

**RAS 11296**

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD

LBP-06-08

**DOCKETED 03/03/06**

**SERVED 03/03/06**

Before Administrative Judges:

G. Paul Bollwerk, III, Chairman  
Dr. Paul B. Abramson  
Dr. Charles N. Kelber

In the Matter of

LOUISIANA ENERGY SERVICES, L.P.

(National Enrichment Facility)

Docket No. 70-3103-ML

ASLBP No. 04-826-01-ML

March 3, 2006

SECOND PARTIAL INITIAL DECISION  
(Environmental Impacts of Disposal of Depleted Uranium)

I. INTRODUCTION

1.1 On December 12, 2003, Louisiana Energy Services, L.P., (LES) filed an application with the NRC seeking authority to construct and operate a uranium enrichment facility -- designated the National Enrichment Facility (NEF) -- near Eunice, New Mexico. This second partial initial decision presents the Licensing Board's findings of fact and conclusions of law relative to portions of an admitted environmental contention (EC) proffered by intervenors Nuclear Information and Resource Service and Public Citizen (NIRS/PC) -- NIRS/PC EC-4 -- Impacts of Waste Storage and Disposal -- which challenges the adequacy of the Final Environmental Impact Statement (FEIS) prepared by the NRC staff in connection with the NEF application. Specifically, this decision addresses those portions of contention EC-4 remanded to the Board by the Commission's decision in CLI-05-20, 62 NRC 523 (2005), concerning the adequacy of the staff's discussion in the FEIS of the environmental impacts of near-surface disposal of depleted uranium (DU) associated with the NEF.

1.2 For the reasons set forth below, the Board finds that, in the face of a NIRS/PC challenge to the FEIS as reflected in that portion of contention NIRS/PC EC-4 concerning the staff's analysis of the impacts of near-surface disposal remanded by the Commission in CLI-05-20, the staff has, based on the record now before the Board, carried its burden of proof to demonstrate the adequacy of the FEIS in accordance with 10 C.F.R. §§ 2.325, 51.104. Thus, the Board concludes that the NIRS/PC claims in contention NIRS/PC EC-4, as remanded, regarding the sufficiency of the FEIS analysis of near-surface disposal impacts cannot be sustained.

## II. PROCEDURAL BACKGROUND

2.1 This Licensing Board has discussed the procedural history of this proceeding on numerous occasions, including in the context of our first partial initial decision on environmental contentions, see LBP-05-13, 61 NRC 385, 392-402 (2005), and will not repeat that detailed discussion here.<sup>1</sup> Accordingly, we provide below a summary of this background, as well as a discussion of the developments with regard to EC-4 since the issuance of that first partial initial decision and, importantly, since the issuance of CLI-05-20, to provide context for this second partial initial decision.

2.2 Following LES's December 2003 submission of its application for a thirty-year 10 C.F.R. Part 70 license to construct and operate the proposed NEF, on January 30, 2004, the Commission issued a notice of hearing and opportunity to intervene in the proceeding on the NEF application. See CLI-04-3, 59 NRC 10 (2004) (69 Fed. Reg. 5873 (Feb. 6, 2004)).

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<sup>1</sup> The Commission likewise discussed in some detail the "unusually complicated procedural history" of contention NIRS/PC EC-4 in its recent decision remanding an amended form of that contention to the Licensing Board for its further consideration and appropriate action. See CLI-05-20, 62 NRC at 525-33.

Several entities responded by filing petitions to intervene pursuant to 10 C.F.R. § 2.309(a), including NIRS/PC.<sup>2</sup> See LBP-05-13, 61 NRC at 392. Following a Commission ruling that found NIRS/PC to have standing and so referred their intervention petition to the Licensing Board Panel for further consideration, this Licensing Board was constituted to preside over the LES adjudicatory proceeding. See id. at 392-93. On June 15, 2004, the Board held a one-day prehearing conference in Hobbs, New Mexico, during which the petitioners, LES, and the staff made oral presentations regarding the admissibility of each contention proffered by the petitioners, see id. at 394, including contention NIRS/PC EC-4.

2.3 On July 19, 2004, the Board issued a memorandum and order admitting NIRS/PC as parties to the proceeding, finding they had proffered at least one admissible contention. See LBP-04-14, 60 NRC at 48. Among those contentions admitted by the Board was NIRS/PC EC-4 which, as originally admitted, contested the sufficiency of the LES Environmental Report (ER) for the NEF in that it allegedly failed to discuss the environmental impacts of the construction and operation of a deconversion plant for the depleted uranium hexafluoride (DUF<sub>6</sub>) waste produced at the NEF. See LBP-05-13, 61 NRC at 395.

2.4 Thereafter, on October 20, 2004, NIRS/PC filed a motion to amend or supplement previously admitted contentions, including EC-4, based on certain additional information contained in the staff's draft environmental impact statement (DEIS) for the NEF. See Motion on Behalf of [NIRS/PC] To Amend and Supplement Contentions (Oct. 20, 2004)

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<sup>2</sup> Two state governmental entities, the New Mexico Environment Department (NMED) and the Attorney General of New Mexico (AGNM), also filed intervention petitions and were subsequently admitted as parties to this proceeding. See LBP-04-14, 60 NRC 40, 75 (2004). On August 12, 2005, the Board issued a memorandum and order that: (1) approved a settlement agreement between NMED, the AGNM, and LES; (2) dismissed those admitted contentions proffered by NMED or the AGNM; and (3) accepted the withdrawal of NMED and the AGNM from this proceeding. See Licensing Board Memorandum and Order (Approving Settlement Agreement and Accepting Withdrawal of Parties) (Aug. 12, 2005) at 7-8 (unpublished).

[hereinafter October Contention Motion]. In a November 22, 2004 memorandum and order, the Board admitted in part the proffered amendment to EC-4. Specifically, the Board admitted that portion of the amendment alleging that the DEIS failed to discuss the environmental impacts of the construction and operation of a DUF<sub>6</sub> deconversion plant.<sup>3</sup> The Board declined at that time, however, to admit a supplemental paragraph that it viewed as related to the issue of whether depleted uranium from an enrichment facility constitutes low-level waste, an issue then pending before the Commission in the context of a related contention, NIRS/PC EC-3/Technical Contention (TC)-1.<sup>4</sup> See LBP-05-13, 61 NRC at 398, 400. In rejecting this latter part of the proffered amendment, however, the Board noted that the challenges appeared to rest on new information first revealed in the DEIS, sufficient to provide “good cause” for the late submission of that amendment such that the amendment was not precluded by its untimely filing. See Licensing Board Memorandum and Order (Ruling on Late-Filed Contentions) (Nov. 22, 2004) at 14-15 (unpublished) [hereinafter November Contention Ruling]. The Board further stated that it rejected that portion of the amendment “without prejudice to a renewed motion should the

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<sup>3</sup> In the Board’s first partial initial decision on environmental contentions, we decided NIRS/PC’s challenges to the discussion of the environmental impacts of the construction and operation of a deconversion facility in the ER and DEIS in favor of LES and the staff, respectively. See LBP-05-13, 61 NRC at 434-36. On November 21, 2005, the Commission declined NIRS/PC’s petition for review of the remainder of the Board’s decision relative to that contention. See CLI-05-28, 62 NRC 721, 726-31 (2005).

<sup>4</sup> As the Commission noted in its decision remanding amended contention EC-4 to the Board, contentions EC-3/TC-1 and EC-4 once comprised a single two-part contention entitled “Waste Storage and Disposal.” See CLI-05-20, 62 NRC at 525. Because each part of that contention raised substantially different issues, the Board separated those claims into two contentions, EC-3/TC-1, related to the issue of a “plausible strategy” for disposal, and EC-4, related solely to the discussion in LES’s ER of the environmental impacts of deconversion of depleted uranium from the NEF. See id. (citing LBP-04-14, 60 NRC at 67-68).

Commission hold that the Board should hear the waste classification issue relative to that contention.” Id. at 15.<sup>5</sup>

2.5 On January 18, 2005, the Commission issued a ruling on the Board-referred question of whether depleted uranium from a uranium enrichment facility could appropriately be categorized as low-level waste. See CLI-05-5, 61 NRC 22 (2005). The Commission concluded that depleted uranium is properly considered low-level waste, but also cautioned that “low-level radioactive waste can encompass both those wastes suitable for near-surface disposal and those that may require greater isolation.”<sup>6</sup> Id. at 32. The Commission further noted that contentions challenging the waste disposal cost estimates set forth by LES were still pending before the Board, and that additional environmental or safety analysis might be required to resolve the issues raised by those contentions. See id. at 35.

2.6 Following the Commission’s January 2005 ruling on the low-level waste issue, on February 2, 2005, NIRS/PC filed with the Board a second motion for the admission of late-filed contentions in which it sought to amend and/or supplement three previously admitted contentions, including EC-4. See Motion on Behalf of Intervenors [NIRS/PC] For Admission of Late-Filed Contentions (Feb. 2, 2005) [hereinafter February Contention Motion]. With regard to EC-4, NIRS/PC referred to the Board’s previous statement concerning the possibility of a renewed contention amendment motion should the Commission rule the Board should hear the issue of the waste classification of depleted uranium, and averred that the Commission ruling in CLI-05-5 raised new information on which the proposed amendment to EC-4 appropriately was

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<sup>5</sup> In addition, to further clarify the scope of EC-4 as then admitted, the Board modified the title of the contention to delete the words “and Disposal.” See LBP-05-13, 61 NRC at 398.

<sup>6</sup> Indeed, the Commission emphasized that the only question before it was “whether depleted uranium is a low-level radioactive waste, not whether it meets one of the particular low-level waste classifications, or whether a near-surface disposal facility will be adequate.” See CLI-05-5, 61 NRC at 34.

based. See id. at 1-5. Specifically, as relevant here, NIRS/PC again challenged the analysis in the DEIS of the environmental impacts of near-surface disposal methods, as well as the analysis of estimated doses from geologic disposal. See id. at 8, 9-12, 16-17. In addition, while the October 2004 motion by NIRS/PC had focused quite narrowly on three issues related to the impacts of depleted uranium disposal, this February motion presented numerous bases and claims touching on a wide range of new issues. See CLI-05-20, 62 NRC at 530.

2.7 In a May 3, 2005 ruling, the Board again declined to admit NIRS/PC's proposed amendment to its contention EC-4 relative to the environmental impacts of depleted uranium disposal. See Licensing Board Memorandum and Order (Ruling on NIRS/PC Late-Filed Contentions and Providing Administrative Directives) (May 3, 2005) at 9-11 (unpublished). Specifically, the Board found that the proffered amendment failed to meet both the standard for nontimely amendment of contentions and the general contention admissibility requirements set forth in 10 C.F.R. § 2.309(c) and 2.309(f), respectively, in that NIRS/PC did not demonstrate good cause for the untimely amendment and, in any event, raised issues outside the scope of the admitted contention and did not present sufficient factual or expert opinion support. See id. at 10-11.

2.8 During the time between NIRS/PC's February 2 motion and the Board's May 3 ruling on that motion, the Board held an evidentiary hearing in Hobbs, New Mexico, during which it took testimony and evidence from LES, NIRS/PC, and the staff on the four admitted NIRS/PC environmental contentions, including the EC-4 challenges to the ER and DEIS discussions of the impacts of deconversion. See LBP-05-13, 61 NRC at 401-02; Tr. at 340-1692. On June 8, 2005, the Board issued its first partial initial decision regarding those environmental contentions. See LBP-05-13, 61 NRC 385. With regard to contention NIRS/PC EC-4, the Board found that NIRS/PC's challenges could not be sustained, in that the staff's

analysis in the DEIS “[met] the requirements of [the National Environmental Policy Act] in that it adequately discuss[ed] the environmental impacts of construction and lifetime operation of a conversion plant for the DUF<sub>6</sub> waste that is required in conjunction with the proposed enrichment plant.” Id. at 436. Because the Board had previously declined to admit any further amendment to contention NIRS/PC EC-4, it noted in its decision that the ruling therein represented the Board’s final determination regarding that contention. See id. at 402 n.3.

2.9 On June 23, 2005, NIRS/PC petitioned for Commission review of the Board’s decision in LBP-05-13 with regard to each of the environmental contentions. See Petition on Behalf of [NIRS/PC] for Review of First Partial Initial Decision on Environmental Contentions (June 23, 2005). As relevant here, NIRS/PC submitted that “[t]he Board erred in refusing to allow NIRS/PC to show the environmental impacts of waste disposal” when the Board declined to admit the amendments to contention NIRS/PC EC-4 asserted by NIRS/PC in its October 2004 and February 2005 motions.<sup>7</sup> See id. at 14.

2.10 While the NIRS/PC petition was pending before the Commission, the Board and the parties prepared for an evidentiary hearing, scheduled for October 24-28, 2005, regarding several NIRS/PC technical contentions. In preparation for that hearing, on September 15 and September 16, 2005, the staff, LES, and NIRS/PC submitted to the Board prefiled direct testimony regarding the contested issues to be litigated at the October hearing.<sup>8</sup> In response to

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<sup>7</sup> In its petition for review, NIRS/PC alleged six other Board errors with regard to its decision on environmental contentions, including two additional claims related to EC-4. On November 21, 2005, the Commission denied further review of those issues. See CLI-05-28, 62 NRC at 726-31.

