MASTER

RESPONSES TO PUBLISHED STATEMENTS
IN LOUISIANA ON
THE NUCLEAR WASTE DISPOSAL PROGRAM
MARCH — JULY 1977

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**UNION
CARBIDE**

OFFICE OF WASTE ISOLATION
OAK RIDGE, TENNESSEE

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FOREWORD

Section I of this report concerns a series of statements taken from Louisiana newspapers over the last several months. The statements needed clarification or correction. The majority of the statements have been made by:

Dr. J. Robert Kemmerly, a Minden, Louisiana, physician, who has opposed the study program in the Bienville-Webster Parish area.

Mr. R. H. Manning of Minden, Louisiana, who has been described as a retired school administrator. He has organized a group called Citizens Against Radioactive Storage (CARS).

Representative L. G. LaPlante of Cutoff, Louisiana, who sponsored legislation which prohibits the storage of nuclear waste in Louisiana salt domes. The legislation was passed by the legislature and signed by the governor.

Section II, which begins on page 16, is a review of comments made in a paper written by Dr. Kemmerly. His paper has been widely distributed and material from it has frequently appeared in news stories.

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SECTION I

Clarification and Correction of Statements Taken
From Louisiana Newspapers March—July 1977 on the
General Subject of Nuclear Waste Disposal Program

Although most of the statements were attributed to Dr. J. R. Kemmerly, a Minden, Louisiana, physician, Mr. R. H. Manning, a Minden, Louisiana, retired school administrator, and Representative L. G. LaPlante, of Cutoff, Louisiana, several others have been included which were attributed to other sources.

ITEM	DATE NEWSPAPER	STATEMENT	FACT
1	3/9/77 <i>Shreveport Times</i>	Kemmerly called the OWI program, "The biggest cover-up since Watergate," and added, "they are failing to give us all the facts."	Kemmerly's comments were made at an information meeting in Minden, Louisiana, following a general overview of the National Waste Terminal Storage Program by C. D. Zerby. The very purpose of this meeting was to provide information on every aspect of the program for the benefit of the local citizens interested in the program. Although it was not possible to cover the entire twenty year history of salt investigations in a thirty minute presentation, a question and answer period followed in which every question that was raised was addressed and answered in considerable detail. Therefore, Dr. Kemmerly's allegation was completely unfounded considering the fact that it came at the end of an extensive information meeting.
2	3/9/77 <i>Shreveport Journal</i>	Newspaper said, "Kemmerly took particular issue with statements that the Webster-Bienville Parish Salt Domes were being considered and studied as possible repositories because they were not in a highly populated area."	Three salt domes in Webster and Bienville Parishes have been proposed as study areas. The basis for this proposal included geologic factors relating to depth, hydrology, surface water characteristics, present utilization of the salt dome, petroleum production, as well as the proximity of nearby population areas. Selection as a study area implies that extensive geologic and hydrologic investigations would be required to verify the suitability of the domes for nuclear waste disposal. The population density is only a secondary factor in the screening process at this time.
3	3/9/77 <i>Minden Press-Herald</i>	Jim Branch, President of the Webster Parish Police Jury, told the information meeting that the Jury's finding out about the studies in January, 1977, was "purely through accident. I think we should have been informed from the outset."	A news release was issued on the subject May 25, 1976, to Louisiana newspapers. Also, the U. S. Army Corps of Engineers in the Spring of 1976, informed the Webster-Bienville Parishes of the planned program activities.

ITEM	DATE NEWSPAPER	STATEMENT	FACT
4	3/9/77 <i>Minden Press-Herald</i>	Kemmerly cited Project Salt Vault which had been abandoned "because the danged stuff leaked out a week before the nuclear materials were to be stored there. But I am sure you are going to tell us about that!"	There were no leaks associated with Project Salt Vault. The project operated for a period of four years using spent fuel elements to simulate radioactive nuclear waste. These solid elements did not leak nor could they possibly leak since they were not liquid. All spent fuel elements were removed from the salt mine after the experiment without any incident whatsoever. A nearby solution mining operation along with a number of boreholes led to a decision that plans to develop a federal repository at Lyons, Kansas, should be abandoned because its safety might be impaired by these man-made excavations.
5	3/10/77 <i>Minden Press-Herald</i>	Newspaper columnist Marilyn Miller said it was "accidentally" revealed in February that the <u>Federal Energy Administration</u> was investigating the possibility of using Louisiana Salt Domes for disposal of nuclear waste.	See the answer to item 3, page 1. Also, it is ERDA that is responsible for the program, not the FEA.
6	3/31/77 <i>Bienville Democrat</i>	Manning is quoted as saying, "If that material is released, it would be 200 times more powerful than the A-bomb that was dropped on Hiroshima."	There is absolutely no evidence to support this allegation.
7	3/31/77 <i>Bienville Democrat</i>	Manning said, "And what about heat? They (ERDA) say they are going to test the salt up to 400 degrees but we don't know what temperature that material could reach when buried."	The repository in salt will be at a depth somewhere between 800 to 3,000 feet. The maximum temperature in the salt will be 300 degrees centigrade for a very limited region adjacent to canisters of high level wastes. Corresponding maximum temperatures associated with disposal of spent fuel elements will be much lower.

