SUMMARY OF THE ENVIRONMENTAL SITE AUDIT RELATED TO THE REVIEW OF THE COMBINED LICENSE APPLICATION FOR CALLAWAY PLANT UNIT 2 AT THE CALLAWAY PLANT 1 SITE

This report summarizes the staff's March 23 to 27, 2009, site audit visit related to the environmental report portion of the combined license (COL) application for the proposed Callaway Plant Unit 2. The U.S. Nuclear Regulatory Commission (NRC) staff were accompanied by contractor personnel from Pacific Northwest National Laboratory (PNNL) and Numark Associates. The primary objective of the site audit was to review documentation related to the Environmental Report (ER) portion of the COL application submitted by AmerenUE, to visit the proposed site and environs, and to meet with relevant state and federal regulatory agency personnel.

The schedule of activities for the meetings is given in Attachment 1 and a listing of meeting attendees and their organization affiliations is given in Attachment 2. In preparation for the meeting, a draft Information Needs Table was forwarded to AmerenUE to identify the topics for discussion during the audit. That Information Needs table can be found in the NRC's Agencywide Documents Access and Management System (ADAMS) under accession number ML090900600 accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html. Note that the Uniform Resource Locator (URL) is case-sensitive.

The visit took place at the existing Callaway Unit 1 site operated by AmerenUE, located in Callaway County, Missouri, approximately ten miles southeast of the town of Fulton. A tabular listing of the information needs discussed and their status/resolution at the end of the audit is given in Attachment 3.

Daily Meeting Summary

On Monday, the team met with AmerenUE representatives and contractors at the CPF multi-purpose classroom 117/118 at the Callaway Plant. After a brief overview presentation by AmerenUE and introductions, AmerenUE personnel led NRC staff and other attendees on a tour of the existing site and planned construction sites and areas that will be disturbed by proposed project activities. The tour included stops at the planned centerline for the new Callaway Plant Unit 2 reactor, the existing cooling tower, the barge loading dock area for heavy equipment on the Missouri River, the location of proposed water collection wells, and the existing power transmission line corridors. After lunch, AmerenUE gave a presentation summarizing the permit approval process for the project. Following that, a government-to-government meeting was held among NRC and state and local regulators to discuss roles and issues of interest to the Missouri Department of Natural Resources, Army Corps of Engineers, and EPA Region 7. Other NRC staff and contractors participated in discipline-specific meetings.

On Tuesday, the team reconvened and broke out into discipline-specific meetings and tours. Some ecology team members went on a boat tour to look at intake and outfall areas, the potentially affected shoreline, as well as the river crossing zone of transmission line towers. Hydrology personnel made separate tours of the intake structure, discharge shoreline, and proposed collector well sites. Socioeconomic, land use, cost benefit, and environmental justice review team personnel made community organization visits. A teleconference was held with NRC Headquarters staff that did not travel to Callaway to discuss accident analysis information needs.

On Wednesday, discipline-specific tours and meetings were held including meteorology/air quality, cultural resources, hydrology, ecology, health physics, transportation, and socioeconomics. Presentations were made by AmerenUE on the alternative site selection

process, alternative sites, and cumulative impacts that have been identified. Field tours included a roadway tour of existing transmission lines. Findings of several individual discipline-specific group discussions were summarized and downloaded to the master Information Needs Tracking Table.

On Thursday, after reconvening in the morning, a field tour was made by the hydrology team to existing water treatment facilities and planned modifications for the proposed new unit. In the morning and afternoon, off-site visits were made to local government officials and representatives to obtain information regarding the impact of the proposed new plant with respect to socioeconomic, land use, and environmental justice issues. Close out discussions were held for Cultural Resources, Hydrology, Health Physics, and Ecology. The Information Needs Table was updated with the most recent findings from the audit and overall results were presented to AmerenUE staff and contractors. Friday was a travel day.

Summary of Issues or Concerns by Technical Discipline

The following summary is intended to describe key issues that were discussed and to identify items that have the potential to impact the review and Draft Environmental Impact Statement (DEIS) preparation schedule. As noted above, the detailed information needs are itemized in Attachment 3.

Accidents

The accident Subject Matter Expert (SME) from PNNL could not attend the site audit. A conference call was held at a later date (4/23/09) to go over the information needs in more detail. Most of the issues were resolved or should be resolved when documents are available in the Reading Room or through documents made available in response to Requests for Additional Information (RAIs) that have been issued for the Final Safety Analysis Report (FSAR).

Alternatives/Need for Power

Alternatives

There were four original information need items; seven more were added at the site audit. Inclusion of the Chamois site as a viable fourth alternative was discussed because of its location on the Missouri River floodplain (a potentially unfavorable construction site from a safety and environmental standpoint). Another issue was raised regarding the lack of quantitative data explaining the basis for rejection of heat-dissipation alternatives.

Need for Power

The applicant's claim that 1,600 MW of power was needed by 2017 was not strongly supported in the ER. The Missouri Public Service Commission process suggests the applicant's service area need is only for 900 MW of base load power. Twelve information needs were added at the site audit; many related to discrepancies in the need for power and the lack of supporting information or adequate explanation to justify the increased power supply.

Aquatic Ecology

Several of the issues related to aquatic ecology were resolved during discussions held during the audit. AmerenUE indicated they would provide requested information in the near future in a Reading Room. Seven additional information needs were identified at the audit, many relating

to requests for data relating to collector well impact, invasive species, and abundance of the pallid sturgeon.

Cultural Resources

The need to survey known sites and new potential effects was discussed. The Callaway Site Cultural Resources Management Plan from 1984 should be updated to reflect recent conditions and plans. References were cited in the ER that were not readily available and may require a significant effort to obtain either from the State Historic Preservation Office (SHPO) or other resource archives.

General Information Needs

Copies of all references, figures and maps used in the ER were requested at the audit under the category of General Information Needs. Not all references that were requested were available in hard copy or electronic form. Means to access all references still need to be developed. ER figures in their native format present possible difficulties, since map layers in graphic files may be subject to alteration when opened electronically and may not accurately or consistently reflect technical data that has been used. Nevertheless, detailed map layer files are useful for reviewers to recheck/confirm analyses that have been done in the ER.

Health Physics/Decommissioning/Radiological Health/ Non-Rad. Health/Noise/EMF

Most of the health physics information need issues were resolved at the audit. Outstanding issues include: 1) the question of whether a new onsite spent fuel storage facility will be constructed; and 2) the need for information on 3 significant species that were not addressed in dose calculations. Two additional non-radiation human health issues were also identified.

Hydrology

Most hydrology issues were resolved. The primary outstanding issue was the potential effect of the proposed collector wells on the groundwater aquifer. Alternative collector well locations were discussed. Additional information is needed on a number of topics which may be provided by documents placed in a reading room or will be requested through the RAI process. No additional information needs were generated at the audit.

Meteorology/Air Quality

A number of questions were raised in the ER, discussed with the applicant, and will need to be resolved before the DEIS is written concerning information. There is also a question about whether the air quality models used by the applicant (AEOLUS and XDCALC) agree with NRC recommended models (XOQDOQ and PAVAN). A full range of simulations will have to be evaluated to test out all aspects of the models.

Site and Technical Oversight

Site and technical oversight issues relate primarily to permits and to operational procedures to control and/or limit impacts from noise, erosion, dust, traffic, and other activities associated with construction and operations. Most of these issues are addressed in other subject areas including health physics and hydrology. No outstanding issues were identified.

Socioeconomics and Environmental Justice

An issue arose about a proposed road linking the city of Fulton and the Callaway site. Several community members indicated that a plan for the road was being considered; however, the ER states that no new roads are being planned in the vicinity of the plant. Inconsistencies in the ER exist regarding the planned construction schedule and construction shift work schedules. Information about worker distribution to municipalities is lacking. Estimates of minority and low income populations need to be recalculated based on state averages, and the methodology for characterizing and analyzing potential adverse impacts on minority and low income populations needs to be explained.

Benefit-Cost

More specific information about the anticipated cost of Unit 2 is needed for the benefit-cost analysis and for the tax calculation during construction. Only generic information is provided in the ER.

Land Use

Further clarification is needed on the impact of the plant and collector wells on wetlands and prime farmland.

Transmission Lines

Further clarification is needed on the impact of the transmission line extension on wetlands and prime farmland.

Terrestrial Ecology

AmerenUE and its contractors provided information and discussions resolving most information needs. Outstanding issues included: jurisdictional determination involving wetlands at the proposed collector well site (USACE will make a final determination and evaluate the need for additional studies); discrepancy between the United States Fish and Wildlife Service (USFWS) and Missouri Department of Conservation (MDC) lists of terrestrial species of concern (USFWS noted only the pallid sturgeon and Indiana bat, while MDC added the gray bat); uncertainty related to the location of the collector wells and their impact on wetland hydrology; and past impacts to wetlands and floodplain habitat were not discussed in the ER but information is available in open-source references. No additional information needs were added at the audit.

Transportation

Many of the original nine information needs were resolved at the audit. A review of documents at the audit added an additional 16 information needs. Issues included resolving discrepancies between data in the ER and data in model outputs (TRAGIS and RADTRAN); supplying justifications for assumptions related to material construction estimates; determining disposition of sanitary waste and non-radioactive, non-hazardous waste.

Data Gathering

AmerenUE provided written documentation on the information needs for staff to review during the site audit. A list of documents requested by PNNL/Numark staff and provided to the NRC is presented in Attachment 4.

Attachment 1

SCHEDULE OF ACTIVITIES

Sunday, March 22, 2009 Travel to Columbia, Missouri

Monday, March 23, 2009

7:00 am Brief NRC-PNNL/Numark Team meeting at the Hilton Garden Inn
8:00 am Check in; meet at Callaway Multipurpose Building
8:15 am Introductions and Site Audit orientation
9:00 am Site tour
11:30 am Lunch
12:30 pm Permitting Discussion
1:00 pm Government-to-Government Meeting
1:00 pm Tours and Discussion
- Meteorology/Air Quality
- Terrestrial Ecology
- Aquatic Ecology
- Health Physics
- Hydrology
- Need for Power
- Cultural Resources
- Socioeconomics/EJ

4:30 pm Staff Data Needs (Staff meet with Deputy Team Lead to summarize progress and discuss document requests and information needs)
5:00 pm Combined NRC/PNNL/AmerenUE Team Meeting
Adjourn

Tuesday, March 24, 2009

8:00 am Meet at Callaway Multipurpose Building
8:15 am Opening
- Questions from Yesterday
- General Discussion

8:30 am Tours and Discussion
- Meteorology/Air Quality
- Terrestrial Ecology
- Aquatic Ecology
- Health Physics
- Hydrology
- Accidents
- Cultural Resources
- Socioeconomics/EJ

12:00 Lunch
1:00 pm Tours and Discussion
- Meteorology/Air Quality
- Terrestrial Ecology
- Aquatic Ecology

- Hydrology
- Transportation
- Health Physics
- Accidents
- Cultural Resources
- Socioeconomics/EJ
- Transportation

4:30 pm Staff Data Needs (Staff meet with Deputy Team Lead to summarize progress and discuss document requests and information needs)

5:00 pm Combined NRC/PNNL/AmerenUE Team Meeting
Adjourn

Wednesday, March 25, 2009

8:00 am Meet at Callaway Multipurpose Building

8:15 am Opening

- Questions from Yesterday
- General Discussion

8:30 am Tours and Discussion

- Meteorology/Air Quality
- Terrestrial Ecology
- Aquatic Ecology
- Alternatives / Need for Power
- Health Physics
- Hydrology
- Cultural Resources
- Socioeconomics/EJ
- Transportation
- General Information Needs

10 am Presentation on Alternative Site Selection Process

11 am Cumulative Impacts presentation

12:00 Lunch

1:00 pm Tours and Discussion

- Terrestrial Ecology
- Aquatic Ecology
- Alternatives / Need for Power
- Hydrology
- Transportation
- Health Physics – toured significant offsite dose receptor locations (including nearest residence, nearest garden) and offsite monitoring stations for gaseous or liquid effluents that could contain radionuclides.
- Cultural Resources
- Socioeconomics/EJ
- Site and Technical Oversight

4:30 pm Staff Data Needs (Staff meet with Deputy Team Lead to summarize progress and discuss document requests and information needs)

5:00 pm Combined NRC/PNNL/AmerenUE Team Meeting Adjourn

Thursday, March 26, 2009

8:00 am Meet at Callaway Multipurpose Building
8:15 am Opening
- Questions from Yesterday
- General Discussion

8:30 am Tours and Discussion
- Terrestrial Ecology
- Aquatic Ecology
- Health Physics
- Hydrology
- Cultural Resources
- Socioeconomics/EJ

12:00 Lunch
1:00 pm Tours and Discussion
- Socioeconomics/EJ site visits

4:00 pm NRC – PNNL/Numark- Ameren Management Debrief/Closeout
4:30 pm Staff Data Needs (Staff meet with Deputy Team Lead to summarize progress and discuss document requests and information needs continued)

Friday, March 27, 2009

Travel Day

Attachment 2

List of Attendees – Callaway 2 Site Audit Visit

Location: Callaway Nuclear Plant Site, Callaway County, Missouri
March 23-26, 2009

Table 1. AmerenUE and contractor personnel, NRC and PNNL staff, and other agency representatives who attended the Callaway COL site audit held March 23 through March 26, 2009, at the Callaway Facility, Missouri

Name	Affiliation
George Cicotte	NRC
Peyton Doub	NRC
Richard Emch	NRC
John Fringer	NRC
Nancy Kuntzleman	NRC
Michael Mazaika	NRC
Mark McBride	NRC
Daniel Mussatti	NRC
Bruce Olson	NRC
Leah Spradley	NRC
Tom Anderson	PNNL
Kristi Branch	PNNL
Michael Fayer	PNNL
Ellen Kennedy	PNNL
George Last	PNNL
Steve Maheras	PNNL
Bill Sandusky	PNNL
Robert Scherpelz	PNNL
Mary Ann Simmons	PNNL
Jeff Ward	PNNL
Bill Cash	Numark
Grant Day	Numark
Steve Hanna	Numark
Sally Mayasich	Numark
Jim Scherrer	Numark
Atay Arona	AmerenUE
Bryan Bezold	AmerenUE
Scott Bond	AmerenUE
Andrew Burgess	AmerenUE
Pat Cryderman	AmerenUE
Kip Dardery	AmerenUE
Chris Fessler	AmerenUE
Gail Gary	AmerenUE
Tom Grothe	AmerenUE
Travis Hart	AmerenUE
Brian Holderness	AmerenUE
Bruce Huhmann	AmerenUE

