NUCLEAR REGULATORY COMMISSION ISSUANCES

November 1997

This report includes the issuances received during the specified period from the Commission (CLI), the Atomic Safety and Licensing Boards (LBP), the Administrative Law Judges (ALJ), the Directors' Decisions (DD), and the Decisions on Petitions for Rulemaking (DPRM)

The summaries and headnotes preceding the opinions reported herein are not to be deemed a part of those opinions or have any independent legal significance.

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U.S. NUCLEAR REGULATORY COMMISSION

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CONTENTS

Issuances of the Atomic Safety and Licensing Boards

INTERNATIONAL URANIUM (USA) CORPORATION (White Mesa Uranium Mill) Docket 40-8681-MLA-2 (ASLBP No. 98-733-01-MLA) (Re: License Amendment) (Alternate Feed Material) MEMORANDUM AND ORDER, LBP-97-21, November 7, 1997	273
LOUISIANA ENERGY SERVICES, L.P. (Claiborne Enrichment Center) Docket 70-3070-ML (ASLBP No. 91-641-02-ML-R) (Special Nuclear Material License) MEMORANDUM, LBP-97-22, November 13, 1997	275
QUIVIRA MINING COMPANY (Ambrosia Lake Facility, Grants, New Mexico) Docket 40-8905-MLA (ASLBP No. 97-728-04-MLA) (Amendment to Source Material License No. SUA-1473) MEMORANDUM AND ORDER, LBP-97-20, November 4, 1997	257

Atomic Safety and Licensing Boards Issuances

ATOMIC SAFETY AND LICENSING BOARD PANEL

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LICENSING BOARDS

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before Administrative Judges:

Charles Bechhoefer, Presiding Officer
Dr. Peter S. Lam, Special Assistant

In the Matter of

Docket No. 40-8905-MLA
(ASLBP No. 97-728-04-MLA)
(Amendment to Source
Material License No.
SUA-1473)

QUIVIRA MINING COMPANY
(Ambrosia Lake Facility, Grants,
New Mexico)

November 4, 1997

The Presiding Officer denies a request for a hearing because the Petitioner lacks standing to participate in the proceeding.

**RULES OF PRACTICE: INTERVENTION/INFORMAL
PROCEEDINGS**

To become a party in a proceeding governed by 10 C.F.R. Part 2, Subpart L, a petitioner is required to set forth (1) its interest in the proceeding — i.e., its standing; (2) how that interest may be affected by the results of the proceeding; (3) its areas of concern about the licensing activity that is the subject matter of the proceeding; and (4) the timeliness of the petition. 10 C.F.R. § 2.1205(e).

**RULES OF PRACTICE: INTERVENTION/INFORMAL
PROCEEDINGS**

To admit a petitioner to a proceeding governed by 10 C.F.R. Part 2, Subpart L, a Presiding Officer must find that the petitioner's specified areas of concern

are germane to the subject matter of the proceeding, as well as the timeliness of the petition and that the petitioner has standing. 10 C.F.R. § 2.1205(h).

RULES OF PRACTICE: STANDING

The standing requirement in NRC's Rules of Practice arises from the hearing authorization in section 189(a)(1) of the Atomic Energy Act, providing a hearing "upon the request of *any person whose interest may be affected*" by a proceeding (emphasis supplied).

RULES OF PRACTICE: STANDING (INFORMAL PROCEEDINGS)

The same standing requirements govern Subpart L proceedings as govern formal, Subpart G proceedings.

RULES OF PRACTICE: STANDING

In determining standing, the Commission looks to "contemporaneous judicial concepts of standing." A contemporary delineation of those concepts appeared in *Bennett v. Spear*, 520 U.S. ___, 117 S. Ct. 1154, 1163 (1997), where the Supreme Court observed that constitutional minimum standards of standing are that (1) the plaintiff suffer injury in fact, both actual or imminent; (2) there is a causal connection between the injury and the conduct in question; and (3) the injury likely will be redressed by a favorable decision. In addition, a "prudential" standing requirement is that the plaintiff's grievance must arguably fall within the "zone of interests" protected or regulated by the statutory or constitutional provisions invoked in the suit.

RULES OF PRACTICE: STANDING (INJURY IN FACT)

For standing purposes, injury in fact need not be substantial. Although such injury must be "actual," "direct," and "genuine," it need not have already occurred. Potential or imminent injury is sufficient.

RULES OF PRACTICE: STANDING (INJURY IN FACT)

Potential competitive injury from a new facility has been recognized as a legitimate basis on which to assert injury in fact.

RULES OF PRACTICE: STANDING (INJURY IN FACT)

Although potential competitive injury may stem from operation of a facility and not technically from its licensing, such a rationalization invokes a distinction without a difference by ignoring the obvious fact that the claimed potential competitive injury could not and would not occur absent the licensing. Such potential injury may thus be used to establish injury in fact.

RULES OF PRACTICE: STANDING (ZONE OF INTERESTS)

Although competitive injury may constitute injury in fact in an NRC licensing proceeding, a party relying for its standing on such injury must also demonstrate that it arguably falls within the zone of interests protected or regulated by the Atomic Energy Act or the National Environmental Policy Act (NEPA).

RULES OF PRACTICE: STANDING (ZONE OF INTERESTS)

The standing of a petitioner asserting a particular type of injury may be derived from a specific section of a statute pertinent to the litigation rather than from the statute as a whole.

RULES OF PRACTICE: STANDING (ZONE OF INTERESTS)

Although economic matters may not be generally comprehended by the Atomic Energy Act or NEPA (unless the economic injury stems directly from alleged radiation hazards or other environmental impacts of a project), economic injury may be comprehended in litigation under section 84 of the Atomic Energy Act, which was amended in 1983 to include economic considerations concerning the regulation of byproduct material.

RULES OF PRACTICE: STANDING (ZONE OF INTERESTS)

Although certain types of alleged economic injury are within the zone of interests protected under amended section 84 of the Atomic Energy Act, the legislative history of amended section 84 indicates that the amendment was designed to provide the NRC Staff more latitude in regulating byproduct material and was not intended to include injury to a competitor caused by the business activities of another competitor.

RULES OF PRACTICE: STANDING (INJURY IN FACT; ZONE OF INTERESTS)

Although matters such as groundwater contamination, seepage of waste material into the substrate, additional radioactive releases, and transportation of large volumes of byproduct waste material to a site fall within the zone of interests protected by NEPA, the impacts must themselves, in some manner, either economically or physically, have a direct impact on a petitioner in order for it to use those impacts to establish its standing.

RULES OF PRACTICE: STANDING (ZONE OF INTERESTS)

Economic injury resulting directly from the environmental impacts of a project may serve as a basis for a petitioner's standing under NEPA. Although NEPA does not encompass monetary interests alone, a petitioner is not precluded from asserting cognizable injuries to environmental values because his real or obvious interest may be viewed as monetary.

U.S. CONSTITUTION: EQUAL TREATMENT

ATOMIC ENERGY ACT: LICENSING STANDARDS

Although similarly situated licensees must be accorded equal treatment by the NRC, the law does not require consistency of treatment of two parties in different circumstances.

MEMORANDUM AND ORDER

(Denying Request for Hearing)

This proceeding involves an amendment to the source material license (SUA-1473) of Quivira Mining Company (QMC or Applicant) to permit it to receive defined quantities of section 11e(2) byproduct material from outside generators for disposal at its Ambrosia Lake uranium mill and tailings site, located near Grants, New Mexico.¹ It is being conducted pursuant to the Commission's informal hearing procedures, set forth in 10 C.F.R. Part 2, Subpart L.

¹That material is defined by section 11e(2) of the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2014(e)(2), as "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

One timely request for a hearing (Request), submitted by Envirocare of Utah, Inc. (Envirocare or Petitioner), has been received. For reasons set forth herein, I am denying that request and terminating the proceeding.

A. Background

As set forth in my Memorandum and Order (Request for Hearing), dated June 20, 1997 (unpublished), Envirocare filed its Request on May 28, 1997. QMC and the NRC Staff (Staff) filed responses in opposition to Envirocare's Request, dated June 12 and 19, 1997, respectively.² Both of those responses were founded, in large part, on Envirocare's lack of demonstrated standing to participate.

