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April 29, 2005

Mr. David Cobrain
State of New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505-6303

Reference: Work Assignment No. 06110.310.0002; State of New Mexico Environment Department, Santa Fe, New Mexico; Sandia National Laboratories Expert Witness and General Support; Matrix of Public Comments Received by NMED on the Sandia Mixed Waste Landfill, Corrective Measures Study Report, Task 2 Deliverable.

Dear Mr. Cobrain:

Enclosed please find the deliverable for the above-referenced work assignment. The deliverable consists of a matrix of public comments received by NMED on the Sandia Mixed Waste Landfill Corrective Measures Study Report and a draft response for each comment.

There were two comments for which we did not provide a response. The first comment is Comment No. 1.9. This comment specifically refers to statements made in an interview of Donna Hartzel to G.L, dated 1989. This transcript was obtained by Citizen Action though a Freedom of Information Act (FOIA) request. TechLaw does not have a copy of this interview, and thus, was unable to address the specific questions. One of the questions in this comment addressed the issue of tritium sampling in plants. TechLaw is aware that Sandia National Laboratory (SNL) has conducted some tissue sampling for fauna in the area of the MWL, however, to our knowledge, only plant diversity tests have been conducted, and no actual plant tissues have been collected and analyzed for tritium.

The second comment for which we did not provide a response is Comment No. 7.1. This comment questioned why the Operation and Maintenance (O&M) costs for Alternatives III.b and III.c were different. As TechLaw did not participate in either the development or review of the cost estimates, we believe NMED is more able to provide a better

response to this comment. These two comments are highlighted in yellow in the attached deliverable.

The document is formatted in Word. The deliverable was emailed to you on April 29, 2005 at David_Cobrain@nmenv.state.nm.us and to Mr. William Moats at wpmoats@sandia.gov. A formalized hard (paper) copy of this deliverable will be sent via mail.

If you have any questions, please call me at (303) 763-7188.

Sincerely,

June K. Dreith (pulletm)

June K. Dreith
Program Manager

Enclosure
cc: Mr. William Moats, NMED
Ms. Paige Walton, TechLaw

TASK 2 DELIVERABLE

MATRIX OF PUBLIC COMMENTS RECEIVED BY NMED ON THE SANDIA MIXED WASTE LANDFILL, CORRECTIVE MEASURES STUDY REPORT

SANDIA NATIONAL LABORATORIES EXPERT WITNESS AND GENERAL SUPPORT

Submitted by:

TechLaw, Inc.
560 Golden Ridge Road
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Golden, CO 80401-9532

Submitted to:

Mr. David Cobrain
State of New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505

In response to:

Work Assignment No. 06110.310.0002

April 29, 2005

Matrix of Public Comments Received by NMED on the Sandia Mixed Waste Landfill Corrective Measures Study Report.

Comment Number	Commenter/ Affiliation	Topic Area	Commenter Number	Comment Summary	Response	Include in Draft Permit? Y/N
A	For Citizen Action, Sue Dayton	Metallic Sodium	1.1	The unknown amounts of metallic sodium reportedly buried in the MWL (see FOIA document #20, par. 4) have been omitted from discussion in the Corrective Measures Study (CMS). Metallic sodium, used in the oxide reactor fuel experiments at SNL, has not been identified as a hazardous substance in the inventory of the MWL nor has it been included in the CMS risk assessment. The commenter wants to know why it was not included.	There has been a great deal of controversy surrounding the Mixed Waste Landfill (MWL) and to what extent the published Sandia National Laboratory (SNL) waste inventory accurately reflects the waste contents of the landfill. Most older landfills in operation at the time of the MWL have no records or incomplete disposal records at best, and often interviews with former workers is based on memory, which can sometimes be unreliable and uncertain. There could be the potential that metallic sodium was disposed of in the landfill. However, the New Mexico Environment Department (NMED) has reviewed various classified and unclassified disposal records to evaluate the waste inventory and believes the SNL's estimates on the amount and type of waste to be accurate. In addition, it should be stated that the presence of metallic sodium in the landfill would not impact the final action to be taken by NMED in the review of the Corrective Measures Study (CMS), or in the final permit action.	

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A	For Citizen Action, Sue Dayton	Beryllium	1.2	The commenter indicated that the MWL contains significant amounts of beryllium (218 cubic yds total), well over the action levels. The commenter indicated that there is no discussion in the CMS about the beryllium and no response from the NMED regarding clean up of this material.	See response to Comment 1.1. In addition, while the landfill may contain levels of beryllium above risk-based action levels, the beryllium is contained within the landfill and monitoring has not indicated that beryllium is migrating from the landfill. Therefore, there is no immediate risk to receptors from beryllium, regardless of the concentration of beryllium in the landfill. Continued monitoring during the post-closure phase will be conducted to ensure that waste is not migrating from the landfill.	
A	For Citizen Action, Sue Dayton	PCBs	1.3	The commenter indicated that according to the CMS the MWL contains 251 cubic yards of PCBs. Considering this amount the commenter asked why TSCA wasn't identified and discussed in the CMS	NMED is aware that polychlorinated biphenyls (PCBs) may have been disposed of in the MWL. The Toxic Substance Control Act (TSCA) regulates the use and disposal of PCBs; however, the need for TSCA involvement is not necessary since the design of the unit meets TSCA standards.	
A	For Citizen Action, Sue Dayton	Inhalation Factors	1.4	The commenter indicated on Page I-84 and I-85 of the CMS (Tables 2 and 3, "Default Non-Radiological/Radiological Exposure Parameter Values for Various Land Use Scenarios") the inhalation factors are different for radiological and non-radiological under industrial, recreational and residential scenarios. The commenter wants to know the reason for these differences.	It appears that the commenter is referring to Tables 2 and 3 on pages I-88 and I-89. The difference in inhalation factors is that for the chemical risks, the Environmental Protection Agency (EPA) exposure assumptions were applied and for the radiological risk, Department of Energy/ Nuclear Regulatory Commission (DOE/NRC) exposure assumptions were applied. The most notable difference is inhalation factors used for the recreational scenario. Both	

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					assessments use a base inhalation rate for the recreation scenario of 30 cubic meters per day; however the rate as shown in Table 2 incorporates other exposure assumptions, such as limited use, while RESRAD incorporates these factors within the model.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.5	The commenter provided selected statements taken from documents obtained by Citizen Action under a FOIA. Several following comments address this issue. The first comment indicated that an estimated 720,000 cubic feet of waste has been buried on site during the 28-year operation. (SNL ER Program Information Sheet, 1987 (FOIA 90)). The commenter asked why these estimated volumes continue to change.	Estimates may change because the data from which SNL is working are old and incomplete disposal records that may be inaccurate. This is a common occurrence for landfills that are as old as the MWL. The estimates were made using the best available data at the time, and as new information became available, the volumes were modified accordingly.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.6	Approximately 50,000 ft of radioactive waste has been buried at the site (SNL Working Draft, Sampling Plan 1992 (FOIA 92)). The commenter asked why these estimated volumes continue to change.	See response to Comment No. 1.5	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.7	Accurate records before 1965 no longer exist and records from 1965 to 1976 are incomplete with regard to waste disposal. (SNL ER Program, 1993, Phases 2 RFI Work Plan (FOIA 101)). The commenter had several questions regarding this issue. First, the commenter indicates that SNL states that the lost records have been found but indicated that the files contain conflicting data, the researcher applied a straight-line averages to waste disposal from 1959-1969; and the estimated values for individual waste categories. The	As stated above, conflicting data and information in records dealing with a landfill that was in operation in the later 1950s to mid 1970s would be expected. In fact, the records that SNL have provided are actually more detailed than many such facilities used for disposal during that time frame. NMED believes that SNL has attempted to provide as thorough and complete a list as possible.	

