



A FAX FROM THE:

**U.S. NUCLEAR REGULATORY COMMISSION**  
DIVISION OF WASTE MANAGEMENT  
Onsite Licensing Representatives Office  
Las Vegas, Nevada

DATE: May 22, 2003

TO: Janet Schlueter, NRC

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FROM: Jack Parrott, NRC

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SUBJECT: Selected pages from the BSC Baseline Change  
Proposal for Replan

NOTE:

Number of pages excluding cover sheet: 11

**PLEASE EXPEDITE DELIVERY**





QA: N/A

W. John Arthur, III, Deputy Director  
U.S. Department of Energy  
Office of Civilian Radioactive Waste Management  
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CONTRACT NO. DE-AC28-01RW12101 – BASELINE CHANGE PROPOSALS YUCCA MOUNTAIN PROJECT (YMP)-2003-032, "REVISE PRELIMINARY PROJECT ENGINEERING DESIGN (PED) BASELINE TO INCORPORATE RECENT FUNDING IMPACTS," AND YMP-2003-034, "REVISE LEVEL 2 YMP MILESTONES"

References:

1. Ltr, Arthur to Mitchell, dtd 2/21/03, BSC Correspondence Log #0225036215
2. Ltr, Mitchell to Arthur, dtd 3/7/03, BSC Correspondence Log #0307036365
3. Ltr, Arthur to Mitchell, dtd 3/13/03, BSC Correspondence Log #0317036469
4. Ltr, Mitchell to Arthur, dtd 3/28/03, BSC Correspondence Log #0327036664
5. Ltr, Arthur to Mitchell, dtd 4/10/03, BSC Correspondence Log #0421036986
6. Ltr, Arthur to Mitchell, dtd 4/11/03, BSC Correspondence Log #0416036933

As requested in your April 10, 2003 and April 11, 2003 letters, Bechtel SAIC Company, LLC (BSC) has completed detailed planning (re-plan) and preparation of Baseline Change Proposals (BCPs) to update the Critical Decision-1 (CD-1) Preliminary Project Engineering Design (PED) baseline for the YMP. This is inclusive of the period from October 2002 (start of FY03) through Construction Authorization (CA) in December 2007. BCPs associated with this change were based on the approval authorities in the YMP Project Execution Plan (PEP), PLN-MGR-AD-00006 Revision 0, Table 3 - Baseline Change Levels for the Yucca Mountain Project.

Agreements reached are documented in the referenced letters and form the basis for the BCPs, including:

- BSC will develop a high quality License Application (LA) to be submitted by December 2004, recognizing that risk has increased.
- For YMP activities, the Department of Energy (DOE) will provide BSC/U.S. Geological Survey (USGS) approved funding plans of \$295 million for FY03 and \$330 million for FY04. Funding below these levels could jeopardize the LA submittal in December 2004.
- BSC will implement the case 12, "Minimum Safe Operations with Limited Site Access" for the Exploratory Studies Facility (site). BSC will work closely with DOE on a site shutdown contingency plan dependent on the FY04 budget mark. Reductions in funding may result in further reductions in Site Operations activities up to, and including, full site closure.

- BSC reduced "other" technical and business support and indirect costs by approximately 15% in FY03 and another 10% in FY04. Impacts, associated with these reductions, were provided in the March 28, 2003 submittal have been further reviewed and clarified, with your senior staff, during meetings held between April 17-24, 2003. Results of those meetings, including open items and path forward, are included in Attachment-C.
- BSC completed the detailed planning and BCPs to align with the new work breakdown structure (WBS) as requested in your April 11, 2003 letter. BSC information provided to DOE to support the May 29, 2003 Monthly Operating Review (MOR), future reviews and reports will be provided in this new WBS structure.

This re-plan resulted in multi-year savings of \$238.6 million to the Preliminary PED baseline, reducing it from \$2.798 billion to \$2.559 billion. Because this change did not result in the transfer of DOE Contingency to the BSC Contractor/Project Budget Baseline, we were able to approve this change at Level 3.

