ENHANCED REPOSITORY BLOCK CHARACTERIZATION
DEVELOPMENT SUMMARY TESTING WORKING GROUP

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
1) fracture variability	Reduce parameter uncertainties in the 3-D Rock Characteristics Models Customer Needs Addressed: Mechanical stability and engineering design of drifts Preliminary data will be available for VA, complete data set will be available for TSPA-LA			

ENHANCED REPOSITORY BLOCK CHARACTERIZATION
DEVELOPMENT SUMMARY TESTING WORKING GROUP

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
2) unexposed faults	Reduce uncertainties in distribution of lithologies and structures in the 3-D Geologic Model and the UZ Flow Model Customer Needs Addressed: Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, and definition of fast and preferential flow pathways. Preliminary data will be available for VA, complete data set will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
3) hydrologic properties, fracture properties and geotechnical properties in and near faults.	Reduce parameter uncertainties in the 3-D Rock Characteristics Models and the UZ Flow and the SZ Flow Models Customer Needs Addressed: Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, and definition of fast and preferential flow pathways. Mechanical stability and engineering design of drifts Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
4) the characterization of the spatial distribution of moisture tension and saturation.	Reduce parameter uncertainties and improve representation of the flow field in the UZ Flow Model Customer Needs Addressed: Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, and definition of fast and preferential flow pathways. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
5) the age and distribution of perched water.	Evaluate alternative configurations of the UZ Flow Model and improve understanding of flow field Customer Needs Addressed: Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, and definition of fast and preferential flow pathways. UZ fracture/matrix flow and advective and diffusive transport at and below the repository horizon. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
6) alternative conceptual models of perched water formation.	Evaluate alternative conceptual models of UZ flow and transport Customer Needs Addressed: UZ fracture/matrix flow and advective and diffusive transport at and below the repository horizon. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
7) the distribution and mineralogy of fracture fillings.	Reduce parameter uncertainty and test flow representations in the UZ Flow Model Customer Needs Addressed: Long-term seepage into drifts and in-drift humidity in the post thermal phase; etc. Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, and definition of fast and preferential flow pathways. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
8) the age and genesis of fracture filling minerals.	Reduce parameter uncertainty and test flow representations in the UZ Flow Model Customer Needs Addressed: Long-term seepage into drifts and in-drift humidity in the post thermal phase; etc. Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, and definition of fast and preferential flow pathways. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
9) the distribution of environmental isotopes from systematic and feature based samples	Evaluate importance of alternative flow and transport processes in the UZ Flow Model and the UZ Transport Model Customer Needs Addressed: Long-term seepage into drifts and in-drift humidity in the post thermal phase; etc. Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, etc. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
10) the spatial distribution of percolation flux.	Improve representation of the flow field in the UZ Flow Model Customer Needs Addressed: Long-term seepage into drifts and in-drift humidity in the post thermal phase; etc. Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, and definition of fast and preferential flow pathways. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
11) fracture and matrix components of flow and Transport.	Evaluate importance of alternative flow and transport processes in the UZ Flow Model and the UZ Transport Model Customer Needs Addressed: Long-term seepage into drifts and in-drift humidity in the post thermal phase; etc. Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, etc. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
12) flow into openings.	Improve understanding of this procress and representation in the Near Field Environment Models Customer Needs Addressed: Long-term seepage into drifts and in-drift humidity in the post thermal phase; without pert. due to heat but considering future climate change and perm. changes due to repository heat release (variable in space and time). Environmental cond in the drifts (pH, Eh, T, chem., relative humidity, radiation, and nutrients). Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
13) temperature gradients in the repository block.	Improve representation of the flow field in the UZ Flow Model Customer Needs Addressed: Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, and definition of fast and preferential flow pathways. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
14) gas ages and flow patterns/distribution of gaseous environmental isotopes.	Improve representation of the flow field in the UZ Flow Model Customer Needs Addressed: Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, and definition of fast and preferential flow pathways. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
15) infiltration and percolation throughout the UZ in and around faults.	Evaluate conceptual models for flow in and around faults and incorporate in the UZ Flow Model Customer Needs Addressed: Percolation flux in the unsaturated zone at the site scale, from land surface to the water table; including temporal and spatial variability, fracture/matrix interactions, etc. UZ fracture/matrix flow and advective and diffusive transport at and below the repository horizon. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
16) pressure and chemical gradients and flow in the SZ in and around faults.	Evaluate the representation of flow and transport process in the SZ Flow Model and the SZ Transport Model Customer Needs Addressed: SZ flux distribution - spatial and temporal - for regional and site-scale transport models. SZ fracture/matrix flow and advective and diffusive transport. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
17) flow patterns in the UZ below the repository horizon.	Evaluate importance of alternative flow and transport processes in the UZ Flow Model and the UZ Transport Model Customer Needs Addressed: UZ fracture/matrix flow and advective and diffusive transport at and below the repository horizon. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
18) the distribution and continuity of zeolitization.	Improve our understanding of the distribution of this key natural barrier and incorporate in the 3-D Mineralogy Model and the UZ Transport Model Customer Needs Addressed: UZ fracture/matrix flow and advective and diffusive transport at and below the repository horizon. UZ and SZ solubility and retardation of key radionuclides (such as Np, Pu) and colloids. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
19) the hydrochemistry of the UZ below the repository horizon.	Evaluate importance of alternative flow and transport processes in the UZ Flow Model and the UZ Transport Model Customer Needs Addressed: UZ fracture/matrix flow and advective and diffusive transport at and below the repository horizon. UZ and SZ solubility and retardation of key radionuclides (such as Np, Pu) and colloids. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
20) the location and origin of the Large Hydraulic Gradient north of the repository block.	Evaluate alternative models for this feature and improve our understanding of the SZ flow field at the site and regional scales Customer Needs Addressed: SZ flux distribution - spatial and temporal - for regional and site-scale transport models. Preliminary data will be available to VA and complete data sets will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
21) dilution, mixing and flux distribution in the SZ.	Evaluate importance of alternative flow and transport processes in the SZ Flow Model and the SZ Transport Model Customer Needs Addressed: SZ flux distribution - spatial and temporal - for regional and site-scale transport models. SZ fracture/matrix flow and advective and diffusive transport. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
22) the hydrochemistry of the SZ.	Evaluate importance of alternative flow and transport processes in the SZ Flow Model and the SZ Transport Model Customer Needs Addressed: SZ flux distribution - spatial and temporal - for regional and site-scale transport models. SZ fracture/matrix flow and advective and diffusive transport. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
23) the spatial distribution of thermal and geomechanical properties of the repository horizon.	Reduce parameter uncertainties in the 3-D Rock Characteristics Models and the 3-D Mineralogy Model Customer Needs Addressed: Mechanical stability and engineering design of drifts. Data will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
24) the location and continuity of stratigraphic contacts in the expanded repository block.	Reduce uncertainties in the 3-D Geologic Model and the 3-D Mineralogy Model Preliminary data will be available for VA and complete data sets will be available for TSPA-LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
25) the distribution of hazardous minerals in the rock mass.	Reduce uncertainties in the distribution of these minerals for ES&H and the 3-D Mineralogy Model Preliminary data will be available for VA and complete data sets will be available for LA			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
2) unexposed faults?	Identification and characterization of potential fast pathways. This is of limited importance to PA. This is because we don't expect fault zones to be important for transporting significant quantities of radionuclides to the water table.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
3) hydrologic properties, fracture properties and geotechnical properties in and near faults?	Bound the role of faults as potential pathways for radionuclides in the unsaturated zone and their role in the saturated zone as preferential pathways or barriers to flow and transport. This is of limited importance to PA. The role of faults only becomes important if focusing of flow can divert a large portion of this percolation flux throughout the repository into fault zones. The diversion of UZ flow into fault zones is not strongly dependent on the hydrologic properties of the fault zones. The current assumption for the SZ is that fractures, including those in faults control the flow and that the SZ has a well-connected fracture system. The relative behavior of SZ transport through more highly fractured areas, such as fault zones, is more important.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
5) the age and distribution of perched water?	Determine transport rate and direction through the unsaturated zone. This is of moderate importance to PA. If properly interpreted, it may provide important information about flow distribution between fractures and matrix, transport times through the UZ, and lateral diversion.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
6) alternative conceptual models of perched water formation?	Determine if perched water bodies grow or deplete under future climate conditions and the transport characteristics for radionuclides migrating through perched water bodies. This is of moderate importance to PA. Evaluation of the conceptual models are important for interpretation of perched water data. Given a valid conceptual model, the perched water data may provide important information about flow distribution between fractures and matrix, transport times through the UZ, and lateral diversion.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
8) the age and genesis of fracture filling materials?	Provides information on past flow paths through the unsaturated zone. This is of limited importance to PA. It could potentially be useful for UZ flow and transport model calibration.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
9) the distribution of environmental isotopes from systematic and feature based samples?	Determine the extent of fast transport pathways through nonwelded units. Estimate the potential for lateral diversion of water and/or radionuclide pathways in the unsaturated zone. This is very important to PA. This data is expected to provide valuable information concerning fracture/matrix interaction for transport processes that can be used to help estimate model parameters for this important, but poorly constrained, characteristic of unsaturated zone transport.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
10) spatial distribution of infiltration flux?	Incorporate the spatial variability of percolation flux in flow and transport modeling for performance predictions. This is potentially very important to PA if the spatial or temporal variations are large enough. Percolation flux has been identified as one of the most important parameters in TSPA-95.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
11) fracture and matrix components of flow and transport?	Determine fracture/matrix interaction for water flow and aqueous radionuclide transport in the UZ. This is of moderate importance to PA. In particular, the delay in transport for strong fracture/matrix transport coupling can have a large effect on performance at 10,000 years, but is less important for performance over 1,000,000 years. Fracture/matrix coupling of flow is also important for the interaction of water with the EBS.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
12) flow into openings?	Define the likelihood of water contact modes with waste packages and the likelihood of advective radionuclide transport through the engineered barrier system. This is very important to PA. TSPA-95 and subsequent studies have shown that advective flow directly in contact with waste canisters is a serious detriment to performance. One of the questions surrounding this behavior is the extent to which water moving through the potential repository environment will drip into potential waste emplacement drifts.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
15) infiltration and percolation throughout the UZ in and around faults?	Provide estimates for levels of percolation flux and radionuclide transport parameters along faults. This is of moderate importance to PA. This is because we don't expect fault zones to be important for transporting significant quantities of radionuclides to the water table. If investigations of percolation along faults indicates that a large portion of the percolation flux is diverted to the SZ through faults, then this benefit would take on more importance.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
17) flow patterns in the unsaturated zone below the repository horizon?	Estimate the potential for lateral diversion of water and/or radionuclide pathways in the unsaturated zone. This is of moderate importance to PA. The occurrence of lateral diversion is a potentially important element of focused flow through faults in the unsaturated zone and/or mechanism for bypassing zeolites.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
18) the distribution and continuity of zeolitization?	Estimate the potential for aqueous radionuclide transport through the unsaturated zone to bypass zeolites. This is of moderate importance to PA. A portion of the radionuclide inventory is known to sorb more strongly in zeolitic rock than any other rock type. Therefore zeolites can provide an important delay function for the arrival of radionuclides at the accessible environment. The continuity and extent of zeolitization can impact the effectiveness of this natural barrier.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
19) the hydrochemistry of the unsaturated zone below the repository horizon?	Estimate chemical transport parameters (e.g. adsorption and matrix diffusion) and fracture/matrix interaction. Determine the extent of fast transport pathways through nonwelded units. Estimate the potential for lateral diversion of water and/or radionuclide pathways in the unsaturated zone. This is very important to PA. This data is expected to provide valuable information concerning fracture/matrix interaction for transport processes. Fracture/matrix interaction is a very important factor affecting the arrival time of radionuclides at the water table. Model parameters for fracture/matrix interaction are currently very poorly constrained. Information about hydrochemistry both above and below the potential repository will contribute to more defensible conceptual models of flow and transport in the unsaturated zone.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
20) the location and origin of the large hydraulic gradient north of the repository block?	Distinguish between conceptual models for the large hydraulic gradient. This is of limited importance to PA. The conceptual model of saturated zone flow that is used to describe the large hydraulic gradient could affect predictions of saturated zone flow and transport behavior, especially with climate change.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
21) dilution, mixing and flux distribution in the saturated zone?	Estimate physical transport parameters, including flow rate, velocity, and dispersion, for the saturated zone. This is very important to PA. The current characterization of the saturated zone is sparse. TSPA-95 found that performance over 1,000,000 years is very sensitive to dilution in the saturated zone.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
22) the hydrochemistry of the saturated zone?	Estimate chemical transport parameters (e.g. adsorption and matrix diffusion), mineral distribution, and fracture/matrix interaction for the saturated zone. Determine sources of water and flow paths throughout the saturated zone. This is very important to PA. In addition to the information hydrochemistry may provide concerning the dilution resulting from the mixing of different regional groundwater flows, the partitioning of radionuclide species between a mobile aqueous phase and an immobile precipitate is dependent on hydrochemistry.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
26) transport through a perforated waste package to see if radionuclide releases from waste packages can occur through the initial pinhole perforations?	Bound the potential for radionuclide releases from waste packages through the initial pinhole perforations. This is very important to PA. Performance assessment calculations have shown that the capillary characteristics of the pinhole perforations are important for determining the water contact mode with the waste. Advective water contact and radionuclide mobilization our of the waste package seriously degrade performance in comparison with diffusive-limited radionuclide mobilization. Furthermore, the effects of corrosion products in the perforations may also have an important effect on diffusion processes for radionuclide movement out of the waste package.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
27) in-drift water movement in the presence of a drip shield to better define the effects of such a barrier on water contact with waste packages and its potential effect on radionuclide releases?	Estimate the effectiveness of such a barrier on water contact with waste packages and its potential effect on radionuclide releases. This is very important to PA. The drip shield is an EBS component that is intended to prevent advective water contact with the waste package. TSPA-95 and subsequent studies have shown that advective flow directly in contact with waste canisters is a serious detriment to performance.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
28) cathodic protection to better define the effects on waste package corrosion?	Bound the potential improvement for waste package corrosion. This is very important to PA. Recent performance assessment calculations have shown that cathodic protection can significantly improve performance.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REQ'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
29) the geochemical environment in the drifts (including the interaction with cement) to better define conditions affecting radionuclide solubilities and waste package corrosion?	Bound the geochemical conditions that may affect radionuclide solubilities and waste package corrosion. This is very important to PA. Currently, the geochemical conditions and their effects on radionuclide solubilities and waste package corrosion are poorly constrained. The drift geochemical environment could alter solubilities (and therefore, release) by several orders of magnitude.			