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				commenter asked if NMED believes that these statements are representative of a Cold War waste site with an "excellent" inventory.		
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.8	The commenter asked what information NMED has on the "lost records which have been found. The files indicate that all records prior to 1964 were destroyed as part of a record purge (letter from Delacroix Davis, Jr. to James G. Steger, 1977, pg.11 (FOIA 50))	As indicated, some of the purged records have been located at the Idaho National Environmental and Engineering Laboratory (INEEL).	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.9	"They have a feel for what is in there but the numbers are questionable...use vegetation as indicator, succulent plants work best. Elevated concentrations {found} up to 5 km away. (Interview the Donna Hartzel to G.L, 1989 (FOIA). The commenter asked if NMED has reviewed this document and if NMED has conducted any off-site radiological monitoring to detect tritium in vegetation. Does the statement in the document mean that biological transport of tritium has been occurring for years? What are the elevated concentrations of tritium referred to in this report and is this still occurring. What does Donna's term "have a feel for" mean in terms of describing the MWL inventory?	***[Will – please address. We do not have a copy of this document referred to in the comment. To our knowledge, SNL has conducted plant studies, but only to assess numbers and diversity, not actually to conduct analytical tests on plant samples.?]***	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.10	"Most waste from this facility should be considered mixed waste since the exact composition of the waste is uncertain and radioactive chemicals as well as classified toxic materials could be expected". The commenter asked if this was indicative of a landfill with an excellent inventory.	See responses to Comment Nos. 1.1 and 1.5	
A	For Citizen	Known	1.11	...the most common metal disposed of at	See response to Comment Nos. 1.1 and	

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	Action, Sue Dayton, 2nd submittal	Waste Inventory at MLW		MWL is lead. Also, barium, beryllium and chromium were probably disposed of. No records are available on the quantities of metals disposed of..." (SNL ER Program Information Sheet, FOIA, 1987 (FOIA 90)). The commenter asked if NMED has accurate records of quantities of metals (such as lead) disposed of at MWL.	1.5. NMED believes that SNL has attempted to provide as thorough and complete a list of the type and amount of waste in the MWL as possible.	
A	For Citizen Action, Sue Dayton, 2nd	Known Waste Inventory at MLW	1.12	The commenter indicated that "SP-4 contains what is purported to be reactor vessel plates. Very little is known about these plates, their origin, number, size or configuration (Memo from Jerry Pease/SNL to Mark Jackson, John Gould/DOE/KAO, 1997 (FOIA 22). The commenter asked if there is still little known about the "reactor vessel plates?	On July 20, 2000, NMED staff members reviewed SNL's classified disposal records. NMED's review found that the classified inventory contains thousand of disposal records from 1950s to 1989 (both on paper and microfiche). In the records reviewed, NMED was able to trace the specific classified waste items. NMED's review indicated that reactor vessel plates were not disposed of in the MWL.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.13	"Radioactivity contaminated waste water was discharged into one of the trenches during the month of 1967; the water could potentially have increased the migration rate of contamination through the soil column towards the aquifer" (SNL ER Program Information Sheet FOIA, 1987 (FOIA 90)). The commenter indicated that SNL maintains that no liquids were disposed of in the MWL, and those that were of were containerized. Does the NMED agree that this statement from the FOIA document 90 refers to liquid wastewater that is not containerized?	In 1967, approximately 204,000 gallons of coolant wastewater from the SNL Engineering Reactor Facility was discharged into Trench D, and there is no indication that this water was stabilized or containerized. There is no indication at the present time that the disposal of the water increased migration rates, as there have been no detections of contaminants in groundwater above natural background levels. This is based on sampling of groundwater wells in the area. In addition, NMED will require groundwater monitoring as part of the post-closure plan.	
A	For Citizen	Known Waste	1.14	"... MWL received as variety of	NMED conducted research to	

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	Action, Sue Dayton, 2nd submittal	Inventory at MLW		radioactive and potentially radioactive/hazardous mixed waste..." Primary radionuclides are uranium, and tritium, some plutonium and plutonium-contaminated material, cobalt-60, cesium-137, radioactive tracers, radionuclear waste from operating and decommissioned Sandia Pulsed Reactors and experiments at the Nevada Test Site. Radioactively contaminated oils and naphthalene scintillation vials..." The commenter asked if there was a complete inventory of each of these specific waste products, i.e., quantity, type, curies, and method used for containment.	understand if high-level waste was buried. NMED focused its research on spent nuclear fuels received by SNL. As a result of this research, NMED verified that all experimental packages containing spent fuel are accounted for in storage at SNL.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.15	"Chemical waste including acids, solvents, TCE, carbon tetrachloride, and scintillation cocktails. Other wastes disposed of in the classified area include uranium, thorium, plutonium, enriched lithium, various facilities, and plutonium-contaminated nuclear weapons test debris". The commenter states that SNL maintains that no liquid waste was disposed of in the MWL, the term "leaky" does not typically refer to solid waste. In addition, based on SNL's reports less than a gram of Pu was buried in the MWL, The commenter asked if that amount took into consideration the total volume of plutonium-contaminated wastes and the Pu reportedly contained in the 19 drums as reported in the MWL known inventory? The commenter also request that these records, apparently on microfiche and stored at INEEL, be made available to the public in order to fully	NMED has evaluated waste inventory records. NMED believes that SNL has attempted to provide as thorough and complete a list as possible considering the nature of the records that were kept at that time.	

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				characterize the content of the MWL.		
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.16	"Characteristics of contamination: disposal in unlined pits and trenches; contaminated oils, liquids and solvents; solid and liquid wastes." The commenter indicated that SNL maintains that no liquid wastes were disposed of at the MWL, this statement refutes that claim. The commenter asked that NMED respond to the comment.	There are some indications in historical records that wastewater was disposed of in Trench D in 1967.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.17	"Possible mixed fission products were to the dump. Lots of fuel in mountains stored. Only neutron activated material went to the dump. Lots, large amounts of Pu" (interview with former SNL employee H. Abbott, 19... (FOIA 1) The commenter would like a list of the fission products, volumes, and curies disposed of at the MWL. The commenter asked if NMED has records of where these mixed fission products originated. The commenter also asked what "lots of fuel stored in mountains" refers too.	See response to Comment 1.14. The commenter is requesting information on fission products that are classified, and not available to the public. As stated in Comment 1.14, NMED has evaluated these classified records and trace the fact that fission products are in storage. The NMED is not aware of what the commenter is referring too when discussing "storage in containers". In regard to the question concerning fuel stored in the mountains, it is believed that the commenter may be referring to another site within the SNL; this does not relate to the CMS for the MWL.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.18	"Two summers ago workers found 5 feet of water in nearby completed trench. Workers pumped water into the trench to the west" The commenter asked if this comment meant that workers were ordered to never release any "liquids" into MWL	The meaning of this comment is unclear. It is likely that standing water (including water accumulated from rain/snow) is pumped away from the MWL on various occasions. There has been a policy in later years that liquid not be disposed of in the MWL.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.19	'Incompatible and un-neutralized ignitable and reactive gases may have been placed in pits and trenches. Subsequent reactions generate hazardous vapors which could	MWL Phase 2 Resource Conservation and Recovery Act Facility Investigation Report (RFI) field work include two surface radiological surveys, ambient air	

