Appendix I

ESEM/EDS Data for Test #3 Day-30 Sediment

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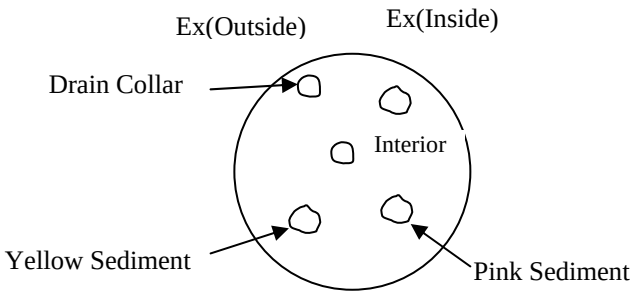
Particulate sediments at the bottom of the tank directly relate to the corrosion products and debris generated during ICET tests. This appendix lists the ESEM/EDS and XRD/XRF results for the sediment samples collected from the bottom of the tank on the date Test #3 was shut down (May 5, 2005). The sediment samples were identified and classified by their pink or yellow color. The purpose of these analyses is to provide information on the morphology and composition of these sediments.

Environmental SEM (ESEM) was used to examine the sediment samples without any coating. EDS results provide an elemental composition of the sediment. Based on XRD results, the sediment sample contained crystalline substances of tobermorite ($Ca_{2.25}(Si_3O_{7.5}(OH)_{1.5})(H_2O)$ and calcite ($CaCO_3$), the same as unused raw or unused baked cal-sil samples. XRF results show the chemical composition of the sediment. Available logbook entries for this laboratory session are included in this appendix as transcribed notes.

Transcribed Laboratory Log

Laboratory session from May 6, 2005.
Test #3 Day-30 Sediment.



Pink Sediment

Image:	t3PNKP29	1000 ×	ESEM image	Figure I-1
	t3PNKP29	1000 ×	Annotated ESEM image	Figure I-2
EDS:	t3pnkp30		EDS on image 29	Figure I-3
Image:	t3pnkp31	100 ×	ESEM image	Figure I-4
	t3Pnkp32	100 ×	ESEM image	Figure I-5

Yellow Sediment

Image	t3ylwp34	100 ×	ESEM image	Figure I-6
	t3ylwp34	100 ×	Annotated ESEM image	Figure I-7
EDS:	t3ylwp35		EDS on image 34	Figure I-8
	t3ylwp36		Comparing EDS image t3ylwp35 with pink sediment EDS image t3pnkp30	Figure I-9
Image:	t3ylwp37	100 ×		Figure I-10

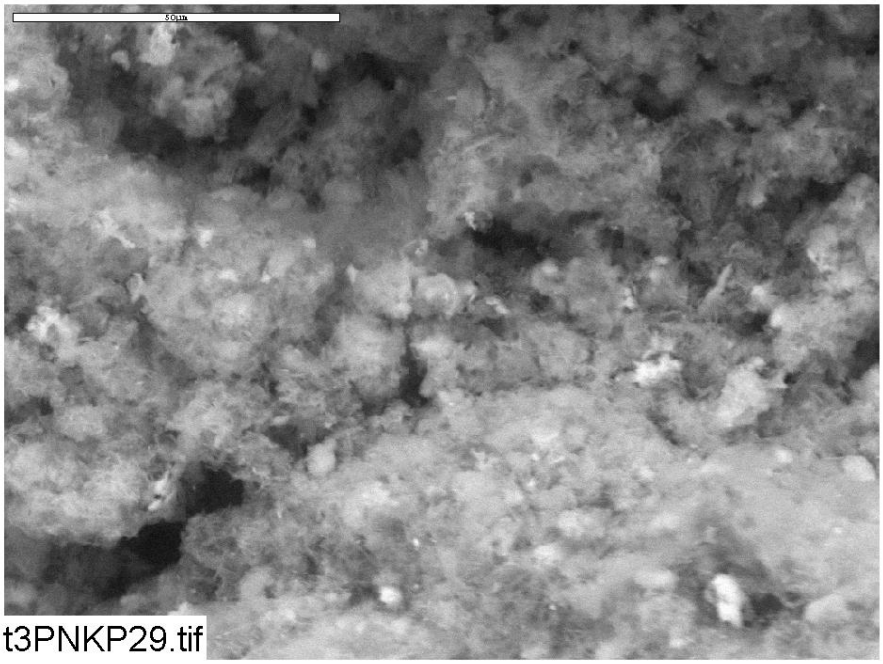


Figure I-1: ESEM image magnified 1000 times for Test #3 Day-30 pink sediment. (t3PNKP29)

