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July 29, 1982



Mr. R.G. Page, Chief  
 Uranium Fuel Licensing Branch  
 United States Nuclear Regulatory Commission  
 Washington, D.C. 20555

RE: Draft Environmental Statement related to the decommissioning of the Rare Earths Facility, West Chicago, Illinois, Docket No. 40-2061

Dear Mr. Page:

The People of the State of Illinois, by its attorney, Tyrone C. Fahner, submits the following comments on the Draft Environmental Statement referenced above ("DES").

COMMENTS ON DES

I. The DES does not make clear what action is being recommended.

This DES is not clear about what course of action it is recommending. The Staff endorses Alternative III as the "preferred alternative" (page 1-2), but Alternative III, as it is described on page 1-2, is ambiguous. The first paragraph of the description states that Alternative III is "storage onsite" of the wastes in the disposal cell proposed in Alternative I. The word "storage" implies that the wastes will not be disposed of on site but will remain there only for some delimited period of time. In the sec-

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ond paragraph, however, the DES states that the "decision" on disposal (i.e., permanent burial) will be "deferred pending" the establishment of a state or regional low-level radioactive waste disposal facility; the DES does not say that the wastes will be removed from the West Chicago site when such a facility is established. This implies that the NRC may ultimately decide that the wastes should be left on-site permanently. Indeed, the DES later frankly acknowledges that removal is uncertain; see page 1-6: "Lacking assurance that the wastes will be removed in the future . . ."

Removal, however, is not merely uncertain. On the contrary, it is apparent from the DES as a whole that if the wastes are placed in a disposal cell on site, they will most probably remain there forever, or at least until long after Kerr-McGee's responsibility for them under NRC license has expired. To begin with, the NRC recognizes that establishment of a state or regional low-level site is speculative. See page 3-17: "When, and if, such a site becomes available . . ."; page 3-19: "Future Illinois Regional Low-Level-Waste Disposal Site. This alternative is possible but is recognized as somewhat speculative at this time". Moreover, the NRC acknowledges that even if a state or regional facility is created it will not accept the huge volume of wastes from the West Chicago operation.

Even if, in the future, Illinois were to enter into a compact with other states to provide a burial ground for low-level wastes, it is questionable whether the other compact members would agree to disposal of the large volume of wastes present

at the West Chicago site at the burial ground operated by the compact organization.<sup>1</sup>

Page 1-5. The DES also repeatedly states that existing commercial low-level facilities cannot take volumes like that present in West Chicago, thus indicating the unlikelihood that a state or regional facility would accept them. See page 1-6: "There is considerable doubt that any existing site would agree to accept the large volume of low-level wastes involved"; page 3-18: "[N]one [of the existing sites] are currently designed for the high volumes of low-level waste contained at the West Chicago site."<sup>2</sup>

Second, the concerns about transportation costs expressed in the DES (and discussed below in these Comments) belie the NRC's recommendation for storage. Kerr-McGee's proposed disposal cell, to be constructed purportedly for storage purposes under Alternative III, will cost an alleged \$14 million.<sup>3</sup> There are considerably less radical and expensive interim measures which could be implemented to protect public health for a limited storage period-- such as covering the wastes with soil. It is most unlikely that the NRC would authorize Kerr-McGee to spend \$14 million on the

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1. It is the understanding of the Attorney General's Office that the Illinois Department of Nuclear Safety believes that any compact low-level site which may be developed will not accept the Kerr-McGee wastes because of their great volume.

2. On that same page the NRC indicates that the Kerr-McGee wastes represent more than 35 times as much material as has already been accepted at one of the existing commercial facilities (Barnwell).

3. "Implementation of Alternative III, however, would make eventual removal of the wastes from the West Chicago site a less desirable option because of the additional costs and environmental impacts associated with recovery and movement of the stabilized waste material." Page 1-6; emphasis added.

disposal cell if later removal of the waste were actually contemplated. It should be noted that, according to Kerr-McGee's Table 3.2, disposal at New Douglas, one of the off-site locations considered in this DES, would cost \$29 million. Thus, if Alternative III is the NRC's real preference, the NRC expects Kerr-McGee to spend about \$43 million in today's dollars on disposal of the wastes.

Third, the NRC strongly suggests that it disapproves of the additional environmental impacts which would result from exhuming and burying the wastes on site and later re-exhuming them for removal to an off-site disposal area.

Implementation of Alternative III will, however, make eventual removal of the wastes from the West Chicago site a less desirable option because of the additional costs and environmental impacts associated with recovery and movement of the stabilized waste material.

Page 1-6; emphasis added. The NRC expresses the same concern for the environmental consequences of repeated exhumation in relation to the option of storing the wastes off site and subsequently removing them from the storage site for disposal at another location. Pages 1-5 to 1-6. If the NRC disapproves of the double impacts resulting from such a course of action--i.e., exhumation at the West Chicago site and a subsequent exhumation at the off-site storage area--then a fortiori the NRC must disapprove of the double exhumation impacts inherent in on-site storage, given that they would occur at the same site (West Chicago) and doubly expose the same local population.

The NRC should forthrightly state whether it is recommending storage on site and, if so, for how long, or whether it actually contemplates permanent on-site disposal. If the recommendation is storage, then the NRC must describe and evaluate as precisely as possible the environmental and social impacts of exposing the local population to two exhumations. If, on the other hand, the NRC believes that the wastes probably will not or should not be removed once they are buried in West Chicago, it must describe and evaluate the long-term impacts of on-site disposal.

