MAKING USE OF PERFORMANCE ASSESSMENT

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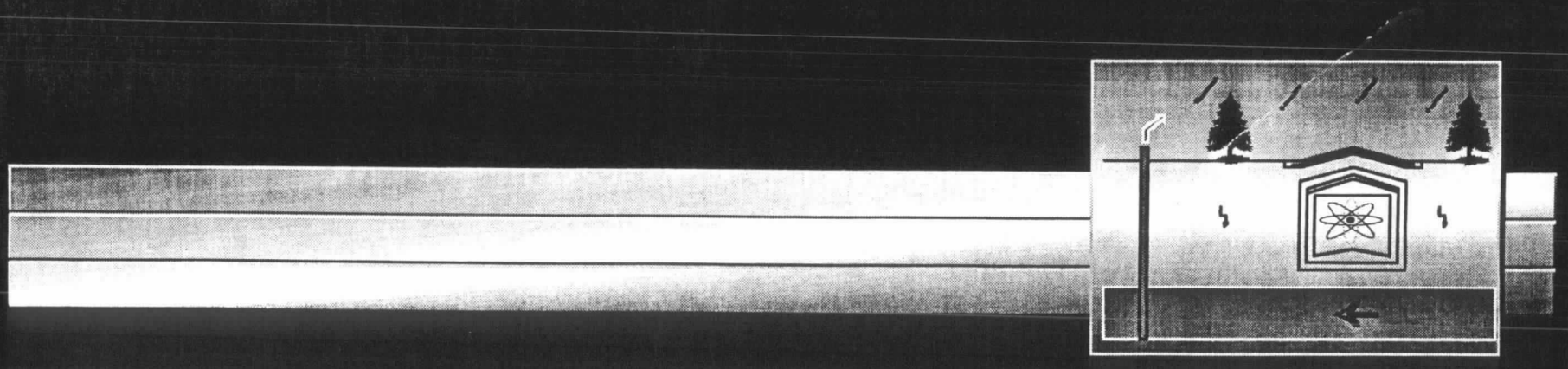
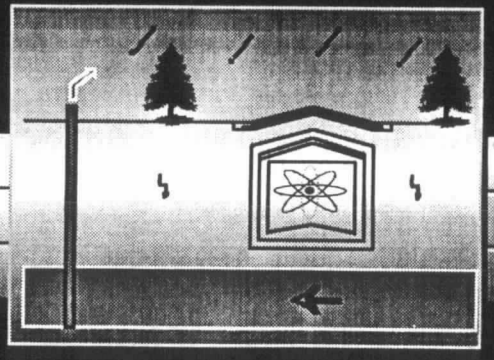


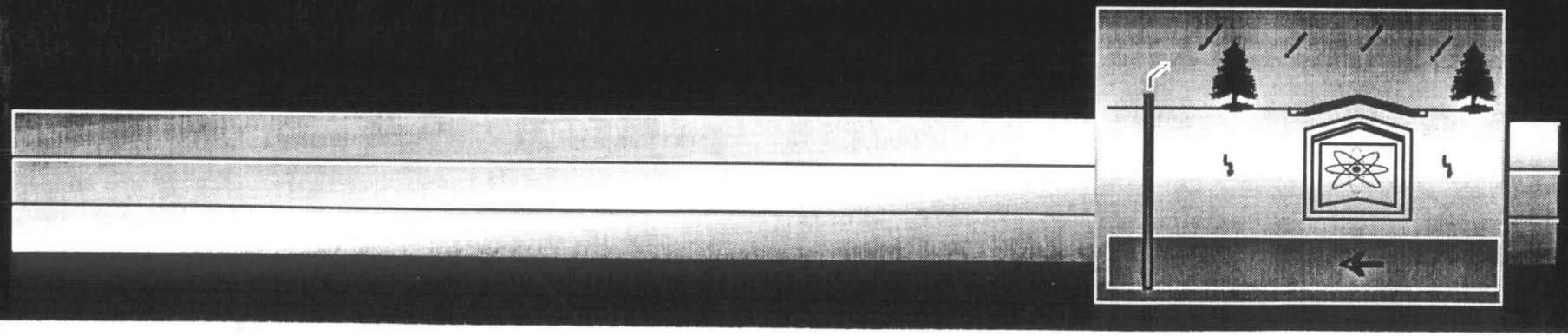
PRESENTATION OUTLINE

- USES OF PERFORMANCE ASSESSMENT IN HLW DISPOSAL
- YMP APPROACH TO PERFORMANCE ASSESSMENT AND IT'S POTENTIAL USE
- ALTERNATIVE APPROACHES USED BY GCD AND WIPP



