FLORIDA DEPARTMENT OF HEALTH

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INTEROFFICE MEMORANDUM

DATE: April 1, 1999

TO: Sharon Heber, M.P.H.
Director, Division of Environmental Health

THROUGH: Brian Hughes, Ph.D., M.P.H.
Chief, Bureau of Environmental Epidemiology

FROM: Raúl Quimbo
Biological Administrator I

SUBJECT: Stauffer Chemical (Tarpon Springs)

INFORMATION ONLY

Enclosed is a report of our analysis on the matched data between the Stauffer Chemical Company of Tarpon Springs and the Florida Cancer Data System. Please let us know if you need additional information.

Raq/
Enclosure

Cc: Randall Merchant, Bureau of Toxicology
Lynn Chang, Office of the Inspector General

Analysis Of Cancer Incidence Patterns Among Former Employees
Of Stauffer Chemical Company (Tarpon Springs)

In response to a request by the Florida Department of Health, Bureau of Environmental Toxicology, to conduct an epidemiological study among former employees of the Stauffer Chemical Company at Tarpon Springs, the Bureau of Environmental Epidemiology initiated an analysis of available cancer information. The specific objectives of the analysis were: to collect and evaluate available cancer-related information on former employees in Stauffer Chemical Company (Tarpon Springs), and to explore the possibility of an epidemiological study. The following is a report based on the data.

Data sources

1) *Company employee list (CEL)*: A list of former employees' name and social security number was obtained from the Stauffer Chemical Company. There are 2,567 names on the list. Among the 2,567, 13 did not have social security number. There is no other information available in the CEL.

2) *Florida Cancer Data System (FCDS):* The FCDS is a state registry of all cancers diagnosed or treated in Florida hospitals since 1981. It was established by law and funded by the state through a Department of Health contract with the University of Miami. The data items collected for FCDS are compatible with national standards set by the Surveillance, Epidemiology and End Results reporting program, a project of the National Cancer Institute. The FCDS was used in the study to identify those in the CEL who were diagnosed with cancer in Florida since 1981.

Data process and analysis

We submitted the CEL to the FCDS to obtain a list of cancer cases among the former employees. A file with 208 records was returned. After eliminating duplicate records, 153 individuals and 171 cancer incident cases remained. If an individual had two primary cancers, then he was counted as two incident cases. The FDCS data contained personal information and diagnosis information.

The racial breakdown of the cancer cases indicate that 80 percent of the cancer cases are white and 20 percent are black (Table 1). The CEL did not contain information on the race of all employees hence, we could not determine if this racial distribution represents the population of employees.

TABLE 1. RACE DISTRIBUTION OF CANCER CASES AMONG FORMER STAUFFER CHEMICAL EMPLOYEES, 1981 -- 1998

RACE	NUMBER OF CASES	PERCENT
White	122	79.7
Black	30	19.6
Unknown	1	0.7
TOTAL	**153**	**100**

Source: Stauffer Chemical Company & the Florida Cancer Data System.

Ninety-four percent of the cases were male (Table 2). The CEL did not contain information on the gender of all employees hence, we could not determine if this gender distribution represents the population of employees.

TABLE 2. GENDER DISTRIBUTION OF CANCER CASES AMONG FORMER STAUFFER CHEMICAL EMPLOYEES, 1981 -- 1998

GENDER	*NUMBER OF CASES*	*PERCENT*
MALE	144	94.1
FEMALE	9	5.9
TOTAL	**153**	**100**

Source: Stauffer Chemical Company & the Florida Cancer Data System.

More than 80 percent of the cancer cases were diagnosed in patients 55 years old or older (Table 3). The CEL did not contain information on the ages of all employees hence, we could not determine if this age distribution represented the population of employees.

TABLE 3. AGE DISTRIBUTION OF CANCER CASES AMONG FORMER STAUFFER CHEMICAL EMPLOYEES, 1981 -- 1998

AGE GROUP	*NUMBER OF CASES*	*PERCENT*
20 TO 24	1	0.7
25 TO 29	1	0.7
30 TO 34	2	1.3
35 TO 39	1	0.7
40 TO 44	4	2.6
45 TO 49	9	5.9
50 TO 54	9	5.9
55 TO 59	16	10.5
60 TO 64	24	15.7
65 TO 69	25	16.3
70 TO 74	34	22.2
75 TO 79	13	8.5
80 TO 85	8	5.2
> 85	3	2.0
Unknown	3	2.0
TOTAL	**153**	**100.0**

Source: Stauffer Chemical Company & the Florida Cancer Data System.
Note: If a case was diagnosed with two or more cancers, we took the age of the patient during the first diagnosis.

