

UNIT OF AMERICAN METAL CLIMAX, INC.  
GRAND JUNCTION, COLORADO

April 20, 1966

Mr. Charles Steen  
1790 East Plumb Lane  
Reno, Nevada

Dear Charlie:

Our metallurgical staff has recently completed work on several rather exhaustive amenability tests using one part Mi Vida ore mixed with four parts of Salt Wash ore. The purpose of this test work was to determine the overall recovery to be attained from grinding the mixed ore to 28 mesh which we normally use for straight Salt Wash ores. From the tests made, it was apparent that the relatively coarse grind of 28 mesh was not sufficient to effect a satisfactory overall recovery of the mixed ore. Our test work showed that Mi Vida ore must be ground to 100 mesh in order to effect an appropriate recovery using our sand-slime separation circuit. Grinding the mixed ore to 100 mesh instead of 28 mesh that we normally use for Salt Wash ore resulted in a 75% slime product which is prohibitive to our milling operation. In addition to the grinding problem, your Mi Vida ore averages 18%  $\text{CO}_3$  (1%  $\text{CaCO}_3$  - 17%  $\text{MgCO}_3$ ) which requires a prohibitive amount of acid for neutralization.

For these reasons we must reluctantly inform you that we cannot give Mi Vida ore any further consideration. The results of the test work comes as a disappointment to us because we not only had mill capacity for your Mi Vida ore but wanted to deal with you.

We appreciate the courtesies that you extended to us and look forward to the time when we can possibly work together on another project.

Kind personal regards and we would appreciate a call when you are in the Grand Junction area.

Yours very truly,

CLIMAX URANIUM COMPANY

Anthony Mastrovich  
General Manager

AM/jpl

# Climax Uranium Company

Unit of American Metal Climax, Inc.

## Inter-Office Memorandum

Subject : Amenability: MiVida Ore (Fine Grind)

Date 4/14/66

To : P. Wire

Copies To: A. M. Mastrovich ✓

From : L. Hoggatt

E. J. Duggan

1 Part MiVida Ore and 4 Parts Morrison Ore ground to -100 Mesh

<u>Sample</u>	<u>Assay</u> U308	<u>Assay</u> V205	<u>%</u> U308	<u>%</u> V205	<u>Assay</u> CaCO <sub>3</sub>	<u>%</u> Weight
Heads	0.256	0.962			5.327	
Slime Heads	0.404	1.574				59.0
Sand Heads	0.041	0.309				41.0

AFTER ATTRITIONING

Slime Heads	0.380	1.592	98.13	97.86		<u>76.3 % dry weight</u>
Sand Heads	0.023	0.112	1.87	2.14		23.7

Slime Heads	0.380	1.592				
Slime Tails	0.012	0.254				
% Recovery	96.84	84.04				

Sand Heads	0.023	0.112				
Sand Tails	nil	0.080				
% Recovery	99.0+	28.57				

*No Total Recovery*      96.00    83.00

*L. G. Hoggatt*  
L. G. Hoggatt

*Capacity = 300 tons per day of ore fed to process*

First Test Work

# Climax Uranium Company

Unit of American Metal Climax, Inc.

## Inter-Office Memorandum

Subject : Amenability 1 part MiVeta Ore & 4 Parts Morrison Ore.  
 To : P. Wire  
 From : L. Hoggatt

Date 3/10/66

Copies To: A. M. Mastrovich ✓  
 E. J. Duggan

1 Part Mi Veta  
4 Parts Morrison

<u>Sample</u>	<u>Assay</u> <u>U308</u>	<u>Assay</u> <u>V205</u>	<u>%</u> <u>U308</u>	<u>%</u> <u>V205</u>	<u>W t. %</u>
Heads	0.302	0.951			

SAND - SLIME SEPARATION BEFORE ATTRITION

Slimes	---	---	---	---	22%
Sand	0.119	0.547	---	---	78%

SAND - SLIMES SEPARATION AFTER ATTRITION

Slimes	0.692	2.887	76.32%	91.29%	30%
Sand	0.092	0.188	23.68%	8.71%	70%

SLIMES ROASTED & LEACHED WITH H<sub>2</sub>SO<sub>4</sub>

Slime Heads	0.692	2.887			
Slime Tails	0.010	0.523			
% Recovery	98.55%	81.88%			

SAND ACID LEACHED IN PLANT HCl AT 50%  
SOLIDS FOR 20 MINUTES

Sand Heads	0.092	0.188			
Sand Tails	0.026	0.201			
% Recovery	71.73	0.00%			
Total Recovery	92.20%	74.75%			

*L. Hoggatt*

L. Hoggatt

LGH/sh

# Climax Uranium Company

Unit of American Metal Climax, Inc.

