

LSC
FALCONBRIDGE NICKEL MINES LIMITED

INTER-OFFICE MEMORANDUM

DATE: November 28, 1980

TO: W.A. Moore

COPIES TO:

FROM: L.S. Price

SUBJECT: RE: ARSENIC SHIPPING - CONTINGENCY PLAN

After our phone conversation last night, I quickly read what had been put together.

Attached is a copy of the draft format and what has been done so far.

As you can see there are quite a few gaps.

We will push Koppers for the info they are to provide.

Will you please give us your comments and any missing information from Giant.

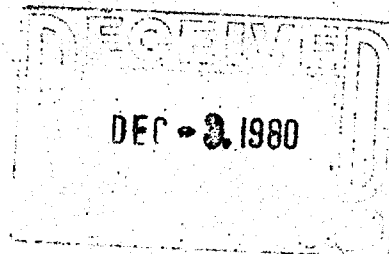
We will complete the write-up once we have all the information.

Best regards to you and Betty.

L.S. Price

L.S. Price

LSP:sh
attch.



PROPOSED OUTLINE

- A. INTRODUCTION:
 - a) Proposal
 - b) General Information and Procedures
 - c) Precautions Taken
- B. PROPOSED ROUTE:
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 - b) Map of Route
- C. DESCRIPTION OF EQUIPMENT:
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 - b) Maintenance and Schedules
 - c) Safety Factors
- D. AMOUNT SHIPPED:
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- E. LOADING PROCEDURES:
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 - b) In Compliances OSHA, Safety Controls and Equipment
- F. EMERGENCY SPILL PLAN:
CONTINGENCY PLANS
 - a) Contingency Plans - NWT/ Super Sucker
 - b) Emergency Spill Plan USA
 - c) Contacts of Agencies to Clean up Spills
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- G. DESCRIPTION OF ARSENIC:
 - a) Uses
 - b) Hazards
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- H. USAGE OF WOLMAN CCA and Wolmanized Pressure - Treated Wood Products

A. INTRODUCTION

Giant Yellowknife Mines will be shipping arsenic trioxide from Yellowknife in the N.W.T. to Koppers Company Inc. in Conley, Georgia.

Koppers Company Inc. will convert the arsenic trioxide into arsenic acid that is blended with other chemicals to produce a wood preservative. This is known as chromate copper arsenate, used in pressure impregnation of wood, which protects it against fungus and insect attack.

Many precautions have been taken to ensure prompt, safe transportation of the material. Provincial and State agencies are being notified of the transit. Emergency contingency plans have been established throughout the proposed route. In the event of an accident resulting in the release of arsenic trioxide specific agencies have been contracted to handle prompt clean up operations.

Each truck will contain emergency instructions regarding first aid and agencies to be contacted, as well as emergency equipment to either repair a small tear or to contain possible spills.

The arsenic trioxide will be transported in sealed dry bulk trailers that are designed, labelled and operated in compliance to the proposed Canadian Department of Transportation Regulations as outlined in the Transportation of Dangerous Goods Act. This act is to be proclaimed in December of 1980. Once proclaimed the Dangerous Goods Act will mandate the same handling techniques for hazardous materials as outlined in the Department of Transportation, title 49 U.S. Code of Federal Regulations, thus achieving essentially the same set of standards for international trade.

B. PROPOSED ROUTE

Shipment will commence at Yellowknife, N.W.T. The Transcanada highway will be followed through Alberta, Saskatchewan Manitoba and into Ontario. At Sault Ste. Marie the vehicles will cross into the United States and proceed through Michigan, Indiana, Kentucky, Tennessee to their destination at Conley, Georgia, which is located just south of Atlanta.

Major transportation routes will be used whenever possible to avoid transporting through numerous urban areas.

B. PROPOSED ROUTE

Need map of Proposed Route

Mr. Cogan to send one.

C. DESCRIPTION OF TRAILERS AND TRUCKS

The arsenic trioxide will be shipped in 26 foot sealed dry bulk trailers that are mounted on a Kentworth chassis. These trucks have a 4500 CFM pneumatic loading system to load and unload the powdery material through flexible vacuum lines with inside diameters ranging from 2 inches to 8 inches and ranging up to 600 feet in length.

