
QUIVIRA MINING COMPANY

Ambrosia Lake Facility

TRANSPORTATION ACCIDENT RESPONSE GUIDE
FOR
DRIED YELLOWCAKE

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QUIVIRA MINING COMPANY

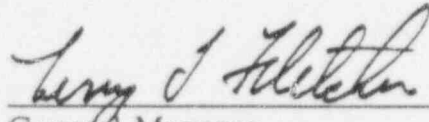
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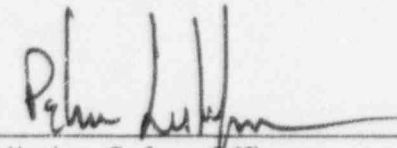
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I. INTRODUCTION

Transportation accidents during the shipment of uranium concentrates (yellowcake or brine) infrequently occur on public highways and at trucking terminals. Leakage or spillage of concentrates from its container can be a potential health hazard to persons if they ingest or inhale the material. The health hazard, even with an acute exposure, is usually small and is primarily because of chemical toxicity to the kidneys. Radioactivity is a much lesser health hazard.

The purpose of this procedure is to provide guidance for persons responding to a shipping accident involving uranium concentrate, particularly when the concentrate has leaked or is spilled from its containers. Leakage or spillage can range in severity depending on the specific accident conditions and locations. Although this guide addresses the worst case situation, it intends lesser response activity for less severe accidents.

The guide provides instructions to the truck driver and to other persons who are the first to arrive at the accident scene. These instructions request notification be made to the shipper and the carrier. If warranted, the shipper is to dispatch an initial response team to investigate the accident. He also alerts a clean-up crew for possible duty. Guidance is also given for securing prearranged clean-up equipment and services. Clean-up methods, monitoring, sampling, release levels, and concluding activities are also described.

II. SHIPPING PROCEDURES AND RESPONSIBILITIES

The shipper (Quivira Mining Company) will insure the following actions are accomplished prior to any shipment of uranium concentrate (yellowcake or brine).

A. D.O.T. Regulations

All general requirements, Title 49 CFR, Department of Transportation regulations, have been compiled with by the shipper (Appendix A).

B. Carrier Emergency Response Procedures

Each truck driver is provided with two copies of the emergency response procedures (Appendix B). One copy is to be maintained with the shipping documents. The second copy is to be secured to the rear door of the truck for ready access when transporting dried yellowcake.

C. Spill Cover Kit

Each truck driver is provided with a spill cover kit consisting of the following:

- Four (4) respirators with user instructions
- 1,000 square feet of plastic sheeting
- Twenty (20) tent stakes
- One (1) box of nails
- One (1) hammer
- One (1) folding knife
- Four (4) pair shoe coverings
- One (1) pair gloves
- Two (2) "CAUTION: RADIOACTIVE MATERIAL" signs

The kit will be clearly marked as to its purpose and use and will be addressed for return by the carrier. The kit should be the last item loaded on the truck for easy accessibility in the event it is needed.

III. TRANSPORTATION ACCIDENT RESPONSE ORGANIZATION AND DUTIES

A. The Shipper

1. Security

In the event of a transportation related accident, the carrier is instructed to promptly notify Quivira Mining Company Security (Appendix B). The responsibilities of the security official receiving such a call are as follows:

- (a) Record the information set forth in the evaluation questionnaire (Appendix B).

- (b) Notify the proper management and emergency response personnel (Appendix C).

2. Emergency Response Coordinator

- (a) Direct the initial response team and the clean-up crew.
- (b) Designate individuals as emergency response crew members and train them in emergency procedures which include the safe handling of Low Specific Activity (LSA) radioactive material.
- (c) If necessary, procure additional personnel for the clean-up crew and any additional equipment as required.
- (d) Coordinate movement of team and equipment to accident site.

3. Environmental Technician (Sr.)

- (a) Provide initial response capability including maintenance of necessary equipment.
- (b) Serve as the on-site technical liaison between the emergency response coordinator and the appropriate state and federal officials.
- (c) In cooperation with the emergency response coordinator, direct all radiation safety activities required by the clean-up operation including air, water, and personnel monitoring.

4. General Manager - Ambrosia Lake

- (a) Notify appropriate Rio Algom Corporate personnel (Appendix D).

5. Manager Radiation Safety Licensing and Regulatory Compliance

- (a) Make official notification to NRC, the state health dept. and appropriate federal/state agencies (Appendix E).

B. The Carrier

The carrier shall require his drivers to learn and carry the emergency procedures given in Appendix B. The carrier shall have persons assigned to receive emergency calls at any time. The person receiving the call will promptly notify company management. The company management will make a call to the shipper to confirm that appropriate action is being taken. The carrier may have one of its staff and/or insurance agent visit the accident site.

IV. **EMERGENCY RESPONSE TEAM**

A. Personnel in Charge

The emergency response team will have the following personnel who will be in charge of managing all emergency response activities on site (Appendix C):

1. Sr. Environmental Engineer - Emergency Response Coordinator
2. Environmental Technician (Sr.) - Alternate Emergency Response Coordinator.

B. Duties of the Emergency Response Team

At least one of the team members should proceed immediately to the accident scene with the minimum equipment necessary to perform an initial investigation of the site. The equipment should include:

1. One copy of the emergency response plan.
2. Survey instrument(s) to determine the extent of the contaminated area. This may include one or both surface alpha survey meter and gamma meter.
3. Personal protective equipment-coveralls, respirators, and shoe covers.
4. Camera (still or video)
5. Sample bottles (6-1 liter capacity).

The remainder of the response team should prepare the shipping accident response trailer for transport to the site. Once advised of the necessity for clean-up, the crew will proceed to the site and perform the required clean-up procedures.

The member(s) initially available at the site will coordinate preclean-up planning with appropriate state officials after a complete review of the emergency response plan.

Refer all questions from media personnel to the Manager of Regulatory Affairs (see Appendix D).

All persons who were first upon the scene of the accident including the carrier, law enforcement agents or other individuals who may have been exposed to the concentrate should be instructed by the coordinator that urine samples may be requested to determine potential yellowcake intake.

