

323
May 28, 1986

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
KERR-MCGEE CHEMICAL)	Docket No. 40-2061-SC
CORPORATION)	
(Kress Creek Decontamination))	Source Material License
)	No. STA 583
)	ASLBP No. 84-502-01-SC

NRC STAFF'S REPLY FINDINGS OF
FACT AND CONCLUSIONS OF LAW

On May 21, 1986, the NRC Staff filed its "... Proposed Findings of Fact and Conclusions of Law In the Form of a Partial Initial Decision." As permitted by the Atomic Safety and Licensing Board (Tr. 691), the NRC staff files the following additional proposed findings of fact and conclusions of law in reply to the Post-Hearing Submission of Kerr-McGee Chemical Corporation (hereinafter, "Post-Hearing Submission"), dated May 21, 1986.

ORAU Results

Kerr-McGee questions ORAU's testimony to the effect that the base-line radionuclide concentration of total thorium is 1.6 pCi/g in the area. Post-Hearing Submission, at 8. ORAU's testimony in this regard is based on data obtained through actual measurements, (Staff Ex. 1, at 6; Id. at Table 1) and is not an estimate based on a computer curve, as Kerr-McGee assumes (see Post-Hearing Submission, at 8, ns. 2 and 3). Thus, the Board finds that Kerr-McGee's argument as to any slight

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imperfections in the computer code are inapplicable to the validity of ORAU's actual measurements of baseline radionuclide concentrations.

Kerr-McGee also would have this Board find that the "ORAU measurements along the Creek are subject to question" because the computer curve used to calculate the thorium concentrations tended to slightly overestimate concentrations near baseline levels, and because any particular measurement point has "a very large" associated error, which may tend to distort the averages upward somewhat. Post-Hearing Submission, at 8, n.10. ^{1/} This Board has already determined that any deficiency in correlation is only slight. See Staff proposed finding 39. In any event, even assuming "slightly" high calculations near baseline, because these concentrations are combined with the very elevated concentrations found in the hot spots in order to get the average levels, such slightly high numbers would have a negligible effect on the average concentration levels.

As for the error associated with any one measurement, Dr. Weaver explained that if you use a large number of data points, as ORAU did in its survey, you will get much more accurate statistical results than you get at any one data point. Tr. 308 (Weaver). Further, Drs. Auxier and Chambers stated that the ORAU concentration measurements were reliable. Tr. 594-95. The Board finds that as the number of data points increases, the average value calculated will more closely approach the true aver-

^{1/} The Board notes that while Kerr-McGee refers to "measurements", the figures used by ORAU are actually estimates from a calibration curve for converting direct radiation levels in the boreholes into thorium concentrations in soil. Staff Exhibit 1, at 5.

age, and accordingly accepts ORAU's explanation of the accuracy of its data points.

The Board briefly questioned Dr. Salamon as to whether, from his sampling of the Creek bed, he could draw any inferences as to the percent of rocky bottom as opposed to soft sediment. Dr. Salamon conceded that, based upon his sampling stations, he would not be able to generalize, but would have to "specifically walk" the Creek to so generalize. Tr. 577. We take him to mean by this that he would have to walk the Creek with the specific purpose of observing the rocky and sandy nature of the bottom in order to generalize. There is no evidence that Dr. Salamon walked the Creek with such an intent, although Dr. Salamon stated, in response to questioning by counsel for Kerr-McGee, that he would approximate, if asked, that the ratio of gravel to soft sediment was 70/30 percent. Tr. 5 & 6. We do not find Dr. Salamon's testimony persuasive on this point, and, in any event, it in no way undercuts our finding that the ORAU measurements accurately reflect the thorium levels in the sediment.

