/14/1994	4	SIO2	18.36	0.10	18.28	18.49	17.75	103.00	104.21	0.05	.
Natural	FN13	04/14/1994	9	SO4	120.35	0.75	119.02	121.81	115.09	103.41	105.83	0.25	.
Natural	FN15	04/14/1994	4	CA	115.53	1.15	114.32	117.07	111.80	102.25	104.71	0.57	.
Natural	FN15	04/14/1994	9	CL	14.15	0.20	13.87	14.44	15.75	88.09	91.67	0.07	.
Natural	FN15	04/14/1994	4	K	10.78	0.15	10.62	10.98	11.35	93.60	96.76	0.07	.
Natural	FN15	04/14/1994	4	MG	30.78	0.76	29.96	31.77	29.67	100.98	107.08	0.38	.
Natural	FN15	04/14/1994	4	NA	30.23	0.43	29.71	30.67	31.08	95.59	98.66	0.22	.
Natural	FN15	04/14/1994	9	NO3	22.99	0.08	22.89	23.14	22.00	104.06	105.16	0.03	.
Natural	FN15	04/14/1994	4	O_AL	59.95	1.53	58.38	61.93	35.42	164.83	174.85	0.76	.
Natural	FN15	04/14/1994	5	SIO2	69.45	0.25	69.12	69.74	69.26	99.81	100.70	0.11	.

QC Type	Site ID	Date	n	Analyte	Mean	Std. Dev.	Min	Max	Target	Recovery Low	Recovery High	Std Error	C _p
Natural	FN15	04/14/1994	9	SO4	135.44	0.38	134.85	135.91	130.92	103.00	103.81	0.13	.
Natural	FN15	04/14/1994	6	T_AL	102.02	2.09	98.04	103.68	165.08	59.39	62.80	0.85	.
Natural	FN16	04/14/1994	3	CA	290.53	3.05	287.42	293.51	285.96	100.51	102.64	1.76	.
Natural	FN16	04/14/1994	9	CL	26.79	0.50	26.23	28.00	27.67	94.79	101.21	0.17	.
Natural	FN16	04/14/1994	3	K	18.82	0.09	18.74	18.92	19.29	97.15	98.08	0.05	.
Natural	FN16	04/14/1994	3	MG	134.15	2.28	132.83	136.78	131.33	101.14	104.15	1.32	.
Natural	FN16	04/14/1994	3	NA	43.21	0.32	42.85	43.46	44.13	97.09	98.47	0.18	.
Natural	FN16	04/14/1994	9	NO3	5.68	0.14	5.47	5.91	5.93	92.26	99.60	0.05	.
Natural	FN16	04/14/1994	5	SIO2	37.04	0.16	36.89	37.25	37.30	98.89	99.87	0.07	.
Natural	FN16	04/14/1994	9	SO4	177.29	1.14	175.78	178.98	174.33	100.83	102.67	0.38	.
Synthetic	HPS1	03/22/2000	9	CL	28.27	0.64	27.50	29.53	28.20	97.50	104.70	0.21	.
Synthetic	HPS1	03/22/2000	9	NO3	33.01	0.51	32.59	34.29	32.20	101.20	106.50	0.17	.
Synthetic	HPS1	03/22/2000	3	SIO2	84.21	0.09	84.15	84.31	88.81	94.75	94.93	0.05	.
Synthetic	HPS1	03/22/2000	9	SO4	105.34	0.94	104.62	107.68	104.00	100.60	103.54	0.31	.
Synthetic	HPS2	03/22/2000	5	CA	123.37	0.26	123.05	123.70	124.75	98.64	99.16	0.12	.
Synthetic	HPS2	03/22/2000	4	K	37.76	0.64	37.04	38.53	38.40	96.47	100.33	0.32	.
Synthetic	HPS2	03/22/2000	5	MG	61.91	1.75	60.00	64.52	61.73	97.20	104.53	0.78	.
Synthetic	HPS2	03/22/2000	4	NA	42.99	0.52	42.28	43.54	43.50	97.20	100.10	0.26	.
Synthetic	HPS2	03/22/2000	16	NH4	14.01	0.22	13.46	14.35	13.85	97.20	103.60	0.06	.

Table 3.1.B: Field Blanks Used

Site	Date	Time
PINE	2001-08-02	1430
PINE	2001-10-31	1400
PINE	2002-01-30	1255
PINE	2002-04-24	1400

Table 3.1.C: Field Blank Statistics

Analyte	Mean	N	Standard Deviation	Standard Error
ALK	2.98	4	1.61	0,80
CA	-0.55	4	0.24	0.12
CL	0.13	4	0.42	0.21
COND	0.63	4	0.12	0.06
DOC	0.11	4	0.10	0.05
H	1.62	4	0.77	0.39
K	0.06	4	0.43	0.22
MG	-0,21	4	0.44	0.22
NA	0.04	4	0.40	0.20
NH4	-0.03	4	0.14	0.07
NO3	0.19	4	0.09	0.04
SIO2	0.37	4	0.38	0.19
SO4	0.08	4	0.03	0.01
T_AL	0.71	4	0.14	0.07

Table 3.1.D: Duplicates Collected

Site	Date	Time
VT02	2002-04-29	1345
VT08	2002-04-30	1055
VT12	2001-08-09	1035
VT14	2002-01-28	1000
VT25	2001-10-29	0950
VT31	2001-11-01	1300
VT34	2001-07-26	1315
VT36	2001-07-31	0835
VT36	2002-01-29	0920
VT38	2001-10-31	1110
VT42	2002-01-24	1215
VT44	2002-04-27	1550
VT52	2002-04-24	1100
VT53	2001-10-29	0907
VT53	2002-04-30	1032
VT56	2001-07-25	0750
VT63	2002-01-27	1150
VT78	2001-07-25	1320
VT78	2002-01-26	1000
VT80	2001-10-25	1145

Table 3.1.E: Duplicate Statistics

Analyte	Mean of Duplicate Differences	N	Standard Deviation	Standard Error
ALK	0.26	20	3.82	0.85
CA	-0.11	20	0.52	0.12
CL	0.09	20	0.42	0.09
COND	0.36	20	0.65	0.15
H	0.10	20	0.42	0.09
K	0.04	20	0.37	0.08
MG	-0.03	20	0.95	0.21
NA	0.17	20	0.51	0.11
NO3	-0.40	20	1.84	0.41
O_AL	-0.02	20	0.07	0.02
SIO2	0.03	20	0.42	0.09
SO4	-0.05	20	0.23	0.05
T_AL	0.09	20	0.92	0.21

Table 3.2 Analysis of reference samples used at University of Maryland for DOC analysis

Samples

10QCCS and 2QCCS....Separate stocks of standard solutions.

Lab Blank De-ionized water.

Lab Duplicate... Splits of field samples. Mean is of the percent relative standard deviations between the two split values, for all duplicates.

FNBR001.....Natural field audit sample.

Results

	10QCCS	2QCCS	Lab Blank	Lab Duplicate	FNBR002
Count	243	251	54	156	30
Mean	9.84	2.06	0.074	3.17	0.82
Std. Dev.	0.23	0.11	0.10	2.95	0.07
Target	10.00	2.00		<10%	
Recovery - Low	92.3	89.3			
Recovery - High	104.9	123.9			
Std. Error	0.015	0.007	0.013	0.24	0.013

Table 4: Sample Analyses

Concentrations in ueq/L (alkalinity and ions), umol/L (SiO₂), uS/cm (conductivity), ug/L (T_AL=total monomeric aluminum, O_AL=organic monomeric aluminum), and mg/L (DOC).

Chloroform (1 mL) added to bulk streamwater samples (other than aluminum aliquots),

Site	Date	Time	Project	Method	Temp °C	pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁺	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_AL	O_AL	DOC
DR01	07/03/2001	1435	SWAS	GRAB	17	5.28	7	21	23	40	27	46	88	6	27	105	-0	.	.	.
DR01	07/10/2001	1355	SWAS	GRAB	18	5.32	15	20	23	42	27	47	85	9	26	105	-0	.	.	.
DR01	07/31/2001	1305	SWAS	GRAB	18	5.57	9	16	21	35	24	41	83	4	24	96	0	18	.	1
DR01	08/07/2001	1315	SWAS	GRAB	20	5.07	6	17	22	39	27	46	82	3	26	105	-0	.	.	.
DR01	08/14/2001	1300	SWAS	GRAB	21	5.45	9	16	19	33	25	43	81	2	24	100	-0	.	.	.
DR01	08/21/2001	1210	SWAS	GRAB	19	5.51	18	19	22	38	26	45	82	5	25	105	-0	.	.	.
DR01	09/25/2001	1700	SWAS	GRAB	16	5.18	11	24	33	59	30	51	73	47	27	104	0	.	.	.
DR01	11/27/2001	1405	SWAS	GRAB	11	5.34	18	20	29	51	27	41	92	7	29	93	-0	.	.	.
DR01	12/11/2001	1315	SWAS	GRAB	8	5.56	16	19	29	47	25	50	91	0	34	84	-0	.	.	.
DR01	12/18/2001	1340	SWAS	GRAB	8	5.42	11	19	25	43	25	39	90	0	29	89	-0	.	.	.
DR01	01/08/2002	1245	SWAS	GRAB	4	5.44	10	18	24	44	25	33	88	1	25	80	2	.	.	.
DR01	01/15/2002	1130	SWAS	GRAB	5	5.43	9	17	23	44	25	33	86	0	25	82	-0	.	.	.
DR01	01/22/2002	1330	SWAS	GRAB	5	5.45	10	17	23	44	25	31	86	0	24	83	-0	.	.	.
DR01	01/29/2002	1120	SWAS	GRAB	6	5.54	8	17	22	42	25	32	85	0	25	88	-0	.	.	.
DR01	02/05/2002	1325	SWAS	GRAB	6	5.49	12	16	23	41	27	34	86	0	25	89	-0	.	.	.
DR01	02/12/2002	1155	SWAS	GRAB	5	5.46	10	17	22	41	27	33	87	0	24	86	-0	.	.	.
DR01	02/19/2002	1215	SWAS	GRAB	5	5.54	12	17	23	42	27	32	88	0	24	86	-0	.	.	.
DR01	02/26/2002	1300	SWAS	GRAB	7	5.48	12	17	24	43	28	34	88	0	25	88	-0	.	.	.
DR01	03/05/2002	1355	SWAS	GRAB	5	5.52	8	17	22	40	27	33	88	0	25	85	-0	.	.	.
DR01	03/12/2002	1310	SWAS	GRAB	6	5.44	7	18	23	40	26	31	90	0	25	89	-0	.	.	.
DR01	03/19/2002	1105	SWAS	GRAB	8	5.50	6	17	21	38	27	35	91	0	26	89	-0	.	.	.
DR01	03/26/2002	1325	SWAS	GRAB	8	5.45	4	19	23	39	28	36	98	0	25	91	-0	.	.	.
DR01	04/02/2002	1440	SWAS	GRAB	11	5.52	5	20	23	39	29	41	102	0	26	91	0	.	.	.
DR01	04/09/2002	1123	SWAS	GRAB	10	5.46	5	20	23	40	29	41	102	0	26	91	0	.	.	.
DR01	04/16/2002	1510	SWAS	GRAB	16	5.40	4	20	22	39	29	44	101	0	27	92	0	.	.	.
DR01	04/23/2002	1335	SWAS	GRAB	11	5.36	-4	20	26	46	24	50	111	0	25	89	0	.	.	.

