MICA SCHIST PROGRAM

August 1967 Progress Report
Minerals Research Laboratory
Lab. Nos. 3078, 3079, 3081, 3094, 3119, 3124, 3153-B -
Book 211, p. 73-96 & Book 221, p. 39-47

by
Robert M. Lewis

Object

This is a continuation of the mica schist evaluation program which has been investigated intermittently since being reported in the August 1964 Progress Report. Mica schist samples from various localities throughout the State have been beneficiated by a standardized procedure. The purpose of this program is to locate large ore bodies from which marketable mica products can be produced. The geologists of the Division of Mineral Resources have done most of the field work and ore sampling. Samples have also been processed for other interested parties.

Because of the lack of firm specifications for mica, which are usually worked out between seller and purchaser, the density and colors of a minus 325 mesh, marketed product (Lab. No. 2023-B) are used as a standard. The standard is as follows:

Density - lbs/cu.ft.	Colors by Photovolt Meter		
	Green	Amber	Blue
12.8	74	75	66

Procedure

The mica is floated by either of two methods; an amine float in an acid circuit, or the Bureau of Mines amine-fatty acid float in a basic circuit. The mica concentrate is leached with hot H_2SO_4 to improve color and is then ground in a pebble mill to product size specifications. The pebble mill grind was standardized by grinding a mica concentrate, furnished by a mica producer, in a pebble mill until it met his product specifications. The grinding time, charge, mill speed, etc. were noted.

Details of the flotation, leaching and grinding methods are as follows:

Float - Grind 500-gram sample four minutes at 25 percent solids in a rod mill with ten rods and 1.0 pound per ton of NaOH. Screen rod mill discharge to obtain plus 28 mesh mica product. Deslime minus 28

mesh two times on 325 mesh. Scrub ten minutes at 65 percent solids with 2.0 pounds per ton NaOH. Deslime two times on 325 mesh. Condition three minutes at 45 percent solids with either of the following sets of reagents:

Basic Circuit	Acid Circuit
3.4 lbs/ton Goulac	2.0 lbs/ton H_2SO_4
0.5 lbs/ton DLR (fatty acid)	1.5 lbs/ton fuel oil

Add to cell and condition one minute at 25 percent solids with:

Basic Circuit	Acid Circuit
0.2 lbs/ton Armac-T (amine acetate)	0.5 lbs/ton Armac-T
0.25 lbs/ton MIBC (frother)	0.25 lbs/ton MIBC

Float mica, then clean one time. Combine plus 28 mesh mica (screened out before flotation) with flotation mica (approximately 150 grams). The mica recovery is calculated on the assumption that no mica loss occurs in minus 325 mesh slimes.

Leach - Approximately 150 grams of mica concentrate leached in 1000 ml. beaker at 25 percent solids with ten percent H_2SO_4 for one hour at 95 to 100° C. Stir continuously with mechanical stirrer. Filter hot on Buchner filter using No. 4 filter paper. Spray wash twice with 250 ml. of water. Gravity wash five minutes with 500 ml. of water and ten ml. of two and one-half percent NaOH. Dry sample and determine weight, color and bulk density. Record loss due to leaching (approximately five percent).

Grind - Approximately 150 grams of leached mica ground in pebble mill at 60 rpm for 45 minutes at 65 percent solids with 4000 grams of one-half-inch alumina balls (one-half mill volume) and ten pounds per ton (based on flotation head feed) of tetrasodium pyrophosphate. Settle mill discharge in full bucket of water for one hour. Siphon off water and s uspended solids. These suspended solids contain clay, iron oxides and altered mica, and they are considered to be waste. Dry settled mica, weigh and calculate grinding recovery assuming no loss in mica will occur in further grinding of oversize. Screen settled mica on 325 mesh and return oversize to pebble mill for additional one and one-half hour grind at 65 percent solids without reagents. Dry all of mill discharge and screen on 325 mesh. Combine minus 325 mesh fractions from both grinds, obtain colors and density and record as finished product specifications. Percent mica recovery is recorded by taking into account the flotation, leaching and grinding recoveries. The yield is recorded as weight of product recovered expressed as percent of ore.

Results

A summary of results on the most promising ore samples is shown in Table 1 below. Pertinent data on each of these samples is also included in pages 4 through 14.