Cause of the Contamination of the Creek and River

Regarding the assertion by Kerr-McGee (Post-Hearing Submission, at 5, 58) that "a discharge of ore during rail transport was a possible explanation of the materials in the Creek", citing Tr. 408, Mr. Schumacher testified that he was not aware of any incident involving the escape of thorium from a train. Tr. 408. Further, Dr. Paperiello testified that there should be a record of such an incident if it occurred and he is unaware of any record or information of such an event. Tr. 419. Based on this testimony the Board finds that there is no

evidence in this proceeding indicating any discharge of thorium from railcars into the Creek. Furthermore, the Board finds that there is no evidence in the record that a rail car carrying monazite ore or thorium passed over or near Kress Creek. See, Tr. 408.

Kerr-McGee asserts that the location of the yard drains has not been established. Post-Hearing Submission, at 58. The Board disagrees. Mr. Schumacher testified that based on personal observation the yard drain "was near the southwest corner of building nine, the thorium building, right near the loading dock." Tr. 370-71; See also Tr. 410 (Januska). The Board also disagrees with Kerr-McGee's assertion about the Staff witnesses not knowing the "nature of the connections to the sewer" (Post-Hearing Submission, at 58). In Kerr-McGee's memorandum dated August 10, 1972, which discusses a visit to the Kerr-McGee site by two Illinois State EPA officials, it is clearly stated that the drains connect to the storm sewer:

Both men said they were looking for pollution of the storm sewer by plant waste water. Thomas asked at least twice for process piping drawings of the plant. We temporarily persuaded him drawings were not available and would not be pertinent to their study anyway. If he insists on more drawings the EPA will make an official written request. At that time I would recommend giving them sketches that show the four outfalls from the plant into the City storm sewer but not internal process piping which I don't think is required.
[Emphasis added]

Staff Facility Operations Testimony, ff. Tr. 349, Attachment 5 at 1. As to the later Kerr-McGee memorandum of August 11, 1972, clarifying that some of the yard drains referenced by Mr. Hurst in the earlier memorandum were in fact roof drains, it is stated, "[h]e is correct on the yard rainwater drainage." Id. Attachment 6.

The Board finds that whether or not certain waste discharges contained thorium levels that met NRC regulatory limits (See Post-Hearing Submission, at 58) is not as important as the fact that thorium was released and that, as Dr. Paperiello testified, thorium can concentrate in the environment. Tr. 410.

Relying on the Final Environmental Statement related to the decommissioning of the Rare Earths Facility (FES), Kerr-McGee asserts that no radioactive contamination of the groundwater has been shown. Post-Hearing Submission, at 58. The Board agrees with Staff witness, Ms. Horn, who testified that the fact that the FES does not indicate that there has been a radiological impact on groundwater from site operations does not rule out the possibility that radioactive contamination could have reached the sewer system by way of percolation through the ground. Tr. 411. In a letter to the AEC dated June 13, 1972, Kerr-McGee states that the most permeable of the strata of the ground soils in which the percolation ponds are located is the coarse sand and gravel stratum which forms the base or floor of the ponds. Staff Facility Operations Testimony, ff. Tr. 349, Attachment 4, at 7. Further, Kerr-McGee states in a memorandum dated November 10, 1972, that pH was controlled in the percolation ponds to increase percolation into the ground. The memorandum states the addition of 571,000 lbs. of acid for such control in October 1972. Id. Attachment 7.

Relying on a photograph taken in April of 1986 (See Respondents' Exhibit 3; Tr. 397), Kerr-McGee asserts that "[m]ovement of thorium-containing materials from the tailings pile to the sewer by way of a nearby manhole is unlikely". Post-Hearing Submission, at 58. The Board finds that this recent photograph can be given little weight in light

of the testimony of the Staff witnesses which identified thorium contamination washed from the tailings pile into a swail between the perimeter fence and the railroad embankment to the west, indicating that tailings crossed the storm sewer (Staff Facility Operations Testimony, ff. Tr. 349, at 17 and Attachments 1, 2 and 19) and which indicated possible entry into the storm sewer of such material by direct wash into the manhole adjacent to the tailing pile or possible entry through cracks in the sides of the brick manhole or the tile storm sewer. Staff Facility Operations Testimony, ff. Tr. 349, at 17. Furthermore, evidence in the record indicates grading work by Kerr-McGee following the offsite thorium contamination noted by NRC inspectors in 1976. See Staff Facility Operations Testimony, ff. Tr. 349, at 17 and Attachment 1, at p. 1.

