UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of

Callaway Plant Unit 2	Docket No. 52-037
Combined Construction and License Application	NRC-2008-0556

REPLY OF MCE/MSE

On April 6, 2009, Petitioners the Missouri Coalition for the Environment (MCE) and Missourians for Safe Energy (MSE) filed their Petition to Intervene and request for Hearing. On May 1, AmerenUE ("UE") and the NRC Staff ("Staff") filed their answers. This Reply addresses both answers.

No issue is made of standing, and this reply will not address it. The Board in its Initial Prehearing Order of April 27, pp. 4–5 ordered UE to address its recent decision to suspend the Callaway 2 project after the failure of CWIP legislation in the Missouri General Assembly. MCE/MSE will address UE's response.

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STATUS OF CASE: SUSPENSION OF THE PROJECT

In its Initial Prehearing Order, pp. 4–5 the Board ordered UE and Staff to respond to the announcement by UE that it had suspended its attempt to build Callaway 2. The Board gave Petitioners the option to reply.

UE is asking the Commission to continue reviewing its application while acknowledging that its financial qualifications can no longer be reviewed, as that portion of its application is "no longer correct" (UE Answer, 3). By letter to the Board on May 1, Staff said it will continue its review of the COLA "consistent with existing and planned resource availability."

The failure of a CWIP bill in the Missouri legislature precipitated the suspension. UE's cost estimates are contingent on CWIP financing, and without it the company will have to "reevaluate its options" (COLA, Gen. Info., p 1-12). UE has publicly said throughout the CWIP battle that without CWIP it will not be able to build the plant (see quotations in MAHUR petition, pp.9–10). Its Answer offers no reason to believe that this is no longer the case.

It takes considerable gall, therefore, for UE to ask the Commission and its staff (not to mention humble intervenors and their witnesses) to continue to review the great bulk of the COLA in what may very well prove to be an exercise in futility.

There is no good reason for piecemeal adjudication and little if any precedent for segmenting projects this way. *In the Matter of Nuclear Fuel Services*, LBP-03-01, 57 NRC 9, 14 (2003). The proper procedure, as in that case, is to hold the entire adjudication in abeyance.

UE's "indecision should not dictate the scope and timing of the hearing process." *In re Hydro Resources*, CLI-01-04, 53 NRC 31, 39 (2001). The Commission's "commitment to treat all parties fairly," *id.* at 40, militates against kowtowing to an applicant that merely wants to keep its "options" open — without the slightest indication that it will be successful. Aside from the

Commission's own resources, the intervenors are devoting substantial effort and resources to this adjudication — an "unacceptable and unfair burden." *Id.* at 43.

The applicant's financial qualification is a required component of the General Information part of the COLA. 10 CFR §§ 52.77 and 50.33(f). The COLA must be "complete and acceptable for docketing." 10 CFR § 2.101(a)(3). Information provided by the applicant to the Commission "shall be complete and accurate in all material respects." 10 CFR § 52.6(a). With rare exceptions not applicable here, it is the Commission's policy to avoid piecemeal litigation on incomplete COLAs. *Statement of Policy on Conduct of New Reactor Licensing Proceedings CLI-08-*07, 73 FR 20963, 20970–71 (April 17, 2008).

AmerenUE's COLA is no longer complete or accurate. The Board should determine that UE has effectively withdrawn the application, and the case should be dismissed. 10 CFR § 2.107(a).

The Board should therefore dismiss the application, or, in the alternative, hold the entire adjudicatory proceeding in abeyance.

CONTENTIONS

Contention NEPA-1: The COLA violates the National Environmental Policy Act by failing to address the environmental effects of the low-level radioactive wastes that will be generated and stored on-site in the absence of a licensed disposal facility or the ability to isolate the radioactive wastes from the environment. The ER must describe how UE will store LLRW on-site and the environmental consequences of extended on-site storage unless it can show that another licensed disposal facility is available.

This contention was drafted with *Calvert Cliffs 3*, LBP-09-04, in mind. There the Board, at pp. 64–6, examined the Commission's decision in *Bellefonte,* CLI-09-03, and said, at 66:

> We therefore conclude that we may, without creating a conflict with Table S-3, admit an application-specific contention concerning the environmental consequences of the need for extended onsite storage of LLRW as the result of the closure of the Barnwell facility, assuming that contention satisfies the requirements of 10 C.F.R. § 2.309(f)(1).

This contention satisfies the pleading requirements. The Petition, pp. 5–6, identifies where the ER fails to discuss onsite storage and assumes that disposal will be offsite; a contention of omission need only identify the regulatively required missing information and provide enough facts to show that the application is incomplete. *Vogtle*, LBP-09-03 at 22. It identifies the NEPA issue and the regulations which impose the duty to conduct a NEPA assessment (p. 7). NEPA is within the scope of the proceeding.

Staff (p.18) objects to our citation of Government Accounting Office (GAO/RCED-98-40R Questions on Ward Valley, 5-22-98 pp. 49–52) to the effect that low-level radioactive wastes:

> . . . contain every radionuclide found in 'high-level' radioactive waste...low-level radioactive wastes constitute a very broad category containing many different types and concentrations of radionuclides, including the same radionuclides that may be found in high-level radioactive wastes.

This establishes that LLRW poses an environmental hazard important enough that it must be addressed. The issue is therefore material — significant enough that if assessed it could lead to denial of the license. Contentions may be raised "seeking corrections of significant inaccuracies and omissions in the ER." *Grand Gulf ESP*, CLI-05-4, 61 NRC 10, 13 (2005). (NEPA informs but never dictates agency action. *Foundation on Economic Trends v. Lyng*, 943 F.2d 79, 83 fn. 2 (D.C. Cir. 1991). Therefore it is never possible to say conclusively that a license would be denied after NEPA analysis.)

Staff (p. 19) asserts that it is "mere speculation" that no offsite storage facility will be available, and UE (23) says that MCE/MSE fail to support the assertion that a facility will not be available. Yet it is an established fact that there is currently no such facility, and neither MCE/MSE, Staff nor UE can say when or if one will be available. Nearly 30 years after passage of the 1980 Low Level Radioactive Waste Policy Act (Public Law 96-573) encouraging

development of new "low-level" radioactive waste disposal facilities, not one new full service "low-level" radioactive waste disposal facility has opened in the US.

UE cites sections of the ER dealing with dose assessments (23, 25) and with radioactivity during normal operations (25), which are irrelevant to storage. It also (24–5) cites ER § 3.5.4, p.3-51 (sic; p. 3-54), but that deals only with temporary storage pending offsite disposal. These allegations do not refute the contention.