The Total Estimated Cost (TEC) for capital work scope, remains at the CD-1 baseline level of \$751.1 million. The TEC associated with this re-plan now includes the results of DOE approved BCP-YMP-2003-030 for the LSN Contractor work scope. This LSN cost increase of \$48.5 million was offset by reductions in the TEC Contractor Budget Baseline and DOE Contingency. The Other Project Cost (OPC) for non-capital work scope was reduced from \$2.046 billion to \$1.808 billion. This \$238.6 million decrease is primarily due to reductions in work scope for site operations, technical and business support, and BSC indirect activities. The DOE may want to consider using this reduction to increase the level of DOE contingency thus increasing the overall level of DOE confidence for managing technical and programmatic risks through CA.

The M&O fee, based on provisional payments, was adjusted and re-distributed as part of this re-plan from an average of \$30 million per year (as identified in the DOE set-aside table) as follows:

- FY03 - \$17.6 million
- FY04 - \$24.9 million
- FY05 - \$49.6 million
- FY06 - \$44.7 million
- FY07 - \$44.0 million
- FY08 - \$11.0 million (3 months only through December 2007)

BCP-YMP-2003-034 includes proposed changes to DOE Level 2 milestones. These include:

- Description, date and numbering changes for milestones, approved per BCP YMP-2003-030, to support work performed by the LSN Contractor.
- Deletion of milestones for reduction in work scope associated with the cross drift thermal test.
- Revised scope of milestone LAM2ME, *Draft Pre-closure Safety Analysis (PSA) Sections*, to eliminate the final stand alone PSA report and replace it with PSA sections of the safety analysis report using direct inputs from the PSA guide and supporting calculations. This three-month milestone change from June 2003 to September 2003 requires Level 1 approval per the PEP.

- Revised date for milestone RPM2MW, *Complete Repository Design for LA*, from January 2004 to March 2004. This is based on non-critical design work that will be completed in support of LA.
- Revised date for milestone PAM2NY, *Complete Total System Performance Assessment (TSPA) for LA*, from May 2004 to June 2004, due to late AMR feeds supporting TSPA-LA, workarounds were developed to move TSPA-LA out while maintaining the LA date.
- Revised date for milestone PAM2AA, *Complete Site Description Document for LA*, a change of 30 days from August 1, 2003 to August 30, 2003.

Multi-year planning information from this re-plan is available to support DOE with FY05 budget development and to update the OCRWM capital asset plan. For the YMP, the FY05 budget authorization (BA) requirements are \$522.2 million. This includes \$165.0 million for TEC and \$357.2 million for OPC. The budget outlay (BO) for the same period is \$497.9 million, segregated by \$140.7 million for TEC and \$357.2 million for OPC. Additional details of work scope, cost and schedule, aligned to DOE's budget and reporting codes, are available from the BSC Project Controls System.

As part of this change, the Budgeted Cost of Work Scheduled (BCWS) will be adjusted in the Project Controls System to account for schedule impacts from continuing resolution, changes in FY03 and FY04 funding, and work scope that was deferred, eliminated or reduced. This will require a single month adjustment, reflected in the April 2003 reporting period, to re-align the cost and schedule baselines.

The following are included with this submittal:

- **Attachment-A:** BCP YMP-2003-032, *Revise PED Baseline to Incorporate Recent Funding Impacts*, approved by the BSC Baseline Management Review Board for changes to technical, schedule and cost baselines within Level 3 thresholds.
  - Description and justification of change
  - Changes to the work scope baseline on a selected basis to reduce, eliminate or defer products and services not specifically supporting completion and submittal of the LA by December 2004.
  - Changes to the cost baseline, by new summary WBS, that does not involve the transfer of DOE contingency to the Performance Measurement Baseline (PMB) or Contractor/Project Budget Baseline (PBB)
  - Changes to the budget outlay (BO) and budget authorization (BA) profiles
  - Changes to the BSC RAM based on the new WBS
  - Changes to project assumptions
  - Trend reconciliation (trends in process subsequent to BCP cutoff of April 15, 2003)
- **Attachment-B:** BCP YMP-2003-034, *Revise Level 2 YMP Milestones*, endorsed by the BSC Baseline Management Review Board.

