Testimony of Mark Whitney

Acting Assistant Secretary for Environmental Management

U.S. Department of Energy

Before the

Subcommittee on Oversight and Investigations

Energy and Commerce Committee

U.S. House of Representatives

Waste Isolation Pilot Plant Public Hearing

June 12, 2015

Good morning and thank you Mr. Chairman, Ranking Member DeGette, and distinguished members of the Subcommittee on Oversight and Investigations. I appreciate the opportunity to be here with you today to share our commitment and vision on the critically important topic of the Department of Energy's (DOE) ongoing recovery of the Waste Isolation Pilot Plant, otherwise known as WIPP, and the associated Accident Investigation Board (AIB) Reports and management improvement efforts.

I want to thank the Committee for their interest in WIPP recovery. As a result of the events at WIPP, the repository is currently shut down and is not accepting any transuranic waste shipments. I know we share a common goal of restarting WIPP operations as soon as we can safely do so. I appreciate the opportunity to be here today to discuss the important progress we are making in recovering WIPP.

Safety Focus

First, let me state that safe performance of work is our over-arching priority. It has been my commitment and has also been stated by the Secretary. This will not be compromised. The Department's first responsibility is to protect the workers, the public, and the environment in the cleanup mission. Safety first is the clear expectation behind every decision and activity we undertake in our WIPP recovery efforts.

Safety has been a core value and integral part of the Office of Environmental Management's (EM) vital mission from its inception. Our goal is to continuously improve our performance and operations in the spirit of integrated safety management. Having a healthy and proactive safety

culture in EM means our values and behaviors are modeled in our leaders and internalized by all employees. Safety first is imperative to our recovery efforts and this starts with the behaviors demonstrated by our managers at Headquarters and in the Field, both Federal and contractor. I continue to set the expectation for the EM workforce that safety is integral in the accomplishment of our mission.

WIPP Background

WIPP is a DOE facility designed and constructed to perform one primary mission — safely and permanently dispose of the Nation's transuranic waste materials generated by atomic energy defense activities. Transuranic waste is defined in the WIPP Land Withdrawal Act as waste containing alpha-emitting radionuclides with half-lives greater than 20 years, in concentrations of greater than 100 nanocuries per gram. This legacy waste is a by-product of nuclear weapons research and production, facility dismantlement, and site cleanup. Legacy transuranic waste inventories are located at five remaining large quantity sites - Hanford Site (Washington State), Idaho National Laboratory (Idaho), Los Alamos National Laboratory (New Mexico), Oak Ridge National Laboratory (ORNL), and Savannah River Site (South Carolina) - and 3 additional small quantity sites across the country. The DOE has completed cleanup and closure of one large quantity site, the Rocky Flats Environmental Technology Site (Colorado), and another 20 small quantity sites, with transuranic waste shipped and disposed of at WIPP.

WIPP is authorized to dispose of contact-handled and remote-handled transuranic waste (mixed waste contains hazardous as well as radioactive constituents). Contact-handled transuranic waste has an external radiation dose that is low enough to allow "hands on" container handling. Remote-handled transuranic waste radiation requires remote handling. WIPP is crucial to DOE for completing its cleanup and closure mission for transuranic waste.

What Happened and DOE's Response

Two separate events took place at WIPP in February 2014. On February 5, 2014, a vehicle used to transport salt caught fire in the underground. Workers were safely evacuated and the underground portion of WIPP was shut down. The fire resulted in minor smoke inhalation to six workers, but it did not adversely impact the public or the environment.

On February 14, 2014, a second unrelated event occurred when a continuous air monitor detected a radiological release in the underground. The underground ventilation system automatically switched to High Efficiency Particulate Air (HEPA) filtration and the HEPA fan damper was manually opened and adjusted to achieve designated airflow. The airflow was reduced from 425,000 cubic feet per minute to 60,000 cubic feet per minute. No employees were in the underground at the time. Redirecting the ventilation through the HEPA filters is designed to protect aboveground workers at the site and the public in the surrounding areas by minimizing radiation releases to the environment.

