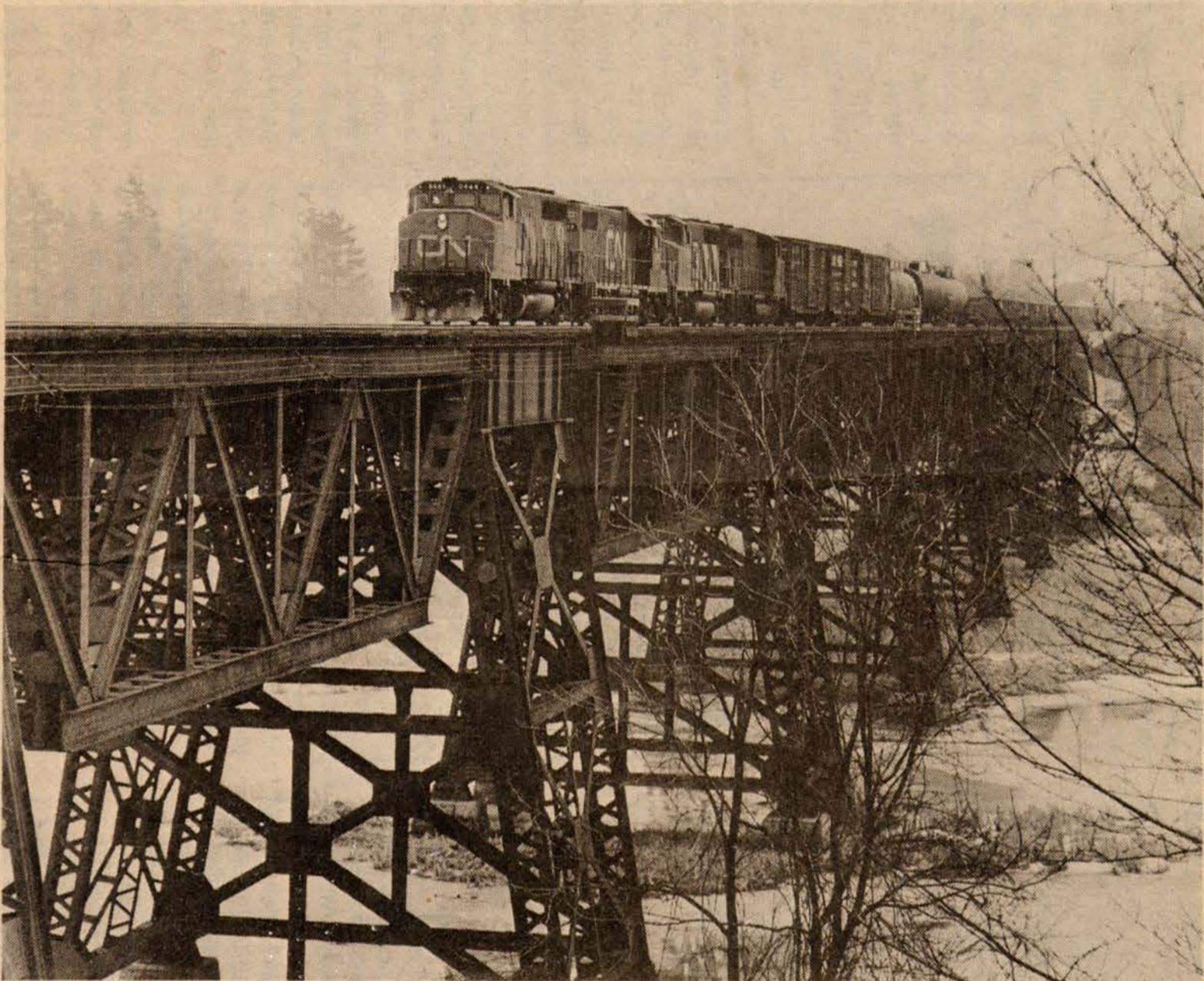


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the Waste Paper

Vol. 5 No. 2



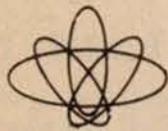
by Ken Kraemer

Trains similar to this one will soon carry high-level nuclear waste across the country. The waste will be transported in 25-100 ton casks which have not been tested to withstand derailment accidents. For details on this, see page 4.

Special issue on cask safety! The Next Nuclear Gamble, page 4, Navy Pushes Ocean Dumping, page 1, NL Industries in Albany, NY, page 3, More on Waste in Wayne, N.J., page 1.

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In Wayne, It's Plainly Rain

A New Jersey suburban community fights the legacy of the atomic bomb.

Does the rain in Wayne lie mainly in the plains? Yes, and according to a recently released Nuclear Regulatory Commission (NRC) report, it arrives at the Pompton Plains River by running off the contaminated Grace Company property into the Sheffield Brook. The brook, in turn, feeds the river. The NRC report, *Radiological Survey of the W.R. Grace Property, Wayne, N.J., January, 1983*, documents large amounts of radioactive thorium sitting in a high water table, surface and underground migration of radioactivity and high radiation levels.

In words unusually revealing for the NRC, the agency stated that "a pattern of increasing concentrations (of radioactivity) was observed as the (sewer) system neared the outfall from the W.R. Grace property." The surface run-off "continues to be a significant mode of migration."

The Grace & Company property in Wayne, N.J., (a suburban community 25 miles west of New York City), was the scene of radioactive thorium processing between years 1948 and 1971. Thorium was used by the Atomic Energy Commission to make atomic bombs from uranium-233 during the early years of the Manhattan Project. Later, plutonium replaced U-233 as bomb material and the federal

government stopped purchasing thorium from Grace & Co in the late 50's. Grace continued to use thorium for other purposes.

The sloping site is below a steep hill rising to the east behind the property. There is an unusually high water table, only 3 to 6 feet below the surface in mid-July. This is due to the water run-off and underground migration from the steep hill. An artesian well, indicator of high underground water pressure and movement, is also located on the site.

A previous NRC survey on radioactivity, along Sheffield Brook, downstream from the Grace property, was reported in *the Waste Paper*, Vol. 5, No. 1.

The new NRC survey, consisting of soil measurements in 43 boreholes showed thorium concentration levels ranging up to 30,500 pCi/g (picocuries per gram), about 6,000 times the Environmental Protection Agency (EPA) standards. In most cases, high soil readings were taken less than three feet from the surface, contrary to NRC regulations (minimum 4' cover) and Grace & Co. claims (6' cover). In several cases, high underground readings were taken far from supposed burial locations, indicating inaccurate previous reports by

Grace (a violation of NRC regulations) or underground migration.

High readings on the southern border of the site, at least 30 feet from pits in which the radioactive residue was originally buried, indicate underground migration of radioactivity off-site. According to the NRC, "the relatively high thorium surface contamination levels in some locations and the findings of the ground-penetrating radar survey suggest that the burials were not necessarily at well defined locations and that buried wastes may have been disturbed and eventually spread over the eastern portion of the property."

Direct exposure to the radiating soil varied from near background to 54 times background levels. Workers at Electronucleonics, Inc., a tenant on the site, could receive a yearly dose greater than one rem, equivalent to the dose received by an average nuclear power plant worker. Yet the site is classified as "unrestricted," by the NRC. The NRC terminated the Grace license in 1975 and now has no control over the property. A notice was put in the deed stating that radioactivity was present on the site.

continued on page 7

Navy Pushes Ocean Dumping

Capes Mendocino and Hatteras Threatened

Citizens across the U.S. are outraged at the Navy's plans to scuttle 100 Polaris nuclear powered submarines in the Atlantic and Pacific Oceans. The Polaris subs are being laid to rest so the newly designed Poseidons can roam the seas.

