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AREA RECOMMENDATION REPORT FOR THE CRYSTALLINE
REPOSITORY PROJECT: AN EVALUATION

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Eastern Band of Cherokee Indians

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AREA RECOMMENDATION REPORT
FOR THE CRYSTALLINE REPOSITORY PROJECT:
AN EVALUATION

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INTRODUCTION

The Department of Energy's conclusions that the Cherokee Tribal Lands, located only 20 miles from the proposed Elk River complex (SE-5) waste site, will not be affected is unrealistic. The dependency of the Eastern Band of Cherokee Indians on tourism is directly impacted upon by national perceptions of the region characterized as the Great Smoky Mountains. This region is made up of many features including, but not exclusive of, the Great Smoky Mountains National Park, the Blue Ridge Parkway, Shining Rock Wilderness and numerous other major tourist attractions. The perception of potential tourists to this area will be affected by the current national debate on nuclear waste disposal, as well as the visibility of the material in transport on the American highway system. The Tribal Lands will, if North Carolina is chosen, be bracketed on the west by the probable Monitored Retrievable Storage Facility (MRS) in Tennessee and on the east by the North Carolina SE-5 site. This will provide maximum visibility by tourists of the material in transport to the MRS and then to the potential disposal site in North Carolina.

Recent surveys at two proposed high level nuclear waste disposal sites, Yucca Mountain, NC. and Asheville, NC., have suggested that tourism could decrease by 80% and 47% respectively near these facilities. Unemployment figures for the Eastern Band of Cherokee Indians are high (between 25 and 45 percent based upon the time of year). Tourists who travel in western North Carolina commonly visit the Great Smoky Mountains National Park and Cherokee at its eastern entrance and the Blue Ridge Parkway with Cherokee located at

its southern terminous. A decline in tourism of 47%, using the nearby Asheville data, would be catastrophic for the Cherokee Tribe and even a less severe decline of perhaps 10% would adversely effect both employment and economy of the Tribe.

The Tribe receives in excess of 36 million dollars a year from tourist trade and is currently experiencing a reduction in federal funds and possible future reduction of federal assistance. Any loss in tourism would also result in even higher unemployment rates for the Cherokee. The loss of tourism dollars combined with declining federal funds will result in major impacts upon the public health of the Cherokee Tribe in terms of increased mortality. The Cherokee currently have higher than average mortality rates due to the typical poverty diseases found in high unemployment and low income populations.

Comments which follow will address and critique the methodology used in the region-to-area screening process and then focus more specifically on the proposed potentially acceptable site SE-5 (Elk River complex) located in western North Carolina.

EVALUATION OF THE REGIONAL SCREENING PROCESS

The majority of this document focuses on geology; however, two important pieces of information receive little or no discussion. First, was each of the final twelve proposed sites re-evaluated to determine the crystalline nature of the rock body? How did DOE establish the crystallinity of the units and

their homogeneity? Second, was any consideration given to the different qualities of geologic data available? Should the quality of geologic information not have been a separate variable that was scaled similarly to the other 16-20 variables?

The variables did not consider the potential of atmosphere temperature inversion in the event of a fire or release of radioactive or chemical material into the atmosphere. Temperature inversions are a major problem in western North Carolina which are conducive to the dissemination of concentrated air pollutants spilling into highly populated valleys. These pollutants remain for extensive periods of time in relatively undiluted form.

The subsequent release of radon gas (from radioactive decay of the uranium minerals found in the granitic rocks) from the mine tailings brought to the surface apparently received no consideration particularly in view of limited dilution of the air as a component of valley effects.

The methodology did not consider the high rainfall, flooding potential and numerous streams and intermittent streams in the designated areas. Locating a waste disposal site at the headwaters of both surface and ground water systems make very little scientific sense.

The farmland in the area is considered among the best in western North Carolina. Due to this diminishing resource it seems that a far more suitable site can be located in a non-agricultural area.

Major Groundwater Discharge Zones

How does DOE define major groundwater discharge points and major through flowing streams? What map scale was used to make these decisions at the proposed sites? Why were existing large scale topographic maps not used for these evaluation?

The statement confining lateral ground water movements from a topographic high to a topographic low is unrealistic for rock bodies as complex as the one located in the Elk River formation. Recharge zones often occur downslope and downstream from topographic highs along fracture surfaces. The potential for conduit transfer of water over large lateral and vertical distances is great.

