

U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

**NUCLEAR WASTE TECHNICAL REVIEW BOARD
FULL BOARD MEETING**

**SUBJECT: HOW WILL PERFORMANCE
ASSESSMENT RESULTS
BE USED?**

PRESENTER: MAXWELL B. BLANCHARD

**PRESENTER'S TITLE
AND ORGANIZATION: DEPUTY PROJECT MANAGER
U.S. DEPARTMENT OF ENERGY
LAS VEGAS, NEVADA**

**PRESENTER'S
TELEPHONE NUMBER: (702) 794-7939**

ARLINGTON, VIRGINIA
JANUARY 12, 1994

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Outline

- **Review performance-based strategy for characterizing Yucca Mountain**
 - **Status of implementation of strategy**
- **Performance assessment input to special studies**
- **Compliance status**
 - **Potential impact of shift to dose-based criteria**
- **Uses of performance assessment in other activities**

Performance-Based Strategy was Used in 1988 SCP

The strategy was

- **Established on the basis of expected site performance and potential for disruptive events**
- **Used to identify areas of emphasis in the site program**

Strategy from 1988 SCP: System Components and Objectives

Postclosure			Preclosure	
	Component	Objectives	Component	Objectives
Engineered Barriers	Unsaturated rock/air gap	Limit the water available to contact and corrode containers and dissolve waste	Surface and underground facility construction	Provide beneficial or no impact on postclosure system performance
	Container	Serve as principal containment barrier during early radiation and heat peak	Surface and underground facility operation	Safe operation under normal and accident conditions
	Waste form	Limit dissolution and leaching of radionuclides due to limited water contact		
Natural Barriers	Unsaturated rock units below the repository	Act as barrier to radionuclide transport by providing long radionuclide travel times		
	Saturated rock below the unsaturated rock	Extend the total travel-time of radionuclides		

The 1988 Strategy Was Used to Focus the Site Testing Program

Postclosure

- **Determine the processes and characteristics of flow in the unsaturated zone**
- **Investigate site conditions and characteristics that could affect waste package performance and radionuclide transport**
- **Identify and characterize potentially significant, but unlikely, disruptive processes and events**

Preclosure

- **Characterize seismic hazards sufficient to develop design criteria for repository facilities**

Should the Strategy be Revised?

- **New site data and performance assessment results support continued use of the strategy**
- **Events that could impact strategy**
 - **Changes in standards**
 - **Selection of new waste-package concepts**
 - **Thermal loading decision**
 - **Results of major trade studies**



Status of Implementation of SCP Strategy

Implementing the SCP Strategy

Natural Barrier Characterization: Highlights

	<u>Activity</u>	<u>Objective</u>	<u>Status</u>
Unsaturated zone	Deep UZ drillholes	Understand UZ flux and flow mechanisms	UZ-14, 16 dry-drilled/saturation profiles available; instrumentation for pneumatic testing being installed
	Shallow infiltration	Estimate quantity and variability in net infiltration	99 Neutron holes complete/logging and monitoring underway
Saturated zone	C-Well program	Understand flow and transport in saturated zone	Testing underway at C-Holes to evaluate models

Implementing the SCP Strategy

Engineered Barrier Studies: Highlights

	<u>Activity</u>	<u>Objective</u>	<u>Status</u>
Waste form	Solubility and speciation studies	Expand database for modeling	New solubility data used in TSPA 1993
Container	Alternatives to SCP reference case being considered	<ul style="list-style-type: none">• Consider more robust alternatives• Develop multipurpose container (MPC) concepts	<ul style="list-style-type: none">• Evaluating alternative container designs• Evaluating MPC concepts