The potential dump sites are off Cape Mendocino in northern California and Cape Hatteras off the coast of North Carolina. The Navy recently released a draft environmental impact statement (DEIS) on getting rid of the subs. This massive document discusses three options:

- 1) sinking the defueled (fuel has been removed), but still radioactively contaminated subs in the briny deep,
- 2) burial of the subs defueled reactor compartment in the ground at Savannah River, S.C. or Hanford, Wash. or
- 3) delaying action for several years (20-30) to reduce the radiation levels in the submarine.

Remember in thinking about these options, that long-lived radioactive materials found in the subs' defueled reactor compartments, will be toxic from *hundreds to thousands of years*. Some examples of these are: Cobalt-60, Nickel-59 and 63, Niobium-94, Technetium-99 and Carbon-14.

Underestimated Toxicity Unfortunately, the DEIS's facts and figures are skewed, favoring ocean dumping of the old subs. The Navy claims the ocean option is cheap, safe to humans as well as the marine environment.

According to Dr. Marvin Resnikoff, Campaign scientific consultant, the Navy's levels of Cobalt-60 and Niobium-94 in the subs are *seriously underestimated*. The levels of Cobalt-60 are off by a factor of six and the levels of Niobium-94 are off by a factor of 100. Both are strong, penetrating gamma emitters. This means that every calculation the Navy has made on exposures to workers, marine life and the general public is *grossly wrong*.

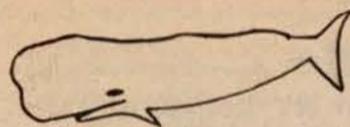
Many environmentalists have advocated the delayed action for the nuclear powered subs. A 30-year storage period at a government facility could significantly reduce occupational exposures, exposures to the public and to marine life. At that time, it is possible that new methods of disposal could be available.

Currently, 5 decommissioned subs are being stored on site — Triton, since 1967; Halibut, since

1976; Nautilus, since 1980; and Theodore Roosevelt and Abraham Lincoln, since 1981. Why not store the rest of the Polaris subs too?

To Corrode or Not to Corrode The Navy opposes this interim storage for two reasons: 1) sub maintenance will be required every 20 years and 2) there is no reduction in exposures to workers to warrant storing the subs prior to dismantling. The

continued on page 8



Derailed Tankers Firefighter and officials inspect wreckage of freight cars and tankers that derailed near Orillia, Ontario in March 1982. It was feared that hydrofluoride gas could leak from the tanker in the left hand corner of the photo. Nearby towns were evacuated. What if this had been a car carrying irradiated nuclear fuel? See pages 4 and 5.

Radscope

Chem-Nuclear Eyes South Dakota for Nuclear Waste Dump

South Dakota citizens are angry that their state is under consideration for a 5,000 acre "low-level" nuclear waste dump. Citizens are particularly upset because South Dakota generates 35 cubic feet of "low-level" nuclear waste each year.

So why should South Dakota eat the whole thing? The Midwest region could include 16 states and a state like Illinois which produces over 200,000 cubic feet of waste each year and has the most operating reactors in the U.S.

The site has already been surveyed by Chem-Nuclear which operates a nuclear dump in Barnwell, South Carolina. Chem-Nuclear has recently been bought by Waste Management, Inc. Waste Management has been found guilty of bid rigging in Wisconsin, of burying waste without permits, and of shipping damaged and leaking drums.

Chem-Nuclear claims that South Dakota has the best suitable geology and geography for a nuclear waste site. Yet South Dakota has a scarce water supply and ground water contamination from a leaky burial site could deplete it even more.

Britain Flies Irradiated Fuel

One-half ton of irradiated fuel was flown out of Hurn Airport in Bournemouth, England in July of 1982. The extremely hazardous irradiated fuel flew via Air Bridge Vanguard en route to Germany for experimentation. How frequent air shipments of irradiated fuel are, has not yet been determined by the *Waste Paper*.

Please Write

U-Mining Bill in NY Legislature

A proposed bill for a 10-year ban on uranium mining is being introduced to the NY state legislature. The bill is being sponsored by Assemblyman Maurice Hinchey and Senator John Dunne.

Please call or write your state legislator today, urging support for the uranium mining ban. (bill numbers A-4722 and S-3639.) Gulf Oil has leased over 430 acres in Sullivan County. Additional leases could threaten the water reservoirs which supply New York City. (See the *Waste Paper* Vol. 3, No. 2 and Vol. 4, No. 1.)

Addresses for state legislature : NYS Assembly, Albany, N.Y. 12248 or NYS Senate, Albany, N.Y. 12247.

The tiny community of Edgemont, South Dakota, where Chem-Nuclear would like to site a dump, is applauding the plan. The Chamber of Commerce has whole-heartedly invited Chem-Nuclear to their neighborhood. It seems that Edgemont was once a uranium mining and milling town, and when the mine closed in the 1970's, unemployment became overwhelming. The community feels the dump is job blessing to Edgemont.

The 7,000 acre site is mostly barren land at former Igloo Ordnance Depot, nine miles southwest of Edgemont. The site was formerly used to store and test weapons for chemical warfare.

It is interesting to note that Chem-Nuclear is negotiating a site in Naturita, Colorado for a Rocky Mountain region dump which the *Waste Paper* reported in Vol. 4, No. 4. It seems the company would like to have its fingers in all the pies of nuclear waste dumping.

Thanks to Sierra Club Dacotah Chapter and the Black Hills Alliance for providing this information.

Wisconsin Says "NO" to Granite Dump

February 17, 1983 is a day U.S. Department of Energy officials may never forget! They spent 7½ hours — till 3 a.m. — in a Howard Johnson's being grilled by over 600 citizens and state officials in Wausau, Wisconsin regarding the siting of a nuclear waste dump.

Governor Earl, of Wisconsin, was among the Chief critics of the federal agency. He noted that the DOE had previously denied it was looking at granite in Wisconsin for a possible high-level waste repository, when in fact it is studying the area.

The DOE also came under fire from the state's Radioactive Waste Review Board. It adopted a policy to not cooperate with the DOE regarding the search for a site. Only information available through the state's Freedom of Information law will be given to the DOE.

U.S. Sends Nuclear Satellites Too!

Recall the most recent Soviet nuclear satellite which fell into the South Atlantic Ocean 1,100 miles east of Brazil. Recall how the U.S. media claimed that the U.S. only sends solar powered satellites into space, while the Soviets send nuclear powered ones.

It is unfortunate that U.S. journalists depended on government information and did not do their homework on nuclear powered satellite accidents. If they had, they would have found that the U.S. actually has had three nuclear powered satellite mishaps.

In 1964, a U.S. nuclear powered satellite burned upon re-entry and contaminated the atmosphere with one kilogram of plutonium-238. The lethal load plummeted into the Indian Ocean.

In 1968, a Nimbus weather satellite failed to achieve orbit and plunged into the Santa Barbara Channel, off the coast of California. Luckily, the plutonium power pack was recovered intact.

The final incident occurred in April 1970, when the Apollo 13 moon landing was aborted because of a fire on board. The astronauts were saved, but the plutonium fuel pack plunged into the Pacific and was never recovered.