Jurisdiction

The Staff asserts jurisdiction over the radiologically contaminated materials in the Creek and River area based, in part, upon the NRC's authority to regulate the use and possession of source material at the Rare Earths Facility under Section 63 of the AEA (42 U.S.C. § 2093). Proponents' Reply Memorandum in Response to Brief of Kerr-McGee Chemical Corporation, dated January 22, 1985, at 2-5. Kerr-McGee agrees that jurisdiction lies over the offsite contamination if the Staff can demonstrate that materials in the Creek and River area got there by accidental release from the Rare Earths Facility. Post-Hearing Submission at 18, 20-21. Respondent's Exhibit 15 (at 4) indicates that prior to the enactment of UMTRCA the NRC did not have authority to order a mill operator to clean up offsite tailings that had been intentionally transferred to others for purposes unrelated to milling activities. Kerr-McGee asserts that

the Staff has not carried its burden of going forward because "[n]o one on the Staff has personal knowledge of how materials got from the site to the Creek." Post-Hearing Submission, at 57. The Board recognizes that the Staff's case on this point relies upon documentary evidence and the simple fact that there is no other facility within 50 miles of Kress Creek that processed or processes thorium bearing materials. Staff Facility Operations Testimony, ff. Tr. 349, at 19-20; Staff Exhibit 4, at 16-29. The Board finds that the Staff has carried its burden of going forward with evidence to establish that the contamination of the Creek and River occurred as a result of operation of the Rare Earths Facility. Staff Facility Operations Testimony, ff. Tr. 349. Kerr-McGee did not offer any evidence to rebut this testimony, including any evidence drawing a distinction between accidental and intentional causes of the offsite contamination. Based upon the Staff's testimony, the Board concludes that jurisdiction lies in the NRC to require Kerr-McGee to submit a remedial action plan.

Source Material

Kerr-McGee argues in its Post Hearing Submission (at 23-26) that wastes from the extraction of source material from ore are not properly classified as source material. The definition of source material in 10 C.F.R. § 40.4(h)(1), which was relied upon by the Staff, does not make any such distinction. Cool/Shum Testimony, ff. Tr. 425, at 5. Under that definition, if thorium is found in the soil and sediment in the Creek and River area then that soil and sediment is source material, and the evidence is uncontradicted that the predominant radiological isotopes in the soil and sediment are thorium-232 and its daughters. Staff

Exhibit 1, p. 10; Berger/Frame/Weaver, ff. Tr. 231, at 6; Cool/Shum, ff. Tr. 425, at 3; Tr. 594-5 (Auxier).

Kerr-McGee additionally argues that the thorium in the soil and sediments must be 0.05% by weight or greater of the total material before it may be classified as source material or regulated under 10 C.F.R. Part 40, citing to §§ 40.4(h)(2) and 40.13(a). ^{2/} Post-Hearing Submission, at 26-28. Section 40.13(a) does not, however, exempt disposal of source material from a uranium or thorium mill. Rather, the exemption afforded by that section is limited to a person who "...receives, possesses, uses, transfers or delivers..." source material that is by weight less than 0.05% of the mixture, compound, solution or alloy in which it is contained. Kerr-McGee has not identified any reason why this provision should be stretched to include disposal activities. Indeed, the reason for the exemption in § 40.13(a) and the definition of source material in § 40.4(h)(2) (i.e., that materials with concentrations of thorium or

^{2/} Section 40.4(h)(2) provides a second definition of source material:

ores which contain by weight one-twentieth of one percent (0.05%) or more of: (i) Uranium, (ii) thorium or (ii) any combination thereof.