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8	3/31/77 <i>Bienville Democrat</i>	"A quake in California is way overdue," Manning said, "and because of this, the dome could crack and the materials escape into our water."	There is no evidence that any earthquake over the last 200 million years caused a "split" in a Louisiana salt dome. The Gulf Coast area has the lowest seismicity of any area on the North American continent and is in a different tectonic region than the West Coast area. Even if a salt dome "split" (extremely unlikely), it would remain an excellent medium because of its plasticity and its ability to "heal" itself.
9	4/6/77 <i>Shreveport Times</i>	Newspaper said, "Government officials maintain that salt impedes the disruptive nature of radioactive materials."	Officials have said salt is a good medium because it has good physical properties like good heat conduction and compressive strength. In addition, it has the ability to "heal" after fracturing. Extensive salt deposits are located throughout the U. S. in geologic stable regions. The fact that salt exists indicates a general absence of water. Consequently, all of these factors indicate that salt is a good medium for containment of radioactive nuclear wastes.
10	4/7/77 <i>Shreveport Times</i>	Representative LaPlante is reported to have said an incident occurred in the Soviet Union which resulted in the surrounding area being evacuated.	There is considerable speculation that something occurred; however, because Russia is a closed society, we have no details. Based upon what little information we do have, the incident may have involved a reactor malfunction rather than an explosion of nuclear waste. Two former Russian citizens, Leo Tumerman and Zhores Medvedev, have reported on a so-called "disaster." A <i>Newsweek</i> article from December 20, 1976, stated that Tumerman <u>did not see</u> the actual explosion, if that is what it was, but he said when he visited the area, people still spoke in ominous whispers of the "Kyshtym disaster," which had laid waste of a village south of Sverdlovsk. Medvedev, in fact, admits to having <u>no direct information</u> about the

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			<p>primary incident and even less technical knowledge of the nature of the installation and possible mechanism for an explosion. This was reported by <i>Nuclear News</i>, August, 1977. If an explosion did occur, it would have had to have occurred near the surface. A repository such as that planned by ERDA would be located deep below the earth's surface and in all probability, any explosion would be contained within the structure itself. The United States has conducted numerous underground nuclear explosions at the Nevada Test Site without any effect on the health and safety of the general public.</p>
11	4/7/77 <i>Shreveport Times</i>	LaPlante said, "The history of this business is particularly bad."	<p>The history of waste management in this country over the past 30 years has clearly indicated that our waste management programs have been highly effective. For example, there have been no injuries of any kind to members of the general public at Hanford, Savannah River, or Idaho Falls, areas that are frequently mentioned.</p>
12	4/7/77 <i>Monroe World</i>	LaPlante is reported to have said that the U. S. Atomic Energy Commission abandoned a storage site after a leakage occurred in Kansas.	See response given to item 4, page 2.
13	4/7/77 <i>Monroe World</i>	The story written by John Hill said that in a letter last fall to Governor Edwards notifying him of the site study, ERDA said it would withdraw consideration of the Webster-Bienville site if the State objected.	<p>The correct statement from the letter reads as follows: "It is ERDA's position that the project will be terminated if the State raises issues on the project connected with these criteria and their application that are not resolved through mutually accepted procedures."</p>

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14	4/11/77 <i>Minden Press-Herald</i>	Manning is quoted as saying, "At every location in the United States where storage has been attempted, leaks have developed."	It is true that radioactivity has leaked into the ground at several locations. However, it should be pointed out that these leaks were localized and that they had no effect on the health and safety of the general public. Also, it should be noted that solid nuclear waste is planned for disposal in a repository. Leakages have not occurred from deep geological facilities such as those planned.
15	4/12/77 <i>Minden Press-Herald</i>	Dr. Kemmerly said, "Union Carbide, a major contractor for the United States Energy Research and Development Administration, prepares to begin construction in fiscal year 1978 of its first experimental salt depository for highly radioactive waste at the Vacherie Dome on the Webster-Bienville line in North Louisiana."	This statement is wrong on two counts. First, the Vacherie Dome has not been selected for a Federal repository. It has, however, been selected for study. Second, construction will not begin in 1978 as Dr. Kemmerly has alleged. The first repository sites probably will not be selected until 1979. Then the site must be approved by the Nuclear Regulatory Commission before construction can begin. Currently it is estimated that the NRC approval schedule will take approximately two years before construction can begin after the sites have been selected.
16	4/12/77 <i>Minden Press-Herald</i>	The newspaper reports that according to Manning, the question is what temperature will it (nuclear waste) attain covered one mile deep. He answers his own question by saying, "At this time, no answer is available."	See response to item 7, page 2.
17	4/12/77 <i>Minden Press-Herald</i>	Although Manning is not quoted, it appears the following was taken from some remarks that he made. The story continues, "Some scientists are concerned that the heat will melt the salt and then leakage of radioactive material into the water supply and food chain will result."	There is no concern with melting of the salt. The melting temperature is 800°C. The maximum salt temperature will be about 300°C.
18	4/13/77 <i>Minden Press-Herald</i>	Manning appeared before a local group to explain his concern about radioactive storage of materials. The newspaper quotes him as saying that "minerals which	Manning did not say what type of minerals were involved or what type of tests the government might have undertaken or when the tests were