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				penetrate soil caps and released. Potential for release to air from pits 24-30 is high". (SNL ER Program Information Sheet, FOIA, 1992 (FOIA 90)). The commenter asked if it was true that no active soil gas surveys have been conducted in classified pits 24-30.	monitoring, soil sampling for background, metals and radionuclides, non-intrusive geophysical surveys, active and passive soil gas surveys, surface soil sampling for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals and tritium including vadose zone testing. These surveys included data from pits 24-30. The results from the soil gas surveys were used to model an air concentration. The resulting inhalation risks to an industrial worker to the maximum modeled vapor concentration were well under the target level of 1E-5.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.20	"Organic wastes were disposed of at the MWL beginning in 1959 and continued until 1962 when the Chemical Waste Landfill was opened" (ER Program/Site Health and Safety Plan, 1992 (FOIA 116)). Uncontainerized liquids were disposed of at the Chemical Waste Landfill it makes sense that liquids were disposed of at MWL prior to being sent to CWL. Why would SNL indicate that liquids were solidified at MWL, and not at CWL.	There is some historical information that indicates that liquids and organic waste were disposed of in MWL during the early years of operations. However, in later years, only solid waste was disposed of in the MWL and records indicate that liquids were solidified prior to disposal in the MWL.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.21	"Based on interview with TA5 personnel there may be hazardous constituents in the canisters. As little process knowledge, there have been no controls since it was generated..." The commenter asked what those statements mean.	As a result of extensive research by NMED, we have verified that canisters (4) containing special nuclear materials were stabilized in epoxy, and then removed from the canisters. Four empty canisters were placed in the MWL. Other research verifies that STAR canisters were not opened after	

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					experiments, and were not disposed of in the MWL.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.22	"Records of disposal in pits from Nevada Test Site and South Pacific were examined and then disposed of at the MWL." (Interview with former SNL employee Bob Schwing, 1995(FOIA 7)). The commenter asked if there are such records, and in which section at MWL these materials were disposed of.	There is no indication that waste from Nevada Test Site or South Pacific has been disposed of in the MWL.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.23	"..other records suggest that transuranic wastes may have been buried at the MWL; waste records did not define contents of the TRU waste before 1972, thus actual presence and quantities of these wastes cannot be accurately determined...". (SNL ER Program, 1993 Phases 2 RFI Work Plan (FOIA 101) The commenter asked if NMED has further documentation about TRU wastes disposed of at MWL, and does NMED believe the information represents an accurate inventory of waste disposed of at the MWL?	Transuranic (TRU) mixed wastes are wastes which contain both hazardous waste components as well as radiological hazards (including debris personnel, protective equipment, leaded gloves etc.). Considering that these types of materials as well as other TRU waste were being generated at the time the MWL was accepting waste, it seems plausible that TRU wastes were disposed of at MWL. The presence of TRU waste in the landfills does not impact the final NMED recommendation at this time to cap the landfill and provide a bio-intrusion barrier.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.24	"On the order of 1000s of REM/hr {disposed of in the MWL} on contact. Truckloads were disposed of during decommissioning. Some elements of reactor exceeded 5000 rem/yr. Disposal of much material in pits-100 rem/hr" (Interview with former SNL employee Max Moms regarding disposal of nuclear reactor material in dump, 1998 (FOIA 12)). The commenter asked what "elements of	The disposal of decommissioning waste may have been disposed of in MWL. It is highly unlikely that waste with a 5,000 rem/yr was disposed of in MWL, as no records have indicated that this type of waste was placed in the MWL.	

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				reactor waste exceeded 5000 rem/hr"		
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.25	Interview with Frank Statzula a former SNL employee (FOIA 58) mentions a radioactive acid pit and indicates that chemicals, radioactive materials were disposed of in the pit until 1969. The commenter indicated that his pit was never disclosed to members of the SNL/Citizens Advisory Board. The commenter asked if NMED has a complete inventory of waste disposed of in the radioactive acid pit.	The scope of this CMS addresses the MWL unit only. NMED is unaware of a radioactive acid pit at the MWL.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.26	An interview with George Tucker, former SNL employee, 1995 (FOIA 3) indicates that explosives were not allowed in the MWL, FOIA document #21 states that metallic sodium "may be present". The commenter asked NMED to address this apparent discrepancy.	Metallic sodium is not considered explosive. The material is highly reactive when it comes into contact with air or other oxidizers. Therefore, this is not a discrepancy.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.27	"After 1975, SNL required liquid wastes to be solidified prior to disposal. Before this time unsolidified radioactive liquids, whether containerized or not were disposed of in the MWL (ER Program/Site Health and safety Plan, 1992 (FOIA 115,116)) The commenter again points out that this conflicts with SNL statement that no liquids were disposed of at MWL. The commenter wants NMED to comment on this.	NMED concurs with this comment. See response to Comment No. 1.20.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.28	The commenter indicates that there were between 1965 and 1970, before complete records began being kept a lot "unknown" about the final disposal of "Fission Product/Induced Activity. The commenter questions if these "unknown" statements are indicative of a landfill with an excellent	See response to Comment Nos. 1.1 and 1.5.	

Comment Number	Commenter/ Affiliation	Topic Area	Commenter Number	Comment Summary	Response	Include in Draft Permit? Y/N
				inventory.		
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.29	"Trailer was buried in Trench F, deeper than the picture shows. The trailer was not a flatbed, but a box-type with doors, which was backed down the trench, unhooked and the truck drove out". The commenter asked if NMED knows of any box-type trailers that were disposed of at MWL. SNL responded by stating that no box-type trailers were buried in the landfill. The commenter believes that this raises questions regarding the complete inventory at the landfill.	See response to Comment Nos. 1.1 and 1.5.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Known Waste Inventory at MLW	1.30	The commenter indicated that in 1984 George Tucker of SNL made an estimate for the clean up of the MWL. The cost estimate included protective equipment, with the waste being shipped to the Nevada Test site. The cost estimate assumed "a lot of manual labor". The total in 1984 was $181,570,000. The commenter asked why MWL couldn't be cleaned up today based on the above excavation scenario and the cost estimates performed in 1984.	Costs have seriously escalated since 1984, and there is a good possibility that the waste would not be able to be shipped to the Nevada Test Site as was the case in the mid 1980's. Due to worker safety and environmental concerns, it is not plausible at this time to excavate the landfill. NMED believes it is more prudent to leave the material in place and provide an engineered design cap and a bio-intrusion cover, which will minimize infiltration of precipitation, and minimize instruction from burrowing animals.	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.31	The following comments were sent to NMED by Sue Dayton., from a review of the evaportranspiration (ET) cap. It is a "Review of Sandia National Laboratories ET Cap Closure Plans for the Mixed Waste Landfill", by Tom Hakonson, Ph.D., Environmental Evaluation Services, and LLC. The next 13 comments and a	NMED concurs that bio-intrusion via burrowing animals and roots can allow the migration of contaminants to the ground surface. However, NMED has recommended that a bio-intrusion barrier be placed over the landfill to minimize the impact of burrowing animals. The engineered cap will	