Actions were taken immediately following the incident to determine the extent of impact to WIPP personnel, the public, and the environment. Activities included radiological surveys across

the WIPP site and adjacent areas, as well as collection and analysis of environmental and personnel bioassay samples. Periodic air sampling downstream of the HEPA filters was conducted and publicized on the WIPP recovery website. Soil, surface water, sediment, animal, and vegetation sampling were performed. Slight amounts of off-site contamination were briefly detected at sampling locations immediately after the event. Since then, all samples show no detectable contamination. The Carlsbad Environmental Monitoring & Research Center, which conducts independent monitoring, has documented that all activity levels are below environmental or public concern.

After these events, the Department established two independent Accident Investigation Boards (AIB) to fully investigate the events in accordance with DOE Order 225.1B, *Accident Investigations*. DOE Order 225.1B prescribes organizational responsibilities, authorities, and requirements for conducting investigations of certain accidents occurring at DOE sites, facilities, areas, operations, and activities. The purpose of the accident investigation is to understand and identify the causes that contributed to the accident so those deficiencies can be addressed and corrected. This is intended to prevent recurrence and promote improved environmental protection and safety and health of the workers and the public. Moreover, accident investigations are used to promote the values and concepts of a learning organization, as part of the Department's Integrated Safety Management processes.

The AIB reports document the Judgments of Need. These are managerial controls, safety measures, or human performance improvements necessary to prevent or minimize the probability or severity of a recurrence of an accident. The responsible organization, Federal and/or contractor, prepares corrective actions, which are documented in Corrective Action Plans that are approved, completed and implemented to satisfy the Judgments of Need.

The AIB Board Chairman for both WIPP events was a member of the Senior Executive Service and had no line management responsibilities related to WIPP or the National Transuranic Program. The board members were subject matter experts in areas related to the accident, including knowledge of the Department's Integrated Safety Management directives. All of the AIB members were selected from different duty stations than the accident location. These professionals were also independent of the management chain of command responsible for the WIPP site.

The AIB's report on the haul-truck fire was released March 13, 2014. The report details a number of Judgments of Need that form the basis for corrective actions in the recovery plans, designed to prevent the recurrence of such an event. It also identified issues including maintenance, fire protection, training and qualifications, emergency response/preparedness, oversight, and included other areas where the Department should evaluate processes or procedures, and develop and implement corrective actions.

The AIB Phase I Report related to the radioactive material release event was issued on April 24, 2014, and focused on the site's response to the radioactive material release, including related exposure to above-ground workers and the response actions. The Phase I Report covered many of the safety management programs and systems, including nuclear safety (e.g. hazards analysis

and safety-significant classification), maintenance, radiological protection and controls, emergency management, integrated safety management, safety culture and oversight.

The AIB Phase II Report was issued April 16, 2015 and focused specifically on what caused the radiological release and how to prevent a reoccurrence. I will discuss this in more detail.

Recovery Status

We have made considerable progress towards safely recovering WIPP over the past 16 months, including immediate response to the incidents, evaluation and investigation into these events, approval and implementation of the Corrective Action Plans for the fire event and radiological release related to the Phase I findings and issuing the high-level WIPP Recovery Plan.

We will resume operations at WIPP when it is safe to do so. The Department's current target date to resume waste emplacement operations is in the first quarter of calendar year 2016. Prior to the resumption of operations, we will:

- Properly establish safety management programs;
- Upgrade the Documented Safety Analysis to the latest DOE standards; and
- Develop and implement a Corrective Action Plan to address the AIB Phase II Report.

Strengthening safety management programs is among the highest priorities within the Department and of great importance to the Secretary and to me. The AIBs identified a number of weaknesses in the safety basis and safety management programs at WIPP that are being addressed. DOE Headquarters, the Carlsbad Field Office (CBFO) and the WIPP management and operations contractor, Nuclear Waste Partnership LLC, (NWP) are implementing corrective actions documented in the Corrective Action Plans related to Phase I findings to strengthen WIPP's nuclear safety, fire protection, emergency management, oversight and radiological and maintenance programs.

