

**MINUTES  
of the  
FIFTH MEETING  
of the  
RADIOACTIVE AND HAZARDOUS MATERIALS COMMITTEE**

**November 28, 2012  
Room 321, State Capitol  
Santa Fe**

**D** The fifth meeting of the Radioactive and Hazardous Materials Committee was called to order by Senator Richard C. Martinez, vice chair, at 10:00 a.m. on Wednesday, November 28, 2012, at the State Capitol.

**Present**

Sen. Richard C. Martinez, Vice Chair  
Rep. Thomas A. Anderson  
Sen. Carroll H. Leavell  
Sen. John Pinto  
Rep. Jim R. Trujillo  
Rep. Shirley A. Tyler  
Sen. David Ulibarri

**Absent**

Rep. Antonio Lujan, Chair  
Sen. Vernon D. Asbill  
Rep. Cathrynn N. Brown  
Rep. Brian F. Egolf, Jr.  
Sen. Stephen H. Fischmann

**Advisory Members**

Sen. Rod Adair  
Rep. Eliseo Lee Alcon  
Rep. Donald E. Bratton  
Sen. Gay G. Kernan  
Sen. Lynda M. Lovejoy  
Sen. Nancy Rodriguez  
Rep. Nick L. Salazar  
Sen. Bernadette M. Sanchez

**A**

Sen. William F. Burt  
Sen. Eric G. Griego  
Rep. Jim W. Hall  
Sen. William H. Payne

**Staff**

Gordon Meeks, Legislative Council Service (LCS)  
Renée Gregorio, LCS

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**Guests**

The guest list is in the meeting file.

**Handouts**

Handouts and other written testimony are in the meeting file.

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**Wednesday, November 28**

## **International Isotopes Status Report**

Steve Laflin, chief executive officer and president of International Isotopes, Inc. (I<sup>3</sup>), introduced the operations and procedures of his company to the committee. As the first commercial depleted uranium facility to be built in the United States, the facility will produce high-value fluoride products during its deconversion process. The company's focus on recycling materials and saving energy is crucial to its "green" mission. He said that a site for the facility has been selected in Lea County and that Nuclear Regulatory Commission (NRC) licensing has been achieved. He described the nuclear fuel cycle, especially the part that URENCO, Inc. plays in uranium enrichment to make uranium useable for fuel reactors. The enrichment of uranium produces depleted uranium, or "tails", a byproduct that his company will address, Mr. Laflin added. In giving more specifics, Mr. Laflin stated that: 1) the enrichment process increases the concentration of U-235 from .7% to 4.5%; 2) it takes 10 pounds of uranium to produce one pound that is useable for fuel; and 3) a typical reactor (1,000 megawatts) requires about 37,000 pounds of enriched uranium per year, and this results in the production of approximately 485,000 pounds of tails.

He said that with the expiration of the "megatons to megawatts program" in 2013, there will be a new opportunity for enrichment facilities in the United States. He referred to the immense stockpile of depleted uranium that has been stored for nearly 50 years already and how I<sup>3</sup> would offer services to process these tails into something of value. In giving a picture of uranium enrichment in the United States today, Mr. Laflin indicated that URENCO, Inc. is the only company currently engaged in this process, although there are three other companies in varying stages of development. He said that URENCO, Inc. is also ready to grow and expand if the other companies do not work out and that I<sup>3</sup> will build alongside URENCO.

Mr. Laflin reviewed the process of bringing in uranium hexafluoride (UF<sub>6</sub>), pulling fluoride atoms off that material and producing fluoride products. He said that the end product of his company's processing is uranium oxide, which is a natural uranium and, as such, is chemically neutral and not radioactive. He emphasized that the I<sup>3</sup> facility brings material in, processes it and then sells it off; I<sup>3</sup> is not a storage facility for any waste. He talked about the use of fluoride products in such product industries as microelectronics, refrigerants, synthetic lubricants and pharmaceuticals.

Mr. Laflin explained how I<sup>3</sup> acquired the assets of the only complete deconversion plant in the country in 2008 and disassembled it to move it to New Mexico. The formal design work shows significant advances, he mentioned, but most of these are proprietary at present. He spoke about the licensing requirements of the NRC and how stringent the safety analysis is — the same procedure through which nuclear reactor facilities go. He explained this process as asking all the "what if" questions to calculate hazards and base corrective actions on the likelihood of such events occurring. He spoke of identifying the hazards, ranking them and sorting out a course of mitigation. In this design phase, he said, his company identified all the systems and functions it would depend on to maintain safety; drew boundaries around systems it would rely on to demonstrate quality and safety to regulators; and trained its operators. He added that even

though I<sup>3</sup> is handling uranium, the plant is a chemical processing plant and no chemical plant in the United States has this level of safety built into it.