In my June 20 Memorandum and Order, I noted that in Subpart L proceedings such as this one, a petitioner is required to set forth (1) its interest in the proceeding — i.e., its standing; (2) how that interest may be affected by the results of the proceeding; (3) its areas of concern about the licensing activity that is the subject matter of the proceeding; and (4) the timeliness of the petition. 10 C.F.R. § 2.1205(e). I also stated that to admit Envirocare, I must find that its specified areas of concern are germane to the subject matter of the proceeding, that its petition was timely, and that the Petitioner has standing. 10 C.F.R. § 2.1205(h).

In that Memorandum and Order, I went on to find that Envirocare's petition was timely submitted and that, as asserted by the Staff, certain (although not all) of its areas of concern are germane to the subject matter of the proceeding.³ But I determined that the Petitioner's statement of standing — particularly injury in fact — was not sufficiently specific for me to determine whether the relevant factors had been satisfied.

Accordingly, taking into account (1) in Subpart G proceedings there is a right for a petitioner to supplement its request for a hearing, (2) in Subpart L proceedings there is no bar to that practice, (3) the lack of local availability of information concerning the proceeding, and (4) the complexity of questions concerning standing and injury in fact, I permitted Envirocare to file a supplement to its petition (Supplement) and the Applicant and Staff to respond. Envirocare filed a timely Supplement on July 3, 1997, and the Applicant and Staff filed timely responses in opposition to Envirocare's Request on July 15, 1997 (Applicant's Supplemental Response, Staff's Supplemental Response).

² In its response (at 2), the Staff stated that, in accordance with 10 C.F.R. § 2.1213, it wishes to participate as a party. The Staff also stated (at 3 n.7) that, consistent with 10 C.F.R. § 2.1205(m), the license amendment was approved by the Staff on May 16, 1997; and that, as issued, the license amendment differs in certain respects from that applied for by QMC.

³ In particular, taking into account Envirocare's supplementary statement, the adequacy of the environmental review carried out for this license amendment (Request at 18, ¶5.6.9) is clearly germane.

In my June 20, 1997 Memorandum and Order, I also indicated that I might convene a prehearing conference to resolve questions of standing either near the site (if a site visit would prove useful) or by telephone conference call. I invited suggestions from the parties and Petitioner. Envirocare did not comment. The Staff opined that a site visit would not be helpful in determining the issue of standing. The Applicant suggested that, because the legal issue of standing can be decided on briefs alone, such a conference would not be beneficial. In light of the issues before me at this time, I agree with these positions and accordingly am issuing this Order based on the various briefs (i.e., petitions and responses) to which I have referred.

B. Envirocare's Standing

The standing requirement in NRC's Rules of Practice — including that applicable in 10 C.F.R. Part 2, Subpart L proceedings such as this one⁴ — arises from the hearing authorization in section 189(a)(1) of the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2239(a)(1), providing a hearing “upon the request of *any person whose interest may be affected*” by a proceeding (emphasis supplied). Through a long series of cases, the Commission has held that, in determining standing, it will look to “contemporaneous judicial concepts of standing.” *Portland General Electric Co.* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610, 613-14 (1976); *see also Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1), CLI-83-25, 18 NRC 327, 332 (1983); *id.*, CLI-85-2, 21 NRC 282, 316 (1985); *Sacramento Municipal Utility District* (Rancho Seco Nuclear Generating Station), CLI-92-2, 35 NRC 47, 56 (1992); *Envirocare of Utah, Inc.*, LBP-92-8, 35 NRC 167, 172 (1992).

As set forth by the Applicant (Supplemental Response at 3), a contemporary delineation of judicial concepts of standing appeared in a recent Supreme Court decision, *Bennett v. Spear*, 520 U.S. ___, 117 S. Ct. 1154, 1163 (1997) (citing *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 560-61 (1992)). In *Bennett*, the Court observed that constitutional minimum standards of standing are that (1) the plaintiff suffer injury in fact, both actual or imminent, not conjectural or hypothetical; (2) there is a causal connection between the injury and the conduct in question; and (3) the injury likely will be redressed by a favorable decision. In addition, a “prudential” standing requirement is that the plaintiff's grievance must arguably fall within the “zone of interests” protected or regulated by the statutory or constitutional provisions invoked in the suit (here, the Atomic

⁴The same standing requirements govern Subpart L proceedings as govern formal, Subpart G proceedings. *Chemetron Corp.* (Bert Avenue, Harvard Avenue, and McGean-Rohco Sites, Newburgh Heights and Cuyahoga Heights, Ohio), LBP-94-20, 40 NRC 17, 18 (1994).

Energy Act, the National Environmental Policy Act (NEPA), and Amendments V and XIV of the Constitution itself). 117 S. Ct. at 1160-61.

Commission decisions are consistent with these requirements. To satisfy "judicial" standing, the Commission has held that a petitioner must demonstrate, *inter alia*, that it could suffer an actual "injury in fact" to its interest, that the injury occur as a consequence of the proceeding, and that the petitioner's interest is "arguably" within the "zone of interests" to be protected by the statute(s) under which the petitioner seeks to intervene. *Georgia Power Co.* (Vogtle Electric Generating Plant, Units 1 and 2), CLI-93-16, 38 NRC 25, 32 (1993); *Rancho Seco*, CLI-92-2, *supra*, 35 NRC at 56. To conform to the "injury in fact" requirement, the injury must also be "concrete and particularized, fairly traceable to the challenged action, and likely to be redressed by a favorable decision." *Vogtle*, CLI-93-16, *supra*, 38 NRC at 32; *Envirocare*, LBP-92-8, *supra*, 35 NRC at 173; *Dellums v. NRC*, 863 F.2d 968, 971 (D.C. Cir. 1988). Each of these elements is in dispute here.

I. Envirocare's Position

Envirocare, which operates a waste disposal facility at Clive, Utah, some 500 miles from QMC's Ambrosia Lake facility, claims that it will suffer injury through the NRC's licensing of a facility that will be its competitor. It claims (Request at 3) to be "the first private facility in the United States to be licensed . . . to accept § 11.e(2) material from outside generators for disposal." It alleges potential economic harm from the licensing of the Ambrosia Lake facility to accept the same type of byproduct waste material from outside generators that it now accepts at its Clive, Utah site.

In its Request (at 11), Envirocare claims an economic interest in ensuring that all licensees that propose to accept section 11e(2) byproduct material from other persons for disposal comply with applicable NRC standards. It adds (Request at 11-12) that if QMC need not comply with the same requirements as were imposed on Envirocare, then Envirocare will be placed at a "severe competitive disadvantage, because QMC's lower costs will allow it to attract customers away from Envirocare."

In its Supplement, Envirocare acknowledges that QMC is currently authorized to store certain specified section 11e(2) materials at the Ambrosia Lake facility. Envirocare, however, differentiates the limited, strictly defined authorization for disposal activities under QMC's license prior to this amendment (derived for the most part from in situ leach uranium facilities) with the amendment which allegedly "changed the nature of QMC's facility from a uranium mill to a commercial disposal facility" (Supplement at 3). Envirocare claims that this "fundamental" change was permitted by the NRC without requiring a full environmental review under NEPA, comparable to the full review previously

carried out for the Petitioner's own facility (*id.* at 3-4). It adds that no full environmental review was ever carried out for the QMC facility (Request at 5; Supplement at 3). Among impacts allegedly created or exacerbated by the amendment and never reviewed, Envirocare lists groundwater contamination, seepage into the substrate, additional radioactive releases and transportation of large volumes of section 11e(2) material to the site (Supplement at 8-9).

In sum, therefore, Envirocare relies for standing on alleged economic injury to its interests coupled with purported environmental impacts of the project that it does not appear to be claiming directly affect it. With respect to a causal connection with this proceeding, it asserts that a favorable decision by me — overturning the Staff's Finding of No Significant Impact (FONSI) and, as a result, requiring QMC to prepare an Environmental Report that would initiate further environmental reviews — will redress the injury both to itself and to the environment (Supplement at 12).