CRITERIA	BENEFITS	FOR INVESTIGATIVE CRITERIA PREFERRED SOURCE, ALTERNATIVE SOURCES	FOR CONTROLS/REO'S CRITERIA AFFECTED INVESTIGATIVE CRITERIA	RATIONALE
30) the effects of EBS materials and waste heat on the geochemical environment outside the drift to better define the influence of the altered zone on radionuclide transport characteristics (solubilities, sorption, colloidal interactions) in the unsaturated zone?	Bound changes to radionuclide transport characteristics (solubilities, sorption, colloidal interactions) in the unsaturated zone due to repository-perturbed conditions. This is of moderate importance to PA. The extent to which geochemical alteration can extend through the unsaturated zone affecting radionuclide transport is poorly constrained.			

Enhanced Characterization of the Repository Block
Integrated Planning Committee meeting
4/24/97 1:00pm-2:00pm
Room 1275

Meeting Minutes

This meeting was held to discuss the following items associated with the Enhanced Characterization of the Repository Block:

- Update on configuration optimization
- Contracting Scheme
- K/PB involvement
- Update to Project Manager
- NWTRB information request

Those in attendance are listed on the attached sign-in sheet.

Jim Beyer gave an update regarding the results of the initial compilation of configuration elements which had been sent to the Working Group leads for their review and concurrence. It was agreed that the initial compilation be sent to all Integrated Planning Committee members for their information. Jim Beyer indicated that it would be sent immediately following the meeting (see attached Lotus Notes from Jim Beyer to Robert Sandifer et. al. Dated 4/24/97).

There was a brief discussion regarding the scheme for contracting the field portion of the ECRB and how would Kiewit be involved. While no decision has been made regarding who will perform the field work nor how it will be contracted, several options were discussed for the understanding of those present.

Michael Voegele agreed to setup a meeting to update the Project Manager on the ECRB planning effort.

Ric Craun passed on a request from the NWTRB for cost information on the ESF Main Loop and on the proposed East-West drift. Information was sent to Ric by Lotus Note from Jim Beyer dated 4/24/97 (copy attached).

Minutes recorded by James R. Beyer.

