

AGENDA

54th WIPP QUARTERLY REVIEW MEETING April 24, 1996

Carlsbad Area Office
101 W. Greene Street
Carlsbad, New Mexico
505-234-7303

8:30 a.m.	Welcome and Opening Remarks	10 min.	George Dials, Manager, CAO
8:40 a.m.	U.S. Department of Energy: Status/Activity Report * Including Budget Forecast	30 min.	George Dials, Manager, CAO
9:10 a.m.	Environmental Evaluation Group: Status/Activity Report	30 min.	Robert Neill, Director, EEG
9:40 a.m.	NMED DOE Oversight: Status/Activity Report	15 min.	Keith McKamey, NMED
9:55 a.m.	NMED Haz/Rad Materials Status/Activity Report	15 min.	Steve Zappe, NMED
10:10 a.m.	N.M. Radioactive Waste Task Force: Status/Activity Report	20 min.	Chris Wentz, NMEMNRD
10:30 a.m.	BREAK	15 min.	
10:45 a.m.	Status of the RCRA Part B Permit; NMED NOD	30 min.	Steve Zappe, NMED
11:15 a.m.	Status of Data Inputs to Performance Assessment	45 min.	Mel Marietta, SNL
12:00 p.m.	LUNCH		
1:30 p.m.	Experimental Programs - Results of Actinide Source Term Experiments - Results of Blowout Releases - Results of Colloid Program	60 min.	Butch Stroud, CAO Butch Stroud, CAO Butch Stroud, CAO
2:30 p.m.	Backfill Status	30 min.	Mike McFadden, CAO
3:00 p.m.	WAC Rev. 5 Update	30 min.	Don Watkins, CAO
3:30 p.m.	Status of BIR/LWA Survey Report	30 min.	Kent Hunter, CAO
4:00 p.m.	Q&A/Discussions	30 min.	
4:30 p.m.	Action Item Commitments/Closeouts	15 min.	Pat Kilgore, CAO
4:45 p.m.	Adjourn		

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TENTATIVE AGENDA

54th WIPP QUARTERLY REVIEW MEETING
April 24, 1996

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12:00 p.m.	LUNCH		
1:30 p.m.	Experimental Programs - Results of Actinide Source Term Experiments - Results of Blowout Rods - Results of Chemical Retardation in Culebra - Results of Colloid Program	90 min.	Butch Stroud, CAO Butch Stroud, CAO Dick Lark, CAO Butch Stroud, CAO
3:00 p.m.	WAC Rev. 5 Update	30 min.	Don Watkins, CAO
3:30 p.m.	Status of BIR/LWA Survey Report	30 min.	Kent Hunter, CAO
4:00 p.m.	Q&A/Discussions	30 min.	
4:30 p.m.	Action Item Commitments/Closeouts	15 min.	Pat Kilgore, CAO
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4/24/96

George
Dubs

Stressed pushing the state to issue the permit, but will modify DDIP milestone

LWA Amendments - Senate bill sets opening for June 30 1997, but DOE says that's not reasonable - prefer House bill date of 11/30/97

RH volume limit is in C+C agreement, not LWA.

WAC Rev 5 signed & released, distributed end of April

Revising shipping routes in NE, eliminate route thru OK, eliminate 23 tribal nations

Bob Neill

- railed about how, while DOE claims WIPP is safe, it is EPA's authority to determine.

Discussion of LWA Amendments. No reason to reduce review time, exempt from LDR delay, don't set opening date, don't eliminate incentive to produce required reports + studies.

* Mine safety - EEB to recommend abandoning Panel 1 (4 rooms excavated in 6 weeks). Will submit report to DOE within a few weeks

Keith McKamey - see handout

Steve

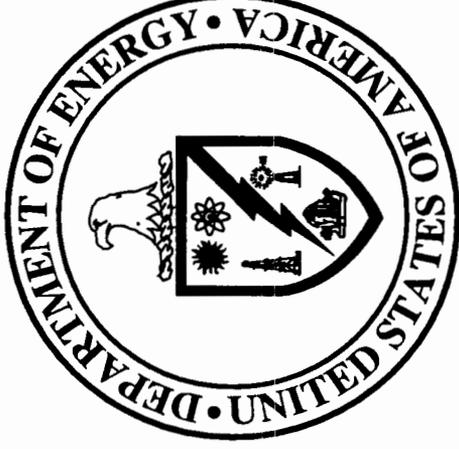
Chris Wente - public awareness program - targeting elected officials, emergency responders, etc.

Transportation meeting w/ LANL - will try to make it a periodic

Public meeting of Rad. Task Force May 2 rm 326
Oct 14-18 - Hosting Haz Mat. transport^{regional} conference with WIPP emphasis. Anticipate 225 people.

Concern over LWA Amendments - LDR, non defense waste. will get letter to delegation in next couple of weeks

**WIPP 54th
QUARTERLY REVIEW**



**George Dials, Manager
Carlsbad Area Office
*April 24, 1996***

ACTION ITEMS
53rd WIPP QUARTERLY REVIEW
JANUARY 25, 1996

Rev. 3, 4/10/96

Action Items	Action By
<p>Conduct a technical exchange meeting to discuss backfill as now required in the Agreement for Consultation and Cooperation (C&C) between the DOE and the state.</p>	<p>Kent Hunter, CAO</p> <p><i>In a letter from Cooper Wayman, CAO Legal Counsel, to Lindsay Lovejoy, NMAG, it was stated that backfill is not mandatory. In addition, the Land Withdrawal Act supersedes the C&C Agreement.</i></p>
<p>Provide NMAG with copy of NM Bureau of Mines Natural Resource Study.</p>	<p>Kent Hunter, CAO</p> <p><i>Copy of report sent to NMAG 3/5/96.</i></p>
<p>Check status of EEG outstanding requests.</p> <ol style="list-style-type: none"> 1) Rationale for screening out scenarios on Regulatory Basis 2) SPM II reports, especially Volume III containing basis for SPM decision 3) Documentation volumes <ul style="list-style-type: none"> - FEP screening - Software Quality Assurance 4) Model validation 	<p>Mike McFadden/Kent Hunter, CAO</p> <ol style="list-style-type: none"> 1) <i>Met with EEG 12/15/95 to discuss this issue.</i> 2) <i>Letter sent 1/12/96.</i> 3) <i>Letter sent 1/24/96.</i> 4) <i>Letter sent 3/6/96.</i>
<p>Provide EEG with sampling comparison data from NMED and CEMRC.</p>	<p>Keith McKamey, NMED</p> <p><i>Data submitted to the CAO 3/4/96 for 30-day review. Was submitted to EEG 4/10/96.</i></p>
<p>Provide Dr. Bill Lee with two slides (WIPP cut-away diagram on page iii of CAO Strategic Plan and photo of WIPP on page iv of Plan)</p>	<p>Pat Kilgore, CAO</p> <p><i>Work request submitted January 26, 1996. Slides mailed January 30, 1996.</i></p>
<p>Improve communications with Governor's Radioactive Task Force by providing copies of correspondence, documents, and other data provided to other oversight groups.</p>	<p>George Dials, CAO</p> <p><i>Met with Secretary Salisbury and Chris Wentz on 1/26/96; direction to staff on 2/1/96.</i></p>

<p>Conduct detailed briefing with Radioactive Task Force about TRU Waste Management Plan and EMNRD WIPP issues and concerns.</p>	<p>Don Watkins, CAO <i>Briefing conducted 2/21/96 during WGA meeting, Colorado Springs, CO</i></p>
<p>Conduct technical exchange meetings starting in early April 1996 to discuss experimental program results/data.</p>	<p>Jim Mewhinney, CAO <i>Coordinate/schedule meetings. Provide status and schedule at 54th Quarterly.</i></p>
<p>Provide draft copy of WAC Rev. 5 to Lindsay Lovejoy, Steve Zappe, Chris Wentz, and Keith McKamey.</p>	<p>Don Watkins, CAO <i>Completed 2/13/96.</i></p>
<p>Provide Lindsay Lovejoy, Steve Zappe, Chris Wentz, and Keith McKamey with information on relaxed and/or deleted requirements in WAC and calculations for basis of decision.</p>	<p>Don Watkins, CAO <i>Letter and documentation sent 2/20/96.</i></p>
<p>Conduct technical exchange meeting to clarify definitions of RH and high-level waste.</p>	<p>Don Watkins, CAO <i>Tentative agenda being prepared for meetings the week of July 15, 1996.</i></p>
<p>Include RH TRU Study in topics for 54th Quarterly.</p>	<p>Steve Zappe, NMED <i>After Mike McFadden mentioned he had discussed this issue at the last quarterly, Mr. Zappe said he would check to see if further briefings are desired.</i></p>
<p>Schedule 54th WIPP Quarterly Review.</p>	<p>Pat Kilgore, CAO <i>The next quarterly will be held in Carlsbad on April 24, 1996, at the DOE Carlsbad Area Office, 2nd floor conference room. Agenda distributed 3/29/96.</i></p>

DDP MILESTONES

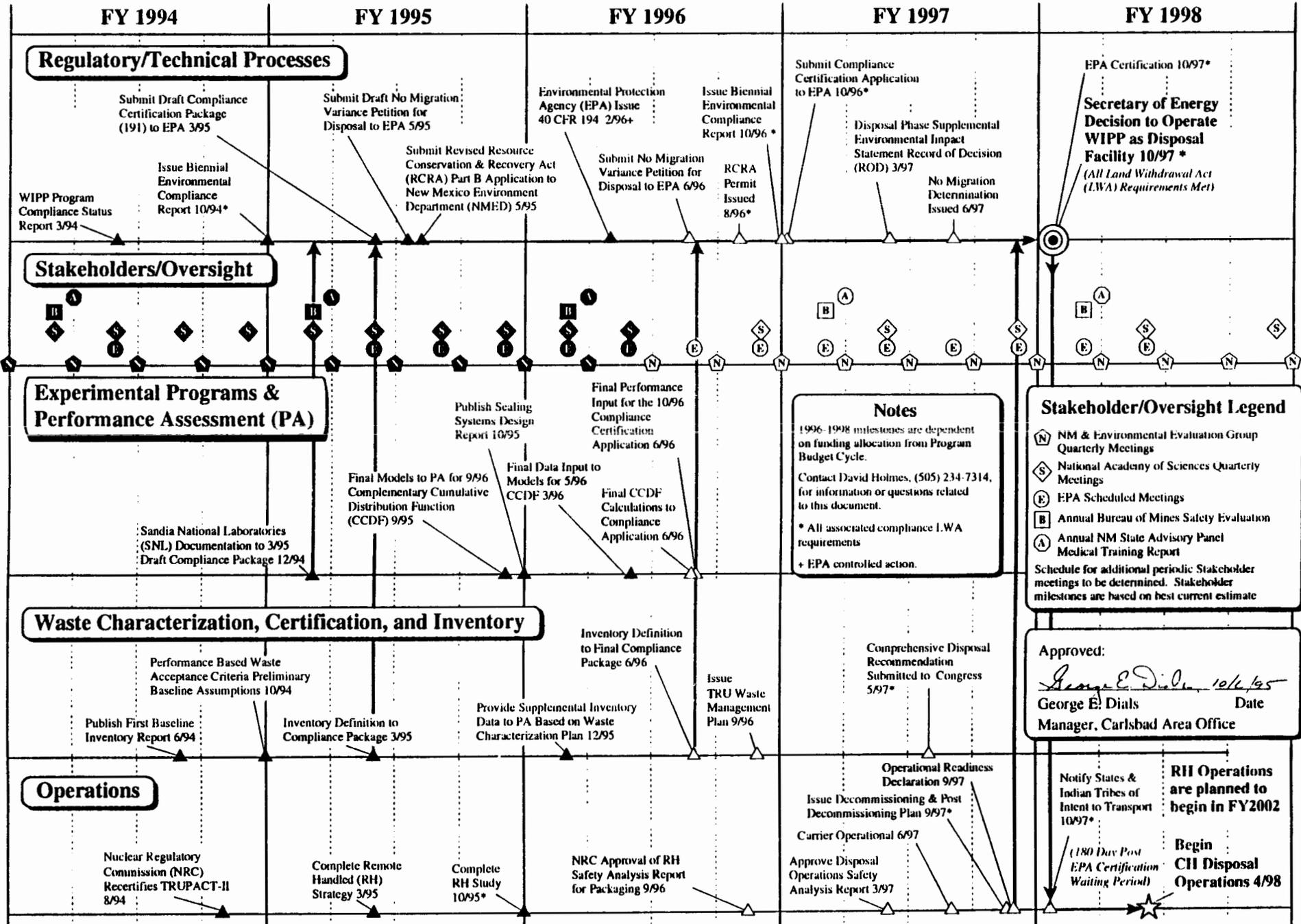
- **Completed DDP milestones since last quarter**
 - **Final data input to models for 5/96 CCDF** **3/96**
 - **EPA issue 40 CFR 194** **2/96**