The study has not taken into consideration the thousands of spring systems located in the area yielding an average of 2-5 gallons per minute flow rates. The springs are typically of excellent chemical quality and represent many real and potential potable water sources.

Postemplacement Faulting

Elaborate upon how DOE established the distance from fault surfaces? Is this value a measure of surface (horizontal) or vertical (depth below the surface) distance from the fault surface? Are both used in determining the distance? If no, why not?

Proximity to Federally Protected Lands

Why was six miles selected as a suitable buffer zone between federally protected lands and the proposed disposal sites? This distance seems short when considering the special status of these protected lands. The SE-5 site is located near three federally protected areas (all are within eight miles). How can DOE justify placing a nuclear waste repository so close to three american preserves? What long term economic impact will this have on tourism?

The scientific rationale for the relatively small buffer zones around the waste disposal site and the highly complex ecological systems of the national park should be stated in scientific terms utilizing fact and not subjective judgement.

Distance From National Forest Lands

Has the National Forest Service had the opportunity to comment on using their land as a disposal site? Although these are multiple use areas, is a waste disposal site an appropriate use of the land?

Surface Water Bodies

How was the decision to exclude lakes over three miles distant from the proposed sites made? Why was the proximity of ponds and small lakes and streams not considered in the flood potential of the sites?

Population Density

The Department of Energy has neglected to consider the major fluctuation of population of western North Carolina due to summer time residents, second home ownerships, and tourism. U.S. Park Service officials estimate nearly 20 million visitors on the Blue Ridge Parkway at Asheville, NC. and over 14 million visitors in the Great Smoky Mountains National Park, adjacent to Cherokee annually.

Archaeologic Sites

Dixon (1978) has shown that a number of Mississippian cultural sites of the Eastern Woodlands Indians are located within the drainage basins of both the Pigeon and French Broad Rivers. Furthermore, Dixon (1978) suggests that the Pisgah and Qualla phases of the Mississippian culture are part of a cultural continuum leading from prehistoric South Appalachian Mississippian to historic Cherokee. Other authors imply that this region may have been occupied by the Cherokee Indians or their antecedents since 700 AD. The SE-5 site is located within the area of both the Pisgah and Qualla occupations as described by Dixon.

Will the DOE undertake an archaeologic study to determine if any historic or pre-historic Indian camps, villages, or mound sites exist within SE-5? If any site is found will the DOE proceed with further studies to establish the feasibility of SE-5 to house nuclear waste? Will the Cherokee Indians be active participants in such an investigation?

COMMENTS ON PRELIMINARY CANDIDATE AREA DESCRIPTION, SE-5

A general comment should be mentioned at an early point. In the geologic discussions it appears that only data which enhances the area for a proposed waste site are used. Information which casts the site in unfavorable light is overlooked, treated lightly, or dismissed for various reasons.

Lithology and Tectonics

Rocks of the Elk River Complex are defined by Bartholomew and Lewis (1984) as units composed of "pre-Grenville or early Grenville layered gneisses that serve as country rock into which Grenville age intrusive suites were emplaced." Therefore, this complex contains meta-igneous plutons (crystalline rocks) and layered gneisses of unknown origin (non-crystalline rocks?). Fig. 3-147 lists three dominant rock types at the proposed SE-5 site: pCg, pCgs, pCgn. Using Hadley and Nelson's (1971) map, from which Fig. 3-147 was taken, the following rock descriptions appear in part. Units pCg and pCgn comprise the Elk River Complex.

- pCg - biotite augen gneisses, and gneissic granite and quartz monzonites...all rocks variably foliated or blastomylonitic.
- pCgn - mafic and calc-alkaline migmatite gneiss and various biotite hornblende, or garnet bearing gneisses; contains abundant layers and lenses of granitic rocks. Variably foliated and blastomylonitic.

pCgs - largely feldspathic metasandstones with interbeds of mica schist or gray phyllite.