In reviewing the accomplishments of I<sup>3</sup>, Mr. Laflin emphasized the success the company has had in garnering state support through the Department of Environment (NMED) and the governor's office because of I<sup>3</sup>'s emphasis on communication with all involved. (See a detailed time line in the handout.) In conclusion, Mr. Laflin stated that the NRC issued a 40-year construction and operating license as a result of I<sup>3</sup>'s efforts. He then spoke of the plant layout plans and the choice of modular construction to separate out processes and buildings and to give I<sup>3</sup> the ability to grow.

In reviewing environmental impacts of I<sup>3</sup>'s process, Mr. Laflin said that there are uranium and fluoride air emissions and that because of this, all effluent systems are triple filtered at the facility. He added that no filters are 100% effective and that the uranium emission exposure is at five millirems per year, which is measured assuming 24-hour-per-day exposure directly at the fence line of the facility. He clarified that one would receive about half as much radiation at the fence line as one would receive living in Santa Fe.

Mr. Laflin gave an overview of radon levels in the state, with the north central region exhibiting a high annual dose and the rest of the state falling in the moderate range. With regard to fluorine air emissions, he indicated that the largest sources are from coal-generating stations. In terms of water usage, Mr. Laflin said that the facility's usage is minimized through recycling and is estimated at fewer than 10,000 gallons per day. In addition, he said that there is no discharge of processed water into the environment — all of it is recycled and reused. He added that the sanitary wastewater will be treated and discharged onto the property for small nursery or agricultural product use.

With a project cost of \$115 million, I<sup>3</sup>'s benefit to New Mexico will be substantial, and that benefit includes an education reimbursement program at 100%, about 250 construction jobs and 125 full-time professional staff positions. Mr. Laflin indicated that the project will put New Mexico on the map because a manufacturing source of fluoride products does not yet exist in the United States. He added that with I<sup>3</sup>'s 40 acres near the middle of a full section of property, there will be plenty of room for other companies to co-locate alongside I<sup>3</sup>.

Mr. Laflin also spoke about the financial difficulties the nuclear industry faces after the Fukushima Daiichi nuclear disaster. He said that Southeast Asia looks like the next growth place for nuclear energy. He spoke of I<sup>3</sup>'s biggest limitation to funding as being the NRC license itself, but now that the NRC licensing has been obtained, I<sup>3</sup> is working hard to build this project. The only permit remaining in New Mexico is the ground water permit, he added. He said that construction of monitoring wells would start after January 1, and once financing is in hand, construction would begin. I<sup>3</sup> plans on being in full operation by the middle of 2014. Mr. Laflin concluded his presentation by stating that this project fills a void in the fuel cycle, that it deals with waste in a proactive and environmentally friendly way, that it provides employment for New Mexicans and that safety and environmental protection is I<sup>3</sup>'s number one concern.

Committee member questions and ensuing discussion included:

- the Idaho operation differs from I<sup>3</sup>'s new facility in that it has been functioning for 12 years and it produces nuclear medicine products;
- the current number of nuclear power plants permitted at present in the United States is 103, and four new plants are under construction;
- depleted uranium is initially owned by URENCO, Inc., or the enrichment company, then the title changes to I<sup>3</sup> when it takes it for processing, then is transferred again to the United States Department of Energy after processing;
- UF<sub>6</sub> is only handled when it is in a solid state;
- I<sup>3</sup>'s customers include a large distribution company that I<sup>3</sup> contracts with for distribution of hydrochloric acid and another company it contracts with for its fluoride products;
- I<sup>3</sup> supplies the raw fluoride product, such as a fluoride compound gas, and then contracts with companies that manufacture, for example, synthetic lubricants;
- southern New Mexico was chosen by I<sup>3</sup> as its location for this facility largely because it is a community already involved with the nuclear industry and was welcoming;
- out of 125 jobs at I<sup>3</sup>'s new facility, 75% are technician-level jobs for which the average compensation is an annual salary of \$40,000 to \$80,000, which includes full medical benefits; and
- uranium is a global business, with most of it being mined in Canada alongside the needed chemical cleanup and purification.

### **Approval of Minutes**

The minutes from the fourth meeting of the Radioactive and Hazardous Materials Committee, which met on October 22, 2012, were unanimously approved on a motion by Representative Anderson, seconded by Representative Tyler.

