

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**RAS 11645**  
COMMISSIONERS:

**DOCKETED 05/16/06**

**SERVED 05/16/06**

Nils J. Diaz, Chairman  
Edward McGaffigan, Jr.  
Jeffrey S. Merrifield  
Gregory B. Jaczko  
Peter B. Lyons

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In the Matter of )

HYDRO RESOURCES, INC. )  
(P.O. Box 777 )  
Crownpoint, NM 87313 )

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Docket No. 40-8968-ML

**CLI-06-14**

**MEMORANDUM AND ORDER**

Intervenors Eastern Navajo Diné Against Uranium Mining and Southwest Research and Information Center (together, "Intervenors") have petitioned for review of LBP-06-1, the Presiding Officer's January 6, 2006, Partial Initial Decision (Phase II Radiological Air Emission Challenges to In Situ Leach Uranium Mining License).<sup>1</sup> The Presiding Officer found that radiological air emissions from Hydro Resources, Inc.'s ("HRI's") proposed *in situ* leach mining facility in Church Rock, New Mexico would not exceed the NRC dose limits.<sup>2</sup> Intervenors claim that the Presiding Officer erroneously discounted, as "background radiation," existing radiation from mining spoil left at the site by previous owners.

We granted review so that we could resolve the "background radiation" issue definitively.<sup>3</sup> Today we decide, as the Presiding Officer held, that radioactive residue from

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<sup>1</sup> LBP-06-1, 63 NRC 41 (2006).

<sup>2</sup> *Id.* at 52-71.

<sup>3</sup> CLI-06-7, 63 NRC 165 (2006).

previous mining activity amounts to “background radiation” and does not count toward the 0.1 rem dose limit applicable to new *in situ* facility licenses.<sup>4</sup>

## I. BACKGROUND

### A. Regulation of Uranium Mining

The NRC does not regulate conventional uranium mining. The Atomic Energy Act requires an NRC license to transfer or receive in interstate commerce any source material (such as uranium ore) only “after removal from its place of deposit in nature.”<sup>5</sup> This agency has traditionally viewed this provision as precluding jurisdiction over uranium mining as such.<sup>6</sup> In keeping with this interpretation, the NRC begins its oversight at the mill, rather than at the mine. Part 40 of our regulations governs *processing* of uranium ore.<sup>7</sup> NRC regulates *in situ* leach mining, in contrast to conventional mining, because *in situ* extraction involves altering the chemical form of the uranium and thus constitutes the first step of processing.

Conventional mining is controlled by other regulatory authorities. The State of New Mexico, for example, regulates conventional uranium mining within the state.<sup>8</sup> New Mexico’s laws address “the process of obtaining useful minerals from the earth,” with the exception of “the extraction, processing, or disposal of commodities, byproduct materials or wastes or other

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<sup>4</sup> Under 10 C.F.R. § 20.1301(a)(1), each licensee must conduct operations so that a member of the public does not receive a dose exceeding 0.1 rem in a year “exclusive of the dose contributions from background radiation.”

<sup>5</sup> Atomic Energy Act of 1954, as amended, (“AEA”) § 62, 42 U.S.C. § 2092.

<sup>6</sup> See, e.g., *Rochester Gas and Electric* (Sterling Power Project Nuclear Unit No. 1), ALAB-507, 8 NRC 551, 554 n.7 (1978) (“[T]he Commission’s authority over uranium ore and other ‘source material’ attaches only ‘after removal from its place of deposit in nature,’ and not when the ore is mined,” citing 42 U.S.C. § 2092 (emphasis removed)).

<sup>7</sup> In 10 C.F.R. § 40.4, our regulations define “unrefined and unprocessed ore” as “ore in its natural form prior to any processing *such as* grinding, roasting or beneficiating, or refining” (emphasis added).