Isn't pCg the only rock unit that fits the description of a crystalline rock? How can the DOE include rocks that have schistose, gneissic, blastomylonitic, and augen textures as crystalline? All of these terms are suggestive of foliation within the rocks. The pCgn and pCgs units do not fit the description of crystalline rocks as established by DOE (1984): (1) both may have a meta-sedimentary origin, (2) all rocks possess foliated to gneissic textures, (3) most possess distinct layering, (4) the units are a heterogeneous mix of many rock types and ages (700-1100 my), and (5) most have not been metamorphosed to upper amphibolite facies (sillimanite plus potassium feldspar). DOE (1984) lists the physical characteristics of the above mentioned rocks on pages A-118 and A-119 which corroborates points 1 - 5. Since the SE-5 proposed site is, in great part, underlain by pCgs and pCgn units should it not be disqualified on the basis of inappropriate rock types? Only the northwestern edge is underlain by metamorphosed crystalline rocks. Furthermore this documents has a different definition of a crystalline rock than the 1984 DOE study. Which definition is correct and which will be used?

The following example is used to illustrate the non-crystalline nature of the rock units at this site. The Environmental Protection Agency is sponsoring a nationwide acid deposition study. Little Sandymush Watershed, immediately adjacent to the SE-5 site, is one of their study areas. A recently completed soils map of this watershed indicates that two soil series,

the Chandler Loam and Fannin Loam, make-up nearly one-third of the area. Both soils contain over 35 volume percent mica. Few igneous rocks can produce such a highly micaceous soil suggesting that the underlying rocks are rich in mica (and probably metasedimentary) and unsuitable for a repository.

Another problem with using Elk River Complex rock descriptions is that the type area is located north and northeast of Grandfather Mountain. Bartholomew and Lewis (1984) did not map at the SE-5 site and their descriptions may be inappropriate (e.g. rocks metamorphosed to upper amphibolite grade and locally to granulite grade may apply only to units well northeast of the SE-5 site). Hadley and Nelson's (1971) metamorphic isograd map indicates the SE-5 site is situated at kyanite-staurolite grade or lower.

The question of joint and fault surfaces has not been adequately evaluated. The text lists the rocks of the Elk River Complex as highly jointed and the site itself as surrounded by major faults. How will the fractures alter the subsurface water flow?

Little mention is made of the major near horizontal decollement which is postulated by Cook et. al. (1979) to underlie the Blue Ridge and Piedmont at a depth of 3.5 to 10 km? This decollement dips gently eastward and if Cook's interpretation is correct the rocks below the fault could be sedimentary which would have a different groundwater flow regime than the overlying metamorphic rocks.

More importantly, was any consideration given to the seismic reflection study done by Harris et. al. (1981) 75 miles northeast of the proposed SE-5 site? Their study suggests that the allocthonous rocks of the Blue Ridge are intricately cut through by low angle thrust faults. The thrust sheets are

stacked vertically with a crystalline sheet at the surface which is in turn underlain by lower Paleozoic and upper Proterozoic sedimentary units. Each sheet (with various degrees of folding) is separated from the next in the stack by a low angle thrust (typical of thin-skinned tectonics). Although their seismic profile is some distance away from the proposed site it may contain significant information on depth to nearest subsurface fault(s), orientation of the fault surfaces, number and distribution of the faults, and the types of rocks one might expect at various depths below the surface. Did DOE omit the results of this study for any particular reason? It could offer a more detailed view of the subsurface than any other investigation done in this region!

DOE presents one set of data that suggests that tectonic uplift is very high (6mm per year) in the Southern Appalachians. Yet DOE dismisses this information by saying it is subject to many interpretations. Using these figures one can estimate the uplift in the southeast to be 600mm in the next century. Will this nearly two feet of vertical motion be great enough to induce fracturing of the brittle surface rocks? If so, what effect will this have on ground water flow? The document states that in-situ stress data are available for the SE-5 site yet does not give or evaluate the data. Why?

Host Rock Geometry and Overburden Thickness

The statement "the Elk River Complex has been extensively mapped" is quite misleading. Certain sections have been mapped in reasonable large scale detail (1:24,000). However, the preliminary site SE-5 is not one of these.

Only Hadley and Nelson's (1971) map covers this site. Their work is at best a reconnaissance map of small scale (1:250,000) which does not show detail in rock lithologies, mineralogy, textures, or structures. The cross sections are sketches from a generalized piece of work. A number of rock boundaries in Hadley and Nelson's work are queried indicating insufficient field data to provide a detailed geologic picture of the site. Why was this site, with only a small scale geologic map available, selected as one of the twelve final sites when inadequate detail is known of the area? Other sites, with more detailed maps, were eliminated from further consideration. How did DOE weight the quality of geologic maps (data) for various areas? Were all geologic maps considered as equal regardless of the scales at which they were published?

