

# Final Technical Report on “Chemical Analysis of VMC High Elevation Paired Watershed Study”

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Chemical analyses were conducted on stream samples from West Branch and Ranch Brook collected during the water year of 2002. The results from all three water years are summarized in Table 1 and the specific results, funded by this project, are given in Table 2. As requested, funds were used to measure cations and anions on all archived samples.

Additional analyses were performed on a stream survey of Ranch Brook tributaries between May and July of 2004. Sampling points (Fig. 1a) were selected to provide coverage of subwatersheds within the Ranch Brook basin. Samples were taken on five different dates under differing flow conditions and examined for temporal trends. It is clear that different subwatersheds have strongly contrasting stream chemistry (Fig. 1b). Low pH streams were low in Ca (Fig. 2) and higher in Al (Fig. 3). Nitrate was more variable with a clear seasonal trend (Fig. 4). These results will be used to support a soils study investigating nitrification in different subwatersheds and a graduate student’s study of end-member mixing analysis (attempting to identify sources of stream water).

Methods used were standard techniques with quality control samples run at least once in every 12 analytical samples. The ICP (Perkin-Elmer Optima DV) elements were determined after dilution with nitric acid to give a final concentration of  $0.01 \text{ mol L}^{-1}$ , matching standards and QCs. The samples were not filtered and possible positive errors could occur for both Al and Si. Although, the good relationship between pH and Al (Fig. 3) suggests that error was minimal. The anions were run on a Dionex 600 series ion chromatograph using an AS14A anion separation column and standard conditions.

Figure 1a. Location of stream sampling sites for the survey performed in 2004.

### Ranch Brook Stream Sampling Sites

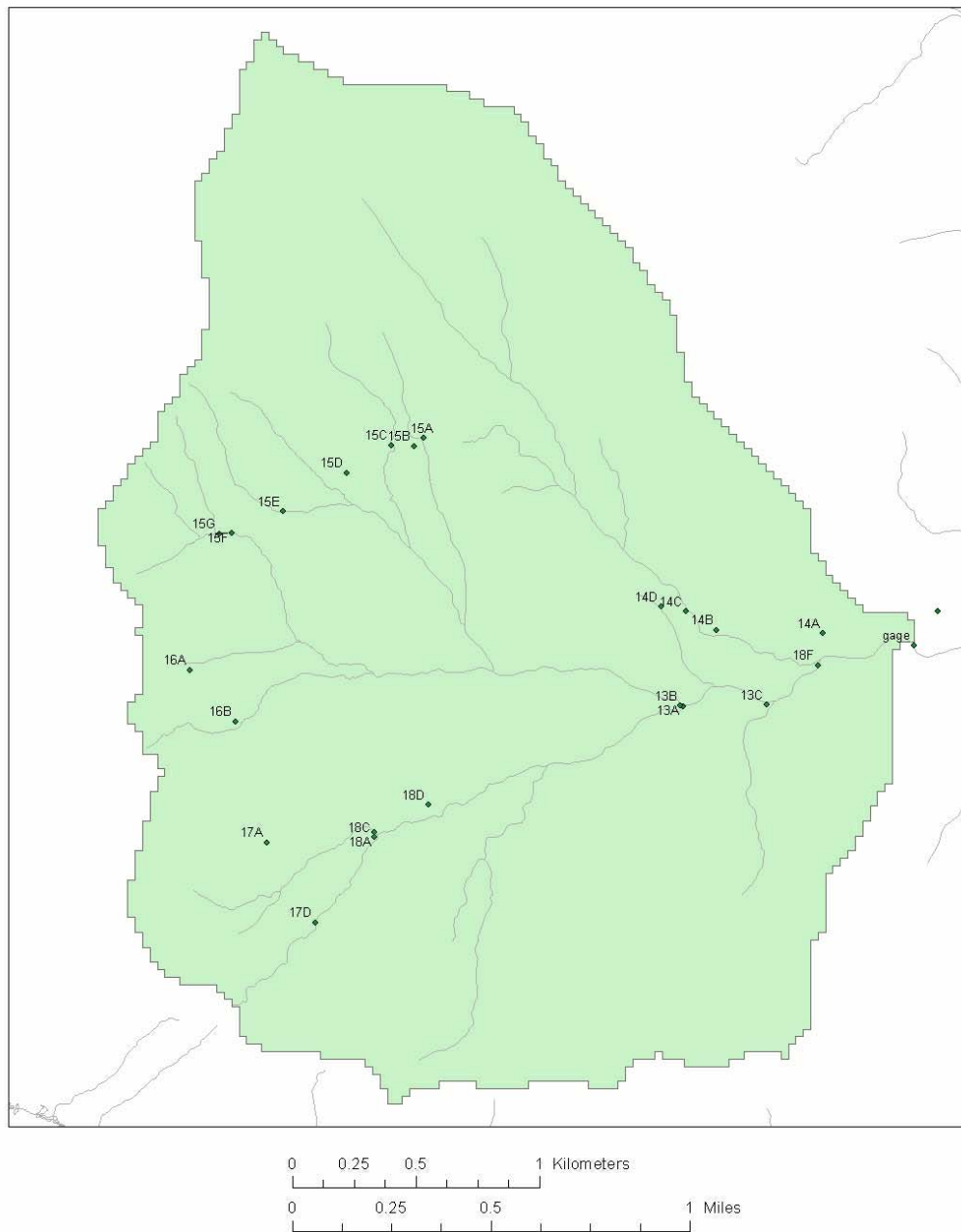
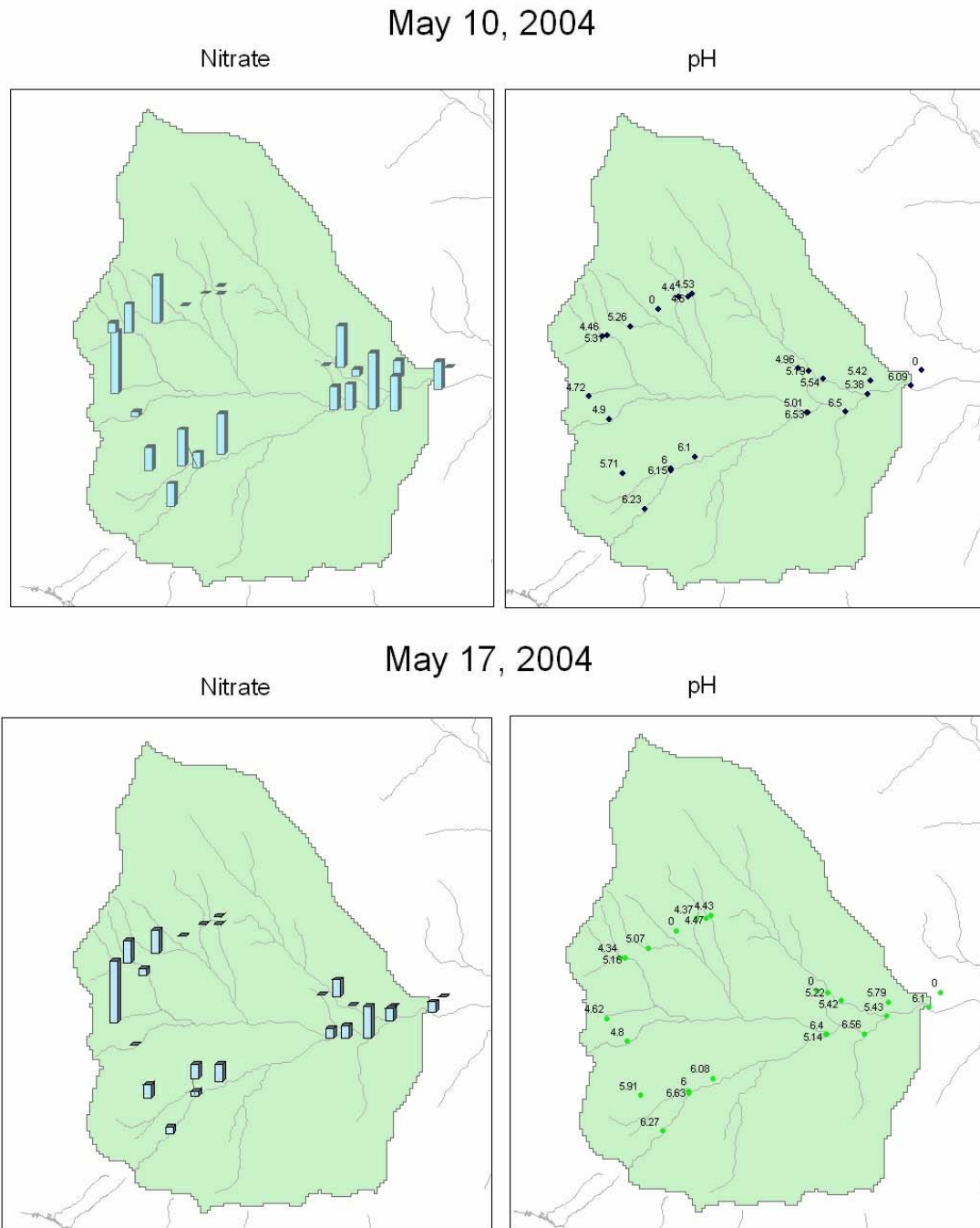
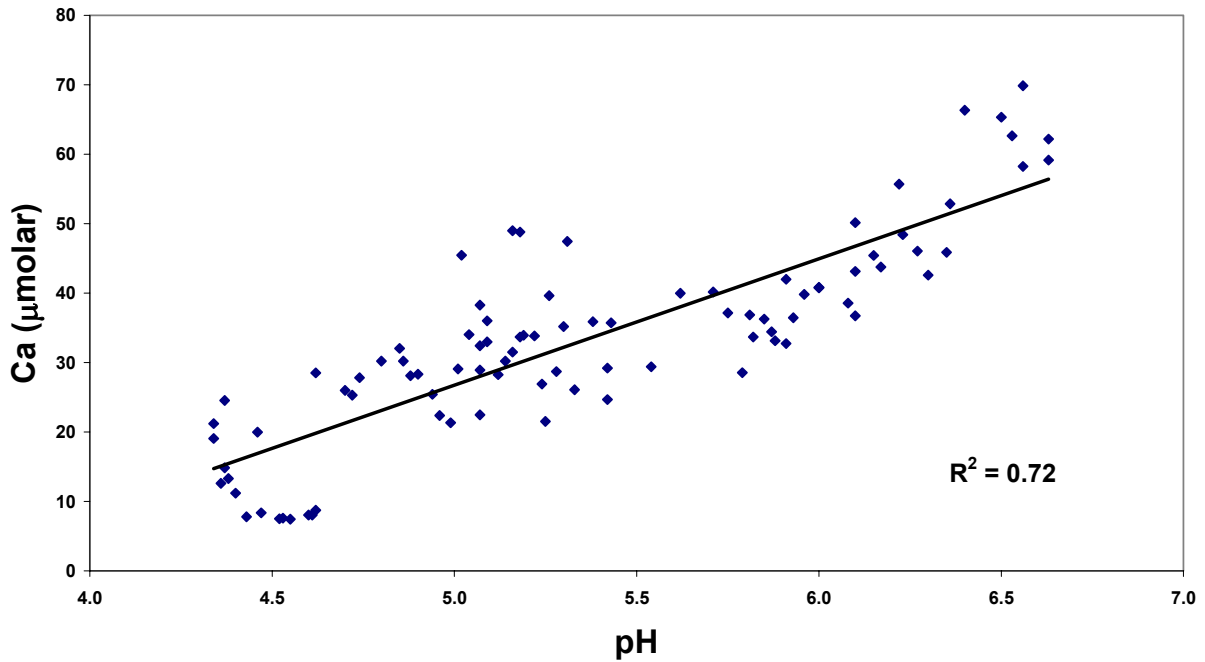