Name	Affiliation
Paula Johnson	AmerenUE
Cory Jutting	AmerenUE
Susan Klang	AmerenUE
Adam Lunn	AmerenUE
Rich Lutz	AmerenUE
Matt Michels	AmerenUE
Al Passwater	AmerenUE
Rick Rice	AmerenUE
Dave Shafer	AmerenUE
Neil Slaten	AmerenUE
Josh Vandenvert	AmerenUE
Dave Waller	AmerenUE
Roger Wink	AmerenUE
Mark Abrams	ABS
Keith Woodard	ABS
Jennifer Butler	Areva
Dave Gerlits	Areva
Peter Leroy	Areva
Stanley Levinson	Areva
Adam Mancini	Areva
Ted Messier	Areva
Pedro Perez	Areva
Joshua Reinert	Areva
Pedro Salas	Areva
Bill Syzmczak	Areva
Rick Williamson	Areva
Paul McCormick	Burns & McDonald
David Strous	Burns & McDonald
Emmett Brown	Mactec
Bill Elzinga	Mactec
Sam McCord	Mactec
Steve Stumne	Mactec
Steve Strout	Excel
Melissa Dubinsky	Rizzo
Lori Gross	Rizzo
Bob Halden	Rizzo
Mel Koleber	Rizzo
Fehmida Mesania	Rizzo
Sevil Onder	Rizzo
Mark Walz	Scientech
John Tynan	Unistar
George Wrobel	Unistar
Tim Waldon	Own company
Larry Shepard	USEPA
Kenny Pointer	USACE
Patrick Anderson	MoDNR

Name	Affiliation
Jane Beetman	MoDNR
Charles DuCharme	MoDNR
Randy Niemeyer	MoDNR
John Noller	MoDNR
Aaron Schmidt	MoDNR
Tim Stallman	MoDNR
Josh VanderVeen	MoDNR
Judith Deel	MoSHPO
Jim Freels	Licensing
NRC	Nuclear Regulatory Commission
PNNL	Pacific Northwest National Laboratory
MoDNR	Missouri Department of Natural Resources
MoSHPO	Missouri State Historic Preservation Office
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency

Table 2. Community representatives who attended offsite meetings (outside the Central Processing Facility) with PNNL/NRC socioeconomics staff from March 23 to 26, 2009, during the Callaway COL site audit near Fulton, Missouri.

Name, Title	Organization
Dr. Dustin Storm	Superintendent of Schools; South Callaway R-II Schools
Dr. Mark Enderle	Superintendent of Schools; Fulton School District 58
Nancy Lewis	Executive Directory, Kingdom of Callaway Chamber of Commerce
Jim Chruckshank	Pastor, Ecumenical Ministries
Bruce Hackmann	President, Fulton Area Development Corporation
Chief Steve Myers	Chief of Police, Fulton Police Department
Lee Fritz	Presiding Commissioner, Callaway County
Dan Roe	Assessor, Callaway County Assessor's Office
Paul G. Winklemann, P.E.	County Highway Administrator, Callaway County Road & Bridge
Tony St. Romaine	Assistant City Manager, City of Columbia, Missouri
Marc H. Ellinger	Presiding Commissioner, Cole County Commission
Larry J. Benz, P.E.	Director, Cole County Department of Public Works
Larry Bishop	Road Superintendent, Cole County Public Works
John Landweher	Mayor, City of Jefferson
Roger Schwartze	District Engineer, Missouri Department of Transportation
Mark Fohey	President, Columbia-Jefferson City Missouri and Vicinity Construction and Building Trades Council
Robert Halden	Project Manager, Paul C. Rizzo Associates, Inc.
Melvin Koleber, P.E.	Principal Midwest Region, Paul C. Rizzo Associates, Inc.

Attachment 3

Accidents

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
Acc-		**Accidents**			
Acc-1	Table 2.7-52	Provide a subject matter expert (SME) who can explain: 1) the definitions of the exclusion area boundary (EAB) and the low-population zone (LPZ), 2) the relationship of the EAB and LPZ distances for Unit 2 to the EAB and LPZ used for Unit 1, and 3) the distances for calculating the short-term X/Q values in ER Table 2.7-52.	Final Safety Analysis Report (FSAR) Figure 2.1-5 and Table 2.1-1 provide information related to site LPZ and EAB. Footnote to ER Table 2.7-52 explains the 2.5-mile distance to inside 2.6 LPZ. May receive request for additional information (RAI) to add information to combined license application (COLA). Information in the ER is similar to that presented in the FSAR. Further discussions were held in a conference call on 4/23/2009.	None	Resolved
Acc-2	Table 2.7-52	Provide an SME who can explain the process used to calculate the 50 percent X/Q values in Table 2.7-52.	Following Regular Guide 1.145. Information was place in a reading room in Richland, where it was reviewed on 4/22/2009.	None	Resolved
Acc-3	2.7, 7.1	Provide an SME who can explain the inconsistency in the meteorological data sets used for calculation of the X/Q for long-term dispersion (normal operations) and X/Qs for short-term dispersion (accidents).	This may not be an issue unless specific statement is desired by NRC; OK to use 3 years of data for long term analysis. Additional discussions were held in a conference call on 4/23/2009.	None	Resolved
Acc-4	2.7, 7.1	Provide access to the AEOLUS, Design Basis Accident (DBA), and XDCALC calculation packages for staff review two weeks before site audit, if possible.	Information was placed in the Richland reading room and reviewed on 4/22/2009; hourly meteorological data was docketed and discussed as ACC-12.	None	Resolved
Acc-5	7.2.1	Provide an SME who can discuss the rationale for selecting 2005 meteorological data for severe accident analysis.	2005 data has most valid data points, so 2005 was selected as base case. This information was reviewed in the Richland reading room on 4/22/2009.	None	Resolved
Acc-6	7.2.1	Provide SMEs who can discuss the selection of site-specific input to the MACCS2 code.	Place information in reading room.	None	RAI
Acc-7	7.2.1.3	Provide an SME who can discuss the rationale for limiting the time window for severe accident analysis to 24 hrs (ER 7.2.1.3) and other input parameters.	Traces were run until plateau reached even if beyond 24 hours run-time was needed; may need COLA ER update to include this information.	None	RAI
Acc-8	7.2.1.4	Provide SMEs who can discuss the core damage frequencies listed in the ER including damage from both internally and externally initiated events.	Information provided in the Richland reading room was reviewed on 4/22/2009. Additional discussions were held in a conference call on 4/23/2009, which were adequate to resolve.	None	Resolved
Acc-9	7.2.1.4	Provide an SME who can discuss whether the core damage frequencies listed in the ER include damage during plant low-power operation and shutdown conditions as well as during normal operation.	Agreement between Design Control Document (DCD) and ER was questioned. (Are shutdown conditions included?) Further discussions held in a conference call on 4/23/2009 clarified issues.	None	Resolved
Acc-10	7.2	Provide access to the MACCS2 calculation package for staff review – two weeks before site audit, if possible.	Information provided in the Richland reading room and was reviewed on 4/22/2009.	None	Resolved

Accidents

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
Acc-		**Accidents**			
Acc-11	7.2.2	Provide for review a water ingestion dose estimate for each severe accident release category.	Information provided in the Richland reading room was reviewed on 4/22/2009.	None	Resolved
Acc-12	2	Provide access to electronic copies of hourly meteorological data for 2003 through 2007.	Covered in letter: ALNRC 00013. This is covered under Meteorology, and thus not applicable here.	None	Resolved
Acc-13	7.2	Provide for review electronic copies of hourly MACCS2 input and output files and copies of AEOLUS3 and XDCALC output data files.	Place information in reading room.	None	Potential RAI
Acc-14	7.2	Provide access to estimates of the average individual risk of early fatality and the risk of cancer fatality to area population for each release category.	Information provided in the Richland reading room was reviewed on 4/22/2009.	None	Resolved
Acc-15	7.2.2.2	Provide an SME who can discuss all of the surface water pathway impacts of severe accidents.	Similar to Calvert Cliffs RAI 173. Used NUREGs 0440 and 1437 for methodology.	None	RAI
Acc-16	7.2.2.3	Provide an SME who can discuss all of the groundwater pathway impacts of severe accidents.	Similar to Calvert Cliffs RAI 173. Used NUREG's 0440 and 1437 for methodology	None	RAI
Acc-17	7.3	Provide SMEs who can discuss severe accident mitigation alternatives (SAMAs), including design alternatives and procedural and training alternatives.	Probable RAI for AmerenUE to review list of DCER SAMA and provide risk insights and schedule for review and possible procedures and training.	None	RAI
Acc-18	7.3.1	Provide an SME who can discuss the SAMDA screening process.	NRC may pursue DC RAI.	None	RAI
Acc-19	7.3.2	Provide SMEs who can discuss the rationale for assuming that the fire risk is the dominant contributor to risks from external events.	Further discussions were held in a conference call on 4/23/2009.	None	Resolved
Acc-20	7.3.2	Provide SMEs who can discuss the evaluation of the minimum implementation cost of alternatives.	No RAI; used level-3 probabilistic risk assessment (PRA) and processing design changes through AREVA internal processes. Further discussions were held in a conference call on 4/23/2009.	None	Resolved
Acc-21	7.3	Provide SMEs who can discuss the schedule for and factors to be considered in developing nonhardware alternatives.	Like ACC-17.	None	RAI.
Acc-22	7.2	Provide estimates of the total core damage frequency and population risk estimates for Callaway Unit 1 for use in estimating cumulative risks for the site.	Mark Walz verbally provided Callaway Unit-1 PRA information. AmerenUE has not located a submittal letter to the NRC of the April 2006 PRA update. Can place in reading room.	None	Potential RAI.
Acc-23	Sec. 7.1	Provide an SME who can discuss the apparent departures of DBA source term assumptions in Section 7.1 of the ER from the assumptions made in the DCD for corresponding accidents. Specifically, the SME should be prepared to discuss steam system piping failures, locked rotor accidents, and rod ejection accidents. Assumptions for other design basis accidents may also be discussed.	Make consistent with FSAR Chapter 15 via RAI. ER revision of Chapter 7.1.	None	RAI

Alternatives

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
Alt-		**Alternatives**			
Alt-1	9.2.3	Provide an SME to discuss the costs of the proposed project and energy alternatives such as: the fixed charge rate for the utility or consortium of utilities; fuel cost estimates at time of application for the proposed project and for other alternatives; the operation and maintenance cost estimates (fixed component and variable component) at time of application for the proposed project and each alternative; the escalation rates from date of application through facility lifetime (30-year life) for the components of operation and maintenance and fuel for the proposed project and each alternative; the discount rate for the proposed project and each alternative, etc.	After discussion with the SMEs, this information need was found to be not applicable.	None	Resolved
Alt-2	9.3	Provide an SME to discuss the viability of the Alternative sites for Callaway Unit 2. Specifically, clarify issues such as: 1) constructability within the floodplain; 2) acquisition of private residential, industrial, and/or commercial land; 3) removal of prime and unique farmland	AmerenUE gave an overview presentation on the alternative site selection process, and in subsequent discussions, potential resolution to the 3 items were: 1) AmerenUE will provide a floodplain map of Chamois alternative site; 2) this need was determined to be not applicable; 3) AmerenUE will provide map of prime and unique farmland. These needs may be addressed in future revisions to the ER, if they include discussion relative to CEQ (section 1508.27(b)(3) and Federal Register 59189.	None	Potential RAI for #1 and #3; resolved for #2.
Alt-3	9.2	Provide an SME to discuss the viability of energy alternatives. Specifically, clarify issues such as costs and impacts of natural gas line routing and capacity at the intertie location; costs and impacts of coal rail line routing capacity at the intertie location.	AmerenUE will provide additional detail regarding costs and impacts.	None	Potential RAI.
Alt-4	9.4.1	Provide an SME to discuss the viability of alternatives to the proposed heat dissipation system. For each viable alternative, address relevant information such as: • Land-use requirements • Water-use requirements • Operating and maintenance experience for similar units • Capital, maintenance, and operating costs • Effect on generating efficiency • Predicted thermal and physical effects (e.g., thermal plume and scouring) • Predicted atmospheric effects (e.g., fogging, icing, and drift) • Predicted operating noise levels • Predicted aesthetic effect (e.g., visual plumes) • Predicted recreational benefits.	AmerenUE will provide quantitative support for the rejection of heat-dissipation alternatives, and may include this in a future revision of ER.	None	Potential RAI.

Alternatives

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
Alt-		**Alternatives**			
Alt-A		Provide an SME to clarify why alternative power sources were evaluated as if located at the Callaway site.	AmerenUE will provide further clarification and may include this in a future revision to ER.	None	Potential RAI.
Alt-B		Provide access to explicit references for declaratory statements in the ER (e.g., ER, Rev 0, Section 9.2.2.1, paragraph 3, sentence 1, "There are no Class 3+ … territory.").	AmerenUE will provide further clarification and may include this in a future revision to ER.	None	Potential RAI.
Alt-C		Provide an SME to clarify the magnitude of land-use impacts in Table 9.2-1; inconsistent with the text in 4.1.1.2.	AmerenUE will provide further clarification and may include this in a future revision to ER.	None	Potential RAI.
Alt-D		Provide an SME to clarify the inclusion of the Chamois site in light of the exclusionary criteria relative to distance from areas with significant flood potential.	AmerenUE will provide further clarification and may include this in a future revision to ER.	None	Potential RAI.
Alt-E		Provide an SME to describe additional socioeconomic and environmental justice characteristics of the alternative sites.	AmerenUE will provide further clarification and may include this in a future revision to ER.	None	Potential RAI.
Alt-F		Provide an SME to describe the technical basis for conclusionary statements within the ER (e.g., ER, Rev 0, Section 9.3.2.1.9, paragraph 1).	AmerenUE will provide further clarification and may include this in a future revision to ER.	None	Potential RAI.
Alt-G	9.3	Provide access to documentation on the siting process used to screen alternatives sites resulting in the four alternatives sites submitted in the ER. In particular, provide access to documentation that further defines the criteria used, such as, but not limited to distance from areas with significant flood potential, and the scoring and ranking of sites at each step of the down-select process.		Documentation on the alternative site selection process.	Potential RAI.