II. The DES does not address the environmental impacts of the action it recommends.

If the NRC is recommending storage of the wastes in West Chicago with later removal to another site, the environmental impacts of double exhumation should be addressed. This DES has not addressed them. Nor has the DES addressed the environmental issues associated with long-term presence of the wastes at their present location. These issues include:

1. What would or might be the environmental and health impacts of a disposal cell liner or cover failure, particularly in light of the abundant groundwater in the vicinity and the proximity of residences and schools?
2. How reliable is the disposal cell design?
3. How much settlement will occur within the disposal cell; over what period of time is such settlement expected to occur; to what extent will such settlement damage the cap; and how will

such damage be repaired?<sup>4</sup>

4. To what degree and for how long would the disposal site have to be restricted after stabilization? Although at one point the NRC remarks that the site might be used for a park (page 5-6), the DES is generally more frank on the subject of necessary land-use restrictions:

Whether publicly or privately owned, any disposal site will need continuous surveillance and possibly licensing for decades to come.

Page 1-5.

Use of the 11-ha (27-acre) disposal/storage site will be severely restricted if the wastes are buried onsite.

Page 5-35.

The onsite disposal and storage alternatives (I, II, and III) would entail future restrictions to prevent disturbance of the subsurface in the disposal/storage site.

Page 5-32. The DES also indicates that scavengers and burrowing animals must be excluded (page 5-17) and that a fence will be necessary to deter children (page 5-5). Thus, the NRC implicitly acknowledges that the site would have to be withdrawn from virtually all human use. Further, while the NRC refers to "decades to come", it is apparent, given the 14 billion year half-life of thorium and the shallowness of the proposed burial, that such restrictions would have to be imposed forever. The DES should forth-

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4. Any permanent cover over the disposal areas will require periodic maintenance as a result of the unavoidable settlement of the fill.

Letter to Jose Luis Saguinsin from Tom Johnson, Assistant Geologist, Illinois State Geological Survey, September 28, 1979, page 3.

rightly describe the type of restrictive measures to be taken (e.g., security fence, security guard) and their probable impact on the community.

5. Precisely what types of monitoring will be necessary after stabilization; for how long will such monitoring be necessary; who will conduct such monitoring and any remedial measures indicated by it; and who will pay for such monitoring and remedial measures?

6. What types of general maintenance will be necessary-- upkeep of the security fence above and below ground; repair of any damage done by burrowing or domestic animals; weeding out of undesirable vegetation;<sup>5</sup> surveillance of monitoring wells and pipes? Will a 24-hour/day security guard be necessary? Who will be responsible for such general maintenance and related activities, and who will bear their cost?

7. What would or might be the consequences of a failure to enforce use restrictions at the site, and who will be legally liable for any damages resulting from such a failure?<sup>6</sup>

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5. Deep-rooted plants can act as radium and radon pumps, bringing such nuclides to the surface.

"Environmental Assessment related to Kerr-McGee Chemical Corporation, West Chicago: Characterization of the Site Surface," Argonne National Laboratory, June 1978, page 18.

6. On page 1-5 the DES makes some confusing remarks about the applicability of the Uranium Mill Tailings Radiation Control Act ("UMTRCA") and governmental ownership of the disposal site. If UMTRCA applies, the disposal site, be it in West Chicago or at some other now privately-owned location, will have to be transferred to governmental custody. Section 202 of UMTRCA, 42 U.S.C. §2113. The matter of ultimate title and the related urgent issues of custodianship, financial responsibility, and legal liability are not discussed in this DES.

III. The Uranium Mill Tailings Radiation Control Act applies to the Kerr-McGee wastes.

On page 1-2 the NRC states that it

is taking no position on the application of the Mill Tailings Act to the disposal/storage site.

This attitude is not readily understandable. The NRC is the agency responsible for implementing Title II of the Uranium Mill Tailings Radiation Control Act of 1978 ("UMTRCA"). Furthermore, disposition of the Kerr-McGee wastes may well differ depending on whether they are governed by UMTRCA or by the NRC's regulations in 10 C.F.R. §§20.301 et seq. If §§20.301 et seq. applies, the wastes may be disposed of at a location owned by the owner of the wastes. If UMTRCA applies, then the wastes may be disposed of at a privately-owned site, but title to such site must be transferred to the State or the United States after burial is completed. Furthermore, as discussed below, UMTRCA has specific decommissioning requirements not contained in 10 C.F.R. §§20.301 et seq. The NRC should therefore decide whether UMTRCA applies.

It is the People's position that the Kerr-McGee decommissioning is governed by UMTRCA. As indicated in Table 4.1, thorium was produced during the entire time the West Chicago facility operated, and there is nothing in Table 4.1 or the accompanying text to indicate that thorium production constituted an insignificant portion of the facility's operations. Moreover, a large part of the rare earths also produced at the facility were produced from thorium-bearing ores. Because the ore sediments resulting from thorium production--i.e., "byproduct material"--are inextricably inter-



mixed with the sediments resulting from rare earth production, the byproduct material and non-byproduct material will be buried together. Therefore, to insure that the byproduct material is disposed of in accordance with UMTRCA, all of the Kerr-McGee wastes<sup>7</sup> should be disposed of in accordance with UMTRCA.