V. SPILL CLEAN UP

A. Equipment - In Storage

10 Pair	Disposable Rain Suits
10 Pair	Coveralls (2 Small, 4 Medium, 4 Large)
10	Cloth head covers
10 Pair	Rubber Boots (assorted sizes)
20 Pair	Work Gloves
10	Y. C. Respirators (4 full-face, 6 half-face)
30	6 oz. bottles w/caps and labels (sealed in a plastic bag)
3,000 feet	Barricade Rope
20	4 foot Metal Fence Posts
4	Radiation Zone and Radioactive Materials Signs
1,000 sq. ft.	Plastic Sheeting
2	Rolls of Vent Bag Tape
40	Drum Liner Bags
8	55 gallon drums
1	Vacuum Cleaner
6	Shovels
4	Brooms
1	Drum lid closure wrench
10	Washcloths and Towels

2	Wash Basins
6	Bars of Toilet Soap
1	Small first-aid kit
2	5-gallon Water Tanks with Spray Nozzels on hose
1	Drum of Cleaning Rags
1	Portable Generators (including engine oil)
1	Gasoline can (empty)
2	50-foot extension cords
2	Extension-cord type trouble lights
1	Tent
50	DOT "Radioactive II" labels
4	DOT "Radioactive" Placards
2 each	Clipboards, writing materials, logbooks
10 pair	Shoe Covers
2	Sledge Hammers
2	Axes
1	Portable Toilet
6	Water Sampling Bottles
1 Box	Soil Sampling Bags & Zip Lock Baggies

(Immediately Available at Ambrosia Lake's Environmental Office)

1	Generator
1	High-Volume Air Sampler, filter paper
5	"Personnel" air samplers
1	Gamma Survey Meter
1	Small Tool Kit
1	Camera
1	Compass

Other equipment as needed should be procured as near the accident site as is most expedient. The containers should be stored in a readily accessible location with adequate handling equipment available. The clean-up crew responding to the accident shall bring calibrated survey instruments and their TLD or film badge dosimeters.

B. Personnel

The clean-up crew will consist of employees of Quivira Mining Company. These persons will be assigned tasks commensurate with their training and experience such

as:

1. Handling and repackaging the spilled yellowcake.
2. Performing decontamination efforts.
3. Monitoring, sampling, and related exposure evaluation activities.
4. Providing logistical support for the crew.
5. Crew supervision.
6. Coordination of activities with civil organizations and governmental agencies.

Non-shipper personnel may be hired locally to handle clean drums, operate tractors, load trucks and other jobs not involving the direct contact with uncontained ore concentrate or contaminated materials.

C. Clean-up Crew Response

The supervisor of the crew responding will promptly gather his personnel and equipment. Travel to the accident site will be done in the most expeditious manner.

D. Preclean-up Activities

After the clean-up crew arrives at the accident scene and has been briefed by the Initial Response Team, the crew should perform the following tasks as assigned by the person in charge:

1. Unload equipment.
2. Correct or mitigate safety hazards which could interfere with the clean-up operation.
3. Continue covering the spill and contaminated items.
4. Rope off the exclusion area and post signs.

5. Establish an upwind "hot line" monitoring station at the exclusion area border.
6. Erect the personnel decontamination tent at the hot line location.
7. Establish a "command post" location outside the exclusion area near the hot lines.
8. Set up portable toilet near the command post.
9. Obtain water (use empty, clean drums which previously did not contain yellowcake).
10. Set windbreaks.
11. Fuel and oil the generators.
12. Set the air samplers downwind.
13. Mount the vacuum cleaner head on an empty drum.

E. Spill Clean-up Methods

It is desirable to repackage spilled yellowcake into 55-gallon drums. Contaminated debris, snow, ice, soil and water should be similarly packaged. Where spilled yellowcake is more than 1/4 inch thick and in solid form, shovel methods are recommended, in liquid form, a vacuum pump system is recommended. Where the spill is less than 1/4 inch thick and the material is dry, vacuum sweeping should be successful. Where dried spilled material covers soil, it is expected that 1/2 inch of soil will be removed. In areas of a liquid spill, depth of soil removal depends on earth permeability and settling rate. Contamination remaining on pavements and other hard surfaces after vacuuming may need to be cleaned with water and detergent as described later. All waste containers shall be properly labeled and/or marked.

1. Shoveling Methods (Dry Spill)

The crew members should be fully attired in coveralls, hood, gloves, shoe covers, and respirator. Their pant legs should be taped to the top of their shoe covers and their sleeves taped to their work gloves. Working behind the windbreak, they should uncover a few square feet of spilled concentrate and spray the area gently with water in order to wet the yellowcake or soil in which brine may have dried. Care must be taken so as to avoid water runoff or a slushy condition. The dampened concentrate is then shoveled into empty drums. Soil and surfaces from which the concentrate was removed should be kept damp or recovered with plastic until final decontamination is performed.

2. Vacuum Cleaning (Dry & Wet Spills)

Vacuum cleaners with high efficiency particulate absolute filters will be used. Vacuum methods are successful where thin layers of yellowcake dust have settled. Care must be taken that the cleaner filter(s) are not punctured. Before removing the cleaner head from its drum collector, be sure that the dust inside the drum has settled (wait two minutes after turning the vacuum off).

The operator of the vacuum should be completely attired with coveralls, shoe covers, hard hat, respirator and gloves.

3. Wet Cleaning Methods (Dry & Wet Spills)

Conventional wet scrubbing with detergent/water solutions using brooms and cleaning rags can reduce surface contamination of pavements and other hard surfaces to acceptable levels. Release limits are given in Section V (F).

4. Other Decontamination Methods

Contaminated soil may be dozed, shoveled or otherwise scooped from the ground and packaged in drums. Items with surface contamination exceeding the limits given in Section V (F) should also be packaged.

