Non-Ferrous Mine Waste

Characterization Project

Status Report

Minnesota Department of Natural Resources
Division of Minerals

June 1992

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1. INTRODUCTION

This status report is tardy due largely to my vacation, which extended from the beginning of June to July 5. Rather than submit a cursory report upon my return, time was taken to compile, analyze, and summarize the data collected through the first year of the two-year project. The importance of compiling the data was judged to exceed the inconvenience in delaying the report. Apologies are extended for any problems created.

2. LABORATORY EXPERIMENTS

2.1. Long-Term Oxidation Experiment

The Long-Term Oxidation Experiment is designed to examine the dissolution behavior of the tailings over a period well beyond the 20 week interval commonly used for predictive tests in the past. In this experiment dissolution of samples T2 (8.19% S, 10.1% $CaCO_3$, 7.4% $MgCO_3$), T6 (2.18% S, 3.32% $CaCO_3$, 1.1% $MgCO_3$), T9 (5.40 %S, 1.4% $CaCO_3$, 0% $MgCO_3$), and T10 (6.51% S, 12.7% $CaCO_3$, 6.2% $MgCO_3$) was continued beyond the 52 weeks used for other samples. This experiment is presently in week 111. Laboratory parameters (pH, alkalinity, specific conductance) have been analyzed and compiled through week 106. Sulfate, calcium, and magnesium have been analyzed and compiled through week 96.

The key drainage quality parameters with respect to acid drainage are pH and alkalinity/acidity. The drainage from all four tailings samples has remained in the slightly alkaline range through week 106, as indicated by a pH range of 7.4 to 8.4 and elevated alkalinities (figures 1-4). This indicates that dissolution of the calcium and magnesium carbonate minerals present has neutralized the acid produced by the oxidation of iron sulfide minerals present. The oxidation of the iron sulfides is reflected by the sulfate concentrations in the drainage.

The only apparent temporal trends for the variation of pH and alkalinity are observed for sample T9. Both alkalinity and pH decline after about week 95 (figure 3). This suggests that the carbonates initially present may be nearing depletion.

The oxidation of iron sulfides present in the four tailings samples has continued, as indicated by the release of sulfate over time. This suggests that iron sulfide oxidation, and the consequent acid production, continues over a period considerably longer than that commonly used in predictive testing. This indicates that the drainage quality observed in short-term tests does not necessarily reflect the drainage quality which will be generated by mine wastes upon abandonment.

All four samples exhibit the same general temporal variation for sulfate release. Sulfate concentrations in the drainage from the tailings decreased over the initial 60 weeks, increased to a relative maximum at about 40 weeks, and decreased to a fairly constant (or moderately increasing) level after week 70 (figures 5-8). Concentrations during the initial six weeks of the experiment were considerably higher than those observed subsequently. These values were omitted from the figures in order to depict long-term concentration variations in greater detail.

The initial decrease is probably influenced by the release of sulfate initially present in the tailings. The rate of sulfate release due to sulfide mineral oxidation is most likely influenced by variation in experimental conditions, in particular temperature and relative humidity, over the course of the experiment. The relative influence of these factors on sulfate release will be examined using mass release rates compiled in appendix 1, in conjunction with sulfate analyses of the tailings and experimental data on temperature and relative humidity.

The observed calcium and magnesium concentrations in the drainage from the tailings samples vary in a manner similar to, but less pronounced than, that observed for sulfate concentrations (figures 5-8). The initial decline in concentrations of these metals roughly parallels the trend observed for sulfate concentrations over the initial 40 weeks. A peak in calcium and/or magnesium concentrations at 60 weeks (parallel to that observed for sulfate) is most pronounced for samples T9 and T10. With the notable exception of T9, the calcium and magnesium concentrations were fairly stable after 70 weeks of reaction.

The observed sulfate, calcium, and magnesium concentrations in drainage from T9 are of particular interest. Sulfate concentrations after 75 weeks of dissolution were similar to those observed between weeks 20 and 50. In contrast, calcium concentrations after 75 weeks were markedly lower than those observed in the earlier stage of the experiment.

This suggests that the calcium carbonate initially present in the samples was being depleted. This hypothesis is consistent with the aforementioned trends observed for pH and alkalinity. T9 has the lowest carbonate content (1.4% $CaCO_3$) of the samples subjected to the long-term dissolution experiment and is, therefore, most susceptible to carbonate depletion. To determine the extent of calcium and magnesium carbonate dissolution from all tailings samples, the mass releases of calcium and magnesium will be calculated and compared to the initial tailings composition. A similar approach will be used to determine the extent of sulfide mineral dissolution.

If the calcite is depleted from T9 and the iron sulfides continue to oxidize, the drainage from this sample will become acidic. The production of acidic drainage was not observed during the initial 20 weeks of the experiment. Assuming the drainage generated in such a short-term test was representative of the drainage from the tailings upon abandonment could lead to a serious error. Further dissolution of this sample will lend insight into its potential for acid generation.

2.2. Variable Mass Experiment

The Variable Mass Experiment was conducted to examine the effect of the mass of sample used in a dissolution experiment on the amount of acid neutralized by carbonate mineral dissolution. (Drainage quality and mass release data compiled through week 17, as well as additional figures, are presented in appendix 2). This amount can vary from zero to two moles of acid per mole of carbonate mineral dissolved. Carbonate minerals will dissolve to a given extent in the absence of acid (reaction 1). The presence of acid will lead to dissolution by reaction 2 or 3.

$$CaCO_3(s) = Ca^{2+}(aq) + CO_3^{2-}(aq) \quad [1]$$

These reactions result in the neutralization of acid produced by iron sulfide oxidation.

$$CaCO_3(s) + H^+(aq) = Ca^{2+}(aq) + HCO_3^-(aq) \quad [2]$$

$$CaCO_3(s) + 2H^+(aq) = Ca^{2+}(aq) + H_2CO_3(aq) \quad [3]$$

Carbonate minerals will always dissolve to some degree due to their solubility, that is by reaction 1. If the acid produced by iron sulfide oxidation is relatively small, reaction 1 may be the dominant path of carbonate dissolution. The low acid production is more likely to occur when the mass of iron sulfide minerals is small. In the field, the mass of mine waste will be very large in comparison to that used in laboratory experiments. Consequently, the acid production will be greater and carbonate minerals will be more apt to dissolve according to reactions 2 and 3. In this case the carbonate mineral dissolution will consume a greater amount of acid.

The extent of acid consumption by carbonate mineral dissolution and the degree to which carbonate minerals dissolve by reaction 1 using observed molar concentrations in the drainages. The sum of calcium and magnesium concentrations vs the corresponding sulfate concentrations in drainage samples were plotted for each sample. Linear regression analyses were conducted to determine the constants for the equation:

$$[Ca^{2+}] + [Mg^{2+}] = m[SO_4^{2-}] + b \quad [4]$$

Twice the inverse of the slope, m, yields the number of moles of acid neutralized by the dissolution of carbonate minerals.

The value b is the y-intercept, which in this case represents the molar sum of calcium and magnesium concentrations when no sulfate is present. This represents the amount of calcium and magnesium carbonate which dissolves in the absence of the acid produced by iron sulfide oxidation.

Error is introduced in this approach since a single slope will be applied to the entire data set. In actuality, each of reactions 1-3 will generate its own distinct slope for reaction 4. If iron sulfide oxidation is very small, the generation of sulfate and acid will be small. In this case reaction 1 will dominate and the slope will be near zero. That is, the release of calcium and magnesium by carbonate dissolution will be independent of sulfate concentration.

As iron sulfide oxidation and the consequent acid production increases, reaction 2 will represent the dominant path of carbonate dissolution, and the slope of the line ($\{[Ca] + [Mg]\}/[SO_4]$) would be 2.0. As the concentration of acid produced by iron sulfide oxidation increases, bicarbonate concentrations produced by reaction 2 will increase and carbonic acid will form (reaction 5). The net reaction is represented by reaction 3, which would generate a slope of 1.

$$H^+(aq) + HCO_3^-(aq) = H_2CO_3(aq) \quad [5]$$

The slope determined in the regression analysis will reasonably reflect the dominant carbonate mineral dissolution reaction and the attendant extent of acid neutralization. However, the intercept will provide only a first cut approximation of the extent of dissolution occurring by reaction 1. This value can be more accurately determined by analyzing drainage samples in which the sulfate concentrations are low.

Regression analysis was conducted on the drainage data for the individual samples (T2, T4, T10), as well as the combined data for all samples. The correlations were very high as indicated by r^2 values of 0.830 to 0.995 for data sets of 76 to 240 points (table 1). The extent of acid consumption was close to two moles acid per mole of carbonate mineral dissolved in all cases (table 1, figures 9-12).

The extent of acid consumption calculated for sample T4 was slightly lower than that for the other two solids. The sulfate concentrations in the drainage from the T4 tailings were considerably lower than those in the drainage from the other tailings. This may have influenced the lower acid consumption, as explained above. The carbonate mineral dissolution by reaction 1 was estimated to be in the range of 0.56 to 0.76 mmoles/L, based on the y-intercepts obtained.

The combined data for sulfate concentrations less than 1.0 mmole/L indicated that the acid consumption at low sulfate concentrations was 1.5 mole acid per mole carbonate mineral dissolved (table 2, figure 13). Additional analysis of these data is required for more accurate interpretation. The variation in mass release will also be analyzed to assess the efficiency of reaction product transport from the tailings as a function of sample mass.

2.3. Extended Oxidation Cycle

Predictive dissolution tests are typically conducted using a one week rinsing cycle. The rinsing cycle length was varied for all twelve samples to examine its effect on drainage quality and mass release. The rinsing cycles used were 1, 3, 5, 7, and 10 weeks. The experiment is yet in progress, and the data presented on drainage pH and sulfate concentrations are incomplete (appendix 3).

The preliminary data indicate that pH generally decreased as the length of the oxidation interval increased (figure 14). Exceptions to this trend were samples T5, T11, and T12. The pH decrease was influenced by the increase in sulfide oxidation as the length of the oxidation interval increased (figure 15). In the longer oxidation interval the samples were subject to increased iron sulfide oxidation, and the attendant acid production. Since the samples also dried to a greater extent during the longer oxidation interval, the acid was not transported to carbonate minerals present in the samples. Consequently, although the acid production increased, neutralization may have been limited by decreased efficiency of acid transport to carbonate minerals.

2.4. Elevated Temperature Test

Samples T1, T2, T4, T8, T9, T10, and T12 were submitted to the Elevated Temperature Test

in order to compare the results from this predictive test to those in the Wet-Dry Cycle Test conducted at 25°C. Test results have been compiled through week 16 of this experiment.

Samples T2, T9, and T10 produced acidic drainage within the first 16 weeks of the Elevated Temperature Test (figure 16). Static Test results indicated that these samples were most likely to produce acidic drainage. None of these samples produced acidic drainage in the 111 weeks of the Wet-Dry Cycle Test, although the pH of drainage from sample T9 has been decreasing recently.

The data from sample T9 suggest that the Elevated Temperature Test may identify mine wastes, of composition similar to these (typically quartz-carbonate tailings), much more rapidly than the Long-Term Wet-Dry Cycle Test. Sample T9 had the lowest calcium/magnesium carbonate content of the tailings examined. These minerals may have dissolved completely due to the accelerated iron sulfide oxidation, and consequent acid production, in the Elevated Temperature Test. Mass release data for calcium, magnesium, and sulfate, as well as data from the Long-Term Wet-Dry Cycle Test (appendix 1), will be examined to assess the accuracy of this hypothesis.

However, it is presently unknown if samples T2 and T10 will indeed generate acidic drainage under field conditions. The neutralization available as calcium and magnesium carbonate in these samples is roughly 14 times that of sample T9 (table 4). It seems unlikely that these carbonates could have been depleted so soon even at an accelerated rate of acid production. The mineral form of the carbonate may influence the effectiveness of its buffering in the Elevated Temperature Test, and under other conditions also. The dominant buffering carbonate mineral in sample T2 was calcite. In contrast the dominant buffering minerals present in T2 and T10 were dolomite and ankerite, respectively. Mass release data will be examined to provide a preliminary assessment of the accuracy of the Elevated Temperature predictions. Solid phase analyses of leached solids may provide additional insight into the carbonate dissolution process in this test.

3. PLANS

Mass release data will be examined and conclusions derived from the data will be presented in the next progress report.

Drainage quality data will be analyzed in more detail to better assess the extent of acid consumption by carbonate minerals at low sulfate concentrations (table 2).

Companies which contributed samples have been contacted. Field data and other information relevant to mine waste drainage quality have been requested. Their responses to these requests will be presented in the next status report.

Table 1. Acid neutralization by carbonate minerals based on regression data for [Ca] + [Mg] vs [SO_4], all data.

Solid	Neutralization[1]	Slope	INT[2]	r^2	n[3]
T2	2.02	0.991	0.756	0.995	82
T4[4]	1.82	1.096	0.556	0.830	76
T10	1.95	1.027	0.664	0.990	82
ALL	1.98	1.010	0.659	0.993	240

1 Moles H^+ neutralized per mole Ca/Mg carbonate mineral dissolved, calculated as 1/slope
2 Y-intercept
3 Number of data points for regression
4 This regression omitted three points for which [SO_4] exceeded 4.0 mmole/L.

Table 2. Carbonate dissolution at low sulfate concentrations ([SO_4] < 1.0 mmole/L).

Solid	Neutralization[1]	Slope	INT[2]	r^2	n[3]
T2	3.12	0.642	0.986	0.540	28
T4	1.53	1.306	0.509	0.810	72
T10	6.99	0.286	1.392	0.053	25
ALL	1.50	1.332	0.554	0.784	125

1 Moles H^+ neutralized per mole Ca/Mg carbonate mineral dissolved, calculated as 1/slope
2 Y-intercept
3 Number of data points for regression

Table 3. Summary of Static Test Results

SAMPLE	S_T[1]	S^{2-}[2]	ABA			MODIFIED ABA			APP:S			NP/APP[9]
			APP[3]	NP	NET NP[4]	APP[5]	NP	NET NP[5]	APP[6]	NP[7]	NET NP[4]	
T1	0.55	0.50	17	230[8]	213	16	200	184	17	162	145	12
T2	8.19	7.87	256	230	* -26	246	180	* -66	256	175[8]	* -81	* 0.73
T4	1.23	1.18	38	184[8]	146	37	130	93	38	150	112	3.5
T8	1.86	1.79	58	174	116	56	120	64	58	134	76	* 2.1
T9	5.40	5.03	169	18	*-151	157	16	*-141	169	19	* -150	* 0.10
T10	6.51	6.30	203	373	170	197	200	M 3	203	171	* -32	* 1.0
T12	0.04	0	1.2	139	138	0	150	150	1.2	35	34	large

1 Total sulfur, percent. Analyzed by Lerch Brothers, Inc.
2 Sulfide sulfur calculated as the difference between total sulfur and sulfate sulfur, percent.
3 Acid Production Potential in kg $CaCO_3$/metric ton = 31.25 x total sulfur
4 Net Neutralization Potential in kg $CaCO_3$/metric ton = NP-APP
5 Acid Production Potential in kg $CaCO_3$/metric ton = 31.25 x sulfide sulfur
6 Acid Production Potential in kg $CaCO_3$/metric ton = 31.25 x total sulfur. Calculated for comparison with other methods.
7 Net Neutralization Potential refers to the Alkaline Production Potential defined by Caruccio et al. (1981)
8 Average of duplicate values.
9 Neutralization Potential to Acid Production Potential Ratio for Modified ABA Method
* Indicates samples identified by the test as a potential acid producer.
M Indicates moderate potential for acid production, with Net NP in the range of -20 to +20 kg $CaCO_3$/metric ton.

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Table 4. Mineralogical composition of non-ferrous tailings. (Analysis by Hanna Research Center)

		Weight Percent Minerals						
		T1	T2	T4	T8	T9	T10	T12
Carbonates								
Calcite		0.2	1.5	0.6	-	1.4	2.1	0.4
Dolomite		18.9	16.1	13.0	10.1	-	-	-
Ankerite		-	-	-	-	-	19.7	-
Siderite		1.9	1.3	1.1	0.1	-	31.4	-
Regulatory Element-Bearing Minerals								
Pyrite	S	0.86	13.58	1.99	2.43	6.57	7.32	-
Pyrrhotite	S	0.04	0.02	0.05	1.04	0.13	-	See Text
Barite[1]	Ba,SO_4	-	-	-	-	14.22	-	-
Arsenopyrite	As	0.01	0.09	0.03	0.40	0.05	0.06	See Text
Chalcopyrite	Cu	0.01	0.04	0.04	0.04	0.01	0.01	See Text
Molybdenite	Mo	-	-	-	-	0.19	<0.01	-
Galena	Pb	<0.01	0.01	<0.01	0.01	<0.01	-	See Text
Stibnite	Sb	-	-	-	0.01	0.04	0.01	-
Sphalerite	Zn	0.05	0.14	0.02	0.01	0.02	-	See Text

Notes:

1) Barite was the only sulfate mineral detected. Sulfate in other samples is probably due to pyrite and/or pyrrhotite oxidation which often forms melanterite, $FeSo_4.7H_2O$.

c:\nonferr\june92\table4

Figure 1. pH and alkalinity in drainage from T2: weeks 7 - 96 (Long Term Oxidation at One Week Interval).

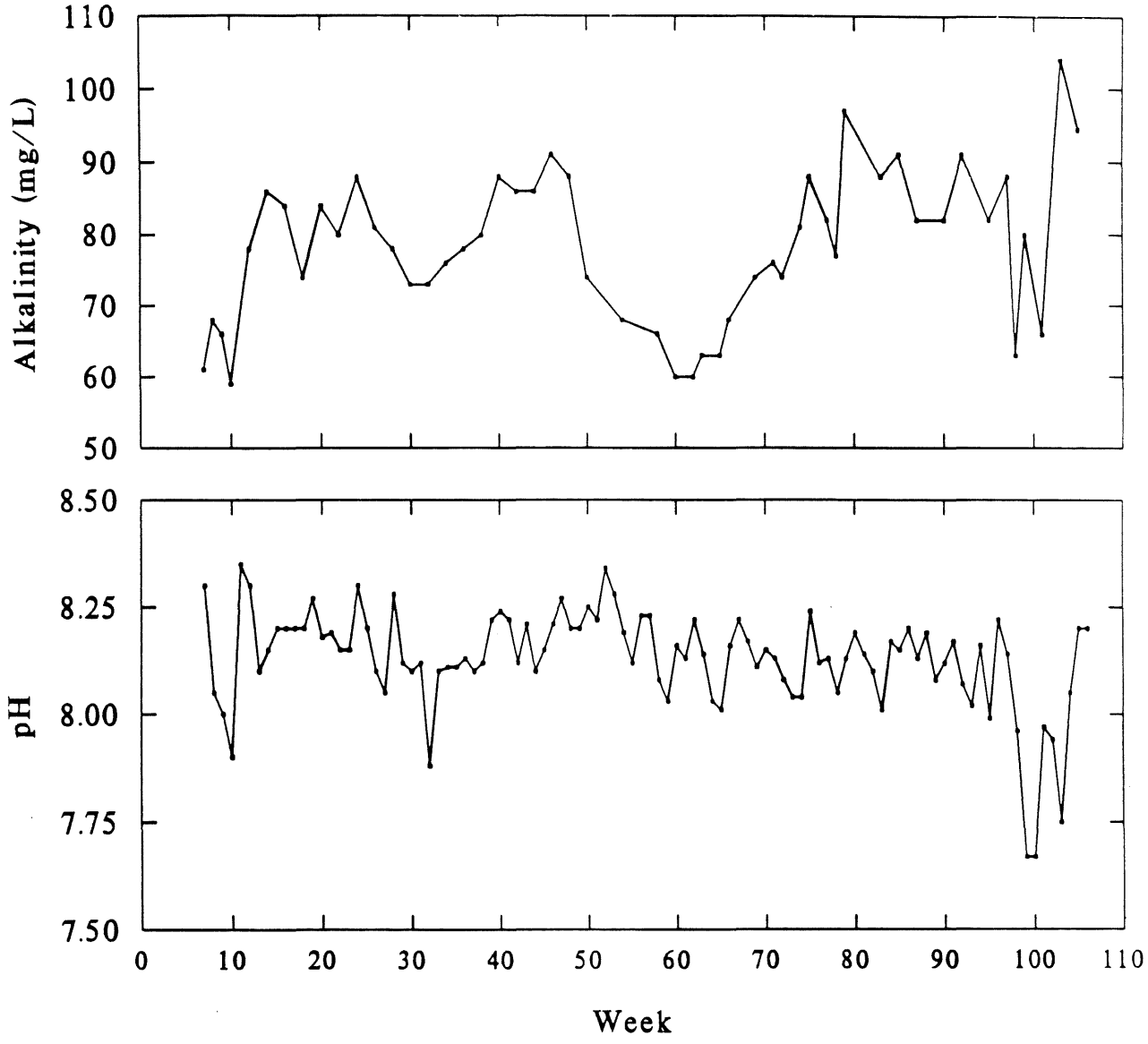


Figure 2. pH and alkalinity in drainage from T6: weeks 7 - 96 (Long Term Oxidation at One Week Interval).

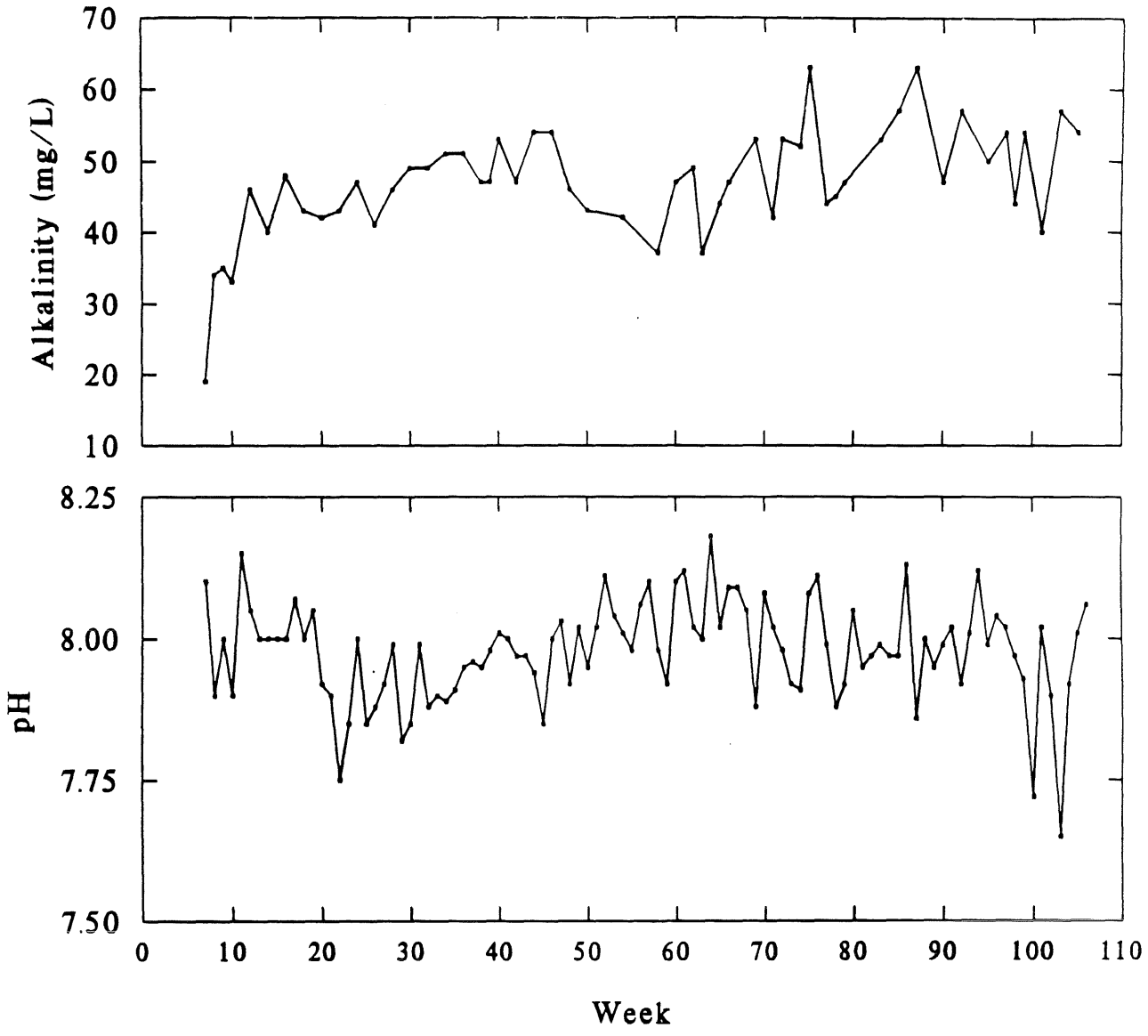


Figure 3. pH and alkalinity in drainage from T9: weeks 7 - 96 (Long Term Oxidation at One Week Interval).

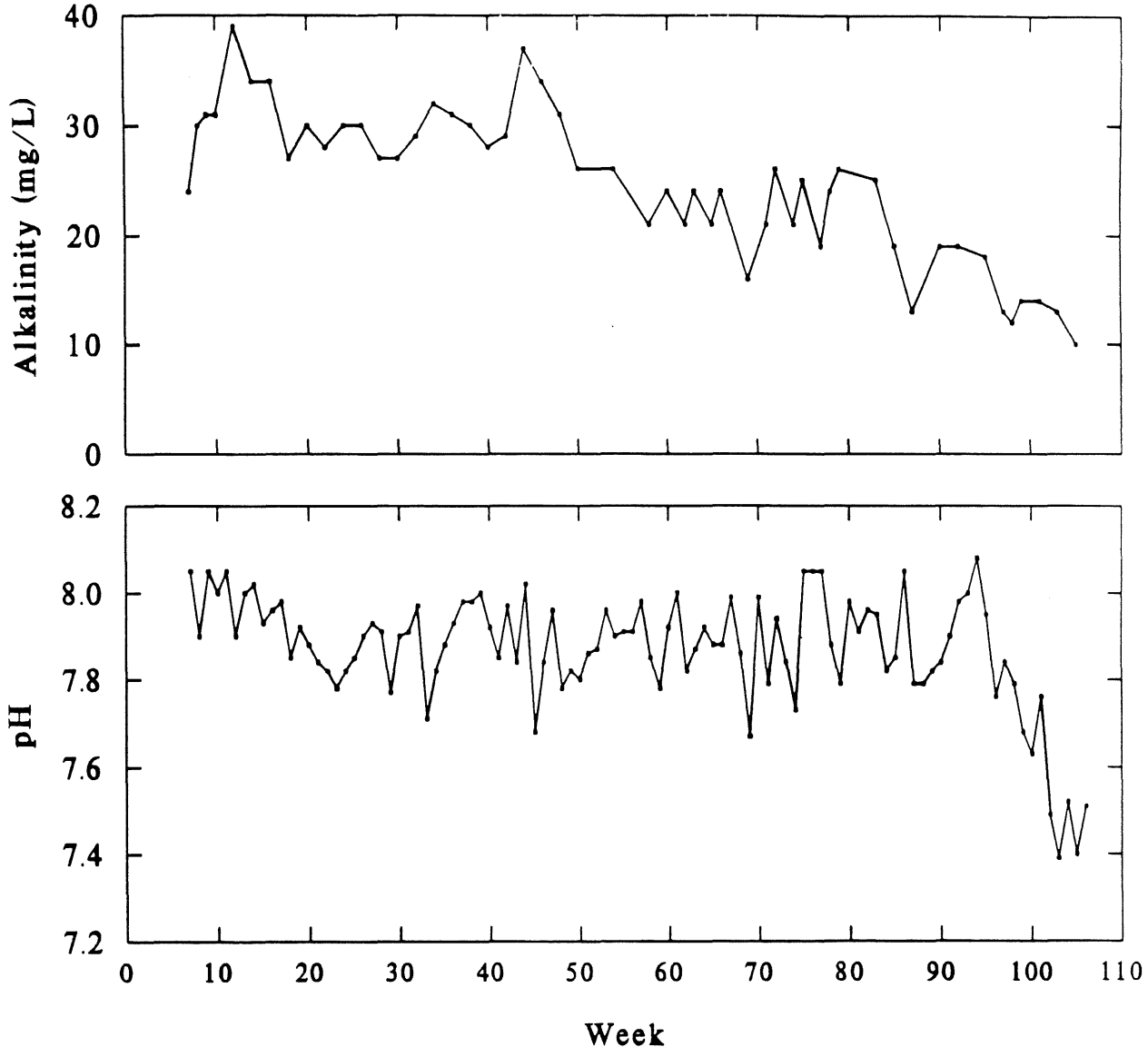


Figure 4. pH and alkalinity in drainage from T10: weeks 7 - 96 (Long Term Oxidation at One Week Interval).

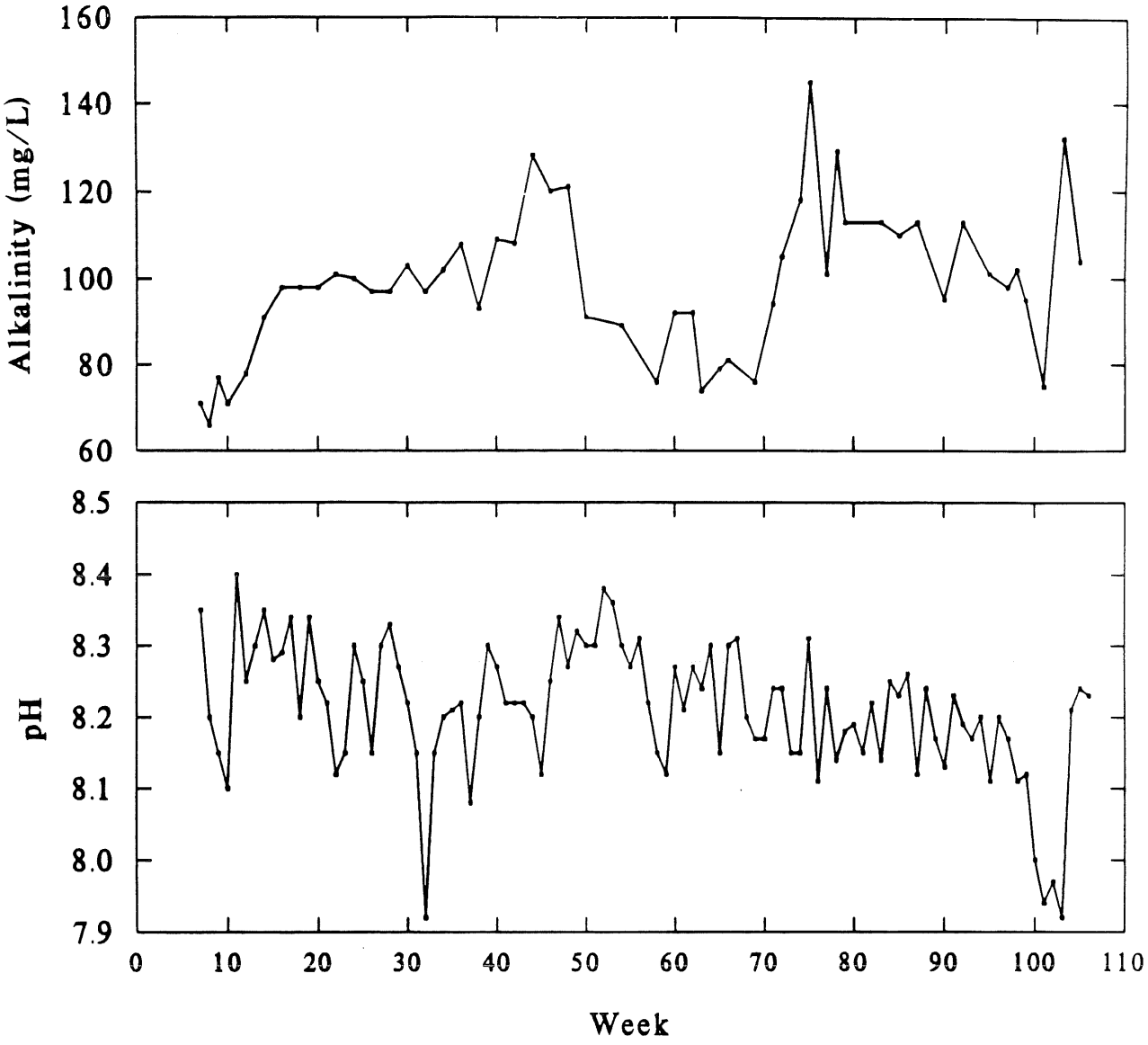


Figure 5. Sulfate, calcium, and magnesium concentrations in drainage from T2: weeks 7 - 96 (Long Term Oxidation at One Week Interval).

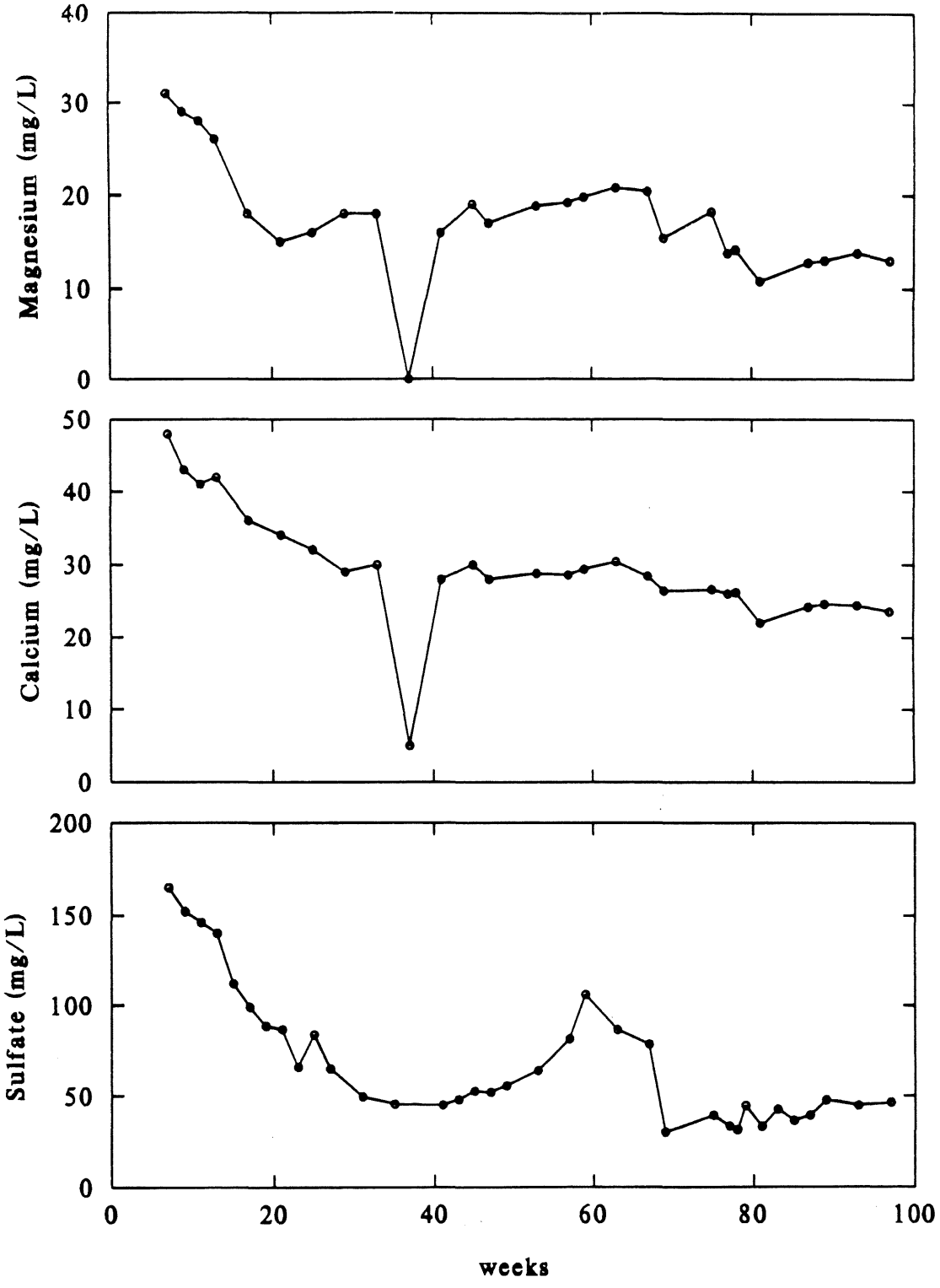


Figure 6. Sulfate, calcium, and magnesium concentrations in drainage from T6: weeks 7 - 96 (Long Term Oxidation at One Week Interval).

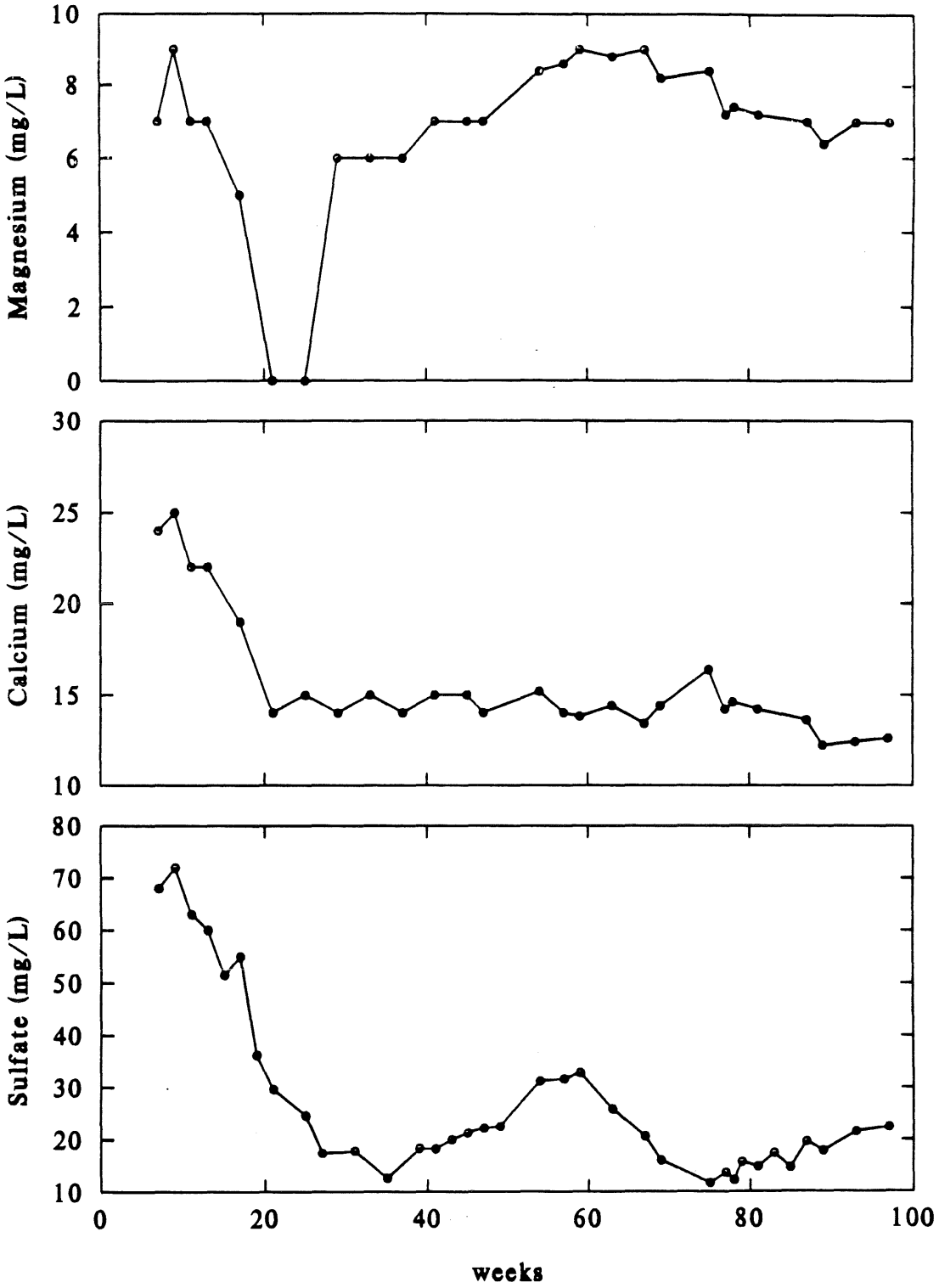


Figure 7. Sulfate, calcium, and magnesium concentrations in drainage from T9: weeks 7 - 96 (Long Term Oxidation at One Week Interval).

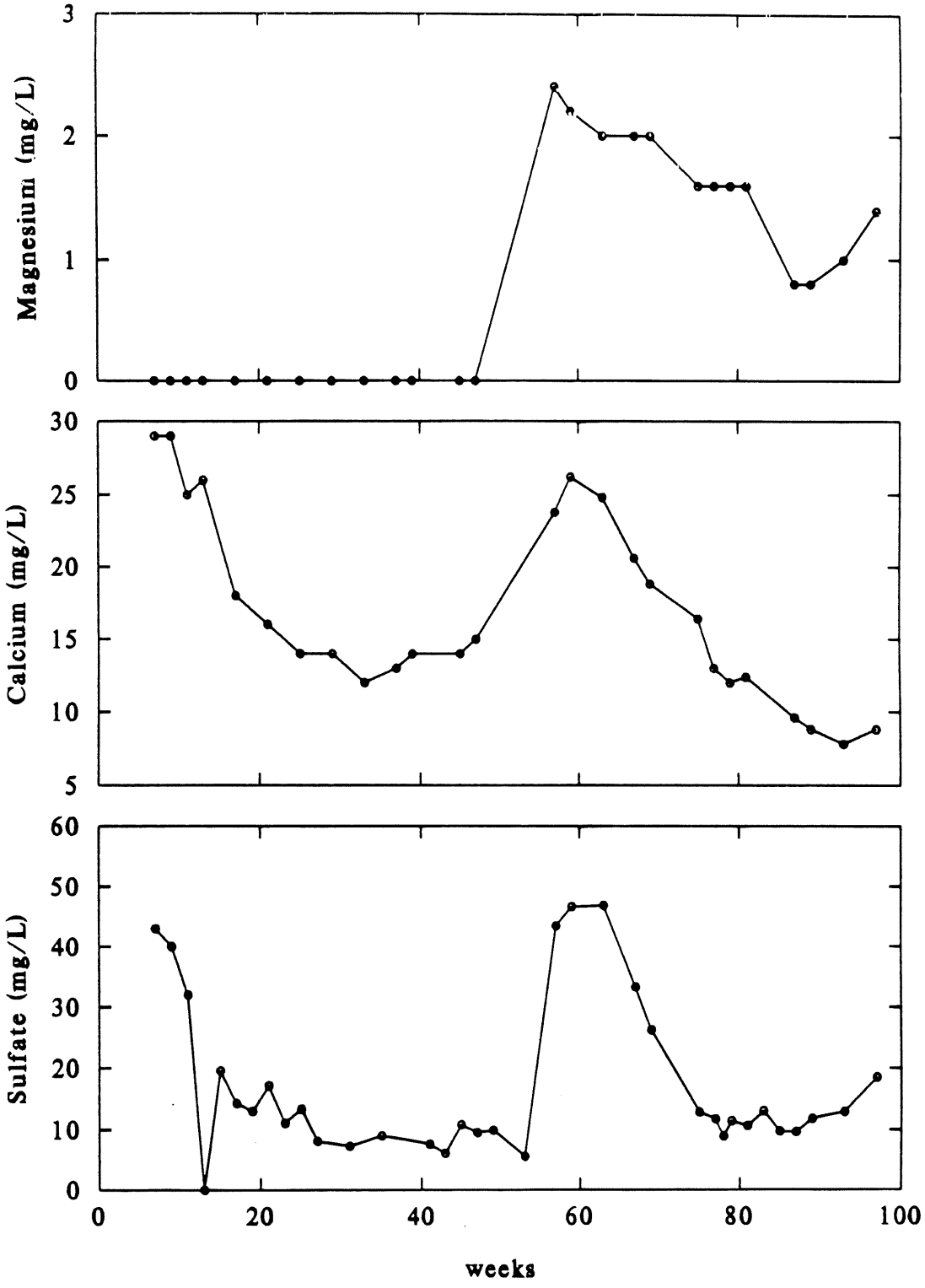


Figure 8. Sulfate, calcium, and magnesium concentrations in drainage from T10: weeks 7 - 96 (Long Term Oxidation at One Week Interval).

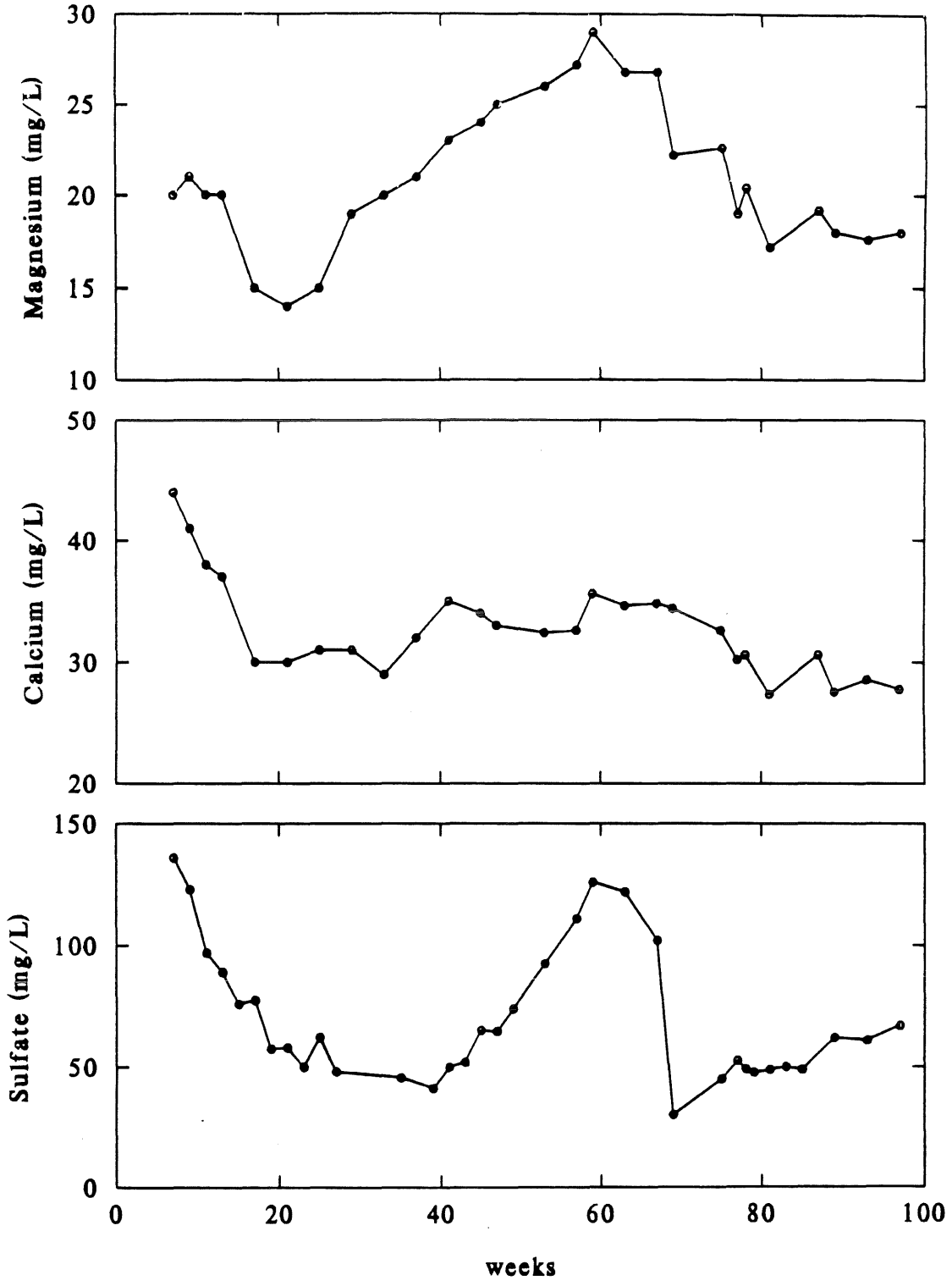


Figure 9. Sum of calcium and magnesium concentrations vs. sulfate in drainage from T2: weeks 0 - 12; 75 g sample weeks 0 - 106 (Variable Mass Experiment).

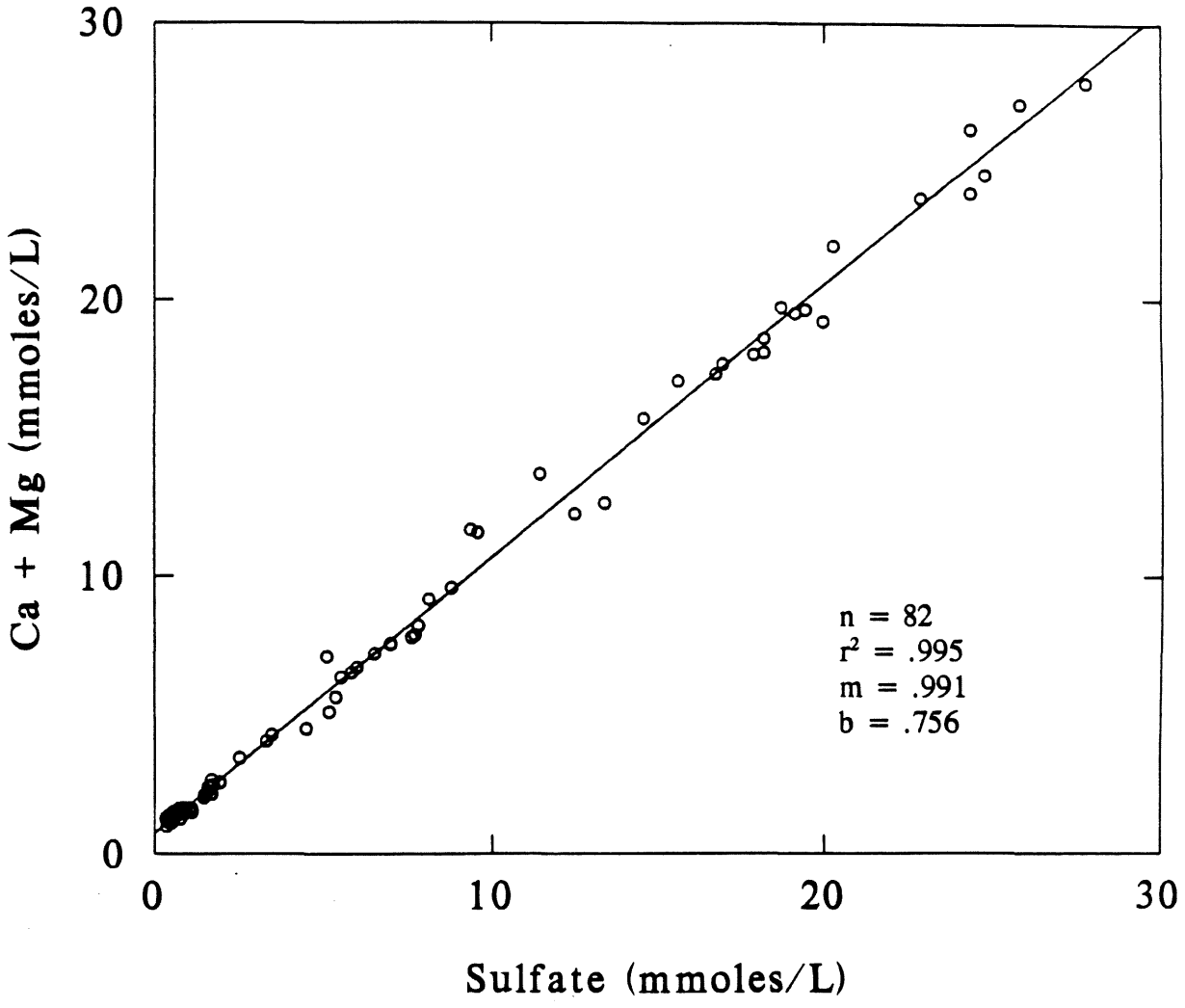


Figure 10. Sum of calcium and magnesium concentrations vs. sulfate in drainage from T4: weeks 0 - 12; 75 g sample weeks 0 - 106 (Variable Mass Experiment); three outlier values removed from data set.