Some Learn by Degrees

In encouraging news to citizen activists who feel they need a Ph.D. to discuss nuclear waste, important lessons can be learned from "Dr." Robert Jefferson, head of Sandia Laboratories' Transportation Technology Center. The center tests irradiated fuel shipping casks and produced the film, "Accident Safe" which purportedly proves cask safety (see *Accident Unsafe* on page 4). "Dr." Jefferson, identified as a nuclear engineer by Sandia Laboratories, is neither. Mr. Jefferson has an M.B.A. and has never taken a formal nuclear engineering course. In a recent interview with Vermont Public Radio, Mr. Jefferson never disputed the "Doctor" title, which fits well with his authoritative approach to the subject. He has appeared at several debates using the title "Doctor."

Jefferson has traveled extensively lobbying local legislatures to prevent restrictive bans on nuclear waste transport. Whether such lobbying is appropriate for an individual primarily funded by the U.S. Department of Defense, is being looked into by Congressional aides.

Thanks to Don Hancock of the Southwest Research and Information Center for the information.



It's No Ordinary Shovel It may look like an ordinary shovel, but to these men it has great significance. Stan Gingrich, (left) president of the Associated Citizens for the Protection of the Environment of Sheffield, Illinois, hands the ceremonial shovel used to begin exhuming hazardous waste at Wilsonville, Ill. to State Representative Dick Mautino. John Lynn, of the Sierra Club (right), in a press conference announced the release of a Sierra Club Radioactive Waste Campaign report, *Insecure Landfills: The Exhumation Option*. He stated that exhumation of the U.S. Ecology managed nuclear waste dump in Sheffield, Ill. could be a viable alternative to the numerous problems at the site.

Nevada Nuclear Dump Remains Open

Despite the Nevada Board of Health's order to close the Beatty, Nevada nuclear waste dump last August 1982, it will remain open until the court decides its fate.

Poor burial practices, like off-site migration and waste drums found outside the fence line, caused the Department of Health to scrutinize the license renewal request in 1980. The current litigation is a result of this scrutiny.

U.S. Ecology, Inc., manager of the site, has appealed the closure and the case will probably reach the Nevada Supreme Court. Newly elected governor, Richard Byron, is continuing the stand taken by his predecessor, Bob List, to close the dump. In the meantime, it will remain open and operating to receive waste shipments.

The closing of Beatty would certainly squeeze the already tight situation for nuclear waste dump sites. States are now authorized to either locate low-level nuclear sites of their own or join regional interstate agreements. This was mandated by Congress in 1980. Sites must be chosen by 1986 but actual siting could take another two years.

The *Waste Paper* applauds the Board of Health and hopes it stands firm for the Beatty closure. But, while in the courts, a temporary restraining order to keep the site closed during litigation should be issued.

the Waste Paper

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Special thanks to our guest writers, photographers and artist for their terrific work on this issue. Thanks to all our volunteer proofreaders and layout crew for their energy and time and Panagraphics for their typesetting.

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Spring, 1983

Speaking of Sponges

EPA report summaries distort information found in original EPA research

Have you been hearing bland assurances from the U.S. Environmental Protection Agency (EPA) that past dumping of radioactive waste in the ocean had no harmful effects? Chances are the EPA representative who makes that claim has not read 15 EPA reports that discuss surveys made in 1977 of old ocean dumpsites. Chances are the EPA staffer has only read EPA summaries of the actual reports.

According to Dr. Jackson Davis of the Long Marine Laboratories at the University of California at Santa Cruz, EPA summaries of the agency's own reports are inaccurate and misleading. Read how EPA summarizes a study on the giant sponges discovered at the Farallon nuclear waste dump, off of the shore of California. Then compare a summary prepared by Dr. Davis.

EPA document #15: Silver, Gary R., "A Taxonomic Review of the Farallon Island Sponge Fragments," February 1979.

EPA Summary

Dr. Silver, an hexactinellid sponge specialist, analyzed samples of the large hexactinellid for taxonomic purposes. EPA first observed these sponges growing on the radioactive waste containers at the site. His report confirms that this sponge, a new species, is indeed a typical hexactinellid which is growing to a normal hexactinellid sponge size. It is not an aberrant organism.

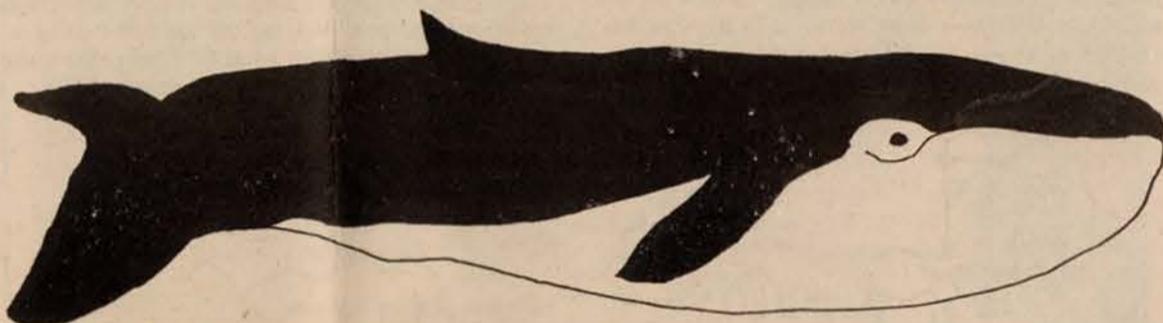
EPA's interest in the sponge stems from curiosity concerning the sponges large holdfast and the potential impact it might have on acceleration or deceleration of container corrosion.

New Summary (by Dr. Davis)

This report analyzes fragments of the giant sponge returned from the Farallon nuclear waste dump site. The author, a specialist in sponge classification, states that "The diagnosis presented here is conclusive only to Sub-Family because of the

fragmentary nature of the sponge material that is presently available and to its poor state of preservation." The report states further that identification of genus will require more tissue, and identification of species will require "at least one fully intact and representative specimen." Nowhere in the report is this sponge described as a "typical hexactinellid which is growing to a normal hexactinellid sponge size." The word "size" appears nowhere in the report. Neither does the document state or imply that the sponge "is not an aberrant organism." This report does not confirm nor exclude the possibility that these giant sponges found only attached to radioactive waste canisters represent a mutation caused by the radioactivity. ☸

A hexactinellid sponge is a class of sponges. It is a cup-shaped sponge that resembles a tall urn.



WIPP Coverups

Do you remember when lethal hydrogen sulfide and methane gases were discovered during core drillings at the Waste Isolation Pilot Project (WIPP) site, 26 miles east of Carlsbad, New Mexico, in 1981?

The reason you do not remember is because the findings received virtually no publicity. In fact, the U.S. Department of Energy (DOE), has consistently ignored and discounted published results on testing gas concentrations so as to allow construction to continue on the controversial site. WIPP is DOE's experimental repository for the burial of government-produced transuranics and supposedly, a small quantity of unprocessed, military irradiated fuel. In 1981, the drilling of shafts at WIPP were initiated.

An engineer, R.P. Murphy, called in to conduct gas and pressure tests has grave concerns about what the presence of hydrogen sulfide and methane gas will do to the feasibility of the site. Both gases and brine are approximately 500-800 feet from the proposed storage area. Murphy, the President of Profile, Inc., a firm specializing in petroleum reservoir analysis, was contracted by D'Appolonia Consulting Engineers from Pittsburgh, Pa., the prime contractors for the site. The contract was to do gas sampling at one exploratory hole - ERDA 6 - at the site.

