

11 Apr. 85.

To: D.J. Emery

cc: T.J.D., S.O.F., P.J.R.

From: K. Blawie

Subject: APPLIED RESEARCH / GIANT ARSENIC TRIOXIDE VENTURE.

S.O.F., P.J.R., AND THE WRITER MADE A TRIP RECENTLY TO THE APPLIED RESEARCH FACILITY IN CHARLOTTE, N.C. TO REVIEW THE TECHNICAL ASPECTS OF THEIR PROCESS AND TO ASSESS THE NEEDS AND EXTENT OF FURTHER TESTWORK. AS WELL, WE ATTEMPTED TO DEVELOP A FEEL FOR THE POTENTIAL OF AN OPERATION THAT WOULD BE REQUIRED TO ACHIEVE OUR CORPORATE NEEDS (OF MAXIMIZING THE "VALUE-ADDED" OF A NEW PRODUCT RELATIVE TO OUR RAW MATERIAL ( $As_2O_3$  CRUDE)), AND THE ASSOCIATED RISKS.

GIANT CURRENTLY (1985 RATES) ARE SHIPPING ABOUT 185 TONS/MO. OF CRUDE  $As_2O_3$  (CONTAINING 154 TONS OF  $As_2O_3$ ). TOTAL <sup>RECEIVED FOR</sup> ~~VALUE OF~~  $As_2O_3$  IS ABOUT \$6110/MO. OR A 2¢/LB. (AN.).

REFINED  $As_2O_3$  IS CURRENTLY MARKETING @ 40¢/LB. U.S. = 54.8¢/CAN.

GIANT PRODUCTION CURRENTLY IS 280-300 TONS/MO. OF CRUDE WITH THE SURPLUS BEING STORED IN UNDERGROUND CHAMBERS AT THE MINE. MORE CHAMBER DEVELOPMENT WILL BE REQUIRED PRIOR TO YEAR-END 1985 IF CURRENT PRODUCTION AND SHIPPING REMAIN UNCHANGED.

A NUMBER OF OPTIONS APPEAR TO BE DEVELOPING AND I WILL TRY TO SUMMARIZE THESE IN <sup>THIS</sup> REPORT IN ORDER THAT THE APPLIED RESEARCH PROPOSAL CAN BE EVALUATED AGAINST THEM.

### APPLIED RESEARCH.

PROPOSAL IS TO FORM A NEW CORPORATE STRUCTURE BETWEEN GIANT AND APPLIED RESEARCH. <sup>(G.A.R.)</sup> PROPORTIONS IN THE ORDER OF 70:30 / 60:40.

GIANT WILL PROVIDE RAW MATERIALS (AND LONG-TERM SUPPLY INVENTORY) TO ~~THE~~ G.A.R. FOR SOME PRICE (SAY 10¢/LB. U.S.)

THE G.A.R. PLANT WILL PRODUCE ~~AN INTERMEDIATE C.C.A. PRODUCT~~ A PARTLY PROCESSED MATERIAL AS AN INGREDIENT FOR C.C.A. MIXERS. THIS WOULD PERMIT THEM TO SELL TO ESTABLISHED C.C.A. PRODUCERS.

THE PROCESS WILL CONSUME COPPER METAL ~~AND~~, CRUDE  $As_2O_3$  <sup>AMMONIA</sup> AND OXYGEN AND WILL PRODUCE C.A. AND A RESIDUE WHICH WILL NEED FURTHER HANDLING. FROM THE STAND POINT OF CAPITAL AND OPERATING COSTS THE PLANT WOULD BE LOCATED NEAR MARKETS - PROBABLY SOUTHERN STATES.