F. Acceptable Surface Contamination Levels (NRC Regulatory Guide 8.30)

<u>Average 1, 2</u>	<u>Maximum 1, 3</u>	<u>Removable 1, 4</u>
5,000 dpm/100cm ²	15,000 dpm/100cm ²	1,000 dpm/100 cm ²

Footnotes:

1. As used in this table, dpm (disintegration per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
2. Measurements of average contaminant should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each such object.
3. The maximum contamination level applies to an area of not more than 100 cm².
4. The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping the area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

G. Monitoring and Sampling

1. Hot Line Operations

The Hot Line is an established control line separating the spill-contaminated area from contamination-free area. All personnel and equipment entering and leaving the accident scene are channeled through the Hot Line. The Hot Line is manned by at least one person skilled at monitoring. No person or equipment leaves the contamination area without first being monitored and decontaminated if necessary.

The Hot Line is supplied with clean, protective clothing, respirators and tape as well as the washing facility (tents). Drums or plastic bags for "dirty" clothing and waste are also provided at the Hot Line.

2. Air Sampling

Personnel air sampling should be considered for the clean-up crew when handling large spills of ore concentrate. This should be done to assure that the respiratory protective equipment used is adequate and to provide data for exposure evaluations.

During clean-up operations, a high-volume air sampler shall be operated about 25-30 yards downwind from the accident. When no operations are being performed, the sampler shall collect a background sample from an area about 500 yards upwind of the accident.

An example of air sample calculation assuming 50% geometry of an alpha detector is as follows:

$$\frac{dpm}{m^3} = \frac{\frac{cpm}{0.5} \times \frac{A_f}{A_c}}{m^3 \times E \times X}$$

dpm/m^3 = Disintegrations per minute found in one cubic meter of air

cpm = Counts per minute indicated by instrument

$cpm/0.5$ = dpm (cpm corrected for instrument geometry)

A_f = Area of filter paper used (any units)

A_c = Area of filter paper actually counted by the instrument
(same as units A_f)

X = Alpha absorption factor for paper used
(from manufacturer's specifications)

E = Collection efficiency of paper used
(from manufacturer's specifications)

m^3 = Total volume of sampled air in cubic meters

The background radioactivity should be subtracted from the calculated downwind concentration.

Proper controls are being used during the clean-up if the downwind sampler results (corrected for background) are below 100 dpm/m³.

3. Soil and Water Sampling

At the upwind air sampler (background) location and other suitable locations, obtain four 2-inch deep, 6-inch square samples of soil and place in suitable containers. Identify each container with labels.

Soil samples similarly obtained at the spill site after the final decontamination effort should be collected.

The soil samples should be analyzed for uranium content as promptly as possible. Soil decontamination efforts will be considered successful when the spill site samples show no more than 30 pCi of uranium per gram of soil above the background soil sample. Water samples, if required, will be taken both upstream and downstream of the incident site, at varying distances, prior to and during the clean-up period.

4. Personnel Dosimetry

TLD or film badge dosimeters may be worn by the clean-up crew, if necessary. Frequent recorded external radiation surveys near the individual at his work location may be done in lieu of the use of personal dosimeters.

5. Bioassay Sampling

Urine samples may be obtained from potentially exposed clean-up crew members and other personnel involved. The sampling should be done as directed by the person responsible for supervising the health physics activities. Precautions will be taken to prevent the sample bottles from becoming contaminated from external sources. The samples should be analyzed promptly.

Follow-up urine sampling will be considered necessary when any single sample

exceeds 15 ug/liter of uranium. An exposure evaluation should be made for each potentially exposed individual.

VI. CONCLUDING ACTIVITIES

A. Review of Monitoring and Sampling Data

All monitoring and sampling data including personnel evaluations should be reviewed with the appropriate governmental authorities. Upon securing their approval, the decontamination efforts shall cease.

B. Abandoning the Site

It is desirable to restore an accident site to its pre-accident condition, or better. Arrangements should be made to accomplish this restoration during or after packing up and leaving the site.

C. Cost Accounting

An accurate documentation of losses and costs should be made. The appropriate insurance company(s) should be notified if the accounting shows that losses and costs of more than nominal value have occurred.

D. Reports

Reports of the accident will need to be prepared as required by federal, state or local regulations. For example, the shipper may need to report in accordance with Title 10 CFR Part 20.2202 (Appendix F). The carrier may need to report in accordance with Title 49 CFR Parts 171.15 and 171.16 (Appendix G).

APPENDIX A

§ 172.200. Applicability. (a) Description of hazardous materials required. Except as otherwise provided in this subpart, each person who offers a hazardous material for transportation shall describe the hazardous material on the shipping paper in the manner required by this subpart.

(b) Exceptions. This subpart does not apply to any material, other than a hazardous waste or a hazardous substance, that is:

(1) An ORM-A, B, or C, unless it is offered or intended for transportation by air, when it is subject to the regulations pertaining to transportation by air as specified in § 172.101; or

(2) An ORM-A, B, or C, unless it is offered or intended for transportation by water when it is subject to the regulations pertaining to transportation by water as specified in § 172.101; or

(3) An ORM-D unless it is offered or intended for transportation by air.

§ 172.201. General entries. (a) Contents. When a description of hazardous material is required to be included on a shipping paper, that description must conform to the following requirements:

(1) When a hazardous material and a material not subject to the requirements of this subchapter are described on the same shipping paper, the hazardous material description entries required by § 172.202 and those additional entries that may be required by § 172.203:

(i) Must be entered first; or

(ii) Must be entered in a color that clearly contrasts with any description on the shipping paper of a material not subject to the requirements of this subchapter, except that a description on a reproduction of a shipping paper may be highlighted, rather than printed, in a contrasting color (the provisions of this paragraph apply only to the basic description required by §§ 172.432(a)(1) and (2), or (3)).

(a) Must be entered by the entry of an "X" placed before the proper shipping name in a column captioned "HM." (The "X" may be replaced by "RD," if appropriate.)

(2) The required shipping description on a shipping paper and all copies thereof used for transportation purposes, must be legible and printed (manually or mechanically) in English.

(3) Unless it is specifically authorized or required in this subpart, the required shipping description may not contain any code or abbreviation.