The petition (7–8) took pains to explain that this is not a forbidden attack on Table S-3. Table S-3 "does not include health effects from the effluents described in the Table, or estimates of releases of Radon-222 from the uranium fuel cycle or estimates of Technetium-99 released from waste management," as stated in footnote 1 of Table S-3. "These issues may be the subject of litigation in the individual licensing proceedings." The footnote states that "there are. . . areas that are not addressed at all in the Table." It is some of those "unaddressed areas" which Petitioners contend must be addressed in the Application.

Greater than Class C (GTCC) Radioactive Waste

Greater than Class C waste is the most highly concentrated "low-level" radioactive waste. It is generally not suitable for shallow land burial disposal which NRC allows for Classes A, B and C radioactive wastes. The Answers assert that this part of the contention is speculative and unsupported (Staff 16 fn. 16) and that GTCC is a federal responsibility (UE 13–4), but do not explain how Callaway 2's GTCC waste will be managed in the long term. Disposal of GTCC waste was designated a federal responsibility in the Low Level Radioactive Waste Policy Amendments Act (P.L. 99-240, § 3(b)(1) (D)) passed in 1985. To this day, more than 23 years later, the Department of Energy (DOE) does not have a disposal site. Some GTCC has gone to so-called "low-level" radioactive waste sites on a case-by-case basis, but in the absence of access

to such facilities, the waste could very well remain onsite. Although DOE supposedly began to consider its responsibility for this waste some time ago, it was not until a Congressional directive in 2005 that an Advance Notice Of Intent (ANOI) was filed, and DOE has still made no decision on how to proceed or whether to look for a site. It has been determined by the courts that DOE is responsible for the irradiated fuel (high-level) radioactive waste from nuclear power reactors. Tax money is being given to utilities to store irradiated fuel, but no disposal is available despite numerous efforts and enormous expenditures by DOE. DOE has not even made the determination to begin to seek disposal for GTCC, hence the likelihood of DOE finding such a place in time for the waste generated by Callaway 2 to leave the site is quite speculative. The long-term management of the GTCC waste on-site is not addressed in the COLA. The NRC's high-level radioactive waste confidence decision does not apply to or cover GTCC waste.

Contention SAFETY-1: The COLA is incomplete because the FSAR fails to provide any site-specific discussion as to how UE will comply with NRC regulations governing storage of LLRW in the event an off-site waste disposal facility remains unavailable when Callaway 2 begins operations.

This contention was written with *Vogtle*, LBP-09-03, in mind, where the Board said, at 20–21, "this contention is similar to contentions admitted by licensing boards in the North Anna and Bellefonte COL proceedings. See Virginia Electric & Power Co. (Combined License Application for North Anna Unit 3), LBP- 08-15, 68 NRC, (slip op. at 21-32) (Aug. 15, 2008); Tennessee Valley Authority (Bellefonte Nuclear Power Plant Units 3 and 4), LBP-08-16, 68 NRC, (slip op. at 57-60) (Sept. 12, 2008), rev'd, CLI-09-3, 69 NRC at __ (slip op. at 5-9)."

MCE and MSE took pains to satisfy the pleading requirements of 10 CFR 2.309(f) as the Board in *Vogtle*, at 22–3, laid them out. We identified the omission in the COLA (Pet. 8–9). We

identified scope, basis, materiality, the issue of law or fact and the existence of a genuine dispute, and provided a brief explanation (Pet. 9–10).

Staff, at 22, insists that 10 CFR 52.79(a)(3) is inapplicable, but the Board in *Vogtle*, at 24 said: "While section 52.79(a)(3) does not explicitly speak to long-term storage of LLRW or any specific amount of waste storage, we do not see how, if offsite disposal for LLRW remains unavailable, a COL applicant could address compliance with 10 C.F.R. Part 20 limits in accordance with section 52.79(a)(3) without addressing what it intends to do with the LLRW (which certainly qualifies as radioactive material) expected to be produced in the operation of the proposed units."

UE, at 19–20, maintains that the EPR FSAR, incorporated by reference, fulfills the regulation. A design certification is a generic proceeding; this contention is site-specific. Staff, at 25, extend this argument by saying the EPR FSAR shows the availability of storage space for several years' worth of solid waste. Of course, this falls far short of space for the 40-year license period, let alone indefinitely after that.

UE, at 16–19, relies on guidance documents. However, NRC guidance documents do not constitute law, but are merely the Staff's opinion on how regulations may be satisfied. *Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), LBP-96-7, 43 NRC 142, 147 (1996). Therefore, compliance with guidance documents may not be used as a basis for denying the admissibility of contentions.

As MCE/MSE have already said under Contention NEPA-1, the unavailability of offsite storage can scarcely be contested. UE's assertion (p.23, fn. 10), that offsite treatment is possible falls far short of an assurance that all LLRW will be shipped for such treatment.

Contention NEPA-2: The ER is fatally deficient in its analysis of the effects of water pumping for the Callaway 2 plant on local groundwater and wetlands. Contrary to the report, groundwater is not confined to the vicinity but will migrate, and will not be adequately recharged due to the demands of Callaway 2; therefore the water table will fall and other users will be deprived of water.

UE's lengthy assault on this contention serves mainly to prove the existence of a genuine dispute on a material issue. Are the Graydon Chert and CJC aquifers confined? UE says yes (Answer 34–6) but Prof. Criss cites "[a]bundant contrary evidence" (Pet. 11). Is the CJC part of the Ozark aquifer? UE says no (Answer 35–6) but Prof. Criss cites authority to show that it is (Pet. 13).

In fact, the authorities cited by UE actually confirm Criss's statements while refuting UE's own, not only regarding a name commonly applied to these water-bearing strata, but more importantly concerning UE's description of the actual hydrogeologic character of the strata included within the CJC formations, which directly bear on UE's analysis of pumping impacts. For example, USGS (1997, p. D20) clearly states that "The Ozark and the Cambrian-Ordovician aquifers are mapped together in this report" and that they are "equivalent," refuting the answer's claim at p. 40 that this same authority "differentiated" these aquifers in the report. More importantly, UE insists that the upper half of the CJC unit is an "aquitard" (e.g., ER 2-60; Fig. 2.3-21), that these same strata are "confined" and "artesian" (ER 2.3 page 2-54; Answer pp. 34–35), and that the CJC aquifer is regionally considered to represent "the top of the Cambrian-Ordovician aquifer system" (ER 2.3 pp. 2-61, 2-89). To the contrary, authority considers the entire CJC formation to be part of a thick hydrostratigraphic aquifer, regardless of whether the CJC strata occur south or north of the river, and regardless of whether the collective unit may be called the Ozark aquifer to the south or the Cambrian-Ordovician aquifer to the north of the Missouri River (see Imes, 1985, 1988; USGS 1997). Specifically, Fig 95 of the *Groundwater*

Atlas of the United States (USGS 1997, Hydrologic Atlas 730-D), which is attached to this reply as an exhibit, shows that a 5–10 mile wide region mapped as the "Ozark Aquifer" occurs throughout all of southern Callaway County, to the NORTH of the Missouri River, in a zone encompassing all of the area south of the power block, including all of the area spanned by the UE computer model, and all of the groundwater users along CR 457 mentioned in the Criss declaration. In direct contrast to UE's characterization, no "confining beds" are shown in this zone; those are mapped only to the north of the power block (see Fig 95 of USGS 1997).

