MICA SCHIST PROGRAM

August 1967 Progress Report
Minerals Research Laboratory
Lab. Nos. 3078, 3079, 3081, 3094, 3119, 3124, 3153-BBook 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 b	y Photovol	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 $\rm H_2SO_4$ 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 ₂ SO 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 $\rm H_2SO_4$ 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 suspended 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. 1b/ft. ³		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-В	45.2	70.5	31.8	12.2	77	11	(2)
3079-C	37.4	42.6	15.8	11.8	66	lf .	(2)
3079-D	51.9	58.8	30.5	12.9	70	11	(2)
3079 Comp.	45.1	59.7	27.0	14.2	75	Ħ	(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.	
3124	37.8	57.2	21.6	15.5	68	Haywood Co.	JB, AC
3153-B	29.8	49.6	14.8	14.6	70	Burke Co.	JB, AC, RML 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

ORE DRESSING DATA

Sample Weights

Product

Date	Ore3078
Engineer	Sample No.
FLO	PATION

Assays

Dens. Color with filter

Mica

						A						
/ 60		Grams	Wt. %	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
 28		0.4	0.1	ľ	100.0		l			0.10		22020
	P.)	235.2			99.5	51.6	45	47	36	46.67		
Cl. Mids (M.D.		41.8			4.0					0.34		
Ro. Tails (M.D	.)	65.4	13.2		1.0		 			0.13	Z	
#1 Slime (-325		103.0	20.6							0.13		
#2 Slime (-325)	40.0	8.0									
Losses		14.2	2.8							 		
Total			100.0		47.2					47 07	00.0	
							ļ			47.24	99.0	46.3
						, ——.						
70		ocess				R	eagent	s (lbs	per	ton of	feed)	
Equipment	Feed	Time	Solids	Ħα	rom	NaOH	H ₂ S0 ₄	F.0.	Ar-T	MIBC	1000	-
Rod Mill	500 gπ	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		2.0		~ =	~ ~ -		
Mica Cleaner			18	2.4			1.0		0.5	0.25		
Mica Creater			10	2.7			1.0					

ACID LEACH OF FLOTATION MICA CONCENTRATE

.	Wei	ghts		Assay	Com	14		
Product		_	Dens.	Color	w/fil	ter		Mica
	Grams	Dist.	#/cu. 1	Green	Amber	Blue	Dic+	V1024
After leach	144	96.0	48.5	51	54	37	94. I	42 Z
Loss	_ 6	4.0					2 102	
Before leach	150	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weig	ghts
	Grams	Dist.
After grind	113	78.5
Ioss	31	21.5
Before grind	144	100.0

	<u>FINA</u>	L MICA	PRODU	CT	
Dens.	Color	with i	Cilter	Cum.	Mica
#/cu.	Green	Amber	Blue	Dist.	Yield
18.4	70				34.9

Note: Dist. - Percent of head feed mica recovered in product.

Yield - Weight of product recovered covered in product.