Table 1

Mica Schist Summary

Lab. No.	Head Fd. % Mica	Mica % Recov.	Yield % of Hd.Fd.	Product B. Dens. lb/ft.^{3}	Product Green Color	Location	Donor (1)
Ref.sample				12.8	74		
3078	47.2	73.9	34.9	18.4	70	Clay Co.	AFL, RML
3079-A	44.1	62.3	27.4	16.3	65	Haywood Co.	(2)
3079-B	45.2	70.5	31.8	12.2	77	"	(2)
3079-C	37.4	42.6	15.8	11.8	66	"	(2)
3079-D	51.9	58.8	30.5	12.9	70	"	(2)
3079 Comp.	45.1	59.7	27.0	14.2	75	"	(2)
3081	46.1	67.4	31.1	12.1	71	Ashe Co.	AFL
3094	41.9	61.3	25.7	12.9	66	Gaston Co.	AFL
3119	30.7	53.1	16.3	14.7	69	McDowell Co.	JB, AC
3124	37.8	57.2	21.6	15.5	68	Haywood Co.	JB, AC, RML
3153-B	29.8	49.6	14.8	14.6	70	Burke Co.	JB, AC, RML

(1) AFL = A. F. Alsobrook; RML = R. M. Lewis; WTM = W. T. McDaniel; JB = Jerry Bundy; AC = Al Carpenter

(2) W. T. McDaniel, Jerry Bundy, A. Carpenter, A. F. Alsobrook and R. M. Lewis

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3078

Engineer _____ Sample No. _____

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
+28	0.4	0.1		100.0					0.10	0.2	
Mica Conc. (F.P.)	235.2	46.9		99.5	51.6	45	47	36	46.67	98.8	
Cl. Mids (M.D.)	41.8	8.4		4.0					0.34		
Ro. Tails (M.D.)	65.4	13.2		1.0					0.13		
#1 Slime (-325)	103.0	20.6									
#2 Slime (-325)	40.0	8.0									
Losses	14.2	2.8									
Total	500.0	100.0		47.2					47.24	99.0	46.3

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	2.1	700		2.0	1.5				
Mica Float			18		1200				0.5	0.25		
Mica Cleaner			18	2.4			1.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	144	96.0	48.5	51	54	37	94.1	44.4
Loss	6	4.0						
Before leach	150	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	113	78.5
Loss	31	21.5
Before grind	144	100.0

FINAL MICA PRODUCT

Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
18.4	70	72	67	73.9	34.9

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3079-A

Engineer _____ Sample No. 1

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
+28	4.0	0.8		89					0.70	1.6	
Mica Conc. (F.P.)	218.0	43.6		95	38.0	37	37	31	41.50	94.1	
Cl. Mids (M.D.)	46.7	9.3		20					1.86		
Ro. Tails (M.D.)	96.0	19.2		nil							
#1 Slime (-325)	88.0	17.6									
#2 Slime (-325)	42.5	8.5									
Losses	4.8	1.0									
Total	500.0	100.0		44.1					44.06	95.7	42.2

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	4.1	700		2.0	1.5				
Mica Float		3	18	5.3	1200				0.5	0.25		
Mica Cleaner		3	18	2.8			2.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	137.6	91.7	37.5	44	45	34	87.8	38.7
Loss	12.4	8.3						
Before leach	150.0	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	97.6	70.9
Loss	40.0	29.1
Before grind	137.6	100.0

FINAL MICA PRODUCT					
Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
16.3	65	66	56	62.3	27.4

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3079-B

Engineer _____ Sample No. 1

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
+28	6.5	1.3		96.5					1.25	2.8	
Mica Conc. (F.P.)	238.2	47.6		87.0	45.8	42	42	36	41.50	91.9	
Cl. Mids (M.D.)	52.0	10.4		18.0					1.87		
Ro. Tails (M.D.)	92.0	18.4		3.0					0.55		
#1 Slime (-325)	61.0	12.2									
#2 Slime (-325)	45.0	9.0									
Losses	5.3	1.1									
Total	500.0	100.0		45.2					45.17	94.7	42.8

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	4.7	700		2.0	1.5				
Mica Float		3	18	5.6	1200				0.5	0.25		
Mica Cleaner		4	18	3.4			1.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	139.2	92.8	43.4	51	52	42	87.9	39.7
Loss	10.8	7.2						
Before leach	150.0	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	111.7	80.2
Loss	27.5	19.8
Before grind	139.2	100.0

FINAL MICA PRODUCT					
Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
12.2	77	77	71	70.5	31.8