<sup>8</sup> See New Mexico Mining Act, N.M. STAT. § 69-36-1 *et seq.* (1978).

activities regulated by the [NRC].”<sup>9</sup> Pursuant to this authority, New Mexico has enforced cleanup orders against United Nuclear Corporation (“UNC”) – HRI’s predecessor-in-interest at Church Rock – with respect to its uranium mining activities within the state.<sup>10</sup>

The United States Environmental Protection Agency (“EPA”) exercises authority, under various statutes, to protect the public from hazards associated with so-called “technologically enhanced naturally occurring radioactive material” (“TENORM”), including TENORM produced in uranium mining.<sup>11</sup>

### **B. History of this Proceeding<sup>12</sup>**

In 1994, HRI applied for a license to conduct *in situ* leach uranium mining at four sites in McKinley County, New Mexico. In January 1998, after completing its technical review of the application, the NRC Staff granted HRI a materials license under 10 C.F.R. Part 40 to mine all four sites. In May 1998, the then-Presiding Officer granted the Intervenor’s requests for a hearing to challenge the license.

The adjudication was split into two phases, with the first phase covering the sites where HRI intended to start operations. The order now under review comes from the second phase of the adjudication and deals with a site known as Church Rock Section 17. Although HRI has held its license for eight years, it has not yet started mining at any of the four sites, “due in part,

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<sup>9</sup> See N.M. STAT. § 69-36-3.H. In *New Mexico Mining Comm’n v. United Nuclear Corp.*, 57 P.3d 862 (N.M. Ct. App. 2002), the New Mexico Court of Appeals rejected the argument by a mining company that this statute gave New Mexico no jurisdiction over its uranium mining because of the clause exempting NRC-regulated activities. The court noted that the NRC has never asserted jurisdiction over conventional uranium mining. *Id.* at 864.

<sup>10</sup> See *id.*

<sup>11</sup> See EPA’s website at <http://www.epa.gov/radiation/tenorm/index.html>; see also [http://www.epa.gov/radiation/tenorm/uranium\\_waste.htm](http://www.epa.gov/radiation/tenorm/uranium_waste.htm).

<sup>12</sup> The Presiding Officer described the long history of this proceeding, as well as the leach-mining process, in his January 6, 2006, Order. As such, we do not provide a lengthy recapitulation in today’s decision.

to profitability concerns relating to the fluctuating price of uranium.”<sup>13</sup>

The Church Rock Section 17 site is contaminated with mining spoil left over from underground uranium mining by its previous owner, UNC. UNC conducted underground mining on Section 17 for about 30 years before selling the land to HRI. The contamination is in the form of dust and rocks apparently lost from trucks hauling the ore from the site, or possibly from excavated rock used to build the road.<sup>14</sup> No ore was ever processed on the Section 17 site.<sup>15</sup>

Intervenors presented evidence suggesting that spoil left over from conventional mining on Section 17 has raised the level of gamma radiation at the site significantly.<sup>16</sup> They further provided expert testimony showing that radioactive air emissions, particularly near the roads, were elevated as compared to nearby unmined areas having “physical, chemical, radiological and biological characteristics” similar to Section 17.<sup>17</sup> Intervenors claim that, due to this contamination, the Section 17 site emits radiation “above the NRC’s minimum safety levels,”<sup>18</sup> and this is reason enough for the NRC to deny a license for any further mining activity there. Intervenors argue that HRI should be forced to clean up the existing contamination before it is allowed to proceed with additional uranium recovery processes.<sup>19</sup>

HRI argues that the dose levels of radiation at Section 17 are high due to “natural

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<sup>13</sup> LBP-06-1, 63 NRC at 46.

<sup>14</sup> *See id.* at 52 n.7.

<sup>15</sup> *Id.*

<sup>16</sup> *See* Intervenors Eastern Navajo Diné Against Uranium Mining’s, Southwest Research And Information Center’s Written Presentation in Opposition to Hydro Resources, Inc.’s Application for a Materials License with Respect to: Radiological Air Emissions for Church Rock Section 17 (June 13, 2005), Declaration of Melinda Ronca-Battista, at 8-9; 12-13.

<sup>17</sup> *Id.*

<sup>18</sup> *See* Intervenors’ Petition for Review of LBP-06-1 (Jan. 26, 2006), at 4.