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
DR01	04/30/2002	1415	SWAS	GRAB	13	5.52	-4	19	23	44	24	48	109	0	26	88	0	28	.	.	1
DR01	05/07/2002	1305	SWAS	GRAB	13	5.48	2	19	24	46	25	46	107	0	27	82	0	.	.	.	.
DR01	05/14/2002	1405	SWAS	GRAB	14	5.48	3	19	23	41	24	47	106	0	26	87	0	.	.	.	.
DR01	05/21/2002	1545	SWAS	GRAB	10	5.52	2	18	24	43	24	44	104	0	26	83	0	.	.	.	.
DR01	05/28/2002	1335	SWAS	GRAB	15	5.52	9	20	30	43	25	50	103	0	25	84	1	.	.	.	.
DR01	06/04/2002	1540	SWAS	GRAB	17	5.35	9	20	23	43	25	47	99	0	26	93	0	.	.	.	.
DR01	06/11/2002	1300	SWAS	GRAB	18	5.36	13	19	24	42	26	49	96	0	25	93	0	.	.	.	.
DR01	06/18/2002	1310	SWAS	GRAB	17	5.38	18	20	25	45	29	53	95	0	28	99	0	.	.	.	.
DR01	06/25/2002	1320	SWAS	GRAB	19	5.39	18	20	26	44	29	52	95	1	28	100	0	.	.	.	.
M002	07/26/2001	1130	VTSSS	GRAB	19	4.79	-18	13	25	17	8	7	47	0	13	42	.	156	108	.	.
M002	10/30/2001	1140	VTSSS	GRAB	6	5.26	0	12	32	24	10	12	52	0	18	59	.	82	62	.	.
M002	01/28/2002	1120	VTSSS	GRAB	4	4.68	-23	17	22	19	9	6	67	3	12	46	.	140	33	.	.
M002	04/25/2002	1100	VTSSS	GRAB	15	4.81	-18	14	20	17	10	6	57	0	12	46	.	123	51	.	.
M003	07/26/2001	1030	VTSSS	GRAB	21	6.56	95	20	124	66	10	7	74	5	13	27	.	.	.	.	.
M003	10/30/2001	1100	VTSSS	GRAB	11	6.71	104	21	130	70	10	7	71	4	11	35	.	.	.	.	.
M003	01/28/2002	1210	VTSSS	GRAB	.	6.77	117	24	122	93	9	8	72	11	11	37	.	.	.	.	.
M003	04/25/2002	1644	VTSSS	GRAB	16	6.83	93	21	103	84	10	7	74	0	11	34	.	.	.	.	.
M004	07/26/2001	1000	VTSSS	GRAB	17	6.23	69	18	107	25	35	8	73	0	14	91	.	.	.	.	.
M004	10/30/2001	1030	VTSSS	GRAB	6	6.67	113	22	139	32	41	12	74	0	17	96	.	.	.	.	.
M004	01/28/2002	1240	VTSSS	GRAB	.	5.57	17	20	90	26	28	9	92	13	17	77	.	78	75	.	1
MAD2	07/31/2001	1145	SWAS	GRAB	19	6.59	179	30	78	108	54	34	68	0	25	148	.	.	.	.	1
MAD2	10/30/2001	1325	SWAS	GRAB	10	6.23	199	33	95	130	57	36	77	0	25	142	.	.	.	.	0
MAD2	01/29/2002	1300	SWAS	GRAB	8	6.56	94	25	63	87	49	25	95	0	31	112	.	.	.	.	1
MAD2	04/30/2002	1305	SWAS	GRAB	13	6.74	75	20	51	73	37	27	78	0	28	101	.	.	.	.	1
NFDR	07/04/2001	1145	SWAS	GRAB	15	6.56	64	28	92	52	75	10	96	25	31	169	.	.	.	.	.
NFDR	07/11/2001	1340	SWAS	GRAB	17	6.58	73	24	93	51	80	12	94	25	33	176	.	.	.	.	.
NFDR	07/18/2001	1335	SWAS	GRAB	16	6.50	79	30	102	55	83	12	93	29	36	180	.	.	.	.	.
NFDR	07/25/2001	1540	SWAS	GRAB	19	6.65	87	29	105	57	85	13	92	32	36	187	.	.	.	.	.
NFDR	08/01/2001	1345	SWAS	GRAB	.	6.21	76	25	105	57	82	12	94	55	29	175	.	.	.	.	1
NFDR	08/08/2001	1310	SWAS	GRAB	18	6.28	84	28	101	55	82	12	97	29	31	179	.	.	.	.	.
NFDR	08/15/2001	1430	SWAS	GRAB	16	6.48	57	28	101	55	77	11	106	48	26	167	.	.	.	.	.
NFDR	08/22/2001	1210	SWAS	GRAB	16	6.29	72	29	97	53	78	11	99	27	31	173	.	.	.	.	.
NFDR	08/29/2001	1245	SWAS	GRAB	18	6.56	84	28	101	55	80	11	95	29	31	180	.	.	.	.	.
NFDR	09/05/2001	1300	SWAS	GRAB	17	6.55	86	28	99	55	80	11	93	30	32	185	.	.	.	.	.

Site	Date	Time	Project	Method	Temp	PH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T	Al	O	AL	DOC
					°C																	
NFDR	09/12/2001	1220	SWAS	GRAB	17	6.47	80	29	101	56	83	11	93	32	33	186	.	.	.	.	.	.
NFDR	09/19/2001	1205	SWAS	GRAB	15	6.46	82	28	100	56	83	11	93	38	33	186	.	.	.	.	.	.
NFDR	09/26/2001	1215	SWAS	GRAB	13	6.57	66	27	104	57	81	11	90	54	31	176	.	.	.	.	.	.
NFDR	10/03/2001	1205	SWAS	GRAB	12	6.53	74	28	101	56	82	10	91	40	32	178	.	.	.	.	.	.
NFDR	10/10/2001	1205	SWAS	GRAB	9	6.65	74	27	98	55	79	10	92	29	33	176	.	.	.	.	.	.
NFDR	10/17/2001	1235	SWAS	GRAB	10	6.50	85	28	100	57	80	12	93	23	37	175	.	.	.	.	.	.
NFDR	10/24/2001	1205	SWAS	GRAB	13	6.57	98	28	103	60	84	13	91	16	35	183	.	.	.	.	.	.
NFDR	10/31/2001	1220	SWAS	GRAB	9	6.49	87	28	98	54	80	12	89	16	33	180	.	.	.	.	.	1
NFDR	11/07/2001	1030	SWAS	GRAB	8	6.64	91	27	97	54	79	11	89	18	34	180	.	.	.	.	.	.
NFDR	11/14/2001	1140	SWAS	GRAB	6	6.54	89	27	96	53	79	10	89	22	32	178	.	.	.	.	.	.
NFDR	11/21/2001	1035	SWAS	GRAB	6	6.46	90	27	95	54	78	10	89	22	33	180	.	.	.	.	.	.
NFDR	11/28/2001	1130	SWAS	GRAB	9	6.45	76	31	112	63	84	14	90	63	39	168	.	.	.	.	.	.
NFDR	12/05/2001	1135	SWAS	GRAB	8	6.58	71	28	100	55	77	11	93	43	34	164	.	.	.	.	.	.
NFDR	12/12/2001	1145	SWAS	GRAB	8	6.42	54	29	105	59	77	12	97	61	36	159	.	.	.	.	.	.
NFDR	12/19/2001	1145	SWAS	GRAB	7	6.50	52	29	99	56	76	10	99	50	33	154	.	.	.	.	.	.
NFDR	12/28/2001	1115	SWAS	GRAB	1	6.33	46	27	94	53	71	8	96	46	34	153	.	.	.	.	.	.
NFDR	01/03/2002	1345	SWAS	GRAB	0	6.34	44	27	90	53	71	8	95	46	34	150	.	.	.	.	.	.
NFDR	01/09/2002	1155	SWAS	GRAB	0	6.50	49	27	92	53	74	9	93	47	33	153	.	.	.	.	.	.
NFDR	01/16/2002	1225	SWAS	GRAB	2	6.49	51	27	91	53	75	9	94	48	33	155	.	.	.	.	.	.
NFDR	01/23/2002	1300	SWAS	GRAB	4	6.50	49	27	91	54	79	9	95	46	32	153	.	.	.	.	.	.
NFDR	01/30/2002	1125	SWAS	GRAB	7	6.31	52	28	92	53	79	9	98	49	33	152	.	.	.	.	.	1
NFDR	02/06/2002	1120	SWAS	GRAB	1	6.47	39	27	93	54	74	8	98	54	33	148	.	.	.	.	.	.
NFDR	02/13/2002	1115	SWAS	GRAB	2	6.50	40	27	92	55	75	8	97	40	33	148	.	.	.	.	.	.
NFDR	02/20/2002	1115	SWAS	GRAB	4	6.54	46	26	90	53	74	8	96	39	33	147	.	.	.	.	.	.
NFDR	02/27/2002	1100	SWAS	GRAB	3	6.54	47	25	90	53	73	8	96	36	33	149	.	.	.	.	.	.
NFDR	03/06/2002	1350	SWAS	GRAB	5	6.42	34	29	98	55	71	9	103	58	31	142	.	.	.	.	.	.
NFDR	03/13/2002	1325	SWAS	GRAB	6	6.48	42	28	96	55	70	9	98	47	31	142	.	.	.	.	.	.
NFDR	03/20/2002	1310	SWAS	GRAB	6	6.47	39	30	107	60	71	10	106	60	32	142	.	.	.	.	.	.
NFDR	03/27/2002	1120	SWAS	GRAB	7	6.46	37	29	96	55	69	9	104	56	32	141	.	.	.	.	.	.
NFDR	04/03/2002	1110	SWAS	GRAB	10	6.58	44	28	91	50	70	9	101	48	32	143	.	.	.	.	.	.
NFDR	04/10/2002	1220	SWAS	GRAB	10	6.55	48	29	91	52	73	9	99	30	34	145	.	.	.	.	.	.
NFDR	04/17/2002	1045	SWAS	GRAB	12	6.55	56	29	95	53	76	10	98	40	33	153	.	.	.	.	.	.
NFDR	04/24/2002	1145	SWAS	GRAB	9	6.43	34	28	102	59	74	11	104	63	29	149	.	.	.	.	.	1
NFDR	05/01/2002	1325	SWAS	GRAB	10	6.54	44	26	94	54	73	10	99	47	30	152	.	.	.	.	.	.

Site	Date	Time	Project	Method	Temp		Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T. Al	O. Al	DOC
					°C	PH														
NFDR	05/08/2002	1235	SWAS	GRAB	11	6.56	56	26	94	55	74	10	99	40	33	157	-	-	-	-
NFDR	05/15/2002	1220	SWAS	GRAB	11	6.58	55	27	95	54	76	10	99	43	34	159	-	-	-	-
NFDR	05/22/2002	1250	SWAS	GRAB	9	6.52	49	26	93	53	75	9	100	43	32	153	-	-	-	-
NFDR	05/29/2002	1300	SWAS	GRAB	13	6.59	52	29	99	56	77	11	102	45	32	160	-	-	-	-
NFDR	06/05/2002	1325	SWAS	GRAB	15	6.57	64	27	97	55	80	12	98	35	34	164	-	-	-	-
NFDR	06/12/2002	1230	SWAS	GRAB	17	6.60	69	28	97	54	85	12	95	34	37	173	-	-	-	-
NFDR	06/19/2002	1330	SWAS	GRAB	15	6.58	64	28	98	57	81	11	96	42	34	164	-	-	-	-
NFDR	06/26/2002	1400	SWAS	GRAB	18	6.58	71	28	97	52	80	11	94	37	36	173	-	-	-	-
PAIN	07/03/2001	1200	TIME	GRAB	15	6.00	12	20	29	49	26	51	106	1	22	97	-	-	-	-
PAIN	07/10/2001	1200	TIME	GRAB	21	6.16	13	19	28	48	26	52	106	2	23	100	-	-	-	-
PAIN	07/17/2001	1125	TIME	GRAB	20	6.03	15	21	29	48	26	52	105	4	23	100	-	-	-	-
PAIN	07/24/2001	1135	TIME	GRAB	20	6.00	16	19	28	48	27	53	103	6	24	103	-	-	-	-
PAIN	07/31/2001	1100	TIME	GRAB	17	5.88	12	20	29	49	25	48	106	5	23	103	0	8	-	1
PAIN	08/07/2001	1125	TIME	GRAB	21	6.01	18	18	27	46	26	53	104	3	23	104	-	-	-	-
PAIN	08/14/2001	1100	TIME	GRAB	20	6.05	14	19	28	47	26	52	107	4	22	106	-	-	-	-
PAIN	08/21/2001	1030	TIME	GRAB	18	5.94	18	21	28	47	26	51	103	3	23	106	-	-	-	-
PAIN	08/28/2001	1025	SWAS	GRAB	20	6.18	21	19	28	48	26	53	103	4	22	108	-	-	-	-
PAIN	09/04/2001	1210	TIME	GRAB	18	6.05	19	20	28	48	26	53	102	5	23	109	-	-	-	-
PAIN	09/11/2001	1135	TIME	GRAB	18	6.04	20	20	29	49	26	53	103	7	23	109	-	-	-	-
PAIN	09/18/2001	1320	TIME	GRAB	15	6.17	18	20	29	51	29	52	105	8	25	110	0	-	-	1
PAIN	09/25/2001	1840	TIME	GRAB	14	6.07	20	19	29	49	25	54	101	3	22	108	-	-	-	-
PAIN	10/02/2001	1120	TIME	GRAB	12	5.96	16	20	30	52	26	50	110	1	22	107	0	6	-	1
PAIN	10/09/2001	1210	TIME	GRAB	8	6.04	18	20	30	53	26	48	110	1	22	108	-	-	-	-
PAIN	10/16/2001	1145	TIME	GRAB	11	6.03	21	19	29	51	26	55	110	0	25	109	0	-	-	1
PAIN	10/23/2001	1210	TIME	GRAB	13	5.93	19	20	30	53	26	55	113	0	23	109	-	-	-	-
PAIN	10/30/2001	1410	TIME	GRAB	7	6.12	18	20	29	51	26	52	114	0	23	110	0	-	-	1
PAIN	11/06/2001	1210	TIME	GRAB	5	6.08	11	20	30	51	27	48	115	0	22	111	-	-	-	-
PAIN	11/13/2001	1145	TIME	GRAB	3	5.91	17	20	29	51	26	46	116	0	22	110	-0	6	-	1
PAIN	11/20/2001	1005	TIME	GRAB	7	5.88	17	19	29	51	26	48	117	0	21	109	-	-	-	-
PAIN	11/27/2001	1200	TIME	GRAB	9	5.89	10	20	30	52	27	52	119	0	26	106	0	9	-	1
PAIN	12/04/2001	1045	TIME	GRAB	5	5.96	14	20	31	53	26	47	119	0	22	106	-	-	-	-
PAIN	12/11/2001	1100	TIME	GRAB	6	5.78	11	20	31	53	24	52	109	0	26	95	-0	29	-	2
PAIN	12/18/2001	1050	TIME	GRAB	7	5.95	13	21	31	53	27	50	122	0	25	100	-	-	-	-
PAIN	12/27/2001	1010	SWAS	GRAB	2	5.97	11	21	32	56	27	46	122	0	24	98	-	-	-	-