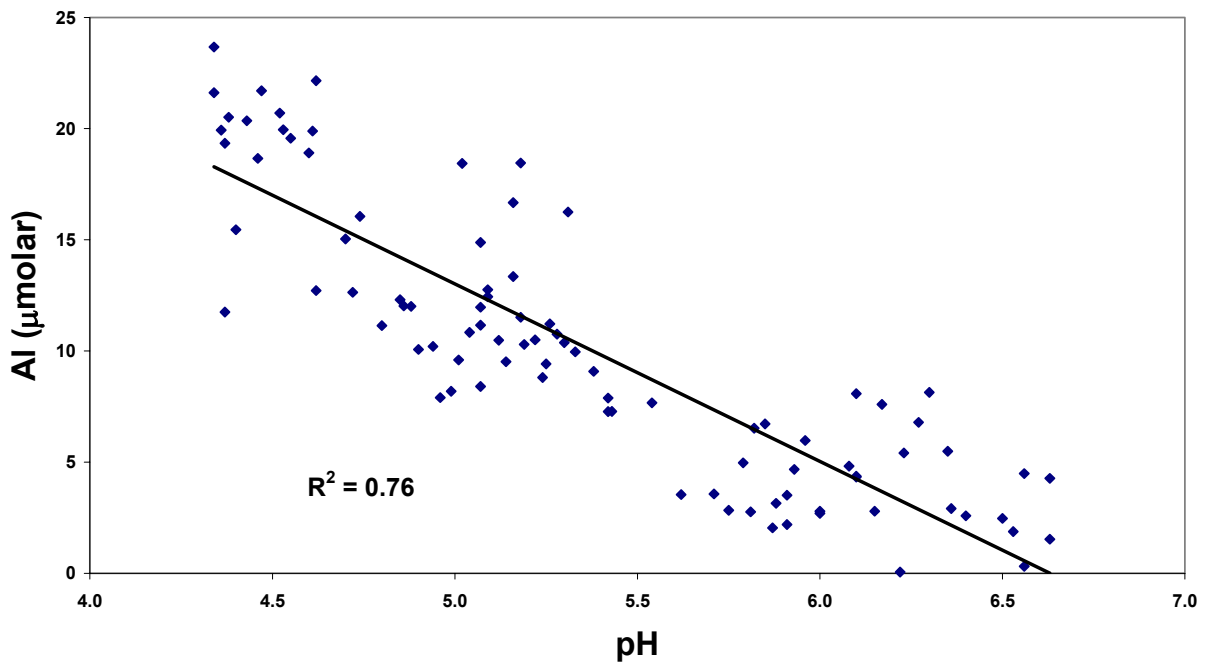
Figure 1b. Map of Ranch Brook watershed showing pH and nitrate results for two of the sampling dates.



**Figure 2. Relationship between Stream Calcium and pH  
Mansfield Stream Survey**



**Figure 3. Relationship between Stream Aluminum and  
pH, Mansfield Stream Survey**



**Figure 4. Selected Sampling Points from Ranch Brook  
Change in nitrate May-July, 2004**

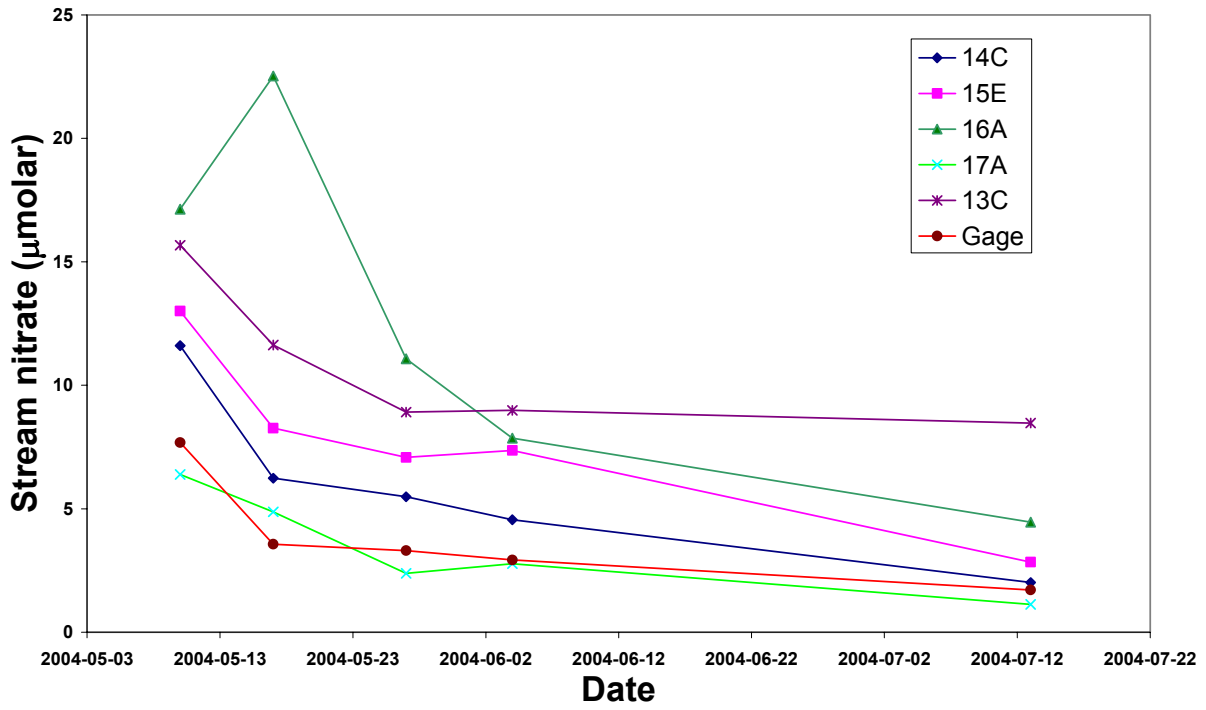


Table 1. Fluxes of water, suspended sediment and solutes for the West Branch and Ranch Brook basins, WY 2001, 2002, 2003. (from Beverley Wemple, UVM)