Further statements suggest that the rock mass extends to a depth of from 2,080 ft. to 16,000 ft. Within the preliminary site SE-5, rock depth is project to 2.4 miles (4 Km) below the surface. Nowhere in this section does DOE reference the works of Cook et. al. (1979) or Harris et. al (1981). As mentioned earlier, both these investigations suggest that the rock masses are highly faulted and these faults may be within several kilometers of the surface. Why was this data omitted in discussing the subsurface extent of the Elk River Complex? DOE states there are at least eight surface faults within 6 miles of the northwest boundary of the site and two other surface faults 6 miles to the west - southwest of the site. Could these faults possibly be surface manifestations of the subsurface fault systems reported first by Cook and later by Harris? DOE overlooks this data and concludes, using information from a reconnaissance map rather than detailed subsurface data, that the rocks extend to great depths. Furthermore, Harris et. al.'s (1981) suggestion that the crystalline rocks may be underlain by sedimentary rocks is not discussed.

Won't sedimentary rocks have differing ground water flow paths than crystalline rocks?

DOE has not demonstrated that the rocks are sufficiently thick or that the surface extent of the crystalline rocks is large enough to locate a repository. Nearly three fourths of the candidate site is underlain by layered gneisses and other rock types which do not meet the definition of crystalline. Why was this site not disqualified on the basis of inappropriate geology, insufficient rock thickness, and extent?

Seismicity

In considering the seismicity of the candidate site, the report focuses on earthquakes in the immediate vicinity of that site. Figs. 3-118 and 3-119 indicate a number of epicenters on the NC-TN border, in eastern TN and in VA. State boundaries do not stop earthquakes and; therefore, should be considered in the text. As important, no discussion exists of the two major earthquakes that effected western NC - Charleston in 1886 and New Madrid in 1811-1812. Vibrations from these quakes may have caused more damage than local ones.

Memphis State University has a seismograph station located north of Asheville. Is there some reason for not including the results of their investigations? An earthquake epicenter southwest of the candidate area, labeled VII 1916, has not been described in the document.

The report states "there is no apparent relationship between the observed seismicity and the known faults within or surrounding the candidate site." Does this not suggest that a more serious look at Harris et. al.'s (1981) study may be warranted and that existing geologic data of this site is

inadequate? Again selection of a initial site that lacks detailed geologic data may be a serious waste of money in the long run.

The statement that "future seismic activity would not produce ground motion in excess of design limits or affect waste containment or isolation" is not valid. DOE has not considered whether subsurface faults would be opened or activated, particularly the effect of blasting during construction or tremors from earthquakes. No consideration has been given to major earthquake activity outside the area and its effect on ground motion. How can DOE unequivocally say "future seismic activity would not produce ground motion in excess of structural design?" Can they guarantee this?

Mineral Resources

To the northeast of the proposed candidate site lie a series of ultramafic plutons. North Carolina is the leading producer of olivine in the United States. Would a nuclear waste site west of Asheville prohibit extraction of olivine from these plutons? Chromite, a strategic mineral, is found in minor concentrations within these plutons. If our international source of chromite were to be cut-off, the U.S. may have to rely, in part, on these ultramafic bodies as a potential source of chromite. Would a nuclear waste site prevent their mining and extraction?

The sedimentary rocks which may underlie this region may be a potential source of hydrocarbons (Harris et. al. 1981). DOE's report states "no such resources have been proven to date." This implies geologists have looked for but found nothing. In fact no subsurface exploration has occurred due to financial difficulties within the petroleum industry. Only extensive drilling

through the subsurface horizontal decollement will verify or disprove the hydrocarbon potential. Using the lack of drilling to suggest that hydrocarbons do not exist is extremely misleading.