The truck's storage compartment is a sealed structure with a 16 cubic yard capacity. It may be unloaded pneumatically or by hydraulically lifting it and letting the material flow out the closable end part.

The storage compartment is designed to carry either solids or liquid materials, or the combination of the two in the form of a slurry. The exit ports are sealed to prevent movement or spillage during transportation.

Additional safety factors on the trucks include provisions to carry a 500 imperial gallon water tank, a water pump with 3" diameter lines, an air compressor which can be used to provide air for life support units, a water heater and shower as well as other equipment that may be required to clean up and contain the material in the event of an accidental spill.

C. DESCRIPTION OF EQUIPMENT

Maintenance of Schedules needed

Mr. Cogan to send

D. AMOUNT SHIPPED

Four to five transport trailers with a carrying capacity of approximately 22 tons per unit will be the weekly tonnage shipped from Giant Yellowknife Mines in the N.W.T. to Conley, Georgia.

An estimated 8% of each 22 tons leaving Giant will be returned in the form of a slurry residue for disposal in the tailings area. The slurry will contain less than 2% insoluble arsenic trioxide and will be transported in sealed drums, attached to the outside trailers.

Shipments will be scheduled according to the ferry schedules, when in operation and in accordance to an ice bridge which will be built for winter use.

Ferries crossing the McKenzie River will be used from mid-May to mid-November. Upon closure, an ice bridge will be constructed to accommodate transportation.

Tonnage will be controlled through the use of weight scales. It is anticipated that the tonnage will be reduced, should it exceed the estimated bridge tolerance.

Periods of heavy shipment will occur before closure of the ice bridge and immediately after the resumed operation of the ferry.

To ensure swift, safe trips all trucks will be monitored during transit through the use of short-wave communication and double teamed drivers have been instructed not to leave loaded trailers.

Should shipment problems arise, an alternative from transportation has been devised. Rail cars will transport the dry bulk trailers to the desired destination.

E. LOADING PROCEDURES

The loading system is completely sealed during operation. The product is pneumatically conveyed into the trailers by flexible vacuum line placed in the loading spout which is wedged inside the trailer ponts.

The trailers will be agitated during loading so that the arsenic trioxide will become de-aerated which forms a dense compact substance that is similar to a solid. However the trailers are not under pressure and should a rupture occur the arsenic trioxide would stay compact, in a dense form, rather than being drawn out by the void.

The trailers will be loaded and weighed inside a load out building. This facility will prevent over loading of trailers and should a spill occur it would be contained in a confined area.

Loading will occur between the hours of 8am to 8pm with an approximate loading time of 2 hours per trailer.

To ensure additional safety no personnel will be in the load-out building once the pneumatic system has been connected and loading is to begin. Any dust displaced by the loading will be directed into baghouse facilities. If arsenic dust is found on the trailers, it will either be wiped off or vacuumed off prior to shipment.

During loading operations all personnel will wear protective equipment which includes coveralls, gloves, boots and aprons, as well as approved respirators equipped with high efficiency particulate filters. Gravimetric sampling will be regularly carried out and should the situation warrant it, further protection will be used.

No information regarding Koppers load out facilities.

F. EMERGENCY SPILL PLAN
ACCIDENT SENARIO

The dry bulk tankers are very strong and seldom rupture even when a roll-over occurs. If damage does occur involving a spill or leak contingency plan will be set in motion.

Each trailer will carry an emergency kit containing 4 sets of goggles, 4 disposal uniforms, 4 disposal boots, 4 respirators with cartridges, 8 sets of additional cartridges, 4 long gauntlet rubber gloves, large plastic garbage bags with ties, 2 small shovels, 1 spill plan. The necessary instruction, emergency equipment and emergency repair equipment will be well market and located in the dab available to authorized personnel in the event the drivers have been hurt. Accidents involving minor damage, such as a tear, may be repaired by tape. Arsenic trioxide has the tendency to leak out until it forms a dam and then the flow stops. Small amounts can be collected in a simple way be using the pneumatic system. For larger quantities exposed to the environment, the primary effort will be the containment of the spill, either by using special tarps or dust placed on top of the powder. The personnel involved will wear protective coveralls with rubber boots, gloves, dust respirators and close fitting goggles.