	<b>WEST BRANCH</b>			<b>RANCH BROOK</b>		
	WY 01	WY 02	WY 03	WY 01	WY 02	WY 03
<b>Water</b>						
precipitation depth (mm)	1,489	1,653	1,488	1,448	1,613	1,448
runoff depth (mm)	1,190	1,416	1,132	872	1,173	958
runoff/precip ratio	0.80	0.86	0.76	0.60	0.73	0.66
precip-runoff (mm)	299	237	356	576	440	489
snowmaking depth (mm)	47	45	53			
snowmaking/natural precip	0.03	0.03	0.04			
snowmelt depth (mm)	545	636	537	419	520	434
fraction of runoff as snowmelt	0.46	0.45	0.47	0.48	0.44	0.45
<b>Sediment</b>						
suspended load (kg/ha)	172	197	121	64	75	42
<b>Solutes (kg/ha)</b>						
Na	55.72	61.11	59.72	4.36	5.86	4.79
Ca	45.41	52.02	45.12	17.23	22.36	19.41
Mg	7.24	8.33	7.20	3.28	4.21	3.71
K	5.95	7.08	5.66	3.58	4.81	3.93
Si	13.70	15.78	13.37	10.19	13.33	11.40
NO <sub>3</sub> -N	6.45	7.74	6.30	4.24	5.39	4.69
SO <sub>4</sub> -S	20.96	24.40	20.32	11.19	14.65	12.60
Cl	94.27	102.71	105.08	3.52	4.73	3.87

Table 2. Chemical analyses of stream samples from Ranch Brook and West Branch, 2002 WY.

ID	Na	Al	Ca	Fe	K	Mg	Mn	Si	chloride	nitrate	sulfate
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	μmol/L	μmol/L	μmol/L
WB 1	14.0	0.02	6.57	0.00	0.66	1.03	0.02	1.85	655.8	34.9	80.2
WB 2	14.0	0.02	6.66	0.00	0.67	1.05	0.02	1.86	694.0	40.2	79.9
WB 3	12.4	0.01	6.67	0.01	0.54	1.04	0.00	1.95	674.0	42.5	77.3
WB 4	12.4	0.02	6.50	0.01	0.50	1.06	0.48	1.81	656.6	36.1	76.8
WB 5	16.5	0.01	7.12	0.01	0.55	1.13	1.10	1.94	877.7	46.3	79.1
WB 6	13.3	0.01	6.72	0.01	0.52	1.04	0.00	1.96	727.2	34.9	77.0
WB 7	14.7	0.02	7.98	0.01	0.61	1.33	0.00	1.99	730.5	37.5	80.1
WB 8	13.5	0.01	7.17	0.01	0.53	1.14	0.00	1.98	702.9	37.5	74.8
WB 9	13.1	0.00	6.96	0.01	0.51	1.11	0.00	1.96	703.6	37.6	76.9
WB 11	14.7	0.02	6.67	0.00	0.67	1.06	0.02	1.83	762.4	36.3	76.1
WB 12	26.7	0.02	7.52	0.00	0.77	1.12	0.02	1.61	1209.8	43.8	73.4
WB 13	22.1	0.04	7.42	0.00	0.73	1.12	0.02	1.66	1001.2	39.7	70.1
WB 14	19.4	0.01	7.59	0.01	0.54	1.16	0.12	1.75	1000.9	40.0	72.1
WB 15	23.4	0.07	7.84	0.05	0.60	1.16	0.09	1.74	1213.5	43.9	72.2
WB 16	21.7	0.00	7.29	0.03	0.55	1.07	0.00	1.59	1073.2	46.1	68.0
WB 17	22.0	0.03	7.34	0.02	0.55	1.12	0.00	1.53	1126.0	44.7	68.7
WB 18	22.1	0.01	8.28	0.01	0.64	1.30	0.00	1.58	1112.4	45.7	69.1
WB 19	28.0	0.02	7.63	0.00	0.77	1.14	0.02	1.52	1325.1	53.3	71.0
RB 20	0.6	0.06	2.69	0.00	0.48	0.52	0.02	1.76	12.3	26.0	47.3
RB 21	0.6	0.06	2.74	0.00	0.49	0.53	0.02	1.76	8.5	30.9	44.5
RB 22	0.6	0.06	2.77	0.00	0.49	0.53	0.02	1.76	10.8	27.4	47.0
RB 23	0.5	0.06	2.68	0.00	0.49	0.52	0.02	1.67	14.2	27.5	47.9
RB 24	0.5	0.09	2.59	0.00	0.49	0.51	0.02	1.61	25.5	30.6	46.1
RB 25	0.6	0.07	2.64	0.00	0.49	0.51	0.02	1.60	10.7	33.6	46.6
RB 26	0.5	0.07	2.60	0.00	0.49	0.50	0.02	1.57	12.0	38.6	41.9
RB 27	0.5	0.08	2.66	0.00	0.50	0.51	0.02	1.61	10.0	37.6	46.5
RB 28	0.7	0.10	2.06	0.01	0.31	0.38	0.00	1.20	8.3	51.1	35.0
RB 29	0.7	0.21	2.08	0.02	0.32	0.39	0.00	1.20	13.3	54.2	36.9
RB 31	0.9	0.15	2.31	0.01	0.37	0.46	0.01	1.12	10.6	57.6	38.9
RB 32	0.7	0.15	2.06	0.02	0.33	0.38	0.01	1.12	8.3	67.0	34.7
RB 33	0.9	0.14	2.38	0.02	0.40	0.46	0.01	1.16	12.6	58.3	34.0
RB 34	0.8	0.15	2.24	0.02	0.32	0.44	0.02	1.15	25.4	58.1	39.2
RB 35	0.7	0.22	1.41	0.01	0.28	0.28	0.03	0.65	8.4	66.4	34.8
RB 36	0.9	0.12	2.44	0.01	0.35	0.48	0.01	1.25	9.8	57.8	32.9
RB 37	1.0	0.11	2.49	0.01	0.36	0.49	0.00	1.27	9.1	59.0	36.9
RB 38	0.9	0.11	2.41	0.01	0.39	0.46	0.00	1.28	8.2	56.7	36.8
RB 39	1.0	0.10	2.42	0.01	0.47	0.46	0.47	1.30	9.7	53.6	36.4
RB 40	0.6	0.25	1.47	0.03	0.29	0.29	0.04	0.84	7.0	74.7	25.2
RB 41	0.6	0.27	1.59	0.03	0.37	0.30	0.04	0.81	7.6	76.9	25.7
RB 42	0.6	0.24	1.47	0.02	0.29	0.29	0.04	0.75	7.3	68.7	24.5
RB 43	0.6	0.23	1.71	0.08	0.46	0.39	0.04	0.76	7.4	72.7	23.2
RB 44	0.6	0.23	1.47	0.02	0.32	0.28	0.04	0.75	6.4	74.8	26.5
RB 45	0.6	0.21	1.61	0.02	0.29	0.30	0.03	0.78	7.2	68.0	26.1
RB 46	0.6	0.21	1.61	0.01	0.28	0.29	0.03	0.85	7.7	71.8	25.3
RB 47	0.4	0.12	2.09	0.00	0.45	0.41	0.02	1.27	8.3	50.2	37.2
RB 48	0.5	0.11	2.03	0.04	0.45	0.41	0.02	1.26	8.5	49.9	37.6