(4) A shipping paper may contain additional information concerning the material provided the information is not inconsistent with the required description, unless otherwise permitted or required by this subpart. Additional information must be placed after the basic description required by § 172.432(a).

(i) When appropriate, the entries "IMO" or "IMO Class" may be entered immediately before or immediately following the class entry in the basic description.

(ii) For a material meeting the definition of more than one hazard class, the additional hazard class or classes may be entered after the hazard class in the basic description.

(b) Name of shipper. A shipping paper for a shipment by water must contain the name of the shipper.

(c) Continuation page. A shipping paper may consist of more than one page. If each page is consecutively numbered and the first page bears a notation specifying the total number of pages included in the shipping paper. For example, "Page 1 of 4 pages."

§ 172.202. Description of hazardous material on shipping papers. (a) The shipping description of a hazardous material on the shipping paper must include:

(1) The proper shipping name prescribed for the material in § 172.101 or § 172.102 (when authorized).

(2) The hazard class prescribed for the material in the same Section. Except for a proper shipping name that contains words describing more than one hazard class, inclusion of the hazard class is not required when the words of the proper shipping name contain the key word or words of the hazard class of the material, such as Flammable liquid, Poison B, liquid, Radioactive device, or Corrosive liquid.

(3) The identification number prescribed by "UN" or "NA" as appropriate prescribed for the material in the same Section; and

(4) Except for empty packagings, the total quantity (by weight, volume, or as otherwise appropriate) of the hazardous material covered by the description.

(b) Except as provided in this subpart, the basic description specified in paragraphs (a)(1), (2), and (3) of this section must be written in sequence, not example: "Flammable, Flammable liquid, UN 1203."

(c) The line plurality of the material covered by one description must appear before or after, or both before and after, the description required and authorized by this subpart.

(1) Abbreviations may be used to specify the type of packaging and which is exempt. For example: 40 Cyl. Nitrogen Non-flammable gas UN 1001 (40) pounds, 1 box Corrosive Flammable liquid, NA 1133, 25.55.

(2) The type of packaging and destination marks may be entered in any appropriate manner before or after the basic description.

(d) Technical and chemical group names may be entered in parentheses between the proper shipping name and hazard class.

(e) Except for those materials in the UN Recommendations the ICAO Technical Instructions, or the IMDG Code, a material that is not a hazardous material according to this subchapter may not be offered for transportation or transported when its description on a shipping paper includes a hazard class or an identification number specified in § 172.101.

§ 172.203. Additional description requirements. (a) Exemptions. Each shipping paper issued in connection with a shipment made under an exemption must bear the notation "DOT-2" followed by the exemption number assigned and so located that the notation is clearly associated with the description to which the exemption applies.

(b) Limited quantities. The description for a material offered for transportation as "limited quantity" as authorized by this subchapter must include the words "Limited Quantity" or "Ltd Qty" following the basic description.

(c) Hazardous substances.

(1) If the proper shipping name for a mixture or solution that is a hazardous substance does not identify the constituents making it a hazardous substance, the name or names of such hazardous substance constituents as shown in the Appendix to § 172.101 must be entered in parentheses in association with the basic description. For waste streams or for wastes which exhibit an EPA characteristic of ignitability, corrosivity, reactivity or toxicity the basic description must be followed by the waste stream number in parentheses or by the letters "EPA" and the word "ignitability" or "corrosivity" or "reactivity" or "toxicity" in parentheses, as appropriate. These requirements also apply when descriptions from the Optional Table in § 172.102 are used.

(2) The letters "RD" must be entered on the shipping paper either before or after the basic description required by § 172.202 for each hazardous substance. For example: "RD, Ceresol, Corrosive material, UN 2075, or Hazardous substance liquid, n.o.s., ORM-E, NA 9183 (Acidic Aqueous)." (d) Radioactive material.

(1) The description for a shipment of radioactive material must include the following additional entries as appropriate:

(i) The name of each radionuclide in the radioactive material that is listed in § 173.435 of this subchapter. Abbreviations, e.g., "Tm-90" are authorized.

(ii) A description of the physical and chemical form of the material, if the material is not in special form (generic chemical description is acceptable for chemical form).

(iii) The activity contained in each package of the shipment in terms of curies, millicuries, or microcuries. Abbreviations are authorized. For the shipment of a package containing a highway route controlled quantity of radioactive materials (see § 173.433(i) of this subchapter), the words "highway route controlled quantity" must be entered in association with the basic description.

(iv) The category of label applied to each package in the shipment. For example: "RADIOACTIVE WHITE-1."

(v) The transport index assigned to each package in the shipment bearing RADIOACTIVE YELLOW-III or RADIOACTIVE YELLOW-III labels.

(vi) For a shipment of fissile radioactive materials:

(A) The words "Fissile Exempt," if the package is exempt pursuant to § 173.433 of this subchapter; or

(B) If not exempt, the fissile class of each package in the shipment, pursuant to § 173.435 of this subchapter; and

(C) For a fissile Class III shipment, the additional notation "Warning—Fissile Class III Shipment. Do not Load More than 11 Packages per Vehicle." (Asterisks to be replaced by appropriate number.) "In Loading and Storage Areas, Keep at Least 20 Feet (6 Meters) from Other Packages Bearing Radioactive Labels."

(D) If a fissile Class III shipment is to be transported by water, the supplementary notation must also include the following statement: "For shipment by water, only one fissile Class III shipment is permitted in each hold."

(vii) For a package approved by the U.S. Department of Energy (DOE) or U.S. Nuclear Regulatory Commission (USNRC) a notation of the package identification marking as prescribed in the applicable DOE or USNRC approval. (See § 173.471 of this subchapter.)

(viii) For an export shipment or a shipment in a form in which a package is a notation of the package identification marking as prescribed in the applicable International Atomic Energy Agency (IAEA) Certificate of Competent Authority which has been issued for the package. (See § 173.473 of this subchapter.)

(2) Empty packagings. (i) The description on the shipping paper of a packaging containing the residue of a hazardous material must include the words "RESIDUE" last contained in the association with the basic description of the hazardous material last contained in (1)(d) of this section.