<sup>8</sup> While much of the prefiled testimony and, accordingly, LES and staff motions in limine relative to the NIRS/PC testimony, is irrelevant for purposes of this second partial initial decision, as the Board explains further below, some of the prefiled testimony does relate directly or peripherally to the issues now before the Board in the context of contention NIRS/PC EC-4.

the prefiled direct testimony of NIRS/PC witness Dr. Arjun Makhijani, LES and the staff each filed motions in limine seeking to strike various portions of Dr. Makhijani's testimony. See Licensing Board Memorandum and Order (Ruling on In Limine Motions and Motion to Dismiss) (Oct. 4, 2005) at 1 (unpublished) [hereinafter First In Limine Ruling].<sup>9</sup> On October 4, 2005, the Board issued a ruling granting the LES and staff motions to strike certain portions of Dr. Makhijani's prefiled direct testimony to the degree the testimony fell outside the scope of the admitted NIRS/PC contentions at issue. See id. at 3-17.

2.11 Following the Board's October 4 ruling, LES and the staff each filed a motion seeking to exclude certain exhibits purportedly associated with Dr. Makhijani's prefiled direct testimony, and subsequently filed in limine motions relative to Dr. Makhijani's prefiled rebuttal testimony, again seeking to exclude certain testimony and associated evidentiary materials. In an October 20, 2005 memorandum and order, the Board addressed the LES and staff motions relative to the NIRS/PC prefiled exhibits and Dr. Makhijani's prefiled rebuttal testimony. With regard to the prefiled rebuttal testimony, the Board again granted the motions in part, finding that certain portions of Dr. Makhijani's testimony fell outside the scope of the contentions as admitted and/or the permissible scope of rebuttal testimony. See Licensing Board Memorandum and Order (Ruling on In Limine Motions Regarding Prefiled Exhibits and Rebuttal Testimony) (Oct. 20, 2005) at 2-7 (unpublished) [hereinafter Second In Limine Ruling]. With

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<sup>9</sup> In its motion, LES also included a renewed motion to dismiss in whole or in part certain admitted NIRS/PC contentions scheduled to be litigated at the October hearing. LES had previously sought, in an August 31, 2005 motion, to have dismissed and/or limit the scope of several admitted NIRS/PC contentions, a motion the Board found would more appropriately be framed as a motion in limine relative to NIRS/PC prefiled direct testimony or by a renewed motion to dismiss at the time such testimony was filed. See First In Limine Ruling at 2. The Board denied the renewed LES motion, finding dismissal of any contention or portion thereof improper in that even if the Board struck all NIRS/PC prefiled testimony relative to those contested issues, NIRS/PC could nonetheless seek to make its case solely on the basis of cross-examination of LES and staff witnesses. See id. at 3.



regard to the prefiled exhibits proffered in support of Dr. Makhijani's prefiled testimony, the Board essentially found that any exhibits not expressly cited in Dr. Makhijani's prefiled direct or rebuttal testimony would not be admitted in support of that testimony, though such a finding did not preclude the use of those as exhibits for cross-examination purposes or in support of oral surrebuttal testimony, as appropriate.<sup>10</sup> See id. at 8-9.

2.12 Thereafter, a few days prior to the start of the evidentiary hearing, in an October 19, 2005 memorandum and order, the Commission determined that "the Board erred in not admitting for hearing an amended contention [NIRS/PC EC-4] on the environmental impacts of depleted uranium disposal," CLI-05-20, 62 NRC at 524, and remanded certain "impacts"-related aspects of the amended contention to the Board for its consideration, see id. Specifically, the Commission directed the Board to consider the text and three bases of the amendment proffered by NIRS/PC in its October 2004 motion, as well as the February 2005 motion "to the extent that it raises or elaborates upon essentially the same 'impacts' analysis arguments made following the DEIS." Id. at 532; see also id. at 533 n.49. The Commission further indicated its belief that, because the remanded issues regarding disposal impacts "substantially overlap those now before the Board as a part of NIRS/PC's contentions challenging LES's estimates of depleted uranium disposal costs," which were scheduled to be litigated during the evidentiary hearing the following week, there would be no need for a stand-alone hearing on the issues raised by the remanded impacts contention.<sup>11</sup> See id. at 524.

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<sup>10</sup> In addition, with regard to two documents that NIRS/PC had previously sought to incorporate by reference into the prefiled testimony of Dr. Makhijani, the Board again emphasized that incorporation by reference of a document as purported testimony or evidence is not an acceptable practice, and that those documents should instead be specifically cited and relied on as evidentiary support for Dr. Makhijani's prefiled testimony. See Second In Limine Ruling at 10.

<sup>11</sup> The Commission also stated, however, that if the Board found supplemental evidence  
(continued...)

2.13 On October 24-27, 2005, the Board held the scheduled evidentiary hearing on the subject of the remaining admitted NIRS/PC contentions. See Tr. at 1738-3179. Prior to taking any testimony or evidence, the Board discussed with the parties the scope of the Commission remand of contention NIRS/PC EC-4, as well as how the parties believed, as a procedural matter, litigation of contention NIRS/PC EC-4 should proceed, particularly given the Commission's expressed belief that the remanded issues overlapped to a considerable degree the issues already before the Board. See Tr. at 1773-1814. While the parties differ in their interpretations of the scope of the Commission remand, an issue we address in Part III.B infra, they essentially agreed that they were prepared to go forward and present testimony regarding the sufficiency of the staff's review in the FEIS of the environmental impacts of near-surface disposal of depleted uranium from the NEF, see Tr. at 1789-98.<sup>12</sup> Accordingly, based on the Commission's guidance in CLI-05-20 and the parties' expressed belief that many, if not all, of the issues presented by the Commission remand could be litigated in the context of that October hearing, the parties presented supplemental oral testimony by their respective

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<sup>11</sup>(...continued)

necessary to fill any gaps remaining in the record following the conclusion of the October hearing, it could request such evidence from the parties. See CLI-05-20, 62 NRC at 524. Because the Board finds that the evidentiary hearing record now before it, in conjunction with the information submitted by the parties in support of the pending cross-motions for summary disposition, contains sufficient testimony and evidentiary material on which to make a determination regarding amended contention NIRS/PC EC-4 as remanded by the Commission, the Board sees no utility in requesting further supplemental evidence from the parties.

<sup>12</sup> Counsel for the staff did note that she was not prepared to say that the staff could provide a complete evidentiary basis to support the staff National Environmental Policy Act review relative to disposal impacts and that, therefore, the record of the hearing should be kept open following the conclusion of that week's hearing sessions in case a need for additional testimony and evidence on the substance of the Commission remand were to arise. See Tr. at 1793-94. Because the Board finds sufficient evidence on the record of this proceeding on which to resolve the substance of EC-4 as remanded by the Commission, staff's concern in this regard is now a nonissue. With this decision, however, we do close the evidentiary record regarding contention NIRS/PC EC-4.

“disposal” witnesses/panels (originally proffered to testify on the subject of the plausibility and estimated cost of disposal) regarding the sufficiency of the staff’s analysis in the FEIS of the impacts of disposal of depleted uranium from the NEF, and conducted cross-examination of the other parties’ witnesses. See Tr. at 2606-3083.

2.14 Following the conclusion of the October 2005 evidentiary hearing, NIRS/PC once again filed with the Board a motion for the admission of an amendment to contention NIRS/PC EC-4. See Motion on Behalf of Intervenors [NIRS/PC] For Admission of Supplemental and Additional Late-Filed Contentions Under 10 CFR 2.309(c) (Nov. 11, 2005). Specifically, NIRS/PC sought to add two paragraphs challenging the FEIS analysis of the impacts of waste disposal as insufficient, in that (1) the staff failed to take a “hard look” at the impacts of near-surface disposal of large quantities of depleted uranium from an enrichment facility, and (2) the FEIS fails adequately to disclose the models and parameter values used in its analysis of the impacts of deep disposal, and the results of that analysis cannot be reproduced. See id. at 8-14. LES and the staff filed responses to this motion on, respectively, November 28 and 29, 2005, each objecting to the admission of any additional amendment to contention NIRS/PC EC-4 on both timeliness and general admissibility grounds. See NRC Staff Response to Motion on Behalf of Intervenors [NIRS/PC] for Admission of Supplemental and Additional Late-Filed Contentions Under 10 C.F.R. § 2.309(c) (Nov. 29, 2005); [LES] Response to Intervenors’ Supplemental and Additional Late-Filed Contentions (Nov. 28, 2005). The Board issues a separate decision today denying NIRS/PC’s motion to amend contention EC-4. See Licensing Board Memorandum and Order (Ruling on Motion to Amend Contention NIRS/PC EC-4) (Mar. 3, 2006) (unpublished) [hereinafter Contention Amendment Ruling]. Accordingly, the issues raised in that proposed amendment, to the extent they fall outside the scope of the

amended contention admitted by the Commission in CLI-05-20, are not considered or addressed in the instant partial initial decision.

2.15 While the November NIRS/PC motion to amend contention NIRS/PC EC-4 was pending before the Board, the staff and NIRS/PC filed cross-motions for summary disposition of a portion of contention NIRS/PC EC-4 remanded by the Commission. See NRC Staff Motion for Summary Disposition (Nov. 18, 2005); Motion for Partial Summary Disposition Submitted on Behalf of Intervenors [NIRS/PC] (Nov. 18, 2005). In a footnote to its decision in CLI-05-20, the Commission indicated that, though it deemed admissible and was remanding to the Board for litigation a NIRS/PC challenge to the DEIS analysis of dose estimates for geologic disposal, it viewed the issue as “amenable to summary disposition.” See CLI-05-20, 62 NRC at 533 n.48. During the October evidentiary hearing, the Board indicated its agreement with the Commission that the geologic disposal impacts challenge could likely be relegated to summary disposition, see, e.g., Tr. at 1817-18, 1823, and set resolution of this issue on a separate track. See Tr. at 3156-60; Licensing Board Order (Accepting Joint Report Proposals) (Nov. 9, 2005) at 1-2 (unpublished). The Board discusses the deep disposal impacts issues subject to summary disposition in a separate ruling issued today on the NIRS/PC and staff summary disposition motions, in which the Board grants the staff’s motion for summary disposition as to the remanded NIRS/PC challenge to the analysis in the DEIS/FEIS of the environmental impacts of geologic disposal. See LBP-06-09, 63 NRC \_ (Mar. 3, 2006).

2.16 Finally, on November 30, 2005, pursuant to 10 C.F.R. § 2.712 and the schedule set forth in an August 12, 2005 Board memorandum and order, see Licensing Board Memorandum and Order (Memorializing Results of Prehearing Conference) (Aug. 12, 2005) at 3 (unpublished), NIRS/PC, LES, and the staff filed proposed findings of fact and conclusions of law regarding the NIRS/PC contentions litigated at the October hearing, including contention

NIRS/PC EC-4 as remanded.<sup>13</sup> See Proposed Findings of Fact and Conclusions of Law Submitted on Behalf of Intervenors [NIRS/PC] Based Upon Evidence Taken on October 24-27, 2005 (Nov. 30, 2005) [hereinafter NIRS/PC Proposed Findings]; [LES] Proposed Findings of Fact and Conclusions of Law Concerning Contentions NIRS/PC EC-3/TC-1, EC-5/TC-2, EC-6/TC-3, and EC-4 (As Remanded) (Nov. 30, 2005) [hereinafter LES Proposed Findings]; NRC Staff's Proposed Finding of Fact and Conclusions of Law Concerning NIRS/PC Contentions [EC-3/TC-1], [EC-5/TC-2], [EC-6/TC-3], and [EC-4] (Nov. 30, 2005) [hereinafter Staff Proposed Findings]. Each of the parties likewise filed reply findings of fact and conclusions of law in accordance with the schedule set by the Board, in which each responded to the proposed findings and conclusions proffered by the other parties. See [LES] Reply Findings of Fact and Conclusions of Law Concerning Contentions NIRS/PC EC-3/TC-1, EC-5/TC-2, EC-6/TC-3, and EC-4 (As Remanded) (Dec. 23, 2005); Reply Proposed Findings of Fact and Conclusions of Law Submitted on Behalf of Intervenors [NIRS/PC] Based Upon Evidence Taken on October 24-27, 2005 (Dec. 22, 2005); NRC Staff Reply Findings of Fact Concerning NIRS/PC Contentions [EC-3/TC-1], [EC-5/TC-2], [EC-6/TC-3], and [EC-4] (Dec. 22, 2005).

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<sup>13</sup> On November 29, 2005, the staff filed a motion requesting an extension of time to file proposed findings of fact and conclusions of law, based on a motion by LES to supplement the hearing record on two discrete cost issues. The Board denied that motion. See Licensing Board Order (Denying Filing Extension Motion) (Nov. 30, 2005) at 1 (unpublished).

### III. APPLICABLE LEGAL STANDARDS AND SCOPE OF CONTENTION NIRS/PC EC-4

#### A. Applicable Legal Standards and Regulatory Requirements

##### 1. National Environmental Policy Act and 10 C.F.R. Part 51 Regulations

3.1 The contention at issue here arises under the National Environmental Policy Act (NEPA), and the NRC regulations implementing the agency's responsibilities pursuant to that Act. See 42 U.S.C. §§ 4321 et seq.; 10 C.F.R. Part 51. In short, NEPA and the corresponding agency regulations require a license applicant to describe and the staff to consider the potential environmental effects of the proposed agency action (i.e., issuance of a license). Further, the Council on Environmental Quality (CEQ) has implemented regulations providing guidance on agency compliance with NEPA, which may help to direct the staff's NEPA review. See 40 C.F.R. Part 1500.<sup>14</sup> The Board described the requirements of NEPA and the agency's Part 51 regulations in some detail in its first partial initial decision on environmental contentions, see LBP-05-13, 61 NRC at 403-05, and will not provide a lengthy recitation here. Instead, a brief discussion of the pertinent NEPA principles provides a sufficient framework for the Board's decision.