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		<p>were present in the soil of a New Mexico test site which caused the government to give up testing there were also present in the local domes."</p>	<p>alleged to have occurred. However, ERDA is still pursuing a program to develop a deep geologic disposal facility for defense wastes in New Mexico, and has found no basis whatsoever to stop the study program.</p>
19	<p>4/26/77 <i>Minden Press-Herald</i></p>	<p>Manning is reported to have told a Jaycees meeting at Spring Hill that long range plans for the storage of waste have been completed for the Vacherie Dome to begin construction in 1978.</p>	<p>Vacherie Dome has only been selected as a study area. Extensive geologic and hydrologic studies must be completed before it can be evaluated as a potential repository site. See additional comments on page 5, item 15.</p>
20	<p>4/27/77 <i>The Bienville Democrat</i></p>	<p>The newspaper published a story with the headline reading "Nuclear Radiation is Deadly-Veterans Angered by Treatment." The following note by the Editor accompanied the story.</p> <p>"The following article may shed some light on nuclear tests that have been conducted in the past and give Bienville Parish residents a preview of what we might expect if we allow dangerous radioactive waste to be stored in our salt domes. In 1957, the U. S. Army had 1,104 troops stand unprotected while they exploded an atomic bomb twice the size of the one that leveled Hiroshima and Nagasaki about 3,000 yards from where the men stood. Many of them have died or now are critically ill but the Army insists it was not their fault."</p>	<p>The story that followed the Editor's comments had nothing to do with the storage of solid nuclear waste in a repository. The circumstances surrounding the bomb explosions and the storage of material deep underground are totally unrelated.</p>
21	<p>4/27/77 <i>The Press-News Journal</i></p>	<p>The paragraph reads, "The Federal Energy Administration has sent teams of scientists to study the feasibility of using the Vacherie and Rayburn's Salt Dome areas for waste storage.</p>	<p>It is not FEA but the Energy Research and Development Administration and it is the Institute for Environmental Studies at Louisiana State University that has been conducting the research studies.</p>
22	<p>4/27/77 <i>The Press-News Journal</i></p>	<p>The statement reads, "Manning said that in the State of Washington, a storage site leaked into a fresh water supply and there was nothing done to stop it."</p>	<p>This allegation is false. Officials at the Hanford site in Washington said there have been no radioactive leakages from storage tanks into a fresh water supply.</p>

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23	4/27/77 <i>Press-News Journal</i>	Manning is reported to have said that in Kentucky, some of the stored waste leaked into a creek which killed nearby wildlife and eventually could find its way into the Ohio River and through it, the Mississippi River.	<p>The waste that was disposed at Maxey Flats, Kentucky, was commercial low-level waste which was packaged and placed in trenches about 25 feet deep. It was then covered with soil. This work was done within then existing standards. A 6-month investigation by the State of Kentucky of the low-level leakage concluded that the amount of radioactivity contributed to the local environment was at levels which did not create a public health hazard. A subsequent investigation by the Nuclear Regulatory Commission (NRC) in 1975 concluded that there is no significant public health problem associated with the release of radioactive material from the burial ground.</p> <p>In a report (NUREG-0217), an NRC Task Force concluded, "The States, in discharging their regulatory duties, have operated under difficult circumstances but have adequately protected the public health and safety. The Task Force can find no compelling health or safety reason for reassertion of Federal control at this time."</p> <p>Also, the Manning allegation is in conflict with the Environmental Protection Agency conclusion that while there was some contamination of water in the disposal trenches, "There is no current indication of significant environmental levels of radionuclides from low-level waste burial sites."</p> <p>There is no evidence to support the allegation that nearby wildlife was killed.</p>

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24	4/27/77 <i>The Press- News Journal</i>	Manning is reported to have said that similar problems involving nearby oil and gas wells would arise if the Vacherie Salt Dome was used as a storage site. He was referring to the boreholes that were found in the Lyons, Kansas, area. He said that old oil and gas wells in the area around Lyons indicated leakages might occur through the drill holes.	It is the intent of the program to plug all drill holes in the vicinity of a federal repository using proven technology. Although holes did exist around Lyons, Kansas, none of these holes indicated at any time that radioactivity was leaking from the Project Salt Vault which was located in the Carey mine at Lyons, Kansas.
25	4/27/77 <i>The Press- News Journal</i>	The statement reads, "Manning said the government has been making a geological survey at the Vacherie Dome for the past two years. The survey and its purpose, however, were only recently discovered, Manning added. He said he felt the government was trying to deposit the waste before anyone found out about it."	See earlier correction on page 1, item 3.
26	4/27/77 <i>The Press- News Journal</i>	The statement reads, "A research team from LSU is working on the survey but Manning said he thinks LSU was not asked to investigate some of the more harmful and controversial aspects of the storage program."	The Institute for Environmental Studies at Louisiana State University is attempting to determine if salt dome basins have salt domes which are geologically stable. LSU has this expertise. At the present time, contractors with other professional disciplines are performing different studies and tests across the nation which are also related to disposal of nuclear wastes. The tests, together with those performed by LSU will be considered when the various site decisions are made and disposal processes are finalized.
27	4/27/77 <i>The Press- News Journal</i>	The statement reads, "He (Manning) said the heat cannot be dissipated and that some scientists are concerned that the heat could melt the salt in a dome storage and leak into the water supply and food chain."	See correct response on page 5, item 17.

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28	4/27/77 <i>The Press- News Journal</i>	The statement reads, "A plan for storage in glass containers, Manning said, is also being considered but the process would not be ready until 1991 and the government expects to begin waste storage by 1985 at the latest."	The containers will be made of steel. The glass would actually be the waste which is placed in a container. A television program in early 1977 said it would be 14 years or 1991 before the glass-making process is developed. The statement is correct only as it applies to the liquid waste now stored at West Valley, New York. The liquid waste at West Valley is composed of nuclear waste material including military waste and the solidification process for this waste which has been neutralized with sodium hydroxide is not fully developed. However, the solidification process has been developed for the waste that is expected from the present day commercial nuclear power reactors. Because the solidification process is developed, there is expected to be no problem in solidifying and disposing of that waste in 1985 if the United States moves to the reprocessing of spent fuel. If the spent fuel is not reprocessed, the spent fuel would then be disposed of in solid form as it comes out of the reactor.
29	4/27/77 <i>The Press- News Journal</i>	The statement reads, "Manning said the danger of an earthquake must also be considered. He said that a large quake in California would be enough to split a salt dome in Louisiana."	See response on page 3, item 8.
30	4/27/77 <i>The Press- News Journal</i>	Manning said the waste could do little harm as long as the 'train was moving', but questioned the danger of the materials if the train should stop for repairs or be involved in a collision. Manning said that if the train were to stop in such an area as Spring Hill, the radiation could get into the water tables and the city would lose its fresh water supply.	The nuclear waste that is transported by truck or rail is containerized and packaged in such a way that there are no significant radiation levels emitted from the cask that would have any effect on the surrounding communities. The radiation cannot leak out and get into the water tables as alleged by Manning. ERDA conducted a test earlier this year involving a cask with fresh fuel in it. The cask was placed on a truck which was deliberately placed on railroad tracks. A train