Aquatic Ecology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
AQ-		**Aquatic Ecology**			
AQ-1	2.4.2.2.3	Provide access to all cited references (such as MDC 1999).	AmerenUE provided copies of references in a binder for viewing onsite during the site audit.	A list of required documents is provided in a separate file.	RAI
AQ-2	Tables 2.4-7 and 2.4-8	Identify data that are from the stream stations and the Missouri River stations, and provide an SME and supporting documentation to clarify Tables 2.4-7 and 2.4-8.	AmerenUE will provide data tables showing distribution of aquatic species in river and streams, and may include this information in a future ER revision.	None	Potential RAI

Aquatic Ecology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
AQ-		**Aquatic Ecology**			
AQ-3	2.4.2.2.3.3	Provide an SME and supporting documentation to address the text and Table 2.4-7 regarding Channel Catfish.	AmerenUE will revise the text and include this in a future ER revision.	None	Potential RAI
AQ-4	Figure 4.3-3	Provide an SME and supporting maps and documentation to clarify the actual location of collector wells shown in ER Figure 4.3-3.	AmerenUE will revise Figure 3.4-2 and include this in a future ER revision.	None	Potential RAI
AQ-5	5.3.2.2	Provide an SME and supporting data and information to explain the statement that "… an absence of harm" has been observed for aquatic species associated with the Callaway Unit 1 cooling system discharges into the Missouri River (Section 5.3.2.2).	AmerenUE will provide acute toxicity WET test results for years 2004 through 2008 associated with Unit 1.	None	RAI
AQ-6	5.5.1.2, p. 5-86	The ER states that cooling water discharge characteristics for the planned Unit 2 (and expected impact to receiving water) is expected to be similar to those associated with the existing Unit 1. Provide an SME who can explain current National Pollutant Discharge Elimination System (NPDES)-required toxicity testing and supporting documentation. If available, provide for review the results of whole-effluent testing required and conducted for Unit 1 under the existing NPDES permit for the past 5 years.	AmerenUE will provide acute toxicity WET test results for years 2004 through 2008 associated with Unit 1.	None	RAI
AQ-7	6	Provide a SME who can discuss the measurement and monitoring programs that have been conducted for Unit 1. Specific areas of interest include the programs that evaluated aquatic resources in the streams and Missouri River near the existing intake and outfall structures and summaries of thermal and chemical monitoring related to blowdown discharge. Provide access to annual monitoring reports or reports required by NPDES for the last five years, if available. (Environmental Measurements and Monitoring)	AmerenUE will provide selected data associated with Unit 1.	DMR quarterly information/ reports for 2004 through 2008	RAI
AQ-8	4.3.2	Provide access to any mitigation plan for the site and an SME to discuss the plan.	A mitigation plan for wetland and stream-related impacts is under development with a report due in May or June; plan will include a functional assessment for the Molly Dozier Chute and all other jurisdictional waters on the site (Table 2.4-14), and an enhanced conceptual discussion of mitigation with respect to wetlands, streams, and ponds affected by the construction and operation of Unit 2.	None	RAI
AQ-9	4.3.2	Provide an SME and supporting information to clarify the disposal of dredged materials at the site.	The barge slip structure was last used in 2005; dredging may or may not be required for future construction. If required, a 404 permit will be submitted and a dredging plan developed. This may be addressed in a future ER revision.	None	Potential RAI
AQ-A		ER Rev 0, Table 4.3-3, p 4-57. Potentially permanent versus	Information still needs to be addressed and	None	Potential RAI

Aquatic Ecology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
AQ-		Aquatic Ecology			
		permanent; clarify in ER revision	perhaps included in a future ER revision.		
AQ-B		If available, please provide data from any aquatic monitoring studies that have been conducted since beginning operation of Unit 1 on ponds, streams, or the Missouri River near the existing intake and discharge structure.	Information still needs to be addressed and perhaps included in a future ER revision.	None	Potential RAI
AQ-C		If available, provide descriptions of other studies that evaluated the impacts of collector well construction and operation in the Missouri and Mississippi Rivers	Information still needs to be addressed and perhaps included in a future ER revision.	None	Potential RAI
AQ-D		If available, provide data and discussion on the population trends of aquatic invasive species observed in the Missouri River near the existing discharge since Unit 1 began operation.	Information still needs to be addressed and perhaps included in a future ER revision.	None	Potential RAI
AQ-E		Update Table 2.4-13 to include Spring 2008 sampling.	Information still needs to be addressed and perhaps included in a future ER revision.	None	Potential RAI
AQ-F		Describe any instances of heat or cold shock episodes associated with the operation of Unit 1.	Information still needs to be addressed and perhaps included in a future ER revision.	None	Potential RAI
AQ-G		If available, provide abundance data for the Pallid sturgeon in water bodies on or near AmerenUE property since Unit 1 began operation.	Information still needs to be addressed and perhaps included in a future ER revision.	None	Potential RAI

Cultural Resources

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
CR-		**Cultural Resources**			
CR-1	2.5.3 4.1.3	Provide an SME and supporting data/information to: • Show that archaeology and historic and resulting reports have been completed and finalized • Address the survey status of the collector wells system, access road, bridge, water supply pipeline, and transmission lines areas • Provide access to all final reports for review.	1. AmerenUE will docket requested references. 2. AmerenUE will supply future reports from surveys of areas associated with transmission lines and the support system for collector wells. 3. AmerenUE will provide a written response for its plan of avoidance for the proposed settlement pond near Site (23CY256) by the end of July. 4. AmerenUE will provide written assurance regarding cultural survey of transmission pole footings in the flood plain.	All Cultural Reports in the ER; Phase I Survey Access Road and Pipeline Corridor Callaway County, Missouri - July 25, 2008; Phase I Archaeological Survey of Collector Well Monitor and Pedistrial Survey, Burns and McDonnell April 7, 2008; SHPO site reports CY 140, CY 141, CY 137 - Blowdown Discharge Management Summary; Cultural Resources Discovery Plan for Archaeological Monitoring of Soil Borings Callaway Nuclear Plant COLA Callaway County, Missouri MACTEC May 2007, Project # 06-3624; Letter Report of Cultural Resource Monitoring Inst. of Test Wells Callaway Nuclear Power Facility Callaway County, Missouri, Sept. 4, 2007 #3250-07-5219 Task 6.21.	Potential RAI
CR-2	2.5.3 4.1.3	Provide an SME to discuss pertinent survey reports with regard to current State Historic and Preservation Officer (SHPO) survey standards.	1. AmerenUE will provide the current Cultural Resource Management Plan and procedure (APAZZ-00140). 2. AmerenUE will provide an updated and revised Cultural Resource Management Plan, including updated SHPO guidelines, a plan for discovery of human remains, a plan for discovery of archaeological material, cemeteries, and ship-wrecks, a section on Native-American consultation, a section on Traditional Cultural Properties, a section on cultural resource surveys for new construction, and a section on avoidance plans. This will require SHPO concurrence.	The current Cultural Resource Management Plan, procedure (APAZZ-00140), and a Revised Cultural Resources Management Plan including plans for all Eligible/Potentially Eligible Archaeological Sites and Architectural Sites 4, 11, 12, 15 (Ray 1984).	RAI

Cultural Resources

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
CR-		**Cultural Resources**			
CR-3	2.5.3 4.1.3	Provide copies of all relevant correspondence between applicant and SHPO, and/or tribes including SHPO comments on definitions of area of potential effects, and all related archaeological and architectural surveys and reports. Provide an SME to discuss related archaeological and architectural surveys and reports.	AmerenUE will docket all correspondence with the SHPO, AmerenUE, and its contractors. AmerenUE also will provide summaries of meetings and phone logs with the SHPO, and will describe the results of those meetings; all written correspondence between AmerenUE, their contractors, and Native American tribes (includes copies of the mailing lists and descriptions of how the mailing lists were compiled; copies of form letters sent to the tribes; copies of responses; copies of replies to responses; and written responses summarizing the consultation process, including phone calls). AmerenUE will provide two maps of the area of potential effect. The first map will consist of 7.5 min topographic maps, boundaries for all archaeological sites, locations of all historic structures (REF: Ray 1984), the construction footprint for Unit 2, and the AmerenUE property boundaries. The second map will be the same as previous map but without showing the archaeological or historic sites. AmerenUE will provide ArcView shapefiles for all the layers needed to make the two area of potential effect maps.	Tribal Mailing Lists and a description of how it was compiled. Copies of form letters that were sent to each tribe on the mailing lists. Copies of all Responses from the tribes (letters and phone call logs/notes). Copies of subsequent replies to tribal responses. Letters describing the whole process including phone conversations. Correspondence to/from SHPO.	RAI
CR-4	2.5.3 4.1.3	Provide an SME who can describe any archaeological sites that have been recommended for Phase-II or Phase-III investigations and if any Traditional Cultural Properties have been identified, and if so, provide avoidance or mitigation plans (MOAs or MOUs).	AmerenUE will provide written descriptions of the cultural sites that fall (partially or entirely) within the construction footprint of Unit 2 and the SHPO concurrence letter that approves the avoidance and mitigation plan for each. Currently we are aware that sites 23CY359 and 23CY256 fall within the construction footprint of Unit 2. AmerenUE will provide written descriptions of all traditional cultural properties (TCPs) located within or adjacent to the construction footprint and their plan of avoidance.	None	Potential RAI.
CR-5	2.5.3	Provide access to all consultation letters with Native American tribes and interested parties.	Consultation with Native American tribes is covered in CR-3. AmerenUE will provide a written description indicating that interested parties were sought out during public meetings and contractor research and that none were identified.	None	Potential RAI

Cultural Resources

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
CR-		**Cultural Resources**			
CR-6	2.5.3	Provide an SME and provide supporting information that describes and lists all tribes that were consulted and how each tribe was selected.	Resolved through CR-3.	None	Resolved
CR-7	4.1.3 2.5.3	Provide an SME to describe the discovery process for the possible steamboat wreck sites and access to any references and discussion of the possibility of steamboat wreck sites in the project area for review.	AmerenUE will provide, in their future survey report on the support system for collector wells, a section on remote sensing (ground penetrating radar) looking for shipwrecks within construction corridors in floodplain areas.	None	RAI
CR-8	4.1.3 5.1.3	Provide an SME and provide supporting information regarding the plan for inadvertent discoveries (human remains and all other cultural sites).	Will be provided in the Cultural Resource Management Plan (see CR-2).	None	Resolved
CR-9	4.1.3,5.1.3	Provide an SME to describe how potential impacts resulting from preconstruction, construction, and operations on cultural and historic resources were analyzed, as well as if indirect effects were considered to cultural resources located outside the project's footprint including TCPs and above ground structures.	AmerenUE will provide copies of the written responses that explain preconstruction impacts that were included in the Cultural Resources binder made available during site audit. AmerenUE will provide a written description of why Unit 2 construction and operating impacts to cultural resources is considered small due to plans of avoidance and the updated Cultural Resources Management Plan. Information needs related to indirect effects to TCPs and above-ground resources were deemed not applicable, because they are dealt with elsewhere. AmerenUE will provide a written response on transmission line maintenance activities and how these (operations) will not impact cultural resources.	None	Potential RAI
CR-A	9.3	Provide SME to describe methods used to describe cultural resources impacts. Provide references used.	AmerenUE will provide a written response describing research conducted to provide reconnaissance-level information for cultural resources, including a list of database searches (Referenced in 9.3). AmerenUE will provide written a response describing how cultural resources were weighted in the alternative site selection process.	None	Potential RAI

Cultural Resources

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
CR-		**Cultural Resources**			
CR-B	10.1	Provide SME to describe how cumulative impacts to cultural resources were evaluated.	AmerenUE will provide a written response describing projects in the area that can result in cumulative impacts to cultural resources and how these will impact cultural resources.	None	Potential RAI

Hydrology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
H-		Hydrology			
H-0	2.3, 4.2, 5.2, 5.3	Have available for review all references used to support statements made in the hydrology sections of the ER, including calculation packages, model input files, and modeling result summaries. Include relevant information on groundwater modeling used to assess performance of the water intake system and input files for CORMIX.	AmerenUE will provide the hydrology-related references cited in the ER.	Hydrology references from ER	Potential RAI
H-1	2.3	Provide an SME who can address the temperature variation within the Missouri River (such as the average-maximum and average-minimum temperature of this water body).	AmerenUE will supply raw data (and a data summary if it exists) for historical intake temperatures at Callaway Unit 1; Missouri River data can be found on the Internet at http://waterdata.usgs.gov/mo/nwis.	None	Potential RAI
H-2	2.3	Provide an SME who can address sediment transport in surface water bodies and wetlands (such as quantities, locations where rates were measured, bed and suspended load fractions and gradation).	Pre-Callaway erosion rates may be obtained from NRCS reports (publicly available). AmerenUE referred NRC to MoDNR Water Pollution Control Branch for any offsite observations of erosion from the Callaway site. AmerenUE will provide NPDES records (total suspended solids).	None	Potential RAI
H-3	2.3, 4.2, 4.3	Provide an SME who can address the design basis flood (including its relationship to 100-year value) and the impacts of those floods on alluvial collector wells and plant operation.	The largest flood in recent times was in 1993. That flood was below the 200-year flood level (539 ft msl) at the intake structure, as shown in Figure 3.4-4. It was concluded that this question was not applicable to the environmental review.	None	Resolved
H-4	2.3	Provide an SME who can address the discharge area bathymetry in the channel (such as its seasonal characteristics, three-dimensional distribution, and the discharge velocity and temperature differential characteristics).	See response to H-24a.	Burns and McDonnell. February 2008. "Modeling the Thermal Component of the Wastewater Discharge Plume from Units 1 and 2 of the Callaway Nuclear Power Plant."	Potential RAI
H-5	2.3	Provide an SME who can address quantification of hydrologic budget data (such as monthly information to supplement annual information).	The groundwater model described in the ER is steady state and addresses seasonal changes through sensitivity studies. See responses to H-24b and H-24c.	None	Potential RAI
H-6	2.3, 3.3	Provide an SME who can address surface water usages (such that the rate of use by the plant under various operational conditions is defined).	Necessary information is provided in Table 3.3-1 and Figure 3.3-1.	None	Resolved

