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**FERNALD CITIZENS TASK FORCE WEEKLY MAILING OF UPCOMING  
EVENTS AND MEETINGS AND LETTER BIERER TO CRAIG RE:  
INFORMATION RECOMMENDATIONS ON NATURAL RESOURCE RESTORAT  
AND SUMMARY OF CDC SUBCOMMITTEE MEETING**

**02/21/97**

**TASK FORCE    TASK FORCE  
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ANNOUNCEME**



2/21/97

# FRIDAY MAILING

## INCLUDED IN THIS MAILING ARE:

- Letter from Jim Bierer to Jack Craig re Informal Recommendations on Natural Resource Restoration
- Summary of Centers for Disease Control and Prevention Fernald Health Effects Subcommittee Meeting

## ANNOUNCEMENTS:

*Please note the following upcoming meetings:*

- WASTE MANAGEMENT COMMITTEE:** The Waste Management Committee will meet Wednesday, March 12, 1997, at 7:00 p.m. in the Uno Building.

Please Note!

- TASK FORCE MEETING:** There will be a full Task Force Meeting on Saturday, **March 15, 1997**, at 8:30 a.m. in the Alpha Building.
- FRESH MEETING:** FRESH will hold a meeting on Thursday, March 20, 1997, at Venice Presbyterian Church on Layhigh Road in Ross. All are welcome to attend!

## QUESTIONS:

- Please call John at [redacted] or Doug at [redacted] with questions or concerns. You may also fax or e-mail us at:

John      FAX: 281-3331      E-MAIL: john.applegate@law.uc.edu

Doug      FAX: 648-3629      E-MAIL: [redacted]



# NATURAL RESOURCES COMMITTEE

## MEMORANDUM

TO: Jack Craig, USDOE FEMP  
 CC: Task Force Members  
 Natural Resource Trustees  
 FROM: Jim Bierer, committee chair  
 DATE: February 19, 1997  
 RE: Informal Recommendations on Natural Resource Restoration

The Natural and Cultural Resources Committee met with representatives of DOE, USEPA, OEPA, and FDF to discuss progress on the draft Natural Resource Impact Assessment and the draft Natural Resource Restoration Plan. As part of this discussion the committee identified two areas where we believe DOE attention is required.

1. There are a great many activities going on at the FEMP which are beginning to change its physical configuration and appearance. In the course of asking questions about these activities, it became apparent that the Task Force was not completely aware of the nature of all of these activities. Almost certainly, area residents are even less informed. We recommend that DOE begin preparing an ongoing series of concise and informative fact sheets to keep citizens informed of site activities, particularly those that are visible from outside the site. Using pictures and describing how these activities relate to expected remediation at the site will help to keep everyone informed. The committee would be happy to discuss this matter further and assist in any way we can.
2. Within the Natural Resource Restoration Plan there are a number of proposals for early action to begin site contouring and resource restoration with the aim of minimizing the visual impact of site activities from local roadways and surrounding properties. These sorts of activities are consistent with previous Task Force recommendations regarding natural resource restoration, contouring, and planting in the buffer zone surrounding the on-site disposal facility. We fully endorse this approach and hope that the relatively small amount of resources required will be appropriated for these activities.

The Natural and Cultural Resources Committee is continuing to review and analyze information as it becomes available and anticipates sending a full slate of recommendations regarding natural resource restoration plans to DOE sometime in 1997. In the meantime, we feel it is useful to identify issues as they come to our attention to ensure that DOE can incorporate stakeholder issues into its plans to the maximum extent possible. Thank you for the opportunity to present these views to you. Please feel free to contact me or Doug Sarno should you have any questions about these informal recommendations.

**CENTERS FOR DISEASE CONTROL AND PREVENTION  
NATIONAL CENTER FOR ENVIRONMENTAL HEALTH  
FERNALD HEALTH EFFECTS SUBCOMMITTEE**

Summary of the Third Meeting  
November 13-14, 1996

The third meeting of the Fernald Health Effects Subcommittee (FHES) was held on November 13-14, 1996 in Fairfield, Ohio. All members were present but for Mr. Gary Storer and Ms. Nancy A. Smith. The minutes of the last meeting were accepted as edited at this meeting. A draft FHES mission statement prepared by Chairman Dr. Farrell and DFO Mr. Steven Adams was submitted to the members, and their comments requested before the next meeting on the mission statement and/or activities to accomplish those goals.