3.2 As a general matter, NEPA imposes procedural restraints on agencies, requiring them to take a "hard look" at the environmental impacts of a proposed action and reasonable alternatives to that action. See Louisiana Energy Services, L.P. (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 87-88 (1998). This "hard look" is subject to a "rule of reason" in that the agency's environmental review, rather than addressing every impact that could possibly result, need only account for those that have some likelihood of occurring or are reasonably

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<sup>14</sup> While the CEQ regulations are not binding on the NRC when the agency has not expressly adopted them, the regulations are entitled to considerable deference. See Limerick Ecology Action, Inc. v. NRC, 869 F.2d 719, 725, 743 (3d Cir. 1989).

foreseeable. See, e.g., Long Island Lighting Co. (Shoreham Nuclear Power Station), ALAB-156, 6 AEC 831, 836 (1973). Agencies have considerable discretion in determining the extent to which a particular subject is analyzed, see Claiborne, CLI-98-3, 47 NRC at 103, and may decline to examine “remote and speculative” or “inconsequentially small” impacts, see Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), ALAB-919, 30 NRC 29, 44 (1989) (citing Limerick Ecology Action, 869 F.2d at 739). In the words of the Commission, “NEPA does not call for certainty or precision, but an estimate of anticipated (not unduly speculative) impacts.” CLI-05-20, 62 NRC at 536 (emphasis in original). Also in that vein, when reviewing an application filed by a private entity, as opposed to a federally-sponsored project, the agency may accord substantial weight to the preferences of the applicant with regard to the consideration of alternatives, including choices regarding site selection and project design. See Hydro Resources, Inc. (P.O. Box 15910, Rio Rancho NM 87174), CLI-01-4, 53 NRC 31, 55 (2001) (citing Citizens Against Burlington v. Busey, 938 F.2d 190, 197 (D.C. Cir. 1991)); Claiborne, CLI-98-3, 47 NRC at 104 (quoting City of Grapevine v. Dep’t of Transp., 17 F.3d 1502, 1506 (D.C. Cir. 1994)).

3.3 In addition, the CEQ regulations state that an agency environmental impact statement (EIS) must address both direct and indirect, or secondary, effects of an action. See 40 C.F.R. §§ 1502.16, 1508.8. Direct effects are those caused by the federal action, and occurring at the same time and place as that action, while indirect effects are caused by the action at a later time or more distant place, yet still are reasonably foreseeable. See 40 C.F.R. § 1508.8. An agency is not, however, required to discuss any indirect effects it considers remote or speculative. See Vermont Yankee Nuclear Power Corp. v. Natural Res. Def. Council, Inc., 435 U.S. 519, 551 (1978).

3.4 Finally, in conducting its environmental review, an agency may, in its discretion, rely on data, analyses, or reports prepared by persons or entities other than agency staff, including competent and responsible state authorities, see, e.g., Public Service Co. of Oklahoma (Black Fox Station, Units 1 and 2), LBP-78-28, 8 NRC 281, 282 (1978), provided, however, that the staff independently evaluates and takes responsibility for the pertinent information before relying on it in an EIS, see 10 C.F.R. § 51.70(b). In other words, the staff need not replicate the work completed by another entity, but rather must independently review and find relevant and scientifically reasonable any outside reports or analyses on which it intends to rely.

3.5 NEPA and Part 51 require that as a part of its environmental review the staff prepare a “record of decision” to accompany any Commission decision on “any action for which a final environmental impact statement has been prepared.” 10 C.F.R. § 51.102(a). Typically under Part 51, the staff prepares the record of decision on an action, see id. § 51.102(b), but when a hearing is held on the proposed action, as here, the Licensing Board’s initial decision on that action constitutes the record of decision, see id. § 51.102(c). Section 51.103(c) goes on to state that the record of decision may in fact incorporate by reference any material contained in the relevant FEIS. Thus, the FEIS and Board initial decisions (and any subsequent final decision by the Commission) together form the record of decision in a contested proceeding, such as the instant proceeding on the NEF application. See Claiborne, CLI-98-3, 47 NRC at 89. In addition, when a Board decision supplements or differs from the findings of the staff as set forth in its FEIS, the FEIS is deemed modified by the decision to that extent. See, e.g., HRI, CLI-01-4, 53 NRC at 53. The Commission indicated as much here, noting in its October 2005 remand to the Board that “[a]ny Board ‘impacts’ findings will be added to the NEPA record of decision.” CLI-05-20, 62 NRC at 537 n.59 (citing HRI, CLI-01-4, 53 NRC at 53).



2. 10 C.F.R. Part 61 Regulations and the NRC Agreement State Program

3.6 10 C.F.R. Part 61 sets forth the NRC's regulations for the disposal of low-level radioactive waste in a land disposal facility, including certain "performance objectives" and "technical requirements" that must be met before waste can be disposed of at a particular site. See generally 10 C.F.R. Part 61, Subparts C & D. The Part 61 requirements, as relevant here, are discussed in greater detail in Part III.B.1 infra.

3.7 Though in the strictest sense the Part 61 requirements provide direction to the staff, the Atomic Energy Act of 1954 (AEA), 42 U.S.C. §§ 2011 et seq., permits the NRC to delegate certain regulatory authority to individual states. Specifically, AEA section 274 authorizes the Commission "to enter into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the Commission" with respect to byproduct materials, source materials, and small quantities of special nuclear materials, including the disposal of such materials. See 42 U.S.C. § 2021(b). Such "Agreement States" have the authority, for the duration of the agreement, "to regulate the materials covered by the agreement for the protection of the public health and safety from radiation hazards." Id. Before it can be authorized to participate in the Agreement State program, a state pursuing Agreement State status must pass legislation establishing the authority for that state to conduct a radiation control program, and must further assume and implement that authority through the promulgation of state regulations. See id. § 2021(d), (o). In essence, the state must demonstrate its willingness to assume regulatory responsibility for the materials covered by the proposed agreement under a regulatory regime that is equivalent to or more stringent than Part 61. See id. § 2021(d)(1), (o)(2).

3.8 Section 274 likewise imposes certain requirements on the Commission that must be met before it enters into an agreement with any state. Specifically, the Commission is

required to find the state radiation control program “compatible” in certain respects with that of the NRC, and must further find that program “adequate to protect the public health and safety with respect to the materials covered by the proposed agreement.” Id. § 2021(d)(2).

Importantly, among those regulations for which compatibility must be found are the performance objectives and technical requirements set forth at Subparts C and D, respectively, of the NRC’s Part 61 regulations. See Office of State & Tribal Programs (STP), NRC, STP Procedure SA-200, Compatibility Categories and Health and Safety Identification for NRC Regulations and Other Program Elements (Oct. 8, 2004) at 6-7, app. A at 125-26 (ADAMS Accession No. ML042820600). Once the Commission and a state enter into an agreement, the NRC retains oversight authority over the specific activities covered by the agreement, see 42 U.S.C. § 2021(j), while the Agreement State assumes all active regulatory authority with regard to those specified activities, see id. § 2021(b). As part of its oversight role, the NRC conducts regular reviews of a state’s radiation control program, intended to ensure Agreement State programs continue to be compatible and to provide adequate protection of public health and safety. The NRC further retains the power to terminate or suspend an agreement with any state under certain circumstances if it determines that such action is required to ensure public health and safety. See id. § 2021(j); see also Statement of Principles and Policy for the Agreement State Program; Policy Statement on Adequacy and Compatibility of Agreement State Programs (62 Fed. Reg. 46,517, 46,520-21 (Sept. 3, 1997)).

B. Scope of Commission Remand of Contention NIRS/PC EC-4

3.9 As noted above, several days prior to the October 2005 evidentiary hearing in this proceeding, the Commission remanded to the Board for its consideration an amendment to contention NIRS/PC EC-4 regarding the environmental impacts of disposal of depleted uranium from the NEF. See CLI-05-20, 62 NRC at 524. Specifically, the Commission directed the

Board to consider three separate but related challenges raised by NIRS/PC in their October 2004 motion, and reiterated, though more opaquely, in a February 2005 NIRS/PC motion. The first, raised by paragraph A to the October 2004 proffered amendment, see October Contention Motion at 15, is the NIRS/PC claim that the staff concluded in the DEIS that depleted uranium could be disposed of as Class A low-level waste, notwithstanding the fact that in adopting the agency's waste classification regulations, the Commission did not include an environmental analysis of disposal of large quantities of depleted uranium, thereby requiring a further environmental analysis to determine whether near-surface disposal of DU was appropriate, or whether DU should more appropriately be disposed of similar to "greater than Class C" waste.<sup>15</sup> See CLI-05-20, 62 NRC at 528, 530. Second, raised by paragraph B to the October amendment, see October Contention Motion at 15-16, was the NIRS/PC allegation that the DEIS failed to acknowledge repeated statements by the Commission expressing doubt or concern about the appropriateness of DU for near-surface disposal in that it would not meet the agency's Part 61 performance objectives for land disposal, but instead "simply assumed" near-surface disposal would be appropriate for DU from the NEF. See CLI-05-20, 62 NRC at 528, 530. Finally, in paragraph C to the October amendment, see October Contention Motion at 16, there is the NIRS/PC complaint that the DEIS did not specify the models or parameter values used for estimating radiological releases from geologic deep disposal sites, a deficiency that is not corrected by the DEIS suggestion that models associated with the FEIS issued in connection with the earlier LES application for the Claiborne Enrichment Center (CEC) were employed, given that the results were unlike those reported in the CEC FEIS.<sup>16</sup> See CLI-05-20,

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<sup>15</sup> A discussion of waste classification and associated disposal methods is set forth in Part III.B.1 infra.

<sup>16</sup> In sum, the Commission remanded the following contention for the Board's  
(continued...)

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<sup>16</sup>(...continued)  
consideration:

NIRS/PC EC-4 – IMPACTS OF WASTE STORAGE AND DISPOSAL

CONTENTION: The DEIS contains an incorrect analysis of the environmental impacts of the disposal of depleted uranium hexafluoride waste. The DEIS assumes that depleted uranium may be disposed of as low-level waste, which is incorrect. The DEIS fails to recognize the Commission's stated position that depleted uranium is not appropriate for near-surface disposal. The DEIS fails to support or explain the modeling of disposal of depleted uranium.

- (A) The DEIS states that depleted uranium may be disposed of as Class A low-level waste. (DEIS at 2-27, 2-3 1). This is erroneous, because the Commission has not ruled that depleted uranium constitutes low-level waste. It is also erroneous, because the Commission's adoption of 10 CFR Part 61 included no analysis of the environmental impact of disposal of depleted uranium as low-level waste, and the Commission could not lawfully decide that such disposal is permissible without undertaking a full environmental impact analysis. Further, NIRS/PC have previously explained, in support of contention NIRS/PC EC-3/TC-1, that depleted uranium should be managed and disposed of in accordance with rules applicable to Greater than Class C waste, not low-level waste.
  - (B) The DEIS fails to recognize the Commission's repeatedly stated position that depleted uranium is not appropriate for near-surface disposal. The CEC Final EIS concluded that near-surface disposal of DU3O8 would not comply with 10 CFR Part 61 and suggested some form of deep disposal. (CEC Final EIS at 4-67). In 1995, during the scoping process for DOE's Programmatic EIS concerning long-term management of DU, NRC stated that large quantities of DU3O8 such as those derived from the DOE enrichment tailings inventory suggest the need for a unique disposal facility, such as a mined cavity or exhausted uranium mine. See Croff, A.G., et al., Evaluation of the Acceptability of Potential Depleted Uranium Hexafluoride Conversion Products at the Envirocare Disposal Site, ORNL/TM-2000/355, at 12 (Dec. 2000). On October 18, 2000, in commenting on the DOE Roadmap for management of DU, the Commission stated that "[s]hallow land (near-surface) disposal was not a likely option because a generic performance assessment indicated the dose requirements of 10 CFR Part 61 could be exceeded by a wide margin." (Letter, E. Leeds, NRC, to Depleted Uranium
- (continued...)

62 NRC at 528, 530-31.

3.10 LES, the staff, and NIRS/PC nonetheless differ in their respective interpretations of the scope of the Commission's CLI-05-20 remand.<sup>17</sup> We address these differing interpretations below, as well as provide additional information about the scope of the matters before the Board resulting from recent developments in this proceeding.

1. Waste Classification of Depleted Uranium from Enrichment Facilities Under 10 C.F.R. § 61.55

3.11 10 C.F.R. Part 61 sets forth the licensing requirements for land disposal of low-level radioactive waste (LLRW). A "land disposal facility" effectively includes any "land, building, and structures, and equipment which are intended to be used for the disposal of

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<sup>16</sup>(...continued)

Hexafluoride Management Program, DOE, Oct. 18, 2000). The DEIS for the NEF fails to account for the NRC's repeated positions on the subject of disposal of DU and simply assumes that disposal may occur at a near-surface site. An explanation of such a change in agency position is required.

- (C) The DEIS attempts to estimate the impact of disposal of depleted uranium from the NEF in its modeling of the releases expected from the site. (at 4-58, 4-59 and Table 4-19). The DEIS fails to disclose the models used or the parameter values. The text suggests that models used in analyzing the CEC site were used; however, the results are unlike any reported in connection with the CEC facility. Further, the model addresses only two hypothetical disposal sites and fails to examine any actual location of disposal. Performance of a disposal site is highly site-specific.

In addition, the Commission remanded for Board consideration paragraphs B(1), B(2), C, J, and K as presented in the February 2005 NIRS/PC motion, see February Contention Motion at 9-12, 16-17, to the extent those paragraphs legitimately amplify the text and paragraphs A, B, and C of the October motion.