Hydrology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
H-		Hydrology			
H-7	2.3, 3.3	Provide an SME who can address plant water use (including monthly data and during period of low water availability).	Necessary information is provided in FSAR 2.4.11, 2.4.12, and 9.2. Also, see response to H-10.	None	Resolved
H-8	2.3, 5.2, 6.3	Provide an SME who can address surface water chemical analysis as reported in the ER (including mercury baseline measurements).	Table 2.3-35 shows that dissolved mercury was measured in the surface water testing program. Mercury was not detected at or above the detection limit of 0.2 µg/L. AmerenUE will provide laboratory reports containing surface water chemical analyses with detection limits identified.	None	Potential RAI
H-9	2.3, 5.2, 6.3	Provide an SME who can address plant water discharges to surface water bodies including the magnitude and nature of the pollutant discharge in space and time.	Necessary information is provided in Figure 3.3-1 and Sections 5.2 and 5.3.	None	Resolved
H-10	3.4, 5.3	Provide an SME who can address heat dissipation systems (including system performance due to variations in hydrological variations).	The design of Unit 2 is a closed-cycle system. System performance due to hydrologic variations is discussed in ER Section 2.3.1.2.3.4.2 and Burns and McDonnell (June 2008; Phase II Hydrogeologic Investigation…Siting Study). AmerenUE will provide Burns and McDonnell (2007; Closed-Cycle Cooling…for Future Units).	Burns and McDonnell (June 2008; Phase II Hydrogeologic Investigation… Siting Study). Burns and McDonnell (2007; Closed-Cycle Cooling…for Future Units).	Potential RAI
H-11	3.3, 3.6	Provide an SME who can address the nonradioactive effluent treatment facilities (with a focus on the materials within the intake and discharge flows).	Necessary information is provided in ER Sections 5.2.3.1, 6.6.2, and 6.6.3 regarding monitoring of discharge water.	None	Resolved
H-12	4.2	Provide an SME who can address Construction Phase water quality (and the baseline water-quality data being used and the surface and groundwater quality related to interaction with exposed substrate material).	Necessary information is provided at http://www.dnr.mo.gov/DWW/JSP/WaterSystemDetail.jsp... ; MoDNR Drinking Water Branch Water System Details Water System No. M03182219; this refers to analyses of water collected from on-site well No. 3. AmerenUE intends to reopen wells Nos. 1 and 2 to provide construction water as described in ER Section 2.3.2. AmerenUE will submit additional details about sources and quality of water used in construction.	None	Potential RAI
H-13	5.2	Provide an SME who can address groundwater levels expected during operation (relative to plant grade) and the factors that control groundwater levels.	After discussion it was concluded that this question was not applicable to the environmental review.	None	Resolved

Hydrology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
H-		Hydrology			
H-14	5.2	Provide an SME who can address groundwater withdrawals during operation and the factors that can affect whether the rate of withdrawal is high, average, or low.	See Response to H-10.	See H-10.	Resolved
H-15	5.2	Provide an SME who can address possible simultaneous occurrence of low river discharge and low groundwater levels during operation (such that analysis of interactions might be considered).	See Response to H-10.	See H-10.	Resolved
H-16	5.2	Provide an SME who can address areal groundwater withdrawals by other users occurring during operation (with consideration of monthly withdrawals to identify periods during which groundwater use by other users might interfere with plant operations).	Necessary information is provided in ER Section 2.3.1.2.3.4.2 and Figures 2.3-57, 2.3-58, and 2.3-30, and Table 2.3-30 to show that there are no groundwater users in the contributing recharge area of the collector wells.	None	Resolved
H-17	5.2	Provide an SME who can address the impact of Missouri River alluvium groundwater collector wells during operation (and their relationship to wetlands north of Bingell Island).	Necessary information is provided in ER Figures 2.3-41, 2.3-42, 2.3-43, 2.3-57, and 4.3-6, and Tables 2.3-14 and 2.3-15. AmerenUE will provide drawing 8600-X-89931 containing surface topography in the floodplain.	None	Potential RAI
H-18	5.3	Provide an SME who can address numerical models for water discharge from the outfall into receiving surface (including theory, assumptions, basis for parameter values, and passage times).	See response to H-24.	None	Potential RAI
H-19	6.1	Provide an SME who can address thermal monitoring of discharge during phases of pre-application, pre-operational, and operation (such that bathymetry can be shown relative to sample locations at all thermal, hydrological, or aquatic biological monitoring stations).	AmerenUE will provide NPDES data for discharge from Callaway Unit 1, along with data collection locations.	None	Potential RAI
H-20	6.3	Provide an SME who can address hydrological monitoring programs and attendant sediment transport expectations during phases of pre-application, pre-operation, and operation (such that expected transported sediment can be quantified).	See response to H-19.	None	Potential RAI
H-21	6.6	Provide an SME who can address chemical monitoring programs during phases of pre-application, pre-operation, and operation (such that details of the analytical procedure and its quality assurance program can be documented).	AmerenUE will provide the QA Plan and analytical procedures used for site characterization (Rizzo 2007. "QA Project Plan for Baseline Study: Surface Water and Groundwater Quality, Callaway Unit 2 Environmental Report Section 2.3.3, Rev. 1." August 2007).	Rizzo 2007. QA Project Plan for Baseline Study: Surface Water and Ground-water Quality, Callaway Unit 2 ER Section 2.3.3, Revision 1. August 2007.	Potential RAI

Hydrology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
H-		**Hydrology**			
H-22	5.2, 5.3	Provide an SME who can discuss Burns & McDonnell (2008a). Modeling the Thermal Component of the Wastewater Discharge Plume from Units 1 and 2 of the Callaway Nuclear Power Plant, February 2008.	See response to H-24a.	See H-24.	Potential RAI
H-23	2.3, 5.2, 5.3	Provide an SME who can discuss Burns & McDonnell (2008). Phase II Hydrogeologic Investigation Report, Collector Well Siting Study, June 2008.	AmerenUE will provide a paper copy and an electronic copy of Burns & McDonnell (2008). "Phase II Hydrogeologic Investigation Report, Collector Well Siting Study," June 2008.	Burns & McDonnell (2008). "Phase II Hydrogeologic Investigation Report, Collector Well Siting Study," June 2008.	Potential RAI
H-24	2.3, 5.2 5.3	Provide SMEs who can discuss and provide all input assumptions and data for each of the models used in: a. thermal plume analysis b. groundwater modeling c. water budget d. surface water runoff.	a. AmerenUE will provide a paper copy and an electronic copy of Burns & McDonnell "Modeling the Thermal Component of the Wastewater Discharge Plume from Units 1 and 2 of the Callaway Nuclear Power Plant," February 2008. b. AmerenUE will provide electronic MODFLOW files for (1) calibrated model, (2) sensitivity cases, and (3) collector well study and several supporting documents that are not publicly available. c. AmerenUE will provide the zone budget calc package in the reading room. d. AmerenUE will provide a CD of input/output files for HEC modeling, and text that describes objectives, methods, results, and conclusions.	Burns & McDonnell "Modeling the Thermal Component of the Wastewater Discharge Plume from Units 1 and 2 of the Callaway Nuclear Power Plant," February 2008.	Potential RAI

Health Physics

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
HP-		Health Physics - Radiological Health/Waste Systems/Decommissioning			
HP-1	4.5	Provide an SME to discuss the models, assumptions, and input data used to arrive at estimates of doses to construction workers (e.g., Geographic Information System [GIS] layer of site and compass sectors; locations of workers on the construction site receiving exposures, etc.).	AmerenUE provided a calculation package with the needed information. AmerenUE will make the calculation packages available in a reading room.	None	Potential RAI
HP-2	Table 5.4-6	Provide an SME to discuss the models, assumptions, and input data used to arrive at estimates of doses to the general population (e.g., location of milk goat, which was not mentioned in Table 5.4-6).	AmerenUE provided a calculation package with the needed information. AmerenUE will make the calculation packages available in a reading room.	None	Potential RAI
HP-3	5.4	Provide an SME to discuss the models, assumptions, and input data used to arrive at estimates of doses to biota other than humans (e.g., selection of surrogate species, calculation input values for the species and effluent concentrations, etc.).	AmerenUE provided a calculation package with the needed information. There is some concern over species that were omitted from analysis (Northern bobwhite, mourning dove, wild turkey); information on doses to omitted species is needed. AmerenUE may revisit this information.	None	RAI
HP-4	4.5, 5.4	Provide access to the Offsite Dose Calculation Manuals (ODCM) for Unit 1 and for Unit 2 for review.	AmerenUE provided a copy of the ODCM for review during the site audit and said that it was available through the ADAMS.	None	Resolved
HP-5	2.7, 4.5, 5.4	Provide access to electronic copies of input and output files for the following models: XDCALC, LADTAP-II, and GASPAR-II. Also provide an SME to discuss the input and output of the code calculations, and access to the calculation packages used to support dose calculations.	AmerenUE provided access to the calculation packages during the site audit. Copies of the input and output files will be needed for docketing.	None	RAI.
HP-6	2.7, 4.5	Provide information on the XDCALC computer code, including the software manual with instructions for input and description of output.	AmerenUE provided a calculation package with information on XDCALC. No manual exists; however, AmerenUE gave a presentation on XDCALC that provided the needed information.	None	Resolved
HP-7	6	Provide for review the annual reports of the Callaway Radiological Environmental Monitoring Program. The last 5 years of environmental monitoring reports at the Callaway site should be included.	Copies were provided by AmerenUE; these were already docketed and are available.	None	Resolved
HP-8	5.4	Provide an SME to discuss the models, assumptions, and input data used to arrive at estimates of radioactive releases through the liquid, gas, and solid waste systems.	Adequate information is available in the DCD and FSAR.	None	Resolved

Health Physics

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
HP-		**Health Physics - Radiological Health/Waste Systems/Decommissioning**			
HP-9	3.5, 4.5, 5.4	Provide data on transit times for liquid effluent to receptors.	The necessary information is provided in the ER, Section 2.4.13.	None	Resolved
HP-10	1.3, 3.5	Provide a SME to discuss radioactive waste systems (e.g., waste minimization plans as specified in the Standard Review Plans for Environmental Reviews for Nuclear Power Plants).	AmerenUE provided an SME to discuss the waste systems our satisfaction.	None	Resolved

Land Use

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
LU-1		**Land Use**			
LU-2	Figure 2.2-7	Provide an SME who can discuss utility rights-of-way near the site (re: Figure 2.2-7).	Utility rights-of-way were shown on the site tour and information about the rights-of-way and transmission lines are included in Section 2.3. However, more detailed maps maybe required.	None	Potential RAI
LU-3	4.1	Provide an SME who can discuss whether borrow pits will be created and/or expanded.	AmerenUE indicated that no borrow pits will be created or expanded; a written statement relating specifically to the creation of borrow pits may be needed.	None	Potential RAI
LU-4	2.2, 2.5, 4.1, 5.1	Provide an SME who can discuss historical use patterns on the Reform Conservation Area.	AmerenUE indicated that there are no entry/access areas that could provide use data: General description of use of the Conservation Area was provided; this description indicated that greatest use was during deer and turkey hunting season when there might be 40 to 60 cars in the parking lots.	None	Resolved
LU-5	4.1	Provide an SME to discuss the disposition of dredge spoils for any dredging to deepen the barge slip.	AmerenUE indicated that any potential dredge spoils will be deposited on its property in accordance with U.S. Army Corps of Engineer criteria. A citable reference is needed.	None	Potential RAI
LU-6	4.1	Provide an SME to discuss potential for land-use change from the development of recreational vehicle (RV)/mobile home parks to house construction workers and the historical experience with land-use changes that occurred in response to housing demand for workers associated with Unit 1 (both construction and operation).	AmerenUE indicated that no such data existed. Interviews with community residents present on the site during the construction of Unit 1 indicate that considerable density of mobile homes/RVs on rural properties in the vicinity of the site may be expected during construction.	None	Resolved
LU-7	4.1, Figure 4.1-2	Provide an SME to discuss land-use impacts from any modifications to the water supply/discharge system, including the collector well system (re: Figure 4.1-2 and prime farmland).	AmerenUE provided a site tour of the road and well sites. Some prime farmland will be disrupted in these areas, and AmerenUE will provide information on prime farmland acreage affected (re: Table 2.3). However, the relationship of the road and well sites to wetlands still needs some clarification.	None	Potential RAI
LU-8	4.1, 4.4	Provide an SME who can discuss modifications to the haul road and modifications to access roads and parking areas to accommodate construction traffic to and from the site (e.g., on p. 4-67, the ER states that two new site access roads connecting Routes 428 and 459 will be built).	AmerenUE staff indicated that no significant changes in the haul road are anticipated, and noted the graphic of the footprint in ER Section 2.3. A citable reference is needed.	None	Potential RAI
LU-A	2	Provide an estimate of the volume of demolition material that will need to be disposed of, and whether it will go into an onsite landfill or be transported offsite. Indicate implications for truck traffic.	There was no estimate available at this time; the estimate of demolition material and its deposition was requested.	None	Potential RAI