According to Murphy, the ERDA 6 hole had concentrations of hydrogen sulfide in excess of 200,000 ppm. A person can receive a lethal dose at 100 ppm. Not only is the hydrogen gas lethal if inhaled, it is also inflammable and explosive.

Some of the comments made by Murphy in an interview with a freelance writer, Ken McCormack, follow. K is McCormack and R is Murphy.

- K. Do you think that there is brine under the proposed WIPP construction site?
 R. Electric logs from wells drilled in the last 30 years in the immediate area show water on all sides of the site. WIPP would have to be a coincidental island not to be over high pressure brine and explosive gas. Not to ignore, of course, an almost unprecedented concentration of deadly hydrogen sulfide gas. To answer your question - yes, I do.

K. Would this preclude the feasibility of continuing with WIPP construction?

R. Not by reason of the brine, gas, and high pressure alone, but when added to the evidence given in several published papers on the integrity of the salt or halite overlaying the brine and forming the base of the WIPP site "floor," the project becomes "not feasible" in all three status criteria - economics, engineering, and safety.

K. You refer to "Published Papers."

R. I can only give you a sampling. Here's a partial listing.

Roger Y. Anderson, Dept. of Geology, UNM
 Walter E. Dean, U.S. Geological Survey
 Marc W. Bodine, Jr., Dept. of Geosciences, NM Tech

Steven J. Lambert, Sandia Laboratories
 Dennis W. Powers, Sandia Laboratories
 J.W. Mercer, U.S. Geological Survey
 W.L. Hiss, U.S. Geological Survey
 and several others.

Sandia Laboratories has numerous papers written on the WIPP site - without exception they indicate too many negative geological conditions to justify WIPP construction at the present planned location. Come to think of it, I have never read a paper that had a positive statement to make about the WIPP site by anybody - academic or otherwise. Sandia must not believe their own stuff. After all, they seem to be ramrodding the feasibility report presently in operation.

K. What, exactly, is a "Feasibility Report"?

R. Any project, whether it's construction, business ventures, acquisitions, or even minor Corporate decisions are first introduced by a "Feasibility

Report." This is either formal or informal depending on the circumstances and importance of the project. If it's informal, it may be as simple as a sales meeting where pro's and con's of the advisability of new methods might be argued before the final decision. In the case of a formal report, it's usually done by getting all information covering, as I have already mentioned, the status and effects of economics, engineering, and safety. A negative report on any one of the three parameters or factors will cancel the "Feasibility" of the subject project. WIPP has negative reports on all three.

K. Is the WIPP Feasibility Report (FR) completed?

R. Of course it is! The report just wasn't accepted, that's all.

K. How can that happen?

R. That's simple! By changing the word "Feasibility" to "Study" or "Research." The FR would have to be completed before the U.S. Government would commence construction on the site. This was started in September of 1981, I believe. The FR is now labeled "research" and the WIPP construction is well on its way. To have an FR in progress concurrent with its subject on-going project would be grossly irresponsible. Unless, of course, the FR outcome is prearranged. In horse racing, this is called "fixing." ☸

Add the gas problems to the already discovered underground brine reservoir at WIPP and the integrity of the WIPP site becomes highly questionable.

Special thanks to Ed Burns of the Sierra Club Southern New Mexico Group for sending this information on WIPP to the Waste Paper and Ken McCormack for investigating the problems at WIPP.

NL Defense Contracts Bring Waste to Colonie, N.Y.

by Anne Rabe and Tom Ellis

Residents near the NL Industries (formerly National Lead) armaments plant in Colonie, N.Y., 5 miles north of Albany, won a minor victory in October 1982 when Niagara Mohawk Power Corp. spent \$10,000 to remove uranium contaminated surface soil from its property adjacent to the NL site. This was a limited success since Niagara Mohawk cleaned the contaminated soil to the state radiation limit of 200 picoCuries per gram, which is over five times the federal Nuclear Regulatory Commission's (NRC) limit of 35 picoCuries per gram. The Niagara Mohawk property, along with the sur-

rounding neighborhood, had been contaminated with radioactive uranium for years from NL's operations.

NL has operated the Colonie plant for 40 years. Since 1958, it has been a licensed nuclear facility. Under the former Atomic Energy Commission's (AEC) license from 1958 to 1961, NL used depleted and enriched uranium to manufacture experimental fuel rods for atomic reactors - some of which went to Idaho Falls, Idaho, and others to a breeder reactor in Hallett, Nebraska.

Since 1962, NL has been licensed by New York State to use depleted uranium. Radiation shields, anti-tank shells and airplane counterweights have

been built at the site. A majority of these contracts are with the Department of Defense.

The plant is located in a residential neighborhood on the Colonie-Albany line. Thousands of people live and work within a mile of the facility and hundreds of people within a quarter mile. Tens of thousands pass by NL every day on Interstate 90, routes 85 and 5 and on an Amtrak line.

Illegal Emissions. In September of 1979, just as NL was stepping up production in response to a newly acquired defense contract to produce anti-tank shells, a worker began complaining about unsafe conditions. The Albany County Health Dept. (ACHD) and three state agencies investigated and

continued on page 7

The Next Nuclear Gamble

CEP Releases Study

The long awaited Council on Economic Priorities study *The Next Nuclear Gamble* is out. This book is a must for safe energy activists, legislators, and policy makers. It's chock full of fascinating data, charts, and tables. It's laden with facts, meticulously documented. It's readable. It's understandable to laypersons.

Its authors, Dr. Marvin Resnikoff with Lindsay Audin, assisted by Nancy Bernstein and Leslie Birnbaum, edited by Alice Tepper Marlin and Ann Morris, deserve high praise for the extraordinary wealth of important information which they have researched and presented in the book. The book *should* mark a turning point in the debate on nuclear energy in this country.

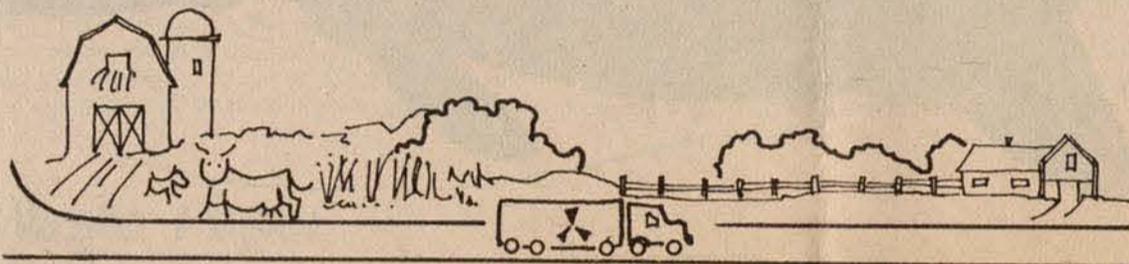
No longer can it be said that the safety issue is limited to our 72 operating reactors. Equally compelling safety issues apply to the highways and railroads along which thousands of shipments of extremely toxic, irradiated fuel will travel, if the utilities get their way.

But whether the book *does* mark a turning point depends upon what you, the reader, do with the information. If citizens read the book, memorize the Council on Economic Priorities (CEP) data and go to local, state and federal legislators to urge that all

the unsafe, inadequately tested, poorly regulated and improperly maintained transport casks be **WITHDRAWN FROM SERVICE**, then the labors of the authors have not been in vain.

The book demonstrates the need for a nationwide campaign to raise people's consciousness on the transport issue — a campaign that ultimately must reach the halls of Congress. If such a campaign is not launched, a highway or railroad disaster that could make Three Mile Island look inconsequential is all too possible.