4/24/97
1:00 - 2:00 PM

NAME	ORG	Phone
JIM BEYER	M&O C&O PE	5-5395
Mark VanDerPuy	DOE ~~AA~~ AMESH	45563
Dick Spence	DOE/OPC	4-1436
Michael Voegele	M&O	5-5520
ALBIN BRANDSTETTER	M&O/TPA	5-4607
DENNIS R. WILLIAMS	DOE/AML	4-1417
Vince Iorii	DOE/AMAAM	4-1470
JERRI J ADAMS	DOE/AMAAM	4-1481
DICK SNELL	M&O/ENG&INTG	5-5601
Ralph Rogers	M&O/SPO	5-5785
Bill Kennedy	MGDS DGN	5-4240
Larry Hayes	M&O/SPO	5-5646
MARSHALL Bishop	MTS	4-1385
Mike Lugo	M&O/Reg.	5-4761
Ken Ashe	M&O/Lic	5-5563
Peter Hastings	M&O/Sys Eng	5-5931
Richard Craun	DOE	4-1488

James Beyer
04/24/97 05:01 PM

To: Robert Sandifer@CRWMS, Richard Snell@CRWMS, Larry Hayes@CRWMS, Jean Younker@CRWMS, Doug Chandler@CRWMS, Jerri Adams@CRWMS, Dennis Williams@CRWMS, Dick Spence@CRWMS, Scott Wade@CRWMS, Vince Iorii@CRWMS, Marshall Bishop@CRWMS, Ned Elkins@CRWMS, Ken Ashe@CRWMS, Jim Houseworth@CRWMS, William Kennedy@CRWMS, Michael Voegele@CRWMS, Mike Cline@CRWMS, Ralph Rogers@CRWMS, James Beyer@CRWMS, Richard Craun@CRWMS, Glenn Vawter@CRWMS, Peter Hastings@CRWMS, Mark VanDerPuy@CRWMS
cc:
Subject: ECRB - Initial configuration compilation

As promised here is the configuration info discussed at today's meeting.

To: Ken Ashe, Peter Hastings, Ned Elkins, Jim Houseworth, William Kennedy
cc: Jeff Skov, Ralph Rogers
From: James Beyer
Date: 04/23/97 01:28:33 PM
Subject: ECRB - Initial configuration compilation

Attached is my intitial compilation of the configuration input provided by Testing WG, PA WG and Design/Construction WG. Please go over this info as sson as possible to ensure I have interpretted your input correctly. Ken & Peter can now add constraint/requirements in the appropriate column. There are 36 pages to the attachment (i.e. 36 configuration elements).


ECRBOPCF

My preliminary ranking based on a simple arithmetic approach (2 points for each entry in the preferred column & 1 point for each entry in the alternate column) yields the following info:

Various E-W drift alternatives — 16 pts - 48 pts
Northern Crest borehole — 29 pts
Southern Crest borehole — 28 pts
All Laboratory testing — 17 pts
Southern Testing Complex — 9 pts

All other elements less than 10 pts each

Jim Houseworth -- I was not able to identify configuration elements form your input on Criteria 6, 10 & 11. Please assist.

Ralph Rogers -- Help me with the alternate source "single hole along Solitario Canyon Fault" for Criteria 16.

All -- If I have missed a configuration element please let me and the other leads know.

I hope to have a meeting with you folks tomorrow afternoon (Thursday). Will let you know time and place.

Sorry for the short notice.

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block above repository horizon	2(TS2), 36(C1), 37(C2), 38(C3), 39(C4), 8(PA)	1(TS1), 6(TS6), 25(TS25), 15(PA)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block at repository horizon	1(TS1), 2(TS2), 10(TS10), 15(TS15), 23(TS23), 32(TS), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 8(PA)	6(TS6), 25(TS25), 15(PA)	34(D6)			

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block below repository horizon	2(TS2), 36(C1), 37(C2), 38(C3), 39(C4), 8(PA)	1(TS1), 6(TS6), 25(TS25), 2(PA15), 15(PA)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block above repository horizon	2(TS2), 6(TS6), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(D3), 3(D3 & D5B), 23(D4), 1(D5C), 8(PA)	1(TS1), 5(TS5), 25(TS25), 12(PA1), 15(PA)	47(D8)			

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block at repository horizon	6(TS6), 10(TS10), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 8(PA)	1(TS1), 5(TS5), 25(TS25), 12(PA1), 15(PA)	34(D6) 47(D8)			

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block below repository horizon	2(TS2), 6(TS6), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 8(PA)	1(TS1), 5(TS5), 25(TS25), 2(D3), 3(D3 & D5B), 23(D4), 1(D5C), 2(PA15), 12(PA1), 15(PA)	47(D8)			

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OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block above repository horizon	2(TS2), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 23(D4), 1(D5C), 8(PA)	1(TS1), 25(TS25), 15(PA)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block at repository horizon	23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 8(PA)	1(TS1), 25(TS25), 15(PA)	34(D6)			

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
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Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block below repository horizon	2(TS2), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 8(PA)	1(TS1), 25(TS25), 23(D4), 1(D5C), 2(PA15), 15(PA)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
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INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference2	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block above repository horizon w/ loop down to Calico Hills	2(TS2),17(TS17), 18(TS18), 19(TS19), 36(C1), 37(C2), 38(C3), 39(C4), 5(PA), 8(PA)	1(TS1), 6(TS6), 25(TS25), 15(PA), 17(PA10)				

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Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference2	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block at repository horizon w/ loop down to Calico Hills	1(TS1), 2(TS2), 3(TS3), 7(TS7), 8(TS8), 9(TS9), 10(TS10), 11(TS11), 12(TS12), 15(TS15), 17(TS17), 18(TS18), 19(TS19), 23(TS23), 32(TS), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 5(PA), 8(PA)	6(TS6), 25(TS25), 15(PA), 17(PA10)	34(D6)			

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
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Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference2	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block below repository horizon w/ loop down to Calico Hills	2(TS2),17(TS17), 18(TS18), 19(TS19), 36(C1), 37(C2), 38(C3), 39(C4), 5(PA), 8(PA)	1(TS1), 6(TS6), 25(TS25), 2(PA15), 15(PA), 17(PA10)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block above repository horizon w/ loop down to Calico Hills	2(TS2), 6(TS6), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(D2), 3(D3 & D5B), 23(D4), 1(D5C), 5(PA), 8(PA)	1(TS1), 3(TS3), 5(TS5), 25(TS25), 12(PA1), 15(PA), 17(PA10)	47(D8)			

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
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Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block at repository horizon w/ loop down to Calico Hills	2(TS2), 6(TS6), 7(TS7), 8(TS8), 10(TS10), 11(TS11), 12(TS12), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 5(PA), 8(PA)	1(TS1), 3(TS3), 5(TS5), 25(TS25), 12(PA1), 15(PA), 17(PA10)	34(D6) 47(D8)			

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block below repository horizon w/ loop down to Calico Hills	2(TS2), 6(TS6), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 5(PA), 8(PA)	1(TS1), 3(TS3), 5(TS5), 25(TS25), 23(D4), 1(D5C), 2(PA15), 12(PA1), 15(PA), 17(PA10)	47(D8)			

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OPTIMIZATION OF CONFIGURATION
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Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block above repository horizon w/ loop down to Calico Hills	2(TS2), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 23(D4), 1(D5C), 5(PA), 8(PA), 18(PA12)	1(TS1), 25(TS25), 15(PA), 17(PA10)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
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INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block at repository horizon w/ loop down to Calico Hills	2(TS2), 7(TS7), 8(TS8), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 5(PA), 8(PA), 18(PA12)	1(TS1), 25(TS25), 15(PA), 17(PA10)	34(D6)			

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block below repository horizon w/ loop down to Calico Hills	2(TS2), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 5(PA), 8(PA), 18(PA12)	1(TS1), 25(TS25), 23(D4), 1(D5C), 2(PA15), 15(PA), 17(PA10)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Cross drift alcoves and subsurface boreholes, northern	6(TS6), 10(TS10), 11(TS11), 12(TS12), 37(C2), 40(C5), 20(D5A)	4(TS4), 13(TS13), 14(TS14), 24(TS24), 3(PA14), 12(PA1), 15(PA)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Cross drift alcoves and subsurface boreholes, central	10(TS10), 11(TS11), 12(TS12), 15(TS15), 37(C2), 40(C5)	4(TS4), 6(TS6), 13(TS13), 14(TS14), 24(TS24), 3(PA14), 15(PA)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Cross drift alcoves and subsurface boreholes, southern	37(C2), 40(C5), 18(PA12)	14(TS14), 24(TS24), 23(D1), 24(D1), 3(PA14), 15(PA)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Existing Thermal Test Facility	29(PA8)					