Site	Date	Time	Project	Method	Temp		PH	Alk	Cond	Ca2 ⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T _{Al}	O _{Al}	DOC
					°C																
PAIN	01/02/2002	1130	SWAS	GRAB	0	5.89	12	22	33	58	28	48	128	0	24	101	.	.	.	.	.
PAIN	01/08/2002	1510	TIME	GRAB	1	5.93	10	20	30	54	25	45	119	0	22	91	.	.	.	.	.
PAIN	01/15/2002	1405	TIME	GRAB	4	5.91	12	21	31	54	25	46	123	0	22	86	.	.	.	.	.
PAIN	01/22/2002	1113	TIME	GRAB	2	5.86	12	21	31	55	25	44	123	0	21	84	.	.	.	.	.
PAIN	01/29/2002	1355	TIME	GRAB	9	5.99	7	21	31	55	25	47	125	0	21	81	-0	7	.	.	1
PAIN	02/05/2002	1055	TIME	GRAB	1	5.98	12	18	32	58	26	46	126	0	23	84	.	.	.	.	.
PAIN	02/12/2002	1440	TIME	GRAB	4	5.90	9	21	31	56	27	48	126	0	23	80	.	.	.	.	.
PAIN	02/19/2002	1010	TIME	GRAB	1	5.96	11	20	32	59	25	44	125	0	21	79	.	.	.	.	.
PAIN	02/26/2002	1435	TIME	GRAB	8	5.98	9	20	31	54	26	48	125	0	21	77	.	.	.	.	.
PAIN	03/05/2002	1500	TIME	GRAB	5	5.91	9	22	34	57	26	46	127	0	26	83	.	.	.	.	.
PAIN	03/12/2002	0915	TIME	GRAB	5	5.93	11	22	34	57	23	44	126	0	23	73	.	.	.	.	.
PAIN	03/19/2002	1410	TIME	GRAB	9	5.88	8	21	34	54	24	45	125	0	24	80	-0	11	.	.	1
PAIN	03/26/2002	1112	TIME	GRAB	8	5.91	11	21	34	56	24	46	126	0	25	73	.	.	.	.	.
PAIN	04/02/2002	1120	TIME	GRAB	11	5.95	7	22	33	52	24	45	123	0	25	74	-0	9	.	.	1
PAIN	04/09/2002	1437	TIME	GRAB	12	5.92	9	21	32	52	24	46	121	0	24	61	.	.	.	.	.
PAIN	04/16/2002	1545	TIME	GRAB	17	5.92	7	21	31	51	24	49	118	0	25	60	-0	9	.	.	1
PAIN	04/22/2002	0200	TIME	ISCO	.	5.61	9	21	36	54	25	54	116	0	27	83	-0	34	.	.	9
PAIN	04/22/2002	0200	TIME	ISCO	.	5.61	9	21	36	54	25	54	116	0	27	83	-0	34	.	.	9
PAIN	04/22/2002	0400	TIME	ISCO	.	5.54	3	23	39	59	24	56	121	0	29	85	-0	48	.	.	4
PAIN	04/22/2002	0400	TIME	ISCO	.	5.54	3	23	39	59	24	56	121	0	29	85	-0	48	.	.	4
PAIN	04/22/2002	0600	TIME	ISCO	.	5.53	3	23	41	62	24	58	121	3	28	86	-0	42	.	.	4
PAIN	04/22/2002	0600	TIME	ISCO	.	5.53	3	23	41	62	24	58	121	3	28	86	-0	42	.	.	4
PAIN	04/22/2002	0800	TIME	ISCO	.	5.53	-3	23	39	63	23	56	121	9	28	83	-0	37	.	.	3
PAIN	04/22/2002	0800	TIME	ISCO	.	5.53	-3	23	39	63	23	56	121	9	28	83	-0	37	.	.	3
PAIN	04/22/2002	1000	TIME	ISCO	.	5.55	-1	23	40	62	23	55	121	18	27	83	-0	35	.	.	3
PAIN	04/22/2002	1000	TIME	ISCO	.	5.55	-1	23	40	62	23	55	121	18	27	83	-0	35	.	.	3
PAIN	04/22/2002	1400	TIME	ISCO	.	5.56	-1	22	37	61	23	55	120	16	27	83	-0	30	.	.	2
PAIN	04/22/2002	1400	TIME	ISCO	.	5.56	-1	22	37	61	23	55	120	16	27	83	-0	30	.	.	2
PAIN	04/22/2002	1800	TIME	ISCO	.	5.54	0	21	37	59	23	54	119	5	31	83	-0	28	.	.	2
PAIN	04/22/2002	1800	TIME	ISCO	.	5.54	0	21	37	59	23	54	119	5	31	83	-0	28	.	.	2
PAIN	04/23/2002	1410	TIME	GRAB	12	5.56	-1	20	34	57	23	50	116	3	26	81	.	.	.	.	.
PAIN	04/30/2002	1500	TIME	GRAB	13	5.83	5	20	30	50	24	48	115	1	26	78	-0	19	.	.	1
PAIN	05/07/2002	1515	TIME	GRAB	13	5.84	7	20	30	51	23	46	115	0	26	57	.	.	.	.	.
PAIN	05/14/2002	1500	TIME	GRAB	14	5.89	8	20	30	47	24	50	116	0	26	64	-0	11	.	.	1

Site	Date	Time	Project	Method	Temp °C	pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
PAIN	05/21/2002	1155	TIME	GRAB	11	5.91	9	19	31	49	23	47	116	0	25	61	-	.	.	.
PAIN	05/28/2002	1100	TIME	GRAB	17	6.04	9	20	30	50	25	50	115	0	24	59	-0	.	.	1
PAIN	06/04/2002	1130	TIME	GRAB	20	6.08	13	20	31	50	25	53	114	0	25	63	.	.	.	.
PAIN	06/11/2002	1040	TIME	GRAB	20	6.14	16	20	30	50	26	54	113	0	25	69	0	.	.	1
PAIN	06/18/2002	1020	TIME	GRAB	17	6.18	14	19	31	54	26	51	113	5	25	78	.	.	.	.
PAIN	06/25/2002	1030	TIME	GRAB	22	6.11	14	21	32	54	26	55	113	5	26	82	.	.	.	.
PINE	07/04/2001	1040	TIME	GRAB	17	7.17	290	42	166	130	86	6	59	0	23	235	.	.	.	.
PINE	07/11/2001	1110	TIME	GRAB	18	7.12	299	38	172	135	90	7	55	5	25	243	.	.	.	.
PINE	07/18/2001	1115	TIME	GRAB	16	7.09	324	44	183	146	96	8	53	0	25	252	.	.	.	.
PINE	07/25/2001	1300	TIME	GRAB	19	7.08	345	42	184	148	99	8	49	4	26	261	.	.	.	.
PINE	07/29/2001	2030	TIME	ISCO	.	6.92	254	36	161	128	76	8	66	17	21	219	0	.	.	3
PINE	07/29/2001	2030	TIME	ISCO	.	6.92	254	36	161	128	76	8	66	17	21	219	0	.	.	3
PINE	07/29/2001	2230	TIME	ISCO	.	6.76	254	37	163	131	79	8	69	16	20	219	0	.	.	2
PINE	07/29/2001	2230	TIME	ISCO	.	6.76	254	37	163	131	79	8	69	16	20	219	0	.	.	2
PINE	08/01/2001	1110	TIME	GRAB	17	6.83	301	31	171	136	87	6	66	2	22	238	-0	.	.	1
PINE	08/04/2001	0400	TIME	ISCO	.	6.56	192	33	142	106	61	11	71	17	15	165	4	.	.	4
PINE	08/04/2001	0400	TIME	ISCO	.	6.56	192	33	142	106	61	11	71	17	15	165	4	.	.	4
PINE	08/04/2001	0600	TIME	ISCO	.	6.61	187	33	144	108	61	9	79	17	15	169	1	.	.	4
PINE	08/04/2001	0600	TIME	ISCO	.	6.61	187	33	144	108	61	9	79	17	15	169	1	.	.	4
PINE	08/04/2001	0800	TIME	ISCO	.	6.73	200	28	147	114	64	8	80	14	16	179	0	.	.	3
PINE	08/04/2001	0800	TIME	ISCO	.	6.73	200	28	147	114	64	8	80	14	16	179	0	.	.	3
PINE	08/08/2001	1120	TIME	GRAB	19	6.82	275	32	159	125	79	6	67	0	21	223	.	.	.	.
PINE	08/12/2001	2200	TIME	ISCO	.	7.03	287	38	174	137	81	9	66	9	21	234	-0	.	.	3
PINE	08/12/2001	2200	TIME	ISCO	.	7.03	287	38	174	137	81	9	66	9	21	234	-0	.	.	3
PINE	08/15/2001	1230	TIME	GRAB	18	7.10	305	36	179	145	86	7	70	4	24	242	.	.	.	.
PINE	08/22/2001	1035	TIME	GRAB	17	6.91	331	45	186	149	91	7	60	0	23	249	.	.	.	.
PINE	08/29/2001	1110	SWAS	GRAB	18	7.16	345	43	192	150	92	7	55	0	23	253	.	.	.	.
PINE	09/05/2001	1123	TIME	GRAB	17	7.14	345	43	188	149	90	7	53	5	24	257	.	.	.	.
PINE	09/12/2001	1100	TIME	GRAB	16	7.18	355	41	194	155	99	7	52	6	25	261	.	.	.	.
PINE	09/19/2001	1035	SWAS	GRAB	15	7.09	349	43	189	149	96	7	50	8	24	261	.	.	.	.
PINE	09/26/2001	1040	SWAS	GRAB	13	7.11	339	44	189	151	91	7	55	5	26	247	.	.	.	.
PINE	10/03/2001	1030	SWAS	GRAB	14	7.05	339	42	184	146	92	7	50	0	26	252	-0	.	.	0
PINE	10/10/2001	1035	SWAS	GRAB	8	7.17	334	41	181	144	92	7	49	0	27	249	.	.	.	.
PINE	10/17/2001	1100	SWAS	GRAB	10	7.10	354	44	192	154	93	11	54	0	32	246	-0	.	.	1

Site	Date	Time	Project	Method	Temp °C	pH	Alk	Cond	Ca ²⁺	Mg ²⁺ *	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T	Al	O	AI	DOC
PINE	10/24/2001	1415	SWAS	GRAB	15	7.03	353	43	188	151	97	12	50	0	31	253	-	-	-	-	-	-
PINE	10/31/2001	1400	SWAS	GRAB	10	7.25	340	41	185	149	94	11	49	0	32	251	-0	-	-	-	-	1
PINE	11/07/2001	1240	SWAS	GRAB	10	7.23	337	39	178	143	92	10	48	0	31	248	-	-	-	-	-	-
PINE	11/14/2001	1325	SWAS	GRAB	8	7.15	324	40	173	134	89	8	48	0	30	243	-0	-	-	-	-	0
PINE	11/21/2001	1235	SWAS	GRAB	6	7.17	317	39	169	135	87	8	48	0	30	239	-	-	-	-	-	-
PINE	11/28/2001	1250	SWAS	GRAB	11	7.10	301	41	173	142	85	9	59	0	40	229	-0	-	-	-	-	1
PINE	12/05/2001	1305	SWAS	GRAB	11	7.16	294	39	167	130	88	8	53	0	38	236	-	-	-	-	-	-
PINE	12/12/2001	1310	SWAS	GRAB	9	7.02	254	38	160	129	80	7	64	3	43	216	-0	-	-	-	-	1
PINE	12/19/2001	1315	SWAS	GRAB	7	7.15	259	38	155	126	86	7	60	1	40	220	-	-	-	-	-	-
PINE	12/28/2001	1235	SWAS	GRAB	3	6.71	227	35	144	116	77	6	57	1	38	209	-	-	-	-	-	-
PINE	01/03/2002	1145	SWAS	GRAB	1	6.90	227	34	138	110	81	6	55	3	37	210	-	-	-	-	-	-
PINE	01/09/2002	1325	SWAS	GRAB	2	7.19	223	32	134	104	81	6	56	5	36	203	-	-	-	-	-	-
PINE	01/16/2002	1010	TIME	GRAB	2	7.12	213	35	136	107	78	5	60	12	36	195	-	-	-	-	-	-
PINE	01/23/2002	1130	SWAS	GRAB	3	7.14	216	33	133	109	77	5	59	10	35	199	-	-	-	-	-	-
PINE	01/30/2002	1255	SWAS	GRAB	9	6.80	217	34	131	107	79	5	61	3	35	198	-0	-	-	-	-	1
PINE	02/06/2002	1240	SWAS	GRAB	3	7.11	218	33	131	110	77	5	61	4	34	198	-	-	-	-	-	-
PINE	02/13/2002	1250	SWAS	GRAB	4	7.09	204	33	128	108	77	5	62	0	35	194	-	-	-	-	-	-
PINE	02/20/2002	1235	SWAS	GRAB	5	7.20	213	31	129	107	77	5	60	0	35	196	-	-	-	-	-	-
PINE	02/27/2002	1225	SWAS	GRAB	5	7.21	222	32	133	109	80	5	60	0	34	200	-	-	-	-	-	-
PINE	03/06/2002	1055	SWAS	GRAB	4	7.10	175	34	131	113	69	5	80	13	36	174	-	-	-	-	-	-
PINE	03/13/2002	1112	TIME	GRAB	6	7.13	193	33	126	103	67	6	69	0	34	184	-	-	-	-	-	-
PINE	03/20/2002	1050	SWAS	GRAB	6	7.07	165	34	138	112	64	7	91	10	35	175	-0	-	-	-	-	2
PINE	03/27/2002	1330	SWAS	GRAB	7	7.15	164	32	126	101	65	6	87	11	32	173	-	-	-	-	-	-
PINE	04/03/2002	1415	SWAS	GRAB	10	7.20	192	34	123	100	69	6	75	0	30	171	-0	-	-	-	-	1
PINE	04/10/2002	0955	TIME	GRAB	9	7.26	189	34	123	103	67	5	69	1	29	170	-	-	-	-	-	-
PINE	04/17/2002	1335	SWAS	GRAB	16	7.46	212	34	129	103	78	7	70	0	29	185	-0	-	-	-	-	1
PINE	04/18/2002	1600	SWAS	ISCO	-	7.06	185	36	150	120	67	10	102	10	27	201	1	-	-	-	-	3
PINE	04/18/2002	1600	SWAS	ISCO	-	7.06	185	36	150	120	67	10	102	10	27	201	1	-	-	-	-	3
PINE	04/18/2002	1800	SWAS	ISCO	-	7.12	176	36	151	120	68	10	106	14	27	194	0	-	-	-	-	2
PINE	04/18/2002	1800	SWAS	ISCO	-	7.12	176	36	151	120	68	10	106	14	27	194	0	-	-	-	-	2
PINE	04/18/2002	2000	SWAS	ISCO	-	7.15	178	36	150	121	69	10	107	15	27	194	0	-	-	-	-	2
PINE	04/18/2002	2000	SWAS	ISCO	-	7.15	178	36	150	121	69	10	107	15	27	194	0	-	-	-	-	2
PINE	04/18/2002	2200	SWAS	ISCO	-	7.19	179	36	150	121	68	9	107	13	27	195	0	-	-	-	-	2
PINE	04/18/2002	2200	SWAS	ISCO	-	7.19	179	36	150	121	68	9	107	13	27	195	0	-	-	-	-	2