There is far too much fascinating information in the *Next Nuclear Gamble* for us to do justice to this monumental work. But to give *Waste Paper* readers a taste of what the CEP book includes, we have excerpted and summarized *some* of the findings and we present them here. We have paraphrased where the original language was a tad academic and we have revised some of the important CEP charts so as to remove intimidating exponential numbers and too-technical information. All quotations are from the *Next Nuclear Gamble*, unless otherwise specified. Comments appearing in bold italics are the *Waste Paper's*. We extend special thanks to CEP for providing us with advance copy of the book so as to allow us to produce this section. ❀



The Dry Storage Option?

The *Next Nuclear Gamble*, Marvin Resnikoff's new book, will spark a major debate on the transport issue. CEP's way out of the transport dilemma is to suggest dry storage of aged nuclear fuel in giant casks at reactor sites for the 40-year lifetime of reactors.

The *Waste Paper* cannot share CEP's optimism regarding either the long term safety of the option or of its acceptability to communities surrounding reactors. We suspect citizens simply will not accept the storage of millions and millions of curies of radioactivity at reactors for *decades* to come.

However, the *Waste Paper* feels that the dry storage option is a promising short-term (5-10 years)

option that must be considered as an *interim solution* at certain reactors, until a federal repository is developed, if ever. If citizens want to work for phase-out of reactors they must have a reasonable plan of what to do with irradiated fuel *until* phase out has become a reality.

Reactors are not going to shut down, presto, instantly, tomorrow. In the *interim* period, it is far better to store this highly dangerous material on site, than to send it careening down our highways and railroads. How long the interim period will be depends on how effective the phase-out movement becomes. ❀

Sandia Testing Faulty

Accident Unsafe

Accident Safe, a film prepared by Sandia National Laboratories in 1977 and 1978 is misleading and inapplicable to the current generation of casks. The film has been shown repeatedly around the country as "proof" of industry claims that shipping casks are "indestructible." The film was made under contract to the U.S. Department of Energy and filmed crash and fire tests on three casks. *The Waste Paper* has decided to dub this film *Accident Unsafe*.

- All of the casks in the film were OBSOLETE, they had been removed from service "ten years before the test."

- The casks contained fresh fuel. **Fresh fuel can be handled with gloved hands in sharp contrast to irradiated fuel which, if unshielded, will deliver a lethal dose in a matter of seconds or minutes, depending on how long the fuel has cooled down. Unlike the fresh fuel, the irradiated fuel generates high heat and pressure.**

- The fuel was surrounded by a stainless steel cladding, not the more brittle zircaloy cladding used in commercial nuclear fuel.

- The film soundtrack states no radiation was released after each test. "No clarification is made that fresh fuel used in the test is one-millionth as radioactive as irradiated fuel, that it had no contaminants on its surface (as is usual with irradiated fuel) or that there was little likelihood of detecting much radiation from the fresh fuel, even if the cask had been breached, unless the geiger counter was directly over the crack." (Italics is the *Waste Paper's*)

- The film fails to mention that in two of the tests, there was *leakage* of water from the cask. In one instance, about one-half a cup was released. If the cladding had been damaged, the internal pressure would have been higher. And in an accident, there could have been a release of contaminated steam, instead of a small amount of water.

- The film fails to mention that ten minutes after the 90 minute fire, the outer shell of the cask, *cracked open in two places. If this cask had been in the five day Livingston, LA fire or the Caldecott tunnel fire in California, it might have cracked.* Furthermore, the cask tested in a fire in the Sandia film had been designed to withstand a fire *twice the regulatory standard.*

Faulty or Non-Existent Data

The Department of Transportation (DOT) estimates on the probability of radiation releases during and after an accident are based on a poor data base and incorrect assumptions.

- In estimating the severity of potential accidents, Sandia, which performed the analysis for DOT, used skewed data on speed of trucks at the time of crashes. Sandia assumed that with trucks, 78% of accidents occur at impacts less than 5 m.p.h. and only a mere 1.1% occur at impacts greater than 30 m.p.h. This assumption ignored a Texas survey showing that 98% of trucks on two-lane roads travel faster than 40 m.p.h.

- In estimating fire hazards, Sandia assumed a fire would burn at 1850° F. This assumption ignores the fact that 21 chemicals careening down highways or traveling by rail burn in excess of 3000°F.

- Sandia ignores that many nuclear waste transport routes are the same as routes along which hazardous chemicals travel. "Of 1,100 hazardous material accidents reported to DOT between 1977-1981, 40% took place along designated nuclear transport routes." "Incorrect assumptions" also plague NRC \$4 billion estimate of damages due to cask accidents in a city.

- The Nuclear Regulatory Commission (NRC) "assumes contamination would be primarily external." This ignores potential for contamination of buildings through ventilation ducts or of apartments through open windows. It also ignores likely contamination of subways.

- "The NRC assumes 10-day decontamination of a city." This lightning, ten day clean-up is based on preceding assumptions regarding external contamination. Plus it assumes only fire hosing down and street sweeping will be necessary. **Sand blasting of contaminated surfaces is not even considered.**

- NRC calculations ignore the high population densities during "daytime business hours" in cities such as Boston, Chicago, Pittsburgh and St. Louis.



Deep Insights We thought *Waste Paper* readers would like to know Blueberry, who was thanked for her "deep insights" in the acknowledgements for the *Next Nuclear Gamble*. Here she is, a canine who really knows her isotopes.

by Marvin Resnikoff

The Sad Saga of NAC-1

1979 • Duke Power Company finds the internal shell of NAC-1 is "bowed out of shape." Copper plates had been welded onto the outer shell of the cask in an attempt to provide radiation shielding necessitated by the bowing. This welding was done by the shipper, Nuclear Assurance Corp. (NAC), without approval of the Nuclear Regulatory Commission (NRC).

- NAC makes no effort to locate other NAC-1 casks or stop shipments.
- Eight shipments using two NAC-1 casks travel the 280 miles between a nuclear power plant in La Crosse, Wisconsin, and the away-from-reactor storage site at Morris, Ill. **The irradiated fuel was shipped from the nuke to Morris because, during re-racking at La Crosse, there was not enough space to store the hazardous fuel on site. Once the re-racking was completed, the fuel was shipped back again!**

- After the over 2000 miles of shipments are completed, the NRC orders inspection of the casks, and four are suspended from service. And what happened to one of the casks that was not removed from service — the NAC-1-D?

1980 • NAC-1-D ships irradiated fuel from San Onofre, California, to Morris, Illinois.

- After the 1800 mile trip, the cask is inspected and discovered to suffer from bowing. It is removed from service.

- After five months, the cask is re-inspected. Now, surprisingly, the bowing is no longer a problem and the cask is returned to service. But it is limited to the transfer of old fuel.

- NAC-1-D proceeds from Morris, Illinois to the nuclear power plant in Oyster Creek, N.J.

- Although out of service for five months, the cask is found to have significant surface contamination. **We wonder where the contaminated cask was stored for almost half a year?**

- The cask is painted to keep in the contamination and sent on its way from N.J. to Batelle Memorial Institute in Columbus, Ohio.

- The paint starts to peel off in a rainstorm in Pennsylvania because the wrong type of paint was used.

1981 • The cask continues to have a high surface contamination but remains in service, moving irradiated fuel between Morris, Illinois and La Crosse, Wisconsin.