- **Attachment-C:** Results of April 17-24, 2003 BSC/DOE meetings for "Issues that Require Clarification".
- **Attachments-D1 to D10:** Updates to CD-1 Supplemental Documentation (*information for quick reference only*)
  - D1 - Contractor/Project Budget Baseline profile
  - D2 - Total Project Cost profile
  - D3 - Budget Planning profile
  - D4 - Staffing summary profile
  - D5 - Level 1 summary schedule to waste emplacement
  - D6 - Level 2 summary schedule
  - D7 - Preliminary design phase estimate to CA at terminal WBS level
  - D8 - Spend out summary by fiscal year to CA at summary WBS level
  - D9 - Summary of BSC management reserve and DOE contingency profiles
  - D10 - Staffing profiles by BSC functional department

The statements of work for each element of the WBS dictionary are available in the Multi-Year Planning System (MYPS) located on <http://pcs.ymp.gov>. BSC controlled elements, below the terminal level of the WBS, i.e. work packages, are available in MYPS for DOE information only, but are not subject to the Level 0, 1, 2 BCP process. The electronic version of the resource loaded Integrated Project Schedule is available for DOE review at T:\P3\WINP3\PUBLIC\REPLAN\CDRT.

This scope of this BCP does not include Transportation (WBS element 3.0), Quality Assurance (WBS element 8.0), or Program Management & Integration (WBS 9.0). BSC will provide separate transmittals and baseline change proposals, for these scopes of work, based on DOE guidance.

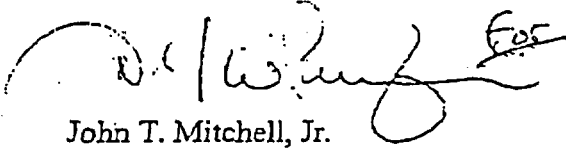
BSC has not yet received, from the USGS, any changes in plans and costs to the FY03 and FY04 USGS base program of \$8.7 million in FY03 and \$7.9 million in FY04. This is needed by BSC to finalize the detailed planning and ensure actual BSC/USGS expenditures do not exceed revised DOE approved funding plans.

Note that the attached BCPs do not address the technical baseline changes associated with the evolving design. A BCP for these technical changes, including a description of their impact on the configuration of selected surface and subsurface facilities, will be processed separately during the month of May 2003.

Also excluded from the planning base for the attached BCPs is the Cask Maintenance Facility that is currently part of the Transportation Project. Cask maintenance capability is required for licensed operations and its design must be advanced for LA along with the design for other surface facilities. To ensure the timely integration of these design activities, BSC recommends that the scope, budget, and funding for the Cask Maintenance Facility be shifted from the Transportation Project to the Yucca Mountain Project. With your concurrence, we will include this change with the BCP to be written for other pending technical baseline changes as described in the paragraph immediately above.

BSC requests DOE concurrence, by April 30, 2003, to implement BCP YMP-2003-034, *Revise Level 2 YMP Milestones*, into the Project Controls systems. This will provide for more up-to-date performance measurement and variance analysis that can be used for the May 29, 2003 MOR, pending final disposition of the BCP by the Level 2 Project Operations Review Board and Level 1 OCRWM Level Change Board.

Please call me on 295-0506 if you have any questions or comments.

  
John T. Mitchell, Jr.  
President and General Manager

4/28/2003  
Date Signed

JTM/RSH:ks - 0428037076

enclosures:  
As Stated

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## ATTACHMENT "F" PLANNING ASSUMPTIONS