## Inter-Office Memorandum

**Subject** Amenability MiVeta Ore  
**To** P. Wire  
**From** L. Hoggatt

**Date** 3/10/66

**Copies To:** A. M. Mastrovich ✓

<u>Sample</u>	<u>Assay</u> <u>U308</u>	<u>Assay</u> <u>V205</u>	<u>Assay</u> <u>CaCO<sub>3</sub></u>	<u>Assay</u> <u>H<sub>2</sub>O%</u>	<u>Wt. %</u>
Heads Assay	0.571	0.791	18.5	1.8	
 <u>Before Attritioning</u>					
	<u>Assay</u>	<u>Assay</u>	<u>U308%</u>	<u>V205%</u>	
Slime Heads	0.819	1.111	55.6	56.4	34%
Sand Heads	0.336	0.521	44.4	43.6	66%
 <u>After Attritioning</u>					
	<u>Assay</u>	<u>Assay</u>	<u>U308%</u>	<u>V205%</u>	
Slime Heads	0.602	1.187	73.6	85.6	43%
Sand Heads	0.330	0.365	26.4	14.4	57%

SLIMES ROASTED & LEACHED WITH H<sub>2</sub>SO<sub>4</sub>

	<u>Assay</u>	<u>Assay</u>
Slime Heads	0.602	1.187
Slime Tails	0.068	0.493
% Recovery	88.70%	58.46%

SAND ACID LEACHED IN PLANT HCl AT 50%  
SOLIDS FOR 20 MINUTES

	<u>Assay</u>	<u>Assay</u>
Sand Heads	0.330	0.365
Sand Tails	0.106	0.314
% Recovery	67.87%	13.97%
 Total Recovery	 83.20%	 52.05%

*L. Hoggatt*  
L. Hoggatt

.43% U<sub>3</sub>O<sub>8</sub> Stearn estimated grade on 38,065 tons of ore  
 .87% K<sub>2</sub>O<sub>5</sub>

Value of Ore in Cars

U <sub>3</sub> O <sub>8</sub>	.43%	8.6# x .94	8,084# x \$4.50 = \$36.38
V <sub>2</sub> O <sub>5</sub>	.87%	17.4# x .69	12,006# x \$1.00 = 12.00
			\$48.38

Proposal to Stearn  
One Payment  
 1.10 - .45% U  
 Reduce Contract work  
 6.00/lb  
 (CUC cost depletion figure)

Climax Cost

Hauling	\$4.90	} 24.70
Milling	13.80	
G & A	6.00	
One Payment	9.46	
	<u>\$34.16</u>	

One Payment to Stearn

\$1.10 per lb x 8.6# = \$9.46 per ton

Stearn Contract Mining Cost

\$2.75	basic direct mining cost (as per his own sheet)
1.00	Fuel, power, supervision, supplies, etc.
1.00	Capital equipment
<u>\$4.75</u>	
2.25	mining profit
<u>\$7.00</u>	

\$48.38  
 34.16  
\$14.22

We will propose variance of 5¢ up or down per .01% U<sub>3</sub>O<sub>8</sub> in grade

Per Ton Realized by Stearn

\$9.46  
 2.25  
\$11.71

\$14.22  
 7.00  
\$7.22 gross profit to Climax

38,065 tons x \$9.46 = \$360,094

Taxes

Climax Total Operating Cost

Hauling	\$4.90
Milling	13.80
G & A	6.00
Mining Cost	7.00
	<u>\$31.70</u>

\$48.38 Value Conc.

31.70

\$16.68 Operating Profit before cost depletion

9.46 CUC cost depletion

\$7.22 profit before taxes (taxable & true income)  
 x 48% tax = \$3.46 after tax profit

Take greater of cost depletion or statutory (%) depletion  
 23 1/2% of sales or 50% net.