Table 2 continued

	<b>ID</b>	<b>Na</b>	<b>Al</b>	<b>Ca</b>	<b>Fe</b>	<b>K</b>	<b>Mg</b>	<b>Mn</b>	<b>Si</b>	<b>chloride</b>	<b>nitrate</b>	<b>sulfate</b>
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µmol/L	µmol/L	µmol/L
RB	<b>49</b>	0.5	0.11	2.19	0.00	0.46	0.42	0.02	1.32	10.3	47.6	37.7
RB	<b>50</b>	0.7	0.13	2.08	0.02	0.32	0.39	0.00	1.20	7.8	45.6	36.8
RB	<b>51</b>	0.5	0.09	2.06	0.01	0.45	0.41	0.02	1.32	8.5	43.9	39.6
RB	<b>52</b>	0.4	0.11	1.83	0.02	0.44	0.38	0.02	1.16	12.7	39.4	35.6
RB	<b>53</b>	0.4	0.13	2.00	0.01	0.45	0.38	0.02	1.19	13.1	40.5	34.1
RB	<b>54</b>	0.5	0.12	1.95	0.02	0.44	0.39	0.02	1.21	15.3	44.0	38.2
RB	<b>55</b>	0.4	0.13	1.92	0.00	0.45	0.37	0.03	1.16	7.3	50.5	34.5
RB	<b>56</b>	0.7	0.19	1.68	0.01	0.31	0.32	0.03	0.94	34.1	62.7	28.5
RB	<b>57</b>	0.8	0.18	1.97	0.01	0.32	0.39	0.02	0.99	28.3	58.7	30.5
RB	<b>58</b>	0.9	0.20	2.07	0.02	0.36	0.42	0.04	0.92	12.7	55.4	27.7
RB	<b>59</b>	0.8	0.21	1.89	0.02	0.44	0.37	1.09	0.99	8.2	55.5	28.8
RB	<b>60</b>	0.9	0.20	2.13	0.01	0.37	0.43	0.03	0.93	7.1	53.9	28.9
RB	<b>61</b>	0.9	0.20	2.10	0.02	0.31	0.42	0.02	0.96	6.8	56.2	29.5
RB	<b>62</b>	0.9	0.18	2.04	0.01	0.32	0.41	0.05	0.98	12.4	58.1	33.2
RB	<b>63</b>	0.4	0.17	1.70	0.02	0.44	0.35	0.04	1.00	9.6	56.4	29.9
RB	<b>64</b>	0.7	0.17	1.92	0.01	0.30	0.37	0.02	0.96	8.2	47.3	31.3
RB	<b>65</b>	0.7	0.18	1.80	0.01	0.28	0.35	0.02	0.97	7.9	55.0	30.7
WB	<b>66</b>	20.3	0.02	7.17	0.01	0.71	1.09	0.02	1.66	1101	38.5	72.1
RB	<b>67</b>	0.6	0.06	2.65	0.00	0.48	0.52	0.02	1.73	8.1	31.7	48.0
RB	<b>68</b>	0.3	0.23	1.75	0.01	0.48	0.34	0.06	0.85	6.8	76.0	26.8
RB	<b>69</b>	0.5	0.07	2.64	0.00	0.50	0.51	0.02	1.61	8.0	39.1	45.7
RB	<b>70</b>	0.6	0.06	2.69	0.00	0.49	0.52	0.02	1.66	8.4	38.6	45.1
RB	<b>71</b>	0.5	0.06	2.66	0.00	0.49	0.51	0.02	1.65	8.3	37.7	44.5
RB	<b>72</b>	0.5	0.07	2.58	0.00	0.50	0.50	0.02	1.58	8.6	42.0	46.5
RB	<b>73</b>	0.5	0.08	2.45	0.00	0.50	0.48	0.02	1.40	8.7	43.5	43.2
RB	<b>74</b>	0.5	0.10	2.53	0.01	0.49	0.49	0.02	1.44	9.0	46.2	43.4
RB	<b>75</b>	0.7	0.07	2.51	0.01	0.30	0.46	0.00	1.63	9.2	44.8	44.3
RB	<b>76</b>	0.5	0.07	2.52	0.00	0.49	0.49	0.02	1.47	8.9	43.4	42.5
RB	<b>77</b>	0.5	0.12	2.27	0.00	0.49	0.44	0.02	1.27	8.1	43.0	39.3
RB	<b>78</b>	0.5	0.09	2.44	0.00	0.48	0.48	0.02	1.40	8.7	46.9	40.8
WB	<b>79</b>	25.6	0.04	7.59	0.00	0.76	1.13	0.02	1.55	1675	50.8	66.8
WB	<b>80</b>	24.3	0.02	7.45	0.00	0.74	1.12	0.02	1.55	1525	49.9	66.0
WB	<b>81</b>	22.0	0.02	7.02	0.02	0.73	1.07	0.02	1.51	1292	49.1	63.1
WB	<b>82</b>	19.2	0.04	6.56	0.04	0.71	1.01	0.02	1.43	1196	51.7	59.9
WB	<b>83</b>	18.2	0.04	6.33	0.03	0.74	0.98	0.02	1.27	1186	57.4	60.7
WB	<b>84</b>	17.7	0.05	6.46	0.01	0.71	0.99	0.02	1.34	1148	58.9	62.1
WB	<b>85</b>	21.7	0.04	6.77	0.03	0.73	1.01	0.02	1.36	1367	54.6	59.3
WB	<b>86</b>	14.4	0.03	5.69	0.03	0.69	0.89	0.02	1.16	900	54.4	51.8
WB	<b>87</b>	14.4	0.04	5.94	0.01	0.66	0.91	0.02	1.23	915	58.2	55.7
WB	<b>88</b>	14.2	0.07	5.97	0.00	0.67	0.92	0.02	1.28	913	59.2	56.5
WB	<b>89</b>	16.7	0.04	6.20	0.01	0.67	0.94	0.02	1.31	1101	57.2	57.5
WB	<b>90</b>	5.5	0.08	4.20	0.05	0.57	0.69	0.03	1.09	307	63.2	46.8
WB	<b>91</b>	5.4	0.05	4.26	0.03	0.42	0.67	0.00	1.17	323	67.1	48.3
WB	<b>92</b>	5.4	0.04	4.21	0.03	0.36	0.65	0.00	1.19	301	66.2	46.5
WB	<b>93</b>	5.4	0.06	3.97	0.02	0.55	0.64	0.02	1.04	293	64.5	43.3
WB	<b>94</b>	5.4	0.05	3.98	0.03	0.36	0.62	0.00	1.08	318	66.6	45.4