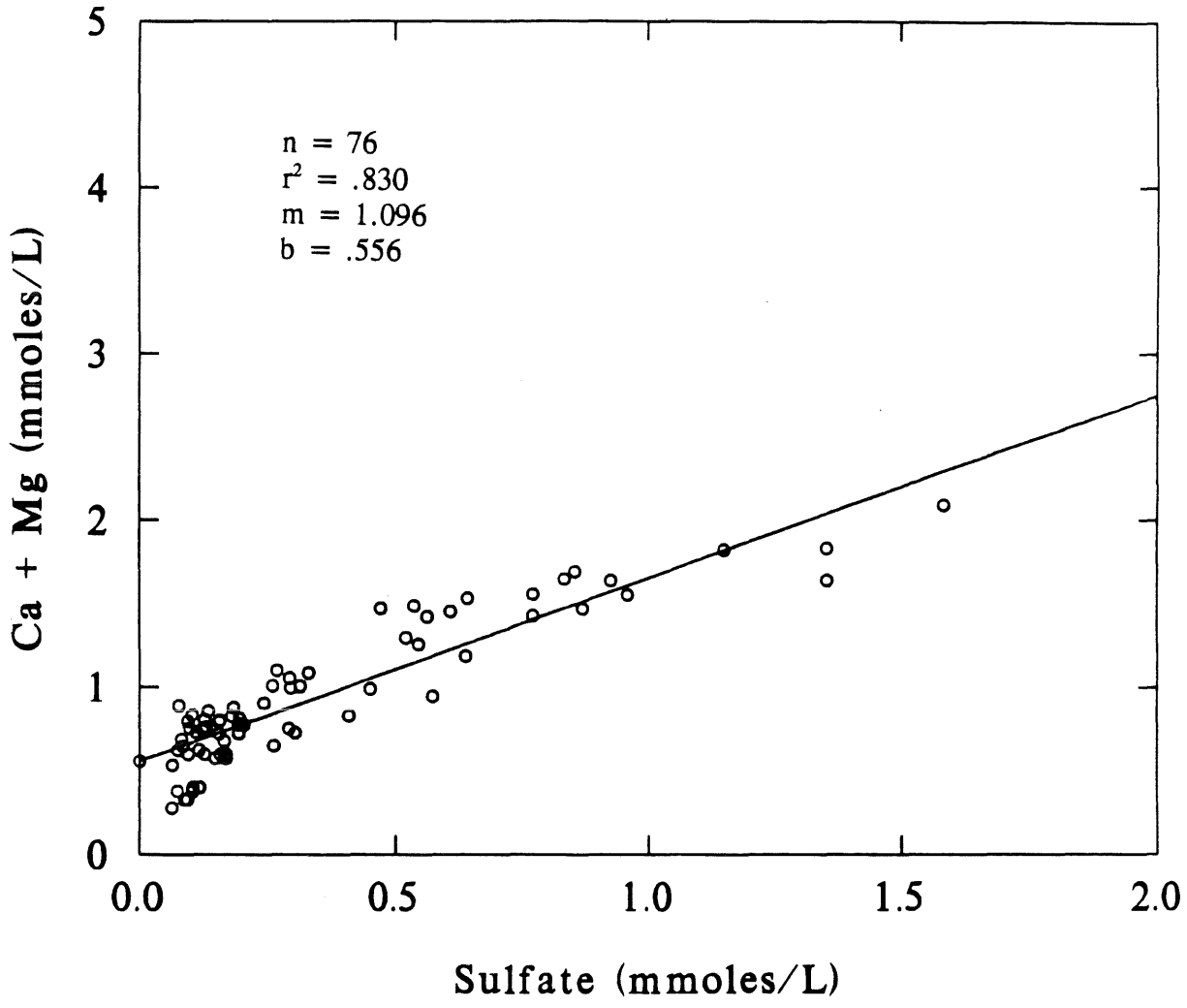


Figure 11. Sum of calcium and magnesium concentrations vs. sulfate in drainage from T10: weeks 0 - 12; 75 g sample weeks 0 - 106 (Variable Mass Experiment).

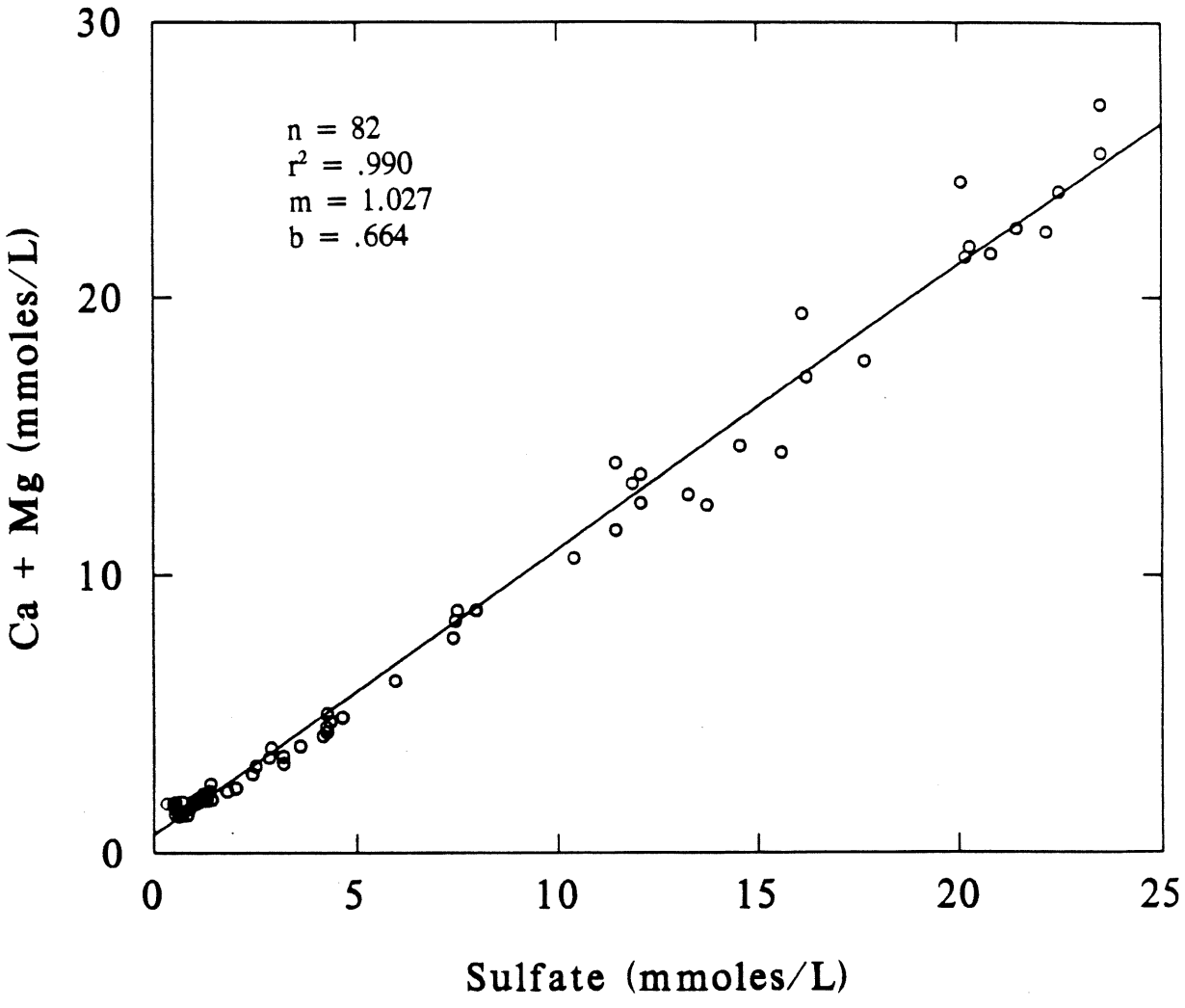


Figure 12. Sum of calcium and magnesium concentrations vs. sulfate in drainage from all three solids: weeks 0 - 12; 75 g sample weeks 0 - 106 (Variable Mass Experiment); three outlier values removed from data set.

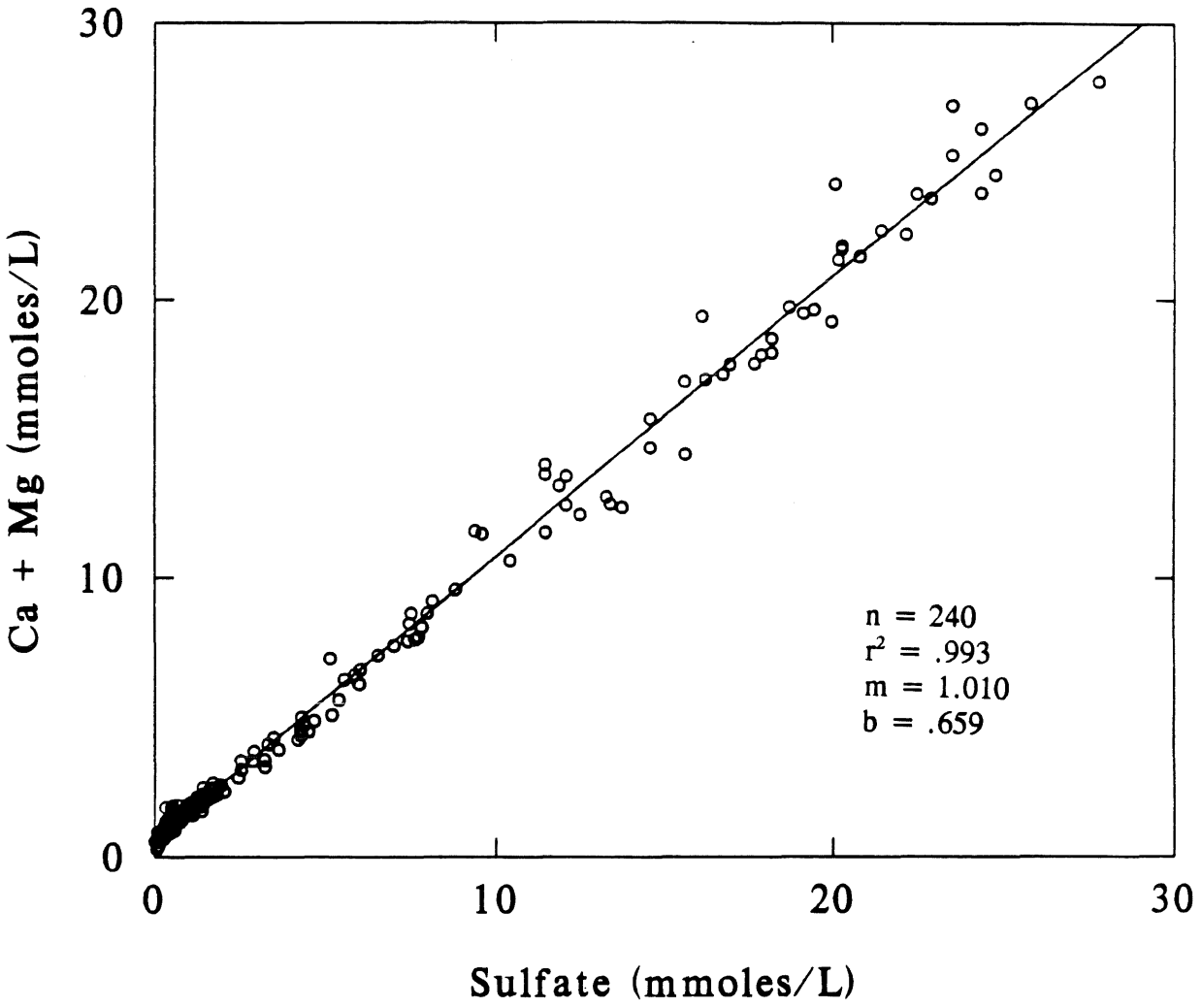


Figure 13. Sum of calcium and magnesium concentrations vs. sulfate in drainage from all three solids: weeks 0 - 12; 75 g sample weeks 0 - 106 (Variable Mass Experiment); for sulfate < 1.0 mmoles/L.

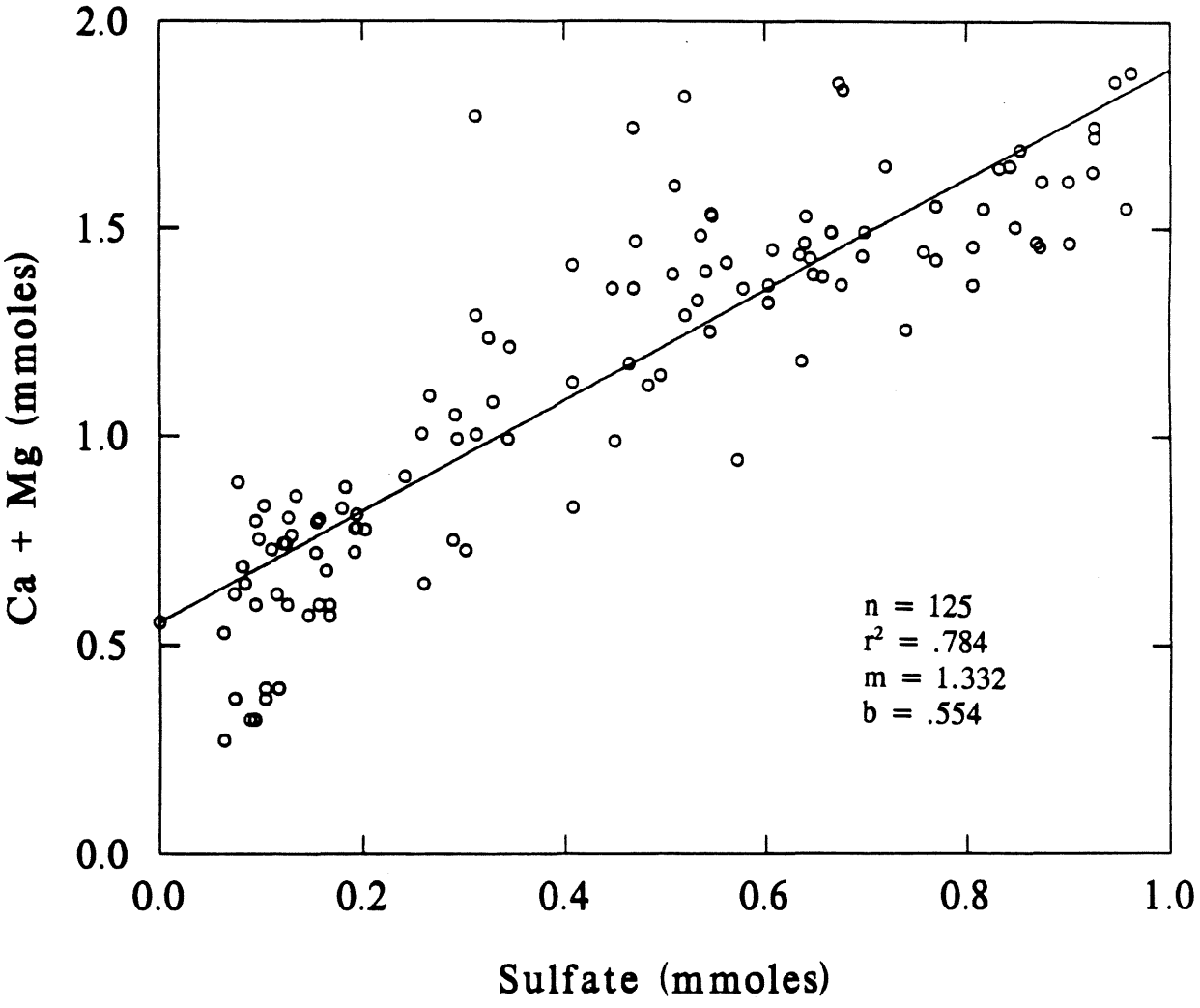


Figure 14. pH as a function of oxidation interval length for T1, T2, and T3: weeks 30 - 52 for T1 and T3, weeks 57 - 106 for T2 (Extended Oxidation Experiment).

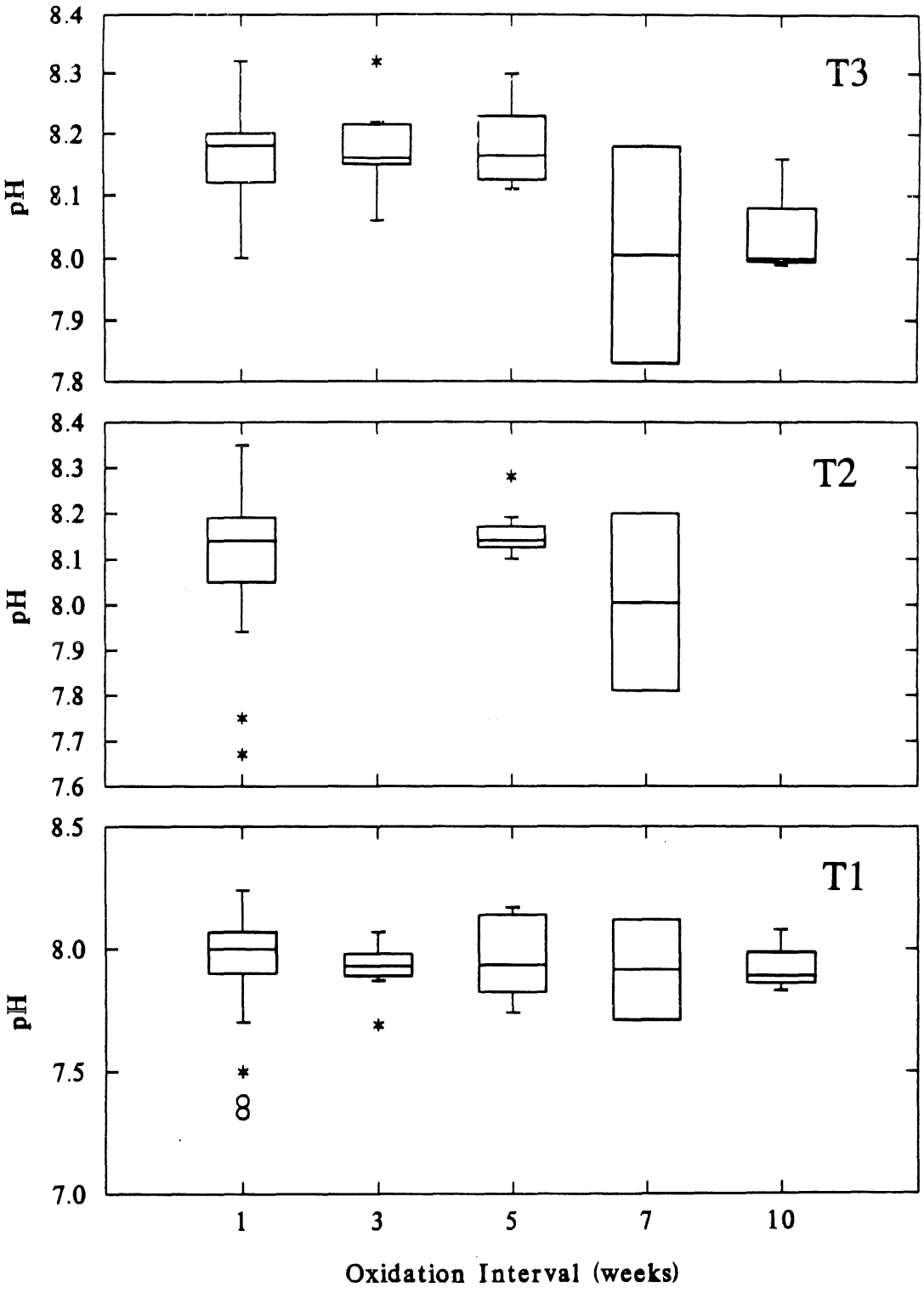


Figure 14 (continued). pH as a function of oxidation interval length for T4, T5, and T6: weeks 30 - 52 for T4 and T5, weeks 57 - 106 for T6 (Extended Oxidation Experiment).

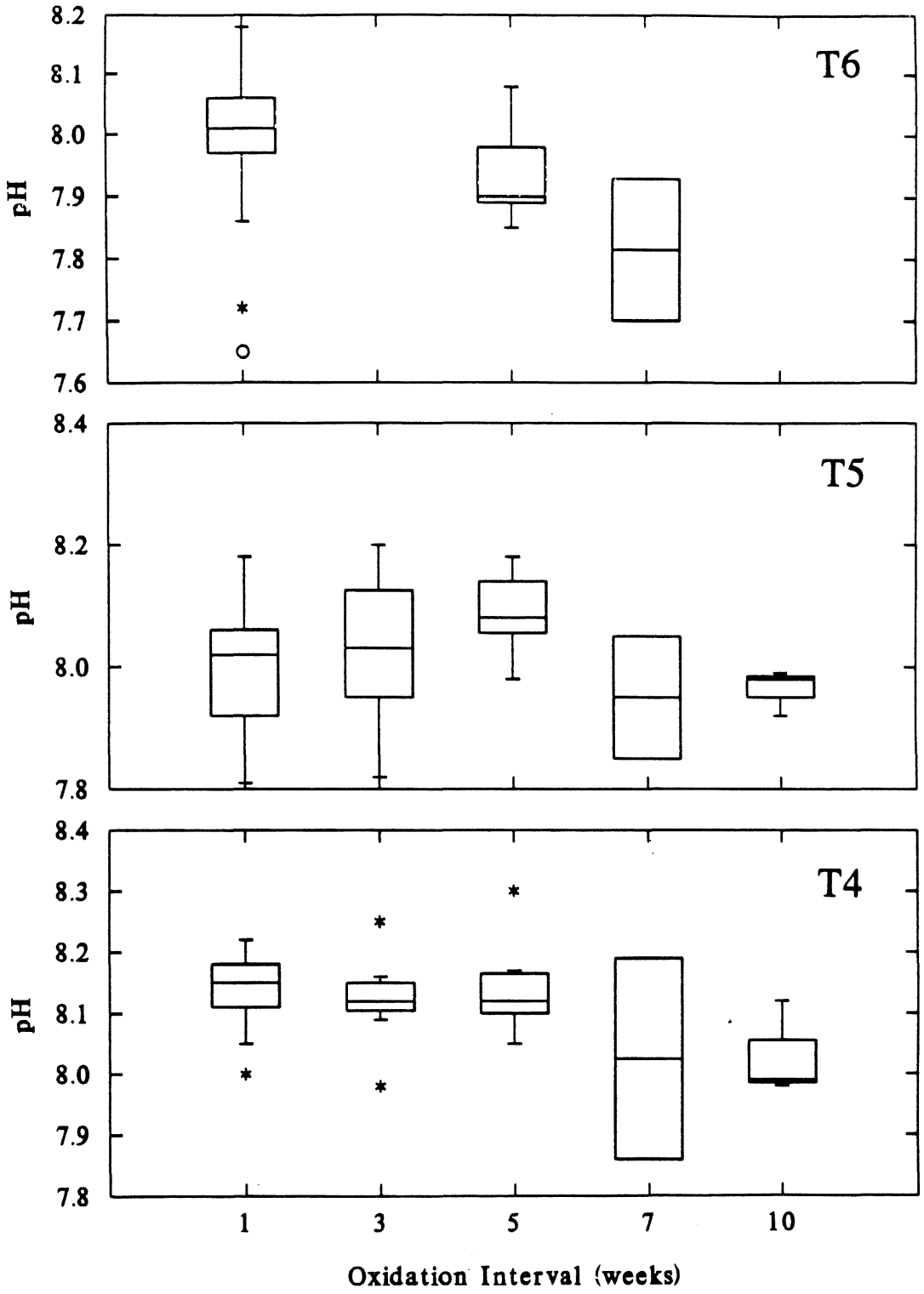


Figure 14 (continued). pH as a function of oxidation interval length for T7, T8, and T9: weeks 30 - 52 for T7 and T8, weeks 57 - 106 for T9 (Extended Oxidation Experiment).

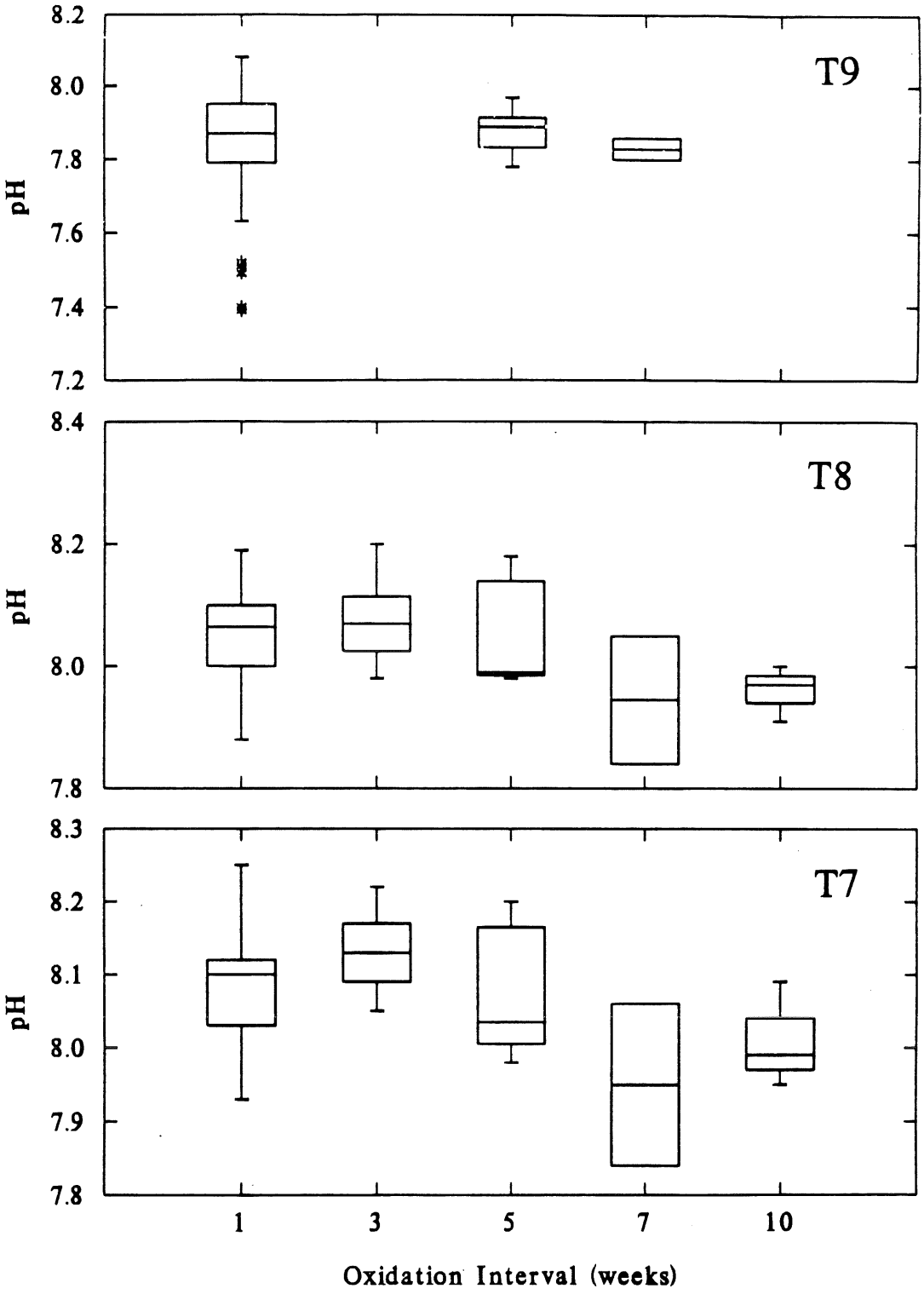


Figure 14 (continued). pH as a function of oxidation interval length for T10, T11, and T12: weeks 30 - 52 for T11 and T12, weeks 57 - 106 for T10 (Extended Oxidation Experiment).

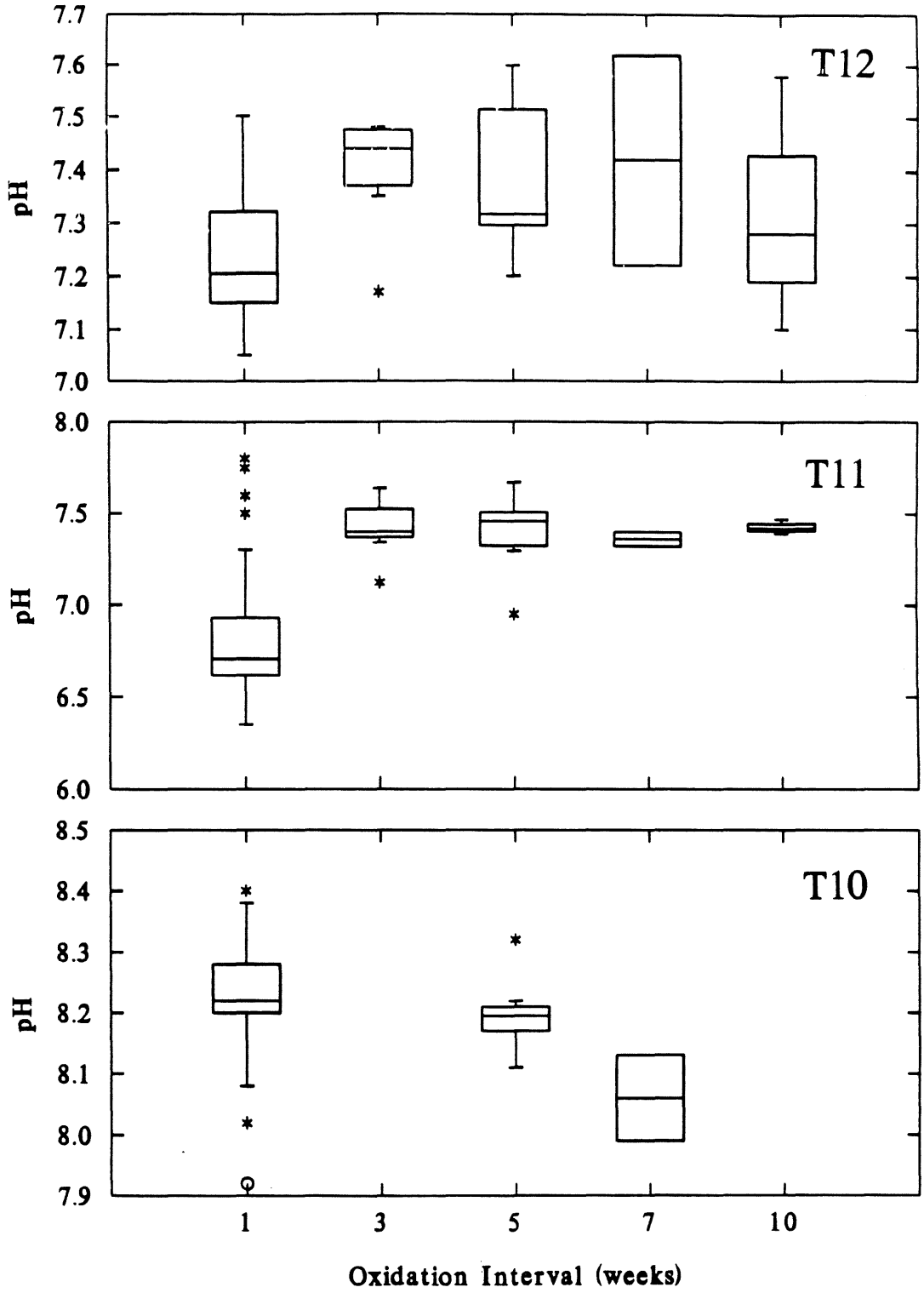


Figure 15. Sulfate concentration as a function of oxidation interval length for T1, T2, and T3: weeks 30 - 52 for T1 and T3, weeks 57 - 106 for T2 (Extended Oxidation Experiment).

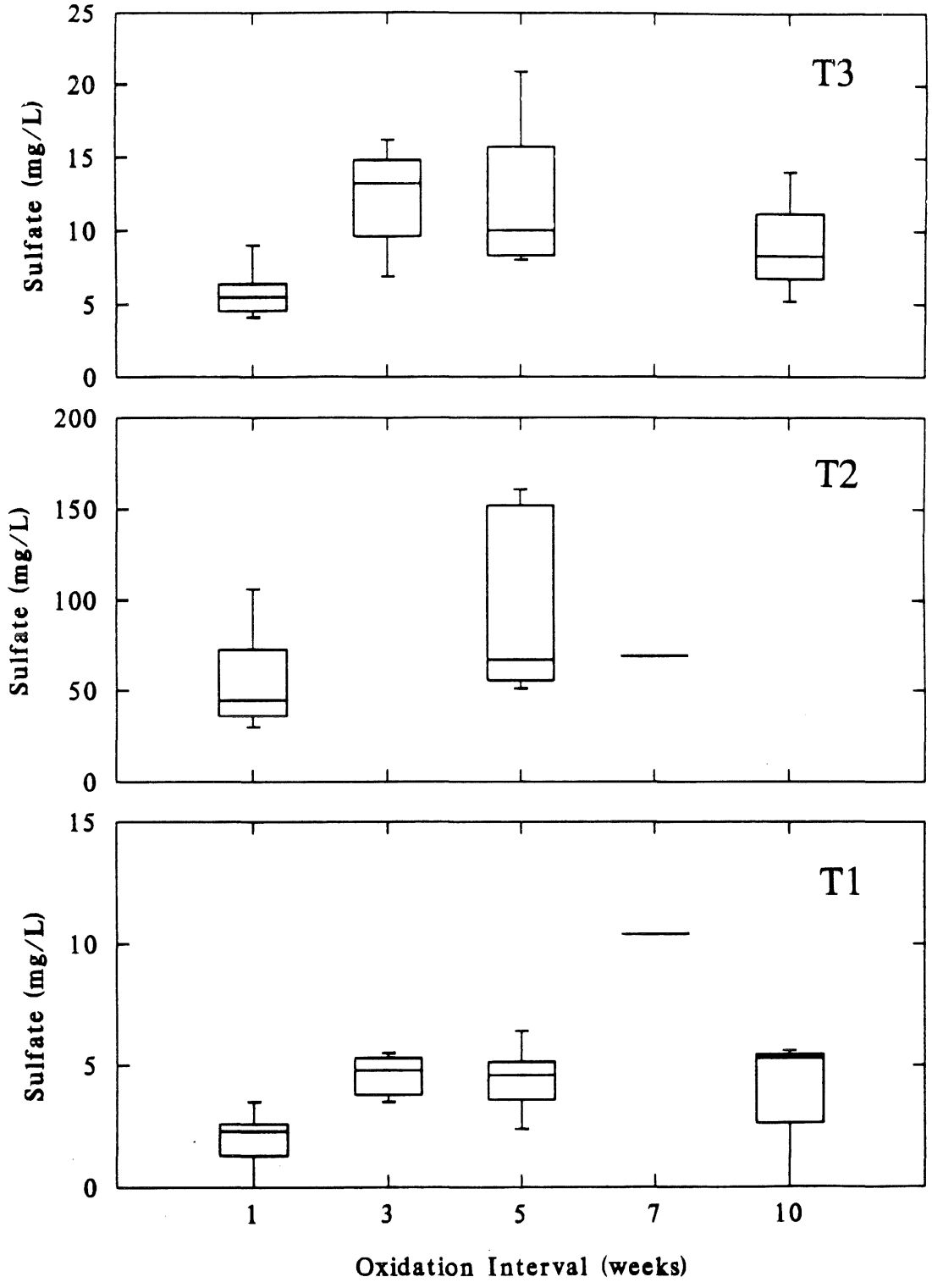


Figure 15 (continued). Sulfate concentration as a function of oxidation interval length for T4, T5, and T6: weeks 30 - 52 for T4 and T5, weeks 57 - 106 for T6 (Extended Oxidation Experiment).

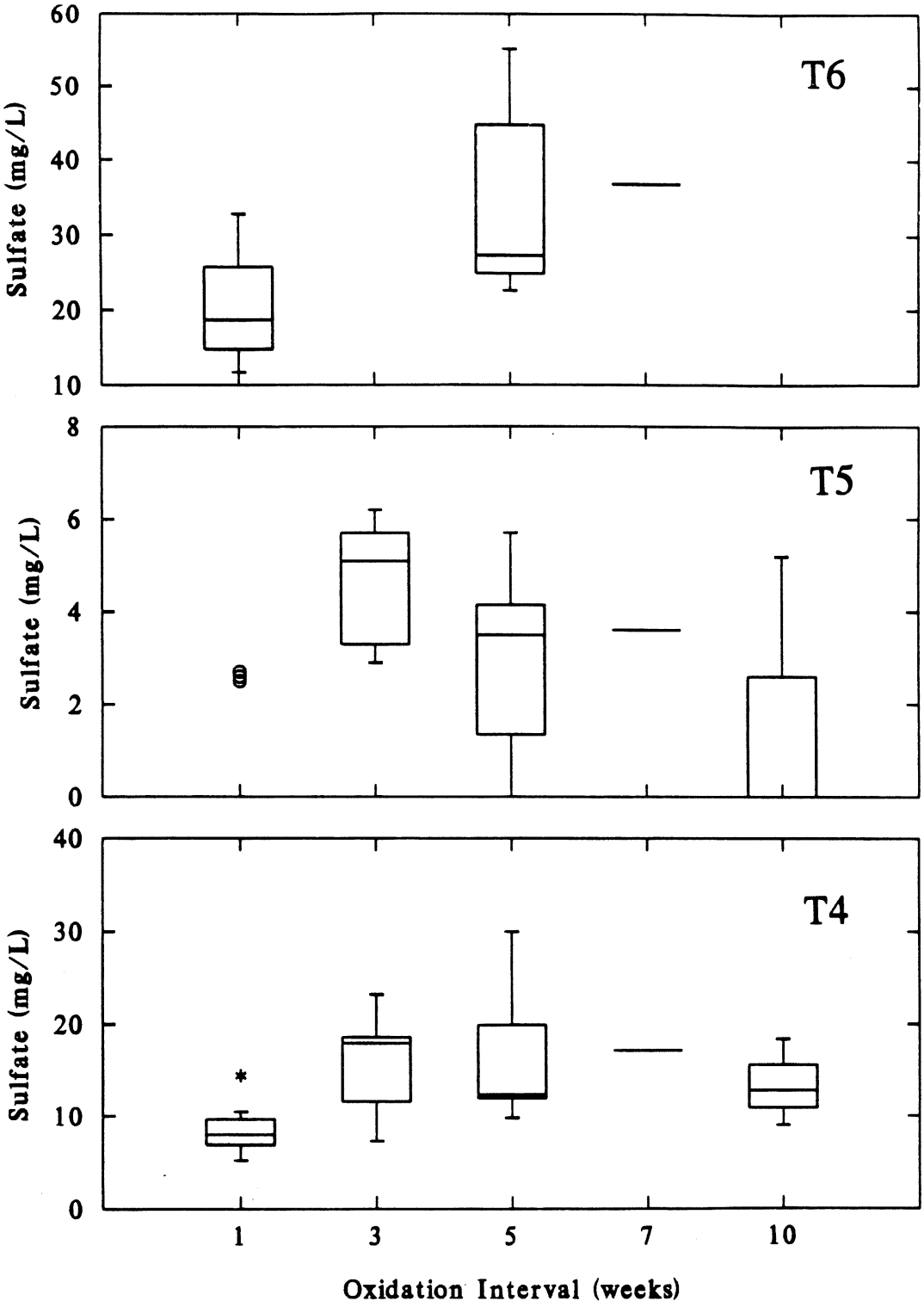


Figure 15 (continued). Sulfate concentration as a function of oxidation interval length for T7, T8, and T9: weeks 30 - 52 for T7 and T8, weeks 57 - 106 for T9 (Extended Oxidation Experiment).

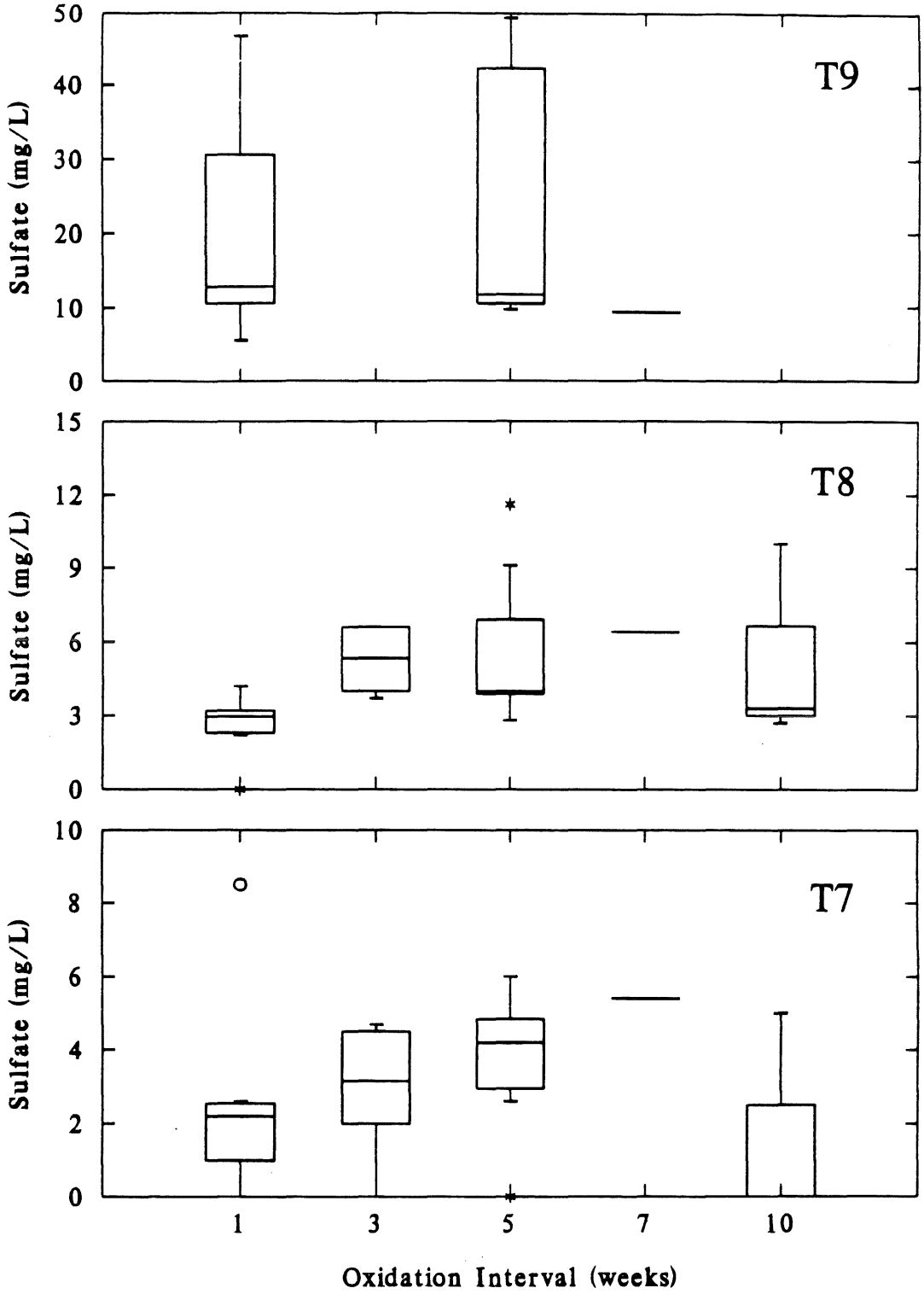


Figure 15 (continued). Sulfate concentration as a function of oxidation interval length for T10, T11, and T12: weeks 30 - 52 for T11 and T12, weeks 57 - 106 for T10 (Extended Oxidation Experiment).

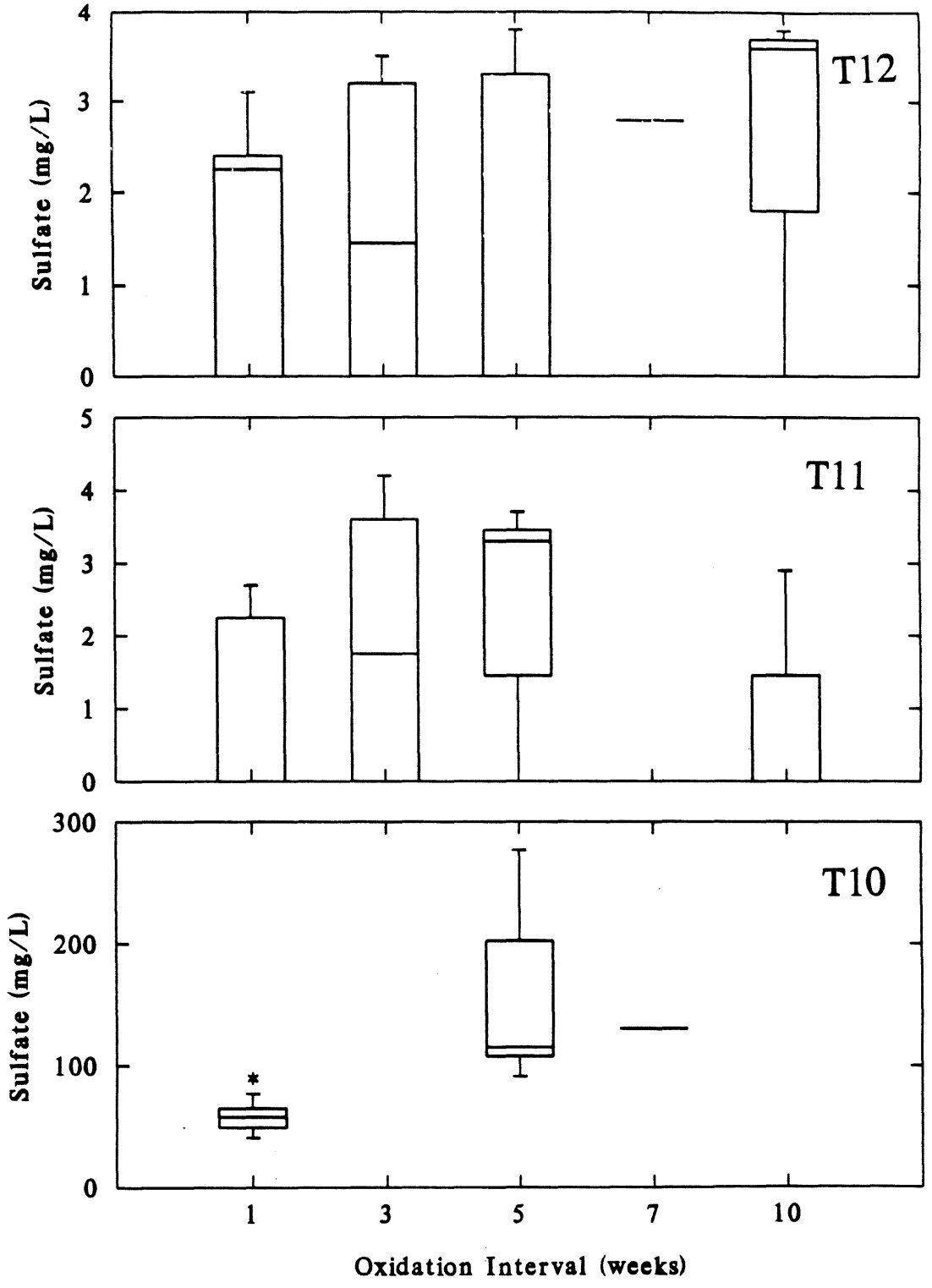
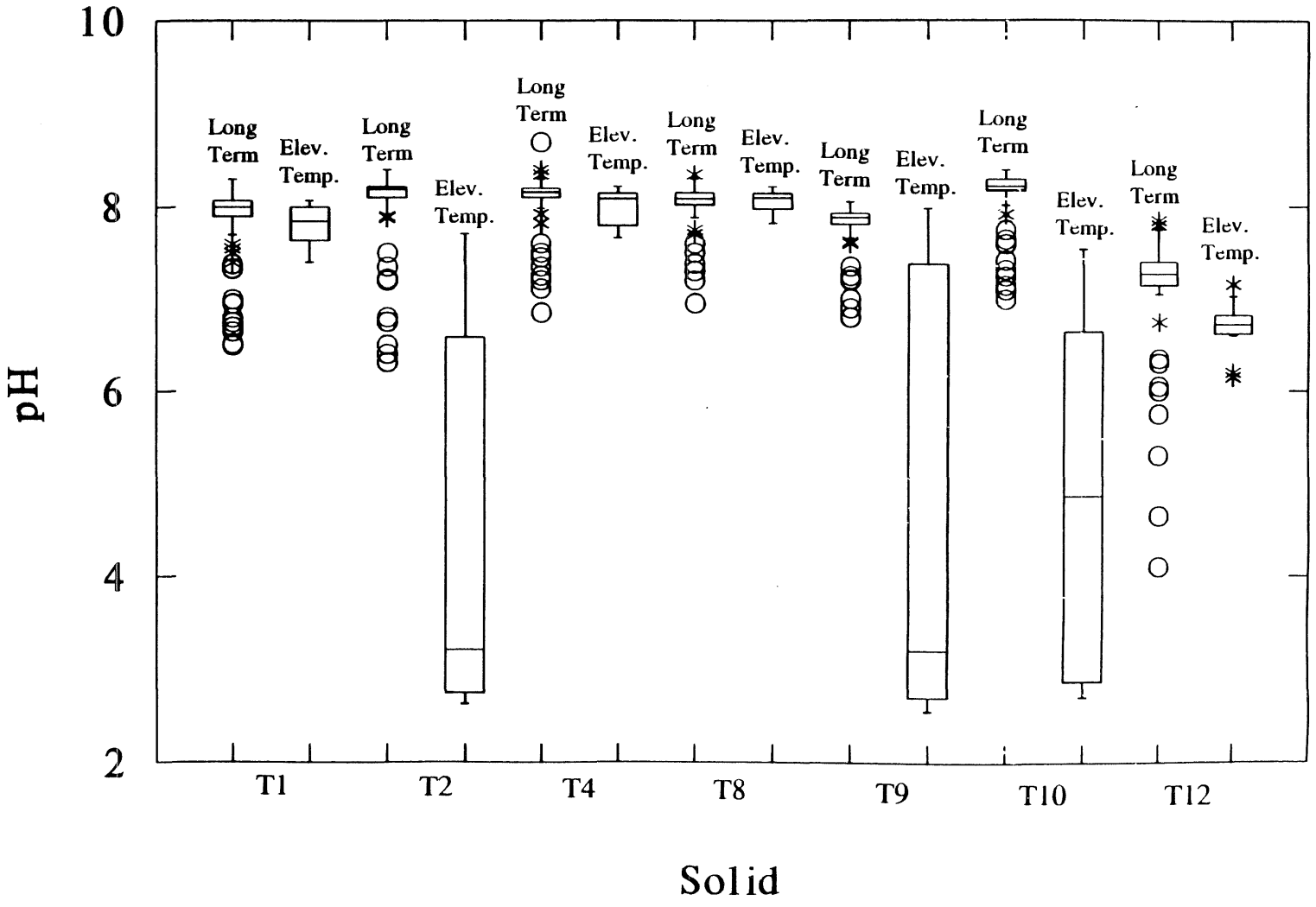


Figure 16. Comparison between pH values from the Long-Term Oxidation at One Week Interval Experiment (weeks 0 - 52) and the Elevated Temperature Experiment (weeks 2 - 16).