Thus, published authority that is inconsistently and incorrectly cited by UE (Answer, p. 40) directly refutes UE's characterization of the fundamental hydrogeologic nature of the relevant aquifers in the project area. Criss's point is therefore not one of semantic detail as alleged by the answer, and even were this true he would have abundant support (USGS 1997, Fig 95), but rather he has raised a material issue, and his declaration provides a clear-cut documentation of UE's persistent mischaracterization of the hydrogeologic character of the CJC strata, which are the exact same strata that provide essential drinking water to private and public wells near the site (Table 2.3-30), and the strata that would be affected by the huge pumping increases anticipated by UE. As Criss also clearly states, mischaracterization of the hydrologic properties of those water-bearing strata will directly affect the outcome of the UE computer model, directly refuting UE's claim (Answer p. 31) that this matter is not contested.

Likewise, the detailed relevant section on the "Missouri River Valley, Missouri" (USGS 1997, p. D9 and figure #33, which is also reproduced as ER 2.3-20 on p. 2-186) does not make the statement that the alluvial aquifers are, in most places, "separated from the bedrock aquifers by low permeability beds of clay or shale"(ER 2-45) . To the contrary, the detailed section on the Missouri River states that "Recharge to the stream-valley aquifer is by infiltration of

precipitation, seepage of water from the Missouri River to the aquifer during periods of high streamflow, *and inflow from bedrock aquifers*." (USGS 1997, p. D9; emphasis added). Associated Figure 33 and its caption show that "The stream-valley aquifer consists of coarse grained alluvium in the lower part," i.e. that part that is directly in contact with the adjacent bedrock, which in the Callaway project area is the CJC formation.

A more extensive set of river cross sections (Missouri Dept of Natural Resources, 1997, Water Resources Rept. 46, Figures 56–60, cited at ER 2-77) show the same basic relationships, namely that coarse, highly permeable alluvial materials in the lower parts of the stream valley aquifers ubiquitously occur immediately adjacent to bedrock.

In short, NONE of these detailed, relevant figures or descriptive sections show any "low permeability beds of clay or shale" separating the alluvial aquifer and bedrock aquifers, as UE alleges (ER 2-45) and the declaration challenges. Nevertheless, UE vigorously defends the implausible general statements they quoted (Answer p. 38), even though they lifted a misleading general statement that suited their purpose of alleging "minimal" impacts of pumping on bedrock groundwater uses, while ignoring the detailed relevant sections and figures of the same reports that in fact say exactly the opposite for the area of concern.

This has substantial relevance to the contention. UE is attempting to establish that their huge anticipated pumping of the alluvial aquifer will not affect the private and public groundwater users who rely on the bedrock aquifer. To establish this, UE has mischaracterized the nature of the bedrock and grossly understated its interconnectivity to the stream valley aquifer.

UE complains, at 40, that Prof. Criss's authorities are ancient (1967 and 1988), but this does not disqualify them, and UE cites the same 1967 authority several times on p. 2-897 of the

FSAR. Regarding caves and karst, Criss also cites several 2007 and 2009 articles (Pet. 13), while page 2-896 of the FSAR cites Bretz (1956) yet ignores Dieke's (1959) paper as irrelevant. The former is a general treatment of the entire state while the latter describes a significant cave located only 3 miles from the site. Instead of discussing the caves closest to their site, the FSAR provides only a generalized discussion and Figure 2.5.1-20 showing "Cave Density of Missouri," which includes thousands of caves located hundreds of miles away. UE fails to explain why the generalized information they present is more relevant than descriptions of actual karst features located within 3 miles of their site that they omit, and apparently are not even aware of. This rebuts the statement that Criss has not shown the presence of karst (UE 37).

UE claims that Prof. Criss has misspoken about UE's monitoring wells, but the cited Table 2.3-30, at ER pp. 2-152–3, does indeed show that many of the wells are not private, as UE asserts (p. 38), but are UE monitoring wells. The Answer, at 29, points out that three rather than two collector wells are planned, but ER 2-87 says that one of the three is for Callaway 1. Moreover, the relevant quantitative information provided in the ER and referred to in the Criss declaration is the combined anticipated pumpage of these collector wells, whether they be 2 or 3.

The materiality of all this is to show impermissible impacts on local groundwater and its human users, as well as on the alluvial aquifer (Pet. 14–5). Both answers (Staff 28, UE 29) assail Prof. Criss's use of the word "colossal" to describe the impact, but this only qualifies the quantities given at ER 2-87 and FSAR 2-624 and does not make the contention one that is unsupported by evidence.

Criss's statement that the anticipated yield of the collector wells is "nearly 100 MGD" is more accurate than information in the Answer (p. 29) which falsely claims a "maximum collective yield of 50,000 gpm, equating to about 72 MGD." To the contrary, multiple and

inconsistent values for the collective yield are provided at different places in the ER and FSAR. For example, page 2-624 of FSAR § 2.4 and page 2-70 of ER § 2.3 both list an "average summer" value of 37 MGD for each of the three collector wells, representing a total exceeding 110 MGD. Note that 110 MGD is much larger than UE's asserted "maximum value" of 72 MGD, and is much closer to the reasonable statement provided in the Criss declaration. The alleged "maximum" value of 72 MGD provided by UE is inaccurate and misleading, yet pertains to the most critical quantity of all. Further, UE's claim of "72 MGD" embodies a false level of precision.

Finally, UE's stated value proves their misunderstanding that the greatest environmental impacts and human consequences will be associated with the highest pumping rates. Contrary to claims by Staff and UE, the petition's statement that the anticipated collective yield is "nearly 500 times larger than other nearby groundwater use in southern Callaway County" is likewise based on factual information. The Criss declaration specifically details that he examined Table 2.3-30, "Listing of Local, Public and Private Wells for Callaway and Osage Counties, Missouri." Table2.3-30 specifically shows that the collective yields of the largest, non-UE wells within six miles of the power block are considerably less than 1 MGD, a very small value compared to the pumpage anticipated by Callaway, particularly considering that the "yields" reported for small wells are normally much larger than actual pumpage. In short, contrary to allegations by Staff and UE, Petitioners' statement is a reasoned expert conclusion based on factual evidence presented in Tables cited in the Criss declaration.