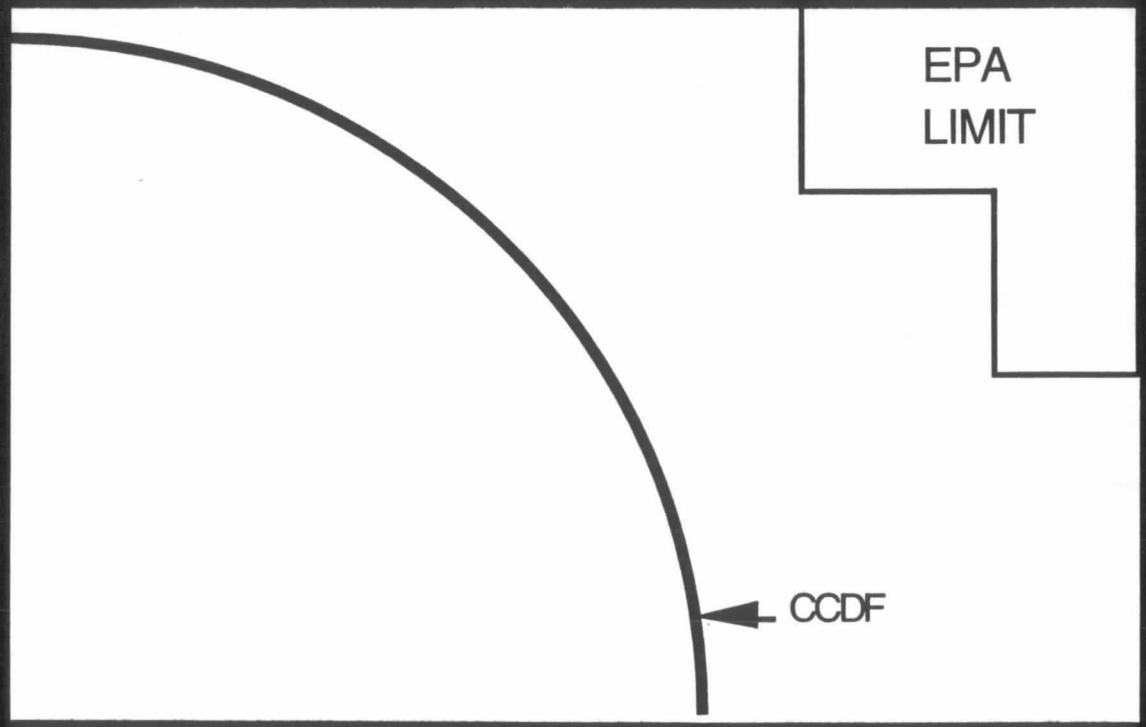
USES OF PA IN HLW DISPOSAL

- REGULATORY COMPLIANCE
- IDENTIFICATION AND PRIORITIZATION OF DATA COLLECTION ACTIVITIES
- SETTING REGULATIONS



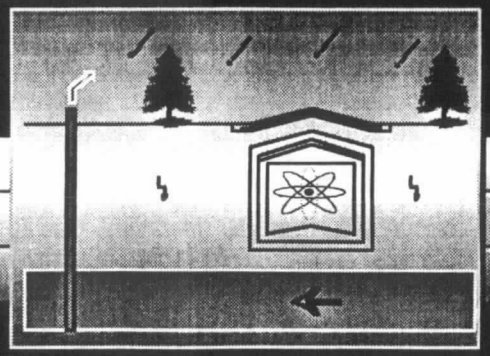
TSPA 95 RESULTS

"PROBABLE REPOSITORY PERFORMANCE"