APPENDIX 1

LONG TERM DISSOLUTION AT ONE WEEK INTERVAL

A1.1 - A1.12. Drainage quality data.
A1.13. - A1.24. Cumulative mass release data.

Table A1.1. Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T2 (Reactor 3, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	143.6	1900.	6.80	19.	.	1200.0	306.0	112.0	9003.	6	6	90
1	.	.	3050.	6.75	28.	.	2200.0	591.0	218.0	9027.	6	13	90
2	.	155.0	3000.	7.22	31.	.	1920.0	560.0	128.0	9051.	6	20	90
3	.	151.3	2300.	6.31	38.	.	1500.0	534.0	91.0	9075.	6	27	90
4	.	167.9	1280.	8.00	70.	.	.	.	.	.	7	4	90
5	.	171.0	650.	7.35	71.	.	240.0	75.0	38.0	9099.	7	11	90
6	.	152.0	575.	8.00	68.	.	.	.	.	.	7	18	90
7	.	155.0	550.	8.30	61.	.	165.0	48.0	31.0	9123.	7	25	90
8	.	156.6	500.	8.05	68.	.	.	.	.	.	8	1	90
9	.	153.8	500.	8.00	66.	.	152.0	43.0	29.0	9147.	8	8	90
10	.	154.2	475.	7.90	59.	.	.	.	.	.	8	15	90
11	.	151.2	460.	8.35	.	.	146.0	41.0	28.0	9171.	8	22	90
12	.	153.0	430.	8.30	78.	.	.	.	.	.	8	29	90
13	.	152.6	405.	8.10	.	.	140.0	42.0	26.0	9195.	9	5	90
14	.	153.7	410.	8.15	86.	.	.	.	.	.	9	12	90
15	.	.	388.	8.20	.	.	112.0	.	.	9219.	9	19	90
16	.	.	358.	8.20	84.	.	.	.	.	.	9	26	90
17	.	.	370.	8.20	.	.	99.0	36.0	18.0	9243.	10	3	90
18	.	.	365.	8.20	74.	.	.	.	.	.	10	10	90
19	.	152.4	335.	8.27	.	.	88.5	.	.	9267.	10	17	90
20	.	.	330.	8.18	84.	.	.	.	.	.	10	24	90
21	.	.	295.	8.19	.	.	86.6	34.0	15.0	9291.	10	31	90
22	.	.	345.	8.15	80.	.	.	.	.	.	11	7	90
23	.	153.7	302.	8.15	.	.	66.0	.	.	9315.	11	14	90
24	.	.	350.	8.30	88.	.	.	.	.	.	11	21	90
25	.	.	335.	8.20	.	.	83.8	32.0	16.0	9339.	11	28	90
26	.	.	340.	8.10	81.	.	.	.	.	.	12	5	90
27	.	152.1	303.	8.05	.	.	65.0	.	.	9363.	12	12	90
28	.	.	320.	8.28	78.	.	.	.	.	.	12	19	90
29	.	.	240.	8.12	.	.	.	29.0	18.0	9387.	12	26	90
30	.	.	255.	8.10	73.	.	.	.	.	.	1	2	91
31	.	154.3	275.	8.12	.	.	49.6	.	.	9411.	1	9	91
32	.	.	242.	7.88	73.	.	.	.	.	.	1	16	91
33	.	.	252.	8.10	.	.	.	30.0	18.0	9435.	1	24	91
34	.	.	242.	8.11	76.	.	.	.	.	.	1	30	91
35	.	.	240.	8.11	.	.	45.5	.	.	9459.	2	6	91
36	.	.	240.	8.13	78.	.	.	.	.	.	2	13	91
37	.	.	220.	8.10	.	.	.	5.0	<2.0	9483.	2	20	91
38	.	152.0	238.	8.12	80.	.	.	.	.	.	2	27	91
39	.	.	218.	8.22	.	.	.	.	.	9504.	3	6	91
40	.	.	227.	8.24	88.	.	.	.	.	.	3	13	91
41	.	.	217.	8.22	.	.	45.0	28.0	16.0	9525.	3	20	91
42	.	.	230.	8.12	86.	.	.	.	.	.	3	27	91
43	.	153.2	226.	8.21	.	.	48.0	.	.	9549.	4	3	91

Table A1.2. (Continued) Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T2 (Reactor 3, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
44	.	.	240.	8.10	86.	.	.	.	.	.	4	10	91
45	.	.	260.	8.15	.	.	52.6	30.0	19.0	9572.	4	17	91
46	.	.	270.	8.21	91.	.	.	.	.	.	4	24	91
47	.	.	245.	8.27	.	.	52.0	28.0	17.0	9585.	5	1	91
48	.	152.8	270.	8.20	88.	.	.	.	.	.	5	8	91
49	.	.	220.	8.20	.	.	55.6	.	.	9613.	5	15	91
50	.	.	290.	8.25	74.	.	.	.	.	.	5	22	91
51	.	.	292.	8.22	.	.	.	.	.	.	5	29	91
52	.	156.5	.	8.34	.	.	.	.	.	.	6	5	91
53	.	.	319.	8.28	.	.	64.0	28.8	18.8	9648.	6	12	91
54	.	.	294.	8.19	68.	.	.	.	.	.	6	19	91
55	.	157.9	301.	8.12	.	.	.	.	.	.	6	26	91
56	.	.	330.	8.23	.	.	.	.	.	.	7	3	91
57	.	.	335.	8.23	.	.	81.5	28.6	19.2	9672.	7	10	91
58	1.	.	318.	8.08	66.	.	.	.	.	.	7	17	91
59	2.	.	387.	8.03	.	.	106.0	29.4	19.8	9683.	7	24	91
60	3.	.	330.	8.16	60.	.	.	.	.	.	7	31	91
61	4.	.	320.	8.13	.	.	.	.	.	9695.	8	7	91
62	5.	155.1	315.	8.22	60.	.	.	.	.	.	8	14	91
63	6.	157.2	355.	8.14	63.	.	86.5	30.4	20.8	9713.	8	21	91
64	7.	.	285.	8.03	.	.	.	.	.	.	8	28	91
65	8.	.	375.	8.01	63.	.	.	.	.	9724.	9	4	91
66	9.	158.9	350.	8.16	68.	.	.	.	.	.	9	11	91
67	10.	.	338.	8.22	.	.	78.5	28.4	20.4	9737.	9	19	91
68	11.	.	332.	8.17	.	.	.	.	.	.	9	24	91
69	12.	.	265.	8.11	74.	.	30.0	26.4	15.4	9753.	10	2	91
70	13.	.	240.	8.15	.	.	.	.	.	.	10	9	91
71	14.	.	290.	8.13	76.	.	.	.	.	9764.	10	16	91
72	15.	154.7	270.	8.08	74.	.	.	.	.	.	10	23	91
73	16.	.	240.	8.04	.	.	.	.	.	9788.	10	30	91
74	17.	.	280.	8.04	81.	.	.	.	.	.	11	6	91
75	18.	.	258.	8.24	88.	.	39.2	26.6	18.2	9793.	11	13	91
76	19.	155.6	283.	8.12	.	.	.	.	.	.	11	20	91
77	20.	156.2	238.	8.13	82.	.	33.2	26.0	13.8	9805.	11	27	91
78	21.	154.4	260.	8.05	77.	.	31.2	26.2	14.2	9821.	12	4	91
79	22.	155.4	233.	8.13	97.	.	44.6	.	.	9832.	12	11	91
80	23.	.	250.	8.19	.	.	.	.	.	.	12	18	91
81	24.	.	205.	8.14	.	.	33.0	22.0	10.8	9836.	12	26	91
82	25.	154.9	240.	8.10	.	.	.	.	.	.	1	2	92
83	26.	155.1	240.	8.01	88.	.	42.6	.	.	9852.	1	8	92
84	27.	153.5	274.	8.17	.	.	.	.	.	.	1	15	92
85	28.	153.4	224.	8.15	91.	.	36.2	.	.	9856.	1	22	92
86	29.	.	260.	8.20	.	.	.	.	.	.	1	29	92
87	30.	155.8	230.	8.13	82.	.	39.2	24.2	12.8	9861.	2	5	92

Table A1.3. (Continued) Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T2 (Reactor 3, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
88	31.	156.5	232.	8.19	.	.	.	.	.	.	2	12	92
89	32.	157.0	245.	8.08	.	.	47.6	24.6	13.0	9884.	2	19	92
90	33.	152.9	253.	8.12	82.	.	.	.	.	.	2	26	92
91	34.	153.8	280.	8.17	.	.	.	.	.	.	3	4	92
92	35.	157.7	223.	8.07	91.	.	.	.	.	.	3	11	92
93	36.	153.8	225.	8.02	.	.	44.6	24.4	13.8	9900.	3	18	92
94	37.	154.2	250.	8.16	.	.	.	.	.	.	3	25	92
95	38.	153.3	260.	7.99	82.	.	.	.	.	.	4	1	92
96	39.	149.9	475.	8.22	.	.	.	.	.	.	4	8	92
97	40.	156.8	280.	8.14	88.	.	46.4	23.6	13.0	9904.	4	15	92
98	41.	156.8	260.	7.96	63.	.	.	.	.	.	4	22	92
99	42.	149.8	300.	7.67	80.	.	.	.	.	.	4	29	92
100	43.	.	245.	7.67	.	.	.	.	.	.	5	6	92
101	44.	152.0	245.	7.97	66.	.	.	.	.	40020.	5	13	92
102	45.	147.9	281.	7.94	.	.	.	.	.	.	5	20	92
103	46.	156.5	310.	7.75	104.	.	.	.	.	.	5	27	92
104	47.	149.3	275.	8.05	.	.	.	.	.	.	6	3	92
105	48.	153.4	305.	8.20	94.	.	.	.	.	.	6	10	92
106	49.	158.1	270.	8.20	.	.	.	.	.	40025.	6	17	92

Table A1.4. Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T6 (Reactor 11, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	169.7	1200.	7.00	18.	.	740.0	159.0	53.0	9011.	6	6	90
1	.	.	230.	7.35	33.	.	94.0	23.0	9.0	9035.	6	13	90
2	.	167.6	227.	7.30	31.	.	65.0	20.0	7.0	9059.	6	20	90
3	.	168.1	252.	6.99	33.	.	77.0	23.0	9.0	9083.	6	27	90
4	.	166.9	300.	8.00	36.	.	.	.	.	.	7	4	90
5	.	169.0	350.	7.40	28.	.	111.0	32.0	12.0	9107.	7	11	90
6	.	168.9	290.	7.95	36.	.	.	.	.	.	7	18	90
7	.	168.5	285.	8.10	19.	.	68.0	24.0	7.0	9131.	7	25	90
8	.	169.6	292.	7.90	34.	.	.	.	.	.	8	1	90
9	.	169.4	268.	8.00	35.	.	72.0	25.0	9.0	9155.	8	8	90
10	.	170.6	272.	7.90	33.	.	.	.	.	.	8	15	90
11	.	169.8	215.	8.15	.	.	63.0	22.0	7.0	9179.	8	22	90
12	.	169.1	205.	8.05	46.	.	.	.	.	.	8	29	90
13	.	169.3	205.	8.00	.	.	60.0	22.0	7.0	9203.	9	5	90
14	.	170.1	205.	8.00	40.	.	.	.	.	.	9	12	90
15	.	.	190.	8.00	.	.	51.5	.	.	9227.	9	19	90
16	.	.	182.	8.00	48.	.	.	.	.	.	9	26	90
17	.	.	195.	8.07	.	.	55.0	19.0	5.0	9251.	10	3	90
18	.	.	190.	8.00	43.	.	.	.	.	.	10	10	90
19	.	169.1	152.	8.05	.	.	36.2	.	.	9275.	10	17	90
20	.	.	155.	7.92	42.	.	.	.	.	.	10	24	90
21	.	.	143.	7.90	.	.	29.6	14.0	<5.0	9299.	10	31	90
22	.	.	173.	7.75	43.	.	.	.	.	.	11	7	90
23	.	169.9	150.	7.85	.	.	.	.	.	9323.	11	14	90
24	.	.	162.	8.00	47.	.	.	.	.	.	11	21	90
25	.	.	157.	7.85	.	.	24.6	15.0	<5.0	9347.	11	28	90
26	.	.	172.	7.88	41.	.	.	.	.	.	12	5	90
27	.	.	170.	7.92	.	.	17.4	.	.	9371.	12	12	90
28	.	.	162.	7.99	46.	.	.	.	.	.	12	19	90
29	.	.	123.	7.82	.	.	.	14.0	6.0	9395.	12	26	90
30	.	.	132.	7.85	49.	.	.	.	.	.	1	2	91
31	.	172.4	128.	7.99	.	.	17.8	.	.	9419.	1	9	91
32	.	.	138.	7.88	49.	.	.	.	.	.	1	16	91
33	.	.	122.	7.90	.	.	.	15.0	6.0	9443.	1	24	91
34	.	.	128.	7.89	51.	.	.	.	.	.	1	30	91
35	.	.	119.	7.91	.	.	12.6	.	.	9467.	2	6	91
36	.	.	122.	7.95	51.	.	.	.	.	.	2	13	91
37	.	.	117.	7.96	.	.	.	14.0	6.0	9490.	2	20	91
38	.	167.9	112.	7.95	47.	.	.	.	.	.	2	27	91
39	.	.	121.	7.98	47.	.	18.3	.	.	9511.	3	6	91
40	.	.	123.	8.01	53.	.	.	.	.	.	3	13	91
41	.	.	116.	8.00	.	.	18.2	15.0	7.0	9533.	3	20	91
42	.	.	120.	7.97	47.	.	.	.	.	.	3	27	91
43	.	167.2	121.	7.97	.	.	20.0	.	.	9557.	4	3	91

Table A1.5. (Continued) Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T6 (Reactor 11, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
44	.	.	135.	7.94	54.	.	.	.	.	.	4	10	91
45	.	.	135.	7.85	.	.	21.3	15.0	7.0	9576.	4	17	91
46	.	.	138.	8.00	54.	.	.	.	.	.	4	24	91
47	.	.	130.	8.03	.	.	22.2	14.0	7.0	9593.	5	1	91
48	.	169.3	138.	7.92	46.	.	.	.	.	.	5	8	91
49	.	.	140.	8.02	.	.	22.5	.	.	9621.	5	15	91
50	.	.	165.	7.95	43.	.	.	.	.	.	5	22	91
51	.	.	164.	8.02	.	.	.	.	.	.	5	29	91
52	.	167.1	.	8.11	.	.	.	.	.	.	6	5	91
53	.	.	152.	8.04	.	.	.	.	.	.	6	12	91
54	.	.	162.	8.01	42.	.	31.2	15.2	8.4	9652.	6	19	91
55	.	165.4	144.	7.98	.	.	.	.	.	.	6	26	91
56	.	.	160.	8.06	.	.	.	.	.	.	7	3	91
57	.	.	170.	8.10	.	.	31.6	14.0	8.6	9676.	7	10	91
58	1.	.	158.	7.98	37.	.	.	.	.	.	7	17	91
59	2.	.	172.	7.92	.	.	32.8	13.8	9.0	9684.	7	24	91
60	3.	.	160.	8.10	47.	.	.	.	.	.	7	31	91
61	4.	.	170.	8.12	.	.	.	.	.	9696.	8	7	91
62	5.	.	170.	8.02	49.	.	.	.	.	.	8	14	91
63	6.	166.1	153.	8.00	37.	.	25.8	14.4	8.8	9717.	8	21	91
64	7.	.	152.	8.18	.	.	.	.	.	.	8	28	91
65	8.	.	155.	8.02	44.	.	.	.	.	9725.	9	4	91
66	9.	165.2	157.	8.09	47.	.	.	.	.	.	9	11	91
67	10.	.	150.	8.09	.	.	20.6	13.4	9.0	9742.	9	19	91
68	11.	.	160.	8.05	.	.	.	.	.	.	9	24	91
69	12.	.	140.	7.88	53.	.	16.0	14.4	8.2	9757.	10	2	91
70	13.	.	132.	8.08	.	.	.	.	.	.	10	9	91
71	14.	.	120.	8.02	42.	.	.	.	.	9765.	10	16	91
72	15.	169.4	150.	7.98	53.	.	.	.	.	.	10	23	91
73	16.	.	140.	7.92	.	.	.	.	.	9789.	10	30	91
74	17.	.	145.	7.91	52.	.	.	.	.	.	11	6	91
75	18.	.	130.	8.08	63.	.	11.7	16.4	8.4	9797.	11	13	91
76	19.	168.5	132.	8.11	.	.	.	.	.	.	11	20	91
77	20.	168.8	130.	7.99	44.	.	13.7	14.2	7.2	9810.	11	27	91
78	21.	167.7	135.	7.88	45.	.	12.2	14.6	7.4	9825.	12	4	91
79	22.	168.6	117.	7.92	47.	.	15.7	.	.	9833.	12	11	91
80	23.	.	136.	8.05	.	.	.	.	.	.	12	18	91
81	24.	.	123.	7.95	.	.	14.8	14.2	7.2	9837.	12	26	91
82	25.	168.7	137.	7.97	.	.	.	.	.	.	1	2	92
83	26.	168.8	140.	7.99	53.	.	17.4	.	.	9853.	1	8	92
84	27.	169.9	148.	7.97	.	.	.	.	.	.	1	15	92
85	28.	168.2	128.	7.97	57.	.	14.6	.	.	9857.	1	22	92
86	29.	.	158.	8.13	.	.	.	.	.	.	1	29	92
87	30.	167.5	135.	7.86	63.	.	19.6	13.6	7.0	9866.	2	5	92

Table A1.6. (Continued) Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T6 (Reactor 11, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
88	31.	166.7	132.	8.00	.	.	.	.	.	.	2	12	92
89	32.	167.7	138.	7.95	.	.	17.8	12.2	6.4	9885.	2	19	92
90	33.	169.6	142.	7.99	47.	.	.	.	.	.	2	26	92
91	34.	170.0	154.	8.02	.	.	.	.	.	.	3	4	92
92	35.	165.4	130.	7.92	57.	.	.	.	.	.	3	11	92
93	36.	169.3	125.	8.01	.	.	21.5	12.4	7.0	9901.	3	18	92
94	37.	165.6	148.	8.12	.	.	.	.	.	.	3	25	92
95	38.	167.0	135.	7.99	50.	.	.	.	.	.	4	1	92
96	39.	166.3	150.	8.04	.	.	.	.	.	.	4	8	92
97	40.	169.2	160.	8.02	54.	.	22.4	12.6	7.0	.	4	15	92
98	41.	167.4	168.	7.97	44.	.	.	.	.	.	4	22	92
99	42.	166.6	162.	7.93	54.	.	.	.	.	.	4	29	92
100	43.	.	161.	7.72	.	.	.	.	.	.	5	6	92
101	44.	156.5	125.	8.02	40.	.	.	.	.	.	5	13	92
102	45.	167.0	133.	7.90	.	.	.	.	.	.	5	20	92
103	46.	165.6	142.	7.65	57.	.	.	.	.	.	5	27	92
104	47.	165.3	135.	7.92	.	.	.	.	.	.	6	3	92
105	48.	165.7	149.	8.01	54.	.	.	.	.	.	6	10	92
106	49.	167.3	142.	8.06	.	.	.	.	.	.	6	17	92

Table A1.7. Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T9 (Reactor 17, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	166.4	1400.	6.80	14.	.	810.0	302.0	4.0	9017.	6	6	90
1	.	.	1150.	7.00	14.	.	570.0	265.0	<5.0	9041.	6	13	90
2	.	168.0	500.	7.20	23.	.	190.0	82.0	<5.0	9065.	6	20	90
3	.	165.2	400.	7.25	31.	.	130.0	71.0	<5.0	9089.	6	27	90
4	.	163.9	340.	7.96	32.	.	.	.	.	.	7	4	90
5	.	166.0	272.	7.60	19.	.	79.0	43.0	<5.0	9113.	7	11	90
6	.	164.1	212.	7.95	30.	.	.	.	.	.	7	18	90
7	.	162.4	195.	8.05	24.	.	43.0	29.0	<5.0	9137.	7	25	90
8	.	162.6	198.	7.90	30.	.	.	.	.	.	8	1	90
9	.	163.4	180.	8.05	31.	.	40.0	29.0	<5.0	9161.	8	8	90
10	.	165.2	175.	8.00	31.	.	.	.	.	.	8	15	90
11	.	164.5	145.	8.05	.	.	32.0	25.0	<5.0	9185.	8	22	90
12	.	161.9	132.	7.90	39.	.	.	.	.	.	8	29	90
13	.	160.9	130.	8.00	.	.	<7.0	26.0	<5.0	9209.	9	5	90
14	.	159.7	130.	8.02	34.	.	.	.	.	.	9	12	90
15	.	.	115.	7.93	.	.	19.6	.	.	9233.	9	19	90
16	.	.	110.	7.96	34.	.	.	.	.	.	9	26	90
17	.	.	105.	7.98	.	.	14.3	18.0	<5.0	9257.	10	3	90
18	.	.	98.	7.85	27.	.	.	.	.	.	10	10	90
19	.	164.7	92.	7.92	.	.	13.0	.	.	9281.	10	17	90
20	.	.	92.	7.88	30.	.	.	.	.	.	10	24	90
21	.	.	86.	7.84	.	.	17.1	16.0	<5.0	9305.	10	31	90
22	.	.	95.	7.82	28.	.	.	.	.	.	11	7	90
23	.	164.5	73.	7.78	.	.	11.1	.	.	9329.	11	14	90
24	.	.	90.	7.82	30.	.	.	.	.	.	11	21	90
25	.	.	92.	7.85	.	.	13.3	14.0	<5.0	9353.	11	28	90
26	.	.	95.	7.90	30.	.	.	.	.	.	12	5	90
27	.	167.5	90.	7.93	.	.	8.1	.	.	9377.	12	12	90
28	.	.	90.	7.91	27.	.	.	.	.	.	12	19	90
29	.	.	73.	7.77	.	.	.	14.0	<2.0	9401.	12	26	90
30	.	.	78.	7.90	27.	.	.	.	.	.	1	2	91
31	.	162.4	68.	7.91	.	.	7.3	.	.	9425.	1	9	91
32	.	.	80.	7.97	29.	.	.	.	.	.	1	16	91
33	.	.	66.	7.71	.	.	.	12.0	<2.0	9449.	1	24	91
34	.	.	74.	7.82	32.	.	.	.	.	.	1	30	91
35	.	.	71.	7.88	.	.	9.0	.	.	9473.	2	6	91
36	.	.	70.	7.93	31.	.	.	.	.	.	2	13	91
37	.	.	69.	7.98	.	.	.	13.0	<2.0	9495.	2	20	91
38	.	163.9	63.	7.98	30.	.	.	.	.	.	2	27	91
39	.	.	67.	8.00	.	.	.	14.0	<2.0	9516.	3	6	91
40	.	.	65.	7.92	28.	.	.	.	.	.	3	13	91
41	.	.	62.	7.85	.	.	7.6	.	.	9539.	3	20	91
42	.	.	71.	7.97	29.	.	.	.	.	.	3	27	91
43	.	164.4	62.	7.84	.	.	6.1	.	.	9563.	4	3	91

Table A1.8. (Continued) Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T9 (Reactor 17, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
44	.	.	70.	8.02	37.	.	.	.	.	.	4	10	91
45	.	.	71.	7.68	.	.	10.8	14.0	<2.0	9579.	4	17	91
46	.	.	75.	7.84	34.	.	.	.	.	.	4	24	91
47	.	.	70.	7.96	.	.	9.5	15.0	<2.0	9599.	5	1	91
48	.	165.5	75.	7.78	31.	.	.	.	.	.	5	8	91
49	.	.	80.	7.82	.	.	9.9	.	.	9627.	5	15	91
50	.	.	98.	7.80	26.	.	.	.	.	.	5	22	91
51	.	.	120.	7.86	.	.	.	.	.	.	5	29	91
52	.	159.6	.	7.87	.	.	.	.	.	.	6	5	91
53	.	.	148.	7.96	.	.	5.6	.	.	9655.	6	12	91
54	.	.	148.	7.90	26.	.	.	.	.	.	6	19	91
55	.	162.3	132.	7.91	.	.	.	.	.	.	6	26	91
56	.	.	152.	7.91	.	.	.	.	.	.	7	3	91
57	.	.	160.	7.98	.	.	43.4	23.8	2.4	9679.	7	10	91
58	1.	.	157.	7.85	21.	.	.	.	.	.	7	17	91
59	2.	.	190.	7.78	.	.	46.6	26.2	2.2	9685.	7	24	91
60	3.	.	172.	7.92	24.	.	.	.	.	.	7	31	91
61	4.	.	170.	8.00	.	.	.	.	.	9697.	8	7	91
62	5.	.	150.	7.82	21.	.	.	.	.	.	8	14	91
63	6.	.	157.	7.87	24.	.	46.8	24.8	2.0	9720.	8	21	91
64	7.	.	178.	7.92	.	.	.	.	.	.	8	28	91
65	8.	.	165.	7.88	21.	.	.	.	.	9726.	9	4	91
66	9.	.	160.	7.88	24.	.	.	.	.	.	9	11	91
67	10.	.	132.	7.99	.	.	33.3	20.6	2.0	9746.	9	19	91
68	11.	.	135.	7.86	.	.	.	.	.	.	9	24	91
69	12.	.	118.	7.67	16.	.	26.2	18.8	2.0	9760.	10	2	91
70	13.	.	100.	7.99	.	.	.	.	.	.	10	9	91
71	14.	.	100.	7.79	21.	.	.	.	.	9766.	10	16	91
72	15.	.	100.	7.94	26.	.	.	.	.	.	10	23	91
73	16.	.	95.	7.84	.	.	.	.	.	9790.	10	30	91
74	17.	.	80.	7.73	21.	.	.	.	.	.	11	6	91
75	18.	.	80.	8.05	25.	.	12.8	16.4	1.6	9800.	11	13	91
76	19.	.	80.	8.05	.	.	.	.	.	.	11	20	91
77	20.	.	70.	8.05	19.	.	11.7	13.0	1.6	9814.	11	27	91
78	21.	.	69.	7.88	24.	.	8.9	.	.	9828.	12	4	91
79	22.	.	70.	7.79	26.	.	11.4	12.0	1.6	9834.	12	11	91
80	23.	.	78.	7.98	.	.	.	.	.	.	12	18	91
81	24.	.	64.	7.91	.	.	10.6	12.4	1.6	9838.	12	26	91
82	25.	165.3	62.	7.96	.	.	.	.	.	.	1	2	92
83	26.	165.9	69.	7.95	25.	.	13.0	.	.	9854.	1	8	92
84	27.	165.4	70.	7.82	.	.	.	.	.	.	1	15	92
85	28.	164.1	60.	7.85	19.	.	9.7	.	.	9858.	1	22	92
86	29.	.	75.	8.05	.	.	.	.	.	.	1	29	92
87	30.	165.2	50.	7.79	13.	.	9.6	9.6	0.8	9870.	2	5	92

Table A1.9. (Continued) Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T9 (Reactor 17, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
88	31.	164.7	55.	7.79	.	.	.	.	.	.	2	12	92
89	32.	166.6	65.	7.82	.	.	11.8	8.8	0.8	9886.	2	19	92
90	33.	166.6	68.	7.84	19.	.	.	.	.	.	2	26	92
91	34.	166.2	69.	7.90	.	.	.	.	.	.	3	4	92
92	35.	163.3	55.	7.98	19.	.	.	.	.	.	3	11	92
93	36.	165.7	50.	8.00	.	.	12.9	7.8	1.0	9902.	3	18	92
94	37.	165.0	68.	8.08	.	.	.	.	.	.	3	25	92
95	38.	164.7	68.	7.95	18.	.	.	.	.	.	4	1	92
96	39.	165.0	75.	7.76	.	.	.	.	.	.	4	8	92
97	40.	166.5	89.	7.84	13.	.	18.5	8.8	1.4	9906.	4	15	92
98	41.	165.7	93.	7.79	12.	.	.	.	.	.	4	22	92
99	42.	159.5	100.	7.68	14.	.	.	.	.	.	4	29	92
100	43.	.	112.	7.63	.	.	.	.	.	.	5	6	92
101	44.	164.2	128.	7.76	14.	.	.	.	.	40022.	5	13	92
102	45.	164.5	145.	7.49	.	.	.	.	.	.	5	20	92
103	46.	162.3	163.	7.39	13.	.	.	.	.	.	5	27	92
104	47.	163.5	132.	7.52	.	.	.	.	.	.	6	3	92
105	48.	164.6	161.	7.40	10.	.	.	.	.	.	6	10	92
106	49.	165.2	145.	7.51	.	.	.	.	.	40034.	6	17	92

Table A1.10. Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T10 (Reactor 19, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	167.6	1750.	7.00	19.	.	1100.0	317.0	90.0	9019.	6	6	90
1	.	.	2100.	7.10	38.	.	1500.0	492.0	52.0	9043.	6	13	90
2	.	164.6	720.	7.75	52.	.	400.0	114.0	33.0	9067.	6	20	90
3	.	167.0	520.	7.42	69.	.	232.0	66.0	29.0	9091.	6	27	90
4	.	165.0	520.	8.21	67.	.	.	.	.	.	7	4	90
5	.	170.0	500.	7.25	57.	.	193.0	54.0	24.0	9115.	7	11	90
6	.	164.5	470.	8.15	64.	.	.	.	.	.	7	18	90
7	.	164.9	465.	8.35	71.	.	136.0	44.0	20.0	9139.	7	25	90
8	.	166.5	427.	8.20	66.	.	.	.	.	.	8	1	90
9	.	166.5	410.	8.15	77.	.	123.0	41.0	21.0	9163.	8	8	90
10	.	167.5	400.	8.10	71.	.	.	.	.	.	8	15	90
11	.	145.5	360.	8.40	.	.	97.0	38.0	20.0	9187.	8	22	90
12	.	167.0	340.	8.25	78.	.	.	.	.	.	8	29	90
13	.	167.9	338.	8.30	.	.	89.0	37.0	20.0	9211.	9	5	90
14	.	168.1	340.	8.35	91.	.	.	.	.	.	9	12	90
15	.	.	329.	8.28	.	.	76.0	.	.	9235.	9	19	90
16	.	.	307.	8.29	98.	.	.	.	.	.	9	26	90
17	.	.	308.	8.34	.	.	77.5	30.0	15.0	9259.	10	3	90
18	.	.	305.	8.20	98.	.	.	.	.	.	10	10	90
19	.	167.0	295.	8.34	.	.	57.5	.	.	9283.	10	17	90
20	.	.	320.	8.25	98.	.	.	.	.	.	10	24	90
21	.	.	278.	8.22	.	.	58.0	30.0	14.0	9307.	10	31	90
22	.	.	328.	8.12	101.	.	.	.	.	.	11	7	90
23	.	166.7	295.	8.15	.	.	50.0	.	.	9331.	11	14	90
24	.	.	313.	8.30	100.	.	.	.	.	.	11	21	90
25	.	.	345.	8.25	.	.	62.2	31.0	15.0	9355.	11	28	90
26	.	.	350.	8.15	97.	.	.	.	.	.	12	5	90
27	.	166.8	340.	8.30	.	.	48.0	.	.	9379.	12	12	90
28	.	.	340.	8.33	97.	.	.	.	.	.	12	19	90
29	.	.	260.	8.27	.	.	.	31.0	19.0	9403.	12	26	90
30	.	.	297.	8.22	103.	.	.	.	.	.	1	2	91
31	.	167.5	291.	8.15	.	.	.	.	.	9427.	1	9	91
32	.	.	290.	7.92	97.	.	.	.	.	.	1	16	91
33	.	.	270.	8.15	.	.	.	29.0	20.0	9451.	1	24	91
34	.	.	280.	8.20	102.	.	.	.	.	.	1	30	91
35	.	.	268.	8.21	.	.	45.5	.	.	9475.	2	6	91
36	.	.	280.	8.22	108.	.	.	.	.	.	2	13	91
37	.	.	277.	8.08	.	.	.	32.0	21.0	9496.	2	20	91
38	.	165.2	260.	8.20	93.	.	.	.	.	.	2	27	91
39	.	.	288.	8.30	.	.	41.0	.	.	9517.	3	6	91
40	.	.	287.	8.27	109.	.	.	.	.	.	3	13	91
41	.	.	287.	8.22	.	.	50.0	35.0	23.0	9541.	3	20	91
42	.	.	285.	8.22	108.	.	.	.	.	.	3	27	91
43	.	167.4	278.	8.22	.	.	52.0	.	.	9565.	4	3	91

Table A1.11. (Continued) Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T10 (Reactor 19, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
44	.	.	310.	8.20	128.	.	.	.	.	.	4	10	91
45	.	.	312.	8.12	.	.	65.2	34.0	24.0	9580.	4	17	91
46	.	.	338.	8.25	120.	.	.	.	.	.	4	24	91
47	.	.	330.	8.34	.	.	64.8	33.0	25.0	9601.	5	1	91
48	.	169.5	328.	8.27	121.	.	.	.	.	.	5	8	91
49	.	.	330.	8.32	.	.	74.0	.	.	9629.	5	15	91
50	.	.	378.	8.30	91.	.	.	.	.	.	5	22	91
51	.	.	387.	8.30	.	.	.	.	.	.	5	29	91
52	.	166.4	.	8.38	.	.	.	.	.	.	6	5	91
53	.	.	403.	8.36	.	.	92.5	32.4	26.0	9656.	6	12	91
54	.	.	419.	8.30	89.	.	.	.	.	.	6	19	91
55	.	166.5	350.	8.27	.	.	.	.	.	.	6	26	91
56	.	.	450.	8.31	.	.	.	.	.	.	7	3	91
57	.	.	445.	8.22	.	.	111.0	32.6	27.2	9680.	7	10	91
58	1.	.	430.	8.15	76.	.	.	.	.	.	7	17	91
59	2.	.	500.	8.12	.	.	126.0	35.6	29.0	9686.	7	24	91
60	3.	.	450.	8.27	92.	.	.	.	.	.	7	31	91
61	4.	.	465.	8.21	.	.	.	.	.	9698.	8	7	91
62	5.	.	440.	8.27	92.	.	.	.	.	.	8	14	91
63	6.	167.5	430.	8.24	74.	.	122.0	34.6	26.8	9721.	8	21	91
64	7.	.	490.	8.30	.	.	.	.	.	.	8	28	91
65	8.	.	455.	8.15	79.	.	.	.	.	9727.	9	4	91
66	9.	168.7	435.	8.30	81.	.	.	.	.	.	9	11	91
67	10.	.	435.	8.31	.	.	102.0	34.8	26.8	9748.	9	19	91
68	11.	.	355.	8.20	.	.	.	.	.	.	9	24	91
69	12.	.	360.	8.17	76.	.	30.0	34.4	22.2	9761.	10	2	91
70	13.	.	290.	8.17	.	.	.	.	.	.	10	9	91
71	14.	.	360.	8.24	94.	.	.	.	.	9767.	10	16	91
72	15.	169.2	393.	8.24	105.	.	.	.	.	.	10	23	91
73	16.	.	220.	8.15	.	.	.	.	.	9791.	10	30	91
74	17.	.	380.	8.15	118.	.	.	.	.	.	11	6	91
75	18.	.	320.	8.31	145.	.	45.0	32.6	22.6	9801.	11	13	91
76	19.	169.0	325.	8.11	.	.	.	.	.	.	11	20	91
77	20.	169.7	315.	8.24	101.	.	52.5	30.2	19.0	9816.	11	27	91
78	21.	167.7	322.	8.14	129.	.	49.0	30.6	20.4	9829.	12	4	91
79	22.	168.1	282.	8.18	113.	.	47.6	.	.	9835.	12	11	91
80	23.	.	295.	8.19	.	.	.	.	.	.	12	18	91
81	24.	.	270.	8.15	.	.	48.8	27.4	17.2	9839.	12	26	91
82	25.	166.3	295.	8.22	.	.	.	.	.	.	1	2	92
83	26.	168.1	310.	8.14	113.	.	50.0	.	.	9855.	1	8	92
84	27.	165.3	335.	8.25	.	.	.	.	.	.	1	15	92
85	28.	166.0	284.	8.23	110.	.	48.8	.	.	9859.	1	22	92
86	29.	.	343.	8.26	.	.	.	.	.	.	1	29	92
87	30.	167.8	310.	8.12	113.	.	.	30.6	19.2	9872.	2	5	92

Table A1.12. (Continued) Drainage quality for Long Term Dissolution at One Week Oxidation Interval (Wet-Dry Cycle): Solid T10 (Reactor 19, 75 g sample).

Week	Week2	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
88	31.	165.4	292.	8.24	.	.	.	.	.	.	2	12	92
89	32.	168.3	315.	8.17	.	.	62.0	27.6	18.0	9887.	2	19	92
90	33.	168.5	300.	8.13	95.	.	.	.	.	.	2	26	92
91	34.	166.8	365.	8.23	.	.	.	.	.	.	3	4	92
92	35.	165.7	315.	8.19	113.	.	.	.	.	.	3	11	92
93	36.	166.5	280.	8.17	.	.	61.0	28.6	17.6	9903.	3	18	92
94	37.	166.9	355.	8.20	.	.	.	.	.	.	3	25	92
95	38.	166.8	330.	8.11	101.	.	.	.	.	.	4	1	92
96	39.	164.5	330.	8.20	.	.	.	.	.	.	4	8	92
97	40.	167.7	230.	8.17	98.	.	67.0	27.8	18.0	.	4	15	92
98	41.	168.3	382.	8.11	102.	.	.	.	.	.	4	22	92
99	42.	164.3	384.	8.12	95.	.	.	.	.	.	4	29	92
100	43.	.	374.	8.00	.	.	.	.	.	.	5	6	92
101	44.	163.1	328.	7.94	75.	.	.	.	.	.	5	13	92
102	45.	161.9	352.	7.97	.	.	.	.	.	.	5	20	92
103	46.	166.2	402.	7.92	132.	.	.	.	.	.	5	27	92
104	47.	161.9	345.	8.21	.	.	.	.	.	.	6	3	92
105	48.	166.6	368.	8.24	104.	.	.	.	.	.	6	10	92
106	49.	169.2	340.	8.23	.	.	.	.	.	.	6	17	92

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Table A1.13. Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T2 (reactor 3), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
0	143.6	1200.0	172.320	172.320	306.0	43.942	43.942	112.0	16.083	16.083
1	.	2200.0	328.460	500.780	591.0	88.236	132.178	218.0	32.547	48.631
2	155.0	1920.0	297.600	798.380	560.0	86.800	218.978	128.0	19.840	68.471
3	151.3	1500.0	226.950	1025.330	534.0	80.794	299.772	91.0	13.768	82.239
4	167.9	.	146.073	1171.403	.	51.126	350.898	.	10.830	93.068
5	171.0	240.0	41.040	1212.443	75.0	12.825	363.723	38.0	6.498	99.566
6	152.0	.	30.780	1243.223	.	9.348	373.071	.	5.244	104.810
7	155.0	165.0	25.575	1268.798	48.0	7.440	380.511	31.0	4.805	109.615
8	156.6	.	24.821	1293.619	.	7.125	387.636	.	4.698	114.313
9	153.8	152.0	23.378	1316.997	43.0	6.613	394.249	29.0	4.460	118.774
10	154.2	.	22.976	1339.973	.	6.476	400.726	.	4.395	123.168
11	151.2	146.0	22.075	1362.048	41.0	6.199	406.925	28.0	4.234	127.402
12	153.0	.	21.879	1383.927	.	6.350	413.274	.	4.131	131.533
13	152.6	140.0	21.364	1405.291	42.0	6.409	419.684	26.0	3.968	135.501
14	153.7	.	19.366	1424.657	.	5.994	425.678	.	3.381	138.882
15	.	112.0	17.147	1441.804	.	5.971	431.649	.	3.368	142.250
16	.	.	16.152	1457.956	.	5.971	437.620	.	3.368	145.618
17	.	99.0	15.157	1473.113	36.0	5.512	443.131	18.0	2.756	148.374
18	.	.	14.391	1487.504	.	5.359	448.490	.	2.526	150.900
19	152.4	88.5	13.487	1500.992	.	5.334	453.824	.	2.515	153.415
20	.	.	13.412	1514.403	.	5.359	459.182	.	2.526	155.941
21	.	86.6	13.258	1527.662	34.0	5.205	464.388	15.0	2.297	158.238
22	.	.	11.636	1539.297	.	5.052	469.440	.	2.373	160.611
23	153.7	66.0	10.144	1549.442	.	5.072	474.512	.	2.382	162.993
24	.	.	11.527	1560.969	.	5.079	479.591	.	2.385	165.378
25	.	83.8	12.815	1573.783	32.0	4.893	484.484	16.0	2.446	167.825
26	.	.	11.376	1585.159	.	4.663	489.147	.	2.599	170.424
27	152.1	65.0	9.887	1595.046	.	4.639	493.786	.	2.586	173.010
28	.	.	8.778	1603.824	.	4.673	498.459	.	2.604	175.614
29	.	.	8.778	1612.602	29.0	4.443	502.902	18.0	2.758	178.372
30	.	.	8.778	1621.381	.	4.519	507.421	.	2.758	181.129
31	154.3	49.6	7.653	1629.034	.	4.552	511.973	.	2.777	183.907
32	.	.	7.292	1636.326	.	4.519	516.492	.	2.758	186.664
33	.	.	7.292	1643.619	30.0	4.596	521.088	18.0	2.758	189.422
34	.	.	7.292	1650.911	.	2.681	523.769	.	1.379	190.801
35	.	45.5	6.971	1657.882	.	2.681	526.450	.	1.379	192.180
36	.	.	6.940	1664.821	.	2.681	529.131	.	1.379	193.558
37	.	.	6.940	1671.761	5.0	0.766	529.897	<2.0	0.000	193.558
38	152.0	.	6.886	1678.647	.	2.508	532.405	.	1.216	194.774
39	.	.	6.913	1685.560	.	2.518	534.923	.	1.221	195.995
40	.	.	6.913	1692.473	.	2.518	537.441	.	1.221	197.216
41	.	45.0	6.867	1699.340	28.0	4.273	541.714	16.0	2.442	199.658

Table A1.14. (Continued) Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T2 (reactor 3), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	.	.	7.096	1706.435	.	4.425	546.139	.	2.671	202.328
43	153.2	48.0	7.354	1713.789	.	4.443	550.582	.	2.681	205.009
44	.	.	7.696	1721.485	.	4.437	555.019	.	2.678	207.687
45	.	52.6	8.048	1729.533	30.0	4.590	559.609	19.0	2.907	210.594
46	.	.	8.002	1737.535	.	4.437	564.046	.	2.754	213.348
47	.	52.0	7.956	1745.491	28.0	4.284	568.330	17.0	2.601	215.949
48	152.8	.	8.221	1753.711	.	4.340	572.670	.	2.735	218.684
49	.	55.6	8.601	1762.313	.	4.393	577.063	.	2.769	221.453
50	.	.	9.263	1771.576	.	4.393	581.456	.	2.769	224.222
51	.	.	9.251	1780.827	.	4.393	585.850	.	2.769	226.991
52	156.5	.	9.359	1790.186	.	4.445	590.295	.	2.801	229.792
53	.	64.0	10.061	1800.247	28.8	4.527	594.822	18.8	2.955	232.748
54	.	.	11.444	1811.691	.	4.512	599.334	.	2.987	235.735
55	157.9	.	11.495	1823.186	.	4.532	603.865	.	3.000	238.735
56	.	.	11.393	1834.579	.	4.492	608.357	.	2.974	241.708
57	.	81.5	12.755	1847.334	28.6	4.476	612.833	19.2	3.005	244.713
58	.	.	14.680	1862.014	.	4.539	617.371	.	3.052	247.765
59	.	106.0	16.589	1878.603	29.4	4.601	621.972	19.8	3.099	250.863
60	.	.	15.071	1893.674	.	4.679	626.652	.	3.177	254.040
61	.	.	15.071	1908.744	.	4.679	631.331	.	3.177	257.217
62	155.1	.	14.936	1923.681	.	4.637	635.969	.	3.149	260.366
63	157.2	86.5	13.598	1937.278	30.4	4.779	640.747	20.8	3.270	263.636
64	.	.	13.043	1950.322	.	4.648	645.396	.	3.257	266.893
65	.	.	13.043	1963.365	.	4.648	650.044	.	3.257	270.149
66	158.9	.	13.109	1976.474	.	4.672	654.715	.	3.273	273.423
67	.	78.5	12.309	1988.783	28.4	4.453	659.168	20.4	3.199	276.621
68	.	.	8.514	1997.297	.	4.296	663.465	.	2.807	279.428
69	.	30.0	4.704	2002.001	26.4	4.140	667.604	15.4	2.415	281.843
70	.	.	5.425	2007.426	.	4.155	671.760	.	2.634	284.477
71	.	.	5.425	2012.852	.	4.155	675.915	.	2.634	287.111
72	154.7	.	5.353	2018.204	.	4.100	680.014	.	2.599	289.710
73	.	.	5.370	2023.574	.	4.113	684.127	.	2.607	292.318
74	.	.	5.370	2028.944	.	4.113	688.240	.	2.607	294.925
75	.	39.2	6.084	2035.028	26.6	4.128	692.368	18.2	2.825	297.750
76	155.6	.	5.633	2040.661	.	4.092	696.460	.	2.490	300.239
77	156.2	33.2	5.186	2045.847	26.0	4.061	700.522	13.8	2.156	302.395
78	154.4	31.2	4.817	2050.664	26.2	4.045	704.567	14.2	2.192	304.587
79	155.4	44.6	6.931	2057.595	.	3.745	708.312	.	1.943	306.530
80	.	.	6.022	2063.616	.	3.740	712.052	.	1.940	308.470
81	.	33.0	5.122	2068.738	22.0	3.414	715.467	10.8	1.676	310.146
82	154.9	.	5.855	2074.593	.	3.578	719.045	.	1.828	311.974
83	155.1	42.6	6.607	2081.201	.	3.583	722.628	.	1.830	313.804

Table A1.15. (Continued) Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T2 (reactor 3), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
84	153.5	.	6.048	2087.248	.	3.546	726.174	.	1.811	315.615
85	153.4	36.2	5.553	2092.802	.	3.544	729.717	.	1.810	317.425
86	.	.	5.828	2098.630	.	3.571	733.288	.	1.824	319.250
87	155.8	39.2	6.107	2104.737	24.2	3.770	737.059	12.8	1.994	321.244
88	156.5	.	6.792	2111.529	.	3.819	740.877	.	2.019	323.263
89	157.0	47.6	7.473	2119.003	24.6	3.862	744.740	13.0	2.041	325.304
90	152.9	.	7.507	2126.510	.	3.746	748.486	.	2.049	327.353
91	153.8	.	7.552	2134.062	.	3.768	752.254	.	2.061	329.414
92	157.7	.	7.743	2141.805	.	3.864	756.117	.	2.113	331.527
93	153.8	44.6	6.859	2148.664	24.4	3.753	759.870	13.8	2.122	333.649
94	154.2	.	7.016	2155.680	.	3.701	763.571	.	2.066	335.715
95	153.3	.	6.975	2162.655	.	3.679	767.250	.	2.054	337.770
96	149.9	.	6.820	2169.476	.	3.598	770.848	.	2.009	339.778
97	156.8	46.4	7.276	2176.751	23.6	3.700	774.548	13.0	2.038	341.817
98	156.8	.	.	.	.	.	.	.	.	.
99	149.8	.	.	.	.	.	.	.	.	.
100	.	.	.	.	.	.	.	.	.	.
101	152.0	.	.	.	.	.	.	.	.	.
102	147.9	.	.	.	.	.	.	.	.	.
103	156.5	.	.	.	.	.	.	.	.	.
104	149.3	.	.	.	.	.	.	.	.	.
105	153.4	.	.	.	.	.	.	.	.	.
106	158.1	.	.	.	.	.	.	.	.	.