Implementing the SCP Strategy

Disruptive Condition Studies: Highlights

	<u>Activity</u>	<u>Objective</u>	<u>Status</u>
Climate	Paleoclimate field studies and modeling	Predict future climate	Small program maintained
Volcanism	Volcanic studies	<ul style="list-style-type: none"> • Evaluate primary & secondary effects • Improve basis for probabilities 	Basis for 1995 Topical Report nearly complete
Hydrotectonism	Trench 14/Calcite-Silica studies	Determine potential for disruptive hydrotectonic processes	Review by National Academy panel resolved concerns
Seismic Hazards	Trenching, seismic monitoring	Establish appropriate design basis	Topical Report on Methodology to NRC in 1994



Performance Assessment Role in Special Studies

Performance Assessment Role in Special Studies

Purpose of Study

Prioritize site program to evaluate suitability

Establish risk vs. benefit of excavating Calico Hills

Evaluate alternatives to SCP Exploratory Shaft design

Ranking Criteria

Ability to improve confidence in 10,000 yr release predictions

- Value of data obtained
- Potential for adverse impacts
- Maximize UZ thickness below emplacement area
- Avoid direct connection to Calico Hills

Knowledge Gained from Study

1. Predicting gaseous releases highest priority
2. Second priority: understand UZ flow and transport

- Excavation of Calico Hills could increase confidence in hydrologic models
- Impacts of excavation appeared acceptable

Performance predicted for all options and results were similar

Performance Assessment Role in Special Studies

(Continued)

Purpose of Study

**Early Site Suitability
Evaluation**

Ranking Criteria

**Part 960 siting criteria
(which includes
Part 20 release
limits and Part 60
performance
objectives)**

Knowledge Gained from Study

- **Disqualification of Yucca Mountain site appears very unlikely**
- **Highest priorities for completing suitability evaluation are: understand gaseous releases, develop design for Part 20 compliance, understand UZ flow & transport, and develop credible predictions of future climates**

Performance Assessment Role in Special Studies

(Continued)

Purpose of Study

**Integrated test
priorities**

Ranking Criteria

- Combination of:**
- **Results from ESSE**
 - **Ability to improve confidence in Part 60 compliance**
 - **Ability to build scientific confidence**
 - **Cost of tests**

Knowledge Gained from Study

- **Tests to improve scientific confidence should have highest priority**
- **Tests to improve confidence in Part 60 compliance should be intermediate**
- **Low probability of site being unsuitable results in low priority for suitability tests**



Status of Compliance

Compliance Status/Impact of Shift to Dose-Based Standard

Previous presentations show status

- **C-14 releases are likely to exceed EPA's remanded 10,000 yr total system standards**
- **+10,000 yr calculations show significant peak doses for any site with low dilution factors, or without extremely long-lived waste packages**

Compliance Status/Impact of Shift to Dose-Based Standard

(Continued)

- **If 10,000 yr cumulative release standards are reinstated, the Yucca Mountain site appears robust except for C-14 releases**
 - **Continue site characterization to improve scientific confidence that probability of disruptive events and “unknown-unknowns” is low and acceptable**
- **If new standards are dose-based and require +100,000 yr protection**
 - **Increase reliance on robust engineered systems with site as additional barrier**
 - **Priority of understanding flow and transport in saturated zone will increase**



Performance Assessment Uses in Other Project Activities

Other Uses of Performance Assessment

- **Waste isolation impact evaluations: covered previously**
- **Determination and updating of Q-Listed items**
 - **Items that contribute to preclosure or postclosure radiological safety**
- **TSPA 93 provided input to engineered barrier design (thermal loading, container thickness, overpack thickness)**
- **Performance assessment results are considered when resources are allocated**

Use of Performance Assessment in Other Programmatic Activities

(Continued)

Annotated outline/Issue resolution

- **Topical reports**
 - **Erosion Topical Report developed on basis of low probabilities of extreme erosion: no PA consequence analysis necessary**
 - **Seismic Hazard Methodology Topical Report: will utilize performance-based arguments**
 - **Other Topical Reports in planning stages will rely heavily on performance-based arguments**
 - **Substantially complete containment**
 - **Ground-water travel time**
 - **Volcanism**
- **License Application/Annotated Outline**
 - **Annotated Outline: TSPA-93 results will be included in upcoming revisions**