16.68 = \$8.34 = statutory depletion

\$9.46 = cost depletion

Transfer statutory depletion to Stearn by way of lease

Mining Profit = \$2.25  
 50% net tax credit = 1.12  
 1.13 tax base x 48% = 64¢

7.22  
 3.46  
\$3.76 profit after tax

38,065  
 1.61  
\$61,284 after tax

2.25  
 .64  
\$1.61 income after tax

Steers After Tax Income

1) Mining Profit after tax \$ 61,284

2) Capital Gains Tax on \$ 360,094

$$\begin{array}{r}
 \$ 360,094 \\
 \times .25 \\
 \hline
 180,047.0 \\
 72,018.8 \\
 \hline
 \$ 90,023.50
 \end{array}$$

$$\begin{array}{r}
 \$ 360,094 \\
 90,023 \\
 \hline
 \$ 270,071
 \end{array}$$

$$\begin{array}{r}
 1) \$ 61,284 \\
 2) 270,071 \\
 \hline
 \$ 331,355
 \end{array}$$

Mining Profit after tax  
Capital Gains after tax

$\frac{\$ 331,355}{38,065} = \$ 8.70$  per ton after tax

CUC After Tax Income

$\$ 7.22 \times .48 = \$ 3.46$  per ton

$38,065 \times \$ 3.76 = \$ 143,124$

$\frac{\$ 143,124}{38,065} = \$ 3.76$  per ton after tax

*Second Test Work*

# Climax Uranium Company

Unit of American Metal Climax, Inc.

## Inter-Office Memorandum

Subject : Amenability of MiVida Ore  
To : P. Wire  
From : L. G. Hoggatt

Date 4/1/66

Copies To: A. M. Mastrovich ✓  
E. J. Duggan

From the tests made, it is evident that in our present grinding circuit the MiVida ore is not being ground finely enough to free the individual sand grains. Also, there are particles of carbonaceous material that are not being completely reacted upon in neutralization. Attrition does not accomplish the work it should on these particles.

Tests indicate our present flowsheet with the long time sand acid leach gives a higher recovery than can be expected with the attrition and short time acid sand leach. Recoveries by the latter method are not high enough to warrant the purchase of this ore.

See attached test results.

*L. G. Hoggatt*  
L. G. Hoggatt

LGH/sh

1 PART MI VIDA ORE & 4 PARTS MORRISON ORE BY ATTRITON

(TEST RESULTS)

<u>Sample</u>	<u>Weight</u>	<u>Assay</u> <u>U<sub>3</sub>O<sub>8</sub></u>	<u>Assay</u> <u>V<sub>2</sub>O<sub>5</sub></u>	<u>%</u> <u>U<sub>3</sub>O<sub>8</sub></u>	<u>%</u> <u>V<sub>2</sub>O<sub>5</sub></u>	<u>CaCO<sub>3</sub></u>	<u>MgCO<sub>3</sub></u>	<u>Weight</u> <u>%</u>
MiVida Ore	500 Gr.	0.561	1.063	35.84	12.32	18.054	15.70	
Morrison Ore	2000 Gr.	0.251	1.891	64.16	87.68			
Heads Mixture Neutralized		0.358	1.734					

HEADS MIXTURE AFTER NEUTRALIZATION

Slimes		0.529	3.693					19.6
Sand		0.297	1.164					80.4

AFTER ATTRITON

Slimes Heads		0.609	4.280	51.04	73.32			27.0
Sand Heads		0.216	0.576	48.96	26.68			73.0
Slime Heads		0.609	4.280					
Slime Tails		0.014	0.443					
% Recovery		97.70	89.64					

ATTRITIONED SAND LEACHED WITH 7.1% HCl AT 50% SOLIDS FOR 30 MIN.

Sand Heads		0.216	0.576					
Sand Tails		0.078	0.369					
% Recovery		63.88	35.93					
TOTAL RECOVERY		84.00%	77.56%					

(Repeat of Tests  
on Page #1)

(TEST RESULTS)

<u>Sample</u>	<u>Weight</u>	<u>Assay</u> <u>U308</u>	<u>Assay</u> <u>V205</u>	<u>%</u> <u>U308</u>	<u>%</u> <u>V205</u>	<u>CaCO<sub>3</sub></u>	<u>MgCO<sub>3</sub></u>	<u>%</u> <u>Weight</u>
Head Mixture		0.326	1.385					

AFTER ATTRITION

Slime Heads		0.748	4.250	75.25	83.25			31.1
Sand Heads		0.111	0.381	24.75	16.75			68.9
Attrition Sand Feed		0.254	0.762					
Attritioned Sand		0.111	0.381					
% Recovery		56.29	50.00					
Slime Heads		0.748	4.250					
Slime Tails		0.014	0.429					
% Recovery		98.12	89.90					

ATTRITIONED SAND LEACHED WITH 7.15% HCl AT 50% SOLIDS FOR 30 MIN.