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31	4/27/77 <i>The Press- News Journal</i>	Manning said, "If the storage is permitted, the earth will look just like the surface of the moon."	traveling at 81.5 MPH struck the truck broadside. The cask was not breached. Casks have been designed to withstand tremendous shocks under various conditions and will be used to transport spent fuel to storage facilities.
32	4/27/77 <i>The Press- News Journal</i>	He (Manning) compared the World War II bombing of Hiroshima which killed 287,000 people instantly to waste storage and said the dangers of waste storage contamination are potentially greater.	There is no credible evidence to support this allegation by Manning. Waste must be stored to prevent widespread distribution.
33	4/27/77 <i>Minden Press- Herald</i>	"Dr. Kemmerly, who time and time again related tales of attempts by the government to store the materials which failed; pointed out that this would not become a 'garbage' ground for the United States alone, but for the 'entire world.' He explained that when the U. S. sells nuclear energy to foreign countries, it demands that the 'wastes' are returned so that the countries will not be able to develop nuclear weapons by extracting the leftover plutonium"	There is absolutely no evidence to support this allegation. The material that would be stored in a deep geological repository cannot explode.
34	4/28/77 <i>The Bienville Democrat</i>	This is a portion of a letter to the Editor written by State Senator Charles C. Barham. The statement reads, "I certainly do agree with you that such deposits (nuclear waste) would endanger the people of Louisiana and would be detrimental to their health and safety."	Only waste from reactors in the United States is planned at this time for storage in deep geologic formations under the ERDA program. Further, the United States makes no demand to foreign countries that wastes must be returned to this country if they want to purchase American nuclear energy facilities.
35	4/29/77 <i>The Shreveport Times</i>	The statement reads, "The long range plans for the program calls for six repositories to be built across the nation with the first two to be built in salt domes."	This determination has not been made nor can it be made until after all the studies have been concluded and the evidence evaluated.
			ERDA and OWI have never said the first two repositories will be built in salt domes. They have said the first two repositories are expected to be located in salt formations (bedded and/or dome) which underlie many portions of the United States.

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36	5/5/77 <i>The Bienville Democrat</i>	The statement reads, "Dr. Kemmerly, who has been an outspoken opponent of the plans since it was first discovered some months ago, explained that it is anticipated that the waste from two plants will be contained in salt repositories by fiscal year 1978."	The statement is incorrect. The first waste is not expected to be stored before 1985. Deferral of waste reprocessing may delay storage well beyond 1985.
37	5/5/77 <i>The Bienville Democrat</i>	Dr. Kemmerly is quoted again as saying the area would not become a "garbage" ground for the United States alone but for the entire world.	See earlier response on page 10, item 33.
38	5/5/77 <i>The Bienville Democrat</i>	The statement reads, "Kemmerly pointed out that the plutonium found in nuclear weapons (used by the military) is the most dangerous substance in the world."	Arsenic, anthrax spores, botulism, and chlorine, which is used in water purification, just to name a few, are far more toxic than plutonium when ingested. The hazards of plutonium are not to be underestimated, but there are nearly 30 years of experience in the production, reprocessing, shipment, and fabrication of very large quantities of plutonium resulting from the weapons production during and after World War II. To date, there have been no known deaths attributable to the inhalation or ingestion of plutonium, even though 25 employees involved in the weapons program ingested plutonium 30 years ago. Industrial processes and safeguards can continue this enviable record. Plutonium can only be obtained after the spent fuel is reprocessed. However, because President Carter's Administration is attempting to prevent the proliferation of atomic weapons, reprocessing has been deferred.
39	5/5/77 <i>The Bienville Democrat</i>	The statement reads, "Many landowners will forfeit millions of dollars worth of oil, gas and lignite" if the government chooses this site, he (Kemmerly) said.	There has been no clear evidence to suggest the value of oil, gas or lignite. Those studies that are now under way, and those planned, will help in determining available resources. Repositories will not be located at sites where there is a high potential for gas or oil.

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40	5/5/77 <i>The Bienville Democrat</i>	The following statement was not attributed to anyone. "The project in Kansas did progress to the point of flooding the Kansas salt dome (sic) to see if it leaked and thousands upon thousands of gallons of salt water leaked to the surface all over the test area. <u>This led the nuclear experts to abandon the project because the nuclear waste leakage would devastate such an area.</u> "	The reason for abandoning the proposed repository at Lyons, Kansas, was discussed on page 2, item 4. At no time was water introduced into the Carey mine at Lyons, Kansas. At no time was it flooded. In addition, the Carey mine is located in a salt bed, not a salt dome.
41	5/5/77 <i>The Bienville Democrat</i>	"Approximately 100 residents and visitors listened at great length to expert on top of expert voice their opinion but no one could say that storage of nuclear waste in salt domes in Bienville Parish would be safe."	This type of categorical statement could not be made because the necessary studies have not been completed. The purpose of the meeting was to explain the studies that are necessary to determine the safety of the site.
42	5/6/77 <i>Baton Rouge Morning Advocate</i>	A statement in a story attributed to Dr. Joel Selbin, Professor of Chemistry at LSU, says <i>Business Week</i> magazine reported that at Savannah River, Georgia, (sic) "unexpected radiation from building materials and land fill have already caused bone marrow abnormalities in several people and forced abandonment of a school and five homes."	Dr. Selbin apparently got some of his facts confused. According to Dr. Selbin's own reference, <i>Business Week</i> edition of 2/2/76, the alleged incident occurred at Port Hope, Ontario, Canada, not at Savannah River, Georgia (some waste is stored at Savannah River, S. C.). Furthermore, officials with the Atomic Energy Control Board of Canada have disputed the <i>Business Week</i> article. There have been no "bone marrow abnormalities." The situation at Port Hope is similar to the situation that was observed at Grand Junction, Colorado, where uranium mill tailings were used as aggregate in cement products or landfill. Low radiation levels were detected at both locations. But there has been no noticeable effect on the health of the population in the two areas. The mill "tailings" at both locations accumulated many years ago and do not constitute any hazard or danger.