Summary

- **Performance-based understanding is basis for DOE's strategy for site characterization**
- **Input from performance assessment has been used to review priorities, reevaluate plans, and make funding decisions**
- **DOE relies on performance-based arguments that consider public health and safety impacts to manage site characterization and the evolving designs for engineered systems**

Log : Waste Isolation Evaluations

PA: Site Construction/Characterization Activity Schedule as of 1/11/94

Activity	Contributors	Requestor	Start	Due	Compl.
Completed					
Waste isolation evaluation - Liner for Exploratory Studies Facility (ESF) Phase 1A rock storage area	A. Brandstetter	J. Gardiner	10/30/92	11/04/92	11/04/92
Waste isolation evaluation - plugging of existing drillhole NRG-1	C. Bruch	R. Dyer D. Williams	11/10/92	11/10/92	11/23/92 12/15/92
Meet with involved organizations to discuss internal and external coordination	A. Brandstetter	A. Brandstetter	10/01/92	none	11/30/92
Waste isolation evaluation - Fran Ridge Borrow Pit No. 1	A. Brandstetter J. Houseworth E. Paleologos	C. Gertz R. Dyer J. Gardiner	11/05/92 11/25/92 12/17/92	11/19/92 11/30/92 ASAP	11/10/92 12/10/92 12/21/92
Waste isolation evaluation - Exploratory Studies Facility (ESF) Phase 1A tracers, fluids and materials (TFMs)	A. Brandstetter E. Paleologos	H. Kalia J. Gardiner	11/13/92 12/17/92	11/20/92 ASAP	12/11/92 12/18/92
Waste isolation evaluation - plugging of existing drillholes RF-3, 3B, 5, 9, 10 and 11	C. Bruch	R. Dyer D. Williams	11/25/92	12/04/92	12/15/92
Waste isolation evaluation - cement to be used in plugging of existing drillhole NRG-1	C. Bruch	H. Kalia	11/24/92	12/11/92	12/15/92
Waste isolation evaluation - UZ-1/UZ-14 hydrocarbon spill remediation	A. Brandstetter	R. Dyer T. Sullivan	12/15/92	12/14/92	02/16/93
Waste isolation evaluation - C-well complex testing	E. Paleologos	R. Dyer C. Newbury	12/01/92	12/15/92	03/01/93
Waste isolation evaluation - prototype ponding and infiltration tests at existing neutron borehole UZN-85	J. Houseworth	R. Dyer A. Girdley	11/19/92	12/31/92	01/04/92

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PA: Site Construction/Characterization Activity Schedule as of 1/11/94

Activity	Contributors	Requestor	Start	Due	Compl.
Waste isolation evaluation - data acquisition phase of drillhole UZ-16, including geophones and sealing - status report	C. Bruch	R. Dyer M. Tynan	11/10/92	12/31/92	03/09/93
Prepare prioritized list of PA evaluations in support of ESF design and testing	A. Brandstetter	T. Petrie	12/03/92	12/31/92	01/19/93
Input to Test Planning Package (TPP) process improvement recommendations	A. Brandstetter	J. Boak	10/05/92	01/04/93	01/18/93
Formulate constraints on organic fluid leakage and on water use for dust control by first ESF tunnel boring machine	A. Brandstetter J. Houseworth	J. Younker	01/12/93	01/13/93	01/13/93
Waste isolation evaluation - drilling of drillhole UZ-14	C. Bruch	R. Dyer T. Sullivan	12/18/92	01/22/93	02/25/93
Waste isolation evaluation of TFMs for starter tunnel testing	A. Brandstetter	R. Oliver	02/17/93	03/04/93	03/11/93
Waste isolation evaluation - construction of drillhole NRG-4 road and NRG-5 road and pad	E. Paleologos	R. Bullock	01/20/93	not specified	03/04/93
Waste isolation evaluation - hydrocarbon spill at C-well complex	J. Houseworth	R. Dyer C. Newbury	02/24/93	02/26/93	03/31/93
Tracer Use in Fill Compaction and Dust Control Water	J. Houseworth	M. Blanchard	02/08/93	03/12/93	03/12/93
Waste Isolation Evaluation, Electrical Grounding Grid for NRG-5	J. Houseworth	H. Kalia	03/04/93	03/10/03	03/17/93
Waste Isolation Evaluation, Drilling of NRG#2A	J. Houseworth	R. Dyer	02/16/93	04/01/93	03/23/93
Evaluation of Potential Impacts Due to Use of Lithium Bromide in the ESF	J. Houseworth	N. Elkins	02/26/93	03/31/93	03/31/93