We are methodically working through re-establishing safe operations, rigorously implementing training on new procedures and processes, and responding to concerns of the New Mexico Environment Department, the Environmental Protection Agency, the Defense Nuclear Facilities Safety Board, the Mine Safety and Health Administration, and the Department's Office of Enterprise Assessment. We are currently working on corrective action plans in response to the AIB Phase II Report. When these programs, procedures and safety basis are in place and the workers have completed ongoing training, we will then conduct a comprehensive review of operational readiness, which will include formal Operational Readiness Reviews, at both the contractor and Federal levels, to ensure that we are prepared to safely restart operations.

Underground entries, which were by necessity slow and limited in the weeks following the radiological event, are now safely performed on a daily basis, and we have been working multi-shift operations since February 2015. Restoration of the underground includes radiological surveys, radiological buffers in non-contaminated areas, ground control stability inspections, roof-bolting and equipment maintenance. To date, over 2,100 roof bolts have been installed,

which is essential to WIPP safety. We are finishing the cleaning of electrical equipment from smoke damage and we are approximately 80 percent complete. Restoration and maintenance of required equipment is ongoing. The waste hoist was returned to service in November 2014, allowing more personnel, larger equipment, and materials to be transported into the underground.

As an element of the formal accident investigation, we undertook an effort to perform a comprehensive video inspection of all waste stacks in Panel 7, Room 7, called Project Reach. Aerial videos over the waste stacks and between the waste stacks were recorded and completed in late January 2015. Photographic and video examination found no other breached drums. Successful completion of Project Reach allowed for issuance of the final AIB Phase II Report and the Technical Assessment Team Report. This was a critical step in continuing our recovery actions.

Work is being performed in contaminated areas. The decontamination approach for the walls is to apply a water mist to create a crust on salt surfaces, followed by a spray-on fixative for areas of higher activity. The sides, or ribs, of Rooms 1-6 in Panel 7 have been spray washed with water. Continued washing is in progress with the goal of downgrading Panel 7 from a potential airborne contamination area, based on radiological surveys. This will decrease the level of radiological protection necessary for workers, thereby increasing the efficiency for work in this panel.

Adequate ventilation is required for habitability of the underground including removal of dust during mining and removal of exhaust fumes during diesel engine operations. Increasing ventilation capacity is a principal requirement for safe underground operations. Additional ventilation is necessary because the facility is now, and has been since the incidents, operating in High Efficiency Particulate Air (HEPA) filtration mode, at a reduced airflow of 60,000 cubic feet per minute, as compared with 425,000 cubic feet per minute that is required for full underground operations. The reduced airflow significantly limits the number of workers in the underground and the number of diesel engines that can be operated at any one time. Our plan is to increase ventilation in three phases to support increased underground operations.

- Phase 1--Interim Ventilation: This ongoing first phase is the installation of two skid-mounted fans, which will allow increased activities requiring diesel engines, such as roof bolting, and will provide redundancy with the current HEPA filter system operations.

- Phase 2—Supplemental Ventilation: Additional fans will be added with ducting and bulkheads reconfigured. This reconfiguration allows for increased activities that create fumes and dust, including very limited mining and initial waste operations.

- Phase 3—Permanent Ventilation System: Required prior to resuming full operations, this last phase will restore WIPP to its pre-incident airflow capacity for mining and waste operations.

The initial closure of Panel 6 and Panel 7, Room 7, the underground areas containing the nitrate salt drums, is complete. This has been a priority for us and the New Mexico Environment Department, in order to permanently isolate the drums associated with the Los Alamos National Laboratory (LANL) waste that was the source of the radiological release. Other required activities included bolting in contaminated areas, construction and sealing of bulkheads, and movement of salt for Panel 6. The initial closure for the Panel 6 was completed on May 13, and closure of Panel 7 was successfully completed on May 29, ahead of schedule.