ORE DRESSING DATA

Date	Ore 3079-A
Engineer	Sample No. 1

Assays

FLOTATION

Sample Weights

75	Dundund		Sample Weights				% Dens.Color with filter					Mica			
Product			 		- %	Dens.	Color	with f	ilter	1_	Mica				
<i>∔</i> 28			Wt.%	Cum.%		#/cu.'	Green	Amber		Units	Dist	Yiel			
	_ ~	4.0			89	, .				0.70	1.6				
	P.)	218.0			95	38.0	37	37	31	41.50	94.1	1			
Cl. Mids (M.D.		46.7			20					1.86		+			
Ro. Tails (M.I		96.0	19.2		nil						 	 			
#1 Slime (-325		88.0	17.6							 	 	┼ —			
#2 Slime (-325)	42.5	8.5			<u> </u>	 					 			
Losses		4.8	1.0								 	 			
Total		500.0	100.0	-	44.1	†				44.06	95.7	42.2			
	Pr	ocess	-			<u> </u>	22224	a (32 -							
		ocess				R	eagent	s (lbs	ner	ton of	feed	\			
Equipment	Feed	Time	Solids	Нα	rpm	NaUH	eagent H ₂ SO ₄	s (lbs	per Ar-T	ton of	feed				
Rod Mill		Time		рН	rom	R NaOH 1.0	eagent H ₂ SO ₄	s (lbs F.O.	per Ar-T	ton of MIBC	feed				
Rod Mill Screen 28 M.	Feed 500 gm	Time 4	Solids	Hq	rom	NaUH	eagent H ₂ SO ₄	s (lbs	per Ar-T	ton of MIBC	feed)				
Rod Mill Screen 28 M. No. 1 Deslime	Feed	Time 4	Solids 25	Hq		1.0	eagent H ₂ SO ₄	s (lbs F.O.	per Ar-T	ton of MIBC	feed				
Rod Mill Screen 28 M. No. 1 Deslime Scrub	Feed 500 gm 2 X	Time 4 1 10	Solids	Щ	1200	NaUH	eagent H ₂ SO ₄	s (lbs F.O.	per Ar-T	ton of	feed)				
Rod Mill Screen 28 M. No. 1 Deslime Scrub No. 2 Deslime	Feed 500 gm	1 10 1	Solids 25 65		1200	1.0	eagent H ₂ SO ₄	s (lbs	per Ar-T	ton of	feed				
Rod Mill Screen 28 M. No. 1 Deslime Scrub No. 2 Deslime Mica Cond.	Feed 500 gm 2 X	1 10 1 3	Solids 25 65 45	4.1	1200	1.0	eagent H ₂ SO ₄	s (lbs F.O.	per Ar-T	ton of	feed				
Rod Mill Screen 28 M. No. 1 Deslime Scrub No. 2 Deslime Mica Cond. Mica Float	Feed 500 gm 2 X	1 10 1 3 3	Solids 25 65 45	4.1	1200	1.0	H2SO4	F.O.	Ar-T	MIBC	feed				
Rod Mill Screen 28 M. No. 1 Deslime Scrub No. 2 Deslime Mica Cond.	Feed 500 gm 2 X	1 10 1 3	Solids 25 65 45	4.1	1200	1.0	H2SO4	F.O.	Ar-T	ton of MIBC	feed)				

ACID LEACH OF FLOTATION MICA CONCENTRATE

	Weig	hts		Assay	75		A	344
Product	L. 1	-	Dens.	Color	w/fil	ter		Mica
	Grams	Dist.	#/cu.'	Green	Amber	Blue	DV c+	V4 - 2 -
After leach	137.6	91.7	37.5	44	45	74	87.8	38.7
Loss	12.4	8.3					07.0	30.7
Before leach	150.0	100.0						

GRIND OF LEACHED MICA CONC.

Product	Weig	hts
	Grams	Dist.
After grind	97.6	70.9
Ioss	40.0	29.1
Before grind	137.6	100.0

FINAL MICA PRODUCT										
Color	with:	filter	Cum.	Mica						
Green	Amber	Blue	Dist.	Yield						
65	66	56	62.3	27.4						
	Color Green	Color with Green Amber	Color with filter Green Amber Blue	FINAL MICA PRODUCT Color with filter Cum. Green Amber Blue Dist. 65 66 56 62.3						

Note: Dist. - Percent of head feed mica recovered in product.

ORE DRESSING DATA

Date	Ore 3079-B
Engineer	Sample No. 1

96.5

<u>Assays</u>

Dens. Color with filter

Mica #/cu. Green Amber Blue Units Dist. Yield

Mica

FLOTATION

Cum. %

Sample Weights

Product

7 28

P.)	238.2	47.6		87.0	45.8	42	42	36	41.50	91 9	
)				18.0			 -				
.)	92.0	18.4		3.0		 	<u> </u>				+
)	61.0	12.2					+	 	1 0.33	 	┿
)	45.0	9.0			 	 	 	 	 	 	┼
	5.3	1.1		† — —		 	 	 			├
	500.0	100.0		45.2		 	 	-	45 17	94 7	42.8
		1			F	Reagent	ts (lbs	per	ton of	feed	
	<u> Time</u>		рĦ	rom	NaOH	H ₂ SO ₂	F.O.	Ar-I	MEBG		
500 gm	4	25			1.0						
											