<sup>17</sup> The parties do not disagree, however, that, while NIRS/PC's challenges in the October 2004 and February 2005 were directed at the DEIS since the FEIS had not yet been issued by the staff, this contention can be construed as a challenge to the FEIS without the need for further modification. See, e.g., Claiborne, CLI-98-3, 47 NRC at 84 (Board appropriately deemed environmental contentions based on ER as challenges to FEIS).

radioactive wastes,” but does not include “geologic repository” disposal. 10 C.F.R. § 61.2. As relevant here, Subparts C and D of Part 61 set forth, respectively, the “performance objectives” and “technical requirements” that must be met for LLRW land disposal facilities. See id. Part 61, Subparts C & D. For its part, Subpart D “specif[ies] the minimum characteristics a disposal site must have to be acceptable for use as a near-surface disposal facility.” Id. § 61.50(a). Near-surface disposal is a subset of land disposal, and a near-surface disposal facility is accordingly defined as “a land disposal facility in which radioactive waste is disposed of in or within the upper 30 meters of the earth’s surface.”<sup>18</sup> Id. § 61.2. A primary purpose of the Subpart D technical requirements is to ensure that the Subpart C performance objectives for a land disposal facility are met. Id. § 61.50(a). The Subpart C performance objectives, in turn, must be met regardless of the classification of the waste involved, and are specifically intended to (1) protect the general public from releases of radioactivity, id. § 61.41; (2) protect individuals from inadvertent intrusion at any time after active institutional controls over a disposal site are removed, id. § 61.42; (3) protect individuals from radiation exposures during operation of a facility, id. § 61.43; and (4) ensure the long-term stability of the disposal site after closure, id. § 61.44.

3.12 Much of the Subpart D determination about whether near-surface disposal is appropriate for a particular type of radioactive waste turns on how that waste is classified.

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<sup>18</sup> The type of near-surface disposal contemplated by Subpart D has been referred to variously throughout the course of this proceeding as shallow land burial, shallow trench burial, and engineered-trench burial, among others, and these terms have been used seemingly interchangeably by the parties. Part 61 itself contemplates that “[n]ear-surface disposal includes disposal in engineered facilities which may be built totally or partially above-grade provided that such facilities have protective earthen covers,” and that “[b]urial deeper than 30 meters may also be satisfactory” provided that those disposal methods meet the specific technical requirements for near-surface disposal. See 10 C.F.R. § 61.7(a). For the purposes of this decision the Board refers generally to “near-surface disposal,” and intends that term to describe, inclusively, any type of disposal that would meet the technical requirements for near-surface disposal under Part 61.

Section 61.55 sets forth a classification system for evaluating the propriety of near-surface disposal for particular wastes, as well as for determining appropriate waste forms and stability requirements. Specifically, section 61.55 calls for the classification of waste based on the long-lived and/or short-lived radionuclides present in the waste, as listed in Part 61, Tables 1 and 2, respectively. See id. § 61.55(a)(3)-(5), tbls. 1 & 2. Class A, B, and C waste are generally appropriate for near-surface disposal, see id. § 61.55(a)(2)(i)-(iii), while wastes having a greater radioactivity than Class C, i.e., “greater than Class C” waste, are typically not appropriate for near-surface disposal, see id. § 61.55(a)(2)(iv). Finally, if a particular radioactive waste does not contain any of the radionuclides listed in Tables 1 and 2, it is, by default, designated Class A waste. See id. § 61.55(a)(6); see also Staff Exh. 47, at 2-28, 2-31 (NUREG-1790, Final Environmental Impact Statement for the Proposed National Enrichment Facility in Lea County, New Mexico, vols. 1 & 2 (June 2005)) [hereinafter NEF FEIS].

3.13 In its January 18, 2005 decision regarding the proper waste category determination for depleted uranium, the Commission found that depleted uranium “is appropriately categorized as a low-level radioactive waste.” CLI-05-5, 61 NRC at 34. None of the parties dispute that the Commission has so categorized the waste. The Commission declined at that time, however, to reach the issue of whether depleted uranium from the NEF would meet the Part 61 requirements for near-surface disposal.<sup>19</sup> In fact, the Commission expressly stated that the only question it was addressing was “whether depleted uranium is a low-level radioactive waste, not whether it meets one of the particular low-level waste

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<sup>19</sup> As a related matter, the Commission directed that the parties, in their briefs regarding whether depleted uranium constitutes LLRW, address 10 C.F.R. § 61.55(a)(6), which, as noted above, states that “[i]f radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A.” Because the Commission reached a decision based on the relevant statutes, it did not address the issues surrounding section 61.55(a)(6) discussed in the parties’ briefs. See CLI-05-5, 61 NRC at 35 n.64.

classifications, or whether a near-surface disposal facility will be adequate” for disposal of depleted uranium. Id. Thus, the question of the classification of depleted uranium, i.e., whether it should be classified as Class A, Class B, Class C, or otherwise, was not resolved by the Commission at that time, and remained an open question. Indeed, as the Commission made clear in CLI-05-20, it did not, at that time, “remand” this issue of classification, or any other waste disposal issue, to the Board for its consideration. See CLI-05-20, 62 NRC at 529.

3.14 The issue of the classification of depleted uranium waste nonetheless was brought to the forefront again in the context of CLI-05-20. In partially admitting the October 2004 amendment to contention NIRS/PC EC-4 proffered by NIRS/PC, the Commission noted NIRS/PC’s challenge to the staff’s purported assumption in the DEIS that depleted uranium can be disposed of as Class A waste. See id. at 535. The parties dispute the meaning of this challenge, however, and therefore dispute the scope of the Commission’s remand in this regard.

3.15 The differing party interpretations of the Commission’s remand appear to be rooted in the fact that in CLI-05-20, in addition to remanding several issues for the Board’s consideration, the Commission also directed the staff, “outside of this adjudication, to consider whether the quantities of depleted uranium at issue in the waste stream from uranium enrichment facilities warrant amending section 61.55(a)(6) or the section 61.55(a) waste classification tables,” id. at 536. The Commission further found that, because depleted uranium does not contain the radionuclides listed in the section 61.55(a) classification tables, “under a plain reading of the regulation” as currently in force, depleted uranium is a Class A waste. See id. at 535. Lastly, the Commission stated that “[d]espite section 61.55(a), we are permitting the NIRS/PC waste impacts contention to go forward because a formal waste classification finding is not necessary to resolve the disposal impacts contention, which at bottom goes to whether



the impacts of near-surface disposal have been adequately estimated or assessed for NEPA purposes.” Id. at 536.

3.16 Based on the foregoing language from the Commission, NIRS/PC would have the Board find, in essence, that the Commission instructed that no classification of the depleted uranium at issue has been made pursuant to 10 C.F.R. § 61.55, that the Board may not make such a classification finding in the context of this proceeding, and that, instead, additional NEPA analysis must be conducted before the depleted uranium from the NEF can be classified pursuant to section 61.55. See NIRS/PC Proposed Findings at 54-55. Indeed, following the Commission’s issuance of CLI-05-20, and prior to the start of the October evidentiary hearing, NIRS/PC filed a motion in limine seeking to exclude certain staff and LES prefiled testimony as inadmissible and to have admitted certain prefiled testimony on behalf of NIRS/PC that the Board had previously stricken, averring that:

[s]ince a classification decision for depleted uranium from enrichment plants under 10 CFR Sec. 61.55 cannot be made, testimony in support of a classification of depleted uranium from an enrichment plant as Class A low-level radioactive waste should not be admitted, nor should testimony be admitted whose basis is the assumption that the depleted uranium from the proposed NEF is Class A and can therefore be disposed of in a shallow land burial facility.

Motion In Limine on Behalf of Intervenors [NIRS/PC] To Exclude Inadmissible Evidence and To Admit Relevant Evidence Under Ruling of Nuclear Regulatory Commission Dated October 19, 2005 (Oct. 21, 2005) at 3-4.<sup>20</sup> NIRS/PC has since repeatedly relied on this position that depleted uranium has not been and cannot be classified as Class A waste, or given any other classification under section 61.55, until a NEPA analysis has been conducted in support of a

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<sup>20</sup> In response to this motion, the Board reinstated certain NIRS/PC testimony it had previously excluded, but declined to strike any of the LES or staff testimony regarding classification of depleted uranium as Class A waste. See Tr. at 1820-23.

waste classification. See, e.g., Tr. at 1775-77, 1811, 2672; NIRS/PC Proposed Findings at 54-55.

3.17 LES, on the other hand, takes the position that depleted uranium is undoubtedly Class A waste under the plain meaning of section 61.55(a), and that this question “is not an issue for this proceeding because the Commission has resolved the issue.” Tr. at 1779-80; see also Tr. at 1787-88, 1800, 2671, 2672, 2736-37, 2767-68; LES Proposed Findings at 26. In LES’s estimation, then, the issue for litigation is limited to whether disposal of depleted uranium from the NEF in a Class A container or facility would comport with the requirements of Part 61.

3.18 The staff takes a position similar to that of LES. Specifically, the staff asserts that depleted uranium is Class A waste under the provisions of Part 61, but that classification does not settle the inquiry because Part 61 also sets forth performance requirements, in terms of radiation dose, that must be met before near-surface disposal can be permitted pursuant to Part 61. See Tr. at 1760-61; see also 1790-91, 1801-02; Staff Proposed Findings at 44-45.

3.19 As each of the parties’ respective positions make clear, a distinction must be drawn between the classification of depleted uranium waste, and the appropriateness of land disposal of that waste according to Part 61 performance standards. The Board declines to read contention NIRS/PC EC-4, as remanded by the Commission, as anything more than a challenge to the appropriateness of near-surface disposal of large quantities of depleted uranium from the NEF. As the Commission stated in CLI-05-20, and as NIRS/PC has repeatedly pointed out, it is not for this Board to make a waste classification in this proceeding. See CLI-05-20, 62 NRC at 536. In fact, such a classification ruling by this Board is entirely unnecessary because the Commission has unequivocally stated that, under a plain reading of section 61.55(a), depleted uranium is Class A waste. See id. at 535. The Board made repeated statements to that effect during the October evidentiary hearing, emphasizing that it was the Board’s understanding that the Commission said in CLI-05-20 that under the current

regulations depleted uranium is Class A waste. See, e.g., Tr. at 1821-22, 2671-72. Further, the Commission made a point of noting that section 61.55(a)(6) does not make any exception for depleted uranium from enrichment facilities, that NIRS/PC did not seek a waiver of the application of that rule as permitted by 10 C.F.R. § 2.335, and that any attempt by NIRS/PC to use this adjudicatory proceeding to insert such an exception into that regulation is entirely misdirected. See CLI-05-20, 62 NRC at 536. Thus, a waiver of the existing regulatory requirements is not a matter before the Board, and we reject any implication by NIRS/PC that the Board should effectively waive the application of section 61.55(a)(6) relative to a determination about whether depleted uranium is Class A waste under the Part 61 regulations.

3.20 As the foregoing discussion makes clear, there is no need for the Board to make a waste classification determination with regard to large quantities of depleted uranium, and we decline to do so here. The Commission has stated unequivocally that depleted uranium is Class A waste under 10 C.F.R. § 61.55(a) as currently in force. Further, the questions of whether this determination is supported by a NEPA analysis, or whether this is indeed a proper classification of depleted uranium, are not before the Board.<sup>21</sup> Rather, based on the scope of the contention proffered by NIRS/PC, the only issue for the Board with regard to the radiological impacts of near-surface disposal of NEF-generated depleted uranium is whether, regardless of waste classification, “the impacts of near-surface disposal have been adequately estimated or assessed for NEPA purposes.” See id. In other words, the Board is to determine whether the staff has taken the requisite “hard look” at the environmental impacts of near-surface disposal of large quantities of depleted uranium from the NEF.

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<sup>21</sup> As the Commission indicated in CLI-05-20, 62 NRC at 536, if there is to be any change in the classification status of the quantities of depleted uranium at issue in the waste stream from uranium enrichment facilities, that will come in the context of a staff rulemaking-related review of that matter.

2. Board Rulings on Cross-Motions for Partial Summary Disposition of Contention NIRS/PC EC-4 and NIRS/PC Motion to Amend Contention

3.21 As was also noted above, in its remand of an amended contention NIRS/PC EC-4, the Commission indicated that the Board should give further consideration to the matter of the environmental impacts of deep disposal of depleted uranium, suggesting that this aspect of the contention might be subject to summary disposition. See id. at 533 nn.48-49. Cross-motions for summary disposition were filed by both the staff and NIRS/PC, along with a NIRS/PC request to amend contention NIRS/PC EC-4 regarding both near-surface disposal and deep disposal impacts concerns associated with the NEF FEIS. As is described in more detail in the Board's rulings on those matters, we find the staff's motion dispositive of the deep disposal impacts aspects of remanded contention NIRS/PC EC-4, see LBP-06-09, 63 NRC at \_ (slip op. at 31), and dismiss the additional NIRS/PC attempt to amend this contention as both untimely and inadequate to meet the contention admissibility standards, see Contention Amendment Ruling at 16-17, in part because of the findings we make below.

3.22 Based on the foregoing discussion, that portion of paragraph A that asserts that the Commission has not ruled that depleted uranium is low-level waste and paragraph C in its entirety have been decided on the merits, and accordingly are not before the Board here. With these determinations in hand, the Board addresses below the remaining challenges by NIRS/PC to the adequacy of the staff's analysis in the FEIS of the impacts of near-surface disposal of large quantities of depleted uranium.<sup>22</sup>

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<sup>22</sup> As is apparent from our rulings today regarding the adequacy of the staff's NEPA analysis of the impacts of near-surface disposal and the NIRS/PC challenges to the staff's assessment of the impacts of deep disposal, the staff has analyzed the environmental impacts of both depleted uranium disposal options. As such, we need not resolve now the question of whether deep geologic disposal should be mandated for the NEF depleted uranium, an issue we will address when we rule on the question of the cost of disposal relative to contentions NIRS/PC EC-5/TC-2 and EC-6/TC-3.

