U.S. Department
of Transportation

Pipeline and Hazardous Materials
Safety Administration

1200 New Jersey Ave., SE
Washington, DC 20590

DEC 22 2008

Mr. Andrew Bentley
Biodiversity Research Institute
University of Kansas
1345 Jayhawk Boulevard
Lawrence, KS 66045

Ref. No.: 08-0209

Dear Mr. Bentley:

This responds to you letter regarding the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) as they apply to the transportation of fluid preserved research specimens of mammals, birds, fishes, insects and other invertebrates, and amphibians and reptiles. While many of your specimens are "dry" (skeletons, skins, pinned insects), a significant number are stored or transported moistened in 70% ethanol solution, a standard practice in natural history museums worldwide. Still others are stored or transported "wet" in 95% ethanol for genetic or DNA extraction purposes.

You state that you represent two organizations whose members include natural history museums and collections worldwide (The Society for Preservation of Natural History Collections (SPNHC) and the Natural Science Collections Alliance (NSCA)). You have been tasked with attempting to resolve issues involving shipping specimens both domestically and internationally between museums and individual researchers studying the life of the planet as it pertains to biodiversity, ecology, genetics, conservation, evolution, and virtually any other aspect of natural history.

Your members were discussing two previous interpretations regarding zoology specimens shipped in 70% ethanol solution (Ref. No. 05-0139; 8/9/05) and invertebrates stored in 70% ethanol solution (Ref. No. 07-0076; 8/2/07). Specifically, you asked for clarification of these responses. Your current shipping procedures vary depending on the type of specimen being shipped. The various scenarios include:

- Specimens wrapped in cheesecloth wet with 70% ethanol with little or no visible fluid at time of packaging, and
- Specimens placed in vials or other rigid containers with 30 ml or less of 70% or 95% ethanol (fluid preserved specimens)

Your current shipping procedures use triple-bagging and absorbent and shock-absorbing material to protect the specimens. The larger vertebrate and invertebrate specimens are removed from their storage jars and wrapped in cheesecloth moistened with 70% ethanol.

The cheesecloth-wrapped specimens are then placed into a plastic bag. The bag is closed with a heat sealer. The bag is subsequently heat-sealed inside a second bag, which is then heat-sealed inside a third bag, along with an appropriate amount of absorbent material. The bags are then packed in sturdy cardboard boxes (200 lb test weight) and cushioned by Styrofoam packing "peanuts".

The previous responses were provided on a case-by-case basis, and do not necessarily address all types of transportation scenarios. The two previous requests for interpretation described the packing methods used in both scenarios as having "little or no visible free-flowing liquid at the time they are sealed." Consequently, it was our opinion that the procedures and methods described in these letters and used for shipment of the cheesecloth-wrapped specimens moistened with 70% ethanol to protect the specimens from drying out and damage, and the fluid preserved dry specimens in shell vials of less than 30 ml of 70% ethanol to prevent desiccation, mitigate the minimal hazard that may be present during transportation.

Based on the information provided in your letter, it is the opinion of this Office that in accordance §173.120(d), shipments of zoological specimens preserved in ethanol that are packaged as described in your letter are not subject to regulation under the HMR.

I hope this information is helpful. If we can be of further assistance, please contact us.

Sincerely

Charles E. Betts
Chief, Standards Development
Office of Hazardous Materials Standards

Ergrum
§ 173.120
§ 172.101
Applicability
08-0209

Mr. Edward T. Mazzullo
Director, Office of Hazardous Materials Standards, PHH-10
Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation
Washington, DC 20590

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August 11th 2008

Dear Mr. Mazzullo

I represent two organizations whose members include natural history museums and collections worldwide (The Society for the Preservation of Natural History Collections (SPNHC) and the Natural Science Collections Alliance (NSCA)) and have been tasked with attempting to resolve issues involving shipping specimens both domestically and internationally between museums and individual researchers studying the life of the planet as it pertains to biodiversity, ecology, genetics, conservation, evolution, and virtually any other aspect of natural history.