Table 4 displays the cancer incidence by type among the former Stauffer Chemical employees. Some employees were diagnosed with two or more cancers. This explains the difference between cases and incident cases. The two most frequent types of cancer among the former Stauffer Chemical employees were prostate cancer, and lung and bronchial cancer. Prostate cancer is the leading cancer diagnosed among men in Florida. The age-adjusted rate of prostate cancer among males in Pinellas County is 104.9 per 100,000 person-years. The age-adjusted rate for the entire state is 102.1 per 100,000 person-years. The age-adjusted rate of lung cancer among males in Pinellas County is 82.1 per 100,000 person-years. The age adjusted rate for the state is 82.3 per 100,000 person-years.

TABLE 4. CANCER INCIDENCE AMONG FORMER STAUFFER CHEMICAL EMPLOYEES, 1981 -- 1998

TYPE OF CANCER	*INCIDENT CASES*	*PERCENT*	*RANK*
Prostate	42	24.6	1
Lung & Bronchus	30	17.5	2
Bladder	10	5.8	3
Non-Hodgkin's Disease -- Nodal	9	5.3	4
Stomach	7	4.1	5
Sigmoid Colon	7	4.1	5
Esophagus	5	2.9	7
Large Intestine, NOS	5	2.9	7
Melanomas-Skin	5	2.9	7
Defined & Unspecified Sites	5	2.9	7
Pancreas	4	2.3	11
Rectum	3	1.8	12
Breast	3	1.8	12
Kidney & Renal Pelvis	3	1.8	12
Other Buccal Cavity & Pharynx	2	1.2	15
Cecum	2	1.2	15
Ascending Colon	2	1.2	15
Hepatic Flexure	2	1.2	15
Splenic Flexure	2	1.2	15
Rectosigmoid Junction	2	1.2	15
Larynx	2	1.2	15
Cervix Uteri	2	1.2	15
Testis	2	1.2	15
Non-Hodgkin's Disease -- Extranodal	2	1.2	15
Tongue	1	0.6	25
Salivary Glands	1	0.6	25
Gum & Other Mouth	1	0.6	25
Tonsil	1	0.6	25
Oropharynx	1	0.6	25
Descending Colon	1	0.6	25
Liver	1	0.6	25
Other Non-Epithelial Skin	1	0.6	25
Brain	1	0.6	25
Thyroid	1	0.6	25
Chronic Lymphocytic Leukemias	1	0.6	25
Acute Granulocytic	1	0.6	25
Aleukemic, Subleukemic & NOS	1	0.6	25
TOTAL	**171**	**100**	

Source: Stauffer Chemical Company & the Florida Cancer Data System.

In the following three tables, we further analyzed the lung cancer incident data. The racial distribution of the lung cancer case is not significantly different from the racial distribution of all cancer cases (Table 5).

TABLE 5. RACE DISTRIBUTION OF LUNG CANCER INCIDENCE AMONG FORMER STAUFFER CHEMICAL EMPLOYEES, 1981 -- 1998

RACE	*INCIDENT CASES*	*PERCENT*
White	23	76.7
Black	7	23.3
TOTAL	**30**	**100**

Source: Stauffer Chemical Company & the Florida Cancer Data System.

The age distribution of lung cancer incidents is similar to all cancer cases in that 80 percent of the lung cancer cases were diagnosed in individuals 55 years old or older (Table 6).

TABLE 6. AGE DISTRIBUTION OF LUNG CANCER INCIDENCE AMONG FORMER STAUFFER CHEMICAL EMPLOYEES, 1981 -- 1998

AGE GROUP	*INCIDENT CASES*	*PERCENT*
20 TO 24	0	0.0
25 TO 29	0	0.0
30 TO 34	0	0.0
35 TO 39	0	0.0
40 TO 44	1	3.3
45 TO 49	4	13.3
50 TO 54	1	3.3
55 TO 59	3	10.0
60 TO 64	9	30.0
65 TO 69	2	6.7
70 TO 74	5	16.7
75 TO 79	3	10.0
80 TO 85	2	6.7
> 85	0	0.0
TOTAL	**30**	**100.0**

Source: Stauffer Chemical Company & the Florida Cancer Data System.

Of 30 lung cancer incidents, 33 percent smoked less than one pack a day or had a history of smoking. More than half of lung cancer cases smoked one pack or more a day (Table 7). Lung and bronchial cancers have been associated with the use of tobacco products.

TABLE 7. TOBACCO USE AMONG FORMER STAUFFER CHEMICAL EMPLOYEES DIAGNOSED WITH LUNG CANCER, 1981 -- 1998

TOBACCO USE	*INCIDENT CASES*
NONE	1
HISTORY OF SMOKING	8
LIGHT, LESS THAN 1 PACK/DAY	2
MODERATE, 1-2 PACK/DAY	9
HEAVY, MORE THAN 2 PACK/DAY	8
CIGARETTES, NOS	1
UNKNOWN	1
TOTAL	30

Source: Stauffer Chemical Company & the Florida Cancer Data System.