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PA: Site Construction/Characterization Activity Schedule as of 1/11/94					
Activity	Contributors	Requestor	Start	Due	Compl.
Waste Isolation Evaluation for YMP Temporary 69 kV Power Distribution System	E. Paleologos	W. Kopatich	03/01/93	?	04/06/93
Waste Isolation Evaluation; Road Oyl and EMC ² , Dust Suppression and Soil Stabilization Products	C. Bruch	H. Kalia	03/23/93	04/16/93	04/20/93
Define design and construction requirements for ESF to assure repository can be sealed	SNL: Larry Costin	T. Petrie	12/03/93	04/30/93	02/02/93
Waste isolation evaluation - need for separate rock storage areas for Topopah Spring and Calico Hills muck	SNL: Larry Costin	T. Petrie	12/03/93	04/30/93	02/02/93
Waste Isolation Evaluation, TFM for C-Well Pump Tests	J. Houseworth	H. Kalia	04/06/93	04/10/93	04/29/93
Waste Isolation Evaluation, TFM for NRG-4, Electrical Grounding Grid	J. Houseworth	H. Kalia	04/06/93	04/10/93	04/29/93
Waste Isolation Evaluation, Drilling of SRG-5	C. Bruch	J. Weaver	04/28/93	05/03/93	05/04/93
Waste Isolation Evaluation, Drilling of UE-25 NRG#2 and UE-25 NRG#2A, Supplement #1	J. Houseworth	R. Dyer	05/24/93	05/24/93	05/25/93
Waste Isolation Evaluation, Drilling of UE-25 NRG#5, Supplement #1	J. Houseworth	R. Dyer	05/24/93	05/24/93	05/25/93

PA: Site Construction/Characterization Activity Schedule as of 1/11/94

Activity	Contributors	Requestor	Start	Due	Compl.
Waste Isolation Evaluation, Package 1A Water Supply System for the Exploratory Studies Facility	J. Houseworth	P. Hastings	05/17/93	05/28/93	06/01/93
Waste Isolation Evaluation, Package 1B Surface Buildings, Parking, and Compressed Air Facility	J. Houseworth	P. Hastings	05/17/93	06/01/93	06/01/93
Waste Isolation Evaluation, Fran Ridge Large Block Experiment	C. Bruch	R. Oliver	04/22/93	05/28/93	06/04/93 ?
Waste Isolation Evaluation, Concrete Batch Plant	J. Houseworth	W. Kopatich	05/24/93	06/02/93	06/16/93
Letter Response for TFM for thread compound	J. Younker	R. Dyer	05/26/93	ASAP	06/15/93
Waste Isolation Evaluation, Drilling of UE-25 NRG#2B	J. Houseworth	M. Voegele	05/26/93	ASAP	06/15/93
Letter Response for 138 kV service for the North Portal and 12.47 kV service from the North Portal to the South Portal	J. Younker	W. Simecka	05/27/93	07/30/93	06/15/93
Waste Isolation Evaluation, Package 1A Water Distribution System for the Exploratory Studies Facility	J. Houseworth	P. Hastings	NA	07/19/93	06/17/93
Performance Assessment Concerns Regarding a Diesel Transportation System to Service Tunnel Boring Machine (TBM) Operations	J. Houseworth	R. Sandifer	NA	07/12/93	07/13/93