Table 2 continued

	<b>ID</b>	<b>Na</b>	<b>Al</b>	<b>Ca</b>	<b>Fe</b>	<b>K</b>	<b>Mg</b>	<b>Mn</b>	<b>Si</b>	<b>chloride</b>	<b>nitrate</b>	<b>sulfate</b>
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µmol/L	µmol/L	µmol/L
WB	<b>95</b>	5.6	0.06	4.22	0.03	0.36	0.65	0.00	1.12	337	66.7	47.6
WB	<b>96</b>	5.8	0.04	4.38	0.03	0.36	0.68	0.00	1.19	323	62.1	46.0
WB	<b>97</b>	7.8	0.02	4.80	0.02	0.42	0.73	0.00	1.17	488	61.3	49.7
WB	<b>98</b>	7.8	0.02	4.65	0.02	0.40	0.71	0.00	1.14	492	56.1	47.5
WB	<b>99</b>	7.6	0.04	4.79	0.03	0.39	0.73	0.00	1.19	443.5	60.6	53.5
WB	<b>100</b>	7.9	0.05	4.90	0.03	0.44	0.75	0.00	1.23	489	59.2	50.6
WB	<b>101</b>	9.0	0.02	5.08	0.02	0.40	0.76	0.00	1.24	588	56.7	51.6
WB	<b>102</b>	1.5	0.12	2.51	0.03	0.48	0.45	0.03	0.76	76.9	64.1	36.8
WB	<b>103</b>	1.6	0.19	2.48	0.04	0.33	0.42	0.01	0.77	69.7	66.5	37.4
WB	<b>104</b>	1.4	0.13	2.19	0.03	0.29	0.37	0.01	0.71	58.8	57.1	32.5
WB	<b>105</b>	1.4	0.10	2.20	0.03	0.37	0.36	0.01	0.64	54.1	54.3	31.3
WB	<b>106</b>	1.8	0.09	2.55	0.02	0.43	0.45	0.00	0.69	68.6	58.9	32.5
WB	<b>107</b>	2.1	0.08	2.77	0.02	0.35	0.47	0.00	0.79	105.3	65.0	35.2
WB	<b>108</b>	2.8	0.06	3.59	0.02	0.41	0.63	1.13	0.88	127.2	66.4	39.6
WB	<b>109</b>	8.6	0.05	4.84	0.01	0.58	0.77	0.02	1.20	514	51.7	51.1
WB	<b>110</b>	8.6	0.04	5.01	0.02	0.57	0.78	0.03	1.23	522	54.0	54.0
WB	<b>111</b>	10.0	0.03	5.28	0.00	0.59	0.82	0.02	1.30	579	53.9	54.9
WB	<b>112</b>	9.6	0.03	5.06	0.00	0.58	0.79	0.03	1.22	580	50.2	54.2
WB	<b>113</b>	9.6	0.03	5.19	0.00	0.58	0.81	0.02	1.25	567	50.8	52.8
WB	<b>114</b>	10.0	0.03	5.20	0.01	0.61	0.81	0.02	1.22	592	47.3	51.5
WB	<b>115</b>	6.4	0.04	4.20	0.02	0.56	0.68	0.03	1.04	353	43.2	43.9
WB	<b>116</b>	5.7	0.05	4.25	0.02	0.54	0.69	0.02	1.09	326	49.0	48.0
WB	<b>117</b>	6.3	0.05	4.40	0.02	0.54	0.70	0.03	1.15	345	51.2	49.1
WB	<b>118</b>	5.8	0.03	3.98	0.01	0.55	0.65	0.02	1.03	316	47.6	44.2
WB	<b>119</b>	2.7	0.14	3.05	0.02	0.32	0.49	0.00	0.92	157.9	57.7	42.8
WB	<b>120</b>	3.3	0.04	3.45	0.02	0.33	0.55	0.00	1.02	197.4	58.1	45.5
WB	<b>121</b>	2.3	0.08	2.81	0.04	0.32	0.45	0.00	0.84	114.7	46.7	40.5
WB	<b>122</b>	2.8	0.05	3.18	0.03	0.31	0.50	0.00	0.95	145.0	54.1	45.4
WB	<b>123</b>	2.1	0.09	2.59	0.04	0.28	0.40	0.01	0.86	110.3	46.0	41.6
WB	<b>124</b>	2.6	0.06	3.09	0.03	0.30	0.50	0.00	0.95	134.2	54.9	44.7
WB	<b>125</b>	3.1	0.05	3.46	0.03	0.38	0.57	0.31	0.98	131.0	49.8	44.0
WB	<b>126</b>	3.7	0.04	4.35	0.02	0.41	0.78	0.00	1.06	167.9	52.3	48.7
WB	<b>127</b>	2.7	0.04	3.24	0.03	0.34	0.52	0.00	0.96	137.0	44.2	46.6
WB	<b>128</b>	3.3	0.04	3.87	0.02	0.36	0.65	0.00	1.04	168.0	49.6	52.8
RB	<b>129</b>	0.8	0.18	1.87	0.01	0.30	0.36	0.02	0.97	5.3	53.8	31.5
RB	<b>130</b>	0.8	0.20	1.84	0.01	0.29	0.36	0.02	0.92	8.3	59.3	32.3
RB	<b>131</b>	0.8	0.20	1.74	0.01	0.30	0.33	0.02	0.73	18.1	56.9	27.7
RB	<b>132</b>	0.6	0.20	1.51	0.00	0.26	0.28	0.02	0.82	16.7	110.4	58.5
RB	<b>133</b>	0.8	0.20	1.77	0.01	0.30	0.35	0.17	0.69	6.7	52.3	28.5
RB	<b>134</b>	0.8	0.22	1.75	0.01	0.29	0.34	0.02	0.76	5.8	54.4	29.5
RB	<b>136</b>	0.5	0.21	1.29	0.01	0.24	0.25	0.02	0.71	4.9	50.5	30.5
RB	<b>137</b>	0.6	0.33	1.22	0.02	0.26	0.23	0.02	0.70	15.7	43.8	31.9
RB	<b>138</b>	0.6	0.19	1.41	0.02	0.26	0.26	0.02	0.80	7.3	49.3	33.6
RB	<b>139</b>	0.6	0.18	1.51	0.03	0.30	0.29	0.02	0.96	7.8	45.4	35.8
RB	<b>140</b>	0.8	0.16	1.88	0.01	0.29	0.37	0.02	0.99	9.5	45.2	30.6
WB	<b>141</b>	2.0	0.11	2.74	0.04	0.32	0.48	0.00	0.88	87.3	44.3	42.2

Table 2 continued

	<b>ID</b>	<b>Na</b>	<b>Al</b>	<b>Ca</b>	<b>Fe</b>	<b>K</b>	<b>Mg</b>	<b>Mn</b>	<b>Si</b>	<b>chloride</b>	<b>nitrate</b>	<b>sulfate</b>
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µmol/L	µmol/L	µmol/L
WB	<b>142</b>	2.3	0.09	3.20	0.03	0.39	0.56	2.43	0.95	89.1	48.9	44.7
WB	<b>143</b>	1.3	0.10	2.21	0.02	0.29	0.39	0.01	0.70	55.5	42.1	40.1
WB	<b>144</b>	1.8	0.08	2.75	0.02	0.32	0.48	0.00	0.81	67.7	52.3	41.9
WB	<b>145</b>	1.6	0.11	2.52	0.03	0.36	0.47	0.00	0.67	44.3	46.0	37.1
WB	<b>146</b>	1.5	0.11	2.32	0.02	0.29	0.42	0.00	0.68	61.6	49.3	39.2
WB	<b>147</b>	1.1	0.09	1.89	0.02	0.26	0.32	0.00	0.60	43.1	47.1	35.6
WB	<b>148</b>	1.6	0.12	2.35	0.03	0.38	0.41	0.01	0.69	56.1	41.1	38.9
WB	<b>149</b>	1.3	0.09	1.99	0.02	0.26	0.34	0.00	0.63	53.5	41.5	38.2
WB	<b>150</b>	1.7	0.07	2.43	0.02	0.29	0.40	0.00	0.76	79.1	47.6	42.9
WB	<b>151</b>	2.1	0.03	2.71	0.02	0.31	0.43	0.00	0.86	102.6	44.6	45.7
WB	<b>152</b>	2.3	0.03	3.12	0.01	0.32	0.50	0.00	0.98	120.9	47.1	49.4
RB	<b>153</b>	0.5	0.09	2.59	0.01	0.51	0.49	0.02	1.75	9.6	<3	53.0
RB	<b>154</b>	0.6	0.09	2.28	0.04	0.51	0.45	0.02	1.67	8.8	<3	51.6
RB	<b>155</b>	0.4	0.19	2.23	0.05	0.48	0.42	0.02	1.48	9.0	<3	49.3
RB	<b>156</b>	0.5	0.21	2.15	0.03	0.53	0.41	0.02	1.38	13.6	7.1	47.5
RB	<b>157</b>	0.4	0.24	2.09	0.04	0.48	0.39	0.03	1.28	11.3	13.6	46.3
RB	<b>158</b>	0.4	0.24	1.89	0.02	0.44	0.34	0.03	1.17	9.2	14.3	40.9
RB	<b>159</b>	0.6	0.06	2.62	0.00	0.48	0.51	0.02	1.70	9.4	6.6	40.4
RB	<b>160</b>	0.4	0.23	1.76	0.05	0.40	0.33	0.03	1.21	160	12.5	41.2
RB	<b>161</b>	0.4	0.17	1.91	0.02	0.42	0.35	0.02	1.25	10.4	7.2	45.3
RB	<b>162</b>	1.0	0.07	2.62	0.02	0.61	0.53	0.00	1.93	12.1	<3	49.0
RB	<b>163</b>	0.7	0.19	2.14	0.04	0.59	0.46	0.00	1.70	14.4	<3	49.6
RB	<b>164</b>	0.9	0.09	2.59	0.03	0.38	0.53	0.00	1.87	11.2	<3	50.3
RB	<b>165</b>	0.9	0.08	2.42	0.02	0.63	0.52	0.00	1.76	12.6	4.9	54.9
RB	<b>166</b>	0.8	0.15	1.99	0.04	0.62	0.43	0.00	1.48	13.8	<3	52.0
RB	<b>167</b>	0.9	0.23	2.42	0.05	0.55	0.56	0.01	1.39	16.3	<3	50.6
RB	<b>168</b>	0.7	0.24	1.95	0.04	0.42	0.41	0.01	1.47	19.9	<3	47.5
RB	<b>169</b>	0.7	0.15	1.97	0.02	0.33	0.39	0.01	1.54	14.3	<3	47.7
RB	<b>170</b>	0.8	0.09	2.28	0.01	0.37	0.45	0.00	1.49	9.8	<3	47.2
RB	<b>171</b>	0.8	0.10	2.28	0.02	0.42	0.44	0.00	1.58	10.6	3.9	47.5
RB	<b>172</b>	0.9	0.20	2.27	0.04	0.39	0.47	0.16	1.44	13.0	<3	46.1
RB	<b>173</b>	0.7	0.13	1.96	0.04	0.26	0.37	0.01	1.53	17.6	<3	46.3
RB	<b>174</b>	0.8	0.24	1.88	0.05	0.36	0.36	0.01	1.41	17.8	<3	47.5
RB	<b>175</b>	0.7	0.07	1.92	0.02	0.24	0.36	0.01	1.54	11.7	5.9	48.4
WB	<b>176</b>	5.0	0.03	5.40	0.00	0.63	0.85	0.02	1.86	233.7	21.6	75.2
WB	<b>177</b>	4.5	0.03	5.32	0.00	0.68	0.83	0.02	1.73	219.0	27.3	74.4
WB	<b>178</b>	3.8	0.03	4.92	0.00	0.69	0.77	0.02	1.57	176.3	18.9	72.3
WB	<b>179</b>	2.5	0.06	4.26	0.01	0.62	0.69	0.02	1.45	106.3	12.4	69.7
WB	<b>180</b>	1.8	0.05	3.81	0.04	0.62	0.64	0.03	1.39	74.6	10.0	68.8
WB	<b>181</b>	1.7	0.05	3.61	0.01	0.60	0.59	0.02	1.29	70.1	n.a.	66.0
WB	<b>182</b>	1.4	0.07	3.26	0.03	0.62	0.54	0.02	1.24	58.1	5.0	63.8
WB	<b>183</b>	1.3	0.07	3.12	0.02	0.60	0.52	0.02	1.21	51.2	5.4	62.5
WB	<b>184</b>	1.1	0.10	2.50	0.05	0.50	0.43	0.02	1.12	39.9	9.6	57.3
WB	<b>185</b>	1.1	0.09	2.55	0.03	0.50	0.43	0.02	1.06	44.4	7.8	55.4
WB	<b>186</b>	1.0	0.12	2.61	0.02	0.45	0.43	0.03	1.12	40.2	1.9	60.4
WB	<b>187</b>	1.2	0.09	2.76	0.03	0.45	0.46	0.03	1.16	44.4	7.7	58.3