Table A1.16. Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T6 (reactor 11), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
0	169.7	740.0	125.578	125.578	159.0	26.982	26.982	53.0	8.994	8.994
1	.	94.0	15.858	141.436	23.0	3.880	30.862	9.0	1.518	10.512
2	167.6	65.0	10.894	152.330	20.0	3.352	34.214	7.0	1.173	11.685
3	168.1	77.0	12.944	165.274	23.0	3.866	38.080	9.0	1.513	13.198
4	166.9	.	15.689	180.962	.	4.590	42.670	.	1.752	14.951
5	169.0	111.0	18.759	199.721	32.0	5.408	48.078	12.0	2.028	16.979
6	168.9	.	15.117	214.838	.	4.729	52.807	.	1.605	18.583
7	168.5	68.0	11.458	226.296	24.0	4.044	56.851	7.0	1.180	19.763
8	169.6	.	11.872	238.168	.	4.155	61.006	.	1.357	21.120
9	169.4	72.0	12.197	250.365	25.0	4.235	65.241	9.0	1.525	22.644
10	170.6	.	11.516	261.880	.	4.009	69.250	.	1.365	24.009
11	169.8	63.0	10.697	272.578	22.0	3.736	72.986	7.0	1.189	25.198
12	169.1	.	10.400	282.977	.	3.720	76.706	.	1.184	26.381
13	169.3	60.0	10.158	293.135	22.0	3.725	80.431	7.0	1.185	27.566
14	170.1	.	9.832	302.967	.	3.487	83.918	.	1.021	28.587
15	.	51.5	8.734	311.702	.	3.477	87.394	.	1.018	29.605
16	.	.	9.040	320.741	.	3.477	90.871	.	1.018	30.622
17	.	55.0	9.328	330.069	19.0	3.222	94.094	5.0	0.848	31.470
18	.	.	7.734	337.803	.	2.798	96.892	.	0.424	31.894
19	169.1	36.2	6.121	343.924	.	2.790	99.682	.	0.338	32.232
20	.	.	5.577	349.501	.	2.797	102.479	.	0.424	32.656
21	.	29.6	5.019	354.520	14.0	2.373	104.852	<5.0	0.000	32.656
22	.	.	4.593	359.113	.	2.458	107.310	.	0.000	32.656
23	169.9	.	4.604	363.718	.	2.464	109.773	.	0.000	32.656
24	.	.	4.640	368.357	.	2.482	112.256	.	0.000	32.656
25	.	24.6	4.212	372.569	15.0	2.568	114.824	<5.0	0.000	32.656
26	.	.	3.595	376.164	.	2.482	117.306	.	0.514	33.170
27	.	17.4	2.979	379.143	.	2.482	119.788	.	0.514	33.683
28	.	.	3.013	382.156	.	2.482	122.271	.	0.514	34.197
29	.	.	3.013	385.169	14.0	2.397	124.668	6.0	1.027	35.224
30	.	.	3.013	388.182	.	2.482	127.150	.	1.027	36.251
31	172.4	17.8	3.069	391.251	.	2.500	129.650	.	1.034	37.286
32	.	.	2.587	393.838	.	2.468	132.118	.	1.021	38.307
33	.	.	2.587	396.425	15.0	2.553	134.671	6.0	1.021	39.328
34	.	.	2.587	399.012	.	2.468	137.139	.	1.021	40.349
35	.	12.6	2.145	401.156	.	2.468	139.607	.	1.021	41.370
36	.	.	2.638	403.795	.	2.468	142.074	.	1.021	42.392
37	.	.	2.638	406.433	14.0	2.383	144.457	6.0	1.021	43.413
38	167.9	.	2.602	409.035	.	2.435	146.892	.	1.091	44.504
39	.	18.3	3.067	412.102	.	2.430	149.322	.	1.089	45.594
40	.	.	3.067	415.169	.	2.430	151.752	.	1.089	46.683
41	.	18.2	3.050	418.220	15.0	2.514	154.266	7.0	1.173	47.856

Table A1.17. (Continued) Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T6 (reactor 11), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	.	.	3.201	421.421	.	2.514	156.780	.	1.173	49.029
43	167.2	20.0	3.344	424.765	.	2.508	159.288	.	1.170	50.200
44	.	.	3.484	428.249	.	2.525	161.813	.	1.178	51.378
45	.	21.3	3.585	431.833	15.0	2.525	164.337	7.0	1.178	52.556
46	.	.	3.669	435.502	.	2.440	166.778	.	1.178	53.734
47	.	22.2	3.736	439.239	14.0	2.356	169.134	7.0	1.178	54.912
48	169.3	.	3.792	443.031	.	2.472	171.605	.	1.304	56.216
49	.	22.5	3.785	446.815	.	2.456	174.061	.	1.295	57.511
50	.	.	4.525	451.340	.	2.456	176.517	.	1.295	58.806
51	.	.	4.525	455.865	.	2.456	178.973	.	1.295	60.101
52	167.1	.	4.495	460.360	.	2.440	181.412	.	1.287	61.388
53	.	.	4.473	464.833	.	2.428	183.840	.	1.281	62.668
54	.	31.2	5.189	470.022	15.2	2.528	186.368	8.4	1.397	64.065
55	165.4	.	5.194	475.215	.	2.415	188.783	.	1.406	65.471
56	.	.	5.206	480.421	.	2.421	191.204	.	1.409	66.881
57	.	31.6	5.239	485.660	14.0	2.321	193.525	8.6	1.426	68.306
58	.	.	5.339	490.999	.	2.305	195.829	.	1.459	69.765
59	.	32.8	5.438	496.437	13.8	2.288	198.117	9.0	1.492	71.258
60	.	.	4.858	501.295	.	2.338	200.455	.	1.476	72.733
61	.	.	4.858	506.153	.	2.338	202.793	.	1.476	74.209
62	.	.	4.858	511.011	.	2.338	205.131	.	1.476	75.685
63	166.1	25.8	4.285	515.297	14.4	2.392	207.523	8.8	1.462	77.146
64	.	.	3.844	519.141	.	2.303	209.826	.	1.475	78.621
65	.	.	3.844	522.985	.	2.303	212.129	.	1.475	80.096
66	165.2	.	3.833	526.818	.	2.296	214.425	.	1.470	81.566
67	.	20.6	3.446	530.264	13.4	2.242	216.667	9.0	1.506	83.072
68	.	.	3.062	533.326	.	2.325	218.993	.	1.439	84.510
69	.	16.0	2.677	536.003	14.4	2.409	221.402	8.2	1.372	85.882
70	.	.	2.325	538.328	.	2.576	223.978	.	1.389	87.271
71	.	.	2.325	540.654	.	2.576	226.555	.	1.389	88.659
72	169.4	.	2.355	543.008	.	2.609	229.163	.	1.406	90.066
73	.	.	2.349	545.357	.	2.603	231.766	.	1.403	91.468
74	.	.	2.349	547.706	.	2.603	234.369	.	1.403	92.871
75	.	11.7	1.977	549.684	16.4	2.772	237.140	8.4	1.420	94.291
76	168.5	.	2.140	551.824	.	2.578	239.718	.	1.314	95.605
77	168.8	13.7	2.313	554.136	14.2	2.397	242.115	7.2	1.215	96.820
78	167.7	12.2	2.046	556.182	14.6	2.448	244.564	7.4	1.241	98.061
79	168.6	15.7	2.647	558.829	.	2.428	246.991	.	1.231	99.292
80	.	.	2.581	561.410	.	2.429	249.421	.	1.232	100.523
81	.	14.8	2.497	563.907	14.2	2.396	251.816	7.2	1.215	101.738
82	168.7	.	2.716	566.623	.	2.345	254.161	.	1.198	102.936
83	168.8	17.4	2.937	569.560	.	2.346	256.508	.	1.198	104.134

Table A1.18. (Continued) Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T6 (reactor 11), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
84	169.9	.	2.718	572.279	.	2.362	258.869	.	1.206	105.341
85	168.2	14.6	2.456	574.734	.	2.338	261.207	.	1.194	106.535
86	.	.	2.871	577.605	.	2.334	263.541	.	1.192	107.727
87	167.5	19.6	3.283	580.888	13.6	2.278	265.819	7.0	1.173	108.899
88	166.7	.	3.117	584.006	.	2.150	267.969	.	1.117	110.016
89	167.7	17.8	2.985	586.991	12.2	2.046	270.015	6.4	1.073	111.090
90	169.6	.	3.341	590.332	.	2.086	272.101	.	1.136	112.226
91	170.0	.	3.349	593.681	.	2.091	274.192	.	1.139	113.365
92	165.4	.	3.258	596.939	.	2.034	276.227	.	1.108	114.473
93	169.3	21.5	3.640	600.579	12.4	2.099	278.326	7.0	1.185	115.658
94	165.6	.	3.643	604.222	.	2.070	280.396	.	1.159	116.817
95	167.0	.	3.674	607.896	.	2.088	282.484	.	1.169	117.986
96	166.3	.	3.659	611.555	.	2.079	284.562	.	1.164	119.150
97	169.2	22.4	3.790	615.345	12.6	2.132	286.694	7.0	1.184	120.335
98	167.4	.	.	.	.	.	.	.	.	.
99	166.6	.	.	.	.	.	.	.	.	.
100	.	.	.	.	.	.	.	.	.	.
101	156.5	.	.	.	.	.	.	.	.	.
102	167.0	.	.	.	.	.	.	.	.	.
103	165.6	.	.	.	.	.	.	.	.	.
104	165.3	.	.	.	.	.	.	.	.	.
105	165.7	.	.	.	.	.	.	.	.	.
106	167.3	.	.	.	.	.	.	.	.	.

Table A1.19. Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T9 (reactor 17), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
0	166.4	810.0	134.784	134.784	302.0	50.253	50.253	4.0	0.666	0.666
1	.	570.0	95.304	230.088	265.0	44.308	94.561	<5.0	0.000	0.666
2	168.0	190.0	31.920	262.008	82.0	13.776	108.337	<5.0	0.000	0.666
3	165.2	130.0	21.476	283.484	71.0	11.729	120.066	<5.0	0.000	0.666
4	163.9	.	17.128	300.612	.	9.342	129.409	.	0.000	0.666
5	166.0	79.0	13.114	313.726	43.0	7.138	136.547	<5.0	0.000	0.666
6	164.1	.	10.010	323.736	.	5.908	142.454	.	0.000	0.666
7	162.4	43.0	6.983	330.719	29.0	4.710	147.164	<5.0	0.000	0.666
8	162.6	.	6.748	337.467	.	4.715	151.879	.	0.000	0.666
9	163.4	40.0	6.536	344.003	29.0	4.739	156.618	<5.0	0.000	0.666
10	165.2	.	5.947	349.950	.	4.460	161.078	.	0.000	0.666
11	164.5	32.0	5.264	355.214	25.0	4.113	165.191	<5.0	0.000	0.666
12	161.9	.	2.590	357.804	.	4.128	169.319	.	0.000	0.666
13	160.9	<7.0	0.000	357.804	26.0	4.183	173.503	<5.0	0.000	0.666
14	159.7	.	1.565	359.370	.	3.513	177.016	.	0.000	0.666
15	.	19.6	3.179	362.549	.	3.568	180.584	.	0.000	0.666
16	.	.	2.757	365.306	.	3.568	184.153	.	0.000	0.666
17	.	14.3	2.319	367.625	18.0	2.920	187.072	<5.0	0.000	0.666
18	.	.	2.222	369.848	.	2.757	189.830	.	0.000	0.666
19	164.7	13.0	2.141	371.989	.	2.800	192.630	.	0.000	0.666
20	.	.	2.485	374.474	.	2.798	195.428	.	0.000	0.666
21	.	17.1	2.823	377.297	16.0	2.634	198.061	<5.0	0.000	0.666
22	.	.	2.321	379.618	.	2.469	200.530	.	0.000	0.666
23	164.5	11.1	1.826	381.444	.	2.468	202.998	.	0.000	0.666
24	.	.	2.025	383.469	.	2.490	205.488	.	0.000	0.666
25	.	13.3	2.218	385.687	14.0	2.324	207.812	<5.0	0.000	0.666
26	.	.	1.776	387.463	.	2.324	210.136	.	0.000	0.666
27	167.5	8.1	1.357	388.820	.	2.345	212.481	.	0.000	0.666
28	.	.	1.271	390.090	.	2.310	214.791	.	0.000	0.666
29	.	.	1.271	391.361	14.0	2.310	217.101	<2.0	0.000	0.666
30	.	.	1.271	392.631	.	2.145	219.246	.	0.000	0.666
31	162.4	7.3	1.186	393.817	.	2.111	221.357	.	0.000	0.666
32	.	.	1.338	395.155	.	2.122	223.479	.	0.000	0.666
33	.	.	1.338	396.493	12.0	1.958	225.437	<2.0	0.000	0.666
34	.	.	1.338	397.832	.	2.040	227.477	.	0.000	0.666
35	.	9.0	1.469	399.300	.	2.040	229.517	.	0.000	0.666
36	.	.	1.355	400.655	.	2.040	231.557	.	0.000	0.666
37	.	.	1.355	402.009	13.0	2.122	233.679	<2.0	0.000	0.666
38	163.9	.	1.360	403.370	.	2.213	235.891	.	0.000	0.666
39	.	.	1.363	404.733	14.0	2.299	238.190	<2.0	0.000	0.666
40	.	.	1.363	406.096	.	2.299	240.489	.	0.000	0.666
41	.	7.6	1.248	407.343	.	2.299	242.788	.	0.000	0.666

Table A1.20. (Continued) Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T9 (reactor 17), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	.	.	1.133	408.476	.	2.299	245.087	.	0.000	0.666
43	164.4	6.1	1.003	409.479	.	2.302	247.388	.	0.000	0.666
44	.	.	1.403	410.882	.	2.310	249.698	.	0.000	0.666
45	.	10.8	1.782	412.664	14.0	2.310	252.008	<2.0	0.000	0.666
46	.	.	1.683	414.347	.	2.393	254.401	.	0.000	0.666
47	.	9.5	1.568	415.914	15.0	2.475	256.876	<2.0	0.000	0.666
48	165.5	.	1.605	417.520	.	3.211	260.086	.	0.199	0.865
49	.	9.9	1.610	419.129	.	3.154	263.241	.	0.195	1.060
50	.	.	1.268	420.398	.	3.154	266.395	.	0.195	1.255
51	.	.	1.268	421.666	.	3.154	269.550	.	0.195	1.450
52	159.6	.	1.245	422.911	.	3.096	272.646	.	0.192	1.642
53	.	5.6	0.902	423.812	.	3.123	275.769	.	0.193	1.835
54	.	.	3.945	427.757	.	3.123	278.893	.	0.193	2.028
55	162.3	.	3.976	431.733	.	3.149	282.041	.	0.195	2.223
56	.	.	4.013	435.746	.	3.178	285.219	.	0.197	2.420
57	.	43.4	7.109	442.855	23.8	3.898	289.117	2.4	0.393	2.813
58	.	.	7.371	450.226	.	4.095	293.212	.	0.377	3.190
59	.	46.6	7.633	457.859	26.2	4.292	297.504	2.2	0.360	3.550
60	.	.	7.649	465.509	.	4.177	301.681	.	0.344	3.894
61	.	.	7.649	473.158	.	4.177	305.858	.	0.344	4.238
62	.	.	7.649	480.808	.	4.177	310.035	.	0.344	4.582
63	.	46.8	7.666	488.474	24.8	4.062	314.097	2.0	0.328	4.909
64	.	.	6.568	495.042	.	3.718	317.815	.	0.328	5.237
65	.	.	6.568	501.610	.	3.718	321.534	.	0.328	5.565
66	.	.	6.568	508.179	.	3.718	325.252	.	0.328	5.892
67	.	33.3	5.455	513.633	20.6	3.374	328.626	2.0	0.328	6.220
68	.	.	4.881	518.515	.	3.227	331.853	.	0.328	6.547
69	.	26.2	4.292	522.806	18.8	3.079	334.932	2.0	0.328	6.875
70	.	.	3.194	526.000	.	2.883	337.815	.	0.295	7.170
71	.	.	3.194	529.194	.	2.883	340.698	.	0.295	7.465
72	.	.	3.194	532.388	.	2.883	343.581	.	0.295	7.760
73	.	.	3.194	535.582	.	2.883	346.464	.	0.295	8.054
74	.	.	3.194	538.777	.	2.883	349.347	.	0.295	8.349
75	.	12.8	2.097	540.873	16.4	2.686	352.033	1.6	0.262	8.611
76	.	.	2.015	542.888	.	2.408	354.441	.	0.262	8.873
77	.	11.7	1.916	544.804	13.0	2.129	356.570	1.6	0.262	9.135
78	.	8.9	1.458	546.262	.	2.048	358.618	.	0.262	9.398
79	.	11.4	1.867	548.130	12.0	1.966	360.583	1.6	0.262	9.660
80	.	.	1.802	549.931	.	1.998	362.582	.	0.262	9.922
81	.	10.6	1.736	551.668	12.4	2.031	364.613	1.6	0.262	10.184
82	165.3	.	1.951	553.618	.	1.818	366.431	.	0.198	10.382
83	165.9	13.0	2.157	555.775	.	1.825	368.256	.	0.199	10.581

Table A1.21. (Continued) Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T9 (reactor 17), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
84	165.4	.	0.232	556.006	.	1.819	370.076	.	0.198	10.780
85	164.1	9.7	1.592	557.598	.	1.805	371.881	.	0.197	10.977
86	.	.	1.598	559.196	.	1.812	373.692	.	0.198	11.174
87	165.2	9.6	1.586	560.782	9.6	1.586	375.278	0.8	0.132	11.306
88	164.7	.	1.762	562.544	.	1.515	376.793	.	0.132	11.438
89	166.6	11.8	1.966	564.510	8.8	1.466	378.260	0.8	0.133	11.571
90	166.6	.	2.066	566.576	.	1.383	379.642	.	0.150	11.721
91	166.2	.	2.061	568.637	.	1.379	381.022	.	0.150	11.871
92	163.3	.	2.025	570.662	.	1.355	382.377	.	0.147	12.018
93	165.7	12.9	2.138	572.799	7.8	1.292	383.670	1.0	0.166	12.184
94	165.0	.	2.591	575.390	.	1.370	385.039	.	0.198	12.382
95	164.7	.	2.586	577.975	.	1.367	386.406	.	0.198	12.579
96	165.0	.	2.591	580.566	.	1.370	387.776	.	0.198	12.777
97	166.5	18.5	3.080	583.646	8.8	1.465	389.241	1.4	0.233	13.010
98	165.7	.	.	.	.	.	.	.	.	.
99	159.5	.	.	.	.	.	.	.	.	.
100	.	.	.	.	.	.	.	.	.	.
101	164.2	.	.	.	.	.	.	.	.	.
102	164.5	.	.	.	.	.	.	.	.	.
103	162.3	.	.	.	.	.	.	.	.	.
104	163.5	.	.	.	.	.	.	.	.	.
105	164.6	.	.	.	.	.	.	.	.	.
106	165.2	.	.	.	.	.	.	.	.	.

Table A1.22. Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T10 (reactor 19), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
0	167.6	1100.0	184.360	184.360	317.0	53.129	53.129	90.0	15.084	15.084
1	.	1500.0	249.150	433.510	492.0	81.721	134.850	52.0	8.637	23.722
2	164.6	400.0	65.840	499.350	114.0	18.764	153.615	33.0	5.432	29.153
3	167.0	232.0	38.744	538.094	66.0	11.022	164.637	29.0	4.843	33.996
4	165.0	.	35.063	573.157	.	9.900	174.537	.	4.373	38.369
5	170.0	193.0	32.810	605.967	54.0	9.180	183.717	24.0	4.080	42.449
6	164.5	.	27.060	633.027	.	8.061	191.777	.	3.619	46.068
7	164.9	136.0	22.426	655.453	44.0	7.256	199.033	20.0	3.298	49.366
8	166.5	.	21.562	677.015	.	7.076	206.109	.	3.413	52.779
9	166.5	123.0	20.480	697.494	41.0	6.827	212.936	21.0	3.497	56.276
10	167.5	.	18.425	715.919	.	6.616	219.552	.	3.434	59.709
11	145.5	97.0	14.114	730.033	38.0	5.529	225.081	20.0	2.910	62.619
12	167.0	.	15.531	745.564	.	6.263	231.343	.	3.340	65.959
13	167.9	89.0	14.943	760.507	37.0	6.212	237.556	20.0	3.358	69.317
14	168.1	.	13.868	774.375	.	5.631	243.187	.	2.942	72.259
15	.	76.0	12.738	787.113	.	5.615	248.802	.	2.933	75.192
16	.	.	12.872	799.985	.	5.615	254.416	.	2.933	78.125
17	.	77.5	12.989	812.974	30.0	5.028	259.444	15.0	2.514	80.639
18	.	.	11.313	824.287	.	5.028	264.472	.	2.430	83.069
19	167.0	57.5	9.603	833.889	.	5.010	269.482	.	2.422	85.491
20	.	.	9.647	843.536	.	5.007	274.489	.	2.420	87.911
21	.	58.0	9.680	853.216	30.0	5.007	279.496	14.0	2.337	90.248
22	.	.	9.013	862.229	.	5.090	284.587	.	2.420	92.668
23	166.7	50.0	8.335	870.564	.	5.084	289.671	.	2.417	95.085
24	.	.	9.357	879.921	.	5.087	294.758	.	2.419	97.503
25	.	62.2	10.390	890.311	31.0	5.171	299.929	15.0	2.502	100.005
26	.	.	9.191	899.502	.	5.171	305.100	.	2.836	102.841
27	166.8	48.0	8.006	907.508	.	5.171	310.271	.	2.836	105.677
28	.	.	7.825	915.333	.	5.183	315.454	.	2.842	108.519
29	.	.	7.825	923.158	31.0	5.183	320.637	19.0	3.177	111.696
30	.	.	7.825	930.983	.	5.016	325.653	.	3.260	114.956
31	167.5	.	7.839	938.822	.	5.025	330.678	.	3.266	118.222
32	.	.	7.788	946.610	.	4.992	335.670	.	3.245	121.467
33	.	.	7.788	954.397	29.0	4.826	340.496	20.0	3.328	124.795
34	.	.	7.788	962.185	.	5.075	345.571	.	3.411	128.206
35	.	45.5	7.571	969.756	.	5.075	350.646	.	3.411	131.618
36	.	.	7.205	976.961	.	5.075	355.721	.	3.411	135.029
37	.	.	7.205	984.166	32.0	5.325	361.046	21.0	3.494	138.523
38	165.2	.	7.153	991.319	.	5.534	366.580	.	3.634	142.158
39	.	41.0	6.818	998.138	.	5.571	372.151	.	3.659	145.816
40	.	.	7.400	1005.538	.	5.488	377.639	.	3.659	149.475
41	.	50.0	8.315	1013.853	35.0	5.821	383.460	23.0	3.825	153.300

Table A1.23. (Continued) Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T10 (reactor 19), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	.	.	8.481	1022.334	.	5.737	389.197	.	3.908	157.208
43	167.4	52.0	8.705	1031.039	.	5.775	394.972	.	3.934	161.142
44	.	.	9.874	1040.913	.	5.813	400.786	.	3.960	165.101
45	.	65.2	10.986	1051.899	34.0	5.729	406.515	24.0	4.044	169.145
46	.	.	10.953	1062.852	.	5.645	412.159	.	4.128	173.274
47	.	64.8	10.919	1073.771	33.0	5.561	417.720	25.0	4.213	177.486
48	169.5	.	11.763	1085.534	.	5.543	423.263	.	4.322	181.808
49	.	74.0	12.432	1097.966	.	5.494	428.756	.	4.284	186.092
50	.	.	13.994	1111.960	.	5.494	434.250	.	4.284	190.376
51	.	.	13.994	1125.955	.	5.494	439.743	.	4.284	194.660
52	166.4	.	13.861	1139.816	.	5.441	445.185	.	4.243	198.904
53	.	92.5	15.401	1155.217	32.4	5.395	450.579	26.0	4.329	203.233
54	.	.	16.950	1172.167	.	5.411	455.990	.	4.429	207.661
55	166.5	.	16.950	1189.117	.	5.411	461.402	.	4.429	212.090
56	.	.	17.001	1206.117	.	5.428	466.829	.	4.442	216.533
57	.	111.0	18.537	1224.654	32.6	5.444	472.273	27.2	4.542	221.075
58	.	.	19.790	1244.444	.	5.695	477.968	.	4.693	225.768
59	.	126.0	21.042	1265.486	35.6	5.945	483.913	29.0	4.843	230.611
60	.	.	20.708	1286.194	.	5.862	489.775	.	4.659	235.270
61	.	.	20.708	1306.902	.	5.862	495.637	.	4.659	239.929
62	.	.	20.708	1327.610	.	5.862	501.498	.	4.659	244.589
63	167.5	122.0	20.435	1348.045	34.6	5.796	507.294	26.8	4.489	249.078
64	.	.	18.827	1366.872	.	5.833	513.127	.	4.505	253.583
65	.	.	18.827	1385.699	.	5.833	518.960	.	4.505	258.088
66	168.7	.	18.894	1404.593	.	5.854	524.814	.	4.521	262.609
67	.	102.0	17.238	1421.831	34.8	5.881	530.695	26.8	4.529	267.138
68	.	.	11.154	1432.985	.	5.847	536.543	.	4.141	271.279
69	.	30.0	5.070	1438.055	34.4	5.814	542.356	22.2	3.752	275.030
70	.	.	6.338	1444.393	.	5.797	548.153	.	3.786	278.816
71	.	.	6.338	1450.730	.	5.797	553.950	.	3.786	282.602
72	169.2	.	6.345	1457.075	.	5.804	559.753	.	3.790	286.392
73	.	.	6.341	1463.417	.	5.800	565.553	.	3.788	290.180
74	.	.	6.341	1469.758	.	5.800	571.353	.	3.788	293.967
75	.	45.0	7.610	1477.367	32.6	5.513	576.866	22.6	3.822	297.789
76	169.0	.	8.247	1485.615	.	5.307	582.173	.	3.515	301.304
77	169.7	52.5	8.909	1494.524	30.2	5.125	587.298	19.0	3.224	304.529
78	167.7	49.0	8.217	1502.741	30.6	5.132	592.429	20.4	3.421	307.950
79	168.1	47.6	8.002	1510.743	.	4.875	597.304	.	3.160	311.110
80	.	.	8.059	1518.802	.	4.849	602.153	.	3.143	314.253
81	.	48.8	8.159	1526.961	27.4	4.581	606.734	17.2	2.876	317.129
82	166.3	.	8.215	1535.176	.	4.823	611.557	.	3.027	320.156
83	168.1	50.0	8.405	1543.581	.	4.875	616.432	.	3.059	323.215

Table A1.24. (Continued) Long Term Dissolution at One Week Interval (Wet-Dry Cycle) cumulative mass release: Solid T10 (reactor 19), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
84	165.3	.	8.166	1551.747	.	4.794	621.225	.	3.008	326.224
85	166.0	48.8	8.101	1559.848	.	4.814	626.039	.	3.021	329.245
86	.	.	9.246	1569.094	.	4.840	630.880	.	3.038	332.282
87	167.8	.	9.296	1578.390	30.6	5.135	636.014	19.2	3.222	335.504
88	165.4	.	9.163	1587.554	.	4.813	640.827	.	3.076	338.581
89	168.3	62.0	10.435	1597.988	27.6	4.645	645.472	18.0	3.029	341.610
90	168.5	.	10.363	1608.351	.	4.735	650.207	.	2.999	344.609
91	166.8	.	10.258	1618.609	.	4.687	654.894	.	2.969	347.578
92	165.7	.	10.191	1628.800	.	4.656	659.551	.	2.949	350.528
93	166.5	61.0	10.157	1638.956	28.6	4.762	664.312	17.6	2.930	353.458
94	166.9	.	10.682	1649.638	.	4.707	669.019	.	2.971	356.429
95	166.8	.	10.675	1660.313	.	4.704	673.723	.	2.969	359.398
96	164.5	.	10.528	1670.841	.	4.639	678.362	.	2.928	362.326
97	167.7	67.0	11.236	1682.077	27.8	4.662	683.024	18.0	3.019	365.345
98	168.3	.	.	.	.	.	.	.	.	.
99	164.3	.	.	.	.	.	.	.	.	.
100	.	.	.	.	.	.	.	.	.	.
101	163.1	.	.	.	.	.	.	.	.	.
102	161.9	.	.	.	.	.	.	.	.	.
103	166.2	.	.	.	.	.	.	.	.	.
104	161.9	.	.	.	.	.	.	.	.	.
105	166.6	.	.	.	.	.	.	.	.	.
106	169.2	.	.	.	.	.	.	.	.	.

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APPENDIX 2

VARIABLE MASS

A2.1. - A2.15. Drainage quality rinse data.
A2.16. - A2.46. Drainage quality data.
A2.47. - A2.67. Cumulative mass release data.
A2.68. - A2.75. Regression analysis

Table A2.1. Variable Mass Drainage Quality Rinse Data: Solid T2 (reactor 11), mass 225 g.

Rinse	Volume (mL) In	Volume (mL) Out	Retained	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Sample	Month	Day	Year
1	275	56.2	.	5000	7.62	.	4080.0	500.0	640.0	149.0	28.4	5026.	2	4	92
2	275	259.9	.	3100	7.72	41.	2050.0	560.0	170.0	27.0	9.6	5038.	2	5	92
3	275	259.5	.	2450	7.85	32.	1530.0	580.0	44.2	4.8	3.4	5061.	2	6	92
4	275	243.6	.	2300	7.76	44.	.	.	.	.	.	.	2	10	92
5	275	227.8	.	2150	7.72	63.	.	.	.	.	.	.	2	12	92
6	275	243.0	.	1825	7.95	66.	.	.	.	.	.	.	2	14	92
7	275	240.8	.	1050	8.15	91.	.	.	.	.	.	.	2	17	92
8	275	239.4	.	750	8.18	110.	.	.	.	.	.	.	2	19	92
9		1194.6	.	1594	7.88	74.	880.0	380.0	23.0	2.8	1.4	5084.	2	19	92
10	275	242.9	.	458	8.28	110.	.	.	.	.	.	.	2	21	92
11	275	241.5	.	325	8.28	113.	.	.	.	.	.	.	2	24	92
12	275	251.7	.	300	8.22	107.	.	.	.	.	.	.	2	26	92
13	275	243.8	.	265	8.23	88.	.	.	.	.	.	.	2	28	92
14	275	233.1	.	410	8.38	107.	.	.	.	.	.	.	3	2	92
15	275	236.2	.	360	8.28	113.	.	.	.	.	.	.	3	4	92
16		1449.2	.	358	8.28	107.	66.0	43.0	13.6	2.8	1.0	5151.	3	4	92
17	275	241.0	.	320	8.32	113.	56.0	36.6	15.0	3.6	1.4	5156.	3	6	92

Table A2.2. Variable Mass Drainage Quality Rinse Data: Solid T2 (reactor 12), mass 375 g.

Rinse	Volume (mL) In	Volume (mL) Out	Retained	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Sample	Month	Day	Year
1	350	114.9	.	5000	7.62	.	3780.0	560.0	600.0	149.0	26.6	5027.	2	4	92
2	350	333.2	.	3425	7.75	41.	2280.0	540.0	227.0	33.6	13.0	5039.	2	5	92
3	350	333.5	.	2450	7.67	27.	1470.0	580.0	49.8	4.2	4.2	5062.	2	6	92
4	350	313.9	.	2300	7.77	32.	.	.	.	.	.	.	2	10	92
5	350	304.7	.	2400	7.64	38.	.	.	.	.	.	.	2	12	92
6	350	287.5	.	2075	7.91	57.	.	.	.	.	.	.	2	14	92
7	350	316.8	.	1400	7.94	63.	.	.	.	.	.	.	2	17	92
8	350	320.0	.	1025	7.91	63.	.	.	.	.	.	.	2	19	92
9		1542.9	.	1843	7.91	51.	1000.0	460.0	21.4	2.4	1.4	5085.	2	19	92
10	350	313.5	.	950	8.02	95.	.	.	.	.	.	.	2	21	92
11	350	322.1	.	530	8.17	95.	.	.	.	.	.	.	2	24	92
12	350	316.6	.	365	8.10	82.	.	.	.	.	.	.	2	26	92
13	350	316.4	.	370	8.23	82.	.	.	.	.	.	.	2	28	92
14	325	292.3	.	295	8.24	76.	.	.	.	.	.	.	3	2	92
15	350	306.2	.	335	8.22	79.	.	.	.	.	.	.	3	4	92
16		1867.1	.	478	8.17	85.	163.0	73.4	12.2	2.8	0.8	5152.	3	4	92
17	350	314.7	.	335	8.21	88.	55.2	36.6	14.6	2.8	1.0	5157.	3	6	92

Table A2.3. Variable Mass Drainage Quality Rinse Data: Solid T2 (reactor 13), mass 750 g.

Rinse	Volume (mL) In	Volume (mL) Out	Retained	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Sample	Month	Day	Year
1	550	40.7	.	2125	7.47	.	.	.	.	.	.	.	2	4	92
2	550	524.4	.	4900	7.72	63.	3120.0	520.0	440.0	87.8	19.6	5040.	2	5	92
3	550	530.5	.	2800	7.57	33.	1800.0	580.0	111.6	12.8	8.2	5063.	2	6	92
4	550	506.0	.	2410	7.78	35.	.	.	.	.	.	.	2	10	92
5	550	485.8	.	2450	7.65	38.	.	.	.	.	.	.	2	12	92
6	550	494.6	.	1910	7.74	38.	.	.	.	.	.	.	2	13	92
7	550	506.0	.	2000	7.81	41.	.	.	.	.	.	.	2	17	92
8	550	504.4	.	2200	7.82	53.	.	.	.	.	.	.	2	19	92
9		2496.8	.	2170	7.68	41.	1340.0	560.0	34.2	3.0	2.2	5086.	2	19	92
10	550	514.6	.	2100	7.91	63.	.	.	.	.	.	.	2	21	92
11	550	502.8	.	1680	7.93	76.	.	.	.	.	.	.	2	24	92
12	550	491.9	.	1050	8.05	95.	.	.	.	.	.	.	2	26	92
13	550	499.9	.	680	8.20	95.	.	.	.	.	.	.	2	28	92
14	500	447.5	.	500	8.30	101.	.	.	.	.	.	.	3	2	92
15	550	480.2	.	460	8.24	107.	.	.	.	.	.	.	3	4	92
16		2936.9	.	1108	8.10	88.	200.0	214.0	13.6	4.0	1.8	5153.	3	4	92
17	550	504.8	.	352	8.29	95.	51.0	42.4	12.0	2.4	0.8	5158.	3	6	92

Table A2.4. Variable Mass Drainage Quality Rinse Data: Solid T2 (reactor 14), mass 1125 g.

Rinse	Volume (mL) In	Volume (mL) Out	Retained	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Sample	Month	Day	Year
1	725	24.6	.	1500	7.35	.	.	.	.	.	.	.	2	4	92
2	725	678.3	.	4750	7.77	72.	2920.0	520.0	404.0	87.6	18.4	5041.	2	5	92
3	725	693.5	.	3700	7.71	48.	2200.0	569.0	248.0	41.6	12.4	5064.	2	6	92
4	725	660.9	.	2550	7.90	38.	.	.	.	.	.	.	2	10	92
5	725	655.5	.	2480	7.71	32.	.	.	.	.	.	.	2	12	92
6	725	651.6	.	2390	7.64	38.	.	.	.	.	.	.	2	13	92
7	725	677.5	.	2200	7.64	28.	.	.	.	.	.	.	2	17	92
8	725	690.6	.	1050	7.59	31.	.	.	.	.	.	.	2	19	92
9		3336.1	.	2145	7.77	35.	1270.0	500.0	36.0	3.2	2.6	5087.	2	19	92
10	725	671.4	.	2450	7.76	50.	.	.	.	.	.	.	2	21	92
11	725	679.8	.	2400	7.69	50.	.	.	.	.	.	.	2	24	92
12	725	670.0	.	2100	7.89	69.	.	.	.	.	.	.	2	26	92
13	725	674.1	.	1500	8.05	82.	.	.	.	.	.	.	2	28	92
14	650	596.8	.	720	8.11	95.	.	.	.	.	.	.	3	2	92
15	725	605.2	.	230	8.04	63.	.	.	.	.	.	.	3	4	92
16		3897.3	.	1582	7.85	68.	800.0	356.0	14.0	2.8	1.4	5154.	3	4	92
17	725	677.3	.	385	8.30	113.	62.0	48.4	13.0	2.4	0.8	5159.	3	6	92

Table A2.5. Variable Mass Drainage Quality Rinse Data: Solid T2 (reactor 15), mass 1500 g.

Rinse	Volume (mL)			S.C.	pH	Alk.	SO_4	Ca	Mg	Na	K	Sample	Month	Day	Year
	In	Out	Retained	(µS)	(s.u.)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)				
1	925	22.3	.	1525	7.35	.	.	.	.	.	.	.	2	4	92
2	925	858.7	.	5000	7.79	76.	2920.0	540.0	440.0	94.4	20.2	5042.	2	5	92
3	925	895.0	.	3550	7.83	48.	2220.0	569.0	242.0	37.2	12.8	5065.	2	6	92
4	925	876.1	.	2550	8.13	35.	.	.	.	.	.	.	2	10	92
5	925	837.6	.	2490	8.07	32.	.	.	.	.	.	.	2	12	92
6	925	841.8	.	2300	7.85	25.	.	.	.	.	.	.	2	14	92
7	925	868.2	.	2200	7.77	25.	.	.	.	.	.	.	2	17	92
8	925	867.9	.	2300	7.64	32.	.	.	.	.	.	.	2	19	92
9		4291.6	.	2368	7.89	29.	1350.0	560.0	36.0	3.2	3.0	5088.	2	19	92
10	925	867.3	.	2450	7.59	32.	.	.	.	.	.	.	2	21	92
11	925	863.7	.	2400	7.73	44.	.	.	.	.	.	.	2	24	92
12	925	852.7	.	2090	7.89	63.	.	.	.	.	.	.	2	26	92
13	925	854.8	.	1000	8.13	82.	.	.	.	.	.	.	2	28	92
14	825	760.6	.	380	8.26	91.	.	.	.	.	.	.	3	2	92
15	925	810.9	.	270	8.23	98.	.	.	.	.	.	.	3	4	92
16		5010.0	.	1450	7.88	67.	730.0	352.0	9.8	2.6	1.2	5155.	3	4	92
17	925	863.9	.	242	8.31	88.	31.0	29.4	8.8	2.2	0.6	5160.	3	6	92

Table A2.6. Variable Mass Drainage Quality Rinse Data: Solid T4 (reactor 1), mass 225 g.

Rinse	Volume (mL) In	Out	Retained	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Sample	Month	Day	Year
1	275	156.1	.	2100	7.40	27.	1320.0	440.0	52.8	26.6	25.0	5016.	2	4	92
2	275	257.2	.	475	7.76	54.	193.0	69.0	11.6	6.0	6.4	5028.	2	5	92
3	275	263.3	.	142	8.07	60.	16.0	16.2	5.8	2.6	2.4	5051.	2	6	92
4	275	223.6	.	142	8.24	82.	.	.	.	.	.	.	2	10	92
5	275	224.6	.	145	8.35	91.	.	.	.	.	.	.	2	11	92
6	275	448.2	.	144	8.30	87.	10.0	16.6	8.0	2.4	2.2	5074.	2	11	92
7	275	162.3	6.1	162	8.19	101.	13.0	16.4	10.6	2.8	2.2	5105.	2	20	92
8	275	183.3	19.1	220	8.27	107.	27.2	18.0	14.4	3.2	2.4	5115.	2	27	92
9		164.7	6.1	200	8.23	101.	15.4	17.8	13.0	4.0	3.2	5141.	3	5	92

Table A2.7. Variable Mass Drainage Quality Rinse Data: Solid T4 (reactor 2), mass 375 g.

Rinse	Volume (mL) In	Out	Retained	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Sample	Month	Day	Year
1	350	190.5	.	1650	7.39	25.	965.0	300.0	50.0	26.0	20.6	5017.	2	4	92
2	350	332.7	.	1225	7.76	44.	720.0	260.0	26.4	9.4	12.2	5029.	2	5	92
3	350	331.7	.	170	8.16	66.	20.4	19.2	4.0	3.0	3.2	5052.	2	6	92
4	350	314.9	.	155	8.33	85.	.	.	.	.	.	.	2	10	92
5	350	298.0	.	152	8.37	91.	.	.	.	.	.	.	2	11	92
6	350	612.9	.	153	8.35	88.	10.1	18.4	8.6	2.4	2.2	5075.	2	11	92
7		203.3	22.0	180	8.21	101.	17.6	16.6	12.2	2.8	2.4	5106.	2	20	92
8	300	174.3	45.3	178	8.27	82.	16.6	16.0	11.2	4.8	2.6	5116.	2	27	92
9	300	169.7	25.0	235	8.28	104.	25.2	17.6	14.2	3.6	2.4	5142.	3	5	92

Table A2.8. Variable Mass Drainage Quality Rinse Data: Solid T4 (reactor 3), mass 750 g.

Rinse	Volume (mL) In	Out	Retained	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Sample	Month	Day	Year
1	550	95.5	.	1375	7.42	27.	760.0	260.0	31.6	23.0	13.0	5018.	2	4	92
2	550	529.2	.	2175	7.65	36.	1320.0	460.0	62.4	25.6	26.8	5030.	2	5	92
3	550	524.5	.	400	8.05	58.	125.0	49.2	8.0	3.6	4.8	5053.	2	6	92
4	550	497.7	.	190	8.39	98.	.	.	.	.	.	.	2	10	92
5	550	476.8	.	153	8.36	85.	.	.	.	.	.	.	2	11	92
6		974.5	.	172	8.38	92.	18.2	21.4	9.4	3.2	3.2	5076.	2	11	92
7	525	242.9	37.1	212	8.25	95.	28.0	16.2	12.4	3.2	3.6	5107.	2	20	92
8	450	249.7	103.9	253	8.26	117.	33.2	19.2	17.6	4.0	3.0	5117.	2	27	92
9	375	114.7	15.0	275	8.23	107.	37.8	17.6	16.4	4.6	3.2	5143.	3	5	92

Table A2.9. Variable Mass Drainage Quality Rinse Data: Solid T4 (reactor 4), mass 1125 g.

Rinse	Volume (mL)			S.C.	pH	Alk.	SO_4	Ca	Mg	Na	K	Sample	Month	Day	Year
	In	Out	Retained	(µS)	(s.u.)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)				
1	725	227.0	.	1625	7.41	27.	960.0	300.0	36.2	22.0	15.6	5019.	2	4	92
2	725	690.0	.	2250	7.67	36.	1400.0	480.0	69.6	25.4	29.2	5031.	2	5	92
3	725	693.4	.	428	8.03	63.	130.0	52.8	8.0	3.4	4.8	5054.	2	6	92
4	725	668.5	.	139	8.23	76.	.	.	.	.	.	.	2	10	92
5	725	630.9	.	190	8.41	101.	.	.	.	.	.	.	2	11	92
6		1299.4	.	164	8.32	88.	15.6	19.0	8.0	2.6	2.6	5077.	2	11	92
7	725	434.5	157.2	253	8.32	107.	36.8	19.4	15.4	2.8	3.2	5108.	2	20	92
8	475	225.2	166.5	275	8.34	120.	40.8	20.4	19.2	4.4	3.8	5118.	2	27	92
9	425	156.2	128.9	310	8.26	117.	49.6	18.8	20.4	4.2	3.8	5144.	3	5	92

Table A2.10. Variable Mass Drainage Quality Rinse Data: Solid T4 (reactor 5), mass 1500 g.

Rinse	Volume (mL)			S.C.	pH	Alk.	SO_4	Ca	Mg	Na	K	Sample	Month	Day	Year
	In	Out	Retained	(µS)	(s.u.)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)				
1	925	257.6	.	2350	7.41	32.	1440.0	480.0	67.4	34.0	26.0	5020.	2	4	92
2	925	886.7	.	2275	7.56	38.	1390.0	480.0	66.8	23.4	29.0	5032.	2	5	92
3	925	891.5	.	335	8.08	69.	92.0	47.2	6.2	3.2	4.4	5055.	2	6	92
4	925	856.4	.	198	8.45	98.	.	.	.	.	.	.	2	10	92
5	925	841.4	.	175	8.26	101.	.	.	.	.	.	.	2	12	92
6		1697.8	.	187	8.36	100.	16.2	22.6	9.6	2.8	3.4	5078.	2	12	92
7	900	532.3	208.4	245	8.40	107.	32.0	19.8	14.8	3.0	3.4	5109.	2	20	92
8	550	274.0	242.2	275	8.39	113.	34.4	19.6	19.2	4.0	3.6	5119.	2	27	92
9	450	98.5	147.9	310	8.24	104.	56.0	16.8	19.8	4.8	3.8	5145.	3	5	92

Table A2.11. Variable Mass Drainage Quality Rinse Data: Solid T10 (reactor 6), mass 225 g.

Rinse	Volume (mL)			S.C.	pH	Alk.	SO_4	Ca	Mg	Na	K	Sample	Month	Day	Year
	In	Out	Retained	(µS)	(s.u.)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)				
1	275	122.8	.	3675	7.62	79.	2360.0	580.0	303.0	49.0	17.4	5021.	2	4	92
2	275	255.4	.	2400	7.74	44.	1550.0	580.0	63.8	8.4	4.6	5033.	2	5	92
3	275	257.2	.	1900	7.86	58.	1080.0	460.0	17.6	3.0	1.6	5056.	2	6	92
4	275	241.3	.	1100	8.11	91.	.	.	.	.	.	.	2	10	92
5	275	222.1	.	700	8.13	132.	.	.	.	.	.	.	2	11	92
6	275	235.8	.	350	8.25	139.	.	.	.	.	.	.	2	13	92
7	275	234.6	.	300	8.36	139.	.	.	.	.	.	.	2	17	92
8	275	229.2	.	440	8.18	132.	.	.	.	.	.	.	2	19	92
9		1163.0	.	582	8.20	126.	227.0	103.0	16.0	2.6	1.0	5079.	2	19	92
10	275	240.9	.	368	8.29	139.	56.5	46.2	14.8	2.8	0.4	5110.	2	21	92
11	275	174.6	0.0	900	7.78	76.	416.0	112.0	42.8	3.8	0.6	5120.	2	27	92
12	275	202.6	0.0	990	7.82	72.	472.0	122.0	44.8	4.8	1.2	5146.	3	5	92

Table A2.12. Variable Mass Drainage Quality Rinse Data: Solid T10 (reactor 7), mass 375 g.

Rinse	Volume (mL)			S.C.	pH	Alk.	SO_4	Ca	Mg	Na	K	Sample	Month	Day	Year
	In	Out	Retained	(µS)	(s.u.)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)				
1	350	218.4	.	3450	7.60	79.	2380.0	520.0	304.0	49.0	18.2	5022.	2	4	92
2	350	330.0	.	2500	7.71	41.	1670.0	600.0	98.0	9.0	5.4	5034.	2	5	92
3	350	331.5	.	2190	7.70	40.	1360.0	580.0	20.4	3.2	2.0	5057.	2	6	92
4	350	309.3	.	1725	7.93	63.	.	.	.	.	.	.	2	10	92
5	350	317.1	.	625	7.99	72.	.	.	.	.	.	.	2	11	92
6	350	303.9	.	590	8.17	113.	.	.	.	.	.	.	2	13	92
7	350	306.6	.	370	8.30	113.	.	.	.	.	.	.	2	17	92
8	350	301.6	.	440	8.17	118.	.	.	.	.	.	.	2	19	92
9		1538.5	.	756	8.19	98.	352.0	158.0	14.2	2.8	1.0	5080.	2	19	92
10	350	313.6	.	340	8.32	132.	57.5	42.2	14.4	2.8	0.6	5111.	2	21	92
11	325	199.2	14.2	1450	7.35	79.	740.0	208.0	80.0	4.2	1.0	5121.	2	27	92
12	300	182.1	17.6	1500	7.49	79.	890.0	218.0	77.6	4.8	1.4	5147.	3	5	92

Table A2.13. Variable Mass Drainage Quality Rinse Data: Solid T10 (reactor 8), mass 750 g.

Rinse	Volume (mL)			S.C.	pH	Alk.	SO_4	Ca	Mg	Na	K	Sample	Month	Day	Year
	In	Out	Retained	(µS)	(s.u.)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)				
1	550	242.7	.	3975	7.51	96.	2490.0	480.0	356.0	64.8	19.8	5023.	2	4	92
2	550	522.0	.	2800	7.76	50.	1780.0	560.0	140.0	17.0	9.2	5035.	2	5	92
3	550	528.0	.	2280	7.68	38.	1420.0	569.0	35.6	4.2	3.2	5058.	2	6	92
4	550	500.0	.	2100	7.88	50.	.	.	.	.	.	.	2	10	92
5	550	483.2	.	1720	7.81	63.	.	.	.	.	.	.	2	12	92
6	550	488.2	.	1210	7.98	76.	.	.	.	.	.	.	2	13	92
7	550	496.8	.	625	8.23	107.	.	.	.	.	.	.	2	17	92
8	550	506.3	.	380	8.15	95.	.	.	.	.	.	.	2	19	92
9		2474.5	.	1207	8.02	78.	675.0	280.0	16.8	3.0	1.2	5081.	2	19	92
10	550	497.9	.	420	8.24	132.	92.0	51.0	16.0	3.0	0.8	5112.	2	21	92
11	500	236.0	0.0	1825	7.31	66.	1130.0	272.0	104.8	5.2	1.2	5122.	2	27	92
12	425	199.4	28.8	2375	7.39	57.	1400.0	354.0	126.2	5.6	1.6	5148.	3	5	92

Table A2.14. Variable Mass Drainage Quality Rinse Data: Solid T10 (reactor 9), mass 1125 g.

Rinse	Volume (mL)			S.C.	pH	Alk.	SO_4	Ca	Mg	Na	K	Sample	Month	Day	Year
	In	Out	Retained	(µS)	(s.u.)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)				
1	725	288.2	.	3550	7.63	91.	2210.0	480.0	298.0	57.8	16.6	5024.	2	4	92
2	725	689.9	.	3300	7.76	63.	2200.0	560.0	224.0	29.6	14.8	5036.	2	5	92
3	725	689.7	.	2400	7.60	33.	1450.0	580.0	41.4	4.2	3.8	5059.	2	6	92
4	725	662.4	.	2275	7.85	38.	.	.	.	.	.	.	2	10	92
5	725	623.4	.	2200	7.79	47.	.	.	.	.	.	.	2	12	92
6	725	649.6	.	1625	7.95	50.	.	.	.	.	.	.	2	14	92
7	725	672.1	.	875	8.27	98.	.	.	.	.	.	.	2	17	92
8	725	664.1	.	415	8.30	113.	.	.	.	.	.	.	2	19	92
9		3271.6	.	1465	8.04	71.	870.0	369.0	15.4	3.2	1.4	5082.	2	19	92
10	725	676.9	.	280	8.33	120.	34.4	34.0	11.2	3.0	0.8	5113.	2	21	92
11	650	360.6	79.4	1800	7.35	76.	900.0	250.0	106.4	4.8	1.4	5123.	2	27	92
12	450	166.0	55.6	2425	7.21	66.	1210.0	336.0	129.4	5.6	2.0	5149.	3	5	92

Table A2.15. Variable Mass Drainage Quality Rinse Data: Solid T10 (reactor 10), mass 1500 g.