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
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INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Existing Ghost Dance Fault Alcoves	3(PA14), 12(PA1), 15(PA)	27(PA6), 28(PA7)				

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OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
3-D Seismic from surface and ESF		2(TS2), 2(D3), 3(D3 & D5B)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Horizontal borehole from Solitario Canyon	3(TS3), 13(TS13)					

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OPTIMIZATION OF CONFIGURATION
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Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Northern crest borehole to water table	4(TS4), 5(TS5), 13(TS13), 14(TS14), 24(TS24), 25(TS25), 18(D2), 5(PA), 9(PA2), 17(PA10), 19(PA10), 22(PA3)	6(TS6), 18(TS18), 19(TS19), 23(TS23), 21(PA3)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Southern crest borehole to water table	4(TS4), 14(TS14), 18(TS18), 24(TS24), 25(TS25), 23(D1), 24(D1), 5(PA), 9(PA2), 17(PA10), 19(PA10), 22(PA3)	19(TS19), 23(TS23), 18(PA12), 21(PA3)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
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Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Paired WT holes across middle of Solitario Canyon Fault	16(TS16)	19(TS19)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
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Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Borehole west of Solitario Canyon Fault		15(TS15)				

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	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Borehole near WT-17		16(TS16), 19(TS19)				

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OPTIMIZATION OF CONFIGURATION
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Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Additional testing in G2 (existing) and WT-24(planned)	20(TS20), 22(TS22), 20(D5A), 20(PA13)	21(TS21)				

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INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Southern Testing Complex (near WT-17)	21(TS21), 21(PA3), 22(PA3)	16(TS16), 19(TS19), 22(TS22)				

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OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
G-hole in Crater Flats		21(TS21)				

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	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
WT-23		20(TS20)				

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	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Testing in SD-6	18(D2), 23(D1), 24(D1)	17(PA10), 21(PA3)				

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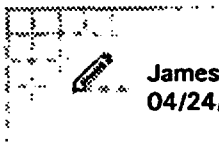
Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Laboratory testing	27(TS), 29(TS), 30(TS), 26(PA5), 27(PA6), 28(PA7), 30(PA11), 26A(PA)	29(PA8)				



James Beyer
04/24/97 05:29 PM

To: Richard Craun
cc:
Subject: Excavation costs

Per our discussion earlier this afternoon, here is FY96 information concerning excavation costs.

	Budget	Actuals
Total 1.2.6 FY96(w/o FY95 carryover)	$61,355K	$68,923K
Total 1.2.6 K/PB FY96 (w/o FY95 CO)	$45,637K	$49,427K
Total TBM Excavation FY96 K/PB	$29,237K	$33,492K

The following is the breakdown of the E-W drift as found in the Long Range Plan.

Total		$18,949K
Design		$1,245K
Design Starter tunnel & drift	$395K	
Title III	$774K	
Ground support Confirmation	$ 77K	
Construction Management		$1,269K
Power		$ 116K
K/PB		$16,319K
Excavate Starter Tunnel		$2,725K
Excavate drift & Demob		$9,957K
Constructor's Supv & Eng	$2,415K	
Muck Handling	$ 206K	
UG Transportation	$1,015K	

If you have any questions, I will be at the site on Friday.

Enhanced Characterization of the Repository Block
Integrated Planning Committee Meeting
5/01/97 4:00pm-5:00pm
Room 1275
&
5/02/97 12:30pm
Room 1257

Meeting Minutes

These meetings were held to discuss and ultimately validate the optimum for the Enhanced Characterization of the Repository Block. Those in attendance are listed on the two attached sign-in sheets.

The recommended "optimum configuration" was presented to the Integrated Planning Committee on May 1, 1997. The committee was presented with the complete list of configuration elements that were identified by the Working Groups. The methodology for scoring each element was described and the score for each configuration element was presented to the committee. The details and supporting rationale for the recommended "optimum configuration" were then presented to the committee. Several questions were raised and a considerable amount of discussion occurred concerning the potential impact of the East-West cross drift on waste isolation and potential repository performance. Dennis Williams indicated that the fourth element, Calico Hills excavation, should be recombined with the East-West cross drift consistent with the original Working Group recommendation. The committee agreed with the caveat that the Calico Hills work would not take precedence over the northern and southern boreholes and would not be included in the ECRB Change Request. Mike Voegele asked the committee members to further examine the recommended "optimum configuration" and the committee would reconvene on the following day.

The Integrated Planning Committee reconvened on May 2, 1997 to finalize discussion on the "optimum configuration." The list of attendees is included as Attachment 2. The discussions from the previous day were concluded with all questions answered to the satisfaction of those present. The committee members present were then polled for final questions and whether they concurred with the scope of the "optimum configuration. All members present indicated their concurrence with the scope of the "optimum configuration." The "optimum configuration" is described in Attachment 3.

Minutes recorded by James R. Beyer.

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK

RECOMMENDED OPTIMUM CONFIGURATION

PRESENTED TO THE INTEGRATED PLANNING COMMITTEE ON MAY 1, 1997
RANK ORDER

1. EAST-WEST CROSS DRIFT COMING OFF THE NORTH RAMP TO THE SOUTHWEST INTERSECTING SOLITARIO CANYON FAULT CENTRAL BLOCK(BETWEEN SECTIONS 2 &3), ABOVE THE REPOSITORY HORIZON, PRESERVE ABILITY TO GO TO CALICO HILLS

2. NORTHERN BOREHOLE TO THE WATER TABLE BETWEEN UZ-14 AND G-2 AT THE HEAD OF TEACUP WASH

3. SOUTHERN BOREHOLE TO THE WATER TABLE ALONG THE CREST BETWEEN UZ-6 AND H-3.

4. ACCESS TO CALICO HILLS FROM THE WEST END OF THE EAST-WEST CROSS DRIFT.

5. PERFORMANCE ASSESSMENT RELATED LABORATORY TESTING
   - Cathodic Protection
   - Flow & transport through corrosion pits in waste package
   - Drip shield
   - Cladding
   - Thermomechanical data and dissolution rates under different water composition and heating scenarios

6. SOUTHERN TESTING COMPLEX (3-4 BOREHOLES)

Elements 1,2 & 3 are approximately equal in rank. Elements 4 and 5 are approximately equal in rank, but noticably less than 1,2 & 3. Element 6 is noticably less in rank than 4 and 5.

5/1/97

Enhanced Characterization of the Repository Block
Initial List of Configuration Elements

- **East-West Drift (9 variations), includes alcoves (17-31)**
  - Northern Block @ 3 different elevations (at emplacement horizon, above, below)
  - Central Block @ 3 different elevations (at emplacement horizon, above, below)
  - Southern Block @ 3 different elevations (at emplacement horizon, above, below)

- **East-West Drift w/ Calico Hills Loop (9 variations), includes alcoves (26-48)**
  - Same 9 options identified above but with each having a Calico Hills loop

- Existing Thermal Test Facility (2)

- Existing Ghost Dance Fault Alcoves (8)

- Other existing ESF excavations (8)

- 3D Seismic from surface and ESF (3)

- Horizontal Borehole from Solitario Canyon (4)

- **Northern Crest Borehole to WT (29)**

- **Southern Crest Borehole to WT (28)**

- Paired WT holes across middle of Solitario Canyon Fault (3)

- Borehole west of Solitario Canyon Fault (1)

- Borehole near WT-17 (2)

- Additional testing in G-2 and WT-24 (9)

- **Southern Testing Complex (9)**

- Additional 4 boreholes to carbonate aquifer, between repository block & Franklin Lake Playa (4)

- G-hole in Crater Flats (1)

- WT-23 (1)

- Testing in SD-6 (8)

- **Laboratory Testing (17)**

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block above repository horizon	2(TS2), 36(C1), 37(C2), 38(C3), 39(C4), 8(PA), 1(D5C), 23(D4), 35(D7)	1(TS1), 6(TS6), 25(TS25), 15(PA)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block at repository horizon	1(TS1), 2(TS2), 10(TS10), 15(TS15), 23(TS23), 32(TS), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 8(PA)	6(TS6), 25(TS25), 15(PA)	34(D6)			

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block below repository horizon	2(TS2), 36(C1), 37(C2), 38(C3), 39(C4), 8(PA)	1(TS1), 6(TS6), 25(TS25), 2(PA15), 15(PA), 1(D5C), 23(D4), 35(D7)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block above repository horizon	2(TS2), 6(TS6), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(D3), 3(D3 & D5B), 23(D4), 1(D5C), 8(PA), 35(D7)	1(TS1), 5(TS5), 25(TS25), 12(PA1), 15(PA)	47(D8)			