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3079-C

Engineer _____ Sample No. 1

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
+28	2.2	0.4		95.0					0.38	1.0	
Mica Conc. (F.P.)	139.2	27.8		90.6	38.1	35	36	28	25.20	67.3	
Cl. Mids (M.D.)	67.2	13.4		69.0					9.25		
Ro. Tails (M.D.)	177.1	35.5		7.3					2.59		
#1 Slime (-325)	73.5	14.7									
#2 Slime (-325)	29.3	5.9									
Losses	11.5	2.3									
Total	500.0	100.0		37.4					37.42	68.3	25.3

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	3.7	700		2.0	1.5				
Mica Float		3	18	5.0	1200				0.5	0.25		
Mica Cleaner		3	18	3.0			2.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	114.5	89.5	37.0	45	46	35	61.1	22.6
Loss	13.5	10.5						
Before leach	128.0	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	79.9	69.8
Loss	34.6	30.2
Before grind	114.5	100.0

FINAL MICA PRODUCT					
Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
11.8	66	69	57	42.6	15.8

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3079-D

Engineer _____ Sample No. 1

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
+28	2.3	0.5		96.0					0.48	0.9	
Mica Conc. (F.P.)	254.2	50.8		94.0	40.2	39	39	31	47.80	92.2	
Cl. Mids (M.D.)	46.3	9.3		30.8					2.86		
Ro. Tails (M.D.)	85.2	17.0		4.3					0.73		
#1 Slime (-325)	64.0	12.8									
#2 Slime (-325)	38.6	7.7									
Losses	9.4	1.9									
Total	500.0	100.0		51.9					51.87	93.1	48.3

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	4.0	700		2.0	1.5				
Mica Float		3	18	5.1	1200				0.5	0.25		
Mica Cleaner		3	18	2.9			2.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	136.4	90.9	38.8	47	48	37	84.6	43.9
Loss	13.6	9.1						
Before leach	150.0	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	94.8	69.5
Loss	41.6	30.5
Before grind	136.4	100.0

FINAL MICA PRODUCT					
Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
12.9	70	73	63	58.8	30.5

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3079 (ABCD)

Engineer _____ Sample No. 1

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
+28	7.5	1.5		99.5					1.49	3.3	
Mica Conc. (F.P.)	211.6	42.3		99.5	39.2	41	42	32	42.09	93.3	
Cl. Mids (M.D.)	50.8	10.2		11.4					1.16		
Ro. Tails (M.D.)	97.5	19.5		2.0					0.39		
#1 Slime (-325)	74.0	14.8									
#2 Slime (-325)	52.2	10.4									
Losses	6.4	1.3									
Total	500.0	100.0		45.1					45.13	96.6	43.6

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	3.5	700		2.0	1.5				
Mica Float		-		4.9	1200				0.5	0.25		
Mica Cleaner		-		3.3			1.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	133	88.7	38.8	50	53	41	85.7	38.7
Loss	17	11.3						
Before leach	150	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	93	69.9
Loss	40	30.1
Before grind	133	100.0

FINAL MICA PRODUCT					
Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
14.2	75	75	68	59.7	27.0

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3081

Engineer _____ Sample No. 1

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
#28	9.0	1.8		100.0					1.80	3.9	
Mica Conc. (F.P.)	213.5	42.7		99.0	36.5	43	45	34	42.27	91.7	
Cl. Mids (M.D.)	61.6	12.3		10.0					1.23		
Ro. Tails (M.D.)	102.4	20.5		4.0					0.82		
#1 Slime (-325)	53.5	10.7									
#2 Slime (-325)	37.0	7.4									
Losses	23.0	4.6									
Total	500.0	100.0							46.12	95.6	44.1

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	2.5	700		2.0	1.5				
Mica Float		-	18	-	1200				0.5	0.25		
Mica Cleaner		-	18	3.0			1.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	132	88.0	33.5	49	51	39	84.1	38.8
Loss	18	12.0						
Before leach	150	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	93	70.5
Loss	39	29.5
Before grind	132	100.0

FINAL MICA PRODUCT					
Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
12.1	71	74	64	67.4	31.1

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3094

Engineer _____ Sample No. 2

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
+28	58.0	11.6		98.0	-	44	46	34	11.37	27.1	
Mica Conc. (F.P.)	143.3	28.6		97.2					27.80	66.4	
Cl. Mids (M.D.)	24.8	5.0		34.5					1.73		
Ro. Tails (M.D.)	128.4	25.7		3.8					0.98		
#1 Slime (-325)	99.6	19.9									
#2 Slime (-325)	37.4	7.5									
Losses	8.5	1.7									
Total	500.0	100.0		41.9					41.88	93.5	39.2