Rinse	Volume (mL) In	Volume (mL) Out	Retained	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Sample	Month	Day	Year
1	925	354.8	.	4250	7.52	101.	2800.0	520.0	392.0	70.4	21.8	5025.	2	4	92
2	925	885.5	.	3300	7.78	57.	2210.0	560.0	218.0	27.6	15.0	5037.	2	5	92
3	925	890.5	.	2400	7.65	30.	1460.0	600.0	38.8	4.0	3.8	5060.	2	6	92
4	925	824.1	.	2275	7.74	35.	.	.	.	.	.	.	2	10	92
5	925	796.5	.	2350	7.65	38.	.	.	.	.	.	.	2	12	92
6	925	839.8	.	1975	7.95	57.	.	.	.	.	.	.	2	14	92
7	925	888.9	.	850	8.19	107.	.	.	.	.	.	.	2	17	92
8	925	823.0	.	280	8.26	107.	.	.	.	.	.	.	2	19	92
9		4172.3	.	1532	7.96	68.	820.0	380.0	13.6	3.0	1.4	5083.	2	19	92
10	925	891.5	.	240	8.27	107.	24.0	28.2	10.6	2.8	0.6	5114.	2	21	92
11	825	625.1	247.2	1100	7.50	139.	425.0	130.0	58.6	4.8	1.6	5124.	2	28	92
12	450	229.0	202.6	2425	7.15	101.	1010.0	318.0	126.6	6.0	2.0	5150.	3	5	92

Table A2.16. Variable Mass drainage quality: Solid T2 (reactor 3), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	200	143.6	.	1900.	6.80	19.0	1200.00	306.0	112.0	9003.	6	6	90
1	.	200	.	.	3050.	6.75	28.0	2200.00	591.0	218.0	9027.	6	13	90
2	.	200	155.0	.	3000.	7.22	31.0	1920.00	560.0	128.0	9051.	6	20	90
3	.	200	151.3	.	2300.	6.31	38.0	1500.00	534.0	91.0	9075.	6	27	90
4	.	200	167.9	.	1280.	8.00	70.0	.	.	.	.	7	4	90
5	.	200	171.0	.	650.	7.35	71.0	240.00	75.0	38.0	9099.	7	11	90
6	.	200	152.0	.	575.	8.00	68.0	.	.	.	.	7	18	90
7	.	200	155.0	.	550.	8.30	61.0	165.00	48.0	31.0	9123.	7	25	90
8	.	200	156.6	.	500.	8.05	68.0	.	.	.	.	8	1	90
9	.	200	153.8	.	500.	8.00	66.0	152.00	43.0	29.0	9147.	8	8	90
10	.	200	154.2	.	475.	7.90	59.0	.	.	.	.	8	15	90
11	.	200	151.2	.	460.	8.35	.	146.00	41.0	28.0	9171.	8	22	90
12	.	200	153.0	.	430.	8.30	78.0	.	.	.	.	8	29	90
13	.	200	152.6	.	405.	8.10	.	140.00	42.0	26.0	9195.	9	5	90
14	.	200	153.7	.	410.	8.15	86.0	.	.	.	.	9	12	90
15	.	200	.	.	388.	8.20	.	112.00	.	.	9219.	9	19	90
16	.	200	.	.	358.	8.20	84.0	.	.	.	.	9	26	90
17	.	200	.	.	370.	8.20	.	99.00	36.0	18.0	9243.	10	3	90
18	.	200	.	.	365.	8.20	74.0	.	.	.	.	10	10	90
19	.	200	152.4	.	335.	8.27	.	88.50	.	.	9267.	10	17	90
20	.	200	.	.	330.	8.18	84.0	.	.	.	.	10	24	90
21	.	200	.	.	295.	8.19	.	86.60	34.0	15.0	9291.	10	31	90
22	.	200	.	.	345.	8.15	80.0	.	.	.	.	11	7	90
23	.	200	153.7	.	302.	8.15	.	66.00	.	.	9315.	11	14	90
24	.	200	.	.	350.	8.30	88.0	.	.	.	.	11	21	90
25	.	200	.	.	335.	8.20	.	83.81	32.0	16.0	9339.	11	28	90
26	.	200	.	.	340.	8.10	81.0	.	.	.	.	12	5	90
27	.	200	152.1	.	303.	8.05	.	65.00	.	.	9363.	12	12	90
28	.	200	.	.	320.	8.28	78.0	.	.	.	.	12	19	90
29	.	200	.	.	240.	8.12	.	.	29.0	18.0	9387.	12	26	90
30	.	200	.	.	255.	8.10	73.0	.	.	.	.	1	2	91
31	.	200	154.3	.	275.	8.12	.	49.60	.	.	9411.	1	9	91
32	.	200	.	.	242.	7.88	73.0	.	.	.	.	1	16	91
33	.	200	.	.	252.	8.10	.	.	30.0	18.0	9435.	1	24	91
34	.	200	.	.	242.	8.11	76.0	.	.	.	.	1	30	91
35	.	200	.	.	240.	8.11	.	45.50	.	.	9459.	2	6	91
36	.	200	.	.	240.	8.13	78.0	.	.	.	.	2	13	91
37	.	200	.	.	220.	8.10	.	.	5.0	<2.0	9483.	2	20	91
38	.	200	152.0	.	238.	8.12	80.0	.	.	.	.	2	27	91
39	.	200	.	.	218.	8.22	.	.	.	.	9504.	3	6	91
40	.	200	.	.	227.	8.24	88.0	.	.	.	.	3	13	91
41	.	200	.	.	217.	8.22	.	45.00	28.0	16.0	9525.	3	20	91
42	.	200	.	.	230.	8.12	86.0	.	.	.	.	3	27	91
43	.	200	153.2	.	226.	8.21	.	48.00	.	.	9549.	4	3	91
44	.	200	.	.	240.	8.10	86.0	.	.	.	.	4	10	91
45	.	200	.	.	260.	8.15	.	52.60	30.0	19.0	9572.	4	17	91
46	.	200	.	.	270.	8.21	91.0	.	.	.	.	4	24	91

Table A2.17. (Continued) Variable Mass drainage quality: Solid T2 (reactor 3), 75 g sample.

Week	Week2	Volume (mL) In	Out	Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
47	.	200	.	.	245.	8.27	.	52.00	28.0	17.0	9585.	5	1	91
48	.	200	152.8	.	270.	8.20	88.0	.	.	.	.	5	8	91
49	.	200	.	.	220.	8.20	.	55.60	.	.	9613.	5	15	91
50	.	200	.	.	290.	8.25	74.0	.	.	.	.	5	22	91
51	.	200	.	.	292.	8.22	.	.	.	.	.	5	29	91
52	.	200	156.5	.	.	8.34	.	.	.	.	.	6	5	91
53	.	200	.	.	319.	8.28	.	64.00	28.8	18.8	9648.	6	12	91
54	.	200	.	.	294.	8.19	68.0	.	.	.	.	6	19	91
55	.	200	157.9	.	301.	8.12	.	.	.	.	.	6	26	91
56	.	200	.	.	330.	8.23	.	.	.	.	.	7	3	91
57	.	200	.	.	335.	8.23	.	81.50	28.6	19.2	9672.	7	10	91
58	1.	200	.	.	318.	8.08	66.0	.	.	.	.	7	17	91
59	2.	200	.	.	387.	8.03	.	106.00	29.4	19.8	9683.	7	24	91
60	3.	200	.	.	330.	8.16	60.0	.	.	.	.	7	31	91
61	4.	200	.	.	320.	8.13	.	.	.	.	9695.	8	7	91
62	5.	200	155.1	.	315.	8.22	60.0	.	.	.	.	8	14	91
63	6.	200	157.2	.	355.	8.14	63.0	86.50	30.4	20.8	9713.	8	21	91
64	7.	200	.	.	285.	8.03	.	.	.	.	.	8	28	91
65	8.	200	.	.	375.	8.01	63.0	.	.	.	9724.	9	4	91
66	9.	200	158.9	.	350.	8.16	68.0	.	.	.	.	9	11	91
67	10.	200	.	.	338.	8.22	.	78.50	28.4	20.4	9737.	9	19	91
68	11.	200	.	.	332.	8.17	.	.	.	.	.	9	24	91
69	12.	200	.	.	265.	8.11	74.0	30.00	26.4	15.4	9753.	10	2	91
70	13.	200	.	.	240.	8.15	.	.	.	.	.	10	9	91
71	14.	200	.	.	290.	8.13	76.0	.	.	.	9764.	10	16	91
72	15.	200	154.7	.	270.	8.08	74.0	.	.	.	.	10	23	91
73	16.	200	.	.	240.	8.04	.	.	.	.	9788.	10	30	91
74	17.	200	.	.	280.	8.04	81.0	.	.	.	.	11	6	91
75	18.	200	.	.	258.	8.24	88.0	39.20	26.6	18.2	9793.	11	13	91
76	19.	200	155.6	.	283.	8.12	.	.	.	.	.	11	20	91
77	20.	200	156.2	.	238.	8.13	82.0	33.20	26.0	13.8	9805.	11	27	91
78	21.	200	154.4	.	260.	8.05	77.0	31.20	26.2	14.2	9821.	12	4	91
79	22.	200	155.4	.	233.	8.13	97.0	44.60	.	.	9832.	12	11	91
80	23.	200	.	.	250.	8.19	.	.	.	.	.	12	18	91
81	24.	200	.	.	205.	8.14	.	33.00	22.0	10.8	9836.	12	26	91
82	25.	200	154.9	.	240.	8.10	.	.	.	.	.	1	2	92
83	26.	200	155.1	.	240.	8.01	88.0	42.60	.	.	9852.	1	8	92
84	27.	200	153.5	.	274.	8.17	.	.	.	.	.	1	15	92
85	28.	200	153.4	.	224.	8.15	91.0	36.20	.	.	9856.	1	22	92
86	29.	200	.	.	260.	8.20	.	.	.	.	.	1	29	92
87	30.	200	155.8	.	230.	8.13	82.0	39.20	24.2	12.8	9861.	2	5	92
88	31.	200	156.5	.	232.	8.19	.	.	.	.	.	2	12	92
89	32.	200	157.0	.	245.	8.08	.	47.60	24.6	13.0	9884.	2	19	92
90	33.	200	152.9	.	253.	8.12	82.0	.	.	.	.	2	26	92
91	34.	200	153.8	.	280.	8.17	.	.	.	.	.	3	4	92
92	35.	200	157.7	.	223.	8.07	91.0	.	.	.	.	3	11	92

Table A2.18. (Continued) Variable Mass drainage quality: Solid T2 (reactor 3), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
93	36.	200	153.8	.	225.	8.02	.	44.60	24.4	13.8	9900.	3	18	92
94	37.	200	154.2	.	250.	8.16	.	.	.	.	.	3	25	92
95	38.	200	153.3	.	260.	7.99	82.0	.	.	.	.	4	1	92
96	39.	200	149.9	.	475.	8.22	.	.	.	.	.	4	8	92
97	40.	200	156.8	.	280.	8.14	88.0	46.40	23.6	13.0	9904.	4	15	92
98	41.	200	156.8	.	260.	7.96	63.0	.	.	.	.	4	22	92
99	42.	200	149.8	.	300.	7.67	80.0	.	.	.	.	4	29	92
100	43.	200	.	.	245.	7.67	.	.	.	.	.	5	6	92
101	44.	200	152.0	.	245.	7.97	66.0	.	.	.	40020.	5	13	92
102	45.	200	147.9	.	281.	7.94	.	.	.	.	.	5	20	92
103	46.	200	156.5	.	310.	7.75	104.0	.	.	.	.	5	27	92
104	47.	200	149.3	.	275.	8.05	.	.	.	.	.	6	3	92
105	48.	200	153.4	.	305.	8.20	94.5	.	.	.	.	6	10	92
106	49.	200	158.1	.	270.	8.20	.	.	.	.	40025.	6	17	92

Table A2.19. Variable Mass drainage quality: Solid T2 (reactor 4), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	200	145.2	.	1950.	6.40	9.5	1286.00	292.0	130.0	9004.	6	6	90
1	.	200	.	.	2850.	6.75	33.0	1950.00	578.0	184.0	9028.	6	13	90
2	.	200	165.0	.	2850.	7.20	41.0	1750.00	553.0	105.0	9052.	6	20	90
3	.	200	155.7	.	2500.	6.50	47.0	1630.00	526.0	111.0	9076.	6	27	90
4	.	200	166.8	.	1320.	8.10	74.0	.	.	.	.	7	4	90
5	.	200	171.0	.	750.	7.50	68.0	316.00	91.0	43.0	9100.	7	11	90
6	.	200	154.0	.	640.	8.10	64.0	.	.	.	.	7	18	90
7	.	200	156.2	.	575.	8.30	57.0	184.00	50.0	32.0	9124.	7	25	90
8	.	200	159.2	.	503.	8.15	66.0	.	.	.	.	8	1	90
9	.	200	155.4	.	500.	8.10	66.0	148.00	43.0	29.0	9148.	8	8	90
10	.	200	154.3	.	475.	8.05	66.0	.	.	.	.	8	15	90
11	.	200	152.9	.	455.	8.40	.	160.00	40.0	28.0	9172.	8	22	90
12	.	200	154.6	.	410.	8.30	80.0	.	.	.	.	8	29	90
13	.	200	154.0	.	405.	8.20	.	140.00	40.0	25.0	9196.	9	5	90
14	.	200	153.5	.	395.	8.20	86.0	.	.	.	.	9	12	90
15	.	200	.	.	380.	8.20	.	105.00	32.0	17.0	9220.	9	19	90
16	.	200	.	.	338.	8.21	87.0	.	.	.	.	9	26	90
17	.	200	.	.	350.	8.26	.	100.00	.	.	9244.	10	3	90
18	.	200	.	.	345.	8.20	77.0	.	.	.	.	10	10	90
19	.	200	151.4	.	330.	8.28	.	77.50	32.0	16.0	9268.	10	17	90
20	.	200	.	.	340.	8.21	90.0	.	.	.	.	10	24	90
21	.	200	.	.	288.	8.20	.	69.00	.	.	9292.	10	31	90
22	.	200	.	.	500.	8.03	86.0	.	.	.	.	11	7	90
23	.	200	151.2	.	315.	8.15	.	104.78	34.0	19.0	9316.	11	14	90
24	.	200	.	.	330.	8.30	94.0	.	.	.	.	11	21	90
25	.	200	.	.	330.	8.15	.	58.50	.	.	9340.	11	28	90
26	.	200	.	.	315.	8.15	78.0	.	.	.	.	12	5	90
27	.	200	150.7	.	305.	8.05	.	71.13	29.0	13.0	9364.	12	12	90
28	.	200	.	.	278.	8.24	68.0	.	.	.	.	12	19	90
29	.	200	.	.	215.	8.07	.	56.20	.	.	9388.	12	26	90
30	.	200	.	.	249.	8.09	65.0	.	.	.	.	1	2	91
31	.	200	150.4	.	264.	8.15	.	.	28.0	17.0	9412.	1	9	91
32	.	200	.	.	230.	7.92	65.0	.	.	.	.	1	16	91
33	.	200	.	.	240.	8.12	.	51.60	.	.	9436.	1	24	91
34	.	200	.	.	230.	8.13	70.0	.	.	.	.	1	30	91
35	.	200	.	.	233.	8.18	.	.	28.0	16.0	9460.	2	6	91
36	.	200	.	.	220.	8.21	79.0	.	.	.	.	2	13	91
37	.	200	.	.	223.	8.19	.	.	.	.	9483.	2	20	91
38	.	200	151.2	.	237.	8.20	87.0	.	.	.	.	2	27	91
39	.	200	.	.	225.	8.30	.	.	27.0	16.0	9504.	3	6	91
40	.	200	.	.	215.	8.22	76.0	.	.	.	.	3	13	91
41	.	200	.	.	216.	8.22	.	42.00	.	.	9526.	3	20	91
42	.	200	.	.	218.	8.20	81.0	.	.	.	.	3	27	91
43	.	200	151.4	.	224.	8.23	.	43.00	28.0	16.0	9550.	4	3	91
44	.	200	.	.	240.	8.20	94.0	.	.	.	.	4	10	91
45	.	200	.	.	262.	8.20	.	.	30.0	19.0	9572.	4	17	91

Table A2.20. (Continued) Variable Mass drainage quality: Solid T2 (reactor 4), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
46	.	200	.	.	271.	8.23	99.0	.	.	.	.	4	24	91
47	.	200	.	.	240.	8.29	.	46.00	.	.	9586.	5	1	91
48	.	200	155.1	.	264.	8.20	86.0	.	.	.	.	5	8	91
49	.	200	.	.	245.	8.23	.	56.00	.	.	9614.	5	15	91
50	.	200	.	.	280.	8.20	74.0	.	.	.	.	5	22	91
51	.	200	.	.	302.	8.25	.	52.50	.	.	9636.	5	29	91
52	.	200	165.7	.	.	8.35	71.0	.	.	.	.	6	5	91
53	.	200	.	.	300.	8.28	.	.	.	.	.	6	12	91
54	.	200	.	.	294.	8.19	.	.	.	.	.	6	19	91
55	.	200	153.9	.	296.	8.17	.	72.80	28.0	18.1	9660.	6	26	91
56	.	200	.	.	330.	8.25	42.0	.	.	.	.	7	3	91
57	.	200	.	.	300.	8.28	.	.	.	.	.	7	10	91
62	5.	200	152.3	.	520.	8.10	81.0	161.00	53.6	31.8	9700.	7	19	91
67	10.	200	.	.	500.	8.13	.	152.00	48.6	29.2	9738.	8	14	91
72	15.	200	151.9	.	372.	8.17	79.0	81.00	34.2	19.4	9770.	10	23	91
77	20.	200	154.0	.	315.	8.15	98.0	67.20	32.4	16.6	9806.	11	27	91
82	25.	200	153.0	.	277.	8.14	95.0	51.20	29.2	14.6	9841.	1	2	92
87	30.	200	154.8	.	274.	8.19	95.0	55.60	30.0	14.8	9862.	2	5	92
92	35.	200	151.0	.	290.	8.12	104.0	63.20	30.8	15.0	9889.	3	11	92
99	42.	200	153.6	.	375.	7.81	95.0	69.20	37.8	17.2	40009.	4	29	92
106	49.	200	152.8	.	385.	8.20	88.0	.	.	.	40026.	6	17	92

Table A2.21. Variable Mass drainage quality: Solid T2 (reactor 11), 225 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	275	153.7	23.1	1175.	7.80	76.0	625.00	175.0	69.0	5171.	3	12	92
2	.	275	161.1	19.3	1000.	7.91	85.0	575.00	159.0	66.2	5202.	3	19	92
3	.	275	173.0	34.6	1070.	7.93	69.0	560.00	159.0	62.0	5217.	3	26	92
4	.	275	165.1	22.0	1300.	7.94	69.0	530.00	155.0	60.0	5248.	4	2	92
5	.	275	162.2	14.6	1150.	7.89	.	.	.	.	.	4	9	92
6	.	275	163.8	19.7	1125.	7.93	76.0	496.00	120.0	50.6	45010.	4	16	92
7	.	265	154.9	16.4	1200.	8.01	.	.	.	.	.	4	23	92
8	.	265	166.8	16.4	1000.	8.15	77.0	430.00	105.0	45.2	45025.	4	30	92
9	.	265	148.2	.	950.	8.09	.	.	.	.	.	5	7	92
10	.	265	132.8	.	1100.	7.89	63.0	.	.	.	45039.	5	14	92
11	.	280	145.6	.	835.	8.13	.	.	.	.	.	5	21	92
12	.	280	164.3	.	880.	7.88	76.0	.	.	.	45051.	5	28	92

Table A2.22. Variable Mass drainage quality: Solid T2 (reactor 12), 375 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	300	140.1	47.7	1800.	7.64	72.0	900.00	286.0	110.0	5172.	3	12	92
2	.	325	205.0	76.3	1300.	7.96	88.0	780.00	216.0	91.8	5203.	3	19	92
3	.	325	214.7	85.4	1200.	7.97	88.0	670.00	181.0	74.0	5218.	3	26	92
4	.	300	186.0	77.2	1500.	7.95	82.0	750.00	202.0	77.2	5249.	4	2	92
5	.	300	177.1	65.7	1600.	7.94	.	.	.	.	.	4	9	92
6	.	300	190.7	74.9	1550.	7.86	79.0	730.00	189.0	74.8	45011.	4	16	92
7	.	275	162.5	66.5	1850.	7.93	.	.	.	.	.	4	23	92
8	.	275	178.0	59.1	1500.	8.09	69.0	740.00	192.0	75.0	45026.	4	30	92
9	.	275	152.5	.	1450.	8.01	.	.	.	.	.	5	7	92
10	.	275	110.9	.	1450.	7.88	63.0	.	.	.	45040.	5	14	92
11	.	300	113.1	.	1435.	8.06	.	.	.	.	.	5	21	92
12	.	325	189.7	.	1300.	7.83	69.0	.	.	.	45052.	5	28	92

Table A2.23. Variable Mass drainage quality: Solid T2 (reactor 13), 750 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	425	237.1	197.9	1175.	7.41	91.0	490.00	174.0	66.8	5173.	3	12	92
2	.	350	71.3	90.6	2000.	7.84	.	1100.00	324.0	136.0	5204.	3	19	92
3	.	375	135.6	128.1	2400.	7.81	63.0	1610.00	416.0	169.0	5219.	3	26	92
4	.	375	132.7	126.7	3100.	7.80	57.0	1840.00	466.0	192.4	5250.	4	2	92
5	.	390	166.9	139.2	3250.	7.78	.	.	.	.	.	4	9	92
6	.	390	202.9	168.9	3100.	7.71	66.0	1750.00	448.0	181.0	45012.	4	16	92
7	.	375	173.2	147.1	2950.	7.84	.	.	.	.	.	4	23	92
8	.	375	165.1	148.8	2925.	7.92	63.0	1720.00	446.0	168.0	45027.	4	30	92
9	.	375	162.3	.	2350.	7.93	.	.	.	.	.	5	7	92
10	.	375	.	.	.	.	.	.	.	.	.	5	14	92
11	.	525	133.1	.	2850.	7.73	.	.	.	.	.	5	21	92
12	.	500	213.0	.	2300.	7.71	57.0	.	.	.	45053.	5	28	92

Table A2.24. Variable Mass drainage quality: Solid T2 (reactor 14), 1125 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	450	263.3	351.4	1000.	7.53	98.0	515.00	136.0	53.8	5174.	3	12	92
2	.	350	103.4	277.2	1700.	7.91	.	920.00	276.0	113.6	5205.	3	19	92
3	.	400	202.1	302.6	2100.	7.85	76.0	1400.00	372.0	156.0	5220.	3	26	92
4	.	400	166.3	267.6	3300.	7.81	66.0	1870.00	464.0	196.8	5251.	4	2	92
5	.	400	177.0	267.3	3700.	7.80	.	.	.	.	.	4	9	92
6	.	400	197.3	282.9	3775.	7.71	79.0	2340.00	536.0	256.0	45013.	4	16	92
7	.	375	166.4	264.5	3950.	7.84	.	.	.	.	.	4	23	92
8	.	375	176.5	236.5	3850.	7.93	63.0	2380.00	526.0	278.0	45028.	4	30	92
9	.	375	153.4	.	3500.	7.91	.	.	.	.	.	5	7	92
10	.	375	.	.	.	.	.	.	.	.	.	5	14	92
11	.	600	130.5	.	3700.	7.92	.	.	.	.	.	5	21	92
12	.	575	272.9	.	3200.	7.66	63.0	.	.	.	45054.	5	28	92

Table A2.25. Variable Mass drainage quality: Solid T2 (reactor 15), 1500 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	500	287.7	484.2	775.	7.92	110.0	332.00	99.0	43.6	5175.	3	12	92
2	.	375	32.3	325.2	1500.	7.84	.	845.00	230.0	93.4	5206.	3	19	92
3	.	450	166.0	377.6	2700.	7.91	88.0	1800.00	464.0	199.0	5221.	3	26	92
4	.	450	138.5	339.8	4000.	7.80	79.0	2340.00	566.0	294.0	5252.	4	2	92
5	.	450	172.5	359.1	4150.	7.89	.	.	.	.	.	4	9	92
6	.	450	203.0	395.5	4350.	7.80	104.0	2670.00	568.0	334.0	45014.	4	16	92
7	.	425	203.0	393.8	4750.	7.95	.	.	.	.	.	4	23	92
8	.	400	173.4	384.2	4075.	8.03	107.0	2480.00	540.0	332.0	45029.	4	30	92
9	.	400	146.8	.	3800.	7.99	.	.	.	.	.	5	7	92
10	.	400	.	.	.	.	.	.	.	.	.	5	14	92
11	.	700	136.9	.	4100.	7.96	.	.	.	.	.	5	21	92
12	.	650	290.4	.	4000.	7.61	82.0	.	.	.	45055.	5	28	92

Table A2.26. Variable Mass drainage quality: Solid T4 (reactor 7), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	200	164.4	.	725.	6.85	14.0	430.00	135.0	16.0	9007.	6	6	90
1	.	200	.	.	220.	7.25	33.0	55.00	23.0	9.0	9031.	6	13	90
2	.	200	164.2	.	153.	7.35	38.0	16.00	14.0	6.0	9055.	6	20	90
3	.	200	163.5	.	139.	7.11	47.0	12.00	14.0	6.0	9079.	6	27	90
4	.	200	164.6	.	132.	8.25	45.0	.	.	.	.	7	4	90
5	.	200	170.0	.	140.	7.60	38.0	14.00	13.0	6.0	9103.	7	11	90
6	.	200	163.2	.	140.	8.70	47.0	.	.	.	.	7	18	90
7	.	200	162.7	.	145.	8.35	43.0	6.00	13.0	5.0	9127.	7	25	90
8	.	200	161.0	.	142.	8.20	47.0	.	.	.	.	8	1	90
9	.	200	162.3	.	140.	8.30	50.0	9.00	14.0	6.0	9151.	8	8	90
10	.	200	165.3	.	140.	8.25	52.0	.	.	.	.	8	15	90
11	.	200	166.2	.	120.	8.40	.	<7.00	14.0	5.0	9175.	8	22	90
12	.	200	163.0	.	120.	8.30	55.0	.	.	.	.	8	29	90
13	.	200	165.4	.	133.	8.30	.	8.00	16.0	6.0	9199.	9	5	90
14	.	200	164.4	.	95.	8.20	37.0	.	.	.	.	9	12	90
15	.	200	.	.	100.	8.29	.	6.60	.	.	9223.	9	19	90
16	.	200	.	.	123.	8.20	59.0	.	.	.	.	9	26	90
17	.	200	.	.	100.	8.20	.	6.00	11.0	<5.0	9247.	10	3	90
18	.	200	.	.	129.	8.20	46.0	.	.	.	.	10	10	90
19	.	200	163.4	.	120.	8.21	.	6.90	.	.	9271.	10	17	90
20	.	200	.	.	120.	8.14	54.0	.	.	.	.	10	24	90
21	.	200	.	.	120.	8.11	.	11.14	16.0	<5.0	9295.	10	31	90
22	.	200	.	.	130.	8.05	54.0	.	.	.	.	11	7	90
23	.	200	163.6	.	124.	8.10	.	6.20	.	.	9319.	11	14	90
24	.	200	.	.	128.	8.20	57.0	.	.	.	.	11	21	90
25	.	200	.	.	136.	8.12	.	9.90	16.0	<5.0	9343.	11	28	90
26	.	200	.	.	138.	7.92	54.0	.	.	.	.	12	5	90
27	.	200	166.6	.	98.	7.82	.	3.60	.	.	9367.	12	12	90
28	.	200	.	.	95.	8.16	32.0	.	.	.	.	12	19	90
29	.	200	.	.	125.	8.09	.	.	16.0	8.0	9391.	12	26	90
30	.	200	.	.	98.	8.09	43.0	.	.	.	.	1	2	91
31	.	200	167.9	.	108.	8.15	.	7.00	.	.	9415.	1	9	91
32	.	200	.	.	120.	8.00	54.0	.	.	.	.	1	16	91
33	.	200	.	.	109.	8.12	.	.	16.0	7.0	9439.	1	24	91
34	.	200	.	.	119.	8.08	59.0	.	.	.	.	1	30	91
35	.	200	.	.	104.	8.10	.	5.20	.	.	9463.	2	6	91
36	.	200	.	.	120.	8.18	59.0	.	.	.	.	2	13	91
37	.	200	.	.	113.	8.18	.	.	15.0	7.0	9486.	2	20	91
38	.	200	161.5	.	99.	8.19	54.0	.	.	.	.	2	27	91
39	.	200	.	.	109.	8.12	.	7.00	.	.	9507.	3	6	91
40	.	200	.	.	120.	8.20	64.0	.	.	.	.	3	13	91
41	.	200	.	.	102.	8.17	.	7.80	16.0	7.0	9529.	3	20	91
42	.	200	.	.	117.	8.16	61.0	.	.	.	.	3	27	91
43	.	200	162.4	.	100.	8.17	.	6.30	.	.	9553.	4	3	91
44	.	200	.	.	125.	8.12	63.0	.	.	.	.	4	10	91
45	.	200	.	.	112.	8.00	.	9.30	17.0	8.0	9574.	4	17	91
46	.	200	.	.	128.	8.12	63.0	.	.	.	.	4	24	91

Table A2.27. (Continued) Variable Mass drainage quality: Solid T4 (reactor 7), 75 g sample.

Week	Week2	Volume (mL) In	Out	Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
47	.	200	.	.	125.	8.21	.	10.50	16.0	8.0	9589.	5	1	91
48	.	200	165.8	.	122.	8.12	63.0	.	.	.	.	5	8	91
49	.	200	.	.	132.	8.20	.	9.90	.	.	9617.	5	15	91
50	.	200	.	.	145.	8.15	51.0	.	.	.	.	5	22	91
51	.	200	.	.	130.	8.14	.	.	.	.	.	5	29	91
52	.	200	160.0	.	.	8.22	.	.	.	.	.	6	5	91
53	.	200	.	.	135.	8.24	.	14.70	15.0	8.4	9650.	6	12	91
54	.	200	.	.	137.	8.12	47.0	.	.	.	.	6	19	91
55	.	200	163.9	.	89.	8.04	.	.	.	.	.	6	26	91
56	.	200	.	.	150.	8.19	.	.	.	.	.	7	3	91
57	.	200	.	.	152.	8.25	.	18.40	14.4	8.8	9674.	7	10	91
60	3.	200	.	.	200.	8.16	62.0	23.20	18.4	10.8	9689.	7	31	91
63	6.	200	162.0	.	152.	8.09	45.0	18.60	16.4	9.0	9715.	8	21	91
66	9.	200	161.6	.	178.	8.14	.	.	.	.	9730.	9	11	91
69	12.	200	.	.	170.	7.98	60.0	17.50	19.0	9.8	9755.	10	2	91
72	15.	200	163.7	.	158.	8.12	58.0	11.60	16.6	8.0	9773.	10	23	91
75	18.	200	.	.	153.	8.12	82.0	7.30	20.8	9.0	9795.	11	13	91
78	21.	200	163.7	.	153.	7.99	72.0	9.00	18.4	8.2	9823.	12	4	91
88	31.	200	160.8	.	162.	8.12	82.0	12.80	20.8	8.2	9878.	2	12	92
98	41.	200	166.0	.	205.	7.98	65.0	18.40	19.0	7.4	40002.	4	22	92

Table A2.28. Variable Mass drainage quality: Solid T4 (reactor 8), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	200	161.9	.	600.	6.85	.	390.00	117.0	14.0	9008.	6	6	90
1	.	200	.	.	378.	7.25	33.0	130.00	41.0	15.0	9032.	6	13	90
2	.	200	163.2	.	168.	7.45	47.0	25.00	16.0	6.0	9056.	6	20	90
3	.	200	161.9	.	142.	7.20	50.0	15.00	14.0	6.0	9080.	6	27	90
4	.	200	162.1	.	137.	8.28	47.0	.	.	.	.	7	4	90
5	.	200	170.0	.	142.	7.50	35.0	16.00	13.0	6.0	9104.	7	11	90
6	.	200	162.4	.	150.	8.20	50.0	.	.	.	.	7	18	90
7	.	200	161.5	.	150.	8.35	52.0	9.00	14.0	6.0	9128.	7	25	90
8	.	200	158.2	.	150.	8.20	50.0	.	.	.	.	8	1	90
9	.	200	160.2	.	142.	8.30	52.0	11.00	15.0	6.0	9152.	8	8	90
10	.	200	159.7	.	150.	8.20	47.0	.	.	.	.	8	15	90
11	.	200	161.2	.	132.	8.40	.	7.00	15.0	6.0	9176.	8	22	90
12	.	200	161.3	.	130.	8.35	57.0	.	.	.	.	8	29	90
13	.	200	162.2	.	130.	8.30	.	8.00	16.0	6.0	9200.	9	5	90
14	.	200	162.8	.	118.	8.29	43.0	.	.	.	.	9	12	90
15	.	200	.	.	128.	8.29	.	8.90	13.0	<5.0	9224.	9	19	90
16	.	200	.	.	124.	8.20	59.0	.	.	.	.	9	26	90
17	.	200	.	.	127.	8.28	.	9.60	.	.	9248.	10	3	90
18	.	200	.	.	132.	8.20	57.0	.	.	.	.	10	10	90
19	.	200	162.2	.	123.	8.22	.	7.00	15.0	<5.0	9272.	10	17	90
20	.	200	.	.	125.	8.14	52.0	.	.	.	.	10	24	90
21	.	200	.	.	125.	8.12	.	8.60	.	.	9296.	10	31	90
22	.	200	.	.	130.	8.08	57.0	.	.	.	.	11	7	90
23	.	200	163.7	.	122.	8.10	.	9.88	15.0	<5.0	9320.	11	14	90
24	.	200	.	.	125.	8.22	57.0	.	.	.	.	11	21	90
25	.	200	.	.	140.	8.12	.	8.00	.	.	9344.	11	28	90
26	.	200	.	.	135.	8.02	55.0	.	.	.	.	12	5	90
27	.	200	162.6	.	117.	7.98	.	8.45	13.0	<5.0	9368.	12	12	90
28	.	200	.	.	121.	8.18	51.0	.	.	.	.	12	19	90
29	.	200	.	.	112.	8.05	.	7.40	.	.	9392.	12	26	90
30	.	200	.	.	102.	8.07	49.0	.	.	.	.	1	2	91
31	.	200	163.9	.	122.	8.10	.	.	16.0	7.0	9416.	1	9	91
32	.	200	.	.	135.	8.00	59.0	.	.	.	.	1	16	91
33	.	200	.	.	109.	8.10	.	6.80	.	.	9440.	1	24	91
34	.	200	.	.	124.	8.05	59.0	.	.	.	.	1	30	91
35	.	200	.	.	118.	8.16	.	.	16.0	7.0	9464.	2	6	91
36	.	200	.	.	120.	8.14	62.0	.	.	.	.	2	13	91
37	.	200	.	.	101.	8.15	.	5.40	.	.	9487.	2	20	91
38	.	200	.	.	117.	8.16	60.0	.	.	.	.	2	27	91
39	.	200	160.6	.	92.	8.11	.	.	12.0	5.0	9508.	3	6	91
40	.	200	.	.	127.	8.21	62.0	.	.	.	.	3	13	91
41	.	200	.	.	118.	8.18	.	9.40	.	.	9530.	3	20	91
42	.	200	.	.	119.	8.18	63.0	.	.	.	.	3	27	91
43	.	200	160.9	.	112.	8.20	.	7.70	16.0	7.0	9554.	4	3	91
44	.	200	.	.	125.	8.15	63.0	.	.	.	.	4	10	91
45	.	200	.	.	128.	8.08	.	9.30	17.0	8.0	9574.	4	17	91
46	.	200	.	.	124.	8.13	65.0	.	.	.	.	4	24	91

Table A2.29. (Continued) Variable Mass drainage quality: Solid T4 (reactor 8), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
47	.	200	.	.	115.	8.20	.	8.20	.	.	9590.	5	1	91
48	.	200	162.5	.	140.	8.14	63.0	.	.	.	.	5	8	91
49	.	200	.	.	130.	8.18	.	10.20	.	.	9618.	5	15	91
50	.	200	.	.	142.	8.15	57.0	.	.	.	.	5	22	91
51	.	200	.	.	132.	8.12	.	14.40	.	.	9638.	5	29	91
52	.	200	159.2	.	.	8.20	42.0	.	.	.	.	6	5	91
53	.	200	.	.	118.	8.22	.	.	.	.	.	6	12	91
54	.	200	.	.	137.	8.15	.	.	.	.	.	6	19	91
55	.	200	157.0	.	121.	8.10	.	15.70	13.6	8.2	9662.	6	26	91
56	.	200	.	.	140.	8.19	47.0	.	.	.	.	7	3	91
57	.	200	.	.	142.	8.30	.	.	.	.	.	7	10	91
62	5.	200	158.5	.	184.	8.17	63.0	24.80	20.2	12.2	9702.	8	14	91
67	10.	200	.	.	215.	8.16	.	30.00	19.8	12.4	9740.	9	19	91
72	15.	200	162.2	.	170.	8.10	60.0	15.00	17.6	8.8	9774.	10	23	91
77	20.	200	162.1	.	157.	8.12	63.0	9.80	19.2	8.6	9808.	11	27	91
82	25.	200	160.6	.	162.	8.10	72.0	12.10	18.4	8.4	9843.	1	2	92
87	30.	200	160.4	.	155.	8.12	63.0	11.90	17.6	7.4	9864.	2	5	92
92	35.	200	159.4	.	145.	8.05	76.0	12.40	18.0	7.6	9891.	3	11	92
99	42.	200	161.2	.	183.	7.86	72.0	17.20	19.6	8.2	40011.	4	29	92
106	49.	200	159.5	.	182.	8.19	67.0	.	.	.	40028.	6	17	92

Table A2.30. Variable Mass drainage quality: Solid T4 (reactor 1), 225 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	275	174.0	17.2	162.	8.08	88.0	14.80	14.0	10.8	5161.	3	12	92
2	.	275	172.7	11.5	160.	7.96	82.0	39.20	13.8	11.8	5192.	3	19	92
3	.	275	177.4	19.4	162.	7.90	82.0	18.60	13.4	11.6	5207.	3	26	92
4	.	265	163.5	13.0	200.	7.84	101.0	19.40	13.6	10.6	5238.	4	2	92
5	.	265	158.5	6.0	140.	8.04	.	.	.	.	.	4	9	92
6	.	265	161.4	9.3	197.	7.88	72.0	27.80	13.6	10.0	45000.	4	16	92
7	.	265	157.7	7.8	215.	7.96	.	.	.	.	.	4	23	92
8	.	265	159.1	7.2	205.	8.13	69.0	29.00	13.6	9.4	45015.	4	30	92
9	.	265	157.0	6.0	215.	8.13	102.0	.	.	.	.	5	7	92
10	.	265	156.7	5.8	205.	8.11	91.0	.	.	.	45030.	5	14	92
11	.	265	154.6	7.5	230.	7.96	.	.	.	.	.	5	21	92
12	.	265	156.6	.	210.	7.66	82.0	.	.	.	45041.	5	28	92

Table A2.31. Variable Mass drainage quality: Solid T4 (reactor 2), 225 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	300	190.1	47.6	223.	8.35	107.0	25.60	17.6	16.0	5162.	3	12	92
2	.	300	184.9	35.5	220.	8.15	88.0	31.60	17.0	16.0	5193.	3	19	92
3	.	300	191.9	46.9	208.	8.15	88.0	28.00	16.4	15.6	5208.	3	26	92
4	.	275	167.7	47.6	170.	8.19	98.0	28.20	16.4	14.2	5239.	4	2	92
5	.	275	150.9	30.7	250.	8.09	.	.	.	.	.	4	9	92
6	.	275	165.8	33.6	268.	7.94	91.0	43.20	16.2	14.2	45001.	4	16	92
7	.	275	158.7	35.5	240.	8.08	.	.	.	.	.	4	23	92
8	.	275	150.0	33.5	320.	8.26	95.0	61.20	19.4	17.0	45016.	4	30	92
9	.	275	146.8	.	290.	8.20	101.0	.	.	.	.	5	7	92
10	.	275	132.7	.	340.	8.08	88.0	.	.	.	45031.	5	14	92
11	.	275	144.4	.	300.	8.13	.	.	.	.	.	5	21	92
12	.	275	151.7	.	280.	7.86	85.0	.	.	.	45042.	5	28	92

Table A2.32. Variable Mass drainage quality: Solid T4 (reactor 3), 750 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	375	182.2	100.2	315.	8.28	139.0	45.20	20.6	23.2	5163.	3	12	92
2	.	375	175.8	83.9	300.	8.20	113.0	54.00	18.6	23.2	5194.	3	19	92
3	.	375	186.5	103.6	270.	8.21	104.0	50.00	17.2	21.0	5209.	3	26	92
4	.	355	160.7	94.5	290.	8.22	110.0	52.40	17.6	19.8	5240.	4	2	92
5	.	355	129.4	62.4	275.	8.15	.	.	.	.	.	4	9	92
6	.	355	145.6	79.6	405.	8.05	107.0	83.50	19.2	24.0	45002.	4	16	92
7	.	375	158.4	73.8	430.	8.02	.	.	.	.	.	4	23	92
8	.	375	159.2	86.4	380.	8.30	101.0	405.00	19.6	21.0	45017.	4	30	92
9	.	375	144.6	.	410.	8.31	120.0	.	.	.	.	5	7	92
10	.	375	82.1	.	570.	8.10	.	.	.	.	45032.	5	14	92
11	.	425	118.9	.	448.	8.13	.	.	.	.	.	5	21	92
12	.	475	191.7	.	340.	7.99	82.0	.	.	.	45043.	5	28	92

Table A2.33. Variable Mass drainage quality: Solid T4 (reactor 4), 1125 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	425	100.7	78.6	328.	8.37	132.0	58.40	17.2	24.8	5164.	3	12	92
2	.	425	234.5	180.1	360.	8.26	120.0	80.00	19.8	28.0	5195.	3	19	92
3	.	425	230.4	209.6	310.	8.22	113.0	74.00	19.4	26.0	5210.	3	26	92
4	.	375	170.6	198.3	340.	8.26	107.0	74.00	18.2	23.6	5241.	4	2	92
5	.	375	136.2	168.7	340.	8.16	.	.	.	.	.	4	9	92
6	.	375	160.2	190.9	435.	8.05	110.0	51.50	19.2	24.4	45003.	4	16	92
7	.	375	152.1	184.3	485.	8.17	.	.	.	.	.	4	23	92
8	.	375	146.4	189.6	500.	8.29	101.0	130.00	24.6	29.6	45018.	4	30	92
9	.	375	134.7	.	450.	8.28	107.0	.	.	.	.	5	7	92
10	.	390	44.0	.	500.	8.30	.	.	.	.	45033.	5	14	92
11	.	500	104.4	.	625.	8.20	.	.	.	.	.	5	21	92
12	.	500	191.9	.	620.	7.97	107.0	.	.	.	45044.	5	28	92

Table A2.34. Variable Mass drainage quality: Solid T4 (reactor 5), 1500 g sample.

Week	Week2	Volume (mL) In	Out	Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	450	183.7	243.1	342.	8.34	126.0	61.60	18.4	26.0	5165.	3	12	92
2	.	500	220.8	229.1	330.	8.27	120.0	82.00	19.6	29.2	5196.	3	19	92
3	.	450	205.2	258.6	320.	8.22	101.0	88.80	19.4	28.0	5211.	3	26	92
4	.	425	164.7	252.8	385.	8.23	101.0	92.00	19.2	26.0	5242.	4	2	92
5	.	425	181.8	268.2	390.	8.17	.	.	.	.	.	4	9	92
6	.	425	215.1	297.3	470.	8.06	104.0	110.50	25.8	28.6	45004.	4	16	92
7	.	400	180.4	281.5	500.	8.17	.	.	.	.	.	4	23	92
8	.	400	166.2	280.1	525.	8.29	113.0	152.00	29.0	33.2	45019.	4	30	92
9	.	400	152.9	.	490.	8.25	.	.	.	.	.	5	7	92
10	.	400	.	.	.	.	.	.	.	.	.	5	14	92
11	.	600	102.2	.	620.	8.23	.	.	.	.	.	5	21	92
12	.	600	259.5	.	650.	8.04	88.0	.	.	.	45045.	5	28	92

Table A2.35. Variable Mass drainage quality: Solid T10 (reactor 19), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (μ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	200	167.6	.	1750.	7.00	19.0	1100.00	317.0	90.0	9019.	6	6	90
1	.	200	.	.	2100.	7.10	38.0	1500.00	492.0	52.0	9043.	6	13	90
2	.	200	164.6	.	720.	7.75	52.0	400.00	114.0	33.0	9067.	6	20	90
3	.	200	167.0	.	520.	7.42	69.0	232.00	66.0	29.0	9091.	6	27	90
4	.	200	165.0	.	520.	8.21	67.0	.	.	.	.	7	4	90
5	.	200	170.0	.	500.	7.25	57.0	193.00	54.0	24.0	9115.	7	11	90
6	.	200	164.5	.	470.	8.15	64.0	.	.	.	.	7	18	90
7	.	200	164.9	.	465.	8.35	71.0	136.00	44.0	20.0	9139.	7	25	90
8	.	200	166.5	.	427.	8.20	66.0	.	.	.	.	8	1	90
9	.	200	166.5	.	410.	8.15	77.0	123.00	41.0	21.0	9163.	8	8	90
10	.	200	167.5	.	400.	8.10	71.0	.	.	.	.	8	15	90
11	.	200	145.5	.	360.	8.40	.	97.00	38.0	20.0	9187.	8	22	90
12	.	200	167.0	.	340.	8.25	78.0	.	.	.	.	8	29	90
13	.	200	167.9	.	338.	8.30	.	89.00	37.0	20.0	9211.	9	5	90
14	.	200	168.1	.	340.	8.35	91.0	.	.	.	.	9	12	90
15	.	200	.	.	329.	8.28	.	76.00	.	.	9235.	9	19	90
16	.	200	.	.	307.	8.29	98.0	.	.	.	.	9	26	90
17	.	200	.	.	308.	8.34	.	77.50	30.0	15.0	9259.	10	3	90
18	.	200	.	.	305.	8.20	98.0	.	.	.	.	10	10	90
19	.	200	167.0	.	295.	8.34	.	57.50	.	.	9283.	10	17	90
20	.	200	.	.	320.	8.25	98.0	.	.	.	.	10	24	90
21	.	200	.	.	278.	8.22	.	58.00	30.0	14.0	9307.	10	31	90
22	.	200	.	.	328.	8.12	101.0	.	.	.	.	11	7	90
23	.	200	166.7	.	295.	8.15	.	50.00	.	.	9331.	11	14	90
24	.	200	.	.	313.	8.30	100.0	.	.	.	.	11	21	90
25	.	200	.	.	345.	8.25	.	62.29	31.0	15.0	9355.	11	28	90
26	.	200	.	.	350.	8.15	97.0	.	.	.	.	12	5	90
27	.	200	166.8	.	340.	8.30	.	48.00	.	.	9379.	12	12	90
28	.	200	.	.	340.	8.33	97.0	.	.	.	.	12	19	90
29	.	200	.	.	260.	8.27	.	.	31.0	19.0	9403.	12	26	90
30	.	200	.	.	297.	8.22	103.0	.	.	.	.	1	2	91
31	.	200	167.5	.	291.	8.15	.	.	.	.	9427.	1	9	91
32	.	200	.	.	290.	7.92	97.0	.	.	.	.	1	16	91
33	.	200	.	.	270.	8.15	.	.	29.0	20.0	9451.	1	24	91
34	.	200	.	.	280.	8.20	102.0	.	.	.	.	1	30	91
35	.	200	.	.	268.	8.21	.	45.50	.	.	9475.	2	6	91
36	.	200	.	.	280.	8.22	108.0	.	.	.	.	2	13	91
37	.	200	.	.	277.	8.08	.	.	32.0	21.0	9496.	2	20	91
38	.	200	165.2	.	260.	8.20	93.0	.	.	.	.	2	27	91
39	.	200	.	.	288.	8.30	.	41.00	.	.	9517.	3	6	91
40	.	200	.	.	287.	8.27	109.0	.	.	.	.	3	13	91
41	.	200	.	.	287.	8.22	.	50.00	35.0	23.0	9541.	3	20	91
42	.	200	.	.	285.	8.22	108.0	.	.	.	.	3	27	91
43	.	200	167.4	.	278.	8.22	.	52.00	.	.	9565.	4	3	91
44	.	200	.	.	310.	8.20	128.0	.	.	.	.	4	10	91

Table A2.36. (Continued) Variable Mass drainage quality: Solid T10 (reactor 19), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (μ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
45	.	200	.	.	312.	8.12	.	65.20	34.0	24.0	9580.	4	17	91
46	.	200	.	.	338.	8.25	120.0	.	.	.	.	4	24	91
47	.	200	.	.	330.	8.34	.	64.80	33.0	25.0	9601.	5	1	91
48	.	200	169.5	.	328.	8.27	121.0	.	.	.	.	5	8	91
49	.	200	.	.	330.	8.32	.	74.00	.	.	9629.	5	15	91
50	.	200	.	.	378.	8.30	91.0	.	.	.	.	5	22	91
51	.	200	.	.	387.	8.30	.	.	.	.	.	5	29	91
52	.	200	166.4	.	.	8.38	.	.	.	.	.	6	5	91
53	.	200	.	.	403.	8.36	.	92.50	32.4	26.0	9656.	6	12	91
54	.	200	.	.	419.	8.30	89.0	.	.	.	.	6	19	91
55	.	200	166.5	.	350.	8.27	.	.	.	.	.	6	26	91
56	.	200	.	.	450.	8.31	.	.	.	.	.	7	3	91
57	.	200	.	.	445.	8.22	.	111.00	32.6	27.2	9680.	7	10	91
58	1.	200	.	.	430.	8.15	76.0	.	.	.	.	7	17	91
59	2.	200	.	.	500.	8.12	.	126.00	35.6	29.0	9686.	7	24	91
60	3.	200	.	.	450.	8.27	92.0	.	.	.	.	7	31	91
61	4.	200	.	.	465.	8.21	.	.	.	.	9698.	8	7	91
62	5.	200	.	.	440.	8.27	92.0	.	.	.	.	8	14	91
63	6.	200	167.5	.	430.	8.24	74.0	122.00	34.6	26.8	9721.	8	21	91
64	7.	200	.	.	490.	8.30	.	.	.	.	.	8	28	91
65	8.	200	.	.	455.	8.15	79.0	.	.	.	9727.	9	4	91
66	9.	200	168.7	.	435.	8.30	81.0	.	.	.	.	9	11	91
67	10.	200	.	.	435.	8.31	.	102.00	34.8	26.8	9748.	9	19	91
68	11.	200	.	.	355.	8.20	.	.	.	.	.	9	24	91
69	12.	200	.	.	360.	8.17	76.0	30.00	34.4	22.2	9761.	10	2	91
70	13.	200	.	.	290.	8.17	.	.	.	.	.	10	9	91
71	14.	200	.	.	360.	8.24	94.0	.	.	.	9767.	10	16	91
72	15.	200	169.2	.	393.	8.24	105.0	.	.	.	.	10	23	91
73	16.	200	.	.	220.	8.15	.	.	.	.	9791.	10	30	91
74	17.	200	.	.	380.	8.15	118.0	.	.	.	.	11	6	91
75	18.	200	.	.	320.	8.31	145.0	45.00	32.6	22.6	9801.	11	13	91
76	19.	200	169.0	.	325.	8.11	.	.	.	.	.	11	20	91
77	20.	200	169.7	.	315.	8.24	101.0	52.50	30.2	19.0	9816.	11	27	91
78	21.	200	167.7	.	322.	8.14	129.0	49.00	30.6	20.4	9829.	12	4	91
79	22.	200	168.1	.	282.	8.18	113.0	47.60	.	.	9835.	12	11	91
80	23.	200	.	.	295.	8.19	.	.	.	.	.	12	18	91
81	24.	200	.	.	270.	8.15	.	48.80	27.4	17.2	9839.	12	26	91
82	25.	200	166.3	.	295.	8.22	.	.	.	.	.	1	2	92
83	26.	200	168.1	.	310.	8.14	113.0	50.00	.	.	9855.	1	8	92
84	27.	200	165.3	.	335.	8.25	.	.	.	.	.	1	15	92
85	28.	200	166.0	.	284.	8.23	110.0	48.80	.	.	9859.	1	22	92
86	29.	200	.	.	343.	8.26	.	.	.	.	.	1	29	92
87	30.	200	167.8	.	310.	8.12	113.0	.	30.6	19.2	9872.	2	5	92
88	31.	200	165.4	.	292.	8.24	.	.	.	.	.	2	12	92
89	32.	200	168.3	.	315.	8.17	.	62.00	27.6	18.0	9887.	2	19	92
90	33.	200	168.5	.	300.	8.13	95.0	.	.	.	.	2	26	92

Table A2.37. (Continued) Variable Mass drainage quality: Solid T10 (reactor 19), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
91	34.	200	166.8	.	365.	8.23	.	.	.	.	.	3	4	92
92	35.	200	165.7	.	315.	8.19	113.0	.	.	.	.	3	11	92
93	36.	200	166.5	.	280.	8.17	.	61.00	28.6	17.6	9903.	3	18	92
94	37.	200	166.9	.	355.	8.20	.	.	.	.	.	3	25	92
95	38.	200	166.8	.	330.	8.11	101.0	.	.	.	.	4	1	92
96	39.	200	164.5	.	330.	8.20	.	.	.	.	.	4	8	92
97	40.	200	167.7	.	230.	8.17	98.0	67.00	27.8	18.0	.	4	15	92
98	41.	200	168.3	.	382.	8.11	102.0	.	.	.	.	4	22	92
99	42.	200	164.3	.	384.	8.12	95.0	.	.	.	.	4	29	92
100	43.	200	.	.	374.	8.00	.	.	.	.	.	5	6	92
101	44.	200	163.1	.	328.	7.94	75.0	.	.	.	.	5	13	92
102	45.	200	161.9	.	352.	7.97	.	.	.	.	.	5	20	92
103	46.	200	166.2	.	402.	7.92	132.0	.	.	.	.	5	27	92
104	47.	200	161.9	.	345.	8.21	.	.	.	.	.	6	3	92
105	48.	200	166.6	.	368.	8.24	104.0	.	.	.	.	6	10	92
106	49.	200	169.2	.	340.	8.23	.	.	.	.	.	6	17	92

Table A2.38. Variable Mass drainage quality: Solid T10 (reactor 20), 75 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	200	166.7	.	1640.	7.00	28.0	1000.00	272.0	93.0	9020.	6	6	90
1	.	200	.	.	2175.	7.15	38.0	1400.00	505.0	50.0	9044.	6	13	90
2	.	200	171.2	.	850.	7.65	61.0	410.00	120.0	33.0	9068.	6	20	90
3	.	200	166.4	.	600.	7.32	69.0	240.00	76.0	30.0	9092.	6	27	90
4	.	200	166.0	.	510.	8.22	64.0	.	.	.	.	7	4	90
5	.	200	168.0	.	502.	7.60	57.0	172.00	51.0	23.0	9116.	7	11	90
6	.	200	166.9	.	425.	8.20	65.0	.	.	.	.	7	18	90
7	.	200	164.9	.	420.	8.35	66.0	108.00	42.0	20.0	9140.	7	25	90
8	.	200	165.7	.	405.	8.20	66.0	.	.	.	.	8	1	90
9	.	200	166.1	.	396.	8.20	66.0	105.00	39.0	21.0	9164.	8	8	90
10	.	200	167.7	.	385.	8.20	73.0	.	.	.	.	8	15	90
11	.	200	170.1	.	345.	8.40	.	84.00	35.0	18.0	9188.	8	22	90
12	.	200	167.8	.	325.	8.25	84.0	.	.	.	.	8	29	90
13	.	200	169.2	.	332.	8.30	.	89.00	36.0	20.0	9212.	9	5	90
14	.	200	168.5	.	340.	8.37	89.0	.	.	.	.	9	12	90
15	.	200	.	.	312.	8.29	.	65.00	30.0	15.0	9236.	9	19	90
16	.	200	.	.	300.	8.28	95.0	.	.	.	.	9	26	90
17	.	200	.	.	306.	8.33	.	74.00	.	.	9260.	10	3	90
18	.	200	.	.	300.	8.22	93.0	.	.	.	.	10	10	90
19	.	200	166.8	.	290.	8.36	.	58.00	30.0	15.0	9284.	10	17	90
20	.	200	.	.	310.	8.26	98.0	.	.	.	.	10	24	90
21	.	200	.	.	270.	8.28	.	49.00	.	.	9308.	10	31	90
22	.	200	.	.	330.	8.20	103.0	.	.	.	.	11	7	90
23	.	200	167.9	.	292.	8.18	.	64.06	35.0	15.0	9332.	11	14	90
24	.	200	.	.	323.	8.30	103.0	.	.	.	.	11	21	90
25	.	200	.	.	340.	8.25	.	47.40	.	.	9356.	11	28	90
26	.	200	.	.	348.	8.25	103.0	.	.	.	.	12	5	90
27	.	200	167.7	.	325.	8.31	.	61.48	34.0	15.0	9380.	12	12	90
28	.	200	.	.	330.	8.33	100.0	.	.	.	.	12	19	90
29	.	200	.	.	156.	8.04	.	29.40	.	.	9404.	12	26	90
30	.	200	.	.	302.	8.21	100.0	.	.	.	.	1	2	91
31	.	200	168.5	.	289.	8.20	.	.	31.0	19.0	9428.	1	9	91
32	.	200	.	.	280.	8.02	92.0	.	.	.	.	1	16	91
33	.	200	.	.	268.	8.18	.	48.50	.	.	9452.	1	24	91
34	.	200	.	.	279.	8.20	103.0	.	.	.	.	1	30	91
35	.	200	.	.	278.	8.25	.	.	32.0	20.0	9476.	2	6	91
36	.	200	.	.	277.	8.23	97.0	.	.	.	.	2	13	91
37	.	200	.	.	272.	8.18	.	47.00	.	.	9497.	2	20	91
38	.	200	166.9	.	277.	8.20	97.0	.	.	.	.	2	27	91
39	.	200	.	.	278.	8.28	.	.	33.0	22.0	9518.	3	6	91
40	.	200	.	.	300.	8.28	106.0	.	.	.	.	3	13	91
41	.	200	.	.	292.	8.25	.	56.40	.	.	9542.	3	20	91
42	.	200	.	.	288.	8.25	108.0	.	.	.	.	3	27	91
43	.	200	167.0	.	280.	8.22	.	58.00	25.0	17.0	9566.	4	3	91
44	.	200	.	.	320.	8.28	125.0	.	.	.	.	4	10	91

Table A2.39. (Continued) Variable Mass drainage quality: Solid T10 (reactor 20), 75 g sample.