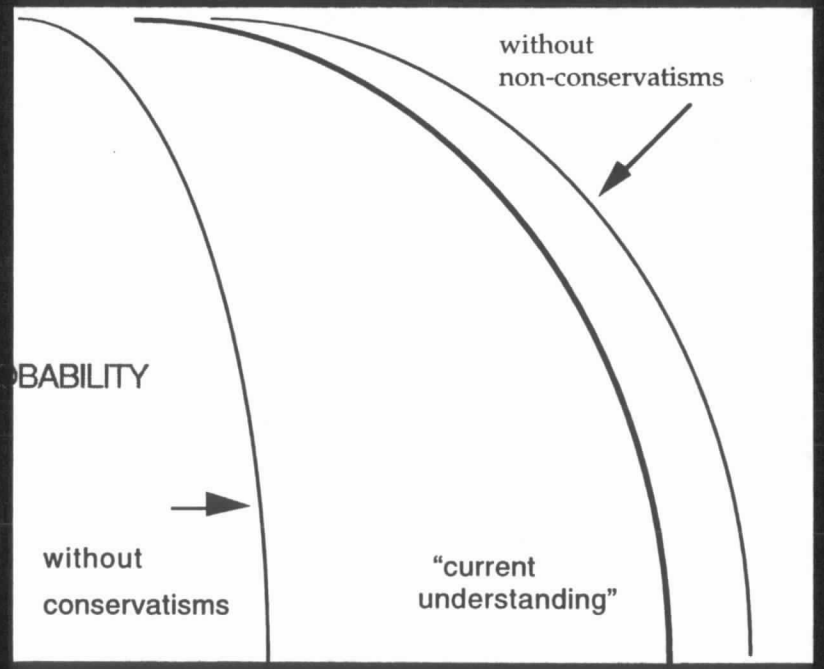


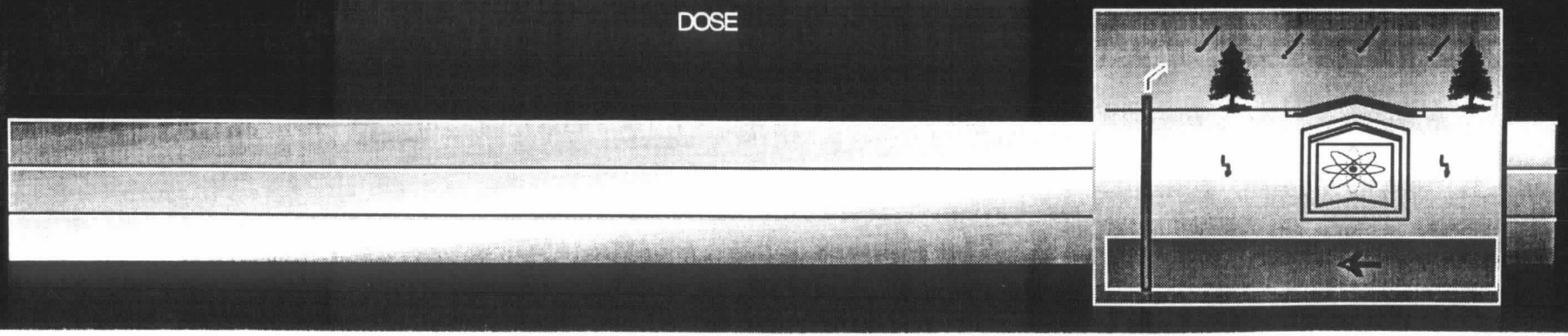
PROBABILITY
> R in 10,000 years

EPA SUM



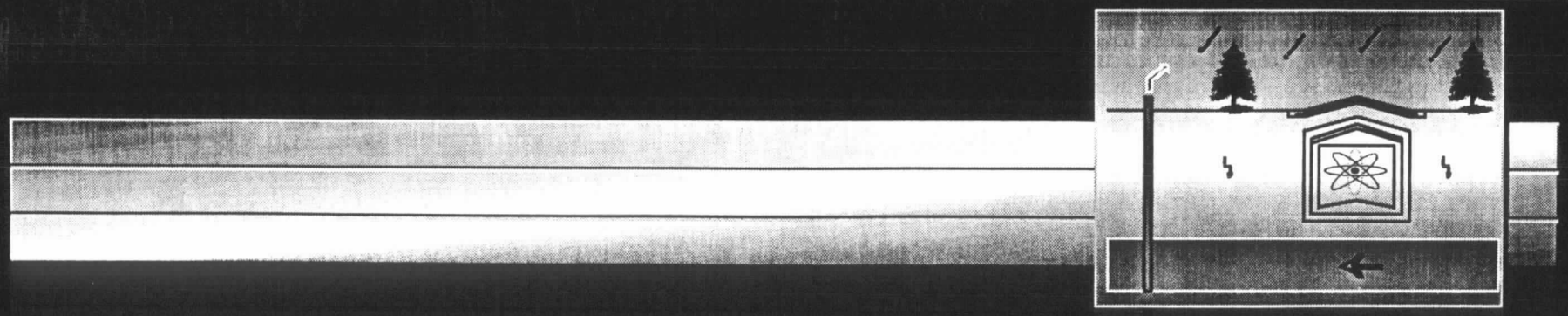
INTERPRETATION OF THE TSPA 95 RESULTS FOR COMPLIANCE





TSPA 95 REMAINING ISSUES

- COMPLIANCE ISSUE:
- *WHY AREN'T WE DONE?*
- DATA COLLECTION ISSUES:
- *WHICH DATA SHOULD BE COLLECTED?*
- *WHERE SHOULD THE DATA BE COLLECTED?*
- *HOW DO WE KNOW WHEN WE'RE DONE COLLECTING DATA?*



USE OF YMP PA FOR COMPLIANCE ISSUES