Recently we convened a roundtable at our joint conference in Oklahoma City (which Shane Kelley of DOT attended) at which we attempted to get resolution of these issues. Copied to attending representatives of DOT, IATA, UPS and FedEx were two letters of interpretation emanating from your office – one to the Field Museum (Ref. No. 05-0139) and the other to the Los Angeles Natural History Museum (Ref. No. 07-0076) dealing with the shipping of natural history specimens in small quantities of hazardous materials, specifically 70% ethanol.

In discussion with the attending representatives and SPNHC members it became clear that the letters were contradictory and not all-encompassing with respect to the types and quantities of materials and hazardous materials we are sending. Specifically, the Natural History Museum of Los Angeles County letter states in the third chapter that "The small specimens in shell vials containing less than 30ml of ethanol are sealed in the same manner...." while just below that in the same paragraph it states "After sealing in the two plastic bags, there is little or no visible free flowing liquid." This appears to be contradictory in that specimens in shell vials would be in free standing ethanol that would be "visible." There is also a need to expand the hazardous materials outlined to include small quantities of 95% ethanol and packages which require more than 30ml of fluid but have no visible fluid at time of packaging as outlined below.

Museums worldwide maintain collections of billions of specimens of mammals, birds, fishes, insects and other invertebrates, and amphibians and reptiles. Our collections exist, in part, to give the scientific community an opportunity to study specimens collected decades (or even centuries) ago, to answer questions about biodiversity, ecology, genetics, conservation, evolution, and virtually all other aspects of natural history. These collections are not unlike libraries, with a wealth of information associated with each and every specimen. While many of our specimens are "dry" (skeletons, skins, pinned insects), a significant number are stored or transported moistened in a 70% ethanol solution ("fluid-preserved" specimens), a standard practice in natural history museums worldwide. Still others are stored or transported in wet in 95% ethanol for genetic or DNA extraction purposes.

Just as libraries loan out their books, we loan our specimens to researchers all over the world. There are literally thousands of these packages that are sent domestically every year to and from

the approximately 2500 museums and collections in the US (not to mention an exponentially larger number of international shipments to and from the thousands more museums and collections abroad outside the jurisdiction of DOT). Of course, this involves great care and effort to ensure our specimens are not damaged in transit (each specimen is unique and irreplaceable), but with careful packing this can be done. My question relates to the applicability of the HMR to our shipping procedures, specifically those used for fluid-preserved specimens.

Our current shipping procedures vary depending on the type of specimen being sent. Superior packing is of critical importance to us since the specimens can suffer significant, permanent damage if allowed to dry out. Thus we take great pains (such as triple-bagging and the addition of both absorbent and shock-absorbing material) to ensure the specimens are well-protected.

The larger vertebrate and invertebrate specimens are removed from their storage jars and wrapped in cheesecloth moistened with 70% ethanol. The cheesecloth-wrapped specimens are then placed into a plastic bag. Next the bag is closed with a heat sealer. This bag is subsequently heat-sealed inside a second bag, which is then heat-sealed inside a third bag, along with an appropriate amount of absorbent material. The bags are then packed in sturdy cardboard boxes (200lb test weight) and cushioned by Styrofoam packing "peanuts".

For delicate specimens, as well as tissue samples used in genetic research, that cannot withstand being wrapped in cheesecloth, the packing protocol varies slightly. Small specimens or tissues are placed in sealed glass or polypropylene vials which are filled with 30ml or less of either 70% or 95% ethanol. These vials are then sealed in secondary and tertiary bags, again using a heat sealer, together with sufficient absorbent material.

The various scenarios thus include:

- Specimens wrapped in cheesecloth wet with 70% ethanol with little or no visible fluid at time of packaging, and
- Specimens placed in vials or other rigid containers with 30ml or less of 70% or 95% ethanol visible fluid

We are thus writing to obtain a further letter of interpretation concerning the shipment of preserved museum specimens addressed to the two organizations mentioned above that would be effective for all our members and encompass all the various scenarios outlined in the above paragraph. Our hope is that by providing you with technical information and an outline of our current shipping procedures, you can determine if we are subject to the requirements of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180).

Please do not hesitate to contact me if further information or explanation is required regarding any of the above.

Thanking you in advance

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