It should be noted that the tailings at Kerr-McGee's West Chicago site, though a mixture of sediments from ores processed primarily for source material and of sediments processed primarily for other elements, are exactly the kind of material Congress had in mind when it enacted UMTRCA. From a radiation perspective the Kerr-McGee tailings pose hazards similar to UMTRCA tailings due to quantity, configuration, and radionuclide content. Like UMTRCA tailings the Kerr-McGee tailings were generated in very large quantities; they contain radium, the principle radionuclide of concern; the radionuclides are dispersed throughout a nonradioac-

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7. UMTRCA's definition of byproduct material is "the tailings or waste produced by . . .". 42 U.S.C. §2014(e)(2). The reference to "waste" suggests that more than ore sediments are included in the definition. Unusable, discarded materials such as contaminated buildings, soils, and equipment generated during the extraction process would be "waste" within the statutory definition.

The "low-level wastes" over which the NRC has authority must qualify as source, byproduct, or special nuclear material under the Atomic Energy Act ("AEA"), 42 U.S.C. §2014(z), (e), or (aa), respectively. The AEA does not establish any category of material other than these three over which the NRC may exercise jurisdiction. The contaminated buildings, equipment, and soils at the West Chicago site are not source material (although the non-byproduct ore sediments might be, depending on the residual source material content) as defined by 42 U.S.C. §2014(z); they are not byproduct material as defined by 42 U.S.C. §2014(e)(1); and they are not special nuclear material as defined by 42 U.S.C. §2014(aa). Thus, unless they are byproduct material under UMTRCA, the NRC lacks jurisdiction over them.

tive medium in relatively low concentrations; and they create a health hazard, chiefly from inhalation, to members of the public chronically exposed to them. The Kerr-McGee wastes also pose the nonradiological hazards about which Congress was concerned when it enacted UMTRCA. In light of the remedial purposes of UMTRCA, it makes no more sense from a technical than from a legal point of view to shield the Kerr-McGee wastes from UMTRCA's requirements merely because some portion of those wastes was generated by processing ores primarily for elements other than thorium.

UMTRCA's requirements are considerably more specific than those contained in 20 C.F.R. §§301 et seq.<sup>8</sup> For example, Section 203 of UMTRCA, 42 U.S.C. §2201(x), requires that the licensee make appropriate financial arrangements when long-term maintenance and monitoring is found by the NRC to be necessary. Moreover, under that section of the statute, mill tailings sites must be decommissioned so that the need for long-term maintenance and monitoring is reduced to the maximum extent practicable. The short-term costs to the licensee are therefore of little importance in identifying the proper decommissioning method. With respect to the Kerr-McGee decommissioning, the statute itself thus appears to dictate that if another location exists at which dis-

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8. The NRC's proposed new regulations for land burial of low-level wastes, 10 C.F.R. Proposed Part 61, also contain specific requirements. The NRC's current thinking, as evidenced in the DES, on the Kerr-McGee matter appears to be in serious conflict with those proposed requirements; see Section V of these Comments, below.

posal of the wastes would result in less need for long-term maintenance and monitoring than would the West Chicago location, the wastes must be disposed of at such other location.

In sum, the NRC must determine whether UMTRCA applies to the Kerr-McGee matter. The failure to make that determination has fatally flawed this DES.

IV. The DES should address disposal of the off-site "hot spots."

In West Chicago there are a number of areas contaminated with ore sediments from the Kerr-McGee facility. The most serious of these are, according to Frigerio et al., "Thorium Residuals in West Chicago, Illinois", ANR/ES-67, September 1978, and the NRC's inspection report of August 1981 (04002061/81-2), Kress Creek, Reed-Keppler Park, and the residential area adjacent on the east to the Kerr-McGee site. The sediments at these "hot spots" represent several times the volume of sediments now on the Kerr-McGee site. Furthermore, the potential radiological health hazard posed by these hot spots appears, at least in some cases, to be considerably greater than that posed by the wastes on site. Given their radioactivity, the more significant hot spots will have to be cleaned up at some point. The DES strongly suggests that the NRC contemplates the eventual transfer of at least some of the hot spot sediments to Kerr-McGee's West Chicago site. See pages xii; 1-2 ("The Kerr-McGee proposed plan is for permanent disposal of all material moved to or located on the disposal/storage site" (emphasis added); and Appendix F, which purports to include the Reed-Keppler materials in a radon flux projection.

Therefore, from a technical perspective, it makes no sense for the DES to exclude consideration of the hot spot issue.

It is not only technically but also legally inappropriate for the NRC to limit the scope of its environmental assessment of the Kerr-McGee project by ignoring the hot spot issue. Since the Reed-Keppler materials, and possibly others as well, will eventually be moved to the Kerr-McGee site if that site is authorized for permanent disposal, and since the DES unmistakably indicates that the site will be authorized for permanent disposal, the NRC should forthrightly assess the environmental impacts of disposing of the hot spot tailings in West Chicago. These impacts include the total amount of wastes to be buried on site, the total surface area which will consequently have to be restricted after closure, the radiological effects of unloading and burying the materials on site, and the expected radon flux after closure.

V. The West Chicago site is inappropriate for disposal of the Kerr-McGee wastes.

The West Chicago site is a highly inappropriate place for disposal of the Kerr-McGee wastes because of its urban location and because of its subsurface hydrogeological characteristics.

From a population standpoint, the West Chicago site is entirely unsuitable. The immediate area is residential and commercial. The southern border consists of industrial offices, a restaurant, and a bowling alley; Factory and Weyrauch Streets to the east, and the streets perpendicular to them, are residential; the area north of Ann Street (which is north of the site) is residen-

tial and commercial; and the property to the west of the railroad tracks along the western edge of the Kerr-McGee property is also residential and commercial. Figure 3.1, Figure 3.9, Page 4-1, Page 4-40. Pioneer Park and most of West Chicago's schools are located within 1600 feet of some part of the Kerr-McGee property; the combined enrollment of these schools comprises 80% of West Chicago's public school population (page 4-40).