2. *QMC and Staff Responses*

QMC and the Staff directly controvert Envirocare's claims of injury in fact as well as its formulation of a causal connection. First, they assert that the additional storage authority is essentially a *de minimis* addition to amounts already authorized to be stored (although, admittedly, stemming from different sources).⁵ QMC faults Envirocare for failing to show a causal connection between the asserted economic injury and the allegedly deficient environmental review of the project, or any potential health and safety violation under the Atomic Energy Act (Applicant's Supplemental Response at 2, 5-7). The Staff asserts that the alleged environmental harm is "speculative, at best," that the economic harm is not a direct harm to Envirocare flowing from the physical or environmental effects of the project, and that Envirocare has not demonstrated that the alleged injuries can be fairly traced to the issuance of the license amendment under review (Staff Response at 10, 13, 15).

3. *Economic Impacts*

I turn first to whether Envirocare may suffer economic injury from the license amendment and conclude, for purposes of standing, that it has indeed demonstrated injury in fact. For standing purposes alone, such injury need not

⁵ QMC asserts in its Response (at 2 n.2) that it had previously been authorized to accept source-specific section 11e(2) byproduct material for disposal at the Ambrosia Lake facility. In its license amendment application dated November 20, 1995 (forwarded to me on June 27, 1997, with copies to Envirocare and the Staff), QMC states that "[t]he addition of a generator's 10,000 [cubic] yard per year quantity is minimal in comparison to the 16 million tons of capacity available for storage . . . and in comparison to the 33 million tons of tailings material already at the site."

be substantial. *Houston Lighting and Power Co.* (South Texas Project, Units 1 and 2), LBP-79-10, 9 NRC 439, 447-48, *aff'd*, ALAB-549, 9 NRC 644 (1979). Although it must be "actual," "direct," and "genuine," *id.* at 448, it need not have already occurred. Potential or imminent injury is sufficient. There need only be a real possibility of concrete harm to a petitioner's interest as a result of the proceeding. *Nuclear Engineering Co.* (Sheffield, Illinois, Low-Level Radioactive Waste Disposal Site), ALAB-473, 7 NRC 737, 743 (1978).

Here, it is clear that the facility authorized by the instant license amendment might be a competitor to Envirocare's existing facility. There clearly is a real possibility, although not a certainty, that competition from the Ambrosia Lake facility will cause economic harm to Envirocare. Competitive injury such as this has been recognized as a legitimate basis on which to assert injury in fact. *UPS Worldwide Forwarding, Inc. v. U.S. Postal Service*, 66 F.3d 621, 626 (3d Cir. 1995), *cert. denied*, 116 S. Ct. 1261 (1996); *Panhandle Producers and Royalty Owners Association v. Economic Regulatory Administration*, 822 F.2d 1105, 1108 (D.C. Cir. 1987).

Given the realities of market competition, the possibility of economic harm appears to be stronger than "speculative." Moreover, although any such injury would stem from operation of the facility and not technically from its licensing (as claimed by the Applicant and Staff⁶), such a rationalization invokes a distinction without a difference by ignoring the obvious fact that the claimed potential competitive injury could not and would not occur absent the licensing. *Cf. Bennett v. Spear, supra*, 117 S. Ct. at 1163-64.

Accordingly, I conclude that injury in fact, as well as a causal connection to this proceeding, has been shown for standing purposes. The real standing question, to which I now turn, is whether that injury arguably falls within the "zone of interests" protected by the Atomic Energy Act or NEPA so as to be redressable here. *Rancho Seco*, CLI-92-2, *supra*, 35 NRC at 56. The Applicant and NRC Staff both claim that competitive injury is not within the zones of interests protected by any of these statutes, whereas Envirocare claims that it is.⁷

With respect to the Atomic Energy Act, Envirocare claims that one should inquire about the zones of interests to be protected by particular sections of a statute pertinent to the litigation, and not necessarily to the statute as a whole. It refers specifically to section 84 of the Atomic Energy Act, which was amended in 1983 to include language that permits consideration of economic matters and encompasses the section 11e(2) byproduct material at issue here. As further authority, Envirocare cites several cases under various environmentally oriented

⁶ Applicant's Supplemental Response at 6; Staff's Supplemental Response at 2.

⁷ Envirocare also makes certain economic standing claims based on purported constitutional violations. I deal with these assertions below.

statutes (including NEPA) that permit economic injury to serve as a basis for standing, in particular, a recent U.S. Supreme Court decision, *Bennett v. Spear*, *supra* (Endangered Species Act); and *Port of Astoria, Oregon v. Hodel*, 595 F.2d 467, 476 (9th Cir. 1979) (NEPA).

The Applicant and Staff each rely on a long series of Commission decisions to assert that economic matters are not comprehended by the Atomic Energy Act or NEPA (unless the economic injury stems directly from the alleged radiation hazards or other environmental impacts of the project). *See, e.g., Public Service Co. of New Hampshire* (Seabrook Station, Unit 2), CLI-84-6, 19 NRC 975, 978 (1984) ("[t]he zone of interests affected does not include general economic considerations"); *Gulf States Utilities Co.* (River Bend Station, Unit 1), CLI-94-10, 40 NRC 43, 48-49 (1994); *Rancho Seco*, CLI-92-2, *supra*, 35 NRC at 56-57. These decisions each involve the licensing of nuclear power reactors.

The licensing authority applicable to this proceeding stems from section 84 of the Atomic Energy Act which, as noted above, was specifically amended in 1983 to include economic considerations. *See Envirocare of Utah, Inc.*, LBP-92-8, *supra*, 35 NRC at 180-81. At least insofar as the Atomic Energy Act is concerned, the "zone of interests" affected by byproduct material regulated under section 84 of the Act (including the disposal of section 11e(2) wastes) is thus different from that protected under the sections of the Act regulating nuclear reactors or other production or utilization facilities.

Moreover, as the Petitioner claims, under current judicial authority standing may be derived from a specific section of the statute (i.e., § 84) rather than from the statute as a whole. *Bennett v. Spear*, *supra*, 117 S. Ct. at 1166-67. Decisions excluding all economic matters from the zone of interests protected by the Atomic Energy Act and based on regulation other than under the amended section 84 (most of the cases relied on by the Applicant and Staff) are therefore not relevant or applicable in this respect to a case such as this one arising under the amended section 84.

The one case involving standing under the amended section 84 opined (by way of dictum) that standing could arise from economic injury but rejected standing because the petitioner had failed to demonstrate injury in fact caused by the licensing action under review. *Envirocare*, LBP-92-8, *supra*. The Staff distinguishes LBP-92-8 from this proceeding on the ground that the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability invoked there by the petitioner (although held by the Licensing Board to have not been sufficiently demonstrated to satisfy injury-in-fact standards) would allegedly have resulted directly from the project's asserted environmental and safety deficiencies (concerning the adequacy of material storage and isolation) and is different in substance from the competitive injury alleged here, which is not directly attributable to any of the project's environmental or safety aspects (Staff Response at 11 n.11).

In my view, certain types of alleged economic injury are within the zone of interests protected under amended section 84 of the Atomic Energy Act. As outlined by the Applicant (Response at 9-10) and Staff (Response at 11), the legislative history of the 1983 amendment to section 84 suggests that it was designed to afford flexibility to the Staff to permit it to balance health and safety requirements with cost of compliance, so that cost of compliance would bear a reasonable relationship to expected benefits. As amended, section 84 contemplates that, in dealing with section 11e(2) byproduct material, the Staff will have somewhat more latitude than under other Atomic Energy Act licensing provisions to take into account the economic impact of regulatory compliance.