Table 2 continued

	<b>ID</b>	<b>Na</b> mg/L	<b>Al</b> mg/L	<b>Ca</b> mg/L	<b>Fe</b> mg/L	<b>K</b> mg/L	<b>Mg</b> mg/L	<b>Mn</b> mg/L	<b>Si</b> mg/L	<b>chloride</b> µmol/L	<b>nitrate</b> µmol/L	<b>sulfate</b> µmol/L
WB	<b>188</b>	4.6	0.02	5.40	0.00	0.45	0.82	0.00	1.98	200.9	32.4	72.6
WB	<b>190</b>	3.9	0.05	5.08	0.08	0.63	0.79	0.00	1.75	180.8	29.3	74.8
WB	<b>191</b>	3.7	0.31	5.02	0.01	0.87	0.82	0.00	1.65	188.9	8.3	65.9
WB	<b>192</b>	2.6	0.01	4.53	0.13	0.79	0.79	0.00	1.63	127.8	1.7	65.9
WB	<b>193</b>	1.9	0.06	3.65	0.07	0.63	0.67	0.00	1.48	87.3	n.a.	66.1
WB	<b>194</b>	2.1	0.07	3.65	0.04	0.41	0.63	0.00	1.56	89.9	11.1	63.1
WB	<b>195</b>	3.0	0.02	4.40	0.02	0.41	0.71	0.00	1.74	139.1	13.3	66.7
WB	<b>196</b>	3.9	0.02	4.88	0.04	0.58	0.79	0.00	1.64	186.2	33.7	74.4
WB	<b>197</b>	3.3	0.03	4.88	0.08	0.85	0.75	0.00	1.41	158.9	29.7	72.4
WB	<b>198</b>	2.6	0.02	4.39	0.07	0.81	0.73	0.00	1.44	120.5	25.2	75.0
WB	<b>199</b>	2.3	0.02	4.15	0.06	0.98	0.70	0.01	1.24	106.6	20.2	71.1
WB	<b>200</b>	1.7	0.08	3.54	0.06	0.75	0.66	0.00	1.25	65.7	14.0	70.0
WB	<b>201</b>	1.3	0.15	2.85	0.06	0.55	0.51	0.00	1.21	52.5	9.6	64.9
WB	<b>202</b>	1.3	0.15	2.81	0.06	0.42	0.49	0.00	1.24	49.8	14.0	61.2
WB	<b>203</b>	1.8	0.01	3.75	0.03	0.32	0.61	0.00	1.39	81.9	11.6	73.5
WB	<b>204</b>	1.8	0.03	3.46	0.04	0.32	0.59	0.00	1.50	74.6	10.4	71.2
WB	<b>205</b>	1.8	0.03	3.35	0.03	0.36	0.55	0.00	1.29	72.0	13.4	63.6
WB	<b>206</b>	1.5	0.07	2.87	0.06	0.31	0.49	0.00	1.27	54.3	9.3	62.5

Al and Si were run on unfiltered samples via ICP.

Detection limits were 0.01 mg/L for Al, Ca, Fe, Mg and Mn; 0.05 mg/L for Na, K and Si; and 2 µmol/L for the anions.

Table 3. Ranch Brook Stream Survey, May-July 2004.

Date Sampled	Site	Chloride μmol/L	Nitrate μmol/L	Sulfate μmol/L	pH
May-10-2004	14A	15.0	4.6	41.0	5.42
May-10-2004	14B	15.4	1.9	43.6	5.54
May-10-2004	14C	15.5	11.6	42.1	5.19
May-10-2004	14D	7.4	<2	39.5	4.96
May-10-2004	15A	4.7	<2	31.5	4.53
May-10-2004	15B	12.9	<2	31.8	4.60
May-10-2004	15C	5.7	<2	24.2	4.40
May-10-2004	15E	10.7	13.0	48.0	5.26
May-10-2004	15F	15.6	2.8	47.5	5.31
May-10-2004	15G	9.4	8.0	29.6	4.46
May-10-2004	16A	12.4	17.1	31.4	4.72
May-10-2004	16B	11.9	1.3	37.1	4.90
May-10-2004	17A	10.6	6.4	40.5	5.71
May-10-2004	17C	5.3	<2	29.0	5.28
May-10-2004	17D	8.7	6.3	35.6	6.23
May-10-2004	17E	9.2	7.8	40.3	5.88
May-10-2004	18A	7.7	10.1	41.7	6.00
May-10-2004	18B	8.1	2.9	36.9	5.85
May-10-2004	18C	6.8	4.3	40.0	6.15
May-10-2004	18D	10.5	11.2	42.1	6.10
May-10-2004	13C	9.3	15.7	44.3	6.50
May-10-2004	13B	10.2	6.5	39.1	5.01
May-10-2004	13A	8.9	7.1	43.1	6.53
May-10-2004	18F	16.2	9.6	43.6	5.38
May-10-2004	Gaging Station	7.2	7.7	42.2	6.09

Table 3 continued

Date Sampled	Site	Chloride μmol/L	Nitrate μmol/L	Sulfate μmol/L	pH
May-17-2004	14A	14.6	<2	45.2	5.79
May-17-2004	14B	10.6	<2	47.2	5.42
May-17-2004	14C	13.8	6.2	45.2	5.22
May-17-2004	14D	not	sampled		
May-17-2004	15A	6.6	<2	34.7	4.43
May-17-2004	15B	7.2	<2	35.0	4.47
May-17-2004	15C	5.8	<2	29.5	4.37
May-17-2004	15E	7.7	8.3	50.1	5.07
May-17-2004	15F	9.1	2.5	51.1	5.16
May-17-2004	15G	8.8	8.0	34.4	4.34
May-17-2004	16A	6.2	22.5	34.1	4.62
May-17-2004	16B	6.9	<2	40.7	4.80
May-17-2004	17A	6.1	4.9	44.1	5.91
May-17-2004	17C	3.8	<2	32.6	5.07
May-17-2004	17D	7.4	2.5	38.5	6.27
May-17-2004	17E	8.6	4.2	44.0	5.87
May-17-2004	18A	9.3	5.3	44.7	6.00
May-17-2004	18B	7.2	<2	40.1	5.93
May-17-2004	18C	5.9	1.6	41.2	6.63
May-17-2004	18D	11.3	6.5	45.3	6.08
May-17-2004	13C	10.8	11.6	50.0	6.56
May-17-2004	13B	13.0	3.6	43.2	5.14
May-17-2004	13A	12.9	4.8	48.7	6.40
May-17-2004	18F	14.2	4.4	43.9	5.43
May-17-2004	Gaging Station	9.4	3.6	43.1	6.10