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				comment on his recommendations are the next series of comments. The commenter stated that buried waste can be mobilized to the ground surface through plant roots and animals and insect burrowing can dramatically increase infiltration of water into the landfill with covers as thick as those proposed.	minimize the impact of plant roots. In addition SNL will be required to monitor the facility and maintain the cover system.	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph. D.	The Evapor-transpiration Cap	1.32	The commenter indicated that vertical transport of contaminants to the ground surface by biota may be small on a short time scale, but over many decades these processes may become dominant in mobilizing buried wastes.	See response to Comment No. 1.31	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph. D	The Evapor-transpiration Cap	1.33	The commenter indicated that the long-term consequences of bio-intrusion into low level waste landfills located in arid areas estimated that the doses to humans resulting from biological transport were as high as doses calculated from human intrusion scenario (Pacific Northwest Laboratory).	The Pacific Northwest Laboratory and the MWL cannot be directly compared, as conditions related to both waste and siting are dissimilar. See response to Comment No. 1.31. However, intrusive activities will not be allowed at the MWL and will be enforced by NMED through the permit.	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.34	The commenter stated that one of the more important deficiencies in Sandia National Lab's closure plan proposed for the MWL is the assumption that vertical and horizontal transport of contaminants resulting from biological processes is not an important contributor to exposure pathways.	NMED concurs with this comment and has proposed a bio-intrusion barrier as part of the cap system.	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by	The Evapor-transpiration Cap	1.35	The commenter indicated that both cap designs (Dwyer et, al. SNL Environmental Restoration Group) do a credible job of analyzing the ET cover, and in the reviewer's opinion both cap designs will	NMED concurs with this statement and will require that the cap and the ground water system be monitored and maintained.	

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				created by burrowing animals.	levels of contaminants in surface soil, the cover will be adequate prevent any off-site migration of surface contaminants and will prevent direct human health and ecological exposure to contents of the MWL.	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.39	The commenter indicated that once contaminants are transported to ground surface a complex distribution process occurs that can result in widespread transport of contaminants across the landfill surface to off-site areas.	NMED concurs with this generality. NMED has proposed a bio-intrusion barrier in association with the engineered cap to minimize distribution of contaminates by small burrowing animals. See response to Comment No. 1.38.	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.40	The commenter stated that human intrusion scenarios should take a conservative approach such as the loss of institutional controls under a subsistence farmer scenario.	It appears that the commenter is referring to the NRC regulation in 40 Code of Federal Regulations (CFR) Part 61.59(b), which is not applicable to RCRA. Under EPA regulations, there is no requirement that specifies the facility must assume a loss of institutional controls and evaluate a subsistence farming scenario at some time (for example 100 years) in the future. In addition, there are no time limits on NMED's authority to impose and enforce institutional controls, which NMED will enforce through the permit	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.41	The commenter stated that changes in climate could radically affect the integrity of the cap.	SNL is required to continually monitor the cap for the next 30 years. This time frame may be increased by the Secretary of NMED if necessary. If climatic changes were to occur during this period that affected the performance of the cover system, NMED can impose additional requirements to ensure stabilization of the MWL.	

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A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.42	The commenter indicated that SNL's proposed plan to use a neutron moisture gage (NMG) are vague on how the monitoring data will be used to conclude that percolation is or is not occurring. NMG is labor intensive (data must be downloaded and managed) and the NMG must be calibrated to soil (difficult when layered soils are involved), and reliable measurements are limited to volumetric water content above 5% the NMG integrates moisture content over a relatively large area making it difficult to pinpoint the specific zone depth being interrogated. NMG provides instantaneous estimates of soil moisture so that measuring after precipitation is critical. NMG should not be used as an early warning system.	Neutron Moisture Gauges (NMGs) have been shown to be an effective tool in monitoring variations in soil moisture. NMED concurs that specific calibrations must be conducted and that correction factors applied to account for any changes in soil bulk density. However, the use the NMG does not affect the CMS or the decisions concerning the selection of the alternative. Rather, NMED will consider monitoring under SNL's post-closure plan. It is suggested that comments related to monitoring during the post-closure phase be submitted during the public comment period for the review of that document.	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.43	The commenter stated that little or no planning has been done on the post-closure phase of the Mixed Waste Landfill closure and there is no contingency plan should the ET cap not perform as predicted.	The Contingency Plan is not required as part of the CMS process, but rather is submitted as part of the post-closure care plan. SNL will be required to submit a post-closure care plan, which will require a permit modification requiring a public comment period, and a public hearing. Comments related to the Contingency Plan may be submitted at that time.	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.44	Dr. Tom Hakonson has the following recommendations.1) Any post-closure plan should provide measurements on all possible migration pathways that include vadose zone transport, soil sampling for surface contaminants and biological transport; 2) Soil surveys should be	NMED agrees that a robust soil and groundwater monitoring program must be established to ensure early detection of the migration of contaminants. The scope of the exact program will be evaluated by NMED as additional documents on the MWL are provided	

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	Tom Hakonson, Ph.D.			provide adequate protection of contaminants to ground water assuming the site is diligently monitored and maintained throughout the post-closure monitoring period while assuming the surface pathway proves to be unimportant in contributing doses to humans.		
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.36	The commenter indicated that under the right conditions the roots of all types of vegetation have the ability to extend several meters into the soil and transport contaminants to the surface.	The reviewer appears incorrect in the assumption that all types of vegetation have a root system that could extend several meters into the soil. The native plant community at the MWL consists primarily of shrubs and grasses, which have a maximum root depth of about two feet. The cap system, including the bio-intrusion layer, will provide adequate protection against bio-intrusion from native plants. NMED has proposed a bio-intrusion barrier in association with an engineered cap.	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.37	The commenter indicated that while an ET cap can minimize soil moisture it could contribute to vapor phase transport of volatiles.	This is true to some degree, however, with an engineered cap, vapor phase transport of volatiles outside the landfill should be minimal. In addition, NMED will address the issue of volatilization of volatiles to the ground surface during the post-closure care monitoring plan.	
A	For Citizen Action, Sue Dayton, 2nd submittal, comments by Tom Hakonson, Ph.D.	The Evapor-transpiration Cap	1.38	The commenter states that SNL's conclusion that the waste has not been mobilized to the ground surface by animals is poorly supported as it is 1) based on soil sampling taken (in Part) from areas of landfill recently backfilled; 2) sampling was coarse in resolution; 3) samples were non-random in space; and 4) samples purposely did not include disturbed areas	NMED believes that these concerns will be resolved by requiring that a bio-intrusion barrier be built in association with the engineered cap. Add that the cover system will result in a thickness of approximately four to five feet of soil/materials over the present surface of the MWL and while surface soil sampling has not indicated elevated	

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				required in undisturbed areas closed early in the landfill operation with comprehensive long-term sampling program after MWL is closed consisting of sampling of surface soils and biota; 3) A comprehensive sampling plan should be required that reflects the inventory of the contaminants in the landfill, not just tritium; 4) The use of bio-intrusion barriers to keep animals from burrowing into the landfill has had mixed reviews in terms of effectiveness, a wire mesh type barrier proposed by Dwyer is the best choice for the MWL in terms of effectiveness. The commenter would like NMED to address these recommendations.	for NMED approval. These phases of the review process will be open for public review and comment. NMED concurs that a bio-intrusion barrier is necessary to keep burrowing animals from disturbing the cap of the landfill and burrowing into the landfill contents.	
A	For Citizen Ac For Citizen Action, Sue Dayton, 2nd submittal	Risk Assessment for MWL	1.45	The commenter indicated that a new baseline risk assessment for the MWL has not been conducted by SNL due to the uncertainties of the inventory and source terms. This was verified by Tommy Tharp/SNL at a public meeting of the "WERC Independent Technical Peer Review of the Working Draft CMS for MWL", in December, 2002. This was also mentioned in the WERC Peer Review Report. The commenter would like NMED to comment on this.	NMED accepts the current baseline risk assessment as presented in the Phase 2 RFI. NMED acknowledges that there are some uncertainties associated with the contents of the landfill. However, the goal of a baseline risk assessment is to assessment risk to human health and the environment under current conditions, meaning to contamination that has been released from the MWL. Therefore, uncertainties concerning waste that has not been released from the MWL do not affect the risk assessment. For additional information and the purpose of the baseline risk assessment, see EPA's Office of Solid and Hazardous Waste (OSWER) Directive No. 9355.0-30.	
A	For Citizen Action, Sue	Risk Assessment for MWL	1.46	The commenter indicated that the Resnikoff "Risk Screening Review of SNL	Questionable laboratory results for Pu-238 and Pu-239/240 resulted from the	