NRC Staff dismiss Criss's qualitative description of the pumping rates as "colossal" yet blindly accept as factual the baseless UE comparison of the planned collector field to actual experience for "well fields in the Kansas City area" (ER sec. 5.2.1.3, cited by Staff p. 29),

described by Kelly (USGS, 1996). Note the following differences. The KC well fields include 12 distinct well fields separated over a lateral distance of 40 miles (USGS, 1996, Plates 1–6). Hundreds of individual wells are included, yet their collective pumpage in 1990 was only 10.58 billion gallons (USGS, 1996), or an average of less than 29 MGD, which is less than the maximum pumping rate of a single well planned by UE as documented above.

Additional discussion on page 2-70 of ER § 2.3 describes two large collector wells completed in 2000 and 2006. The highest combined pumping rate for *both* wells was 37 MGD, matching the maximum rate anticipated by UE for *only one of three* wells. Kansas City rainfall was far above normal in 2008, and all-time records were set at many sites in Missouri (NWS 2009), so the period of observation when both wells were pumping is extremely short and climatically abnormal. Even so, the observed drawdown was 18 feet below the river level, representing an undisclosed depth below the land surface, and the drawdown 1000 feet upgradient was 7 feet below the river level (ER 2.3 at 2-70). These actual, observed drawdowns are therefore much larger than those claimed for the Callaway collector field (Figs. 2.3-57 and 2.3-58), particularly considering that the contours on the ER diagrams are not being referred to river level. Again, the KC experience is not comparable to the ER collector well plan, and the UE drawdown simulation is not supported in any way by this comparison, but rather is called into question on an actual basis, because larger drawdowns have already been observed during a climatically anomalous period when the actual pumping rate is considerably less than that planned by UE.

Staff says Prof. Criss has not provided a reasoned basis, but he says (Pet. 15):

> Impacts to private and public wells located nearby, such as the private wells along CR 457 (see Fig. 2.3-63 on p. 2-229) can therefore be expected, as considerable groundwater will be produced from storage. Such impacts could be severe if the recharge rates to these

aquifers are as low as Section 2.3 insists. Computer calculations are meaningless if inappropriate aquifer characteristics are used as parameter inputs.

This is reasoned. Prof. Criss's opinion and specific sources have been given as required by 10 CFR 2.309(f)(1)(v).

UE takes it as conclusively proven that there are no local groundwater users who will be affected (Answer 29–30). But the pages cited, ER 2-64 and 2-66, do not say this, and it is not apparent to the untrained eye from Figures 2.3-57, 2.3-58 and 2.3-63. Moreover, the model conclusions and the rock properties upon which it depends are being contested. The discussion of local groundwater use in ER § 2.3.2.2.3 (ER 2-83–84) is also not conclusive. There is an issue of fact.

UE says that Prof. Criss's call for more study of the potential for more groundwater drop constitutes an unsupported assertion (UE 32). But NEPA contentions are by their nature often ones of omission. They point out that some impact needs to be studied but has not been — properly "seeking corrections of significant inaccuracies and omissions in the ER." *Grand Gulf ESP*, CLI-05-4, 61 NRC 10, 13 (2005).

Contention NEPA-3: The Environmental Report is deficient under NEPA because it fails to discuss or analyze the incremental, cumulative impact of the filling of wetlands and encroachment on the flood plain when added to the impact of the filling of other wetlands and other losses of flood plain.

Petitioners showed (Pet. 16–18) that the Environmental Report is deficient because it fails to discuss or analyze the cumulative impact of filling the wetlands when added to the impact of filling other wetlands.

Staff agrees (p. 32) that the Report's cumulative impacts discussion fails to discuss the cumulative impacts to wetlands.

UE mischaracterizes the contention by asserting (p. 43) the contention alleges "the ER is inadequate because it does not analyze impacts upon wetlands from individual past actions during the past two centuries, and over geographic areas well beyond the area of the proposed plant." UE's assertion is a diversion. Petitioners pointed out (p. 16) that the Report says absolutely nothing about the project's impact when added to the loss of other wetlands. Petitioners pointed to (p. 17) reports of the Government Accountability Office and of the U.S. Dept. of Agriculture to illustrate the severity of past losses. However, the contention does not allege the Report is deficient for its failure to discuss or analyze losses over a period of two centuries and over an area consisting of the lower 48 states. Rather, the Report is deficient in its complete failure to discuss or analyze cumulative impacts to wetlands.

UE attempts to set up and demolish a straw man by characterizing the issue as being whether past actions should be analyzed individually or in the aggregate (Answer 47). Petitioners' purpose in reciting the history of wetlands loss is to give a factual basis for the contention of omission. 10 CFR § 2.309(f)(1)(vi). By showing the severity of the problem, it also demonstrates the materiality of the contention — the NRC must make the required NEPA findings to support the action of issuing a license, and the contention identifies a deficiency in the ER sufficient to justify denial of the license. § 2.309(f)(1)(iv).

Cumulative impacts analysis is required by 10 CFR § 51.45(c). There is no temporal limitation on the preconstruction activities to be considered, either in the NRC rule, the CEQ rules, or in the case law quotations in Staff's answer (pp. 30–32). The actions of early settlers, steamboats, etc. are part of the aggregate to be considered, though they may have been relatively minor.

UE's answer relies on admissions in the ER that there will be adverse impacts to wetlands that will have to be mitigated (Answer 51–2). But that was not a *cumulative* impacts analysis. UE points to no analysis of the cumulative effects on wetlands, whether individually or in the aggregate, during the past year, decade, century, or during any other period of time. Similarly, UE points to no analysis of the cumulative impacts on wetlands, whether individually or in the aggregate, within the Callaway 2 site, the eight-mile vicinity, the fifty-mile region, or within any other geographic area.

Petitioners also showed (Pet. 18) that the Environmental Report is deficient because it fails to discuss or analyze the project's cumulative impact on flood plain loss when added to other flood plain losses. The ER contains no analysis of past flood plain losses, whether individually or in the aggregate, over any period of time or within any geographic area.

Contention NEPA-4: The ER is deficient in its discussion of alternatives because it overstates the need for power, understates the potential and overstates the cost of renewable energy and demand-side resources, and understates the costs of nuclear power. As a result it does not aid the Commission in its consideration of the costs and benefits of alternatives and violates NEPA.