- *WHY AREN'T WE DONE?*

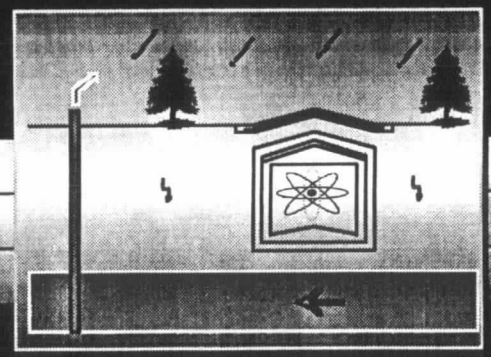
  DOE IS NOT READY TO DEFEND THE ANSWERS

- ADDITIONAL WORK IS REQUIRED TO:

  PROVIDE A "MORE ROBUST ASSESSMENT"

  "VALIDATE" THE MODELS

  PROVIDE REASONABLE ASSURANCE



USE OF YMP PA FOR PRIORITIZATION OF DATA COLLECTION GUIDANCE

WHICH DATA SHOULD BE COLLECTED?

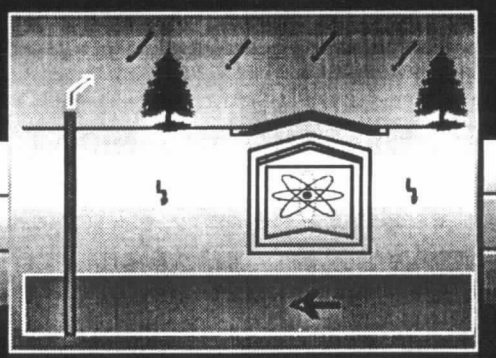
POST AUDIT (SENSITIVITY ANALYSIS) USED TO IDENTIFY DATA NEEDS/PRIORITIES

WHERE SHOULD THE DATA BE COLLECTED?