### Policy Assumptions

1. The design, performance assessment, and licensing strategy must accommodate initial waste emplacement by December 31, 2010 within the confines of existing regulatory constraints. Waste receipt will precede waste emplacement with sufficient time to ensure the initial emplacement date is met.
2. Requirements for receipt of waste at the repository are de-coupled from emplacement requirements. A revision to the CRWMS Requirements Document is needed to incorporate this planning basis.
3. The repository Phase 1 will develop the initial operational capability to allow the start of operations in 2010, in time to support the OCRWM key performance target of receiving the first 400 MTHM of commercial spent nuclear fuel and initiating emplacement by the end of the year. The basis for planning is Revision 5, DCN 5 of that document (DOE/RW-0406)
4. The repository facility will be capable of emplacing 70,000 MTHM of SNF/HLW. Phase 1 repository facilities will accommodate initial receipt of CSNF types and quantities identified in the 1999 *Design Basis Waste Input Report for CSNF B00000000-01717-5700-00041 Rev. 1*.
5. The LA submittal for construction authorization will describe the complete repository at a sufficient level to demonstrate the acceptability of the repository against the regulatory performance standards. Further, the LA will describe the expected initial facility and operations phase with commensurate pre-closure safety assessment and performance assessment.
6. Closure of the repository will not occur before a pre-closure period of 100 years (start of emplacement to start of permanent closure operations/construction). However, the pre-closure period (including performance confirmation activities) can be as long as 300 years. Therefore, the MGR design shall allow the repository to remain open and ventilated for up to 300 years (after final emplacement) with appropriate monitoring and maintenance. The design life for surface and subsurface facilities is 50 years based on the anticipated maximum duration of the actual facility operations phase.
7. The initial staging area for Phase 1 operations (Initial Operating Capability as defined by the Project Execution Plan., Paragraph 3.4.1 and Table 1) will be 1000 MTHM. The License Application will identify a total staging capacity of 20,000 MTHM to support thermal management.
8. GROA construction activities will not commence until construction authorization is obtained.
9. The LA submittal will not occur within the 90-day period from the date on which the site designation is effective as specified in NWPA 114(b).
10. National security requirements for the repository will remain consistent with the current 10CFR73 and NRC compensatory measures that invoke requirements for the physical protection of stored spent nuclear fuel and high-level radioactive waste.
11. DOE will complete Land withdrawal before construction authorization.

12. Before completion of the CD-2 cost estimate, TSLCC updates will be limited to parametric methods including current approved trends to the CD-1 baseline.
13. The Navy will license naval multi-purpose canisters for shipment. The Navy will ship their own SNF canisters.
14. DOE will take title to SNF at the purchaser sites.
15. The repository facility and project operations organization will receive and take possession of SNF and HLW at the Transportation/MGR interface point in accordance with approved procedures.

General Assumptions

16. The license application (LA) submittal for construction authorization will contain a post-closure safety case based on a high temperature-operating mode. Repository design, TSPA analyses and operations are based on a waste package thermal limit of 11.8 kW and a waste package spacing of 10cm.
17. For KTI items, the scope and schedule is based upon the current set of 293 existing KTI agreements. Changes to these, if any, will be managed through the scope, cost, and schedule change process. NRC evaluation of KTI Agreement items is expected to be available 90 days after DOE submittal to NRC, in order to appropriately address NRC issues in the LA.
18. The risk-informed, performance-based approach will be an acceptable method for NRC resolution of selected KTI agreement items.
19. Actions identified in the Management Improvement Initiatives will be funded and completed as described in the plan PLN-CRW-AD-000009.
20. Interruptions in the schedule due to litigation, along with any staffing or schedule implications, are not included. Plans to provide support to litigation activities within the confines of the projected schedule to achieve significant milestones are not included.
21. Reviews by parties external to OCRWM (OGC, DOE SNF, Naval Nuclear Propulsion Program, other DOE offices) will support the LA schedule. A team review approach in which reviews are conducted in parallel is planned to facilitate timely reviews.
22. The support relationship with the NTS for Area 25 will continue in its current form. DOE will modify the NTS agreements as needed to support repository construction and operations schedules.
23. Resolution of NWTRB outstanding issues is not a requirement for LA.
24. There will be timely approval of level 0, 1 and 2 technical baseline changes.