<sup>19</sup> *See* Intervenors’ Reply Brief Regarding Church Rock Section 17 Air Emissions (Mar. 20, 2006), at 5.

mineralization” in the area,<sup>20</sup> but acknowledges that the mine spoil has elevated the radiation levels at least to some extent.<sup>21</sup>

The issue we consider today deals exclusively with how to classify the radiation attributable to the existing mine spoil. Radioactive air emissions from HRI’s proposed *in situ* leach mining operations are not at issue. The Presiding Officer found that HRI’s controls would ensure its operations would not emit airborne radiation in excess of the 0.1 rem “total effective dose equivalent” (“TEDE”) limit set out in Part 20 of our regulations.<sup>22</sup> In making this finding, the Presiding Officer analyzed the text and history of key provisions of Part 20 and concluded that pre-existing radioactive residue from prior mining should be considered “background radiation” and therefore not counted in the TEDE calculation.<sup>23</sup>

Conversely, however, in the first phase of this adjudication, a different Presiding Officer held that radioactive emissions from material left on the mine site, as well as emissions from an underground mine, should be considered part of the TEDE from HRI’s operations.<sup>24</sup> In the ruling now at issue, the Presiding Officer considered and rejected the previous Presiding Officer’s reasoning on this issue.<sup>25</sup> This disagreement between the two Presiding Officers’

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<sup>20</sup> See [HRI’s] Response in Opposition to Intervenors’ Written Presentation to the Presiding Officer Regarding Air Emissions (July 29, 2005), at 22-23.

<sup>21</sup> See HRI’s Response, at 28 (“It is likely that background gamma radiation will be elevated due to the presence of the naturally occurring radioactive materials (i.e., mine waste) noted above”).

<sup>22</sup> LBP-06-1, 63 NRC at 69-71. Although Intervenors originally claimed that emissions from the old UNC mine should count toward TEDE, the issue is moot because the Presiding Officer found that there are no such emissions due to the sealing of the mine. See LBP-06-1, 63 NRC at 53-55. The Intervenors do not challenge that finding on appeal.

<sup>23</sup> *Id.* at 28-33.

<sup>24</sup> LBP-99-15, 49 NRC 261, 266-67, *interlocutory pet. for review denied*, CLI-99-8, 49 NRC 311 (1999).

<sup>25</sup> See LBP-06-1, 63 NRC at 59.

rulings was one reason we took review of this matter.<sup>26</sup>

## II. DISCUSSION

We agree with and affirm the phase II Presiding Officer's comprehensive decision.<sup>27</sup> His ruling is consistent with the NRC's regulations and with its longstanding interpretation of its role in the uranium fuel cycle. Were the NRC to expand the definition of TEDE to include radioactive air emissions from debris left over from unlicensed conventional mining activities, the agency, in effect, would be entering an area of regulation that it has historically considered beyond the scope of the Atomic Energy Act. This we decline to do.

### A. TEDE

The key question that the Presiding Officer had to answer was whether the TEDE from HRI's operation would exceed our regulatory dose limits. The pertinent regulation ties the TEDE calculation to radiation from "licensed operations"; it expressly excludes pre-existing "background radiation":

[E]ach licensee shall *conduct operations* so that:

The [TEDE] to individual members of the public from the licensed operation does not exceed 0.1 rem . . . in a year, exclusive of the dose contributions from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released under § 35.75, from voluntary participation in medical research programs, and from the licensee's disposal of radioactive material into sanitary sewerage in accordance with 20.2003 . . . .<sup>28</sup>

Thus, the plain language of the regulation on TEDE emissions excludes emissions not directly linked to licensed activity. Both grammar and logic dictate that the emissions from already

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<sup>26</sup> See CLI-06-7, 63 NRC at 166.

<sup>27</sup> Hence, for the reasons given by the phase II Presiding Officer, we disagree with the phase I Presiding Officer that emissions from pre-existing radioactive materials deposited onsite as part of an operation not licensed by the NRC should be considered part of the TEDE from the licensed operation. See LBP-06-1, 63 NRC at 55-59.