Accident Investigation Boards

The scope of the AIB's investigation was to identify relevant facts; analyze the facts to determine the direct, contributing, and root causes of the event; develop conclusions; and identify Judgments of Need for actions that, when implemented, should prevent recurrence of the accident. Facts relevant to the event were gathered through over 140 interviews and reviews of documents and other evidence, including photographs, videos, and other forensic evidence. The AIB also established a hotline at both WIPP and LANL to allow personnel to communicate concerns or other related information to the AIB. The Board analyzed the facts and derived causal factors (direct, root, and contributing causes) including those associated with human performance and safety management systems using event and causal factors analysis, barrier analysis, change analysis, and root cause analysis.

The AIB Phase 1 report identified the root cause of the release of radioactive material from underground to the environment to be NWP's and CBFO's management failure to fully understand, characterize, and control the radiological hazard. The cumulative effect of inadequacies in ventilation system design and operability compounded by degradation of key safety management programs and safety culture resulted in the release of radioactive material from the underground to the environment and the delayed/ineffective recognition and response to the release.

The AIB Phase II Report identified the direct cause of the radiological release to be an exothermic reaction of incompatible materials in LANL waste drum 68660 that led to thermal runaway, which resulted in over-pressurization of the drum, breach of the drum, and release of a portion of the drum's contents (combustible gases, waste, and wheat-based absorbent) into the WIPP underground. This was based on the AIB's extensive visual surveillance, chemical and radiological sampling, modeling, and source term calculations.

Root causes can be local (specific to the one accident), and/or systemic (common to a broad class of similar accidents). For this accident, the AIB identified both local and systemic root causes.

The AIB identified the local root cause of the radioactive material release in the WIPP underground to be the failure of LANL's management and operations contractor, Los Alamos National Security, LLC (LANS), to understand and effectively implement the LANL Hazardous Waste Facility Permit and CBFO-directed controls. Specifically, LANL's use of an organic wheat-based absorbent instead of the directed inorganic absorbent, such as kitty litter/zeolite clay

absorbent, in the glovebox operations procedure for nitrate salts resulted in the generation, shipment, and emplacement of a noncompliant, ignitable waste form.

The AIB identified the systemic root cause as failure by the Los Alamos Field Office and CBFO's National Transuranic Program to ensure that LANL had adequately developed and implemented repackaging and treatment procedures and requirements that incorporated suitable hazard controls and included a rigorous review and approval process.

Based upon the evidence obtained during this accident investigation, the AIB concluded that the release from the drum was preventable. The AIB identified 40 specific Judgments of Need requiring action by Headquarters and both the Federal offices and contractors at WIPP and Los Alamos. The Department is in the process of developing formal Corrective Action Plans in response.

The Department is not waiting for formal issuance of the Corrective Action Plan for Phase II and corrective actions are ongoing. Examples include the improvements to oversight of the transuranic program(e.g., planning for waste generator site reviews of transuranic waste processing systems); approval of all new and revised Acceptable Knowledge Summary Reports prior to certification; improving the quality of CBFO oversight at WIPP and at waste generator sites; increased reviews of procedure changes (e.g., changes that could lead to waste incompatibilities); improving interactions with generator site DOE offices to verify appropriate levels of oversight are provided; increasing oversight in the area of Acceptable Knowledge verification; and clarifications of roles and responsibilities.

Technical Assessment Team

In parallel with the AIB investigation, the Department established a Technical Assessment Team to determine the mechanisms and chemical reactions that may have resulted in the failure of the waste drum. The Technical Assessment Team was led by Savannah River National Laboratory and was composed of scientists from Savannah River National Laboratory and other DOE national laboratories, including Lawrence Livermore National Laboratory, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Sandia National Laboratory and Idaho National Laboratory. The multi-laboratory composition of the Technical Assessment Team included scientific subject matter experts in many disciplines – sampling and analysis, forensic science, modeling, and reaction chemistry. This diversified team approach ensured that the appropriate expertise was available to assess the event and to support DOE's implementation of WIPP recovery actions. The participation of many scientists enabled the generation and peer-review of scientifically-based conclusions. The Technical Assessment Team maintained independent authority to direct all activities within its charter.