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	2.4	700		2.0	1.5				
Mica Float		2	18	3.5	1200				0.5	0.25		
Mica Cleaner		2	18	-			1.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	142	94.7	-	45	49	37	88.5	37.1
Loss	8	5.3						
Before leach	150	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	98.4	69.3
Loss	43.6	30.7
Before grind	142.0	100.0

FINAL MICA PRODUCT					
Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
12.9	66	69	56	61.3	25.7

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3119

Engineer _____ Sample No. 1

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
+28	22.2	4.4		100.0					4.40	14.3	
Mica Conc. (F.P.)	107.0	21.3		95.4	41.2	34	36	29	20.32	66.2	
Cl. Mids (M.D.)	48.3	9.6		54.0					5.18		
Ro. Tails (M.D.)	195.7	39.2		2.0					0.78		
#1 Slime (-325)	77.7	15.5									
#2 Slime (-325)	28.5	5.8									
Losses	20.6	4.2									
Total	500.0	100.0		30.7					30.68	80.5	24.7

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	2.5	700		2.0	1.5				
Mica Float		-	18	3.5	1200				0.5	0.25		
Mica Cleaner		-	18	-			1.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	117.8	92.8	39.6	41	43	34	74.7	22.9
Loss	9.2	7.2						
Before leach	127.0	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	83.3	71.1
Loss	33.9	28.9
Before grind	117.2	100.0

FINAL MICA PRODUCT					
Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
14.7	69	71	64	53.1	16.3

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3124

Engineer _____ Sample No. _____

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
+28	1.0	0.2		100.0					0.20	0.5	
Mica Conc. (F.P.)	184.0	36.8		85.5	41.9	40	41	30	31.46	83.1	
Cl. Mids (M.D.)	59.5	11.9		44.0					5.24		
Ro. Tails (M.D.)	80.0	16.0		5.9					0.94		
#1 Slime (-325)	117.0	23.4									
#2 Slime (-325)	35.0	7.0									
Losses	23.5	4.7									
Total	500.0	100.0		37.8					37.84	83.6	31.6

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	3.7	700		2.0	1.5				
Mica Float		-	18	-	1200				0.5	0.25		
Mica Cleaner		-	18	-			1.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	143	95.3	37.6	50	50	42	79.7	30.1
Loss	7	4.7						
Before leach	150	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	102	71.8
Loss	40	28.2
Before grind	142	100.0

FINAL MICA PRODUCT					
Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
15.5	68	70	65	57.2	21.6

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.

N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date _____ Ore 3153-B

Engineer _____ Sample No. 1

FLOTATION

Product	Sample Weights			Assays					Mica		
				%	Dens.	Color with filter					
	Grams	Wt.%	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
+28	24.8	5.0		100.0					5.00	16.8	
Mica Conc. (F.P.)	103.5	20.7		92.4	45.9	40	40	31	19.13	64.3	
Cl. Mids (M.D.)	85.4	17.1		31.3					5.35		
Ro. Tails (M.D.)	182.7	36.5		0.8					0.29		
#1 Slime (-325)	51.5	10.3									
#2 Slime (-325)	29.0	5.8									
Losses	23.1	4.6									
Total	500.0	100.0		29.8					29.77	81.1	24.1

Process						Reagents (lbs. per ton of feed)						
Equipment	Feed	Time	Solids	pH	rpm	NaOH	H_2SO_4	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.												
No. 1 Deslime	2 X	1										
Scrub		10	65		1200	2.0						
No. 2 Deslime	2 X	1										
Mica Cond.		3	45	3.2	700		2.0	1.5				
Mica Float		-	18	-	1200				0.5	0.25		
Mica Cleaner		-	18	-			1.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

Product	Weights		Assays				Cum. Mica	
			Dens.	Color w/filter				
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Yield
After leach	113.0	91.1	41.7	49	51	39	73.9	22.0
Loss	11.0	8.9						
Before leach	124.0	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weights	
	Grams	Dist.
After grind	73.8	67.1
Loss	36.2	32.9
Before grind	110.0	100.0

FINAL MICA PRODUCT					
Dens.	Color with filter			Cum.	Mica
#/cu.'	Green	Amber	Blue	Dist.	Yield
14.6	70	72	66	49.6	14.8

Note: Dist. - Percent of head feed mica recovered in product.
Yield - Weight of product recovered expressed as percent of ore.