Staff tries to put MCE and MSE in a bind: any alternatives must be consistent with the goal of the project as defined by UE, and the NRC must defer to the applicant's goal (Staff 34–5). Staff cites *Citizens Against Burlington v. Busey*, 938 F.2d 190, 195 (D.C.Cir 1991) to that effect, but the same case says, at 196, "Yet an agency may not define the objectives of its actions in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality." Just because UE wants to build a nuclear plant doesn't mean the case is closed.

As a regulated utility, UE has a duty to provide adequate service to its customers. *DeMaranville v. Fee Fee Trunk Sewer, Inc.* 573 S.W.2d 674, 676 (Mo.App. 1978); *National Food Stores v. Union Electric Co.*, 494 S.W.2d 379, 381 (Mo.App. 1973). Its purpose is to provide for the energy needs of the patrons in its service territory. There are alternative ways to do this.

In essence, the answers argue that NEPA requirements are met if the applicant has not identified a resource that has operational characteristics exactly equivalent to a 1600 MW EPR, plus equal or superior environmental performance. The proper standard should be that the applicant needs to discuss and show that other resource plans, including those involving DSM and renewables, do not produce a lower lifecycle present value of revenue requirements, consistent with meeting environmental requirements.

The answers' numerous complaints that the contention is not material, doesn't raise a genuine issue, and is unsupported by sufficient evidence can be met by pointing out the scope of a NEPA contention — to seek "corrections of significant inaccuracies and omissions in the ER." *Grand Gulf ESP*, CLI-05-4, 61 NRC 10, 13 (2005). Furthermore, Petitioners have cited relevant portions of the ER (Pet. 20, 24–6).

A. Understated cost of Callaway 2.

The answers insist that cost data must come from exactly comparable reactors, but they reject data from the only two EPRs being built in the world. They cite no regulation that requires a degree of comparability that makes cost estimates impossible because there is nothing that can be compared (Staff 37–40, UE 61–2). ERs "shall, *to the fullest extent practicable*, quantify the various factors considered." 10 CFR § 51.45(c)(emphasis added). No more should be required of a petition.

With respect to the estimated cost of Callaway 2, the Commission staff argues that bids received by Duke Energy and the Electric Energy [sic; Supply] Commission of South Africa cannot be compared to those here because of parts of construction included in the estimate, scale, construction schedules, and geographic location (Staff 38). Both of these utilities did all-source nuclear bids, including EPRs. The overnight cost estimates are therefore directly relevant to Callaway 2.

The answers point out that financial and ratemaking considerations are for the state PSC and business decisions for the applicant (Staff 41, UE 62–5). But, as they also say, cost is relevant if there are environmentally preferable alternatives; then a cost-benefit analysis favors what the applicant can actually afford to build. To this extent, cost is a factor in the ER. The ER "should also include consideration of the economic, technical, and other benefits and costs of the proposed action and its alternatives." 10 CFR § 51.45(c).

The supply chain issues that Staff says are unsubstantiated (Staff 40) are in fact spelled out in the petition, p. 23 — the lack of qualified labor, the weakness of construction firms, and the prospect that these risks will drive cost escalation.

UE, p. 61, objects to references to the trade journal *Nucleonics Week*. Nothing says news articles cannot inform an expert's opinion.

B. Outdated forecast of need

Staff says that projections of need for power need not be precise (a concession they are not willing to make for MCE/MSE), but surely they should not be inaccurate (Staff 42).

UE does not deny, but rather tacitly admits, that it only needs 900 MW of Callaway 2 (UE 74). Nevertheless, they continue to insist that they need 1600 MWe of baseload (UE 69 fn.38, 84) or, more ambiguously, "AmerenUE will need Callaway 2 as baseload power" (UE 74).

This is a large discrepancy. If need for power is exaggerated, then this is material to the ability of alternatives to meet the real need. UE's need diminishes yet further when one considers that it is now legally required to meet 15% of its sales from renewables by 2021. Perhaps we're being dense in thinking that this creates a genuine issue of the viability of alternatives — or perhaps UE is being dense in refusing to see this.

UE says that the load forecast in its Integrated Resource Plan (IRP) meets the standards of NUREG-1555, and endeavors to show how Missouri's IRP process meets the NUREG criteria (UE 72–3). But according to the quotation from NUREG-1555, it is not the process but the utility's documents that must meet the criteria. One criterion is that the IRP be "subject to confirmation." When UE vaunts the IRP and says it is "subject to MoPSC review" (UE 61, fn.33) it is worth noting that review of the IRP by the Missouri PSC is limited to whether the IRP meets the requirements of the rule. 4 CSR 240-22.080(13). (CSR is the Missouri Code of State Regulations.) Confirmation by the state agency is therefore procedural only, not substantive.

C. Deficient discussion of energy efficiency and renewable generation

UE points to its 110 IRP portfolios as proof that it considered renewables and DSM as alternatives (UE 69, 73). Yet in none of those portfolios was renewable energy or DSM anything more than a minor component, with the main component being in almost all cases a nuclear plant. Petitioners are talking about alternatives, not supplements, to a nuclear reactor.

Petitioners do not see wherein they have failed to explain their attack on the baseload myth (Staff 45–6, UE 68–9); it is documented (Pet. at 25–6).

The staff appears to rule out any resources that are not operationally equivalent to a nuclear plant, meaning large thermal units with high capacity factors. The goal of electric utility planning and operation is to build an inexpensive and reliable system, and the operational

characteristics of an individual plant are irrelevant. Mr. Harding is a former electric utility executive from Seattle City Light, one of the largest, most reliable, cheapest, and environmentally friendly utilities in the United States. He is also a former advisor to the chairman of the California Energy Commission, and Washington staff director of the Northwest Power Planning Council. Seattle City Light has a 50 percent reserve margin and 25 percent average system capacity factor. In other words, it has not a single conventional baseload (i.e., high capacity factor) resource, and is yet a reliable and cost effective system.

Staff argues that the "applicant considered DSM and a number of alternatives... and found none of the alternatives were both viable baseload alternatives and environmentally preferable to the proposed project" (p 36). Therefore, because a feasible environmentally preferable alternative has not been identified, a comparison of the costs of the proposed project and alternative generation is not material to the NRC's licensing decision and is outside the scope of this proceeding.