Regulatory Assumptions

25. The draft LA chapters will be prepared based on the information provided in the YMRP (NUREG-1804, draft Revision 2). At the section/subsection level, the organization may be customized to best present the requested information. Impacts to the technical work scope due to subsequent revisions of the YMRP, if any, will be addressed through the scope, cost and schedule baseline control process.
26. Early, meaningful NRC interactions are required to improve LA docketability and will include phased review by NRC of programmatic, design, science, and analysis topics between SR and LA. An interactions schedule will be developed.
27. LSN certification will occur six months prior to the License Application submittal. (Note that in accordance with 10CFR 2.1012, the NRC will not docket the application until at least 6 months have elapsed from the time of certification.) Updates to documentation can still be made after LSN certification and will be verified during LSN re-certification at the time of LA submittal. Continued evolution of material used to support the license application will be utilized to support post-docketing interactions with the NRC. In accordance with agreed upon protocols, BSC will provide electronic and hard copy documents by types specified by CACI for their screening. Design development will continue after those deliveries. The regulatory process in 10CFR63.44 for evaluation of changes will be used for impact determination of ongoing data collection.
28. The LA review schedule will have a technical review early in the process that consists of the affected cognizant personnel associated with that section of the LA. The next phase of the LA review will be an integration review (not a re-review of the technical information) of the entire LA by affected parties. Reviews by all parties will be in accordance with the Management Plan for Development of the Yucca Mountain LA PLN-MGR-RL-000001 Rev. 0.
29. DOE will accept LA sections (during team review) based on the use of action item lists that call out additional information for the section. Action items in the LA shall be captured and tracked in an appropriate tracking system to ensure they are completed.
30. Unresolved safety questions, if any, at time of LA submittal will be handled on a case-by-case basis, will be reviewed in accordance with the Yucca Mountain Review Plan, and will be processed in accordance with 10 CFR 63.21(c)(16).
31. As a basis directed by DOE, the NRC authorization of repository construction is 36 months after the license application is tendered. Therefore, the 3-month docketing review is included in the 3-year CA review process.
32. Between LA and CA, there will be one round of 1,000 RAIs from the NRC. 100 RAIs will be resolved during the LA acceptance review. The remaining RAIs will be resolved during the NRC review. The SER will include 50 Open Items and 100 Confirmatory Items that will be resolved during the 18 months from SER to CA. The RAIs and other items will be distributed as follows: 40% Repository Design, 40% Performance Assessment, 10% Pre-closure Safety Analysis, 10% Operations and Others. The SAR will be amended quarterly until CA. From the LA Update to the License to Receive and Possess (18 months) there will be 500 RAIs, 25 Open Items and 50 Confirmatory Items. The SAR will be amended bimonthly during this period and annually thereafter.
33. Any supplement to the FEIS (by DOE) will not impede the license to receive and possess waste.
34. The license application to receive and possess source, special nuclear or byproduct material at a geologic repository operations area at the Yucca Mountain site, and any license amendments or updates, will be accepted, reviewed, and the license issued within 18 months of tendering, including hearings and appeals.

Design and Construction Assumptions

35. Staging capacity of nominally 1000 MTHM of CSNF for thermal management or operational queuing is included in the initial Phase 1 of repository facilities.
36. Preliminary design for LA starts after conceptual design. Preliminary design was started in advance of the CD-1 milestone by special authorization from the Secretary of Energy on October 7, 2002. The critical decision -2 (CD-2) process will not impose restrictions on the design process
37. Training functions and facilities will be included in the repository design, pre-closure safety analysis and construction and operational plans for the LA. Offsite training facilities will be available to support equipment testing and checkout before startup.
38. Any additional characterization of the repository emplacement area in the form of additional boreholes will be conducted as confirmatory information after the license application is submitted. Soil properties data supporting repository Phase 2 facilities will not be included in the LA.
39. The repository surface and subsurface designs shall utilize phased detailed design and construction approaches, with the following implications:
  - As the phased construction scenario is refined, it will be subjected to appropriate NEPA reviews to ensure adequate coverage was contained in the Final EIS
  - Surface staging will be modularized with the first staging module(s) located near the initial dry transfer building in an area that has sufficient site-specific characterization.
  - Dual-purpose canisters (DPCs) and bare fuel shipping casks received for disposal will require fuel transfer operations at the repository facility; however, receipt of DPCs will not be required in Phase 1 repository facilities. No multi-purpose canisters other than Naval SNF will be handled in Phase 1 repository facilities.
40. No SNF characterization capability or burn-up measurements are provided at the repository. Adequacy of CSNF reactivity characteristics will be demonstrated in the LA based upon process knowledge and existing reactor data.
41. Surface facilities important to safety will be designed for annual earthquake recurrence probabilities of  $10^{-3}$  or  $5 \times 10^{-4}$ , depending on the potential dose consequences of failure. The most important facilities will be evaluated for continued safety function for a recurrence probability of  $10^{-4}$ /yr. Limited risk analyses will be conducted for probabilities down to one chance in 10,000 for the pre-closure period.
42. Full scale waste package prototyping and testing, particularly full scale closure development, welding demonstration, NDE development, and structural testing, will be initiated prior to construction authorization.
43. Prototyping of complex items, particularly transportation and handling devices requiring hardware and software integration, will be completed in time to allow design adjustments to support construction and installation.
44. Before construction authorization, there will be early procurement of engineered equipment or other long lead items and offsite mockup or operator training facilities. Test facility upgrades for safety or Performance Confirmation will be allowed before construction authorization.
45. Construction and operations power requirements will be furnished by DOE as needed to support construction and operational ramp-up schedules.