(ii) For a tank car containing the residue (as defined in (1)(d) of a hazardous material, the requirements of § 174.20(c) and Paragraph (e)(3) of this section apply.

(3) If a packaging, shipment, or tank car, contains a residue that is a hazardous substance, the description on the shipping paper must be:

APPENDIX A (continued)

prefixed with the phrase "RESIDUE" Last contained "****" and the letters "RQ" must be entered on the shipping paper either before or after the basic description.

(f) Transportation by air. When a package containing a hazardous material is offered for transportation by air and this subchapter prohibits its transportation aboard passenger-carrying aircraft, the words "Cargo aircraft only" must be entered after the basic description.

(g) Transportation by rail.

(1) The shipping paper for a rail car containing a hazardous material must contain the notation "Placarded" followed by the name of the placard required for the rail car.

(2) The shipping paper for each Class DOT-113 tank car containing a flammable gas must contain an appropriate notation such as "DOT-113A" and the statement "Do Not Hump or Cut Off Car While in Motion."

(h) Transportation by highway. Following the basic description for a hazardous material in a specification MC 330 or MC 331 cargo tank, there must be entered for—

(1) Anhydrous ammonia.

(i) The words "0.2 PERCENT WATER" to indicate the suitability for shipping anhydrous ammonia in a cargo tank made of quenched and tempered steel as authorized by § 173.315(a)(1), Note 14 of this subchapter; or

(ii) The words "NOT FOR Q AND T TANKS" when the anhydrous ammonia does not contain 0.2 percent or more water by weight.

(2) Liquefied petroleum gas.

(i) The word "NONCORROSIVE" or "NONCOR" to indicate the suitability for shipping "noncorrosive" liquefied petroleum gas in a cargo tank made of quenched and tempered steel as authorized by § 173.315(a)(1), Note 15 to this subchapter; or

(ii) The words "NOT FOR Q AND T TANKS" for grades of liquefied petroleum gas other than "Noncorrosive".

(f) Transportation by water.

(1) Each shipment by water must have the following additional shipping paper entries:

(i) Identification of the type of packages such as barrels, drums, cylinders, and boxes.

(ii) The number of each type of package including those in a freight container or on a pallet, and

(iii) The gross weight of each type of package or the individual gross weight of each package.

(2) The shipping paper for a hazardous material offered for transportation by vessel to any country outside the United States must have in parentheses the technical name of the material immediately following the proper shipping name when the material is described by an n.o.s. entry in § 172.101 or 172.102. For example: "Corrosive liquid, n.o.s. (acetyl chloride, UN 1750)." If the material is a mixture of two or more hazardous materials, the names of at least two components most predominately contributing to the hazard or hazards of the mixture shall be entered in parentheses. For example: "Flammable liquid, corrosive, n.o.s. (Methyl alcohol, Potassium hydroxide, UN 2924)." The provisions of this paragraph do not apply:

(i) If the n.o.s. description for the material (other than a mixture of hazardous materials of different classes meeting the definition of more than one hazard class) contains the name of the chemical element or group which is primarily responsible for the material being included in the hazard class indicated. For example: "Mercury compound, solid, n.o.s., Poison 8, UN 2025."

(ii) If the n.o.s. description for the material (which is a mixture of hazardous materials of different classes meeting the definition of more than one hazard class) contains the name of the chemical element or group responsible for the material meeting the definition of one of these classes. In such cases, only the technical name of the component that is not appropriately identified in the n.o.s. description shall be entered in parentheses. For example: "Carbamate pesticide, liquid, n.o.s. (contains Xylene), Flammable liquid, UN 2758, POISON."

(3) The entry "Skin corrosive only" must be included to also authorize "under deck" stowage for corrosive liquid, n.o.s. and corrosive solid, n.o.s. that meet only the criteria for skin criteria of § 173.240(a)(1).

(j) Dangerous When Wet. The words "Dangerous When Wet" shall be entered on the shipping paper in association with the basic description when a package covered by the basic description is required to be labeled with a DANGEROUS WHEN WET label.

(k) Poisonous materials. Notwithstanding the class to which a material is assigned:

(1) If the name of the compound or principal constituent that causes a material to meet the definition of a poison (according to this subchapter) is not included in the proper shipping name for the material, the name of that compound or constituent shall be entered on the shipping paper in association with the shipping description for the material. The name of the compound or principal constituent may be either a technical name or any name for the material that is used in the NIOSH Registry. This subparagraph does not apply to:

(i) A material having a proper shipping name that includes the chemical element or group which causes the material to be a poison.

(ii) Limited Quantities.

(2) If a liquid or solid material in a package meets the definition of a poison

according to this subchapter, and the fact that it is a poison is not disclosed in the shipping name or class entry, the word "Poison" shall be entered on the shipping paper in association with the shipping description.

(2) The provisions of paragraphs (k)(1) and (2) of this section do not apply—

(i) To consumer commodities, ORM-D, or

(ii) To compounds or principal constituents that would cause death by corrosive destruction to tissue rather than by systemic poisoning.

(4) If the initial-inventory of any material falls within the criteria specified in § 173.240(a)(2) (subject to definitions and implementation conditions of (c) and (d) of the same section), the words "Poison-inventory hazard" shall be entered on the shipping paper in association with the shipping description. However, the word "Poison" need not be repeated if it is entered as part of the basic description or in compliance with paragraph (k)(2) of this section. This paragraph does not apply to packages having primary containment units of one liter capacity or less.

(5) IM portable tanks. A hazardous material described by an n.o.s. entry in § 172.101 or § 172.102 (when authorized) and offered for transportation in an IM portable tank must be described on shipping papers in accordance with the provisions of paragraph (k)(2) of this section.

§ 172.204 Shipper's certification. (a) General. Except as provided in paragraphs (b) and (c) of this section, each person who offers a hazardous material for transportation shall certify that the material is offered for transportation in accordance with this subchapter by printing (manually or mechanically) on the shipping paper containing the required shipping description the certification contained in paragraph (a)(1) of this section or the certification (declaration) containing the language contained in paragraph (a)(2) of this section.