2 X	1										
	10	65		1200	2.0						 -
2 X	1										
	3	45	4.7	700		2.0	1.5				
	3	18	5.6	1200				0.5	0.25	_	
	4	18	3.4		····	1.0				-	
									<u> </u>	··	
) Pr Feed	Process Feed Time 500 gm 4 2 X 1 10 2 X 1 3 3	Process Feed Time Solids 500 gm 4 25 2 X 1 1 3 45 3 45 3 18						Second S		Second 10.4 18.0 1.87

ACID LEACH OF FLOTATION MICA CONCENTRATE

	Weig	thts		Assay	75		C	W.
Product			Dens.	Color	w/filter			Mica
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Vield
After leach	139.2	92.8	43.4	51	52	42	87.9	39.7
Loss	10.8	7.2					07.5	37.7
Before leach	150.0	100.0	·					

GRIND OF LEACHED MICA CONC.

Product	Weig	hts
	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				31.8						

Note: Dist. - Percent of head feed mica recovered in product.

ORE DRESSING DATA

Date	Ore 3079-C
Engineer	Sample No. 1

<u>Assays</u>

Dens. Color with filter

Mica

FLOTATION

Sample Weights

Product

						• בווסת						
		Grams		Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
<u> </u>		2.2	0.4		95.0					0.38	1.0	
	P.)		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	0,.5	
Ro. Tails (M.D.	.)	177.1	35.5		7.3				i	2.59		
#1 Slime (-325		73.5	14.7							2.35		
#2 Slime (-325)	29.3	5.9				_			 		
Losses		11.5								 		
700 / 0					27 /					37.42	68.3	25.2
Total		500.0	100.0		37.4	I	·	L		37.42	08.3	25.3
Total		500.0	100.0		37.4					37.42	00.3	23.1
Total	D		μου.ο		37.4							25.3
		ocess				R	eagent		per	ton of		25,3
Equipment	Feed	ocess Time	Solids	Нq	37.4	NaOH	eagent H ₂ SO/		per Ar-T	ton of		25,3
Equipment Rod Mill		ocess Time		Нq		Re NaOH			per Ar-T	ton of		23,3
Equipment Rod Mill Screen 28 M.	Feed 500 gm	ocess Time	Solids	Н		NaOH			per Ar-T	ton of		25,3
Equipment Rod Mill Screen 28 M. No. 1 Deslime	Feed	Ocess Time 4	Solids 25	η	rom	NaOH			per Ar-T	ton of		23,3
Equipment Rod Mill Screen 28 M. No. 1 Deslime Scrub	Feed 500 gm 2 X	ocess Time	Solids	Н		NaOH			per Ar-T	ton of		23,3
Equipment Rod Mill Screen 28 M. No. 1 Deslime Scrub No. 2 Deslime	Feed 500 gm	Ocess Time 4	Solids 25	На	rom	NaOH 1.0			per Ar-T	ton of		23,3
Equipment Rod Mill Screen 28 M. No. 1 Deslime Scrub No. 2 Deslime	Feed 500 gm 2 X	Ocess Time 4	Solids 25	рН	rom	NaOH 1.0		F.O.	per Ar-T	ton of		25,3
Equipment Rod Mill	Feed 500 gm 2 X	rocess Time 4 1 10 1	Solids 25 65		1200	NaOH 1.0	H ₂ SO ₄		per Ar-T	ton of		25,3

ACID LEACH OF FLOTATION MICA CONCENTRATE

<u> </u>	Wei	ghts		Assay	'5		C	14
Product			Dens.	Color	w/fil	ter		Mica
	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	Weig	ghts
	Grams	Dist.
After grind	79.9	69.8
Ioss	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			15.8				

Note: Dist. - Percent of head feed mica recovered in product.