An overview of cancer terminology, rates and risks was presented by Dr. Judith Qualters. National and Ohio mortality and incidence rates were presented, as compiled from periodic U.S. and state population data estimates, state and federal death certificate data, and from new cases logged in state cancer registries. One local registry is the regional Northern Ohio Cancer Research Center, affiliated with the Greater Cleveland Hospital Association.

There are age, sex, racial/ethnic and geographic differences in cancer incidence and/or mortality. About 30% of cancers stem from tobacco use; about 20-35% from diet and nutritional factors, about 10% from infective processes, and 8% from are genetic. Other factors relate to occupation, reproduction, geography, pollution, etc. In the U.S., cancer is second only to heart disease in causing death. Of every 100,000 of the population in 1992, 172.2 died of it (mortality rate) and 419.9 developed it (incidence). Males have a 1:2 chance of developing some cancer, and 1:4 of dying of it; for women, those odds are 1:3 and 1:5, respectively. In 1996, over a million people will be diagnosed with cancer and about a half-million will die of it. Since 1973, cancer mortality has increased by only about 6%, but incidence is up 30%. Higher cancer mortality rates are often attributed to factors associated with lower socioeconomic status.

Males have a 50% cancer incidence and 54% higher mortality than females. Black males' incidence rose 46%, and blacks' mortality is 35% higher than whites. Lung cancer is the second leading cause of death for males. For females, stroke is second, lung cancer is third, and breast cancer is fourth. In 1996, Ohio was estimated to have 61,900 new cases and 25,300 cancer deaths. It has a significantly cancer mortality (180.4 versus 172.8/100,000 over a period of five years). Cancer incidence in 1996 was 419.9/100,000 and mortality was 380.4. Butler county's mortality rate was a little higher than the U.S., and Hamilton county was statistically significantly higher at 436.1/100,000.

For lung cancer, there is a 1:12 incidence and 1:14 mortality for men; 1:9 incidence and 1:24 mortality in women. The American Cancer Society (ACS) estimates 8400 new cases and 7500 deaths in 1996. Incidence rose 37% from 1972-1992, but survival also rose about 41%. Again, Ohio has a significantly higher lung cancer rate than the U.S. (53.4 versus 49.6/100,000). Incidence in Butler county (69.1) and Hamilton (76.1) is statistically significantly higher.

Dr. Richard Hornung then provided an overview of radon and its health effects. Radon itself does not cause lung cancer; its "daughter products" do. Radon is an alpha-emitting type of radiation which does not penetrate, but can be inhaled into the deep lung and has a short half-life of only 30 minutes. As a gas, radon does not travel far, but its daughter products can attach to particulates in the air ("equilibrium" is the extent they do this). Smoking creates air particulates, one reason radon is more hazardous to smokers who can then inhale the radon to the deep lung.

The average exposure of a U.S. home is about 1 pCi/L; about 4 pCi/L in a home would advise remediation (e.g., a ventilation system placed under a house's slab) to avoid lung cancer. Radon has a high linear transfer factor for radiation within a short distance; just one alpha particle's exposure to a cell can cause a mutation. Dr. Hornung outlined several radon studies, including those of miners that set the radon safety standard. He also reviewed the relative risk and additive risk models used in these studies. Relative risk defines the risk as it is affected by the person's age, background rate for some age, the radon dose, and other factors. In additive risk, the number of additional deaths attributed to radon would be added to the background rate (e.g. a 50% increase over 400 expected deaths would be 200 extra deaths). Radon risk is affected by age (the older, the less relative risk), the exposure rate, smoking status, and time from the last exposure. This was proven by the BEIR IV (Biological Effects of Ionizing Radiation) study series.