Meteorology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
Met-		**Meteorology/Air Quality**			
Met-1	2.7, 4.0, 5.0	Provide an SME and supporting data/information to explain the logic for conclusions reached in the ER (e.g., "impacts are small" or "onsite conditions are similar to those at other regional sites"). Details should be addressed, such as criteria for the decision, inputs and methodologies used, analysis of outputs, and statistical methods applied.	AmerenUE will provide additional discussions and justifications for climate and meteorological data presented in the ER, and will provide rationale for why they reached the conclusion that impacts are small (i.e., better define what is meant by small and give comparisons with air quality standards). These responses may result in a revision to the ER.	None	RAI
Met-2	2.7, 5.4	Provide an SME and supporting data/information to explain why the meteorological analyses are done separately for the two measurement levels on the meteorological tower.	AmerenUE will explain differences between XDCALC and XOQDOC modeling; possible differences in stack exhaust parameters obtained by the use of the AEOLUS3 and XDCALC models; explanations of the use of meteorological data by XDCALC for mixed-mode release; and a discussion of the data substitution process and met data recovery.	None	RAI
Met-3	2.7, 5.4	Provide an SME and supporting data/information (e.g., input and output files, and assumptions) to support all transport and dispersion model runs.	AmerenUE needs to identify other model input related parameters; provide references for information sources (e.g., DCD); and the basis for assuming that certain inputs are conservative. For example, AmerenUE needs to present the precise assumptions for source locations, elevations, emission rates, buoyancy flux, nearby building dimensions, etc. This information need may be addressed through a combined RAI with MET-13 and/or similar RAIs for the FSAR.	None	RAI
Met-4	2.7.1.1	Provide an SME and supporting data/information (such as detailed topographic maps) to explain the logic behind the statement that "drainage is expected to be minimal."	Drainage is important for the low level sources. The EIS will address this issue by explaining where impacts may occur and substantiating why drainage flow is expected to be minimal. AmerenUE may revise some of the current discussion for incorporation in the next revision of the ER.	None	Potential RAI
Met-5	2.7.1.2	Provide an SME to clarify statements such as "macro-scale diffusion" and "diffusion is worst."	The EIS will address context of terminology used to describe dispersion climatology in terms of source heights. The conclusion reached in the ER about "diffusion is worst" is true mainly for low-level sources. For elevated stack sources, the plume may not come down to the ground under such conditions and therefore concentrations are less. The statement about low pressure systems is not always correct. Poor diffusion conditions (light winds and low mixing depths) are known to exist near the warm front boundary near the center of low pressure systems. AmerenUE will improve the discussion in the ER that may be incorporated into a revision of the ER.	None	Potential RAI

Meteorology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
Met-		**Meteorology/Air Quality**			
Met-6	2.7.2	Provide an SME and access to specific references (documents, dates, sampler locations, and sampler data and analysis, standard, and sampling results) that can support the statement that the area "is listed as being better than national standards" (ER Section 2.7.2 Regional Air Quality).	Information is needed to address if Missouri has adopted NAAQS; the distance of the site from Class-1 areas (e.g., national parks), maps showing attainment status, the status of 8-hr ozone standard (AmerenUE will contact state agency), and a continuity check of air quality information with other ER sections and the FSAR. AmerenUE will list the standards and the results of the sampling.	None	RAI
Met-7	2.7.4	Provide an SME and supporting data and information to explain the following: 1. Details on the Callaway meteorological tower and instruments (photo, period of record, types of instruments, types of data archived, QA/QC methods, etc.) 2. The use of only 3 years (2004-2006) of meteorological data 3. The use of "monthly design wet bulb temperature" (ER Section 2.7.4 Local Meteorology). Also, provide a tour of the meteorological tower and supporting structures.	AmerenUE will address why the meteorological tower and operation are not part of the quality assurance (QA) plan, and will place some of the QA information in to a reading room. Additional information is still needed regarding an explanation of how design wet-bulb temperature data is used, and on meteorological data processing and validation, data flagging and data substitution, quality, and data discussions (ER Section 6.4). Additional information is also needed on the use of only 3 years (2004-2006) of meteorological data, relative to conclusions concerning, maximum, mean, and minimum monthly rainfall.	None	RAI
Met-8	2.7.4.2	Provide an SME and supporting data and information to explain the phrase "heavy rains occur infrequently," to clarify the discussion of precipitation wind roses, and to discuss general conclusions that apply across the data (p. 2-496).	Additional information is needed to better define terminology (e.g., heavy rain) and clarify tables of statistics based on onsite data. The onsite period of record (POR) is too short, is not climatologically representative, and should include data from offsite stations within 50 miles of the site (e.g., NWS and cooperative observing stations). Within the ER, the stated wind direction with greatest precipitation jumps around from one wind rose to another. Additional information is needed regarding the significance between the precipitation wind roses.	None	RAI
Met-9	2.7.4.3	Provide an SME and supporting data and information to clearly explain the method of estimating mixing depth and what is meant by "temperature inversion," and how the persistence numbers are calculated.	The number of cases with multiple hour persistence is unexpectedly low, since this is what happens on most nights. Additional information is needed to describe the methodology for calculating mixing height based on Springfield, Missouri, data; address missing linkage with mixing height input to modeling; explain representativeness of Springfield data to plant site; and clarify terminology (stability class, persistence, etc.).	None	RAI

Meteorology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
Met-		**Meteorology/Air Quality**			
Met-10	2.7.4.4	Provide an SME and supporting data and information to explain the data, scientific interpretation, and logic in reaching conclusions regarding the dominant wind direction and similarities between the on-site data and the NWS sites near Callaway (including wind roses and the use of wind speed data to estimate the site roughness length).	Comparisons are made with the Columbia, Kansas City, and St. Louis met data from 1970-2000 and conclusions drawn about whether the Callaway site is similar to the others, without concurrent data, from the same time period. Explain the statistical criterion (if any) set up for deciding whether the Callaway data are indeed statistically similar (i.e., at the 95 % confidence level) to the other site data. Explain the conclusion that the dominant wind direction is a certain value when it jumps around from one level or time period to another. Also, explain the similarities between the on-site data and the NWS sites near Callaway - are the wind roses at Callaway similar to those at the other sites with 95 % confidence limits? Explain how and why the wind speed data at the two levels (10 m and 60 m) are used (e.g., using the log-linear wind profile formula).or not used to estimate the site roughness length. Additional information is needed to describe why onsite data are considered representative of near and far field receptors; clarify text that explains similarities of wind-rose data between on and off site data (e.g., discuss quadrants rather than sectors); note the difference of Jefferson City wind-rose and indicate the reason for the difference and any other differences in wind-roses presented. AmerenUE may choose to revise the discussion in Section 2.7.4.4.	None	RAI
Met-11	2.7.4.6	Provide an SME and supporting data and information to discuss the stability method used (determined by the temperature difference between two levels [10 and 60 m] on a tower), the stability persistence for the 10 m separate from 60 m levels, and the conclusion that an inversion persists for a full day. Also, provide access to all hourly met data for this period.	Additional information is needed to clarify what Tables 2.7-33 to 2.7-35 and other data tables are presenting. Based on discussions at the site audit, some of these issues might be resolved by providing revised captions for the tables and figures and by more careful wording of the text. Explain why the stability persistence is presented separately for the 10 m and 60 m levels, since the stability is a single value (temperature difference between 60 and 10 m) for both levels. Clarify how there can be an inversion persisting for a full day, given that even in the winter, there is some surface heating at the latitude of Callaway. Also provide all hourly met data for this period.	None	RAI
Met-12	2.7.5	Provide access to a detailed topographic map and an SME to discuss the possible drainage wind effects at night.	This information need is similar to that covered by MET-4.	None	Potential RAI

Meteorology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
Met-		**Meteorology/Air Quality**			
Met-13	2.7.6	Provide an SME and supporting data and information to explain: 1. Estimates of atmospheric dispersion factors 2. The use of the ABS code XDCALC 3. What is meant by "mixed mode release," including source locations, elevations, release rates, momentum and buoyancy flux, and nearby building dimensions 4. The logic behind the statement that "building wake credit was taken" 5. The logic behind decisions regarding nearest cow, gardens, etc. (all approximately 4 km) 6. The basis for concluding that the data from an earlier period "agree well" or are "very similar" to those from the 2004 to 2006 period (using standard statistical tests) 7. How the 50th percentile dispersion factors were calculated with AEOLUS3 (including the input and output files and model options chosen).	This information need is similar to MET-3. Additional information is needed to explain the basis for assumptions andprovide cross-references for input data (including those regarding estimates of the atmospheric dispersion factors). Explain differences between XDCALC and XOQDOQ. AmerenUE provided the references in Appendix B in a binder for review during the site audit, and will make that information available.	None	RAI
Met 14	Tables 2.7-36 and 2.7-37	Provide an SME and access to supporting data and information to explain these tables of wind speed and direction joint frequency distributions for stability relative to estimating inversion strength and stability.	These ER tables show a large difference in the numbers of hours for a given stability class at 60 m than at 10 m. The AmerenUE contractor confirmed that there was an error in the tables of inversion strength. AmerenUE will revise Table 2.7-37 in the ER, to eliminate the duplicate page (page 7 and 8 of 8) and to recheck the entire table for correctness. Additional information is needed to explain the differences in Table 2.7-43 and 2.7-44 regarding persistence. Revisions made by AmerenUE may result in a revision to the ER.	None	RAI

Meteorology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
Met-		**Meteorology/Air Quality**			
Met-15	5.3.3.1.1	Provide an SME and supporting data and information to discuss: • The version number and the exact citation for SACTI • How SACTI uses the two sets of met input files (from the 10 m and 90 m levels) • The effects that cooling towers have on cloud formation and precipitation • Low frequency combinations of conditions that might have a major environmental impact • The logic behind why the ESWS cooling towers are "not considered further in this analysis" • The rationale for concluding that "impacts from elevated plumes would be small" • The possibility of plume interaction (thermodynamics and kinematics) • The detailed outputs of SACTI and the logic behind conclusions of "small" or "no impact" or "insignificant increases" • Conclusions for the ESWS cooling towers particularly relative to near-field impacts • The high relative humidity relative to ground level fog • The design wet bulb temperature for the cooling towers • The source of inputs in Tables 5.3-4 and 5.3-5. (Heat dissipation to atmosphere from cooling tower plumes).	AmerenUE needs to clarify how low freguency combinations of conditions that might have a major environmental impact are addressed, given that SACTI calculates impact only for the 50 or so most frequently occurring combinations of conditions. AmerenUE needs to clarify why the ESWS cooling towers are not considered more extensively in the analysis, given that their plumes are closer to the ground and may cause fog and may impact nearby roads and structures. AmerenUE needs to further explain the possibility of plume interaction from multiple cooling towers, and the rationale for concluding that impacts from elevated plumes would be small, given the rather large visible plume lengths (averaging 0.6 to 4.2 km). For all cooling tower effects, the detailed outputs of SACTI is needed to support estimates of impact. Provide additional explanation and supporting information (tables and figures and analysis) concerning relative humidity and increases in ground level fog. Clarify the design wet bulb temperature for the cooling towers, and the source of the inputs in Tables 5.3-4 and 5.3-5. AmerenUE will clarify the distances between Unit 2 cooling towers and Unit 1 cooling tower. AmerenUE referenced NUREG-1437 (cooling tower effects) and needs to revise the text to address potential effects of merging of cooling tower plumes.	None	RAI
Met-16	6.4	Provide access to a site plan/map that shows, by sector, the distance between the meteorological tower and existing obstructions to airflow (including Callaway Unit 1 buildings, cooling tower, paved or improved surfaces, terrain features, trees, and other vegetation), and planned obstructions to airflow (including Callaway Unit 2 buildings, cooling towers, paved or improved surfaces).	AmerenUE will provide a figure that shows listed obstructions to air flow on the met tower and/or a table to list direction and distance to obstructions. They will also add the location of the backup meteorological tower to a figure/map of the site.	None	RAI
Met-17	6.4	Provide an SME to discuss routine operation, maintenance, and calibration of the meteorological tower, instrumentation, data acquisition and recording equipment.	AmerenUS provided a list of Standard Operating Procedures (SOPs) for review during the site audit. These also need to be made available at a reading room.	None	Potential RAI

Meteorology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
Met-		**Meteorology/Air Quality**			
Met-18	6.4	Provide access to the SPOs, related records and documentation regarding, routine operation, maintenance, and calibration, data processing, validation, reporting and archival, and problem reports and corrective action for the meteorological monitoring program covering the POR used in the COLA (i.e., 2004 through 2007).	AmerenUS provided a list of SOPs for review during the site audit. These also need to be made available at a reading room. Verbal discussions by the AmerenUE contractor meteorologist indicated that the delta-T's for high wind conditions had been checked and that they were close to adiabatic. This data (e.g., table or figure) with accompanying text is needed.	None	Potential RAI
Met-19	6.4	Provide access to a table listing percent data recovery and data counts for each year and the composite POR for individual parameters, the joint recovery of wind speed and wind direction, and the joint recovery of wind speed, and direction, and atmospheric stability class (for each wind measurement level).	AmerenUE will provide a table for data recovery as listed in the information needs. Additional information also needed for 90-meter results and for qualification of poor data recovery, where applicable.	None	RAI
Met-A		Provide input and output files from XDCALC and output files from AEOLUS.3	AmerenUE will provide input/output files from XDCALC and output files from AEOLUS 3, in a format that will allow checking with NRC models XOQDOQ and PAVAN. Additional documentation of satisfactory comparisons between non-NRC dispersion models (e.g., AEOLUS and XDCALC) and NRC models (e.g., XOQDOQ and PAVAN) is needed.	None	RAI
Met-B		Submit hourly data in Regulatory Guide 1.23 format; JFDs (joint frequency distribution) for POR 2003 through 2007.	AmerenUE will submit hourly data in Regulatory Guide 1.23 format and JFDs (joint frequency distribution) for POR 2003 through 2007.	None	RAI
Met-C	6.4	More discussion is needed on the instrumentation change in 2007, and the use of backup data during that time.	AmerenUE will provide additional discussion on the instrumentation change in 2007, and the use of backup data during that time.	None	RAI
Met-D	6.4	Description is needed of the Sigma-Theta method for classifying stability and a comparison to traditional classification methods; include how frequently this substitution approach was used during the entire period of record.	AmerenUE will describe, in detail, the Sigma-Theta method for classifying stability and compare it to traditional classification methods; included in the discussion will be how frequently this substitution approach was used during the entire period of record.	None	RAI
Met-E		Need clarification or discussion of how channel checks are performed.	AmerenUE will clarify or discuss how channel checks are performed.	None	RAI
Met F		Manufacturer's specs and results of analysis of the Callaway observations of delta-T are needed in order to justify a quantitative uncertainty estimate for delta-T.	A review of the meteorological tower location, instrumentation, and data collection and QA procedures found them to be adequate. Potentially, a problem is that a temperature difference - measuring device should be used rather than two separate thermometers to determine delta-T. The use of two separate thermometers may lead to larger errors in Delta-T.	None	Potential RAI

