



**Luminant**

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April 27, 2012

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555  
ATTN: David B. Matthews, Director  
Division of New Reactor Licensing

**SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4  
DOCKET NUMBERS 52-034 AND 52-035  
INTEGRATED HYDROLOGY CLOSURE PLAN**

Dear Sir:

The NRC conducted an audit of the Comanche Peak Nuclear Power Plant Units 3 and 4 combined license application hydrology review on June 7-9, 2011. This was followed by several conference calls and a March 27, 2012 public meeting. At the end of that meeting, Luminant understood the remaining NRC issues and committed to submit an Integrated Hydrology Closure Plan (IHCP) to resolve those issues.

Resolution of some of the hydrology issues is related to and dependent upon resolution of US-APWR standard design seismic issues that impact the site-specific seismic design. Luminant has developed an integrated approach to resolving both the site-specific seismic issues and the hydrology issues, and submitted the Integrated Seismic Closure Plan on April 16, 2012 (ML12109A154). The companion IHCP is submitted herein. The deliverable dates in the IHCP take into consideration the work necessary to complete some of the seismic issues. The IHCP will be refined and updated as work progresses to address these integrated issues.

Should you have any questions regarding the IHCP, please contact Don Woodlan (254-897-6887, Donald.Woodlan@luminant.com) or me.

There are no commitments in this letter.

I state under penalty of perjury that the foregoing is true and correct.

Executed on April 27, 2012.

Sincerely,

Luminant Generation Company LLC

Rafael Flores

Attachment: Comanche Peak Nuclear Power Plant Units 3 and 4 Integrated Hydrology Closure Plan

DO NOT  
NRC

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**Comanche Peak Nuclear Power Plant Units 3 and 4**

**Integrated Hydrology Closure Plan**

**Rev. 0**

Through numerous interactions between the NRC and Luminant regarding the hydrology review, and due to design changes to the standard plant design affecting plant layout, Luminant has determined that it is necessary to update components of the hydrology analyses for Comanche Peak Nuclear Power Plant (CPNPP) Units 3 and 4. This document provides the Integrated Hydrology Closure Plan (IHCP). The following analyses will be revised and updated as part of the IHCP:

- Probable maximum water surface level analysis based on the probable maximum precipitation (PMP) event
- Erosion and scouring potential analysis due to the effects of local intense PMP
- Groundwater level analysis
- Tank failure and release pathways analysis
- Stability of subsurface materials and foundation analyses

This document provides:

- The detailed IHCP to address site-specific changes resulting from standard plant design changes and resolution of NRC hydrology concerns
- Details of the revisions to the combined license application (COLA) based on the revised and updated analyses

The IHCP addresses the following site-specific hydrology issues:

### **Surface Water**

- Update to reflect plant layout and grading and drainage (G&D) changes
- Provide electronic AutoCAD G&D drawings with one foot elevation changes
- Provide quantitative and qualitative justification where water surface elevations exceed the maximum flood level allowed by the standard plant
- Provide a table that explicitly describes the sensitivity analysis of the integrative HEC-RAS model. The table will include outputs, boundary conditions, and channel transfer information.
- Utilize interpolation in all regions of the HEC-RAS model and perform a sensitivity analysis. Water levels that are most conservative will be selected.
- Update scour and erosion calculations to reflect final design of site
- Provide a table that contains a range of appropriate Manning's Roughness Coefficient values from literature, the values selected for use, and physical basis for the value utilized
- Explain the source of the Probable Maximum Precipitation (PMP) rates used in the analysis in order to address a discrepancy between the value used by Luminant and the one used by NRC in their confirmatory analysis.
- Confirm FSAR Subsection 2.4.10 flooding protection requirements based on Subsection 2.4.2 changes.

- Submit a supplement to RAI 139-4309 Question 02.04.02-2 when the probable maximum water surface level analysis and the erosion and scouring potential analysis are updated.

### **Groundwater**

- Develop a MODFLOW-type model to determine post-construction groundwater level
- Determine a bounding groundwater level (GWL) value to use in seismic assessments
- Determine a final GWL value based on final site design
- Define the range of fill and cap properties (hydraulic conductivity and porosity) in the model and confirm that the conservative end of the range is selected for each type of calculation being performed by the model (e.g., determining GWL versus tank leakage flow paths)
- Maintain consistency with FSAR Section 2.5
- Describe in sufficient detail the locations of the existing and engineered fills
- Describe in the FSAR how the engineered fill and ground caps will be maintained
- Ensure recharges and drainage ditches have been accounted for in the model
- Submit a supplement to RAI 147-4314 Question 02.04.12-8 when the MODFLOW model, GWL, seismic foundation levels, etc. are updated and complete.