ORE DRESSING DATA

Date	Ore_3079-D
Engineer	Sample No. 1

FLOTATION

	Samo	le Wei	onte l			ssays					
Product				%	Dens.	Color	with f	'ilter	1	Mica	
	Grams	Wt. %	Cum. %	Mica	#/cu.'	Green			Units	Dist	Yield
<u> </u>	2.3	0.5		96.0			Ī ———		0.48		1220
Mica Conc. (F.P.)	254.2	50.8		94.0	40.2	39	39	31	47.80		
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					 		0.73		
#2 Slime (-325)	38.6	7.7							 		
Losses	9.4	1.9							 		
Total		100.0		51.9					51.87	93.1	48.3

	Pr	ocess				F	eagent	s (lbs	ner	ton of	food \	_
Equipment	Feed	Time	Solids	Ħα	rom	NaOH	H ₂ SO ₂	F.O.	Ar-T	MIBC	1660	_
Rod Mill	500 gm	4	25		1	1.0		1		1		┢╾
Screen 28 M.						 		 	 			<u> </u>
No. 1 Deslime	2 X	1					 	 	 	 		
Scrub		10	65		1200	2.0				 		
No. 2 Deslime	2 X	1				1		 	 	 	-	
Mica Cond.		3	45	4.0	700		2.0	1.5		 	-	
Mica Float		3	18	5.1	1200			1	0.5	0.25		
Mica Cleaner		3	18	2.9		 	2.0		 •••	P-23		

ACID LEACH OF FLOTATION MICA CONCENTRATE

	Weig	ghts		Assay	~····	10.			
Product		_	Dens.	Color w/filte:		ter		Mica	
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Vield	
After leach	136.4	90.9	38.8	47	48	37	84.6	43.9	
Loss	13.6	9.1				<u> </u>	07.0	43.3	
Before leach	150.0								

GRIND OF LEACHED MICA CONC.

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

FINAL MICA PRODUCT Dens. Color with filter Cum. Mica										
Dens.	Color	with i	filter	Cum.	Mica					
#/cu.'	Green	Amber	Blue	Dist.	Yield					
				58.8						

Note: Dist. - Percent of head feed mica recovered in product.

ORE DRESSING DATA

Date	Ore 3079 (ABCD)
Engineer	Sample No. 1

FLOTATION

Cum.%	% Mica 99,5 99.5	Dens. #/cu.'	Color Green 41	with f Amber 42	ilter Blue 32	Units 1.49 42.09	Dist. 3.3 93.3	Yield
5 3 2	99,5 99,5	#/cu.'	Green	Amber	Blue	Units 1.49 42.09	3.3	Yield
3	99,5 99,5					1.49 42.09	3.3	
2		39.2	41	42	32		93.3	
	11.4		1			1 1/	 	
	·					1.16	1	
5	2.0					0.39		
8			1		i	1	 	
		1						
3				<u> </u>		 		
	45.1					45.13	96.6	43.6
	8 4 3 0	3	3	3	3	4 3	4 3	4 3

	Process							Reagents (lbs. per ton of feed)				
Equipment	Feed	Time	Solids	рĦ	rom	NaOH	H ₂ SO ₂	F.O.	Ar-T	MIBC		
Rod Mill	500 gm	4	25			1.0						
Screen 28 M.			ļ ————					 				
No. 1 Deslime	2 X	1							1			
Scrub		10	65		1200	2.0		1				
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

	Wei	ghts		Assay	_	/sum	Mica	
Product	""		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	1.50	100.0						

GRIND OF LEACHED MICA CONC.

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

Dens. Color with filter Cum. Mic									
Dens.	Color	with:	filter	Cum.	Mica				
#/cu.	Green	Amber	Blue	Dist.	Yield				
14.2	75				27.0				

Note: Dist. - Percent of head feed mica recovered in product.