<sup>28</sup> 10 C.F.R. § 20.1301(a)(1) (emphasis added).

existing mining spoil do not constitute emissions from the licensed operation. In HRI's case, then, only emissions actually stemming from the proposed *in situ* leach mining count in calculating the TEDE.

Intervenors gain no ground with their argument that the calculated TEDE from a "licensed operation" must include *all* radioactive emissions, not just those from "licensed materials."<sup>29</sup> The Presiding Officer's ruling does not say that the material emitting radiation must be "licensed" to count toward TEDE, only that it must come from the licensed operation. HRI's bare ownership of land containing radioactive mine spoil is not part of its NRC-licensed "operation." HRI did not bring the material to the surface. It is not required to have an NRC license to possess source material in the form of unprocessed ore (so long as it does not process that ore).<sup>30</sup> Nothing in the record suggests that HRI plans to "process" the dust and rock that cover the surface of Section 17.

The Presiding Officer noted that simply interpreting the phrase "from the licensed operation" as limiting the scope of TEDE arguably renders unnecessary other provisions in the TEDE rule expressly excluding doses resulting from medical administrations and disposal of radioactive material in sanitary sewerage.<sup>31</sup> Because of this concern, the Presiding Officer took his analysis a step farther, and inquired whether mine spoil emissions fit into the category of "background radiation" – which our rules explicitly exclude from the TEDE calculation.<sup>32</sup> Finding that mine spoil is a subset of "naturally occurring radioactive material" ("NORM") commonly

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<sup>29</sup> See Intervenors' Supplemental Brief Regarding Church Rock Section 17 Air Emissions (Mar. 13, 2006), at 5 n.8.

<sup>30</sup> See 10 C.F.R § 40.13(b) (persons do not need a license to "possess" source material in the form of unprocessed and unrefined ore so long as they do not process or refine such ore).

<sup>31</sup> See LBP-06-1, 63 NRC at 66 n.22.

<sup>32</sup> *Id.*

known as “technologically enhanced naturally occurring radioactive material” or TENORM, he concluded that these emissions fit the definition of background radiation,<sup>33</sup> a matter to which we now turn.

## **B. Background Radiation**

In 1991, NRC published revisions to the standards in 10 C.F.R. Part 20 for protection against radiation.<sup>34</sup> In its definition of “background radiation,” the rule expanded the category of what was once called “natural background” radiation to include various anthropogenic sources as well as NORM, and to expressly exclude NRC-regulated sources:

[R]adiation from cosmic sources; naturally occurring radioactive material, including radon (except as a decay product of source or special nuclear material); and global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl that contribute to background radiation and are not under the control of the licensee. “Background radiation” does not include radiation from source, byproduct, or special nuclear materials regulated by the Commission.<sup>35</sup>

“Naturally occurring radioactive material” -- NORM -- is not defined elsewhere in the regulations.

The Presiding Officer addressed the last sentence of the “background radiation” definition first, concluding that radiation from “source material” can be background radiation where, as here, the source material from which it emanates is not “source material . . . regulated by the Commission.”<sup>36</sup> While the Atomic Energy Act provides that uranium and thorium are source material, the Presiding Officer explained, the NRC does not regulate *all* source material.<sup>37</sup>

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<sup>33</sup> *Id.* at 65-69.

<sup>34</sup> Final Rule, Standards for Protection Against Radiation, 56 Fed. Reg. 23,360; 23,365 (May 21, 1991).

<sup>35</sup> 10 C.F.R. § 20.1003.

<sup>36</sup> See LBP-06-1, 63 NRC at 55-60.

<sup>37</sup> See *id.* The Presiding Officer observed “If, as the Intervenor asserts, radiation from *all* source material (whether or not regulated by the Commission) is excluded from background radiation, then radiation from, for example, surface soils and outcrops containing naturally

Unprocessed ores and source material with insignificant concentrations of radionuclides are not regulated by the Commission.<sup>38</sup> Because mining spoil is unprocessed ore and thus *not* “regulated by the Commission,” the Presiding Officer determined that the last sentence of the definition did not preclude his finding that the radiation from mining spoil constituted “background radiation.”<sup>39</sup> The Presiding Officer went on to conclude that mining spoil should be considered NORM, and thus background radiation within the first sentence of our definition. He found that the mining spoil falls within the scope of TENORM.<sup>40</sup>