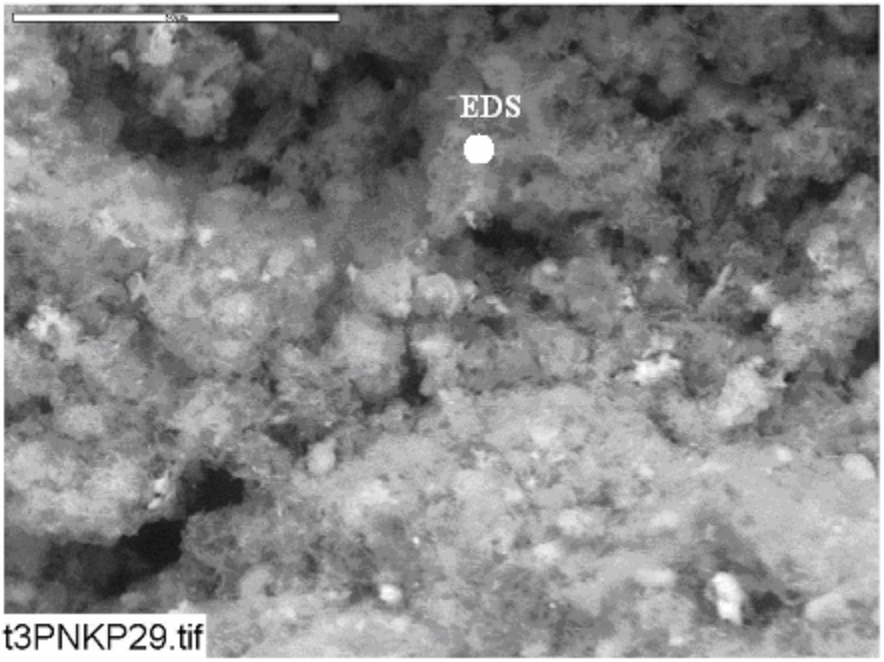


Figure I-2: Annotated ESEM image magnified 1000 times for Test #3 Day-30 pink sediment. (t3PNKP29)

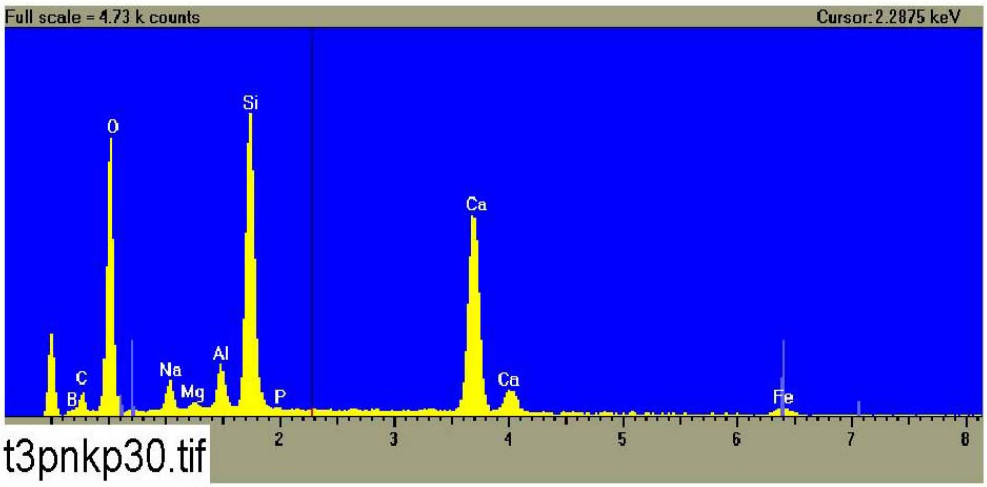


Figure I-3: EDS counting spectrum for the particles shown in Figure I-2. (t3pnkp30)