S.O.F. REQUESTED SOME ADDITIONAL BENCH SCALE TESTING TO PERMIT A PRACTICAL CIRCUIT TO BE DESIGNED. IN ESSENCE, THE CHEMICAL REACTIONS HAVE BEEN DEMONSTRATED AND IT REMAINS TO APPLY THE CHEMISTRY TO A COMMERCIAL SCALE. TO DO THIS A SHIPMENT OF GIANT CRUDE  $As_2O_3$  WILL BE REQUIRED BUT NOT UNTIL WE HAVE LOOKED AT HANDLING THE RESIDUES. S.O.F. WILL <sup>HAVE TESTS CONDUCTED @ LAB FIELD AND</sup> CONTACT SPECIFIC MECHANICAL EQUIPMENT SUPPLIERS TO DETERMINE <sup>WHAT</sup> TEST EQUIPMENT IS <sup>RECOMMENDED</sup> ~~AVAILABLE~~ AND AVAILABLE.

FROM AN OPERATING STANDPOINT HANDLING THE RESIDUE IS THE LARGEST RISK.

LOOKING AT MARKETS AND POTENTIAL MARKETS GIANT ARE NOT AS KNOWLEDGEABLE OR <sup>AS WELL</sup> INFORMED. BILL DENKARD SEEMS TO KNOW THE BUSINESS WELL. FOR STARTERS HE ADVISES THAT APPLIED MIN. CURRENTLY ARE PROVIDING 10% OF THE C.C.A. MARKET. AT WORST, THIS PRODUCT COULD BE MADE FROM OUR C.A. PRODUCTION. I.E. 10,000,000 LBS./YR. THEY VISUALIZE BECOMING SOLE SUPPLIER FOR EITHER KOPPEL'S <sup>OSMOSE</sup> ~~RESEARCH~~ OR THE INDEPENDENT MIXERS (EACH HOLD ABOUT 1/3 OF THE TOTAL MARKET - WITHIN 1 YEAR. ~~BASICALLY THERE ARE TWO WAYS TO ACCOMPLISH THIS~~ a) BUY MIDWAY'S RESEARCH [LOOK STOCK AND BARREL] (\$7,000,000) b) PROVIDE THE C.A. AT A DISCOUNT TO THOSE WHO ARE CURRENTLY PRODUCING C.C.A. FROM SCRATCH.

THE ARGUMENT IS:

CRUDE ARSENIC + AMMONIA + COPPER + OXYGEN = PURE C.A. + RESIDUE IN ONE STEP. OTHERS REFINER CRUDE  $As_2O_3$  OR BUY REFINED  $As_2O_3$  AT 40¢ PER LB. U.S. <sup>MONIC ARSENIC ACID</sup> <sub>1,1</sub> THEY MIX THIS WITH COPPER OXIDE (AT A 50% PREMIUM OVER COPPER CONTENT) - CURRENTLY 90¢/LB. CU.)

From  
Buck Hall

John Hall

$\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$   
 $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$

12/20/2025

Clad 53% ; leaf 95%

$$3500T_{\text{oss}} \text{ (ms)} \equiv 1800000 \text{ (ms)} \cdot 1150A$$

1 lb. crude = 2 lbs C.A.  
@ 70%

CCA: c  
Formula

$\begin{Bmatrix} 34\% & \text{As}_2\text{O}_3 \\ 48\% & \text{Cu}_2\text{O} \\ 18\% & \text{CO} \end{Bmatrix}$  in 50% H<sub>2</sub>O

88¢/lb. Dry Basis. Sales Price

Crude 10¢

Shipping 10¢

Treatment 5¢

Copper 60¢

Cost 85¢/lb. C.A.

Value in Market  $\frac{85}{1.05}$  /lb. C.A.?

Doesn't add  
up as 30¢ was  
value added & discussed  
earlier - many  
have been Giant  
share.

As price of As<sub>2</sub>O<sub>3</sub>, Copper / Copper Oxide increase - so does our margin.

Objective for consideration would be a facility to ~~produce~~ <sup>CCA</sup> 20,000,000 lb. ~~As<sub>2</sub>O<sub>3</sub>~~ equiv. with provision to double throughput at minimal expense. Capital cost is a question mark. Applied Research as an operating entity doesn't impress me. If we get together on G.A.R. we should give serious consideration to being the operator.

