U.S. Department
of Transportation

**Research and
Special Programs
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

NOV 7 2000

Mr. John V. Currie
President
Currie Associates, Inc.
1118 Bay Road
Lake George, New York 12845-4618

Ref. No. 00-0303

Dear Mr. Currie:

This is in response to your letter dated October 14, 2000, regarding the definition of a hazardous substance. Specifically, you ask if a shipment of natural earth with deposits of mineral ores that contain arsenic trisulfide meets the definition of a hazardous substance in 49 CFR 171.8.

In your letter, you state that your client is mining an ore that contains 3 to 4 percent arsenic trisulfide and transporting it in "large dump trucks and dump trailers." You state that these vehicles often transport several tons of the ore in a single shipment.

Under § 171.8, a hazardous substance is defined as a material, including its mixtures and solutions, that: (1) is listed in Appendix A to § 172.101 of the HMR; (2) is in a quantity, in one package, which equals or exceeds its reportable quantity (RQ); and (3) is in a concentration by weight which equals or exceeds the concentration corresponding to the RQ of the material, as shown in the table under § 171.8.

Arsenic trisulfide has an RQ of one pound. Therefore, a package (e.g., a dump truck or a dump trailer) containing 33.33 pounds or greater of an ore that is 3 to 4 percent arsenic trisulfide would meet the definition of a hazardous substance and would be subject to Hazardous Materials Regulations (49 CFR Parts 171-180).

I hope this satisfies your request.

Sincerely,

Thomas G. Allan

Thomas G. Allan
Senior Transportation Regulations Specialist
Office of Hazardous Materials Standards

CURRIE ASSOCIATES, INC.
THE GLOBAL COMPLIANCE PROFESSIONALS

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172.101
Classification
Applicability
00-0303

October 14, 2000

Mr. Robert A. McGuire
Associate Administrator, DHM-1
Research and Special Programs Administration
Office of Hazardous Materials Safety
US Department of Transportation
400 7th Street SW
Washington, DC 20590-0001

Dear Mr. McGuire:

I am writing on behalf of a client of Currie Associates, Inc. to request an interpretation regarding the applicability of the Hazardous Materials Transportation Regulations in Title 49 of the Code of Federal Regulations in regards to what may be considered to be a common activity but which has created some unique considerations as a result of the due diligence of my client.

The client engages in mining activities for the purpose of extraction of valuable minerals and precious metals. The activities include the removal of large quantities of natural undisturbed earth known to contain deposits of such ores, transportation of the unrefined earth to a refinery site, grinding and extraction of the desired natural resource elements through a refining process, and disposal of the by-products and any resultant wastes.

My client, in assaying the stockpiles of natural earth at the mine-site with deposits of mineral ores has discovered that the ore contains trace amounts of Orpiment (Arsenic trisulfide) as a natural element in the mined earth. I have attached copies of the laboratory analysis conducted at the request of my client that indicates the presence of several natural elements present in the ore. The report further suggests that "elemental arsenic in ores can be disregarded." I would agree with the scientific analyst that in most cases the testing for the presence of minuscule traces of toxins as natural elements is not even considered since the toxicity of the elements would not be a factor due to the large quantity of dirt that would need to be ingested to reach the lethal dose, and the improbability if not impossibility of such an occurrence. While the criteria of §173.132 applicable to Class 6.1 is not met, OSHA may exercise jurisdiction over occupational exposure to the long-term chronic effects of dusts incurred in the operations.

However, Arsenic trisulfide is listed in Table 1 to Appendix A of §172.101 with a reportable quantity of 1 pound or 0.454 kg. The ore that contains the traces of this element is transported in large dump trucks and dump trailers from the mine site to the refinery, often transporting quantities of several tons depending on the capacity of the vehicle and the weight limit on the highway. Using the table in §171.8 for defining a hazardous substance with an RQ of 1 pound, the concentration by weight that meets that definition would be

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.0002 percent or 20 parts per million. It is probable that a dump semi-trailer, filled to legal capacity, would contain a quantity exceeding the threshold, based on the laboratory analysis.

I understand that the regulations of both the DOT and the EPA apply to the by-products and wastes resulting from the refining process if they met the classification criteria of Title 49 and/or Title 40 since they would no longer represent natural elements of our environment. However, while it seems impractical that the loads of dirt containing the ore that have just been mined from undisturbed earth would then be subject to the CERCLA regulations regarding releases back to their origination, it appears that there are no provisions excepting such application. Further, although my client has elected to do so, I would question whether mine operators were under regulatory obligation to conduct testing of natural undisturbed earth to determine the presence of regulated substances as natural elements.

We are making a two-fold request on behalf of the client. We ask first that you consider the applicability of the Hazardous Materials Transportation Regulations (HMR) to these mining operations based on the test data presented and concur that the materials should not be considered hazardous in transportation. Are there exceptions to the HMR that would apply to the activities at issue?

Secondly, if you should so find that the HMR should apply, we would ask that you consider the scientific data and grant an exemption under Part 107, Subpart B, for transporting the ore from the mine site to the refinery by means of public highway. The exemption request would seek relief from the packaging requirements of §173.240(b) requiring sift-proof closed vehicles, the shipping paper requirements of Part 172, Subpart C, and the marking requirements of part 172, Subpart D, including §172.302(a). If such an exemption is required it is requested that it be granted as provided in §107.117 as permitted for emergency processing, since significant financial hardship will result from the suspending of the mining operation which involves transportation of approximately 6400 tons of ore per day. Additionally, numerous employees will be idled pending the outcome. Should this option be required, my client is prepared to forthwith prepare and submit any application documents deemed appropriate under Part 107.