Topography and Surface Water Characteristics

The statement that "the candidate area is characterized by several creeks flowing northeast and southwest" is grossly in error. Fig. 3-151 shows only the 5th order and higher streams in the region. When one includes the first through fourth order streams the drainage density is high (as one would expect in this high rainfall region). Two typical watersheds, in and around the Sandymush area, were analysed to estimate the drainage density. Little Sandymush Creek (adjacent to the proposed site) and Sugar Creek within the proposed site) have watershed areas of approximately 9.8 sq. mi. and 3.4 sq. mi. respectively. Little Sandymush Creek has nearly 35.6 miles of perennial streams within its drainage (stream density of 3.6 miles of streams per square mile of drainage), while the Sugar Creek watershed contains 12.1 miles of streams (drainage density of also 3.6 miles of streams per square mile of watershed). These streams appear on the 1:24,000 topographic quadrangles; however, this analysis does not take into consideration the intermittent streams. Why was there no mention of the high drainage density? It appears that little effort was given to a detailed analysis of existing large scale topographic maps. Why were the large scale maps ignored in favor of the small scale topographic maps?

The text describes the drainage pattern of the candidate site as dendritic. Yet cursory studies of the six topographic quadrangles in which

this proposed site is situated suggest many of the stream valleys are structurally controlled. Beaverdam Creek, Rough Creek, James Branch, Linear Cove, Popular Cove, Wesley Creek, Fines Creek, Spring Creek, Bald Creek, and Rush Creek all trend north-south; while Turkey Creek, Cove Creek, Crabtree Creek and Big Branch all flow perpendicular (east-west) to the above streams. In this region the ridges trend NE-SW. The above stream patterns suggest that they follow a regional fracture pattern. The possibility of streams flowing in fractures is serious. Is there some reason this data was not reviewed?

Although no large lakes are within the proposed site, there are several dozens of small ponds within and adjacent to the site. Lake Junaluska (5-6 miles from the site), Enka Lake (10 miles away), and Lake Logan (10-11 miles away) have been omitted from the discussion on surface water. Why is there no comment on them? Who selected a 6 km buffer zone around the site for discussion of lakes and ponds? What is the reasoning for this?

The southwest flowing streams empty into the Pigeon River which flows in some places to within one mile of the NE boundary of the Great Smoky Mountains National Park. If nuclear waste enters the Pigeon River what effect would this have on the ecology of the park? What could happen to park visitations?

Were the location of community or municipal water systems taken into consideration as a disqualifying factor? The city of Canton's watershed lies within the proposed site.

The final sentence in paragraph one on page 3-590 does not follow from the preceeding sentences and its validity is suspect. How do high relief, narrow flood plains, V-shaped valleys, and lack of natural lakes/swamps contribute to low flooding? No mention was made of storm intensity, depth of overburden, permeability, etc. to explain flood frequency. One should expect, in regions

with the topography as described, rapid rising waters and flash floods during high intensity storms. Also shallow soils underlain by bedrock implies that the ground will saturate quickly, runoff will increase, and flood water will rise correspondingly.

Have the effects of the 100 year storm been considered in making the above statements? For example, in 1982, the Newfound area received approximately 7.5 inches of rainfall in a little over three hours of time (National Climatic Center data). Massive flash floods were generated. Residents indicated this was worse than the 1977 floods. Lee and Goodge (1984) describe an intense rainstorm in 1978, located twenty miles southeast of Asheville, which dropped 11.39 inches of rainfall: 11.25 inches of which fell in a six hour period of time. They continue by saying that "the 11.25 inch total exceeds the expected 100 year six-hour rainfall by five inches and even exceeds the expected 100 year 24-hour rainfall by three inches". Finally, the 1940 floods in the region caused extensive damage. Crabtree Creek recieved 5.5 - 6 inches of rain in 20 - 22 hours with a maximum intensity of 2.5 inches per hour (TVA, 1960).

Therefore, it can be seen that short duration intense rainfall events (and subsequent flooding) are not uncommon near the proposed SE-5 site. How can DOE justify statements which suggest low flood potential at the proposed site when no analysis has been done on historical rainfall or flood records? Such misleading conclusions makes other DOE statements suspect.

Groundwater Resources

Were the water yield rates taken from saprolite or bedrock? The well-yield rates appear relatively high. Does this not suggest that there are large volumes of water below the proposed site? If this groundwater is assumed to be located in fractures, does this not suggest that (1) the fractures systems are extensive, or (2) the fractures are open and not tightly closed, or (3) the fractures extend to high elevations which may provide the high hydraulic head needed for such yield rate?

Brown (1966) has indicated that the ground water at Hot Springs, NC (only 20-25 airline miles north of the site) moves along deep fractures to depths of 6,000 feet where it is heated and rises back to the surface along a different set of fractures. If such fractures exist in the Hot Springs region, why can they not be expected to exist a few miles further south? Harris et. al's (1981) geophysical study suggests the rocks are highly fractured with many low angle thrusts. Would you not expect higher rates of groundwater flow in areas cut through by many faults?