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43	5/10/77 <i>The Shreveport Journal</i>	C. D. Zerby, Director of OWI, is reported in the newspaper as saying area residents will have the final say in whether area domes are used for waste repositories.	C. D. Zerby has never made this type of statement. Rather, Zerby frequently cited the letter sent to the governors late in 1976. See response on page 4, item 13.
44	5/19/77 <i>Minden Press-Herald</i>	According to Manning, salt domes in Louisiana do not meet the standards for federal repositories.	Site selection criteria are now in the process of being developed by the Nuclear Regulatory Commission. ERDA is also expanding on a preliminary set of site selection criteria which it has used over the last several years in its geologic exploration program. Manning is not specific enough in his accusation in order to provide a detailed response. ERDA is not aware of any site selection criteria that salt domes do not meet. However, considerable study has yet to be done before a final determination can be made.
45	6/3/77 <i>New Orleans States-Item</i>	The House Natural Resources Committee yesterday unanimously approved the bill by Representative L. G. LaPlante of Galliano who said storage of the radioactive material would pose a threat to water supplies and air.	No such determination has been made about storage of radioactive material in the Vacherie or Rayburn's Domes. Determinations can be made only after extensive study.
46	6/3/77 <i>Baton Rouge Morning Advocate</i>	"He (C. D. Zerby) said it will be 1985 before the company (Union Carbide Corporation-Nuclear Division) selected the storage terminal spots."	Zerby said a repository would be operational by 1985. The site selection is expected to be accomplished by the end of 1979.
47	6/3/77 <i>Baton Rouge Morning Advocate</i>	Representative LaPlante said, "There isn't a metal it (nuclear waste) won't corrode, he noted, and in some areas the toxic liquid is kept in open vats."	This statement is not pertinent to geologic disposal where there are no liquid wastes. The salt will be the final container. The corrosion of a metal can is irrelevant. We know of no location where nuclear waste is stored in open vats.

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48	6/3/77 <i>Morning Advocate</i>	LaPlante is reported to have said the hot nuclear wastes could cause steam to form in the salt domes and result in fissures in the geologic formations allowing leakage.	It is conceivable that the very small quantities of trapped brine in all salt deposits, could become vaporized if they came in contact with nuclear waste. However, the steam pressures formed in this manner would be far below that required to crack or fracture the salt.
49	6/3/77 <i>The Morning Advocate</i>	Representative LaPlante is quoted as saying, "If you have got plutonium in a salt dome and some yo-yo would go drop a stick of dynamite in it, it could destroy the whole world."	There is no evidence to support this allegation.
50	6/12/77 <i>The Shreveport Times</i>	The statement reads, "They can find some comfort from OWI Chief Zerby who said that if the State doesn't want the facilities once the final test results are in, it has only to say so."	Zerby never spoke to the reporters who wrote the story nor has he ever made that statement.
51	6/15/77 <i>Ruston Daily Leader</i>	LaPlante is reported to have said that salt dome storage is too dangerous for nuclear waste.	The risk may be unacceptable but this determination cannot be made until after all studies have been completed and the results analyzed.
52	6/28/77 <i>Minden Press-Herald</i>	The statement reads, "He (Kemmerly) said that C. D. Zerby, Director of the Office of Waste Isolation for Union Carbide, was misleading when he told citizens here recently that the decision as to where radioactive materials would be stored would not be made until 1985."	Zerby has never made the statement and therefore, could not have mislead the local citizens. He has on several occasions said that the first repository is expected to be operational by 1985 and that site selection is expected to be accomplished by 1979.
53	6/28/77 <i>Minden Press-Herald</i>	He (Kemmerly) showed the businesswomen a chart belonging to Union Carbide which indicated that ERDA would purchase land by fiscal 1978 - or October of 1977.	Sites for the first repositories have not been determined. On the contrary, Union Carbide has made no plans for land purchases to begin fiscal year 1978, as is indicated in a January, 1977, "Overview" that Dr. Kemmerly referenced in his talk. That "Overview" says, "The first phase shows identification of acceptable sites for the first two repositories will not occur until near the end of FY 1978." The "Overview" continues, "In the second phase, although purchase of land and long lead

ITEM	DATE NEWSPAPER	STATEMENT	FACT
54	7/14/77 <i>Minden Press-Herald</i>	The statement reads, "However, the Energy Research and Development Administration has included this State in a study of six states as probable locations for burial sites."	times are shown (chart in the back of the "Overview"), it should be noted that land purchase will not start until the entire review process for site <u>selection has been completed.</u> Union Carbide will never purchase land. Any purchase will be made by the federal government. Probable locations simply have not been determined.
55	7/21/77 <i>Minden Press-Herald</i>	The paragraph reads, "Just recently, Louisiana State University's Purchasing Office began advertising for bids to prepare a site on the Vacherie Salt Dome, a move which led many citizens to believe that the Federals had already begun making plans to build the repository near here."	LSU was preparing the site in anticipation of a contract for core drillings that are part of the studies and experiments which are necessary before any decision is reached on a repository site.