Site	Date	Time	Project	Method	Temp °C	pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T Al	O Al	DOC
PINE	04/21/2002	2000	SWAS	ISCO	.	7.21	177	35	148	118	70	9	107	13	27	196	-0	.	.	2
PINE	04/21/2002	2000	SWAS	ISCO	.	7.21	177	35	148	118	70	9	107	13	27	196	-0	.	.	2
PINE	04/21/2002	2200	SWAS	ISCO	.	7.23	179	35	147	117	69	9	107	14	27	196	-0	.	.	2
PINE	04/21/2002	2200	SWAS	ISCO	.	7.23	179	35	147	117	69	9	107	14	27	196	-0	.	.	2
PINE	04/22/2002	0000	SWAS	ISCO	.	7.21	179	35	146	117	68	9	105	12	27	197	-0	.	.	1
PINE	04/22/2002	0000	SWAS	ISCO	.	7.21	179	35	146	117	68	9	105	12	27	197	-0	.	.	1
PINE	04/22/2002	0200	SWAS	ISCO	.	7.20	178	35	148	120	70	9	104	9	28	195	-0	.	.	1
PINE	04/22/2002	0200	SWAS	ISCO	.	7.20	178	35	148	120	70	9	104	9	28	195	-0	.	.	1
PINE	04/22/2002	0400	SWAS	ISCO	.	7.21	183	35	146	118	71	9	103	10	28	197	-0	.	.	1
PINE	04/22/2002	0400	SWAS	ISCO	.	7.21	183	35	146	118	71	9	103	10	28	197	-0	.	.	1
PINE	04/22/2002	0800	SWAS	ISCO	.	7.20	177	34	145	119	71	9	101	7	28	195	-0	.	.	1
PINE	04/22/2002	0800	SWAS	ISCO	.	7.20	177	34	145	119	71	9	101	7	28	195	-0	.	.	1
PINE	04/22/2002	1200	SWAS	ISCO	.	6.69	193	35	141	110	65	22	88	15	25	241	19	.	.	6
PINE	04/22/2002	1200	SWAS	ISCO	.	6.69	193	35	141	110	65	22	88	15	25	241	19	.	.	6
PINE	04/22/2002	2000	SWAS	ISCO	.	7.16	203	36	150	119	73	9	96	11	30	203	-0	.	.	2
PINE	04/22/2002	2000	SWAS	ISCO	.	7.16	203	36	150	119	73	9	96	11	30	203	-0	.	.	2
PINE	04/24/2002	1400	SWAS	GRAB	12	7.19	176	32	133	107	67	7	88	6	27	190	-0	.	.	1
PINE	04/28/2002	1200	SWAS	ISCO	.	7.14	189	31	133	108	69	9	74	10	25	187	-0	.	.	2
PINE	04/28/2002	1200	SWAS	ISCO	.	7.14	189	31	133	108	69	9	74	10	25	187	-0	.	.	2
PINE	04/28/2002	1400	SWAS	ISCO	.	7.15	175	32	131	105	67	9	79	11	24	181	-0	.	.	2
PINE	04/28/2002	1400	SWAS	ISCO	.	7.15	175	32	131	105	67	9	79	11	24	181	-0	.	.	2
PINE	04/28/2002	1600	SWAS	ISCO	.	7.16	172	32	134	107	63	8	84	13	24	179	-0	.	.	2
PINE	04/28/2002	1600	SWAS	ISCO	.	7.16	172	32	134	107	63	8	84	13	24	179	-0	.	.	2
PINE	04/28/2002	1800	SWAS	ISCO	.	7.16	175	33	136	109	64	8	87	13	25	180	-0	.	.	2
PINE	04/28/2002	1800	SWAS	ISCO	.	7.16	175	33	136	109	64	8	87	13	25	180	-0	.	.	2
PINE	04/28/2002	2000	SWAS	ISCO	.	7.18	181	33	140	116	65	8	90	11	26	182	-0	.	.	2
PINE	04/28/2002	2000	SWAS	ISCO	.	7.18	181	33	140	116	65	8	90	11	26	182	-0	.	.	2
PINE	04/29/2002	0000	SWAS	ISCO	.	7.19	183	33	139	111	66	8	94	14	26	185	0	.	.	2
PINE	04/29/2002	0000	SWAS	ISCO	.	7.19	183	33	139	111	66	8	94	14	26	185	0	.	.	2
PINE	04/29/2002	0400	SWAS	ISCO	.	7.09	179	32	139	113	66	8	95	8	26	185	-0	.	.	1
PINE	04/29/2002	0400	SWAS	ISCO	.	7.09	179	32	139	113	66	8	95	8	26	185	-0	.	.	1
PINE	04/29/2002	1200	SWAS	ISCO	.	7.18	176	33	136	112	66	7	94	12	27	186	-0	.	.	1
PINE	04/29/2002	1200	SWAS	ISCO	.	7.18	176	33	136	112	66	7	94	12	27	186	-0	.	.	1
PINE	05/01/2002	1050	SWAS	GRAB	10	7.20	177	31	129	107	66	6	81	3	27	187	-0	.	.	1

Site	Date	Time	Project	Method	Temp		Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T Al	O Al	DOC
					°C	PH														
PINE	05/08/2002	1040	SWAS	GRAB	12	7.27	220	34	138	114	72	7	70	6	27	193	.	.	.	4
PINE	05/15/2002	1055	SWAS	GRAB	11	7.29	229	35	141	117	74	6	69	2	28	197	-0	.	.	1
PINE	05/22/2002	1100	TIME	GRAB	10	7.25	224	34	139	115	75	6	65	5	27	197	.	.	.	.
PINE	05/27/2002	0000	TIME	ISCO	.	6.90	198	34	129	105	69	11	73	0	23	217	1	.	.	3
PINE	05/27/2002	0000	TIME	ISCO	.	6.90	198	34	129	105	69	11	73	0	23	217	1	.	.	3
PINE	05/27/2002	0200	TIME	ISCO	.	7.09	196	36	144	117	69	11	81	10	22	205	1	.	.	3
PINE	05/27/2002	0200	TIME	ISCO	.	7.09	196	36	144	117	69	11	81	10	22	205	1	.	.	3
PINE	05/27/2002	0400	TIME	ISCO	.	7.11	196	36	147	118	72	10	85	5	23	190	1	.	.	3
PINE	05/27/2002	0400	TIME	ISCO	.	7.11	196	36	147	118	72	10	85	5	23	190	1	.	.	3
PINE	05/27/2002	0600	TIME	ISCO	.	7.14	201	37	147	121	71	9	86	5	23	189	-0	.	.	2
PINE	05/27/2002	0600	TIME	ISCO	.	7.14	201	37	147	121	71	9	86	5	23	189	-0	.	.	2
PINE	05/27/2002	0800	TIME	ISCO	.	7.19	202	37	146	120	73	8	86	7	25	188	-0	.	.	2
PINE	05/27/2002	0800	TIME	ISCO	.	7.19	202	37	146	120	73	8	86	7	25	188	-0	.	.	2
PINE	05/29/2002	1040	TIME	GRAB	14	7.24	214	35	140	116	72	6	77	5	25	197	-0	.	.	1
PINE	06/05/2002	1120	TIME	GRAB	15	7.21	252	35	148	114	80	7	64	6	26	209	.	.	.	4
PINE	06/12/2002	1100	TIME	GRAB	17	7.29	274	37	161	133	86	7	59	3	26	220	-0	.	.	1
PINE	06/19/2002	1100	TIME	GRAB	16	7.27	280	40	164	136	84	7	61	5	25	221	.	.	.	.
PINE	06/26/2002	1120	TIME	GRAB	19	7.25	304	40	171	138	91	7	57	0	26	229	.	.	.	.
STAN	07/03/2001	1650	SWAS	GRAB	17	6.79	99	18	69	28	67	11	45	0	20	147	.	.	.	.
STAN	07/10/2001	1555	SWAS	GRAB	21	6.71	104	19	70	29	69	12	43	0	20	147	.	.	.	.
STAN	07/17/2001	1545	SWAS	GRAB	21	6.58	103	18	68	28	71	12	43	0	20	146	.	.	.	^
STAN	07/24/2001	1535	SWAS	GRAB	22	6.96	109	18	70	29	71	12	43	0	20	148	.	.	.	.
STAN	07/31/2001	1510	SWAS	GRAB	17	6.46	109	16	73	30	63	12	43	0	19	142	0	.	.	1
STAN	08/07/2001	1445	SWAS	GRAB	22	6.41	107	18	71	29	70	13	43	0	20	145	.	.	.	.
STAN	08/14/2001	1530	SWAS	GRAB	21	6.72	114	18	75	29	70	13	44	0	18	147	.	.	.	4
STAN	08/21/2001	1400	SWAS	GRAB	21	6.48	111	21	73	29	69	13	43	0	20	146	.	.	.	.
STAN	08/28/2001	1300	SWAS	GRAB	19	6.72	111	18	72	29	69	13	42	0	20	145	.	.	.	.
STAN	09/04/2001	1620	SWAS	GRAB	18	6.63	115	20	74	30	68	13	42	0	20	146	.	.	.	.
STAN	09/11/2001	1425	SWAS	GRAB	19	6.60	113	20	74	31	67	13	41	0	21	147	.	.	.	4
STAN	09/18/2001	0910	SWAS	GRAB	16	6.68	109	19	72	30	68	12	43	1	22	147	-0	.	.	1
STAN	09/24/2001	2000	SWAS	ISCO	.	6.58	81	18	72	29	54	19	34	0	21	112	7	.	.	10
STAN	09/24/2001	2000	SWAS	ISCO	.	6.58	81	18	72	29	54	19	34	0	21	112	7	.	.	10
STAN	09/25/2001	1515	SWAS	GRAB	16	6.83	109	18	76	31	64	14	41	0	20	137	.	.	.	.
STAN	10/02/2001	1450	SWAS	GRAB	14	6.64	94	18	69	28	63	12	41	0	21	140	0	.	.	0

Site	Date	Time	Project	Method	Temp		Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T Al	O Al	DOC
					°C	PH														
STAN	10/09/2001	1550	SWAS	GRAB	11	6.85	94	18	68	29	62	11	41	0	21	139	-	-	-	-
STAN	10/16/2001	1545	SWAS	GRAB	13	6.52	80	19	75	31	63	15	42	0	30	135	0	.	.	1
STAN	10/23/2001	1630	SWAS	GRAB	14	6.77	91	18	69	29	63	13	42	0	26	139	.	^	.	.
STAN	10/30/2001	0945	SWAS	GRAB	8	6.86	95	18	71	30	62	12	42	0	24	141	-0	.	.	1
STAN	11/06/2001	1550	SWAS	GRAB	8	6.89	99	18	72	29	62	13	41	0	24	142	.	.	.	.
STAN	11/13/2001	1515	SWAS	GRAB	6	6.73	98	18	69	29	60	12	41	0	23	142	-0	.	.	0
STAN	11/20/2001	1430	SWAS	GRAB	7	6.60	90	18	67	28	60	12	41	0	22	141	.	.	.	.
STAN	11/27/2001	1525	SWAS	GRAB	10	6.87	104	20	82	35	63	16	45	0	34	136	-0	.	.	1
STAN	12/04/2001	1610	SWAS	GRAB	9	6.85	93	18	71	30	57	13	42	0	25	136	.	.	.	.
STAN	12/11/2001	1500	SWAS	GRAB	8	6.31	72	17	71	29	54	13	41	0	24	125	-0	.	.	1
STAN	12/18/2001	1505	SWAS	GRAB	7	6.76	87	18	68	28	56	12	43	0	23	130	.	.	.	.
STAN	12/27/2001	1315	SWAS	GRAB	4	6.27	84	17	65	27	55	10	41	0	22	128	.	.	.	1
STAN	01/02/2002	1445	SWAS	GRAB	2	6.33	84	17	63	28	54	10	40	0	22	129	.	.	.	.
STAN	01/08/2002	1055	SWAS	GRAB	2	6.76	74	17	63	29	54	10	39	0	21	128	.	.	.	.
STAN	01/15/2002	0935	SWAS	GRAB	4	6.76	78	17	61	26	56	10	40	0	22	128	.	.	.	.
STAN	01/22/2002	1500	SWAS	GRAB	4	6.78	78	18	62	28	55	10	39	0	21	127	.	.	.	.
STAN	01/29/2002	0910	SWAS	GRAB	7	6.78	87	17	61	26	56	10	40	1	22	128	-0	.	.	0
STAN	02/05/2002	1510	SWAS	GRAB	4	6.78	86	17	62	26	58	10	41	0	22	129	.	.	.	.
STAN	02/12/2002	0925	SWAS	GRAB	4	6.80	84	17	63	28	58	9	41	0	22	129	.	.	.	.
STAN	02/19/2002	1403	SWAS	GRAB	5	6.83	79	16	59	26	57	9	42	0	23	128	.	.	.	.
STAN	02/26/2002	0930	SWAS	GRAB	6	6.82	74	16	60	26	58	9	42	0	22	128	.	.	.	.
STAN	03/05/2002	1030	SWAS	GRAB	3	6.76	74	18	66	29	56	9	44	1	23	127	.	.	^	.
STAN	03/13/2002	0900	SWAS	GRAB	6	6.89	74	18	64	28	53	9	45	0	24	124	.	.	.	.
STAN	03/19/2002	0920	SWAS	GRAB	8	6.84	76	17	65	26	56	10	46	0	23	130	-0	.	.	1
STAN	03/26/2002	1515	SWAS	GRAB	8	6.75	80	18	65	28	55	10	51	0	24	130	.	.	.	.
STAN	04/02/2002	1610	SWAS	GRAB	11	6.32	58	17	62	26	57	10	49	0	23	131	-0	.	.	1
STAN	04/09/2002	0920	SWAS	GRAB	11	6.85	79	18	60	25	57	10	45	0	22	126	.	.	.	.
STAN	04/16/2002	1000	SWAS	GRAB	15	6.81	85	19	63	26	62	11	45	0	23	130	-0	.	.	1
STAN	04/22/2002	0400	SWAS	ISCO	.	6.46	89	18	71	30	59	16	54	0	20	124	-0	.	.	.
STAN	04/22/2002	0400	SWAS	ISCO	.	6.46	89	18	71	30	59	16	54	0	20	124	-0	.	.	.
STAN	04/23/2002	0925	SWAS	GRAB	10	6.81	79	19	72	30	62	13	61	0	23	136	.	.	.	.
STAN	04/28/2002	1200	SWAS	ISCO	.	6.69	77	17	64	27	56	12	49	0	21	124	0	.	.	2
STAN	04/28/2002	1200	SWAS	ISCO	.	6.69	77	17	64	27	56	12	49	0	21	124	0	.	.	2
STAN	04/30/2002	0930	SWAS	GRAB	11	6.89	79	18	64	27	59	11	51	0	23	134	-0	.	.	1