Cook et. al. (1979) suggest that sedimentary rocks underlie the crystalline rocks. Since these may be sandstones and limestones their porosity may be high and be a major aquifer. Have groundwater flow regimes in these rocks been studied where they are exposed in eastern TN? If so, can their porosity and permeability be extrapolated to western NC? If limestone exists at depth should not solution cavities be looked for?

The DOE (1984) literature studies show that the Elk River rocks are highly fractured. How will further DOE studies monitor groundwater flow? Many hydrologists realize that water in one drainage basin may migrate to adjacent

drainage basins via fractures. Since it appears that some surface water flow at this site is structurally controlled and crosses the grain of ridges and valleys, can we not assume that groundwater move similarly? Could the effluent from a surface spill in one watershed be transmitted via groundwater flow along a fracture into another watershed?

Can the DOE assure local residents that during construction no new fractures in rocks will be produced or existing ones reopened during the blasting of shafts, tunnels, or cannister tombs? Will subsurface construction cutoff or behead aquifers utilized by adjacent homeowners?

Environmental Compliance

During and after the construction phase of this project a large volume of rock material will be stored on-site to be used later as material to back-fill passageways. For some period after the rocks are brought to the surface, they will be covered with rock dust and contain small rock fragments. The dust and fragments can be transported via surface flow during the frequent rainfall events in this region. Will the surface storage of this rock material be subjected to the sedimentation guidelines outlined in the N.C. Sedimentation Act (1973) or the N.C. Mining Act (1976)? Who will monitor this site for environmental compliance? Will the presence of large amounts of rocks and perhaps the associated sedimentation ponds (required by state law) make this site a visual eyesore? Will the breakdown of this tailing material result in higher groundwater, surface water and atmosphere radion levels? The State Department of Human Resources has well documented data indicating radion problems in the area with possible impacts on human health.

Transportation

Transportation of spent high level nuclear wastes is one of the key human, environmental, social, and economical issues of the Indian Reservation. The trucking of high level nuclear waste over North Carolina and Tennessee highways is a principal concern, especially along the rock slide area of Interstate 40 just east of the Tenn. - N.C. border. A recent low-level nuclear waste trucking accident has made the public more concerned of further shipments of high level radioactive waste. Detailed information and instructions relative to any further shipments should be obtained from DOT, DOE and EPA. Since protection of public health and safety of the Tribe is of great importance, we urge that this information be made available to the Tribe as a top priority request.

The other major highway system for transporting high level nuclear waste to the proposed candidate site is I-26 connecting Asheville, N.C. and Charleston, S.C. A number of other U.S. highways, U.S. 19, 23, 25, 70 and 276 are located within 16 km (10 miles) of the preliminary candidate area. Two state highways cross the mountains over the preliminary candidate area: State route 209 runs north and south while route 63 runs Northwest through the defined area. A number of these roads are narrow and winding which may make transport of radioactive wastes over them difficult.

The primary railroad nearest to the candidate area is the Southern Railroad and follows the French Broad River between Asheville, N.C. and the Tennessee state line. This railroad is from 8-13 km (5-8 miles) northeast of the preliminary area site. The nearest branch line is a Southern line between

Asheville and the southwestern part of North Carolina. This line is located from 3.2-8 km (2-5 miles) to the south of the selected site area.

From the data presented above, access to the preliminary candidate area from both local and regional highway and railway systems appear to be available for the shipment of high level radioactive nuclear waste.

Actively used railroads described above should be considered for the transportation of high level nuclear waste for additional safety of the transportation system. However DOT and DOE have not made information available for the mode and safety of nuclear waste transportation. Carrier containment, derailment issues, and proper escort for all shipments must be properly executed. DOT must consider properly designed safety railroad cars and the safety of the shipments in the event of accidents to the MRS facility and the repository site.

Hazardous waste facilities served by rail transportation routes must be identified and screened on a regional basis. Shipments through populated areas must be screened and disqualified for the transporting of high level nuclear waste in order to insure health and safety. Since health is of the utmost importance to the Tribe, DOE and DOT must consider all aspects to insure all shipments to be safe.