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block at repository horizon	6(TS6), 10(TS10), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 8(PA)	1(TS1), 5(TS5), 25(TS25), 12(PA1), 15(PA)	34(D6) 47(D8)			

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block below repository horizon	2(TS2), 6(TS6), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 8(PA)	1(TS1), 5(TS5), 25(TS25), 2(D3), 3(D3 & D5B), 23(D4), 1(D5C), 2(PA15), 12(PA1), 15(PA), 35(D7)	47(D8)			

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block above repository horizon	2(TS2), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 23(D4), 1(D5C), 8(PA), 35(D7)	1(TS1), 25(TS25), 15(PA)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block at repository horizon	23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 8(PA)	1(TS1), 25(TS25), 15(PA)	34(D6)			

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block below repository horizon	2(TS2), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 8(PA)	1(TS1), 25(TS25), 23(D4), 1(D5C), 2(PA15), 15(PA), 35(D7)				

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
OPTIMIZATION OF CONFIGURATION
INITIAL COMPILATION OF CONFIGURATION ELEMENTS

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference2	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block above repository horizon w/ loop down to Calico Hills	2(TS2),17(TS17), 18(TS18), 19(TS19), 36(C1), 37(C2), 38(C3), 39(C4), 5(PA), 8(PA), 1(D5C), 23(D4), 35(D7)	1(TS1), 6(TS6), 25(TS25), 15(PA), 17(PA10)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference2	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block at repository horizon w/ loop down to Calico Hills	1(TS1), 2(TS2), 3(TS3), 7(TS7), 8(TS8), 9(TS9), 10(TS10), 11(TS11), 12(TS12), 15(TS15), 17(TS17), 18(TS18), 19(TS19), 23(TS23), 32(TS), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 5(PA), 8(PA)	6(TS6), 25(TS25), 15(PA), 17(PA10)	34(D6)			

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference2	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, central block below repository horizon w/ loop down to Calico Hills	2(TS2),17(TS17), 18(TS18), 19(TS19), 36(C1), 37(C2), 38(C3), 39(C4), 5(PA), 8(PA)	1(TS1), 6(TS6), 25(TS25), 2(PA15), 15(PA), 17(PA10), 1(D5C), 23(D4), 35(D7)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block above repository horizon w/ loop down to Calico Hills	2(TS2), 6(TS6), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(D2), 3(D3 & D5B), 23(D4), 1(D5C), 5(PA), 8(PA), 35(D7)	1(TS1), 3(TS3), 5(TS5), 25(TS25), 12(PA1), 15(PA), 17(PA10)	47(D8)			

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block at repository horizon w/ loop down to Calico Hills	2(TS2), 6(TS6), 7(TS7), 8(TS8), 10(TS10), 11(TS11), 12(TS12), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 5(PA), 8(PA)	1(TS1), 3(TS3), 5(TS5), 25(TS25), 12(PA1), 15(PA), 17(PA10)	34(D6) 47(D8)			

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, northern block below repository horizon w/ loop down to Calico Hills	2(TS2), 6(TS6), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 5(PA), 8(PA)	1(TS1), 3(TS3), 5(TS5), 25(TS25), 23(D4), 1(D5C), 2(PA15), 12(PA1), 15(PA), 17(PA10), 2(D3), 3(D3, D5B), 35(D7)	47(D8)			

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block above repository horizon w/ loop down to Calico Hills	2(TS2), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 23(D4), 1(D5C), 5(PA), 8(PA), 18(PA12), 35(D7)	1(TS1), 25(TS25), 15(PA), 17(PA10)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block at repository horizon w/ loop down to Calico Hills	2(TS2), 7(TS7), 8(TS8), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 2(PA15), 5(PA), 8(PA), 18(PA12)	1(TS1), 25(TS25), 15(PA), 17(PA10)	34(D6)			

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
E-W Cross drift, southern block below repository horizon w/ loop down to Calico Hills	2(TS2), 23(TS23), 36(C1), 37(C2), 38(C3), 39(C4), 5(PA), 8(PA), 18(PA12)	1(TS1), 25(TS25), 23(D4), 1(D5C), 2(PA15), 15(PA), 17(PA10), 35(D7)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Cross drift alcoves and subsurface boreholes, northern	6(TS6), 10(TS10), 11(TS11), 12(TS12), 37(C2), 40(C5), 20(D5A)	4(TS4), 13(TS13), 14(TS14), 24(TS24), 3(PA14), 12(PA1), 15(PA)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Cross drift alcoves and subsurface boreholes, central	10(TS10), 11(TS11), 12(TS12), 15(TS15), 37(C2), 40(C5)	4(TS4), 6(TS6), 13(TS13), 14(TS14), 24(TS24), 3(PA14), 15(PA)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Cross drift alcoves and subsurface boreholes, southern	37(C2), 40(C5), 18(PA12)	14(TS14), 24(TS24), 23(D1), 24(D1), 3(PA14), 15(PA)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Existing Thermal Test Facility	29(PA8)					

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Existing Ghost Dance Fault Alcoves	3(PA14), 12(PA1), 15(PA)	27(PA6), 28(PA7)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
3-D Seismic from surface and ESF		2(TS2), 2(D3), 3(D3 & D5B)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Horizontal borehole from Solitario Canyon	3(TS3), 13(TS13)					

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Northern crest borehole to water table	4(TS4), 5(TS5), 13(TS13), 14(TS14), 24(TS24), 25(TS25), 18(D2), 5(PA), 9(PA2), 17(PA10), 19(PA10), 22(PA3)	6(TS6), 18(TS18), 19(TS19), 23(TS23), 21(PA3)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Southern crest borehole to water table	4(TS4), 14(TS14), 18(TS18), 24(TS24), 25(TS25), 23(D1), 24(D1), 5(PA), 9(PA2), 17(PA10), 19(PA10), 22(PA3)	19(TS19), 23(TS23), 18(PA12), 21(PA3)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Paired WT holes across middle of Solitario Canyon Fault	16(TS16)	19(TS19)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Borehole west of Solitario Canyon Fault		15(TS15)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Borehole near WT-17		16(TS16), 19(TS19)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Additional testing in G2 (existing) and WT-24(planned)	20(TS20), 22(TS22), 20(D5A), 20(PA13)	21(TS21)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Southern Testing Complex (near WT-17)	21(TS21), 21(PA3), 22(PA3)	16(TS16), 19(TS19), 22(TS22)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Additional 4 boreholes to carbonate aquifer between repository block and Franklin Lake Playa	21(PA), 22(PA)					

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
G-hole in Crater Flats		21(TS21)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
WT-23		20(TS20)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Testing in SD-6	18(D2), 23(D1), 24(D1)	17(PA10), 21(PA3)				

Configuration Element	Investigative Criteria Satisfied		Applicable Controls/Requirements Criteria WG Development Summary Cross Reference			Rationale Summary
	Preferred Source Available/ Individual WG Development Summary Cross Reference	Alternate Source Available/ Individual WG Development Summary Cross Reference	Criteria Number	Sheet Number	Description	
Laboratory testing	27(TS), 29(TS), 30(TS), 26(PA5), 27(PA6), 28(PA7), 30(PA11), 26A(PA)	29(PA8)				

ATTACHMENT 1

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
INTEGRATED PLANNING COMMITTEE MEETING
MAY 1, 1997 4:00-5:00PM
ROOM 1275

NAME	ORG	PHONE
Jim Beyer	M&O CEO PE	5-5395
Glenn Vawter	M&O	5-5517
Dick Spence	DOE/OPC	4-1346
Michael Voegele	MTU	5-5520
Richard L. Craun	DOE/VA	4-1488
Mark Van Der Puy	AMESH	45563
Dennis R. Williams	DOE/NWML	4-1417
Jim Houseworth	M&O/PA	5-4638
Peter Hastings	M&O/SE	5.3961
Ken Ashe	M&O/Lic	5-5563
DAN McKENZIE	M&O/REPOSITORY	5-4393
Bill Kennedy	M&O/MGDS	5-4240
Michael Cline	BAH	45481
Ralph Rogers	M&O/SPO	5-5785
Larry R. Hayes	M&O/SPO	5-5604
Dick Snell	M&O/E&T	5-5601
Mike Lugo	M&O/Reg	5-4761

ATTACHMENT 2

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
INTEGRATED PLANNING COMMITTEE MEETING
MAY 2, 1997 12:30-1:30PM
ROOM 1257