The proper authorities will be contacted as well as the agencies involved in the contingency plan. These specific agencies have been contracted by Giant and Koppers to clean up any spills at any given point.

Catastrophic spills will require the use of a large vacuum truck to transfer the trioxide into a large sift-proof trailer with final clean-up conducted either by shovelling dirt into approved drums or possibly through the use of front-end loaders into sift-proof drump trucks for transportation to an approved disposal site.

Contingency plans regarding NWT procedures to be sent from Giant.

F. SUPER SUCKER - to be used in Contingency Plan

- a) Model 2045 Myero Sherman (Peabody Myero)
vactor vacuum truck mounted on a 1979 Kenworth
truck with 290 cumming engine
- Blower 4500 cfm Rootes Blower
 - 16 yd³ Box (wet or dry)
 - 2 compartment (52 bag) baghouse with reverse jet
cleaning. Baghouse dust augered back to box
 - unloads by dumping (at present)
 - main intake 8"
 - center remote controlled boom for main intake hose
 - in addition to baghouse unit has a screen filter,
baffle separators, wet cyclone
 - maximum operating vacuum 18" Hg
 - complete with noise suppression package for blower
 - 600' of hose 8" down to 2" diameter

F. EMERGENCY SPILL PLAN

Contingency plans regarding U.S. procedures to be sent from Koppers.

The prearranged provincial and U.S. agencies responsible for clean-up operation in the event of spillage.

- (i) Canada
- (ii) U.S.

Not able to obtain any information regarding private agencies either in Canada or U.S.

Contingency Plan - Contacts:

STATE - U.S.

Mr. Dave Dennis
Chief Oil & Hazardous Materials
Control Section
Department of Natural Resources
Steven P. Mason Building
LANSING, Michigan 48926
U.S.A.
1-517-373-2794

Federal Overseers

Mr. R. Diefenback
Contingency Planning Region V
Environment Protection Agency
IW Walker Drive
CHICAGO, Illinois 60606
U.S.A.
(312) 353-2316

Missesota Pollution Control Agency
1015 Torrey Building
BULETH, Missesota 55802
U.S.A.
(612) 296-7373

G. DESCRIPTION OF ARSENIC

Arsenic is a semi-metallic element that is present throughout the environment and can be detected in all living organisms. Its persistence occurs naturally in soil, air and water which exists in a relatively inert condition when present as a low-level impurity in a number of ores. However considerable amounts of arsenic may be leached from minerals and ores containing higher arsenic concentrations.

The Federal Occupational Safety and Health Administration (OSHA) has set a maximum exposure safety limit of 10 micrograms of arsenic per cubic metre of air. The arsenic content of the earth's crust is usually below 2 mg/kg. The water normally contains 0.001-0.005 mg/l but varies considerably. Groundwater concentrations depends on the arsenic concentrations of the bed rock. Organisms in turn absorb trace amounts of arsenic through the food chain.

Arsenic trioxide is obtained from various metal ores, the most important being copper ores with by-products in lead, zinc and gold ores. It is a white odorless powder that is the basic chemical from which nearly all arsenic compounds are made.

Arsenic compounds have proven to be valuable for numerous uses in commercial applications. The major use of arsenates and arsenites include wood preservatives, pesticides, herbicides, insecticides, larvicides and disiccants. Other applications include glass making, anti-fouling paints, pigments, textile printing, tanning, taxidermy and sludge control in lubricating oils.

Arsenic has been recognized as an environmental problem because of its toxic nature when handled improperly and large amounts are released. The severity of illness will vary with the exposure levels and death is certain if large quantities have either been ingested or inhaled.

Some studies have indicated that arsenic may be a possible carcinogen causing cancer however proof is not affirmative. Other health problems associated with exposure include severe skin rash, irritation of the covering of the eye and the inside of the eyeball. If inhaled, the dust can irritate the whole respiratory track, including membranes in the nose, the throat area and lungs. Death or serious irritation of the stomach and intestines can result if large quantities of arsenic have been swallowed.

All employees will be completely familiar with the potentially hazardous nature of arsenic trioxide. Protective equipment and information regarding emergency action as well as first aid procedures will be made available and stressed to all personnel.