Potential issues and problems for the transportation of high level nuclear waste through states and Indian Reservations that may be affected include the following.

1. Transportation activities will create additional financial demands for the safety and the environment of all the population of the

reservation. These specific transportation costs should be offset by DOT (Department of Transportation), DOE (Department of Energy) and the state of North Carolina.

2. The Cherokee Tribe needs to be involved in discussions concerning the dates and mode of transportation, the public health and safety of the population, and the financial implications when transport occurs on or near Tribal Lands.
3. Further considerations should be given for routing, travel times, pre-notification of states, escorts, emergency response, preparedness, liability and financial assistance to allow the Tribe to study transportation issues.
4. Legal problems may also arise over continuing efforts by the states, Indian Tribes, or local government units to regulate the transportation of radioactive waste through their jurisdictions.

RECOMMENDATIONS

1. It is strongly suggested that the Tribe appeal both through political and legal avenues for inclusion as an affected area primarily due to projected impacts upon economy and public health as a consequence of the potential for reduced tourism. In addition, the Tribe should insist on funds to study the public health and economic impacts resulting both from the current visibility as well as the potential impacts of locating the site in western North Carolina.
2. The DOE has not scientifically demonstrated that the SE-5 site is geologically suitable as a nuclear waste depository and therefore the Cherokee Tribe should ask for its disqualification.
3. As a consequence of the location of the waste disposal site in an area with high annual rainfall, potential for flooding, and at the headwaters of several drainage systems, a detailed hazards analysis should be requested to establish the potential for surface and groundwater contamination.
4. Questions should be resolved considering the potential for groundwater systems and their possible contamination, particularly those involving deep cracks and fissures, which could allow rapid transport of radioactive materials into adjacent areas. DOE should be asked to evaluate the geothermal energy potential (because of nearby hot springs) of the SE-5 site.

5. The Tribe should question the scientific rationale for the relatively small buffer zones around the waste disposal site in relationship to the highly complex ecological systems of the nearby national parks and wilderness area. DOE should be required to respond in scientific terms utilizing fact and not subjective judgement.
6. The United States Public Health Service, which has the prime federal health role with the Indian tribes, should undertake a baseline survey and explore the potential impacts of reduction of the economic base, and environmental degradation of the region. The component of the agency, known as the Centers for Disease Control, should be involved in a major baseline epidemiological study.
7. Transportation activities related to the proposed nuclear waste disposal site will create additional financial demands for the safety and the environment of all the population of the reservation. These specific transportation costs should be offset by DOT (Department of Transportation), DOE (Department of Energy) and the state of North Carolina.
8. The Cherokee Tribe needs to be involved in discussions concerning the dates and mode of transportation and more specifically the financial implications when transport occurs on or near Tribal Lands.

9. Should transportation occur on or near Tribal Lands the Cherokee should request travel routes and times, escorts, emergency response and preparedness plans, and liability and financial responsibility statements.
10. The Cherokee Tribe should consider the implications of regulating the transportation of radioactive wastes through their jurisdictions.
11. A detailed study should be requested concerning the potential for increased radiation (from radon gas) levels caused by the mining operation and the surface storage of tailings and of the potential for increased lung cancer in the connecting valleys of the southern North Carolina area.
12. The Cherokee Tribe should request that DOE undertake a thorough archaeologic investigation of SE-5 to establish if any historic sites are located within or near its perimeter. Furthermore, the Tribe should be an active participant in such a study.

PASSED

Cherokee Council House
Cherokee, North Carolina

APR 08 1986

DATE

RESOLUTION NO. 167 (1986)

WHEREAS: The Eastern Band of Cherokee Indians is concerned about the impacts of the possible location of a high level Nuclear Waste Repository in Western North Carolina twenty miles (20 miles) N.E. of the Reservation boundary, and

WHEREAS: The Tribe has contracted with Joseph Beck, Steve Yurkovich and Hal Lowe to conduct a study and produce a report on the potential impact of the location of a high level Nuclear Waste Repository close to Tribal lands, and

WHEREAS: Joe Beck and Steve Yurkovich has presented their final report with questions and comments concerning the potential impact of the above project.

NOW THEREFORE BE IT RESOLVED by the Eastern Band of Cherokee Indians in Annual Council Assembled at which a quorum is present, the tribe approve and accept the completed report.

Submitted by the Tribal Planning Board

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