ORE DRESSING DATA

Date	Ore 3081
Engineer	Sample No. 1

Assays

FLOTATION

Sample Weights

Product			Te Mei		%	Dens.	Color	with f	ilter		Mica		
/ 00			Wt. %		Mica	#/cu.'	Green	Amber	Blue	Units	Dist	Yiel	
<u>+28</u>		9.0			100.0					1.80	3.9		
	P.)	213.5			99.0	36.5	43	45	34	42.27	91.7		
Cl. Mids (M.D.		61.6			10.0					1.23		 	
Ro. Tails (M.I		102.4	20.5		4.0					0.82			
#1 Slime (-325		53.5	10.7							1113			
#2 Slime (-325	i)	37.0	7.4						-	 			
Losses		23.0	4.6									 	
Total		500.0	100.0							46.12	95.6	44.	
		ocess				R	eagent	s (lbs	ner	ton of	feed		
	Dv	100000											
Equipment				ъĦ	mom	R NaOH	eagent	s (lbs	per	ton of	feed)		
Rod Mill	Feed 500 gm	Time	Solids 25	Ħq	rpm	NaOH	eagent H ₂ SO ₄	s (lbs F.O.	per Ar-T	ton of MIBC	feed)		
Rod Mill	Feed	Time	Solids	Нq	rom	R NaOH	eagent H ₂ SO ₄	s (lbs F.O.	per Ar-T	ton of MIBC	feed)		
Rod Mill Screen 28 M.	Feed	Time	Solids	Ħq	rom	NaOH	eagent H ₂ SO ₄	s (1bs F.O.	per Ar-T	ton of MIBC	feed)		
Rod Mill Screen 28 M. No. 1 Deslime	Feed 500 gm	Time	Solids	Ħq	1 200	1.0	eagent H ₂ SO ₄	s (lbs F.O.	per Ar-T	ton of	feed)		
Rod Mill Screen 28 M. No, 1 Deslime Scrub	Feed 500 gm	Time 4	Solids 25	Щq		NaOH	eagent H ₂ SO ₄	s (lbs F.O.	per Ar-T	ton of	feed)		
Rod Mill Screen 28 M. No. 1 Deslime Scrub No. 2 Deslime	Feed 500 gm	Time 4	Solids 25	рН		1.0	H ₂ S0 ₄	F.O.	per Ar-T	ton of	feed)		
Rod Mill Screen 28 M. No. 1 Deslime Scrub No. 2 Deslime Mica Cond.	Feed 500 gm	1 1 10	Solids 25 65		1200	1.0	eagent H ₂ SO ₄	s (lbs F.O.	Ar-T	MIBC	feed)		
Equipment Rod Mill Screen 28 M. No. 1 Deslime Scrub No. 2 Deslime Mica Cond. Mica Float Mica Cleaner	Feed 500 gm	1 10 1 3	Solids 25 65 45	2.5	1200	1.0	H ₂ S0 ₄	F.O.	Ar-T	ton of MIBC	feed)		

ACID LEACH OF FLOTATION MICA CONCENTRATE

<u>.</u>	Weig	ghts		Assay	Cham			
Product		_	Dens.	Color	w/fil	ter		Mica
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Diet	Yield
After leach	132	88.0	33.5	49	51	39	84.1	38.8
Loss	18	12.0						30.0
Before leach	150	100.0						

GRIND OF LEACHED MICA CONC.

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

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

Note: Dist. - Percent of head feed mica recovered in product.

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N.C. STATE UNIVERSITY MINERALS RESEARCH LABORATORY

ORE DRESSING DATA

Date		Ore3094
Engineer		Sample No. 2
	ET OMANTON	

<u>Assays</u>

FLOTATION

Sample Weights

I –		l Samm	le Wei	ohts !			Bodys			\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \		
Product	1	 	1		1 %	Dens.	Color	with f	ilter	<u></u>	Mica	
		Grams	Wt.%		Mica	#/cu.'	Green		Blue	Units	Dist.	Yield
<u></u> ≠ 28		58.0			98.0		44	46	34	11.37		
	P.)	143.3			97.2						66.4	
Cl. Mids (M.D.		24.8			34.5					1.73		
Ro. Tails (M.D		128.4			3.8					0.98		
#1 Slime (-325		99.6										
#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
77		ocess	· · · · · · · · · · · · · · · · · · ·			R	eagent	s (lbs	per	ton of	feed)	
Equipment	Feed		Solids	**		NaOH	<u>eazent</u>	s (lbs	per	ton of	feed)	
Rod Mill	500 gn		25	рл	rom	1.0	H ₂ SO ₄	F.U.	Ar-T	MI BC		
Screen 28 M.	300 8					1.0						
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