Table 3 continued

Date Sampled	Site	Chloride μmol/L	Nitrate μmol/L	Sulfate μmol/L	pH
May-27-2004	14A	7.3	1.6	39.1	5.07
May-27-2004	14B	6.5	<2	39.8	5.24
May-27-2004	14C	10.0	5.5	42.3	5.04
May-27-2004	14D	6.3	<2	36.5	4.99
May-27-2004	15A	3.7	<2	31.0	4.55
May-27-2004	15B	3.7	<2	31.1	4.61
May-27-2004	15C	2.4	<2	25.4	4.36
May-27-2004	15E	5.8	7.1	45.4	5.09
May-27-2004	15F	6.7	1.4	45.9	5.02
May-27-2004	15G	5.3	3.0	30.9	4.34
May-27-2004	16A	3.4	11.1	32.3	4.70
May-27-2004	16B	3.4	<2	37.4	4.86
May-27-2004	17A	2.6	2.4	41.5	5.75
May-27-2004	17C	1.7	<2	31.1	5.12
May-27-2004	17D	4.2	2.7	35.8	6.17
May-27-2004	17E	6.2	3.6	40.8	5.91
May-27-2004	18A	7.2	5.3	40.2	5.81
May-27-2004	18B	3.6	1.3	38.3	5.82
May-27-2004	18C	4.4	1.9	37.2	6.35
May-27-2004	18D	not sampled			
May-27-2004	13C	6.4	8.9	42.7	6.63
May-27-2004	13B	5.4	2.9	37.1	4.88
May-27-2004	13A	6.1	2.6	41.2	6.56
May-27-2004	18F	9.5	5.0	44.6	5.30
May-27-2004	Gaging Station	7.3	3.3	41.2	6.10

Table 3 continued

Date Sampled	Site	Chloride μmol/L	Nitrate μmol/L	Sulfate μmol/L	pH
Jun-04-2004	14A	11.4	0.9	39.2	5.25
Jun-04-2004	14B	8.3	<2	40.6	5.33
Jun-04-2004	14C	11.0	4.6	42.6	5.07
Jun-04-2004	14D	13.8	4.6	44.7	5.18
Jun-04-2004	15A	6.0	5.6	32.3	4.52
Jun-04-2004	15B	6.3	<2	31.9	4.62
Jun-04-2004	15C	7.8	<2	27.2	4.38
Jun-04-2004	15E	17.7	7.4	47.6	5.09
Jun-04-2004	15F	13.2	1.0	45.8	5.18
Jun-04-2004	15G	6.0	3.0	33.0	4.37
Jun-04-2004	16A	7.9	7.9	34.0	4.74
Jun-04-2004	16B	5.0	<2	38.7	4.85
Jun-04-2004	17A	7.2	2.8	41.5	5.62
Jun-04-2004	17C	7.4	<2	31.7	5.16
Jun-04-2004	17D	8.1	2.5	35.3	6.3
Jun-04-2004	17E	12.0	3.5	41.1	5.9
Jun-04-2004	18A	not	sampled		
Jun-04-2004	18B	not	sampled		
Jun-04-2004	18C	not	sampled		
Jun-04-2004	18D	13.3	3.6	40.4	5.61
Jun-04-2004	13C	8.9	9.0	43.3	6.22
Jun-04-2004	13B	9.4	4.1	35.2	4.94
Jun-04-2004	13A	8.2	3.7	39.7	6.36
Jun-04-2004	18F	not	sampled		
Jun-04-2004	Gaging Station	9.1	2.9	40.8	5.96

Table 3 continued

Date Sampled	Site	Chloride μmol/L	Nitrate μmol/L	Sulfate μmol/L	pH
Jul-13-2004	14A	13.0	2.4	39.3	5.04
Jul-13-2004	14B	7.4	<2.0	42.5	5.04
Jul-13-2004	14C	11.8	2.0	45.0	4.21
Jul-13-2004	14D	9.4	<2.0	36.2	4.64
Jul-13-2004	15A	3.2	<2.0	34.0	4.29
Jul-13-2004	15B	4.2	<2.0	34.4	4.38
Jul-13-2004	15C	4.1	<2.0	31.6	4.07
Jul-13-2004	15E	21.6	2.8	47.0	4.89
Jul-13-2004	15F	4.4	<2.0	35.5	4.14
Jul-13-2004	15G	4.6	1.7	35.8	4.13
Jul-13-2004	16A	5.1	4.5	37.1	4.56
Jul-13-2004	16B	3.2	<2.0	40.6	4.32
Jul-13-2004	17A	2.6	1.1	40.3	5.85
Jul-13-2004	17C	1.6	<2.0	32.6	4.98
Jul-13-2004	17D	3.6	0.7	35.2	6.05
Jul-13-2004	17E	not	sampled		
Jul-13-2004	18A	5.6	2.7	39.1	5.50
Jul-13-2004	18B	2.5	<2.0	37.8	5.87
Jul-13-2004	18C	5.0	<2.0	36.8	6.24
Jul-13-2004	18D	not	sampled		
Jul-13-2004	13C	7.6	8.5	49.1	6.24
Jul-13-2004	13B	4.0	1.1	37.9	4.80
Jul-13-2004	13A	4.8	1.9	41.1	6.26
Jul-13-2004	18F	11.5	2.3	43.1	5.09
Jul-13-2004	Gaging Station	4.8	1.7	40.7	nd
Jul-13-2004	pre15A	6.0	<2.0	36.5	4.43
Jul-13-2004	pre16A	3.3	6.0	44.5	4.62
Jul-13-2004	pre17A	3.1	<2.0	39.8	4.67
Jul-13-2004	upBear-1	3.8	1.6	38.5	4.99
Jul-13-2004	upBear-2	3.6	<2.0	37.7	4.56



Table 3 continued

Date Sampled	Site	Ca μmol/L	Mg μmol/L	K μmol/L	Na μmol/L	Fe μmol/L	Mn μmol/L	Si μmol/L	Al μmol/L
May-10-2004	14A	24.7	9.6	3.2	17.1	1.8	0.6	49.0	7.3
May-10-2004	14B	29.4	14.0	4.5	14.1	2.4	0.2	69.8	7.7
May-10-2004	14C	33.9	12.4	6.2	12.2	2.6	0.3	44.6	10.3
May-10-2004	14D	22.4	7.2	3.3	10.8	2.4	0.5	38.5	7.9
May-10-2004	15A	7.6	5.7	0.9	11.1	3.0	0.4	22.7	20.0
May-10-2004	15B	8.0	5.4	1.4	7.8	2.9	0.4	20.8	18.9
May-10-2004	15C	11.2	4.7	1.7	13.1	6.6	0.4	15.8	15.5
May-10-2004	15E	39.6	10.4	6.2	15.3	2.7	0.6	54.4	11.2
May-10-2004	15F	47.4	12.0	7.7	13.8	3.8	0.5	55.3	16.3
May-10-2004	15G	20.0	7.2	5.3	11.9	6.3	0.7	40.3	18.7
May-10-2004	16A	25.3	11.9	5.1	13.6	3.3	1.0	28.3	12.6
May-10-2004	16B	28.3	8.6	4.5	24.1	2.5	0.4	26.1	10.1
May-10-2004	17A	40.2	4.9	8.9	17.3	1.8	0.0	37.2	3.6
May-10-2004	17C	28.7	11.1	4.0	17.1	2.8	0.2	17.3	10.8
May-10-2004	17D	48.4	11.9	3.4	15.8	2.4	0.1	35.0	5.4
May-10-2004	17E	33.1	11.8	3.8	18.4	1.8	0.0	43.8	3.2
May-10-2004	18A	40.7	13.2	7.9	18.7	2.3	0.0	46.4	2.7
May-10-2004	18B	36.3	9.9	5.1	13.7	2.1	0.0	34.3	6.7
May-10-2004	18C	45.4	14.4	4.1	19.1	1.8	0.0	44.2	2.8
May-10-2004	18D	36.7	11.7	7.5	23.2	2.1	0.1	52.0	4.4
May-10-2004	13C	65.3	17.1	3.6	16.1	1.9	0.0	46.7	2.5
May-10-2004	13B	29.1	12.6	3.7	13.3	2.7	0.4	47.3	9.6
May-10-2004	13A	62.6	18.3	5.1	16.5	1.7	0.0	59.4	1.9
May-10-2004	18F	35.9	13.9	3.2	6.8	1.9	0.2	51.3	9.1
May-10-2004	Gage	nd							