Need for Power

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
NP-		**Need for Power**			
NP-1	8.2.1	Provide an SME to discuss the status of the State's review of the integrated resource plan (IRP). Specifically, clarify issues such as 1) recent discussions with the Missouri Public Service Commission (PSC) about revising the IRP; 2) expected schedule for IRP approvals; 3) current PSC issues with the IRP and their resolution.	AmerenUE will provide clarification about all aspects of need-for-power assumptions (especially any potential new partners). They may incorporate this information into a revision to the ER.	None	Potential RAI
NP-2	8.2.1	Provide an SME to discuss how Callaway Unit 2 is integrated into the North American Electricity Reliability Council/ Southeast Electric Reliability Council Long-Term Reliability Assessment.	Any addition of partners may change the region of interest (ROI). Additional information is needed to clarify the potential for new partners. This information may be incorporated into a revision to the ER.	None	RAI
NP-3	8.2.1	Provide an SME to discuss customers for the power to be generated; specifically, clarify issues such as 1) the identity of expected customers (or firm power sales) for the power to be supplied by the proposed facility and any signed agreements for the purchase of the power and 2) an estimate of forecasted power sales by the applicant in the relevant service area. (Note: this information is likely to be business sensitive and/or proprietary information).	This information need was found to be not applicable during the site audit.	None	Resolved
NP-A		Provide an SME to address Noranda's statement that AmerenUE intends to take only a 900-Mw share of the 1600 Mw, per their comments to the PSC on March 16, 2009.	AmerenUE stated that they are not seeking partners.	None	Resolved
NP-B		Provide an SME to address the effect on the ROI if partners are added.	AmerenUE stated that they are not seeking partners.	None	Resolved
NP-C		Provide an SME to address the effect on the Alternatives if the ROI changes.	AmerenUE stated that they are not seeking partners.	None	Resolved
NP-C		Provide an SME to address the effect on cost benefits if tax-exempt partners are added.	AmerenUE stated that they are not seeking partners.	None	Resolved
NP-D		Provide an SME to address the effect on transmission if the partners change.	AmerenUE responded that there would be no change in transmission even with new partners.	None	Resolved
NP-E		With recent and planned future upgrades to the Meramec Plant, provide an SME to discuss the rationale that was used to determine a 2021 retirement date for all four units.	AmerenUE will provide a written response clarifying these issues. Their response may be incorporated into a revision of the ER.	None	Potential RAI
NP-F		Provide an SME to clarify the discrepancy between a 2017 operational date in the ER text, and information in Table 8.4-1, which indicates Unit 2 will not be operational until 2020.	AmerenUE will provide a written response clarifying these issues. Their response may be incorporated into a revision of the ER.	None	Potential RAI

Need for Power					
Info needs #	**ER Section**	**Information Needs**	**Status**	**Document Requests**	**Resolved**
NP-		**Need for Power**			
NP-G		Provide an SME to rectify the planned 2017 operational date with Tables 8.2-3 and Tables 8.4-1 which indicate that the need for 1600 MW is not reached until 2023/2024.	AmerenUE will provide a written response clarifying these issues. Their response may be incorporated into a revision of the ER.	None	Potential RAI
NP-H		Provide an SME to explain what the "probable environmental benefits test" is and how it is applied (ER RV 0, page 8-11).	AmerenUE will provide a written response clarifying these issues. Their response may be incorporated into a revision of the ER.	None	Potential RAI
NP-I		Provide an SME to describe the new high forecast growth rate requested by the PSC and address the implications on the timing for the need for power and AmerenUE's construction planning process.	AmerenUE will provide a written response clarifying these issues. Their response may be incorporated into a revision of the ER.	None	Potential RAI
NP-J		Provide an SME to address a possible error under Sioux description in ER RV 0 page 8-63. Shouldn't this be Callaway instead of Sioux?	AmerenUE will provide a written response clarifying these issues. Their response may be incorporated into a revision of the ER.	None	Potential RAI
NP-K		Provide an SME to clarify statements made within the Chapter 1 on the purpose and need, regarding of what kind of power is to be provided, to what area will it be supplied, and the schedule for supplying the power.	AmerenUE will provide a written response clarifying these issues. Their response may be incorporated into a revision of the ER.	None	Potential RAI

Benefit-Cost

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
BC-		**Benefit - Cost**			
BC-1	10.4	Provide an SME to discuss the projected costs and cost components/factors for the construction and operation of the project and the sources upon which these projections are based. Be prepared to explain how and why these costs compare to other proposed nuclear power plants and what has been done to provide bounding estimates of these costs and whether they are expressed in current or constant dollars.	AmerenUE was reluctant to provide updates and costs. Project-specific information rather than generic (and older) estimates of project materials and costs are needed.	Reference sources for data and assertions in Section 10.4.	RAI
BC-2	10.4	Provide an SME to discuss projected current-dollar estimates of the annual tax benefits expected to be paid because of constructing and operating the new operating unit over the lifetime of the new plant. The discussion should include historic and expected property taxes paid to Callaway County (and other tax recipient counties), expected annual sales taxes paid to the State of Missouri, and any expected corporate taxes paid to jurisdictions affected by the plant.	AmerenUE will provide tables and text.	None	Potential RAI
BC-3	10.4	Provide an SME to explain and discuss how the Federal incentives provided by the Energy Policy Act of 2005 are expected to specifically mitigate projected construction and operations costs over the life of the proposed facility. The SME should quantify the anticipated amount of Federal incentives likely to apply to the proposed action from the following: • Production tax credit for the first advanced reactors brought online in the United States • Federal risk insurance benefits expected as part of the Nuclear Power 2010 Partnership. The expert should also describe the expected impact of these incentives in terms of their role in making the project economically viable, and the impact on the proposed action in case Callaway Unit 2 does not qualify for some or all of the incentives.	AmerenUE provided sufficient information during discussions at the site audit.	None	Resolved
BC-4	10.4	Provide an SME to discuss the important conclusions to be drawn from the summary in Table 10.4.1.	AmerenUE will clarify conclusions drawn from Table 10.4.1.	None	Potential RAI
BC-5	10.4.1	Provide an SME to discuss 1) the benefits of the project that might be nonquantifiable or nonmonetary and 2) if and how the forecasted benefits from electricity consumption have been independently verified.	AmerenUE will provide a written response clarifying the electrical demand being met by the new unit. Unit 2 specific information was not available at the time of the meeting.	See NP-G above	Potential RAI

Non-Rad Human Health

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
NRHH		**Non-Rad Human Health/Noise**			
NRHH-1	4.4.1, 4.7	Provide an SME to discuss public and occupational health, and noise associated with preconstruction and construction activities. The discussion should include examples or controls that would be imposed to mitigate air emissions during construction activities; specific references to air quality and noise limit regulations; distance to nearest accessible area that could be impacted by noise (e.g., closest resident to the fence line); schedule for construction activities (e.g., will construction be 24/7?); and peak noise levels during construction activities.	AmerenUE provided SMEs to discuss plant practices for minimizing dust and other emissions (vehicle etc) during construction. This topic was adequately addressed in general ecology-related discussions and in discussion on site and technical oversight (see ST-4).	None	Resolved with ST-4
NRHH-2	5.3.4.1	If available, provide access to any correspondence with the Missouri Department of Health and Senior Services regarding public health concerns from thermophilic microorganisms (etiological agents) from cooling waters.	Neither the applicant nor Rizzo is aware of consultation with DOH.	None	Resolved
NRHH-3	5.3.4.1	Provide an SME to discuss potential thermophilic microorganism impacts from cooling water discharge to the Missouri River. The discussion should include the proximity and types of recreational activities occurring near the cooling water discharge.	AmerenUE will provide documentation on recreational proximity, including an activity figure or statement. This information may be incorporated in a revision of the ER.	None	Potential RAI
NRHH-4	5.3.4.1	Provide an SME to discuss occupational health in association with operation and maintenance activities of cooling towers and protection of workers from thermophilic microorganisms. Discussion to include examples of personal protective equipment or activities implemented when working in and around the cooling towers.	AmerenUE provided a response binder for review during the site audit that described the worker safety process related to the cooling system. It is important to be able to cite this information. This information may be incorporated in a revision of the ER.	None	Potential RAI
NRHH-5	5.6.3	Provide an SME to discuss the following associated with the transmission system: ozone, electrostatic effects (electric shock), and conformance with the National Electricity Safety Code concerning steady-state currents.	The specific alignment and pole design have not been finalized; therefore, the analysis has not been completed. AmerenUE stated any line built would conform to the standards. Results of more specific analysis are needed. This information may be incorporated into a future ER revision, which may add analytic results demonstrating that standards will be met.	None	Potential RAI
NRHH-	10.5	Provide an SME to discuss cumulative nonradiological	Electrostatic effects, electro-	None	Potential RAI

Non-Rad Human Health

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
NRHH		**Non-Rad Human Health/Noise**			
6		human health impacts of construction and operation including etiological agents (formerly thermophilic organisms), noise, electrostatic effects (electric shock), and electromagnetic field effects. Discuss other activities, either existing or planned in the area, that should be considered in cumulative impacts.	magnetic effects, and thermophilic organisms were discussed with AmerenUE. They will provide a written response based on information in a binder that was made available at the site audit.		
NRHH-A		Provide access to a copy of NDES permit No MO-0098001 for Outfall 2007, if available.	NDES permit No MO-0098001 for Outfall 2007 has been transmitted to NRC, and it is docketed under Docket Number 50-483.	None	Resolved
NRHH-B		Provide an SME to discuss the mixed waste minimization program at the plant.	The waste minimization plan for mixed waste is an informal plant procedure.	Procedure for mixed waste minimization plan.	RAI

Socioeconomics

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
SE-		**Socioeconomics/EJ**			
SE-1	2.5.1	Provide an SME to discuss the "baseline" population forecasting methods and assumptions.	AmerenUE provided a general verbal description of the forecasting methods. However, it is not clear that the method has been described in a document. Documentation is needed on the methods used to determine baseline population forecasting.	Documentation on baseline population forecasting.	Potential RAI
SE-2	2.5.2 (pp.2-368)	Provide an SME to discuss sources of tax information and budgets (e.g., 2-368).	Tax expert, Chris Cudney (AmerenUE), provided a description of the taxes paid by AmerenUE to local jurisdictions and documentation of rates and amounts distributed to local jurisdictions. Information is needed to clarify the local tax system and tax payments, and to provide source documentation for all tables in the ER. AmerenUE may provide written responses that may be incorporated into a revision to the ER.	References used to create tables presented in the ER.	Potential RAI
SE-3	2.5.2	Provide an SME who can discuss the distribution of tax payments for Unit 1 in quantitative terms and their impacts on neighboring jurisdictions and service levels.	Tax expert, Chris Cudney (AmerenUE), provided a description of AmerenUE taxes to local jurisdictions and provided documentation of rates and amounts distributed to local jurisdictions. Additional information is need on source documentation for all the tables in the ER. AmerenUE may provide written responses that may be incorporated into a revision to the ER.	References used to create tables presented in the ER.	Potential RAI
SE-4	2.5.2	Provide an SME who can discuss how the service levels in the various jurisdictions compare to national or state standards and to pertinent officials' assessments of adequacy.	AmerenUE indicated that Missouri had no service standards. Additional information is needed on per capita rate information.	Documentation on per capita rate information.	Potential RAI
SE-5	4.4, 5.8	Provide an SME who can discuss the residential patterns and commuting routes of workers on Unit 1, for both historic construction and current operations workers.	No one was available who had been present during peak construction of Unit 1. Additional information is needed on the residential patterns and commuting routes of construction workers for Unit 1.	None	RAI
SE-6	2.2.1, 4.1.1	Provide knowledgeable expert to discuss status of developing County Planning Commissions.	This information was obtained from the community interviews; no authorization for county planning/zoning has yet passed the legislature.	None	Resolved

Socioeconomics

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
SE-		**Socioeconomics/EJ**			
SE-7	2.5.4	Provide an SME to discuss the source of information about the characteristics and life-style attributes of minority populations in the ROI and nearby communities beyond census data.	A survey was conducted of knowledgeable individuals to obtain information about local minority populations. Copies of survey questions and list of individuals contacted are needed. Better descriptions of sources used to determine Environmental Justice description and analysis are needed.	Documentation on the survey of minority populations. References used to prepare the Environmental Justice description and analysis.	Potential RAI
SE-8	2.7.7, 3.7.3, 4.4.1, 5.3, 5.8	Provide an SME and supporting data and information to describe the results of the noise analysis, in terms of the noise levels at the site boundaries (in addition to the general rules about sound attenuation).	Documentation related to calculation of noise levels at site boundaries and along local access roads is needed.	Documentation on calculation of noise levels.	Potential RAI.
SE-9	4.4	Provide an SME to discuss the projected composition of the workforce during the construction phase; the distribution between construction, operations, and security personnel during the construction phase; and the shift schedules of these different groups (and the availability of data from the construction and operation of Unit 1 that might inform the analysis).	AmerenUE will provide a revised table of the construction phase workforce indicating craft workers, supervisors, etc., and operations workers (Unit 2) over time throughout the construction period. Additional information is also needed to clarify shift schedules.	None	Potential RAI
SE-10	4.4, 5.8	Provide an SME who can discuss the traffic analysis, including traffic from both workers and materials entering and exiting the site, the numbers of vehicles expected to be on each of the major access routes and their affect on traffic congestion, Levels of Service, and who can identify and discuss the impacts of this traffic on affected populations, including the impacts of the workforce onsite during outages.	PNNL will request time series ADT data from the Missouri Department of Transportation.	None	Resolved
SE-11	4.4	Provide an SME who can discuss the local populations that will be affected by the construction activities, particularly those within 10 to 15 miles of the site.	Additional information is needed about nearest residents, and their distance from the nearest point of construction activity, as well as the results of the noise analysis, with data indicating dBL at site boundary and nearest residences.	None	Potential RAI