PA: Site Construction/Characterization Activity Schedule as of 1/11/94

Activity	Contributors	Requestor	Start	Due	Compl.
Waste Isolation Evaluation, Package 2A Extension of the North Ramp Starter Tunnel	C. Bruch	P. Hastings	NA	07/05/93	07/15/93
Waste Isolation Evaluation, Tracers, Fluids, and Materials for North Ramp Starter Tunnel Testing and Construction, Supplement #1	J. Houseworth	H. Kalia	07/07/93	07/12/93	07/15/93
Waste Isolation Evaluation - Different ESF Ramp/Drift Sizes - Thermo-Mechanical and Flow and Transport	F. Tsai	T. Petrie	12/03/92	04/15/93	07/26/93
Waste Isolation Evaluation TFM for North Portal Pad Substation & 69 kV Power and Feeder System	J. Houseworth	H. Kalia & P. Hastings	05/28/93	06/11/93	07/26/93
Waste Isolation Evaluation, ESF Subsurface Wastewater Pond, Pkg 1B	C. Bruch	P. Hastings	NA	07/19/93	07/27/93
Waste Isolation Evaluation, Shop, Pkg 1B (Package 1B Surface Buildings Supplement #1)	J. Houseworth	P. Hastings	NA	07/19/93	07/29/93
Waste Isolation Evaluation, H-Road Widening and Paving, Pkg 1B (Pkg 1A Water Supply System Supplement #1)	J. Houseworth	P. Hastings	NA	07/19/93	07/29/93
Waste Isolation Evaluation Package 1B Sewer System	E. Paleologos	P. Hastings	06/07/93	06/18/93	07/30/93
Waste Isolation Evaluation, ESF Explosives Storage Area, Pkg 1B	J. Houseworth	P. Hastings	NA	07/19/93	07/30/93
Waste Isolation Evaluation, Excavation Trenches along Solitario Canyon Fault	J. Houseworth	J. Weaver	06/23/93	07/15/93	08/03/93
Letter Response to Ghost Dance Fault Roadcuts	J. Houseworth	R. Dyer	06/08/93	06/22/93	08/12/93

PA: Site Construction/Characterization Activity Schedule as of 1/11/94

Activity	Contributors	Requestor	Start	Due	Compl.
Waste Isolation Evaluation, Drilling and Testing of USW SD-12	E. Paleologos	J. Weaver	06/27/93	-	09/01/93
Clarification of Ghost Dance Fault Letter of 08/12/93	J. Houseworth	R. Dyer	-	-	09/03/93
Waste Isolation Evaluation, ESF Package 1A North Ramp Alcove #1	J. Houseworth	R. Oliver	07/05/93	08/30/93	09/03/93
Waste Isolation Evaluation, TFMs for North Ramp Starter Tunnel Testing and Construction, Supplement #2	J. Houseworth	H. Kalia	09/02/93	09/07/93	09/08/93
Waste Isolation Evaluation, ESF Package 1A North Ramp Alcove #1: Rev. 01	J. Houseworth	P. Hastings	-	-	09/10/93
Waste Isolation Impact Evaluation, TFMs for FY-1993 ESF Phase 1A Construction, Rev. 02	J. Houseworth	P. Hastings	-	-	09/10/93
Waste Isolation Evaluation, Package 1A Water Supply System for the ESF, Rev. 01	J. Houseworth	P. Hastings	-	-	09/10/93
Waste Isolation Evaluation, UZ-14 Perched Water Grouting Plan	J. Houseworth	H. Kalia	09/03/93	09/07/93	09/10/93
Waste Isolation Evaluation, NRG-7 Drill Pad and Access Road	J. Houseworth	R. Dyer	08/09/93	08/23/93	09/13/93
Waste Isolation Evaluation, Midway Valley Alice Ridge Trenching	J. Houseworth	J. Weaver	08/10/93	08/20/93	09/15/93
Waste Isolation Evaluation, Package 1A Water Distribution System for the ESF, Rev. 01	J. Houseworth	P. Hastings	09/20/93	-	09/16/93