In general, DuPage County is densely populated and is urbanizing at a rapid rate. Table 4.10 shows that the 1980 population density was 1,975 persons per square mile, making DuPage County 20 times more densely populated than the second most densely populated county under consideration. During 1975 to 1980 the population of DuPage County grew 18.1%, while population growth during the same period for the other counties ranged from -5.6% to +9.2%. Furthermore, between the years 1980 and 2020 the population of DuPage County is expected to grow another 50% (Table 4.11).

The urban location of Kerr-McGee's West Chicago site, and in particular the proximity of residences, is of concern because there is greater likelihood of adverse human health impacts in the event of a design failure than if the disposal site were remote from human population. Because of this, there will be greater urgency, and therefore less time, to repair damage or defects (once they are discovered) than if the site were more remotely situated. Furthermore, one can reasonably foresee disruptions of the site because of the number of children living or playing nearby and/or passing by on their daily trips to and from

school. (The DES acknowledges that the site will be an attractive nuisance; page 5-5.) It is also reasonably foreseeable that years from now, after all controls at the site, whether private or institutional, have ceased, excavations will occur and seriously disturb the wastes.<sup>9</sup>

The West Chicago site is equally unsuitable for waste disposal from a technical standpoint. Its deficiencies are summed up in the May 1977 report of Argonne National Laboratory, "Kerr-McGee Chemical Corporation - West Chicago: Characterization of Geohydrology and Subsurface Chemistry," page 66:

- highly inhomogeneous subsurface
- generally water-saturated and permeable subsurface
- cation exchange capacities<sup>10</sup> greater near surface than below
- hydraulic connection between shallow and deep aquifers
- site-associated pollutants are in water table and in deeper aquifer

The DES acknowledges the existence of all these conditions.

The overall pattern indicates a clay soil sequence near the surface, followed by varying thicknesses of sand, silt, and coarse gravel. The zone of relatively high permeability is generally consistent across the site, although it is of varying composition and thickness.

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9. It should be noted that Kerr-McGee rejected consideration of alternate sites located in heavily populated areas, thus displaying some understanding that populated areas are inappropriate for low-level waste disposal. See page 11.8 of the August 1979 stabilization proposal, as amended.

10. I.e., the ability of subsurface materials to attenuate leachate.

. . . .  
. . . the cation exchange capacity of clays below 6 m (20 feet) is low.

Page 4-52.<sup>11</sup>

Several distinct aquifers have been recognized in the earth materials beneath the West Chicago area. . . . Among these six principal aquifers, the glacial drift and Silurian Dolomite aquifers (which are connected hydraulically) are considered to be the most important shallow aquifers in the site area. . . .

. . . .  
The glacial drift aquifer is made up of sand, gravel, silt, and clay deposited sporadically throughout the unconsolidated glacial drift which overlies the bedrock to a depth of approximately 24 to 30 m (80 to 100 feet). Based upon driller's records obtained by Kerr-McGee in 1976, the water table in the glacial deposits at the West Chicago site was approximately 2 to 5 m (8 to 18 feet) below the surface, with a water table gradient sloping in a southwesterly direction.

Pages 4-62 to 4-63.

The Silurian Dolomite aquifer is considered a major groundwater source in the area and was the first aquifer to be extensively exploited.  
. . . .

. . . .  
Groundwater moves easily through an open network of joints and fractures within the Silurian dolomite. Little or no filtration takes place in the aquifer, resulting in widespread migration of pollution or contamination once it reaches the aquifer. . . .

Page 4-63.

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11. There is thus no basis for the assertion in Section 7 of the DES, "Environmental Effects of Accidents," that

Little impact, if any, is expected to the deep dolomite aquifer, since the permeabilities of the subsurface material at the site are low.

Page 7-2.

. . . downward leakage of the shallow ground-water to the bedrock aquifer can occur. . . .

Page 4-64.

. . . water from the glacial aquifer at the site, although somewhat typical of hardwater wells in the area, contains concentrations in excess of standards for chloride, fluoride, sulfate, and total dissolved solids. The highest pollutant concentration and poorest groundwater quality are generally located in the areas around boreholes 2, 3, and 5. This appears to be consistent with the historical chemical loadings on the site. . . .

Page 4-64.

. . . chloride pollution of the water table is reflected in the Silurian dolomite aquifer . . .

Page 4-68. The contamination of the dolomite aquifer is documented in the DES in Table 4.21. This table shows that water quality standards for sulfate, iron, copper, lead, and zinc have violated Chapter 3 of the Rules and Regulations of the Illinois Pollution Control Board (Water Pollution).

See also the letter to Jose Luis Saguinsin from Tom Johnson, Assistant Geologist, Illinois State Geology Survey, September 28, 1979, page 2, regarding the hydraulic connection between the bedrock and the overlying drift:

The condition that exists is a natural result of the downward infiltration of precipitation and ground water through the fine grained glacial materials which overlie the bedrock. This is not a "perched" water table condition. The glacial aquifer is not isolated from the bedrock aquifer as evidenced by the extent of chemical pollution of ground water in the dolomite.