_	Weis	ghts		Assay	<u>ر</u>	V//		
Product			Dens.	Color	w/fil	ter	i	Mica
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist	Yield
After leach	142	94.7	-	45	49	37	88.5	37.1
Loss	8	5.3						37.12
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.

ORE DRESSING DATA

Date	Ore 3119
Engineer	Sample No. 1

FLOTATION

			TOT.C.	Assays					Mica		
ł		le Wei		%	Dens.	Color	with f	ilter		MICA	
	Grams	Wt.%	Cum.%		#/cu.'	Green	Amber	Blue			Yield
)					41.2	34	36	29	20.32	66.2	
				54.0					5.18		
	195.7	39.2		2.0					0.78	-	
	77.7	15.5									
	28.5	5.8									
	20.6	4.2									
	500.0	100.0		30.7					30.68	80.5	24.7
					R	eagent	s (lbs	per	ton of	feed)	
Pr	ocess				R	eagent	s (lbs	. per	ton of	feed)	
			Ηα	rom		H2S04	F.O.	Ar-T	MIBC	•	
uu gm	4	25			1.0						
2 X	<u> </u>					<u> </u>					
	10	65		1200	2.0						
2 X	1					<u> </u>					
	3			700		2.0	1.5				
	-		3.5	1 200				0.5	0.25		
	-	18				1.0					
											-
	Pr	22.2) 107.0 48.3 195.7 77.7 28.5 20.6 500.0 Process eed Time 00 gm 4 2 X 1 10 2 X 1 3	22.2 4.4	22.2 4.4	22.2 4.4 100.0 107.0 21.3 95.4 48.3 9.6 54.0 195.7 39.2 2.0 77.7 15.5 28.5 5.8 20.6 4.2 500.0 100.0 30.7	22.2 4.4 100.0	22.2 4.4 100.0	22.2 4.4 100.0	22.2 4.4 100.0	22.2 4.4 100.0 4.40 4.40 107.0 21.3 95.4 41.2 34 36 29 20.32 48.3 9.6 54.0 5.18 195.7 39.2 2.0 0.78 77.7 15.5 28.5 5.8 20.6 4.2 500.0 100.0 30.7 30.68	22.2 4.4 100.0 4.40 14.3

ACID LEACH OF FLOTATION MICA CONCENTRATE

	Weig	hts	Assays				Cum.	Wiss	
Product	1 7		Dens.	Color	w/fil	ter			
	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	Weig	hts
	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 t	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.