### **Accidental Release of Radioactive Liquid Effluents**

- Use the MODFLOW-type model developed to model groundwater horizontal and vertical flow paths
- Re-verify key parameters used (e.g., porosity, conductivity and path length) based on literature searches and standard text books or testing results
- Clarify the parameters chosen for the two existing fill areas taking into consideration that very few core borings are available in the existing fill areas
- Utilize RESRAD to analyze contaminant concentrations to verify they are below the effluent concentration limits prior to the leakage reaching Squaw Creek Reservoir (SCR) and/or the Twin Mountains Formation
- If leakage into the SCR and/or the Twin Mountains Formation is assessed, use an appropriate model to project the plume and determine contaminant concentrations at receptor locations
- Document the release point from the BAT tank
- Submit a supplement to RAI 145-4315 Questions 02.04.13-5, -6, and -7

### **Modeling in general**

- Provide the input and output files used for the calculations
- Include sensitivity analyses to justify the reasonableness of the results
- Document the limitations of the models and assumptions made

**Stability of subsurface materials and foundation**

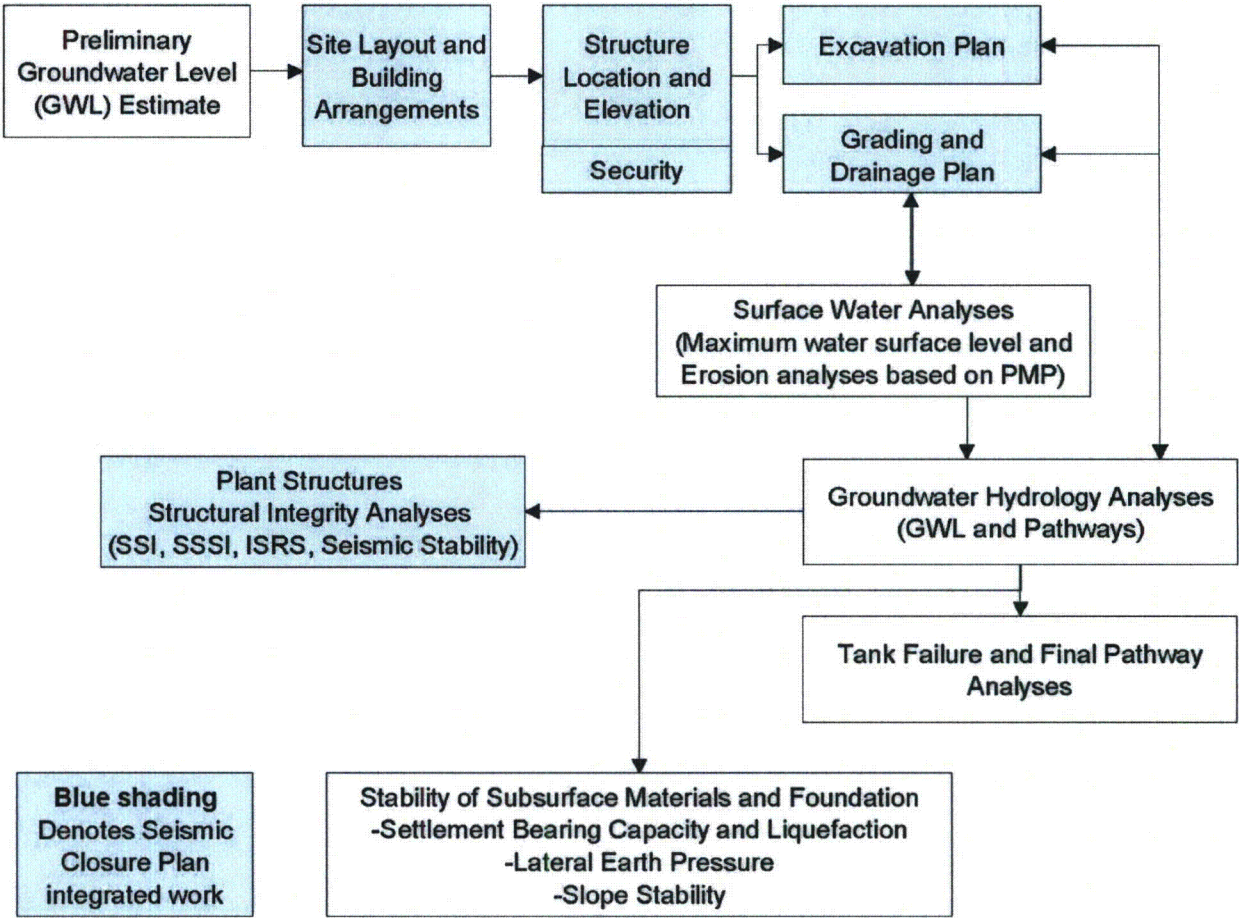
- Update RAI 233 and FSAR Subsection 2.5.4 and 2.5.5 on settlement and bearing capacity, stability of slopes, and lateral earth pressure to maintain consistency with revised GWL

The licensing strategy is to interact with the NRC throughout this effort using mostly complete, but draft material as discussed during the March 27, 2012, hydrology public meeting. Currently, Luminant believes interaction in the form of conference calls or public meetings would be beneficial for the fill properties input to the MODFLOW model [updated white paper previously submitted in TXNB-11082 (ML11334A029)], surface hydrology analysis, groundwater hydrology analysis, and the RESRAD model for the tank failure analysis. It is anticipated that Luminant will request to interface with the NRC staff as follows:

- **May 2012** - Fill properties input to the MODFLOW model
- **August 2012** - Surface Hydrology
- **August 2012** - Groundwater Hydrology
- **October 2012** - Accidental Release of Radioactive Liquid Effluents

**General Strategy**

Following is a flow diagram of the IHCP work.