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	Dayton, 2nd submittal, Dr. Resnikoff's comments			Risk Assessment for MWL, SWMU 76" revealed numerous problems with SNL's methodology in its risk assessment for MWL landfill. These problems are addressed in the next nine comment summaries. First, the commenter indicated that SNL had results for measurements of Pu at 3 different labs, and these samples were not discarded (p.9)	core sample recovered at MW4. In response, NMED required SNL to repeat the analysis and in addition, NMED obtained a split sample for an independent analysis. Results from the split sampling effort indicated that there had not been a release of plutonium isotopes into the vadose zone in the vicinity of MW4.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Risk Assessment for MWL	1.47	The commenter indicated that SNL discarded samples showing high concentration of COCs and kept samples concentrations with false positives (p.9)	NMED scrutinized the data carefully and considers that data reported in the Phase 1 and Phase 2 RFI reports to be of high quality. It is assumed that this comment may also refer to the elevated levels of toluene that were detected. Theses detections were found to be the result of laboratory error. In addition, the elevated results for toluene detected at MW4 were found to be the result of contamination from the packer assembly.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Risk Assessment for MWL	1.48	The commenter stated that radionuclide and cancer risk should be combined, not subtracted as SNL has done in its risk assessment (p.11,12)	NMED concurs that when a radionuclide also possesses chemical toxicity, a chemical risk should also be determined and added to the sum chemical risk. However, NMED does not concur that the cancer and radiological risks were subtracted from each other, but rather the risks were evaluated independently.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr.	Risk Assessment for MWL	1.49	The commenter indicated that SNL's calculations apply only to an adult male and has used outdated conversion factors instead of newer DCFs that evaluate dose	NMED believes that dose conversion factors (DCFs) were appropriately applied, as the site will be restricted to industrial use. The evaluation of an	

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	Resnikoff's comments			to children as well as adults (p. 11.12)	adult only is within reason.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Risk Assessment for MWL	1.50	The Commenter indicated there are questions which remain regarding the filtering of water samples by SNL (p.8)	NMED concurs that use of filtered water samples could result in an underestimation of metals and radionuclides. However, most samples were unfiltered in both the field and laboratory. In addition, no data from filtered water samples for either metals or radionuclides were used in the risk assessments.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Risk Assessment for MWL	1.51	The commenter stated that pit contents (see examples, pits 35-36) do not match the gamma levels at surface taken by SNL. (p. 7, 8)	Since the completion of the Phase 2 RFI, these pits have been backfilled with soil. The present gamma levels of radiation over the backfilled pits are within background levels.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Waste Inventory	1.52	The commenter stated that the purpose of RFI Phase 2 investigation was to "identify all potential or suspected sources of contamination" and "to determine thoroughly the contaminant source". The commenter states that this has not been done. (p. 6. 7)	NMED has reviewed various classified and unclassified disposal records to evaluate the waste inventory and believes SNL's estimates on the amount and type of waste to be accurate. See response to Comment Nos. 1.1 and 1.5.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Risk Assessment for MWL	1.53	The commenter suggests that SNL follow recommendation from EPA and DOE that SNL conduct a risk assessment that includes "no administrative controls in place after 100 years (p. 12, 13).	It appears that the commenter is referring to the NRC regulation in 40 CFR Part 61.59(b), which is not applicable to RCRA. Under EPA regulations, there is no requirement that specifies the facility must assume a loss of institutional controls and evaluate a subsistence farming scenario at some time (for example 100 years) in the future. In addition, there are no time limits on NMED's authority to impose and enforce institutional controls, which	

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					NMED will enforce through the permit	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Waste Inventory	1.54	The commenter indicated that SNL has not fully characterized the inventory of the MWL. (p. 13)	NMED believes that SNL has attempted to provide as thorough and complete description of the waste inventory as possible. See response to Comment Nos. 1.1, 1.5, and 1.52.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Risk Assessment for MWL	1.55	The commenter states that the RFI Phase 2 conducted by SNL concluded that MWL contaminants "present little risk to ground water or as air emissions to potential receptors". This conclusion was disputed in a memo sent to Will Moats by Barbara Toth (August 11, 1999), in that memo she noted numerous deficiencies in the SNL risk assessment. The letter states "Surface/subsurface soil erosion due to surface/subsurface water movement and windblown contaminant transport acts as the primary means for contaminant migration out of the MWL to the surrounding environment... this subsequently threatens human health and the environment". The commenter asked if NMED agree with this assessment of the MWL by Ms. Toth.	NMED concurs with these comments. In response, NMED is requiring the cover system as part of the corrective measures. The cover will mitigate any windblown contamination to off-site receptors.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Risk Assessment for MWL	1.56	The commenter asked why the RFI Phase 2 states all Chromium contamination at MWL is chromium III, the most conservative type. The commenter asked if NMED knows the type of all chromium contaminants at MWL	NMED has previously provided comments to SNL concerning this issue. NMED concurs that the assumption that all chromium is trivalent chrome is not a conservative assumption, but rather is the least conservative approach.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr.	Risk Assessment for MWL	1.57	The commenter stated that SNL claims the inhalation pathway doesn't apply to metals due to their "lack of volatility". This was found to be incorrect as metals can attach	NMED concurs that inhalation of metals in soil does occur and is evaluated using a particulate emission factor (PEF). SNL did consider the inhalation of both	

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	Resnikoff's comments			to soil particles and be inhaled. The commenter asked if SNL's risk assessment included inhalation pathway of heavy metals.	vapor phase and particulate airborne compounds (see Appendix I, Table 1 and the soil inhalation equation presented on page I-85).	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Risk Assessment for MWL	1.58	The commenter states that NMED recommends SNL us EPA's IRIS and HEAST or EPA's NCEA to determine toxicological parameters. The commenter asked if information from these sources been integrated into the risk assessment.	Yes, toxicity data from these databases were applied in the risk assessments (refer to Table 13, Appendix I).	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Risk Assessment for MWL	1.59	The memo recommends SNL use exposure parameter values recommended by HRMB/NMED, the commenter asked if these have been integrated into the SNL risk assessment.	The recommended exposure parameters were applied in the risk assessments. Refer to Tables 2 and 3 in Appendix I of the CMS.	
A	For Citizen Action, Sue Dayton, 2nd submittal, Dr. Resnikoff's comments	Risk Assessment for MWL	1.60	The memo recommends exposure parameter values be used to evaluate exposure and risk from dermal contact with contaminants in soil under industrial, residential and recreational land use scenarios. The commenter asked if these had been done.	SNL identified the dermal contact pathway as a potential nonradiological organic constituent pathway in all the land use scenarios. However, the exposure via this pathway was considered insignificant and excluded from the final risk analyses. However, potential risks associated with the dermal pathway were addressed in the uncertainty analysis.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Risk Assessment for MWL	1.61	The commenter indicates that at a January 31, 2003 "WERC Independent Technical Peer Review of the "Working Draft CMS" for MWL it was pointed out by SNL staff at the January public meeting that these risk assessments were only relative to the different remedies being investigated and did not relate directly to the predicted risk. This issue needs to be clarified as it only adds uncertainty to the overall remedy if	The CMS provides a baseline risk assessment as well as a risk assessment for each proposed alternative. The assessments conducted for the alternatives are done to determine whether a proposed remedy will be protective of human health and the environment. Upon selection and implementation of the final remedy, a verification risk assessment may be	