The team made key determinations in its final report that was released on March 26, 2015, concluding that the contents of the drum involved were chemically incompatible; the drum breached as the result of internal chemical reactions that produced heat and gas buildup; and LANL drum 68660 was the source of the radiological release in the WIPP underground.

The results of the Technical Assessment Team provide useful lessons learned and tools as WIPP continues to move toward resuming operations at the facility.

Accountability, Responsibility and Transparency

As previously stated, the purpose of the accident investigations was to gather and analyze the facts, determine why the incidents happened and if it was preventable, to identify causal factors and conclusions, and to provide clear recommendations to prevent recurrence of the event. The Accident Investigation did not seek to affix blame.

The AIB's reports identified weaknesses in understanding and effectively implementing controls at WIPP and LANL, and at the site offices and Headquarters in conducting effective line management oversight and holding personnel accountable for correcting repeat issues. The AIB also identified weaknesses in the execution of the NWP's Contractor Assurance System, which did not identify precursors to these events.

EM, the National Nuclear Security Administration (NNSA), NWP, and LANS are working to develop corrective actions to address the issues identified in the AIB Phase II Report.

In addition, the CBFO significantly reduced the total fee available to NWP following determinations by the AIB of NWP's level of culpability and poor response to the February 2014 fire and radiological release events. As a result, NWP earned a total fee of $561,000, approximately 7 percent of the total $8.2 million maximum available for Fiscal Year 2014.

Oversight Improvements

Since the WIPP truck fire and radiological release events, EM has been working diligently to improve oversight, both at the Headquarters and CBFO levels. To ensure the continued health and safety of the workers, the public and the environment, the Department must provide effective and comprehensive oversight of the work at every phase and level. All three of the AIB reports identified weaknesses in these areas. EM is committed to continuous improvement to strengthen federal and contractor oversight competencies. Many of these actions are being, or have already been, implemented.

Following the February 2014 events, the CBFO Manager conducted an evaluation of WIPP's organizational structure to identify specific staffing needs related to line management, technical discipline, current oversight functions, and overall performance and effectiveness. As a result of that evaluation, the Office of Operations Oversight was established. The objective was to segregate operations, safety, engineering and environmental oversight for WIPP facility operations from programmatic production activities to enhance oversight independence, particularly through the recovery phase. The newly-established Office of Operations Oversight is developing and implementing a new contractor oversight program that fully addresses the requirements of DOE Order 226.1B, *Implementation of the Department of Energy Oversight Policy*. The program will ensure that processes for planning, conducting and documenting oversight evaluations of NWP programs and activities are developed, issues are evaluated and

corrected to prevent recurrence and communicated to management in a timely manner; and CBFO oversight personnel are highly qualified and trained to perform their oversight function. The CBFO Manager, along with the Office Assistant Managers and Division Directors, are holding personnel accountable for implementation and operation of the oversight program by revising position descriptions for their staff to identify expected oversight functions for the position.

Additional steps the Department is taking to improve oversight include documenting the Headquarters and CBFO Corrective Action Plans to respond to the AIB's Judgments of Need. EM Headquarters has also increased oversight in the areas of safety programs and waste management. The EM Office of Safety, Security and Quality Programs has an increased level of oversight responsibility for coordinating the recruitment, logistics, and management of subject matter experts from offsite organizations to provide improved oversight of WIPP contractor activities in the areas of Operations, Radiological Protection, Maintenance, Nuclear Safety, Work Planning and Control, Safety System Engineering, and Management. EM Headquarters provides oversight of the emergency management program by working with the Federal site staff; attending, evaluating and completing more assist visits; and conducting "Assist and Assess Reviews." Approximately a dozen of these visits have taken place in 2014 and 2015.