SECTION II

A Review of

Dr. J. Robert Kemmerly's

April 10, 1977, Paper

Entitled

"The Search for Safe Disposal of Radioactive Nuclear Waste -
A Series of Trial and Error Experiments"

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"The Search for Safe Disposal of Radioactive Nuclear Waste - A Series of Trial and Error Experiments"

ITEM	STATEMENT	FACT
1	<p>Union Carbide, as a major contractor for the U. S. Energy Research and Development Administration (ERDA), has made plans for land purchases to begin in fiscal year 1978 in order to begin construction of its first experimental salt depository for highly radioactive waste at the Vacherie Salt Dome on the Webster-Bienville Parish line in North Louisiana. Rayburn's Salt Dome in Bienville Parish is their second proposed site.</p>	<p>Sites for the first repositories have not been determined. On the contrary, Union Carbide has made no plans for land purchases to begin fiscal year 1978, as is indicated in the January, 1977, "Overview" that Dr. Kemmerly has referenced in his paper. That "Overview" says, "The first phase shows identification of acceptable sites for the first two repositories will not occur until the end of fiscal year 1978." The "Overview" continues, "In the second phase, although purchase of land and long lead times are shown (chart in the back of the "Overview"), it should be noted that land purchase will not start until the entire review process for site selection has been completed." Union Carbide will never purchase land. Any purchase will be by the federal government.</p>
2	<p>ERDA officials state that liquid wastes will be solidified by a glass making process and the solid product will start to be placed in salt domes by 1985. Contrary to that wishful forecast is the statement by Battelle Laboratories which is developing the glass that it will be 14 years, 1991, until the process is ready.</p>	<p>ERDA has never said that solidified waste will be placed in salt domes by 1985. It has said, the first repositories are expected to be located in salt formations. Clarification is needed with respect to the glass that will be used for encapsulating waste. An NBC television program in early 1977 said it will be 14 years before the glassmaking process is developed. That would be 1991 as Dr. Kemmerly stated. The statement is correct but only as it applies to the liquid waste now stored at West Valley, New York. The neutralized liquid waste at West Valley is composed of nuclear waste material (including military waste) and the solidification process for this waste is not fully developed. However, the solidification process has been developed for the waste that is expected from present day commercial nuclear power reactor fuel cycles. Because this solidification process is developed, there is expected to be no problem in solidifying and disposing of that waste in 1985, if reprocessing is deemed to be appropriate by the government. If reprocessing is still deferred, the Federal Repository will be designed to dispose of solid spent fuel elements.</p>

ITEM	STATEMENT	FACT
3	Recently, President Carter announced the U. S. would not pursue reprocessing of nuclear waste. So another experiment in nuclear waste management, thought at the time it was begun to be safe, has now been abandoned.	President Carter said there will be no reprocessing at this time because of his concern for the proliferation of nuclear weapons by foreign countries. The President's decision does not relate to the safety of waste management.
4	The results of a disastrous nuclear accident that took place in Russia in late 1957 or early 1958 have just been observed.	There is considerable speculation that something occurred; however, because Russia is a closed society, we have no details. Based upon what little information we do have, the incident may have involved a reactor malfunction rather than an explosion of nuclear waste. Kemmerly alleged that Leo Tumerman and Zhores Medvedev witnessed the so-called disaster. The same source cited by Kemmerly, the <i>Newsweek</i> article from December 20, 1976, stated that Tumerman <u>did not see</u> the actual explosion, if that is what it was, but he said when he visited the area, people still spoke in ominous whispers of the "Kyshtym disaster," which had laid waste of a village south of Sverdlovsk. Medvedev, in fact, admits to having <u>no direct information</u> about the primary incident and even less technical knowledge of the nature of the installation and possible mechanism for an explosion. This was reported by <i>Nuclear News</i> , August, 1977. If an explosion did occur, it would have had to have occurred near the surface. A repository such as that planned by ERDA, would be located deep below the earth's surface and in all probability any explosion would be contained within the structure itself. The United States has conducted numerous underground nuclear explosions at the Nevada Test Site without any effect on the health and safety of the general public.

ITEM	STATEMENT	FACT
5	<p>What would be the result if highly radioactive wastes were placed in salt domes in North Louisiana and leakage occurred because of one or more of many reasons such as: underground water melting an area of salt, melting of the salt by the intense heat of the waste, leakage through an old or new drill hole for oil and gas, a fracture in the salt dome from an earth shock by distant earthquake, or nuclear explosion, military or accidental, unstable degeneration of radioactive material stored in glass form? The result would be contamination of the underground water that travels to a very wide area.</p>	<p>In the case of a repository in North Louisiana, it is theoretically possible that some radioactivity could reach the Mississippi River in the unlikely event of an occurrence that would breach the containment. It is virtually impossible to envisage a credible scenario that would create a breach in the repository and leach out radioactivity that would significantly contaminate the Mississippi River or other bodies of water in the vicinity. Not even a major earthquake at the repository site nor a direct strike by a meteorite about 3,000 feet in diameter or larger would be expected to lead to significant releases to a water source. The low leachability (insoluble by usual standards) would prevent significant concentration of radioactivity from escaping and any release would be over a time span of thousands of years.</p>
6	<p>ERDA has several criteria for selecting a site for underground nuclear waste disposal. The site is suppose to be some distance from any population center. There should be no deep holes in the immediate vicinity. This requirement pertains not only to the immediate site, but to a buffer zone of about 30 square miles.</p>	<p>Site selection criteria are now in the process of being developed by the Nuclear Regulatory Commission. ERDA is also expanding on a preliminary set of site selection criteria which it has used over the last several years in its geologic exploration program. Considerable study has yet to be done before a final determination can be made on site selection criteria.</p>
7	<p>In order to place in proper prospective the LSU studies, it is important to know the relationship of the project to the U. S. Energy Research and Development Administration (ERDA) and also the limited scope of the goals and especially what the LSU workers are <u>not</u> being asked to study.</p>	<p>The Institute for Environmental Studies at Louisiana State University is attempting to determine if salt dome basins have salt domes which are geologically stable. LSU has this expertise. At the present time, <u>contractors with other professional disciplines are performing different studies and tests across the nation which are also related to the disposal of nuclear waste. The tests together with those performed by LSU, will be considered when the various site selections are made and disposal processes are finalized.</u></p>