- **Upcoming DDP milestones**
 - **Submit NMVP for disposal phase to EPA** **6/96**
 - **Final performance input for 10/96 compliance certification application** **6/96**
 - **Final CCDF calculations to compliance application** **6/96**
 - **Inventory definition to final compliance package** **6/96**



WIPP Disposal Decision Plan

Updated 4/2/96
Revision 2
October 6, 1995



40 CFR 194 ISSUES AND PROGRESS

- **Consideration of mining**
 - **Implementing mining scenario described by EPA**
 - **Adding magnesium oxide to the repository as assurance**

- **Drilling rate**
 - **Exploring plugging practices in the Delaware Basin**
 - Determine length of plugs**
 - Determine frequency of plugging**

- **Credit for PICs**
 - **Assembled task force to demonstrate credit methodology**
 - **Plan to have final task force report peer review**



RESOURCE CONSERVATION AND RECOVERY ACT PART B APPLICATION 40 CFR 264 Operating Standards

- **Order issued by New Mexico Environment Department Secretary, 9/2/94**
- **Final application submitted to New Mexico Environment Department on 5/31/95**
- **NOD received 3/14/96**
- **DOE responses provided 4/12/96**
- **Carlsbad Area Office Disposal Decision Plan schedule calls for permit issuance 8/96; expect to revise to reflect state needs**



LAND WITHDRAWAL AMENDMENTS ACT

- **HR 1663 - Skeen, Schaefer, Crapo**
- **S 1402 - Craig, Kempthorne, Johnston**



THE AMENDMENTS

- **Change EPA's role**
 - HR 1663-EPA certifies (1 year); DOE submits application in increments
 - S 1402-EPA certifies, but scope limited (6 months)
- **Repeal 180-day waiting period**
- **Eliminates plans/studies as disposal requirement**
 - HR 1663-repealed
 - S 1402-plans/studies required at later date
- **Exempts WIPP waste from RCRA land disposal restrictions**
- **Accelerates opening**
 - HR 1663-November 30, 1997
 - S 1402-June 30, 1997



TRU WASTE BASELINE INVENTORY REPORT (TWBIR) SCHEDULE

- TWBIR, Rev. 2, data call *3/15/95*
- Draft Rev. 2, for CAO review *10/17/95*
- DOE and stakeholder review *11/7/95*
- Comments due back *12/7/95*
- Publication of WTWBIR, Rev. 2 *12/19/95*
- TWBIR, Rev. 3, data call *1/11/96*
 - Certifiability data
 - Inventory of cement and chelating agent
 - Remainder of small-quantity sites
 - Rocky Flats waste volumes converted to reflect residues processed for waste disposal
- TWBIR, Rev. 3 publication *6/30/96*



PERFORMANCE ASSESSMENT EXPERIMENTAL PROGRAMS

- All models have been submitted to PA
- Twenty-four PA codes have been developed to NQA 2, Subpart 2.7 QA level
- Final data input to models 3/96
 - Shaft seals and rock mechanics
 - Actinide source term and colloids



WASTE ACCEPTANCE CRITERIA, REVISION 5

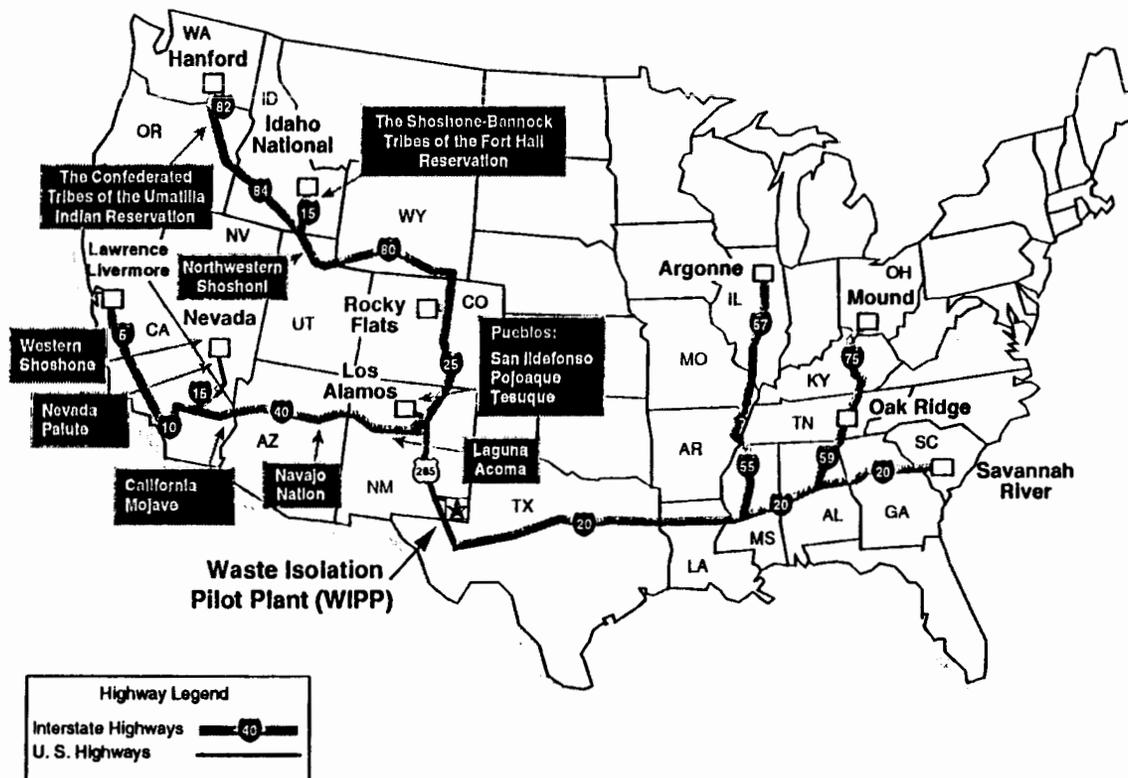
- Revision initiated *2/10/95*
- Schedule established *3/2/95*
- First draft completed *9/29/95*
- Second draft completed *12/29/95*
- All reviews completed and Revision 5 approved *4/5/96*
- Printing and distribution scheduled completion date *4/30/96*



NORTHERN PUEBLOS

- Discussions are ongoing between CAO and the five northern pueblos
- Cooperative agreements should be finalized in CY96

TRIBAL LANDS CROSSED BY PROPOSED WIPP SHIPPING ROUTES



SANTA FE RELIEF ROUTE



- One-third of the 14-mile Santa Fe relief route is completed
- Remaining portion is in planning and design stages
- State estimates \$30-56 million required to complete relief route
- Completion date estimated 1998
- Land designated for route contains expensive real estate making right-of-way costs high
 - State Highway and Transportation Department indicates it has funding necessary to complete road



WIPP: One valuable safe step toward solution of the national nuclear waste disposal problem

- **WIPP is focused and on schedule**
- **Remaining critical areas for continued research have been identified**
- **Path to regulatory compliance identified**
- **Disposal operations will begin 1998**



LITIGATION ACTIVITIES

- **TWO ACTIONS ON 40 CFR 194 (EPA Lawsuits)**
 - **Attorney General of New Mexico, SWIC (pre -194 publication)**
 - EPA failure to finalize criteria per LWA schedule
 - Promulgate CAG outside of rulemaking
 - Covert meetings EPA/DOE/OMB
 - Mandamus Action denied by Court of Appeals
 - **Attorney General's - New Mexico, Texas, SWIC, and Two Citizens**
 - EPA failed to give notice and allow public comment after end of comment period
 - Substantially changed rule
 - DOE/OMB exercised undue influence on final rule
 - EPA acted arbitrarily and capriciously in decision



ENVIRONMENTAL EVALUATION GROUP

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER

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SUITE F-2
ALBUQUERQUE, NEW MEXICO 87109
(505) 828-1003
FAX (505) 828-1062

54th QUARTERLY MEETING

US Department of Energy

**NM Energy, Minerals and Natural
Resources Department**

NM Environment Department

NM Environmental Evaluation Group

Robert H. Neill

April 24, 1996

Carlsbad, NM

OVERALL IMPRESSION

- **Not a draft document to demonstrate compliance.**
- **Only a framework since it lacks a logical presentation of proofs of compliance.**
- **Preface states it does not contain "detailed information".**
- **History of project incomplete.**

CONCEPTUAL MODELS

- **Weak in describing alternative conceptual models for projected conditions and in defending ones selected.**
- **Experimental data not available to justify a particular model.**
- **Potentially erroneous interpretations of data.**
- **Problem with DOE conceptual model of radionuclide migration in Culebra.**

HYDROLOGY

Basic Understanding Not Yet Complete.