Headquarters has also been providing critical reviews and comments of CBFO and the contractor's Corrective Action Plans developed in response to the Accident Investigation Board reports.

Additionally, in the area of waste management, the CBFO and EM Headquarters have increased oversight prior to the resumption of repackaging of transuranic waste. Examples include: the CBFO certification program is focusing additional efforts on understanding and validating waste stream information supporting Acceptable Knowledge, the Central Characterization Project interface agreement is being revised to ensure any anomalies on specific waste is directed through the proper channels; the reviews of procedure changes are being increased, amplified presence at waste generator sites and interactions with generator site DOE offices is being enhanced. Environmental Management Headquarters has initiated more comprehensive extent of condition reviews at the Oak Ridge, Argonne and Idaho transuranic waste sites to evaluate procedures. Planning for implementation of the revised DOE Order 435.1, *Radioactive Waste Management* enhanced oversight is ongoing.

DOE takes its oversight responsibilities seriously. We recognize that through the WIPP incidents, significant weaknesses have been identified. EM Headquarters, the CBFO and NWP are developing and implementing corrective actions and as a result of these actions the transuranic waste programs at WIPP and the waste generator sites will be stronger. This heightened attention on safety and improved oversight will be the normal course of business in the future. The improvements in the programs, policies and procedures will be permanent, ensuring they are sustained over the long term.

<u>Actions taken to Prevent Recurrence</u>

In order to prevent a reoccurrence of the kind of issues that led to the event at WIPP, improvements at WIPP and LANL, within both the Federal and contractor organizations, are occurring. These weaknesses are highlighted as Judgments of Need in the AIB Reports and corrections are being implemented. Each Judgment of Need is being addressed before operations at WIPP or LANL resume. For each Judgment of Need, the Department and/or, NWP, as appropriate, have developed, or are developing, corrective actions. These actions are, or will be, documented in formal, approved Corrective Action Plans before being implemented to ensure safety and accuracy. Adequate completion and validation of the pre-start actions and activities will address the root causes prior to restarting waste operations. Similarly, for the AIB Phase II Report, the EM Los Alamos Field Office and the contractor, LANS, are developing separate Corrective Action Plans for implementation

EM has evaluated, and is continuing to evaluate procedures used to treat and/or remediate transuranic waste at the waste generator sites. These reviews will ensure the level of specificity, the quality assurance, the change management processes, and the level of required documentation is adequate to meet WIPP requirements and waste acceptance criteria. Prior to resumption of shipments to WIPP, the packaged waste will be reviewed against new TRU waste program requirements, programs and processes.

LANL Transition

Consistent with the Secretary of Energy's direction in late 2014, the Department transitioned the acquisition and management of legacy cleanup scope at LANL from NNSA to EM. The transition enables increased efficiencies in the environmental cleanup through employment of a specialized contractor (or contractors) and synergies with other EM operations. In addition, the focus of LANL M&O contractor on the core national security missions at the site is strengthened. EM established the Environmental Management Los Alamos Field Office (EM-LA) on March 22, 2015. EM-LA is led by a senior leader from EM Headquarters pending selection of a permanent Manager. A Memorandum of Understanding is being developed between NNSA and EM that identifies responsibilities, and sets the operating framework for safe and compliant operations.

A short-term contract, referred to as a "bridge contract" between EM and the existing management and operations contractor (LANS), is in final negotiations. A separate long-term procurement strategy is in development.

Summary

In summary, WIPP is an important national resource, and DOE is working hard to recover following this unfortunate incident. DOE will resume disposal operations at WIPP when it is safe to do so. The safety of workers, the public, and the environment is first and foremost. We will continue to keep the community and a wide range of stakeholders, including Congress, informed along the way of WIPP recovery in a transparent manner.

Thank you again for the opportunity to discuss the Department's recovery efforts. I would be happy to answer any questions you may have.