(1) "This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation."

Note: In one of the certification words "above-named" may be substituted for the words "above-named."

(2) "I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packaged, marked and labeled, and are in all respects in proper condition for transport by (") according to applicable international and national governmental regulations."

Additional language indicating the mode of transportation to be used may be inserted at this point in the certification. All modes of transportation may be indicated provided that any mode not applicable to a specific shipment is deleted (crossed out).

(b) Exceptions. (1) Except for a hazardous waste no certification is required for a hazardous material offered for transportation by motor vehicle and transported—

(i) in a cargo tank supplied by the carrier; or

(ii) by the shipper as a private carrier except for a hazardous material that is to be reshipped or transferred from one carrier to another.

(2) No certification is required for the return of any empty tank car which previously contained a hazardous material and which has not been cleaned or purged.

(c) Transportation by air.

(1) General. Certification containing the following language may be used in place of the certification required by paragraph (a) of this section:

"I hereby certify that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packaged, marked and labeled, and are in proper condition for carriage by air according to applicable national governmental regulations."

(2) Certificate in duplicate. Each person who offers a hazardous material to an aircraft operator for transportation by air shall provide two copies of the certification required in this section. (See § 175.30 of this subchapter.)

(3) Passenger and cargo aircraft. Each person who offers for transportation by air a hazardous material authorized for air transportation shall add to the certification required in this section the following statement:

"This shipment is within the limitations prescribed for passenger aircraft/cargo aircraft only (delete nonapplicable)."

(4) Radioactive material. Each person who offers any radioactive material for transportation aboard a passenger-carrying aircraft shall sign (mechanically or manually) a printed certificate stating that the shipment contains radioactive material intended for use in, or incident to, research or medical diagnosis or treatment.

(5) Signature. The certifications required by paragraphs (a) or (c) of this section:

(1) Must be either signed by a principal officer, partner, or employee of the shipper or his agent; and

(2) May be legibly signed manually, by typewriter, or by other mechanical means.

APPENDIX B

EMERGENCY RESPONSE PROCEDURES PROVIDED TO CARRIER

TO WHOM IT MAY CONCERN:

- (a) Rescue and lifesaving may be conducted with minimal potential hazards from the cargo on this truck. If possible, avoid breathing dust from spilled cargo.
DO NOT DELAY RESCUE EFFORTS!
- (b) After needed rescue, lifesaving, first aid or fire fighting, please read the attached instructions in the event of cargo spillage.
- (c) Please note that a box of emergency equipment was the last item loaded onto this truck. It should be accessible through the rear cargo doors.

TO THE DRIVER:

Keep these emergency procedures with your shipping papers.

This vehicle contains uranium concentrate, which may be either in the form of yellowcake (U_3O_8) or brine. It is a naturally radioactive material of low specific activity. Its color may be yellow, greenish brown, or black. The brine is a liquid material. Neither form of concentrate can burn or explode. It can be approached without danger of injury from external radiation. In the event of an accident involving spillage of concentrate, the following actions are recommended in the order given if appropriate:

I. LIFESAVING, RESCUE, AND FIRE FIGHTING

This may be done with minimal potential hazards from the yellowcake. If possible, avoid breathing and swallowing yellowcake dust or brine. Yellowcake on the skin or clothing is relatively harmless and simple washing methods will remove it. If you believe you may have been contaminated with yellowcake, please notify the Quivira Mining Emergency Response Team upon their arrival at the accident site. To avoid

ingestion of uranium, do not eat, drink or smoke while near the spill. In the event of a fire: the material will not burn or explode. Use respirator (provided) if necessary to avoid breathing smoke from fire due to the possibility of airborne particles if containers have been ruptured. Minimize the amount of water used. There is no reaction with water, but water will disperse the material which will make clean-up more difficult.

2. CONTACT THE LOCAL LAW ENFORCEMENT AGENCY

Tell the police of the accident with spillage of "LOW SPECIFIC ACTIVITY (LSA)" radioactivity material called uranium concentrate - "Yellowcake or brine". Ask them to notify the state health department. Give them the location of the accident site and tell them of any injured persons.

(a)	Colorado State Police	(303) 239-4500
(b)	Illinois State Police	(217) 782-7762
(c)	Kansas State Highway Patrol	(913) 296-3102
(d)	Missouri Highway Patrol	1-800-525-5555
(e)	Nebraska Highway Patrol	(308) 535-8047
(f)	New Mexico State Police	(505) 827-9126
(g)	Oklahoma State Police	(405) 682-4343
(h)	Texas State Police	(806) 359-4751
(i)	Wyoming State Highway Patrol	1-800-442-9090

3. COVER THE SPILLED URANIUM ORE CONCENTRATE

This vehicle carries a box containing gloves, shoe covers, "CAUTION: RADIOACTIVE MATERIAL" signs, four approved dust respirator/user instructions, 1000 square feet of plastic sheeting, tent stakes, nails, a hammer and a knife. Put on the respirator, gloves, and shoe covers, then cover the spilled material with the plastic. Secure the edges of the plastic to the ground using the tent stakes, or to the vehicle floor, etc., using the nails. The "CAUTION: RADIOACTIVE MATERIAL" signs should be positioned to provide notice to bystanders. They should be instructed to stand upwind of the spill and 25 feet or more from it. Undamaged containers lying on the road may be moved to the side of the road.

4. FILL OUT THE QUESTIONNAIRE ATTACHED

Please obtain all of the information required on the attached form. You will need to relay this information to the carrier and the shipper.

5. TELEPHONE THE CARRIER AND THE SHIPPER (CALL COLLECT)

- (a) The carrier is:
Phone the company or unit to whom the truck and trailer belongs. If self owned and operated continue on with phoning procedures.
- (b) The shipper is:
Quivira Mining Company
Security
(505) 287-8851 Ext. 366 (Day or Night)

Read the completed questionnaire to whoever answers your call. If necessary, for complete understanding, read the questionnaire a second time.