Continued on next column

- These shipments were not insured because of a loophole in the Price Anderson Act. "Irradiated fuel shipments are not insured if they go from an uninsured facility to an insured facility." Morris is an uninsured facility.

- **The CASK IS WRAPPED IN A GIANT PLASTIC BAG. This is, apparently, the latest, in radiation protection.**

- Finally, after seven inspections, showing high surface contamination, the cask is pulled off the road. Meanwhile, the NAC-1-E cask was also experiencing major problems.

Defining Irradiated Fuel

Irradiated fuel is very different from fresh fuel. Irradiated means the fuel has been removed from the reactor core because it can no longer generate electricity. Irradiated fuel is extremely hot, both thermally and radioactively. In fact, the radioactivity levels are one million times higher than in fresh fuel.

You may have heard the term "spent" fuel before. Although it is referring to irradiated fuel, the term is misleading. It implies material that is wasted, has lost its power or decreased in radioactivity. Therefore, we use the term irradiated. One irradiated fuel rod contains over 60 radionuclides when it comes out of the reactor core. Some of these, like Uranium-238, will be toxic for over one trillion years.



Chlorine Gas Leak Firefighters in action at the scene of the derailment and explosion in Mississauga, Ontario in Nov. 1982. Chlorine gas leaked from a tank car. Could the emergency team have controlled this mishap if it involved an irradiated fuel car derailment?

The Globe and Mail, Toronto

Your Community Threatened

Valves — "The Achilles Heel" of Cask Design

- The pressure-relief valves on casks (designed to vent coolant and prevent the cask seal from rupturing in an accident) are designed in accordance with the standard American Society of Mechanical Engineers Boiler and Pressure Code. This standard was designed for "stationary nuclear power plant components." The adequacy of these standards for a cask that hurtles along the highway at high speeds has not been determined.

- After five years of service, the GE-IF-300 shipping casks were found to have valves that would not reseal after opening. The casks were "restricted to shipping older irradiated fuel in dry state." **Fuel older than five years does not have to be cooled by water. Therefore, there is less risk of water converting to steam in the heat of a fire and of the steam forcing the valves open. There is still some risk, however, because even "dry" casks have a small residue of water that, in an accident, could become steam.**

- Valves have never been adequately tested. During the Sandia tests, the casks were not under pressure equivalent to transport conditions, and valve opening and resealing problems were not addressed.

- The Teflon-like material used on valves and seals means the "failure threshold for closure drain valve

and vent valve seals is 30 minutes in a fire of 1,850° F." It is even less on a ruptured disk.

- "Data on Teflon valve seals indicate that failure would occur if the cask temperature [not fire temperature] exceeds 540° F." (Pacific Northwest Laboratories, *An Assessment of the Risk of Transporting Spent Nuclear Fuel by Truck*). **Shipping casks carrying fuel cooled for 150 days will normally have a temperature higher than boiling water. Some casks, such as the NLI-1/2, is normally 300-400° F. During a fire, this cask could reach 1200° F.**

Fires

- Casks are tested for only one-half hour. A CEP survey, however, shows that the average fire in a rural area lasts 47 minutes. Furthermore, a fire, such as the Livingston, LA train wreck of Sept. 28, 1982 raged for five days.

- The half-hour test is only at 1475° F. But the average highway fire burns at 1850° F. The Caldecott Tunnel Fire in California lasted for 1 hour and 45 minutes, burning at 1850° F, almost four hundred degrees higher than the testing requirements. In this devastating fire, in which 8 persons died, the truck completely melted, leaving only a radiator and pieces of metal behind.

- One out of 60 truck accidents result in a fire.
- Former President Jimmy Carter wanted casks to be tested to the same rigorous fire standard as pro-

pane tank cars — 1600° F for one hour and forty minutes.

- A cask's interior can reach 1600° F within "several hours after a fire has been put out . . . this is dangerously close to the ignition temperature of zirconium cladding (1688° F)." Zirconium cladding is used on all commercial nuclear fuel.

Drop, Torch and Crush Events

- Casks have been tested for a 30-foot drop. This equals a 39 m.p.h. crash into a movable barrier, such as a bridge abutment.

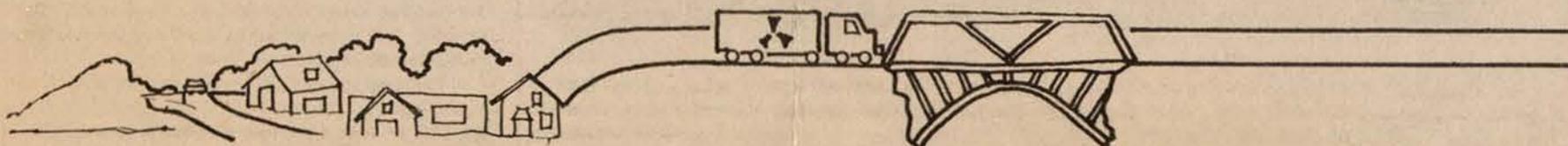
- There are no regulations which require shippers to travel no faster than 39 m.p.h.

- A crash at 12.5 m.p.h. can unseat a cask valve.

- The casks have not been tested for torch events. **This is not the Visigoths burning down Rome but an intense flame which can be produced by a punctured propane or ethylene oxide tanker.**

- Cask tie-downs are inadequately tested. These are the chains which attach the casks to the truck. The test requires only a 1.8 gravity force, "if the tie-down is not a structural part of the cask, e.g. a chain." Impact in an accident can be 90 gravity force. This means the cask would go flying in an accident.

- Crush tests are not required by the Nuclear Regulatory Commission. Yet, "If a cask is pinned between two rail cars, crush forces in a train accident can range up to 550 tons."



Resources

Hazardous Waste in America

by Epstein, Brown and Pope
\$27.50, 593 pp.
Sierra Club Books, 1982.

Prior to the 1970's no laws existed to regulate the disposal of hazardous waste generated from industry. Thus, indiscriminate dumping of toxic waste into unregulated landfills, large bodies of water, streams, open fields and abandoned lots proceeded unchecked for decades.

Despite the enormous increase in environmental laws and regulations, the Environmental Protection Agency (EPA) estimates that only 10% of the 80 billion pounds of hazardous waste generated annually is disposed of in an environmentally sound manner.

In their new book, *Hazardous Waste in America*, Brown, Epstein and Pope offer a comprehensive account of the development and the discovery of waste management problems in the U.S. The authors critique current policies designed to mitigate the problem by recommending alternative actions and policies for both citizens and government. For example, in Chapter 13 the authors recommend the establishment of an independent "superfund corp" of qualified experts to research and implement new hazardous waste clean-up technologies.

Appendix V explains techniques citizens and organizations can use to seek out and expose unidentified dump sites, such as by participating in the Sierra Club's and Environmental Action's "Hunt the Dump" Campaign.

By incorporating true accounts of communities which directly experienced the effects of poor hazardous waste disposal practices, Epstein, Brown and Pope disclose the horrors associated with these past actions. Similar problems exist with buried nuclear waste at sites across the U.S.

Samuel Epstein is an MD, at the University of Illinois; Lester Brown is a staff person for the U.S. House of Representatives Energy and Commerce Committee and Carl Pope is the Associate Conservation Director of the Sierra Club. Reviewed by Lisa J. Bunin and available from Sierra Club Books, 2034 Fillmore St., San Francisco, Ca. 94115, *Hazardous Waste in America* is required reading for the concerned layperson and an excellent desk reference for the more well informed.