Mr. Robert Whitcomb then discussed radioactivity and its health effects. He defined ionizing and non-ionizing radiation, external and internal exposures, and pathways. Biological effects can be somatic (changes in individuals), genetic (changes in their offspring) or teratogenic (changes in the fetal or embryonic stages of development). These effects can occur in two ways: stochastic (random or occurring by chance) or deterministic (having a threshold for occurrence). No matter how small the stochastic dose, there is an increase of effect (e.g., the amount or severity of cataracts associated with radiation is proportional to the dose). But a deterministic dose-response relationship allows a portion of dose with no observed effects (the threshold).

Time factors in exposure include acute exposure (a large exposure over a short time) and chronic exposure (occurs over a long time). No genetic effects have yet been observed for any exposure, only inferred, in part because there is no advanced technology to do so. Factors that modify effects include the dose amount, rate over time, amount of the body exposed, radiation type, the person's health status, and age. In the U.S., cosmic, terrestrial and internal radiation produce a total natural radiation exposure of about 300 mrem/year. Artificial doses from medical x-rays, etc. raise this to 360 mrem/year.

Subsequently, Ms. Edwa Yocum described FRESH's activity to collect voluntary information on cases of area illness. She and Dr. Alfredo Vergara also described the Geographic Information System (GIS) program being used to computerize that information. This system includes complex census and EPA regulatory data; when the case information is included, it provides a common framework to allow comparison of information. The program is like a map developed by transparencies placed on top of each other to add or delete elements of the map. In a demonstration, the state of Ohio was reduced to zip codes, city/towns, streets, or company sites. For each area or specific point highlighted, the program can collect and display information, such

as a company's name, address, and the form and amount of EPA-regulated materials discharged. Census data can be used to show the population's characteristics (number, groupings [family, renters, etc.], land/water area), useful to estimates in standardizing a population's disease rate.

The FRESH information was coded to maintain the person's confidentiality. The program can map all the cases geographically or zoom in to provide details on a particular one. Among other information, the records revealed basically similar reports of lung cancer, kidney cancer and kidney disease for young adults 25-35, leukemia in children under 15, a lot of learning disabilities and Down Syndrome in one area. Currently, this program only uses map coordinates; other components of potential information could be diagnosis date, date of birth/death, address, residence dates, phone, date of data update, etc. The Subcommittee's input was solicited on this type of information's usefulness and what to include.

In discussion, the voluntary status of FRESH's and the Fernald Medical Monitoring Program's (FMMP) data was described as a weakness, as they may not be representative of the overall population. However, they can suggest incidence (though FRESH's reports may be duplicative) and serve to involve the community in active reporting. The FMMP information could also easily be transferred to a cancer registry.

Also raised by Ms. Yocum and discussed several times during the meeting was the possibility of scheduling the meeting times and sites more accessible to the public. The Subcommittee members decided to hold a Tuesday evening meeting around the Fernald site would be investigated before the next Wednesday/Thursday meeting, and set the future meeting dates for February 12-13 and May 7-8. However, Ms. Lisa Crawford, the FRESH President, stated that the current schedule does not meet the public's needs and makes inaccessible the valuable information given here. She urged the committee to meet in the Fernald area, on evenings and on Saturdays. Or, to allow the time needed for the committee's early instructional stages, she suggested a full day for internal discussions, as well as an evening and Saturday morning session. She noted that one Subcommittee member had not been able to attend a single meeting because of she has to work. She warned that continuing the present schedule would result in no public involvement.

On the other hand, it was noted that this committee is charged only to advise CDC and ATSDR on research, and that the members were specifically selected to be representative for both input and to convey information back to the community. CDC's difficulty, with five ongoing committees, to hold short evening and Saturday meetings was also raised. The members themselves were interested in greater public contact, but noted the intensity and length of meeting time to date, and that committee business could not be accomplished with a completely interactive process. The meeting minutes also are now available at the DOE Reading Room, through which the public can stay apprised. Among other solution suggested were further media releases (particularly to local (free) media and organization newsletters), videotaping the meetings, or establishing another easy vehicle of communication than the committee representatives, through which the public could submit written questions or opinions and receive a written answer. In the end, the committee members agreed to try a different schedule to support FRESH, and assess the schedule's practicability and the community's response.