ORE DRESSING DATA

Date	Ore	3124
Engineer	Sample	No

<u>Assays</u>

Mica

FLOTATION

Sample Weights

Product		penifi	Te Mei	Sircs	90	Dens.	Color	with f	ilter		Mica	
		Grams	Wt. %	Cum.%	Mica	#/cu.'	Green	Amber	Blue	Units	Dist.	Yield
<u></u> 28		1.0	0.2		100.0					0.20		
Mica Conc. (F.	P.)	184.0	36.8		85.5	41.9	40	41	30	31.46		
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							1		
#2 Slime (-325)	35.0	7.0				_					
Losses		23.5	4.7			1						<u> </u>
		500 0	100.0		37.8					37 84	83.6	31 6
Total			[100.0]		37.0							
	Pr	ocess			37.0	R	l Reagent	s (lbs	. per			
Equipment	Feed	ocess Time	Solids	Ħq	rom	R NaOH	eagent H ₂ SO ₄	s (lbs	. per Ar-T	ton of		
Equipment Rod Mill		ocess Time		Ħq		NaOH	eagent H ₂ SO ₄	s (lbs	per Ar-T	ton of		
Equipment	Feed 500 gm	ocess Time	Solids	Нq		NaOH	eagent H ₂ SO ₄	s (lbs	per Ar-T	ton of		
Equipment Rod Mill	Feed	ocess Time	Solids	рН		NaOH	eagent H ₂ S04	s (1bs	per Ar-T	ton of		
Equipment Rod Mill Screen 28 M.	Feed 500 gm	ocess Time 4	Solids	Hq		NaOH	eagent H ₂ SO ₄	s (lbs F.O.	per Ar-T	ton of		
Equipment Rod Mill Screen 28 M. No. 1 Deslime	Feed 500 gm	ocess Time 4	Solids 25	на	rom	NaOH 1.0	eagent H ₂ SO ₄	s (lbs	per Ar-T	ton of		
Equipment Rod Mill Screen 28 M. No. 1 Deslime Scrub	Feed 500 gm 2 X	Ocess Time 4	Solids 25	рН	rom	NaOH 1.0	eagent H ₂ SO ₄	s (1bs F.O.	per Ar-T	ton of		
Equipment Rod Mill Screen 28 M. No. 1 Deslime Scrub No. 2 Deslime	Feed 500 gm 2 X	Time 4 1 10	Solids 25 65		rom 1200	NaOH 1.0	H ₂ SO ₄	F.O.	per Ar-T	ton of		

ACID LEACH OF FLOTATION MICA CONCENTRATE

	Weig	thts		Assay	S	Cham		Mica	
Product			Dens.	Color	w/fil	ter			
	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.

Weig	ghts
Grams	Dist.
102	71.8
40	28.2
142	100.0
	102 40

FINAL MICA PRODUCT							
Dens.	Color	with t	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.

ORE DRESSING DATA

Date	Ore 3153-B
Engineer	Sample No. 1

Assays

FLOTATION

Sample Weights

		Sam	le Wei	ahte .		<u>. </u>	moody 5					
Product		Calib	le Wei	Burs	%	Dens.	Color	with f	'ilter	1	Mica	
		Grams	Wt. %	Cum.%	Mica	#/cu.'	Green	Amber		Units	Dist.	Yiel
<u>+ 28</u>		24.8			100.0					5.00	16.8	
Mica Conc. (F.		103.5			92.4	45.9	40	40	31	19.13	64.3	
Cl. Mids (M.D.		85.4			31.3					5.35		
Ro. Tails (M.D		182.7	•		0.8					0.29		
#1 Slime (-325		51.5						 		-		
#2 Slime (-325	.)	29.0	5.8									
Losses		23.1	4.6						_	 		
Total		500.0	100.0		29.8				_	29.77	81.1	24.
Equipment	Feed	Time	Solids	Ħа	_x-Dm	NaOH	H ₂ SO ₄	F.O.	Ar-T	ton of MIBC	reed)	
Pand		cocess	1=			R	eagent	s (lbs	per	ton of	feed)	
Rod Mill	500 gr	h 4	25	D.A.	T.DIII		H2304	F.U.	Ar-1	MIBC		
Screen 28 M.	300 8.	-				1.0						
No. 1 Deslime	2 X	1								 		
Scrub		10	65		1 200	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		0.5	0.25		
							<u> </u>		<u> </u>	<u></u>		
						_						_
				·								

ACID LEACH OF FLOTATION MICA CONCENTRATE

	Weig	hts		Assay	Cum.	16.00		
Product			Dens.	Color	w/fil	ter		
	Grams	Dist.	#/cu.'	Green	Amber	Blue	Dist.	Vield
After leach	113.0	91.1	41.7	49	51	39	73.9	22.0
Loss	11.0	8.9		i				
Before leach	124.0	100.0						

GRIND OF LEACHED MICA CONC.

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

FINAL MICA PRODUCT				
Color	with:	filter	Cum.	Mica
Green	Amber	Blue	Dist.	Yield
70	72	66	49.6	14.8
	Color Green	Color with : Green Amber	Color with filter Green Amber Blue	Color with filter Cum. Green Amber Blue Dist.

Note: Dist. - Percent of head feed mica recovered in product.