- **Water Table.**
- **Recharge and discharge of Culebra Dolomite.**
- **Direction of flow by potentiometric heads differs from water chemistry results.**
- **Water level rise in Culebra Wells.**

CONTAINMENT REQUIREMENT

- **Most important part of Application, but only rudimentary information provided.**
- **Deficient in not analyzing several potentially disruptive scenarios.**
- **Did not establish probabilities for a number of potential breach scenarios.**
- **Inadequate justification for exclusion of FEPs on regulatory or low consequence potential.**
- **23 of 53 parameters listed in PAR lack specific information.**
- **No sensitivity analysis.**
- **Consequence calculations reduced from 70 in 1992 to 20 in draft.**
- **No evidence of computer model validation.**
- **No QA of data demonstrated.**
- **Only 1 CCDF shown.**

WASTE INVENTORY AND CHARACTERIZATION

- **Conflicting estimates by DOE of volume and radioactivity.**
- **Performance based WAC still non-existent.**

**EXISTING TRU WASTE
(m³)**

	<u>CH</u>	<u>RH</u>	<u>TOTAL</u>
Feb. 1995	73,000	1200	74,000
Dec. 1995	58,000	3600	62,000

Baseline Inventory Report, Rev. 1 and 2

ANTICIPATED TRU WASTE INVENTORY
(m³)

	<u>CH</u>	<u>RH</u>	<u>TOTAL</u>
Feb. 1995	120,000	4800	130,000
Dec. 1995	110,000	27,000	140,000

DOE WIPP Baseline Inventory Report (BIR)
Rev. 1 and Rev. 2

ASSURANCE REQUIREMENTS

- **Active and passive institutional controls**
 - **Plans not available**
- **Monitoring**
 - **Only a commitment for a plan**
- **Engineered Barriers**
- **Natural Resources**
- **Retrievability**

ENGINEERED BARRIERS

- **Decisions to incorporate Engineered Barriers**
- **Backfill**
- **MgO**
 - **Raises pH**
 - **Lowers solubility of waste**
 - **Decreases amount of radionuclides reaching accessible environment in 10^4 years**

DOE SELF REGULATION

- **WIPP LWA Sec. 9 requires documentation of compliance with laws and regulation issued by EPA as well as all other applicable Federal laws pertaining to public health and safety on the environment on all regulations promulgated and permits required.**
- **Application does not include status of compliance with DOE AEA, DOE Orders, approvals by ES and H, other DOE components or the DNFSB.**

CHAPTER 1

- **Estimates of waste volume and radioactivity continue to change.**
- **Project overview and history incomplete.**
 - **Purpose of WIPP.**
 - **Test Phase.**
 - **Purpose of assurance requirements incorrect. Purpose is "To provide the confidence with the requirements of 191.13 (containment).**
- **Site selection process incomplete.**
 - **2 miles to deep drill holes.**
 - **NAS 1957 recommendations.**
 - **WIPP-12 brine interception.**
- **1992 DOE sensitivity analysis will not be available until final CCA.**

CHAPTER 2 SITE CHARACTERIZATION

- **Dewey Lake Redbeds**
- **Culebra Hydrology**
- **Hydro of R/S interface**
- **Castile Hydrology**
 - **Brine flowed at WIPP-12**
 - **Brine under repository**
- **Natural Resources**
 - **Much more than anticipated**
 - **Threshold of economically recoverable potash may change in future**

CHAPTER 2 (cont.)

- **Location of hydrocarbon wells and applications should be updated. List of boreholes in SE NM in Appendix incomplete.**
- **Consideration of mineral extraction confined to "existing leases" (40 CFR 194). Should consider future leases.**
- **Measured concentrations and MDLs of radionuclides in water wells appear incorrect.**
- **Climatic changes**
- **Seismology**

CHAPTER 3

- **Compliance with Subpart A not addressed.**
 - **Status of Subpart A criteria.**
- **Description of various facilities.**
- **Plans for waste emplacement.**
- **Abandoning northern area W/O backfill.**
- **Impact of longer waste emplacement period.**
- **Disposal Phase SAR.**
- **Self regulation of operation safety.**
- **Engineered barriers neither identified nor effects quantified.**
- **Seals and plugs permeability.**
- **Plugging of boreholes to use conventional procedure.**

CHAPTER 4 WASTE DESCRIPTION

- **Assessments based on assumed characteristics.**
- **BIR is/is not waste characterization document.**
- **RH-TRU inventory keeps changing.**
- **WAC**
 - **Short vs. long term purpose.**
 - **Recent changes (Ex. 1% respirable fines).**
 - **Performance based WAC non existent.**
- **Waste characterization Program.**
 - **Parameters important to compliance.**

CHAPTER 4 (cont.)

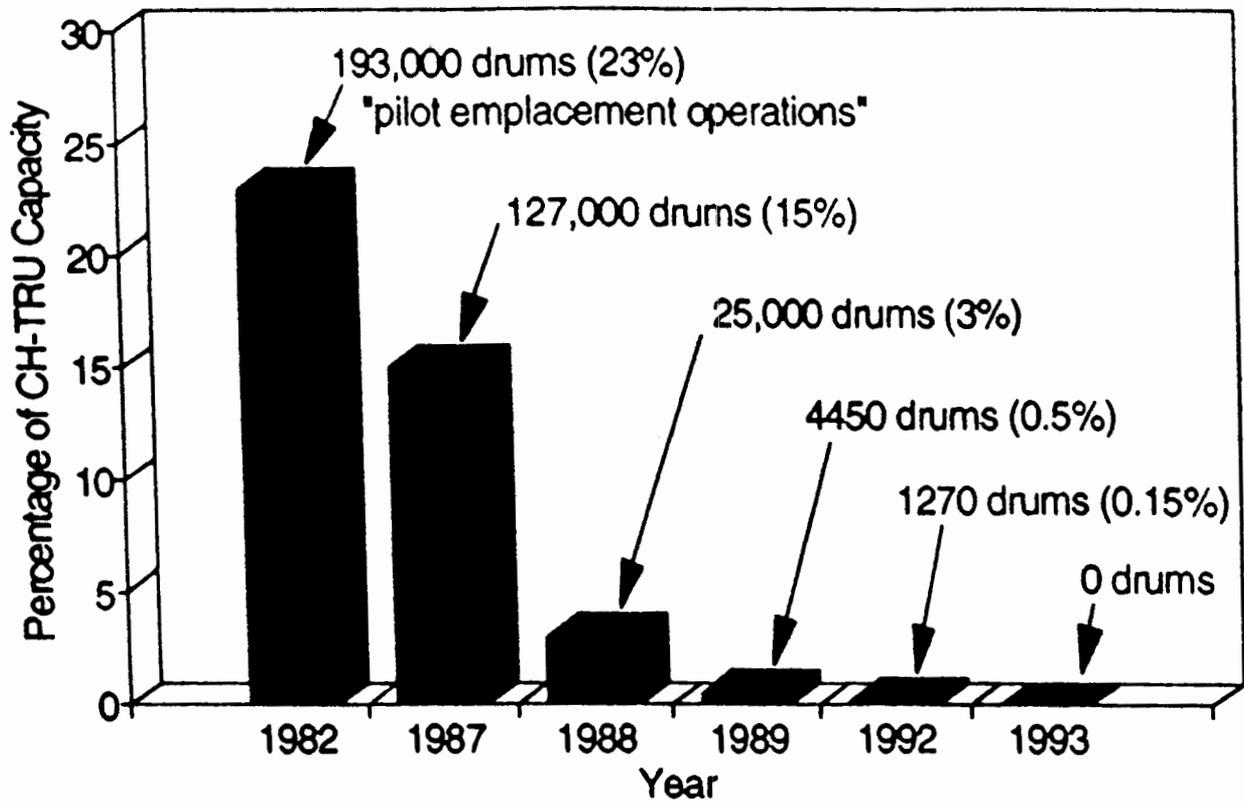
- **Uncertainty in Waste streams.**
 - **Free liquids may be present.**
 - **RH-TRU characterization unavailable.**
 - **Miscertification of 46 out of 80 INEL drums.**

CHAPTER 5

QUALITY ASSURANCE

- **Lack of specific information.**
- **Model validation.**
- **Did not address proposed 194 QA requirements.**
- **Monitoring programs.**
- **Qualifications of existing data.**
- **PRE QA program data.**

In situ tests with waste at WIPP (Proposed Quantities)



CHAPTER 6 CONTAINMENT

- **Not all relevant scenarios have been analyzed.**
- **Probabilities of water flooding and potash mining not estimated.**
- **PA results are questionable since "Place Holders" are substitutes for most important data.**
- **Solubility**
 - **Generic values used.**
 - **Oxidation states not adequately addressed.**
- **Conceptual model for flow in Culebra.**
- **Retardation mechanisms**
 - **Equilibrium sorption**
 - **Matrix diffusion**
 - **Corrensite clay**

CHAPTER 6 (cont.)

- **Colloids**
- **FEP cutoff at 10^4 y**
- **FEP screening criteria**
- **HYDRO**
- **PAR**
- **BRAGFLO**
- **CUTTINGS**
- **NUTS**
- **SECO FL 2D and SECO TP2D**

CHAPTER 7 ASSURANCE REQUIREMENTS

- **Purpose — to provide confidence with containment.**
- **AICs non-specific.**
- **DOE would permit uncontrolled access to non fenced area of site.**
- **AIC and PIC descriptions should be in CCA.**
- **Borehole plugging not described.**
- **No backfill in SPDV experimental area.**
- **No TRU waste markers at other sites.**
- **Archive radiation protection standards.**
- **DOE incorrectly states 194.44 imposes additional engineered barrier requirements.**
- **Evaluation of engineered alternatives incomplete.**
- **Multiple engineered barriers.**

CHAPTER 8
INDIVIDUAL AND GROUNDWATER
PROTECTION REQUIREMENTS

- **Dose calculation not done.**

- **Concentration calculation not done.**

**PAR
VOLUME I**

- **Specific information not available on 23 of 53 parameters sampled.**
- **Halite permeability.**
- **Gas and brine storage model.**
- **Initial liquid saturation of panel and repository.**

SCREENING CRITERIA VOLUME I

- **Synergistic effects of independent FEPs not considered.**
- **No analyses to justify conclusions of little impact on probabilities or consequences.**
- **Potash mining impact on Culebra not addressed.**
- **DOE is analyzing only those H.I. events they are required to address and holds EPA responsible for exclusion.**
- **Nuclear criticality**
 - **SC&A analysis**
 - **Increase in RH-TRU quantities.**
- **Backfill commitment**
- **Fluid injection**

ACTIVE ACCESS CONTROLS VOLUME II

- **Does not identify specific AICs.**
- **Paraphrasing regulations may cause confusion.**
- **DOE concludes risk of slant drilling into repository is essentially zero.**
- **Long term monitoring confined to subsidence measurements.**

**BIENNIAL ENVIRONMENTAL
COMPLIANCE REPORT
VOLUME II**

- **DOE regulatory material not included.**

- **Roles of various regulatory agencies poorly defined.**
 - **NRC standards are generally not incorporated into DOE Orders.**

 - **NRC does not regulate transportation from sites to WIPP.**

- **No information on RH-TRU waste transportation.**

VOLUME II

- **Compilation of borehole data in Southeastern NM incomplete.**
- **Report on oil and gas boreholes unavailable (to be used for predicting future drilling rates).**

VOLUMES III AND IV

- **BIR values changing.**
- **Method to scale projected inventory unnecessarily convoluted.**
- **Half of the TRU waste may be LLW.**

VOLUME V

- **Estimates of amounts of metal to be emplaced in repository following D&D.**

VOLUMES VI AND VII

- **1978 Geological Characterization Report reviewed by EEG-2.**

RESOURCE DISINCENTIVE (IRD)

- **Issues identified earlier by EEG still unresolved.**

See Supplement 5, 6 and 7

DOE/EEG/NMED QUARTERLY MEETING:

April 24, 1996

(Status Report since January 25, 1996)

NMED/DOE-OB/WIPP

I. Environmental Monitoring/Sampling:

- A) Biotics -**
- B) Groundwater - WQSP-6A**
- C) Surface Water - Exhaust Shaft Boreholes**
- D) Sediment -**
- E) Soils - surface - Smith Ranch, WIPP Far Field (1000 meters NW of Waste Handling Shaft), WIPP South South (1000 Meters south of Waste Handling Shaft)**

II. Environmental Oversight:

- A) Working with Westinghouse to evaluate borehole compliance within the Land Withdrawal boundary**
- B) Attended the DOE/EPA WIPP Shaft Seal Technical Exchange**
- C) Recommended that Westinghouse maintain the High Pressure Ionization Chamber (HPIC) since it is the only ambient penetrating radiation detection equipment.**
- D) Witnessed the closing of Access "G" and room "H" underground experimental areas.**
- E) Released 95 NMED data to DOE for 30 day review. Returned with no comments or discrepancies. DOE-OB/WIPP plans to incorporate this data in a 95 Surveillance report using control charts to illustrate how NMED's data compares to DOE's data and the data's proximity to action and regulatory levels for easier understanding by the public.**