NAME	ORG	PHONE
Jim Beyer	M&O C&O PE	5-5395
Mark Van De Ruy	DANESH	45503
Dennis R. Williams	DOE/AML	4-1417
Bill Kennedy	M&O/DESIGN A/E	5-4240
Dan McKenzie	M+O/ Repository	5-4393
Dick Snell	M+O/E&I	5-5601
Ralph Rogers	M&O/SPO	55785
Mike Lugo	M&O/Regulatory	
Jim Houseworth	M+O/PA	5-4638
Peter Hastings	M&O/SE	5.3961
Larry R. Hayes	M+O - SPO	5-5604
Ned Z. Elkins	SPO/LANL	5-3403
Ken Ashe	M+O/Lic	5-5563
K. Michael Clark	BAH/MTS	4 5481
Bob Sandifer	M&O/SC&O	555504
Dale Foust	M&O	

ATTACHMENT 3

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK

OPTIMUM CONFIGURATION

VALIDATED BY THE INTEGRATED PLANNING COMMITTEE ON MAY 2, 1997
RANK ORDER

1. EAST-WEST CROSS DRIFT COMING OFF THE NORTH RAMP TO THE SOUTHWEST INTERSECTING SOLITARIO CANYON FAULT CENTRAL BLOCK(BETWEEN SECTIONS 2 &3), ABOVE THE REPOSITORY HORIZON, PRESERVE ABILITY TO GO TO CALICO HILLS

   1A. ACCESS TO CALICO HILLS FROM THE WEST END OF THE EAST-WEST CROSS DRIFT. (This element is included as part of the East-West drift but the cost and schedule will not be included in the Change Request)

2. NORTHERN BOREHOLE TO THE WATER TABLE BETWEEN UZ-14 AND G-2 AT THE HEAD OF TEACUP WASH

3. SOUTHERN BOREHOLE TO THE WATER TABLE ALONG THE CREST BETWEEN UZ-6 AND H-3.

4. PERFORMANCE ASSESSMENT RELATED LABORATORY TESTING
   - Cathodic Protection
   - Flow & transport through corrosion pits in waste package
   - Drip shield
   - Cladding
   - Thermomechanical data and dissolution rates under different water composition and heating scenarios

5. SOUTHERN TESTING COMPLEX (3-4 BOREHOLES)

Enhanced Characterization of the Repository Block
Integrated Planning Committee meeting
5/19/97 8:00am-9:00am
Room 1275

Meeting Minutes

This meeting was held to discuss the status the work scope, cost and schedule development and for the Enhanced Characterization of the Repository Block. Those in attendance are listed on the two attached sign-in sheets.

Bob Sandifer went over the preliminary draft of the East-West drift schedule. There were several questions concerning timing and duration of specific tasks. These would be addressed in an updated schedule due out 5/21/97. The DOE representatives asked that draft work scope statements be provided for their initial review by the end of the week. The Working Group leads indicated this would be done.

Bob Sandifer distributed an initial draft of the outline for the ECRB Report. Dennis Williams indicated that a Background section would be appropriate.

The group discussed the need for affected Working Groups to review the proposed TBM configuration related to dust control, safety, and operability. Ralph Dresel(CMO) will distribute copies of the documentation(copy attached).

Minutes recorded by James R. Beyer. JRB

ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK
INTEGRATED PLANNING COMMITTEE MEETING
MAY 19, 1997
8:00 - 10:00 am
Room 1275

NAME	ORG	PHONE
JIM BEYER	M&O C/O PE	5-5395
JERRI J. ADAMS	DOE/AMAAM	4-1483
VINCENT F. IOZII	DOE/AMAAM	4-1470
RUFUS TAYLOR	M&O/SC&D	5-5386
Dennis R. Williams	DOE/LANL	4-1417
Pic Crane	DOE/AMLASP	4-1488
Dick Spence	DOE/OPC	4-1436
Larry Hayes	M&O/SRO	5-5604
Michael Voegele		55520
Ken Ashe	M&O/Lic	5 5563
Tyler Hastings	M&O / SE	5-3961
NED ELKINS	SPO/LANL	5-3403
DICK SNELL	M&O/E&I	5-5601
Ralph Rogers	M&O/SPO	5-5785
Jim Houseworth	M&O/PA	5-4638
Bill Kennedy	M&O/BECHTEL	5-4260
IVAN COTTLE	M&O	5-5724
MARSHALL Bishop	M&O/BAH	4-1359
Gene Kimura	M&O/ESH	5-4242

Name	ORG	phone
Mike Lugo	M&O/Regulatory	702-295-4761
JEFF LEFEVER	M&O / PE	5-5706
Steve Schuermann	DOE-OAT55	4-5549
Mark VanDe Ry	DOE - AMESH	4-5563
Bob Sundfor	M&O/site Construct Optics	5-5504

ECRB TBM Requirements

General

The ECRB tunnel is planned to be to be approximately 2500 meters in length, 4-5 meters in diameter, excavated using a constructor-furnished TBM. The intent is to use a refurbished rather than new machine. The constructor is required to submit a proposal, for approval by the M&O Construction Management Organization (CMO), describing the machine, the anticipated rework, and showing how the following special requirements of the program will be addressed. A complete or partial rebuild of the TBM is anticipated, the scope of which will be determined upon joint inspection of the machine by constructor and construction management personnel. It is anticipated that all seals and hoses will need replacement. Replacement of the main bearing will depend on results of the inspection. The TBM, backup system, and support utilities, except the ventilation system in the tunnel, will be engineered and furnished by the constructor.

The TBM is to be a main-frame type, with flat-face head using back-loading cutters, and capable of two rotational speeds, the higher being approximately 10 rpm.

The tunnel will be excavated through the volcanic tuffs of Yucca Mountain, similar to those encountered during excavation of the ESF Tunnel. The exact diameter will depend on the TBM available. At completion, the TBM will have to be removed back through the excavated tunnel. Any rebuilding of the machine requires consideration to make this task as efficient as possible.

Schedule

TBM excavation of the ECRB is planned to start in the January-February 1998 time frame, the TBM is to be available to support this schedule.

Special Requirements

The nature of the project combined with knowledge gained from experience on the ESF tunnel, dictates several special requirements that need to be incorporated into the ECRB TBM. These include control of dust, noise attenuation, control of fluids, and accounting of water use.

Dust Control- The approach for ECRB construction is to keep dust out of the exhaust duct by control at the source. With this in mind, the TBM is to be fitted with water sprays on the cutter head, water sprays on the conveyor belts, and dust scrubber(s) in the TBM ventilation system.

A water spray system is required on the head to wet the rock as it is cut. This system should be reliable and easily maintained.

The TBM vent system is to pull all dust-ladened air from the cutter head to be captured in the dust scrubber system. The TBM ventilation system is to be capable of maintaining 25,000 cfm. The dust scrubber system is to be high efficiency and high capacity, sized to handle at least 1.5

times the anticipated air flow (37,500 cfm).

Adequate dust seals around the cutter head will be required to prevent dust from escaping into the work areas. The vent system should also have a branch duct(s) to exhaust any dust-ladened air from the working areas behind the head including conveyor drop points. These branches are also to exhaust through dust scrubbers.

Appropriate water sprays using spray and fogging nozzles are required for the muck conveyors. Sprays are to wet both sides of the belt. Provision to meter the water is required.

Noise Attenuation- Feasible engineering controls are to be incorporated to reduce noise levels at all noise generating areas of the TBM, including but not limited to motors, fans, rock drills, and pumps.

Fluid Spills- Limit quantities of oils and greases on the TBM, smaller reservoirs and closed loop systems for example if feasible. Use hoses of higher-rated pressures than the system would normally dictate. Drip pans are to be used wherever potential exists for leakage.

Water Use- Unrecovered water left in the tunnel is restricted. Because of this, water use must be controlled both to ensure the limits are not exceeded and to document the fact. Water spillage is to be minimized wherever feasible. Water controls on the TBM should include meters on all supply and wastewater lines. Water in cooling systems is to be either contained in a closed loop, recycled to dust control, or discharged to the conveyor or to the wastewater line. Care must be given to insure that no heavy metals, other fluids (antifreeze, oils, etc.) or regulated contaminants are released from the cooling system into the wastewater system and into the environment. Interlocks with remote valve actuation, are to be used on dust control sprays on the TBM and muck conveyor so that sprays are on only when the TBM or conveyor is running.

Ground Support:

The anticipated ground support for the ECRB will be similar to that used in the ESF Tunnel; rock bolts and mesh, steel sets and lagging.

Electrical

Power available in the main tunnel is 12.47kv. Mine power centers provided by the constructor need to have excess capacity to support other systems and operations in the tunnel (e.g. lighting systems and testing activities). Transformers (both on the TBM and in the tunnel) are to be dry type.