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				the risk assessment is not modeled relative to a conservative model of the site situation. The commenter asked for NMED to comment on this.	conducted to assess final risk.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Risk Assessment for MWL	1.62	At the same meeting it was stated that "the risk assessment is based on known releases from the site...several questions remained unanswered during the meeting about the amount and type of waste in the MWL". The commenter would like NMED to respond to this.	Per EPA Directive OSWER 9355.0-30, a risk assessment does not have to be conducted on contents of landfill but rather only on materials released. NMED assumes *a prioir* that exposure to the contents of the landfill will result in unacceptable risk.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Risk Assessment for MWL	1.63	At the same meeting it was stated, "It would seem that a sensitivity analysis of the risk assessment would give some indication of the significance of this concern especially in light of the relative nature of the assessment noted above. (WERC executive summary, p.v).	A sensitively analysis of the contents of the MWL is not necessary, as NMED agrees that direct exposure to these contents would result in unacceptable risk. However, NMED will require post-closure monitoring. If at any time in the future data suggest that there has been a release from the landfill, NMED may require additional risk analyses.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Waste Inventory	1.64	The following four questions refer to the "WERC Independent Technical Peer Review of the Working Draft CMS for MWL". The Executive Summary section. The first comment in Section (ii. 1): the WERC states that the site operational history (section 1.0 of the draft CMS) fails to include information that the early inventory data (once believe to be lost) can now be found in microfiche at INEEL. This information was omitted from the CMS as well as the fact that the MWL was used for disposal of chemicals prior to the opening of the CWL. This information was obtained in a document found by Citizen Action under a FOIA. The	NMED is aware that waste records have been located at INEEL. NMED has evaluated both classified and non-classified documents and records associated with the MWL and believe that the inventory provided by SNL to accurately reflexes the waste contained in the landfill to the extent possible. Classified information is not available for public review, however NMED has evaluated these records and are in agreement that the high level waste has not been disposed of in MWL, but is still in storage at Sandia. (also see 1.1)	

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				comment requests that the information be included in the CMS. As well as that the records are released to the public as well as a complete MWL inventory is prepared.		
A	For Citizen Action, Sue Dayton, 2nd submittal	Waste Inventory	1.65	In sections (ii and iii, a-e) the WERC describes the MWL inventory as: Anecdotal testimony in the records regarding disposal of non-stabilized free liquids. The location of many dangerous materials appears to be unknown such as nuclear fuel canisters and radioactive sealed sources. The amount of hazardous waste in not well understood, i.e.; inventory does not match characterization of Pit 35 and Trench B and C. Volumes of waste vary widely in different sections of the report. Meanings of words "debris" and "all waste" in the CMS are uncertain. The commenter request that NMED responds to these issues.	See comment 1.64.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Corrective Measure Alternatives	1.66	In section (iii and iv) the WERC strongly recommends that because the "uncertainly of the contents in the MWL could eventually lead to the requirement of excavation" SNL include an alternative that involves a temporary cap with future excavation.	Future excavation of the landfill was conducted by a contractor to SNL, and the results were provided in Appendix J of the CMS.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Corrective Measure Alternatives	1.67	In section (iv. c) the WERC recommends that SNL include an on-site disposal facility as an alternative for waste. SNL has buildings that could be utilized for this. The WERC also recommends including an option for RCRA approved landfill and an on-site retrievable storage unit. The commenter request that NMED require SNL to include these options as well as a	Some concerns with on-site storage are the undue risk to the excavation worker in removing the landfill contents. In addition, certain wastes may require remote handling, which would elevate costs enormously. Other factors would include increased security and maintenance. Overall, the costs associated with this option render the	

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				scenario for the construction of a CAMU.	alternative economically unfeasible.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Post-closure Monitoring	1.68	In section (iv. d) the WERC recommends that SNL include a soil vapor extraction alternative as part of a long-term monitoring strategy.	Long-term monitoring will be addressed in the post-closure care plan. NMED concurs that potential releases of volatiles should be addressed in the post-closure plan.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Risk Assessment for MWL	1.69	In section (iv and v. a, b) the WERC addresses SNL's risk analysis and recommends that SNL conduct a sensitivity analysis. A problem is SNL's consistent "bending" of information to favor its preferred alternative. To correct this situation it would behoove the NMED to require DOE to conduct an independent sensitivity analysis. The commenter asked if NMED would require SNL to conduct a sensitivity analysis by an independent entity. The commenter asked that the uncertainties related to the inventory of the landfill be addressed in a risk assessment that includes all waste products rather than the two contaminants that have been found to migrate from the landfill.	See response to Comment No. 1.62.	
A	For Citizen Action, Sue Dayton, 2nd submittal	Risk Assessment for MWL	1.70	In section (vi. 4) the WERC recommends that SNL conduct a numerical fate and transport model for simulation of the MWL. The data from this could then be integrated into a risk assessment that considers the sensitivities of various options for the MWL. The commenter asked if NMED will require SNL to develop such a model	Fate and transport modeling was conducted as part of the September 1996 Phase 2 RFI. The results from active soil gas surveys were used in conjunction with the model BOSS to estimate maximum VOC concentrations in groundwater. The results were used to estimate risks from ingestion of groundwater at the predicted concentrations. The results for both noncarcinogenic effects and carcinogenic risks were below NMED target levels.	

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A	For Citizen Action, Sue Dayton, 2nd submittal	General Comments	1.71	The commenter indicated that in 2001 Citizen Action went to Pete Maggiore, the Secretary of NMED, to request that NMED issue an order to SNL to complete a Corrective Measures Study (CMS) for MWL. They felt that the plan to simply cover the landfill with 3 feet of dirt was not sufficient and was the wrong choice considering the public. Three years and 10,000 dollars later the same plan proposed by SNL/DOE still emerges from the CMS.	NMED believes public input is necessary and is a positive aspect of the RCRA process. NMED's position is that a cap with a crown to reduce moisture and precipitation, and a bio-intrusion barrier will provide sufficient protection to the public and environment at the present time. NMED is open to re-evaluation of this proposed option after allowing adequate time for the diminishing of radiological hazards.	
A	For Citizen Action, Sue Dayton, 2nd submittal	General Comments	1.72	From the beginning SNL/DOE has downplayed the risk of the MWL. Numerous independent experts, including those who participated in the WERC have suggested that information on MWL is incomplete, biased, and disingenuous. They believe even the term "Accelerated Clean Up" is misleading and dishonest since it is not a clean up.	Since there are currently no releases from the MWL that pose unacceptable risk to either human health or the environment, the CMS did not need to address the cleanup of releases. This simplifies the CMS process and allows for a streamlined approach. The focus of the CMS was on source control.	
A	For Citizen Action, Sue Dayton, 2nd submittal	General Comments	1.73	The commenter believes that the CMS has failed to present a full range of options for the waste. It does not present the true costs of an excavation scenario. It fails to produce a baseline risk assessment, and fails to include historical data that relates directly to risk. It fails to consider the full inventory of the landfill and numerous uncertainties exposed in documents obtained by Citizen Action under the FOIA. It fails to consider any recommendations of independent reviews that attempt to find an appropriate solution for this wastes site.	NMED believes that all options were presented in the CMS and that the cost provided, which were reviewed by NMED, fairly accurately represented the cost. The cost to excavate the site is high due to the fact that extreme safety measures, including the potential for remote handling of the waste, may be necessary. A baseline human health and ecological risk assessment was conducted as part of the CMS.	
A	For Citizen	General	1.74	The commenter believes that considering	NMED believes there would be greater	