Section 40.13, "Unimportant quantities of source material," provides in subpart (a):

(a) Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the Act to the extent that such person receives, possesses, uses, transfers or delivers source material in any chemical mixture, compound, solution, or alloy in which the source material is by weight less than one-twentieth of 1 percent (0.05 percent) of the mixture, compound, solution or alloy. The exemption contained in this paragraph does not include byproduct material as defined in this part.

uranium below this level were deemed "insignificant" in terms of the production of special nuclear material) ^{3/} would not seem to be applicable to disposal activities.

The Board, therefore, concludes that the radiologically contaminated materials in the Creek and River area are source material without regard to the percentage-by-weight of thorium contained therein.

Relevance of Kerr-McGee's Testimony

Kerr-McGee asserts that the Staff has waived its right to assert that Kerr-McGee's testimony is not relevant to the Board's deliberation by virtue of its failure to object to admission of the testimony. Post-Hearing Submission, at 16, n.1, citing Fed. R. Evid. 103(a)(1). The Staff argued before this Board that the only issue to be decided in this Partial Initial Decision is whether Kerr-McGee should be required to submit a remedial action plan. See Staff's proposed finding of fact 105. The Staff

^{3/} See AEA 61, 42 U.S.C. 2091, stating that in determining whether materials other than uranium or thorium should be classified as source material:

the Commission must find that such material is essential to the production of special nuclear material and must find that the determination that such material is source material is in the interest of the common defense and security . . .

This implies that such a finding had already been made for uranium and thorium. See also the Commission's Notice of Proposed Rulemaking (25 Fed. Reg. 8619 (September 7, 1960)), stating:

The Commission has found that possession and use in the United States of source material in these quantities [less than 0.05% source material by weight] . . . are not of significance to the common defense and security. . . .

further argued that the Auxier volume testimony, the Thorsen/Taylor/Denny testimony, and the Salamon testimony do not demonstrate that a remedial action plan should not be required because that testimony is premised on achieving the 5/15 standard and the Staff indicated that Kerr-McGee could seek to justify in its proposal deviations from that standard. Id.; proposed conclusion of law 116. The Board does not consider this argument to constitute an objection to the receipt of this testimony based on relevance and, therefore, concludes that the Staff has not waived this argument.

Provisions of Show Cause Order

Kerr-McGee argues that the show cause order is more stringent than the 5/15 standard in that it does not distinguish between total radium and radium-228 and does not specify that the 5/15 standard refers to "above background." Post-Hearing Submission, at 69. The show cause order, however, references 40 C.F.R. § 192.41, which, by reference to 40 C.F.R. § 192.32(b)(2), specifies levels of radium-228 above background. Tr. 469-70 (Cool). The Board does not perceive any confusion as to the decontamination criteria set forth in the order to show cause and finds that the order states that criteria of 5 and 15 pCi/g of radium-228 above background should be used with regard to the cleanup of the Creek and River area.

Appropriateness of the 5/15 Standard

Kerr-McGee introduced into evidence an August 22, 1985 NRC note prepared by the Office of the Executive Legal Director, which noted in its enclosure that personnel of the Office of Nuclear Material Safety and

Safeguards (hereinafter, "NMSS") had stated to Staff counsel that they considered the 5/15 standard unduly stringent for the thorium chain and that they could not testify in support of the appropriateness of that standard for the cleanup of the Creek and River area. Respondent's Exhibit 11. Staff witnesses Drs. Cool and Shum testified, however, that they consider the 5/15 standard to be appropriate to apply to the preparation of a remedial action plan by Kerr-McGee. Cool/Shum testimony, ff. Tr. 425, at 5-6, 14. Additionally, Drs. Cool and Shum testified that the statement contained in the enclosure to Respondent's Exhibit 11 does not reflect their opinion. Tr. 470-1. Respondent's Exhibit 11 is dated August 22, 1985 and reflects a position communicated to Staff counsel by certain personnel in NMSS as of that date. See comments of Staff counsel at Tr. 471. The Board finds that the note does not reflect the position of the Staff presented in its testimony in this proceeding. Accordingly, the Board simply considers Respondent's Exhibit 11 to reflect the position of certain personnel in NMSS as of August 22, 1985.