Safety

The TBM must conform to the requirements of OSHA regulations for the construction industry (29 CFR Part 1926). Consider that DOE, as the Authority Having Juridiction, will be the interpreter of the regulation. In addition, automatic fire suppression systems are required for

both the TBM and muck conveyor. Fire resistance hydraulic oils and lubricants are also to be used. A combined construction hazard/safety analysis will be conducted jointly by the M&O and constructor prior to operation of the TBM.

Science Program Interface

All scientific operations, e.g. mapping, sample collection, drilling, will take place behind the TBM. Therefore, no special equipment is required as part of the TBM or backup system.

Spare Parts

A list of recommended spare parts will be required as part of the constructor's TBM proposal.

INTERIM REPORT ON THE ENHANCED CHARACTERIZATION OF THE REPOSITORY BLOCK

TABLE OF CONTENTS

October 7, 1997

Executive Summary

An east-west drift has been recognized as an important data source in the site characterization program since the completion of the he Exploratory Studies Facility Alternatives Study. as a data source from the beginning of our current generation of characterization efforts. Completion of the main drift (five mile loop) was considered the initial data source with an east-west drift constructed shortly thereafter. However, budget projections in FY95-FY96 required that work be reprioritized and restructured such that an acceptable continuation of the characterization effort and ultimate license application could be accomplished with a smaller data set, corresponding to the reduced funding. This reduced funding and subsequent reprioritization resulted in the east-west drift being moved to the out years (FY98-FY99 time frame) for consideration.

Additional funding identified in the 2nd quarter of FY97 has subsequently allowed this drifting to be reconsidered for movement forward approximately one year to the FY97-FY98 time frame. DOE chartered a 90-day planning activity beginning in mid-March of 1997 to determine what data would most strengthen the licensing basis while complying with the limitations and constraints imposed on characterization activities. As a critical subset, consideration was to be given to the relationships to on-going activities and how enhancements could provide observations and confirm data used in the Viability Assessment.

An integrated planning team approach was utilized with DOE and M&O representation at all levels. The following five Working Groups, reporting to an Integrated Planning Committee, were charged with planning the enhanced characterization work:

- Testing Working Group
- Performance Assessment Working Group
- Licensing/Regulatory Working Group
- Design/Construction Working Group
- Design, Construction and Testing Controls and Requirements Working Group

The Integrated Planning Committee, consisting of DOE and M&O senior management, provided direction and concurrence.

The role of the working groups was to develop the objectives and criteria for the Enhanced Characterization program as it related to their technical area. These were then validated by the Integrated Planning Committee. The working groups then moved on to the identification of benefits, the identification of configuration elements to achieve these elements, and finally to an optimum configuration for recommendation to the Integrated Planning Committee.

The optimized configuration resulted from the deliberations of the total planning team of the proposed initial configuration elements. These included nine variations of drifting, multiple alcoves, drill holes, and testing options. The consensus action satisfied the data needs of science and engineering while minimizing the risks to the licensability of the site and maintaining the flexibility of the repository design. The recommended optimum configuration had separated the Calico Hills Access from the East-West drift. The Integrated Planning Committee recombined

these two elements consistent with the original concept put forth by the Testing Working Group. This optimized configuration was validated by the Integrated Planning Committee and subsequently accepted by DOE and M&O project executive management in early May. The optimum configuration consists of the following elements, in rank order:

1. East-west Cross Drift Coming off the North Ramp to the Southwest Intersecting Solitario Canyon Fault Central Block, above the repository emplacement horizon, preserve Ability to go to Calico Hills.
   - 1a. Access to Calico Hills from the west end of the East-West cross drift. (This element is included as part of the East-West drift but the cost and schedule will not be included in the Change Request)
2. Northern borehole to the water table between UZ-14 and G-2 at the head of Teacup Wash.
3. Southern borehole to the water table along the crest between UZ-6 and H-3.
4. Performance Assessment(PA) related laboratory testing
   - Cathodic protection
   - Flow & transport through corrosion pits in waste package
   - Drip shield
   - Cladding
   - Thermomechanical data and dissolution rates under different water composition and heating scenarios
5. Southern Testing Complex (3-4 Boreholes)

It has been determined that available additional FY 1997 funding would only be sufficient to support the East-West drift (not including Calico Hills drifting), the northern borehole, and the southern borehole. The PA related laboratory testing and Southern Testing Complex are in the current plan but were to be accelerated as part of the optimum configuration. The need for the Calico Hills access will be evaluated in FY 1998 based on information gained from the East-West drift excavation and the Calico Hills scoping study.

In addition to the 90 day planning, 11-12 months is projected for the preparation and excavation of the East-West drift. Completion is scheduled for May 1998. Subsequent alcove construction will occur between June 1998 and December 1998. The boreholes will be drilled between March 1998 and October 1998 after construction of the necessary access roads and pads. Testing work will begin at the start of East-West excavation(mapping, sampling) and continue through 1999. The projected cost of the Enhanced Characterization effort described in the Change Request is $_____{this will be furnished with the change request (CR) on June 6, 1997}.

1.0 Background

The NWTRB has consistently expressed a position that high-priority site characterization activities include a full east-west traverse of the geologic block, in the area of the geologic repository itself. As most of the major structures are running north-south, an east-west traverse allows these major structures to be encountered, and the opportunity to characterize the fractures, faults and conditions at the site, including the flow paths at and below the repository emplacement level.

The DOE Program Plans have included activities related to development of an east-west drift. These plans have recognized the need to obtain information about potential structures west of the north-south main. However, the DOE has consistently noted that the site characterization program has many components that will provide additional controls on structure and stratigraphy, including information from the surface-based drilling program and geophysics, including reflection, gravity and magnetics. It has been the DOE position that an east west drift will be completed and provide access to the Solitario Canyon Fault prior to the license application in 2002.

Over the past several years, budget reductions have required the DOE to evaluate not just the timing of the east-west drift, but also whether or not completion of the 5-mile loop itself was the best use of resources. In the second quarter of FY 1997, reconsideration of Project status, costs, and budget priorities has resulted in an opportunity to reexamine the benefit and timing of the east-west drift along with other enhanced characterization options.

DOE has recently examined how best to enhance characterization of the repository block, including an east-west drift. The objective was to enhance the scientific understanding of the behavior of the site, as well as enhance understanding of engineering, construction, health and safety, cost, and regulatory and performance aspects of the potential repository. The process and outcome of this examination are discussed in this report.

ECRB IP Meeting Minutes
~~3/30/97~~ 5/27/97 JKB
3:30 p.m. 11/4/97

Bob Sandifer opened the meeting at 3:30 p.m. Agenda was distributed along with Executive Summary, Background, and composite depiction of options for E-W drift. Dennis Williams had questions regarding selected options (testing group options). Ralph Rogers addressed rationale as did Ned Elkins in amplification. The diagonal (testing group options) view still has a very high rating. The concern was that the testing community was not given a full opportunity to fully express their views as to where the proposed drift should be placed. Not so said Dennis Williams. He stated that much more was gained by consensus option and it kept E-W drift out of emplacement horizon. The selected option is a consensus of the group with no compromise. Rather, there was a value added in choosing the consensus option. Clarification on wording regarding options were discussed and reviewed.

Bob Sandifer requested comments on Background and Executive Summary by 5/28/97.

Discussion shifted to next agenda item, Work Scope. Alcove and niches reduction post E-W drift excavation review. The next four items (NEC for ESF, covered muck conveyer, refuge chambers, and safety analysis vs. JSA on contractor systems) were from R. Baumeister (he was not present at meeting). Mark VanDerPuy will work these four issues as to how to mitigate concerns. Mark still wants to draw together a composite team to discuss "lessons learned" in order to mitigate dust and noise concerns. His desire is to incorporate mitigation and engineering controls from the outset. The first point is the TBM configuration. Dr. Kissell will be invited, with DOE concurrence, to participate in the planning process from the beginning. Ric Craun brought up issue that the goal should be to strive toward a "no PPE required" environment. While this is the goal, it would be included in initial Change Request (CR) per Ivan Cottle. Bob Sandifer reiterated the essence of how we would proceed. Mark VanDerPuy discussed rationale behind the need for thorough safety analysis. Ivan Cottle stated that this should be done in review of final A/E drawings. The constructor's preference should be incorporated into final drawings. The constructor would then, as required, construct per the approved drawing. No deviation would be authorized without additional review, including revised safety analysis. Dennis Williams brought up the issue of multiple-level schedule so that all elements are integrated. Ivan Cottle stated that this is being developed, i.e., at the summary account level. Ivan stated it would be ready by 5/30/97.