The Presiding Officer’s understanding of our “background radiation” definition is correct. At the time the NRC drafted the regulation defining “background radiation,” the term NORM was understood to include TENORM. This is evident from the definition’s history. It shows that the NRC considered, and explicitly rejected, a suggestion by the Advisory Committee on Reactor Safeguards (“ACRS”) that the proposed rule be revised to “emphasize” that NORM did *not* include TENORM.<sup>41</sup> As the ACRS suggestion implicitly recognized, *excluding* TENORM would have required express language, if that was what the NRC had intended with this regulation. But the agency rejected the ACRS suggestion, for the reason that most TENORM is outside NRC’s

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occurring uranium and thorium would be excluded from background radiation.” *Id.* at 57-58 (emphasis in original).

<sup>38</sup> See AEA § 3.z, 42 U.S.C. § 2014.z (“Source material” includes ores containing uranium or thorium in concentrations that the Commission determines to be significant); see *also* 10 C.F.R. § 20.1003 (setting the threshold concentration at 0.05 percent). The Presiding Officer also found that the record showed that the mining spoil did not exceed the threshold concentration of uranium to make it licensable material. LBP-06-1, 63 NRC at 62.

<sup>39</sup> See LBP-06-1, 63 NRC at 61-63. The Presiding Officer explained that the mining spoil is “not regulated by the Commission” both because Part 40 regulations exempt from regulations “unimportant quantities” of source material and because the spoil is “unrefined and unprocessed” ore. See 10 C.F.R. § 40.13(b).

<sup>40</sup> LBP-06-1, 63 NRC at 65-69.

<sup>41</sup> See SECY-88-315, Memorandum from Victor Stello, Jr., NRC Executive Director for Operations, to the Commissioners re: Revision of 10 C.F.R. Part 20, “Standards for Protection Against Radiation,” Enclosure 10 at 3-4 (Nov. 4, 1988).

regulatory jurisdiction.<sup>42</sup> As the Presiding Officer recounts, over the years the NRC and other regulatory authorities have repeatedly considered “TENORM” as equivalent to “NORM.”<sup>43</sup>

Intervenors argue that mine spoil excavated from underground cannot be NORM, and hence cannot emit “background radiation,” because the ordinary meaning of “naturally occurring” is “undisturbed in nature.”<sup>44</sup> But, as the Presiding Officer suggested,<sup>45</sup> it is a well-established rule of construction that “technical terms of art should be interpreted by reference to the trade or industry to which they apply.”<sup>46</sup> The Presiding Officer pointed to *Smith v. United States*<sup>47</sup> to illustrate that a layman’s reading of a regulation, uninformed by context, is not decisive. In *Smith*, the U.S. Supreme Court ruled that trading a firearm for drugs could be considered the “use” of a firearm during a drug trafficking crime, as that term was used in the statute, even though to the “average person on the street” the words “use of a firearm” would evoke use of a firearm as a *weapon*. Similarly, although the term “naturally occurring” certainly includes, as Intervenors stress, material “undisturbed in nature,” it also can be understood to include naturally occurring radioactive material that has been moved, but neither artificially produced nor

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<sup>42</sup> *Id.*

<sup>43</sup> See LBP-06-1, 63 NRC at 67.

<sup>44</sup> See Petition for Review at 4; Intervenors’ Supplemental Brief at 3-4.

<sup>45</sup> See LBP-06-1, 63 NRC at 66-68 & n.24.

<sup>46</sup> *La. Pub. Serv. Comm’n v. FCC*, 476 U.S. 355, 372 (1986), citing *Corning Glass Works v. Brennan*, 417 U.S. 188 (1974). In *Corning Glass*, the Court deferred to the U.S. Department of Labor’s interpretation that the term “working conditions” meant physical surroundings and not whether the work shift was during night or day: “While a layman might well assume that time of day worked reflects one aspect of a job’s ‘working conditions,’ the term has a different and much more specific meaning in the language of industrial relations.” 417 U.S. at 202. See also *Utah v. Evans*, 536 U.S. 452, 468 (2002) (Federal statute prohibiting the census bureau from using “the statistical method known as ‘sampling,’” did not prohibit the use of another technique known as “hot-deck imputation” because each term had specific, and different, meaning as used by statisticians).