Week	Week2	Volume (mL) In	Out	Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
45	.	200	.	.	317.	8.14	.	65.20	34.0	24.0	9580.	4	17	91
46	.	200	.	.	345.	8.28	120.0	.	.	.	.	4	24	91
47	.	200	.	.	300.	8.33	.	60.00	.	.	9602.	5	1	91
48	.	200	168.1	.	327.	8.22	108.0	.	.	.	.	5	8	91
49	.	200	.	.	320.	8.32	.	76.80	.	.	9630.	5	15	91
50	.	200	.	.	380.	8.30	86.0	.	.	.	.	5	22	91
51	.	200	.	.	384.	8.33	.	89.60	.	.	9644.	5	29	91
52	.	200	167.0	.	.	8.40	97.0	.	.	.	.	6	5	91
53	.	200	.	.	428.	8.37	.	.	.	.	.	6	12	91
54	.	200	.	.	420.	8.32	.	.	.	.	.	6	19	91
55	.	200	167.1	.	382.	8.30	.	103.00	32.8	25.2	9668.	6	26	91
56	.	200	.	.	460.	8.32	84.0	.	.	.	.	7	3	91
57	.	200	.	.	460.	8.32	.	.	.	.	.	7	10	91
62	5.	200	166.0	.	675.	8.19	68.0	277.00	78.6	44.0	9708.	8	14	91
67	7.	200	.	.	700.	8.11	.	272.00	69.8	41.2	9749.	9	19	91
72	15.	200	169.1	.	530.	8.20	60.0	133.00	45.4	32.8	9783.	10	23	91
77	20.	200	167.9	.	430.	8.20	88.0	115.00	41.2	25.2	9817.	11	27	91
82	25.	200	167.5	.	387.	8.22	104.0	91.00	36.8	22.8	9849.	1	2	92
87	30.	200	167.9	.	400.	8.19	110.0	100.50	40.4	22.8	9873.	2	5	92
92	35.	200	166.1	.	405.	8.15	113.0	115.00	41.2	27.0	9897.	3	11	92
99	42.	200	168.3	.	500.	7.99	98.0	130.00	47.6	25.4	40017.	4	29	92
106	49.	200	167.7	.	500.	8.13	75.0	.	.	.	40037.	6	17	92

Table A2.40. Variable Mass drainage quality: Solid T10 (reactor 6), 225 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	275	191.7	3.7	890.	7.99	85.0	410.00	120.0	48.6	5166.	3	12	92
2	.	250	162.7	0.0	840.	7.91	76.0	418.00	112.0	46.8	5197.	3	19	92
3	.	250	155.0	0.0	770.	7.88	70.0	408.00	105.0	46.4	5212.	3	26	92
4	.	260	190.3	0.0	800.	7.92	76.0	346.00	88.0	40.0	5243.	4	2	92
5	.	260	165.6	0.0	650.	7.86	.	.	.	.	.	4	9	92
6	.	260	170.9	0.0	775.	7.88	76.0	306.00	77.6	37.4	45005.	4	16	92
7	.	260	166.5	0.0	820.	7.93	.	.	.	.	.	4	23	92
8	.	260	144.9	0.0	750.	8.05	69.0	306.00	69.8	36.0	45020.	4	30	92
9	.	260	162.6	.	670.	7.94	.	.	.	.	.	5	7	92
10	.	260	164.6	.	700.	7.83	82.0	.	.	.	45034.	5	14	92
11	.	260	161.7	.	540.	7.94	.	.	.	.	.	5	21	92
12	.	260	164.4	.	550.	7.99	101.0	.	.	.	45046.	5	28	92

Table A2.41. Variable Mass drainage quality: Solid T10 (reactor 7), 375 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	300	181.6	18.1	1390.	7.82	76.0	765.00	226.0	75.2	5167.	3	12	92
2	.	275	140.7	0.0	1280.	7.70	69.0	710.00	194.0	70.0	5198.	3	19	92
3	.	275	148.1	4.2	1200.	7.83	69.0	720.00	212.0	83.4	5213.	3	26	92
4	.	285	153.2	0.0	720.	7.84	63.0	715.00	202.0	80.4	5244.	4	2	92
5	.	285	164.0	7.7	1100.	7.90	.	.	.	.	.	4	9	92
6	.	285	181.9	23.3	1225.	7.79	69.0	572.00	146.0	61.6	45006.	4	16	92
7	.	285	179.2	15.9	1280.	7.99	.	.	.	.	.	4	23	92
8	.	285	142.1	19.7	1000.	8.11	85.0	446.00	112.0	50.4	45021.	4	30	92
9	.	285	162.3	.	1100.	7.99	.	.	.	.	.	5	7	92
10	.	285	147.9	.	1100.	7.68	76.0	.	.	.	45035.	5	14	92
11	.	295	158.2	.	950.	7.66	.	.	.	.	.	5	21	92
12	.	295	159.0	.	900.	7.82	72.0	.	.	.	45047.	5	28	92

Table A2.42. Variable Mass drainage quality: Solid T10 (reactor 8), 750 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	425	237.1	70.7	1900.	7.89	73.0	1100.00	366.0	119.0	5168.	3	12	92
2	.	375	166.2	35.8	1820.	7.83	63.0	1320.00	320.0	110.0	5199.	3	19	92
3	.	375	194.8	58.7	1600.	7.78	63.0	1140.00	338.0	118.0	5214.	3	26	92
4	.	350	155.3	48.5	2300.	7.77	66.0	1160.00	332.0	117.6	5245.	4	2	92
5	.	350	139.0	31.7	2300.	7.79	.	.	.	.	.	4	9	92
6	.	370	170.7	47.3	2275.	7.66	57.0	1275.00	328.0	114.4	45007.	4	16	92
7	.	370	167.4	37.7	2500.	7.86	.	.	.	.	.	4	23	92
8	.	370	146.5	43.6	2075.	7.93	63.0	1160.00	328.0	107.0	45022.	4	30	92
9	.	370	155.6	.	1850.	7.85	.	.	.	.	.	5	7	92
10	.	370	110.1	.	2680.	7.55	57.0	.	.	.	45036.	5	14	92
11	.	370	141.9	.	2300.	7.89	.	.	.	.	.	5	21	92
12	.	370	156.1	.	2000.	7.66	57.0	.	.	.	45048.	5	28	92

Table A2.45. Variable Mass drainage quality: Solid T10 (reactor 9), 1125 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	450	172.5	67.1	2800.	6.91	50.0	1550.00	490.0	175.0	5169.	3	12	92
2	.	450	133.7	10.2	3000.	7.49	63.0	1950.00	522.0	215.0	5200.	3	19	92
3	.	450	162.6	44.3	2850.	7.58	44.0	2000.00	536.0	200.0	5215.	3	26	92
4	.	450	144.6	32.1	3500.	7.67	38.0	2060.00	534.0	224.0	5246.	4	2	92
5	.	450	182.1	69.2	3150.	7.71	.	.	.	.	.	4	9	92
6	.	450	232.7	126.0	2975.	7.61	63.0	1700.00	468.0	147.0	45008.	4	16	92
7	.	425	206.8	104.4	3075.	7.81	.	.	.	.	.	4	23	92
8	.	400	129.0	106.8	2700.	7.96	69.0	1560.00	468.0	133.0	45023.	4	30	92
9	.	400	164.7	.	2450.	7.89	.	.	.	.	.	5	7	92
10	.	400	48.3	.	3200.	7.53	.	.	.	.	45037.	5	14	92
11	.	550	181.7	.	3125.	7.34	.	.	.	.	.	5	21	92
12	.	500	207.5	.	2400.	7.63	57.0	.	.	.	45049.	5	28	92

Table A2.46. Variable Mass drainage quality: Solid T10 (reactor 10), 1500 g sample.

Week	Week2	Volume (mL) In	Volume (mL) Out	Volume (mL) Retained	S.C. (µ/S)	pH (s.u.)	Alk. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
1	.	450	205.2	180.7	3450.	6.91	69.0	1930.00	648.0	196.0	5170.	3	12	92
2	.	425	158.9	149.8	3750.	7.35	69.0	2260.00	678.0	246.0	5201.	3	19	92
3	.	425	193.4	179.9	3200.	7.19	63.0	2260.00	640.0	226.0	5216.	3	26	92
4	.	425	176.9	168.9	3700.	7.33	57.0	2160.00	594.0	220.0	5247.	4	2	92
5	.	425	188.8	173.9	3450.	7.28	.	.	.	.	.	4	9	92
6	.	425	227.9	199.9	3500.	7.69	88.0	2130.00	578.0	194.0	45009.	4	16	92
7	.	400	184.8	183.9	3550.	7.90	.	.	.	.	.	4	23	92
8	.	400	152.4	184.9	3400.	7.93	77.0	1940.00	538.0	196.0	45024.	4	30	92
9	.	400	163.5	.	2820.	7.88	.	.	.	.	.	5	7	92
10	.	400	18.3	.	3700.	7.53	.	.	.	.	45038.	5	14	92
11	.	575	143.9	.	4500.	7.20	.	.	.	.	.	5	21	92
12	.	525	232.8	.	3400.	7.60	63.0	.	.	.	45050.	5	28	92

Table A2.47. Variable Mass cumulative mass release: Solid T2 (reactor 3), 75 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
30	.	.	8.778	8.778	.	4.519	4.519	.	2.758	2.758
31	154.3	49.60	7.653	16.431	.	4.552	9.070	.	2.777	5.536
32	.	.	7.292	23.723	.	4.519	13.590	.	2.758	8.293
33	.	.	7.292	31.016	30.0	4.596	18.186	18.0	2.758	11.051
34	.	.	7.292	38.308	.	2.681	20.867	.	1.379	12.430
35	.	45.50	6.971	45.278	.	2.681	23.548	.	1.379	13.808
36	.	.	6.940	52.218	.	2.681	26.229	.	1.379	15.187
37	.	.	6.940	59.158	5.0	0.766	26.995	<2.0	0.000	15.187
38	152.0	.	6.886	66.044	.	2.508	29.503	.	1.216	16.403
39	.	.	6.913	72.957	.	2.518	32.021	.	1.221	17.624
40	.	.	6.913	79.870	.	2.518	34.539	.	1.221	18.845
41	.	45.00	6.867	86.737	28.0	4.273	38.811	16.0	2.442	21.286
42	.	.	7.096	93.832	.	4.425	43.237	.	2.671	23.957
43	153.2	48.00	7.354	101.186	.	4.443	47.680	.	2.681	26.638
44	.	.	7.696	108.882	.	4.437	52.117	.	2.678	29.315
45	.	52.60	8.048	116.930	30.0	4.590	56.707	19.0	2.907	32.222
46	.	.	8.002	124.932	.	4.437	61.144	.	2.754	34.976
47	.	52.00	7.956	132.888	28.0	4.284	65.428	17.0	2.601	37.577
48	152.8	.	8.221	141.108	.	4.340	69.767	.	2.735	40.313
49	.	55.60	8.601	149.710	.	4.393	74.161	.	2.769	43.082
50	.	.	9.251	158.961	.	4.393	78.554	.	2.769	45.851
51	.	.	9.251	168.212	.	4.393	82.948	.	2.769	48.620
52	156.5	.	9.359	177.570	.	4.445	87.392	.	2.801	51.421

Table A2.48. Variable Mass cumulative mass release: Solid T2 (reactor 4), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
30	.	.	8.117	8.117	.	4.292	4.292	.	2.259	2.259
31	150.4	.	8.107	16.224	28.0	4.211	8.504	17.0	2.557	4.815
32	.	.	8.128	24.352	.	4.222	12.726	.	2.488	7.304
33	.	51.60	7.781	32.133	.	4.222	16.948	.	2.488	9.792
34	.	.	7.057	39.191	.	4.222	21.171	.	2.488	12.280
35	.	.	7.057	46.248	28.0	4.222	25.393	16.0	2.413	14.693
36	.	.	7.057	53.306	.	4.147	29.540	.	2.413	17.106
37	.	.	7.057	60.363	.	4.147	33.687	.	2.413	19.519
38	151.2	.	7.076	67.439	.	4.158	37.845	.	2.419	21.938
39	.	.	7.081	74.520	27.0	4.085	41.930	16.0	2.421	24.359
40	.	.	7.081	81.601	.	4.161	46.091	.	2.421	26.779
41	.	42.00	6.355	87.956	.	4.161	50.252	.	2.421	29.200
42	.	.	6.430	94.386	.	4.161	54.412	.	2.421	31.621
43	151.4	43.00	6.510	100.896	28.0	4.239	58.652	16.0	2.422	34.043
44	.	.	6.822	107.718	.	4.446	63.097	.	2.683	36.726
45	.	.	6.822	114.540	30.0	4.599	67.696	19.0	2.913	39.639
46	.	.	6.822	121.362	.	4.446	72.142	.	2.851	42.490
47	.	46.00	7.052	128.413	.	4.446	76.588	.	2.851	45.342
48	155.1	.	7.910	136.324	.	4.498	81.086	.	2.885	48.226
49	.	56.00	8.982	145.306	.	4.652	85.737	.	2.983	51.210
50	.	.	8.710	154.016	.	4.652	90.389	.	2.983	54.193
51	.	52.50	8.421	162.437	.	4.652	95.040	.	2.983	57.177
52	165.7	.	10.389	172.826	.	4.805	99.846	.	3.082	60.259

Table A2.49. Variable Mass cumulative mass release: Solid T2 (reactor 11), 225 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	153.7	625.00	96.063	96.062	175.0	26.898	26.898	69.0	10.605	10.605
2	161.1	575.00	92.633	188.695	159.0	25.615	52.512	66.2	10.665	21.270
3	173.0	560.00	96.880	285.575	159.0	27.507	80.019	62.0	10.726	31.996
4	165.1	530.00	87.503	373.078	155.0	25.591	105.610	60.0	9.906	41.902
5	162.2	.	83.209	456.286	.	22.303	127.912	.	8.970	50.872
6	163.8	496.00	81.245	537.531	120.0	19.656	147.568	50.6	8.288	59.160
7	154.9	.	71.719	609.250	.	17.426	164.995	.	7.420	66.580
8	166.8	430.00	71.724	680.974	105.0	17.514	182.509	45.2	7.539	74.119
9	148.2	.	.	.	.	.	.	.	.	.
10	132.8	.	.	.	.	.	.	.	.	.
11	145.6	.	.	.	.	.	.	.	.	.
12	164.3	.	.	.	.	.	.	.	.	.

Table A2.50. Variable Mass cumulative mass release: Solid T2 (reactor 12), 375 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	140.1	900.00	126.090	126.090	286.0	40.069	40.069	110.0	15.411	15.411
2	205.0	780.00	159.900	285.990	216.0	44.280	84.349	91.8	18.819	34.230
3	214.7	670.00	143.849	429.839	181.0	38.861	123.210	74.0	15.888	50.118
4	186.0	750.00	139.500	569.339	202.0	37.572	160.782	77.2	14.359	64.477
5	177.1	.	131.054	700.393	.	34.623	195.405	.	13.460	77.937
6	190.7	730.00	139.211	839.604	189.0	36.042	231.447	74.8	14.264	92.201
7	162.5	.	119.438	959.041	.	30.956	262.404	.	12.171	104.372
8	178.0	740.00	131.720	1090.761	192.0	34.176	296.580	75.0	13.350	117.722
9	152.5	.	.	.	.	.	.	.	.	.
10	110.9	.	.	.	.	.	.	.	.	.
11	113.1	.	.	.	.	.	.	.	.	.
12	189.7	.	.	.	.	.	.	.	.	.

Table A2.51. Variable Mass cumulative mass release: Solid T2 (reactor 13), 750 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	237.1	490.00	116.179	116.179	174.0	41.255	41.255	66.8	15.838	15.838
2	71.3	1100.00	78.430	194.609	324.0	23.101	64.356	136.0	9.697	25.534
3	135.6	1610.00	218.316	412.925	416.0	56.410	120.766	169.0	22.916	48.451
4	132.7	1840.00	244.168	657.093	466.0	61.838	182.604	192.4	25.531	73.982
5	166.9	.	299.586	956.679	.	76.273	258.877	.	31.160	105.143
6	202.9	1750.00	355.075	1311.754	448.0	90.899	349.777	181.0	36.725	141.867
7	173.2	.	300.502	1612.256	.	77.330	427.247	.	30.223	172.091
8	165.1	1720.00	283.972	1896.228	446.0	73.635	500.882	168.0	27.737	199.828
9	162.3	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.
11	133.1	.	.	.	.	.	.	.	.	.
12	213.0	.	.	.	.	.	.	.	.	.

Table A2.52. Variable Mass cumulative mass release: Solid T2 (reactor 14), 1125 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	263.3	515.00	135.600	135.600	136.0	35.809	35.809	53.8	14.166	14.166
2	103.4	920.00	95.128	230.728	276.0	28.538	64.348	113.6	11.746	25.912
3	202.1	1400.00	282.940	513.668	372.0	75.181	139.529	156.0	31.528	57.440
4	166.3	1870.00	310.981	824.649	464.0	77.163	216.692	196.8	32.728	90.168
5	177.0	.	372.585	1197.234	.	88.500	305.192	.	40.073	130.241
6	197.3	2340.00	461.682	1658.916	536.0	105.753	410.945	256.0	50.509	180.749
7	166.4	.	392.704	2051.620	.	88.358	499.303	.	44.429	225.178
8	176.5	2380.00	420.070	2471.690	526.0	92.839	592.142	278.0	49.067	274.245
9	153.4	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.
11	130.5	.	.	.	.	.	.	.	.	.
12	272.9	.	.	.	.	.	.	.	.	.

Table A2.53. Variable Mass cumulative mass release: Solid T2 (reactor 15), 1500 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	287.7	332.00	95.516	95.516	99.0	28.482	28.482	43.6	12.544	12.544
2	32.3	845.00	27.294	122.809	230.0	7.429	35.911	93.4	3.017	15.561
3	166.0	1800.00	298.800	421.609	464.0	77.024	112.935	199.0	33.034	48.595
4	138.5	2340.00	324.090	745.699	566.0	78.391	191.326	294.0	40.719	89.314
5	172.5	.	432.113	1177.812	.	97.808	289.133	.	54.165	143.479
6	203.0	2670.00	542.010	1719.822	568.0	115.304	404.437	334.0	67.802	211.281
7	203.0	.	522.725	2242.547	.	112.462	516.899	.	67.599	278.880
8	173.4	2480.00	430.032	2672.579	540.0	93.636	610.535	332.0	57.569	336.449
9	146.8	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.
11	136.9	.	.	.	.	.	.	.	.	.
12	290.4	.	.	.	.	.	.	.	.	.

Table A2.54. Variable Mass cumulative mass release: Solid T4 (reactor 7), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
20	.	.	1.472	1.472	.	2.207	2.207	.	0.000	0.000
21	.	11.14	1.821	3.293	16.0	2.616	4.823	<5.0	0.000	0.000
22	.	.	1.422	4.716	.	2.616	7.439	.	0.000	0.000
23	163.6	6.20	1.014	5.730	.	2.618	10.057	.	0.000	0.000
24	.	.	1.337	7.068	.	2.642	12.698	.	0.000	0.000
25	.	9.90	1.634	8.702	16.0	2.642	15.340	<5.0	0.000	0.000
26	.	.	1.123	9.825	.	2.642	17.982	.	0.660	0.661
27	166.6	3.60	0.600	10.424	.	2.666	20.647	.	0.666	1.327
28	.	.	0.887	11.311	.	2.677	23.324	.	0.669	1.996
29	.	.	0.887	12.198	16.0	2.677	26.001	8.0	1.338	3.335
30	.	.	0.887	13.085	.	2.677	28.678	.	1.255	4.589
31	167.9	7.00	1.175	14.260	.	2.686	31.364	.	1.259	5.849
32	.	.	1.005	15.264	.	2.635	33.999	.	1.235	7.084
33	.	.	1.005	16.269	16.0	2.635	36.634	7.0	1.153	8.237
34	.	.	1.005	17.274	.	2.553	39.187	.	1.153	9.390
35	.	5.20	0.856	18.130	.	2.553	41.740	.	1.153	10.543
36	.	.	1.005	19.135	.	2.553	44.293	.	1.153	11.696
37	.	.	1.005	20.140	15.0	2.471	46.763	7.0	1.153	12.848
38	161.5	.	0.985	21.125	.	2.503	49.267	.	1.131	13.979
39	.	7.00	1.134	22.259	.	2.513	51.779	.	1.134	15.113
40	.	.	1.199	23.458	.	2.513	54.292	.	1.134	16.247
41	.	7.80	1.264	24.721	16.0	2.592	56.884	7.0	1.134	17.381
42	.	.	1.150	25.871	.	2.673	59.557	.	1.215	18.596
43	162.4	6.30	1.023	26.894	.	2.680	62.236	.	1.218	19.814
44	.	.	1.280	28.174	.	2.708	64.944	.	1.231	21.045
45	.	9.30	1.526	29.701	17.0	2.790	67.734	8.0	1.313	22.358
46	.	.	1.625	31.325	.	2.708	70.441	.	1.313	23.670
47	.	10.50	1.723	33.048	16.0	2.626	73.067	8.0	1.313	24.983
48	165.8	.	1.691	34.739	.	2.570	75.637	.	1.360	26.343
49	.	9.90	1.613	36.352	.	2.525	78.162	.	1.336	27.678
50	.	.	2.004	38.356	.	2.525	80.687	.	1.336	29.014
51	.	.	2.004	40.359	.	2.525	83.212	.	1.336	30.350
52	160.0	.	1.968	42.327	.	2.480	85.692	.	1.312	31.662

Table A2.55. Variable Mass cumulative mass release: Solid T4 (reactor 8), 75 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
20	.	.	1.271	1.271	.	2.445	2.445	.	0.000	0.000
21	.	8.60	1.402	2.673	.	2.445	4.890	.	0.000	0.000
22	.	.	1.500	4.172	.	2.445	7.335	.	0.000	0.000
23	163.7	9.88	1.617	5.790	15.0	2.456	9.791	<5.0	0.000	0.000
24	.	.	1.452	7.242	.	2.285	12.076	.	0.000	0.000
25	.	8.00	1.306	8.548	.	2.285	14.360	.	0.000	0.000
26	.	.	1.338	9.886	.	2.285	16.645	.	0.000	0.000
27	162.6	8.45	1.374	11.260	13.0	2.114	18.759	<5.0	0.000	0.000
28	.	.	1.290	12.550	.	2.368	21.127	.	0.572	0.572
29	.	7.40	1.208	13.759	.	2.368	23.495	.	0.572	1.143
30	.	.	1.159	14.918	.	2.368	25.862	.	0.572	1.715
31	163.9	.	1.164	16.082	16.0	2.622	28.485	7.0	1.147	2.862
32	.	.	1.152	17.234	.	2.597	31.082	.	1.136	3.998
33	.	6.80	1.104	18.338	.	2.597	33.678	.	1.136	5.134
34	.	.	0.990	19.328	.	2.597	36.275	.	1.136	6.270
35	.	.	0.990	20.318	16.0	2.597	38.872	7.0	1.136	7.407
36	.	.	0.990	21.308	.	2.272	41.144	.	0.974	8.380
37	.	5.40	0.876	22.184	.	2.272	43.417	.	0.974	9.354
38	.	.	1.201	23.385	.	2.272	45.689	.	0.974	10.328
39	160.6	.	1.188	24.574	12.0	1.927	47.616	5.0	0.803	11.131
40	.	.	1.190	25.764	.	2.251	49.867	.	0.965	12.096
41	.	9.40	1.512	27.275	.	2.251	52.118	.	0.965	13.061
42	.	.	1.383	28.658	.	2.251	54.370	.	0.965	14.025
43	160.9	7.70	1.239	29.897	16.0	2.574	56.944	7.0	1.126	15.152
44	.	.	1.374	31.271	.	2.668	59.612	.	1.213	16.364
45	.	9.30	1.504	32.775	17.0	2.749	62.361	8.0	1.294	17.658
46	.	.	1.423	34.198	.	2.474	64.835	.	1.310	18.968
47	.	8.20	1.326	35.524	.	2.474	67.309	.	1.310	20.278
48	162.5	.	1.495	37.019	.	2.486	69.795	.	1.316	21.594
49	.	10.20	1.641	38.660	.	2.462	72.257	.	1.303	22.897
50	.	.	1.979	40.639	.	2.462	74.719	.	1.303	24.200
51	.	14.40	2.317	42.956	.	2.462	77.180	.	1.303	25.504
52	159.2	.	2.404	45.360	.	2.436	79.616	.	1.290	26.793

Table A2.56. Variable Mass cumulative mass release: Solid T4 (reactor 1), 225 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	174.0	14.80	2.575	2.575	14.0	2.436	2.436	10.8	1.879	1.879
2	172.7	39.20	6.770	9.345	13.8	2.383	4.819	11.8	2.038	3.917
3	177.4	18.60	3.300	12.645	13.4	2.377	7.196	11.6	2.058	5.975
4	163.5	19.40	3.172	15.817	13.6	2.224	9.420	10.6	1.733	7.708
5	158.5	.	3.741	19.557	.	2.156	11.576	.	1.633	9.341
6	161.4	27.80	4.487	24.044	13.6	2.195	13.771	10.0	1.614	10.955
7	157.7	.	4.479	28.523	.	2.145	15.915	.	1.530	12.484
8	159.1	29.00	4.614	33.137	13.6	2.164	18.079	9.4	1.496	13.980
9	157.0	.	.	.	.	.	.	.	.	.
10	156.7	.	.	.	.	.	.	.	.	.
11	154.6	.	.	.	.	.	.	.	.	.
12	156.6	.	.	.	.	.	.	.	.	.

Table A2.57. Variable Mass cumulative mass release: Solid T4 (reactor 2), 375 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	190.1	25.60	4.867	4.867	17.6	3.346	3.346	16.0	3.042	3.042
2	184.9	31.60	5.843	10.710	17.0	3.143	6.489	16.0	2.958	6.001
3	191.9	28.00	5.373	16.083	16.4	3.147	9.636	15.6	2.994	8.994
4	167.7	28.20	4.729	20.812	16.4	2.750	12.387	14.2	2.381	11.376
5	150.9	.	5.387	26.200	.	2.460	14.846	.	2.143	13.519
6	165.8	43.20	7.163	33.362	16.2	2.686	17.532	14.2	2.354	15.873
7	158.7	.	8.284	41.646	.	2.825	20.357	.	2.476	18.349
8	150.0	61.20	9.180	50.826	19.4	2.910	23.267	17.0	2.550	20.899
9	146.8	.	.	.	.	.	.	.	.	.
10	132.7	.	.	.	.	.	.	.	.	.
11	144.4	.	.	.	.	.	.	.	.	.
12	151.7	.	.	.	.	.	.	.	.	.

Table A2.58. Variable Mass cumulative mass release: Solid T4 (reactor 3), 750 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	182.2	45.20	8.235	185.806	20.6	3.753	91.145	23.2	4.227	55.648
2	175.8	54.00	9.493	195.299	18.6	3.270	94.415	23.2	4.079	59.727
3	186.5	50.00	9.325	204.624	17.2	3.208	97.623	21.0	3.917	63.643
4	160.7	52.40	8.421	213.045	17.6	2.828	100.451	19.8	3.182	66.825
5	129.4	.	8.799	221.844	.	2.381	102.832	.	2.834	69.659
6	145.6	83.50	12.158	234.002	19.2	2.796	105.628	24.0	3.494	73.154
7	158.4	.	38.650	272.651	.	3.073	108.701	.	3.564	76.718
8	159.2	405.00	64.476	337.127	19.6	3.120	111.821	21.0	3.343	80.061
9	144.6	.	.	.	.	.	.	.	.	.
10	82.1	.	.	.	.	.	.	.	.	.
11	118.9	.	.	.	.	.	.	.	.	.
12	191.7	.	.	.	.	.	.	.	.	.

Table A2.59. Variable Mass cumulative mass release: Solid T4 (reactor 4), 1125 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	100.7	58.40	5.881	178.707	17.2	1.732	101.578	24.8	2.497	62.756
2	234.5	80.00	18.760	197.467	19.8	4.643	106.221	28.0	6.566	69.322
3	230.4	74.00	17.050	214.517	19.4	4.470	110.691	26.0	5.990	75.312
4	170.6	74.00	12.624	227.141	18.2	3.105	113.796	23.6	4.026	79.339
5	136.2	.	8.553	235.694	.	2.547	116.343	.	3.269	82.607
6	160.2	51.50	8.250	243.945	19.2	3.076	119.418	24.4	3.909	86.516
7	152.1	.	13.811	257.755	.	3.331	122.749	.	4.107	90.623
8	146.4	130.00	19.032	276.787	24.6	3.601	126.351	29.6	4.333	94.956
9	134.7	.	.	.	.	.	.	.	.	.
10	44.0	.	.	.	.	.	.	.	.	.
11	104.4	.	.	.	.	.	.	.	.	.
12	191.9	.	.	.	.	.	.	.	.	.

Table A2.60. Variable Mass cumulative mass release: Solid T4 (reactor 5), 1500 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	183.7	61.60	11.316	11.316	18.4	3.380	3.380	26.0	4.776	4.776
2	220.8	82.00	18.106	29.422	19.6	4.328	7.708	29.2	6.447	11.223
3	205.2	88.80	18.222	47.644	19.4	3.981	11.688	28.0	5.746	16.969
4	164.7	92.00	15.152	62.796	19.2	3.162	14.851	26.0	4.282	21.251
5	181.8	.	18.416	81.212	.	4.091	18.941	.	4.963	26.214
6	215.1	110.50	23.769	104.981	25.8	5.550	24.491	28.6	6.152	32.366
7	180.4	.	23.687	128.667	.	4.943	29.434	.	5.574	37.940
8	166.2	152.00	25.262	153.930	29.0	4.820	34.254	33.2	5.518	43.458
9	152.9	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.
11	102.2	.	.	.	.	.	.	.	.	.
12	259.5	.	.	.	.	.	.	.	.	.

Table A2.61. Variable Mass cumulative mass release: Solid T10 (reactor 19), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
20	.	.	9.647	9.647	.	5.007	5.007	.	2.420	2.420
21	.	58.00	9.680	19.328	30.0	5.007	10.014	14.0	2.337	4.756
22	.	.	9.013	28.340	.	5.090	15.105	.	2.420	7.176
23	166.7	50.00	8.335	36.675	.	5.084	20.189	.	2.417	9.593
24	.	.	9.357	46.033	.	5.087	25.276	.	2.419	12.012
25	.	62.29	10.390	56.423	31.0	5.171	30.447	15.0	2.502	14.514
26	.	.	9.191	65.613	.	5.171	35.618	.	2.836	17.350
27	166.8	48.00	8.006	73.620	.	5.171	40.789	.	2.836	20.185
28	.	.	7.825	81.445	.	5.183	45.972	.	2.842	23.028
29	.	.	7.825	89.270	31.0	5.183	51.155	19.0	3.177	26.204
30	.	.	7.825	97.095	.	5.016	56.171	.	3.260	29.465
31	167.5	.	7.839	104.934	.	5.025	61.196	.	3.266	32.731
32	.	.	7.788	112.721	.	4.992	66.188	.	3.245	35.976
33	.	.	7.788	120.509	29.0	4.826	71.014	20.0	3.328	39.304
34	.	.	7.788	128.296	.	5.075	76.089	.	3.411	42.715
35	.	45.50	7.571	135.867	.	5.075	81.164	.	3.411	46.126
36	.	.	7.205	143.073	.	5.075	86.239	.	3.411	49.538
37	.	.	7.205	150.278	32.0	5.325	91.564	21.0	3.494	53.032
38	165.2	.	7.153	157.431	.	5.534	97.098	.	3.634	56.666
39	.	41.00	6.818	164.249	.	5.571	102.669	.	3.659	60.325
40	.	.	7.567	171.816	.	5.571	108.240	.	3.659	63.984
41	.	50.00	8.315	180.131	35.0	5.821	114.061	23.0	3.825	67.808
42	.	.	8.481	188.612	.	5.737	119.798	.	3.908	71.716
43	167.4	52.00	8.705	197.317	.	5.775	125.574	.	3.934	75.650
44	.	.	9.874	207.191	.	5.813	131.387	.	3.960	79.610
45	.	65.20	10.986	218.177	34.0	5.729	137.116	24.0	4.044	83.654
46	.	.	10.953	229.130	.	5.645	142.761	.	4.128	87.782
47	.	64.80	10.919	240.049	33.0	5.561	148.321	25.0	4.213	91.995
48	169.5	.	11.763	251.812	.	5.543	153.864	.	4.322	96.317
49	.	74.00	12.432	264.244	.	5.494	159.357	.	4.284	100.601
50	.	.	13.994	278.238	.	5.494	164.851	.	4.284	104.885
51	.	.	13.994	292.233	.	5.494	170.345	.	4.284	109.169
52	166.4	.	13.861	306.094	.	5.441	175.786	.	4.243	113.412

Table A2.62. Variable Mass cumulative mass release: Solid T10 (reactor 20), 75 g sample.

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
20	.	.	8.956	8.956	.	5.441	5.441	.	2.511	2.511
21	.	49.00	8.203	17.158	.	5.441	10.882	.	2.511	5.022
22	.	.	9.458	26.616	.	5.441	16.322	.	2.511	7.533
23	167.9	64.06	10.756	37.372	35.0	5.877	22.199	15.0	2.519	10.052
24	.	.	9.346	46.718	.	5.789	27.988	.	2.517	12.569
25	.	47.40	7.954	54.672	.	5.789	33.777	.	2.517	15.086
26	.	.	9.128	63.801	.	5.789	39.566	.	2.517	17.603
27	167.7	61.48	10.310	74.111	34.0	5.702	45.268	15.0	2.516	20.118
28	.	.	7.632	81.742	.	5.463	50.731	.	2.858	22.976
29	.	29.40	4.942	86.685	.	5.463	56.194	.	2.858	25.834
30	.	.	6.556	93.240	.	5.463	61.658	.	2.858	28.691
31	168.5	.	6.572	99.812	31.0	5.224	66.881	19.0	3.202	31.893
32	.	.	6.540	106.352	.	5.283	72.164	.	3.270	35.163
33	.	48.50	8.133	114.486	.	5.283	77.446	.	3.270	38.433
34	.	.	8.016	122.502	.	5.283	82.729	.	3.270	41.703
35	.	.	8.016	130.518	32.0	5.366	88.095	20.0	3.354	45.057
36	.	.	8.016	138.534	.	5.450	93.545	.	3.522	48.579
37	.	47.00	7.882	146.416	.	5.450	98.996	.	3.522	52.101
38	166.9	.	8.629	155.045	.	5.424	104.420	.	3.505	55.606
39	.	.	8.634	163.678	33.0	5.511	109.931	22.0	3.674	59.280
40	.	.	8.634	172.312	.	4.843	114.774	.	3.090	62.369
41	.	56.40	9.419	181.731	.	4.843	119.617	.	3.090	65.459
42	.	.	9.552	191.284	.	4.843	124.460	.	3.090	68.548
43	167.0	58.00	9.686	200.970	25.0	4.175	128.635	17.0	2.839	71.387
44	.	.	10.324	211.294	.	4.944	133.579	.	3.436	74.823
45	.	65.20	10.928	222.221	34.0	5.698	139.278	24.0	4.022	78.845
46	.	.	10.492	232.713	.	5.598	144.875	.	4.123	82.968
47	.	60.00	10.056	242.769	.	5.598	150.473	.	4.123	87.091
48	168.1	.	11.498	254.267	.	5.615	156.088	.	4.135	91.227
49	.	76.80	12.872	267.139	.	5.598	161.686	.	4.123	95.349
50	.	.	13.944	281.083	.	5.598	167.283	.	4.123	99.472
51	.	89.60	15.017	296.100	.	5.598	172.881	.	4.123	103.595
52	167.0	.	16.082	312.182	.	5.578	178.459	.	4.108	107.704

Table A2.63. Variable Mass cumulative mass release: Solid T10 (reactor 6), 225 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	191.7	410.00	78.597	78.597	120.0	23.004	23.004	48.6	9.317	9.317
2	162.7	418.00	68.009	146.605	112.0	18.222	41.226	46.8	7.614	16.931
3	155.0	408.00	63.240	209.845	105.0	16.275	57.501	46.4	7.192	24.123
4	190.3	346.00	65.844	275.689	88.0	16.746	74.247	40.0	7.612	31.735
5	165.6	.	53.986	329.675	.	13.712	87.959	.	6.409	38.144
6	170.9	306.00	52.295	381.970	77.6	13.262	101.221	37.4	6.392	44.535
7	166.5	.	50.949	432.919	.	12.271	113.492	.	6.111	50.646
8	144.9	306.00	44.339	477.259	69.8	10.114	123.606	36.0	5.216	55.862
9	162.6	.	.	.	.	.	.	.	.	.
10	164.6	.	.	.	.	.	.	.	.	.
11	161.7	.	.	.	.	.	.	.	.	.
12	164.4	.	.	.	.	.	.	.	.	.

Table A2.64. Variable Mass cumulative mass release: Solid T10 (reactor 7), 375 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	181.6	765.00	138.924	181.251	226.0	41.042	126.733	75.2	13.656	45.318
2	140.7	710.00	99.897	281.148	194.0	27.296	154.029	70.0	9.849	55.167
3	148.1	720.00	106.632	387.780	212.0	31.397	185.426	83.4	12.352	67.519
4	153.2	715.00	109.538	497.318	202.0	30.946	216.373	80.4	12.317	79.836
5	164.0	.	105.534	602.852	.	28.536	244.909	.	11.644	91.480
6	181.9	572.00	104.047	706.899	146.0	26.557	271.466	61.6	11.205	102.685
7	179.2	.	91.213	798.112	.	23.117	294.583	.	10.035	112.720
8	142.1	446.00	63.377	861.489	112.0	15.915	310.498	50.4	7.162	119.882
9	162.3	.	.	.	.	.	.	.	.	.
10	147.9	.	.	.	.	.	.	.	.	.
11	158.2	.	.	.	.	.	.	.	.	.
12	159.0	.	.	.	.	.	.	.	.	.

Table A2.65. Variable Mass cumulative mass release: Solid T10 (reactor 8), 750 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	237.1	1100.00	260.810	306.170	366.0	86.779	166.395	119.0	28.215	55.008
2	166.2	1320.00	219.384	525.554	320.0	53.184	219.579	110.0	18.282	73.290
3	194.8	1140.00	222.072	747.626	338.0	65.842	285.421	118.0	22.986	96.277
4	155.3	1160.00	180.148	927.774	352.0	54.666	340.087	117.6	18.263	114.540
5	139.0	.	169.233	1097.007	.	47.260	387.347	.	16.124	130.664
6	170.7	1275.00	217.643	1314.649	328.0	55.990	443.336	114.4	19.528	150.192
7	167.4	.	203.810	1518.459	.	54.907	498.244	.	18.531	168.723
8	146.5	1160.00	169.940	1688.399	328.0	48.052	546.296	107.0	15.676	184.399
9	155.6	.	.	.	.	.	.	.	.	.
10	110.1	.	.	.	.	.	.	.	.	.
11	141.9	.	.	.	.	.	.	.	.	.
12	156.1	.	.	.	.	.	.	.	.	.

Table A2.66. Variable Mass cumulative mass release: Solid T10 (reactor 9), 1125 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	172.5	1550.00	267.375	267.375	490.0	84.525	84.525	175.0	30.188	30.188
2	133.7	1950.00	260.715	528.090	522.0	69.791	154.316	215.0	28.746	58.934
3	162.6	2000.00	325.200	853.290	536.0	87.154	241.470	200.0	32.520	91.454
4	144.6	2060.00	297.876	1151.166	534.0	77.216	318.686	224.0	32.390	123.844
5	182.1	.	342.348	1493.514	.	91.232	409.918	.	33.780	157.624
6	232.7	1700.00	395.590	1889.104	468.0	108.904	518.822	147.0	34.207	191.830
7	206.8	.	337.084	2226.188	.	96.782	615.604	.	28.952	220.782
8	129.0	1560.00	201.240	2427.428	468.0	60.372	675.976	133.0	17.157	237.939
9	164.7	.	.	.	.	.	.	.	.	.
10	48.3	.	.	.	.	.	.	.	.	.
11	181.7	.	.	.	.	.	.	.	.	.
12	207.5	.	.	.	.	.	.	.	.	.

Table A2.67. Variable Mass cumulative mass release: Solid T10 (reactor 10), 1500 g sample.

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
1	205.2	1930.00	396.036	396.036	648.0	132.970	132.970	196.0	40.219	40.219
2	158.9	2260.00	359.114	755.150	678.0	107.734	240.704	246.0	39.089	79.308
3	193.4	2260.00	437.084	1192.234	640.0	123.776	364.480	226.0	43.708	123.016
4	176.9	2160.00	382.104	1574.338	594.0	105.079	469.558	220.0	38.918	161.934
5	188.8	.	404.976	1979.314	.	110.637	580.195	.	39.082	201.016
6	227.9	2130.00	485.427	2464.741	578.0	131.726	711.921	194.0	44.213	245.229
7	184.8	.	376.068	2840.809	.	103.118	815.040	.	36.036	281.265
8	152.4	1940.00	295.656	3136.465	538.0	81.991	897.031	196.0	29.870	311.135
9	163.5	.	.	.	.	.	.	.	.	.
10	18.3	.	.	.	.	.	.	.	.	.
11	143.9	.	.	.	.	.	.	.	.	.
12	232.8	.	.	.	.	.	.	.	.	.

Figure A2.68. Sum of calcium and magnesium concentrations vs. sulfate in drainage from all three solids: weeks 0 - 12, 75 g sample weeks 0 - 106; for sulfate < 0.5 mmoles/L (Variable Mass Experiment).

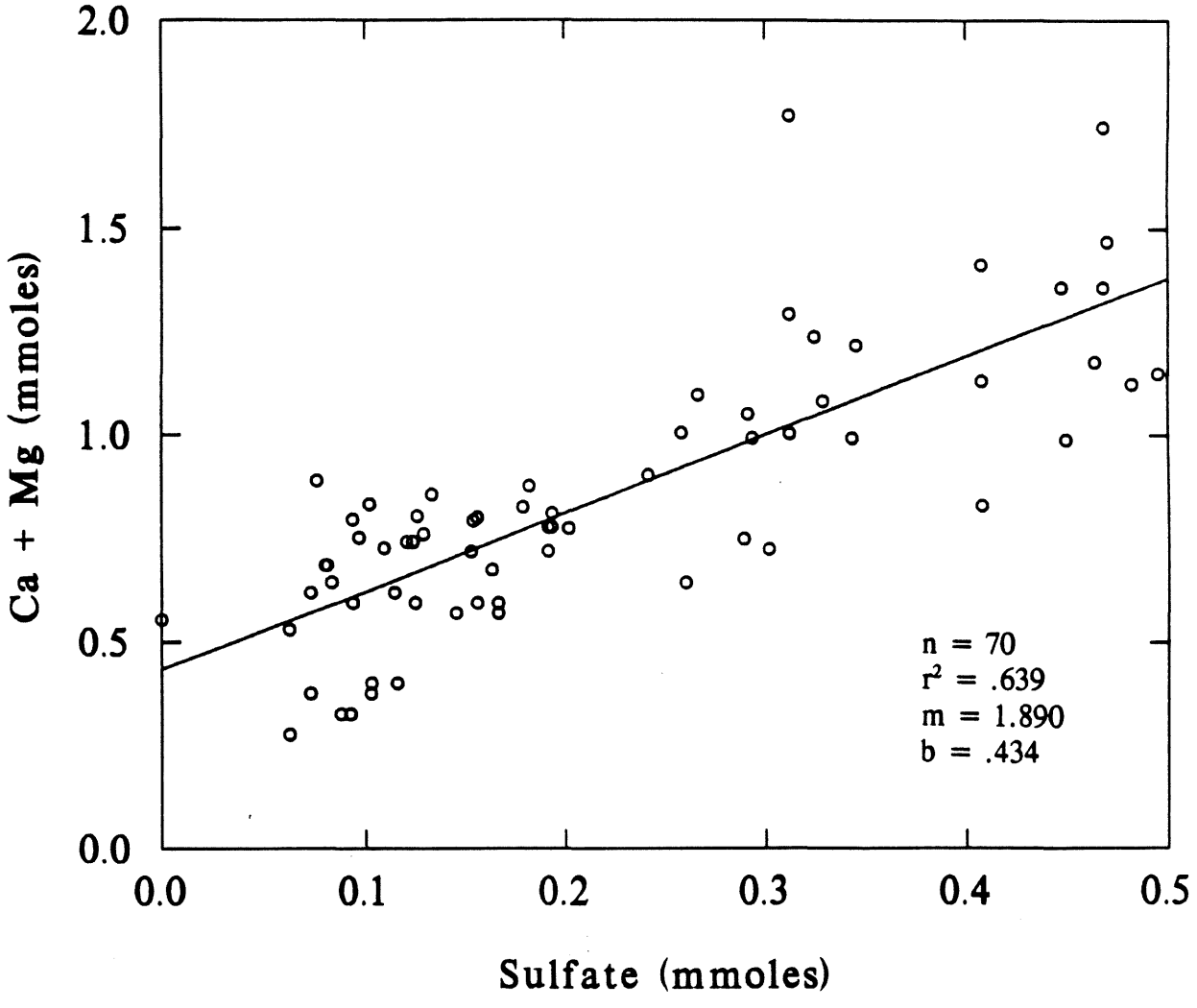


Figure A2.69. Sum of calcium and magnesium concentrations vs. sulfate in drainage from T2: weeks 0 - 12, 75 g sample weeks 0 - 106; for sulfate < 0.5 mmoles/L (Variable Mass Experiment).