6. WHEN HELP ARRIVES

Please cooperate with all civil authorities, carrier's and shipper's personnel who arrive at the scene. Follow their health-safety instructions for checking possible contamination of your clothing or body. Please be assured that your exposure to this material will be relatively harmless if you have followed these instructions. The health-safety personnel who will arrive will be glad to answer any questions you have about this matter.

Thank you very much.

EVALUATION QUESTIONNAIRE

1. Name of Truck Driver _____
2. Name of Trucking Company _____
3. Bill of Lading Number _____
4. Destination of Shipment _____
5. Time of Accident _____
6. Place of Accident _____
7. Name of Police Department Notified _____
8. Phone Number of Police Notified _____
9. Is the Driver Injured? _____ Others? _____
10. Is or Was There a Fire? _____
11. Is the Truck Road Worthy? _____
12. Is It Raining or Was Water Used to Put Out Fire or Wash Off Road?

13. Are Drums Outside of the Truck? _____ How Many? _____
14. Estimate the Number of Square Feet of Spilled Material _____
15. Has the Spill Been Covered? _____
16. Is the Spill on Ground? _____
17. Is the Spill in Water? _____ Lake? _____ Stream? _____
18. Is Spill Near a Building? _____ Sewer? _____
19. Is the Accident Place Lighted at Night? _____
20. What is Nearest Airport? _____
21. Other Comments: _____

22. Where Can You Be Reached by Phone? _____
 - (a) Near the Accident Site _____
 - (b) Home or Business Phone _____
 - (c) Your name please _____

Signature: _____ Date: _____

APPENDIX C

Quivira Mining Company - Ambrosia Lake, NM

Security Guard Notification

		<u>Work Phone</u>	<u>Home Phone</u>
1.	Terry Fletcher	(505) 287-8851 ext. 200	(505) 287-4553
2.	Alberto Delgado	(505) 287-8851 ext. 203	(505) 285-5030

Security Guard Notification Emergency Response Team

		<u>Work Phone</u>	<u>Home Phone</u>
1.	Peter Luthiger	(505) 287-8851 ext. 246	(505) 899-8714
2.	George Trujillo	(505) 287-8851 ext. 250	(505) 287-4216
3.	Don Sweeney	(505) 287-8851 ext. 250	(505) 287-9364

APPENDIX D

Corporate Notification

The General Manager of the Ambrosia Lake facility is responsible for notifying appropriate corporate office personnel.

		<u>Work Phone</u>	<u>Home Phone</u>
1.	Bill Ferdinand (Manager Radiation Safety, Licensing, and Regulatory Compliance)	(405) 842-1773	(405) 341-7075
2.	Marvin Freeman (Vice President)	(405) 848-1187	(405) 341-7919
3.	Rob Luke (President)	(405) 848-1185	(405) 848-4030

APPENDIX E

EMERGENCY RESPONSE
TELEPHONE NOTIFICATION GUIDE

COLORADO

State Police	(303) 239-4500
Health Department	(303) 370-9395
Nuclear Regulatory Commission Operations Center - Bethesda, Maryland	(301) 816-5100
Department of Transportation National Response Center	1-800-424-8802

ILLINOIS

State Police (Command Center)	(217) 782-7762
Patrol Office in Metropolis, Illinois	(618) 542-2171
Emergency Management Agency (In Illinois)	1-800-782-7860
Emergency Management Agency (Outside Illinois)	(217)-782-7860
Nuclear Regulatory Commission Operations Center - Bethesda, Maryland	(301) 816-5100
Department of Transportation National Response Center	1-800-424-8802

APPENDIX E (cont.)

KANSAS

State Highway Patrol (Topeka, Kansas)	(913) 296-3102
Health Department - Environment Division (24 hours)	(913) 296-1500
Nuclear Regulatory Commission Operations Center - Bethesda, Maryland	(301) 816-5100
Department of Transportation National Response Center	1-800-424-8802

MISSOURI

State Highway Patrol - Statewide	1-800-525-5555
Department of Natural Resources Emergency Response (24 hours)	(314) 634-2436
Nuclear Regulatory Commission Operations Center - Bethesda, Maryland	(301) 816-5100
Department of Transportation National Response Center	1-800-424-8802

NEBRASKA

State Highway Patrol - North Platte, Nebraska	(308) 535-8047
Health Department - Environmental Division (8 a.m.-5 p.m.) (After hours - Highway Patrol in Lincoln, NB)	(402) 471-2168 (402) 471-4545
Nuclear Regulatory Commission Operations Center - Bethesda, Maryland	(301) 816-5100
Department of Transportation National Response Center	1-800-424-8802

APPENDIX E (cont.)

NEW MEXICO

State Police - Santa Fe	(505) 827-9126
Health Department - Hazardous Waste (24 hour)	(505) 827-0006
Nuclear Regulatory Commission Operations Center - Bethesda, Maryland	(301) 816-5100
Department of Transportation National Response Center	1-800-424-8802

OKLAHOMA

State Highway Patrol - Oklahoma City, OK	(405) 682-4343
Health Department (24 hours)	1-800-522-0206
Nuclear Regulatory Commission Operations Center - Bethesda, Maryland	(301) 816-5100
Department of Transportation National Response Center	1-800-424-8802

TEXAS

State Police - Amarillo	(806) 359-4751
Health Department - (Region 1)(24 hours)	(307) 777-7756
Nuclear Regulatory Commission Operations Center - Bethesda, Maryland	(301) 816-5100
Department of Transportation National Response Center	1-800-424-8802

APPENDIX E (cont.)

WYOMING

State Highway Patrol	1-800-442-9090
Department of Environmental Quality	
Land Quality Division (8 a.m. - 5 p.m.)	(307) 777-7756
Emergency Management Agency (8 a.m. - 5 p.m.)	(307) 777-4900
Nuclear Regulatory Commission	
Operations Center - Bethesda, Maryland	(301) 816-5100
Department of Transportation	
National Response Center	1-800-424-8802

APPENDIX F

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§ 20.2202 Notification of incidents.

