

November 28, 2007
Lab no. 207862

Mr. Alexander Van Geen
Columbia University
Lamont-Doherty Earth Observatory
61 Route 9W, P.O. Box 1000
Palisades, New York 10964

Dear Mr. Van Geen:

Enclosed are the x-ray fluorescence (XRF) and x-ray diffraction (XRD) analytical results for your 18, "Sediment Samples from Bangladesh." Also enclosed are the raw XRD data in graph format, as requested. This report will be mailed and emailed to you. The raw data will be mailed with the report. The analyses will be charged to Karen Hoffer's VISA card, as requested.

A representative portion of each sample was ground to approximately -400 mesh in a steel swing mill and then analyzed by our standard XRF procedure for 31 major, minor and trace elements. The relative precision/accuracy for this procedure is ~5-10% for major-minor elements and ~10-15% for trace elements (those elements listed in ppm) at levels greater than twice the detection limit in samples of average geologic composition. A replicate sample and a standard reference material ("SY3", a CANMET standard rock) were analyzed with the samples to demonstrate analytical reproducibility for your samples and analytical accuracy for a geologic standard, respectively. The accepted ("known") values for the quality control standard are listed with the XRF results.

A representative portion of each ground sample was packed into a well-type plastic holder and then scanned with the diffractometer over the range, 3-61° 2θ using Cu-Kα radiation. The results of the scans are summarized as approximate mineral weight percents on the enclosed table. Estimates of mineral concentrations were made using our XRF-determined elemental compositions and the relative peak heights/areas on the XRD scans. The detection limit for an average mineral in these samples is ~1-3% and the analytical reproducibility is approximately equal to the square root of the amount. "Unidentified" accounts for that portion of the XRD scan which could not be resolved and a "?" indicates doubt in both mineral identification and amount.

Thank you for the opportunity to be of continuing service to Lamont-Doherty.

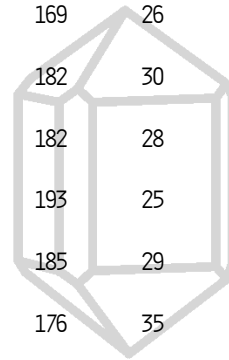
Sincerely,

Peggy Dalheim

Ident	-----						Wt %	-----					
	Na ₂ O	MgO	Al ₂ O ₃	SiO ₂	P ₂ O ₅	S	Cl	K ₂ O	CaO	TiO ₂	MnO	Fe ₂ O ₃	BaO
NS19 60'	1.27	0.57	10.4	83.7	0.07	<0.05	<0.02	2.45	0.43	0.18	0.03	1.96	0.04
NS19 70'	1.57	0.59	10.2	83.1	<0.05	<0.05	<0.02	2.40	0.53	0.18	0.03	1.78	0.04
NS19 80'	1.45	0.63	8.65	85.3	<0.05	<0.05	<0.02	1.92	0.36	0.17	0.03	1.87	0.04
NS20 20'	1.63	0.60	10.3	83.5	0.05	<0.05	<0.02	2.31	0.67	0.19	0.04	1.75	0.04
NS20 50'	1.76	0.67	10.8	81.8	0.06	<0.05	<0.02	2.52	0.81	0.22	0.05	1.87	0.04
NS20 60'	1.84	0.61	10.6	82.8	<0.05	<0.05	<0.02	2.69	0.73	0.19	0.03	1.53	0.05
NS21 30-35'	1.88	1.81	12.7	74.7	0.34	<0.05	0.02	2.44	1.78	0.60	0.09	4.59	0.05
NS21 35-40'	1.86	2.06	12.8	73.7	0.18	<0.05	<0.02	2.56	1.75	0.65	0.09	5.11	0.05
NS21 70-75'	2.00	1.56	11.0	76.9	0.21	<0.05	<0.02	1.96	2.36	0.64	0.09	3.95	0.04
NS23 25-30'	1.92	1.50	11.7	76.5	0.18	<0.05	<0.02	2.44	1.88	0.57	0.08	3.88	0.05
NS23 42-45'	1.95	1.49	10.6	77.6	0.20	<0.05	<0.02	1.95	2.40	0.58	0.08	3.78	0.04
NS23 55-60'	1.90	1.41	11.1	77.2	0.14	<0.05	<0.02	2.34	1.90	0.48	0.08	4.00	0.05
NS36 25'	2.13	1.16	11.2	78.3	0.09	<0.05	<0.02	2.38	1.71	0.37	0.06	2.99	0.05
NS36 45'	1.83	1.21	10.9	78.4	0.11	<0.05	<0.02	2.20	1.81	0.47	0.08	3.60	0.05
NS36 52'	1.74	1.09	10.4	76.9	0.15	<0.05	<0.02	2.04	2.03	0.51	0.12	5.83	0.04
NS37 35'	2.11	1.33	11.3	77.7	0.14	<0.05	<0.02	2.28	1.96	0.43	0.07	3.25	0.05
NS37 45'	2.06	1.65	12.3	75.6	0.20	<0.05	<0.02	2.47	1.86	0.49	0.09	3.99	0.05
NS37 65'	1.95	2.39	13.3	72.2	0.18	<0.05	<0.02	2.61	1.98	0.67	0.10	5.45	0.05
Quality Control - Replicate (R) sample and standard reference material (SY3) analyzed with samples													
NS19 60' (R)	1.32	0.57	10.3	83.8	0.07	<0.05	<0.02	2.43	0.43	0.18	0.03	2.01	0.04
SY3-XRF	4.19	2.40	12.6	60.9	0.74	<0.05	<0.02	4.06	8.25	0.12	0.33	6.33	0.05
SY3-known	4.15	2.67	11.8	59.7	0.54	0.05	0.014?	4.20	8.26	0.15	0.32	6.45	0.05