Site	Date	Time	Project	Method	Temp		PH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T Al	O Al	DOC
					°C																
STAN	05/07/2002	0945	SWAS	GRAB	12	6.80	77	17	65	28	60	11	49	0	24	133					
STAN	05/14/2002	0900	SWAS	GRAB	13	6.87	82	18	65	27	61	11	46	0	23	137		-0	.	.	1
STAN	05/21/2002	1720	SWAS	GRAB	11	6.84	84	17	63	26	60	10	45	0	22	135			*	.	.
STAN	05/28/2002	1525	SWAS	GRAB	11	6.85	92	18	64	27	66	12	43	0	22	139		-0	.	.	1
STAN	06/04/2002	1730	SWAS	GRAB	19	6.79	102	18	70	29	66	13	41	0	22	142		»	.	.	(
STAN	06/11/2002	1430	SWAS	GRAB	21	6.92	94	17	67	28	65	12	40	0	21	143		0	.	.	1
STAN	06/18/2002	1500	SWAS	GRAB	20	6.90	97	19	68	28	67	12	41	0	21	142			.	.	(
STAN	06/25/2002	1530	SWAS	GRAB	21	6.83	104	18	72	30	70	13	40	0	21	142			.	*	1
SY21	05/27/2002	1355	VTSSS	GRAB	12	6.29	25	10	32	28	19	15	37	6	11	73			.	.	.
VT01	07/31/2001	1055	VTSSS	GRAB	13	6.02	49	18	87	31	44	11	45	56	13	112			.	.	.
VT01	11/01/2001	1124	VTSSS	GRAB	7	6.76	125	20	90	38	61	10	18	33	13	162		J	.	.	.
VT01	01/29/2002	1227	VTSSS	GRAB	7	6.41	54	21	84	35	49	12	38	66	13	120			.	.	.
VT01	04/29/2002	1105	VTSSS	GRAB	10	6.90	83	20	87	35	56	11	9	33	13	131			.	.	.
VT02	07/31/2001	1250	VTSSS	GRAB	13	5.94	14	14	50	22	37	12	59	30	12	112			31	.	.
VT02	11/01/2001	1215	VTSSS	GRAB	7	6.55	51	15	49	26	54	13	47	21	13	146			.	.	.
VT02	01/29/2002	1404	VTSSS	GRAB	6	6.15	16	16	54	27	41	12	51	48	14	112			.	.	.
VT02	04/29/2002	1345	VTSSS	GRAB	12	6.55	26	16	50	24	46	13	50	35	14	123			.	.	.
VT03	11/01/2001	1202	VTSSS	GRAB	8	6.48	79	17	47	38	61	18	29	0	35	138			.	.	.
VT03	01/29/2002	1339	VTSSS	GRAB	7	6.68	42	12	34	34	24	16	37	4	10	95			.	.	.
VT03	04/29/2002	1153	VTSSS	GRAB	12	6.82	63	12	36	34	29	16	32	0	11	107			.	.	.
VT04	07/31/2001	0953	VTSSS	GRAB	14	6.31	29	12	30	18	51	9	51	2	11	132			.	.	.
VT04	11/01/2001	1038	VTSSS	GRAB	8	6.72	52	13	25	17	63	13	41	0	15	167			.	.	.
VT04	01/29/2002	1119	VTSSS	GRAB	7	6.18	19	12	26	19	49	11	53	8	12	125			.	.	.
VT04	04/29/2002	1018	VTSSS	GRAB	10	6.58	34	12	25	17	56	11	50	1	12	138			.	.	.
VT05	07/31/2001	1324	VTSSS	GRAB	15	6.25	26	12	22	33	25	21	45	-0	14	99			.	.	.
VT05	11/01/2001	1345	VTSSS	GRAB	9	6.90	182	25	80	100	47	33	50	0	12	128			.	.	.
VT05	01/29/2002	1453	VTSSS	GRAB	8	6.59	41	12	26	37	26	20	45	0	11	94			.	.	.
VT05	04/29/2002	9999	VTSSS	GRAB	13	6.80	56	12	26	39	30	21	45	0	13	102			.	.	.
VT06	07/31/2001	0831	VTSSS	GRAB	13	5.70	32	14	45	49	25	16	58	12	12	85			.	.	.
VT06	11/01/2001	0942	VTSSS	GRAB	8	6.57	85	17	53	61	36	19	66	0	11	100			.	.	.
VT06	01/29/2002	0954	VTSSS	GRAB	6	6.46	35	15	41	48	24	15	56	18	11	81			.	.	.
VT06	04/29/2002	0916	VTSSS	GRAB	11	6.73	50	15	42	49	30	16	55	7	11	85			.	.	.
VT07	07/30/2001	1430	VTSSS	GRAB	11	5.05	-6	13	42	26	13	9	74	4	13	63			75	42	.
VT07	10/31/2001	1045	VTSSS	GRAB	5	5.88	14	15	53	31	21	16	77	0	17	69			30	.	.

Site	Date	Time	Project	Method	Temp		PH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T	Al	O	Al	DOC
					°C																		
VT07	04/30/2002	1130	VTSSS	GRAB	10	5.22	-3	16	54	27	19	8	77	0	12	55			80		50		
VT08	07/30/2001	1415	VTSSS	GRAB	12	5.06	-6	13	42	26	13	9	74	4	12	63			76		43		
VT08	10/31/2001	1115	VTSSS	GRAB	5	6.04	19	14	65	33	22	12	82	0	15	7	2						
VT08	04/30/2002	1055	VTSSS	GRAB	10	6.02	12	14	62	29	17	8	74	4	13	56			43				
VT09	07/30/2001	1145	VTSSS	GRAB	15	5.05	-8	12	42	26	13	9	75	4	12	62			80		45		
VT09	10/31/2001	1330	VTSSS	GRAB	8	5.26	0	16	53	26	22	13	80	0	21	61			83		68		
VT09	04/30/2002	1410	VTSSS	GRAB	14	5.94	6	13	45	28	15	9	69	0	15	56			25				
VT10	08/09/2001	1415	VTSSS	GRAB	18	6.14	37	12	40	42	16	15	49	6	12	9	0						
VT10	10/29/2001	1430	VTSSS	GRAB		6.37	49	13	43	35	25	17	42	0	17	8	5						
VT10	01/28/2002	1135	VTSSS	GRAB	2	6.21	19	11	31	35	14	11	54	0	13	6	5						
VT10	04/30/2002	1400	VTSSS	GRAB	10	5.84	9	11	25	29	16	13	55	0	18	61			14				
VT11	08/09/2001	0958	VTSSS	GRAB	16	6.16	39	11	37	34	13	12	34	2	14	7	9						
VT11	10/29/2001	1355	VTSSS	GRAB	7	6.41	39	10	33	33	13	16	34	0	13	8	6						
VT11	01/28/2002	0830	VTSSS	GRAB	3	6.28	24	11	34	36	13	11	38	10	15	6	5						
VT11	04/30/2002	1410	VTSSS	GRAB	10	6.02	12	11	30	32	13	12	45	0	16	5	9						
VT12	08/09/2001	1035	VTSSS	GRAB		6.80	185	21	135	98	14	17	37	6	15	7	7						
VT12	10/29/2001	1403	VTSSS	GRAB	8	6.86	226	28	146	111	13	19	39	0	17	6	6						
VT12	01/28/2002	0845	VTSSS	GRAB	4	6.80	86	17	72	56	14	12	41	7	16	6	3						
VT12	04/30/2002	1600	VTSSS	GRAB	10	6.76	70	16	64	56	14	15	44	0	17	6	3						
VT14	08/09/2001	1200	VTSSS	GRAB	18	6.40	29	10	37	37	16	12	48	0	14	8	2						
VT14	10/29/2001	1123	VTSSS	GRAB	7	6.29	37	12	37	37	16	16	41	0	18	8	4						
VT14	01/28/2002	1000	VTSSS	GRAB	4	6.18	20	12	31	35	15	11	50	3	16	6	7						
VT14	04/30/2002	1545	VTSSS	GRAB	11	6.12	14	10	26	31	14	13	50	0	16	6	5						
VT15	08/09/2001	1223	VTSSS	GRAB	18	6.35	34	14	44	45	20	13	65	1	14	9	1						
VT15	10/29/2001	1112	VTSSS	GRAB	8	6.08	33	10	34	31	15	13	33	0	14	9	6						
VT15	01/28/2002	1030	VTSSS	GRAB	4	6.10	19	10	30	27	16	10	44	0	13	8	0						
VT15	04/30/2002	1530	VTSSS	GRAB	10	6.25	17	13	33	41	17	15	65	0	15	6	5						
VT16	08/01/2001	0919	VTSSS	GRAB	18	6.07	34	16	68	38	18	14	76	0	20	8	3						
VT16	10/25/2001	0910	VTSSS	GRAB	14	6.24	39	17	69	38	15	21	72	0	20	8	4						
VT16	01/28/2002	0950	VTSSS	GRAB	4	6.20	18	14	54	33	14	11	74	0	18	6	6						
VT16	04/25/2002	1055	VTSSS	GRAB	13	6.16	14	15	56	38	15	14	82	0	22	6	4						
VT18	07/31/2001	1045	VTSSS	GRAB	15	6.64	89	19	79	64	32	19	71	8	10	8	7						
VT18	10/25/2001	1100	VTSSS	GRAB	9	6.72	173	29	106	87	54	32	79	0	18	8	7						
VT18	01/28/2002	1030	VTSSS	GRAB	1	6.61	55	21	69	55	33	18	83	22	13	8	5						