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	Action, Sue Dayton, 2nd submittal	Comments		the volume of scientific knowledge available at SNL, the CMS is an embarrassing and biased document, which puts the public at risk.	public and environmental risk if other options in the CMS were to be exercised. Excavating of the site would produce greater risk to the worker, the public, and the environment than leaving the waste in place and providing a proper cap and bio-intrusion barrier.	
A	For Citizen Action, Sue Dayton, 2nd submittal	General Comments	1.75	The commenter believes that DOE's claim that cleaning up the MWL is too risky for workers is note really a concern especially since they are planning on building another bomb factory which will cost 4.5 million and will result in more contamination to the environment, and increase cancer risk for workers, and violate international peace treaties of which our country has signed.	See response to Comment No. 1.74	
B	Albuquerque Center for Peace and Justice and Citizens for Alternatives to Radioactive Dumping, Janet Greenwald	Above Ground Retrievable Storage	2.1	The commenter believes that the wastes in the mixed waste landfill should be placed in above ground retrievable storage, located close to where the wastes are now buried.	See response to Comment No. 1.72.	
B	Albuquerque Center for Peace and Justice and Citizens for Alternatives to Radioactive Dumping, Janet Greenwald	Plutonium Disposal, and the Length of Government	2.2	The commenter is concerned about the disposal of plutonium that has a long half-life at the landfill, and the length of time that governments are around. The commenter is concerned that the buried plutonium will outlast the government.	NMED concurs that plutonium isotopes have very long half-lives. However, NMED will enforce land use restrictions through the permit. In the event that the land including the MWL was to change from government to private ownership, deed restrictions would be placed on the property limiting activities and use.	
B	Albuquerque Center for	Time Frame	2.3	The commenter urges NMED to clean up the MWL now she is concerned about	See response to Comment No. 1.74	

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				The commenter believes it is foolish to discard the bio-intrusion barrier.		
G	Citizen, Bob Long	O & M Direct Cost (Operations and Maintenance)	7.1	The commenter had a concern regarding alternative III.b versus III.c. The commenter asked why the O& M direct cost for III.c was $540,000 more than it is for III.b. The commenter believes they should have the same O& M cost.	***Will – please address.***	
H	Citizen, Thomas P. Swiler, former member of the Sandia National Laboratories Citizen Advisory Board	Ground Water Monitoring	8.1	The commenter does not believe there is any evidence that the landfill was leaking any contaminates that would endanger ground water or cause a plume that would increase the cost of remediation. The commenter found the indication that showed contaminates could leak from the MWL, which was provided by Mark Baskaran to be flawed	NMED disagrees with this comment. While contaminants have been found to have migrated from the landfill, data shows that groundwater has not been impacted. However, NMED believes that a comprehensive groundwater monitoring project which is capable of detecting groundwater contaminants is prudent and necessary to ensure long-term protection of human health and the environment.	
H	Citizen, Thomas P. Swiler, former member of the Sandia National Laboratories, Citizen Advisory Board	Removal of Contents of the MWL	8.2	The commenter agrees with NMED that removal of the contents of MWL at this time or in the foreseeable future would be a greater risk to the environment than leaving in place. Therefore he indicated that he supports this.	NMED concurs with this comment that at the present time, removal of the contents of the MWL presents unacceptable risks. However, NMED is open to re-evaluation of the excavation option at a later date after sufficient time to allow for radioactive decay of contaminants.	
H	Citizen, Thomas P. Swiler, former member of the Sandia National Laboratories, Citizen Advisory Board	Capping MWL	8.3	The commenter indicated that he does not support the capping of the MWL. He believes that MWL already has maintenance free vegetative cover formed by nature and the passing of time. The commenter is not convinced that adding an additional layer of soil and establishing a new vegetative cover over the MWL will make it safer. He is also concerned that	NMED disagrees with the comment and believes a cap with a bio-intrusion barrier is necessary. The additional cost of a cap and bio-intrusion barrier is minimal considering the additional protective properties of these items, and when these actions are compared to other alternatives mentioned in the CMS.	

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				such action will give many a false sense of closure. He is concerned about the additional cost of the cover. He would like to know how the additional cover would make MWL safer in terms of reducing the percolation of water through MWL, reducing moisture content in the MWL, and reducing the possibility of inadvertent human or animal intrusion into the MWL.		
I	Citizen, Craig D. Richards	Re-evaluation of Data/assumptions	9.1	The commenter indicated that he is O.K. with the vegetative cover for the near further but he asked where is the funding and when will the re-evaluation of all the data and assumptions over time be done. The commenter indicated that the radioactivity, transport modes, technology will change very rapidly over the next 30-50 years. When will a re-evaluation be scheduled (every 5 years?)? Technically breakthroughs may offer a full-scale disposal option rather than just monitoring and storage. MWL inventory charts indicate that Co-60 and H-3 "go away" by 2039/2049 what year has been selected for future excavation? The commenter believes the cost estimates for the NFA/vegetative cover and vegetative cover/barrier seem way too low (i.e. less than 2 million for monitoring the MWL for the next 70 years. He stated that 2 million a year would be more like it. He expressed great concern regarding the cost estimates.	NMED agrees with this commenter that in the future the option should be re-evaluated, however, the NMED believes some flexibility regarding when the unit is re-evaluated (based on radioactive levels and monitoring results) must be provided to the facility and NMED. NMED evaluated the cost estimate for all options in the CMS and believe the cost estimates are acceptable.	
J	Citizen, Robert Anderson	Risk Associated with MWL	10.1	The commenter believes this is being sweeping it under the rug, and that dangerous, unknown constituents at the site should not be left in place because there	NMED does not agree with this comment. See response to Comment No. 1.74.	

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				are too many risks associated with them for the communities and the water supply.		
K	Citizen, Diana de la Rosa, Sandia Site	Capping	11.1	The commenter encourages capping the facility. The commenter states that digging it up would be a nightmare and there would be emergency issues, ALARA issues and potential lawsuits.	NMED concurs with this comment.	
L	Citizen, J.D. Jojola	Ground Water	12.1	The commenter asked how much input SNL had on the Water Quality Control Commission hearings held in Santa Fe on February 24th and 25th, including the technical and non-technical testimony, since the attendance was poor. The commenter stated that he was submitting a copy of the WERC academy recommendations concerning vadose zone monitoring and the ground water protection plan. (Note—No such documents were included with the comment)	NMED is not familiar with the Water Quality Control Commissioner hearing which occurred on February 24th and 25th. Nonetheless, NMED does agree with the commenter that the site must be continually monitored including the vadose zone and the ground water.	
M	Citizen, Steve Dapra	Liquids in MWL	13.1	The commenter indicated that there are no free liquids in the MWL. According to the Summary of MWL, Oct. 3,2002, p.2, par.2: Disposal of free liquids was not allowed at the MWL. Liquids such as acids, bases, and solvents were solidified with commercially available agents such as Aquaset, Safe-T-Set, Petroset, vermiculite, marble chips, or yellow powder before containerization and disposal.	NMED agrees with the commenter that early on in 1967 liquids were disposed of at MWL. Later in the operations of MWL liquids were solidified with commercially available agents.	
M	Citizen, Steve Dapra	Ground Water Contamination	13.2	The commenter stated that the MWL has not caused any contamination of ground water. See the "Department of Energy and Sandia National Laboratories" response to Dr. Mark Baskaran's Final Report, Mixed Waste Landfill Review, and pp. 20,22-28.	There is no indication at this time that groundwater contamination has occurred. However, NMED believes it is prudent to continue monitoring the groundwater.	
M	Citizen, Steve	Air Monitoring	13.3	The MWL has not caused any air	The Phase 2 survey conducted at the site	