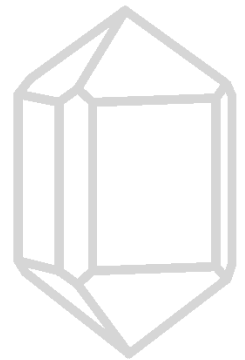
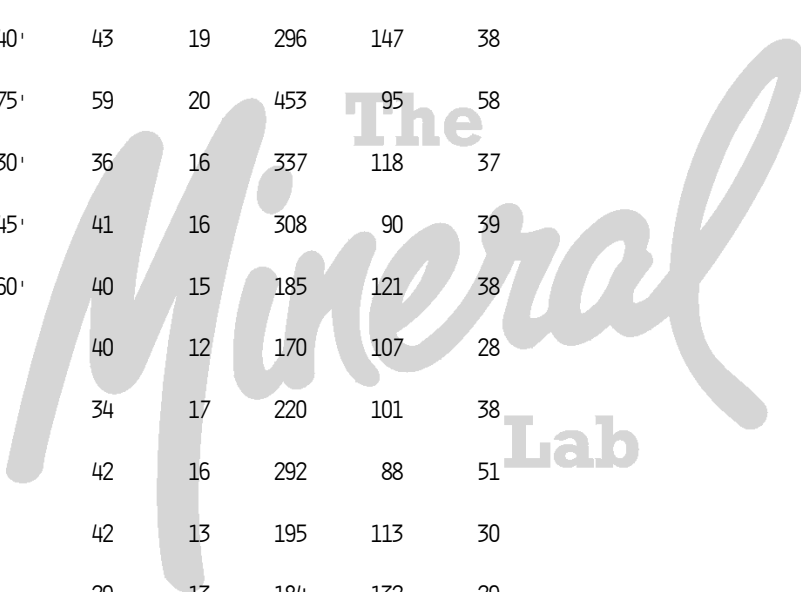
Analysis Performed By The Mineral Lab, Inc

Ident	----- PPM -----										
	V	Cr	Ni	Cu	Zn	As	Sn	Pb	Mo	Sr	U
NS19 60'	28	19	<10	<10	18	<20	<50	20	<10	71	20
NS19 70'	27	19	<10	<10	20	<20	<50	25	<10	76	32
NS19 80'	24	16	<10	<10	19	<20	<50	21	<10	77	26
NS20 20'	25	16	<10	<10	15	<20	<50	19	<10	77	29
NS20 50'	28	18	<10	<10	20	<20	<50	23	<10	85	29
NS20 60'	27	17	<10	<10	19	<20	<50	27	<10	90	18
NS21 30-35'	77	68	28	16	53	<20	98	21	<10	170	32
NS21 35-40'	81	74	34	14	63	<20	113	21	<10	169	40
NS21 70-75'	80	78	17	<10	41	<20	90	19	<10	189	40
NS23 25-30'	67	63	20	13	43	<20	86	19	<10	169	26
NS23 42-45'	75	63	18	<10	39	<20	86	16	<10	182	30
NS23 55-60'	68	58	21	<10	45	<20	86	20	<10	182	28
NS36 25'	58	45	18	<10	35	<20	63	21	<10	193	25
NS36 45'	69	70	19	12	47	<20	77	20	<10	185	29
NS36 52'	78	85	22	11	41	<20	119	25	<10	176	35
NS37 35'	63	51	18	<10	43	<20	69	19	<10	189	21
NS37 45'	70	58	25	14	61	<20	84	20	<10	188	33
NS37 65'	89	72	35	21	84	<20	117	18	<10	175	34
NS19 60' (R)	28	18	<10	<10	17	<20	<50	20	<10	65	12
SY3-XRF	45	<10	<10	29	262	<20	63	128	<10	318	639
SY3-known	51	10	11	16	250	20	--	130	--	306	650