PA: Site Construction/Characterization Activity Schedule as of 1/11/94

Activity	Contributors	Requestor	Start	Due	Compl.
Waste Isolation Evaluation, TFMs for North Ramp Starter Tunnel Testing and Construction, Supplement #2, Rev. 01	J. Houseworth	H. Kalia	09/02/93	09/07/93	09/20/93
Waste Isolation Evaluation, Seismic Reflection Line, ESF Support	J. Houseworth	J. Weaver	09/07/93	09/15/93	09/20/93
Waste Isolation Evaluation, TFMs for the UE-25C-Well Complex, Rev. 01	J. Houseworth	H. Kalia	-	-	09/24/93
Waste Isolation Evaluation, ESF Package 1B Explosives Storage Area, Rev. 01	J. Houseworth	P. Hastings	-	-	09/24/93
Waste Isolation Evaluation, ESF Package 1B Surface Buildings, Parking, and Compressed Air Facility, Supplement #1, Rev. 01	J. Houseworth	P. Hastings	-	-	09/24/93
Waste Isolation Evaluation, TFM, for the ESF North Portal Pad 69-12.47 kV Electrical Power, Site Grounding and Lightning Systems, Rev. 01	J. Houseworth	P. Hastings	-	-	09/24/93
Waste Isolation Evaluation, H-Road Widening and Paving, Rev. 01	J. Houseworth	P. Hastings	-	-	09/28/93
Waste Isolation Evaluation, ESF Package 1A North Ramp Alcove #1, Rev. 02	J. Houseworth	R. Oliver	-	-	09/28/93
Waste Isolation Evaluation, TFMs for North Ramp Starter Tunnel Testing and Construction, Supplement #2, Rev. 02	J. Houseworth	H. Kalia	-	-	09/28/93
Waste Isolation Evaluation, Additional Grouting of Perched Water Zones in USW UZ-14	J. Houseworth	R. Dyer	09/30/93	09/30/93	09/30/93

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Activity	Contributors	Requestor	Start	Due	Compl.
Waste Isolation Evaluation, Drilling of NRG-7	J. Houseworth	R. Dyer	09/24/93	09/30/93	10/04/93
Waste Isolation Evaluation, Seismic Reflection Line, Revision	J. Houseworth	R. Dyer	09/29/93	-	10/12/93
Waste Isolation Evaluation, Drilling and Testing of USW SD-12, Rev. 01	E. Paleologos	R. Dyer	10/08/93	10/11/93	10/13/93
IOC: Meeting Minutes concerning use of oil-flooded compressors	J. Houseworth L. Engwall	N/A	-	-	10/29/93
Waste Isolation Evaluation, Pulling Casing on NRG#2A and B	J. Houseworth	R. Dyer	11/2/93	11/3/93	11/03/93
IOC : Trenching for Electrical Ducts at ESF North Portal Pad	A. Brandstetter	P. Pimentel	11/3/93	11/3/93	11/03/93
Waste Isolation Evaluation, ESF 69 - 12.47 kV System	D. Sassani	P. Hastings	-	-	11/04/93
Waste Isolation Evaluation, Bow Ridge Fault Trenching near Drillhole UE-25 NRG#2A	A. Brandstetter	J. Weaver	-	-	11/09/93
Test and Waste Isolation Analyses for Activities at Reclamation Sites	J. Houseworth C. Newbury	N/A	-	-	11/09/93
Waste Isolation Evaluation, Infiltration Test in Fortymile Wash near H-Road Crossing	A. Brandstetter	J. Weaver	-	-	11/12/93