Sand Heads		0.111	0.381					
Sand Tails		0.061	0.137					
% Recovery		45.04	64.04					
<b>TOTAL RECOVERY</b>		<b>84.98%</b>	<b>85.57%</b>					

MI VIDA ORE USING ATTRITION

(TEST RESULTS)

<u>Sample</u>	<u>Assay U308</u>	<u>Assay V205</u>	<u>% U308</u>	<u>% V205</u>	<u>CaCO<sub>3</sub></u>	<u>Weight %</u>
Heads	0.561	1.063			18.054	
Total Slime	0.822	1.657	50.90	70.36		39.2
Attritioned Sand	0.511	0.450	49.10	29.64		60.8

Attrition Sand Feed		0.658				
Attritioned Sand		0.450				
% Recovery		31.61				
Slime Heads	0.822	1.657				
Slime Tails	0.062	0.422				
% Recovery	92.45	74.53				

ATTRITIONED SAND LEACHED WITH 7.1% HCl AT 50% SOLIDS FOR 30 MIN.

Sand Heads	0.511	0.450				
Sand Tails	0.244	0.381				
% Recovery	52.25	15.33				

TOTAL RECOVERY

72.71%      56.98%

MI VIDA ORE BY PRESENT MILL FLOWSHEET

(TEST RESULTS)

<u>Sample</u>	<u>Assay</u> U308	<u>Assay</u> V205	<u>%</u> U308	<u>%</u> V205	<u>%</u> CaCO <sub>3</sub>	<u>%</u> Weight
Heads	0.561	1.063			18.054	
Slimes	0.671	1.212	55.74	56.66		40.2
Sand	0.358	0.623	44.26	43.34		59.8
Slime Heads	0.671	1.212				
Slime Tails	0.048	0.090				
% Recovery	92.84	92.57				
*Sand Heads	0.358	0.623				
*Sand Tails	0.102	0.415				
*% Recovery	71.50	33.38				

\*\*ATTRITIONED SAND LEACHED WITH 7.0% HCl AT 50% SOLIDS FOR 30 MIN.

TOTAL RECOVERY

83.40%

66.92%

1 PART MI VIDA ORE & 4 PARTS MORRISON ORE BY PRESENT MILL FLOWSHEET

(TEST RESULTS)

<u>Sample</u>	<u>Assay U308</u>	<u>Assay V205</u>	<u>% U308</u>	<u>% V205</u>	<u>% CaCO<sub>3</sub></u>	<u>% Weight</u>
Heads	0.312	1.490				
Slime Heads	0.796	3.507	65.33	59.15		25.69
Sand Heads	0.146	0.837	34.67	40.85		74.31
Slime Heads	0.796	3.507				
Slime Tails	0.016	0.321				
% Recovery	97.98	90.84				
Sand Heads	0.146	0.837				
Sand Tails	0.039	0.505				
% Recovery	73.28	39.66				
TOTAL RECOVERY	89.42%	69.93%				

1 PART MI VIDA ORE 4 PARTS MORRISION ORE BY PRESENT MILL FLOWSHEET

(TEST RESULTS)

<u>Sample</u>	<u>Assay U308</u>	<u>Assay V205</u>	<u>% U308</u>	<u>% V205</u>	<u>% CaCO<sub>3</sub></u>	<u>% Weight</u>
Heads	0.358	1.734				
Slimes	0.748	3.497	60.80	57.07		25.5
Sand	0.165	0.900	39.20	42.93		74.5
Slime Heads	0.748	3.497				
Slime Tails	0.013	0.381				
% Recovery	98.26	89.10				
Sand Heads	0.165	0.900				
Sand Tails	0.027	0.554				
% Recovery	83.63	38.44				
TOTAL RECOVERY	92.52	67.35				