(a) Immediate notification. Notwithstanding any other requirements for notification, each licensee shall immediately report any event involving by-product, source, or special nuclear material possessed by the licensee that may have caused or threatens to cause any of the following conditions—

(1) An individual to receive—

(i) A total effective dose equivalent of 25 rems (0.25 Sv) or more; or

(ii) An eye dose equivalent of 75 rems (0.75 Sv) or more; or

(iii) A shallow-dose equivalent to the skin or extremities of 250 rads (2.5 Gy) or more; or

(2) The release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake five times the occupational annual limit on intake (the provisions of this paragraph do not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures).

(b) Twenty-four hour notification. Each licensee shall, within 24 hours of discovery of the event, report any event involving loss of control of licensed material possessed by the licensee that may have caused, or threatens to cause, any of the following conditions:

(1) An individual to receive, in a period of 24 hours—

(i) A total effective dose equivalent exceeding 5 rems (0.05 Sv); or

(ii) An eye dose equivalent exceeding 15 rems (0.15 Sv); or

(iii) A shallow-dose equivalent to the skin or extremities exceeding 50 rems (0.5 Sv); or

(2) The release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake in excess of one occupational annual limit on intake (the provisions of this paragraph do not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures).

(c) The licensee shall prepare any report filed with the Commission pur-

suant to this section so that names of individuals who have received exposure to radiation or radioactive material are stated in a separate and detachable part of the report.

(d) Reports made by licensees in response to the requirements of this section must be made as follows:

(1) Licensees having an installed Emergency Notification System shall make the reports required by paragraphs (a) and (b) of this section to the NRC Operations Center in accordance with 10 CFR 50.72; and

(2) All other licensees shall make the reports required by paragraphs (a) and (b) of this section by telephone to the NRC Operations Center and by telegram, mailgram, or facsimile to the Administrator of the appropriate NRC Regional Office listed in appendix D to §§ 20.1001-20.2401.

(e) The provisions of this section do not include doses that result from planned special exposures, that are within the limits for planned special exposures, and that are reported under § 20.2204.

[56 FR 23406, May 21, 1991, as amended at 56 FR 40766, Aug. 16, 1991]

APPENDIX G

§ 171.15 Immediate notice of certain hazardous materials incidents. (a) Within 15 days of discovery of an incident involving certain hazardous materials, including hazardous wastes, under the scope of jurisdiction with jurisdiction of this section, any person who determines that an incident has occurred, including loading, unloading, and temporary storage in which as a direct result of the hazardous materials:

- (1) A person is killed;
 - (2) A person receives injuries requiring his hospitalization;
 - (3) A major carrier or other property damage exceeds \$50,000;
 - (4) Fire, explosion, leakage, or suspected radioactive contamination occurs involving shipment of radioactive material (see also §§ 174.43, 175.43, 176.46, and 177.207 of this subchapter); or
 - (5) Fire, leakage, spillage, or suspected contamination occurs involving shipment of toxicologic agents;
- (b) A condition exists or such a notice that in the shipment of the latter materials be required in accordance with paragraph (c) of this section even though no other material elements of paragraph (a) are present, if the condition is a continuing danger to the public or the scene of the incident.

(c) Each notice required by paragraph (a) of this section shall be given to the Department by telephone, letter or electronic mail. Such notice may be given to the carrier, owner, or lessee of the vehicle, or to the Public Health Service, Atlanta, Georgia, or to the State or Federal Department of the Department of Ecology in accordance with § 171.15. Each notice must include the following information:

- (1) Name of reporter;
 - (2) Name and address of carrier represented by reporter;
 - (3) Phone number where reporter can be contacted;
 - (4) Date, time, and location of incident;
 - (5) The extent of injuries, if any;
 - (6) Classification, name, and quantity of hazardous materials involved;
 - (7) Date of incident and nature of hazardous material involvement; and whether a continuing danger to the public exists at the scene;
- (d) Each carrier making a report under this section shall also make the report required by § 171.16.

§ 171.16 Detailed hazardous materials incident reports. (a) Each carrier who transports hazardous materials shall file a report within 15 days of discovery of an incident that occurs during the course of transportation including loading, unloading, or temporary storage in which as a direct result of the hazardous materials, any of the circumstances set forth in § 171.15(a) occurs or there has been an unintentional release of hazardous materials from a package including a spill or any quantity of hazardous waste has been discharged during transportation, if a report pertains to a hazardous waste discharge:

- (1) A copy of the hazardous waste manifest for the waste must be attached to the report; and
- (2) An estimate of the quantity of the waste removed from the scene, the name and address of the facility to which it was taken, and the manner of disposition of the unremoved waste, must be entered in Part H of the report, Form R-1000.

(b) Such carrier making a report under this section shall send it to report to the Information Systems Manager, Research and Public Policy, United States Department of Transportation, Washington, D.C. 20590.

(c) Except as provided in paragraph (d) of this section, the requirements of paragraph (a) of this section do not apply to incidents involving the unintentional release of hazardous materials being transported under the following proper shipping names:

- (1) Corrosive, liquid, organic;
- (2) Corrosive, liquid, inorganic, when shipped with acid or alkali;
- (3) Flammable, liquid, organic, when shipped in packagings of less than 60 L or 1.6 m³.

(d) The exceptions to incident reporting provided in paragraph (c) of this section do not apply to:

- (1) Incidents requiring a report under § 171.15(a);
- (2) Incidents involving transportation of certain types of waste;
- (3) Incidents involving the transportation of hazardous waste.

APPENDIX B

**HANDLING/DISPOSAL OF
BYPRODUCT AND CONTAMINATED WASTES**

QUIVIRA MINING COMPANY

Ambrosia Lake Facility

HANDLING/DISPOSAL OF BYPRODUCT MATERIAL
AND CONTAMINATED WASTE
STANDARD OPERATING PROCEDURE

Original: February 1990

Revised\Reviewed:

October 5, 1990

June 1991

January 1992

June 1992

June 1993

December 1993

June 1994

June 1995