<sup>47</sup> 508 U.S. 223 (1993).

processed for its radioactive content. This is particularly true where, as here, that is the relevant regulatory agency's (the NRC's) understanding as well as that of the regulated industry.

Intervenors are simply mistaken in their assertion that TENORM only designates materials, such as plasterboard and fertilizer, that have been manufactured for a use unrelated to their incidental radioactive properties. The EPA, which regulates TENORM, describes TENORM as including waste streams from various industries, such as sewage treatment waste and waste from drinking water treatment.<sup>48</sup> Consistent with this, the NRC has recognized that TENORM includes waste materials:

TENORM is found in various concentrations in a variety of forms (physical and chemical matrices) such as scrap metal, sludges, fluids, scales in storage tanks and piping, chemical residues, processing fluids, surface and groundwaters, and mine tailings.<sup>49</sup>

Finally, we reject Intervenors' claim that the Presiding Officer improperly broadened our "background radiation" regulation in a way that should only be done in a formal rulemaking. As shown above, the understanding at the time the regulation issued implicitly included TENORM as a type of NORM. The fact that NRC regulations do not define "TENORM," as such, is not surprising. There is no need for the NRC to draw fine distinctions among various classes of materials that it does not even regulate; the spoil leftover from mining falls into that category.

The Presiding Officer, in short, had ample basis to conclude that mining spoil near the site of HRI's leach mining operation does not contribute to the TEDE for the "licensed operation" and, in fact, should be considered background radiation.

### **C. Policy Considerations**

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<sup>48</sup> For more information, see the EPA's website, *supra* n.11.

<sup>49</sup> SECY-01-0057, Partial Response to SRM COMEXM-00-0002 - "Expansion of NRC Statutory Authority Over Medical Use of Naturally Occurring and Accelerator-Produced Radioactive Material (NARM)", Attachment 2, P. Egidi and C. Hull, "NORM and TENORM Producers, Users, and Proposed Regulations" (1999) Attachment 2 at 1.

We reject Intervenor's overarching argument that we should invalidate HRI's license for policy reasons, lest we shirk our duty to protect the public from unsafe levels of radiation. Intervenor argues that granting HRI a license "rewards HRI for failing to remediate its site," and complains that a land transfer from UNC to HRI should not transform contamination into "background radiation."<sup>50</sup>

According to the Presiding Officer's findings (which Intervenor does not challenge), HRI's *in situ* leach mining operations will have a negligible effect on radioactive air emissions around the site. But under Intervenor's theory, the NRC should revoke the license for HRI's benign activity because of pre-existing contamination that denying the license would not alleviate. Nowhere in Intervenor's petition for review or supplemental brief do they cite authority for NRC to order cleanup of the pre-existing radiation at the Section 17 site. As such, we decline to revoke HRI's license because of the existence of residue from prior mining activity that the NRC did not, and does not, regulate.

The Presiding Officer's decision (and our decision affirming it) does not extinguish any right or cause of action Intervenor may have under state (or other Federal) law to force a cleanup. It merely finds that, *for purposes of calculating the TEDE* for an NRC-licensed activity, radiation from pre-existing, conventional mining spoil is not included. Policy considerations do not support revoking HRI's license.

### III. CONCLUSION

For the foregoing reasons, and for the reasons given by the Presiding Officer, the Presiding Officer's partial initial decision on phase II radiological air emissions is hereby *affirmed*.

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<sup>50</sup> See Intervenor's Supplemental Brief Regarding Church Rock Section 17 Air Emissions (Mar. 13, 2006), at 9-10; see also Petition for Review at 9.

IT IS SO ORDERED.

For the Commission

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Annette L. Vietti-Cook  
Secretary of the Commission

Dated at Rockville, MD  
this 16<sup>th</sup> day of May, 2006