46. Water, air, and other environmental permits for extended usage requirements will be obtained by DOE in advance of pre-construction activities.
47. Low Level waste will be packaged at the repository and disposed at an NRC regulated facility.
48. Continued construction on subsequent repository phases will occur in parallel with turnover and initial operations of initial phases.
49. The repository operations contractor will be procured by FY 2006 to support detailed design and to develop the operations program.
50. Repository Start-up will follow commercial NRC processes and requirements, not the DOE ORR process.

TSPA/Modeling/Science Assumptions

51. SSPA Volumes 1 and 2 are one-time documents and will not be updated.
52. TSPA used for the license application will continue to utilize a logic sequence involving data collection, AMR development revisions (process models & abstractions), TSPA revision, and sensitivity evaluations. To the extent practical, the logic sequence will utilize parallel product development, including AMR documentation and TSPA development. There will be one complete revised TSPA in support of the LA submittal.
53. Any new or additional testing or analyses specified by the NRC as a result of their review of the LA is additional scope that will be managed through the baseline change process.
54. Post closure dose analysis presented in the LA will be limited to a 10,000-year period. The models developed for the LA (process, abstraction and TSPA) will be focused on the 10,000-year compliance case (with extensions beyond that to 20,000 years to assess any significant changes associated with the post-10, 000-year period).
55. It is assumed that the FEIS analysis of long-term performance conducted in support of the Site Recommendation decision is sufficiently bounded that it does not require updating to reflect revised models.
56. The LA human intrusion analysis consistent with 10CFR63.321 is assumed to result in equivalent results as the FEIS analysis such that no human intrusion dose analyses are required. The planning basis is that the LA will demonstrate the human intrusion without knowledge cannot occur during the regulatory period.
57. An adequate technical basis will exist for LA volcanism analysis; however, ongoing volcanism data collection and analyses will continue beyond LA to respond to additional information needs identified in NRC's December 19, 2002 letter to DOE (BSC Correspondence Log # 1223025551).
58. A revision to the TSPA, if needed due to additional information from the Performance Confirmation Program, will be performed to support submittal of the LA update for the license to receive and possess.

Transportation Assumptions

59. Transportation must be sufficient to support the minimum receipt rates specified in the CRWMS Requirements Document (DOE/RW-0406). National and Nevada transportation will support rail delivery to the repository in 2010.
60. Repository - shipping cask interface requirements will be established by the MGR to control parameters such as dimensions, weights, closure and lifting systems, cleanliness, etc.
61. Design for transportation cask maintenance functions and facilities will be sufficiently advanced to be included with the repository design, pre-closure safety analysis, and construction / operational plans for LA submittal in December 2004. To ensure the timely integration of these activities, BSC recommends that scope, budget, and funding for the Cask Maintenance Facility be transferred from the Transportation Project to the Yucca Mountain Project.