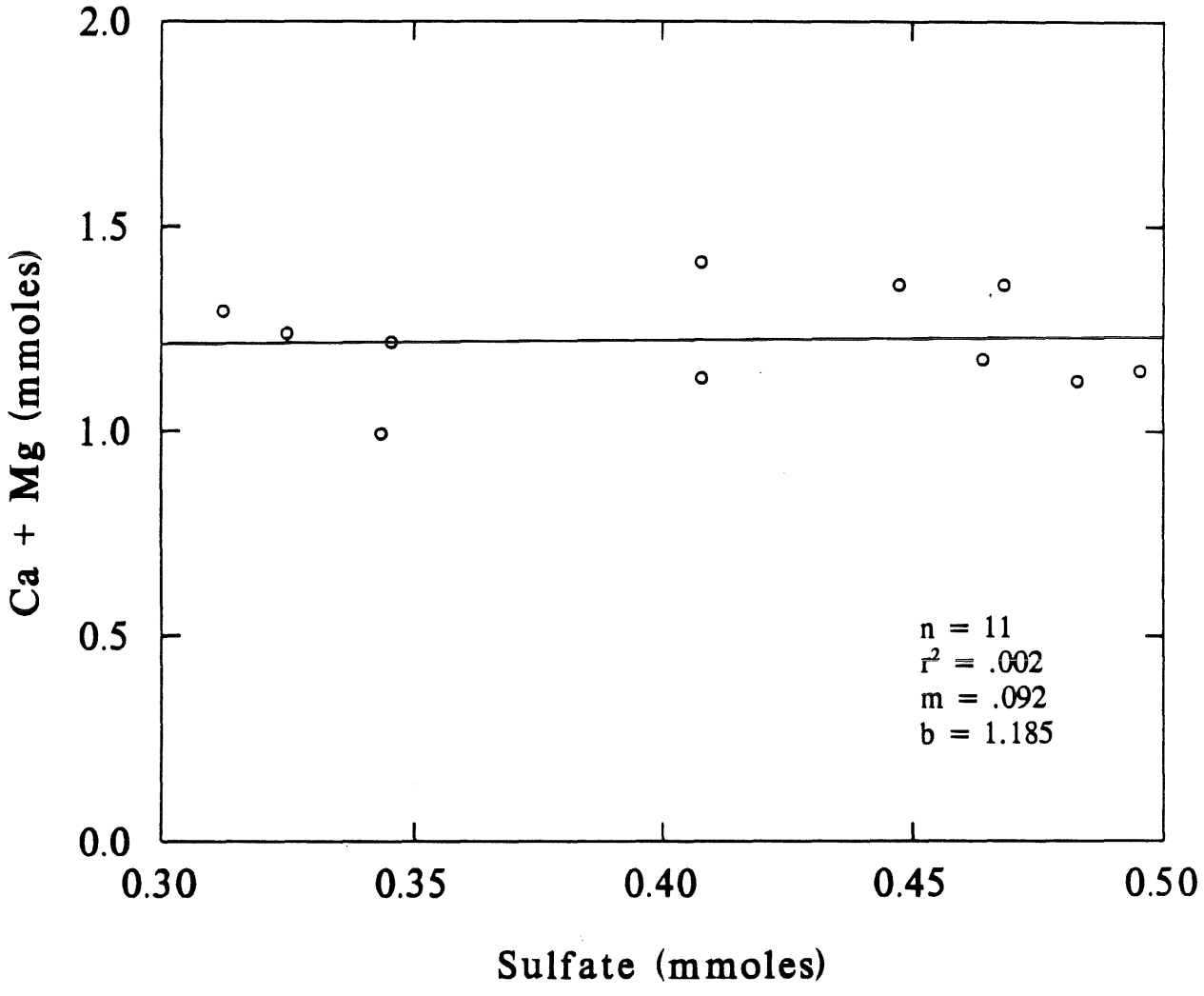


Figure A2.70. Sum of calcium and magnesium concentrations vs. sulfate in drainage from T2: weeks 0 - 12, 75 g sample weeks 0 - 106; for sulfate < 1.0 mmoles/L (Variable Mass Experiment).

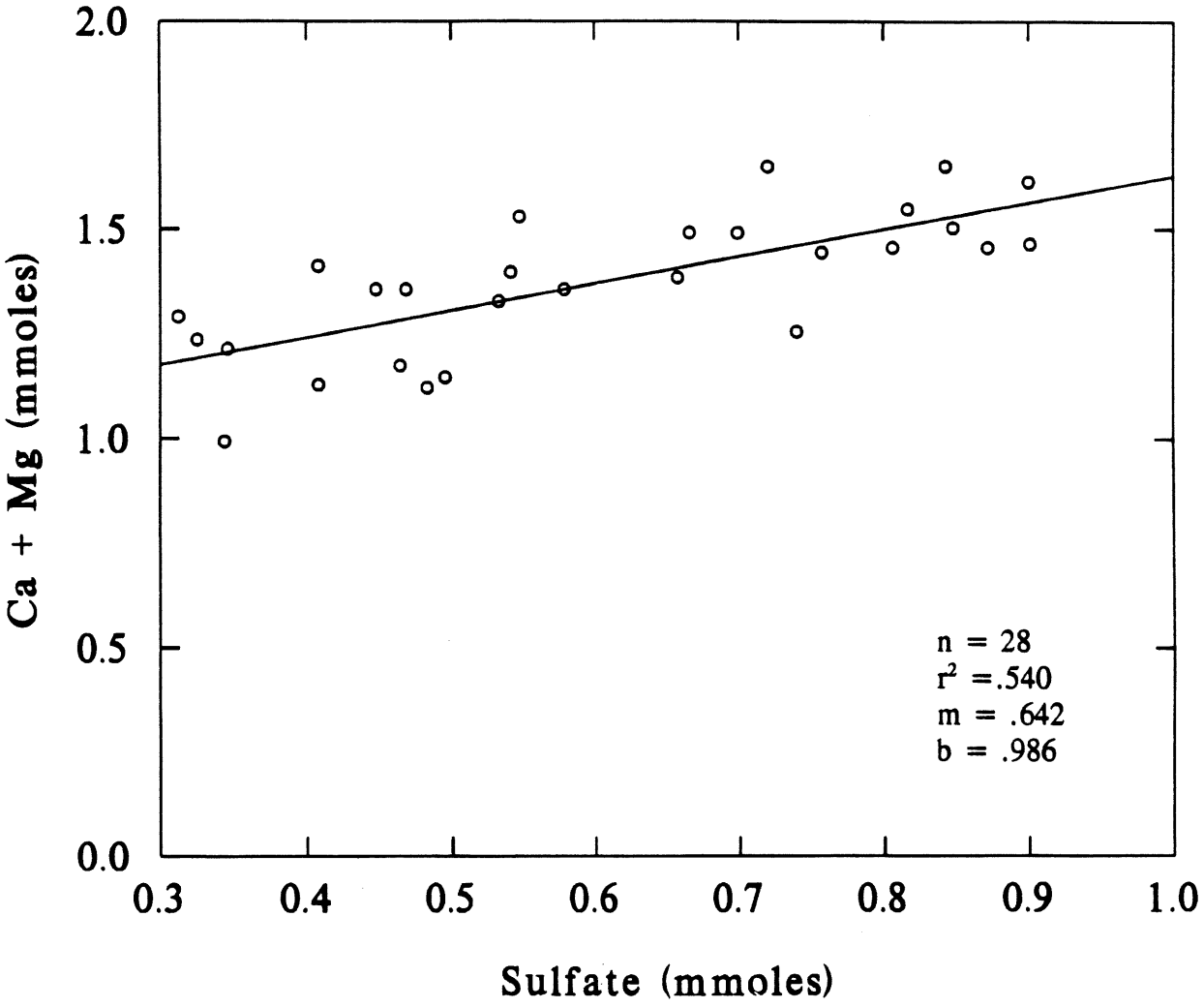


Figure A2.71. Sum of calcium and magnesium concentrations vs. sulfate in drainage from T4: weeks 0 - 12, 75 g sample weeks 0 - 106; for sulfate < 0.25 mmoles/L (Variable Mass Experiment).

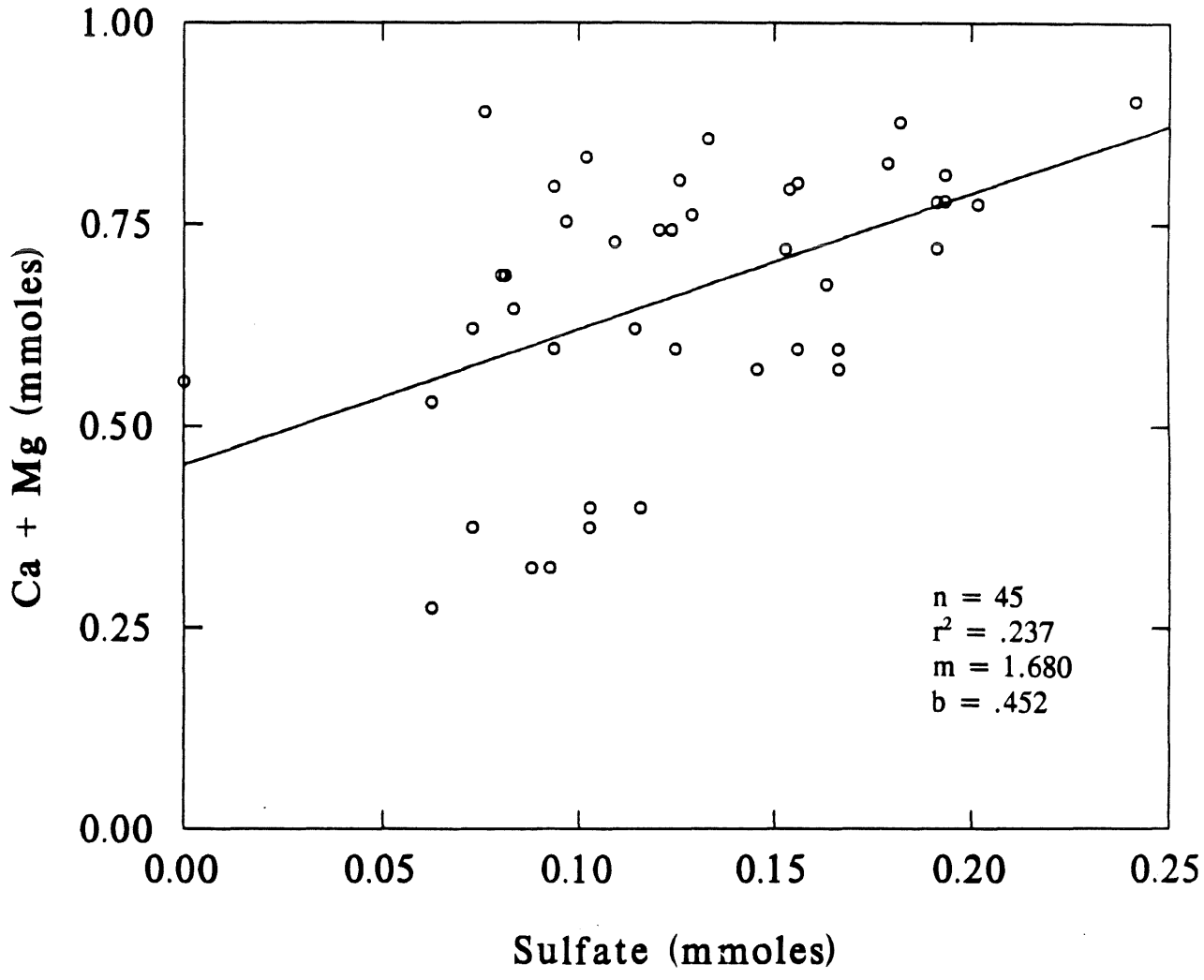


Figure A2.72. Sum of calcium and magnesium concentrations vs. sulfate in drainage from T4: weeks 0 - 12, 75 g sample weeks 0 - 106; for sulfate < 0.5 mmoles/L (Variable Mass Experiment).

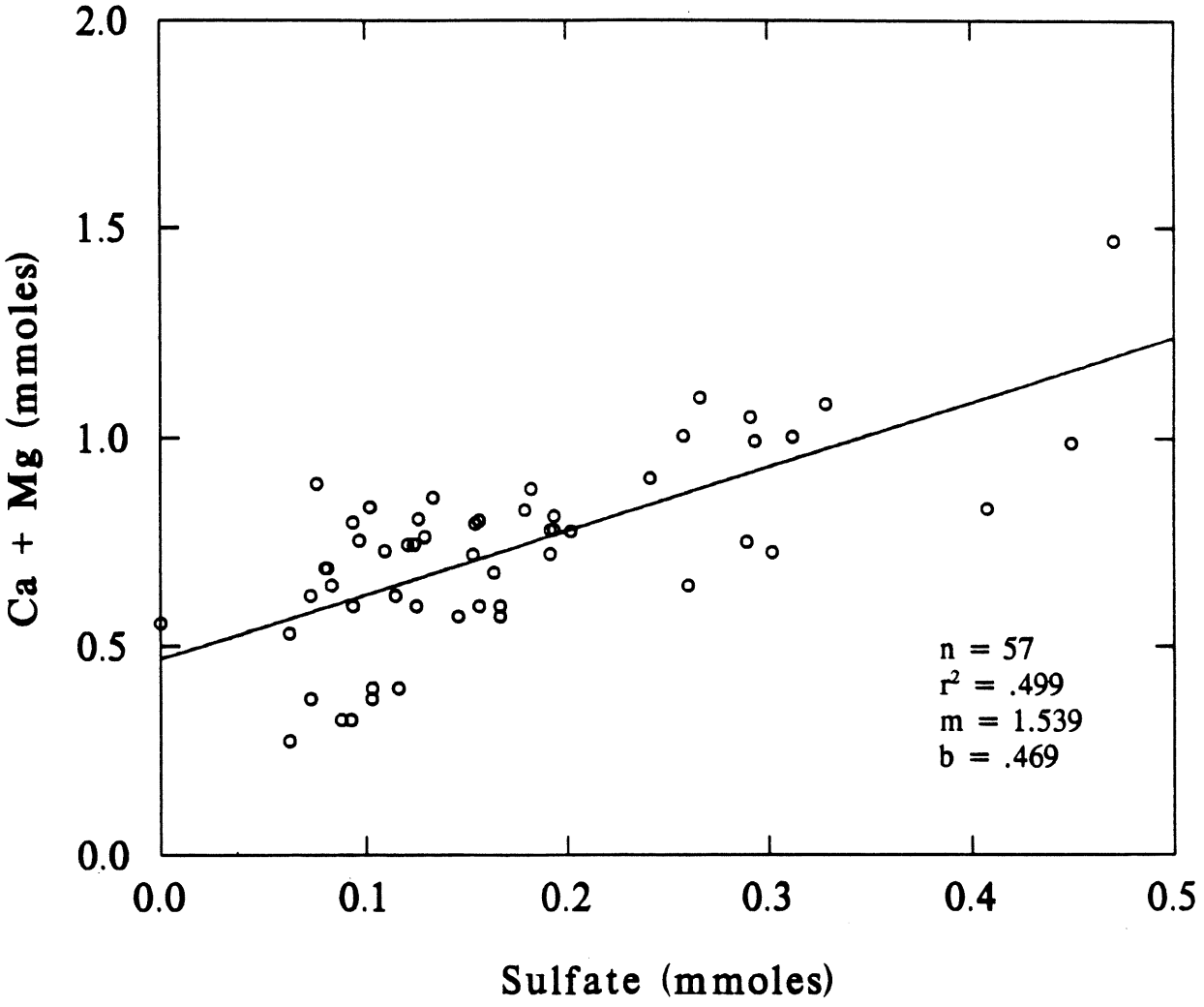


Figure A2.73. Sum of calcium and magnesium concentrations vs. sulfate in drainage from T4: weeks 0 - 12, 75 g sample weeks 0 - 106; for sulfate < 1.0 mmoles/L (Variable Mass Experiment).

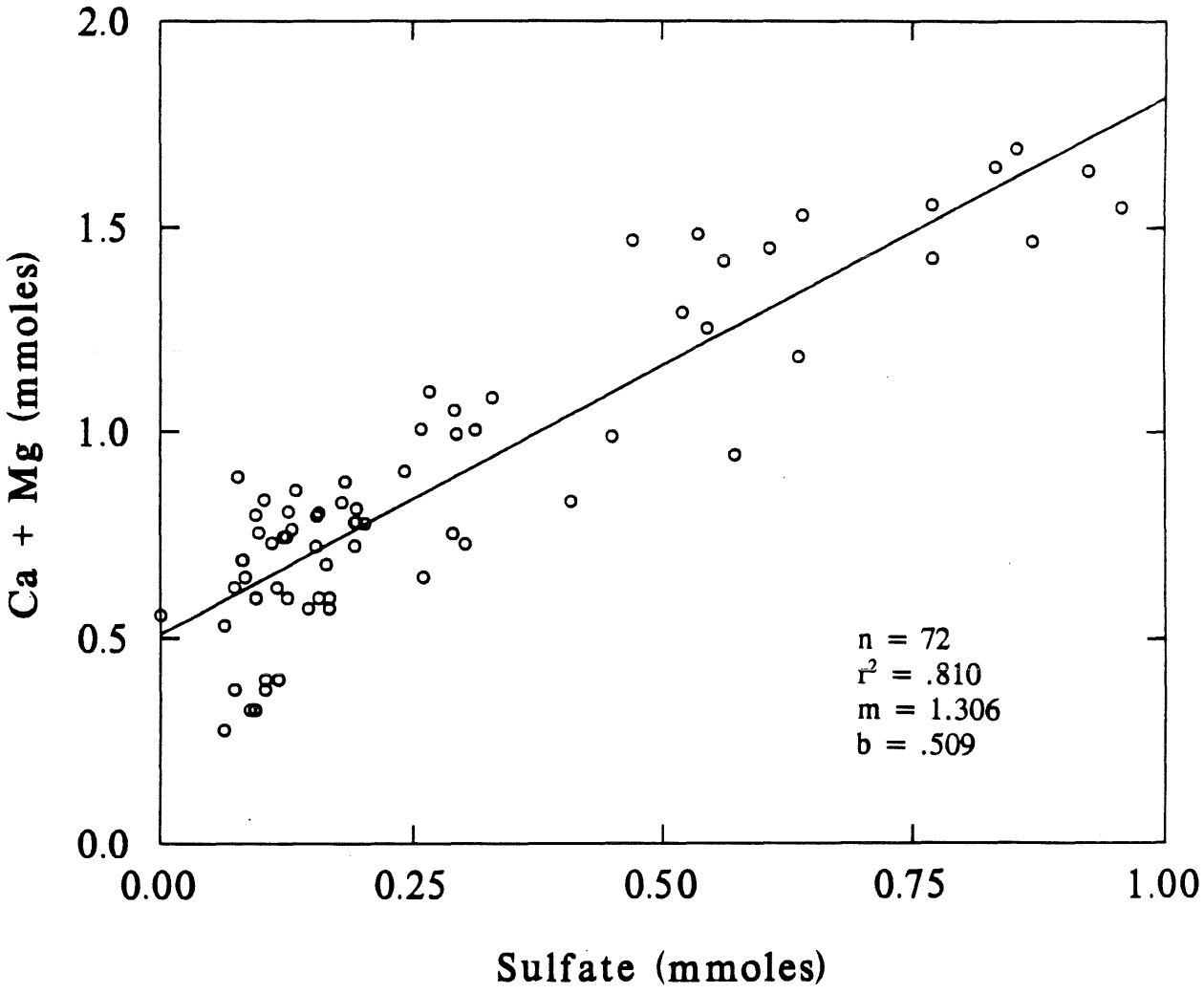


Figure A2.74. Sum of calcium and magnesium concentrations vs. sulfate in drainage from T10: weeks 0 - 12, 75 g sample weeks 0 - 106; for sulfate < 0.5 mmoles/L (Variable Mass Experiment).

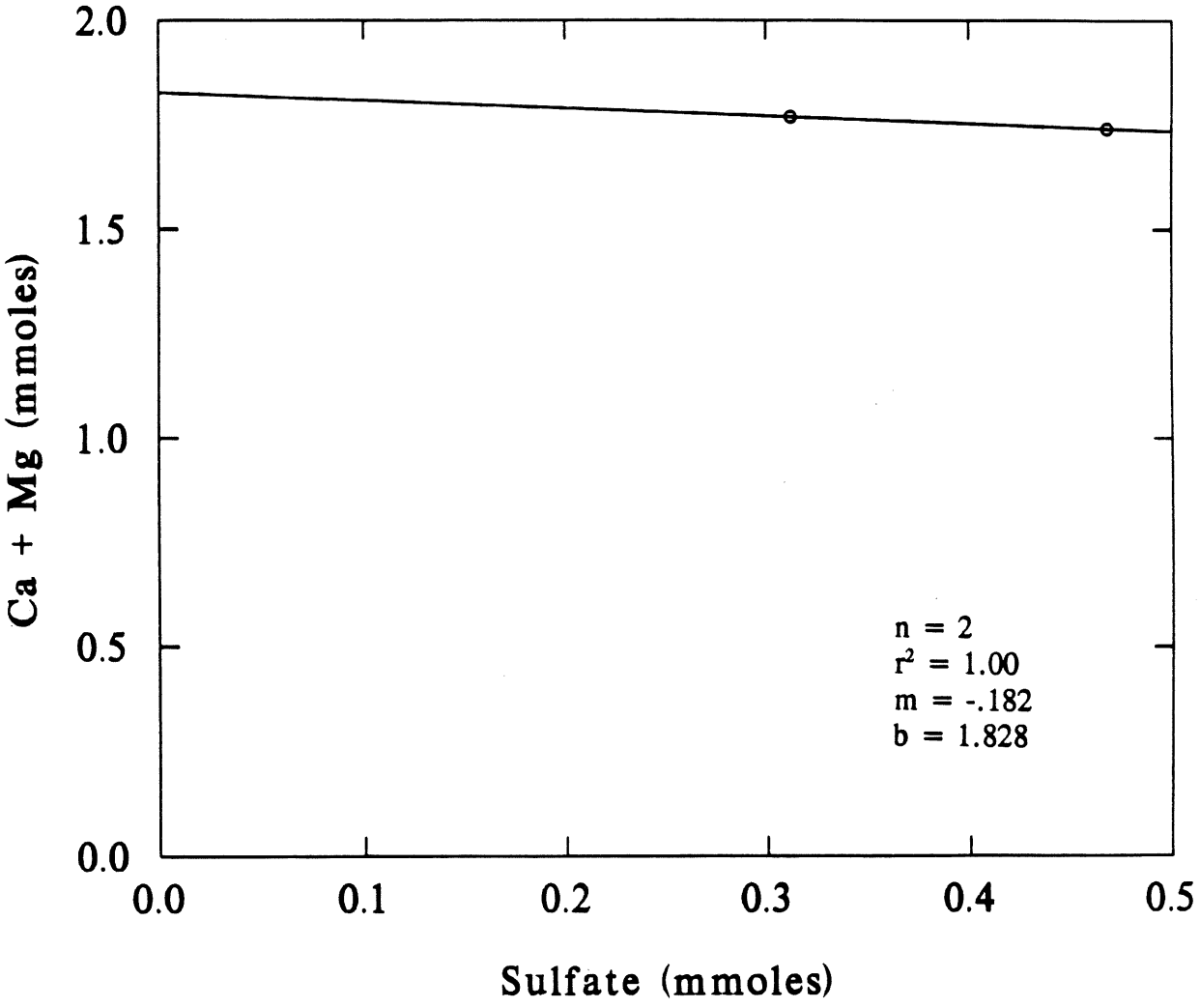
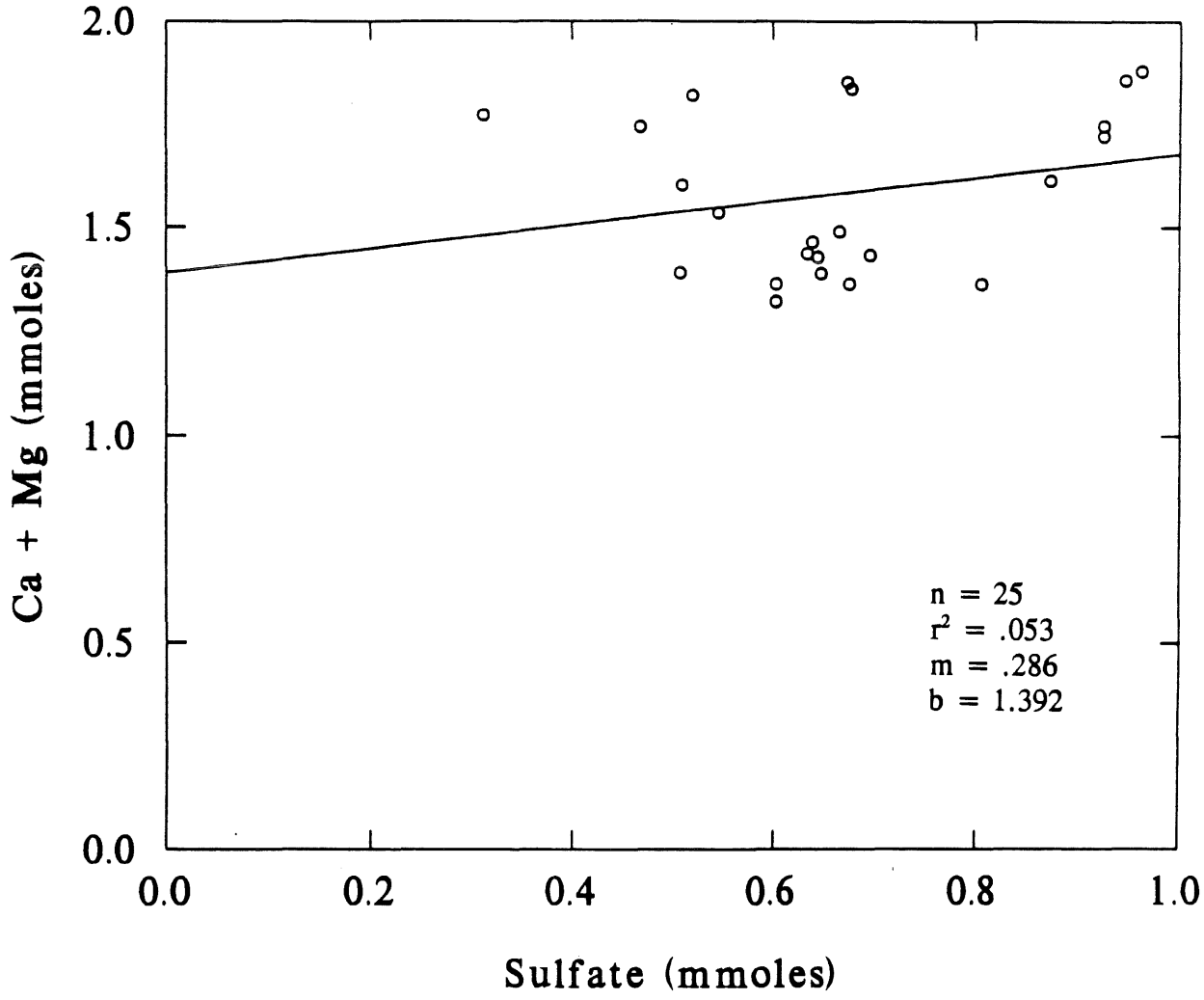


Figure A2.75. Sum of calcium and magnesium concentrations vs. sulfate in drainage from T10: weeks 0 - 12, 75 g sample weeks 0 - 106; for sulfate < 1.0 mmoles/L (Variable Mass Experiment).



APPENDIX 3

EXTENDED OXIDATION

A3.1. - A3.40. Drainage quality data.
A3.41. - A3.80. Cumulative mass release data.

Table A3.1 Extended Oxidation (Three Week Interval) drainage quality: Solid T1 (reactor 1).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	100	8.02	.	.	4.7	11.6	5.6	9671.	7	10	91
3	.	128	8.07	47.	.	5.5	13.8	7.0	9687.	7	31	91
6	166.9	115	7.94	52.	.	4.9	14.0	6.8	9712.	8	21	91
9	167.7	114	7.87	52.	.	.	.	.	9728.	9	11	91
12	.	102	7.93	53.	.	5.3	13.0	6.6	9752.	10	2	91
15	162.3	102	7.69	50.	.	3.8	14.8	6.6	9768.	10	23	91
18	.	102	7.91	69.	.	3.5	13.6	8.0	9792.	11	13	91
21	169.3	125	7.83	48.	.	<2.0	13.8	5.8	9820.	12	4	91

Table A3.2. Extended Oxidation (Five Week Interval) drainage quality: Solid T1 (reactor 2).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	100	8.12	.	.	.	.	.	.	7	10	91
5	166.5	130	8.17	58.	.	5.7	15.6	8.0	9699.	8	14	91
10	.	140	8.16	.	.	6.4	14.8	7.8	9736.	9	19	91
15	168.4	105	7.92	53.	.	3.3	14.0	6.2	9769.	10	23	91
20	168.1	115	7.74	57.	.	2.4	14.8	5.6	9804.	11	27	91
25	170.1	108	7.85	60.	.	4.6	15.0	6.0	9840.	1	2	92
30	168.5	110	7.95	69.	.	4.6	13.0	5.0	9860.	2	5	92
35	166.4	102	7.80	63.	.	3.9	12.4	4.8	9888.	3	11	92

Table A3.3. Extended Oxidation (Seven Week Interval) drainage quality: Solid T1 (reactor 2).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	168.0	130	7.71	63.	.	10.4	14.0	5.2	40008.	4	29	92
49	169.5	115	8.12	57.	.	.	.	.	40024.	6	17	92

Table A3.4. Extended Oxidation (Ten Week Interval) drainage quality: Solid T1 (reactor 1).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
31	165.3	118	8.08	63.	.	5.3	15.4	6.0	9876.	2	12	92
41	169.7	157	7.89	63.	.	5.6	14.2	5.8	40000.	4	22	92

Table A3.5. Extended Oxidation (Five Week Interval) drainage quality: Solid T2 (reactor 4).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	300	8.28	.	.	.	.	.	.	7	10	91
5	152.3	520	8.10	81.	.	161.0	53.6	31.8	9700.	7	19	91
10	.	500	8.13	.	.	152.0	48.6	29.2	9738.	8	14	91
15	151.9	372	8.17	79.	.	81.0	34.2	19.4	9770.	10	23	91
20	154.0	315	8.15	98.	.	67.2	32.4	16.6	9806.	11	27	91
25	153.0	277	8.14	95.	.	51.2	29.2	14.6	9841.	1	2	92
30	154.8	274	8.19	95.	.	55.6	30.0	14.8	9862.	2	5	92
35	151.0	290	8.12	104.	.	63.2	30.8	15.0	9889.	3	11	92

Table A3.6. Extended Oxidation (Seven Week Interval) drainage quality: Solid T2 (reactor 4).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	153.6	375	7.81	95.	.	69.2	37.8	17.2	40009.	4	29	92
49	152.8	385	8.20	88.	.	.	.	.	40026.	6	17	92

Table A3.7. Extended Oxidation (Three Week Interval) drainage quality: Solid T3 (reactor 5).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	142	8.32	.	.	13.2	13.0	8.6	9673.	7	10	91
3	.	180	8.22	63.	.	16.2	16.2	10.6	9688.	7	31	91
6	163.1	155	8.16	52.	.	14.8	16.0	9.2	9714.	8	21	91
9	159.6	150	8.16	42.	.	.	.	.	9729.	9	11	91
12	.	146	8.06	58.	.	13.2	16.8	9.6	9754.	10	2	91
15	166.0	155	8.14	63.	.	9.6	16.8	8.2	9771.	10	23	91
18	.	143	8.21	79.	.	6.9	18.6	9.4	9794.	11	13	91
21	161.5	142	7.99	75.	.	5.2	16.8	7.8	9822.	12	4	91

Table A3.8. Extended Oxidation (Five Week Interval) drainage quality: Solid T3 (reactor 6).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	137	8.30	.	.	.	.	.	.	7	10	91
5	161.7	182	8.22	68.	.	20.9	18.2	12.0	9701.	8	14	91
10	.	187	8.24	.	.	19.4	17.2	10.8	9739.	9	19	91
15	163.2	160	8.12	63.	.	10.0	17.0	8.6	9772.	10	23	91
20	166.0	157	8.18	82.	.	8.0	19.2	9.2	9807.	11	27	91
25	165.7	142	8.13	66.	.	12.1	17.6	7.8	9842.	1	2	92
30	164.7	140	8.15	63.	.	8.6	15.2	7.2	9863.	2	5	92
35	161.5	130	8.11	72.	.	8.0	15.4	7.0	9890.	3	11	92

Table A3.9. Extended Oxidation (Seven Week Interval) drainage quality: Solid T3 (reactor 6).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	164.5	165	7.83	70.	.	17.6	19.0	9.0	40010.	4	29	92
49	164.8	150	8.18	62.	.	.	.	.	40027.	6	17	92

Table A3.10. Extended Oxidation (Ten Week Interval) drainage quality: Solid T3 (reactor 5).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
31	159.6	152	8.16	85.	.	8.3	19.4	7.8	9877.	2	12	92
41	163.2	192	8.00	69.	.	14.0	17.8	7.8	40001.	4	22	92

Table A3.11. Extended Oxidation (Three Week Interval) drainage quality: Solid T4 (reactor 7).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	152	8.25	.	.	18.4	14.4	8.8	9674.	7	10	91
3	.	200	8.16	62.	.	23.2	18.4	10.8	9689.	7	31	91
6	162.0	152	8.09	45.	.	18.6	16.4	9.0	9715.	8	21	91
9	161.6	178	8.14	.	.	.	.	.	9730.	9	11	91
12	.	170	7.98	60.	.	17.5	19.0	9.8	9755.	10	2	91
15	163.7	158	8.12	58.	.	11.6	16.6	8.0	9773.	10	23	91
18	.	153	8.12	82.	.	7.3	20.8	9.0	9795.	11	13	91
21	163.7	153	7.99	72.	.	9.0	18.4	8.2	9823.	12	4	91

Table A3.12. Extended Oxidation (Five Week Interval) drainage quality: Solid T4 (reactor 8).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	142	8.30	.	.	.	.	.	.	7	10	91
5	158.5	184	8.17	63.	.	24.8	20.2	12.2	9702.	8	14	91
10	.	215	8.16	.	.	30.0	19.8	12.4	9740.	9	19	91
15	162.2	170	8.10	60.	.	15.0	17.6	8.8	9774.	10	23	91
20	162.1	157	8.12	63.	.	9.8	19.2	8.6	9808.	11	27	91
25	160.6	162	8.10	72.	.	12.1	18.4	8.4	9843.	1	2	92
30	160.4	155	8.12	63.	.	11.9	17.6	7.4	9864.	2	5	92
35	159.4	145	8.05	76.	.	12.4	18.0	7.6	9891.	3	11	92

Table A3.13. Extended Oxidation (Seven Week Interval) drainage quality: Solid T4 (reactor 8).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	161.2	183	7.86	72.	.	17.2	19.6	8.2	40011.	4	29	92
49	159.5	182	8.19	67.	.	.	.	.	40028.	6	17	92

Table A3.14. Extended Oxidation (Ten Week Interval) drainage quality: Solid T4 (reactor 7).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
31	160.8	162	8.12	82.	.	12.8	20.8	8.2	9878.	2	12	92
41	166.0	205	7.98	65.	.	18.4	19.0	7.4	40002.	4	22	92

Table A3.15. Extended Oxidation (Three Week Interval) drainage quality: Solid T5 (reactor 9).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	81	8.20	.	.	5.7	12.6	2.2	9675.	7	10	91
3	.	110	8.09	37.	.	5.7	16.0	2.4	9690.	7	31	91
6	167.9	92	8.03	37.	.	6.2	15.6	2.0	9716.	8	21	91
9	162.7	95	7.96	39.	.	.	.	.	9731.	9	11	91
12	.	90	7.82	39.	.	4.5	16.0	2.2	9756.	10	2	91
15	166.8	85	7.94	38.	.	2.9	15.2	0.6	9775.	10	23	91
18	.	82	8.16	47.	.	3.3	16.0	1.2	9796.	11	13	91
21	167.3	82	7.92	42.	.	<2.0	14.4	2.0	9824.	12	4	91

Table A3.16. Extended Oxidation (Five Week Interval) drainage quality: Solid T5 (reactor 10).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	80	8.18	.	.	.	.	.	.	7	10	91
5	167.3	110	8.08	42.	.	5.7	17.4	2.2	9703.	8	14	91
10	.	110	8.18	.	.	4.7	17.0	2.6	9741.	9	19	91
15	167.8	88	7.98	37.	.	<2.0	15.6	0.8	9776.	10	23	91
20	168.0	92	8.10	44.	.	2.7	16.8	3.0	9809.	11	27	91
25	168.3	83	8.06	40.	.	3.5	14.6	1.6	9844.	1	2	92
30	166.0	87	8.08	38.	.	<2.0	12.8	0.8	9865.	2	5	92
35	166.0	75	8.05	34.	.	3.6	13.2	0.8	9892.	3	11	92

Table A3.17. Extended Oxidation (Seven Week Interval) drainage quality: Solid T5 (reactor 10).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	164.8	94	7.85	43.	.	3.6	15.2	1.0	40012.	4	29	92
49	167.6	92	8.05	41.	.	.	.	.	40029.	6	17	92

Table A3.18. Extended Oxidation (Ten Week Interval) drainage quality: Solid T5 (reactor 9).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
31	165.3	87	7.99	42.	.	<2.0	15.2	1.0	9879.	2	12	92
41	165.8	110	7.98	44.	.	5.2	14.6	1.0	40003.	4	22	92

Table A3.19. Extended Oxidation (Five Week Interval) drainage quality: Solid T6 (reactor 12).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	165	8.08	.	.	.	.	.	.	7	10	91
5	.	208	8.05	47.	.	44.8	19.2	11.2	9704.	8	14	91
10	.	245	7.98	.	.	55.2	19.8	12.8	9743.	9	19	91
15	168.4	171	7.90	47.	.	25.0	16.8	9.2	9777.	10	23	91
20	168.7	170	7.88	44.	.	22.6	18.0	9.2	9811.	11	27	91
25	171.5	160	7.90	49.	.	24.9	16.4	8.0	9845.	1	2	92
30	171.5	165	7.92	57.	.	27.3	15.6	7.6	9867.	2	5	92
35	168.6	162	7.85	47.	.	30.9	16.8	8.0	9893.	3	11	92

Table A3.20. Extended Oxidation (Seven Week Interval) drainage quality: Solid T6 (reactor 12).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	168.0	205	7.70	49.	.	36.8	19.4	8.0	40013.	4	29	92
49	167.0	205	7.93	39.	.	.	.	.	40031.	6	17	92

Table A3.21. Extended Oxidation (Three Week Interval) drainage quality: Solid T7 (reactor 13).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	103	8.22	.	.	3.1	12.0	4.8	9677.	7	10	91
3	.	130	8.13	51.	.	4.5	14.4	6.0	9691.	7	31	91
6	169.4	110	8.11	57.	.	4.7	14.6	6.0	9718.	8	21	91
9	172.1	118	8.17	.	.	.	.	.	9732.	9	11	91
12	.	116	8.07	55.	.	3.2	15.6	6.0	9758.	10	2	91
15	169.7	118	8.05	53.	.	<2.0	15.4	6.0	9778.	10	23	91
18	.	112	8.17	64.	.	2.0	17.4	5.6	9798.	11	13	91
21	.	108	7.95	60.	.	<2.0	13.8	5.0	9826.	12	4	91

Table A3.22. Extended Oxidation (Five Week Interval) drainage quality: Solid T7 (reactor 14).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	100	8.20	.	.	.	.	.	.	7	10	91
5	168.2	128	8.17	59.	.	4.2	16.0	6.2	9705.	8	14	91
10	.	132	8.16	.	.	6.0	16.0	7.0	9744.	9	19	91
15	169.9	119	8.03	53.	.	<2.0	15.8	6.0	9779.	10	23	91
20	170.9	110	8.02	63.	.	2.6	16.4	5.6	9812.	11	27	91
25	171.2	110	7.99	55.	.	3.3	14.8	5.2	9846.	1	2	92
30	169.0	112	8.04	53.	.	5.1	.	.	9868.	2	5	92
35	168.9	105	7.98	56.	.	4.6	13.2	4.6	9894.	3	11	92

Table A3.23. Extended Oxidation (Five Week Interval) drainage quality: Solid T7 (reactor 14).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	169.4	125	7.84	63.	.	5.4	14.6	4.6	40014.	4	29	92
49	145.3	125	8.06	57.	.	.	.	.	40032.	6	17	92

Table A3.24. Extended Oxidation (Ten Week Interval) drainage quality: Solid T7 (reactor 13).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
31	168.4	121	8.09	69.	.	<2.0	15.4	6.6	9880.	2	12	92
41	166.3	162	7.99	63.	.	5.0	16.4	5.8	40004.	4	22	92

Table A3.25. Extended Oxidation (Three Week Interval) drainage quality: Solid T8 (reactor 15).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	108	8.20	.	.	5.7	13.0	4.4	9678.	7	10	91
3	.	140	8.11	52.	.	6.6	16.0	5.2	9692.	7	31	91
6	168.7	115	8.06	52.	.	6.6	15.2	5.4	9719.	8	21	91
9	167.3	122	8.12	42.	.	.	.	.	9733.	9	11	91
12	.	118	7.98	40.	.	5.0	16.4	4.8	9759.	10	2	91
15	167.5	120	7.99	53.	.	3.7	16.4	5.4	9780.	10	23	91
18	.	106	8.07	60.	.	4.0	17.8	4.2	9799.	11	13	91
21	167.3	117	7.91	60.	.	2.7	16.4	4.6	9827.	12	4	91

Table A3.26. Extended Oxidation (Five Week Interval) drainage quality: Solid T8 (reactor 16).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	106	8.18	.	.	.	.	.	.	7	10	91
5	168.2	205	8.16	58.	.	11.6	18.8	5.0	9706.	8	14	91
10	.	140	8.12	.	.	9.1	17.6	5.6	9745.	9	19	91
15	169.0	120	7.99	50.	.	3.9	16.2	5.6	9781.	10	23	91
20	171.6	120	7.99	53.	.	2.8	16.8	5.2	9813.	11	27	91
25	169.6	111	7.98	52.	.	3.9	15.6	4.4	9847.	1	2	92
30	166.6	108	7.99	63.	.	4.7	14.0	4.0	9869.	2	5	92
35	167.5	103	7.98	63.	.	4.0	15.2	3.6	9895.	3	11	92

Table A3.27. Extended Oxidation (Seven Week Interval) drainage quality: Solid T8 (reactor 16).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	166.0	132	7.84	40.	.	6.4	16.4	3.6	40015.	4	29	92
49	167.1	122	8.05	54.	.	.	.	.	40033.	6	17	92

Table A3.28. Extended Oxidation (Ten Week Interval) drainage quality: Solid T8 (reactor 15).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
31	167.5	117	8.00	63.	.	3.3	16.8	5.2	9881.	2	12	92
41	166.2	156	7.97	63.	.	10.0	18.4	5.6	40005.	4	22	92

Table A3.29. Extended Oxidation (Five Week Interval) drainage quality: Solid T9 (reactor 18).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	166.0	155	7.90	.	.	.	.	.	.	7	10	91
5	.	208	7.97	36.	.	42.4	34.4	1.6	9707.	8	14	91
10	.	200	7.89	.	.	49.4	29.8	2.0	9747.	9	19	91
15	164.2	112	7.78	29.	.	16.9	19.0	2.8	9782.	10	23	91
20	166.6	102	7.89	32.	.	11.7	17.2	1.6	9815.	11	27	91
25	167.2	91	7.83	29.	.	11.0	15.8	1.4	9848.	1	2	92
30	165.8	78	7.93	32.	.	9.7	13.2	0.6	9871.	2	5	92
35	164.6	112	7.84	28.	.	10.5	12.4	1.0	9896.	3	11	92

Table A3.30. Extended Oxidation (Seven Week Interval) drainage quality: Solid T9 (reactor 18).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	164.4	92	7.80	40.	.	9.3	13.6	0.6	40016.	4	29	92
49	162.3	92	7.86	28.	.	.	.	.	40035.	6	17	92

Table A3.31. Extended Oxidation (Five Week Interval) drainage quality: Solid T10 (reactor 20).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	460	8.32	.	.	.	.	.	.	7	10	91
5	166.0	675	8.19	68.	.	277.0	78.6	44.0	9708.	8	14	91
10	.	700	8.11	.	.	272.0	69.8	41.2	9749.	9	19	91
15	169.1	530	8.20	60.	.	133.0	45.4	32.8	9783.	10	23	91
20	167.9	430	8.20	88.	.	115.0	41.2	25.2	9817.	11	27	91
25	167.5	387	8.22	104.	.	91.0	36.8	22.8	9849.	1	2	92
30	167.9	400	8.19	110.	.	100.5	40.4	22.8	9873.	2	5	92
35	166.1	405	8.15	113.	.	115.0	41.2	27.0	9897.	3	11	92

Table A3.32. Extended Oxidation (Seven Week Interval) drainage quality: Solid T10 (reactor 20).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	168.3	500	7.99	98.	.	130.0	47.6	25.4	40017.	4	29	92
49	167.7	500	8.13	75.	.	.	.	.	40037.	6	17	92

Table A3.33. Extended Oxidation (Three Week Interval) drainage quality: Solid T11 (reactor 21).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	7	7.12	.	.	4.2	3.0	1.8	9681.	7	10	91
3	.	15	7.40	7.	.	<2.0	3.4	2.4	9693.	7	31	91
6	179.0	13	7.53	3.	.	3.6	4.0	1.8	9722.	8	21	91
9	180.7	14	7.40	8.	.	.	.	.	9734.	9	11	91
12	.	12	7.34	11.	.	3.5	4.4	2.4	9762.	10	2	91
15	179.7	13	7.64	5.	.	<2.0	4.4	4.8	9784.	10	23	91
18	.	16	7.52	6.	.	<2.0	4.4	1.4	9802.	11	13	91
21	180.7	11	7.47	6.	.	<2.0	3.6	1.8	9830.	12	4	91

Table A3.34. Extended Oxidation (Five Week Interval) drainage quality: Solid T11 (reactor 22).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	6	6.95	.	.	.	.	.	.	7	10	91
5	182.8	18	7.35	9.	.	3.4	5.6	1.6	9709.	8	14	91
10	.	22	7.49	.	.	3.7	4.4	2.4	9750.	9	19	91
15	180.4	12	7.48	5.	.	<2.0	3.8	3.2	9785.	10	23	91
20	180.5	19	7.67	3.	.	<2.0	4.2	3.2	9818.	11	27	91
25	179.8	12	7.43	6.	.	2.9	3.2	1.6	9850.	1	2	92
30	180.1	11	7.29	4.	.	3.5	0.8	0.8	9874.	2	5	92
35	178.3	10	7.52	6.	.	3.3	0.8	1.0	9898.	3	11	92

Table A3.35. Extended Oxidation (Seven Week Interval) drainage quality: Solid T11 (reactor 22).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	179.6	16	7.40	9.	.	<2.0	3.0	1.0	40018.	4	29	92
49	182.0	16	7.32	5.	.	.	.	.	40038.	6	17	92

Table A3.36. Extended Oxidation (Ten Week Interval) drainage quality: Solid T11 (reactor 21).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
31	179.7	16	7.39	8.	.	<2.0	1.6	1.6	9882.	2	12	92
41	181.1	21	7.42	6.	.	2.9	1.4	1.0	40006.	4	22	92

Table A3.37. Extended Oxidation (Three Week Interval) drainage quality: Solid T12 (reactor 23).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	21	7.17	.	.	2.9	3.6	2.8	9682.	7	10	91
3	.	38	7.48	17.	.	3.2	4.0	3.8	9694.	7	31	91
6	174.5	31	7.47	16.	.	3.5	4.0	3.6	9723.	8	21	91
9	174.1	38	7.44	18.	.	.	.	.	9735.	9	11	91
12	.	38	7.39	16.	.	<2.0	5.0	4.4	9763.	10	2	91
15	174.4	44	7.35	16.	.	<2.0	4.8	6.2	9786.	10	23	91
18	.	40	7.48	23.	.	<2.0	6.4	5.2	9803.	11	13	91
21	172.8	49	7.28	24.	.	3.8	4.8	4.8	9831.	12	4	91

Table A3.38. Extended Oxidation (Five Week Interval) drainage quality: Solid T12 (reactor 24).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
0	.	21	7.20	.	.	.	.	.	.	7	10	91
5	167.7	45	7.59	15.	.	<2.0	5.2	4.0	9710.	8	14	91
10	.	47	7.60	.	.	3.8	5.2	5.0	9751.	9	19	91
15	176.4	43	7.30	18.	.	<2.0	5.2	7.8	9787.	10	23	91
20	177.6	42	7.44	25.	.	<2.0	5.4	4.8	9819.	11	27	91
25	176.9	38	7.29	14.	.	3.2	4.4	4.0	9851.	1	2	92
30	177.2	39	7.30	28.	.	<2.0	2.4	3.4	9875.	2	5	92
35	174.5	39	7.33	24.	.	3.4	1.8	0.4	9899.	3	11	92

Table A3.39. Extended Oxidation (Seven Week Interval) drainage quality: Solid T12 (reactor 24).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
42	175.2	50	7.62	23.	.	2.8	2.8	4.0	40019.	4	29	92
49	182.8	42	7.22	23.	.	.	.	.	40039.	6	17	92

Table A3.40. Extended Oxidation (Ten Week Interval) drainage quality: Solid T12 (reactor 23).