#### IV. FACTUAL FINDINGS AND LEGAL CONCLUSIONS REGARDING CONTENTION NIRS/PC EC-4

4.1 Based on the Board's discussion regarding the scope of amended contention EC-4 as remanded to the Board by the Commission, as well as the Board rulings issued today addressing NIRS/PC's November 2005 motion to amend contention EC-4 and cross-motions for summary disposition by the staff and NIRS/PC relative to the deep disposal impacts issue remanded by the Commission, the portion of the admitted contention left for the Board to address here provides in pertinent part:<sup>23</sup>

##### NIRS/PC EC-4 – Impacts of Waste Storage and Disposal<sup>24</sup>

CONTENTION: The FEIS contains an incorrect analysis of the environmental impacts of the disposal of depleted uranium hexafluoride waste. The FEIS assumes that depleted uranium may be disposed of as low-level waste, which is incorrect. The FEIS fails to recognize the Commission's stated position that depleted uranium is not appropriate for near-surface disposal.

- (A) The FEIS states that depleted uranium may be disposed of as Class A low-level waste. This is erroneous, because the Commission's adoption of 10 CFR Part 61 included no analysis of the environmental impact of disposal of depleted uranium as low-level waste, and the Commission could not lawfully decide that such disposal is permissible without undertaking a full

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<sup>23</sup> Based on the Board's rulings discussed in Part III.B supra, the following text has not been included in this restatement of remanded contention NIRS/PC EC-4: (1) in the text of the contention, the sentence that reads "[t]he DEIS fails to support or explain the modeling of disposal of depleted uranium"; (2) in paragraph A, the sentence that reads "[t]his is erroneous, because the Commission has not ruled that depleted uranium constitutes low-level waste"; and (3) paragraph C to the remanded contention, in its entirety. In addition, to the extent that paragraph K from the February 2005 NIRS/PC motion might have supported the NIRS/PC claim that the staff's EIS failed to support or explain the modeling for disposal impacts, the Board has not considered that claim in this decision regarding contention NIRS/PC EC-4.

<sup>24</sup> Although the Board modified the title of this contention by deleting the words "and Disposal" from that title in its November 22, 2004 ruling on late-filed contentions, see supra note 5, based on the Commission remand, and the fact that contention NIRS/PC EC-4 now contains challenges related to the disposal of depleted uranium, we reinstate the original title of this contention.

environmental impact analysis. Further, NIRS/PC have previously explained, in support of contention NIRS/PC EC-3/TC-1, that depleted uranium should be managed and disposed of in accordance with rules applicable to Greater than Class C waste, not low-level waste.

- (B) The FEIS fails to recognize the Commission's repeatedly stated position that depleted uranium is not appropriate for near-surface disposal. The CEC Final EIS concluded that near-surface disposal of  $\text{DU}_3\text{O}_8$  would not comply with 10 CFR Part 61 and suggested some form of deep disposal. (CEC Final EIS at 4-67). In 1995, during the scoping process for [the Department of Energy's (DOE)] Programmatic EIS concerning long-term management of DU, NRC stated that large quantities of  $\text{DU}_3\text{O}_8$  such as those derived from the DOE enrichment tailings inventory suggest the need for a unique disposal facility, such as a mined cavity or exhausted uranium mine. See Croff, A.G., et al., Evaluation of the Acceptability of Potential Depleted Uranium Hexafluoride Conversion Products at the Envirocare Disposal Site, ORNL/TM-2000/355, at 12 (Dec. 2000). On October 18, 2000, in commenting on the DOE Roadmap for management of DU, the Commission stated that "[s]hallow land (near-surface) disposal was not a likely option because a generic performance assessment indicated the dose requirements of 10 CFR Part 61 could be exceeded by a wide margin." (Letter, E. Leeds, NRC, to Depleted Uranium Hexafluoride Management Program, DOE, Oct. 18, 2000). The FEIS for the NEF fails to account for the NRC's repeated positions on the subject of disposal of DU and simply assumes that disposal may occur at a near-surface site. An explanation of such a change in agency position is required.<sup>25</sup>

A. Witnesses and Evidence Presented

4.2 As mentioned briefly above, see supra p. 9, the Commission remanded contention NIRS/PC EC-4 to the Board only a few days prior to the scheduled evidentiary hearing on the remaining contested issues in this proceeding with the guidance that, at least with respect to near-surface disposal impacts, the NEPA issues raised by EC-4 "substantially

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<sup>25</sup> As the Commission directed in its remand of this contention, the Board focuses on the terms and bases proffered in connection with the October 2004 NIRS/PC motion to amend contention NIRS/PC EC-4. To the extent that paragraphs B(1), B(2), C, and J as presented in the February 2005 NIRS/PC motion legitimately amplify the text and bases of the first motion, see February Contention Motion at 9-12, 16-17, the Board has considered those bases in reaching the instant decision on amended contention NIRS/PC EC-4.

overlap” those being addressed in the context of NIRS/PC’s challenges to LES’s cost estimates for disposal of depleted uranium. After consulting with the parties, the Board did not take written direct or rebuttal testimony from the parties relative to the issues remanded in connection with amended contention NIRS/PC EC-4. Rather, the Board and the parties agreed that the parties would litigate the issues raised by amended contention NIRS/PC EC-4 to the extent possible through oral testimony (in the form of redirect/surrebuttal and cross-examination) by their respective witnesses/witness panels scheduled to testify on the topic of the plausibility and estimated cost of depleted uranium disposal. See Tr. at 1789-98. Accordingly, the oral testimony elicited from the respective party witnesses dealt directly with the adequacy of the staff’s discussion of near-surface disposal of depleted uranium in the FEIS.

4.3 LES presented testimony by a panel of two witnesses on the issue of the impacts of disposal of depleted uranium from the NEF: (1) Rod Krich, Vice President of Licensing, Safety, and Nuclear Engineering for LES, and (2) Thomas E. Potter, an independent Radiation Protection Consultant. Mr. Krich previously testified before the Board in the context of our February 2005 evidentiary hearing on environmental contentions, and his qualifications are outlined in the Board’s partial initial decision on those contentions. See LBP-05-13, 61 NRC at 420-21. Mr. Potter holds a Bachelor of Science in Chemistry from the University of Pittsburgh, a Master of Science in Environmental Science (Radiation Protection focus) from the University of Michigan, and has more than thirty years of professional experience in the area of radiation protection. Specifically, he has experience in the areas of health physics, waste management, and environmental issues surrounding the handling and processing of uranium, trans-uranium, fission and activation product radionuclides, and decommissioning of facilities used for processing those radionuclides, including waste classification evaluations and radiological dose assessments for operations and decommissioning actions. In his capacity as

an independent consultant, Mr. Potter provides technical advice to the NRC and Agreement States materials licensees on a range of radiation protection issues, including radiation assessments associated with operations and decommissioning, the formulation of licensee positions and comments on proposed radiation protection regulations, and plans to implement 10 C.F.R. Part 20. See Prefiled Direct Testimony of Rod Krich and Thomas Potter on Behalf of [LES] Regarding Applicant's Strategy and Cost Estimate for the Private Sector Disposal of Depleted Uranium from the Proposed [NEF] (Sept. 16, 2005) (fol. Tr. at 2607) at 3-4 & attached resume [hereinafter LES Disposal Direct Testimony].

4.4 For its part, the staff presented a panel of five witnesses: (1) Timothy C. Johnson, NRC Project Manager for the licensing of the proposed NEF; (2) James Park, NRC Project Manager for the environmental review of the NEF license application; (3) Jennifer Mayer, consultant for ICF Consulting, providing testimony under a technical assistance contract with the NRC; (4) Craig Dean, consultant for ICF Consulting, providing testimony under a technical assistance contract with the NRC; and (5) Donald Palmrose, employee of Advanced Systems Technology and Management, Inc., providing testimony under a technical assistance contract with NRC. Dr. Palmrose previously provided testimony before the Board in the context of the February 2005 hearing on environmental contentions, and his qualifications are outlined in the Board's partial initial decision on those contentions. See LBP-05-13, 61 NRC at 427-28.

4.5 Timothy C. Johnson has a Bachelor of Science in Mechanical Engineering from Worcester Polytechnic Institute and a Master of Science in Nuclear Engineering from Ohio State University. Mr. Johnson has more than thirty years of professional experience as an engineer, and has been employed by the NRC since 1977 in the areas of radioactive waste management, decommissioning, and fuel cycle facility licensing. His duties at the NRC have included responsibility for the waste form performance aspects of low-level radioactive wastes



and coordinating the development of waste form and waste classification requirements, including preparing the appropriate sections for the low-level waste management regulation of 10 C.F.R. Part 61, the draft and final EISs that support Part 61, and the technical positions on waste form and waste classification that provide guidance to waste generators for complying with the Part 61 requirements. As the Project Manager overseeing the licensing of the proposed NEF, Mr. Johnson's responsibilities include coordinating the review of the NEF application, as well as the preparation of the Safety Evaluation Report (SER) for the NEF, including the chapter on decommissioning the NEF. In his review of the application, Mr. Johnson focused on the decommissioning funding and waste management aspects of the proposed facility. See NRC Staff Testimony Regarding Disposal (Sept. 15, 2005) (fol. Tr. at 2831) at 1-2 & attached resume [hereinafter Staff Disposal Direct Testimony].

4.6 James Park holds a Bachelor of Science in Geology from Virginia Polytechnic & State University and a Master of Science in Structural Geology and Rock Mechanics from Imperial College at the University of London. He has more than ten years of experience at the NRC, including preparing and reviewing environmental assessments and EISs on various aspects of the nuclear fuel cycle. As Project Manager for the environmental review of the NEF application, Mr. Park was responsible for overseeing the preparation of the FEIS for the NEF, including the chapters on alternatives and environmental impacts. See id. at 1, 2-3 & attached resume.

4.7 As a consultant with ICF Consulting, Jennifer Mayer assisted the NRC staff in evaluating LES's proposed decommissioning funding plan for the NEF and was the principal author of the sections of the SER addressing decommissioning costs. Ms. Mayer received a Bachelor of Science in Chemical Engineering from Bucknell University, and has over thirteen years of experience in cost-benefit analyses and cost modeling, including preparing cost

estimates for clean-up for license terminations and a cost benefit analysis for the generic EIS for the NRC's clearance rule, regarding the regulatory approaches for control of solid materials. See id. at 1, 3 & attached resume.

4.8 Craig Dean holds a Bachelor of Arts in History from Carleton College, a Master of Arts in Russian Studies from Columbia University, and a Juris Doctor from Georgetown University Law Center, and has completed graduate coursework in Economics and Statistics at American University. As an employee of ICF Consulting, he has provided support to the NRC in analysis of financial assurance submissions, evaluation of financial assurance issues, development of guidance documents, and delivery of training on financial assurance, licensing reviews, and enforcement. Mr. Dean is the manager responsible for the technical support provided to the staff by ICF Consulting in evaluating the financial assurance provisions in LES's decommissioning funding plan for the NEF. In this capacity, he was the principal evaluator of the financial assurance instruments and assessment of the adequacy of the contingency factor applied to the LES cost estimates. See id. at 1, 3 & attached resume.

4.9 NIRS/PC presented one witness, Arjun Makhijani, President and Senior Engineer at the Institute for Energy and Environmental Research, an organization that assesses environmental damage from the operation of nuclear fuel facilities, and estimates facility compliance with environmental regulations, primarily relating to radioactive materials and wastes and radioactivity exposures. Dr. Makhijani previously provided testimony before the Board in the context of the February 2005 hearing on environmental contentions, and his qualifications are outlined in the Board's partial initial decision on those contentions. See LBP-05-13, 61 NRC at 428.

4.10 Though none of these party witnesses was expressly proffered as experts on the matters remanded to the Board in the context of EC-4, based on the respective qualifications

presented in their written testimony on the plausibility and cost estimates for disposal, the Board finds that each of the LES, staff, and NIRS/PC witnesses is qualified as an expert on the environmental impacts of disposal of depleted uranium from the NEF for the purposes of this proceeding.<sup>26</sup>

4.11 Based on the limited scope of the issues before the Board, and the additional record evidence elicited at the October 2005 hearing, the Board does not believe further testimony from the parties on the issue of near-surface disposal impacts would be useful in reaching our findings on this matter, and we therefore resolve these issues on the record now before the Board.

B. NRC Position as to the Appropriateness of Near-Surface Disposal of Depleted Uranium (Paragraph B)

4.12 Because resolution of the issues raised by paragraph B of amended contention NIRS/PC EC-4 provides a solid foundation for the Board's consideration of the more complex challenges at issue in paragraph A, we treat these claims in reverse order.