Deliverables and milestones - Dennis Williams believes there should be more level 3's. Hydrological and moisture monitoring are two important ones. There should be level 4 feeders to these specifically in WBS 1.2.3. In WBS 1.2.6, Dennis Williams believes there should be key level 3's in this WBS area as well. Ivan Cottle commented that if there are any other concerns from the client, please let him know. Mark VanDerPuy brought up the issue of location of paramedics. Tommy Touchstone stated they would be centralized in change house; there would not be two distinct units in area 25. Ivan Cottle will look into this. TR6612FB3 is the pertinent

account in this area. Jerri Adams asked Bob Sandifer if our dust concerns are incorporated into day-to-day operations of the E-W drift. Bob responded affirmatively.

Documentation Notebook Review: Bob Sandifer showed the group its content. He specifically addressed Jerri Adams that the report to Mr. Barrett would be minus section 3.5 and the appendices. Jerri said he (Barrett) would be here and she would ask him if that would be OK.

In summary, Glenn Vawter suggested we need acceptance/closure criteria for level 3 milestones. Dennis Williams said this would mainly apply to WBS 1.2.3 and 1.2.6. This does not apply to out-year planning. The CR would have "pointers" that look ahead to those areas if they apply.

The meeting adjourned at 4:45 p.m.

Minutes recorded by Rufus Taylor

AGENDA

ECRB IP Committee Meeting
May 27, 1997

- Executive Summary and Background - Discussion
- Work Scope
  - Notebook review and discussion
  - Comments already received
    * Reduction of alcoves and niches (current 3 and 2)
    * National Electric Code for ESF
    * Covered muck conveyor
    * Refuge chambers
    * Safety Analysis (vs. JSA's) on constructors' systems
- Documentation Notebook Review
  - Copy of current report to Lake Barrett on 6/2/97

ECRB IP Committee Meeting

May 27, 1997

ATTENDEES

NAME	ORGANIZATION	Tele. #
Rufus Taylor	M&O / SCO	5-5786
Dennis R. Williams	DOE / AML	4-1417
Mark E. VanDenPuy	DOE / AMESH	4-5563
Larry Hayes	M&O - SPO	5-5604
Glenn Vawter	M&O / TRW	5-5517
Jerry Adams	DOE/AMAAM	4-1481
Dick Spence	DOE / CPC	4-1346
R. Grant	DOE / [illegible]	4-[illegible]
Peter Hastings	M&O / Systems	5-3961
Dick Snell	M&O / E&T	5-5601
Marshall Bishop	M&O / BAH	4-1589
Mike Lugo	M&O / Regulatory	5-4761
J. LeFever	M&O / PE	5-5706
Ivan Cottle	M&O	5-5729
Ned Z. Elkins	SPO / LANL	5-3403
Ralph Rogers	SPO / WCFS	5-5785
Steve Schuermann	OQA / QATS	4-5549
Larry Morrison	M&O / A&E	5-4288
Jim Houseworth	M&O / PA	5-4638
Bob Sandifer	M&O / SC&O	5-5504

Enhanced Characterization of the Repository Block
Integrated Planning Committee meeting
6/03/97 2:00pm-4:00pm
Room 1257

Meeting Minutes

This meeting was held to discuss the cost estimates for the ECRB Change Request. Those in attendance are listed on the attached sign-in sheet.

Bob Sandifer gave a short briefing on the cost estimate for the ECRB. The initial unscrubbed estimate is approximately $51M. He indicated that the estimate was currently undergoing a M&O management scrub. Jerri Adams indicated that the scrubbed package should be brought to her for distribution within DOE.

Jerri Adams also indicated that DOE would be having an independent validation performed on the ECRB work scope and cost estimate.

Jerri Adams also indicated that approximately $17M of FY97 risk mitigation funding was available to support the ECRB.

Jerri Adams also reiterated DOE's position - The ECRB cannot impact required work.

Minutes recorded by James R. Beyer. JRB

ECRB Integrated Planning Committee Meeting 6/3/97 2:00 - 4:00, Rm 1257

Name	Org	Phone
Jim Beyer	M&O C&O PE	5-5395
Bob Sandifer	M&O, SC&O	55504
Tommy Touchstone	M&O SC&O	55592
P.E. Spence	DOE/OPC	4-1346
Jerri J. Adams	DOE/AMAAM	4-1481
Dennis F. Williams	DOE/AML	4-1417
K. Michael Cline	MTS/13+H	45491
Bill Kennedy	M&O/ESF DGN	4-4240
Robert Wemheuer	M&O / Safety Assurance	5-3906
Steve Schuelmann	OQA/QATS	4-5549
Ron Olson	M&O/TCO	5-3578
Ralph Rogers	M&O/SPO	5-5785
Frank Van Der Laan	M&O/SE	5-4158
Richard Crawn	DOE/AMVASP	4-1488
Mark Van Der Ploeg	DOE/AMESH	45563
Vincent F. Iocii	DOE/AMAAM	4-1470
Chuck Metzga	MTS	4-1382
Jeff LeFever	M&O/PE	5-5706
Ivan Cottle	"	5-5724
Jim Houseworth	M&O/PA	5-4638
Jack Nesbitt	M&O / Proj. Control	5-5396
Marshall Bishop	MTS/BAH	5-1389

Enhanced Characterization of the Repository Block
Integrated Planning Committee meeting
6/05/97 1:00pm
Room 1275

Meeting Minutes

This meeting was held to discuss the redirection from management for the ECRB Change Request. Those in attendance are listed on the attached sign-in sheet.

Bob Sandifer went over the attached briefing and answered questions from the group. The discussion centered on what things would be removed from FY97-FY98 consistent with the redirection.

Minutes recorded by James R. Beyer. JRB

ECRB
Integrated Planning Committee
June 5, 1997
1:00 Rm 1275

Name	Org	Phone
Jim Beyer	M&O C&OPE	5-5395
Bob Smulifer	M&O SC&O	5-5504
Chuck Metzger	MTS	4-1382
Jack Nesbitt	M&O PC	5-5485
Tommy Touchstone	M&O SCO	5-5592
Rufus Taylor	M&O/SC&O	5-5386
Vincent F Iozzi	DOE/AMAAM	4-1470
Jerri J. Adams	DOE/AMAAM	4-1483
Ken Ashe	M&O/Licensing	5-5563
Ralph Rogers	M&O/SPO	5-5785
Bill Kennedy	M&O/Design	5-4240
Jim Houseworth	M&O/PA	5-4638
Vic Pulock	M&O/ETI	5-4370
Marshall Bishop	MTS/BAH	5-1389
Robert Wemhoff	M&O/Safety Assurance	5-3961
Ned E. Elkins	SPO/LANL	5-3403
Frank Van Der Laan	M&O/SE	5-4158

90-Day ECRB Costing Approach

ECRB Change Request

Submitted 6/3/97

FY97 - 98

- Design and construction of cross drift and alcoves, niches
- Two surface boreholes
- DIE, SE, etc., to support construction, drilling and testing
- FY97 - 98 science

Funded with new dollars ($40M) plus FY98 cross drift allocation in LRP ($385K)

FY99 - 00

- Ongoing construction
- Ongoing/new science

Funded with required portion of previously planned FY99 dollars in LRP for cross drift ($11M of $22M)

ECRB - Management Redirection

- **Develop high level proposal for doing just $30M worth of enhanced characterization of the repository block work.... confine activities to enhanced characterization of the block only. Present to management on 6/17/97. Do not replan dollars in FY98/99 LRP for ECRB work (targeted in the LRP for EW drift).**
- **Leave current ECRB CR on the table with updated cost numbers (summary numbers to management by COB 6/5/97, new CR costing by 6/9/97). This CR will be reviewed concurrently.**
- **Continue early ECRB work (launch chamber design, DIE support, TBM requirements development) to preserve current cross drift construction schedule.**

ECRB - Suggested Approach

- **Preserve as much of consensus configuration as practical**
  - **cross drift**
  - **science**
- **Start with current cross drift but stop at edge of repository block. Eliminate work not associated with the block itself.**
- **Assume acceptable level of science support**
- **Utilizing detailed costing data from current ECRB CR, develop proposal totaling $30M maximum. Work would likely be spread across FY97, 98, and into 99.**
- **Keep integrated with IP Committee...submit to management by 6/17/97.**
- **Any work not covered could be considered with everything else in normal FY98, 99, etc. planning.**