Shielding By Soil

Kerr-McGee argues (Post-Hearing Submission, at 78,80) that the risk of maximum exposure from elevated concentrations of thorium could be eliminated by excavating surface layers of soil only. The Staff testified, however, that radium-228 concentrations of 15 pCi/g or greater at depths of 15 cm or more below the surface could still be a significant contribution to direct gamma radiation. Tr. 462 (Shum). The Board finds that the precise depth to which soil would have to be excavated need not be determined in this Partial Initial Decision, but may be left for resolution

as part of the review of the remedial action plan required to be submitted by Kerr-McGee.

Floodplain Considerations

Kerr-McGee argues (Post-Hearing Submission, at 80) that it is implausible to suggest that homes will be built in soil containing high levels of thorium because most of that material is found within the Creek and River's floodplain. The Staff testified, however, that considering the 1.4×10^{10} year half-life of thorium-232 (Auxier/Chambers/Still testimony, ff. Tr. 591, Figure I-1), the future uses of the Creek and River area cannot be reliably predicted for that long a period. Cool/Shum testimony, ff. Tr. 425, at 14. We find that it is prudent to assume that new structures may be built in the area and that these structures could be built in close proximity to the present location of the Creek and River. Id.

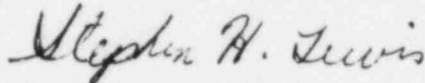
NEPA Considerations

Kerr-McGee argues (Post-Hearing Submission, at 33, n.1) that the National Environmental Policy Act of 1969 (hereinafter, "NEPA"), 42 U.S.C. § 4321, et seq., requires consideration of risks, costs, and environmental impacts of remedial action undertaken pursuant to NRC enforcement orders. As recognized by Kerr-McGee, however, 10 C.F.R. § 51.10(d) states:

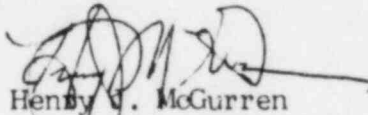
Commission actions initiating or relating to administrative or judicial civil or criminal enforcement actions or proceedings are not subject to section 102(2) of NEPA. These actions include issuance of notices, orders, and denials of requests for action pursuant to Subpart B of Part 2 of this chapter
...

Although Kerr-McGee argues that 51.10(d) only relieves the NRC from an obligation to prepare an environmental impact statement under NEPA § 102(2)(c) (42 U.S.C. § 4332(2)(c)), no such limitation is apparent from the language of the provision. Rather, § 51.10(d) states that Commission enforcement actions are not subject to any of the provisions of § 102(2). Thus, the Board concludes that NRC is not required under NEPA to undertake any environmental assessment, whether by an environmental impact statement or other mechanism, in connection with this enforcement action. The Board does not read § 51.10(b) ^{4/} to the contrary.

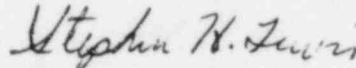
Respectfully submitted,



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Dated at Bethesda, Maryland
this 28th day of May, 1986

^{4/} That section refers generally to the Commission's "... domestic licensing and related regulatory functions ..." The Commission's recognition of its "continuing obligation" to conduct such activities "in a manner which is ... receptive to environmental concerns" does not override the more specific provisions of § 51.10(d) exempting enforcement actions from the requirements of NEPA § 102(2).

UNITED STATES OF AMERICA
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KERR-MCGEE CHEMICAL)	Docket No. 40-2061-SC
CORPORATION)	
(Kress Creek Decontamination))	Source Material License
)	No. STA 583
)	
)	ASLBP No. 84-502-01 SC

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF'S REPLY FINDINGS OF FACT AND CONCLUSIONS OF LAW" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, or as indicated by an asterisk through deposit in the Nuclear Regulatory Commission's internal mail system, or as indicated by a double asterisk by hand-delivery, this 28th day of May, 1986:

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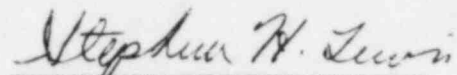
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