And see the report of Kerr-McGee's own contractor, Law Engineering Testing Company, showing sand and gravel (i.e., permeable)



layers at the West Chicago site. "Hydrologic Studies of the West Chicago Site," August 24, 1981, pages 18-19. The Law Engineering report also found that hydraulic conductivities at the site are very high, within the range of values for clean sand (pages 25-26).

To compensate for the unsuitable natural conditions, Kerr-McGee proposes to construct a containment system at the site. The proposed design (Alternative I) has not been proven capable of permanently containing waste materials, and can reasonably be expected to be less reliable than in-situ naturally occurring clay. In fact, there are no engineered designs now known to permanently contain radioactive or chemically hazardous wastes buried in the ground. (The NRC is aware of radioactive waste migration problems occurring at Maxey Flats, Kentucky, West Valley, New York, and Sheffield, Illinois.) Therefore, an engineered design--which is necessarily experimental--should not be used to compensate for adverse hydrogeologic conditions, particularly when the site is located in the midst of a residential neighborhood.

The NRC has indicated its own views on low-level waste disposal in the final draft, approved by the Commission, of 10 C.F.R. Proposed Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste". Proposed Part 61 and its Supplementary Information indicate that the NRC's chief concern is with long-term performance and protection of public health rather than with short-term considerations.

Protection of the public health and safety over the long term is most important and long-term performance of the land disposal facility after operations cease should be given greater emphasis than short-term considerations and conveniences. It is therefore at the time of the land disposal facility closure that greatest reliance will be placed on the disposal site characteristics and design as well as the waste characteristics to assure protection of the public health and safety without the need for continued active care and maintenance.

Supplementary Information, page 9. Assuring long-term safety involves (1) protection of individuals from inadvertently intruding into the site in the future and coming in contact with the wastes, (2) protection of the general public from

potential releases, and (3) stability of the waste and the site to eliminate the need for ongoing maintenance after site closure. Id.

In light of the surrounding land uses at Kerr-McGee's West Chicago site, it is virtually impossible to assure that individuals will not inadvertently intrude into the waste site after site controls come to an end. It is similarly impossible to assure the stability of the site so as to eliminate ongoing maintenance after site closure. Therefore, it is impossible to protect the public from potential releases in the long run.

Proposed Part 61 disapproves of long-term maintenance and establishes a procedure for the orderly and gradual cessation of site controls after closure. §61.7(c). For five years after closure the private licensee must remain at the site for observation and maintenance and to assure that the site is stable. The license will then be transferred to the governmental custodian for monitoring, restriction of access, and performance of minor custodial activities. The period of such active institutional control shall not extend more than 100 years. §61.59(b). The NRC states in the Supplementary Information:

Active institutional controls involving periodic surveillance by the custodial agency and controlled access (e.g., maintaining a fence) cannot be relied upon indefinitely. (§61.59 will not allow reliance on active institutional controls for more than 100 years since this is judged to be maximum time that governmental institutions should be relied on to carry out active controls.)

Page 19. Although under §61.59(a) government ownership of the disposal site apparently would not be mandated here, Proposed Part 61's prohibition against indefinite use of active controls should

be duly considered in relation to Kerr-McGee's proposal. Since active controls (such as maintaining a security fence and weeding out long-rooted plants) will be necessary at the West Chicago site for considerably more than 100 years, Proposed Part 61 suggests a different result from that reached in the DES.

In sum, the information contained in the record thus far overwhelmingly demonstrates that the West Chicago site is wholly unsuitable for disposal of the Kerr-McGee wastes. Furthermore, Proposed Part 61 clearly indicates that a site like the one in West Chicago is not an appropriate location for establishment of a low-level radioactive waste burial ground; the NRC would therefore violate the spirit of its own proposed regulations if it authorized Kerr-McGee to dispose of the wastes in West Chicago.

VI. The DES's approach to alternate sites is deficient.

The NRC's assessment of alternate disposal sites--Alternative IV--is deficient because it is based entirely on Kerr-McGee's own inadequate exploration of alternate sites. Not only did the NRC fail to independently assess alternate sites; it did not establish any geographical guidelines or minimum exploration standards according to which Kerr-McGee would assess alternate sites. Without such guidelines and standards there was no way to insure that the applicant would conduct a good faith and thorough examination of other options.

Indeed, the DES suggests that NRC does not particularly care whether Kerr-McGee locates a viable alternative:

The staff views the selection methodology to be adequate and sufficient, given the site information currently available and the level of detail required of alternative sites at this time.

Page 3-18; emphasis added. In other words, the NRC apparently did not require sufficient details about alternate sites to make the determination it purports to make in the DES--i.e., whether the wastes should be buried in West Chicago or at some other location. Only this circumstance--that the NRC actually did not want or call for enough detail to properly assess the options--can account for the fact that so little information was actually gathered by Kerr-McGee. Time after time the DES states that necessary studies have not been conducted and site-specific information not obtained; see, for example, page 4-45 (historical and archaeological resources), pages 4-52 to 4-56 (geology), page 5-5 (social impacts), page 5-19 (radiological impacts). The hydrologic and geologic information gathered by Kerr-McGee on alternate sites is helpful in determining which of the clay/shale quarries considered are more likely to be favorable for waste disposal. But, as NRC itself repeatedly makes clear, only site-specific data can allow meaningful comparison of potential impacts. Such data includes the depth and lateral extent of permeable layers, susceptibility of aquifers to contamination, hydraulic flow, proximity of shallow wells, and hydraulic connection, if any, of such wells with the quarry site.