This, however, is very different from the competitive injury invoked by Envirocare, which apparently was not considered by Congress in amending section 84 and accordingly does not appear to be the type of economic injury that may form a basis for standing under amended section 84. Indeed, at its heart, Envirocare's economic argument is aimed at depriving the Staff of additional flexibility by making the precise licensing requirements governing its own facility the floor (rather than the ceiling) for any authorization that might be given to QMC. Ultimately, to rule that Envirocare has standing to obtain such a result would mean not only that any competitor of QMC anywhere in the country would also be entitled to such standing, but also would run contrary to the congressional purpose behind amended section 84 and would counter the zone-of-interests requirement's purpose to "exclude those [petitioners] whose suits are more likely to frustrate than to further" the statutory objectives. *Nevada Land Action Association v. U.S. Forest Service*, 8 F.3d 713, 716 (9th Cir. 1993).⁸

4. *Environmental Impacts Under NEPA*

I turn next to whether the alleged environmental impacts of the Ambrosia Lake facility, which surely fall within the zone of interests protected by NEPA, must affect the petitioner directly in order to serve as a foundation for injury in fact. I conclude they must.

In this connection, I am not dealing with the magnitude of the alleged impacts, or whether they are truly *de minimis*, as claimed by the Applicant and Staff, or to the adequacy of the Staff's environmental review. Those are matters for the merits, if the proceeding progresses that far. But my interpretation of the various cases cited by all parties or the Petitioner convinces me that the specific environmental or radiological impacts allegedly emanating from the project itself (listed, *supra*, at p. 264) must themselves, in some manner, either economically

⁸The Atomic Energy Act deals with certain antitrust aspects of the licensing of nuclear power reactors, but those provisions are specialized in their applicability and are of no relevance here.

or physically, have an impact on the Petitioner in order for it to use those impacts to establish its standing.

The case relied on most strongly by Envirocare in support of its position (see Supplement at 6, 8, 10, 11, 13 and 14) is *Port of Astoria, Oregon v. Hodel*, 595 F.2d 467, 476 (9th Cir. 1979). There, various plaintiffs, including a port district and the corporate owner of commercial radio facilities, brought suit under NEPA, claiming that an environmental impact statement (EIS) was required in connection with the execution of a power supply contract which obligated the Bonneville Power Administration to supply electrical power to a proposed aluminum reduction plant. The Court ruled the corporate sponsor of commercial radio facilities did have standing to bring suit, but the port district did not.

The port district was far removed from the facility site and claimed injury from the new facility only through losses of potential tax base and potential revenue. The Court commented that these alleged injuries "represent only pecuniary losses and frustrated financial expectations that are not coupled with environmental considerations" and thus are outside NEPA's zone of interests (595 F.2d at 475); it denied standing on that basis.

On the other hand, it granted standing to the corporate owner of broadcast facilities which alleged that the transmission lines to be built to service the new plant would interfere with its broadcast. The Court acknowledged that the injury was economic in nature — static caused by the transmission lines would cause economic injury to the radio station — and was the "immediate and direct result of the building of the [facility]." It added that this injury, unlike that of the port district, "[is] causally related to an act that lies within NEPA's embrace." *Id.* at 476. Thus, the corporate owner of the broadcast facilities was found to have standing whereas the port district was not.

Envirocare interprets this case to permit standing on the basis of economic injury in a proceeding subject to NEPA. It equates itself with the corporate owner of broadcast facilities. But it has not shown the direct injury alleged by the broadcast facilities arising from one of the environmental attributes of the project in question that was crucial to the finding of standing. In my view, Envirocare in this proceeding is more equivalent to the port district that was found not to have standing than to the broadcasters who had standing.

This view is supported by *Western Radio Services Co. v. Espy*, 79 F.3d 896, 902-03 (9th Cir. 1996), *cert. denied*, 117 S. Ct. 80 (1996), also cited by Envirocare (Supplement at 6, 14). There, the Court denied standing to a radio communication company also asserting economic injury from a transmission tower. Before the trial court, the plaintiff had asserted only economic harm, and the appellate court refused to allow the plaintiff on appeal to characterize its injuries as environmental. It interpreted *Hodel* as permitting standing on the basis of economic injury that was "causally related" to the environmental

impacts of the facility. It characterized the alleged economic injury as "not one that NEPA aims to redress." 79 F.3d at 903.

Envirocare also cites *Overseas Shipholding Group, Inc. v. Skinner*, 767 F. Supp. 287 (D.D.C. 1991) (Supplement at 9, 14-15), for the proposition that asserting a competitive interest does not preclude a firm from falling within the zone of interests protected by NEPA. The case granted standing to a corporate shipholding group attempting to challenge a Department of Transportation/Maritime Administration rule for failing to follow NEPA requirements. Although the case does hold economic interests within the zone of interests protected by NEPA, as claimed by Envirocare, it involved economic claims resulting *directly* from the environmental impacts allegedly produced by the rule in question. This direct connection is what is lacking here, where there has not even been an assertion that the alleged environmental impacts of the Ambrosia Lake facility in any way directly affect Envirocare. As the Supreme Court has observed, standing is never allowed "solely on the basis of a 'procedural right' unconnected to the plaintiff's own concrete harm." *Lujan v. Defenders of Wildlife*, *supra*, 504 U.S. at 573 n.8.

County of Josephine v. Watt, 539 F. Supp. 696, 703-04 (N.D. Cal. 1982), another case cited by Envirocare (Supplement at 6, 11), supported standing on the basis of "direct use in a recreational or occupational sense of the areas and places" involved. Certain lumber plaintiffs were "causally affected by a matter of NEPA concern." This was not merely a case where, as asserted by Envirocare (Supplement at 11), the act that causes the economic harm (the licensing action) is also one that will harm the environment. A direct causal connection was also involved.

Similarly, *Lake Erie Alliance v. United States Army Corps of Engineers*, 486 F. Supp. 707, 712 (W.D. Pa. 1980) (Supplement at 6), found standing under NEPA to challenge the adequacy of an environmental impact statement for a complex steel production facility by individual steelworkers (among others) who might lose or be required to change their jobs because of the new facility. The court observed that NEPA does not encompass monetary interests alone but that a party is not precluded from asserting cognizable injuries to environmental values because his "real" or "obvious" interest may be viewed as monetary. It added:

While the "real" interest of the steelworkers before us is undoubtedly in job security, all live in or around the . . . area which will be affected environmentally by this project, and all have alleged a concern with those adverse environmental effects.

486 F. Supp. at 713. In other words, those found to have standing were directly affected not only economically but also by the environmental impacts of the project (alleged quality of air, water, lands, and wildlife in the region). This is

the direct connection to environmental impacts that Envirocare has not claimed here. To the same effect, see *Realty Income Trust v. Eckerd*, 564 F.2d 447, 452 (D.C. Cir. 1977) (Supplement at 14).

The Applicant points to another NEPA case where a direct causal connection to alleged environmental impacts was required for standing. Applicant's Supplemental Response at 7. Absence of a direct connection to potential harm to the plaintiff caused by the environmental impact in a case involving allegations of economic injury was crucial to the court's holding of lack of standing. *Clinton Community Hospital Corp. v. Southern Maryland Medical Center*, 374 F. Supp. 450, 455-56 (D. Md. 1974), *aff'd*, 510 F.2d 1037 (4th Cir.), *cert. denied*, 422 U.S. 1048 (1975).⁹

Envirocare cites several other cases which it characterizes as not requiring a direct link between economic injuries and environmental harm to the petitioner. *Port of Astoria*, *supra*; *Western Radio Services*, *supra*. (Supplement at 10.) As discussed earlier, however, Envirocare is misinterpreting these cases. A direct link was indeed required. Envirocare also tries to distinguish the results in cases requiring direct environmental injury (e.g., *Defenders of Wildlife*, *supra*, and *Florida Audubon Society v. Bentsen*, 94 F.3d 658 (D.C. Cir. 1996)) on the basis that those cases did not involve a combination of economic and environmental harm (Supplement at 10). Again, however, Envirocare has misconstrued the cases that did involve such a combination.¹⁰

Commission holdings under NEPA are consistent with the foregoing zone-of-interests and causal effect rulings. For example, in *Rancho Seco*, CLI-92-2, *supra*, the Commission indicated to be cognizable for standing purposes, economic harm under NEPA must be occasioned by the environmental impacts alleged: "NEPA does protect some economic interests; however, it only protects against those injuries that result from environmental damage." 35 NRC at 56. Economic standing based on loss of employment at a nuclear plant that was closing did not suffice.