***Preliminary indications reveal the Upper Action Limit (UAL) has been exceeded at a number of locations. The UAL is designed to represent the established WIPP baseline mean concentration plus two standard deviations and when exceeded should reflect a warning for further investigation. The following media and locations are above the UAL and warrant further investigation:**

Reasons we need NMED at WIPP? (listed by number of times mentioned)

- 1) Protect the environment**
- 2) Keep the environment safe**
- 3) Keep radioactive waste buried with no leaks**
- 4) Keep clean air and water**
- 5) Protect future generations**
- 6) Keep from ruining the environment**
- 7) Sample the earth to keep clean**
- 8) Make sure the earth lasts longer**
- 9) Make the world a better place**
- 10) Make sure they follow laws**
- 11) Have somewhere to store waste**
- 12) To have a brighter tomorrow**

6.5 NON-RADIOLOGICAL EXCEEDANCE MATRIX

EXCEEDANCE OF UAL AND RBC			
NON-RADIOLOGICAL			
ENVIRONMENTAL MEDIA	SAMPLE LOCATION OR TYPE	>UAL	>RBC
		VOLATILE ORGANICS	TOTAL METALS
GROUND WATER	WQSP-1		
	WQSP-2		
	WQSP-3		
	WQSP-4 Toluene - .9 ug/L detected		
	WQSP-6 Toluene - 1.0 ug/L detected		
	H-03b3		
	H-14		
	H-18		
	WIPP-19 (trending downward)		
	SURFACE WATER	Facility West	
SOIL	Solid Waste Management Unit - 001g		
BIOTIC TISSUE	Catfish (Pecos River)	EPA Risk-Based Concentrations were not exceeded.	

ug/L - micro grams per Liter

UAL - Upper Action Level

RBC - EPA Risk-Based Concentration

WIPP Quarterly Review April 24, 1996

Activities Update for NMED's RCRA Permits Program

1. Meetings and Presentations

- Attended LANL/State Coordination of WIPP Activities meeting in Los Alamos, February 29.
- Presented "NMED and the WIPP Disposal Permit Application" at the NM Conference on the Environment in Albuquerque, March 12.
- Escorted seven NMED staff members to the WIPP site for a facility tour, April 11 and 12.
- Participated in review of voluntary release assessments performed at selected WIPP solid waste management units (SWMUs), April 12.

2. RCRA Part B Permit Application - Technical Review

- DOE submitted Revision 5.2 (six volumes) on January 17, incorporating comment responses and revisions to Part B permit application.
- Reviewed revised application for technical adequacy. Issued formal Notice of Deficiency (**NOD**) on March 14, missing original target of February 19.
- Held meetings with DOE to clarify issues and discuss proposed responses to NOD, March 21, 26, and April 4. Issued clarification letters March 29 and April 9.
- DOE submitted Revision 6 (13 volumes plus comment/response volume) on April 12.
- Currently reviewing response for technical adequacy.

3. Development of Draft Permit

- Revision 6 is the final submittal. If any further modifications are required, they will be handled by page changes.
- Expect technical review will take until May 24. Contractor received copies of revised application eleven days after NMED.
- Detailed schedule for draft permit development will be issued with determination of technical adequacy.
- HRMB will produce preliminary modules sequentially, supply to contractor for technical and regulatory review.
- The HSWA module is being developed by EPA Region 6 as a service to NMED.
- Still targeting issuance of draft permit for public comment by late summer.

WIPP Quarterly Review

April 24, 1996

Status of RCRA Part B Permit Application, NMED NOD

1. What we can discuss

- Clarify any comments in the NOD dated March 14, 1996 or its cover letter
- The contents of the subsequent two letters of clarification

2. What we can't discuss

- Relative merits or shortcomings of DOE's response
- NMED's evaluation of DOE's response
- How NMED intends to address particular issues in the draft permit (i.e., permit conditions, compliance schedules, etc.)

3. Why we can't discuss certain things

- NMED's position will become public with issuance of draft permit
- Informational meetings, public hearings, and written comments are the appropriate vehicles for dialogue, which occur during the public comment period once the draft permit is issued.

**WIPP PUBLIC AWARENESS PROGRAM 1996
FINAL SCHEDULE FOR COMMUNITY OUTREACH¹**

DATE	COMMUNITY	LOCATION	ADDRESS/DIRECTIONS
April 9	Las Vegas	San Miguel County Commission Hall 520 West National Street	From Santa Fe: take first Las Vegas exit off I-25, left on New Mexico Avenue, Right on West National. (Meeting with the San Miguel County Commission in their Chambers at 1:00; Open House from 3:30-8:30)
April 11	Las Vegas	Las Vegas City Hall, 1700 N. Grand Avenue	From Santa Fe: take 2nd exit off I-25 onto Grand and it is in the central part of town. (Open House from 1:00-4:30; meeting with Las Vegas City Council in their Chambers at 6:00)
May 14	Nambe Pueblo	Nambe Senior Citizens' Center	North on 285 to Rt. 503. East on 503 about 4.5 miles. Right at sign for Nambe Falls & Recreation Area. Right at sign for Nambe Pueblo government Offices.
May 15	Pojoaque Pueblo	Tribal Administration Council Chambers	From Santa Fe: Take frontage road past Pojoaque up hill. Hill winds around; chamber building on left.
May 16	Santa Fe	Capitol Building Rotunda	In Downtown Santa Fe at the corner of Paseo Del Peralta and Old Santa Fe Trail
June 5	Los Alamos	Los Alamos Community Center 475 20th Street	From Santa Fe: stay on Central Avenue as you enter Los Alamos (don't turn on Trinity). Community Center is on left side at 20th Street, just past Post Office and next to Ashley Pond.
June 6	San Ildefonso	San Ildefonso Pueblo Community Center	
July 9	Springer	City Council Room, Springer City Complex 606 Colbert Avenue	From Santa Fe: take first exit off I-25 and follow Main St. to 6th. Turn left on 6th Street (at Senior Center). After one block, turn right onto Colbert.
July 10	Wagon Mound	Wagon Mound Fire Department 600 Catron Avenue	From Santa Fe: Exit highway at Wagon Mound, Cross Frontage Road, RR tracks, Railroad Ave. Right on Catron Avenue. Fire Department is about 3 blocks down, on right.
August 14	Raton	Raton Convention Center, 901 S. 3rd Street	Located just North of Raton High School, near the electric plant.

¹ Unless otherwise indicated, Open Houses will be held between 1:30 and 4:30 p.m. and 6:00-8:30 p.m.

For further information contact Heidi Snow or Chris Wentz of the New Mexico Energy, Minerals or Natural Resources Department at 505/827-5950.

Status of Data Inputs to Performance Assessment

54th WIPP Quarterly Review Meeting
April 24, 1996

Mel Marietta

SNL

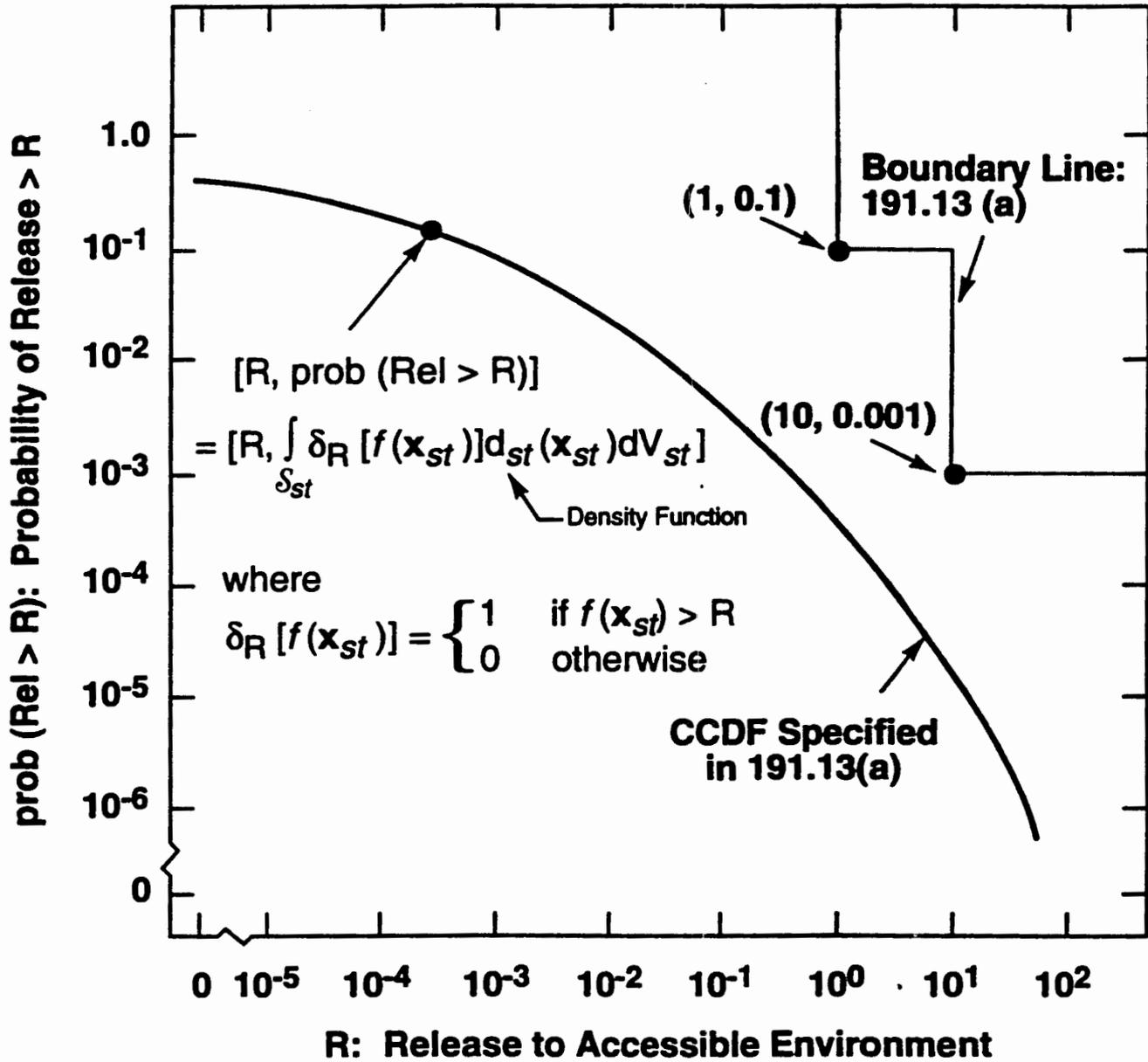
PA Input & PA Calculation Status

- PA calculations have been phased. Three independent LHSs are being propagated through the modeling system one code at a time. i.e. all three replicates through BRAGFLO, then NUTS/PANEL. and so on.
- PA Inputs have also been phased. Inputs for BRAGFLO are entered into the PA controlled data base and the WIPP Records Center, then NUTS/PANEL inputs, and so on.