PA: Site Construction/Characterization Activity Schedule as of 1/11/94					
Activity	Contributors	Requestor	Start	Due	Compl.
Waste Isolation Evaluation Pumping Tests at USW G-2, USW WT-1, UE-25 WT#12, UE-25 WT#17	E. Paleologos	J. Weaver	-	-	11/12/93
Waste Isolation Evaluation, Tracers, Fluids, and Materials for the Radiological and Environmental Field Monitoring Program	D. Sassani	H. Kalia	-	-	11/12/93
Waste Isolation Evaluation, Drilling of UZ-14 Through the Perched Water Zone	J. Houseworth	R. Dyer	-	-	11/15/93
Waste Isolation Evaluation, Construction of Drillpads and Drilling and Testing of Boreholes UE-25 NRG-2C, 2D and 2E	A. Brandstetter	J. Weaver	-	-	11/16/93
IOC: Preliminary Evaluation of the Future ESF Muck Storage Area Location	J. Houseworth R. Wemheuer	J. Nesbitt	-	-	11/18/93
TBM Seal Purge letter	J. Houseworth R. Kirk	J. Replogle	-	-	11/22/93
Waste Isolation Evaluation for Use of Non-Permanent Fluids and Materials at the Site Surface	D. Sassani	P. Hastings	-	-	11/22/93
Preliminary Waste Isolation Evaluation, Emissions from a Diesel Transportation System Supporting Tunnel Boring Machine (TBM) Excavation of the Exploratory Studies Facility (ESF) from the North Portal to the First Turn	D. Sassani	J. Nesbitt	-	-	11/24/93

PA: Site Construction/Characterization Activity Schedule as of 1/11/94					
Activity	Contributors	Requestor	Start	Due	Compl.
IOC: Performance Assessment Capability Letter- ESF Package 1B	J. Houseworth	P. Pimentel	-	-	12/01/93
Waste Isolation Evaluation, Tracers, Fluids and Materials Usage for Construction of the Waterline for the North Ramp	D. Sassani	H. Kalia	-	-	12/02/93
Cleaning of LM-300 Drilling Rig on the USW UZ-14 Borehole Drilling Pad	A. Brandstetter	R. Dyer	-	-	12/08/93
IOC: Conservative Water Use Limit in Advance of Completed DIE Revision fo ESF Starter Tunnel	J. Houseworth R. Kirk	J. Naaf	-	-	12/16/93
Waste Isolation Evaluation, Construction of Access Road and Drill Pad, and Drilling and Testing of Borehole USW SD-9	A. Brandstetter	J. Weaver	-	-	12/17/93
Waste Isolation Evaluation, Drilling and Testing of Boreholes UE-25 NRG-8A, NRG-8B and NRG-8C	A. Brandstetter	J. Weaver	-	-	12/23/93
Waste Isolation Evaluation, Exploratory Studies Facility, Surface Systems for Water Conveyance and Disposal	J. Houseworth	P. Hastings	-	-	12/31/93
Waste Isolation Evaluation, Pumping Tests at USW WT-10 and UE-25 WT#13	E. Paleologos	J. Weaver	-	-	1/6/94

PA: Site Construction/Characterization Activity Schedule as of 1/11/94

Activity	Contributors	Requestor	Start	Due	Compl.
Waste Isolation Evaluation, Tracers, Fluids, and Materials Usage at Yucca Mountain C-Well Complex Tests - Use of Argon and Nitrogen to Inflate Packers	D. Sassani	H. Kalia	-	-	1/7/94
Waste Isolation Evaluation, Exploratory Studies Facility, Standby Electrical Generators and Air Compressors on the North Portal Pad	J. Houseworth	P. Hastings	-	-	1/7/94
Waste Isolation Evaluation, Tracers, Fluids and Materials for Exploratory Studies Facility (ESF) Phase 1A Construction	D. Sassani	P. Hastings	-	-	1/10/94