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	Dapra			contamination. See "Department of Energy and Sandia Nation Laboratories', Response to Dr. Mark Baskaran's Final Report, "Mixed Waste Landfill Review," pp. 33-35.	indicated that there has been no air contamination above risk-based standards.	
M	Citizen, Steve Dapra	Records of Content	13.4	The commenter indicated that although Sandia National Laboratories and the Department of Energy do not know the identity of every item in the MWL, there is a thorough inventory of the Landfill's contents. No previously unknown items have been detected, either from the soil, water, or air sampling; or by radiation detection instruments. There is no reason to believe that any of the possibly unknown items are harmful. (See also Summary of the MWL, p.2, par. 4)	NMED concurs with this commenter, but believes the prudent action is to continue to monitor the site.	
M	Citizen, Steve Dapra	Tritium	13.5	The commenter indicated that Tritium contamination below or near the MWL has been studied as discussed in some detail. See the "Department of Energy and Sandia National Laboratories' Response to Dr. Mark Baskaran's Final Report, " Mixed Waste Landfill Review," pp.19, 24, 28-29, 33-35.	NMED is aware that tritium contamination has been evaluated by SNL, and NMED has evaluated information generated by such studies and believes the information to be representative.	
M	Citizen, Steve Dapra	Hiding Behind Classified Status	13.6	The commenter stated that certain parties have claimed that SNL or DOE have been concealing Landfill contents behind their classified status. This claim is false. (See Memorandum from Rich Kilbury (DOE oversight Bureau SNL/ITRI) to Roger Kennett (DOE Oversight Bureau, Program Manager, SNL/ITRI), July 21, 2000)	NMED has evaluated the records associated with the contents in the landfill and believes the information provided by SNL is acceptable.	
M	Citizen, Steve Dapra	Fuel Rods in MWL	13.7	The commenter indicated that certain parties claimed that fuel rods are buried in the MWL. This claim is answered in a	See response to Comment 13.6. NMED has evaluated the classified	

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				letter from Ron Curry, Secretary of New Mexico Environment Department to Dr. Maurice Weisberg, M.D, (August 22, 2003). The claim is both false and unreasonable. Fuel rods are extremely expensive and they would not be buried.	information associated with fuel rods accepted for research at SNL. Records indicate that the material was not disposed of in MWL and are still in storage at a secure location at SNL.	
M	Citizen, Steve Dapra	Proposed Cover for MWL	13.8	The commenter stated that he does not believe that a cap or cover at MWL is necessary. He recommends that a sufficient amount of soil be spread over the area to smooth out the lumps, and that the soil be given a crown to prevent low spots from forming when the dirt settles. Then plant native grasses on the MWL, so it will have the same appearance as the surrounding terrain. The commenter believes the current regimen of air and water sampling should continue for 20 years. If the landfill has not leaked by that time it probably isn't going to.	NMED disagrees with this comment and believes that a cap and a bio-intrusion barrier provide additional protection. NMED agrees with the commenter that monitoring of the site should continue for at least 20 years. RCRA requirement include a post-closure timeframe of 30 years, and NMED believes a 30 year time period should be specified.	
M	Citizen, Steve Dapra	Engineered Cover	13.10	The commenter indicated that he does not support the placement of an engineered cover or cap, however he has no real objective if that proposal is implemented. Also, he has no objection if the monitoring time is greater than 20 years.	See response to Comment No. 13.9.	
N	Citizen, Maurice Weisburg, M.D.	Waste Inventory and Storage	14.1	The commenter indicated that his principal concerns involve the possible presence of high-level wastes buried with metal containers that have undergone irradiation in on-site research reactors in TA-5. Related to that concern is an SNL document dated October 15,1993 "Site Team Report on Spend Fuels", which is an assessment of the vulnerability of storage of irradiated nuclear fuels, both fresh as	NMED has evaluated the classified records at SNL. Records indicate that high level waste, such as fission products, have not been disposed at MWL, and that such material is in storage in a secure location at SNL. As was stated previously (see Comment No. 1.14), excavations and removal of the waste, rather then leaving in place for now, would be a greater risk to	

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				well as previously irradiated. In only a few instances are these materials referred as spend fuels or high-level wastes. Instead the term used is "RINM" (reactor irradiated nuclear material). The statement on page 3 of the executive summary states that " there is no spend reactor fuel on-site [disposed in MWL] from the SNL reactors. This would seem misleading since both fresh and pre-irradiated samples were used and exposed in the core for different time periods. Storage of RINM form experiments in one instance was into 32-foot deep holes with steel sides and an open gravel filled bottom. For storage after use, Sandia Pulse Reactor had 19 such storage areas. The commenter expressed concern that 11 years later we are still talking about long-term storage, with no approved method of disposal. The commenter is concerned about leaking from the unit into the vadose zone and ground water, and is concerned that the Albuquerque sole aquifer. The commenter is also concerned about the corrosion of the metal containers. He asked about the follow-up on the Tiger Team, and what findings were presented.	human health and the environment. NMED concurs with the commenter regarding the concern with groundwater and believes continued monitoring of the vadose zone and the groundwater is necessary. NMED is unaware of any follow-up on the Tiger Team findings.	
N	Citizen, Maurice Weisburg, M.D	Wastes Inventory and Storage	14.2	The commenter believes that air monitoring and monitoring of the vadose zone and the ground water is a prudent requirement.	NMED concurs with this comment.	
N	Citizen, Maurice Weisburg, M.D	Wastes Inventory and Storage	14.3	The commenter is concerned about the material so close to the border of a major city, he believes it would be prudent to move the wastes to a more secure location.	As previously stated excavation of the waste and disposal off site presents numerous other problems.	

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					See response to Comment Nos. 1.30, 1.66, and 1.67.	

DEFINITION OF ACRONYMS

ALARA – As Low As Reasonably Achievable
CAMU – Corrective Action Management Unit
CMS – Corrective Measure Study
COC – Constituent of Concern
CWL – Chemical Waste Landfill
DCF – Dose Conversion Factor
DOE – Department of Energy
EPA – Environmental Protection Agency
ER – Environmental Restoration
FOIA - Freedom of Information Act
HEAST – Health Effects Assessment Summary Table
INEEL – Idaho National Environmental and Engineering Laboratory
IRIS – Integrated Risk Information System
MWL – Mixed Waste Landfill
NCEA – National Center for Environmental Assessment
NFA – No Further Action
NMED – New Mexico Environment Department
NMG – Neutron Moisture Gauge
NRC – Nuclear Regulatory Commission
O&M – Operation and Maintenance
OSWER – Office of Solid Waste and Emergency Response
PCB – Polychlorinated Biphenyl
PEF – Particulate Emission Factor
RCRA – Resource Conservation and Recovery Act
RFI – RCRA Facility Investigation
RIMN – Reactor Irradiated Nuclear Material
SNL – Sandia National Laboratory
SVOC – Semi-volatile Organic Compounds
TCE - Trichloroethelyne
TSCA – Toxic Substance Control Act
TRU - Transuranic
VOC – Volatile Organic Compound