Three Entities Underlie WIPP PA

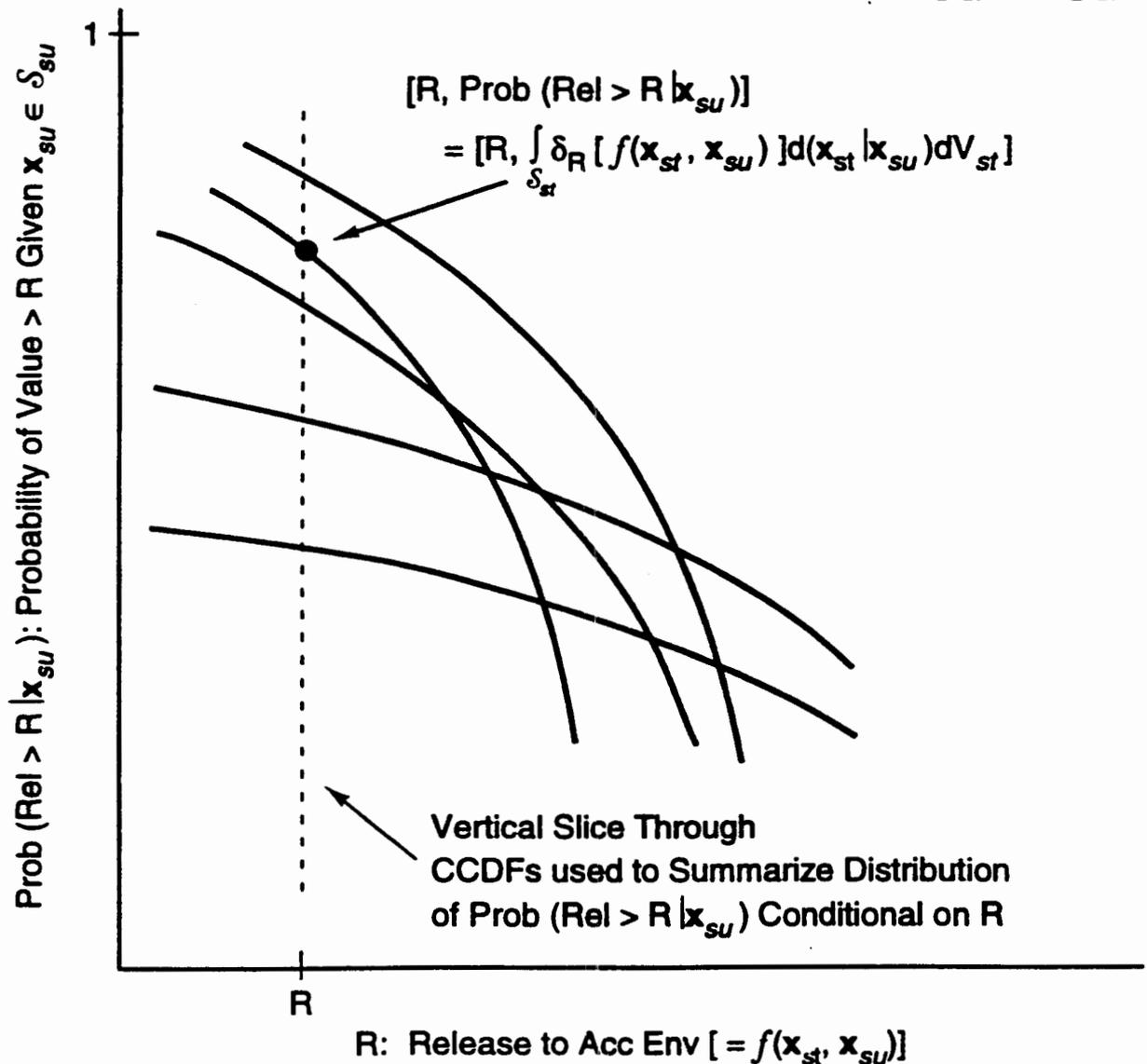
- EN1:** a probabilistic characterization of the likelihood of different futures occurring at the WIPP site over the next 10,000 yrs
- EN2:** a procedure for estimating the normalized release to the accessible environment associated with each of the possible futures that could occur at the WIPP site over the next 10,000 yrs
- EN3:** a probabilistic characterization of the uncertainty in the parameters used in the definition of EN1 and EN2

EN1, EN2: CCDF for 40 CFR 191.13



TRI-6342-730-13

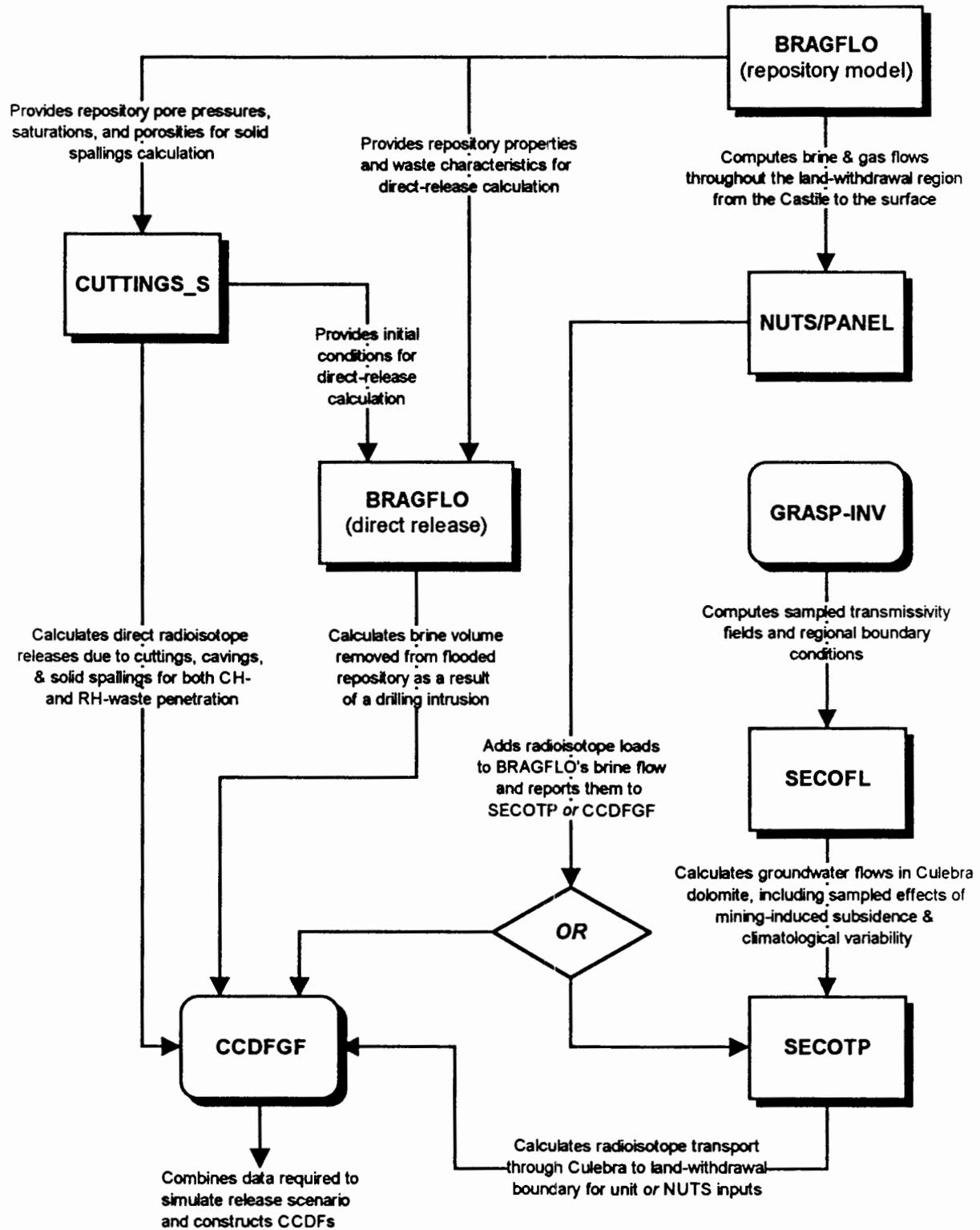
EN3: Distribution of CCDFs Due to $(S_{SU}, \delta_{SU}, P_{SU})$



TRI-6342-4639-1

Important Points

- Different Values for x_{SU} Produce Different CCDFs
- Probability Space for Subjective Uncertainty Leads to Distribution of CCDFs
- Distribution of CCDFs Often Summarized Conditional on Individual Consequence (i.e., R) Values

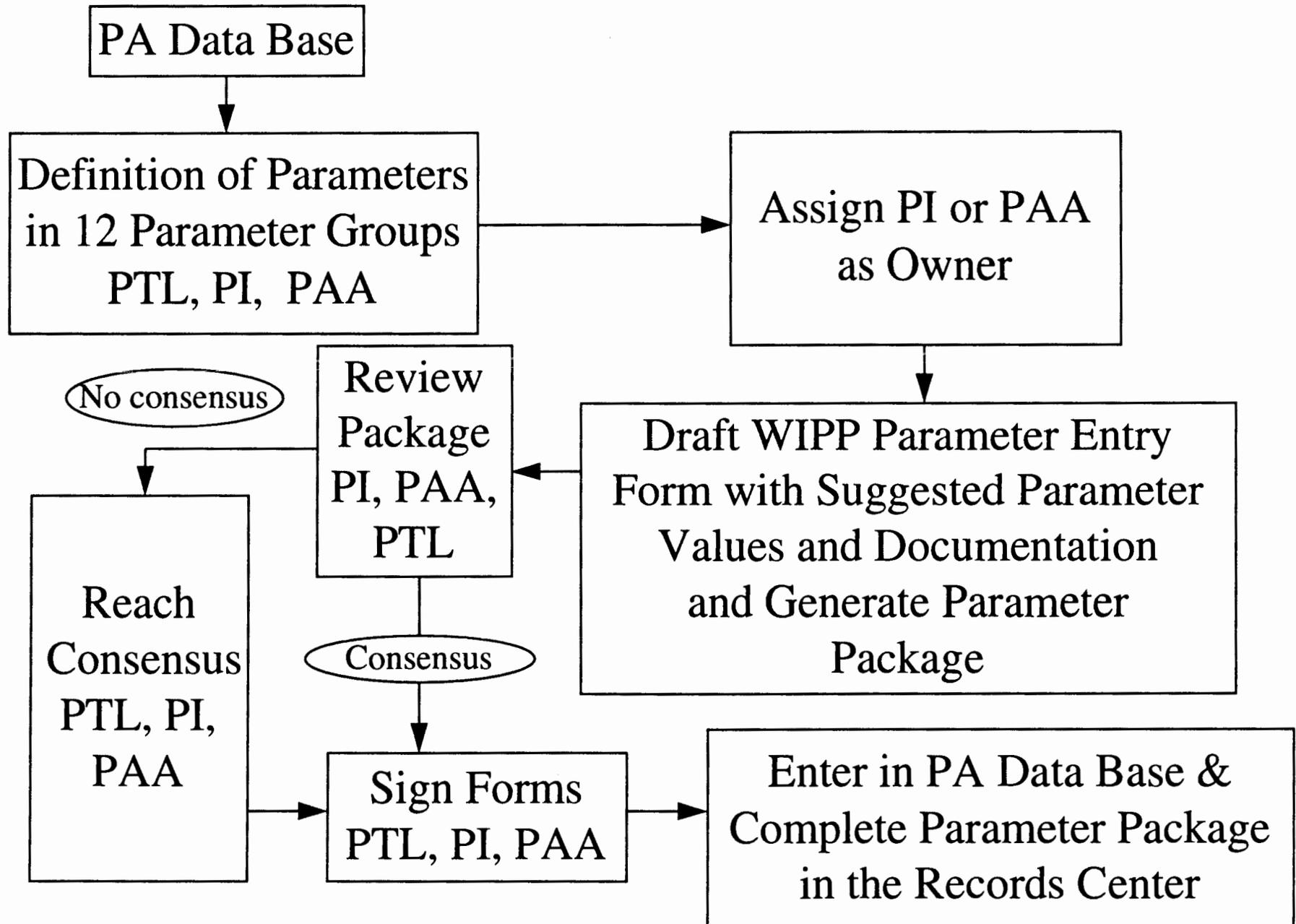


Overview of the CCA PA code sequence. (NUTS/PANEL can forward results to either SECOFL or CCDFGF).