ITEM	STATEMENT	FACT
8	The selection of LSU personnel to do an ERDA financed study of limited scope, was a transparently smart public relations maneuver because it has automatically placed staff members of our correctly highly respected parent state university alongside ERDA officials at public hearings.	The Institute at LSU is not being used for "public relations" purposes. The Institute was selected because of its knowledge of the area and because of its ability to perform the very exacting and important testing that is planned.
9	U. S. contracts to supply nuclear power plant technology to foreign countries, have typically included the provision that the waste will be returned to the U. S.	This is a totally incorrect statement. The United States government has not asked that nuclear waste be returned in exchange for American nuclear power plant technology.
10	The Kemmerly paper on page 2 suggests there are other means for disposing of nuclear waste.	Several alternatives to deep, underground disposal have been proposed. Included are seabed emplacement, outerspace disposal, transmutation and others. All of these alternatives, although philosophically attractive, are beyond the present state of technology and would require extended development programs. On the other hand, placement in excavated underground openings is well within the present state of technology. For example, there was Project Salt Vault conducted at Lyons, Kansas, in the 1960s. In this experiment, radiated fuel elements from the Engineering Test Reactor at Idaho Falls were used (augmented by electrical resistance heaters) to simulate the radiation and heat generation properties of solidified high level waste. Following the analysis of Project Salt Vault data and a number of other design studies, the AEC in June, 1970, announced its intention of establishing a Federal Waste Repository adjacent to and encompassing the inactive Lyons Mine <u>provided that subsequent geological investigations confirmed the suitability of that site.</u> Those investigations over the next two years resulted in the conclusion that the Lyons site was in fact, not suitable. However, it is interesting to note that the factors which disqualified this proposed site were related entirely to man's activities (the high density of oil and gas exploration holes in the

ITEM	STATEMENT	FACT
11	Dr. John W. Gofman, M.D., PhD, co-discoverer of uranium-233 and now professor of medical physics at the University of California, says that plutonium is probably the world's most toxic substance; an infinitesimal speck is almost certain to cause cancer if inhaled.	<p>immediate vicinity and a nearby solution mining operation) and not due to <u>natural geologic conditions and certainly not due to any fundamental question of the utility of salt formations in general for this purpose.</u></p> <p>Plutonium can only be obtained after the spent fuel is reprocessed. However, President Carter, as part of his Administration's efforts to stem the development of atomic weapons has deferred reprocessing at this time. Opponents say plutonium is toxic, that it can kill. Plutonium is toxic but not highly toxic in the ordinary sense. That is, not chemically toxic. In fact, <u>several grams of plutonium would have to be ingested to be fatal in the usual sense of a poison that produces death in a relatively short period of time.</u> <u>Arsenic, anthrax spores, botulism and chlorine</u> which is used in water purification are <u>far more toxic than plutonium when ingested.</u> The hazards of plutonium are not to be underestimated, but there are nearly 30 years of experience in the production, reprocessing, shipment and fabrication of very large quantities of plutonium resulting from the weapons production during and after World War II. To date, there have been no known deaths attributable to the inhalation or ingestion of plutonium even though at least 25 employees involved in the weapons program ingested plutonium 30 years ago (see <i>Nuclear Engineering</i>, November, 1976.) Industrial processes and safeguards can continue this enviable record. Nuclear critics frequently say that a pound of plutonium dispersed in the wind could cause 9 billion lung cancers (world population 4.5 billion people equals two lung cancers per person.) The amount of plutonium dispersed in the atmosphere from <u>all nuclear weapons tests</u> is approximately 10,000 pounds. <u>Still, there has been no detectable effect on the health and safety of the world's population.</u></p>

ITEM	STATEMENT	FACT
12	Scratch the experiment of ocean dumping of barrels of radioactive waste as a reliable method of disposal; it is not in use by the U. S. anymore due to leakage.	Low level waste has leaked from some barrels which were placed in the oceans. This was not unexpected because it was projected that the containers would corrode. This type of storage is no longer being performed by the United States. However, the leakage just cited, has had no demonstrated effect on marine life or on man and his environment.
13	Kemmerly quotes from the <i>Bulletin of the Atomic Scientists</i> in England. The statement is, "There are two reasonable options for the permanent disposal of vitrified wastes: to geological formations on land and below the ocean bed. <u>But neither of these has been sufficiently studied nor demonstrated as a feasible option.</u> " (underlines by Kemmerly.)	The studies that have been under way and that are planned for the salt domes in North Louisiana will <u>help in determining whether or not the use of salt domes for nuclear waste disposal is a feasible option.</u>
14	The search for safe disposal of radioactive nuclear wastes has been a series of trial and error experiments.	On the contrary, disposal of radioactive wastes has not been marked by trial and error. For example, the public has never been harmed from nuclear facilities at Savannah River, South Carolina, Idaho Falls, Idaho, or at Hanford, Washington. There has never been a radiation injury to the public from the defense, reprocessing and waste management programs at these three facilities nor has there been a radiation injury to anyone in the country as a result of transporting radioactive materials. Opponents frequently refer to liquid waste that has leaked from storage tanks in some locations in the country. These leaks were from military waste that was stored in single walled steel tanks many years ago. Tanks built since the mid-1960s have been double walled and no leaks have been detected. Waste that is destined for a national terminal storage repository will come from commercial nuclear power reactors and will be in a <u>solid form, thus it cannot leak.</u>