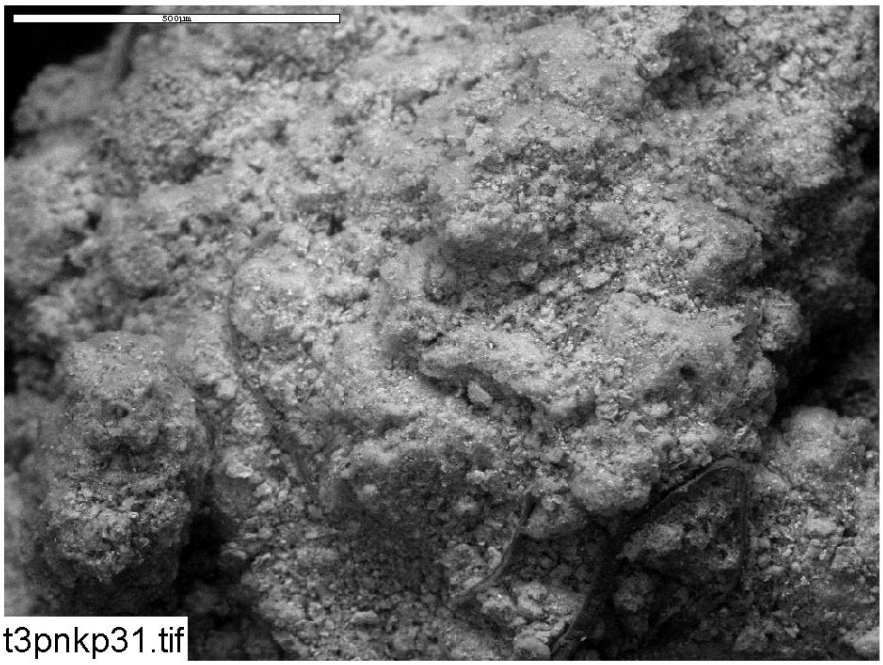


Figure I-4: ESEM image magnified 100 times for Test #3 Day-30 pink sediment. (t3pnkp31)

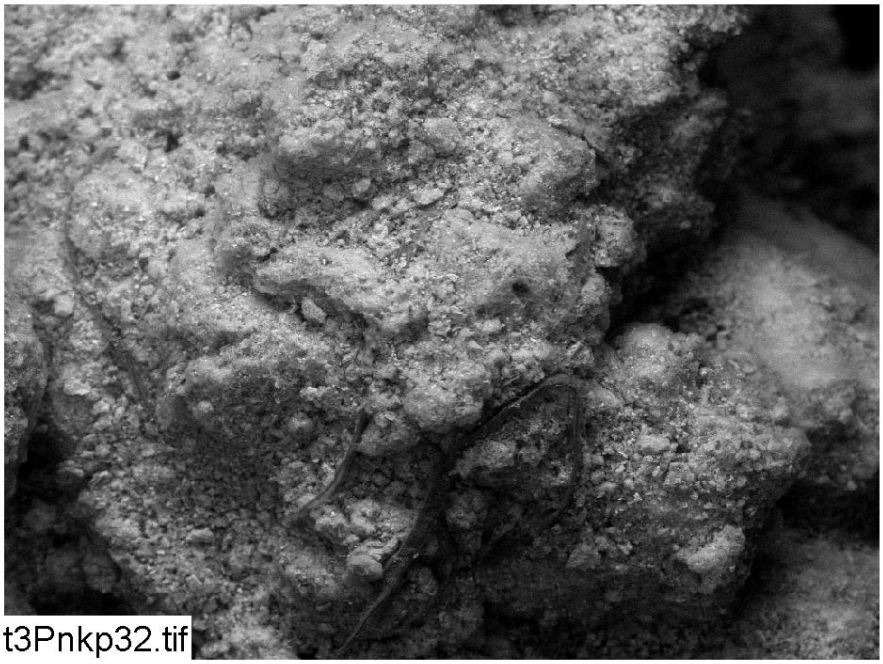


Figure I-5: ESEM image magnified 100 times for Test #3 Day-30 pink sediment. (t3pnkp32)