Three hydrogeologic factors affect the design of landfills in Illinois: (1) the position of the landfill site within the ground-water flow system; (2) the position of the top of the zone of saturation, or water table, with respect to the refuse; and (3) the texture and composition of the surrounding earth materials,

which affect their ability to transport and attenuate dissolved solids in the leachate.

George M. Hughes, "Hydrogeologic Considerations in the Siting and Design of Landfills," Illinois State Geological Survey, Environmental Geology Notes, April 1972, Number 51, page 2. The result of the failure on NRC's part to demand, and Kerr-McGee's to supply, such site-specific information is, of course, that official preference for on-site burial was a foregone conclusion.

In Chapter 3 of the DES the NRC describes Alternatives I through VI. The description of Alternative IV--Section 3.4.1 on pages 3-17 to 3-18--sets out a number of views that are unwarranted by the law or the facts.

The first sentence of Section 3.4.1 states that "The basic approach for any offsite disposal or storage, currently restricted by limited availability . . ." If the meaning of this rather unclear sentence is that off-site disposal or storage locations are limited in availability, such a view is not supported by anything in the DES. All that is "limited" was Kerr-McGee's exploration of alternate sites. First, Kerr-McGee directed its attention only to locations in the State of Illinois; the DES offers no explanation for this limitation. Second, in Illinois itself, Kerr-McGee failed to explore all possibilities.

For example, Kerr-McGee did not give adequate consideration to surface coal mines (strip mines). The DES states on page A-2:

The abandoned surface coal mines are not suitable for waste disposal because of ponded water conditions and fracture permeability persistent in all coal beds. It was concluded that high permeability and high groundwater level probably would not be suitable.

The limited knowledge on which these remarks were based is insufficient to warrant rejection of all surface coal mines in the State. Many abandoned strip mines have been partially refilled with spoil material. An example is an abandoned strip mine in Fulton County at which the Metropolitan Sanitary District of Greater Chicago spreads sludge. Other abandoned strip mines exist in Fulton County as well as in Logan, Sangamon, and Livingston Counties, and these merit consideration.<sup>12</sup> Keros Cartwright et al., "Hydrogeologic Considerations in Hazardous Waste Disposal in Illinois, Environmental Geology Notes 94, February 1981, page 12, indicates five large areas "with widespread geologic conditions suitable for hazardous waste disposal." Fulton, Logan, Sangamon, and Livingston Counties fall within those five areas.

More generally, Kerr-McGee arbitrarily limited the search for alternatives by restricting itself to areas where excavation had for some reason already occurred. There is no technical reason for imposing this restriction. In addition, Kerr-McGee did no drilling at any of the sites to obtain specific information on soils, geology, and groundwater.

A site like the New Douglas quarry, identified as #3 in the DES, is quite promising and should have been studied in detail. Moreover, there is every reason to believe that sites just as favorable as #3 exist in other parts of the State, if only Kerr-

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12. Phone conversation with Tom Johnson, Assistant Geologist, Illinois State Geological Survey, July 27, 1982.

McGee will conscientiously seek them out. The "limited availability" referred to in Section 3.4.1 is therefore, at least until a genuine search for alternate sites is made, an imaginary problem.

Section 3.4.1 goes on to identify other problems associated with offsite disposal: licensing, distance from West Chicago, availability of treatment/facilities, population, condition of the site, and the assumption that clay and cover soil will be required for both above- or below-ground disposal. The DES does not indicate why any of these matters is a problem, or why any of them poses more of a problem for off-site disposal than for disposal in West Chicago.

First, "licensing" is surely no more problematic than it is in West Chicago. It is not sites which are licensed, but the receipt, possession, or disposal of licensed materials. 10 C.F.R. §20.302, Proposed §61.3. (Kerr-McGee's current license is not for the West Chicago site but to possess and store source material.) Just as Kerr-McGee will need an appropriate license to store or dispose of the wastes at the West Chicago site, so it will need an appropriate license to store or dispose of the wastes at an off-site location under Alternative IV.

Second, it is not apparent why "distance from Chicago" is a problem.<sup>13</sup> The NRC implies elsewhere in the DES (page 5-5, last full paragraph) that distance is problematic because of associated

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13. At page A-2 the DES inconsistently states that "distance [is] not considered by NRC as criteria for disposal".

transportation costs, but that is never made explicit. Nor is a reason given why costs to Kerr-McGee should concern the NRC.

Third, the People does not understand what is meant by "availability of treatment/facilities." If by "treatment" the NRC means treatment, for example, of contaminated run-off, Kerr-McGee can set up an appropriate treatment system at an off-site location just as it plans to do in West Chicago during stabilization activities. If by "facilities" the NRC means sanitary facilities, Kerr-McGee can set up temporary water closets and other equipment. If the NRC has other "treatment/facilities" in mind, they should be specified.

Fourth, "population" most certainly cannot be more of a problem at any of the six off-sites than at the West Chicago location. See Tables 4.10 through 4.13. If the NRC is concerned that residences or businesses will in future grow up around a site used for disposal, then the solution is to require Kerr-McGee to purchase buffer land around such site. (In this regard, see 10 C.F.R. Proposed §61.52(a)(8).)

Fifth, the People does not understand what is meant by "condition of the site."

Finally, "the assumption that clay and cover soil will be required" is not justified by the information in this DES. If a site had sufficiently impermeable soils, the need for a clay liner might be eliminated.