NOT EASILY DETERMINED BECAUSE OF MODEL ABSTRACTION PROCESS

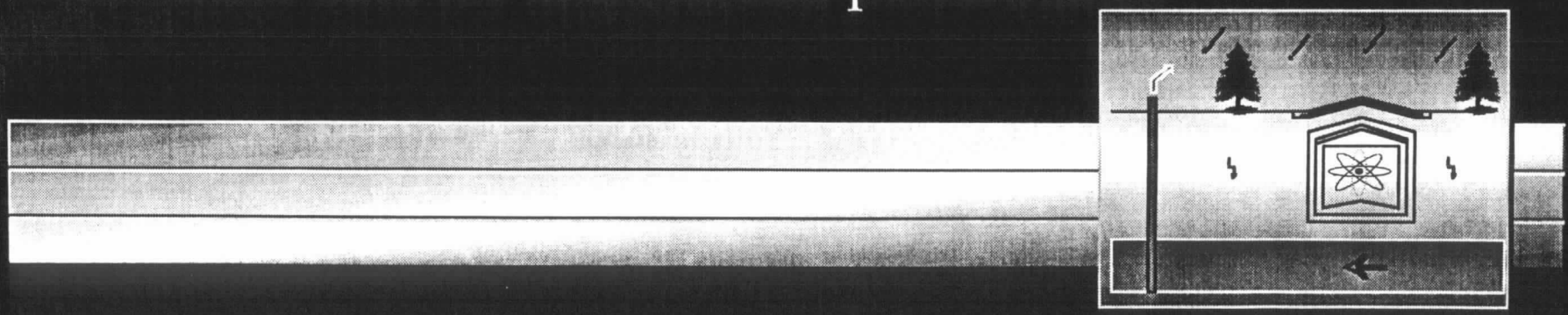
HOW DO WE KNOW WHEN WE'RE DONE COLLECTING DATA?

? - EXPERT JUDGMENT BY PROGRAM STAFF AND ULTIMATELY BY NRC - ?



GCD EXPERIENCE

- PA Developed using "Conservative" Parameters and Models for Undisturbed Performance
- Experimental Group Requested to Challenge the Conservativeness of the PA
- The Experimental Group Concluded that the PA was indeed "Conservative" ('too conservative')
- Compliance with the Ground-Water Protection Standard was Demonstrated with the "Conservative" PA
- Funding was continued for the Experimental Group to collect data for undisturbed performance



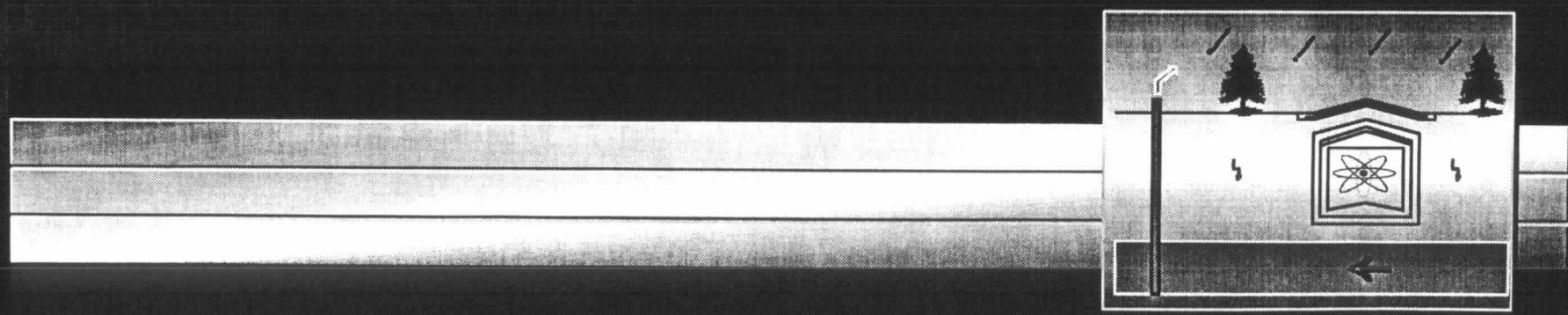
WIPP EXPERIENCE

System Prioritization Method (SPM) developed by Paul Davis and Walt Beyeler to;

1) demonstrate regulatory compliance

2) identify remaining 'activities' needed to achieve regulatory compliance

Where demonstrating compliance is defined as providing confidence in the assessment process and satisfying quantitative regulatory criteria