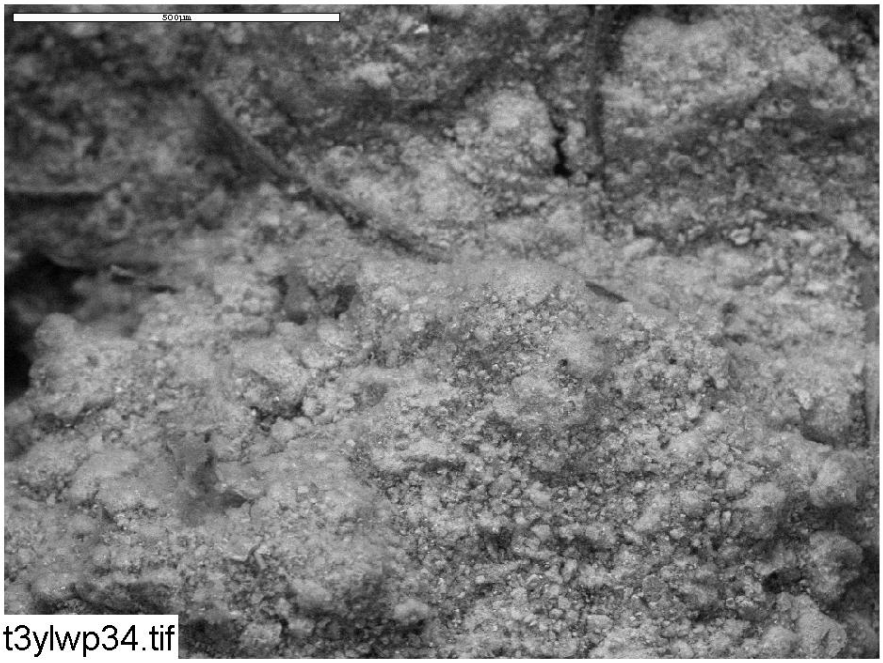


Figure I-6: ESEM image magnified 100 times for Test #3 Day-30 yellow sediment. (t3ylwp34)

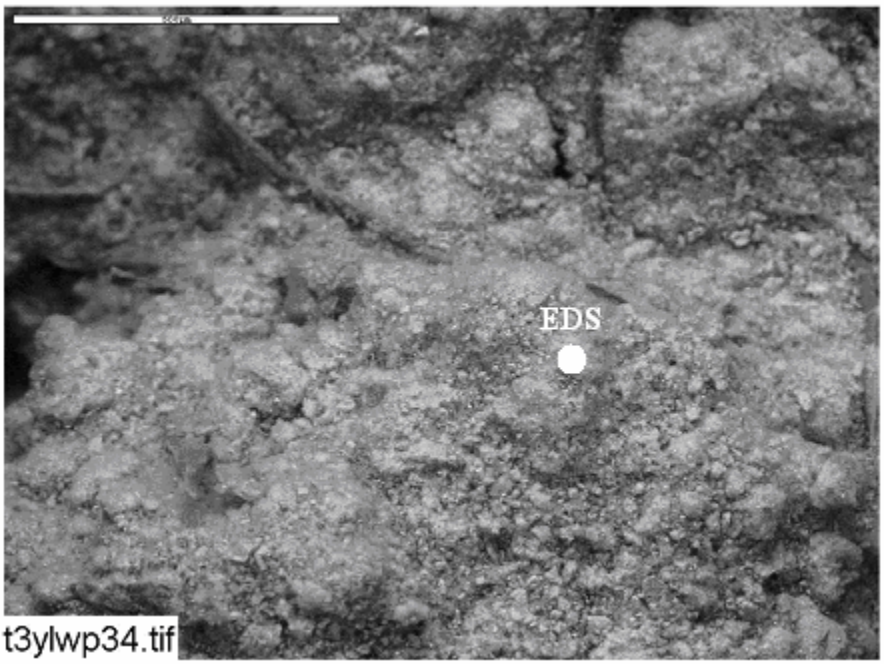


Figure I-7: Annotated ESEM image magnified 100 times for Test #3 Day-30 yellow sediment. (t3ylwp34)