Socioeconomics

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
SE-		**Socioeconomics/EJ**			
SE-12	4.4	Provide an SME to discuss the basis for the assumptions and calculations concerning the residential location and characteristics of the construction workforce and the impact of their employment on the local and area economy and employment, including the use of the RIMS II multipliers, assumptions about who would fill the indirect jobs, and consequences for area demographics. The discussion should cover from where the workforce during construction is assumed to originate and where its members are assumed to reside, including those expected to be weekly commuters (i.e., residing in the ROI during the work week), including how this relates to the survey information referenced on p. 4-71. It should also include discussing the numbers of different types of workers over the construction period, including those estimated to reside currently in the ROI. If available, provide for review, a graph and tables showing the numbers of these different groups over time and the estimated number of people, families, and school age children estimated to be in the local communities and counties of the estimated impact area (EIA) because of the project.	AmerenUE indicated that assumptions were based on survey of area unions and residence of current workers and survey of housing. Additional information is needed on the source/references for tables and for data cited in text. Reference information is also needed for the summary of housing data/interpretation of table (discussed on p. 2-360).	Copy of the Fohey letter (survey of craft unions) regarding availability and potential location and housing choices of construction phase workers. Also information about the residential location of Unit 1 operating personnel at the level of towns and cities.	Potential RAI
SE-13	4.4.2.2 (pp.4-70-71)	Provide an SME to discuss when site-specific workforce estimates are expected to be available.	AmerenUE will provide better estimates.	None	Potential RAI
SE-14	4.4.2.5	Provide an SME to discuss the assumptions about the residential location choices of the construction phase workforce including the basis of those assumptions and how they compare with information from the construction of Unit 1. In particular, discuss how many temporary and in-migrating workers would be distributed into the communities in Callaway County. Provide information about the sources of the assumptions/estimates of distribution of workers into the migration categories and of the total wages and wage rates presented in the ER (p. 4-73).	Needed information was provided.	None	Resolved

Socioeconomics

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
SE-		**Socioeconomics/EJ**			
SE-15	4.4	Provide an SME to discuss how housing prices and availability, including temporary housing, were affected during the construction of Unit 1, particularly in Callaway County, and how they are likely to be affected by the construction of Unit 2, particularly in the residential neighborhoods and communities closest to the site.	Needed information was provided.	None	Resolved
SE-16	4.4, 5.8	Provide an SME who can discuss expenditures for plant construction and operation other than wages that would occur in the EIA, and their effect on local employment, income, and tax receipts.	AmerenUE will rewrite the section; may involve a revision to the ER.	None	Potential RAI
SE-17	4.4, 5.8	Provide an SME to discuss how the increased demand resulting from project-related populations and activities, and tax revenues would affect impacts (e.g., schools in Boone County).	Discussions with the tax expert clarified this information. Additional information will be addressed through community interviews.	None	Resolved
SE-18	4.6, 5.10	Provide an SME to discuss the analysis of potential pathways by which it was determined that minority and low-income populations would not be affected disproportionately by adverse impacts.	Environmental Justice calculations were based on average population within a 50 mi radius; this needs to be recalculated based on the State-wide average. Updated calculations of minority and low-income populations and updated maps are needed. This information may be incorporated into a revision to the ER.	None	RAI
SE-19	5.8	Provide an SME to discuss when the estimated 363 operations phase workers for Unit 2 would arrive on site, including whether a majority of them would start work during the construction phase of the project, and how this would affect the assessment of operations-phase impacts.	See SE-9.	None	RAI
SE-20	5.8	Provide an SME to discuss the challenges for area communities to adjust to the rapid decline in employment following the construction phase, and how this affects the characterization of impacts of the operations phase.	Additional information is needed to clarify and expand discussion of employment declines.	None	RAI
SE-21	4.6, 5.10	Provide an SME to discuss the basis for the conclusions about the magnitude of impacts assigned to the EIA from employment, income, taxes, and housing, with particular attention to consistency between construction and operations phases.	Additional information is needed to clarify and expand discussion of employment declines.	None	RAI

Socioeconomics					
Info needs #	**ER Section**	**Information Needs**	**Status**	**Document Requests**	**Resolved**
SE-		**Socioeconomics/EJ**			
SE-A	4.4	Provide estimate of construction phase worker distribution into 1) nonmoving, daily commuters; 2) weekly commuters; 3) movers, and their expected distribution within counties and cities.	Discussions during the site audit indicated that AmerenUE expects workers to fall within these three categories. AmerenUE will provide information used for the economic and housing analyses.	None	Potential RAI

Site and Technical

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
ST-		**Site and Technical Oversight**			
ST-1	1.3	Provide an SME to clarify the status of environmentally related authorizations required by Federal, State, regional, local, and affected Native American tribal agencies.	AmerenUE addressed these authorizations in their presentation on permitting, but the current version of the ER is not up-to-date. AmerenUE will revise Table 1.3-1 that maybe incorporated into a future ER revision.	None	RAI
ST-2	2.2, 3.1	Provide aerial photographs and perspective drawings of the site (such as high-oblique aerial views that show the facility and the site boundary).	AmerenUE will provide all ER figures (see G-1 and G-7).	None	Potential RAI
ST-3	4.1	Provide an SME and topographic maps to describe the construction zone and land to be cleared (including transmission line and transportation line rights-of-way).	AmerenUE will provide all needed figures (see G-7).	None	Potential RAI
ST-4	4.6	Provide SMEs to discuss the measures and control/operational procedures to limit potential impacts (such as noise, erosion, dust, traffic, waste, surface water, and groundwater).	AmerenUE will review procedures (best practices, DNR, safety, etc.) used during construction processes and provide that information.	Control and Operation Procedures (ground maintenance, erosion, traffic)	Potential RAI
ST-5	5.1	Provide an SME to discuss possible buildup of radionuclides in the environment, such as in sediments.	Discussions indicated that this information is adequately addressed in the Health Physics sections.	None	Resolved

Transportation

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
T-		**Transportation**			
T-1	5.11.2	Provide an SME and supporting data and information to support the decay heat generation rate of 5.450 kW.	AmerenUE will review the calculation, and provide an updated number if necessary.	None	Potential RAI
T-2	3.8, 5.11, 7.4	Provide access to the Transportation Calculation Package for the calculations in ER Sections 3.8, 5.11, and 7.4 (including the basis for the number of shipments, the TRAGIS output files, RADTRAN 5.6 input and output files, spreadsheets used to perform the nonradiological transportation analyses, and reference citations for the data used in RADTRAN 5.6).	Information was provided and reviewed at the site audit.	None	Resolved
T-3	5.11	Provide an SME and supporting data and information to discuss the transportation calculations, and provide references for the "RADTRAN Input from NRC Models" contained in Table 5.11-3, and "Additional RADTRAN Input Parameters" in Table 5.11-8.	Information was provided and reviewed at the site audit.	None	Resolved
T-4	7.4	Provide an SME and supporting data and information to discuss the transportation calculations in Section 7.4 and possible under-reporting resulting from the use of the Motor Carrier Management Information System.	PNNL will provide reference citation that illustrates use of Blower and Matteson data to account for under-reporting. Applicant will evaluate use of Blower and Matteson data in adjusting Saricks and Tompkins data. Evaluation may result in a revision to the ER, if appropriate.	None	Potential RAI
T-5	7.4	Provide an SME to explain how release fractions are used in the transportation accident analyses, and provide the assumptions to support the selection of these release fractions (e.g., describe the release fraction for Category 8 accidents in Table 7.4-5 compared to the original source for this data [NUREG/CR-6672, Table 7.31, p. 7-73]).	AmerenUE will evaluate use of original data from NUREG/CR-6672 in RADTRAN analyses. Evaluation may result in a revision to the ER.	None	Potential RAI
T-6	10.2.2	Provide an SME and supporting data and information to discuss assumptions for the preconstruction and construction material estimates.	Information was provided and reviewed at the site audit.	None	Resolved
T-7	5.11, 7.4	Provide an SME and supporting data and information to clarify how the numbers of shipments of unirradiated fuel, irradiated fuel, and radioactive waste were estimated.	Information was provided and reviewed at the site audit.	None	Resolved
T-8	5.7.8, 5.11, 7.4	Provide an SME and supporting data and information to clarify how the numbers of shipments and impacts were normalized to the 1100 MW (e) reactor.	Information was provided and reviewed at the site audit.	None	Resolved
T-9	4.4, 5.8	Provide an SME and supporting data to clarify how to partition the number of construction workers into the preconstruction and construction periods.	Partitioning would apply only if the applicant decided to pursue a Limited Work Authorization (LWA). It was determined at the site audit that an LWA was not being pursued by AmerenUE.	None	Resolved

Transportation

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
T-		**Transportation**			
T-a		In reviewing data in Transportation binder, discrepancies between data in ER and data in TRAGIS output in Transportation binder were discovered. (ER Tables 7.4-11, 7.4-7, and 7.4-6)	AmerenUE will review data provided in the Transportation binder at the site audit and in the ER. This review may result in a revision to the ER.	None	Potential RAI
T-b		Provide reference for Table 7.4-3.	AmerenUE will provide reference.	Reference for Table 7.4-3.	Potential RAI
T-c		For RADWASTE, radiological accident risks are based on using release fractions for spent nuclear fuel contained in Type B containers. For RADWASTE, this may be nonconservative, because RADWASTE will not perform as well as spent nuclear fuel during accidents.	AmerenUE will evaluate use of alternative release fractions. Evaluation may result in a revision to the ER.	None	Potential RAI
T-d		ER, page 7-63, states that the result from RADTRAN is 3.20E-8 person-Sv for RADWASTE radiological accidents. This value does not match the result in the RADTRAN run provided in the Transportation binder, which was 2.87E-8 person-Sv.	AmerenUE self-identified this issue, and will make changes in any revisions to the ER.	None	Potential RAI
T-e		The radionuclide inventory in the RADTRAN run did not match the radionuclide inventory in Table 7.4-10 of the ER.	AmerenUE self-identified this issue, and will make changes in any revisions to the ER.	None	Potential RAI
T-f		Table 5.11-3 lists the suburban population density as 326.5 people/km^2, while the RADTRAN run lists the population density as 326.0 people/km2.	AmerenUE will review data in Transportation binder and the ER, and will revise if appropriate.	None	Potential RAI
T-g		Provide reference for Table 7.4-10.	AmerenUE will provide reference.	References used for Table 7.4-10.	Potential RAI
T-h		Provide reference for 1.6 and 1.5 people/vehicle in Table 5.11-8.	AmerenUE will provide reference.	References used for Table 5.11-8.	Potential RAI
T-i		Provide reference for crew distances of 3.1 and 5.45 in Table 5.11-8.	AmerenUE will provide reference.	References used for Table 5.11-8.	Potential RAI
T-j		In the Transportation binder, a capacity factor of 92% was used to normalize shipments. In the ER (page 3-26), a capacity factor of 95% used.	AmerenUE will determine which capacity factor to use in normalizing shipments. Their evaluation may result in a revision to the ER.	None	Potential RAI
T-k		The reference "Application of Advanced Construction Technologies to New Nuclear Power Plants," (Sept. 24, 2004) was used as the reference for concrete and rebar in the ER (Section 10.2.2). This reference was developed based on four reactor designs, the ABWR, ESBWR, AP1000, and ACR-700. Provide justification for the use of the construction material estimates in this report for a US EPR.	AmerenUE will review information in the report. This review may result in a revision to the ER.	None	Potential RAI

Transportation

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
T-		**Transportation**			
T-l		From the data in Table 4.2-1, footnote "c" of the ER, a volume of concrete of 402,000 yd^3 is estimated for concrete. (6700 yd^3/yr x 12 mo/yr x 5 yrs= 402,000 yd^3). In Section 10.2.2 of the ER, 195,139 yd^3 of concrete is estimated for construction (12,239 yd^3 + 182,900 yd^3= 195,139 yd^3).	AmerenUE will review information in the ER, and provide updated estimates of concrete and constituents (cement, sand, aggregate). Their review may result in a revision to the ER.	None	Potential RAI
T-m		Provide MoDOT and RIZZO traffic references discussed during cumulative impacts meeting on March 25, 2009.	AmerenUE will provide studies or reference citations to studies.	References for traffic studies.	Potential RAI
T-n		Provide estimates of the amount of backfill that would be shipped to the site during construction (discussed in Section 4.2.1.2, page 4-17 of the ER).	AmerenUE will provide information on volumes of backfill.	None	Potential RAI
T-o		How will the sanitary waste generated during construction and during outages be shipped offsite (i.e., what volume will be shipped per truck), and where would it be shipped (discussed in Section 3.6.2, page 3-123, and Section 5.5.1.5, page 5-87 of the ER)?	AmerenUE will provide requested information.	None	Potential RAI
T-p		How much nonradioactive, nonhazardous waste will be generated and shipped offsite for disposal per year during construction and operations, and where would it be disposed of (discussed in Section 3.6.3.5 of the ER)?	AmerenUE will provide requested information.	None	Potential RAI