ITEM	STATEMENT	FACT
15	In 1969 at West Valley, a little known but extraordinary episode took place: 42 ruptured spent fuel elements that could not be reprocessed were simply encased in concrete and put at the bottom of a 50 foot deep hole.	Some ruptured spent fuel claddings were found to be damaged and a decision was made in 1969 by NFS, the operator of the facility at West Valley, to take parts of the elements and place them in three scrap drums which were then placed in a 50 foot deep hole. There were no violations of any kind.
16	At Hanford, Washington, hundreds of thousands of gallons of radioactive waste have leaked out of storage tanks into the ground. From a series of 18 leaks more than 400,000 gallons of high level wastes have leaked into the soil from tanks at Richland, Washington, and Savannah River, GA. (?S. C.) reported <i>Business Week</i> magazine.	<p>The Final Environmental Statement (FES) issued in December, 1975, concerning waste management operations at Hanford reported a series of 18 tank leaks occurring over a period of 18 years. The total volume of liquid waste was estimated at about 460,000 gallons. The largest was the 241-T-106 tank which released 115,000 gallons in 1973. It was predicted and confirmed by tests that the waste liquid would be sorbed in the dry sediments near the 241-T-106 tank and would not percolate to the underlying water table. Also, the FES said no off site or groundwater contamination resulted from the incident.</p> <p>The leak at Savannah River, S. C., occurred in 1960 in tank 16. The leak amounted to "tens" of gallons and did not migrate more than 25 feet, according to Savannah River officials. Further, this leak did not affect the health and safety of the population of the area.</p> <p>See additional comments on page 21, item 14.</p>

ITEM	STATEMENT	FACT
17	<p>"...the Environmental Protection Agency announced that highly toxic plutonium is percolating through the soil from a Maxey Flats, Kentucky, burial site that has been the dumping ground for radioactive liquid and solid wastes since 1963."</p>	<p>The waste that was disposed of at Maxey Flats, Kentucky, was commercial low-level waste which was packaged and placed in trenches about 25 feet deep. It was then covered with soil. This work was done within then existing standards. A 6-month investigation by the State of Kentucky of the low-level leakage concluded that the amount of radioactivity contributed to the local environment was at levels which did not create a public health hazard. A subsequent investigation by the Nuclear Regulatory Commission (NRC) in 1975 concluded that there is no significant public health problem associated with the release of radioactive material from the burial ground.</p> <p>In a report (NUREG-0217), an NRC Task Force concluded, "The States, in discharging their regulatory duties, have operated under difficult circumstances but have adequately protected the public health and safety. The Task Force can find no compelling health or safety reason for reassertion of Federal control at this time."</p> <p>The Environmental Protection Agency concluded that while there was some contamination of water in the disposal trenches, "There is no current indication of significant environmental levels of radionuclides from low-level waste burial sites."</p>
18	<p>The Vacherie Salt Dome area includes 8 producing oil and gas wells and 21 abandoned wells, two of which were drilled into the dome. By ERDA's own criteria, this should remove this particular site from consideration.</p>	<p>None of the activities described below will affect the integrity of a repository if one should be built in either Vacherie or Rayburn's Domes.</p> <p>As many as five oil and gas test wells were drilled by others into the Vacherie Dome ranging from 800 to 5,500 feet. <u>All were dry.</u> As many as three oil and gas test wells were drilled into Rayburn's Salt Dome probably in the 1920s. The drilling ranged from nearly 300 feet to 700 feet deep. Again these holes were <u>dry.</u></p>

ITEM	STATEMENT	FACT
		<p>Continuous cores will be drilled into the Vacherie and Rayburn's Salt Domes in the remainder of this fiscal year and in FY 78. The total hole depth will be 5,000 feet from the surface. The diameter of the holes will be four inches. One core will be drilled this fiscal year into Vacherie Salt Dome. Three more are planned for FY 78. Four similar core drillings will be made in Rayburn's Dome in FY 78. The objective of the core drilling is to obtain fundamental information on the geological character of the rock salt that comprises the domes as well as to determine the nature of the overlying material and the cap rock.</p> <p>A series of hydrology tests are planned for the two domes this fiscal year and in FY 78. Seven water wells will be drilled in each dome ranging from 300 to 1,200 feet deep. Two wells have been drilled into the Vacherie Dome this fiscal year and two off to the side of the dome. Three more wells are planned for FY 78, one on the dome and two off to the side of the dome. Of the seven water wells planned for Rayburn's Dome, one has been drilled on and another off the dome this fiscal year. The other five wells will be drilled in FY 78 with three on and two off the dome.</p> <p>Other drillings taking place include the sampling of deposits over and around the domes. These drillings will be three inches in diameter and will range from 25 to 200 feet deep. Seventy-five such holes have been drilled into the Vacherie Dome; forty more are planned for FY 78. Seventy-five are also planned this fiscal year for Rayburn's Dome; seventeen have already been performed. An additional 10 holes will be drilled in Rayburn's Dome in FY 78.</p> <p>Finally, drillings are being performed to determine the soil properties of the two domes. The test holes for soil samples will range from 150 to 200 feet deep and will be four inches in diameter. Four have already been done this fiscal year in the Vacherie Dome and four are planned for FY 78 in Rayburn's Dome.</p>