4.13 In paragraph B of its remanded contention, NIRS/PC challenges the alleged failure of the FEIS "to recognize the Commission's repeatedly stated position that depleted uranium is not appropriate for near-surface disposal," in that it "simply assumes" that near-surface disposal is appropriate, and that an explanation is required for this change in agency position. See October Contention Motion at 13, 15-16. In support of this challenge, Dr. Makhijani testified that numerous NRC and Department of Energy (DOE) statements and reports concluded that additional environmental review would be required before a

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<sup>26</sup> In this regard, the Board found in the context of the February 2005 evidentiary hearing that Mr. Krich, Dr. Palmrose, and Dr. Makhijani were each qualified to testify as expert witnesses on the subject of the impacts of the construction and operation of a deconversion plant for depleted uranium waste associated with the NEF raised by NIRS/PC's challenge in contention NIRS/PC EC-4 (i.e., impacts of waste storage). See LBP-05-13, 61 NRC at 427-28.

determination of the appropriateness of near-surface disposal could be made. See Revised Direct Testimony of Dr. Arjun Makhijani In Support of NIRS/PC Contentions EC-3/TC-1, EC-5/TC-2, and EC-6/TC-3 Concerning LES's Disposal Strategy and Cost Estimate (Oct. 18, 2005) (fol. Tr. at 2968) at 10-15 [hereinafter NIRS/PC Disposal Direct Testimony]. He further posits that the staff, in the NEF DEIS, took a "somewhat more nuanced position," stating that additional environmental analysis could be necessary prior to final disposal of large quantities of depleted uranium. See id. at 13-14.

4.14 Dr. Makhijani did not, however, present any testimony or evidence that demonstrates the agency has ever taken such an absolute stance on the appropriateness of near-surface disposal of large quantities of depleted uranium, and certainly not any testimony that rises to the level of a "stated [Commission] position that depleted uranium is not appropriate for near-surface disposal" as NIRS/PC asserts in its remanded contention, see October Contention Motion at 13. More accurately, as Mr. Johnson's oral testimony on this matter reflects, the staff has consistently taken the position that "some near-surface disposal facilities may not be suitable for large quantities of depleted uranium from enrichment operations," and that pathway analysis should be performed on a site-specific basis to ensure compliance with Part 61, Subpart C. See Tr. at 2836.

4.15 Witnesses for the staff and NIRS/PC both testified about the history of the agency's position on the issue of disposal of large quantities of depleted uranium. As Mr. Johnson explained during the hearing, the NRC's Part 61 regulations were developed based on an exposure pathway analysis (e.g., intruder agriculture) that applied the proposed Part 61 requirements to a series of reference sites to determine whether, as applied to those particular reference sites, land disposal would meet the performance objectives of now-Subpart C. See Tr. at 2834-35. Though such an analysis with regard to large quantities of depleted uranium

was included in the proposed rule for Part 61, as Dr. Makhijani noted in his testimony, the final rule and supporting EIS did not include an analysis of, or requirements for, depleted uranium from enrichment operations because, at that time, no commercial source possessed large quantities of depleted uranium. See NIRS/PC Disposal Direct Testimony at 11. In 1991, however, in anticipation of a license application from LES to construct a uranium enrichment facility in Claiborne Parish, Louisiana, the NRC's Executive Director of Operations (EDO) issued a policy statement concluding that depleted uranium could be disposed of as low-level waste, but that "analysis of the disposal of depleted uranium tails from an enrichment facility at a Part 61 [low-level waste] disposal facility should be conducted similar to the pathway analyses conducted in support of Part 61." See NIRS/PC Exh. 193, encl. at 4 (Memorandum from J.M. Taylor, NRC EDO, to NRC Commissioners, regarding Disposition of Depleted Uranium Tails from Enrichment Plants (Jan. 25, 1991)).

4.16 Mr. Johnson testified for the staff that such an analysis was just what the NRC contemplated when it included section 61.58 in the Part 61 rulemaking. Specifically, Mr. Johnson noted that the drafters of Part 61 anticipated that new waste streams or disposal methods might become relevant in the future, and left flexibility in Part 61 to deal with such occurrences. Section 61.58 states:

The Commission may, upon request or on its own initiative, authorize other provisions for the classification and characteristics of waste on a specific basis, if, after evaluation, of the specific characteristics of the waste, disposal site, and method of disposal, it finds reasonable assurance of compliance with the performance objectives in subpart C of this part.

10 C.F.R. § 61.58. In his testimony on this issue, Dr. Makhijani likewise relies on section 61.58 in concluding that compliance with the Subpart C performance objectives is the ultimate consideration in determining the suitability of depleted uranium disposal in a near-surface facility. See Revised Rebuttal Testimony of Dr. Arjun Makhijani In Support of NIRS/PC

Contentions EC-3/TC-1, EC-5/TC-2, and EC-6/TC-3 Concerning LES's Disposal Strategy and Cost Estimate (Oct. 25, 2005) at 3-5 (fol. Tr. at 2968).

4.17 Dr. Makhijani cited several examples that allegedly support the NIRS/PC proposition that the staff repeatedly has taken the position that depleted uranium should not be disposed of in near-surface facilities. For example, he first referred to analyses done in connection with the LES license application to construct and operate the CEC facility in Louisiana, noting that a 1992 report prepared for the staff concluded that "further analysis is necessary to demonstrate whether the disposal of this material in a 10 CFR [Part] 61 disposal facility will be acceptable in terms of public health and safety." See NIRS/PC Disposal Direct Testimony at 12 (quoting NIRS/PC Exh. 128, at 1 (M. Kozak, et al., Sandia National Laboratories, Cover Letter & Final Report, Performance Assessment of the Proposed Disposal of Depleted Uranium as Class A Low-Level Waste (Dec. 16, 1992)) [hereinafter Kozak Report]). Dr. Makhijani also referred to EISs published in connection with the management of large amounts of depleted uranium currently stored at three DOE facilities, in which DOE stated that it would "decide the specific disposal location(s) for the depleted  $U_3O_8$  conversion product after additional appropriate NEPA review." See id. at 13 (quoting LES Exh. 17, at 2-11 (Final Environmental Impact Statement for the Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Paducah, Kentucky Site, DOE/EIS-0359, Oak Ridge Operations, DOE Office of Environmental Management (June 2004))).

4.18 Counsel for NIRS/PC elicited additional testimony on this matter by cross-examining Mr. Johnson, through whom counsel introduced several exhibits that, variously, contained statements indicating that, for particular reference sites studied, near-surface disposal of large quantities of depleted uranium would not be appropriate, and that disposal of large quantities indicated the need for a unique type of disposal facility given that

generic performance assessments showed the Part 61 dose requirements could be exceeded by a wide margin. See Tr. at 2930-44; see also NIRS/PC Exh. 247 (Letter from R. Bernero, Director, Office of Nuclear Material Safety & Safeguards (NMSS), NRC, to C. Bradley, Office of Uranium Programs, DOE (Jan. 3, 1995)); NIRS/PC Exh. 248 (Letter from E. Leeds, Chief, Special Projects Branch, Division of Fuel Cycle Safety & Safeguards, NMSS, NRC, to Depleted Uranium Hexafluoride Management Program, DOE (Oct. 18, 2000)); NIRS/PC Exh. 256 (Letter from J. Hickey, Chief, Fuel Cycle Safety Branch, Division of Industrial & Medical Safety, NMSS, NRC, to W. H. Arnold, President, LES (Sept. 22, 1992)); NIRS/PC Exh. 257 (A. Croff, et al., Oak Ridge National Laboratory, Assessment of Preferred Depleted Uranium Disposal Forms (June 2000)); NIRS/PC Exh. 277 (Memorandum from R. Bangart, Director, Division of Low-Level Waste Management & Decommissioning, NMSS, NRC, to R. Cunningham, Director, Division of Industrial & Medical Nuclear Safety, NMSS, NRC (Jan. 12, 1993)).

4.19 On cross-examination, however, Mr. Johnson explained that NRC statements to the effect that near-surface disposal would not be appropriate were based on the specific facts or parameters upon which those analyses were based. See Tr. at 2930-44. For example, with regard to the CEC analyses, the Kozak report and the CEC FEIS both concluded that near-surface disposal of large quantities of depleted uranium at a “humid southeastern U.S.” or “wet” site would not be plausible. See Kozak Report at 5; Staff Exh. 46, at 4-67 (NUREG-1484, Final Environmental Impact Statement for the Construction and Operation of Claiborne Enrichment Center, Homer, Louisiana, § 4.2.2.8 & app. A (Aug. 1994)). Those analyses of hypothetical “wet” near-surface disposal sites, which included the drinking water and agricultural exposure pathways, showed that doses would exceed Part 61 limits at the hypothetical site(s) studied, and therefore concluded that at such sites deep disposal would likely be necessary. See id. Further, the staff pointed out that nothing in its review of disposal of depleted uranium

from the NEF contradicts NRC statements in connection with, for instance, the scoping process for the DOE Programmatic EIS (PEIS); rather, the staff testified that it considers the Envirocare facility, which the staff used as a reference site for its analysis of the impacts of near-surface disposal of depleted uranium from the NEF, a unique disposal site based on certain unique characteristics of that site. See Tr. at 2937.

4.20 As demonstrated above, party positions on this issue are not as divergent as they might initially appear. The staff does not dispute that, in the reports and statements introduced by NIRS/PC, the agency determined that in certain circumstances near-surface disposal was not, or likely would not be, appropriate for large quantities of depleted uranium. The crux of NIRS/PC's argument, both here and in the context of paragraph A to contention NIRS/PC EC-4, discussed infra, is that regardless of a determination that depleted uranium is low-level radioactive waste, or even a particular class of low-level waste, the issue of whether depleted uranium is appropriate for near-surface disposal must be resolved on a site-specific basis, based on an analysis of whether disposal at a particular site would satisfy the radiation protection requirements of Part 61, Subpart C. See NIRS/PC Disposal Direct Testimony at 11-12. The staff does not dispute this point. Rather, the staff agrees that a particular waste classification does not conclude the inquiry about whether near-surface disposal at a given site is appropriate, asserting that "the ultimate test in determining whether a proposed site would be suitable for disposal as to whether or not it could meet the overall performance objectives in subpart C to Part 61." Tr. at 2835.

4.21 NIRS/PC would have the Board find that the fact that the staff has now, in the NEF FEIS, stated that the impacts of near-surface disposal at a particular reference site would be "small," see NEF FEIS at 4-63, demonstrates an unexplained change in agency position,



given that the staff has repeatedly found that the Part 61 performance objectives would be exceeded for near-surface disposal of large quantities of depleted uranium.

4.22 The Board cannot agree. To the contrary, the Board is persuaded that the staff has carried its burden of proof to demonstrate that the NRC has consistently applied the principle that near-surface disposal of large quantities of depleted uranium requires a site-specific analysis that takes into consideration the particular characteristics of an individual site or hypothetical site. Indeed, Mr. Johnson testified for the staff that the type of site-specific exposure pathway analysis Dr. Makhijani would have the staff conduct to determine whether the performance objectives of Subpart C can be met is just the kind of analysis the State of Utah conducted in licensing the Envirocare facility. See Tr. at 2836-37. To the extent NEPA requires an agency to acknowledge, explain, or otherwise account for a change in agency position,<sup>27</sup> no such explanation or acknowledgment is required here, when the agency position has in fact not changed. Rather, the approach taken in the context of this license application is in line with the NRC's position over the past decade and a half, namely, that the appropriateness of near-surface disposal of large quantities of depleted uranium depends on whether such disposal would comply with the Part 61 performance objectives, and that such compliance, in turn, depends on specific disposal site characteristics or, in the case of a generic analysis, assumptions regarding specific site characteristics. Based upon the foregoing, and the testimony and evidence in the record before the Board, relative to the matters raised by NIRS/PC in paragraph B to its contention NIRS/PC EC-4, as remanded, we find the NIRS/PC challenge cannot be sustained.

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<sup>27</sup> NIRS/PC has made no presentation to the Board demonstrating that NEPA in fact imposes such a requirement on the agency. All the CEQ and corresponding NRC regulations require is that the staff take a hard look at the environmental impacts of the proposed action, an issue we address in Part IV.C infra.

4.23 With this foundation, the Board turns to the more complex question before it; namely, whether the staff in the FEIS indeed did satisfy its NEPA obligation in its analysis of the environmental impacts of near-surface disposal of large quantities of depleted uranium.

C. Adequacy of the Staff's NEPA Analysis Relative to the Impacts of Near-Surface Disposal of Depleted Uranium (Paragraph A)

4.24 As the foregoing discussions demonstrate, the scope of the contention the Board seeks to resolve today is quite narrow. The only issue remaining for the Board's consideration is whether the staff took the hard look required by NEPA with regard to the environmental impacts of near-surface disposal of depleted uranium in the concentrations and quantities produced by a uranium enrichment facility such as the proposed NEF. As the Commission noted in CLI-05-20,

[a]n NRC "impacts" analysis does not require a full-scale site-specific review, an inquiry in the purview of the responsible licensing agency, such as an Agreement State. NEPA also does not call for certainty or precision, but an estimate of anticipated (not unduly speculative) impacts. An assessment of the estimated impacts at one or more representative or reference sites can be sufficient.

CLI-05-20, 62 NRC at 536 (emphasis in original).

4.25 Two FEIS sections bear directly on the question at hand. Section 2.1.9 discusses the disposition options for depleted uranium from the NEF. See NEF FEIS at 2-27 to 2-33. As is relevant here, the FEIS states that converted depleted uranium in the form of  $U_3O_8$ , the waste form LES proposes to utilize, "can be considered a Class A low-level radioactive waste." Id. at 2-31.<sup>28</sup> FEIS section 2.1.9 further explains that there are three commercial low-level radioactive waste disposal facilities licensed and operating in the United

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<sup>28</sup> As discussed above, any challenge by NIRS/PC to the finding that depleted uranium from the NEF constitutes low-level waste and, further, that under the current 10 C.F.R. Part 61 regulations such waste is properly classified as Class A waste, runs contrary to express Commission statements and therefore is not before this Board.