Terrestrial Ecology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
TE-		**Terrestrial Ecology**			
TE-1	2.4.1.1	Provide an SME to describe U.S. Geological Survey (USGS) 2005 Land Use and Land Cover (LULC) mapping for the ecological investigation area and the 2006 National Agricultural Imagery Program (NAIP) aerial photo interpretation of existing land cover with field reconnaissance on the site, especially in habitat areas that may be utilized by important species. Also, provide sample items of LULC and NAIP materials used in mapping terrestrial habitats.	The methods were explained satisfactorily at the site audit. Information contained in the Terrestrial Ecology binder at the site audit is needed.	None	Potential RAI
TE-2	2.4.1.2.1.3	Provide an SME and supporting references to support the statement that historically, Indiana bats have been observed in the vicinity. Provide access to the Clawson (2003) and MDC (2007d) references. Provide access to any correspondence with federal or state agencies, regarding threatened or endangered species or critical habitats.	Information contained in the Terrestrial Ecology binder provided at the audit is needed.	None	Potential RAI
TE-3	2.4	Make copies of all cited references available.	Bibliography was reviewed and a list of required documents was developed.	List of required documents provided in separate file, including the SOP.	RAI
TE-4	2.4.1.1	Provide an SME to discuss the methods used to map and quantify habitat distribution onsite, methods and locations of wildlife and plant surveys, and methods used and expertise of persons identifying species sighted, heard, or trapped, especially threatened and endangered species.	Method details are in the SOP that was made available at the site audit. Resumes were also made available and were reviewed for relevant expertise. This information need maybe resolved with a conference call with U.S. Fish and Wildlife Service (USFWS) and the Missouri Department of Conservation (MDC).	SOP	Potential RAI
TE-5	2.4.1.2.4	Provide an SME and supporting data and information to discuss the Federally listed running buffalo clover relative to suitable habitat in cover types known to be present at Callaway (e.g., forest-grassland interfaces and stream corridors). Provide access to a description of any survey efforts for State-listed plant species.	Agency consultation letters were reviewed. These did not identify running buffalo clover or any state S1 species. The plant surveys appeared to be comprehensive and these species were not observed. This information need maybe resolved with a conference call with the USFWS and the MDC.	None	Potential RAI

Terrestrial Ecology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
TE-		**Terrestrial Ecology**			
TE-6	2.4.1.4	Provide an SME and supporting data and information/ references to support the statement. "The only disease vector known to occur on the AmerenUE property is the deer tick (*Ixodes scapularis*) which has been known to transmit Lyme disease to humans."	Public health advisory information was provided at the site audit. This information is available on the Internet.	None	Resolved
TE-7	2.4.1.4	Provide an SME and supporting data and information/ references to support the statement, "No pest species are known to be widespread or cause serious problems at the AmerenUE property and surrounding ecological investigation area."	The Reform Conservation Area 10-Year Management Plan was reviewed at the site audit.	Reform Conservation Area 10-Year Management Plan	RAI
TE-8	2.4.2.1.1.4	Provide an SME and supporting data and information to discuss the jurisdictional status of wetlands and the status of whether the U.S. Army Corps of Engineers or other stakeholder agencies concur with the findings of the wetland delineation.	Resolution of information need is contingent on completion of the jurisdictional wetland report which is due in May or June 2009, functional assessment for the Molly Dozier chute (Table 2.4-14), and an enhanced conceptual discussion of wetland mitigation.	Preliminary Jurisdictional Determination	RAI
TE-9	4.3.1.3	Provide an SME and supporting data and information/ references to discuss all (local, state and federal) permitting aspects associated with construction impacts to wetlands, streams, and rivers, and any state or local guidance documents.	Resolution is contingent on jurisdictional wetland report. Local permitting was adequately explained at the site audit.	None	RAI
TE-10	4.3.1.3	Provide an SME and supporting data and information/ references to discuss how collector well sites were determined to ensure adequate water supply while limiting potential environmental impacts, including possible location of all three collector wells to the land side of the levee to reduce wetland impacts.	AmerenUE provided a hydrologist who explained the differences in elevations between the groundwater levels and the ground surface, suggesting that the wetlands along the river bank are perched and will not be affected by aquifer drawdown.	None	Resolved
TE-11	4.3.1.3	Provide an SME and supporting data and information/references to discuss the potential impacts to the Mollie Dosier Chute associated with culvert construction. For example, was this area included in the preoperational sampling? Is there any reason to believe that threatened and endangered species might exist there?	Existing surveys were adequately discussed at the site audit.	None	Resolved

Terrestrial Ecology

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
TE-		**Terrestrial Ecology**			
TE-12	5.2.1.3	Provide an SME to describe how wetlands could be affected by hydrological changes caused by the collector well system. For example, what do groundwater model results predict in terms of water level changes below wetland areas and the associated effects?	AmerenUE provided a hydrologist who explained the differences in elevations of groundwater levels and the ground surface. Additional information is needed on ground surface levels in the Molly Dozier Chute (such as those based on the Site Layout Corridor and Flood Plain Areas map 8600-x-89931, Rev. 12); and wetland delineation soils data.	None	RAI
TE-13	5.3.3.2.4	Provide an SME and access to additional information on bird collisions with cooling towers, construction cranes, and other tall structures, including both migratory and resident birds.	This information is available in the Annual Reporting and Environmental Management Plan.	None	Resolved
TE-14	5.3.3.2.1	Provide an SME to discuss the effects of salt deposition on vegetation. Provide access to a figure overlaying maximum salt deposition isopleths over terrestrial and wetland habitats.	The results of calculations are provided in the ER.	None	Resolved
TE-15	5.6.1.3	Provide an SME to discuss how vegetation management will be implemented on the site and transmission line rights-of-way, including herbicide application methods, herbicides to be used, and vegetation removal methods.	A satisfactory explanation of herbicide application was provided; herbicides are applied in accordance with standard applications procedures.	None	Resolved
TE-16	6.5.1.1	Provide an SME and supporting data and information to discuss construction and operational monitoring related to terrestrial and wetland resources.	Information is available in the Annual Reporting and Environmental Management Plan.	None	Resolved
TE-17	4.1.2, 4.3	Provide an SME to clarify the status of transmission line route selection, whether important species surveys have been conducted in these routes, and the transmission line impacts to wildlife.	The SOP was reviewed and the transmission line route is set per the ER; poles will be placed to avoid impacts to wetlands. Copies of the information contained in the Terrestrial Ecology binder provided at the site audit are needed.	None	Potential RAI
TE-18	10.5	Provide an SME to discuss cumulative impacts of preconstruction, construction and operation on ecologically important species on the site. Discuss what other activities are in the area or planned for the area that should be considered in cumulative impacts.	The Reform Conservation Area will provide for species rebound after construction; there are no other projects in the region. A copy of the management agreement for the reform conservation area is needed.	Management Agreement for the Use of Public Lands, Reform Conservation Area (January 15, 2009)	RAI

Transmission Lines

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
TL-		**Transmission Lines**			
TL-1	2.2.2, 4.1.2	Provide an SME to clarify the status of the construction within the transmission line right-of-way described on p. 2-13 of the ER and its relationship to decisions regarding extension/modifications of the transmission line right-of-way associated with Unit 2, particularly about the timing of the Callaway-Loose Creek connection and its relationship to the transmission line modifications contemplated for Unit 2.	AmerenUE will provide acreage for the transmission line easement.	None	Potential RAI
TL-2	2.2.2, 3.7, 4.1.2	Provide an SME to discuss all aspects of the transmission line rights-of-way and switchyards for Unit 2, including the siting process (what is meant by an “extension”) and the attributes and management of the right-of way, including, for example, seasonal access for maintenance and whether widening the corridor will affect the Reform Conservation area, and to review how the construction of a new transmission line is addressed in different chapters of the ER, and to clarify what is meant on p. 3-133 by the statement that, “The transmission corridor siting is currently undergoing evaluation by the Midwest Independent Transmission System Operator (MISO) and has not been established. Therefore, construction of the transmission line required for the Callaway Plant Unit 2, as well as all impacts, are considered independent from the Callaway Plant Unit 2 project...”	AmerenUE will provide a map and calculation of nearest residential locations at the south end of the proposed new transmission line.	None	Potential RAI

General Info Needs

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
G-		**General Information Needs** To the extent not identified in the subject matter areas addressed above, provide the following general information.			
G-1		Provide originals of all ER figures (both line drawings and photographs) in .jpeg, .png, or .tif format at a resolution of at least 300 dpi, sized correctly, with legends. The information in the figures must be legible in when reproduced black and white or grayscale. (Figures for wind roses need not be included.)	AmerenUE was concerned about the number of figures to be converted to Black and White, and the need for native formats. There were also concerned about version control. NRC will provide a list of prioritized figures for Black and White conversion to AmerenUE and AmerenUE will look into the issues involved. A more discrete path forward will be discussed in a conference call.	None	Potential RAI
G-2		Provide SMEs and supporting information (including assumptions, calculation packages, and consultation letters) in appropriate disciplines to support all statements made and conclusions reached.	SMEs and supporting information were provided during the site audit.	None	Resolved
G-3		Make all references cited in the ER available.	AmerenUE will triage the document list into those publically available, those available at a website, and those that are proprietary. Resolution is dependent on establishment of reading room(s), perhaps in Richland, Washington, and Washington, D.C.	All ER references	Potential RAI
G-4		Make available SMEs and supporting information used to support statements and conclusions in the ER.	SME's and supporting information were provided as needed.	None	Resolved
G-5	Tables 10.1-1 and 10.1-2	Provide SMEs in appropriate disciplines to discuss contents of Tables 10.1-1 and 10.1-2 and assure consistency between the contents of the summary tables and the results of information needs discussions. It is anticipated that this will be addressed in specific breakout sessions for the individual disciplines.	AmerenUE provided a briefing on cumulative effects (e.g., Table 10.1-1 and 10.1.2) at the site audit.	None	Resolved

General Info Needs

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
G-		**General Information Needs** To the extent not identified in the subject matter areas addressed above, provide the following general information.			
G-6		Provide large wall map(s) at the site audit that show key features related to the proposed project, including: • Proposed temporary and permanent facilities • Proposed construction laydown areas • Proposed intake pipeline • Proposed collector wells • Proposed discharge pipeline • Proposed transmission corridor(s) • Property boundaries • Points of interest (e.g., nearby residences, gas pipelines, nearby industries, including quarries/mines) • Proposed rail line spur • Proposed haul roads.	Wall maps showing requested features were provided at the site audit.	None	Resolved

General Info Needs

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
G-		**General Information Needs** To the extent not identified in the subject matter areas addressed above, provide the following general information.			
G-7		Provide access to all GIS and/or CAD data/databases used to support the ER analysis and results, including existing and proposed conditions as appropriate. The data should generally include, but are not limited to: • All existing and proposed site infrastructure (roads, buildings, intake/discharge pipelines, transmission lines, utility/transmission line rights-of-way, power blocks, switchyards, pipeline corridors, cooling and retention ponds, dams, canals, rail lines, monitoring/instrument stations, etc.) • Location data (official property boundary, official unit point location, exclusion area boundary, and other relevant boundaries on-site or regionally) • All surface and groundwater hydrologic data (watershed/subbasin boundaries, stream/river channels, springs, sinkholes, flood boundaries, reservoir boundary, site stormwater drainage, levees, hydrogeologic study boundaries, aquifers, potentiometric contours, well locations, surface water monitoring sites, etc.) • All terrestrial and aquatic ecological data (wetlands, ponds, terrestrial and aquatic sampling sites, wildlife/habitat areas, land use/land cover, and threatened and endangered species locations) • Terrain and bathymetric data (LiDAR, contours, river cross sections, bathymetric point samples, etc.) • Socioeconomic data (sector data at various radii, census blocks with attribute data including low income and minority data, state/county park recreational area boundaries, trails, water trails, wildlife management units, traffic count data, commuter routes, etc.) • Geology and soils data (site and vicinity data, faults, folds, seismic activity, etc.) • Alternative (candidate) site data (point locations, proposed site boundary, proposed infrastructure, etc.).	A prioritized list of GIS files was given to AmerenUE at the site audit. AmerenUE will provide the needed files as requested.	None	Potential RAI

General Info Needs

Info needs #	ER Section	Information Needs	Status	Document Requests	Resolved
G-		**General Information Needs** To the extent not identified in the subject matter areas addressed above, provide the following general information.			
G-8	4.0, 10.0	Provide SMEs to discuss preconstruction vs. construction impacts associated with each subject area (e.g., land use, surface water), and provide estimated percentages of the preconstruction impacts relative to the total construction impacts described, as well as the basis for those estimates.	AmerenUE provided a new table (Table 4.6-2) that addressed preconstruction versus construction impacts, for review at the site audit (in binder). AmerenUE will formally provide this information for docketing and possible inclusion in a revision of the ER.	None	RAI
G-A	Section 1.0	Update all ER figures and text to reflect new property boundaries	AmerenUE staff clarified this issue, stating that all property affected by Callaway 2 is solely owned by AmerenUE, but that the AmerenUE property near the collector wells is not currently part of the official Callaway Unit 1 site.	None	Resolved

Attachment 4

Table 3. List of Priority Documents Requested.

Sections	References	Comments
Accidents		None specifically identified.
Alternatives		None specifically identified.
Aquatic Ecology		
2.4.3	Camp, Dresser and McKee, Inc. (CDM). 1981. Water quality and aquatic biological preoperational monitoring program for the Callaway Nuclear Plant, Volume 1. Unpublished report. Milwaukee, WI.	
2.4.3	Camp, Dresser and McKee, Inc. (CDM). 1982. Water quality and aquatic biological preoperational monitoring program for the Callaway Nuclear Plant, Volume 2. Unpublished report. Milwaukee, WI.	
2.4.3	Kallemeyn, L.W. 1983. Status of the pallid sturgeon. Fisheries 8:3-9.	
2.4.3	MDC, 2007m. Missouri Department of Conservation, Heritage Review Report, July 13, 2007.	
2.4.3	Missouri Department of Natural Resources (MDNR). 2002. Semi-quantitative macroinvertebrate stream assessment. Unpublished report. Jefferson City, MO.	
2.4.3	Poulton, B.C., A.L. Allert, K.R. Echols, and W.G. Brumbaugh. 2005. Validation of aquatic macroinvertebrate community endpoints for assessment of biological condition in the Lower Missouri River. Unpublished report. U.S. Geological Survey: Columbia Environmental Research Center. Columbia, MO.	
2.4.3	U.S. Fish and Wildlife Service (USFWS), 2007b. Fish and wildlife resources potentially affected by Callaway Plant Unit 2. October 18, 2007.	
4.3.3	Scott, 2007. Letter from C.M. Scott of the U.S. Fish and Wildlife Service to S.P. Stumne of MACTEC Engineering and Consulting re: Ameren's Callaway Nuclear Plant Unit 2 COLA in Callaway County, Missouri, October 18, 2007.	
5.2.4	Burns& McDonnell, 2007. Report on the Closed-Cycle Cooling and Makeup Water Supply Options for Future Units at the Callaway Nuclear Plant, Fulton, Missouri, March 2007.	
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