The staff does even begin to defend the arguable need for any conventional baseload generation, despite evidence that no "baseload" resources are necessary for a cheap and reliable grid. Moreover, the staff does not even define the term baseload, which has different meanings for planning, economic dispatch, and reliability. A resource can be baseload for planning purposes (i.e., lowest lifecycle cost), but not for operational purposes (e.g., combined cycle gas turbines). It can be baseload for both planning and operational purposes one year, but not the next (combined cycle gas). It can be baseload for planning and operational purposes (e.g., wind), but not dispatchable for reliability purposes.

It also strains credibility to argue that DSM is not a baseload resource for planning, operational, and reliability purposes.

It's worth noting that FERC Chairman Jon Wellinghof has recently gone on record as saying we may never need another baseload coal or nuclear plant, ever, because renewables can fill that need. "Building nuclear plants is cost-prohibitive, he said, adding that the last price he saw was more than $7,000 a kilowatt — more expensive than solar energy." http://www.nytimes.com:80/gwire/2009/04/22/22greenwire-no-need-to-build-new-us-coal-or-nuclear-plants-10630.html?pagewanted=1

To sum up this contention: the ER is deficient because the need for the project is exaggerated. Energy efficiency can reduce that need further, and renewable energy can fill the remaining gap in a way that is more environmentally benign than nuclear energy because it does not produce nuclear waste or cause the pollution that fossil fuels do. It is also at least as cost-effective. The renewable and DSM alternatives are therefore environmentally preferable and must be treated as such. Petitioners believe this is an admissible NEPA contention.

D. Uranium supply and price

UE (pp. 75–6) cites the Keystone report as supportive of the notion that there are ample supplies of uranium available at reasonable cost, and that surplus government inventories enhance availability. The author of that section is Mr. Harding, Petitioners' expert. The issue is not supply of uranium in the ground, but mining, milling, and enrichment capacity, and price when government surpluses disappear, as they will in several years. The problem is that surplus government uranium (especially HEU) drives down price to the point that investments in new mining, milling, and enrichment capacity are not being made, and the lead time for all these investments is substantial. As a consequence, when surpluses disappear, there is a high probability of price spikes (or possible unavailability) of uranium and separative work for the Callaway plant.

The relevance of the uranium supply should be apparent (UE 74, Staff 47) even if it could have been more explicitly stated: "a substantial shortfall of future supplies, which may jeopardize new reactor builds" (Pet. 27) is further proof that alternatives merit more study as resources preferable to Callaway 2. Building a white elephant is not environmentally preferable.

Declaration

Petitioners criticize the declaration of Mr. Harding for incorporating the contention by reference (Staff 34, UE 57, fn. 32). Petitioners apologize if it is not in good form and promise to do better hereafter. However, neither answer argues that it is deficient fatally to the contention.

Contention NEPA-5: The ER is deficient in that it has not been supplemented to take into account the passage of Proposition C, the Renewable Energy Standard, which requires UE to supply 15% of its retail sales from renewable sources by 2021. Prop C must be considered in the ER because it materially affects UE's need for nonrenewable power and the available alternatives.

Petitioners do not allege a violation of state law beyond the scope of this proceeding (Staff 50) — although UE seems at times to be saying that it won't have to comply with the Renewable Energy Standard (RES)(UE 81–3). No, MCE/MSE assume UE *will* comply with the RES. Since, according to Ameren's own web site, AmerenUE has nearly 9,900 MW of generation now (http://ameren.mediaroom.com/index.php?s=38), a 15% requirement could eliminate or come close to eliminating the need for Callaway 2. And this is an alternative about which UE has no choice.

UE maintains that this contention is premature because the RES is still in administrative rulemaking (UE 78–9). The RES became law immediately upon passage on November 4, 2008. Missouri Constitution, Article III, § 51. The renewable energy targets are in force. Administrative rules must comply with the law and are void if they go beyond the scope of the

legislative authority or attempt to extend or modify statutes. *Missouri Hospital Association v. Missouri Department of Consumer Affairs, Regulation and Licensing*, 731 S.W.2d 262, 264 (Mo.App. WD 1987). "Regulations may be promulgated only to the extent of and within the delegated authority of the statute involved." *Golde's Department Store v. Director of Revenue*, 791 S.W.2d 478, 481 (Mo.App. ED 1990). The PSC rules cannot substantively alter the RES.

The answers fault the petition for not discussing the alternatives analysis (Staff 51, 53, UE 82). It shouldn't be necessary to repeat what's been said in the related contention NEPA-4, which did discuss it (Pet. 25) and which is cross-referenced in this contention (Pet. 29). The specific portions of the COLA most pertinent to the RES are cited, demonstrating that UE's renewable energy commitment will not satisfy the RES (Pet. 27–8). This is an alternatives contention that deserves separate treatment because it rests on its own, firm, statutory foundation. Staff (51–2) faults the petition for not complying with 10 CFR § 2.309(f)(1)(iv and vi). But MCE/MSE have demonstrated that this is a material alternatives contention and identified the failure to contain information on a relevant matter either in contention NEPA-4 or NEPA-5.

MCE/MSE wish the Staff *would* take a position on whether the EIS will deal with the RES (Staff 51, fn. 26). Since they do not, the existence of a genuine dispute is apparent.

Staff deny (p. 51) that discussion of Prop C is necessary for a complete statement of the status of compliance with applicable state environmental quality standards required by § 51.45(d). That section provides a non-exclusive list of such standards and requirements. The RES is an environmental quality requirement because the use of non-polluting power generation technologies protects the air and water.

This contention is within the scope of the proceeding because an ER that is, through omission, inaccurate and misleading results in a legally insufficient COLA. *Vogtle COL*, LBP-

09-03, p. 22. There is a genuine dispute on the material issue of whether Callaway 2 needs to be built, or should be built, at all.

Contention NEPA-6: The Commission must require completion of an EIS and selection of a preferred alternative prior to authorizing any construction activity of any sort

Contrary to the answers (Staff 55, UE 85), Petitioners are not challenging a rule but rather noting the consequences of a rule. Their contention is directed at enjoining the performance of pre-LWA construction activities.

Staff's answer (at 55, 58) denies that the Commission has jurisdiction over preconstruction activities. The NRC has authority over public health and safety issues relating to nuclear power in general, and the safety aspects of construction and operation of nuclear plants. *U.S. v. Construction Products Research*, 73 F.3d 464, 467 (2d Cir. 1996). That case acknowledged the NRC's investigatory power over a company that made grout and structural concrete products used in reactor construction and repair. Preconstruction work could have as much impact on the public health and safety as faulty manufacture of construction material.