Site	Date	Time	Project	Method	Temp °C	PH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T Al	O Al	DOC
VT18	04/26/2002	0940	VTSSS	GRAB	6	6.63	39	19	66	54	27	17	85	15	12	83	.	.	.	.
VT19	07/31/2001	1055	VTSSS	GRAB	15	6.29	74	21	79	62	27	22	67	25	11	89	.	.	.	.
VT19	10/25/2001	1115	VTSSS	GRAB	10	6.62	126	24	95	77	31	27	78	0	15	91	.	.	.	.
VT19	01/28/2002	1045	VTSSS	GRAB	4	6.52	46	20	69	58	26	19	72	33	13	81	.	.	.	.
VT19	04/26/2002	0955	VTSSS	GRAB	7	6.53	37	20	67	55	25	19	77	0	13	82	.	.	.	.
VT22	07/31/2001	1335	VTSSS	GRAB	16	6.60	139	25	81	56	79	16	52	1	22	199	.	.	.	.
VT22	10/24/2001	1200	VTSSS	GRAB	13	6.70	174	25	93	68	81	19	47	0	30	203	.	.	.	.
VT22	01/24/2002	1030	VTSSS	GRAB	7	6.45	79	22	68	52	71	13	64	14	27	165	.	.	.	.
VT22	04/24/2002	1235	VTSSS	GRAB	10	6.84	105	21	65	49	69	12	54	0	27	181	.	.	.	.
VT23	07/31/2001	1425	VTSSS	GRAB	16	6.48	138	20	81	57	78	16	53	1	22	199	.	.	.	.
VT23	10/24/2001	1330	VTSSS	GRAB	13	6.96	218	27	100	64	98	25	27	0	29	239	.	.	.	.
VT23	01/24/2002	0915	VTSSS	GRAB	7	6.37	105	24	75	50	81	16	49	22	33	178	.	.	.	.
VT23	04/25/2002	0830	VTSSS	GRAB	10	6.87	140	22	77	48	80	16	42	0	31	190	.	.	.	.
VT24	07/31/2001	0910	VTSSS	GRAB	16	6.30	39	15	67	27	15	11	57	0	14	95	.	.	.	.
VT24	10/29/2001	1040	VTSSS	GRAB	5	6.50	59	15	79	29	14	12	59	0	12	106	.	.	.	.
VT24	01/30/2002	0945	VTSSS	GRAB	7	6.36	28	14	58	27	16	11	62	0	17	79	.	.	.	.
VT24	04/26/2002	1515	VTSSS	GRAB	9	6.19	18	12	45	26	17	11	58	0	19	73	.	.	.	.
VT25	07/31/2001	0830	VTSSS	GRAB	17	5.80	6	10	28	26	14	9	47	0	14	74	.	20	.	.
VT25	10/29/2001	0950	VTSSS	GRAB	7	6.07	14	9	23	25	14	13	37	0	16	83	.	.	.	.
VT25	01/30/2002	0900	VTSSS	GRAB	8	5.82	8	10	26	25	14	9	47	1	17	67	.	14	.	.
VT25	04/26/2002	1430	VTSSS	GRAB	10	5.95	5	9	24	26	14	9	46	0	18	60	.	13	.	.
VT26	07/26/2001	1000	VTSSS	GRAB	17	5.08	-11	14	44	30	14	6	77	0	18	84	.	34	.	.
VT26	11/01/2001	1120	VTSSS	GRAB	9	5.40	-2	13	41	28	14	9	73	0	17	83	.	28	.	.
VT26	01/28/2002	1320	VTSSS	GRAB	6	5.27	-6	18	50	38	14	12	90	3	23	63	.	37	.	.
VT26	04/29/2002	1230	VTSSS	GRAB	10	5.25	-4	17	51	37	15	13	97	0	24	64	.	48	.	.
VT28	07/25/2001	1700	VTSSS	GRAB	18	5.90	15	7	24	21	12	7	21	0	12	94	.	28	.	.
VT28	11/01/2001	1030	VTSSS	GRAB	8	6.17	19	8	23	21	12	9	24	0	12	97	.	.	.	.
VT28	01/28/2002	1200	VTSSS	GRAB	4	5.27	-3	12	24	28	12	8	54	1	16	62	.	38	.	.
VT28	04/29/2002	1145	VTSSS	GRAB	10	5.17	-8	12	24	28	13	9	58	0	16	60	.	59	31	.
VT29	07/25/2001	1230	VTSSS	GRAB	17	5.31	6	9	23	24	13	8	37	1	15	68	.	15	.	.
VT29	11/01/2001	0815	VTSSS	GRAB	7	5.64	3	10	22	24	11	10	44	0	15	63	.	14	.	.
VT29	01/28/2002	0845	VTSSS	GRAB	4	5.50	-5	10	24	25	11	9	43	4	16	49	.	18	.	.
VT29	04/29/2002	1000	VTSSS	GRAB	9	5.71	2	9	22	23	12	9	42	0	16	50	.	18	.	.
VT31	07/26/2001	1130	VTSSS	GRAB	17	5.21	-1	9	18	22	13	8	36	0	16	79	.	58	41	.

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
					°C																
VT31	11/01/2001	1300	VTSSS	GRAB	6	5.64	7	9	19	24	14	10	38	0	16	81			37		
VT31	01/28/2002	1130	VTSSS	GRAB	4	5.05	-11	12	17	26	14	7	52	0	16	61			52	24	
VT31	04/29/2002	1400	VTSSS	GRAB	10	5.13	-6	11	15	22	13	7	48	0	15	63			56	27	
VT32	07/25/2001	1400	VTSSS	GRAB	17	5.55	8	13	53	33	12	8	67	8	18	69			27		
VT32	11/01/2001	0930	VTSSS	GRAB	7	5.86	14	13	52	34	12	9	68	1	19	65			20		
VT32	01/28/2002	1000	VTSSS	GRAB	4	5.32	-4	17	57	37	13	9	80	15	21	48			44		
VT32	04/29/2002	1100	VTSSS	GRAB	8	5.33	-3	16	57	35	12	9	82	10	20	50			50	24	
VT33	07/26/2001	1430	VTSSS	GRAB	19	7.46	1E3	106	994	149	23	18	67	0	14	122					
VT33	10/29/2001	1004	VTSSS	GRAB	6	7.55	1E3	110	989	160	24	20	73	0	14	119					
VT33	01/28/2002	1104	VTSSS	GRAB	5	7.55	583	70	553	91	21	12	72	0	15	96					
VT33	04/24/2002	1507	VTSSS	GRAB	12	6.76	112	21	129	40	18	12	61	0	20	77					
VT34	07/26/2001	1315	VTSSS	GRAB	19	6.82	97	20	103	52	21	12	53	7	16	98					
VT34	10/29/2001	0935	VTSSS	GRAB	6	6.77	99	18	90	53	20	14	56	0	16	96					
VT34	01/28/2002	1140	VTSSS	GRAB	4	6.75	79	20	96	53	20	10	74	1	19	81					
VT34	04/24/2002	1549	VTSSS	GRAB	11	6.42	23	16	65	37	20	13	81	0	23	71					
VT36	07/31/2001	0835	VTSSS	GRAB	17	5.63	3	14	23	34	22	29	72	8	22	99			20		
VT36	10/29/2001	0815	VTSSS	GRAB	7	5.63	5	14	21	33	24	29	73	0	23	110			15		
VT36	01/29/2002	0920	VTSSS	GRAB	5	5.65	4	14	20	32	22	25	69	0	22	100			14		
VT36	03/12/2002	0835	SWAS	GRAB	5	5.66	4	14	19	30	21	25	70	0	23	91					
VT36	04/30/2002	0930	VTSSS	GRAB	9	5.37	-1	20	36	50	22	34	104	7	28	77			41		
VT37	07/25/2001	0850	VTSSS	GRAB	17	6.25	42	17	47	58	28	23	68	24	15	86					
VT37	10/29/2001	1010	VTSSS	GRAB	9	6.44	63	19	52	63	30	21	74	8	15	80					
VT37	01/28/2002	0843	VTSSS	GRAB	6	6.33	22	17	42	52	26	15	72	17	15	69					
VT37	04/24/2002	0815	VTSSS	GRAB	7	6.16	19	16	43	53	21	18	82	5	17	72					
VT38	10/31/2001	1110	VTSSS	GRAB	10	6.48	131	30	117	106	43	23	113	13	18	81					
VT38	01/28/2002	9999	VTSSS	GRAB	4	6.60	56	25	80	73	35	16	116	15	17	67					
VT38	04/24/2002	1140	VTSSS	GRAB	9	6.43	40	23	78	76	32	20	129	2	20	79					
VT39	07/30/2001	1020	VTSSS	GRAB	17	5.36	-1	8	9	14	16	14	36	0	15	85			43		
VT39	10/25/2001	1130	VTSSS	GRAB	13	5.34	0	10	9	14	16	21	42	0	17	90			34		
VT39	01/24/2002	1035	VTSSS	GRAB	7	5.30	-2	10	10	16	17	15	43	0	15	80			33		
VT39	04/24/2002	1340	VTSSS	GRAB	11	5.09	-8	13	14	21	18	18	61	1	18	67			66	21	
VT40	07/30/2001	1040	VTSSS	GRAB	17	5.70	12	7	18	20	17	16	25	0	14	101			74	63	
VT40	10/25/2001	1045	VTSSS	GRAB	13	6.26	25	11	16	25	23	27	44	0	18	92					
VT40	01/24/2002	0945	VTSSS	GRAB	7	6.03	14	11	15	26	23	19	49	0	17	74					

Site	Date	Time	Project	Method	Temp		PH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T Al	O Al	DOC
					°C																
VT40	04/24/2002	1245	VTSSS	GRAB	11	5.91	12	12	16	26	26	25	58	0	23	75			16		
VT41	07/30/2001	0945	VTSSS	GRAB	16	6.22	27	12	45	30	17	18	52	5	14	77					
VT41	10/25/2001	1315	VTSSS	GRAB	13	6.16	35	13	42	29	18	21	52	0	18	88		*	*		
VT41	01/24/2002	1130	VTSSS	GRAB	5	6.36	24	14	40	28	18	16	56	2	16	80		*	*		
VT41	04/24/2002	1430	VTSSS	GRAB	10	6.09	13	13	41	30	18	20	69	0	19	67		*	*		
VT42	07/31/2001	1207	VTSSS	GRAB	16	6.43	109	14	60	35	58	12	20	7	20	157		*	*		
VT42	10/24/2001	0755	VTSSS	GRAB	12	6.67	115	16	57	32	59	14	19	0	21	159		*	*		
VT42	01/24/2002	1215	VTSSS	GRAB	7	6.44	74	15	48	29	52	10	25	13	21	136		*	*		
VT42	04/24/2002	1100	VTSSS	GRAB	9	6.76	71	14	48	28	51	10	24	6	22	137		*	*		
VT43	07/30/2001	1410	VTSSS	GRAB	14	6.45	72	10	47	17	42	7	16	0	17	108		*	*		
VT43	10/27/2001	1405	VTSSS	GRAB	9	6.62	77	12	47	17	44	10	12	0	21	115		*	*		
VT43	01/27/2002	1245	VTSSS	GRAB	5	6.69	37	11	38	14	41	7	15	0	19	102					
VT43	04/27/2002	1415	VTSSS	GRAB	0	6.69	49	9	34	12	39	6	12	0	19	99					
VT44	07/30/2001	1220	VTSSS	GRAB	16	6.35	87	15	59	22	56	9	34	0	18	136					
VT44	10/27/2001	1635	VTSSS	GRAB	10	6.61	92	16	60	26	59	13	33	0	24	141					
VT44	01/27/2002	1100	VTSSS	GRAB	5	6.32	59	15	54	23	51	8	45	2	22	114		*	*		
VT44	04/27/2002	1550	VTSSS	GRAB	2	6.56	55	14	53	21	51	8	39	0	23	119		*	*		
VT45	07/30/2001	1535	VTSSS	GRAB	19	6.47	67	16	35	63	37	31	59	2	20	123					
VT45	10/27/2001	1330	VTSSS	GRAB	10	6.55	94	19	38	72	40	30	55	0	22	124		*	*		
VT45	01/26/2002	1300	VTSSS	GRAB	6	6.45	41	19	32	61	43	25	87	0	23	113		*	*		
VT45	04/27/2002	1215	VTSSS	GRAB	3	6.57	40	17	30	58	38	29	83	0	25	105		*	*		
VT46	07/30/2001	1505	VTSSS	GRAB	16	6.64	82	15	73	23	57	5	46	0	19	132		*	*		
VT46	10/25/2001	0741	VTSSS	GRAB	14	6.62	109	19	81	27	61	11	34	0	27	145		*	*		
VT46	01/24/2002	1440	VTSSS	GRAB	6	5.87	61	17	64	23	55	6	46	0	25	117		*	*		
VT46	04/25/2002	1040	VTSSS	GRAB	10	6.77	65	16	66	22	58	6	47	0	25	120		*	*		
VT48	07/31/2001	1530	VTSSS	GRAB	20	6.54	49	14	29	47	33	39	67	0	18	123		*	*		
VT48	10/31/2001	1420	VTSSS	GRAB	9	6.72	92	22	48	65	47	40	80	0	19	142		*	*		
VT48	01/31/2002	1900	VTSSS	GRAB	10	6.52	41	16	29	46	35	35	76	0	17	115		*	*		
VT48	04/24/2002	0800	VTSSS	GRAB	8	6.66	52	16	28	47	35	34	70	0	18	114		*	*		
VT49	07/25/2001	1020	VTSSS	GRAB	17	6.49	45	17	71	57	22	13	89	4	17	96					
VT49	10/25/2001	1305	VTSSS	GRAB	13	6.76	123	24	125	66	25	19	85	0	18	97		*	*		
VT49	01/29/2002	0923	VTSSS	GRAB	4	6.70	66	25	99	74	22	15	112	7	19	85		*	*		
VT49	04/24/2002	1500	VTSSS	GRAB	10	6.46	29	23	89	66	18	21	129	8	21	78		*	*		
VT50	07/25/2001	1100	VTSSS	GRAB	16	4.70	-23	21	30	48	17	15	130	1	20	86			202	25	