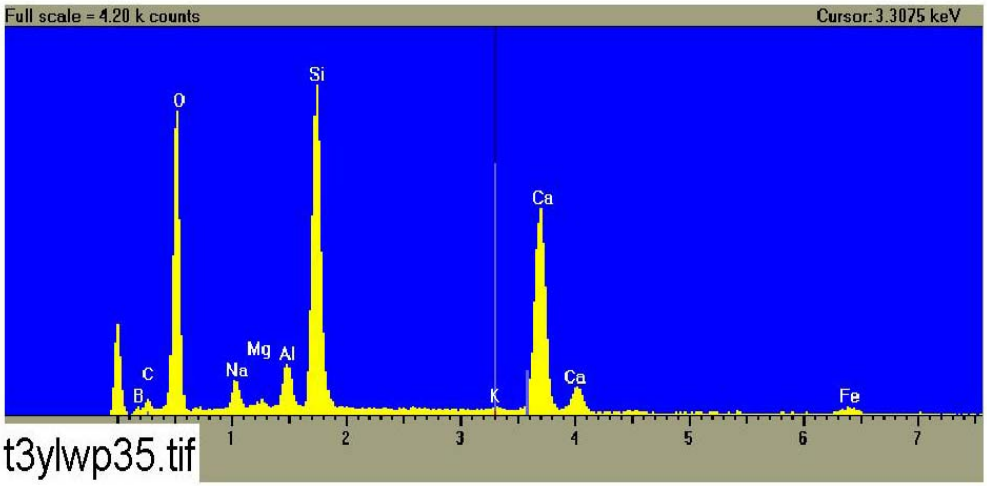


Figure I-8: EDS counting spectrum for the particles shown in Figure I-7. (t3ylwp35)

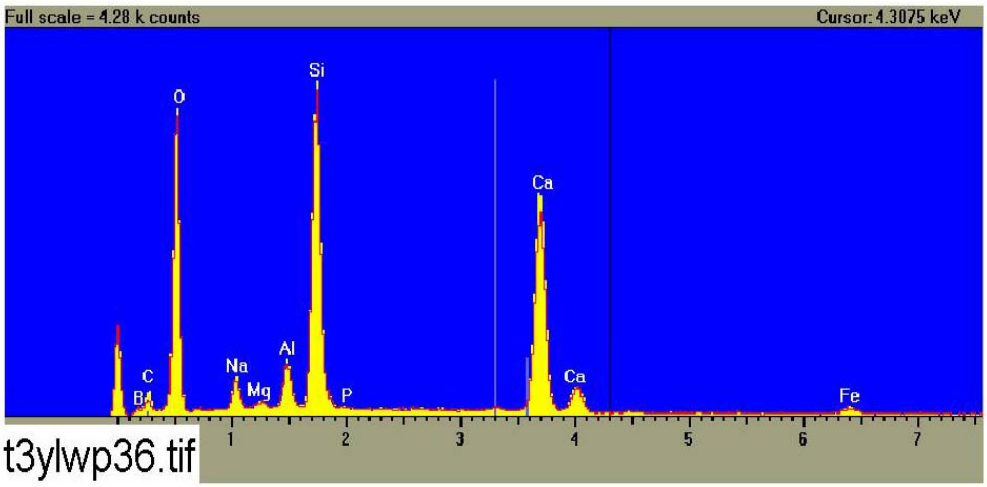


Figure I-9: Comparison of EDS counting spectra for pink sediment (yellow, t3pnkp30) and yellow sediment (red, t3ylwp35). (t3ylwp36)

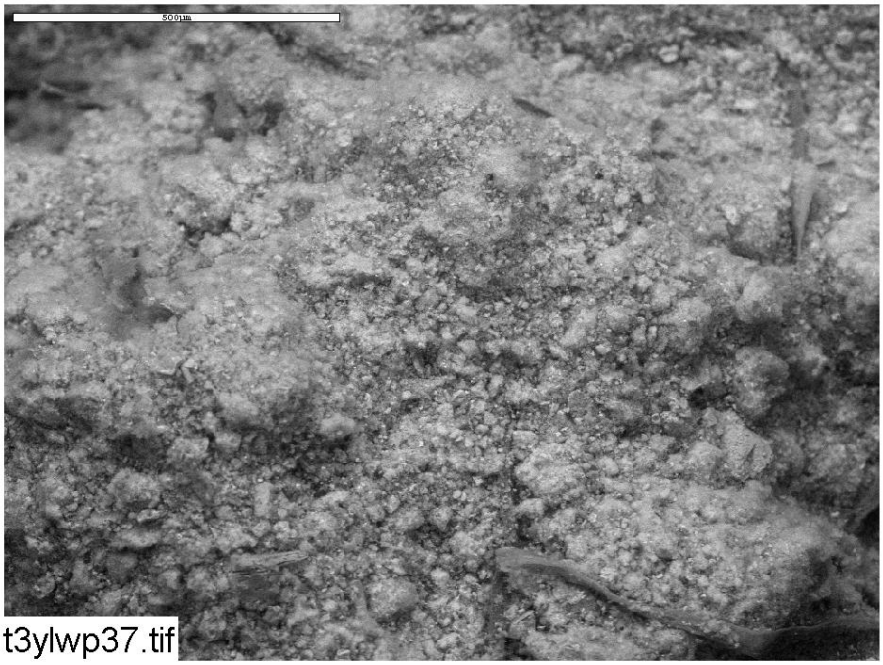


Figure I-10: ESEM image magnified 100 times for Test #3 Day-30 yellow sediment. (t3ylwp37)