States: (1) Barnwell, located in Barnwell, South Carolina, and licensed by the State of South Carolina to accept Class A, B, and C wastes; (2) Hanford, located in Hanford, Washington, and licensed by the State of Washington to receive Class A, B, and C wastes; and (3) Envirocare, located in Clive, Utah, and licensed by the State of Utah to accept Class A waste.<sup>29</sup> See id. at 2-31 to 2-32. In addition, Envirocare is the only facility that is not limited to accepting waste from particular compact states and, therefore, can accept waste from all regions of the United States.<sup>30</sup> See id. at 2-32.

4.26 Section 4.2.14.4 of the FEIS discusses the environmental impacts from disposal of the converted depleted uranium waste from the proposed NEF. See id. at 4-63. Specifically, the FEIS uses Envirocare as a “reference site,” and makes four points regarding the impacts of near-surface disposal at Envirocare: (1) the environmental impacts of disposal at a given licensed near-surface disposal site, such as Envirocare, would have been examined at the time the facility received its initial license, or in conjunction with any amendment to that license; (2) under the terms of its license, Envirocare is authorized by the State of Utah to accept depleted uranium without any volume restrictions; (3) certain site-specific characteristics make disposal of depleted uranium acceptable at the Envirocare site; and (4) because disposal of depleted

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<sup>29</sup> The FEIS also discusses two other potential waste disposal options. DOE operates a low-level radioactive waste disposal facility at the Nevada Test Site, which is restricted to waste generated by DOE. See NEF FEIS at 2-31. As the NEF FEIS notes, the Nevada Test Site is a disposal option for depleted uranium waste from the NEF only if ownership of the waste is first transferred to DOE, see id. at 2-32, but LES has stated that private disposal is its preferred option. Waste Control Specialists (WCS), a commercial hazardous waste disposal facility, submitted an application to the State of Texas in August 2004 for a license to dispose of Class A, B, and C low-level radioactive waste. See id. Because several regulatory actions would need to be completed before depleted uranium waste from the proposed NEF could be disposed of at WCS, the FEIS assumes that the NEF waste “would be disposed at another disposal site licensed to accept this material.” Id. at 2-33.

<sup>30</sup> Despite the limitations on waste disposal between and among compact states, Mr. Krich testified for LES that there are certain processes in place that may permit the export of LLRW from a compact state to a facility outside of that particular compact. See Tr. at 3081-83.

uranium at Envirocare meets the State of Utah low-level waste licensing requirements,<sup>31</sup> impacts of disposal of depleted uranium from the NEF at Envirocare would be “small.”

4.27 As noted above, the Commission stated in CLI-05-20 that an assessment of the impacts of near-surface disposal at one or more representative or reference sites may be sufficient to satisfy NEPA. Dr. Palmrose testified for the staff that a reference site is “a site where it would be possible to meet all the performance criteria of Part 61 to safely dispose of the depleted uranium, where the environmental impacts would be small,” Tr. at 2866, and further stated that Envirocare was used as a reference site for purposes of the staff’s analysis in the FEIS, see Tr. at 2865.

4.28 At bottom, the staff maintains that its NEPA obligation is satisfied by its conclusion in the FEIS that the impacts of near-surface disposal at a licensed low-level waste facility, here Envirocare, would be “small” because such disposal would meet the Part 61, Subpart C performance objectives. Such a conclusion by the staff, however, requires two separate determinations. First, the staff must find that Envirocare is licensed to accept the quantities of depleted uranium at issue here, meaning that the impacts of near-surface disposal of large quantities of depleted uranium were assessed by Utah, as an Agreement State, at the time it was licensed to accept such waste and were found to meet the requirements of Utah’s analog to the Part 61 performance objectives. See, e.g., Tr. at 2836-37, 2865-67; NEF FEIS at 4-63. Second, to satisfy its own NEPA obligation with regard to the particular challenge to the NEF license application at issue here, the staff would have to “independently review” the determination made by the licensing body, and exercise “independent judgment” in determining the radiological impacts of disposal at that particular site. See Part III.A.1 supra.

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<sup>31</sup> Because Utah is an NRC Agreement State, its low-level radioactive waste disposal regulations must be compatible with 10 C.F.R. Part 61 to receive, in the first instance, and maintain its Agreement State status. See supra pp. 17-18.

4.29 While the question before the Board has been stated broadly as whether the Subpart C performance objectives would be met in the case of near-surface disposal of depleted uranium at Envirocare, in actuality, as this issue was litigated by NIRS/PC at the hearing, its challenge was focused on the question whether the intruder dose would be exceeded in the long term at the Envirocare site (i.e., 10 C.F.R. §§ 61.41, .42).<sup>32</sup> See, e.g., Tr. at 2974-3005, 3066-81; see also NIRS/PC Proposed Findings at 65-92. In essence, NIRS/PC contends that the analysis of exposure pathways for various intruder scenarios exceeds the dose limits specified in Subpart C when carried out over the long term, and that the staff did not take a sufficiently hard look at these impacts for purposes of NEPA.<sup>33</sup> See Tr. at 3076-77.

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<sup>32</sup> Although NIRS/PC has sought to interpose other concerns regarding disposal at the Envirocare facility, including compliance with radium-226 limits and Environmental Protection Agency (EPA) drinking water contamination limits, as well as the need to use another depleted uranium disposal form (i.e., DUO<sub>2</sub>), all these matters are irrelevant to the narrow staff environmental analysis issue here before the Board. With regard to radium-226, because the Utah DRC has interpreted the applicable state regulations to mean that “[d]etermination of whether waste is Class A LLW is based on the waste composition when received by Envirocare,” and, “at the time of receipt by Envirocare, DU products would easily meet the 226Ra concentration limits,” see NIRS/PC Exh. 273, at 9 (A. G. Croff, et al., Oak Ridge National Laboratory, Evaluation of the Acceptability of Potential Depleted Uranium Hexafluoride Conversion Products at the Envirocare Disposal Site (Dec. 2000)), whether the radium-226 concentrations might exceed regulatory protection limits at some time in the future is not a matter before the Board. As to compliance with EPA drinking water contamination limits, this is an issue beyond the Board’s jurisdiction and the scope of this proceeding. See Hydro Resources, Inc. (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-98-16, 48 NRC 119, 121-22 (1998) (licensing boards do not have jurisdiction over matters properly before other regulatory bodies). Lastly, the Board has repeatedly excluded consideration of alternate disposal forms such as DUO<sub>2</sub> as outside the scope of this proceeding. See, e.g., First In Limine Ruling at 5, 11-12.

<sup>33</sup> Given that the contention now before the Board is framed in terms of a challenge to the staff’s NEPA compliance based on the supposition that NEPA “impacts” associated with near-surface disposal cannot be “small” because they exceed the Part 61 radiation dose limits, we need not reach the question as to whether, despite compliance with the Part 61 regulations, consistent with the agency’s NEPA obligations the impacts could be such as to preclude a finding of “small.” In this instance, a finding by the staff and/or the Board that Part 61, or its Utah regulatory equivalent, has been satisfied is sufficient to demonstrate that the agency has taken the requisite “hard look” at the specific NEPA-related matters challenged by NIRS/PC  
(continued...)

4.30 As Dr. Makhijani pointed out in his oral testimony at the hearing, the Part 61 regulations establish dose limitations to protect members of the public from releases of radioactivity from land disposal facilities. See Tr. at 2975. Specifically, 10 C.F.R. § 61.41 establishes whole body and organ dose limits, requiring that radioactive material released to the environment in ground or surface water, air, soil, plants, or animals “must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public.” Further, section 61.42 refers to protection of the “inadvertent intruder,” and requires that:

Design, operation, and closure of the land disposal facility must ensure protection of any individual inadvertently intruding into the disposal site and occupying the site or contacting the waste at any time after active institutional controls over the disposal site are removed.

Id. (emphasis added). Taken together then, as Dr. Makhijani indicated during his oral testimony at the hearing, see Tr. at 2975, the performance objectives for a near-surface disposal facility such as Envirocare require that the relevant licensing entity examine whether, at any particular time after active institutional controls are removed, the section 61.41 dose limitations will be met for the inadvertent intruder.

4.31 Absent particular circumstances establishing a foundation for excluding intruder scenarios in evaluating compliance with the Part 61 requirements, intruder scenarios and, correspondingly, intruder dose must be considered by the licensing entity at the time of initial licensing or any subsequent amendment to the license. Consideration and evaluation of those intruder scenarios and related intruder dose would then be an obvious part of the “hard look” NEPA requires be taken at environmental impacts associated with a particular licensing action.

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<sup>33</sup>(...continued)  
paragraphs A and B of contention EC-4.

4.32 As it turns out, regardless of whether the staff's FEIS analysis of near-surface disposal impacts was deficient on its face,<sup>34</sup> the Board finds that -- as reflected in its presentation at the hearing -- there is now sufficient evidence on the record before us to conclude that the staff indeed took a hard look at the impacts of near-surface disposal at Envirocare as required by NEPA. Because the Board finds evidence on the record sufficient for the staff to carry its burden of proof relative to NEPA, and because our decision here amends the FEIS pro tanto, the Board concludes that it has no reason to remand this issue to the staff for further analysis or review.

4.33 During the October 2005 evidentiary hearing, the staff provided additional testimony relative to the review it conducted in evaluating Envirocare as a reference site for near-surface disposal for purposes of the FEIS. Mr. Johnson testified that the staff reviewed a 1990 report "which was the princip[al] basis for the original licensing of the Envirocare facility" by the State of Utah, see Tr. at 2884-85; NIRS/PC Exh. 170 (R. D. Baird, et al., Rogers and Associates Engineering Corp., Evaluation of the Potential Public Health Impacts Associated with Radioactive Waste Disposal at a Site Near Clive, Utah (June 1990)) [hereinafter referred to

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<sup>34</sup> Despite NIRS/PC's claims to the contrary, it is not apparent the staff failed to include in the FEIS the minimum discussion required to comply with NEPA. The concern, nonetheless, is whether statements in the FEIS such as "[s]everal site-specific factors contribute to the acceptability of depleted uranium disposal at the Envirocare site, including highly saline groundwater . . . , saline soils . . . , and low annual precipitation," NEF FEIS at 4-63, rise to the level that permits us to determine that the staff took the requisite hard look. While it may well be acceptable to conclude that the high salinity of the water and soil and low annual rainfall make the site unsuitable for future use by humans, e.g., for irrigation or agriculture, it is problematic whether such a conclusory statement by the staff is sufficient to comply with NEPA. So too, it is not clear whether the staff's deferral to the State of Utah's conclusion that Envirocare can accept large quantities of depleted uranium for disposal can, in and of itself, suffice to fulfill the staff's obligation to review the State of Utah's determination before reaching its own conclusions. Despite the fact that the staff is permitted to rely on the reports and conclusions of other agencies in completing its NEPA analysis, the staff must review the determinations of that agency before reaching its own independent conclusion. See Part III.A.1 supra.



as the Baird report], prior to issuing the FEIS, and further stated that the staff's review of that report was factored into the FEIS for the NEF, see Tr. at 2886. NIRS/PC relies on the fact that the Baird report, which, according to Mr. Johnson, the staff reviewed and found scientifically reasonable as addressing the appropriate exposure pathways and reaching reasonable scientific results, see NIRS/PC Proposed Findings at 88 (citing Tr. at 2886-87), concluded that the dose limits of Part 61 would likely be exceeded for the intruder scenarios evaluated for the Envirocare site, see, e.g., Tr. at 2894-97; NIRS/PC Proposed Findings at 88-89.

4.34 What this NIRS/PC position does not fully account for, however, is Mr. Johnson's testimony that the staff reviewed and likewise found reasonable the State of Utah's conclusion that it was "appropriate to drop the intruder pathways because they were unrealistic because of the unique site characteristics of the Envirocare site."<sup>35</sup> Tr. at 2887. As a summary of a telephone conference between officials from the Utah Division of Radiological Control (DRC), the state agency responsible for administering Utah's radiation protection program, and the NRC staff reflects, the DRC staff stated that they found residential and/or farming scenarios at Envirocare unrealistic for several reasons, including low precipitation, high evapotranspiration rates, and high saline content in both the soil and groundwater at the site. See LES Exh. 104,

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<sup>35</sup> Dr. Palmrose testified, however, that he did not review the Baird report in conjunction with his involvement in the staff's preparation of the FEIS, and only reviewed the report in preparation for the October evidentiary hearing. See Tr. at 2882-83. Further, Dr. Palmrose stated that he did not review the Baird report, even in preparation for his testimony, in a manner sufficient to make any finding that the report was a "scientifically responsible job, with scientifically reasonable results." See Tr. at 2883. This lack of review by the staff's expert is troubling, particularly since Dr. Palmrose's job responsibilities in connection with the staff's review of the NEF application included "principal author of . . . [section] 4.2.14.4, Impacts from Disposal of the Converted Waste," see Staff Disposal Direct Testimony at 3, the section of the FEIS directly at issue here. Nonetheless, we conclude that review of the Baird report by NEF project manager Johnson provides a sufficient basis to find the staff's hard-look responsibility has been fulfilled. Although the staff is ultimately responsible for the work undertaken, or not undertaken, by its contractors, a staff analysis is not necessarily insufficient if, in the face of a deficiency on the part of its contractor, a responsible staff official has "stepped into the breach" and conducted the necessary review and analysis.



at 2 (Memorandum from M. Blevins, Senior Project Manager, Environmental and Low-Level Waste Section, Division of Waste Management and Environmental Protection, NMSS, NRC, to S. Flanders, Deputy Director, Environmental and Performance Assessment Directorate, Division of Waste Management and Environmental Protection, NMSS, NRC (Apr. 6, 2005)). Specifically with regard to groundwater salinity, the DRC found that such high rates (approximately 30,000-80,000 milligrams per liter of total dissolved solids) precluded the use of that water for both animal and human consumption, and for irrigation. See id. at 3. Based on these site-specific characteristics, the DRC found intruder events at the Envirocare facility not credible, and accordingly eliminated all intruder pathways from consideration in conducting its analysis to determine compliance with the Part 61 performance objectives. See Tr. at 2874-76.