Analysis Performed By The Mineral Lab, Inc

Ident	PPM				
	Th	Nb	Zr	Rb	Y
NS19 60'	28	11	77	122	25
NS19 70'	39	12	86	130	19
NS19 80'	33	10	77	91	18
NS20 20'	32	10	83	109	23
NS20 50'	36	11	91	124	29
NS20 60'	27	12	86	127	20
NS21 30-35'	43	16	266	131	41
NS21 35-40'	43	19	296	147	38
NS21 70-75'	59	20	453	95	58
NS23 25-30'	36	16	337	118	37
NS23 42-45'	41	16	308	90	39
NS23 55-60'	40	15	185	121	38
NS36 25'	40	12	170	107	28
NS36 45'	34	17	220	101	38
NS36 52'	42	16	292	88	51
NS37 35'	42	13	195	113	30
NS37 45'	29	13	184	132	29
NS37 65'	35	16	248	147	36
Quality Control					
NS19 60' (R)	14	<10	77	120	23
SY3-XRF	996	171	361	213	792
SY3-known	990	145	320	208	740



Analysis Performed By The Mineral Lab, Inc

Mineral Name	Chemical Formula	Approx. Wt %					
		NS19 60'	NS19 70'	NS19 80'	NS20 20'	NS20 50'	NS20 60'
Quartz	SiO ₂	60	63	67	59	57	58
Plagioclase feldspar	(Na,Ca)Al(Si,Al) ₃ O ₈	10	14	13	14	17	18
K-feldspar	KAlSi ₃ O ₈	10	10	9	9	10	11
Mica/illite	(K,Na,Ca)(Al,Mg,Fe) ₂ (Si,Al) ₄ O ₁₀ (OH,F) ₂	10	7	5	10	12	10
Chlorite	(Mg,Fe,Al) ₆ (Si,Al) ₄ O ₁₀ (OH)	7	<5?	<5	6	<5	<5
Clinoamphibole	Ca ₂ (Mg,Fe) ₅ Si ₈ O ₂₂ (OH) ₂	<1	—	—	<3	<2?	—
Sillimanite	Al ₂ SiO ₅	<1?	—	—	<1?	—	—
"Unidentified"	?	<5	<5	<5	<5	<5	<5

Analysis performed by The Mineral Lab, Inc

Mineral Name	Chemical Formula	Approx. Wt %					
		NS21 30-35'	NS21 35-40'	NS21 70-75'	NS23 25-30'	NS23 42-45'	NS23 55-60'
Quartz	SiO ₂	48	46	50	51	51	52
Plagioclase feldspar	(Na,Ca)Al(Si,Al) ₃ O ₈	23	21	24	22	25	23
K-feldspar	KAlSi ₃ O ₈	11	10	9	10	9	10
Mica/illite	(K,Na,Ca)(Al,Mg,Fe) ₂ (Si,Al) ₄ O ₁₀ (OH,F) ₂	7	10	5	7	5	7
Chlorite	(Mg,Fe,Al) ₆ (Si,Al) ₄ O ₁₀ (OH)	5	5	<5?	<5	<5	<5
Clinoamphibole	Ca ₂ (Mg,Fe) ₅ Si ₈ O ₂₂ (OH) ₂	<5	5	7	<5	5	<5
Sillimanite	Al ₂ SiO ₅	—	—	—	—	—	—
"Unidentified"	?	<5	<5	<5	<5	<5	<5

Analysis performed by The Mineral Lab, Inc

Mineral Name	Chemical Formula	Approx. Wt %					
		NS36 25'	NS36 45'	NS36 52'	NS37 35'	NS37 45'	NS37 65'
Quartz	SiO ₂	52	53	54	49	46	46
Plagioclase feldspar	(Na,Ca)Al(Si,Al) ₃ O ₈	24	22	24	24	23	24
K-feldspar	KAlSi ₃ O ₈	12	10	10	10	11	11
Mica/illite	(K,Na,Ca)(Al,Mg,Fe) ₂ (Si,Al) ₄ O ₁₀ (OH,F) ₂	5	5	6	7	8	8
Chlorite	(Mg,Fe,Al) ₆ (Si,Al) ₄ O ₁₀ (OH)	<5?	<5	—	<5?	<5	<5
Clinoamphibole	Ca ₂ (Mg,Fe) ₅ Si ₈ O ₂₂ (OH) ₂	<3	<5	<5	7	7	5
Sillimanite	Al ₂ SiO ₅	—	—	—	—	—	—
"Unidentified"	?	<5	<5	<5	<5	<5	<5

Analysis performed by The Mineral Lab, Inc