Site	Date	Time	Project	Method	Temp		PH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_AI	O_AI	DOC
					°C																
VT50	10/25/2001	1410	VTSSS	GRAB	13		4.83	-21	22	29	50	16	20	128	0	20	87		154	23	
VT50	01/28/2002	1325	VTSSS	GRAB	5		4.93	-13	23	35	60	16	16	127	9	19	73		152	17	
VT50	04/24/2002	1300	VTSSS	GRAB	10		4.82	-15	25	40	59	15	21	134	9	20	75		191	34	
VT51	07/31/2001	1015	VTSSS	GRAB	18		6.76	279	41	164	150	83	17	95	0	28	186				
VT51	10/31/2001	0745	VTSSS	GRAB	8		7.16	391	54	215	203	94	22	98	0	38	193				
VT51	01/29/2002	1130	VTSSS	GRAB	6		7.13	236	41	152	140	75	16	99	0	42	152				
VT51	04/30/2002	1209	VTSSS	GRAB	11		6.87	141	34	128	120	57	17	139	0	31	153				
VT52	07/25/2001	1345	VTSSS	GRAB	16		6.65	107	23	117	74	22	10	84	3	18	96				
VT52	10/25/2001	0900	VTSSS	GRAB	12		6.84	169	26	157	79	20	12	70	0	17	96				
VT52	01/30/2002	0820	VTSSS	GRAB	7		7.14	236	35	221	89	21	11	71	4	16	96				
VT52	04/24/2002	1100	VTSSS	GRAB	10		6.59	50	24	135	48	18	16	124	0	24	79				
VT53	07/31/2001	0905	VTSSS	GRAB	17		6.15	26	18	33	50	28	42	88	7	21	109				
VT53	10/29/2001	0907	VTSSS	GRAB	5		6.08	32	18	32	51	29	39	88	0	23	116				
VT53	01/29/2002	1025	VTSSS	GRAB	5		6.16	19	21	39	60	29	38	118	0	21	100				
VT53	03/12/2002	1030	SWAS	GRAB	5		6.11	19	20	37	55	26	38	116	0	22	84				
VT53	04/30/2002	1032	VTSSS	GRAB	10		6.14	11	18	32	50	26	40	103	1	24	83				
VT54	07/25/2001	1155	VTSSS	GRAB	18		6.29	101	32	110	102	45	31	123	31	19	104				
VT54	10/30/2001	0945	VTSSS	GRAB	6		6.35	119	33	115	105	49	26	123	25	20	99				
VT54	01/28/2002	1150	VTSSS	GRAB	3		6.11	72	35	107	99	49	23	112	74	20	86				
VT54	04/24/2002	1300	VTSSS	GRAB	9		6.30	28	25	82	82	29	23	124	28	21	83				
VT56	07/25/2001	0750	VTSSS	GRAB	18		5.73	9	13	24	46	17	23	70	10	17	92		9		
VT56	10/29/2001	0900	VTSSS	GRAB	5		5.64	14	15	23	46	18	24	78	0	17	87		14		
VT56	01/28/2002	0940	VTSSS	GRAB	3		5.74	7	14	23	44	17	17	77	3	15	66		9		
VT56	04/24/2002	0945	VTSSS	GRAB	9		5.57	-1	14	25	45	15	21	82	5	17	68		26		
VT57	07/25/2001	1000	VTSSS	GRAB	20		6.35	51	23	66	81	29	27	99	31	18	92				
VT57	10/29/2001	1225	VTSSS	GRAB	13		6.38	64	22	64	80	30	25	106	3	20	86				
VT57	01/28/2002	1030	VTSSS	GRAB	2		6.31	26	23	61	75	29	20	109	30	19	73				
VT57	04/24/2002	1100	VTSSS	GRAB	10		6.18	16	22	61	76	25	23	119	21	21	78				
VT58	07/31/2001	1150	VTSSS	GRAB	18		6.52	109	15	72	43	63	11	45	0	20	159				
VT58	10/30/2001	0900	VTSSS	GRAB	8		6.68	124	20	74	47	63	14	40	0	25	163				
VT58	01/30/2002	0855	VTSSS	GRAB	8		6.43	99	19	65	42	64	10	44	3	24	137				
VT58	04/30/2002	1446	VTSSS	GRAB	12		6.87	80	19	64	39	65	11	52	0	25	146				
VT61	07/30/2001	0905	VTSSS	GRAB	17		6.79	346	41	189	169	107	12	78	2	25	271				
VT61	10/30/2001	0800	VTSSS	GRAB	7		7.21	410	49	203	177	120	15	58	0	34	273				

Site	Date	Time	Project	Method	Temp		PH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T Al	O Al	DOC
					°C																
VT61	01/29/2002	1620	VTSSS	GRAB	8	6.76	288	42	153	132	109	10	72	1	36	232					
VT61	04/30/2002	1320	VTSSS	GRAB	12	6.80	230	40	152	137	90	10	120	0	37	2	2	9			
VT62	07/30/2001	0940	VTSSS	GRAB	17	6.36	94	16	73	48	60	14	46	0	22	1	5	4			
VT62	10/30/2001	0830	VTSSS	GRAB	7	6.94	133	21	70	51	70	18	32	0	28	1	8	1			
VT62	01/30/2002	0805	VTSSS	GRAB	7	6.37	111	21	67	48	68	12	40	3	27	1	5	8			
VT62	04/30/2002	1413	VTSSS	GRAB	12	6.41	77	18	64	46	65	13	50	0	27	1	6	0			
VT63	07/30/2001	1325	VTSSS	GRAB	16	6.49	114	14	69	25	59	10	26	0	19	1	4	4			
VT63	10/27/2001	1600	VTSSS	GRAB	10	6.88	136	19	78	33	63	20	22	0	24	151					
VT63	01/27/2002	1150	VTSSS	GRAB	5	6.56	69	15	56	22	54	8	28	0	22	1	2	3			
VT63	04/27/2002	1510	VTSSS	GRAB	1	6.56	63	13	53	20	52	8	28	0	23	1	2	9			
VT64	07/30/2001	1205	VTSSS	GRAB	16	6.54	68	11	48	16	38	8	12	0	18	1	0	4			
VT64	10/25/2001	0910	VTSSS	GRAB	13	6.57	88	13	54	19	44	17	12	0	22	1	1	4			
VT64	01/24/2002	1310	VTSSS	GRAB	6	6.46	55	12	43	17	38	8	21	0	20	79					
VT64	04/25/2002	1155	VTSSS	GRAB	10	6.80	53	10	40	14	39	7	16	0	19	9	3				
VT65	07/30/2001	1210	VTSSS	GRAB	16	6.42	84	14	58	18	45	8	21	0	16	1	2	1			
VT65	10/25/2001	0915	VTSSS	GRAB	13	6.41	94	16	66	22	52	12	24	0	21	1	2	9			
VT65	01/24/2002	1305	VTSSS	GRAB	6	6.42	60	13	49	17	45	7	26	8	18	1	0	4			
VT65	04/25/2002	1150	VTSSS	GRAB	10	7.14	57	13	51	16	48	8	27	0	21	1	0	9			
VT66	07/31/2001	1300	VTSSS	GRAB	18	6.84	193	30	132	95	64	5	51	15	31	1	5	7			
VT66	10/30/2001	1015	VTSSS	GRAB	10	7.00	210	33	135	100	66	7	43	0	45	1	4	6			
VT66	01/30/2002	1020	VTSSS	GRAB	8	6.81	153	29	111	84	60	5	55	14	37	1	3	2			
VT66	04/30/2002	1603	VTSSS	GRAB	12	7.06	139	27	114	86	59	6	66	8	34	1	4	9			
VT67	07/25/2001	1015	VTSSS	GRAB	16	6.71	43	9	26	25	36	6	15	0	19	9	4				
VT67	10/25/2001	1300	VTSSS	GRAB	13	6.54	53	10	24	25	37	12	15	0	22	9	9				
VT67	01/25/2002	1400	VTSSS	GRAB	6	6.24	28	10	23	24	33	7	28	0	20	7	9				
VT67	04/29/2002	1355	VTSSS	GRAB	13	6.52	39	9	21	21	36	6	17	0	19	8	5				
VT75	07/31/2001	1225	VTSSS	GRAB	18	6.56	174	24	127	91	53	5	51	12	26	1	3	9			
VT75	10/30/2001	0935	VTSSS	GRAB	11	6.51	183	29	126	91	55	5	41	0	40	1	2	8			
VT75	01/30/2002	0940	VTSSS	GRAB	7	6.79	137	27	106	82	53	5	53	14	33	1	2	3			
VT75	04/30/2002	1534	VTSSS	GRAB	11	6.89	132	25	107	82	52	5	63	5	31	1	3	5			
VT76	01/24/2002	1455	VTSSS	GRAB	6	5.87	10	13	12	28	24	25	54	0	20	99			11		
VT76	04/24/2002	1345	VTSSS	GRAB	12	5.93	10	12	12	27	26	28	61	0	19	97			8		
VT77	10/24/2001	0940	VTSSS	GRAB	13	6.47	89	21	43	66	49	37	79	0	21	1	1	3			
VT77	01/24/2002	1335	VTSSS	GRAB	7	6.33	35	17	29	48	39	27	78	0	20	9	1				

Site	Date	Time	Project	Method	Temp °C	PH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_Al	O_Al	DOC
VT77	04/24/2002	0920	VTSSS	GRAB	9	6.42	34	14	22	39	34	26	65	0	20	95	*			
VT78	07/25/2001	1320	VTSSS	GRAB	17	5.18	-5	11	29	25	15	7	60	5	13	64		44		
VT78	10/25/2001	1000	VTSSS	GRAB	11	5.82	13	13	31	29	17	26	63	0	15	67		41		
VT78	01/26/2002	1000	VTSSS	GRAB	5	4.97	-8	15	30	27	11	8	66	9	12	51		94	30	
VT78	04/27/2002	1030	VTSSS	GRAB	9	5.31	-2	11	25	23	11	7	59	0	12	55		43		
VT80	07/25/2001	0930	VTSSS	GRAB	17	6.36	16	14	40	54	21	12	86	3	16	96				
VT80	10/25/2001	1145	VTSSS	GRAB	12	6.47	31	15	41	57	23	17	80	0	16	98				
VT80	01/29/2002	1253	VTSSS	GRAB	5	6.25	19	20	51	72	21	15	109	6	18	85				
VT80	04/24/2002	1430	VTSSS	GRAB	10	5.30	-5	22	52	66	17	20	128	6	22	76		115	35	
VT81	07/25/2001	1000	VTSSS	GRAB	16	6.25	42	9	26	24	37	6	15	0	21	95				
VT81	10/25/2001	1310	VTSSS	GRAB	12	6.36	47	10	23	23	38	12	14	0	20	99				
VT81	01/25/2002	1400	VTSSS	GRAB	6	6.28	30	10	25	26	34	8	32	0	20	82				
VT81	04/29/2002	1410	VTSSS	GRAB	13	6.53	41	9	21	21	36	6	17	0	19	86				
WOR1	07/03/2001	1250	SWAS	GRAB	15	6.63	44	21	36	56	25	50	78	13	20	87	-	O		
WOR1	07/10/2001	1300	SWAS	GRAB	22	6.66	42	20	34	55	25	51	77	12	20	89	-	O		
WOR1	07/31/2001	1200	SWAS	GRAB	19	6.27	54	23	40	60	25	51	77	19	20	93	-0			0
WOR1	08/07/2001	1220	SWAS	GRAB	23	6.27	57	17	39	59	26	54	78	8	22	92	-	O		
WOR1	08/14/2001	1150	SWAS	GRAB	20	6.29	57	19	38	57	24	49	78	7	20	96	-	O		
WOR1	08/21/2001	1115	SWAS	GRAB	18	6.38	54	22	38	58	25	52	78	8	20	94	O			
WOR1	09/25/2001	1750	SWAS	GRAB	15	6.37	59	26	51	80	27	61	74	43	22	102	-	O		
WOR1	10/16/2001	1245	SWAS	GRAB	12	6.31	71	22	45	72	26	60	82	8	24	101	O			
WOR1	11/27/2001	1300	SWAS	GRAB	11	6.26	58	24	44	70	26	59	85	12	23	96	-	O		
WOR1	12/11/2001	1200	SWAS	GRAB	7	5.93	46	22	40	64	23	56	82	4	25	86	-	O		
WOR1	12/18/2001	1145	SWAS	GRAB	7	6.30	54	21	42	65	24	46	88	1	23	88	1			
WOR1	01/08/2002	1400	SWAS	GRAB	0	6.18	44	21	39	64	23	44	88	9	20	84	O			
WOR1	01/15/2002	1305	SWAS	GRAB	5	6.37	45	21	40	61	23	43	91	7	20	83	-	O		
WOR1	01/22/2002	1205	SWAS	GRAB	2	6.39	45	21	41	66	24	44	91	8	20	78	-0			
WOR1	01/29/2002	1235	SWAS	GRAB	11	6.43	40	20	36	54	23	43	90	5	19	75	-0			1
WOR1	02/05/2002	1208	SWAS	GRAB	1	6.27	49	22	42	67	25	44	96	6	21	78	-	O		
WOR1	02/12/2002	1240	SWAS	GRAB	6	6.43	32	19	36	59	23	41	90	1	20	75	-	O		
WOR1	02/19/2002	1105	SWAS	GRAB	4	6.34	39	19	39	63	23	41	91	1	20	72	-	O		
WOR1	02/26/2002	1145	SWAS	GRAB	7	6.44	44	19	40	62	24	43	92	0	20	66	O			
WOR1	03/05/2002	1240	SWAS	GRAB	6	6.15	26	19	36	57	23	39	90	1	21	73	-	O		
WOR1	03/12/2002	1205	SWAS	GRAB	6	6.24	34	19	38	59	22	39	90	0	21	67	-	O		

Site	Date	Time	Project	Method	Temp		pH	Alk	Cond	Ca ²⁺	Mg ²⁺	Na ⁺	K ⁺	SO ₄ ²⁻	NO ₃ ⁻	Cl ⁻	SiO ₂	NH ₄ ⁺	T_AI	O_AI	DOC			
					°C																			
WOR1	03/19/2002	1215	SWAS	GRAB	8	6.26		28	19	34	53	23	38	87	2	21	75	-	O			.	.	.
WOR1	03/26/2002	1220	SWAS	GRAB	8	6.18		21	18	31	49	23	35	86	0	21	71	-	O			.	.	.
WOR1	04/02/2002	1345	SWAS	GRAB	10	6.20		24	23	29	46	22	35	86	0	21	66		O			.	.	.
WOR1	04/09/2002	1255	SWAS	GRAB	9	6.21		25	19	30	46	23	35	87	0	21	53		O			.	.	.
WOR1	04/16/2002	1400	SWAS	GRAB	13	6.21		24	17	28	43	23	38	83	0	21	58		O			.	.	.
WOR1	04/23/2002	1220	SWAS	GRAB	10	6.03		15	18	35	53	20	39	86	13	22	73		O			.	.	.
WOR1	04/30/2002	1240	SWAS	GRAB	12	6.22		17	16	30	48	19	36	83	2	21	72		O			.	.	1
WOR1	05/07/2002	1415	SWAS	GRAB	12	6.16		24	17	30	48	20	38	84	1	21	64		O			.	.	.
WOR1	05/14/2002	1130	SWAS	GRAB	13	6.35		24	16	30	44	22	40	81	0	20	67		O			.	.	.
WOR1	05/21/2002	1330	SWAS	GRAB	12	6.36		26	16	30	46	21	38	83	0	20	65		O			.	.	.
WOR1	05/28/2002	1210	SWAS	GRAB	15	6.41		39	18	32	50	23	43	84	0	20	65		O			.	.	.
WOR1	06/04/2002	1350	SWAS	GRAB	15	6.48		42	18	33	52	23	47	82	1	21	70		O			.	.	.
WOR1	06/11/2002	1140	SWAS	GRAB	20	6.47		47	19	35	56	23	48	81	5	21	73		O			.	.	.
WOR1	06/18/2002	1120	SWAS	GRAB	19	6.55		45	20	37	60	24	49	81	10	21	75		O			.	.	.
WOR1	06/25/2002	1220	SWAS	GRAB	23	6.62		45	20	35	56	25	53	79	8	21	75		O			.	.	.