In contrast, marina operators were admitted to a proceeding (and accordingly found to have standing) to complain of shipworms in the vicinity of their business, resulting from operation of a nuclear power plant. *Jersey Central*

⁹ It perforce does not follow, as claimed by Envirocare (Supplement at 11, 15), that requiring a direct connection to environmental impacts to support standing undercuts the informational and educational purposes served by NEPA.

¹⁰ Still other cases cited by Envirocare involve specific statutory provisions — not present here — allowing participation of competitors to further the intent of the particular statute to regulate a defined area of competition, without a direct connection to the physical or environmental impacts (if any) of the action under review. *Clarke v. Securities Industry Association*, 479 U.S. 388, 396 (1987) (National Bank Act); *First National Bank & Trust Co. v. National Credit Union Administration*, 988 F.2d 1272, 1277 (D.C. Cir.), *cert. denied*, 510 U.S. 907 (1993) (Federal Credit Union Act); *Schering Corp. v. Food and Drug Administration*, 51 F.3d 390 (3d Cir.), *cert. denied*, 116 S. Ct. 274 (1995) (Drug Price Competition and Patent Term Restoration Act). Cf. *Hazardous Waste Treatment Council v. Thomas*, 885 F.2d 918, 922-23 (D.C. Cir. 1989) (Resource Conservation and Recovery Act, standing denied to trade association facing competition as a result of new EPA rule).

Power & Light Co. (Forked River Nuclear Generating Station, Unit 1), ALAB-139, 6 AEC 535 (1973). And a commercial fisherman was found to have standing under NEPA to complain of the discharge of cooling water that might affect his catch. *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-223, 8 AEC 241 (1974). See also *Gulf States Utilities Co.* (River Bend Station, Unit 1), LBP-94-3, 39 NRC 31, 37-38, *aff'd*, CLI-94-10, 40 NRC 43, 47-48 (1994) (interest in protecting property from radiological hazards sufficient for standing).

In summary, the cases seem uniformly to hold that, to establish standing, there must be a direct connection between the environmental or physical injury alleged to emanate from the project and the plaintiff. Economic injury may be permissible, as long as the environmental or physical damage assertedly resulting from the activity directly affects the plaintiff (or, here, the Petitioner.) Because Envirocare cannot satisfy this aspect of standing, I am compelled to find that it does not have standing under the Atomic Energy Act or NEPA.

5. *Constitutional Basis for Standing*

Envirocare also claims that the competitive interests it asserts are cognizable under the Equal Protection and Substantive Due Process clauses of the fifth and fourteenth amendments of the Constitution, inasmuch as it has suffered injury in fact from the differing treatment accorded by NRC to QMC and itself. Envirocare also asserts that its interest in ensuring that the NRC consistently applies its regulations and standards to similarly situated licensees is within the zone of interests protected by those two clauses. Supplement at 27-28. The single case it cites, however, *Metropolitan Life Insurance Co. v. Ward*, 470 U.S. 869 (1985), concerns the differing applicability of certain state taxes to in-state and out-of-state companies and appears to have nothing to do with standing.

Moreover, Envirocare has failed to develop adequately its thesis that it in fact is similarly situated with QMC. That the two facilities may eventually be in competition for the same business and that they are governed by the same statutes is not sufficient; indeed, the very circumstance that Envirocare was involved in the first such facility may well constitute a difference, as might the circumstance that QMC will be using an existing facility for purposes similar to that for which the facility already is licensed.

Further, regulatory requirements, particularly with respect to impact statements, may well not be similar, because of the different years in which applications were submitted. As QMC observes, "the law does not require consistency in treatment of two parties in different circumstances." *Offshore Power Systems* (Floating Nuclear Power Plants), ALAB-489, 8 NRC 194, 222 (1978) (Applicant's Supplemental Response at 17 n.11.) Envirocare's assertions concerning

these clauses, therefore, do not provide an appropriate basis upon which I could found its standing.¹¹

6. Conclusion

Envirocare has not demonstrated standing to be granted the hearing it requests, and its request for a hearing must therefore be dismissed and the proceeding terminated.

C. Order

For the reasons stated, it is, this 4th day of November 1997, ORDERED:

1. The request for a hearing and petition for leave to intervene of Envirocare, Inc., is hereby *denied*.
2. This proceeding is hereby *terminated*.
3. This order is effective immediately and, absent appeal, will become the final order of the Commission thirty (30) days after the date of issuance. *See* 10 C.F.R. § 2.1251(a).
4. This Order is appealable to the Commission in accordance with the provisions of 10 C.F.R. § 2.1205(o). Any appeal must be filed within ten (10) days of service of this Order and may be taken by filing and serving upon all parties a statement that succinctly sets out, with supporting argument, the errors alleged. Any other party may support or oppose the appeal by filing a counter-statement within fifteen (15) days of the service of the appeal brief.

Charles Bechhoefer, Presiding Officer
ADMINISTRATIVE JUDGE

Rockville, Maryland
November 4, 1997

¹¹ Although Envirocare lacks standing to participate in this proceeding, it may not lack a remedy to correct what it may perceive as unequal treatment by the Staff. At least in terms of regulatory requirements currently being applied to operation of the two facilities, Envirocare is always free to seek to have its license amended to incorporate provisions similar to those it may perceive give QMC a competitive advantage. If denied by the Staff, Envirocare could request a hearing on the validity of the denial.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before Administrative Judges:

Peter B. Bloch, Presiding Officer
Charles N. Kelber, Special Assistant

In the Matter of

Docket No. 40-8681-MLA-2
(ASLBP No. 98-733-01-MLA)
(Re: License Amendment)
(Alternate Feed Material)

INTERNATIONAL URANIUM (USA)
CORPORATION
(White Mesa Uranium Mill)

November 7, 1997

The Presiding Officer in this Subpart L proceeding held that: "Petitioners have failed to demonstrate grounds for their standing in this case. In particular they have not provided any plausible explanation of how the milling of Cabot Corporation Nuclear Waste by a licensed mill operator would cause Petitioners (or people they are authorized to represent) 'injury in fact.' Consequently, the request for a hearing shall be denied."

MEMORANDUM AND ORDER
(Denial of Petition for a Hearing)

Petitions for Leave to Intervene were sent on September 16, 1997, to Shirley Jackson, Chairman, Nuclear Regulatory Commission, by Norman Begay, White Mesa Utes; Lula J. Katso, Community Spokesperson for the Westwater Navajo Community; and Winston M. Mason, for Great Avikan House. The amendment sought by International Uranium (USA) Corporation in this case would permit it

to mill Cabot Corporation Nuclear Waste, at a facility that it is already licensed to mill uranium. Petitioners oppose this amendment.

In a Memorandum and Order of October 21, provision was made that "[a]mended petitions may be filed by 5 p.m. October 31, 1997." That date has come and gone with no amended petition being filed. As a result, Petitioners have failed to demonstrate grounds for their standing in this case. In particular they have not provided any plausible explanation of how the milling of Cabot Corporation Nuclear Waste by a licensed mill operator would cause Petitioners (or people they are authorized to represent) "injury in fact." Consequently, the request for a hearing shall be denied.

Order

For all the foregoing reasons and upon consideration of the entire record in this matter, it is, this 7th day of November 1997, ORDERED that:

The Petition for Leave to Intervene filed by Norman Begay, White Mesa Utes; Lula J. Katso, Community Spokesperson for the Westwater Navajo Community; and Winston M. Mason, for Great Avikan House *is denied*.

Peter B. Bloch, Presiding Officer
ADMINISTRATIVE JUDGE

Rockville, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Thomas S. Moore, Chairman
Richard F. Cole
Frederick J. Shon

In the Matter of

Docket No. 70-3070-ML
(ASLBP No. 91-641-02-ML-R)
(Special Nuclear Material License)

LOUISIANA ENERGY SERVICES, L.P.
(Claiborne Enrichment Center)

November 13, 1997

In this Memorandum, the Licensing Board provides the additional explanation required by the Commission's remand order in CLI-97-11, 46 NRC 49 (1997) concerning one aspect of an issue decided in the Board's original findings on contentions B and J.3 set forth in LBP-97-3, 45 NRC 99 (1997).