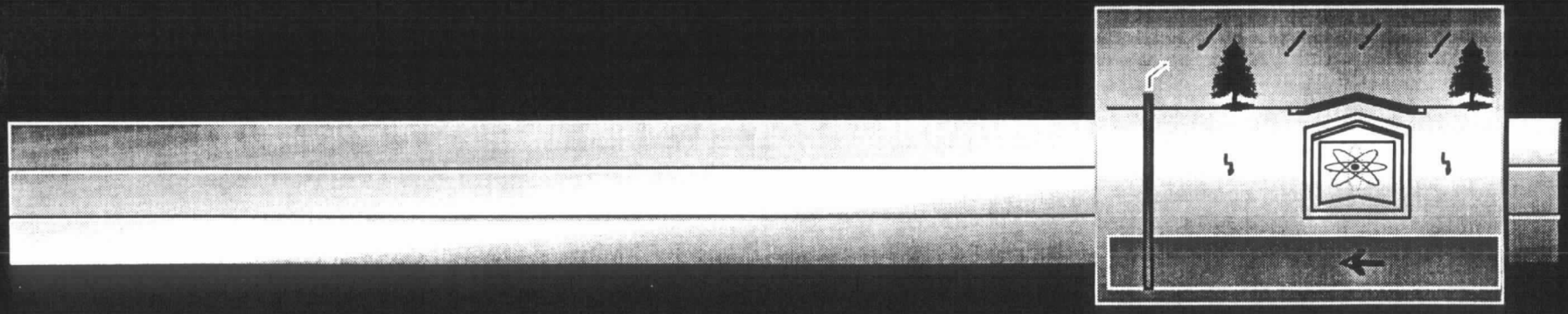


BASIS FOR SPM APPROACH

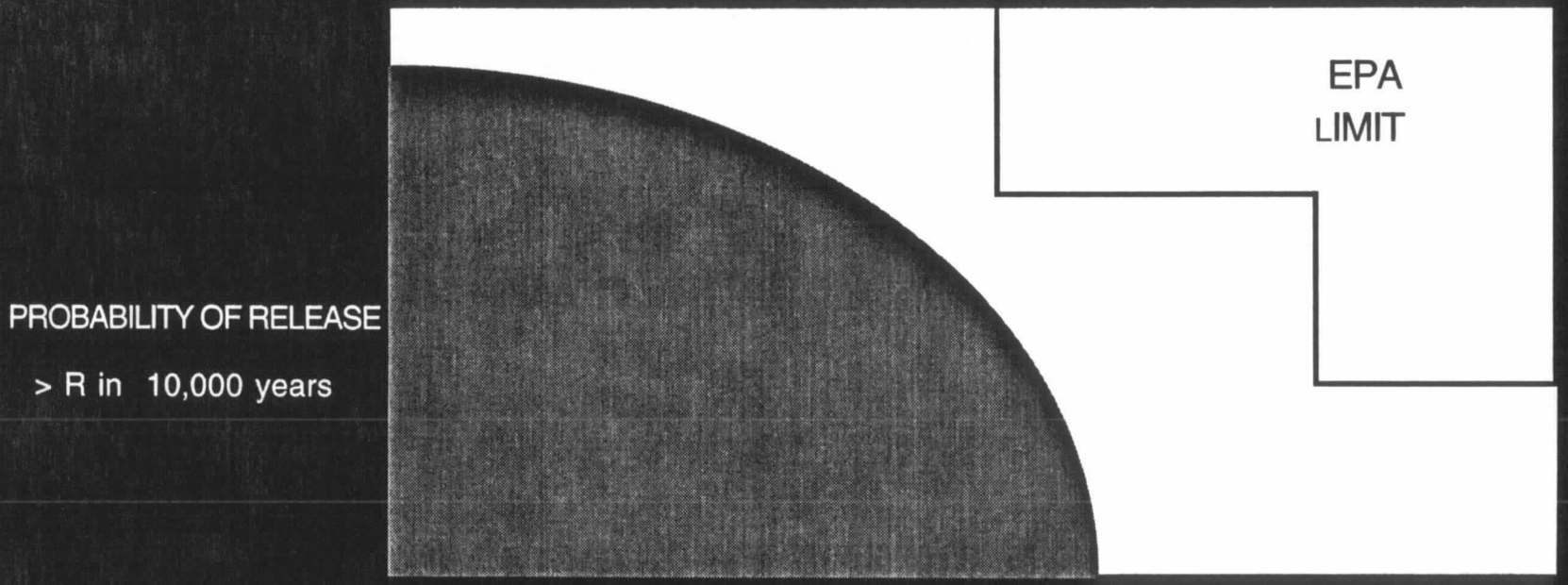
- "All models are wrong, some are useful"