Your expeditious response with interpretation is requested. If additional information is needed please do not hesitate to contact me.

Sincerely,

John V. Currie
President

CURRIE ASSOCIATES, INC.
THE GLOBAL COMPLIANCE PROFESSIONALS

October 12, 2000

Mr. Robert A. McGuire
Associate Administrator, DHM-1
Research and Special Programs Administration
Office of Hazardous Materials Safety
US Department of Transportation
400 7th Street SW
Washington, DC 20590-0001

Dear Mr. McGuire:

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The client engages in mining activities for the purpose of extraction of valuable minerals and precious metals. The activities include the removal of large quantities of natural undisturbed earth known to contain deposits of such ores, transportation of the unrefined earth to a refinery site, grinding and extraction of the desired natural resource elements through a refining process, and disposal of the by-products and any resultant wastes.

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.0002 percent or 20 parts per million. It is probable that a dump semi-trailer, filled to legal capacity, would contain a quantity exceeding the threshold, based on the laboratory analysis.

I understand that the regulations of both the DOT and the EPA apply to the by-products and wastes resulting from the refining process if they met the classification criteria of Title 49 and/or Title 40 since they would no longer represent natural elements of our environment. However, while it seems impractical that the loads of dirt containing the ore that have just been mined from undisturbed earth would then be subject to the CERCLA regulations regarding releases back to their origination, it appears that there are no provisions excepting such application. Further, although my client has elected to do so, I would question whether mine operators were under regulatory obligation to conduct testing of natural undisturbed earth to determine the presence of regulated substances as natural elements.

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Your expeditious response with interpretation is requested. If additional information is needed please do not hesitate to contact me.

Sincerely,

John V. Currie
President

M E M O R A N D U M

File 11154
MI 4168

TO:

FROM:

DATE: September 30, 2000

COPY:

SUBJECT: Arsenic and Silica in U2 Stockpile

Site submitted three samples from the U2 stockpile for identification of arsenic and silica phases. The first two samples were splits from coarse- and fine-grinds, and the third was made up of coarse (±0.25") crystals of the suspected arsenic minerals. Representative splits of the ground samples were analyzed by XRD-XRF (Tables I and II attached).

The coarse crystals were mostly orpiment (yellow, As_2S_3) with minor realgar (red, AsS). A prominent X-ray reflection representing orpiment appeared in the XRD pattern, and the count-rates yielded the 3-4% semiquantitative values for orpiment shown in Table I. (The amount of orpiment calculated from the XRF As results would be higher.) Realgar did not show up by XRD, indicating <1% quantities, or <25% of the fraction of arsenic as orpiment, consistent with a visual estimate of the coarse crystals.

Arsenic is likely present also as a low (<2%) substitution in pyrite (FeS_2). The 3-4% pyrite quantities found by XRD (Table I) would therefore yield <0.1% As as pyrite, a minuscule fraction compared to arsenic as orpiment. Similarly, arsenic may be present as arsenopyrite (FeAsS), but also as a very small fraction of the total. Elemental arsenic in ores is practically unheard of, and can be disregarded.

Silica was present only as quartz, which is estimated at ±70% of the material by XRD. Illite and kaolinite also account for some of the SiO_2 shown in Table II, indicating that the XRD figure for quartz may be somewhat high.

Table I
Semiquantitative X-ray Diffraction Analysis of U2 Stockpile

SAMPLE	QTZ	ILL	KAO	CAL	APT	BAR	ANHY	PYR	RUTL	ORP
U-2 STOCKPILE-FINE	72	3	15	1	1	1	1	3	1	4
U-2 STOCKPILE-COARSE	70	3	15	1	1	1	1	4	1	3

QTZ Quartz
ILL Illite
KAO Kaolin
CAL Calcite
APT Apatite
BAR Barite
ANHY Anhydrite
PYR Pyrite
RUTL Rutile
ORP Orpiment

Table II
Semiquantitative X-Ray Fluorescence Analysis of U2 Stockpile

SAMPLE	SIO2	AL2O3	FE	MGO	CAO	NA2O	K2O	TIO2	P2O5	S	MNO	BA	CO	CR	CU	MO	NI	PB	SB	ZN	AS
U-2 STOCKPILE-FINE	69.91	10.31	2.04	2.01	2.67	0.01	1.41	0.59	0.48	2.45	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.07	4.57
U-2 STOCKPILE-COARSE	68.78	9.43	2.24	2.27	2.45	0.01	1.30	0.57	0.45	2.86	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.07	4.57

SIO2 Silica
AL2O3 Alumina
FE Iron
MGO Magnesium Oxide
CAO Calcium Oxide
NA2O Sodium Oxide
K2O Potassium Oxide
TIO2 Titanium Oxide
P2O5 Phosphate
S Sulfur
MNO Manganese Oxide
BA Barium
CO Cobalt
CR Chromium
CU Copper
MO Molybdenum
NI Nickle
PB Lead
SB Antimony
ZN Zinc
AS Arsenic