MEMORANDUM
(Explanation Required by Remand)

In CLI-97-11, 46 NRC 49 (1997), the Commission remanded "one issue" from LBP-97-3, 45 NRC 99 (1997), for "further explanation." LBP-97-3 is a Partial Initial Decision containing the Board's findings of fact and conclusions of law on contentions B and J.3. Those contentions were filed by the Intervenor, Citizens Against Nuclear Trash ("CANT"), in this combined construction permit-operating license proceeding on the application of Louisiana Energy Services, L.P. ("Applicant"), for a 30-year materials license to build and operate the Claiborne Enrichment Center, a gas centrifuge uranium enrichment facility to

be located in Claiborne Parish, Louisiana. Intervenor's contentions B and J.3 are primarily economic cost contentions regarding the reasonableness of the cost estimates contained in the Applicant's Decommissioning Funding Plan and Environmental Report and the NRC Staff's Final Environment Impact Statement ("FEIS") for the disposal of the depleted uranium tails (DUF_6) from the enrichment process. 45 NRC at 100-01. This Memorandum provides the requested additional explanation.

I. BACKGROUND

As explained in LBP-97-3, the Commission's hearing notice initiating this licensing proceeding required the Applicant to develop a "plausible strategy" for disposing of the tails from the enrichment process — a requirement the Board interpreted as necessitating a reasonable or credible plan for disposing of DUF_6 tails. 45 NRC at 101, 105. In addition to that hearing notice requirement, the Commission's regulations further prescribe that an applicant's decommissioning funding plan contain reasonable cost estimates for the various components of the plan. *Id.* In LBP-97-3, the Board found that the Applicant's tails disposal plan of first converting depleted UF_6 to U_3O_8 and then transporting the U_3O_8 to a final site for deep land burial (such as in a deep mine) was a plausible strategy for purposes of estimating the Applicant's tails disposal costs. *Id.* at 108. With one exception not relevant here concerning the Applicant's failure to include in its cost estimate the substantial costs of neutralizing the byproduct hydrofluoric acid when converting DUF_6 to U_3O_8 , the Board found that the Applicant's estimates for transportation and disposal of U_3O_8 for disposal by deep burial were reasonable. *Id.* at 112, 113.

Along with its direct challenge to the Applicant's tails disposal cost estimate, CANT also challenged the Staff's analysis in the FEIS of deep burial of U_3O_8 . The Intervenor generally claimed that the Staff's analysis was so flawed that it could not support the conclusion that deep burial of U_3O_8 in an existing abandoned mine will adequately protect the health and environment, thereby mandating disposal in a geologic repository at much higher costs. *Id.* at 119-20. In this regard, because no deep burial site has been licensed for the disposal of depleted uranium tails, the Staff modeled two hypothetical sites in the FEIS making, *inter alia*, a number of assumptions about geologic and groundwater characteristics. From its analysis, the Staff concluded that the dose impacts for a deep disposal site are less than those set forth in the applicable regulations, 10 C.F.R. Part 61. *Id.* at 107-08.

In challenging the FEIS analysis, the Intervenor claimed, among other things, that the Staff used inappropriate and misleading values for groundwater regarding redox potential ("eH"), pH, and retardation factor. *Id.* at 119-21.

In each instance, the Board found that the Intervenor's challenge was without merit and that the representative values for groundwater generally selected by the Staff from a range of values with respect to eH, pH, and retardation factor were reasonable. *Id.* at 120-21. Further, the Board concluded, contrary to CANT's claim, that an uncertainty analysis to obtain upper and lower bounds for estimated doses was unnecessary for the Staff's evaluation of the impacts from two representative hypothetical disposal sites. *Id.* at 121-22.

In its remand order, the Commission sought a more detailed explanation of the basis underlying one aspect of the Board's finding that the Applicant's cost estimate for the deep burial disposal of U_3O_8 was reasonable. Specifically, the Commission questioned whether the Board had found that it was plausible that a deep mine will be available in the United States with the exact values selected by the Staff for each groundwater parameter or whether the Board instead had found that it was plausible there will be a mine in the United States with characteristics falling within the expected range. CLI-97-11, 46 NRC at 50. The Commission opined that it was most likely that the Board only relied upon the plausibility of the existence of a mine with characteristics lying within the potential range and, if so, it directed the Board "to discuss why it found that the Staff's dose impact calculations can be taken as representative of disposal in mines with groundwater characteristics that differ from the Staff's single set of values." *Id.* at 50-51. Further, the Commission noted that the Board had not identified the effect that varying the values within the expected range would have on dose impacts. *Id.* at 51.

In response to the Commission's remand order, the Board held a hearing conference and directed the parties to file new proposed findings addressing various Board questions as well as the matters raised in the Commission's remand order.¹ No party advocated that the Board reopen the record to take

¹ Along with the parties' proposed findings of fact filed in response to the Board's direction, the Applicant filed a motion to strike and the Intervenor filed a motion for leave to file surreply findings as well as a counter-motion to strike. See Applicant's Motion to Strike (Oct. 15, 1997); CANT's Motion for Leave to File Surreply Proposed Supplemental Findings (Oct. 16, 1997); CANT's Response to Louisiana Energy Services' Motion to Strike and Counter-Motion to Strike (Oct. 22, 1997). Each of these motions is denied.

Further, in its proposed findings on the matters remanded by the Commission, the Staff relied upon a previously filed affidavit, with attachments, that had been filed by the Staff after the close of the evidentiary record. See NRC Staff's Proposed Findings Addressing Issue in Commission Remand Order CLI-97-11 (Oct. 7, 1997). The Staff filed this material as part of its response to the Board's post-hearing directive that the parties file legal memoranda addressing, *inter alia*, the legal status of waste generated at the Claiborne Enrichment Center. In this regard, the Board inquired of the parties whether, under current law, the Applicant's waste must be disposed of in Louisiana or a state belonging to a compact with Louisiana and whether the characteristics of such locations were compatible with the Staff's two hypothetical sites modeled in the FEIS. Order (March 24, 1995). As part of its response, the Staff filed an affidavit, with attachments, by its expert witnesses at the hearing to the effect that the states in the Central Interstate Compact contained layered-shale and granitic formations that are compatible with the hypothetical sites modeled in the FEIS. NRC Staff Memorandum in Response to Licensing Board Order Dated March 24, 1995 Regarding Legal Status of Depleted UF_6 Generated at the Claiborne Enrichment Center and Legal Standard for Assessing Financial Qualification (Apr. 21, 1995). In its reply to the Staff's memorandum, CANT objected to the Licensing Board making any

(Continued)

new evidence to respond to the Commission's order. Nor did any party object to the Board's decision not to accept any new evidence.

II. DISCUSSION

The Board's earlier findings in LBP-97-3 on contentions B and J.3 based on the original evidentiary record remain the Board's principal findings of fact on these contentions. This further explanation is intended to answer the Commission's inquiry and set forth in greater detail the basis for the Board's findings that the Applicant's cost estimate for the deep burial of U_3O_8 was reasonable and that the Intervenor's challenge to the Staff's dose estimate analysis in the FEIS was without merit.