4.35 As discussed above, NEPA's hard look requirement is tempered by the fact that an agency's review is governed by the "rule of reason," which requires only that an agency consider impacts that it views as reasonably foreseeable. See Part III.A.1 supra. While acknowledging that performance objectives and technical standards must be interpreted and applied with reason, NIRS/PC nonetheless argues that the performance objectives and technical standards of Part 61 must be met for all times and circumstances, including intruder scenarios in the long term, which in this instance precludes the elimination of intruder pathways relative to the Envirocare site. See NIRS/PC Proposed Findings at 87-93.

4.36 In assessing this NIRS/PC claim, two separate questions must be evaluated. First, witnesses for both the staff and LES have asserted that it is reasonable to extend evaluations of the performance of a near-surface disposal site out only as far as 1,000 or, perhaps, 10,000 years. See, e.g., Tr. at 2618-19, 2889-91. They acknowledged, however, that this is not a time limit imposed or approved by any NRC regulation, but rather it is a matter of agency policy or judgment. See id. As stated above, section 61.42 indicates that the dose

limits be met without time limitation, i.e. “at any time.” Although this regulation does not provide a basis for arbitrarily truncating exposure computations at 1,000 or 10,000 years,<sup>36</sup> the Board nonetheless is persuaded that it was appropriate for the Utah DRC, and the NRC staff, to make a determination that certain scenarios are so unlikely as to warrant elimination from consideration. As the Commission cautioned in its remand of this matter to the Board, NEPA does not require certainty or precision, but a reasonable estimate of anticipated and not “unduly speculative” impacts. See CLI-05-20, 62 NRC at 536. Here, the staff made a reasonable determination, as did the DRC staff, that the high salinity of the soil and groundwater and the low annual precipitation and high evapotranspiration rates make any intruder scenario so unrealistic, i.e., so unduly speculative, as to fall outside the scope of the staff’s NEPA review.<sup>37</sup> NIRS/PC has presented no real challenge to such a determination, positing instead that the plain meaning of section 61.42 precludes such a determination, a position the Board rejects. Thus, the Board concurs with the conclusion by the State of Utah and the staff that the intruder

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<sup>36</sup> Indeed, the fact that other Part 61 provisions contain time limits, see, e.g., 10 C.F.R. § 61.52(a)(2) (referring to “intruder barriers that are designed to protect against an inadvertent intrusion for at least 500 years”), indicates that the agency was not unaware of how to include such a time limit in section 61.42.

<sup>37</sup> The conclusion that such scenarios are so highly unrealistic rests on the nature of the pathways excluded. For example, as Mr. Johnson testified, under an intruder agriculture pathway scenario, it would be assumed that an inadvertent intruder would enter and take up residence at the Envirocare site, drill a well, take up groundwater for consumption and for irrigation of foods grown on site, such that the dose pathway would then be through consumption of food grown on-site, in contaminated soil, irrigated by contaminated water. See Tr. at 2875-76. Given the extreme salinity of the soil and groundwater, as well as the low annual precipitation/high evapotranspiration rates, which make the groundwater and food grown at the site unsuitable for consumption, the staff found it reasonable to eliminate those unlikely pathways. See Tr. at 2876. Presumably, for such residential or agricultural uses to be practicable in the future, material socio-economic changes and/or improvements in technology would have to occur. Because such material technological and socio-economic changes are not predictable with any confidence, any projections about the likelihood of an intruder scenario would be exceedingly speculative. In fact, the Board expressly declined to go down the path of making speculative projections about the distant future at the October evidentiary hearing. See Tr. at 2909-10.

scenarios are so unlikely based on the specific characteristics of the Envirocare site as to fall outside of what can reasonably be called anticipated or not unduly speculative impacts.

4.37 In addition to the question of the reasonableness of eliminating intruder pathways relative to the Envirocare site, there is the matter of whether the use of Envirocare as a reference site is appropriate. NEPA requires the staff to take a hard look at all reasonably foreseeable environmental consequences of construction and operation of the proposed NEF, including those secondary or indirect consequences of disposal of the waste generated by that facility. These secondary effects cannot, and need not for the purposes of satisfying the agency's NEPA obligation, see CLI-05-20, 62 NRC at 536, be examined with particularity since a specific disposal site has not yet been identified. The staff did not include in its FEIS any analysis of the environmental impacts of near-surface disposal at any other site, simply referencing the Envirocare site as an "example" of a potential disposal site, see NEF FEIS at 4-63, and leaving for the Board the question of whether an analysis of the impacts at this one reference site is sufficient.

4.38 As noted above, the FEIS indicates that only a few sites in the United States are currently licensed to dispose of depleted uranium, one of which is the Envirocare site that, as we also noted above, is the only one of the three that currently does not have a compact-related restriction that could affect the receipt of any NEF waste. Recognizing that the environmental consequences of disposal of the deconverted depleted uranium generated at the NEF is a secondary or indirect environmental consequence of constructing and operating the NEF, the particular consequences of which cannot be fully evaluated until a particular disposal site is determined, the Board nonetheless finds it reasonable, for NEPA purposes, that the staff examined the environmental impacts of disposal using the currently licensed Envirocare facility as a reference site. In other words, in the particular circumstances of this case, the staff's

NEPA review based upon a single reference site satisfies the staff's NEPA obligation to take a hard look at the environmental impacts of near-surface disposal with regard to the particular challenges asserted by NIRS/PC in paragraph A to its amended contention.

4.39 This is not to say that, by any measure, the environmental impacts at the Envirocare site can be considered to be "bounding." To reach the conclusion that the disposal impacts at Envirocare "bound" those that might be found for near-surface disposal at any other site would require the Board to find that impacts at any other site would be similar to, or less than, the impacts at the Envirocare site. This is a finding the Board cannot make based on the record now before it.

4.40 The Envirocare site impacts analysis has been found acceptable (i.e., the environmental impacts found to be "small") based on its unique site characteristics, e.g., high groundwater and soil salinity and low annual precipitation/high evapotranspiration. The Board has been presented with no evidence that would lead it to believe that these unique characteristics are present at any other United States site currently licensed to accept depleted uranium, or at any other site that has been identified as a potential disposal site, including the WCS site discussed in the FEIS, see NEF FEIS at 2-32 to 2-33. There is no evidence before the Board as to whether near-surface disposal at any other currently licensed site (which the staff could also have deemed "representative" or "reference" sites for the purposes of its FEIS analysis) might meet the requirements of Part 61 with respect to the intruder dose.<sup>38</sup>

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<sup>38</sup> Although the Board ruled at the October 2005 evidentiary hearing that NIRS/PC has waived the opportunity to challenge the underlying analyses for generic "wet" and "dry" disposal sites as those are discussed in Appendix I to the DOE PEIS, see Tr. at 2600, the Board also declines the LES invitation to find that the analyses of generic "wet" and "dry" disposal sites in the DOE PEIS are bounding for the impacts of near-surface disposal, see LES Proposed Findings at 82; see also Tr. at 2641-2646; LES Exh. 18, app. I, at I-3 to I-4, I-19, I-69 to I-70 (Final Programmatic Environmental Impact Statement for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride, DOE/EIS-0269, DOE (continued...))

4.41 Nonetheless, while the Board cannot, on the record now before it, find that the staff's NEF FEIS evaluation of the environmental impacts of near-surface disposal of the depleted uranium ultimately arising as waste from the NEF is "bounding" or broadly scoped, the Board is satisfied that the NEF FEIS examination of the potential consequences at one reference site is sufficient, in these unique circumstances, to satisfy the staff's NEPA obligations.

4.42 To be sure, the question of the sufficiency of the staff's FEIS discussion of near-surface disposal impacts is a close case for the Board, as it apparently was for the Commission in determining how to address the issues raised by this NIRS/PC contention, see CLI-05-20, 62 NRC at 536. As outlined above, the FEIS as written does not provide an expansive explanation regarding this matter. Nonetheless, when combined with the full record before the Board, in particular the staff's analysis of the reasonableness of excluding the intruder scenarios for the Envirocare site, the aggregate is sufficient to satisfy the agency's obligation under NEPA for this aspect of the environmental impacts of near-surface disposal, albeit only as to that particular site.

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<sup>38</sup>(...continued)

Office of Nuclear Energy, Science and Technology (April 1999)). Putting aside Dr. Palmrose's testimony for the staff that he did not rely on the DOE PEIS to assess the radiological impacts of near-surface disposal of depleted uranium, see Tr. at 2867, the fact that the PEIS analyses incorporate certain limiting assumptions forecloses a Board finding that those analyses are bounding relative to the impacts of near-surface disposal of large quantities of depleted uranium. In particular, the PEIS Appendix I modeling analyses incorporate a time limit of 1,000 years after the first release of radioactivity which, as discussed above, does not comport with the "at any time" language of section 61.42. Since the relevant regulation does not incorporate any such time limit, the Board is not in a position to find, with regard to near-surface disposal impacts, that analyses that are not carried out beyond 1,000 years "bound" the impacts of near-surface disposal. This is not to say, however, that the PEIS analyses are inapplicable to any other findings the Board may make with regard to the NEF application; rather, the Board simply cannot find the analyses presented in Appendix I to the PEIS "bounding" based on the record before it.

4.43 Finally, as was discussed above, the Board notes that the Commission has directed the staff to examine, outside of this adjudication, whether the quantities of depleted uranium from enrichment facilities warrant amending section 61.55(a)(6), or the waste classification tables of section 61.55(a). See id. Should the Commission make a determination in the course of that rulemaking proceeding that section 61.55 or other portions of Part 61 need revision to address the impacts resulting from the waste stream from uranium enrichment facilities, such a determination may well require that licenses for near-surface disposal facilities, including Envirocare, be evaluated in light of any new requirements imposed by any revised Part 61 regulations.

## V. SUMMARY FINDINGS OF FACT AND CONCLUSIONS OF LAW

5.1 Regarding contention NIRS/PC EC-4, Impacts of Waste Storage and Disposal, as remanded by the Commission in CLI-05-20 relative to the issue of the adequacy of the NEF FEIS analysis of the environmental impacts of near-surface disposal of NEF depleted uranium, pursuant to 10 C.F.R. § 51.102, the discussion in FEIS section 4.2.14.4 regarding the impacts of disposal of depleted uranium at a near-surface disposal facility is supplemented by the Board's decision above, along with the underlying adjudicatory record supporting that decision.

5.2 Having considered all of the evidence submitted and testimony given by the parties in this proceeding, as well as the proposed findings of fact and conclusions of law submitted by the parties, regarding contention NIRS/PC EC-4, Impacts of Waste Storage and Disposal, as remanded by the Commission relative to the issue of the adequacy of the NEF FEIS analysis of the environmental impacts of near-surface disposal of NEF depleted uranium, based on the findings and conclusions set forth in Part IV above, the Board finds that the NRC staff has met its burden with regard to the challenges by NIRS/PC to the adequacy of the NEF

FEIS in accordance with 10 C.F.R. §§ 2.325, 51.104. Therefore, relative to the near-surface disposal impacts issues raised in connection with remanded contention NIRS/PC EC-4 that were litigated during the October 2005 evidentiary hearing, the Board finds that this contention is resolved in favor of the staff.

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6.1 Pursuant to 10 C.F.R. § 2.713, it is this third day of March 2006, ORDERED, that this second partial initial decision will constitute a final decision of the Commission forty (40) days from the date of issuance, i.e., on Wednesday, April 12, 2006, unless a petition for review is filed in accordance with 10 C.F.R. § 2.341, or the Commission directs otherwise. Any party wishing to file a petition for review on the grounds specified in 10 C.F.R. § 2.341(b)(4) must do so within fifteen (15) days after service of this second partial initial decision. The filing of a petition for review is mandatory for a party to have exhausted its administrative remedies before seeking judicial review. Within ten (10) days after service of a petition for review, parties to the

proceeding may file an answer supporting or opposing Commission review. Any petition for review and any answer shall conform to the requirements of 10 C.F.R. § 2.341(b)(2)-(3).

THE ATOMIC SAFETY  
AND LICENSING BOARD<sup>39</sup>

/RA/

G. Paul Bollwerk, III  
ADMINISTRATIVE JUDGE

/RA/

Paul B. Abramson  
ADMINISTRATIVE JUDGE

/RA/

Charles N. Kelber  
ADMINISTRATIVE JUDGE

Rockville, Maryland

March 3, 2006

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<sup>39</sup> Copies of this partial initial decision were sent this date by Internet e-mail transmission to counsel for (1) applicant LES; (2) intervenors NIRS/PC; and (3) the staff.



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )  
 )  
LOUISIANA ENERGY SERVICES, L.P. ) Docket No. 70-3103-ML  
 )  
 )  
(National Enrichment Facility) )

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing SECOND PARTIAL INITIAL DECISION (ENVIRONMENTAL IMPACTS OF DISPOSAL OF DEPLETED URANIUM) (LBP-06-08) have been served upon the following persons by deposit in the U.S. mail, first class, or through NRC internal distribution.

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Docket No. 70-3103-ML  
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(ENVIRONMENTAL IMPACTS OF DISPOSAL  
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Office of the Secretary of the Commission

Dated at Rockville, Maryland,  
this 3<sup>rd</sup> day of March 2006