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Grum

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## LAKEFIELD RESEARCH OF CANADA LIMITED

LAKEFIELD, ONTARIO

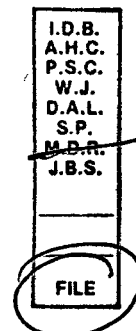
CANADA KOL 2HO

P.O. BOX 430

PHONE (705) 652-3341

April 12, 1977

Mr. M.D. Rowswell,  
Kerr Addison Mines Limited,  
P.O. Box 91,  
Commerce Court West,  
Toronto, Ontario.



Dear Mr. Rowswell:

Re: Testing of Grum Samples

Following the meeting with you in the Noranda office on February 28, 1977, I had discussions with Messrs. R.L. Coleman and D.J.T. Carson concerning the mineralogy of the deposit and the significance of the samples that were sent to Lakefield for testing. It was agreed that the order of priority for testing should be as follows: Samples H-3, C-3, D-3, F<sub>3</sub> hard, F, F<sub>3</sub> Vuggy. Samples A-77 and C-77 were not considered significant and were therefore dropped from the present program. A standard method was selected for testing each sample and modifications were then applied in an attempt to improve the results. We have crushed and sampled all drums and placed the rejects as well as the test charges in deep freeze storage (-20°C).

1. Head Analyses

Sample No.	Assays, %				Ag oz/ton
	Pb	Zn	S	C	
H-3	3.11	6.20	16.1	0.10	1.47
C-3	3.82	6.52	26.0	0.11	1.62
D-3	3.84	7.82	6.42	0.15	1.84
F-3 Hard	6.87	17.1	22.8	0.06	3.59
G-3	1.37	2.83	6.11	0.05	0.56
F-3 Vuggy	6.86	15.8	32.0	0.06	3.31

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2. Flotation Tests on Sample H-3

Test No.	Description
153	Standard test 87.1 % -200 mesh
154	Pb circuit only, with regrinding and scavenging of Pb cleaner tailings
155	Repeat 154 with coarser grind (67 % -200 mesh)
158	Repeat 154 with zinc circuit
161	Improve zinc recovery (Na <sub>2</sub> S, Z-6)
164	Improve zinc recovery (different reagents)

2.1. Metallurgical Results

Test No.	Product	Weight %	Assays, %		% Distribution		% Recovery at	
			Pb	Zn	Pb	Zn	60 % Pb * 54 % Zn	
153	Pb Conc.	3.64	65.9	3.69	78.2	2.2	81	53**
	Zn Conc.	7.41	0.38	46.8	0.9	57.0		
	Tailing	63.3	0.34	1.21	7.1	12.6		
154	Pb Conc.	3.64	68.0	3.68	80.9	2.2	83	-
155	Pb Conc.	3.98	54.9	5.52	72.8	3.5	70	62**
	Zn Conc.	9.39	2.85	46.1	8.9	69.0		
	Tailing	75.2	0.45	1.44	11.4	17.3		
158	Pb Conc.	4.35	59.8	4.66	85.4	3.4	85	63**
	Zn Conc.	8.18	0.67	50.0	1.8	66.6		
	Tailing	68.9	0.35	1.35	7.9	15.1		
161	Pb Conc.	4.40	57.7	4.89	83.5	3.4	83	73**
	Zn Conc.	10.89	1.79	45.5	6.4	77.4		
	Tailing	45.10	0.24	1.34	3.6	9.8		
164	Pb Conc.	3.90	55.2	5.62	76.1	3.6	70**	57
	Zn Conc.	6.40	0.35	54.4	0.8	56.8		
	Tailing	52.2	0.24	1.22	4.5	10.4		

\* Graphical Interpolation

\*\* Graphical Extrapolation

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2.2. Pb Circuit

Concentrates with grades of 72 % Pb could be made at a lead recovery of about 75 %. With the standard open circuit (Test 153) concentrates assaying 60 % Pb could be made with a lead recovery of 81 %. When the cleaner tailings were combined and scavenged, the recovery could be increased to 85 % (Test 158). Rougher flotation recovery was 92 % Pb and 26 % Zn. In the final lead concentrate only 2 % to 3 % of the zinc was displaced. Roughly 13 % of the lead was passed on into the zinc circuit. The scavenger circuit would need more work to increase the lead recovery or to simplify the circuit.