A. Plausibility of Locating a Suitable Disposal Site

As previously mentioned, the Board found in LBP-97-3 that (1) the Applicant's tails disposal strategy, including the deep burial of U_3O_8 (such as in an abandoned mine), was a reasonable plan for purposes of estimating its tails disposal costs, and (2) its estimate for the deep burial of U_3O_8 was reasonable. Further, the Licensing Board found that (1) the Intervenor's challenge to the Staff's dose estimate analysis of two hypothetical burial sites in the FEIS was without merit, and (2) in each instance, the Staff's use of a representative value for eH, pH, and retardation factor of deep groundwater was reasonable. In making these findings the Licensing Board necessarily concluded that it was reasonable to assume that a mine can be located in the United States for U_3O_8 disposal that will have groundwater parameters sufficiently close to the representative values used in the Staff's analysis so that any deviation will not result in dose estimates exceeding the regulatory limits of 10 C.F.R. Part 61. Thus, the short answer to the initial question asked by the Commission in its remand order, as the Commission correctly discerned, is that the Licensing Board found that it is "plausible that there is a mine in the U.S. with characteristics falling within the expected range." CLI-97-11, 46 NRC at 50.

findings based on the Staff's new factual assertions regarding the geologic characteristics of any sites in the Central Interstate Compact. CANT's Response Memorandum Regarding Effects of Low Level Radioactive Waste Policy Act on Depleted Uranium Tails Disposal (May 8, 1995). Due to the intervening enactment of the USEC Privatization Act, 42 U.S.C. § 2297h-11, the Board did not reach any questions concerning the effect of the Low Level Radioactive Waste Policy Act, 42 U.S.C. § 2021b *et seq.*, on the Applicant's tails disposal strategy. See 45 NRC at 110 n.7. The Board, therefore, did not include in LBP-97-3 any ruling on the Intervenor's objection to the Staff's evidentiary material that was filed after the close of the hearing record. Because this Staff evidentiary material was filed after the close of the evidentiary record (Tr. 1243) and the Staff did not seek to reopen the record, the Staff's late-filed factual material is not properly part of the evidentiary record of the proceeding and it cannot now properly be used by the Board as the basis for any factual findings.

Further, in finding that each of the representative values for eH, pH, and retardation factor used by the Staff in its dose estimate analysis was reasonable, the Board clearly recognized that each of the Staff's chosen values, generally selected from a range of values, was not a worst case parameter but rather an acceptable compromise for assessing hypothetical sites — a situation necessitated by the fact that no licensed site for the deep disposal of enrichment tails exists. In this regard, the Board relied upon the Staff's assertions in the FEIS that "[t]he objective of [the Staff's] analysis is to develop estimates of impacts for conditions which may be expected to occur at a carefully selected site" (Staff Exh. 2, at Appendix A, at A-7), and that "[t]he characteristics of these sites are representative of natural variability and expected conditions for deep disposal." *Id.* at A-10. Moreover, in choosing the values for eH, pH, and retardation factor used in its analysis, the Staff's FEIS states that "[t]he literature values indicate that the selected groundwater analysis is representative of conditions expected for deep disposal locations." (*Id.* at A- 12.)

B. Reasonableness of Representative Values

1. Redox Potential

In finding that the redox potential value used by the Staff in its dose estimate analysis was reasonable, the Board's decision addressed the major arguments of Dr. Arjun Makhijani, the Intervenor's expert witness, and those arguments and findings need not be repeated here. It suffices to note that, as indicated in LBP-97-3, the basis for the Staff's selection of an eH value of minus 100 millivolts ("mV") is not explained in the FEIS. In the FEIS, the Staff only provides a range of values for the eH of uranium mine water and the FEIS contains no data at all with respect to the eH of deep groundwater. (Staff Exh. 2, at Appendix A, at A-12, Table A.5.) In his direct testimony, Dr. Makhijani, in effect, claimed that the Staff arbitrarily selected an eH value that fell outside the range of eH values of typical uranium mine water listed in the FEIS. According to Dr. Makhijani, this action minimized the amount of uranium in solution in the Staff's dose analysis because all of the eH values for uranium mine water set out in the FEIS would result in higher solubilities for uranium in groundwater. (Makhijani at 10-11 fol. Tr. 1081.) Further, he declared that notwithstanding one of the Staff's own expert's admissions that uranium is 3500 times more soluble at an eH of 50 mV (a value within the range of uranium mine water set out in the FEIS) than at an eH of minus 100 mV, the latter value was the one used by the Staff in its dose analysis. (*Id.* at 11-12.)

As the Staff's expert, Dr. Joseph D. Price, testified, however, the comparative eH values for uranium mine water set out in the FEIS likely do not represent the eH of waters in a closed uranium mine, in contrast to an uranium mine exposed

to the air, because reported studies show that once such a mine is closed and contact with the atmosphere is precluded, the mine returns to a reducing state. (Tr. 1147.) Further, as noted in LBP-97-3, Dr. Price explained that the Staff's analysis used an eH value of minus 100 mV because the comparative eH values for uranium mine water reproduced in the FEIS are not representative of eH values for deep groundwater. According to Dr. Price, reported experimental observations of deep groundwater show a range from minus 26 mV to minus 210 mV with some data going even lower. (Tr. 1148-49, 1118-19, 1146.) In light of these data, the Staff employed a redox potential value of minus 100 mV, which is an approximate mid-point negative eH value, because the majority of the range of available data for deep groundwater show reducing conditions. (Price Tr. 1119.) And, as found in LBP-97-3, Dr. Price indicated that depleted uranium tails only will be placed in a disposal site that has reducing conditions. (Tr. 1148.)

Moreover, in additional testimony that the Board found persuasive, Dr. Price explained that the maximum dose by many orders of magnitude over the next highest dose is received from the agricultural use of water from a nearby well and this critical dose, which is many orders of magnitude below the regulatory standard, is due to radium and its daughters, not uranium. (Tr. 1152; Staff Exh. 2, at Appendix A, at A-14, Table A.7.) Further, the critical radium dose is not sensitive to the solubility of uranium in groundwater. (Price Tr. 1152.) Stated otherwise, the solubility of uranium is largely irrelevant to the critical dose. Dr. Price also indicated that the Staff dose estimate calculation assumes that all the radium is "grown in" immediately at the disposal facility and, because radium has only a single valance state, it thus is not sensitive to eH. (*Id.*) Further, he indicated that the dose estimate coming from uranium, which is the eH sensitive element, is negligible in comparison to the dose that comes from radium. (*Id.*; Staff Exh. 2, at Appendix A, at A-14, Table A.7.) In other words, even if the solubility of uranium — the primary characteristic determining release rates — increased by a factor of 3500 in oxidizing conditions, that environment would not have a significant impact on the corresponding dose because the dose attributable to uranium is already infinitesimally small and would remain many orders of magnitude below the regulatory standard.

In this regard, the Board notes that in his testimony Dr. Makhijani nowhere claimed to have rigorously investigated the critical dose as eH is varied and he readily acknowledged that the "very back-of-the-envelope" figuring he had done could not be represented as "scientific work." (Tr. 1181.) Rather, his assertion that it is possible that the Staff may have incorrectly estimated the transport of uranium by "millions or tens of millions" of times is based almost entirely on his adjustment of the calculation of uranium solubility. (Tr. 1182; Makhijani at 12-14 fol. Tr. 1081.) Yet, as Dr. Price emphasized in testimony that the Board

credited in finding the Staff's use of an eH value of minus 100 mV reasonable, dissolved uranium is not what delivers the critical dose. (Tr. 1152.)

2. pH Value

In LBP-97-3, the Board indicated that the reference literature for deep groundwater pH showed a range of 7.2 to 8.5. It also found that the Staff's use of a mid-point value of 7.8 in the FEIS dose estimate analysis was appropriate and reasonable. 45 NRC at 120. In challenging the Staff's use of a pH value of 7.8, however, Dr. Makhijani claimed that the pH in the basalt rock formations at the Hanford reservation, a geologic characteristic similar to one of two hypothetical sites modeled in the FEIS, had been found to be greater than 9. He asserted that such pH variations could have a significant effect on the solubility and transport of uranium and, therefore, the calculated dose to the public. (Makhijani at 9-10 fol. Tr. 1081.) Specifically, Dr. Makhijani argued that the Staff's choice of a pH value appeared to be designed to yield low dose estimates because a 7.8 pH value is within the narrow range of values between 7 and 8 for which schoepite — one chemical form of uranium into which U_3O_8 might be transformed in some geologic environments — has its lowest solubility, while a change in pH from 8 to 9 would increase the solubility of schoepite by a factor of about 10. (*Id.* at 14-15.)

