



To: W. G. Dahl

Subject: Giant Yellowknife - Arsenic Trioxide

Date: January 29, 1979

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## INTER-OFFICE MEMORANDUM

From: T. J. Desanti

Copies to: DJE, PJR, EHH, MOP, file.



A meeting was held in the Pittsburg offices of Koppers Company Inc., Specialty Wood Chemicals Division, Forest Products Group, on Thursday, January 25 to discuss a draft copy of a letter of intent. This letter covered the purchase by Koppers of their total annual requirement (2,000 ST) of contained arsenic trioxide to be supplied by Giant from existing crude As<sub>2</sub>O<sub>3</sub> production.

As<sub>2</sub>O<sub>3</sub> is used by Koppers to produce a chromated copper arsenate (CCA) which is highly effective as a wood preservative. CCA is a mixture of stable metallic oxides which are reduced by wood sugars to form insoluble precipitates. These precipitates are fixed in the wood, are highly leach resistant and non-volatile and will not evaporate. CCA pressure impregnated wood is impervious to rot, decay and insect attack because the insoluble precipitates render the wood fibers useless as a food for fungi and insects. The wood retains its structural strength indefinitely since the chemicals are fixed in the wood cells and will not evaporate. One of the primary active ingredients in CCA wood preservative is inorganic pentavalent arsenate, a naturally occurring trace element present in nature. CCA pressure treated wood has been in use for over 40 years, and it complies fully with all government regulatory and environmental regulations. There have not been any reported problems with CCA pressure treated wood since its inception.

Present at the meeting in Pittsburg were:

Koppers

J. D. Hite - VP & GM  
J. Kozak - Mgr. Chem. Section  
Forest Products Development  
K. Cogan - Operations Mgr., Conley  
T. Beatty - Man. Planning Dept.  
Forest Products Div.

Giant

P. J. Raleigh  
T. J. Desanti

1. The initial approach to Giant by Koppers was made in early 1978 when Koppers became concerned about the long term supply of As<sub>2</sub>O<sub>3</sub> because of the strong growth in the consumption of arsenic in the wood preservative market. Koppers is the only U.S. company producing arsenic compounds whose production process is capable of utilizing a low grade As<sub>2</sub>O<sub>3</sub> feed. The Giant material produced now without

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upgrading is 88%-92% As<sub>2</sub>O<sub>3</sub> compared to the standard commercial grade of 98% (minimum) As<sub>2</sub>O<sub>3</sub>.

2. Although Koppers would be able to use the crude Giant product at their Conley, Georgia plant, they have just recently discovered that the Fe content of the Giant material results in serious problems. Unless the Fe is removed from the feedstock it results in an operating cost penalty (increased use of chemicals and energy) equivalent to 1.8¢-2.0¢ per pound of As<sub>2</sub>O<sub>3</sub> processed. Further and more importantly, the iron arsenate, which reports in the chromated copper arsenate, is not impregnated in the wood and instead is effectively filtered out and deposited on the surface of the wood. Two problems then exist. First, the surface of the wood has a film of iron arsenate which could present problems in painting or otherwise finishing the wood surface. Second, the arsenate on the surface could be considered an environmental hazard. Koppers cannot in any way risk this latter problem because it could jeopardize their whole wood preservative market.

3. Koppers are currently looking into the capital and operating costs associated with the removal of Fe at Conley. They were shown samples of Giant's upgraded As<sub>2</sub>O<sub>3</sub> running 0.015% - 0.019% Fe and considered this level perfectly acceptable. A maximum acceptable Fe limit was suggested to be 0.03%. Koppers will provide us with their upgrading costs in the next 2-3 weeks.

4. In view of the iron problem and the costs associated with handling and shipping the residual sludge containing gold (plus residual arsenic acid) to a potential buyer, Koppers now feel strongly that it would be in Giant's interest to upgrade the crude As<sub>2</sub>O<sub>3</sub> and remove the residual gold at the mine. Koppers were advised (a) we already are studying the costs concerned with respect to the upgrading of crude As<sub>2</sub>O<sub>3</sub> stockpiled underground and (b) we would compare these costs with those from Koppers to assist in reaching a decision on the upgrading location for the current production.

5. Hite volunteered the following. Koppers would be prepared to enter into a joint venture to produce up to 6,000 ST of 98% minimum As<sub>2</sub>O<sub>3</sub> annually at the mine. Koppers would consume 2,000-3,000 STPY and arrange to sell the balance in the export market (Koppers have a subsidiary in New Zealand and much of the exported material presumably would go there). In order to export As<sub>2</sub>O<sub>3</sub> it would have to be put in barrels. Shipments to Conley would be made in bulk. Assuming Giant was not interested in a joint venture, Koppers would be prepared to contract for their own needs (2,000-3,000 STPY) provided Giant offered a price incentive. No incentive was mentioned but they would be looking for 3¢-4¢/lb As<sub>2</sub>O<sub>3</sub>. In 1978, Koppers purchased 600 ST of As<sub>2</sub>O<sub>3</sub> from Asarco and 1,500 ST from Boliden and a French company. Koppers now have an inventory of 2,000 ST of As<sub>2</sub>O<sub>3</sub> as insurance against possible future supply problems.

6. Koppers were recently visited by Asarco who confirmed they plan to stay in the As<sub>2</sub>O<sub>3</sub> business because they will continue to import high arsenic containing copper concentrate from the Philippines in the future. Hite indicated that As<sub>2</sub>O<sub>3</sub> accounted for roughly 35% of the cost of the wood preservative end product. This suggests (within reason) that the market for As<sub>2</sub>O<sub>3</sub> is not strongly sensitive to price.

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7. The feeling at the meeting on the part of the Koppers people was that for commercial and environmental reasons, Giant should seriously consider upgrading the product at the mine. Koppers are prepared to be directly involved so long as the incentive is attractive. In this regard, Koppers said our draft letter of intent proposal based upon upgrading at Conley was unacceptable because the monetary incentive was insufficient. The proposal concerned provided for (a) an assured supply of As<sub>2</sub>O<sub>3</sub> over 3 years and (b) a 50% before tax ROI on a capital investment by Koppers of about \$350,000. Koppers also want a price incentive.

#### Summary

Our coverage of the U.S. market indicates 3-4 major As<sub>2</sub>O<sub>3</sub> consumers other than Koppers. These companies have already indicated tentative interest in purchasing upgraded As<sub>2</sub>O<sub>3</sub> from Giant. They will be called on again to determine whether they would be prepared to commit to take upgraded As<sub>2</sub>O<sub>3</sub> if Giant build a plant at the mine. This interest coupled with the estimated capital and operating costs concerned will determine whether Giant should go forward alone or in some form of association with Koppers in producing upgraded As<sub>2</sub>O<sub>3</sub>.



T. J. Desanti

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