### **Corrective Action Fund Status Report**

Jeff Canney, Legislative Finance Committee program evaluator, gave a presentation on the status of the Corrective Action Fund (CAF), which provides for financial assurance coverage to take corrective action in response to a petroleum release, to pay for the costs of a minimum site assessment, to pay the state's share of federal leaking underground storage tank trust fund cleanup costs, to make payments to or on behalf of owners and operators for corrective action, to match federal funds for underground contamination cleanup and to address water needs. Mr. Canney indicated that the goal of his findings is to provide accountability and strength in government processes. He stated that petroleum as a hazardous waste can cause contamination to ground water and should be of interest to everyone. Referring to his brief, Mr. Canney highlighted figures leading to annual "revenue by the truckload". With 1.4 billion gallons of gasoline consumed per year in the state, and with a loading fee of \$110 per 8,000-gallon delivery, which goes into the CAF, the fund earns more than \$18 million per year.

Mr. Canney reported that most of the state's 3,880 underground storage tanks (USTs) have or will release petroleum into the environment through spills, overfills or tank system failures. The Petroleum Storage Tank Bureau (PSTB) of the NMED is responsible for

overseeing administration of the CAF and for tank inspections and cleanup. Among the key findings, which focus on spills from the USTs, Mr. Canney's report indicated: 1) 66% of USTs were in compliance with regulations, which is behind the national average of 71%; 2) remediation of 739 contaminated sites would cost the state about \$263 million; and 3) the PSTB process for remediation does not follow federal Environmental Protection Agency (EPA) standards in regard to expedited site assessments and pay-for-performance contracts. Mr. Canney referred to Table 2 in his report, which shows New Mexico's UST compliance measured against the national average, and which indicates a gradual improvement over time in the national average and a declining trend in New Mexico's averages, with figures bottoming out in 2008 and 2009 when the PSTB introduced higher standards. He said that an upward trend should continue and indicated that the "prohibition of delivery" amendment to regulations in New Mexico, which prevents noncompliant operators from receiving gasoline deliveries, is a success for the state. He added that data in Table 2 are reported to the EPA and are included in future performance reports.

In a table showing cleanup inventory, Mr. Canney noted that ending inventory dropped from 784 to 722 between 2006 and 2011 and that the net reduction percentages indicating progress drastically slowed in those same years. In addition, in 2009, 85 sites were added back into the inventory. In showing graphs of both national progress and New Mexico progress in cleanup measures, which are both reported to the EPA, Mr. Canney said that these also need to be included as a state performance measure. He added that New Mexico remediates both the soil and the ground water below it, which contributes to higher cost and longer remediation times. He said that more than 700 sites remain to be remediated.

Mr. Canney mentioned that because the PSTB's site assessments are not done in a complete manner, the planning of the site's remediation and the selection of appropriate technology is not accomplished in a fashion that rewards contractors for reaching cleanup goals rather than for completion. In addition, the PSTB does not disburse payments to vendors based on contamination level reduction and hires vendors in a way that removes incentives for quick remediation by not basing payment on performance.

He spoke of the Grants Triple Site as the top priority for the PSTB and as one of the most expensive remediation projects in the state, for which Brown Environmental, Inc., won the bid. Mr. Canney talked about the Triple Site cleanup contract, which amounted to \$1.39 million, expanded to a four-year project and is still active. He added that the EPA should have done a site assessment first and then awarded vendors for their speed in finishing the project. He then mentioned 24 states that either have retired or intend to retire their CAFs.

Featured in Table 14 of the report is the allocation of the CAF in New Mexico, and Mr. Canney stated that the United States Government Accountability Office reported that New Mexico transfers more out of its CAF than any other state for purposes other than the UST program. He showed in a graph format the uses of CAF revenues, noting that 55% of the fund is available for remediation purposes. Mr. Canney then spoke of the current UST inventory, which is at 739 sites that could be eliminated by 2032 at the cost of \$263 million. He said that the

NMED's goal is to close 30 sites per year and that once these spill sites are cleaned up, the state could move this funding to focus on other key areas.

Mr. Canney mentioned that the PSTB was without a chair and had not met for a long time, but fortunately will meet on Friday, December 14, 2012. Among the reporting and accountability recommendations that Mr. Canney's report advocates are: 1) report quarterly compliance percentages; 2) report the number of cleanup sites in inventory and prioritize those sites; 3) report annual goals by priority for the number of closed sites from inventory; 4) report annually the projected year for the elimination of cleanup inventory; 5) conduct site assessments prior to executing work plans; and 6) execute pay-for-performance contracts and work plans. (See handout for details of these recommendations.)