Parameterization Process Objectives

1. Provide consistent, traceable links between PA database parameters and data packages in a summary format.
2. Provide data and distribution summaries.
3. Identify QA status of data and related interpretive codes.
4. Where applicable, provide summary of experimental data collection, i.e. method used, assumptions made in test and interpretation, related references including SAND reports, test plans and journal publications, related Records Center file codes, etc.

Parameterization Process



Data Base Materials

- Borehole
- Borehole Concrete Plug
- Borehole Unrestricted
- Borehole Silty Sand
- Borehole Creep
- Shaft DRZ
- Earthen Fill
- Rustler Compacted Clay
- Asphalt
- Shaft-Concrete
- Shaft Crushed Salt
- Upper Shaft Clay
- Lower Shaft Clay
- Bottom Clay Component
- Concrete Monolith
- Santa Rosa Formation
- Dewey Lake Red Beds
- Forty Niner Member
- Magenta Dolomite
- Tamarisk Member
- Culebra Dolomite
- Unnamed Lower Member
- Salado Halite
- Marker Bed 138
- Anhydrite Layer a & b
- Disturbed Rock Zone

Data Base Materials (Cont.)

- Waste Panel
- Rest of Repository
- Panel Closure
- Operations Region
- Experimental Area
- Marker Bed 139
- Castile Formation
- Brine Reservoir
- Predisposal Cavities
- Salado & Castile Brine
- Gas Generation
- Global
- Radionuclides
- Reference Constants

PA Parameter Categories (QAP 9-2):

Category I: Derived parameter values (e.g, from experimental programs)

Category II: Waste Inventory; Transuranic Waste Baseline Inventory Report (TWBIR) DOE/CAO-95-1121, Rev. 2, December 1995.

Category III: Physical constants (e.g., radionuclide half-life)

Category IV-a: Analog of Cat. I parameter values

Category IV-b: Model configuration

Category V: not used in CCA calculations

Parameter Groups

1. Salado Flow
2. Non-Salado Flow
3. Shaft Seals
4. Gas Generation
5. Disposal Room
6. Dissolved Actinide Retardation: K_D
7. Colloid Actinide Concentration
8. Colloid Actinide Retardation
9. Dissolved Species
10. Cuttings
11. Non-Salado: Culebra Transmissivity Zone
12. Non-Salado: Physical Transport

Last Data Packages to PA

Already to PA:

Dissolved Actinide Concentration

Colloid Actinide Concentration

Cuttings / Spallings

Non-Salado Hydrology

To PA by April 30th:

Dissolved Actinide Retardation

Colloid Actinide Retardation

Non-Salado Physical Transport

Packages in the Records Center - May 31st

Results of Actinide Source Term, Cuttings/Cavings & Spallings Programs

**Butch Stroud
Office of Regulatory Compliance
Experimental Programs**

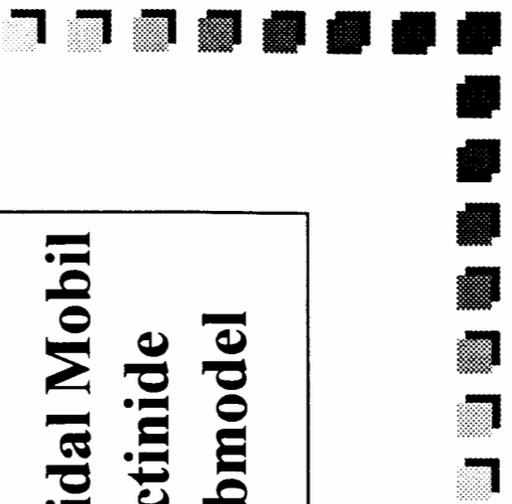
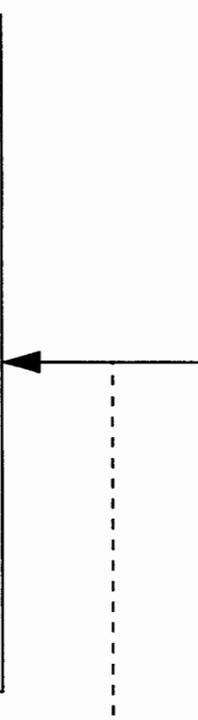


**Actinide
Source Term**

**Source Term
Test Program**

**Dissolved
Species
Submodel**

**Colloidal Mobil
Actinide
Submodel**



**Dissolved
Species Submodel**

**PA Look-up
Table Development**



**Inorganic Dissolved
Models
+III, +IV, +V, +VI**

**Organic Ligand
Parameters**

**Oxidation
State
Distribution**



**Colloidal Mobil
Actinide
Submodel**

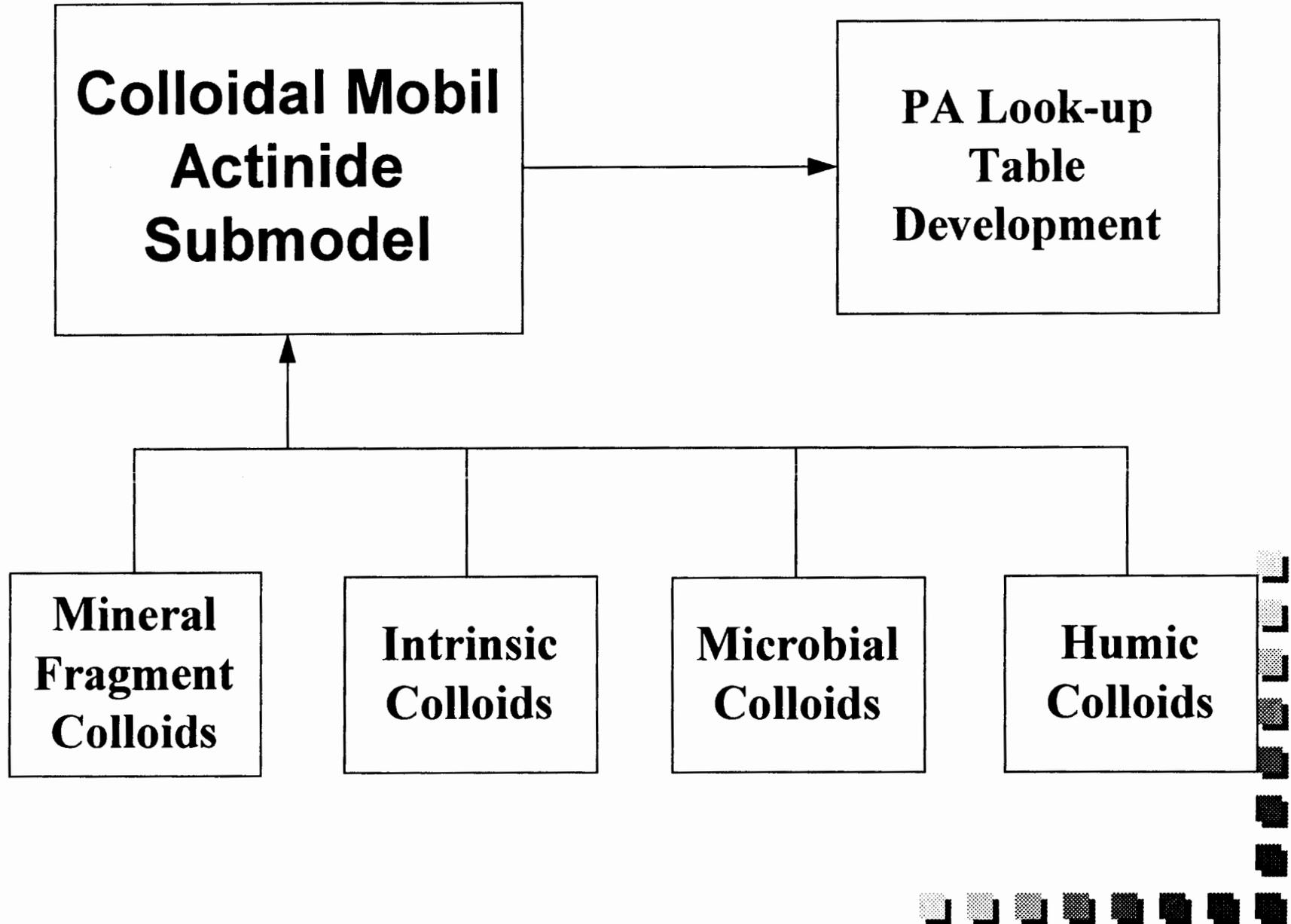
**PA Look-up
Table
Development**

**Mineral
Fragment
Colloids**

**Intrinsic
Colloids**

**Microbial
Colloids**

**Humic
Colloids**



Oxidation State Distribution Results

Actinide	Stable Oxidation States
Am	+III
Pu	+III & +IV
Np	+IV & +V
U	+IV & +VI
Th	+IV



Actinide Source Term Results

with BackAll

Actinide	Brine	Dissolved Source Term (M)	Colloid Source Term (M)	Total Source Term (M)
Am(III)	Salado	4.5E-6	1.4E-5	1.9E-5
Am(III)	Castile	2.9E-6	1.9E-6	4.8E-6
Th(IV)	Salado	4.4E-6	4.1E-5	4.6E-5
Th(IV)	Castile	5.7E-9	5.6E-8	6.2E-8



Actinide Source Term Results (Cont.)

Actinide	Brine	Dissolved Source Term (M)	Colloid Source Term (M)	Total Source Term (M)
Pu(III)	Salado	4.5E-6	1.4E-5	1.9E-5
Pu(III)	Castile	2.9E-6	7.2E-7	3.6E-6
Pu(IV)	Salado	4.4E-6	1.7E-5	2.1E-5
Pu(IV)	Castile	5.7E-9	1.2E-8	1.8E-8



Actinide Source Term Results (Cont.)

Actinide	Brine	Dissolved Source Term (M)	Colloid Source Term (M)	Total Source Term (M)
Np(IV)	Salado	4.4E-6	7.1E-5	7.5E-5
Np(IV)	Castile	5.7E-9	7.2E-8	7.8E-8
Np(V)	Salado	7.7E-6	3.7E-5	4.5E-5
Np(V)	Castile	7.4E-5	2.6E-5	1.0E-4



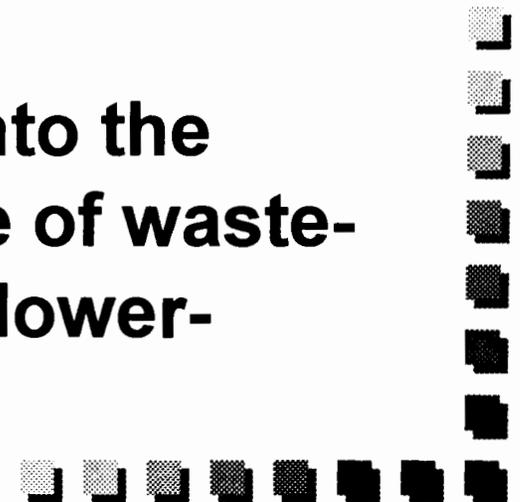
Actinide Source Term Results (Cont.)