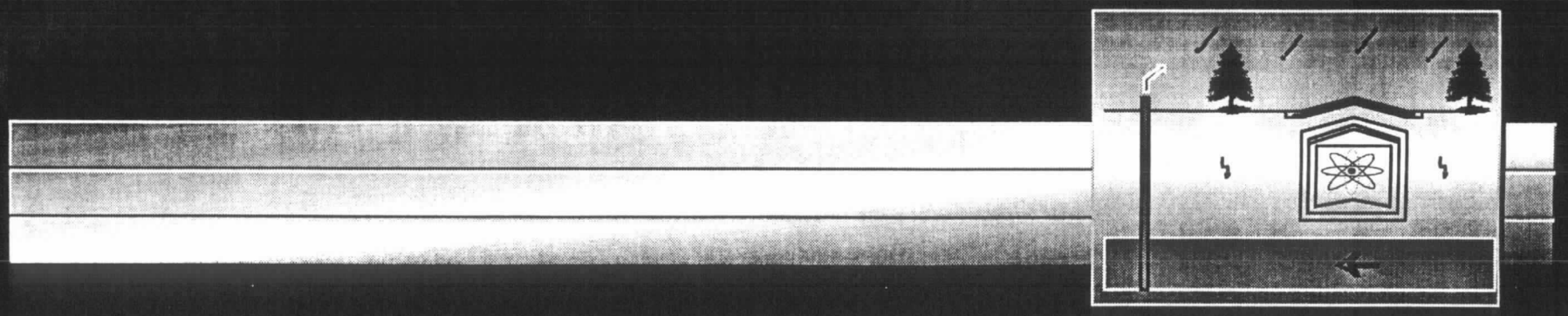
  – G. Box-

- Validation = adequate for purpose not an 'adequate representation of reality'
- Reasonable Assurance = no credible evidence that the site violates the regulatory criteria



MEANING OF A CCDF IN THE SPM PROCESS





SPM Process

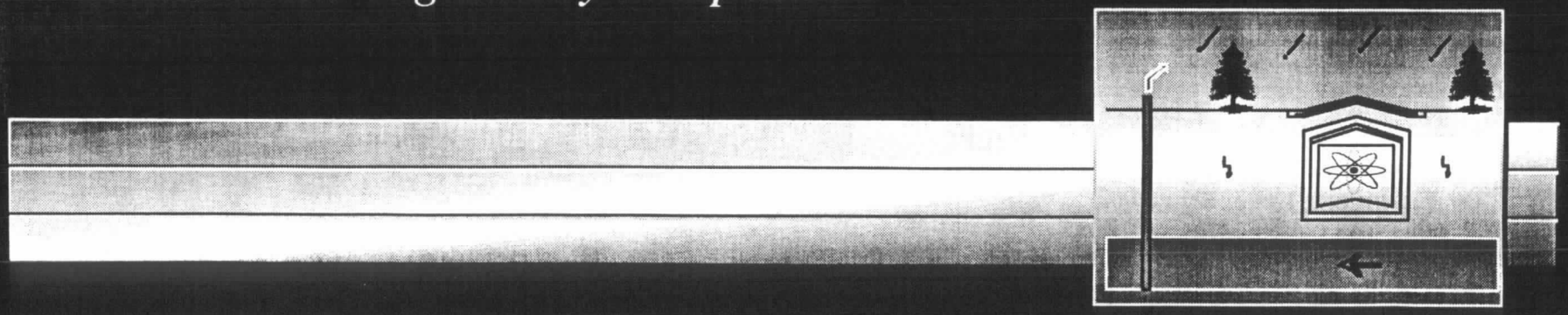
- SPM begins with defensible model assumptions and data as defined by:

  -the experimentalists

  -the project team

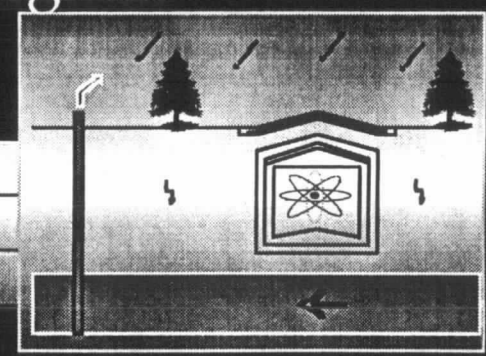
  -the stakeholders (public, regulators, oversight groups)