On page 5-5, last full paragraph, the DES cites "additional problems" associated with the off-site locations: (1) high costs



of transferring the material, (2) higher accident rates, highway maintenance costs, and consumption of fuel, and (3) negative reaction of people living near the quarry site. Since there has been no assessment by the NRC of costs of transportation and highway maintenance or of fuel consumption, the importance of those factors and the weight they should be given (even assuming they are legally relevant) cannot be evaluated. As to higher accident rates, we assume this is of concern for radiological reasons; see Section 6 of the DES. In that Section the NRC identifies the radiological consequence of truck accidents during transfer to New Douglas as an individual 50-year lung dose of 550 mrem at 110 yards. The NRC does not show how it calculated the 50-year lung dose, nor does it discuss the health significance of the calculated dose. Thus, the importance of accident rates and the weight they should be given cannot be evaluated. Finally, public reaction to off-site disposal should not be considered a problem, in light of the view expressed by NRC in Section 3:

A preconceived and speculative view that public opinion will not permit the use of an alternative site for disposal is deemed not sufficient to consider the site unreasonable, infeasible, or unavailable.

Page 3-17.

In sum, none of the problems alluded to in this DES relating to off-site disposal is justified.

In connection with the issue of off-site disposal, the People emphasizes that the responsibility to locate a site for burial of the Kerr-McGee wastes is not the State's. The State has no duty--

or even authority--under any state or federal statute to assume the task and the cost of performing studies and purchasing land necessary to dispose of the industrial wastes of this particular company.<sup>14</sup> Kerr-McGee and its predecessor companies reaped the profits of operating a thorium plant in West Chicago (insulated, let it be said, from the state environmental laws which would have prevented the very disposal and pollution problems addressed by this DES). Now Kerr-McGee must bear full responsibility for disposing of the wastes its operations created.

VII. The DES provides no rationale for recommending Alternative III over Alternative IV.

The DES does not provide a rationale for recommending burial of the Kerr-McGee wastes in West Chicago rather than at a now privately-owned off-site location such as Alternate #3. There are no comparative analyses of conditions at the West Chicago and various alternate sites, and no conclusions about the relative overall superiority of one site to another. To be sure, the DES is full of data about the various sites; but the significance of such data from a comparative perspective is never explicitly dis-

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14. Under the Low Level Radioactive Waste Policy Act of 1980, P.L. 96-573, Congress expressed its "policy" that States are responsible for disposal of low-level wastes generated within their borders, and authorized States to enter into multi-State compacts to establish and operate regional disposal facilities. 42 U.S.C. §202ld. This statute does not indicate, explicitly or implicitly, that States are responsible for disposal of the wastes of a particular generator--especially a generator whose wastes would fill several low-level burial grounds and who has the resources to locate and purchase an appropriate disposal site. Rather, the statute appears to be directed at on-going State-wide radioactive waste-generating activities for which adequate disposal facilities are becoming increasingly scarce and expensive.

cussed. What, for example, is the comparative significance of the data on topography, meteorology, demography, land ownership and use, and the other topics in Section 4?<sup>15</sup>

The NRC's failure to explicitly assess the options comparatively is all the more puzzling given that, on the basis of information in this DES, some of the off-site locations--particularly #3--look far superior to West Chicago. In contrast to the abundance of groundwater under the West Chicago site, groundwater supplies are generally small near #3, and there is no significant aquifer in the vicinity (pages 4-89, 5-11, 5-34). In contrast to the West Chicago site which is located in the midst of a rapidly urbanizing residential area (page 40 and Table 4.11), #3 is located in a rural area (page 4-12) and, like the other five off-site locations, is more than a mile from any population center of over 500 people (page 5-19).

Not only do some of the particular off-site locations look superior to West Chicago, but the NRC suggests that, in general, burial off-site is preferable. During stabilization activities, disturbance of the waste materials either for on-site or off-site disposal will have air quality (non-radiological) impacts, though the sum total of such impacts will be less for off-site disposal:

Loading of the waste material into trucks  
for off-site burial should lead to the same

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15. Indeed, what is relevance at all of some of this information? Why, for example, does the DES discuss the number of blacks and hispanics in West Chicago (pages 4-31 to 4-32), the percentage of West Chicago's residents with postgraduate degrees (page 4-34), the form of West Chicago's government (page 4-37)?

or even less air quality impacts at the West Chicago site than if the material were buried onsite. Onsite burial would require both loading and unloading and some bulldozing of the overburden.

Unloading of the trucks at any of the proposed offsite burial sites will result in brief periods of elevated emissions at the site. However, air quality impacts are expected to be small because of the nature of the release times and the release point, which will be within the confines of a quarry.

Pages 5-2 to 5-3. Similarly, radiological health impacts should be lower at the off-sites than in West Chicago during stabilization:

Thus, the radiological health impact of disposal at each of the six sites is expected to be . . . less than that associated with excavating and loading the ore residues and sludge at the original site in West Chicago.

Page 5-19. With respect to surface water impacts during stabilization, the DES states that in West Chicago some impacts to Kress Creek will occur but that at pit type quarries like #3 "it is unlikely that the disposal and burial activities will in any way contaminate the surface water run-off and nearby stream flow."

Page 5-8. (As for hill-side type quarries, the DES states that surface water impacts can be minimized by proper disposal methods; page 5-33. See also page 5-17.)

From a long-term perspective as well, the DES suggests that off-site disposal is generally preferable to disposal in West Chicago:

Allowing for the more remote location of the six offsite disposal sites, the potential radiological health risk of any one of the buried and covered wastes [sic] would be lower than that from onsite disposal.

Page 5-19. The same is true for groundwater protection:

Removal of waste materials from the existing site under Alternatives IV and V would essentially eliminate future contamination of groundwater at the West Chicago site.