All prostate cancer cases were diagnosed in individuals 55 years old or older (Table 8). This is significantly different from the age distribution of all Stauffer Company employees cancer cases.

TABLE 8. AGE DISTRIBUTION OF PROSTATE CANCER INCIDENCE AMONG FORMER STAUFFER CHEMICAL EMPLOYEES, 1981 -- 1998

AGE GROUP	*INCIDENT CASES*	*PERCENT*
20 TO 24	0	0.0
25 TO 29	0	0.0
30 TO 34	0	0.0
35 TO 39	0	0.0
40 TO 44	0	0.0
45 TO 49	0	0.0
50 TO 54	0	0.0
55 TO 59	3	7.1
60 TO 64	5	11.9
65 TO 69	14	33.3
70 TO 74	11	26.2
75 TO 79	5	11.9
80 TO 85	2	4.8
> 85	0	0.0
UNKNOWN	2	4.8
TOTAL	**42**	**100.0**

Source: Stauffer Chemical Company & the Florida Cancer Data System.

The racial distribution of prostate cancer incidents is similar to that for all cancer cases in that 80 percent the prostate cancer cases were diagnosed among those who were white.
(Table 9).

TABLE 9. RACE DISTRIBUTION OF PROSTATE CANCER INCIDENCE AMONG FORMER STAUFFER CHEMICAL EMPLOYEES, 1981 -- 1998

RACE	*INCIDENT CASES*	*PERCENT*
White	34	81
Black	8	19
TOTAL	**42**	**100.0**

Source: Stauffer Chemical Company & the Florida Cancer Data System.

Discussion

The basic information needed to conduct an occupational health outcome investigation such as date of birth, date of employment, data of termination, sex, race, job classification, hours worked, and location in the company while on the job was not available in the CEL. The absence of necessary information prevented us from formulating a hypothesis regarding exposure to specific chemicals and cancer outcomes among the former employees of Stauffer Chemical Company.

We also do not have an appropriate reference population to compare incidence rates. An appropriate reference population is a comparison group with similar characteristics, such as employment history, age, race, gender and location of residency. Without an appropriate reference population, we can not determine if the occurrence of cancers among employees is unusual. This would hold true even if we could obtain additional information on the former employees from Stauffer Chemical Company.

We examined the most frequent types of cancers diagnosed every year in men for the entire state from data published by the FCDS for the years 1989 to 1997. In these nine years, prostate, lung and bronchus, and bladder cancers consistently ranked first, second, and third. The next most common types of cancers in men were Non-Hodgkin's (nodal), sigmoid colon, melanoma of the skin, rectum, kidney and renal pelvis, larynx, and stomach. The frequency distribution of cancers among former employees of Stauffer Chemical Company is almost similar to that of all male cancers in the state. However, as explained above, a comparison should be done with caution since the general population of men may not be the appropriate reference population for the employees of Stauffer Chemical Company. Also, for reasons explained below, the use of FCDS to identify cases might not completely identify all employees who were diagnosed with cancer.

Since the company operated between 1950 to 1981, the use of FCDS may not count all cancers occurring in the employee population. Some former employees may have moved out of Florida. If these employees have retained residency in Florida and were diagnosed in states where we have an information exchange agreement then they would be included in the FCDS database. If the former employee declares residency in the new state, then his cancer records will not be shared with FCDS. Presently, FCDS has information exchange agreements with only 36 states (with three pending). Furthermore, since the FCDS only started collecting hospital based cancer information in 1981, we are not able to include cancers diagnosed before this date. The data used in this report may therefore undercount the true number of cancer incidence among the former employees in Stauffer Chemical Company in Tarpon Springs.

Conclusion

The available data does not allow analysis beyond a simple description of employees of Stauffer Chemical Company who were diagnosed with cancer. Since we used the FCDS as our source in identifying cases, we may not have captured all cancer outcomes in this group. Even if other sources were included, our ability to evaluate the cancer outcomes is limited by the absence of an appropriate comparison group.

To investigate an association between cancer outcomes to specific hazards while working with Stauffer Chemical Company, we will need information on type, duration, and intensity of exposure to these hazards. These are not currently available to the Bureau.

In conclusion, our analysis of the available data did not produce conclusive results, even when supplemented with additional data from FCDS. We are not able to ascertain if the occurrence of cancer among employees of the company is high or low. We are also not able to relate these cancer outcomes to occupational hazards that may have been present when Stauffer Chemical Company was in operation. Further epidemiological analysis will not be possible until the additional information, as previously identified above, is available.