But as other parts of Dr. Makhijani's own direct testimony show, U_3O_8 converts to schoepite in oxidizing geologic conditions, not reducing conditions. (*Id.* at 8, 15). Moreover, as Staff expert Dr. Price testified, and the Board found in LBP-97-3, U_3O_8 will only be disposed of in a deep burial site with reducing conditions, not oxidizing conditions. (Tr. 1148.) Thus, Dr. Makhijani's challenge to the Staff's use of a representative pH value, much like his challenge to the Staff's representative eH value, is not based on rigorous investigation of the critical dose as pH is varied. Rather, he relied upon a single inappropriate and unpersuasive example. Indeed, in his criticism of the Staff's selection of a pH value, Dr. Makhijani appeared to have ignored completely the dominant effect of the radium dose. Accordingly, in finding the Staff's use of a representative pH value of 7.8 in its dose estimate analysis appropriate and reasonable, the Board found nothing in Dr. Makhijani's testimony that showed that the value selected by the Staff was far from what might plausibly be found in an appropriately selected site or that a modest change in pH would present significant problems.

3. Retardation Value

In LBP-97-3, the Board also found that the Staff's use in its dose calculation analysis of a retardation factor of 1200 for uranium was reasonable. This

value was based on actual experimental observations for a comparable medium reported in a 1978 Swedish study and was corroborated by additional experimental observations reported in a German study. 45 NRC at 121. Dr. Makhijani criticized the Staff's use of data from the Swedish study based on a 1983 report by the National Academy of Sciences ("NAS"). This NAS report contained retardation factor data for basalt and granite rock formations in the United States, the general geologic characteristics of the two sites modeled in the Staff analysis, that were lower than the value selected by the Staff. According to Dr. Makhijani, the NAS report listed retardation factors for granite of between 10 and 500 and for basalt of between 20 and 1000, with 50 being the recommended estimate if one number was to be used for both geologic settings. (Makhijani at 10 fol. Tr. 1081.)

As stated in LBP-97-3, the Board found the retardation factor value used by the Staff reasonable because it was selected from actual experimental observations for a comparable medium and corroborated by a second set of experimental observations. In reaching that conclusion, the Board also took into consideration Dr. Price's testimony that the Staff's primary reference source for retardation factor values presented two sets of values for both uranium and radium: one set was labeled "cautiously conservative" while the much higher second set was labeled "best estimate." For uranium, Dr. Price testified that the best estimate value was approximately 24,000, while the cautiously conservative value, and the one used by the Staff, was 1200. For radium, he stated that the best estimate value was in the range of 50,000, while the cautiously conservative value, and the one used by the Staff, was in the 1200 to 1800 range. (Tr. 1235.) Further, Dr. Price testified that the best estimate values were also corroborated by observations reported in a second study. (*Id.*) Additionally, Dr. Price stated that, while he and his colleagues were aware of the lower values in the report of the National Academy of Sciences, the text of that study "qualified" the values and provided no direct citations for them. For this reason, Dr. Price indicated that they used references for retardation factors that cited experimental data directly because it provided the most reliable data. (Tr. 1116-17.)

As a consequence, in finding the Staff's use of a retardation factor of 1200 for uranium reasonable, the Board essentially was confronted with differing professional opinions. The Staff's experts, after surveying all the data and selecting a conservative value, performed the calculations that produced a conservative result. The Intervenor's expert, on the other hand, cited another value without performing any calculations and neither convincingly stated why that value was preferable nor provided any direct experimental sources for the data. The Board was persuaded that the Staff's approach was the correct one.

C. Compliance with Regulatory Standards

Having thus rejected the Intervenor's challenge to the Staff's choice of values for eH, pH, and retardation factor and found those values reasonable, the Board necessarily concluded that deep burial of the enrichment tails would comply with the regulatory standards of 10 C.F.R. Part 61. This determination, in turn, was integral to the Board's finding in LBP-97-3 that deep burial was a plausible disposal strategy by which to judge the Applicant's tails disposal costs. In making these determinations, the Board also took into account the numerous conservatisms involved in the Staff's dose estimate analysis. As Dr. Price testified, the Staff's analysis did not take any credit for retardation and decay during vertical transport and it assumed that all radionuclides "grew in" at the disposal site instantaneously. Additionally, the dose calculation did not take into account resaturation time at the disposal site. (Tr. 1124-25.) Moreover, the various computer codes used in the Staff's dose estimate analysis (*see* Staff Exh. 2, at Appendix A, at A-8) are themselves inherently conservative. (Price Tr. 1125.) In light of these factors, the Board, like the Staff's expert who performed the analysis, reasonably concluded that the dose estimate analysis in the FEIS overestimates doses and that the projected doses from deep burial of enrichment tails are many orders of magnitude below the regulatory standard of 10 C.F.R. Part 61. (*See* Staff Exh. 2, at Appendix A, at A-12, Table A-7.) In this regard, the Board also was cognizant that the methodology, logic, approach, and major source documents used in the Staff's dose estimate analysis were reviewed by the Applicant's expert witnesses who concluded that "[t]his margin of safety provides confidence that a site can be located whose characteristics are similar enough to those of the generic sites analyzed in [FEIS] Appendix A to allow disposal in accordance with the Performance Objectives of Part 61." (Dubiel-Donelson at 14-15 fol. Tr. 1026.) They further concluded that, "[b]ecause resultant doses are projected to be several orders of magnitude below the Performance Objectives in 10 C.F.R. Part 61, it is reasonable to assume that sites can be located which will ensure that the Part 61 Performance Objectives are met." (*Id.* at 15.)

Finally, in determining on the basis of the Staff's dose estimate analysis that deep burial of enrichment tails would meet the standards of 10 C.F.R. Part 61, the Board rejected two additional Intervenor arguments. First, Dr. Makhijani argued that the Staff's dose estimates attributable to uranium were "unbelievably low" and "incredible" in comparison to routine groundwater samples. (Tr. 1182.) According to Dr. Makhijani, a well drilled into typical groundwater in the United States would yield water with a concentration of uranium many times the dose estimated by the Staff from the deep burial of pure depleted uranium. (*Id.*) As the FEIS makes clear, however, the Staff's dose estimates are only the projected doses from the deep disposal of U_3O_8 . (Staff Exh. 2, at 4-65.) Those

dose estimates, therefore, do not reflect background radiation. Furthermore, and contrary to the Intervenor's assertions, the Board had no reason to find it surprising, much less incredible, that the Staff dose estimates were far below regulatory limits. As the Staff dose estimate analysis demonstrated, U_3O_8 from depleted uranium tails is essentially insoluble and largely impervious to water transport when buried deep in appropriate granite or basalt rock formations.

Second, the Board rejected Dr. Makhijani's argument that the Staff should have performed an uncertainty analysis as part of its dose estimate analysis so that upper and lower bounds for doses could be obtained. 45 NRC at 121-22. In LBP-97-3, the Board found, based on Dr. Price's testimony, that an uncertainty analysis was unnecessary for the evaluation of the impacts of two hypothetical disposal sites. *Id.* at 122. As Dr. Price testified, an uncertainty analysis is useful and necessary in the analysis of an actual site when the range of parameters of site characteristics can be measured or carefully estimated. For the evaluation of a hypothetical site, however, he indicated that an uncertainty analysis was impractical and unnecessary due to the lack of specific site data on the various site parameters. (Tr. 1120-21.) The clear import of Dr. Price's testimony, with which the Board agreed, was that, for a hypothetical site analysis, the challenge was to select a reasonable value from a range of critical parameters for known sites that likely would be found in a reasonably thorough search for an actual site. In such circumstances, a worst case analysis would merely provide information about dose rates for sites that would not be considered in the "search" for an actual licensable site. As the Board found, therefore, such an analysis was unnecessary.

III. CONCLUSION

For the foregoing reasons, the Board concluded in LBP-97-3 that (1) it was plausible that a mine for the disposal of enrichment tails with characteristics within the range of parameters used by the Staff in its dose estimate analysis can be found in the United States; (2) the eH, pH, and retardation factor values used by the Staff in its dose estimate analysis were reasonable and representative values; and (3) given the extremely low doses calculated in the FEIS and the conservatism associated with those dose calculations, variations in the representative

values of those parameters within the expected range likely would not cause the overall dose estimates to exceed the regulatory standards of 10 C.F.R. Part 61.

THE ATOMIC SAFETY AND
LICENSING BOARD

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ADMINISTRATIVE JUDGE

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ADMINISTRATIVE JUDGE

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ADMINISTRATIVE JUDGE

Rockville, Maryland
November 13, 1997