Committee member questions and ensuing discussion included:

- Mr. Canney would like more accountability in compliance and cleanup measures; regulations to prevent and stop a leak if it occurs; a reporting mechanism in place for the state; and a way to encourage speed in remediation of sites; and
- incentives might be needed for fast cleanup of the 700-plus sites that need remediation, and the NMED could institute goals on yearly achievement as a means of accomplishing cleanup of these sites.

On request from a committee member to hear the NMED's response, Jim Davis, director of the Resource Protection Division, NMED, stated that the PSTB is within the division's purview and that he also served as bureau chief and feels that the program is mischaracterized by Mr. Canney's report. He said that New Mexico regulates above-ground storage tanks, too, which is one-third of the program. He said there are more than 800 sites still on the books, but there were 3,000 sites at the beginning of the program.

Mr. Davis stated that there are two types of storage tanks: "those that have leaked and those that will". He also said that although new releases are diminishing, the NMED still finds legacy releases — many along Interstate 40. He spoke of how difficult it is to plan for the sort of releases that do occur, such as releases from closed gas stations or releases at the new Santa Fe County Courthouse in Santa Fe, where old gasoline from gas stations operating in the 1930s to 1950s had to be cleaned up. Mr. Davis argued that the cleanup program is doing exactly what it was designed to do. He said that the NMED is not paying for the remediation currently underway at Kirtland Air Force Base, where there was the largest petroleum release in the state's history, which began in the late 1950s and extended until it was discovered in 1999. He added that the United States Air Force is paying for this remediation under a pay-for-performance contract.

Committee member questions and ensuing discussion included:

- the NMED stated that the procedure for cleanup begins with a site assessment paid for by the company and the fund, then design on active remediation follows, and then the NMED issues a request for proposals for the work;

- in cases where the owner of the property that needs cleanup is in question, the state takes over responsibility;
- there is a need to protect the future of the state by being cautious about industries that cause remediation to be necessary in the first place, with many of the top-priority sites caused by gas spills during the boom of the Grants area uranium industry;
- the NMED has a huge task on its hands, and there are always a lot of surprises in the business of remediation;
- the loading fee is in Taxation and Revenue Department statutes and is collected at the loading rack, of which \$110 of the \$150 per load goes to the NMED; of this, 30% is used to match federal grants for water protection programs and for PSTB operations; and 10% to 12% goes to direct remediation;
- the state needs to train operators for emergency action to prevent a catastrophic petroleum release, and the NMED has seen remarkable progress in terms of the knowledge of operators and the strong collaboration with the petroleum industry in operator training; and
- it is the work of the PSTB to make sure the CAF is spent properly.

## Sinkholes

Dr. Courtney Herrick, Sandia National Laboratories, gave the committee an overview of sinkholes, which are formed by the dissolution and collapse of a cavern roof and are sometimes natural and other times man-made. He said that in a true sinkhole, the soil keeps going down into the hole. Dr. Herrick stressed that sinkholes occur in evaporite rock regions, and they can form gradually or suddenly. He added that sinkholes are found all over the world, as evaporite rocks lie underneath over 20% of the world's land surface and underneath approximately 35% to 40% of the United States. Noteworthy in what Dr. Herrick pointed out is that a large portion of New Mexico shows a prevalence of evaporite rock. The natural formation of breccia pipes and mining have both created sinkholes.

He gave details as to how sinkholes are formed in other parts of the world and said that sinkholes can be stabilized naturally. Dr. Herrick defined stability as a function of thickness of the roof, width of the cavity, rock mass strength and the stress condition of the ground. He discussed how structural analysis of a cave roof is handled and said that rock mass strength is difficult to assess. Dr. Herrick discussed several charts in his handout that correlate roof thickness and cavity span in relationship to the failure of intact beams and that compare roof thickness, cavity span and rock mass rating. (See handout for details of these charts.) He gave a rule of thumb for cavity formation, which speaks of the ratio between cavern diameter and cavern depth in relationship to cratering.

He then discussed the rock mechanics' view of caving, which has been identified as chimney failure, block caving and plug subsidence. (These are shown in detailed drawings in the handout.) Dr. Herrick described the major reason for sinkholes as being a loss in the water table and advocated controlling water depth. He said that sinkholes can be prevented by not allowing unsaturated water to flow into the evaporite rock. This can be accomplished, he added, through geologic mapping of the subsurface; assessment of the area's hydrogeology; designing

engineering systems to prevent unwanted penetration; proper design, construction and maintenance of mines; and proper casing or sealing-off of beds when boreholes are drilled into evaporite rock.