Later, CDC's work to categorize the population by five-year age groups into an area grid, using census and other data, was reported. They now plan to verify the risk assessment numbers and identify a population for about 10% of the cells on the grid map. They will apply RAC's numbers to support a dose estimate to that population, to be done by next year.

ATSDR summarized the community health concerns collected by them since 1992, categorized by health concerns, exposures, the safety of the environment, and procedural issues related to the agency's work. Some of the concerns have been addressed, such as radon monitoring done in about 100 homes around the site to measure radon concentrations. Those measuring >10 pCi/L were re-tested and advised to remediate. ATSDR will continue to monitor at about a dozen area monitoring sites through the site's remediation. ATSDR also determined that though the silos are leaking more, the bentonite clay is still blocking the radon, and DOE is working to address that issue.

In addition, the produce and groundwater samples analyzed by ATSDR showed no radioactivity of concern, nor were milk samples. The agency was warned that DOE's collection methods may have diluted the samples, but ATSDR took these samples directly from the farm. The data from ATSDR's and Ohio EPA's ambient radon monitoring also showed no dramatic difference from DOE's sample analyses. Data from the EPA's National Air/Radiation Environmental Laboratory were to be checked for comparison, and national data which was collected continuously through the 1960s and 1970s. A Masters thesis done on Fernald's radon monitoring with data from inside and outside the buildings was to be supplied to the members.

NIOSH then reported the beginning of their exposure assessment of hazardous waste and decontamination/decommissioning (D&D) and cleanup workers, which may include Fernald. This site is also under consideration for inclusion in a lung cancer case-control study. NIOSH was urged to follow up on Fernald workers to address any exposure-related illness, but this constituted medical monitoring, not a NIOSH activity. The planned study would focus only on lung cancer, and since not all workers have been monitored, it was still uncertain how well it could be linked to health monitoring data. However, it is in this committee's purview to recommend new studies, and written suggestions would be responded to in writing.

Dr. Robert Wones then described the FMMP and the Fernald Workers Medical Monitoring Programs (FWMMP) for the committee. They both seek to determine the factors for disease, educate participants on how to modify those risk factors, and to provide baseline data for subsequent epidemiologic and genetic studies. The program's protocol was described.

About 1000 children and 8500 adults had participated in the FMMP, those who lived near or worked at the plant for two continuous years from 1982-1994. Any ambiguous test result precipitates a follow-up test, and telephone follow-up to urge health practices is extensive. They have a 65% completion rate for the annual follow-up questionnaire, and about a 75% return rate for the first focused triennial exam. The residents' program is funded for about 20 years. They have developed a re-examination protocol to be offered every three years, although annual mammograms are provided for women over 40.

The FWMMP is different from the residents' program in that it is funded to re-examine the

participants annually, rather than every three years, for the participant's life. Particularly for older persons (50 and over), annual examinations are of value. About 4000 workers were approved for the program, and about 2500 are expected to participate. Subcontractors were allowed into the program, but under more stringent criteria: they had to work one year straight as opposed to the workers' six consecutive weeks or two cumulative years.

The program provides compensation for emotional distress, medical monitoring and a concession on workers compensation claims. The program's goals for workers are similar to that for the residents. They have just begun an similar initial reexamination protocol, but more focused on occupational history. The worker's settlement also established a three-physician panel to review all the workers' compensation benefits applications potentially related to Fernald's toxins/radiation. If found valid, DOE agreed not to contest the claim; a first for DOE.

All information on the residents is computerized, but not that of the workers. The thorough protocol for researchers' access to this data was described, through to the return of the downloaded data. Such research done to date is very technical, relating to standardization devices for laboratory testing.

The FMMP was urged to actively involve the community's physicians to support and supplement its work. Also suggested was further outreach to those less-educated people who may not have a personal physician to be referred to. However, though the program has done outreach for monitoring, the settlement judge was not supportive of any further services than monitoring.