Page 5-1i. And:

Removal of waste materials from the existing disposal/storage site would essentially eliminate future potential contamination of groundwater at the West Chicago site.

Page 1-4. Long-term social factors also favor off-site disposal:

When long-term social considerations (e.g., population density, land use) are included in the assessment, eventual shipment of the wastes to a licensed repository would be preferable to permanent onsite disposal under Alternatives I and II.

Page 5-6.<sup>16</sup> The same opinion is expressed on page 1-4. The DES also views off-site disposal as superior esthetically and from a land use perspective. Pages 1-4, 5-12, 5-17, and 5-35.

Since the DES gives no technical or social policy reasons for preferring on-site to off-site stabilization, the only conceivable reason for this preference can be the supposed high cost of transporting the wastes out of West Chicago. See page 5-5.<sup>17</sup>

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16. In the preceding sentence, the DES states that for the short term, onsite stabilization is the most "acceptable alternative from a socioeconomic and political point of view." Pages 5-5 to 5-6. There is no basis for this view in the DES. The only possible basis is hinted at on page 5-5: a concern that West Chicago's residents may be impatient for a resolution of the Kerr-McGee problem, and a feeling that such impatience would be satisfied by on-site stabilization and would not be satisfied if Kerr-McGee and the NRC took further time to explore off-site alternatives. Even assuming that the public is impatient, the answer to the problem is not on-site disposal, given the serious adverse long-term consequences. See Section IX, below, for a suggested solution.

17. The NRC's concern with cost of transportation is yet another indication that it does not intend to have the wastes removed after they are stabilized on site--or, at least, have them removed at Kerr-McGee's expense.

However, the DES never explicitly states that cost is the determinative factor. If the NRC believes that the public health and welfare factors it has identified do not warrant the expenditure by Kerr-McGee to transport the wastes off-site, the NRC should expressly say so, and the issue can be joined by the interested parties. Furthermore, if cost-benefit analysis is legally permissible under these circumstances (i.e., under UMTRCA), then the NRC must do an analysis of all costs (including long-term costs of monitoring and maintenance) and must weigh such costs against the benefits of a particular course of action. Simply to assert that off-site disposal costs more than on-site disposal is not enough to justify on-site disposal.

In sum, the NRC's recommendation of on-site burial is not supported by evidence that the necessary environmental analysis has been made to justify such recommendation.

#### VIII. Kerr-McGee's cost estimates are unfounded.

In Table 3.2 the DES sets out Kerr-McGee's preliminary cost estimates for the various alternatives. No foundation for any of the estimated figures is given, and the NRC did not independently verify them. Therefore, to the extent that Kerr-McGee's costs may be considered by NRC in determining whether on-site burial should be authorized, there are as yet no reliable figures to consider. In specific:

1. On what basis were these particular multipliers chosen?
2. How were the labor and supervision cost figures derived?

How many man-hours did Kerr-McGee assume, and at what hourly wage rate?

3. What are the bases for the health physics monitoring and equipment figures? Are they based on proposals of particular contractors or sellers? What kind and quantity of equipment are contemplated?

4. What do the hauling costs include--truck rental fees, labor, packaging? How many trucks and what kind of packaging are contemplated?

5. How can Kerr-McGee estimate the cost of labor, supervision, health physics monitoring, equipment, and backfill and cover at the New Douglas site when Kerr-McGee does not know exactly the extent of excavation, lining, and covering which would be necessary to properly stabilize the wastes?<sup>18</sup>

6. Why is an \$18,000,000 "burial fee" for New Douglas included? Since the New Douglas site is privately owned, Kerr-McGee would have to purchase it. Therefore, it makes more sense to estimate the purchase price--assuming, of course, that Kerr-McGee knows the amount of land to be purchased and its fair market value. In any case, purchase of as much as 100 acres would cost a small fraction of \$18,000,000.

7. Why aren't figures for post-stabilization monitoring and maintenance for Alternatives I through IV included?

8. On what basis does Kerr-McGee add \$4,584,000 to the "direct site cost" of Alternatives I and III? What indirect costs are contemplated?

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18. Detailed information on each one of the potential offsite disposal sites is not available, and specific burial plans for each site have not been developed.

IX. A suggested solution.

There is a solution to the Kerr-McGee problem that may satisfy both short-term and long-term considerations. First, Kerr-McGee should take interim measures to protect public health and safety. For example, a cover of soil or other appropriate material could be applied to the West Chicago disposal site to reduce radon exhalation and contaminated leachate migration and run-off. Efforts should also be undertaken to control contaminated run-off to the storm sewer southwest of the site. Additional measures which are appropriate, such as improved security, should be implemented. Second, the NRC should order Kerr-McGee to remove the wastes from the site and dispose of them at a suitable location as soon as possible but no later than some specified date. The time permitted should be great enough to enable Kerr-McGee to conduct all necessary studies and obtain state and federal approval, but not so great as to encourage further dawdling by Kerr-McGee. For each day after such specified date during which the wastes remain on site, the NRC should assess a substantial civil penalty. Only in this way will NRC provide an incentive to Kerr-McGee to set about locating a disposal site. It has been almost ten years since Kerr-McGee's West Chicago manufacturing operations ceased; NRC should not allow yet more time to pass before Kerr-McGee takes steps to resolve the problem.

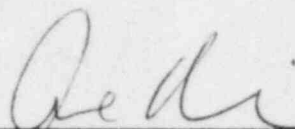
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