Anticipated Net Back: (Wild Guess)

Selling Price:  $\frac{1.00}{\text{lb. equipment}}$   ~~$\times 20,000,000$~~

Volume of Sales 20,000,000 " / year

Revenue:  $20 \times 10^6$  U.S.

Loss Cost of Matl:  $11 \times 10^6$  U.S.

Loss Adm & Market:  $1 \times 10^6$  U.S.

Oper. Profit.  $8 \times 10^6$

Giant Portion @ 75%:  $6 \times 10^6$  U.S. Before Tax. / yr.

Taxes.  $2 \times 10^6$ .

Balance.  $4 \times 10^6$  U.S.  $\equiv 333,333$  / mo.

Plus Giant would receive 10¢/lb. U.S. for crude  $\frac{166,666}{500,000}$  / mo.

Residue Gold Values = Residue Shipping & Treatment Costs.

What Gold Production for Giant?  $2350 \text{ oz.} @ 0.61 \text{ ct} \equiv 574,439 \text{ Gms.} \equiv 466,000 \text{ U.S.}$

Applied would get  $2.2 \times 10^6$  / yr incl. gold

$\equiv 313,000 \text{ Gms.}$

< 202. / TON. >

Koppers. Currently using 185/280 % of production. Breakup will reduce shipping to say 50% of current production.

They have invested heavily in plant. What are the chances of them agreeing to pay 10¢/lb. U.S.?

They indicated that they are out of the woods. Will be increasing production by end June to double present rate; by year end will be handling twice as much as we can produce from present operations. Residue will be dry and free flowing - easy to handle. They are using and will continue to use ~~more~~ arsenic from other sources.

Assume 3500 Tons Crude/yr.

$$\frac{3500 \times 2000}{0.85} \times \$.10 = \$823,500 \text{ /yr.}$$

Cominco. Cominco needs additional feed for their plant. They have indicated an interest in testing Giant Crude. We have agreed in principle to provide a limited amount at no cost. Ultimately, their plant will be out of feed and they will have an increasing interest in treating Giant material.

Treatment costs are approx. 4¢/lb of finished  $As_2O_3$ ?

If we are prepared to wait until Cominco are ready then we could probably get a higher price - say 15¢/lb. Can.

We would need to continue U/G storage development.

# Recommendations. 0.

100,000 DPT.  
60,000 OPAK.  
40,000 LAWYER  
+ STORAGE

1. Proceed to Pilot-Marketing Test. [LAKOTA: SYSTEM TESTS.]
2. SIMULTANEOUSLY CONDUCT BUSINESS NEGOTIATIONS RE: TERMS.
3. SET UP A PRODUCING COMPANY - 70%/30% or 75%/25%  
GIANT TO OPERATE, APPLIED<sup>US.</sup> TO MARKET. (G.A.R.)
4. Sell CRUDE TO G.A.R. FOR SOME REASONABLE PRICE.
5. SPLIT CURRENT PRODUCT LEVELS OF GOLD WITH G.A.R.
6. RETAIN ANY SURPLUS WITH GIANT.

200,000 U.S.

1. LAKOTA → FRONT-END SOLID/LIQUID SEPARATION IN AMMONIA.  
TEST COMPLETE BY MAY 30

10-12,000 → 50,000

3. MANUFACTURER FOR EQUIPMENT → TO TEST PRODUCTION EQUIPMENT<sup>200,000</sup>  
PILOT-MARKETING PLANT TEST

2. PRELIMINARY DESIGN OF PLANT. / NEGOTIATION OF AGREEMENT.  
By July 1<sup>st</sup>

4. PRODUCTION DECISION.

$$\begin{aligned} 1. + 2. &= \$50,000 \\ 3. + \text{PILOT} &= \$200,000 \end{aligned}$$