Week	Volume (mL)	S.C. (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
31	173.5	50	7.58	25.	.	<2.0	3.0	4.8	9883.	2	12	92
41	173.7	58	7.10	19.	.	3.6	3.0	4.4	40007.	4	22	92

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Table A3.41. Extended Oxidation (Three Week Oxidation Interval) cumulative mass release: Solid T1 (reactor 1).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
3	.	5.5	0.918	0.918	13.8	2.303	2.303	7.0	1.168	1.168
6	166.9	4.9	0.818	1.736	14.0	2.337	4.640	6.8	1.135	2.303
9	167.7	.	0.855	2.591	.	2.264	6.904	.	1.124	3.427
12	.	5.3	0.875	3.466	13.0	2.145	9.049	6.6	1.089	4.516
15	162.3	3.8	0.617	4.082	14.8	2.402	11.451	6.6	1.071	5.587
18	.	3.5	0.580	4.663	13.6	2.255	13.706	8.0	1.326	6.913
21	169.3	<2.0	0.000	4.663	13.8	2.336	16.042	5.8	0.982	7.895

Table A3.42. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T1 (reactor 2).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	166.5	5.7	0.949	0.949	15.6	2.597	2.597	8.0	1.332	1.332
10	.	6.4	1.072	2.021	14.8	2.479	5.076	7.8	1.307	2.639
15	168.4	3.3	0.556	2.577	14.0	2.358	7.433	6.2	1.044	3.683
20	168.1	2.4	0.403	2.980	14.8	2.488	9.921	5.6	0.941	4.624
25	170.1	4.6	0.782	3.763	15.0	2.552	12.473	6.0	1.021	5.645
30	168.5	4.6	0.775	4.538	13.0	2.191	14.663	5.0	0.843	6.487
35	166.4	3.9	0.649	5.187	12.4	2.063	16.727	4.8	0.799	7.286

Table A3.43. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T1 (reactor 2).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	168.0	10.4	1.747	1.747	14.0	2.352	2.352	5.2	0.874	0.874
49	169.5	.	.	.	.	.	.	.	.	.

Table A3.44. Extended Oxidation (Ten Week Oxidation Interval) cumulative mass release: Solid T1 (reactor 1).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
31	165.3	5.3	0.876	0.876	15.4	2.546	2.546	6.0	0.992	0.992
41	169.7	5.6	0.950	1.826	14.2	2.410	4.956	5.8	0.984	1.976

Table A3.45. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T2 (reactor 4).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	152.3	161.0	24.520	24.520	53.6	8.163	8.163	31.8	4.843	4.843
10	.	152.0	23.119	47.639	48.6	7.392	15.555	29.2	4.441	9.284
15	151.9	81.0	12.304	59.943	34.2	5.195	20.750	19.4	2.947	12.231
20	154.0	67.2	10.349	70.292	32.4	4.990	25.740	16.6	2.556	14.787
25	153.0	51.2	7.834	78.126	29.2	4.468	30.207	14.6	2.234	17.021
30	154.8	55.6	8.607	86.733	30.0	4.644	34.851	14.8	2.291	19.312
35	151.0	63.2	9.543	96.276	30.8	4.651	39.502	15.0	2.265	21.577

Table A3.46. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T2 (reactor 4).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	153.6	69.2	10.629	10.629	37.8	5.806	5.806	17.2	2.642	2.642
49	152.8	.	.	.	.	.	.	.	.	.

Table A3.47. Extended Oxidation (Three Week Oxidation Interval) cumulative mass release: Solid T3 (reactor 5).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
3	.	16.2	2.628	2.628	16.2	2.628	2.628	10.6	1.719	1.719
6	163.1	14.8	2.414	5.041	16.0	2.610	5.237	9.2	1.501	3.219
9	159.6	.	2.234	7.276	.	2.617	7.855	.	1.500	4.719
12	.	13.2	2.149	9.425	16.8	2.735	10.590	9.6	1.563	6.282
15	166.0	9.6	1.594	11.018	16.8	2.789	13.379	8.2	1.361	7.643
18	.	6.9	1.130	12.149	18.6	3.047	16.425	9.4	1.540	9.183
21	161.5	5.2	0.840	12.988	16.8	2.713	19.138	7.8	1.260	10.443

Table A3.48. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T3 (reactor 6).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	161.7	20.9	3.380	3.380	18.2	2.943	2.943	12.0	1.940	1.940
10	.	19.4	3.153	6.533	17.2	2.795	5.738	10.8	1.755	3.695
15	163.2	10.0	1.632	8.165	17.0	2.774	8.512	8.6	1.404	5.099
20	166.0	8.0	1.328	9.493	19.2	3.187	11.699	9.2	1.527	6.626
25	165.7	12.1	2.005	11.498	17.6	2.916	14.615	7.8	1.292	7.918
30	164.7	8.6	1.416	12.914	15.2	2.503	17.119	7.2	1.186	9.104
35	161.5	8.0	1.292	14.206	15.4	2.487	19.606	7.0	1.131	10.235

Table A3.49. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T3 (reactor 6).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	164.5	17.6	2.895	2.895	19.0	3.126	3.126	9.0	1.481	1.481
49	164.8	.	.	.	.	.	.	.	.	.

Table A3.50. Extended Oxidation (Ten Week Oxidation Interval) cumulative mass release: Solid T3 (reactor 5).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
31	159.6	8.3	1.325	1.325	19.4	3.096	3.096	7.8	1.245	1.245
41	163.2	14.0	2.285	3.610	17.8	2.905	6.001	7.8	1.273	1.372

Table A3.51. Extended Oxidation (Three Week Oxidation Interval) cumulative mass release: Solid T4 (reactor 7).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
3	.	23.2	3.782	3.782	18.4	2.999	2.999	10.8	1.760	1.760
6	162.0	18.6	3.013	6.795	16.4	2.657	5.656	9.0	1.458	3.218
9	161.6	.	2.925	9.720	.	2.052	7.708	.	1.519	4.738
12	.	17.5	2.847	12.568	19.0	3.091	10.799	9.8	1.594	6.332
15	163.7	11.6	1.899	14.466	16.6	2.717	13.517	8.0	1.310	7.642
18	.	7.3	1.195	15.661	20.8	3.405	16.922	9.0	1.473	9.115
21	163.7	9.0	1.473	17.135	18.4	3.012	19.934	8.2	1.342	10.457

Table A3.52. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T4 (reactor 8).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	158.5	24.8	3.931	3.931	20.2	3.202	3.202	12.2	1.934	1.934
10	.	30.0	4.812	8.743	19.8	3.176	6.378	12.4	1.989	3.923
15	162.2	15.0	2.433	11.176	17.6	2.855	9.233	8.8	1.427	5.350
20	162.1	9.8	1.589	12.765	19.2	3.112	12.345	8.6	1.394	6.744
25	160.6	12.1	1.943	14.708	18.4	2.955	15.300	8.4	1.349	8.093
30	160.4	11.9	1.909	16.617	17.6	2.823	18.123	7.4	1.187	9.280
35	159.4	12.4	1.977	18.593	18.0	2.869	20.992	7.6	1.211	10.492

Table A3.53. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T4 (reactor 8).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	161.2	17.2	2.773	2.773	19.6	3.160	3.160	8.2	1.322	1.322
49	159.5	.	.	.	.	.	.	.	.	.

Table A3.54. Extended Oxidation (Ten Week Oxidation Interval) cumulative mass release: Solid T4 (reactor 7).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
31	160.8	12.8	2.058	2.058	20.8	3.345	3.345	8.2	1.319	1.319
41	166.0	18.4	3.054	5.112	19.0	3.154	6.499	7.4	1.228	2.547

Table A3.55. Extended Oxidation (Three Week Oxidation Interval) cumulative mass release: Solid T5 (reactor 9).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
3	.	5.7	0.946	0.946	16.0	2.656	2.656	2.4	0.398	0.398
6	167.9	6.2	1.041	1.987	15.6	2.619	5.275	2.0	0.336	0.734
9	162.7	.	0.879	2.866	.	2.571	7.846	.	0.342	1.075
12	.	4.5	0.742	3.607	16.0	2.637	10.482	2.2	0.363	1.438
15	166.8	2.9	0.484	4.091	15.2	2.535	13.018	0.6	0.100	1.538
18	.	3.3	0.551	4.643	16.0	2.674	15.691	1.2	0.201	1.739
21	167.3	<2.0	0.000	4.643	14.4	2.409	18.100	2.0	0.335	2.073

Table A3.56. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T5 (reactor 10).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	167.3	5.7	0.954	0.954	17.4	2.911	2.911	2.2	0.368	0.368
10	.	4.7	0.788	1.742	17.0	2.849	5.760	2.6	0.436	0.804
15	167.8	<2.0	0.000	1.742	15.6	2.618	8.378	0.8	0.134	0.938
20	168.0	2.7	0.454	2.196	16.8	2.822	11.200	3.0	0.504	1.442
25	168.3	3.5	0.589	2.785	14.6	2.457	13.657	1.6	0.269	1.712
30	166.0	<2.0	0.000	2.785	12.8	2.125	15.782	0.8	0.133	1.844
35	166.0	3.6	0.598	3.382	13.2	2.191	17.973	0.8	0.133	1.977

Table A3.57. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T5 (reactor 10).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	164.8	3.6	0.593	0.593	15.2	2.505	2.505	1.0	0.165	0.165
49	167.6	.	.	.	.	.	.	.	.	.

Table A3.58. Extended Oxidation (Ten Week Oxidation Interval) cumulative mass release: Solid T5 (reactor 9).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
31	165.3	<2.0	0.000	0.000	15.2	2.513	2.513	1.0	0.165	0.165
41	165.8	5.2	0.862	0.862	14.6	2.421	4.934	1.0	0.166	0.331

Table A3.59. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T6 (reactor 12).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	.	44.8	7.576	7.576	19.2	3.247	3.247	11.2	1.894	1.894
10	.	55.2	9.334	16.911	19.8	3.348	6.595	12.8	2.164	4.058
15	168.4	25.0	4.210	21.121	16.8	2.829	9.424	9.2	1.549	5.608
20	168.7	22.6	3.813	24.933	18.0	3.037	12.461	9.2	1.552	7.160
25	171.5	24.9	4.270	29.203	16.4	2.813	15.273	8.0	1.372	8.532
30	171.5	27.3	4.682	33.885	15.6	2.675	17.949	7.6	1.303	9.835
35	168.6	30.9	5.210	39.095	16.8	2.832	20.781	8.0	1.349	11.184

Table A3.60. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T6 (reactor 12).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	168.0	36.8	6.182	6.182	19.4	3.259	3.259	8.0	1.344	1.344
49	167.0	.	.	.	.	.	.	.	.	.

Table A3.61. Extended Oxidation (Three Week Oxidation Interval) cumulative mass release: Solid T7 (reactor 13).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
3	.	4.5	0.761	0.761	14.4	2.436	2.436	6.0	1.015	1.015
6	169.4	4.7	0.796	1.557	14.6	2.473	4.909	6.0	1.016	2.032
9	172.1	.	0.688	2.246	.	2.599	7.508	.	1.033	3.064
12	.	3.2	0.547	2.792	15.6	2.666	10.174	6.0	1.025	4.090
15	169.7	<2.0	0.000	2.792	15.4	2.613	12.787	6.0	1.018	5.108
18	.	2.0	0.338	3.131	17.4	2.942	15.730	5.6	0.947	6.055
21	.	<2.0	0.000	3.131	13.8	2.334	18.063	5.0	0.846	6.900

Table A3.62. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T7 (reactor 14).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	168.2	4.2	0.706	0.706	16.0	2.691	2.691	6.2	1.043	1.043
10	.	6.0	1.015	1.720	16.0	2.706	5.397	7.0	1.184	2.227
15	169.9	<2.0	0.000	1.720	15.8	2.684	8.081	6.0	1.019	3.246
20	170.9	2.6	0.444	2.165	16.4	2.803	10.884	5.6	0.957	4.203
25	171.2	3.3	0.565	2.729	14.8	2.534	13.418	5.2	0.890	5.093
30	169.0	5.1	0.862	3.591	.	2.366	15.784	.	0.828	5.921
35	168.9	4.6	0.777	4.368	13.2	2.229	18.013	4.6	0.777	6.698

Table A3.63. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T7 (reactor 14).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	169.4	5.4	0.915	0.915	14.6	2.473	2.473	4.6	0.779	0.779
49	145.3	.	.	.	.	.	.	.	.	.

Table A3.64. Extended Oxidation (Ten Week Oxidation Interval) cumulative mass release: Solid T7 (reactor 13).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
31	168.4	<2.0	0.000	0.000	15.4	2.593	2.593	6.6	1.111	1.111
41	166.3	5.0	0.832	0.832	16.4	2.727	5.320	5.8	0.965	2.076

Table A3.65. Extended Oxidation (Three Week Oxidation Interval) cumulative mass release: Solid T8 (reactor 15).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
3	.	6.6	1.105	1.105	16.0	2.678	2.678	5.2	0.870	0.870
6	168.7	6.6	1.113	2.218	15.2	2.564	5.242	5.4	0.911	1.781
9	167.3	.	0.970	3.189	.	2.643	7.885	.	0.853	2.634
12	.	5.0	0.837	4.026	16.4	2.745	10.631	4.8	0.804	3.438
15	167.5	3.7	0.620	4.645	16.4	2.747	13.378	5.4	0.905	4.342
18	.	4.0	0.670	5.315	17.8	2.980	16.357	4.2	0.703	5.045
21	167.3	2.7	0.452	5.767	16.4	2.744	19.101	4.6	0.770	5.815

Table A3.66. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T8 (reactor 16).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	168.2	11.6	1.951	1.951	18.8	3.162	3.162	5.0	0.841	0.841
10	.	9.1	1.534	3.485	17.6	2.967	6.130	5.6	0.944	1.785
15	169.0	3.9	0.659	4.144	16.2	2.738	8.868	5.6	0.946	2.731
20	171.6	2.8	0.480	4.624	16.8	2.883	11.750	5.2	0.892	3.624
25	169.6	3.9	0.661	5.286	15.6	2.646	14.396	4.4	0.746	4.370
30	166.6	4.7	0.783	6.069	14.0	2.332	16.729	4.0	0.666	5.036
35	167.5	4.0	0.670	6.739	15.2	2.546	19.275	3.6	0.603	5.639

Table A3.67. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T8 (reactor 16).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	166.0	6.4	1.062	1.062	16.4	2.722	2.722	3.6	0.598	0.598
49	167.1	.	.	.	.	.	.	.	.	.

Table A3.68. Extended Oxidation (Ten Week Oxidation Interval) cumulative mass release: Solid T8 (reactor 15).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
31	167.5	3.3	0.553	0.553	16.8	2.814	2.814	5.2	0.871	0.871
41	166.2	10.0	1.662	2.215	18.4	3.058	5.872	5.6	0.931	1.802

Table A3.69. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T9 (reactor 18).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	.	42.4	7.000	7.000	34.4	5.679	5.679	1.6	0.264	0.264
10	.	49.4	8.156	15.155	29.8	4.920	10.599	2.0	0.330	0.594
15	164.2	16.9	2.775	17.930	19.0	3.120	13.719	2.8	0.460	1.054
20	166.6	11.7	1.949	19.880	17.2	2.866	16.585	1.6	0.267	1.321
25	167.2	11.0	1.839	21.719	15.8	2.642	19.226	1.4	0.234	1.555
30	165.8	9.7	1.608	23.327	13.2	2.189	21.415	0.6	0.099	1.654
35	164.6	10.5	1.728	25.055	12.4	2.041	23.456	1.0	0.165	1.819

Table A3.70. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T9 (reactor 18).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	164.4	9.3	1.529	1.529	13.6	2.236	2.236	0.6	0.099	0.099
49	162.3	.	.	.	.	.	.	.	.	.

Table A3.71. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T10 (reactor 20).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	166.0	277.0	45.982	45.982	78.6	13.048	13.048	44.0	7.304	7.304
10	.	272.0	45.587	91.570	69.8	11.698	24.746	41.2	6.905	14.209
15	169.1	133.0	22.490	114.060	45.4	7.677	32.423	32.8	5.546	19.756
20	167.9	115.0	19.309	133.368	41.2	6.917	39.341	25.2	4.231	23.987
25	167.5	91.0	15.243	148.611	36.8	6.164	45.505	22.8	3.819	27.806
30	167.9	100.5	16.874	165.485	40.4	6.783	52.288	22.8	3.828	31.634
35	166.1	115.0	19.102	184.586	41.2	6.843	59.131	27.0	4.485	36.119

Table A3.72. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T10 (reactor 20).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	168.3	130.0	21.879	21.879	47.6	8.011	8.011	25.4	4.275	4.275
49	167.7	.	.	.	.	.	.	.	.	.

Table A3.73. Extended Oxidation (Three Week Oxidation Interval) cumulative mass release: Solid T11 (reactor 21).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
3	.	<2.0	0.000	0.000	3.4	0.613	0.613	2.4	0.432	0.432
6	179.0	3.6	0.644	0.645	4.0	0.716	1.329	1.8	0.322	0.754
9	180.7	.	0.651	1.295	.	0.759	2.088	.	0.379	1.134
12	.	3.5	0.631	1.926	4.4	0.793	2.881	2.4	0.432	1.566
15	179.7	<2.0	0.000	1.926	4.4	0.791	3.671	4.8	0.863	2.429
18	.	<2.0	0.000	1.926	4.4	0.793	4.464	1.4	0.252	2.681
21	180.7	<2.0	0.000	1.926	3.6	0.651	5.115	1.8	0.325	3.006

Table A3.74. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T11 (reactor 22).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	182.8	3.4	0.622	0.622	5.6	1.024	1.024	1.6	0.292	0.292
10	.	3.7	0.672	1.294	4.4	0.799	1.823	2.4	0.436	0.727
15	180.4	<2.0	0.000	1.294	3.8	0.686	2.508	3.2	0.577	1.305
20	180.5	<2.0	0.000	1.294	4.2	0.758	3.266	3.2	0.578	1.882
25	179.8	2.9	0.521	1.815	3.2	0.575	3.842	1.6	0.288	2.170
30	180.1	3.5	0.630	2.445	0.8	0.144	3.986	0.8	0.144	2.314
35	178.3	3.3	0.588	3.034	0.8	0.143	4.128	1.0	0.178	2.492

Table A3.75. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T11 (reactor 22).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	179.6	<2.0	0.000	0.000	3.0	0.539	0.539	1.0	0.180	0.180
49	182.0	.	.	.	.	.	.	.	.	.

Table A3.76. Extended Oxidation (Ten Week Oxidation Interval) cumulative mass release: Solid T11 (reactor 21).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
31	179.7	<2.0	0.000	0.000	1.6	0.288	0.288	1.6	0.288	0.288
41	181.1	2.9	0.525	0.525	1.4	0.254	0.542	1.0	0.181	0.469

Table A3.77. Extended Oxidation (Three Week Oxidation Interval) cumulative mass release: Solid T12 (reactor 23).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
3	.	3.2	0.556	0.556	4.0	0.695	0.695	3.8	0.660	0.660
6	174.5	3.5	0.611	1.167	4.0	0.698	1.393	3.6	0.628	1.288
9	174.1	.	0.313	1.480	.	0.783	2.176	.	0.696	1.984
12	.	<2.0	0.000	1.480	5.0	0.872	3.048	4.4	0.767	2.751
15	174.4	<2.0	0.000	1.480	4.8	0.837	3.885	6.2	1.081	3.832
18	.	<2.0	0.000	1.480	6.4	1.111	4.996	5.2	0.903	4.735
21	172.8	3.8	0.657	2.137	4.8	0.829	5.825	4.8	0.829	5.564

Table A3.78. Extended Oxidation (Five Week Oxidation Interval) cumulative mass release: Solid T12 (reactor 24).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
5	167.7	<2.0	0.000	0.000	5.2	0.872	0.872	4.0	0.671	0.671
10	.	3.8	0.654	0.654	5.2	0.895	1.767	5.0	0.861	1.532
15	176.4	<2.0	0.000	0.654	5.2	0.917	2.684	7.8	1.376	2.908
20	177.6	<2.0	0.000	0.654	5.4	0.959	3.643	4.8	0.852	3.760
25	176.9	3.2	0.566	1.220	4.4	0.778	4.421	4.0	0.708	4.468
30	177.2	<2.0	0.000	1.220	2.4	0.425	4.846	3.4	0.602	5.070
35	174.5	3.4	0.593	1.813	1.8	0.314	5.160	0.4	0.070	5.140

Table A3.79. Extended Oxidation (Seven Week Oxidation Interval) cumulative mass release: Solid T12 (reactor 24).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
42	175.2	2.8	0.491	0.491	2.8	0.491	0.491	4.0	0.701	0.701
49	182.8	.	.	.	.	.	.	.	.	.

Table A3.80. Extended Oxidation (Ten Week Oxidation Interval) cumulative mass release: Solid T12 (reactor 23).

Week	Volume	Sulfate			Calcium			Magnesium		
	(mL)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
31	173.5	<2.0	0.000	0.000	3.0	0.521	0.521	4.8	0.833	0.833
41	173.7	3.6	0.625	0.625	3.0	0.521	1.042	4.4	0.764	1.597

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APPENDIX 4

ELEVATED TEMPERATURE

A4.1. Drainage quality rinse data.
A4.2. - A4.17. Drainage quality data.
A4.18. - A4.33. Cumulative mass release data.

Table A4.1. Elevated Temperature drainage quality rinse (week 0) data.

Solid	Reactor	Rinse	Volume (mL)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Month	Day	Year
T1	3	1	154.8	282.0	96.0	18.0	2	4	92
T1	3	2	188.8	.	.	.	2	5	92
T1	3	3	196.7	4.4	13.8	2.8	2	6	92
T1	4	1	152.3	290.0	96.0	18.2	2	4	92
T1	4	2	182.5	11.4	14.6	3.6	2	5	92
T1	4	3	202.8	.	.	.	2	6	92
T2	14	1	136.5	1990.0	580.0	198.0	2	4	92
T2	14	2	195.3	1520.0	580.0	31.4	2	5	92
T2	14	3	189.4	.	.	.	2	6	92
T2	15	1	136.8	1500.0	380.0	170.0	2	4	92
T2	15	2	195.4	.	.	.	2	5	92
T2	15	3	189.5	930.0	400.0	10.8	2	6	92
T2	16	1	136.3	2160.0	660.0	201.0	2	4	92
T2	16	2	195.2	1310.0	2.2	1.0	2	5	92
T2	16	3	187.8	.	.	.	2	6	92
T4	5	1	154.4	334.0	107.0	16.0	2	4	92
T4	5	2	180.6	.	.	.	2	5	92
T4	5	3	199.1	10.4	14.8	3.6	2	6	92
T4	6	1	155.6	510.0	198.0	22.2	2	4	92
T4	6	2	188.7	13.6	13.8	5.0	2	5	92
T4	6	3	192.2	.	.	.	2	6	92
T8	7	1	158.2	282.0	119.0	6.2	2	4	92
T8	7	2	182.4	.	.	.	2	5	92
T8	7	3	199.4	<2.0	14.6	2.0	2	6	92
T8	8	1	154.4	134.0	54.0	3.8	2	4	92
T8	8	2	181.1	132.5	54.2	5.0	2	5	92
T8	8	3	200.9	.	.	.	2	6	92
T9	9	1	150.9	1180.0	500.0	6.0	2	4	92
T9	9	2	183.1	.	.	.	2	5	92
T9	9	3	200.6	103.5	49.0	0.8	2	6	92
T9	10	1	156.8	2150.0	73.0	3.6	2	4	92
T9	10	2	184.3	1080.0	400.0	3.6	2	5	92
T9	10	3	194.9	.	.	.	2	6	92
T10	11	1	158.3	680.0	226.0	83.2	2	4	92
T10	11	2	184.2	.	.	.	2	5	92
T10	11	3	192.5	300.0	138.2	10.4	2	6	92
T10	12	1	155.3	1450.0	560.0	99.6	2	4	92
T10	12	2	179.7	755.0	300.0	18.4	2	5	92
T10	12	3	198.2	.	.	.	2	6	92
T10	13	1	159.1	1520.0	520.0	97.6	2	4	92
T10	13	2	178.5	.	.	.	2	5	92
T10	13	3	197.8	110.0	60.0	7.6	2	6	92
T12	1	1	164.5	138.0	18.8	28.2	2	4	92
T12	1	2	180.5	.	.	.	2	5	92
T12	1	3	200.0	3.8	2.8	2.4	2	6	92
T12	2	1	163.7	146.5	17.4	27.4	2	4	92
T12	2	2	180.0	10.8	4.4	5.0	2	5	92
T12	2	3	198.3	.	.	.	2	6	92

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Table A4.2. Elevated Temperature drainage quality: Solid T1 (reactor 3), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	301.3	375.	210	8.07	79.	.	31.2	35.2	7.4	5091.	2	19	92
4	312.8	.	680	8.01	126.	.	224.0	116.0	16.2	5127.	3	4	92
6	306.8	850.	500	7.79	119.	.	177.0	91.2	15.6	5178.	3	18	92
8	312.3	510.	330	7.60	82.	.	63.2	40.8	11.0	5224.	4	1	92
10	320.3	.	355	7.48	95.	.	93.6	51.0	12.4	50002.	4	15	92
12	308.6	675.	400	7.91	82.	.	121.0	44.0	11.8	50017.	4	29	92
14	316.8	552.	370	7.40	94.	.	.	.	.	50026.	5	13	92
16	318.4	780.	382	7.64	.	.	.	.	.	.	5	27	92

Table A4.3. Elevated Temperature drainage quality: Solid T1 (reactor 4), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	312.0	575.	312	8.04	69.	.	75.0	62.4	8.8	5092.	2	19	92
4	312.0	.	312	8.06	95.	.	92.0	58.0	12.6	5128.	3	4	92
6	306.9	525.	340	7.97	94.	.	83.2	47.6	11.2	5179.	3	18	92
8	311.0	525.	360	7.88	82.	.	69.6	41.4	11.0	5225.	4	1	92
10	302.0	.	420	7.65	101.	.	126.0	59.6	12.8	50003.	4	15	92
12	307.4	650.	420	7.99	.	.	.	.	.	.	4	29	92
14	327.7	470.	295	7.64	82.	.	.	.	.	50027.	5	13	92
16	325.1	472.	300	7.81	88.	.	.	.	.	50041.	5	27	92

Table A4.4. Elevated Temperature drainage quality: Solid T2 (reactor 14), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	302.5	2600.	2000	7.25	151.	.	1290.0	440.0	70.2	5102.	2	19	92
4	276.4	.	5000	2.94	.	1604.000	4940.0	580.0	436.0	5138.	3	4	92
6	294.1	5000.	4100	2.91	.	837.000	2840.0	458.0	232.0	5189.	3	18	92
8	318.6	5000.	3200	7.15	79.	.	2320.0	760.0	222.0	5235.	4	1	92
10	299.2	.	5000	2.65	.	2415.000	4600.0	532.0	310.0	50013.	4	15	92
12	299.2	5000.	5000	2.72	.	.	.	.	.	.	4	29	92
14	314.1	4810.	3450	5.25	.	299.000	.	.	.	50037.	5	13	92
16	312.9	4310.	3200	7.04	107.	.	.	.	.	50046.	5	27	92

Table A4.5. Elevated Temperature drainage quality: Solid T2 (reactor 15), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	305.5	2275.	1650	7.70	189.	.	1010.0	360.0	54.2	5103.	2	19	92
4	285.3	.	5000	3.30	.	1035.000	3920.0	560.0	348.0	5139.	3	4	92
6	296.9	5000.	4350	2.84	.	1058.000	2800.0	438.0	234.0	5190.	3	18	92
8	301.0	5000.	5000	2.75	.	1288.000	3140.0	466.0	304.0	5236.	4	1	92
10	300.9	.	2700	6.59	41.	.	1860.0	474.0	167.6	50014.	4	15	92
12	299.9	5000.	5000	2.64	.	.	3940.0	462.0	276.0	50023.	4	29	92
14	304.2	5000.	3400	3.38	.	494.000	.	.	.	50038.	5	13	92
16	297.3	5000.	3100	3.97	.	.	.	.	.	.	5	27	92

Table A4.6. Elevated Temperature drainage quality: Solid T2 (reactor 16), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	334.8	2150.	900	7.71	170.	.	670.0	280.0	44.4	5104.	2	19	92
4	303.0	.	5000	2.62	.	1869.000	4760.0	600.0	366.0	5140.	3	4	92
6	312.1	5000.	5000	2.72	.	2283.000	4520.0	626.0	342.0	5191.	3	18	92
8	323.0	775.	3880	5.93	.	126.000	2240.0	392.0	372.0	5237.	4	1	92
10	319.1	.	4400	3.11	.	489.000	2660.0	470.0	284.0	50015.	4	15	92
12	316.1	4350.	2500	6.58	.	.	.	.	.	.	4	29	92
14	316.1	5000.	3900	2.73	.	1639.000	.	.	.	50039.	5	13	92
16	319.9	5000.	5000	2.83	.	1003.000	.	.	.	50047.	5	27	92

Table A4.7. Elevated Temperature drainage quality: Solid T4 (reactor 5), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	303.3	880.	420	8.22	126.	.	136.0	94.6	16.2	5093.	2	19	92
4	313.0	.	550	8.10	116.	.	244.0	111.0	22.2	5129.	3	4	92
6	300.8	875.	500	8.07	120.	.	183.0	83.0	20.2	5180.	3	18	92
8	298.2	1900.	950	7.91	101.	.	446.0	173.0	35.0	5226.	4	1	92
10	300.7	.	760	7.75	113.	.	446.0	155.0	37.8	50004.	4	15	92
12	304.7	1175.	620	8.15	107.	.	264.0	84.0	20.0	50018.	4	29	92
14	324.3	780.	485	7.66	95.	.	.	.	.	50028.	5	13	92
16	316.5	890.	490	7.83	.	.	.	.	.	.	5	27	92

Table A4.8. Elevated Temperature drainage quality: Solid T4 (reactor 6), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	308.9	590.	350	8.22	117.	.	81.5	57.4	13.0	5094.	2	19	92
4	302.7	.	750	8.15	139.	.	252.0	115.0	22.6	5130.	3	4	92
6	301.2	710.	500	8.12	126.	.	158.0	74.0	17.4	5181.	3	18	92
8	299.7	875.	600	8.14	110.	.	184.0	83.2	20.4	5227.	4	1	92
10	307.2	.	770	7.79	101.	.	490.0	170.0	34.0	50005.	4	15	92
12	296.5	2025.	1100	8.10	.	.	.	.	.	.	4	29	92
14	317.8	970.	670	7.75	107.	.	.	.	.	50029.	5	13	92
16	288.6	1300.	900	7.80	107.	.	.	.	.	50042.	5	27	92

Table A4.9. Elevated Temperature drainage quality: Solid T8 (reactor 7), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	320.0	370.	235	8.22	76.	.	32.6	36.8	4.0	5095.	2	19	92
4	325.4	.	325	8.15	82.	.	58.0	45.2	7.2	5131.	3	4	92
6	323.3	328.	210	8.12	69.	.	29.2	28.4	4.6	5182.	3	18	92
8	326.1	305.	220	8.11	69.	.	22.6	24.4	3.8	5228.	4	1	92
10	329.5	.	475	7.93	107.	.	237.0	120.0	9.4	50006.	4	15	92
12	326.1	1300.	780	8.14	113.	.	304.0	116.0	13.4	50019.	4	29	92
14	319.7	920.	600	7.82	95.	.	.	.	.	50030.	5	13	92
16	327.7	740.	388	7.97	.	.	.	.	.	.	5	27	92

Table A4.10. Elevated Temperature drainage quality: Solid T8 (reactor 8), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	332.3	124.	200	8.17	69.	.	24.2	31.8	3.4	5096.	2	19	92
4	325.8	.	310	8.11	88.	.	51.2	43.8	6.8	5132.	3	4	92
6	322.3	322.	200	8.08	76.	.	29.2	26.8	4.2	5183.	3	18	92
8	324.3	500.	330	8.03	76.	.	266.0	39.2	5.8	5229.	4	1	92
10	328.3	.	260	8.07	63.	.	47.2	31.4	4.4	50007.	4	15	92
12	324.9	1125.	580	8.17	.	.	.	.	.	.	4	29	92
14	324.8	700.	395	7.93	95.	.	.	.	.	50031.	5	13	92
16	322.0	940.	500	7.98	82.	.	.	.	.	50043.	5	27	92

Table A4.11. Elevated Temperature drainage quality: Solid T9 (reactor 9), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	316.8	590.	310	7.96	69.	.	122.0	75.0	1.8	5097.	2	19	92
4	297.1	.	550	7.98	82.	.	193.0	104.6	3.2	5133.	3	4	92
6	310.8	1600.	1000	7.55	44.	.	680.0	302.0	7.6	5184.	3	18	92
8	312.6	4425.	2700	2.71	.	920.000	1430.0	288.0	26.8	5230.	4	1	92
10	322.2	.	3300	2.68	.	1570.000	1860.0	214.0	25.4	50008.	4	15	92
12	315.3	5000.	2900	2.55	.	.	1830.0	91.0	18.4	50020.	4	29	92
14	317.2	2230.	800	2.81	.	357.000	.	.	.	50032.	5	13	92
16	322.7	600.	390	3.31	.	.	.	.	.	.	5	27	92

Table A4.12. Elevated Temperature drainage quality: Solid T9 (reactor 10), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	318.3	675.	440	7.97	63.	.	148.0	84.0	1.8	5098.	2	19	92
4	316.2	.	2000	3.63	.	247.000	1130.0	352.0	15.0	5134.	3	4	92
6	316.9	1275.	850	7.21	32.	.	446.0	179.0	6.6	5185.	3	18	92
8	315.7	4600.	3300	2.68	.	1282.000	1680.0	260.0	24.4	5231.	4	1	92
10	320.6	.	3000	2.66	.	1225.000	1240.0	128.0	20.6	50009.	4	15	92
12	318.3	1600.	800	3.15	.	.	.	.	.	.	4	29	92
14	320.0	2050.	1000	2.86	.	276.000	.	.	.	50033.	5	13	92
16	324.0	740.	450	3.25	.	121.000	.	.	.	50044.	5	27	92

Table A4.13. Elevated Temperature drainage quality: Solid T10 (reactor 11), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	312.9	3000.	2550	6.45	63.	.	1440.0	580.0	58.0	5099.	2	19	92
4	303.4	.	5000	2.80	.	2007.000	4360.0	620.0	242.0	5135.	3	4	92
6	303.7	5000.	5000	2.84	.	1506.000	3400.0	676.0	180.0	5186.	3	18	92
8	305.8	4300.	3100	6.42	50.	.	1830.0	722.0	67.8	5232.	4	1	92
10	307.1	.	3000	6.46	50.	.	1880.0	67.8	72.0	50010.	4	15	92
12	317.7	5000.	3900	2.90	.	.	2460.0	466.0	119.2	50021.	4	29	92
14	317.4	3520.	950	7.01	101.	.	.	.	.	50034.	5	13	92
16	333.7	3440.	3100	4.52	.	.	.	.	.	.	5	27	92

Table A4.14. Elevated Temperature drainage quality: Solid T10 (reactor 12), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	326.1	3000.	2650	7.20	88.	.	1780.0	600.0	67.8	5100.	2	19	92
4	317.8	.	2900	6.69	75.	.	1830.0	620.0	77.0	5136.	3	4	92
6	310.4	5000.	4400	2.99	.	925.000	3140.0	598.0	152.0	5187.	3	18	92
8	311.8	5000.	4200	2.92	.	747.000	2280.0	586.0	135.0	5233.	4	1	92
10	313.5	.	2900	6.40	36.	.	1620.0	570.0	71.6	50011.	4	15	92
12	320.5	5000.	4600	2.77	.	.	.	.	.	.	4	29	92
14	322.3	3490.	2200	7.08	88.	.	.	.	.	50035.	5	13	92
16	324.4	4270.	2900	3.60	.	345.000	.	.	.	50045.	5	27	92

Table A4.15. Elevated Temperature drainage quality: Solid T10 (reactor 13), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	350.0	2625.	1650	7.54	126.	.	1080.0	400.0	28.4	5101.	2	19	92
4	341.8	.	3500	4.44	.	397.000	2360.0	640.0	81.2	5137.	3	4	92
6	344.1	3275.	2750	6.60	98.	.	1680.0	636.0	76.0	5188.	3	18	92
8	338.7	5000.	4900	2.77	.	1132.000	2800.0	628.0	114.0	5234.	4	1	92
10	343.5	.	5000	2.80	.	1610.000	3300.0	640.0	116.0	50012.	4	15	92
12	342.6	3450.	2200	5.21	.	.	1180.0	362.0	68.0	50022.	4	29	92
14	345.9	2290.	1250	6.71	69.	.	.	.	.	50036.	5	13	92
16	350.2	5000.	4500	2.70	.	.	.	.	.	.	5	27	92

Table A4.16. Elevated Temperature drainage quality: Solid T12 (reactor 1), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	331.8	225.	120	6.70	35.	.	16.1	9.8	9.6	5089.	2	19	92
4	328.7	.	210	6.61	31.	.	58.0	14.0	17.4	5125.	3	4	92
6	321.6	190.	100	6.67	19.	.	24.8	5.4	9.8	5176.	3	18	92
8	324.3	153.	100	6.62	25.	.	15.7	4.4	7.8	5222.	4	1	92
10	329.9	.	110	6.63	31.	.	18.6	4.6	8.2	50000.	4	15	92
12	321.5	213.	110	7.03	28.	.	17.0	5.0	8.4	50016.	4	29	92
14	328.9	138.	80	6.84	22.	.	.	.	.	50024.	5	13	92
16	332.8	140.	90	6.67	.	.	.	.	.	.	5	27	92

Table A4.17. Elevated Temperature drainage quality: Solid T12 (reactor 2), 75 g sample.

Week	Volume (mL)	S.C. (µS)	S.C.2 (µS)	pH (s.u.)	Alk. (mg/L)	Acy. (mg/L)	SO_4 (mg/L)	Ca (mg/L)	Mg (mg/L)	Sample	Month	Day	Year
2	320.1	238.	130	6.77	31.	.	15.3	9.8	9.6	5090.	2	19	92
4	317.1	.	250	6.15	31.	.	61.6	15.4	19.2	5126.	3	4	92
6	320.1	235.	140	6.20	25.	.	24.0	7.4	12.6	5177.	3	18	92
8	319.9	178.	110	6.75	25.	.	16.4	4.4	9.0	5223.	4	1	92
10	320.4	.	110	6.81	25.	.	17.8	4.4	8.0	50001.	4	15	92
12	322.4	222.	120	7.16	.	.	.	.	.	.	4	29	92
14	325.7	117.	71	6.91	25.	.	.	.	.	50025.	5	13	92
16	330.7	115.	70	6.78	32.	.	.	.	.	50040.	5	27	92

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Table A4.18. Elevated Temperature cumulative mass release: Solid T1 (reactor 3).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	301.3	31.2	9.401	9.401	35.2	10.606	10.606	7.4	2.230	2.230
4	312.8	224.0	70.067	79.468	116.0	36.285	46.891	16.2	5.067	7.297
6	306.8	177.0	54.304	133.772	91.2	27.980	74.871	15.6	4.786	12.084
8	312.3	63.2	19.737	153.509	40.8	12.742	87.613	11.0	3.435	15.519
10	320.3	93.6	29.980	183.489	51.0	16.335	103.948	12.4	3.972	19.491
12	308.6	121.0	37.341	220.830	44.0	13.578	117.527	11.8	3.641	23.132
14	316.8	.	.	.	.	.	.	.	.	.
16	318.4	.	.	.	.	.	.	.	.	.

Table A4.19. Elevated Temperature cumulative mass release: Solid T1 (reactor 4).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	312.0	75.0	23.400	23.400	62.4	19.469	19.468	8.8	2.746	2.746
4	312.0	92.0	28.704	52.104	58.0	18.096	37.564	12.6	3.931	6.677
6	306.9	83.2	25.534	77.638	47.6	14.608	52.173	11.2	3.437	10.114
8	311.0	69.6	21.646	99.283	41.4	12.875	65.048	11.0	3.421	13.535
10	302.0	126.0	38.052	137.335	59.6	17.999	83.048	12.8	3.866	17.401
12	307.4	.	.	.	.	.	.	.	.	.
14	327.7	.	.	.	.	.	.	.	.	.
16	325.1	.	.	.	.	.	.	.	.	.

Table A4.20. Elevated Temperature cumulative mass release: Solid T2 (reactor 14).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
4	276.4	4940.0	1365.416	1755.641	580.0	160.312	293.412	436.0	120.510	141.747
2	302.5	1290.0	390.225	390.225	440.0	133.100	133.100	70.2	21.236	21.236
6	294.1	2840.0	835.244	2590.885	458.0	134.698	428.110	232.0	68.231	209.978
8	318.6	2320.0	739.152	3330.037	760.0	242.136	670.246	222.0	70.729	280.707
10	299.2	4600.0	1376.320	4706.357	532.0	159.174	829.420	310.0	92.752	373.459
12	299.2	.	.	.	.	.	.	.	.	.
14	314.1	.	.	.	.	.	.	.	.	.
16	312.9	.	.	.	.	.	.	.	.	.

Table A4.21. Elevated Temperature cumulative mass release: Solid T2 (reactor 15).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	305.5	1010.0	308.555	308.555	360.0	109.980	109.980	54.2	16.558	16.558
4	285.3	3920.0	1118.376	1426.931	560.0	159.768	269.748	348.0	99.284	115.842
6	296.9	2800.0	831.320	2258.251	438.0	130.042	399.790	234.0	69.475	185.317
8	301.0	3140.0	945.140	3203.391	466.0	140.266	540.056	304.0	91.504	276.821
10	300.9	1860.0	559.674	3763.065	474.0	142.627	682.683	167.6	50.431	327.252
12	299.9	3940.0	1181.606	4944.671	462.0	138.554	821.237	276.0	82.772	410.024
14	304.2	.	.	.	.	.	.	.	.	.
16	297.3	.	.	.	.	.	.	.	.	.

Table A4.22. Elevated Temperature cumulative mass release: Solid T2 (reactor 16).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	334.8	670.0	224.316	224.316	280.0	93.744	93.744	44.4	14.865	14.865
4	303.0	4760.0	1442.280	1666.596	600.0	181.800	275.544	366.0	110.898	125.763
6	312.1	4520.0	1410.692	3077.288	626.0	195.375	470.918	342.0	106.738	232.502
8	323.0	2240.0	723.520	3800.808	392.0	126.616	597.534	372.0	120.156	352.658
10	319.1	2660.0	848.806	4649.614	470.0	149.977	747.511	284.0	90.624	443.282
12	316.1	.	.	.	.	.	.	.	.	.
14	316.1	.	.	.	.	.	.	.	.	.
16	319.9	.	.	.	.	.	.	.	.	.

Table A4.23. Elevated Temperature cumulative mass release: Solid T4 (reactor 5).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	303.3	136.0	41.249	41.249	94.6	28.692	28.692	16.2	4.913	4.913
4	313.0	244.0	76.372	117.621	111.0	34.743	63.435	22.2	6.949	11.862
6	300.8	183.0	55.046	172.667	83.0	24.966	88.401	20.2	6.076	17.938
8	298.2	446.0	132.997	305.665	173.0	51.589	139.990	35.0	10.437	28.375
10	300.7	446.0	134.112	439.777	155.0	46.609	186.598	37.8	11.366	39.741
12	304.7	264.0	80.441	520.218	84.0	25.595	212.193	20.0	6.094	45.835
14	324.3	.	.	.	.	.	.	.	.	.
16	316.5	.	.	.	.	.	.	.	.	.

Table A4.24. Elevated Temperature cumulative mass release: Solid T4 (reactor 6).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	308.9	81.5	25.175	25.175	57.4	17.731	17.731	13.0	4.016	4.016
4	302.7	252.0	76.280	101.455	115.0	34.811	52.541	22.6	6.841	10.857
6	301.2	158.0	47.590	149.045	74.0	22.289	74.830	17.4	5.241	16.098
8	299.7	184.0	55.145	204.190	83.2	24.935	99.765	20.4	6.114	22.212
10	307.2	490.0	150.528	354.718	170.0	52.224	151.989	34.0	10.445	32.657
12	296.5	.	.	.	.	.	.	.	.	.
14	317.8	.	.	.	.	.	.	.	.	.
16	288.6	.	.	.	.	.	.	.	.	.

Table A4.25. Elevated Temperature cumulative mass release: Solid T8 (reactor 7).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	320.0	32.6	10.432	10.432	36.8	11.776	11.776	4.0	1.280	1.280
4	325.4	58.0	18.873	29.305	45.2	14.708	26.484	7.2	2.343	3.623
6	323.3	29.2	9.440	38.745	28.4	9.182	35.666	4.6	1.487	5.110
8	326.1	22.6	7.370	46.115	24.4	7.957	43.623	3.8	1.239	6.349
10	329.5	237.0	78.092	124.207	120.0	39.540	83.163	9.4	3.097	9.446
12	326.1	304.0	99.134	223.341	116.0	37.828	120.990	13.4	4.370	13.816
14	319.7	.	.	.	.	.	.	.	.	.
16	327.7	.	.	.	.	.	.	.	.	.

Table A4.26. Elevated Temperature cumulative mass release: Solid T8 (reactor 8).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	332.3	24.2	8.042	8.042	31.8	10.567	10.567	3.4	1.130	1.130
4	325.8	51.2	16.681	24.723	43.8	14.270	24.837	6.8	2.215	3.345
6	322.3	29.2	9.411	34.134	26.8	8.638	33.474	4.2	1.354	4.699
8	324.3	266.0	86.264	120.398	39.2	12.713	46.187	5.8	1.881	6.580
10	328.3	47.2	15.496	135.893	31.4	10.309	56.495	4.4	1.445	8.024
12	324.9	.	.	.	.	.	.	.	.	.
14	324.8	.	.	.	.	.	.	.	.	.
16	322.0	.	.	.	.	.	.	.	.	.

Table A4.27. Elevated Temperature cumulative mass release: Solid T9 (reactor 9).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	316.8	122.0	38.650	38.650	75.0	23.760	25.760	1.8	0.570	0.570
4	297.1	193.0	57.340	95.990	104.6	31.077	56.837	3.2	0.951	1.520
6	310.8	680.0	211.344	307.334	302.0	93.862	150.699	7.6	2.362	3.882
8	312.6	1430.0	447.018	754.352	288.0	90.029	240.728	26.8	8.378	12.260
10	322.2	1860.0	599.292	1353.644	214.0	68.951	309.678	25.4	8.184	20.444
12	315.3	1830.0	576.999	1930.643	91.0	28.692	338.371	18.4	5.802	26.245
14	317.2	.	.	.	.	.	.	.	.	.
16	322.7	.	.	.	.	.	.	.	.	.

Table A4.28. Elevated Temperature cumulative mass release: Solid T9 (reactor 10).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	318.3	148.0	47.108	47.108	84.0	26.737	26.737	1.8	0.573	0.573
4	316.2	1130.0	357.306	404.414	352.0	111.302	138.039	15.0	4.743	5.316
6	316.9	446.0	141.337	545.751	179.0	56.725	194.764	6.6	2.092	7.408
8	315.7	1680.0	530.376	1076.127	260.0	82.082	276.846	24.4	7.703	15.111
10	320.6	1240.0	397.544	1473.671	128.0	41.037	317.883	20.6	6.604	21.715
12	318.3	.	.	.	.	.	.	.	.	.
14	320.0	.	.	.	.	.	.	.	.	.
16	324.0	.	.	.	.	.	.	.	.	.

Table A4.29. Elevated Temperature cumulative mass release: Solid T10 (reactor 11).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	312.9	1440.0	450.576	450.576	580.0	181.482	181.482	58.0	18.148	18.148
4	303.4	4360.0	1322.824	1773.400	620.0	188.108	369.590	242.0	73.423	91.570
6	303.7	3400.0	1032.580	2805.980	676.0	205.301	574.891	180.0	54.666	146.236
8	305.8	1830.0	559.614	3365.594	722.0	220.788	795.679	67.8	20.733	166.970
10	307.1	1880.0	577.348	3942.942	67.8	20.821	816.500	72.0	22.111	189.081
12	317.7	2460.0	781.542	4724.484	466.0	148.048	964.548	119.2	37.870	226.951
14	317.4	.	.	.	.	.	.	.	.	.
16	333.7	.	.	.	.	.	.	.	.	.

Table A4.30. Elevated Temperature cumulative mass release: Solid T10 (reactor 12).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	326.1	1780.0	580.458	580.458	600.0	195.660	195.660	67.8	22.110	22.110
4	317.8	1830.0	581.574	1162.032	620.0	197.036	392.696	77.0	24.471	46.581
6	310.4	3140.0	974.656	2136.688	598.0	185.619	578.316	152.0	47.181	93.762
8	311.8	2280.0	710.904	2847.592	586.0	182.715	761.030	135.0	42.093	135.855
10	313.5	1620.0	507.870	3355.462	570.0	178.695	939.725	71.6	22.447	158.301
12	320.5	.	.	.	.	.	.	.	.	.
14	322.3	.	.	.	.	.	.	.	.	.
16	324.4	.	.	.	.	.	.	.	.	.

Table A4.31. Elevated Temperature cumulative mass release: Solid T10 (reactor 13).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	350.0	1080.0	378.000	378.000	400.0	140.000	140.000	28.4	9.940	9.940
4	341.8	2360.0	806.648	1184.648	640.0	218.752	358.752	81.2	27.754	37.694
6	344.1	1680.0	578.088	1762.736	636.0	218.848	577.600	76.0	26.152	63.846
8	338.7	2800.0	948.360	2711.096	628.0	212.704	790.304	114.0	38.612	102.458
10	343.5	3300.0	1133.550	3844.646	640.0	219.840	1010.144	116.0	39.846	142.304
12	342.6	1180.0	404.268	4248.914	362.0	124.021	1134.165	68.0	23.297	165.601
14	345.9	.	.	.	.	.	.	.	.	.
16	350.2	.	.	.	.	.	.	.	.	.

Table A4.32. Elevated Temperature cumulative mass release: Solid T12 (reactor 1).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	331.8	16.1	5.342	5.342	9.8	3.252	3.252	9.6	3.185	3.185
4	328.7	58.0	19.065	24.407	14.0	4.602	7.853	17.4	5.719	8.905
6	321.6	24.8	7.976	32.382	5.4	1.737	9.590	9.8	3.152	12.056
8	324.3	15.7	5.092	37.474	4.4	1.427	11.017	7.8	2.530	14.586
10	329.9	18.6	6.136	43.610	4.6	1.518	12.535	8.2	2.705	17.291
12	321.5	17.0	5.466	49.075	5.0	1.608	14.142	8.4	2.701	19.992
14	328.9	.	.	.	.	.	.	.	.	.
16	332.8	.	.	.	.	.	.	.	.	.

Table A4.33. Elevated Temperature cumulative mass release: Solid T12 (reactor 2).

Week	Volume (mL)	Sulfate			Calcium			Magnesium		
		Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)	Conc. (mg/L)	Mass (mg)	Cum. Mass (mg)
2	320.1	15.3	4.898	4.898	9.8	3.137	3.137	9.6	3.073	3.073
4	317.1	61.6	19.533	24.431	15.4	4.883	8.020	19.2	6.088	9.161
6	320.1	24.0	7.682	32.114	7.4	2.369	10.389	12.6	4.033	13.194
8	319.9	16.4	5.246	37.360	4.4	1.408	11.797	9.0	2.879	16.073
10	320.4	17.8	5.703	43.063	4.4	1.410	13.206	8.0	2.563	18.637
12	322.4	.	.	.	.	.	.	.	.	.
14	325.7	.	.	.	.	.	.	.	.	.
16	330.7	.	.	.	.	.	.	.	.	.

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