Direct contact with the skin is prevented when goggles, suitable respiratory protection, plastic or rubber gloves, aprons and boots are worn.

Additional precautions involve good washing facilities and appropriate eating and smoking regulations that are enforced to prevent the possibility of ingestion.

H. USAGE OF WOLMAN CCA AND WOLMANIZED PRESSURE - TREATED WOOD PRODUCTS

Introduction:

Wolmanized pressure-treated wood is lumber and plywood which has been pressure-impregnated with Wolman wood preservative chemicals to protect is against decay and insect attack.

In the treatment process, preservative chemicals are pressure-impregnated and chemically fixed in the wood cells. They react with wood sugars to form highly insoluble precipitates, rendering the wood useless as a good substance for fungi, termites, and other wood-destroying agents.

Untreated wood is subject to rot and decay caused by fungus and wood-eating insects such as termites. Fungus is a living plant and certain strains can and do attack wood. This type of fungus utilizes wood fiber as its food supply. As the fungus feeds on the wood fibers, the wood decays and loses strength. Termites, the most common type of wood-eating insect, subsist on the cellulose content of wood.

By impregnating the wood with Wolman preservatives, the wood fiber is rendered useless as food for fungi and insects. This results in lumber and plywood that indefinitely retains structural integrity.

The Wolman preservative chemical pressure-impregnated in the wood cells of Wolmanized pressure-treated wood is a unique formulation of chromated copper arsenate a formulation found to be highly effective as a wood preservative. CCA is a mixture of stable stable metallic oxides which are reduced by wood sugars to form insoluble precipitates. These highly insoluble precipitates are fixed in the wood, are highly leach resistant, and are non-volatile—they will not vaporize or evaporate.

One of the primary active ingredients in Wolman CCA wood preservative is inorganic pentavalent arsenate, a naturally-occurring trace element present in the soil, water, air, plants, and in the tissues of most living creatures--including man. Pentavalent arsenate is relatively non-toxic and non-injurious to man in the preservative retention levels impregnated in Wolmanized Pressure-Treated wood.

Untreated wood generally incurs rot and/or insect damage within three to five years. Since Biblical times, various preservative treatments have been applied to wood to enhance its durability and longevity, especially in soil contact and weather-exposed applications such as railroad ties and utility poles.

However, lumber and plywood used in home construction, home foundations, sundecks, patios, swimming pool sidewalls, walkways, railings, stadium seating, and comparable applications must meet requirements exceeding durability and longevity. Such wood must be attractive, workable, clean, odorless, non-staining, and safe: safe to handle, safe to work with, and non-injurious and non-irritating in close proximity to humans, domestic animals, wildlife, plants and the environment.

WOLMANIZED CCA pressure-treated wood has been recognized for over 40 years as meeting the above requirements in addition to its resistance to rot, decay, and insect attack. During this period of time billions of board feet of WOLMANIZED pressure-treated wood have been effectively and safely used in residential, commercial, industrial, agricultural, recreational, public utility, transportation and military applications.

The evaluation criteria applicable to WOLMANIZED pressure-treated wood can be generally categorized as follows:

1. Serviceability (durability/longevity, non-leaching, non-volatile, demonstrated resistance to rot, decay and insect attack.)
2. Practicality (effectiveness, workability, economy, non-staining, clean, aesthetic, finishable, market acceptable.)
3. Safety (non-toxic, non-injurious, non-irritating, non-leaching, non-volatile, non-contaminating to man or the environment.)

4. Compliance and Conformance with applicable standards

- (a) Federal government regulations
- (b) American Wood Preservers Association standards
- (c) Government agency specifications
- (d) All other applicable regulations, standards and specifications

The following is a review of WOLMAN CCA wood preservative and WOLMANIZED pressure-treated wood on the basis of the above evaluation criteria.

Verbatim copies of all reports, test and studies cited are available on request. Inquiries are invited for additional information, including technical data.

Write:

KOPPERS COMPANY, INC.
1900 Koppers Building
Pittsburgh, PA 15219

From: A Review of Forty Years of the Safe and Versatile Usage of
Wolman CCA and Wolmanized Pressure-Treated Wood Products

WOL-86 1978 Koppers Company, Inc.