Table 3 continued

Date Sampled	Site	Ca μmol/L	Mg μmol/L	K μmol/L	Na μmol/L	Fe μmol/L	Mn μmol/L	Si μmol/L	Al μmol/L
May-17-2004	14A	28.5	10.3	1.2	7.5	0.2	1.3	52.3	5.0
May-17-2004	14B	29.2	12.4	0.2	6.8	0.4	0.2	74.0	7.9
May-17-2004	14C	33.8	13.4	1.8	15.5	0.5	0.2	47.4	10.5
May-17-2004	14D	ns							
May-17-2004	15A	7.8	6.3	0.0	15.3	0.8	0.4	29.7	20.4
May-17-2004	15B	8.4	4.7	0.0	10.8	0.7	0.4	25.3	21.7
May-17-2004	15C	14.9	5.6	0.0	8.7	5.0	1.1	19.4	19.3
May-17-2004	15E	38.3	9.9	4.1	8.8	0.3	0.7	56.8	14.9
May-17-2004	15F	49.0	14.4	6.3	9.5	2.2	0.5	62.8	16.7
May-17-2004	15G	21.2	9.2	4.5	7.0	5.2	0.9	43.8	21.6
May-17-2004	16A	28.5	12.0	2.6	16.1	1.7	1.0	28.4	12.7
May-17-2004	16B	30.2	9.6	3.9	11.1	0.6	0.5	25.0	11.1
May-17-2004	17A	42.0	3.8	6.8	13.2	0.1	0.1	29.7	3.5
May-17-2004	17C	28.9	9.2	0.5	15.5	0.5	0.2	14.4	11.2
May-17-2004	17D	46.1	14.5	1.7	11.3	0.7	0.0	34.2	6.8
May-17-2004	17E	34.4	12.6	1.0	13.0	0.4	0.4	44.6	2.0
May-17-2004	18A	40.8	9.2	6.7	16.2	0.1	0.0	39.2	2.8
May-17-2004	18B	36.5	7.1	2.9	18.6	0.3	0.0	31.3	4.7
May-17-2004	18C	59.2	15.1	3.2	16.9	0.2	0.0	42.1	4.3
May-17-2004	18D	38.6	12.0	5.5	18.9	0.1	0.2	46.5	4.8
May-17-2004	13C	69.9	15.5	4.8	18.3	0.0	0.0	47.7	0.3
May-17-2004	13B	30.2	10.4	4.9	6.3	0.8	0.4	42.5	9.5
May-17-2004	13A	66.3	15.5	5.5	19.4	0.4	0.0	57.5	2.6
May-17-2004	18F	35.7	12.3	2.3	21.5	0.3	0.3	47.5	7.3
May-17-2004	Gage	50.1	13.9	5.7	29.5	1.0	0.0	52.0	4.3

Table 3 continued

Date Sampled	Site	Ca μmol/L	Mg μmol/L	K μmol/L	Na μmol/L	Fe μmol/L	Mn μmol/L	Si μmol/L	Al μmol/L
May-27-2004	14A	22.5	5.8	2.1	15.2	0.0	0.6	39.3	8.4
May-27-2004	14B	26.9	14.8	2.5	19.0	1.1	0.3	66.0	8.8
May-27-2004	14C	34.0	13.3	1.8	14.9	1.0	0.3	42.2	10.8
May-27-2004	14D	21.3	4.5	2.1	16.0	1.3	0.6	44.2	8.2
May-27-2004	15A	7.4	6.0	0.8	12.3	1.3	0.4	25.9	19.6
May-27-2004	15B	8.0	5.3	4.3	17.2	1.4	0.4	24.5	19.9
May-27-2004	15C	12.6	3.9	0.8	21.0	5.2	0.5	24.2	19.9
May-27-2004	15E	33.0	10.2	4.8	11.2	0.6	0.6	52.6	12.4
May-27-2004	15F	45.4	15.1	7.7	11.2	2.9	0.4	64.7	18.4
May-27-2004	15G	19.0	8.0	4.4	9.5	6.5	0.7	44.0	23.7
May-27-2004	16A	26.0	13.5	3.2	14.6	2.6	1.0	30.9	15.0
May-27-2004	16B	30.2	7.4	3.9	12.4	1.4	0.4	31.3	12.0
May-27-2004	17A	37.1	8.7	7.5	7.0	0.0	0.1	33.1	2.8
May-27-2004	17C	28.2	8.5	1.1	15.7	1.0	0.2	20.0	10.5
May-27-2004	17D	43.8	18.2	2.6	17.4	1.1	0.1	36.6	7.6
May-27-2004	17E	32.7	12.6	3.6	20.1	0.3	0.0	40.7	2.2
May-27-2004	18A	36.9	9.8	6.9	13.2	0.2	0.1	43.6	2.8
May-27-2004	18B	33.7	11.5	3.8	17.4	0.5	0.0	35.1	6.5
May-27-2004	18C	45.9	16.8	2.9	9.2	0.3	0.0	41.1	5.5
May-27-2004	18D	ns							
May-27-2004	13C	62.2	13.3	2.2	17.2	0.9	0.0	42.1	1.5
May-27-2004	13B	28.1	11.4	2.0	17.8	1.4	0.4	50.3	12.0
May-27-2004	13A	58.2	12.9	3.6	15.2	0.6	0.0	49.7	4.5
May-27-2004	18F	35.2	10.8	2.3	19.8	0.7	0.3	50.4	10.4
May-27-2004	Gage	43.1	14.7	2.4	19.3	0.8	0.1	49.0	8.1

Table 3 continued

Date Sampled	Site	Ca μmol/L	Mg μmol/L	K μmol/L	Na μmol/L	Fe μmol/L	Mn μmol/L	Si μmol/L	Al μmol/L
Jun-04-2004	14A	21.5	5.1	0.7	11.6	0.3	0.6	40.2	9.4
Jun-04-2004	14B	26.1	9.7	0.5	18.1	0.8	0.2	57.7	10.0
Jun-04-2004	14C	32.4	8.1	1.1	13.7	1.3	0.3	41.1	12.0
Jun-04-2004	14D	33.7	12.0	2.5	13.9	1.0	0.3	45.0	11.5
Jun-04-2004	15A	7.5	6.9	0.6	6.3	1.8	0.3	23.1	20.7
Jun-04-2004	15B	8.7	5.1	0.2	17.2	1.9	0.4	24.6	22.2
Jun-04-2004	15C	13.3	8.9	0.6	6.3	5.9	0.5	23.9	20.5
Jun-04-2004	15E	36.0	9.8	3.2	6.8	0.6	0.6	57.4	12.8
Jun-04-2004	15F	48.8	10.8	5.2	12.7	3.1	0.5	64.8	18.5
Jun-04-2004	15G	24.5	5.1	1.6	17.2	0.4	0.5	38.0	11.7
Jun-04-2004	16A	27.8	12.4	1.9	9.4	2.5	1.0	35.8	16.1
Jun-04-2004	16B	32.0	9.5	2.9	8.0	1.4	0.4	31.5	12.3
Jun-04-2004	17A	40.0	2.2	6.0	9.0	0.5	0.1	31.5	3.5
Jun-04-2004	17C	31.5	11.2	0.4	8.8	0.9	0.2	23.9	13.3
Jun-04-2004	17D	42.6	12.0	2.2	6.1	0.5	0.1	35.4	8.1
Jun-04-2004	17E	nd							
Jun-04-2004	18A	ns							
Jun-04-2004	18B	ns							
Jun-04-2004	18C	ns							
Jun-04-2004	18D	nd							
Jun-04-2004	13C	55.7	12.3	1.4	13.0	-0.2	-0.1	40.6	0.1
Jun-04-2004	13B	25.4	7.9	1.1	18.3	1.1	0.3	40.8	10.2
Jun-04-2004	13A	52.9	14.3	2.1	11.9	-0.1	-0.1	44.3	2.9
Jun-04-2004	18F	ns							
Jun-04-2004	Gage	39.8	11.0	0.7	13.6	0.5	0.1	39.9	6.0

ns = not sampled

nd = not determined

Al and Si were run on unfiltered samples via ICP