The final presentation was given by Dr. Evan Douple and Dr. James Martin of the National Academy of Sciences (NAS) committee which reviews CDC's radiation-related studies. They outlined the NAS' structure and membership. Their review of the Fernald dose reconstruction report was not yet final, but they offered some pertinent comments. They found the past doses well reconstructed, and the work on validation as good as could be done. The estimates of uranium releases to the environment were accurate and the modeling, data retrieval and analysis were excellent. The modeling may have even over-estimated the risk from releases; this is still under discussion. The nine exposure scenarios served well to help the Fernald public to interpret the study results to their own lives. It may be possible to offer personal dose estimates in future.

However, the NAS committee took exception to the risk assessment chart used in the report, a bar graph which showed the nine scenarios' best estimate of increased cancer risk. They felt that the graph makes the risk range look four times larger than the background, and much larger than the site's 3% increased relative risk. They felt that a broken line on the bar graph did not clearly represent the background range of radiation. Showing the complete bar graph without the break would have shown much more quickly that Fernald's risk was much smaller than the background risk. The graph's median shaded areas also focus on the highest percentile, not well indicating the minimal risk of anyone being in this group. The lowest (5th) percentile they also felt to be incorrectly placed and unclear about a person's chance of being in that group. The committee preferred a bell-shaped curve representation. Finally, they also noted the rarity of lung cancer from radon, so unusual that it requires 10,000-20,000 such lung cancer deaths to show an association. NAS hopes a combined-study meta-analysis in 5-6 years may be able to assess this

risk.

It was clarified that NAS will not develop a specific number of the possible over-estimation. However they will advise CDC when the demographic information is incorporated to apply the doses to the real populations in the grids. At that time, they will assess any source term overestimation to reduce the uncertainty and produce the best dose estimate. However, since the silo releases were so high, it may not ultimately matter if the release term was higher, as other uncertainties may balance that. A member of the audience asked how NAS or the contractor would factor in the synergistic effects of other factors than smoking, but there is not no science yet to allow this. However, a relative, if not quantitative, risk might be possible to construct, given comparable study populations.

In final discussion, the members began discussion of what was wanted from an epidemiologic study after CDC develops the population dose. The size of the effect is a consideration, as a large effect can be seen in a small population and vice versa. This involves study power; e.g., there would have to be separate studies for smokers and non-smokers since their risks are so different. It was reported that the FMMP is looking for any big excess of disease in their data to date, but this won't be known for some time. To counter multiple studies' potential of burning out the community, it was suggested that the FHES or a workgroup address cooperation to share data gathering efforts and perhaps data.

Further discussion focused on the members' wish to preserve a focus on the individuals behind the statistics, who can often be lost in the overall population numbers. There was some frustration expressed at the time it is taking to determine how the members can best help those people, even while acknowledging the help of epidemiologic study to indicate whether an abundance of disease in one area is an accurate representation of the whole picture. And, of the major areas of concern (cancer deaths and birth defects), the work to address the latter is extremely large and complex. Only a part of the problem is that 15-50% of medically-confirmed pregnancies spontaneously abort or miscarry, requiring a large population for sufficient statistical power to determine spontaneous abortion. However, a 3% background of birth defects better allows study. The FMMP is addressing male reproductive problems, a potential source of fetal deformities causing spontaneous abortion. More frustration was expressed at seeing such effects without any proof, and establishing a registry was strongly advocated. ATSDR could investigate that potential. Whatever work is done, it is almost certain to be costly.

Types of studies were outlined: case-control study (determining those with disease, those without it, and then comparing their doses), or a cohort study (determining those dosed and not dosed, and then comparing those with- and without disease). These involve many study components to find all the information necessary and then perhaps to extend it to a dose per person. A literature search about Down Syndrome was to be done for the committee, and further interest was expressed in uranium's toxicity as a chemical and teratogenic effects from chemicals, such as neural tube defects (NTD). A presentation of historical data was requested, to see how Hamilton county cancer rates may have changed over time. Another point of view was to have a qualitative presentation, or one on incidence and background, followed by a focus on conditions.

Finally, future agenda items were solicited and listed and the meeting adjourned.