The Commission can suspend, and the courts can enjoin, construction work before the completion of a NEPA analysis because construction can foreclose consideration of alternatives that should be assessed. *Public Service Co. of New Hampshire*, CLI-78-14, 7 NRC 952, 959 (1978); *Davis v. Mineta*, 302 F.3d 1104, 1115 fn. 7 (10th Cir. 2002). That is what this contention seeks. — to prevent a violation of NEPA

Contention NEPA-7: The applicant's Environmental Report has omitted adequate analysis of the various long-term environmental impacts of highly radioactive wastes that would be generated by Callaway Plant Unit 2, given the Areva Evolutionary Power Reactor's (EPR) high burn-up irradiated nuclear fuel.

Perhaps Petitioners were remiss in not quoting more of the Posiva report to supply the definition of "high burn-up" that UE complains is missing (Answer 91, 102):

> The discharge burn-up of spent nuclear fuel refers to the quantity of energy produced with the fuel per mass unit. The higher the discharge burn-up of the fuel, the less fuel is required to produce the same amount of energy, making the quantity of spent fuel smaller as well (Posiva p. 137).

However, the Petition at 35 went on to quote the consequence of this high burn-up, which forms the basis of the contention: "Posiva reported '...the discharge burn-up of spent nuclear fuel affects the fuel's radionuclide composition and heat production. In the case of a damaged canister, it also has significance for the radionuclide release rate.'"

With knee-jerk consistency, Staff and UE complain that MCE and MSE are challenging NRC rules, particularly Tables S-3 and S-4 (Staff 61–2, UE 96–7, 99). This is a contention of omission saying that the ER must consider conditions revealed by the Posiva report that were not contemplated in the existing rules. *Calvert Cliffs* 3, LBP-09-04 at 64–6. It is therefore not correct to say the missing information is in the ER (Staff at 60–1). Furthermore, the contention identifies additional environmental hazards that need to be assessed — shipping accidents involving underwater submersion, fires resulting from radiolysis, contamination of drinking water by leaks from burial canisters (Pet. 36–8).

Staff, at 62–3, notes the caveat from the report, "The increase in the quantity of released iodine would still not lead to exceeding the dose limits in the case of canisters with a manufacturing defect." This was addressed (Pet. 39). Moreover, it does not affect the risk from *damaged* canisters (Posiva 137): "Higher burn-up will increase the intensity of the fuel's ionizing radiation. If water gains access to a damaged canister, the ionizing radiation may sever

the chemical bonds of water molecules. This phenomenon is called radiolysis, and it can potentially speed up the release of radioactive substances from solid fuel."

Short of repeating the entire contention, Petitioners can only sum up by saying they have identified the omission in the ER and given facts and reasons in support of their position as required by 10 CFR § 2.309(1)(f)(v and vi). Contrary to Staff's Answer at 63, the contention is relevant and material to the decision to issue a license for this specific proposed reactor because the NEPA omission relates to serious environmental hazards. It seeks "corrections of significant inaccuracies and omissions in the ER." *Grand Gulf ESP*, CLI-05-4, 61 NRC 10, 13 (2005); *Calvert Cliffs* 3, LBP-09-04 at 66.

Contention NEPA-8: The COL must be held in abeyance pending the rulemaking on the Proposed Waste Confidence Decision and Proposed Temporary Spent Fuel Storage Rule because the license cannot be granted in compliance with NEPA nor with confidence in the ability to safely store spent fuel until those matters are resolved.

Our confidence in waste confidence is further diminished by the demise, or near-demise, of Yucca Mountain.

This is admittedly a generic contention. As such it can be held in abeyance, *Statement of Policy on Conduct of New Reactor Licensing Proceedings CLI-08-*07, 73 FR 20963, 20972 (April 17, 2008) — if it is otherwise admissible. That is the only issue.

The pleading requirements of 10 CFR § 2.309(f)(1) are painstakingly addressed in the contention. The facts given throughout the contention are supported by the references to the experts' opinions cited in conformity with 2.309(f)(1)(v) (Pet. 46). The petition relies on an omission from the COLA, so the failure is identified to the extent possible under 2.309(f)(1)(vi). Scope and materiality to this site-specific COL are also addressed:

> Our contention seeks to enforce, in this specific proceeding, the NRC's commitment that "it would not continue to license reactors if it did not have reasonable confidence that the wastes can and will in due course be disposed of safely"... The contention also seeks to enforce the requirement of the National Environmental Policy Act ("NEPA") that generic determinations under NEPA must be applied to individual licensing decisions and must be adequate to justify those individual decisions. (Pet. 40)
>
> ...we therefore seek to ensure, as required by NEPA and *Baltimore Gas and Electric Co.*, that whatever decisions the NRC reaches in response to our Comments on the Proposed Waste Confidence Decision and Proposed Temporary Storage Rule will be applied in a timely way to the licensing decision for the proposed Callaway 2 nuclear power plant, *i.e.*, before that plant is licensed. (Pet. 41)
>
> Before licensing the proposed Callaway 2 nuclear power plant, the NRC must make a determination under the Atomic Energy Act that it has a reasonable assurance that spent fuel can be safely stored and disposed of. See Comments at pages 7–8. Under NEPA, the NRC must also evaluate the environmental impacts of spent fuel storage and disposal. *Id.* While the NRC has chosen to make these determinations generically, in the Proposed Waste Confidence Decision and the Proposed Temporary Storage Rule, those generic determinations must be adequate to support any individual licensing decision. *Id.* Therefore the contention is within the scope of this proceeding and material to the findings the NRC must make to support the requested issuance of a license. (Pet.46)

As discussed in contentions NEPA-1 and SAFETY-1, the problem of waste storage has safety implications for this specific reactor. They are certainly no less for HLW than for LLRW.

Contention MISC-1: The Commission must suspend the COL adjudication pending completion of the NRC review of the EPR reactor design and the obligatory design rulemaking.

The Staff (Answer at 69) and Applicant (UE Answer 120–1) urge that this contention constitutes an impermissible challenge to a regulation 10 C.F.R. § 52.55(c): "An applicant for a construction permit or a combined license may, at its own risk, reference in its application a design for which a design certification application has been docketed but not granted." By the very wording of the cited regulation, the applicant is putting its combined license application "at ... risk" by specifying an unapproved reactor design. The "risk" is that a reactor design might be

referenced which does not or cannot be properly addressed by an FSAR until it is at or near certification.

It seems self-evident to us that a COL cannot issue before the design is certified. Site-specific safety issues and environmental impacts cannot be known until the size and type of reactor are known (Pet. 49). This is not affected by the fact that generic safety and environmental issues are addressed in the design certification.