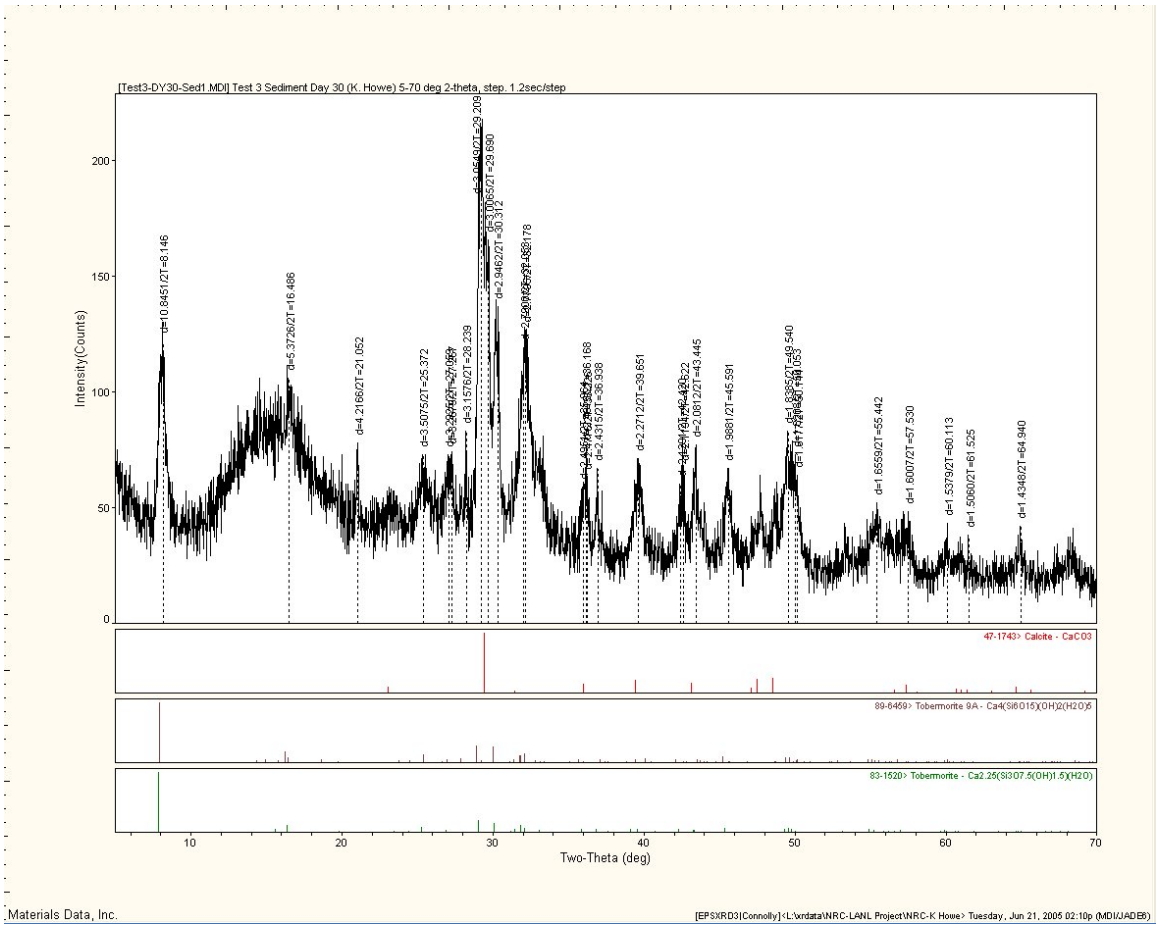


Figure I-11: XRD Results forTest #3 Day-30 Sediment.

Table I-1. Dry Mass Composition of a Test #3 Day-30 Sediment by XRF Analysis

Sample ID	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	$H_20(-)$	$H_2O(+)CO_2$	P_2O_5	Total	H2O(+)CO2 /DF (10) & Cover. To %
Test #3 Day 30 Sediment	36.29	0.20	4.92	2.24	0.00	0.06	0.62	27.16	2.19	0.45	0.58	20.65	3.05	98.42	1.0211