2.3. Zinc Circuit

Two significant characteristics were observed:

- 1) The zinc concentrates were always contaminated with gangue (quartz, feldspar, minor carbonates) and pyrite. Even after 4 stages of cleaning the concentrates assayed only 46 % - 48 % Zn. In Test 158 a 50 % Zn concentrate was made and in Test 164 the zinc concentrate grade was 54 % Zn.
- 2) The tailing assay was invariably in the range of 1.3 % Zn + 0.1 %. Only traces of sphalerite could be detected optically. An x-ray diffraction scan was made and the major zinc bearing mineral was found to be hemimorphite.

Testwork is now in hand to improve the zinc concentrate grades. Gangue depressants (Na<sub>2</sub>SiO<sub>3</sub>, CMC, guar) will be tested first followed by depression of pyrite.

3. Testwork on Sample C-3

Two tests were performed on this sample. One standard test in open circuit (Test 159) and one test with scavenging of Pb cleaner tailings and passing the tailings on into the zinc circuit (Test 166, results not yet available).

3.1. Metallurgical Results

Test No.	Product	Weight %	Assays, %		% Distribution		% Recovery at	
			Pb	Zn	Pb	Zn	60 % <del>Pb</del> * 54 % Zn	
159	Pb Conc.	4.72	57.2	3.75	74.9	2.7	72	58
	Zn Conc.	6.78	0.28	54.4	0.5	57.3		
	Tailing	60.04	0.42	0.79	7.0	7.2		

\* by Graphical Interpolation

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3. Testwork on Sample C-3

Compared with the results of Test 153 (H-3 ore), these results were worse in the lead circuit but better in the zinc circuit. The lead upgrading was slower, indicating perhaps a closer association with pyrite or simply a stronger floatability of free pyrite because of the greater abundance in the ore. Zinc losses in the tailing were decreased and upgrading of the zinc rougher concentrate was faster than on the H-3 sample.

4. Sample D-3

Three tests were carried out on this ore. The main feature of this ore was the strong interference of a "graphitic" component. Under standard conditions ( Test 156) virtually no lead floated in the early stages of roughing. Only after the 4th reagent addition was it possible to float the galena. After a prefloat, a clean galena concentrate could be produced. Almost 10 % by weight was removed as a prefloat concentrate. In the third test the prefloat concentrate was cleaned to reduce the weight and therefore the lead and zinc loss. Still 4 % by weight was removed. The zinc flotation in Test 156 suggested that cleaning should not be too difficult (53 % Zn concentrate) but too much lead passed into the zinc circuit. The froth conditions were not satisfactory in the zinc rougher flotation (shallow, effervescent froth).

In Test 157, in an attempt to improve the zinc rougher conditions, some of the Z-200 was replaced by Z-11 and DF-250. The froth improved greatly but pyrite floated also strongly, resulting in a low-grade zinc concentrate. In Test 160, the lead cleaner tailings were passed into the zinc stream (after scavenging) and the resulting zinc concentrate was low in Zn (46 %) and high in Pb (3.2 %). Obviously, the reagent balance in the lead cleaning-scavenging as well as in the zinc rougher circuits were not satisfactory.

4. Standard Tests of F-3 hard, F-3 Vuggy and G-3

Sample No.	Products	Weight %	Assays, %		% Distribution		% Recovery at	
			Pb	Zn	Pb	Zn	60 % Pb *	54 % Zn
F-3 Hard 162	Pb Conc.	10.47	57.9	12.0	92.6	7.0	92	68
	Zn Conc.	21.20	0.39	57.1	1.2	67.0		
	Tailing	44.85	0.23	0.47	1.7	1.2		
F-3 Vuggy 163	Pb Conc.	10.23	58.3	11.8	88.0	7.5	87	61
	Zn Conc.	16.69	0.79	58.1	2.0	59.9		
	Tailing	51.56	0.47	0.86	3.5	2.8		
G-3 165	Pb Conc.	1.31	54.1	36.6	55.5	1.7	49	62**
	Zn Conc.	4.31	0.67	45.2	2.3	68.2		
	Tailing	74.85	0.26	0.17	15.1	4.3		

\* by Graphical Interpolation

\*\* by Graphical Extrapolation

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4. Standard Tests of F-3 hard, F-3 Vuggy and G-3

All tests were performed with an open circuit flowsheet and therefore the zinc recoveries appeared low for the two F samples (~16 % Zn head). Tests with a flowsheet that provides an outlet for the lead cleaner tailings have been performed but results are not yet available. No further tests on these 3 samples are planned. Priority will be given to samples H-3 and D-3.

If you should need more specific details on the tests carried out to date do not hesitate to contact me.

Yours sincerely,  
LAKEFIELD RESEARCH OF CANADA LIMITED

*D. M. Wyslouzil*

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DMW:dmm

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Mr. R.L. Coleman  
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