Table 5: Seasonal Kendall Tau (T) Trend Test Results (Quarterly Data).
October 1987 - July 2001. Rows where the T statistic is significant at the $p < 0.05$ level are in bold. There is no significance test associated with the Sen Slope.

Site	Stream	Analyte	T	Prob (t=0)	Sen Slope ueqL ⁻¹ yr ⁻¹
DR01	DEEP RUN	ALK	0.1124	0.3769	0.12
DR01	DEEP RUN	CA	0.1864	0.0299	0.12
DR01	DEEP RUN	CL	-0.2396	0.1499	-0.13
DR01	DEEP RUN	H	0.0266	0.8609	0.02
DR01	DEEP RUN	K	0.0059	0.9799	0.00
DR01	DEEP RUN	MG	-0.2929	0.0053	-0.29
DR01	DEEP RUN	NA	-0.4497	0.0018	-0.20
DR01	DEEP RUN	NO3	0.0355	0.7760	0.00
DR01	DEEP RUN	SIO2	-0.1154	0.2899	-0.18
DR01	DEEP RUN	SO4	-0.2367	0.0105	-0.53
DR01	DEEP RUN	TEMP	0.0288	0.7877	0.00
NFDR	NF OF THE DRY RUN	ALK	0.0192	0.8678	0.11
NFDR	NF OF THE DRY RUN	CA	-0.1401	0.3515	-0.52
NFDR	NF OF THE DRY RUN	CL	-0.2033	0.0981	-0.21
NFDR	NF OF THE DRY RUN	H	-0.0192	0.8966	0.00
NFDR	NF OF THE DRY RUN	K	-0.0577	0.6393	-0.03
NFDR	NF OF THE DRY RUN	MG	-0.2170	0.1323	-0.41
NFDR	NF OF THE DRY RUN	NA	-0.1429	0.1704	-0.24
NFDR	NF OF THE DRY RUN	NO3	-0.0495	0.7517	-0.39
NFDR	NF OF THE DRY RUN	SIO2	0.0275	0.7947	0.10
NFDR	NF OF THE DRY RUN	SO4	-0.2308	0.0897	-0.52
NFDR	NF OF THE DRY RUN	TEMP	0.1396	0.2444	0.08
VT35	PAINE RUN	ALK	-0.0027	1.0000	0.00
VT35	PAINE RUN	CA	0.1374	0.2625	0.12
VT35	PAINE RUN	CL	-0.2940	0.0777	-0.13
VT35	PAINE RUN	H	-0.1016	0.2963	-0.01
VT35	PAINE RUN	K	-0.1126	0.3304	-0.13
VT35	PAINE RUN	MG	-0.1978	0.1195	-0.18
VT35	PAINE RUN	NA	-0.3929	0.0040	-0.18
VT35	PAINE RUN	NO3	-0.0357	0.8223	0.00
VT35	PAINE RUN	SIO2	-0.2253	0.0397	-0.53
VT35	PAINE RUN	SO4	-0.1374	0.4152	-0.22
VT35	PAINE RUN	TEMP	0.1688	0.1537	0.15
VT36	MEADOW RUN	ALK	-0.0357	0.7881	-0.02
VT36	MEADOW RUN	CA	0.2830	0.0073	0.22
VT36	MEADOW RUN	CL	0.0577	0.7427	0.02
VT36	MEADOW RUN	H	0.1181	0.3839	0.06
VT36	MEADOW RUN	K	0.1126	0.3151	0.05
VT36	MEADOW RUN	MG	-0.0412	0.7074	-0.03
VT36	MEADOW RUN	NA	-0.3104	0.0218	-0.07
VT36	MEADOW RUN	NO3	0.1181	0.3764	0.00

Site	Stream	Analyte	t	Prob (t=0)	Slope ⁻¹ yr ⁻¹ Sen µeqL ⁻¹ yr ⁻¹
VT36	MEADOW RUN	SIO2	-0.0247	0.8182	-0.06
VT36	MEADOW RUN	SO4	0.0165	0.8609	0.04
VT36	MEADOW RUN	TEMP	-0.0476	0.6812	-0.03
VT51	JEREMYS RUN	ALK	0.1209	0.1852	1.11
VT51	JEREMYS RUN	CA	-0.0934	0.3938	-0.48
VT51	JEREMYS RUN	CL	-0.1813	0.0816	-0.18
VT51	JEREMYS RUN	H	0.3626	0.0062	0.01
VT51	JEREMYS RUN	K	0.0110	0.9360	0.01
VT51	JEREMYS RUN	MG	-0.0742	0.4605	-0.27
VT51	JEREMYS RUN	NA	-0.0824	0.2086	-0.17
VT51	JEREMYS RUN	NO3	-0.1841	0.1836	0.00
VT51	JEREMYS RUN	SIO2	-0.3077	0.0120	-1.19
VT51	JEREMYS RUN	SO4	-0.3297	0.0090	-0.95
VT51	JEREMYS RUN	TEMP	-0.0226	0.8487	0.00
VT53	TWO MILE RUN	ALK	0.1401	0.2586	0.25
VT53	TWO MILE RUN	CA	0.2280	0.0792	0.17
VT53	TWO MILE RUN	CL	-0.2582	0.1200	-0.13
VT53	TWO MILE RUN	H	-0.0659	0.5713	-0.01
VT53	TWO MILE RUN	K	-0.1374	0.2370	-0.07
VT53	TWO MILE RUN	MG	-0.0192	0.8794	-0.01
VT53	TWO MILE RUN	NA	-0.2143	0.1020	-0.12
VT53	TWO MILE RUN	NO3	-0.0412	0.7670	0.00
VT53	TWO MILE RUN	SIO2	0.0412	0.7215	0.05
VT53	TWO MILE RUN	SO4	-0.1484	0.0926	-0.29
VT53	TWO MILE RUN	TEMP	-0.1861	0.1098	-0.10
VT58	BROKENBACK RUN	ALK	0.1346	0.2127	0.72
VT58	BROKENBACK RUN	CA	0.0852	0.4502	0.19
VT58	BROKENBACK RUN	CL	-0.3407	0.0389	-0.14
VT58	BROKENBACK RUN	H	0.1841	0.1444	0.01
VT58	BROKENBACK RUN	K	0.1319	0.3077	0.06
VT58	BROKENBACK RUN	MG	0.0330	0.7657	0.07
VT58	BROKENBACK RUN	NA	-0.1154	0.2872	-0.20
VT58	BROKENBACK RUN	NO3	-0.1346	0.3566	0.00
VT58	BROKENBACK RUN	SiO2	-0.1978	0.0488	-0.51
VT58	BROKENBACK RUN	SO4	-0.0275	0.8352	-0.06
VT58	BROKENBACK RUN	TEMP	0.0952	0.4921	0.03
VT59	STAUNTON RIVER	ALK	0.0522	0.6138	0.19
VT59	STAUNTON RIVER	CA	0.1896	0.0654	0.25
VT59	STAUNTON RIVER	CL	-0.3819	0.0236	-0.21
VT59	STAUNTON RIVER	H	0.2363	0.0759	0.01
VT59	STAUNTON RIVER	K	0.1758	0.1771	0.07
VT59	STAUNTON RIVER	MG	0.0604	0.5993	0.02
VT59	STAUNTON RIVER	NA	-0.0412	0.6922	-0.04
VT59	STAUNTON RIVER	NO3	-0.1566	0.1165	0.00
VT59	STAUNTON RIVER	SiO2	-0.4231	0.0028	-0.75
VT59	STAUNTON RIVER	SO4	0.2418	0.0816	0.31
VT59	STAUNTON RIVER	TEMP	0.1688	0.2502	0.17

Site	Stream	Analyte	τ	Prob (t=0)	Sen Slope ueqL ⁻¹ yr ⁻¹
VT60	PINEY RIVER	ALK	0.1429	0.0908	1.22
VT60	PINEY RIVER	CA	0.1758	0.1228	0.63
VT60	PINEY RIVER	CL	-0.3159	0.0194	-0.25
VT60	PINEY RIVER	H	0.0330	0.7965	0.00
VT60	PINEY RIVER	K	-0.0027	1.0000	-0.00
VT60	PINEY RIVER	MG	0.0330	0.7780	0.11
VT60	PINEY RIVER	NA	-0.0522	0.4950	-0.12
VT60	PINEY RIVER	NO3	-0.1538	0.3203	-0.14
VT60	PINEY RIVER	SIO2	-0.1593	0.0505	-0.59
VT60	PINEY RIVER	SO4	-0.0385	0.6750	-0.08
VT60	PINEY RIVER	TEMP	-0.0476	0.7703	0.00
VT61	NF THORNTON RIVER	ALK	0.1538	0.0751	1.64
VT61	NF THORNTON RIVER	CA	0.1374	0.2204	0.52
VT61	NF THORNTON RIVER	CL	-0.0989	0.4720	-0.11
VT61	NF THORNTON RIVER	H	0.2500	0.0919	0.00
VT61	NF THORNTON RIVER	K	0.1209	0.3847	0.06
VT61	NF THORNTON RIVER	MG	0.0604	0.5448	0.22
VT61	NF THORNTON RIVER	NA	0.0082	0.9106	0.01
VT61	NF THORNTON RIVER	NO3	-0.0769	0.5938	0.00
VT61	NF THORNTON RIVER	SIO2	-0.1813	0.0927	-0.55
VT61	NF THORNTON RIVER	SO4	-0.1758	0.1213	-0.50
VT61	NF THORNTON RIVER	TEMP	-0.2727	0.0515	-0.18
VT62	HAZEL RUN	ALK	0.0220	0.8431	0.22
VT62	HAZEL RUN	CA	0.0110	0.9432	0.01
VT62	HAZEL RUN	CL	-0.0165	0.9290	-0.02
VT62	HAZEL RUN	H	0.1456	0.2991	0.00
VT62	HAZEL RUN	K	0.2637	0.0365	0.10
VT62	HAZEL RUN	MG	-0.0412	0.7300	-0.06
VT62	HAZEL RUN	NA	-0.0714	0.5201	-0.13
VT62	HAZEL RUN	NO3	-0.0879	0.5270	0.00
VT62	HAZEL RUN	SIO2	-0.3407	0.0052	-1.06
VT62	HAZEL RUN	SO4	-0.1538	0.1332	-0.34
VT62	HAZEL RUN	TEMP	0.0649	0.6417	0.01
VT66	ROSE RIVER	ALK	0.2840	0.0369	1.25
VT66	ROSE RIVER	CA	0.1893	0.0838	0.52
VT66	ROSE RIVER	CL	0.2781	0.0816	0.33
VT66	ROSE RIVER	H	0.1568	0.2938	0.00
VT66	ROSE RIVER	K	-0.0858	0.5487	-0.01
VT66	ROSE RIVER	MG	0.1361	0.1846	0.29
VT66	ROSE RIVER	NA	0.0266	0.7903	0.06
VT66	ROSE RIVER	NO3	-0.2751	0.1008	-1.03
VT66	ROSE RIVER	SIO2	-0.4467	0.0003	-0.93
VT66	ROSE RIVER	SO4	0.0000	1.0000	-0.00
VT66	ROSE RIVER	TEMP	0.1299	0.3572	0.06
VT75	WHITE OAK CANYON R	ALK	0.2511	0.0561	2.13
VT75	WHITE OAK CANYON R	CA	0.0823	0.5469	0.50
VT75	WHITE OAK CANYON R	CL	0.1299	0.4612	0.25

Site	Stream	Analyte	T	Prob (T=0)	Sen Slope ueqL ⁻¹ yr ⁻¹
VT75	WHITE OAK CANYON R	H	0.2165	0.2433	0.01
VT75	WHITE OAK CANYON R	K	0.0866	0.6245	0.01
VT75	WHITE OAK CANYON R	MG	0.1342	0.2721	0.45
VT75	WHITE OAK CANYON R	NA	0.0909	0.3557	0.22
VT75	WHITE OAK CANYON R	NO3	-0.4848	0.0042	-1.37
VT75	WHITE OAK CANYON R	SiO2	-0.3506	0.0208	-0.88
VT75	WHITE OAK CANYON R	SO4	-0.1082	0.4541	-0.25
VT75	WHITE OAK CANYON R	TEMP	0.1082	0.4420	0.06
WOR1	WHITE OAK RUN	ALK	-0.0382	0.7056	-0.14
WOR1	WHITE OAK RUN	CA	0.0446	0.8149	0.10
WOR1	WHITE OAK RUN	CL	-0.2134	0.2563	-0.17
WOR1	WHITE OAK RUN	H	0.0032	1.0000	0.00
WOR1	WHITE OAK RUN	K	0.0382	0.8210	0.03
WOR1	WHITE OAK RUN	MG	-0.2102	0.2179	-0.37
WOR1	WHITE OAK RUN	NA	-0.4013	0.0027	-0.20
WOR1	WHITE OAK RUN	NO3	-0.0573	0.7669	-0.11
WOR1	WHITE OAK RUN	SiO2	-0.1815	0.0873	-0.32
WOR1	WHITE OAK RUN	SO4	0.1274	0.4955	0.30
WOR1	WHITE OAK RUN	TEMP	0.0254	0.7856	0.00