

FALCONBRIDGE NICKEL MINES LIMITED

INTER-OFFICE MEMORANDUM

DATE: June 15, 1977

TO: W.A. Moore 

COPIES TO: D.J. Emery

FROM: L.S. Price

SUBJECT: GIANT STACK EMISSIONS

The Canadian Public Health Association Task Force on Arsenic has suggested in their Recommendation No. 20, that Giant reduce the daily arsenic emission.

I have checked what Campbell Red Lake Mine say they emitting (which is confirmed by Environment Canada stack tests performed immediately after the installation of new bags), against the theoretical amount derived from vapour pressure curves at that temperature. It seems that at least with new bags, Campbell is very close to theory.

For the Giant gas volume and temperature, the vapour pressure curves indicate the Giant emission should be 66 lbs. or less per day. Two different curves that I found give two different levels, the above is based on the higher of the two.

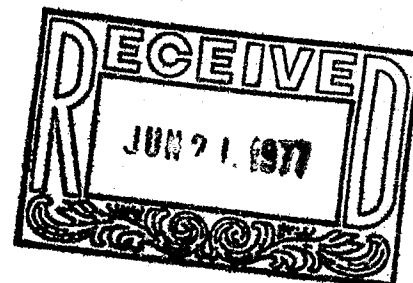
There are probably at least four possible reasons for the Giant emissions being well above this theoretical level.

1. Poor maintenance or inspection of baghouse, resulting in excessive numbers of broken bags.

The quite uniform stack results obtained by both Giant and Environment Canada indicate that this is not a major reason.

One would expect a wide variation of results from week to week or month to month if broken bags were the main cause of dust escape.

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2. The air to cloth ratio is so high that the system is overloaded. This definitely is not the case, since your air to cloth ratio is about 1/3 that of many modern systems.
3. The bag cloth weave is too loose, or the shaking cycles are too frequent, allowing excessive amounts of very fine dust to pass through the cloth. One or both of these factors may be contributing to the current conditions.

The cloth being used does not appear too loose a weave on visual inspection but perhaps a cloth with lower air rating but of the same material should be tried. Pat Raleigh and I discussed the lengthening of the period between shaking cycles with Albert Hall. He was going to check what would be involved in trying this change.

4. Method of cooling of the gas is producing an excessive amount of superfine dust that is extremely difficult to catch with any cloth.

Factors that could produce this condition are:

- (a) Extremely rapid, shock, cooling.
- (b) Too short a time period between air inlet and bags.
- (c) Incomplete mixing followed by uneven baghouse inlet flow pattern. This could result in some compartments operating at too high a temperature, even though the average was at the control temperature.
- (d) Gas temperature is not actually at the level recorded because of inaccuracy of recording instrument or poor location for the measuring probe.

If other efforts do not produce the desired improvements, it would be worth trying "two stage air addition" before looking at the major expense of some type of final clean-up equipment.

If an air inlet point was installed, as close to one of the precipitators as physically possible and this air flow controlled to drop the temperature in the flue to about 400°F (380-410). The cooling then would be completed using the present control system as a second stage.

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Such a procedure may have a seeding effect, so that a smaller number of larger particles are formed, rather than the extreme number of small ones.

Such a first "tempering" air inlet should be shaped to inject the cold air into the center of the gas stream, not along one wall of the flue. For an initial trial period, this could likely be controlled manually. Such a trial if carried out on one precipitator only, would likely give a lot of valuable information at little expense. A coarser product would probably have the added economic advantage of having a higher bulk density in storage. The attached sketch is a crude illustration of how I envision such a system to look.

The above suggestions and comments are intended to put on paper, my thoughts on areas that should be looked at first, in any study of ways to improve on current performance.

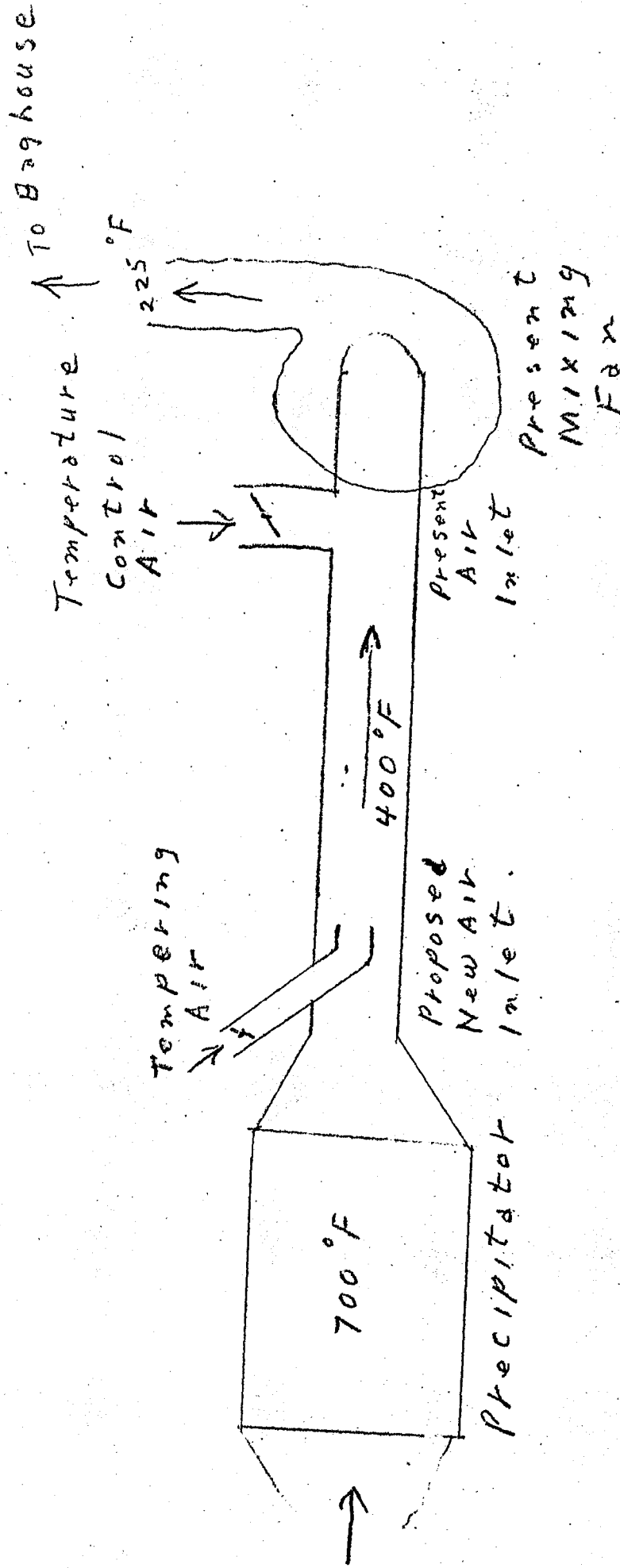
All the very best,



L.S. Price

LSP/ft
attachment

Two Stage Cooling of Roaster Gas.



Concept for Discussion

L. J. Lawrence
June 14/57