An admissible contention can be held in abeyance, *Statement of Policy on Conduct of New Reactor Licensing Proceedings CLI-08-*07, 73 FR 20963, 20972 (April 17, 2008). This contention raises a specific issue of law. 10 CFR § 2.309(f)(1)(i). It is amply explained in the Petition. It is within the scope of the proceeding, which comprises the COL (Notice of Hearing, p. 1). It is material, since the design certification is essential to the issuance of the COL. While UE's answer, at 116–7, makes the rather incredible assertion that it is not essential, this proves the existence of a genuine dispute with the applicant. 2.309(f)(1)(iv, vi).

To the extent that a factual basis can be provided for a purely legal contention, it is given where the petition, at 47, shows that the COL proceeding could be completed before the design certification.

Thus this contention meets the pleading requirements. It should be admitted and held in abeyance, which is the relief it seeks.

Contention NEPA-9. The ER is deficient for failing to address the potentially catastrophic environmental effects of a terrorist attack against the Callaway 2 plant.

The contention raises an issue of law that is in dispute. 10 CFR § 2.309(1)(f)(i and vi). There is an unresolved split between the Ninth and Third Circuit Courts of Appeals on whether the possibility of terrorist attack satisfies the causation requirement of NEPA. *San Luis Obispo*

Mothers for Peace v. NRC, 449 F.3d 1016, 1029–30 (9th Cir. 2006), cert. denied, 127 S.Ct. 1124 (2007); *New Jersey Department of Environmental Protection v. NRC,* 561 F.3d 132, 142–3 (3d Cir. 2009).

Moreover, the latter opinion recognizes an important distinction between the two cases: "We note, initially, that *Mothers for Peace* is distinguishable on the ground that it involved the proposed construction of a new facility — a change to the physical environment arguably with a closer causal relationship to a potential terrorist attack than the mere relicensing of an existing facility." 561 F.3d at 142. Only relicensing was at issue in *NJDEP.*

We acknowledge the position taken by the Commission in previous cases, but ask that it be reconsidered.

CONCLUSION

The Missouri Coalition for the Environment and Missourians for Safe Energy request that the Commission find that their contentions are admissible as meeting the requirements of 10 C.F.R. § 2.309(f)(1). They request a hearing on these contentions. 10 C.F.R. § 2.309(a).

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CERTIFICATE OF SERVICE

I hereby certify that, on this 15th day of May, 2009, copies of the foregoing Reply were electronically served on the following through the Electronic Information Exchange.

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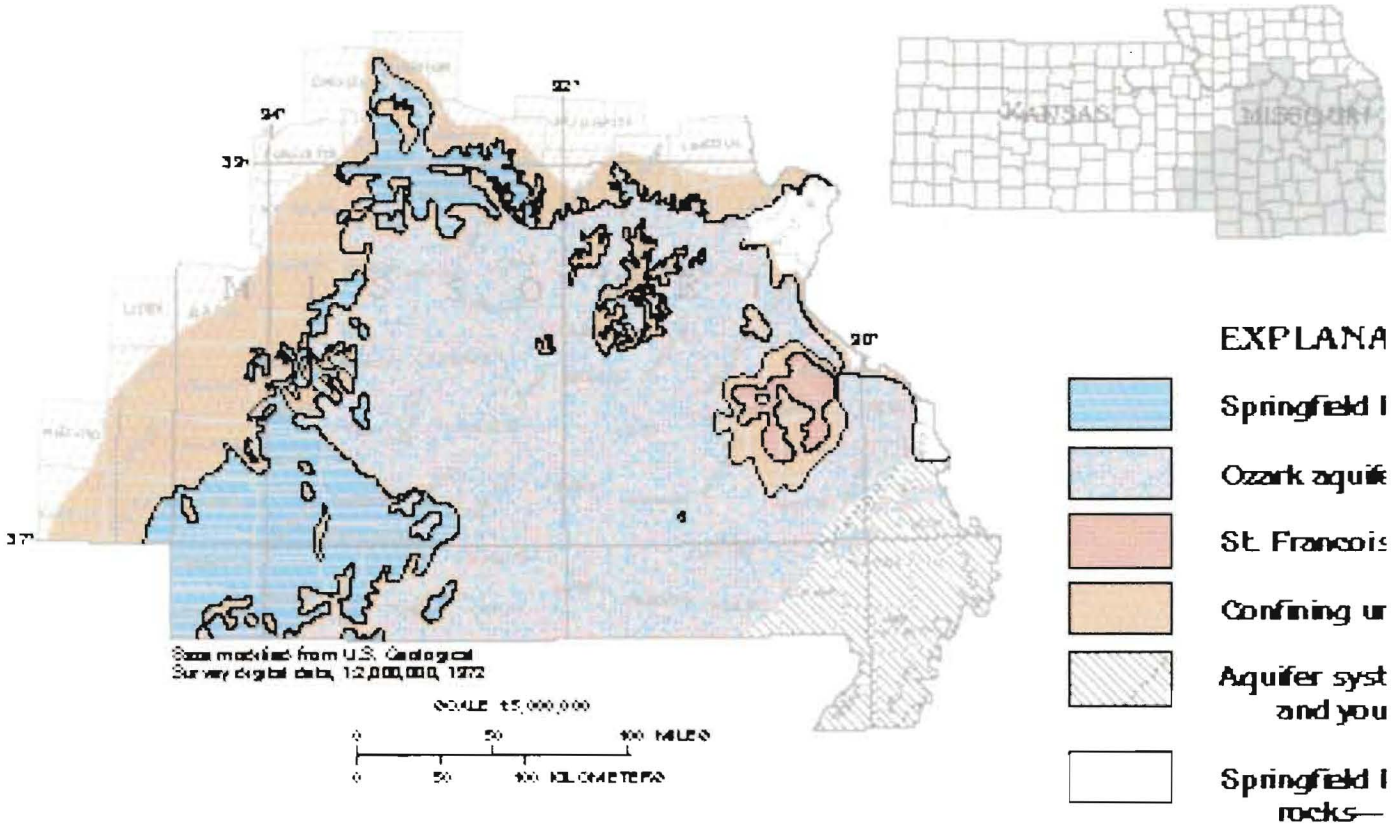

Modified from Imes, J.L., and Emmett, L.F., 1994, Geohydrology of the Ozark Plateaus aquifer system in parts of Missouri, Arkansas, Oklahoma, and Kansas: U.S. Geological Survey Professional Paper 1414-D, 127 p.

Figure 95. The aquifers and confining units of the Ozark Pla-teaus aquifer system are exposed at the land surface as concentric bands that surround the St. Francois Mountains in southeastern Missouri. The confining units that overlie and underlie the aquifer system also are exposed at the land surface.

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Plateau aquifer

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aquifer

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Plateau aquifer equivalent
Not part of aquifer system