Actinide	Brine	Dissolved Source Term (M)	Colloid Source Term (M)	Total Source Term (M)
U(IV)	Salado	4.4E-6	9.2E-6	1.4E-5
U(IV)	Castile	5.7E-9	3.0E-9	8.7E-9
U(VI)	Salado	1.0E-5	1.8E-5	2.8E-5
U(VI)	Castile	7.0E-5	4.4E-6	7.4E-5



Definitions

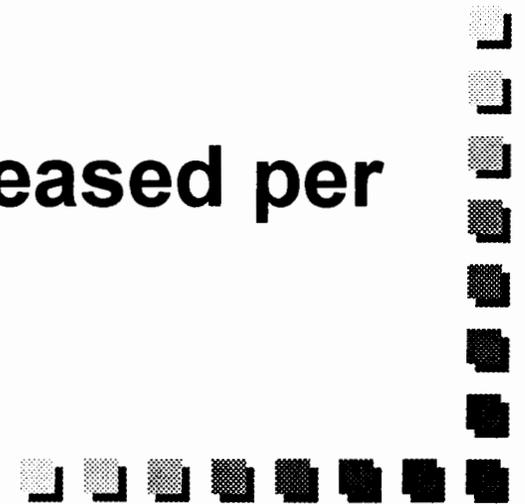
- **Cuttings** - Waste contained in the cylindrical volume created by the cutting action of the drill passing through the waste
- **Cavings** - Waste that erodes from the borehole in response to the upward-flowing drilling fluid
- **Spallings** - Waste introduced into the drilling fluid caused the release of waste-generated gas escaping to the lower-pressure borehole



Cuttings/Cavings

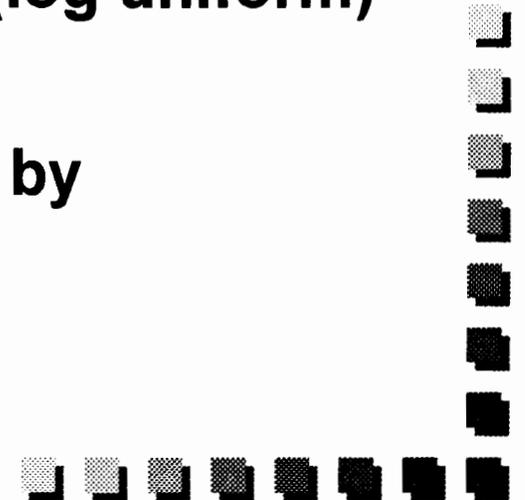
- **Models unchanged since 1992 PA**
- **New input data reflects current drilling practice**
 - **Drill Bit Diameter: 0.31 m (constant)**
- **Results**

Approx. 0.3 m³ of waste released per intrusion

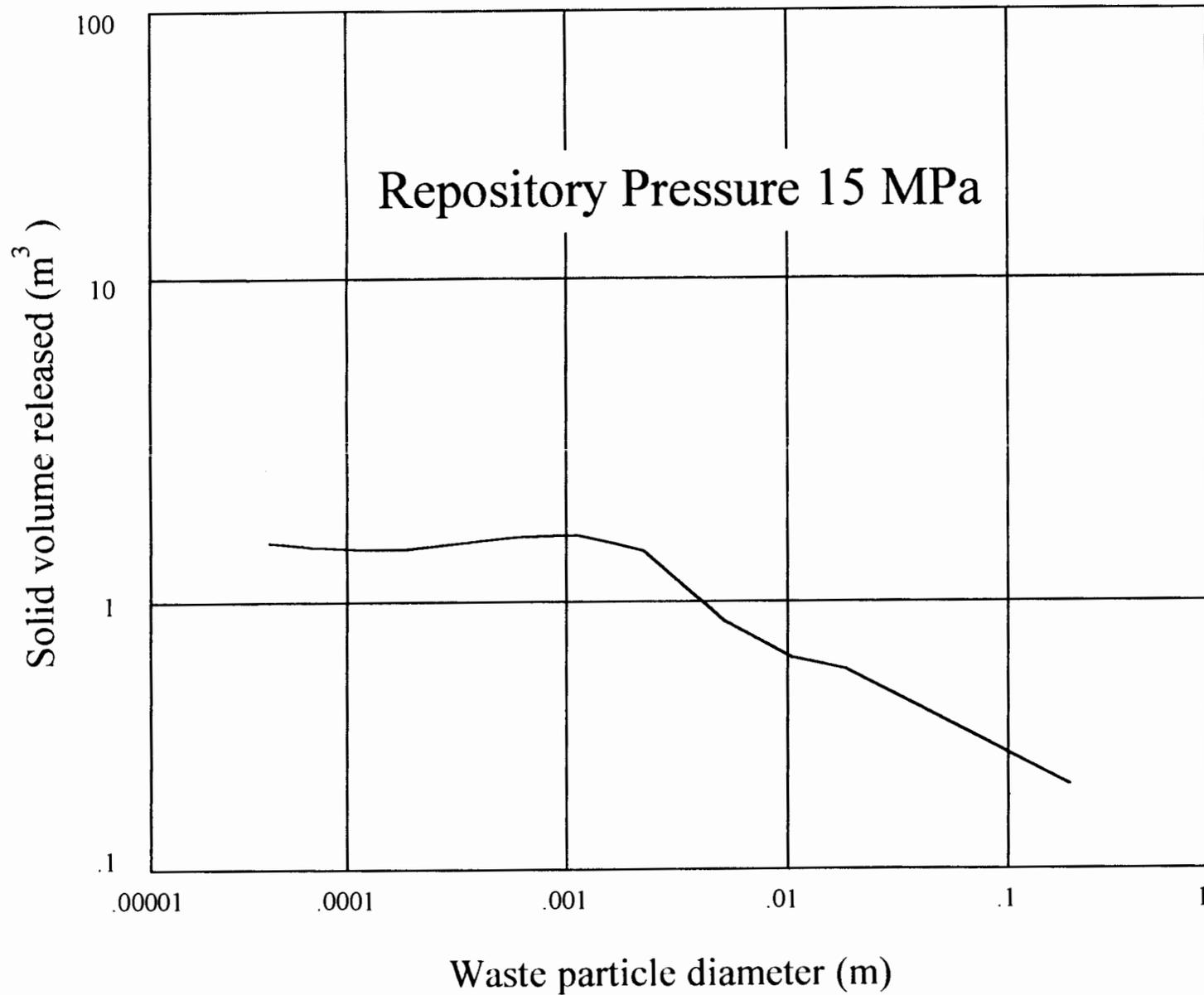


Spallings

- **New model based on experimental data**
- **Model calculates erosion in fissures and fractures**
- **Parameters**
 - **Particle Diameter: 40 μm to 0.2m (log uniform)**
 - **Waste Strength: 1 psi (constant)**
 - **Repository Pressure: Determined by BRAGFLO (up to 15 MPa)**



SPALLING RELEASE





**Implementation of a Backfill
to
Improve Repository
Conditions**

April 24, 1996

Biggest Advantage of Backfill is Control of pH and Removal of CO₂

- ◆ pH has greatest influence on actinide solubility
- ◆ Carbonate concentration, resulting from interaction of CO₂ and pH, also has significant effect on actinide solubility

Many Candidate pH Controllers Were Considered

- ◆ Calcium oxide-CaO
- ◆ Calcium hydroxide-Ca (OH)₂
- ◆ Calcium phosphate-Ca₃ (PO₄)₂
- ◆ Magnesium oxide-MgO
- ◆ Magnesium hydroxide-Mg (OH)₂
- ◆ Copper oxide-CuO
- ◆ Sodium phosphate-Na₃PO₄

Many Candidate pH Controllers Were Considered-cont.

- ◆ Sodium orthophosphate-dibasic- Na_2HPO_4
- ◆ Potassium phosphate- K_3PO_4
- ◆ Potassium orthophosphate-dibasic- K_2HPO_4
- ◆ Iron oxide- FeO
- ◆ Iron hydroxide- $\text{Fe}(\text{OH})_2$
- ◆ Copper oxide- Cu_2O
- ◆ Borax- $\text{Na}_2\text{B}_4\text{O}_5(\text{OH})_4 \cdot 8\text{H}_2\text{O}$

Magnesium Oxide has Been Selected as the Material of Choice

- ◆ Ability to maintain pH in a region of low actinide solubility
- ◆ Effectively removes CO₂
- ◆ Few operational concerns
- ◆ Data available to implement within existing models

Quantity of Material Specified

- ◆ Sufficient MgO to react with maximum possible amount of CO₂ generated
 - 9.84×10^8 moles MgO
 - 43,700 tons
- ◆ Total mass added with safety factor
 - 83,150 tons
 - 1.9×10^9 moles of MgO

Basis for Safety Factor

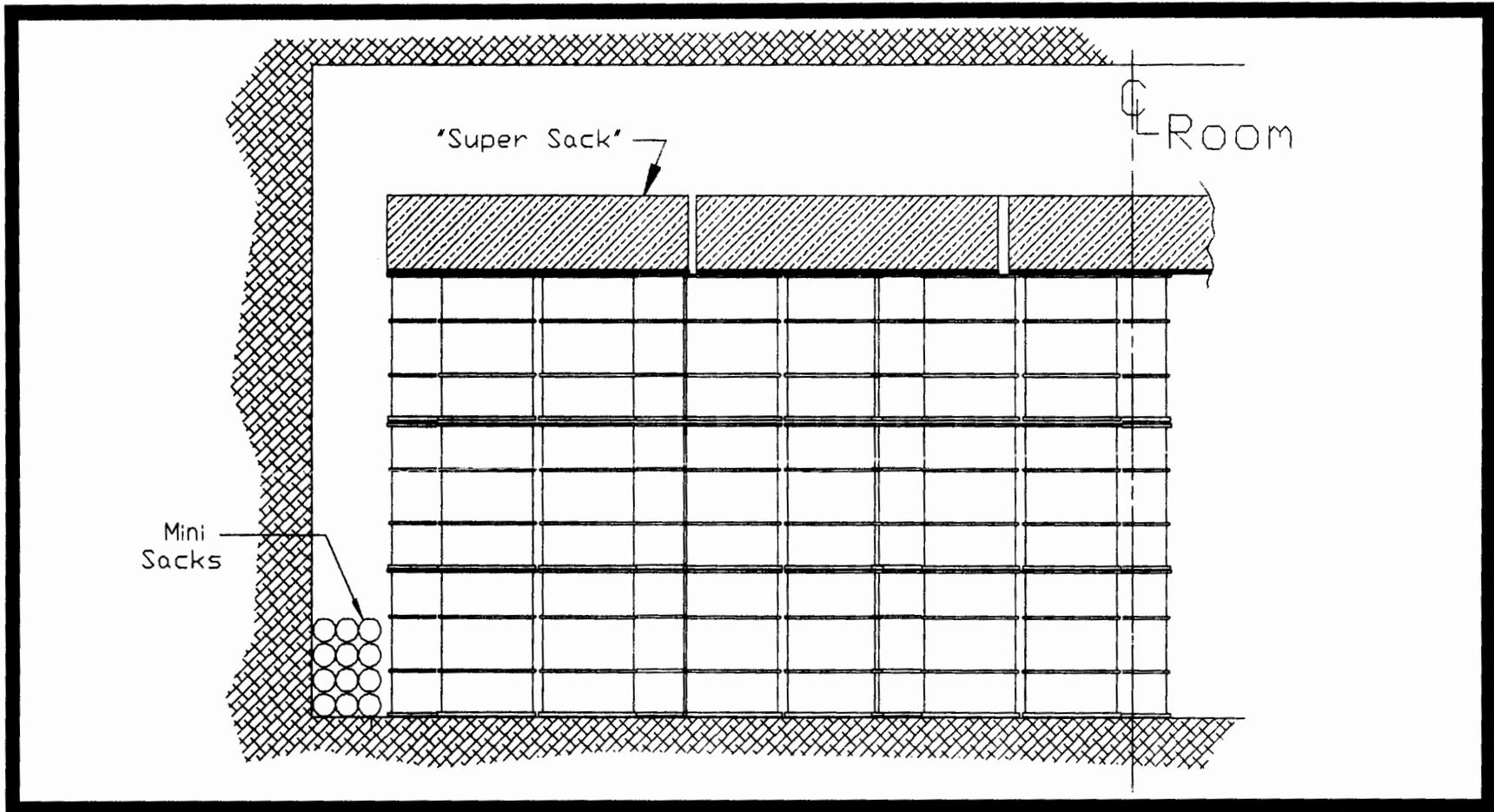
- ◆ **Accomodate randomness of intrusion geometry**
- ◆ **Variations in inventory**
- ◆ **Losses due to reaction prior to closure**
- ◆ **Uncertainty in reaction rates and efficiencies**