Lisa J. Bunin is a recent graduate from the University of Buffalo. She received a master's degree in Environmental Studies.

Just Off the Press

Do you live near a leaky radioactive waste dump?

Are you a taxpayer that may have to pay maintenance costs on an abandoned "low-level" nuclear waste dump for several hundred years?

Is your state entering a regional compact that may encourage the siting of a nuclear dump in your community?

If so, you need two new, important educational aids from the Sierra Club Radioactive Waste Campaign. Our new fact sheet, "A 'Low-Level' Nuclear Waste Primer," answers the most often asked questions about "low-level" nuclear waste - what it is, how reactor and medical waste differ, the experiences at closed-down burial sites and much, much more. Available for \$1.00, or 20¢ each for 25 or more.

Also a new 30-page Resource Paper, "Insecure Landfills: The Exhumation Option" - an examination of the costs and methodology of exhumation projects at Idaho Falls, Idaho; Hanford, Washington; and Middlesex, N.J. It's an excellent resource for local, county, and state officials, available for \$5.00 to individuals and \$25.00 to corporations.

Send for our updated resource sheet for a full listing of educational materials.

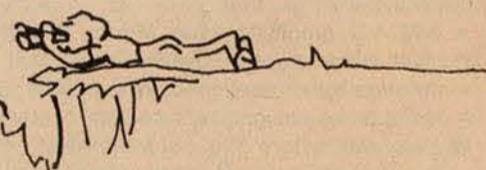
Waste Paper

Book Offer

27 nuclear waste truck

accidents likely by year 2000...

The *Waste Paper* is offering the Council on Economic Priorities' new book on the hazards of transporting irradiated fuel for a special price exclusively to our readers. The *Next Nuclear Gamble* by Dr. Marvin Resnikoff, with Lindsay Audin, describes the inadequate cask tests, faulty welds and discusses options to transporting this fiendishly toxic waste. The book can be purchased through the Radioactive Waste Campaign's Buffalo office for a special price . . . only \$14.95 including postage and handling. N.Y. residents add 7% sales tax. Countries outside the U.S. add \$1. This 378-page, soft-covered book is a great reference for organizing on nuclear waste issues and a must for concerned citizens.



Bubble, Bubble, Toil and Trouble

by Arjun Makijani
\$5, non-profit, \$25, other, 53 pp.
Health and Energy Learning Project, 1982.

Bubble, Bubble, Toil and Trouble is not the story of chocolate pudding boiling and burning on your stove. Rather it is an excellent report of the failures of the irradiated fuel reprocessing industry, both in the U.S. and abroad.

The report analyzes the operating experience of six reprocessing facilities in the U.S.A., Europe, and Japan. It concludes that plutonium reprocessing is not a viable, commercial technology. High capital costs, short plant lifetimes, operating capacities averaging 10 to 20 percent, and frequent accidents have plagued the industry. (See chart.)

At the present time, it is not certain whether the Tarapur, India plant is operating or at what capacity. It has had various trial runs in 1982. Socialist countries were excluded from this report because the only commercial reprocessing plant is in the USSR and information was not readily available.

Dr. Makijani is from India and has his doctorate in controlled nuclear fusion. He is currently working with the Health and Energy Learning Project in Washington, D.C. A copy of the report is available through the Project at: 236 Massachusetts Avenue, N.E., Suite 506, Washington, D.C. 20002.

Reprocessing Factories

COUNTRY	LOCATION	START-UP DATE	STATUS	DESIGN CAPACITY TONS/YR	APPROXIMATE AVERAGE ANNUAL AMOUNT REPROCESSED TONS/YR	COMMENTS
FRANCE	La Hague	1976	Operating	800	80	On the average, one serious accident every four months since January, 1980.
UNITED STATES	West Valley	1966	Shut Down 1972	300	100	Shut down due to excessive operating problems and radioactive releases.
JAPAN	Tokai Mura	1981	Operating Intermittently	210	30	Several prolonged shut downs and accidents in 1981. Trial runs conducted for four years, 1977-1980 inclusive.
UNITED KINGDOM	Windscale	1969	Shut Down 1973	100	25	An accident caused extensive radioactive contamination leading to shut down.
INDIA	Tarapur	1982	Trial Runs	100	--	Start up due 1982.
BELGIUM	Mol	1968	Shut Down 1974	75	30	Shut down due to chemical problems in dissolver.
WEST GERMANY	Karlsruhe	1971	Shut Down 1980	35	11	Shut down due to corrosion in dissolver.

*Chart taken from *Bubble, Bubble, Toil, and Trouble*.

Wayne... continued from page 1

The NRC has not been able to "estimate with reasonable accuracy the total volume and activity of the on-site wastes." The regulations call for accurate surveys, but NRC oversight was clearly lax. So far no one has stepped forward to claim responsibility for the cleanup. Grace & Co has made no statement. Neither the U.S. Department of Energy (DOE) nor the NRC has said what they intend to do with the radioactivity on the Grace property and downstream along Sheffield Brook. Former Grace workers claim this downstream contamination is partly due to purposeful dumping of thorium residues in the sewer system which feeds Sheffield Brook.

In a letter to DOE Secretary Hodel, Representative Robert Roe (Democrat, New Jersey) has requested DOE plans for the site cleanup. The silence has been embarrassing to Representative Roe, a powerful member of the House Science and Technology Committee that oversees the DOE budget. Meanwhile, the town of Wayne and the local activist group, Concerned Citizens of Wayne, are growing impatient at the foot dragging and are threatening a law suit.

Amid this growing storm, the only constant is the rain, averaging 40 inches per year, which drains into the Pompton Plains in Wayne, bringing thorium and radium into downstream water supplies. ☸

NL in Albany...

continued from page 3

reported illegal emissions of depleted uranium. NL was told to immediately halt these illegal operations.

A groundswell of community residents became greatly alarmed and held public meetings with an ACHD official who told them to keep their children indoors and to stop eating their garden produce. ACHD Commissioner John Lyons stated that NL would be shut down if the hazardous emissions did not cease.

Following this threat, NL and the Department of Environmental Conservation (DEC) signed an agreement limiting plant emissions to 500 microCuries per year (1 microCurie = one-millionth of a curie). They also agreed to place specific limits on the uranium chip melter bypass, the chief emission source. The limit would be *no more than* 1 microCurie per 24 hours and 50 per 12 months.

Only a month later, the State took NL to court and shut down the plant. NL's chip melter bypass had released 2,000 microCuries in a month and on January 23, 1980, alone had discharged 504 microCuries.

NL's 250 workers were laid off. Limited operations were resumed on March 31, 1980, and several dozen people were rehired. However, operations were cut back to practically nothing after a defense contract was cancelled. Today, eleven workers remain - four union men and seven management personnel.

In 1980, Commissioner Lyons stated that in order for NL to clean up the large quantities of uranium dust which had settled in the neighborhood, they had to produce a report detailing the extent of the contamination. NL hired Teledyne Isotopes to do the survey. Results were sent to state and county officials in November of 1980 and suppressed until May of 1982 when a *Knickerbocker News* reporter obtained the Teledyne report. It showed contamination on resident's front lawns were significant - as much as seven times over state radiation limits.

Barrels Found The aftermath of a May 1982 press conference held in front of the NL plant by concerned citizens, former NL workers and the Eastern New York Council on Occupational Safety & Health (ENYCOSH) uncovered eight uranium contaminated barrels and a piece of graphite mold on Niagara Mohawk land next to NL property. The mold was 500 times over the state limits for radiation. During the state's investigation of these materials, NL admitted for the first time, that they had a "legal," AEC approved uranium burial site from 1961. The state is still investigating why the contaminated material from this "legal" waste site ended up on Niagara Mohawk's land.