Committee member questions and ensuing discussion included:

- there are many cases of sinkholes being prevented by keeping a roof from caving in through monitoring pressure in the cavity continuously to ensure that a sinkhole is not forming; and
- in making general recommendations about the brine well issue in Carlsbad, Dr. Herrick said that making assessments after the fact is a lot more difficult than before, but he would begin looking at characterization of the cavity through recommended methods, such as three-dimensional seismic chromography, ground penetrating radar and metallurgy.

### **Mercury-Filled Light Bulbs**

Steve Pullen, manager, Hazardous Waste Bureau's Compliance and Technical Assistance Program, NMED, gave the committee an overview of the history, regulations, mercury reduction plans, recycling programs and environmental management of mercury light bulbs. He mentioned the two types of mercury bulbs: fluorescent tubes and compact fluorescent light bulbs (CFLs). He said that these bulbs are replacing incandescent bulbs, as they are 10 times more energy-efficient. The amount of mercury in these bulbs varies from three milligrams (mg.) to 46 mg., as compared to the amount of mercury in old thermometers, which was 500 mg., he added. He also said that production is moving more toward "green" bulbs, with less and less mercury in the new bulbs. He spoke of mercury's numerous forms — solid, vapor (low vapor point) and liquid — and said that in bulbs, mercury exists in its elemental form. He spoke of mercury as a toxin that can affect the nervous system and that is most toxic in relationship to the transportation, recycling and disposal of bulbs.

Mr. Pullen then delineated the history of the regulation of mercury bulbs, with mercury first becoming a hazardous waste in 1976. It was not until 1985 that New Mexico began regulation of mercury as a hazardous waste. He added that the NMED's involvement includes the regulation of bulbs in medium- to large-sized businesses, and the Solid Waste Bureau of the NMED oversees its use at solid waste facilities across the state.

He spoke of House Memorial 5 from the 2006 legislative session, which required the NMED and the Department of Health (DOH) to develop a mercury reduction plan. In October of this year, he added, the manufacturing of incandescent bulbs became illegal. Regarding the regulation of mercury bulbs, Mr. Pullen gave details on the mercury concentration that constitutes hazardous waste and discussed the option that businesses have to manage bulbs as either hazardous waste or universal waste. He also mentioned that the universal waste rule does not apply to businesses that generate 220 pounds or less per month of waste and that households are not subject to either rule.

He then gave details of the mercury reduction plan, stating that in the memorial, the responsibilities of the NMED and the DOH were not made clear. The plan includes strategies on mercury reduction and a study to create an inventory of mercury sources, wastes and emissions; to establish a monitoring program that assesses mercury contamination; and to educate the public. He added that the Solid Waste Bureau of the NMED has funded mercury bulb crushing machines at two solid waste facilities. He also reviewed recycling efforts and percentages and cost variance nationwide for the disposal of mercury bulbs. Apparently, no business in New Mexico is permitted to recycle regulated bulbs, he added. Many distributors have programs to take back mercury bulbs, such as at The Home Depot and Lowe's, and the Solid Waste Bureau and the National Electrical Manufacturers Association have lists of recycling sites on their web sites.

Next, Mr. Pullen reviewed the NMED's best management practices related to mercury bulbs, which include storing them to avoid breakage, closing containers and ensuring that they are structurally sound, labeling, informing employees about the danger of mercury in lamps, training employees to handle these materials and making sure there is documentation to show that the lamps have been properly recycled.

In conclusion, Mr. Pullen spoke about the environmental effects of mercury bulbs, saying that they release one-quarter of the amount of mercury as that of incandescent bulbs, which, although they contain no mercury, indirectly cause high mercury emissions due to their high use of energy, which is often generated from coal-fired plants. He noted that 50% of atmospheric mercury emissions in the United States comes from coal-fired plants.

Committee member questions and ensuing discussion included:

- the NMED's Solid Waste Bureau recommends that landfills not dispose of mercury bulbs and recycle them to an appropriate facility, although there is only a small percent being recycled;
- there is concern over the hazardous release when mercury bulbs are stepped on, as well as subsequent, often ghastly, injuries, and how to properly disseminate information to citizens;
- the NMED has recycling days and sets up booths at county and state fairs to inform citizens and encourage recycling as well as produces brochures on safe management practices; and
- although committee members had several concerns for household safety and regulation and the control of mercury-producing products in general, as well as lead contained in ceramics coming over the border from Mexico, the NMED does not regulate individuals or households, just businesses.

### **Adjournment**

There being no further business, the committee adjourned at 3:05 p.m.