- Compliance is assessed based on defensible models and data
- SPM then directs the gathering of additional data to make the models more realistic *to the degree necessary to demonstrate regulatory compliance*



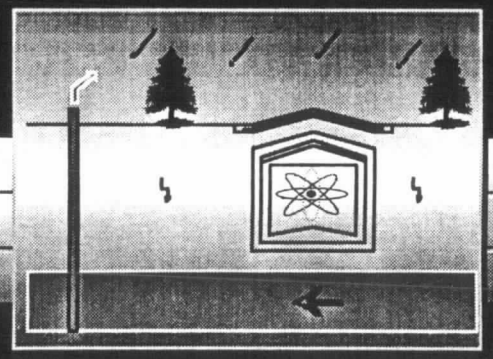
Notes on "Defensible"

- Experimentalists directed to define the **"least conservative data and models"** that they would defend to a group of their peers without reliance on future experiments
- Project Team and Stakeholders asked to critique these positions with instructions to provide input that could lead to either higher releases or lower releases
- Input was in the form of data, information, or logic
- The review process was fully documented for traceability of all changes made to the original positions



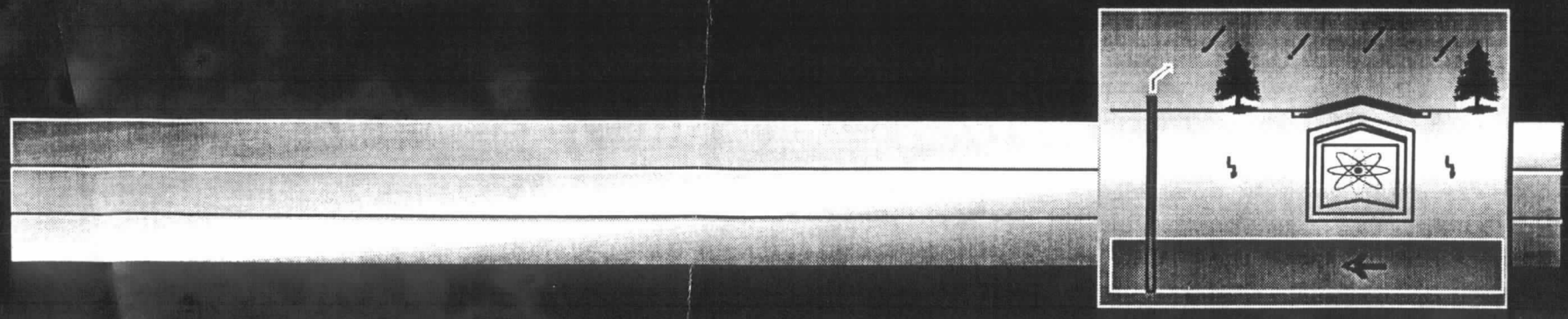
Notes on "Conservatism" in the SPM Process

- There is no inherent conservatism in the process
- Conservatism could arise through:
  - Inability to defend "beliefs" with current knowledge
  - Inability to model current state of knowledge
- Consideration of alternative conceptual models is unrelated to the notion of conservatism



Status/Results of the SPM Process

- From March 1994 to November 1994 position papers were reviewed, approved, and presented to the public and EPA. In addition, a test iteration was run with an artificial technical base line
- Since then the project has:
  - changed the baseline presented to the public
  - decoupled the SPM process from regulatory compliance
  - used an alternative process for elicitation of experimental results



Identification of Remaining Activities

- Experimental Program Plan, Engineered Alternative Study, & Alternative Waste Acceptance Criteria formed possible list of Activities
- Experimentalists required to provide:
  - likely experimental results
  - likelihood of obtaining those results
  - relation between results and PA
  - cost and schedule
- Performance-Based Decision Analysis used to identify the set of activities that most efficiently maximized the likelihood of satisfying the quantitative regulatory criteria