In the months that followed this discovery, DEC refused to conduct core sampling to determine the extent of the buried waste on NL and Niagara



Bumper Sticker for Congress? George Yasenchock and U.S. House Representative Robert Roe, as the Congressman places a bumper sticker on his shiny Cadillac. The group, Concerned Citizens of Wayne, N.J., which George organized, is currently fighting for the clean-up of a nuclear waste dump left from the Manhattan Project over 40 years ago. The citizens asked their Congressman to display the placard on his car in support of clean-up efforts at the site. Citizens across the country should urge their legislators and Congresspersons to display the placard.

courtesy of Today Newspapers

Mohawk land. Several streams traverse the properties. In addition to the eight barrels found in May 1982, citizens easily found another two uranium contaminated barrels in July. As a result of this find, residents called for the fencing of Niagara Mohawk land. Children played in this abandoned field where partially rusted drums protrude from the ground. Only after a New York State Assembly hearing on NL was fencing constructed in September 1982.

NL workers have documented overexposures from inhaling uranium and report serious accidents where uranium was imbedded in their skin. According to a 1979 lung scan test, seven workers were exposed to depleted uranium over the annual federal limit. In 1980, the Occupational Safety and Health Association (OSHA) cited NL for violations on respirator mask use and for overexposing two workers above the daily limits of uranium.

ENYCOSH's Task Force On NL has asked the federal agency, National Institute for Occupational

Safety & Health (NIOSH) for a health hazard evaluation. Despite NIOSH's analysis that NL's uranium contamination of the workers was as serious as the Tennessee Nuclear Specialties plant, in Jonesboro, Tenn., where a NIOSH study was in progress - they disapproved the request, citing such factors as budget cutbacks and their claims of a low likelihood of cancer.

Hearings Held In August of 1982, Assemblyman Maurice Hinchey of the N.Y.S. Assembly Environmental Conservation Committee, supported local demands for core sampling to investigate the buried waste claims. Former workers claimed that as many as four illegal buried wastes sites exist on NL's grounds. Hinchey subsequently held a State Assembly hearing on NL in September, where numerous NL workers presented personal accounts of dumping radioactive waste in storm sewers, working in rooms with heavy uranium dust with no masks and burning uranium waste without stack filters. Hinchey called NL's operations "a disaster."

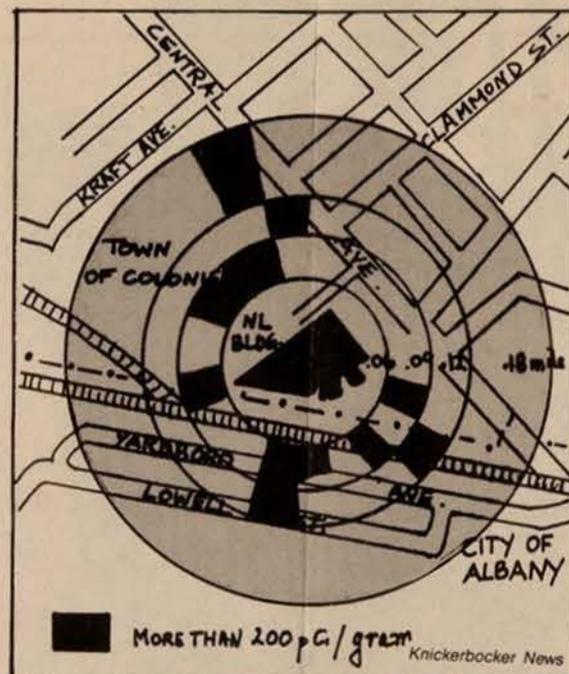
Community residents told of suspiciously high rates of cancer, of tumors in dogs and rabbits and of receiving little to no information from ACDH. They expressed their anger and frustration at watching the state and NL negotiate while living for three years in a contaminated community. One former resident emotionally recounted her son's recent death from leukemia and her fight to sue NL for the child's wrongful death.

Now after two years of out-of-court negotiations, the New York State Attorney General is taking NL back to court next spring, 1983, to force a clean-up of the surface contamination only. The buried waste and health study aspects may never be dealt with, unless strong pressure is brought by citizens.

Letters urging core sampling around the NL property and a health study of residents and workers are needed. Write to: The N.Y. State Dept. of Health, Bureau of Environmental Radiation Protection, Empire State Plaza, Tower Bldg., Albany, N.Y. 12237 and the Attorney General's office, James Sevensky, Environmental Protection Bureau, Empire State Plaza, Justice Bldg., Albany, N.Y. 12223. For more information on NL, write: A. Rabe, 248 Lark St., Albany, N.Y. 12210. ☸

Anne Rabe is chairperson of ENYCOSH's Task Force on NL Industries and has been working on the NL issue for over two years.

Tom Ellis is also a member of ENYCOSH's Task Force on NL and has been testifying for two years against Niagara Mohawk's nuclear program before the N.Y.S. Public Service Commission.



Map shows areas of radioactive contamination surrounding the NL Industries plant on Central Avenue in Colonie, N.Y. Dark areas show where concentrations exceed 200 picoCuries per gram (pCi/gm), the safety limit set by the state. Remainder of the area shown on map was found to have radioactive contamination below 200 pCi/gm, but above the natural level of 2 pCi/gm. Map is based on report of Teledyne Isotopes, a consulting firm that recommended contaminated areas be cleaned up.

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David Rogers
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Bulk Rates For public interest groups, 10 or more \$5 for adults, \$4 for kid's. Commercial, 10 or more \$5.50 for adults, \$4.50 for kid's. Send orders to: Sierra Club Radioactive Waste Campaign, 78 Elmwood Ave., Buffalo, N.Y. 14201. **Sizes:** S (32-34), M (36-38), L (40-42), XL (44-46). Kid's: 4-6, 8-10, 12-14.

Navy Pushes Ocean...

continued from page 1

implications of sub maintenance every 20 years is that its hull is corroding. But since the Navy downplays the effects of corrosion if the sub was sunk, the necessity for maintenance is peculiar. We feel the subs will corrode quickly in the briny deep.

The claim that there is no reduction in exposures is nonsense. During a 20 year period, Cobalt-60 would decay by a factor of 15 in the reactor compartment, therefore radiation exposures would be greatly reduced. But the Navy claims sinking the subs provides the lowest exposures. This is because the DEIS states it could take hundreds of years before water could enter the reactor compartment area if the subs were sunk.

Finally, concerning sub reactor compartment burial at Savannah River or Hanford, the Navy has not adequately addressed the barge transportation of these subs and the accident rates.

And at Savannah River, about 7,800 cubic yards of swamp would have to be dredged to construct a barge slip to bring the subs to the site. This swamp is laced with cesium from the L-reactor used in nuclear weaponry. The L-reactor is scheduled to start up again after a long rest of 14 years. This means more cesium in the swamp. Dredging will disperse the cesium into the Savannah River.

At Hanford, the nearby Yakima Indian Reservation is opposed to further nuclear contamination at the site. Neither of these issues are addressed in the DEIS.

Currently, there is a two-year moratorium on ocean dumping of any radioactive wastes. In the meantime, citizens should begin STOP OCEAN DUMPING campaigns in their communities. Both the Navy and the DOE will be pushing to kill any extension of a moratorium in the next two years. ☸

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