Materials Specifications

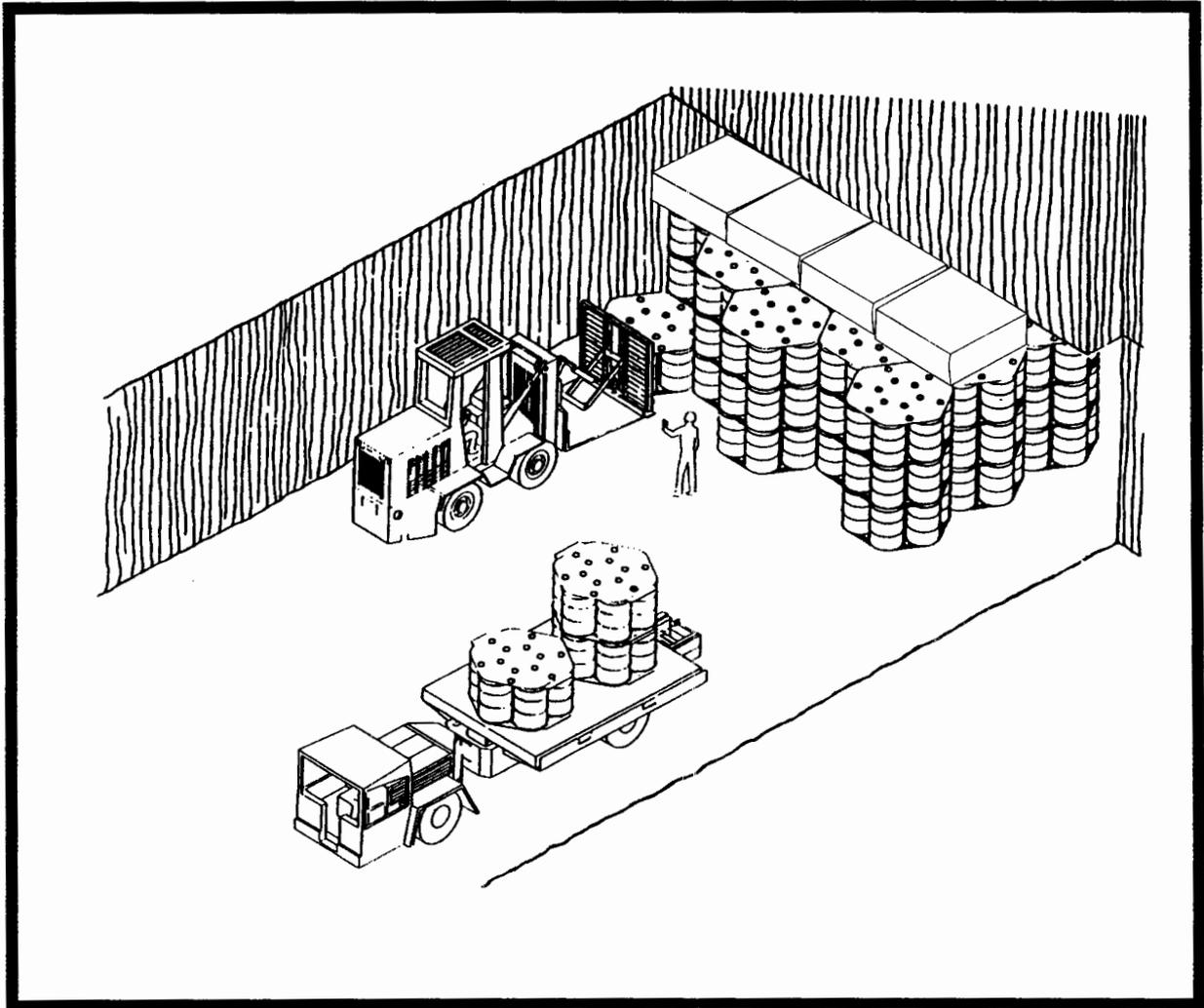
- ◆ **MgO prepared by the low-temperature dehydration of the hydroxide**
- ◆ **Coarse sand to small pellets size range**
- ◆ **Provision for protection from reaction with atmospheric CO₂ during emplacement and prior to closure**

Backfill System - Placement

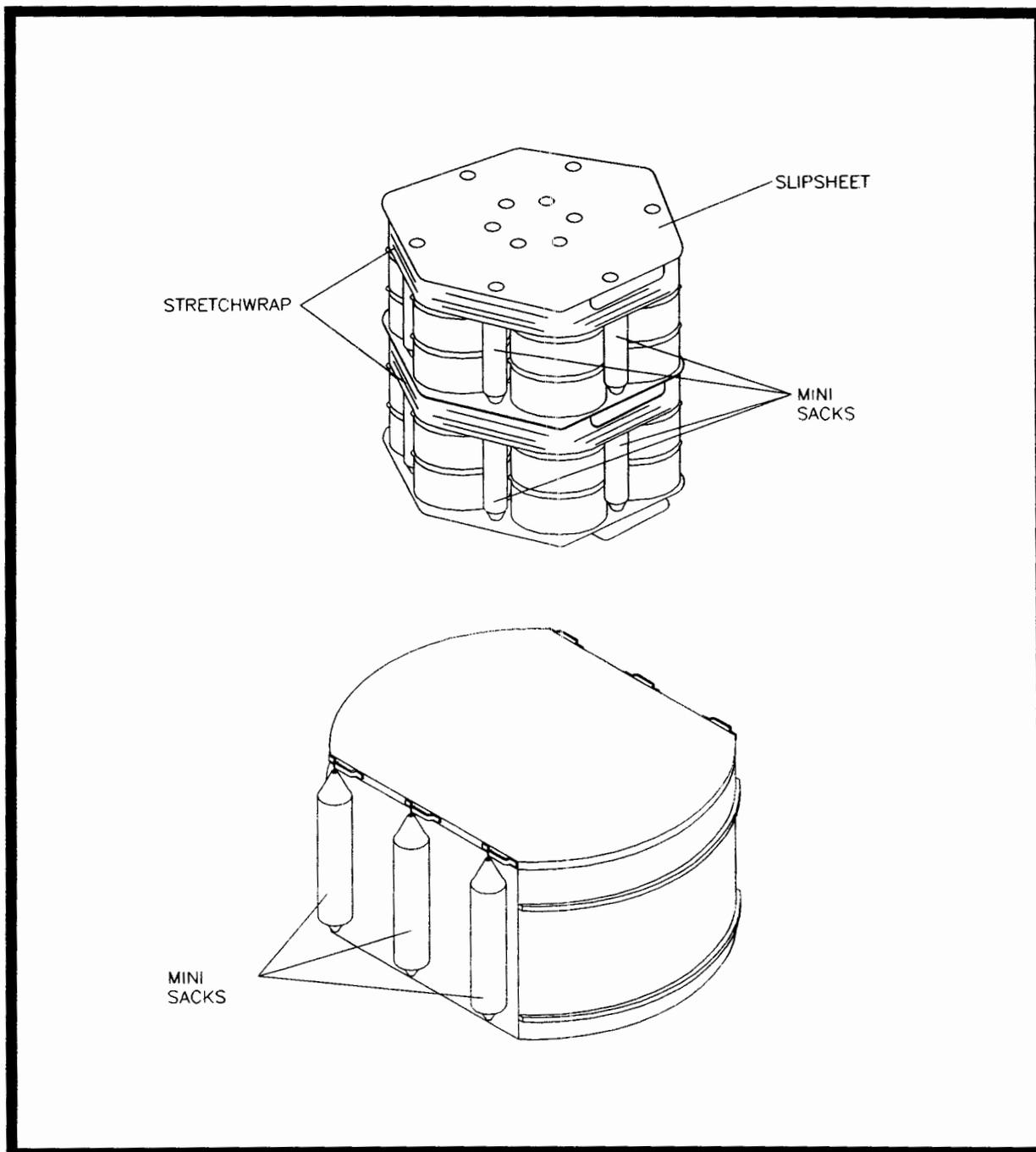
- ◆ **Super Sacks on top of Waste Stack**
About 4000 lb each, About 7400 t/panel
- ◆ **Mini Sacks Attached to Waste Units**
About 25 lb each, About 800 t/panel
- ◆ **Mini Sacks Along Ribside**
About 100 lb/ft, About 360 t/panel



Room Cross Section showing the position of Super Sacks and Mini Sacks



Super Sacks Placed on Top of Waste Stack



Mini Sacks as Used with Seven-Pack and Standard Waste Box

Backfill System - Advantages

- ◆ **Simple - uses Existing Techniques and Capabilities**
- ◆ **Flexible - in Approach, Quantities, and Composition**
- ◆ **Controllable**
- ◆ **Good QA & QC**
- ◆ **Minimal Impact on Existing Systems**

54th WIPP Quarterly Review Meeting
April 24, 1996

Waste Acceptance Criteria,
Revision 5 Update

Don Watkins
Manager National TRU Program

Carlsbad Area Office 4/22/96

Final Modifications to Approval

- **PE-Ci:** Requirements expanded to cover solidified, vitrified or overpacked wastes.
- Reason: Generators need another option for handling certain waste forms. Analysis verifies the new limits are within safety envelope.

Carlsbad Area Office 4/22/96

2

Final Modifications to Approval

- **Container Description:** Compliance to Type A payload containers was referenced to 49 CFR 173.463.
- Reason: Best defensible standard available.

Carlsbad Area Office 4/22/96

3

Final Modifications to Approval

- **VQC Concentrations:** VQC limits in payload containers were revised.
- Reason: To match the RCRA permit application.

Carlsbad Area Office 4/22/96

4

Final Modifications to Approval

- **Confinement Layers:** More options were added for bag closure.
- Reason: Demonstrations at LANL have shown that new options provide same or better path for gas transfer.

Carlsbad Area Office 4/22/96

5

Final Modifications to Approval

- **General:** Numerous syntax and editorial changes.
- Reason: Provides an improved more user friendly document.

Carlsbad Area Office 4/22/96

6