### Schedule of Submittals

Luminant plans to provide COLA changes in supplemental RAI responses as the work progresses. Luminant's schedule has been created by integrating the changes caused by seismic issues and hydrology issues listed above. The changes resulting from this IHCP will be provided in four RAI response supplements as information becomes available.

- **December 2012** – Supplemental response to RAI 139, revised FSAR Subsection 2.4.2, updated grading and drainage figures, revised surface water calculation package and HEC-RAS input/output files, revised erosion potential calculation package and HEC-RAS input/output files
- **February 2013** – Supplemental response to RAI 233, revised FSAR Subsection 2.5.4 and 2.5.5, and updated settlement and bearing capacity, stability of slopes, and lateral earth pressure analysis
- **March 2013** – Supplemental response to RAI 145, revised FSAR Subsection 2.4.13, and input/output files to RESRAD model
- **March 2013** – Supplemental response to RAI 147, revised FSAR Subsection 2.4.12, and input/output files to MODFLOW model

### COLA Impacts

Luminant has performed a preliminary review of the COLA to identify the impacts that the currently defined hydrology work will have on the COLA content. The attached table provides a summary of the planned changes and includes the RAI or UTR in which Luminant expects to submit those changes.

### Basis Documents

A list of affected basis documents and their completion dates is being created and Luminant plans to provide the list to the NRC upon completion.

### IHCP Updates

Luminant will keep the NRC informed of changes and updates to this IHCP.



**Attachment – COLA Impacts**

COLA Part and Section	Summary of Affected Contents of R-COLA	Summary of Planned Revisions to Content	RAI/UTR Submittal to NRC
<b>COLA Part 2, Final Safety Analysis Report</b>			
FSAR Subsection 2.4.3	Figures 2.4.3-209	Revise to reflect common foundation and the new plant layout based on wind wave calculation revision and as necessary.	RAI 139 12/2012
FSAR Subsection 2.4.2, & 2.4.3	Subsection 2.4.2 and 2.4.3, Table 2.4.2-207, Table 2.4.2-208, Table 2.4.2-209, Figure 2.4.2-202, 2.4.2-206, 2.4.2-207.	Revised text, tables and figures for Surface Hydrology issues resulting from changes to Calculations 036, 037 and 013 and to reflect common foundation and the new plant layout.	RAI 139 12/2012
FSAR Subsection 2.4.12	Figures 2.4.12-208; 2.4.12-210; 2.4.12-212 thru 2.4.12-216, Table 2.4.12-211	Revise figures, tables, and text to reflect common foundation and the new plant layout increased gaps between structures and/or changes in the grading and drainage plan. FSAR text changes based on GWL and/or path for BAT Failure Analysis.	RAI 147 03/2013
FSAR Subsection 2.4.13	Section 2.4.13, Figure 2.4.13-201, Table 2.4.13-202 thru 2.4.13-211	Revise figures, tables, and text to reflect common foundation and the new plant layout. FSAR text changes based on GWL and/or path for BAT Failure Analysis. Update tank failure concentration amounts in the fill and Squaw Creek Reservoir.	RAI 145 03/2013
FSAR Subsection 2.5.4	Section 2.5.4, Figures 2.5.4-201 thru 2.5.4-203; 2.5.4-212 thru 2.5.4-217; 2.5.4-242 thru 2.5.4-244 2.5.4-246 thru 2.5.4-261	Revise text, tables and figures to reflect common foundation and the new plant layout. Consider impact of new foundation bottom.  Settlement, Shear wave velocity, Bearing Capacity and Liquefaction – Update text and tables to reflect new Seismic methodology and new plant arrangement.	RAI 233 02/2013
FSAR Subsection 2.5.5	Section 2.5.5, Figures 2.5.5-201 and 2.5.5-204 thru 2.5.5-219	Revise text, tables and figures to reflect common foundation and the new plant layout.	RAI 233 02/2013

**Attachment – COLA Impacts**

COLA Part and Section	Summary of Affected Contents of R-COLA	Summary of Planned Revisions to Content	RAI/UTR Submittal to NRC
<b>COLA Part 3, Environmental Report</b>			
ER Section 2.3	Subsection 2.3.1.5.6 and Table 2.3-31	Revise figures, tables, and text to reflect common foundation and the new plant layout. FSAR text changes based on GWL and/or path for BAT Failure Analysis.	RAI 147 03/2013